

[Back To Article](#)

2002-04 ENGINE COOLING

Electric Cooling Fans - MX-5 MIATA

DESCRIPTION & OPERATION

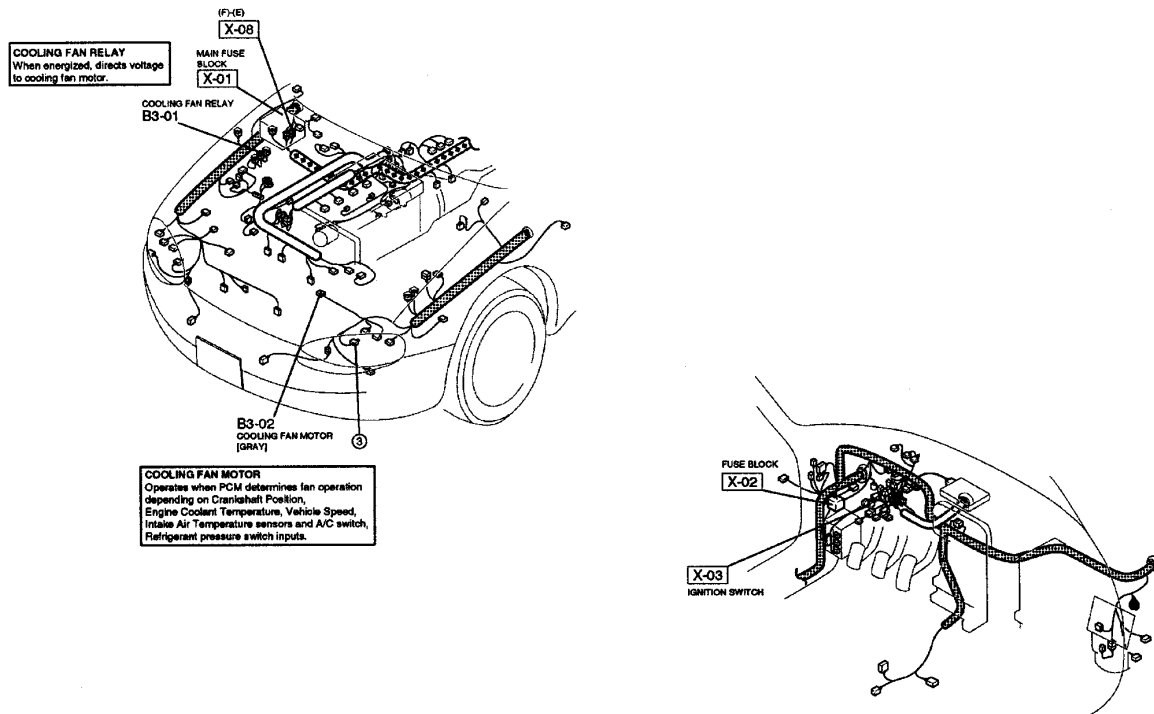
CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See the following:

- For 2002 models, see [COMPUTER RELEARN PROCEDURES](#) article in GENERAL INFORMATION before disconnecting battery.
- For 2003 models, see [COMPUTER RELEARN PROCEDURES](#) article in GENERAL INFORMATION before disconnecting battery.
- For 2004 models, see [COMPUTER RELEARN PROCEDURES](#) article in GENERAL INFORMATION before disconnecting battery.

Cooling fan motors operate when Powertrain Control Module (PCM) determines fan operation depending on crankshaft position, Engine Coolant Temperature (ECT) sensor, vehicle speed, Intake Air Temperature (IAT) sensor, A/C switch and refrigerant pressure switch inputs. Cooling fans receive power through the cooling fan relay. Condenser fan operates only when A/C compressor clutch engages except 2004 models with turbocharger which uses dual fans for engine cooling with or without A/C operation. See [WIRING DIAGRAMS](#).

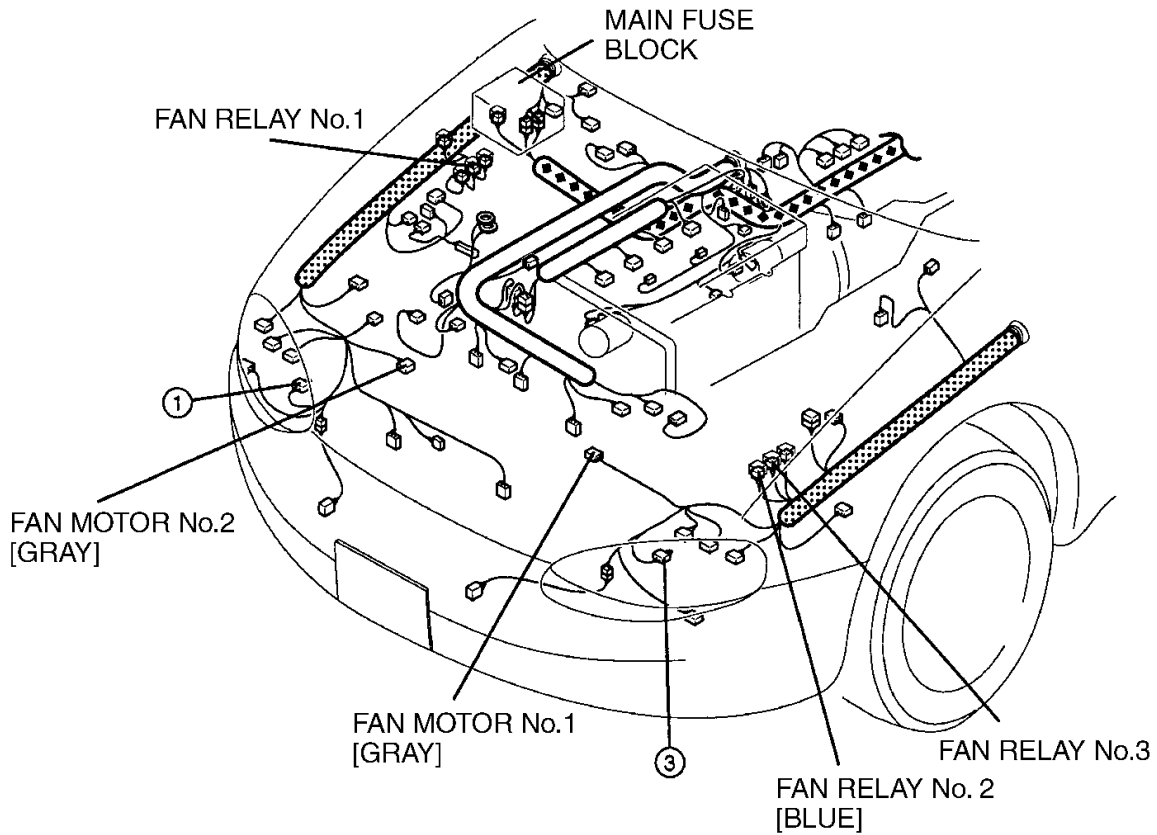
COMPONENT LOCATION

For component locations, refer to illustrations. See [Fig. 1 -Fig. 3](#).



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Fig. 1: Locating Cooling Fan System Component Connectors
Courtesy of MAZDA MOTORS CORP.



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Fig. 2: Locating Cooling Fan Connectors & Relays (With Turbocharger)
Courtesy of MAZDA MOTORS CORP.

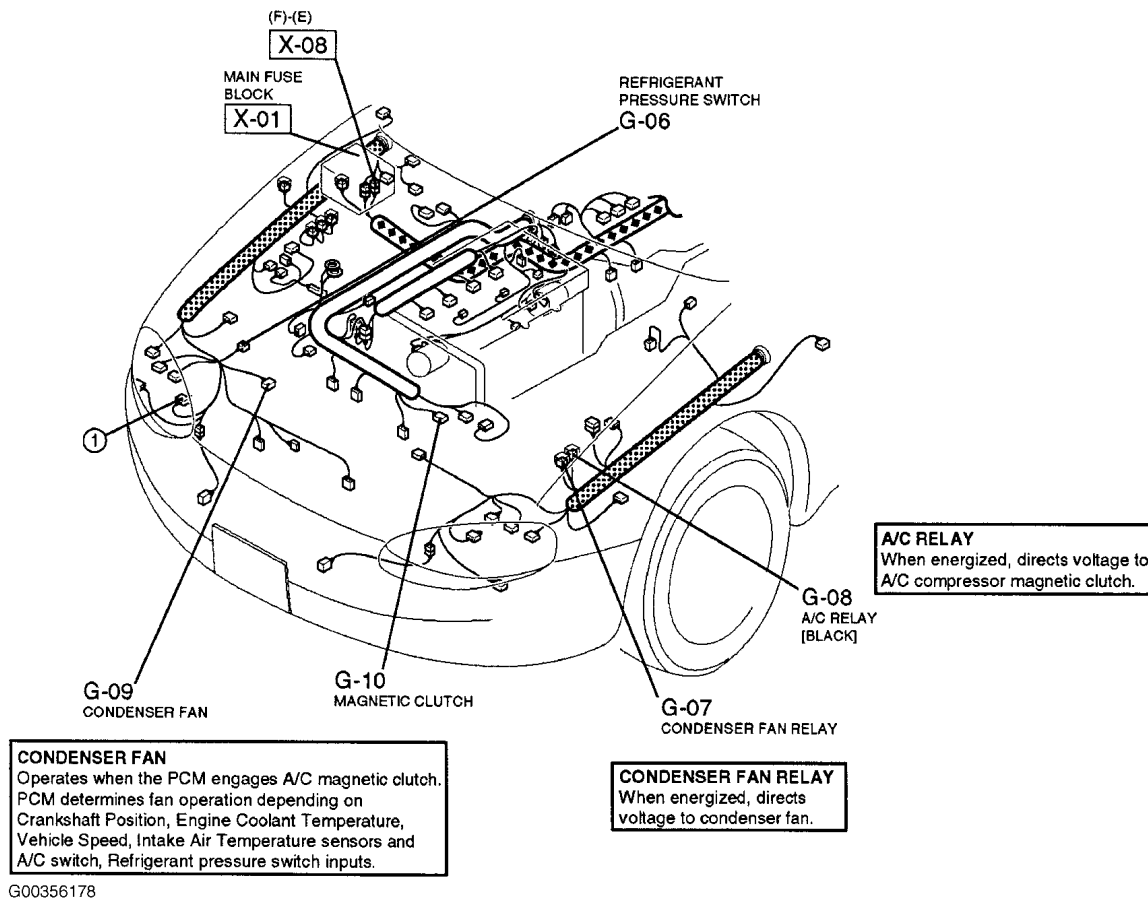


Fig. 3: Locating Condenser Fan & Related Component Connectors
Courtesy of MAZDA MOTORS CORP.

SELF-DIAGNOSTIC SYSTEM

SELF-DIAGNOSTICS

Retrieve Diagnostic Trouble Codes (DTCs). To retrieve DTCs, see the following:

- For 2002 models, see **RETRIEVING DIAGNOSTIC TROUBLE CODES** under SELF-DIAGNOSTICS SYSTEM in SELF-DIAGNOSTICS - MX-5 MIATA article in ENGINE PERFORMANCE.
- For 2003 models, see **RETRIEVING DIAGNOSTIC TROUBLE CODES** SELF-DIAGNOSTICS SYSTEM in SELF-DIAGNOSTICS - MX-5 MIATA article in ENGINE PERFORMANCE.
- For 2004 models, see **RETRIEVING DIAGNOSTIC TROUBLE CODES** SELF-DIAGNOSTICS SYSTEM in SELF-DIAGNOSTICS - MX-5 MIATA article in ENGINE PERFORMANCE.

If no DTCs are stored, perform preliminary inspection. See **PRELIMINARY INSPECTION** under TROUBLESHOOTING. If any DTCs exist, diagnose and repair any DTC that has been retrieved. For DTC definitions, see the following:

- For 2002 models, see [DIAGNOSTIC TROUBLE CODE DEFINITIONS](#) in SELF-DIAGNOSTICS - MX-5 MIATA article in ENGINE PERFORMANCE.
- For 2003 models, see [DIAGNOSTIC TROUBLE CODE DEFINITIONS](#) in SELF-DIAGNOSTICS - MX-5 MIATA article in ENGINE PERFORMANCE.
- For 2004 models, see [DIAGNOSTIC TROUBLE CODE DEFINITIONS](#) in SELF-DIAGNOSTICS - MX-5 MIATA article in ENGINE PERFORMANCE.

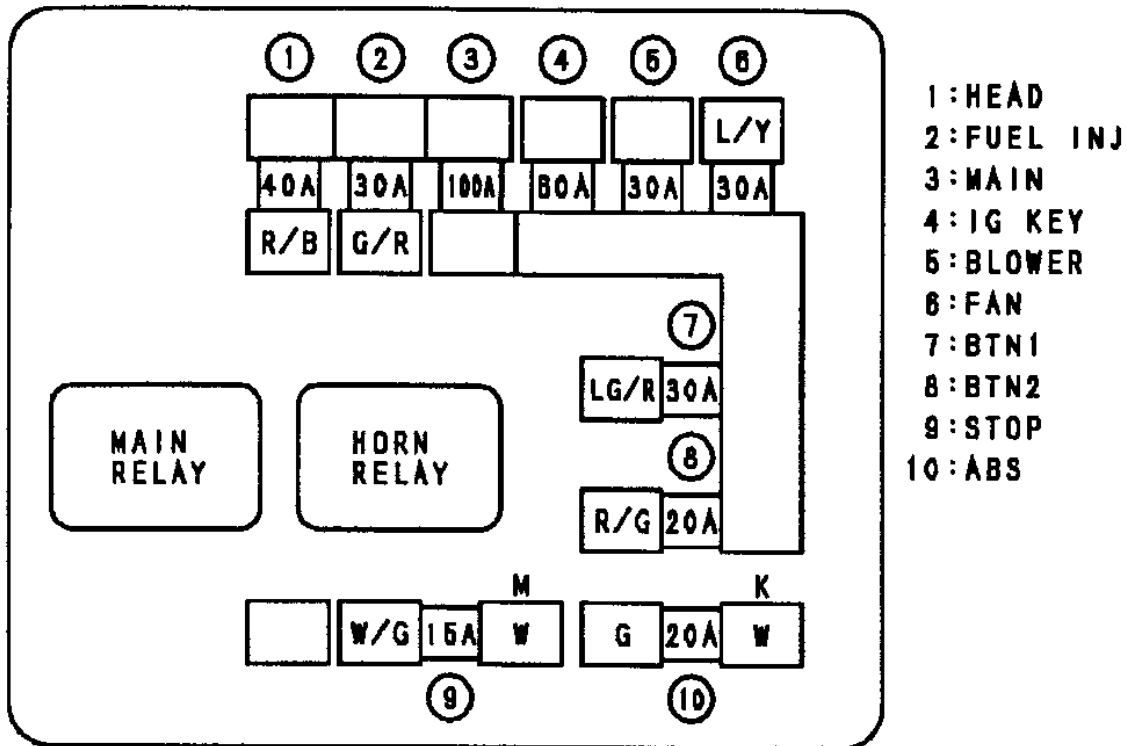
TROUBLESHOOTING

PRELIMINARY INSPECTION

Verify customer complaint by operating suspected system. Visually inspect for obvious signs of mechanical and electrical damage. Inspect for blown fuses and damaged relays. For fuse and/or relay identification, refer to illustrations. See [Fig. 4 -Fig. 7](#) . Inspect for loose or corroded connections, damaged wiring harnesses and/or switches. Check for a broken or partially broken wire inside insulation, which could cause system malfunction but prove good in a continuity/voltage check with system disconnected. Ensure any aftermarket electronic equipment is properly installed. If fault is found, repair as necessary. If no fault is found, perform appropriate component tests. See [COMPONENT TESTS](#) .

Inspect the fan for damage or cracking. Cracking is most likely to occur near the base of each individual blade. If the fan is damaged, replace it. Do not attempt to straighten or repair the fan blade.

X-01 MAIN FUSE BLDCK (E)

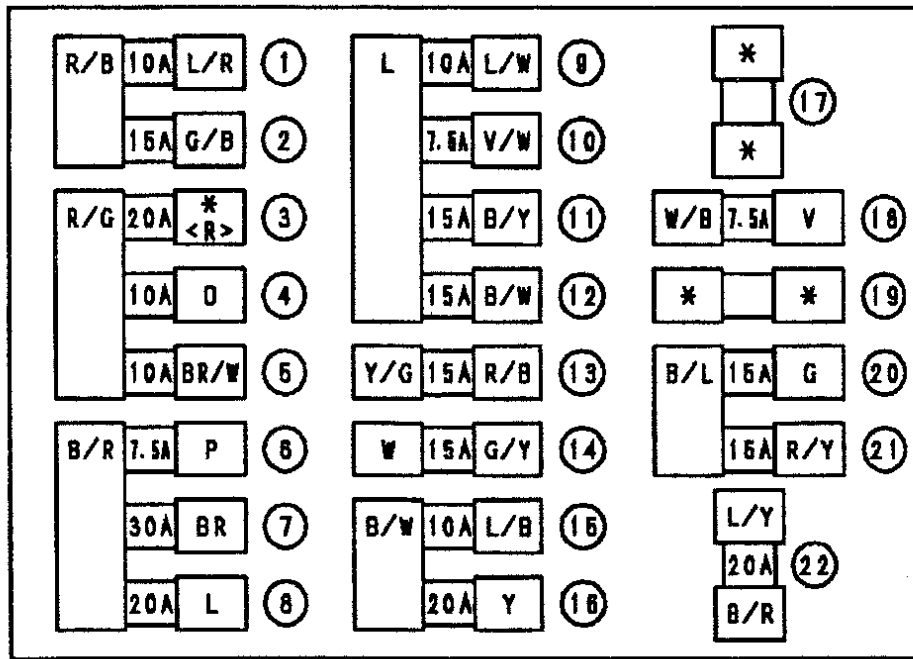


NOTE: THIS IS THE CONNECTOR AS SEEN FROM THE TERMINAL SIDE.

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Fig. 4: Identifying Main Fuse Block Fuses & Relays (2002-03)
 Courtesy of MAZDA MOTORS CORP.

X-04 FUSE BLOCK (F)



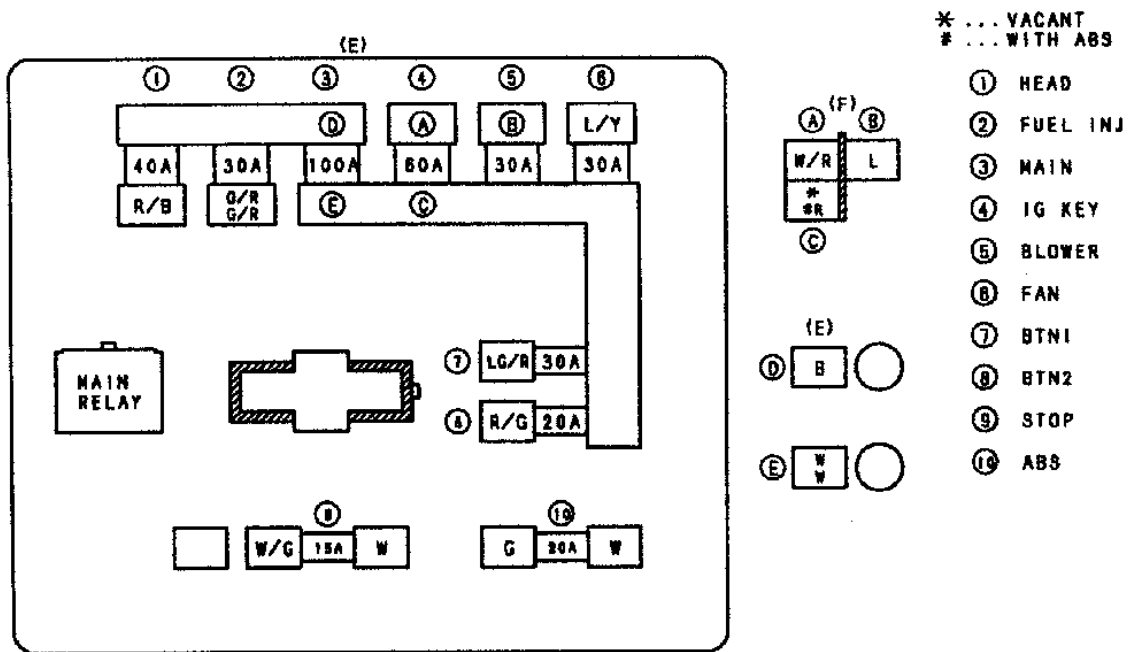
- 1: ROOM
- 2: DEFOG
- 3: AUDIO
- 4: D. LOCK
- 5: HAZARD
- 6: A/C
- 7: P. WIND
- 8: WIPER
- 9: A/B
- 10: TURN
- 11: METER
- 12: ENGINE
- 13: TAIL
- 14: F. FOG
- 15: RADIO
- 16: CIGAR
- 17: -
- 18: ST. SIG
- 19: -
- 20: HEAD RH
- 21: HEAD LH
- 22: AD FAN

< > BOSE AUDIO

NOTE: THIS IS THE CONNECTOR AS SEEN FROM THE TERMINAL SIDE.

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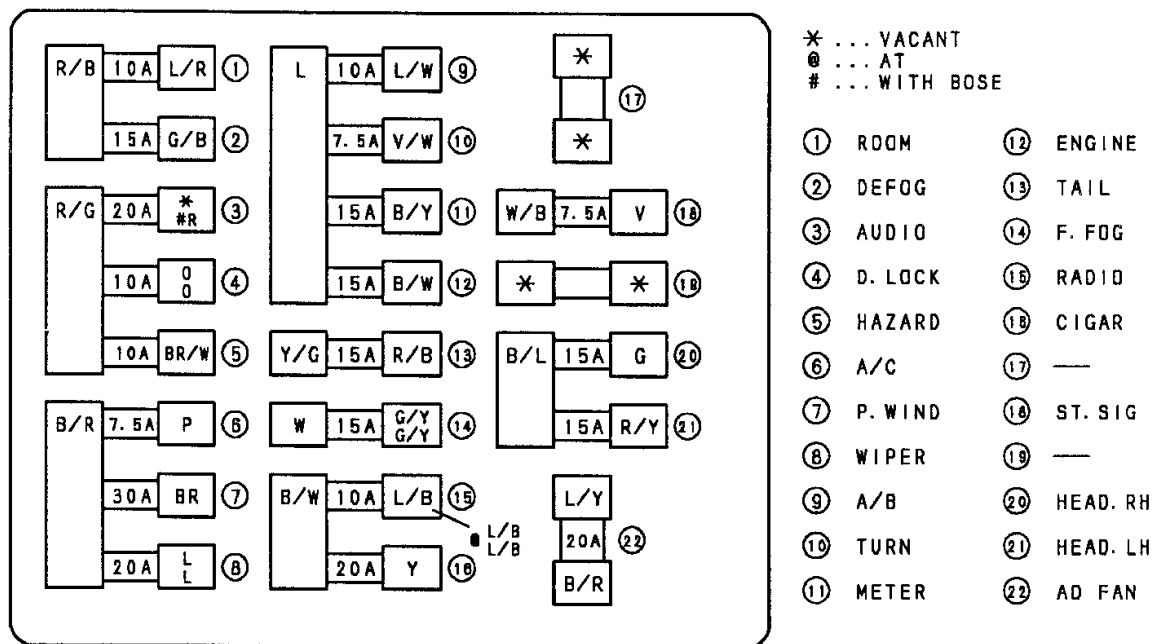
Fig. 5: Identifying Fuse Block Fuses (2002-03)
 Courtesy of MAZDA MOTORS CORP.



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Fig. 6: Identifying Main Fuse Block Fuses & Relays (2004)
 Courtesy of MAZDA MOTORS CORP.

X-02 FUSE BLOCK (F)



NOTE: SEEN FROM TERMINAL SIDE

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Fig. 7: Identifying Fuse Block Fuses (2004)

Courtesy of MAZDA MOTORS CORP.

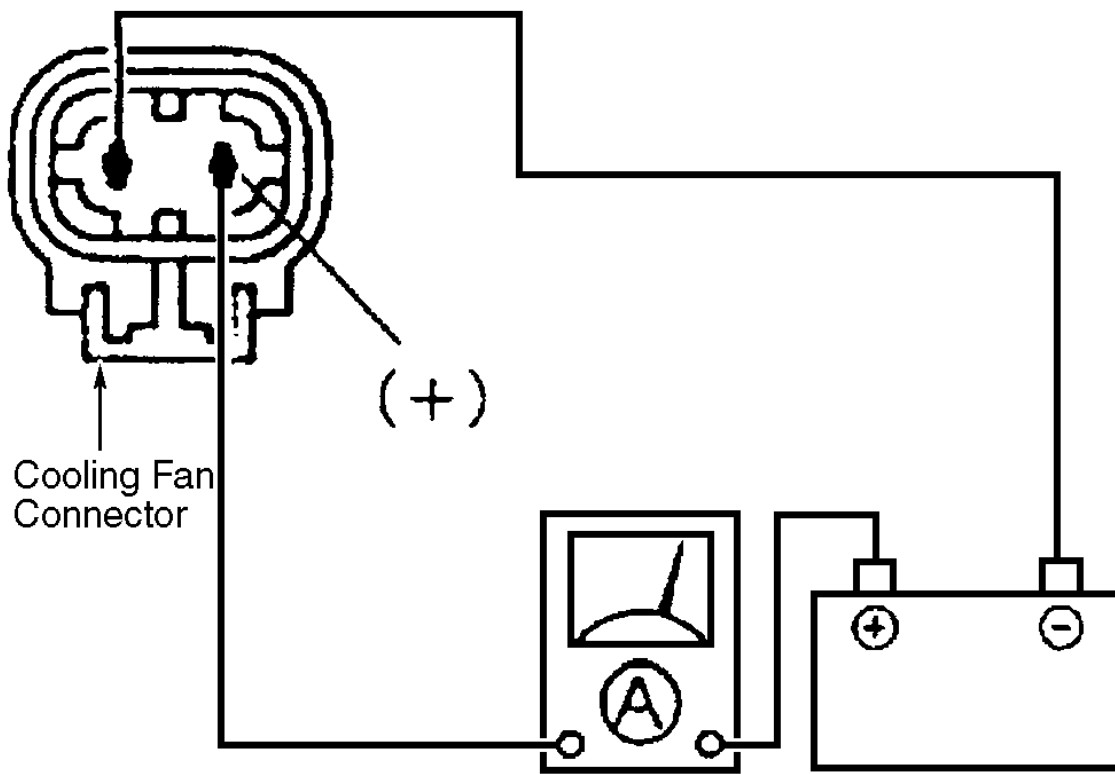
COMPONENT TESTS

COOLING FAN MOTOR

1. Verify that the battery is fully charged.
2. Disconnect cooling fan motor harness connector.
3. Connect positive battery voltage and an ammeter to the cooling fan motor connector terminals. See [Fig. 8](#) or [Fig. 9](#).
4. Verify cooling fan motor(s) operate smoothly at the specified current draw. See [COOLING FAN MOTOR AMPERAGE DRAW](#) table.

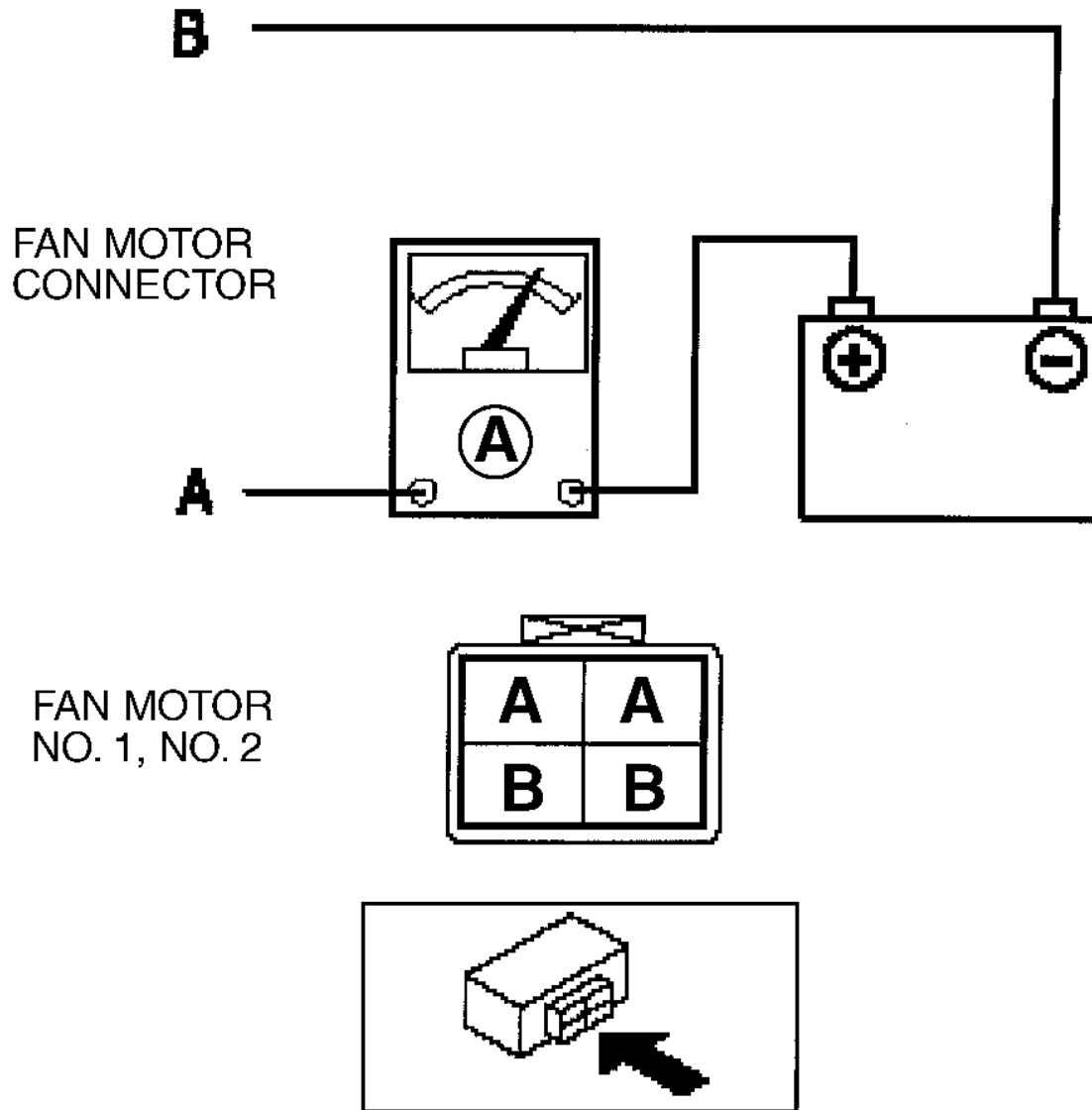
COOLING FAN MOTOR AMPERAGE DRAW

Application	Current Draw - Amps
2002-04 Without Turbocharger	4.50-6.49
2004 With Turbocharger	10



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Fig. 8: Checking Single Cooling Fan Motor Current (Without Turbocharger)
Courtesy of MAZDA MOTORS CORP.

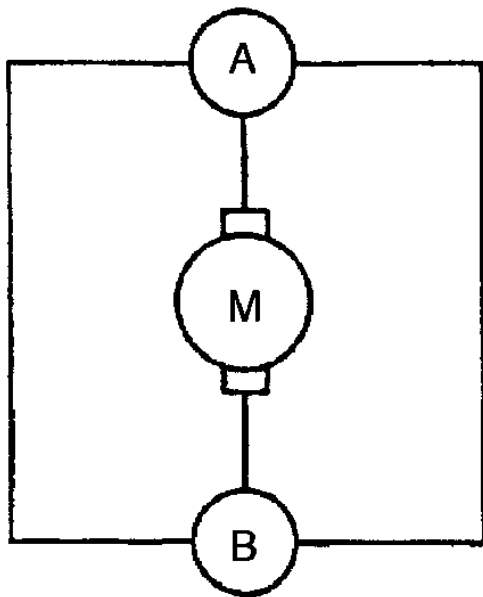


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Fig. 9: Testing Dual Cooling Fan Motor Current Draw (With Turbocharger)
 Courtesy of MAZDA MOTORS CORP.

CONDENSER FAN

1. Disconnect the condenser fan connector. See [Fig. 13](#) .
2. Connect positive battery voltage to terminal "A" and ground to terminal "B" of the condenser fan, and verify that air blows towards the engine. See [Fig. 10](#) . If the condenser fan does not operate, replace the condenser fan.



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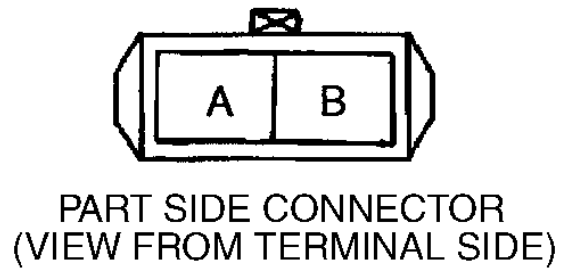
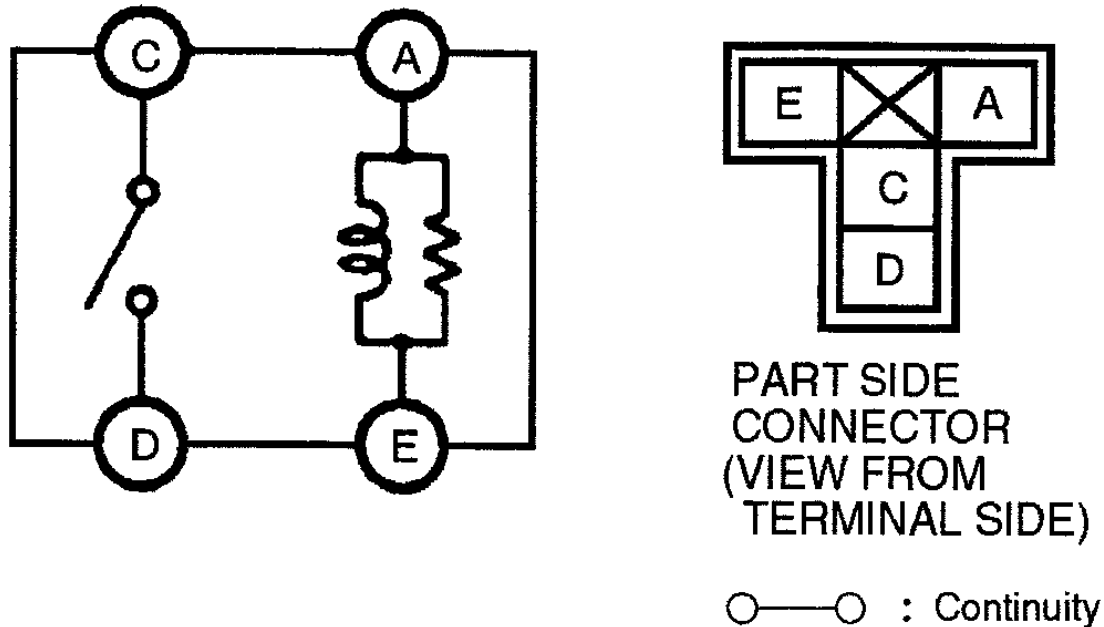


Fig. 10: Testing Condenser Fan
Courtesy of MAZDA MOTORS CORP.

COOLING FAN RELAY & COOLING FAN RELAY NO. 1 (TURBOCHARGED)

NOTE: Testing for cooling fan relays No. 2 and 3 not provided by manufacturer.

1. Disconnect the negative battery cable.
2. Remove cooling fan relay.
3. Using an ohmmeter, inspect for continuity between the relay terminals. See [Fig. 11](#) . If continuity is not as specified, replace relay.



Step	Terminal			
	A	E	C	D
1	○ — ○			
2	B+	GND	○ — ○	

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Fig. 11: Testing Cooling Fan Relay
Courtesy of MAZDA MOTORS CORP.

CONDENSER FAN RELAY

1. Disconnect the negative battery cable.
2. Remove cooling fan relay.
3. Using an ohmmeter, inspect for continuity between the relay terminals. See [Fig. 12](#) . If continuity is not as specified, replace relay.

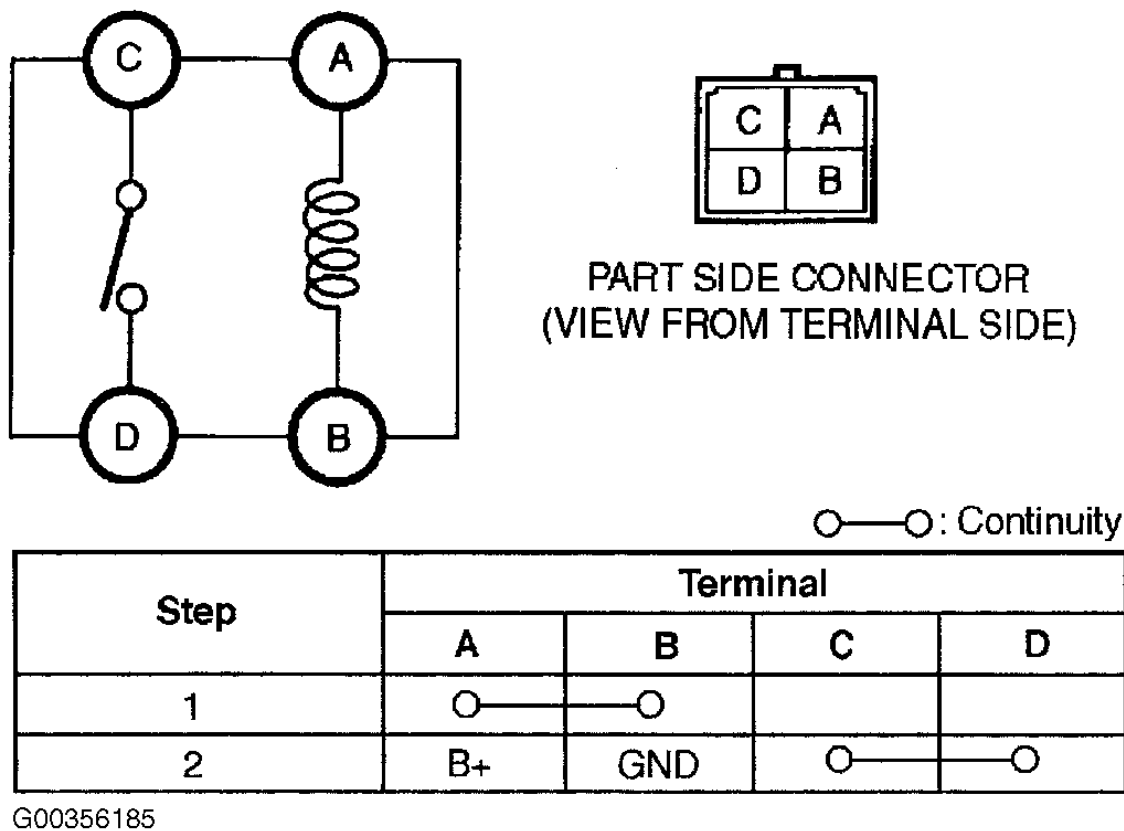


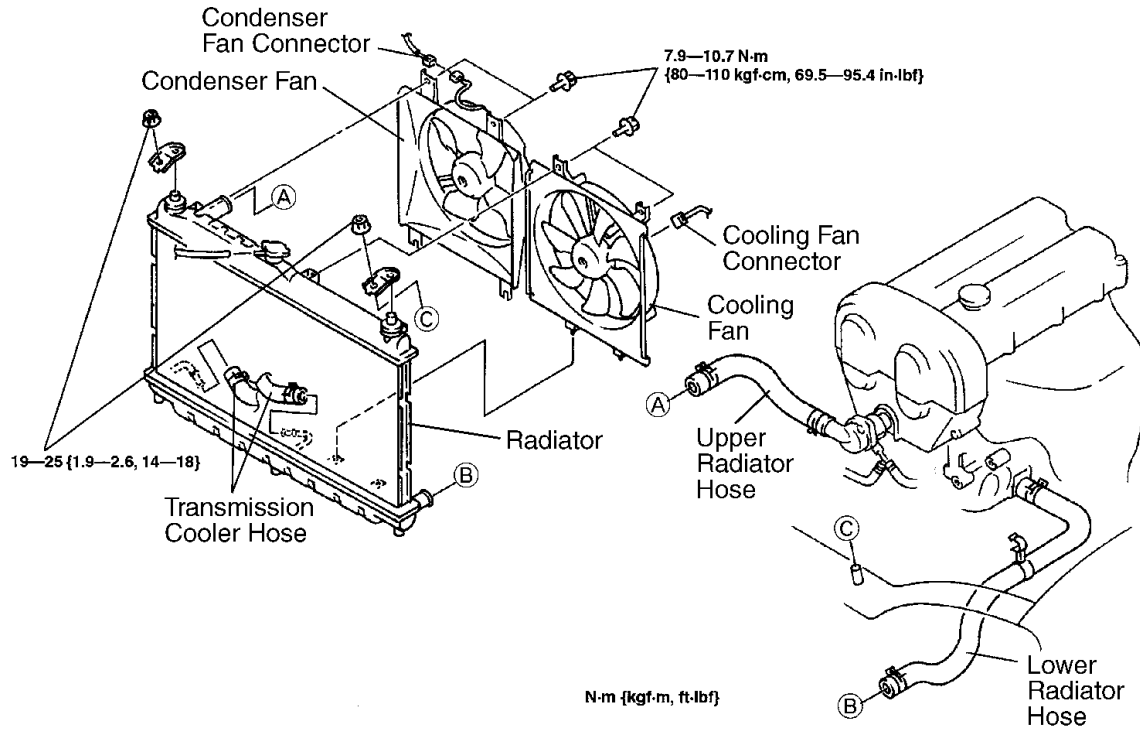
Fig. 12: Testing Condenser Fan Relay
Courtesy of MAZDA MOTORS CORP.

REMOVAL & INSTALLATION

COOLING FAN MOTOR

Removal & Installation (Without Turbocharger)

1. Disconnect the negative battery cable.
2. Drain coolant below upper radiator hose level, into appropriate container.
3. Disconnect the electric cooling fan harness connector. See [Fig. 13](#) .
4. Disconnect upper radiator hose (if necessary).
5. Remove cooling fan cowling mounting bolts and lift the shroud and electric cooling fan assembly from the vehicle. See [Fig. 13](#) .
6. Remove fan blade.
7. Remove fan motor from cowling.
8. To install, reverse removal procedure.



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Fig. 13: Removing/Installing Cooling Fans (Without Turbocharger)

Courtesy of MAZDA MOTORS CORP.

Removal & Installation (With Turbocharger)

1. Disconnect the negative battery cable.
2. Loosen clamp and remove the tube from the Mass Air Flow (MAF) sensor. See [Fig. 14](#) .
3. Remove the air hose No. 1 and No. 2.
4. Set the air pipe No. 3 out of the way. See [Fig. 15](#) .
5. Disconnect the cooling fan harness connectors. See [Fig. 16](#) .
6. Drain coolant to a level below upper radiator hose. Disconnect upper radiator hose.
7. Remove cooling fan cowl mounting bolts and lift the cowl and cooling fan assembly from the vehicle. See [Fig. 16](#) .
8. Remove fan blades No. 1 and 2. See [Fig. 17](#) .
9. Remove fan motors from cowl.
10. To install, reverse removal procedure.

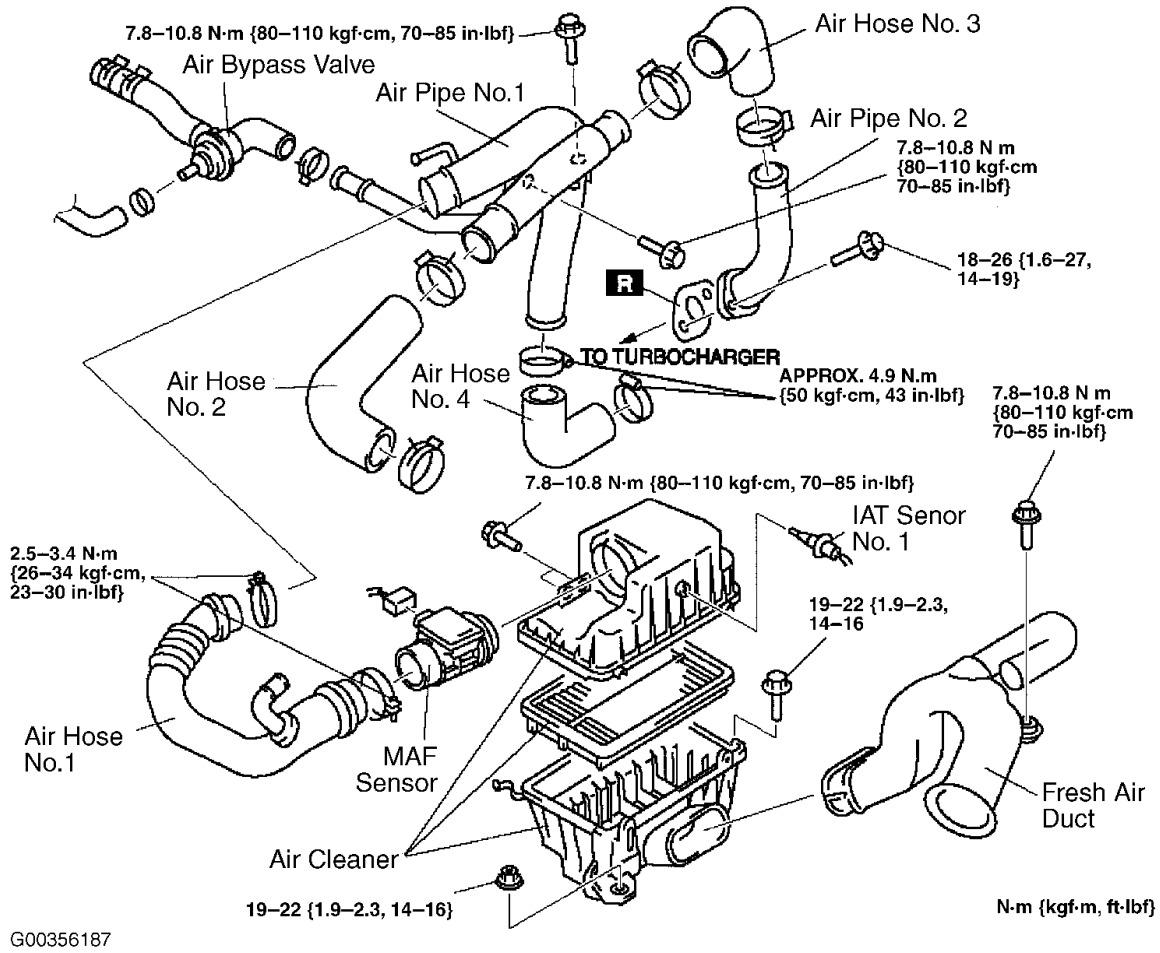
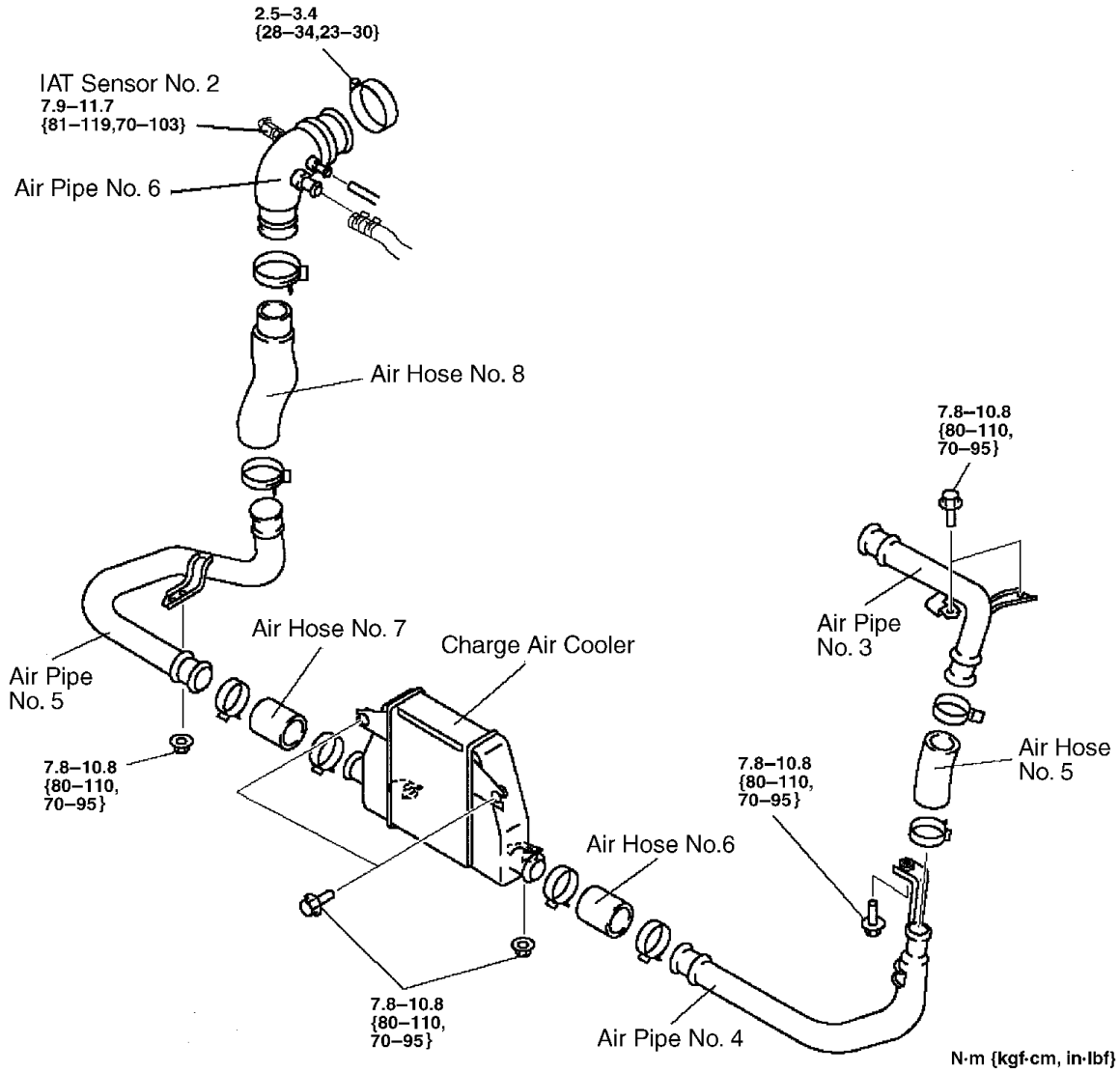


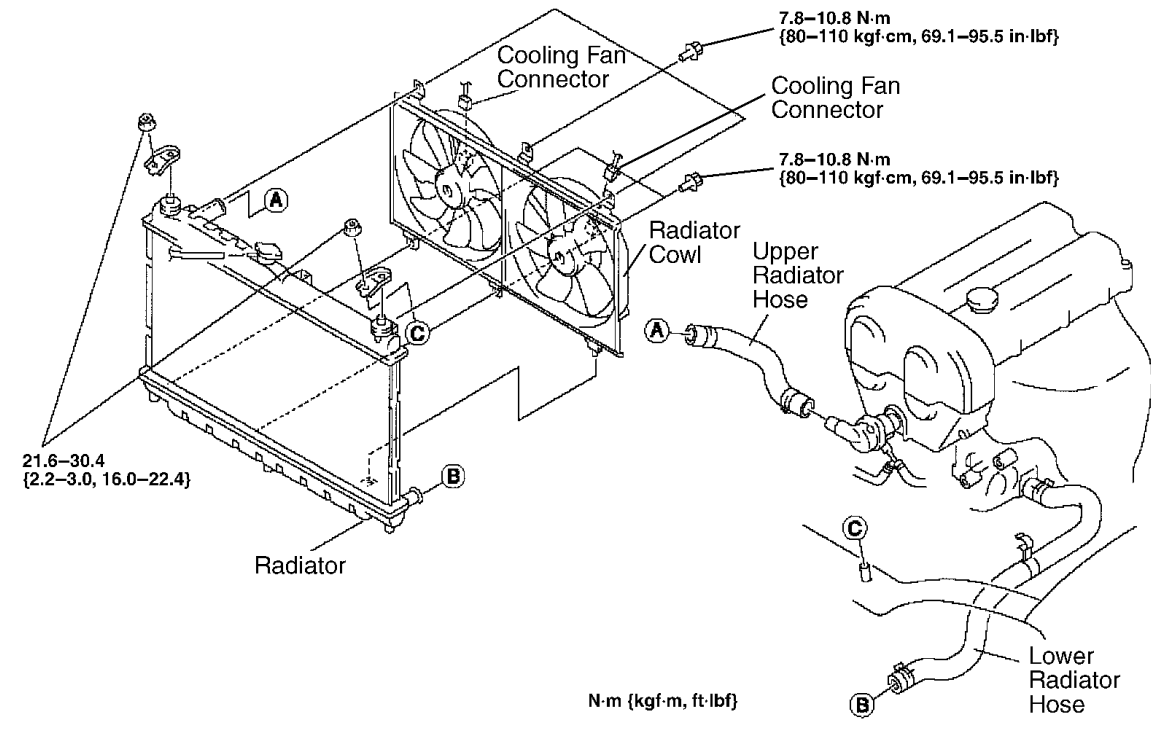
Fig. 14: Identifying Air Intake System Components (1 Of 2)
 Courtesy of MAZDA MOTORS CORP.



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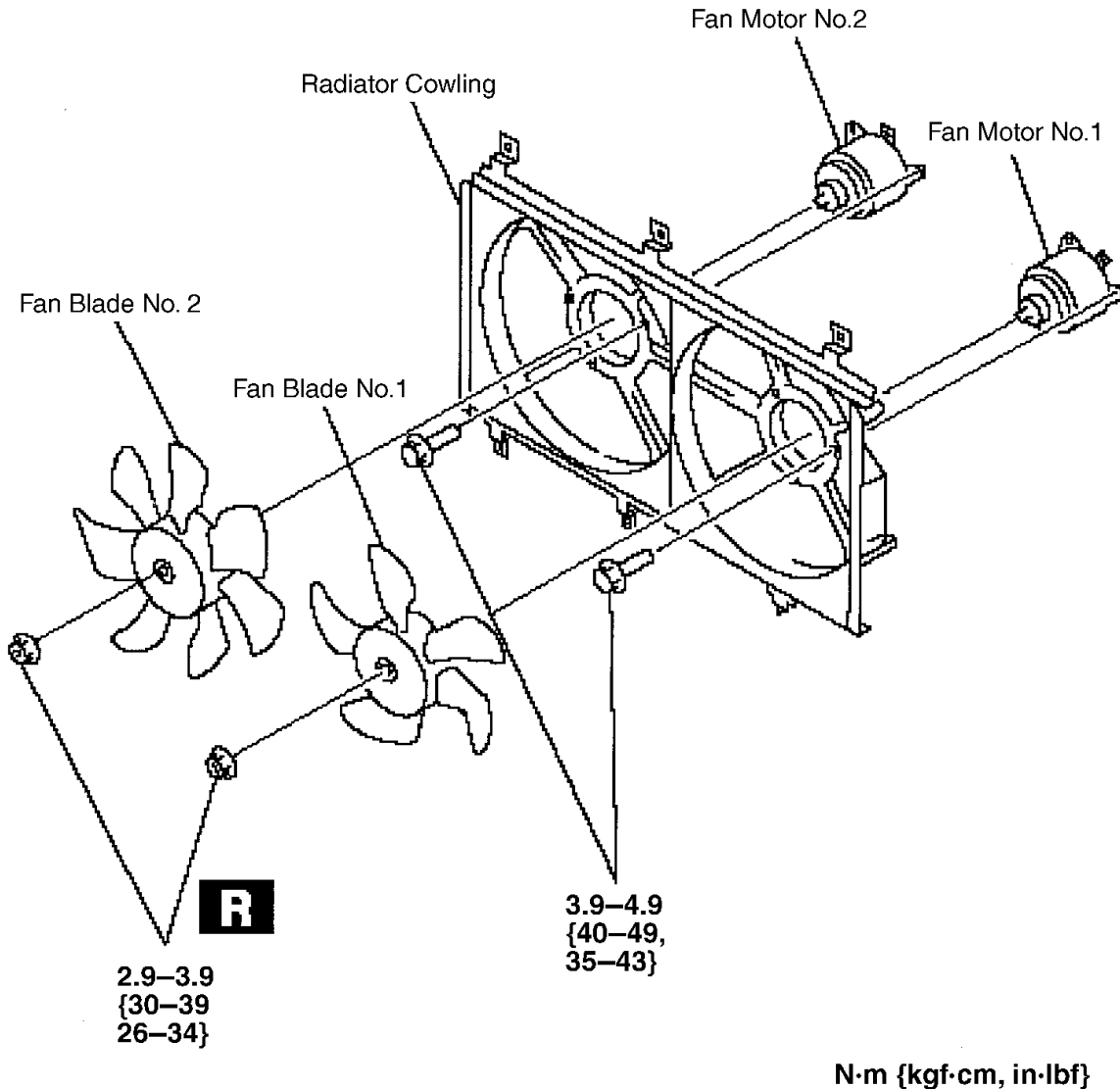
Fig. 15: Identifying Air Intake System Components (2 Of 2)

Courtesy of MAZDA MOTORS CORP.



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Fig. 16: Removing/Installing Cooling Fan Assembly (With Turbocharger)
Courtesy of MAZDA MOTORS CORP.



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Fig. 17: Exploded View Of Cooling Fan Assembly (With Turbocharger)
 Courtesy of MAZDA MOTORS CORP.

WIRING DIAGRAMS

2002

For COOLING SYSTEM wiring diagram, see [COOLING FAN](#) in SYSTEM WIRING DIAGRAMS article.

2003

For COOLING SYSTEM wiring diagram, see [COOLING FAN](#) in SYSTEM WIRING DIAGRAMS article.

2004

For COOLING SYSTEM wiring diagram, see [COOLING FAN](#) in SYSTEM WIRING DIAGRAMS article.

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