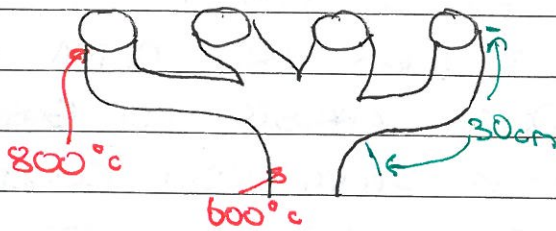


COMPETITION ENGINE PERFORMANCE

17/3/16

m.g.

PRIMARY LENGTH WL THE

PORT = 40cm

ASSUME SAME CAMSHAFT AS

PEUGEOT

$$T. \text{ FOR BEST TUNING} = \frac{230}{360} \times \frac{60}{\text{RPM}}$$

$$\text{MEAN SPEED OF SAWD} = 330 \times \sqrt{\frac{973}{293}} = 601 \text{ m/s}$$

$$T. \text{ FOR PUSSE TO RETURN TO VALVE} = n \times 2 \times L$$

MEAN SPEED
OF SAWD

$$= n \times 2 \times 4$$

601

$$\therefore \frac{230}{360} \times \frac{60}{\text{RPM}} = \frac{n \times 2 \times 4}{601}$$

$$\therefore \text{RPM} = \frac{601}{n \times 2 \times 4} \times \frac{230}{360} \times 60$$

$$n_1 = 28,797 \text{ RPM}$$

$$n_2 = 14,398 \text{ RPM}$$

$$n_3 = 9,599 \text{ RPM}$$

$$n_4 = 7,199 \text{ RPM}$$

$$n_5 = 5,759 \text{ RPM}$$

$$n_6 = 4,799 \text{ RPM}$$

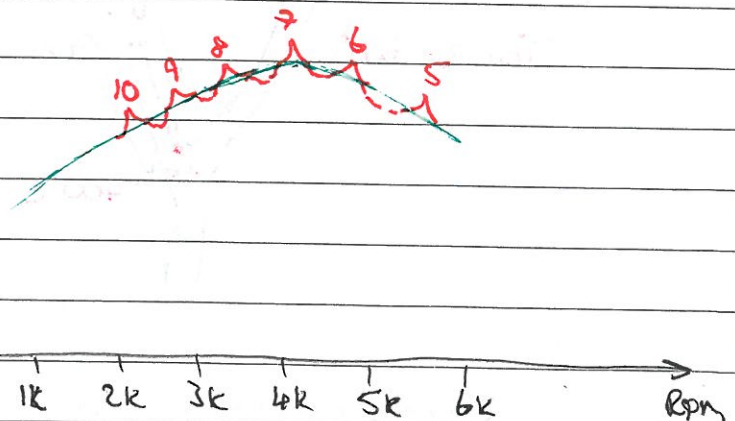
$$n_7 = 4,113 \text{ RPM}$$

$$n_8 = 3,509 \text{ RPM}$$

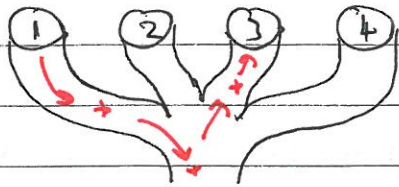
$$n_9 = 3,199 \text{ RPM}$$

$$n_{10} = 2,879 \text{ RPM}$$

V.EFFY



LATER HARMONICS ARE CLOSER + SMALLER $\therefore$ SMOOTHER
DRIVING CHARACTERISTICS IF NOT AS POWERFUL.



POTENTIAL PROBLEM WITH 4 $\rightarrow$ 1,
IF FIRING ORDER IS 1, 3, 4, 2 THEN
NO. 3 FIRES 180° AFTER NO. 1

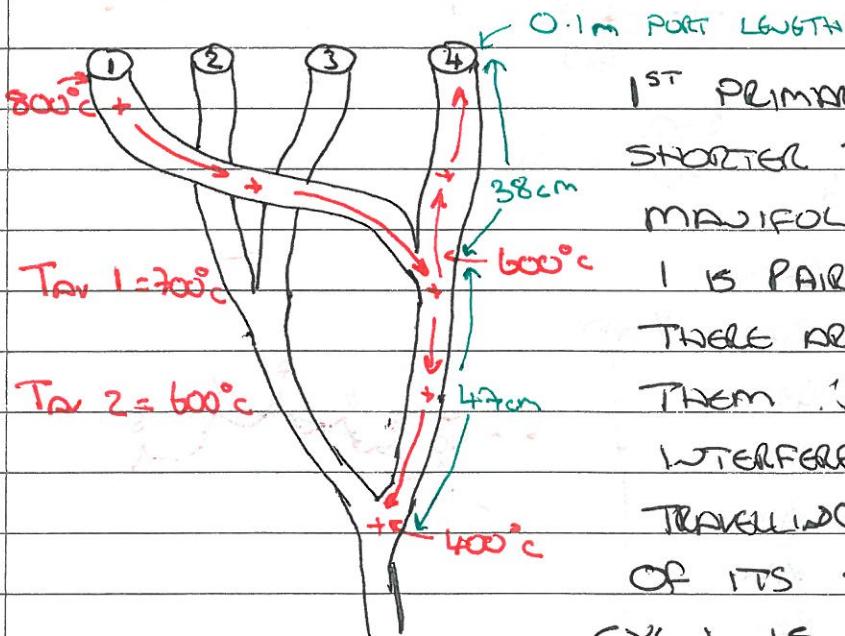
$\therefore$ NO. 3 EXHAUSTS ITS GASES 180°

AFTER NO. 1, +VE PULSE FROM NO. 1 COULD INTERFERE
WITH CYL. 3. VERY DIFFICULT TO SIMULATE, NEED
SOMETHING LIKE RICARDO WAVE.

TRIPLES HAVE 240° FIRING INTERVAL $\therefore$ IS LESS
AFFECTED BY INTERFERENCE.

ANOTHER WAY TO COMBAT THIS INTERFERENCE IS TO
USE A DIFFERENT CONFIGURATION OF EXHAUST.

FOLD FOCUS ST 170



1ST PRIMARY LENGTH OF 38 cm IS
SHORTER THAN A GOOD 4 $\rightarrow$ 1
MANIFOLD (USUALLY 80+ cm). CYL.
1 IS PAIRED TO CYL. 4 BECAUSE
THERE ARE 360° BETWEEN
THEM $\therefore$ LESS CHANCE OF NO
INTERFERENCE FROM +VE PULSE
TRAVELLING BACK UP THE PRIMARY
OF ITS PAIR. EXHAUSTING OF
CYL. 1 IS OVER BEFORE CYL. 4
BEGINS.

REALLY THIS IS TWO MANIFOLD LENGTHS AS YOU
HAVE ~~THE~~ EXPANSIONS (ALTHOUGH SMALLER) AT BOTH
38 cm + 85 cm. EVERY EXPANSION CREATES A -VE
SUCTION PULSE IN THE EXHAUSTING PRIMARY.

MEAN SPEED OF SOUND 1 = 601 m/s (FROM PEUGEOT)

$$\text{MEAN SPEED OF SOUND 2} = 330 \times \sqrt{\frac{873}{293}} = 570 \text{ m/s}$$

TIME FOR THE PULSE TO RETURN TO VALVE AS -VE.
PULSE FROM EXPANSION 2 = $\frac{2 \times 0.95}{570} \times N$

USING SAME CAN TIMING AS PEUGEOT

$$\therefore \frac{N \times 2 \times 0.95}{570} = \frac{230}{360} \times \frac{60}{\text{RPM}}$$

$$\therefore \text{RPM} = \frac{570}{N \times 2 \times 0.95} \times \frac{230}{360} \times 60$$

$$N_1 = 11,500 \text{ RPM}$$

$$N_2 = 5,750 \text{ RPM}$$

$$N_3 = 3,833 \text{ RPM}$$

$$N_4 = 2,875 \text{ RPM}$$

$$N_5 = 2,300 \text{ RPM}$$

FROM VALVE TO FIRST EXPANSION = 48 cm

MEAN $V_{\text{GAS}} = 601 \text{ m/s}$

$$\text{RPM} = \frac{601}{N \times 2 \times 0.48} \times \frac{230}{360} \times 60$$

$$N_1 = 23,998 \text{ RPM}$$

$$N_2 = 11,999 \text{ RPM}$$

$$N_3 = 7,999 \text{ RPM}$$

$$N_4 = 5,999 \text{ RPM}$$

$$N_5 = 4,799 \text{ RPM}$$

