

Table a. Troubleshooting Bosch Continuous Fuel Injection

Symptom	Probable cause	Corrective action
1. Cold start—Engine starts hard or fails to start when cold	<ul style="list-style-type: none"> a. Cold-start valve or thermo-time switch faulty b. Fuel pump not running c. Air-flow sensor plate rest position incorrect d. Fuel pressure incorrect e. Coolant temperature sensor or wiring faulty (KE only) 	<ul style="list-style-type: none"> a. Test cold-start valve and thermo-time switch. Replace faulty parts. 8. b. Check fuel pump fuse and fuel pump relay, as well as fuel pump voltage supply. 4.1 c. Inspect air-flow sensor plate rest position and adjust if necessary. 3.2 d. Test fuel pressure. 5.1, 6.1 e. Check control system. 6.2
2. Hot start—Engine starts hard or fails to start when warm	<ul style="list-style-type: none"> a. Cold start valve leaking or operating continuously b. Fuel pressure incorrect c. Air-flow sensor plate rest position incorrect d. Insufficient residual fuel pressure e. Fuel leak(s) f. Lambda control faulty g. Fuel injectors faulty or clogged 	<ul style="list-style-type: none"> a. Test cold-start valve and thermo-time switch. 8. b. Test fuel pressure. 5.1, 6.1 c. Inspect air-flow sensor plate rest position and adjust if necessary. 3.2 d. Test residual fuel pressure. Replace fuel pump check valve or fuel accumulator as necessary. 5.1, 6.1 e. Inspect fuel lines and connections. Correct leaks as required f. Check lambda control. 5.2, 6.2 g. Check injectors. 4.3
3. Engine misses and hesitates under load	<ul style="list-style-type: none"> a. Fuel injector clogged b. Fuel pressure incorrect c. Fuel leak(s) d. Lambda control faulty e. Coolant temperature sensor or wiring faulty (KE only) 	<ul style="list-style-type: none"> a. Test fuel injectors. Check for clogged injector lines. Replace faulty injectors. 4.3 b. Test fuel pressures. 5.1, 6.1 c. Inspect fuel lines and connections. Correct leaks as required d. Check lambda control. 5.2, 6.2 e. Check control system. 6.2
4. Engine starts but stalls at idle	<ul style="list-style-type: none"> a. Incorrect fuel pressure b. Cold-start valve leaking c. Auxiliary-air regulator/Idle-speed stabilizer faulty d. Vacuum (intake air) leak e. Fuel injectors faulty or clogged f. Coolant temperature sensor or wiring faulty (KE only) g. Control plunger binding or fuel distributor faulty 	<ul style="list-style-type: none"> a. Test fuel pressures. 5.1, 6.1 b. Test and, if necessary, replace cold-start valve. ;bd8. c. Test and, if necessary, replace. 8. d. Inspect intake air components for leaking hoses, hose connections, and cracks or other leaks. Repair as required e. Check injectors. 4.3 f. Check control system. 6.2 g. Check air-flow sensor plate movement. 3.2
5. Engine idles too fast	<ul style="list-style-type: none"> a. Accelerator pedal, cable, or throttle valve binding b. Auxiliary-air regulator faulty c. Air leaking past throttle valve 	<ul style="list-style-type: none"> a. Inspect for worn or broken parts, kinked cable, or other damage. Replace faulty parts. b. Test and, if necessary, replace. 8. c. Inspect throttle valve and adjust or replace as required. 3.1
6. Hesitation on acceleration	<ul style="list-style-type: none"> a. Vacuum (intake air) leak b. Fuel injectors clogged c. Cold-start valve leaking d. Control plunger in fuel distributor binding or fuel distributor faulty e. Air-flow sensor plate out of adjustment f. Fuel pressure incorrect g. Idle mixture (%CO) incorrectly adjusted h. Potentiometer faulty or misadjusted (KE only) 	<ul style="list-style-type: none"> a. Inspect intake air components for leaking hoses, hose connections, and cracks or other leaks. Repair as required b. Test injector spray pattern and quantity. Replace faulty injectors. 4.3 c. Test and, if necessary, replace cold-start valve. 8. d. Check air-flow sensor plate movement and, if necessary, replace fuel distributor. 3.2 e. Inspect air-flow sensor plate position and adjust if necessary. 3.2 f. Test fuel pressures. 5.1, 6.1 g. Check and adjust CO. 7. h. Test and adjust or replace as necessary. 6.2

continued on next page

6 CONTINUOUS INJECTION – TROUBLESHOOTING & SERVICE

Table a. Troubleshooting Bosch Continuous Fuel Injection (cont'd)

Symptom	Probable cause	Corrective action
7. Poor fuel mileage	<ul style="list-style-type: none"> a. Idle speed, ignition timing, and idle mixture (%CO) out of adjustment b. Cold-start valve leaking c. Fuel pressure incorrect 	<ul style="list-style-type: none"> a. Check and adjust. 7. b. Test and, if necessary, replace cold-start valve. 8. c. Test fuel pressures. 5.1, 6.1
8. Engine continues to run (diesels) after ignition is turned off	<ul style="list-style-type: none"> a. Incorrect ignition timing or faulty ignition system b. Engine overheated 	<ul style="list-style-type: none"> a. Check ignition system b. Check cooling system
9. Low power	<ul style="list-style-type: none"> a. Coolant temperature sensor faulty or wire to sensor broken (KE only) b. Fuel pressure incorrect c. Throttle plate not opening fully d. Full throttle switch faulty or incorrectly adjusted (KE only) e. Control-pressure regulator faulty (control-pressure regulators with full-load compensation only) 	<ul style="list-style-type: none"> a. Check control system. 6.2 b. Test fuel pressures. 5.1, 6.1 c. Check throttle cable adjustment to make sure throttle is opening fully. Adjust cable if necessary. d. Check throttle switch and adjust if necessary. Replace a faulty switch. 6.2 e. Check control-pressure regulator full-load function. 5.1

3. AIR-FLOW MEASUREMENT

As discussed in chapter 5, the throttle valve regulates the amount of air drawn into the engine; the air-flow sensor measures the air intake and moves the control plunger to meter the fuel. Incorrect adjustment of the throttle valve or air-flow sensor plate, or binding of the control plunger, can cause many problems including rough idle, stalling and hard starting.

Whenever any changes are made to the throttle valve or air-flow sensor, idle speed and mixture (CO) will need to be adjusted also.

3.1 Throttle Valve Basic Adjustment

The throttle valve is adjusted at the factory and does not normally require adjustment. The stop screw should not be used to adjust the idle; its purpose is to prevent the valve from closing too far and damaging the inside of the throttle body. The throttle-valve adjustment procedure is given in case the factory adjustment has been changed.

To correct a faulty throttle valve adjustment, use a screwdriver to back off the throttle-valve adjusting screw until there is clearance between its tip and the throttle valve lever. The screw is shown in Fig. 3-1. It may be necessary to first loosen a locknut. Place a thin piece of paper between the adjusting screw and the throttle valve lever. With the throttle valve closed, turn the screw in until it lightly contacts the paper. From this position, remove the paper and turn the screw in an additional 1/2 turn.

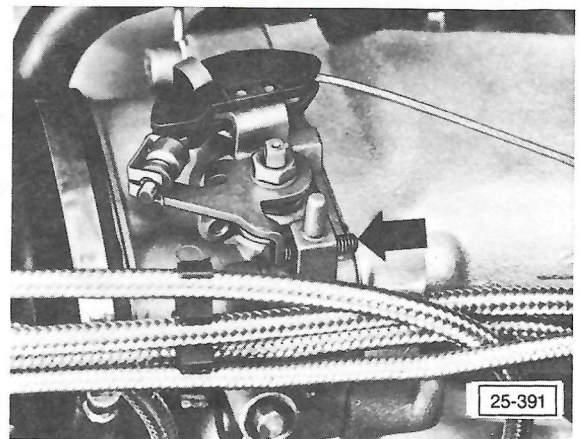


Fig. 3-1. Typical location (arrow) of throttle-valve adjusting screw.

3.2 Air-Flow Sensor and Fuel Distributor

For some of the tests of the air-flow sensor in this section, you will need fuel pressure on the plunger. You can do this by starting the engine for a minute, then shutting it off.

If you run the pump without running the engine, don't move the sensor plate in the air-funnel. Remember, the pump delivers system pressure, usually about 5 bar (75 psi), and that is high enough to cause continuous injection of raw fuel into the cylinders. After the pump stops, the accumulator provides residual fuel-pressure, about 2 bar (30 psi) for these tests, but that's lower than injector-opening pressure, about 3 bar (45 psi), so the injectors will not deliver fuel when you lift the sensor plate.