RESTRICTED

# PILOT TRAINING MANUAL FOR THE P-40

FOR USE WITH MICROSOFT FLIGHT SIMULATOR 2020 ONLY.

WARNING: THIS MANUAL AND MSFS MODEL MUST NOT BE USED FOR REAL FLIGHT TRAINING PURPOSES. THIS MANUAL AND MODEL ARE FOR ENTERTAINMENT PURPOSES ONLY

RESTRICTED

FOR OFFICIAL USE ONLY

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# *PILOT'S FLIGHT OPERATING INSTRUCTIONS*

*FOR*

ARMY MODEL

# P-40N Series

BRITISH MODEL

# KITTYHAWK IV

# AIRPLANES

*FLIGHT REPLICAS*

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*25 SEPTEMBER 1944*

# Introduction:

Thank you for purchasing this MSFS aircraft. Its aim is to give you a precise and detailed feeling for this most-produced variant of the famous P-40, the N model.

Outstanding as a close ground support aircraft, the P-40 somehow gained a post-war reputation as a mediocre design as an air superiority fighter. Modern research has shown that the P-40 in reality performed surprisingly well in this regard as well, taking a very heavy toll of enemy aircraft, including when flown against the lightweight and maneuverable Japanese fighters like the Oscar and Zero.

Later versions, such as the N version of this package, were the most capable. Climb performance was still below average, and performance above 15,000 feet lagged behind many other fighters, but manouverability at mid to low level was truly excellent, dive acceleration was good and dive speed was excellent. The highest-scoring P-40 ace, Clive Caldwell (RAAF), who claimed 22 of his 28½ kills in the type, said that the P-40 had "almost no vices."

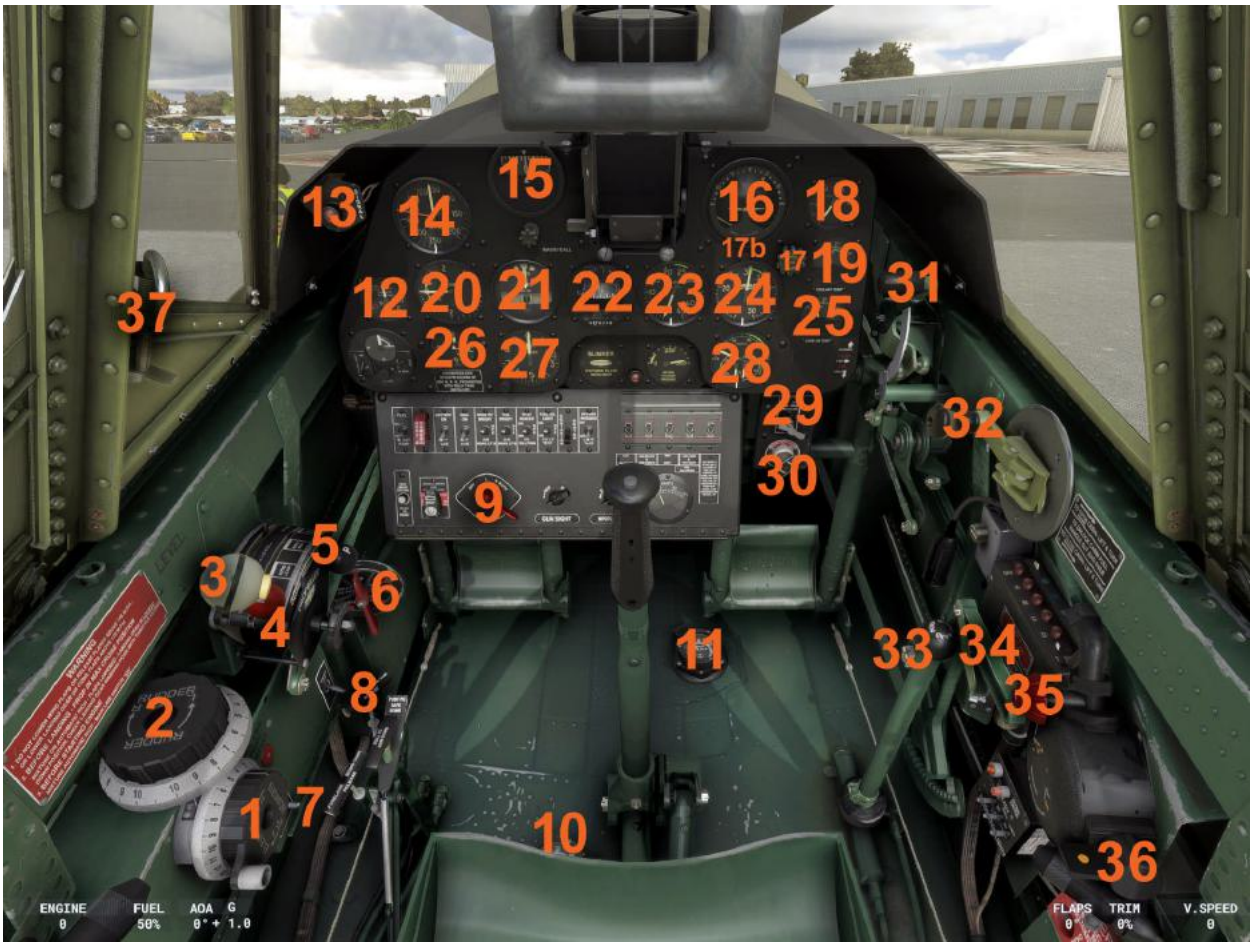
The P-40 tolerated harsh conditions in the widest possible variety of climates, from the heat and humidity of the Pacific to the dust and sand of the North African deserts to the Arctic conditions of Alaska and Russia. It was a semi-modular design and thus easy to overhaul and repair, including in the field. Although it lacked many of the aircraft innovations of the later War fighters, it made up for this with a strong structure including a five-spar wing, which enabled P-40s to even go so far as to survive several midair collisions (some intentional). Caldwell said P-40s "would take a tremendous amount of punishment, violent aerobatics as well as enemy action." Operational range was good by early war standards, and was almost double that of the Supermarine Spitfire or Messerschmitt Bf 109, although this was quickly overtaken my newer aircraft types.

The P-40 offered the additional advantage of low cost, which kept it in production as a ground-attack aircraft and a trainer long after it was obsolete as a fighter.

More N's were built than any other P-40 variant, some 5,215 in all. The last rolled off of the production line in Buffalo, NY, on November 30, 1944.

As of 2022, it was reported that some 72 P-40's were still in existence (25 of those being N models), with 31 of those (10 N) being airworthy.

# Main Panel




1. Elevator trim
2. Rudder trim
3. Throttle
4. Mixture
5. Propeller
6. Fuel tank selector
7. Starter switch
8. Landing light switch
9. Magnetos
10. Fuel: wing rear
11. Fuel: wing fwd
12. Fuel: fuselage
13. Gear warning light
14. Airspeed
15. Gyro compass
16. Artificial Horizon
17. Art Horiz Cage Knob (17b = bird adjust)
18. Suction
19. Coolant temp
20. Vertical Speed
21. Turn and slip
22. Whiskey compass
23. Prop RPM
24. Manifold Pressure
25. Carb temp
26. Clock
27. Altitude
28. Oil temp; oil pressure; fuel pressure
29. How air cabin entry
30. Primer
31. Carb temp adjust
32. Canopy open/close
33. Gear emergency pump handle
34. Cooling gills control
35. Oxygen pure (inop)
36. Oxygen on/off (pilot will put on mask)
37. Ventilation and clear-view window.

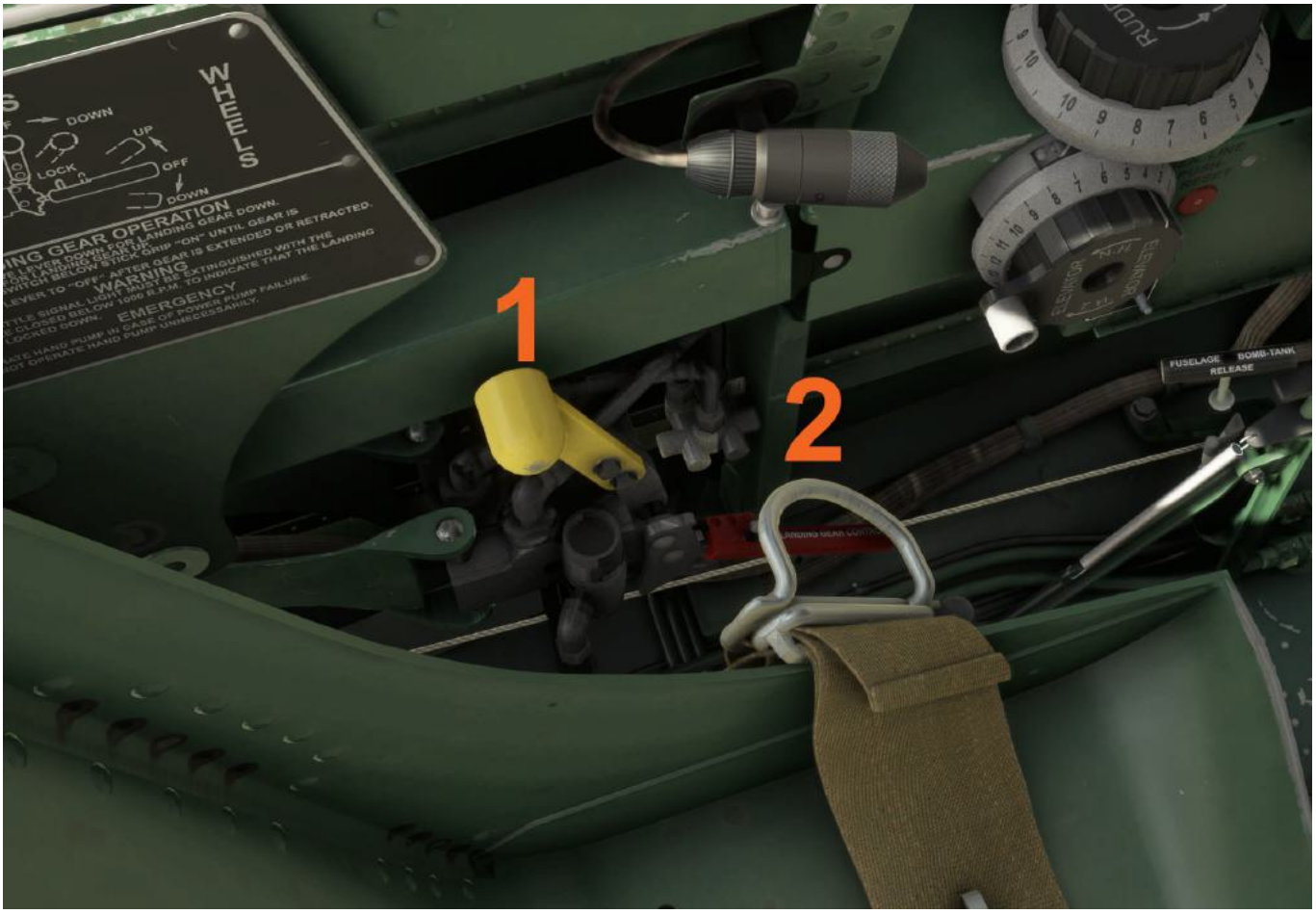
# Main Panel – Modern restored


1. Radio
2. Avionics on-off switch
3. Transponder

# Lower Panel


1. Fuel Pump
2. Master battery
3. Generator
4. Nav and tail lights
5. Pitot heat
6. Floor fuel gauge lights
7. Panel spotlights

# Landing Gear and Flaps




1. Gear lever
2. Flap lever

The real hydraulic system of the P-40N behaved differently than as animated on the model. The real gear lever movements are depicted on the accurate placard above the handle.

# Flap Position Indicator

The flap position indicator is a three-colour rod, which progressively emerges from the wing surface (left-hand wing only) as the flaps lower. All three colours being visible indicate ‘Flaps fully lowered’, through all three settings. When flaps are up, the top of the rod lies flush with the wing surface.

The rod is on the left-hand wing only, which we assume means that left-hand circuits were primarily used with the P-40N.

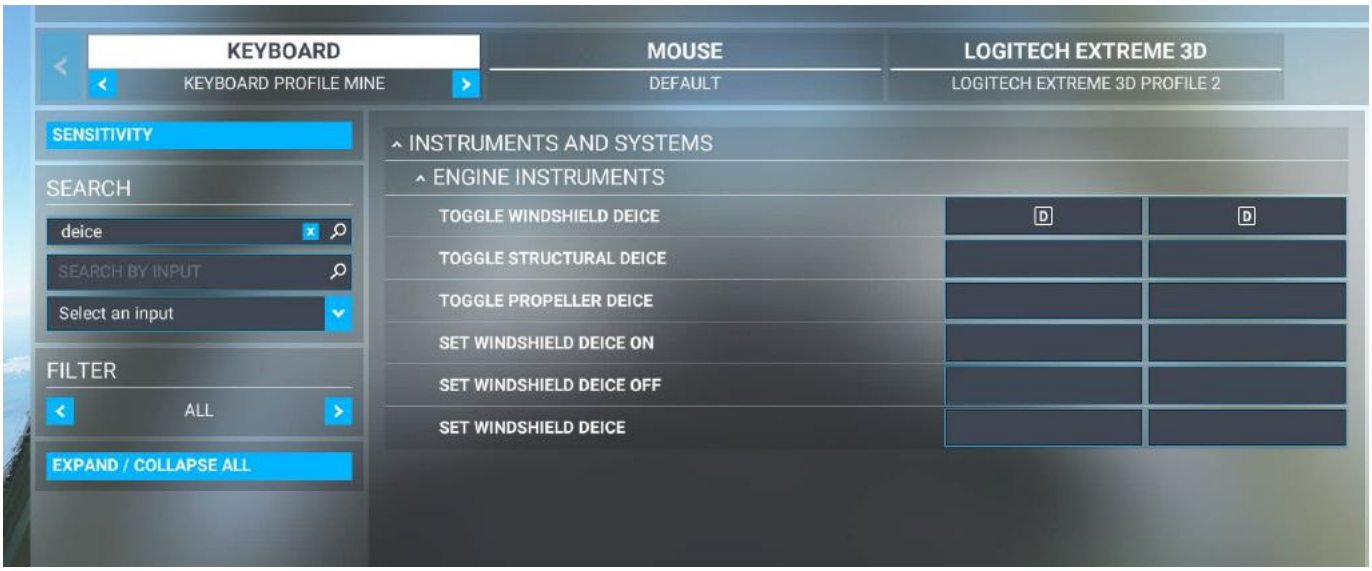
# Gear Position Indicator


Gear position is indicated by a yellow rod, which emerges from the wing surface as the gear lowers. This rod appears on both wings. The rods aren’t easily visible from the model’s cockpit, and it's suggested that you do a check using the external camera.

# Pilot Visibility


In order to have the pilot exit the aircraft on the ground, click one of the two bolts under the panel glareshield. The same applies for the civilian airshow variant.

# Windscreen Deice




To de-ice the windscreen if needed, it is recommended to set up a key on your keyboard or button on your controller to do so. The name of the input is provided above, along with an example key.

The engine must be running for the deicing system to function.

# *Flying the* P-40N

*(This procedure assumes you have saved a flight with the aircraft in 'cold and dark' mode. If not, certain actions will already be set.)*

**Before Starting:**

1. **Ignition** switch "OFF"
2. **Parking brakes** "ON"
3. **Flight controls** free and correct
4. Set **propeller pitch** to fully fine (full forward)
5. Turn **fuel selector** to fuselage tank
6. Check all **fuel gauges** for quantity

**Starting the Engine:**

1. Open **throttle** approximately one quarter
2. **Battery** and **generator** switches "ON"
3. **Prop lever** fully forward
4. Return **mixture control** to 'rich' (full aft)
5.Set **cowl flaps** in fully open position
6. Check fuel selector is on fuselage tank
7. **Prime** engine 2 to 4 strokes
8. Turn **magneto switch** to 'both', and then:

***Option 1: Use starter switch below throttle to start engine***
***Option2: For user convenience, if option 1 is difficult, turn magneto switch one extra step to start engine.***

**Engine Warm-Up:**

1. When engine starts, warm the engine at 800-1000 rpm until oil pressure stabilizes.
2. As engine warms, increase idle to 1400 rpm.
3. In cold climates, move carburetor air control to "HOT"

4. When engine warm, set prop to 2200 rpm and manifold to 28.5.

**Taxiing:**

1. In cold climates, pitot heat switch “ON”
2. If full horsepower is desired, carburetor air control to “COLD”
3. Set cockpit heat as desired.

**Take-Off:**

1. Fuel selector to fuselage
2. Wing flaps up
3. Controls free
4. Prop to **3000** rpm
5. Booster pump “ON”
6. Manifold to **52** inches of mercury.
7.When aircraft has gained **sufficient speed**, raise tail slightly.
8.When flying speed has been reached, **the airplane will fly itself off the ground, using slight backpressure on the control stick.**
9. As soon as off ground and clear of obstacles, reduce manifold to **44.2** inches of mercury.
10. Apply **brakes** before retracting gear
11. If **flaps** used on take-off, do not retract below 500 feet.

**Climb:**

1. **Combat climb** is 15 minutes at **3000** rpm and **44.4** manifold; after that, reduce to **2600** rpm and **38.3** manifold
2. Ferry climb is **2280 rpm at 38.7 manifold.**
3. Cowl flap lever to “COMBAT CLIMB” position.
4. Best **climb speed** (sea level to 8000’) is 140 mph

**General Flying:**

**a. Fuselage** tank “FUS” for starting and take-off
**b. Fuselage** tank “FUS”
**c. Then wing** tanks “FRONT WING” then “REAR WING”


3. **Trim** the aircraft for level flight

4. Ratios of manifold pressure to prop rpm to be used:

| Manifold pressure: | Allowable RPM limits: |
|---|---|
| 45.5 | 3000 +/- 40 |
| 37.2 | 2600 +/- 40 |
| 30.8 | 2280 +/- 40 |
| 28.5 | 2190 +/- 75 |
| 24 | 1950 +/- 75 |

5. **Stalls** (approximate only – will depend on aircraft weight):

| | |
|---|---|
| Landing gear up – flaps up | 88 mph |

| | |
|---|---|
| Landing gear down – flaps up | 90 mph |
| Landing gear up – flaps down | 78 mph |
| Landing gear down – flaps down | 79 mph |

6. Spins: **intentional spinning is prohibited**. If a spin should develop, the normal methods of recovery must be employed **at once** and the importance of **maintaining full opposite rudder** is stressed. Crack the throttle open and at normal loadings and centre of gravity positions apply full opposite rudder. Then after approximately one-half turn of the spin, push the control stick forward with a quick positive motion. This should effectively straighten out the airplane within two turns. It will usually take at a minimum 2000-2500 feet to recover, coming out in a spiral dive.

7. All aerobatics are prohibited with auxiliary tanks or bombs mounted.

8. Dives:

Maximum permissible dive is **496 mph** indicated.
Cowl flaps must be in **combat climb** setting.
**Minimum** manifold pressure during a dive is **21 to 23** inches mercury.

**Normal Landing:**

1. A curved, sideslip approach is recommended, due to poor visibility over the nose.
2. Engine **cowl flaps** to open below **175 IAS**.
3. Landing **gear down** below **175 IAS**.
4. On preliminary approach, reduce speed to **140 IAS** and open the **canopy**.
5. **Lower wing flaps** below **140 IAS**
6. **Mixture** lever fully forward
7. Throttle to 2000 rpm.
8. **Carburetor air control** to “COLD”, except to “FILTERED” in dusty conditions.
9. Landing gear **warning light** will come on if gear not down and below 1000 rpm.
10. Final approach: **throttle fully back** (power off) recommended, as a power on approach is very flat and visibility over the nose will be obscured.
Normal approach speeds:

Power **“ON”** final approach **110** IAS
Power **“OFF”** final approach **130** IAS

11. In a cross wind or strong gusts, half flaps are recommended with a tail high landing. Land power “ON” provided sufficient runway is available, at 95 to 100 IAS.

12. Go around: If the initial approach is unsuccessful and the landing is not completed, increase manifold pressure to 44.2 inches of mercury. Retract flaps after gaining at least 500 feet altitude.

**Stopping Engine:**

1. Apply **parking brake**
2. Open throttle to approximately 1300 rpm, and then pull the mixture control to the **IDLE CUT-OFF** position (due to automixture, inop in simulation).
3. When the propeller stops spinning, turn the magneto switch to “OFF”
4. All **electrical switches** to “OFF”
5. **Generator switch** to “OFF”
6. **Battery** “OFF”

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**Emergencies**:

To challenge your flying skills, use of MSFS’s programmable random failures is highly recommended!

In the event of engine failure, undercarriage and flaps will not work due to loss of the automatic hydraulic pump. In order to lower the flaps and undercarriage:
1. Move undercarriage/flap selectors to down, as required
2. Pump (click) manual hydraulic pump lever until gear/flaps are down.

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# Night Lighting

The intensity of the red ‘night vision’ lighting is controlled via the lower panel knob, item 7 on the “**Lower Panel**” menu above.

# Thank you:

- Bill Ortiz, of Lionheart Creations LLC for test flying and general help.
- Ron H., for great help with the new gauge formats.

- And everyone else for their encouragement, input and contributions! -

# Support:

support@flight-replicas.com

All requests for support must be accompanied by the following information:

1. Place/website where the P-40N was purchased;
2. Order number;
3. Name used when purchasing; and
4. Date of purchase.

No support will be available without this information.