



Compression Ratio Quick Look up guide for V6 Wingless Sprint 3.8Litre.

Following 3 tables for some early OEM VR Pistons with 34.7cc Dish

Std Bore 96.52mm **Deck Height 1mm** Head Gasket 1mm 34.7cc Piston Dish

Combustion Chamber Volume CC's	Resulting Compression Ratio
37	8.32 : 1
36	8.41 : 1
35	8.49 : 1
34	8.58 : 1
33	8.68 : 1
32	8.77 : 1
31	8.87 : 1
30	8.97 : 1

* Note Ratio increases approximately 0.09 to 0.1 per CC of chamber size.

Std Bore 96.52mm **Deck Height 0mm** Head Gasket 1mm 34.7cc Piston Dish

37	9.00 : 1
36	9.10 : 1
35	9.21 : 1
34	9.31 : 1
33	9.42 : 1
32	9.54 : 1

1mm Over Bore (97.52mm) Deck Height 0mm Head Gasket 1mm 34.7cc Piston Dish

37	9.16 : 1
36	9.27 : 1
35	9.38 : 1
34	9.49 : 1

Std Bore (96.52mm) Deck Height – 0.25mm (0.010" proud) Head Gasket 1mm **34.7cc Piston Dish**

37	9.19 : 1
36	9.30 : 1
35	9.41 : 1
34	9.52 : 1

Following 3 tables for late VR Piston and NEW VR Piston with smaller 33.5cc Dish and over deck.

Std Bore (96.52mm) Deck Height - .25mm (0.010" proud) Head Gasket 1mm 33.5cc Piston Dish

37	9.32 : 1
36	9.43 : 1
35.5	9.48 : 1
35	9.54 : 1

0.5mm Over Bore (97.02mm) Deck Height - .25mm (0.010" proud) Head Gasket 1mm 33.5cc Piston Dish

38 hard to find this size	9.30 : 1
37.5	9.35 : 1
37	9.41 : 1
36.5 common	9.46 : 1
36	9.52 : 1

1mm Over Bore (97.52mm) Deck Height - .25mm (0.010" proud) Head Gasket 1mm 33.5cc Piston Dish

38 hard to find this size	9.38 : 1
37.5	9.44 : 1
37	9.49 : 1

Following table for VP Piston with 25.5 cc Dish and reduced Pin Height

Std Bore 96.52mm Deck Height 1mm Head Gasket 1mm VP 25.5cc Piston Dish

37	9.19 : 1
36	9.30 : 1
35	9.41 : 1
34	9.52 : 1

Notes:

- Its Advisable not to deck any of these blocks. All VN series 2 and early VP Pistons have a lower compression height (piston pin centreline to top of piston), and thus the piston will be down the bore by up to 1mm at TDC (top dead centre). It is far more practical to fit later VR piston to the engine. If you have good used Early OEM VR pistons with a slightly larger dish of 34.7, it gives you good flexibility with cylinder head selection (eg, will allow a head with smaller chamber without going over 9.5). However, advise you to have them crack tested.

- Sourcing cylinder heads. The best advice I can give is try and find a set that have never been machined. Again, the less material that has been surfaced from the head gasket face, the larger the chamber will be. This allows you the opportunity to go to 0.040" (1mm) over bore. However, if you want to keep the engine for a few seasons and on a tight budget, don't be too tempted to go straight to 1mm oversize chasing power. It will leave you with no-where to go if you have engine damage, and will be forced to find another block and start again.
- Have a look at the second to last Table..... For 1mm oversize bore, with 33.5 cc VR Piston, you are VERY LIMITED with cylinder head choices. You are going to need un-touched factory heads with nice big chamber volumes to run this combo safely, OR..... sink the valves into the Head to remove some compression at the detriment of flow potential. Motorsport and engine building is full of compromises. For every alteration you make, there is a positive and negative effect. Always consider both. Eg: don't go chasing maximum bore size and engine capacity then sacrifice flow in the heads to combat the compression issues.
- Most of these engines now have 200,000 km or more on them. If you find a VN series 2 / VP Block which has been running VP Pistons (further down the bore), don't fit VR pistons without removing the "ridge" that the top ring has created at the top of the bore, as the VR rings will come further up the bore and damage or break them. If on a tight budget, remove the ridge and hone, or select 0.010" (0.25mm) oversize pistons, bore and hone. This will remove the ridge in most cases, give you nice straight bores, and leave enough meat on the bores to go to another 2 oversize pistons if bore damage occurs. Also, try and look at the cost of engines as a two season cost. If you need to rebuild it every season, factor that in to the cost. If you can run it for two seasons, divide the cost of the engine work by two to get the true seasonal cost.
- CC all your combustion chambers. If you cant do it, ask a machine shop to do them for you prior to machining the heads. Develo Pro have various heads on the shelf of different combustion chamber size to suit most Bottom ends.
- Do not "Buff" the old head gasket material off the block or cylinder heads with course scotch-brite wheels, flapper discs, or heavy duty wire wheel. These will round off and curve the surfaces and lead to gasket failure. Scrape the gasket off with a good quality scraper without gouging the head or block, and clean off with Solvent. Check the head and block surfaces are flat with a professional straight edge and feeler gauges.
- Check all your piston deck heights, not just one. At minimum, a front and rear cylinder from each bank (1 and 5, 2 and 4) to check deck true. Make sure you have oil on the main bearings and conrod bearings as it will make a couple of thou difference.
- When all else fails, and you are out of options, thicker head gaskets may be an option if available. You would only do this if for some reason someone has decked the block to suit lower VP Pistons, or has shaved far too much off the head, and you need to lower the compression by means of thicker brand gasket.
- These charts are purely a guide to help. Final measuring and maths need to be carried out very accurately to assure the final compression figures. Eg:, in the maths for these charts, I have not allowed for the area between the top part of the piston and the cylinder wall, down to the top compression ring. This area is part of the volume at TDC, and when taken into account, these small things make a difference to compression ratios.