

## APT Flow Test Comparison

Initial testing and modification of 5 port alloy MGB cylinder head.  
By David Anton December 1999

These notes correspond to the graph and data table shown below.

The colors of the text relates to the line color of the relevant data line on the graph.

All testing was done with APT Rimflo type stainless valves.

**As an additional reference the flow figures from a stock factory head have been included for reference. It would probably be fair to say this head was above average in its flow capabilities, most stock heads have a job to reach a maximum flow of 120 CFM @ 0.500" lift.**

I'm not sure what instructions were shipped with the head to our customer, but they should point out that as supplied it would be necessary to get a good 3 angle valve job done on the seats.

**All exhaust testing was done using the end exhaust port. The shape of the port is a lot worse than stock as the port has been straightened as it leaves the valve seat, this is not what it actually wants. The net result is that the flow on the inner ports are very similar to the end ones. With a factory head the end ports become a lot more efficient as the lift goes above 0.250".**

**Now compare the modified port combined with a little chamber reshaping. Remember this is still the same valve, but now the seat has been cut so it actually has 4 angles instead of the single 45 degree it had originally. All the porting work involved trying to move the port wall back on the cylinder wall side, as well as blending out the original nasty short side turn.**

**Note that this valve size, 1.560" is the one used in MGA and very early 1800 engines. There is a lot of rubbish talked about valve sizes, especially how they can be too big, which causes loss of low end and all sorts of other problems. What is not sometimes realized is that all these old design British engines with a small bore in comparison to the stroke have an inherent problem in that there is just not enough room to fit a valve that's too big! Certainly a very big valve in these small chambers runs into a situation of the increased shrouding from the cylinder wall, but that's only part of the valve circumference, the rest of it, if done correctly can give you a gain, perhaps not much, but a gain is a gain and we sure can use it!**

**These figures are from the factory cast iron head, we have been using them as a baseline for over 12 years, they are certainly better than you would normally see, but if we sorted through and found the worst head we have, then who are we kidding? Only ourselves ... right?**

**There is one slight testing anomaly here, this head was tested on an older flowbench, and I'm sure on the new fully computerized model we use now that the figures would probably be in the order of 3-5% less.**

**The last two tests in the data chart are for the inlet, first with a 1.625" valve, and lastly 1.690".**

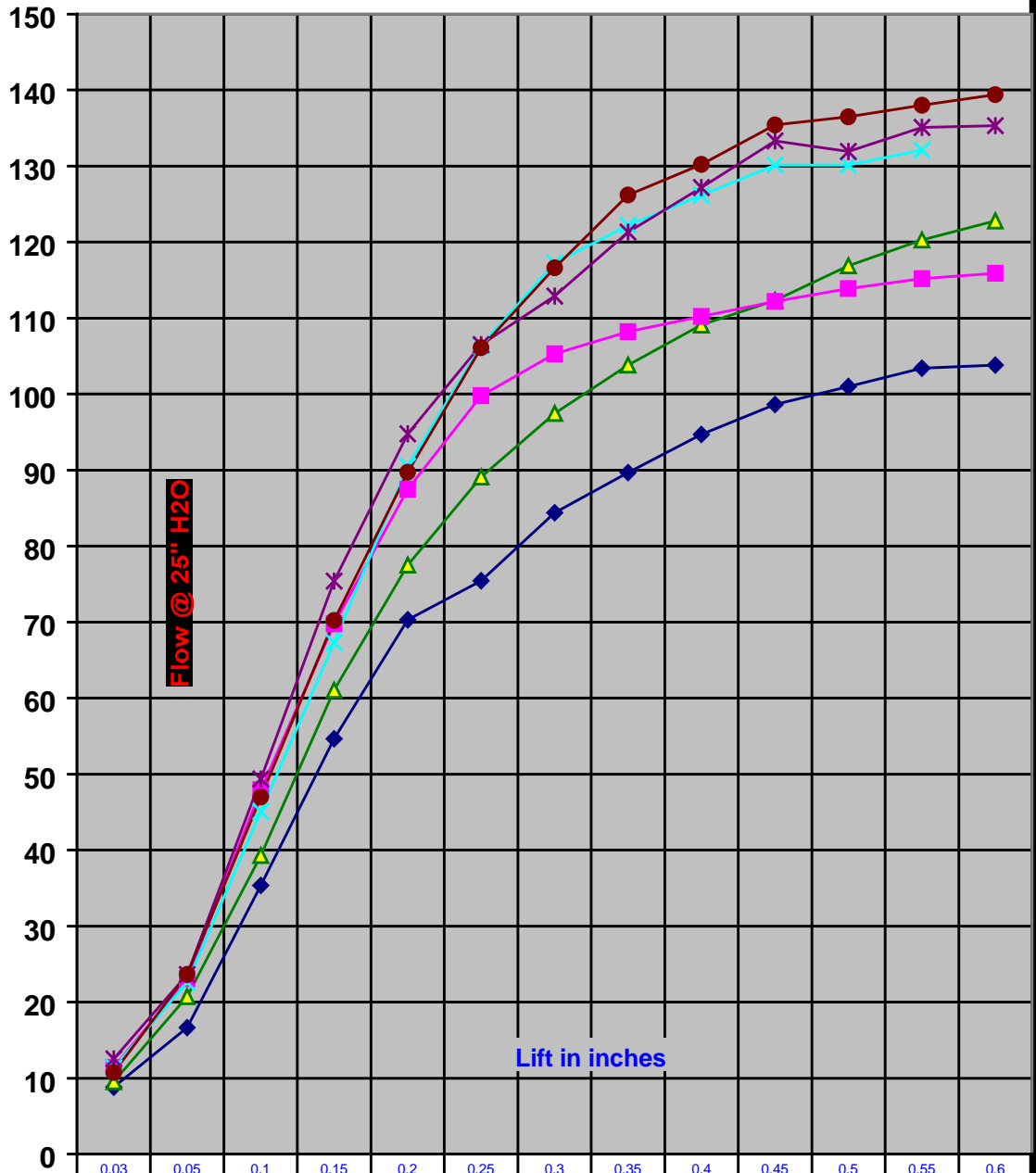
**The 1.69" valve required a larger seat insert, where as going to 1.625" can be accommodated on the seat insert as supplied with the head.**

**Both of these tests involved porting work, most of it around the valve seat area, with only a little at the manifold face.**

**The fact that this was a customers head which had to be fitted to a car precluded going too crazy trying to chase airflow at this stage!**

For more info on the theory and practice of cylinder head development pick up the 3<sup>rd</sup> edition copy of David Vizards book, recently printed September 1999 "Tuning the A series engine" # B-01

# MGB Head - Alloy V Stock



Flow @ 25" H2O

Lift in inches

	0.03	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6
Stock Alloy Exhaust 1.345"	8.818	16.63	35.36	54.64	70.29	75.45	84.39	89.67	94.68	98.64	101	103.4	103.8
Modified Alloy Exhaust 1.345"	9.53	20.73	39.27	61.06	77.52	89.08	97.48	103.8	109.1	112.3	116.9	120.3	122.8
Stock Alloy Intake 1.56"	11.4	23.08	47.91	69.78	87.48	99.8	105.3	108.2	110.2	112.2	113.9	115.2	115.9
Stock Factory Intake 1.625"	11.374	22.598	45.076	67.303	90.53	106.37	117.26	122.21	126.17	130.13	130.13	132.11	
Modified Alloy Intake 1.625"	12.51	23.62	49.35	75.42	94.79	106.5	112.9	121.3	127.2	133.3	131.9	135.1	135.3
Modified Alloy Intake 1.69"	10.74	23.61	46.97	70.22	89.73	106.1	116.6	126.2	130.2	135.4	136.5	138	139.4

◆ Stock Alloy Exhaust 1.345"	▲ Modified Alloy Exhaust 1.345"
■ Stock Alloy Intake 1.56"	✕ Stock Factory Intake 1.625"
✱ Modified Alloy Intake 1.625"	● Modified Alloy Intake 1.69"