PORTABLE LIFE SUPPORT SYSTEM/OXYGEN PURGE SYSTEM DESCRIPTION

The Portable Life Support System (PLSS) is a self-contained life support system that provides life support, voice communications, and telemetry for an astronaut performing Apollo Mission extravehicular tasks.

The PLSS performs the following functions:

1. Provides breathing oxygen and controls the pressure of the astronaut's suit.

2. Provides thermal control by recirculating oxygen in the Pressure Garment Assembly (PGA) and water through the Liquid Cooling Garment (LCG).

3. Removes humidity, carbon dioxide, odors, and other contaminants from the recirculating oxygen.

4. Provides communication and telemetry between the astronaut and the Lunar Module (LM) or the Lunar Communications Relay Unit (LCRU).

The Oxygen Purge System (OPS) adds an independent backup life support capability. It provides oxygen for respiration, pressure control, and cooling.

The BSLSS is a portable backup system which supplies LCG cooling water to two astronauts from one PLSS.

Five main subsystems comprise the PLSS: the extravehicular communications system (EVCS), oxygen ventilating circuit, feedwater loop, liquid transport loop, and primary oxygen subsystem.

PRIMARY OXYGEN SUBSYSTEM

The primary oxygen subsystem consists of a primary oxygen bottle, primary oxygen fill connector, primary oxygen regulator assembly, oxygen flow rate sensor, PGA low differential pressure warning switch, PGA differential pressure transducer, primary oxygen pressure transducer, and connecting tubing. The primary oxygen bottle is charged on the ground to approximately 1500 psia (1.85 pounds of O_2). Subsequent recharges in the LM yield charge pressures of approximately 1420 psia (1.72 pounds of O_2).

The primary oxygen subsystem provides oxygen for system leakage and metabolic needs, and regulates the pressure in the PLSS oxygen ventilating circuit to 3.85 $\pm$ .15 psid. This subsystem is rechargeable.

The shutoff valve of the primary oxygen regulator assembly is actuated by a linkage assembly. The linkage is connected to an operating lever at the lower right-front corner of the PLSS.

The oxygen shutoff valve is closed when the PLSS is not in use or when the primary oxygen subsystem is being charged. An orifice limits the flow of oxygen to the PGA in the event of a regulator failure.

The primary oxygen fill connector is a quick-disconnect type used for recharging the primary oxygen subsystem.

The oxygen flow sensor and the primary oxygen pressure transducer provide electrical signals to the audio warning system and telemetry system, respectively. The oxygen pressure transducer also sends a signal to a visual display on the RCU.

The PGA differential pressure transducer provides an eletrical signal to telemetry for monitoring suit differential pressure.

The PGA differential pressure switch provides a signal to the audio warning system.