

# Appendix 9: New Features in v3.5 B

Port Flow Analyzer has had many updates since this user manual was written for the original v3.0 for Windows. These include 3.0 A through v3.0 E, v3.5 and now v3.5 B. For the features added to the v3.5, refer to the Readme.doc file (click on Help, then Display Readme.doc File) in the program. Listed here are features introduced in v3.5 B. Also, v3.5 B has a more advanced version we call “Head Porter”. So now there are 3 versions of Port Flow Analyzer:

- Basic Version
- Professional (Pro) Version (includes all Basic features and more advanced Pro features)
- Head Porter Version (includes all Professional features and more advanced Head Porter features)

Here is a listing of the major enhancements and new features for v3.5 B.

## Data Recording:

In Test Options, you can now select to record port velocity data at 3 depths in the port. See Figure A41, 47. Head Porter only.

Several enhancements to Port Velocity Report for Head Porter version have been added, to allow more averaging for all possible combinations of recording port velocity. See Figure A42. Head Porter only.

A new Preference to allow for English units of CFM, Deg F, inches of water pressure, etc. but mm valve, lift and engine dimensions has been added. See Figure A43. Head Porter only.

The Electronics or FlowCom screen has been enlarged in its default setting. You can still enlarge to most any size you want by turning on the appropriate Preference setting. See Figure A43-B. All versions.

You can now include a “gauge” (bar graph) for some readings on the Electronics or FlowCom screen. This gives you a graphical representation of the stability of the readings and if the readings are going higher or lower than expected values. See Figure A43-B. Head Porter only.

## Data Analysis (including Graphs and Reports):

You can create custom, user defined graphs, where you choose what data gets included. For example, you can graph CFM and Swirl and % Exh/Int on the same graph. See Figure A44, A45. Head Porter only.

Program now allows for graphing Flow results corrected to 2 different test pressures. See Figure A46. Head Porter only.

You have several options to allow for more options for doing Port Velocity Graphs. This is an extension to the feature to be able to record Port Velocity for many more data points. See Figure A47. Head Porter only.

You can now specify if you want the Test Piece picture to be drawn smaller in printouts in portrait mode. (See “Other” category for Test Piece picture.) This can allow for more printed text to be included with the graph on 1 page. NOTE: In landscape mode, the Test Piece picture is always drawn small on the same line as the test title. The Test Piece picture can also be printed in reports. See Figure A48. Head Porter only.

You can now select a single cylinder to make graphs which require a valve lift profile, like Flow Area and Pseudo Flow Velocity. In previous versions, only the Average Flow for the entire head was used. Head Porter only.

You can now request the graph to be printed in a smaller height. This can allow for more printed text to be included with the graph on 1 page. See Figure A49. Pro and Head Porter only.

You can now select a Preference to have the graph NOT autoscale when you first open it. This can be handy if you are using some pre-defined scales and want to keep them for all graphs. Pro and Head Porter only.

Added a graph line thickness between Thin and Thick, called Thin 'Plus'. See Figure A50. All versions.

The graph line styles in the drop down menu of line thicknesses are listed together, with the appropriate check mark by the type currently used. See Figure A50. All versions.

You can now select larger legends (labels) in the graph screen. See Figure A50. Pro and Head Porter only.

Added label to better explain what cylinder or that Average of All Cylinders will be used for Flow Area and Pseudo Flow Velocity graphs. Pro and Head Porter only.

The graph screen now should more completely fill the available screen in most all situations. All versions.

Improved appearance of some printed graphs, especially in Landscape orientation. Previously the graphs had a border drawn around them. On the left side, the border could be broken. On the right side the legend (labels) could also be distorted. Now the border is not drawn in those locations. See Figure A49. All versions.

The graph choices have been simplified by eliminating many of the Int, Exh, and Int & Exh choices into just 1 choice. Now the program looks to a separate input of "Port to Graph" for this setting Int, Exh, and Int & Exh choices. See Figure A45. All versions.

Fixed bug where the Port Velocity Map was not being graphed correctly. Pro and Head Porter only.

Made Overlap Graphs go to zero at start and beginning of graph to look more correct. Pro and Head Porter only.

Fixed bug where graphs for % Exh/Int only showed the first cylinder on the head even though you requested all cylinders to be graphed. Pro and Head Porter only.

Added menu command 'Edit Printed Comments & Data Output' under the File option on the Graph screen in the printing options section. Pro and Head Porter only.

Program now includes more example cam files, the same files included in the new Engine Analyzer v3.4. See Figure A51. Pro and Head Porter only.

## Hardware:

Pro version now allows for Performance Trends' motor controller to be used. See Figure A52. Pro and Head Porter only.

Program now allows for a USB switch to be used for starting to record data. This option does not present conflicts with some features of the SuperFlow Flowcom. This is done buy purchasing the proper switch from Performance Trends, then going into FlowCom or Electronics screen, clicking on Options at the top, then select the USB Switch Option. You must also set the proper Com Port for the USB Switch under this option also. See Figure A53. All versions.

In the Bench Specs screen, the program now allows for Valve Opener for any Pro version. Pro and Head Porter only.

Added Hot Wire (hot wire anemometer mass air flow sensor) as a Custom Bench Type. See Figure A54. All versions.

## Other:

The program now lets you "Filter" tests in the library for finding tests of a certain date, certain file name, etc. Pro and Head Porter only.

When quitting program and you select 'Cancel' for Saving Changes to current test file, now the program keeps program open. Before v3.5B, it continued shutting down. All versions.

The option for using a 2 pulse swirl meter, to be read directly with a FlowCom (no Performance Trends electronics) has been added. In addition, a special calibration factor for this 2 Blade Swirl meter is also possible. Pro and Head Porter only.

Fixed bug where reports may be requested for intake and exhaust ports, but only intake ports were reported. All versions.

Fixed bug where the cylinders you may "Pick" for a report were not being shown clearly (another input was in front of it). All versions.

Fixed bug where FlowCom/Electronics screen could be off screen too high or too far to left. All versions.

Fixed bug where Test Comments were not being shown in the Preview when opening some older Port Flow files. All versions.

Updated a text file to more accurately show Mass Flow correctly for gm/sec and lb/min, and correct for proper air density specs. Pro and Head Porter only.

Program now hides the 'Range' column for bench types which have only 1 range, like EZ Flow, JKM, new Hot Wire, and LFE. See Figure A55. All versions.

Program now shows the Company Logo graphic on the main screen. See Figure A55. Pro and Head Porter only.

Added option to include a Test Piece Pic with your data file. This could be of the head, carb, etc. It is displayed on the main screen and in printouts if you choose to included it from the "Print Options" list (graphs and reports). See Figure A55. Head Porter only.

Program no longer 'nags' as much about using the CFM at 0 lift as Leakage. All versions.

New Example Flow Files have been added to show new features.

Figure A41 More Port Velocity Options

Click on Test Options at Main Screen

New choice for Type of Port Velocity data: Record 9 points across the port (3 rows of 3 positions) at all lift data points.

New option of "Depths in Port" to allow you to record data at different depths in the port, 1 depth (the only choice in previous versions and in the current Pro version), 2 and 3.

Click on Graph button (shown here as "Layout" because Graph is being shown) and with more than 1 depth you have 2 options. Front View (as done before) or new Side View (as shown here). The depth in Front View (A, B, or C) or the depth in Side View is determined by which cell is currently highlighted in the grid. In this case, it is side depth 3 (farthest from viewer).

Different depths marked as "A", "B" and "C".

Labels let you know which data points are being graphed.

Arrow shows you flow direction.

Slide side bar left to see all the entry points for port velocity.

Point	Lit"	Full CFM	Test Pres"	Flow Pres %	CFM	Stability +/- %	Swirl	Vel #1 [A]	Vel #2 [A]	Vel #3 [A]	Vel #4 [A]	Vel #5 [A]	Vel #6 [A]	Vel #7 [A]	Vel #8 [A]	Vel #9 [A]	Vel #1 [B]	Vel #2 [B]
1	100	321.0	27.92	20.1	64.7	24	-1504	75.5	75.5	70.4	72	53.6	64.6	48.4	64.9	57.2	61.5	40.
2	200	321.0	27.95	40.4	129.8	28	-1781	113.4	105.1	92.6	80.1	106.4	131.	93	136.7	110.2	82.9	125.8
3	300	321.0	27.94	57.4	184.5	80	-1972	169.3	163.4	163.2	168.5	159.6	109.6	164.1	212.7	213.7	121.8	125.5
4	400	321.0	27.94	70.1	225.3	50	-2496	160.5	183.5	165.8	270.7	183.8	180.4	153.1	257.7	209.	260.6	136.1
5	500	321.0	27.92	77.2	248.2	1.10	-2617	256.6	199.4	281.2	208.2	175.8	229.5	228.	295.2	171.3	287.5	274.5
6	600	321.0	28.05	79.1	253.7	86	-3105	238.1	323.1	284.5	160.8	189.6	279.6	184.2	157.4	302.	296.6	214.2

Figure A42 Port Velocity Reports

**Report Options**

Report Specs

Type: Meas Int & Exh VelData

Correct to New Test Pressure: Yes

New Int Test Pres, "water": 28

New Exh Test Pres, "water": 28

Which Cylinders: All Cylinders

Cyl to Report: 1

Notes:  
Select the options you want for this report. Some options may be disabled (grayed out so you can't change them) depending on the type of report you select or other settings. Then click on the 'Make Report' button.

Make Report Help Cancel Print

	Vel #1	Vel #2	Vel #3	Vel #4	Vel #5	Vel #6	Vel #7 (C)	Vel #8 (C)	Vel #9 (C)	Avg	Avg (B)	Avg (C)
Int #1 .100" Lift	79	75	70	72	53		74	72	66	65	60	55
Int #1 .200" Lift	113	105	82	80	106		159	79	104	106	118	122
Int #1 .300" Lift	169	163	183	168	158		215	214	204	171	153	194
Int #1 .400" Lift	160	181					190	239	166	197	215	205
Int #1 .500" Lift	255	191					0	161	293	227	231	218
Int #1 .600" Lift	238	32					0	283	241	238	239	223
Exh #1 .100" Lift	62	55	71	66	95		61	87	88	68	78	74
Exh #1 .200" Lift	107	191	168	109	113		104	145	191	140	138	149
Exh #1 .300" Lift	143	207	192	171	254		187	178	155	181	202	190
Exh #1 .400" Lift	274	267	156	174	229		275	192	166	213	206	234
Exh #1 .500" Lift	319	209	323	192	242		252	208	317	252	249	234
Exh #1 .600" Lift	244	208	329	183	272		194	281	220	248	254	240
Int #3 .100" Lift	60	76	75	74	74		58	75	68	66	58	58
Int #3 .200" Lift	134	153	95	139	127		125	150	145	131	112	120
Int #3 .300" Lift	187	188	188	188	149		201	185	158	156	178	151
Int #3 .400" Lift	258						227	201	221	195	204	211
Int #3 .500" Lift	181						148	293	267	204	204	216
Int #3 .600" Lift	269						309	291	234	243	265	227
Exh #3 .100" Lift	86						81	55	76	77	68	70
Exh #3 .200" Lift	126						185	123	111	139	135	151
Exh #3 .300" Lift	163						167	223	204	194	187	190
Exh #3 .400" Lift	150	207	107	171	300		153	188	213	224	210	207
Exh #3 .500" Lift	236	304	327	172	329		232	161	258	237	271	248
Exh #3 .600" Lift	237	203	242	209	178		167	208	186	220	272	236
Int #5 .100" Lift	42	71	57	64	48		62	58	53	56	60	57
Int #5 .200" Lift	82	92	108	117	142		97	122	156	119	119	115
Int #5 .300" Lift	225	137	186	147	140		144	167	194	163	163	163
Int #5 .400" Lift	257	137	141	256	198		179	222	242	196	217	214
Int #5 .500" Lift	290	285	239	161	207		165	223	214	228	230	203
Int #5 .600" Lift	256	219	238	197	213		284	304	209	235	247	248
Exh #5 .100" Lift	80	65	61	89	91		76	91	61	75	70	69
Exh #5 .200" Lift	98	186	168	152	171		105	170	135	153	163	143
Exh #5 .300" Lift	257	166	229	183	259		148	127	127	222	223	183
Exh #5 .400" Lift	290	174	256	250	284		277	228	262	244	245	235
Exh #5 .500" Lift	269	224	169	294	159		236	217	234	224	224	238
Exh #5 .600" Lift	182	340	267	260	186		265	299	200	265	289	279
Int #7 .100" Lift	58	49	47	73	48		77	49	52	55	55	64
Int #7 .200" Lift	100	148	100	77	132		137	137	117	114	126	141
Int #7 .300" Lift	137	180	139	166	219		132	131	166	161	183	161
Int #7 .400" Lift	177	213	262	137	255		266	266	195	211	201	194
Int #7 .500" Lift	260	156	181	245	213		263	228	253	244	218	227
Int #7 .600" Lift	314	272	234	242	315		271	282	292	265	254	263
Exh #7 .100" Lift	83	62	54	56	96		52	81	82	75	77	69
Exh #7 .200" Lift	195	191	199	132	119		149	156	136	158	139	144
Exh #7 .300" Lift	256	253	131	130	236		233	130	164	184	183	181
Exh #7 .400" Lift	167	285	226	214	297		295	275	294	235	239	244
Exh #7 .500" Lift	203	270	320	174	204		219	161	202	227	238	237
Exh #7 .600" Lift	215	216	178	293	250		263	329	217	238	240	282
Avg Int .100 Lift	60	68	62	70	55		68	63	60			59
Avg Int .200 Lift	107	125	96	103	126		129	122	130			120
Avg Int .300 Lift	179	150	165	155	167		173	174	180			166
Avg Int .400 Lift	196	186	178	202	223		208	232	206			204
Avg Int .500 Lift	244	218	227	200	194		207	226	257			220
Avg Int .600 Lift	256	273	249	189	247		271	290	244			245
Avg Exh .100 Lift	78	68	70	75	92		72	78	76			72
Avg Exh .200 Lift	132	169	171	132	132		136	148	143			146
Avg Exh .300 Lift	205	214	175	179	228		184	165	162			193
Avg Exh .400 Lift	222	233	201	202	278		250	221	238			228
Avg Exh .500 Lift	257	252	285	208	234		235	187	253			239
Avg Exh .600 Lift	219	242	254	236	222		222	279	206			255

Figure A43 English Units but Using Millimeters for Lift and Dimensions

The Preferences dialog box is open, showing the 'Definitions (calcs)' tab. The 'Units' dropdown is set to 'English with Millimeters'. Other options include 'Use Seat Angle to Calc Valve Area' (No), 'SF Cal. Test Pres. Corr' (None), and 'Std Pres' (English (CFM, inches, etc.)).

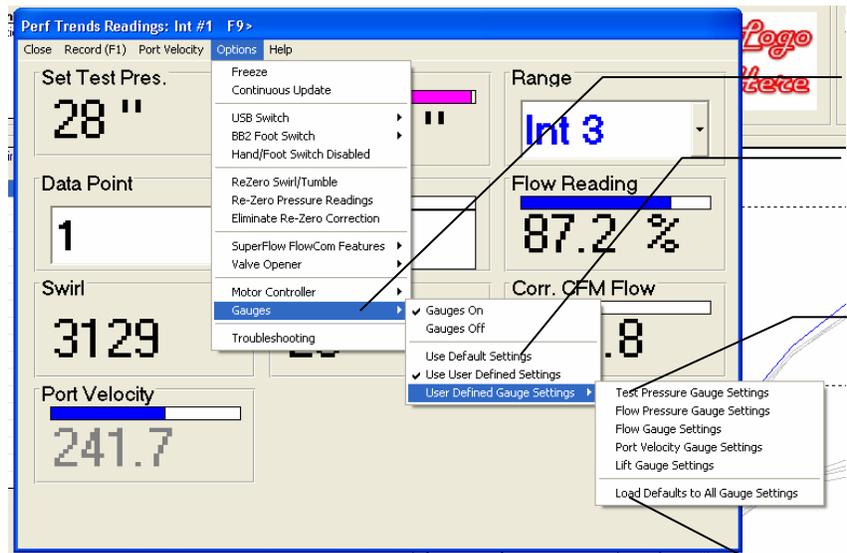
The main application window shows 'Int #1' and 'Test & Head Conditions'. The 'Test Data' table is as follows:

Point	Lift mm	Full CFM	Test Pres"	Flow Pres %	CFM	Stbly +/- %	Swirl	Vel # (A)
1	2.00	321.	27.82	20.1	62.7	.24	-1504	80
2	4.00	321.	27.95	48.4	127.8	.28	-1781	113
3	6.00	321.	27.94	57.4	182.5	.80	-1972	169
4	8.00	321.	27.94	70.1	223.3	.50	-2496	161
5	10.00	321.	27.92	77.2	246.2	1.10	-2617	256
6	12.00	321.	28.05	79.1	251.7	.86	-3105	238

The Head Specs dialog box is open, showing 'Head #, Customer and Comments'. The 'Intake' and 'Exhaust' sections show dimensions in millimeters.

Parameter	Intake Value	Exhaust Value
Layout	1 valve & 1 port	1 valve & 1 port
Valve Diameter, mm	51.31	40.64
Stem Diameter, mm	8.74	8.74
Throat Diameter, mm	45.47	35.56
Avg Seat Angle, deg	45	45
Port Shape	Rectangular	Rectangular
Port Volume, ccs	217	83
Avg Port Width, mm	33.81	26.92
Avg Port Height, mm	50.44	40.64
Port Length, mm	127.0	76.2

Figure A43-B Bar Gauges for Selected Readings.



Gauge Options

This option lets program pick the scales for the gauges.

Choose options to change the settings for each particular gauge, the high and low value of the bar graph, and any limits to be flagged out in either red or yellow color (warnings or cautions).

Click this and program will generate "reasonable" scales for the gauges. This is useful when first turning on "Use User Defined Settings" because these will all be blank.

Bar gauge with real time updates. This one shown in red because reading went above user defined limit of 29.5. See screen to right for setting scales and limits.

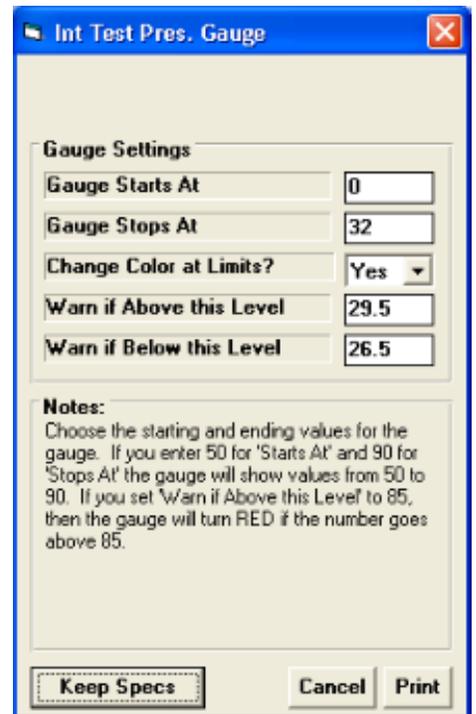
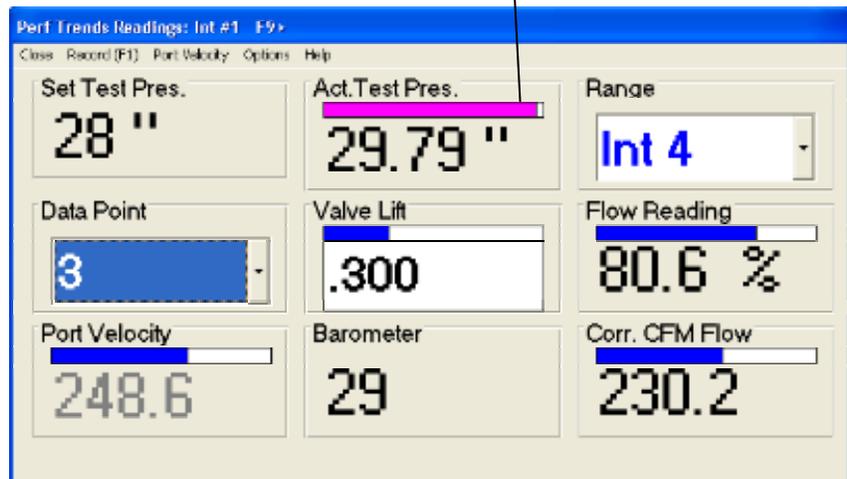


Figure A44 Custom, User Defined Graphs

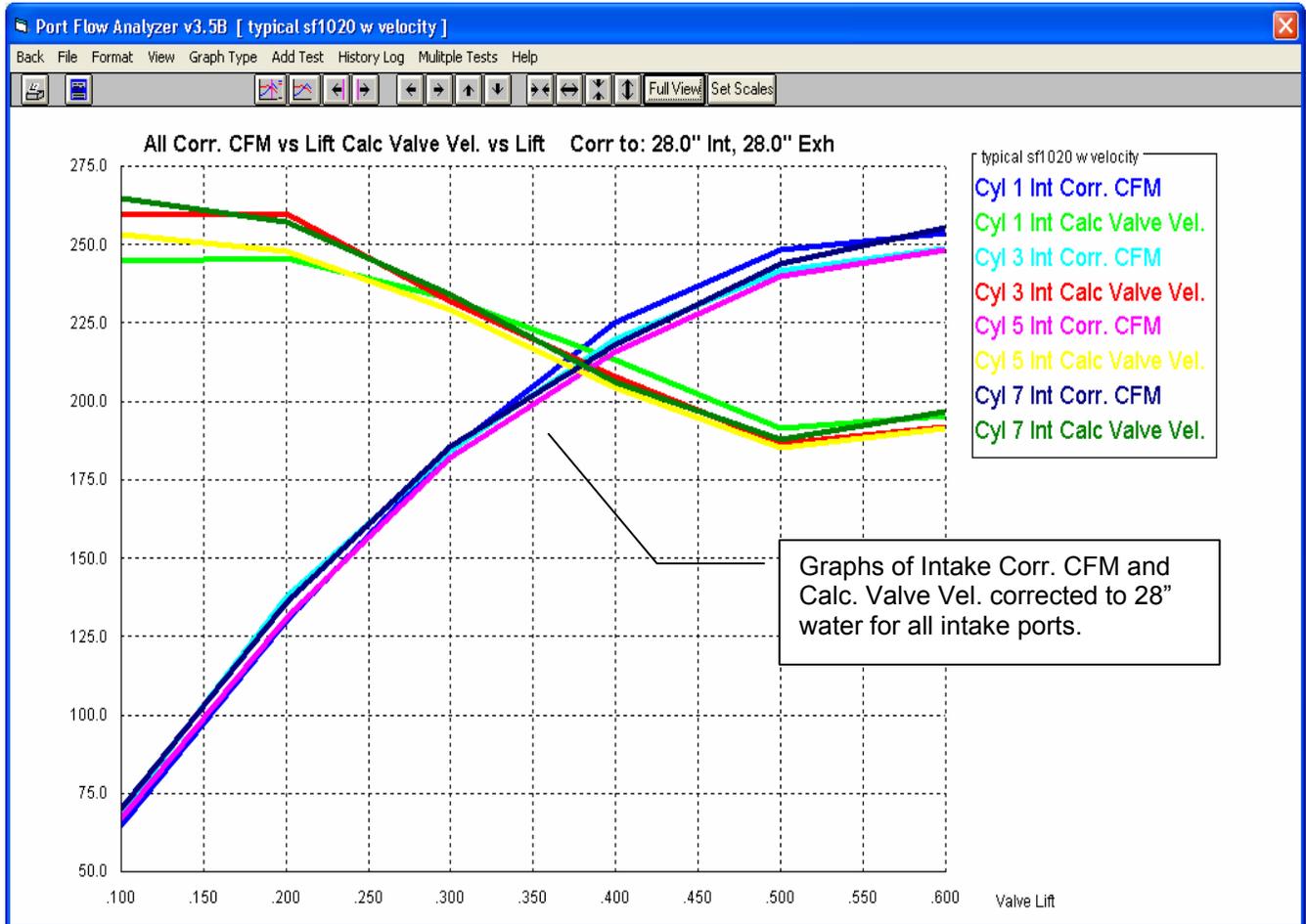


Figure A45 Custom, User Defined Graphs

Graph Options

**Graph Specs**

Type: Corr CFM

Correct to New Test Pressure: No

New Int Test Pres, "water": 28

New Exh Test Pres, "water": 28

Which Cylinder(s): 1st Cylinder Only

Port to Graph: Intake and Exhaust

Horizontal X Axis: Lift, inches

1000

Notes:  
Select the options you want for this graph. Some options may be disabled (grayed out so you can't change them) depending on the type of graph you select or other settings. Then click on the 'Make Graph' button.

**Pick from List Below**

- Corr. CFM vs Lift
- Calc Valve Vel. vs Lift
- Calc Port Vel. vs Lift
- Swirl vs Lift
- Swirl Stab. vs Lift
- Tumble vs Lift
- Tumble Stab. vs Lift
- Flow Coef. vs Lift
- % Exh/Int vs Lift
- Flow Stab. vs Lift
- Flow Area vs Crank Deg
- Valve Area vs Crank Deg
- Valve Lift vs Crank Deg

'Pick from List' Details

Correct to a 2nd Test Pres.: No

2nd New Int Test Pres, "water": 20

2nd New Exh Test Pres, "water": 10

Port Velocity Map Options

Type: Front View, all data

Lift for Graphing: 1st

Cylinder for Graphing: 1st

Buttons: Make Graph, Help, Cancel, Print

Check here to get these Custom Options

Pick your graph data types

Which Cylinder(s)

Which Ports



Figure A46 Custom Graph at 2 Test Pressures



Figure A47 Custom Port Velocity Graphs

**Graph Options**

**Graph Specs**

Type: Corr CFM

Correct to New Test Pressure: No

New Int Test Pres. "water": 28

New Exh Test Pres. "water": 28

Which Cylinders: 1st Cylinder Only

Cyl to Graph: 1

Port to Graph: Intake

Horizontal X Axis: Lift, inches

RPM to Graph: 1000

Pick from List Below

Flow Stab. vs Lift  
Flow Area vs Crank Deg  
Valve Area vs Crank Deg  
Valve Lift vs Crank Deg  
Overlap Flow Area vs Crank Deg  
Overlap Valve Area vs Crank Deg  
Overlap Valve Lift vs Crank Deg  
**Port Velocity Map**  
Pseudo Flow Vel. vs Crank Deg @ RPM  
Pseudo Flow mach # vs Crank Deg @ RPM  
Piston Vel., ft/min vs Crank Deg @ RPM  
Piston Vel., ft/sec vs Crank Deg @ RPM  
Piston Accel, Gs vs Crank Deg @ RPM

'Pick from List' Details

Correct to a 2nd Test Pres.: No

2nd New Int Test Pres. "water": 20

2nd New Exh Test Pres. "water": 10

**Port Velocity Map Options**

Type: Side View, one lift

Lift for Graphing: 1st

Cylinder: 1st

**Graph Options**

**Graph Specs**

Type: Corr CFM

Correct to New Test Pressure: No

New Int Test Pres. "water": 28

New Exh Test Pres. "water": 28

Which Cylinders: 1st Cylinder Only

Cyl to Graph: 1

Port to Graph: Intake

Horizontal X Axis: Lift, inches

RPM to Graph: 1000

Pick from List Below

Flow Stab. vs Lift  
Flow Area vs Crank Deg  
Valve Area vs Crank Deg  
Valve Lift vs Crank Deg  
Overlap Flow Area vs Crank Deg  
Overlap Valve Area vs Crank Deg  
Overlap Valve Lift vs Crank Deg  
**Port Velocity Map**  
Pseudo Flow Vel. vs Crank Deg @ RPM  
Pseudo Flow mach # vs Crank Deg @ RPM  
Piston Vel., ft/min vs Crank Deg @ RPM  
Piston Vel., ft/sec vs Crank Deg @ RPM  
Piston Accel, Gs vs Crank Deg @ RPM

'Pick from List' Details

Correct to a 2nd Test Pres.: No

2nd New Int Test Pres. "water": 20

2nd New Exh Test Pres. "water": 10

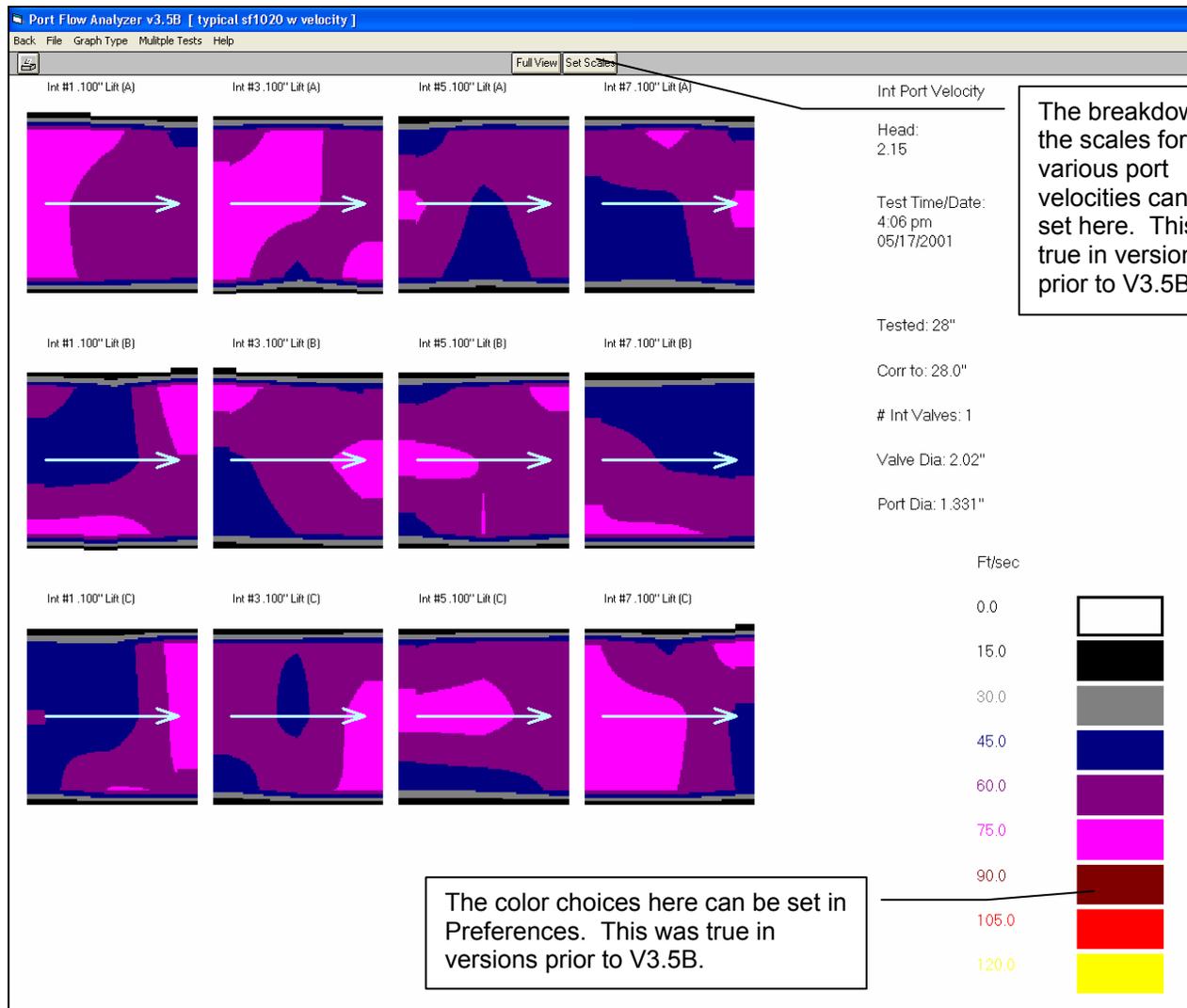
**Port Velocity Map Options**

Type: Side View, one lift

Lift for Graphing: 1st

Cylinder for Graphing: 1st

Notes:  
Select the options you want for this graph. Some



Pick Port Velocity

Pick View and what lifts and cylinders to graph

Pick Lift or Cylinder for graphing, which ever needed

The breakdown of the scales for various port velocities can be set here. This was true in versions prior to V3.5B.

The color choices here can be set in Preferences. This was true in versions prior to V3.5B.

Figure A48 Smaller Test Piece Picture in Portrait Mode Printer Orientation

**Port Flow Analyzer v3.5 B**  
 Back File Format View Gra  
 Add Test to Graph  
 Print Color (solid lines)  
 Print Black & White (dashed lines)  
 Edit Printed Comments and Data Output  
 Windows Print Options  
 Email 256 Color Graph  
 Email 16 Color Graph  
 Exit

Click here for screen to right. This feature is also listed under Format.

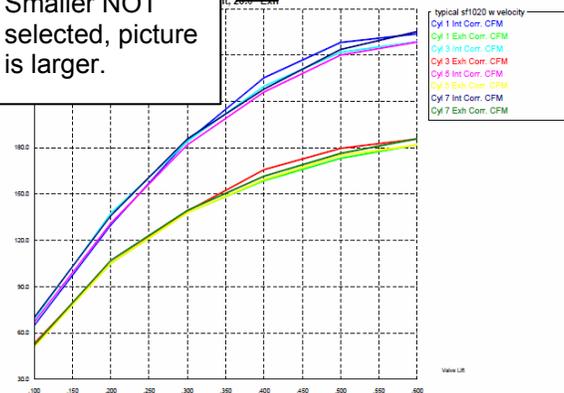
**Printed Graph Comments**  
 1 Graph Data Sets (comments available for each Data Set)  
 Graph Title: typical sf1020 w velocity  
 Test Comment: Choose to include Test Piece Picture in printout  
 Test Summary: Test Summaries are created by the program and include valve and port sizes, test times and dates, etc. They can not be changed by the user.  
 Include on Graph:  
 Test Summaries  
 Test Comments  
 Graph Comment  
 Data Table  
 Test Piece Picture  
 Make Picture Smaller  
 Titles to Use:  
 Std Titles  
 Alt. Titles  
 See Titles  
 Graph Height, %: 100  
 OK Help

You can choose to make the picture smaller, which can give you more room on a printed page.

Picture Smaller. This only applies to Portrait page orientation. Landscape always does this.

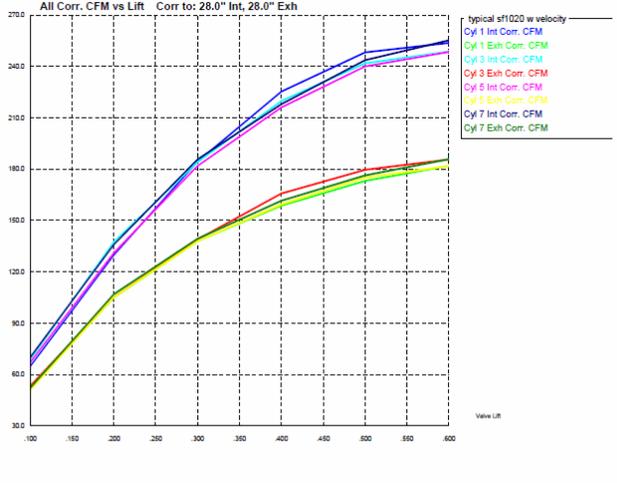
Port Flow Analyzer v3.5 B  
 Eng: typical sf1020 w velocity  
 Calculated Test Results  
 Your name / company name can go here. See Preferences.  
 Performance Trends (C) 2009  
 This Graph Printed: 8:28 pm 06-26-13  
 Page: 1

Smaller NOT selected, picture is larger.



No room on this page for Data Table.

Port Flow Analyzer v3.5 B  
 Eng: typical sf1020 w velocity  
 Calculated Test Results  
 Your name / company name can go here. See Preferences.  
 Performance Trends (C) 2009  
 This Graph Printed: 8:35 pm 06-26-13  
 Page: 1



Test Summary and Comments for: typical sf1020 w velocity

Lift	.100	.200	.300	.400	.500	.600
Cyl 1 Int Corr. CFM	64.7	129.8	184.5	225.3	249.2	253.7
Cyl 3 Int Corr. CFM	68.5	137.5	184.1	219.8	241.8	248.8
Cyl 5 Int Corr. CFM	66.9	131.1	181.8	216.0	240.0	248.4
Cyl 7 Int Corr. CFM	70.0	135.9	185.7	217.9	243.6	255.3
Cyl 1 Exh Corr. CFM	51.8	104.9	137.9	158.6	173.1	181.8
Cyl 3 Exh Corr. CFM	53.3	105.3	138.9	165.7	179.6	185.6
Cyl 5 Exh Corr. CFM	50.8	105.1	137.9	159.5	175.0	181.8
Cyl 7 Exh Corr. CFM	52.1	106.9	139.3	161.5	176.3	185.8

Room for Data Table on a single sheet.

Figure A49 Smaller Graph Fits All Results on 1 Printed Sheet

The screenshot shows the 'Printed Graph Comments' dialog box with the following settings:

- Graph Title:** typical sf1020 w velocity
- Test Comment:** Progressive racing World Products heads  
Includes examples of Port Velocity data and Test Piece picture file for Head Porter Version
- Include on Graph:**
  - Test Summaries
  - Test Comments
  - Graph Comment
  - Data Table
  - Test Piece Picture
  - Make Picture Smaller
- Titles to Use:**
  - Std Titles
  - Alt. Titles
- Graph Height, %:** 85

The 'File' menu is open, showing options like 'Print Color (solid lines)', 'Print Black & White (dashed lines)', and 'Edit Printed Comments and Data Output'.

Choose a % to reduce the height of the printed graph. This option works in both Portrait and Landscape printer orientations.

Printed header section of a report:

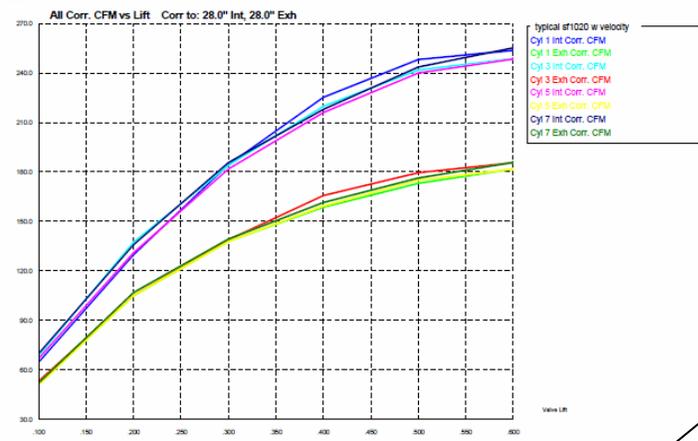
Port Flow Analyzer v3.5 B  
Eng: typical sf1020 w velocity  
Calculated Test Results

Your name / company name can go here. See Preferences.  
Performance Trends (C) 2009

This Graph Printed:  
8:53 pm 06-26-13  
Page: 1



Printed graphs no longer have a border on the left and right sides around the graph. This border often had a slight "jog" in it depending on printer, screen resolution, etc. Now without a border, there is no "jog".

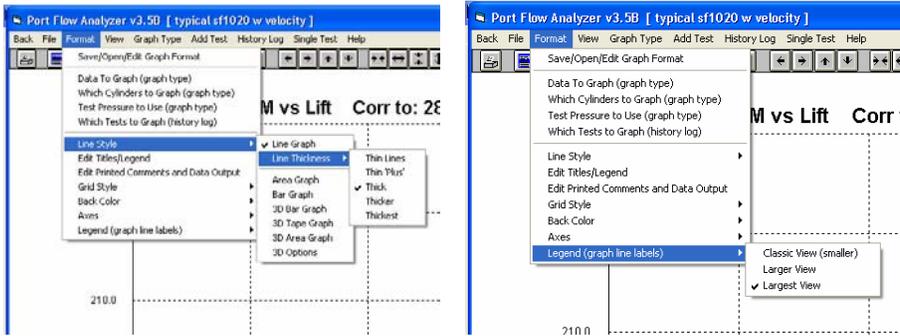


The graph can be printed to include the Data Table even though the Test Piece picture is printed large.

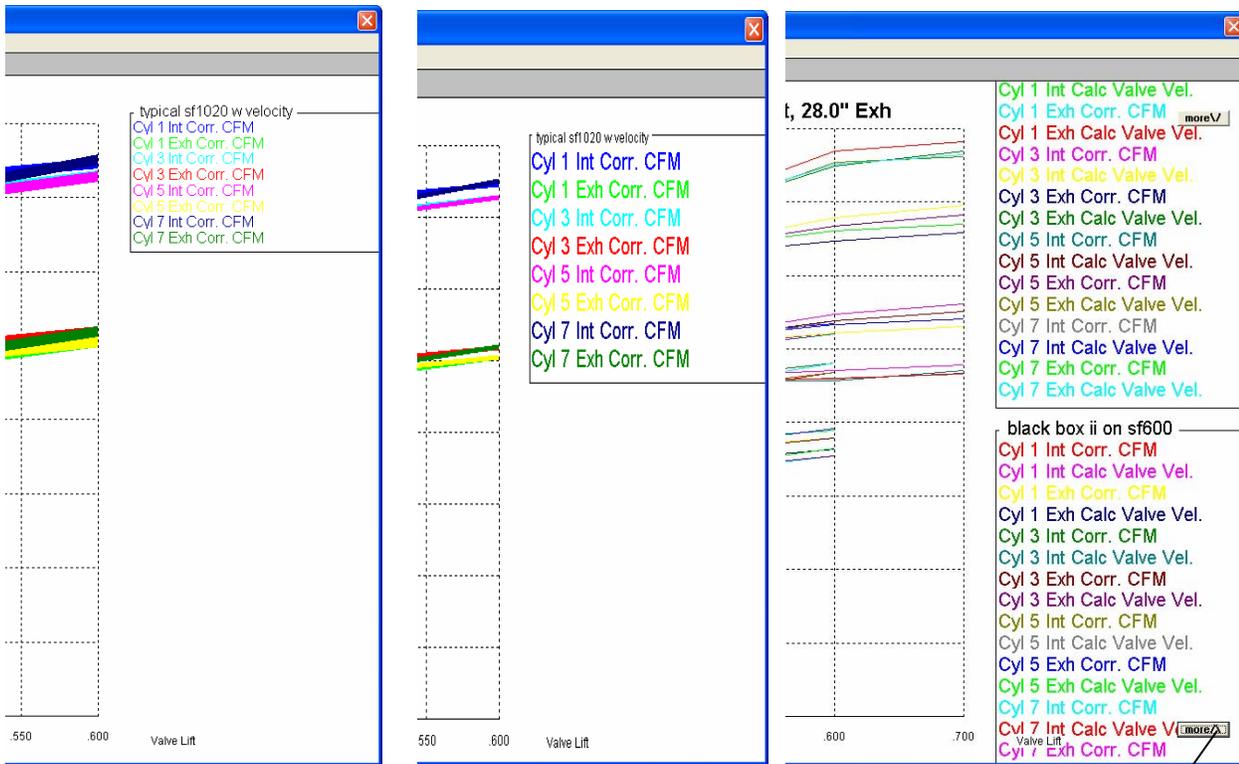
Test Summary and Comments for: typical sf1020 w velocity

Lift	.100	.200	.300	.400	.500	.600
Cyl 1 Int Corr. CFM	64.7	129.8	184.5	225.3	248.2	253.7
Cyl 3 Int Corr. CFM	68.5	137.5	184.1	219.8	241.8	248.8
Cyl 5 Int Corr. CFM	66.9	131.1	181.8	216.0	240.0	248.4
Cyl 7 Int Corr. CFM	70.0	135.9	185.7	217.9	243.6	255.3
Cyl 1 Exh Corr. CFM	51.8	104.9	137.9	158.6	173.1	181.8
Cyl 3 Exh Corr. CFM	53.3	105.3	138.9	165.7	179.6	185.6
Cyl 5 Exh Corr. CFM	50.8	105.1	137.9	159.5	175.0	181.8
Cyl 7 Exh Corr. CFM	52.1	106.9	139.3	161.5	176.3	185.8

Figure A50 New Graph Features: Line Thickness and Larger Legends



Various combinations of line thickness and Legend Size



If the legend is too large to fit on the screen, "more" buttons appear at top and or bottom. You can click on these buttons to scroll through the labels.

Figure A51 More Example Cams for Engine Specs Screen

**Engine Specs [ CHEVY-97.LS1 ]**

Back (ok) File Help

**Cam Specs**

	Intake	Exhaust
Centerline, deg	113	121
Duration @ .050 "	202	210
Open @ .050 "	-12	46
Close @ .050 "	34	-16
Max Lobe Lift, Clc	.278	.281
Actual Valve Lash,		
Rocker Arm Ratio	1.7	1.7
Gross Valve Lift, in	.473	.478
Use Cam File	No	No

**General Cam Specs**

Type: Ex: Stock 97 LS1 SB Chevy

Lift for: Use Specs in this Menu  
Pick an Example

Lifter (Ex: Stock 97 LS1 SB Chevy)

Total Cam Advance: 4.0 Advance

Designed Valve Lash, in

Lobe Separation, cam deg: 117.0

**General Engine Specs**

Bore, in: 3.9 Stroke, in: 3.62

# Cyl: 8 C.R. Clc: 10

Connecting Rod Length, in: 6.098

Cu In: 346.0 CCs: 5670.2 Chamber CCs: 78.8

**Engine Comments**

Stock 97 LS1 small block Chevy

**Categories of Cam Exempl...**

Categories (groups) of Performance Trends' Examples

- Buick - Other Engines
- Cadillac
- Small Block Chevy
- Big Block Chevy
- Chevy 4 Cyl
- Chevy Inline 6 Cyl
- Chevy V-6**
- Other Chevy V-8s
- Chevy Corvair
- Chevy Gen III LS V-8
- Comp Cams All Mopar
- Crane All Mopar

Use Category Cancel

Tip: Click on a category in either section to highlight it, then click on the 'Use Category' button, or just Double Click on the category in one step. (Categories are groups of examples, like a group of Chevy heads, instead of individual examples.)

Choose Pick an Example

Choose a Category of Cam from a much larger list than in earlier versions.

**Examples**

Cam Name	Rated Lift	Lifter Profile	Valve Train	Center Line	Dur	Lobe Lift	Valv
Chevy V-6 Cams							
Stock CHEVROLET 79-84 V6 231 cid All w/2BC even fire eng.	.050	MHydFlt	P+RA prd	104	181	.239	na
(exh)				110	194	.256	na
Stock CHEVROLET 78-83 V6 231 cid All w/4BC turbo even fire eng	.050	MHydFlt	P+RA prd	104	181	.239	na
(exh)				110	194	.256	na
Stock CHEVROLET 85-87 V6 231 cid All w/2BC Export & Canada	.050	MHydFlt	P+RA prd	104	181	.239	na
(exh)				110	194	.256	na
Crower 03340 Chevy 262 90° V6 (4.3L)	.050	MHydFlt	P+RA imp	110	182	.257	na
(exh)				118	190	.258	na
Crower 03140 Chev 200 229 90° V6 (3.8L)	.050	MHydFlt	P+RA imp	110	182	.257	na
(exh)				118	190	.258	na
Crower 03040 Chev 173 60° (2.8L) 189 (3.1L) V6	.050	MHydFlt	P+RA imp	110	182	.257	na
(exh)				118	192	.258	na
Stock CHEVROLET L6 63-89 292/4.8-T 292 cid A11	.050	MHydFlt	P+RA prd	113	188	.271	na
(exh)				110	188	.271	na
CompCam 246-HR10 GM 3800/3.8 V6 1996-PRESENT	.050	MHydFlt	P+RA imp	110	191	.3	na
(exh)				110	201	.31	na
CompCam 240H Chevy 2.8/3.1/3.4L V-6 1980-95	.050	AHydFlt	P+RA imp	104	192	.26	na
(exh)				112	200	.26	na
CompCam 240H CHEVROLET 2.8L 3.1L 3.4L V-6 1980-1995	.050	AHydFlt	P+RA imp	104	192	.26	na
(exh)				112	200	.26	na
CompCam 240H CHEVY 200,229 V-6 1978,1984 w/ 90° ODD FIRE RACE	.050	AHydFlt	P+RA imp	104	192	.26	na

Abbreviations: BIR=Blue Racer CC=Comp Cams Lun=Lunati Ms=Motorsports Comp Cams Grinds: DEH=Duel-Energy XR/XE=Extreme-Energy NX=Nitrous-HP

Tip: Click on Example to highlight it, then click on 'Pick' or 'Delete' button. Double click to pick Example in 1 step.

Pick Delete Print Cancel

Pick the particular cam from a large list of cams, almost double from what was in earlier versions.

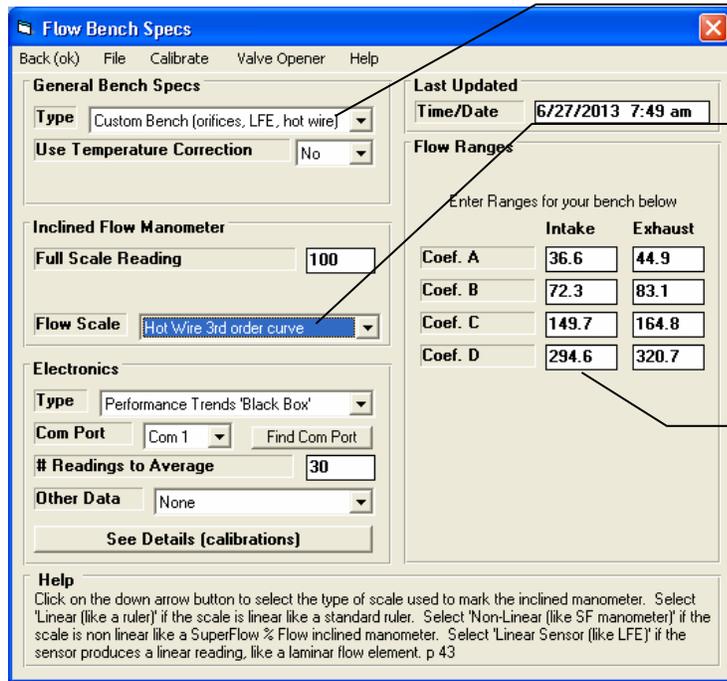
Figure A52 Motor Controller to Control Test Pressure

The figure shows a screenshot of the 'Perf Trends Readings: Int #1 F9>' software interface on the left and a photograph of a motor controller on the right. The software interface displays various parameters: 'Set Te: 28', 'Data P: 1', 'Act. Test Pres.: 7.99"', 'Range: Int 3', 'Valve Lift: 100', 'Flow Reading: 95.6', and 'Corr. CFM Flow: 267.9'. A 'Motor Controller' menu is open, showing options like 'Temporarily Power Down', 'Turn On from Temporarily Power Down', 'Turn Motor Controller On', 'Turn Motor Controller Off', 'Show/Adjust Controller Settings', and 'Turn Controller Output'. The photograph shows a metal motor controller with a power cord and control lines. Callouts point to 'Controlled AC power to bench', 'AC power in', and 'Control lines from special Black Box II'. A text box at the bottom left states: 'Motor controller options. Current design only works with special Black Box IIs.'

Figure A53 USB Recording Switch

The figure shows a screenshot of the software interface on the left and two photographs of USB recording switch options on the right. The software interface shows the 'Options' menu with 'USB Switch' selected. The photographs show a 'Foot Switch w USB connector' and a 'Hand Switch w USB connector'. A text box at the bottom explains the setup: 'Under Options, click on USB Switch to see options. First, click on Set USB Switch Com Port and set that to one of the available Com Ports shown by the program when you click on this. Then click on Use USB Switch to tell program to look for this switch input for recording data. F1 keystroke will still work also.'

Figure A54 New Bench Type: Hot Wire Anemometer

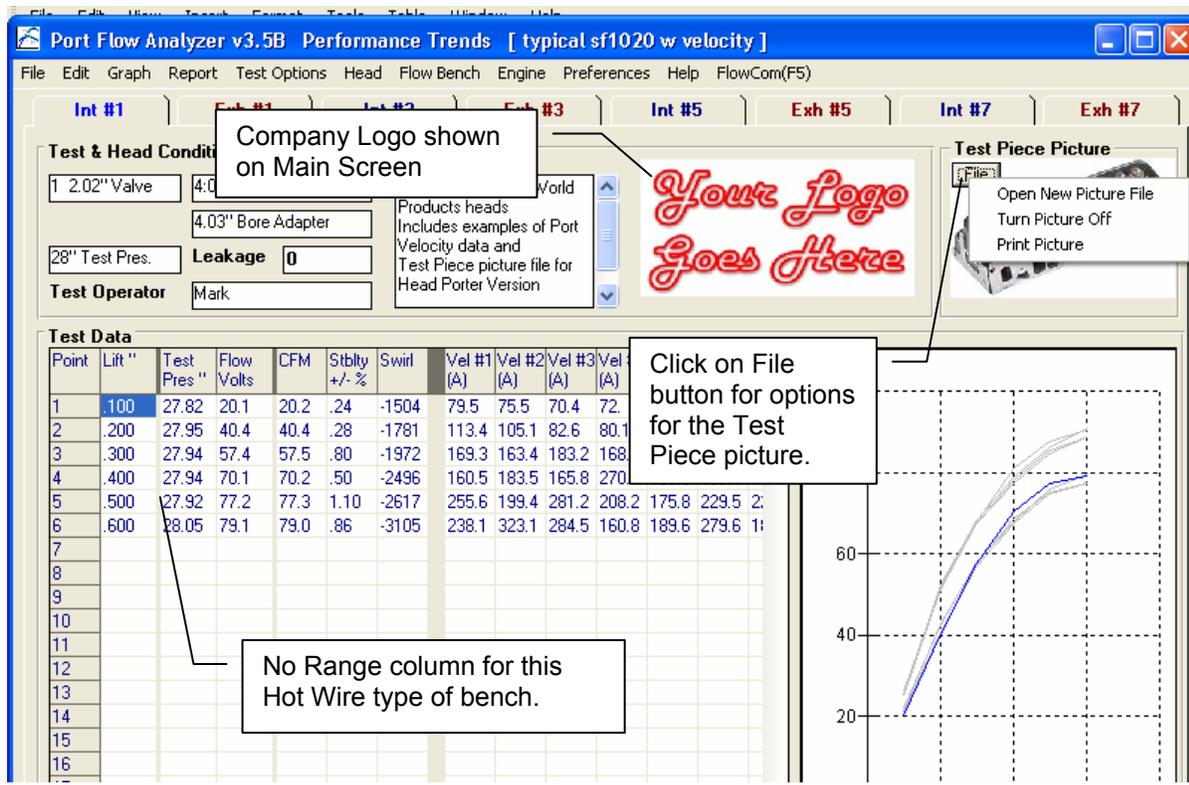


Choose Custom Bench Type

Choose Hot Wire

Enter the 3<sup>rd</sup> order coefficients for a curve of flow vs voltage. Most likely you will have to obtain this from Performance Trends after you run a calibration on your bench.

Figure A55 Main Screen: No Range Column for Certain Benches and Logo Picture



Company Logo shown on Main Screen

Click on File button for options for the Test Piece picture.

No Range column for this Hot Wire type of bench.