Springfield Dyno LLC Radiator Test Process and Results.

The purpose of the test was to compare the Springfield Dyno Rev B 2C and the Koyo 54mm radiator under controlled conditions.

The radiator test was scheduled for a full day on the dyno. The morning hours were used to prepare the car and equipment. The afternoon would be used for actual testing because of the more consistent environmental conditions (temperature).

The engine oil, transmission oil, and differential oil were all changed. The cooling system was flushed out with water and 12 Oz of antifreeze and 2 oz of water wetter (redline) were added to the system. This would be the mix used in every radiator (other prototypes were also tested). The car was warmed up and OBD II data logging was verified. The car was allowed to cool down and a full tank of gas was added. Two fans were placed in front of the car. The first fan was a high velocity squirrel cage directly in front of the radiator opening. The second fan was a 36" high volume fan pushing air around the entire car. The fans were not touched during the entire test. A quieter muffler was installed on the end of the current exhaust to improve test conditions for the operator. Hood was closed (but not latched) for every test.

Test Process. The process was started with a cool car (water temp less than 120° F) and the car had not been run for at least 45 minutes. The car was started and placed in 4th gear on a free rolling dyno. A precision ground shim was placed under the idle adjustment screw resulting in 14.5% throttle. The dyno's load testing feature was engaged and held the dyno at 50 mph in 4th gear at 14.5% throttle.' This created a 24.5% to 26.5% calculated load on the vehicle.

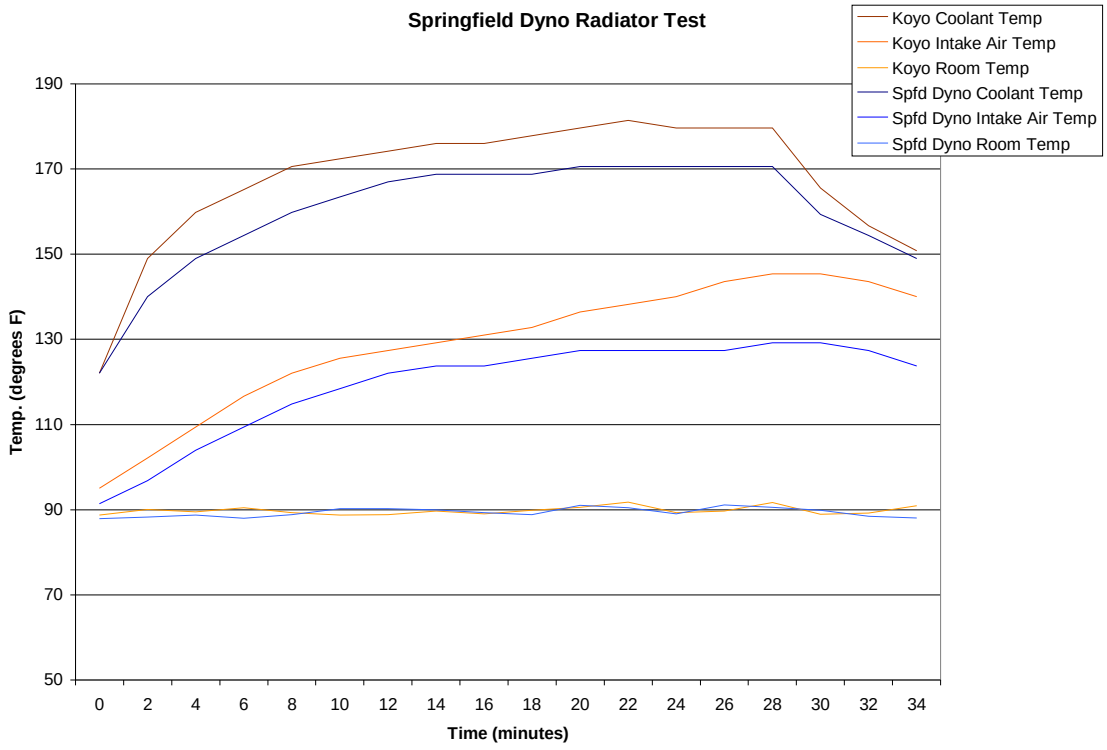
The following data was viewed and recorded: Throttle Position (TP), Engine Coolant Temp (ECT), Spark Advance (IGN ADV), Calculated Load (LOAD), Intake Air Temperature (IAT), Room Air Temp, Barometric Pressure, Humidity, Air/Fuel ratio (A/F).



When the engine coolant reached 120° F the data was logged and a timer was started. The data was electronically recorded every 2 minutes for 28 minutes. At that time the shim was removed and the car was placed into neutral and allowed to idle. The data was recorded every 2 minutes for the next 6 minutes to document recovery. Each test lasted for 34 minutes total.

This process was followed for all radiators. The first radiator tested (Springfield Dyno production) was retest at the end (last) to verify that unobvious conditions were not skewing the results. The second test is documented as SD 2CC. The results of the verification test showed no significant change in conditions.

Results:
Springfield Dyno radiators were able to cool the car better. The Springfield Dyno radiator also provided the best intake air temperature (test conditions did not change). The Koyo was the heaviest of the radiators (full). It was 2.5 pounds heavier than the SD radiator. I believe the majority of the weight is the additional water that the Koyo holds compared to the others. I have tested the radiator in 18 sessions. Team Saferacer has been involved in on track beta testing and they have reduced water temps by approximately 30 degrees in one of their cars. I would estimate that I have reduced my on track water temps by 20 to 25 degrees. I believe this is due to the additional air that can be forced through the radiator at race speeds. Our 1999 system will be tested soon.



Regards,
Sam Henry