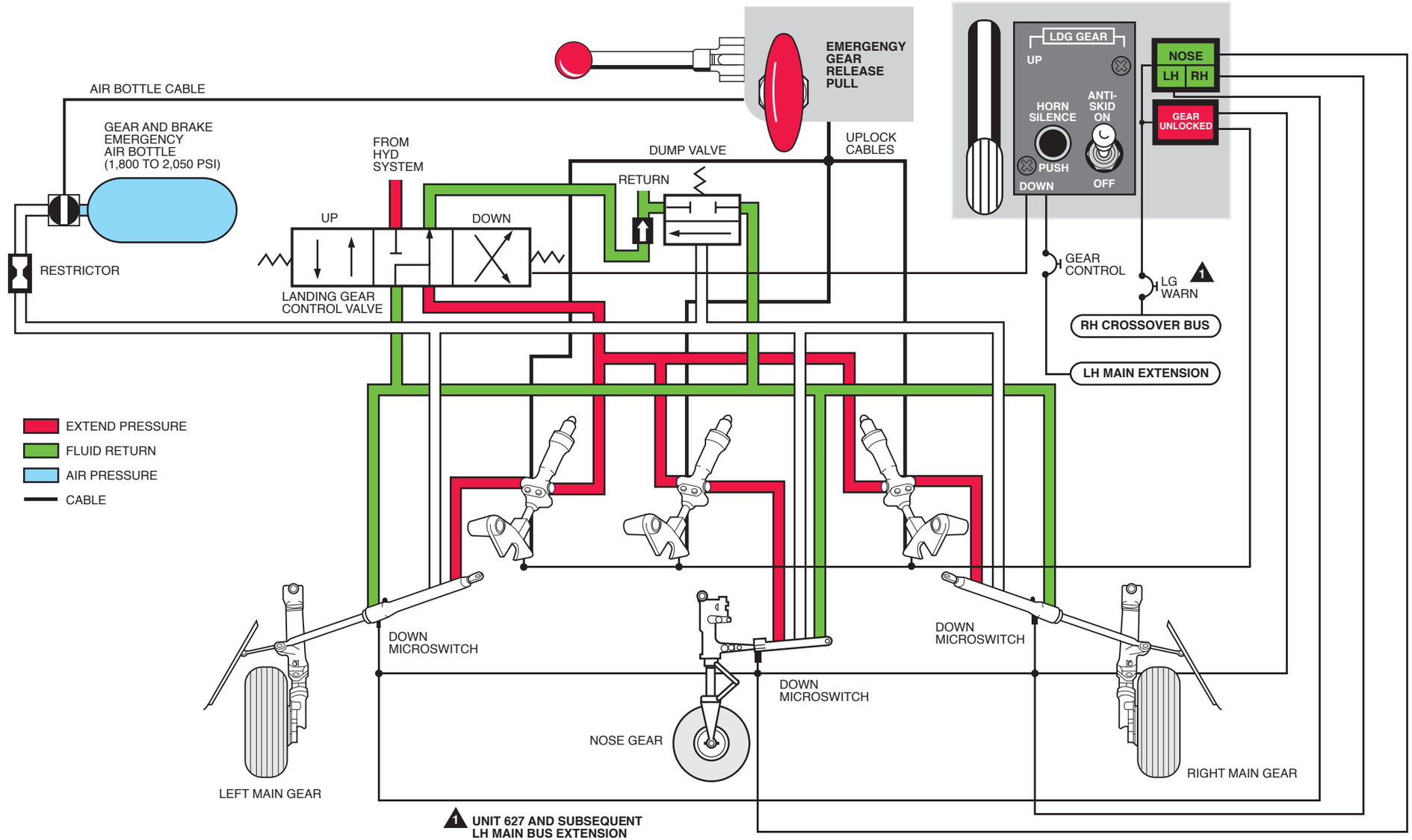
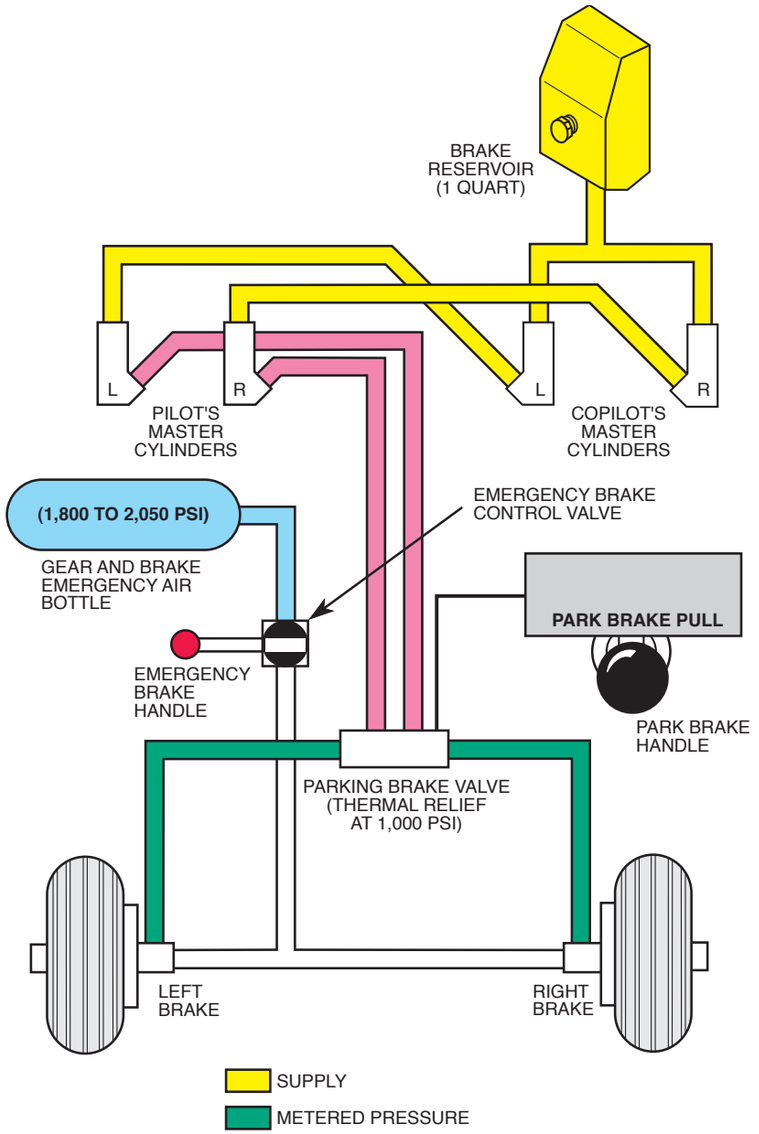
Landing Gear



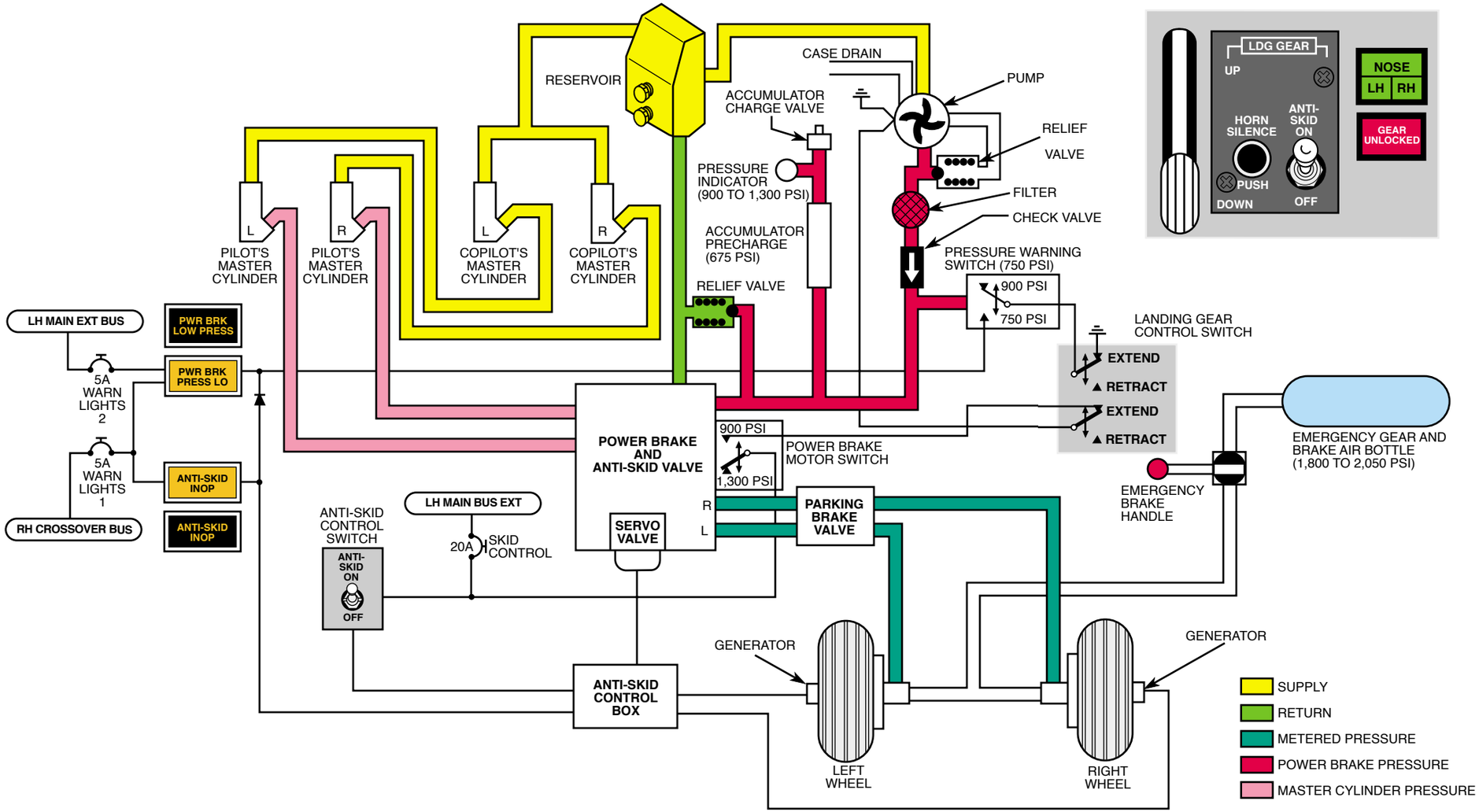
Brake System

Without Anti-Skid



Brake System

With Anti-Skid



Landing Gear System

The Citation landing gear system is a standard tricycle design consisting of a single wheel nose gear and single wheel main gear. The system is electrically controlled and hydraulically actuated. A chined nosewheel tire deflects slush and rain away from the engine intakes. Each landing gear strut is an air/oil type that absorbs taxiing and landing shocks. Hydraulic pressure normally retracts and extends the landing gear. If the hydraulic system fails, free fall and pneumatic pressure extend the landing gear.

A mechanically operated nosewheel steering system positions the nose gear in response to rudder pedal movement.

The main gear has hydraulically operated disc brakes with an optional electrically operated anti-skid system. The anti-skid system provides maximum braking efficiency on all runway surfaces while minimizing wheel skid.

Landing Gear

Squat switches on the left and right main landing gear supply on-ground and in-air signals to various aircraft systems (see **Data Summaries**). Downlock switches on the landing gear and up lock switches in the wheel wells control the gear indicating system and the landing gear system during retraction and extension.

Retraction

After the aircraft leaves the ground and the landing gear struts extend, the left main gear squat switch opens to release the landing gear handle locking solenoid.

Pulling the landing gear handle out releases it from the detent. Moving the handle to the UP position begins the retraction sequence by actuating the landing gear control switch to the retract position. Then the red GEAR UNLOCK light illuminates, the hydraulic system bypass valve closes to increase hydraulic pressure to 1,500 PSI, and the landing gear control valve shifts to route hydraulic pressure to the landing gear actuator retract ports. Hydraulic pressure unlocks the internal downlocks; the green LH, NOSE, and RH lights extinguish.

When the landing gear reaches the fully retracted position, uplocks engage the gear and hold it in the retracted position. The nose gear doors close when the nose gear completely retracts. The main gear doors follow the main gear as it retracts.

When the landing gear is up and locked, the nose and main gear uplock switches actuate to extinguish the red GEAR UNLOCK light, de-energize the landing gear control valve, and open the hydraulic system bypass valve.

Extension

Pulling the landing gear control handle out to unlock it and moving it to the DOWN position begins the landing gear extension sequence by actuating the landing gear control switch. The red GEAR UNLOCK light illuminates, the hydraulic system bypass valve closes to pressurize the hydraulic system to 1,500 PSI, and the landing gear control valve shifts to the extend position. Hydraulic pressure then flows through the landing gear control valve to the uplock actuators. The uplocks release then direct pressure to the extend side of the landing gear actuators. The gear begins extending.

As the landing gear reaches the down-and-locked position, the landing gear downlocks engage. The downlock switches actuate to extinguish the GEAR UNLOCK light, illuminate the LH, NOSE, RH gear lights, and open the hydraulic system bypass valve.

Emergency Extension

Pulling the red AUX GEAR CONTROL T-handle below the pilot's instrument panel and rotating it 45° clockwise mechanically releases the landing gear uplocks to allow the landing gear to free-fall to the down and locked position. Yawing the aircraft assists gear extension and locking by exerting pressure on the landing gear through the gear doors. With the gear handle in the DOWN position, the green LH, NOSE, and RH gear position lights illuminate when the gear is down and locked.

Pulling the emergency air knob mechanically opens the emergency air bottle to direct pressurized nitrogen to the landing gear actuator extend ports. It also shifts the dump valve to route hydraulic fluid to the reservoir. After emergency gear extension, the landing gear system must be serviced to bleed the hydraulic system and the bottle must be recharged.

Nosewheel Steering

With the aircraft on the ground, the nosewheel steering system positions the nosewheel up to 20° left or right of center through rudder pedal movement. Deflecting a rudder positions a bellcrank between the pedals that connects through a bungee to a steering arm. Movement of the steering arm then moves the nosewheel through a universal joint and steering gears.

As the nose gear retracts, the universal joint pivots to center the nosewheel. When the nose gear fully retracts, the joint swivels to allow normal rudder pedal movement.

Wheels and Brakes

The nosewheel carries a chined, 18 x 4.4-10DD, 10-ply rating (PR) tubeless tire inflated to approximately 120 ± PSI. Each main wheel carries a 22 x 8.0-8, 10 PR, 22 x 8.0-10, 10 PR, or 22 x 8.0-10, 12 PR tire (depends on aircraft). Normal main wheel tire pressure varies from 100 to 125 PSI (see Servicing). The tires must be serviced with nitrogen.

Normal Braking

On **aircraft without an anti-skid system**, pressing on the top of the rudder pedals (toe brakes) mechanically operates master cylinders that supply hydraulic pressure to the wheel brake assemblies. Under pressure, the braking assembly piston applies pressure against the pressure plate to force the stationary and rotating discs together. Braking pressure is proportional to pedal effort; the crew member applying the most force controls the braking system.

On **aircraft with an anti-skid system**, an independent hydraulic system supplies pressure to operate the brakes. With the landing gear extended and electrical power available, a motor-driven hydraulic pump, controlled by a pressure switch, pressurizes the system to 900 to 1,300 PSI. An accumulator, precharged to 675 PSI with nitrogen, maintains system pressure when the pump is not operating. If system pressure falls to 750 PSI, a pressure warning switch illuminates the PWR BRK PRESS LO annunciator.

Pressing on the top of each rudder pedal (toe brake) mechanically operates a master cylinder that hydraulically controls braking effort supplied through the power brake and anti-skid valve. The power brake and anti-skid valve, in turn, supplies pressure proportional to braking effort to the brake assemblies. Under pressure, the braking assembly piston extends against the pressure plate to force the stationary and rotating discs together.

With the ANTI-SKID switch ON, a transducer in each main wheel axle provides wheel speed signals to the anti-skid system control box. If the control box senses an excessive wheel deceleration indicative of an impending skid, it commands the respective anti-skid valve to reduce braking pressure to that wheel. When the wheel spins up to match the other wheel, the system restores normal braking pressure to that wheel brake assembly.

On **Citation II units 437 and subsequent; Citation SII aircraft**, the anti-skid system also provides touchdown and locked wheel crossover protection. If the brakes are applied before touchdown, the system dumps pressure until the squat switches actuate on touchdown. Above 40 kts groundspeed, locked wheel crossover protection compares left and right wheel speeds and dumps pressure when the slow wheel's speed is 50% or slower than the fast wheel.

If an anti-skid component fails, the ANTI-SKID INOP annunciator illuminates. After a system failure, the ANTI SKID switch should be placed in OFF. Normal braking without anti-skid protection is still available.

Emergency Braking

Pulling the EMER BRAKE PULL handle below the pilot's instrument panel mechanically opens the brake valve assembly to release pressurized nitrogen into the supply lines. Pressure in the supply lines shifts a shuttle valve at each wheel brake assembly to stop normal hydraulic system pressure and to admit pressurized nitrogen into the brake assemblies. Braking pressure is proportional to handle extension. Anti-skid protection (if installed) is not available.

Pulling the handle out completely supplies full pressure from the bottle for maximum braking. Releasing the handle shifts the brake valve assembly to vent pressure to atmosphere and release the brakes.

Parking Brakes

With the aircraft on the ground and the hydraulic system pressurized, applying toe pressure applies the brakes. Pulling the parking brake handle out shifts the parking brake valve to trap pressure and hold the brakes. Pushing the handle down releases the brakes.

Landing Gear System

Power Sources	Emergency air bottle L/R Main DC buses
Control	Landing gear control valve Auxiliary gear controls T-handle Emergency air knob Rotary test switch: LDG GEAR position HORN SILENCE button Left main gear squat switch
Monitor	Green landing gear down lights Red GEAR UNLOCKED annunciator Amber hydraulic pressure on Landing gear warning horn
Protection	Circuit breakers Left main gear squat switch

Landing Gear System (cont.)

Miscellaneous	Anti-skid must be operative for takeoff and landing on sod/dirt or gravel runways. Squat switch With aircreaft on the ground, signals via the squat switch relay affect the following system components and functions. Left main gear squat switch Anti-skid (**CII 437 and subsequent; SII)** Cross-generator start Emergency pressurization valve Hour meter and digital clocks Landing gear handle solenoid Outflow valves Ground valve (**CII 437 and sub; SII**) Pressurization takeoff modes (**C0 214 and subsequent; CI; CII; SII**) Thrust reversers (if installed) Radar forced standby (**CII 627 and subsequent**) Bleed air ground – right engine (**CII 482 to 485 and subsequent; SII**) Stick shaker and stick shaker test (**SII**) Right main gear squat switch Thrust reversers (if installed) Stick shaker test (**SII**)

Brakes/Anti-Skid Systems

Power Source	Independent hydraulic system Electric power brake pump and accumulator Emergency air bottle LH Main DC buses (**except C0 and CI without optional skid warning or optional anti-skid power brake system**)
Control	Brake pedals ANTI-SKID switch (**except C0 and CI without optional anti-skid power brake system**) Parking brake handle Emergency brake handle Rotary test switch: ANTI-SKID position (**Unit 437 and subsequent; SII**)
Monitor	Annunciators (**except C0 and CI without optional anti-skid power brake system**) PWR BRK PRESS LO POWER BRAKE PRESS LOW (**Unit 437 and subsequent; SII**) ANTI-SKID INOP Emergency air pressure gage (preflight) Brake accumulator pressure gage (preflight) Brake fluid reservoir (preflight) Skid warning horn (**C0; CI**) Brake pedal feel Rudder pedal skid warning motor (**C0; CI**)
Protection	Circuit breakers Skid warning system (**C0; CI**) Emergency air bottle knob Mechanical downlock Left squat switch (**CII 437 and sub; SII**)
Miscellaneous	Anti-skid must be operative for takeoff and landing on sod/dirt or gravel runways.