

It is the purpose of the landing gear _____ to prevent accidental retraction of the gear while on deck. The source of its sensing information is a microswitch (ground safety) located on the _____.

*control safety solenoid
left main gear scissors*

FRAME 19

The landing gear position indicating system consists of a d.c. powered position indicator on the left side of the instrument panel of each cockpit and gear position lights on each gear assembly. The cockpit position indicators provide a visual indication of the landing gear position to the pilot. When the gear are up and locked, the word "UP" will appear in each of the three indicator dials. When the gear are in an intermediate position, a two-colored "barberpole" appears, indicating an unsafe condition. When the landing gear are down, a "tiretread" will appear in each cockpit indicator dials.

The cockpit position indicators provide a _____ indication of the landing gear position to the pilot. A "barberpole" on the nose gear, and a "tiretread" on both main gear indicates the nose gear is _____ and the main gear are _____.

*visual
unsafe
down and locked*

FRAME 20

The red light in the landing gear handle will illuminate any time the position of the landing gear does not correspond with the position of the landing gear handle. In a malfunction, it is possible to have an unsafe indication in the indicator and the landing gear handle light will be out. With this malfunction, the indicator is probably stuck in the wrong position. A gentle tap on the indicator usually corrects this.

When the landing gear handle does not correspond with the position of the landing gear, the landing gear light will be _____ and the landing gear indicators will indicate _____.

*on
unsafe*

FRAME 21

The T-28 incorporates a landing gear warning horn that provides the pilot with an audible reminder that the landing gear are not down and locked for landing. The warning horn will sound whenever the throttle is retarded to approximately 15" MAP, and the landing gear are not down and locked. The warning horn will be silenced when the landing gear are down and locked. The horn can also be silenced by advancing the throttle above 15" MAP or depressing the horn cut-out button located on the aft plate of the throttle quadrant. If the horn has been silenced, by depressing the button, the relay will be reset when the gear handle is moved to the down position or the throttle is advanced above 15" MAP.

The warning horn will be silenced when:

1. _____
2. _____
3. _____

-
1. Landing gear are down and locked.
 2. Adding power to above 15" MAP
 3. Depressing the warning horn cut-out button

FRAME 22

The white position lights are located on each landing gear assembly and are controlled through the downlock switches and exterior lighting system. If the external master light switch (EXT MASTER) is ON, the position lights will illuminate when the gear reach the down and locked position.

The white position lights on each gear will indicate the gear are _____ only if the _____ switch is ON.

*down and locked
external master lights*

FRAME 23

The landing flap system consists of two single-slotted, all metal wing flaps, one hydraulic actuating cylinder, a d.c.-powered position-indicating system, and a mechanical control system. Flap limitation airspeed is 140 knots.

For proper flap operation, _____ is required for operation, and _____ power is required for position indication.

hydraulic pressure
d.c.

FRAME 24

The flap hydraulic system consists of a flap selector valve and associated linkage; a manually operated bypass valve; a system thermal relief valve; an actuating cylinder; two restrictors; a check valve; and two microswitches. (See figure 3.) With the flaps up and locked and the control handle in the UP position, the microswitches will be closed, the bypass valve will be open, and the system will be depressurized.

When dropping 3/4 flaps, lowering the flap handle _____ the microswitches,
_____ the bypass valve causing the hydraulic system to _____.

opens
closes
pressurize

FRAME 25

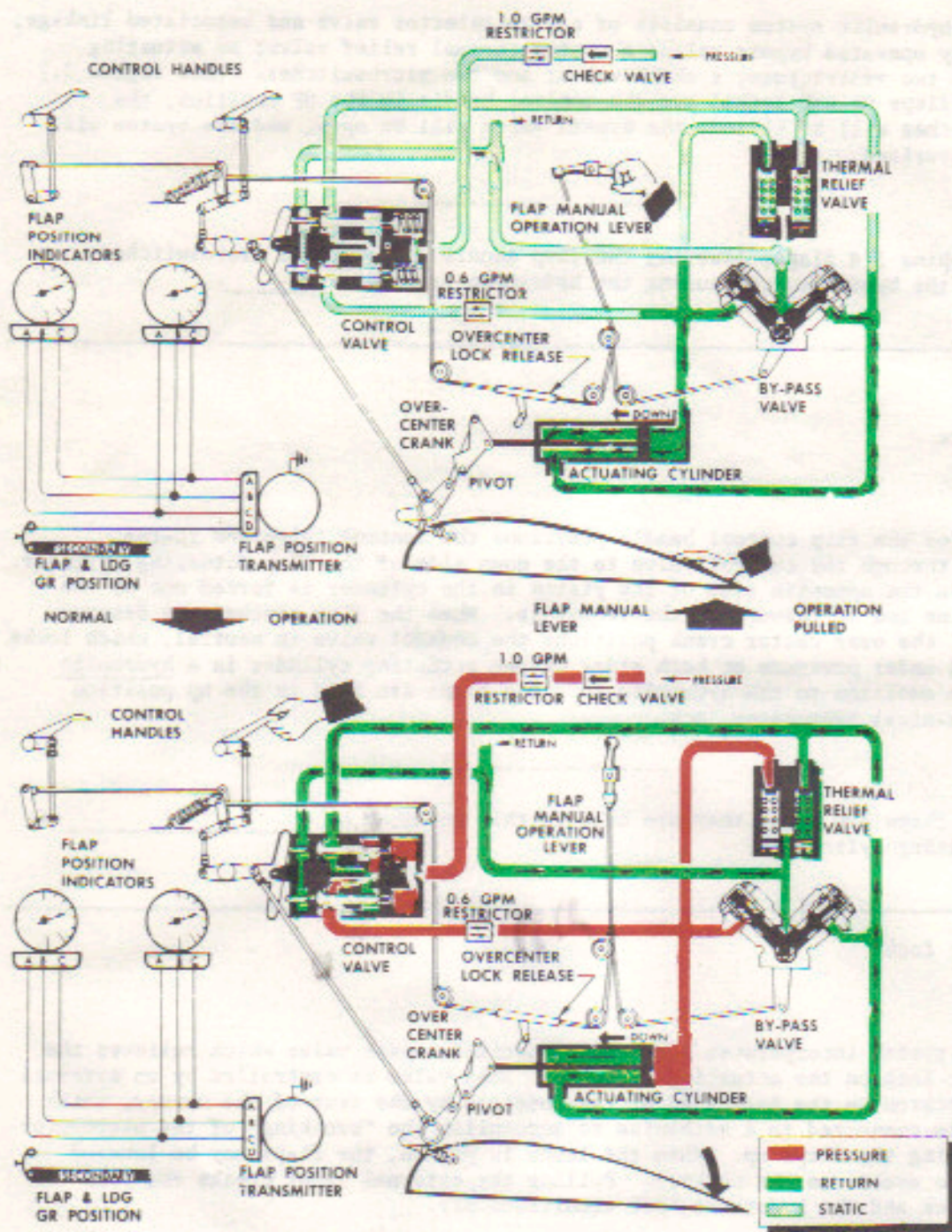
Movement of the flap control handle positions the control valve and routes pressure through the control valve to the down side of the flap actuating cylinder. Fluid from the opposite side of the piston in the cylinder is forced out of the return line and on through to the reservoir. When the flap reaches the desired position, the over center crank positions the control valve in neutral, which locks the fluid under pressure on both sides of the actuating cylinder in a hydraulic lock. In addition to the hydraulic lock, the flaps are held in the up position by a mechanical overcenter lock.

When the flaps are down, they are held in this position by a _____ in
the actuating cylinder.

hydraulic lock

FRAME 26

The flap system incorporates a manually operated bypass valve which relieves the hydraulic lock on the actuating cylinder. This valve is controlled by an external lever, located on the left side of the fuselage by the rear of the canopy, which in turn is connected to a mechanism to accomplish the "breaking" of the overcenter lock holding the flaps up. When the lever is pulled, the flaps may be lowered to provide access to the cockpit. Pulling the external lever breaks the overcenter lock and the hydraulic lock simultaneously.



WING FLAP SYSTEM

UNATNA-T-100

Figure 3
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Releasing the _____ valve will permit the flaps to be lowered. The flaps are held in the up position by means of an _____ lock and a _____ lock. The flaps are _____ actuated and _____ operated.

*manually operated bypass
overcenter
hydraulic
manually
hydraulically*

FRAME 27

In both the T-28B and T-28C, a d.c. electrically actuated, hydraulically operated speed brake is located under the baggage compartment. It is of all metal construction and fits flush with the lower contour of the fuselage when the speed brake switch (located on the throttle handle) is in the OFF (closed) position. The speed brake may be actuated from either cockpit, as long as that cockpit has electrical control. (See figure 4.)

The speed brake is _____ actuated by means of a switch on the _____. The pilot operating the speed brake must have _____. When the speed brake is extended, the hydraulic pressure should be _____ to _____ p.s.i.

*electrically
throttle handle
electrical control
1250
1650*

FRAME 28

The speed brake is held up by two mechanical locks linked together to ensure simultaneous action. The down position is maintained by hydraulic pressure. In the event of electrical failure, the solenoid-operated hydraulic control valve, being spring-loaded to the neutral position, will vent both sides of the actuating cylinders to the return line. Therefore, if the speed brake is in the down position when an electrical failure occurs, the air pressure loads against the speed brake will return it to the trail position. If an electrical failure occurs with the brake in the up position, the speed brake will be held up by the mechanical locks and is inoperative.

The speed brake is held up by _____ and down by _____. When the speed brake is down, if an electrical failure occurs, the speed brake will _____.

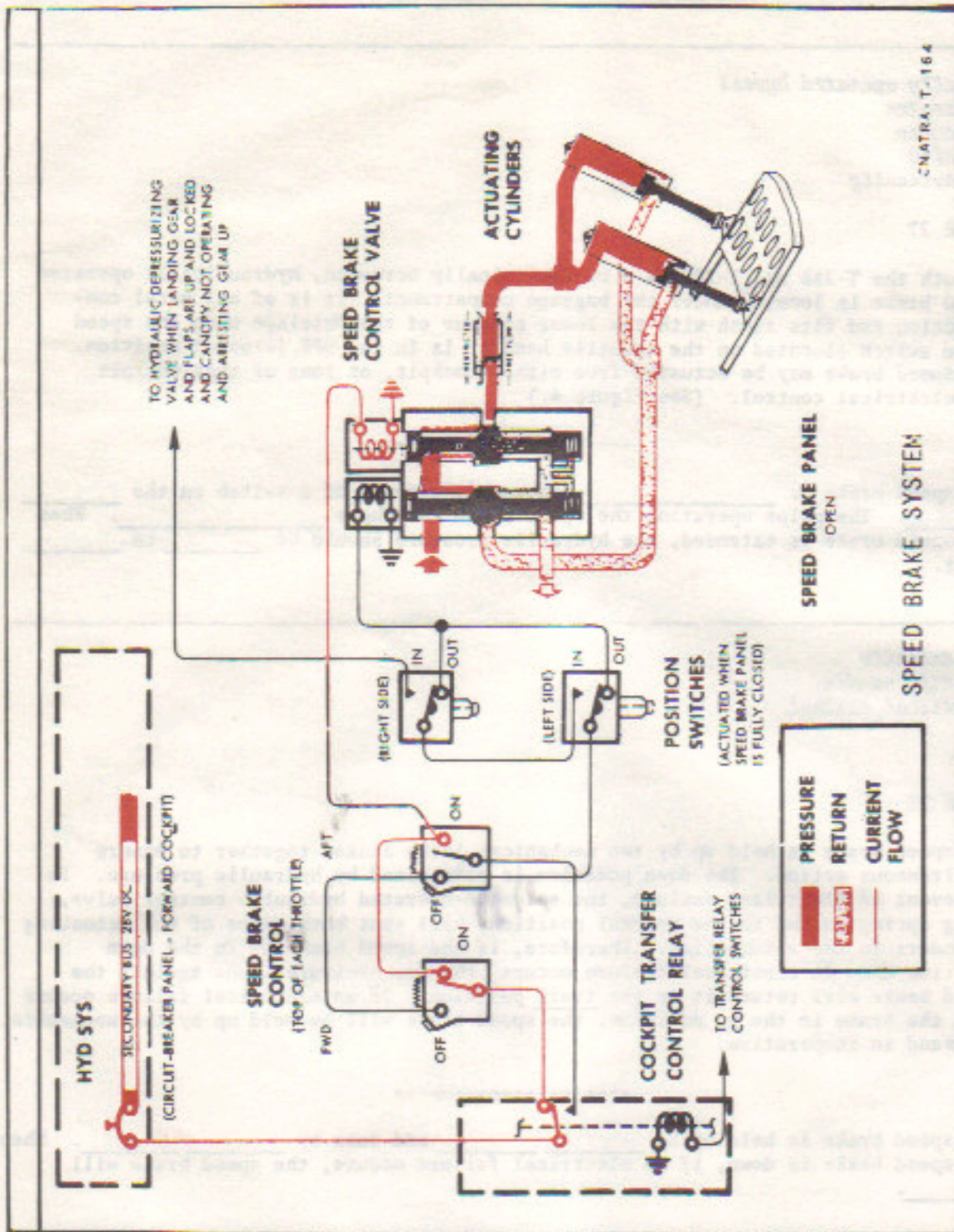


Figure 4

mechanical locks
hydraulic pressure
trail

FRAME 29

The speed brake cannot be extended in event of an electrical failure. With a hydraulic failure and the speed brake down, the speed brake will return to the trail position when the speed brake switch is positioned OFF. The speed brake may be extended by use of the hydraulic hand pump if the engine-driven pump fails. The speed brake cannot be extended without hydraulic pressure to break the up locks, and a functioning secondary bus.

With the speed brake up and an engine-driven hydraulic pump failure, the speed brake will _____ if the switch is later placed to ON. The speed brake may be fully extended at this point by means of the _____.

stay up
hydraulic hand pump

FRAME 30

Movement of the speed brake switch to the OFF position energizes the speed brake control solenoid valve and allows hydraulic pressure to retract the brake. When the speed brake is up and locked, the limit position switches are actuated and return the speed brake control valve to the neutral position. At the same time, the electrical circuit to the hydraulic system bypass valve is energized and the hydraulic system is depressurized.

Placing the speed brake switch to OFF, energizes the _____, causing the speed brake to retract. When the speed brake is up and locked, the circuit is complete, the _____ valve is energized, and the hydraulic pressure should read _____ to _____ p.s.i., provided no other hydraulic systems are actuated.

speed brake control valve
bypass
0
100

FRAME 31

Movement of the speed brake control switch to the ON position de-energizes the hydraulic system solenoid bypass valve so that hydraulic pressure is available and energizes the speed brake control valve to the brake open position. Hydraulic

pressure is then routed to the brake actuating cylinder, which releases the mechanical locks, and the speed brake is actuated to the down position. The hydraulic system remains pressurized as long as the speed brake is down. A limiter valve is incorporated in the speed brake system to preclude possible overstress when the speed brake is extended at speeds in excess of 250 knots. The limiter valve will automatically adjust the degree of extension of the speed brake depending on the force created by aerodynamic pressures.

The hydraulic solenoid bypass valve is _____ so as to permit hydraulic pressure to release the up locks and to extend the speed brake when the speed brake switch is placed ON.

de-energized

FRAME 32

The hydraulically operated canopy system consists of two canopy control switches, a canopy solenoid shutoff valve, a hydraulic control valve, a thermal relief valve, a bypass valve, a shuttle valve, and actuating cylinder. Each canopy control lever knob incorporates a button-type switch which, when depressed, de-energizes the solenoid-actuated hydraulic system bypass valve and energizes the solenoid of the canopy shutoff valve, thus pressurizing the hydraulic system and admitting hydraulic pressure to the canopy control valve. (See figure 5.)

Depressing the canopy button in either cockpit _____ the hydraulic system bypass valve and energizes the solenoid of the canopy shutoff valve. At this point, the hydraulic pressure should be _____ to _____ p.s.i.

de-energizes

1250

1650

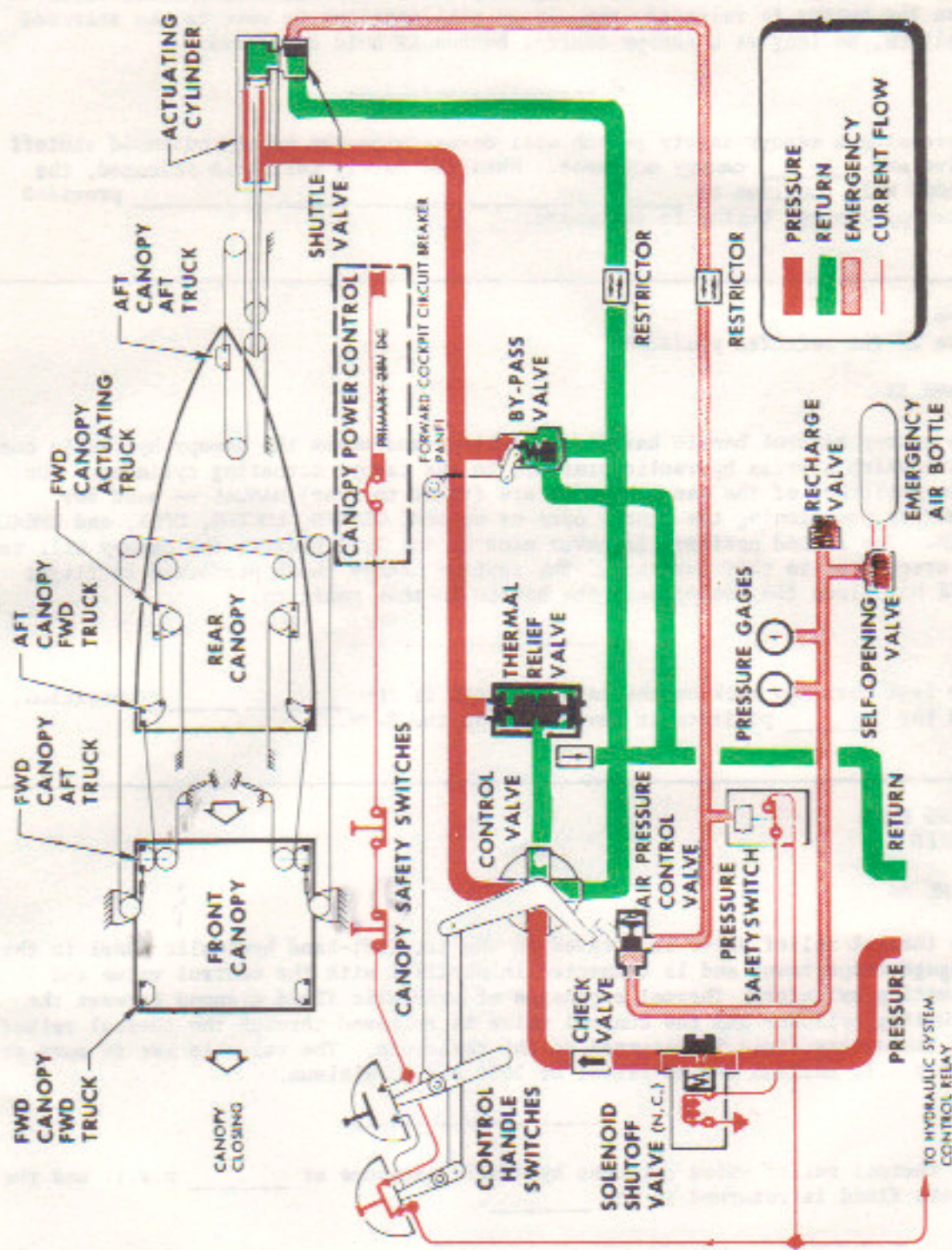
FRAME 33

The canopy solenoid-operated shutoff valve is normally closed, isolating the canopy from the rest of the hydraulic system. It is opened to allow hydraulic pressure into the canopy system when either cockpit canopy button is depressed. The canopy control button is not on the electrical control shift relay, and receives its power from the primary bus.

When the canopy solenoid-operated shutoff valve is _____, the canopy system is isolated from the rest of the aircraft hydraulic systems.

closed

THE CANOPY SYSTEM



C NATRA-T-165

CANOPY SYSTEM

Figure 5

FRAME 34

Canopy safety switches (red knobs) are located in each cockpit on the left side of the instrument panel shroud. Depressing either of the safety switches will stop the canopy movement by de-energizing the canopy solenoid shutoff valve. When the button is released, the canopy will continue to move to the selected position, as long as a canopy control button is held depressed.

Depressing a canopy safety switch will de-energize the canopy solenoid shutoff valve and _____ canopy movement. When the safety switch is released, the canopy will continue to _____ provided a canopy control button is depressed.

*stop
move to the selected position*

FRAME 35

The canopy control handle has five positions and moves the canopy hydraulic control valve which directs hydraulic pressure to the canopy actuating cylinder. The five positions of the canopy handle are (front to rear) MANUAL -- used for manually positioning the canopy open or closed, CLOSED, LOCKED, OPEN, and EMERG OPEN. The locked position is never used in the T-28 because the canopy will tend to creep open in this position. The routine canopy check performed in flight will not close the canopy with the handle in this position.

The last position back on the canopy handle is the _____ position, and the _____ position is never used in the T-28.

EMERG OPEN
LOCKED

FRAME 36

The thermal relief valve is located on the aft left-hand hydraulic panel in the baggage compartment and is connected in parallel with the control valve and actuating cylinder. Thermal expansion of hydraulic fluid trapped between the actuating cylinder and the control valve is relieved through the thermal relief and the excess fluid is returned to the reservoir. The valve is set to open at 2050 p.s.i. maximum and to reseal at 1850 p.s.i. minimum.

The thermal relief valve relieves hydraulic pressure at _____ p.s.i. and the excess fluid is returned to the _____.
