

2001 ENGINE COOLING

Electric Cooling Fans

ELECTRIC COOLING FAN

NOTE: For testing and specifications on Spectra models, see Sephia information unless otherwise directed.

NOTE: Sportage testing information is not available from manufacturer. Sportage electric cooling fan is controlled by air conditioning control switch. For circuit identification, see WIRING DIAGRAMS .

COMPONENT TESTS

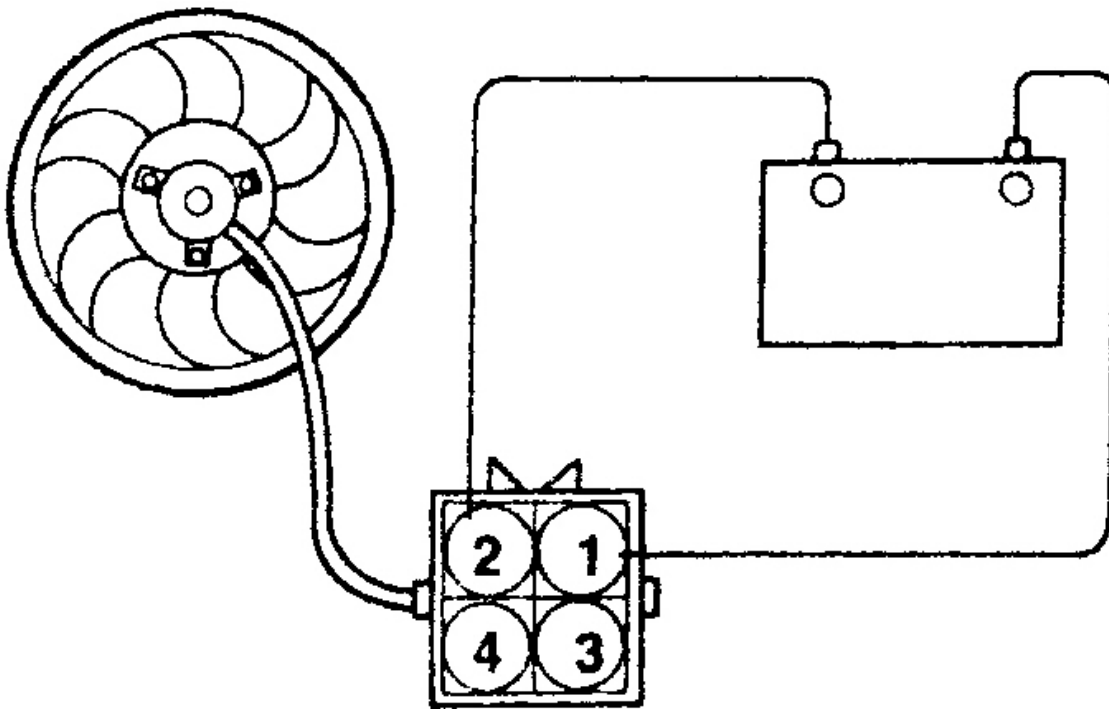
NOTE: Sportage testing information is not available from manufacturer.

COOLING FAN MOTOR

NOTE: Cooling fan motor testing information for Rio is not available from manufacturer.

Optima

1. Disconnect radiator cooling fan motor connector. Apply battery voltage across specified motor connector terminals. See **Fig. 1** . See COOLING FAN MOTOR SPECIFICATIONS table.
2. Check motor operation, ensure no abnormal noises or vibrations exist. Replace cooling fan and motor assembly if operation is not as specified.



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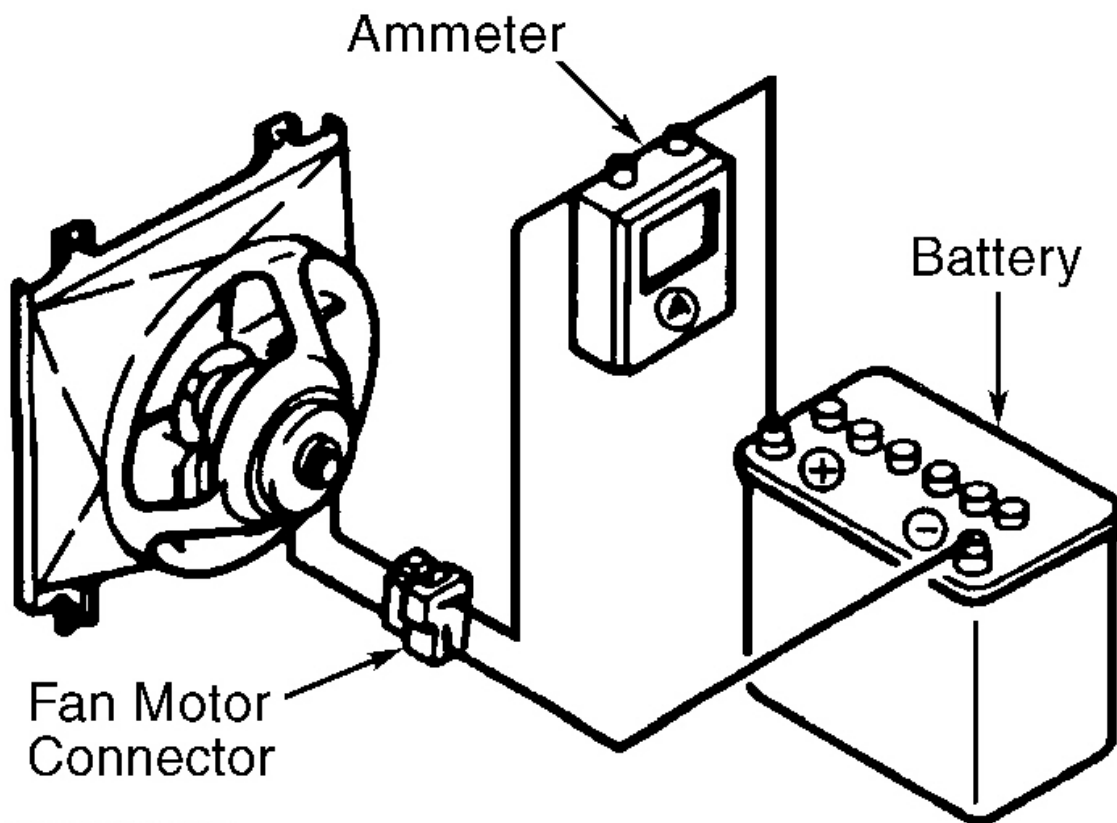
Fig. 1: Testing Cooling Fan Motor (Optima)
 Courtesy of KIA MOTORS AMERICA, INC.

COOLING FAN MOTOR SPECIFICATIONS

Battery Positive Terminal	Battery Negative Terminal	Motor Speed
1	3	Slow
1 & 2	4	Medium
1 & 2	3 & 4	Fast

Sephia

1. Disconnect fan motor connector. Connect ammeter between battery and cooling fan motor connector. See **Fig. 2** . Cooling fan should operate smoothly.
2. Check ammeter reading while cooling fan is in operation. If cooling fan does not operate smoothly or amperage draw is not 8-13 amps, replace fan motor.



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Fig. 2: Testing Cooling Fan Motor (Sephia)
 Courtesy of KIA MOTORS AMERICA, INC.

ENGINE COOLANT TEMPERATURE SENSOR

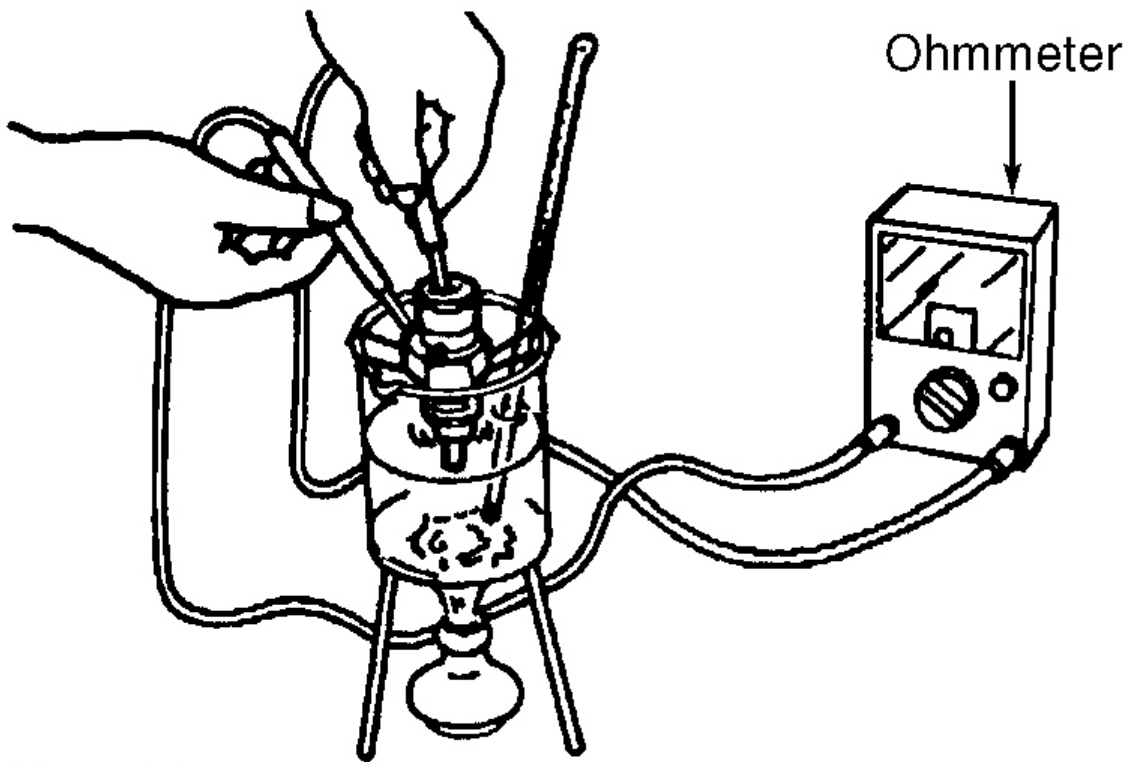
NOTE: Testing information for Optima and Sephia not available from manufacturer.

Rio

1. Disconnect negative battery cable. Remove temperature sensor, suspend sensor in container filled with water. Connect DVOM between temperature sensor terminals. **Fig. 3**.
2. Heat water and check resistance at specified temperatures. See **TEMPERATURE SENSOR SPECIFICATIONS** table. If resistance is not as specified, replace temperature sensor.

TEMPERATURE SENSOR SPECIFICATIONS

Temperature °F (°C)	Resistance Ohms
-4 (-20)	13.44-16.83
68 (20)	2.27-2.64
176 (80)	0.21-0.43



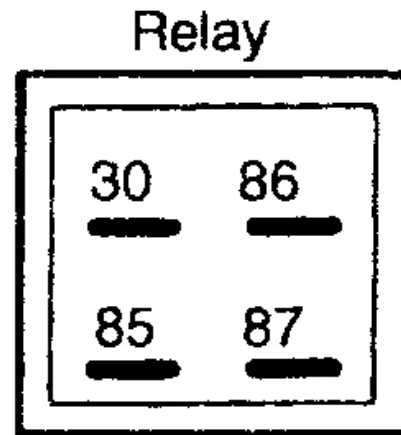
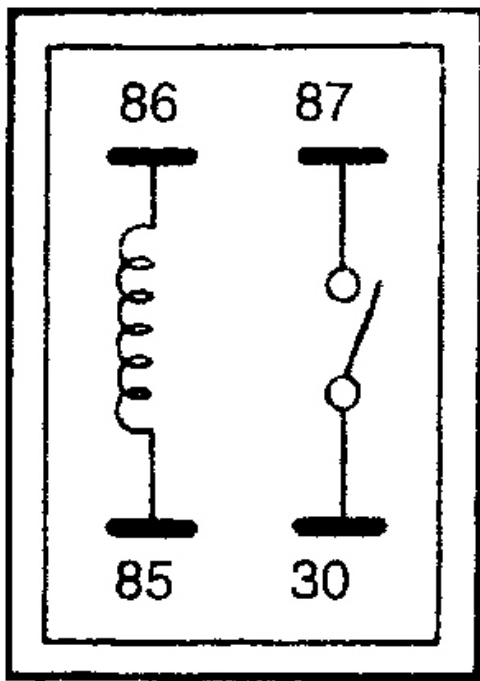
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Fig. 3: Testing Engine Coolant Temperature Sensor
Courtesy of KIA MOTORS AMERICA, INC.

COOLING FAN RELAY

Optima & Rio

1. Disconnect negative battery cable. Remove fan relay from engine compartment relay box.
2. Check for continuity between fan relay terminals No. 86 and 85. See **Fig. 4** . Continuity should exist. Check for continuity between terminals No. 87 and 30. Continuity should not exist.
3. Apply 12 volts to terminal No. 86 and ground terminal No. 85. Check continuity between terminals No. 87 and No. 30. Continuity should exist. Replace relay if operation is not as specified.

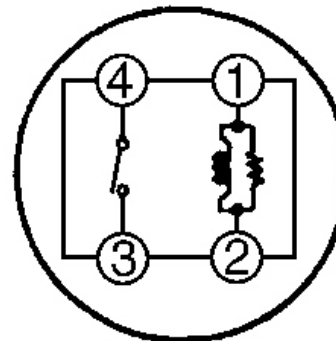
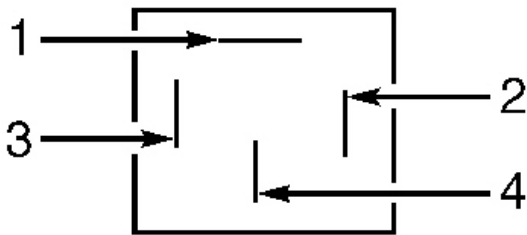


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Fig. 4: Testing Cooling Fan Relay (Optima & Rio)
 Courtesy of KIA MOTORS AMERICA, INC.

Sephia

1. Disconnect negative battery cable. Remove fan relay. Relay is located in engine compartment fuse/relay box, near battery.
2. Check for continuity between fan relay terminals No. 3 and 4. See **Fig. 5** . Continuity should not exist. Check for continuity between terminals No. 1 and 2. Continuity should exist.
3. Apply 12 volts to terminal No. 1, and ground terminal No. 2. Check for continuity between terminals No. 3 and 4. Continuity should exist. If continuity is not as specified, replace relay.



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Fig. 5: Testing Cooling Fan Relay (Sephia)
 Courtesy of KIA MOTORS AMERICA, INC.

FAN CLUTCH

Testing (Sportage)

With engine cool, fan should rotate freely. With engine hot, resistance should be felt when fan is rotated. Check for excessive bearing play and for fluid leakage from fan drive. Replace fan clutch if not as specified.

WIRING DIAGRAMS

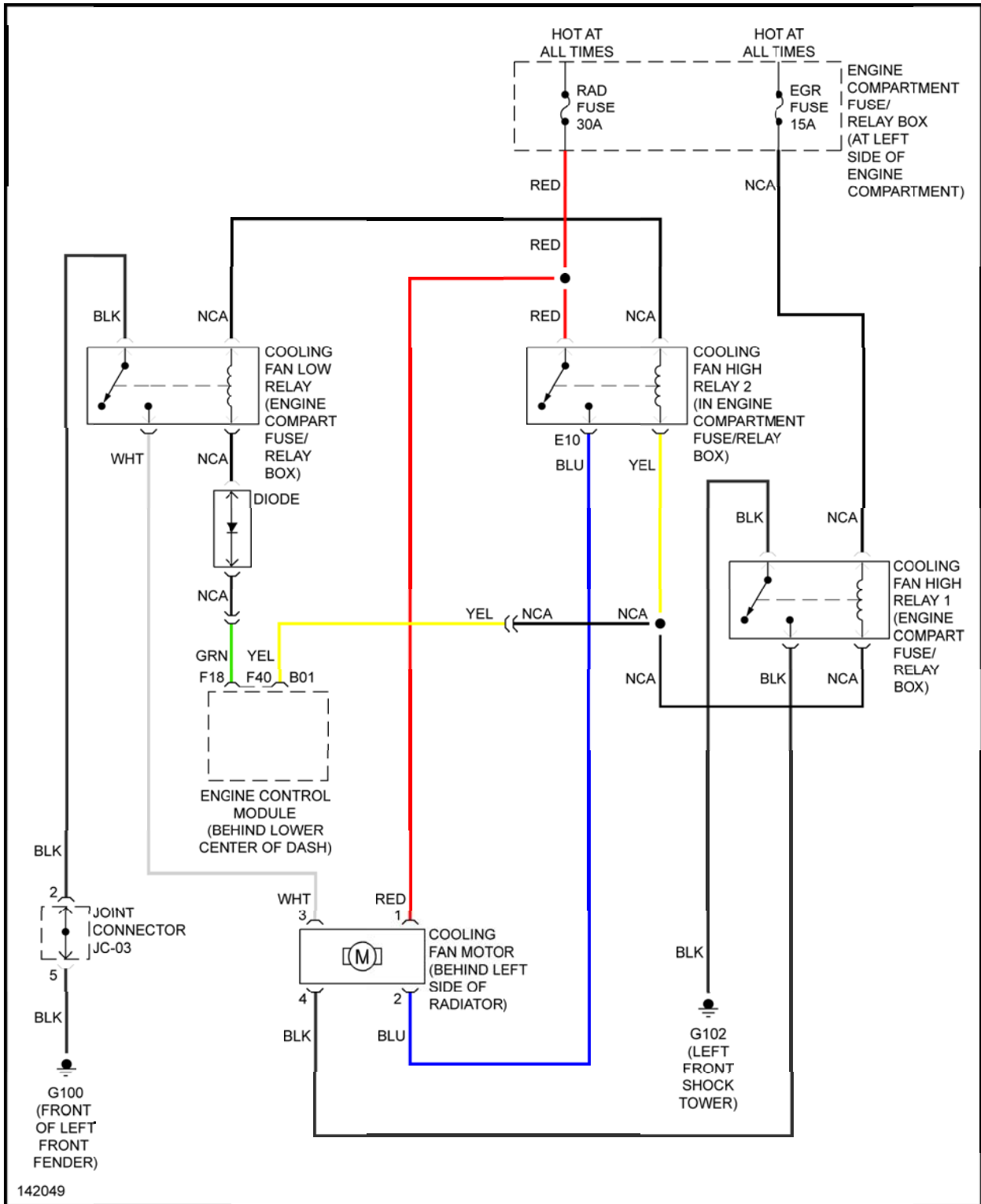
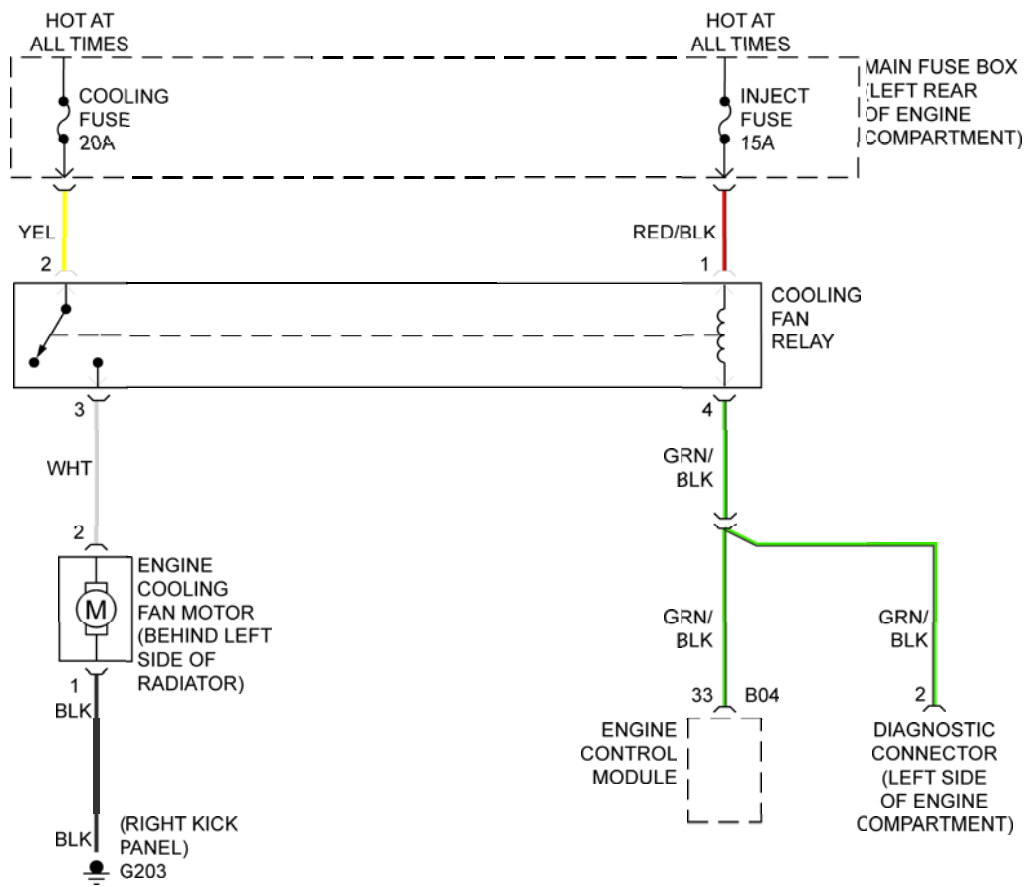


Fig. 6: Cooling Fan Circuit (Optima)



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Fig. 7: Cooling Fan Circuit (Rio)

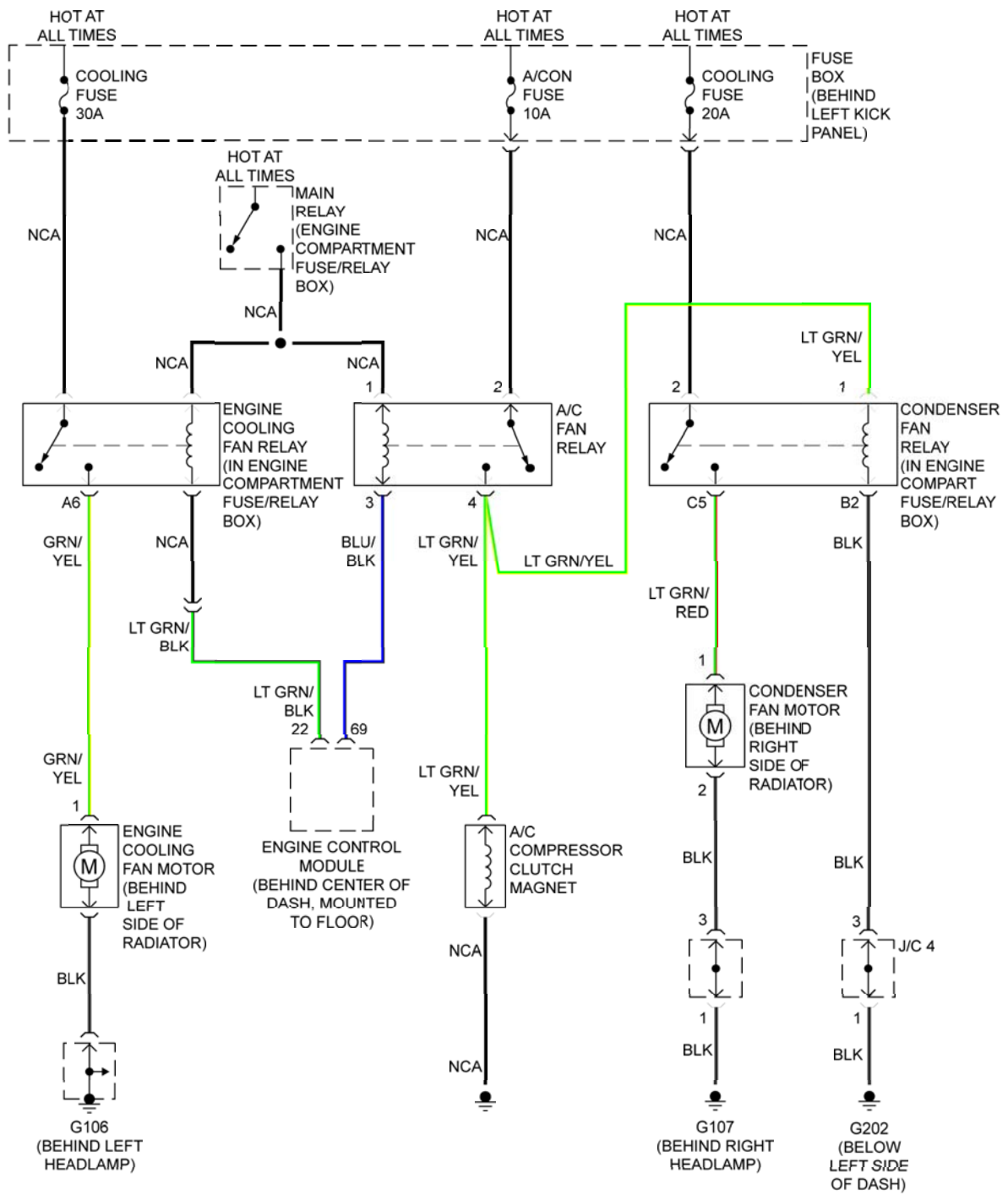


Fig. 8: Cooling Fan Circuit (Sephia & Spectra)

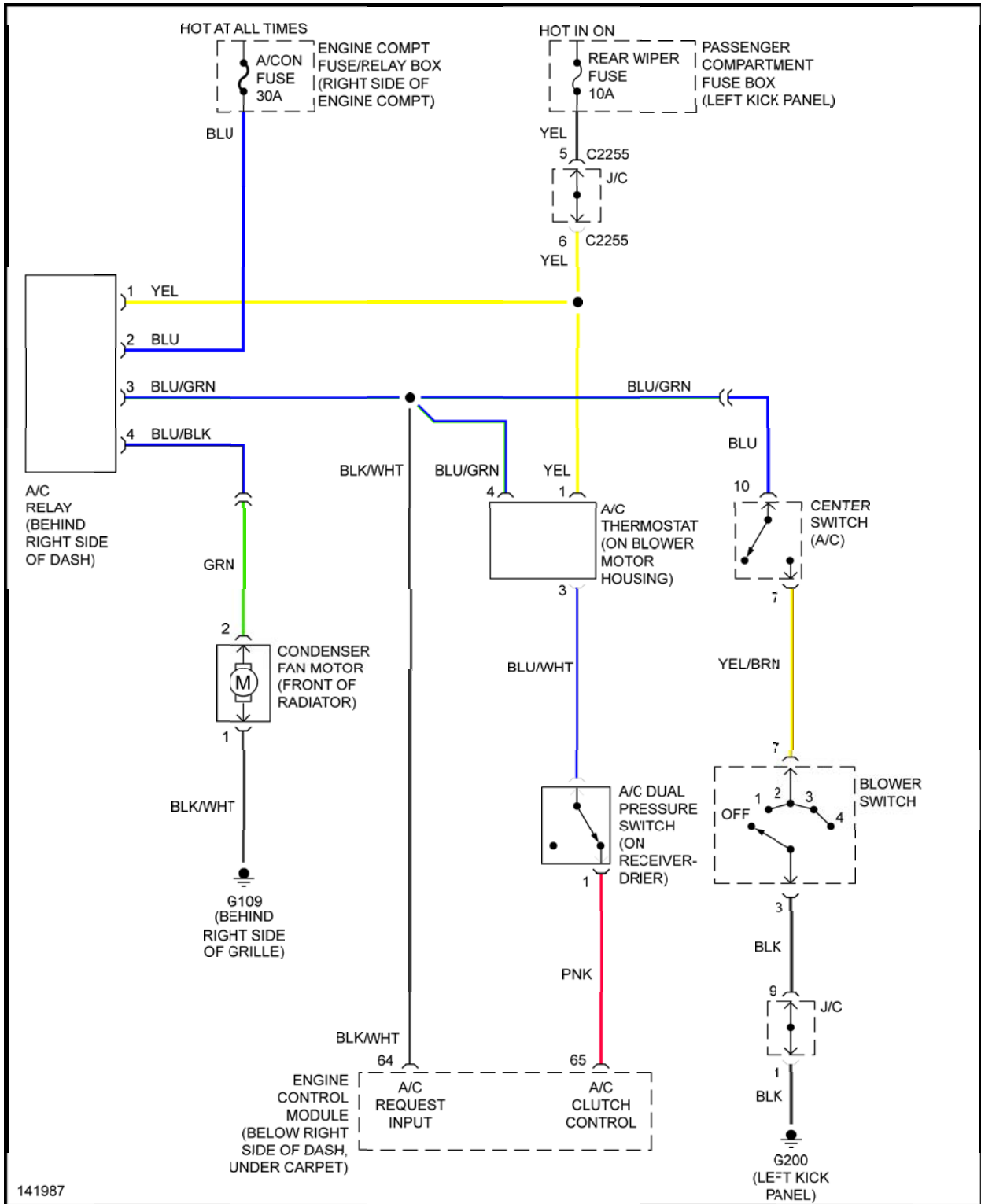


Fig. 9: Cooling Fan Circuit (Sportage)