

ROYAL AUSTRALIAN AIR FORCE HEADQUARTERS

36A

File BF

FORWARD ECHELON

Commonwealth Govt. Offices,
Anzac Square,
Adelaide Street,
BRISBANE.



26th August, 1943.

In Reply Please Quote

No. 1360/6/Eng.

RECORDED IN REGISTRY
R.A.A.F. COMMAND
Date 26 AUG 1943

From: Commanding Officer, Forward Echelon.

To: Headquarters, R.A.A.F. Command.
Attention: S.A.S.O.
Engineer Officer.

Subject: P40-N AEROPLANES.

32A

Reference: (a) R.A.A.F. Command letter 2022 dated 24th August, 1943.

1. From the limited amount of printed matter available on the P40-N type aircraft, and from conversations with U.S.A.A.C. personnel, the attached information has been compiled.

2. As U.S.A.A.C. Technical Orders have not yet been completely prepared for this aircraft, and a copy of the aircraft specification is not available, the data should be accepted as approximate only; this applies particularly to the performance figures.

3. Further particulars will be forwarded after a physical inspection of the aircraft has been made. //

W.D. Richmond
(W.D. Richmond),
Group Captain,
Commanding Officer,
Forward Echelon,
R.A.A.F. HEADQUARTERS.

for

40
Ops 1A

A physical inspection seems to be the only way to find out.

Please follow up. See also minute 37
& let me have your comments.
W.D. Richmond
Ops 1. 25/8

452.13

OPERATIONAL COMPARISON P40-E AND P40-N AIRCRAFT.

36B

ITEM	P40-E	P40-N
Rated Altitude	15,500' - ?	17,300'
Top speed at sea level	300 M.P.H.	312 M.P.H.
Top speed at rated altitude	338 M.P.H.	364 M.P.H.
Rate of climb		+ 210 F/M to 20,000'
Cruising speed	200 M.P.H.	212 M.P.H.
Dive	Faster in dive	
Manoeuverability		Increased.
Gross weight	8500 lbs.	7500 lbs.
Engine	V1710-35	V1710-81
Fuel Capacity	130 Imp. galls.	100 Imp. galls.
Fuel tanks	Metal with self sealing liners	Non metallic fuel cell
	Front and rear wing tanks.	Rear wing tank only; (front tank may be installed.)
Fuel gauges	U.S. & British marking	U.S. markings only.
Oil Tank Capacity	11.3 Imp. galls.	6.7 Imp. galls.
Total capacity oil system	14.5 Imp. galls.	11 Imp. galls.
Oil Dilution System	Electrical.	Manual.
Coolant System		Armour protected.
Overall dimensions		Similar with exception of fuselage which is 20" longer.
Armour Plate		Side baffle protection for pilot's side.
Rear vision		Improved.
Wind shield	Defrosting type	Single panel.
Brake system		Similar.
Hydraulic controls	Hyd. gun charger	Manual gun charger.
	Emergency hydraulic system	Deleted.
Propellor		Anti icing slinger ring installation.
Manifold pressure		Automatic type.
Engine controls		Friction adjustment.
		Break down seal on throttle quadrant.

36B

(2)

ITEM	P40-E	P40-N
Instruments	Propellor warning light	Deleted.
	Coolant warning light	"
	Suction guage, rate of climb indicator	"
	Vacuum bank and turn indicator	Electric.
	Electric flat & wheel position indicator	Visual type.
	Tail wheel indicator	Deleted.
	Electrically operated Aileron wing tab.	Manual type.
	Landing light	Removed
	Directional Gyro	"
	Artificial Horison	"
Bomb release	Electrical	Manual
Engine Starter	Electrical	Manual
	Identification light	Similar.
Wing fixed guns	6x .50 calibre	4x .50 calibre. (extra two may be fitted.)
Wing bombs	6x 20 lb. bombs	Removed.
Provision for belly cowl bombs		Similar.
Oxygen regulator	Constant flow type	Demand type.
Belly tanks	43.4 Imp. galls.	43.4, 60.5 or 125 Imperial gallon tanks.

NOTE:For fuller details refer to copy of notes held by Engineer Officer, R.A.A.F. Command.

401-B

40A

D I F F E R E N C E B E T W E E N

P-40E, P-40E-1 AND P-40N AIRCRAFT

Notes from
Factory Representative's Report

APRIL 13, 1943.

April 13, 1943.

DIFFERENCE BETWEEN P40E, P-40E-1, AND P40N AIRCRAFT

The differences outlined herein apply to the P-40E, P40E-1, and P-40N aircraft. This information is given in a descriptive manner only. No attempt is made to list detail parts or give installation numbers.

1. General Assembly.

Overall dimensions are the same for both airplanes except for the length.

The P-40E and P-40E-1 airplanes are approximately 20 inches shorter than the P-40N airplane. This is due to the extended fuselage which the P-40N airplane has.

The gross weight of the P-40E and P-40E-1 airplanes was 8500 pounds. The gross weight of the P-40N airplane is approximately 7500 pounds.

P-40E and P-40E-1 aircraft were fabricated from aluminum alloy, P-40N aircraft shall be eventually fabricated almost entirely of alclad.

2. Attachment Wing to Fuselage.

Physically the wings and fuselage of all three aircraft are interchangeable. There are differences in the electrical systems of the three aircraft but by means of rewiring the wing to fuselage connector plugs the P-40N panel can be installed on P-40E or P-40E-1 airplanes.

3. Wing Erection.

The wing erections of both airplanes are interchangeable except for minor detail parts.

4. Installation - Empennage.

P-40N aircraft are equipped with an elevator that has distributed balance. The elevators on the three aircraft are interchangeable. Rudders on the P-40N aircraft have been modified to provide for the extended tail. This consists of a bracket which holds the trim tab actuator unit. Old rudders can be made to fit P-40N Airplanes by the use of this bracket which can be installed in the field.

One other item of note in the elevator and rudder in the P-40N aircraft is that P-40N rudder and elevator units are equipped with dust seals to prevent dust and frime from entering into the bearings.

In addition to this all trim tab actuators and extensions are lubricated with Beacon M285 low-temperature grease on P-40N aircraft.

5. Fuselage Assembly.

The fuselage of the first 400 P-40N aircraft is essentially the same as that in the P-40E and P-40E-1 aircraft except for the tail extension which is a section approximately 20 inches in length which has been added on the tail end of the aircraft in order that flying characteristics of the aircraft can be improved by the relocation of the rudder and fin.

5. Fuselage Assembly.- Cont'd

P-40E-1 aircraft did not have the additional pilot's head armor plate. Starting with approximately the 561st article P-40E-1 airplanes were equipped with the additional pilot's head armor. This condition exists up to the 401st article of the P-40N contract. The 401st airplane and subsequent shall have the redesigned fuselage which has improved rear vision due to the incorporation of a deck section aft of the pilot's armor at Station No. 5. The armor plate is also changed starting with this number aircraft and provides for side baffles on the blade to give protection to the pilot's side and this armor is not interchangeable with that mentioned above. The front armor plate on P-40E and P-40E-1 airplane is not interchangeable with that used on P-40N airplanes due to deletion of the apron part of the armor plate. P-40E and P-40E-1 aircraft were equipped with face hardened armor plate. P-40N aircraft are being equipped with the homogeneous type plate.

The first 100 P-40E aircraft had non-defrosting type windshield. Subsequent to the 100th article P-40E aircraft and all P-40E-1 aircraft had a defrosting type windshield which consisted of an outer and inner pane with hot air ducted between them. P-40N aircraft are again equipped with the single panel type windshield.

6. Installation - Cowl and Covering.

Cowl and covering on P-40E and P-40E-1 aircraft were identical except for the fact that top cowl on P-40E-1 aircraft had provision for a ring and bead sight. This in no way effects interchangeability of the two cowls on P-40E and P-40E-1 airplane. P-40N aircraft had a redesigned top cowl to provide for the carburetor air filter. This top cowl is not interchangeable with the top cowl on P-40E and P-40E-1 aircraft. Side cowl on P-40N aircraft has provisions for the installation of a filter unit. The P-40N aircraft right side cowl has also been modified to provide for access to the manual cuno oil type filter which shall be installed at an early date on P-40N aircraft.

Exit ducts on P-40N aircraft differ from those on P-40E and P-40E-1 aircraft due to the fact that provision has been made for the addition of coolant radiator shutters if they should ever be installed.

7. Installation - Landing Gear.

P-40N aircraft up to the 400th article are equipped with 87-13-901-10 landing gear. P-40E and P-40E-1 aircraft were equipped with the 87-31-501 landing gear. Certain parts of these gears are interchangeable, but the pinion gears are changed on P-40N aircraft due to the incorporation of a forged chassis bulkhead and, therefore, these gears are not interchangeable insofar as installation is concerned between P-40N and P-40E and P-40E-1 aircraft.

Size of wheels and tires is the same on P-40E and P-40E-1 and the first 400 P-40N aircraft. This includes brakes. Start-in with the 401st airplane, the P-40N airplanes shall have 27" smooth contour wheels. This requires a change in the landing gear axle to accommodate this wheel.

Starting with the 401st aircraft also, P-40N airplanes shall be equipped with the landing gear dust excluder boot which is installed on the landing gear oleo. This boot cannot be installed on the first 400 P-40N aircraft nor on the P-40E's or P-40E-1's.

8. Installation - Brake System.

The brake system on the P-40E and P-40E-1 and first 400 P-40N airplanes was identical. On the 401st P-40N the brake size shall be changed from 12" x 3 $\frac{1}{2}$ " to 11" x 3". This change is related to the change mentioned in Paragraph 7 above with relation to the change from 30" to 27" smooth contour wheels.

9. Installation - Hydraulic Controls.

All P-40E and P-40E-1 aircraft with the exception of approximately the last 200 of the P-40E-1 contract, were equipped with Bendix hydraulic gun charging. P-40N aircraft have manual gun charging. That is, the guns must be charged on the ground. Manual gun charges are furnished with the aircraft.

P-40E and P-40E-1 aircraft had an emergency hydraulic system which consisted of an extra hydraulic hand pump and an auxiliary tank. P-40N aircraft have had this system deleted.

10. Installation - Tail Wheel. The tail wheel installation is essentially the same in all three aircraft.

11. Installation - Engine.

Detail differences are covered under the item of fuel, oil, coolant, and breather and vent system.

P-40E and P-40E-1 aircraft were equipped with the Allison V-1710-F3R engine. P-40N aircraft are equipped with the Allison V-1710-F20R engines.

P-40N aircraft are equipped with a propeller which has a wider blade than the one used on P-40E and P-40E-1 airplanes. This affects interchangeability of the propeller due to the increased size of the propeller blade cut-outs in the spinners. In addition to this, P-40N aircraft have provisions for the installation of an anti-icing slinger ring. P-40E and P-40E-1 aircraft did not have this provision.

P-40N aircraft are equipped with an automatic manifold pressure regulator. P-40E and P-40E-1 aircraft did not have this provision. It is intended to install automatic engine control units ("Idiot's Delight") at some time later in the P-40N contract.

12. Installation - Fuel System.

P-40E and P-40E-1 aircraft were equipped with metal tank fuel shells with self-sealing liners. P-40N aircraft are equipped with non-metallic fuel cells. As complete units, that is the tanks and shell from the P-40E or P-40E-1 aircraft, can be installed in P-40N aircraft and P-40N tanks can be installed in P-40E or P-40E-1 aircraft. Fuel cells on P-40N aircraft are of the aromatic resistant type whereas fuel tanks on P-40E and P-40E-1 aircraft were not of the aromatic resistant type but were sloshed with Fuller's compound. P-40N aircraft, as delivered, are only equipped with the rear wing tank and the fuselage tank installed. The front tanks are left out, but space provisions for the tanks are made in the aircraft for future installation of these tanks in service.

Total fuel capacity has been reduced from 156 to 120 U.S. gallon.

The fuel tanks dials on P-40E and P-40N aircraft are marked in U.S. gallons. On P-40E and P-40N aircraft are marked in U.S. gallons. On P-40E-1 airplanes they were marked in British

12. Installation - Fuel System (Cont'd)

Imperial gallons. P-40E and P-40E-1 aircraft were equipped with a Type G-6 auxiliary fuel pump. In P-40N aircraft this has been changed to a Type G-9. The engine-driven fuel pump was Type G-9 for all three aircraft.

Except for approximately the first 225 P-40E airplanes, all P-40E P-40E-1, and P-40N airplanes have self-sealing hose.

13. Installation - Oil System.

P-40N aircraft are equipped with an oil tank which has a capacity of 8 U.S. Gallons. P-40E and P-40E-1 aircraft had an oil tank 13.6 U.S. Gallons. The oil tank installation is also changed on P-40N airplanes due to the fact that the present tank is shorter than the one previously used. Total capacity of the oil system on P-40N aircraft is approximately 13 U.S. Gallons. On P-40E and P-40E-1 aircraft the capacity of the system was approximately 17.4 U.S. gallons. The size of oil scavenger lines has been changed from 1 1/4" to 2" on P-40N airplanes. The "Y" drain has been increased from 1 1/2" to 2" on P-40N's.

P-40E and P-40E-1 aircraft were equipped with the Type D-8 thermostatic valves whereas some of the earlier P-40N aircraft are equipped with Harrison Rotary Valves on the Oil coolers. P-40E and P-40E-1 aircraft were equipped with copper type oil coolers. P-40N aircraft, except for those equipped with the Harrison Rotary valve mentioned above, shall be equipped with aluminum type oil coolers. Both aluminum and copper type coolers are interchangeable.

P-40E and P-40E-1 aircraft had an engine which was equipped with an automatic type Cuno oil filter. This is also true of some of the earlier P-40N aircraft which are equipped with the automatic type Cuno oil filter but shall change upon receipt of engines equipped with the manual type oil filter.

14. Installation - Breather and Vent.

Due to the fact that the engines are different on P-40E and P-40E-1 and P-40N aircraft the breather and vent lines differ somewhat. Particular reference is made to the front engine breather which is different due to the change in the connection at the forward end of the engine. P-40N aircraft have a welded tube drain in lieu of the drain casting used in P-40E and P-40E-1 aircraft.

Due to the installations which have been changed, the majority of the lines have been changed on P-40N aircraft from those on P-40E and P-40E-1 aircraft.

15. Installation - Coolant System.

P-40E and P-40E-1 aircraft were equipped with copper type radiators. Approximately the first 400 aircraft of the P-40N series shall also be equipped with the copper type radiators. Subsequent to this point, the P-40N aircraft shall have aluminum alloy radiators. All radiators are interchangeable.

P-40E and P-40E-1 airplanes and approximately the first 400 P-40N aircraft shall have the old type sniffer valve. This shall be replaced by an 85033 (AC Spark Plug) sniffer valve on later P-40N airplanes.

16. Installation - Engine Controls.

P-40E aircraft did not have a quadrant which provided for a friction adjustment; Some of the P-40E-1 airplanes were similarly equipped, but approximately the last four hundred P-40E-1 airplanes had a friction adjustment device on the throttle

16. Installation - Engine Controls.

P-40N aircraft shall also have a friction device on the throttle quadrant, but it differs from that used on the P-40E-1 airplanes in that friction adjustment can only be made in flight in the throttle lever. Friction adjustment on mixture and propeller can only be made on the ground. In addition to this P-40N airplanes have a break-down seal on the throttle quadrant which indicates after every flight whether the airplane has been run at emergency war power rating.

P-40E and P-40E-1 airplanes had carburetor air head which consisted of hot air being conducted from the exit duct through a rubber sleeve into the carburetor. P-40N aircraft have hot air which is taken off of the exhaust shrouds. The hot air control on the P-40E and P-40E-1 aircraft was of the push-pull type which only controlled the hot and cold air. P-40N aircraft have three way control which controls the selection of hot air, filtered air, and cold air, at will.

17. Installation- Vacuum System.

P-40E and P-40E-1 aircraft had a vacuum system. P-40N aircraft had this system deleted entirely, due to the removal of the vacuum operating instruments.

18. Installation - Instruments.

P-40N airplanes have the following instruments deleted, which P-40E and P-40E-1 airplanes had installed: Propeller warning light, coolant warning light, suction gage, rate-of-climb indicator, directional gyro, and bank-and-turn indicator. In lieu of the vacuum bank-and-turn indicator, the electrical bank-and-turn indicator is provided on P-40N airplanes. P-40N aircraft have provisions for the installation of carburetor air heat which P-40E-1 aircraft did not have. P-40E airplanes had this installation installed. (On P-40N aircraft the carburetor air heat thermometer installation is shipped as part of the winterization kit.)

Instrument panels on the P-40N will not accommodate all the instruments which were installed in P-40E and P-40E-1 airplanes.

The electric flap and wheel position indicator has been deleted from P-40N aircraft. In lieu thereof, visual flap type indicators have been installed on the landing gear and flaps. There is no tail wheel indicator on the P-40N as was installed on the other two airplanes.

19. Installation - Flight Control.

The flight controls on the P-40E and P-40E-1 aircraft were the same. P-40N aircraft have different flight controls due to the addition of the 20" fuselage extension which required an extension of the rudder cables and a change in the trim tab extension. The P-40N aircraft also do not have an electrically operated aileron trim tab. This has been replaced by a manual type trim tab adjustment, which is adjustable on the ground only.

20. Installation - Airplane Electrical.

P-40N electrical system differs from P-40E and P-40E-1 electrical systems as follows. For the sake of clarity the description herein has been broken down into three sections: (A) Panel Electrical, (B) Fuselage Electrical, and (C) General Electrical.

A. Panel Electrical.

On P-40N airplanes all conduits have been replaced by the use of the loom.

No junction boxes are used.

of Lettered insulator blocks are exposed. Terminal blocks are of the NAS type in lieu of the Curtiss type terminal blocks.

The landing gear lock-up switch has been removed. The only switch which has been retained is the landing gear warning switch.

20. Installation - Airplane Electrical (cont'd).

A. Panel Electrical (cont'd).

The P-40N airplane has no landing light installed on the left-hand panel. Junction boxes which are installed inside of the wing beneath the top wing skin have been deleted. Gun relays have been removed from the main switch box beneath the instrument panel as installed in P-40E and P-40E-1 airplanes and replaced in the wing panels. The number of gun relays has been decreased. Previously there was one relay to every two guns. This has been changed to one relay for every three guns; thus, decreasing the number of relays by one.

The electric trim tab motor has been deleted. Electrical provision for the wing bombs has been removed.

B. Fuselage Electrical.

In the fuselage all junction boxes except those mentioned herein have been removed. A new battery junction box has been installed; also a new main terminal box and a new main switch box underneath the instrument panel.

The P-40N aircraft has no electric starter; only a hand inertia starter is installed. The started pedal has been removed. The booster coil, which was previously connected with the starter pedal, is now interconnected with the starter engaging lever so that when the starter is engaged, the booster coil shall be energized. This switch is now mounted on the starter itself.

The landing gear warning switch on the throttle has been relocated to the firewall. The landing gear warning horn has been deleted and the coolant warning light as used on P-40E and P-40E-1 airplanes now serves as a landing gear warning light.

Circuit breakers have been changed from the Heineman Co. circuit breaker, Curtiss drawing 87-66-570 to circuit breakers constructed to 87-552-1060. These circuit breakers can be either Square D, Culter-Hammer, or Spencer Thermostat Company manufacture. All circuit breakers fabricated to 87-552-1060 are interchangeable regardless of the manufacture. The number of circuit breakers in the main junction box underneath the instrument panel has been changed from 7 to 5, but 3 new circuit breakers have been added on the battery junction box. They are Spencer D-6364 class.

These circuit breakers are not interchangeable with 87-552-1060 circuit breakers.

There are no fuses in the airplane other than those which are used in connection with the radio.

The battery installed is the small size, number 12AC-7D, weight 34 pounds and has an 11 ampere hour capacity. Provisions are made in the airplane for the installation of a 34 pound, 54 pound, or a 76-pound battery. P-40E and P-40E-1 aircraft were equipped with the 76-pound battery of 34 ampere hour capacity. The battery is installed between Sta. 9 and 10 in the same position as the battery was located in P-40E and P-40E-1 airplanes.

20. Installation - Airplane Electrical - (Cont'd)

B. Fuselage Electrical - (Cont'd)

P-40E-1 aircraft had provisions for identification lights. Approximately the first 800 P-40E-1 aircraft had the British type recognition lights installed. This consisted of one upper and one lower light. The remainder of the P-40E-1 aircraft had the Army type recognition lights installed which consisted of one upper and three lower lights. P-40E airplanes had no recognition lights installed, and the first 400 P-40N aircraft will have no recognition lights installed. The balance of the P-40N airplanes shall have Army type recognition lights installed which shall consist of one upper and three lower, the same as the last of the P-40E-1 airplanes, as mentioned above.

The firewall junction box has been changed.

C. Electrical General.

Terminals are changed from wedge on type to Stakon type.

All plugs in the aircraft are of the AN type except for the plugs which are used to interconnect the panel and the fuselage. This is of the Cannon type the same as that used on previous P-40 series airplanes. In the event it is desired to interchange panels or fuselages between P-40N, P-40E, and P-40E-1 airplanes, it will be necessary to re-wire these plugs.

P-40E airplanes did not have propeller warning lights installed. P-40N airplanes also do not have this light installed. P-40N aircraft have provisions for the inter-aircraft signal light which the P-40E and P-40E-1 did not have.

21. Installation - Radio.

The P-40E airplanes up to the 540th article had provisions for the Army SCR-284 radio. Subsequent to that the number, all P-40E and all P-40E-1 airplanes had provisions for the following radios; SCR-274-N, SCR-522, SCR-535, and SCR-515. P-40N aircraft from Number 1 through 80 had provisions for only the one receiver and one transmitter of the SCR-274-N and for the SCR-522 radios. From the 81st through the 400th article, the aircraft had provisions for the SCR-275-N, SCR-522, and SCR-695 radios. Starting with the 401st aircraft, P-40N airplanes shall have provisions for the three receivers and two transmitters of the SCR-274-N, and for the SCR-522, SCR-595, SCR-535, and SCR-515 Radios. The actual radios installed in these aircraft are dependant upon allocation.

The P-40E aircraft did not have provisions for AN-73 and AN-74 masts. It did not have the broad arrow antenna installed. P-40E-1 aircraft had provision for the broad arrow antenna, and the last two hundred P-40E-1 aircraft had provisions for the AN-73 and AN-74 masts. P-40N aircraft have provisions for the AN-73 and AN-74 masts. P-40N aircraft No. 81 and subsequent and all P-40E-1 airplanes had wiring for all radio sets whether they were installed or not, except for the SCR-515 which has G.R.E. wiring. P-40N aircraft have only wiring for the specific radio sets installed.

In the main switch box on P-40N airplanes a circuit breaker to Curtiss drawing 87-52-1060 has been added in lieu of the 2-ampere fuse which was previously furnished for the radios on P-40E and P-40E-1 aircraft. P-40E and P-40E-1 aircraft which had provisions for the interchangeable Army radio had provisions for the instal-

ation of the JB-29A junction box whereas P-40N aircraft have a BK-42 relay.

22. Installation - Wing Fixed Guns.

P-40E and P-40E-1 aircraft are equipped with six .50 calibre wing guns which were installed prior to delivery. P-40N aircraft have only four .50 caliber wing guns installed prior to delivery. The other two guns, along with all associated parts to complete the installation, are shipped as loose equipment along with the aircraft.

P-40E and P-40E-1 aircraft were equipped with the N-3A gun sight. The first 1000 P-40N aircraft shall be equipped with the Type N-3B gun sight which is the same as the N-3A except that the N-3B gun sight has been rewired to prevent compass deflections; that is, a change from a single wire to a two-wire system has been made. P-40E-1 aircraft had provisions for a ring and bead sight and actually had them installed. P-40E aircraft had no ring and bead sight installed nor any provisions for them. P-40N aircraft have a bead sight, but the ring sight is a part of the windshield.

P-40E and P-40E-1 aircraft did not have a gun sight crash pad installed. P-40N aircraft up to the 1000th aircraft shall have the Contractor-furnished crash pad. Aircraft subsequent to the 1000th article shall have a crash pad which is built into the sight. Upon installation of Type N-7 gun sight the only part of the gun sight provision that can be used is the support which bolts into the armor plate.

The bead sights on P-40E-1 and P-40N aircraft are not identical and they are not interchangeable.

23. Installation - Gun Camera

P-40E aircraft had provisions for the installation of the Army type gun camera on the electrical gun sight. P-40E-1 airplane had provisions for the British G-45 gun camera installed in the right-hand panel. Actually the installation consisted of a separate fairing which bolted into the lower side of the panel. P-40E aircraft, which had provisions for the Army type gun camera also had provisions for the over-run control. P-40E-1 aircraft had provisions for the exposur indicator required with the British G-45 gun camera. P-40N aircraft have no provisions for the over-run control. The gun camera in the P-40N aircraft is located in the P-40N aircraft is located in the right-hand landing gear fairing.

24. Installation - Wing Bombs.

P-40E and P-40E-1 aircraft had provisions for the six twenty-pound wing bombs. P-40N aircraft have had these provisions removed. Starting with approximately the 401st article of the P-40N contract, provisions shall be made in the aircraft for carrying the same compliment of bombs as can be carried under the belly cowl of P-40E, P-40E-1, and P-40N aircraft.

25. Installation - Furnishings.

P-40E airplanes had the round type duffle bag. P-40E-1 had a square type duffle bag which had provisions for a stowage of desert equipment. P-40N aircraft had a duffle bag similar to that installed in P-40E-1 airplanes.

P-40E and P-40N aircraft had a mooring kit provided. P-40E-1 aircraft had provision for installing the mooring kit but did not have the mooring kit installed.

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P-40E and P-40E-1 aircraft had provisions for the six twenty-pound wing bombs. P-40N aircraft have had these provisions removed. Starting with approximately the 401st article of the P-40N contract, provisions shall be made in the aircraft for carrying the same compliment of bombs as can be carried under the belly cowl of P-40E, P-40E-1, and P-40N aircraft.

25. Installation - Furnishings.

P-40E airplanes had the round type duffle bag. P-40E-1 had a square type duffle bag which had provisions for a stowage of desert equipment. P-40N aircraft had a duffle bag similar to that installed in P-40E-1 airplanes.

P-40E and P-40N aircraft had a mooring kit provided. P-40E-1 aircraft had provision for installing the mooring kit but did not have the mooring kit installed.

P-40E-1 and P-40N aircraft did not have data cases, which the P-40E had.

P-40E and P-40E-1 aircraft had a stowage for the parking harness. In the P-40N aircraft this provision has been removed.

The parking harness is installed in the duffle bag.

P-40E and P-40E-1 aircraft had a pilot's headrest. The first 400 P-40N aircraft do not have a headrest installed; but starting with the 401st aircraft, a new type of headrest shall be furnished.

On P-40E and P-40E-1 aircraft a pilot's relief tube was installed. In the P-40N aircraft this has been deleted.

P-40E and P-40E-1 aircraft had the metal type seat. P-40E-1 aircraft and P-40N aircraft seats have the seat depression installed. The first 400 P-40N aircraft may be equipped with either the wood or metal seat which is interchangeable with the seat installed in P-40E and P-40E-1 airplanes. P-40N aircraft subsequent to the 401st article shall have a seat which is not the same as the seat installed in previous P-40 series aircraft.

In addition to this the P-40N seat shall not be adjustable in flight. It must be adjusted on the ground. This seat is supported off of the armor plate in lieu of an its own support as provided in P-40E, P-40E-1 and first 400 P-40N airplanes.

P-40E-1 aircraft were equipped with a rear vision mirror which was located externally. P-40 aircraft have the rear vision mirror installed inside of the cabin subsequent to the 30th article. It is contemplated that a new type of mirror shall be installed at a later date in the contract. P-40E-1 aircraft had provisions for the Army low-pressure oxygen system with the old constant-flow type regulator. P-40E-1 aircraft had the same type oxygen system except that provisions were also made for the installation of a British type oxygen economiser. ~~P-40N aircraft are equipped with a demand type oxygen system.~~ Approximately the first 300 P-40N airplanes are to have the single-bottle installation, but a change is contemplated to remove the single-bottle and replace it with two smaller bottles.

All P-40E aircraft except approximately the 50 aircraft, had a glycol spray installation. All P-40E-1 aircraft had this installation installed. P-40N aircraft no longer have this installed.

26. Markings and Insignia.

P-40E aircraft had Army type camouflage applied. P-40E-1 might have either U.S. Army camouflage or the old British type camouflage or British desert camouflage dependant upon allocation. P-40E aircraft had the Roundel insignia applied. P-40E-1 aircraft had the Roundel insignia shipped as loose equipment with the aircraft except for flyaway aircraft which had it applied. P-40N aircraft shall likewise have the insignia applied in accordance with allocation except for Russian aircraft which shall have no insignia applied prior to delivery.

27. Installation - Belly Tanks.

P-40E aircraft had provisions for the installation of a 52 U.S. Gallon auxiliary fuel tank. P-40E-1 aircraft were also so equipped. P-40N aircraft have provisions for carrying a 52 gallon, 75 gallon or 150 gallon tank underneath the belly cowl. P-40N aircraft have droppable sway braces for the 75-gallon belly tank.

At approximately the 401st article P-40N airplanes shall be equipped with provisions for carrying two auxiliary external wing tanks of 225 U.S. Gallons capacity each.

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The same mounting provisions with suitable sway braces, which shall be furnished with all aircraft, can also accommodate the same compliment of bombs which would be carried on P-40E and P-40E-1 aircraft.

28. Installation - Pyrotechnics.

P-40E aircraft had provisions for the M-2 signal pistol. P-40E-1 aircraft had provisions for the installation of the British type automatic recognition device which is interchangeable with the Army type M-5 signal discharger. P-40N aircraft have provisions for the installation of a Type M-8 signal pistol.

In addition to this, P-40N aircraft have provisions for the installation of the Type AN-M-14 incendiary grenade.

29. Winterization.

P-40N aircraft have spare provisions for the installation of Winterization items. The winterization equipment is to be furnished in kit form and is only supplied upon aircraft which the Materiel Center designates.

30. Interchangeability.

In general, various installations on P-40E, P-40E-1, and P-40N aircraft are interchangeable. The discrepancies noted within the letter will have some affect upon actual installation of the various units, but the following may be considered as being interchangeable;

1. Fairings.
2. Aft keel cowls.
- N 3. Prestons radiators.
4. Engine mounts.
- N 5. Ailerons (if these are changed they must be changed in pairs; that is left and right, due to the change in the type of balance.)
- N 6. Elevators.
7. Fins.
8. Bullet-resistant windshield.
9. Cabin and windshield glass, except for the clear vision panel, which is installed on P-40N airplanes, and left side windshield.
10. Control stock assembly.
11. Wing tips.
12. Ammunition boxes. (These may be either plastic or stainless steele type).
13. Feed Chutes.
14. Tail wheel installation.
15. Flaps.
16. Flap retracting cylinder.
17. Hydraulic selector valve.
18. Hydraulic Pumps (both hand and electrically driven)
19. Front engine cowl attachment bulkhead.
20. Hydraulic reserve tank.
21. Fuel selector valve.
22. Stabilizer.
23. Trim tabs, except for aileron trim tab.
24. Actuator Units.

N These items affect the balance of the airplane.