TEST RESULTS

Certified to the ISO 5011 Air Filtration Standard

1994-1997 Ford F250/350 V8-7.3L Diesel

S&B Cold Air Intake Kit
Part # 75-5027

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ISO 5011, Second Edition
Air Filter or Intake Kit Test Report

The test data presented in the following report represents the restriction of airflow, efficiency and dust loading capacity. The filters tested were procured from various distributors or provided by customers. The tests were performed in accordance with ISO 5011. The following were measured in accordance with the test: (1) Pressure Drop for Clean Element, Initial Efficiency and Dust Loading Capacity. The Flow Rate used to conduct the Dust Loading and Capacity test(s) is listed under the *Average Environmental Conditions and Test Specifications*. PTI ISO Course Test Dust was utilized and the particle data sheet for the batch is attached.

The test sequence begins with measuring the pressure drop of a clean filter as a function of the airflow rate which is measured in cubic feet per minute (CFM). Subsequently, the cumulative efficiency and dust loading capacity are measured. The termination point when measuring for capacity is shown at the bottom of the report under the heading *Termination ^P*. The results of the tests are recorded in the top table and charts shown on the next page. The filters are inspected before and after the tests are performed.

The Top Table demonstrates the results of the testing for up to three (3) samples per filter type (part number). The Efficiency represents the amount of dust (contaminants) that was stopped by the filter during each test. The Capacity measures the dust holding capability of the filter.

During the test, the filter is loaded with dust until it reaches a terminal pressure drop increase of 10 inches of water (28”H2O for Heavy Duty Vehicles) across the filter element (please refer to the Average Environmental Conditions and Test Specifications at the bottom of the next page to verify the pressure drop utilized on this particular test).

The Line Graph shows the pressure drop as a function of the airflow rate for the clean filter(s). The computer controlled test equipment initiates the test at close to zero (0) cubic feet per minute (CFM) and then increases the CFM gradually until the CFM termination point is reached. During the test, the restriction of the filter is measured in inches of water (“H2O) as it relates to the air flow rate (CFM). Visual inspections of filters are performed to insure against dust leakage and manufacturing flaws.

The Bar Graph illustrates the cumulative efficiency for the filter(s) tested.

Definition of Terms & Test Protocol

Restriction

Restriction measures how difficult it is for the air to get through the filter and is measured in inches of H2O. Instead of referring to restriction, the industry uses "air flow" to describe the effect of restriction. They say for example, that a High Performance Filter "flows better" than the OEM paper filter. On a line graph, the lower the restriction of a filter the better the air flow.

Efficiency

Efficiency is measured in % and is the amount of dirt/contaminants that the filter stops from going into the engine.

Capacity

Capacity is the total amount of contaminants/dirt the filter will hold before reaching its termination point. The termination point is a predefined restriction point that is used as the cut-off point when measuring how much dirt a filter will hold. For typical vehicles, 10”H2O is used at the termination point. For heavy duty trucks, this number is 28”H2O.

Note: Testing was conducted based on the ISO 5011 testing standard; however, variances from the actual test procedures may exist. The intent of the testing is to show comparative test results between various products that are intended for similar use. Tests are conducted under a climate controlled environment; however, changes in temperature and humidity between tests may occur which could alter the actual test results.

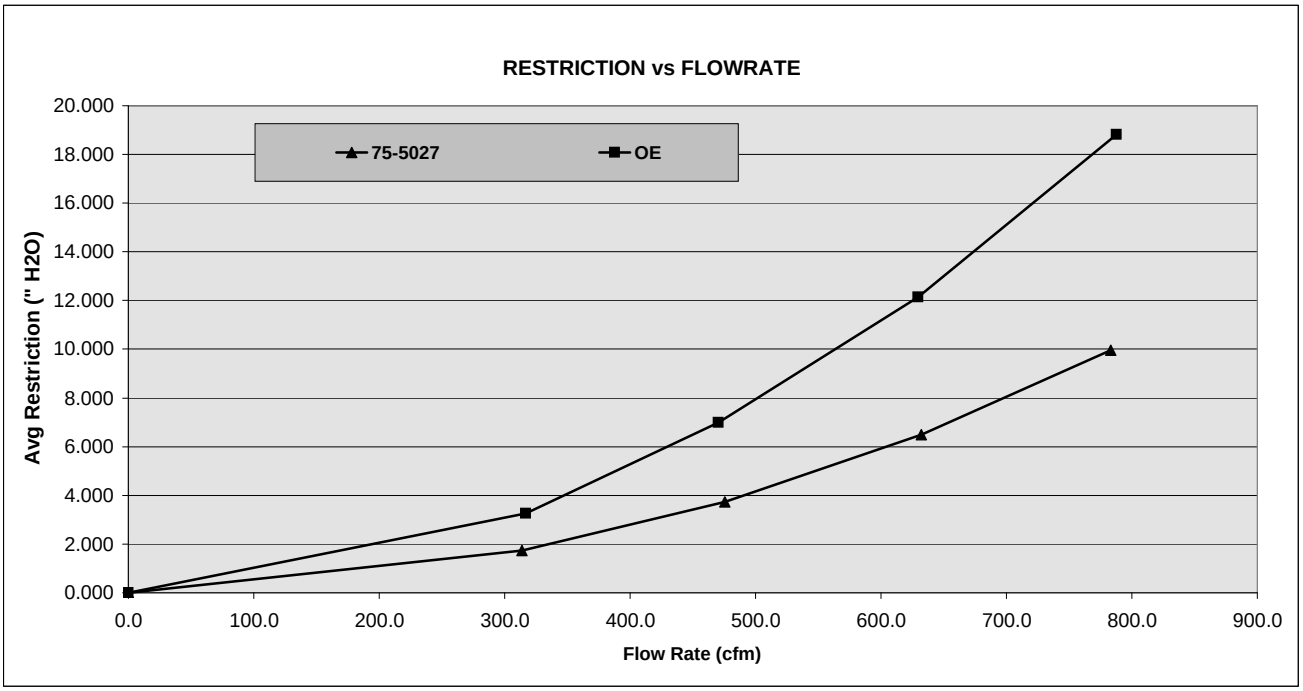
ISO 5011 Air Filtration Standard

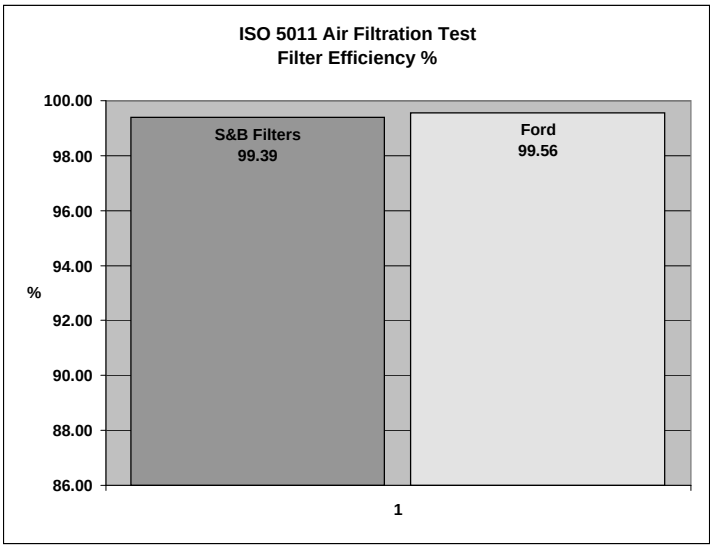
Intake Kit Comparison

S&B Filters 75-5027

Test Number 291

Filter Mfg. & Part No.	INITIAL RESTRIC. ("H2O)	CAPACITY (grams)	EFFICIENCY (%)	Air Flow cfm	Net Restriction (Inches of H2O)	% Less Restrictive than OEFord
Filter #1	5.9	205.5	99.39	0.0	0.000	0.0%
S&B Filters				313.7	1.722	47.3%
75-5027				475.3	3.720	46.7%
				631.9	6.493	46.5%
				783.3	9.949	47.1%
				945.1	14.228	46.9%
Filter #2	10.4	257.8	99.56	0.0	0.000	
Ford				317.0	3.270	
OE				470.6	6.982	
				629.5	12.138	
				787.9	18.815	
				943.8	26.797	





ISO 5011 Air Filtration Test
Air Flow Summary

94'-97' Ford F-Series 7.3L Diesel

S&B Filters Part Number **75-5027 (Prototype)** Flows:

46.5% Better than OE at rated CFM

46.9% Better than OE Across CFM Spectrum

99.39% Efficiency

AVERAGE ENVIRONMENTAL CONDITIONS & TEST SPECIFICATIONS

Temperature:	71.94	deg F	**Housing:**	OE/ Uni con.	
Relative Humidity:	51.08	%	**Contaminant:**	Coarse	
Baro Pressure:	43.26	mmHg	**Contam. Lot #:**	5410C	
Test Stand:	#1		**Dust Feed Rate:**	17.67	grams/minute
Inlet Size:	3.75	inches	**Rated Flow:**	631	cfm

Testing was conducted based on the ISO 5011 Air Filtration standard.

S&B PERFORMANCE
FILTERS & INTAKE KITS

Determination of Gasoline and Diesel Engine Air Consumption

CFM Calculator: Enter Data in Blue Shaded Areas

Engine Displacement (cubic inches)	**445.4**
RPM at maximum horse power	**2,800**
Cycle Factor:	**2**
Enter "2" for 4 Cycle Diesel and Gasoline	
Enter "1" for 2 Cycle Diesel and Gasoline	
Volumetric Efficiency:	**1.75**
Naturally Aspirated Gasoline & Diesel Engines Enter "0.8"	
Super Charged Diesel Engines Enter "1.30"	
Turbocharged Diesel Engines Enter "1.75"	

Liters to CID Converter

Liters:	7.3
Cubic Inches:	445.4

Vehicle Information

Model Year	94'-97'
Make	Ford
Model	F-Series
Engine Specs	V8 Diesel

Based on the information entered above, the estimated CFM of the vehicle at maximum Horse Power is:	**631**

CYCLE FACTOR	Cycle Factor
4 Cycle Diesel and Gasoline Engine	2
2 Cycle Diesel and Gasoline Engine	1

VOLUMETRIC EFFICIENCY	Volumetric Efficiency (Approximate)
Naturally Aspirated Gasoline & Diesel Engines	0.8
Supercharged Diesel Engines	1.30
Turbocharged Diesel Engines	1.75

Note: The 1.75 volumetric efficiency is applicable only at top governed engine speed under full load conditions.

EQUATION

The following is a method of determining approximated gasoline and diesel engine air flow requirement:

$$\text{Air Flow (CFM)} = \frac{\text{Displacement (cubic inches)}}{1728} \times \frac{\text{RPM}}{\text{Cycle Factor}} \times \text{Volumetric Efficiency}$$

EXAMPLE

Information necessary to calculate air consumption:

Ford F250 7.3L V8 Diesel Truck

4 cycle, 2800 RPM, 445.4 (cubic inches) displacement, turbocharged

$$\text{Air Flow (CFM)} : \frac{445.4}{1728} \times \frac{2800}{2} \times 1.75 = 631 \text{ CFM}$$

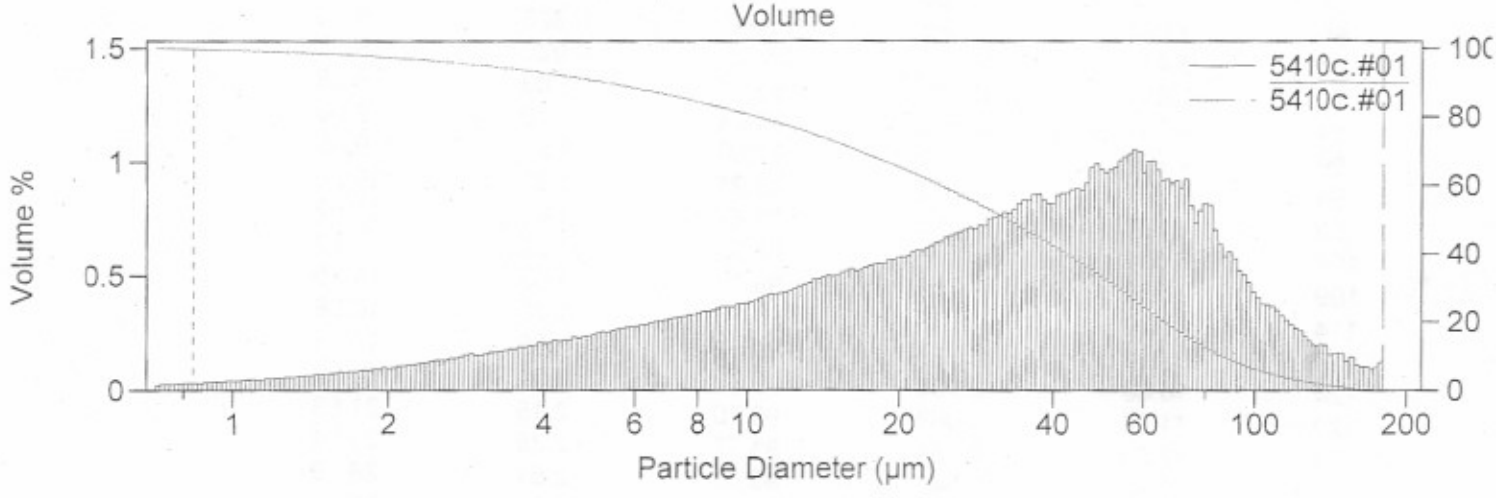
COULTER® MULTISIZER AccuComp® 1.19

9 Oct 2006

POWDER TECHNOLOGY, INC.

PTI
POWDER TECHNOLOGY INC.
14351 Ewing Avenue South Burnsville, Minnesota 55306
Phone: 952-894-8737

Filename:	5410c.#01	Sample Number:	200
Group ID:	5410C		
Sample ID:	ISO 12103-1, A4 COARSE TEST DUST		
Comment:	SAE COARSE TEST DUST, NIST TRACEABLE		
Operator:	LHA		
Electrolyte:	ISOTON II		
Dispersant:	TYPE IC		
Aperture Size:	400 µm	5410d.#01	
	200 µm	5410d.#02	
	100 µm	5410d.#03	
	30 µm	5410d.#04	
Acquired:	23:47 5 Oct 2006		
Serial Number:	33		
Edited size data			



LC= 0.835 µm UC= 180.1 µm {99.79%}

Volume Statistics (Geometric) 5410c.#01

Calculations from 0.835 µm to 180.1 µm

Volume	5.940e9 μm^3		
Mean:	25.85 µm	S.D.:	50.5 µm
Median:	32.40 µm	Variance:	2550 μm^2
Mean/Median Ratio:	0.798		
Mode:	57.73 µm		
Spec. surf. area:	0.488 m^2/ml		

% >	10	25	50	75	90
Size µm	85.20	58.94	32.40	13.33	5.257

Cumulative Volume Micron size	Numeric data% less than
1	0.6
2	2.6
3	5.0
4	7.3
5	9.6
7	13.9
10	19.6
20	35.1
40	58.1
80	87.9
120	97.0
180	100.0

5410c.#01

Channel Number	Particle Diameter µm	Diff Number %	Cum < Number %	Diff Volume %	Cum < Volume %
9	0.835	12.64	24.69	0.164	0.212
14	0.931	10.78	37.33	0.193	0.376
19	1.037	9.15	48.10	0.227	0.569
24	1.156	7.69	57.25	0.265	0.797
29	1.288	6.40	64.94	0.304	1.06
34	1.435	5.35	71.34	0.352	1.37
39	1.599	4.46	76.69	0.406	1.72
44	1.783	3.65	81.15	0.460	2.12
49	1.986	2.96	84.80	0.518	2.58
54	2.214	2.46	87.76	0.594	3.10
59	2.467	2.01	90.22	0.673	3.70
64	2.749	1.65	92.23	0.762	4.37
69	3.064	1.29	93.88	0.823	5.13
74	3.415	1.04	95.17	0.920	5.96
79	3.805	0.837	96.21	1.03	6.88
84	4.241	0.650	97.04	1.10	7.90
89	4.726	0.514	97.69	1.21	9.00
94	5.267	0.403	98.21	1.31	10.21
99	5.870	0.313	98.61	1.41	11.52
104	6.541	0.244	98.92	1.52	12.93
109	7.290	0.189	99.17	1.63	14.45
114	8.124	0.147	99.36	1.75	16.08
119	9.053	0.112	99.50	1.86	17.83
124	10.09	0.088	99.62	2.01	19.68
129	11.24	0.068	99.70	2.15	21.69
134	12.53	0.054	99.77	2.35	23.84
139	13.96	0.041	99.83	2.51	26.19
144	15.56	0.032	99.87	2.64	28.70
149	17.34	0.024	99.90	2.78	31.35
154	19.33	0.018	99.92	2.93	34.13
159	21.54	0.014	99.94	3.13	37.06
164	24.00	0.011	99.96	3.39	40.19
169	26.75	0.008	99.97	3.58	43.59
174	29.81	0.007	99.97	3.84	47.17
179	33.22	0.005	99.98	4.14	51.01
184	37.02	0.004	99.99	4.19	55.15
189	41.26	0.003	99.99	4.38	59.33
194	45.98	0.002	99.99	4.80	63.71
199	51.24	0.002	100.00	5.01	68.51
204	57.11	0.001	100.00	5.07	73.52
209	63.64	0.001	100.00	4.64	78.59
214	70.92	0.001	100.00	4.16	83.23
219	79.04	0.0033	100.00	3.57	87.38
224	88.08	0.0018	100.00	2.69	90.95
229	98.16	9.4E-5	100.00	1.96	93.65
234	109.4	5.3E-5	100.00	1.54	95.60
239	121.9	2.8E-5	100.00	1.10	97.14
244	135.9	1.6E-5	100.00	0.868	98.24
249	151.4	7.6E-6	100.00	0.579	99.11