

90 H.P. R.A.F.

This engine is of the 8 cyl. air cooled V type. Cyls set at 90° . The cyls are staggered 37 mm. to allow 2 connecting rods to operate independently on 1 crank pin. This engine can only be used as a Tractor as there is no means of taking thrust or cooling if engine were used as Pusher. Pistons are made of cast iron with convex heads, 3 cast iron rings & a hardened steel gudgeon pin. Connecting rods are made of C.N. steel H section with a phosphor bronze bush in small end & white metal for big end. Valves are operated by hardened steel tappets bearing direct on cams & running in phosphor bronze guides. Inlet valves are operated direct from these tappets & E.Vs are operated from hollow push rods & rocker arm. Cam shaft is driven direct from crank shaft at $\frac{1}{2}$ engine speed. Propp. is mounted on cam shaft. Carburettor is by C.H. duplex carburettor. Ignition is by 2 mags giving 2 sparks per rev of armature or by one mag giving 4 sparks per rev of armature.

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Data:- Bore 100 mm. stroke 140 mm. normal revs.
1600 max revs 1800. Petrol 7-9 gals per hour.
Oil - 5-6 pts per hour. Weight of engine 450 lbs
or 5 lbs per H.P. Order of firing 15374826.

Crank shaft:-

Made of C.N. steel in a one piece forging.
It has 4 throws set in two pairs at
180°. Nos 1+4, 2+3 forming the pairs.

The bearings are 5 in number, 4 roller
& 1 radial ball bearing. The latter being
fitted at rear end to take up end play.

Roller bearings are used because they
are more reliable than ball bearings.

A fly wheel is fitted on rear end taking
the place of lubricating pump. Two
spur wheels on crank shaft drive
mags & cam shaft respectively.

Oil throw rings are secured to the
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bearings for lub. purposes. Direction of
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Direction of rotation anti-clockwise.

Cam shaft: is made of case hardened steel & is hollow, it has 17 cams; 16 for valves & 1 for air pump. The cam shaft is made up in two parts. (i) The air screw extension, (ii) The cam shaft proper. They are held together by a serrated joint & taper pin.

The bearings are as follows: - two ball bearings on air screw extension, one ball bearing at rear & a plain bearing in centre.

The cam shaft turning pinion, prop. & thrust are fitted on air screw extension. This serrated joint & pin bears no strain of prop. drive. Prop. is held in position on air screw extension by tapered serration & internal locking bolt. Direction of rotation clockwise.

Cooling: - The cooling of cyls is effected by the forward motion of machine. The running of engine must not be prolonged. The engine is covered in by an aluminium cowling. As engine moves forward air is forced into cowling, & is prevented from

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Lubrication: - All oil is contained in the sump which holds 24 pts. Oil passes through gauge strainer & through three holes into flywheel housing. The flywheel revolves in oil, oil adheres to flywheel rim & is picked up by a scraper & flows down an overhead gully into a chamber formed by one of the rear engine bearers being hollow. The oil flows from this chamber by gravity into an oil duct passing & running the full length of top half of crank case. Two copper branch pipes convey oil from this duct to Nos 2 & 4 main bearings holding down straps where it is led by a

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groove into the oil rings which convey the oil by centrifugal force into hollow crank pins. It then passes through 2 holes onto big end bearings. $\frac{8}{1000}$ " clearance being left between the 2 big ends so that surplus oil can be splashed out lubricating cyl walls, pistons, gudgeon pins, tappet guides, cams, cam shaft bearings & main bearings.

A lead is taken from the end of main duct passing out along front of nose plate, entering on meshing side of turning wheel lubricating turning wheels, thrust bearing & front radial ball bearing. The overhead valve gear is lub. by hand before machine goes into flight & is supplemented whilst in air by oil vapour from 2 breathers attached to crank case, ^{in front of} in line with cyls.

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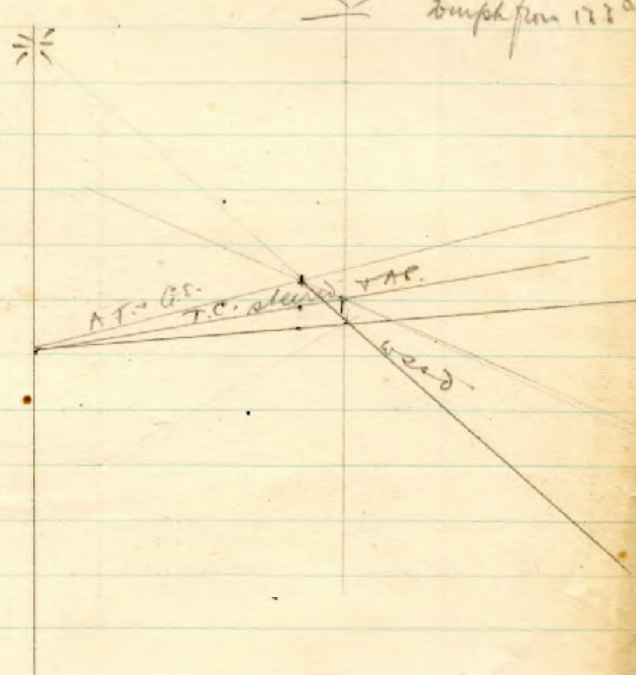
A ball indicator is fitted to register the amount of oil in sump. The oil should be drained out of sump & sump cleaned out with paraffin after 20hrs running. Oils used are Vacuum B.B. & equal parts of A & B.B. mixed.

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The T.C. started by an aeroplane in 85° T. angle 75°
 of A.S. & G.S. all respectively 100 mph & 90 mph
 Wind S & D.

2000 ft
 15 mph

20 mph from 173°



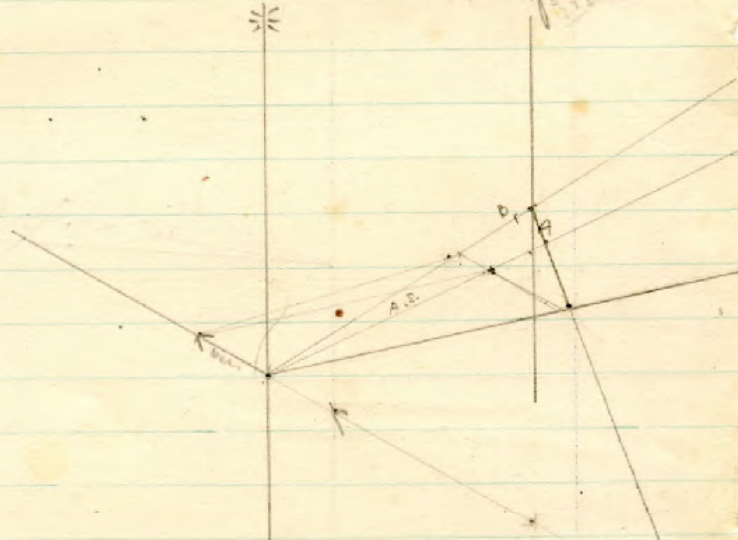
SEAN 2
 WIZTO
 YNRFX
 GWNBS
 ZL6DE
 HOUUR
 RAVPR
 ST7IF
 ANMIL
 K62NO
 JK2AP
 LIY89
 RHMWA
 N87GF
 60LVE
 PUKKD
 QIB33
 SPAME
 IYWTI
 XQYF5
 VGBW
 E6QDLO
 RWZ

M09XR
 P7YNY
 L6W5R
 PFE6X
 YFEJO
 4NIDU
 ZC8TM
 LSH28
 R9AXK
 VA72W
 B'G5K
 T80AC
 YN4GV
 6SDCE
 M3F17
 5XR6F
 2LEJ1
 WQ3AQ
 9MXCT
 V12N79
 W1567

The TC [illegible] by an aeroplane in 85° [illegible]
 75° if AS & GS all respectively 100 mph & 90 mph ?
 wind S & D.
 (Full page calculation & illustration)

A pilot estimates the wind to be 20 mph from 120° he steers a course to reach a point A leaving 65° & 100 miles from aerodrome instead of reaching A he arrives at B. 57° T & 95 miles. Correct wind? AS 65 mph.

35 mph from 160°

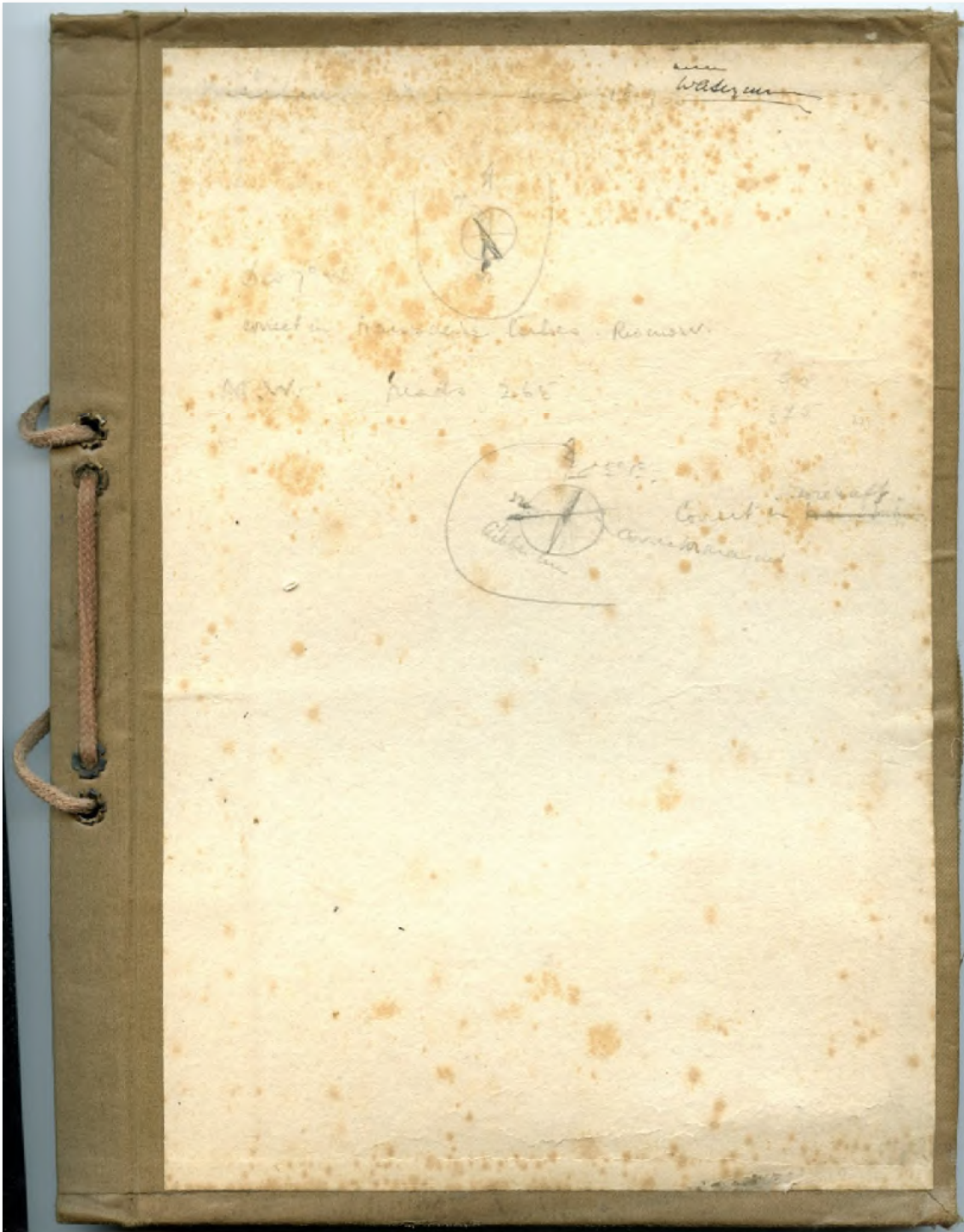


TXOWJ
 9AUIZP
 1Y6QBE
 1NLRKE
 QBVW
 UP
 OZM5A
 N.GT2
 ZRS
 K3 5Y
 196DC
 40TVR
 UGDH.

VLQGI
 CHD6Y
 QEV8P
 5DKZQ
 W5.FN7
 XMQEV
 BC2KL
 RVB3U
 11AQFC
 WDAQVC
 GTUXB
 J8S
 1MR7F
 KR62Q
 50YNX
 LC4AFM
 K26FM
 EFPQ1
 1AQ4EM
 OC6VK
 9BEQK
 52DTF
 WNS.

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(Inside rear cover – illustrations difficult to make out as a result of age-related staining of the paper)

