

## **IL-2 STURMOVIK: Battle of Stalingrad**

### Messerschmitt Bf 109 F-4

#### **Start and warm up the engine**

- Use throttle control to set idle power.
- Start the engine. Cold engine (especially in winter) may not work steadily and may even stall at idle power - to avoid it increase the revs slightly.
- Increase revs to 1000 RPM to warm up the engine.

#### **Take-off**

- Lower flaps for 20 degrees (4 full turns of the flaps control wheel, watch the progress by special marks on the left flaps).
- Make sure there are no obstacles on the runway.
- Smoothly increase thrust to maximum.
- Use pedals to stay on the take-off route.
- The plane tends to turn left - parry it with the right rudder pedal.
- Take off will occur at 180 km/h. Avoid early take-off, alternatively the aircraft may not respond the controls properly, and the landing gear may get damaged.
- After takeoff, gain speed of 250 km/h. then raise the gear (can be checked by the signal lamps: red - raised, green - extended and fixed).
- Retract flaps.
- Start ascending after reaching 280 km/h.
- Takeoff mode (at 2700 RPM and 1,42 ata manifold pressure) should not last longer than 1 minute.

#### **Ascending**

- Climb with engine working at 2500 RPM and 1,30 ata manifold pressure, and keep speed at 280km/h.
- Cooling liquid temperature should not exceed 115°C, oil temperature should be kept between 70°-80°C (short time maximum - 85°C).

## **Forward flight.**

- Maximum continuous power during forward flight - 2300 RPM and manifold pressure 1,15 ata.
- At contingency rating - 2700 RPM and manifold pressure 1,42 ata - not longer than 3 minutes.
- Speed limitation.
- Maximum limit speed with flaps down - 250 km/h.
- Maximum limit speed with extended gears - 350 km/h.
- Maximum limit speed in diving - 750 km/h. Warning! Propeller pitch changes slowly that's why diving, flying at maximum limit speed, and sharp t control movements can damage the engine.

## **Gliding flight and landing**

- Gliding speed - 220 km/h.