COE
120 Conventional
> FLA COE

> FLB COE
> FLD Conventional

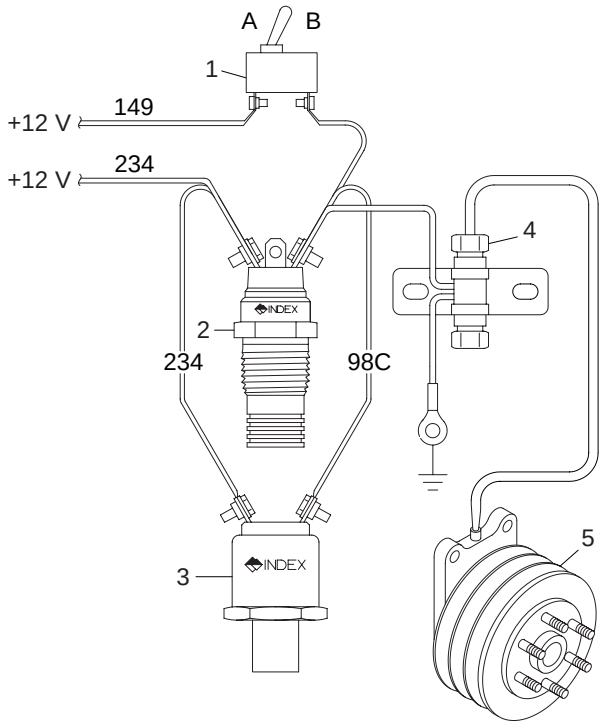
Medium Trucks
FLC 112 Conventional

Freightliner Service Bulletin

Description of Revisions: *This SB replaces the previous version dated December 1993. Instructions are added for troubleshooting a normally closed (NC) fan control system.*

If the fan control on vehicles with an Index coolant temperature switch (fan stat) seems to be malfunctioning, do the following applicable diagnostic procedures before replacing the temperature switch.

Troubleshooting a Normally Open (NO) Fan Control System (See Fig. 1 and Fig. 2)

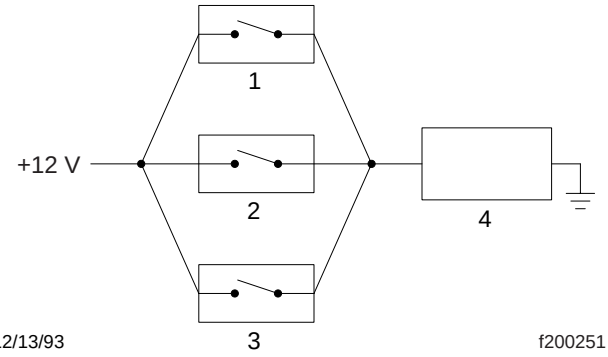


12/22/93 f200250

A. Automatic B. Manual

1. Manual Override Switch
2. Coolant Temperature Switch
3. Refrigerant Pressure Switch
4. Air Solenoid Valve
5. Fan Clutch Assembly

Fig. 1, Fan Control System, Normally Open (NO)



12/13/93 f200251

1. Manual Override Switch
2. Coolant Temperature Switch
3. Refrigerant Pressure Switch
4. Air Solenoid Valve

Fig. 2, Normally Open (NO) Electrical Schematic

1. Park the vehicle on a level surface, build system air pressure, set the parking brakes, and shut down the engine. Turn the ignition switch to the "ON" position.
2. Chock the tires.

3. Check the operation of the manual override and fan solenoid.

   3.1 Switch the manual override (dash-mounted switch) to the manual position, if equipped. If the vehicle is not equipped with this switch, attach a jumper wire across the coolant temperature switch terminals.[1] The fan drive should engage.

   NOTE: When the fan drive is engaged, the fan can't be rotated by hand.

   3.2 If the fan drive does not engage, check for the following problems:

   - Insufficient air pressure (pressure below 90 psi or 6.2 bar; models with air fan drives),
   - Friction facing excessively worn (models with air fan drives),
   - Disconnected solenoid connector,
   - Leaking air lines to the solenoid valve (models with air fan drives),
   - Leaking air line to the fan hub (models with air fan drives),
   - Leaking fan hub seals (models with air fan drives),
   - Inadequate solenoid ground,
   - Inoperative manual override switch,
   - Blown fuse or circuit breaker.

4. Check the operation of the refrigerant pressure switch.

   4.1 Install A/C manifold pressure gauges.

   4.2 Idle the engine with the air conditioner set on high and with the cab doors open. Ambient temperature should be above 60°F (15°C). The fan should engage when the pressure exceeds about 275 psi (19 bar). If the ambient temperature is below 60°F (16°C) it may be necessary to run the engine at high rpm, or move to a heated area to attain the required 275 psi (19 bar).

   4.3 If the fan does not engage, jump across the refrigerant pressure switch harness connector.

   4.4 If the fan engages, the wiring to the solenoid valve is OK. Replace the refrigerant pressure switch.

5. Check the operation of the coolant temperature switch.

   5.1 Run the engine at fast idle with the A/C off. The fan should engage when the coolant temperature reaches about 195° to 205°F (91° to 96°C).[2] (The fan should disengage when the coolant temperature has fallen about 7° to 10°F (4° to 6°C).

   5.2 If the fan does not engage, jump across the coolant switch terminals.[1]

   5.3 If the fan engages, the wiring to the solenoid valve is OK. Replace the coolant temperature switch.

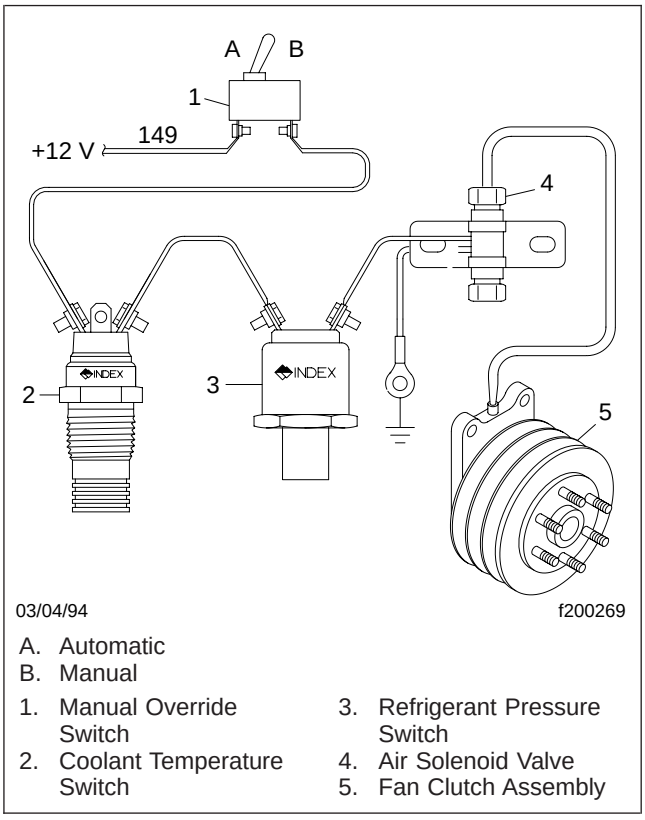
6. Turn off the ignition switch.

7. Remove the chocks from the tires.

Troubleshooting a Normally Closed (NC) Fan Control System (See Fig. 3 and Fig. 4)

1. Park the vehicle on a level surface, build system air pressure, set the parking brakes, and shut down the engine. Leave the ignition switch on.

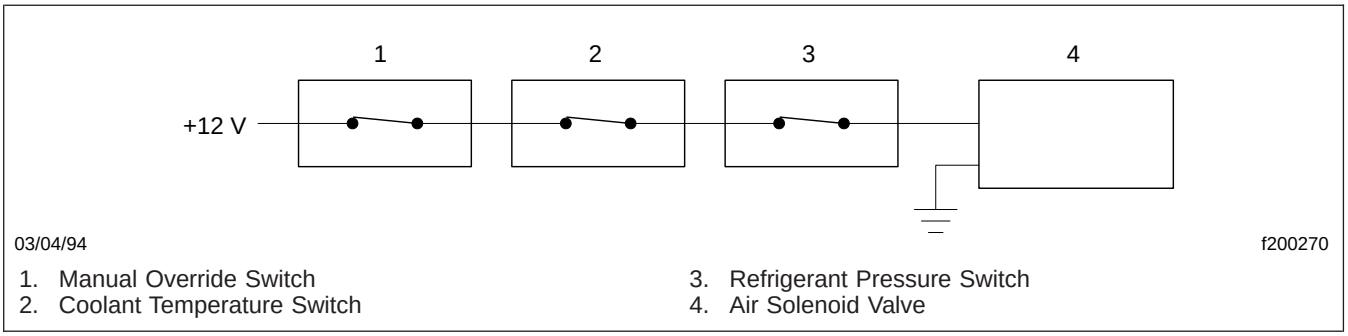
[1] Temperature and pressure switches can be damaged if jumper wires are used incorrectly. Connect jumper wires only between switch terminals—never between a switch terminal and the vehicle ground.
[2] Dashboard-mounted temperature gauges are usually not very accurate. If possible, install a thermometer in the surge tank to determine the coolant temperature.



A. Automatic
B. Manual

1. Manual Override Switch
2. Coolant Temperature Switch
3. Refrigerant Pressure Switch
4. Air Solenoid Valve
5. Fan Clutch Assembly

Fig. 3, Fan Control System, Normally Closed (NC)



1. Manual Override Switch
2. Coolant Temperature Switch
3. Refrigerant Pressure Switch
4. Air Solenoid Valve

Fig. 4, Normally Closed (NC) Electrical Schematic

2. Chock the tires.
3. Check the operation of the fan solenoid valve (vehicles with air fan control).

   3.1 Check for power (12 volts) at the solenoid valve. If power is present, the fan drive should engage and disengage when the harness is momentarily disconnected from the solenoid valve, or when the manual override switch (if equipped) is turned on and off.

   NOTE: When the fan drive is engaged, the fan can't be rotated by hand.

3.2 If power is not present, and the fan hub is engaged, check for the following problems:

- The fan fuse or circuit breaker is blown,
- Broken wire,
- The refrigerant pressure switch is stuck open (see applicable step below),
- The temperature switch is stuck open (see applicable step below),
- The manual override switch (if equipped) is on or inoperative,
- Inadequate air pressure or leaking air line (Kysor or Bendix fan drive),
- Inadequate ground to solenoid valve.

4. Check the operation of the refrigerant pressure switch.

   4.1 Instal A/C manifold pressure gauges.

   4.2 Idle the engine with the air conditioner set on high and with the cab doors open. Ambient temperature should be above 60°F (15°C). The fan should engage when the pressure exceeds about 275 psi (19 bar).

   4.3 If the fan does not engage, disconnect the harness connector.

   4.4 If the fan engages, the wiring to the solenoid valve is OK. Replace the refrigerant pressure switch.

5. Check the operation of the coolant temperature switch.

   5.1 Run the engine at fast idle with the A/C off. The fan should engage when the coolant temperature reaches about 195° to 205°F (91° to 96°C). (The fan should disengage when the coolant temperature has fallen about 7° to 10°F (4° to 6°C).)

   5.2 If the fan does not engage, disconnect one terminal of the temperature switch.

   5.3 If the fan engages, the wiring to the solenoid valve is OK. Replace the temperature switch.

6. Turn off the ignition switch.

7. Remove the chocks from the tires.

Warranty

Troubleshooting and repair of the fan control system is covered under normal warranty. When submitting claims, reference this service bulletin by number, and use the damage code and repair time information in the table below.

Damge Code and Repair Time Information

Damage Code	Operation Number	Description	Time (hours)
700–001850590	700–5002A	Refrigerant Pressure Switch Replacement, With Schrader Valve Includes: Troubleshooting	0.9
700–001850590	700–5002B	Refrigerant Pressure Switch Replacement, Without Schrader Valve Includes: Troubleshooting	2.1
273–002548590	273–0036A	Coolant Temperature Switch, Replacement Includes: Troubleshooting	1.0