Note 13 Part 1
Sub-Note A addition 20 May 2019
Cosworth type TJ piston

In the web-site "f1technical.net/forum" the contributor "Mudflap" provided a detailed stress/temperature analysis of a Cosworth type TJ piston. This additional Sub-Note A Note 13 Part 1 shows the drawing of the piston from that source for comparison with the earlier pistons in that Note.

Cosworth TJ

Installed in 2003 JaguarR4 and 2004 Jaguar R5 (TJ perhaps indicates "**T**eam **J**aguar?).

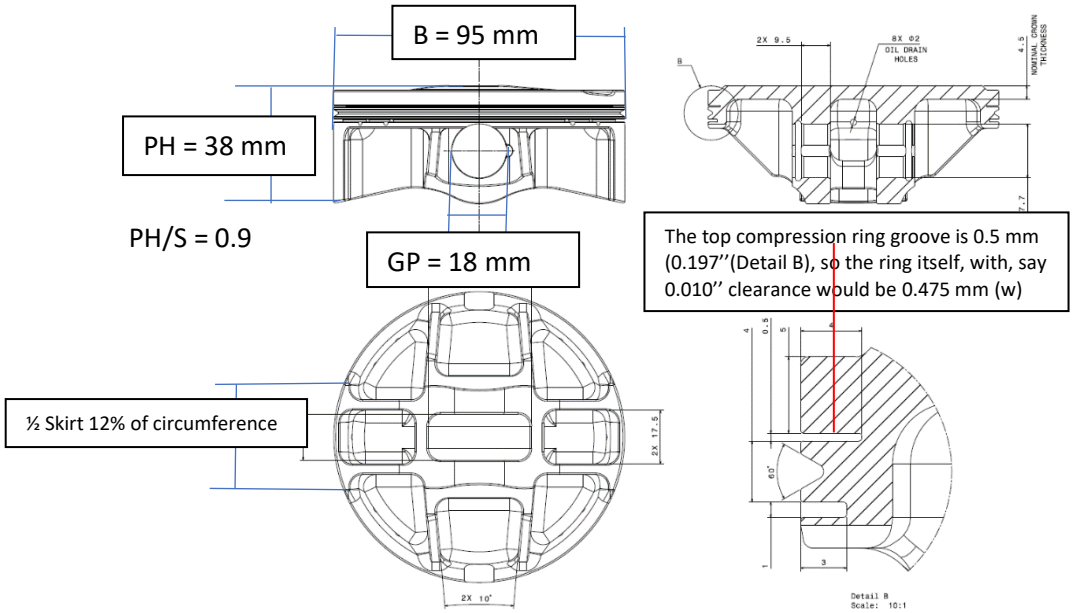
After Jaguar was sold to Red Bull, the TJ engine continued in their 2005 RB1

90V10 Bore (B) 95/Stroke (S) 42.3* mm =2.246; V = *Assumed 2998 cc.

Rev. limit 19,000 RPM. Assumed Peak Power (PP) speed (NP) was 18,500 RPM.

PP claimed 915 BHP.

BMPP = 14.76 Bar @ MPSP = 26.08 m/s



Gudgeon pin (GP)/S = 42%

Cut-away of skirt = 76%

Maximum Piston Deceleration at Peak Power RPM (MPDP), assuming that Con.-Rod Length (CRL)/Stroke (S) = 2.5, was 9,710g.

So, Top ring axial width (w) x MPDP = 0.475mm x 9,710g = 4,612 mm.g

Piston mass – not given.

This 2003 – 05 piston proportions are very similar to those given for 1996 pistons in Note 13 Part 1, **except** for the thinner top ring. The value of w.MPDP is not very far above the statistical critical value (flutter onset) of 4,000 mm.g given in that Note for rectangular iron rings. Density of the TJ ring is unknown, but may be lower than iron. Honda in 2006-2008 ran successfully with Ti-alloy (see Corrections & Additions, P.10, 30 October 2015), which was 60% lower density than iron.

Piston material

Given as 2618A. This is virtually the same as RR58, whose %age composition by weight (see Note 14) is:-

Si	Fe	Cu	Mg	Ni	Ti	Al
0.2	1	2.5	1.6	1	0.1	93.6

with control over various trace elements. Cosworth developed their own process methods for RR58.