Full-Race VW 1.8T Turbo Manifold Test ProStreet Tubular Manifold vs. Log Style Manifold.

Abstract

Full-Race Motor sports conducted a back to back manifold experiment testing the performance gains of our ProStreet manifold versus a log or cast style manifold. All variables during this experiment were held constant as possible. The test proved that Full-Race ProStreet manifold offers greater performance than a log or cast style manifold!. Midrange and overall power band gains where also greater with the ProStreet manifold when compared to the log or cast style manifold.

Introduction

A back to back manifold test was conducted to determine the performance difference between a Full-Race ProStreet turbo manifold and a traditional log or cast style turbo manifold. Every possible aspect and or variable of the experiment was controlled. All testing was performed on an engine dyno. The only variable that was manipulated was the swapping of manifolds. The tests performed were setup with the following conditions:

Test #1

- -VW 1.8T motor
- -Log/Cast manifold
- -Garrett GT30R



Figure 1. Cast/Log Style Manifold

<u>Test #2</u>

- -VW 1.8T motor
- -FR ProStreet Manifold
- -Garrett GT30R



Figure 2. FR-ProStreet Turbo Manifold

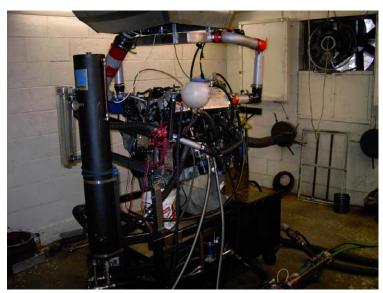


Figure 3. Engine Dyno

Results

The results were quite astonishing, but do make a lot of sense. The log manifold spooled the turbo about 100 rpm sooner than the equal length. From \sim 4400 rpm on the log manifold could not keep up with the ProStreet manifold.

ATP LOG vs FULL-RACE IND. RUNNER MANIFOLD FULL-RACE Hp --- ATP Trq -운 , pth , p

Figure 4. Full Race manifold power output vs ATP log at identical boost pressures.

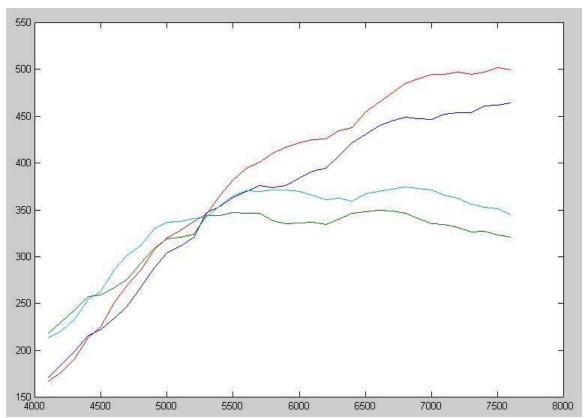


Figure 5. 100 octane, 23.5psi boost pressure comparison graphs. FR manifold output is denoted as trq=aqua line and bhp=red line. Cast manifold output is denoted as trq=green line and blue=bhp.

	Listing o Channel G Printed o Test Desc EngSpd	roup: Tor n Feb 25, ription: STP HP	rque, Powe , 2005 at Accel. T	er, AFR, Pre 16:31:08 Cest - 20	essures a	ind Temps	83.SFD) etc F	Page 1 Water	AirTmp degF
**	3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 5000 5100 5200 5300 5500 5600 5700 6800 6600 6700 6800 6600 6700 6800 68	363.5 369.6 375.8 374.0 376.2 384.1 391.5 394.4 0, 407.6 0, 422.0 430.6 0, 439.3 0, 444.7 0, 446.4 0, 452.1 0, 454.2 0, 461.1	346.3 347.9 349.6 348.6 346.6 340.5 1 334.4 334.4 331.2 2326.3 26 326.3 323.4	12.4 12.2 12.1 11.9 12.1 11.8 11.3 11.0 10.8 10.8 10.8 10.9 10.9 11.0 11.0 11.1		85.7 86.7 88.3 90.0 91.9 93.3 93.8 94.9 95.9 97.3 98.6 100.6 101.2 103.0 104.7 105.8 107.5 108.6 109.3 110.9 113.0 114.3 115.9 117.0 118.2 119.4 122.3 122.3 124.1 125.4 126.3 126.3	152 152 152 152 152 153 153 153 153 153 153 153 153 153 153		23 23 23 24 24 24 24 24 25 25 25 25 25 25

Figure 6. Engine dyno data.

100 Unkeded 26BAR

Listing of: BBQU8364 (C:\WINDYN\901\05\BOBQ\BBQU8364.SFD)
Channel Group: Torque, Power, AFR, Pressures and Temps etc Page 1
Printed on Apr 20, 2005 at 10:57:13
Test Description: Accel. Test - 200 rpm/second

	EngSpd RPM	STP HP CHp	STPTrq Clb-ft	O2AFR Ratio	VolEff %	Oil psig	Oil degF	Water degF	AirTmp degF
	4100	166.8	213.6	11.7	0.0	94.9	168	180	72
	4200	176.4	220.6	11.6	0.0	96.1	168	180	72
	4300	191.2	233.5	11.5	0.0	97.4	168	180	72
	4400	213.0	254.2	11.4	0.0	99.4	168	180	72
	4500	225.1	262.7	11.2	0.0	100.8	168	180	72
	4600	250.9	286.5	11.2	0.0	102.4	168	180	72
	4700	269.8	301.5	11.2	0.0	103.2	168	180	72
	4800	285.1	311.9	11.3	0.0	104.6	168	180	73
200	4900	307.2	329.3	11.3	0.0	105.4	168	180 180	74
100	5000	320.3	336.4	11.3	0.0	106.4	168 168	180 179	73 72
	5100 5200	327.8	337.6	11.2 11.2	0.0	109.3	168	179	72
	5300	345.6	342.5	11.1	0.0	109.2	168	178	71
	5400	364.6	354.6	11.1	0.0	111.5	168	178	72
	5500	381.9	364.7	11.1	0.0	113.6	168	178	72
	5600	394.8	370.2	11.1	0.0	115.0	168	178	72
	5700	400.8	369.3	11.1	0.0	116.0	168	178	73
	5800	410.2	371.5	11.1	0.0	116.8	168	178	73
	5900	417.1	371.3	11.1	0.0	119.4	168	179	73
	6000	421.9	369.3	11.1	0.0	118.8	166	179	73
	6100	424.9	365.9	11.0	0.0	120.2	167	179	73
	6200	425.5	360.5	11.0	0.0	120.6	167	179	73
	6300	434.7	362.4	11.0	0.0	120.6	168	179	72
	6400	437.5	359.0	11.0	0.0	121.7	168	180	73
	6500	454.3	367.1	11.0	0.0	121.4	168	181	73
	6600	464.3	369.4	11.0	0.0	122.4	168	181 181	73 73
	6700	474.7	372.1	11.0	0.0	123.6 123.8	168 168	181	73
	6800	484.9	374.5	11.0	0.0	124.3	168	181	73
	6900 7000	490.0	373.0 371.0	11.0	0.0	125.4	168	181	73
	7100	494.7	365.9	11.0	0.0	125.7	168	181	73
	7200	496.7	362.3	11.0	0.0	126.3	169	181	73
	7300	494.4	355.7	11.0	0.0	126.4	169	181	73
	7400	496.7	352.5	11.0	0.0	127.1	169	181	73
**	7500	502.0	351.5	11.0	0.0	126.7	169	181	73
	7600	499.1	344.9	11.1	0.0	127.6	169	181	74
**Rai	nge: 500	00 RPM -	7500 RI	PM					
AVG:	6250	430.5	361.2	11.1	0.0	119.2	168	180	73
MIN:	5000	320.3	336.4	11.0	0.0	106.4	166	178	71
MAX:	7500	502.0	374.5	11.3	0.0	127.1	169	181	73

Figure 7. Engine dyno data.

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Cisting of: BBQU8366 (C:\WINDYN\901\05\BOBQ\BBQU8366.SFD)
Channel Group: Torque, Power, AFR, Pressures and Temps etc Page 1
Printed on Apr 20, 2005 at 12:29:15
Test Description: Accel. Test - 200 rpm/second

		STP HP CHp	STPTrq Clb-ft		VolEff %	Oil psig	Oil degF	Water degF	AirTmp degF	
	4100	174.8	223.9	11.8	0.0	94.5	164	179	77	
	4200	180.8	226.1	11.7	0.0	95.8	164	179	77	
	4300	197.1	240.8	11.5	0.0	97.5	164	179	77	
	4400	210.6	251.4	11.5	0.0	98.5	164	179	77	
	4500	225.8	263.5	11.4	0.0	99.9	164	179	77	
	4600	242.7	277.1	11.3	0.0	100.8	164	178	76	
	4700	255.4	285.4	11 2	0.0	102.6	164	178	76	
	4800	273.7	299.5	11.3	0.0	103.7	164	178	77	
	4900	301.6	323.3	11.3	0.0	105.1	164	178	76	
	5000	339.0	356.1	11.2	0.0	106.3	164	178	76	
	5100	371.6	382.6	11.2	0.0	106.9	164	178	76	
	5200	376.4	380.1	11.0	0.0	108.1	164	179		
	5300	380.5		11.0	0.0	108.7	164			
	5400	388.8	378.1		0.0		164		75	
	5500	399.6	381.6	11.0	0.0	112.2	164			
	5600	414.3	388.5	11.0	0.0	112.6	164		75	
	5700	426.4	392.8	11.0	0.0	114.2	164 165	179	75	
	5800	435.8	394.6	11.2	0.0	114.9	165	179	75	
	5900	446.4	397.4	11.5	0.0	117.3	165	179	75	
	6000	454.6	397.9	11.3	0.0	117.1	165	180	76	
	6100	460.8	396.8	11.0	0.0	120.3	165	180	76	
	6200	459.0	388.8	10.9	0.0	120.2	165	178	76	
	6300	464.0	386.9	10.8	0.0	121.1	165	179	76	
	6400	469.4	385.2	10.8	0.0	122.1	166	180	75	
	6500	481.9	389.3	10.8	0.0	121.7	167	180	75	
	6600	483.5	384.8	11.0	0.0	123.0	166	180	75	
	6700	511.1	400.8	11.0	0.0	124.5		180	75	
	6800	524.2	404.0	11.1		125.3		180	75	
	6900	527.8 531.7		11.2	0.0	124.8		180	7.5	
	7000	533.6	394.8	11.2		124.8		180	75	
	7100	530.6	387.0	11.2	0.0	125.4	166		75	
	7200 7300	532.0				126.6		180	75	
	7400	529.8	382.8 376.0	11.2		126.0	166	181		
		531.0	371.9	11.2		126.3	166		74	
	7600	526.4	363.8	11.1	0.0	125.2	166	181	75	
a	nge: 50	00 RPM -	7500 F		2 192	220 5	165	179	75	
:	6250	461.7	387.6	11.1	0.0	118.5	164	178		
:		339.0	356.1	10.8	0.0	106.3	167	181		
:	7500	533.6	404.8	11.5	0.0	126.6	101	101		

Figure 8. Engine dyno data.

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- 40	Printed o Test Desc	n Apr 20	, 2005 a	t 13:00:	51				
								-	
All little	EngSpd RPM	STP HP CHp	STPTrq Clb-ft	Ratio	VolEff %	Oil psig	0il degF	Water degF	AirTmp degF
7 1									
100	4100	153.5	196.6	11.9	0.0	94.2	165	180	77
The same	4200 4300	160.4	200.5	11.8 11.6	0.0	94.8 96.6	165 165	180 180	77 78
	4400	187.1	223.3	11.4	0.0	97.9	165	180	78
	4500	211.3	246.6	11.2	0.0	99.9	165	180	78
	4600 4700	225.8 264.1	257.8 295.1	11.1	0.0	99.4	165 166	180 180	79 79
100	4800	283.4	310.1	11.2	0.0	102.6	166	181	79
	4900	303.5	325.3	11.3	0.0	103.7	167	181	78
**	5000	319.8	335.9	11.3	0.0	104.3	167	181	78
	5100 5200	345.8 360.8	356.1 364.4	11.2 11.2	0.0	106.6	167 167	181 181	79 79
	5300	391.5	388.0	11.0	0.0	108.8	167	181	78
188 L	5400	407.7	396.5	11.0	0.0	110.4	168	181	78
170	5500	419.7	400.7	11.0	0.0	111.4	168	181	78
3,50	5600 5700	429.1 441.8	402.4	11.0	0.0	111.9	168 167	181 181	78 78
	5800	446.9	404.7	11.0	0.0	114.8	167	181	7.8
	5900	449.3	400.0	11.0	0.0	115.8	167	181	77
	6000	447.5	391.7	10.9		117.2	167	181	77
	6100 6200	447.8	385.5 382.5	10.9		117.8	167 167	180 180	77
	6300	455.8	380.0	10.7	0.0	119.1	167	180	78
100	6400	465.5	382.0	10.6	0.0	120.9	168	180	78
	6500	477.1	385.5	10.6	0.0	120.8	168	180	78
	6600 6700	485.8	386.6	10.7	0.0	121.9	168 168	180 181	78 78
	6800	513.4	396.5	11.0	0.0	122.5	167	181	78
	6900	518.8	394.9	11.0	0.0	122.8	167	181	78
	7000	521.7	391.4	11.0	0.0	124.1	167	181	78
	7100 7200	524.6 521.4	388.1	11.0	0.0	124.1	167 168	181 181	79 79
	7300	522.9	376.2	11.0	0.0	124.9	168	181	79
	7400	517.7	367.4	11.0	0.0	125.8	169	181	79
**	7500 7600	517.4 515.9	362.3	11.0	0.0	125.7	169	182	79 79
	7000	313.9	356.5	11.0	0.0	124.8	170	182	19
100000000000000000000000000000000000000	nge: 500		7500 RF						The second
AVG: MIN:		457.7	384.5	2.0	0.0	117.6	168	181	78
MAX:		319.8 524.6	335.9	10.6 11.3	0.0	104.3	167 169	180 182	77 79
11111									

Figure 9. Engine dyno data.

C16 Rough sting of: BBQU8390 (C:\WINDYN\901\05\BOBQ\BBQU8390.SFD) hannel Group: Torque, Power, AFR, Pressures and Temps etc Printed on Apr 20, 2005 at 17:35:15 Test Description: Accel. Test - 200 rpm/second EngSpd STP HP STPTrq 02AFR VolEff Oil Water AirTmp RPM Clb-ft Ratio psig degF degF degF 170 4100 161.6 207.0 12.1 0.0 92.3 181 213.8 4200 171.0 12.1 0.0 94.2 170 181 4300 180.7 220.7 12.0 0.0 95.0 170 181 242.0 11.7 4400 202.8 170 0.0 96.6 181 228.0 77 4500 266.1 11.5 97.8 170 181 245.9 255.0 170 77 77 77 4600 99.1 280.7 11.5 0.0 181 4700 11.6 100.8 170 274.6 11.6 4800 300.4 102.5 170 0.0 181 4900 287.1 307.7 102.8 170 11.6 0.0 181 77 304.2 319.6 11.6 104.9 170 181 329.4 319.9 11.6 170 78 5100 105.8 181 346.8 350.3 11.5 106.7 170 181 78 379.6 77 77 77 5300 383.1 108.0 170 181 11.5 0.0 170 5400 404.6 393.5 11.4 0.0 108.9 182 437.4 417.7 11.3 0.0 110.2 170 181 77 449.1 421.2 110.5 170 11.3 181 77 170 428.0 111.7 5700 464.5 11.3 0.0 181 5800 113.2 474.2 429.4 11.3 181 77 5900 488.3 434.7 11.3 114.9 170 181 77 489.6 6000 428.6 117.0 170 181 421.6 6100 489.7 0.0 117.3 170 181 77 77 6200 492.5 117.9 181 77 6300 494.1 411.9 11.0 117.9 170 181 502.5 11.0 77 6400 412.4 0.0 119.6 170 181 78 410.5 417.0 11.0 0.0 119.9 6600 524.0 11.0 120.7 170 180 0.0 6700 531.3 416.5 11.0 0.0 121.8 170 78 543.0 419.4 11.0 0.0 122.3 78 78 11.0 6900 550.3 418.9 122.4 181 123.5 554.3 415.9 11.0 0.0 170 78 7100 552.9 409.0 78 125.3 402.2 551.4 11.0 0.0 123.2 545.9 392.7 11.0 124.6 545.4 11.0 125.6 7400 387.1 549.8 385.0 11.0 124.2 182 11.0 537.6 124.0 **Range: 5000 RPM -7500 RPM 6250 480.6 77 AVG: 402.7 181 116.8 304.2 554.3 319.6 434.7 11.0 MIN: 104.9 170 78 MAX: 125.6 182

Figure 10. Engine dyno data