The nose wheel steering is automatically deactivated when the nose gear strut extends during takeoff. The nose wheel is centered mechanically for landing gear retraction. On takeoff when the noise gear extends the ON light will extinguish and the ARM light will remain illuminated until gear retraction, when it will extinguish and remain extinguished during the flight. When the gear is extended the NOSE WHL STEERING button is pressed just before landing; the ARM light will illuminate. After touchdown and compression of the nose gear strut the ON light will illuminate and the nose gear steering is activated.

The nose wheel steering system incorporates a hydraulic accumulator which smoothes out system surges and provides nose wheel steering for a limited time in case of hydraulic system failure. Sufficient pressure will be retained for steering during landing roll and runway clearing.

SPOILERS AND SPEEDBRAKES

Each wing incorporates four hydraulically actuated spoiler segments. The outboard segment is called the roll control spoiler and operates with the aileron. After approximately 3.5 degrees of up aileron movement the spoiler moves up. At full aileron the spoiler travels 50 degrees. The middle two segments operate as speedbrakes and are controlled by an infinite positioning lever on the pedestal. UP position (full aft travel of the lever) configures the speedbrake spoilers to 50 degrees and arms a secondary two-position lever. This secondary lever, when positioned to UP, configures the inboard and outboard segments on each wing to the spoiler position (50 degrees on the outboard and 30 degrees on the inboard) for deceleration on landing and for emergency descents. In the spoiler position, the outboard segments stay extended and do not operate with the ailerons. With all spoilers/speedbrakes extended, roll authority is somewhat reduced.

In case any of the spoiler segments should float up the airplane range could be reduced as much as 5 percent, so a spoiler hold-down system is provided. Turning the spoiler hold-down switch to SPOILER HOLD DOWN locks all spoiler panels down. The roll control spoilers may then be used in the roll mode by turning on the auxiliary hydraulic pump.

Floating of spoilers or speedbrakes may be annunciated by illumination of the SPOILERS UP and SPEED BRAKE annunciators respectively.

An AILERON/SPOILER DISCONNECT handle is provided on the rear portion of the pedestal to release the tie between the aileron and the roll control spoiler in the event of a jam in either the aileron system or the roll control spoiler system. When disconnected, the pilot's wheel controls only the ailerons and the copilot's wheel controls only the roll control spoilers; consequently, the location of the jam will determine whether the pilot or copilot will control the airplane.

SPOILER AND SPEEDBRAKE HYDRAULIC SCHEMATIC

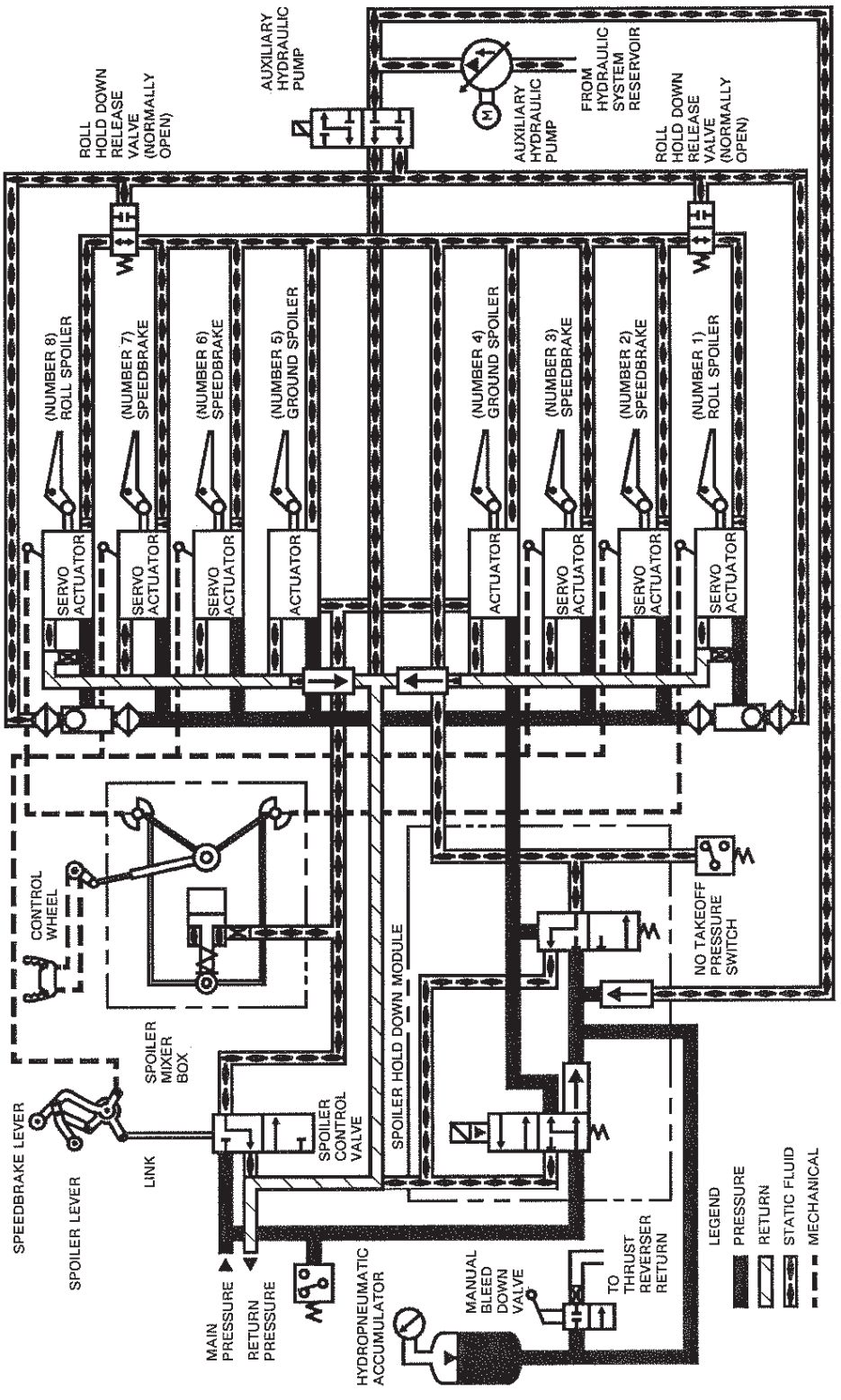

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Figure 2-30 (Sheet 1 of 4)

SPOILER AND SPEEDBRAKE HYDRAULIC SCHEMATIC

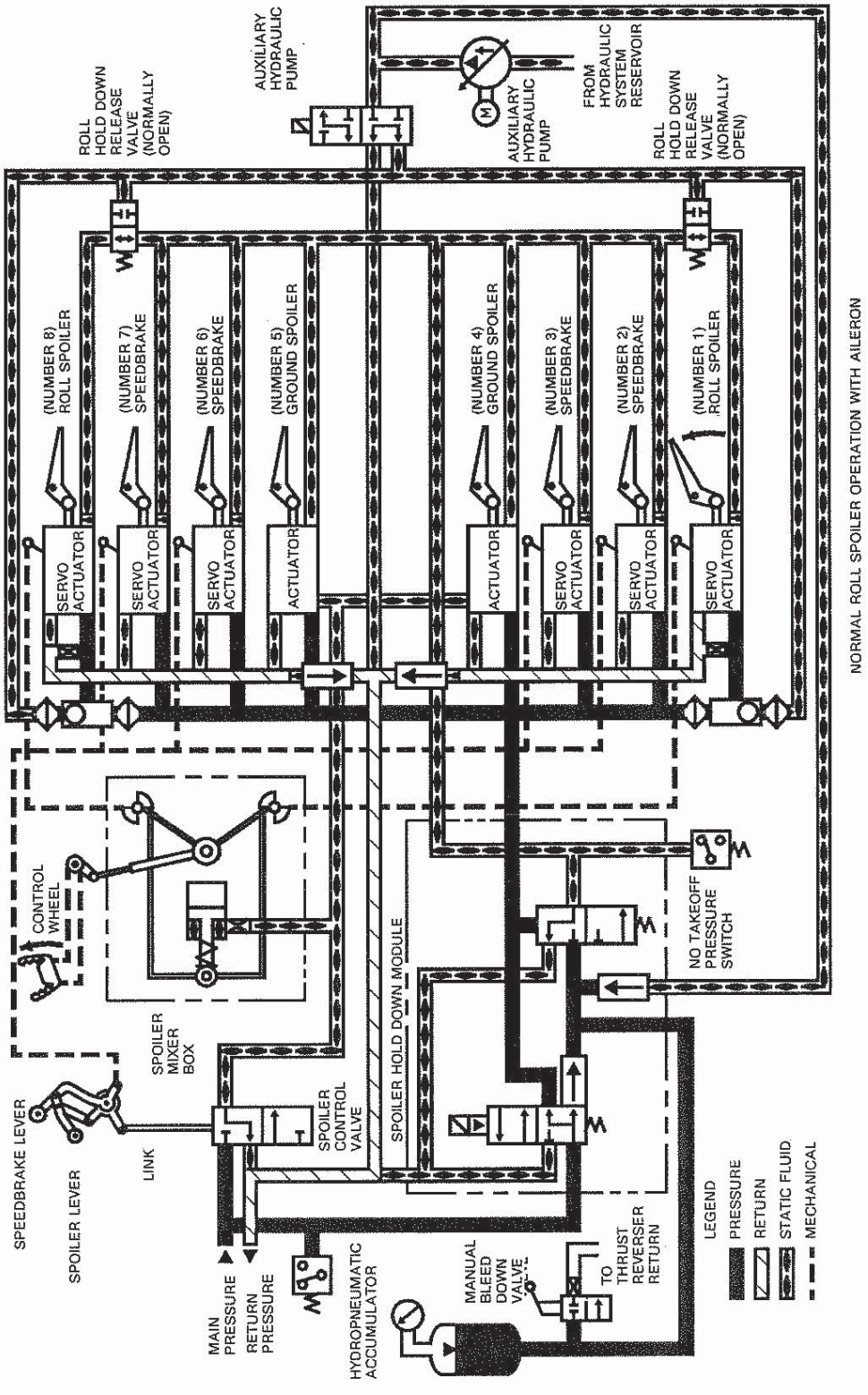

Figure 2-30 (Sheet 2)

SPOILER AND SPEEDBRAKE HYDRAULIC SCHEMATIC

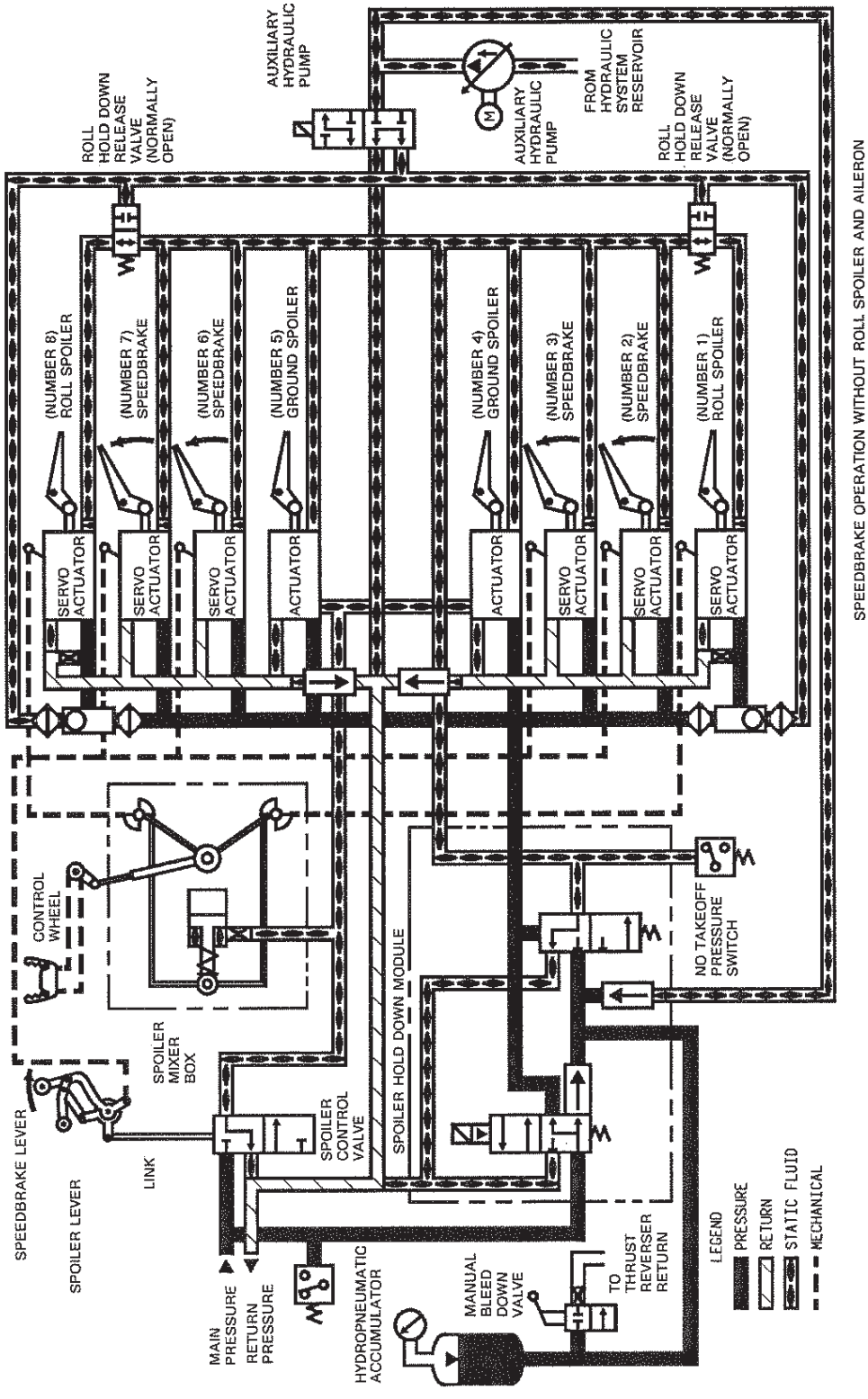

Figure 2-30 (Sheet 3)

SPOILER AND SPEEDBRAKE HYDRAULIC SCHEMATIC

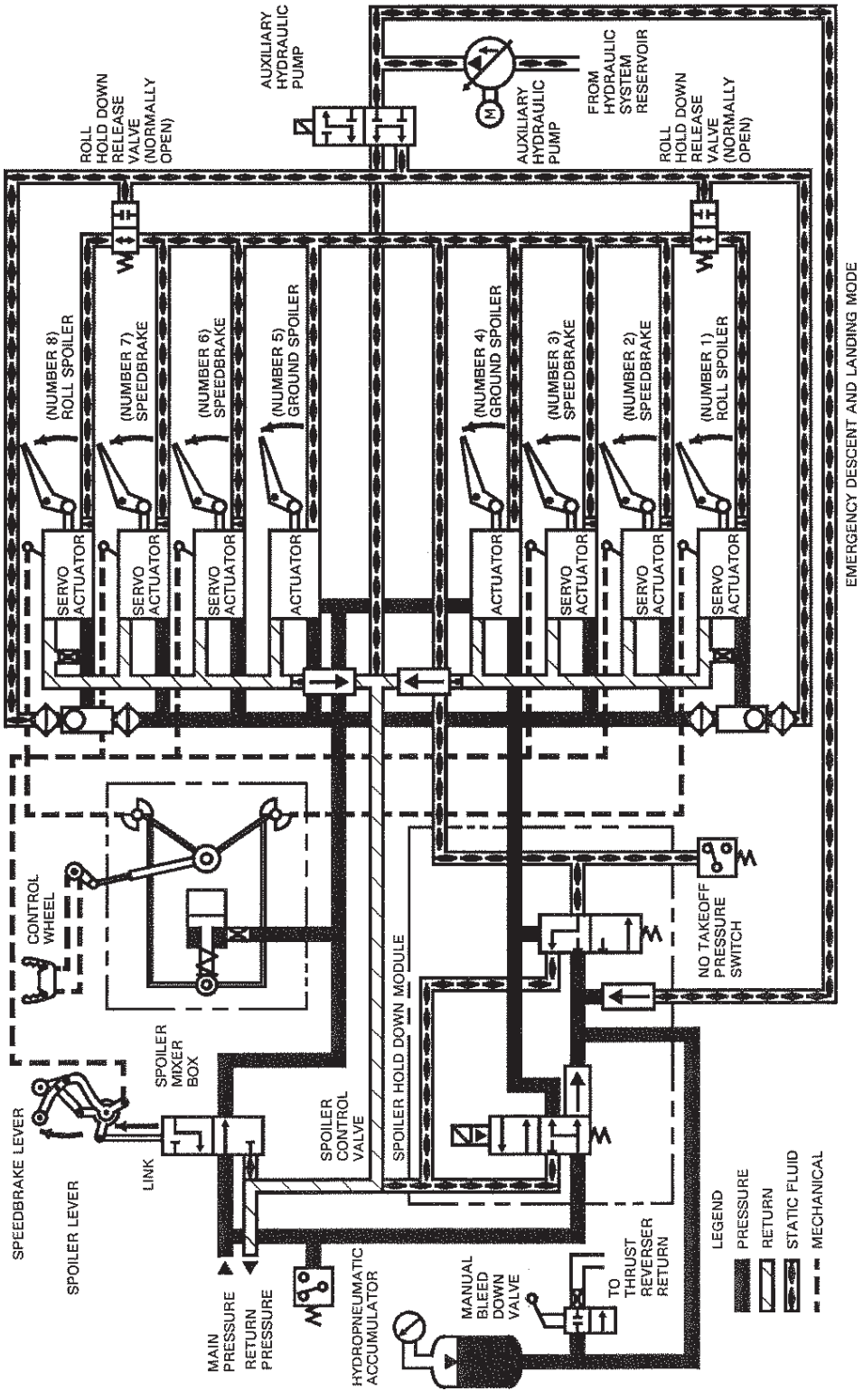

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Figure 2-30 (Sheet 4)

SPOILER AND HOLD DOWN SCHEMATIC

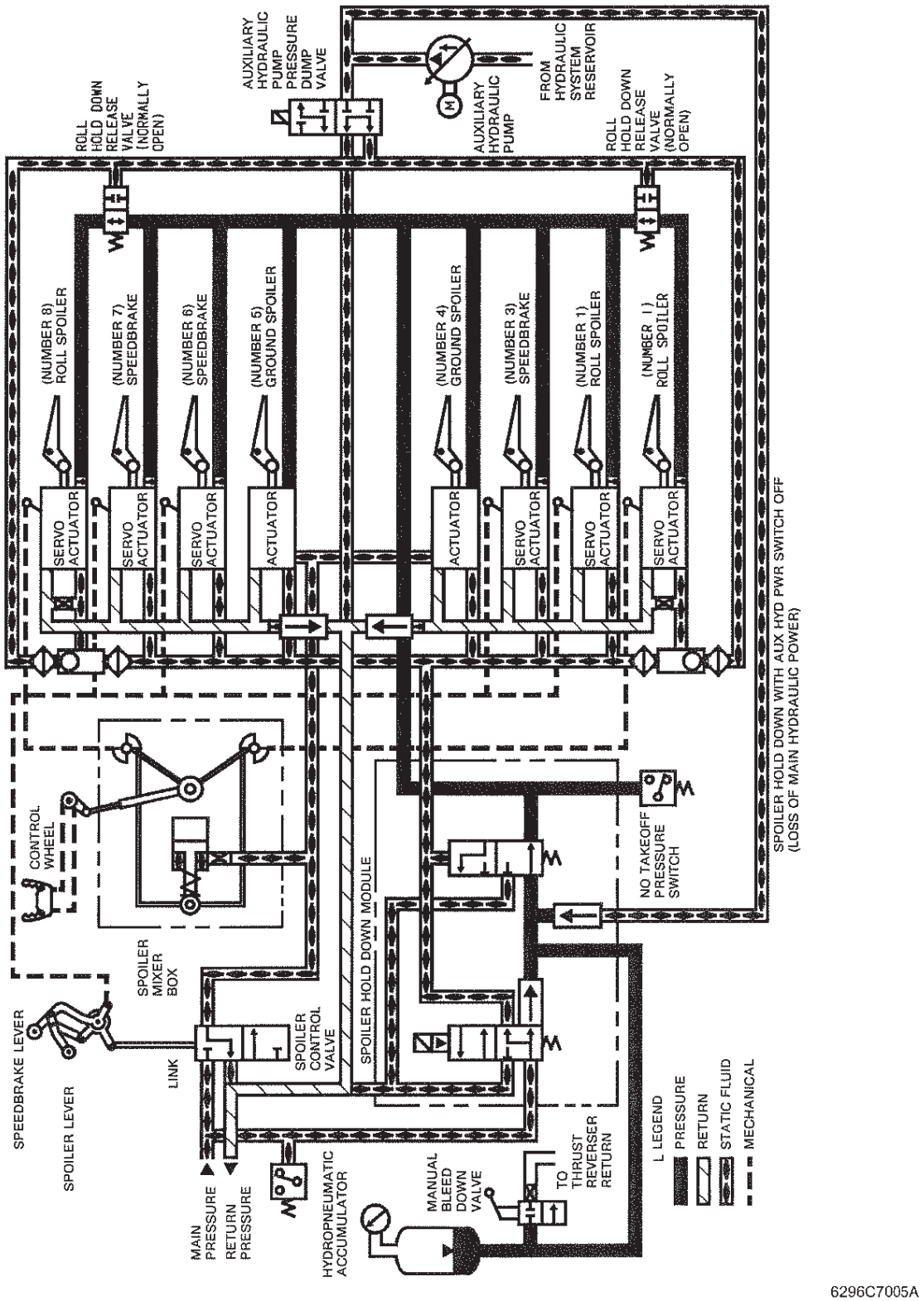

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Figure 2-31 (Sheet 1 of 4)

SPOILER HOLD DOWN SCHEMATIC

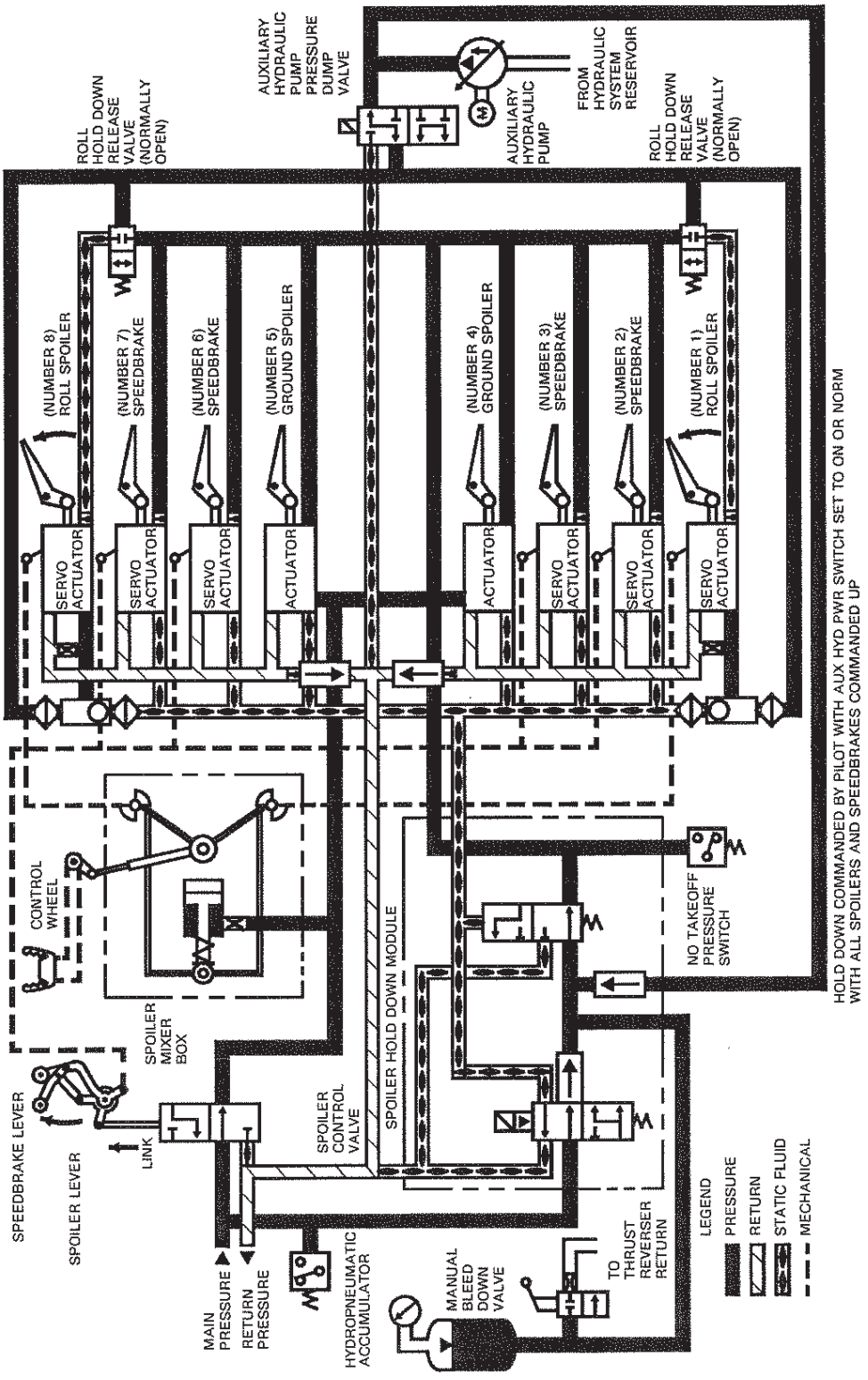

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Figure 2-31 (Sheet 2)

SPOILER HOLD DOWN SCHEMATIC

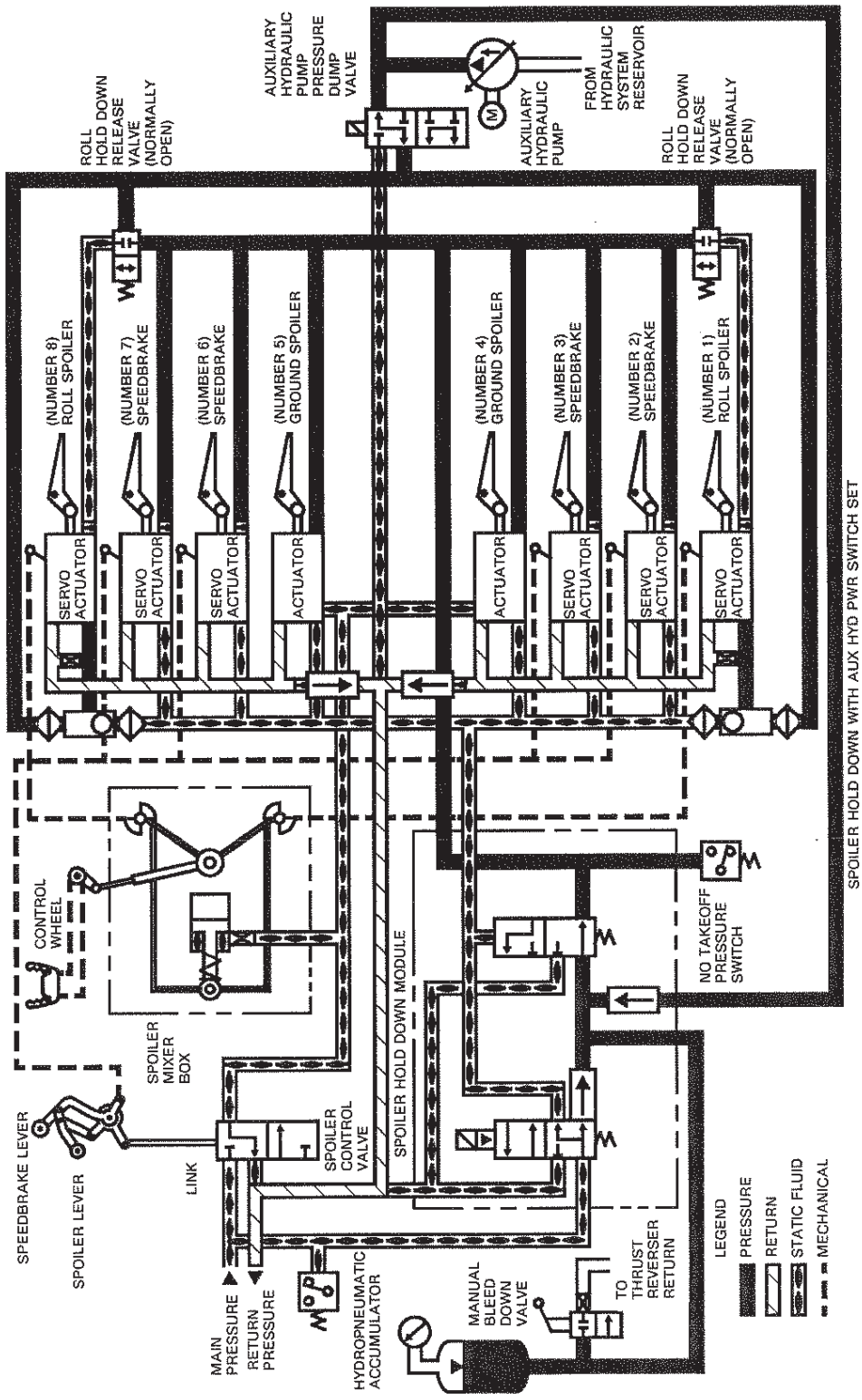

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Figure 2-31 (Sheet 3)

SPOILER HOLD DOWN SCHEMATIC

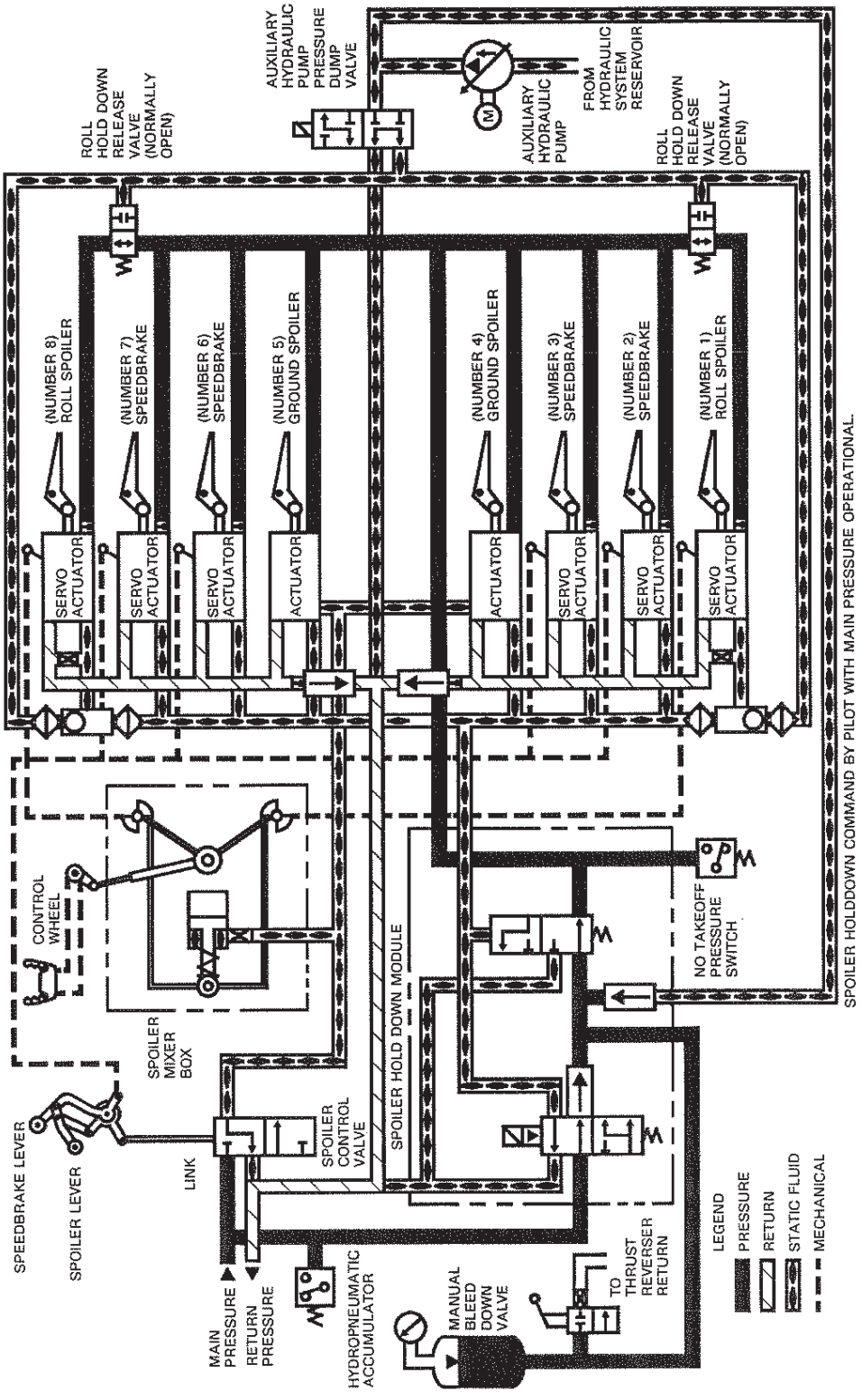

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Figure 2-31 (Sheet 4)

FLAPS

The trailing edge flaps are mechanically controlled and driven by an electric power unit through ballscrew actuators and flex-drive shafts. The flaps are in three segments on each wing; however, the drive system is designed to preclude the possibility of a split flap condition. If at any time an asymmetrical flap condition occurs, the flap controller disables the system and engages the asymmetry brakes which mechanically lock the flap segments in that position. The asymmetry brakes can only be reset on the ground. The flap system will annunciate FLAPS INOP if the flap handle is not positioned in a detent. In this case the flaps must be reset by presssing the reset switch (FLAP INOP/O'HT) located to the left of the flap handle. A mechanical detent is provided at the 7 and 20-degree position of the flap lever.

FLAP SYSTEM

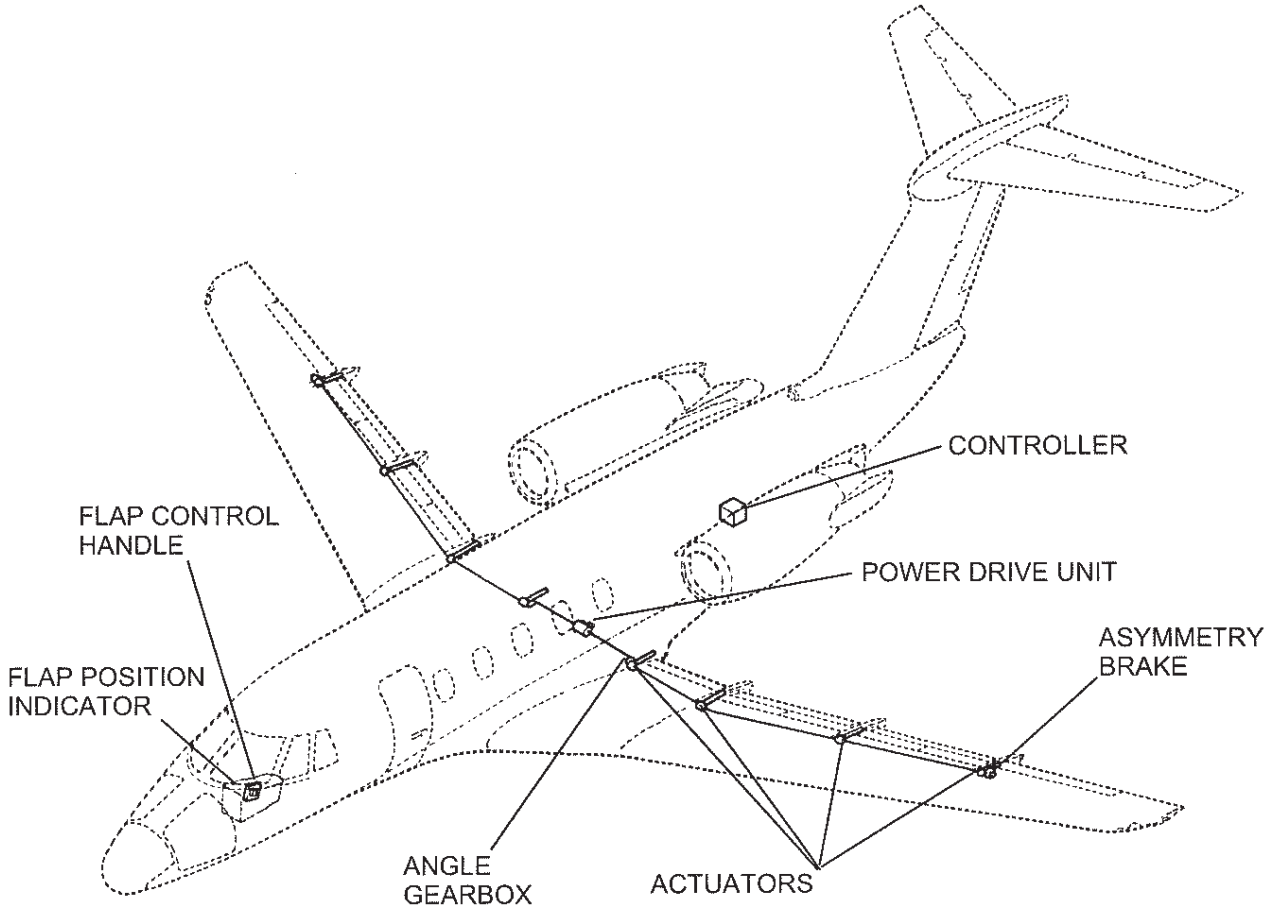

Figure 2-32

If the flaps are extended beyond the 20-degree (TO/APPR) position in flight with the landing gear not down-and-locked, the landing gear warning horn will sound and cannot be silenced with the horn silence switch.

A FLAP INOP/O'HT light, near the flap control handle, cautions the pilot of a flap controller malfunction. If the flap control system becomes disabled, the FLAP INOP portion of the light will illuminate. Depressing the light will extinguish the light but if the fault is still present, the light will re-illuminate. This procedure may be repeated. The O'HT portion of the light will illuminate only if a flap controller overtemperature condition exists. This overtemperature condition will also illuminate the FLAP INOP portion. The lights cannot be reset but the OHT light will extinguish when the condition is cleared. At this time, the FLAP INOP light can be reset.

The flap controller asymmetry detection system provides continuous monitoring of both position sensor signals for a possible asymmetry condition. When an asymmetry condition exists, the flap controller disables the flap electrical power drive unit.

FLAP O'SPEED annunciator lights on the pilot's and copilot's instrument panels indicate that the flaps are extended beyond 1.2 degrees with an airspeed greater than 215 knots.

CONTROL LOCK

The control (gust) lock system is mechanically operated and, when engaged, locks the ailerons, elevator and rudder in the neutral position and limits throttle advancement to the ground taxi idle position approximately 1.25 inches forward of the idle position. This provides for engine start and taxi with the flight controls locked against gusty conditions. The system is controlled by a T-handle located below the pilot's instrument panel. The T-handle is pulled straight aft to engage the control lock. The flight controls should be near neutral position and the throttles in idle or below before engaging the control lock. The control lock is released by pushing the T-handle full forward. The T-handle is secured in position by rotating it clockwise and released by turning it 1/4 turn counterclockwise.

STALL WARNING - STICK SHAKER

Stick shakers are mounted on the forward side of each pilot's control column. An electric motor with rotating weights induces a vibration feel to the control column alerting the pilot of an approaching stall condition. The stick shakers are energized by inputs from the angle-of-attack system. The test switch on the switch panel provides a means of checking the shakers on preflight.