PESCO VACUUM AND AIR PUMP

TYPE B3X

GENERAL DESCRIPTION.

The Pesco Air Pump is designed to provide both vacuum and pressure, and was developed to meet the requirements of suction-driven flight instruments and gyropilots, and to provide ample discharge pressure for the operation of de-icing equipment on aircraft. It is of the rotary, four vane, positive displacement type, and operates equally well for either direction of rotation.

The pump consists of a heat-treated aluminium housing containing a nitrided steel sleeve, within which a rotor mounted on ball bearings and containing two nitrided steel blades is driven by means of a cushioned type drive coupling of two similar parts, both of which are indentured so that they may be inserted through a rectangular opening in the other blade as well as through the slots in the rotor.

The axis of the rotor is eccentric to that of the sleeve, and the two blades sliding in equally-spaced slots in the rotor are maintained in contact with the bore of the sleeve by reason of its special generated profile. This design eliminates impact and high centrifugal loading between the blades and sleeve, and so ensures long life and high pump efficiency.

The drive coupling is designed to absorb torsional oscillation and to compensate for any slight misalignment of the driving members. A safety shear section is provided in order to prevent damage to the accessory drive gears in the event of an overload on the pump. The coupling consists of a solid steel drive bar mounted in oil resisting synthetic rubber inserts on the splined or tongued driving member which engages with the accessory drive shaft. The drive bar engages with a slot in the end of the pump rotor and the coupling is secured by means of a snap ring.

The absence of screws, rivets or other bonds among the moving parts insures against damage resulting from the loosening of such bonds during operation.

LUBRICATION.

Lubrication is provided by engine oil which is fed to the pump at pressures of from 25 to 100 lb. per sq. in. through either the mounting pad, or one of the two oil connections provided at the top of the pump, the flow being controlled by a fool-proof internal metering device.

MOUNTING FLANGES AND DRIVES.

Four standard types of drive and mounting flange are available which meet the general requirements of the aircraft industry. Pumps may be converted to any one of the four types by substituting the appropriate coupling assembly and mounting flange.

ACCESSORIES

The Pesco Suction Regulating Valve Type 215.A. and Oil Separator Type 218.F. should be installed with the Type B3X Vacuum Pump for efficient operation.

SUCTION REGULATING VALVE TYPE 215.A.

This is an oil-damped spring-loaded valve and is designed to provide a range of adjustment of from 4 ins. to 10 ins. of mercury suction at the instruments.

The valve is contained in a body of heat-treated aluminium. The two ports are tapped 5/8 in. B.S.P. and are located on opposite sides of the body, one boss being hexagonal to permit the use of a spanner when installing ; the other being provided with two lugs for locking wires. The cup-shaped valve member slides on a tubular guide pressed into the body, and is held in contact with the valve seat by means of a compression spring housed within the valve guide. The spring loading may be varied by means of an adjusting screw and nut situated on the side of the body. The grooves on the valve guide and in the bore of the valve member are filled with oil, which provides effective damping and eliminates valve " flutter " without affecting the sensitivity of the valve. The valve seat is screwed into the body and is screened to prevent the ingress of foreign matter.

TYPE 215 (Superseded by Type 215.A.)

This valve is similar in construction to the Type 215.A. above, except for the valve member which consists of a bakelite disc located in a counterbore in the end of the valve guide.

OIL SEPARATOR TYPE 218F.

The separator is made of sheet brass with brazed seams and joints, the whole being electro-tinned after manufacture. Inlet and air discharge connections are provided to accommodate 5 in. inside diameter hose couplings. The oil outlet connection is a removable $\frac{1}{2}$ in. hose nipple, having a drilled restriction ·064 in. diameter, protected by a perforated disc strainer. On one side of the separator a boss tapped 1/8 in. B.S.P. is provided for a pressure gauge connection.

INTERCHANGEABILITY.

All component parts of the pump and accessories are produced to very fine limits and are fully interchangeable with spares.