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TECHNICAL ORDER No. 01-25CF-1

No. 3
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HANDBOOK
OF
OPERATION AND FLIGHT INSTRUCTIONS
FOR THE
MODELS P-40D AND P-40E PURSUIT AIRPLANES
MANUFACTURED BY
**CURTISS AEROPLANE DIVISION
CURTISS-WRIGHT CORP.**
BUFFALO, N. Y.

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SECTION IINTRODUCTION AND REFERENCES

1. This Technical Order is the Operation and Flight Instructions for the Models P-40D and P-40E Pursuit Airplanes. Pilots and other personnel who are required to understand the operation of this airplane will read and be familiar with the information contained herein.
2. Reference has been made in this Handbook to the following Technical Orders which contain applicable data and instructions:

T. O. No. 01-1-60	Use of Flaps
02-5AB-1	Preliminary Operation Instructions - V-1710-27 and V-1710-29.
03-5G-1	Inverters, Auxiliary Boxes & Lamp Assemblies
03-5G-2	To be Issued
03-10G-1	Operation of Carburetor Mixture Controls
03-20BA-1	Operation and Flight Instructions - Curtiss.

1. Airplane.

a. General. - The -40D and P-40E Pursuit Airplanes are single-place, low wing monoplanes. The overall dimensions are: span 37 feet 3-1/2 inches, length 31 feet 8-3/4 inches, and height at rest 10 feet 9 inches.

b. Wing. - The wing is of the stressed skin cantilever type, built in two pieces and jointed at the center line of the airplane. The wing tips are detachable. The joint where the two wing sections connect together will serve as a skid in case of an emergency landing with the landing gear retracted. The ailerons are both dynamically and aerodynamically balanced. The left aileron is fitted with an electrically controlled trim tab, while the right aileron trim tab is fixed and can be adjusted only on the ground. The flaps are the split trailing edge type extending from the aileron to near the center line of the airplane and are operated hydraulically either by an electric pump or by the auxiliary hand pump. An indicator on the left side of the instrument panel shows the relative position of the flaps any time the ignition switch is turned on.

c. Empennage. - The fixed horizontal and vertical stabilizers are of all metal construction. The fabric-covered rudder and elevators are dynamically balanced, and are equipped with metal-covered, flush-type trim tabs controllable from the cockpit.

d. Fuselage. - The fuselage is of aluminum alloy semi-monocoque type with an engine mount constructed of steel bearer tubes supported by aluminum alloy forgings. The fuselage access door is on the left side of the fuselage just forward of the tail surfaces. The constructure behind the pilot is of sufficient strength to withstand nose-over loads.

e. Landing Gear. - (1) General: The landing gear is equipped with oleo pneumatic shock struts which retract by rotating backward about a trunnion at the top of the strut. During retraction the strut is rotated 90° about its longitudinal axis by gears so that the wheel lies flush in the wing. The gear is locked in both the up and down positions by hydraulically operated mechanical locks. An electric warning horn sounds when the throttle is closed except when the wheels are down and locked. An indicator on the left side of the instrument panel shows the relative position of the landing gear whenever the ignition switch is turned on.

(2) Wheels and Brakes: The landing gear is equipped with special 30" diameter wheels and 8 ply smooth contour tires. The hydraulic brakes are 12 x 3-1/4 inch.

(3) Tail Wheel: The tail wheel assembly includes a steerable knuckle unit with oleo pneumatic strut and a 12-1/2 inch smooth contour tire and wheel. The tail wheel is steerable throughout the range of the rudder movement and is provided with an automatic throwout permitting free swiveling throughout the remainder of the 360°. Throwout occurs at approximately 35° deflection from the longitudinal axis. The tail wheel is fully retractable and operates "clam shell" type doors which enclose it completely after retraction. An indicator on the left side of the instrument panel shows the relative position of the landing gear whenever the ignition switch is turned on.

2. Power Plant.

a. Engine. - The engine is the Allison V-1710-39 with compression ratio 6.65 to 1, impeller gear ratio 8.80 to 1 and propeller gear ratio 2 to 1. For further description and ratings refer to T. O. No. 02-5AB-1.

b. Propeller. - The propeller is a Curtiss Constant Speed electrically operated type, which may be controlled automatically or by manual selection. When controlled automatically, a predetermined engine speed is held constant by means of a governor set by the propeller control on the throttle quadrant. When controlled by manual selection, the blade angle may be varied by operation of the "Increase" or "Decrease R.P.M." switch control which is independent of the governor.

c. Oil System. - The design amount of oil in the tank plus the oil in the system is approximately 16 gallons. The oil outlet is thru a pendulum valve which allows a 90° dive, a 60° climb or a ten second inverted flight, without uncovering the oil outlet provided the tank is one-third or more full. The design oil in the tank is indicated by a rivet completely thru the center of the filler neck. The oil level should be maintained to this rivet at all times. Auxiliary oil is carried by adding 3 gallons as alternate load above the design capacity indicated by the rivet. The oil dilution equipment provided for winter starting is operated by a switch mounted on the left side of the main switch panel.

d. Fuel System. - Fuel is carried in three "Self-sealing" tanks with a total capacity of 145.5 gallons. The main tank of 51.0 gallons capacity and the reserve tank of 32.0 gallons capacity are in the center of the wing, and the fuselage tank of 62.5 gallons capacity is aft of the pilot in the fuselage. See Figs. 2 and 3 for the flow and main units of the fuel system. The main and reserve tank gages are on the cockpit floor. The dial indicator gage for the fuselage tank is located on the left side of the instrument panel. All fuel tanks are of rubber construction

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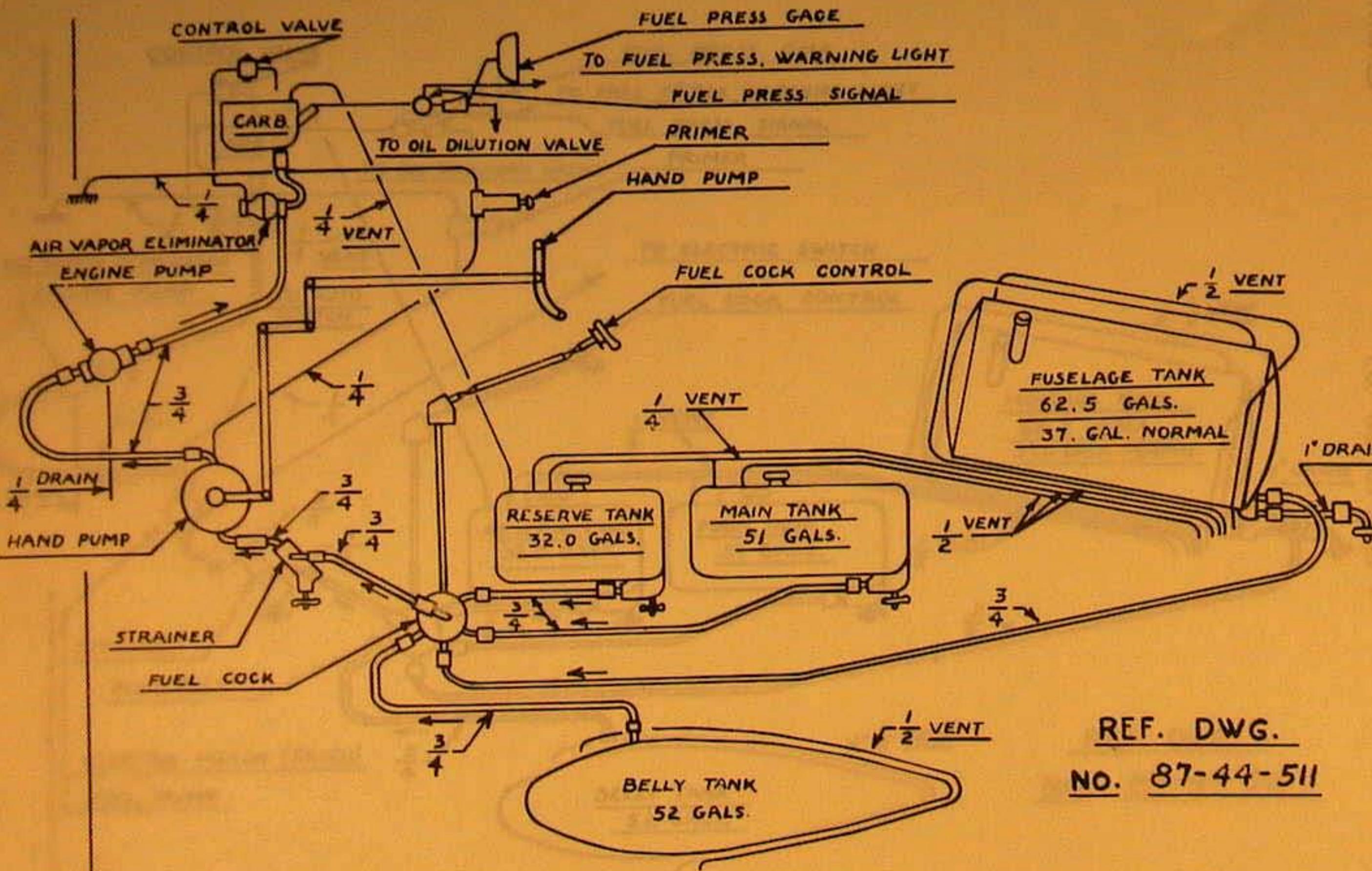
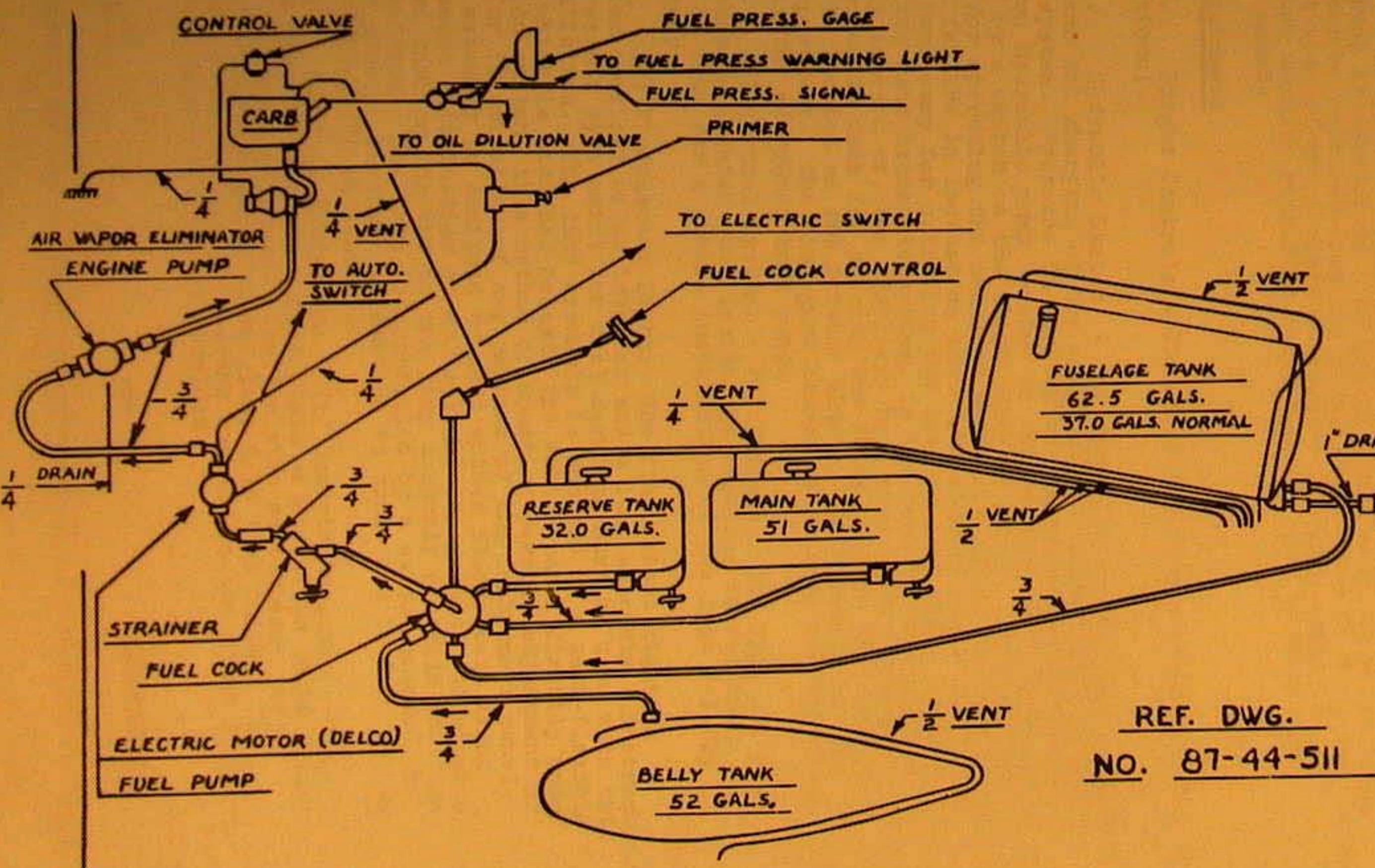


FIG. 2 - P-40D FUEL SYSTEM DIAGRAM

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FIG. 3 - P-40E FUEL SYSTEM DIAGRAM

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composed of six different layers firmly cemented together totaling 5/8 inch of thickness, and covered with an aluminum alloy shell. Auxiliary fuel is carried in a 52 gallon aluminum alloy belly tank. This tank may be released from the airplane by means of a handle located on the left side of the cockpit forward of the bomb controls. A fuel pressure warning signal is located on the left side of the instrument panel.

3. Equipment.

a. Flight Controls. - The stick and rudder pedal controls are conventional.

b. Hydraulic System. - The operation of the landing gear and flaps and the charging of the wing guns is accomplished by the hydraulic system. Pressure is applied to the system by an electrically driven hydraulic pump located in the rear of the fuselage and controlled by a switch on the flight control stick. An auxiliary hand pump for operating the complete hydraulic system in case of an electrical failure is located on the right side of the cockpit. An emergency hand pump for operating the landing gear only, in case of damage to the main hydraulic system, is the same as, and located immediately inboard of, the auxiliary hand pump. The emergency reserve hydraulic tank for storing the fluid used by the emergency hand pump is located on the forward side of the firewall in the engine compartment. The wing guns cannot be charged nor the flaps operated by the emergency hand pump.

c. Electrical System. - (1) Battery: The Type G-1 (24 volt) battery is located just inside the fuselage access door. Provision is made for a future installation of the Type F-1 (24 volt) battery.

(2) Fluorescent Light: The fluorescent lighting installation consists of an inverter and a lamp assembly. Instruments with fluorescent type paint for dial markings must be used with this type installation. The lamp assembly is mounted on a semi-flexible extension which is attached beneath the switch panel directly under the ignition switch, this method of mounting permits adjustment of the lamp for illumination of any portion of the instrument panel. This lamp assembly is designed to emit either fluorescent light for instrument illumination or white light for general illumination. The knurled knob on the end of the lamp assembly controls the type of light emitted. The lamp is controlled by a switch mounted on the switch panel. Further information is contained in T.O. No. 03-5G-1 and 03-5G-2 (To be issued).

d. Fuselage Equipment. - (1) Cockpit Enclosure:- The windshield front section is a flat plate of 1-1/2 inch thick bullet-resistant "Multiplate" glass. The two side sections are curved sections of non-shatterable plate glass 5/16 inch thick. The sliding canopy is operated by a crank mounted on the right longeron. An emergency canopy release is provided.

(2) Miscellaneous: A seat, safety belt, map case, data case and duffle bag are provided. The data case duffle bag, and engine and airplane tool kit are accessible thru the fuselage access door.

(3) Armour Plate: Armour plate is installed fore and aft of the pilot. The armour plate which completely shields the pilot from the rear is 5/16 inch thick. The armour plate in front of the pilot is 3/8 inch thick.

e. Heating and Ventilating Equipment. - A cockpit heating and ventilating system is operated by a push-pull control located below the instrument panel.

f. Oxygen Equipment. - A Type F-1 low pressure oxygen cylinder is permanently installed in the aft part of the fuselage and is accessible thru the fuselage door. A Type A-9 oxygen regulator is located on the floor of the cockpit at the right of the pilot. The oxygen cylinder filler valve is located immediately aft of the access door.

g. Communications Equipment. - The Type SCR-283 command radio set is installed with controls and microphone grouped on the right side of the cockpit. The Hi-Lo frequency switch for the receiver is also located on the right side of the cockpit.

h. Bombing Equipment. - The bomb load carried may be either six 20 lb. Type M42 fragmentation bombs, or six 20 lb. Type T7 practice bombs. The manual control for bomb release is accomplished by means of the L-21A bomb release handle on the floor of the cockpit at the left of the pilot. The electrical release is accomplished by means of the button on the Modified B-4 trigger switch on the control stick, and by the "BOMB" selector switch.

i. Gunnery Equipment. - (1) Gunnery Equipment for P-40D airplane:

(a) Wing Guns: Two hydraulically charged .50 caliber model M-2, fixed machine guns are mounted in each wing panel outside of the propeller disc. They are fired by operating the Modified Type B-4 trigger switch on the control stick in conjunction with a safety on the left side of the main switch panel. The safety switch has two positions, all guns either "ON" or "OFF". The wing guns may be charged by actuating the hydraulic control valves mounted under the main switch panel. Should the electric hydraulic pump fail, pressure may be kept in the lines by use of the outboard auxiliary hand pump. Provisions are made for 1,000 rounds (250 rounds per gun) of .50 caliber ammunition with links as design load and 2460 rounds (615 rounds per gun) as alternate load.

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(b) Cannon: Provisions for external attachment of 20 mm. Hispano-Suiza Birkigt cannon are made on the under surface of the wings just outboard of the outer .50 caliber gun. One cannon may be mounted under each wing panel by making the proper skin cutouts and installation of the equipment.

(c) Gun Sight: The Type N-3 optical gun sight with a modified reflector holder is installed, and is designed for full adjustment.

(d) Gun Camera: An aiming point type miniature gun camera can be mounted on the gun sight and operated by the trigger switch on the control stick in conjunction with the "CAMERA" toggle switch on the main switch panel.

(2) Gunnery Equipment for P-40E airplane: The P-40E has six .50 cal. model M-2 machine guns controlled and fired the same as the four wing guns on the model P-40D airplane. No provisions are made for cannon. Provisions are made for the 1410 rounds (235 rounds per gun) of .50 caliber ammunition with links as design load, and 1686 rounds (No. 1 gun 312, No. 2 gun 291, No. 3 gun 240 rounds) as alternate load. The gun sight and gun camera are the same as for the P-40D airplane.

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SECTION III.

GENERAL INSTRUCTIONS.

1. Location of Controls.

a. Flight Controls. - (1) Rudder Trim Tab: Left side of cockpit.

(2) Elevator Trim Tab: Left side of cockpit.

(3) Aileron Trim Tab: Center of Main Switch Panel.

b. Landing Gear Controls. - (1) Hydraulic Pump Switch: On control stick below trigger switch.

(2) Auxiliary Hydraulic Hand Pump: At right side of cockpit.

(3) Emergency Hydraulic Hand Pump: At right side of cockpit, just inboard of auxiliary hydraulic hand pump.

(4) Landing Gear Control Handle: At pilot's left. (Separate from flap control handle).

(5) Flap Control Handle: At pilot's left. (Separate from landing gear control handle).

(6) Landing Gear Warning Horn Disconnect Switch: On left side of cockpit forward of main switch panel and operated by an arm on the throttle rod.

(7) Brakes: On rudder pedals.

(8) Parking Brake: Push-pull knob at the left side of the instrument panel.

c. Power Plant Controls - (1) Throttle and Mixture Controls: Type B-21 engine control assembly on pilot's left.

(2) Propeller Control Switches: Left side of the main switch panel.

(3) Ignition Switch : Left side of main switch panel.

(4) Wobble Pump Control for P-40D: Forward of the engine control assembly.

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Figure 4.

Cockpit Arrangement and Controls - Left Side
(To be issued when available).

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Figure 5.

Cockpit Arrangement and Controls - Right Side
(To be issued when available).

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(5) Electric Fuel Pump for P-40E: Switch on left side of main switch panel.

(6) Primer Control: Right side of cockpit below the main switch panel.

(7) Fuel Selector Control: On left side of cockpit below the engine control quadrant.

(8) Carburettor Heat Control: On right side of the instrument panel.

(9) Cooling System Controls: A handle on right side of cockpit adjusts the position of the cowl flaps.

(10) Starter Control Switch: The starter control switch is located in a junction box on the cockpit floor immediately under the instrument panel and is actuated by a foot treadle mounted on the cover.

d. Other Controls. - (1) Electrical Controls: The following electrical controls are located on the main switch panel: -

- (a) Spotlights (Two) Switch.
- (b) Pitot Heater Switch.
- (c) Running Lights Switch.
- (d) Landing Light Switch.
- (e) Generator Circuit Switch.
- (f) Oil Dilution Switch.
- (g) Coolant & Fuel Pressure Test Switch.
- (h) Fluorescent Light Switch.
- (i) Electric Fuel Pump Switch.
- (j) Ammeter.
- (k) Gun Sight Rheostat.
- (l) Compass Rheostat.
- (m) Formation Lights Rheostat.

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- (2) Rudder Pedal Adjustment: Inboard side of each rudder pedal.
- (3) Pilot's Seat Adjustment: Right side of seat.
- (4) Oxygen Controls: Right side on floor of cockpit.
- (5) Radio Switches: Right side of cockpit.
- (6) Coolant System Warning Light: Right side of instrument panel.
- (7) Heating and Ventilating Control: Push-pull handle located under the right side of the main switch panel.
- (8) Bomb Release: Lower left side of cockpit.
- (9) Belly Tank Release: Lower forward left side of cockpit.
- (10) Cockpit Enclosure: The sliding canopy is operated by a crank located on the right longeron at the base of the wind-shield.
- (11) Gun Camera Control: Lower left side of cockpit.
- (12) Gun Charging Controls: Below main switch panel.

2. Operation of Controls.

a. Flight Controls. - (1) General: Operation of the rudder pedals and control stick is conventional. Three different adjustment positions of the rudder pedals may be obtained by pushing inboard on the control levers and moving the rudder pedal forward or aft to the desired position. The control is spring operated and snaps back into place automatically when the levers are released.

(2) Rudder Trim Tab: Rotate clockwise to obtain right yaw.

(3) Elevator Trim Tab: A crank handle is provided for rapid adjustment. Rotate clockwise to lower nose.

(4) Aileron Trim Tab: Raise switch to raise left wing. The switch returns to neutral "OFF" position when released allowing the trim tab to remain as adjusted.

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(5) Normal Operation of Flaps: Move control handle forward to lower flaps and aft to raise flaps. After placing control handle, squeeze the hydraulic pump switch below the control stick until the operation is complete and then return control handle to the normal position. Further instructions pertaining to the operation of the flaps is contained in T.O. No. 01-1-60.

(6) Emergency Operation of Flaps: If the electrical system fails, operate flaps by means of auxiliary hydraulic hand pump.

b. Landing Gear Controls. - (1) To Retract Landing Gear: Slide the safety latch bolt on the control handle forward and raise the handle to the up position. Then operate the hydraulic pump switch below the control stick until retraction is complete. Return lever to neutral position after completion of operation.

(2) To Lower Landing Gear: Place control handle in the down position and operate the hydraulic pump switch below the control stick until a few seconds after the indicator and warning horn indicate that the gear is down, at which time the down position locks will be engaged. If a further check is desired, move the auxiliary hydraulic hand pump lever. If a high load is required to move this lever the operator can be certain that the gear is locked down. Then return the control handle to the neutral position. The safety latch bolt prevents the accidental raising of the handle beyond the neutral position.

(3) Emergency Landing Gear Operation: If the electrical system should be inoperative, the landing gear can be operated by the auxiliary hydraulic hand pump. Should the auxiliary hand pump fail, as a last resort the landing gear should be operated by means of the emergency hydraulic hand pump.

(4) Warning Horn Disconnect Switch: Pull out the cam on throttle rod to disconnect switch temporarily. Automatic engagement of the switch results the next time the throttle is opened to its stop, bringing the horn back into operation.

(5) Brakes: The brakes are operated by the conventional toe-operated pedals. The parking brake lever may be engaged by pulling it when the pedals are depressed. It is automatically disengaged when the pedals are again depressed.

c. Power Plant Controls. - (1) General: Complete operation and flight instructions for the engine are contained in T.O. No. 02-5AB-1.

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(2) Mixture Control: Refer to T.O. No. 03-100-1.

The four main positions of the mixture control are : "Idle Cut-Off", "Automatic Lean", "Automatic Rich" and "Full Rich". The mixture should be at "Automatic Rich" for any take-off. The "Automatic Rich" position should be used for normal flight conditions, climb and level flight at normal and military power ratings, cruising and landing. The extreme rear position of the mixture control is "Idle Cut-Off".

(3) Starting: When starting the engine, perform the following operations in the sequence given below.

- (a) Pull the engine through by hand, with ignition off, if it has been idle for more than two hours.
- (b) Carburettor heat control on "COLD".
- (c) Cooling system shutter control as required.
- (d) Main line switches on.
- (e) Propeller switch "ON" - control set for take-off R.P.M.
- (f) Throttle set from 800 to 1000 R.P.M.
- (g) Mixture control at "Idle Cut-Off" position.
- (h) Wobble pump to 4 lbs. pressure.
- (i) Prime two to four strokes.
- (j) Mixture Control - to "Auto. Rich".
- (k) "Energize" starter.
- (l) "Engage" starter.

(m) Do not wobble pump to more than 4 lbs. pressure with the mixture control out of "Idle Cut-Off" position. Prime to keep the engine from stalling. Pumping the throttle does not prime the engine.

CAUTION : If engine does not fire, return mixture control lever to idle cut-off immediately.

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T.O. No. 01-25CP-1.

(4) Stopping: Stop engine in accordance with T.O. No. 02-5AB-1. Before switching off engine in cold weather hold this toggle in the "ON" position for about four minutes with an engine speed of 800 R.P.M. for oil dilution.

(5) Propeller Control Switches: Set the safety switch which is of the circuit breaker type, to the "ON" position whenever the propeller control is desired. If the switch throws out and will not stay in the "ON" position, a short circuit or an over-load is indicated, in which event the pitch should be changed only if absolutely necessary. For controlling the propeller pitch manually, set the selector switch to "Manual" and "Decrease" or "Increase" the pitch with the manual control so marked. See T.O. No. 03-20BA-1 for additional operating instructions. For automatic constant speed control, set the selector switch to "Automatic", and set the manual selector for automatic control as follows.

(a) For Take-Off: Set for 3000 R.P.M.

(b) During Flight: Set the propeller control for the desired R.P.M.

(c) For Landing: Set the propeller control for 2770 R.P.M. to prevent overspeeding of the engine in case a sudden burst of power is applied.

NOTE: The markings on the propeller control are approximate. The desired R.P.M. should be obtained accurately by reading the tachometer.

(6) Ignition Switch: The ignition switch has five positions, "OFF", "BATTERY", "LEFT", "RIGHT" and "BOTH". The battery circuit is closed at all times except when the switch is in the "OFF" position, then the battery circuit is open. The switch in the "LEFT" or "RIGHT" position indicates that the corresponding magneto circuit is open. All circuits are safetied through the ignition switch.

(7) Wobble Pump Control for P-4OD: The fuel pressure necessary for starting is obtained by manual operation of this pump.

(8) Electric Fuel Pump for P-4OE: The fuel pressure necessary for starting is obtained by a G-6 fuel pump driven by an electric motor (Delco).

(9) Primer Control: The primer control is pulled out to prime the engine.

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(10) Fuel Selector Control: The five settings of this control are: "OFF", "RESERVE WING", "MAIN WING", "FUSELAGE" and "BELLY" tanks. The selection of the tank to be used is made by turning the selector handle to the desired tank as shown on the dial.

(11) Carburetor Heat Control: This control operates a hinged vane in the carburetor air intake duct elbow and permits either warm air from the engine compartment or cold air from the outside to enter the carburetor.

NOTE: The engine should be operated on "COLD" at all times unless engine behaviour leads the pilot to believe that carburetor icing conditions are being experienced and in that case the control should be moved to the "FULL HOT" position. If this does not clear up the trouble the control should again be returned to the "COLD" position.

(12) Cooling System Controls: When the handle is all the way up the radiator shutters are closed. An intermediate position designated "NEUTRAL" and determined by the indicator plate on the control assembly, is used for high speed operation. For ground running, taxiing, take-off and climb the control should be adjusted to maintain the proper engine temperature. A warning light to indicate excessive coolant temperatures is provided. This warning light will indicate when the pilot should adjust radiator shutters.

d. Other Controls. - (1) Electrical Controls on Main Switch Panel:

(a) Spotlights: The two spotlights are turned on by raising the toggle to the "ON" position.

(b) Pitot Tube Heater Switch: Raise the toggle to the "ON" position to heat the pitot tube.

(c) Running Lights Switch: These lights are turned on by raising the toggle up to the "ON" position. They may be used for signalling by holding the toggle down to the "SIGNAL" position which is a momentary contact.

(d) Landing Light Switch: This switch has "ON", "RETRACT", and neutral "OFF" positions. By placing the toggle in the "ON" position, the landing light swings out of the left wing. The light automatically lights after passing the center line of the pivot. By placing the toggle in the "RETRACT" position, the landing light retracts and the light is automatically turned off. The toggle returns to the "OFF" position at the completion of the operation.

CAUTION: Avoid burning the light longer than three minutes.

(e) Generator Circuit Switch: This switch, used only when the ship is on the ground, is for testing the circuits that are safetied through the ignition switch.

(f) Coolant and Fuel Pressure Test Switch: This is a double throw switch with two "ON" positions and a neutral "OFF" position. The coolant test "ON" position is upward, and the fuel pressure test "ON" position is downward. Both positions of this test switch are momentary and are used to test the operation of their respective warning systems.

(g) Fluorescent Light Switch: Raise the toggle to the "ON" position to light the fluorescent lamp.

(h) Electric Fuel Pump Switch: Raise the toggle to the "ON" position to actuate the electric motor driving the fuel pump.

(i) Ammeter: This dial shows the amperage of the system at the battery solenoid switch.

(j) Compass, Gun Sight and Formation Lights Rheostats: The three rheostat knobs control the intensity of the light for their respective systems. The "OFF" position is when the rheostat is at the stop when turned counter-clockwise. To turn "ON" and to increase the intensity of the light turn the rheostat knob clockwise as indicated by the arrow.

(2) Rudder Pedal Adjustment: Move the adjusting control release inboard and locate the rudder pedals in the desired position. There are three positions obtainable.

(3) Pilot's Seat Adjustment: The pilot's seat may be raised or lowered by pulling back on the adjustment handle and adjusting the seat to the desired height. The handle is spring operated and snaps back into place automatically when released.

(4) Oxygen Controls: The manually operated control valve is opened by turning to the left, as indicated by the arrow on the control knob.

(5) Radio Controls: To operate, turn receiver control switch to "MANUAL" for receiving radio range stations (otherwise "AUTO" may be used) and set the transmitter switch to "VOICE". Set Hi-Lo switch to desired receiver frequency of the station and adjust the volume suitably. To transmit by voice, press the throttle button and speak slowly and clearly in a normal tone of voice. To turn the radio off, set the receiver control switch to "OFF".

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T.O. No. 01-2507-1.

(6) Heating and Ventilating Control: When the control is pulled out hot air enters the cockpit, when pushed in cold air enters the cockpit. A mixture results when the control is in an intermediate position. In cold weather closing the radiator shutters increases the heat.

(7) Cockpit Enclosure: The operating cranks may be disengaged in case of emergency by pulling to the disengaged position. An emergency canopy release handle is at the top forward frame of the cabin. In case of emergency, while in flight, the entire canopy may be released from the fuselage by pulling on the handle. In case of turnover, on the ground, pull release handle at the bottom of kick-out panel and push open the emergency exit panel on the left side of the canopy. This panel may also be released from the outside by operating the handle located on the lower, left cabin frame.

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SECTION IV.

SPECIAL FLYING PROBLEMS.

1. Flying Limitations.

a. Maneuvers Prohibited. - (1) Outside Loop.

(2) Inverted flight.

(3) Inverted spin.

(4) Snap roll at speed in excess of 175 M.P.H. indicated.

(5) Slow roll at speed in excess of 300 M.P.H. indicated.

(6) Spin of more than three turns.

(7) Spin with baggage, auxiliary fuel or any other overload.

b. Other Restrictions. - (1) Do not exceed an indicated airspeed of 485 M.P.H.

(2) Do not exceed an engine speed of 3120 R.P.M. in dives.

(3) Do not begin to lower flaps at airspeed in excess of 140 M.P.H. indicated.

(4) Do not begin to lower landing gear at an indicated airspeed in excess of 175 M.P.H.

(5) Do not begin to lower radiator shutters at an indicated airspeed in excess of 175 M.P.H.

(6) Do not begin to lower landing light at an indicated airspeed in excess of 175 M.P.H.

(7) Climbs up to 60° and dives up to 90° will be performed only with 1/3 or more of the maximum oil capacity.

(8) Do not exceed a maneuver acceleration of +8.0 G positive or -4.0 G negative with a maximum alternate gross weight load.

(9) Do not exceed a maneuver acceleration of +7.2 G positive or -5.6 G negative with a maximum alternate gross weight.

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2. Warnings.

- a. When intending to operate the flaps while plane is on the ground, make certain that the landing gear control is not operated by mistake.
- b. Avoid unnecessary landing and excessive use of brakes when loaded in excess of the normal gross weight.
- c. Before starting engine, taxiing or landing be sure that the landing gear warning horn will sound when the throttle is closed and the battery circuit is on.
- d. The gun selector switch must be "OFF" prior to operating the flaps or landing gear so that the guns will not be accidentally fired if the trigger switch is squeezed instead of the hydraulic pump switch.
- e. In flight, the flaps will go up automatically as soon as the control is set in its "UP" position. Caution should be exercised to anticipate the sudden resultant loss of lift.

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SECTION V

FLYING CHARACTERISTICS

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(To be issued when available)

1. Weight
Weight
Weight
Useful
Crew
Fuel

Alter

Oil 1

Oil 2

Armament
Guns,
Ammun
Ammun
Bombs
Armor
Misce
Armamen

Guns,
Ammun
Ammun
Bombs
Armor
Misce

Miscell
Gun C
Bagge
Auxil
Radio

Design
Design
Maximum
Maximum

Wing Lo
Wing Lo

Power L
Power L

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SECTION VIWEIGHT DATA

1. <u>Weight in Pounds (Calculated)</u>	<u>Maximum</u>	<u>Alternate</u>	<u>Design</u>
Weight Empty (With Radio Installed) P-40D	5894	5894	
Weight Empty (With Radio Installed) P-40E	5982	5982	
Useful Load			
Crew (Pilot and Parachute)	180	180	
Fuel 120 Gallon, Design (32.0 Gal. Front Wing Tank) (51.0 Gal. Rear Wing Tank) (37.0 Gal. In Fuselage Tank)	720	720	
Alternate Load 25.5 Gal. (Fuselage Tank-Special) 52.0 Gal. (Belly Tank)	153	312	
Oil Design 16 Gal. (13 Gal. Main Tank and 3 Gal. System)	120	120	
Oil Alternate 3 Gal. (Maximum capacity-Filled to Cap)	22.5		
Armament P-40D			
Guns, Wing - 4 - .50 Cal. M-2	256	256	
Ammunition - Design - 1000 Rounds	-	300	
Ammunition - Maximum - 2460 Rounds	738		
Bombs - 6 - #20 Lb. Bombs	143		
Armor Plate	108.5	108.5	
Miscellaneous Equipment for Wing Guns	65.5	65.5	
Armament P-40E			
Guns, Wing - 6 - .50 Cal. M-2	384	384	
Ammunition - Design - 1410 Rounds		423	
Ammunition - Maximum - 1870	561	-	
Bombs - 6 - #20 Lb. Bombs	143		
Armor Plate	108.5	108.5	
Miscellaneous Equipment for Wing Guns	94	94	
Miscellaneous Equipment			
Gun Camera, 24 Volt	3.0	-	
Baggage Maximum			
Auxiliary Tank and Supports	54.0	-	
Radio Spare Coils	8.0		
Design Gross Weight P-40D	7944		
Design Gross Weight P-40E	8011.5		
Maximum Alternate Gross Weight P-40D	8777.5		
Maximum Alternate Gross Weight P-40E	8845.0		
Wing Loading, Design Gross Wt. 33.9 Lbs/Sq.Ft. P-40D			
Wing Loading, Design Gross Wt. 34.2 Lbs/Sq.Ft. P-40E			
Power Loading, Design Gross Wt. 7.94 Lbs/H.P. P-40D			
Power Loading, Design Gross Wt. 7.99 Lbs/H.P. P-40E			

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