

3.13 ENGINE DRIVEN FUEL PUMP FAILURE

Should a malfunction of the engine driven fuel pump occur, the auxiliary fuel pump system can supply sufficient fuel pressure for engine power up to approximately 75%. Any combination of RPM and Manifold Pressure defined on the Power Setting Table may be used, but leaning may be required for smooth operation at altitudes above 15,000 feet or for RPM's below 2300. Normal cruise, descent and approach procedures should be used.

Loss of fuel pressure and engine power can be an indication of failure of the engine driven fuel pump. Should these occur and engine driven fuel pump failure is suspected, retard the throttle and unlatch the auxiliary fuel pump and select the HI position. The throttle can then be reset at 75% power or below.

CAUTION

If normal engine operation and fuel flow is not immediately re-established, the auxiliary fuel pump should be turned off. The lack of a fuel flow indication while on the HI auxiliary fuel pump position could indicate a leak in the fuel system, or fuel exhaustion.

DO NOT actuate the auxiliary fuel pumps unless vapor suppression is required (LO position) or the engine driven fuel pump fails (HI position). The auxiliary pumps have no standby function. Actuation of the HI switch position when the engines are operating normally may cause engine roughness and/or power loss.

3.15 LANDING GEAR UNSAFE WARNINGS

The red landing gear light will illuminate when the landing gear is in transition between the full up position and the down and locked position. The pilot should recycle the landing gear if continued illumination of the light occurs. Additionally, the light will illuminate when the gear warning horn sounds. The gear warning horn will sound at low throttle settings if the gear is not down and locked.

3.17 MANUAL EXTENSION OF THE LANDING GEAR

Several items should be checked prior to extending the landing gear manually. Check for popped circuit breakers and ensure the master switch is ON. Now check the alternators. If it is daytime, turn OFF the navigation lights.

To execute a manual extension of the landing gear, begin by repositioning the clip covering the emergency disengage control downward, clear of the knob. Power should be reduced to maintain airspeed below 85 KIAS. Place the landing gear selector switch in the GEAR DOWN LOCKED position and pull the emergency gear extension knob. Check for 3 green indicator lights.

WARNING

If the emergency gear extension knob has been pulled out to lower the gear due to a gear system malfunction, leave the control in its extended position until the airplane has been put on jacks to check the proper function of the landing gears hydraulic and electrical systems.

3.19 GEAR-UP EMERGENCY LANDING

An approach should be made with power at a normal airspeed with the flaps up. The flaps are left up to reduce wing and flap damage. Close the throttles just before touchdown. Turn OFF the master and ignition switches and move the fuel selector valve controls to OFF. Contact to the surface should be made at a minimum airspeed.

3.21 ENGINE FAILURE IN ICING CONDITIONS

If engine failure occurs during icing flight select ALTERNATE AIR and attempt to restart the engine. If the engine restart procedure fails, feather the inoperative propeller (refer to Engine Securing Procedure, paragraph 3.7). An airspeed at or above 89 KIAS must be maintained. It may be necessary to descend to maintain this airspeed. Reduce the electrical loads (refer to Alternator Failure in Icing Conditions, paragraph 3.23, for load reduction). Further icing conditions should be avoided if possible and a landing made as soon as practical.

Maintain an airspeed of at least 89 KIAS during final approach. Do not extend the landing gear or lower the wing flaps until certain of making the field. Use 25° flaps rather than full flaps for landing.

3.23 ALTERNATOR FAILURE IN ICING CONDITIONS

If an alternator fails during flight in icing conditions, an attempt should be made to reset the alternator overvoltage relay by cycling the corresponding alternator switch OFF and then ON. Check the circuit breakers and, if possible, reset any that have popped.

If these attempts to restore the alternator have failed, turn off all avionics except one NAV COM and TRANSPONDER. Turn off the electric windshield to maintain a load less than 65 amperes. If icing conditions continue terminate flight as soon as practical.

Prior to landing the electric windshield may be turned on if necessary. If the battery has been depleted the gear may require free-fall extension and the green gear lights may not illuminate.

3.25 ENGINE FAILURE WITH REAR CABIN AND CARGO DOORS REMOVED

The minimum single engine control speed for this configuration is 67 KIAS. If engine failure occurs at an airspeed below 67 KIAS, reduce power as necessary on the operating engine and apply rudder to maintain directional control.

During taxi, takeoff, landing or single engine operations the propeller synchrophaser switch should be in the "MANUAL" position. During cruise, propellers should be synchronized manually to within approximately 10 RPM and the switch placed in the "AUTO SYNC" position. Normally, propeller synchrophasing will take place within a few seconds, but occasionally it may take up to a full minute. When the power setting is to be changed, the synchrophaser switch should be set to "MANUAL" for 30 seconds before the power setting is adjusted; then the synchrophaser switch may be returned to the "AUTO SYNC" position. If the propeller RPM differential exceeds 50 RPM, the switch should be placed on "MANUAL" for 30 to 40 seconds; then the propellers can be synchronized again and the synchrophaser switch returned to "AUTO SYNC." Pulling the circuit breakers completely deactivates the propeller synchrophaser system. If the master switch is turned "OFF" or if there is an electrical system failure, the slave engine will return to the controlled selected RPM plus approximately 25 RPM "out of synchronization" regardless of the position of the synchrophaser switch.

7.9 LANDING GEAR

The Seneca II is equipped with hydraulically operated, fully retractable, tricycle landing gear.

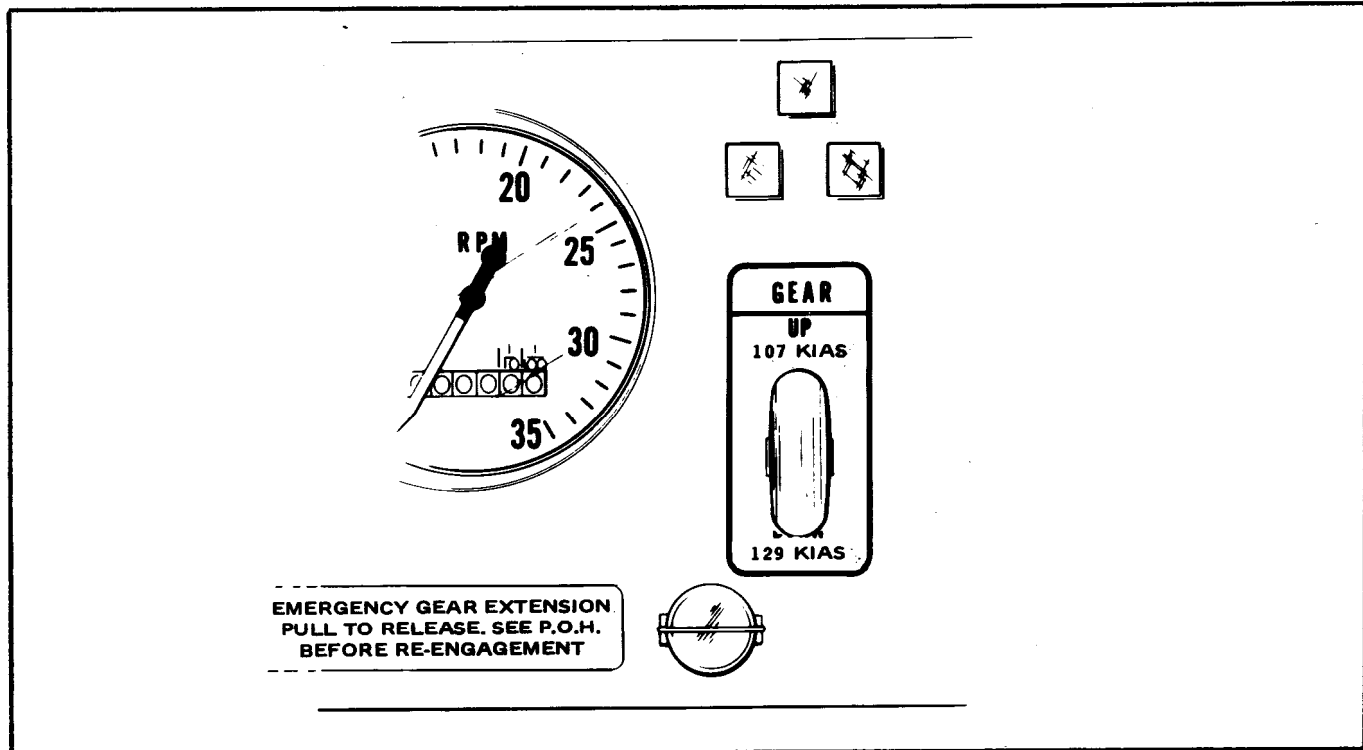
Hydraulic pressure for gear operation is furnished by an electrically powered, reversible hydraulic pump (refer to Figures 7-5 and 7-7). The pump is activated by a two-position gear selector switch located to the left of the control quadrant on the instrument panel (Figure 7-3). The gear selector switch, which has a wheel-shaped knob, must be pulled out before it is moved to the "UP" or "DOWN" position. When hydraulic pressure is exerted in one direction, the gear is retracted; when it is exerted in the other direction, the gear is extended. Gear extension or retraction normally takes six to seven seconds.

CAUTION

If the landing gear is in transit, and the hydraulic pump is running, it is NOT advisable to move the gear selector switch to the opposite position before the gear has reached its full travel limit, because a sudden reversal may damage the electric pump.

The landing gear is designed to extend even in the event of hydraulic failure. Since the gear is held in the retracted position by hydraulic pressure, should the hydraulic system fail for any reason, gravity will allow the gear to extend. When the landing gear is retracted, the main wheels retract inboard into the wings and the nose wheel retracts forward into the nose section. Aerodynamic loads and springs assist in gear extension and in locking the gear in the down position. During gear extension, once the nose gear has started toward the down position, the airstream pushes against it and assists in moving it to the downlocked position. After the gears are down and the downlock hooks engage, springs maintain force on each hook to keep it locked until it is released by hydraulic pressure.

To extend and lock the gears in the event of hydraulic failure, it is necessary only to relieve the hydraulic pressure. Emergency gear extension must not be attempted at airspeeds in excess of 84 KIAS. An emergency gear extension knob, located directly beneath the gear selector switch is provided for this purpose. Pulling this knob releases the hydraulic pressure holding the gear in the up position and allows the gear to fall free. During normal operation, this knob is covered by a guard to prevent inadvertent extension of the gear. Before pulling the emergency gear extension knob, place the landing gear selector switch in the "DOWN" position to prevent the pump from trying to raise the gear. If the emergency gear knob has been pulled out to lower the gear by gravity, due to a gear system malfunction, leave the control in its extended position until the airplane has been put on jacks to check the proper function of the landing gears hydraulic



LANDING GEAR SELECTOR

Figure 7-3

and electrical systems. See Aircraft Service Manual for proper landing gear system check out procedures. If the airplane is being used for training purposes or a pilot check out mission, and the emergency gear extension has been pulled out, it may be pushed in again when desired if there has not been any apparent malfunction of the landing gear system.

When the gear is fully extended or fully retracted and the gear selector is in the corresponding position, electrical limit switches stop the flow of current to the motor of the hydraulic pump. The three green lights directly above the landing gear selector switch illuminate to indicate that each of the three landing gears is down and locked. A convex mirror on the left engine nacelle both serves as a taxiing aid and allows the pilot to visually confirm the condition of the nose gear. If the gear is in neither the full up nor the full down position, a red warning light on the instrument panel illuminates. Should the throttle be placed in a low setting - as for a landing approach - while the gear is retracted, a warning horn sounds to alert the pilot that the gear is retracted. The gear warning horn emits a 90 cycles per minute beeping sound.

The green gear lights are dimmed automatically when the navigation lights are turned on. For this reason, if the navigation lights are turned on in the daytime, it is difficult to see the landing gear lights. If the green lights are not observed after the landing gear selector switch is placed in the "DOWN" position, the first thing to check is the position of the navigation lights switch.

If one or two of the three green lights do not illuminate when the gear down position has been selected, any of the following conditions could exist for each light that is out:

- (a) The gear is not locked down.
- (b) A bulb is burned out.
- (c) There is a malfunction in the indicating system.

In order to check the bulbs, the square indicator lights can be pulled out and interchanged.

A micro switch incorporated in the throttle quadrant activates the gear warning horn under the following conditions:

- (a) The gear is not locked down and the manifold pressure has fallen below 14 inches on either one or both engines.
- (b) The gear selector switch is in the "UP" position when the airplane is on the ground.

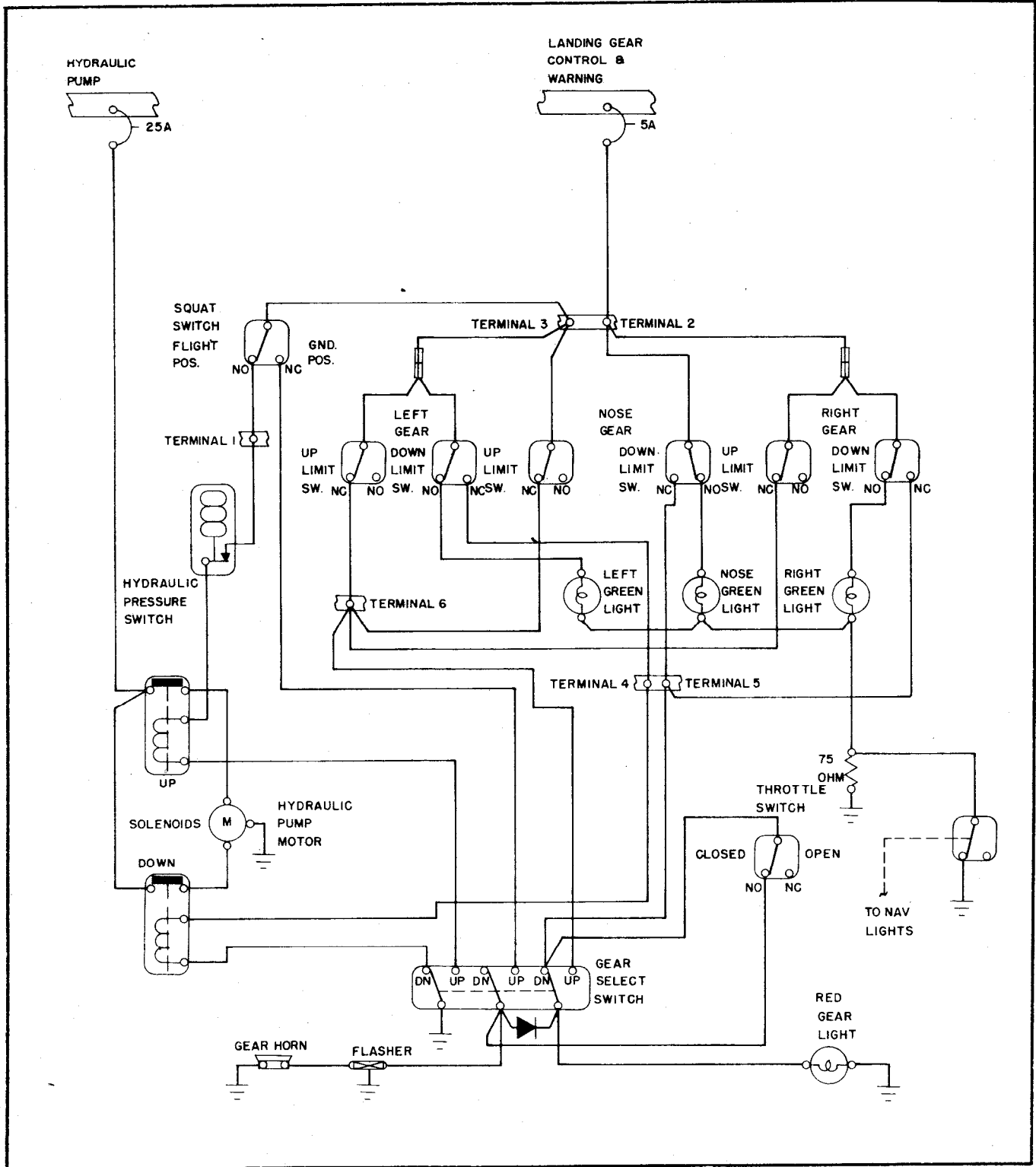
To prevent inadvertent gear retraction should the gear selector switch be placed in the "UP" position when the airplane is on the ground, a squat switch located on the left main gear will prevent the hydraulic pump from actuating if the master switch is turned on. On takeoff, when the landing gear oleo strut drops to its full extension, the safety switch closes to complete the circuit which allows the hydraulic pump to be activated to raise the landing gear when the gear selector is moved to the "UP" position. During the preflight check, be sure the landing gear selector is in the "DOWN" position and that the three green gear indicator lights are illuminated. On takeoff, the gear should be retracted before an airspeed of 107 KIAS is exceeded. The landing gear may be lowered at any speed up to 129 KIAS.

The hydraulic reservoir for landing gear operation is an integral part of the gear hydraulic pump. Access to the combination pump and reservoir is through a panel in the nose baggage compartment. For filling instructions, see the PA-34-200T Service Manual.

The nose gear is steerable through a 27 degree arc either side of center by use of a combination of full rudder pedal travel and brakes. A gear centering spring, incorporated in the nose gear steering system, prevents shimmy tendencies. A bungee assembly reduces ground steering effort and dampens shocks and bumps during taxiing. When the gear is retracted, the nose wheel centers as it enters the wheel well, and the steering linkage disengages to reduce pedal loads in flight. The landing light turns off automatically when the gear is retracted.

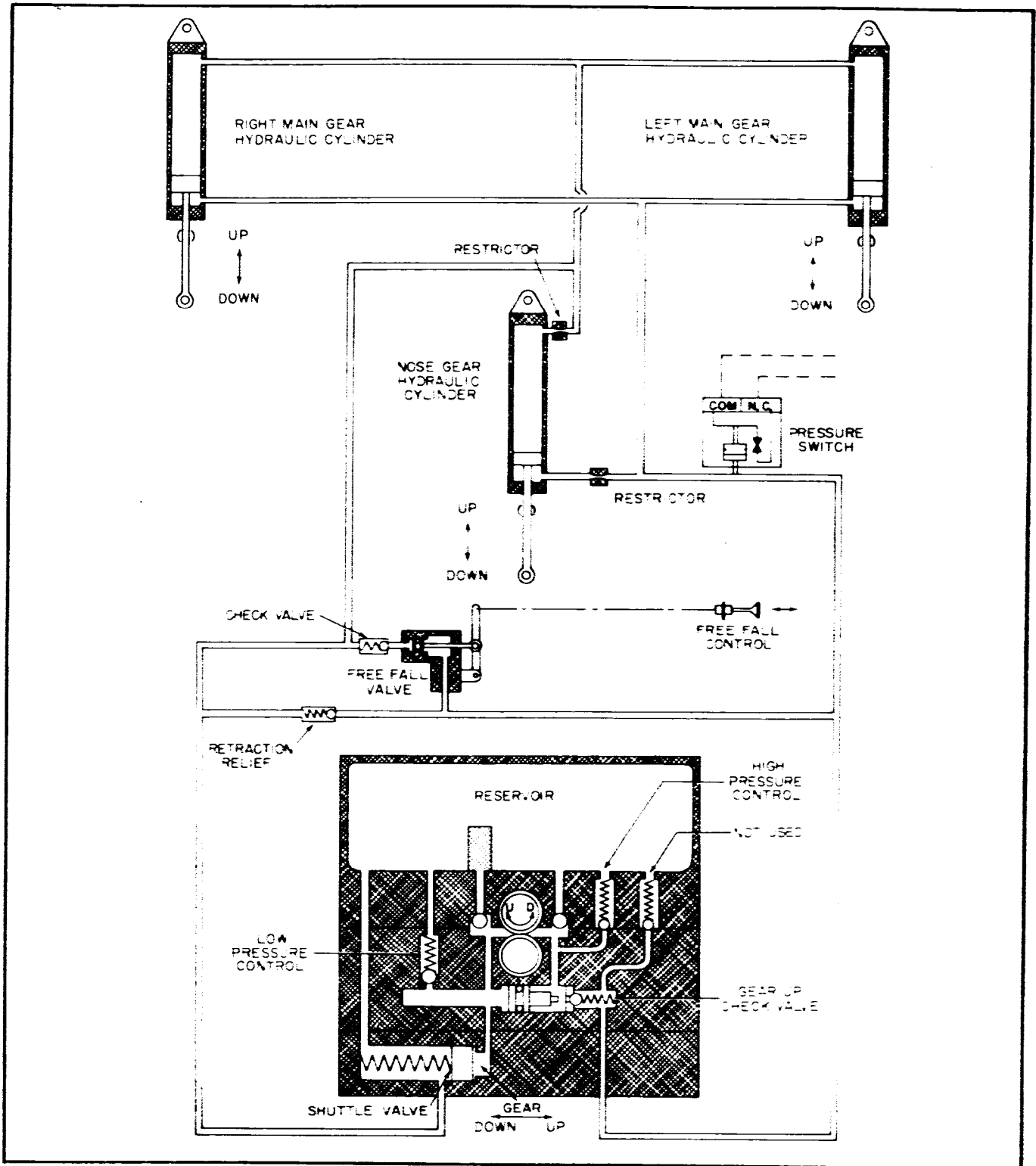
All three landing gears carry 6.00 x 6 tires. The nose wheel has a 6-ply tire and the main wheels have 8-ply tires. For information on servicing the tires, see "Tire Inflation" in the Handling and Servicing Section of this Handbook.

Struts for the landing gear are air-oil assemblies. Strut exposure should be checked during each preflight inspection. If a need for service or adjustment is indicated, refer to the instructions printed on the units. Should more detailed landing gear service information be required, refer to the PA-34-200T Service Manual.



LANDING GEAR ELECTRICAL SYSTEM SCHEMATIC

Figure 7-5



LANDING GEAR HYDRAULIC SYSTEM SCHEMATIC

Figure 7-7