



### AIR TO WATER INTERCOOLER SYSTEMS

It is simply an undisputed fact that lowering charge air temperatures will substantially improve both performance and engine longevity.

A air to water intercooler system is an attractive alternative to a air-air intercooler system. Water has higher heat conduction properties than air, making it a more effective medium for heat transfer.

The air to water system works by transferring the charged air heat (from turbocharger or supercharger) to a liquid coolant, this coolant is then pumped to a heat exchanger remotely located at the front of the vehicle to be cooled by wind chilled air.

Another advantage with this technology, is that one can optimally position a heat exchanger in the cooling air stream, regardless of the location of the engine or associated space limitations.

### THE HRT INTERCOOLER MANIFOLD

The attractively designed HRT inlet manifold was developed to provide customers who want the additional power from their supercharged and turbo-charged engines with the added safety of ca. 35% reduction in charged air temperature.

The manifold is made of cast AA601.3 aluminum, with a wall thickness of 5mm to reduce harmonic noise.

A Setrab air to water core with seamless water tubes is used to ensure no possibility of fracture failure to the core due to engine vibrations or sonic shock.

Air deflection fins at the entrance to the plenum chamber are used to ensure even spread of the hot charged air across the face of the core to ensure more efficient intercooling.

## HRT Air to Water Intercooler - BMW 6 Cylinder

### Key Points

- ▶ Better engine longevity by reducing the possibility of inadvertent detonation (engine knocking).
- ▶ Cool/higher density charged air resulting in higher power gains without an increase in boost.
- ▶ Ability to run higher boost more safely.
- ▶ The M5024 intercooler is designed for BMW 6-cylinder engines - **M50, M52 & M54**.

### Case Study

An HRT charge cooler was tested on an E36 328i M52 with an ESS centrifugal supercharger system installed.

An autonomous watercooling loop with 2.5 ltr water volume, cooled by a Setrab 600 x 120 x 30 Slimline cooler with a 13.3 L/min water circulation pump.

The following results were experienced:

- ▶ Negligible pressure drop across the intercooling core ( less than 0.07 bar at 0.7 bar boost).
- ▶ At 0.7 bar boost and an ambient temperature of 30°C the charged air temperature reduced from 92°C (without intercooler) to 58°C with intercooling.

