Lavochkin La-5 Лавочкин Ла-5

SERIES 8

By Chuck

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	(Unit)	LaGG-3	Yak-1	La-5	Il-2	Pe-2	Bf.109F4	Bf.109G2	Fw190A3	Ju-87	He-111
TEMPERATURES											
Water Rad Min Max	Deg C	80 100	80 100	- 	80 110	40 100	40 100	40 100	-	60 100-110	40 95
Oil Rad (OUTBOUND) Min Max	Deg C	40 100	40 100	55 75	70 115	-	40 80	40 80	40 110	30 105	35 95
Oil Rad (INBOUND) Min Max	Deg C	-	-	-	40 80	-	-	-	-	-	-
Cylinder Head Temp Min Max	Deg C	-	-	120 200	-	-	-	-	-	-	-
ENGINE SETTINGS											
Takeoff RPM	RPM	2700	2700	2400	2200	2700	2600	2500	2500	2500	2400
Takeoff Manifold Pressure	RU: mm Hg GER: ATA	1050	1050	1150	1150	1050	1.3	1.3	1.3	1.3	1.35
Climb RPM	RPM	2600	2650	2300	2050	2600	2600 30 min	2500	2400	2450 30 min	2300 30 min
Climb Manifold Pressure	RU: mm Hg GER: ATA	1020	1050	1150	1050	1050	1.3 30 min	1.3	1.3	1.25 30 min	1.15 30 min
Normal Operation/Cruise RPM	RPM	1700	1850	2300	1850	2200	2200	1900	2200	2100	2200
Normal Operation/Cruise Manifold Pressure	RU: mm Hg GER: ATA	1020	850	900	850	1020	1.0	1.0	1.1	1.2	1.10
Combat RPM	RPM	2650	2650	2400	2050	2600	2600	2500	2400	2250	2300
Combat Manifold Pressure	RU: mm Hg GER: ATA	1050	1050	1150	1050	1050	1.3	1.3	1.32	1.2	1.15
Emergency Power/ Boost RPM @ km	RPM	2700	2700	2400 10 min max	2200	2700	2700 1 min max	2500	2600 7-8 min max	2600 1 min max	2400 1 min max
Emergency Power / Boost Manifold Pressure @ 1 km	RU: mm Hg GER: ATA	1050	1050	1150 10 min max	1150	1050	1.42 1 min max	1.3	1.42 7-8 min Max	1.4 1 min max	1.35 1 min max
Supercharger Stage 1 Operation Altitude	m	0 2000	0 2500	0 2000	-	0 2000	-	-	-	Auto/man modes	Auto/man modes
Supercharger Stage 2 Operation Altitude	m	2000+	2500+	2000+	-	2000+	-	-	-	Auto/man modes	Auto/man modes
*Landing Approach RPM	RPM	2600	2200	2400	1800	2700	1500	1500	-	2000	2300
*Landing Approach Manifold Pressure	RU: mm Hg GER: ATA	As required	600	As required	600	As required	0.6	0.6	-	0.6	As required
Notes				Open Oil Radiator at all times	Close Oil radiator in combat	Flaps 30 on Takeoff & 15 on Landing			Lock tailwheel on takeoff	No Abrupt Throttling	Eng. very sensitive to ata/rpm
AIRSPEEDS											
Takeoff – Rotation	km/h	190	200	180	190	250	180	180	200	170	150
Optimal Climb Speed	km/h	270	260	250	250	240	280	280	270	230	N/A
Landing – Approach	km/h	200	180	200	200	200	180	180	190	190	200
Landing – Touchdown	km/h	170	150	170	150	160	160	160	150	150	140-150

PART I: THE AIRCRAFT

History

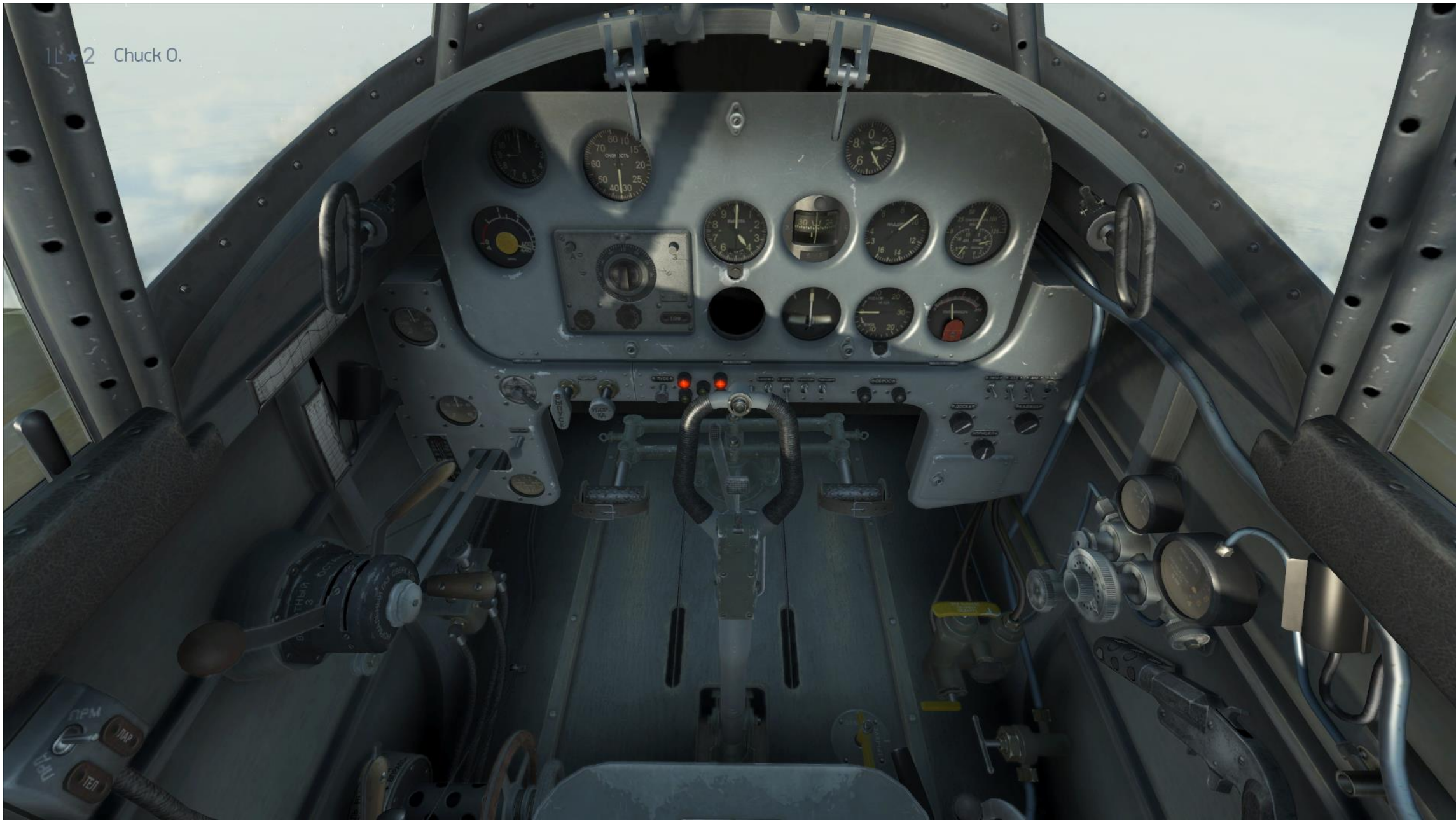
In early 1942, two of the LaGG-1 and -3's designers, Semyon Lavochkin and Vladimir Gorbunov, attempted to correct this deficiency by experimentally fitting a LaGG-3 with the more powerful Shvetsov ASh-82 radial engine.

By now, the shortcomings of the LaGG-3 had caused Lavochkin to fall out of Joseph Stalin's favour, and factories previously assigned to LaGG-3 construction had been turned over to building the rival Yakovlev Yak-1 and Yak-7. The design work required to adapt the LaGG-3 to the new engine and still maintain the aircraft's balance was undertaken by Lavochkin in a small hut beside an airfield over the winter of 1941-1942, all completely unofficially.

When the prototype took flight in March, the result was extremely pleasing - the fighter finally had a powerplant that allowed it to perform as well in the air as it had been supposed to on paper. While still inferior to the best German fighters at high altitudes, the La-5 proved to be every bit their match closer to the ground. With most of the air combat over the Eastern Front taking place at altitudes of under 5,000 m (16,404 ft), the La-5 was very much in its element.

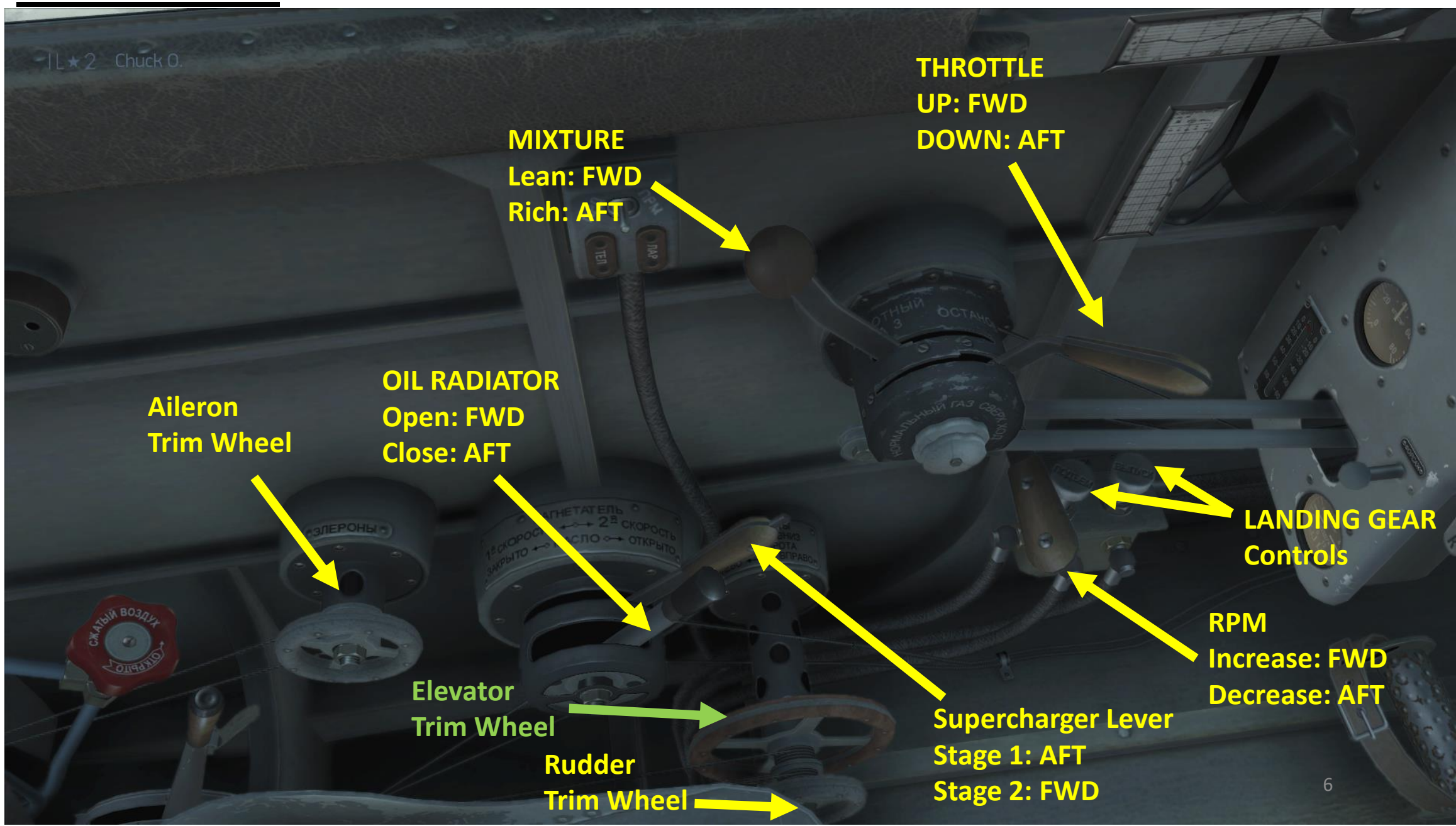
PART I: THE AIRCRAFT

The Cockpit

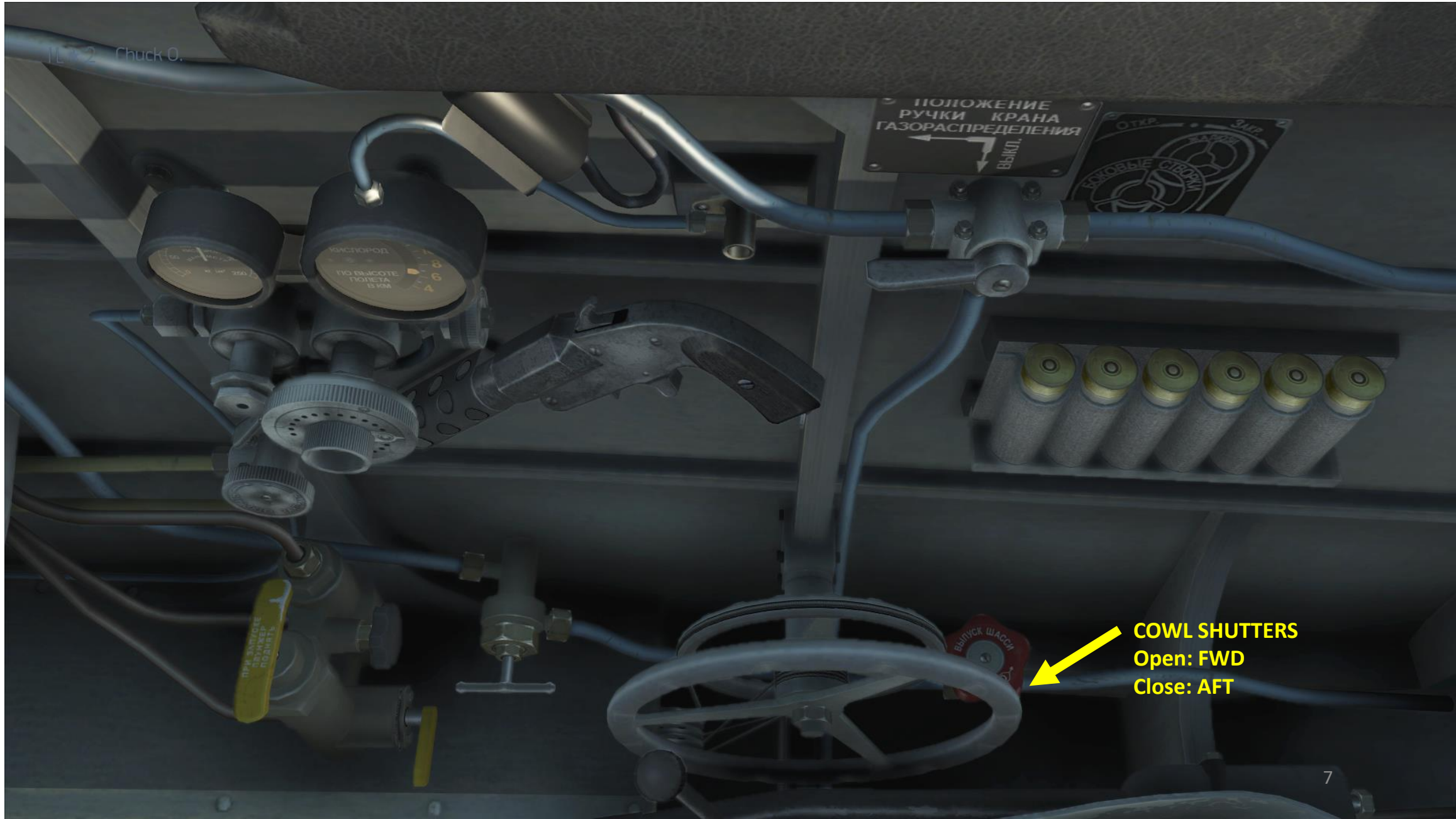


PART I: THE AIRCRAFT

Left Side

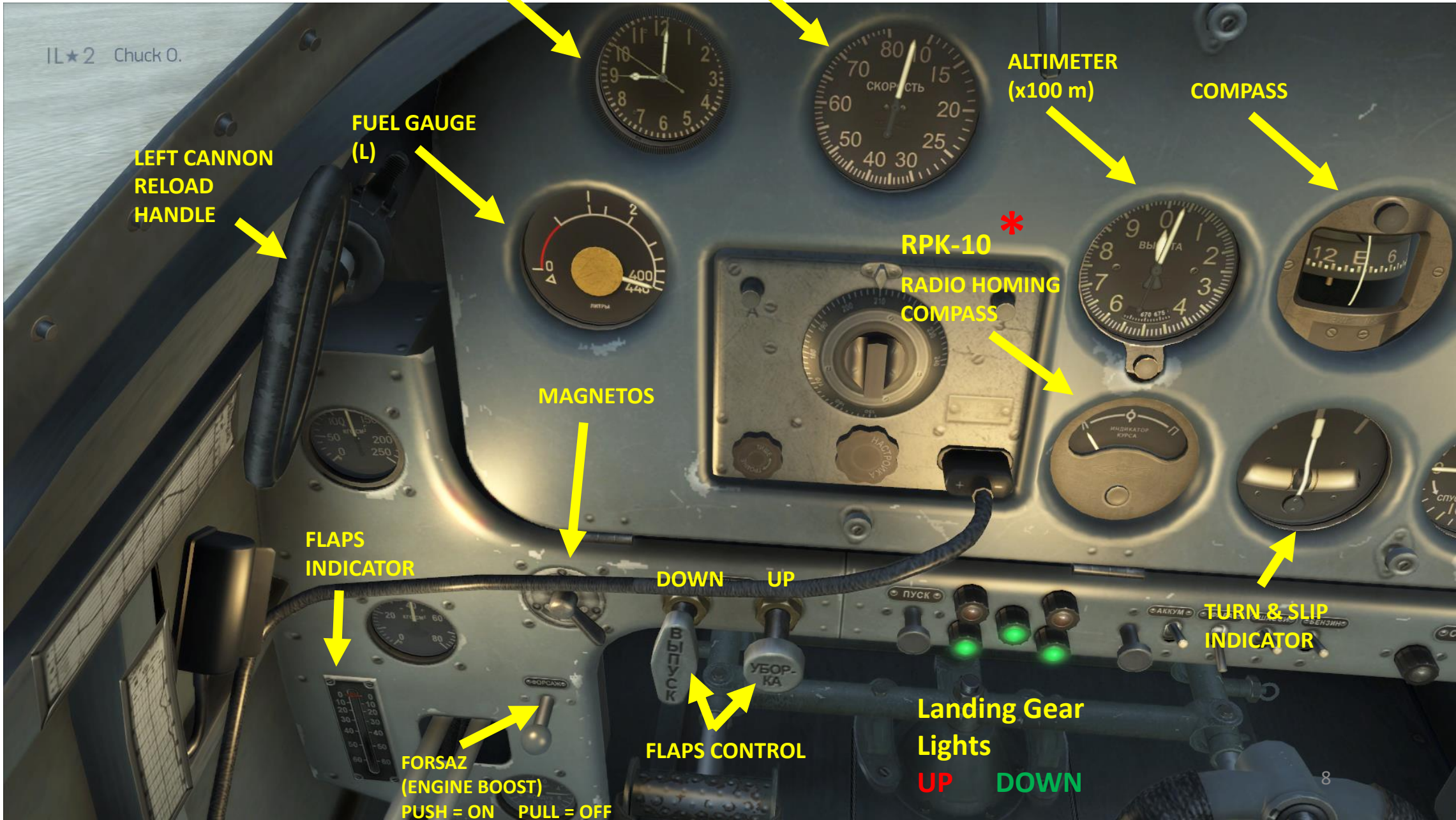


Right Side

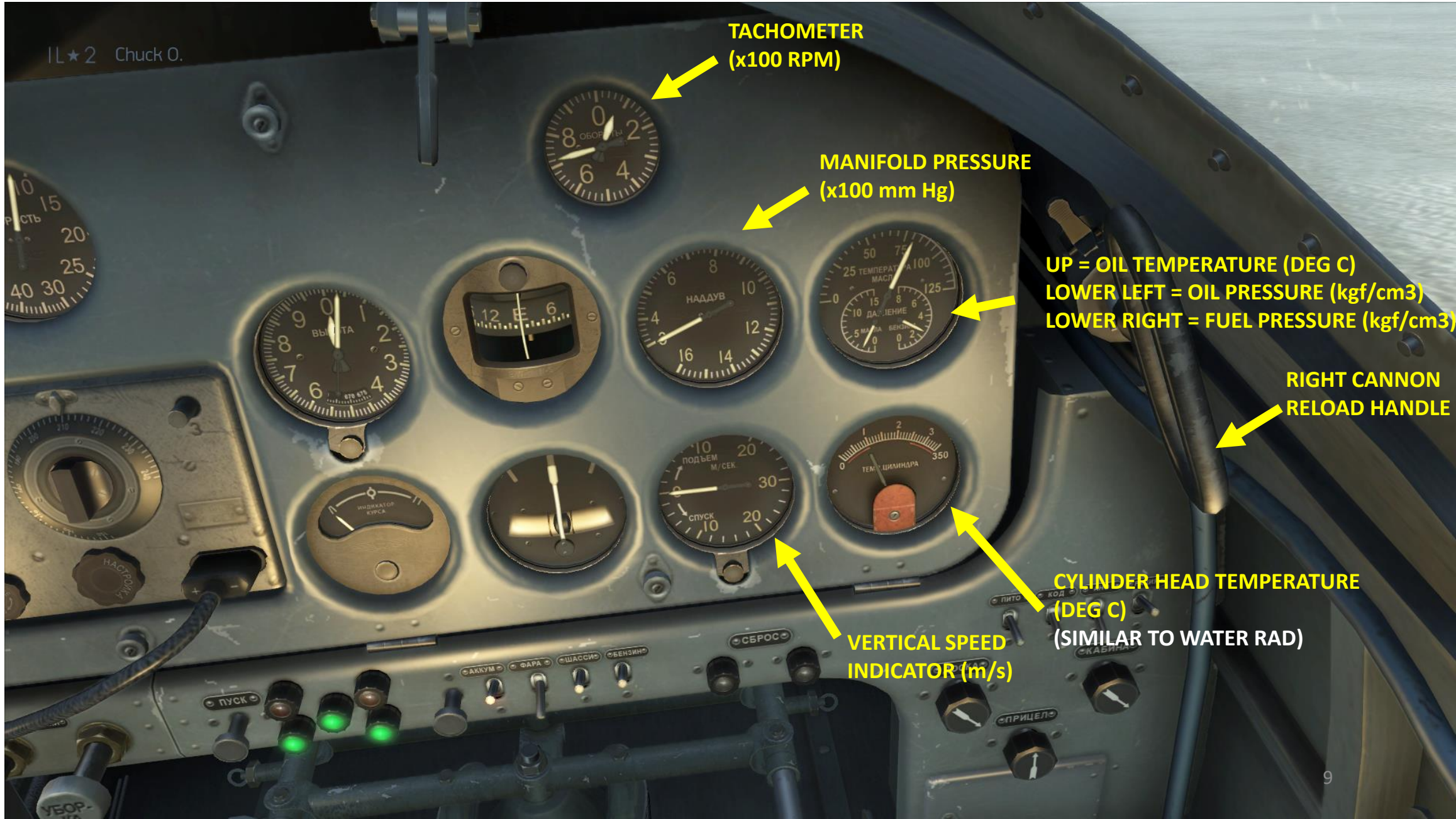

ПОЛОЖЕНИЕ
РУЧКИ КРАНА
ГАЗОРАСПРЕДЕЛЕНИЯ
ВЫКЛ.
ВЫПУСК ШАССИ
COWL SHUTTERS
Open: FWD
Close: AFT

PART I: THE AIRCRAFT

Front Left



Front Right


TACHOMETER
(x100 RPM)
MANIFOLD PRESSURE
(x100 mm Hg)
UP = OIL TEMPERATURE (DEG C)
LOWER LEFT = OIL PRESSURE (kgf/cm3)
LOWER RIGHT = FUEL PRESSURE (kgf/cm3)
RIGHT CANNON
RELOAD HANDLE
CYLINDER HEAD TEMPERATURE
(DEG C)
(SIMILAR TO WATER RAD)
VERTICAL SPEED
INDICATOR (m/s)

Important key bindings

- The La-5 has a radial engine, which doesn't have a water radiator. What you have instead to cool your engine are engine cowlings. Don't forget to set your controls accordingly.
- However, the La-5 still has an oil radiator.

COWLING FLAPS OPEN

COWLING FLAPS CLOSED

PART II: THE CONTROLS

Important key bindings

- The La-5, like most Russian planes, has a brake system similar to what you would find in your car.
- In order to brake, you need to hold your wheel brake key while you give rudder input to steer your aircraft. Make sure you have adequate mixture, RPM and Manifold Pressure settings or your turn radius will suffer. These factors matter in heavier planes like the Il-2 Sturmovik.

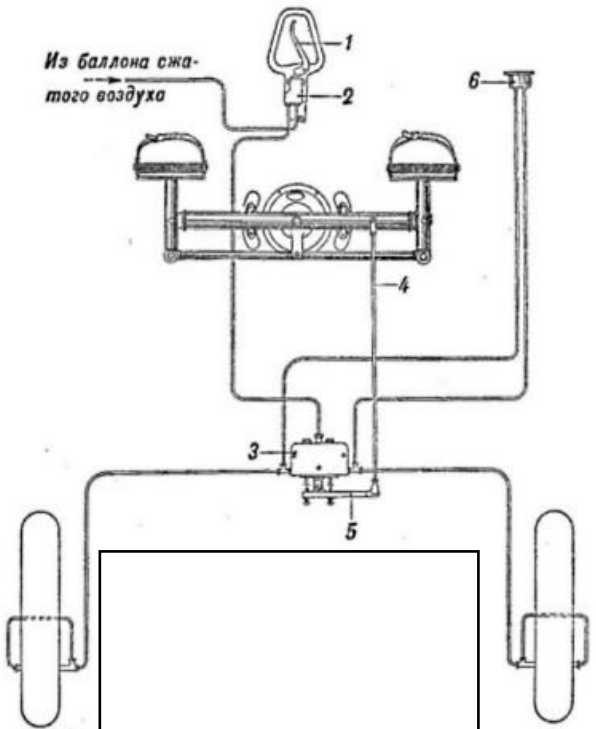


Рис. 61. Схема управления тормозами:
1 — рычаг клапана ПУ-6; 2 — клапан ПУ-6; 3 — дифференциал; 4 — тяга, соединяющая педаль ножного управления с рычагом дифференциала; 5 — рычаг дифференциала; 6 — манометр тормоза.

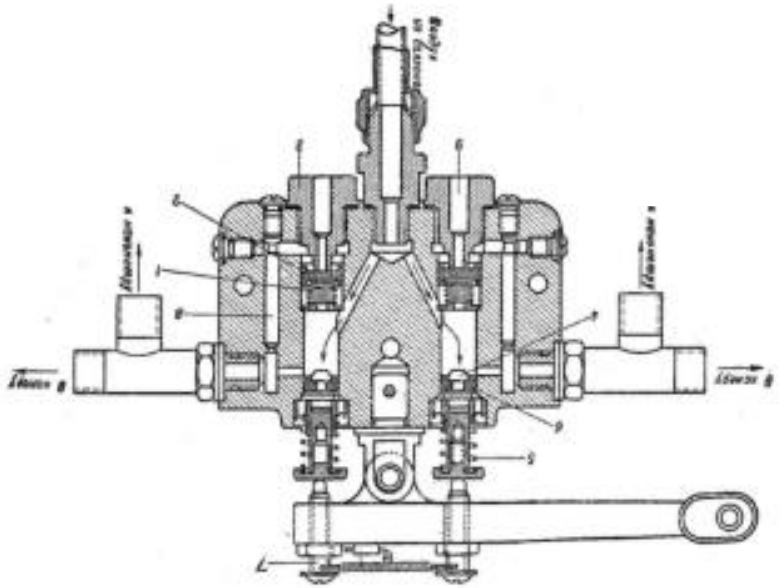
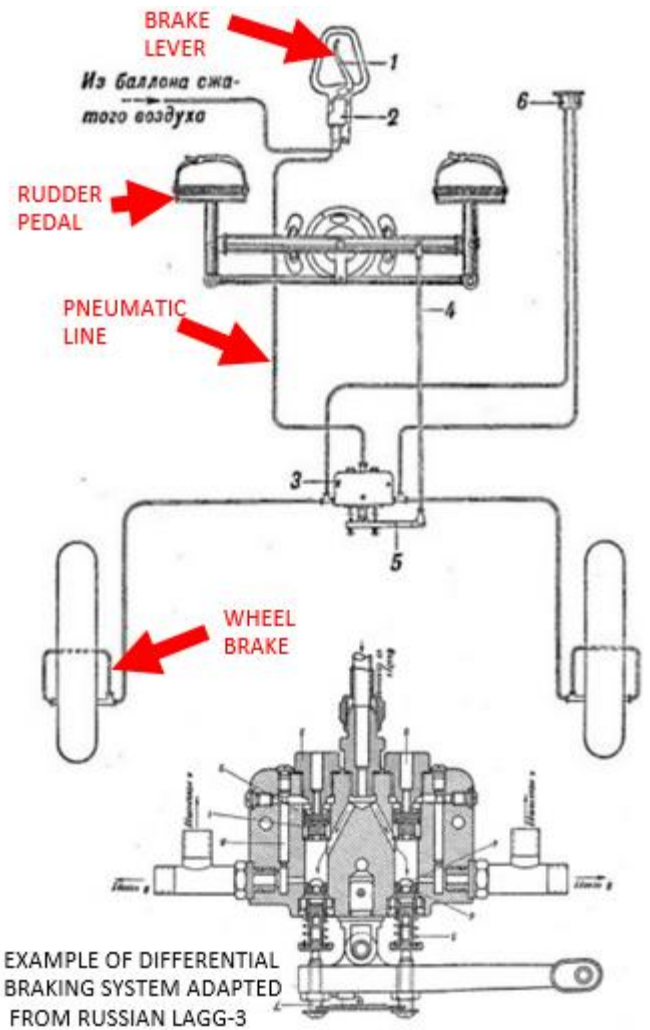


Рис. 62. Дифференциал пневматического управления тормозами:
1 — пружина предохранительного клапана; 2 — манжета предохранительного клапана; 3 — штуцер; 4 — шток поршня управляющего клапана; 5 — пружина управляющего клапана; 6 — манжета поршня; 7 — толкач; 8 — канал, сообщающий тормоз с предохранительным клапаном; 9 — отверстие штуцера предохранительного клапана.



EXAMPLE OF DIFFERENTIAL BRAKING SYSTEM ADAPTED FROM RUSSIAN LAGG-3

PART III: TAKEOFF

- Taking off in the La-5 is straightforward if you follow these steps for a cold engine start.

1) Crack your throttle about 15 %

2) Set your mixture to full rich

3) Close your cowling and your oil radiator flaps

4) Set minimum RPM

5) Ignite (“E” key by default)!

6) Set your flaps to 20 degrees.

PART III: TAKEOFF

7) Wait for your oil radiator temperatures to reach 55-60 degrees C and your cylinder head temperatures to reach between 120 and 205 degrees C.

8) Line yourself up on the runway and lock your tailwheel by pulling your stick back to keep your tailwheel down.

9) Fully open your cowling and oil radiator flaps.

10) Throttle up full power, max RPM. Correct heading with small rudder input.

Note: You can use engine boost, but it is completely optional.

11) As soon as you reach 120 kph, center the stick and level out to pick some speed.

12) When you reach 180 kph, rotate gently.

13) Once you are up in the air, retract flaps, pull your gear up and start climbing. Adjust RPM and manifold pressure accordingly (see engine management in part V).

PART IV: LANDING

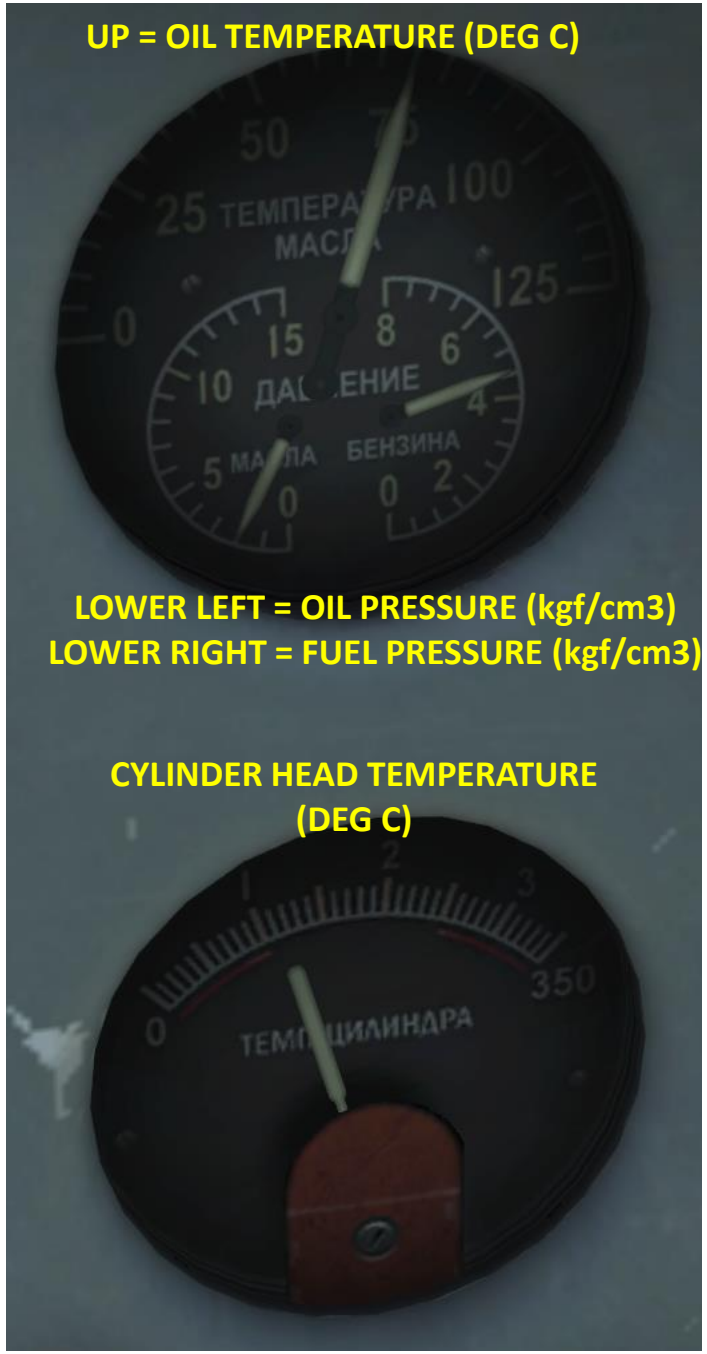
1) Deploy landing gear when going slower than 300 kph.
2) Deploy flaps 30 degrees when going slower than 250 kph.
3) Max RPM, throttle as required to maintain approach speed at 200 kph.
4) Trim nose down as flaps generate extra lift.
5) Cut throttle when reaching runway and let yourself glide until you touch the ground naturally.
6) Touchdown at 170 kph with a 3-point attitude.
7) Once on the ground, pull back on the stick to lock your tailwheel and tap your brakes.

Powerplant

- The La-5 is powered by the **Shvetsov ASh-82 (M-82). It** is a 14-cylinder, two-row, air-cooled radial engine developed from the Shvetsov M-62. The M-62 was the result of development of the M-25, which was a licensed version of the Wright R-1820 Cyclone.

Operating Limits

- Cylinder head temperatures will exceed operating limits before oil temperature overheats, which makes monitoring the oil temp a low priority (in-game… not in real life… d'uh!) . Check the cylinder head temps instead.
- Min oil temperature: 55-60 deg C.
- Max oil temperature: 75 deg C.
- Min cylinder head temperature: 120 deg C.
- Max cylinder head temperature: 190-200 deg C.
- When using "Forsaz" (boost), do not use it for more than 10 minutes. Unlike the La-5, later La-5 F and La-5 FN variants allowed almost unlimited use of boost. "F" was for "forced" (for improved aircraft performance) and "N" was for a new fuel injection system.
- Do not use Forsaz/Boost above 2000 m.
- If your RPM starts to oscillate, lean your mixture progressively until RPM stabilizes.

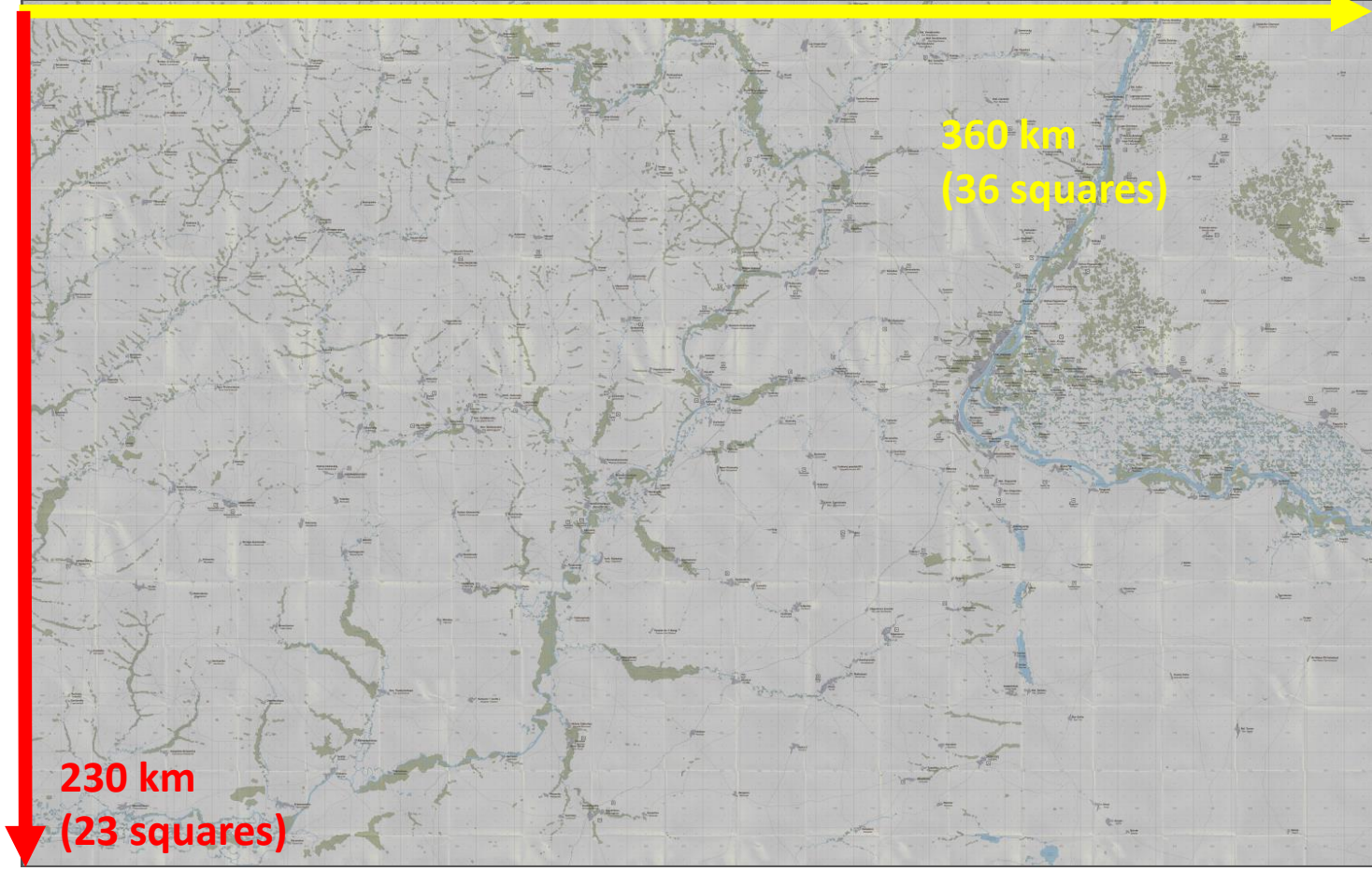


Recommended Settings

- When using forsaz/boost, make sure that you have your cowl flaps open. Boost is disengaged automatically when supercharger stage 2 is engaged.
- Oil radiator should be open at all times, as it was designed to have minimal impact on aircraft performance, open or not.
- Normal Operation (maximal performance & speed)
  - 2300 RPM, 900 Manifold Pressure
  - Cowl flaps fully closed
  - Mixture at 80 %
- Supercharger (increases Manifold Pressure @ higher altitudes)
  - Lshift+S to toggle supercharger stages
  - Stage 1 below 2000 m, Stage 2 above 2000 m
  - Note: La-5 manual recommends using Stage 1 at altitudes under 3500 m and Stage 2 above 3500 m in to save fuel.

PART VI: AIRCRAFT PERFORMANCE

- Range: 750 km
- Fuel Max Capacity: ~440 L
- Endurance: 108 min (1h48)
- Operational ceiling: 9600 m
- Optimal Climb Speed: 250 kph
- Best Climb Rate: 840 m/min
- Turn time: 22 s



- Note: Your fuel loadout will impact your aircraft's performance, but also your cowl flaps, your trim, the air temperature and many other factors. Keeping your speed up without blowing your engine will require a heavy workload that will diminish with practice and experience. Performance data often being subject to many factors (test conditions, state of aircraft (captured vs factory fresh), etc.), these numbers are to be taken with a grain of salt. Just like today, aircraft performance can and will vary between the real values and the values that you get on paper.

PART VI: AIRCRAFT PERFORMANCE

- Cold weather conditions modeled in Battle of Stalingrad allow superior engine power in comparison to values obtained for standard atmosphere.
- Even if the La-5 is a direct improvement over the LaGG-3's design, you should not expect all of its inherent problems to be magically fixed.
- Addition of slats helps slow speed handling, but will not help you turn better at higher speeds.
- The wing of the La-5 is still the same as the LaGG-3, which has a nasty accelerated stall. An accelerated stall is induced by the pilot when the aircraft is flying at high speeds and he pulls too hard on the stick.
- Turn performance is pretty much the same as the LaGG, even if stall can be slightly delayed due to higher power and higher airspeed.
- Be smooth when pulling the stick: you will maintain airspeed.
- The La-5 bleeds airspeed very easily. You should fly it like a high-speed energy fighter and use boom and zoom tactics.
- You should use minimal elevator input and focus on using the La-5's excellent roll rate, which is comparable to the FW190's.
- Use your flaps to forestall wing buffet at slow speeds. It will save your life.

MAXIMUM SPEED QMB CONDITIONS (Graph by Matt)