

Trouble	Possible cause	Correction
	(8) Incorrect spark advance	Adjust spark advance (Ref. 074.10.01, Task Card No. 202)
	(9) Carburetor is mal-adjusted or needle sticks	Check carburetor adjustment, smooth movement of needle
	(10) Exhaust valves are burnt through	Replace valves
<u>NOTE:</u> Operations are carried out by Supplier's representatives		
12. Oil is ejected from breather	(11) Incorrect clearances between rocker roller and exhaust valve stem	Adjust clearances (Ref. Task Card No. 247)
	(1) Engine is overheated	Ref. Item 9
	(2) Blow-by of gases through piston rings	Find defective cylinder and replace rings
<u>NOTE:</u> Operations are carried out by Supplier's representatives		
	(3) Degraded breathing of engine	Remove and wash engine breathers
	(4) Water in oil	Replace oil

ENGINE M-14P - MAINTENANCE PRACTICES

1. LIST OF TASK CARDS

<u>Title</u>	<u>Task Card No.</u>
Engine Starting	201

CAUTION: COLLECTION OF OIL AND GASOLINE CAN BE ENCOUNTERED IN ENGINE LOWER CYLINDERS, THEIR INTAKE PIPES AND EXHAUST MANIFOLD.

TO PRECLUDE HYDRAULIC SHOCK, PRIOR TO STARTING WHILE IGNITION IS SWITCHED OFF, TURN AIRSCREW MANUALLY IN ITS NORMAL DIRECTION FOR 3 TO 4 TURNS. IF TURNING THE AIRSCREW REQUIRES GREAT FORCE OR IT CANNOT BE TURNED AT ALL, AS WELL AS AFTER A PARKING PERIOD OF MORE THAN 3 DAYS, AFTER DEPRESERVATION OF THE ENGINE, IN CASE OF OVERPRIMING AND AFTER TWO UNSUCCESSFUL ATTEMPTS TO START THE ENGINE, CARRY OUT THE FOLLOWING OPERATIONS:

- (1) DRIVE OUT DRAIN PLUGS OF THE INTAKE PIPES OF CYLINDERS NOS 4, 5, 6 AND ONE SPARK PLUG FROM EACH OF THESE CYLINDERS, REMOVE PLUGS FROM THE EXHAUST MANIFOLDS.
- (2) TURN THE AIRSCREW MANUALLY FOR 3 TO 4 TURNS IN ITS NORMAL TURNING DIRECTION, ACCUMULATED OIL OR MIXTURE OF OIL AND FUEL SHOULD DRAIN FULLY FROM THE INTAKE PIPES, EXHAUST MANIFOLD AND CYLINDERS (AT A TEMPERATURE OF 5 °C AND BELOW, IT IS RECOMMENDED TO PERFORM THIS OPERATION AFTER HEATING THE ENGINE AND INTAKE PIPES OF THE LOWER CYLINDERS). WHEN TURNING THE AIRSCREW MANUALLY KNOCKS MAY BE HEARD IN THE ENGINE WHICH ARE CAUSED BY THE COUNTERWEIGHT WITH THE LOCK STRIP ON THE WEB AND ARE REGARDED NORMAL.
- (3) REINSTALL AND TIGHTEN THE SPARK PLUGS.
- (4) INSTALL AND LOCK THE DRAIN PLUGS.

Engine Warm-Up and Test Run	202
Engine Shutdown	203

Engine Maintenance at Low Ambient Temperatures

NOTE: Preparation for starting and starting of the engine are very important for its reliable operation.

At ambient temperatures of 5 °C and below, oil viscosity increases, which impedes starting of non-warmed-up engine and may lead to rapid wear of parts and assemblies on turning the engine crankshaft.

MAINTENANCE MANUAL

Heating and winterization of the engine, dilution of oil with gasoline facilitate starting, decreases wear of parts, particularly of cylinders and pistons.

Perform engine maintenance under low ambient temperatures according to the following Task Cards:

<u>Title</u>	<u>Task Card No.</u>
Winterization of Powerplant	204
Dilution of Oil with Gasoline	205
Maintenance of Engine Operating on Diluted Oil	206
Preparation of Engine for Starting	207
Engine Starting	208
Engine Warm-Up and Test Run	209
Engine Shutdown	210

Flight Preparation (Line Maintenance Checks)

NOTE: Line maintenance checks incorporate the preflight maintenance and postflight action.

<u>Title</u>	<u>Task Card No.</u>
Obtaining Pilot's Complaints on Engine Troubles in Flight	211
Visual External Inspection of Engine and Leakage Check of Engine Assembly and Accessory Joints	212
Inspection and Check of Reliability of Engine Mounting	213
Cleaning of Engine	214
Drainage of Oil for Inspecting It for Metal Particles	215
Engine Test Run before Shutdown to Determine Troubles	216
Dilution of Oil with Gasoline	217
Engine Covering after Inspection and Elimination of Troubles	218
External Inspection of Speed Governor	219
Check of Reliable Attachment and Operability of Speed Governor Control System	220
Inspection of Cylinders, Exhaust Manifold, Its Pipes at Joints with Cylinders	221
Check of Cylinder Intake Pipes for Condition	222
Checking of Deflectors for Condition and Reliable Attachment	223
Check of Covers and Cables of Valve Mechanism Case Cables for Condition	224

<u>Title</u>	<u>Task Card No.</u>
Check of Reliable Attachment and Locking of Oil Line Joints, Drain Cocks and Plugs and Visual Inspection of Oil System for Leakage	225
Check of Filter with Chip Detector Circuit for Continuity	226
Check of Fuel Line Joints, Drain Cocks and Plugs for Reliable Attachment and Locking	227
Check of Fuel Line for Leakage under Pressure of 0.2 to 0.5 kgf/cm ²	228
Check of Fuel Line and Membrane Mechanism Fuel Valve for Leakage under Pressure of 0.12 to 0.15 kgf/cm ²	229
Visual Check of Fuel System for Leakage of Gasoline	230
Check of Fuel System and Carburetor for Leakage under Fuel Pressure of 0.4 to 0.5 kgf/cm ²	231
Check of Fuel Lines for Proper Attachment	232
Check of Fuel Pump Attachment	233
Check of Fine Fuel Filter Joints for Leakage	234
Check of Carburetor for Proper Attachment and Its Control Linkage Articulated Joints for Serviceability	235
Check of Attachment of Magneto to Engine and Wires to Magneto and Spark Plugs	236
Check of Ignition Cable Braids for Condition	237
Check of Routing of Ignition Harness	238
Sampling Inspection of Spark Plug Tightening Using Wrench	239
Check of Air Line Joints, Drain Cocks and Plugs for Reliable Attachment and Locking	240
Check of Reliable Attachment of Compressed Air Distributor, Pipes and Connections for Supply and Discharge of Compressed Air	241
Check of Compressor for Good Repair and Reliable Attachment	242
Check of Starting Valves for Reliable Attachment	243

Scheduled Maintenance Operations (Periodic Maintenance)

NOTE: Periodic maintenance operations include:

- Maintenance after the first flight of the airplane with newly installed engine.
- Maintenance after first 5 h of engine operation.
- Maintenance after every (100±10) h of engine operation.
- Maintenance after (200±10) h of engine operation.
- Maintenance after (300±10) h of engine operation.

MAINTENANCE MANUAL

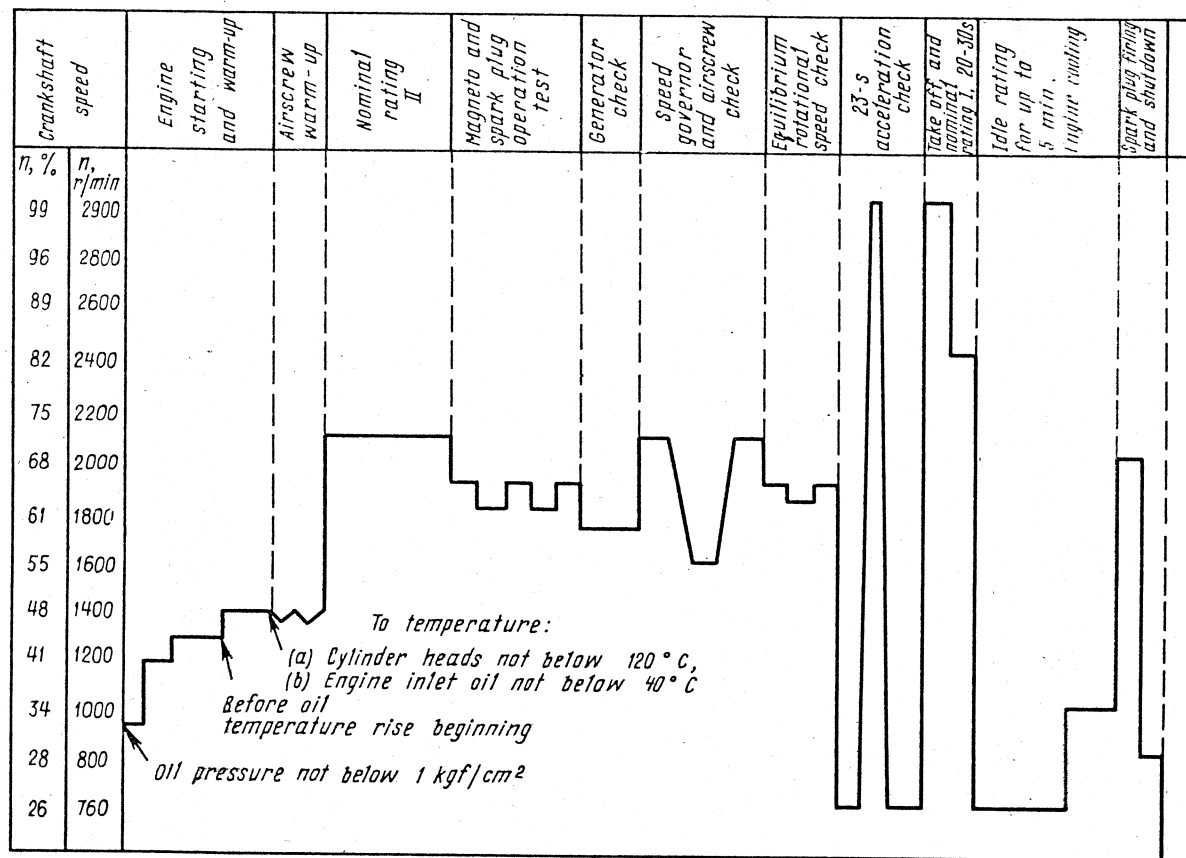
<u>Title</u>	<u>Task Card No.</u>
Change of Oil	244
Test Run of Engine after Scheduled Maintenance Operations	245
Check of Valve Mechanism Parts for Condition	246
Check of Clearance between Rocker Rollers and Valve Stem Ends	247
Check of Cylinder Compression	248
Inspection and Washing of Engine Rear Cover Mesh Filter	249
Inspection and Washing of Filter with Chip Detector	250
Inspection and Washing of Speed Governor Oil Supply Filter	251
Washing of Inlet Oil Filter	252
Check of Filter with Chip Detector Internal Circuit for Continuity	253
Washing of Engine Oil Lines with Clean Unleaded Gasoline	254
Drainage of Oil from Generator Drive	255
Drainage of Oil from Magneto Drives	256
Replacement of Filtering Element in Fuel Fine Filter 8D5.886.027	257
Inspection and Washing of Carburetor Fuel Filter	258
Accomplishment of Carburetor Scheduled Maintenance according to Carburetor Maintenance Manual	259
Accomplishment of Magneto Scheduled Maintenance according to Magneto Maintenance Manual	260
Accomplishment of Spark Plug Scheduled Maintenance according to Spark Plug Maintenance Manual	261
Check of Compressor Attachment	262
Replacement of Compressor Filtering Element	263
Check of Compressor Inlet Valve for Easy Travel	264
Washing of Compressor Delivery Valve	265

2. OPERATION PROCEDURE

TO M-14P M.S.	TASK CARD No. 201	PAGE(S) 205 - 207	
M.S. ITEM	PROCEDURE: Engine Starting		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Shift the speed governor lever to the LOW PITCH (МАЛЫЙ ШАГ) position.</p> <p><u>NOTE:</u> At a carburetor inlet air temperature of below 10 °C, open the air heating shutter at the carburetor inlet.</p> <p>2. Set the carburetor throttle control lever to the position corresponding to a speed of 28 to 38 % (800 to 1100 r/min).</p> <p>3. Cut in all the engine instruments.</p> <p><u>CAUTION:</u> DO NOT FILL MORE GASOLINE THAN SPECIFIED, OTHERWISE IT CAN WASH DOWN OIL FROM THE CYLINDER WALLS AND CAUSE SCORING OF PISTONS, WHILE ACCUMULATION OF GASOLINE IN LOWER CYLINDERS AND SUCTION PIPES MAY CAUSE HYDRAULIC SHOCK.</p> <p>4. Make sure the ignition is switched on, prime the engine mixture collector by the hand priming pump with 8 to 12 shots in summer and 15 to 20 shots in winter, simultaneously turning the airscrew manually in its normal direction.</p> <p>5. Allow gasoline vapors evaporate, for 1 to 2 min in summer and 3 to 5 min in winter.</p> <p>6. Operate the hand pump to build up gasoline pressure of 0.2 to 0.5 kgf/cm² before the carburetor inlet.</p>			

OPERATIONS AND TECHNICAL REQUIREMENTS	CORRECTIVE ACTIONS	CHECKED BY
<p>7. Give command "Clear off" and on receiving "Cleared" reply, open the on-board bottle valve and push the START (ЗАПУСК) button.</p> <p><u>CAUTION</u>: DO NOT DEPRESS THE "START" (ЗАПУСК) BUTTON FOR MORE THAN 30 s CONTINUOUSLY, INTERVALS BETWEEN DEPRESSIONS SHALL BE AT LEAST 3 min AND AFTER 10 DEPRESSIONS AT LEAST 10 min.</p> <p>8. Cut in the magneto by setting selector switch PM-1 to position "1+2" as soon as the engine starts running steadily from the starting coil (12 to 14 %).</p> <p><u>NOTES</u>: 1. For better starting the engine, supply additional shots of fuel with priming pump after first firings.</p> <p>2. In the course of starting as firing appears in the cylinders, it is allowed to assist engine acceleration to steady RPM by moving to and fro the carburetor throttle control lever within the speed range of 28 to 60 %, the rate of movement is 2 to 3 s.</p> <p>9. Cut out the ignition by setting the selector switch to position "0" if the engine does not fire for 30 s.</p> <p>10. Turn the airscrew manually with the throttle fully open for 8 to 10 turns in its normal direction and without priming the engine repeat starting.</p> <p>11. If the engine fails to start after two attempts, cease starting and carry out the following operations:</p> <p>(1) Turn off the ignition.</p> <p>(2) Drive out the drain plugs of the intake pipes of cylinders Nos 4, 5, 6.</p> <p>(3) Drive out one spark plug from each cylinder.</p> <p>(4) Fill 30 to 40 g of fresh oil heated to 75 to 80 °C into the cylinders using a pump.</p>		

OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>(5) Turn the airscrew manually for 3 to 4 turns in its normal direction to drain accumulated oil or mixture of gasoline and oil from the intake pipes, exhaust manifold and cylinders.</p> <p>(6) Reinstall the spark plugs and drain plugs.</p> <p>(7) Lock the plugs and repeat starting as instructed in Items 1 through 7.</p> <p>12. Set the throttle control lever to a position of 38 to 41 % (1100 to 1200 r/min) as soon as the engine starts operating steadily.</p> <p>13. Set the priming pump knob to neutral, engage the start button lock simultaneously checking engine inlet oil pressure.</p> <p>14. Immediately shut down the engine if 15 to 20 s after starting the oil pressure does not reach 1.0 kgf/cm².</p> <p>15. Find and eliminate the cause of oil low pressure.</p> <p>16. Repeat starting after eliminating the trouble.</p>			
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	Pump, priming 740400		



Engine M-14P Test Run Chart

Figure 201

TO M-14P M.S.	TASK CARD No. 202	PAGE(S) 209 - 215
M.S. ITEM	PROCEDURE: Engine Warm-Up and Test Run	
OPERATIONS AND TECHNICAL REQUIREMENTS		CHECKED BY
<p>1. Warm up the engine at a speed of 41 to 44 % (1200 to 1300 r/min) in 0.5 to 1 min after starting till engine inlet oil temperature starts rising (the engine test run chart is given in Fig. 201).</p> <p>2. Increase engine rotational speed by carburetor throttle control lever to 44 to 48 % (1300 to 1400 r/min) in summer and up to 51 % (1500 r/min) in winter and keep on warming the engine at this speed till the cylinder head temperature is at least 120 °C and engine inlet oil temperature is not below 40 °C.</p> <p><u>T.R.</u> The engine is considered warm if the temperature of the heads of the coldest cylinders is not below 120 °C and engine inlet oil temperature is not below 40 °C.</p> <p>3. Maintain the required temperature conditions of the engine by opening or closing shutters of the cowlings and oil cooler.</p> <p>4. Warm up the airscrew hub by changing its pitch two times.</p> <p>5. Check engine operation at different ratings by smoothly moving the carburetor throttle control lever to the stop and increasing the airscrew pitch simultaneously, change over the engine to nominal rating II.</p> <p><u>T.R.</u> The engine should run steadily and without vibration.</p>		<p>In case of unsteady running or vibration, refer to Section "Trouble Shooting", Item 4</p>

OPERATIONS AND TECHNICAL REQUIREMENTS	CORRECTIVE ACTIONS	CHECKED BY
<p>6. Check engine instrument readings for correspondence to the Specification.</p> <p><u>CAUTION:</u> TO AVOID OVERHEATING BECAUSE OF INSUFFICIENT BLOWING, DO NOT OPERATE THE ENGINE FOR A LONG TIME AT NOMINAL RATING II ON GROUND.</p> <p>7. Check operation of the magneto and spark plugs at a speed of 64 % and then 70 % using the following procedure:</p> <p>(1) Use the carburetor throttle control lever to set a speed of 64 to 70 % (1860 to 2050 r/min) having set the airscrew to the LOW PITCH (МАЛЫЙ ПИТЧ) stop.</p> <p>(2) Cut out each magneto alternately for 15 to 20 s.</p> <p><u>T.R.</u> Speed drop should not exceed 3 % (85 r/min) when operating with one magneto.</p> <p>(3) Cut in both magnetos for 20 to 30 s when changing over from one of them to the other to avoid spark plug fouling.</p>	<p>If speed drops for more than 3 %, proceed as follows:</p> <p>(1) Check attachment of spark plug elbows (Ref. 074.20.02, Task Card No. 202).</p> <p>(2) Check operability of spark plugs (Ref. 074.20.02, Task Card No. 202).</p> <p>(3) Check magneto point gap (Ref. 074.10.01, Task Card No. 202).</p> <p>(4) Check shielding of ignition wires</p>	

OPERATIONS AND TECHNICAL REQUIREMENTS	CORRECTIVE ACTIONS	CHECKED BY
<p>8. Check operation of the generator at engine rotational speed of 57 to 58 % (1680 to 1700 r/min).</p> <p><u>T.R.</u> When pushing the voltmeter button, voltage should be 27 to 27.5 V with power consumers switched on.</p> <p>9. Check operation of the airscrew mechanism and speed governor as follows:</p> <p>(1) Set the speed governor control lever to the LOW PITCH (МАЛЫЙ ШАГ) position.</p> <p>(2) Set the carburetor throttle control lever to a rotational speed of 70 %.</p> <p>(3) Smoothly shift the speed governor control lever to the HIGH PITCH (БОЛЬШОЙ ШАГ) position without touching the carburetor throttle control lever.</p> <p><u>T.R.</u> The speed should drop to 53 % (1550 r/min).</p> <p>(4) Shift the speed governor control lever back to the LOW PITCH (МАЛЫЙ ШАГ) position.</p> <p><u>T.R.</u> The rotational speed should rise to initial one of 70 % (2050 r/min).</p> <p><u>NOTE:</u> Short-time drop of engine inlet oil pressure to 2 kgf/cm² with subsequent restoration during 8 to 11 s is tolerable.</p> <p>10. Check operation of the airscrew and speed governor at equilibrium speed using the following procedure:</p> <p>(1) Set the speed governor control lever to the LOW PITCH (МАЛЫЙ ШАГ) position.</p>	<p>If voltage drops below 27 to 27.5 V, proceed as instructed in generator Certificate or replace generator</p> <p>For cause of speed deviation from 53 % and initial one, refer to Section "Trouble Shooting", Item 11</p>	

OPERATIONS AND TECHNICAL REQUIREMENTS	CORRECTIVE ACTIONS	CHECKED BY
<p>(2) Set engine rotational speed of 70 % (2050 r/min) using the carburetor throttle control lever.</p> <p>(3) Increase the airscrew pitch to a speed of 64 % (1860 r/min) by the speed governor control lever.</p> <p>(4) Without touching the speed governor control lever, smoothly open and close (not fully) the carburetor throttle with somewhat varying the blower outlet pressure.</p> <p><u>T.R.</u> The engine rotational speed should not change.</p> <p><u>NOTE:</u> At a sharp opening and closing of the carburetor throttle, the engine rotational speed may increase or decrease for 2 to 4 % (60 to 120 r/min), respectively and be restored in 2 to 3 s to the equilibrium speed.</p> <p>11. Check engine pickup as follows:</p> <p>(1) Lower the engine rating to IDLE (МАЛЫЙ ПАЗ) by simultaneously shifting the throttle control lever to the IDLE (МАЛЫЙ ПАЗ) position and the speed governor control lever to the LOW PITCH (МАЛЫЙ ШАГ) position.</p> <p>(2) Shift the carburetor throttle control lever to the TAKE-OFF (ВЗЛЕТ) position within 0.5 to 3 s.</p> <p><u>T.R.</u> The engine should change over to the take-off rating from the idle one smoothly without flats for a time of up to 3 s.</p> <p>(3) Repeat the pickup test by combining it with engine test at take-off and nominal I ratings. As the engine accelerates to the speed of take-off rating 99 % (2900 r/min), make a delay at this rating for 20 to 30 s, then increase the airscrew pitch to set a speed of 82 % (2400 r/min) and check operation of the engine for 20 to 30 s at nominal rating I.</p>	<p>For cause of speed variation, refer to Section "Trouble Shooting", Item 11</p> <p>In case of troubles, refer to Section "Trouble Shooting"</p> <p>In case of troubles, refer to Section "Trouble Shooting"</p>	

OPERATIONS AND TECHNICAL REQUIREMENTS	CORRECTIVE ACTIONS	CHECKED BY
<p>(4) Note engine instrument readings and make sure they are in line with the Specification.</p> <p><u>T.R.</u> The engine rotational speed, the blower outlet pressure and oil pressure should correspond to the Specification.</p> <p><u>CAUTION:</u> 1. TO ENSURE NORMAL PICKUP, THE CYLINDER HEAD TEMPERATURE SHOULD BE NOT BELOW THAN 120 °C AND ENGINE INLET OIL TEMPERATURE, NOT BELOW THAN 40 °C.</p> <p>2. WHEN GROUND TESTING THE ENGINE AT SUBZERO TEMPERATURES, IT IS ALLOWED TO DECREASE SPEED AT TAKE-OFF RATING. THE SPEED DROP IS DETERMINED ACCORDING TO THE ENGINE SPEED VERSUS ATMOSPHERIC CONDITIONS GRAPH AND SHOULD NOT EXCEED THE VALUES INDICATED IN FIG. 202.</p> <p>12. Check operation of the engine at the IDLE (МАЛЫЙ ПАЗ) rating with setting the airscrew in the LOW PITCH (МАЛЫЙ ШАГ) position.</p> <p><u>T.R.</u> The engine should run steadily.</p> <p><u>NOTES:</u> 1. Do not run the engine idle for more than 5 min, otherwise spark plugs will foul.</p> <p>2. When operating the engine with compressor loaded, the tachometer indicator pointer may hunt within +3 % (up to 100 r/min), while the pointer of the boost pressure indicator remains steady which indicates that the crankshaft speed is constant. Such a hunting does not indicate engine malfunctions. At no-load operation of the compressor, the tachometer pointer ceases hunting.</p> <p>3. When shifting the throttle control lever to the IDLE (МАЛЫЙ ПАЗ) position, a short-time drop of idle speed with engine operating steadily is allowed.</p>	<p>In case of troubles, refer to Section "Trouble Shooting", Item 11; 072.50.00, "Trouble Shooting"</p> <p>If engine runs non-steadily, refer to Section "Trouble Shooting", Item 4</p>	

TO M-14P M.S.	TASK CARD No. 203		PAGE(S) 217, 218
M.S. ITEM	PROCEDURE: Engine Shutdown		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Prior to shutdown, cool the engine as follows:</p> <p>(1) Fully open the cowling and oil cooler shutters.</p> <p>(2) Decrease engine speed to 28 to 34 % (800 to 1000 r/min) (the airscrew is in the LOW PITCH (МАЛЫЙ ШАГ) position) and run the engine at this rating till cylinder head temperature drops to 140 to 150 °C.</p> <p><u>CAUTION:</u> 1. IT IS ALLOWED TO SHUT DOWN THE ENGINE AT A CYLINDER HEAD TEMPERATURE OF UP TO 170 °C AS READ BY THE INDICATOR IN THE PILOT'S CABIN IF THEY CANNOT BE COOLED DOWN TO 140 TO 150 °C.</p> <p>THE NUMBER OF SHUTDOWNS AT ELEVATED CYLINDER HEAD TEMPERATURES SHOULD BE INDICATED IN THE ENGINE LOG BOOK.</p> <p>2. IT IS PROHIBITED TO RUN THE ENGINE IDLE FOR A LONG TIME BEFORE SHUTDOWN, OTHERWISE SPARK PLUG FOULING, OVERFILLING OF CRANKCASE WITH OIL MAY RESULT, WHICH IN TURN MAY LEAD TO HYDRAULIC SHOCK AT SUBSEQUENT STARTING.</p> <p>2. After cooling down the cylinder heads, increase engine rotational speed to 65 to 68 % (1900 to 2000 r/min) by the carburetor throttle control lever.</p> <p>3. Fire the spark plugs at a speed of 65 to 68 % (1900 to 2000 r/min) during 20 to 30 s.</p> <p>4. Decrease the rotational speed to 28 to 34 % (800 to 1000 r/min), turn off the ignition and smoothly open fully the carburetor throttle.</p>			

OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p><u>CAUTION:</u> 1. TO AVOID SCORING OF PISTONS AND CYLINDER SURFACE AT SUBSEQUENT STARTINGS BECAUSE OF RAPID FLOW DOWN OF OIL FROM CYLINDER WALLS AT HIGH HEAD TEMPERATURES, NEVER SHUT DOWN THE ENGINE DIRECTLY FROM CRUISE AND HIGHER RATINGS.</p> <p>2. NEVER SHUT DOWN THE ENGINE BY CLOSING THE FUEL SHUT-OFF VALVE WITH CONSUMING FUEL FROM THE CARBURETOR TO AVOID BACK-FIRE AND FIRE OF THE AIRPLANE.</p> <p>5. After shutting down the engine, shift the carburetor throttle control lever to the IDLE (МАЛЫЙ ПАЗ) position and close the fuel shut-off valve.</p> <p>6. Fill in the engine Log Book after each flight, enter notes on engine malfunctions and elapsed time, including time of operation at take-off and nominal ratings.</p>			
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	

TO M-14P M.S.	TASK CARD No. 204	PAGE(S) 219, 220	
M.S. ITEM	PROCEDURE: Winterization of Powerplant		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Install covers on the R-2, series 04, speed governor, oil cooler and oil tank.</p> <p><u>NOTES:</u> 1. Arrange the covers so that it is possible to fill oil into the tank and warm the engine with hot air from ground heaters without removing the covers.</p> <p>2. If the oil tank is not heat-insulated on the airplane, heat-insulate it with a special cover which tightly closes the entire surface of the tank and has a hole for the filler.</p> <p>2. Wrap the covers at points of passing of the heater pipes with heat insulation material.</p> <p>3. Insulate rubberized fabric hoses, flexible hoses, electric wires with asbestos or cover with shields to protect them against hot air at heating.</p> <p>4. Insulate metal oil lines with two layers of heat insulation material: the first layer of asbestos cord and the other layer of calico tape.</p> <p>5. Sew the calico tape with threads at both ends of wrapping.</p> <p>6. Paint insulation material with enamel to fit the oil system color and coat with water glass.</p> <p><u>CAUTION:</u> DO NOT HEAT-INSULATE FLEXIBLE HOSES.</p> <p>7. Make sure oil can be fully drained from the oil system through drain cocks.</p>			

OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p><u>NOTES:</u> 1. If oil trapping is detected, replace the pipes where pockets are formed.</p> <p>2. Check drainage of oil from the oil cooler.</p>			
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
		<p>Needle</p> <p>Threads, coarse, flax No. 105x6</p> <p>Tape, calico, cotton 16x0.22, grade 1</p> <p>Enamel, brown PF-223</p> <p>Glass, water sodium</p>	

TO M-14P M.S.	TASK CARD No. 205	PAGE (S) 221, 222
M.S. ITEM	PROCEDURE: Dilution of Oil with Gasoline	
OPERATIONS AND TECHNICAL REQUIREMENTS		CHECKED BY
<p>At an ambient temperature below +5 °C, dilute oil with gasoline as follows:</p> <ol style="list-style-type: none"> (1) Heat the engine with a ground heater to a cylinder head temperature of 30 °C. (2) Start and warm up the engine to an inlet oil temperature of 40 to 45 °C (Ref. Task Card No. 201). (3) Set the airscrew to the LOW PITCH (МАЛЫЙ ШАГ) position and the carburetor throttle control lever to a speed of 54 % (1600 r/min). (4) Push the button of solenoid valve EKR-3 and keep it depressed throughout the time of dilution. <p><u>T.R.</u> Oil pressure during dilution should drop for not more than 1.0 kgf/cm² from the specified value.</p> <p><u>NOTES:</u> 1. The time of opening of the solenoid valve is determined depending on the amount of oil in the tank and elapsed time of engine operation after recent dilution according to the Table located on board the airplane.</p> <p>2. The amount of gasoline required for diluting oil MS-20 is found on the basis of 10 to 12 % of the amount of oil in the oil system and engine (by volume).</p> <ol style="list-style-type: none"> (5) Release the button of solenoid valve EKR-3 without changing the engine rating, and run the engine for 3 min to mix gasoline with oil. (6) Shift the airscrew from low pitch to high one 3 or 4 times to fill the airscrew cylinder with diluted oil. 		<p>If oil pressure drops below 1 kgf/cm², cease dilution</p>

OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p><u>NOTE:</u> Perform dilution at the end of the flying day or in case of engine dead periods when engine oil may cool down below +5 °C.</p> <p>(7) Shut down the engine (Ref. Task Card No. 203).</p>			
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	

TO M-14P M.S.	TASK CARD No. 206	PAGE(S) 223
M.S. ITEM	PROCEDURE: Maintenance of Engine Operating on Diluted Oil	
OPERATIONS AND TECHNICAL REQUIREMENTS		CHECKED BY
<p>1. Warm up the engine for 5 to 6 min at a speed of 41 to 44 % (1200 to 1300 r/min).</p> <p><u>NOTE:</u> The engine with diluted oil is regarded warmed up and ready for flight, if the cylinder head temperature is at least 120 °C and engine inlet oil temperature is not below 25 °C.</p> <p>2. Gradually increase rotational speed to 51 % (1500 r/min) and see to it that the oil pressure in the main line is 4 to 6 kgf/cm².</p> <p><u>NOTE:</u> If oil pressure drops below 1.0 kgf/cm² owing to excessive dilution with gasoline during engine idling on the ground, drain diluted oil from the oil system and fill it with non-diluted fresh oil with subsequently checking pressure with the engine running.</p> <p>3. Wash all oil filters after first dilution.</p> <p><u>CAUTION:</u> IN THE COURSE OF DILUTION, AVOID ENGINE INLET OIL TEMPERATURE RISE ABOVE 50 °C AND CYLINDER HEAD TEMPERATURE ABOVE 160 °C.</p>		
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS

TO M-14P M.S.	TASK CARD No. 207	PAGE(S) 225, 226	
M.S. ITEM	PROCEDURE: Preparation of Engine for Starting		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Warm up the engine, airscrew cylinder and oil system with hot air from a ground heater so that the cylinder head temperature is at least 30 °C as read off the indicator if the ambient temperature is below minus 10 °C.</p> <p><u>CAUTION:</u> HOT AIR TEMPERATURE AT OUTLET FROM THE HEATER HOSE SHOULD NOT EXCEED 100 to 120 °C TO AVOID WARPAGE OF RUBBER ITEMS.</p> <p>2. Turn off the ignition.</p> <p>3. Turn the airscrew shaft for 3 to 4 turns in its normal direction.</p> <p><u>NOTES:</u> 1. The airscrew shaft should turn easily, while oil in the oil tank is regarded heated if it flows down freely from the dipstick.</p> <p>2. At ambient temperatures from 5 to minus 10 °C it is allowed to start the engine without preheating if oil in the engine and oil system is diluted with gasoline.</p> <p>4. Fill the oil system with oil heated to a temperature of 75 to 80 °C, if oil was drained from the oil system.</p> <p>5. Fill 2 to 3 lit of oil heated to 75 to 80 °C through the rear breather.</p> <p>6. Drain mud from the oil tank.</p> <p>7. Disconnect the hose from the oil pump flange and drain up to 3 lit of heated oil to a clean vessel to heat the oil line running from the tank to the engine at a subzero ambient temperature.</p>			

OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	Wrench 24x27 700880-8 Wrench 27x30 7811-0041 Pliers, flat-nosed 150	Wire, locking K0-0.8	

TO M-14P M.S.	TASK CARD No. 208		PAGE (S) 227
M.S. ITEM	PROCEDURE: Engine Starting		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>Start as indicated in Task Card No. 201 the engine preheated according to Item 1, Task Card No. 207.</p>			
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	

TO M-14P M.S.	TASK CARD No. 209		PAGE(S) 229
M.S. ITEM	PROCEDURE: Engine Warm-up and Test Run		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Warm-up and test run the engine as instructed in Task Card No. 202.</p> <p><u>NOTE:</u> To ensure appropriate mixing and preclude icing of carburetor venturi, the carburetor inlet air temperature should not be less than 10 °C.</p> <p>2. Close the cowlings and oil cooler shutters to speed up warming-up.</p> <p>3. Before take-off, change over the airscrew from the LOW PITCH (МАЛЫЙ ШАГ) to HIGH PITCH (БОЛЬШОЙ ШАГ) position two or three times and back to warm oil in the airscrew cylinder.</p>			
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	

TO M-14P M.S.	TASK CARD No. 210		PAGE(S) 231
M.S. ITEM	PROCEDURE: Engine Shutdown		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Dilute oil with gasoline (Ref. Task Card No. 205).</p> <p>2. Shut down the engine (Ref. Task Card No. 203).</p> <p>3. Drain oil from the airplane and engine oil system, if oil was not diluted with gasoline and ambient temperature is 5 °C and less.</p> <p><u>NOTES:</u> 1. Drain oil at an oil temperature of not less than 30 °C through the oil tank cock, oil sump drain cock and oil cooler cock.</p> <p>2. Leave all the cocks open after draining oil.</p>			
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	

TO M-14P M.S.	TASK CARD No. 211		PAGE(S) 233
M.S. ITEM 072.00.00a	PROCEDURE: Obtaining Pilot's Complaints on Engine Troubles in Flight		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
1. Listen to pilot's complaints on engine troubles encountered in flight. 2. Enter the information in the airplane preparation Register.			
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	

TO M-14P M.S.	TASK CARD No. 212	PAGE(S) 235
M.S. ITEM 072.00.00b, 072.00.00c	PROCEDURE: Visual External Inspection of Engine and Leakage Check of Engine Assembly and Accessory Joints	
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS
<p>1. Check the engine for external condition and tightness of joints of assemblies and accessories.</p> <p><u>T.R.</u> Leakage of fuel and oil through joints of assemblies and accessories is not allowed.</p> <p>Damaged locking, loosened attachment are not allowed.</p> <p><u>NOTE:</u> Tighten nuts for attachment of the gearbox to the intermediate crankcase by torque wrench 14-024-260 with socket 14-324-06. Tightening torque $M_t = (1.5^{+0.3})$ kgf·m.</p> <p>At locations of the oil sump bellows, boss of the passage for supply of oil to the R-2, series 04, speed governor, boss for the R-2, series 04, governor attachment and boss for the centrifuge (on engines M-14P, series 2) where torque wrench cannot be used, tighten the nuts with the wrench.</p>		<p>Detect and eliminate cause of fuel and oil leakage</p> <p>Tighten nuts and replace locking</p>
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS
	<p>Wrench, torque 14-024-260</p> <p>Socket set</p> <p>Wrench 700002</p>	

TO M-14P M.S.	TASK CARD No. 213		PAGE(S) 237
M.S. ITEM 072.00.00d, 072.20.00a	PROCEDURE: Inspection and Check of Reliability of Engine Mounting		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<ol style="list-style-type: none"> 1. Inspect the engine crankcase-to-frame attachment bosses. 2. Inspect rubber shock absorbers for proper condition. 3. Check reliable attachment of the engine to its frame. 4. Inspect the units for attachment of the engine frame to the fuselage. 5. Inspect the frame bars and ring. 6. Make sure they are free from deformation or cracks. 7. Check reliability of bolted joints and make sure locking is intact. <p><u>T.R.</u> Deformations and cracks are not allowed. Bolted joints should be tightened and locked.</p>		<p>Replace defective frame Tighten and lock inspected bolted joints</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	<p>Pliers, flat-nosed 150 Wrench 14x17 14-232-03</p>		

TO M-14P M.S.	TASK CARD No. 214	PAGE(S) 239	
M.S. ITEM 072.00.00e	PROCEDURE: Cleaning of Engine		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>Clean the engine of dust, dirt, runs of oil and fuel.</p> <p><u>T.R.</u> Soiling of the engine is not allowed.</p> <p><u>CAUTION:</u> CLEAN THE ENGINE AFTER COOLING IT DOWN.</p>		<p>If soiling is detected, wash engine with clean gasoline and wipe with dry rags</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	Syringe UB-24-05	<p>Gasoline Nefras-S 50/170 or BR-1, BR-2</p> <p>Rags</p> <p>Cloths</p> <p>Brush, hair</p>	

TO M-14P M.S.	TASK CARD No. 215		PAGE(S) 241, 242
M.S. ITEM 072.00.00f	PROCEDURE: Drainage of Oil for Inspecting It for Metal Particles		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Drain 0.5 lit of oil from the engine oil sump as follows:</p> <p>(1) Unlock and drive out the filter with chip detector (Ref. Task Card No. 212).</p> <p>(2) Drain 0.5 lit of oil through fine-mesh funnel.</p> <p>(3) Make sure the funnel mesh, filter with chip detector and its seat are free from metal particles.</p> <p><u>T.R.</u> Presence of metal particles on the funnel mesh and filter with chip detector cannot be tolerated.</p> <p>2. Wash the filter with chip detector and funnel with clean gasoline.</p> <p>3. Make sure the filter with chip detector is not damaged.</p> <p><u>T.R.</u> Damage to the filter with chip detector is not allowed.</p> <p>4. Check the filter gasket for condition.</p> <p><u>T.R.</u> Damage to the gasket is not allowed.</p> <p>5. Reinstall the filter with chip detector.</p> <p>6. Lock the filter with chip detector.</p> <p>7. Fill fresh oil.</p>		<p>If metal particles are detected, trace cause of their getting in oil</p> <p>Replace or repair filter with chip detector</p> <p>Replace damaged gasket</p>	

OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	Wrench 7x9 700880-2 Wrench 9x11 700002 Funnel, fine-mesh	Gasoline Nefras-S 50/170 or BR-1, BR-2	

TO M-14P M.S.	TASK CARD No. 216	PAGE(S) 243	
M.S. ITEM 072.00.00g	PROCEDURE: Engine Test Run before Shutdown to Determine Troubles		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Taxi the airplane to the parking ground.</p> <p>2. Listen to engine operation before shutdown. Make sure the engine does not miss, there are no pops in suction and exhaust systems. <u>T.R.</u> Missing and pops are not allowed.</p> <p>3. Test run the engine at all ratings if troubles were encountered in flight (Ref. Task Card No. 202).</p> <p>4. Eliminate all troubles detected.</p>		Determine and eliminate cause of missing and pops	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	

TO M-14P M.S.	TASK CARD No. 217		PAGE(S) 245
M.S. ITEM 072.00.00h	PROCEDURE: Dilution of Oil with Gasoline		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
Dilute oil with gasoline if ambient temperature drops below 5 °C (Ref. Task Card No. 205).			
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	

TO M-14P M.S.	TASK CARD No. 218	PAGE(S) 247	
M.S. ITEM 072.00.001	PROCEDURE: Engine Covering after Inspection and Elimination of Troubles		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Eliminate defects detected in flight and in the course of inspection.</p> <p>2. Cover the engine as follows:</p> <p>(1) Put folded cover on the engine and spread it.</p> <p>(2) Fasten the cover straps.</p> <p>(3) Install blanking covers on the exhaust pipes.</p>			
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	

TO M-14P M.S.	TASK CARD No. 219	PAGE(S) 249	
M.S. ITEM 072.10.00a	PROCEDURE: External Inspection of Speed Governor		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>Inspect the speed governor externally to make sure it is free from defects, plays in the roller, damaged locking.</p> <p><u>T.R.</u> Damage, plays, broken locking cannot be allowed.</p>		<p>(1) Replace damaged governor (Ref. 061.20.01, Task Cards Nos 201 through 204).</p> <p>(2) Eliminate play by tightening attachment nut.</p> <p>(3) Lock roller attachment nut anew.</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	<p>Wrench 9x11 700002</p> <p>Wrench 11x14 14-24-861</p> <p>Pliers, flat-nosed 150</p>		

TO M-14P M.S.	TASK CARD No. 220		PAGE(S) 251
M.S. ITEM 072.10.00b	PROCEDURE: Check of Reliable Attachment and Operability of Speed Governor Control System		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Inspect the speed governor location.</p> <p><u>T.R.</u> Oil leakage is not allowed.</p> <p>2. Check attachment of the governor control roller.</p> <p><u>T.R.</u> Loose attachment of the roller is not allowed. Roller attachment nut locking should be intact.</p> <p>3. Check easy movement of the airscrew pitch control lever.</p>		<p>Find and eliminate leakage by replacing gasket or tightening governor attachment nuts</p> <p>Eliminate play by tightening nut, replace damaged locking</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	

TO M-14P M.S.	TASK CARD No. 221		PAGE(S) 253
M.S. ITEM 072.30.00a	PROCEDURE: Inspection of Cylinders, Exhaust Manifold, Its Pipes at Joints with Cylinders		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Inspect the cylinders.</p> <p>2. Inspect the exhaust manifold and its pipes at joints with the engine cylinders.</p> <p>3. Make sure gases do not escape through the seals, there are no traces of overheating or cracks on the exhaust manifold.</p> <p><u>T.R.</u> Overheating, warpage of fins and gas blow-by are not allowed.</p> <p>4. Perform sampling inspection of pipe attachment nuts for proper tightening.</p> <p>5. Tighten the loose attachment nuts.</p>		<p>(1) Replace cylinder with traces of overheating and warpage.</p> <p>(2) Eliminate cause of gas blow-by</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	Wrench 14-24-538 for cylinder attachment nuts		

TO M-14P M.S.	TASK CARD No. 222		PAGE(S) 255
M.S. ITEM 072.30.00b	PROCEDURE: Check of Cylinder Intake Pipes for Condition		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Check condition and attachment of the cylinder intake pipes.</p> <p><u>T.R.</u> Loosening of cylinder intake pipe attachment nuts is not allowed.</p> <p>Dents, cracks on cylinder intake pipes are not allowed.</p> <p>Traces of fuel leakage are not allowed.</p> <p>2. Make sure the drain plugs of the intake pipes of cylinders Nos 4, 5, 6 are reliably installed and locked.</p> <p><u>T.R.</u> Damaged locking, loosening of drain plugs are not allowed.</p> <p>Leakage of fuel through plugs is not allowed.</p>		<p>Tighten loose attachment nuts of pipes.</p> <p>Replace damaged intake pipes.</p> <p>Eliminate fuel leakage through joints by replacing gaskets and tightening nuts</p> <p>Tighten loose drain plugs.</p> <p>Eliminate leakage, replace locking</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	<p>Wrench 14-24-571</p> <p>Pliers, flat-nosed 150</p> <p>Pin</p> <p>Bar, handle 12x350 UB-24-53</p> <p>Wrench 11x14 14-24-861</p> <p>Wrench 10-32-12</p>		

TO M-14P M.S.	TASK CARD No. 223	PAGE(S) 257	
M.S. ITEM 072.30.00c	PROCEDURE: Check of Deflectors for Condition and Reliable Attachment		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>Check the engine deflectors for condition and reliable attachment.</p> <p><u>T.R.</u> The deflectors should be fully tightened.</p> <p>Deflector damage, dents, and cracks are not allowed.</p>		<p>Tighten deflector attachment bolts and nuts</p> <p>Replace defective deflectors</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	<p>Wrench 7 14-324-100</p> <p>Wrench 11 14-624-09</p>		

TO M-14P M.S.	TASK CARD No. 224	PAGE (S) 259	
M.S. ITEM 072.30.00d	PROCEDURE: Check of Covers and Cables of Valve Mechanism Case Cables for Condition		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Check the valve mechanism case covers for condition.</p> <p><u>T.R.</u> Damage is not allowed. Leakage of oil from under the covers is not allowed.</p> <p>2. Check the valve mechanism case cover attachment cables for condition.</p> <p><u>T.R.</u> Damage of cable is not allowed. Cable loosening is not allowed.</p>		<p>Replace damaged cover Replace gasket and tighten attachment cable</p> <p>Replace damaged cable Tighten cable (Ref. Task Card No. 247)</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	<p>Wrench 10-32-07</p> <p>Screwdriver 700346 A200x1</p>		

TO M-14P M.S.	TASK CARD No. 225		PAGE (S) 261
M.S. ITEM 072.50.00a, 072.50.00b	PROCEDURE: Check of Reliable Attachment and Locking of Oil Line Joints, Drain Cocks and Plugs and Visual Inspection of Oil System for Leakage		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Inspect the oil hoses, pipelines of the oil system, connections, locking of nuts and drain plugs.</p> <p><u>T.R.</u> Leakage of pipeline and hose joints is not allowed.</p> <p>Chafing of hoses and pipelines is not allowed. Joints should be reliably locked.</p> <p>2. Check cleanliness of the oil tank vent pipe.</p> <p><u>T.R.</u> Clogging is not allowed.</p>		<p>Eliminate leakage by tightening connections and nuts Replace damaged hoses Lock joints properly</p> <p>Wash pipe with gasoline</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	<p>Pliers, flat-nosed 150</p> <p>Wrench 27x30 7811-0041</p> <p>Wrench 14x17 14-232-03</p> <p>Wrench 17x19 UB-24-07</p>	<p>Gasoline Nefras-S 50/170 or BR-1, BR-2</p>	

TO M-14P M.S.	TASK CARD No. 226		PAGE(S) 263
M.S. ITEM 072.50.00c	PROCEDURE: Check of Filter with Chip Detector Circuit for Continuity		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
1. Remove the rubber cap from the filter terminal. 2. Close the filter terminal to ground by pressing it to the oil sump. <u>T.R.</u> Warning lamp on the panel should come on.		Detect fault in external electric circuit and eliminate it	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	

TO M-14P M.S.	TASK CARD No. 227		PAGE (S) 265
M.S. ITEM 073.00.00a	PROCEDURE: Check of Fuel Line Joints, Drain Cocks and Plugs for Reliable Attachment and Locking		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>Check condition and locking of the fuel lines, hoses, connections and plugs.</p> <p><u>T.R.</u> Fuel hoses and lines should be intact.</p> <p>Connections and plugs should be reliably tightened and locked.</p>		<p>Replace damaged fuel hoses and lines</p> <p>Tighten and lock connection nuts</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES		MATERIALS
	<p>Pliers, flat-nosed 150</p> <p>Wrench 14x17 14-232-03</p> <p>Wrench 11x14 14-24-861</p>		<p>Wire, locking KO-0.8</p>

TO M-14P M.S.	TASK CARD No. 228		PAGE(S) 267
M.S. ITEM 073.00.00b, 073.00.00d	PROCEDURE: Check of Fuel Line for Leakage under Pressure of 0.2 to 0.5 kgf/cm ²		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<ol style="list-style-type: none"> 1. Build up a pressure of 0.2 to 0.5 kgf/cm² with a priming pump. 2. Inspect the pipelines and hoses, make sure there are no leaks and the joints are reliably tightened. 3. Inspect the fuel system units, their connections and make sure there are no fuel leaks. <p><u>T.R.</u> Joint leakage is not allowed.</p>		Eliminate leakage of fuel	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	Wrench 17x19 UB-24-07 Wrench 19x22 700880-7 Wrench 27x30 7811-0041 Wrench 24x27 700880-8 Pliers, flat-nosed 150		

TO M-14P M.S.	TASK CARD No. 229		PAGE(S) 269
M.S. ITEM 073.00.00b, 073.00.00c	PROCEDURE: Check of Fuel Line and Membrane Mechanism Fuel Valve for Leakage under Pressure of 0.12 to 0.15 kgf/cm ²		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>1. Open the fuel shut-off valve.</p> <p>2. Fill the fuel line with fuel by building up pressure of 0.12 to 0.15 kgf/cm² with a hand priming pump and wait for several minutes.</p> <p>3. Check the fuel line for leakage at joints of connections, pipes, filters and fuel pressure measuring pipe and at locations of drain plug and jet plug seals.</p> <p><u>T.R.</u> Leaky joints are not allowed.</p> <p>4. Inspect atomizing pipe of the membrane mechanism valve.</p> <p><u>T.R.</u> Leakage of fuel from atomizing pipe is not allowed.</p>		<p>Eliminate fuel leakage by tightening connection nuts or replacing sealing rings</p> <p>In case of fuel leakage, replace carburetor (Ref. 073.10.03, Task Cards Nos 201 through 207)</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	<p>Wrench 17x19 UB-24-07</p> <p>Wrench 19x22 700880-7</p> <p>Wrench 27x30 7811-0041</p> <p>Wrench 14x17 14-232-03</p> <p>Pliers, flat-nosed 150</p>	Wire, locking KO-0.8	

TO M-14P M.S.	TASK CARD No. 230		PAGE(S) 271
M.S. ITEM 073.00.00d	PROCEDURE: Visual Check of Fuel System for Leakage of Gasoline		
OPERATIONS AND TECHNICAL REQUIREMENTS		CORRECTIVE ACTIONS	CHECKED BY
<p>Check the pipeline and unit joints of the fuel system visually for leakage.</p> <p><u>T.R.</u> Leakage or sweating of fuel through the joints is not allowed.</p>		<p>Eliminate leakage of fuel by tightening joint nuts</p>	
TEST EQUIPMENT	TOOLS AND FIXTURES	MATERIALS	
	<p>Wrench 17x19 UB-24-07</p> <p>Wrench 24x27 700880-8</p> <p>Wrench 27x30 7811-0041</p>		