Engine Coolant Temperature Sensor

K75, K100, K1 & K1100

https://www.kbikeparts.com/classickbikes.com/ckb.tech/0.ckb.tech.files/tempsensor/tempsensor.htm#:~:text=K100RS4V%2C%20K1%20%26%20Early%20K1100s%3A,that%20might%20damage%20the%20terminals.

Introduction:

The engine temperature sensor is located in the metal coolant exit pipe coming out of the cylinder head at the top left front of the engine behind the lower left corner of the radiator. This applies to all K75s, K100s, K1s and K1100s.

Example: K75 Temperature Sensor Location

(all other Ks are similar)

Note: For Ks equipped with a round temperature gauge there is a second water temperature sensor located at the bottom of the water pump in the drain hole. It only connects to the temp gauge and has nothing to do with engine fueling or fan operation.

Access K 75 / K 100 Coolant Temp Sensor: Follow this link.

Temp Sensor Part Numbers: You can buy the Bosch temp sensor from your BMW dealer but it's usually less expensive to buy it using the Bosch part number.

K Bike Model/Year	BMW Part #	Bosch Part #
All K75s	61311459197	0280130032 or 0280130069
2 Valve K100s		
K 100 RS 4V	13622242184	0280130055
K1		
K 1100s Model Year 93 & Earlier		
K 1100s Model Year 94 & Later	12611341602	0280130079

How The Cooling System Works

K 75 / K 100: The dual temp sensor sends signals (resistance to ground) to both the L-Jetronic for fuel control as well as to the white temp relay in the relay box to control radiator fan operation and the instrument cluster warning light.

K 100 RS 4V / K1 / K 1100: The temp sensor sends a signal (via resistance) to the Motronic to control fueling, radiator fan operation (via the fan relay) and the instrument cluster warning light.

Fueling: Based on the resistance from the temp sensor either the L-Jetronic or Motronic controls how rich/lean the fuel/air mixture is. As the temperature increases and the temp sensor resistance decreases the fuel/air mixture is leaned out.

Cooling System States: K bikes go through several states as the engine heats up.

(K75/K100 values in **red**, 4V values in **green**, **black** for both)

State	°C	°F	Description
Normal	85	185	**Thermostat opens** so water flows through radiator for more cooling. This is the usual state when a K bike is moving with the thermostat opening and closing as needed.
Warm	103 105	217 221	**Fan turns on** to get more air flowing through the radiator. Usually only occurs when bike is stopped in warmer weather.
Hot	111 115	232 239	**Warning light** in instrument cluster illuminates. Usually means that the fan is not working. If you turn the bike off when stopped and then restart right before getting moving again then you can usually still ride until you get to your destination. If the light stays on once you're moving again then pull over.
Overheating	120	248	**Radiator cap blows.** Similar to a car, K bikes have a radiator cap under the right front of the tank that will "blow" - spewing coolant on the right side of the bike and your right boot. (From the coolant reservoir.) If you see steam and your right boot is wet then pull over. The radiator cap actually blows due to pressure, not temperature. The cap blows at 1 bar (14.5 psi) When the system is cooling down the radiator cap lets coolant be sucked from the coolant reservoir at -0.1 bar. (-1.45 psi)
Super Nova	?	?	I've heard that somewhere above 120° C the L-Jetronic or Motronic will shut down to prevent engine damage but I've never tested that and it isn't documented in the BMW service manuals like the above temperatures are.

Temp Sensor Troubleshooting

Symptoms:

Poor mileage - If a temp sensor is failing then the L-Jetronic or Motronic will think that the engine is cooler than it really is and the fuel/air mixture will be too rich.

Overfueling: - Fuel in exhaust headers

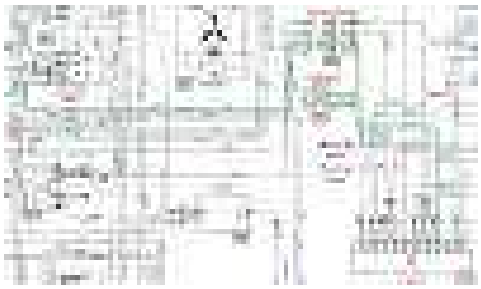
Dark exhaust fumes - Because the mixture is too rich.

Fouled spark plugs - Because the mixture is too rich.

Overheating when stopped - Because the radiator fan is not coming on when it should. Note that this can also be caused by a failed radiator fan.

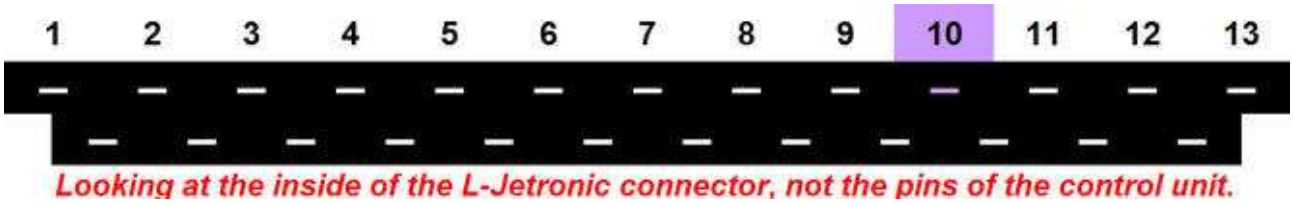
K 75 / K 100 (2V): The temp sensor is a dual sensor. It grounds via the mounting threads and has two VIO/GRN wires: one to the L-Jetronic control unit to control fueling and another to the white thermostat relay on the right side of the relay box under the tank.

Wiring diagram:



Click to enlarge

1) Test the temp sensor by using an ohmmeter to measure the resistance between the Pin 10 of the L-Jetronic connector and ground. Pins 5 and 13 are ground but any ground on the bike should work.



Just make contact with the connector terminal. Do not jam the ohmmeter probe into the terminal as that might damage the terminal.

2) Test the thermostat relay lead of the temp sensor by measuring the resistance between Pin E of the thermo relay socket and ground.

The blue column in this table shows the specification resistance for each temperature but readings within 10% should be OK.

°C	°F	90%	Ohms	110%
0	32	5,306	5,896	6,486
10	50	3,413	3,792	4,171
20	68	2,250	2,500	2,750
30	86	1,536	1,707	1,878
40	104	1,058	1,175	1,293
50	122	751	834	917
60	140	536	596	656
70	158	392	436	480
80	176	291	323	355
90	194	219	243	267
100	212	168	187	206
110	230	130	144	158
120	248	102	113	124
130	266	80	89	98

K100 RS 4V, K1 & Early K1100 s: Test the temp sensor by using an ohmmeter to measure the resistance between pins 21(VIO) and 32(BRN/YEL) of the Motronic connector. Just make contact with the connector terminals. Do not jam the ohmmeter probes into the terminals as that might damage the terminals.

Note: I do not have the data specs for this sensor. If you have them please email me at smithduck@gmail.com to update this page.

K1100s - 94 & Later: Test the temp sensor by using an ohmmeter to measure the resistance between pins 7(VIO) and 14(BRN/YEL) of the Motronic connector. Just make contact with the connector terminals. Do not jam the ohmmeter probes into the terminals as that might damage the terminals.

94 and later K1100 Temp Sensor 12611341602

Degrees C	Degrees F	Ohms	
7.7	46	1195	Motronic pins
10.5	51	1004	7 Violet
14	57	794	14 Brown/Yellow
17.5	64	707	
20.1	68	628	
25	77	530	
30	86	405	
35	95	357	
40	104	293	
45	113	252	
50	122	220	
55	131	167	
60	140	146	
65	149	116	
70	158	97	
75	167	89.7	
80	176	71	
85	**185**	**60.5**	**Thermostat**
90	194	50.7	
95	203	46	
100	212	41	
105	221	34.5	Fan kicks in
110	230	30	
115	239	26.3	Warning light
120	248	24.8	
125	257	21	
130	266	19.5	

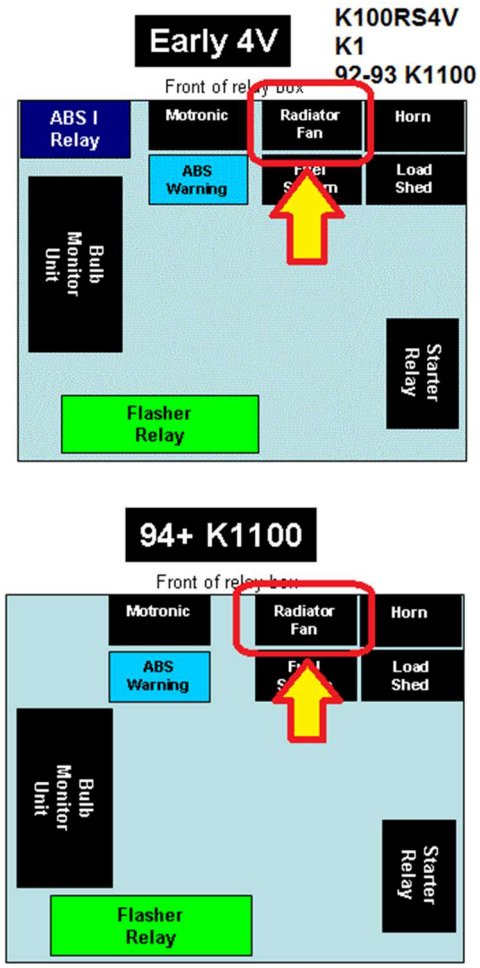
Temp sensor torque - 9 Nm (6.6 ft-lb, 80 in-lb)

Fan Troubleshooting

K 75 / K100 (2V): The fan should run when you put 12V+ to the A2 terminal of the thermo relay socket. You can do this by shorting Pin 15 to Pin A2 of the socket.

If you ground Pin E with the relay plugged then the fan should come on and the temperature warning light in the instrument cluster should illuminate.

K100RS4V, K1, K1100: The fan should run when you ground the BLU/YEL wire to the fan relay. (Pin 85)



Replace Radiator Fan

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