Confidential

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CF-105 BROCHURE L.P.-1

LOW PRESSURE PNEUMATIC SYSTEM

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

BROCHURE L-P 1

LOW PRESSURE PNEUMATIC SYSTEM

FOR

CF-105 ALL WEATHER FIGHTER

CONSISTS OF 3 PAGES

COMPILED BY F. Crockwell

DATE Feb 1. '56

APPROVED BY

DATE Feb 10/56

CHECKED BY K Kovak

DATE Feb. 10. 56

RELEASED BY

DATE Feb 10/56

INDEX

LIST OF ILLUSTRATIONS

FIG. NO.

AVRO AIRCRAFT

1. INTRODUCTION

The low pressure pneumatic systems are:-

(a) An equipment pressurizing system, drawing air from the aircraft air conditioning system and utilizing this to pressurize canopy, crew members 'G' suits, and a radome fluid de-icing system.

(b) An air data system, drawing air pressure from pitot masts and static reference sensors and conveying these pressures to flight instruments, flight and fire control systems, and cabin pressure control safety valve.

2. DESCRIPTION OF SYSTEMS (Ref. Fig.1)

2.1 EQUIPMENT PRESSURIZING SYSTEM

2.1.1 AIR SUPPLY

The air for the equipment pressurizing system is derived from the inlet side of the air conditioning system cooling turbine, at pressures between 20 and 90 psig and temperatures up to 370°F, (depending on aircraft speed and altitude) with a potential flow rate up to 140 lb/min. The air is then passed through a 10 micron filter to eliminate foreign matter. The filter contains a water trap from which entrapped moisture may be drained periodically.

2.1.2 ANTI "G" SUITS

The air is led to the air pressure regulating valves supplying the pilots and navigators anti "G" suits. These valves admit air to the "G" suits at the proper pressure when under varying degrees of positive acceleration. The valves are themselves controlled by the "G" force acting on them, and are adjusted to provide initial pressurization of the suits at a value between 1.5 and 1.8G with subsequent pressurization varying as the 'G' force up to a maximum of approximately 10 psig at 8G. (Ref Fig.4) Each "G" valve incorporates a relief valve to limit the suit pressure to this value under acceleration forces in excess of 8G.

Connection between 'G' valve and anti-G suit is made through the crew member's composite leads disconnect (described in para. 2.3 and Fig. 3 of Brochure O-1, "Oxygen System").

2.1.3 CANOPY SEALS

A branch line, upstream of the Anti G Valves, is taken to the canopy seal control valve (Ref.Fig.3). This valve is a composite unit consisting of a three way solenoid operated control valve with an initial pressure regulating stage and integral pressure relief valve. The output pressure is regulated to a pressure of 18 to 22 psig. which is vented to atmosphere when the solenoid is not energized. Upon energizing the solenoid, the air pressure is directed to the pilot's and navigator's synthetic rubber canopy seals. The energizing of the solenoid is accomplished by the closing of two series wired micro switches each of which is actuated by a separate canopy locking handle in the respective cockpit. Thus the locking of both canopies is required to inflate the seals, and conversely, the unlocking of either canopy will deflate the seals and vent the pressure to atmosphere.
(An access panel is provided to allow the rear canopy locking handle to be operated from the pilot's cockpit, should the aircraft be flown solo.)

2.1.4 RADOME DE-ICING

The main pressure supply line is continued forward to a pressure reducing valve, from which the air at a reduced pressure of 10 psi is used to maintain pressurization in the de-icing fluid container, and to purge the de-icing fluid lines. (See Brochure D.1 1 for full description).

2.2. PITOT AND STATIC SYSTEM

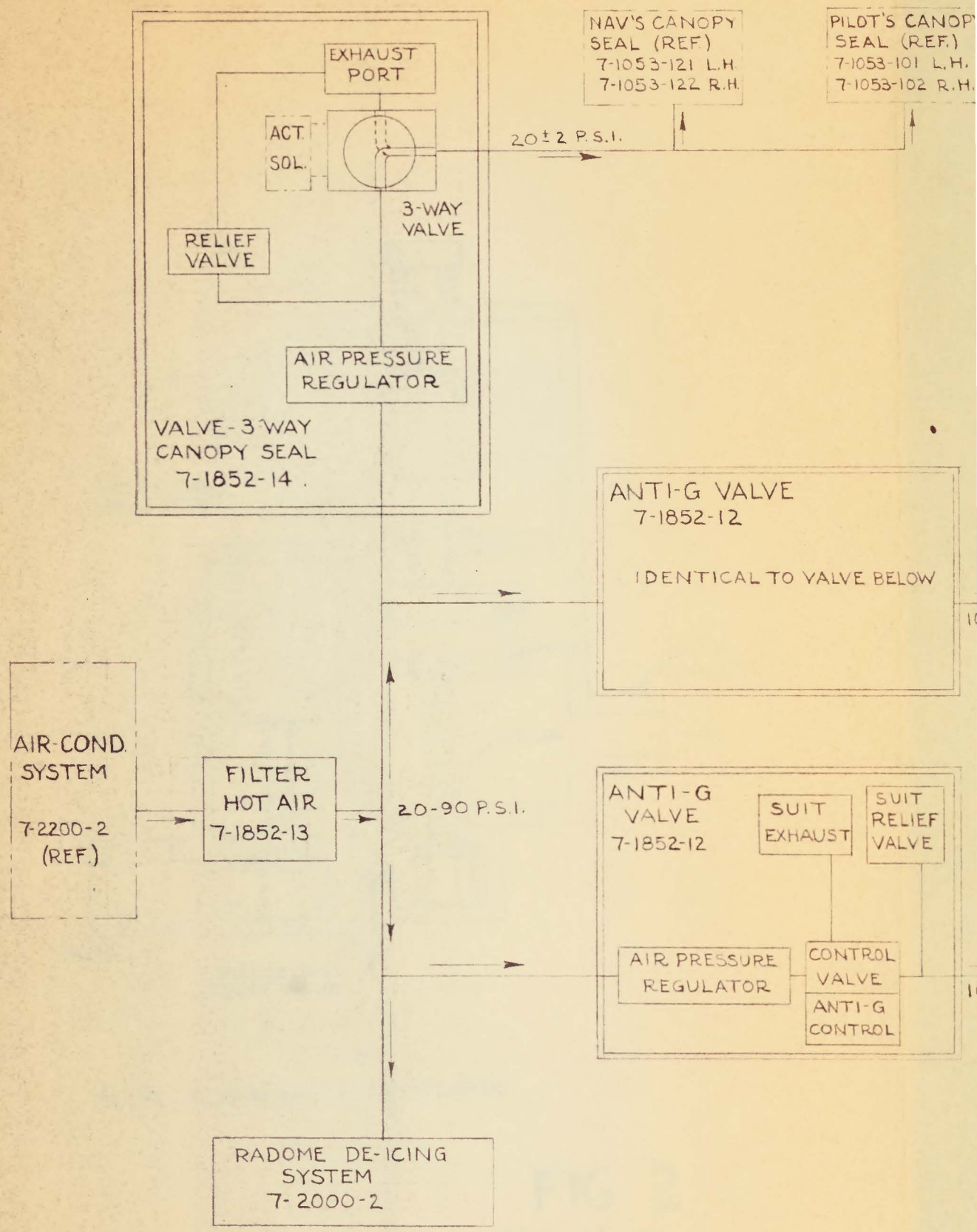
Static reference for the flight instruments and cabin pressure control safety valve is obtained from the nose boom. Pitot pressure for flight instruments and damping system is obtained from two electrically heated pitot masts located at the tip of the fin.

APPENDIX I

EQUIPMENT LIST

LOW PRESSURE PNEUMATIC SYSTEM

DESCRIPTION	QTY.	PART No.	SPEC.	MANUFACTURER AND PART No. WHERE APPLICABLE
FILTER – HOT AIR	1	AC–621–2 AVRO 7–1852–13	AVROCAN E328	A/C POROUS MEDIA, INC.
HOSE ASS'Y – L/P PNEUMATIC PILOT'S CANOPY HOSE	2	CS–II–131–3B–0170	E355	
HOSE ASS'Y – L/P PNEUMATIC NAV. CANOPY HOSE	2	CS–II–131–3B–0150	E355	
HOSE ASS'Y – L/P PNEUMATIC INST. PIPING	1	CS–II–131–4B–0100	E355	
HOSE ASS'Y L/P – PNEUMATIC INST. PIPING	1	CS–II–131–4A–0190	E355	
HOSE ASS'Y L/P PNEUMATIC INST. PIPING	1	CS–II–131–4B–0190	E355	
HOSE ASS'Y L/P PNEUMATIC PILOT'S	1	CS–II–131–4B–0194	E355	
SEAL – CANOPY INFLATING L.H. PILOT'S	1	AVRO 7–1053–101	E343	B. F. GOODRICH CO.
SEAL – CANOPY INFLATING R. H. PILOT'S	1	AVRO 7–1053–102	E343	B. F. GOODRICH CO.
SEAL – CANOPY INFLATING L. H. NAV.	1	AVRO 7–1053–121	E343	B. F. GOODRICH CO.
SEAL – CANOPY INFLATING R. H. NAV.	1	AVRO 7–1053–122	E343	B. F. GOODRICH CO.
VALVE – ANTI "G"	2	AVRO 7–1852–12	MIL–V–9370	ALAR PRODUCTS INC.
VALVE – CANOPY SEAL CONTROL	1	AVRO 7–1852–14	E332	SURFACE COMBUSTION


EXHAUST PORT
ACT. SOL.
3-WAY VALVE
RELIEF VALVE
AIR PRESSURE REGULATOR
VALVE-3 WAY CANOPY SEAL 7-1852-14.
20 ± 2 P.S.I.
NAV'S CANOPY SEAL (REF.) 7-1053-121 L.H. 7-1053-122 R.H.
PILOT'S CANOPY SEAL (REF.) 7-1053-101 L.H. 7-1053-102 R.H.
ANTI-G VALVE 7-1852-12
IDENTICAL TO VALVE BELOW
AIR-COND. SYSTEM 7-2200-2 (REF.)
FILTER HOT AIR 7-1852-13
20-90 P.S.I.
ANTI-G VALVE 7-1852-12
SUIT EXHAUST
SUIT RELIEF VALVE
AIR PRESSURE REGULATOR
CONTROL VALVE
ANTI-G CONTROL
RADOME DE-ICING SYSTEM 7-2000-2

PILOT'S CANOPY SEAL (REF.)
7-1053-101 L.H.
7-1053-102 R.H.

PILOT'S INSTR. PANEL (REF.)

MACHMETER & A.S.I. (REF.) G.F.E.

ALTIMETER (REF.) G.F.E.

RATE OF CLIMB INDICATOR (REF.) G.F.E.

EMER'CY

NORMAL

DAMPING SYSTEM.

EMER'CY

NORMAL

DAMPING SYSTEM.

A.S.I. SYSTEM

ALVE BELOW

10 P.S.I. MAX.

SEAT DISCONNECT OXY SYS. (REF.) 7-2100-2

NAVIG'S SUIT (REF)

T
UST

SUIT RELIEF VALVE

CONTROL VALVE

ANTI-G CONTROL

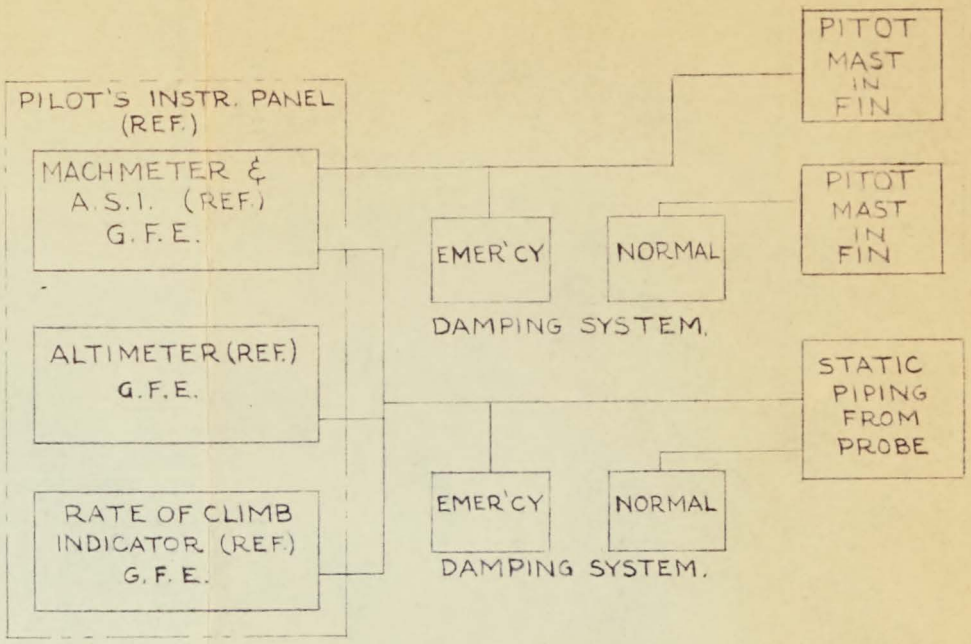
10 P.S.I. MAX.

SEAT DISCONNECT OXY. SYS. (REF.) 7-2100-2

PILOT'S SUIT (REF.)

SCHEMAT
L.P. PNEUMATIC
INCLUDING

BRO



A.S.I. SYSTEM

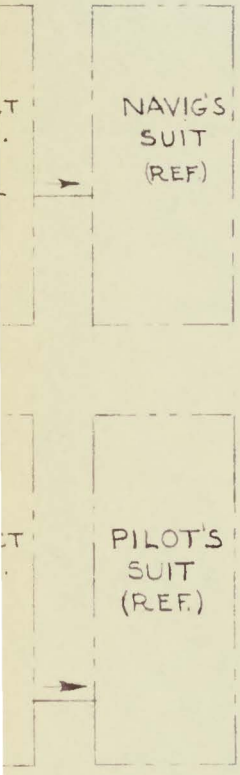
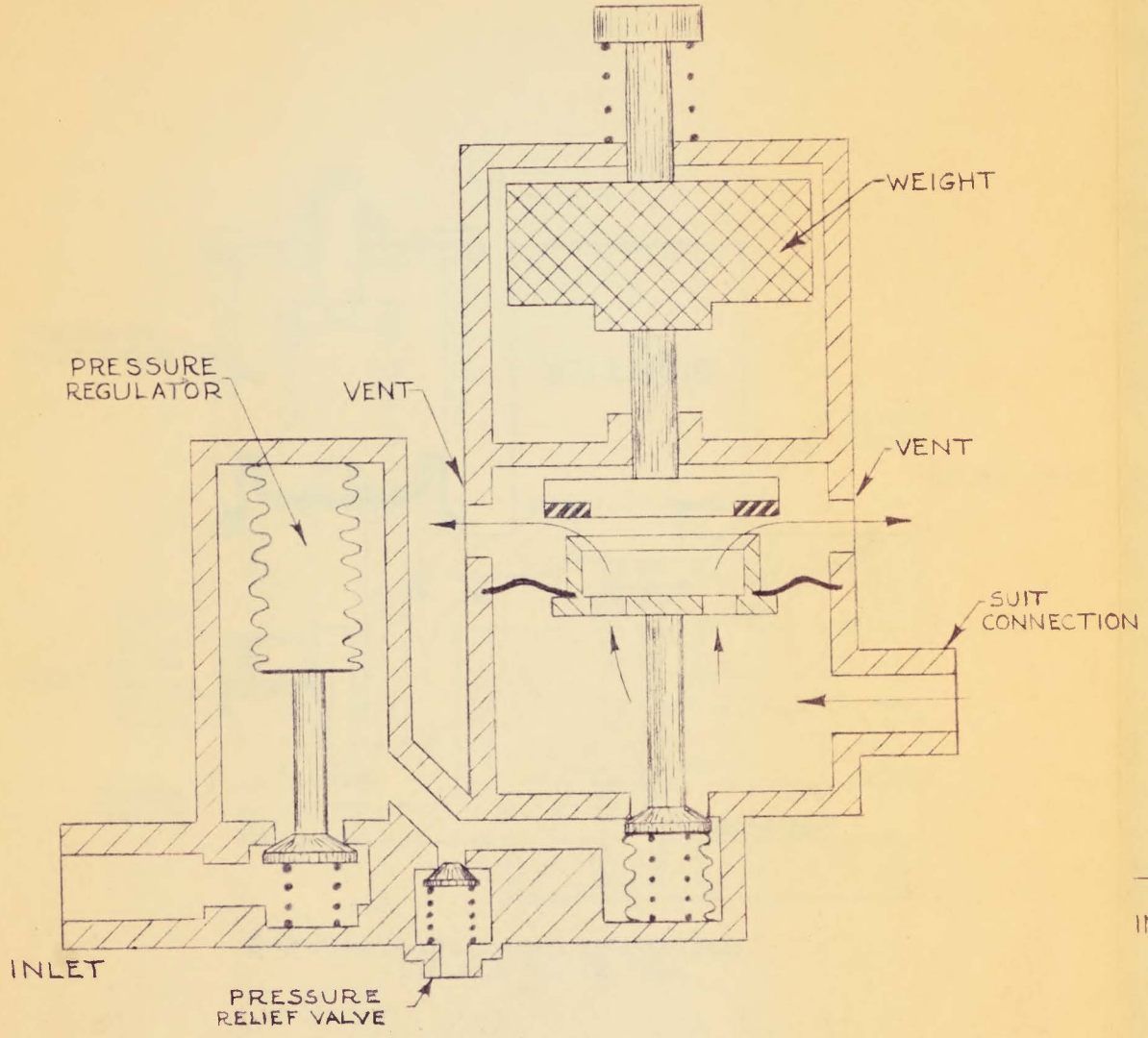


FIG. 1

SCHEMATIC
L.P. PNEUMATIC SYSTEM
INCLUDING A.S.I.

BROCHURE L.P. 1.

NOTE:-THIS IS A DIAGRAMMATIC REPRE



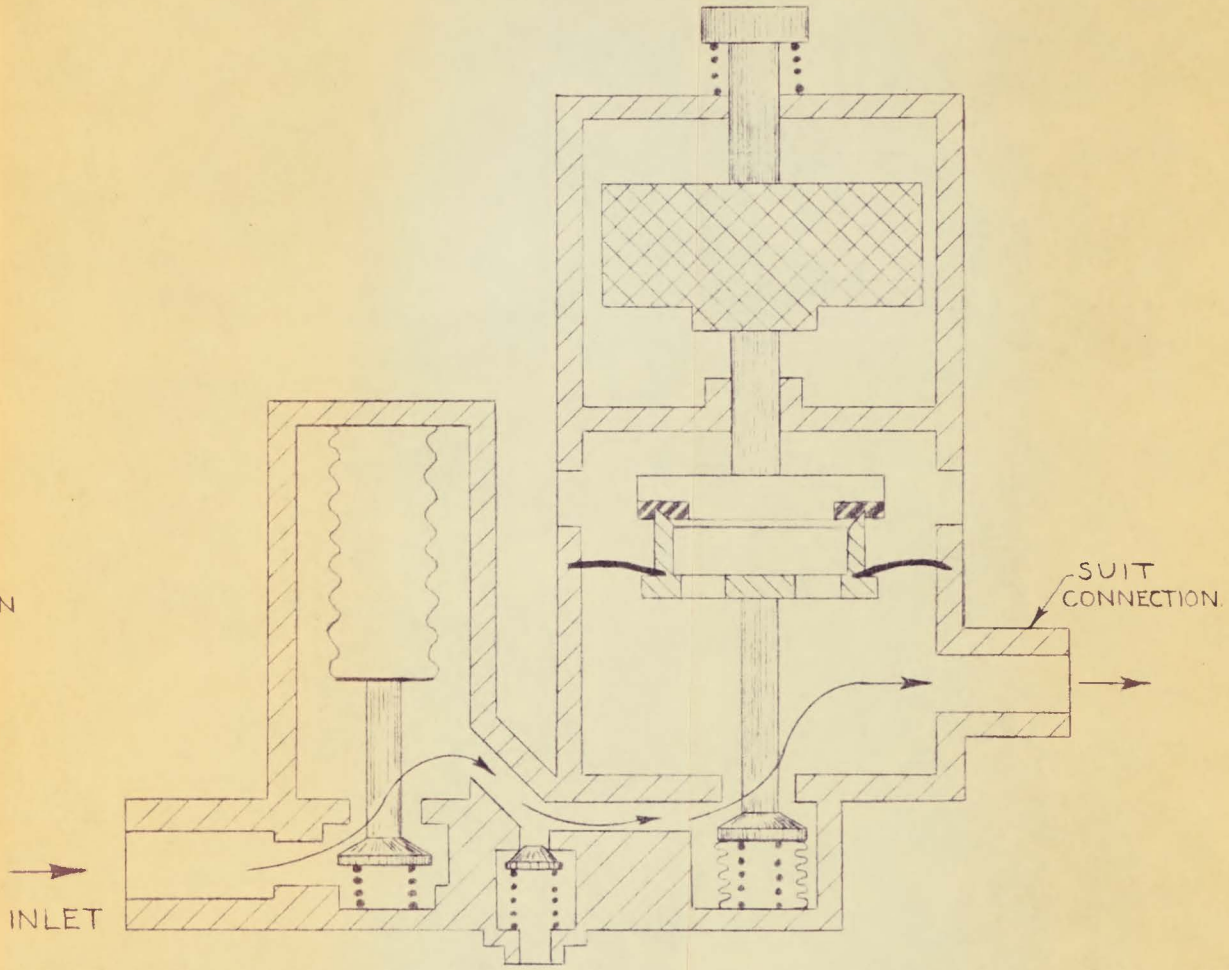
NO ACCELERATION - SUIT VENTED.

P

ANTI-G VALVE.

. REPRESENTATION ONLY.

CTION



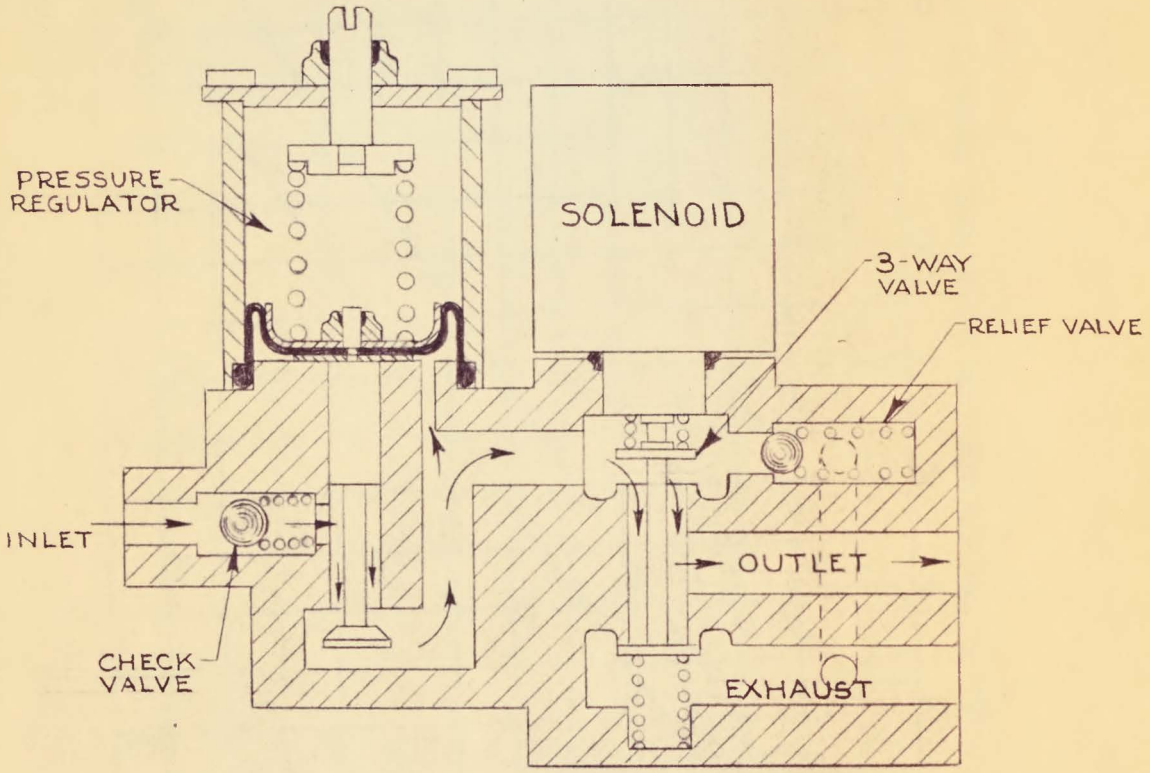
POSITIVE ACCELERATION - SUIT INFLATED.

E.

FIG. 2

BROCHURE L.P.1

NOTE:- THIS IS A DIAGRAMMATIC REPRESENTATION ONLY.



SHOWING :- SOLENOID ENERGIZED
SEALS INFLATING.

CANOPY SEAL CONTROL VALVE.

FIG. 3