Eng: CHIPPED 1Z/AHU TDI, STOCK CAM
Calculated Test Results

Date: 09-07-2008
Time: 12:53:42 pm


## Projected Performance

| Engine RPM | 1000 | 1250 | 1500 | 1750 | 2000 | 2250 | 2500 | 2750 | 3000 | 3250 | 3500 | 3750 | 4000 | 4250 | 4500 | 4750 | 5000 | 5250 | 5500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brk Tq, ft lb | 95.2 | 105 | 122 | 160 | 182 | 177 | 172 | 167 | 160 | 153 | 145 | 136 | 126 | 116 | 105 | 94.9 | 84.3 | 74.5 | 64.9 |
| Brake HP | 18.12 | 25.09 | 34.78 | 53.2 | 69.4 | 75.9 | 82.0 | 87.3 | 91.4 | 94.5 | 96.8 | 97.3 | 96.1 | 93.8 | 90.2 | 85.8 | 80.2 | 74.4 | 67.9 |
| Exh Pres, PSI | 1.2 | 2.2 | 4.1 | 9.3 | 14.1 | 15.1 | 16.1 | 17.0 | 17.9 | 18.6 | 19.1 | 19.6 | 19.9 | 20.0 | 20.1 | 20.1 | 20.1 | 20.0 | 19.8 |
| Boost, PSI | 1.0 | 2.0 | 4.0 | 9.3 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 12.9 | 12.9 | 12.9 | 12.9 | 12.9 | 12.9 | 12.9 | 12.9 | 12.9 | 12.9 |
| Vol Eff, % | 79.0 | 85.1 | 96.2 | 124.0 | 142.4 | 141.4 | 140.2 | 138.6 | 136.3 | 133.3 | 129.6 | 125.1 | 120.1 | 114.7 | 109.1 | 103.6 | 98.1 | 92.8 | 87.7 |
| Actual CFM | 26.45 | 35.60 | 48.33 | 72.6 | 95.3 | 107 | 117 | 128 | 137 | 145 | 152 | 157 | 161 | 163 | 164 | 165 | 164 | 163 | 162 |
| Fuel Flow, lb/hr | 5.77 | 7.77 | 10.55 | 15.86 | 20.82 | 23.26 | 25.63 | 27.88 | 29.90 | 31.68 | 33.16 | 34.31 | 35.12 | 35.64 | 35.90 | 35.97 | 35.85 | 35.62 | 35.28 |
| Nitrous, lb/hr | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Ntrs Fuel, lb/hr | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BMEP, PSI | 124 | 137 | 159 | 208 | 237 | 231 | 225 | 217 | 209 | 199 | 189 | 178 | 164 | 151 | 137 | 124 | 110 | 97.0 | 84.5 |
| A/F Mxtr Qlty, % | 95.2 | 98.6 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| BSFC, lb/HP-hr | 0.319 | 0.310 | 0.303 | 0.298 | 0.300 | 0.307 | 0.312 | 0.319 | 0.327 | 0.335 | 0.343 | 0.353 | 0.366 | 0.380 | 0.398 | 0.419 | 0.447 | 0.479 | 0.519 |
| Thermal Eff, % | 50.3 | 51.5 | 52.0 | 51.5 | 50.8 | 50.2 | 49.75 | 49.26 | 48.72 | 48.22 | 47.99 | 47.56 | 47.02 | 46.52 | 45.96 | 45.36 | 44.63 | 44.01 | 43.30 |
| IMEP, PSI | 148 | 163 | 187 | 238 | 270 | 265 | 260 | 255 | 248 | 240 | 232 | 222 | 211 | 199 | 187 | 175 | 163 | 152 | 142 |
| Frctn Tq, ft-lbs | 18.53 | 19.92 | 21.38 | 23.06 | 24.64 | 25.97 | 27.32 | 28.67 | 30.03 | 31.38 | 32.74 | 34.10 | 35.47 | 36.84 | 38.22 | 39.61 | 41.02 | 42.44 | 43.87 |
| Frctn HP | 3.53 | 4.74 | 6.11 | 7.68 | 9.38 | 11.13 | 13.01 | 15.01 | 17.15 | 19.42 | 21.82 | 24.35 | 27.01 | 29.81 | 32.75 | 35.83 | 39.05 | 42.42 | 45.95 |
| FMEP, PSI | 24.14 | 25.95 | 27.86 | 30.05 | 32.10 | 33.85 | 35.60 | 37.36 | 39.13 | 40.90 | 42.67 | 44.44 | 46.22 | 48.00 | 49.80 | 51.6 | 53.5 | 55.3 | 57.2 |
| Mech Eff, % | 83.7 | 84.1 | 85.1 | 87.4 | 88.1 | 87.2 | 86.3 | 85.3 | 84.2 | 82.9 | 81.6 | 80.0 | 78.1 | 75.9 | 73.4 | 70.5 | 67.3 | 63.7 | 59.7 |
| Motoring HP | 3.73 | 5.09 | 6.68 | 8.73 | 11.48 | 14.27 | 17.42 | 20.86 | 24.66 | 28.68 | 32.91 | 37.35 | 41.94 | 46.71 | 51.6 | 56.7 | 61.9 | 67.1 | 72.6 |
| Pumpng Work, HP | -0.21 | -0.35 | -0.58 | -1.05 | -2.10 | -3.14 | -4.41 | -5.85 | -7.50 | -9.26 | -11.09 | -13.00 | -14.92 | -16.90 | -18.88 | -20.86 | -22.80 | -24.70 | -26.64 |
| Residual Exh, % | 5.0 | 4.6 | 4.6 | 4.5 | 4.6 | 4.8 | 5.0 | 5.3 | 5.6 | 6.5 | 6.9 | 7.3 | 8.4 | 9.1 | 9.8 | 10.5 | 12.0 | 12.9 | 13.9 |
| Shrt Circuit, % | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Exh Temp, deg F | 943 | 997 | 1049 | 1116 | 1157 | 1176 | 1187 | 1195 | 1204 | 1212 | 1224 | 1231 | 1238 | 1242 | 1246 | 1249 | 1252 | 1255 | 1255 |
| Mx Cyl Pres, PSI | 1704 | 1854 | 2109 | 2728 | 3149 | 3106 | 3095 | 3070 | 3030 | 2978 | 2921 | 2836 | 2738 | 2628 | 2515 | 2402 | 2289 | 2182 | 2080 |
| Mx Cyl Tmp, deg F | 4084 | 4114 | 4130 | 4141 | 4151 | 4087 | 4080 | 4067 | 4055 | 4046 | 4051 | 4035 | 4019 | 3995 | 3971 | 3945 | 3914 | 3884 | 3852 |
| In Port Tmp, deg F | 194 | 189 | 186 | 186 | 189 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 197 | 199 | 201 | 203 | 206 | 208 | 211 |
| Piston Spd, ft/min | 627 | 783 | 940 | 1097 | 1253 | 1410 | 1567 | 1723 | 1880 | 2037 | 2193 | 2350 | 2507 | 2663 | 2820 | 2977 | 3133 | 3290 | 3447 |
| Piston Gs @ TDC | 70 | 110 | 160 | 220 | 280 | 360 | 440 | 540 | 640 | 750 | 870 | 1000 | 1140 | 1280 | 1440 | 1600 | 1780 | 1960 | 2150 |
| Coolant HP | 9.74 | 11.46 | 13.29 | 15.49 | 17.62 | 19.59 | 21.51 | 23.42 | 25.43 | 27.44 | 29.63 | 31.73 | 33.84 | 35.88 | 37.98 | 40.04 | 42.10 | 44.19 | 46.22 |
| Blow By, CFM | 1.9 | 2.0 | 2.3 | 3.0 | 3.5 | 3.5 | 3.4 | 3.4 | 3.4 | 3.3 | 3.2 | 3.2 | 3.0 | 2.9 | 2.8 | 2.7 | 2.6 | 2.5 | 2.3 |
| In Tun Pres, PSI | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.5 | 0.6 | 0.7 | 0.8 | 1.0 | 1.1 | 1.2 | 1.4 | 1.5 | 1.7 |
| Avg In Vel, ft/sec | 52 | 65 | 78 | 91 | 104 | 117 | 131 | 144 | 157 | 170 | 183 | 196 | 209 | 222 | 235 | 248 | 261 | 274 | 287 |
| Avg Ex Vel, ft/sec | 65 | 82 | 98 | 115 | 131 | 147 | 164 | 180 | 196 | 213 | 229 | 246 | 262 | 278 | 295 | 311 | 327 | 344 | 360 |
| Mach # | 0.182 | 0.227 | 0.272 | 0.318 | 0.363 | 0.409 | 0.454 | 0.499 | 0.545 | 0.590 | 0.636 | 0.681 | 0.726 | 0.772 | 0.817 | 0.863 | 0.908 | 0.953 | 0.999 |
| Act In FlowArea,% | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Act Ex FlowArea,% | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Valve Toss | | | | | | | | | | | | | | | | | | | |
| Knock Index | 43.3 | 42.2 | 47.0 | 69.3 | 86.7 | 81.4 | 77.8 | 73.8 | 69.8 | 65.6 | 62.3 | 57.6 | 52.8 | 48.2 | 43.7 | 39.6 | 35.8 | 32.4 | 29.3 |
| Spark Advnc, deg | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 26.9 | 27.1 | 27.4 | 27.7 | 27.9 | 28.2 | 28.4 | 28.7 | 29.0 | 29.2 | 29.5 | 29.8 | 30.0 | 30.3 |
| Injctr Dty Cyc, % | | | | | | | | | | | | | | | | | | | |
| Inj Plse Wdth, ms | | | | | | | | | | | | | | | | | | | |
| Calc Error | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Compressor Eff, % | 57.7 | 59.8 | 62.4 | 65.1 | 66.4 | 67.5 | 68.5 | 69.5 | 70.3 | 71.0 | 71.5 | 71.9 | 72.2 | 72.4 | 72.4 | 72.5 | 72.4 | 72.4 | 72.2 |
| Cmprssr Pres Ratio | 1.07 | 1.14 | 1.28 | 1.64 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 |
| Compressor HP | 0.2 | 0.5 | 1.3 | 3.8 | 6.5 | 7.1 | 7.7 | 8.3 | 8.8 | 9.2 | 9.6 | 9.8 | 10.0 | 10.2 | 10.2 | 10.2 | 10.2 | 10.2 | 10.1 |
| Turbo Wastegt, % | 0.0 | 0.0 | 0.0 | 0.0 | 6.3 | 12.9 | 18.1 | 22.1 | 26.3 | 29.0 | 31.2 | 32.7 | 33.8 | 34.4 | 34.8 | 35.0 | 35.0 | 34.8 | 34.5 |
| Turbo Surge, % | 0.0 | 0.0 | 0.0 | 4.9 | 7.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

PkTq=182@2000 Avg=128
PkHP=97.3@3750 Avg=74.4

Special Calculations

| ------ Valve Flow & Cam Calculations | | | ------------------ | --Int-- | --Exh-- |
|---|---|---|---|---|---|
| Overlap Area, deg*sq-in | 0.0 | | Vlv Area, deg*sq-in | 76.6 | 74.7 |
| Total Exh/Int % | 97.6 | | Total Avg Flow Coef | 0.217 | 0.276 |
| Lobe Separation, deg | 112.0 | | Lobe Area, inch*deg | 20.01 | 20.01 |
| Overlap, deg | 3 | | Duration, deg | 225 | 225 |
| Overlap @ .050, deg | -44 | | Opening Events, deg | 2 | 44 |
| | | | Closing Events, deg | 44 | 2 |
| ------------------ | --Int-- | --Exh-- | Duration @.050, deg | 180 | 180 |
| Duration @.200, deg | 109 | 109 | Opn Evnts @.050, deg | -21 | 24 |
| TDC Tappet Lift, in | 0.010 | 0.010 | Cls Evnts @.050, deg | 21 | -24 |
| Gross Valve Lift, in | 0.339 | 0.339 | Lobe Centerlns, deg | 110.5 | 113.5 |
| Net Valve Lift, in | 0.333 | 0.333 | Grss Tappet Lft, in | 0.339 | 0.339 |

| ------ General Engine Calculations | | ---------- | |
|---|---|---|---|
| Displacement, ccs | 1896.7 | Displacement, cu in | 115.72 |
| Dynamic Comp. Ratio | 17.69 | Compression Ratio | 19.50 |
| Theo. Crank Comprssn,PSI | 594 | Clearance Volume, ccs | 25.6 |
| Pk Secondary Tuning RPM | na | Idle Vacuum, ''Hg | 25.0 |
| Pk Secondary Tuning RPM | na | Idle Vacuum, ''Hg | 25.0 |