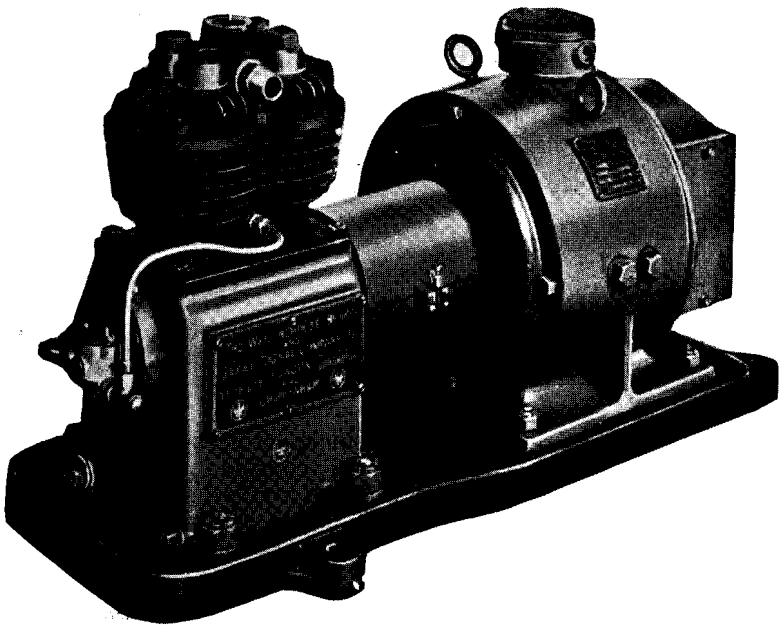
WESTINGHOUSE

AIR COMPRESSOR

Type E.13



THE WESTINGHOUSE BRAKE & SAXBY SIGNAL Co LTD.

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Air Compressor. Type E. 13.

PISTON DISPLACEMENT : 13 cubic feet per minute at 1075 r.p.m. Requiring $2\frac{1}{4}$ h.p. Motor.

OVERALL DIMENSIONS : See drawing and table on back page.

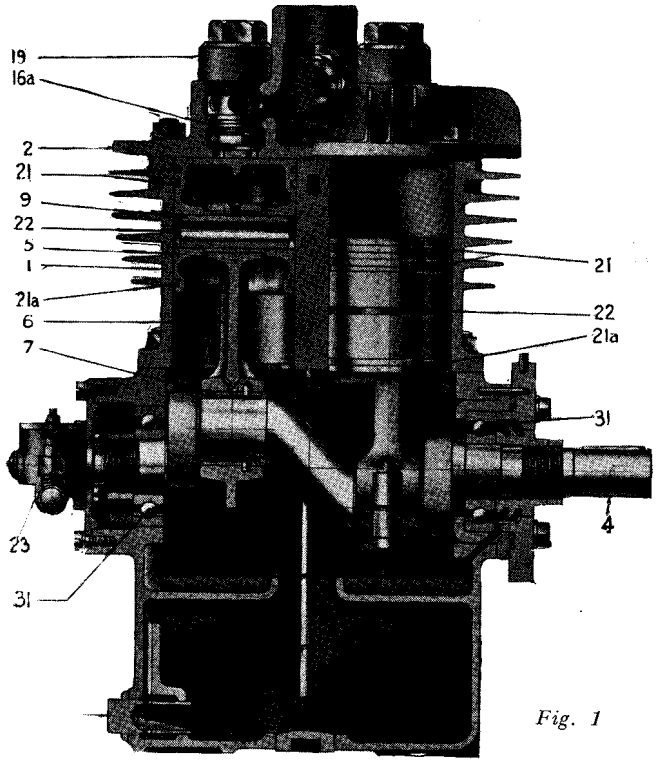


Fig. 1

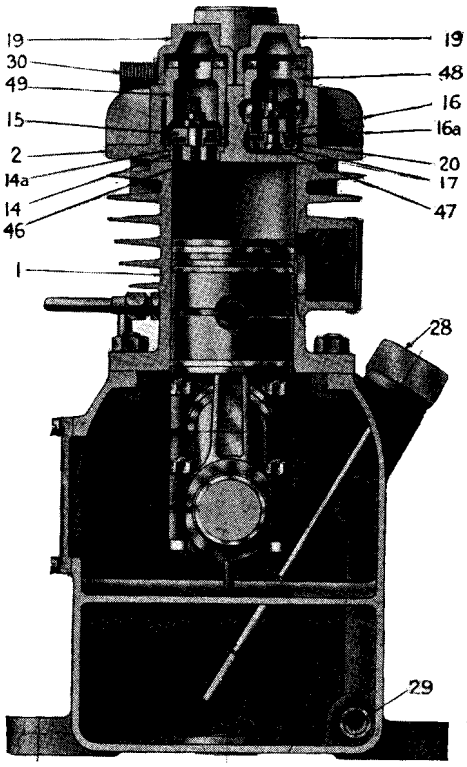


Fig. 2

General Design. This compressor is of the duplex vertical single acting type, with automatic suction and delivery valves, and automatic lubrication. It is directly coupled to the motor by flexible couplings, the whole being mounted on a cast iron bed plate, having a raised surrounding lip to retain waste oil. Four lugs are provided for bolting down to the floor or cradle. An ample oil supply is provided by means of a large sump on the underside of the crank case. The compressor is air cooled, the upper portion of the cylinder barrels and the head being provided with heat radiating fins.

Valves. The suction valves 16a, and the delivery valves 14a, are all of the annular disc type. The whole valve assembly is easily accessible by unscrewing the valve cap 19 and valve holders 48 or 49, when the complete valve unit can be withdrawn for inspection, without removing the cylinder head 2 or breaking any pipe joints. The valve assembly is so designed that should a valve disc break from any cause, pieces of it cannot fall into the cylinder.

The suction valves are in communication with chamber A, to which is piped the suction strainer, while the delivery valves are in communication with delivery nipple 30.

All the valve gear is contained in the cylinder head, so that a replacement of the complete unit can be very quickly carried out if necessary.

Bearings. The crankshaft is mounted in deep groove ball bearings 31, and the connecting rod big end bearings 7 are brass bushes lined with white metal having ample bearing surfaces. The gudgeon pins 9 are of steel, hardened and ground, and are fully floating, being held central by means of ring 22. The small ends of connecting rod 6 are bronze bushed.

Lubrication. A mechanical oil pump 23 of the positive plunger type, is driven from the end of the crankshaft 4 by its steel worm and bronze gear wheel. The pump transfers oil, via a filter 29, to a point in the cylinder block 1 between the cylinders and above crankshaft 4, on to which the oil falls and is splashed on to the big ends and cylinder walls. From there it finds its way to the main ball bearings, and also maintains the level of oil in the crankcase trays into which the big end caps splash. The oil filling plug 28 incorporates a dipstick for determining the oil level at any time, and indicating by means of two grooves the upper and lower limits beyond which the oil level must not be allowed to rise or fall.

Oil Pump. The operation of the oil pump is as follows (*see* Figs. 3 and 4) :—The gear wheel already referred to rotates sleeve 3, of which it is an integral part. The plunger 4, having a lug which projects through a vertical slot B in the sleeve, also rotates, and, in addition, is caused to reciprocate by the lug moving in fixed cam groove A. Port P in the sleeve registers with the supply port S on the up stroke of the plunger, and with delivery port D on the down stroke, and this acts as a valve. The flow of oil is regulated by turning the block 7, in which the cam groove A is cut. This alters the timing of the plunger stroke in relation to the opening and closing of the supply and delivery ports. When the correct adjustment is found, the block is fastened in position by the two screws.

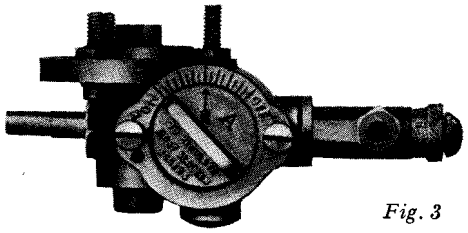


Fig. 3

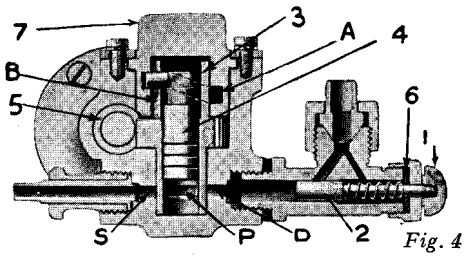


Fig. 4

Oil. It is most important that a suitable lubricating oil be used for these air compressors. Poor or unsuitable oil may cause serious damage. It has been found that the Vacuum Oil Company's D.T.E. Heavy Medium is a most suitable oil, and we strongly recommend that this, or its equivalent, be used.

Suction Strainer. An efficient suction strainer of the hair type is always supplied with each compressor. This should be installed in a convenient position, where it is not exposed to dust or water, but where a cool supply of clean air is available.

MAINTENANCE.

Valves. These must be kept in good condition and should be periodically examined, particularly where the service demanded of the compressors is heavy. Carbon deposit from burnt lubricating oil should be removed from the head. The valves, seats, springs and ports should also be thoroughly cleaned. If allowed to accumulate, the carbon will cause the air compressor to heat rapidly ; and the excessive wear and tear on bearings and valves, etc., increases unnecessarily the power required to drive the compressor.

The valve units can be removed as a whole, without removing the cylinder head. Invariably it is found preferable to fit spare valve units, so that those removed can be inspected on the bench.

Rings. Excessive oil passing into the air system usually indicates a badly worn scraper ring 21a. If necessary, this ring should be renewed to prevent waste of oil, and trouble to other apparatus, due to excessive oil in the brake system.

The packing rings 21, should also be examined periodically, as bad fitting considerably reduces the efficiency of the compressor.

Oil. In the bottom of the crank case is provided a sump with a sufficient oil capacity to lubricate the compressor satisfactorily, with occasional replenishment. The oil level should be tested daily, by lifting out the dipstick 28, and examining the oil mark. The oil level should never be allowed to fall below the level of the lower groove on the dipstick.

Although an efficient strainer is provided the sump should be drained occasionally by removing the plug provided at the lowest point of the sump, and, at the same time, the strainer 29 should be removed and thoroughly cleaned.

After the oil has all been drained off, the sump should be flushed with clean oil (not paraffin) and refilled with a good oil (*see* above) through filler 28, up to the level of the top groove on the dipstick.

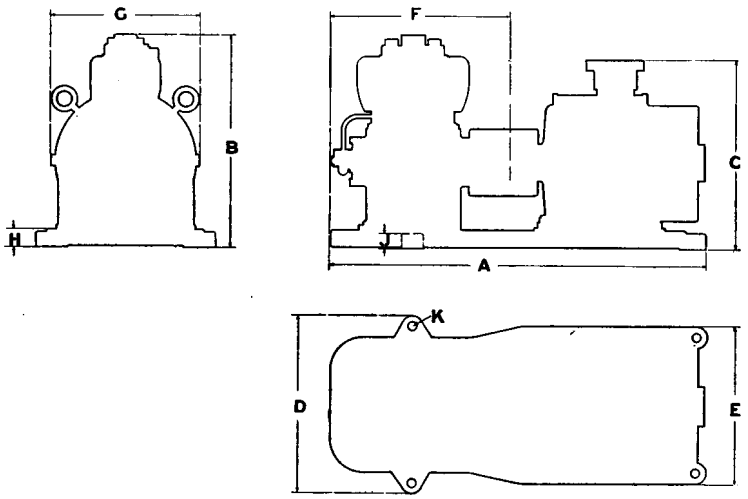
Causes of Heating. If the compressor heats excessively, the cause may be due to lack of oil in the crank case, clogged-up air passages, worn or cut rings, or insufficient lift of delivery valves.

Suction Strainer. The curled hair in the suction strainer should be removed periodically and washed in petrol. Similar treatment should be given occasionally to the hair in the crank case vent between the cylinder bores.

Bolts, Alignment, etc. After removal and replacement of the compressor the mounting should be checked to make certain that the drive is in correct alignment, and that all bolts are securely fastened. This alignment should be periodically checked.

Motor. The motor is of the two-pole series-wound totally enclosed type, and should be periodically cleaned and inspected at the same time as the compressor, and the bearings re-greased.

OVERALL DIMENSIONS



Overall dimensions in inches.

A.*	B.	C.	D.	E.	F.	G.	H.	J.	K.
31	$17\frac{3}{4}$	$15\frac{3}{4}$	$14\frac{3}{4}$	13	$14\frac{3}{4}$	$12\frac{7}{8}$	$1\frac{5}{8}$	$1\frac{1}{4}$	$\frac{11}{16}$ dia. holes.

* These dimensions may vary slightly according to motor supplied.

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