

KENNE BELL SUPERCHARGED MAZDA MIATA

TECH & TUNING TIPS

The Mazda engine produces a greater percentage HP gain (+65%) from 6 psi boost than any vehicle we ever supercharged. We believe this to be the most flexible and best engineered forced induction kit available for the Mazda Miata. Installation will require approx. 12 hours. Take your time, particularly on the wiring. Read ALL the instructions FIRST. Run 92 octane minimum. 91 octane (California and Arizona) use a slightly larger pulley and lower boost than 92.

BOOST The Kenne Bell Miata kit offers a great degree of power flexibility, as boost and horsepower - up to 240RWHP - may be varied from 6-12 psi in intercooled or non-intercooled versions. The stock Miata is a very strong and reliable engine that loves to be supercharged. Doubling the power output (100% increase) is relatively easy with only a Kenne Bell Twin Screw kit. It is important to remember that increasing boost requires fuel octane to be raised. Every 1 psi of boost needs approx. 1.5 octane to support it. Intercooling allows boost to be increased approx. 3 psi from 6-9 psi. However, 9 psi may be used without an intercooler if the octane level is 1.5 octane x 3 psi = 4.5 octane + 91 = 95.5 octane. 12 psi intercooled boost will also require approximately 95.5 octane. Increasing or decreasing boost when alternating applications (street vs. slalom, competition, drag strip, oval, road racing etc.) only requires a pulley and belt change - and the necessary octane enhancement.

FUEL, SPARK & OCTANE Forget about the "more fuel" recommendations. More fuel doesn't help detonation nor does it make "more power." Ideal air fuel ratio is what makes power and/or controls detonation. So think octane. The Kenne Bell OPTIMIZER™ is calibrated for a relatively safe 11:1 air fuel ratio with our injectors. The OPTIMIZER™ is also calibrated to retard ignition spark at higher rpm. If the engine experiences detonation (knock), the stock ECM will retard ignition timing up to 4° and help protect the engine. It is important to understand that any audible knock with the Kenne Bell kit clearly indicates that all the spark retard (Kenne Bell and Mazda) protection is in effect and the engine is knocking. If knock occurs, FIND THE PROBLEM. It's either poor quality fuel, insufficient octane, lean mixture (vacuum leaks), plugged injector, insufficient fuel pressure, excessive engine coolant temp, too hot a spark plug, high air charge temp etc. NEVER assume the Kenne Bell OPTIMIZER™ can be re-calibrated to magically solve unrelated problems. It has already been optimally calibrated. California and Arizona offer maximum 91 octane. Other states have 92, 93 and 94 octane. Use unleaded fuel only. 100 octane unleaded is classified as racing fuel but it works great and can be mixed to obtain the desired octane. Example: 50% 92 + 50% 100 = 98 octane. NOS brand octane booster also works very well (see Jim Bell's Supercharger/Turbocharger Tuning Tips). The larger injectors supply all the fuel necessary and the OPTIMIZER™ has re-calibrated the entire fuel program. Never under any circumstances use auxiliary (wet flow) injectors. It results in uneven fuel distribution to the cylinders.

KENNE BELL TWIN SCREW There is no better, more efficient supercharger for the Mazda. Boost will not drop off at higher rpm and there is no boost lag. And you won't get sleepy or hungry waiting for the boost to build up. Best shift rpm is 6500 rpm. Boost will increase after 6500, but HP levels out because the engine goes lean above 6500. Don't over rev it. 12 psi competition kits must be shifted at 6500 rpm. The power output above 6500 exceeds the MAF meter capacity and the engine misfires and sets a code. 6 and 9 psi kits have no problem as the power is less at these boost levels. Limit engine speed to 6500 rpm. A wide selection of pulleys are available. Removal requires pulley wrench (part# SC3140) and a new belt that is specific to the pulley. No change to the OPTIMIZER™ is necessary.

HP Sorry, but we don't agree with the 155HP rating of the 1.8 and we always like to tell it like it is. Based on the magazine drag strip tests of 15.7/86.1 mph in a 2387 lb. car (2587 with driver), the HP is 120. 155HP would propel the car to 91 mph. Our Dynojet rear wheel dyno recorded a best of 109HP on a stock '01. That's around 90% of 120 (-10% loss for drivetrain). So, if you haven't tested your Mazda before the supercharger install, don't assume it has 155HP. At 266 engine HP ($240 \div .9 = 266$) the math says the Mazda with the Kenne Bell 12 psi kit has a potential of 110 mph in the 1/4 mile. That can get you a low 12 ET if it hooks up. When comparing HP, NEVER just gawk at the "peak" number. Look at the power at all engine RPM. Equally important is how well the dyno curve is "tuned" i.e. how smooth and linear it is. Dips, low spots, peaks and lulls in the curve indicate a poorly tuned combination. Finally, compare the modified engine HP curve to the stock torque (twisting force) curve. It should closely follow the stock curve. Check out our supercharger and turbocharger competitors curves, particularly below 4000 rpm. And don't let anyone B.S. you into thinking low and mid range rpm boost (HP and torque) aren't important and you don't need it there.

OTHER BOLT ON PRODUCTS Yes, there are plenty available and lots of claims, but we haven't seen any big gains in headers or exhaust on the 1.8. Magazine tests confirm this. Yes, headers help more on the 1.6's. Some fail to distinguish this and do not show the header gains on both a 1.8 and 1.6, so enthusiasts assume the gains are the same. One need only to look at the stock 1.6 and 1.8 manifolds to see the difference. We couldn't muster 10HP with aftermarket headers, ram air kit and exhaust. Anyone disagreeing - bring it by our dyno with a magazine writer. Remember that 10HP can barely be felt and is only a car length in a full 1/4 mile.

IGNITION The Kenne Bell BOOST-A-SPARK™ is the only ignition we recommend for the Miata.

SPARK PLUGS The Denso Iridium IT20 is the best spark plug available for the Mazda. If your budget won't allow purchasing IT20's, use 1 heat range cooler NGK or Denso "standard" copper plugs with our supercharger.

INTERCOOLER Use 25% coolant and 75% water. Never use 100% water as corrosion becomes a problem. Don't use more than 25% coolant. Check coolant level occasionally. There is a 1-1.5 psi maximum pressure drop across the intercooler so intercooled and non intercooled kits use different pulley sizes (see chart).

CLUTCH The clutch appears to be the weak link when increasing HP and torque in the Mazda. We've tried them all. Centerforce has the necessary clamping force to hold the Kenne Bell HP and torque while maintaining a near stock pedal pressure.