

50X1-HUM

**Page Denied**

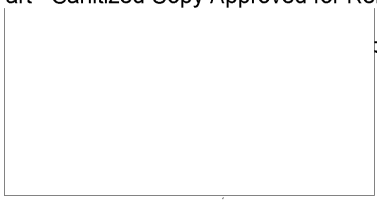
Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

50X1-HUM

MAINTENANCE INSTRUCTIONS

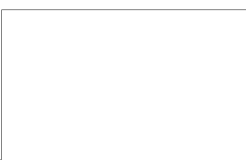
No. 11

50X1-HUM



GENERAL

1. Inspections and maintenance operations on the aircraft should be performed in compliance with the present Maintenance Instructions, Routine Maintenance Instructions, Aircraft Operating and Maintenance Instructions as well as with relevant instructions and bulletins in effect.
2. Maintenance operations related to the aircraft, engines, armament, radio, radar and aircraft equipment should be performed at fixed intervals determined by the number of flying hours, i.e. every 25 $\pm$ 5, 50 $\pm$ 5, and 100 $\pm$ 10 flying hours. It should be noted that 50-hour maintenance should include 25-hour maintenance operations and 100-hour maintenance should include 25-hour and 50-hour operations.
3. If the engine or other units of the aircraft have been replaced, maintenance work related to these units should be carried out after a certain number of flying hours, i.e. after 25 $\pm$ 5, 50 $\pm$ 5 and 100 $\pm$ 10 flying hours. In this case maintenance operations on the newly installed engine or unit may be performed ahead of schedule.
4. To ensure trouble-free operation of aircraft material under diverse climatic conditions (excessive humidity, dust, etc.), or when specific missions impose heavier loads upon individual units of the aircraft (landing gear or armament subjected to more strenuous use), when the engines have been replaced or the aircraft withdrawn from flying missions for a long time, the



Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

organization and unit commanders are entitled with the right of issuing orders on performance of maintenance operations in all or individual aircraft or units thereof ahead of time, in conformity with the present Maintenance Instructions No.11.

5. Prior to forwarding the aircraft for maintenance it should be inspected according to the postflight inspection program and a list of defects should be drawn up. The discovered defects should be corrected by the aircraft and ground crews except for the defects which can be eliminated during maintenance work only.

6. Before proceeding with maintenance operations, unload the seat ejection gun, after which the aircraft should be inspected by the heads of the maintenance groups together with the aircraft mechanic in the scope of the postflight inspection.

7. All the airframe units except for the turbo-cooler, stabilizer emergency unit ANC-4 electric mechanism and wheel bearings should be lubricated with IMATM-201 lubricant. The turbo-cooler should be lubricated with OKE-122-14 oil, the ANC-4 mechanism - with OKE-122-12 oil, and the wheel bearings - with HK-50 lubricant. Cables enclosed in flexible metal sheathing should be lubricated with MK-8 oil or transformer oil.

8. Corroded sections of cables should be wiped with kerosene-soaked rags, then with dry rags and coated with IMATM-201 lubricant.

9. All maintenance work on the aircraft should be performed with serviceable and marked tools and accessories.

Before and after maintenance operations on the aircraft, check the tools against a special check list to prevent their loss or inadvertent leaving in the aircraft.

10. Before inspection and maintenance work on the aircraft, remove dirt, dust, and old lubricant from the external surfaces of the aircraft units, armament, radio, radar and aircraft equipment and their wiring and linkage.

11. Ball bearings of a closed type must be neither packed with grease nor washed; they must only be wiped and coated with a thin layer of lubricant on the outside.

12. Inspection of the aircraft should be carried out in a definite sequence shown in Inspection Route (Fig.1); the engine should be run up in accordance with the Engine Testing Chart (Fig.2).

13. The squibs of the seat ejection gun, canopy jettisoning gun and fire extinguishing system should be replaced every 12 months.

#### SAFETY PRECAUTIONS

14. Before the beginning of an inspection or maintenance work on the aircraft, take necessary precautions to prevent accidental firing, dropping of tanks, retraction of landing gear, and undue functioning of the electric units which may result in an accident or destruction of the aircraft material.

For this purpose, open the cockpit and, without climbing in, do the following:

- (a) make sure that the seat ejection gun is locked by the main and ground safety latches and that the face screen handle, ejection levers on the arm-rests and the spring mechanism levers are locked;
- (b) check whether the canopy independent jettisoning handle is in the CLOSED (SAFETY) position and locked;
- (c) check whether the bomb jettisoning and fire control buttons are closed with protective caps and clips;
- (d) see that the L.G. control is locked in the neutral position;

(e) check whether the storage battery and all electric switches are OFF (circuit breakers located under the R.H. organic glass panel may be turned ON except the ARMED-SAFE (B3PHE-HEB3PHE) circuit breaker). When installing the drop tanks on the aircraft do not switch ON the battery and the ground power supply source until the installation of both tanks is completed;

(f) check whether the ARMED circuit is OFF (safety pin is in).

15. Adjustment and checking of the seat ejection gun firing linkage as well as test ejections by means of dummy cartridges should be carried out by the armourers together with the operators from the aircraft maintenance group.

When the seat is removed between the specified maintenance intervals, the seat ejection linkage should be inspected by the aircraft mechanic together with the armourers from the ground crew. The ejection gun should be loaded with squibs and dummy cartridges (for test ejections) and unloaded by the armourer.

16. Before proceeding with maintenance work unload the rocket armament, 9KCP-4G, magazine and the seat ejection gun. All the operations related to repairs, preparation and adjustment of the ejection gun on the ground should be performed with the squibs removed.

17. When the aircraft engines are running, the personnel must keep at least 15 m. away from the front part of the intake ducts.

18. On aircraft with controlled stabilizer it is not allowed to switch on the APV mechanism<sup>x)</sup> control unit without switching on the BY-14MC hydraulic booster or AHC-4 electric mechanism drive.

<sup>x)</sup> The mechanism referred to here and hereunder as "APV mechanism" is the variable ratio automatic boost control unit.

19. All the openings in the aircraft units and pipes uncovered during disassembly should be immediately closed with plugs or P.V.C. covers.

20. To avoid emptying of the internal chambers of the engine pumps open the filler neck of No.1 tank before draining it and build up a certain pressure in the fuel system (by the use of No.1 tank pump) after which close the fuel cut-off cocks and drain the fuel.

21. When performing maintenance operations in the engine compartment (with the engines installed) observe the following:

(a) all operations must be performed only with tools secured by strings;

(b) take necessary measures to prevent the removed units and fastening parts from falling into the compartment; for this purpose spread a clean cloth around the unit being serviced;

(c) all assembly and disassembly work should be performed with closed air blow-off bands.

22. If the engine lubricating system has been drained, fill the engine with oil to the normal level before starting, spin the cold engine two or three times then start it; after stopping the engine, check the oil level and add oil to bring its level to 10.5 - 11 lit. mark.

23. When starting the engine, it is not allowed to leave the air blow-off band closed as this may cause engine hunting during starting or operation or at intermediate speeds.

24. Before carrying out any work in the wells of the landing gear, wing flaps, and air brakes, reduce pressure in the hydraulic system down to zero, switch off the storage battery and shift the air brake switch to the **ВЫПУЩЕНО** (BYPYIYIIEHO) position.

25. When inspecting the air brakes do not extend them by pressing the button located on the aircraft control stick; the air brakes should be extended only by means of the switch located on the engine control lever. Failure to observe these rules may cause spontaneous closing of air brakes and lead to an accident.

26. Having opened the sliding section of the canopy from outside, shift the external opening handle to the initial (depressed) position; with the canopy open do not switch on the canopy pressurization cock.

27. The canopy glasses and rubber parts should be protected from sunlight by putting a special cover on the canopy of the parked aircraft.

28. It is not allowed to remove the canopy from the aircraft together with the interlocking cable.

When carrying out any work in the cockpit with opened or removed canopy, place safety caps on the rods of the canopy remover pneumatic gun.

29. While loading or unloading the aircraft armament, place a red danger tag or a red light 3 to 5 m. ahead of the aircraft nose. In addition, when installing the rockets into the pods a red danger tag or lamp should be placed also behind the aircraft tail unit. The tag or lamp indicates that personnel are not allowed to approach the nose or the tail part of the aircraft.

30. It is not allowed to start the engines more than four times in succession including cold spinning; after four startings make a 30-minute interval.

31. Before starting the engine for the first time and each time after disconnecting the engine fuel system or replacing the fuel system units as well as when there are

reasons to suppose that the fuel system is air-bound, the system should be primed; in this case the engine should be started with open hatches; having checked the system for tightness, close the hatches in the engine compartment.

AIRFRAME AND ENGINE

PREFLIGHT OPERATIONS

Inspect and check the following:

Intake ducts 1 (Fig.1)

1. Look for shell holes and foreign objects.

Fuselage nose section 2

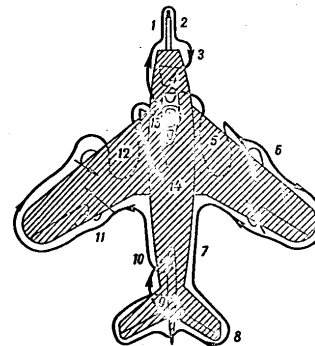
2. Look for deformations and damaged sections of the skin.
3. Check condition and attachment of the Pitot tube rod and TH-15G impact pressure tube.
4. Look for leaks in the de-icing system.
5. Make sure that the armament and radio equipment access hatches are closed.

Upper nose compartment 3

6. Check for any foreign objects in the compartment.
7. Inspect condition of the nose gear mechanical position indicator.

Nose gear 4

8. Check inflation of the nose wheel tyre by measuring its deflection which should be from 10 to 15 mm.
9. Check whether the grounding cable is properly secured in its socket.



**Fig.1. Inspection Route**

1 - intake ducts; 2 - fuselage nose section; 3 - upper nose compartment; 4 - nose gear; 5 - main landing gear, R.H. strut; 6 - starboard wing; 7 - fuselage, starboard side; 8 - tail unit; 9 - jet nozzles; 10 - fuselage, port side; 11 - port wing; 12 - main landing gear, L.H. strut; 13 - draining fuel sediment from No. 1 tank; 14 - refuelling the aircraft; 15 - cockpit.

10. Look for leakage of AMT-10 oil from the shimmy damper.
11. Check the pressure of air (nitrogen) in the shock absorber (by parking compression) and look for leakage of AMT-10 oil on the surface of the rod.
12. Look for AMT-10 oil leaks from the nose gear retracting cylinder.
13. Look for AMT-10 oil leaks from the units, pipes and hoses in the nose gear well. Inspect condition of pipe flanging and check fastening of the oxygen cylinders.
14. Check fastening and functioning of the nose gear doors.

Main landing gear, R.H. strut 5

15. Check inflation of the wheel tyre by its deflection which should be from 30 to 40 mm. At sub-zero temperatures of the outside air, make sure there is no ice under the brake shoes (as far as this can be checked visually).
16. Check the pressure of air or nitrogen in the shock absorber (by the degree of parking compression) and look for AMT-10 oil leaks through the shock absorber scaling collars.
17. Look for AMT-10 oil leaks from the strut retracting cylinder.
18. Check whether the uplocks of the strut and wheel door are open. Inspect the condition and attachment of the L.G. doors (on the wings, strut and wheel).
19. Look for AMT-10 oil leaks from units, hoses and pipes located in the strut well.
20. Check whether the wing hatch lids are reliably closed, look for AMT-10 oil leaks from the aileron hydraulic booster hatch and inspect attachment of the aerodynamic stall fence.



21. Examine condition of the main landing gear strut mechanical position indicator.

22. Check for fuel leaks from the drop tank.

Fuselage, starboard side 7

23. Check whether the hatch lids are reliably closed.

24. Inspect the position of the air by-pass shutters on the lid of the R.H. hatch in the engine compartment.

25. Look for AMP-10 oil and fuel leaks (with opened engine hatches and during short-term operation of the pumps of Nos 1, 2, 3 and 4 tanks).

26. Check the vent pipe connections for cleanliness.

27. Make sure that the fuel shut-off cocks and the air blow-off band are open.

Tail unit 8

28. Inspect condition of the stabilizer and look for any foreign articles between the fillet and the stabilizer.

29. Check the tail unit hatch lids for reliable closing.

30. Check condition of the trailing edge or position of the rudder trim tab (if any) in keeping with the inscription on the tab.

Jet nozzles 9

31. Look for any foreign articles and for AMP-10 oil leaks from the pipes and cylinders controlling the jet nozzle shutters, check whether the nozzle shutters open easily and check their position (the shutters should occupy the AUGMENTED position).

Fuselage, port side 10

32. Inspection should be carried out in the same way as prescribed for the starboard side (See Paras 23 - 27).

33. Examine the drag chute hatch doors for reliable

closing, check for proper locking and reliable closing of the drag chute door locks and cable lock; the cable must not be slack and it must be securely fastened in the clamps; the door lock closed position stops should be located opposite the marks on the fuselage.

Port wing 11

34. Carry out the inspection in the same way as prescribed for the starboard wing (See Paras 20 - 22).

35. Check position of the aileron trim tab in keeping with the inscription on the tab.

Main landing gear, L.H. strut 12

36. Inspect in the same way as it is prescribed for the R.H. strut (See Paras 15 - 19).

Checking fuel quality in No.1 tank 13

37. Drain fuel sediment through drain cocks of No.1 tank and make sure it contains no water or foreign matter.

Note: Draining of fuel sediment from other points of the system intended to drain fuel and sediment should be carried out not less than twice a year (in spring and fall).

38. Shut the drain cocks and lock them securely.

Checking aircraft for servicing 14

Open the hatches and do the following:

39. Check the amount of main fuel in the aircraft by the fuel level in No.1 tank; when checking the amount of fuel in the tanks, make a note of the readings of the fuel flow meter.

The fuel level in the fuselage tanks and drop tanks must

be 20 - 30 mm and 10 - 20 mm below the lower edge of the filler neck in summer and winter, respectively.

40. Check the amount of fuel in the starting system. The fuel level in the tank should be 40 mm below the lower edge of the filler neck, both in winter and summer.

41. Check the amount of oil in the lubricating system. The oil level in the tanks should be at the height of 10.5 - 11 lit, mark on the "I" and "II" dipsticks for the port and starboard engines, respectively. Ground operation of the engine is permitted with no less than 7 lit. of oil in the tank.

42. Check the amount of oil in the hydraulic system. At zero pressure in the system, with retracted wing flaps and air brakes the level of AMT-10 oil in the tanks should be within the marks on the dipstick.

43. Check the amount of alcohol in the de-icing system. The tank should contain not less than 3 lit. of alcohol.

44. Close the filler caps and hatch lids after checking the amount of fuel and oil in the aircraft systems.

#### Cockpit 15

45. Check canopy glasses for absence of cracks and see that the organic glass is perfectly transparent; inspect the de-icing manifold for cleanliness. Check condition of the pressurization hose and its coating.

46. Check the pressure in the air bottle of the canopy pressurization system (rated pressure 50 kg/cm<sup>2</sup>) and in the canopy jettisoning bottle (rated pressure 100 - 130 kg/cm<sup>2</sup>) and make sure the emergency rack is properly locked.

47. Inspect condition of the pilot's harness and its locking mechanism on the pilot's seat; see that the face screen, seat arm-rests, L.G. lock emergency opening handle, and the flexible pin of AD-3 automatic pressure unit are locked; inspect condition of the snap hook attaching AD-3 unit halyard to No.7 frame; straighten out the straps.

48. Check whether the blocking devices of the canopy and jettisoning mechanism are properly locked.

49. Climb into the cockpit and check for smooth closing and opening of the sliding section of the canopy and see that it is reliably locked in the foremost and rearmost positions. Check the canopy locks for reliable closing and make sure the canopy lock control levers and the canopy independent jettisoning handle are duly locked and cottered.

50. Check condition of the engine control levers, reliability of their locking on the stops and ease of movement.

51. Check functioning of the brake system by pressing the wheel brake lever and pedals; examine the air vent holes located in VII-30 relief valves for cleanliness.

Note: At subzero temperatures of ambient air make sure that the brake shoes respond to depression of the brake lever.

52. After starting and warming up the engines, work the aircraft control stick right and left (with disconnected hydraulic boosters) and depress the pedal to make sure that the ailerons and the rudder are fully deflected in the necessary directions without knocking and jamming and that the resistance of the spring-feel mechanism is felt on the control stick.

53. Check functioning of the main hydraulic system and hydraulic booster system.

54. Check operation of the stabilizer control system (together with the aircraft equipment mechanics).

55. Check deflection of the aileron trim tab. After the check, set the tab to the position corresponding to the inscription on it.

56. Check whether the landing gear and wing flap emergency opening cocks are tightly closed and locked with type KOK wire of 0.5 mm diameter. Check whether the caps of the FUEL

SHUT OFF COCK (НЕПЕРКРЫТОМ КРАЙ) closing buttons are locked with brass wire of 0.25 mm diameter.

57. Look for foreign objects and water in the cockpit; in winter, look for any ice especially under the pilot's seat (inspect through hatches in the seat). Remove the covers from the АД-5 pressure unit and from the wing flap control panel.

58. Check the pressure of air in the main air system (110-130 kg/cm<sup>2</sup>), landing gear emergency system (50 kg/cm<sup>2</sup>) and wing flap emergency system (110 - 130 kg/cm<sup>2</sup>).

59. Check operation of the АД-5 control button; after being depressed the button should return to the initial position. Under icing conditions, check functioning of the de-icing system.

60. After all the specialists have inspected the aircraft, check whether all the hatch lids removed during inspection are reliably closed; turn OFF all the switches in the cockpit which have been turned ON during preflight operations.

61. Before the pilot climbs into the cockpit, remove the cable with ground stops (except the stop in the ejection gun headrest), remove the safety pin of the ARMED circuit and set the Pitot tube rod to a horizontal position. After the pilot has occupied his seat remove the stop from the ejection gun headrest.

#### Engine Performance Tests

Performance of aircraft engines should be checked in accordance with the Engine Testing Chart (Fig.2) as follows:

0 - 1 - starting of engines; time required for gaining a speed 100 r.p.m. less than low speed - not over 80 sec.; permissible short-term increase in temperature of gases (T<sub>g</sub>) - not over 850°C.

Note: On aircraft with controlled stabilizers the starboard engine should be started first.

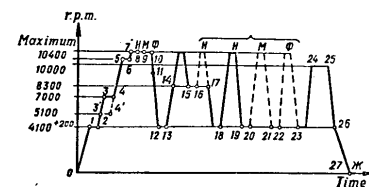


Fig. 2. Engine Testing Chart  
 Symbols: H-normal rating; M-maximum rating;  
 Ø-augmented rating.

1 - 2 "Idling rating" in the course of 1 minute at 4100<sup>+200</sup> r.p.m., gas temperature  $T_g$  - not more than 650°C; oil pressure pilot lamp not burning.

3 - 4 (3<sup>1</sup> - 4<sup>1</sup>) - checking the cockpit pressurization and supercharging system.

5 - 6 - bring engine speed to 10,400 ± 50 r.p.m. (and run it at this speed during 0.5 - 1.5 min.); check operation of the hydraulic system and generators. While engine speed is being increased to 10,400 ± 50 r.p.m., between 4500 and 6500 r.p.m. the shutters of the jet nozzle should move from the starting AUGMENTED position to the NORMAL (НОРМАЛ) position.

7 - 8 NORMAL rating ( maximum speed ± 50 r.p.m., gas temperature - not over 550°C; oil pressure pilot lamp not burning).

8 - 9 MAXIMUM (МАРШМАЛ.) rating (at this speed the engine should be run not more than 10 sec.; engine speed is equal to maximum speed ± 50 r.p.m.; gas temperature not over 650°C, oil pressure pilot lamp not burning).

Caution. The engine should be run at maximum rating not earlier than 1 minute after it has reached idling rating.

9 - 10 - augmented rating (at this speed the engine should be run not in excess of 10 sec.; AUGMENTED (ОПСАЛ) pilot lamp burning; engine speed equals to maximum speed ± 50 r.p.m.; gas temperature not over 650°C at an ambient temperature below +15°C, and not over 680°C at an ambient temperature of +15°C and higher; oil pressure pilot lamp not burning). A short-term increase in speed up to 11,600 r.p.m. is allowed during not more than 3 - 5 seconds; the afterburner may be switched on after keeping the engine control lever in the MAXIMUM rating position in the course of not less than 3 sec. The AUGMENTED rating of the engine should be checked every 10 days (if during this period the afterburner

Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

was inoperative) on a spot specially assigned for this purpose.

During augmented rating measure the actual drop of gas temperature. The permissible gas temperature drop with respect to the stable rating is not over 20°C and the temperature increase - not over 5°C.

If the gas temperature drop exceeds 20°C, the time should be increased for shifting the jet nozzle shutters from the MAXIMUM to AUGMENTED position which should be not more than 2.5 sec.

If the increase in the gas temperature exceeds 5°C, reduce the shutter shifting time to 1.2 - 2.5 seconds.

10 - 11 - 12 - checking operation of the engine at intermediate ratings; 11 - opening of the air blow-off band (n = 9900<sub>-100</sub> r.p.m. for engines No. T726256 incl. and n = 9700<sub>-100</sub> r.p.m. for engines from No. T726257 on).

12 - 13 - checking warmed up engine at idling rating (n = 4200 - 4300 r.p.m. at ambient temperature of +30°C; 4175 - 4275 r.p.m. at +15°C; 4150 - 4250 r.p.m. at 0°C; 4125 - 4225 r.p.m. at -15°C; 4100 - 4200 r.p.m. at -30°C; gas temperature not over 650°C; oil pressure pilot lamp not burning).

14 - 15 - checking controllability of the engine from n = 8300 r.p.m. to normal speed (from 9000 ± 200 r.p.m. to normal speed for engines of the 5th series, and from 9500<sub>-200</sub> r.p.m. for engines of the 6th series). The engine r.p.m. must not lag behind the movement of the engine control lever if the latter is shifted in one direction in no less than 15 sec.

16 - 23 - checking the engine pick-up. The time required for the engine to gain normal speed from n = 8300 r.p.m. (n = 9000 ± 200 r.p.m., n = 9000<sup>+500</sup> r.p.m. or 9500<sub>-200</sub> r.p.m.) should be 9 - 12 sec. when the engine control lever is moved

during 1.5 - 2 seconds from the low speed stop consecutively to NORMAL, MAXIMUM and AUGMENTED positions, the engine should gain maximum speed during not more than 9 - 12 sec.; 9 - 13 sec. (or 11 - 15 sec. for the engines of the 6th series), respectively; 10 - 15 sec. (not more than 18 sec. for the engines of the 6th series); the short-term increase in the engine r.p.m. to 11,600 r.p.m. is allowed in the course of 3 to 5 sec. at a gas temperature of not over 750°C. During the pick-up period check and take a note of the time required for gaining a speed of 9500 r.p.m. from low speed.

The time required for the engine to gain 9500 r.p.m. during the movement of the engine control lever from the low speed stop to the NORMAL position in the course of 1.5 - 2 sec. should be as follows: 8 - 10 sec. at an ambient temperature of +30°C; 7.5 - 9.5 sec. at +15°C; 7 - 9 sec. at 0°C; 6.5 - 8.5 sec. at -15°C; 6 - 8 sec. at -30°C.

For engines of the 3rd, 4th and 5th series equipped with HP-10A pumps manufactured after March 26, 1957 or repaired at repair organizations, the rated pick-up time should be the same as for the engines of the 6th series, viz.:

- from idling rating to normal rating and from 9500 r.p.m. to normal rating - 11 - 14 sec.;
- from idling rating to maximum rating - 11 - 15 sec.;
- from idling rating to augmented rating - not over 18 sec.

24 - 25 - cooling down the engine in the course of not less than 1 min. at n = 9500 - 10,000 r.p.m.; during this test examine the aircraft controls (with disconnected hydraulic boosters) and functioning of the generators.

26 - 28 - stopping the engine.

- Notes:
1. Engine testing time should not exceed 7 min.
  2. On aircraft with controllable stabilizers

the port engine should be stopped first, because during stopping of the starboard engine the shutters of the port engine may remain in the NORMAL position.

- 3. It is allowed to stop the engine without cooling at any rating except MAXIMUM and AUGMENTED ratings. If the port engine is being tested alone, connect the ground hydraulic pump to the main hydraulic system or start and run the starboard engine.

The port engine is allowed to be started only with the starboard engine running at idling rating,

- Caution.
- 1. The START (ЗАПУСК) button should be depressed within 1 or 2 seconds after setting the engine control lever to the low speed position but not later than within 10 sec.
  - 2. If starting or spinning of the engine has been stopped before the IGNITION (ЗАЖИГАНИЕ) pilot lamp has gone out, switch on the STARTING UNITS (АППАРАТЫ ЗАПУСКА) automatic circuit breakers for 40 sec. to allow the automatic starting units to complete their operating cycles.
  - 3. It is not allowed to bring both engines simultaneously to a speed exceeding 10,000 r.p.m.; the engines are allowed to run at different speeds.
  - 4. After stopping the engines as well as after unsuccessful attempts at starting, inspect the interior of the engine through the jet nozzle. If it is discovered that the

fuel continues to burn inside the engine, shut off immediately the second engine and spin up the engine in which after-burning has been discovered. Having eliminated after-burning, inspect the compressor using some sort of light through the intake duct in order to check for burned or sooted vanes. To stop the engine shift the engine control lever smartly to the STOP (СТОП) position and see that the latch snaps home.

While testing the engines check functioning of the hydraulic system, wing flaps, air brakes and their signalling devices, check the aircraft controls with hydraulic boosters ON and OFF, check operation of the generators, engine control instruments and hydraulic system.

On the aircraft with hydraulic systems incorporating constant output pumps (unit 623), the automatic relief valve should operate at pressures of  $140_{-5}$  and  $80 \pm 5$  kg/cm<sup>2</sup>; the time between operation of the valve at  $140_{-5}$  kg/cm<sup>2</sup> and at  $80 \pm 5$  kg/cm<sup>2</sup> should be not less than 15 sec. (with aircraft control stick, landing gear cocks and wing flap cocks in the neutral position, hydraulic boosters turned ON and the air brake cock turned OFF).

On the aircraft whose hydraulic systems incorporate variable-output pumps, after completion of the working cycle the pressure in the system should be restored up to  $135 \pm 7$  kg/cm<sup>2</sup>.

With the hydraulic boosters ON, movement of the aircraft control stick should be smooth, without "creeping" and jerks; the speed of the stick return motion from extreme positions to neutral should be the same (checked visually).

After disconnecting the BV-13M and BV-14M hydraulic boosters the control stick should move smoothly

Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

(against the pressure of the constantly engaged spring-feel mechanisms). If, however, after disconnecting the hydraulic boosters the cross-feed system is disturbed or the friction of the hydraulic booster working rod is increased, this will result in difficult movement of the control stick. If this is the case, measure the effort required for deflecting the control stick. The efforts should be as follows: for elevator -  $7^{+2}$  kg to "pull" and  $11.5^{+2}$  kg to "push"; for ailerons - right and left -  $8^{+2}$  kg. If the effort applied to the control stick exceeds the above specified values refer to "Routine Maintenance of Aircraft and Engine".

After depressing the TRIM TAB EFFECT (ТРИММЕРНЫЙ ЭФФЕКТ) button with ALLERON TRIM TAB, TRIM TAB EFFECT (ТРИММЕР ЭЛЕП., ТРИММЕРНЫЙ ЭФФЕКТ) circuit breaker switched ON the control stick should move forward (if the button is pressed upward) or backward (if it is pressed down).

PRETAKEOFF INSPECTION AND PREPARATION  
FOR THE NEXT FLIGHT

62. Before proceeding with aircraft inspection, study the pilot's report on the functioning of the equipment while in flight.

63. Examine the airframe to look for possible deformations and damage of the skin, airframe, wing flaps, air brakes and intake ducts; make sure the hatches are closed.

64. Inspect visually the lower skin of the fuselage, wing and jet nozzles, and the inside of the engine compartment (with open hatches) to make certain that there are no leaks of fuel, oil or AMT-10 hydraulic fluid.

65. Examine the landing gear for possible cracks in the welded seams of struts, for AMT-10 oil leaks from the shock absorber seals or from hose and pipe connections in the landing gear cupolas. Check condition of the wheel

rims and tyres, see that the wheel tyres and nose wheel axle are not slipping and check pressure in the tyres and shock absorbers.

66. Make sure that the jet nozzle shutters are in the AUGMENTED position. When shutting off the engines, look for after-burning in the jet nozzles. Check condition of the turbine blades and the afterburner pipe using an inspection lamp.

Note: Metal deposits inside the afterburners are an evidence of mechanical damage inside the engine.

67. If the aircraft has landed with the use of the drag chute, remove the chute container from the aircraft and replace it by another container with drag chute. If, however, the drag chute was not employed, check its doors and front lock for reliable closing. Check installation of the stop by the marks and inspect condition of locking devices.

68. Check the storage battery voltage, the amount of fuel in the tanks for the next flight and take a note of the fuel flowmeter readings. Check charging of the air and oxygen systems. Check the quantity of engine lubricating oil (after the flight the minimum quantity of oil in the oil tank should be not less than 7 lit.). The position of the APV mechanism and TRIM TAB EFFECT mechanism must be checked by flashing up of the pilot lamps.

69. At subzero temperatures of ambient air check the front edges of the horizontal struts in the fuselage intake ducts for icing.

70. If the pilot has made use of the de-icing system, check the quantity of alcohol in the tank. The tank should contain not less than 3 lit. of alcohol. Top up, if necessary. Check the quantity of hydraulic fluid in the hydraulic tanks. (Permissible flow of fluid from the main tank into the hydraulic booster system tank during one flight should not exceed 300 cu.cm.).

Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

71. Inspect the canopy glasses; wipe the protective glass of the camera gun.

Note: After each rough landing with the fuselage tail section striking the ground, take the aircraft away from the take off position for exhaustive inspection during which operations should be performed prescribed in Paras 12, 13 and 21 of the "Maintenance Operations" Section.

#### PRELIMINARY OPERATION

72. While stopping the engines, make sure that no smoke issues from the jet nozzle (smoke at the nozzle is an indication of damaged drain valve or of oil and fuel getting into the afterburner pipe).

Listen to the engine operating noise to check for smooth rotation of the engine turbine and absence of unusual noise. At the end of the flying day check the engine rotor for ease of rotation by measuring the time of turbine rotation from the moment corresponding to low speed of the engine to a complete standstill (this time should be not less than 1 min.).

73. Before stopping the engines, open the air brakes (using the switch on the engine control lever) and the wing flaps (using the button on the L.H. control panel). When stopping the engines, shift the engine control lever to the STOP position by a quick and smart motion and see that the lever latch snaps home.

74. Before the pilot leaves the cockpit, insert the ground stop into the ejection gun head; after the pilot has left the cockpit, put the cable with ground stops back in its place in the cockpit and insert the safety pin of the ARMED circuit. Lift the rod of the Pitot tube and ground the aircraft.

75. Add necessary quantities of fuel, AMP-10 oil, alcohol and compressed air into the aircraft systems and service the engine with lubricating oil.

Inspect and check the following:

#### Intake Ducts 1 (Fig.1)

76. Check for shell holes, dents, loose rivets, and oil cans on the skin, look for any foreign objects and check tightening of the screws against the red marks.

77. Examine condition of the compressor blades and of the nose bullet support struts. Use inspection lamps, if necessary.

#### Fuselage Nose Section 2

78. Inspect condition and attachment of the Pitot tube rod and TH-156 impact pressure tube. Make sure that the rod lock functions properly in the flight position.

79. Look for fluid leaks from the de-icing system.

80. Check fastening of the lower hatch lids and look for any leaks from them.

81. Look for shell holes, dents and loose rivets on the skin.

#### Nose Gear 4

82. Inspect the nose wheel, check for condition and inflation of the wheel tyre by measuring its deflection (the tyre should be compressed by 10 to 15 mm); if necessary, inflate it to a pressure of  $7^{+0.5}$  kg/cm<sup>2</sup>. Make sure that the tyre is not slipping on the wheel by observing the marks on the wheel rim and tyre. The permissible degree of wear of tyres is down to the cord.

83. Examine the shimmy damper and its attachments; look for leakage of AMP-10 oil.



84. Inspect the nose strut for cracks (particularly along the welded seams) and condition of locking devices in the joints of assemblies and parts.

85. Check the pressure of air (nitrogen) in the shock absorber (by compression of the shock absorber on the parked aircraft) and look for AMT-10 oil leaks; if necessary, charge the shock absorber with air to a specified pressure of  $30 \pm 1 \text{ kg/cm}^2$ .

86. Inspect the strut retracting cylinder for leaks of AMT-10 oil and condition of joints.

87. Examine the nose gear well, the lower part of No.4 frame, hydraulic and air pipes and hoses in the strut well condition of fastenings, leaks of AMT-10 oil and look for undue contacts, chafing and damage of pipes and units. Make sure that the strut up-lock is open.

88. Inspect condition of the cable and functioning of the nose gear mechanical position indicator.

89. Examine the nose gear doors and their attachment fittings. Wash and lubricate the hinges, if necessary. Check functioning of the door retracting and lowering mechanism for which purpose lift the doors to the full up position and then smoothly begin to lower them. If the doors quickly move back to the full extended (lowered) position, the mechanism is in good repair. Check the play on the end of the door in the extended position (permissible play is not over 5 mm).

Main Landing Gear R.H.Strut 5

90. Inspect the strut wheel, locking of the wheel nut, condition and inflation of the tyre by its deflection (tyre deflection should be from 30 to 40 mm). Inflate, if necessary, to a pressure of  $11^{+0.5} \text{ kg/cm}^2$ . By observing the marks on the wheel rim and tyre make sure that the tyre is not turning on the rim. Permissible wear of tyre is down to the upper layer of the cord.

91. Check the strut, shock absorber and half-fork for cracks (particularly along the welded seams) and leaks of AMT-10 oil on the shock absorber rod.

92. Check the pressure of air (nitrogen) in the shock absorber by parking compression. If necessary, charge the shock absorber to a pressure of  $70 \pm 1 \text{ kg/cm}^2$ .

93. Check condition of the strut mechanical position indicator and make sure the lock nut is securely tightened.

94. Examine condition of the strut retracting cylinder, tightening of the rod lock nut, look for leakage of AMT-10 oil along the rod and from the ends of hydraulic hoses. Inspect the retracting cylinder upper attachment fitting.

95. Inspect the wheel door retracting cylinder.

96. Check the strut and wheel door up-locks and their control cables; check to see that there is no jamming in the moving connections of the lock and its control linkage and check condition of the locking devices. The locks should be opened. Apply fresh lubricant, if necessary.

97. Check condition and fastening of the units and pipes in the L.G. strut well; look for any oil leaks.

98. Check condition, attachment and play of the main strut doors. Permissible plays measured on the end of the doors are as follows: not over 10 mm for the wheel door and not over 5 mm for the wing door; the strut door must have no play at all.

99. Apply ЦИАТИМ-201 lubricant to swivel joints of the units.

Starboard Wing 6

100. Look for signs of damage on the skin, stall fence and rivets; make sure that all the hatch lids, their attachment screws, and the screws fastening the wing tip are in place and their heads are screwed in flush with the skin.

101. Look for any leaks of AMT-10 oil around the hatch of the aileron hydraulic booster.

Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

102. Check condition of the wing fillet and armament fairings, also tightening of their attachment screws.
103. Examine the aileron and interceptor and condition of their hinge joints and attachment fittings. With the aileron in neutral, the interceptor flap should sink in the wing by 1.5 - 2.5 mm. Work the ailerons to check for undue binding and play in the aileron and interceptor controls.
104. Examine the wing flaps, their attachment fittings, guiding slides, locks and carriages; if necessary - wash them and coat with a thin layer of HMATMM-201 lubricant, Check for leakage of AMP-10 oil along the wing flap power cylinder rod and check locking of the rod. The play of the opened wing flaps should be not over 20 mm at an angle of 25°. The play of the wing flaps in horizontal plane should not exceed 1.5 mm.
105. Examine condition of the fuel drop tank and its attachment, look for any fuel leaks. The tank filler necks should be screwed in securely and locked. The drop tank braces must not rotate.

Fuselage, Starboard Side 7

Open the engine inspection hatches and do the following:

106. Inspect the air blow-off band and make sure it is released.
107. Check for any signs of damage on the air by-pass shutters located on the hatch lids.
108. Make sure there are no foreign objects in the engine compartment.
109. Look for any signs of damage on the units, pipes and hoses of the fuel and oil systems and their fastenings; make sure that they are properly locked.
- See that there are no fuel and oil leaks. For this purpose engage for a short time pumps Nos 1, 2, 3,

and 4 tanks with the engine control lever in the STOP position.

Whenever the engines are tested on the run-up sites (first starting of a newly installed engine, starting after replacement of units, hoses or pipes, after adjustment of the fuel system units, etc.), it is necessary, with a view to timely detect leaks or defects in the pipes of the fuel, oil, hydraulic and vent systems, to check them for tightness with the engine running at a speed of 10,200 - 10,400 r.p.m. with open hatches.

110. Check the hydraulic system units and pipes and their attachments for damage and leaks of AMP-10 oil.
111. Inspect the inner lining and framework in the engine compartment.
112. Check condition of the locks and sealing rubber parts of the engine inspection hatch lids.
113. In case of any reported defects related to the aircraft controls, open the hatch in the fin fairing and make sure that the mechanism rod is in the long-arm position and the terminal switch limiting the extreme extended position of the rod is OFF; check condition of the DP-5 rod spring-feel mechanism, fastening of the wire bunches of the DP-5 transmitter, EV-14MC hydraulic booster, and ACB-4 electric mechanism.
114. Inspect the quick-disconnect fittings of the rods, rods proper, and hinge joints of the aircraft and engine control linkage, as well as condition of their locking devices. If necessary, apply HMATMM-201 lubricant.
115. Examine the lids of the fuel tank hatches for fuel leaks.
116. Check the air brakes, their attachment fittings and power cylinders; make sure there is no leakage of AMP-10 oil from under the seals.

Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

117. Clear the outlets of the vent pipes (ice should be removed by heating the pipes with hot air).

118. Inspect the fuselage bottom fence and the bumper and their attachments; look for any leaks of AMT-10 oil and fuel.

119. Check the air intakes for cracks and foreign articles.

120. Check condition of the skin edges along the recesses in the cone lugs and see that there are no distortions, bending and scoring of the cone skin edges at the recesses in the cone lugs; if necessary, straighten out the cone with a wooden mallet; check the clearances along the suction gaps between the inner and outer skins of the tail cone; (specified clearance is  $5^{+1}$  mm).

#### Tail Unit 8

121. Inspect the stabilizer, fin, rudder, elevator and their attachment fittings to see that their play does not exceed the permissible allowance; check condition of the trailing edge on the rudder and position of the rudder trim tab (if any) in accordance with the inscription on it.

122. Check for any jamming, knocking and undue play in the rudder and elevator controls.

123. With the hydraulic booster disconnected check for undesirable knocking or play in the stabilizer control linkage. The play in the stabilizer controls with 10-kg load applied to the stabilizer trailing edge should not exceed 3 mm; measure the play on the stabilizer edge.

124. Make sure that the tail unit hatch lids are reliably closed.

#### Jet Nozzles 9

125. Check the inside surfaces of the afterburners, the

shutters and taper rings of the jet nozzles for burnt holes, warping, cracks, metal deposit, nicks, and for leaks of AMT-10 oil from the shutter control system. Check to see that the nozzle shutters are in the AUGMENTED position.

Notes: 1. Being shifted by hand, the shutters should move easily, without jamming.

2. Metal deposit inside the afterburner is an indication of some damage inside the engine.

126. On the aircraft whose engines are not fitted with adjustable nozzles, in addition to the above operations inspect and check the flame arrestor and igniter (using an inspection lamp); if the flame arrestor posts, igniter nozzle, fastening bolts and cotter locks are burnt, they should be replaced; check condition of the edges of the ejector and jet nozzle and, if they are out of round or their clearances are other than specified, straighten and true up the edges ensuring necessary clearances.

127. Inspect the turbine vanes for damage, burning and overheating (the check should be confined to visual inspection without climbing into the afterburner; in sunny weather the turbine vanes may be lighted by means of a mirror).

128. Check for necessary clearances between the jet nozzle ejector and the fuselage cone: these clearances must be identical on the horizontal axis ( $16 \pm 2$  mm) and different on the vertical axis ( $12 \pm 2$  mm on top and  $20 \pm 2$  mm in the bottom); the clearance between the ejector and the sliding ring should be not less than 6 mm.

#### Fuselage, Port Side 10

129. Inspect the starboard side of the fuselage as prescribed in Paras 105 - 120.

Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

130. Check the drag chute hatch doors for reliability of closing, check cottering and reliable closing of the door front lock and of the drag chute cable lock.

Note: If the drag chute was used during landing, remove the container from the aircraft and install another container with a drag chute having previously cleaned it of snow and dirt. If kerosene had penetrated into the drag chute compartment, remove the parachute and dry up the compartment.

Port Wing 11

131. Inspect the port wing in the same way as it is prescribed for the starboard wing (Paras 100 - 105).

132. Check condition and position of the aileron trim tab (the position of the trim tab should correspond to the inscription on it).

Main Landing Gear, L.H. Strut 12

133. Inspect in the way prescribed for the R.H. strut (Paras 90 - 99).

Cockpit 15

134. Look for cracks and dimming of the cockpit organic glass for damage of the frame and the rubber weather strips.

135. Check condition and attachments of the de-icing system manifold and pipes, as well as locking of the emergency rack.

136. Check condition of the seat, pilot's harness and attachment of the telescopic mechanism; presence of locking devices on the face screen, seat arm-rests and on the L.G. lock emergency opening handle. Check operation of the shoulder strap locking mechanism and presence of locking

devices on the pin of the AИ-3 automatic pressure unit, and fastening of the AИ-3 rope snap hook to No.7 frame.

137. Presence of locking devices on the canopy-to-ejection gun interlocking device.

138. Check fastening of the armoured head-rest and armoured plate. Climb into the cockpit and check whether the sliding section of the canopy opens and closes easily and is reliably locked in the extreme positions. Check the canopy locks for reliable closing, cleanliness and condition of rails, locks and hinges, presence of cotters on the canopy lock control levers and on the canopy independent jettisoning handle.

Close the canopy and open the pressurization cock to check the filling of the pressurization hose. Check air pressure in the canopy pressurization bottle (it should be  $50_{-3}$  or  $100_{-5}$  kg/cm<sup>2</sup>).

Caution. Do not open the pressurization cock when the canopy is open to avoid damage to the pressurization hose.

139. Move the engine control levers to make sure they are easy to move, and there is no jamming or play exceeding the permissible limits; check their clamping and locking on the stops as well.

Check condition of the engine control rods, fastening of the stops and presence of their locking devices.

140. Make sure that the wheel brakes are reliably and simultaneously released at both stages (the pressure should be  $5$  and  $10^{+0.5}$  kg/cm<sup>2</sup>, respectively).

141. Move the aircraft control stick right and left (with hydraulic booster disengaged) and work the pedals to make sure that the ailerons and the rudder are freely and

Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

completely deflected in the correct direction and that their play does not exceed permissible values (the check should be performed after the flight with stopped engines).

142. Check functioning of the stabilizer controls (to be performed together with the aircraft equipment specialist); check reliability of manual control of the APV automatic mechanism and check change-over of the stabilizer hydraulic control to the electric (emergency) control.

Note: If the pilot had any complaints about operation of the stabilizer controls, check them in the scope of 25 $\pm$ 5 hour maintenance operations.

143. Check to see that the wing flap and landing gear emergency extension cocks are tightly closed and cotted with KOK-05 wire; make sure that the SHUT-OFF COCK (ПЕРЕКРЫВНОЙ КРАН) button caps are cotted with brass wire of 0.25 mm diameter).

144. Look for any foreign articles and water (ice in winter) in the aircraft cockpit, particularly under the pilot's seat (inspect through the hatches in the seat).

145. Examine condition of the aircraft and engine control rods and bell cranks. Pay particular attention to condition of the control rods under the pilot's seat, looking through the seat hatches.

146. Switch off the automatic circuit breakers in the cockpit and turn off the storage battery; the circuit breakers located under the organic glass panel on the starboard side of the cockpit (except the ARMED-SAFE circuit breaker) must not be turned OFF.

147. After all the aircraft specialists have finished with their inspection and eliminated all the deficiencies, make sure that no tools, nuts, bolts and other foreign objects are left in the intake ducts, afterburners, aircraft cockpit, etc.

148. Lock the aircraft control stick, put a screw clamp on the rudder, protect the intake ducts, jet nozzles, pressure governor РД-2МА pipe and air by-pass shutter openings with lids, put covers on the АД-5 pressure unit, and on the wing flap control panel, check whether all the previously removed hatch lids are closed, pressurize the canopy and put covers on the aircraft.

After First 5 $\pm$ 1 Hours of Engine Operation

149. Remove the filters from the relief valves and oil units, inspect them and wash, if necessary.

Each time after removal of the filter and cover from the engine, close the oil unit with a lid instead of the cover and stop the hole in the filter cover with a rubber plug (the lid and rubber plug are furnished in the airborne set of engine tools). The procedure for washing the filters is described in the "Routine Maintenance Instructions".

Every 10 $\pm$ 2 Flying Hours

150. Check functioning of the duplicating slide valves of the hydraulic boosters (use a special tester furnished with each set of hydraulic boosters). Coat the face ends of the slide valves with ЦИАТИМ-201 lubricant.

MAINTENANCE OPERATIONS

Every 25 $\pm$ 5 Flying Hours

Aircraft

Landing gear

1. Wash the landing gear struts and shock absorbers

with gasoline and examine them through a magnifying glass for possible cracks. Check locking of the shock absorber seal nuts.

2. Inspect the L.G. lock emergency opening linkage. Corroded sections of the cable should be wiped with kerosene-soaked rags, then with dry rags, and coated with QUATUM-201 lubricant.

3. Check the locks for emergency opening. Fix the emergency opening handle in the retaining clip and cotter it with KOK-0.5 wire.

4. Check the longitudinal and lateral play of struts (measured at the wheel axles).

When the wheel axle is pushed and pulled gently with a force of 15 kg, the total play should be as follows:

(a) main strut: longitudinal play - not over 6 mm and lateral play - not over 10 mm;

(b) nose gear: longitudinal and lateral play - not over 5 mm.

5. Using a feeler gauge, measure the clearance between the stop on No.4 frame and the upper horn of the nose gear.

When a force of 15 to 20 kg is applied to the strut wheel axle in the direction of flight and the L.G. cock is in neutral, the clearance should be from 0.05 to 0.15 mm.

6. Check the pressure of air (nitrogen) in the L.G. shock absorbers with a pressure gauge.

When checking the pressure of air (nitrogen) in the L.G. shock absorbers, take a note of the data contained in the name-plates affixed to the struts.

7. Pack QUATUM-201 lubricant into the grease fittings of the strut joints and the arm of the shimmy damper.

8. Wash the hinged joint connecting the L.G. wing door with the strut and door, inspect it and coat with lubricant.

9. Check condition and fastening of brake inertia transmitters of the main and nose gear struts.

10. Check condition and fastening of the grounding cable.

11. Remove the wheels, inspect the brake shoes and drums, check the brake shoes for wear. Remove the wheel bearings, wash them, inspect and coat with HK-50 lubricant. Check tightening of the brake jacket screws. In winter, after preliminary tightening of the screws, rotate the wheel 5 or 6 revolutions then tighten the screws all the way home.

Cracks in the brake jacket extending through the whole width of the cast-iron layer and reaching the outer butt end are not allowed. Brake shoes whose thickness is less than 8 mm are subject to replacement.

12. Blow the brake hoses with compressed air. For this purpose disconnect the pipes at the wheels and press first the main lever then the emergency braking lever in the cockpit.

Connect the pipes to the wheel pipe unions then check the brake system for tightness.

Checking the brake system:

- with the cocks closed, the nose wheel braked, the pedals in the extreme positions, and the brake lever pressed to  $10^{+0.5}$  kg/cm<sup>2</sup> pressure, the allowable pressure drop in the brake system in the course of 30 min. is not over 2.5 kg/cm<sup>2</sup>;

- with the L.G. emergency system filling cock closed and the emergency wheel brake cock opened, the allowable pressure drop in the emergency wheel brake

system in the course of 30 min, is not over 3 kg/cm<sup>2</sup>; initial pressure in the emergency bottles should be 50 kg/cm<sup>2</sup>.

13. Check the landing gear by retracting and lowering it once.

During this check, pay attention to the following:

- reliability of retraction and lowering; there should be no jamming;
- operation of the L.G. light position indicator terminal switches;
- L.G. retraction pressure (it should be not over 100 kg/cm<sup>2</sup>);
- operation of sequence valves; if between the moment of shifting of the L.G. cock to retraction and the moment when the strut presses the sequence valve, the wheel doors may be closed by the force of one man, this is an evidence that the sequence valve is either faulty or clogged;
- operation of the L.G. strut locks and wheel door locks; with the L.G. cock handle in neutral, the struts and wheel doors must not fall down and open;
- operation of the wheel automatic braking cylinder; at a pressure of not less than 80 kg/cm<sup>2</sup> in the hydraulic system and with the L.G. cock handle in the RETRACTED (ВЕРАНО) position, the pressure in the wheel brake system should be 5 to 10 kg/cm<sup>2</sup>; upon shifting of the L.G. cock to NEUTRAL, the pressure in the brake system should drop to zero within not more than 60 sec.;
- alignment of retracted L.G. doors with the contours of the wing bays and fuselage; the permissible clearances of the main strut doors (with landing gear retracted) should be as stated below:
  - 2.5 ± 0.5 mm between the wheel door and strut door;
  - variable clearance between the strut door and wing

door: 19 ± 2 mm at the front edge, 23<sup>+2</sup> mm in the middle, and 27<sup>+3</sup> mm at the rear edge;

- 2 ± 0.5 mm between all doors (along front and rear edges) and the wing, except for the strut door which must have a clearance of 8<sup>+2</sup> mm at the rear edge and 6<sup>+2</sup> mm elsewhere;

- 6<sup>+1</sup> mm between the wheel door and the wing (at fuselage side) except for the section located along the front edge of the door front attachment fitting, where the clearance should be 2.5 ± 0.5 mm;

- permissible clearances of the retracted nose strut are as stated below:

- 1.5 ± 0.5 mm on the front and rear edges;
- not less than 1.5 mm on the side edges.

Note: In training centres maintenance operations on the landing gear and wing flaps should be performed every 30 ± 5 landings regardless of the number of flying hours.

50-hour maintenance operations on the landing gear and wing flaps of these aircraft should be performed every 25 ± 5 hours.

Wing

14. Clean the interceptor mechanisms, inspect them and coat with M2ATM-201 lubricant. Check operation of the interceptors.

When the ailerons are deflected 3° ± 30', the interceptor arm should start moving downward; as the aileron is deflected down 10.5 ± 2° the interceptor should come out completely; maximum protrusion of the interceptor should be 57 ± 5 mm.

15. Wash the wing flap guide rails, carriages, slides and pins with gasoline and inspect them. Check fastening of the wing flap power cylinders (in the landing gear well

and locking of attachment nuts. Lubricate the guide rails, slides and hinges. Examine the wing flap attachment fittings (through hatches in the upper skin) for signs of corrosion on the fittings.

Check the wing flaps for synchronous lowering. The permissible difference in the wing flap deflection is as follows:

- not over 15 mm for 15° deflection;
- not over 20 mm for 25° deflection.

16. Examine the elektron parts; partioular attention should be paid to condition of painted and varnished surfaces, and to any signs of corrosion and scratches on them.

Fuselage

17. Check condition of nose hatch lid locks.

18. Inspect the attachment fittings of the engines and afterburners through the hatches (within the limits of visibility).

These operations should be performed together with those listed in Para. 50.

19. Lubricate the air brake attachment fittings and hinge joints. Fill the turbo-cooler bearings with OKB-122-14 oil.

20. Check how the drag chute doors are opened by the electric-air system. Wash all the hinges of the drag chute well doors with gasoline and coat them with ЦИАТИМ-201 lubricant.

21. Examine the elektron parts.

Fuel System

22. Check closing of the fuel shut-off cocks by depressing FUEL SHUT-OFF cock buttons in the cockpit, then open the cocks and lock them with KOK-0.8 wire; the caps should be cottered with M-62 brass wire 0.25 mm in diameter.

23. After the first 25<sup>±5</sup> flying hours and in case new tanks are installed, inspect, and wash, if necessary, the fuel filters installed on the fuel line leading from the drop tanks; later these operations must be performed during each successive 50-hour maintenance program.

24. Check the main fuel system for tightness. This should be done with the fuel tanks full and tank filler necks tightly closed. Check the pressure in the drop tanks and No.1 tank and the tightness of the pressurization system pipes.

At the engine speed from 7000 to 9000r.p.m. the pressure gauge in No.1 tank should read 0.15 - 0.18 kg/cm<sup>2</sup> and the drop tank pressure gauge - 0.58 - 0.62 kg/cm<sup>2</sup>.

Hydraulic system

25. Check shifting of the hydraulic booster system over to supply from the main hydraulic system (for aircraft with controllable stabilizer).

For this purpose connect the ground hydraulic pumps and ground electric supply and proceed as follows:

(a) switch ON the circuit breakers bearing inscriptions L.G. SIGNALLING, BRAKE, FLAPS, AILERON BOOSTER, POSITION LIGHTS, (ЧИП.ЩАССМ,ТОПМ.,УМТМН, БУ ШРЕП., АНО) ROCKET STABILIZER BOOSTER (БУ СТАБИЛ.ПАКЕТН) located under the translucent panel in the cockpit;

(b) build up a pressure of 135<sup>±7</sup> kg/cm<sup>2</sup> in the hydraulic systems, then disengage the ground hydraulic pump of the hydraulic booster system;

(c) moving the aircraft control stick right and left reduce the pressure in the hydraulic booster system down to 65<sup>±5</sup> kg/cm<sup>2</sup>; change of the pressure registered by the pressure gauge of the main hydraulic system will be an indication that the hydraulic booster is supplied from the main hydraulic system;



Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

(d) carry out the operations described in Paras b and c; in this case pressure in the hydraulic booster system should be reduced by shifting the aircraft control stick back and forth.

26. Check the pressure of air (nitrogen) in the hydraulic accumulators, which should be  $40^{+5}$  kg/cm<sup>2</sup> (at zero pressure in the hydraulic systems).

27. Having completed the scheduled operations on the landing gear, hydraulic system, hydraulic boosters and engines check the external tightness of the hydraulic system. Check the internal tightness of the hydraulic system (on aircraft whose hydraulic systems are fitted with constant output pumps).

The time required for shifting of the automatic relief valve from idling (at  $140_{-5}$  kg/cm<sup>2</sup>) to operating duty ( $80^{+5}$  kg/cm<sup>2</sup>) should be not less than 15 sec. (with L.G. and wing flap cocks in neutral, air brake cock turned OFF, BV-13M and BV-14M hydraulic boosters engaged and with the aircraft control stick in neutral).

With BV-13M and BV-14M hydraulic boosters disengaged and under all other conditions specified above, the change-over time of the automatic relief valve should be not less than 3 mm.

#### Cockpit

28. Remove the pilot's seat from the aircraft (previously the armourer must unload the ejection gun); wash and inspect all the hinges, moving parts of the seat mechanisms, and the cable linkage on the seat. With the seat removed check opening of the pilot's harness lock and foot grips and of mechanisms of the swing-down foot rests and locking of harness.

This check should be performed twice.

29. Wash and inspect the parts of the canopy locks and canopy jettisoning mechanism on the fuselage and canopy, as well as fastening of the cable tubes and spring mechanism. Lubricate all the mechanisms of the locks and canopy jettisoning system.

30. Check air pressure in the pressurization hose behind the PB-1.5 reducer, which should be  $1.8 - 2.55$  kg/cm<sup>2</sup>; the safety valve must start letting the air out at a pressure of  $2.8$  kg/cm<sup>2</sup> and open fully at  $3.3$  kg/cm<sup>2</sup>.

31. Check functioning of the canopy jettisoning system (to be performed by the aircraft specialist) with simultaneous firing of the seat ejection gun and canopy jettisoning pistol by dummy cartridges (to be carried out by the armourer together with the aircraft specialist; simultaneously check synchronous opening of the canopy locks during slow movement of the canopy opening system).

This check should be performed in the following sequence:

(1) Unload the seat ejection gun (to be performed by the armourer).

(2) Make sure that pressure in the canopy pressurization bottle is equal to  $35 - 50$  kg/cm<sup>2</sup> and pressure in the canopy jettisoning cylinder -  $120 - 130$  kg/cm<sup>2</sup>.

(3) Close and pressurize the canopy.

(4) Inspect and check the canopy remover membrane valve (check position of the lockpin and absence of slack in the cable connections with the lockpin and lever).

(5) Turn back sharply the independent canopy jettisoning handle, preventing the canopy from falling by using the cover, without tension; check operation (piercing) of the membrane valve. The valve must operate at the cable travel not exceeding 15 mm.

Simultaneously with operation of the valve the lock-ball with cable must disengage from the jettisoning mechanism

safety lever. Check outward travel of the canopy jettisoning cylinder rods which should be 65 mm.

Caution. After jettisoning of the canopy, close immediately the canopy pressurization cock to avoid damage to the pressurization hose.

(6) Perform jettisoning operation in the same sequence by the face screen.

(7) Pressing the canopy from underneath lift it and check to see whether the locks are open and the canopy is separated from the aircraft.

(8) Insert the lockpin into the membrane valve so that the lockpin is situated between the roller and washer. The slot of the lockpin should face the roller. Put the safety stop on the membrane valve.

(9) Let the air out from the main air system through the cockpit filling cock and from the independent canopy jettisoning system by unscrewing the union nut of the membrane valve pipe connection.

(10) Shift by hand the canopy jettisoning cylinder rods to the initial positions.

(11) Unscrew the pipe connection of the membrane valve, remove the remaining portion of the membrane which should be broken on not less than half of the effective section, and examine condition of the valve.

Cock the spring of the membrane valve with a special device and insert the lockpin.

When inserting the lockpin, ensure correct positioning of the floating washer (the lockpin must be located between the roller and washer, the lockpin slot facing the roller).

(12) Install a new membrane  $12 \pm 0.2$  mm in diameter made of 1X18H9T-10.1 steel (place the membrane on the chamfered edges of the bushing and insert the bushing together with

membrane into the body); screw in the valve pipe union and connect it to the pipe.

(13) Close the rear lock and, holding the lock lever by hand, cock the spring mechanism. Close the front locks holding at the same time the lock cable by hand at the bell crank of the rear lock mechanism to prevent sharp bending of the cable.

(14) Fill the canopy jettisoning system with air to a pressure of 120 - 130 kg/cm<sup>2</sup> and jettison the canopy by the seat face screen (with the cockpit pressurized) without overpressure, after which remove the membrane.

(15) Blow the canopy jettisoning air system as follows:

- unscrew the union nuts from the canopy jettisoning cylinders and remove the rods;
- connect the hose of the ground air bottle to the pipe union of the membrane valve;
- blow the system with air at a pressure of 10 to 15 kg/cm<sup>2</sup>.

(16) Put the rods in place, install a new membrane in the valve and lock the latter.

(17) With the seat removed check synchronous opening of the canopy locks (See "Routine Maintenance of Aircraft and Engine").

(18) After the check, set the jettisoning mechanisms on the fuselage and canopy to the initial (locked) position, connect the rear lock lever to the spring mechanism and lock the control levers on the front locks, the face screen handle, the independent jettisoning handle, and the jettisoning rack.

(19) Load the seat ejection gun, install the canopy on the aircraft, connect the interlocking cable to the canopy and fill the canopy jettisoning system with air.

32. Inspect the joint of the pipe connection of the cockpit defrosting system.

33. Check condition of the flexible sheathing and control cable of the HV-7 valve, fastening of the HV-8 valve and their control levers and rods. Wash the hinges with gasoline, inspect and lubricate them.

34. Inspect all the sealed fairleads of the control rods in the cockpit and the cockpit pressurization hose for charring and damaged ozone-resisting coating. Renew the ozone-resisting coating where necessary.

Proceed as follows:

(a) wipe the damaged sections of the hose with a gasoline-soaked rag once or twice and allow the gasoline to evaporate;

(b) apply three layers of 23CA compound to the damaged sections of the hose using a soft brush at 2 or 3 min. intervals between each application of the compound; hoses with completely damaged ozone-resisting coating should be coated six times at 3 or 5 min. intervals between each application of the compound. Having reconditioned the hose coating, leave for 24 hours it to dry.

Application of the compound to the hose should be done at an ambient temperature not below +10°C.

Notes: 1. While treating the hoses, the compound should be systematically stirred. If the compound becomes thicker, dilute it with solvents (1.5 parts of ethyl-acetate and 1 part of gasoline) to bring it to the initial concentration.

2. Do not pour the compound on the hose and do not spread it over the hose surface.

The compound should be taken directly from the can with a brush and applied uniformly to the hose surface.

Aircraft Controls

35. Check to see that plays in the rudder and aileron controls do not exceed the permissible values.

The play of the aileron (with the control stick clamped and an effort of 5 kg applied at a point located 80 to 100 mm from the trailing edge of the aileron) should not exceed 5 mm and 5.5 mm for the starboard and port ailerons respectively; the play of the aileron halves with respect to each other should be 21 mm under a force of 5 kg applied to the trailing edge of the aileron; the play of the rudder with the pedal clamped should not exceed 10 mm.

36. Check to see that the plays in the stabilizer attachment fittings and controls do not exceed the permissible tolerances.

The play in the stabilizer controls with an effort of 10 kg applied to the stabilizer trailing edge should not exceed 3 mm with the hydraulic booster disengaged and should be none at all with the booster engaged. The play of the stabilizer beam in the bearings under a force of 10 kg applied to the stabilizer end should not exceed 90 microns (as measured on the extreme stabilizer-to-beam bolt with the aid of a special gauge).

37. Examine the rudder and aileron controls for damaged and corroded parts and for undue brushing against other parts.

38. Inspect the stabilizer controls, including the spring-feel mechanism, the APV mechanism, the hydraulic booster and the AHC-4 electric mechanism.

39. Check correct automatic switching-on of the MVC-2 electric motor, the AHC-4 mechanism hydraulic coupling and correct disengagement of the stabilizer hydraulic booster

by the KB3M electric mechanism actuating valve and by the actuating cylinders.

This check should be performed by using the booster hydraulic system in the following sequence:

- switch on the automatic circuit breakers bearing the inscriptions: "STABILIZER MVC-2 CONTROL (УПРАВЛ. MVC-2 СТАБИЛ.), ROCKET STABILIZER BOOSTER (БУ СТАБИЛ., ПАРЕТЬ) engage the hydraulic booster and create a pressure of up to  $80^{+2}$  kg/cm<sup>2</sup> in the booster hydraulic system (by the ground hydraulic pump); this should turn OFF the АПС-4 mechanism and engage the hydraulic booster. Increase the pressure in the system up to  $135^{+7}$  kg/cm<sup>2</sup> and disengage the hydraulic pump;

- reduce the pressure in the booster hydraulic system down to  $50^{+2}$  kg/cm<sup>2</sup> by the back-and-forth movement of the control stick; this must switch the stabilizer over to the emergency electric control which will be indicated by the change in the speed of the control stick deflection and by the operating noise of the MVC-2 electric motor; at a pressure of  $50^{+2}$  kg/cm<sup>2</sup> the KB3M valve will close, the БУ-14MC hydraulic booster will disengage and the actuating cylinders will switch ON the MVC-2 motor of the stabilizer emergency control system.

40. Coat the rod of the APV mechanism with a thin layer of ЦИАТИМ-201 lubricant.

41. Pack the external bearings of the stabilizer beams with ЦИАТИМ-201 lubricant.

42. Wash, inspect and lubricate (in situ) the attachment fittings of the rudder and ailerons.

43. Having serviced the hydraulic boosters and the hydraulic system, test (together with aircraft specialists) the aircraft controls with the hydraulic boosters engaged

While checking the main (hydraulic) and emergency (electric) stabilizer control systems, see that the aircraft control stick moves smoothly, without "creepage" and jerks; see that the resistance of the spring-feel mechanism is felt on the stick.

When checking the emergency (electric) stabilizer control system, see that the time for complete travel of the stabilizer with the APV rod in the long-arm position is about 7 sec.; the free travel of the aircraft control stick at the long-arm position of the APV mechanism resulting from the movement of the hydraulic booster slide valve and the rod of the ДР-5 pick-up should be  $11^{+2}$  mm.

While checking the stabilizer control by the hydraulic booster, make sure that during smooth movement of the control stick the rod of the ДР-5 pick-up does not operate the switch.

If, however, the switch operates, check to see whether the main slide valve of the hydraulic booster is jammed. If the hydraulic booster is in order, replace the rod with the ДР-5 pick-up; the length of the rod with the ДР-5 pick-up must remain the same (adjust by means of the end-piece screwed into the pick-up).

Having replaced the ДР-5 pick-up check operation of the emergency (electric) system and the stabilizer maximum deflection angles at the long arm of the APV mechanism; the stabilizer deflection angles must be adjusted by changing the length of the rod with the ДР-5 pick-up; the distance from the pick-up butt end to the centre of the adjusting end-piece opening should not exceed 48 mm.

With the APV mechanism shifted to the MANUAL (РУЧНОЕ) position, with the APV rod switch in the SECTOR ARM (СЕКТОР РУЧНО) position and with the aircraft control stick shifted

forward or back, make sure that the stick is heavily loaded and the stabilizer deflection angles are reduced.

Hydraulic boosters

44. Wipe the aileron hydraulic booster with a cloth lightly soaked with clean non-ethylated gasoline and inspect the booster and its attachments.

Make sure that the working rod of the hydraulic booster has no chipping, galling or nicks, that the rod end-piece and head are reliably locked by the lock nut, and that there are no signs of corrosion on the exposed butt ends of the slide valve and barrel.

Overflow of operating fluid along the working surfaces of the hydraulic booster is allowed within the following limits: with the booster inoperative and zero pressure in the hydraulic system - not more than 5 drops per hour; with the booster working and a normal operating pressure in the hydraulic system - not over 3 - 4 drops per minute; increased leakage through rubber seals caused by an interval in operation may be eliminated by operating the hydraulic booster (with the hydraulic system under pressure).

45. Inspect the stabilizer hydraulic booster in the same way as prescribed for the aileron booster.

46. Check locking of the hinges of the hydraulic booster head assembly. Make sure there is no longitudinal play in the hinges of the main slide valve chain (with zero pressure in the hydraulic system and the main slide valve locked). If play is discovered, remove the hydraulic booster from the aircraft and have it repaired. Remove the screen filters installed in the nipples of the pipe unions feeding operating fluid into the boosters; inspect the filters and wash them in clean non-ethylated gasoline.

If the removed filters are found dirty, perform the following additional operations:

- remove the hydraulic booster from the aircraft;
- drain the fluid from the booster into a clean vessel.

If the fluid is clean (free of dark sediment, sand, etc.), wash the booster under pressure, without disassembling it, wash the filter with clean AMT-10 oil and put the booster back in the aircraft. If the drained fluid is contaminated, the booster should be forwarded to a repair organization for overhaul, washing and checking. (Before installing a new hydraulic booster, wash the booster hydraulic system and fill it with fresh operating fluid);

- having installed the hydraulic booster in the aircraft, with the hydraulic system under pressure (before connecting the control rod), check for presence of the suction force of the main slide valve (with this in view shift the main slide valve out of the booster and let it go; under the action of the suction force the slide valve will be pulled in thereby moving the working rod);

- connect the rods to the hydraulic booster, engage the booster and check functioning of the aircraft controls.

Notes: 1. Before installing the filter, check condition of the filter screen wires with a magnifying glass.

2. While assembling the pipe unions after checking the filters, install the pipe unions so as to prevent them and the heads from banging against airframe parts when the aircraft control stick is being worked in the cockpit.

46a. Remove the GP-11/1 filter, wash the screen cleaning element and replace the fine cleaning element with a new one.

Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

46b. Disjoin the tail section of the fuselage. Having performed operations listed in Paras 46c - 52a, connect the tail section.

The belts securing the afterburner pipe attachment shackles should be coated with oilclag.

46c. Inspect the units, pipes and vent holes of all the systems located in the engine compartment and in the tail section of the fuselage.

46d. Inspect the fuselage tail section on the inside for possible burned holes, cracks, destroyed and distorted places and loose screws and rivets.

46e. Inspect rubber parts on No.20 frame.

#### Engines

47. Inspect the engine controls in the cockpit (without removing the side cover of the L.H. control panel). Wash the parts, inspect and lubricate them.

48. Make sure that with the engine control lever shifted to the slow speed stop, the levers of the main fuel pumps of both engines are between the marks of the slow speed segment. If necessary, adjust the position of the pump lever by the aircraft rod after which check functioning of the engine controls.

Note: On engines whose main fuel pumps operate with the KC relief valve switched on check functioning of this valve.

49. Inspect the engine controls in the engine compartment (within the field of vision).

50. Inspect the engine-to-aircraft attachment fittings.

51. Remove and inspect the filters of the oil units to check for presence of metal chips.

52. Remove and inspect the L.P. fuel filter of the 317 A unit. Inspection and washing should be performed without disassembling the filter. Before re-installing the filter replace its rubber seals with new ones.

Note: The above inspection refers to fuel filters whose elements are made of brass screen.

52a. Carry out the following operations:

- examine carefully the pipes to make sure they are free of cracks, dents, chafing, that they do not brush against adjacent parts and are reliably fastened;

- check all the pipes and joints of the fuel, oil and hydraulic systems by starting the engines and working them at all the ratings with the fuselage disjoined; stop the engine and inspect the pipes and their connections on the outside;

- examine the longitudinal welded seams of the outer walls of the middle pipe and diffuser of the afterburner for cracks.

52b. After disjoining the fuselage do the following:

(a) check functioning of the control system of the jet nozzle shutters with the engines inoperative and at an operating fluid pressure of 80 - 140 kg/cm<sup>2</sup>.

The jet nozzle shutter ring shifting time should be as follows:

- from the augmented rating position to the maximum rating position 5 - 7 sec.;

- from the maximum rating position to the augmented rating position - 1.2 - 2.5 sec. (for aircraft of the 6th series - 2.1 - 2.5 sec.);

- from the normal rating position to the maximum rating position - 2.5 - 5 sec.;

- from the maximum rating position to the normal rating

position - not over 25 sec. (this shifting should be checked at 130 - 140 kg/cm<sup>2</sup> pressure of the operating fluid);

(b) check the speed at which the compressor air blow-off band opens is released. On engines of the 3rd, 4th, 5th and 6th series No. T726256 including, this speed should be 9900-100 r.p.m.; on engines of the 6th series, beginning with No. T726257, this speed should be 9700-100 r.p.m.;

(c) check the maximum engine speed (measure accurate within  $\pm$  25 r.p.m.; if there are no gauges ensuring the required degree of accuracy, measure the engine speed by the TD-15 tachometer with the scale graduated in divisions of 100 r.p.m.);

(d) with the air blow-off band closed check the corrected stable engine speed against the specifications;

(e) test the engine at all the ratings as instructed in the Engine Testing Chart (Fig.2);

(f) check visually the fuel, oil and hydraulic systems of the aircraft and engine for tightness.

Every 50<sup>±</sup>5 Flying Hours

Aircraft

Landing Gear

53. Check the level of AMI-10 oil in the L.G. shock absorbers and in the shimmy damper.

54. Check functioning and tightness of the landing gear and wing flap emergency lowering system. After the check secure the L.G. lock emergency opening handle with KOK-0.5 wire.

Fuselage

55. Disjoint the tail section of the fuselage. Having completed operations listed in Paras 56 - 76, connect the tail section to the nose section.

Apply oildag to the bolts which fasten the afterburner attachment shackles.

56. Inspect the air ducts and the engine compartment from inside.

57. Inspect the units, pipes and vent holes of all the systems located in the engine compartment.

58. Inspect the units, pipes and vent pipes of all the systems located in the tail section of the fuselage.

59. Examine the fuselage tail section from inside for burnt holes, cracks, destroyed and distorted places and for loose attachment screws and rivets.

60. Inspect rubber parts on No.20 frame.

61. Remove the wing and tail unit fillets and inspect the attachment fittings.

Hydraulic System

62. Remove  $\Phi$ 11/1 filters. Wash the coarse element and install a new fine element.

Air and Fire-Extinguishing Systems

63. Disassemble the air system and cockpit pressurization system filters, wash them, dry, inspect and reassemble.

64. Remove and weigh the fire extinguishing cylinder (the armorer must previously take out the discharge bonnet explosive cartridge).

Aircraft Controls

- 65. Wash, inspect and lubricate the hinge joints of the aircraft control linkage.
- 66. Wash the inside of the sealing boxes on fuselage from No.9, blow them with compressed air, make sure there are no foreign objects (or ice in winter) and lubricate the hinge joints; check for play of the bell cranks on the fulcrums and of the fulcrums properly; check condition of the rubber pressurization parts and of the sealing box gasket.
- 67. Check fastening of the rudder balance weights.
- 68. Check fastening of the controlled stabilizer balance weights.
- 69. Check condition of aileron balance weights and aerodynamic compensation fabric.
- 70. Check fastening of the weight on the stabilizer control bell cranks near APY mechanism.
- 71. Pack lubricant into the inner bearings of the stabilizer beams.

Engines

- 72. Check fastening and condition of the afterburners and examine them for dents (any discovered dents should be trued up).
- 73. Wash and lubricate the hinged joints of the engine control system (with removed side cover of the L.H. control panel).
- 74. Remove the filters of the oil units (at the engine inlets), inspect them and, depending on the degree of clogging, clean them thoroughly from inside or wash on outside.
- 75. Check all the joints of the fuel and oil systems for tightness.

76. After jointing the fuselage sections do the following:

- (a) check the control mechanisms of the jet nozzle shutters with the engines inoperative (except for aircraft with engines fitted with non-adjustable nozzles).  
Jet nozzle shutter ring shifting time is as follows:
  - from the augmented rating position to the maximum rating position - 5 to 7 sec.;
  - from the maximum rating to the augmented rating - 1.2 to 2.5 sec.;
  - from the normal rating to the maximum rating - 2.5 to 5 sec.
 Check the shutter ring shifting time at 80 - 85 kg/cm<sup>2</sup> pressure of the operating fluid:
  - (b) start the engines and test them at all ratings; check the operation of the generators, instruments, hydraulic system (without retracting the landing gear) and the aircraft controls;
  - (c) check visually the joints of the fuel, oil and hydraulic systems of the aircraft and engine for tightness.

Every 100±10 Flying Hours

Aircraft

Landing Gear

- 77. Change AMF-10 oil in the L.C. shock absorbers, shimmy damper and in the tail support shock absorber (change the oil when winterizing the aircraft).

Wing

- 78. Wash, inspect and lubricate the aileron attachment fittings; check the bearings to see that they move smoothly



and that their ball cages and races are intact.

Fuselage

79. Inspect the wing-to-fuselage attachment fittings and bolts, check tightening of the bolts and replace lubricant.

Hydraulic System

80. Remove and wash the throttle valves located in the wells of the L.G. main struts and the throttle valve located between No.4 and No.5 frames of the fuselage (access to this valve is through the head lamp hatch).

81. On aircraft with controlled stabilizer it is necessary to remove and wash the throttle valves of the main hydraulic system and booster system, which connect the delivery and drainage lines (these valves are installed in the well of the main landing gear R.H. strut and on No.12 frame under the extension of the fixed part of the canopy).

Fuel System

82. Wash and inspect No.1 and No.2 fuel tanks, float valves and the inverted flight compartment in No.1 tank.

83. Remove the panels of No.3 and No.4 fuel tanks; examine the tanks for cracks and worn out places and inspect the tank attachments.

84. Check the fastenings of the rubber fuel tanks and condition of their locking devices.

Air and De-Icing Systems

85. Wash the de-icing tank with hot water.

Note: Wash the de-icing tank every 100±10 flying hours simultaneously with winterization of aircraft.

86. Check the de-icing system for tightness under a working air pressure of 3 kg/cm<sup>2</sup>.

87. Remove the main air system bottles and the wing flap emergency air bottle; inspect them on the outside and examine their attachments; drain condensate from the bottles. Put the bottles in place, charge the system with air and check it for tightness.

- Notes:
1. Condensate should be drained from the canopy pressurization bottle with the canopy removed and the bottle in the canopy.
  2. Condensate should be drained from the air bottles every 100±10 flying hours, in the course of aircraft winterization.

Cockpit

88. Remove the slide valve of the cockpit supercharging cock; wash the slide valve, wipe and lubricate the cock body; put the slide valve in place.

Note: When installing a new engine, remove the OKH-106 valve, disassemble and inspect it. Repair or replace the faulty parts. Reassemble the valve and test it.

89. Check the cockpit for tightness.

Once in Two Years but Not Less than Every 200 Flying Hours

Hydraulic System

90. Wash the hydraulic system in the following sequence:

- (a) drain AMP-10 oil from the systems;

(b) remove the filter of the return line and of the hydraulic tank filler neck, wash them with gasoline and put in place;

(c) remove and wash the filter located in the hydraulic booster return line, then put it back in place;

(d) disconnect both hoses from the hydraulic boosters and interconnect the hose ends with pipe union 1004A50-8. Wash the hydraulic boosters separately;

(e) fill the main and booster hydraulic systems with fresh AMP-10 oil;

(f) prime the main hydraulic system by lowering and retracting the landing gear, wing flaps and air brakes 3 or 4 times;

(g) prime the hydraulic booster system in the course of 4 to 5 min., turning the cocks ON and OFF and disengaging the boosters 5 or 6 times;

(h) drain the washing compound from the main and booster systems;

(i) service the QP11/1 filters as instructed in Para. 62.

(j) service the throttle valves as instructed in Paras 60. and 81;

(k) put in place the washed boosters and connect the hoses;

(l) fill the systems with fresh AMP-10 oil;

Notes: 1. One and the same portion of oil may be used for washing the hydraulic systems of three aircraft.

2. Every two years the aircraft hydraulic system must be washed as part of aircraft winterization.

MAINTENANCE OF THE AIRCRAFT AND ENGINE KEPT IN STORAGE

1. Should the aircraft be withdrawn from flying missions for a period exceeding 10 days it must be slushed and stored in keeping with the relevant instructions. The engines should be slushed if the aircraft is to be stored in excess of 30 days. If, for some reason or other, the aircraft is not to be flown for a lengthy period of time and will not be slushed, service it as follows.

Every 10±2 Days

2. Carry out a preflight inspection of the aircraft. When preparing the aircraft for the first flight after storage, the fuel sediment must be drained from all the points provided for drainage of fuel and sediment.

Points attacked by corrosion should be dressed with emery cloth No.180, polished with IOH paste, washed with clean gasoline and coated with slushing compound.

3. Start and run up the engines at all the ratings.

Caution. 1. Do not perform any operations on the engines while it is snowing or raining.

2. The fuel system of the aircraft should be primed within the entire period of storage.

4. Clean the aircraft of dust and dirt.

5. Prime the hydraulic booster system by deflecting the control stick fully 8 or 10 times with the engines running at a normal working pressure in the hydraulic system, with the hydraulic boosters ON and OFF. Check functioning of the duplicating slide valves.

6. Carry out test retraction and lowering of the landing gear, wing flaps and air brakes, check operation

of the hydraulic boosters (including their control by the duplicating slide valves) and the spring-feel mechanisms.

7. Lubricate the rods of the power cylinders, APY mechanism, and L.G. shock absorbers with MMATHM-201 lubricant (provided the aircraft is not to be prepared for a flying mission).

Every 30±5 Days

8. Perform operations prescribed after every 10±2 days.
9. Inspect all the sealed fairleads through which control rods extend from the cockpit, and examine the pressurization hose. Check the cockpit for tightness.
10. Using a special pressure gauge, check the pressure in the hydraulic accumulators.
11. Inspect the elektron parts.
12. Drain sediment from the fuel tanks to check for water in fuel.

Every 3 Months ± 10 Days

13. Perform operations prescribed after every 30±5 days.
14. Check operation of the canopy jettisoning system. Wash, inspect and lubricate the mechanisms of the canopy locks and jettisoning system. Clamp the jettisoning handle in the locking shackle and lock with KOK-0.5 wire.
15. Examine the lock mechanisms of the pilot's harness and that of the foot grips; disassemble the spring mechanism, wash the parts in clean gasoline, lubricate and reassemble. After installation, check the mechanism for reliable operation from the A4-3 automatic pressure unit.
16. Inspect the seat foot-rest dampers and check their operation; wash the hinge joints with gasoline and coat them with lubricant.

17. Check the mechanical linkage of L.G. locks and check operation and tightness of the L.G. and wing flap emergency lowering system.

18. Check opening of the drag chute doors, wash and lubricate all the hinges.

19. Carry out 25-hour maintenance operations on the hydraulic boosters.

20. Deslush the engines, start them and run up at all ratings for 5 or 10 min.

Check condition of the engine fuel system. Pay attention to tight connections and condition of hoses.

21. In case the engines are to be stored in excess of 30 days, slush them as prescribed for 3-month storage.

ARMAMENT  
PREFLIGHT OPERATIONS

Preparing and Testing Armament Units

1. Open the lids of the hatches giving access to armament, link bags and cartridge belts. Unload the weapons. Wipe the barrels with the locking parts pulled rearward.

Upper Nose Compartment

2. Open the lid of the upper nose compartment and make sure that the EM-2 timer handle is set to the pre-determined time and the switch is in the ON (ВКЛЮЧЕНО) position.

Fuselage Nose Section

3. Remove the hatch lid and check fastenings and condition of the camera gun. Check its operation with the automatic circuit breakers switched ON and the fire-control button in the cockpit depressed and proceed as follows:

- (a) set the diaphragm to suit the weather and sensitivity of the film and install a suitable light filter;
- (b) insert the loaded film magazine into the camera; make sure the cover fits tightly against the camera;
- (c) inspect the camera protecting glass for damage, dirt and stains. Put the hatch lid in place.

4. Check position of localizer ports with respect to the fuselage skin. The localizer ports must be spaced equally with respect to the middle opening of the rear row of ports.

5. Inspect the 9KCP-46 magazine and load it.

Bombs and Rocket Armament

6. Prior to fixing the drop tanks, inspect and check operation of racks from tactical and jettisoning circuits; check functioning of simultaneous release units (AOC) and condition of bomb suspension pilot lamps.

7. Prior to bombing up the aircraft install the universal racks, inspect them and check their operation from tactical and jettisoning circuits at ARMED (ВЗФНВ) and SAFE (БЕЗОПНВ) positions as well as condition of bomb suspension pilot lamps.

8. Check the breech-pieces, the rocket holders and prepare the rocket pods for loading.

Cockpit

9. Open the sliding section of the canopy and check for presence and correct position of the ground lock pin of the seat ejection gun head, seat arm-rest handle ground lock pins and presence of cottering parts on the face screen handle.

Note: Ground lock pins must be removed after the pilot has climbed in the cockpit and before taxiing out.

10. Check condition and correct locking of the wedge key fork to the seat ejection gun head by the canopy inter locking pin.

11. Inspect visually and check by hand condition of the automatic circuit breakers, fire control and bomb release button, tactical release switch and 9KCP-46 signal flare magazine switch.

12. Connect ground power supply to the aircraft network.

13. Inspect the gunsight head from outside and check the following:

- (a) examine the cockpit armoured glass, light filter, reflector and objective glass for dust, dirt and oil stains. Remove any dirt with a flannel cloth soaked with rectified alcohol;
- (b) check condition of the reflector, light filter, and objective glass;
- (c) check fastening of the reflector and light filter and locking of the light filter in the operating and stowed positions;
- (d) check smoothness of rotation of the illumination rheostat, mirror and base setting, and reliability of their locking in any desired position;
- (e) check condition of silica gel. It should be of blue colour;
- (f) check fastening of the gunsight head on the bracket.

14. Check operation of the gunsight (simultaneously with the radio range finder).

This check should be performed together with the radar equipment specialists.

To check operation of the gunsight:

- (a) remove the heading from the CPY-1M antenna;
- (b) switch on the circuit breaker marked GUNSIGHT HEATING (CIRCUIT BREAKER) on the left control panel and 7 to 15 min. later switch on the GUNSIGHT (GUNSIGHT) and CPY-1M antenna circuit breakers.

INSURE AT ALL TIMES THAT THE GUNSIGHT HEATING CIRCUIT BREAKER IS KEPT OPEN AND THE GUNSIGHT HEATING CIRCUIT BREAKER IS KEPT OPEN.

(c) set the heading to 180 degrees (180 degrees) selected on the heading indicator and the compass offset = 18 degrees (18 degrees);

- (d) set the arrester handle to the CYRO (TWPO) position;
- (e) make sure the range handle on the throttle quadrant rotates smoothly and easily from minimum to maximum range positions; during this movement the size of the range ring should diminish and the sight reticle must deflect down which is an evidence of plotting of the sighting angle (with 20 - 30 m. base); the computer range and time scales and the range indicator or pointer should move; readings of the range scale on the indicator and computer should be within specified limits;
- (f) make sure that rotation of the illumination rheostat knob changes brightness of the gunsight reticle from maximum to zero;
- (g) make sure the range ring becomes larger while the base handle is being rotated towards larger base and smaller when it is rotated towards smaller base;
- (h) make sure the gunsight reticle moves down when the mirror angle knob is rotated from zero to the maximum and returns to the initial position when being released;
- (i) make sure that when the switch handle is shifted from the "HP" (annon) to the "FF" (finder) position the gunsight reticle moves down and the computer time scale moves;
- (j) make sure that depressing the locking knob moves the gunsight reticle upward and releasing the knob moves it down with introduced maximum range;
- (k) check condition of the radio range finder. Shift the RADIO-OFFICER selector switch to the RADIO OFFICER position, the radio range finder will come back on screen (RANGE) and the green beam (RANGE) lamp on the gunsight head will burn uniformly steadily;
- (l) check operation of the range finder circuit of CPY-1M by depressing the button on the heading indicator as a check, the green beam will be seen on the heading indicator and the green beam will be seen on the heading indicator.

- Notes: 1. To prevent permanent deformation of the terminal switch springs of the computer "Д" and "Т" units and potentiometer П15 after checking the gun-sight (prior to turning it OFF) do the following:
- set the computer "Д" range scale to the 400 - 1600 m.range;
  - set the range ring between 2° and 7° divisions (the base scale being set between 17 and 60 m.);
2. If the gunsight has been out of service for a long time (in excess of 1 month), it is recommended to switch it ON once every 15 or 20 days and work the computer over the entire range in the course of 5 min.

- 15. Switch off the radio range finder and the gunsight by reversing the switching-on operations.
- 16. Reload and release the working parts of weapons to check condition of weapons, cartridge counters, and of the combat-ready pilot lamps.
- 17. Inspect the camera gun, check its functioning and insert the loaded magazine.
- 18. Check operation of the HV-2 control and switch unit and of the signal unit in the 4-SALVO (4 ЗАЛП) , 1-SALVO (1 ЗАЛП) and AUTOMATIC (АВТОМАТИЧ.) positions.

Note: Having prepared the armament circuit breakers, turn OFF the "PC" tactical release switch and the camera gun magazine switch.

Loading the Weapons and Rocket Pods and Bombing Up.

- 19. Load the weapons and close the hatches giving access to the armament, link bags and cartridge belts of the wing-mounted weapons.

- 20. Get ready the bombs, fuzes, remote arming units and fuze propeller control mechanisms.
- 21. Attach the bombs and insert the fuzes.
- 22. Get ready the rockets and fuzes for loading the rocket pods.
- 23. Load the rocket pods and close the breech-pieces.
- 24. Disconnect the ground supply from the aircraft network.

Preflight Inspection

- 25. Check positions of the following units; automatic circuit breakers, fire control and bomb release knob, tactical release switch, magazine switch and gunsight switch.
- 26. Check visually to see that:
  - (a) the cockpit armoured glass, light filter reflector, and lens are free of dust, dirt and oil stains;
  - (b) illumination rheostat knob, mirror and base angle knobs rotate freely and are reliably fixed in any desired position.

- 27. Make sure the bombs are fitted with fuzes to suit the nature of the missions.
- 28. Check whether the YBN-M fuze control rod is properly installed with respect to the bomb and its fin and make sure the rod snap hooks are reliably connected to the shackles of the remote arming unit (УДБ).
- 29. Make sure the hatch lids of the weapons, link bags and cartridge belts are securely closed.
- 30. Check to see that the special rack hatches giving access to holders and front attachment fittings are closed.
- 31. Check whether the rocket pod plug hatches are closed.
- 32. Inspect the rocket pod rear fairings and check whether they are reliably fastened by trying to turn them to

the left about their axes (without pulling back the catch) and pull them back.

Make sure the HV-2 control and switch unit and the signal unit are ready for fire.

#### PRELIMINARY OPERATIONS

After landing, taxi the aircraft to a specially assigned site, turn it in a safe direction and, taking the necessary precautions, unload the weapons, rocket pods and take away the non-released bombs.

#### Postflight Inspection

##### Fuselage Nose Section

33. Inspect visually the armament and ammunition box attachment fittings. Besides, check adjustment of the gas outlet pipe support.

34. Inspect the units of the air system, feed system and link chute.

35. Inspect the cartridges and links and clean them, if necessary.

This inspection should be performed every 10 to 15 days.

36. Unload the camera gun and inspect it.

##### Starboard Wing

37. Inspect visually the condition of the armament attachment fittings.

38. Check for presence of the circular clearance between the gun barrel and the liner in the barrel support.

The total clearance should be not less than 1.5 mm; that on one side - not less than 0.3 mm.

39. Inspect the units of the air system, feed system, link bag and link chute.

40. Check attachment of the gun feed hose.

41. Inspect the cartridges and links; clean them if necessary.

42. Check fastening of the universal bomb rack to the wing.

Pay attention to condition of the support bracket attachment fittings.

43. Inspect the bomb rack.

44. Examine the screws fastening the special rack to the wing.

45. Check whether the rocket pod is properly attached to the rack carrying lever, check tightening of the pod attachment lug by means of a calibrated wrench, and examine condition of the rocket pod front and rear supports.

##### Tail Unit

46. If signal flares have been used in flight, remove the magazine from the housing, unload it, clean, inspect and lubricate, check serviceability of the magazine control electric circuit. Put the magazine into the housing.

##### PORT WING

47. Inspect the wing following the procedure prescribed for the starboard wing.

##### Cockpit

48. Open the sliding section of the canopy and check for presence of the ground lock pin in the head of the seat ejection gun.

49. Check condition and locking of the wedge key fork with the seat ejection gun head by the canopy locking key.

50. Connect the ground power supply to the aircraft electric network.

51. Unload the camera gun and inspect it.

52. Check condition of the AOC release units and rack control and signal circuits (to be performed only when the aircraft is not equipped with drop tanks).

53. Using a special tester (KII) check serviceability of the rocket igniting circuits in the rocket pods and set the IV-2 control and switch unit and the signal unit to the initial position.

54. Inspect externally the gunsight head and check the following:

(a) cockpit armoured glass, light filter, reflector and lens for dust, dirt and oil stains. Remove any dirt with a flannel cloth soaked with rectified alcohol;

(b) condition of the reflector, lens and light filter;

(c) fastening of the reflector and light filter and reliability of light filter locking in the working and stowed positions;

(d) smoothness of rotation of the illumination rheostat knob, mirror and base knobs and their locking in any desired position;

(e) condition of silica gel desiccator cartridge (if any). The silica gel should be of light blue colour;

(f) fastening of the gunsight head on the bracket;

(g) screws attaching the bracket to the aircraft. The screws should be tightened securely; marks made during test firing should be in perfect alignment.

55. Check functioning of the gunsight as prescribed in Para. 14 of the "Preflight Operations" Section.

56. Switch OFF the radio range finder and gunsight by reversing the switching ON operations.

Cleaning and Lubricating the Cannons and Rocket Pods

57. Prepare the working site, open the cannon access hatches and remove breech-pieces from the rocket pods.

58. Clean and lubricate the cannons and rocket pods without removing them from the aircraft after the flights during which the cannons and rockets have not been fired.

59. Remove the cannons and rocket pods and clean them (the cannons should be disassembled into separate units while the rocket pods should be stripped of rear fairings, breech-pieces and rocket holders); these operations should be performed:

(a) after firing;

(b) after 10 - 15 days during which the aircraft was not flown.

After firing, the armament should be cleaned and lubricated on that same day.

The scope of cleaning operations after firing and when atmospheric moisture gets on the weapons, should be determined by the unit armourer.

60. Inspect the armament units and parts.

61. Lubricate and assemble the weapons.

Note: Preventive replacement of armament parts should be performed in compliance with the weapons certificates.

62. Clean and lubricate the mounts.

63. Install the cannons on the mounts and check all parts for presence and proper locking.

64. By cooking and releasing the parts make sure the cannons, cartridge counters and combat-ready pilot lamps are functioning properly.



65. Clean and lubricate the rocket pod holders and check their operation from the ROCKET JETTISONING (АВАРИЙНЫЙ СЕРОС РС) button.

66. Clean the bomb and drop tank racks and check their operation from the tactical release and jettisoning circuits.

67. Replenish the basic load of ammunition.

68. Load the weapons.

69. Disconnect the ground power supply from the aircraft electric network.

MAINTENANCE OPERATIONS

Every 25 +5 Flying Hours

1. Inspect the aircraft armament in the scope of the postflight inspection.

2. Remove the racks from the aircraft, wash them and inspect for damage. Check the racks operated from the mechanical control lever.

3. Check the following:

(a) the clearance between MBH-48 end-piece and the ARMED-SAFE lever with the 9-mm dia. shaft placed on the carrying lever. This clearance should be not less than 0.3 mm;

(b) reliable meshing of intermediate lever with the tooth of the quadrant;

(c) overlapping of the quadrant supporting surface by the tooth of the electromagnet sear. This overlapping should be not less than 2.5 mm over the entire surface.

4. Check the voltage and operating current of the rack electromagnetic controls. At 24.3 V and 20°C the consumed current should be not over 4.9 A for tactical release and not over 5.4 A for jettisoning. Minimum operating voltage must not be higher than 20 V.

5. Install the racks on the aircraft, connect and lock the electric plug connectors.

6. Check operation of the racks from the tactical circuit and for ARMED and SAFE operation from the jettisoning circuit.

7. Check operation of the tank automatic drop interlocking system.

8. Fire the seat ejection gun once with a dummy cartridge by actuating the face screen and shifting ejection handles on the seat R.H. and L.H. arm-rests in one of the positions of the seat and check handles and face screen for additional travel. Check also functioning of the mechanism without firing it with dummy cartridges (to be performed by the armourer together with the aircraft mechanic). Disassemble the mechanism, clean it, lubricate and reassemble. Make sure the ball lock is locked reliably.

9. Inspect and clean the cameras without disassembling them. Parts to be cleaned are the instruments, magazines, and the prism.

10. Check electric wiring of the rocket pod jettisoning system by the ROCKET JETTISONING button.

11. Check aiming of the cameras and rocket pods.

12. Clean the signal flare magazines, inspect them and lubricate. Check the magazine electric control wiring.

13. Inspect the gunsight in the scope of the postflight inspection.

14. Check bonding of the gunsight units and connecting cables to the aircraft fuselage.

15. Inspect the cartridges and links and clean them, if necessary.

16. Fire the canopy jettisoning pistol with dummy cartridges by actuating the face screen and by shifting the independent canopy jettisoning handle (to be performed together with the aircraft specialist).

Every 50 ~~75~~ Flying Hours

17. Using KN5CM tester (or KN5C tester if the KN5CM is not available) check the following:

(a) condition of gunsight electric circuits;

- D.C. voltage 27 V  $\pm 10\%$ ;
- gunsight head lens heating current 0.5 - 1.1 A;
- main gyro heating current 1.2 - 1.7 A;
- zero gyro heating current 1 - 4 A;
- A.C. voltage 115 V  $\pm 5\%$ , 400 c.p.s.  $\pm 5\%$ ;
- D.C. reference voltage 250 V;
- stabilized D.C. voltage 22 V  $\pm 0.3$  V.

Note: Gunsights manufactured after August 1, 1955 have temperature compensation with which the stabilized voltage may vary within 22  $\pm 1$  V;

(b) tightness of the altitude unit;

(c) accuracy of "R" range computation on the gunsight computer scale with the help of the radio range finder simulator;

(d) accuracy of "T" time computation on the gunsight computer scale in accordance with range, altitude and ballistic properties of weapons;

(e) accuracy of plotting of sighting angles for cannons and of total lag angles for rocket missiles;

(f) accuracy of plotting range rings;

(g) current in lead coil (90 - 400 mA);

(h) zero current in the azimuth channel (not over 3 mA);

(i) zero current in the elevation channel (not over 5 mA);

(j) controllability of the main gyro by the currents in the correction coils of the azimuth channel;

(k) precession time of the main gyro; if it is less than 30 sec., lubricate the pivots of the gyro gimbal frame with ONG-122-5 oil and re-check the precession time.

18. Check condition of the electric cables connecting the gunsight units.

Every 100 ~~150~~ Flying Hours

19. Carry out the test firing.

Note: Test firing should be carried out upon acceptance of the aircraft from the plant, after repairs and replacement of the weapons, gunsight and their attachment fittings, also when the pilot is not certain as to the aiming accuracy of his weapons.

20. Inspect and clean the weapons by detail-stripping them. Clean the contacts and check operation of armament electric triggers. Change kerosene in the cannon hydraulic buffers.

Note: Cleaning and inspection accompanied by detail-stripping should also be undertaken when desludging the weapons, when systematic delays are discovered and after a certain number of rounds fired.

21. Inspect the armament attachment fittings with a magnifying glass and check tightening of the bolt nuts of the front fittings which fasten the weapons to the spars and ribs.

22. Clean the contact sockets for the missile igniter plugs with complete disassembly if the number of rockets launched from each barrel of the pod is not less than 20. Check condition of the launcher attachment fittings, front and rear supports, breech-pieces and rocket pod barrels.

23. Inspect the 9K-48 valves and check them for tightness and minimum operating voltage and amperage.

24. Clean, inspect and airblast the commutators of computer electric motor ДР-3.5M and gunsight electric motor ДГ-4M.

25. Lubricate the centre bearing and the pivots of the gunsight gimbal frame with ОКЕ-122-5 oil and check the precession time.

26. Remove the photographic equipment, inspect it and check operation of the heaters.

27. Inspect and check condition of spare tools and accessories for weapons, rocket launchers, gunsight and photographic equipment and check the completeness and condition of YBN-M fuze control devices.

28. Realign the spare parts and accessories.

Yearly Maintenance

Replace the squibs in the seat ejection gun, canopy jettisoning pistol and in the fire extinguishing system.

MAINTENANCE OF THE ARMAMENT UNITS ON AIRCRAFT  
KEPT IN STORAGE

Every 10 ±2 Days

1. Clean the cannons, rocket pods and ШКР-46 magazines.
2. Check functioning of armament under current in the scope of the preflight operations.

Every 30 ±5 Days

3. Carry out the operations included in the postflight inspection routine.
4. Check condition of silica gel cartridges (if present in the gunsight). Silica gel must be of light blue colour.
5. Inspect the elektron parts.

Every 3 Months ±10 Days

6. Carry out operations included in 30 ±5 days routine.

7. Fire the seat ejection gun by dummy cartridges once from the face screen and once from each of the handles on the R.H. and L.H. arm-rests with the seat in one of its positions. Check for presence of additional travel of the ejection handles and of the face screen. With the seat in the two other positions check functioning of the mechanism without the use of dummy cartridges.

8. Remove the seat ejection gun, disassemble it, clean of corrosion products, dust and dirt. Coat the parts with a thin layer of ЦИАТИМ-201 lubricant, assemble the ejection gun and put it in place. Check the ball lock for reliable closing.

RADIO AND RADAR EQUIPMENT

1. Before starting any maintenance operations, take all the precautionary measures against injuries by H.T. current and accidental operation of the equipment.
2. The maintenance instructions outlined below do not contain any special recommendations as to the necessity of detecting and removing any dirt from cables, feeders, antennas and individual units of the equipment since this work is considered an imperative prerequisite of all servicing operations.
3. Individual units, cables, feeders and antennas must be inspected with the equipment deenergized.

PREFLIGHT OPERATIONS

Radio Equipment

Check the following:

1. Fuselage: condition and fastening of the radio set antenna, and of the fairings of the radio compass loop and of the marker set antenna.
  2. Wings: fastening and condition of the radio altimeter antenna.
  3. Cockpit: omnidirectional antenna of the radio compass and its lead-in; external appearance and fastening of light and pointer-type indicators; serviceability of the equipment and proper functioning of the switches and knobs.
- Upon completion of the check, set all the switches and knobs to their respective initial positions and switch OFF the equipment.

Serviceability of the equipment should be checked as follows:

- radio set: by establishing communication with a ground station or a station of another aircraft in service channels and by monitoring pilot's own signals over the other channels;
- radio compass: by receiving signals and checking the bearings of the homing beacons while shifting the subranges by the LONG RANGE-SHORT RANGE (ДАЛЬНЯЯ-БЛИЗКАЯ) selector switch;
- radio altimeter: by deflection of the altitude indicator pointer after switching ON and changing of subranges;
- marker set: by any kind of simulator.

Radar Equipment

Check the following:

4. Fuselage: fastening and condition of the antenna of responder and range finder.
  5. Fin: condition of the fairing of the warning receiver antenna.
  6. Upper nose compartment: condition of the inertia contactor.
  7. Cockpit: locking of the safety cap of the ARMED (BSEAB) button, serviceability of the equipment and proper functioning of the switches and knobs.
- Upon termination of checks set all the switches and knobs to their initial positions and switch OFF the equipment.

Serviceability of the equipment should be checked as follows:

- responder: by the signals of a ground station or any kind of simulator (accuracy of coding must be checked by means of light and aural signals);
- warning receiver: by the buzzer;

- range finder: by locking on (glowing of indicator lamps) and releasing (extinction of indicator lamps) of the reflected signals with released and depressed RELEASE (CEPCC) button (functioning of the range finder should be checked jointly with the armourer).

8. Switch ON the ARMED circuit before the flight and deenergize it after the flight.

#### PRELIMINARY OPERATIONS

##### Radio Equipment

Check the following:

9. Fuselage: condition and fastening of the radio set antenna, fairings of the radio compass loop and of the marker set antenna. See that there is no kerosene, oil or moisture inside the fairings.

10. Wings: fastening and condition of the radio altimeter antennas.

11. Nose compartments: outward appearance and fastening of units.

12. Cockpit: omnidirectional antenna of the radio compass and its lead-in; outward appearance and fastening of units, light and pointer-type indicators; serviceability of the equipment supplied either from the main or from the stand-by converters, and proper functioning of switches and knobs if the equipment was not used in flight or its operation was reported defective.

Having finished the checks set all the switches and knobs to their initial positions and switch OFF the equipment.

Serviceability of the equipment must be checked as follows:

- radio set: by establishing communication with a ground station or a station of another aircraft in all channels;

- radio compass: by receiving signals and checking the bearings of the homing and broadcasting stations in all the subranges;

- radio altimeter: by deflection of altimeter pointer after switching ON and changing the ranges;

- marker set: by any kind of simulator.

##### Radar Equipment

13. Make sure the ARMED circuit is deenergized.

Check the following:

14. Fuselage: fastening and condition of the range finder and responder antennae.

15. Fin: condition of the warning receiver antenna fairing.

16. Fuselage compartments: external condition and fastening of units.

17. Cockpit: locking of the safety cap of the ARMED button; serviceability of the equipment supplied either from the main or from the stand-by converter and proper operation of the switches and knobs if the equipment was not used in flight or was reported defective.

Upon termination of the checks, set all the switches and knobs to their initial positions and switch OFF the equipment.

Serviceability of the equipment should be checked as follows:

- responder: by the signals of a ground station or any kind of simulator (accuracy of coding should be checked by means of light and aural signals);

- warning receiver: by the buzzer;

- range finder: by a special tester.

MAINTENANCE OPERATIONS

Description of maintenance operations	Maintenance intervals (in flying hours)		
	25±5	50±5	100±10
1	2	3	4
<u>Radio Set</u>			
1. Check the condition and attachments of the antenna.	+	+	+
2. Inspect screening of cables, P.V.C. tubes of feeders, cable and unit bonding strips, fastening of cables and feeders.	+	+	+
3. Remove the receiver-transmitter and rectifier from the aircraft. Inspect the wiring, parts, relays, seating of tubes and crystals in the holders. Dress down the burnt relay contacts.			+
4. The following performance characteristics should be checked on the test stand:			
- current in the artificial antenna; transmitter modulation percentage and sensitivity of receiver;			+
- calibration of the receiver scale and functioning of automatic frequency control.			+
5. Check condition of plug connector pins and pinholes (do not disassemble the sealed connectors). Install the receiver-transmitter and rectifier on the aircraft.			+
6. Check whether the union nuts of plug connectors and feeders are properly tightened.	+	+	

1	2	3	4
7. Check attachments and shock-proofing of units.	+	+	
8. Check functioning of the radio set in the scope of preliminary operations.	+	+	+
9. Check the following performance characteristics (on the aircraft or on a stand):			
- current in artificial antenna; modulation percentage of transmitter and sensitivity of receiver;		+	
- calibration of receiver scale and functioning of automatic frequency control.	+	+	
<u>Radio Compass</u>			
10. Check condition and fastening of antenna, its lead-in and loop fairing. Inspect the desiccator cartridge.	+	+	+
11. Examine the screening and fastening of cables, bonding strips of cables and units.	+	+	+
12. Remove the receiver from the aircraft and check condition of wiring, parts, relays and seating of tubes in the holders.			+
13. Remove the loop unit from the aircraft and service it as follows:			
- replace lubricant in the loop ball bearings;			+
- clean the loop brushes and slip rings;			+
- replace lubricant in the ball bearings of the engine reduction gear DPK-627;			+

1	2	3	4
- remove dust, dirt and silica gel crystals from the loop unit.			+
14. Check the receiver on the stand for the following characteristics: sensitivity of receiver (20 microvolts), accuracy of graduation ( $\pm 2.5\%$ ), maximum homing sensitivity (50 microvolts/m., 250 microvolts).			+
15. Check condition of the plug connector pins and pinholes (do not open the sealed plug connectors). Install the receiver and the loop unit on the aircraft.			+
16. Check tightening of plug connector union nuts.	+	+	
17. Check fastening and shock-proofing of units.	+	+	
18. Check functioning of the radio compass in the scope of preliminary operations.	+	+	+
19. Check the following performance characteristics (on aircraft or on stand): sensitivity of receiver (20 microvolts), accuracy of graduation ( $\pm 2.5\%$ ) and maximum homing sensitivity (50 microvolts/m.).		+	
<u>Radio Altimeter</u>			
20. Remove the antennae from the aircraft. Clean the antenna mounting places. Reinstall the antennae and paint the edges of the antenna bases.			+

1	2	3	4
21. Check screening of cables, P.V.C. tubes of the feeders, bonding strips of cables and units, fastening of cables and feeders.	+	+	+
22. Remove the receiver-transmitter and converter from the aircraft. Check condition of wiring, parts, relays and seating of tubes in the tube holders.			+
23. Blow the inner spaces of the converter. Clean the commutator-and-brush assemblies and replace lubricant in the ball bearings.			+
24. Check the following characteristics on the stand: sensitivity (80 - 70 decibels) and calibration of the radio altimeter.			+
25. Check condition of plug connector pins and pinholes (do not open the sealed plug connectors). Install the receiver-transmitter and converter on the aircraft.			+
26. Check tightening of the plug connector and feeder union nuts.	+	+	
27. Check fastening and shock-proofing of the radio altimeter units, fastening and condition of the antennae.	+	+	
28. Check functioning of the radio altimeter in the scope of preflight operations.	+	+	+
29. Check the radio altimeter on the stand for sensitivity (80 decibels) and calibration.			+

1	2	3	4
<u>Marker Set</u>			
30. Check fastening and condition of the antenna fairing.	+	+	+
31. Check screening of cables, P.V.C. tube of the feeder, bonding strips of cables and units and fastening of cables and the feeder.	+	+	+
32. Remove the receiver from the aircraft. Check condition of wiring, parts, relays and seating of tubes in the tube holders.			+
33. Check on the stand the sensitivity, tuning frequency, and relay operating and release currents.			+
34. Check condition of the plug connector pins and pinholes (do not open the sealed plug connectors). Install the receiver on the aircraft.			+
35. Check tightening of union nuts of the cable and feeder plug connectors.	+	+	
36. Check fastening and shock-proofing of units.	+	+	
37. Check functioning of the receiver in the scope of preliminary operations.	+	+	
38. Check the following characteristics (on the aircraft or on a stand): - sensitivity by the distance (1 - 3 m.) between the receiver and simulator antennae, and tuning frequency (75 Mc/s).	+	+	+
			+

1	2	3	4
<u>Responder</u>			
39. Check condition and fastening of the antenna.	+	+	+
40. Remove the responder from the aircraft. Check condition of wiring, parts, relays and seating of tubes in the tube holders.			+
41. Clean the surfaces of the swinging mechanism and lubricate the rod roller.			+
42. Blow the inside spaces of the converter. Clean the commutator-and-brush assemblies and replace lubricant in open ball bearings.			+
43. Check screening of cables, P.V.C. tube of feeder, bonding strips of cables and units, fastening of cables and feeder. Inspect wiring of the ARMED circuit, check the voltage and its polarity on the pins of the ARMED plug.			+
44. Check on the stand the following performance characteristics: frequency range, power, duration of pulses, coding of signals and sensitivity of receiver.			+
45. Check condition of plug connector pins and pinholes (do not open the sealed plug connectors). Install the responder on aircraft.			+
46. Check tightening of plug connector union nuts.			+
47. Check fastening and shock-proofing of the units.			+
48. Check functioning of the responder in the scope of preflight operations.	+	+	+



1	2	3	4
49. Check the following characteristics (on the aircraft or on a stand): frequency range, coding of signals and sensitivity by the distance (2 - 5 m.) between the responder antenna and indicating instrument.		+	
<u>Tail Warning Receiver</u>			
50. Check condition of the antenna fairing.	+	+	+
51. Check fastening and shock-proofing of the units.		+	
52. Remove No.1 and No.2 units from the aircraft. Check the wiring and restore protective coating, if necessary.			+
53. Check sensitivity of the receiver by means of test instruments.			+
54. Install No.1 and No.2 units on the aircraft.			+
55. Estimate the sensitivity by the distance between the antenna and buzzer.		+	
56. Check functioning of the receiver in the scope of preflight operations.	+		+
<u>Range Finder</u>			
57. Check condition and fastening of the antenna.	+	+	
58. Check screening of cables, P.V.C. tubes of feeders, cable and unit bonding strips, fastening of cables and feeders.	+	+	+

1	2	3	4
59. Remove the receiving-transmitting unit, range unit, power unit and antenna from the aircraft. Dress the antenna mounting place. Open the units, inspect the wiring, parts, relays, and seating of tubes in the holders.			+
60. Check the following characteristics (on the aircraft or on a stand):			
- power of transmitter;		+	+
- sensitivity of reception circuit;		+	+
- calibration by corner reflector;	+	+	+
- sealing of the receiving-transmitting unit.			
61. Check condition of plug connector pins and pinholes (do not open the sealed plug connectors).			+
62. Check tightening of union nuts on cable connectors and feeders.	+	+	
63. Check fastening and shock-proofing of units and reliability of locks fastening the receiving-transmitting unit to the housing.	+	+	
64. Check functioning of the range finder in the scope of preliminary operations.	+	+	+
<u>Converters</u>			
65. Remove the converters from the aircraft, blow their inside, clean the commutator-and-brush assemblies and replace lubricant in the ball bearings.			+

1	2	3	4
66. Check the output voltage of the converters on the stand and install the converters on the aircraft.			+
67. Check the output voltage of the converters on the aircraft.	+	+	

MAINTENANCE OF RADIO AND RADAR EQUIPMENT  
ON AIRCRAFT KEPT IN STORAGE

Every 10<sup>1/2</sup> Days

1. Perform operations prescribed in "Preflight Operations" Section.

Every 30<sup>1/2</sup> Days

2. Check condition of desiccators.
3. Perform operations prescribed in "Preliminary Operations" Section.

Every 3 Months + 10 Days

4. Check condition of desiccators.
5. Perform operations prescribed in "Preliminary Operations" Section.

AIRCRAFT EQUIPMENT

ELECTRIC EQUIPMENT

PREFLIGHT OPERATIONS

Do the following:

Upper Nose Compartment.

1. Inspect and check fastening of the aircraft storage battery, plug connector, and vent pipe.  
Note: If the storage battery has been removed from the aircraft, check the state of its charge, condition of the surface of the sealing compound, fastening of the electric cables to the battery terminals, after which install the battery in the aircraft and connect it to the aircraft network.

Nose Gear

2. Check the condition and fastening of the external light indicators showing the position of the landing gear.
3. Check the taxi light for proper fastening and condition of its lens.
4. Examine the attachment of wiring and terminals of its insulation.
5. Check the condition and fastening of the terminal switches.
6. Check the condition and fastening of the landing gear position external light indicators.

7. Check the condition and fastening of the terminal switches.
8. Check the attachment of wiring and condition of its insulation.

Starboard Wing

9. Check the condition and cleanliness of the navigation light filter and static discharger.

Tail Unit

10. Check the condition and cleanliness of the navigation light lens.

Main Landing Gear, L.H. Strut

11. Check the condition and fastening of the landing gear position external light indicators.
12. Check the condition and attachment of the terminal switches.
13. Inspect the attachment of wiring and condition of its insulation.

Port Wing

14. Check the condition and cleanliness of the navigation light filter and static discharger.

Fuselage, Port Side

15. Check the attachment and condition of the landing light lens.

Cockpit

16. Check the storage battery voltage at a load twice the nominal value; the voltage should be not under 24 V (it is recommended to check battery voltage with the HNE-2 booster pump engaged).

17. Check fastening of the APV@OH ultra-violet lamp and KNCPK-45 cockpit lamp fittings and condition of their electric wiring. Check condition of the caps and light filters of the pilot lamps.

18. Switch ON the ground source of electric power and check the following:

- condition of L.G. position indicating lamps, fire-alarm lamps, and generator pilot lamps;
- condition of pilot lamps in "Tableau-6";
- functioning of AHO navigation, Y@C ultra-violet, and cockpit lamps;
- operation of the booster and fuel transfer pumps and pressure signal units;
- heating of the Pitot tube and TH-156 tube;
- functioning of the air-distributor cock of the cockpit supercharging system;
- functioning of the throttle control lever interlocking devices in accordance with velocity head (to be performed together with the instrument mechanic);
- functioning of the aerodynamic trim tab electric mechanism;
- functioning and condition of pilot lamps of AFY unit, "trim tab effect", operation of stabilizer electric control units; simultaneously with these operations the stabilizer control system must be checked by the aircraft mechanic.

Having carried out the operations related to preflight preparation of electric equipment, make sure that all the power consumers and the aircraft battery are ON, and the trim tabs are shifted to neutral.

Note: While preparing the electric equipment for the next flight, it is allowed to omit operations 1, 5, 7, 12, 17 and 18 if the pilot has no complaints about the operation of units.

PRELIMINARY OPERATIONS

Do the following:

Upper Nose Compartment

19. Check condition of battery sealing compound, filler caps, heat-insulation of battery container, electrolyte level, reliability of connections of electric cables to battery terminals under load.

20. Check storage battery attachments.

21. Check reliability of contact in the container plug connector, tightening and locking of the latter.

22. Check reliability of battery minus wire connection to the aircraft fuselage.

23. Check tightening of nuts and condition of cable insulation at TN-400 fuse in the storage battery circuit.

24. Inspect the storage battery vent system.

Nose Gear

25. Check the fastening, operation and smooth movement of the rods of the L.G. position terminal switches and independent switching ON of the control stick spring-feel mechanism.

26. Check the condition and fastening of the L.G. position external light indicators.

27. Check fastening of the taxilight and condition of its lens.

28. Examine the attachment of wiring and condition of its insulation.

29. Inspect fastening of the inertia contactor and of wheel brake automatic air-electric release valve.

Main Landing Gear, R.H. Strut

30. Check the terminal switches for reliability of fastening and correct operation and for smooth sliding of the rod.

31. Check condition and attachment of the L.G. position external light indicators.

32. Check fastening of the inertia contactor and wheel brake automatic air-electric release valve.

33. Inspect the electric wiring for condition of attachment and insulation.

Starboard Wing

34. Check serviceability of EANO position light fittings, cleanliness of the light filters and static discharger.

35. Check the wing flap terminal switch for reliable fastening and operation.

Fuselage, Starboard Side

36. Check the condition and fastening of the electric air distributor (Unit 525), wing flap cock, electric valve 9K-48 and reliable connections and attachment of wiring.

37. Check condition of insulation and fastening of electric wiring in the fuselage and in the engine compartment.

Tail Unit

38. Check condition and fastening of the navigation light fittings and lens.

Fuselage, Port Side

39. Check the condition and fastening of the L.G. cock, electric valve 9K-48, starting panel, and inspect electric wires for reliable connections and flanging.

40. Inspect the ground electric supply plug.

41. Examine fastening of EHT-2001 relay box and wire connections.

- 42. Check fastening of the landing headlight and condition of its lens.
- 43. Check condition of insulation and attachment of electric wiring in the fuselage and in the engine compartment.

Port Wing

- 44. Check condition of EAHO position light fittings and cleanliness of its light filter. Examine the static discharger.
- 45. Check fastening and operation of the wing flap retracted position terminal switch, and of intermediate position push-button switches (jointly with the aircraft mechanic).

Main Landing Gear, L.H. Strut

- 46. Proceed as prescribed for the R.H. strut (Paras 30-33).

Cockpit

- 47. Check voltage of the aircraft storage battery (with the HMB-2 booster pumps working).
- 48. Check attachments of the electric panels, pilot lamp fittings, PYQO ultra-violet light rheostats, APVQCH ultra-violet lamp fittings and KJCPK cockpit illumination fittings.
- 49. Check the condition and attachment of electric wiring.
- 50. Switch ON the ground electric supply and check the following:

- operation of the electric control mechanism;
- functioning of the booster and transfer fuel pumps and pressure warning units;
- heating of Pitot tube and TH-156 tube;
- condition of AHO navigation, YQO ultra-violet and cockpit illumination lamps;

- functioning of the L.G. position indicators, fire-alarm indicators and generator operation indicators;
  - condition and functioning of the L.G. external position indicators;
  - condition of the pilot lamps in "Tableau 6";
  - functioning of the wing flap and air brake position indicators;
  - operation of the air distributor cock of the cockpit supercharging system;
  - functioning of the cockpit air temperature regulator.
- 51. Check condition of the APV unit and "trim tab effect" pilot lamps.
  - 52. Check functioning of the stabilizer emergency control electric unit and operation of the APV unit electric mechanism when the latter is controlled by the hand switch.

- Notes:
1. Simultaneously with operations prescribed in Paras 51 and 52 the aircraft mechanic must check the stabilizer controls.
  2. If the pilot has any complaints about functioning of the stabilizer controls, check operation of the stabilizer emergency control electric mechanism in the scope of 25±5 hour maintenance.
  3. Do not perform the checks described in Para. 52 if the pilot has switched on these systems in flight for training purposes.

Warnings: Do not switch ON the APV unit electric mechanism without previously turning ON the BY-14MC hydraulic booster or AHC-4 electric mechanism.

Having carried out preliminary operations, make sure that all the electric consumers and the aircraft storage battery are OFF and the trim tab and "trim tab effect" electric mechanisms are set to neutral.

**MAINTENANCE OPERATIONS**

Every 25±5 Flying Hours

**Starter-Generator, Differential-Minimum Relay, Carbon Voltage Regulator, and Ballast Resistor**

1. Check fastening of the starter-generators and condition of cooling air intakes.
2. Examine condition of the commutator.
3. Check electric wires for reliable connection.
4. Airblast the generator inner spaces (at 1.5 - 2 kg/cm<sup>2</sup>).
5. During starting check the time required for the engine to reach the low speed rating. This work should be done jointly with the aircraft mechanic.

6. Check the fastening and tightening of the contact clamp bolts and condition of solder on wire terminals on the panels of the carbon voltage regulator, differential minimum relay and ballast resistor.

7. Check the condition and fastening of units, attachment and insulation of electric wires in power units.

8. With the engines working check the setting of voltage regulators and parallel operation of generators. This should be done together with the aircraft mechanic.

Aircraft Storage Battery

9. Examine the storage battery container and attachments, the plug connector and the electric wires inside the container. Check insulation resistance of the battery container plug connector. The insulation resistance should be not less than 20 megohms.

10. Airblast the battery container vent pipe.

Note: Routine maintenance of the storage battery should be performed in accordance with Battery Operating Instructions.

Contactors and Relays

11. Check visually the condition, attachments and connections of electric wires.

12. Check fastening of the PMA-200A (KM-200A) relay boxes, condition of wire insulation and reliability of their attachment.

13. Check condition and fastening of thermal switches, starting and afterburner ignition coils.

Electric Control Mechanisms

14. Check the external condition and fastening of the electric mechanisms, trim tab controls, "trim tab effect controls", cockpit air distributor cock and AHC (stabilizer emergency control).

15. Check the long and short arms of the APV automatic unit, which should be  $96 \pm \frac{3}{2}$  and  $50 \pm \frac{3}{2}$  mm respectively.

16. Check accuracy of functioning of the APV unit follow-up system at a slow change (60 - 90 sec.) of pressure in the dynamic chamber of Pitot tube corresponding to a change in indicated air speed from 460 - 510 km/hr to 880 - 930 km/hr and back; during this check the pressure in the static chambers of tubes should be at the atmospheric pressure level. The number of the APV unit operations should be not less than 18.

17. Check for accurate altitude connection at a constant dynamic pressure in the dynamic system of the MTR-5

transmitter corresponding to an indicated air speed of 880 to 930 km/hr.

The correction should ensure operation of the APY unit when difference in altitude does not exceed  $\pm 300$  m. at 5000 m, and  $\pm 350$  m. at 10,000 m. The number of operations should be between 13 and 47. The allowance for correction is increased after 100 and 200 hours of the APY unit operation up to  $\pm 350$  m. and  $\pm 400$  m. respectively at an altitude of 5000 m. and up to  $\pm 400$  and  $\pm 500$  m. respectively at 10,000 m.

Warning. Automatic operation of the APY unit should be checked with hydraulic booster BV-14MC or ANC electric mechanism switched ON.

- Notes:
1. Operations listed in Paras 16 and 17 should be carried out jointly with the instrument mechanic.
  2. The altitude correction together with velocity head should be checked at a vacuum in the static chamber of the altitude correction transmitter and at the atmospheric pressure in the static chamber of the velocity head transmitter.

18. Check wire connections in the plug connectors and the fastening of wires.

#### Head Lamps

19. Check external condition and fastening of the electric control mechanism and landing head lamp.

20. Inspect external condition and fastening of the taxilight.

21. Check tightening of plug connectors, condition of insulation and fastening of wires.

#### Cockpit Air Temperature Regulator

22. Check external condition and fastening of the regulator in the cockpit.

#### Aircraft Electric Network

23. Check fastening of the plug connectors, tightening of the union nuts of the plug connectors and "minus" connectors, their locking and condition of bands, flanging clamps and clamp gaskets.

24. Check visually the condition of the electric panels, switch gear mechanisms and their apparatuses; in dry weather leave them open to dry in the course of 2 - 3 hours.

25. Check the bonding strips of electric units.

26. Check the mechanical portion of automatic circuit breakers, switches, Y40 ultra-violet lamp rheostats and their buttons by turning them ON and OFF by hand. Check the reliability of their attachments.

27. Check fastening of the terminal switches of the L.G. struts, wing flaps and air brakes.

28. Working together with the aircraft mechanic check the following:

- functioning of the inertia contactors and the electric-air valve of wheel brake automatic release;
- control of the jet nozzle shutters with the engines inoperative;
- operation of the engine afterburner units;
- control of the spring-feel mechanism;
- time required for complete switching of the air distributor from one line to the other (it should be within 20 and 40 sec.);
- alignment of each terminal switch rod and pressure device; particular attention should be paid to correct

adjustment of the terminal switches of the wing flap intermediate positions.

29. Having completed the routine maintenance operations, check the electric equipment under current in the scope of preliminary operations.

Every 50<sup>+</sup>5 Flying Hours

Starter-Generator, Differential Minimum Relay and Carbon Voltage Regulator

30. Remove the starter-generator, check condition and fastening of the brush springs, spring pressure, condition of the brush current-carrying wires, height of brushes and smoothness of their movement in the brush holders; examine condition of the commutator and dress it, if necessary, with glass paper No.180 - 220. The height of brushes should be not under 17 mm. It should be measured on the higher side of the brush.

Note: When measuring the height of brushes, take into account the degree of their wear. For example, if after 50 hours of operation the brush height was reduced from 25 mm down to 19 mm, this set of brushes should be replaced by a new one. During high-altitude flight the permissible wear of brushes after 50 hours of operation is not over 3.5 mm.

31. Install the starter-generator on the engine and check it for reliable fastening.
32. Check the stability transformer wire contacts and its attachments for reliable operation.
33. Check visually the condition and attachments of the condensers in the power units.

34. Check whether the generator voltage meets the specifications at 6000, 8000 and 10,000 r.p.m. of the engine shaft. The generator voltage must be within 27 - 29.5 volts.

35. The starter-generator cutting-in voltage.

36. The engine shaft speeds at which the starter-generator is out in, and out of the aircraft network.

37. Using telephones, listen to operation of voltage regulators and make sure there is no sparking between the regulator carbon plates.

38. Check the external condition and fastening of the differential minimum relay.

39. Check fastening of the carbon voltage regulators and condition of their shock-absorbing cushions.

40. Check reliability of the relay and contactor operation.

41. Working together with the aircraft mechanic, check functioning of the starting system at all ratings: starting on the ground and in the air, and spinning the engine by the starter-generator.

Starting Coils

42. Check functioning of the coil.

43. Check condition of the breaker points; if the contacts are heavily worn, carry out 100-hour routine maintenance operations.

Fuel Pump Electric Motors (except HMB-3 pump and 425A unit)

44. Remove the plugs from the commutator shield and look for presence of fuel inside the motor.

45. Insulate the brushes and the commutator.

46. Blow the motor plugs with compressed air (at a pressure of 1.5-2.5 kg/cm<sup>2</sup>).

47. Measure the constant current of all the pump electric motors.



48. Check joint operation of the transfer pumps and pressure signal units.

AEC Electrical Mechanism (Stabilizer Emergency Control)

49. Open the motor hood and check condition of the commutator, brushes, brush springs and brush holders and ease of brush movement in the brush holders; determine the degree of brush wear. Replace the brushes whose height has reduced to 12 mm.

External Lights and Signals

50. Check reliable connection and condition of wires leading to the head lamp, taxilight, tail and side navigation lights and to the external L.G. position indicators.

51. Check visually the external condition of sealing gaskets and of side lamp, tail lamp and head lamp fittings.

Air Distributor Electric Mechanism (Unit 525) and Thermostat TPEEK-45 M

52. Blow the inside chamber of the air distributor motor with compressed air (at a pressure of 1 to 1.5 kg/cm<sup>2</sup>). Dress the contacts of TPEEK-45M thermostat.

Aircraft Electric Network

53. Inspect the screened sections of the electric network and make sure that metal braiding is intact and that the screened sections are reliably connected to one another and to the aircraft fuselage.

54. Examine the wiring in the electric panels and control panels, fastening of wires in the terminals; airblast the inside spaces of electric and control panels.

55. Inspect insulation of all the exposed sections of the electric network.

56. Check external condition and fastening of the ammeter shunts.

57. Open the protective housing of the PEA-200A relay box and check condition of contacts and reliability of wire connections.

58. Check fastening and connections of the electric wires as well as condition of wire insulation at the TN-400 fuse of the storage battery circuit.

59. Check condition of points where minus wires of current sources and consumers are connected to the fuselage.

Hydraulic Cock Electromagnets

60. Check tightening and locking of union nuts and reliability of connections of minus wires to the fuselage.

Every 100±10 Flying Hours

Starter-Generator, Differential Minimum Relay and Carbon Voltage Regulator

61. Remove the starter-generator and rotate the armature by hand to see that it is not jamming. Remove the protective band and check condition of the commutator; if necessary, dress the commutator with glass paper No. 180 - 220. Check condition of the brushes and brush springs.

62. Remove the differential minimum relay and examine it on the outside.

63. Check the cutting in and out voltage and reliability of operation of the relay and contactor.

64. Check to see whether the differential minimum relay is cut off by the reverse current.

65. Check condition of the voltage regulator; and check absorbing conditions.

66. With the engine working at 2700 rpm, starting from 0 to 2000 and 20,000 rpm., check the condition of the

starter-generator, differential minimum relay, carbon voltage regulator, and parallel operation of the generators. This work should be performed together with the aircraft mechanic.

#### Starting Coils

67. Remove the starting coils and check on the following:

- external condition of the coils;
- condition of the breaker points; dress the contact points, if necessary, and adjust the current in the primary coil;
- check the primary current. This should be not less than 1.75 A for the KHM-1A coil and for the KII-21B1 and the KII-21M1 coil units.

#### Electric Control Mechanisms

68. Check the external condition of the commutator, brush holders, brush springs and brushes, Measure the brush height.

69. Remove brush dust from the electric motor parts using compressed air at a pressure of 1 to 1.5 kg/cm<sup>2</sup>.

70. Check the accuracy of programmatic operation of the electric mechanisms, measure the consumed current and the operating time of the mechanism.

#### Head Lamps

71. Check the external condition and fastening of the taxilight. Remove the landing head lamp together with the electric control mechanism and examine the commutator, brush holders, brush springs and brushes.

72. Airblast the electric motor inside at a pressure of 1 to 1.5 kg/cm<sup>2</sup>.

73. Measure the consumed current, accuracy of programmatic operation and the operating time.

74. Check the aiming of the taxilight and landing head lamp in situ against the reference marks.

#### Fuel Pump Electric Motors

75. Open the protective hoods and look for any fuel penetrating inside the motors.

76. Check condition of the commutator brushes.

77. Remove brush dust from the protective hood. Blow the motor inside with compressed air at a pressure of 1 to 1.5 kg/cm<sup>2</sup>.

Note: Operations prescribed in Paras 75 - 77 should be performed upon expiration of the Manufacturer's terms of guarantee for the mechanisms in question.

#### Starting Panel

78. Remove the starting panel and check on the following:

- condition of wiring and fastening of the units;
- condition of the motor commutator and brushes and of contacts of the timer centrifugal regulator (to be performed upon expiration of the Manufacturer's guarantee);
- condition of the relay and contactor contacts;
- time for completion of the starting cycle;
- current consumed by the panel.

#### Commutating Equipment

79. Reliability of the relay and contactor operation, their fastening and condition of the electric wiring and protective hoods.

#### Aircraft Electric Network

80. Condition of ordinary and sealed plug connectors.

81. Tightening of the electric clamp screws.

82. Fastening and condition of the wire terminals.

83. Open the L.G. position indicator doors and "TABNO-6" (TABNO-6) and check their fittings for cleanliness and proper fastening.

Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

Filters

84. Open the filter covers, inspect the mounting, blow with compressed air and check the reliability of wire connections.

Side Navigation Light and Tail Light Fittings

85. Examine the condition and cleanliness of the fittings and sealing gaskets.

86. Check the reliability of the wire connections.

Storage Battery Container

87. Check condition of the battery container, felt warming, plug connector, insulation of wires and wire terminals. Repair the felt warming jackets, if necessary.

MAINTENANCE OF ELECTRIC EQUIPMENT OF AIRCRAFT  
KEPT IN STORAGE

Every 10<sup>±</sup> Days

1. Perform the work in the scope of the preflight operations.

Every 30<sup>±</sup> Days

2. Perform the preliminary operations and check serviceability of the entire electric equipment under current supplied from the ground source of electric power.

Every 3 Months ± 10 Days

3. Open the electric and other panels and check condition of the wiring and its connections.

4. Inspect and check the plug connectors.

5. Check the minus wires for reliable connection to the fuselage.

6. Check serviceability of the entire electric equipment under current supplied from the ground source of electric power.

INSTRUMENTS AND OXYGEN EQUIPMENT

PREFLIGHT OPERATIONS

Fuselage Nose Section

1. Check fastening of the Pitot tube and TH tube transmitters. This work should be performed together with the aircraft mechanic.

Cockpit

2. Check fastening of the instrument panel and of the instruments on it.

3. Check location of the instrument pointers.

4. Check functioning of:

- gyroscopic instruments;
- engine control instruments;
- compass;
- aircraft clock.

5. Set the altimeter pointers to zero and check the relation between the readings of the barometric pressure scale and the pressure of the day.

6. Check the tightness of the static and full pressure systems of the Pitot and TH tubes.

7. Check accuracy of airspeed indicator readings at 300, 750 and 1000 km/hr divisions of the scale.

8. Position of the selector cock of the Pitot and TH tube full pressure system.

9. Check the amount of oxygen in the cylinders.  
10. Remove the plug from the combination plug connector, install the upper panel and check it for reliability of connection.

11. Check the oxygen set for the following:

- tightness of the H.P. oxygen system;
- tightness of the L.P. oxygen system;
- functioning of the oxygen unit at an overpressure and without it;
- condition and fastening of the pull-out cable of the combination plug connector;
- oxygen pressure and condition of seals on the bailout oxygen unit;
- fastening of the oxygen hoses;
- condition of the oxygen unit remote controls, positions of the handles and smoothness of their movement;
- functioning of the oxygen unit, condition of the pilot's suit and fittings at excessive pressure; this work should be done with the pilot wearing the anti-g suit.

Notes: 1. While preparing the aircraft for the next flight, perform operations listed in Paras 1-9, if the pilot has no complaints about operation of the instruments and oxygen equipment. The instruments reported defective by the pilot should be checked in the scope of the preliminary operations.  
2. Preflight preparation of the oxygen equipment (Paras 10 and 11) should be performed after testing the engines and carrying out the preflight operations by all the aircraft specialists.

PRELIMINARY OPERATIONS

Fuselage Nose Section

12. Check fastening of the Pitot and TH tubes; check for presence of covers and red danger tags. This work should be performed together with the aircraft mechanic.

13. Check reliability of attachment and condition of the pipes and rubber canvas hoses and settlers of the static and full pressure systems of the Pitot and TH tubes in the nose gear compartment and at the point where the rod bends.

14. Check fastening of the oxygen cylinders and pipes and absence of dust and dirt.

15. Examine condition of the oxygen charging pipe union.

Fuselage

16. Check fastening of the pressure indicators.

17. Look for fuel accumulation in the potentiometer chamber of the fuel content gauge transmitter.

Cockpit

18. Check fastening and shock-proofing of the instrument panel and instruments.

19. Check functioning of the electric gyroscopic instruments under current.

20. Take a note of the position of the instrument pointers.

21. Determine the amount of oxygen in the bottle (re-charge the bottle, if necessary).

22. Check the oxygen equipment for the following:

- tightness of the H.P. oxygen system;
- tightness of the L.P. oxygen system;

- fastening of the oxygen unit, oxygen valve, oxygen indicator, overpressure gauge, oxygen unit remote control panel, and combination plug connector;
- condition and fastening of the combination plug connector wire.

23. Remove the upper panel of the combination plug connector and install the lid.

MAINTENANCE OPERATIONS

Every 25<sup>th</sup> Flying Hours

Instrument Panel

1. Swing down the middle L.H. section of the instrument panel, inspect it and check the following:

- external condition of the instruments (make sure that the gauge bodies and dial glasses are intact, the dial glasses are securely fastened, the pointers are not bent or jammed, the luminous compound has not come off the dials and pointers);

- behind the instrument panel: check fastening of the instruments, mounting of pipes, wiring and units; disconnect the plug connectors of the electric instruments, check condition of contact surfaces of the plugs and sockets. Connect the plug connectors and make sure the union nuts are securely tightened and cottered;

- fastening and shock-proofing of the instrument panel, condition of guides and rods (the latter must be coated with QUATWIM-201 lubricant).

2. Disconnect the canvas rubber hoses of the full- and static pressure systems from the pipe unions of the instruments, gunsight, from the Pitot and TH tubes and from other units. Blow the pipes with compressed air at 0.5 - 1 kg/cm<sup>2</sup> pressure.

Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

After blowing make sure the rubber canvas hoses are securely fastened to the instruments, gunsight unit and to the Pitot and TH tubes.

3. Check condition of moisture settlers of the Pitot and TH tubes and remove condensate if any.
4. Make sure the fuel consumption gauge scale is rotating smoothly.

#### Transmitters of Engine Control Instruments

5. Check fastening of transmitters of the fuel content gauge, fuel flowmeter, tachometer and thermocouples; examine the gas flow openings for cleanliness and position of the thermocouple slots.

6. Check wire and pipe connections.

7. Disconnect the plug connectors, check condition of contact surfaces of the plugs and sockets. Connect the plug connectors and make sure the union nuts are securely tightened and locked.

#### Artificial Horizon

8. Make sure the artificial horizon does not brush against any object behind the instrument panel.

9. Remove the artificial horizon from the aircraft, inspect it and check the following:

- correct setting of the side-slip indicator;
- functioning of the starting button and the airplane silhouette handle;
- operating moment of the bi-metal relay;
- lateral correction switching ON and OFF angles;
- operational readiness of the instrument;
- time of gyroscope erection from toppling;
- current consumed in each phase;
- stability of the gyroscope with lateral correction switched off;

- instrument error during imitation of aerobatic evolutions (wingovers and loops);
- insulation resistance.

#### Remote Gyromagnetic Compass

10. Check the following:

- fastening of units and condition of the gyro unit and amplifier shock-proofing cushions;
- remote transmission error;
- compass rate of slaving;
- transmitter lag;
- fluctuation of indicator pointer in the slaved position.

#### Gyro-Induction Compass

11. Check the following:

- fastening of units;
- position of amplifier sensitivity regulator;
- functioning of the compass;
- compass rate of slaving;
- smoothness of movement of the magnetic course scale.

12. Check operation of the gyroscopic instruments and engine control instruments.

#### Oxygen Equipment

13. Fastening of all oxygen units, condition and attachment of pipes, hoses, and hose sealing rubber gaskets. Check the combination plug connector for ease of uncoupling.

14. Using the KV-6 installation check the following:

- tightness of the H.P. system;
- tightness of the L.P. system under the conditions of vacuum and excessive pressure;

- operation of the oxygen equipment under increased and normal pressure;
- tightness of the pipe line supplying the pilot's anti-g suit bladders.

15. Condition of the oxygen remote control system.

Pilot's Harness Automatic Unbuckling Device

16. Correct timing of operation of the device.

Every 50.5 Flying Hours

Aneroid-Membrane Instruments

17. Remove the altimeter, airspeed indicator, altitude and pressure drop indicator, variometer, machmeter and check on the following:

- external condition and fastening of the dial glasses;
- tightness of the body;
- basic error;
- variation;
- smoothness of pointer movement.

After installing the instruments on the instrument panel, make sure whether the rubber canvas hoses are properly connected to the instruments and check the static and full pressure systems for tightness.

18. Renew the altimeter and airspeed indicator correction charts.

Remote Gyromagnetic Compass

19. Inspect the plug connectors, check the resistance between the plug connector pins of the transmitter and gyro unit.

20. Check the indicator error and variation with respect to the transmitter every 30°.

21. Check the current consumed by the converter, and A.C. voltage on its lead-out.

22. Remove the converter and examine the commutator and brushes. Airblast the converter inside at a pressure of 0.5 to 1 kg/cm<sup>2</sup>.

Gyro-Induction Compass

Check the following:

23. Induction compass transmitter:

- traces of fluid on the transmitter surface and on the plug connector pins;

- insulation resistance between plug connector pins B, Γ and Δ and transmitter body.

24. Compass gyro unit: resistance between gyro unit plug pins 3 and K, X and M, A and B, B and B, A and B and between plug connector socket pins A and B, A and B, B and B.

25. Compass indicator: oscillations and displacement of the magnetic course moving scale with the engines working.

26. Function box:

- tightening of all nuts on the clamp bolts;
- condition of fuse;
- fastening of terminal blocks of clamp bolts.

27. Compass as a complete unit:

- serviceability;
- fast slaving speed;
- smoothness of movement of the indicator magnetic course scale.

PVL-43M Electronic Gyro Indicator

28. Remove the instrument, inspect it and check the following:

- condition of commutator-and-brush assembly. Blow the instrument inside with compressed air at a pressure of 0.5 - 1 kg/cm<sup>2</sup>;
- sensitivity of the instrument at an angular rotation speed of 6 and 18 deg/sec.;
- symmetry of pointer deflection;
- sluggishness and damping of the indicator pointer.

3VN-53 Electric Turn Indicator

29. Remove the instrument, inspect it and check on the following:

- condition of the commutator-and-brush assembly.

Blow the instrument inside with compressed air at a pressure of 0.5 - 1 kg/cm<sup>2</sup>;

- sensitivity of the instrument at an angular rotation speed of 0.6 and 1.5 deg/sec.;
- instrument error at 15°, 30 and 45° banks with angular speeds of 1.1, 2.3 and 4 deg/sec.;
- instrument error at variations of supply voltage within 10% of the nominal value;
- misalignment of the pointer with the zero division of the scale;
- lag of the pointer;
- time required for returning of the pointer from the extreme position;
- deflection of the pointer from the zero division at ±90° roll.

30. Inspect the contact surfaces of the plug connector.

Electric Tachometer

31. Remove the indicator and transmitters, inspect them and check the following:

- basic error of the set;
  - pointer oscillations;
  - stopping of the pointers short of the zero;
  - balance of the indicator moving systems;
  - value of interphase voltages on the transmitter clamps.
32. Inspect the contact surfaces of the plug connectors.

Pressure Warning Units

33. Remove the pressure warning units, inspect them and check on the following:

- basic error;
- tightness of the receiving chambers;
- tightness of the bodies.

34. Inspect the contact surfaces of the plug connectors.

Thermoelectric Thermometer

35. Remove the thermometer indicator, inspect it and check on the following:

- basic error;
- variation;
- jamming of the indicator moving system.

36. Check condition of electric wiring on the aircraft, and of the thermocouple sensing elements.

Pilot's Harness Automatic Unbuckling Device

37. Disassemble the pull-out mechanism, wash its parts in gasoline, wipe them with a soft rag, blow with dry air, inspect and make sure there are no damaged coatings, dents, scores and nicks on the parts.

38. Check the hose and cable to see that the cable terminals are not shifted off their places, and there is no breaking of individual wires of the hose and cable.



39. Coat the working springs and piston with roller with OKB-122-3 oil and apply a thin layer of KBN oil to the cable and hose.

#### Oxygen Equipment

Remove the oxygen equipment set from the aircraft and plug open ends of the pipes.

Using KV-5 (KV-3 and KV-6) testers check the following:

40. Aircraft oxygen unit:

- initial (static) pressure in the oxygen unit reducer;
- oxygen content in the air-oxygen mixture fed from the unit into the mask;
- excessive pressure of oxygen in the mask ensured by the oxygen unit at various altitudes;
- excessive pressure in the unit maintained by the interlocking valve;
- time required for creation of excessive pressure in the mask;
- altitudes at which constant supply of oxygen is turned ON and OFF.

41. Oxygen reducer:

- initial (static) pressure in the reducer.

42. Oxygen indicator:

- pressure at which indicator segments start to open;
- pressure at which indicator segments are wide open;
- tightness of manometric box chamber;
- basic error of H.P. oxygen pressure gauge;
- basic error of the oxygen overpressure gauge.

43. Install the set of oxygen equipment back on the aircraft and perform the following:

- wash the system with oxygen;
- charge the system to normal pressure (at ambient temperature);

scope of preliminary operations.

44. Check the effort required for turning the remote control handle regulating the supply of oxygen into the pilot's anti-g suit.

#### AI-5 Automatic Pressure Unit

45. Check pressures maintained by the pressure unit on the aircraft.

46. Clean and inspect the filter of the pressure unit. Use a soft hair brush to clean the unit.

Operations listed in Paras 45 and 46 should be carried out together with the aircraft specialist.

#### Aircraft Clock

47. Check accuracy of the clock within 24 hours of operation.

#### Every 100<sup>th</sup> Flying Hours

##### Full and Static Pressure System

48. Check for the presence of identification marks (and renew them, if necessary) near the full and static pressure pipe connections on the back surface of the air-speed indicator, automatic speed computer (navigation indicator) altitude and pressure drop indicator, and on rubber canvas hoses.

##### Fuel Content Gauge and Flowmeter

49. Remove the fuel content gauge and flowmeter and check the following:

- basic error of the gauge set;
- tightness of the fuel content gauge transmitter and float;
- reliability of the clamp and locking of the float arm;

- functioning of the fuel flowmeter set;
- basic error of the fuel flowmeter.

Air and Hydraulic Pressure Gauges

50. Working together with the aircraft mechanic, remove the pressure gauges, inspect them and check on the following:

- basic error;
- variation;
- jamming of the mechanism.

51. Install the pressure gauges back in the aircraft and check their connections with the pipes for tightness.

Oxygen Equipment

52. Check condition of paint on the pipes and oxygen bottles; renew painting, if necessary.

53. Check for presence of scale in the bottles.

54. Check condition of the oxygen system filters and wash them with rectified alcohol.

55. Check condition of the charging pipe union.

56. Disassemble the oxygen valves, inspect them, clean and repair, if necessary.

Using KV-5 (KV-3 and KV-6) tester check on the following:

57. Aircraft oxygen unit:

- tightness of the H.P. chamber;
- tightness of the L.P. chamber;
- uninterrupted supply of oxygen;
- oxygen supply at various altitudes with oxygen mask taken off the pilot's face;
- overpressure at the unit outlet at an altitude of 10,000 m. with the air flow cut off;
- inhalation resistance measured in the mask;
- opening pressure of the demand regulator valve;
- tightness of the unit vacuum valve;

- resistance of the unit vacuum valve;
- flow of oxygen through the blocking valve nozzle.

58. Oxygen reducer:

- tightness of the reducer;
- opening pressure of the reducer safety valve.

59. Check the oxygen hose and its connections for tightness.

60. Check the non-return valves of the aircraft oxygen fittings for tightness.

Every 60<sup>±</sup>10 Days

61. During routine flights check the artificial horizon for after-turn errors with the natural horizon within the field of vision.

Every 3 Months <sup>±</sup>10 Days

62. Check accuracy of operation of the combination parachute automatic unit with respect to time and altitude.

63. Bailout oxygen unit;

- tightness of the H.P. chamber;
- tightness of the L.P. chamber on the operating and in-operative unit;
- oxygen supply.

64. Oxygen mask:

- tightness of the mask expiration valve;
- overpressure in the mask and the corresponding pressure in the pressure suit bladders maintained according to the altitude by the overpressure regulator.
- tightness of the overpressure regulator non-potential valve.

Every 6 Months <sup>±</sup>10 Days

65. Combination parachute automatic unit:

Declassified in Part - Sanitized Copy Approved for Release 2011/12/06 : CIA-RDP80T00246A062100090001-2

- 126 -

- disassemble the pull-out mechanism, wash the parts in clean gasoline, wipe them with a soft brush, blow with dry air, inspect and make sure there are no damaged, coatings, dents, nicks and notches;

- check the hose and cable for shifting of the cable terminals and breaking of individual wires of the hose or cable;

- coat the working springs and the piston with roller with OKB-122-3 oil and apply a thin layer of MBN oil to the cable and hose.

## 66. Oxygen mask:

- tightness of the overpressure regulator valve;

- resistance of the overpressure regulator valve at an altitude of 10,000 m.;

- resistance of the overpressure regulator non-return valve;

- tightness of the inhalation valves;

- inhalation resistance of the mask;

- tightness of the mask holding device;

- tightness of the pipe union with the non-return valve.

67. Check the pressure suit for tightness of compensating and anti-g bladders.

MAINTENANCE OF INSTRUMENTS AND OXYGEN EQUIPMENT  
ON AIRCRAFT KEPT IN STORAGE

Every 10±2 Days

1. Carry out preflight preparation of the oxygen equipment and instruments by performing operations prescribed in Paras 1 - 10 of the "Preflight Operations" Section.

Every 30±5 Days

2. Check the tightness of static and full pressure system piping. Under severe humidity conditions blow the systems with compressed air. Clear the water drain holes in the Pitot tube.

Check cleanliness of the hole in the static pressure receiver.

3. Check the relation between the readings of the altimeter barometric pressure scale and the pressure on the ground at the given moment.

4. Check the aircraft clock for accuracy within 24 hours of operation.

5. Check the aircraft oxygen unit by means of the tester.

Every 3 Months ±10 Days

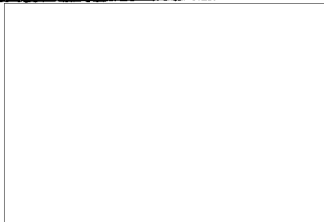
6. Carry out the operations listed in Paras 1 - 5.

7. Remove the airspeed indicator and check its readings against the Specifications.

8. Working together with the aircraft mechanic check the mounting and functioning of the anti-g device.

9. Check the pilot's harness automatic unbuckling device for correct timing.

50X1-HUM



General .....	3
Safety precautions .....	5

AIRFRAME AND ENGINE

Preflight operations .....	10
Pretakeoff inspection and preparation for the next flight .....	22
Preliminary operations .....	24
After first 5 $\pm$ 1 hours of engine operation.....	35
Every 10 $\pm$ 2 flying hours.....	35
Maintenance operations .....	35
Every 25 $\pm$ 5 flying hours .....	35
Every 50 $\pm$ 5 flying hours .....	54
Every 100 $\pm$ 10 flying hours.....	57
Once in two years but not less than every 200 flying hours .....	59
Maintenance of the aircraft and engine kept in storage .....	61
Every 10 $\pm$ 2 days .....	61
Every 30 $\pm$ 5 days .....	62
Every 3 months $\pm$ 10 days .....	62

Page

ARMAMENT

Preflight operations .....	64
Preliminary operations .....	70
Maintenance operations .....	74
Every 25 $\pm$ 5 flying hours .....	74
Every 50 $\pm$ 5 flying hours .....	76
Every 100 $\pm$ 10 flying hours .....	77
Yearly maintenance .....	78
Maintenance of the armament units on aircraft kept in storage .....	78
Every 10 $\pm$ 2 days .....	78
Every 30 $\pm$ 5 days .....	78
Every 3 months $\pm$ 10 days .....	79

RADIO AND RADAR EQUIPMENT

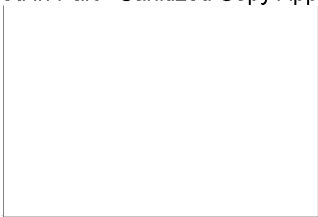
Preflight operations .....	80
Preliminary operations .....	82
Maintenance operations .....	84
Maintenance of radio and radar equipment on aircraft kept in storage.....	92
Every 10 $\pm$ 2 days .....	92
Every 30 $\pm$ 5 days .....	92
Every 3 months $\pm$ 10 days .....	92

AIRCRAFT EQUIPMENT

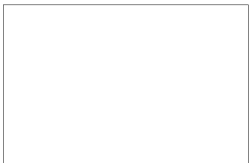
Electric Equipment

Preflight operations .....	93
Preliminary operations .....	96

50X1-HUM



	Page
Maintenance operations .....	100
Every 25 $\pm$ 5 flying hours .....	100
Every 50 $\pm$ 5 flying hours .....	104
Every 100 $\pm$ 10 flying hours .....	107
Maintenance of electric equipment on aircraft kept in storage .....	110
Every 10 $\pm$ 2 days .....	110
Every 30 $\pm$ 5 days .....	110
Every 3 months $\pm$ 10 days .....	110
INSTRUMENTS AND OXYGEN EQUIPMENT	
Preflight operations .....	112
Preliminary operations .....	114
Maintenance operations .....	115
Every 25 $\pm$ 5 flying hours .....	115
Every 50 $\pm$ 5 flying hours .....	118
Every 100 $\pm$ 10 flying hours .....	123
Every 60 $\pm$ 10 days .....	125
Every 3 months $\pm$ 10 days .....	125
Every 6 months $\pm$ 10 days .....	125
Maintenance of instruments and oxygen equipment on aircraft kept in storage .....	126
Every 16 $\pm$ 7 days .....	126
Every 30 $\pm$ 5 days .....	126
Every 3 months $\pm$ 10 days .....	127



50X1-HUM

**Page Denied**