

# CHAPTER 4

## NORMAL PROCEDURES

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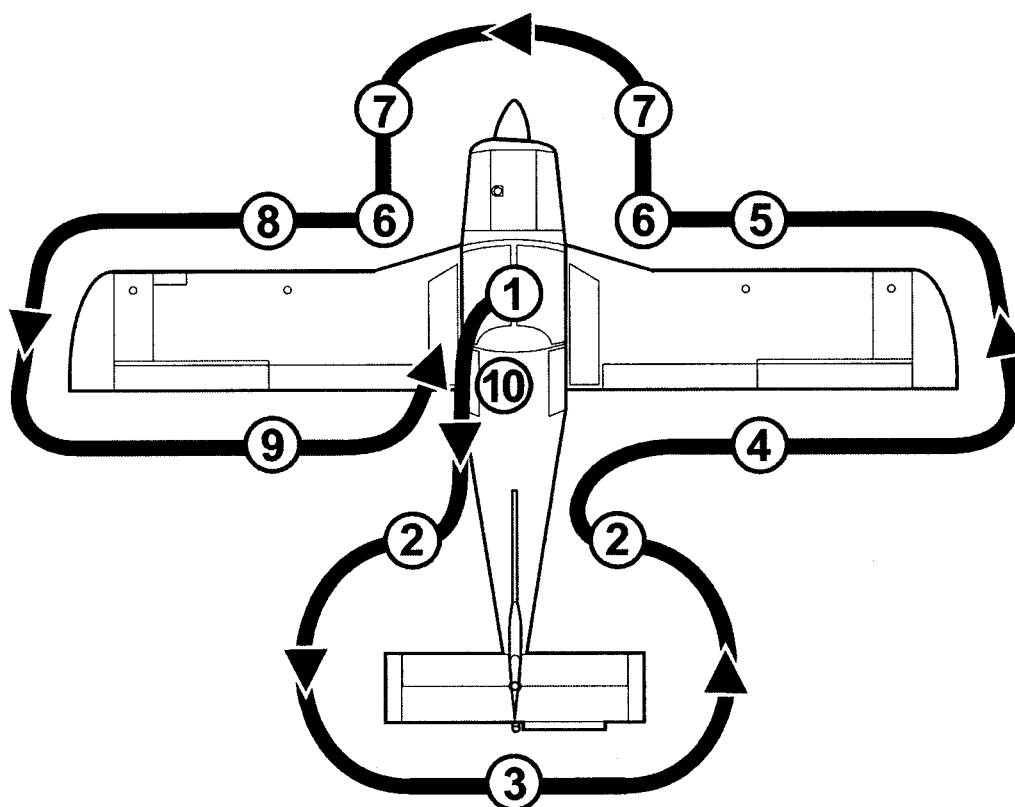
## 4. NORMAL PROCEDURES

### NOTE

Airspeeds shown in this Chapter are IAS.

### 4.1. BEFORE ENTERING THE COCKPIT

#### 4.1.1. Pre-Flight check



### NOTE

Observe the sequence of preflight check according to the following scheme and checklist.

The word "CONDITION" in the checklist means the visual check of surface, damage, deformation, scratches/notches, wear, corrosion, icing or any other condition decreasing the flight safety.

**COCKPIT (1)**

- |     |  |                                  |
|-----|--|----------------------------------|
| 1)  | "MASTER SWITCH" and other circuit switches                                 | - "OFF"                          |
| 2)  | Ignition switch  | - "OFF"                          |
| 3)  | Control stick lock   | - RELEASE                        |
| 4)  | Control stick  | - FREE MOVEMENT                  |
| 5)  | Canopy emergency jettisoning handles                                       | - SECURED                        |
| 6)  | Crash-axe  | - FIXED, SEALED                  |
| 7)  | ASPS switch valve  | - SEALED IN <b>MAIN</b> POSITION |
| 8)  | "COMM 1", "NAV/ADF" emergency switches (if installed)                      | - SEALED "OFF"                   |
| 9)  | Spar cap nitrogen pressure   | - MIN. 150 kPa (22 p.s.i.)       |
| 10) | Before flight:<br>- loose items and baggage<br>- free safety belts         | - FASTEN<br>- LOCK AND SHORTEN   |
| 11) | Before flight manoeuvres in <b>U</b> category<br>- loose items and baggage | - REMOVE                         |
| 12) | Canopy glass:<br>glass cleaning<br>sliding mechanism                       | - CHECK<br>- FREE MOVEMENT       |

**FUSELAGE (2)**

- |    |                         |                                   |
|----|-------------------------|-----------------------------------|
| 1) | Fuselage surface        | - CONDITION, LOOSE SCREWS, RIVETS |
| 2) | Static pressure sources | - REMOVE PLUGS, CLEAN HOLES       |
| 3) | Spring tail skid        | - CONDITION                       |

**EMPENNAGE (3)**

- |    |                                |  |
|----|--------------------------------|--|
| 1) | Empennage surfaces             | - CONDITION, LOOSE SCREWS, RIVETS  |
| 2) | Rudder, elevator trim tab      | - CONDITION, FREE MOVEMENT, PLAY IN BEARINGS, BOLTS SECURED, STATIC DISCHARGES |
| 3) | Position light                 | - CONDITION, ATTACHMENT  |
| 4) | Antennas, anticollision beacon | - CONDITION, ATTACHMENT  |

**RIGHT WING (4)**

- |    |                                       |  |
|----|---------------------------------------|--|
| 1) | Trailing edge                         | - CONDITION  |
| 2) | Wing flap                             | - CONDITION, BOLTS SECURED, LOCKING  |
| 3) | Aileron                               | - CONDITION, MOVEMENT, BOLTS SECURED, BALANCE WEIGHT ATTACHMENT, PLAY IN BEARING, FIXED TAB, STATIC DISCHARGES |
| 4) | Auxiliary fuel tank                   | - CONDITION, ATTACHMENT, LEAKAGE, FUEL DRAINING, CAP CLOSED  |
| 5) | Wingtip, Position light, Strobe light | - CONDITION, ATTACHMENT, LIGHT CONDUCTOR   |
| 6) | Wing skin                             | - CONDITION, LOOSEN RIVETS   |
| 7) | Leading edge                          | - CONDITION  |
| 8) | Main fuel tank                        | - CHECK VISUALLY COVER SCREWS UNDER TANK, FUEL DRAINING, CAP CLOSED  |

<b>CAUTION</b>
----------------

DRAIN THE FUEL SYSTEM ALWAYS BEFORE FLYING AND AFTER ANY RE-FUELLING.

FOR FUEL DRAINING AND FUEL CHECK USE THE TRANSPARENT VESSEL. CHECK WATER ON THE FUEL, SEDIMENTS AND THE CORRESPONDING COLOURSHADE, WHICH INDICATES THE FUEL GRADE. REPEAT THE DRAINING IF WATER AND/OR SEDIMENTS ARE FOUND UNTIL THE FUEL SAMPLE IS PURE!

DRAIN ALL FUEL DRAINING VALVES, INCLUDING THE MASTER VALVE AT THE BOTTOM OF THE FUSELAGE.

**RIGHT MAIN LANDING GEAR (5)**

- |    |                            |   |
|----|----------------------------|---|
| 1) | Tire                       | - CONDITION, INFLATION (250 ± 10 kPa<br>36 ± 2 p.s.i.)      |
| 2) | Wheel fairing with scraper | - CONDITION, CRACKS IN ATTACHMENT                           |
| 3) | Wheel brake                | - CONDITION, ATTACHMENT, BRAKE PIPE,<br>LEAKAGE             |
| 4) | Landing leg (spring)       | - CONDITION, ATTACHMENT, CRACKS,<br>MICROSWITCH CONTROL ROD |

**POWER PLANT (6)**

- |    |   |   |
|----|---|---|
| 1) | Engine cowling,<br>Propeller speed governor | - CONDITION, LOCKED, FREE AIR INTAKES,<br>PROPELLER SPEED GOVERNOR INCL.<br>CONTROL SYSTEM                                    |
| 2) | Propeller                                   | - CONDITION, CRACKS IN BLADES, NOTCH,<br>BLADES PLAY, LEAKAGE   |
| 3) | Engine oil                                  | - QUANTITY, CAP AND LID CLOSED  |
| 4) | Exhaust muffler                             | - CONDITION, ATTACHMENT, BURN-OUT   |
| 5) | Oil and fuel leakage                        | - CHECK SOILING AT HOT-AIR OUTLET<br>IN BOTTOM COWLING  |
| 6) | Bottom fuselage cover                       | - CONDITION, ATTACHMENT<br>- FUEL DRAIN BY DRAINING VALVE<br>- CHECK PITOT-STATIC LINES DRAINING<br>SUMPS, DRAIN IN NECESSARY |

**NOSE LANDING GEAR (7)**

- |    |                               |  |
|----|-------------------------------|--|
| 1) | Tire                          | - CONDITION, INFLATION (250 ± 10 kPa;<br>36 ± 2 p.s.i.)                                |
| 2) | Hydropneumatic shock absorber | - CONDITION, STATIC LOAD DISPLACEMENT,<br>ATTACHMENT STRUTS (TROUGH HOT AIR<br>OUTLET) |
| 3) | Nose wheel fairing            | - CONDITION, ATTACHMENT  |

**LEFT MAIN LANDING GEAR (8)**

- |    |                            |   |
|----|----------------------------|---|
| 1) | Tire                       | - CONDITION, INFLATION (250 ± 10 kPa;<br>36 ± 2 p.s.i.) |
| 2) | Wheel fairing with scraper | - CONDITION, CRACKS IN ATTACHMENT                       |
| 3) | Wheel brake                | - CONDITION, ATTACHMENT, BRAKE PIPE,<br>LEAKAGE         |
| 4) | Landing leg (spring)       | - CONDITION, ATTACHMENT, CRACKS                         |

**LEFT WING (9)**

- |     |  |  |
|-----|--|--|
| 1)  | Main fuel tank                         | - CHECK VISUALLY COVER SCREWS UNDER<br>TANK, FUEL DRAINING, CAP CLOSED   |
| 2)  | Leading edge                           | - CONDITION  |
| 3)  | Wing skin                              | - CONDITION, LOOSEN RIVETS   |
| 4)  | Stall warning probe                    | - REMOVE PLUG, CHECK HOLE CLEAN  |
| 5)  | Pitot tube                             | - REMOVE COVER, CHECK HOLE CLEAN   |
| 6)  | Headlights                             | - CONDITION, ATTACHMENT<br>COVER TRANSPARENCY  |
| 7)  | Auxiliary tank                         | - CONDITION, ATTACHMENT, LEAKAGE,<br>FUEL DRAINING, CAP CLOSED   |
| 8)  | Wing tip, Position light, Strobe light | - CONDITION, ATTACHMENT,<br>LIGHT CONDUCTOR  |
| 9)  | Aileron                                | - CONDITION, MOVEMENT, BOLTS SECURED,<br>BALANCE WEIGHT ATTACHMENT, PLAY IN<br>BEARING, FIXED TAB, STATIC DISCHARGES |
| 10) | Wing flap                              | - CONDITION, BOLTS SECURED, LOCKING  |
| 11) | Trailing edge                          | - CONDITION  |

**BAGGAGE COMPARTMENT AND COCKPIT (10)**

- |    |         |                        |
|----|---------|------------------------|
| 1) | Baggage | - LOAD PROPERLY, FIXED |
| 2) | Doors   | - CLOSED, LOCKED       |

<b>CAUTION</b>
----------------

BEFORE OCCUPANTS EMBARKING AT COCKPIT INNER TEMPERATURE LOWER THAN -15°C (+5°F) THE COCKPIT MUST BE PREHEATED BY HOT AIR TO COMPLY WITH TEMPERATURE LIMITATIONS OF INSTALLED APPLIANCES.

**NOTE**

Put on the parachute (if applicable) before entering the cockpit. Adjust properly and lock the parachute harness.



**4.2. AFTER ENTERING THE COCKPIT**

- |     |  |  |
|-----|--|--|
| 1)  | Front seat   | - ADJUST POSITION  |
| 2)  | Safety belts   | - CLASP, ADJUST, FASTEN  |
|     | Safety belts lock  | - <b>"LOCKED"</b> POSITION   |
| 3)  | Primary controls   | - FREE MOVEMENT  |
| 4)  | Wing flaps   | - FUNCTION, POSITIONS ARRESTMENT, VISUALLY POSITION                                |
| 5)  | Trim:  |  |
|     | - longitudinal   | - FUNCTION, SET NEUTRAL  |
|     | - directional  | - FUNCTION, SET HALF 1/2 BETWEEN NEUTRAL AND FULL TRAVEL RIGHT                     |
| 6)  | Parking brake and brake toe pedals:  |  |
|     | - parking brake handle   | - TURN LEFT 90° AND PUSH   |
|     | - brake pedals   | - 2x FULL PUSH, FUNCTION   |
| 7)  | <b>"MASTER SWITCH"</b>   | - "ON"   |
| 8)  | Emergency electric power source  | - CHECK SIGNAL LIGHT   |
| 9)  | Circuit switches:<br><b>"BATTERY", "GENERATOR",<br/>"ENGINE INSTR.",<br/>"FLIGHT INSTR."</b> | - "ON"   |
| 10) | Spar cap nitrogen pressure   | - min. 150 kPa (22 p.s.i.)   |
| 11) | V-A meter  | - CHECK VOLTAGE 25 V MIN.  |
| 12) | Engine instruments   | - CHECK INITIAL VALUES   |
| 13) | Annunciator panel  | - <b>"OIL PRESS. LOSS",<br/>"STALL. WARN. INACTIVE", "GENERATOR"</b><br>MUST BE ON |
| 14) | <b>"PITOT HEATING"</b> switch  | - "ON"   |
| 15) | Annunciator panel  | - <b>"PITOT HEATING"</b> MUST BE ON  |

**NOTE**

Unless the PITOT HEATING light is ON, the failure of pitot or stall warning probe heating occurred. Verify by finger touch on elements.

- |     |                                |                                      |
|-----|--------------------------------|--------------------------------------|
| 16) | <b>"PITOT HEATING"</b> switch  | - "OFF"                              |
| 17) | <b>"STATIC HEATING"</b> switch | - "ON"                               |
| 18) | Annunciator panel              | - <b>"STATIC HEATING"</b> MUST BE ON |

**NOTE**

Unless STATIC HEATING light is ON, the failure of static probes heating occurred. Verify by finger touch on elements.

- |     |                                |  |
|-----|--------------------------------|--|
| 19) | <b>"STATIC HEATING"</b> switch | - "OFF"  |
| 20) | <b>"SIGNALLING CHECK"</b>      | - PUSH (ALL ANNUNCIATOR LIGHTS MUST BE ON AND THE STALL WARNING HORN MUST SOUND) |
| 21) | <b>"FLIGHT INSTR."</b> switch  | - "OFF"  |
| 22) | Occupants / passenger          | - SAFETY BELTS FASTENED, PASSENGER FAMILIARISED WITH EMERGENCY EQUIPMENT         |
| 23) | Canopy                         | - CLOSED, LOCKED   |

<b>CAUTION</b>
----------------

DO NOT EXCEED THE PERIOD OF PITOT-STATIC HEATING GROUND - CHECK BY MORE THAN ABOUT ONE MINUTE.

### 4.3. ENGINE STARTING

#### 4.3.1 Engine starting with external power source

#### WARNING

**DO NOT CRANK PROPELLER TO THE HOT ENGINE BY HAND - THE SERIOUS INJURY MAY OCCUR.**

#### CAUTION

CIRCUITS SWITCHES "**COMM/NAV 1**", "**COMM/NAV 2**", "**FLIGHT INSTR.**" MUST BE "OFF" BEFORE "EXTERNAL ELECTRIC POWER SOURCE" SELECTION AND ENGINE STARTING. OTHERWISE TRANSIENT VOLTAGE PEAKS MAY DAMAGE AVIONICS AND OTHER ELECTRONIC INSTRUMENTS.

- 1) Circuit Switches "**COMM/NAV 1, 2**"  
"**FLIGHT INSTR.**" - "OFF"
- 2) Ignition switch - "**OFF**"
- 3) External power source - PLUG IN
- 4) "**MASTER SWITCH**" - "ON"
- 5) Circuit switches: "**BATTERY**",  
"**GENERATOR**",  
"**ENGINE INSTR.**" - "ON"
- 6) Switch "**EXT. POW. SOURCE**" - "ON"
- 7) Switch "**BEACON**" - "ON" (AS NECESSARY)
- 8) Fuel:  
- quantity - CHECK  
- fuel valve - "**L+R**"
- 9) Throttle - SET 1/4 TRAVEL OPEN
- 10) Propeller - PUSH "MAX"
- 11) Mixture - PUSH "MAX. RICH"
- 12) Switch "**FUEL PUMP**" - "ON" - SHORTLY (3-5s) (until at operating value in fuel pressure lindicator)
- 13) Mixture - PULL "WEAK"
- 14) Space around propeller - CHECK FREE
- 15) Wheel brakes (or chocks) - APPLY
- 16) Ignition switch - "**START**"  
After starting - RELEASE  
- "**BOTH**"
- 17) Mixture - PUSH "MAX. RICH"
- 18) Throttle - 1000 RPM

- |     |  |  |
|-----|--|--|
| 19) | Switch <b>"EXT. POW. SOURCE"</b>                                     | - "OFF"                                |
| 20) | Circuit switch <b>"FLIGHT INSTR."</b>                                | - "ON"                                 |
| 21) | Oil pressure   | - MIN. 170 kPa (25 p.s.i.) WITHIN 30 s |
| 22) | External power source  | - DISCONNECT                           |
| 23) | Circuit switches <b>"COMM/NAV 1, 2"</b><br>and other needed switches | - "ON"                                 |

CAUTION
---------

SHUT-OFF THE ENGINE UNLESS THE OIL PRESSURE REACHES 170 kPa (25 p.s.i.), WITHIN 30 sec. AFTER STARTING AND CORRECT THE TROUBLE.

**NOTE**

The application of the external power source is recommended for engine starting.

At low ambient air temperatures below -12 °C (+10 °F) preheat the engine (including oil in the engine oil sump) with hot air.

Try to restrict starting intervals to 10 ÷ 12 seconds with five minute pauses between each attempt to start up the engine.

After plugged in the external source and circuit switch **"EXT. POW. SOURCE"** turned ON, the annunciator light **"EXT. POW. SOURCE"** on the annunciator table must be ON.

**4.3.2 Engine Starting with Board Battery**

WARNING
---------

**DO NOT CRANK PROPELLER TO THE HOT ENGINE BY HAND - THE SERIOUS INJURY MAY OCCUR.**

- |    |   |                           |
|----|---|---------------------------|
| 1) | <b>"MASTER SWITCH"</b>  | - "ON"                    |
| 2) | Circuit switches: <b>"BATTERY",</b><br><b>"GENERATOR"</b>           | - "ON"                    |
| 3) | Circuit switches <b>"AVIONIC 1, 2"</b><br>and other needed switches | - "ON"                    |
| 4) | Circuit switch <b>"HORIZON"</b>                                     | - "ON"                    |
| 5) | Fuel:<br>- quantity<br>- fuel valve                                 | - CHECK<br>- <b>"L+R"</b> |
| 6) | Throttle  | - SET 1/4 TRAVEL OPEN     |
| 7) | Propeller   | - PUSH "MAX"              |
| 8) | Mixture   | - PUSH "MAX. RICH"        |

- |     |                                   |   |
|-----|-----------------------------------|---|
| 9)  | Switch " <b>FUEL PUMP</b> "       | - "ON" - SHORTLY (3-5s) (until at operating value in indicator) |
| 10) | Mixture                           | - PULL "WEAK"   |
| 11) | Space around propeller            | - CHECK FREE  |
| 12) | Wheel brakes (or chocks)          | - APPLY   |
| 13) | Ignition switch<br>After starting | - " <b>START</b> "<br>- RELEASE<br>- " <b>BOTH</b> "            |
| 14) | Mixture                           | - PUSH "MAX. RICH"  |
| 15) | Throttle                          | - 1000 RPM  |
| 16) | Oil pressure                      | - MIN. 170 kPa (25 p.s.i.) WITHIN 30 s                          |
| 17) | Fuel pressure                     | - MIN. 96,5 kPa (14 p.s.i.)                                     |

#### 4.4. WARM-UP

- |    |   |   |
|----|---|---|
| 1) | Throttle  | - 1000 ÷ 1200 RPM (increase speed as warm-up continues) |
| 2) | Oil pressure  | - NORMAL OPERATED LIMIT                                 |
| 3) | During warm-up check:   |   |
|    | (a) Smooth engine run and fuel pressure remaining within 96 ÷ 310 kPa (14 – 45 p.s.i.) range at all OPEN position of the fuel valve.  |   |
|    | (b) The correct function of the generator and recharging of the battery:<br>After increasing the engine speed above 900 ÷ 1500 RPM the yellow " <b>GENERATOR</b> " must turn OFF (may turn OFF at idling speed), V-A meter must indicate the voltage 27 ÷ 29 V, positive recharging current or 0. |   |
|    | (c) Check all installed appliances as appropriate (COMM/NAV, Annunciator lights, Gyro instruments, Lighting etc.).  |   |
| 4) | Fuel valve  | - " <b>L + R</b> "                                      |

CAUTION
---------

WHEN WARMING UP THE ENGINE (STILL ON THE GROUND), DO NOT EXCEED THE ENGINE SPEED 2200 RPM AND TRY TO AVOID ENGINE IDLING.

#### NOTE

The engine is sufficiently warmed-up after it runs regularly and the oil pressure is within operating limits.

**4.5. ENGINE CHECK**

- |    |   |                          |                        |
|----|---|--------------------------|------------------------|
| 1) | Wheel brakes (or chocks)                              | - APPLY                  |                        |
| 2) | Control stick   | - NEUTRAL                |                        |
| 3) | Propeller   | - PUSH "MAX"             |                        |
| 4) | Mixture   | - PUSH "MAX. RICH"       |                        |
| 5) | Propeller air-vent and function test:<br>(3 x repeat) |                          |                        |
|    | - Throttle  | - SET 1800 RPM           |                        |
|    | - Propeller   | - PULL SET 1600 RPM      |                        |
|    |   | - PUSH MAX. ENGINE SPEED |                        |
| 6) | Magnetos check:                                       |                          |                        |
|    | - Propeller   | - PUSH "MAX"             |                        |
|    | - Throttle  | - SET 2200 RPM           |                        |
|    | - Ignition switch                                     | - SWITCH "L"             | - speed drop check     |
|    |   | - RETURN "BOTH"          | - until RPM stabilised |
|    |   | - SWITCH "R"             | - speed drop check     |
|    |   | - RETURN "BOTH"          |                        |

**NOTE**

The permissible engine speed loss for single magneto operation about max. 175 RPM.  
The engine speed difference between "L" and "R" single magneto operation must not exceed 50 RPM.

- |    |                             |                                  |
|----|-----------------------------|----------------------------------|
| 7) | Check engine instruments:   |                                  |
|    | - Oil pressure              | - 380 ÷ 650 kPa (55 ÷ 95 p.s.i.) |
|    | - Fuel pressure             | - 96 ÷ 310 kPa (14 ÷ 45 p.s.i.)  |
|    | - Oil temperature           | - max. 118 °C                    |
|    | - Cylinder head temperature | - 200 ÷ 435 °F                   |
| 8) | Throttle                    |                                  |
|    | - Engine speed              | - 600 RPM                        |
|    | - Oil pressure              | - min. 170 kPa (25 p.s.i.)       |
|    | - Fuel pressure             | - min. 96 kPa (14 p.s.i.)        |

**CAUTION**

PERFORM THE GROUND CHECK WITH HEADWIND IF PRACTICABLE, ENSURE ENOUGH SPACE BEHIND THE AIRPLANE.

AVOID GROUND CHECK ON GROUND CONTAINING LOOSE STONES, GRAVEL OR ANY LOOSE MATERIAL. THIS MAY CAUSE DAMAGE TO THE PROPELLER BLADES.

LIMIT THE ENGINE RUN ON SINGLE MAGNETO TO THE SHORTEST NECESSARY PERIOD.

## 4.6. TAXIING

## CAUTION

TAXIING IS PERMITTED ONLY WITH FLAPS RETRACTED.

OBSERVE THE TAXI GROUND CONDITION, OBSTACLES, AIRFIELD TRAFFIC, WIND SPEED AND DIRECTION FOR TAXI SPEED LIMITATION.

- 1) Parking brake release and brake check
  - parking brake handle - TURN LEFT 90° AND PUSH
  - brake pedals - 2x FULL PUSH, FUNCTION

## NOTE

During taxiing take control of airplane by the rudder control, on the small diameter cornering by the wheel brakes.

#### 4.7. BEFORE TAKE-OFF

- |     |                                     |   |
|-----|-------------------------------------|---|
| 1)  | Brakes                              | - APPLY   |
| 2)  | Throttle                            | - 1200 RPM  |
| 3)  | Primary control                     | - CHECK FREE MOVEMENT   |
| 4)  | Trim:                               |   |
|     | - longitudinal                      | - CHECK - NEUTRAL   |
|     | - directional                       | - CHECK - 1/2 BETWEEN NEUTRAL AND MAX. RIGHT                                |
| 5)  | Wing flaps                          | - <b>TAKE-OFF</b>   |
| 6)  | Fuel:                               |   |
|     | - quantity                          | - CHECK   |
|     | - fuel valve                        | - <b>"L+R"</b> OR THE TANK CONTAINS MORE THAN 15 LITRES (4 US.gal.) OF FUEL |
| 7)  | Circuit switches:                   |   |
|     | <b>"BATTERY", "GENERATOR",</b>      |   |
|     | <b>"ENGINE INSTR.",</b>             |   |
|     | <b>"FLIGHT INSTR."</b>              | - "ON"  |
| 8)  | Other circuit switches as necessary | - "ON"  |
| 9)  | <b>"FUEL PUMP"</b> switch           | - "ON"  |
| 10) | Nitrogen in spar cap pressure       | - MIN. 150 kPa (22 p.s.i.)  |
| 11) | Propeller                           | - PUSH "MAX"  |
| 12) | Mixture                             | - PUSH MAX. RICH  |
| 13) | <b>"MASTER SWITCH"</b>              | - "ON"  |
| 14) | Ignition switch                     | - CHECK <b>"BOTH"</b>   |

- |     |  |   |
|-----|--|---|
| 15) | Engine instruments                                     | - CHECK   |
| 16) | Altimeter, gyro instruments<br>and NAV instruments     | - ADJUST  |
| 17) | Battery charge   | - CHECK MAX. RECHARGING CURRENT < 5 A                 |
| 18) | Safety belts   | - CHECK FASTENED, " <b>LOCKED</b> "                   |
| 19) | Cockpit canopy   | - CLOSED, LOCKED                                      |
| 20) | " <b>PITOT HEATING</b> ",<br>" <b>STATIC HEATING</b> " | - "ON" JUST PRIOR TAKE-OFF TO IFR<br>CONDITION FLIGHT |

CAUTION

AVOID COMMENCE IFR OR NIGHT FLIGHT WHENEVER THE BATTERY RECHARGING CURRENT AT 2000 RPM ENGINE SPEED EXCEEDS 5A (BATTERY IS DISCHARGED).

**NOTE**

If the battery capacity is found to be too-low by this check (the recharging current is higher than 5 A.), prolong the ground run at 2000 RPM to recharge the battery until the current limitation is complied. Observe carefully other engine limitations.

To shorten the before take-off procedure and avoid possible delays at take-off it is strongly recommended to check the battery capacity according to step 17) during engine ground check and taxiing. Only short recheck before take-off is then necessary.



**4.8. TAKE-OFF**

- |                       |   |
|-----------------------|---|
| 1) Throttle           | - PUSH SMOOTHLY FULL  |
| 2) Control stick:     | - NEUTRAL<br>- PULL TO LIFT THE NOSE AT 48 ÷ 59 knots<br>(90 ÷ 110 km/h)  |
| 3) Unstick            | - AT 59 ÷ 67 knots (110 ÷ 125 km/h)   |
| 4) Acceleration       | - UP TO<br>73 knots (135 km/h) IN CATEGORY <b>U</b><br>78 knots (145 km/h) IN CATEGORY <b>N</b>                     |
| 5) Climbing           | - SMOOTHLY STABILISE:<br>AT 74 knots (137 km/h) IN CATEGORY <b>U</b><br>AT 79 knots (147 km/h) IN CATEGORY <b>N</b> |
| 6) Brakes             | - APPLY   |
| 7) Wing flaps         | - RETRACT AT SAFE ALTITUDE  |
| 8) Trim               | - AS NECESSARY  |
| 9) "FUEL PUMP" switch | - "OFF"   |
| 10) Fuel pressure     | - CHECK   |

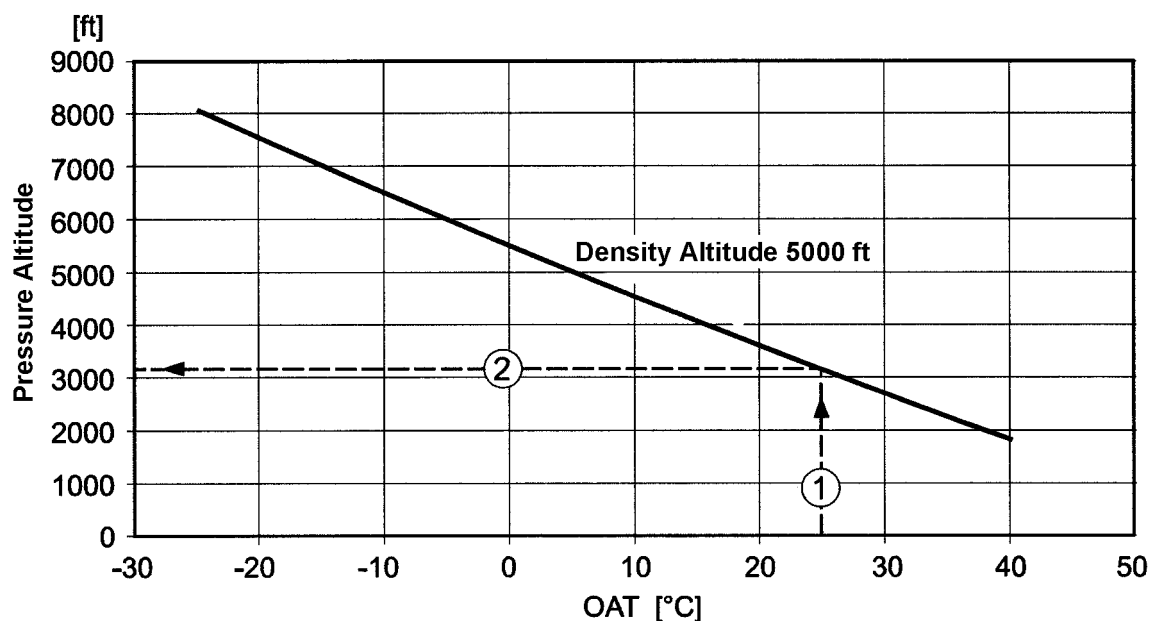
CAUTION
---------

WEAK THE MIXTURE APPROPRIATELY FOR TAKE-OFF FROM THE AIRFIELD WITH THE DENSITY ALTITUDE ABOVE 5000 ft FOR REACH OF MAX. ENGINE POWER.

AVOID BREAKING THE WHEELS AFTER TAKE-OFF FROM THE SLUSH OR SNOW-COVERED AIRFIELD AT TEMPERATURES CLOSE TO OR BELOW FREEZING POINT. THE SNOW/SLUSH PARTIALLY MELTED ON HOT BRAKES BODIES MAY FREEZE AGAIN DURING THE REST OF FLIGHT AND BLOCK THE WHEELS FOR LANDING.

**NOTE**

See the following diagram for the pressure altitude corresponding to 5000 ft of density altitude vs. external air temperature.



It is clear from this example, that pilot must weak the mixture at airports there the pressure altitude is more than 3200 ft and external air temperature is 25°C.

It is recommended to apply the breaks before opening the full throttle and to release them after the maximum engine power is reached. Take-off distances mentioned in Chapter 5 correspond to this procedure.

**4.9. CLIMB**

- |    |                    |                               |
|----|--------------------|-------------------------------|
| 1) | Propeller          | - PUSH "MAX"                  |
| 2) | Throttle           | - PUSH "MAX"                  |
| 3) | Engine instruments | - CHECK                       |
| 4) | Mixture            | - PUSH "RICH" OR AS NECESSARY |
| 5) | Trim               | - AS NECESSARY                |
| 6) | Airspeed           | - OBSERVE ACC: TO THE TABLE   |

Table of recommended climb airspeed

Flight altitude ISA	Airspeed V <sub>x</sub> IAS		Airspeed V <sub>y</sub> IAS	
	[knots]	[km/h]	[knots]	[km/h]
0	79	147	86	159
2500	78	144	84	156
5000	77	142	82	152
7500	75	140	80	149
10000	74	137	78	145

**CAUTION**

ENRICH THE MIXTURE OR INCREASE THE AIRSPEED WHENEVER THE CHT (CYLINDER HEAD TEMPERATURE) OR OIL TEMPERATURE APPROXIMATE THE MAXIMUM LIMITS OR YOU CAN INTERRUPT THE CLIMBING AND COOL THE ENGINE DOWN BY FLYING HORIZONTAL.

**NOTE**

If you climb above 5000 ft of density altitude, weak the mixture in order to maintain the maximum performance setting.

**4.10. CRUISING**

1) Engine power setting

- SEE FOLLOWING TABLE:

Power setting		Maximum continuous (MC)	Cruising (75% MC)	Economy (60% MC)
Engine speed	[RPM]	2400	2200	2000
Manifold pressure	[kPa]	Max.	84,7	82,9
	[in.Hg]		25,0	24,5
Altitude nominal ISA	[ft]	-	4200	4470
	[m]	-	1280	1362
Mixture control	-	Max.	Max.	Best economy

2) Engine instruments

- CHECK

3) Mixture control:

- above 75% MC power
- below 75% MC power

- PUSH MAX. "RICH"
- WEAK AS NECESSARY

4) Trim

- AS NECESSARY

5) Fuel valve

- "L+R"

**CAUTION**

SELECT "L" OR "R" AS NECESSARY, IF THE DIFFERENCE OF FUEL QUANTITY BETWEEN L.H. AND R.H. AUXILIARY TANK EXCEEDS 15 LITRES (4 U.S.GAL.). THE DIFFERENCE MORE THAN 15 LITRES (4 US.gal.) AFFECT THE FLIGHT CHARACTERISTIC.

**4.11. DESCENT**

- |    |           |                |
|----|-----------|----------------|
| 1) | Mixture   | - AS NECESSARY |
| 2) | Throttle  | - AS NECESSARY |
| 3) | Propeller | - AS NECESSARY |
| 4) | Trim      | - AS NECESSARY |

CAUTION
---------

MAINTAIN THE MINIMUM "CHT" ON 200 °F DURING DESCENT. INCREASE THE POWER AND "CHT" WHENEVER IT DROPS BELOW 200 °F.

**4.12. LANDING APPROACH**

- |     |                           |                             |
|-----|---------------------------|-----------------------------|
| 1)  | Airspeed                  | - MAX. 103 knots (191 km/h) |
| 2)  | Mixture                   | - PUSH MAX. "RICH"          |
| 3)  | Throttle                  | - AS NECESSARY              |
| 4)  | Wing flaps                | - <b>"TAKE-OFF"</b>         |
| 5)  | Trim                      | - AS NECESSARY              |
| 6)  | Fuel                      |                             |
|     | - quantity                | - CHECK                     |
|     | - fuel valve              | - "L+R" OR AS NECESSARY     |
| 7)  | <b>"FUEL PUMP"</b> switch | - "ON"                      |
| 9)  | Propeller                 | - PUSH "MAX"                |
| 10) | Safety belts              | - CHECK TIGHTENED           |

**4.13. LANDING**

- |                                      |   |
|--------------------------------------|---|
| 1) Airspeed                          | - 73 knots (135 km/h) IN CATEGORY <b>U</b><br>- 78 knots (140 km/h) IN CATEGORY <b>N</b>  |
| 2) Flaps                             | - <b>“TAKE-OFF”</b> OR <b>“LANDING”</b><br>(according to wind speed and pilot’s decision)   |
| 3) Trim                              | - AS NECESSARY  |
| 4) Flare-out:<br>- start<br>- finish | - AT ABOUT 20 FT ABOVE THE GROUND<br>- AT LESS 3 FT ABOVE THE GROUND  |
| 5) Hold                              | - DECREASE THE AIRSPEED BY FLUENT<br>PULLING THE CONTROL STICK  |
| 6) Main landing gear touch-down      | - PULL GENTLY TO DECREASE SPEED TOUCH<br>ON THE MAIN LANDING GEAR AT:<br>- 57 knots (105 km/h) IN CATEGORY <b>U</b><br>- 62 knots (115 km/h) IN CATEGORY <b>N</b> |
| 7) Nose wheel touch-down             | - AT AIRSPEED 51 ÷ 57 knots (95 ÷ 105 km/h)   |
| 8) Brakes                            | - APPLY IF NECESSARY BELOW 54 knots<br>(100 km/h)   |

**4.14. BALKED LANDING**

- |               |   |
|---------------|---|
| 1) Propeller  | - PUSH “MAX”  |
| 2) Throttle   | - PUSH “MAX”  |
| 3) Climb      | - ACCELERATE TO MIN.:<br>- 73 knots (135 km/h) IN CATEGORY <b>U</b><br>- 78 knots (145 km/h) IN CATEGORY <b>N</b> |
| 4) Wing flaps | - <b>“TAKE-OFF”</b>   |
| 5) Airspeed   | - ACCELERATE TO:<br>- 76 knots (140 km/h) IN CATEGORY <b>U</b><br>- 81 knots (150 km/h) IN CATEGORY <b>N</b>      |

After reaching the safe altitude and airspeed:

- |               |                      |
|---------------|----------------------|
| 6) Wing flaps | - <b>“RETRACTED”</b> |
|---------------|----------------------|

**4.15. AFTER LANDING**

- |    |   |                      |
|----|---|----------------------|
| 1) | Wing flaps  | - <b>"RETRACTED"</b> |
| 2) | "PITOT HEATING",<br>"STATIC HEATING",<br>"FUEL PUMP" switches | - "OFF" (CHECK OFF)  |

**4.16. STOPPING ENGINE**

- |    |  |                    |
|----|--|--------------------|
| 1) | "COMM/NAV 1, 2",<br>"FLIGHT INSTR." switches | - "OFF"            |
| 2) | Throttle                                     | - 1000 RPM         |
| 3) | Mixture                                      | - PULL "MAX. WEAK" |

After engine stopping:

- |    |                        |                |
|----|------------------------|----------------|
| 4) | Ignition switch        | - <b>"OFF"</b> |
| 5) | Other circuit switches | - "OFF"        |
| 6) | <b>"MASTER SWITCH"</b> | - "OFF"        |

**CAUTION**

THE "COMM/NAV 1", "COMM/NAV 2", "FLIGHT INSTR." SWITCHES MUST BE "OFF" BEFORE ENGINE STOPPING. DAMAGE TO ELECTRONIC PARTS OF AVIONICS AND INSTRUMENTS BY TRANSIENT VOLTAGE PEAKS MIGHT OCCUR.

**4.17. PARKING**

- |    |   |  |
|----|---|--|
| 1) | Ignition switch                           | - CHECK "OFF"  |
| 2) | "MASTER SWITCH,<br>Other circuit switches | - "OFF"  |
| 3) | Fuel valve                                | - "L" OR "R" (between individual flights)<br>- "OFF" (after flight day finish) |
| 4) | Parking brake                             | - APPLY (AS NECESSARY)   |
| 5) | Control stick                             | - LOCK   |
| 6) | Cockpit canopy                            | - CLOSE, (LOCK)  |

**NOTE**

Using of parking brake only for short-time parking period. It is recommended to move that airplane for longer parking, without parking brake engaged.

There is a risk of parking brake blocking by freezing at OAT close to the freezing point.

Do not use the fuel valve in position "L+R" not even during short parking. In this position may be at full auxiliary tanks and relatively low lateral bank of the airplane at ground the fuel will overflow from air-venting system.



**4.18. NIGHT FLIGHTS**

Following procedures complete the ones contained in previous paragraphs.

**4.18.1. After Entering the Cockpit**

After **"MASTER SWITCH"** and **"BATTERY"**, **"GENERATOR"**, **"ENGINE INSTR."**, and **"FLIGHT INSTR."** circuit switches continue:

- |   |   |
|---|---|
| 1) <b>"LIGHTING"</b> switch                       | - "ON"<br>- CHECK INSTRUMENT AND CONTROL LIGHTING |
| 2) Dimmers  | - CHECK AND ADJUST REQUIRED INTENSITY             |
| 3) <b>"BEACON"</b> switch                         | - "ON", CHECK FUNCTION                            |
| 4) Auxiliary map light                            | - CHECK FUNCTION, ADJUST                          |
| 5) <b>"POSITION LIGHT"</b> switch                 | - "ON", CHECK FUNCTION<br>- "OFF" AS NECESSARY    |
| 6) <b>"TAXI LIGHT"</b> switch                     | - "ON", CHECK FUNCTION<br>- "OFF"                 |
| 7) <b>"LANDING LIGHT"</b> switch                  | - "ON", CHECK FUNCTION<br>- "OFF"                 |
| 8) <b>"STROBE LIGHT"</b> switch<br>(if installed) | - "ON", CHECK FUNCTION<br>- "OFF" AS NECESSARY    |

**NOTE**

Use auxiliary "map" light for cockpit lighting during this check. The "map" light is turned "ON" by the switch located directly on the light body.

The **"MASTER SWITCH"** need not be "ON" for activation of the "map" light.

**4.18.2. Before Taxiing**

- 1) "POSITION LIGHT" switch - "ON"
- 2) "TAXI LIGHT" switch - "ON"

**4.18.3. Before Take-off**

- 1) "STROBE LIGHT" switch - "ON"  
(if installed)
- 2) "LANDING LIGHT" switch - "ON" JUST PRIOR TAKE-OFF

**4.18.4. After Take-off**

- 1) "LANDING LIGHT" switch - "OFF"
- 2) "TAXI LIGHT" switch - "OFF"

**NOTE**

When flying through clouds, turn off the **STROBE LIGHT** switch.

**4.18.5. Landing**

- 1) "LANDING LIGHT" switch - "ON"
- 2) "TAXI LIGHT" switch - "ON"

**4.18.6. After landing**

- 1) "LANDING LIGHT" switch - "OFF"
- 2) "STROBE LIGHT" switch - "OFF"  
(if installed)

**4.19. FLIGHT MANEUVRES IN CATEGORY “U”**

The flight manoeuvres described in Section 2, paragraph 2.7.2 may be carried out with Z 143 LSi airplane in category or “U” configuration.

**4.19.1. Pre-Flight Check**

- |                                     |                           |
|-------------------------------------|---------------------------|
| 1) Battery                          | - PROPER FASTENING        |
| 2) Baggage                          | - REMOVE                  |
| 3) Loose items                      | - REMOVE                  |
| 4) Safety belts<br>on the free seat | - LOCK, TIGHTEN           |
| 5) Weight and C/G                   | - CHECK ACC. TO SECTION 6 |
| 6) Auxiliary tanks                  | - EMPTY                   |

**4.19.2. Check Prior Commencing Manoeuvres**

- |                                    |                                |
|------------------------------------|--------------------------------|
| 1) Primary controls                | - FREE MOVEMENT                |
| 2) Trims                           | - NEUTRAL                      |
| 3) Fuel valve                      | - “L+R” OR AS NECESSARY        |
| 4) Mixture                         | - PUSH MAX. “RICH”             |
| 5) Propeller                       | - PUSH “MAX”                   |
| 6) Wing flaps                      | - “RETRACTED”                  |
| 7) Cockpit canopy                  | - CLOSED, LOCKED               |
| 8) Seats                           | - ADJUSTED (PROPERLY ARRESTED) |
| 9) Instruments:                    |                                |
| - engine instruments               | - CHECK                        |
| - spar nitrogen pressure indicator | - MIN. 150 kPa (22 p.s.i)      |
| - accelerometer                    | - RESET “0”                    |
| 10) Safety belts                   | - CHECK TIGHTENED              |
|                                    | - CHECK “LOCKED”               |
| 11) Safe altitude                  | - CHECK ALTIMETER              |
| 12) Free operation airspace        | - CHECK                        |

**WARNING**

**ALWAYS MAINTAIN AN ALTITUDE THAT ENSURES SAFE RECOVERY OF ALL FLIGHT MANEUVERS.**

**CAUTION**

IF GIC INSTALLED AIRPLANE THEN SWITCH OFF AUTOMATIC CORRECTION (SLAVE MODE) PRIOR COMMENCING MANEUVERS IN CATEGORY **U**.

CHECK ALL GYRO METERS AS SOON AS YOU FINISH **U** CATEGORY MANEUVERS.

IF ATTITUDE GYRO IS NOT EQUIPPED WITH "QUICK ERECT" FUNCTION, DO NOT ENTER INTO IMC CONDITIONS FOR AT LEAST 10 MINUTES AFTER FINISHING THESE MANEUVERS.

**4.19.3. Spin Training****Normal Spin Entry**

- |  |   |
|--|---|
| 1) Wing flaps                          | - <b>"RETRACTED"</b>  |
| 2) Mixture                             | - PUSH MAX. "RICH"  |
| 3) Throttle                            | - PULL IDLING   |
| 4) Elevator                            | - DECLINE SPEED SLOWLY AT   |
| <u>At reaching 67 knots (125 km/h)</u> |   |
| 5) Rudder                              | - FULL DEFLECTION REQUIRED TO THE DIRECTION OF ROTATION, MAINTAIN MAX. DEFLECTION                                       |
| 6) Elevator                            | - AFTER REACTION OF AIRPLANE ON 5) PULL THE CONTROL STICK IMMEDIATELY AILERONS IN NEUTRAL POSITION, MAINTAIN FULL PULL. |

**Normal Spin Recovery**

- |             |   |
|-------------|---|
| 1) Rudder   | - FULL DEFLECTION OPPOSITE TO THE DIRECTION OF ROTATION   |
| 2) Elevator | - IMMEDIATELY AFTER FULL COUNTERACTION OF RUDDER, PUSH SMOOTHLY CONTROL STICK MINIMALLY TO 3/4 OF THE TRAVEL BETWEEN NEUTRAL AND FULL FORWARD WITHIN 1 ÷ 2 SEC., AILERONS IN NEUTRAL POSITION |
| 3) Ailerons | - MAINTAIN NEUTRAL POSITION   |
- After rotation has stopped:
- |             |   |
|-------------|---|
| 4) Rudder   | - NEUTRAL POSITION  |
| 5) Elevator | - PULL STEADILY CONTROL STICK TO RECOVER AIRPLANE FROM DIVING |
| 6) Throttle | - AS NECESSARY  |

**WARNING**

**THE ENGINE CUT-OFF MAY OCCURE AT SPINNING WITH WEAK MIXTURE.**

**THE CONSIDERABLE SPIN OVERTURNING MAY OCCUR UNLESS THE ABOVE STATED PROCEDURE IS APPLIED.**

**NOTE**

Max. six-turn spin are permitted for operation of utility category (U).

During spin recovery after two and more turns, it is recommended to use both hands to push the control stick.

At correct recovery procedure one or less additional turn after one spin turn and less than one and half additional turn after more spin turns are considered as normal.

The loss of the altitude after spins recovery, incl. diving recovery is:

1 turn before recovery	1300 ft
3 turn before recovery	1800 ft
6 turn before recovery	2700 ft

**Errors in Spins Recovery:**

- 1) Application of aileron deflection during spin entering, rotation and/or recovery.
- 2) Unadequaten or too-slow applications of rudder and/or elevator at recovery manœuvre.
- 3) The reversed procedure of rudder and elevator application at recovery manœuvre (first elevator then rudder). In this case, the spin rotation may not be stopped.
- 4) Control stick is not fully pulled during spin introduction and spin itself.

<b>WARNING</b>
----------------

**IN ANY CASE OF UNCORRECT RECOVERY PROCEDURE, RESULTING IN THE CONTINUING SPIN ROTATION, RETURN THE CONTROLS INTO THE POSITION CORRESPONDING TO THE CARRIED-OUT SPIN AND REPEAT THE RECOVERY IN CORRECT ORDER AS DESCRIBED ABOVE.**

**4.19.4. Stall Training**

- |             |   |
|-------------|---|
| 1) Mixture  | - PUSH "MAX. RICH"  |
| 2) Throttle | - PULL IDLE   |
| 3) Airspeed | - 81 knots (150 km/h)<br>- DECREASE BY GENTLE STICK PULLING BY<br>1 knots (2 km/h) UNTIL STALL OCCURS |

**NOTE**

Depending upon the loading conditions the stall may be indicated by the uncontrolled downward pitching of the airplane nose or by a minimum airspeed condition, when reaching the elevator stop.

- |                        |   |
|------------------------|---|
| 4) Elevator            | - PUSH TO REGAIN CONTROLLABILITY          |
| 5) Ailerons and rudder | - CORRECT BANK AND YAW DURING<br>RECOVERY |
| 6) Throttle            | - AS NECESSARY                            |

**NOTE**

The stall maneuver procedure is similar for wing-level and turning stalls.

The stall-warning horn is activated 5 ÷ 10 knots (9 ÷ 18 km/h) above the stall speed.

**4.20. THROTTLE CONTROL AND ENGINE MIXTURE CONTROL****4.20.1. Throttle control**

Throttle control movements should be gentle and continuous.

**4.20.2. Mixture control**

- 1) During engine ground check, take-off, climb, maneuvering and cruising above the 75% of MC power the mixture control must be set on "MAX.RICH".

Except for take-off and following climb from airfields with elevations above 5000 ft ISA. In this case the mixture could be adequately leaned so that the engine runs smoothly without skipping. The engine speed, temperature, pressure limitations must be observed.

Weak the mixture at cruising power setting only at and below 75% MC.

- 2) Before increasing engine power by change of throttle the mixture control must be set "MAX. RICH" first.
- 3) Weak the mixture at cruising power setting only at and below - 75% MC:

- a) Without EGT indicator

Slowly pull the mixture control from the "MAX. RICH" to "WEAK" position backwards until a drop in engine power observed. (it need not be accompanied by engine roughness).

Push the mixture control forward until the maximum power is regained and engine runs smoothly. Check the CHT and oil temperature.

- b) With EGT indicator

Slowly pull the mixture control from the "MAX. RICH" position to "WEAK" position until the EGT reaches the maximum value and starts to drop again. The white "asterisk" should indicate the maximum EGT at cruising below 75 % MC).

To reach the max. power (speed) push the mixture control slowly forward until the EGT again drops by about 100°F (50°C) below the indicated maximum.

To reach the maximum economy (endurance) "B.E." leave the mixture control in position corresponding to the maximum EGT or to 50°F (25°C) below this maximum value adjusted by pulling the control in "WEAK" position. Check the CHT and oil temperature.

The difference in fuel consumption between these mixture settings may be up to 10 %.

**4.21. NOISE CHARACTERISTIC**

The airplane satisfies without decrease in power specifications with FAR PART 36 an ICAO Annex 16, Catch 10 of noiseworthiness.

Z 143 LSi airplane average noise level in Category **N**:

- a) 74.25 dB(a) in accordance FAR PART 36 as amended through Amdt. 23-20 incl.
- b) 76.88 dB(a) in accordance ICAO Annex 16 Catch 10.