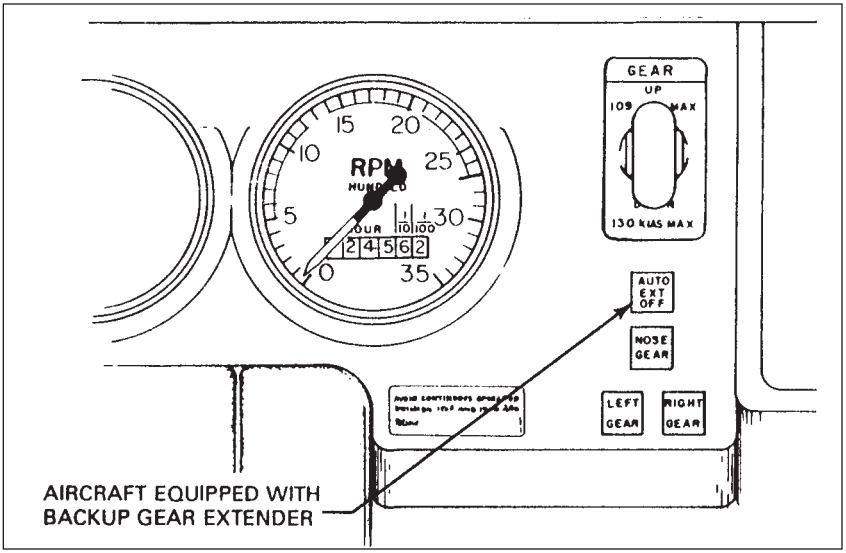


LANDING GEAR SELECTOR
Figure 7-3

7.11 LANDING GEAR

The Arrow IV is equipped with a retractable tricycle landing gear, which is hydraulically actuated by an electrically powered reversible pump. The pump is controlled by a selector switch on the instrument panel to the left of the control quadrant (Figure 7-3). The landing gear is retracted or extended in about seven seconds.

Some aircraft have a backup gear extender system which incorporate a pressure sensing device that lowers the gear regardless of gear selector position, depending upon airspeed and engine power (propeller slipstream). Gear extension is designed to occur, even if the selector is in the up position, at airspeeds below approximately 95 KIAS with power off. The extension speeds will vary from approximately 75 KTS to approximately 95 KIAS depending on power settings and altitude. The device also prevents the gear from retracting at airspeeds below approximately 75 KTS with full power, though the selector switch may be in the up position. This speed increases with reduced power and/or increased altitude. Manual override of the device

is provided by an emergency gear lever located between the front seats to the left of the flap handle (refer to Figure 7-9). The sensing device operation is controlled by differential air pressure across a flexible diaphragm which is mechanically linked to a hydraulic valve and an electrical switch which actuates the pump motor. A high pressure and static air source for actuating the diaphragm is provided in a mast mounted on the left side of the fuselage above the wing. Any obstruction of the holes in this mast will cause the gear to extend. An optional heated mast is available to alleviate obstruction in icing conditions. The optional heated mast is turned on whenever the "PITOT HEAT" is turned on.

WARNING

Avoid ejecting objects out of the pilot storm window which could possibly enter or obstruct the holes in the mast.

The emergency gear lever, when placed in the raised position, can be used to override the system, and gear position is then controlled by the selector switch regardless of airspeed/power combinations. The emergency gear lever is provided with a locking device which may be used to lock the override lever in the up position. The lock is located on the left side panel of the console below the level of the manual override lever. To lock the override lever in the up position, raise the override lever to the full up position and push the pin in. A yellow warning light located below the gear selector switch (Figure 7-3) flashes to warn the pilot that the automatic gear lowering system is disabled. The lock is spring-loaded to the off position to aid disengagement. To disengage the lock raise the override lever and release. The lever will return to its normal position and the yellow flashing light will extinguish. The lever must also be locked in the raised (up) position when gear-up stalls are practiced.

The emergency gear lever, when used for emergency gear extension of the gear, manually releases hydraulic pressure to permit the gear to free-fall with spring assistance on the nose gear. The lever must be held in the downward position for emergency extension. During normal landing gear operation, the Emergency Gear Extension Lever, located between the front seats to the left of the flap handle (Figure 7-9), should be in the up position to permit proper gear extension/retraction. For aircraft equipped with the backup gear extender, the Emergency Gear Extension Lever should be in the normal/disengaged position to permit normal gear extension/retraction.

Gear down and locked positions are indicated by three green lights located below the selector, and a red "Warning Gear Unsafe" light is located at the top of the panel. An all lights out condition indicates the gear is up. The landing gear should not be retracted above a speed of 109 KIAS and should not be extended above a speed of 130 KlAS.

The main landing gear uses 6.00 x 6 wheels. The main gear incorporate brake drums and Cleveland single disc hydraulic brake assemblies. The nose wheel carries a 5.00 x 5 four ply tire and the main gear use 6.00 x 6 six ply tires. All three tires are tube type.

A micro-switch in the throttle quadrant activates a warning horn and red "Warning Gear Unsafe" light under the following conditions:

(a) Gear up and power reduced below approximately 14 inches of manifold pressure.

(b) On aircraft equipped with the backup gear extender, if the system has extended the landing gear and the gear selector is up, with the power reduced below approximately 14 inches of manifold pressure.

(c) Gear selector switch "UP" while on the ground and throttle in retarded position.

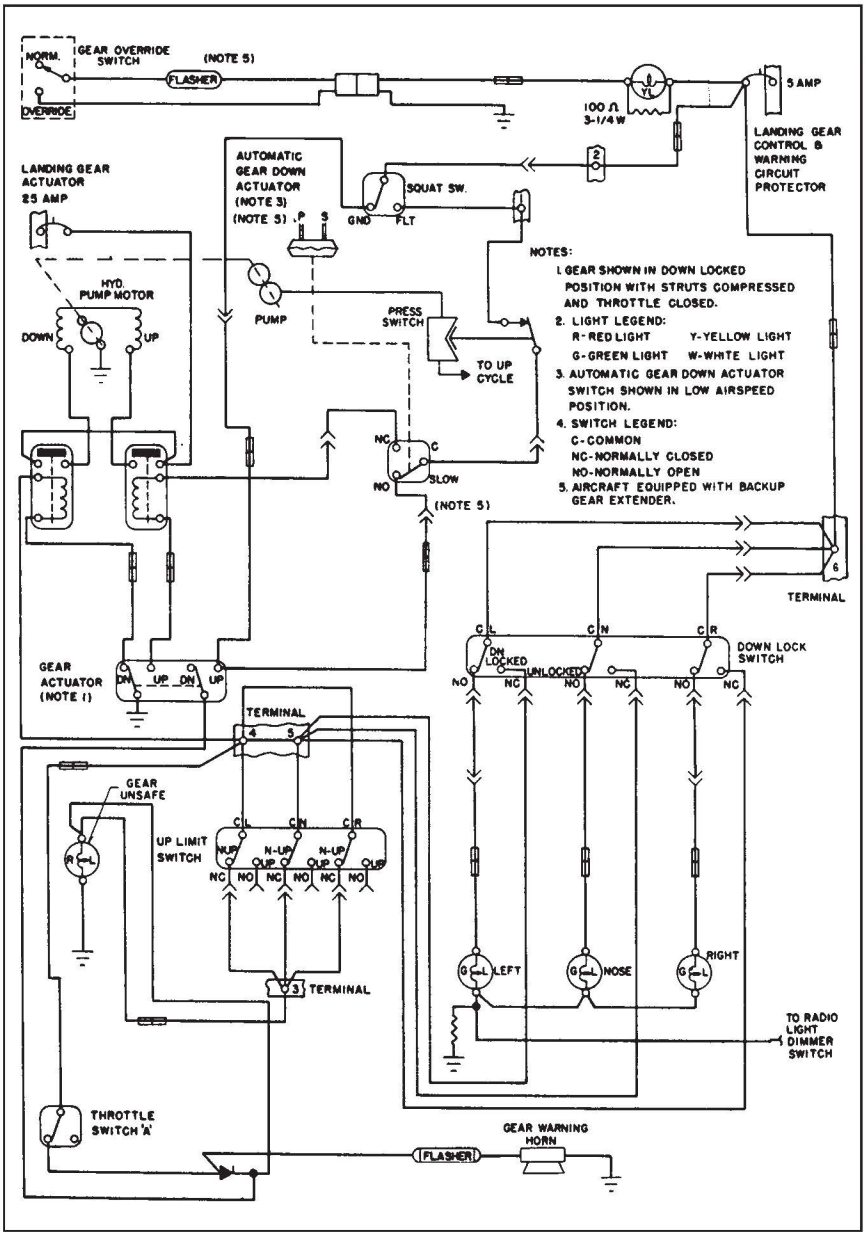
On aircraft which are NOT equipped with the backup gear extender an additional switch is installed which activates the warning horn and light whenever the flaps are extended beyond the approach position (10°) and the landing gear are not down and locked.

The gear warning horn emits a 90 cycle per minute beeping sound in contrast to the stall warning horn which emits a continuous sound.

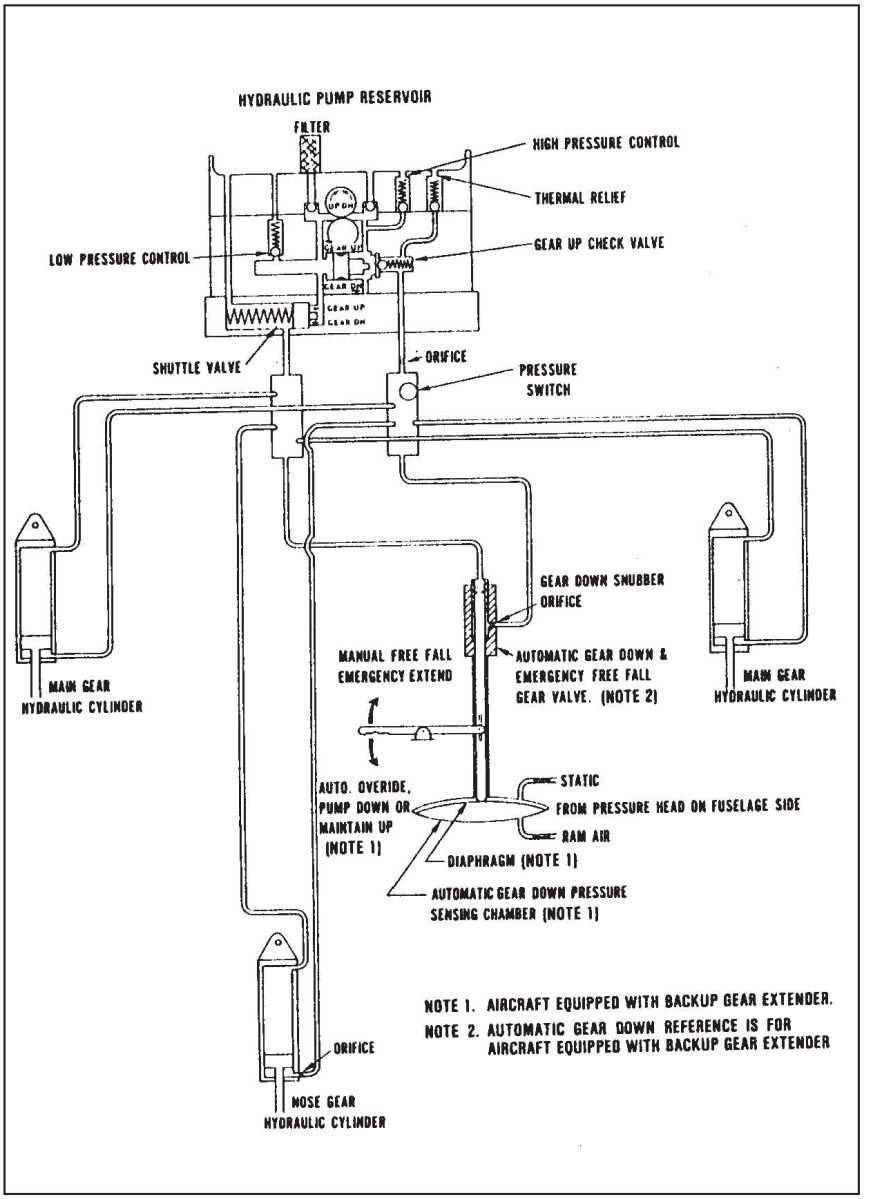
The nose gear is steerable through a 30 degree arc each side of center through the use of the rudder pedals. As the nose wheel retracts, the steering linkage disengages to reduce rudder pedal loads in flight. The nose wheel is equipped with a hydraulic shimmy dampener to reduce nose wheel shimmy. A bungee assembly is also included to reduce ground steering effort and to dampen shocks and bumps during taxiing.

The oleo struts are of the air-oil type, with normal extension being 2.75 + .25 inches for the nose gear and 2.5 + .25 inches for the main gear under normal static load (empty weight of airplane plus full fuel and oil).

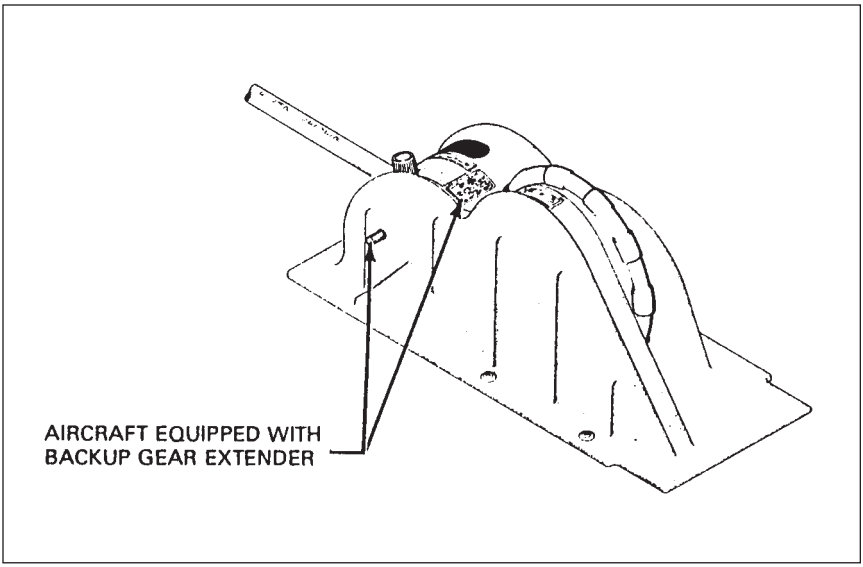
The standard brake system includes toe brakes on the left and right set of rudder pedals and a hand brake located below and near the center of the instrument panel. The toe brakes and the hand brake have individual brake cylinders, but all cylinders use a common reservoir. The parking brake is incorporated in the lever brake and is operated by pulling back on the lever and depressing the knob attached to the top of the handle. To release the parking brake, pull back on the brake lever; then allow the handle to swing forward.



LANDING GEAR ELECTRICAL SCHEMATIC
Figure 7-5



LANDING GEAR HYDRAULIC SCHEMATIC
Figure 7-7



FLIGHT CONTROL CONSOLE
Figure 7-9

7.13 FLIGHT CONTROLS

Dual flight controls are provided as standard equipment. A cable system provides actuation of the control surfaces when the flight controls are moved in their respective directions.

The horizontal surface (stabilator) is mounted atop the fin in a "T" configuration and features a trim tab/servo mounted on the trailing edge. This tab serves the dual function of providing trim control and pitch control forces. The trim function is controlled by a trim control wheel located on the control console between the two front seats (Figure 7-9). Rotating the wheel forward gives nose down trim and rotation aft gives nose up trim.

The rudder is conventional in design and incorporates a rudder trim. The trim mechanism is a spring-loaded recentering device. The trim control is located on the right side of the pedestal below the throttle quadrant. Turning the trim control clockwise gives nose right trim and counterclockwise rotation gives nose left trim.