SERVICE AND MAINTENANCE MANUAL

BELLANCA "300" VIKING MODEL 17-30

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SECTION 1

INTRODUCTION

A. GENERAL

This manual contains service and maintenance information for the Bellanca "300" Viking, Model 17-30.

B. SCOPE OF THIS MANUAL

Sections II and X of this Manual consists of the Service Section, whereas the remaining Sections comprize the maincenance instructions. The service instructions include ground handling, servicing and periodic inspections. The maintenance instructions for each system include trouble shooting, removal and installation of components, corrective maintenance and testing. Each major system of the aircraft is covered in a separate section.

C. DESCRIPTION

The Bellanca "300" Viking Model 17-30 is a four-place, low wing monoplane using steel tube construction in the fuselage and tail control surfaces. The fuselage and all control surfaces are covered with a synthetic Dacron fabric which is highly impervious to acids and deterioration of any kind and has an extremely high tensile strength to resist tearing or punctures. This fabric is finished with Butyrate dope and is very easily repaired using standard accepted methods for fabric repair.

The famous Bellanca wing, made of rugged Sitka spruce and mahogany plywood is one of the most efficient in aviation, with a greater weight-strength ratio than that of any other low-wing plane in the private class. The wing is completely submerged in a vat of special wood preservative which also serves as a sealer. This means that every portion of the wing is completely sealed. Wood rot or deterioration of any kind is virtually non-existent, even in the oldest models.

The baggage compartment is aft of the rear seat and is accessible by an outside door and is also accessible from the rear seat during flight.

D. ENGINES

The "300" Viking is equipped with the Continental IO 520 D fuel injected engine rated at 285 HP at 2700 RPM with a 5 minute take-off rating of 300 HP at 2850 RPM. This engine requires a minimum fuel octane rating of 100/130 (Aviation Grade).

This engine is mounted on a Dyna-focal engine mount to dynamically balance the engine during flight and to reduce the transmission of vibration to the airframe.

E. PROPELLERS

The Viking "300" comes equipped with either the McCauley Constant Speed 3 blade, Model D3A32C90 or the McCauley Constant Speed 2 blade, Model D2A34C58.

F. BRAKE SYSTEM

Brakes and wheel are Goodyear, brake model No. 9532278 or 9532181 and wheel model No. 9532111 or 9532673. These assemblies are eligible only with Model VHR Paramount master cylinders.

Each brake master cylinder is independent of each other and has no hydraulic reservoir other than the master cylinder itself.

G. LANDING GEARS

Landing gears are dydraulically operated by a hydraulic power pack located under the front seats. This power pack contains its own reservoir on the top of the power pack and also has an auxiliary reservoir located on the firewall, this reservoir should be filled to the line marked on the end of the reservoir. Should a complete loss of hydraulic fluid in both reservoirs occur, the base of the power pack will retain enough fluid to actuate the gear.

H. FUEL SYSTEMS

The "300" Viking has a standard fuel system of two wing tanks of 19 U. S. Gallons each, and a fuselage Auxiliary tank of 20 U. S. Gallons.

An optional fuel system consisting of two wing tanks of 19 U. S. gallons each, and a 17 U. S. gallon Auxiliary tank in each wing is available for a total of 72 gallons. The 20 U. S. gallon fuselage Auxiliary fuel tank is also available in addition to the above which brings the total of 92 U. S. gallons.

I. INSTRUMENT PANEL

The instrument panel is designed to provide a functional location of all flight, radio and engine instrument groups.

J. HEATER AND DEFROSTING SYSTEM

Cabin heat is supplied by a heater muff which transmitts heated air by conduction from the engine exhaust manifold. Defrosting of the windshield is accomplished through six vents located at the bottom of the windshield which draws heated air from the cabin heater muff. The defroster control is located on the right side of the instrument panel along with the heater controls. To defog windshield while taxiing, pull all three controls.

K. VENTILATION SYSTEM

Four individual airline type adjustable vents are located with one on each side of the instrument panel and one on each side of the rear seat area. These are adjustable by turning the knurled knob to obtain the desired amount of air. The vents are also moveable up, down and sideways by pushing in the desired direction. A cabin exhaust vent is located in the top of the fuselage to expell cabin air, this vent has a filter located inside of the vent to slow down the flow of air somewhat.. This filter should be checked periodically to see that is is not stopped up or clogged. There is also a drain hole located inside the vent to drain any water collected during washing of the aircraft or during rainy weather, this drain should be checked to see that it remains open.

LEADING PARTICULARS AND PRINCIPAL DIMENSIONS

ENGINE

Model	Continental Fuel Injected IO-520-D
Compression Ratio	8.5:1
Firing Order	1-6-3-2-5-4
Cylinder Head Temp. (Max)	460 Degrees F.

Bore (inches)	5.25
Stroke (inches)	4.00
Displacement (cubic inches	520.00
Brake H. P. (max. cont.)	285
Max. H. P. (takeoff)	300 (5 minute maximum)
Recommended Max. H. P. (cruising)	215
Rpm Max. Cont. Operation	2700
Rpm Max. Takeoff	2850 (5 minute maximum)
Recommended Max. for cruising	2550 RPM
Recommended for Idle	600 RPM
Intake Manifold Pressure (Hg)	
Takeoff	Full Throttle
Max. Cont. at Sea Level	28.8 inches
Max. Cont. at Critical Altitude	28.8 inches
Max. for Cruising	24.0 inches
Minimum Fuel Octane Rating	100/130 (Aviation Grade)
Oil Specification	Continental MHS-24
Above 40 Degrees F.	SAE No. 50
Below 40 Degrees F.	SAE No. 30 or (10W30)
Oil Pressure Min. Idle (PSI)	10 pounds
Oil Pressure (Cruising)	30-60 pounds
Oil Sump Capacity (U.S. Qts.)	12
Oil Temperature Limits	
Minimum for Takeoff	75 Degrees F.
Maximum with SAE No. 50 Oil	240 Degrees F.
Recommended Cruising	170 Degrees F.
Ignition Timing	
Left Magneto	20 Degrees BTC
Right Magneto	20 Degrees BTC

CAUTION

Do not turn the propeller while the ignition switch is in the BOTH, LEFT OR RIGHT position, because this could start the engine and cause injury. Do not turn the propeller of a hot engine, even though the ignition switch is in the OFF position, because the engine could "kick" as the result of auto-ignition of a small amount of fuel remaining in the engine.

2. OVERALL DIMENSIONS OUTSIDE

Wing Span	34 Ft., 2 in.
Fuselage Length	23 Ft., 6 in.
Horizontal Stabilizer length	12 Ft., 2 in.
Total Height	7 Ft., 4 in.
Wheel Tread	9 Ft.
Gross Weight	3000 Lbs.

3. CONTROL SURFACES

Aileron Travel	Up 20 Degrees
	Down 20 Degrees
Flap Travel	Down 46 Degrees
Elevator Travel	Up 22 Degrees
	Down 15 Degrees
Trim Travel	Up 8 Degrees
	Down 35.5 Degrees
Rudder Travel	Left 22 Degrees
	Right 22 Degrees

4. LANDING GEARS

Type	Hydraulic
Tread	9 Feet
Main Wheel Type	Goodyear
Main Gear Tires	6.00 x 6 - 6 ply Tubeless
Main Gear Tire Pressure	30 Lbs.
Brake Type	Goodyear
Fluid Type	MIL-H-5606A AM2
	Petroleum Based
Nose Wheel Type	Goodyear
Nose Wheel Tire	15 x 6.00 6 ply Tubeless
Nose Wheel Tire Pressure	28 Lbs.

SECTION II

HANDLING & SERVICING

CONTENTS

SECTION II

HANDLING AND SERVICE

A. GENERAL

This section provides ground handling and servicing instructions.

B. ACCESS PROVISIONS

Provisions for inspection and maintenance are provided for in the form of snap type inspection plates and flat plates, it is necessary that these plates be removed at each inspection to insure a complete and thorough inspection.

The floor of the baggage compartment is fastened with one-quarter turn fasteners and when raised provides access to the aft portion of the fuselage, battery, oxygen system (if installed) and the radio and electronic mounting racks.

Figure No. 1 shows the inspection plates and fairings and their indentity.

C. GROUND HANDLING

The following instructions are recommended to avoid damage to the aircraft during ground operations.

If improperly handled, extensive damage to the aircraft and its equipment may result. The aircraft may be taxied as required for normal maneuvers, brakes and rudder pedals may be used in taxiing as required. Do not move the nose gear with the rudder pedals while the aircraft is stationary, to do so may bend the nose gear steering rods. It is permissible to move the nose gear with the tow bar while the aircraft is stationary; however, it is not recommended to turn the nose gear by kicking the tire.

Never push down on the tail surfaces to pivot the aircraft; to do so may bend the ribs in the tail surfaces.

Points where pushing the aircraft are permitted are the leading edge of the wings, the wing tips and the inboard position of the propeller blades adjacent to the propeller hub. Do not push or pull anywhere on the tail surfaces.

1. HOISTING THE AIRCRAFT

When it is desired to raise the aircraft for retraction tests or gear servicing, it is suggested that it be done in the following manner.

Place the jacks on the jack pads located on the forward spar as shown in Figure 2. Place a stand approximately 16" high under the tail skid to prevent the tail from going to the ground. This keeps from having to raise the jacks to an excessive height.

The aircraft is in a tail heavy configuration when on the jacks and it is safe to occupy both front seats if necessary and not have the aircraft become nose heavy.

2. LEVELING THE AIRCRAFT

Longitudinal leveling of the aircraft is accomplished by placing a spirit level on the lugs at fuselage stations 2 & 3. These lugs are located on the extreme right side of the front center section, Station 2 and the rear section station 3 inside the cabin area and are usually covered by the upholstery paneling. Leveling the aircraft horizonally is done across the front center section. To be sure and clear any welds or structure on the center section it is advisable to tape 2 blocks of the same height to the center section and place the level on these blocks.

3. MOORING THE AIRCRAFT

When mooring the aircraft the tie down chains are attached to the retractable tie down rings located on the under side of the wings and to the tail tie down ring which also acts as a tail skid. If extremely turbulent weather is expected it would be wise to secure the aircraft with tie down chains on the main gears also.

4. TOWING THE AIRCRAFT

A tow bar is provided as standard equipment with each aircraft. This tow bar fits into lugs welded to the nose gear fork. Care must be exercised to see that the nose gear is not rotated past its normal turning limits, to do so will damage the limit stops. Check to see that the parking brake is off before towing the aircraft with a tug.

D. SERVICING

1. FUEL SYSTEM

The Viking 17-30 BELLANCA has 2 wing tanks of 19 U. S. gallons each with a 20 U. S. gallon Auxiliary tank located just behind the rear seat. In conjuction with this standard fuel system, 2 extra auxiliary tanks each holding 17 U. S. gallons are located in the wings just outboard of the standard wing tanks are available as optional equipment, and bring the total fuel capacity to 92 U. S. gallons. The fuselage tank may be omitted for a total capacity of 72 gallons.

On the standard 58 gallon fuel system each wing tank is accessible for filling by lifting a dzus fastened door and removing the gas cap. A drain is provided to drain off any fuel spilled outside the filler neck. The fuel tank drain is located on the inboard rear corner of each tank underneath the wing. This is the lowest point of each fuel cell.

The 20 U. S. gallon fuselage Auxiliary tank filler opening is located on the right side of the fuselage just behind the rear window. Access to the filler is through a small door. The filler opening is designed to drain off any fuel spilled during the fueling operation. The sump drain for the Auxiliary tank is located on the bottom of the fuselage immediately under the auxiliary tank. Also under the fuselage there is a main fuel system gasculator drain and this is the lowest point in the entire fuel system. This drain is located in the removable plate. This plate also covers the gasculator. This gasculator should be removed and the screen cleaned at every inspection or more frequently if fuel contamination is suspected.

On aircraft equipped with the optional 92 or 72 gallon fuel system, the method of servicing the tanks should be as follows. The rate of fueling should be slow enough to allow the fuel to flow through the connecting line to the inboard fuel cell to insure the complete filling of both outboard cells to capacity.

Minimum fuel Octane rating is 100/130 (Aviation Grade)

2. LUBE OIL SYSTEM

A. FILLING THE ENGINE SUMP

Fill the engine sump with lubrication oil as specified in Table 1. Sump capacity is 12 U.S. quarts maximum. Minimum oil for satisfactory operation and oil cooling is indicated by the LOW mark on the oil dip stick.

3. BRAKE SYSTEM

The brake reservoirs are located in the brake master cylinders, each brake is independent of one another and they are not connected to the hydraulic system which is used for flaps and gear. Brakes should be serviced from the bottom at the wheel cylinders to preclude the possibility of trapping air in the lines. Service brakes with Aircraft Hydraulic Oil AA MIL-H-5606A AM2 Petroleum base fluid. Brake blocks, clips and discs should be checked periodically for wear.

E. LUBRICATION

Refer to the lubrication chart for instructions regarding the location, time intervals and types of lubricants to be used. Grease fittings are provided on the nose gear and main gears. Avoid excessive use of lubricants as they tend to attract dirt and grit and may lead to abnormal wear.

It is very important to keep the down lock spring pistons free of rust and corrosion at all times and also the hydraulic retract cylinders rods free from rust. Periodic inspection of these points should prevent any trouble. The fibre insert on the nose gear steering collar should be lubricated with a light grade oil periodically.

Remove, clean and repack wheel bearings every 100 hours with a suitable bearing grease.

On the bottom of the wings at the inboard end of each aileron bay there is a snap type inspection plate which provides access to the aileron actuating tracks. These tracks should be cleaned of all old grease and relubricated every 100 hours with Lubriplate grease No. 70. This is important if smooth aileron action is to be maintained

All pulleys on the Model 17-30 are of the ball bearing type and need no further lubrication but should be checked for free rotation at each inspection.

Main gear oleos should be serviced with 6 inches of Aircraft Hydraulic Oil AA MIL-H-5606A AM 2 Petroleum Base fluid and the springs should be liberally coated with Lubriplate No. 70 grease, this should be done every 500 hours. Removal of the lower gear legs are required to do this and at this time the seals and O rings should be checked for wear. The nose gear is serviced in the same manner except 4 inches of fluid is used instead of the 6 inches as in the main gears.

TABLE 1

A. OIL SPECIFICATIONS

Detergent oil, compounded to meet Continental Motors Corporation Specifications MHS-24, is the only lubricant which meets all qualifications peculiar to these engines, and is the only recommended lubrication oil.

RECOMMENDED VISCOSITY	AMBIENT AIR TEMPERATURE
SAE 30	Below 40 Degrees Far.
SAE 50	Above 40 Degrees Far.

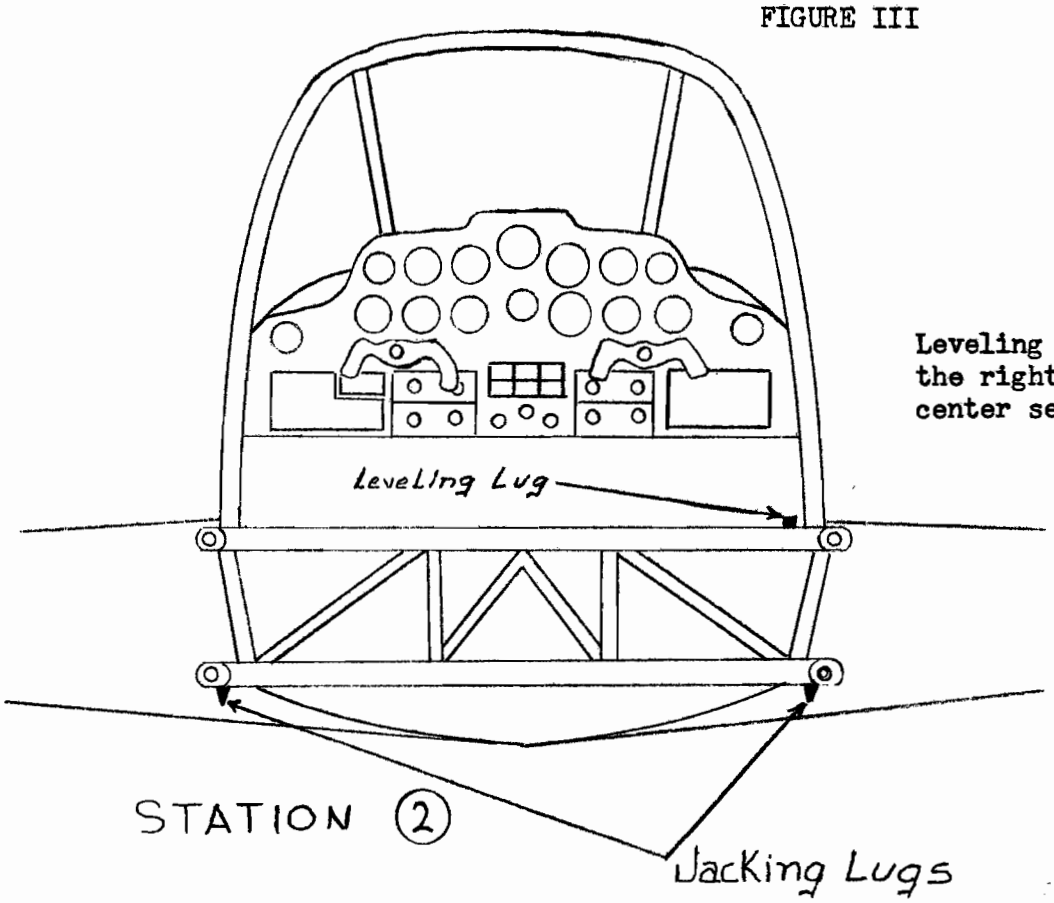
When average ambient air temperature is approximately at the dividing line of the above temperature ranges, use the lighter oil.

It is recommended that the oil supply be drained and the engine sump filled with fresh oil after each 75 hours of engine operation. Always start and warm the engine to operating temperature before draining the oil. Remove and clean the oil screen at each oil change.

FIGURE 2

Jacking Arrangement

FIGURE III



Leveling Lugs are located on the right hand side of each center section as shown.

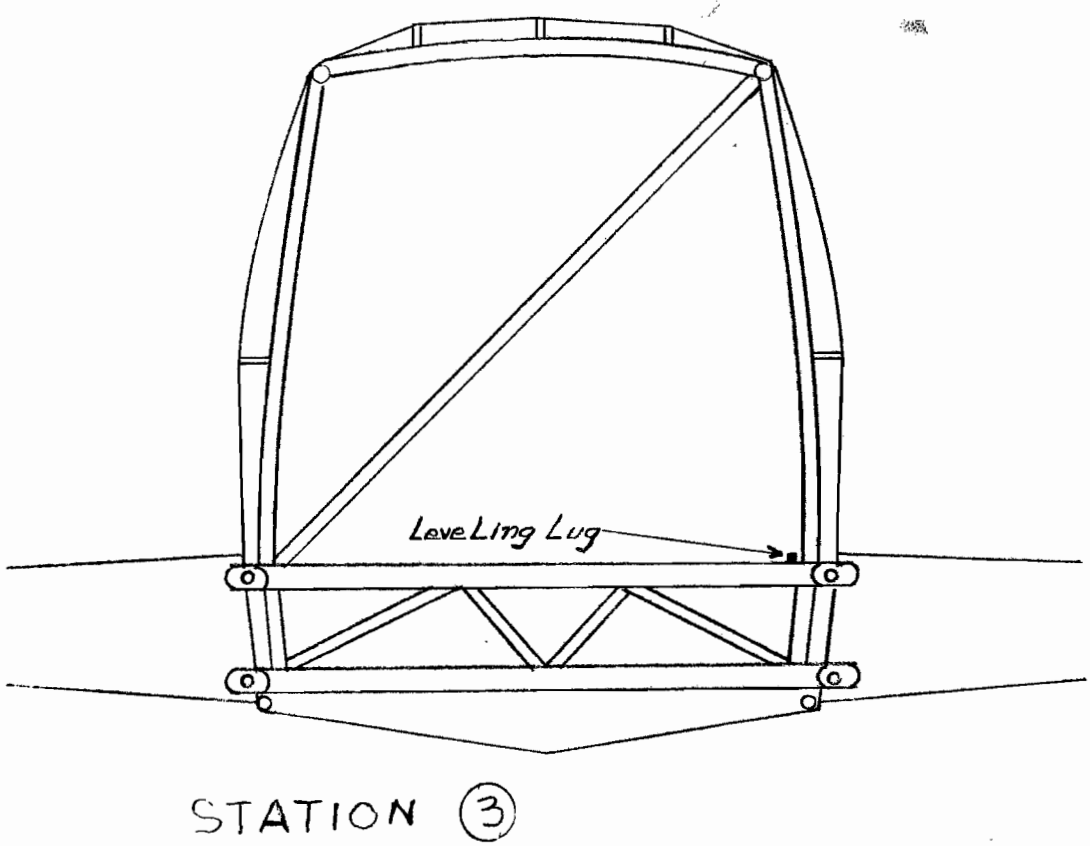
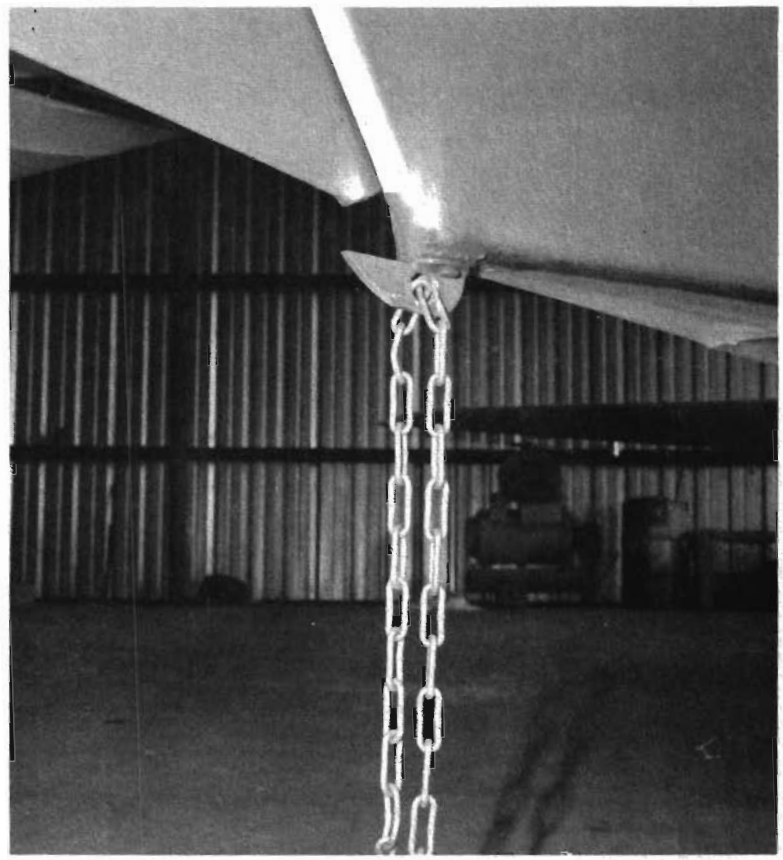


FIGURE 4

Mooring of Aircraft



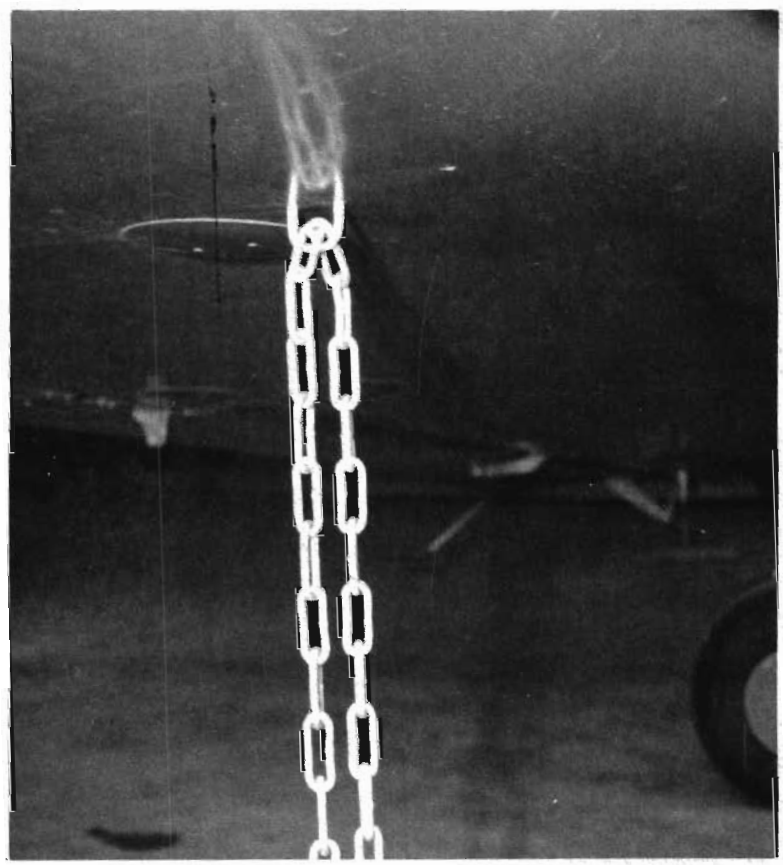


FIGURE 5

Tow Bar Attachment Point

SECTION III

POWER PLANT

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SECTION III

POWER PLANT

A. GENERAL

The Continental I0520-D engine is a 6 cylinder, fuel-injected engine with a continuous rating of 285 HP at 2700 RPM. The IO-520-D engine also incorporates a 5 minute take-off rating of 300 HP at 2850 RPM. These air cooled engines have a wet sump oil system, dual magnetos and continuous-flow injection system. The fuel injection system supplies metered fuel to the individual cylinders through injector nozzles, to assure the proper fuel-air ratio for best performance at all altitudes.

The engines have air cooled, horizontally opposed overhead valve, cylinders with 5.25 inch bore, 4.00 inch stroke, 520 cubic inch displacement, and a compression ratio of 8.5:1. The cylinders have down-directed exhaust outlets. The crankshaft flange has six bolt holes, two dowel pins and a center pilot extension provided for attaching the propeller. Provisions are made in the pilot extension for the hydraulic propeller control oil which is supplied internally from the governor pad. The crankshaft is also equipped with pendulum type torsional damper weights. The engine has removable type hydraulic tappets. Positive rotation is provided for the exhaust valves by the use of rotators. Tappets, pushrod ends and rocker arm bearings are lubricated by the engine main oil pressure system.

The engines are furnished with a direct cranking starter and a generator. The exhaust manifold systems are not supplied with the engines, The engine main fuel filter, engine controls, vacumn pump and propeller governor are furnished by the aircraft manufacturer.

1. Starting Engine
   a. Turn on the fuel selector valve
   b. Set mixture control to "Full Rich" position
   c. Open throttle slightly (See note 1)
   d. Turn Master Switch ON
   e. Turn ignition switch to BOTH
   f. Set auxiliary pump switch ON
   g. When fuel pressure gauge shows normal idle pressure (2 to 2.5 psi), engage starter.

CAUTION

If engine is hot, press starter button first, then turn auxiliary fuel pump switch ON.

NOTE 1

The auxiliary pump delivers a continuous flow of fuel in proportion to the amount of throttle opening and length of time before engaging starter. If the engine is flooded, follow this sequence:

1. Turn auxiliary pump OFF
2. Turn ignition switch OFF
3. Set throttle FULL OPEN
4. Set mixture control to IDLE CUT-OFF
5. Engage starter and crank engine for about 10 seconds to clear cylinders of excess fuel.
6. Repeat normal engine starting procedure.

2. Warm Up

Maintain engine speed at approximately 900 to 1000 RPM for at least one minute in warm weather, and as required during cold weather to prevent cavitation in the pressure oil pump, and to assure adequate lubrication.

CAUTION

Do not run engine at the run-up speed unless oil temperature is at least 75 degrees F.

Restrict ground operation to the time necessary for warm-up and testing.

Increase engine speed to 1700 RPM only long enough to perform the following checks:

1. Check Magnetos. Due to design changes in today's higher output engines, the comparison of single magneto operation versus both magnetos is no longer a sound criteria for evaluation of magneto performance. Therefore all magneto checks should be performed on a comparative basis between Right and Left magneto performance.

Move the ignition switch first to "R" position and note engine RPM, then move switch back to "BOTH" position to clear the other set of sparkplugs. Then move the switch to "L" position and note RPM. The difference between the two magnetos operated singly should not differ more than 50 RPM.

If no drop in speed is observed when operating on either magneto alone, switch circuit should be inspected for loose connections.

2. Check throttle and engine tachometer.
   a. Slowly move propeller governor control toward low RPM position and observe affect on tachometer reading. Engine speed should decrease, Return governor control to high speed position.
   b. Slowly advance throttle to wide open position and observe tachometer. Engine speed should approach maximum RPM. Immediately after this check, close throttle to idle position.

CAUTION

Do not operate the engine at a speed in excess of 1500 RPM longer than necessary to test operation and observe engine instruments. Proper cooling of engine depends upon forward speed of the aircraft. Discontinue testing whenever temperature or pressure limits are approached.

3. INSTRUMENT INDICATIONS

(1) Oil Pressure: The oil pressure relief valve will maintain pressure within specified limits if the oil temperature is within the specified limits and if the engine is not excessively worn or dirty. Fluctuating or low pressure may be due to dirty oil passing the valve.

(2) Oil Temperature: The oil cooler and vernatherm control valve will maintain oil temperature within the specified range unless the cooler oil passages or air channels are obstructed, or the vernatherm valve is held open by solid particles in the engine oil. Oil temperature above the prescribed limit may cause a drop in oil pressure, leading to rapid wear of moving parts in the engine.

(3) Cylinder Head Temperature: Any temperature in excess of the specified limit may cause cylinder or piston damage. Cooling of cylinders depends on cylinder baffles being properly positioned on the cylinder heads and barrels, and other joints in the pressure compartment being tight so as to force air between the cylinder fins. Proper cooling also depends on operation practices.

On the Viking aircraft it is very important to see that the rubber sealing strips along the outer edge of the engine baffles are facing up when installing the top cowling, and that the rubber strips on the front of the cowling are over the engine baffles.

(4) Battery Charging: The ammeter should indicate a positive charging rate until the power used for starting has been replaced by the battery charging circuit, unless the electrical load on the generator is heavy enough to require its full output, in which event the ammeter reading should return to the positive side as soon as the load is reduced. A low charge rate is normal after the initial recharging of the battery. A zero reading or negative reading with no battery load indicates a leak or malfunction in the generator or regulator system.

SECTION III

B. ENGINE TROUBLE SHOOTING CHART

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
1. Engine will not start	a. No fuel gauge pressure No fuel to engine	a. Check fuel control for proper position, auxiliary pump ON and operating, feed valves open. Fuel filters open, and tank fuel level.
	b. Have gauge pressure- engine flooded	b. Turn off auxiliary pump and ignition switch, set throttle to FULL OPEN and fuel control to IDLE CUT-OFF, and crank engine to clear cylinders of excess fuel. Repeat starting procedure.
	c. Have gauge pressure- No fuel to engine	c. Check for bent or loose fuel lines. Loosen one line at fuel nozzle if no fuel shows replace fuel manifold valve.
2. Engine starts but fails to keep running.	a. Inadequate fuel to fuel manifold valve	a. Set fuel control in FULL RICH POSITION turn auxiliary pump ON, check to be sure feed lines and fuel filters are not restricted. Clean or replace defective components.
	b. Defective ignition system	b. Check accessible ignition cables and connections. Tighten loose connections. Replace defective spark plugs.
3. Engine runs rough at idle	a. Improper idle mixture adjustment	a. Readjust idle setting. Tighten adjustment screw to lean mixture and back off adjustment acrew to richen mixture.
	b. Fouled spark plugs	b. Remove and clean plugs, adjust gaps. Replace defective plugs.
4. Engine has poor acceleration.	a. Idle Mixture too lean	a. Readjust idle mixture as described in 3-a.
	b. Incorrect fuel-air mixture, worn control linkage, or restricted air cleaner.	b. Tighten loose connections, replace worn elements of linkage. Service air cleaner.
	c. Defective ignition system	c. Check accessible cables and connections. Replace defective spark plugs.

B. ENGINE TROUBLE SHOOTING CHART (Cont)

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
5. Engine runs rough at speeds above idle	a. Improper fuel-air mixture	a. Check manifold connections for leaks Tighten loose connections. Check fuel control and linkage for setting and adjustment. Check fuel filters and screens for dirt. Check for proper pump pressure, and replace pump if defective.
	b. Restricted Fuel nozzle	b. Remove and clean all nozzles.
	c. Ignition system and spark plugs defective	c. Clean and regap spark plugs. Check ignition cables for defects. Replace defective components.
6. Engine lacks power, reduction in maximum manifold pressure	a. Incorrectly adjusted throttle control, "sticky" linkage or dirty air cleaner.	a. Check movement of linkage by moving control from idle to full throttle. Make proper adjustments and replace worn components. Service air cleaner.
	b. Defective ignition system	b. Inspect spark plubs for fouled electrodes, heavy carbon deposits, erosion of electrodes, improperly adjusted electrode gaps, and cracked procelains. Test plugs for regular firing under pressure. Replace damaged or misfiring plugs. Spark plug gap to be .015 to .019 inch.
	c. Loose or damaged intake manifolding	c. Inspect entire manifold system for possible leakage at connections. Replace damaged components, tighten all connections and clamps.
	d. Fuel nozzles defective	d. Check for restricted nozzles and lines and clean or replace as necessary.

B. ENGINE TROUBLE SHOOTING CHART (Cont)

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
7. Low fuel pressure	a. Restricted flow to fuel metering valve	a. Check mixture control for full travel. Check for restrictions in fuel filters and lines, adjust controls and clean filters. Replace damaged parts.
	b. Fuel control lever	b. Check operation of throttle control and for possible contact with cooling shroud. Adjust as required to obtain correct operation.
	c. Incorrect fuel injector pump adjustment and operation.	c. Check and adjust using appropriate equipment. Replace defective pumps.
	d. Defective fuel injector pump relief valve	d. Replace pump
8. High fuel pressure	a. Restricted flow beyond fuel control assembly	a. Check for restricted fuel nozzles or fuel manifold valve. Clean or replace nozzles. Replace defective fuel manifold valve.
	b. Defective relief valve operation if fuel injector	b. Replace fuel injector pump
	c. Restricted re-circulation passage in fuel injector pump	c. Replace pump
9. Fluctuating fuel pressure	a. Vapor in fuel system, excess fuel temperature	a. Normally operating the auxiliary pump will clear system. Operate auxilairy pump and purge system
	b. Fuel gauge line leak or fuel in gauge line	b. Drain gauge line and tighten connections.
	c. Restriction in vapor separator vent	c. Check for restriction in ejector jet of vapor separator conver. Clean jet with solvent (only) Do not use wire as probe. Replace defective parts

B. ENGINE TROUBLE SHOOTING CHART (Cont)

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
10. Low oil pressure on engine gauge	a. Insuffucient oil in oil sump, oil dilution or using improper grade oil for prevailing ambient temperature	a. Add oil, or change oil to proper viscosity
	b. High oil temperature	b. Defective vernatherm valve in oil cooler; oil cooler restriction. Replace valve or clean oil cooler.
	c. Leaking, damaged or loose oil line connections- Restricted screen or filter	c. Check for restricted lines and loose connections, and for partially plugged oil filter or screens. Clean parts, tighten connections, and replace defective parts.
11. Poor engine idle cut-off	a. Engine getting fuel	a. Check fuel control for being in full IDLE CUT-OFF position. Check auxiliary pump for being OFF. Check for leaking fuel manifold valve. Replace components.

C. ENGINE REMOVAL

Remove the propeller, the top and bottom engine cowl and drain the oil from the engine crankcase.

Disconnect the following.

a. Tachometer cable
b. Oil temperature wires from sender unit
c. Oil pressure line.
d. Fuel pressure lines
e. Mainfold pressure line
f. Cylinder head temperature wire from sender unit
g. Electrical cannon plug on the firewall (left side)
h. Generator wires from generator
i. Main fuel line from fuel pump
j. Vacumn pump line
k. Hydraulic pump lines from firewall
l. Throttle control
m. Propeller governor control
n. Mixture control
o. Starter cable from starter
p. Ground cable from starter
q. Magneto wires

Attach a suitable hoist to the engine lifting eye. Remove the four engine mount bolts from the engine mount, raise the engine straight up from the mount. Check continously while hoisting the engine to make sure there are no cables, wires, or hoses hanging, and to see that no lines were left connected.

D. PROPELLER REMOVAL

a. Remove the spinner
b. Remove the six nuts from the back of the engine crankshaft flange, propeller must be worked forward from time to time to provide clearance for the nuts as they are loosened.
c. After all the nuts are off the bolts the propeller should be worked of the crankshaft. When the propeller comes off the flange there will be a small amount of oil come out of the end of the crankshaft, provision should be made to keep this oil off the air cleaner.

E. ENGINE INSTALLLATION

Hoist engine directly above engine mount and lower carefully into place. Make sure alignment pins on mount rubbers are in the alignment holes on the engine mount, and that the spacers are between the mount rubbers. The barrel nuts which are located in the engine mount legs should be aligned with the holes. Lower engine to set on mount rubbers, align holes and insert bolts.

Attach all lines, hoses and wires, check all lines for leaks. Check fuel system for leaks by running the fuel boost pump for ten seconds and observing all fuel fittings for leaks.

E. ENGINE INSTALLATION (contd)

Check all engine controls to see that they work smoothly and have full travel from stop to stop.

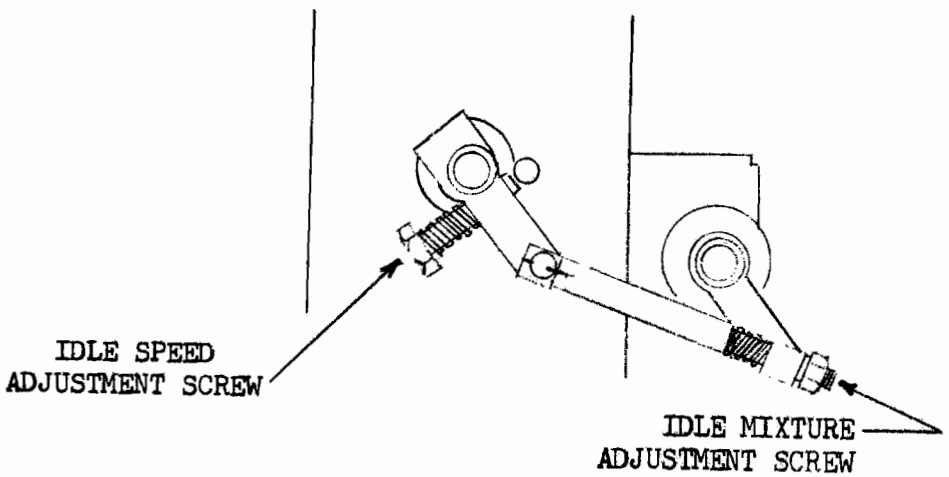
F. PROPELLER INSTALLATION

1. Clean and check mating surfaces of the propeller hub flange and the engine crankshaft flange.
2. Install the "O" ring seal in the propeller hub and lubricate liberally with clean lubricating oil.
3. Line up the dowel pins in the propeller hub with the holes in the crankshaft flange, engage the crankshaft pilot in the propeller hub and push the hub straight back until the studs in the propeller hub engage the holes in the crankshaft flange. When the studs protrude through the crankshaft flange far enough, install the washers and nuts.
4. Avoid twisting and shaking of the propeller as much as possible as damage to the "O" ring could result and cause an oil leak.

G. ADJUSTMENTS

1. Mixture

The idle mixture adjustment is the locnut at the metering valve end of the linkage between the metering valve and the air throttle levers. Tightening the nut to shorten the linkage provides a richer mixture. A leaner mixture is obtained by backing off the nut to lengthen the linkage. Adjust to obtain a slight and momentary gain in idle speed as the mixture control is slowly moved toward idle cut-off. (If set too lean, idle speed will drop under the same conditions.) See illustration below for adjustment locations.



G. ADJUSTMENTS (cont)

2. Idle

Set engine to idle at 500 to 550 RPM.

3. Fuel Pressure

Fuel pressure adjustment is made by turning the screw in to increase fuel pressure and out to decrease fuel pressure. See drawing below to locate screw. Pressure should be adjusted to a minimum of $1\frac{1}{2}$ - 2 pounds at idle speed.

Screw loc.

SECTION IV

STRUCTURE

CONTENTS

SECTION IV

STRUCTURE

A. GENERAL

The fuselage, vertical fin, rudder, horizontal stabilizer and elevators are constructed of 4130 chrome alloy steel tubing, covered with dacron fabric and finished with butyrate dope.

The wings, flaps and ailerons are constructed of Sitka spruce and mahogany plywood and covered with dacron fabric and finished with butyrate dope.

Repairs to the airframe should be done in accordance with Manual 18 and AC 43:13-1.

Removal of fuel cells in the wing for purpose of repairs is accomplished as follows: On the standard 60 gallon system a removeable plywood panel secured with wood screws is located over the top of each wing tank. The outline of this panel can be seen on the fabric surface of each wing, a strip of fabric approximately 2 inches wide should be removed from around this line. One inch on either side of the line, removal of this fabric will expose the location of these screws which are slightly counter sunk into the wood filler. Remove this wood filler and then the wood screws. Disconnect all fuel lines, two large lines at the bottom of the tank and one small line at the top center of the tank, disconnect the fuel gauge wires and pull out the wood filler strips located around the front and back of the tank. It may be necessary to remove the reducer plug located at the top of the tank on the inboard side to clear the butt rib. Lift the tank straight up out of the wing. Only Heli Arc welded repairs are recommended. Leaks may be located by sealing all openings, pressurizing the tank to $2\frac{1}{2}$ pounds per square inch and using a soap solution in the suspected areas. After repair tanks should be rechecked before installing.

CAUTION

Tanks should be thoroughly cleaned before any repairs are made.

When installing tanks be sure rubber pads are securely cemented to tank mounts and the wood filler strips are located around the tank to hold it securely in position.

When installing the tank cover the rubber seal around the filler opening is to be cemented thoroughly all around with a fuel impervious cement to prevent excess fuel or spillage from seeping inside the wing.

After screwing tank cover down and filling holes with wood filler, and sanding smooth the 2 inch wide strip, at least 3 inch tape should be used for proper overlap, doped and finished.

The 92 gallon or 72 gallon fuel system requires removal of a larger portion of the wing skin. This is not a removable panel such as used on the inboard tanks, and if removal of any of these tanks is necessary it is recommended that the factory be contacted for drawings and blue prints to accomplish this.

When installing inspection plates that are secured with screws, care must be exercised to not tighten the screws to the point of stripping them out of the wood. Should this happen it is best to repair the hole by cemented a wood plug in the hole and after the glue has dried to replace the original size screw, rather than replacing the screw with the next larger size.

B. REMOVAL OF WINGS

Place aircraft on jacks or stands located on the jack pads as shown in Fig. 2, Section II. This should be done first before removing any plates, lines or fittings. Next lock the nose gear retracting links with C clamps in the down position. (See illustration Fig. 1, Section IV)

Remove both front seats, rear seat and front floorboards. Disconnect the hydraulic lines from the power pack located under the front seats. These four lines lead out to the main gear retract cylinders. Disconnect the ailerion balance cable and the aileron torque tube at the bellcrank located under the rear seat at the right and left side of the fuselage. All electrical wiring should be disconnected at the splices (remove battery from aircraft before disconnecting an electrical wiring). Disconnect pitot tube hoses and air intake hoses, brake lines and flap cables. It is necessary to remove the flaps to have access to the flap cable pulley, which must also be removed. This pulley is located in the wing at the inboard end of each flap bay.

All fuel lines must be disconnected. Access to these lines is obtained by removing the lower wing bands. There is one line at the top of each fuel cell that is best removed after the wing bolts are removed and the wing pulled away from the fuselage 3 to 4 inches as this makes it much more accessible.

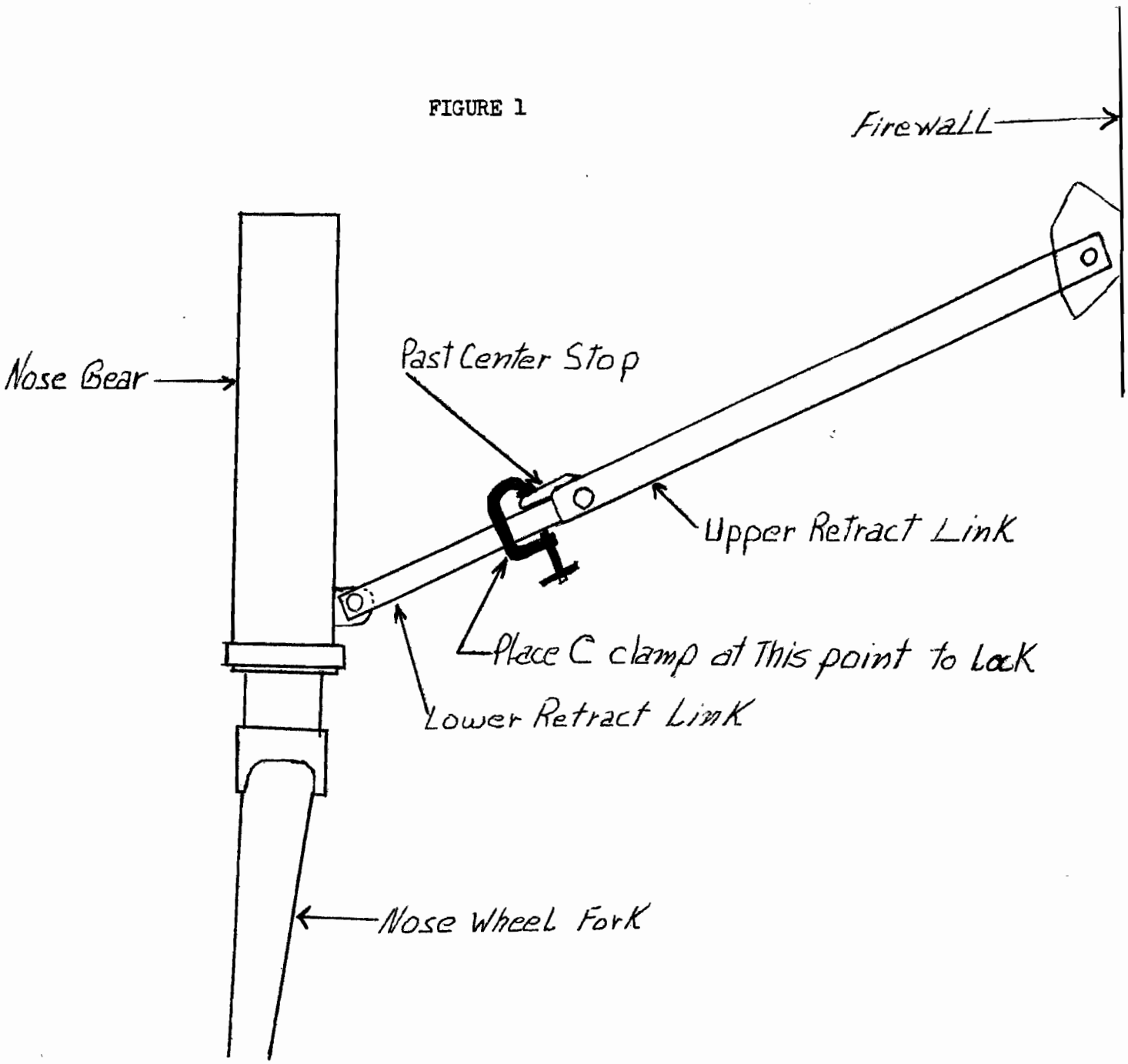
When wing bolts are removed a man should be at the leading and trailing edge on the butt end of each wing and one man on the tip end to hold and steady the wing. It is possible to leave the main gear in a down position and use the wheel itself to carry the weight of the butt end of the wing and to help make it easier to move. This makes it possible for two men to handle the wing very easily. Wings should be placed on wooden horses or pads to prevent damage.

C. REMOVAL OF TAIL SURFACES

Remove inspection plates located on the vertical fin and on the bottom of the fuselage. Through the access plate in the bottom of the fuselage remove the strut nuts on each strut and directly above the strut fittings there are two bolts securing the leading edge of the horizontal stabilizer to the fuselage. Remove these bolts, two to each stabilizer. Through the access plates located in the vertical fin there are three bolts securing the trailing edge of the horizontal stabilizers. Two of these bolts are $\frac{1}{4}$" in diameter and the third is 3/16" diameter clevis bolts.

Remove the bolts holding the trim mechanism acuating arm to the trim mechanism. Remove stabilizer and elevators in one unit by pulling outward on the stabilizer, making sure not to bend the stabilizer struts.

FIGURE 1



Place "C" clamp as shown above to lock nose gear when wings are removed from aircraft.

As soon as the stabilizer is free from the fuselage a brace should be installed from the leading edge of the stabilizer to the stabilizer lift strut to hold the strut in its original position to prevent damage to the strut.

The trim tab is removable from the elevator by pulling the hinge pin. This pin runs through all three hinge points, the inboard end of the pin is drilled and tapped for a $\frac{1}{2}$ x 24 screw. A screw or bolt of this size is screwed into the end of this hinge pin and is used as a point to pull from. As the pin is removed the tab should be held to prevent it from bending the hinge points.

For all control surface movements refer to Section I under Leading Particulars and Principal dimensions.

D. REMOVAL OF FLAPS AND AILERONS

The flaps are removed by disconnecting the flap actuating cable from the flap arm, then remove all three hinge pivot bolts, holding the flap securely. When all three bolts are out, work the flap downward to release the tension on the flap retract spring and then disconnect the spring from the eye bolt on the flap.

When removing or installing the flaps be sure and inspect the inboard flap pivot fitting for looseness where it is bolted on to the flap and also check the inboard flap pivot fitting that is attached to the wings for looseness or a bent condition.

Removal of the ailerons requires a patch of fabric to be removed from the inboard top end of the aileron to gain access to the bolt which the aileron actuating arm pivots on. The three hinge bolts are accessable from the bottom of the aileron by removing the small inspection plates on the bottom of the ailerons.

E. INSTALLATION ON WINGS AND SURFACES

Installation of the wings is a reversal of the procedures for the removal, however, a few precautions should be observed.

The wings should be aligned very carefully and all lines and wires that enter the fuselage should be inserted in their respective positions as the wing is mated to the fuselage.

The line that fits at the top of the wing tank should be secured as soon as the wing is close enough to the fuselage.

The spar fittings should be aligned perfectly with the center section wing fittings before the wing bolts are inserted, if it takes too much force to make the bolts enter the holes, recheck for alignment. Do not force the bolts, to do so may peel some of the metal from the aluminum spar straps causing a loose fit on the bolts. After the bolts are installed, the nuts are put on and run up flush with the spar straps and tightened just to the next castellation which will align with the key hole in the bolt. Do not tighten beyond this point as the four wing bolts serve only as pins.

Installation of flaps and ailerons is the reverse procedure of removal. Check and make sure all bushings in the hinge pivot points are in their place.

SECTION V

LANDING GEAR AND BRAKE SYSTEM

A. GENERAL

B. REMOVAL OF LANDING GEARS
   1. Main Gears
   2. Nose Gear

C. REASSEMBLY AND INSTALLATION OF LANDING GEARS
   1. Main Gears
   2. Nose Gears

D. BRAKE AND WHEEL MAINTENANCE

E. LANDING GEAR RIGGING PROCEDURE
   1. Nose Gear Adjustment
   2. Bleeding Procedure

SECTION V

A. GENERAL

The landing gears on the Bellanca 17-30 Viking are hydraulic operated and have spring-oil type oleos. Gear parts are heat treated and should not be welded or repaired unless equipment for reheat treating is available along with trained personnel to do the job.

B. REMOVAL OF LANDING GEARS

1. Main Gears

Place aircraft on jacks as shown in Figure 2, Section II. Remove wheels, disconnect scissors from upper and lower gear legs. Piston and plunger rod are removed by taking nut off of the upper end of the upper gear leg.

Remove the long pivot bolt at the top of the upper gear leg by sliding outboard through the small clearance hole, then remove upper leg from wheel well, being very careful not to damage the micro switches located in the wheel well.

2. Nose Gear

Remove engine cowl, disconnect hydraulic cylinder shaft from nose gear and disconnect steering rods. Then remove pivot bolt at top of nose gear and remove nose gear from engine mount arms. Disconnect scissors and remove nut on the top of nose gear upper leg to separate top and lower gear legs.

C. REASSEMBLY AND INSTALLATION OF GEARS

1. Main Gears are reassembled by reversing procedure outlined in Part B. Gears should be completely serviced as outlined in Section II of this manual. Extreme care should be taken not to damage micro switches.
2. Nose gear reassembly is the reverse of Part C. The fibre steering collar insert should be lightly oiled and not tightened to the point of binding.

D. BRAKE AND WHEEL MAINTENANCE

1. Instroduction

2. Tire Maintenance

3. Overhaul of Wheels

4. Overhaul of Brake Assembly

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SPECIFICATIONS

GOODYEAR TIRES, WHEELS & BRAKES

BELLANCA AIRCRAFT CORPORATION

BELLANCA 260 MODEL NUMBER 14-19-3A

AND BELLANCA 300 MODEL 17-30

TIRES -

MAIN: Goodyear tubeless nylon with sidewall inflation valve
6.00-6 6 ply rating

NOSE: Goodyear Nylon type III
15 x 6.00-6 4 ply rating or Goodyear tubeless nylon with sidewall inflation valve.
15 x 6.00-6 4 ply rating Tube Type.

WHEELS -

MAIN: Assembly 9532673

NOSE: Assembly 9532186 or Assembly 9532112 tubeless

Torque wheel-half bolts to 83 pound inches.

BRAKE - Assembly 9532181

Functional test pressure: 870 psi

- Disc wear: Minimum disc thickness .225 inch

- Lining wear: (To check serviceability).

a. Park the brake.
b. Measure the distance between the disc and the flat surface of the housing (parallel to the disc) near the center of the disc face.
c. Replace linings if space between the disc and the flat surface of the housing is (or exceeds) .312 (5/16) inch.

CAUTION

Never mix new and used brake linings. If necessary to reuse worn linings, replace them in their original positions.

SECTION I

INTRODUCTION

1-1 GENERAL

1-2 This manual gives instruction for the maintenance of tires, main wheels, nose wheel and brakes used on the Bellanca Aircraft Corporation Bellanca 260 Model Number 14-19-3A and Bellanca 300 Model 17-30 (See page "i" for specifications.)

1-3 TIRES - General Description

a. Mainwheels are designed for and equipped with 6.00-6 6 ply rating Goodyear Nylon, Rib Tread, Sidewall inflation valve, Tubeless Tires.

b. Two types of nose wheels are available. Nose wheel assembly 9532112 utilizes a 15 x 6.00-6 4 ply rating Goodyear Nylon, Rib Tread Sidewall inflation valve, Tubeless Tire and nose wheel assembly 9532186 which uses a 15 x 6.00-6 4 ply rating Goodyear Nylon, Rib Tread Tire with an inner tube.

c. An inflation needle (Stock No. 206-108172) is furnished with each airplane.

1-4 WHEELS - General Description

1-5 The halves of the divided type main wheels and the nose wheel are made of aluminum alloy, held together by bolts and secured with washers and self-locking nuts. Each wheel has two tapered roller bearings, seated in hardened cups in the wheel hubs, protected by special rubber grease seals to prevent loss of lubricant and to keep out foreign material.

1-6 BRAKES - General Description

1-7 Goodyear single disc brake assemblies are used. Braking action is produced by hydraulically clamping the rotating disc between the piston and anvil linings, which are retained in recesses provided in the brake housing and piston. To assure equal pressure from the entire surface of both brake linings, the brake disc is geared to (1) rotate with the wheel, and (2) permit it to "float" sideways. Inlet ports are provided on both sides of the brake so it may be installed on either side of the aircraft.

SECTION II

TIRE MAINTENANCE

2-1 TIRES - Main and Nosewheels (Tubeless)

NOTE

When a tube type nosewheel and tire is used, standard maintenance procedures should be followed.

2-2 INFLATION PROCEDURE

a. An inflation needle is carried in a transparent Zip-Lip Bag, stored in the glove compartment of the airplane.

b. Open the bag according to the instructions which can be read through the bag.

NOTE

Retain the bag to store the inflation needle and spare valves.

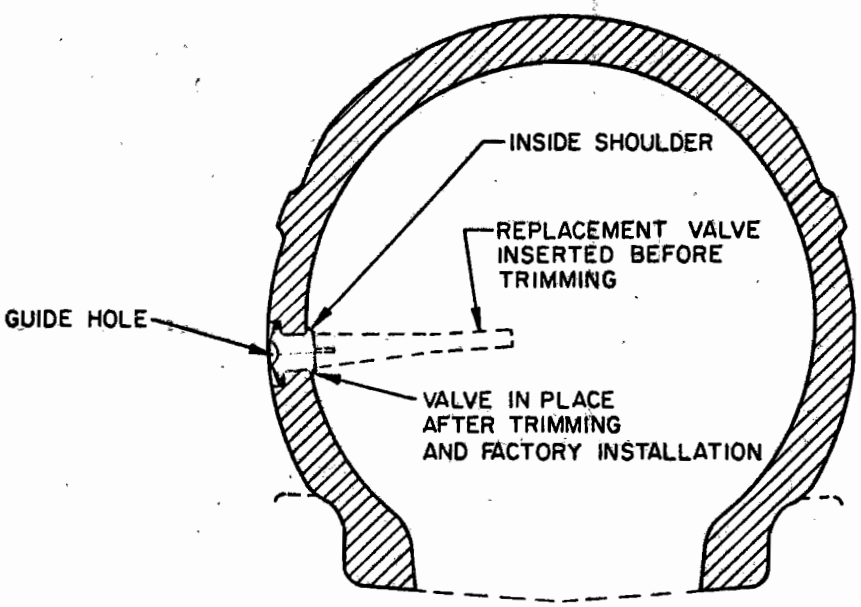


Figure 1 Sidewall Valve Tubeless Tire (Cross-section)

c. Lubricate the end of the inflating needle by pressing it against the glycerine-saturated pad in the case, then lubricate the guide hole of the blue-colored valve with the needle. (See Figure 1)

d. Insert the lubricated end of the inflating needle into the guide hole of the blue-colored valve with a rotary motion.

CAUTION

The valve opening should be well lubricated before inserting the inflating needle. The needle should never be inserted dry. DO NOT FORCE THE NEEDLE. If the needle does not enter easily, re-lubricate.

e. Using a standard air chuck, inflate the tire to approximately 65 psi (check pressure with an air guage) to seat the beads properly against the wheel flanges so as to insure dependable air retention. Then reduce the air pressure (to that recommended by the aircraft manufacturer) by depressing the core in the inflating needle and allowing air to escape.

NOTE

If a low pressure air supply is used to inflate the tire, it may be necessary to restrict the outside diameter of the tire in order to spread the beads until they are seated properly. A length of rope wound snugly around the circumference of the tire before inflating will help to seat the beads.

f. Remove the inflating needle from the valve, replace it in its carrying case and store the case in the Zip-Lip Bag for protection.

2-3 SIDEWALL VALVE REPLACEMENT

NOTE

With normal care and proper inflation, the tubeless tire valve will last the life of the tire. However, if a valve should be found to be leaking it can easily be replaced.

a. Deflate the tire by inserting the inflating needle into the sidewall valve (according to instructions given in paragraph 2-2c and d above) and remove the valve core from the inflating needle to insure complete deflation of the tire; then remove the tire from the wheel.

b. Cut off the inside shoulder of the sidewall valve to be removed with a pair of pincers or side-cutting pliers. (See Figure 1)

CAUTION

Use extreme care to avoid damaging either the tire liner or the sidewall rubber under the head of the valve. Any kind of cut or damage of the rubber in these areas may impair or destroy the air retention properties of the tire.

c. From the outside of the tire raise the blue valve head and use a pair of pliers to pull the valve out of the tire.

d. Place a small amount of cold patch rubber cement into the valve hole of the tire and on the thicker part of the tapered portion of the replacement valve.

e. Insert the small end of the tapered replacement valve through the valve hole in the tire wall from the outside. (See Figure 1)

f. Wipe the cement from the part of the replacement valve projecting inside the tire; grasp the tapered end of the replacement valve with thumb and forefinger and exert a strong steady pull (slowly rotating the valve so as to spread the rubber cement between the body of the valve and the valve hole in the sidewall of the tire) until the head of the valve is seated in the recess provided for it on the outside of the tire.

CAUTION

Be careful. Avoid pulling the entire replacement valve through the hole in the tire wall.

g. Cut off the tapered extension of the replacement valve (just below the shoulder) on the inside of the tire with a pair of pincers or side-cutting pliers. (See Figure 1)

NOTE

When the tapered extension of the replacement valve has been cut off, the molded hole is visible at the center of the valve.

h. The tire may be mounted on the wheel and used immediately after inflation.

SECTION III

OVERHAUL OF WHEELS

3-1 MAINWHEEL 9532673 (See Figure 2)

3-2 DISASSEMBLY

a. Completely deflate the tire according to instructions given in paragraph 2-3a.

b. Remove the disc clips.

c. Remove the wheel assembly and deflated tire from the airplane as a unit, taking care not to damage the bearing seal (1) or the bearing cone (2).

d. Break the tire beads away from the wheel flanges by pressing with the heels of the hands or carefully stepping on the tire while the wheel lies flat on a clean area.

CAUTION

DO NOT USE TIRE TOOLS. They may damage the wheel flanges or tire beads and prevent proper air retention.

e. Remove the self-locking nuts (3) and washers (4) from the wheel bolts (5).

f. Separate the wheel halves (6 and 11) and remove the tire.

g. If the O-ring seal (10) is to be reinstalled on the no-brake wheel half (11) after overhaul, note its position before carefully removing it. Place it on a clean sheet of paper on which has been indicated the position of the seal with relation to the wheel-half. On reassembly it should be installed as nearly as possible in its original position. (See Reassembly instructions, paragraph 3-5b)

NOTE

Bearing cups (7 and 12) are shrunk fit into the wheel halves (6 and 11) and should not be removed unless replacement is necessary. If a bearing cup is to be replaced, the wheel half must be heated, either in boiling water for 30 minutes, or, in an oven not to exceed 149°C (300°F) before attempting to remove or install a cup.

3-3 CLEANING, INSPECTION and REPAIR (Main Wheel Assembly 9532673)

a. Clean all METAL parts in dry cleaning solution and dry with a lint-free cloth.

NOTE

Wash the bearing cones (2) last to keep the solution clean and place all parts in a clean place to avoid picking up foreign matter.

b. Inspect the wheel halves for damage or cracks. If a casting is cracked or shows excessive corrosion, it should be replaced. Small nicks or gouges in the castings should be blended out and polished with fine (400 grit) sandpaper. Areas from which the protective coating has been removed or which show slight corrosion, should be thoroughly cleaned and repainted with two coats of zinc chromate primer and two coats of aluminum lacquer.

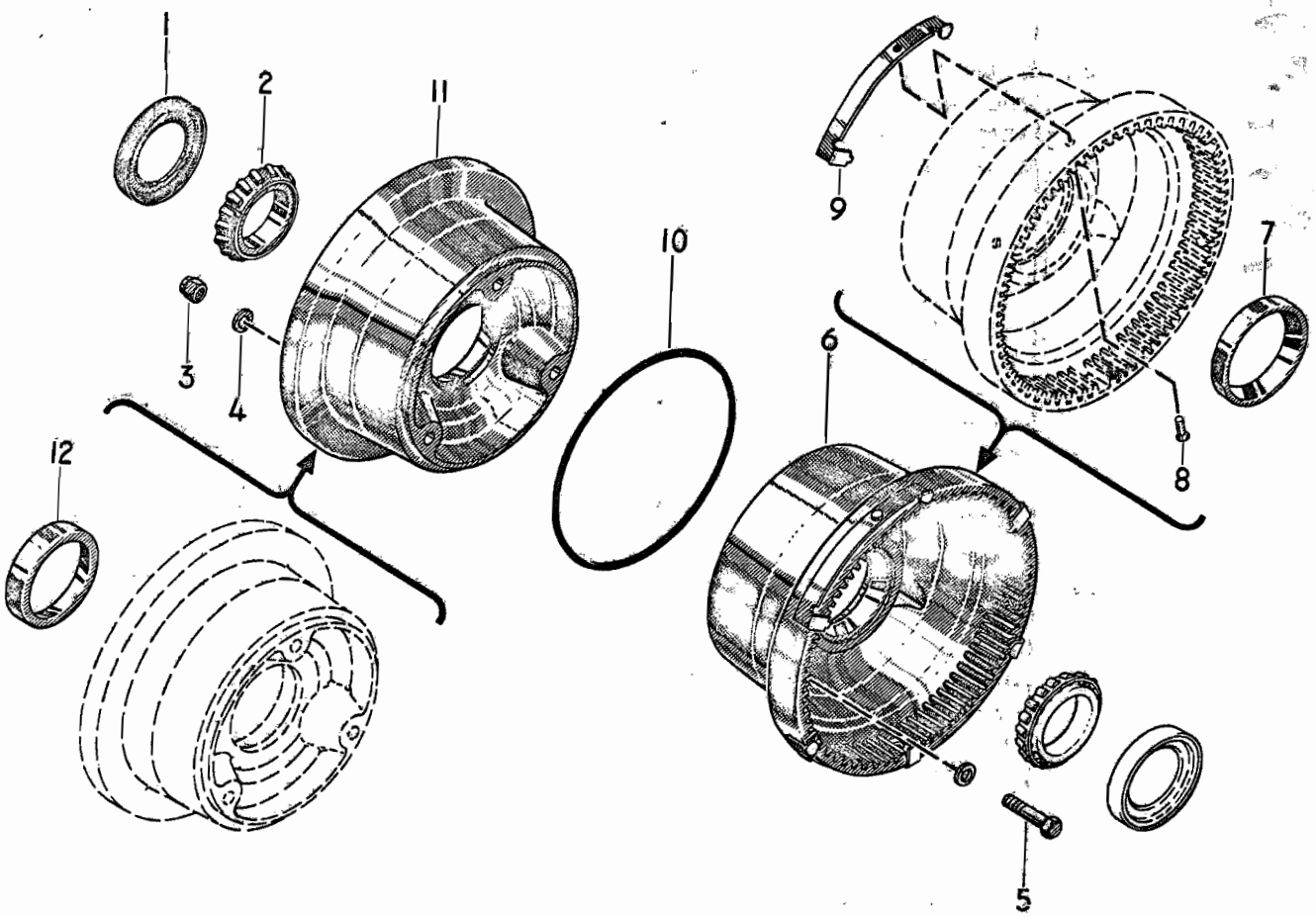


Figure 2 Main Wheel Assembly 9532673

Fig & Index No.	Part N Number	Description	Goodyear Code Number	Units Per Assy
2-	9532673	WHEEL ASSEMBLY.....	39532673	1
-1	9524218	. SEAL, Bearing.....	39524218	2
-2	13889	. CONE, Bearing.....	395-0476	2
-3	22FH-428	. NUT, Self locking.....	395-6867	3
-4	AN960-416	. WASHER, Plain.....	395-0897	6
-5	AN4-13A	. BOLT, Wheel.....	395-3139	3
-6	9524201	. WHEEL SUBASSEMBLY, Inboard Half	39524201	1
-7	13830	. . CUP, Bearing.....	395-0477	1
-8	MS20426DD6-6	. . RIVET,.....	395-7675	3
-9	9525059	. . CLIP, Disc,.....	39525059	3
-10	AN6230B28	. SEAL, Wheel O-ring.....	395-4828	1
-11	9524202	. WHEEL SUBASSEMBLY, Outboard half.....	39524202	1
-12	13830	. . CUP, Bearing	395-0477	1

c. Inspect to disc drive teeth of the wheel half for damage or wear. If any are worn to a thickness of .110-inch from the top of the tooth, replace the wheel half. A gauge can be fabricated to check tooth dimensions accurately. (See Figure 3)

d. Bearing cups (7 and 12) should be inspected for damage or wear, but should not be removed from the wheel castings unless replacement is necessary.

e. Bearing cones (2) after washing thoroughly in dry cleaning fluid, are inspected for damage or wear and then coated with clean bearing grease when re-installed in their cups (7 and 12).

f. Bearing seals (1) should be checked for serviceability.

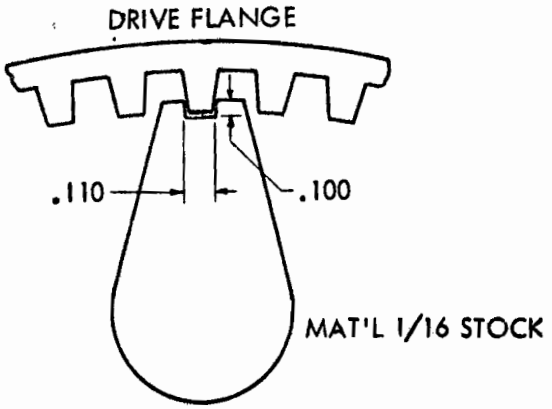


Figure 3 Gauge for Checking Disc Drive Tooth Wear

3-4 LUBRICATION (Main Wheel Assembly 9532673).

a. Use MIL-L-3545 (or equivalent) grease to lubricate bearing cones (2) and spread a thin coat of grease on the surface of the bearing cups (7 and 12). DO NOT OVERLUBRICATE.

b. Lubricate the contacting rubber edges of the bearing seals (1) and the O-ring seal (8) with MIL-L-3545 bearing grease (or equivalent).

3-5 REASSEMBLY

a. Wipe the wheel flange bead seat and wheel register areas with a lint-free cloth (dampened with denatured alcohol) to remove any foreign matter.

b. Install the lubricated O-ring seal(10) on the no-brake wheel half (11).

CAUTION

If the O-ring seal(10) must be re-used, it should be installed as nearly as possible in its original position (see para. 3-2g).

c. Wipe the tire beads with a clean cloth and carefully position the tires on the no-brake half of the wheel (11).

d. Cautiously position the brake-side wheel half (6) on the other half of the wheel so as not to dislocate or damage the O-ring wheel seal (10).

e. Fasten the two wheel halves together with three bolts (5), six washers (4) and three self-locking nuts (3). Tighten the self-locking nuts evenly (in rotation) until a torque of 83 pound-inches is reached.

CAUTION

Uneven torquing of nuts may cause bolt failure or air leaks.

f. Lubricate the bearing cones (2) and the bearing cups (7 and 12) sparingly but thoroughly with MIL-L-3545 grease and carefully install the bearings in the cups.

g. Lubricate the contacting edges of the bearing seals (1) with MIL-L-3545 (or equivalent) bearing grease and install them carefully. The rubber lip should contact the edge of the bearing cup.

h. Install the wheel on the airplane, adjust the bearings and safety.

NOTE

Rotate the wheel while adjusting the axle nut to insure proper seating and check the wheel to see that there is no side motion.

i. Inflate the tire according to instructions given in para 2-2.

3-6 NOSEWHEEL 9532186 (See Figure 4)

a. The nosewheel assembly 9532186 is overhauled according to instructions given for the main wheel 9532111, except it does not require a wheel seal (See paragraphs 3-1 through 5).

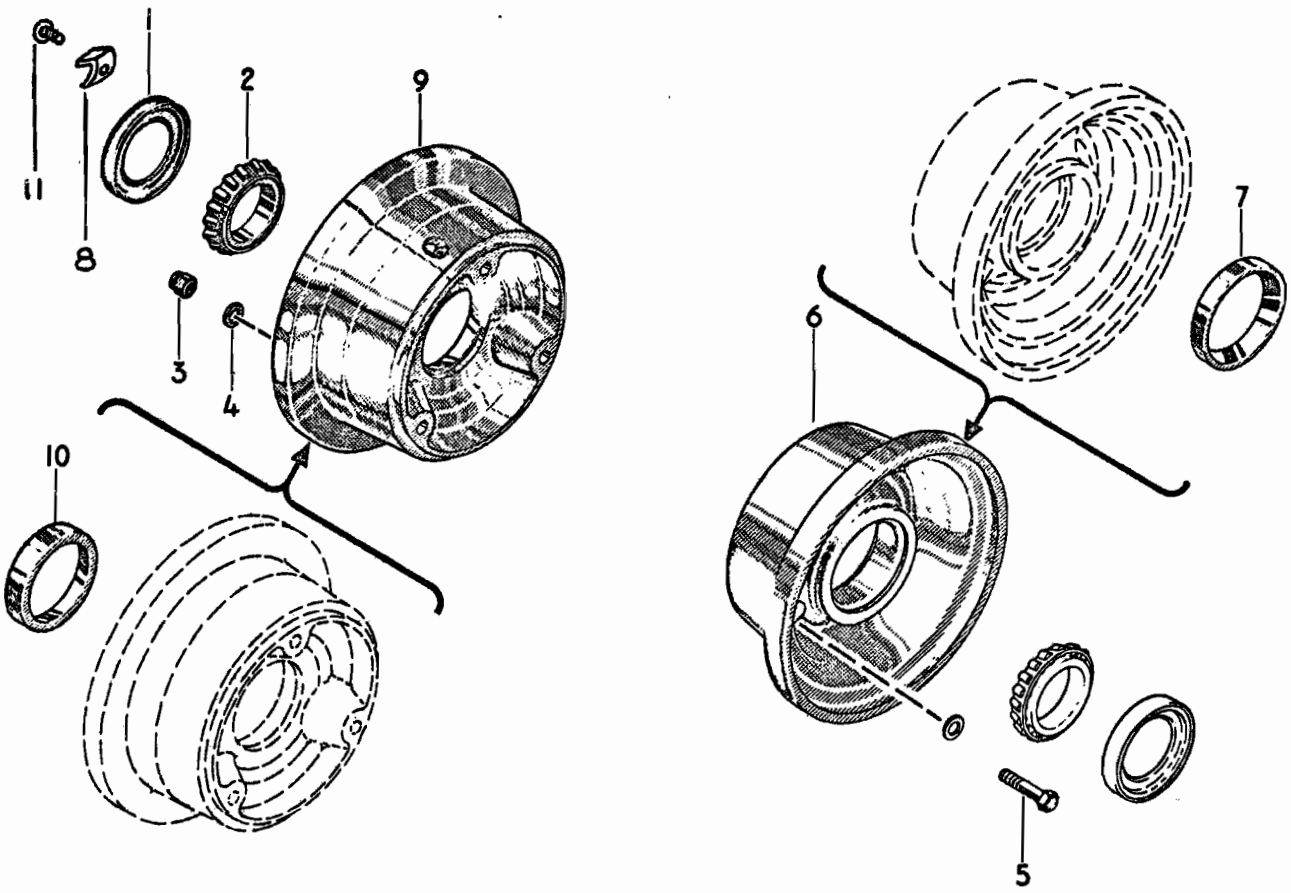


Figure 4 Nosewheel Assembly 9532186

Fig & Index No	Part Number	Description	Goodyear Code Number	Units Per Assy
-4	9532186	Nosewheel Assembly.....	9532186	1
-1	9524218	Seal, Bearing.....	9524218	2
-2	13889	Cone, Bearing.....	95-0476	2
-3	32FE-428	Nut, Self locking.....	95-7146	3
-4	AN960-416	Washer.....	95-0897	6
-5	AN4-13A	Bolt, Wheel.....	95-3139	3
-6	9524203	Wheel Subassembly, Inboard half.....	9524203	1
-7	13830	Cup, Bearing.....	95-0477	1
-8	9524491	Clip, Valve.....	9524291	1
-9	9524318	Wheel Subassembly, Outboard half.....	9524318	1
-10	13830	Cup, Bearing.....	95-0477	1
-11	AN504-8R8	Screw.....	95-7277	1

3-7 NOSEWHEEL 9532112 (See Figure 5) Tubeless Type

a. The nosewheel assembly 9532112 is overhauled according to instructions given for the main wheel 9532111. (See paragraphs 3-1 through -5)

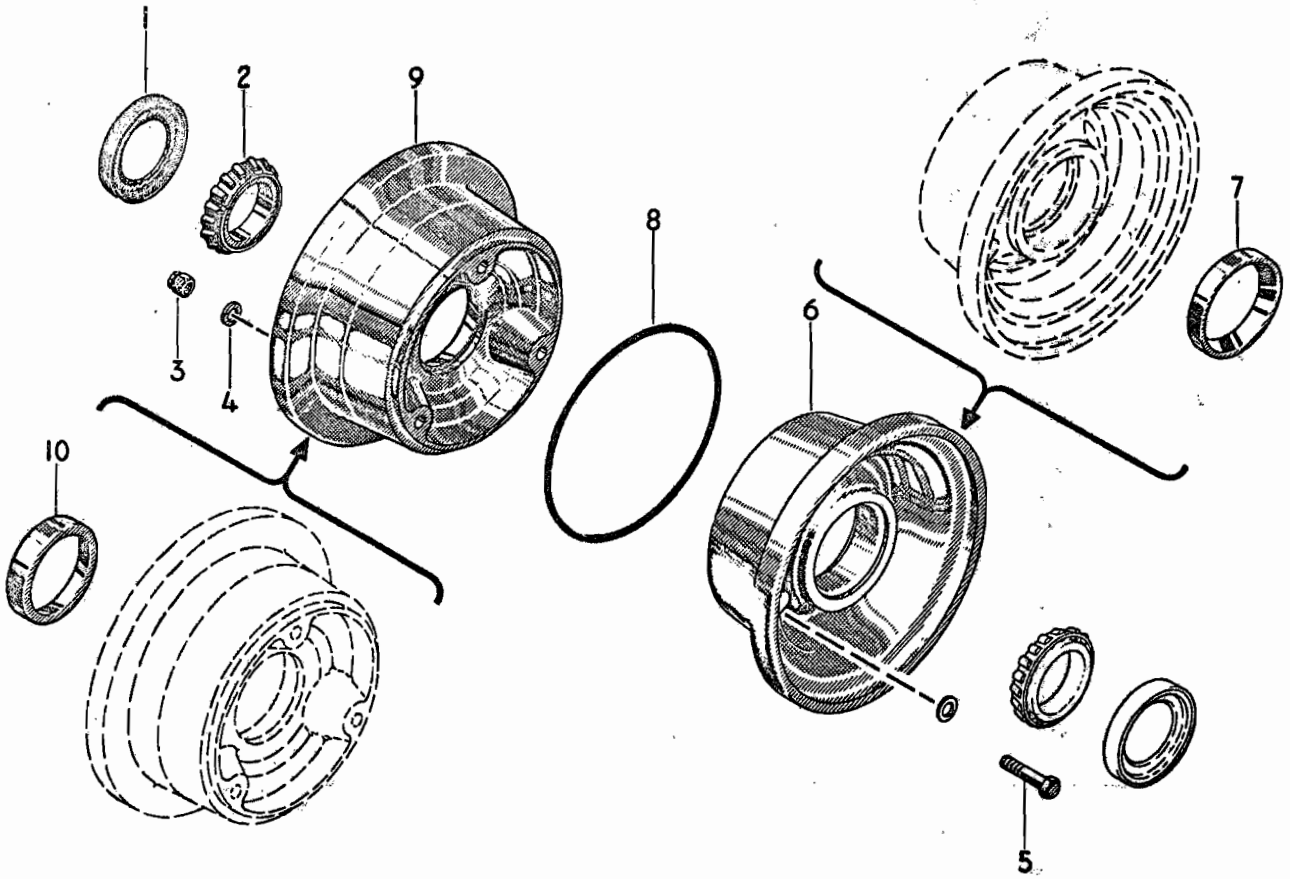


Figure 5 Nosewheel Assembly 9532112

Fig & Index No	Part Number	Description	Goodyear Code Number	Units Per Assy
-5	9532112	Nosewheel Assembly....	9532112	1
-1	9524218	Seal, Bearing.....	9524218	2
-2	13889	Cone, Bearing.....	95-0476	2
-3	32FE-428	Nut, Self locking.....	95-7146	3
-4	AN960-416	Washer.....	95-8897	6
-5	AN4-13A	Bolt, Wheel.....	95-3139	3
-6	9524203	Wheel Subassembly, Inboard half.....	9524203	1
-7	13830	Cup, Bearing.....	95-0477	1
-8	AN6230B28	Seal, O-ring.....	95-4828	1
-9	9524202	Wheel Subassembly, Outboard half.....	9524202	1
-10	13830	Cup, Bearing.....	95-0477	1

SECTION IV

OVERHAUL OF BRAKE ASSEMBLY 9532181

4-1 REPLACING BRAKE LININGS (See Figure 6)

a. Jack up the airplane and deflate the tire according to instructions given in paragraph 2-2.

b. Remove the disc clips and wheel.

c. Move the brake disc (1) as far out of the brake as possible.

d. Insert a flat screwdriver between the worn brake linings (2 and 3) and force the piston (9) to a complete "OFF" position.

e. Remove the worn brake linings (2 and 3) from the brake.

CAUTION

Never mix new and used brake linings. If necessary to reinstall worn linings, replace them in their original positions.

f. Install the thicker brake lining (3) on the piston side of the brake housing (14) with the part number (molded in the lining) facing the piston so that the smooth side of the lining will be in contact with the disc (1).

g. Install the thinner brake lining (2) on the anvil side of the brake housing with the part number (molded on the lining) facing the anvil so that the smooth side of the lining is in contact with the disc (1).

h. Position the disc (1) between the linings (2 and 3).

i. Install the wheel on the airplane, adjust the bearings and safety.

NOTE

Position the wheel so that the three wide slots between the teeth of the disc are in alignment with the disc clip tangs.

j. Deflect the disc clips away from the disc and install the wheel over the disc.

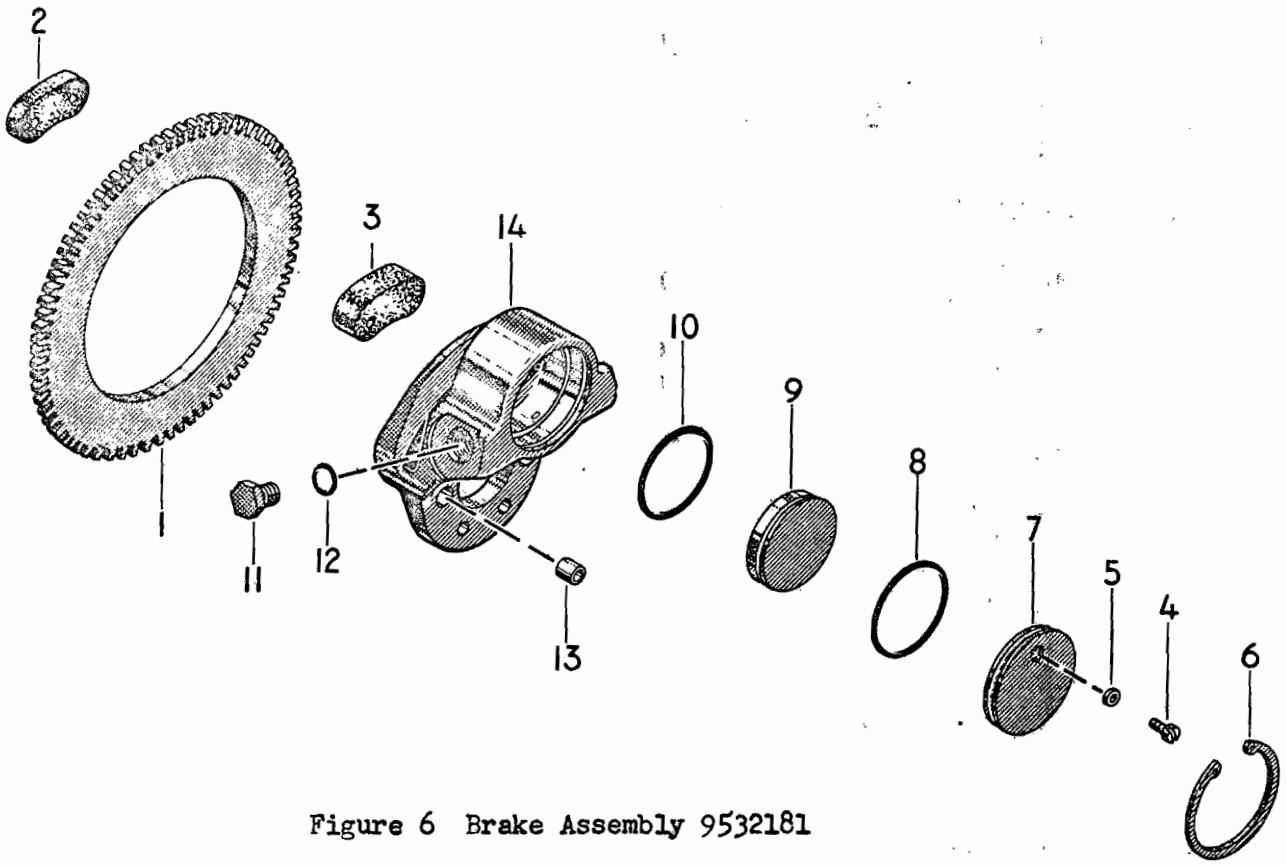


Figure 6 Brake Assembly 9532181

Fig. & Index No.	Part Number	Description	Goodyear Code Number	Units Per Assy
6-	9532181	BRAKE ASSEMBLY	9532181	1
-1	9532277	. DISC, Brake	9532277	1
-2	9511271	. LINING, Anvil.	9511271	1
-3	9511269	. LINING, Piston	9511269	1
-4	AN502-10-6	. SCREW, Bleeder	95-0969	1
-5	511846-4	. WASHER	95-4486	1
-6	NAS669-212	. RING, Retaining	95-3595	1
-7	9524343	. HEAD, Cylinder	9524343	1
-8	AN6230B3	. SEAL, Cylinder head. . . O-ring	95-4803	1
-9	9524223	. PISTON	9524223	1
-10	AN6230B2	. SEAL, Piston O-ring . .	95-4802	1
-11	9520448	. PLUG, Inlet	9520448	1
-12	An6290-4	. GASKET, Inlet.	95-5761	1
-13	9521184	. BUSHING, Mounting flange	9521184	1
-14	9541458	. HOUSING, Brake	9541458	1

k. Apply the brakes several times to seat the parts.

l. Release the brakes and check the wheel to see that it rotates freely and does not rub against the brake.

4-2 DISASSEMBLY - Brake 9532181 (See Figure 6).

a. Remove the wheel.

b. Disconnect the hydraulic line.

c. Remove the bolts from the axle torque flange, thus releasing the brake.

d. Remove the brake disc (1) and the brake linings (2 and 3) from the brake housing (14).

e. Remove the bleeder screw (5) and bleeder washer(4).

f. Remove the retaining ring (6) releasing the cylinder head (7) and cylinder head O-ring seal (8).

g. Push the piston (9) out of the brake housing (14) and remove piston O-ring seal (10).

NOTE

O-ring seals and gaskets should be replaced at each overhaul. If the seals and gaskets are to be reinstalled on reassembly, note their positions before carefully removing them. Place each seal on a clean sheet of paper on which has been indicated the position of the seal with relation to its seat. On reassembly it should be reinstalled as nearly as possible in its original position.

h. Remove the inlet plug (11) and gasket (12) from the brake housing (14).

NOTE

Mounting flange bushing (13) should not be removed unless the brake is to be installed on the opposite side of the airplane.

4-3 CLEANING, INSPECTION and REPAIR - Brake Assembly 9532181

a. Clean all metal parts in dry cleaning solution and dry with a lint-free cloth.

b. Wash seals in clean hydraulic fluid.

c. Repair or replace all worn or damaged parts.

d. Brake discs which have dished (in excess of 1/16 inch) may cause disc clips to become disengaged and should be replaced.

e. Replace brake discs which have worn to a thickness of .225 inch or less.

f. Inspect the brake housing for wear or damage. Any small nicks or corrosion should be polished out with fine sandpaper (400 grit) and repainted with two coats of zinc chromate primer followed by two coats of aluminum lacquer.

g. Inspect cylinder walls and contacting surfaces of the piston for damage. Small scratches and nicks can be removed by polishing with fine sandpaper (400 grit).

h. Brake linings should be replaced at the time of overhaul. Allowable lining wear can be checked by the method described in "Specifications"(inside front cover).

CAUTION

Never mix new and used brake linings. If necessary to reuse worn linings, install them in their original positions.

4-4 REASSEMBLY - Brake 4532181 (See Figure 6)

a. Lubricate the cylinder walls of the brake housing (14), the contacting surfaces of the piston (9) and cylinder head (7) with a thin coat of MIL-L-7711 grease.

b. Lubricate the cylinder head O-ring seal (8) with MIL-L-7711 grease (or equivalent) and install in groove provided in the cylinder head (7).

c. Lubricate the piston O-ring seal (10) with MIL-L-7711 grease (or equivalent) and install it on the piston (9).

d. Install the piston (9) in the brake housing (14) with the thick section of the O-ring groove towards the brake lining.

e. Position the cylinder head (7) on the brake housing (14) and secure with retainer ring (6).

f. Install the thicker brake lining (3, Figure 6) on the piston side of the brake housing (14, Figure 6) with the part number (molded in the lining) facing the piston, so that the smooth side will be in contact with the disc.

g. Install the thinner brake lining (2) on the anvil side of the brake housing (14) with the part number (molded in the lining) facing the anvil, so that the smooth side of the lining will be in contact with the disc (1).

h. Install the brake disc (1) between the brake linings (2 and 3).

i. Install the inlet gasket (12) on the inlet plug (11) and screw the plug into position in the brake housing (14).

j. Place the bleeder screw seals (5) in bleeder screws (4) and install the screws in the cylinder head (7) completing the reassembly.

E. LANDING GEAR RIGGING PROCEDURE

1. Nose Gear Adjustment

Disconnect nose gear steering rods from nose gear and set nose gear and rudder on the center line of fuselage. Tape a bar or stick across all 4 rudder pedals, then adjust nose gear steering rods to fit nose gear, checking to be sure the nose gear wheel is still aligned with the center line. If this checks, insert bolts back in steering rods.

Check rudder for alignment and rudder pedals for alignment. If rudder or rudder pedals do not line up, adjustments on the rudder cable turnbuckles may be made.

2. Bleeding Procedure

Place aircraft on jacks, remove top cowl and remove plug from the firewall reservoir. Raise both front seats and remove the center cover between the seats, then remove the 1/8" plug located on the top of the power pack cover. Use two wrenches, one to hold the base plug and one to remove the 1/8" pipe plug. Loosen the hydraulic line fitting running from the firewall reservoir to the firewall (this should be loosened at the firewall and not at the reservoir), and service the hydraulic power pack located under the front seat, by filling the firewall reservoir. The 1/8" plug on the top of the hydraulic power pack should be removed to ascertain when the power pack is full with fluid being run through the firewall reservoir until it comes out the top of the hydraulic power pack. Insert the 1/8" plug and fill the firewall reservoir to the mark indicated on the side of the reservoir. The line that was loosened previously should now be tightened and the reservoir plug reinstalled.

With the gear lever in the neutral position and the gear in the down and locked position, loosen the down line connection on all cylinders. Place the gear selector handle in the up position and slowly pump the emergency gear handle several times until air is expelled from the cylinders, and then tighten all lines.

Now raise the gear to the full up and locked position with the hand pump until the selector handle returns to the neutral position. With the gear in the up position loosen the up lines at the hydraulic cylinders. The weight of the gear coming down will expell the air from the cylinders. Pump the gear handle slowly several times, as this will expell the air from the lines themselves. After taking each gear through this cycle tighten each line as a gear is bled. To check the gear to be sure that all lines and cylinders are free from air, put the gear in the up position and obtain a red light on the gear indicator. Then apply down pressure to the nose gear by pulling down on the gear. If the gear is solid and does not come down any, the system is usually free of air. If the nose gear can be pulled down any, the system has not been purged of all the air and it will be necessary to repeat the above bleeding procedure. After the gear is bled and is satisfactory, then check the firewall reservoir and power pack and if fluid level is low, service as previously mentioned.

If landing gears bleed down in flight, place aircraft on the jacks and remove the up gear lines completely from the hydraulic cylinders. Then place gear handle in the down position and pump the gear handle until the gear selector handle returns to the neutral position or fluid comes from a cylinder or one of the lines. If fluid comes from a cylinder, this indicates an internal O ring is out in the cylinder. If fluid comes from a line, this indicates an O ring seal is out in the hydraulic power pack itself, and the power pack should be replaced. The seal on the power pack lid should not be broken or removed as to do so will void the warranty on the power pack.

SECTION VI

CONTROL SURFACES

CONTENTS

SECTION VI

CONTROL SURFACES

A. GENERAL

Horizontal stabilizers, elevators and rudder are of tubular steel construction covered with dacron fabric and finished with butyrate dope. Flaps and ailerons are constructed of spruce and covered with dacron fabric and finished with butyrate dope.

The ailerons are actuated by cables and torque rods, whereas the flaps, elevators and rudder are actuated by a cable and pulley arrangement.

B. SPECIFICATIONS

Wings	161.5 square feet (including flaps, ailerons and fuselage cross section)
Flaps	16.16 square feet
Ailerons	11.77 square feet
Wing Loading	18.58 pounds per square foot

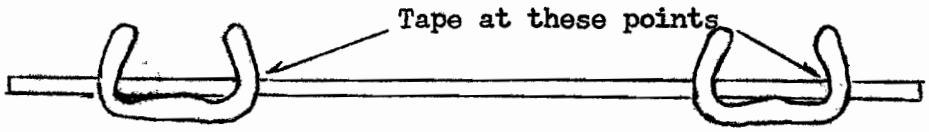
Control Surface travels

Rudder	22 degrees right	22 degrees left
Elevator	22 degrees up	15 degrees down
Trim Tab	8 degrees up	35.5 degrees down
Flaps		46 degrees down

C. RIGGING AND ADJUSTMENTS

1. Ailerons

Set and clamp the control wheels in a neutral position. This may be done by taping a stick or rod to both control wheels as illustrated below.



Adjust turn buckles so the bellcranks are an equal distance from the center line of the airplane. Clamp the aileron in a neutral position and adjust the torque tubes so the distance between the torque tube attachment points are .460 longer than the distance between the hinge points of the bellcranks at the fuselage.

Install the bolts and check aileron travel by means of the stops of the quadrant on the control column. If aileron travel is excessive, shorten the distance between the torque tube attachment points.

2. Flaps

Flaps are adjusted by inserting a small shim or by removing material from the inboard and outboard end of the blocks located in the flap bay area of the wing. If adding shim material to these blocks they should be both glued and nailed in place using small brads and should be painted for protection. If removing material from the blocks, the same applies in that the exposed area of the wood after trimming should be painted. The inboard end of the trailing edge of the flap should be in line with the trailing edge of the wing at that point.

When flaps become out of alignment the inboard flap hinges that are bolted to the wing should be checked to see that they are not bent out of shape.

3. Elevators

Elevators are adjusted for proper travel by lengthening or shortening the elevator control cables at the turnbuckles. See control travel specifications for correct degrees of travel. These specifications are listed in the front part of this section.

4. Trim Tab

Trim Tab adjustments are made at the trim tab actuating arm located at the inspection plate on the aft of the fuselage. It is of the utmost importance to keep the play in this arm and in the trim tab at a minimum. Excessive play in the trim tab or in the trim tab mechanism could cause a flutter at high speeds. Should this occur an immediate reduction in speed is recommended.

5. Rudder

Rudder adjustment is accomplished by shortening or lengthening the turnbuckles on the rudder cables.

SECTION VII

FUEL SYSTEM

A. GENERAL

The fuel system on the Bellanca 17-30 Viking is a positive pressure system utilizing an engine driven fuel pump for the main source and backed up by an electric fuel boost pump which is used for starting pressure and as an emergency boost pump in case of engine driven pump failure.

B. TROUBLE SHOOTING

While this system is relatively trouble free, the sump drain and gasculators should be drained regularily and the fuel screen checked for any sediment and cleaned. It is recommended that the tanks be filled after each flight to prevent condensation of moisture in the system.

C. FUEL INDICATOR SWITCH ADJUSTMENT

The fuel quanity switches are located under the pedestal between the two front seats which is covered over with carpet, and mounted to the fuel selector.

To adjust the fuel switches, put selector on the tank needing adjustment. Loosen jam nut on switch and move switch in or out by means of the nut located on both sides of the bracket. Move the switch in or out until points open or close to give the correct reading on the desired fuel tank.

D. FUEL PRESSURE ADJUSTMENT

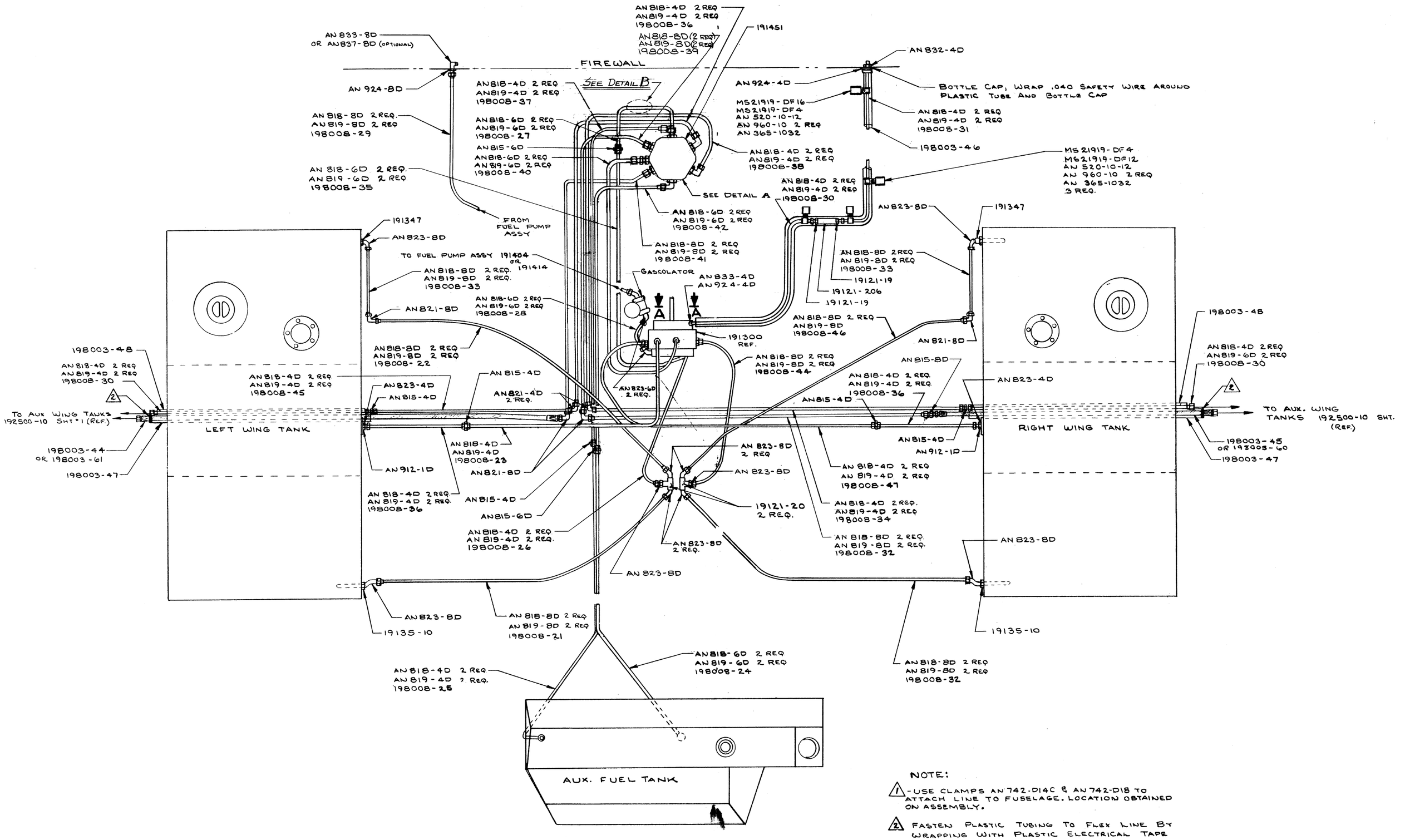
Fuel Pressure adjustment is made at the engine driven fuel pump. Turn the screw located at the back of this pump in to increase fuel pressure and out to decrease. Pressure should be $3\frac{1}{2}$ pounds to $4\frac{1}{2}$ pounds at 550 rpm.

E. FUEL BOOST AND EMERGENCY PUMP

The electric fuel boost pump is located under the left front seat. This is a sealed unit and has no adjustment as to pressure. The boost pump switch on the early model Viking is a two position switch with the up position used for emergency in flight conditions, and the lower position is used for starting. On late model Vikings the up position is used for both starting pressure and emergency use also.

F. FUEL SYSTEMS SCHEMATIC

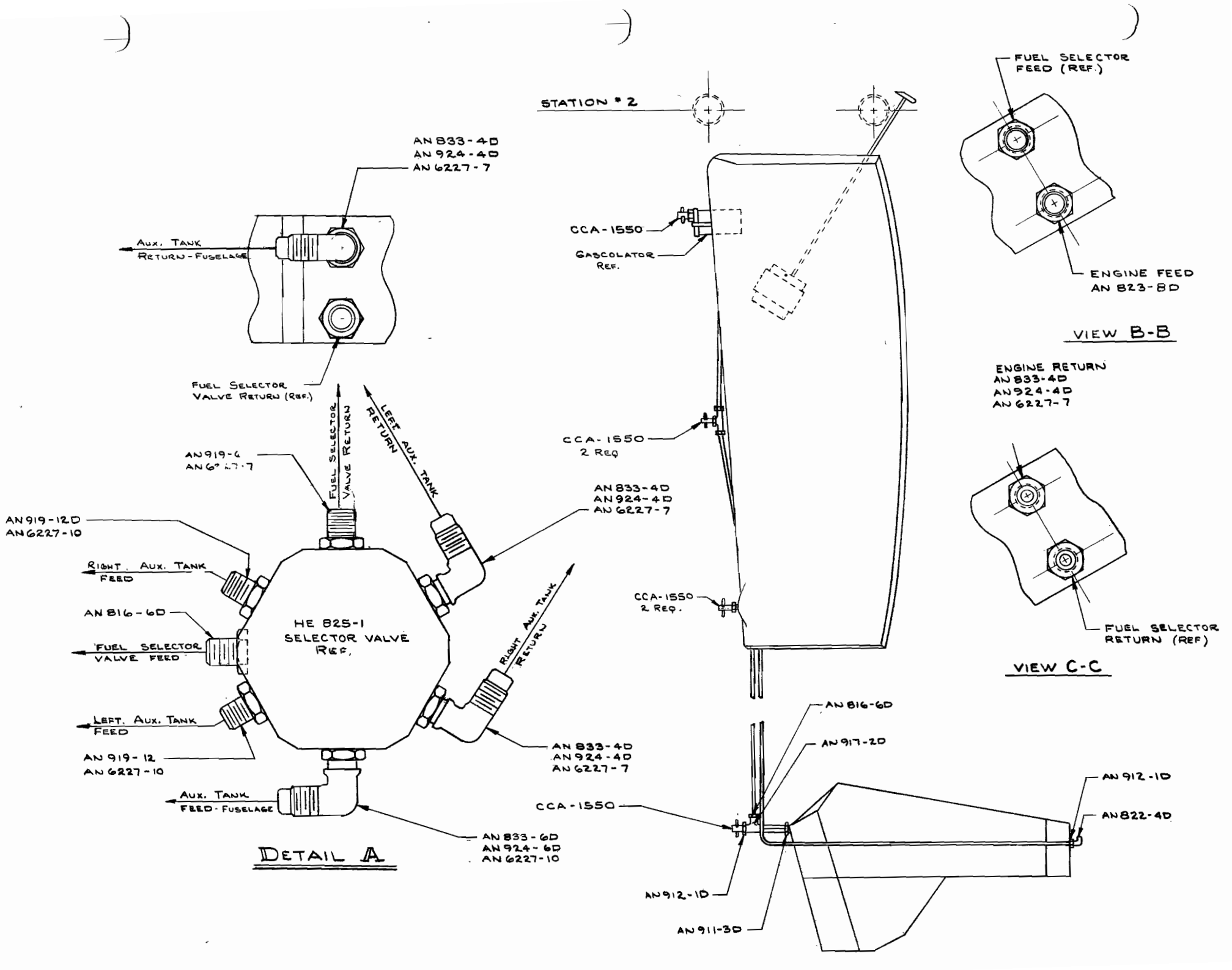
Found on following pages.



NOTE:

1. -USE CLAMPS AN742-D14C & AN742-D18 TO ATTACH LINE TO FUSELAGE. LOCATION OBTAINED ON ASSEMBLY.

2. FASTEN PLASTIC TUBING TO FLEX LINE BY WRAPPING WITH PLASTIC ELECTRICAL TAPE


AN 833-4D
AN 924-4D
AN 6227-7
AUX. TANK
RETURN - FUSELAGE
FUEL SELECTOR
VALVE RETURN (REF.)
AN 919-4
AN 6227-7
FUEL SELECTOR
VALVE RETURN
LEFT AUX. TANK
RETURN
AN 919-12D
AN 6227-10
RIGHT AUX. TANK
FEED
AN 816-6D
FUEL SELECTOR
VALVE FEED
HE 825-1
SELECTOR VALVE
REF.
LEFT AUX. TANK
FEED
AN 919-12
AN 6227-10
AUX. TANK
FEED - FUSELAGE
RIGHT AUX. TANK
RETURN
AN 833-4D
AN 924-4D
AN 6227-7
AN 833-6D
AN 924-6D
AN 6227-10
DETAIL A
STATION * 2
CCA-1550
GASCOLATOR
REF.
CCA-1550
2 REQ
AN 833-4D
AN 924-4D
AN 6227-7
CCA-1550
2 REQ.
AN 816-6D
AN 917-2D
AN 912-1D
AN 822-4D
CCA-1550
AN 912-1D
AN 911-3D
FUEL SELECTOR
FEED (REF.)
ENGINE FEED
AN 823-8D
VIEW B-B
ENGINE RETURN
AN 833-4D
AN 924-4D
AN 6227-7
FUEL SELECTOR
RETURN (REF)
VIEW C-C

SECTION VIII

ELECTRICAL SYSTEM

A. GENERAL

The electrical system is protected by reset circuit breakers. The breaker panel is located at the lower right hand corner of the instrument panel.

B. ELECTRICAL SYSTEM MASTER DIAGRAM

The electrical system master diagram is found on the following page.

REVISIONS					
LET.	CHANGE	DRAWN	DATE	APPVD.	EFF. SER. NO.
A	-100 WAS (2) S.P. SWITCHES	TL	2-28-63	RAG	
B	INCORP USE OF BZ-7RST6 MICRO SWITCH ON -70 & -71	D.K.	7/8/64	MM	4238 & UP
C	INCORP E.A.I.'S H1309A, H1335, H1129 & H1088(1) ADDED DIAGRAM FOR INST'L FUEL PUMP	P.S.	7/15/66	[illegible]	[illegible]
D	ADDED DETAIL "A"	W.B.	5/25/67	[illegible]	

INST'L FUEL PUMP
MODEL 17-30

TO AUTO PILOT—
AN20 MIL-50864 TYPE I WIRE
FURNISHED BY MITCHELL.

JUMPER WIRE

TO ELECTRIC REEL

TO VHF RADIOS

TO LF RADIOS

SEE DETAIL "A"

GROUND SHIELDING TO PLUG 174 #20 SHIELDED 132" LONG

GROUND TO AIRCRAFT STRUCTURE

GROUND SHIELDING TO PLUG 178 #20 SHIELDED 184" LONG

TO BUSS BAR

GROUND TO AIRCRAFT STRUCTURE

173 #18 SHIELDED

INVERTER

GROUND SHIELDING TO AIRCRAFT STRUCTURE

DIAGRAM FOR
REMOTE INDICATING MAGNETIC COMPASS

BUSS BAR

DIAGRAM FOR 2, FL-42'S WITH FLASHER BOX LOCATED ON AIRFRAME

INSTALLATION OF MARKER BEACON RECEIVER OFF SHIPS BUSS BAR.

SELECTOR SWITCHES (REF)

TO SENDER - LEFT WING AUX.

TO SENDER - RIGHT WING AUX.

DETAIL "A"
WIRING DIAGRAM - AUX. WING TANKS

NOTES -
1. WIRES SHOWN IN DETAIL 'A' WILL BE INSTALLED IN ALL AIRCRAFT OF REV. D AND ABT.
2. WHEN AUX. WING TANKS ARE NOT INSTALLED -27 WIRE WILL BE SPLICED TO -156

NO. REQ'D PER UNIT	PART NO.	ZONE	NAME	DIA.	THICK	WIDTH	LENGTH	MATERIAL	MATERIAL SPEC.	CAL. WT.	ACT. WT.
				STOCK SIZE							

UNLESS OTHERWISE NOTED
TOLERANCES:
FRACTIONAL ±1/32
DECIMAL ±.010
ANGULAR ±1/2°
ALL BEND RADII 1/32 UNLESS OTHERWISE SPECIFIED.
HEAT TREAT:
FINISH:

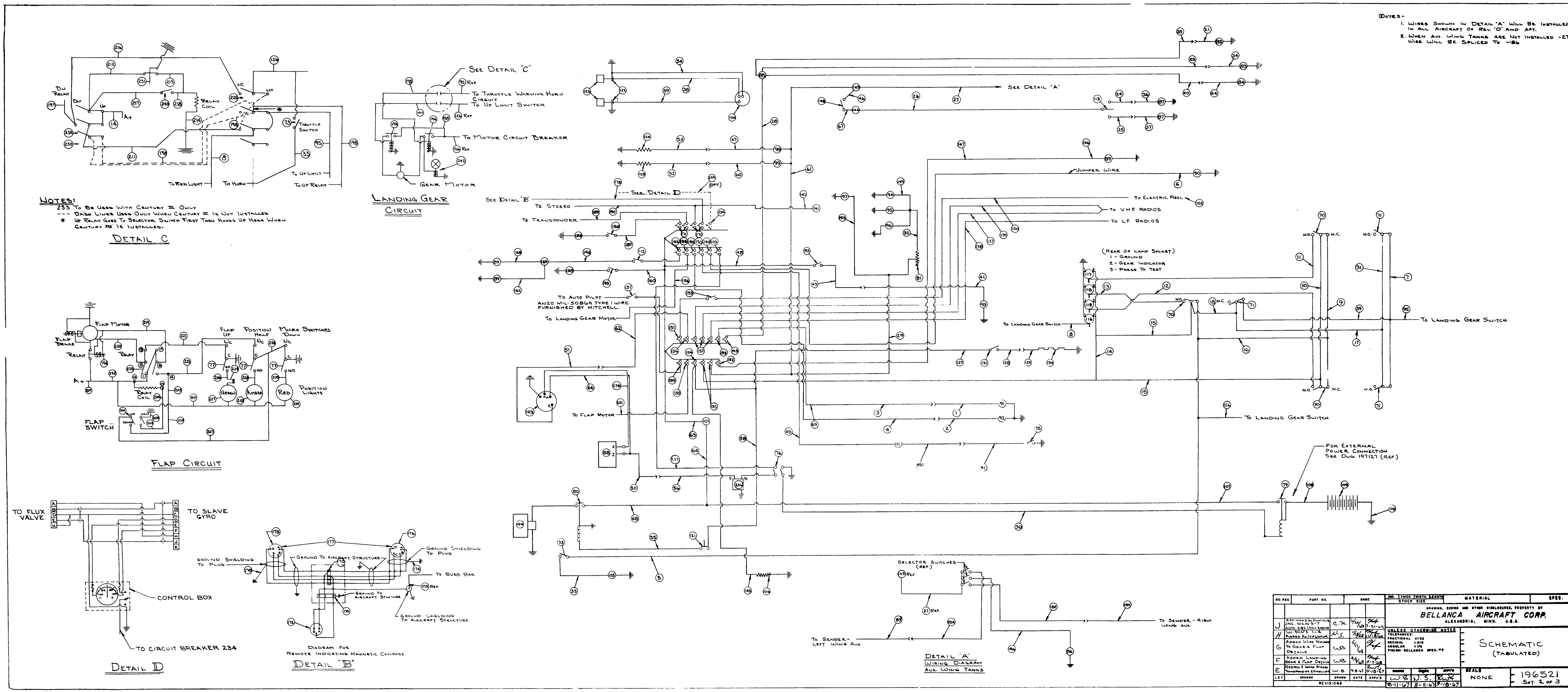
DRAWING, DESIGNS AND OTHER DISCLOSURES, PROPERTY OF
DOWNER AIRCRAFT INDUSTRIES INC.
ALEXANDRIA, MINN.
U.S.A.

SCHEMATIC
(TABULATED)

MODEL	EFF. SER. NO.	NEXT ASSY. DWG. NO.	NO. PER PLANE
14-19-3A	4229 & UP	196201	1

DRAWN	CHECK.	STRUCT.	GR. ENG.	PROJ.	APP'VD.
H.Y. 9/1/62					

SCALE (UNLESS NOTED) NONE
SUPERSEDES 196217
196521
SHT 2 OF 2



Notes -

1. Wires Shown In Detail "A" Will Be Installed In All Aircraft Of Rev. "D" And Aft.
2. When Aux. Wing Tanks Are Not Installed -27 Wire Will Be Spliced To -186

NO. REQ.	PART NO.	NAME	STOCK SIZE (DIA. / THICK / WIDTH / LENGTH)	MATERIAL	SPEC.

LET.	CHANGE	DRAWN	DATE	APPV'D
J	240 was 230 (Switch) Inc. DCN 5-7 Add 242 (Solenoid)	C.H.	6/20/69	7-21-69
H	Inc. DCN'S 1-4 Added Alternator	N.S.	11/13/68	11/15/68
G	Added Wire Numbers To Gear & Flap Details	WB	5/17/68	
F	Added Landing Gear & Flap Details	WB	4/8/68	5-3-68
E	Redrn & Added Stereo Transponder & Stabilizer	W.B.	9-5-67	9-18-67

REVISIONS

Drawing, design and other disclosures, property of
BELLANCA AIRCRAFT CORP.
ALEXANDRIA, MINN. U.S.A.

UNLESS OTHERWISE NOTED
TOLERANCES:
FRACTIONAL ±1/32
DECIMAL ±.010
ANGULAR ±1/2
FINISH: BELLANCA SPEC. #6

SCHEMATIC
(TABULATED)

DRAWN	CHECK	APPV'D	SCALE	
W.B.	N.S.		NONE	196521
8-11-67	8-11-67	9-18-67		SHT. 2 OF 3

SECTION IX

INSTRUMENTS

A. GENERAL

The Viking 300 has as standard equipment the Mitchell Aero Guide which provides aileron control for wing level flight. In addition to the full gyro panel, the Mitchell turn coordinator is standard equipment on the 17-30.

The engine instruments are located in a basic cluster with each instrument a separate module removeable for repair or replacement without removing the whole unit. Instruments in this unit are the oil temperature, fuel gauges, oil pressure, amp meter and cylinder head temperature.

The main fuel gauge indicates fuel quanity for left and right wing tanks. The gauge indicates the fuel quanity in the tank the selector valve is on. On the standard 60 gallon fuel sytem, the selector valve is located between the front seats and is placarded as to position.

BELLANCA AIRCRAFT, INC. Form S-9-1

Make: Model: Serial # Reg. #

100 Hour Periodic

DESCRIPTION	M	I
A. Engine Group		
1. Remove engine cowl & clean engine		
2. Drain oil, check & clean screen		
3. Check engine and intake seals for leaks & clamp for tightness		
4. Check ignition harnesses		
5. Replace or clean spark plugs as required		
6. Check magneto per Cont. Manual		
7. Check Condenser action & coil leaks		
8. Check magneto for correct timing		
9. Overhaul or replace magnetos		
10. Drain carburetor, clean carburetor fuel strainer & check fuel system		
11. Check throttle, mixture & propeller governor controls for travel & operating condition		
12. Check engine mount		
13. Check rubber engine mount bushings		
14. Check exhaust stacks & attach		
15. Replace exhaust stack gaskets as required		
16. Check all engine baffles		
17. Remove air cleaner screen clean & reoil per Owner's Manual		
18. Check vacuum pump, oil separator and lines		
19. Inspect condition of flexible fuel lines		
20. Check fuel pumps for operation (engine driven & electric)		
21. Clean screens on fuel pumps		
22. Fill engine with oil as per information in Owner's Manual		
23. Clean oil radiator cooling fins		
24. Check firewall seals		
25. Check fluid in brake reservoirs		
26. Check cowl for cracks		
27. Check battery & cables...Fill per instructions		
28. Flush battery section-belly		

DESCRIPTION	M	I
B. Propeller Group		
1. Rotate blades & check for tightness		
2. Inspect hub parts for cracks		
3. Check prop mounting bolts		
4. Check prop mounting bolt torque per Propeller Manual		
5. Check pitch actuating arms & bolts		
6. Check for grease & oil leaks		
7. Check spinner mounting brackets		
8. Inspect blades for nicks & cracks		
9. Lubricate propeller as required		
10. Clean & install spinner		
C. Cabin Group		
1. Check control wheels, pulleys & cables		
2. Check parking brakes & brake handle for operations & cylinder leaks		
3. Check trim operations		
4. Check instruments, lines & attachments		
5. Check Vacuum operation instruments & electric turn & cylinder leaks		
6. Check cabin door & windows for damage & operation		
7. Check seats, seat belts, securing brackets & bolts		
8. Check landing, navigation, cabin & instrument lights		
9. Check operation of fuel valve		
10. Compass correction card in AC		
11. Clean filters on gyro horizon & directional gyro		
DATE:		
TOTAL TIME ON SHIP:		

SIGNATURE OF MECHANIC CERTIFICATE #

SIGNATURE OF INSPECTOR CERTIFICATE #

DESCRIPTION	M	I
D. Landing Gear Group		
1. Put airplane on jacks		
2. Remove wheels, clean & repack bearings		
3. Check brake shoes & disc		
4. Check wheels for cracks, broken bolts		
5. Check tires for wear		
6. Check gear legs, attachments, nut-crackers, retraction link & bolts for operation & Cracks		
7. Check brake lines		
8. Check wheels for alignment		
9. Check gear wells & clean out residue		
10. Check nose gear steering		
11. Retract gear-check clearance & op.		
12. Check earning horn, lights & rigging per Service Letter # 10 & Owner's Manual		
13. Check gear and tire pressure		
14. Lubricate per Owner's Manual		
15. Check nutcracker, replace if nec.		
16. Check draglink blots, replace if necessary		
17. Check oleo fluid level		
18. Clean kick down assembly		
19. Check hyd. fluid level in reservoir		
E. Wing Group		
1. Remove inspection plates & fairings at wing roots.		
2. Check surfaces & tips for damage, also check condition of walk way		
3. Check ailerons, attachments, cables, pulleys & bellcranks for damage & op.		
4. Check flaps & attachments for damage & operation		
5. Check fuel tanks & lines for leaks & water		
6. Drain & clean strainer bowl		
7. Fuel tanks marked for minimum octane rating		
8. Fuel tanks marked for capacity		
9. Check wing attachment bolts		
10. Lubricate per Owner's Manual		
11. Check pins & bolts used as hinges		
12. Remove all in spection plates and fairings		
F. Fuselage & Empennage Group		
1. Check stabliator, fins & rudder surfaces for damage		
2. Check elevators for damage		
3. Check rudder, horns & attachments for damage & operation		
4. Check all trim mechanism		
5. Check longerons for damage		
6. Check loop & loop mount, antenna mount & electrical wiring		
7. Check landing gear power pak attachment, hose & fittings		
8. Check emergency operation of gear		
9. Check fuel lines, valve & gauges for damage & operation		
10. Check radio & auto control inst.		
11. Lubricate per Owner's Manual		
12. Check pins & bolts used as hinges		
G. Operation Check Pre-flight		
1. Check fuel pump, fuel tank select.		
2. Check fuel pressure & quanity		
3. Check oil pressure & temp		
4. Check generator output		
5. Check manifold pressure		
6. Check parking brake		
7. Check gyros for noise & roughness		
8. Check cabin heater operation		
9. Check magneto switch operation		
10. Check magneto RPM variation		
11. Check throttle operation		
12. Check propeller smoothness		
13. Check propeller governor action		
14. Check radio & auto control op.		
15. Check engine idle		
H. General		
1. Aircraft conforms to CAA spec.		
2. Manufacturers Service Letters complied with		
3. Aircraft papers in proper order		

NOTE: Both the periodic and 100 hour inspections are complete inspections of the aircraft - identical in scope. The periodic inspection must be accomplished by a mechanic with an inspection authorization, a repair station, or the aircraft manufacturer; the 100 hour inspection may be performed by any certificated rated machanic