

Fig.4

Take-Off Rotational Speed of Engine M-14P
 with Airscrew V530TA-D35 on Airplanes (on Ground)
 Versus Ambient Temperature at Atmospheric
 Pressure P = 720 to 770 mm Hg

8.3.11 Check engine operation at idling speed .The engine shall run steady .

REMARK :

a-This engine should not be operated over prolonged periods at idling speed (more than 5 minutes) , because oil which may have accumulated around the spark plugs in the combustion chamber might make subsequent starting difficult .

b-When the engine is running with the compressor loaded the tachometer may oscillate up to $\pm 3\%$ (up to 100 r.p.m.). In this case , the manifold pressure does not oscillate , thus indicating the lack of the speed change of the crankshaft. This change is not an operation failure of the engine.

c-When driving the throttle control lever , a short drop of the speed to a LOW THROTTLE is allowed , by providing the steady run of the engine .

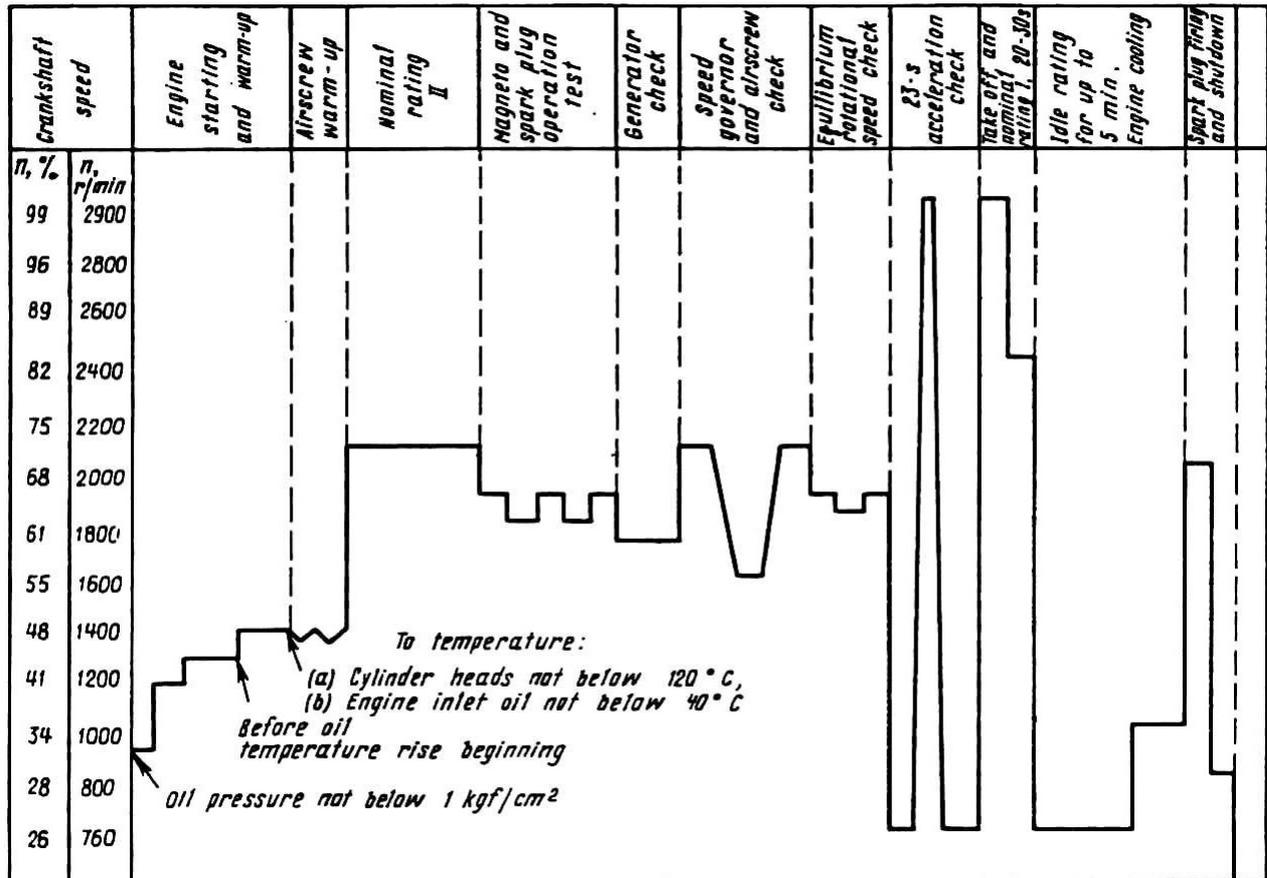


Fig. 5 – ENGINE TEST CHART

8.4 Stopping

8.4.1 Cool the engine before stopping as follows :

- a- completely open all controllable cowling flaps ,baffling,etc and oil cooling radiator shutters ;
- b- throttle to a low enough speed ,28-43% (800-1000 r.p.m.) and set propeller in low pitch, to permit the cylinder to cool to 140-150°C , before to stop the engine .

Do not stop the engine if the cylinders temperature is higher than that mentioned above because oil is flowing quickly away from the cylinder walls that may result in the scratching of the pistons at the next starting.In case the stopping of the engine is made without cooling the engine , this may generate a high temperature under the cowl , thus leading to the rapid deterioration of the rubber unions and the insulation ignition wires . Air-cooled engines cool rapidly and should not be shut down quickly except in emergencies .

The engine may be shut down when the cylinders temperature is 170°C only in case it is impossible to cool it to 140-150°C .

CAUTION : Before to shut down the engine , it is forbidden to run at LOW THROTTLE for a long time because oil which may have accumulated around the spark plugs in the combustion chamber , and thus avoid fouling of spark plugs, which might make subsequent starting difficult ,or cause hydraulic chocks .

8.4.2 When the cylinders have been allowed to cool as instructed above , open the throttle and increase the speed to about 65-68% (1980-2000 r.p.m.) , running at this speed for 20-30 seconds , then close the throttle to about 28-34%(800-1000r.p.m.) .As soon as the engine has returned to idling speed , cut the switch and open the throttle slowly to maximum position ,cutting the switch at start of throttle movement . The purpose of this momentary high speed operation is to burn out any oil which may have accumulated around the spark plugs in the combustion chamber , and thus avoid fouling of spark plugs which might make subsequent starting difficult.

8.4.3 After stopping , set the throttle on LOW THROTTLE position and close the fire cock .

CAUTION :

a- in order to prevent the scratching of the piston and cylinder walls of the rapid drain off of the oil at high temperatures of the cylinder head , it is forbidden to stop the engine directly from the cruise run or other higher runs .

b- it is forbidden to stop the engine by closing the fire cock , in order to prevent misfires and generation of fires .

8.4.4 In winter , at the end of the flight day ,before the final stop of the engine , dilute oil with gasoline , as per chapter 8.2 of this instruction .

8.4.5 It is mandatory to enter remarks after each flight in the engine logbook, relative to the abnormal operation of the engine and the time of operation , calculating also the operation time in different runs (take-off ,nominal) .

8.5 *Post-flight visual inspection*

The post-flight inspection is made in order to check the condition and remedy the failures of the power plant after each day of flight , no matter the runs and the operation time .

The visual inspection is the main manner of checking the power plant of the airplane and the normal operation during the next flight depends on the quality of its performance .At the end of flights, the technician receives information from the pilot relative to the length and operation runs of the engine in flight and on the ground as well as about all difficulties in operating the power plant, then he makes the post-flight visual inspection .

8.5.1 Listen to the nose of the engine before stopping Uneven running , misfires or other unusual noises .

8.5.2 Place the chocks under the landing gear wheels .

8.5.3 Check the battery accumulator and the magnetos to be disconnected and make the earthing of the airplane .

8.5.4 In case of abnormal behavior during flight , start the engine and ground test the engine to define the causes .

8.5.5 If an ambient temperature drop is expected (below +5°C) dilute oil with gasoline .

8.5.6 After stopping open the cowl and make the engine visual inspection according to the list of par. 8.6 .

8.6 *Post-flight main inspection*

| Crt No. | Inspection and methods | Technical conditions |
|---------|---|--|
| 1. | Visually inspect fuel and oil lines , the joint of the crankcase , the flanges of the aggregates, check all lines for leaks. If is not possible to locate the leakage by visual inspection ,then after cleaning and drying , start the engine and locate the leakage . Visually inspect all nuts and bolts on both engine and mount for tightness and safetying . | No leaks are allowed at the fittings , under the flanges of the aggregates or plugs. |
| 2. | Check the condition of the flexible pipes , the wirelocking of the fittings . | No cracks and damage of the pipe coatings are allowed . |
| 3. | Check the condition of the oil tank . | |
| 4. | Remove grease and oil marks from the engine and aggregates . | |
| 5. | After flight, drain oil out immediately after the engine was shut down , when oil is hot. | |
| 6. | Drain 0.5l of oil from oil strainer through a thick sieve . If metal particles are found , find the cause of their presence .Check wire connection of the signaling screen assembly. | No metal particles are allowed to be present in oil . |
| 7. | See that gasoline is flowing at the carburetor and that all fittings are properly tightened . Check all lines for leaks . | No leaks and damping at a pressure of 0.4-0.5 kgf/cm ² are allowed . |
| 8. | Inspect for evidence the lines .They shall not be touched by other parts and aggregates. | The defective pipes shall be removed . |
| 9. | See that carburetor is properly locked and check controls to see that are functioning properly and that throttle lever operate the carburetor to the extremes of their “open” and “closed” positions . | |
| 10. | See that fuel pump is properly locked . | |

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| 11. | See that exhaust system is tight and properly locked , check the carburetor air intake horn and carburetor air heater , check the inlet pipes . | No burns , cracks , gas and fuel seeps are not allowed . |
| 12. | See that the compressor is properly locked . Drain the condense from the air scoop drain (in cold weather conditions ,blow the pipe) . | |
| 13. | See that compressed air distributor, fittings , pipes and starting valves are properly locked . | |
| 14. | Check the ignition and ground wire connection ,making sure that there is no possibility of loose connection . See that the magnetos are properly locked Check all contacts of wires with other parts ,especially the clearance between the wires and the cylinder cooling baffling. | The spark plugs elbows shall be air-tight sealed ; the contact between the wires and the cooling baffling of the cylinder . |
| 15. | Test the tightening of the spark plugs (use a wrench) , by sampling . | The spark plugs shall be tightened . |
| 16. | See that grid-carburetor air intake is properly locked . If the grid-carburetor air intake is dirty, take it out , wash in gasoline then dip in a mixture of 50% aviation oil and 50% non blended gasoline or kerosene ; after draining the mixture excess reinstall the grid . Wipe the external surface of the carburetor with a clean and dry cloth (after installation) . | |
| 17. | Visually inspect the cylinders , the exhaust system; check the gas seals and the existence of cracks or overheating marks on the exhaust system.Visually inspect all nuts for tightness The baffling shall be tight and properly locked . <i>Remark : Visually inspect of the nuts for tightness is made when the engine is cold .</i> | No overheating ,distortion of the cylinder baffling and seeps are allowed . |
| 18. | Visually inspect the cover-rocker box . | Oil drain and manual opening of the locking is not allowed . |
| 19. | Visually inspect all nuts and bolts on both engine and mount for tightness and safetying; visually inspect the shock-absorbers . | No cracks or damage of the mounting coating . |
| 20. | Visually inspect the propeller and see that propeller hub nut is tight and properly locked . Visually inspect the blades : the coating of the blades shall be smooth and even ,without any mechanical damages . Check the overlapping of the blade arrow with the scratch on the front | No paint discontinuities in the lacquer-paint coating and the presence of uncoated surfaces on wood are allowed . |

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| | surface of the hub nut . <i>Remark: The blades showing large and deep cracks will be sent to repair .</i> | |
| 21. | Visually inspect the propeller governor for leakage . | No external damages ,oil drains at the division planes ;Check control to see that it is functioning properly and the control lever operate to the extremes position . |
| 22. | Check for leaks all fittings of the fuel screen . | No fuel leaks are allowed . |
| 23. | Visually inspect for evidence and tightness the cylinder air baffles. | No cracks are allowed .The nuts shall be well tight . |

8.7 *After visual inspection and correction of failures cover the engine and propeller with a hood .*

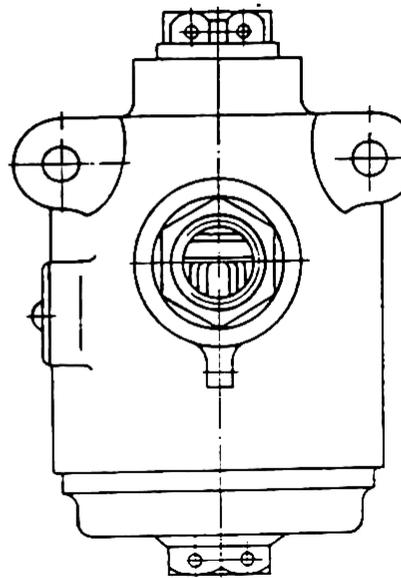
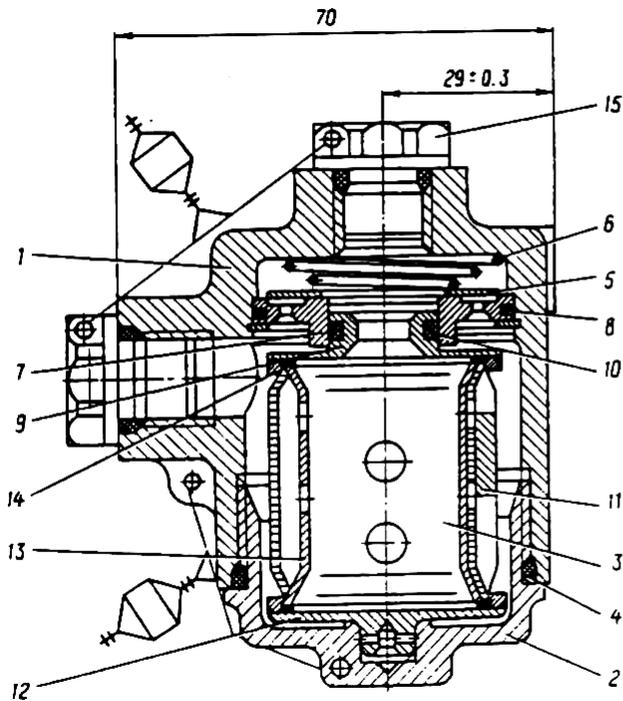
8.8 *Engine service after the first flight of the airplane with the new engine installed and after the first 5 hours of operation .*

| Crt No. | Inspection and methods | Technical conditions |
|---------|---|---------------------------------|
| 1. | All operation set forth in para.8.5 of this instruction shall be carried-out . | |
| 2. | Drain oil from the engine , oil tank and oil cooler ; remove , visually inspect and clean the oil screen from the rear cover oil strainer , the signaling screen assembly and the propeller governor screen (see par. 8.9) Install the screens . Fill up with fresh oil . | No metal deposits are allowed . |
| 3. | Replace the filter cell of the fuel fine screen assembly as follows (fig.6) : a) remove the wirelocking and unscrew the cover of the screen assembly (13) ; b) remove the filter cell (10); c) install the filter cell from the spare parts kit ; d) replace the sealing rings (9) and (12) by those from the spare parts kit ; e) screw in and wirelock the screen assembly cover ; f) send the filter cell to ultrasonic wash . | |

Remarks : 1. The filter cell should be packed in a PVC bag and carton box for its transportation to washing place .
 2. The cleaned filter cell will be attached to spare parts kit .
 3. It is forbidden to dismantle the fuel screen assembly on other purposes than replacement of the filter cell .

4. Remove ,visually inspect and clean the fuel screen assembly of the carburetor in clean gasoline , after removing the cover .

Remarks : 1. Oil and fuel filter cell shall be replaced only after 5 hours of engine operation
 2. If new tanks and fuel lines have been installed on the engine , make a visual inspection of the fuel screen assembly after the first start .



Fuel Filter 8D2.966.064

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|----------------------|----------------------------|
| 1. Filter Housing | 9. Flange |
| 2. Cover | 10. Sealing Ring |
| 3. Filtering Element | 11. Filtering Element Body |
| 4. Sealing Ring | 12. Bottom |
| 5. Valve | 13. Frame |
| 6. Spring | 14. Holder |
| 7. Disk | 15. Shipping Plug |
| 8. Sealing Ring | |

Fig.6 – FUEL FILTER

8.9 *Technical service after every 100±10 hours of operation*

| Crt No. | Inspection and methods | Technical conditions |
|-------------------------------|--|--|
| <p>1.</p> <p>2.</p> <p>3.</p> | <p>All operation set forth at par.8.5 of this instruction shall be carried out .</p> <p>With rocker box covers removed,make visual inspection of valve mechanism for broken springs , condition of springs washers and security of retaining split cone keys. Check valve tappets for proper clearance . Visually inspect the nuts-valve adjusting screw for tightness . See that covers-rocker box are properly locked and visually inspect all covers-rocker box for tightness and safetying .Tight them more , if necessary .</p> <p>Caution : 1. Pay a special attention to the wirelocking of the adjustment screw of the rockers. If the wirelocking is loose , the clearance will increase and cause the damage of the gas distribution mechanism .</p> <p>2. If the clearances between the bearing of the rockers and the front surfaces of the valve did not change after the first 100 hours , the next test would be made after 200 hours of operation .</p> <p>3. Unscrew and tighten the nuts-valve adjusting screw by completely opening the valve .</p> <p>4. It is forbidden to rotate the crankshaft when the screws-valve adjusting are unscrewed more than a half from threaded section (10 mm measured from the surface of the rocker) in order not to damage the end pieces of the rod assembly–push .</p> <p>Remove the signaling oil screen assembly and the rear cover oil strainer and proceed as follows :</p> <p>a) disconnect the power supply and electric wire , drain oil from the oil strainer through a thick sieve funnel ; visually inspect the sieve in order to find the foreign bodies. Find the cause of the presence of the metal deposits if they are found on the signaling oil</p> | <p>The clearances between the bearing of the rockers and the front surfaces of the valve shall be $0.3^{+0.15}_{-0.10}$ mm, when engine is cold , the piston is on UDC position . If the clearance is higher than 0.45 mm or lower than 0.2mm , make the overriding of clearance –at tested cylinder and set the clearance to 0.3mm .</p> <p>No metallic deposits or coke residues are allows The screen assembly shall not show any damages or corrosion .</p> |