Small-Block Intake Manifold Survey

Comparing the performance intake manifolds for 289-302 engines.

Text and Photos by Tom Wilson - Originally ran in Super Ford Magazine July 1988

(Although this article is from 1988 and newer technology manifold have been released - such as the Weiand Stelth, Edelbrock Performer RPM and Victor Jr., many of the manifold designs are still valid for today. Where possible I have included crossover info to similar manifolds not tested. - Fletch)

To begin on the right foot, we'd like to point out the significance of the word 'survey' in the title. This is not an intake manifold shootout, nor is it a search for the ultimate horsepower, although these are performance manifolds. This is an overview of single-plane, single four-barrel intake manifolds for the small-block Ford, and where they make power in the rpm range. Thus, there are no winners or losers - selecting the best manifold from this listing depends on your application just as much as how each manifold makes power.

All work, and there was a bunch of it, was done at Cooks Auto Parts and Service, Inc. (24210 South Avalon Boulevard, Carson, California 90745, 213-830-6471), on Mike Cook's SuperFlow flow bench and dyno. Besides a big thanks to Mike, we also wish to acknowledge our debt to Weiand Industries for the use of their small-block test engine. The '85 ½ 5.0-liter HO crate motor was

straight out of the Motorsports catalog except for the substitution of the M-6250-A311 Motorsport hydraulic camshaft *(280°/290° @ 0.005", 204°/214° @ 0.050", 0.448/0.472 lift - Fletch)* in place of the original. All other pieces were stock ’85 Mustang GT, including carburetion - Holley 600 cfm - and factory tube headers. No accessories were connected during testing, including the water pump, which was powered by an electric motor.

All manifolds were run out of the box with no modifications. Some of the intakes would obviously have made more power with minor casting clean up, but in the interest of comparing applies and apples, the grinder went unused. Other factors normally fiddled with during dyno tests were left alone for the same reason. Ignition timing was set once during the baseline run, then left untouched. Even the carburetor was left alone, except to install it on each manifold. In other words, this was a true ‘bolt-on’ exercise - the only differences we recorded should be the manifolds themselves.

Besides the dyno testing, we ran the manifolds across the flow bench, measuring a center and end port on each. An Alan Root/Motorsport aluminum cylinder head was used for this test, insuring there would be little or no restriction by the head. The port was run open, except for an intake valve inserted upside down in its guide to simulate an open valve.

Along the way, we acquired more dual-plane manifolds than we had originally planned for this all single-plane survey. We wanted to establish a reference point using a popular aftermarket dual-plane, so we ran the Edelbrock Performer. For baseline purposes, of course, there was the stock Ford dual-plane, and then there were the two Ford Power Parts dual-planes which showed up late in the series. They looked like they’d fit in, and they’re definitely not gas-mizer two planes, so we threw them in the pot, too. Plus, we’ll be seeing more of some of these manifolds in future surveys, as we sample the dual-planes and multi-carb manifolds in their own articles *(never happened - Fletch).*

There isn’t enough room here to make even a small dent in intake flow theory, so we are presenting more information without comment than usual this time. When drawing your conclusions, remember the operating range of your engine and the importance of low-end torque for street driving.

Report From the Flow Bench

Test port of 207 cfm @ 25" of water - Valve stem only in port

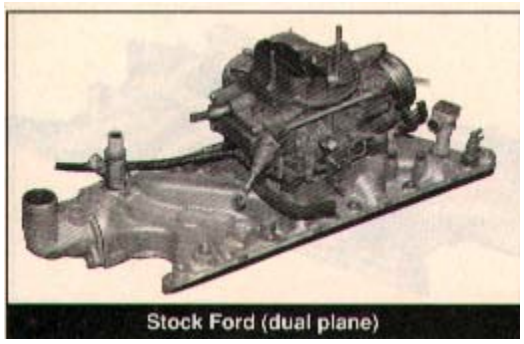
Manifold	Center Port (cfm)	End Port (cfm)	Height (in.)	Width (in.)	Area (sq. in.)	CFM / Area
Stock	160	176	1.613	0.861	1.388	129.6
Performer	201	180	1.850	1.050	1.943	103.4
Torquer II	211	207	1.950	1.000	1.950	108.0
Holley	191	183	1.800	0.875	1.575	120.9
Offy P-O-S	207	201	1.925	1.125	2.166	95.5
Weiand	203	188	1.900	1.000	1.900	106.5
Cobra	192	190	1.881	1.030	1.937	99.1

Tiger	184	172	1.839	1.045	1.922	95.7
Offy tunnel ram	196	196	1.893	1.000	1.893	103.5
Weiand tunnel ram	196	196	1.889	1.000	1.889	103.7

Dyno Results

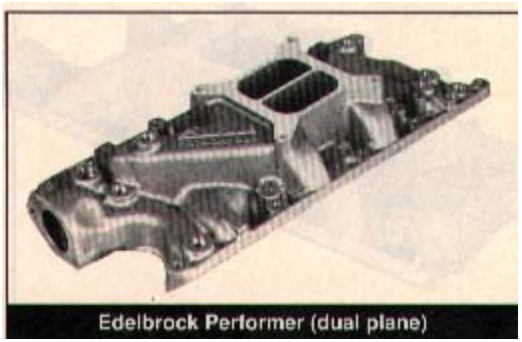
Note: Figures corrected to SAE standard: 29.92 in Hg barometric pressure, 60 degrees F dry air. Dyno acceleration: 600 rpm/sec. VE = Volumetric Efficiency; SCFM = Standard Cubic Feet per Minute.

Stock Ford (dual plane)



RPM	Horsepower	Torque	VE%	SCFM
2750	141.4	270.1	85.4	198.5
3000	155.8	272.8	83.7	212.5
3250	173.3	280.1	84.9	233.7
3500	185.4	278.2	86.5	256.9
3750	194.2	272.0	86.3	274.5
4000	204.8	268.3	86.6	294.0
4250	211.9	261.8	86.2	311.0
4500	215.1	251.1	84.3	322.0
4750	213.0	235.5	82.8	333.8
5000	206.6	217.0	81.2	344.1
5250	204.5	204.6	78.9	351.5
5500	197.8	188.9	75.6	352.6

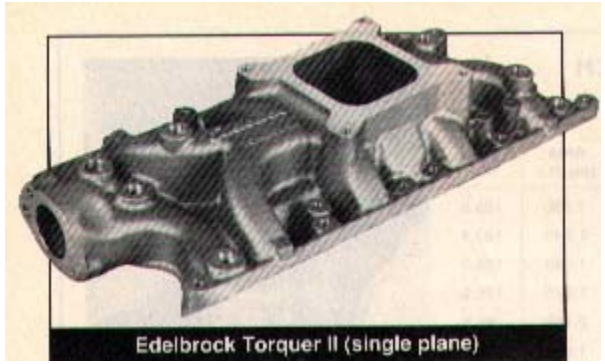
Edelbrock Performer (dual plane)



RPM	Horsepower	Torque	VE%	SCFM
2750	136.1	259.9	84.6	188.5
3000	151.8	265.8	83.9	203.6
3250	171.4	277.0	84.3	229.4
3500	189.3	284.0	90.0	255.4
3750	201.9	282.8	91.2	277.8
4000	211.4	277.6	91.9	299.5
4250	224.1	276.9	92.0	317.3
4500	233.7	272.7	89.5	326.8

4750	226.9	250.9	88.2	339.0
5000	221.2	232.4	86.5	350.0
5250	220.3	220.4	82.7	351.2
5500	188.6	180.1	79.2	352.5

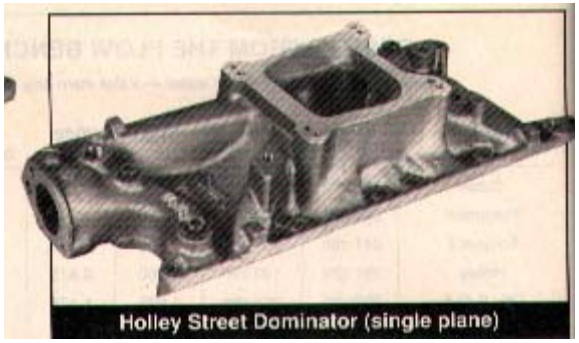
Edelbrock Torquer II (single plane)



RPM	Horsepower	Torque	VE%	SCFM
2750	139.1	265.7	84.0	192.0
3000	151.4	265.1	82.0	204.6
3250	169.2	273.4	83.8	226.3

3500	184.0	276.1	86.2	250.6
3750	197.4	276.4	88.1	274.1
4000	214.1	281.1	88.6	294.1
4250	228.4	282.2	89.0	313.9
4500	230.0	268.4	90.1	336.9
4750	234.7	259.5	89.0	351.0
5000	231.0	242.6	87.5	363.5
5250	229.0	229.1	86.0	375.4
5500	229.3	219.0	83.3	380.1

Holley Street Dominator (single plane)



RPM	Horsepower	Torque	VE%	SCFM
2750	136.8	261.2	84.4	193.2
3000	147.8	258.7	82.6	206.3
3250	169.5	273.9	85.1	230.7
3500	182.9	274.5	88.1	256.8
3750	198.0	277.3	88.7	276.9
4000	211.7	277.9	89.1	296.6
4250	225.5	278.7	90.2	318.6
4500	232.3	271.1	89.8	336.0
4750	233.9	258.6	88.3	348.6
5000	233.1	244.9	87.0	361.4
5250	227.4	227.5	85.2	371.5
5500	226.0	215.8	82.6	377.9

Offenhauser Port-O-Sonic (single plane)

RPM	Horsepower	Torque	VE%	SCFM
2750	142.7	272.6	83.9	195.5
3000	157.9	276.5	82.9	210.6
3250	174.9	282.6	84.0	231.3
3500	191.1	286.8	86.0	256.0
3750	202.6	283.7	87.4	279.3
4000	215.5	283.0	89.7	305.7
4250	228.3	282.1	90.5	327.2
4500	237.4	277.1	90.1	345.1

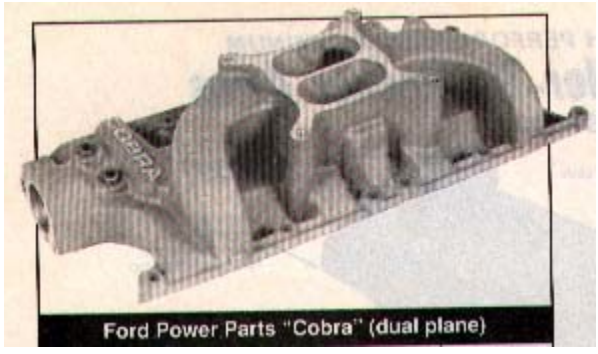
4750	240.1	265.5	88.7	359.2
5000	241.6	253.8	86.7	369.0
5250	239.3	239.4	84.3	377.1
5500	231.1	220.7	82.4	386.0

Weiand 7515 (single plane)
(similar to Edelbrock Torquer 289 manifolds - Fletch)

RPM	Horsepower	Torque	VE%	SCFM
2750	141.5	270.3	84.8	198.4
3000	158.8	278.0	85.5	217.7
3250	175.6	283.7	86.3	238.1

3500	192.5	288.8	88.3	262.7
3750	204.2	286.0	88.6	281.8
4000	217.8	286.0	89.0	301.9
4250	232.2	287.0	90.6	327.0
4500	240.1	280.2	92.2	352.8
4750	238.1	263.3	89.5	361.4
5000	240.9	253.0	88.4	374.7
5250	239.8	239.9	85.7	382.4
5500	235.2	224.6	82.9	386.8

Ford Power Parts "Cobra" (dual plane)
(similar to Edelbrock F4B and Shelby Cobra designs - Fletch)



RPM	Horsepower	Torque	VE%	SCFM
2750	138.0	263.6	85.2	193.9
3000	147.8	258.8	82.0	203.4
3250	171.0	276.4	86.5	233.2
3500	192.1	288.2	89.5	259.7
3750	202.4	283.5	90.5	281.4
4000	215.8	283.3	91.6	303.7
4250	225.8	279.0	92.5	326.1
4500	229.8	268.2	90.7	337.7
4750	231.0	255.4	88.8	349.0
5000	230.4	242.0	86.6	358.1
5250	223.5	223.6	84.2	365.6
5500	219.3	209.4	81.1	369.3

Ford Power Parts "Tiger" (dual plane)
(similar to 1960s stock Ford cast iron manifolds - Fletch)

RPM	Horsepower	Torque	VE%	SCFM
2750	142.9	273.0	85.0	196.0
3000	156.7	274.3	84.5	213.0
3250	175.5	283.6	86.3	235.7
3500	187.0	280.6	87.0	255.9
3750	195.9	274.4	86.9	274.0
4000	205.7	270.1	87.3	293.6
4250	214.5	265.1	86.4	309.9
4500	215.5	251.5	84.5	320.5

4750	215.1	237.8	82.6	331.0
5000	213.8	224.6	80.4	339.1
5250	210.6	210.7	78.3	346.7
5500	207.1	197.8	76.6	355.3

Offenhauser Tunnel Ram with Single Top*

RPM	Horsepower	Torque	VE%	SCFM
2750	141.8	270.9	83.0	187.2
3000	152.2	266.5	81.8	201.0
3250	172.6	279.0	83.9	223.3

3500	190.3	285.6	87.1	251.7
3750	202.6	283.7	88.5	273.2
4000	189.0	248.2	90.0	294.6
4250	210.3	259.9	87.6	304.2
4500	199.0	232.3	90.5	332.5
4750	198.8	219.8	89.2	346.1
5000	200.7	210.8	87.6	357.8
5250	213.1	213.2	86.0	367.8
5500	191.6	183.0	83.1	372.5

*Offenhauser tunnel ram experienced a bog when the secondaries opened.

Weiand Tunnel Ram with Single Top


Weland Tunnel Ram with single top

RPM	Horsepower	Torque	VE%	SCFM
2750	143.2	273.4	83.5	188.7
3000	157.5	276.7	81.5	201.1
3250	173.9	281.1	84.6	226.2
3500	188.7	283.1	86.4	248.9
3750	206.4	289.1	88.6	274.6
4000	220.7	289.8	89.9	269.9
4250	231.8	286.4	91.4	321.2
4500	235.9	275.3	91.2	338.5
4750	235.1	259.9	89.8	352.2

5000	236.4	248.3	88.2	364.1
5250	236.7	236.8	85.9	372.2
5500	223.5	213.4	84.1	381.5

Plotted Results