Longview Inspection

Infrared Inspection Report

Royal Purple

Thermal Profile of Cylinder Heads

Date: January 7, 2004

Overview: Longview Inspection conducted a test to determine if switching to Royal Purple's Max-Cycle would reduce motorcycle operating temperatures.

Equipment: A stock 2003 Harley-Davidson Soft-tail Standard motorcycle with a Twin Cam 88 engine. The only modification to the bike was the addition of a Screaming Eagle slip-on exhaust. The bike had 3,021 miles on the odometer and had been serviced regularly per Harley-Davidson's recommendations. The bike's lubricants were all OEM fluids from the factory including HD 20W50 and HD Primary Lube. The gasoline octane was 93.

Methodology: The bike was secured to a lift and fans were secured in front of bike to prevent overheating. The bike was started and allowed to idle at 1000 rpms until the temperature level peaked and stabilized. The bike was then shut off, the lubricants drained and replaced with Royal Purple Max-Cycle 20W50. With the fluid swap complete, the bike was started and allowed to idle until the temperature peaked and stabilized.

Conclusion: Switching to Max-Cycle throughout the motorcycle reduced engine operating temperatures from 24 – 44 degrees F.

The following report is a summary of the thermal condition of the external surfaces of the equipment at the time of the inspection. Due to some line-of sight restrictions, it is not possible to completely inspect all surfaces.

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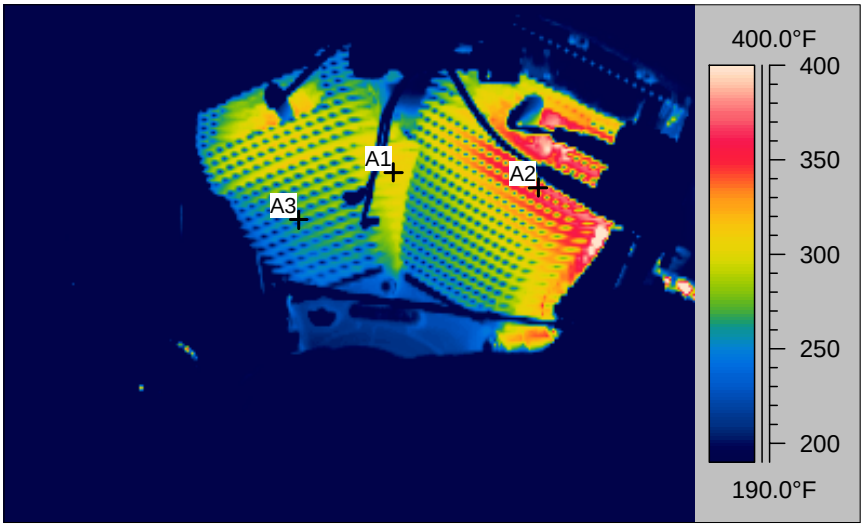
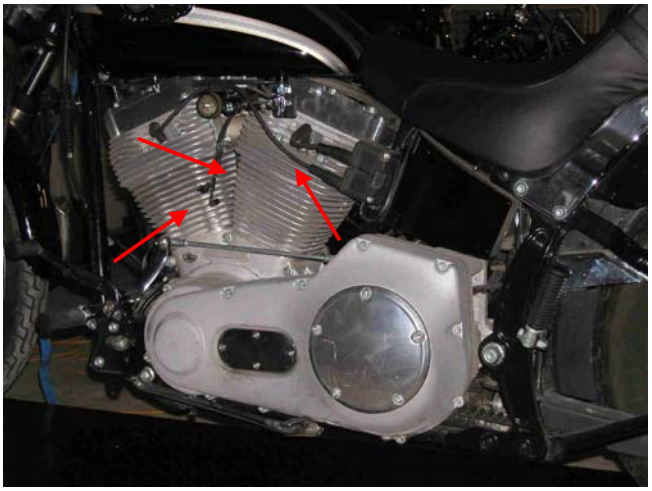
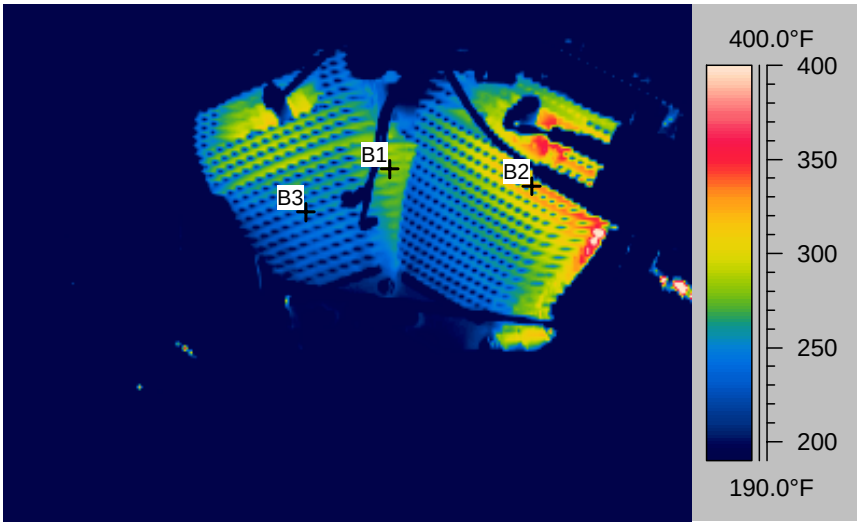


IR information	Value
Date of creation	1/7/2004
Time of creation	11:49:57 AM
Label	**Value**
A1	310.5°F
A2	369.5°F
A3	274.9°F

Lubricant A





IR information	Value
Date of creation	1/7/2004
Time of creation	1:15:22 PM
Label	**Value**
B1	283.6°F
B2	325.4°F
B3	245.8°F

Lubricant B

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Summary of inspection

Notes on test

1. For each lubricant the motorcycle was set into a stand, started, and allowed to idle at approximately 1000 RPM.
2. Using a FLIR Model 550 Radiometer, a spot at the center point of the front cylinder was continuously monitored and the temperature was measured continuously.
3. The test procedure for each lubricant was stopped when the rate of increase of the temperature fell below 1 degree per minute.
4. Runtime for the two tests varied due to the difference in the thermal starting point of the two tests.
5. The ambient temperature for test 1 was 50 F. The ambient temperature for test 2 was 61 F. The ambient temperature is critical since performance is being measured by temperature increase.
6. The temperature of the back side of the front cylinder (point 1) showed a decrease in surface temperature of 26 F. There is a hot temperature zone on the left side of the rear cylinder (point 2) that showed a decrease in surface temperature of 44 F. The average surface temperature on the cylinders (point 3) showed an approximate decrease of 24 F.