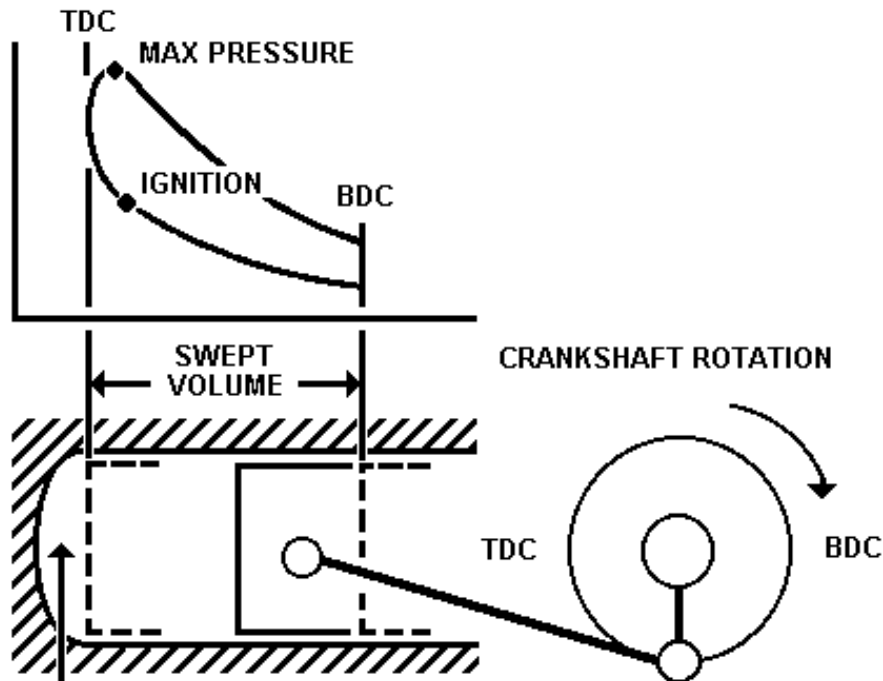# Performance engine preparation

BMEP

- Brake Mean Effective Pressure
    Calculated based on measured torque
    Max pressure occurs at max VE, near peak torque

Performance engine preparation

Formulas

- HP @ peak torque = $\dfrac{\text{Torque x RPM}}{5252}$

- BMEP @ peak torque = $\dfrac{\text{HP x 13,000}}{\text{Liters x RPM}}$

- BMEP @ peak HP = $\dfrac{\text{HP x 13,000}}{\text{Liters x RPM}}$

Cmnts | **Notes**

Notes Summary: Detonation likely, Piston speed somewhat high. Click on Notes for more Details.

PkTq=297 @ 3600 Avg=266
PkHP=230 @ 4800 Avg=187

You can 'Auto-Link' to Vehicle Programs. Click here to see how.

Engine RPM	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600
Brk Tq, ft-lbs	269.2	276.8	284.3	295.4	296.7	290.7	272.6	251.5	226.8	191.4
Brake HP	102.50	126.47	151.57	180.00	203.37	221.43	228.36	229.84	224.56	204.08
Exh Pres, PSI	.4	.6	.8	1.2	1.5	1.9	2.1	2.3	2.4	2.3
Int Vac, "Hg	.1	.1	.2	.3	.4	.5	.6	.6	.6	.6
Vol Eff, %	75.1	77.8	81.2	85.5	87.8	87.9	85.5	81.6	77.3	70.3
Actual CFM	131.13	162.88	198.33	238.80	275.80	306.81	328.31	341.99	350.66	343.60
Fuel Flow, lb/hr	45.81	56.90	69.29	83.42	96.35	107.18	114.69	119.47	122.50	120.04
Nitrous, lb/hr	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Ntrs Fuel, lb/hr	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
BMEP, PSI	134.6	138.4	142.2	147.7	148.4	145.4	136.3	125.7	113.4	95.7
A/F Mxtr Qlty, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BSFC, lb/HP-hr	.447	.450	.457	.463	.474	.484	.502	.520	.546	.588
Thermal Eff, %	33.10	33.10	32.79	32.50	32.06	31.75	31.16	30.79	30.20	29.36
IMEP, PSI	148	154	159	166	168	167	159	150	139	123
Frctn Tq, ft-lbs	27.67	30.49	33.36	36.28	39.25	42.28	45.36	48.50	51.70	54.95
Frctn HP	10.54	13.93	17.78	22.10	26.90	32.20	38.00	44.33	51.19	58.60
FMEP, PSI	13.84	15.25	16.68	18.14	19.63	21.14	22.68	24.25	25.85	27.48
Mech Eff, %	90.7	90.1	89.5	89.1	88.3	87.3	85.7	83.8	81.4	77.7

```
------   Valve Flow & Cam Calculations  --------------------  --Int-- --Exh--
Overlap Area, deg*sq-in    1.3       Ulv Area, deg*sq-in    177.8   123.4
Total Exh/Int %            69.4      Total Avg Flow Coef    0.263   0.281
Lobe Separation, deg       114.3     Lobe Area, inch*deg    20.21   19.73
Overlap, deg               40        Duration @ .003, deg   271     265
Overlap @ .050, deg        -20       Opening Events, deg    21      66
                                     Closing Events, deg    70      18
--------------------  --Int-- --Exh--  Duration @.050, deg  211     206
Duration @.200, deg   110     107     Opn Evnts @.050, deg  -9      37
TDC Tappet Lift, in   0.030   0.026   Cls Evnts @.050, deg  40      -11
Gross Valve Lift, in  0.440   0.440   Lobe Centerlns, deg   114.5   114.0
Net Valve Lift, in    0.434   0.434   Grss Tappet Lft, in   0.275   0.275
                                      Bind Clearance, in    0.022   0.022


------   General Engine Calculations  -------------------------------------
Displacement, ccs          4943.1    Displacement, cu in       301.59
Dynamic Comp. Ratio        6.89      Compression Ratio         9.00
Theo. Crank Comprssn,PSI   166       Clearance Volume, ccs     77.2
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Engine Analyzer Pro   Engine [!v2.1 98-WNSTN.CUP]   Test Results [Untitled]   — ☐ ✕

Back Graph Print Help File ASCII File History Analyze See-Engine Send Stop   _ ☐ ✕

| Cmnts | Notes Summary: Piston speed Extremely high. Click on | PkTq=536 @ 6500 Avg=491 | You can 'Auto-Link' to |
| Notes | Notes for more Details. | PkHP=730 @ 8000 Avg=568 | Vehicle Programs. Click here to see how. |

Engine RPM	4000	4500	5000	5500	6000	6500	7000	7500	8000
Brk Tq, ft-lbs	378.2	442.8	493.6	531.1	517.4	535.7	530.6	508.0	479.1
Brake HP	288.08	379.40	469.91	556.21	591.06	663.01	707.17	725.51	729.77
Exh Pres, PSI	.0	.0	.0	.0	.0	.0	.0	.0	.0
Int Vac, "Hg	.2	.3	.5	.8	.9	1.2	1.4	1.5	1.6
Vol Eff, %	77.8	89.6	101.5	112.7	109.4	116.3	117.0	113.0	109.0
Actual CFM	317.59	411.73	518.23	632.96	670.26	771.85	836.36	865.55	890.07
Fuel Flow, lb/hr	116.28	150.74	189.74	231.74	245.40	282.59	306.21	316.90	325.88
Nitrous, lb/hr	.00	.00	.00	.00	.00	.00	.00	.00	.00
Ntrs Fuel, lb/hr	.00	.00	.00	.00	.00	.00	.00	.00	.00
BMEP, PSI	161.7	189.3	211.0	227.0	221.1	229.0	226.8	217.2	204.8
A/F Mxtr Qlty, %	98.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BSFC, lb/HP-hr	.404	.397	.404	.417	.415	.426	.433	.437	.447
Thermal Eff, %	37.18	37.42	36.67	35.49	35.90	35.04	34.71	34.78	34.47
IMEP, PSI	181	210	233	250	246	255	254	246	235
Frctn Tq, ft-lbs	44.90	47.99	51.11	54.25	57.44	60.66	63.92	67.22	70.56
Frctn HP	34.20	41.12	48.65	56.82	65.62	75.07	85.19	95.99	107.49
FMEP, PSI	19.19	20.51	21.84	23.19	24.55	25.93	27.32	28.73	30.16
Mech Eff, %	89.4	90.2	90.6	90.7	90.0	89.8	89.2	88.3	87.2

```
------   Valve Flow & Cam Calculations  -------------------   --Int-- --Exh--
Overlap Area, deg*sq-in   40.2       Vlv Area, deg*sq-in   492.0   313.8
Total Exh/Int %           63.8       Total Avg Flow Coef   0.411   0.467
Lobe Separation, deg     106.0       Lobe Area, inch*deg   32.07   32.18
Overlap, deg             114         Duration @ .003, deg  329     324
Overlap @ .050, deg       58         Opening Events, deg    60      90
                                     Closing Events, deg    88      54
--------------------   --Int-- --Exh-- Duration @.050, deg  268     272
Duration @.200, deg  175     177     Opn Evnts @.050, deg   30      64
TDC Tappet Lift, in  0.141   0.133   Cls Evnts @.050, deg   58      28
Gross Valve Lift, in 0.666   0.666   Lobe Centerlns, deg   104.0   108.0
Net Valve Lift, in   0.650   0.646   Grss Tappet Lft, in   0.370   0.370
                                     Bind Clearance, in    0.049   0.049

------   General Engine Calculations  ------------------------------------
Displacement, ccs       5782.6       Displacement, cu in     352.81
Dynamic Comp. Ratio        7.43      Compression Ratio        12.00
Theo. Crank Comprssn,PSI   185       Clearance Volume, ccs     65.7
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Cmnts
Notes

Notes Summary: Piston speed Very high. Click on Notes for more Details.

PkTq=275 @ 4000 Avg=221
PkHP=257 @ 5500 Avg=200

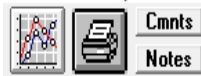You can 'Auto-Link' to Vehicle Programs. Click here to see how.

Engine RPM	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000
Brk Tq, ft-lbs	168.4	176.6	216.5	274.7	271.7	259.0	245.3	224.5	197.5	171.1
Brake HP	80.17	100.85	144.27	209.22	232.78	246.60	256.88	256.49	244.49	228.02
Exh Pres, PSI	1.0	1.7	3.4	6.7	7.6	8.5	9.1	9.6	9.8	9.5
Boost, PSI	1.1	1.8	4.1	8.3	8.0	7.8	7.6	7.5	7.4	7.5
Vol Eff, %	88.7	93.2	113.5	144.0	145.8	144.8	141.3	134.3	125.5	113.7
Actual CFM	97.07	122.40	173.92	252.14	287.06	316.85	340.06	352.55	357.06	348.38
Fuel Flow, lb/hr	35.54	44.81	63.68	92.31	105.10	116.01	124.50	129.08	130.73	127.55
Nitrous, lb/hr	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Ntrs Fuel, lb/hr	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
BMEP, PSI	167.9	176.0	215.8	273.9	270.9	258.3	244.6	223.9	197.0	170.6
A/F Mxtr Qlty, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BSFC, lb/HP-hr	.443	.444	.441	.441	.451	.470	.485	.503	.535	.559
Thermal Eff, %	33.23	33.40	33.35	32.99	32.53	31.62	31.14	30.60	29.64	29.37
IMEP, PSI	184	195	237	297	297	286	275	257	233	209
Frctn Tq, ft-lbs	16.50	18.75	21.05	23.39	25.78	28.22	30.70	33.23	35.81	38.44
Frctn HP	7.85	10.71	14.03	17.82	22.09	26.86	32.15	37.96	44.32	51.23
FMEP, PSI	16.45	18.70	20.99	23.33	25.71	28.13	30.61	33.13	35.70	38.33
Mech Eff, %	91.1	90.4	91.1	92.2	91.3	90.2	88.9	87.1	84.7	81.7

```
------   Valve Flow & Cam Calculations   --------------------   --Int-- --Exh--
Overlap Area, deg*sq-in    1.8         Vlv Area, deg*sq-in    199.4    192.7
Total Exh/Int %           96.7         Total Avg Flow Coef    0.297    0.372
Lobe Separation, deg      112.0        Lobe Area, inch*deg    33.31    32.73
Overlap, deg              45           Duration @ .003, deg   271      267
Overlap @ .050, deg       -6           Opening Events, deg    20       62
                                       Closing Events, deg    71       25
--------------------   --Int-- --Exh-- Duration @.050, deg    220      216
Duration @.200, deg    156     153     Opn Evnts @.050, deg   -4       38
TDC Tappet Lift, in    0.039   0.052   Cls Evnts @.050, deg   44       -2
Gross Valve Lift, in   0.484   0.484   Lobe Centerlns, deg    114.0    110.0
Net Valve Lift, in     0.478   0.478   Grss Tappet Lft, in    0.484    0.484
                                       Bind Clearance, in     0.024    0.024


------   General Engine Calculations   --------------------------------------
Displacement, ccs          2478.9      Displacement, cu in        151.25
Dynamic Comp. Ratio        6.08        Compression Ratio          8.00
Theo. Crank Comprssn,PSI   139         Clearance Volume, ccs      88.5
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