

Colchester Triumph 2000 headstock

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Please send any comments or corrections to bob@chainganger.co.uk

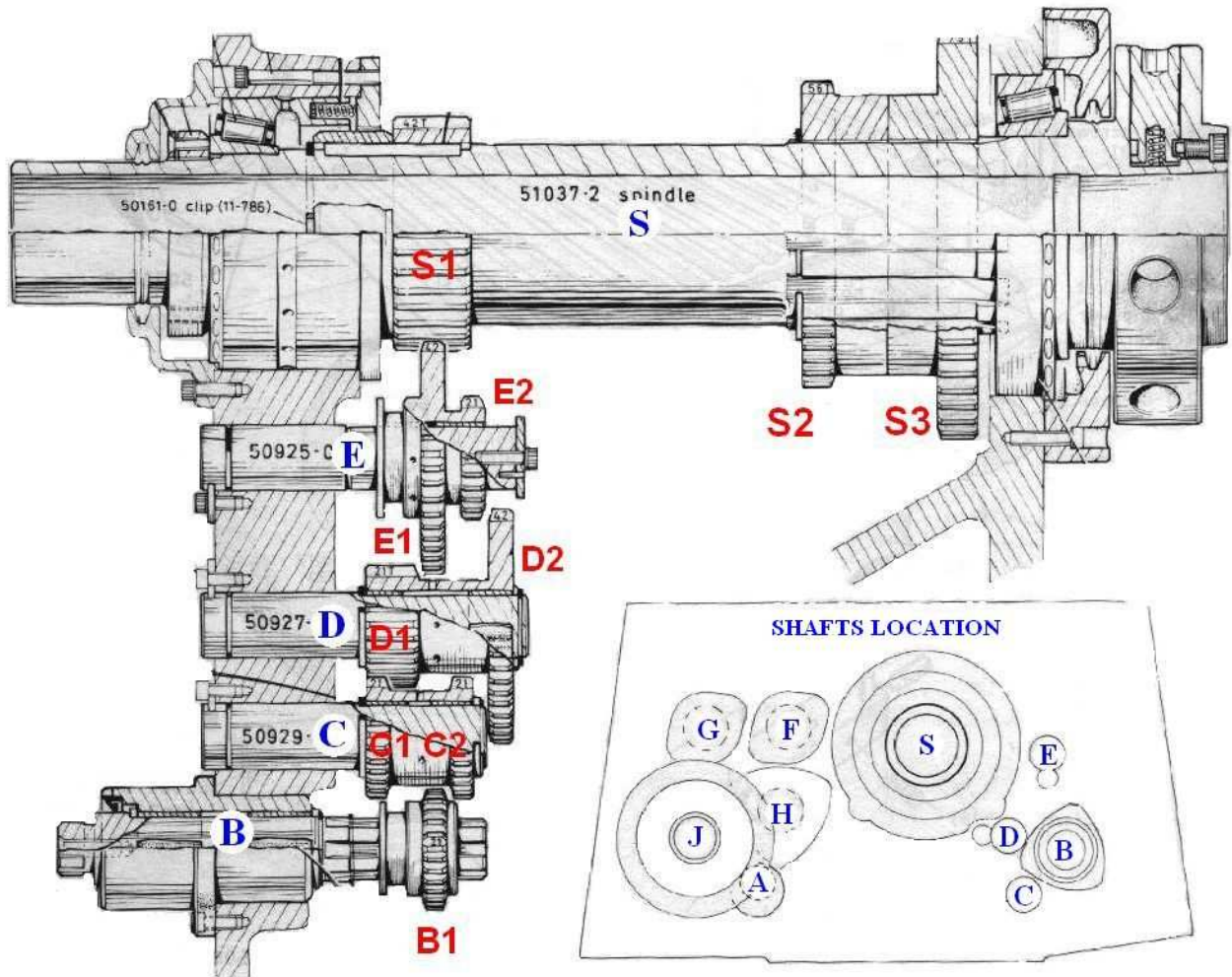


Figure 1

Warning

The figures (taken from the parts section of the Colchester manual) can be misleading as the shafts all appear to be in a plane which is not the case; the true layout can be seen in the "Shafts location" area of figure 1.

For example, in figure 1, it appears that the sliding gear B1 meshes with either C1 or C2 whereas it actually meshes with D1 or C2.

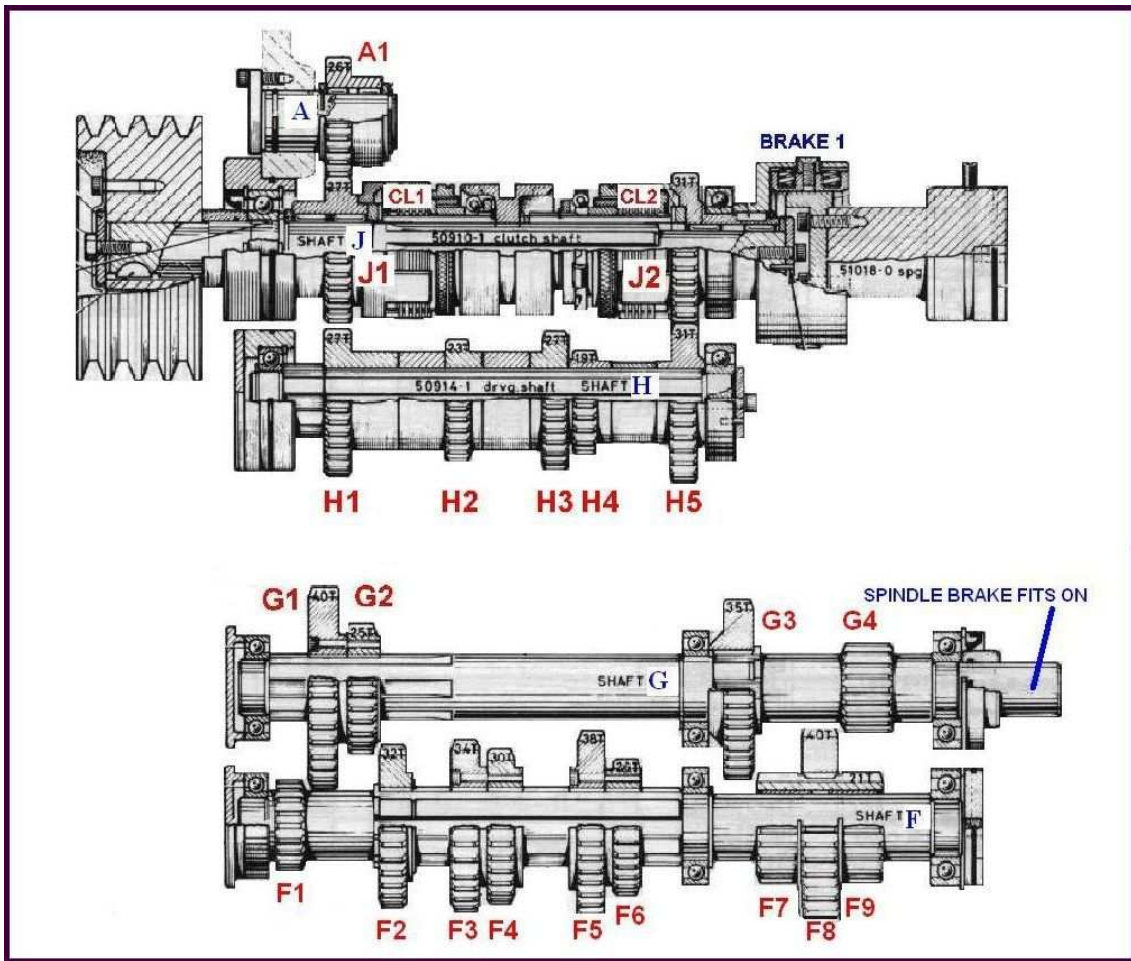


Figure 2

Gear prefix	Number of teeth on gears								
	1	2	3	4	5	6	7	8	9
S	42	56	75						
E	42	21							
D	21	42							
C	21	21							
B	21								
A	26*								
J	27*	31							
H	27*	23	27	19	31				
G	40	25	35	16					
F	16	32	34	30	38	26	21	40	21

*Prior to serial number 28413, A1 had 23 teeth and both J1 and H1 had 31 teeth. This does not affect the overall ratios because for all models the ratio of shaft J to shaft H is 1:1

Drive from motor to the main spindle

Stage 1 – from motor to pulley on shaft J

The motor pulley is sized to suit the motor's speed so that shaft J runs at about 1100 rpm.

Stage 2 – from pulley and shaft J to shaft H

Gears J1 and J2 are free running on shaft J but are coupled to it by clutches CL1 & CL2 respectively.

CL2 is engaged for forward spindle rotation: J2 drives H5 and J1 spins on shaft J.

In reverse, J1 is coupled to shaft J by CL1. H1 is driven from J1 via the intermediate gear, A1. J2 spins on shaft J.

Shaft H runs at the same speed as the pulley when a clutch is engaged.

Stage 3 – from shaft H to shaft F

The inner ring of the speed selector shifts splined clusters F3(34t)-F4(30t) and F5(38t)-F6(26t) on shaft F so that one of those gears meshes with one on shaft H

Range speeds	Driver/Driven	Ratio
25, 80, 260, 840	H4/F5	0.5000
33, 100, 350, 1120	H2/F3	0.6765
45, 140, 470, 1500	H3/F4	0.9000
60, 190, 625, 2000	H5/F6	1.1923

Stage 4 – from shaft F to the main spindle

The outer ring of the speed selector shifts cluster G1-G2 on shaft G and cluster F7-F8-F9 on shaft F.

Cluster F7-F8-F9 is free running on shaft F. All other gears on F or G are splined or fixed to their respective shafts.

F1(16t) or F2(32t) drives G1(40t) or G2(25t) on shaft G.

G4(16t) or G3(35t) drives F7(21t) or F8(40t) of the F7-F8-F9 cluster.

F8(40t) or F9(21t) of the cluster drives S2(56t) or S3(75t) of the main spindle.

Range speeds	Gears	Ratio	Gears	Ratio	Gears	Ratio	Overall ratio for stage 4
25 33 45 60	F1/G1	0.4000	G4/F8	0.4000	F9/S3	0.2800	0.0448
80 100 140 190	F2/G2	1.2800	G4/F8	0.4000	F9/S3	0.2800	0.1434
260 350 470 625	F1/G1	0.4000	G3/F7	1.6667	F8/S2	0.7142	0.4761
840 1120 1500 2000	F2/G2	1.2800	G3/F7	1.6667	F8/S2	0.7142	1.5237

The overall ratio between the pulley and the spindle is the stage 3 ratio multiplied by the overall ratio for stage 4.

Overall speeds

Nominal speed	Stage 3 ratio	Stage 4 ratio	Overall ratio	Overall ratio x 1100
25	0.5000	0.0448	0.0224	24.6
33	0.6765	0.0448	0.0303	33.3
45	0.9000	0.0448	0.0403	44.3
60	1.1923	0.0448	0.0534	58.7
80	0.5000	0.1434	0.0717	78.9
100	0.6765	0.1434	0.0970	106.7
140	0.9000	0.1434	0.1291	142.0
190	1.1923	0.1434	0.1717	188.9
260	0.5000	0.4761	0.2381	261.9
350	0.6765	0.4761	0.3221	354.3
470	0.9000	0.4761	0.4285	471.3
625	1.1923	0.4761	0.5677	624.4
840	0.5000	1.5237	0.7619	838.0
1120	0.6765	1.5237	1.0308	1133.9
1500	0.9000	1.5237	1.3713	1508.5
2000	1.1923	1.5237	1.8167	1998.4

Drive from main spindle, S, to swing frame gear mounted on left end of shaft B.

S1 drives E1 of cluster E1-E2 which is free running on shaft E and slides on E as controlled by the H/L control.

In the H position E1 drives D1 of cluster D1-D2.

In the L position E2 drives D2.

D1 always drives C1 of cluster C1-C2

In the right hand thread and feed position of the control lever, gear B1 is driven by C2 but. in the left hand thread position, B1 is driven by D1.

In the H position of the H/L control lever, shaft B runs at twice the main spindle speed or half main spindle speed when in the L position.

Explanation requested

Figure 2 shows BRAKE 1 on the right end of shaft C: This is not the spindle brake as that is fitted on the end of shaft G on the outside of the headstock housing. Brake 1 appears to have been dispensed with from serial no.36035. Can you explain its function?