

Chapter 5

PRESSURE RATIO LIMITER, TYPE P.R.L.100

LIST OF CONTENTS

	<i>Para.</i>		<i>Para.</i>
<i>Description</i>	1	<i>Installing and servicing</i>	10
<i>Operation</i>	8		

LIST OF ILLUSTRATIONS

	<i>Fig.</i>		<i>Fig.</i>
<i>Exterior view of p.r.l.</i>	1	<i>Functional diagram</i>	2

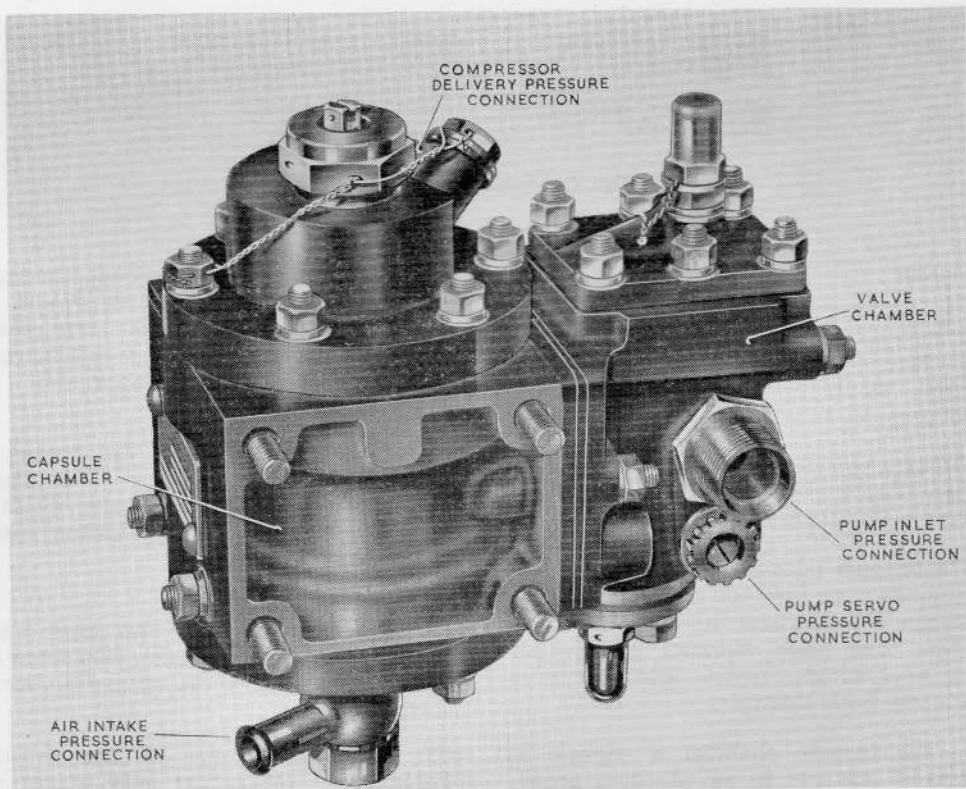


Fig. 1. Exterior view of p.r.l.

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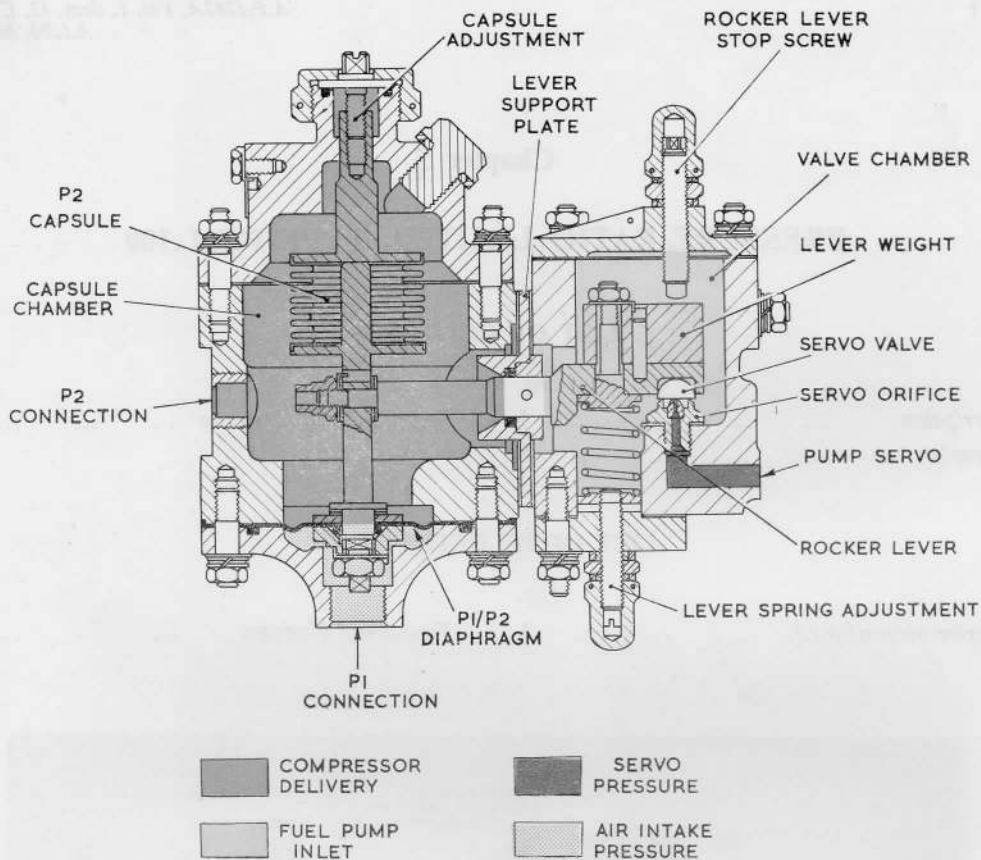


Fig. 2. Functional diagram

Description

1. The pressure ratio limiter compensates for differential air intake and compressor delivery pressures at altitude which, if not corrected, would result in excessive compressor pressure and consequent engine surge.
2. The type number of the unit, e.g. P.R.L. 100, identifies the specific installation standard and calibration code.
3. The pressure ratio limiter body is divided by a support plate into two chambers; one is the capsule chamber and the other the valve chamber. The plate supports a weighted rocker lever at its fulcrum and the lever extends into both chambers.
4. In the capsule chamber a capsule is attached at one end to an adjusting screw. At the other end the capsule terminates in an extension rod which is attached to the centre of a diaphragm. The outer edge of the

diaphragm is clamped between the capsule chamber housing and the diaphragm cover plate. The end of the rocker lever extending into the capsule chamber is supported in a stirrup in the capsule extension rod.

5. The opposite end of the rocker lever which extends into the valve chamber accommodates a half ball valve which controls an orifice in communication with the pump servo system.
6. The extent of the rocker lever travel is determined by an adjustable stop screw in the upper cover plate of the valve chamber.
7. The spring force of the capsule is balanced by the rocker lever weight and a spring in the valve chamber, adjustment for the spring is provided in the lower cover plate of the valve chamber.

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Operation

8. Under steady running conditions below 30 000 feet, the air intake pressure (P1) is generally high enough to render the pressure ratio limiter inoperative, as the P1 pressure on the underside of the diaphragm in the capsule chamber will overcome the compressor delivery pressure (P2) in the capsule chamber, and retain the half ball valve in the valve chamber on the orifice.

9. At full throttle conditions above this altitude the P1 pressure decreases. To compensate for the increased P2/P1 ratios, the P2 pressure acts on the diaphragm and capsule, moves the rocker lever, and lifts the half ball valve clear of the orifice to allow a bleed of fuel from the servo system. As a

result of the decrease in pressure, the servo system operates to reduce the fuel pump delivery by an amount which will avoid compressor surge.

Installing and servicing

10. Instructions for installing the unit are given in the engine Air Publication.

11. No servicing is necessary except for the examination of connections for leaks.

12. If any connections have to be broken, the fuel system must be bled to expel any air.

13. When a unit is removed from an engine, it must be inhibited with OM-11 or OM-13 and have all apertures blanked.

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