
ATSimulations Piaggio\Focke-Wulf P149D for MSFS



User's manual

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Introduction

Friends, we are glad to present you our new project, second our project for MSFS, four seats, whole metall lightweight trainer used in the Luftwaffe and Italian army: Piaggio\Focke-Wulf model 149.

The project was advised by our customer, so we are open for any partnership and feedback with this project or any other in future. Contacts could be found at the end of the manual.

Have fun using ATSimulations products!

Andrey Tsvirenko ATSimulations CEO
December 2020

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System requirements

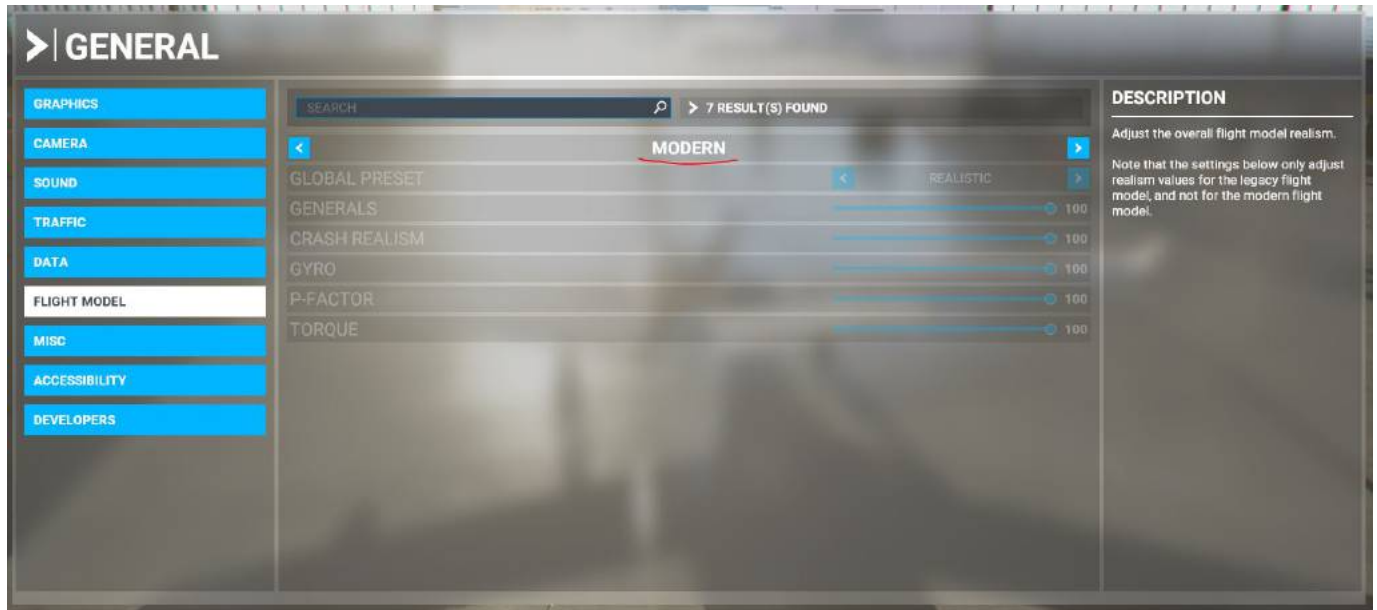
- ✓ Microsoft Flight Simulator 2020
- ✓ Available hard drive space: 2 GB

Product features

- ✓ Accurate exterior and virtual cockpit 3d models
- ✓ Ultra high resolution textures. Three 4096x4096p exterior diffuse maps
- ✓ Ultra smooth gauges developed in 3d
- ✓ Nine liveries in base pack, more free liveries will be provided in future
- ✓ Flight dynamics created in deep cooperation with real Piaggio 149D pilots
- ✓ Virtual cockpit sounds from levers, switches, knobs etc.
- ✓ Sounds recorded from real Piaggio 149D aircraft

MSFS settings

Please make sure you have "Modern" flight dynamics settings on in MSFS properties.



Aircraft history

The P 149D, a fully acrobatic four-seat aircraft, was developed from the P148, a twin-seater, in the early 1950's at the PIAGGIO factory in Genoa, Italy.

The prototypes used a LYCOMING GO-435 engine.

(Today, one of these airplanes is based at Palatka, Kay Larkin Airport, Florida, USA.)

The production airplane, which was a little bit bigger and heavier, used the GO-480 instead (274 HP).

The maiden flight was on the 19th of June 1953. The German Forces picked the aircraft as a trainer, ahead of the Beechcraft T34 Mentor and the Saab 91 Safir, mainly because of its big cabin, since the plane should also serve as a liaison aircraft for the German Air force and the German Navy.

The German Forces got 72 "Piggi's" as unassembled kits from the Italian factory. They carry Piaggio-Dataplates and S/N's between 250 and 325 but were put together in Germany. Thereafter, the type certificate was sold to Focke Wulf and the whole production-line was moved to Bremen/Germany. Here another 190 examples have been produced for the German Military. They carry Focke Wulf Data-plates and S/N's from 001 to 190. Even the engines had been license-built by BMW in Bavaria. (Powered by BMW! Engine S/N's start with a B-)

Total production was 280 aircraft. Most of them were military, but a few examples went to private customers. SWISSAIR, for example, bought five "Piggi's" (P 149E's) for their now abandoned flight academy in Zurich, Switzerland. A few more were delivered to the Uganda Airforce (P 149U's).

The last P 149D was retired from the German Airforce on the 31st of March 1990 at Fuerstenfeldbruck, Bavaria, Germany. For this occasion, it got a very special paint job: The German- as well as the Bavarian colors.

Few "Piggi's" are still flying with military flying clubs.
Most airplanes have been purchased by private party.

(c) <http://www.fwp149d.com/>







Specifications

Type

Four-seat all-metal, low-wing cantilever monoplane.

Wings

Low-wing cantilever monoplane.

Airfoil: root: NACA 230 series; tip: NACA 4412[

Aspect ratio **6.6**.

Chord **1.850 m (6 ft)** constant.

All-duralumin structure.

Central two-spar box with detachable leading-edge.

Slotted flaps and ailerons hinged to rear spar.

Each single bracing strut is a steel tube with dural sheet fairing. Gross wing area: **18.81 m² (202.5 ft²)**.

Fuselage

Duralumin structure with stressed skin canopy.

Tail Unit

Cantilever monoplane inverted-T-type.

Duralumin frames with metal-covered fixed surfaces and fabric-covered elevators and rudders.

Controllable trim-tabs in left elevator and in rudder.

Landing Gear

Retractable gears with front wheel.

Steering front-wheel

ERAM oleo-pneumatic shock-absorber. Brakes on main wheels.

Power Plant

One 1 × Lycoming GO-480 B1A6 , 200 kW (270 hp) six-cylinder opposite air-cooled engine.

Hamilton Standard constant-speed airscrew.

Fuel tanks in wing roots.

Accommodation

Enclosed cabin seating four in two pairs, the front pair with dual controls.

Dimensions, external

Span: **11.12 m (36 ft 6 in)**
Length: **8.8 m (28 ft 10 in)**
Height: **2.9 m (9 ft 6 in)**

Weights and Loadings (Pilot and five passengers)

Weight empty, equipped: **1, 160 kg (2,557 lbs)**
Pilot: **75 kg (165 lbs.)**
Fuel and oil: **328 kg (722 lbs)**
Useful load: **400 kg (900 lbs)**
Weight loaded: **1,680 kg (3,704 lbs)**
Wing loading: **89.3 kg/m² (18.3 lbs/ft²)**
Power/mass: **0.120 kW/kg (0.073 hp/lb)**

Performance

Max. speed at S/L: **304 km/h (189 mph)**
Cruising speed (50% power) at 1,500 m (4,920 ft): **266 km/h (165 mph)**
Min. speed: **92 km/h (57 mph)**
Rate of climb at S/L: **300 m/min (980 ft/m)**
Range: **1,090 km (680 mi, 590 nmi) with 30 minutes reserve**
Take-off run to 15 m: **405 m (1,329 ft)**
Landing run from 15 m: **315 m (1,033 ft)**

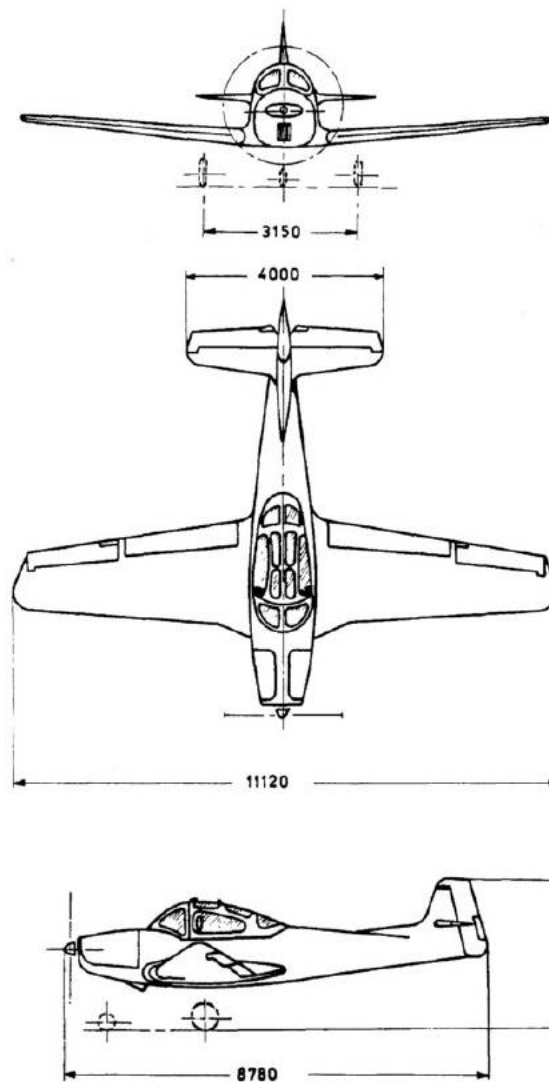


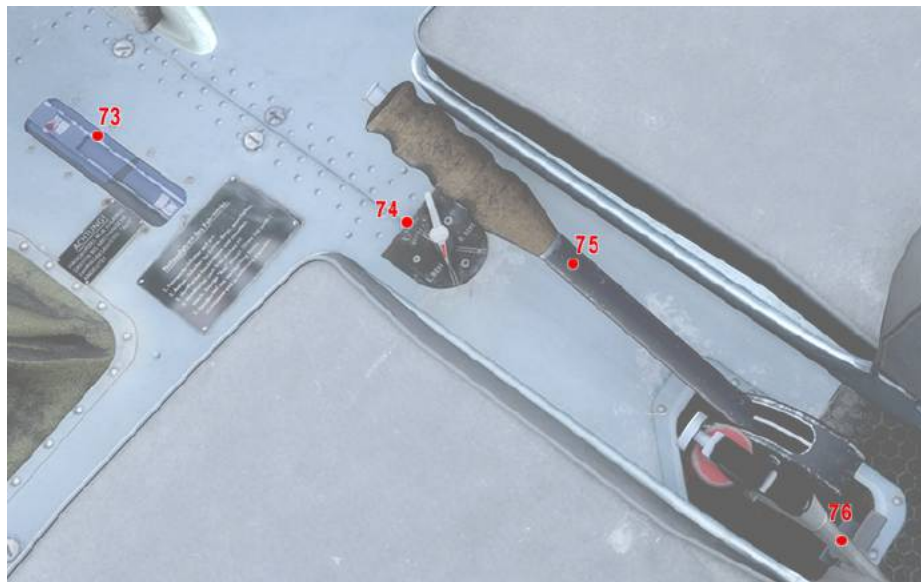
Fig. 1 - AEROPLANE - THREE - VIEW

Panel and Controls



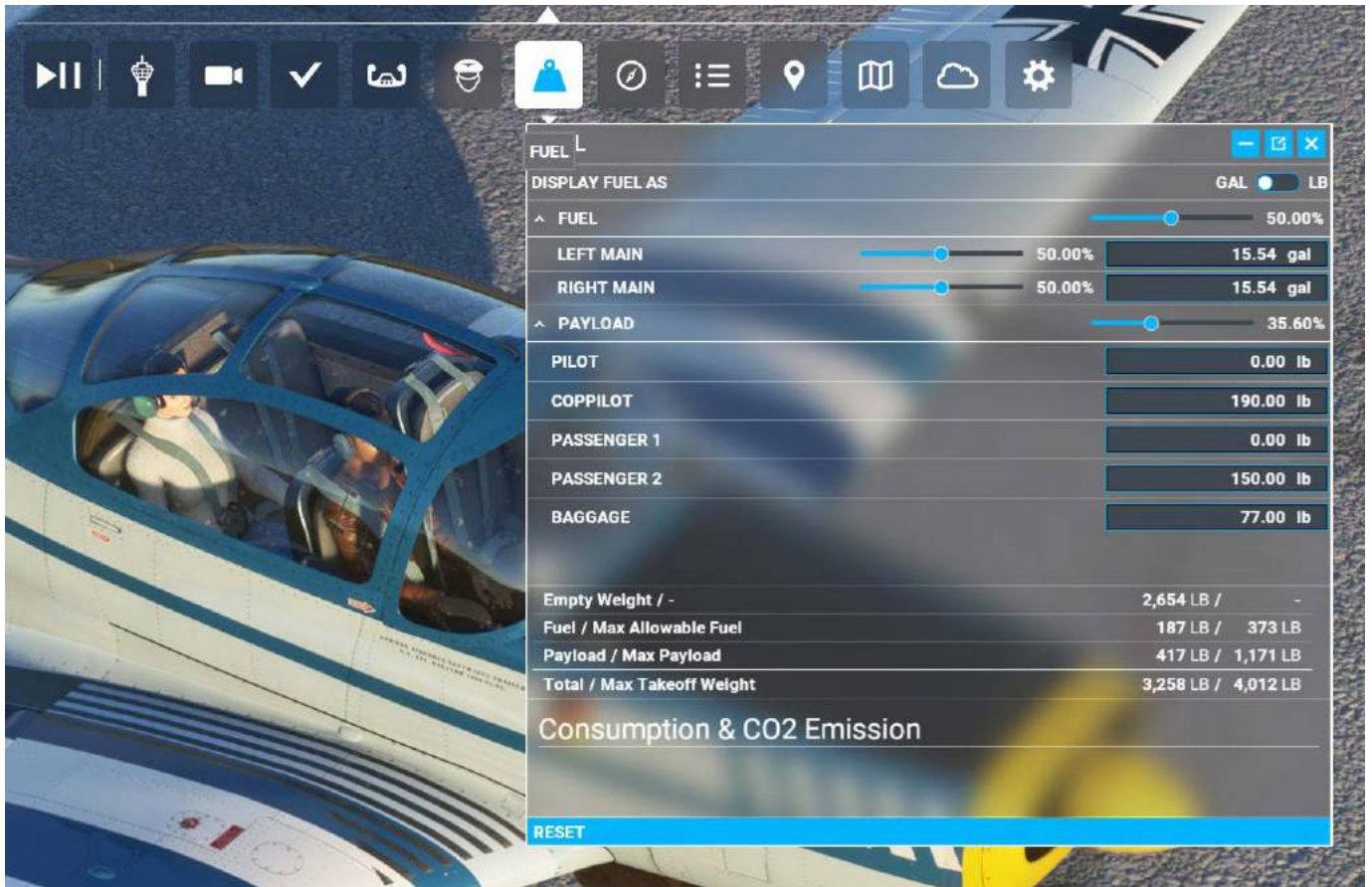
- | | | | |
|-----|----------------------------|-----|------------------------------------|
| 1. | Master battery switch | 13. | Panel lamp |
| 2. | NAV lights switch | 14. | Alternator circuit breaker |
| 3. | Oil gauge circuit switch | 15. | Alternator indicator lamp |
| 4. | Fuel gauges circuit switch | 16. | Left landing light switch |
| 5. | Beacon lamp switch | 17. | Right landing light switch |
| 6. | Panel lamp | 18. | Panel lamp rheostat |
| 7. | Instruments light switch | 19. | Gears circuit breaker |
| 8. | Pitot heat switch | 20. | Temperature gauges circuit breaker |
| 9. | Gyro switch | 21. | Oil gauge circuit breaker |
| 10. | Radio master switch | 22. | Accelerometer |
| 11. | ADF master switch | 23. | Engine fire indicator lamp |
| 12. | Magnetic compass | 24. | Altimeter |

- | | | | |
|-----|----------------------------|-----|---------------------------------|
| 25. | Directional gyro gauge | 51. | Ventilation nozzle |
| 26. | HSI gauge | 52. | Fuel cut off valve lever |
| 27. | Mixture lever | 53. | Starter button |
| 28. | NAV radio panel | 54. | Turn and slip indicator |
| 29. | XPDR panel | 55. | Gear warning lamp |
| 30. | COMM radio panel | 56. | Clock |
| 31. | ADF panel | 57. | Gears position indicator |
| 32. | Fuel pump indicator lamp | 58. | Gears circuit breaker |
| 33. | Magnetos switch | 59. | Carburator heater lever |
| 34. | Fuel pump switch | 60. | Fuel level gauge |
| 35. | VSI gauge | 61. | Rudder trim indicator |
| 36. | Artificial horizon gauge | 62. | Rudder trim lever |
| 37. | ASI gauge | 63. | Throttle lever |
| 38. | Gears switch | 64. | Propeller pitch lever |
| 39. | Oil gauge | 65. | Oil pressure gauge |
| 40. | Engine RPM gauge | 66. | Engine primer lever |
| 41. | Manifold pressure gauge | 67. | Friction knob |
| 42. | Fuel pressure gauge | 68. | Elevator trim lever |
| 43. | Cylinder temperature gauge | 69. | Elevator trim indicator |
| 44. | ADF indicator | 70. | Cowl flaps lever |
| 45. | Voltmeter gauge | 71. | Parking brake lever |
| 46. | GPS panel | 72. | Map |
| 47. | Cabin warm lever | 73. | Gear position indicator |
| 48. | Air intake lever | 74. | Fuel selector lever |
| 49. | Ventilation nozzle | 75. | Flaps lever |
| 50. | Gyro tune panel (INOP) | 76. | Emergency gears extending lever |



Aircraft load management

You may set the weight for passengers in the MSFS load management tab. A corresponded figure will be hidden or shown depending on the value.



Checklists and Performance

Note that most actions can also be performed using the mouse.

Adapted for Flight Simulator. **DO NOT USE FOR REAL FLIGHT.**

STARTING THE ENGINE

NOTE: Head the aeroplane into the wind before starting engine, to prevent overheating the air-cooled engine.

1. Fire guard positioned — propeller clear
2. Set the propeller governor control lever in INCREASE RPM position
3. Set throttle to 1/10 open position
4. Connect external electrical power or turn on battery
5. Close all circuit breakers
6. Close generator and inverter switches
7. Check voltmeter reading
8. Check undercarriage position lights and mechanical indicator

NOTE: The two green lights must show

8. Check fuel quantity gauges
9. Operate primer handle 3-5 strokes — lock handle

NOTE: Do not actuate throttle during priming because of fire hazard

10. Booster pump ON
11. Check fuel pressure gauge — needle must be within green arc
12. ALL CLEAR signal from ground crew
13. Ignition switch — position to magneto 1
14. Energize starter
15. When engine begins to fire, immediately put mixture control in FULL RICH position. Place ignition switch in BOTH position — adjust engine RPM to 800-1000 RPM.

CAUTION: Actuate throttle slowly when advancing or retarding.

NOTE: In cold weather prime again one stroke, if necessary, to keep engine firing.

NOTE: If engine cannot be kept running immediately, pull mixture control (IDLE-CUT-OFF), because of fire hazard.

16. Check oil pressure. If no oil pressure is indicated after 30 seconds — stop engine immediately
17. Booster pump OFF — check fuel pressure gauge

NOTE: If fuel pressure drops, re-energize booster pump for short period.

18. Radio compass and radio communications actuating switches ON
19. Disconnect external power
Battery actuating switch ON.

WARM UP and CHECK-OUT

1. Warm-Up engine 1000 to 1200 RPM
(when head temperature has reached 60°C and oil pressure is indicated, increase to 1600-1700 RPM).
2. Select desired radio frequency — switch to receive

3. Three-way fuel selector — switch to starboard fuel tanks shortly to check fuel pressure — switch back to port fuel tanks

NOTE: Carburetor fuel overflow line is provided for port fuel tanks only, therefore, fire hazard when operating on starboard fuel! When selector is positioned in starboard, fuel is transferred to port fuel tank.

4. Check instrument for readings at or within green arcs
5. Run-up engine when cylinder head temperature gauge reads 150°C:
 - a) Propeller pitch lever « Full Forward ».
Advance throttle smoothly to 3000 RPM
Check manifold pressure
Check propeller governor by slowly increasing pitch (DECREASE RPM) until engine speed drops off 200 RPM, throttle back, then set the propeller governor control lever in INCREASE RPM (max. RPM)
 - b) Reduce engine speed to 2200 RPM
Check magnetos (Magnetos M 1 - BOTH - M 2 - BOTH)
Drop-off should not exceed 180 RPM on either magneto and the difference between magnetos should not exceed 30 RPM
 - c) Throttle back and check idle running of engine

PRE-TAXY AND PRE-TAKE-OFF CHECK

1. Radio equipment and radio compass (TAXI CALL)
2. Set clock to tower time
3. Set altimeter to barometric pressure and check against actual field elevation — note instrument error
4. Set directional gyro to magnetic compass heading and start gyro horizon
5. Have chocks removed and release parking brake handle
6. Check wheel brakes during taxi roll
7. Taxi to runway, thereby checking compass, turn & bank indicator and check rudder for proper angular travel.
8. Adjust rudder trim (5° starboard) and elevator trim for take-off
9. Lower landing flaps for take-off (detent 2)
10. Tighten safety belt and shoulder harness

NOTE: If passengers are aboard, it is the responsibility of the pilot in command to ensure that the passengers tighten their safety belts.

11. Close and lock canopy
12. Booster pump — ON
13. Pitot heat — ON
(in cold weather or if pitot head icing is anticipated)

TAKE-OFF CHECK

1. Take-off Clearance — Note time
2. Check runway and approach area clear
3. Align aeroplane on runway
4. Smoothly advance throttle to full power
(3400 RPM — check manifold pressure)
5. When definitely airborne:
Brake wheels to a stop
Raise undercarriage
Position undercarriage selector toggle switch to « O » (neutral)
NOTE: When the undercarriage is up, the position lights go out and mechanical indicator arrow « UP ».
6. Adjust propeller governor to 3000 RPM,
Manifold pressure 2.7 in. Hg.

NOTE: Although take-off power may be used for a maximum of five minutes, it is advisable to throttle back to rated power (3000 RPM), as soon as take-off has been safely accomplished.

7. When reaching safe flying speed (80 knots)
Slowly raise landing flaps
8. Booster pump — OFF, after reaching 1000 ft.
Check fuel pressure

NOTE: When a safe altitude is attained.

NOTE: When pressure drops below normal operating range, re-energize booster pump for a short time.

9. Airspeed during climb — 100 KIAS — adjust trim control
10. Maintain 3000 RPM until levelling off after initial climb
Succeeding climbs: Operate at a manifold pressure of 24.5 in. Hg. — 3000 RPM — 100 KIAS

NOTE: Level flight:

Normal cruise — 2750 RPM

Manifold pressure: 21.5 in. Hg.

NOTE: Turn fuel selector valve to BOTH, when gauge for left fuel tanks has decreased to 20 gals. Take reading during straight and level flight.

PRE-LANDING CHECK

1. Tune radio to proper frequency — Adjust volume
Contact tower for landing instructions and maintain proper distance from other aeroplanes in the landing pattern
2. Position fuel selector switch to the fuller tank group
3. Adjust propeller governor to RPM (Fine Pitch)
4. Tighten safety belt and shoulder harness

NOTE: If passengers are aboard, the pilot in command is responsible that the passengers tighten their safety belts.

5. Reduce airspeed to 100 KIAS

NOTE: At low outside air temperature (+ 5° or less) and high relative humidity:

Carburetor heat control — pull out (FULL HOT)

During extended glide, open throttle at intervals to clear out engine and maintain temperature.

6. Lower undercarriage — leave undercarriage selector switch in DOWN position. Maintain 100 KIAS using throttle lever.

Check green lights and mechanical undercarriage indicators for DOWN indication.

NOTE: Under no circumstances lower undercarriage at airspeeds, at or above 108 KIAS.

NOTE: In case one of the undercarriage indicators does not display DOWN, recycle undercarriage. In case of emergency, use handcrank to lower undercarriage.

7. When turning to the base leg, contact tower
8. When on base leg, energize booster pump
9. When arriving at key point and entering final, reduce airspeed to 90 KIAS — lower landing flaps adjust trim

NOTE: With landing flaps in « 2 » maintain 90 KIAS

With landing flaps in « 5 » maintain 80 KIAS.

AFTER LANDING PROCEDURE

NOTE: Previous to overshooting action, ascertain that runway is clear:

1. Landing flaps — set to « 0 »
2. Booster pump — OFF
3. Trim controls — « 0 »
4. Pitot heat — OFF (if it was on)

STOPPING THE ENGINE

1. Depress brake pedals — parking brake handle — SET
2. Allow the engine to idle at 800 to 1200 RPM for one minute to cool down.
3. Throttle — IDLE
4. Move manual mixture control to IDLE CUT-OFF (Pull)
5. Ignition switch — OFF (pull out key)
6. Fuel cock — OFF (CLOSED)
7. Fuel cock — OFF (CLOSED)
7. All electrical switches OPEN.
8. Undercarriage control switch — • O • (centre position)
9. Landing flaps — • 1 •
NOTE: Selecting • 1 • position for landing flaps is a precautionary measure to prevent accidental stepping on flaps.
10. Control surface lock — engage
NOTE: Nose undercarriage is not steerable when the control surface lock is engaged.
11. Complete flight log.

Credits

Andrey Tsvirenko: 3d modeling, aircraft textures, gauge logic

Alexander M. Metzger: Flight dynamics

Mike Maarse (SimAcoustics.com), Ivan Vodoleev : Sound set

O.E.V: Installer

Marcel Bussmann, Rafal Stankiewicz: Testing

Contacts

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