Fw 190 A-8 Pilot Handbook

BY FLYINGIRON SIMULATIONS

For Microsoft Flight Simulator

FLYINGIRON SIMULATIONS | WWW.FLYINGIRONSIMULATIONS.COM

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Foreword

Greetings Pilots! Willkommen!

Welcome to the FlyingIron Fw 190 A-8 experience! We are thrilled to present our most ambitious simulation project to date. The Fw 190 needs little introduction, being one of the most formidable fighters of World War II. The "Butcher Bird" earned a fearsome reputation among Allied pilots for its speed, firepower, and rugged construction. Over 20,000 Fw 190s were produced during the war, playing a crucial role on all fronts where the Luftwaffe was engaged.

You'll need keen situational awareness, a steady hand, and deft footwork on the rudder to master the 190. We have invested countless hours into recreating the unique flight characteristics and systems of this legendary aircraft. The result is our most authentic simulation experience yet. You'll need to carefully manage your BMW 801 radial engine to avoid overheating, master ground handling to avoid ground loops, and learn to leverage the 190's exceptional roll rate.

While we've aimed for maximum realism, we also want the Fw 190 to be accessible to all. To that end, many of the more challenging aspects can be toggled on or off via the FlyingIron tablet in the cockpit. However, some key characteristics like the tricky ground handling are integral to the 190 experience and cannot be disabled. Patience and practice will be essential to truly mastering this remarkable aircraft.

We sincerely hope you enjoy flying the Fw 190 A-8 as much as we've enjoyed creating it. The "Würger" holds a special place in aviation history, and its legacy as one of the finest piston-engine fighters ever built is secure. We are fortunate to live in a golden age of flight simulation - now take to the skies and experience the raw power of the Fw 190!
Clear skies and good hunting,

Sincerely,
FlyingIron Simulations

About Us

FlyingIron Simulations is an Australian Flight Simulator development team - based in Sydney, Australia - that creates military & civilian aircraft simulations for Flight Simulator platforms, specialising in historic warbirds and military aircraft. FlyingIron was founded in 2018 by two brothers, Alex & Daniel Kassabian. The team has since expanded internationally, with Raimond (Got Gravel) joining the team in 2021 and becoming an invaluable member of our core team ever since; bringing with him extensive MSFS development experience. Since then we've recruited a number of talented artists and programmers to our cause, including Iakov and Oleg'; who between them have extensive experience working on AAA games & sims.

FlyingIron initially started developing for the X-plane 11 platform, with 4 aircraft releases between 2018-2020. Each aircraft was highly regarded by the community, with quality continuing to improve with every release and even featuring in several print magazines.

As of 2020, FlyingIron Simulations moved to the MSFS platform, beginning with the release of the Spitfire MkIX and followed by the P-38 Lightning, officially licensed by Lockheed Martin. The F6F Hellcat marked FlyingIrons 3rd aircraft release for Microsoft Flight Simulator; followed up with the Bf-109 in 2023.

Simultaneously in 2020, FlyingIron was officially licensed by Eagle Dynamics to develop the A-7E Corsair II for the prestigious DCS world, marking the teams first foray into military jets and study-level simulation. FlyingIron has been steadily working at developing the most realistic A7 simulator available, with development time over 3 years now and thousands of man hours poured into the project. As part of the development process, FlyingIron worked alongside 'Research in Flight' to develop software in the CFD world - this software was then presented at NASA's OpenVSP Workshop in 2022.

Work on the Corsair continues going strong and is highly anticipated by the DCS community.

Installation & Update Procedure

You can install the aircraft by extracting the download into your Community folder.

1. Open the downloaded .zip file with your Zip tool of choice (the default Windows ZIP tool will do, or else an up-to-date 7-Zip app for example).
2. Drag the “flyingiron-fw190” folder into the MSFS Community folder.
3. Restart Microsoft Flight Simulator.

How to find your MSFS Community folder

Default Location for Windows Store MSFS Installations

```
C:\Users\[ComputerName]\AppData\Local\Packages\Microsoft.FlightSimulator_8wekyb3d8bbwe\LocalCache\Packages\Community
```

Default Location for Steam MSFS Installations

```
C:\Users\[Computer Name]\AppData\Local\Packages\
Microsoft.FlightDashboard_8wekyb3d8bbwe\LocalCache\Packages\Community
```

Non-Default Locations

Please read our guide if you cannot find your Community folder: MSFS Where is the Community folder? : FlyingIron Simulations

Quick Start Notes

> “You can roll into a turn pretty smartly and pull Gs. But it's not an airplane that likes flying slow. It's not a Japanese Zero for goodness' sake, or Hellcat in the sense that you can just crank it around and pull it as hard as you want.”
>
> - Steve Hinton

Eager to try your newly purchased Fw 190 A-8 but want to study the manual later? Before you do so, at least check out the **take-off jump start** and **essential pointers** below, they’ll give you a fighting chance for a successful first experience.

Take-off Jump Start

- Set flaps to take-off position (13 degrees)
- Set stabiliser trim to 0 degrees
- Ensure tailwheel is locked (control stick full back)
- Slowly advance throttle to 2000 RPM
- Check engine parameters are within safe limits
- Increase throttle to 2700 RPM (full power)
- Use rudder to maintain directional control
- Lift the tail at 150-180 km/h
- At 200 km/h, gently pull back on the stick to rotate
- Once airborne, raise landing gear before reaching 250 km/h
- Retract flaps before reaching 250 km/h
- At safe altitude, reduce throttle to climb setting (2400 RPM) within 3 minutes of take-off

Special Keybinds

- **BEACON LIGHT:** Pushes the starter lever to spin up the flywheel. Toggle Beacon on a second time to pull the lever to couple the flywheel to the engine and start it.
- **LOGO LIGHT:** Toggles the Propeller Controller switch between Auto and Manual.

Essential Pointers

- **AUTO START:** CTRL-E (MSFS **AUTO START ENGINE** keybind) will start your engine. Prefer Cold & Dark? Follow the MSFS Interactive Checklist in your Toolbar menu. You will also find the same checklists in the FlyingIron Tablet and this manual.

IMPORTANT: Autostart is NOT “insta-start”. It fully simulates the startup procedure in real-time, including priming and flywheel spooling, so it will take a minute.

- **ROLLING RIGHT:** Keep rolling right all the time no matter how much RPM (torque!) you have? Likely you have AUTO-RUDDER enabled in the MSFS Assistance / Piloting menu. When you do so it will essentially disable all torque. Your aircraft however has a default Aileron Trim set to compensate for this (torque is huge on a WWII warbird) so you’ll either need to disable AUTO-RUDDER or set the Aileron Trim to 0 (Tablet / Settings page).
- **DEAD BATTERY:** Your generator only kicks in at 1,300rpm, so if you’re idling on the ground, or your engine is off, the small battery will drain pretty fast if you did not disconnect it (Tablet’s Settings tab under Ground Services).
- **GUNS:** Can’t see the guns? If you bought your Fw 190 through the Marketplace, then guns are removed (a Microsoft requirement for all Marketplace products). If you bought it through the FlyingIron Simulations website you can toggle guns on or off in the Tablet’s Settings page. Do note that guns have weight too, and it will be added to your aircraft.
- **PRIMING:** Don’t prime too long (overpriming) or too short (underpriming). Your current prime level is visible as a mouseover tooltip on the primer switch as well as in your tablet’s Live Data page. The prime lever will move slower once you are almost primed. Overprimed? De-prime as you would in a real engine: set magnetos or fuel selector to off, open throttle wide, and “start”...the blades will spin and excess fumes will be forced to escape from the cylinders. Note that AutoStart will also automatically prime the engine correctly.
- **TAILDRAGGER GROUND PHYSICS:** We have coded a custom Taildragger Ground Handling module as we wanted to give you a true-to-life taildragger experience (which is not what MSFS offers out of the box). Expect your aircraft to behave as such! This means amongst other things you will need airflow over that rudder (ground speed, propwash and wind all provide this) to get her to steer, and/or use differential braking using your rudder pedals. It’s the real deal now, ground loops included. Don’t have rudder pedal brakes? Go to your Tablet’s Settings page and enable “Simplified Groundhandling” which will link your rudder deflection to your differential braking. Spend a few minutes on the ground. Once you’re used to it, she’s a great joy!
- **TAILWHEEL LOCKING:** For Takeoff, lock the tailwheel! In the 190 you lock the tailwheel by moving the stick aft of center. The tailwheel must already be almost straight or the locking pin won’t slide in. To unlock, move the stick forward of center for a moment.
- **GEAR COLLAPSED:** You landed too hard which can result in one or both gears collapsing. Fix your gear in the Tablet’s Workshop tab, and toggle Slew to restore your aircraft’s position. Alternatively, disable Stresses and Failures in the Tablet’s Settings page.
- **ONE OR BOTH GEAR NOT DEPLOYING:** You possibly damaged it by flying with gear extended at too high a speed. Use the Gear Emergency lever for a gravity-assisted drop of your mains and repair once on the ground. There is a small chance your gear can fail even if you don’t go too fast with it extended so do check your gear indicators at all times!

This only covers the proverbial tip of the iceberg but will get you started. However, our Fw 190 simulation is full of juicy details great and small and really, to maximise enjoyment of this vintage aeroplane, some sofa time and reading of the entire manual is the best recommendation we can give you. Left hungry for more? There are tons of resources online and of course, come find us on our FlyingIron Simulations Discord server!

History & Design of the Fw 190 A-8

The Fw 190 A-8 was a German single-seat, single-engine fighter aircraft widely used during World War II. Introduced in 1944, the A-8 was one of the most produced and capable variants of the Fw 190 A series.

Powered by a BMW 801 D-2 14-cylinder twin-row radial engine, the Fw 190 A-8 boasted a maximum output of 1,700 horsepower. This powerful engine, combined with the aircraft's sleek aerodynamic design, allowed it to reach top speeds of around 654 km/h (406 mph) at 6,400 meters (21,000 ft).

The Fw 190 A-8 featured several advancements over its predecessors, including increased armour protection and improved armament. Its standard armament consisted of two 13 mm MG 131 machine guns above the engine and four 20 mm MG 151/20 E cannons in the wings, providing formidable firepower for both air-to-air and ground attack missions.

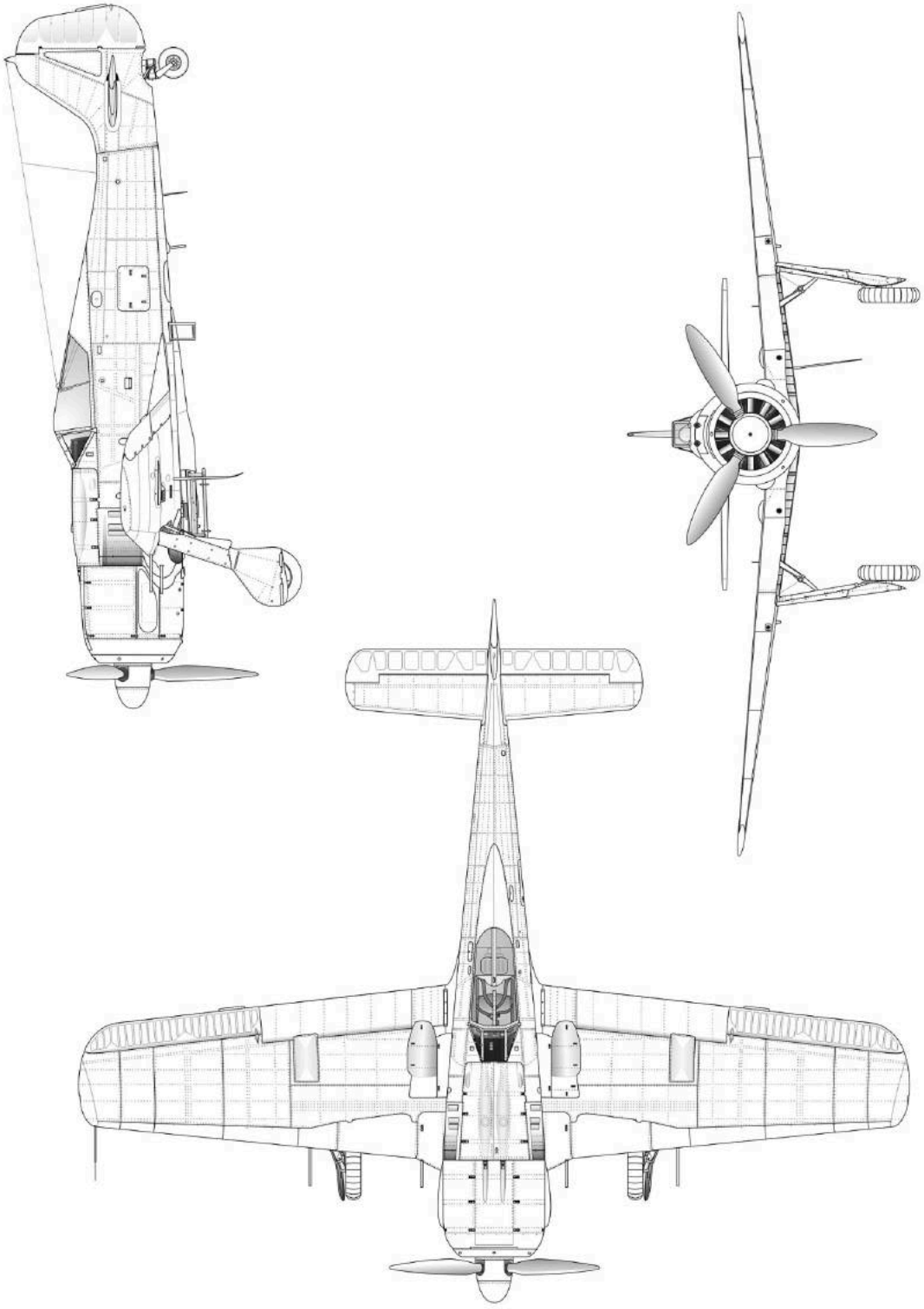
One of the most distinctive features of the Fw 190 was its wide-track landing gear, which provided excellent ground handling characteristics compared to its contemporary, the Messerschmitt Bf 109. The cockpit was also noteworthy for its good visibility and ergonomic layout.

The Fw 190 A-8 incorporated an ingenious engine management system called the Kommandogerät. This mechanical computer automatically adjusted the fuel mixture, propeller pitch, supercharger setting, and ignition timing based on throttle position, greatly simplifying pilot workload during combat situations.

Throughout its operational service, the Fw 190 A-8 proved to be a versatile and highly effective fighter. It was used in various roles including air superiority, ground attack, and bomber interception. The aircraft performed well at low to medium altitudes but faced challenges at high altitudes above 20,000 feet, where Allied fighters often held an advantage. Despite its success, the Fw 190 A-8 faced increasing challenges as the war progressed, particularly with the introduction of more advanced Allied fighters. Nevertheless, in the hands of skilled pilots, it remained a formidable opponent until the end of the conflict.

Today, the Fw 190 A-8 stands as an iconic symbol of German aviation engineering during World War II. Its innovative design features, impressive performance, and historical significance continue to make it a subject of great interest for aviation enthusiasts and historians alike.

Aircraft 3-View Plan



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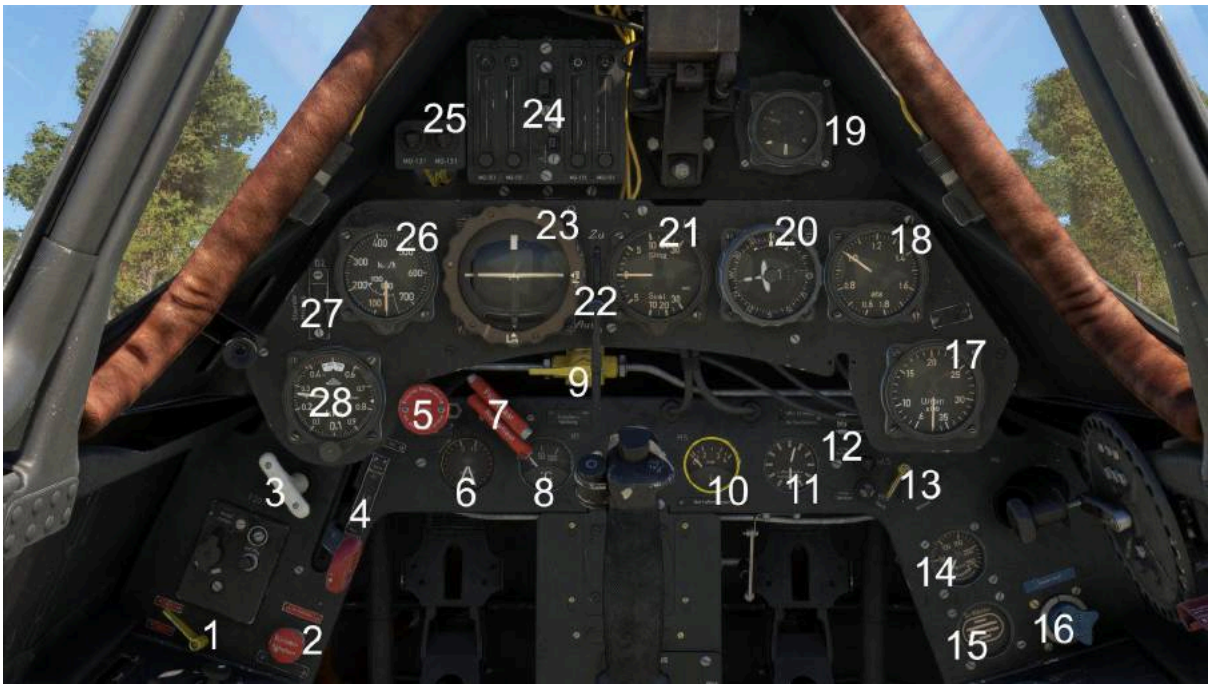
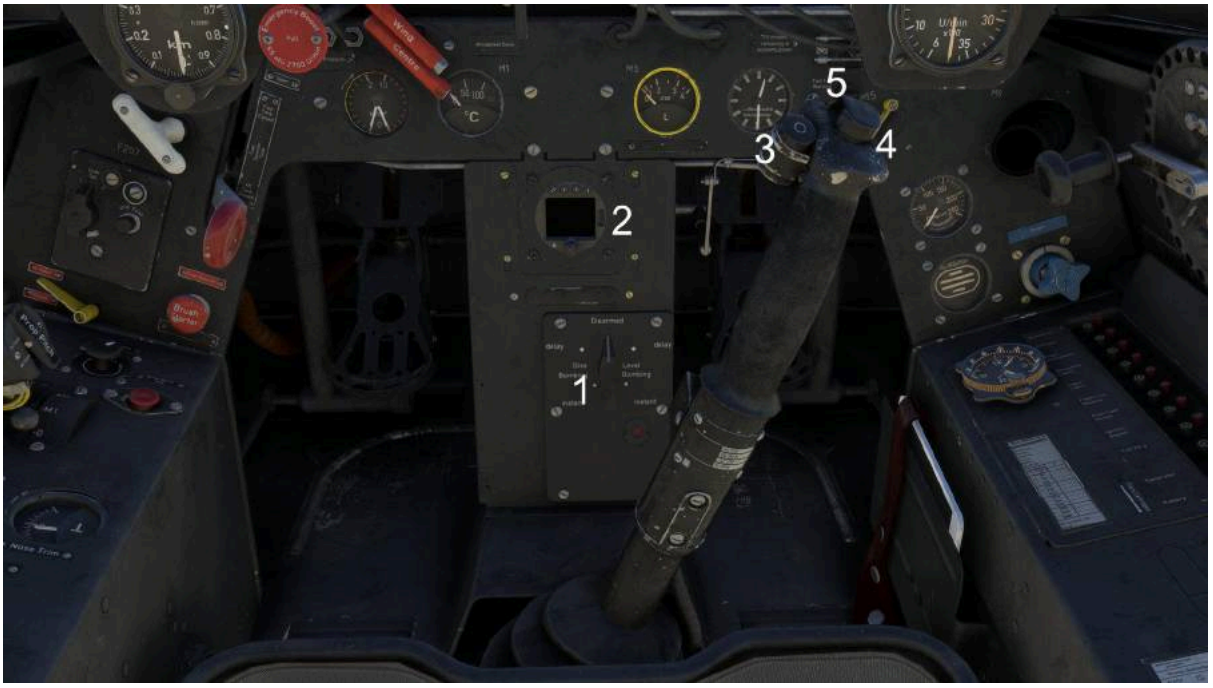
Cockpit Familiarisation

Main Instrument Panel



1. Stop Cock Control Lever
2. Engine Starter Brushes Withdrawal Button (inop)
3. Emergency Gear Release
4. Fuel Valve Selector
5. Engine boost
6. Fuel and Oil Pressure Duo Gauge
7. Emergency Ordinance/Tank Drop Levers (bottom lever centre, top lever wing)
8. Oil Temperature Gauge
9. Windshield Deice (uses fuel)
10. Fuel Quantity Gauge
11. Propeller Pitch Gauge
12. Forward and Aft Fuel Low Fuel Indicators
13. Fuel Gauge Selector
14. Oxygen Pressure
15. Oxygen Flow Blinker
16. Oxygen Valve
17. Tachometer
18. Manifold Pressure Gauge (Ata)
19. AFN-2 Radio Beacon Indicator
20. Compass (with AP Heading integration)
21. Vertical Speed Indicator
22. Radiator Adjustment Knob
23. Artificial Horizon (with cage ring)
24. Ammo Counter or GNS430 (swap using the tablet's Settings page)
25. MG 131 Armed Lights (inop)
26. Airspeed Indicator
27. Pitot Tube Heater Light
28. Altimeter

Centre Console

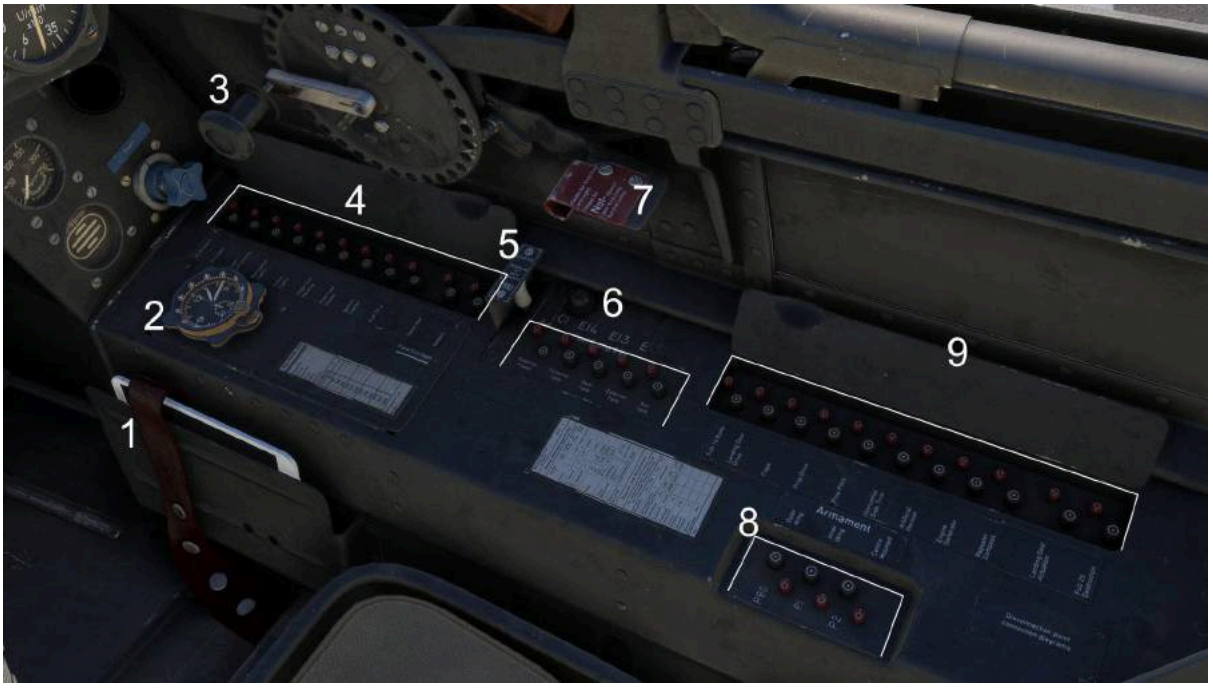


1. Bomb Mode Selector (inop)
2. Radio and Transponder (install via tablet's settings page)
3. Mk 108 Cannon Fire Button (inop)
4. Weapon Release Button (inop)
5. MG131 Gun Trigger (inop)

Left Console

1. Engine Prime Lever
2. Comms Controls (inop)
3. Throttle
4. Flap Buttons (Up, Takeoff & Landing)
5. Landing Gear Buttons & Guard Cover (Up & Down)
6. Landing Gear Indicator
7. Horizontal Stabiliser Trim Gauge
8. Throttle
9. Prop Pitch Adjustment Rocker (use Prop Pitch Keybinds)
10. Automatic / Manual Propeller Pitch Selector
11. Electrical Kill Switch
12. UV Light Dimmer

Right Console

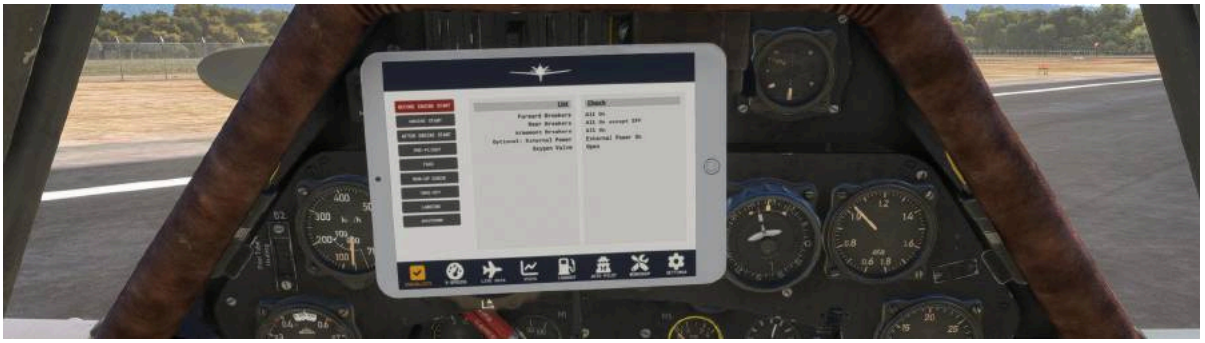


1. FlyingIron Tablet
2. Junghans J30BZ Chronograph
3. Canopy Lever
4. Forward Circuit Breaker Panel
    a. Ordinance
    b. Gunsight
    c. Instruments
    d. Navigation Lights
    e. Cabin Lights
    f. Cabin Heating
    g. Pitot Heating
    h. Ignition and Starter
    i. FUG 25A IFF
    j. Generator
    k. Battery
5. Starter Cover & Starter Lever
6. Mid Circuit Breaker Panel
    a. External Power
    b. Forward Tank Pump
    c. Rear Tank Pump
    d. External Tank Pump
    e. Aux Tank Pump
7. Canopy Jettison Lever
8. Armament Circuit Breaker Panel
    a. Outer wing
    b. Inner wing
    c. Fuselage
9. Aft Circuit Breaker Panel
    a. Radio
    b. Landing Gear Drive Motor
    c. Flaps
    d. Prop Pitch Motor
    e. Prop Pitch Control
    f. Horizontal Stabiliser Trim
    g. Artificial Horizon
    h. Engine Generator
    i. Compass
    j. Landing Gear Control
    k. FUG 25A IFF Self Destruct

FlyingIron Tablet

The FlyingIron Tablet provides additional information and features to your aircraft and flight experience. It has 8 pages available to you: Checklists, V-Speeds, Live Data, Stats, Loadout, Autopilot, Workshop and Settings. By default, it is stowed on the right side of the cockpit, next to the stick, and can be accessed by clicking on it:

Once unstowed it will hover in front of you. Press the HOME button to stow it again:



The tablet also will tell you if an aircraft update is available. You will find the message “Update Available” in the top left if this is the case.

We encourage you to take some time and explore what this useful tablet has to offer:

Checklists

As it says on the tin. This list is the same as the built-in MSFS checklists and the ones in this manual.

V-Speeds

Know your aircraft, and how fast or how slow she should be flown at each stage of flight.

Live Data

Live and accurate digital feedback of the various internal aircraft systems and environment.

Stats

Graphical chart display of a select few data streams over a 10 minute period.

Loadout

One-button pre-configured fuel loadouts for a short, medium or long flight:

- Short = Front and rear internal tanks, no drop tank (524L)
- Medium = Front and rear internal tanks plus drop tank (824L)
- Long = Front and rear internal tanks plus drop tank and aux tank (939L)

Note: the external tank adds considerable drag and decreases aircraft performance and agility.

Auto Pilot

The simplified but oh-so-handy FlyingIron Autopilot for those moments you want your hands free.

Note: the cockpit compass heading ring acts also as an autopilot heading bug. Very convenient…just adjust the ring to change heading when the AP is active, no need to open the tablet to do so.

Workshop

This simulates true-to-life wear and tear (based on careful research and actual experience from warbird pilots) as well as real-life inspection cycles of your aircraft.

It will matter for example for the inertia system how much you use it, or for the starter if you engage it when the engine already runs (that'll toast it quickly). Oxygen needs to be topped up here as well, and the canopy can be replaced here if it's been ejected.

Collapsed one or both mains during a hard landing? That too needs workshop time! (toggle

Slew after a gear repair to re-position the aircraft).

Note: The workshop is only open for business when you're parked and your engine is off.

Settings

This is where you can toggle between your gunsight and GNS530, and enable or disable a number of features. A few notable options on this page:

Stresses and Failures
This will enable or disable engine failures (high oil temp)

Simplified Ground-handling
This effectively links your rudder input to differential brakes, making turning easier (recommended if you don't have rudder pedals).
At all times will you experience the custom FlyingIron Taildragger Physics (this is **always** active and cannot be "turned off"), which is a highly realistic simulation of how a taildragger truly behaves on the ground, vastly different from the (rather incorrect) ground behaviour that MSFS offers out of the box.

Instrument Cameras

To maximise your enjoyment and cockpit accessibility, we have carefully set up the following instrument cameras:

1. Main Instrument Panel
2. Bottom Instrument Panel
3. Centre Console
4. Left Console
5. Right Console
6. Forward Circuit Breakers
7. Aft Circuit Breakers
8. Junghans Chronograph

The usual pilot quick views have been configured with correct pilot eye position in mind, and include head translations when looking in different directions for a natural and organic feel.

Aircraft Systems and Operations

Flight Controls

The Fw 190 A-8's flight controls exemplify advanced German engineering of World War II. Designed for versatility in fighter and fighter-bomber roles, it offers a unique blend of responsiveness and stability. Its standout feature is an exceptional roll rate, achieved through highly responsive controls actuated by push-rods and bearings. The wide-track landing gear provides excellent ground handling, while the combat flaps, when set to 15 degrees, slightly improve turn radius.

At high speeds above 400 mph, the elevator becomes noticeably heavy. The rudder remains light throughout the flight envelope, facilitating precise adjustments. At high angles of attack, the aircraft provides adequate stall warning through buffeting. The electrical trim system for the horizontal stabiliser, while effective, operates slowly, requiring anticipation from the pilot during significant speed or altitude changes.

Ailerons, Elevator and Rudder

The Fw 190 A-8 features highly responsive control surfaces, operated through a push-rod system that provides excellent feedback to the pilot. This design contributes to the aircraft's renowned manoeuvrability, particularly its exceptional roll rate.

- Ailerons: The Fw 190 A-8 is known for its rapid roll rate, thanks to its responsive ailerons. The stick movement is approximately 4.5" left/right, with a maximum deflection of +/-20 degrees.
- Elevator: The elevator provides good pitch control, with about 6" fore/aft stick movement. Maximum deflection is +30/-25 degrees. Unlike some contemporary fighters, the Fw 190's elevator remains effective at high speeds.
- Rudder: Rudder control is light and precise, with approximately 5.5" of pedal travel. Maximum rudder deflection is +/-30 degrees.

The Fw 190 A-8's control surfaces remain effective at high speeds, with less control stiffening compared to some contemporaries. However, pilots should be aware that at speeds approaching VNE (900 km/h), control forces do increase significantly. The aircraft's short-coupled design can lead to a tendency to snap roll if the controls are used too aggressively at high speeds.

Horizontal Stabiliser Trim

The Fw 190 A-8's elevator trim is controlled via an electric motor that adjusts the entire horizontal stabiliser. The pilot operates this system using a spring-loaded toggle switch located on the left console. Pushing the switch forward lowers the stabiliser's leading edge, trimming the aircraft nose-down, while pulling it back raises the leading edge for a nose-up

trim. The switch automatically returns to the neutral position when released, stopping the trim movement. Pilots should make small, incremental adjustments, as the system can be quite responsive.

A dedicated trim position indicator is located on the left instrument panel, showing the current stabiliser angle from -1° (nose-down) to +4° (nose-up). Pilots should monitor this indicator during flight to avoid extreme trim settings. The trim system is particularly useful during takeoff (set to 0° or slightly nose-heavy), for maintaining level flight at various speeds, and when configuring for landing (typically slightly nose-up).

Flaps

The Fw 190 A-8 is equipped with split-type landing flaps located on the inboard trailing edge of each wing. These flaps are electrically operated and can be set to three positions:

- Retracted (0°)
- Takeoff (13°)
- Landing (58°)

The flap position is controlled via push buttons on the left console, with the indicators being located on each wing, above the flaps.

For takeoff, it is recommended to use the 13° flap setting. This configuration provides an optimal balance between lift and drag, resulting in a shorter takeoff run without significantly impacting initial climb performance. When retracting the flaps after takeoff, ensure the aircraft's speed is below 250 km/h (155 mph) to prevent excessive stress on the flap mechanism.

During landing approach, fully extend the flaps to the 58° position once the aircraft's speed has decreased below 250 km/h (155 mph). This configuration significantly increases drag and lift, allowing for a steeper approach angle and slower landing speed. Be aware that full flap deployment will require additional engine power to maintain the recommended approach speed of 220 km/h (137 mph). After touchdown, leave the flaps extended to aid in aerodynamic braking until the aircraft has slowed to taxi speed.

The Take-Off setting can also be used during ‘combat’ situations in order to slightly increase the turn rate.

Landing Gear

The Fw 190 A-8 features a retractable tailwheel landing gear system. The main gear retracts inward into the wing, while the tailwheel retracts upward partially into the fuselage, serving as an emergency skid. The wide-track main gear provides excellent stability during ground operations, making the aircraft less prone to ground loops compared to its contemporary, the Messerschmitt Bf 109.

Normal Operation

To extend the landing gear, press the gear extension button on the left side of the cockpit. The gear takes approximately 6-7 seconds to fully extend. The landing gear position is indicated to the pilot through an indicator on the left console, with red lights illuminating when the gear is retracted and green lights confirming full extension and lock. Retraction is initiated by pressing the gear retraction button, which is protected by a safety cover to prevent accidental activation.

Emergency Operation

In case of electrical failure, the landing gear can be extended manually. Pull the emergency gear extension handle located on the bottom left side of the instrument panel. This releases the gear up lock, allowing the wheels to fall into place by gravity. Always verify gear position using the mechanical indicators on the wings.

Brakes

The Fw 190 A-8 is equipped with hydraulic disc brakes operated by pressing the top of the rudder pedals. Differential braking can be used to assist in tight turns during taxiing. Be cautious not to apply excessive brake pressure during landing to avoid nosing over.

Tail Wheel Lock

The tailwheel can be locked for takeoff and landing by pulling the control stick back (when the tail wheel is straight). This improves directional stability during these critical phases. To unlock the tailwheel for tighter turns during taxiing, move the stick forward of the neutral position. Remember to lock the tailwheel again before takeoff.

If you are finding it difficult to taxi, your tailwheel is likely locked. If you find that you are swerving during takeoff and landing, your tailwheel is likely unlocked!

FlyingIron Taildragger Ground Handling Physics

The Fw 190 A-8 features custom-coded, realistic free-castering taildragger ground physics, replacing the default Microsoft Flight Simulator system. This enhancement provides an authentic experience for mastering taildragger operations, as verified by experienced taildragger pilots.

Key features of the ground handling system include:

- Free-castering tailwheel: Not steerable via rudder input, mirroring real-world taildragger behaviour.
- Steering mechanisms:
    - Lateral thrust from airflow over the rudder (prop wash, ground speed, or wind).
    - Differential braking for effective steering at low speeds.
    - Realistic simulation of ground loops and P-factor effects.

Recommendations for operation:

- Limit taxi operations to 1,200 RPM or less.
- Utilise differential braking and minimal prop wash with rudder input for low-speed steering, compensating for the Fw 190's relatively small rudder.
- Practise to develop proficiency in these more realistic and predictable physics.

For optimal control, rudder pedals are strongly recommended. If unavailable, enable "Simplified Ground handling" in the FlyingIron Tablet's Settings page to link rudder input to differential braking.

Note: This custom ground handling system permanently replaces the default MSFS physics for this aircraft and cannot be disabled.

Engine Management

*Note: managing your aircraft's heating and cooling will only truly have an impact if you have the **Stresses and Failures** toggle enabled in the Tablet's Settings page. When this setting is off, you can go full throttle as much as you like.*

Kommandogerät (Command Device)

The Fw 190 A-8 is equipped with a remarkable piece of German engineering called the Kommandogerät, or "command device." This mechanical computer significantly simplifies engine management, allowing pilots to focus on flying and fighting.

The Kommandogerät is a single-lever power control system that automatically manages multiple engine parameters, including manifold pressure, engine RPM, fuel pressure, fuel-air mixture, propeller pitch, and ignition timing. This sophisticated system reduces pilot workload during critical phases of flight and prevents engine damage from improper settings.

To operate the engine, pilots simply move the throttle lever to the desired power setting. The Kommandogerät then automatically adjusts all engine parameters for optimal performance at any altitude. This allows pilots to concentrate on tactics and situational awareness, giving the Fw 190 A-8 a significant advantage in combat.

While the Kommandogerät handles most engine management tasks, pilots should still monitor engine instruments for any abnormalities. In case of system failure, a propeller pitch override is available. To activate it, locate the propeller pitch selector switch on the left console and set it to "Manual" mode. You can then use the thumb switch on the throttle lever to adjust propeller pitch as needed (use the prop pitch keybindings(**Increase/Decrease Propellor Pitch**).

Propeller Control

The Fw 190 A-8 features an advanced propeller control system that utilises the Kommandogerät (command device) for automated engine management. This system simplifies pilot workload by automatically adjusting propeller pitch based on throttle setting and flight conditions. However, it's essential to understand both the automatic and manual control options available.

Automatic Propeller Control:

1. Normal Operation:
    - The propeller pitch is automatically controlled by the Kommandogerät.
    - As you adjust the throttle, the system will optimise propeller pitch for the current flight regime.
    - No additional pilot input is required for propeller control during most flight operations.
2. Indicator:
    - Monitor the propeller pitch indicator on the auxiliary instrument panel.
    - The indicator displays pitch in a clock-face format, with 12 o'clock representing fine pitch and 3 o'clock representing coarse pitch.

Manual Propeller Control:

In the event of Kommandogerät failure or for specific operational needs, manual propeller control is available:

1. Propeller Control Switch:
    - Located on the left console.
    - Two positions: "Automatic" and "Manual"
2. Switching to Manual Control:
    - Locate the propeller control switch.
    - Move the switch to the "Manual" position.
    - The propeller pitch is now under direct pilot control.
3. Adjusting Propeller Pitch Manually:
    - Use the prop pitch key binds to adjust the pitch.
4. RPM Management:
    - In manual mode, closely monitor engine RPM to avoid over-speeding or under-speeding the propeller.
    - Adjust pitch as needed during climbs, descents, and changes in airspeed.
5. Returning to Automatic Control:
    - Move the propeller control switch back to the "Automatic" position.

    - The Kommandogerät will resume control of propeller pitch.

Best Practices:

1. Use automatic control for normal operations to reduce workload and optimise engine efficiency.
2. Practise manual control during training flights to maintain proficiency in case of system failure.
3. When switching from manual to automatic control, ensure the propeller pitch is set near the expected automatic setting to avoid sudden RPM changes.
4. In emergency situations, such as engine troubles or combat manoeuvres, consider switching to manual control for more precise engine management.

Supercharger

The Fw 190 A-8 is equipped with a two-stage supercharger system integrated into its BMW 801 D-2 radial engine. This system plays a crucial role in maintaining engine performance at higher altitudes. The supercharger system is fully automated by the Kommandogerät, which manages its operation based on altitude and throttle setting.

There are two supercharger stages:

1. Low Gear (MS-Gang): Used from sea level to around 3,700 meters (12,100 feet)
2. High Gear (HS-Gang): Automatically engages above 3,700 meters for improved high-altitude performance

Emergency Boost

The Fw 190 A-8 is equipped with an emergency power boost system that allows for short bursts of increased engine performance. This system overrides the supercharger boost regulator to increase manifold pressure beyond normal limits.

To engage emergency power:

1. Ensure propeller control is set to "Automatic"
2. Advance throttle to 100%
3. Pull "Emergency Boost" button
4. Monitor engine gauges carefully
5. Disengage after max 10 minutes by pushing the button back in

Be sure to keep an eye on the engine gauges whilst the boost is in use to avoid overheating and damaging your engine.

Temperatures

The BMW 801 D-2 uses air cooling and an innovative oil cooling system. A fan at the front of the engine, spinning faster than the propeller, directs airflow over the oil cooler and to the supercharger intake. This design typically prevents overheating issues during normal operations.

The oil temperature gauge on your auxiliary instrument panel displays readings in degrees Celsius. Normal operating range is between 60°C to 95°C.

- Minimum oil temperature for takeoff: 40°C.
- Maximum continuous oil temperature: 95°C.
- Maximum short-term oil temperature (up to 15 minutes): 105°C.

Engine warm-up procedure:

1. Start the engine and allow it to idle at 1200-1300 RPM.
2. Monitor the oil temperature gauge.
3. When oil temperature reaches 25°C (77°F), increase RPM to 1400-1500.
4. Continue warm-up until oil temperature reaches 40-45°C (104-113°F).
5. Open the radiator control (rotate clockwise) before takeoff.

Overheating Prevention:

1. Monitor oil temperature regularly during flight.
2. Adjust power settings if temperatures approach maximum limits.
3. In hot weather, minimise ground running time before takeoff.
4. Use caution when using Emergency Power settings, as they can cause rapid temperature increases.

Emergency Procedures: If oil temperature exceeds 105°C:

1. Reduce power immediately.
2. Open radiator control fully if not already done.
3. Increase airspeed to improve cooling, if possible.
4. Land as soon as practicable if temperature doesn't decrease.

Note: managing your aircraft's heating and cooling will only truly have an impact if you have the Stresses and Failures toggle enabled in the Tablet's Settings page. When this setting is off, you can go full throttle as much as you like.

Priming

Before starting the engine, proper priming is essential, especially in cold weather. Locate the primer pump on the left side of the cockpit. With the fuel valve set to "Automatic," operate the primer pump until you feel increased resistance, typically after 8-10 strokes. This process ensures that fuel is delivered to the cylinders, facilitating easier engine start. Be cautious not to over-prime, as this can lead to flooding. In warmer conditions, fewer pump strokes may be sufficient. Once priming is complete, you're ready to proceed with the engine start procedure.

If you have overprimed the engine, you can do the following:

1. Set magnetos or fuel selector to off.
2. Open the throttle wide.
3. Pull the starter handle.

The blades will begin to spin, and excess fumes will be forced to escape from the cylinders.

Note: Tooltips and the Tablet's Live Data page also will indicate your current prime status (underprimed, primed, overprimed).

Fuel System and Tanks

The FW 190 A-8 features a complex fuel system designed for extended range and flexibility.

Tank Configuration:

- Front Tank: 232 litres (51.0 gallons)
- Rear Tank: 292 litres (64.5 gallons)
- Auxiliary Fuselage Tank: 115 litres (25.3 gallons)
- Under Fuselage Drop Tank: 300 litres (66.2 gallons)

Total maximum fuel capacity: 939 litres (207 gallons)

Fuel Management: The fuel system operates automatically, transferring fuel from auxiliary tanks to the main tanks as needed. However, pilots should monitor fuel levels closely:

1. The drop tank and auxiliary tank transfer fuel to the rear tank once it falls below 240 litres.
2. Use the fuel selector lever to switch between tanks manually if required.
3. Monitor fuel pressure on the gauge (normal range: 1.3-1.7 kg/cm² or 18.49-24.18 psi).

Each tank has an electric fuel pump. Circuit breakers for these pumps are located on the right side panel. To prevent damage:

1. Keep pump circuit breakers on unless a tank is completely empty.
2. The system manages pump operation automatically.

Fuel Valve Positions:

- "Auf" (Open): Normal flight operations
- "Vorderer behälter zu" (Forward tank closed)
- "Hinterer behälter zu" (Rear tank closed)
- "Zu" (Closed): Use for shutdown or emergencies

Remember: Proper fuel management is essential for maintaining aircraft balance and ensuring maximum range. Always verify fuel levels during preflight checks and monitor consumption throughout your flight.

Garmin GNS 530

If you don't have the gunsight installed, you will see the Garmin GNS 430 equipped. It is the standard fully functional model that comes with MSFS.

Note: you may swap the Garmin GNS 530 with the gunsight using the Tablet's Settings page.

Gunsight

The Fw 190 A-8 is equipped with the Revi 16B reflector gunsight, a state-of-the-art optical aiming device for its time.

To operate gunsight, first ensure the gunsight circuit breaker is on (right console, forward circuit breaker panel). You can then change the brightness of the sight by adjusting the rheostat on the top right side of the gunsight.

Note: you may swap the gunsight with the Garmin GNS 430 using the Tablet's Settings page.

Weapons

The Fw 190 A-8 packs formidable firepower with:

- Two 13mm MG 131 machine guns in the fuselage (475 rounds per gun)
- Two 20mm MG 151/20E cannons in the wing roots (250 rounds per gun)
- Two 20mm MG 151/20E cannons in the outer wings (140 rounds per gun)

All weapons are electrically fired and use E-type ammunition. The fuselage and wing-root guns are synchronised to fire through the propeller arc.

The guns are not functional.

Note: if you purchased the aircraft from the Marketplace, you can find a weapon mod on the product page of our website. This is only available for PC users.

Light Systems

The Fw 190 was designed as a day fighter and therefore only has some basic lighting systems.

Internal Lights

The cockpit consists of 2 UV spotlights. To operate the spotlights, press the 'Cockpit Lighting' circuit breaker on the forward circuit board, then adjust the brightness rheostat on the left console (you may also use the **Panel Lights On/Off** keybinds).

External Lights

The Fw 190 comes fitted with basic navigation lights only, being a red port light, blue starboard light and white tail light. They are operated by the External Lights Circuit Breaker on the forward circuit board (you may also use the **Toggle Nav Lights** keybind).

Canopy

To operate the canopy of the Fw 190 A-8, locate the canopy crank handle on the right side of the cockpit. To open, rotate the handle clockwise; to close, rotate it counterclockwise. Ensure the canopy is fully closed before takeoff.

In case of emergency, the Fw 190 A-8 is equipped with a canopy jettison system. To activate, locate the red jettison lever positioned near the canopy crank handle. Firmly depress this lever to trigger the explosive charge that will instantly blow the canopy clear of the aircraft. This action simultaneously raises the rear of the canopy and releases it from its mounting points, allowing for rapid pilot egress.

Oxygen

The Fw 190 A-8 is equipped with an oxygen system for high-altitude operations, consisting of three 2-litre steel bottles mounted in the radio compartment behind Bulkhead 9, a regulator unit, high-pressure lines, and a flow monitor.

To operate, open the oxygen valve on the right side of the cockpit near the forward circuit breaker panel. Monitor oxygen flow using the indicator on the right side of the auxiliary instrument panel, adjusting as needed with the flow valve.

Always use oxygen when flying above 10,000 feet and check the system before each flight. After landing, close the oxygen valve to prevent leakage.

Electrical System

The entire electrical system of your aircraft has been simulated to great detail for every single component, down to the actual voltage used by the smallest of light bulbs. In other words, everything you do will have an impact on electrical load. The Inertia Starter especially - clocking in at 2000W - is a heavy consumer. Also, do not underestimate fuel pumps and navigation lights, they can draw quite a bit.

Battery

The Fw 190 A-8 comes installed with one 24V 20Ah battery. The battery can be turned on or off via the Battery Circuit Breaker, located on the right console (front circuit board panel).

Generator

The BMW 801 powers a 2000W 28V generator. The generator only produces power when the engine is above 1300RPM, so avoid excessive time idling. The generator can be turned on or off via the generator circuit breaker, found on the right console. You can also use the **Toggle Master Alternator** key bind.

External Power

The Fw 190 A-8 can be connected to external power for ground operations and engine start. This is particularly useful for preserving battery charge. To use external power:

1. Turn on the external power circuit breaker in the mid-breaker panel. This will connect the ground power cart to the aircraft.
2. Proceed with normal start procedures.
3. After engine start and generator engagement, turn off the external power breaker.

AFN-2 Radio Beacon Indicator

The AFN-2 Radio Beacon Indicator was a standard navigation instrument in German aircraft of the era, enabling pilots to locate their destination efficiently. In Microsoft Flight Simulator, this functionality is replicated by setting the Nav (VOR) frequency on the GNS 430, allowing the AFN-2 to track the selected beacon.
The instrument consists of three key components:

Vertical Needle

This needle displays course deviation. It operates on an error principle: to approach the beacon, steer in the opposite direction of the needle's deflection. For example, if the needle is deflected left, turn right to intercept the course. As you align with the correct heading, the needle will gradually centre. If the needle moves away from centre, it indicates you're flying away from the beacon, necessitating a 180-degree turn.

Horizontal Needle

This needle indicates the distance to the selected VOR station. The needle's position correlates to distance as follows:

- Bottom position: 60 nautical miles (110 km) or more, or no signal
- Mid-position: Approximately 30 nautical miles (55 km)

- Top position: Directly over the beacon

Centre White Light

When illuminated, this light confirms that you are directly above the beacon (within a few kilometres), signifying successful navigation to your target location.

Junghans J30BZ Chronograph

The Junghans J30BZ Chronograph, a precision instrument from the WWII era, has been meticulously recreated in this simulation. Its functionality is authentic, including subtle operational nuances. To maintain an unobstructed view, tooltips have been omitted. The key components are:

1. Time Adjustment engage/disengage lever
2. Time Adjustment knob
3. Stopwatch Start/Stop/Reset button
4. Time ring
5. Minute hand
6. Hour hand
7. Stopwatch second hand
8. Stopwatch minute hand

Time Adjustment

The chronograph automatically synchronises with the local MSFS time, including updates made through the MSFS Weather toolbar. Manual adjustment is possible by engaging the Time Adjustment lever and rotating the Time Adjustment knob.

Chronograph Operation

The Stopwatch function is controlled by a single button that cycles through Start, Stop, and Reset functions. The second hand indicates elapsed seconds, while the minute hand in the sub-dial tracks up to 15 minutes. True to the original Junghans design, the minute hand advances gradually between the 55 and 60-second marks of each minute.

Time Ring Functionality

The rotatable time ring serves as a manual reference point marker. While it doesn't affect the chronograph's operation, it's a valuable tool for marking specific time points, particularly useful in dead reckoning navigation.

Checklists

For your convenience, checklists can be found in 3 places, all identical:

1. The Pilot Handbook (this one)
2. The MSFS Toolbar Checklists (interactive)
3. The FlyingIron Tablet

Before Engine Start

- Forward Breakers: All On
- Rear Breakers: All On except IFF
- Armament Breakers: All On
- Optional > External Power: External Power On
- Oxygen Valve: Open

Engine Start

- Check Rear and Forward Fuel: Toggle
- Fuel Pumps: On if applicable
- Fuel Valve: Automatic
- Prime: Until slow primer
- Magnetos: Both On
- Throttle: About 20%
- Prop Control: Manual
- Propeller Lever: Set pitch to 12:00
- Prop Control: Automatic
- Prop Pitch: Confirm move to 12:30
- Canopy: Close
- Starter Cover: Open
- Inertia Starter: Push in 20 to 25 Seconds
- Engine Starter: Pull Strongly

After Engine Start

- Oil Pressure: Check for rise
- Brakes: Hold
- Throttle: 1200 rpm
- External Power: External Power Out
- Oil Temperature: Warm to 25C
- Throttle: 1400-1500 rpm
- Oil Temperature: Warm to 40-45C
- Radiator Control: Open Clockwise
- Artificial Horizon: Uncage

Taxi

- Straight > Lock Tailwheel: Stick Aft
- Steering > Unlock Tailwheel: Stick Fwd and tap toe brakes to steer

Run-up Check

- Lock Tailwheel: Stick Aft
- Flaps: Set to Start
- Pitch Trim: Set 0°

Take-Off

- Lock Tailwheel: Stick Aft (whilst tailwheel is straight!)
- Landing Gear Guard: Up
- Throttle: 2000 rpm
- Engine Parameters: Within safety limits
- Throttle: 2700 rpm
- Lift Tail: 150-180kph
- Rotate: 200kph
- Landing Gear: Raise before 250kph
- Flaps: Set 0° before 250kph
- Throttle to Climb within 3 min after T/O: 2400 rpm

Flight

- Stabiliser: Around 0°
- Cross Country Cruise: 1.1ATA
- Oxygen: Open

Descent & Approach

- Reduce Power as needed
- Flaps: Set as required (remember speed limits)
- Landing Gear: Down below 250 km/h
- Trim: Adjust as needed

Landing

- Line up with runway: Runway centred with nose
- Landing Gear: Down below 250kph
- Flaps: Set to Landing below 250kph
- Approach the runway: 220kph and 2.5 to 5m/s sink
- Cross runway threshold: 200kph and 2.5m/s sink
- Touchdown with idle throttle: 160-180kph
- Lock Tailwheel: Stick Aft when below 100kph
- Steer with rudder: Until you lose authority
- Steer with brake taps: When rudder authority is lost

Taxi In

- Straight > Lock Tailwheel: Stick Aft
- Steering: Toebrakes

Stopping the Engine

- Throttle: Idle
- Engine Stop: Press down and hold
- Magnetos: Both Off
- Fuel Valve: Both Closed
- Fuel Pumps: All Off
- Oxygen Valve: Closed
- Canopy: Open
- Armament Breakers: All off
- Rear Breakers: All Off
- Forward Breakers: All Off

Specifications and Reference Data

General Data

Max Gross Weight	10,724 lbs (4,865 kg)
Empty Weight	6,750 lbs (3,062 kg)
CG Limits	22% fwd to 33% aft
Pax	1
Max Fuel Capacity (with wing tanks)	939 litres (248 gallons)
Internal Tanks	Front: 232 litres (61.3 gallons), Rear: 292 litres (77.1 gallons), Aux 115 litres (30 gallons)
Centre Drop Tank	300 litres (79.3 gallons)
Wingspan	34.47 ft (10.506 m)
Wing area	202.50 sq ft (18.81 sq m)
Wing root chord	7.50 ft (2.29 m)
Wing dihedral	5.25°
Wing incidence	2.00°
Wing sweep	5.75°
Length	29.36 ft (8.95 m)
Trim availability	• Cockpit-adjustable pitch control • Groundcrew-adjustable fixed aileron and rudder trim tabs
Flaps	3 positions: • 0° (Up) • 13° (Take-off) • 58° (Landing)
G Limits	Positive: +8.5 (flaps up), +5.0 (flaps down); Negative: -3.5
Operational Ceiling	37,400 ft (11,400 m)

Engine

Model	BMW 801 D-2
Configuration	14-cylinder, twin-row radial
War Emergency Power	Emergency power boost (up to 10 min, 3 times per mission with 10 min cooldown at Combat power in between)
Horsepower	1,700 HP (1,730 HP during Take-Off)
Displacement	Not specified in provided documents
Cylinders	14
Turbo	No
Supercharger	Two-stage internal supercharger
Cooling	Air-cooled (with unique cooling fan system)
Fuel System	Fuel injection
Negative G	Capable

Propeller

Model	VDM 9-12159 A
Blades	3
Diameter	3.30m / 10'10"
Type	Constant speed
Max RPM	2,700 rpm
Feathering	No
Beta min	Approximately 25° (fine pitch)
Beta max	Approximately 70° (coarse pitch)

V-Speeds

Code	Description	Speed (IAS)	
		kph	knots
VBG	Best glide speed	232	125
VC	Design cruise speed	546	295
VD	Design diving speed	850	459
VNE	Never exceed speed	900	486
VFE	Max flaps extended	300	162
VLO	Max gear extended	300	162
VNO	Max speed normal operations	463	250
VR	Rotation speed	220	119
VREF	Threshold cross speed	224	121
VS	Stall speed in cruise configuration	178-207	96-112
VS0	Stall speed in landing configuration	165-189	89-102
VTO	Take-off speed	220	119
VX	Best angle of climb speed	269	145
VY	Best rate of climb speed	269	145
	Loop (aerobatic)		
	Roll (aerobatic)		
	Half-roll off loop (aerobatic)		
	Climbing roll (aerobatic)		

Power Settings

Power	Setting
Idle	1,000-1,100 RPM
Starting and Warm-Up	1,200-1,500 RPM
Taxi	1,400-1,500 RPM
Take-Off & Emergency Power (up to 3 minutes)	2,700 RPM / 1.42 ata
Climb & Combat Power (up to 30 minutes)	2,400 RPM / 1.32 ata
Maximum Endurance Cruise Power	2,300 RPM / 1.20 ata
Maximum Economy Cruise Power	2,100 RPM / 1.10 ata
Emergency Power with WEP (up to 10 minutes)	2,700 RPM / 1.58 ata (low supercharger)
Emergency Power with WEP (up to 10 minutes)	2,700 RPM / 1.65 ata (high supercharger)
Dive (Max)	2,700 RPM
Landing Approach	2,000-2,100 RPM

Speeds

Power	**Altitude (m)**	**Speed (TAS)**	
		kph	*knots*
Max	Sea level	558	301
Max	6,250	670	361

Climb Rates at standard mass (9,680lbs)

To Altitude		Rate	
Meter	*Feet*	*m/s*	*fpm*
S.L.	S.L.	13.8	2,716
3,000	9,843	10.1	1,988
6,000	19,635	7.8	1,535

Runway Performance (3,310kg / 7,297lbs)

Runway	Distance	
	Meters	*Feet*
Take-off	400	1,312
Landing	350	1,148

Roll Rates (3,048m / 10,000ft)

Speed (TAS)		Degrees per second
kph	*knots*	*Ailerons only*
411	222	160

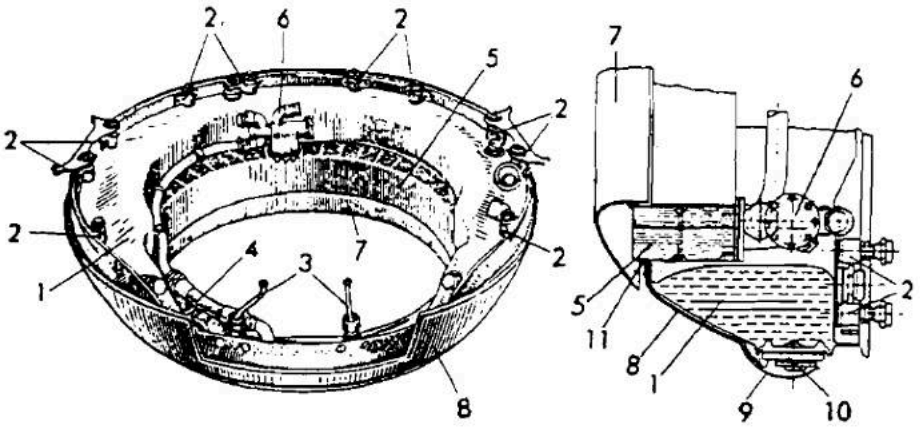
Fuel Burn

Power	Fuel Consumption (sea level)	
	Litre/Hr	*US Gal/Hr*
2,300RPM / 1.20ATA (max cont)	360	95
2,100RPM / 1.10ATA	225	59
2,000RPM / 1.05ATA	205	54

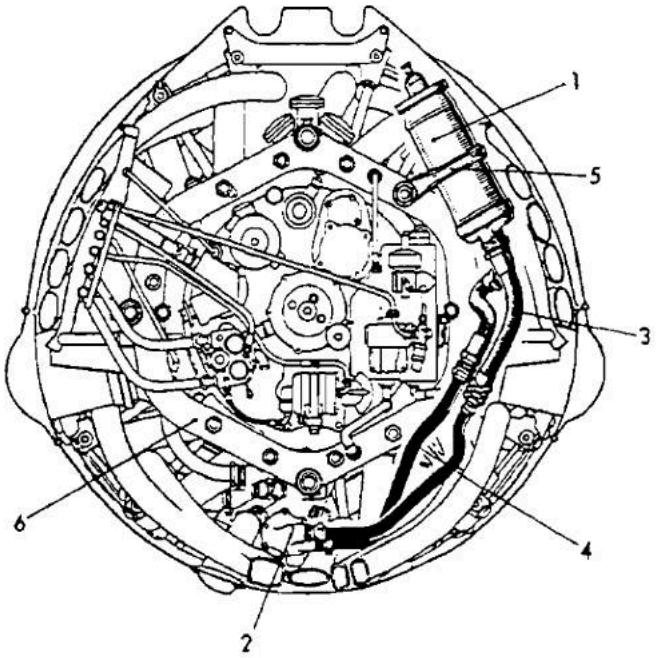

Nur hier betreten

Reference Diagrams

Oil System



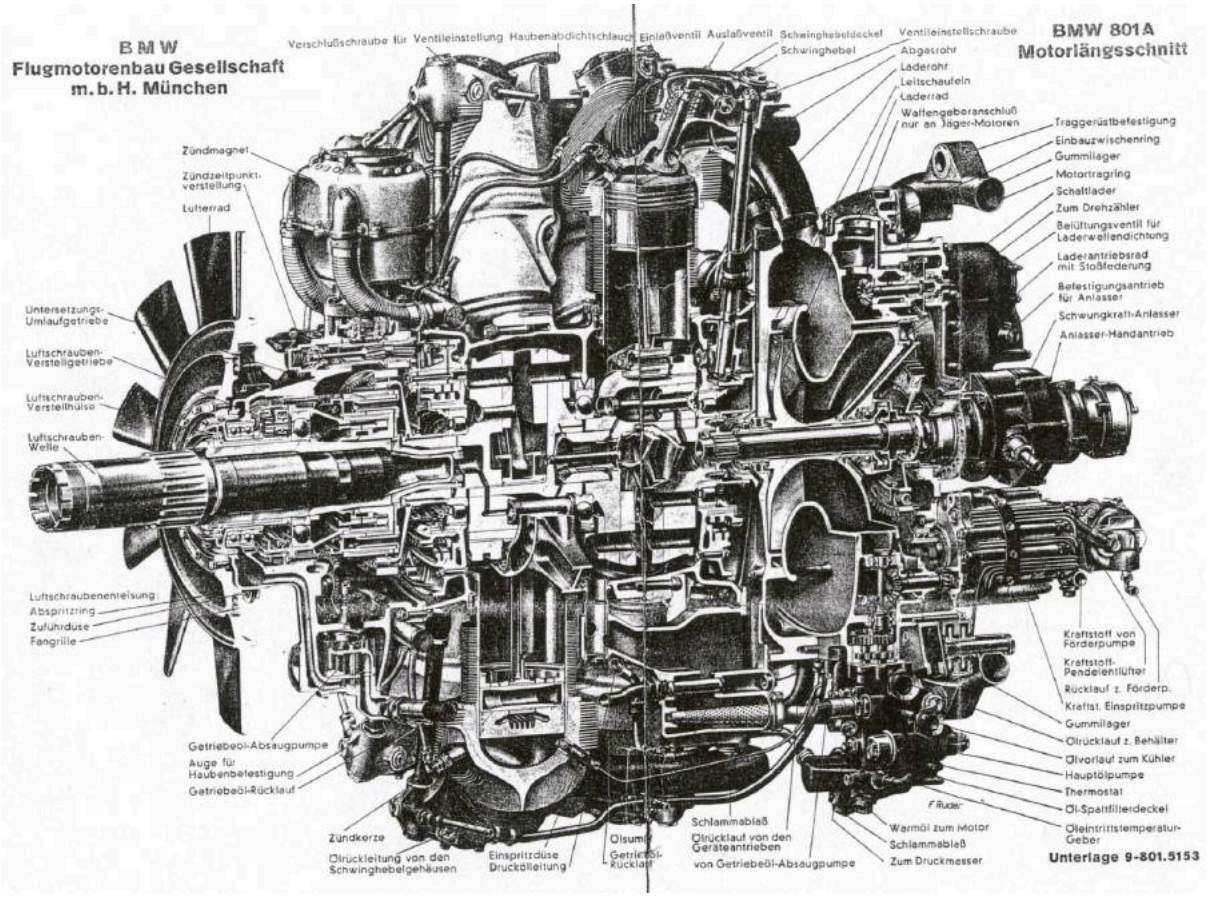
1 Oil tank
2 Rubber shock mounting
3 Connecting lines
4 Oil lines
5 Cooler
5 Thermostat
7 Cooler armour
8 Oil tank armour
9 Cover
10 Tank drain valve
11 Cover segment



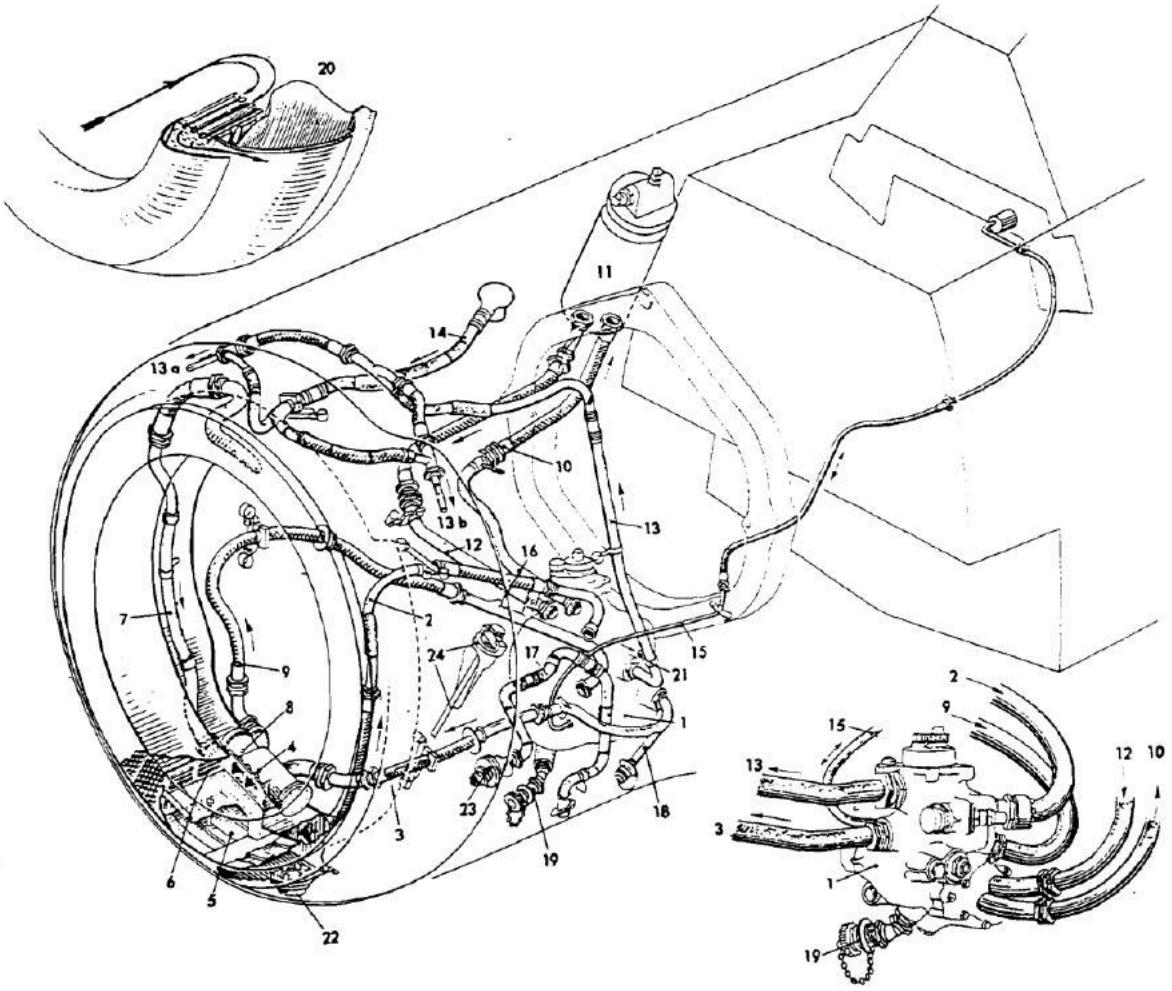
1 Oil filter
2 Oil pump
3 Line from pump to filter
4 Line from filter to pump
5 Securing clamp
6 Engine mounting ring

Fig. 11: BMW 801D oil filter

Kommandogerät



Lubrication System



1 Engine mounted oil pump
2 Input line (tank to pump)
3 Output line (pump to thermostat)
4 Thermostat
5 Oil warming chamber
6 Oil cooler block
7 Line from cooler to temperature probe
8 Temperature probe
9 Input line (probe to pump)
11 Oil filter
12 Line from oil filter to pump
13 Line from pump to tank
13a Tank inlet line
13b Tank inlet line
14 Engine ventilation line
15 Oil pressure measuring line
16 Oil temperature measuring line
17 Tank ventilation line
18 Warm oil filler point for cooler
19 Warm oil filler point for engine
20 Path of cooling air through the oil cooler
21 Oil mixing nozzle for cold weather starting
22 Oil tank drain valve
23 Pendulum valve
24 Filler cap with contents measuring probe

Fuel System

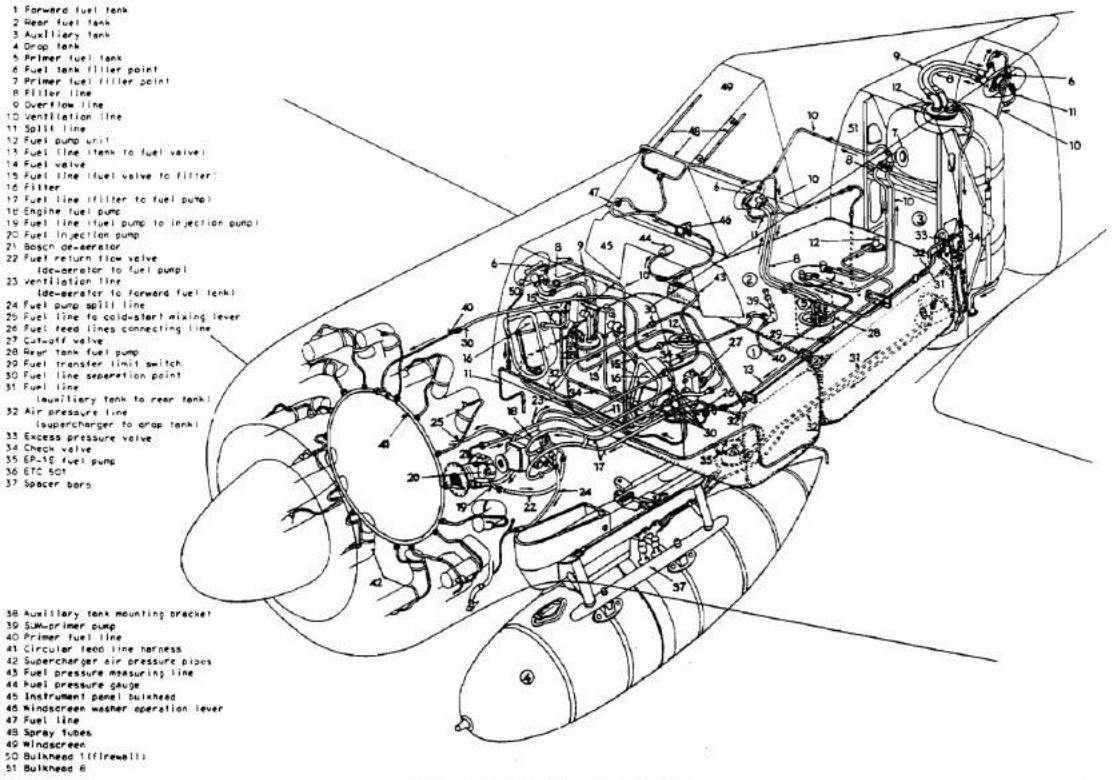


Fig. 13: Fuel system skematic

Unit Conversion Tables

Distance

Nautical Miles (nm)	Miles (m)	Kilometres (km)
50	58	93
100	115	185
200	230	370
300	345	556
400	460	741
500	575	926
750	863	1,389
1,000	1,151	1,852

Speed

Knots (kts)	Miles per hour (mph)	Kilometres per hour (kph)
50	58	93
100	115	185
150	173	278
200	230	370
250	288	463
300	345	556
350	403	648
400	460	741

Intake Pressure

Manifold Pressure (MP, inHg)	Boost	Atmospheric Pressure (ATA)
United States	*England*	*Germany*
10	-9.8	0.35
20	-4.9	0.69
(29.92) 30	0.0	1.04
40	+4.8	1.38
45	+7.4	1.55
50	+9.8	1.66
55	+12.3	1.73
60	+14.7	2.07

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Thank you for your purchase & supporting FlyingIron Simulations; we hope you thoroughly enjoy flying this aircraft, as much as we enjoyed making it.

Warmest Regards,
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