

## section 2

### general description

#### 2.1 GENERAL DESCRIPTION

The Model 377-4 Tester is a compact, portable and precise tester, complete with vacuum-pressure pump, valves, hoses, electric cord and monitoring instruments. All components are contained within the fiberglass case, 10 inches high, 15 inches wide and 15 inches deep, weighing 30 pounds.

The 377-4 can be used by one technician for all test procedures right on the aircraft or on the test bench.

The 377-4 produces precise and controlled pressures, pitot and static, that are normally sensed by airborne flight instruments. Through adapter fittings and hose connections, the precise pressures generated by the tester can be applied to the aircraft's normal pitot and static lines or directly to a specific instrument to check for proper operation.

The 377-4 supplies both positive and negative pressure (vacuum). Self-test of the 377-4 can be made quickly and easily at any time.

Instruments used in the 377-4 are highly accurate and sensitive. These instruments are calibrated and certified to FAA Standards under controlled environmental conditions, thus providing a reliable testing standard.

A dry pump is used in the 377-4 which allows it to be carried, stored or operated in any position without fear of fluid contamination of instruments.

Static and pitot pressures are controlled by micro metering valves adjustable at the front panel. These valves also act as shut-off valves to isolate the aircraft

systems and the tester instruments from the testers pressure sources. This isolation provides a means of checking for system leakage by observing a drop in the altimeter and/or airspeed instruments in the 377-4 over a period of time.

Electrical circuit wiring is fused using a 3 ampere fuse to prevent electrical damage to the tester.

Test connection plug fittings are provided with a dual purpose, dust caps to prevent contamination within the 377-4 and to seal the outlet connections ports to make pre-test self-checks of the Tester possible.

Hoses and fittings furnished with the 377-4 allow interconnections with the aircraft's pitot and static ports. Optional adapters and fittings are available on request.

The pump motor operates on 115/110 volts AC, 50/60 cycles or optional 230/220 volts AC 50/60 cycles single phase.

Three precise instruments are used in the typical 377-4 tester. All functions are clearly labeled on the tester's control panel and instrument dials.

- (1) The airspeed (Pitot pressure monitor) dial is calibrated to read indicated airspeed in knots and/or miles per hour depending on choice.
- (2) The altimeter (static pressure monitor) dial is calibrated to indicate altitude in feet.
- (3) The climb (static pressure rate of change monitor) dial is calibrated to indicate altitude rate of change in feet per minute.

**3.1 GENERAL**

This section provides a discussion of principles and major functional loops involved in operation of the 377-4 Pitot and Static System Tester. Schematic diagram figure 3.1 is provided to aid in understanding the functional discussion.

**3.2 ELECTRIC CIRCUIT**

The 377-4 operates on 115 volts 50 or 60 Hz or optional 220 volts 50 or 60 Hz. Pump Power Switch S1 applies power through fuse F1 to the Vacuum-Pressure Pump VP1.

**3.3 PNEUMATIC CIRCUIT**

Selector Valve V1 allows pressure or vacuum from

pump to be routed to Pitot Control Valve V3 and Static Control Valve V2. Pitot Control Valve V3 regulates and isolates pump pressures from/to Pitot Bleed Valve V4, Cross Feed Valve V6, pitot outlet SC1 and Airspeed M3. Static Control Valve V2 regulates and isolates pump pressures from/to Static Bleed Valve V5, Cross Feed Valve V6, Static Outlet SC2, Altimeter M1 and Climb M2. Cross Feed Valve V6, when opened, allows equalization of pressure between pitot and static lines. Therefore, when the same pressure or vacuum is on both connections of the Airspeed, there will be no differential pressure and airspeed will remain at zero. Relief Valve V7 is a safety valve to limit maximum pressure buildup to approximately 15 PSI. Pitot and Static Outlets SC1 and SC2 provide connections to external instruments or systems. Pitot and Static Bleed Valves V4 and V5 allow each system to be vented to the atmosphere.

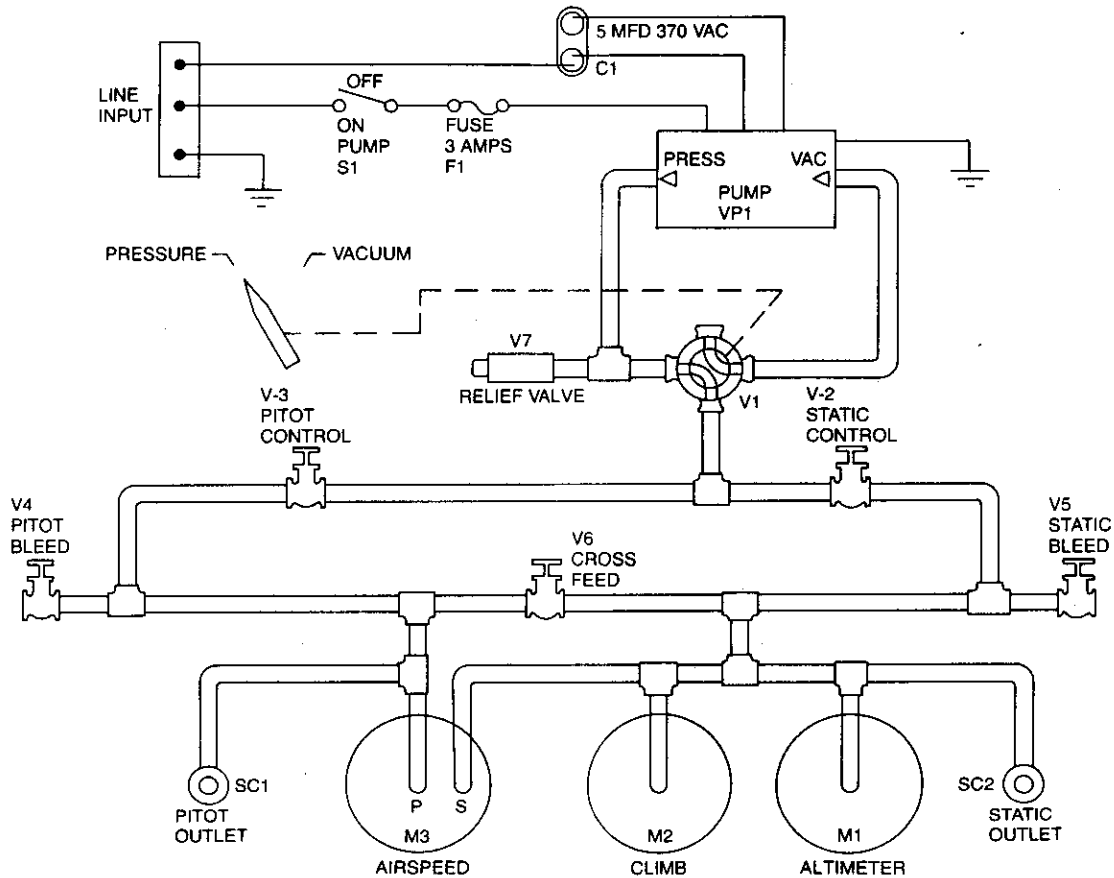


Figure 3.1 Electrical and Pneumatic Schematic

**4.1 GENERAL**

Table 4-1 lists each switch, control and indicator on the 377-4 Pitot and Static System Tester shown in figure 4.1 with its location and function.

*TABLE 4-1. Controls and Indicators*

ITEM NAME	LOCATION	FUNCTION
Airspeed Indicator M3 Knots or MPH	Front Panel	A direct reading instrument that indicates the difference between ram pressure (pitot) of the air and the atmospheric pressure (static).
Altimeter MI 35,000 feet (Standard) 50,000 feet (Optional)	Front Panel	A direct reading instrument that indicates atmospheric pressure (static).
Climb M2 (6,000 feet per minute)	Front Panel	A direct reading instrument that indicates the rate of change in atmospheric pressure (static).
Motor-Pump Unit Dry Type VP1	Internal, accessible after removal of panel.	115/110 volts 60/50 Hertz 1 phase 1.4/1.5 ampere (standard) 230/220 volts 60/50 Hertz 1 phase one (1) ampere (optional). Generates the required pressure.
Power Cord	Front Panel	Heavy duty-three prong 110 volts, 50-60 Hertz (standard); 220 volts 50-60 Hertz (optional). Supplies the power to operate the motor-pump unit.
Power Switch S1	Front Panel	Provides on/off control of power to motor-pump.
Source Selector Control V1	Front Panel	Allows selection of positive or negative (vacuum) pressure.
Static Control V2	Front Panel	Regulates pressure to and isolates the pump pressures from the static outlet and the testers indicators.

TABLE 4.1. Controls and Indicators

ITEM NAME	LOCATION	FUNCTION
Static Bleed V5	Front Panel	Allows the pressures developed in the static lines to be released to the atmosphere.
Pitot Control V3	Front Panel	Regulates pressure to and isolates the pump pressures from the pitot connection on the Testers airspeed.
Pitot Bleed V4	Front Panel	Allows the pressures developed in the pitot lines to be released to the atmosphere.
Cross Feed V6	Front Panel	Allows equalization of pressure between the pitot and static systems.
Accessory Pouch	Inside Lid	Houses hoses, fittings, adapters, manual and test data sheets.

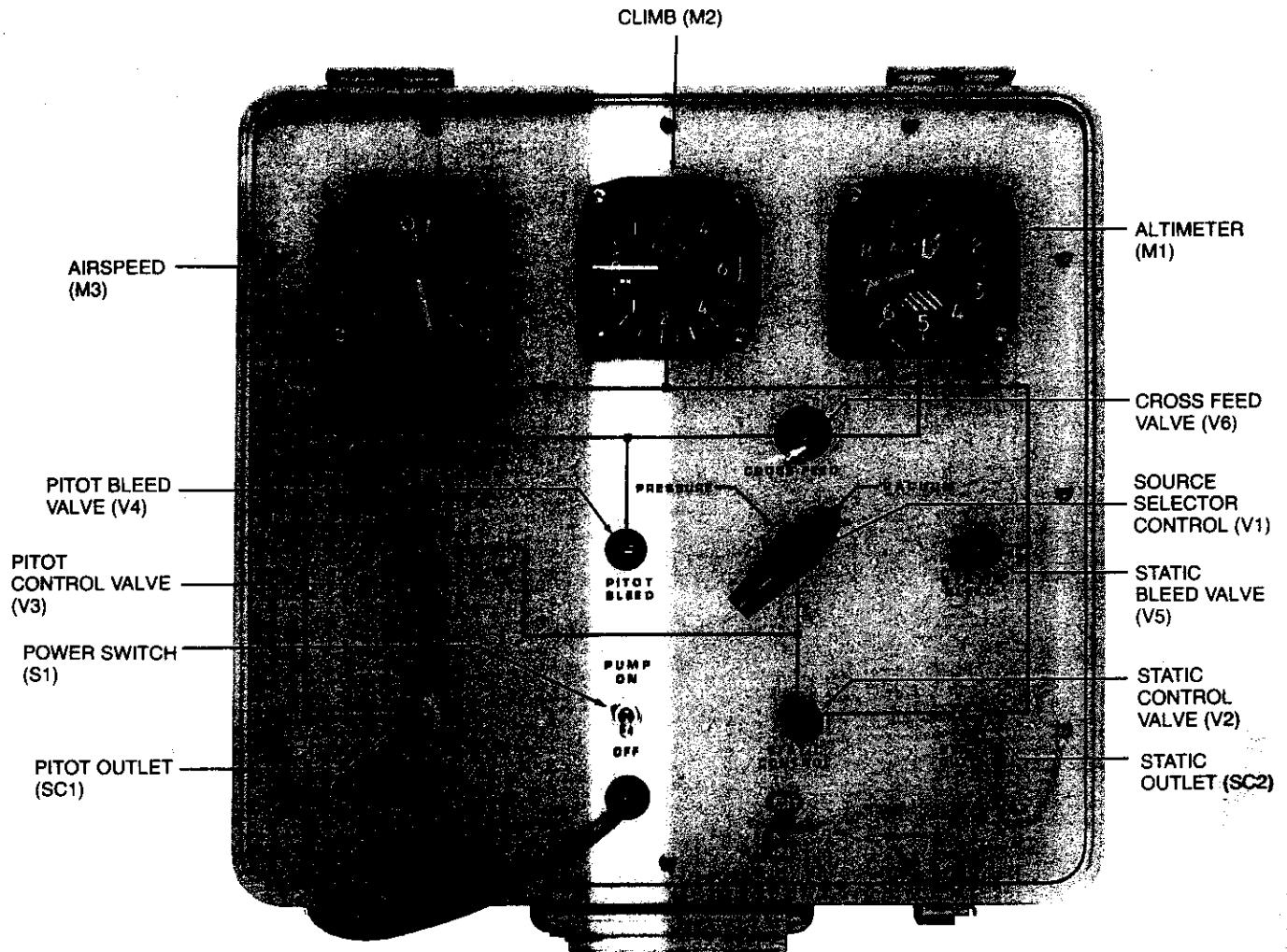


Figure 4.1 377-4 Pitot and Static System Tester, Control Panel