ENGINE

PART 6.

pages 221 - 256

ENGINE.

11/7/01 Oil pump and Distributor: There was some doubt if oil pump shaft w. skew gear on top to drive distributor from camshaft would be able to be taken out, once put in, with sump fitd.

It was found that it could with the use of a pair of pliers.

13/7. Info. on top of pistons: (all same) "FRONT M2006 905044 K41"

" P.m. – Went to Redmans at Fleetwood (Tues. 10/7/01. pm) 1, Copse Road, ph. F'wood 778969. – Spoke to Mark. – One new chain, 3/8" pitch x58 Pitches + 1 chain link.

I had found that when I put the old cam. wheel on the new shaft & tightened it up (to test end play, prior to frg) that there was none. Redmans T.O. cam wheel & machined down the ~~wheel~~ end bkr. (I asked for 2-3 thou. end play) & it came back 4 thou.

I also bought a tube of VANCHORM, nut lock. – This they said was now used in lieu of tab washers. As the cam wheel was fxd. by them it was not possible to put the tab washers on the 2 bolts frg. the front bearing to the engine so I used the nut lock.

I took Joyce's dad's blue book to show them Lanchester cam end play (where to r.o. metal to give end-play + the old chain for pattern. Total cost. £43.53 (22 + 17.85(ch) + Nut lock)

The cam was fitd. to engine + a new split pin.

The cam wheel ref: no. is 300445.

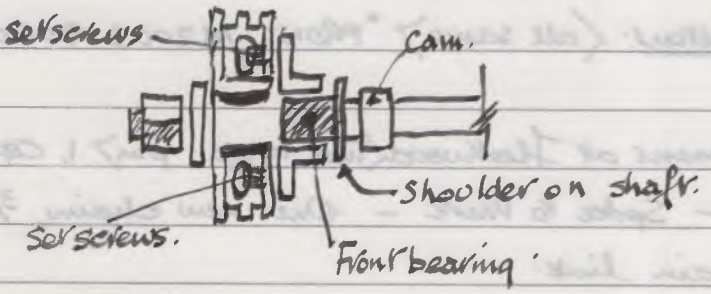
Prior to all last: Outside of engine block, all paint scraped off etc. to bare metal & given 2 cts. of Hermatite Engine lacquer.

Inside of engine carefully cleaned out all grunge.

A.

CAMSHAFT.

Front bearing:



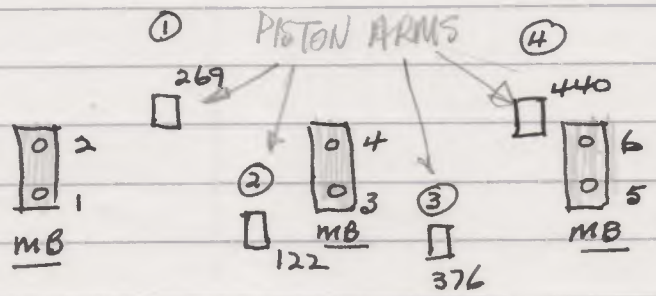
End float on camshaft should be 2 thou. in.
but Reduxus asked for 2-3 thou.
(I think prob. reamer 4 thou. machined).

OIL PUMP. – Most of petroleum jelly cleaned out & then oiled.
– Newthick paper gasket made & pump frd. w. 2 extra. bolts & 2/3 reg washers. <NO HYLOMAR USED>.
No. ON ENGINE – Found another No. stamped of btm. of engine where sump is bolted at centre offside. = B122.

PISTON BEARINGS.

Stamped on both halves of centre main bearing "No. 122".
" " centre balances (shape) "2711"
" " 2 end " (" ") no number visible.
" " No. 1. Piston bearing "269"
" " " 2. " " "122"
" " " 3. " " "376"
" " " 4. " " "440"

On N/S. engine



The numbers 1 – 6 are stamped on bolt heads
M.B. = main bearing.

SUMP.

17/7/01 Sump frd. on No engine with BLUE HYLOMAR. There is no gasket for sump. It bolts right-up. No allow oil return thread to work properly.

N.B. On the N/S. at rear (i.e. next to oil thrower thread) the bolt was stripped – this was T.O. & a non-stripped one put in w. P.T.F.E. tape. – bolt now right.

N.B. On the N/S. 2nd bolt from front, ditto.

18/7/01. Offside of engine block scraped clean a.b. — Treated w. Zilet engine cleaner & washed & dried. Painted a.b.

N.B. Identification Mark. on o/s brm. flange of engine "1·131889"
" " " " stamped at top "13/892."
" under the brass plate near oil dipstick "LIST No 31371" is a number
on the plate reverse side — "DRG. No. 257221"
" under the brass plate stamped on the block is "H 26"

19/7/01. Trial coat of paint put on engine block.
+ Engine water drain cock fitted using new cu. washer & P.T.F.E.

✓

21/7/01. VALVES. E I I E E I I E
(1 2) (3 4) (5 6) (7 8)

Inlet valves are large } All in good order with at
Exhaust " " small. } least 1/16" thickness at edge

- All valves re-ground using only fine valve grinding paste.
- Exhaust valves needed a bit more grinding in than inlet.
- All 8 valves were marked w. 1. 2. 3 or 4 punched dots, indicating that they have been previously removed.
- Cyl. head cleaned of all grinding paste w. paraffin rag.
- N.B. The exhaust seats on head are a bit more worn than the inlet.
- Wood shaped block made to fit inside recess of head for fxg. valves w. Arthurs valve compressor.

22/7/01 - BVALVES FTTD. — spring clips fxd. — (some a bit worn)

N.B. I noted that prior to me doing any work on the exhaust valves must have been renewed as the stems are still shiny whereas the inlet valves have slight pitting at spring (top) end

23/7/01 With Arthurs compressor & valves w. top & brm plated & collars, put in, all in order as T.D. (There were each kept in a separate bag.)

NEW CHAIN fxd. (To put in put link in at top but turn chain back 90° to give better access for putting spring clip on. Chain Oiled.

223

c.

24/7/01 11 No. short studs put in side of cyl. head for exhaust & inlet manifold.
2 No. " thin studs - - " " - - for the bakelite plugs & distributor cover.

NB. All "Penny" disks left unbranched, they seem OK.
" Due to bolts being B.S.F. my socket set does not suit, so unable to use torque wrench, so. I purchased a 15 m.m. socket which just about fits cyl. head & other similar bolts. (61.99)

25/7/01. Put in 8 pillars for rocker gear & 2 for rocker cover freq. in cyl. head.

6/8/01. Cleaned top of cyl. head, ready for gasket.
Exhq. cn. gasket in good order & refixed using HYLOMAR on U/S & lightly greased other side.
Tightened cyl. head bolts in acc. w. Trader Sheets to 50 lb. □".
Bolt, spring & washer put in rear pillar of rocker gear to centralize gear.
Rocker gear (previously cleaned & assembled when orig. T.O) put on head
8 Valve gaps should be 12 thou HOT/. but put in at 15 thou. COLD
* for present. — ADJUST LATER.
2 Rocker box cover bolts fitd.
1 " feed pipe "

8/8/01 See p. 15 & 16 of my notes. Petrol pump checked, confirmed valve positions correct w. Jim Chumbill, oiled, tightened and fitd. to engine.

10/8/01 See Trader sheets p.3. - ROCKERS are offset L.H & R.H in pairs / oil feed is through rear of 4 pairs / Rockers to adjacent cylinders separated by springs & plain washers / End rockers retained by spring steel washers & by split pins through shafts.
Push rods cannot be extracted w. rockers in place.

The tappets were clean & well oiled & fitted well in place.
Con. rods, straight, clean & do.

D.

9/8/05

the notes from Wallace p. 137
are listed purely as a guide
as his explanation of setting
the timing.

NB. I used the Lanchester
handbook to set up
the timing together
with advice from
Arthur.

10.8.01 IGNITION: Set contact points to break 11° before T.D.C. / Ign. mark on flywheel visible gearbox inspection cover.

[$10\frac{5}{8}$" o/all Ø & diff. between T.D.C. & ign. mark is 1".

∴ $10\frac{5}{8}$" × $3\frac{1}{7}$ = $33\frac{3}{8}$" Ø = 360° ≪ ∴ 1" = 360 ÷ $33\frac{3}{8}$ = 10.7865 = say 11°

See my notes p. 99 & 100 ⟨ which are self explanatory ⟩.

✓ i) Turn eng. to put IGN mark on flywheel at centre mark.

✓ ii) Set distributor w. rotor in retarded position (?)

✓ iii) " micrometer adjustment at Zero ⟨ so that the points are just breaking to fire on no. 1. cyl.

✓ ½ iv) After freq. pinch bolt — micrometer adjustment can be operated to adj. for pinking according to petrol in use.

Notes from Wallace p. 137. ⟨ To set timing ⟩

i) Set points gap on distributor to 12 thou.

ii) " valve clearances to 12 thou. HOT. ⟨ actually set to 15 thou COLD ⟩

iii) Put ign. mark on flywheel to centre mark on housing (i.e. 11° B.T.D.C.)

iv) As Lanchester has hole in front of engine for timing chain freq. across 2 gear wheels it is not necy. to do the following:— see opposite page.

a) The mark on the flywheel casing will come up 2×, once at end of exhaust stroke & ice at end of compression stroke.

b) Look for 1 at end of compression stroke — ⟨ find this by putting thumb over no. 1. cyl. plug hole while someone turns the engine. — As the piston comes up on compression stroke the air will hiss out past your thumb.

c) Make a double check as the ~~flywheel~~ mark comes near the pointer (on flywheel casing) by checking that both valves of no. 1. cylinder are closed ⟨ i.e. push rods are free to move up & down.

9/8/05.

The notes from Thames p. 188 are listed purely as a guide as his explanation of setting the timing.

NB. I used the Lanchester handbook to set-up the timing together with advice from Arthur.

d) Now set the distributor by turning the shaft until the electrode on the rotor arm is pointing towards the skid in the distrib cap for no. 1. cylinder. < & set it with the points just about to open.

e) Feed the distributor into the engine.

f) From book, If you have a skew gear the distributor shaft will turn as you fit it in.

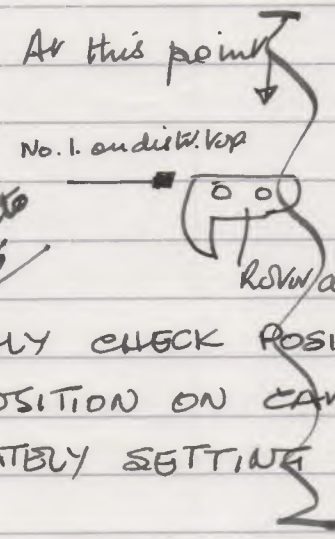
See opposite P. 225

i) Note how much it turns.

ii) T.O. & set it again <11° B.T.D.C.> & turn shaft backwards by this amount.

iii) Now feed it in - it will itself turn fwd. to its correct position.

* PROBLEM. At this point



i.e. the rotor arm has just passed the no. 1 cyl. position in distributor cap.

? IS THIS O.K. ???

Ignore this as timing later set up at P. opposite 225

[THOROUGHLY CHECK POSITION OF ROTOR ARM / CAM GEAR POSITION ON CAM BEFORE STARTING. & ALSO ACCURATELY SETTING IGN.]

Notes from ODHAMS p. 188.

1. Skew gear from the camshaft should be engaged so that the rotor will be pointing towards the electrode in the cap connected to the sparking plug lead serving the cylinder which is at the beginning of the power stroke. (eg. No. 1. cylinder both valves closed; therefore both push rods can be moved up & down & no. 4. cylinder's 2 valves are open, i.e. right push rods).
2. Remember that the rotor will rotate slightly as the gears slide into mesh - & allow for this movement when fixing distributor into cam gear. <BUT NB. ON L.D.10 the rod w. gear on is sep. from offset dog at t/s. distributor>

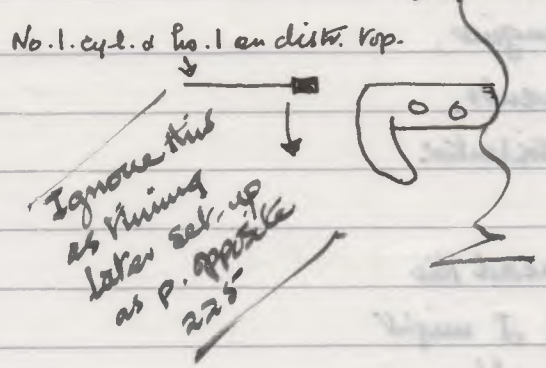
3. The distributor points should be now just about going to break & the timing will thus be at T.D.C. (which is an average setting for many engines when a centrifugal advance mechanism is embodied in the distributor).

4. If the points are not breaking OK, are fully open, then slacken the clamping bolt in 1 direction or the other until the correct position is obtained.

5. Maximum degree of advance should be used which does not cause "pinking" when the engine is pulling hard at low speeds.

6. Rotating the distributor body in the opposite direction to that in which the rotor turns will advance the ignition, whilst timing will be retarded if distributor is turned in same direction as rotor.

NB. as my previous book notes have indicated that the rotor arm should be opposite No. 1 cyl. & my rotor arm when flywheel set at "IGN" is :-



I must query this if this is O.K. or not, as if flywheel is set at T.D.C. the rotor arm will be even further past No. 1 cyl. position ???

9/8/05.

N.B.
Valve timing from Lanchester handbook & Vrader sheets opposite are for reference.

After originally setting-up the valve timing I was not entirely happy about it.

I removed 'A' frame, dynamo, fan belt, timing chain cover and pulley wheel. Then set-up the VALVE TIMING as p. 30 & 31. of Lanchester handbook and the IGNITION TIMING as page 48 of same.
Then refixed all in reverse order.
Timing checked by Arthur.

N.B. When starting-up engine, eventually, minor adjustments can be made at the distributor.

With hindsight if I had read the Lanchester handbook only I might not have been so confused!!

10.8.01. NB. the Engine side plate was unable to be fitd. w. distributor in place.
Do. " " " " " " " " w. a thick cork gasket
Do. " " " " " " " " thin " "
abe able to get distributor in position afterwards.
SO. as I had painted inside side plate w. 2 cts. silver hammerite previously, I applied a thin layer of white B&Q. all purpose gun sealant, bolted on side plate & then went around side plate after frig. w. a little more filler to close the joint on the outside edges.

VALVE TIMING. (from handbook, p.307.

1. Put flywheel at T.D.C.
2. Valves for No.1. cyl. slightly open. (right)
3. Both push rods should be slightly "up" or in the "open" position - (indicating that the valves are open)
4. If it is possible to rotate either of the push rods of No.4 cylinder it will indicate that the particular valve is in the fully closed position & the valve timing is out. by 1 or more teeth on the cam wheel.

VALVE TIMING. (from Trader Sheets)

1. Set contact points to break 11° B.T.D.C.
2. (Ign. mark on flywheel through gearbox inspection cover)

IGN. TIMING. (from handbook p.48)

1. Put flywheel 'IGN' mark at centre line on housing. (This is 11° BTDC)
2. Remove distributor cap.
3. Loosen pinch bolt under distributor.

H.

4. Set distributor, (w. rotor arm in retarded position) ?THIS.?? and micrometer adjustment at Zero (i.e. long mark on body) so that the points are just breaking to fire on No. 1. cylinder.
5. After freq pinch bolt, micrometer adjustment can be operated to adjust for pinking according to petrol in use.

B.8.01 4 PLUGS put in engine – These were original in Lanchester cylinder head, & on 11/6/97 they were tested & cleaned on a machine at Tech. & found to be in good order.

12.8.01 COIL. fitd.
NB.

15.8.01 After much reading & looking at setting value & ign. timing I got Mat. from fenic house to come over & have a look. He said that as I put a drill in hole in camshaft wheel (as p.31 of handbook) the valve timing was 'O.K.' & that I could put the cover on with a greased (b/s) & paper gasket as ign. timing is sufficiently retarded to be able to advance it ~~sufficiently~~ when ready to start engine: new gasket made from my material in roof room. (& Price card from box).

NB. As the cam rotates & 1 of its lobes strikes the block on the rocker arm the circuit is broken & as the current ceases to flow the magnetic field collapses causing a high voltage impulse. This sends a current along the H.T. wire from the coil terminal to the distributor, rotor arm & thense across the distributor gap to the fixed electrode opposite the rotor at that instant.

From the terminal of this electrode, current passes along the sparking plug cable to the plug & across the plug gap in the form of a spark to the earthed electrode on the plug body.

the return path of the current is through the metal parts of the engine, battery, switch & primary coil to the common connection bet. primary and secondary. The process is repeated for each successive spark in the correct order of firing. (Oldham p. 209)

J. 329

17.8.01. I was still not sure timing OK, so I checked w. drill again in cam wheel & flywheel was definately at T.D.C.
T.o. distributor again, lifted out shaft w. splined wheel on top, put it back 1 thread of cam. cog diff. but it still didn't seem right so I put it back as it was.
I now think it is probably sufficient for rotor arm to point in direction of no. 1. terminal in distributor & the opg. of the points on the cam is probably the deciding point.
However I will leave it at that for now, fairly confident that any timing adjustments can be made at the distributor.

" TIMING WHEEL COVER. Put on. <P. 74 my notes>

" PULLEY WHEEL & DOG. — Then I had a problem. — The timing wheel would just not go on. I filed the
• Put the T.W. cover on with 3 bolts loosely.
• Tapped on pulley wheel — but it didn't go on all the way: being 3/16" short of meeting the T.W. Cover.
• I thought that this was because the pulley would not go over the inner of the main cog-wheel. so I filed this also.
• Tapped on pulley wheel.
• Removed T.W. cover.
• Put all back on again — still no difference.
• SO. I measured possible travel which was 2 1/4".
" " " depth of hole in pulley wheel = 2 1/2" to touch T.W. Cover
∴ It couldn't go on all the way as shaft of P.W. longer than end of cam ~~boss~~ projection.
• As it is there is a thick 1/8" of oil thrower screw thread showing outside T.W. Cover & end of pulley wheel.
• I don't think this any different from prior to taken off. but I did expect the thread not to be showing outside the T.W. cover.

K.

Existing 9 bolts & spring washers + 3 nuts, bolts & spring washers refixed + 12 new plain washers to fix the T.W. cover permanently.
NB. Bolts 1 & 2 have had nut lock applied as no. 1. is into aluminium & alum. thread stripped.

The 4thou. clearance around shaft & T.W. cover is hard to judge but generally seems OK.

21.8.01 WATER PUMP <p. 42 et. seq. – my notes>

1) Thermostat re-checked & at room temp. sl. open. – fully open-boiling
2) New gasket fitd. – greased B/S. – Hymoor O/S.
3) Fan blade bolts tightened.
4) Grease nipple - new composition cu. washer fitd.
5) Backing Plate – was painted w. hammerite on inside to keep dry! parted metal in storage. This cleaned off & all joining metal surfaces papered. New large gasket Hylomar O/S & oil the other. & smaller new gasket bet. pump & cyl. head fitd as last – 4 new washers for bottom bolts.

NB. • Hoses & bottom metal pipe & its cap not yet fitd.
• Brass valve <for heater p.> fitd. w. new gasket

" EXTL. OIL FILTER. – This cannot be fitd. yet as tray on which engine sits, the edges of the tray are in the way.
FIX WHEN ENGINE IN CHASSIS.

22.8.01 'A' FRAME ASSEMBLY. <p. 51 my notes>
Fixed, complete with Engine mounting plate assembly, to ~~cylinder head~~ engine block (page 32 & 33 parts book) bolts fully tightened

NB. The 4/1/4" x 3/4" long bolts for frg. assembly to chassis put in roof room.

" DYNAMO ADJUSTING STRAP. <p. 52 my notes> <p10 & 11 parts book>
Refixed on engine block w. new plain washer added.

Aug. 2001

CARBURETTER:

from Handbook. Zenith Downdraught 'V' type model 30 VIG-3.

		Actual in Carb.
Throttle diameter	30 mm.	–
Choke Tube	23 mm.	–
Main Jet.	70	70
Compensating Jet.	77	80
Slow-running Jet.	50	50
Pump Jet.	50	none shown
Capacity Well, fitd. Kickstart	3 mm.	4 mm.
Needle Seating	1.5 mm.	1.0 mm. <under ⌐¬>

N.B. V.I.G. Type carbs not now made <N.B. This note made 1981>

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1. Originally (due to lack of knowledge) small parts T.O., cleaned & refitted before next part T.O.
2. Bert Hobbing & Sons Ltd. of Cold Bath Street Pudsey. I took carb. & handbook to obtain a gasket set. <actually obtained 2>

   One set put on cleaned carb: Spares put in bag & kept w. old set T.O. for reference.
3. Carb. scraped inside & dry paper orig. cleaned & then cleaned w. white spirit before re-assembly.
4. With the gasket set are 3 alum. washers of 1 mm., 1.5 (or 1.6) mm., & 2 m.m. in thickness. The 1 mm. washer has been put on carb needle valve (9) which is under the "lid" of the carb bowl.

   Also under this valve is a circular ⌐¬ shaped washer. I have put the 1 mm. washer under this, though handbook says 1.5 mm. washer., because I do not know if the ⌐¬ shaped washer counts as a washer.

   Look into this if problem with petrol level in bowl when "starting-up" engine.

   N.B. No washer found when carb. orig. taken apart.

m

5. Fibre washers are used under the main & compensating jets the banjo union (2) & under the non-return inlet valve 28.

6. Emulsion Block.

NB. Order of tightening bolts is. 1st. 2 centre.
2nd. 1 at base
" 3rd. 2 at top.

7. NB. The interconnecting linkage has not been interfered with BUT on starting this may need adjustment.

8. The small brass screw valve inside the emulsion block has been screwed right & there is no need to T.O. the emul. block (37)

9. The 6 printed sheets are very explanatory & have been annotated. These should be read before fixing finally.

10. NB. The strangler/throttle interconnection adjusts the amount the Throttle opens when the strangler (choke) is shut for cold starting.

11. The beak of the emulsion block spreads the petrol onto the 2 cross brass wires inside the venturi (choke tube)

12. Winter & summer adjustment is provided by the 2 holes in the pump linkage — It is fixed on "Winter" & should be left where it is.

13. A 4" long spring (painted alum.) is for the operation of the carb. but it is not fixed to it. — One end of spring is fixed to the centre of the last "leg" of the accelerator linkage & the other end to a clip on the steering col. <see p. 35 of handbook>

NB. All the above notes were compiled when the carb. was orig. T.O. & are kept here for reference.

NUMERICAL LIST OF COMPONENTS ON PRINTED 6. PAGES

<To be read w. diagrams on printed p. 2>.

1. Economy valve spring.
2. Permanent air bleed to capacity well.
3. Air intake. <from air cleaner>
4. Capacity Well.
5. Slow-running jet.
6. Strangler lever.
7. " flap.
8. Special screw in top of capacity well to restrict amount of air after passing through drilling 8 when economy valve is fully open.
9. Needle valve seating. <w. 1mm washer fitd.>
10. Choke tube.
11. Economy valve w. rubber & 2 gaskets.
12. Drilling adjacent to last.
13. Volume control screw <to regulate idle mixture>
14. Float.
15. Inclined passage to emulsion block.
16. Emulsion Block Beak.
17. Progression hole at throttle edge. <not adjustable and must not be tampered with — 17. operates after slow-running when accelerating to give addtl. mixture to give a smooth getaway from slow-running.
18. Throttle.
19. Slow-running outlet hole <for volume control screw — jet 5.
20. Main jet in brm. of bowl.
21. Compensating jet. " " " ".

22. Not applicable to this carb.
23. Accelerator pump piston.
24. Rod & spring to accelerator pump piston (& washer)
25. Ball valve <pump discharge>
26. ? in top of base.
27. Pump Jet. <in back of emulsion block>
28. Non-Return inlet valve (gunge covered) in base of float chamber.
29. Accelerator pump well.
30. Inlet in base of base. (i.e. under 31 spring)
31. Spring under piston
32. Air Regulator <Throttle stop screw - determines idling speed>.

What done to carb. since taken out of store, prior to fitd. on engine

1. Piston taken out – moves freely
2. " hole cleaned out.
3. Emulsion block not opened up all in good order originally (when last done)
4. Main Jet. T.O. – washer O.K. – hole clear – refitted right <marked 70>
5. Compensating Jet. All as last, but <marked 80>
6. Non-return Valve. T.O. – clean – replaced (w. socket spanner)
7. Slow-running Jet. – T.O. – <This has hole thro' side just below top. – O.K." & replaced.
8. Pump discharge valve (25) & (26) This is quite deep. – hole through side – hole right through length of valve & ball bearing inside moves freely – refitted
9. Jet at head of Capacity Well. (30) T.O. – cleaned – refitted. This is a restricted jet. it is actually 4.0 mm. & not 3 mm. as stated in handbook <N.B. 4.0 mm is the largest jet available for this position making it the one letting the most air thro. <Also known as a restricted jet>.
10. Float. O.K.
11. Gasket to Bowl – new one was fitd & is O.K.
12. Valve (9) <Needle valve> – plunger is free moving. The washer is 1 mm. – the other 2. (1.5 & 2 mm.) in store.
13. Bowl refitted. – The gasket for this seems a bit thin & I have a query re: Vertical joint on bowl/carb. *
14. (13) & (32) – Adjustments screws are "O.K."
15. New washers & split pin fitd. on 
16. All joints oiled
17. Gasket to inlet manifold: One new one fitd. + One home-made fitd. due to note in Wallage re: Most carb/I. Man. joint not level.

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Summary notes to augment printed & my previous notes.

1. The slow-running jet (5) is supplied via outlet (19) when the throttle (18) is in the idling position.

2. The volume control screw (13) is supplied with air by a fixed orifice in the casting & communicating with the inside of the air intake.

3. The throttle stop screw (32) controls the amount of idle mixture passing through outlet (19) <Turn it clockwise and the mixture will be reduced.>

4. The opening (17) <at the upper edge of the throttle> goes into the vertical slow-running channel.
This "(17)" is used from slow-running to accelerating and is known as the progressive hole & is non-adjustable.
THEN,

5. When throttle opens main jet (20) and compensating jet (21) allows fuel to be drawn from passage (15) and capacity well (4) to emulsion block.

6. Accelerator Pump. (23) provides fuel on quick acceleration (prevents lag) via a non-return valve (28) in btm. of bowl, when accelerating, piston is pushed down, through ball valve (25) & pump jet (27) in emulsion block, to give immediate response.

7. Economy Device [A] & [B] In order to weaken the mixture when the engine depression is high the Economy device is automatically into operation, the spring (1) is lifted and air from intake (3) passes through openings (8) & (12) to top of capacity well (4)

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cont'd.... When depression is low, spring not in use, therefore valve remains closed & only air to capacity well ④ and jets is through the present restriction hole ② in the side of the carb. body at the top of the economy device (② is known as the full throttle air bleed).

To limit the amount of air to jets at part throttle a special screw (ours is 4 m.m.) is fitted. at the top of the capacity well ④ – this restricts the amount of air passing through drilling ⑧ when economy valve is fully open.

NB. The larger the orifice – the mixture strength is decreased.

8. The adjustment of the summer/winter on the linkage (1 of 2 holes in the link) is for the accelerator pump only.

9. Basic Adjustments:

Throttle stop screw (32) – with throttle fully closed, adjust (32) screw so it just touches the throttle stop – then turn inwards.

10. NB. Main & compensating jets are both fixed above idling speeds.

~~Medium~~ Main Jet. = medium to large throttle openings

Compensating Jet. = for a reserve of fuel during acceleration.

Main is NOT vented to air.

Compensating is " " ".

Main is dependant on distributor

Compensating is not.

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Cables SOLEXUK STANMORE

Your ref.

Our ref.

F. Butcher
169 Preston Old Road
Blackpool
FY3 9QX

9th February, 1983

Dear Sir,

Replying to your letter of 21st January asking for information on the 30 VIG carburetter as fitted to your 1953 Lanchester.

We have pleasure in enclosing our leaflet relating to this model but unfortunately, the VIG type carburetters are now out of production. However, we would like to point out that our Main Service Station in North London namely The Carburetter Centre 389 Archway Road, Highgate London N6 do operate a refurbishing service where you could send you carburetter to have it completely overhauled.

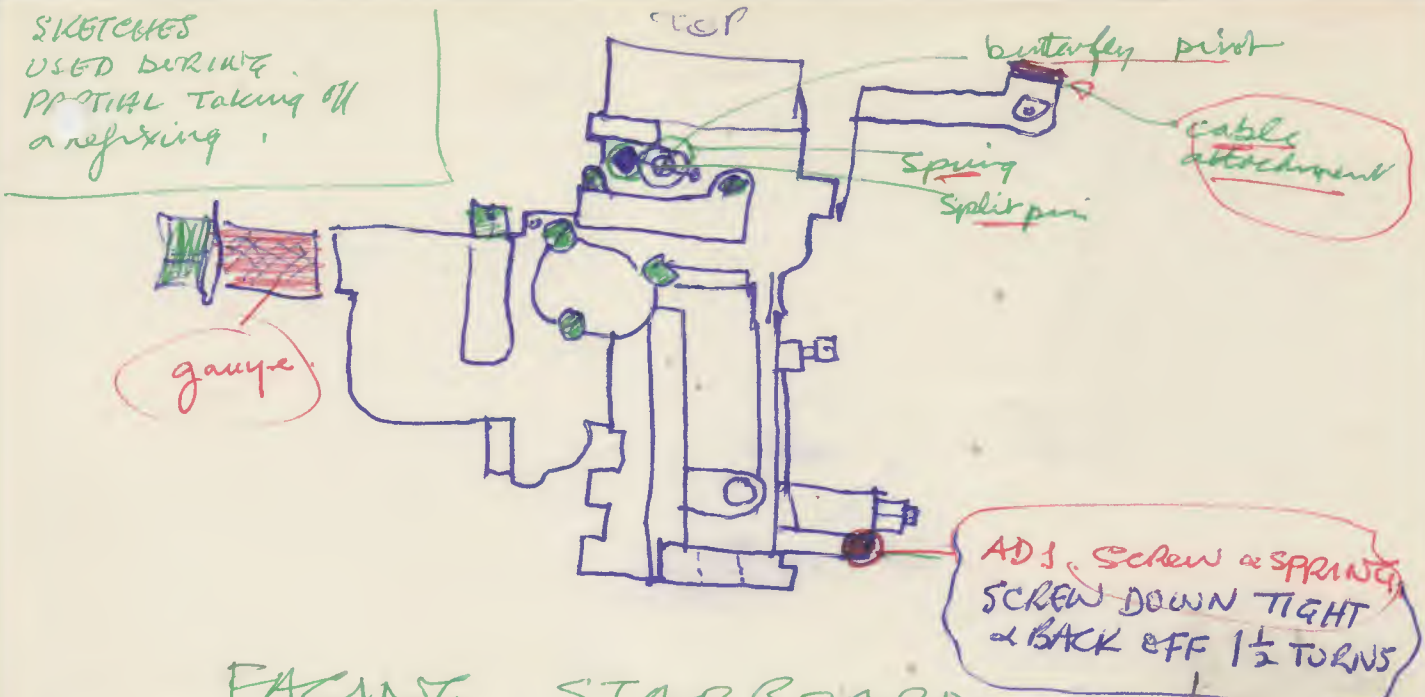
Sorry that we cannot help you further on this matter.

Yours faithfully

J. PRATT
Sales and Service.

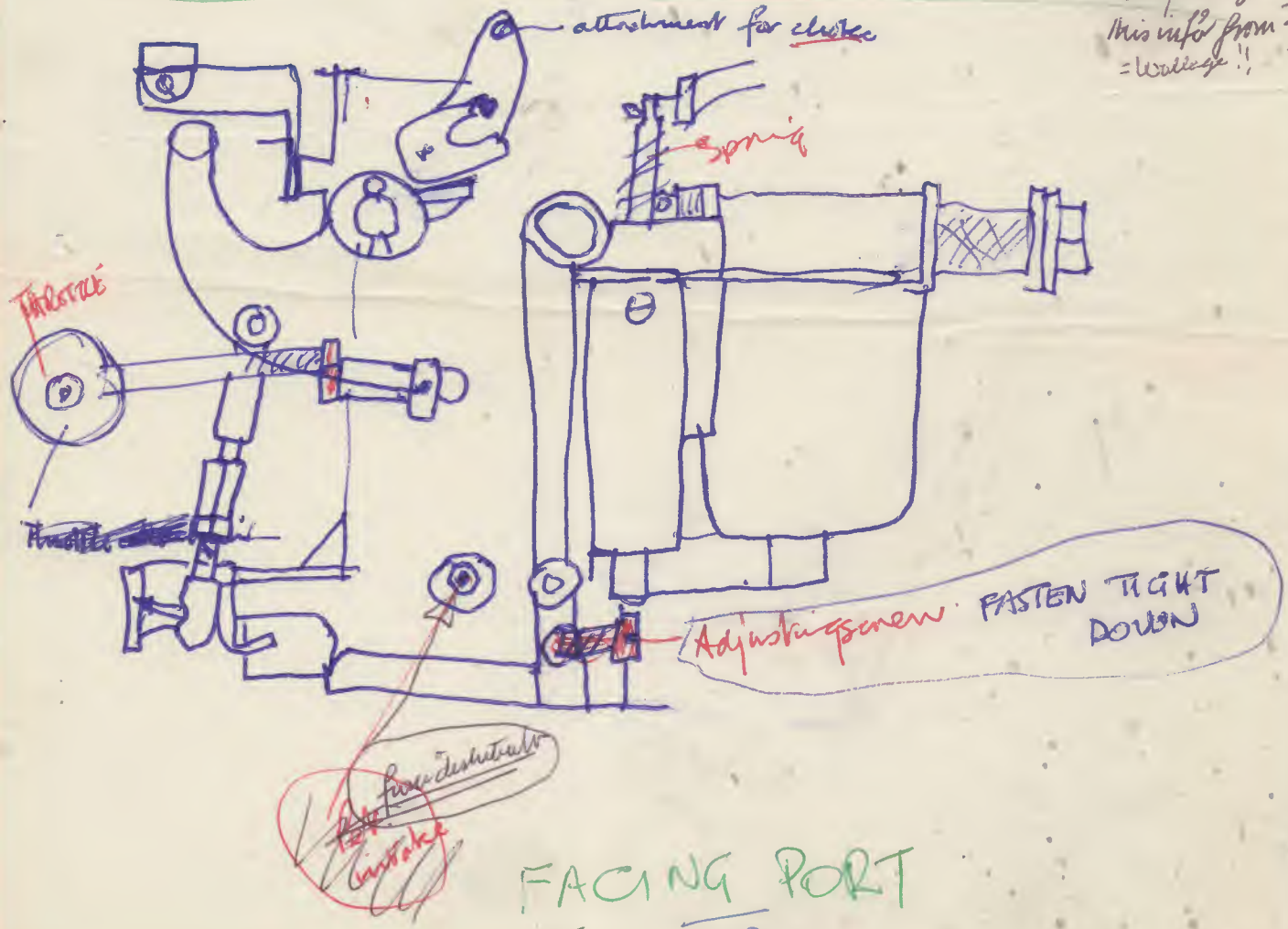
Recd. 12/2/83

SKETCHES USED DURING PARTIAL Taking off & refixing.



FACING STARBOARD.

? Where did I get this info from ? = Wallace !!



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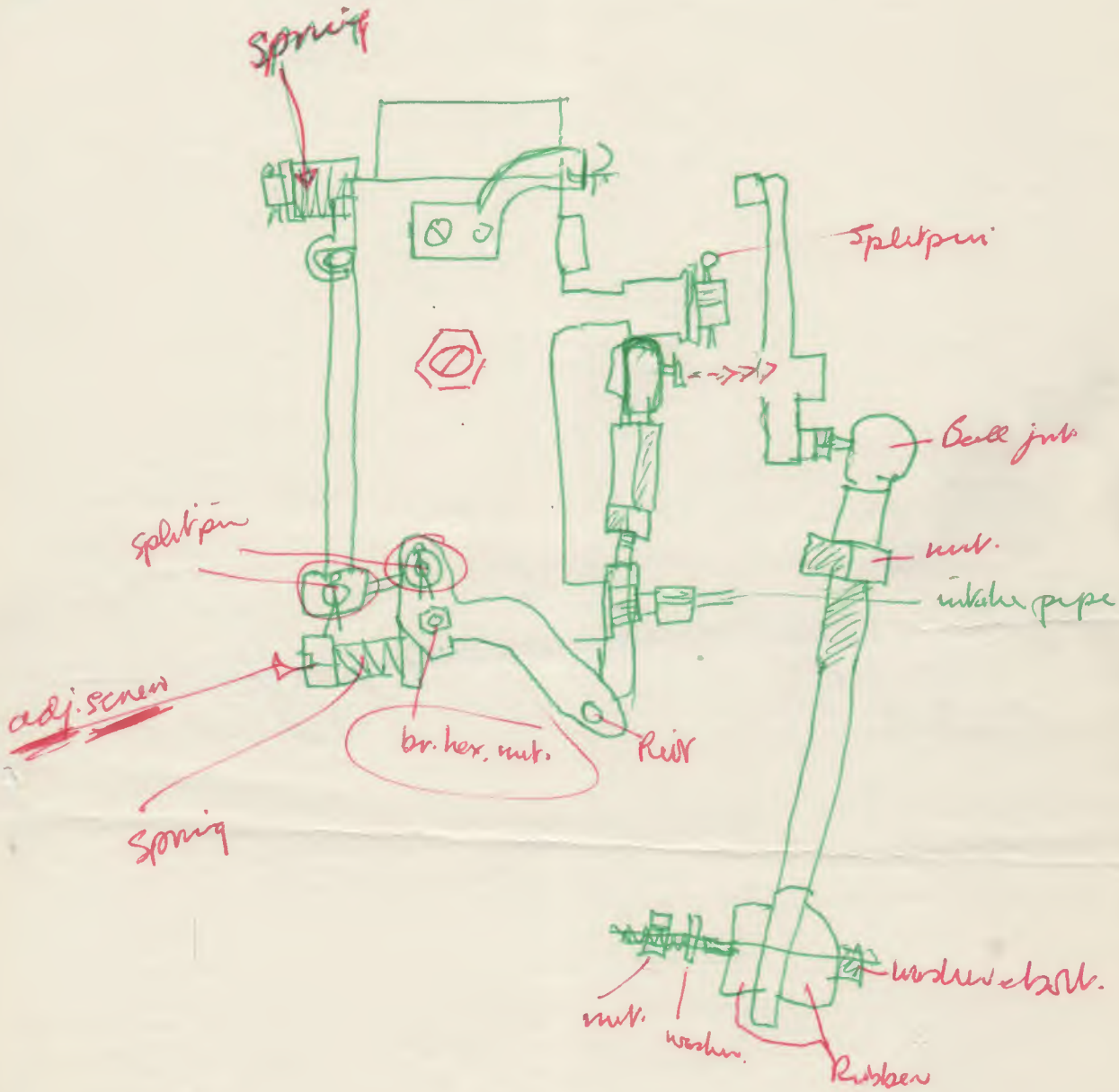
spring
Splitpin
Ball joint
nut.
intake pipe.
splitpin
adj. screw
br. hex. nut.
Rod
spring
nut.
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Rubber

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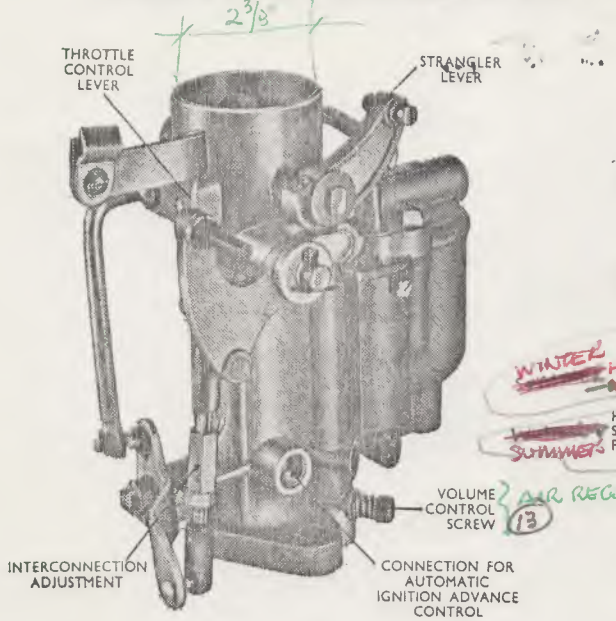
SHEETS 1-6 INCLUSIVE OBTAINED VIA. SOLEX (U.K.) LTD

12/2/83.

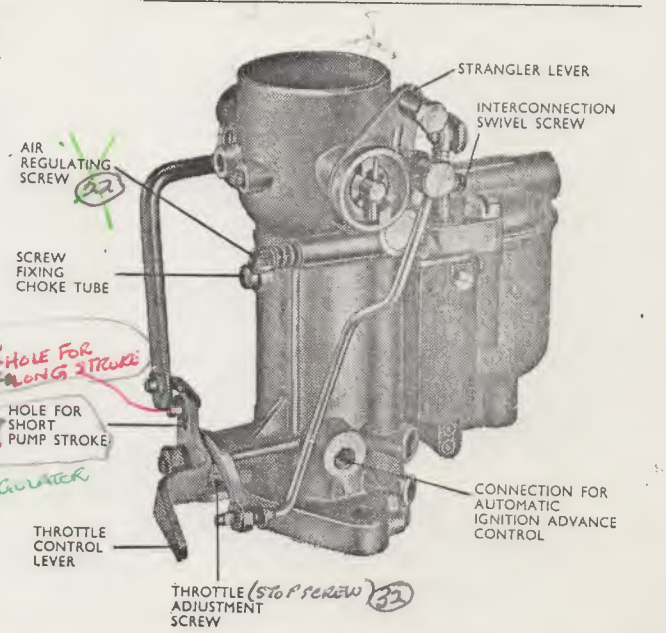
ZENITH® CARBURETTERS
SERVICE BULLETIN

SERIES 30 VIG

Also covers 36 & 42 VIS Models.



TYPE 30 VIG-5



TYPE 30 VIG-8

(1) PRINCIPAL FEATURES

The popular 30 m.m. VIG series of carburetters is used extensively on a wide range of modern vehicle and industrial engines of one to four litres capacity. Several patterns are made—each of the downdraught type—and the flange-hole centres on all current models are 60·3 m.m. (2⅜").

Some types are fitted with fully-automatic, and others with semi-automatic, stranglers for easy starting. Similarly, the quality of the mixture for idling ("slow-running") is controlled in either of two ways. This is by regulating the amount of air admitted to the slow-running circuit, or by varying the amount of idling mixture inspired by the engine (in this case the air supply is constant).

The principal features of the various models are shown in the following table:—

Carburetter type	Normal location of throttle control	Type of strangler	Method of idle control	Notes
30 VIG–5	At side of carburetter, or at end of throttle spindle	Semi-automatic	By volume control (B)	Replaces 30 VIG–2 and 30 VIG–3. Fuel connection $\frac{5}{16}$" o/d pipe
30 VIG–6	At end of throttle spindle	Fully-automatic	By volume control	Fuel connection for ¼" o/d pipe
30 VIG–7	At end of throttle spindle	Semi-automatic	By volume control	Fuel connection for ¼" o/d pipe
30 VIG–8	At end of throttle spindle	Fully-automatic	By air regulation	Auto-ignition connection tapped 6 × 1·0 m.m.
30 VIG–9	At end of throttle spindle	Semi-automatic	By air regulation	
30 VIG–10	At end of throttle spindle	Fully-automatic	By air regulation	Auto-ignition connection tapped 7 × 1·0 m.m.
30 VIG–11	At end of throttle spindle	Semi-automatic	By volume control	Has special "follow-up" pump action

Carburetters prior to 30 VIG–5 are obsolete, and cannot be supplied.

In addition to covering the 30 VIG series of carburetters the description of the operation and comments on the adjustment are appropriate to the VIS carburetters that have been made in sizes 36 and 42 m.m.

On the VIS models the economy device is mounted on top of the floatchamber cover but it operates in an identical manner to the same feature in VIG models.

All VIS carburetters have air regulating screw control to idling mixture as referred to under sub-heading "Idling" on page 3.

Each of the above is fitted with a mechanically-operated accelerating pump, a depression-operated economy device which is entirely automatic, and a strangler interconnected with the throttle for fast idling. A direct-acting float mechanism controls the fuel level in the floatchamber, and an automatic ignition-control connection is provided.

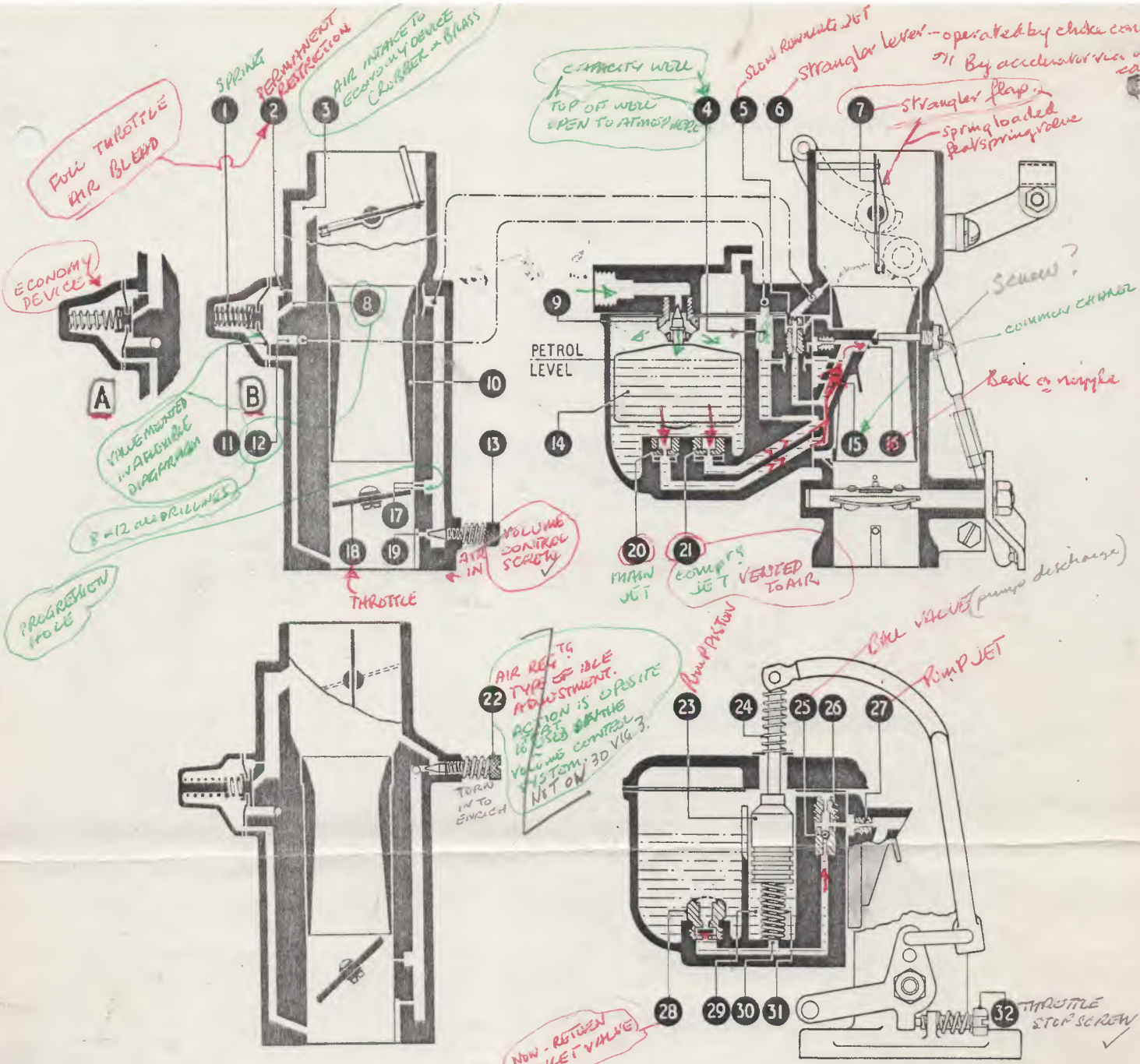


Fig. 2 Diagrammatic section of carburetter Fig. 3

Adjustments

Adjustments to the carburetter may be made in three ways:—

(a) By regulating the idling mixture, either by the air regulating or the volume control screws (13).
(b) By adjusting the idling speed with the throttle stop screw (32).
(c) By the strangler/throttle interconnection, which adjusts the amount the throttle opens when the strangler is shut for cold starting.

These are dealt with later in the bulletin.

(2) OPERATION

(a) Fuel is admitted at the top of the floatchamber cover, then flows through the needle seating (9) past the needle and into the floatchamber. As it enters, the float 14 will rise, lifting the needle and shutting off a further supply when the pre-set level is reached.

As the engine consumes fuel the level drops and the float descends, allowing more petrol to enter the floatchamber; this cycle of operations continues, thus automatically maintaining the correct petrol level the whole time the engine is running.

From the floatchamber the petrol flows, via the main and compensating jets (20) and (21) respectively, into the emulsion block, the beak or nozzle (16) of which protrudes into the choke tube at its smallest diameter, i.e., at the area of maximum depression.

(b) **Starting from cold**

The strangler lever (6) is operated by the choke control fitting on the dashboard. When this is pulled out the strangler flap (7) closes; at the same time, by means of a suitable mechanism—a cam in some cases and an interconnection rod in others—the throttle is automatically cracked open to provide a good fast-idle.

With the ignition switched on (but without touching the accelerator pedal) the starter button is pressed and the engine turned over. Immediately it fires the speed will tend to build up, and consequently the increased depression will operate the strangler flap (7)

In the fully-automatic type of strangler the flap is spring-loaded, and will automatically open sufficiently to meet the engine's needs in the semi-automatic pattern, a special flat spring valve, as shown in the diagram, is incorporated in the flap, so that should the latter be held in the closed position the valve will open. The effect of this, in both cases, is for additional air to be admitted, so weakening the mixture and preventing neat petrol being drawn into the engine cylinders.

When a fully-automatic strangler is fitted the vehicle may, if desired, be driven away with the flap closed, but the control knob on the instrument panel should be released as soon as the engine warms up.

(c) **Idling**

Assuming the throttle (18) to be in the idling position (Fig. 1), the depression will first be concentrated upon the outlet (19) and thence on the slow-running jet (5); in consequence, fuel will be lifted through the jet, where it mixes with air.

Where the carburetter is fitted with a **volume control** screw (3) this air is supplied by a fixed orifice, drilled at an angle in the casting and communicating with the inside of the air intake. The screw, which is located immediately above the main flange near the throttle, controls the amount of idle mixture passing through the outlet (19); therefore by turning the screw clockwise the amount of mixture will be reduced, and by unscrewing it the quantity will be increased.

When the **air-regulating** type of idle adjustment is used, the screw (22) (Fig. 2) controls the air supply to the slow-running jet (5). The tapered end of the screw forms a valve which, by varying the amount of air admitted, governs the depression acting on the jet. As the air is reduced, the depression increases and a greater volume of fuel will issue from the jet. **The action of this screw is directly opposite to that used in the volume control system,** i.e., by turning the screw inwards the mixture will be enriched, and vice versa.

At the upper edge of the throttle a further hole (in some instances holes) (17) breaking into the vertical slow-running channel is provided. When the throttle is opened up from the slow-running position the depression is gradually transferred to this outlet, thus giving additional mixture and ensuring a smooth progressive getaway from slow-running. It is therefore called the "progression" hole. It is not adjustable, and must not be tampered with.

With the throttle continuing to open, the engine depression now becomes imposed upon the beak (16) of the emulsion block, at the restricted portion of the choke tube.

As a result, fuel is drawn from the inclined passage (15) in the emulsion block, the vertical channel beneath the slow-running jet, and from the capacity well (4), so it will be seen that the petrol supply is ultimately through the main and compensating jets (20) and (21).

The petrol in the capacity well will by now have been consumed; therefore, as the top of the well is open to the atmosphere, petrol issuing from the compensating jet (21) along the inclined channel to the emulsion block is airbled.

This explains how the well-tried Zenith system of mixture compensation is maintained. As the engine depression increases, the compensating jet supplies a progressively weaker mixture, while the main jet provides more fuel. Petrol from the main jet (20) meets the emulsified fuel from the compensating jet (21) in the common channel (15).

As the fuel level drops, a number of small holes in the side of the inclined channel in the emulsion block are uncovered. These will admit more air, helping to break up the mixture which, when it reaches the beak (16), will be still further emulsified as it meets the airstream being drawn through the choke tube into the engine.

It is important that the mixture thus produced is used in the most efficient way, and the complete and even filling of the choke tube is therefore essential. In some applications this is ensured by a small circular bar which is arranged, in the choke tube, at right angles to the beak (16). The passage of air through the carburetter creates a depression or partial vacuum on the engine side of the crossbar; the emulsified fuel from the beak will run across the bar to fill the vacuum and then be drawn off by the airstream into the engine, thus providing a thoroughly homogeneous mixture.

In some instances the end of the choke screw is extended to meet the bar at right angles to form a second bar (as shown in the diagram) to assist good distribution. In others, it has been found advantageous to dispense with the bar altogether, but to lengthen the beak of the emulsion block instead.

(d) **Accelerating pump**

In order to secure economical performance at all normal driving speeds, yet at the same time ensure faultless acceleration, a controlled and accurately metered amount of petrol is essential when the throttle is snapped open. This is to prevent any tendency for a lag in acceleration when the carburetter is adjusted to give a low fuel consumption at part-throttle speeds. The accelerating pump provides this feature. It is connected, by suitable linkage, to the throttle spindle, and therefore every time the throttle is suddenly opened a small quantity of metered petrol is discharged into the air stream.

The pump piston (23) is spring loaded, normally being held at the upper end of the pump cylinder, and a retaining screw at the top prevents the piston being lost when the floatchamber is removed.

With the piston in this position, the cylinder holds a charge of petrol drawn from the floatchamber through the non-return inlet valve (28). Consequently when the accelerator pedal is depressed the piston is pushed down, forcing petrol through the ball valve (25) and the pump jet (27) into the airstream in a fine spray. As a result, there is an immediate response by the engine when the accelerator pedal is used.

The travel of the pump piston may be varied as required, to give a shorter stroke for summer use than for winter. In all models of the 30 VIG carburetter (except the 30 VIG–11) this is effected by changing the location of the pump link. The **long** ("winter") stroke is obtained by fitting the link to the **outer** of the two small holes in the throttle lever, and this is the position in which carburetters are usually despatched. The inner hole provides the short stroke.

In the 30 VIG–11 a square diecast block is loosely fitted to the spring-loaded pump rod at the top of the floatchamber. This block has a vertical lug on one corner, and may be arranged in either of two positions. With the lug placed immediately below the end of the pump control lever the short ("summer") stroke will result. To change to the long stroke the block is lifted about a quarter of an inch and revolved through 180°, so that the lug is now adjacent to the air intake.

A further feature is embodied in the 30 VIG–11 carburetter. A spring-loaded throttle lever is fitted, and this converts the positive action pump into a follow-up type. The greatest discharge is at the first part of the throttle movement.

The long stroke is necessary during severe weather, or in a cold climate. Conversely, in hot weather, or in a country where the average daily temperature is appreciably higher than that in the United Kingdom, the short stroke can be employed

(e) **Economy device**

This consists of a valve mounted in a flexible diaphragm at the side of the carburetter. One side, which is spring-loaded, is in direct communication with the engine side of the throttle, and is therefore directly influenced by the engine depression.

When this depression is high, as at part-throttle cruising, the valve (11) is lifted from the seating against the compression of the spring (1) (as shown at "B") thus admitting air from the air intake at (3) through the drillings (8) & (12) to the top of the capacity well (4). This will weaken the mixture by reducing the flow from the jets.

When the manifold depression is insufficient to overcome the spring, the valve remains closed (diagram "A"), and the only air to the capacity well and jets is through the small permanent restriction (2), which is known as the "full-throttle airbleed".

It is sometimes desirable to limit the ventilation to the jets at part-throttle; in such cases, a special screw is fitted in the top of the capacity well to restrict the amount of air after passing through the drilling (8) when the economy valve is fully open. The size of the hole in this screw can vary from 1·4 m.m. to 4 m.m. (generally in steps of 0.2 m.m.), and if one is fitted as part of the standard setting it should be unnecessary to vary the size later.

It must not be overlooked that, by using a screw with a smaller hole, the mixture strength throughout the range will be increased

(see "Screw over capacity well", page 5)

(f) **Petrol level**

This is set at the factory 17 m.m. ($\frac{11}{16}$") down from the top face of the floatchamber, at a pressure of $1\frac{1}{2}$ lb. per sq. inch.

It must be made clear that this is the level which results when the float is in position and holding the needle closed against the pressure of the petrol in the fuel line. When the floatchamber is removed, however, the float will rise when freed, and the level will therefore fall.

In these circumstances, the surface of the petrol should be 22 m.m. ($\frac{7}{8}$") below the top face of the floatchamber if the float remains in position, or 35 m.m. ($1\frac{3}{8}$") if it is removed. In the event of the level being too high, it may be lowered by fitting a thicker aluminium washer under the flange of the needle seating. The thickness of the standard washer is 1 m.m. (·040") but others, 1·6 m.m. (·063") and 2 m.m. (·080") thick respectively, can be supplied if required.

(g) **General**

To remove the float chamber first extract the two hexagon-headed bolts in the floatchamber cover, then withdraw the floatchamber horizontally for about an inch, when it will drop into the hand. The float, pump piston, slow-running jet, the screw over the capacity well (if one is fitted) and the emulsion block will now be exposed. Side by side, beneath the float, will be found the main and compensating jets. These can be recognised by the size of their threads, that of the main jet being the smaller. In all models except the 30 VIG–6, both have squared recesses in them for the reception of the end of one of the bolts holding the floatchamber in position, which acts as a jet key. In the latter case, the jets are slotted for a screwdriver, and both bolts have plain ends.

To clean the jets, either swill them thoroughly in clean petrol or blow them out with air pressure. **Never** use needles, brooches, wire or anything else that is likely to damage the calibrations.

If the emulsion block is removed, check that the gasket is undamaged before replacing. Tighten the centre screws first, then the single one at the base and finally the two top screws. See that the aluminium washers are in position under the heads of the three lower screws.

A small hole will be found near the base of the emulsion block. After the lowest screw has been fitted, the floatchamber should be supported on a suitable block of metal held in the vice and the hole centre-punched to form a burr over the head of the screw, to prevent it dropping into the engine should it work loose. Be careful not to damage the joint face of the emulsion block.

When restoring the float see that the word "TOP" is uppermost.

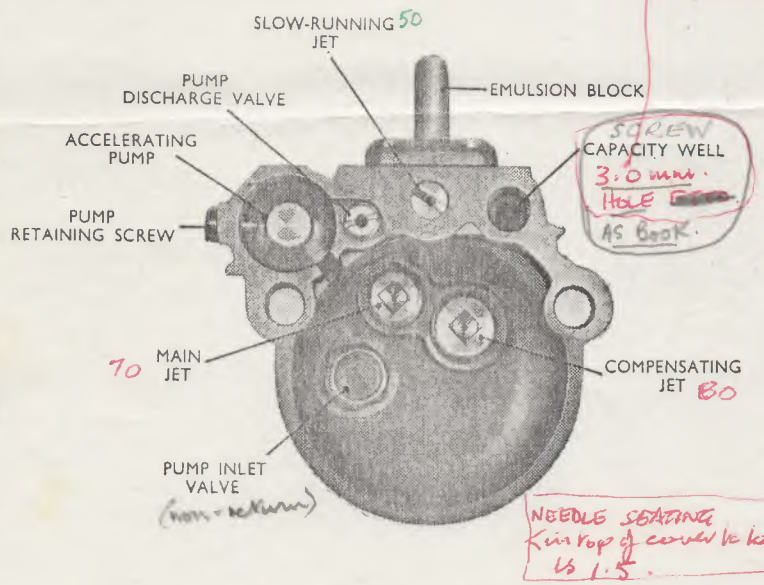
Should the strangler/throttle interconnection be disturbed at any time, it may be reset by the throttle stop screw. With the throttle fully closed, the screw is adjusted so that it just touches the throttle stop. From this point it is turned inwards by the amount given on the Zenith Service Bulletin relating to the particular vehicle in question. (This information is shown under the heading "interconnection setting" and is measured by the number of **half**-turns (i.e., 180°) of the throttle stop screw).

Now, with the strangler flap held fully closed, the clamping screw in the strangler lever swivel is firmly tightened on to the interconnection rod, when the fast-idle setting will be correct. (In the case of the 30 VIG–5, the adjustment is made by slacking off the locknut on the ball-ended interconnection link and adjusting the hexagon sleeve, then tightening the locknut).

Before re-setting the interconnection rod, it is advisable to note carefully the number of half-turns to which the throttle stop screw was already adjusted for idling, so that it may be correctly re-positioned after clamping the rod.

(3) TUNING

(a) A number of variables are provided in the carburetter to enable it to be tuned for the correct fuel/air ratio at all throttle openings and for all speeds and loads.



PLAN OF FLOATCHAMBER (WITH FLOAT REMOVED)

It will be fully appreciated that, where the VIG carburetter is fitted as initial equipment on a production engine, the values of the jets and other variables are fixed only after exhaustive bench and road tests have been carried out by Zenith engineers, working in collaboration with the Experimental and Road-test departments of the vehicle manufacturers. In all such cases, we recommend that no changes should be made to these standard settings—which are normally intended for operation at about sea level—until careful checks of other engine factors (ignition, tappet adjustments, etc.) are first made.

Unless otherwise stated, all the jets in the carburetter are calibrated in units of hundredths of a millimetre, and are normally available in steps of five units. A higher number denotes a larger calibration, i.e., a jet stamped 100 is a size larger than one marked 95.

Half-size main and compensating jets for final tuning can be supplied to order if required; a jet marked 82 is halfway between 80 and 85.

Choke tubes have their sizes clearly marked inside, the figures showing the diameter of the restricted portion. These range in steps of one millimetre, and half sizes are not supplied.

(b) **Altitude**

An exception to the remarks previously made about altering the standard setting arises when the carburetter is consistently used at altitudes above 5,000 feet. Owing to the rarified atmosphere it is necessary to reduce jet sizes to maintain the correct fuel/air ratio. The following changes are therefore recommended:—

	Main jet	Compensating jet
5,000 to 7,000 feet	½ size smaller	½ size smaller
7,000 to 10,000 feet	1 size smaller	1 size smaller
10,000 to 15,000 feet	2 sizes smaller	1 size smaller

Although no alteration is specified for heights up to 5,000 feet, when economy rather than performance is the prime consideration we suggest trying a half-size smaller main or compensating jet above 3,500 feet.

The above changes are suggested only for vehicles used at the various altitudes mentioned. None need be made where cars or trucks climb temporarily to a few thousand feet, then drop back to heights below about 2,000 feet, as in the European Alps.

(c) **Variables**

In addition to the above-mentioned variations to the jets, further alterations to the setting can be carried out when tuning a particular engine. These are:—

Choke tube

This controls the weight of charge inspired by the engine; the size usually decided upon is the smallest that will develop maximum power.

Main jet

As in all "V" type models of the Zenith carburetter the mixture (above idling speeds) is supplied by the main and the compensating jets, both of which feed the beak of the emulsion block via the inclined passage (15). The main jet influences power and speeds at medium to large throttle openings, and its output is directly related to the depression existing at the waist of the choke tube, into which the emulsion block beak (10) protrudes.

For the sake of economy the smallest main jet which, conjointly with the compensating jet, gives maximum power and speed with a particular choke tube, should be used.

Compensating jet

As previously mentioned, the flow from the compensating jet is complementary to that of the main jet, both discharging into the emulsion block, and it is in operation at all ranges above idling speed. From the diagram it will be seen that this jet is ventilated to the atmosphere through the top of the capacity well. The function of this well is to provide a reserve of fuel during acceleration; in some cases the top is left open, and in others a tubular screw is fitted, drilled to a particular size, as referred to elsewhere in this bulletin.

As the compensating jet is vented to the air it will be realized that, although the engine depression increases, the flow from the jet is not affected to the same degree as in the case of the main jet, and it is therefore the combined discharge from both the main and compensating jets that provides the mixture best suited to the engine.

Variations to the compensating jet will have less influence on the mixture strength than alterations to the main jet, affecting acceleration and low-speed pulling.

Slow-running jet

This is a calibrated jet 5 which supplies a measured quantity of fuel to the slow-running hole 19 on the engine side of the throttle, and also to the progression hole(s) 17 at the throttle edge. It is usually unnecessary to alter the size of the jet from that fitted by the makers of the vehicle.

Half-sizes are not supplied.

Pump jet

This is the small calibrated jet 27 which screws into the back of the emulsion block immediately behind the beak of the latter. Access to it is obtained by removing the emulsion block. Its purpose is to meter the amount of fuel injected into the main airstream when the accelerating pump piston is thrust down by the throttle interconnection mechanism.

Care must be taken, when removing or replacing this jet, not to damage the threads or the slot in the head.

Available in steps of ten units from 50 to 90 inclusive, half-sizes are not supplied. Sizes below 50 are liable to become choked. If, therefore, it is desired to reduce the discharge from the jet a modified pump inlet valve can be supplied. In this, a small leak is provided in the valve, so that some of the fuel can be returned to the floatchamber when the pump is operated.

Screw over capacity well (4)

Variations to the size of the hole in this screw will affect the mixture strength, but in a rather different manner to an alteration in the size of main or compensating jets.

A small hole will enrich the mixture when the economy valve (11) is open, but will have little influence when the valve is closed and the extent of ventilation to the capacity well is controlled solely by the small permanent airbleed 2.

Needle valve and seating (9)

This is a calibrated unit, and the diameter of the seating hole, in millimetres, is stamped on one side of the hexagonal body. The correct size depends on the pressure in the fuel line, and the capacity and output of the motor.

(4) GENERAL

(a) It must not be forgotten that several other factors, apart from the carburetter, affect performance and consumption. It is therefore advisable to check plugs, distributor and ignition generally before making carburetter adjustments. See that all manifold joints are tight, and that the compression in all cylinders is good.

As well as the jets and the other variables described above which may, if required, be changed when the carburetter is in service, other features (also part of the setting) are built into the carburetter during manufacture. These concern the sizes and positions of various drillings, strength of springs, etc., and are the features in the design which permit the carburetter to be precisely suited to the engine on which it is fitted. (It is these drillings which prevent the substitution of one 30 VIG model for another by merely changing the choke tube or jets.) However, when the values of the variables in the carburetter have been settled, the mixture strength at different speeds and loads will be constant, assuming that the jets and channels are clean and the instrument is in a sound mechanical condition

In cases where faulty carburation is suspected, first check that the sizes of the choke tube, jets, needle and seating, etc., conform to those given in the setting specification for the engine concerned.

While it is important to see that the correct numbers are stamped on the jets, the possibility that they may have been tampered with, or that careless cleaning has affected the flow of petrol or air through a jet or air bleed, should not be overlooked. If any signs of interference with them are found, new parts should be fitted.

It must be appreciated that, after years of service, the moving parts in the carburetter will inevitably wear. If the vehicle is some years old, and the carburetter is the one originally fitted, this wear—which can affect all aspects of carburation—can have a considerable bearing on some of the typical troubles mentioned below. We therefore strongly recommend that, when an engine needs a major overhaul, the worn carburetter is replaced by a new unit, so that the utmost benefit may be obtained when the engine is restored to its original condition.

When making a general check on carburation, the following notes will be found helpful.

(b) Difficult starting from cold

Ensure there is sufficient petrol in the floatchamber, and that it is replenished within a few seconds of turning the engine over by the starter, or by the operation of the hand primer on the fuel pump.

Occasionally there is a tendency for the needle to stick on its seating owing to the formation of a gummy deposit from petrol or additives, thus preventing the entry of fresh petrol. In such a case remove the needle and seating and rinse well in methylated spirit; this will dissolve the deposit, and allow the needle to drop freely by its own weight.

Check that the strangler flap closes completely when the dashboard control is operated.

In the fully-automatic stranglers fitted to the 30 VIG–6, –8 and –10 models the flap is not rigidly controlled by the strangler spindle, but is operated by the tension of a coil spring. If, therefore, the spindle is bent or the bearings are stiff, either of these could prevent the flap closing fully. Another cause of the trouble could result by over-tightening the air cleaner connection; this can be checked by slackening the clamp to see if the flap operates freely.

The strangler/throttle interconnection is provided to open the throttle beyond the normal idling position when the strangler is fully closed. The correct gap between the edge of the throttle and the side of the throttle bore at the slow-running outlet can be set by means of the shank of a drill. Alternatively, it may be adjusted by the throttle stop screw, as described on page 4, measured in **half**-turns (i.e., 180°) from the fully closed position. Details of both are given under the heading of "Fast-Idle Interconnection Setting" on the Zenith Service Bulletin for the vehicle concerned.

If the above points have been checked, and ignition and engine generally are in good order, the interconnection adjustment should be slightly increased.

(c) **Difficult starting when hot**

This trouble is usually due to over-richness, the most common cause being flooding. In such a case, check that the needle and seating assembly is the correct size, is thoroughly clean and is screwed home tightly. If worn, it should be renewed. Check the fuel level (see paragraph 2 f); examine the float to ensure it is not punctured and that it is the right way up.

Should it be found that flooding persists (evident by petrol dripping from the beak of the emulsion block when the throttle is in the idling position, or within a few seconds after stopping the engine) after a new needle and seating assembly has been fitted, check the fuel pump pressure and, if necessary, have it reduced. In normal circumstances this pressure should not exceed 2¼ lb./sq. in. at cut-off, i.e., at the instant of switching off the engine.

Where difficulty in hot-starting is experienced it can usually be overcome by opening the throttle gently to its fully or near-fully open position, then turning the engine over by the starter with the ignition switched off to clear the over-rich condition. Then return the throttle to the near normal slow-running position, switch on and rotate the engine with the starter, when it should then fire and run.

(d) **Erratic slow-running, or stalling on deceleration**

See that the slow-running jet (5) is perfectly clean, and is screwed home flush with, or a little below, the top surface of the float chamber. Check that the gasket over the floatchamber is in good condition, and that the two bolts securing the floatchamber are evenly tightened when replaced. Ensure that the slow-running outlet hole and the progression hole(s) in the throttle barrel are clear, and not carboned up to form a restriction.

Due to excessive or uneven tightening of the nuts when the carburetter is fitted to the induction manifold, the flange sometimes becomes bowed, thus admitting air at this joint. In such a case, the flange face should be carefully filed flat, and a new gasket used for making the joint. Reasonable force only should be employed when bolting the carburetter down. (22 N/A.)

Inspect the tapered end of the volume control screw 13 (~~or air-regulating screw (22) where fitted~~) and see that it is in good condition. If it has been forced into its seating several times a parallel portion will be formed on the taper, rendering it useless. Replace the screw with a new one. See that the spring on the screw is "live", and prevents the screw vibrating out of adjustment.

The throttle stop screw (32) determines the idling speed, and the volume control ~~or air-regulating~~ screw controls the mixture strength. Set the former to give an idle speed in the region of 500 r.p.m., then adjust the volume control or air-regulating screw so that the engine idles evenly at this speed, with no tendency to stall when the throttle is suddenly closed. At the same time, clean progressive acceleration should result when the throttle is opened gently from the idle position on to the progression hole(s).

With the mixture correctly set, it may be necessary to readjust the throttle stop screw slightly to give a satisfactory idle speed

(e) **High fuel consumption**

The carburetter is frequently blamed for this when the trouble is really due to one or more other causes, i.e., a leak in the petrol system, fuel pump pressure too high, engine stiff or in poor condition, brakes binding, retarded ignition, restriction of the carburetter air supply because of a faulty strangler or a choked air cleaner, etc. Furthermore, rough estimates can be very misleading, and the fuel consumption should be checked over, say, a hundred miles, to see if it is excessive or not. Short journeys and town work mean increased consumption, and the average figures quoted by the car manufacturers are for country running on give-and-take roads with normal loads, driving at 30/35 m.p.h.

If the consumption is found to be excessive, smaller main and/or compensating jets should be tried. One can be altered without affecting the other, and therefore the effect of changing one jet at a time should be tried.

Should the fuel pump pressure be too high, it will not be found possible to obtain a smooth tick-over no matter how the volume control or air-regulating screws are set, and petrol fumes will be noticeable when the car is running downhill. The remedy is to fit a smaller needle and seating, but if this causes restriction to the petrol supply at high speed the pump itself should be suitably adjusted.

Check that the carburetter has the standard setting of jets and air bleeds fitted, and that all holes and passages in the instrument are clear. See that the strangler flap opens completely when the dash control is released or pushed in.

Dismantle the economy device to make sure the diaphragm material is sound and intact, also that the gaskets (one on each side of the diaphragm) are in position and are in good condition.

When re-assembling the economy diaphragm, etc., see that the spring beneath the cover is in position and is located squarely in the recess of the metal cup in the centre of the diaphragm. Take care to tighten evenly and fully the screws securing the cover: any leakage at the joint will affect the degree of depression necessary to overcome the spring which normally holds the diaphragm valve in the closed position.

Remove the ball valve (25) that screws into the top face of the floatchamber, to ensure that the ball moves up and down quite freely, and will drop by its own weight. Sediment or gum might cause the ball to stick on the upper seating; in this event, petrol will issue from the pump jet at all times and affect consumption adversely, and the valve should be rinsed in methylated spirit. (It will be appreciated that, when the ball drops, any depression over the pump jet will merely admit a limited amount of air from the uncovered air bleed at the top of the valve).

Examine the gasket under the emulsion block and check that it is in good condition, also see that the screws securing the block are tightened evenly and firmly to prevent any possibility of leakage.

(f) **Poor acceleration**

Check that the pump piston moves freely in its cylinder, and returns to the upper position by the spring fitted beneath the piston.

Having removed the piston to make sure the cylinder is clean, extract the non-return valve in the base of the floatchamber and wash it thoroughly in clean petrol or methylated spirit. This will ensure it will close effectively on the downward movement of the pump piston.

Remove the pump jet and see it is perfectly clean, and will give an unbroken stream of petrol from the orifice when the pump piston is pushed down.

If the pump link is in the inner or "summer" hole, transfer it to the outer hole or, in the case of the 30 VIG–11, turn the pump block to provide the maximum stroke. (See paragraph 2 (d).

Check the economy device as described in paragraph 2 (e).

In time, carburetter wear will result in reduced output from the pump and affect acceleration and slow-running adversely.

Flat spots or hesitation on progressive opening can generally be banished by careful adjustment of the slow-running mixture, after checking that the progression holes in the throttle barrel are unobstructed.

(g) **Loss of power**

Check that the holes and passages in the emulsion block are clear, and that the throttle opens fully.

Larger main and compensating jets may be tried to see if increasing the strength of the mixture will improve maximum speed and power.

In cases where an engine has been modified with a view to increasing the power output, a larger choke tube with correspondingly bigger jets should be tried. If advised of modifications made to an engine, we can usually suggest an alternative setting which will serve as a basis for tests to tune the carburetter to suit them. These remarks apply equally to twin or multiple carburetter conversions, and we shall be pleased to give owners the benefit of our experience on similar installations.

Parts lists for these carburetters can be supplied on application; please give the name and type of the vehicle concerned In any query, always quote the reference letter and figures stamped on the fuel inlet boss.

THE **ZENITH** CARBURETTER CO. LTD.,

Manufacturers of Zenith, Solex and Stromberg Carburetters.

HONEYPOT LANE, STANMORE, MIDDLESEX, HA7 1EG.

Telegrams: Zenicarbur, Norphone, London. Telex No. 23571 Telephone: 01-204 3388 (12 lines)

Stafford Press Printed in England

Engine (Cont'd.)

31/8/01 Vaccuum pipe fitd. bet. distributor & carb. — The carb. end was previously re-soldered on. — The pipe quite stiff.

Petrol pipe fitd. bet. carb & pet. pump.

* CHECK JNTS. FULLY TIGHT before starting up engine.

NB. Starter Motor. — This cannot yet be refitted until the bellhousing & Gearbox is fitd. to engine.

2-23/09/01 Starter Motor & Dynamo. I was not happy w. previous blue & black paint finish. SO. rubbed blue & 2 cover bands (black) down, (dry) & repainted 1ct.

Dynamo fitd. to engine

Fan belt. ditto. This is original & was very tight — adjust bkt. hardly in use. * CHECK for tightness before starting up engine.

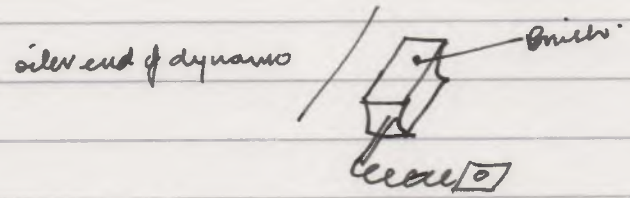
Dynamo:

Original Notes.

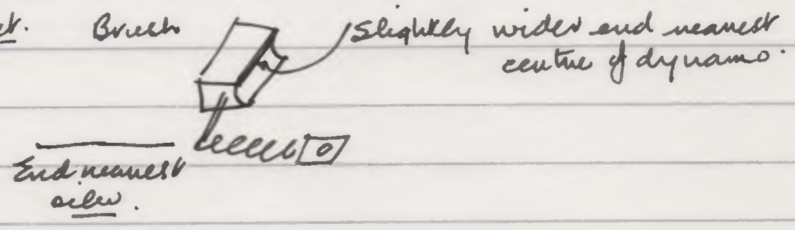
Originally the Dynamo T.O. Feb '81. and serviced. It was taken apart, cleaned inside & out & painted. Exiq. carbon brushes are O.K. A spare new set in store.

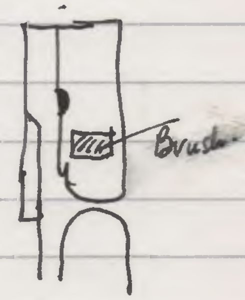
Notes re: Dynamo brushes. — screw. — serrated washer. [0] — tag on end of curled wire.

Lift spring to release carbon brush. — Tag on inside fastened to nut on O/S.



original Notes on sep. sheet.





3.9.01 — NB Aluminium & Black paint touched-up after all previous fixing.

Decided I can't get much further now.

Starter motor + Bell housing & Gear Box to be fitd. when car turned rnd. in garage (after wheels put on)

Gearbox support bracks. to chassis & engine straddles to be fitd. DONE 05

Air filter & pipe from rocker cover.

Water & heater hoses.

Distributor top. & finial timing check. *

Water temp gauge & piping.

Choke, Starter, petrol ~~tap~~ reserve cables.

Reserve pet. cable.

Rods to Gearbox.

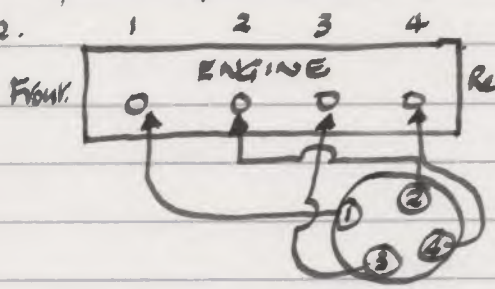
Petrol flexible hose + in-line filter — BUY.

Oil Filter & Gasket.

ENGINE. (Contd)

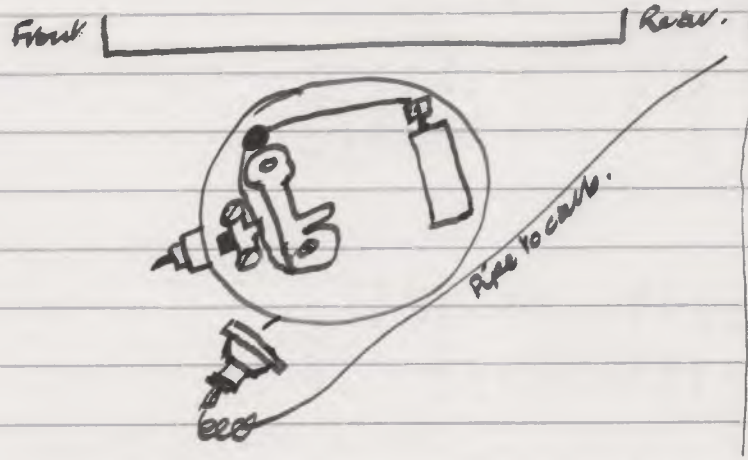
From small brown book. (1984)

1. In order to remove distributor (i.e. must un-provide to remove) took off inner side panel, n.s. front wing side piece - front wing.

2. 

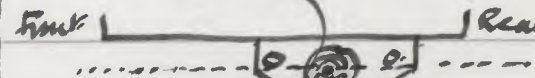
1. = Under
2. = Next.
3. = Top.
4. = by itself - is a very short lead.

• Sketch for order of leads and their place in relation to ea. other.



Ignore this as timing set-up 9|8|05 is correct.

Inside (i.e. beneath after distributor removed)



Parallel with engine block (but don't know position of rest. so of no use)

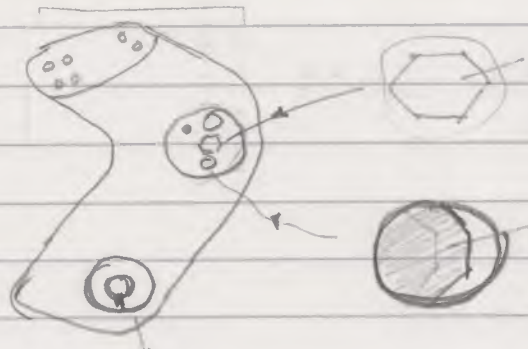
(Largest piece at btm. which has a notch cut out.)

(Again no help in setting up timing)

N.B. New points and condenser ordered from Alexandria Road Elect. Garage. Rotor arm cleaned, in good condition & reused.

From shorthand scrap pad.

With Flywheel at T.D.C. - No. 1 & 4 pistons at the top of their bores the position of the wheels (as exp.) are as follows:—



Nut inside top hole is approx in centre of hole.

Nut inside btm hole is slightly to the left of hole centre

Key on crank wheel/shaft at btm (approx)

Ignore — as above

NB. These as before I disturbed them but details may be of no use in setting-up timing after new cam & new cam wheel fitted.

Recd. 23/11/01

Lanchester L.D.10. Engine gaskets.

Description.	Material.	Thickness.	Payen no.	Page no.
Carburettor to inlet manifold joint	Metal reinforced heat shield	0.075"	N/A	601
Cylinder head gasket	Copper/asbesdos	0.075" at edge.	1A124	214
Engine front plate to block gasket	Gasket paper	0.005" ???		209 A
Engine sump to block gasket	Liquid sealer	0.00"	N/A	N/A
Exhaust and inlet manifold gasket	Metal reinforced Klingerit	0.075"	M3786	237
Exhaust downpipe gasket	copper/asbesdos	0.040 at edge.	40SQ3	4025
Oil filter bracket gasket	Gasket card	0.020" ???		232
Oil pump gasket	Gasket paper	0.005" ???		23A
Petrol pump gasket	Gasket paper	0.005"		205
Tappet chest (Side cover) gasket	Cork/paper/cork sandwich	(0.125" APPROX)		203
Timing chain cover gasket	Gasket card	0.025" ???		211
Valve cover (rocker box) gasket	Cork	0.25"	10843	217
Water outlet (thermostat housing) gasket	Klingerit	0.075"	7991	221
Water pump to cover plate joint gasket	Gasket card	0.025" ???		805
Water pump to cyl' head joint gasket	Gasket paper	0.010" ???		806

??? Means that the measurement was taken from a remanufactured gasket and not from an original.

251

Gaskets. 1) Rocker box - 1/8" thick - o/all 16" × 6½" <no holes>.

2) Engine side plate - 1/8" thick - o/all 15" × 6½" < " >

3) Timing Chain cover - 1/16" thick - o/all 13" × 9" <12/3/8" ∅ holes>

4) Inlet & Exhaust manifold - Réfr. - o/all 15" × 3½" × 1/16" thick.

5) Oil pump. - Paper <inside Engine>

6). Pet. pump & carb. - Paper.

NB. Use HALITE for inlet & exhaust manifold gasket [illegible].

---

19 Sept. 1991. Visit from Alan Ancersley.

1.) When refixing sump use Hermetite Silicone gasket (from a tube) lightly before bolting together.

2.) Inlet & Exhaust Gasket. - Try to remove old gasket <apply petrol - not paraffin> and reuse same with Hermetite tube gasket sealer on b/s, but if inside is clean don't put any on that side.

3.) Cleaning Valves. - Use wire brush gently on top of stem under head only and on top of valve to remove brittle muck. After grinding before putting valves in, wash all head thoroughly with petrol. / pet. on rag / then clean rag / put valve in dry to feel if any grit / if O.K. oil valve & insert.

4.) Rocker Box Assembly. - You should slacken off all adjustments before removing pedestals. When putting all back assembly, ensure that the tappets are fully unscrewed to avoid damaging shaft when bolting pedestal down.

5) Exh. Cyl. head gasket. - Suggest use old cu. gasket as new fibre one bought is inferior. Polish old gasket gently (b/s.) - not fibre around cylinders - keep clear - see that there is no dent in compression rings & use thylamar gasket compound on all 4 faces (thinly) Torque down & after 15 minutes, torque down again.

contd...

after 100 miles, check compression on each cylinder.

6) Rocker Assembly. when taking apart, make sure all (especially shaft) goes back same way (end to end).

7). Engine. block, etc., 1). Timing Chain
2) Camshaft Sprocket.
3) Crankshaft "
4) Camshaft.

All need replacing.
The worst part of engine.

8). Camshaft. the camshaft has rusted due to condensation in the engine whilst storing as the oil soon slides down into the sump leaving dampness / condensation to attack polished surfaces — Engine has been run since initial rust has set in & further rusted whilst later stored.

Check cam followers also after taking out camshaft to see if fine. They may be equally worn & need replacing.

Engine firing order.

(1)	(2)	(3)	(4)
F	E	C	I
E	I	F	C
I	C	E	F
C	F	I	E.

ENGINE (cont'd).

Notes taken from various books prior to engine rebuild.

Valves:

ODHAMS: - NOT specifically for LD10 but general notes:

p. 155. Make piece of wood to fit inside the combustion chamber and place cyl. head on bench with blocks beneath 1 pair of valves.

p. 156. a) Exhaust - valves - hard scaly carbon.

b) Inlet. - " - soft, oily & sooty.

Do not clean stem of valve w. emery cloth. but remove all carbon by scraping.

Valve guides - clean out - carbon will only accumulate at the necks of the guides. - Put petrol soaked rag through bores.

Valve seats. - use fine grinding paste only - smear on seating - rotate 12x, turning in ea. direction with a light pressure applied - frequently raise valve from seating to distribute paste - A matt grey surface over overall valve and seating - thoroughly clean valve and seating - pencil marks across face - replace valve - Rotate once - All pencil marks should have gone. - If not continue grinding.

Reassembling Valves. check if valve springs are not "progressive", ie. more resistance - (coils closer together) at 1 end. <if so, the close - together end goes to top - nearest head>. - ie. as we use when fitg.

* Make sure the spring clip is fitd. to stop valve dropping.

WALLACE. p. 97. et. seq.

Make a former for 8 valves. - valve heads should be at least 1/16" thick - check valve in guide for valve guide wear (ie. cause of oil consumption)

Refitting Head. p. 158

ODHAMS. (a.b.)

try ea. nut on studs first to see if good fit - coat brn. of gasket with Blue shell from tube - ease gasket down over studs - see if it lays perfectly flat on block - slide down cyl. head over studs - tighten nuts in order in accordance with "Trade Sheets" - tighten again after 15 mins. or so.

CRANKSHAFT.

- timing sprocket keyed on front end of crankshaft by Woodruff key
- thrust ring behind sprocket with flange to bearing.
- Pulley with separate Woodruff key, retained by hand starter dog.
- Pully hub has oil return thread.

CAMSHAFT. <From pages 2-3 of Trader Sheets>.

- Duplex roller chain drive, spring link fastening
- Camshaft sprocket keyed on end of shaft - <flat face to front> with Woodruff key - key retained by nut.
- Front bearing assembly trapped between sprocket & shoulder on shaft.
- Centre and rear camshaft bearings are white metal lined steel shells pressed into block.
- Front bearing consists of c.i. housing spigotted & flange bolted to block with white metal lined flanged steel bushes pressed in from both ends & pegged.
- N.B. If centre and rear bearings are removed they should be locked by dimple, made by long punch inserted through oil feed from main bearings.
- To take off camshaft - extract setscrews holding camshaft front bearing <box spanner through holes in sprocket> & draw out shaft w. sprocket.

f.d.b. N.B. Metal tabs on these 2 ~~bolts~~ <set screws> - difficult to flatten to remove setscrews. - Redmans recommended using "nutlock" when replacing setscrews. - this is their practice.

N.B. Front bearing - <p.183> oil hole in housing to be continued through bearing.

Take extreme care when withdrawing camshaft to avoid damage to white metal bearings.

Camshafts (Contd)

FROM WALLACE.

Bearings - White metal lined steel shells pressed into block.

" - can be re-metalled & line bored.

FROM ODHAMS. p. 169 et. seq.

Bearings - are usually of a generous area & owing to copious amounts of oil they receive, wear very slowly. Camshafts will ~~wear~~ run efficiently with quite large bearing clearances.