



Troubleshooting

To better help our customers - this HP Color Laserjet 4600 series troubleshooting page is simply a guide / additional information for your convenience, as you search for assistance in repairing your machine. Although this information is provided for your convenience it is recommended, for the most part, that a technician inspects your office equipment.

It is recommended to consult with a professional when ordering your printer part(s).

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Diagnostics

Diagnostics flowchart

Use this flowchart to help identify the cause of high-level printer problems. These problems are indicated by abnormalities in the printer's power-on sequence. The LED that the flowchart refers to is on the formatter. Figure 7-12 on the next page indicates where this LED is located. This is a "heartbeat" LED that blinks on and off when the formatter is operating properly.

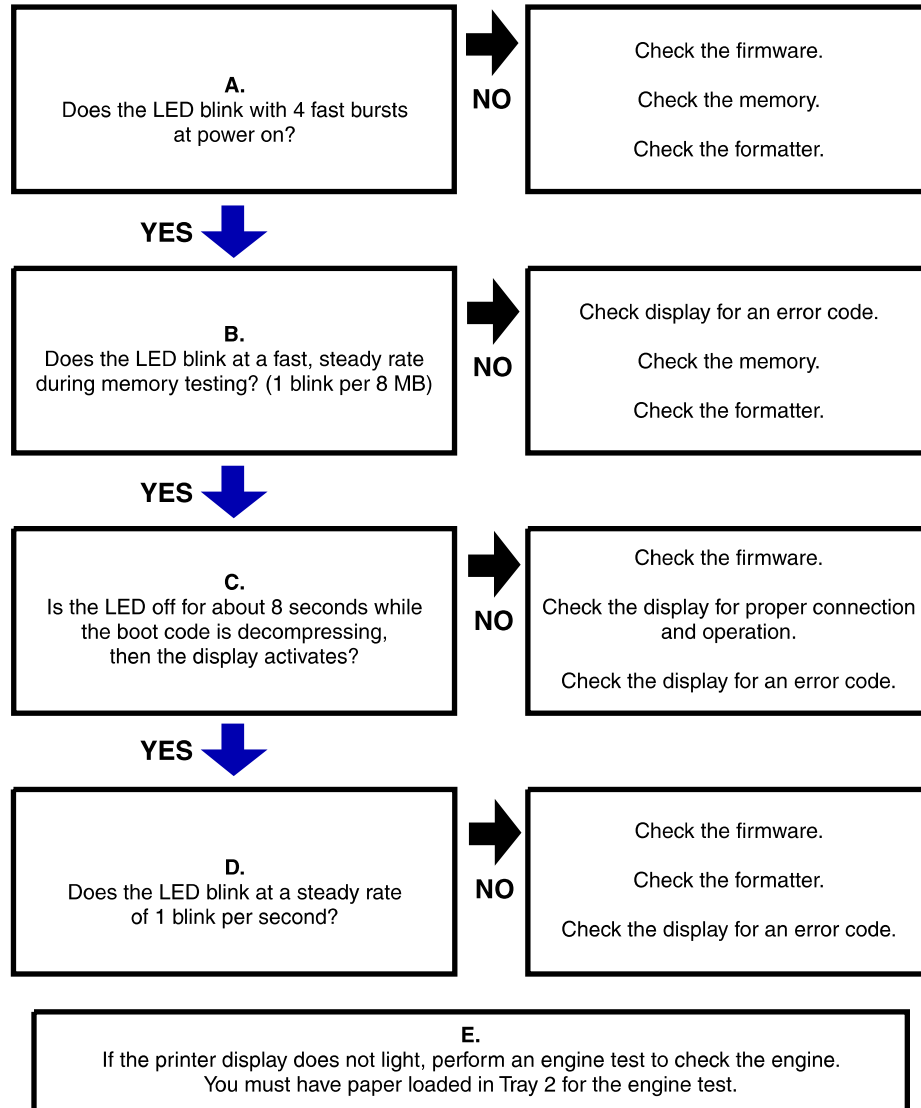


Figure 7-11 Diagnostics flowchart



Figure 7-12 Formatter LED

Engine diagnostics

This section provides an overview of the engine diagnostics incorporated into the HP Color LaserJet 4600 series printer. The printer contains extensive internal diagnostics that help in troubleshooting print quality issues, paper path issues, noise issues, component issues, and timing issues.

Diagnostics mode

Some of the diagnostic tests automatically put the printer into a special diagnostics mode. The special diagnostics mode allows the printer to perform actions that it normally could not because the printer would enter an error state. Always follow the control panel directions in the Diagnostic menu to properly exit the special diagnostics mode and return the printer to a normal state.

Diagnostics that put the engine into the special diagnostics mode

There are three diagnostic tests that put the engine into a special state:

- Disable cartridge check
- Sensor test
- Component test

While the printer is in the special diagnostics mode, the display should read:

```
Ready Diagnostics Mode
To exit press Cancel Job
```

When the printer is in the special diagnostics mode, the three tests listed above appear in the menu and are available to be run. To access other diagnostic tests or to leave the special state, press the **CANCEL JOB** button, and then select `Exit diagnostics`. The printer will reset itself, and then return to the normal state.

Note

A good understanding of how the printer operates is required to use the engine diagnostics successfully. Before proceeding with these diagnostic tests, be sure you understand the information in Chapter 5 of this manual.

Diagnostics tests

Different tests can be used to isolate different types of issues. For component or noise isolation, you can run the diagnostics with the covers removed. Removing the rear cover, top cover, rear top cover, and side covers provides a better view of the areas being tested. To operate the printer with the covers removed, defeat the door switch (SW4, callout 1) and depress the ETB connector (callout 2) after closing the ETB.

WARNING!

Take caution when performing printer diagnostics to avoid risk of injury. Only trained service personnel should access and run the diagnostics with the covers removed. Never touch any of the power supplies with the printer turned on.

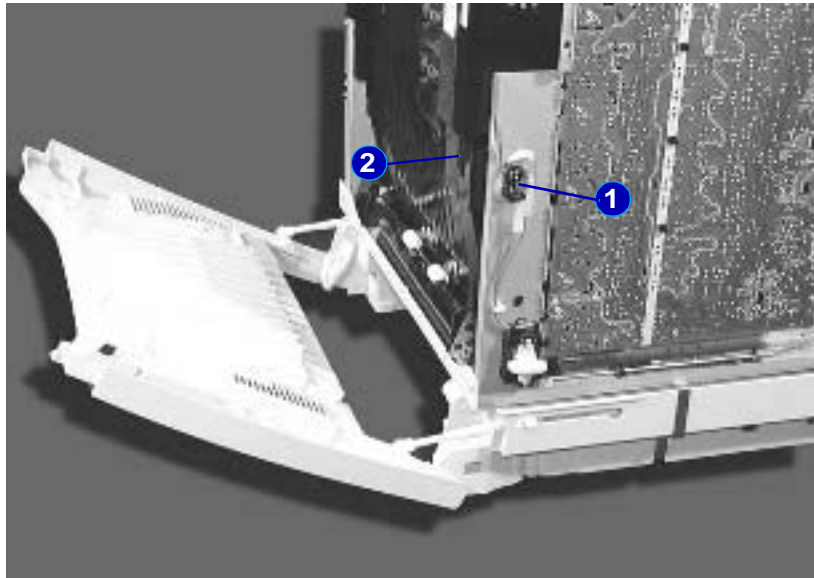


Figure 7-13 Door switch and ETB connector

Note

Any time a cartridge is installed or removed while the covers are removed, the door interlock must be cycled to simulate opening and closing the top cover in order for the engine to recognize the change. The ETB must be closed and its connector must be depressed before cycling the door switch, or the printer will generate a 59.90 Printer Error. With covers installed, the door switch and ETB connector are automatically operated. With covers removed, you must manually perform these steps.

Individual diagnostic tests

The following sections explain in more detail how to operate the various diagnostics properly.

Print event log

This item prints an event log that displays the last 50 entries in the printer's event log, starting with the most recent.

Show event log

This item displays on the control panel the last 50 events on the control panel display, starting with the most recent.

PQ troubleshooting


This item prints a series of print quality assessment pages that help troubleshoot print quality problems.

Disable cartridge check (special mode test)

This diagnostic test allows you to print internal pages or send an external job to the printer with one or more print cartridges removed or swapped. Because the cartridges are not keyed, the diagnostic test can be run with one to four cartridges removed or swapped to another location. Consumable supply errors are ignored while in this mode. Once in this mode, you can navigate the menus and print internal pages or send an external print job to the printer. This diagnostic test can be used to isolate print quality problems related to individual cartridges and to isolate individual cartridge problems such as noise.

Note

Do not remove or swap cartridges before entering the disable cartridge check diagnostic. After entering the test, you can remove or swap cartridges.

While performing the disable cartridge check, you can navigate the menus and print internal pages as desired from the control panel. Use the  button to access the menus as you normally would. You can also send external print jobs to the printer.

To exit this diagnostic, press the **CANCEL JOB** button and then select `Exit diagnostics`.

Paper path test

This diagnostic will generate one or more test pages that you can use to isolate the cause of paper jams.

To isolate a problem, you can specify which input tray to use, specify whether to use the duplex path, and specify the number of copies to print. Multiple copies can be printed to help isolate intermittent problems. The following options become available after you enter the diagnostic:

- **Print test page.** Run the paper path test from the default settings: Tray 2, no duplex, and one copy. To specify other settings, scroll down the menu and select the setting, then scroll back up and select `PRINT TEST PAGE` to execute the test.
- **Source.** Select Tray 1, Tray 2, or Tray 3 (if the optional 500-sheet paper feeder is installed).
- **Duplex.** Enable or disable 2-sided printing.
- **Copies.** Set the numbers of copies to be printed; the choices are 1, 10, 50, 100, or 500.

Sensor Test (special mode test)

This diagnostic test allows you to test the printer's sensors and switches for proper operation. Each sensor is represented by a letter, as indicated in Table 7-47. A one below the letter indicates paper is present. For the paper size sensor, the range of values is from 0 to 7. Table 7-48 indicates the switch state and paper size associated with each of these values.

Note

To eliminate the display flicker during this test, you can leave the door switch in the open state.

Table 7-47 Sensor test letter codes

Letter	Sensor	Sensor/switch number	Idle value (doors closed, paper in Trays 1 and 2)
A	top of page	PS 3	0
B	fuser inlet speed	PS11	1
C	fuser delivery	PS12	0
D	output bin full	PS13	0
E	MP tray paper presence	PS2	0
F	Tray 2 paper presence	PS1	0
G	Tray 2 paper size	SW1, SW2, SW3	0 - 7 (see Table 7-48)
H	Door	SW4	1

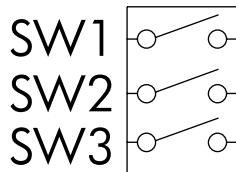



Figure 7-14 Tray 2 paper size switch arrangement

Table 7-48 Tray 2 paper size codes

Size code	Switch state			Paper size
	SW1	SW2	SW3	
0	on	on	on	Custom (see note below)
1	off	on	on	Letter
2	on	off	on	A5
3	off	off	on	Legal
4	on	on	off	B5 (JIS)
5	off	on	off	Executive
6	on	off	off	A4
7	off	off	off	tray not installed

Note

Depressing all three switches of the Tray 2 paper size levers to cause the control panel to display the custom paper menu. Press the  button to return to the sensor diagnostic display.

To toggle a sensor, find and move the sensor flags in the following locations:

- **A.** Remove Tray 2. The flag is located in the center paper inlet path of the paper pickup unit, directly in front of right-side white roller. The flag is recessed above the registration shutter in the paper pickup unit.

WARNING!


The fuser might be hot; wait 10 minutes for it to cool down.

- **B.** Open the ETB and wait for the fuser to cool down. The fuser inlet flag is located at the front center of the fuser. Access the flag from above the black print cartridge.
- **C.** The fuser delivery flag is located at the upper center of fuser, behind the fuser Caution label. It is wrapped in a clear roller.
- **D.** The output bin full sensor is located on upper rear edge of the fuser.
- **E.** Remove Tray 2. The Tray 1 (MP tray) paper presence sensor flag is the black lever on the front right of the paper tray cavity.
- **F.** Remove Tray 2. The Tray 2 paper presence sensor flag is the black lever in the middle center of the paper tray cavity.
- **G.** Remove Tray 2. The Tray 2 paper size sensor switches are located on the left rear side of the paper tray cavity.
- **H.** The door switch is located on the right front of the printer frame (underneath the right cover).

Component test (special mode test)

The component test allows you to exercise individual parts independently to isolate problems.

Each component test can be exercised once or repeatedly. If **CONTINUOUS** is selected as the repeat option, the test will cycle the component on and off. This process will repeat for 2 minutes, and then the test will terminate.

Menus cannot be accessed during component tests, so the  button serves the same function as the **CANCEL JOB** button.

Note

The door interlock switch must be defeated to run any of the component tests. If covers are removed, the door switch must be manually cycled during some tests for the engine to recognize a change.

The ETB assembly can be open, closed, or removed while some of these tests are executing.

Print cartridges can be installed or removed during certain tests. The display prompts for removal of some or all cartridges during certain tests in order to rotate and isolate certain components, as well as to protect the cartridges and ETB.

The following component tests can be executed:

- **Transfer motors.** This test turns the components involved in the image transfer process: the cartridge motors, the ETB motor and belt (if the ETB is closed and the connector is seated), and the print cartridges (if the ETB is closed). You can remove or install print cartridges during this test.
- **Belt only.** This test turns only the ETB motor and belt. The ETB must be closed and the connector seated. The display prompts you to remove the cartridges because the ETB belt contacts the photosensitive drums and cannot turn without them rotating also. Rotating the photosensitive drums could damage the belt or photosensitive drums. If covers are removed, you must manually cycle the door switch after removing the cartridges for the test to execute.
- **Cartridge motors.** This test rotates only the print cartridge drive motors. The display prompts you to remove at least one cartridge for the same reason as stated for the Belt only test. The engine rotates the cartridge motor(s) for only the cartridges that are removed. To rotate all motors sequentially, remove all cartridges; to isolate one motor, remove only that cartridge. If covers are removed, you must manually cycle the door switch after removing the cartridges for the test to execute. Always start this test with all cartridges installed, and cycle the door switch so the printer recognizes the configuration. Then proceed with the test, removing one or more cartridges.
- **Black, Magenta, Yellow, Cyan laser/scanners.** These four tests allow you to rotate each scanner motor individually.
- **Fuser motor.** This test rotates the fuser motor and drive gears.
- **Alienation motor** (also called the developing disengaging motor). This test moves the developing disengaging rod, clutches, and plates through their three positions:
 - Clean/Home: middle position; all cartridges disengaged; used during cleaning cycle
 - Color: top position; no cartridges disengaged; used during color printing
 - Black: lowest position; C, M, and Y cartridges disengaged, black engaged; used during black-only printing
- **Tray1/Tray 2 solenoids.** This test activates and releases the Tray 1 and Tray 2 solenoids. The Tray 1 solenoid is the lower solenoid. Tray 2 is the upper solenoid. You can remove the two securing screws and rotate the paper pickup unit to get a better view of the solenoids.

Print/Stop test

This diagnostic test can be used to isolate the cause of problems, such as image formation defects and jams, within the engine. This test allows you to stop the paper anywhere along the printer's paper path. The test can be programmed to stop printing internal pages or an external print job when the paper reaches a certain position. The test can also be programmed to stop from 0 to 60,000 mS. If the timer is set to a value that is greater than it takes to print the job, there are two ways to recover the printer.

- After the print job completes, press **CANCEL JOB** to return to the diagnostic menu before the timer times out.
- After the timer times out, press **CANCEL JOB**. You will have to cycle the door switch to restart the engine and return it to a normal state.

When the timer trips, the display shows the message `Printing stopped. Press [OK]` to continue. Pressing [OK] will print the previously selected job. If you do not want the previous job to print, press **CANCEL JOB** first, and then press the [OK] button.

Note

Do not attempt to execute a Print/Stop test while the printer is calibrating; a power cycle will be required. If you encounter a jam message during testing, cycle the door switch.

Test pages

Printing test pages helps you determine whether the printer engine and the formatter are functioning.

Engine test page

To verify that the printer engine is functioning, print an engine test page. Use a small pointed object to depress the test page switch located on the left side of the printer, as shown in Figure 7-15. The test page should have a series of horizontal lines. The test page can use only Tray 2 as the paper source, so ensure paper is loaded in Tray 2.

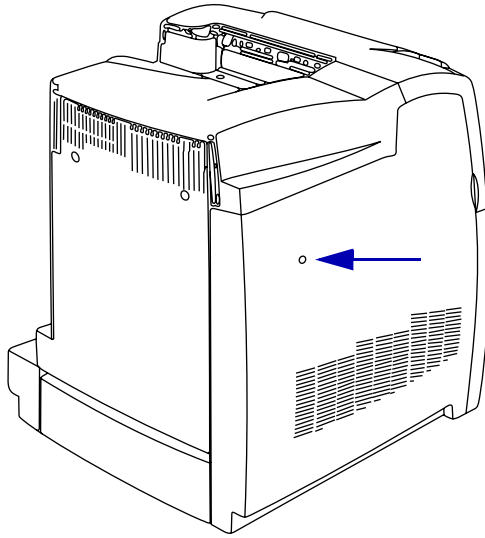







Figure 7-15 Test page switch

Formatter test page

To verify that the formatter is functioning, print a configuration page as follows:




- 1 Press  to enter the MENUS.
- 2 Press  to highlight INFORMATION.
- 3 Press  to select INFORMATION.
- 4 Press  to highlight PRINT CONFIGURATION.
- 5 Press  to select PRINT CONFIGURATION.

Engine resets

Cold reset

A cold reset unlocks menus that have been locked and resets variables in the control panel. However, it does not clear the values in the Service menu (such as the serial number and page counts).

To perform a cold reset

- 1 Turn the printer on.
- 2 As the printer performs its power-on sequence, press and hold  until all three lights on the control panel are lit.
- 3 When `SELECT LANGUAGE` appears on the display, press  until `COLD RESET` appears on the display.
- 4 Press . The printer will perform a cold reset and then continue its power-on sequence.

NVRAM initialization





CAUTION

Initializing NVRAM will reset the serial number, the event log, the page counts, the calibration settings, and the EIO card. Use the Service menu to restore the serial number and page counts. You will also need to reconfigure any computers that print to this printer to recognize the printer. Initialize NVRAM only when absolutely necessary. In most situations, use a Cold reset to reset printer variables but still retain the needed values in the Service menu.

Before initializing NVRAM, print a configuration page and a supplies status page to gather the following information:

- total page count and color page count
- transfer kit count
- fuser kit count
- serial number



To initialize NVRAM

- 1 Turn the printer on and watch the control panel display.
- 2 When the display begins showing the memory count, press and hold  until all three lights on the control panel are lit.
- 3 Press .
- 4 Press **PAUSE/RESUME**. The display should show `SKIP DISK LOAD`.
- 5 Press  until `NURAM INIT` is highlighted.
- 6 Press . The printer will initialize NVRAM and then continue its power-on sequence.

Hard disk initialization

A hard disk initialization will erase and reformat the printer's hard disk. Perform hard disk initialization only if an error code appears on the control panel indicating an EIO disk error. Always try initializing the hard disk before replacing it.





To initialize the hard disk

- 1 Turn the printer on.
- 2 As the printer performs its power-on sequence, press and hold the **PAUSE/RESUME** button until all three lights on the control panel are lit.
- 3 Press . The display should show INITIALIZE DISK.
- 4 Press . The printer will initialize the hard disk and continue its power-on sequence.

Calibration bypass








During certain diagnostic procedures, you will need to bypass the automatic calibration that is performed whenever the printer is turned on.

To bypass calibration

- 1 Turn the printer on and watch the control panel display.
- 2 When the display begins showing the memory count, press and hold  until all three lights on the control panel are lit.
- 3 Press .
- 4 Press **PAUSE/RESUME**. The display should show SKIP DISK LOAD.
- 5 Press  until SKIP CALIBRATION is highlighted.
- 6 Press . The printer will skip calibration and then continue its power-on sequence.

Calibrate Now





Use the following procedure to calibrate the printer whenever you replace the DC controller, the ETB, the drum drive motors, the drum drive gears, or a laser/scanner.

- 1 Press  to enter the MENUS.
- 2 Press  to highlight CONFIGURE DEVICE.
- 3 Press  to select CONFIGURE DEVICE.
- 4 Press  to highlight PRINT QUALITY.
- 5 Press  to select PRINT QUALITY.
- 6 Press  to highlight CALIBRATE NOW.
- 7 Press  to select CALIBRATE NOW.
- 8 Wait for the printer to calibrate.

Service menu

Accessing the Service menu

The Service menu is PIN protected for added security. Only authorized service people have access to the Service menu. When you select `SERVICE` from the list of menus, you are prompted to enter your 8-digit PIN number. The PIN for this printer is 04460002.

- 1 Press  or  until the first digit of the PIN is displayed.
- 2 Press  to save the digit. The display will replace the digit with an asterisk.
- 3 Repeat steps 1 and 2 until all eight digits are entered.
- 4 Press  at any time to move to the previous digit.

Clear event log

This item allows you to clear the printer's internal event log.

Total page count

The page count stored in NVRAM and printed on the configuration page represents the number of pages that the formatter has formatted (not including engine test prints). If you install a new formatter when repairing a printer, use this menu item to reset the page count to the previous value. In this way, the page count reflects the number of pages printed by the engine rather than starting over for the new formatter. The page count is broken into two categories: total mono pages and total color pages.

Transfer kit count

This item allows you to reset the transfer unit count if the value is lost, such as when you replace the formatter. This value is initially set to zero at the factory. Enter a value up to 120,000. This value is automatically reset to zero when a customer installs a new transfer kit and sets `NEW TRANSFER KIT` to `YES` in the Resets menu.

Fuser kit count

This item allows you to reset the fuser count if the value is lost, such as when you replace the formatter. This value is initially set to zero at the factory. Enter a value up to 150,000. This value is automatically reset to zero when a customer installs a new transfer kit and sets `NEW FUSER KIT` to `YES` in the Resets menu.

Serial number

If you replace the formatter, use this item to reset the serial number of the printer.

Service ID

This item allows the date that the printer was first used to be shown through the control panel, eliminating the need for customers to keep paper receipts for proof of warranty. Because the printer does not have an internal clock, the service ID date's availability is dependent on the printer being connected to a source that can provide the date, such as the installer, the driver, or the embedded Web server. In cases where the printer is not connected to a date source, the service ID will not be available, and the control panel will display 000000.

Restoring the Service ID

If you replace the formatter, the date is lost. Use this menu item to reset the date to the original date the printer was first used. The date format is YYDDD. Calculate the date as follows:

- 1 To calculate YY, subtract 1990 from the calendar year. For instance, if the printer was first used in 2002, calculate YY as follows: $2002 - 1990 = 12$. $YY = 12$.
- 2 To calculate DDD, use the following formula:
 $30(\text{calendar month} - 1) + \text{calendar day} = \text{DDD}$. If the calendar day is 31, use 30 instead.
For instance, if the printer was first used on October 17, calculate DDD as follows:
 - a. Subtract 1 from 10 (October is the tenth month of the year): $10 - 1 = 9$.
 - b. Multiply 9 by 30: $9 \times 30 = 270$.
 - c. Add 17 to 270: $270 + 17 = 287$. Thus, $DDD = 287$.

Converting the Service ID to an actual date

You can use the printer's Service ID number to determine whether the printer is still under warranty. Convert the Service ID into the installation date as follows:

- 1 Add 1990 to YY to get the actual year that the printer was installed.
- 2 Divide DDD by 30. If there is a remainder, add 1 to the result. This is the month.
- 3 The remainder from the calculation in step 2 is the date.

Using the Service ID 12287 as an example, the date conversion is as follows:

- 1 $12 + 1990 = 2002$, so the year is 2002.
- 2 $287 \text{ divided by } 30 = 9 \text{ with a remainder of } 17$. Since there is a remainder, add 1 to 9 to get 10, which represents October.
- 3 The remainder in step 2 is 17, so that is the date.
- 4 The complete date is 17-October-2002.

Note

A 6-day grace period is built into the date system.

Cold reset paper

When you perform a cold reset, the paper size stored in NVRAM is reset to the default factory setting. If you replace a formatter board in a country/region such as Europe that uses A4 as the standard paper size, use this menu to reset the default paper size to A4. LETTER and A4 are the only available values.