

hp color LaserJet 2200



i n v e n t

service



HP LaserJet 2200 Series Printer

Service Manual _____

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Part number: C4084-91077

First Edition, October 1999

Second Edition, September 2000

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Table of contents

List of figures

List of tables

1 Product information

Printer features	2
Identification	4
Specifications	5
Product overview	7
External assembly locations	7
Internal assembly locations	10
Safety information	11
Toner safety	11
Laser safety	12
LED safety	12
Regulatory information	12
FCC regulations	12
Declaration of conformity	12
Environmental Product Stewardship Program	13
Protecting the environment	13
Service approach	15
Bench repair warranty	15
HP Express Exchange	15
Ordering information	15
Supplemental documentation	16
HP direct ordering for genuine HP parts	16
Consumables	17
World Wide Web	17
HP service parts information compact disc	17
HP support assistant compact disc	17
Customer care reseller sales and service support	17
Technical assistance	18
Worldwide sales and service offices	18

2 Operating requirements

Site requirements	26
Operating environment	26
Printer space requirement	27
Media specifications	28
General media specifications	28
Guidelines for selecting paper	29
Media input options	30
Tray 1 media sizes	31
Tray 2 and tray 3 (250-sheet feeder)	32
Tray 3 (500-sheet feeder)	32
Envelope specifications	33
Label specifications	35
Transparency specifications	36
Storing print media	36
Shipping print media	37
Paper fillers	37
Testing media specifications	37

3 Printer configuration

Using the control panel	44
Control panel	44
Control panel LEDs	44
Job Cancel	44
Go	44
Printing a demo page	45
Self-test/configuration page	48
Self-test/configuration-page elements	49
JetDirect configuration page	50
JetDirect configuration-page elements	51
Continuous self-test	51
Engine test	52
Performing an engine test	52
Service mode	53
Entering service mode	53
Entering escape characters	53
Setting the page count	54
Setting the cold reset default	55
Resetting the printer	56
Cold reset	56
NVRAM initialization	56
EIO card reset	56
Network printing	57
Installing an HP JetDirect EIO card	57
IR printing	59
Fast Infrared Receiver	59
Using the FIR port	59

4 Printer maintenance

Service check points	62
Periodic inspection of parts	62
Cleaning the printer and accessories	63
General cleaning	63
Internal cleaning	64
Engine cleaning	66
Toner cartridge information	67
Storage	67
Handling instructions	67
Refilled toner cartridges	68
Recycling toner cartridges	68
Toner cartridge weights	68
Toner cartridge life expectancy	68
Saving toner with EconoMode	68
Redistributing the toner	69

5 Theory of operation

Basic operations	72
Power-on sequence	72
Basic print-period operating sequences	73
Printer timing	74
Printer functionality and operation	75
Formatter system	76
Formatter hardware	77
Formatter subsystem	77
Engine control system	79
Engine control subsystems	80
Image formation system	82
Pickup/feed system	89
Sheet feeder	91
Media detection	93
Media detection	93
Media size detection	93
Jam detection	94
Pickup sensors	94
Delivery sensors	94
Reversing sensors	95
Duplexer sensors	95
Paper feed sensor	95

6 Removal and replacement

Removal and replacement strategies	99
Required tools	99
Toner cartridge removal and replacement	100
Remove the toner cartridge	100
Cover and tray removal and replacement	101
Remove tray 3	101
Remove the cassette from tray 2	101
Remove I/O cover	102
Remove EIO card	102
Remove DIMM cover	103
Remove rear cover	104
Remove top cover	106
Remove left cover	109
Remove tray 1	110
Internal disassembly and assembly	113

Remove transfer roller	113
Remove DIMM	115
Remove formatter PCB	116
Remove EIO shield and guide	117
Remove fuser assembly.	118
Remove fuser-film heater assembly.	121
Remove pressure roller	123
Remove duplexer tray	124
Remove duplexer media guide	125
Remove power supply assembly	126
Remove upper output delivery roller	129
Disassemble the upper output delivery roller	130
Remove lower output delivery rollers	131
Remove laser/scanner assembly.	132
Remove transport belts and rollers	134
Remove ribbon cable harness	136
Remove duplexer reverse motor	137
Remove printer drive assembly	138
Remove engine controller assembly	139
Remove main motor.	140
Remove motor plate.	141
Remove printer drive assembly gears	143
Remove tray 1 pickup roller	144
Remove tray 1 pickup roller assembly	146
Remove tray 1 separation pad assembly.	149
Remove tray 1 paper-sensor lever.	150
Remove tray 1 solenoid	152
Remove tray 2 pickup roller assembly.	153
Replace tray 2 pickup roller	156
Remove tray 2 pickup roller and refeeder assembly	157
Remove tray 2 solenoid	160
Remove duplexer drive gears and solenoid.	161
Remove registration assembly.	162
Remove tray 3 assembly connector.	164
Remove cooling fan	165
Remove toner-cartridge guide	166
Remove dc bias voltage contacts (leaf springs).	168
Tray 3 disassembly and assembly	170
Remove tray 3 (250-sheet feeder) cassette.	170
Remove tray 3 (250-sheet feeder) pickup roller.	171
Remove tray 3 (250-sheet feeder) feeder drive assembly.	172
Remove tray 3 (250 sheet-feeder) drive solenoid	174
Remove tray 3 (500-sheet feeder) cassette.	175
Remove tray 3 (500-sheet feeder) pickup roller	176
Remove tray 3 (500-sheet feeder) feeder drive assembly	177
Remove tray 3 (500 sheet-feeder) drive solenoid	179

7 Troubleshooting

Troubleshooting process	182
Preliminary operating checks	182
Basic fault isolation	182
Troubleshooting process flow	184
Power-on	185
Troubleshooting with control-panel messages	186
Control panel LEDs	186
Control-panel LED messages	186
Media-handling problems	196
Print test pages	196
Engine test	196
Self-test/configuration page	196
Jam troubleshooting	197
Media problems	201
Evaluate the test pages	202
Status-log messages	202
Verify installed options	202
Image-formation troubleshooting	203
Image defect tables	205
Repetitive defect ruler	211
Half self-test functional check	212
Drum-rotation functional check	212
Media troubleshooting	213
Determine the problem source: print media or printer	213
Isolate a paper path	213
Isolate a media brand	214
Isolate a media type	215
Evaluate media use practices	219
Evaluate environmental conditions	219
Communication troubleshooting	221
Communications check	221
Test message	221
EIO troubleshooting	221
JetDirect configuration-page elements	223
JetDirect configuration	223
Reference diagrams	224

8 Parts and diagrams

Introduction	234
Ordering parts	234
Ordering consumables	234
Consumables, accessories, and supplies	235
Common fasteners and torque values	236
Illustrations and parts lists	238
External covers and panels	238
Top cover assembly	240
Internal components	242
Power supply assembly	252
Printer drive assembly	254
Cassette pickup assembly	256
Fusing assembly	258
PCB assembly location	260
250-sheet feeder external covers	262
Tray 2 and 250-sheet feeder cassette	264
250-sheet feeder internal components	266
250-sheet feeder drive assembly	268
250-sheet feeder PCB assembly location	270
500-sheet feeder external covers	272
500-sheet feeder cassette	274
500-sheet feeder internal components	276
500-sheet feeder drive assembly	278
500-sheet feeder PCB assembly location	280
Alphabetical parts list	282
Numerical parts list	291

Index

List of figures

Figure 1. Sample identification label	4
Figure 2. External assembly locations (1 of 5)	7
Figure 3. External assembly locations (2 of 5)	7
Figure 4. External assembly locations (3 of 5)	8
Figure 5. External assembly locations (4 of 5)	8
Figure 6. External assembly locations (5 of 5)	9
Figure 7. Internal assembly locations (1 of 2)	10
Figure 8. Internal assembly locations (2 of 2)	10
Figure 9. Top view	27
Figure 10. Side view	27
Figure 11. Media input trays (250-sheet feeder installed)	30
Figure 12. Media input trays (500-sheet feeder installed)	30
Figure 13. Double side seam	34
Figure 14. Long, short, and diagonal grain curl	40
Figure 15. Measuring curl	40
Figure 16. Control panel layout	44
Figure 17. Demo page (front)	45
Figure 18. Demo page (back)	46
Figure 19. Self-test/configuration page	48
Figure 20. JetDirect configuration page	50
Figure 21. Engine-test button	52
Figure 22. Power cord.	57
Figure 23. Interface cables.	57
Figure 24. HP JetDirect EIO card.	57
Figure 25. Network cable.	58
Figure 26. Interface cable door.	58
Figure 27. FIR port	59
Figure 28. Top cover	64
Figure 29. Remove toner cartridge	64
Figure 30. Wipe residue	65
Figure 31. Replace toner cartridge	65
Figure 32. Print sample	66
Figure 33. Redistributing the toner	69
Figure 34. Timing chart	74
Figure 35. Printer functionality divided into systems	75
Figure 36. Formatter system	76
Figure 37. Engine control system	79
Figure 38. Power supply PCB	81
Figure 39. Image formation system	82
Figure 40. Toner cartridge	83
Figure 41. Photosensitive drum	83
Figure 42. Cleaning stage	84
Figure 43. Primary charging roller	84
Figure 44. Laser/scanner system	85
Figure 45. Latent electrostatic image formation	86
Figure 46. Transferring the toner image on the drum	87

Figure 47. Fuser film and pressure roller	88
Figure 48. Pickup/feed system	90
Figure 49. Pickup feed paper-path	91
Figure 50. Pickup feed	92
Figure 51. Media detection sensors	93
Figure 52. Open the toner cartridge door	100
Figure 53. Remove the toner cartridge	100
Figure 54. Remove tray 3 (500-sheet feeder shown)	101
Figure 55. Remove cassette from tray 2	101
Figure 56. Remove the I/O Cover	102
Figure 57. Remove the EIO card	102
Figure 58. DIMM cover release button	103
Figure 59. Remove DIMM cover	103
Figure 60. Disengage the diverter locking pins	104
Figure 61. Rear cover mounting screws	104
Figure 62. Rear cover retaining tabs	105
Figure 63. Remove rear cover	105
Figure 64. Release door swing arm	106
Figure 65. Remove mounting screws	107
Figure 66. Remove mounting screws	107
Figure 67. Release top cover tabs (left tab shown)	108
Figure 68. Remove top cover	108
Figure 69. Release left cover latches	109
Figure 70. Disconnect tray 1 support springs	110
Figure 71. Disconnect tray 1 pivot arms	111
Figure 72. Remove tray 1 door	111
Figure 73. Disconnect pivot arms from tray 1 shelf	112
Figure 74. Remove pivot arms	112
Figure 75. Transfer roller black bushing	113
Figure 76. Removing the transfer roller	114
Figure 77. Remove the white bushing	114
Figure 78. Remove DIMM	115
Figure 79. Remove formatter PCB	116
Figure 80. Remove EIO shield	117
Figure 81. Fuser assembly (under the reverse cover guide)	118
Figure 82. Unplug wire harness connectors	119
Figure 83. Remove mounting screws	119
Figure 84. Remove fuser assembly	120
Figure 85. Unplug fuser-film heater assembly wire harness	121
Figure 86. Remove pressure plate screws	121
Figure 87. Remove pressure plate	122
Figure 88. Remove the fuser-film heater assembly	122
Figure 89. Remove pressure roller	123
Figure 90. Duplexer tray	124
Figure 91. Duplex media guide	125
Figure 92. Unplug wire harness	126
Figure 93. Remove power supply assembly screws	127
Figure 94. Expose the harness connectors assembly	127
Figure 95. Unplug harness connectors	128
Figure 96. Remove upper output roller	129
Figure 97. Remove gear and clips	130
Figure 98. Remove lower output delivery rollers	131
Figure 99. Unplug harness connectors	132
Figure 100. Remove the laser/scanner assembly mount screws	133
Figure 101. Remove the laser/scanner assembly	133
Figure 102. Remove transport roller assembly screw	134
Figure 103. Remove center roller	135
Figure 104. Transport rollers and belts installed	135
Figure 105. Unplug the ribbon cables	136

Figure 106. Remove duplexer reverse motor	137
Figure 107. Remove mounting and ground screws	138
Figure 108. Remove mounting screw (shown from threaded side)	139
Figure 109. Remove main motor	140
Figure 110. Remove motor plate	141
Figure 111. Motor plate retaining clip	142
Figure 112. Remove printer drive-assembly gears	143
Figure 113. Locate left idler roller release tab	144
Figure 114. Release roller	145
Figure 115. Release tray 1 separation roller	145
Figure 116. Remove tray 1 pickup-roller gear	146
Figure 117. Remove black bushing	147
Figure 118. Remove white bushing	147
Figure 119. Remove tray 1 pickup roller assembly	148
Figure 120. Remove tray 1 separation-pad assembly	149
Figure 121. Remove paper sensor	150
Figure 122. Remove the tray 1 paper-sensor lever	151
Figure 123. Remove tray 1 solenoid	152
Figure 124. Top down with infrared sensor port facing forward	153
Figure 125. Unlock and rotate the white bushing	153
Figure 126. Slide the bushing away from roller assembly	154
Figure 127. Remove black bushing	154
Figure 128. Remove the pickup roller assembly	155
Figure 129. Remove rollers	156
Figure 130. Replace rollers	156
Figure 131. Remove tray 2 pickup-roller gear and spring	157
Figure 132. Remove the duplex cover	158
Figure 133. Remove tray 2 pickup-roller and refeeder assembly	158
Figure 134. Remove tray 2 optic sensor and lever	159
Figure 135. Remove the tray 2 solenoid	160
Figure 136. Remove duplexer drive gears and solenoid	161
Figure 137. Remove registration-assembly drive gear	162
Figure 138. Registration assembly	163
Figure 139. Remove the tray 3 connector	164
Figure 140. Remove cooling fan	165
Figure 141. Release toner-cartridge guide pin	166
Figure 142. Remove toner-cartridge guide	167
Figure 143. Identify dc bias contacts	168
Figure 144. Release dc bias spring coil and spring arm	169
Figure 145. Spring loop	169
Figure 146. Remove tray 3 (250-sheet feeder)	170
Figure 147. Tray 3 (250-sheet feeder) roller	171
Figure 148. Remove tray 3 (250 sheet-feeder) drive cover	172
Figure 149. Remove tray 3 (250 sheet-feeder) drive assembly	173
Figure 150. Remove tray 3 (500-sheet feeder) cassette	175
Figure 151. Tray 3 (500-sheet feeder) pickup roller	176
Figure 152. Remove tray 3 (500 sheet-feeder) drive cover	177
Figure 153. Remove tray 3 (500 sheet-feeder) drive assembly	178
Figure 154. Troubleshooting process flow	184
Figure 155. Control panel layout	186
Figure 156. LED states	186
Figure 157. Engine test button	196
Figure 158. Frequency of jams process flow	198
Figure 159. Location of jams	199
Figure 160. Image defects examples	205
Figure 161. Repetitive defect ruler	211
Figure 162. Adhesive labels	216
Figure 163. Envelope sample	217
Figure 164. JetDirect configuration page	222

Figure 165. Timing diagram	224
Figure 166. Printer paper path, sensors, and signals	225
Figure 167. Tray 3 paper path, sensors, and signal lever	226
Figure 168. General printer-component locations (1 of 2)	227
Figure 169. General printer-component locations (2 of 2)	227
Figure 170. Motor, fan, and solenoid locations	228
Figure 171. 250-sheet and 500-sheet tray 3 component locations	228
Figure 172. Engine controller PCB	229
Figure 173. Power supply PCB	230
Figure 174. Location of connectors (1 of 3)	230
Figure 175. Location of connectors (2 of 3)	231
Figure 176. Location of connectors (3 of 3)	231
Figure 177. Printer external covers and panels	238
Figure 178. Top cover assembly	240
Figure 179. Internal components (1 of 5)	242
Figure 180. Internal components (2 of 5)	244
Figure 181. Internal components (3 of 5)	246
Figure 182. Internal components (4 of 5)	248
Figure 183. Internal components (5 of 5)	250
Figure 184. Power supply assembly	252
Figure 185. Printer drive assembly	254
Figure 186. Cassette pickup assembly	256
Figure 187. Fusing assembly	258
Figure 188. PCB assembly location	260
Figure 189. 250-sheet feeder external covers	262
Figure 190. Tray 2 and 250-sheet feeder cassette	264
Figure 191. 250-sheet feeder internal components	266
Figure 192. 250-sheet feeder drive assembly	268
Figure 193. 250-sheet feeder PCB assembly location	270
Figure 194. 500-sheet feeder external covers	272
Figure 195. 500-sheet feeder cassette	274
Figure 196. 500-sheet feeder internal components	276
Figure 197. 500-sheet feeder drive assembly	278
Figure 198. 500-sheet feeder PCB assembly location	280

List of tables

Table 1. Printer features for the HP LaserJet 2200 series printers	2
Table 2. Configuration comparison	5
Table 3. Physical specifications	5
Table 4. Electrical specifications	5
Table 5. Environmental specifications	6
Table 6. Noise-level specifications	6
Table 7. Supplemental documentation	16
Table 8. Worldwide offices	18
Table 9. Guidelines for selecting paper	29
Table 10. Tray 1 media sizes	31
Table 11. Tray 2 and tray 3 (250-sheet feeder) paper sizes	32
Table 12. Tray 3 (500-sheet feeder) paper sizes	32
Table 13. Automatic duplexer paper sizes	32
Table 14. Envelope specifications	33
Table 15. Label specifications	35
Table 16. Transparency specifications	36
Table 17. Determining basis weight of paper	37
Table 18. Paper weight equivalence	38
Table 19. Tools and suppliers	41
Table 20. Escape character table	53
Table 21. PJI service mode commands	54
Table 22. Setting the page count	54
Table 23. Setting the cold reset default	55
Table 24. Storing toner cartridges	67
Table 25. Print period descriptions	73
Table 26. Major steps for troubleshooting	183
Table 27. Primary status codes	187
Table 28. Continuable attention error codes	188
Table 29. Continuable attention error secondary codes	188
Table 30. Fatal error codes	191
Table 31. Fatal error secondary codes	192
Table 32. Accessory error codes	194
Table 33. Accessory errors secondary codes	194
Table 34. General jam troubleshooting questions	197
Table 35. Input jams	200
Table 36. Internal jams	200
Table 37. Duplex jams	201
Table 38. Output jams	201
Table 39. Image quality checks	203
Table 40. Image defects	206
Table 41. Consumables, accessories, and supplies	235
Table 42. Common fasteners	236
Table 43. Common torque values	236
Table 44. Printer external covers and panels	239
Table 45. Top cover assembly	241
Table 46. Internal components (1 of 5)	243

Table 47. Internal components (2 of 5)	245
Table 48. Internal components (3 of 5)	247
Table 49. Internal components (4 of 5)	249
Table 50. Internal components (5 of 5)	251
Table 51. Power supply assembly	253
Table 52. Printer drive assembly	255
Table 53. Cassette pickup assembly	257
Table 54. Fusing assembly	259
Table 55. PCB assembly location	261
Table 56. 250-sheet feeder external covers	263
Table 57. Tray 2 and 250-sheet feeder cassette	265
Table 58. 250-sheet feeder internal components	267
Table 59. 250-sheet feeder drive assembly	269
Table 60. 250-sheet feeder PCB assembly location	271
Table 61. 500-sheet feeder external covers	273
Table 62. 500-sheet feeder cassette	275
Table 63. 500-sheet feeder internal components	277
Table 64. 500-sheet feeder drive assembly	279
Table 65. 500-sheet feeder PCB assembly location	281
Table 66. Alphabetical parts list	282
Table 67. Numerical parts list	291

1

Product information

Chapter contents

Printer features	2
Identification	4
Specifications	5
Product overview	7
External assembly locations	7
Internal assembly locations.	10
Safety information	11
Toner safety	11
Laser safety	12
LED safety	12
Regulatory information	12
FCC regulations	12
Declaration of conformity	12
Environmental Product Stewardship Program.	13
Protecting the environment.	13
Service approach	15
Bench repair warranty.	15
HP Express Exchange	15
Ordering information.	15
Supplemental documentation	16
HP direct ordering for genuine HP parts.	16
Consumables	17
World Wide Web.	17
HP service parts information compact disc.	17
HP support assistant compact disc.	17
Customer care reseller sales and service support	17
Technical assistance	18
Worldwide sales and service offices.	18

Printer features

Table 1. Printer features for the HP LaserJet 2200 series printers

Speed	<ul style="list-style-type: none"> • 19 pages per minute (ppm) for letter-size print media, and 18 ppm for A4-size media (with 133 MHz Motorola Coldfire V4® microprocessor). • Instant-on fuser provides first page out in less than 15 seconds from warm or cold start (simplex) and less than 26 seconds using duplex.
Resolution	<ul style="list-style-type: none"> • HP FastRes 1200 (1200-dpi like quality at up to 19 ppm letter and 18 ppm A4). • HP ProRes 1200 (true 1200 by 1200 dpi text and graphics). • Adjustable line screen settings of 141 to 180 lines per inch to optimize print quality.
Toner	<ul style="list-style-type: none"> • HP UltraPrecise toner cartridge. Capacity rated at average 5,000 pages with 5 percent coverage. • EconoMode capability (saves up to 50 percent of toner at 600 dpi).
Flexible media handling	<p>HP LaserJet 2200d and 2200dn printers:</p> <ul style="list-style-type: none"> • Tray 1 is a 100-sheet or 10-envelope multipurpose tray for automatic and manual feeding of letterhead, envelopes, labels, transparencies, custom-sized media, postcards, and heavy paper (3 by 5 inch to legal size). • Tray 2 is a 250-sheet tray that supports letter, A4, executive, legal, B5 (ISO), B5 (JIS), A5, and 8.5 by 13 inch print media. • Standard output capacity of 75 sheets (face down). • Two output bins: select either the top output bin or the rear output bin for the most convenient output location. • Straight-through paper path capability from tray 1 to the rear output bin. • Paper input level indicators. • Printing on both sides of paper, or duplex printing, is a standard feature of the printer, with the duplexer integrated into the paper path.
Flexible media handling, continued	<p>HP LaserJet 2200dt and 2200dtn printer:</p> <ul style="list-style-type: none"> • Tray 1 is a 100-sheet or 10-envelope multipurpose tray for automatic and manual feeding of letterhead, envelopes, labels, transparencies, custom-sized media, postcards, and heavy paper (3 by 5 inch to legal size). • Tray 2 is a 250-sheet tray that supports letter, A4, executive, legal, B5 (ISO), B5 (JIS), A5, and 8.5 by 13 inch print media. • For the HP LaserJet 2200dt, tray 3 is a 250-sheet tray that supports letter, A4, executive, legal, B5 (ISO), B5 (JIS), A5, and 8.5 by 13 inch print media. • For the HP LaserJet 2200dtn, tray 3 is a 500-sheet tray that supports letter and A4-size paper. • Standard output capacity of 150 sheets in the top output bin and 100 sheets in the rear output bin. • Two output bins: select either the top output bin or the rear output bin for the most convenient output location. • Straight-through paper path capability from tray 1 to the rear output bin. • Paper input level indicators. • Printing on both sides of paper, or duplex printing, is a standard feature of the printer, with the duplexer integrated into the paper path.
Expandability	<ul style="list-style-type: none"> • All models accept tray 3, a 250-sheet or 500-sheet feeder to hold additional print media. • Enhanced input/output (EIO) cards. • Dual inline memory module (DIMM) slots for adding memory and fonts.

Table 1. Printer features for the HP LaserJet 2200 series printers (continued)

PCL printer language and fonts	<ul style="list-style-type: none">● Fast printing performance, built-in Intellifont and TrueType™ scaling technologies, built-in HP-GL/2 vector graphics, and advanced imaging capabilities are benefits of the PCL 6 printer language. PCL 6 also includes 45 scalable TrueType fonts and one bitmapped Line Printer Font.
PS language and fonts	<ul style="list-style-type: none">● PostScript® (PS) Level 2 emulation with 35 built-in PS language fonts included.
Automatic language switching	<ul style="list-style-type: none">● The printer automatically determines and switches to the appropriate language for the print job.
Wireless printing	<ul style="list-style-type: none">● The printer supports wireless printing from an IrDA-compliant device, such as a notebook computer, camera, cell phone, or a personal digital assistant (PDA).● IrReady 2000.
Interface connection	<ul style="list-style-type: none">● Bidirectional ECP type-B parallel port (IEEE-1284 compliant).● Universal serial bus (USB) port.● EIO slot.● Wireless Fast Infrared port (IrDA compliant).
Networking	<ul style="list-style-type: none">● The printer provides an EIO slot for HP JetDirect EIO print servers for fast and easy connectivity. HP 610N JetDirect print server included with HP LaserJet 2200dn and 2200dtn.
Enhanced memory and memory expansion	<ul style="list-style-type: none">● The HP LaserJet 2200 series printers come with 8 MB of memory and can be expanded to 72 MB with the two available memory (DIMM) slots.
Energy savings	<ul style="list-style-type: none">● The printer automatically conserves electricity by substantially reducing power consumption when not printing.● As an ENERGY STAR® partner, Hewlett-Packard Company has determined that this product meets ENERGY STAR® guidelines for energy efficiency.
Economical printing	<ul style="list-style-type: none">● N-up printing and two-sided printing with the built-in duplexer conserves print media.● EconoMode conserves toner.● For tips to reduce the amount of print media used or extend the life of the toner cartridge see the user guide.
Duty cycle	<ul style="list-style-type: none">● 40,000 pages per month average.

Identification

The model number and printer serial number are listed on an identification label located on the rear output bin. The model number is alphanumeric, such as C7058A for the HP LaserJet 2200 printer.

The serial number contains information about the country of origin, the revision level, the production code, and canon serial number of the printer. An example of a serial number is USBBX12345.

The top label also contains power rating and regulatory information. See figure 1.

Note The power rating and regulatory information vary by region.

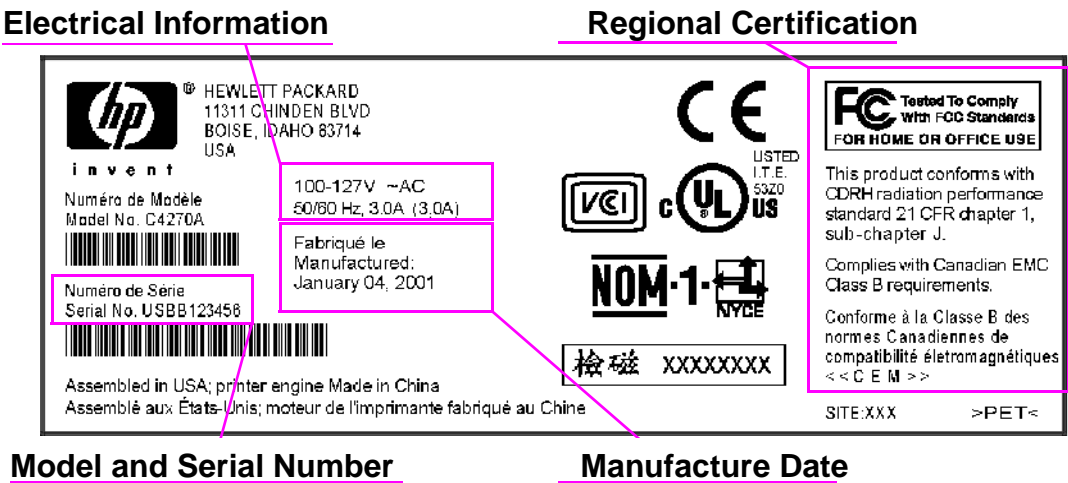


Figure 1. Sample identification label

Specifications

Table 2. Configuration comparison

	HP LaserJet 2200d	HP LaserJet 2200dn	HP LaserJet 2200dt	HP LaserJet 2200dtn
Standard memory	8 MB	8 MB	8 MB	16 MB
Maximum memory	72 MB	72 MB	72 MB	72 MB
PS Level 2 emulation	Standard	Standard	Standard	Standard
JetDirect 610N print server	Optional	Standard	Optional	Standard
Duplex printing	Standard	Standard	Standard	Standard
250-sheet feeder *	Optional	Optional	Standard	Optional
500-sheet feeder *	Optional	Optional	Optional	Standard

Note

* A 250-sheet feeder and 500-sheet feeder can not be installed at the same time.

Table 3. Physical specifications

	HP LaserJet 2200d/ 2200dn	HP LaserJet 2200dt	HP LaserJet 2200dtn
Height	259.2 mm (10.25 in)	361.7 mm (14.24 in)	396.7 mm (15.62 in)
Width	417.9 mm (16.45 in)	417.9 mm (16.45 in)	417.9 mm (16.45 in)
Depth	434.6 mm (17.11 in)	434.6 mm (17.11 in)	434.6 mm (17.11 in)
Weight (with toner cartridge)	12.8 kg (28.219 lb)	15.8 kg (34.833 lb)	17.4 kg (38.360 lb)

Table 4. Electrical specifications

Volts	Frequency	Amperes (A)	Watts (W) (typical)
100-127 Vac \pm 10 percent	50/60 Hz \pm 3 Hz	Minimum recommended current capacity = 5 amps	printing = 400 W standby = 12 W PowerSave on = 12 W off = 0 W (EPA ENERGY STAR®)
220-240 Vac \pm 10 percent	50/60 Hz \pm 3 Hz	Minimum recommended current capacity = 2.5 amps	printing = 400 W standby = 12 W PowerSave on = 12 W off = 0 W (EPA ENERGY STAR®)

WARNING!

Power requirements are based on the region where the printer is sold. Do not convert operating voltages. This can damage the printer and void the product warranty.

The following environmental specifications must be maintained to ensure the correct operation of the printer. Consider the following points before installing the printer:

- Place the printer on a sturdy, level surface.
- Allow adequate space around the printer for unimpeded operation.
- Install the printer in a well-ventilated room.
- Prevent exposure to direct sunlight or chemicals, including ammonia-based cleaning solutions.
- Ensure that an adequate power supply is used.
- Install the printer in a stable environment that experiences no abrupt temperature or humidity changes.

Table 5. Environmental specifications

	Operating/printing	Storage/standby
Temperature (printer and toner cartridge)	10 degrees to 32.5 degrees C (50 degrees to 90.5 degrees F)	-20 degrees to 40 degrees C (-4 degrees to 104 degrees F)
Relative humidity	20 percent to 80 percent	10 percent to 90 percent

Table 6. Noise-level specifications

	Operator position	Bystander (1m)	Sound power
Printing at 18 ppm	L _{pAm} 58 db(A)	L _{pAm} 51 db(A)	L _{WAd} 6.5 db(A)
Powersave	L _{pAm} inaudible	L _{pAm} inaudible	L _{WAd} inaudible

Note

Testing per International Standards Organization (ISO) 9296

Product overview

External assembly locations

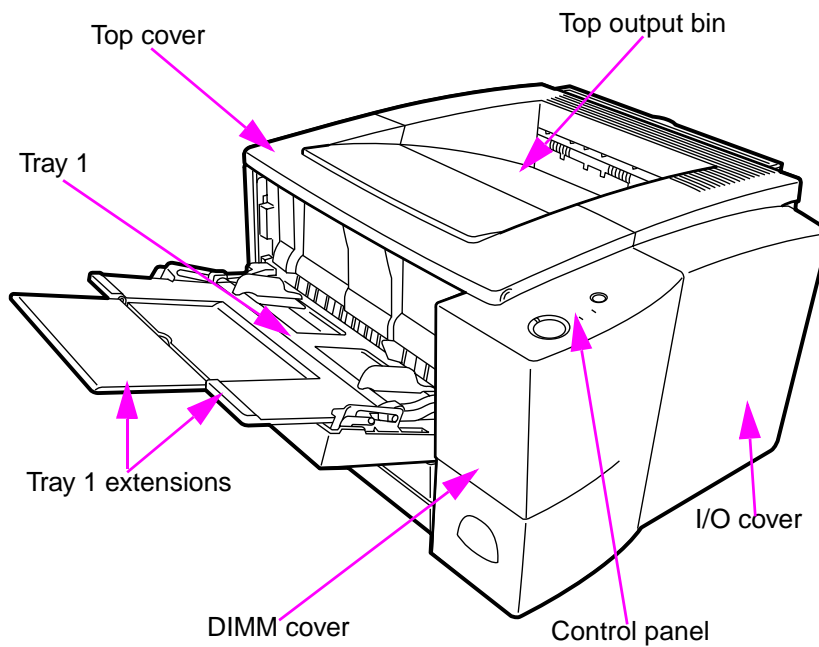


Figure 2. External assembly locations (1 of 5)

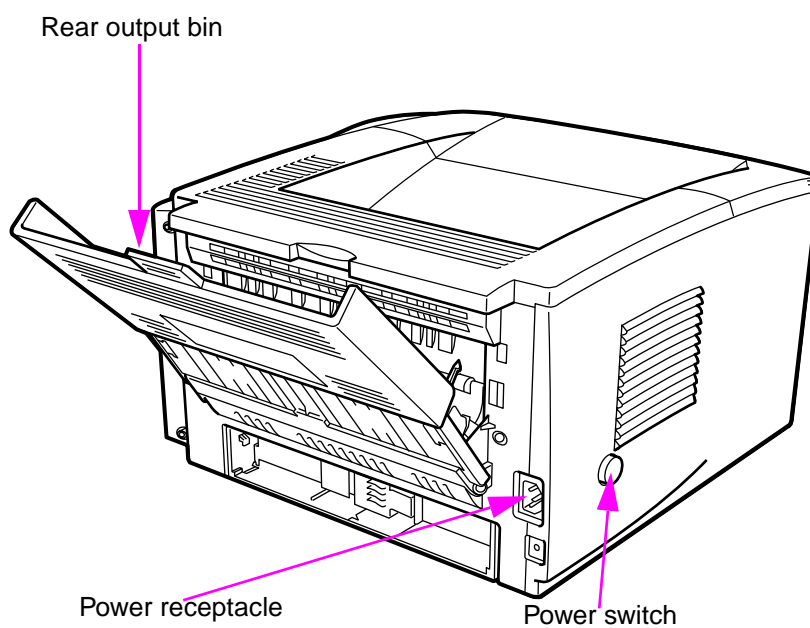


Figure 3. External assembly locations (2 of 5)

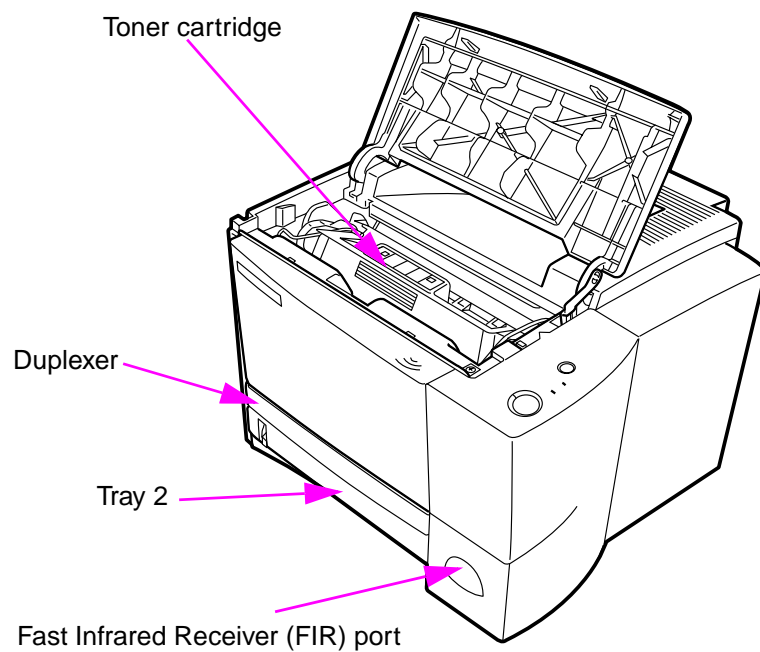


Figure 4. External assembly locations (3 of 5)

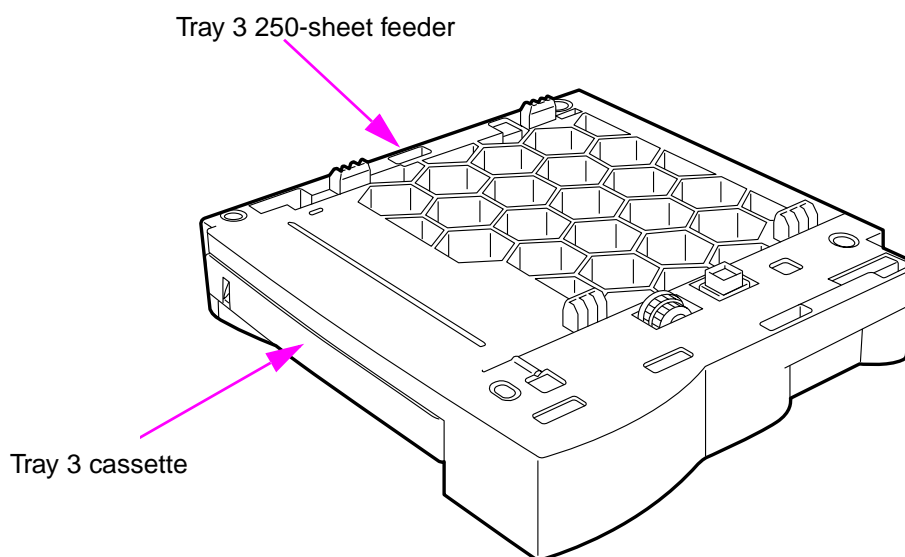


Figure 5. External assembly locations (4 of 5)

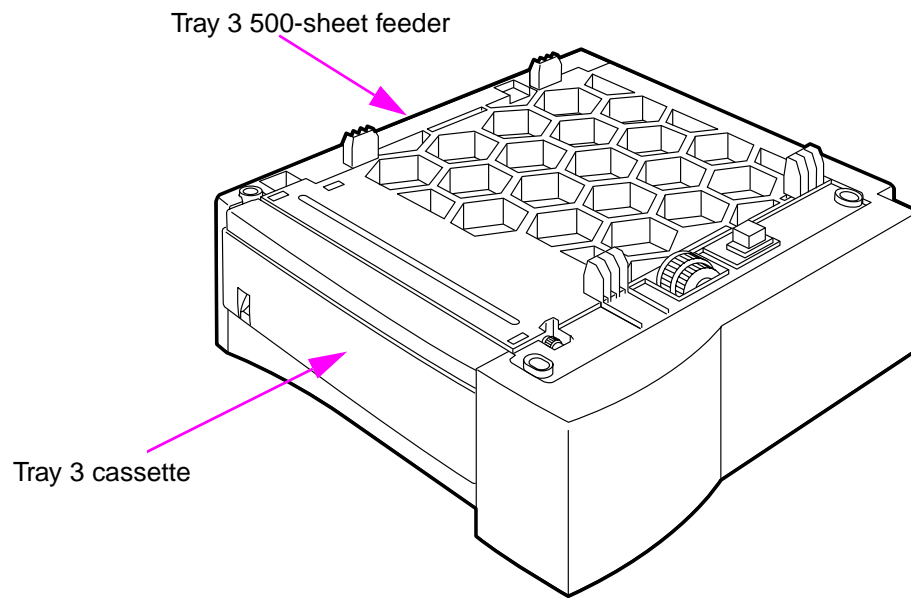


Figure 6. External assembly locations (5 of 5)

Internal assembly locations

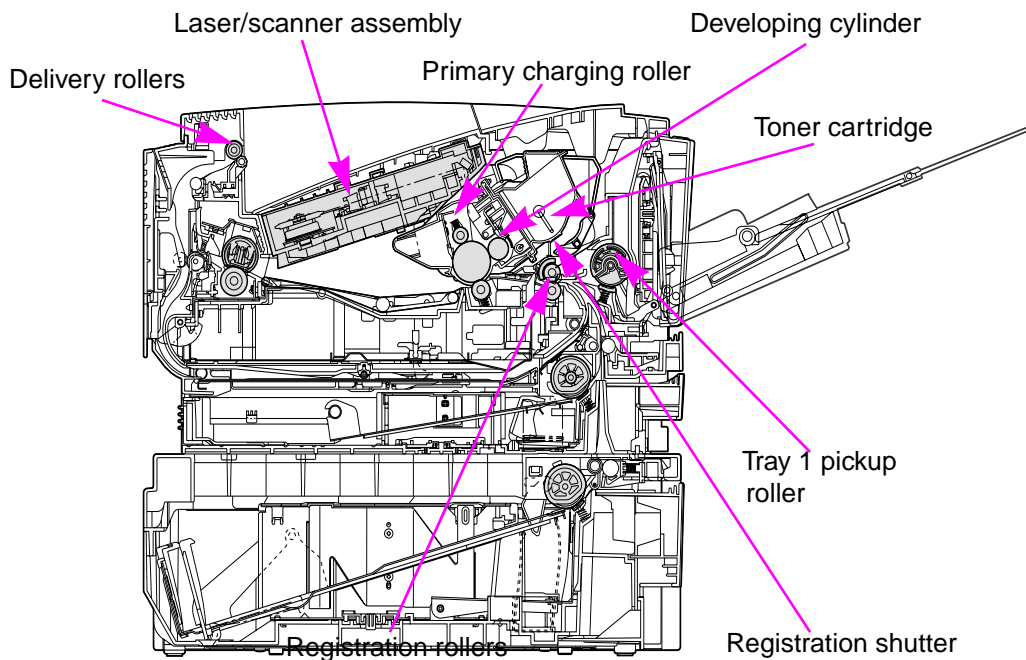


Figure 7. Internal assembly locations (1 of 2)

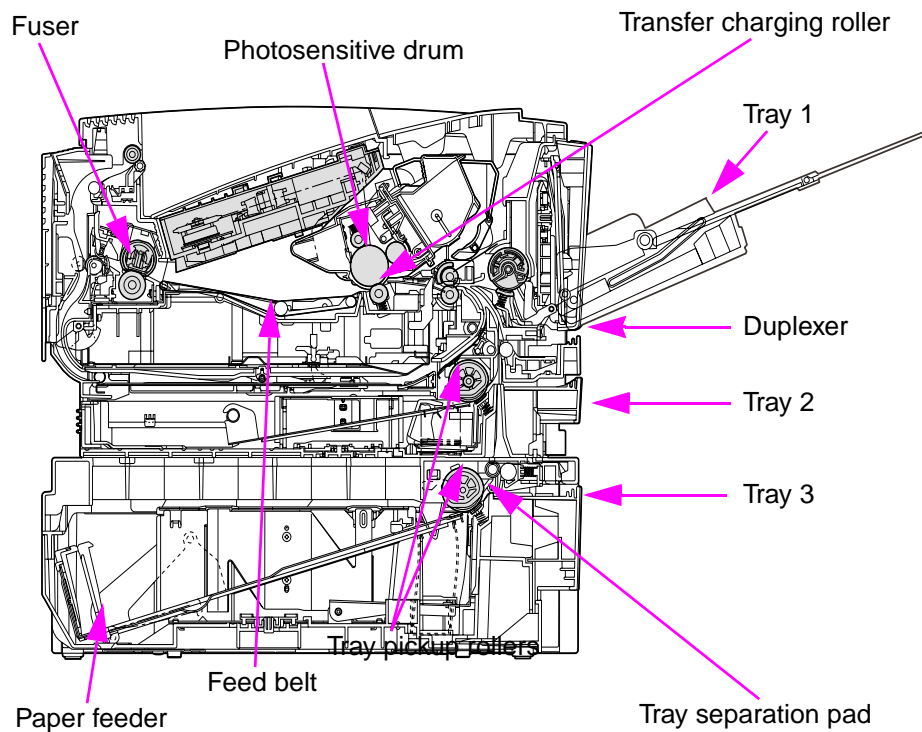


Figure 8. Internal assembly locations (2 of 2)

Safety information

Toner safety

Handling and storage

WARNING!

Keep toner cartridges and toner particles away from excessive heat, sparks, and open flames.

If toner is spilled, avoid breathing in toner particles. Inhalation of toner particles causes respiratory tract irritation. Vacuum or sweep the material into a bag or other sealed container. A vacuum specifically designed for cleaning toner can be used if it is capable of filtering fine particles (5 microns in diameter).

WARNING!

Do not vacuum toner using a conventional vacuum. Toner particles used in this product might be too fine for effective vacuuming and could result in damage to a conventional vacuum.

Dispose of waste toner in accordance with local requirements. Do not discharge toner particles in drains.

First aid measures

- **Ingestion.** If toner is ingested, rinse mouth out thoroughly with water and drink several glasses of water. Get medical attention if symptoms persist.
- **Inhalation.** If toner particles are inhaled, move to fresh air immediately. If symptoms occur, consult a physician.
- **Eye contact.** If toner comes in contact with the eyes, immediately flush with plenty of water for at least 15 minutes. If irritation persists, consult a physician.
- **Skin contact.** If toner spills on skin, remove as much toner as possible with a dry tissue, and then wash with cold water.

Clothing contact

Note

Toner can stain clothing. Hot water or heat (from a clothes dryer) can cause toner to melt and permanently fuse to clothing.

Clothing is best cleaned by removing as much toner as possible with a dry tissue, and then washing with cold water. Air-dry clothing.

Additional information

The Toner Cartridge/Drum Material Safety Data Sheet (MSDS) can be obtained by contacting HP at the following website:

<http://www.hp.com/go/msds>

Laser safety

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration has implemented regulations for laser products manufactured since August 1, 1976. Compliance is mandatory for products marketed in the United States. The printer is certified as a Class 1 laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968.

Because radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape during any phase of normal user operation.

WARNING!

Using controls, making adjustments, bypassing safety switches, or performing procedures other than those specified in this service manual can result in exposure to hazardous radiation.

LED safety

The infrared port on the control panel of this printer is classified as a Class 1 LED (light emitting diode) device according to International Standard IEC 60825-1 (EN 60825-1). This device is not considered harmful, but the following precautions are recommended.

- Avoid direct eye exposure to the infrared LED beam.
- Be aware that the beam is invisible light and cannot be seen.
- Do not attempt to view the infrared LED beam with any type of optical device.

Regulatory information

For regulatory information and requirements, please see the user guide.

FCC regulations

For FCC regulations, please see the user guide.

Declaration of conformity

For declaration of conformity information, please see the user guide.

Environmental Product Stewardship Program

Protecting the environment

Hewlett-Packard Company is committed to providing quality products in an environmentally sound manner. This product has been designed with several attributes to minimize impacts on our environment.

Ozone production

This product generates no appreciable ozone gas (O₃).

Energy consumption

Energy usage drops significantly while the printer is in PowerSave mode, which saves natural resources and saves money without affecting the performance of the printer. This product qualifies for ENERGY STAR® is a voluntary program established to encourage the development of energy-efficient office products.



ENERGY STAR® is a U.S. registered service mark of the United States Environmental Protection Agency. As an ENERGY STAR® partner, Hewlett-Packard Company has determined that this product meets the ENERGY STAR® guidelines for energy efficiency. For more information, see

<http://www.epa.gov/energystar/>

Toner consumption

EconoMode uses significantly less toner, which might extend the working life of the toner cartridge.

Paper use

This product's duplex feature (two-sided printing) and N-up printing capability (multiple pages printed on one sheet of paper) can reduce paper usage and the resulting demands on natural resources.

Plastics

Plastic parts more than 25 grams in weight are marked according to international standards that enhance the ability to identify plastics for recycling purposes at the end of the product's life.

HP LaserJet printing supplies

In many countries, this product's printing supplies (for example: toner cartridge, drum, fuser) can be returned to HP through the HP Printing Supplies Returns and Recycling Program. An easy-to-use takeback program is available in more than 25 countries. Multilingual program information and instruction are included in every new HP LaserJet toner cartridge and consumables package.

HP Printing Supplies Environmental Program information

Since 1990, the HP Printing Supplies Returns and Recycling Program has collected more than 39 million used LaserJet toner cartridges that otherwise might have been discarded in the world's landfills. The HP LaserJet toner cartridges and consumables go to a collection center and are bulk-shipped to our resource and recovery partners who disassemble the cartridge's for recycling. After a thorough quality inspection, selected parts are reclaimed for use in new cartridges. Remaining materials are separated and converted into raw materials for use by other industries to make a variety of useful products.

US returns

For a more environmentally responsible return of used cartridges and consumables, HP encourages the use of bulk returns. Simply bundle two or more cartridges together and use the single, pre-paid, pre-addressed UPS label that is supplied in the package. For more information in the United States, call (1) (800) 340-2445 or visit the HP LaserJet Supplies website at

<http://www.ljsupplies.com/planetpartners/>.

Outside the US returns

Outside the US customers should call the local HP sales and service office for further information regarding availability of the HP Supplies Returns and Recycling Program.

Paper

This printer is suited for the use of recycled papers when the paper meets the guidelines outlined in the *HP LaserJet Printer Family Print Media Guide*. Also, this printer is suitable for the use of recycled paper according to DIN 19309.

Material safety data sheet

Material Safety Data Sheets (MSDS) can be obtained by contacting the HP LaserJet Supplies website at <http://www.hp.com/go.msds>. In the United States, if you do not have access to the internet, call the U.S. HP FIRST (fax on demand service) at (1) (800) 231-9300. Use index number seven for a listing of the material safety data sheets. Outside the US, see "Worldwide offices" in table 8 for appropriate phone numbers and information.

Service approach

Bench repair warranty

The warranty for this product is “return to bench” for a period of one year from the date of purchase. This means that customers needing warranty repair must return their printer to an HP repair center or an Authorized Service Provider (ASP). See “Customer care reseller sales and service support” on page 17.

HP Express Exchange

Through Customer Care Centers In the United States and Canada, customers have an option to initiate Express Exchange. Under this option, customers can have a factory-refurbished printer sent to them within 24 hours.

- 1 The customer contacts the local HP Customer Care Center listed in the product documentation. A technician troubleshoots the situation and determines whether the printer has actually failed. If so, the technician refers the customer to the HP Service Center.
- 2 A representative from the service center requests product and customer information. In some regions, collateral might also be requested.
- 3 Hewlett-Packard Company ships a refurbished replacement unit to arrive the next day. (Geographic distance might prevent next-day shipping.)
- 4 The customer sends the defective printer to Hewlett-Packard at HP's expense.

Customers with onsite support service provided by HP should work directly with the local Customer Care Center instead of following the steps outlined here.

Exchanged units carry the remainder of the original unit's warranty or a 90-day warranty, whichever is greater. The faster turnaround from HP Express Exchange minimizes downtime over traditional service programs that require the user to ship the failed unit to the manufacturer and then wait for it to be repaired and returned. Because HP pays the shipping charges, the user incurs no hidden costs for the service.

Note

For warranty information and requirements, please see the user guide.

Ordering information

"Ordering parts" in chapter 8 of this manual contains factory replaceable unit (FRU) and accessory part numbers. Replacement parts can be ordered from the HP Customer Services and Support Organization.

Use only accessories specifically designed for this printer. Order accessories from an authorized service or support provider. See “HP direct ordering for genuine HP parts” on page 16.

Note

See page “Worldwide sales and service offices” on page 18 for a local HP office in the appropriate region.

Supplemental documentation

Table 7. Supplemental documentation

Document	Description	Part number
<i>HP LaserJet printer family print media guide</i>	A guide to using paper and other print media with HP LaserJet printers.	5963-7863
<i>LaserJet user guide</i>	A printed copy of the user guide	English C7058-90915 Arabic C7058-90911 Czech C7058-90912 Danish C7058-90913 Dutch C7058-90914 Finnish C7058-90916 French C7058-90917 German C7058-90918 Greek C7058-90919 Hebrew C7058-90920 Hungarian C7058-90921 Italian C7058-90922 Korean C7058-90923 Norwegian C7058-90924 Portuguese Brazilian C7058-90925 Polish C7058-90926 Russian C7058-90927 Simplified Chinese C7058-90928 Slovak C7058-90929 Spanish Castilian C7058-90930 Swedish C7058-90931 Traditional Chinese C7058-90932 Thai C7058-90933 Turkish C7058-90934
<i>HP LaserJet 2200 getting started guide</i>	A printed copy of the getting started guide	C7058-00901 (English version)
<i>HP LaserJet 2200 user CD-ROM</i>	English, German, Dutch, French, Spanish, Italian, Portuguese Brazilian, Finnish, Swedish, Norwegian, Danish, Arabic	C7058-60106
<i>HP LaserJet 2200 user CD-ROM</i>	English, Turkish, Russian, Hungarian, Polish, Czech, Hebrew, Greek, Slovak	C7058-60108
<i>HP LaserJet 2200 user CD-ROM</i>	English, Thai, Korean, Simplified Chinese, Traditional Chinese	C7058-60107
<i>HP LaserJet 2200 service and support CD-ROM</i>	English	C7058-60105

HP direct ordering for genuine HP parts

- Customer Services and Support Organization (CSSO)
(1) (800) 227-8164 (U.S. only)
- CSSO (in Europe only)
(49 7031) 142253

Consumables

Paper and toner cartridges can be ordered directly from Hewlett-Packard. See “HP direct ordering for genuine HP parts” on page 16.

World Wide Web

Printer drivers, updated HP printer software, and product and support information can be obtained from the following URL:

in the U.S. <http://www.hp.com/support/lj2200>

Printer drivers can be obtained from the following sites:

- China, <ftp://www.hp.com.cn/support/lj2200>
- Japan, <ftp://www.jpn.hp.com/support/lj2200>
- Korea, <http://www.hp.co.kr/support/lj2200>
- Taiwan, <http://www.hp.com.tw/support/lj2200>
or the local driver website, <http://www.dds.com.tw>

HP service parts information compact disc

This powerful, CD-ROM-based parts information tool is designed to give users fast, easy access to parts information such as pricing and recommended stocking lists for a wide range of HP products. To subscribe to this quarterly service in the U.S. or Canada, call (1) (800) 336-5987. In Asia Pacific, call (65) 740-4484. Parts identification and pricing information can also be found on the World Wide Web at: <http://www.hp.com/go/partsinfo>

HP support assistant compact disc

This support tool offers a comprehensive online information system designed to provide technical and product information about Hewlett-Packard products. To subscribe to this quarterly service in the U.S. or Canada, call (1) (800) 457-1762. In Hong Kong, Indonesia, Malaysia, or Singapore, call Mentor Media at (65) 740-4477.

Customer care reseller sales and service support

The customer care reseller sales and service support center is available to assist resellers and service technicians. You can reach this support center in the U.S. or Canada at (1) (800) 544-9976.

HP authorized resellers and support

To locate authorized HP resellers and support, call (1) (800) 243-9816 in the U.S. or (1) (800) 387-3867 in Canada.

HP service agreements

Call (1) (800) 743-8305 in the U.S. or (1) (800) 268-1221 in Canada.

Other areas

Outside of North America and Europe, contact your local HP sales office for assistance in obtaining technical support for resellers and service technicians. See “Technical assistance” on page 18.

Worldwide sales and service offices

Note

Before calling an HP sales and service office, be sure to contact the appropriate HP Customer Care Center. Products should not be returned to these offices. Product return information is also available through the appropriate HP Customer Care Center.

Table 8. Worldwide offices

Argentina	Hewlett-Packard Argentina S.A. Montañeses 2140/50/60 1428 Buenos Aires Phone: (54 11) 4787-7100 Fax: (54 11) 4787-7213
Australia	Hewlett-Packard Australia Ltd. 31-41 Joseph Street Blackburn, VIC 3130 Phone: (61) (3) 272-2895 Fax: (61) (3) 898-7831 Hardware Repair Center: Phone: (61) (3) 272-8000 Extended Warranty Support: Phone: (61) (3) 272-2577 Customer Information Center: Phone: (61) (3) 272-8000
Austria	Hewlett-Packard GmbH Lieblgasse 1 A-1222 Vienna Phone: (43) (1) 25000-555 Fax: (43) (1) 25000-500
Belgium	Hewlett-Packard Belgium S.A. NV Boulevard de la Woluwe-Woluwedale 100-102 B-1200 Brussels Phone: (32) (2) 778-31-11 Fax: (32) (2) 763-06-13
Brazil	Hewlett-Packard Brazil SA R. Aruana 125 Tambore - Barueri - SP 06460-010 Phone: (0xx11) 829-6612 Fax: (0xx11) 829-0018
Bulgaria	Hewlett-Packard Bulgaria EOD Vaptzarov Blvd., 1407 Sofia Phone: (35) (9) 296-019 40 Fax: (35) (9) 296-019 88

Table 8. Worldwide offices (continued)

Canada	<p>Hewlett-Packard (Canada) Ltd. 17500 Trans Canada Highway South Service Road Kirkland, Québec H9J 2X8 Phone: (1) (514) 697-4232 Fax: (1) (514) 697-6941</p> <p>Hewlett-Packard (Canada) Ltd. 5150 Spectrum Way Mississauga, Ontario L4W 5G1 Phone: (1) (905) 206-4725 Fax: (1) (905) 206-4739</p>
Chile	<p>Hewlett-Packard de Chile Avenida Andres Bello 2777 of. 1 Los Condes Santiago, Chile</p>
China	<p>China Hewlett-Packard Co. Ltd. 9/F, HP Building No.2 Dong San Huan Nan Lu Chao Yang District Beijing 100022, P.R. China Phone: 86-10-6564-3888 Fax: 86-10-6566-8280</p>
Colombia	<p>Hewlett-Packard Colombia Calle 100 No. 8A -55 Torre C Oficina 309 Bogotá, Colombia</p>
Croatia	<p>Hewlett-Packard Trading S.A. Cibona Business Tower TRG Drazena Petrovica 3/13 10000 Zagreb Phone: (385) (1) 488-1000 Fax: (385) (1) 488801010</p>
Czech Republic	<p>Hewlett-Packard s. r. o. Vyskocilova 1/1410 CZ-140-21 Praha Czech Republic Phone: (420) (2) 613-07111 Fax: (420) (2) 61307 613</p>
Denmark	<p>Hewlett-Packard A/S Kongevejen 25 DK-3460 Birkerød Denmark Phone: (45)3929 4099 Fax: (45) 4281-5810</p>
Far East Region	<p>Hewlett-Packard Asia Pacific Ltd. 17-21/F Shell Tower, Times Square 1 Matheson Street, Causeway Bay Hong Kong Phone: (852) 2599-7777 Fax: (852) 2506-9261 Hardware Repair Center: Phone: (852) 2599-7000 Extended Warranty Support: Phone: (852) 2599-7000 Customer Information Center: Phone: (852) 2599-7066</p>

Table 8. Worldwide offices (continued)

Finland	Hewlett-Packard Oy Piispankalliontie 17 FIN-02200 Espoo Phone: (358) (9) 887-21 Fax: (358) (9) 887-2477
France	Hewlett-Packard France 42 Quai du Point du Jour F-92659 Boulogne Cedex Phone: (33) (146) 10-1700 Fax: (33) (146) 10-1705
Germany	Hewlett-Packard GmbH Herrenberger Straße 130 71034 Böblingen Phone: (49) (180) 532-6222 (49) (180) 525-8143 Fax: (49) (180) 531-6122
Greece	Hewlett-Packard Hellas 62, Kifissias Avenue Polis Center Maroussi 151 24 Athens Phone: (30) (1) 619-6411 Fax: (30) (1) 619-6512
Hungary	Hewlett-Packard Magyarország Kft. Info Park Neumann Janos u.1 H-1111 Budapest Phone: (36) (1) 382-6666 Fax: (36) (1) 382-6667 Hardware Repair Center: Phone: (36) (1) 343-0312 Customer Information Center: Phone: (36) (1) 343-0310
India	Hewlett-Packard India Ltd. Paharpur Business Centre 21 Nehru Place New Delhi 110 019 Phone: (91) (11) 647-2311 Fax: (91) (11) 646-1117 Hardware Repair Center and Extended Warranty Support: Phone: (91) (11) 642-5073 (91) (11) 682-6042
Israel	Hewlett-Packard Israel 11 Hashlosa St. Tel-Aviv 67060 Phone: 972 3 5380300 Fax: 972 3 5380351
Italy	Hewlett-Packard Italiana SpA Via Giuseppe di Vittorio, 9 I-20063 Cernusco Sul Naviglio (Milano) Phone: (39) (2) 921-21 Fax: (39) (2) 921-04473

Table 8. Worldwide offices (continued)

Japan	Hewlett-Packard Japan, Ltd. 3-29-21 Takaido-higashi Suginami-ku, Tokyo 168 Phone: (81) (3) 3335-8333 Fax: (81) (3) 3335-8338 Hardware Repair Center: Phone: (81) (4) 7355-6660 Fax: (81) (4) 7352-1848
Kazakhstan	Hewlett-Packard International Trade BV Branch Office Kazakhstan 135 Ablay Khan Ave 480091 Almaty Phone: (7) (3272) 980-824 Fax: (7) (33272) 980-825
Korea	Hewlett-Packard Korea, Ltd. HP Korea House
Yoido-dong	Youngdeungpo-gu Seoul 150-010 724 Phone: (82) (02) 7692 2199-0114 (02) 2199-0114 Fax: (82) (2) 784-7084 Hardware Repair Center: Phone: (82) (2) 3270-0700 (82) (2) 707-2174 (82) (2) 3270-0710 Extended Warranty Support: Phone: (82) (2) 3770-0365 (82) (2) 769-0500
Latin American Headquarters	5200 Blue Lagoon Drive Suite 950 Miami, FL 33126, USA Phone: (1) (305) 267-4220
México	Hewlett-Packard de México, S.A. de C.V. Prolongación Reforma No. 700 Lomas de Santa Fe 01210 México, D.F. Phone: 01-800-22147 Outside México City Phone: 01-800-90529
Middle East/Africa	ISB HP Response Center Hewlett-Packard S.A. Rue de Veyrot 39 P.O. Box 364 CH-1217 Meyrin - Geneva Switzerland Phone: (41) (22) 780-4111
Morocco Northwest and Central Africa Branch	Hewlett-Packard Morocco, Sarl. Morocco Sales 17 Boulevard Moulay Youssef Casablanca, Morocco Phone: (212) (2) 22 13 40 Fax: (212) (2) 22 08 94
Netherlands	Hewlett-Packard Nederland BV Startbaan 16 NL-1187 XR Amstelveen Phone: (31) (020) 547-6666 Fax: (31) (020) 547-7755

Table 8. Worldwide offices (continued)

New Zealand	Hewlett-Packard (NZ) Limited Ports of Auckland Building Princes Wharf, Quay Street P.O. Box 3860 Auckland Phone: (64) (9) 356-6640 Fax: (64) (9) 356-6620 Hardware Repair Center and Extended Warranty Support: Phone: (64) (9) 0800-733547 Customer Information Center: Phone: (64) (9) 0800-651651
Norway	Hewlett-Packard Norge A/S Postboks 60 Skøyen Drammensveien 169 N-0212 Oslo Phone: (47) 2273-5600 Fax: (47) 2273-5610
Poland	Hewlett-Packard Polska Sp. z o.o. Ochota Office Park Al. Jerozolimskie 181 02-222 Warszawa Phone: (48-22) 608-7700 Fax: (48-22) 608-7600
Portugal	Hewlett-Packard Portugal Quinta da Fonte Edificio Bartolomeu Dias Porto Salvo 2780-667 Oeiras Portugal Phone: (351) (21) 4 82 85 00
Romania	Hewlett-packard Romania SRL Boulevard Carol I 34-36 NBC Modern, 10th floor Bucharest Phone: (40) (1) 205-33-00 Fax: (40) (1) 250-60 95
Russia	AO Hewlett-Packard Business Complex Building #2 129223, Moskva, Prospekt Mira VVC Phone: (7) (95) 797-3500 Fax: (7) (95) 797-3501
Singapore	Hewlett-Packard Singapore (Sales) Pte Ltd 450 Alexandra Road Singapore (119960) Phone: (65)275-3888 Fax: (65)275-6839 Hardware Repair Center and Customer Information Center: Phone: (65) 272-5300 Extended Warranty Support: Phone: (65) 272-5333
Slovakia	Hewlett-Packard Slovakia s.r.o. Kutlikova 17 85250 Bratislava Phone: (42) (1) 7 682-090 Fax: (42) (1) 382-6777

Table 8. Worldwide offices (continued)

South Africa	Hewlett-Packard South Africa 9 Eastern Services Road Eastgate Ext.3 Sandton 2148 Private Bag Wendwood 2144 Republic of South Africa Phone: 27 11 8 06 1000 Fax: 27 11 444 1725
Spain	Hewlett-Packard Española, S.A. Carretera de la Coruña km 16.500 E-28230 Las Rozas, Madrid Phone: (34) 91-6311600 Fax: (34) 91-6311830
Sweden	Hewlett-Packard Sverige AB Skalholtsgatan 9 S-164 97 Kista Phone: (46) (8) 444-2000 Fax: (46) (8) 444-2666
Switzerland	Hewlett-Packard (Schweiz) AG In der Luberzen 29 CH-8902 Urdorf/Zürich Phone: (41) (0848) 88 44 66 Fax: (41) (1) 735-77 0 Warranty Support: (41) (0848) 80 11 11
Taiwan	Hewlett-Packard Taiwan Ltd. 8th Floor 337, Fu-Hsing North Road Taipei, 10483 Phone: (886)(02)717-0055 FAX: (886)(02)514-0276 Hardware Repair Center, call: North (886)(02) 717-9673 Central (886)(04) 327-0153 South (886)(080)733-733 Extended Warranty Support Contact: Phone: (886)(02) 714-8882
Thailand	Hewlett-Packard (Thailand) Ltd. 23-25/f Vibulthani Tower II 2199 Rama 4 Rd, Klongton Klintoey, Bangkok 10110 Thailand Phone: (66) (2) 666-3900-34 Fax: (66) (2) 666-3935-37 Hardware Repair Center and Extended Warranty Support Contact: Phone: (66) (2) 661-3900 ext. 6001/ 6002 Customer Information Center: Phone: (66) (2) 661-3900 ext. 3211 Fax: (66) (2) 661-3943
Turkey	Hewlett-Packard Company Bilgisayar Ve ölçüm Sistemleri AS 19 Mayıs Caddesi Nova Baran Plaza Kat: 12 80220 Sisli-Istanbul Phone: (90) (212) 224-5925 Fax: (90) (212) 224-5939

Table 8. Worldwide offices (continued)

Ukraine	Hewlett-Packard Trading S. A. 14, Bekhterevskiy Pereulok, Block E 04053 Kiev Phone: (380) 44 490 61 20 Fax: (380) 44 490 61 21
United Arab Emirates	Hewlett-Packard Middle East P.O. Box 17295 Jebel Ali Free Zone Dubai, U.A.E Phone: (97) 14 88 15 456 Fax: (97) 14 88 14 529
United Kingdom	Hewlett-Packard Ltd. Cain Road Bracknell Berkshire RG12 1HN Phone: (44) (134) 436-9222 Fax: (44) (134) 436-3344
Venezuela	Hewlett-Packard de Venezuela S.A. Los Ruices Norte 3A Transversal Edificio Segre Caracas 1071 Phone: (58) (2) 239-4244 Fax: (58) (2) 239-3080

2

Operating requirements

Chapter contents

Site requirements	26
Operating environment	26
Printer space requirement	27
Media specifications	28
General media specifications	28
Guidelines for selecting paper	29
Media input options	30
Tray 1 media sizes	31
Tray 2 and tray 3 (250-sheet feeder)	32
Tray 3 (500-sheet feeder)	32
Envelope specifications	33
Label specifications	35
Transparency specifications	36
Storing print media	36
Shipping print media	37
Paper fillers	37
Testing media specifications	37

Site requirements

Operating environment

The electrical and environmental specifications must be maintained to ensure the proper operation of this printer. See "Specifications" in chapter 1. Consider the following points before installing the printer:

- Install in a well-ventilated, dust-free area.
- Install on a level, flat, and continuous surface that can support the printer's weight. Make sure all four printer feet are level. Do not install on carpet or other soft surfaces.
- Ensure adequate power supply circuitry. See "Specifications" in chapter 1.
- Install where there is stable temperature and humidity, with no abrupt changes (away from water sources, humidifiers, air conditioners, refrigerators, or other major appliances). See "Specifications" in chapter 1.
- Install away from direct sunlight, areas with vibration, open flames, ultrasonic heaters, ammonia fumes, or magnets and devices that emit a magnetic field. If the printer is placed near a window, make sure the window has a curtain or blind to block any direct sunlight.
- Maintain enough space around the printer for proper access and ventilation. See "Printer space requirement" on page 27.

Printer space requirement

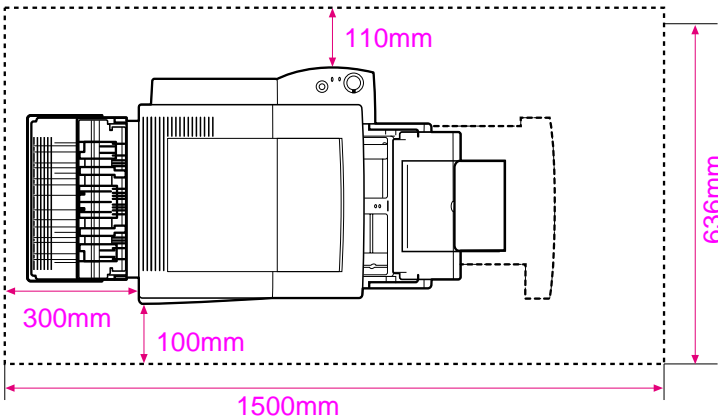


Figure 9. Top view

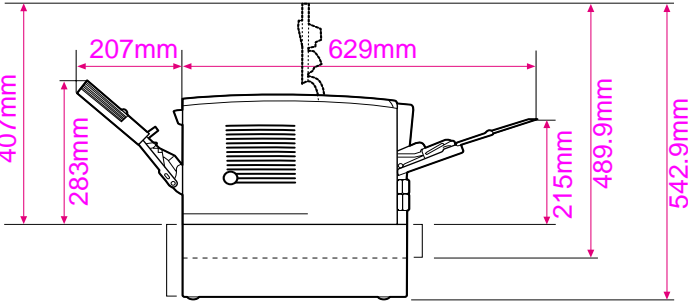


Figure 10. Side view

Media specifications

General media specifications

The HP LaserJet 2200 series printers accept a variety of media, such as cut-sheet paper (including up to 100 percent recycled-fiber-content paper), envelopes, labels, transparencies, and custom-size paper. Properties such as weight, composition, grain, and moisture content are important factors affecting printer performance and output quality. Media that does not meet the guidelines outlined in this manual can cause the following problems:

- poor print quality
- increased jams
- premature wear on the printer, requiring repair

Note

Some print media might meet all of the guidelines in this manual and still not produce satisfactory results. This might be the result of improper handling, unacceptable temperature and humidity levels, or other variables over which Hewlett-Packard has no control.

CAUTION

Using print media that does not meet HP specifications might cause problems for the printer, requiring repair. This repair is not covered by the Hewlett-Packard warranty or service agreements.

Note

Before purchasing large quantities of paper, make sure the paper meets the requirements specified in this service manual and in the *HP LaserJet Printer Family Print Media Guide*. See “Supplemental documentation” on page 16. Always test print media before buying large quantities. For more information see the *HP LaserJet Printer Family Print Media Guide* at <http://www.hp.com/cposupport/printers/manuals/>

Guidelines for selecting paper

For best results, use conventional 80 g/m² (20 lb) paper. Make sure the paper is of good quality, and free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, voids, and curled or bent edges.

If you are unsure what type of paper you are loading (such as bond or recycled), check the label on the package of paper.

The following problems with paper can cause print quality deviations, jamming, or even damage to the printer.

Table 9. Guidelines for selecting paper

Symptom	Problem with paper	Solution
Poor print quality, toner adhesion, or problems with feeding	Too moist, too rough, too heavy, too smooth, or embossed; faulty paper lot	Try another kind of paper, between 100 and 250 Sheffield, 4 percent to 6 percent moisture content
Dropouts, jamming, or curl	Stored improperly	Store paper flat in its moisture-proof wrapping
	Side-to-side variability of paper	Turn paper over
Increased gray background shading, or printer wear	Too heavy	Use lighter paper; open the rear output bin
Excessive curl or problems with feeding	Too moist, wrong grain direction, or short-grain construction	Open the rear output bin; use long-grain paper
	Side-to-side variability of paper	Turn paper over
Jamming or damage to printer	Cutouts or perforations	Do not use paper with cutouts or perforations
Problems with feeding	Ragged edges	Use good, high-quality paper
	Side-to-side variability of paper	Turn paper over

Media input options

The printer comes with two built-in paper trays, tray 1 and tray 2. Tray 3 is an optional tray that can be added to the printer. By default, the printer draws first from tray 1. If tray 1 is empty, the printer draws from tray 2. If tray 1 is empty and tray 3 is installed, the printer draws from tray 3 first and then tray 2.

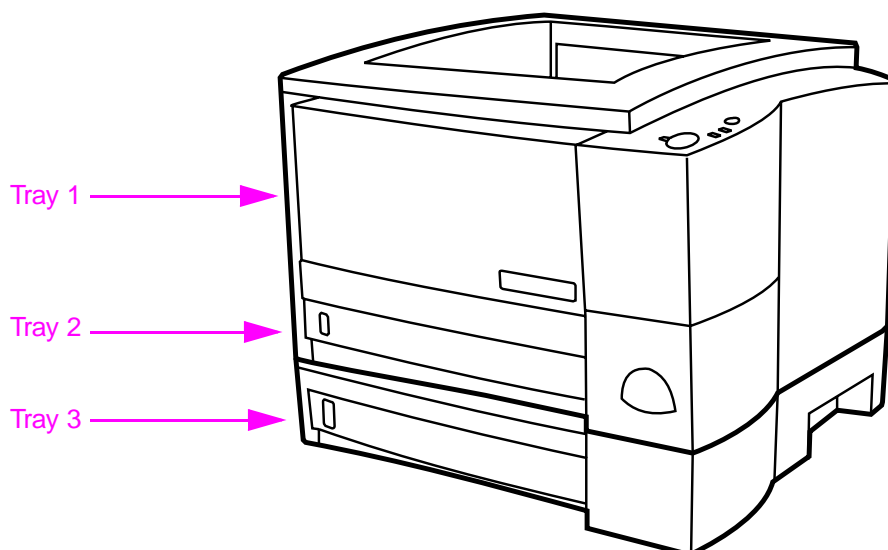


Figure 11. Media input trays (250-sheet feeder installed)

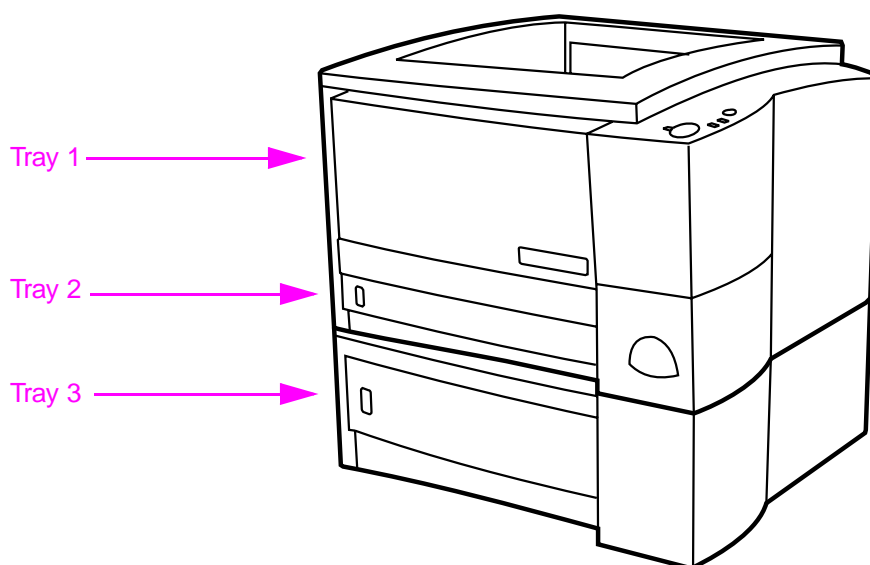


Figure 12. Media input trays (500-sheet feeder installed)

Note

The printer supports a wide range of media sizes. Check the printer software for supported sizes. Capacity can vary depending on media weight and thickness and on environmental conditions. Smoothness should be between 100 and 250 (Sheffield).

- For information about measuring basis weight, see "Basis-weight field test" on page 37.
- For information about measuring caliper, see "Caliper field test" on page 39.
- For information about smoothness, see "Paper-finish field test" on page 39.

Tray 1 media sizes

Tray 1 adjusts for sizes from 76 by 127 mm (3 by 5 inch) to 216 by 356 mm (8.5 by 14 inch). Send media from tray 1 to the rear output bin when printing on the following:

- envelopes
- labels
- transparencies
- custom-sized media or cardstock
- postcards

Table 10. Tray 1 media sizes

Tray 1	Dimensions	Weight	Capacity
Minimum size (custom)	76 by 127 mm (3 by 5 in.)	60 to 163 g/m ² (16 to 43 lb bond)	100 sheets of 75 g/m ² (20 lb bond) paper
Maximum size (custom)	216 by 356 mm (8.5 by 14 in.)		
Transparency	Same as minimum and maximum paper sizes listed above	Thickness: .10 to .14 mm (0.0039 to 0.0055 in.)	75 typical
Labels		Thickness: .10 to .14 mm (0.0039 to 0.0055 in.)	50 typical
Envelopes		Up to 90 g/m ² (16-24 lb)	Up to 10

Note

Users might experience jams when using any media with a length less than 178 mm (7 inch). This can be caused by paper that has been affected by environmental conditions. For optimum performance, make sure that users are storing and handling the paper correctly.

Tray 2 and tray 3 (250-sheet feeder)

Tray 2 and the tray 3 (250-sheet feeder) have settings for the paper sizes shown in table 11. Use only standard copier paper when printing from tray 2 or tray 3 (250-sheet feeder). Other types of print media might jam when printing from tray 2 or tray 3 (250-sheet feeder).

Table 11. Tray 2 and tray 3 (250-sheet feeder) paper sizes

Tray 2	Dimensions	Weight	Capacity
Letter	216 by 279 mm (8.5 by 11 in.)	60 to 105 g/m ² (16 to 28 lb bond)	250 sheets of (75 g/m ²) (20 lb bond) paper
A4	210 by 297 mm (8.3 by 11.7 in.)		
Executive	191 by 267 mm (7.3 by 10.5 in.)		
Legal	216 by 356 mm (8.5 by 14 in.)		
B5 (ISO)	176 by 250 mm (6.9 by 9.9 in.)		
B5 (JIS)	182 by 257 mm (7.2 by 10 in.)		
A5	148 by 210 mm (5.8 by 8.2 in.)		
8.5 by 13 in.	216 by 330 mm (8.5 by 13 in.)		

Tray 3 (500-sheet feeder)

Tray 3 (500-sheet feeder) has settings for the paper sizes shown in table 12. Use only standard copier paper when printing from tray 3 (500-sheet feeder). Other types of print media might jam when printing from tray 3 (500-sheet feeder).

Table 12. Tray 3 (500-sheet feeder) paper sizes

500 sheet feeders	Dimensions	Weight	Capacity
Letter	216 by 279 mm (8.5 by 11 in.)	60 to 105 g/m ² (16 to 28 lb bond)	250 sheets of 75 g/m ² (20 lb bond) paper
A4	210 by 297 mm (8.3 by 11.7 in.)		

Table 13. Automatic duplexer paper sizes

Duplexer	Dimensions	Weight
Letter	216 by 279 mm (8.5 by 11 in.)	60 to 105 g/m ² (16 to 28 lb bond)
A4	210 by 297 mm (8.3 by 11.7 in.)	
Legal	216 by 356 mm (8.5 by 14 in.)	
8.5 by 13 in.	216 by 330 mm (8.5 by 13 in.)	

Envelope specifications

Envelope construction is critical. Envelope fold lines can vary considerably, not only between manufacturers, but also within a box from the same manufacturer. Successful printing on envelopes depends upon the quality of the envelopes. When selecting envelopes, consider the following components:

- **Weight:** The weight of the envelope paper should not exceed 105 g/m² (28 lb) or jamming can occur.
- **Construction:** Prior to printing, envelopes should lie flat with less than 6 mm (0.25 inch) curl, and should not contain air.
- **Condition:** Envelopes should not be wrinkled, nicked, or otherwise damaged.
- **Temperature:** Envelopes should be compatible with the heat and pressure of the printer.
- **Size:** Envelopes must be within the following size ranges: minimum of 76 by 127 mm (3 by 5 inch) and maximum of 216 by 356 mm (8.5 by 14 inch).

Note

Use only tray 1 to print envelopes. Send envelopes straight through the printer, entering at tray 1 and exiting from the rear output bin.

CAUTION

Jams might occur when using any media with a length less than 178 mm (7 inch). This can be caused by paper that has been affected by environmental conditions. See "Evaluate environmental conditions" in chapter 7.

Envelopes might meet the general specifications listed in table 14 and still not print satisfactorily because of the printing environment or other variables over which HP has no control.

Table 14. Envelope specifications

Description	Specification
Paper	Paper used for envelope construction must meet the paper specifications listed in this manual and the <i>HP LaserJet Printer Family Print Media Guide</i> (except for those listed below).
Basis weight	60 to 100 g/m ² (16 to 27 lb), single thickness. Jamming might result if 100 g/m ² (27 lb) weight is exceeded. See "Moisture-content field test" on page 39.
Finish	Avoid using envelopes with adhesive exposed to the printer. Envelopes must be folded accurately so that there are no more than two thicknesses of paper anywhere along the leading edge. All folds must be well scored and sharply creased, and construction must be tight (not baggy). Avoid using envelopes that are stuck together with excess seam gum. See "Furnish (fiber composition) field test" on page 41.
Fusing compatibility	All inks, adhesives, and other materials used in the envelope must be compatible with the heat and pressure of the fusing process. Materials must not discolor, melt, offset materials, or release hazardous emissions when heated to 200 degrees C (392 degrees F) for 0.1 second. See "Fusing-compatibility field test" on page 41.
Curl (Pre-printed)	Envelopes must lie flat, with no more than 5 mm (0.2 in.) curl across the entire surface. See "Curl field test" on page 40.
Caliper	Caliper of 0.084 to 0.14 mm (.0034 in. to .0056 in.), single thickness. See "Caliper field test" on page 39.

Envelopes with adhesive strips or flaps

Envelopes with a peel-off adhesive strip or with more than one flap that folds over to seal must use adhesives compatible with the heat and pressure in the printer. The extra flaps and strips might cause wrinkling, creasing, or jams and can even damage the fuser.

Envelope storage

Proper storage of envelopes contributes to good print quality. Envelopes should be stored flat. If air is trapped in an envelope, creating an air bubble, then the envelope might wrinkle during printing.

Envelopes with double side seams

Double side-seam construction has vertical seams at both ends of the envelope rather than diagonal seams. This style might be more likely to wrinkle. Be sure the seam extends all the way to the corner of the envelope as illustrated below.

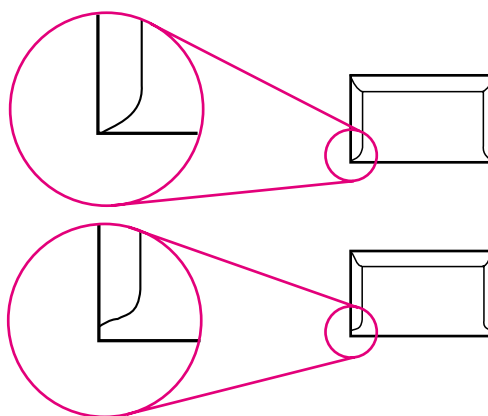


Figure 13. Double side seam

Envelope margins

The following gives typical address margins for a commercial #10 or DL envelope.

Table 1. Envelope margins

Type of address	Top margin	Left margin
Return address	15 mm (0.6 in.)	15 mm (0.6 in.)
Delivery address	51 mm (2 in.)	89 mm (3.5 in.)

Note

For the best print quality, position margins no closer than 15 mm (0.6 inch) from the edges of the envelope.

Avoid printing over the area where the envelope seams meet.

Label specifications

When selecting labels, consider the quality of each component:

- **Adhesives:** The adhesive material should be stable at 200 degrees C (392 degrees F), which is the printer's fusing temperature.
- **Arrangement:** Only use labels with no exposed backing between them. Labels can peel off sheets with spaces between the labels, causing jams.
- **Curl:** Prior to printing, labels must lie flat with no more than 13 mm (.5 inch) of curl in any direction.
- **Condition:** Do not use labels with wrinkles, bubbles, or other indications of separation.

Note

Use only tray 1 to print labels. Send labels straight through the printer, entering at tray 1 and exiting from the rear output bin.

CAUTION

To avoid damaging the printer, use only labels recommended for laser printers.

Never print on the same sheet of labels more than once or print on a partial sheet of labels.

Table 15. Label specifications

Description	Specification
Adhesive	Must not be on any external surfaces of the label before, during, or after printing. Label construction and die-cutting must not let labels peel off during transport, printing, or fusing.
Caliper	Must not exceed 0.19 mm (0.007 in.). See "Caliper field test" on page 39.
Curl	In ream: flat within 5 mm (0.2 in.). See "Curl field test" on page 40.
Surface resistivity	2.0 to 15 by 10 to the 10th ohm square. See "Inspect the rollers for colored ink buildup from preprinted logos or letterhead, and for toner buildup or spots. Inspect printed output for repetitive defects and smearing. If necessary, have users contact the forms vendor to ensure the paper's fusing compatibility with HP LaserJet printers." on page 41.
Volume resistivity	1.2 to 15 by 10 to the 11th ohm-centimeter. See "Inspect the rollers for colored ink buildup from preprinted logos or letterhead, and for toner buildup or spots. Inspect printed output for repetitive defects and smearing. If necessary, have users contact the forms vendor to ensure the paper's fusing compatibility with HP LaserJet printers." on page 41.
Finishing precision	Cut sheet within 0.79 mm (0.031 in.) of nominal and +0.20 degrees square.
Fusing compatibility	All adhesives, carrier sheets, top sheets, and other materials used in label construction must be compatible with the heat and pressure of the fusing process. Materials must not discolor, melt, offset materials, or release hazardous emissions when heated to 200 degrees C (392 degrees F) for 0.1 second. See "Furnish (fiber composition) field test" on page 41.
Packaging	Store in moisture-proof wrap to preserve properties.
Shelf life	One year, maximum, stored at 22 degrees C (72 degrees F) and 50 percent relative humidity.

Transparency specifications

Transparency construction is critical.

Note

Use only tray 1 to print transparencies. Send transparencies straight through the printer, entering at tray 1 and exiting from the rear output bin.

CAUTION

Transparencies used in the printer must be able to withstand 200 degrees C (392 degrees F), the printer's fusing temperature.

To

avoid damaging the printer, use only transparencies recommended for use in laser printers.

Table 16. Transparency specifications

Description	Specification
Surface resistivity	2.0 to 15 by 10 to the 10th ohm square. See "Inspect the rollers for colored ink buildup from preprinted logos or letterhead, and for toner buildup or spots. Inspect printed output for repetitive defects and smearing. If necessary, have users contact the forms vendor to ensure the paper's fusing compatibility with HP LaserJet printers." on page 41.
Volume resistivity	1.2 to 15 by 10 to the 11th ohm-cm. See "Inspect the rollers for colored ink buildup from preprinted logos or letterhead, and for toner buildup or spots. Inspect printed output for repetitive defects and smearing. If necessary, have users contact the forms vendor to ensure the paper's fusing compatibility with HP LaserJet printers." on page 41.
Finishing precision	Cut sheet within 0.79 mm (0.031 in.) of nominal and +0.20 degrees square.
Fusing compatibility	Transparency materials must be compatible with the heat and pressure of the fusing process. Materials must not discolor, melt, offset materials, or release hazardous emissions when heated to 200 degrees C (392 degrees F) for 0.1 second. See "Fusing-compatibility field test" on page 41.
Caliper	Caliper of 0.100 to 0.110 mm (.0039 to .0043 in.). See "Caliper field test" on page 39.

Storing print media

Ideally, the printing and media storage environment should be at or near room temperature, and not too dry or too humid. Remember that paper is hygroscopic; it absorbs and loses moisture rapidly.

Heat works with humidity to damage paper. Heat causes the moisture in paper to evaporate, while cold causes it to condense on the sheets. Heating systems and air conditioners remove most of the humidity from a room. As a paper package is opened and used, it loses moisture, causing streaks and smudging. Humid weather or water coolers can cause the humidity to increase in a room. As paper is opened and used it absorbs any excess moisture, causing light print and dropouts. Also, as paper loses and gains moisture it can distort. This can cause jams.

As a result, paper storage and handling are as important as the paper-making process itself. Paper storage environmental conditions directly affect the feed operation.

Users should not purchase more paper than can be easily used in a short time (about three months). Paper stored for long periods might experience heat and moisture extremes, which can cause damage. Planning is important to prevent damage to a large supply of paper.

Unopened paper in sealed reams can remain stable for several months before use. Opened packages of paper have more potential for environmental damage, especially if they are not wrapped with a moisture-proof barrier.

The paper storage environment should be properly maintained to ensure optimum printer performance. The required condition is 20 degrees to 24 degrees C (68 degrees to 75 degrees F), with a relative humidity of 45 percent to 55 percent. The following guidelines should be helpful when evaluating the papers storage environment:

- Paper should be stored at or near room temperature.
- The air should not be too dry or too humid (because of the hygroscopic properties of paper).
- The best way to store an opened ream of paper is to rewrap it tightly in its moisture-proof wrapping. If the printer environment is subject to extremes, unwrap only the amount of paper to be used during the day's operation to prevent unwanted moisture changes.

Shipping print media

When shipping print media through different environments, plastic-wrap all cartons on the shipping pallet. When shipping media across bodies of water, wrap individual cartons as well. Packaging must protect the media from physical damage.

Paper fillers

Additional chemicals and fillers are frequently added to paper during the manufacturing process. These can affect the paper strength, pick resistance, printability, bulk, feel, and color.

An emulsion containing wax, rosin, starch, or other non-water soluble materials is added to the paper pulp to help control penetration by water and other liquids. Dyes are added and the paper might be bleached. Bleaching is a multistep process using such chemicals as hydrogen peroxide and chlorine dioxide. This transforms the paper from its original brownish state to the desired color.

Finely ground fillers, such as clay, talc, and calcium carbonate, might be added to even out the "peaks and valleys" that occur in the paper mixture, and serve as brighteners. Over time, these fillers can build up on internal assemblies of the printer such as rollers or the toner cartridge. This buildup can eventually cause jams and print defects. To minimize this risk, periodically clean the printer according to procedures. See "Cleaning the printer and accessories" in chapter 4.

Testing media specifications

The following tests describe ways to qualify the media with respect to the specifications listed in this manual and the *HP LaserJet Printer Family Print Media Guide*. See page "Inspect the rollers for colored ink buildup from preprinted logos or letterhead, and for toner buildup or spots. Inspect printed output for repetitive defects and smearing. If necessary, have users contact the forms vendor to ensure the paper's fusing compatibility with HP LaserJet printers." on page 41 for help obtaining tools needed to perform these tests.

Basis-weight field test

The basis weight should be indicated on the ream label. If the label is not available, a simple field test can identify the basis weight of paper. The basis weight of paper is equal to the weight of 2000 sheets of paper, or four full reams. Weigh a full ream on a postal scale and then multiply that weight by four. Or weigh 10 sheets of paper, divide that weight by 10, multiply by 2000, and then divide by 16.

Table 17. Determining basis weight of paper

Amount	Formula
4 reams	weight = basis weight
1 ream	weight x 4 = basis weight
10 sheets	(weight divided by 10) x 2000 and then divided by 16 = basis weight

Note

Example:

10 sheets weigh 1.6 ounces

0.16 ounce x 2000 = 320 ounces

320 ounce ÷ 16 ounce/lb = 20lb paper

Paper weight equivalence table

Use this table to determine approximate equivalent points in weight specifications other than U.S. bond weight. For example, to determine the equivalent of 20 lb U.S. bond-weight paper in U.S. cover-weight paper, locate the bond weight (in row 3, second column) and scan across the row to the cover weight (in the fourth column). The equivalent is 28 lb. Shaded areas indicate a standard weight for that grade.

Table 18. Paper weight equivalence

	U.S. post-card thickness (mm)	U.S. bond weight (lb)	U.S. text/book weight (lb)	U.S. cover weight (lb)	U.S. bristol weight (lb)	U.S. index weight (lb)	U.S. tag weight (lb)	Europe metric weight (g/m ²)	Japan metric weight (g/m ²)
1		16	41	22	27	33	37	60	60
2		17	43	24	29	35	39	64	64
3		20	50	28	34	42	46	75	75
4		21	54	30	36	44	49	80	80
5		22	56	31	38	46	51	81	81
6		24	60	33	41	50	55	90	90
7		27	68	37	45	55	61	100	100
8		28	70	39	49	58	65	105	105
9		32	80	44	55	67	74	120	120
10		34	86	47	58	71	79	128	128
11		36	90	50	62	75	83	135	135
12	.18	39	100	55	67	82	91	148	148
13	.19	42	107	58	72	87	97	157	157
14	.20	43	110	60	74	90	100	163	163
15	.23	47	119	65	80	97	108	176	176
16		53	134	74	90	110	122	199	199

Note

The U.S. postcard measurements are approximate. Use for reference only.

Metric Sizes

For metric-size paper (A4), use the following method to determine basis weight.

Take 16 sheets of A4 paper and weigh them. One square meter of paper contains approximately 16 A4 size sheets. Compare this weight to the appropriate weight in the "Paper weight equivalence table" on page 2-38.

Caliper field test

The specified caliper differs with the type of media used. See “Operating environment” on page 26.

Caliper can be measured in the field using a micrometer.

CAUTION

Never use the coarse-adjustment end of the micrometer when measuring for caliper. The coarse adjustment will compress the paper fibers, resulting in an inaccurate reading. For example, if the fibers are compressed, 6 mil paper could measure as little as 3 mils. Always use the fine adjustment to measure caliper.

Using the fine adjustment, slide the micrometer along the edge of the paper and measure at one end. To double-check the accuracy of the reading, always measure again at the opposite end of the paper.

Paper-finish field test

Paper finish, or smoothness, can be accurately measured with a Sheffield meter. If this tool is not available, use a new U.S. dollar bill as a benchmark for comparing paper texture. A dollar bill has a finish of 350 Sheffields, which is 100 over specifications. If paper feels as rough as a dollar bill, it is recommended that users do not continually use this paper in the printer.

Moisture-content field test

Specification: Use paper with 4 percent to 6 percent moisture content.

A ream or sheet of paper can be measured with a moisture meter. In general, only evaluate the customer’s storage environment when trying to determine if excess moisture or dryness is the cause of a problem with paper.

Grain field test

The grain direction is usually specified on the ream label (written out “long” or “short”). The paper dimensions listed on the label also indicate grain direction. For example, short-grain letter-size paper will read “11 by 8.5” and long-grain paper will read “8.5 by 11.”

If the grain direction is not included on the ream label, it can be determined by a simple wet test. Cut a small square from the corner of a sheet of paper, wet it, and observe the manner in which it curls.

Envelopes should have a diagonal grain, which gives them the best stability. To determine this, cut a square section from one corner of an envelope. Wet this section and observe the manner in which it curls. Two opposite corners should curl toward each other.

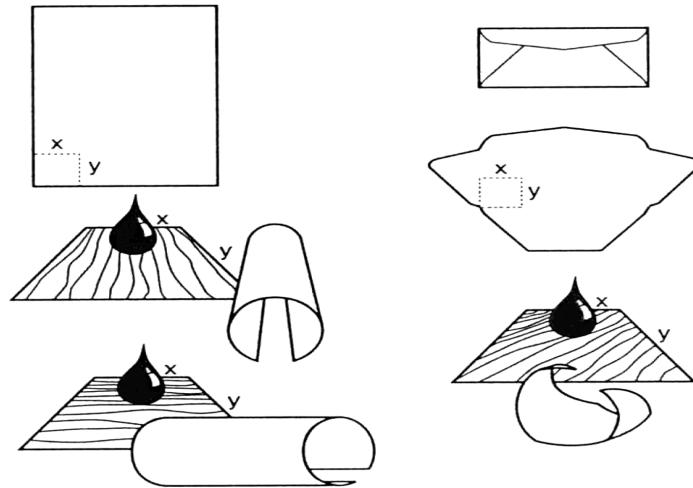


Figure 14. Long, short, and diagonal grain curl

Curl field test

To check for paper curl, place a single sheet of paper onto a flat surface and measure curl at the greatest deflection, holding a ruler perpendicular to the flat surface.

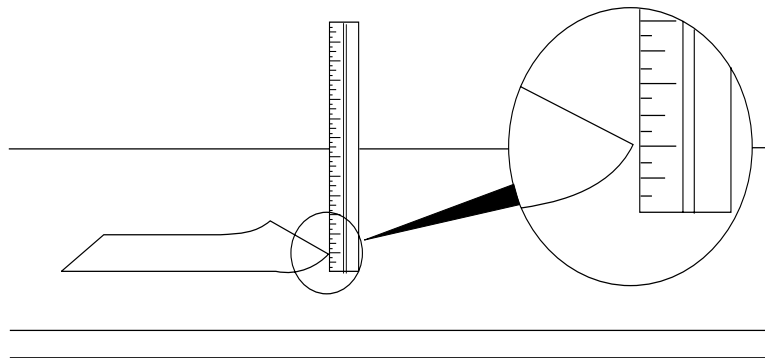


Figure 15. Measuring curl

Cut-edge condition field test

The condition of the cut edge can be easily observed with an eye loop. Under magnification, a good edge will appear even. A poorly cut edge will show fraying, jagged edges, compressed fibers, and other damage.

Furnish (fiber composition) field test

Use paper made from 100 percent chemical wood pulp and /or cotton fiber. Recycled paper made with no more than 5 percent groundwood is also acceptable.

Read the ream label to determine the fiber composition of the paper. Paper is usually specified as xerographic bond (suitable for copiers or laser printers) or cotton bond. Cotton bond paper of 25 percent, 50 percent, or 100 percent will be indicated on a watermark. If paper is less than 25 percent cotton bond, the watermark will not indicate a percentage. A wood-pulp test kit can also be used to test fiber composition.

Fusing-compatibility field test

Inspect the rollers for colored ink buildup from preprinted logos or letterhead, and for toner buildup or spots. Inspect printed output for repetitive defects and smearing. If necessary, have users contact the forms vendor to ensure the paper's fusing compatibility with HP LaserJet printers.

Tools and suppliers

Hewlett-Packard neither warrants nor recommends a particular manufacturer, supplier, or tool. Products are subject to change and HP has no control over such changes. However, the following table of tools and their suppliers is provided for convenience.

Table 19. Tools and suppliers

Tool	Part Number	Supplier Address
Paper moisture meter	2RRDMP	Mitchell Instrument 1570DDD Cherokee St. San Marcos, CA 92069-2433
Single-sheet clamp probe	2R43E	
Temperature/humidity meter	#3T331	Industrial Motor Service 2000 Albright Montgomery, IL 60538
Sheffield tester: precisionaire column	TM 58-25-01	TMI Testing Machines Inc. 400 Bayview Avenue Amityville, NY 11701 (516) 842-5400
Sheffield tester: smoothcheck gauge	TM 58-25-02	
Wood-pulp test kit	4280-2	Shape Products 1127 57th Avenue Oakland, CA 94621 (800) 444-0015
pH test kit	4360-2	
Resistivity test tool: precision current/resistance meter	278	Monroe Electronics 100 Housel Avenue PO Box 100 Lyndonville, NY 14098 (800) 821-6001
Resistivity test tool: surface resistivity probe	96117-1	

3

Printer configuration

Chapter contents

Using the control panel	44
Control panel.	44
Control panel LEDs.	44
Job Cancel	44
Go	44
Printing a demo page	45
Self-test/configuration page	48
Self-test/configuration-page elements	49
JetDirect configuration page	50
Continuous self-test	51
Engine test	52
Performing an engine test.	52
Service mode	53
Entering service mode	53
Entering escape characters	53
Setting the page count	54
Setting the cold reset default	55
Resetting the printer	56
Cold reset	56
NVRAM initialization	56
EIO card reset.	56
Network printing	57
Installing an HP JetDirect EIO card	57
IR printing	59
Fast Infrared Receiver.	59
Using the FIR port.	59

Using the control panel

Control panel

The printer control panel has only two buttons: **JOB CANCEL** and **Go**. See figure 16. Pressing one of these buttons or a combination of the two does the following:

- cancels print jobs
- resumes printing when the printer is paused
- prints a demo page or a self-test/configuration page
- initiates a continuous self test
- performs a cold reset or a nonvolatile random access memory (NVRAM) initialization
- reveals secondary information (for example, LED messages)

Other printer configurations must be performed using printer job language (PJL) commands or the LaserJet configuration utility. See "Service mode" on page 53.

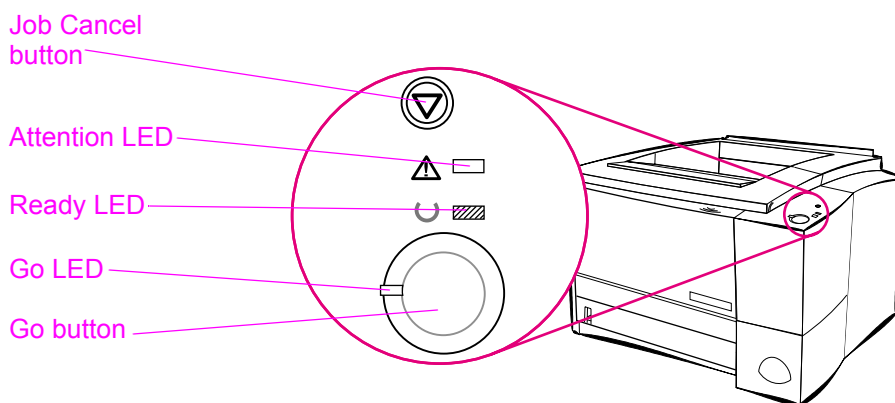


Figure 16. Control panel layout

Control panel LEDs

The control panel LEDs provide both status and error messages by using distinct light patterns. See "Troubleshooting with control-panel messages" in chapter 7.

Job Cancel

Press **JOB CANCEL** to cancel a job the printer is currently printing. The control panel lights will cycle while the print job is cleared from both the printer and the computer, and then return to the ready state (Ready light on). This can take some time, depending on the size of the print job.

- If **JOB CANCEL** is accidentally pushed, the job must be reprinted. There is no undo function.
- If **JOB CANCEL** is pushed when the printer is idle nothing happens.

Go

- Press **Go** to resume printing when the printer is paused or when unprinted data is still in the printer.
- Press **Go** to clear particular printer errors.
- Press **Go** to print a demo page. The printer must be in the ready state (ready light on).

To identify and troubleshoot control panel light messages, see "Troubleshooting with control-panel messages" in chapter 7.

Printing a demo page

To print the demo page, press **Go** when the printer is ready (ready light is on).

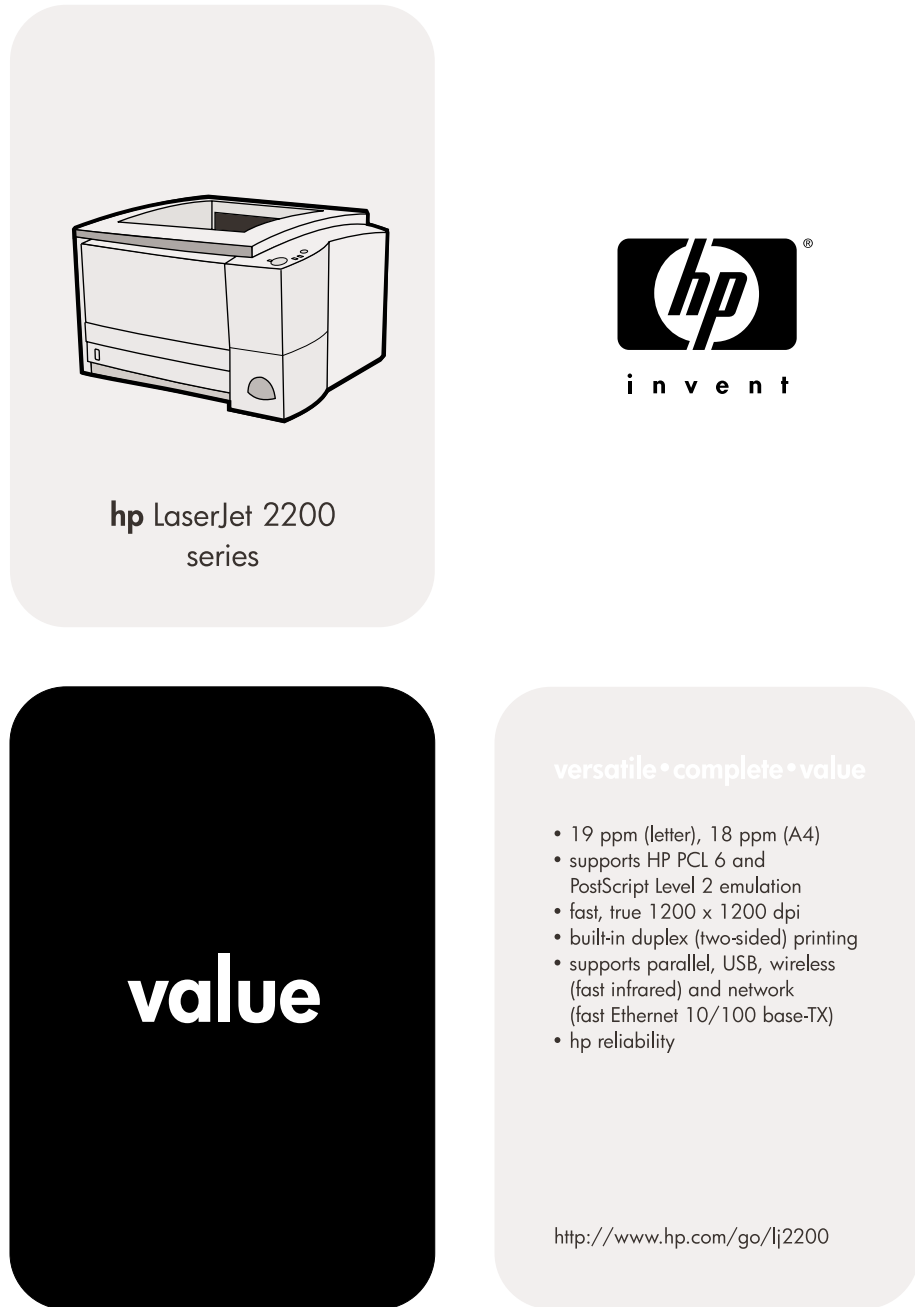


Figure 17. Demo page (front)

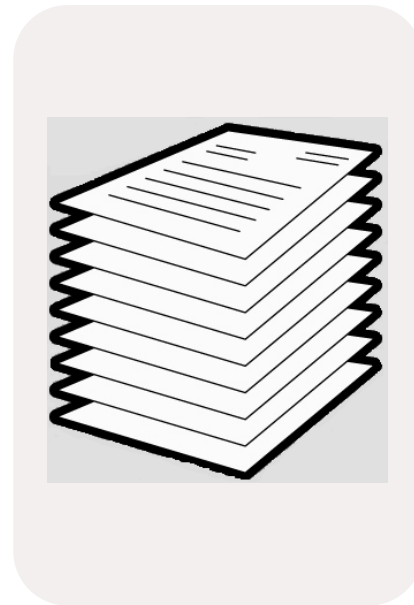



Figure 18. Demo page (back)

Self-test/configuration page

The self-test/configuration page lists many of the printer's current settings and properties. To print the self-test/configuration page, press and release **Go** and **JOB CANCEL** simultaneously when the printer is ready (ready light is on). If you have an EIO print-server card installed, a second page, the JetDirect Page, will print listing all of the HP JetDirect information.

The demo and self-test/configuration pages can also be printed from the HP LaserJet device configuration reports page.



HP LaserJet 2200

Self Test / Configuration

Product Information

Product Name: HP LaserJet 2200
Formatter Number: S04601027KB
Product Serial Number: XXXXXXXXX
Service ID 00000
Firmware Datecode: 20001004
PS Wait Timeout: 300 seconds

Memory

Total Memory: 8 Mbytes
Available Memory: 5.28 Mbytes

Installed Personalities and Options

PCL (19990105)
PCLXL (19990105)
PS (19990105)
DIMM Slot 1: Empty
DIMM Slot 2: Empty
EIO: HP JetDirect J4169A

Status Log

Code	Page
30017	2125

Print Settings

COPIES	= 1	FONT SOURCE	= I (Internal)
PAPER SIZE	= LETTER	FONT NUMBER	= 0
WIDE A4	= NO	PITCH	= 10.00
COURIER	= REGULAR	SYM SET	= PC-8
PAPER OUT TIME	= -1	LINE TERM	= 0
PAPER OUT ACTION	= CANCEL	PRT PS ERRS	= OFF
AUTO CONT	= OFF	RESOLUTION	= 1200
ORIENTATION	= P (Portrait)	BITS PER PIXEL	= 1
FORM	= 60 LINES	PERSONALITY	= AUTO
MANUAL FEED	= OFF	IO TIMEOUT	= 15
RET	= ON	REPRINT	= AUTO
ECONOMODE	= OFF		
DUPLEX	= OFF		
BIND	= LONG EDGE		
MP TRAY	= FIRST		
TRAY1 SIZE	= Any		
TRAY2 SIZE	= Any		
TRAY3 SIZE	= Any		
OPTIMIZE TR1 FOR	= MIDWEIGHT		
OPTIMIZE TR2 FOR	= MIDWEIGHT		
OPTIMIZE TR3 FOR	= MIDWEIGHT		
PRINT DENSITY	= 5		

Figure 19. Self-test/configuration page

Self-test/configuration-page elements

- 1 **Product information** lists the name, formatter number, serial number, service ID, firmware datecode, total pages printed, duplex page count, pages jammed in printer, pages mispicked in printer, and PS wait timeout.
- 2 **Installed personalities and options** lists the installed printer languages (PCL, PCL 6, and PS), DIMM slot 1 and 2 information, and the EIO slot information.
- 3 **Memory** lists total memory and available memory.
- 4 **Status log** lists the PJL status code and the corresponding page count. (The status log only appears when errors have been registered.)
- 5 **Print settings** lists settings for copies, paper size, wide A4, courier, paper out time, paper out action, auto continue, orientation, form, manual feed, Resolution Enhancement technology (REt), EconoMode, duplex, bind, MP tray, tray 1 size, tray 2 size, tray 3 size, optimize tray 1 for, optimize tray 2 for, optimize tray 3 for, print density, font source, font number, pitch, symbol set, line term, PS error reporting, resolution, bits per pixel, personality, I/O timeout, and reprint.



HP LaserJet 2200

JetDirect Page

HP JetDirect Configuration

Status:
I/O Card Not Ready
LAN ERROR - LOSS OF CARRIER
Model Number:
J4169A
Hardware Address:
0001E6236D12
Firmware Version:
L.20.24
Port Select:
None

Port Config:
Disconnected
Auto Negotiation:
On
Manufacturing ID:
424042902007
Date Manufactured:
10/2000
SNMP Set Cmty Name:
Not Specified

Network Statistics

Total Packets Received:
0
Unicast Packets Received:
0
Bad Packets Received:
0
Framing Errors Received:
0

Total Packets Transmitted:
0
Unsendable Packets:
0
Transmit Collisions:
0
Transmit Late Collisions:
0

Protocol Information

TCP/IP

Status:
Initializing
Host Name:
Not Specified
IP Address:
0.0.0.0
Subnet Mask:
0.0.0.0
Default Gateway:
0.0.0.0
Config By:
Not Configured
BOOTP/DHCP Server:
0.0.0.0
TFTP Server:
0.0.0.0
Config File:
Not Specified

Domain Name:
Not Specified
DNS Server:
Not Specified
WINS Server:
Not Specified
Syslog Server:
Not Specified
Idle Timeout:
90 sec
SLP:
Enabled
Access List:
Not Specified
Web JetAdmin URL:
Not Specified

IPX/SPX

Status:
Ready
Primary Frame Type:
Auto Select
Network Frame Type:
Rcvd

Novell/Netware

Status:
16
NOT CONFIGURED
Node Name:
NP1236D12
Netware Mode:
Queue Server
NDS Tree Name:
NDS Context:
Attached Server:
Queue Poll Interval:
2 sec
SAP Interval:
60 sec

AppleTalk

Status:
Initializing
Name:
Zone:
*
Type 1:
LaserJet 2200
Type 2:
LaserWriter
Network Number:
0
Node Number:
0

DLC/LLC

Status:
Ready

Figure 20. JetDirect configuration page

50 Chapter 3 Printer configuration

C7058-90936

JetDirect configuration-page elements

- 1 **General information** lists the HP JetDirect number, firmware revision, LAN hardware address, selected port, manufacturing ID, I/O card status, and network statistics (unicast packets, total packets, bad packets, framing errors received, packets transmitted, unsendable packets, transmit collisions, and transmit late collisions).
- 2 Network statistics lists total packets received, unicast packets received, bad packets received, framing errors received, total packets received, unsendable packets, transmit collisions, transmit late collisions.
- 3 **Protocol information** lists TCP/IP status and configuration, the HP Web JetAdmin server name, Novell NetWare status and configuration, AppleTalk status and configuration, and DLC/LLC status.

Continuous self-test

To initiate a continuous self-test:

- Turn the printer power off.
- Press and hold **Go**.
- Turn the printer power back on and continue to hold **Go** until the **attention** and **ready** LED turn on.
- Release **Go**.
- The **ready** LED blinks indicating the device is in continuous self-test mode.
- The printer prints self-test/configuration pages until **JOB CANCEL** is pressed.

Engine test

Performing an engine test

The engine test can be used to verify that the print engine is functioning correctly. The formatter PCB is completely bypassed during an engine test; therefore, this test is useful for isolating problems. Because the engine test prints a full page of horizontal lines across the entire printable area, it is also useful for checking registration.

To print an engine-test page, insert paper into tray 2, remove the EIO cover, and use a long, nonconductive object to press the engine-test button (callout 1) shown in figure 21. A single page prints.

Note

Duplexer test will pull paper from tray 2, but paper must be present in tray 1.

To perform a duplex test, insert paper into tray 1 and tray 2, remove the EIO cover, and use a long, nonconductive object to press the engine-test button shown in figure 21 twice. A duplexed page prints.

WARNING!

Do not use an electrically conductive object to press the engine-test button.

Do not insert any object into the opening next to the power cord socket. This is not the engine-test button.

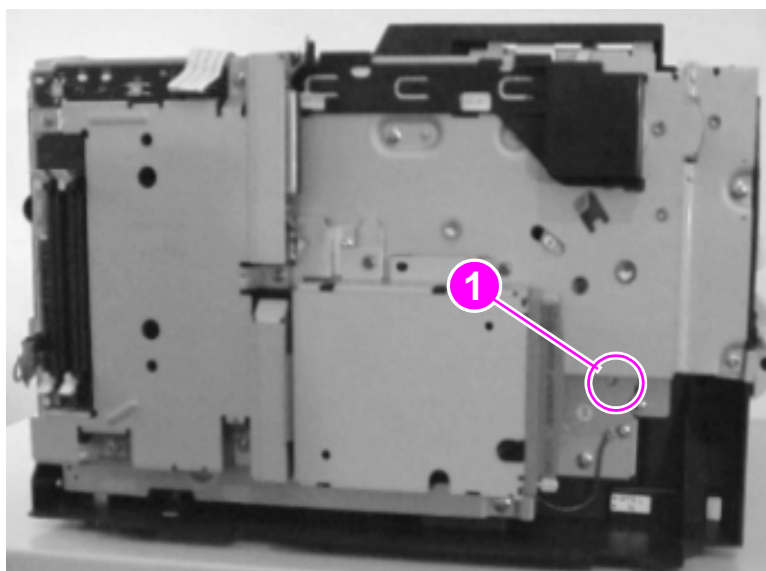


Figure 21. Engine-test button

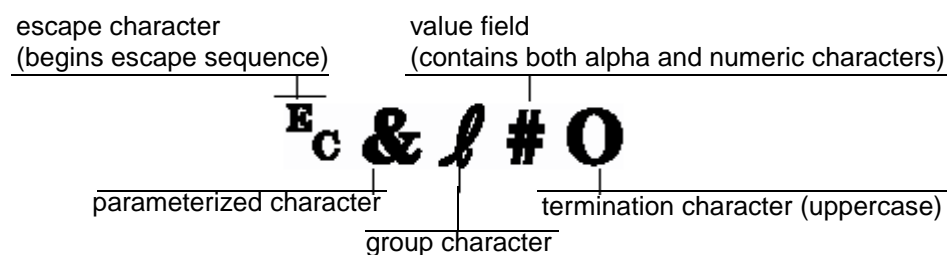
Service mode

In service mode the following can be performed:

- Print a service mode self-test.
- Verify and set the page count. See “Setting the page count” on page 54.
- Set the cold reset default. See “Setting the cold reset default” on page 55.
- Set the demo page = true/false (used to remove the demo page from the service mode self-test).
- Set the diagnostic functions on or off (for software developers use only).

Entering service mode

Use PJL commands to enter service mode and perform various service-mode configurations. See table 21. Users must use the exact character and case specified for PCL printer commands. The following are elements of a typical printer command:



- escape character (begins escape sequence)
- parameterized character
- group character
- value field (contains both alpha and numeric characters)
- termination character (uppercase)

Escape sequences can be combined into one escape sequence string. There are three important rules to follow when combining code:

- 1 The first two characters after the escape character (the parameterized and group characters) must be the same in all of the commands to be combined.
- 2 When combining escape sequences, change the uppercase (termination) character in each individual escape sequence to lowercase.
- 3 The final character of the combined escape sequence must be uppercase.

Entering escape characters

Printer commands always begin with the escape character (E_C). The following table shows how the escape character can be entered from various DOS software applications

Table 20. Escape character table

DOS software	Application entry	What appears
Lotus 1-2-3	Type \027	027
Word Perfect for DOS	Type <27>	<27>
MS-DOS Edit	Hold down Ctrl-P, and press Esc	<--
MS-DOS Edlin	Hold down Ctrl-V, release, then press [^[

Table 21 shows how to use PJI commands to enter service mode and perform various service mode configurations.

Table 21. PJI service mode commands

PJI Command	Description
E _C %-12345X@PJI	Start PJI job
@PJI SET SERVICEMODE=HPBOISEID	Enter service mode
@PJI SET PAGES=0	Set page count [= xxxxx]
@PJI SET SERIALNUMBER=USBBB12345	Set printer serial number (=chassis label serial number)
@PJI SET CRPAPER=LETTER	Set cold reset page size [=letter/A4]
@PJI SET SKIPDEMO=FALSE	Skip demo/PCL type page [=true/false]
@PJI SET DIAGNOSTICS=OFF	Set diagnostics [=OFF/ON] (for ISV use)
@PJI SET SERVICEMODE=EXIT	Exit service mode
DEFAULT PAPER=LETTER	Select user paper-size default
@PJI RESET	Perform PJI reset
E _C %-12345X	Exit PJI mode
E _C Z	Print self-test/configuration page
E _C E	Reset the printer

Setting the page count

The page count is stored in the printer's NVRAM. If it is necessary to replace the formatter PCB, the page count should be reset to the printer's original page count to reflect the age of the print engine. Before removing the old formatter PCB, print a self-test/configuration page to verify the current page count of the printer, if possible. See "Self-test/configuration page" on page 48.

Table 22. Setting the page count

PJI Command	Description
E _C %-12345X@PJI	Start PJI job
@PJI SET SERVICEMODE=HPBOISEID	Enter service mode
@PJI SET PAGES=0	Set page count [= xxxxx]
@PJI SET SERVICEMODE=EXIT	Exit service mode
@PJI RESET	Perform PJI reset
E _C %-12345X	Exit PJI mode
E _C Z	Print self-test/configuration page
E _C E	Reset the printer

Setting the cold reset default

The customization variable will determine the default paper size after a cold reset. This is set to A4/letter at the manufacturer. This variable might need to be reset when the formatter is replaced.

Table 23. Setting the cold reset default

PJL Command	Description
E _C %-12345X@PJL	Start PjL job
@PJL SET SERVICEMODE=HPBOISEID	Enter service mode
@PJL SET CRPAPER=LETTER	Set cold-reset page size [=Letter/A4]
@PJL SET SERVICEMODE=EXIT	Exit service mode
@PJL RESET	Perform PjL reset
E _C %-12345X	Exit PjL mode
E _C Z	Print self-test/configuration page
E _C E	Reset the printer

Resetting the printer

Cold reset

Note

This feature will set all system parameters to the factory defaults.

To perform a cold reset:

- Turn the printer power off.
- Press and hold **Go**.
- Turn the printer power back on and continue to hold **Go** until the **attention** LED is turns on.
- Release **Go**.
- The device LED's will begin cycling from front to rear. The cold-reset process will run until completion and the device will go to the ready state.

NVRAM initialization

This feature will reinitialize NVRAM and set all system parameters to the factory defaults. During the NVRAM initialization process, all button presses will be ignored.

To perform a NVRAM initialization:

- Turn the printer power off.
- Press and hold **Go**.
- Turn the printer power back on and continue to hold **Go** until the **attention**, **ready**, and **Go** LED's turn on.
- Release **Go**.
- The device LED's will begin cycling from font to rear. The NVRAM initialization will run until completion and the device will go to the ready state.

EIO card reset

To perform a EIO card reset:

- Turn the printer power off.
- Press and hold **Go**.
- Turn the printer power back on and continue to hold **Go** until the **attention** LED is turns on.
- Release **Go**.
- The device LED's will begin cycling from front to rear. The cold-reset process will run until completion and the device will go to the ready state.

Network printing

Installing an HP JetDirect EIO card

Step 1 Turn the printer off, and disconnect the power cord.

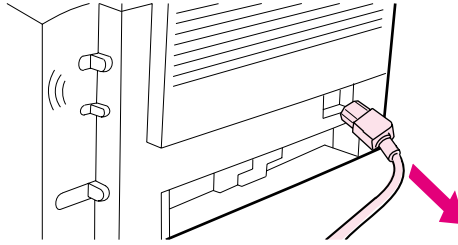


Figure 22. Power cord.

Step 2 Open the interface cable door by pressing on the release tabs. Disconnect all interface cables.

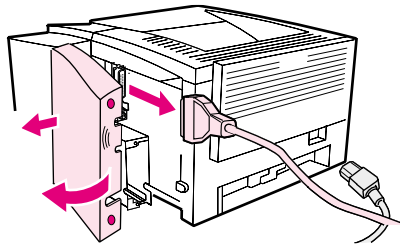


Figure 23. Interface cables.

Step 3 Locate the EIO slot. Firmly insert the HP JetDirect EIO card into the EIO slot. Install the retaining screws.

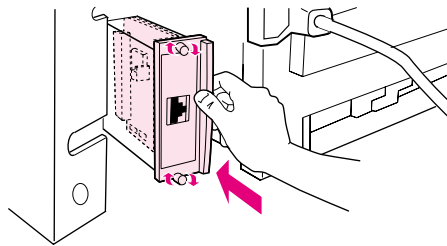


Figure 24. HP JetDirect EIO card.

Step 4 Attach the appropriate network cable to the EIO card.

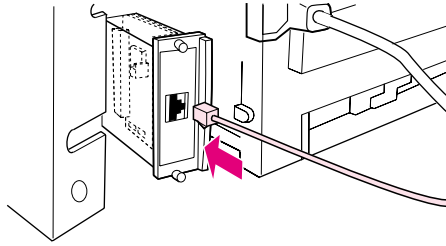


Figure 25. Network cable.

Step 5 Reinstall the interface cable(s), close the interface cable door, reinstall power cord, and turn the printer on.

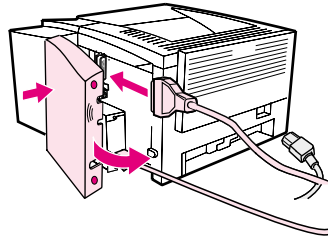


Figure 26. Interface cable door.

Note

Print a self-test/configuration page to verify that the HP JetDirect EIO card appears as an installed option.

Fast Infrared Receiver

The Fast Infrared Receiver (FIR) port is located on the lower right corner of the printer. This port is compliant with the specifications determined by the Infrared Data Association (IrDA). On the right side of the FIR port is a status light that indicates when the port is active. The FIR port transmits data at speeds of up to 4 MB per second. When the infrared (IR) connection is established, the FIR status light comes on. If the connection is broken, or when the print job is complete, the FIR status light goes off.

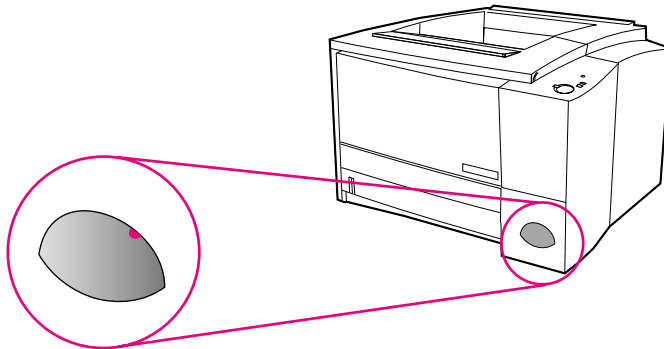


Figure 27. FIR port

Using the FIR port

To use the FIR port, you need the following:

- A computer or personal digital assistant (PDA) equipped with an IrDA-compliant IR port.
- An infrared port driver that allows printing from the computer to the printer using the FIR port and the IrDA communication protocol.
- A computer with a printer driver installed to generate data that the printer can print.

Note

Check with your computer hardware or operating system manufacturer for the correct port driver.

To operate the FIR port, you need to meet the following conditions:

- A portable computer (or other portable device equipped with an IrDA-compliant IR window) aligned within 1 meter (2 to 3 feet maximum) of the HP Fast InfraRed Receiver.
- The IR window must be at an angle of +/- 15 degrees to ensure an effective connection for printing.

4

Printer maintenance

Chapter contents

Service check points	62
Periodic inspection of parts.	62
Cleaning the printer and accessories	63
General cleaning.	63
Internal cleaning	64
Engine cleaning	66
Toner cartridge information	67
Storage	67
Handling instructions	67
Refilled toner cartridges	68
Recycling toner cartridges	68
Toner cartridge weights.	68
Toner cartridge life expectancy	68
Saving toner with EconoMode	68
Redistributing the toner.	69

Service check points

Periodic replacement parts are the parts that should be inspected and if required, replaced at regular intervals. Failure of these parts can seriously affect the printer's performance. These parts should be inspected during a regular service visit near the end of the part's expected life and replaced if found to be worn or damaged.

Periodic inspection of parts

The following parts should be inspected and if required, replaced after approximately 150,000 pages of use:

- fuser assembly
- transfer roller
- separation pads (tray 1, tray 2, and tray 3)
- pickup rollers (tray 1, tray 2, and tray 3)
- output feed rollers (upper and lower)
- transport belts and rollers

See "Removal and replacement" in chapter 6 for procedures to remove and replace these parts.

See "Parts and diagrams" in chapter 8 for the part numbers.

Variables such as media, environment, and usage can cause premature wear of these parts. See "Media specifications" in chapter 2 for information about suitable media, environment, and usage conditions.

Cleaning the printer and accessories

To maintain superior print quality and performance, use the following procedures to clean the printer and the paper-handling accessories thoroughly every time you change the toner cartridge or whenever print-quality problems occur.

General cleaning

WARNING!

Before you begin these steps, turn the printer off and unplug all power cords to avoid shock hazard.

CAUTION

Do not use ammonia-based cleaners on or around the printer. While cleaning the printer, be careful not to touch the transfer roller (located underneath the toner cartridge). Skin oils on the roller can cause print-quality problems.

To prevent damage, do not expose the toner cartridge to light. Place a piece of paper over the top of the toner cartridge to shield it while it is out of the printer.

- Clean the outside of the printer with a water-dampened cloth.
- Clean the inside of the printer with a dry, lint-free cloth:
 - transfer roller
 - tray 1, tray 2, and tray 3 pickup roller
 - tray 1, tray 2, and tray 3 separation pad
 - registration shutter
 - transfer guide unit
 - feed belt/feed guide unit
 - fusing assembly entrance guide

Cleaning spilled toner

Defective toner cartridges can develop leaks. After a jam has occurred, some toner might remain on the rollers and guides inside the printer. The pages that print immediately after the jam can pick up this toner.

Note

To clean skin and clothing if toner spills, remove as much toner as possible with dry tissue, then wash with cold water. Hot water causes toner to permanently set into clothing.

Vacuum specifications

Do not vacuum the printer or any spilled toner using a conventional vacuum. Toner particles used in this product might be too fine for effective vacuuming and could result in damage to conventional vacuums.

A vacuum specifically designed for cleaning toner can be used if it is capable of filtering fine particles (5 microns in diameter).

Internal cleaning

During the printing process, paper, toner, and dust particles can accumulate inside the printer. Over time, this buildup can cause print quality problems such as toner specks or smearing. This printer has an internal cleaning mode that can correct and prevent these types of problems.

WARNING!

Before you begin these steps, turn the printer off and unplug all power cords to avoid shock hazard.

Step 1 Open the top cover.

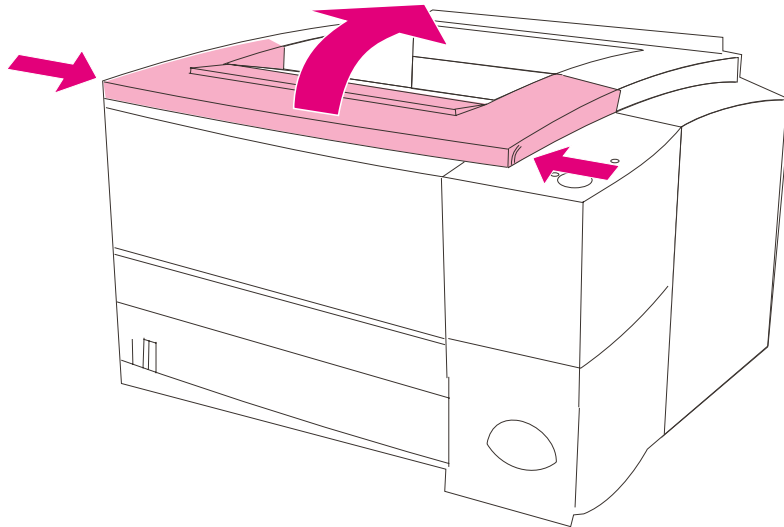


Figure 28. Top cover

Step 2 Remove the toner cartridge.

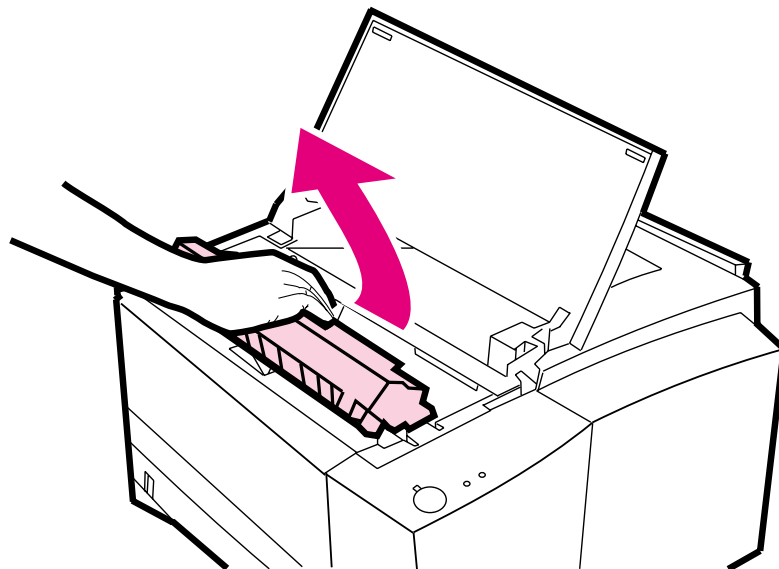


Figure 29. Remove toner cartridge

CAUTION

To prevent damage, do not expose the toner cartridge to light.

- Step 3 With a dry, lint-free cloth, wipe any residue from the paper-path area and the toner cartridge cavity.

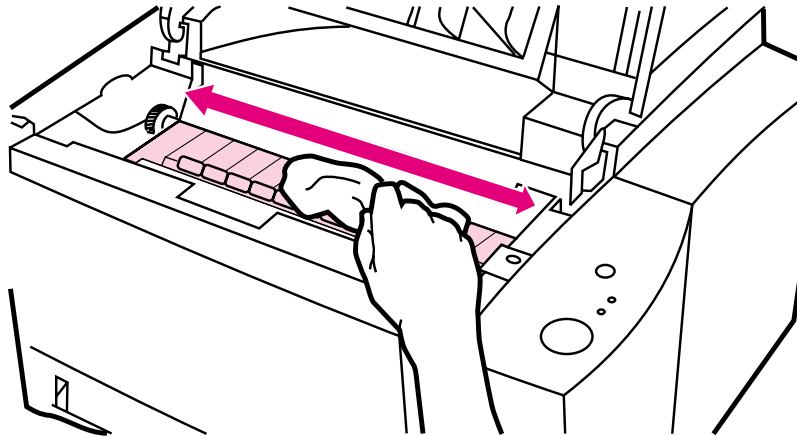


Figure 30. Wipe residue

- Step 4 Replace the toner cartridge and close the top cover. Plug in the power cable, and turn the printer on.

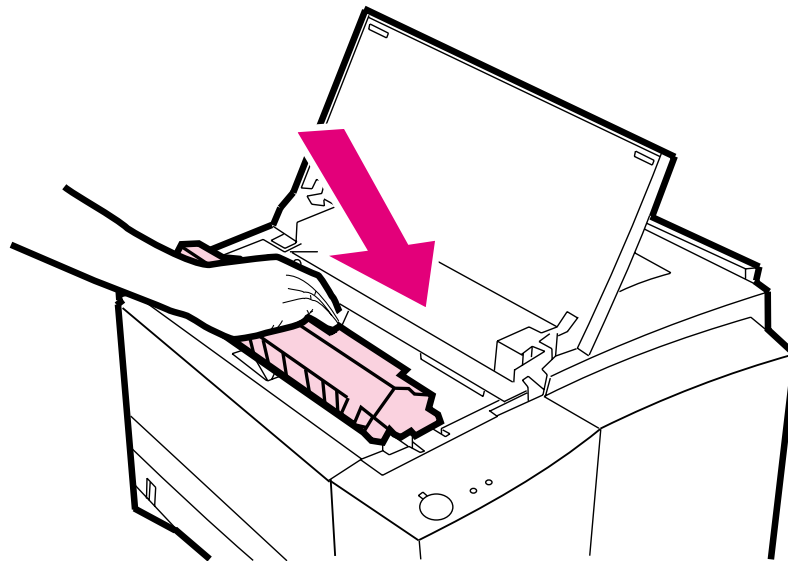


Figure 31. Replace toner cartridge

Engine cleaning

Note

For best results, use a transparency during this process. If a transparency is not available, use copier-grade paper; do not use bond or rough paper.

This process uses a transparency from tray 1 to remove dust and toner from the paper path. Use this process if toner specks or dots appear on printouts. This process will provide a blank page which should be discarded.

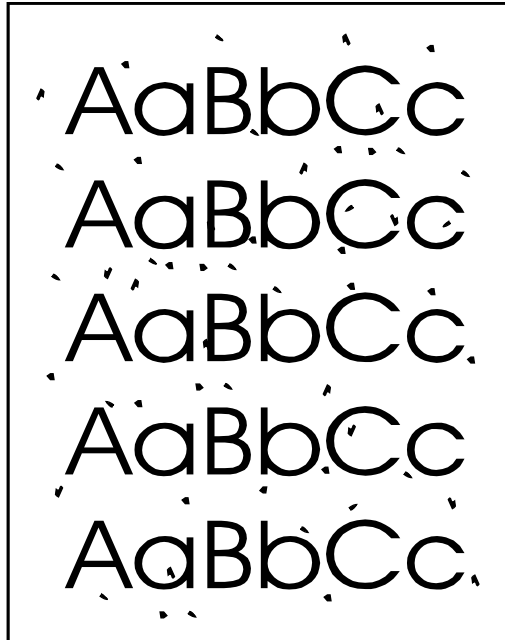


Figure 32. Print sample

Note

During the engine cleaning process, the printer pulls the transparency into the printer and then stops. This is not a jam. The transparency will be slowly stepped through the printer to complete the engine cleaning.

To start engine cleaning

- Step 1 Make sure the printer is turned on and in the ready state. Load a transparency in tray 1.
- Step 2 Press and hold **Go** and **JOB CANCEL** until all lights flash. This will take about 10 seconds. Release the keys when the lights flash.
- Step 3 Press **Go**.
- Step 4 Discard the blank page produced from the engine cleaning process.

Toner cartridge information

Toner cartridges contain components that are sensitive to light, temperature, and humidity. Make sure the user follows the recommendations in this section to ensure the highest quality and longest life of the toner cartridge.

Storage

The toner cartridge (C4096A) should not be removed from its package until installation. The shelf life of a cartridge in an unopened package is approximately 2.5 years. The shelf life of a cartridge in an opened package is approximately 6 months. The expiration date of the toner cartridge is stamped on the cartridge box.

If cartridges are stored, the storage environment should meet the conditions listed in the following table:

Table 24. Storing toner cartridges

Category	Temperature	Humidity
Operating	10 degrees to 32.5 degrees C (50 degrees to 90.5 degrees F)	35 percent to 85 percent RH
Storage	-20 degrees to 40 degrees C (-4 degrees to 104 degrees F)	15 percent to 90 percent RH

If the toner cartridge must be removed from the printer, always store the cartridge:

- inside the protective bag in which it was originally packaged.
- in a dark cabinet, away from direct sunlight.
- correct side up and in a horizontal position (not standing on end).
- in a temperature listed in the table above.
- away from ammonia or other organic solvent fumes.

CAUTION

Never ship the printer with a toner cartridge installed. Excessive vibration during shipping can cause toner to leak, contaminating the printer.

Never expose the toner cartridge to direct sunlight, or to room light. Bright light and direct sunlight can permanently damage a toner cartridge.

Handling instructions

- Before installing a cartridge, evenly distribute the toner. See “Redistributing the toner” on page 69.
- Do not touch the surface of the photosensitive drum in the cartridge. Protect the drum from light and contamination.
- Do not expose the cartridge to unnecessary vibrations or shock.
- Do not expose the photosensitive drum to strong light. Blurred areas on the page might indicate that the drum has been exposed to light for too long. This causes permanent damage to the photosensitive drum. Replace the cartridge.
- Never manually rotate the drum, especially in the reverse direction; it can cause internal damage and toner spills.

Refilled toner cartridges

HP policy on non-HP toner cartridges

Hewlett-Packard Company cannot recommend use of new, refilled, or remanufactured, non-HP toner cartridges. Because they are not HP products, HP cannot influence their design or control their quality.

While Hewlett-Packard Company does not prohibit the use of refilled toner cartridges during the warranty period or while under a maintenance contract, we do not recommend their use for the following reasons:

- Hewlett-Packard has no ability to ensure that a refilled toner cartridge functions at the high level or reliability of a new HP toner cartridge. Hewlett-Packard also cannot predict the long-term effect of the different toner formulations found in refilled cartridges.
- Hewlett-Packard has no control over the print quality of a refilled toner cartridge. The print quality of HP toner cartridges influences the customer's perception of the printer.
- Repairs resulting from the use of refilled toner cartridges might not be covered under the HP warranty or maintenance contract.

Recycling toner cartridges

In many countries, this product's printing supplies (for example, toner cartridge) can be returned to HP through the HP Printing Supplies Environmental Program. An easy-to-use take back component of the program is available in more than 20 countries. Multilingual program information and instructions are included in every new HP LaserJet toner cartridge and consumables box.

For more information, call (1) (800) 340-2445 (U.S. only) or visit the HP LaserJet supplies website:

U.S.: http://www.hp.com/ljsupplies/environment_main.html

Europe: http://www.hp.com/pays/eur_supplies/english/planetpartners

Customers outside the United States should call their local HP sales and service office for further information regarding availability of the HP Printing Supplies Environmental Program.

Toner cartridge weights

The approximate weight of a toner cartridge when full and empty is as follows:

- Full: 1105 grams (39.07 ounce)
- Empty: 900 grams (31.77 ounce)

Toner cartridge life expectancy

The life of the toner cartridge depends on the amount of toner used in each print job. When printing text at 5 percent coverage, an HP LaserJet 2200 toner cartridge lasts an average of 5,000 pages. This assumes the default print density setting and that EconoMode is off (default settings).

Saving toner with EconoMode

Toner cartridge usage can be extended by using the printer's EconoMode feature. EconoMode can be turned on or off through the driver or HP LaserJet device configuration.

- EconoMode functions in portrait orientation only.
- EconoMode does not function at 1200 dpi.
- Some software applications might refer to EconoMode as "draft mode."

Redistributing the toner

When toner is low, faded or light areas might appear on a printed page. To temporarily improve print quality, redistribute the toner. The cartridge will need to be replaced soon. Use the following procedures to redistribute toner.

WARNING!

Avoid reaching too far into the printer. The adjacent fusing area can be hot.

CAUTION

To prevent damage, do not expose the toner cartridge to light.

Step 1 Remove the toner cartridge from the printer.

Step 2 Rotate the toner cartridge and gently shake from side to side to redistribute the toner.
(Do not tip the cartridge on end, or it might leak.)

If toner gets on clothing, wipe it off with a dry cloth and wash clothing in cold water. (Hot water sets toner into fabric.)

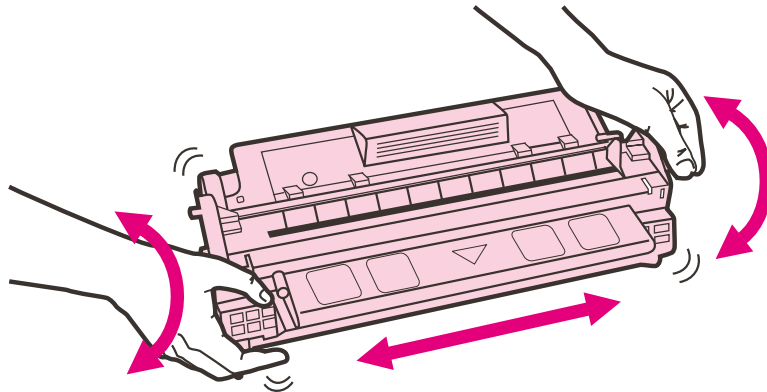


Figure 33. Redistributing the toner

5

Theory of operation

Chapter contents

Basic operations	72
Power-on sequence	72
Basic print-period operating sequences	73
Printer timing.	74
Printer functionality and operation.	75
Formatter system	76
Formatter hardware	77
Formatter subsystem	77
Engine control system.	79
Engine control subsystems.	80
Image formation system	82
Pickup/feed system.	89
Sheet feeder	91
Media detection.	93
Media detection.	93
Media size detection.	93
Jam detection	94
Pickup sensors	94
Delivery sensors	94
Reversing sensors	95
Duplexer sensors	95
Paper feed sensor.	95

Basic operations

Power-on sequence

The sequence from power-on until the printer enters the standby (STBY) mode:

- 1 Power-on.
- 2 CPU initialization.
- 3 Formatter communication start.
- 4 Fusing heater drive.
- 5 Main motor, Reverse motor, and fan drive—Reads the paper-detecting status of each sensor in the printer immediately before driving the main motor, and assesses a jam if residual media is detected.
- 6 High-voltage control—Detects the cartridge presence and cleans the transfer charging roller after the primary charging ac bias is turned on.
- 7 Residual paper check—After starting the main motor, detection of residual media in the printer resumes. If residual media is detected, the printer assesses a jam or automatically delivers the residual media, according to the situation.
- 8 Failure or abnormality check—Detects door-open, fan-motor, and fuser unit failures during the other sequence periods.

Basic print-period operating sequences

The operation sequences of this printer are controlled by the microprocessor (CPU) on the engine controller printed circuit board (PCB). The table below describes the purpose of periods from power-on until the main motor stops when printing is complete.

Table 25. Print period descriptions

Period	Timing	Purpose	Remarks
WAIT (wait period)	From power-on until completion of the main-motor initial drive.	Clears the drum surface potential and cleans the transfer charging roller.	Detects whether the cartridge is installed or not.
STBY (standby period)	From the end of the WAIT period until the print instruction command is input from the formatter, or from the end of the LSTR period until the print instruction command is input from the formatter, or until the power is switched on or off.	Maintains the printer in a ready state.	
INTR (initial rotation period)	From input of the print instruction command from the formatter until the media reaches the top-of-page sensor.	Stabilizes the sensitivity of the photosensitive drum in preparation for printing.	
PRINT (print period)	From the end of the INTR period until 1.2 seconds after the top-of-page sensor detects the trailing edge of the media.	Forms an image on the photosensitive drum in preparation for printing.	
LSTR (last rotation period)	From completion of printing until the main motor stops rotating.	Delivers the final page out of the printer and cleans the transfer charging roller.	If a print instruction command is received from the formatter, the printer bypasses the WAIT and STANDBY periods and immediately enters the INTR period.

Printer timing

(Unit: Seconds)

Operation	WAIT	STBY	INTR	PRINT	LSTR	STBY
1 Print start command						
2 /VDO and VDO signals					← 0.06	
3 Main motor (M1903)					1.2	
4 Cooling fan (FM905)						
5 Scanner motor			Normal scanner speed			
6 Cassette pick-up solenoid (SL1908)			← 0.77	← About 0.026 ← About 2		
7 Multi-purpose tray pick-up solenoid (SL2908)			← 1.3	← About 2.5		
8 Paper feeder pick-up solenoid (SL2001/2002)				← About 1.2		
9 Top-of-page sensor (PS2305)						
10 Primary voltage (AC)	← 2.5	← 2.24		← 1.2		← About 1.22
11 Primary voltage (DC)					← 1.21	
12 Developing bias (AC)			← About 0.03	← About 0.13 ← About 0.04	← About 0.101	
13 Developing bias (DC)			← About 0.57		← About 0.107	
14 Transfer voltage (plus)			← About 0.41	← About 0.28 ← About 0.41	← About 0.28	
15 Transfer voltage (minus)	0.59			← About 0.32 ← About 0.32	← About 0.85	
16 Delivery sensor (PS2301)						
17 Fixing heater		← 0.35				← 5
18						

Figure 34. Timing chart

Printer functionality and operation

There are four major systems that make up the HP LaserJet 2200 printer and allow it to operate. Each system works independently to accomplish its task, but must be coordinated with the other systems to successfully produce a printed page. Understanding these systems, their function, and how they interact with each other is the key to troubleshooting any problem. See "Troubleshooting process" in chapter 7 for detailed information about the HP LaserJet 2200.

The HP LaserJet 2200 printer's four major systems are as follows:

- "Formatter system" page 76—Receives print data from the host, processes the image, and transfers it to the engine control system. The formatter system also provides the interface between the user and the printer (control panel).
- "Engine control system" page 79—Monitors and controls all of the printer's mechanical and electrical subsystems. It is the center of the printer's operation.
- "Image formation system" page 82—Produces the actual physical image on the page.
- "Pickup/feed system" page 89—Moves paper or other print media through the printer from one of the selected input trays (tray 1, 2, or 3) to the selected output bin (top or rear).

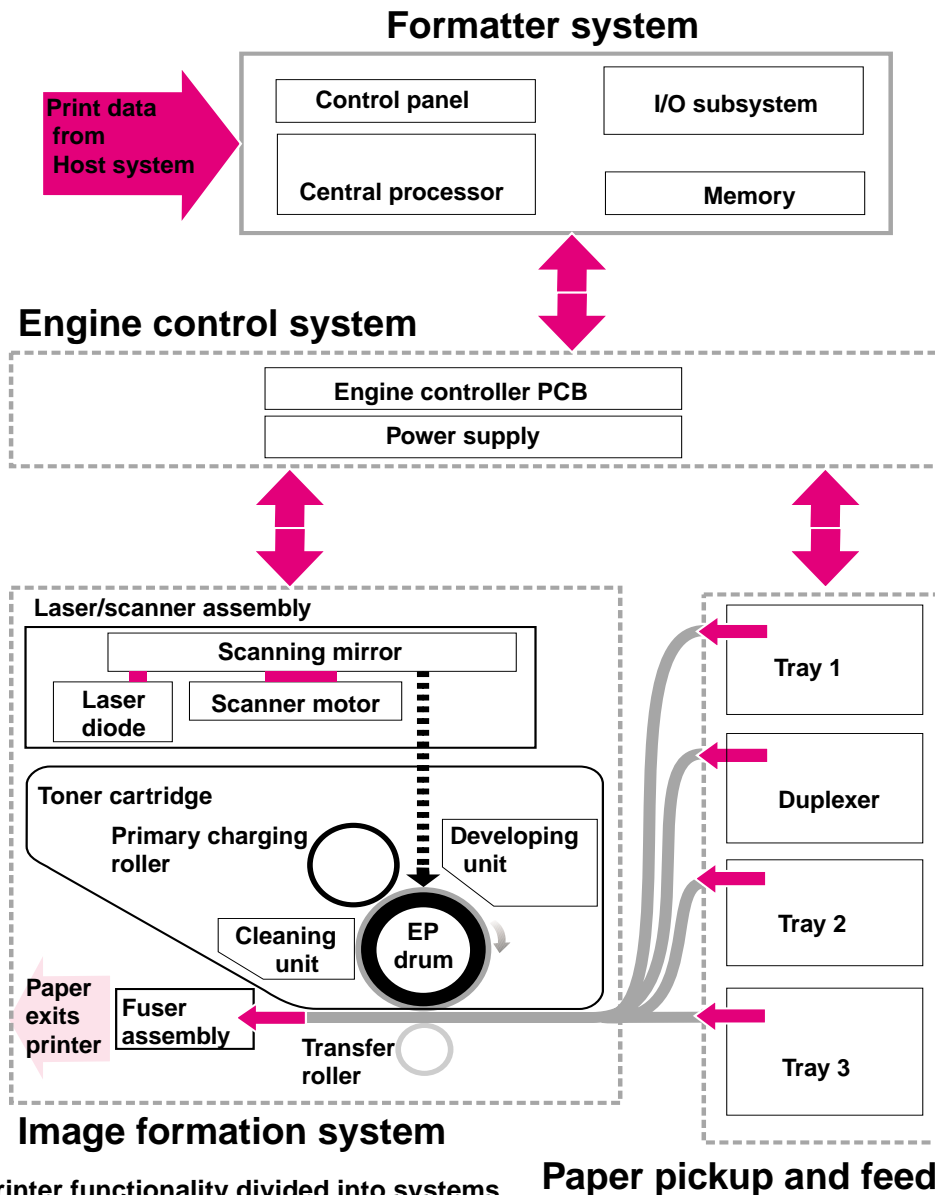


Figure 35.

Printer functionality divided into systems

Paper pickup and feed system

Formatter system

The formatter system is responsible for the following:

- receiving and processing data from the various printer interfaces
- monitoring control panel input and relaying printer status information (through the control panel and the I/O)
- developing and coordinating data placement and timing with the print engine
- storing font information and macros
- communicating with the host computer

The formatter receives data from the I/O and converts it into a dot image. The formatter then sends a print signal to the engine controller assembly. The engine controller assembly synchronizes the image-formation system with the paper-feed system, and signals the formatter to send the print-image data. The formatter sends the print-image data (dots) in the form of a video signal and the printing process begins.

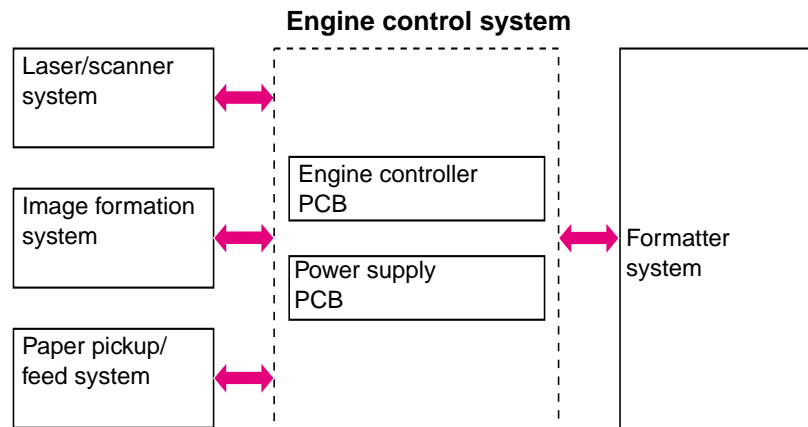


Figure 36. **Formatter system**

Formatter hardware

The formatter system contains the following:

- **CPU**—Is a 133 Mhz Motorola Coldfire V4 with a 66 MHz bus.
- **Read-only memory (ROM)**—Stores the dot patterns of internal character sets (fonts) in addition to storing microprocessor control programs.
- **Random-access memory (RAM)**—Stores printing and font information received from the host system, and can also serve to temporarily store a full page of print-image data before the data is sent to the print engine. Increasing the RAM will increase performance of graphic intense printing operations but it will not increase the I/O buffer space or cause the printer to print more pages per minute.
- **Nonvolatile memory (NVRAM)**—Stores information about the I/O and print environment configuration. The printer keeps the contents of NVRAM when the power is turned off or disconnected. (As in other HP LaserJet printers, downloaded fonts and macros are saved in conventional RAM and are lost when power is turned off.)
- **Interfaces**
 - **Parallel interface**—Receives incoming data through its IEEE1284 B interface connector. The IEEE1284 B interface provides high-speed, two-way communication between the printer and the host, letting the user change printer settings from the host computer.
 - **USB**—Receives incoming data through its universal serial bus (USB) connector. The USB interface provides high-speed, two-way communication between the printer and the host, letting the user change printer settings computer.
 - **EIO**—The PCI-based Enhanced Input/Output (EIO) slots support a wide range of print servers and other add-on devices. HP JetDirect EIO cards provide high-speed, two-way communication for network printing over Ethernet, Ethernet and LocalTalk, Token Ring, or Fast Ethernet networks.
 - **FIR**—This port is compliant with the specifications determined by the Infrared Data Association (IrDA). On the right side of the FIR port is a status light that indicates when the port is active. The FIR port transmits data at speeds of up to 4 MB per second. When the infrared (IR) connection is established, the FIR status light comes on. If the connection is broken, or when the print job is complete, the FIR status light goes off.

Formatter subsystem

Resolution Enhancement technology (300 and 600 dpi only)

Contains circuitry for Resolution Enhancement technology (REt), which modifies the standard video dot data on its way to the engine controller assembly to produce smoothed black-to-white boundaries. The default is on.

Print-density adjustment

Affects the line width (boldness) of the print image. This is accomplished by varying the developer dc bias, which controls the amount of toner applied to the photosensitive drum. Settings range from 1 (lightest) to 5 (darkest). The default is 3.

EconoMode

Uses approximately 50 percent less toner than standard mode printing by reducing the dot density. Users can adjust EconoMode, which can also be thought of as draft mode, through software applications. The default setting is off. EconoMode does not affect print speed or memory usage.

Memory management

This printer uses various methods to conserve and make the most of available memory. Several of these methods are explained below.

Memory Enhancement technology (MEt)

MEt enhances the printer's standard memory through a variety of font and data compression methods. MEt also automatically compresses fonts for desktop publishing applications. MEt is available in all printing modes (PCL 5e, PCL 6, and HP PS emulation). When printing graphics, MEt analyzes each page as it is being printed and automatically applies a variety of compression techniques to print the complete page at the correct resolution.

Image Adapt

Image Adapt uses a compression technique to allow printing of full-page graphics using the printer's base memory. Image Adapt is only used in PCL 5e (PCL 6 and HP PS emulation do not require Image Adapt). The available settings are auto, on, and off. The default is auto.

If Image Adapt is used some data might be lost. To see if there has been some loss of graphic detail, print a self-test page and check the Image Adapt Used line in the Printer Information section. If the printer invoked Image Adapt since the last time the self test was printed (or the last time the printer was turned off and on), that line reads "Image Adapt Used: Yes."

Page Protect

A page's complexity (rules, complex graphics, or dense text) might exceed the printer's ability to create the page image fast enough to keep pace with the engine's printing process. If a page is too complex, it might print in parts (for example, the top half of data on one page and the bottom half on the next page). Some print data loss is likely in these instances, and the printer's **ATTENTION** LED flashes.

Page Protect allows the formatter to create the entire page image in memory before moving the paper through the printer. This process ensures that the entire page is printed. The default is off, which provides the best performance. Page Protect should only be enabled when necessary.

Printer Job Language overview

Printer Job Language (PJP) is an integral part of the printer's configuration, in addition to the standard Printer Command Language (PCL). PJP allows the printer to perform functions such as:

- **Two-way communication** with the host computer through an IEEE1284 B interface connection. The printer can tell the host such things as the control panel settings and allow the control panel settings to be set from the host.
- **Dynamic I/O switching** allows the printer to be configured with a host on each I/O. The printer can receive data from more than one I/O simultaneously until the buffer is full. This can occur even when the printer is offline.
- **Context-sensitive switching** allows the printer to automatically recognize the personalities (PS or PCL) of each host and configure itself to serve that personality.
- **Isolating print environment settings** from one print job to the next. For example, if a print job is sent to the printer in landscape mode, subsequent print jobs only print in landscape if they are formatted for landscape printing.

For more information, see the *HP LaserJet 2200 Series Printer Software Technical Reference*. The complete PJP Status Code listing is contained in the appendix of the *Printer Job Language Technical Reference*. Also see HP's website at www.hp.com.

Engine control system

The engine control system consists of the engine controller PCB and the power supply assembly. The engine controller PCB coordinates all print engine activities. The figure below illustrates the block diagram of this system, and the description of each subsystem follows.

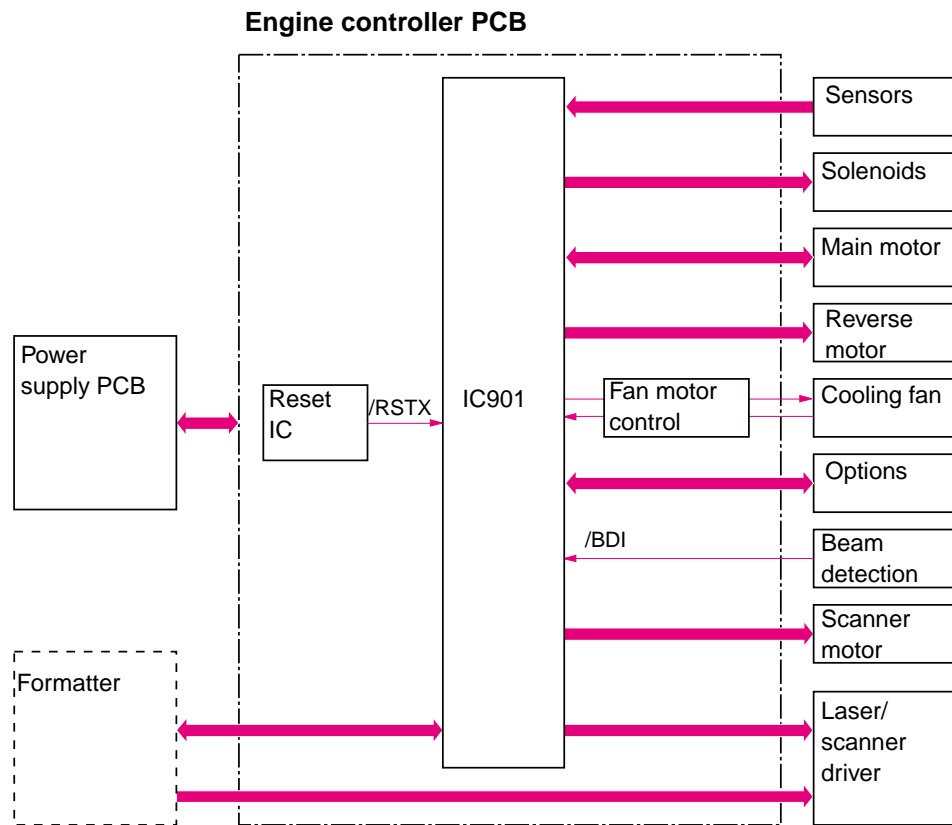


Figure 37. Engine control system

The engine control system directly controls the following subsystems:

- laser/scanner control
- paper-feed control
- microswitch control
- motor control
- fuser-assembly control
- power supply and control

Engine control subsystems

Laser/scanner control

Based on information received from the engine controller PCB, the formatter sends a direct signal to modulate the laser diode on and off. The modulated laser beam strikes the surface of a rotating scanning mirror, then a focusing lens directs the beam onto the photosensitive drum.

The printing system synchronizes the process by continuously monitoring the beam detect signal.

Paper-feed control

The engine controller PCB controls paper motion by continuously monitoring the various paper-sensor levers, and coordinating the timing with the other print processes and systems. See "Pickup/feed system" on page 89.

Microswitch control

The engine controller PCB controls the following microswitches and reports any errors to the formatter:

- Top door and toner cartridge switch. Activated if the top door is open. The toner cartridge is detected electronically.
- Engine test switch. Activated manually through an access hole on the side of the gear plate. This switch causes the print engine to perform a self-test diagnostic, bypassing the formatter. See "Engine test" in chapter 7.

Motor control

The engine controller PCB controls the following motors and reports any failures to the formatter. See "Basic print-period operating sequences" on page 73.

- Main motor. Rotates during interim period (following initial power on), print, and last rotation, or when the top cover is opened or closed.
- Scanner motor. Operates during the interim period and the print period.
- Fan motor. Rotates at full speed while the main motor is rotating and continues rotating for 30 seconds after the main motor stops. Rotates at full speed, half speed, and then stops during power-on and the standby period.
- Reverse motor. A stepping motor responsible for changing the paper direction. It is clockwise/ counterclockwise rotation capable.

Fuser-assembly control

The fuser assembly's film contains a heater. The engine controller PCB controls the fuser heater during the following temperature modes. See "Basic print-period operating sequences" on page 73.

- initial
- print
- between-page
- postprint

The engine controller PCB maintains the fuser at a temperature of 195 degrees C (383 degrees F) during print temperature mode. If the fuser system overheats, reaching about 220 degrees C (428 degrees F), a relay opens the power circuit to the fuser heater, causing a fuser error message. If the fuser system exceeds 230 degrees C (446 degrees F), the thermal fuse melts, cutting off power to the fuser assembly. The engine controller PCB monitors the fuser heater temperature via a thermistor.

Power supply and control

- The power switch supplies ac power to the low-voltage power supply circuit when it is turned on. This circuit supplies dc voltage (+24V, +5V, +3.3V) to the main motor, laser/scanner unit, interlock switch, formatter, solenoids, paper feeder, high-voltage power supply, and formatter.
- The dc voltage supplied to the high-voltage power supply circuit is interrupted when the top cover is open.
- The overcurrent/overvoltage protection circuit in the low-voltage power supply automatically turns off the output voltage when an overcurrent condition occurs because of a short or abnormal voltage on the load side.
- When input power is turned off then on, the protection circuit automatically resets. The low-voltage power supply circuit also contains a fuse that shuts off the power supply to the circuit when overcurrent conditions occur. See “Engine control system” on page 79.

In response to the engine controller PCB, the high-voltage power supply circuit supplies dc and ac voltage to the various parts of the image formation system.

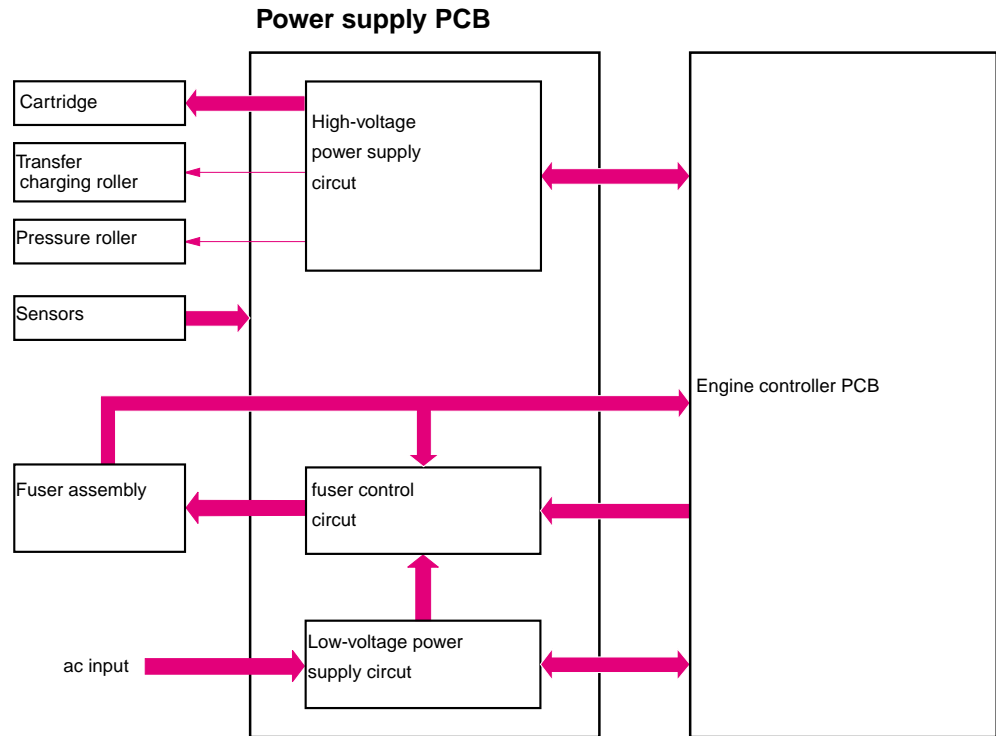


Figure 38. Power supply PCB

Image formation system

The image formation system is the central hub of the printer. The system consists of the cartridge, transfer charging roller, and fuser unit.

When a print command is sent from the formatter, the engine controller drives the main motor to rotate the photosensitive drum, primary charging roller, developing cylinder, transfer charging roller, and pressure roller.

The primary charging roller uniformly applies negative charges to the photosensitive drum surface. To form a latent image on the photosensitive drum, the laser beam modulated by the video signals is exposed on the photosensitive drum surface.

The toner on the developing cylinder develops the latent image formed on the photosensitive drum into a visible image, which is transferred onto media by the transfer charging roller. The transferred toner is changed to a permanent image by heat and pressure in the fuser unit. The cleaning blade scrapes off residual toner on the photosensitive drum. The potential on the drum is made uniform by the primary charging roller in preparation for the next latent image.

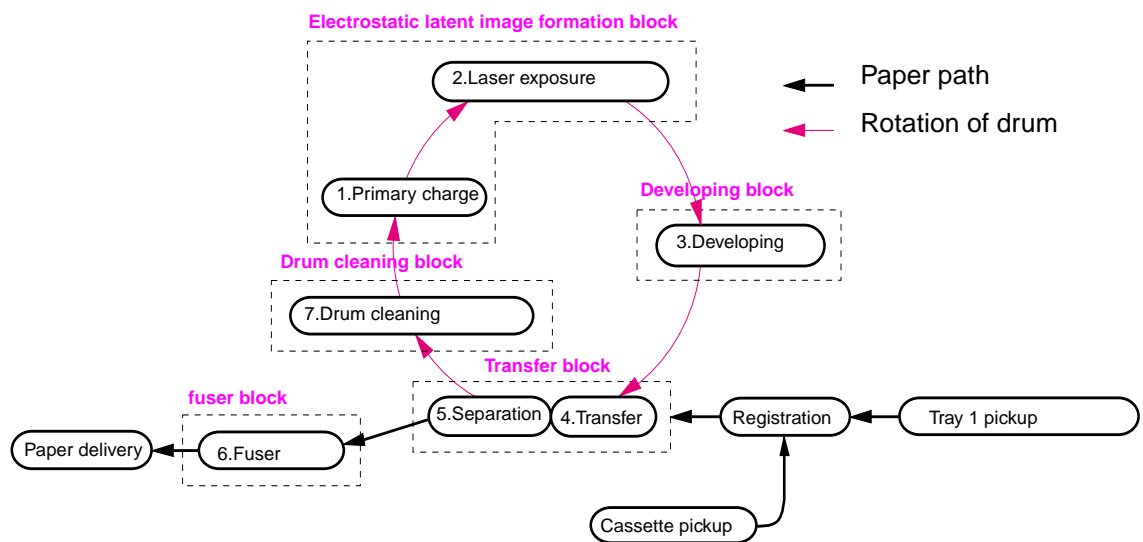


Figure 39. Image formation system

Print process

The toner cartridge contains the cleaning, conditioning, and developing stages of the image formation process. These components are subject to wear and are built into the replaceable toner cartridge. This eliminates the need for a service call when replacement is required.

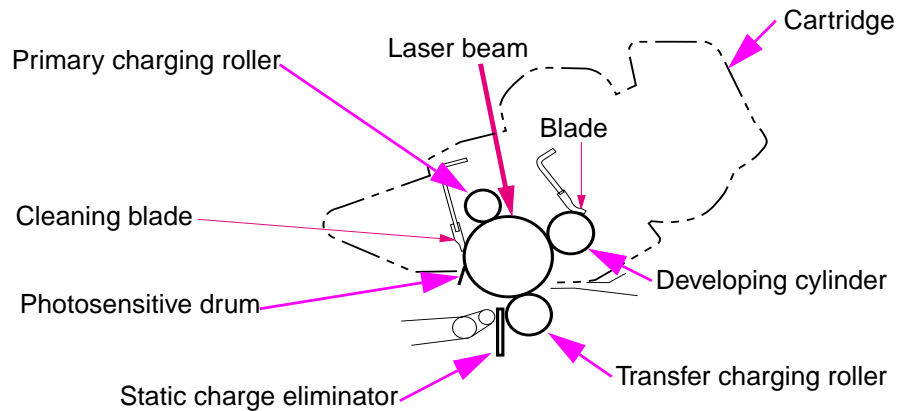


Figure 40. Toner cartridge

Photosensitive drum

The photosensitive drum is the heart of the image formation system. This drum's special properties allow an image to form on the drum's surface and then transfer to paper. The drum is an aluminum cylinder coated with an organic-photoconductive material (OPC). The photosensitive drum's aluminum base is electrically connected to ground. The OPC material becomes electrically conductive when exposed to light. Areas not exposed to light remain nonconductive and maintain their negative charge.

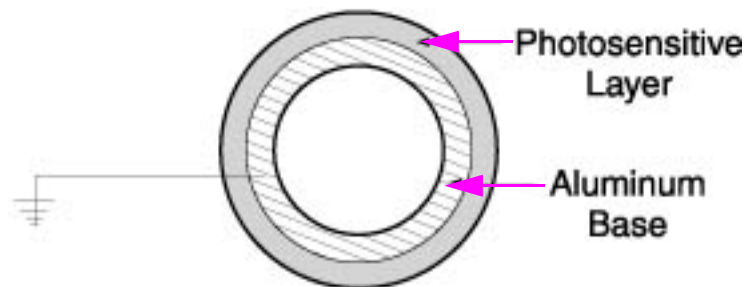


Figure 41. Photosensitive drum

Cleaning stage

At the cleaning stage, the photosensitive drum's surface is prepared to hold an image. During printing, the drum rotates completely several times per printed page. Before forming the image for a given section of print, a cleaning blade removes toner from the previous rotation of the drum. The toner cartridge stores waste toner and prevents it from being used in later print jobs.

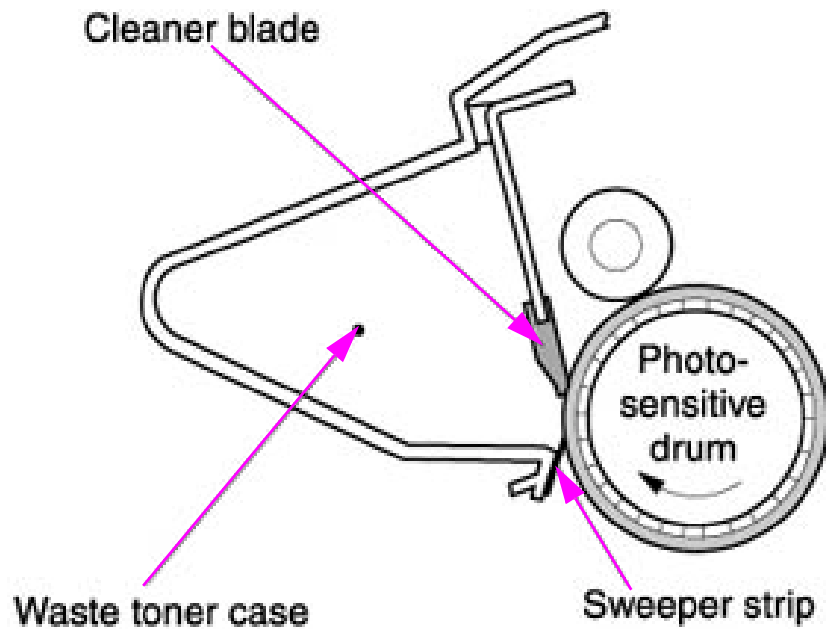


Figure 42. Cleaning stage

Conditioning stage

At the conditioning stage, the primary charging roller applies a uniform negative charge on the photosensitive drum's surface. The primary charging roller erases any residual charges and maintains a constant potential on the drum's surface. In addition, the primary charging roller creates a uniform negative potential on the drum's surface.

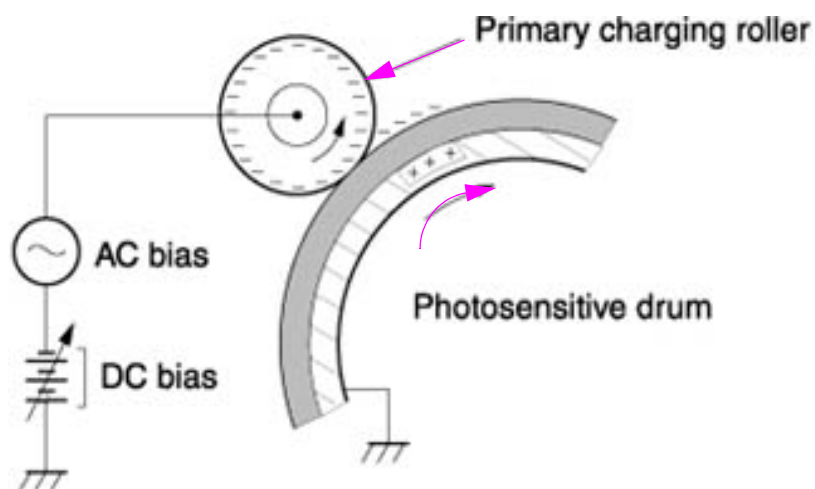


Figure 43. Primary charging roller

Writing stage

At the laser/scanner assembly, two laser beams focus onto the photosensitive drum and discharge the drum's negative potential. This creates a latent electrostatic image, which later is developed into a visible image.

Two small laser diode beams shine onto a rotating, six-sided mirror. As the mirror rotates, the beams reflect off the mirror and sweep the page from left to right.

A set of lenses and mirrors focuses the horizontal sweeping beams through the beam access slots in the rear of the toner cartridge and onto the photosensitive drum. Because the beams sweep the entire length of the drum while the drum rotates, the entire circumference of the drum can be covered. Each successive sweep of the beams is offset 1/1200th of an inch. This is how the printer achieves its 1200 dpi resolution.

At the beginning of each sweep (before the beams reach the drum), the beam detect mirror reflects the beams. The momentary pulse of light goes to the engine controller PCB, which converts the light to an electrical signal used to synchronize other activities in the printer and to diagnose problems with the laser/scanner assembly.

Portions of the drum not exposed to the laser still contain the uniform negative potential (placed there by the primary charging roller), but those portions exposed to light have been discharged to ground to form the latent electrostatic image.

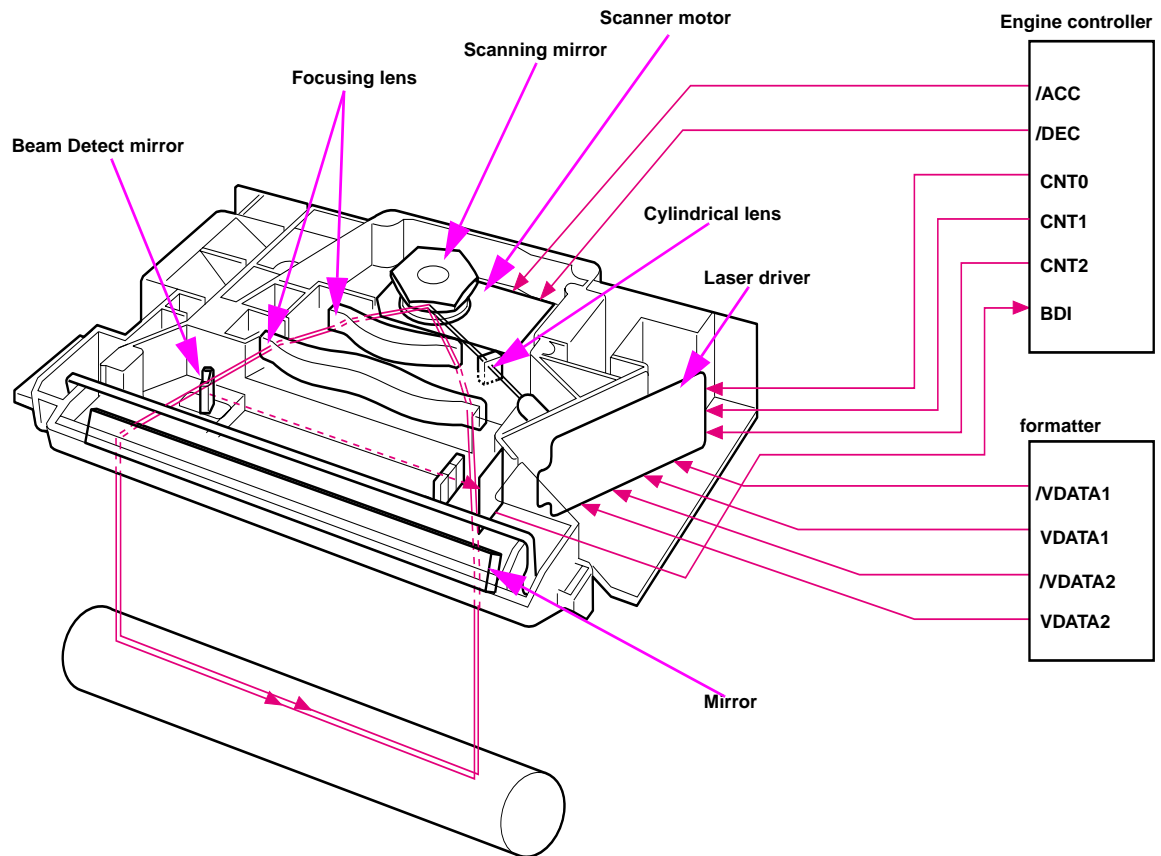


Figure 44. Laser/scanner system

Developing stage

At the developing stage, the latent electrostatic image is developed into a visible image on the photosensitive drum. The developing cylinder consists of a metallic cylinder that rotates around a fixed magnetic core inside the toner cavity. Toner is a powdery substance made of black, plastic resin bound to iron particles, which the magnetic core of the developing cylinder attracts. A rubber blade brushes the toner on the developing cylinder to a uniform thickness.

Note

Charges in the photosensitive drum's exposed areas are shown as positive in figure 45 even though they are actually negative. This means that the photosensitive drum potential is higher than that of the developing cylinder.

To obtain a negative surface charge, the toner particles rub against each other and the developing cylinder which is connected to a negative dc supply. The discharged (grounded) areas of the drum exposed to laser light attract the negatively charged toner. The negatively charged (non-exposed) areas repel the toner. An ac potential is applied to the developing cylinder to decrease the attraction between the toner and the cylinder's magnetic core and to increase the repelling action of toner against the areas of the drum not exposed to laser light. This ac potential improves density and contrast.

The print density setting (through the software) adjusts the developing cylinder's dc bias to change the force of attraction between the toner and drum.

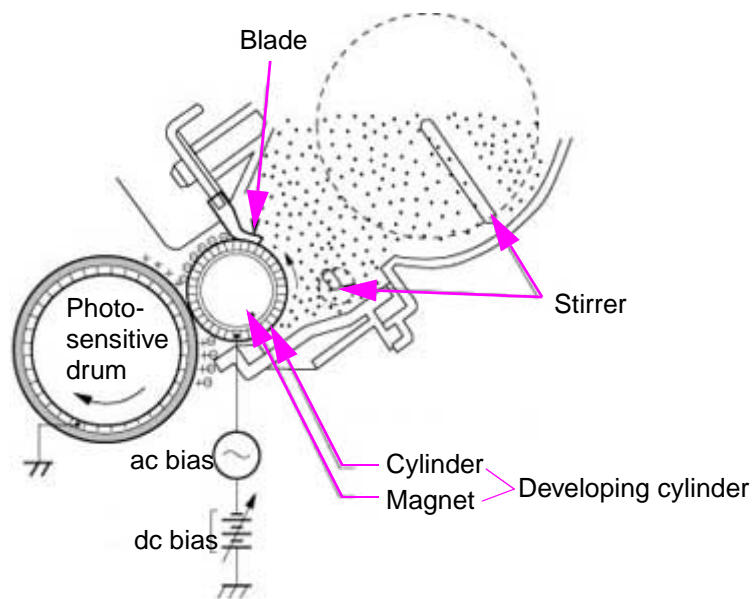


Figure 45. Latent electrostatic image formation

Transferring stage

At the transferring stage, the toner image on the photosensitive drum's surface is moved to the paper. The transfer roller applies a positive charge to the back of the paper, causing the paper to attract the negatively charged toner on the drum's surface.

The drum's small radius combined with the stiffness of the paper causes the paper to peel away from the drum. The static charge eliminator helps separate the paper from the drum by weakening the attractive forces between the negatively charged drum surface and the positively charged paper. Without this help, thin paper might wrap around the drum. The static charge eliminator also prevents droplets on the printed image at low temperature and humidity. After separation, the paper moves to the fuser station and the drum rotates to the cleaning and conditioning stations.

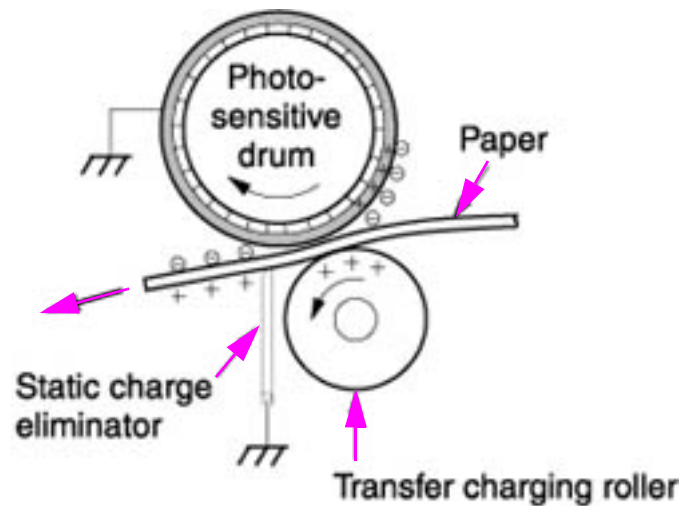


Figure 46. Transferring the toner image on the drum

Fuser stage

At the fuser stage, heat and pressure fuse the toner to the paper to produce a permanent image. The paper passes between a fuser film and a pressure roller. The fuser film melts the toner while the pressure roller compresses it into the paper.

To prevent the toner from dispersing during the fuser stage, this printer applies a negative dc voltage to the fuser film via the pressure roller shaft. A negative charge is applied to the surface of the paper, which improves the adhesion force of the toner particles to the paper and prevents dispersion of the toner particles.

The fuser heater comes up to fuser temperature very quickly and thus does not require any power while the printer is on STBY. This feature saves power while virtually eliminating the warm-up period (less than 10 seconds).

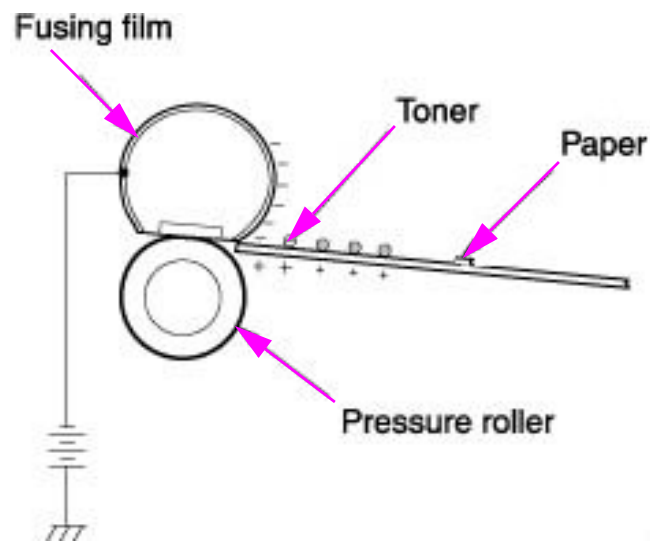


Figure 47. Fuser film and pressure roller

Pickup/feed system

When the formatter sends a print command to the engine controller PCB, the main motor and scanner motor start rotating and the fuser heater temperature control starts.

The paper feed system automatically picks print media from tray 1, tray 2, or tray 3 (if installed) and delivers it to the registration roller. Before the media reaches the registration roller, the separation pad separates any excess sheets of media, and the registration shutter corrects the media skew.

After the top-of-page sensor detects the leading edge of the page, the engine controller PCB sends a signal to the formatter. This signal functions as a synchronization between the engine controller PCB and the formatter. This synchronization allows the leading edge of the image on the photosensitive drum to match the leading edge of the page. After the transferring stage of the image formation process, the paper is fed to the fuser assembly by the feed belts.

The delivery sensor detects the exiting paper, which is usually fed to the top or rear output bin unless duplex is enabled.

To print duplex, this printer prints one side of paper, transports it to the face-down tray once, and then reverses the paper by feeding it back to the duplex feed unit.

The face-up sensor detects paper delivered face-down, with one side printed.

The delivery sensor detects the trailing edge of the paper, then signals the engine controller. The engine controller rotates the reverse motor counterclockwise to send the paper to the duplex feed unit.

The reversed paper sensor receives the paper, then signals the engine controller to turn the duplexer solenoid on. The paper is transported by the oblique roller to the registration roller. If next paper is picked up, the duplex-fed paper stops at the specified position. The top page sensor senses the next paper, the specified period of time passes, then the duplex-fed paper is retransported.

The retransported paper is printed with the other side and delivered to the face-down tray.

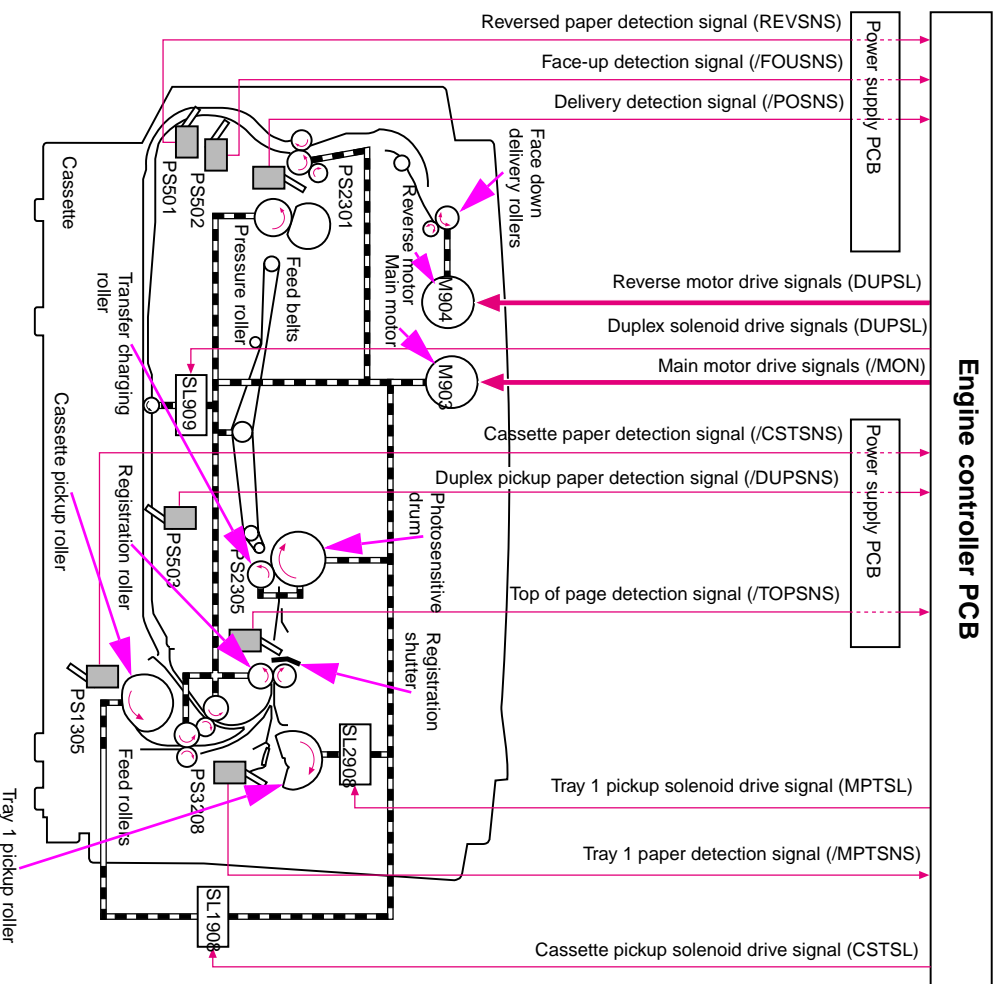


Figure 48.

Pickup/feed system

- PS501: Reversed paper sensor
- PS503: Duplex pickup paper sensor
- PS2301: Delivery sensor
- PS3208: Tray 1 paper sensor
- SL1908: Cassette pickup solenoid
- PS502: Face-up sensor
- PS1305: Cassette paper sensor
- PS2305: Top-of-page sensor
- SL909: Duplex solenoid
- SL2908: Tray 1 pickup solenoid

Sheet feeder

There are two optional sheet feeders: the 250-sheet feeder and the 500-sheet feeder.

The sheet feeders are driven by the printer and controlled by the printer's engine controller. The engine controller drives the solenoid at a necessary timing through the sheet feeder PCB. The paper sensor detects media.

The sheet feeder picks up media loaded in the cassettes and transports it to the printer.

The flow of media is illustrated in figure 49 (the 500-sheet paper feeder shown).

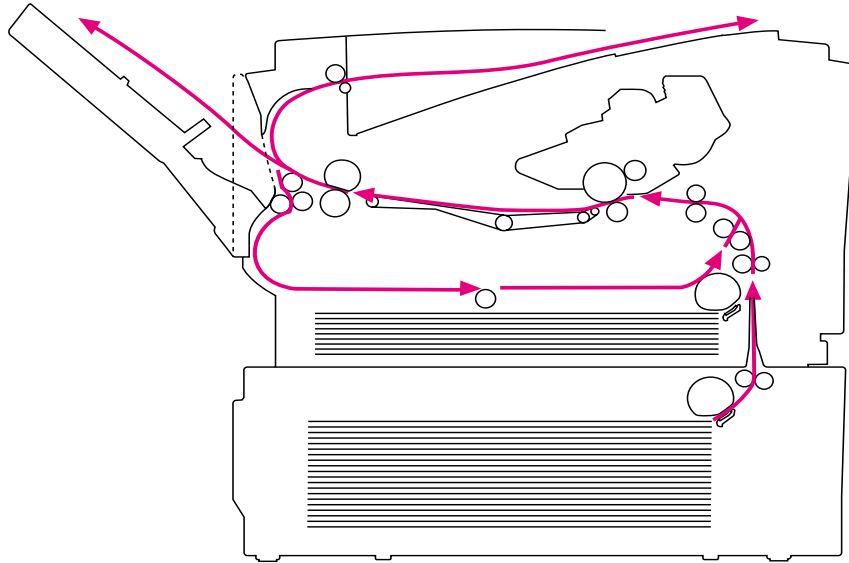


Figure 49. Pickup feed paper-path

The main motor (M903) drives sheet feeder through the use of gears.

When a print command is received from the formatter, the main motor (M903), reverse motor (M904), and scanner motor start rotating. The heating element temperature begins to rise.

The sheet feeder pickup solenoids (SL2001, SL2002) are turned on when the following three requirements are met:

- the main motor has been driven for 0.35 seconds.
- the scanner motor has reached the specified rotation number.
- the heating element temperature has been brought to the specified temperature, or the specified period of time has elapsed after start of the temperature control.

SL2001 and SL2002 transmit the main motor's rotation to the pickup roller. The pickup roller makes a rotation to pick up media in the cassette.

The separation pad separates the media and transports it to the printer. The media goes through the transfer, separation, and fuser/delivery blocks, and is delivered to the selected tray.

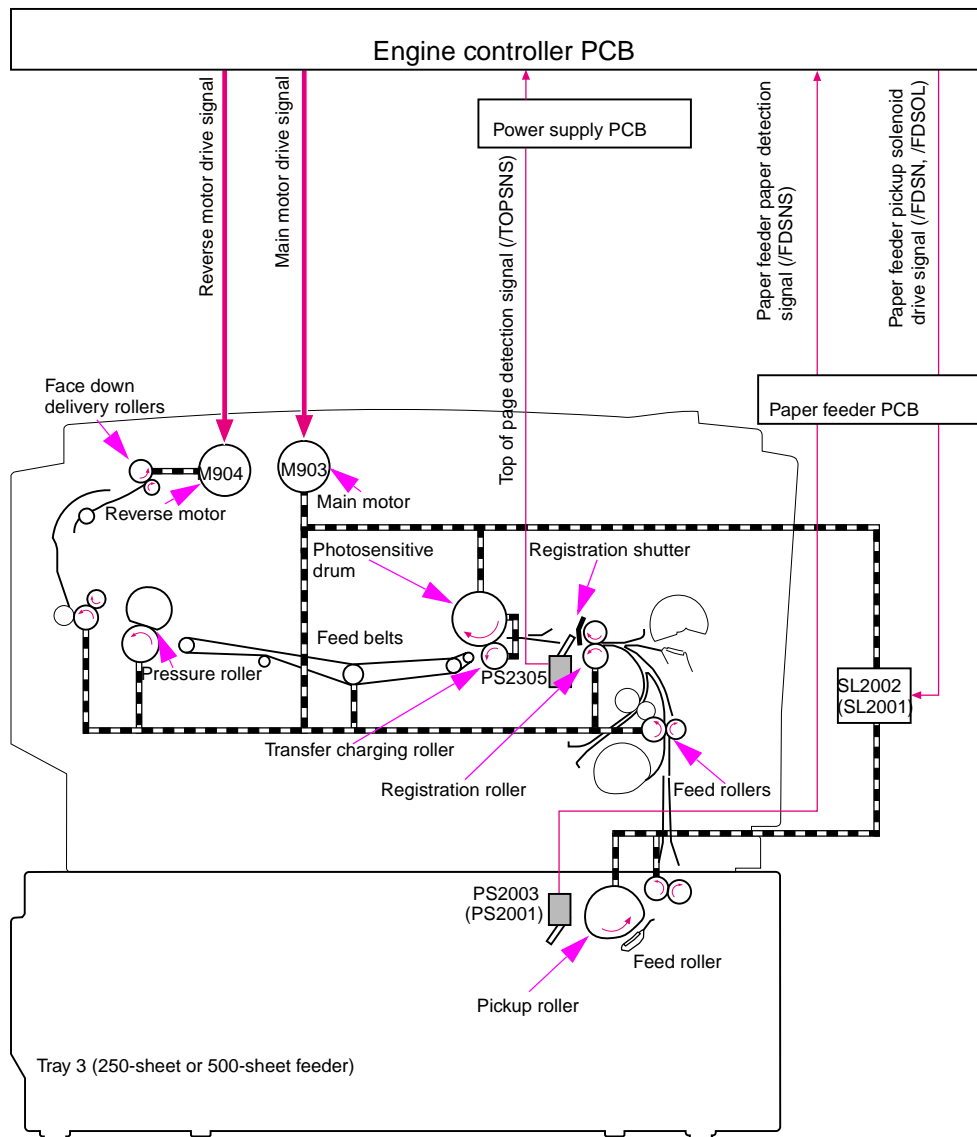


Figure 50. Pickup feed

PS2305: Top-of-page sensor (printer)

PS2003: Paper feeder paper sensor (500-sheet)

SL2002: Paper feeder pickup solenoid (500-sheet)

PS2001: Paper feeder paper sensor (250-sheet)

SL2001: Paper feeder pickup solenoid (250-sheet)

Media detection

Media detection

The model for media detection is essentially the same for all three trays. The paper sensor levers shown below detect the presence of media in the trays. If the sensor does not detect any media, the formatter illuminates the display LED until media is added.

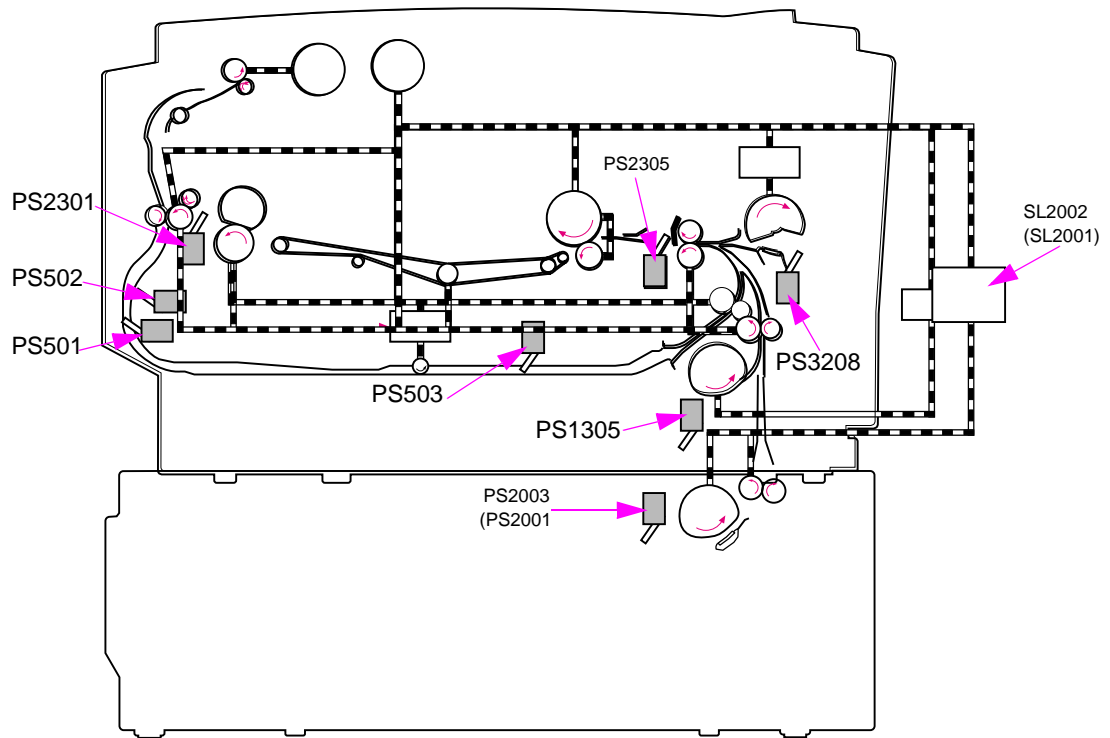


Figure 51. Media detection sensors

PS2305: Top-of-page sensor (printer)

PS2003: Paper feeder paper sensor (500-sheet)

SL2002: Paper feeder pickup solenoid (500-sheet)

PS501: Reversed paper sensor

PS503: Duplex pickup paper sensor

PS2301: Delivery sensor

PS2001: Paper feeder paper sensor (250-sheet)

SL2001: Paper feeder pickup solenoid (250-sheet)

PS502: Face-up sensor

PS1305: Cassette paper sensor

PS3208: Tray 1 paper sensor

Media size detection

The HP LaserJet 2200 printer does not contain a media size detection mechanism; therefore, the printer cannot detect the size of media set in the trays. The printer detects the media size by measuring the time from when the top-of-page sensor detects the leading edge of the page until the trailing edge of the page clears the sensor.

Jam detection

The presence of media and paper-feed condition are detected by:

- top-of-page sensor (PS2305)
- delivery sensor (PS2301)
- reversed paper sensor (PS501)
- duplexer pickup paper sensor (PS503)

A jam is detected by the CPU checking for the presence of media through sensors at the timing stored in the CPU.

If the CPU determines a jam, it stops the print operation and notifies the formatter of a jam.

Pickup sensors

Pickup delay jam

This printer performs retry control to readdress the pickup delay jam caused by pickup error. Pickup operation is conducted a maximum of twice at the all pickup sources except for the duplex feed unit.

If the top-of-page sensor (PS2305) cannot detect the media leading edge within a specified period of time (T) the printer performs the pickup operation again. If PS2305 cannot detect the media leading edge within the specified period of time (T), a jam is indicated.

- Paper pickup from the tray1: T=about 2.5 seconds
- Paper pickup from the cassette: T=about 3.0 seconds
- Paper pickup from the paper feeder: T=about 4.4 seconds
- Paper pickup from the duplexer feed unit: T=about 4.5 seconds

Pickup stationary jam

- A. When WAIT period starts—a pickup stationary jam is assessed if the top-of-page sensor detects media when the WAIT period starts.
- B. During media feeding—a pickup stationary jam is assessed if the top-of-page sensor (PS2305) does not detect the trailing edge of the media within 3.8 seconds after detecting the leading edge.

Delivery sensors

Delivery delay jam

A delivery delay jam is assessed if the media does not reach the delivery sensor (PS2301) within a specified period of time (T) after the top-of-page sensor (PS2305) detects the leading edge.

- paper 270 mm or more: T=about 2.6 seconds
- paper 200 mm to 270 mm: T=about 2.7 seconds
- paper less than 200 mm: T=about 4.6 seconds

Delivery stationary jam

- A. When WAIT period starts—a delivery stationary jam is assessed if the delivery sensor (PS2301) detects media when the WAIT period starts.

- B. During media feeding—a delivery stationary jam is assessed if the delivery sensor (PS2301) does not detect the trailing edge of the media within a specified period of time (T) after the top-of-page sensor (PS2305) detects the trailing edge.
 - paper 200 mm or more: T=about 2.7 seconds
 - paper less than 200 mm: T=about 5.2 seconds
- C. When a pickup delay jam occurs—the printer enters the last rotation period to deliver the jammed media. A delivery stationary jam is assessed if the delivery sensor (PS2301) does not detect the trailing edge of the media within 8 seconds after the completion of the forced laser emission.
- D. During pressure roller cleaning—a delivery stationary jam is assessed if the delivery sensor (PS2301) does not detect the trailing edge of the media within 8 seconds after the 35th feed operation.

Reversing sensors

Reversing delay jam

A reversing delay jam is assessed if the reversed paper sensor (PS501) does not detect the leading edge of the media within 3.9 seconds after the reversing motor starts rotating.

Reversing stationary jam

A reversing stationary jam is assessed when the reversed paper sensor (PS501) detects media after duplex pickup operation has been performed for about 0.77 seconds.

Duplexer sensors

Duplexer pickup delay jam

A duplexer pickup delay jam is assessed if the duplexer pickup paper sensor (PS503) does not detect media within 4.9 seconds after the reversed paper sensor (PS501) detects the leading edge.

Duplexer pickup stationary jam

A duplexer pickup stationary jam is assessed if the duplexer pickup paper sensor (PS503) detects media after about 3.4 seconds has passed since the reversed paper sensor (PS501) detected the trailing edge.

Paper feed sensor

Paper feeder jam detection

Jam detection for the paper feeders during the pickup and feed operations is same as that of the printer. For jam detection, see "Pickup delay jam" on page 94.

6

Removal and replacement

Chapter contents

Removal and replacement strategies	99
Required tools	99
Toner cartridge removal and replacement	100
Remove the toner cartridge	100
Cover and tray removal and replacement	101
Remove tray 3	101
Remove the cassette from tray 2	101
Remove I/O cover	102
Remove EIO card	102
Remove DIMM cover	103
Remove rear cover	104
Remove top cover	106
Remove left cover	109
Remove tray 1	110
Internal disassembly and assembly	113
Remove transfer roller	113
Remove DIMM	115
Remove formatter PCB	116
Remove EIO shield and guide	117
Remove fuser assembly	118
Remove fuser-film heater assembly	121
Remove pressure roller	123
Remove duplexer tray	124
Remove duplexer media guide	125
Remove power supply assembly	126
Remove upper output delivery roller	129
Disassemble the upper output delivery roller	130
Remove lower output delivery rollers	131
Remove laser/scanner assembly	132
Remove transport belts and rollers	134
Remove ribbon cable harness	136
Remove duplexer reverse motor	137
Remove printer drive assembly	138
Remove engine controller assembly	139
Remove main motor	140
Remove motor plate	141
Remove printer drive assembly gears	143
Remove tray 1 pickup roller	144
Remove tray 1 pickup roller assembly	146
Remove tray 1 separation pad assembly	149
Remove tray 1 paper-sensor lever	150
Remove tray 1 solenoid	152
Remove tray 2 pickup roller assembly	153

Replace tray 2 pickup roller	156
Remove tray 2 pickup roller and refeeder assembly	157
Remove tray 2 solenoid	160
Remove duplexer drive gears and solenoid	161
Remove registration assembly	162
Remove tray 3 assembly connector	164
Remove cooling fan	165
Remove toner-cartridge guide	166
Remove dc bias voltage contacts (leaf springs)	168
Tray 3 disassembly and assembly	170
Remove tray 3 (250-sheet feeder) cassette	170
Remove tray 3 (250-sheet feeder) pickup roller	171
Remove tray 3 (250-sheet feeder) feeder drive assembly	172
Remove tray 3 (250 sheet-feeder) drive solenoid	174
Remove tray 3 (500-sheet feeder) cassette	175
Remove tray 3 (500-sheet feeder) pickup roller	176
Remove tray 3 (500-sheet feeder) feeder drive assembly	177
Remove tray 3 (500 sheet-feeder) drive solenoid	179

Removal and replacement strategies

This chapter documents removal and replacement of field replaceable units (FRUs) only.

Replace parts in the reverse order of their removal. If replacement requires difficult or critical installation procedures, notes are provided with detailed special instructions.

WARNING!

To avoid serious injury, unplug the power cord from the power outlet before servicing the printer. Certain functional checks must be performed during troubleshooting with power supplied to the product. However, the power supply should be disconnected during disassembly.

Never operate or service the printer with the protective cover removed from the laser/scanner assembly. The reflected beam, although invisible, can damage eyes.

The clip gasket attached to the formatter's radio frequency interference (RFI) shield contains nickel. Do not touch the clip gasket with bare hands. Repair technicians should wear gloves to handle this gasket. Be advised in accordance with European Union Directive 76/769/EEC that ingestion of water-soluble nickel salts can cause nausea, vomiting, and diarrhea.

The printer might have sharp sheet metal edges. Exercise caution when working on the printer.

CAUTION

The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

To install a self-tapping screw, first turn it counterclockwise to align it with the existing thread pattern, then carefully turn clockwise to tighten. Do not overtighten. If a self-tapping screw-hole becomes stripped, repair the screw-hole or replace the affected assembly.

Always remove the toner cartridge before removing or replacing assemblies and parts.

Note

Note the lengths, diameters, and locations of screws. Be sure to use them in their original locations during reassembly.

Note

Incorrectly routed or loose wire harnesses can interfere with other internal components and become damaged or broken. Frayed or pinched harness wires can be difficult to find. When replacing wire harnesses, always use provided wire loops, lance points, or wire-harness guides.

Required tools

The following tools are required used to remove and replace assemblies detailed in this chapter:

- Phillips #2 screwdriver with magnetic tip
- Small flatblade screwdriver
- Needle-nose pliers
- ESD mat

Toner cartridge removal and replacement

Remove the toner cartridge

Step 1 Open the toner cartridge door.



Figure 52. Open the toner cartridge door

Step 2 Grasp the toner cartridge and pull it back and up to remove it.



Figure 53. Remove the toner cartridge

Cover and tray removal and replacement

Remove tray 3

Step 1 If installed, lift the printer up and off the sheet-feeder assembly.



Figure 54. Remove tray 3 (500-sheet feeder shown)

Remove the cassette from tray 2

Step 1 Position the printer as shown above.

Step 2 Firmly grasp the tray 2 cassette, and slide it out and away from the printer.



Figure 55. Remove cassette from tray 2

Remove I/O cover

Step 1 Push in the two tabs (callout 1) on the back of the I/O cover.

Step 2 Rotate the I/O cover away from the printer.

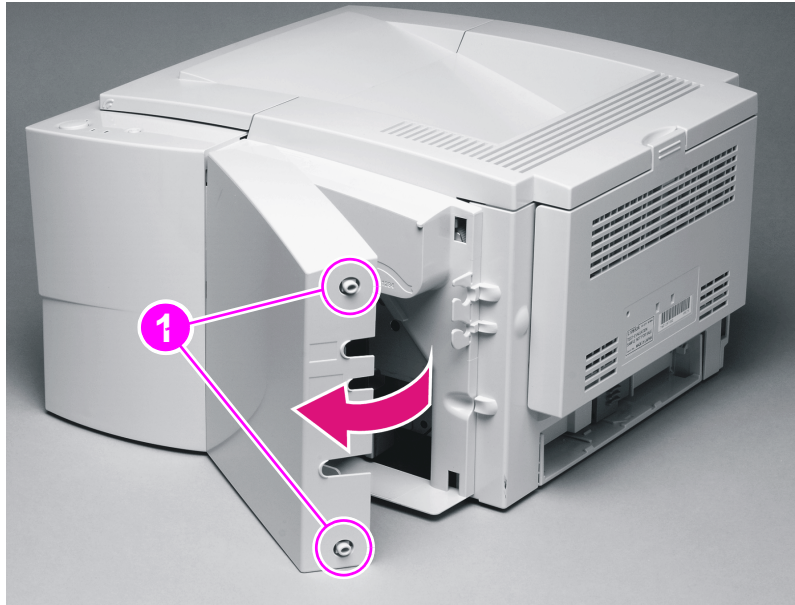


Figure 56. Remove the I/O Cover

Remove EIO card

Step 1 Remove two mount screws (callout 1).

Step 2 Grasp the EIO card, and pull it out of the connector.

Note

Do not remove the Radio Frequency Interference (RFI) clip if it is installed.

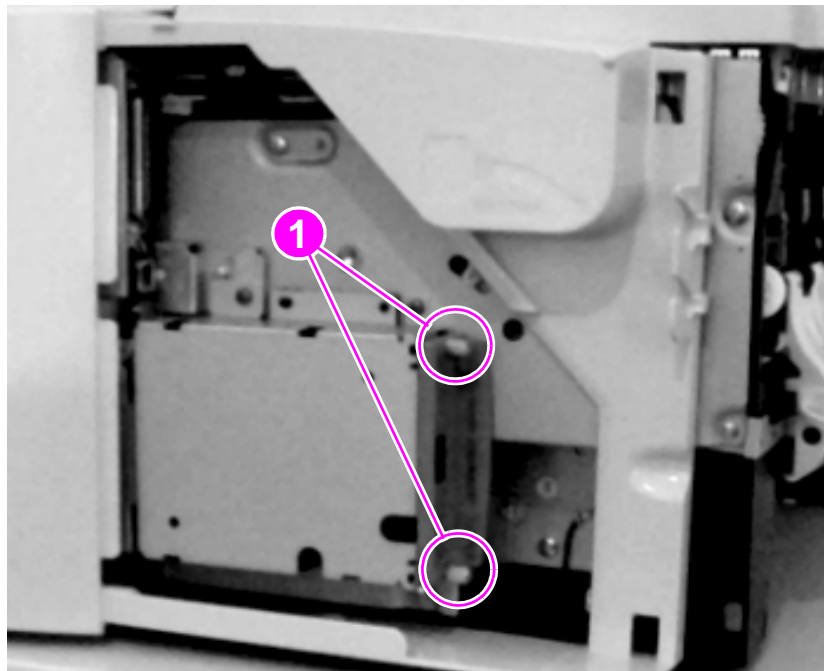


Figure 57. Remove the EIO card

Remove DIMM cover

Step 1 Open the toner cartridge door.

Step 2 Press and hold the release button (callout 1).

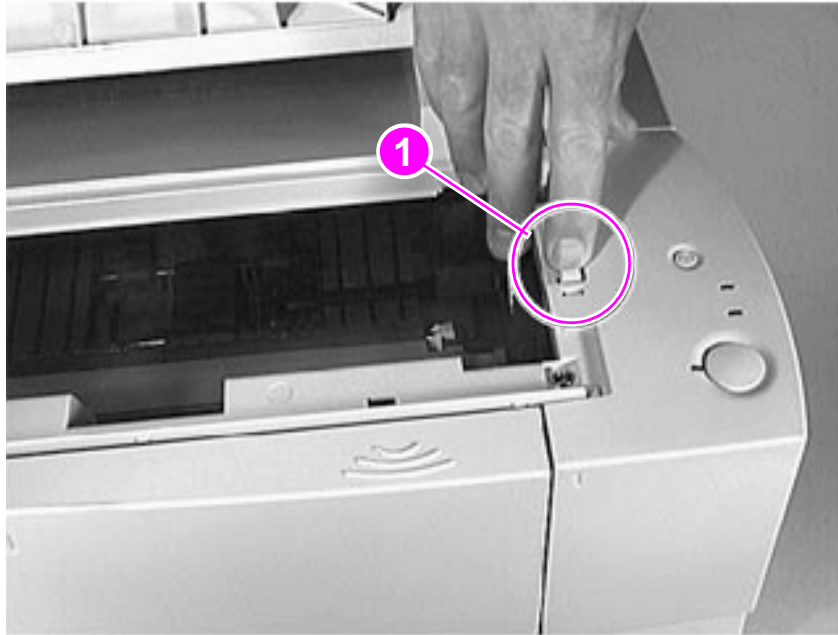


Figure 58. DIMM cover release button

Step 3 Slightly shift the cover forward (toward the front of the printer) and then outward away from the printer.

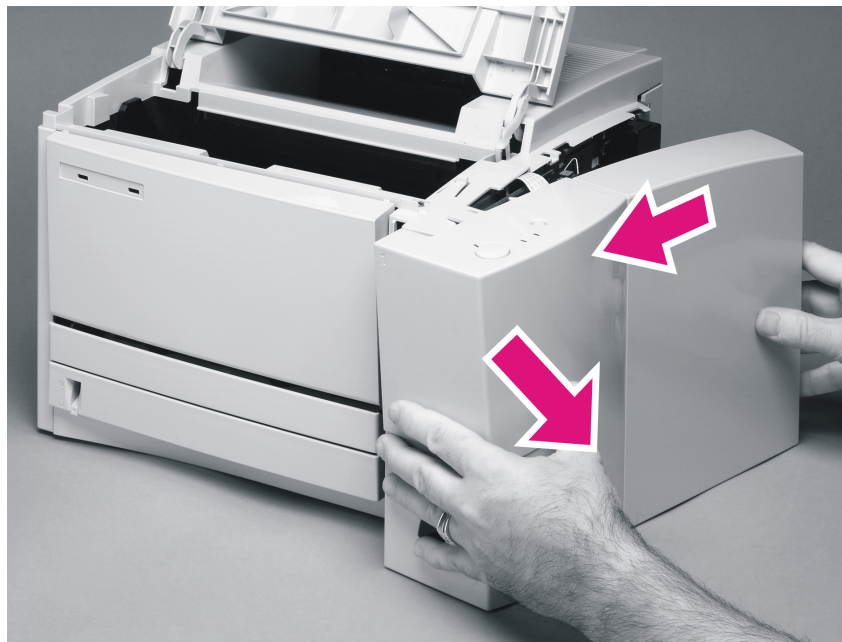


Figure 59. Remove DIMM cover

Remove rear cover

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.

Step 2 Open the rear output bin and release the diverter pivot pins (callout 1). Let the open door rest on the work surface.

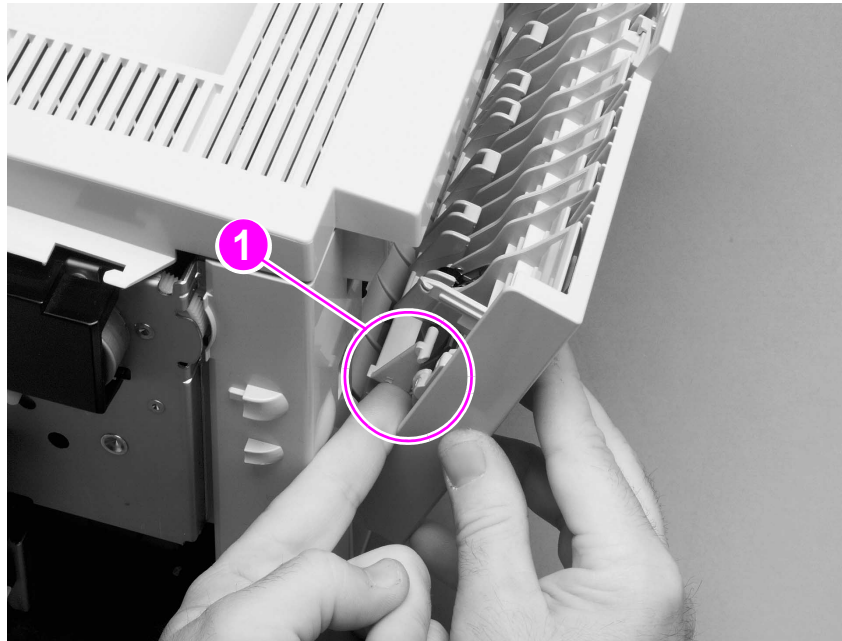


Figure 60. Disengage the diverter locking pins

Step 3 Remove the two mounting screws (callout 1).

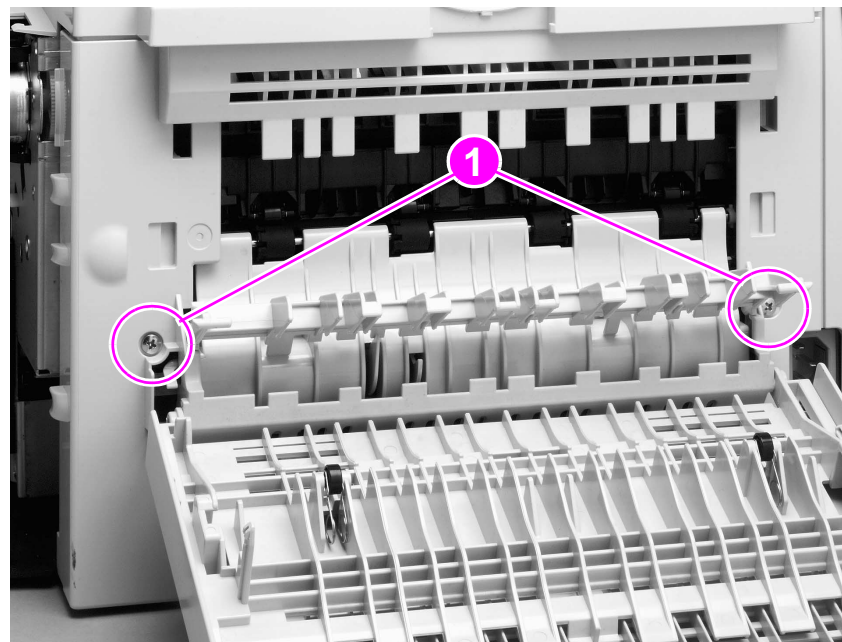


Figure 61. Rear cover mounting screws

- Step 4 Raise the door to engage the retaining locking bar pivot pins and leave the door open.
- Step 5 Unlatch the two rear cover retaining tabs located inside the tray 2 slide area.

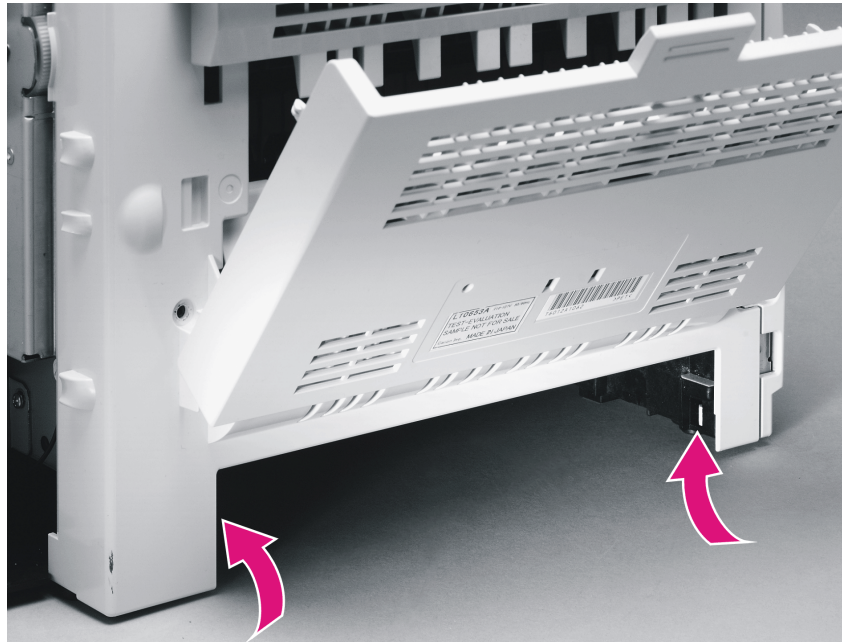


Figure 62. Rear cover retaining tabs

- Step 6 Pull the rear cover down and then out to remove it.

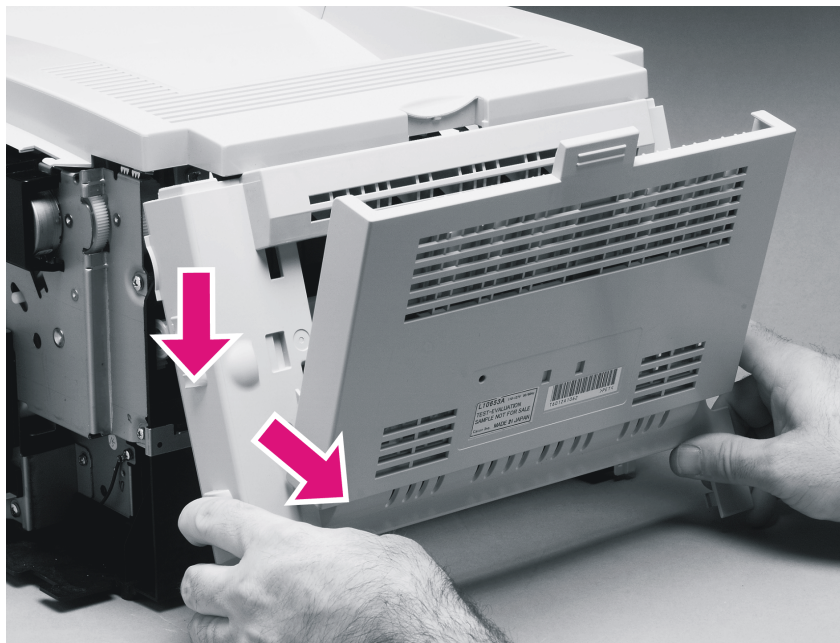


Figure 63. Remove rear cover

Remove top cover

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.

Step 2 Release the swing arm from the toner cartridge door (callout 1) and push it down into the opening.

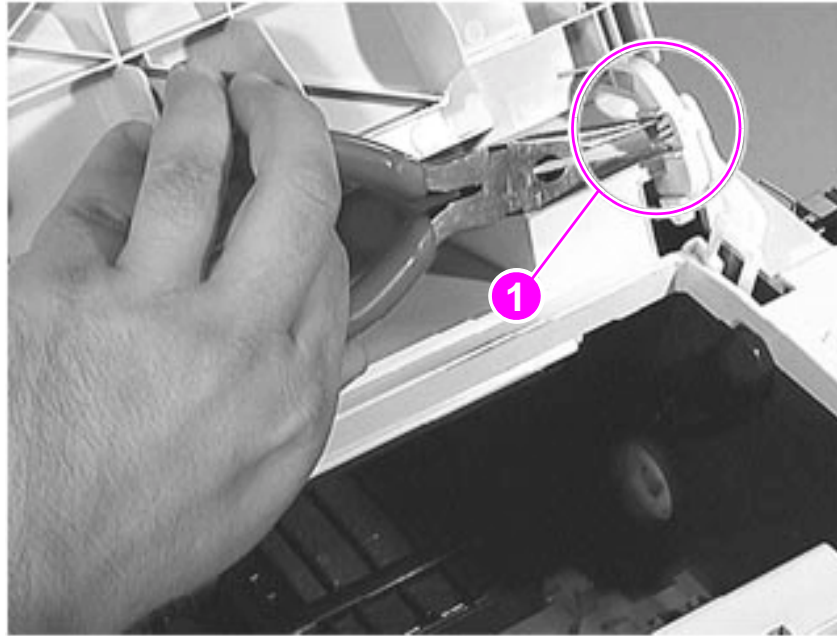


Figure 64. Release door swing arm

Step 3 Remove the top-cover mounting screws (callout 1).

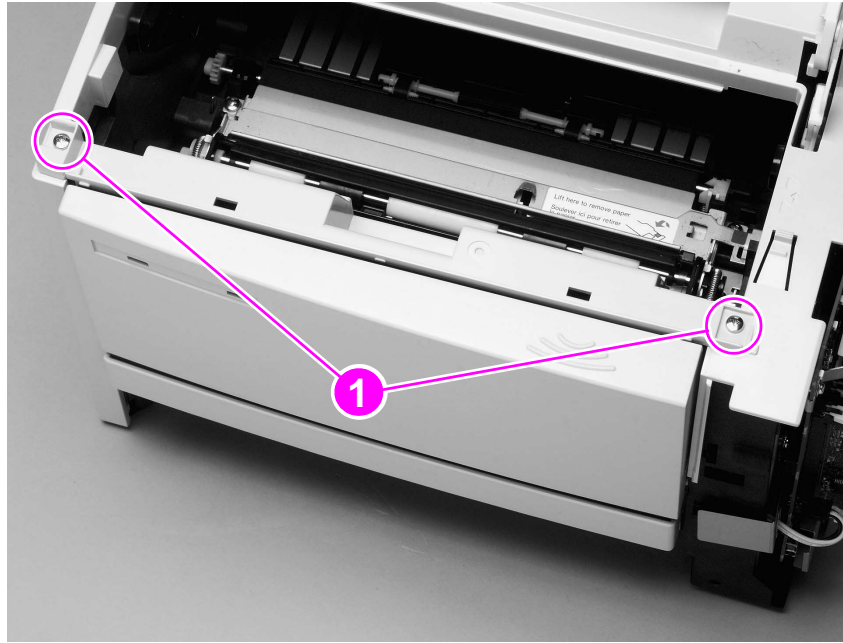


Figure 65. Remove mounting screws

Step 4 With the rear of the printer facing forward as shown, remove the top-cover mounting screws (callout 1).

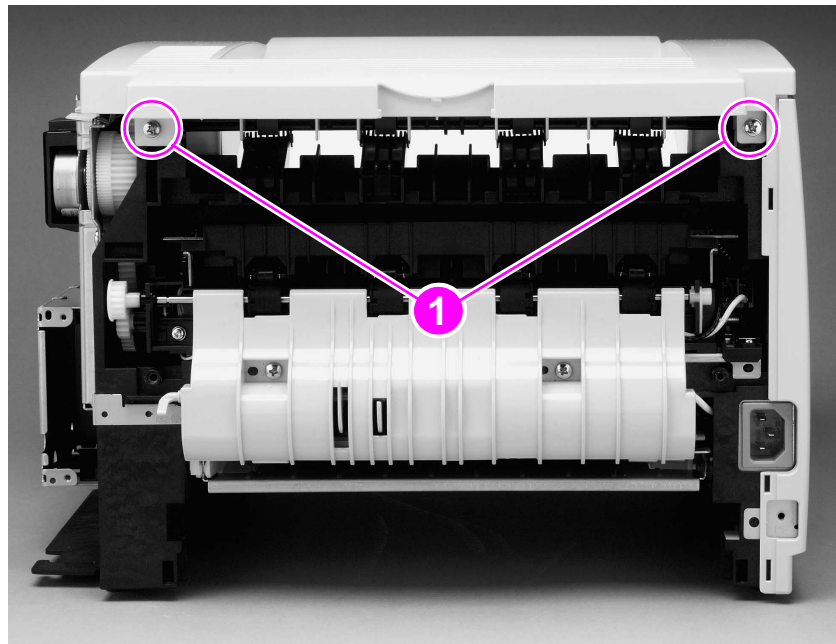


Figure 66. Remove mounting screws

Step 5 Open the tray 1 door.

Step 6 Release the two top cover tabs (callout 1) located on either side of the toner door.

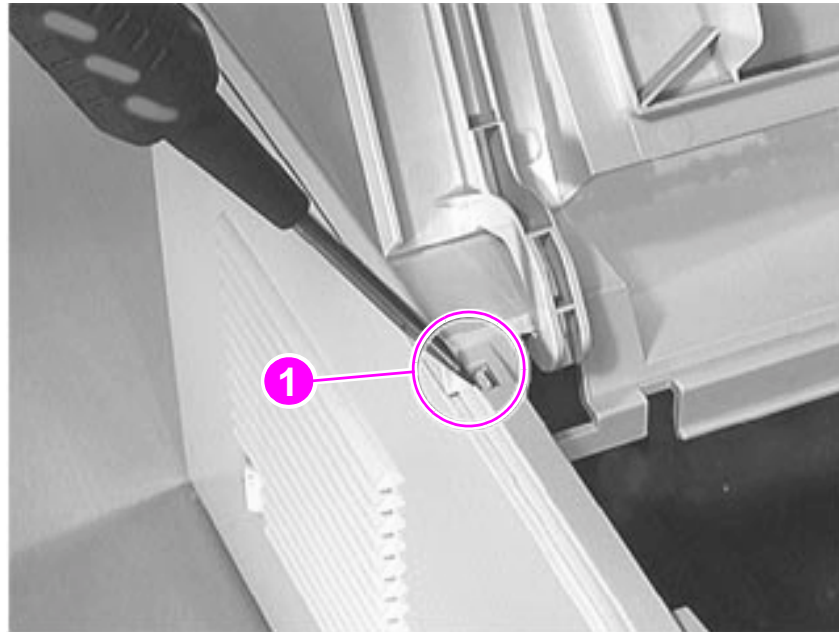


Figure 67. Release top cover tabs (left tab shown)

Step 7 Lift the cover up and off the printer.

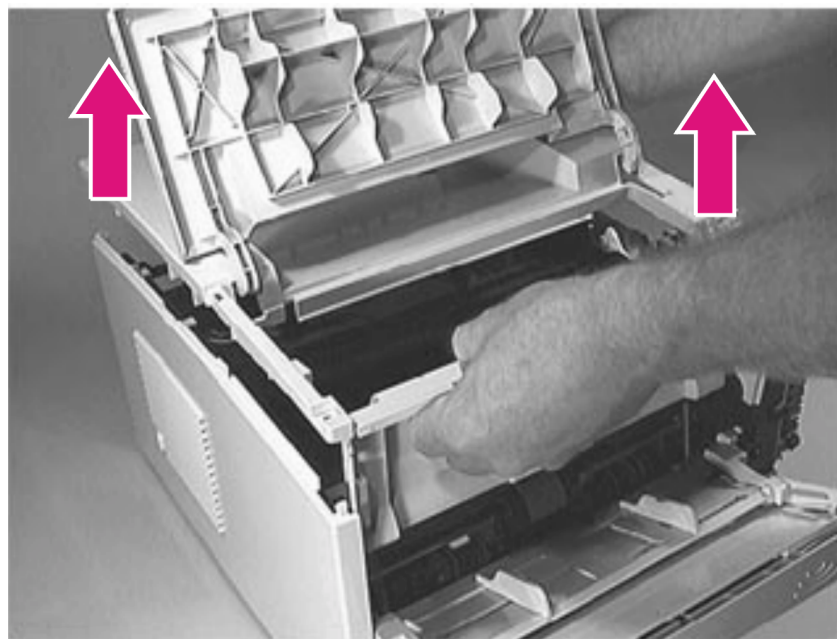


Figure 68. Remove top cover

CAUTION When replacing the top cover, ensure the drive release lever is attached to the swing arm.

Note When replacing the top cover, use the longer of the four mounting screws in the mounting screw-holes located under the toner door.

Remove left cover

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.

Step 2 Release the top latch (callout 1) and lower-front corner locking tab (callout 2).

Step 3 Lift off the cover.

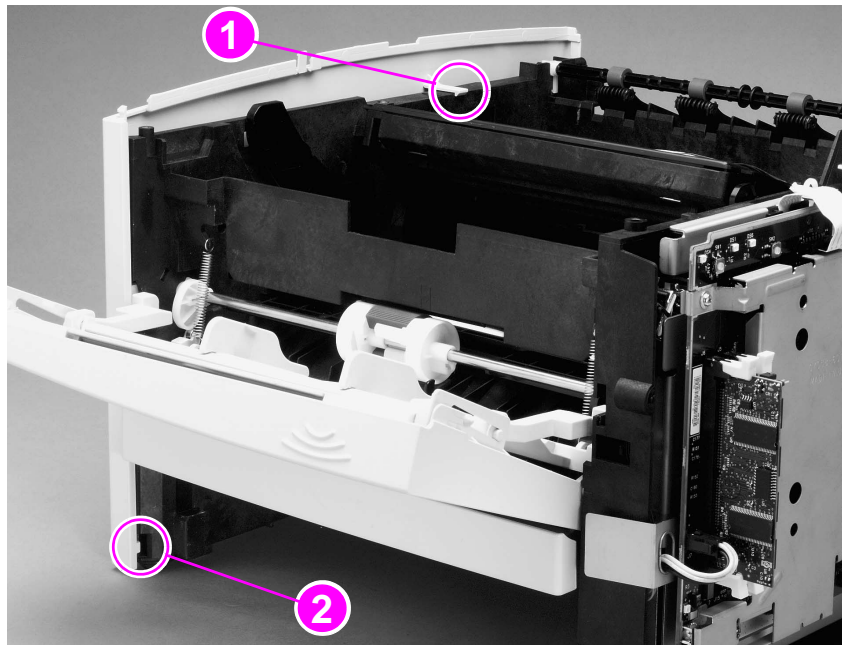


Figure 69. Release left cover latches

Remove tray 1

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the left cover. See “Remove left cover” on page 109.

Step 2 Disconnect the springs (callout 1) from the tray 1 support arms.

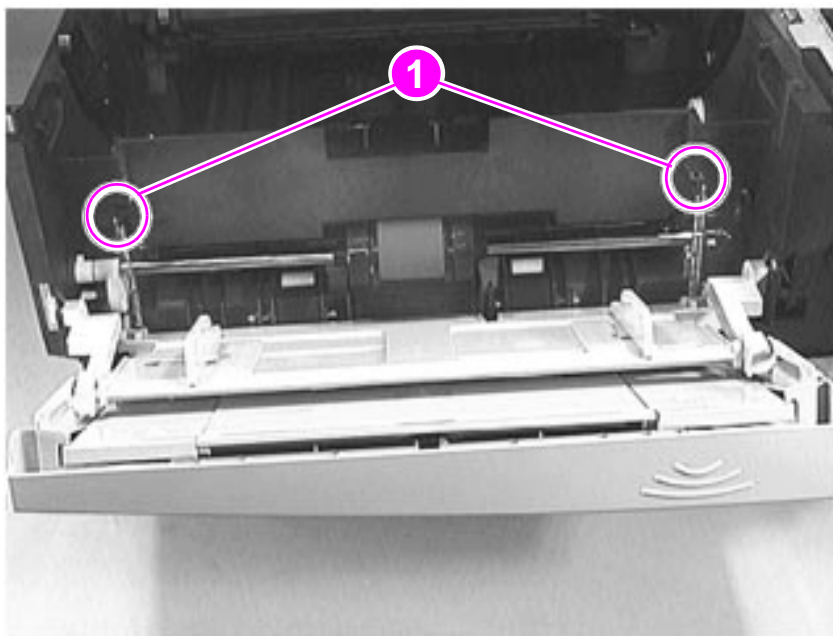


Figure 70. Disconnect tray 1 support springs

Step 3 Disconnect the pivot arms (callout 1).

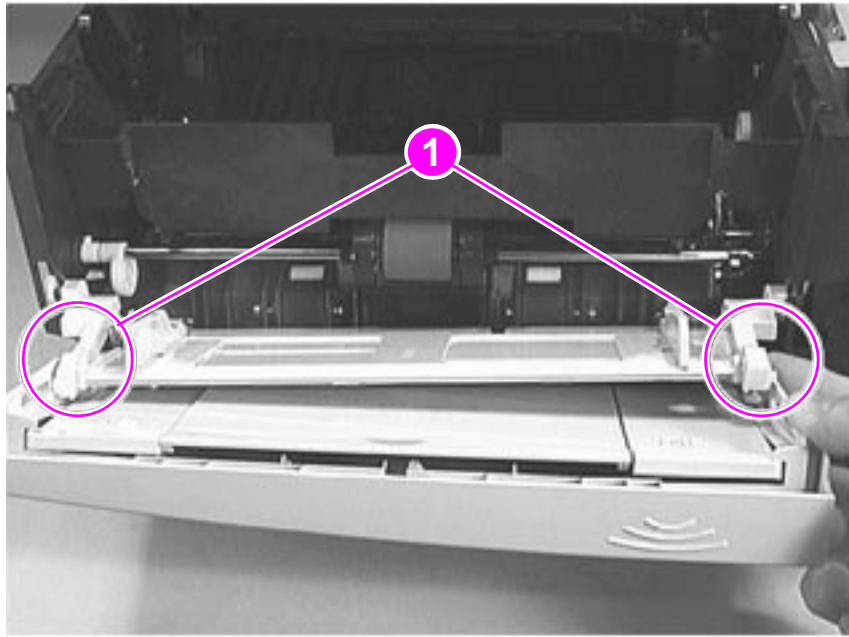


Figure 71. Disconnect tray 1 pivot arms

Step 4 Slide the tray 1 door toward the fan and away from the printer.

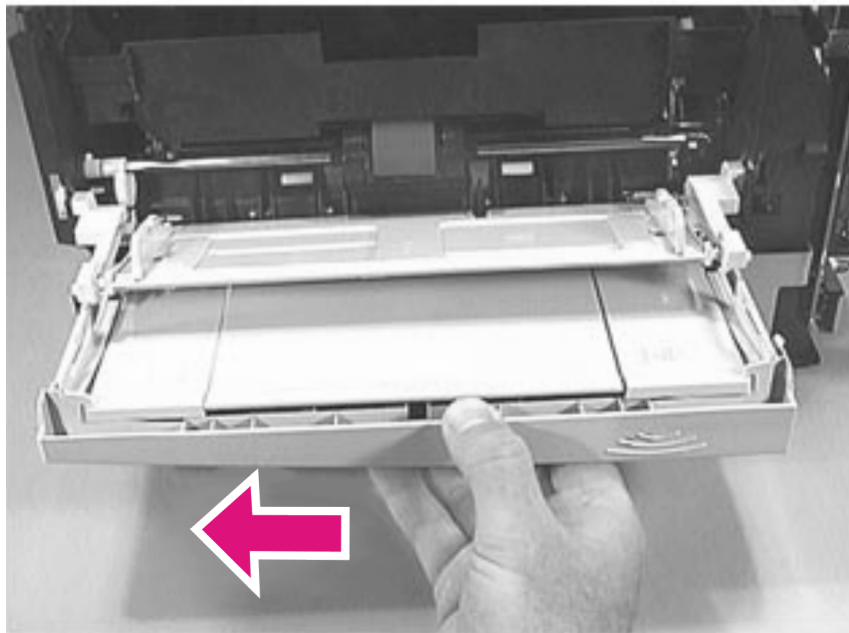


Figure 72. Remove tray 1 door

Step 5 Disconnect the pivot arms (callout 1) from the tray 1 shelf and rotate them to the vertical position.

Step 6 Remove the tray 1 shelf.

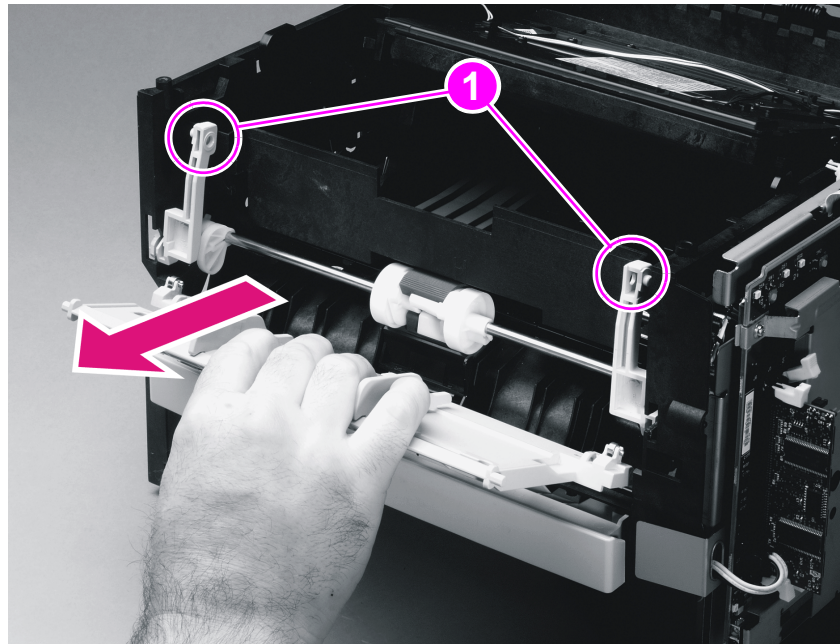


Figure 73. Disconnect pivot arms from tray 1 shelf

Step 7 Rotate the pivot arms downward and remove them from the tray.

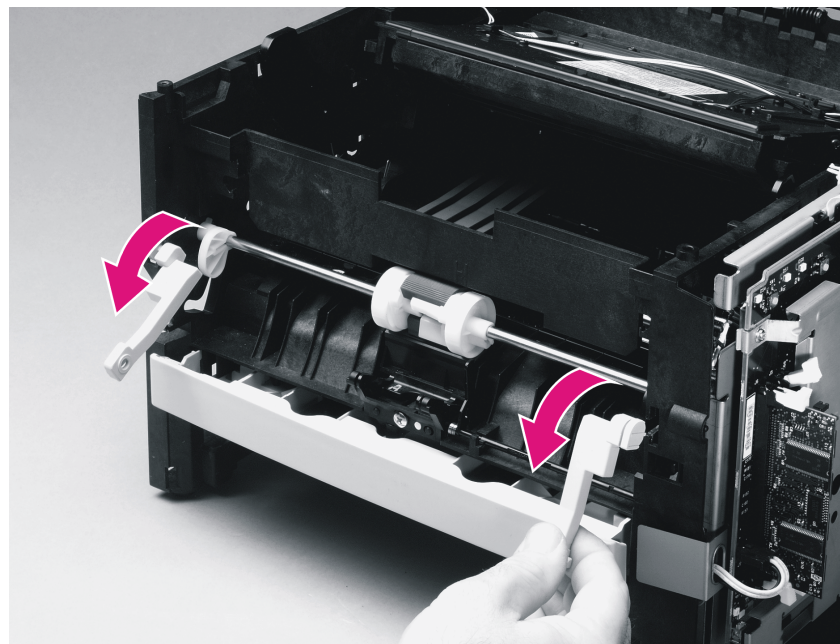


Figure 74. Remove pivot arms

Note

Pivot arms are not interchangeable. When replacing the pivot arms, verify that the right pivot arm (marked R) and left pivot arm (marked L) are correctly installed.

Internal disassembly and assembly

Remove transfer roller

CAUTION

Do not touch the surface of the transfer roller with bare hands. Skin oils can damage the roller. Instead, grasp the bushing and shaft.

- Step 1 Open the toner cartridge door.
- Step 2 Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- Step 3 Locate the black bushing on the left end of the transfer roller shaft and just behind the gear.

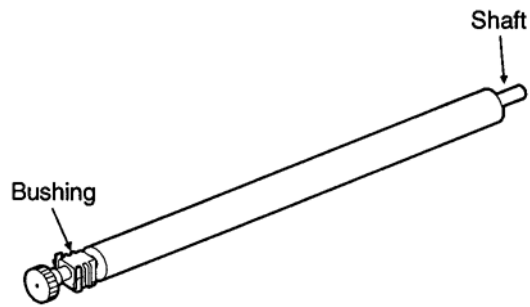


Figure 75. Transfer roller black bushing

Step 4 Squeeze both of the locking tabs on the black bushing, then slightly lift the gear end of the transfer roller. Slide the roller left until the shaft clears the white bushing.

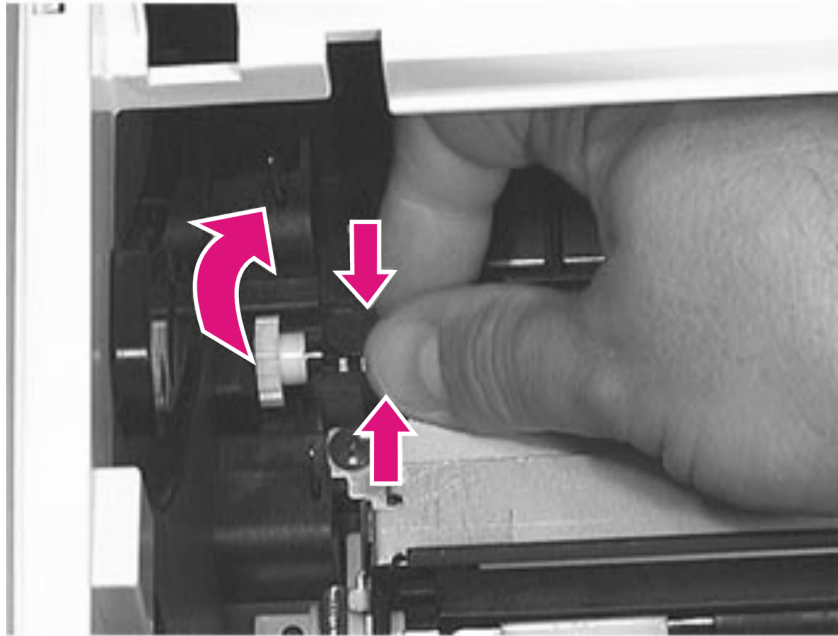


Figure 76. Removing the transfer roller

Step 5 Squeeze both of the locking tabs on the white bushing and slide the bushing out of its mounting slot.

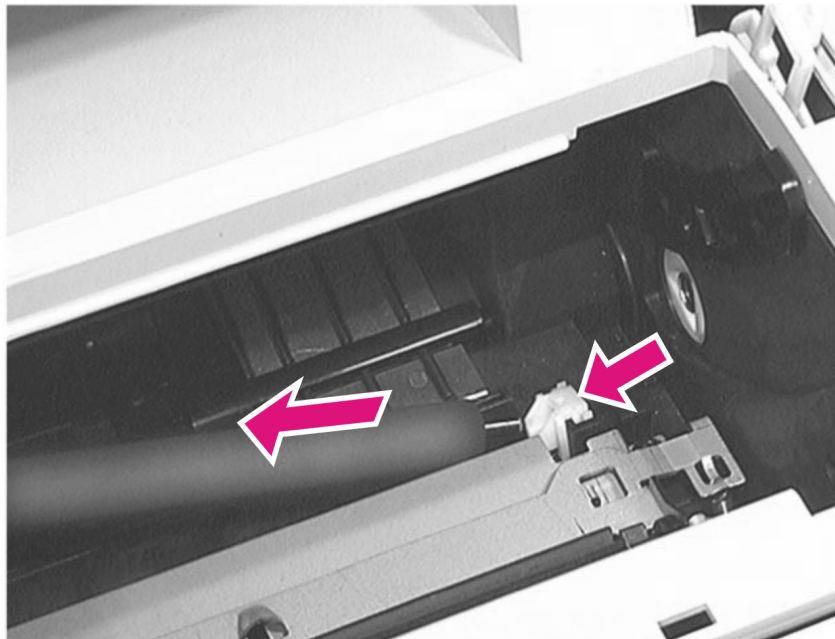


Figure 77. Remove the white bushing

Remove DIMM

Step 1 Remove the DIMM cover. See “Remove DIMM cover” on page 103.

CAUTION

The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

Step 2 Rotate the DIMM socket release levers (callout 1) outward.

Step 3 Pull DIMM out of socket.

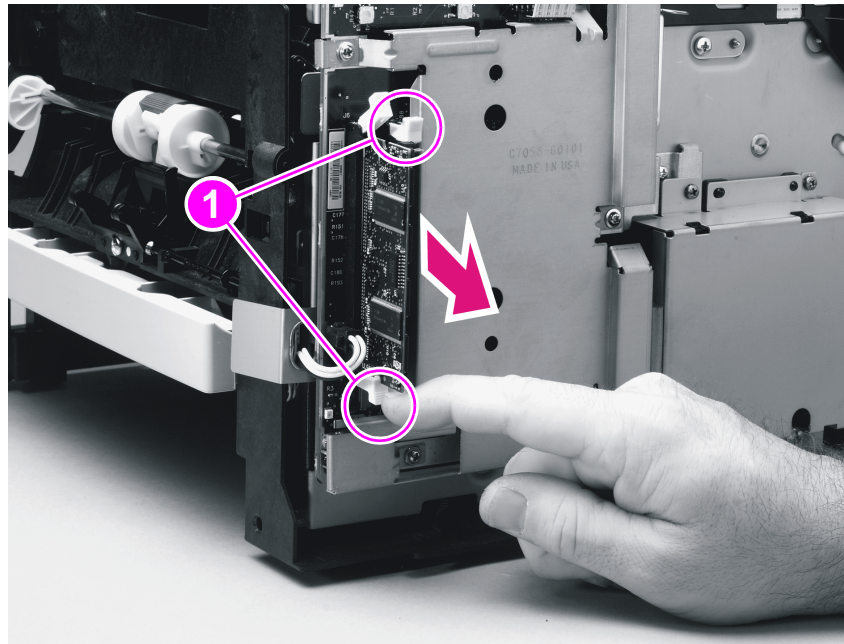


Figure 78. Remove DIMM

Remove formatter PCB

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the EIO card (if installed). See “Remove I/O cover” on page 102.

Step 2 Disconnect the ribbon and power cable (callout 1) and remove the five mounting screws (callout 2) that secure the PCB and shield to the printer drive assembly.

Step 3 Lift off the formatter PCB and shield.

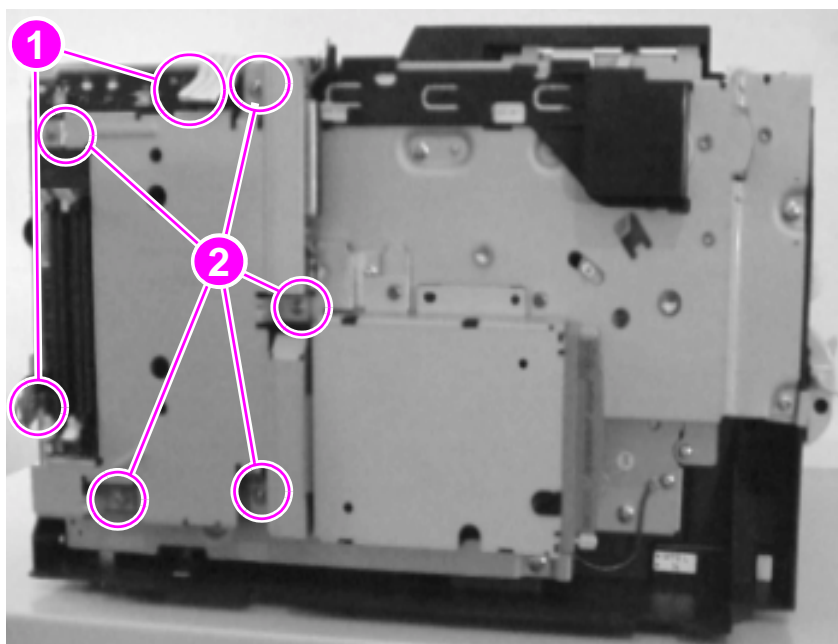


Figure 79.

Remove formatter PCB

Remove EIO shield and guide

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the EIO card (if installed). See “Remove EIO card” on page 102.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.

Step 2 Remove the four screws (callout 1) that secure the shield to the printer drive assembly.

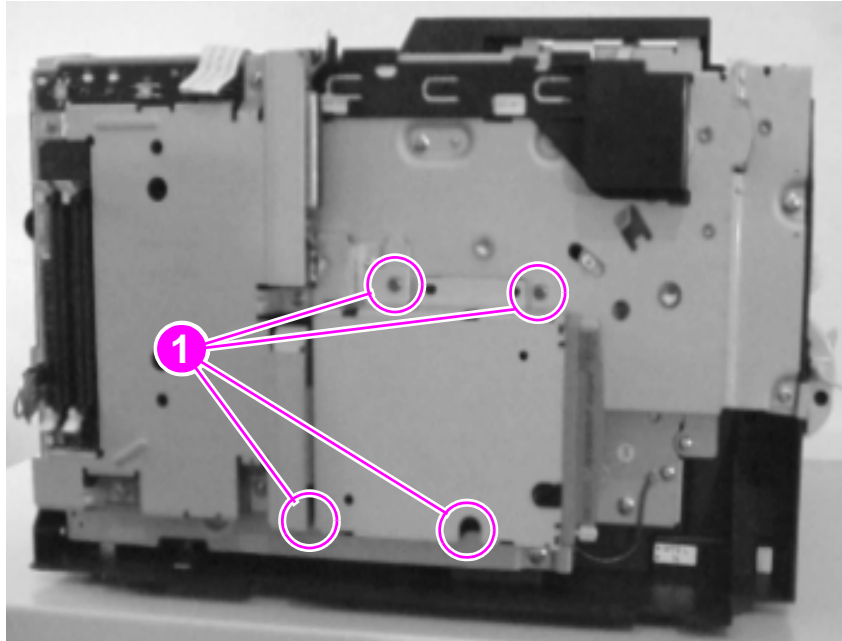


Figure 80. Remove EIO shield

Remove fuser assembly

CAUTION

If the printer was recently operating, verify that the fuser assembly has sufficiently cooled before handling.

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.

Step 2 Remove the two screws (callout 1) that secure the reverse cover guide to the fuser assembly and lift the cover guide off.

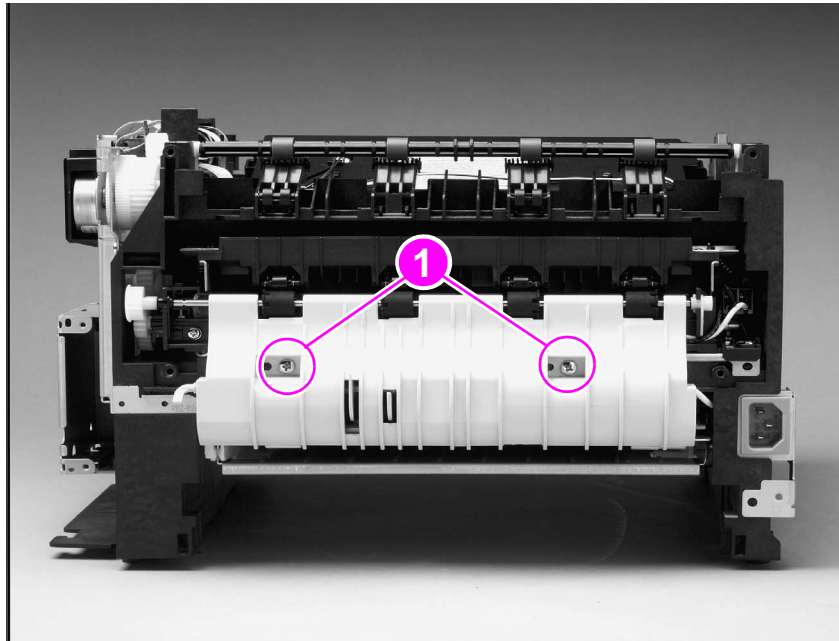


Figure 81. Fuser assembly (under the reverse cover guide)

CAUTION

When replacing the reverse cover guide, use the two screws (callout 1) removed in step 2. These screws allow the cover to expand and contract when the fuser assembly heats up or cools down.

Step 3 Unplug the two-pin, three-pin, and five-pin wire harness connectors (callout 1).

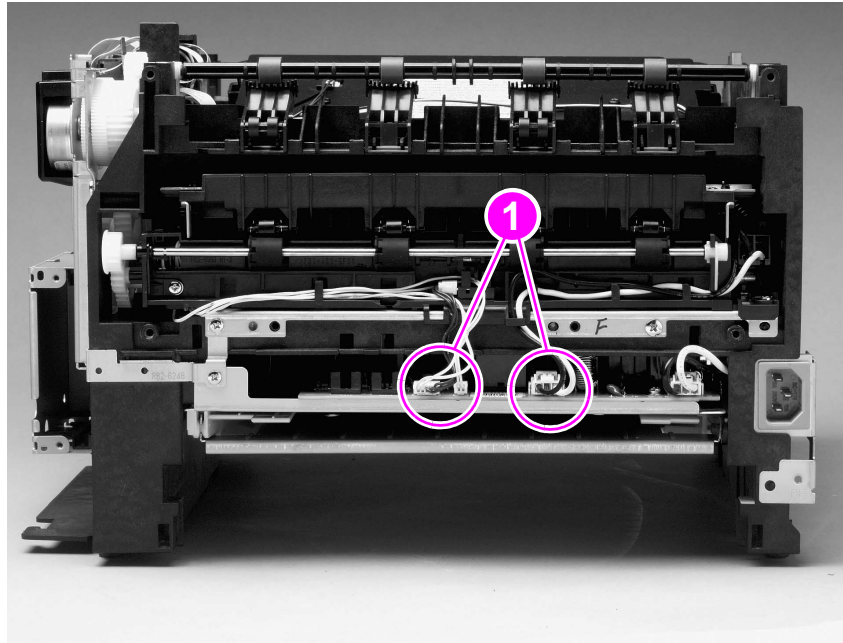


Figure 82. Unplug wire harness connectors

Step 4 Remove one grounding screw (callout 1) and one mounting screw (callout 2) that secures the fuser assembly to the printer.

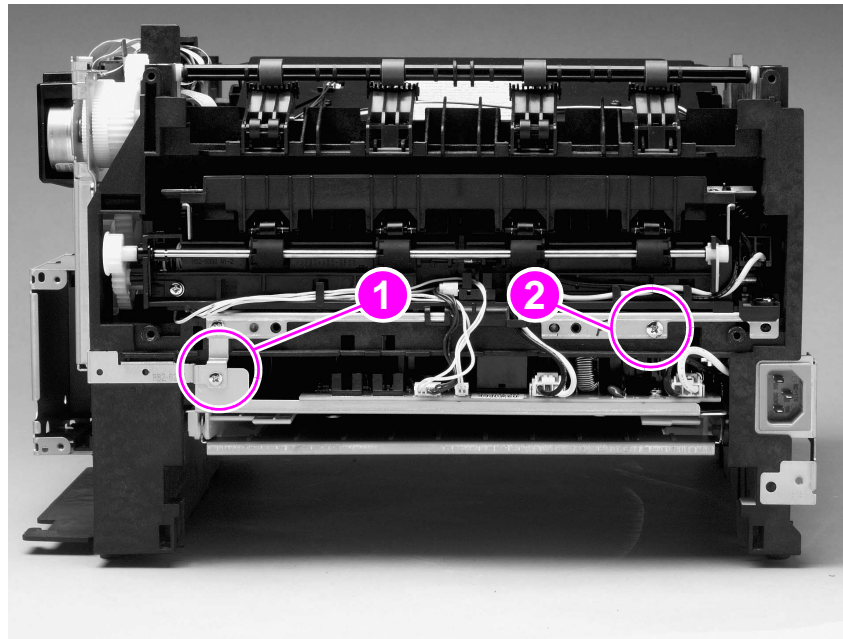


Figure 83. Remove mounting screws

Step 5 Pull the fuser assembly from the printer.

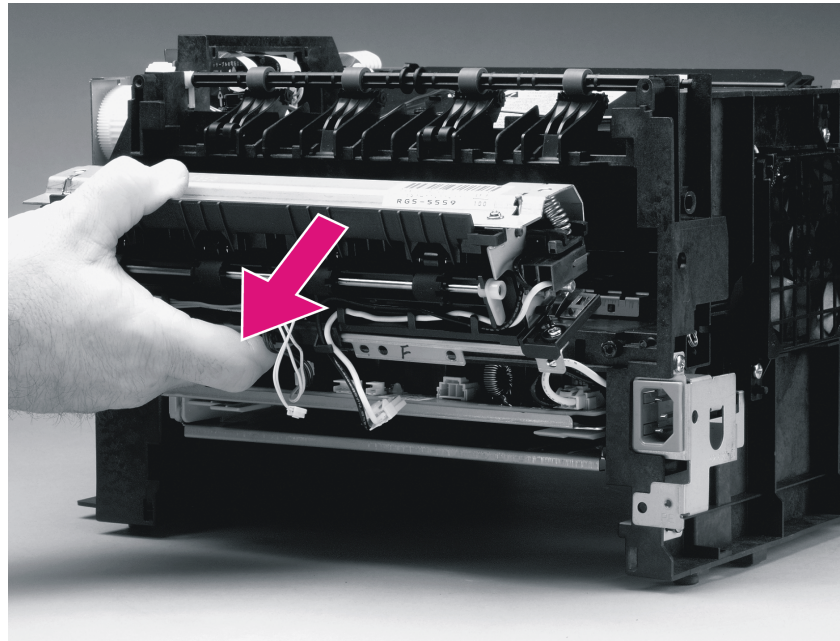


Figure 84. Remove fuser assembly

Note

When replacing the fuser assembly, use the guide pins (located near the mounting screw-holes) to correctly align it.

Remove fuser-film heater assembly

- Step 1 Remove the fuser assembly. See “Remove fuser assembly” on page 118.
- Step 2 Disconnect the wire connector (callout 1) and remove the right and left wire harnesses from the retainer clips (callout 2).

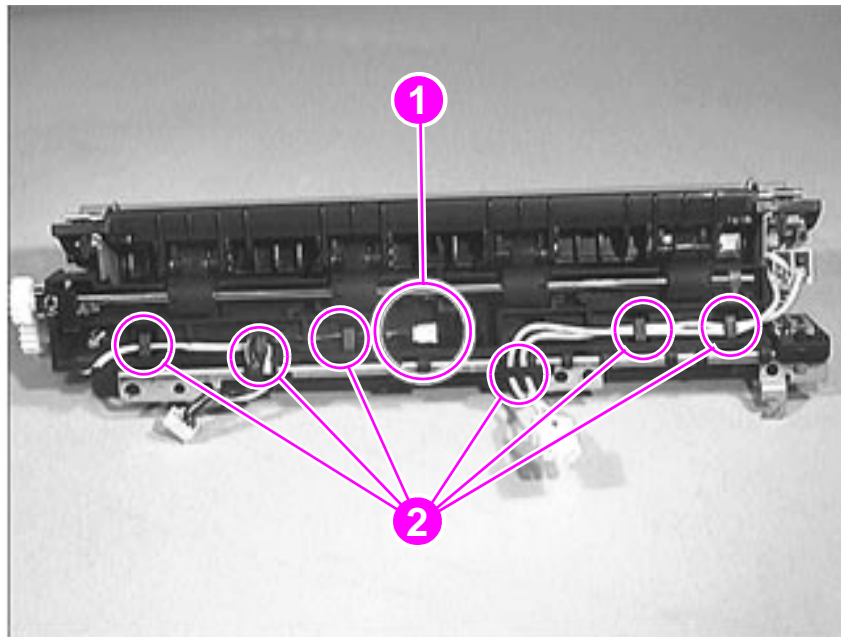


Figure 85. Unplug fuser-film heater assembly wire harness

- Step 3 Remove the two pressure plate screws (callout 1).

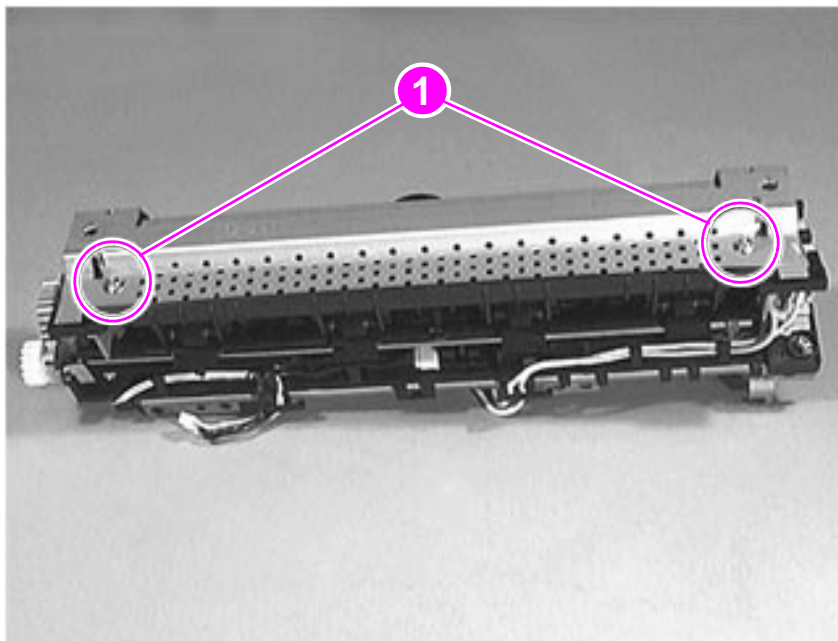


Figure 86. Remove pressure plate screws

CAUTION

The pressure plate is spring-loaded. Exercise caution when removing the pressure plate.

Step 4 Use a small flatblade screwdriver to gently to detach the pressure plate retaining clips (callout 1).

Step 5 Lift off the pressure plate.

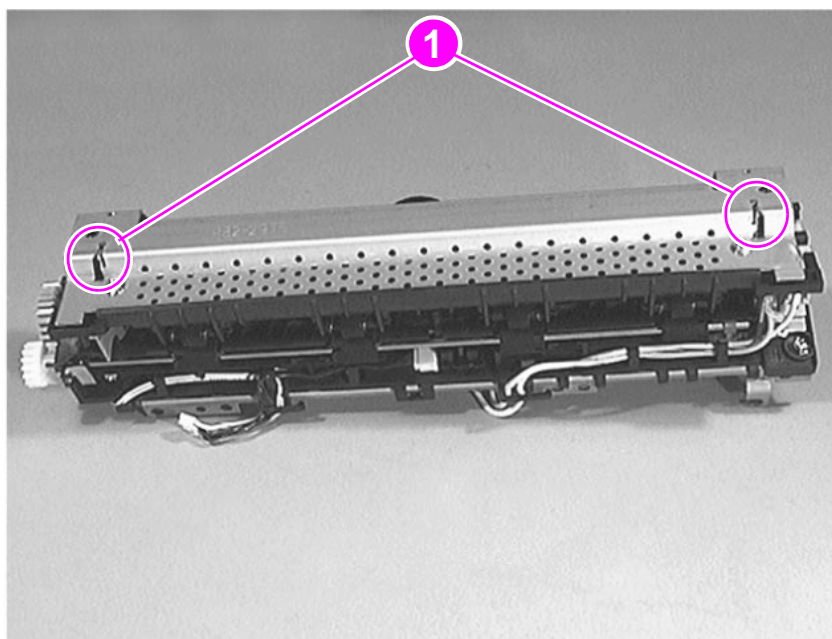


Figure 87.

Remove pressure plate

Step 6 Lift the fuser-film heater assembly out of the assembly carriage.

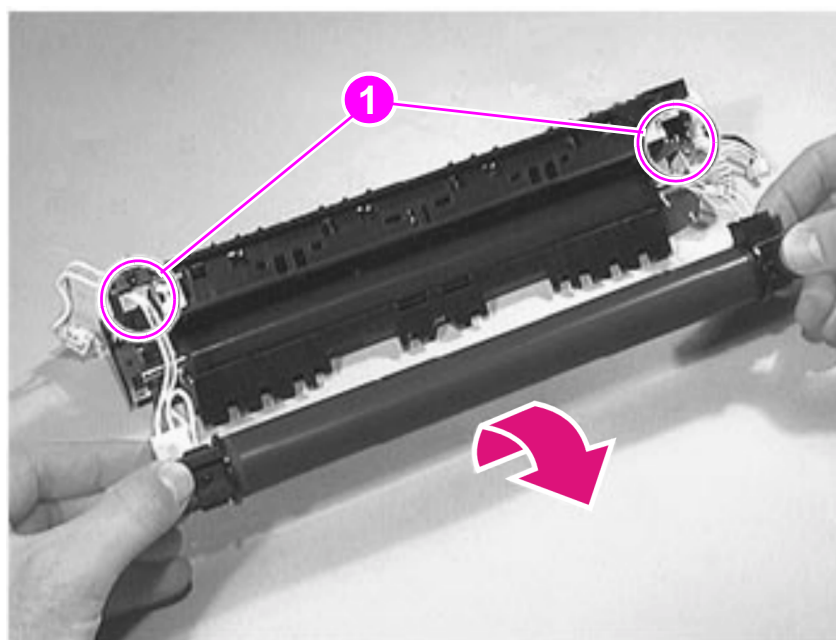


Figure 88.

Remove the fuser-film heater assembly

Note

When replacing the fuser-film heater assembly, verify that it is correctly oriented (callout 1). Position the end with the two-wire harness (black and white wire) is over the shaft end of the pressure roller.

Remove pressure roller

Step 1 Remove the following assemblies:

- Remove the fuser assembly. See “Remove fuser assembly” on page 118.
- Remove the fuser-film heater assembly. See “Remove fuser-film heater assembly” on page 121.

Step 2 Lift the pressure roller out of the assembly carriage.

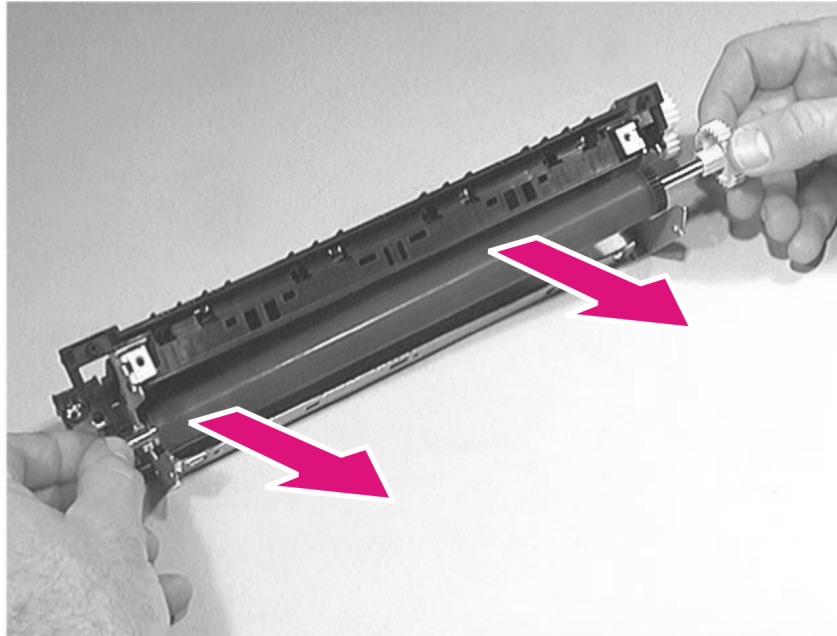


Figure 89. Remove pressure roller

Remove duplexer tray

CAUTION

When picking up the printer with the rear cover removed, do not lift by holding the duplexer tray. Whenever possible, handle the printer by holding the sides to prevent damaging internal components.

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.

Step 2 Turn the printer over, top down.

Step 3 Unsnap the locking lever of the pivot pin, rotate it to the vertical position, and remove it from the mounting hole.

Step 4 Pull the green duplexer release lever (callout 1) forward to release the duplexer tray.

Step 5 Slightly raise the duplexer tray until the stop spring (callout 2) makes contact with the chassis. Push the spring in until it clears the slot in the chassis. Raise the door to the vertical position.

Step 6 Raise the corner of the tray nearest the duplex media guide. Slide the tray toward the printer drive assembly.

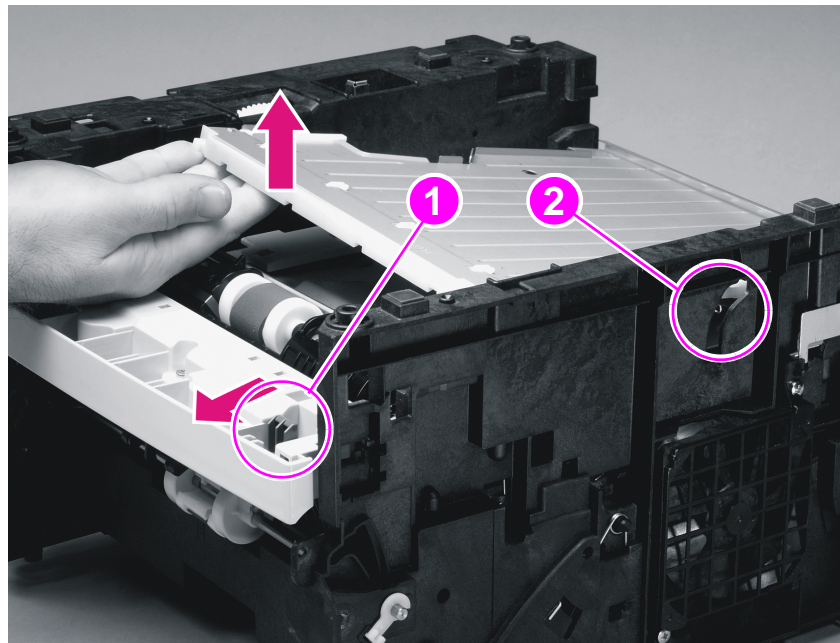


Figure 90. Duplexer tray

Note

When replacing the duplexer tray, verify that the stop spring (callout 2) correctly extends into the provided slot in the chassis.

Remove duplexer media guide

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the duplexer tray. See “Remove duplexer tray” on page 124.

Step 1 Remove the two duplexer media guide mounting screws (callout 1). Lift off the duplexer media guide.

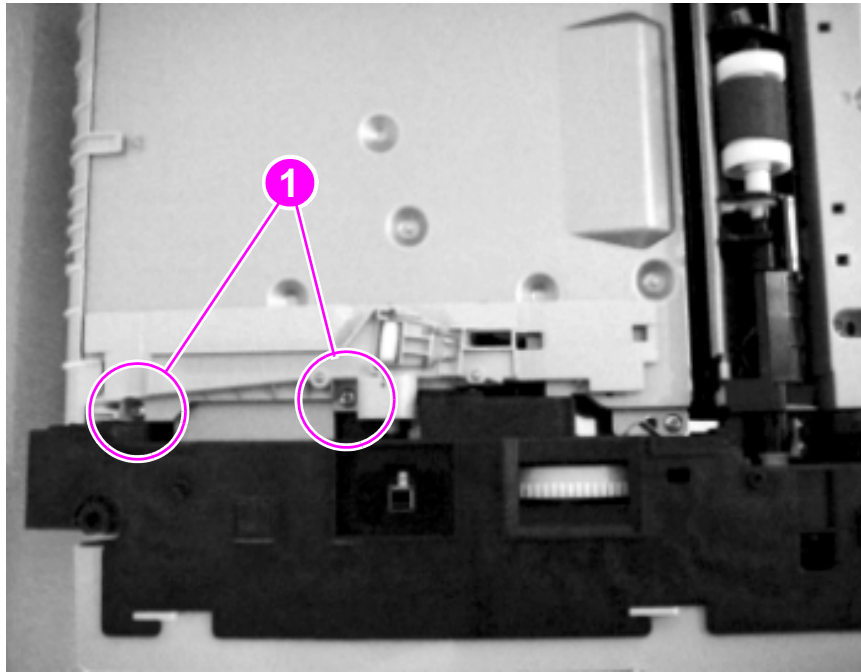


Figure 91. Duplex media guide

Remove power supply assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the rear pivot pin, duplexer tray, and duplex media guide. See “Remove duplexer tray” on page 124.

Step 2 Remove the two mounting screws from the reverse cover guide and lift it off. See “Remove fuser assembly” on page 118.

CAUTION

The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

Step 3 Unplug two two-pin, a three-pin, and the five-pin harness connectors (callout 1).

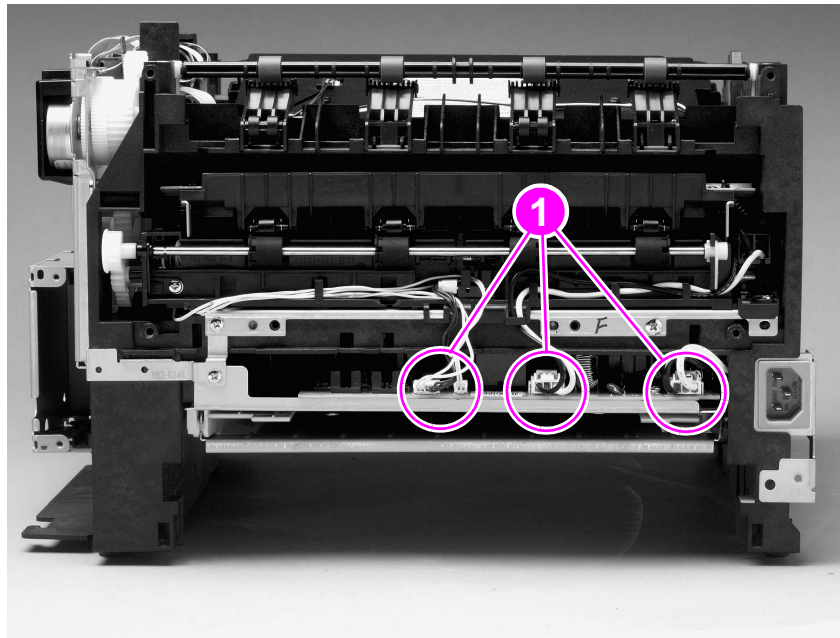


Figure 92. Unplug wire harness

Step 4 Place the printer top-down with the fuser assembly facing outward.

Step 5 Remove the three mounting screws (callout 1) and two ground screws (callout 2).

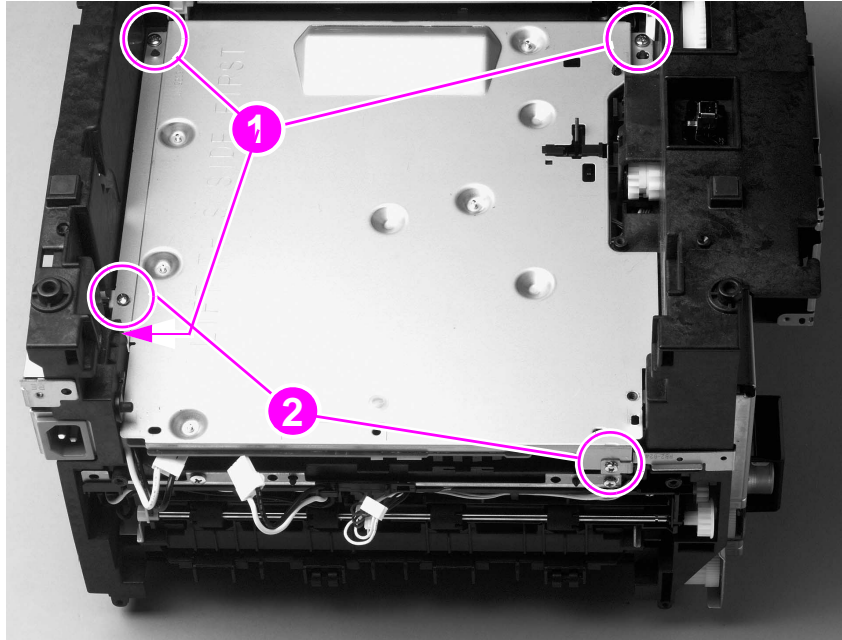


Figure 93. Remove power supply assembly screws

Step 6 Lift the side of the power supply assembly stamped “LIFT THIS SIDE FIRST” to expose assembly harnessing. The harness connectors attach to the right side of the engine power assembly.

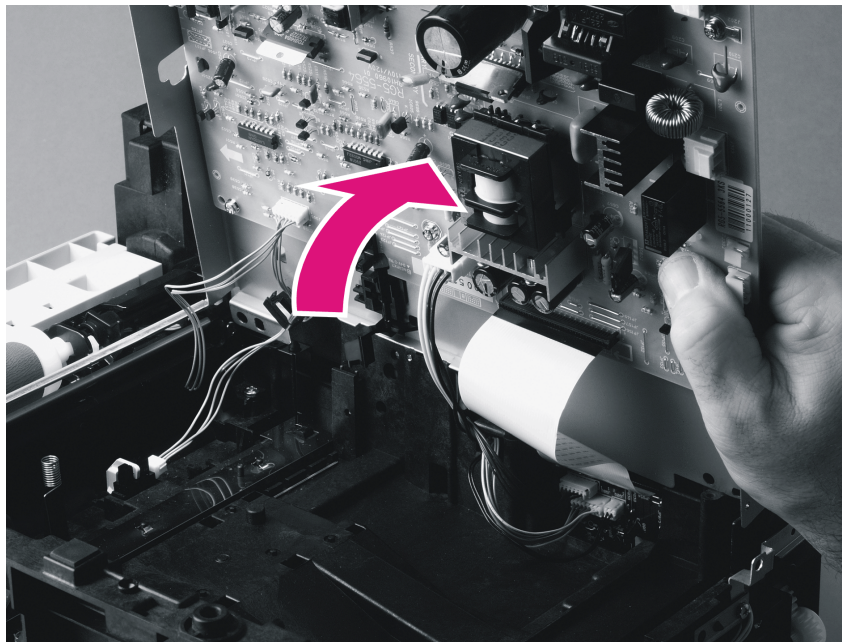


Figure 94. Expose the harness connectors assembly

CAUTION

The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

Step 7 Unplug the formatter ribbon cable (callout 1), four-pin motor power harness (callout 2), and the six-pin refeeder harness (callout 3). Unlace harness as required (callout 4).

Step 8 Lift off the power-supply assembly.

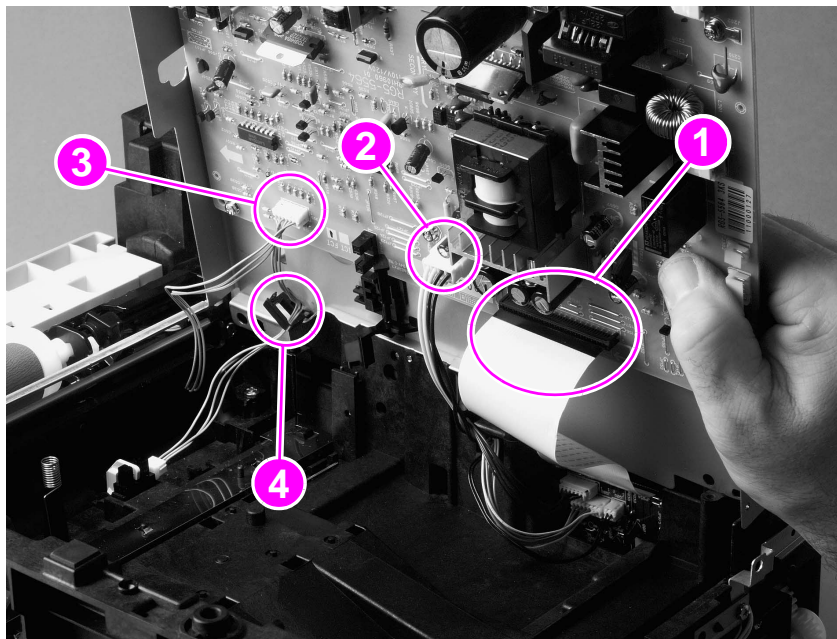


Figure 95. Unplug harness connectors

Note

When replacing the power-supply assembly, verify that the refeeder harness is clipped to the wire clip (callout 4) to prevent it from interfering with other internal components.

Remove upper output delivery roller

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the left cover. See “Remove left cover” on page 109.

Step 2 Release both clips on the roller, geared end first.

Step 3 Lift off the upper output delivery roller.

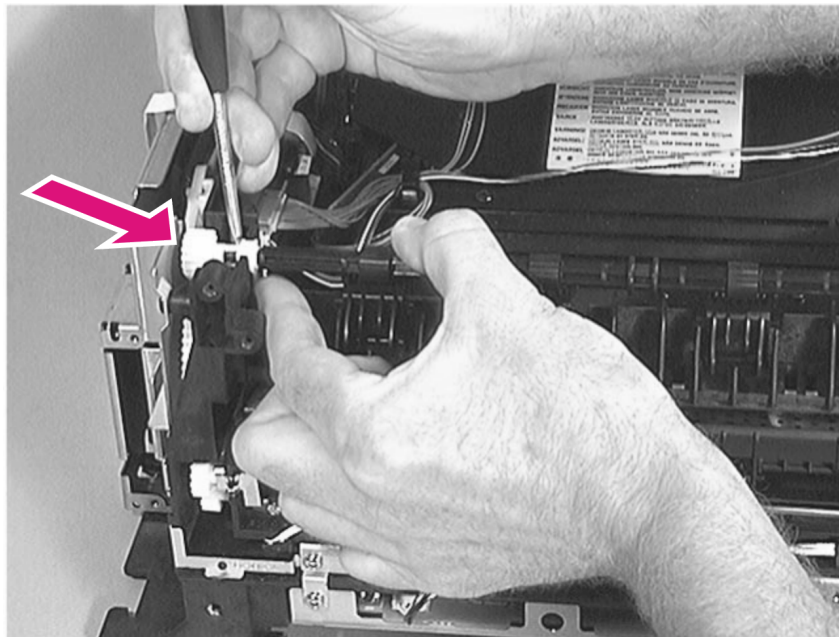


Figure 96. Remove upper output roller

Disassemble the upper output delivery roller

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the left cover. See “Remove left cover” on page 109.
- Remove the upper output delivery roller. See “Remove upper output delivery roller” on page 129.

Step 1 Remove the gear (callout 1) from the roller.

Step 2 Remove the clips (callout 2) from the roller.

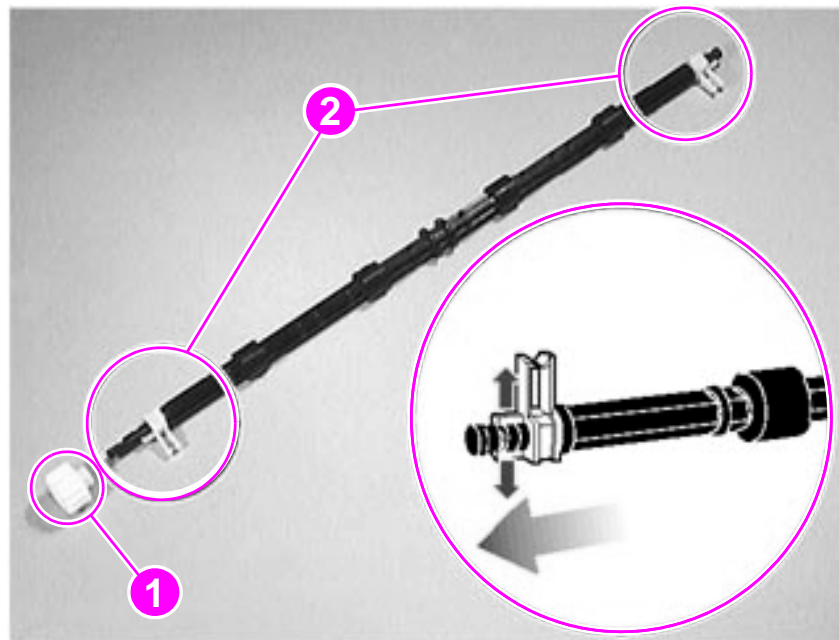


Figure 97. Remove gear and clips

Remove lower output delivery rollers

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the left cover. See “Remove left cover” on page 109.
- Remove the upper output delivery roller. See “Remove upper output delivery roller” on page 129.

Step 2 Rotate the rollers (callout 1) up to the vertical position (away from the laser/scanner), to unseat the roller spring.

Step 3 Push down to disengage the pivot pins of the rollers.

Step 4 Lift out the rollers.

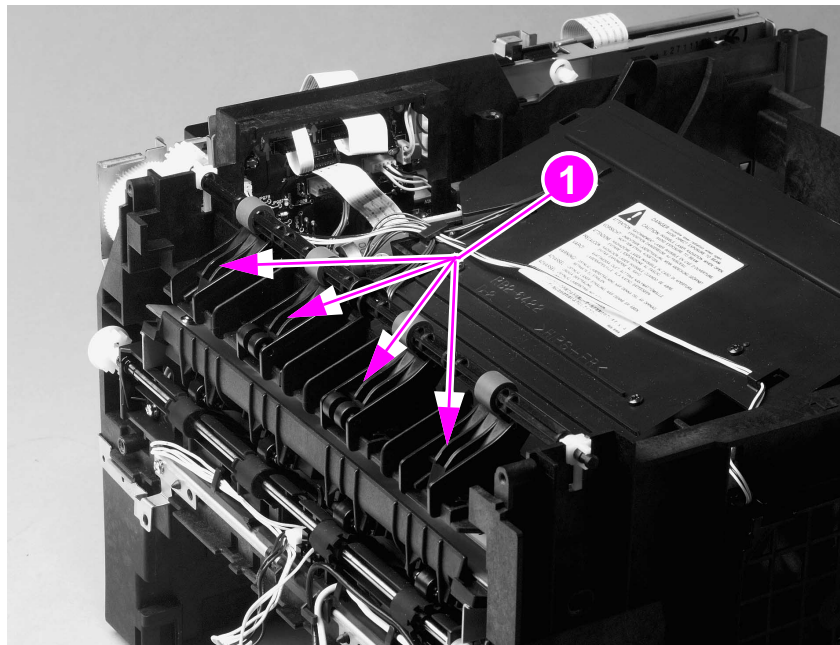


Figure 98. Remove lower output delivery rollers

Note

When replacing the lower output delivery rollers (callout 1), remove the roller springs for use with the new rollers.

CAUTION

When installing the lower output delivery rollers (callout 1), verify that the two middle rollers are equipped with the additional lower wheels.

Remove laser/scanner assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.

CAUTION

The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

Step 2 Unplug the seven-pin scanner harness (callout 1), scanner ribbon cable (callout 1), and the two-pin fan harness (callout 2).

Step 3 Unlace the two-pin fan harness (callout 3) from the wire clips on the scanner.

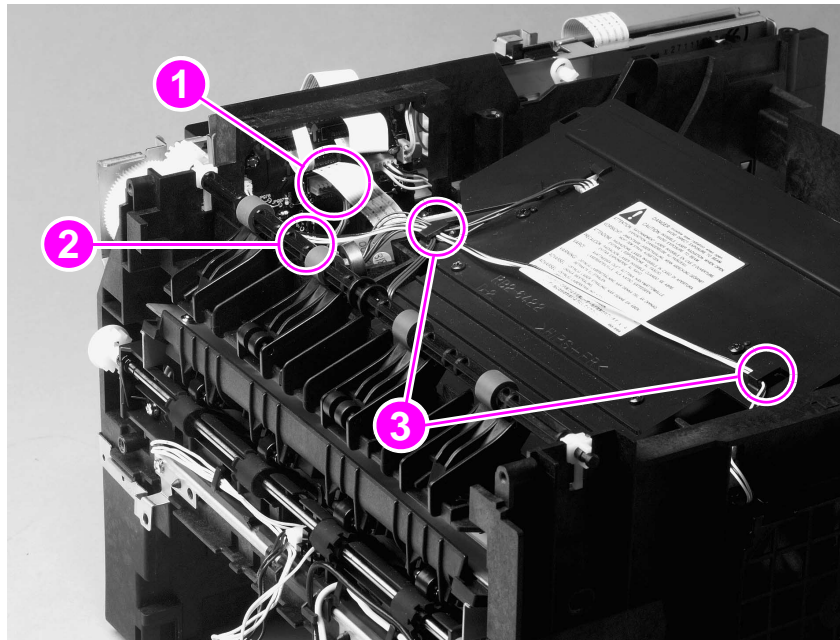


Figure 99. Unplug harness connectors

Step 4 Remove the four mounting screws (callout 1).

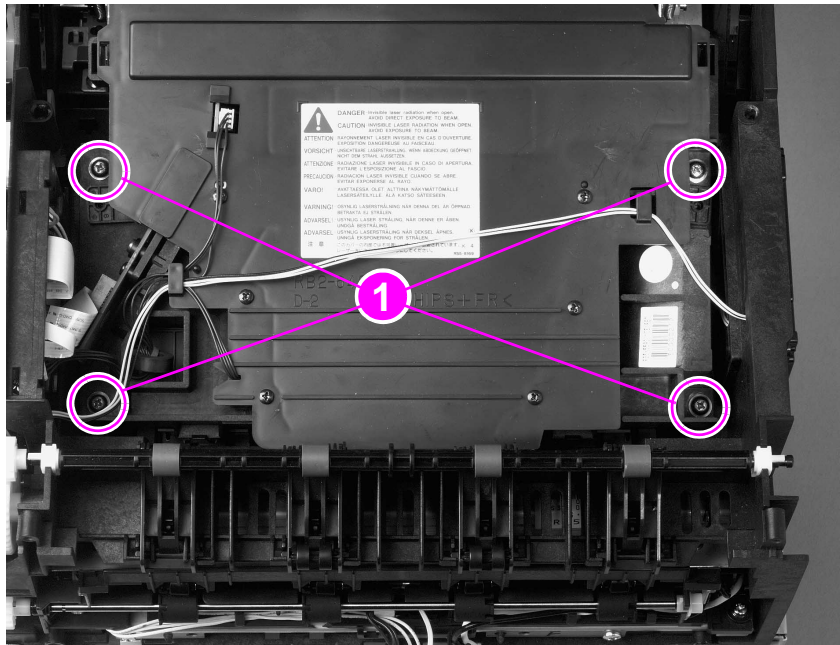


Figure 100. Remove the laser/scanner assembly mount screws

Step 5 Lift the laser/scanner assembly out of the chassis.

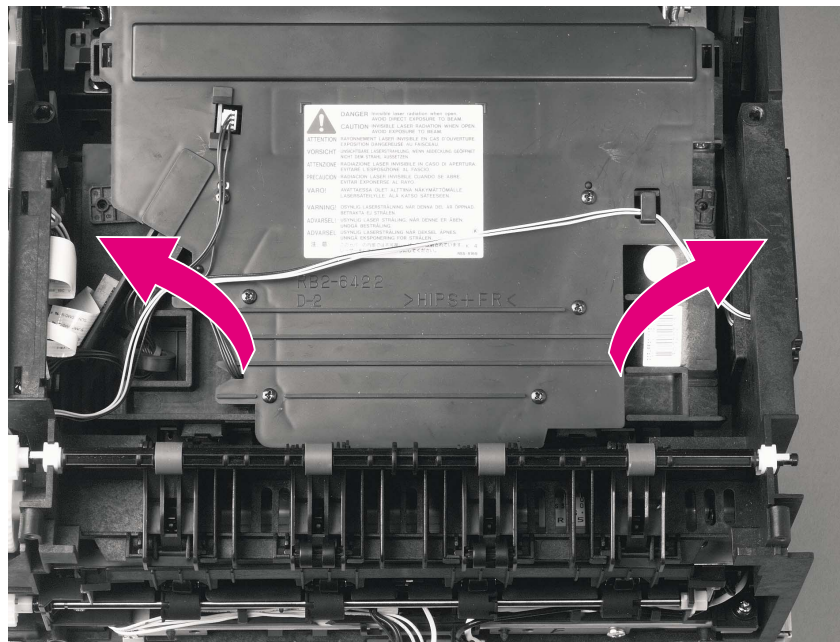


Figure 101. Remove the laser/scanner assembly

CAUTION

When replacing the scanner assembly, verify that the locator pins on the assembly are properly seated. Failure to fully seat the locator pins can result in damage to the scanner assembly mounting surfaces when the mounting screws are tightened down.

Note

When replacing the scanner assembly, verify that the torrid ring on the seven-pin scanner harness is fully recessed into the provided well to prevent it from interfering with other internal components.

Remove transport belts and rollers

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the laser/scanner assembly. See “Remove laser/scanner assembly” on page 132.

Step 2 Remove the roller assembly screw (callout 1).

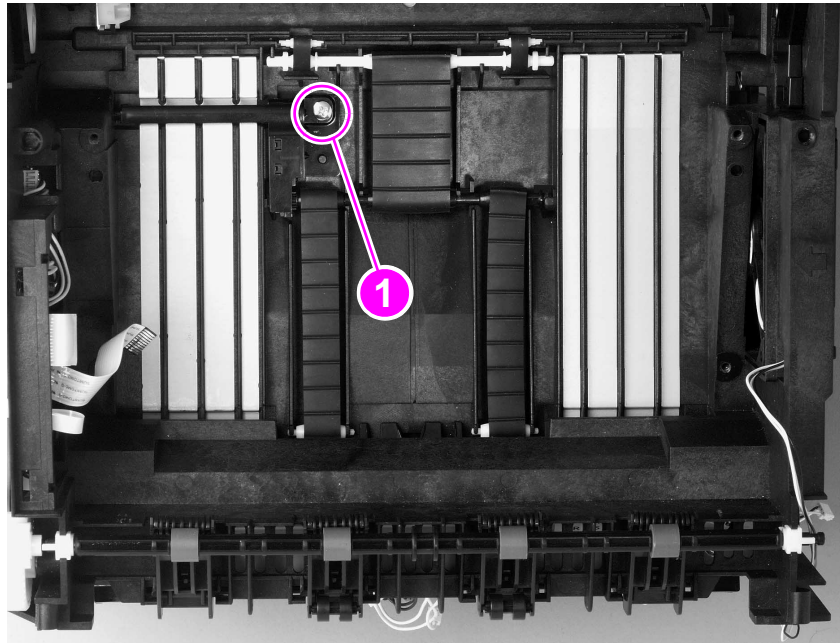


Figure 102. Remove transport roller assembly screw

- Step 3 Lift up on the gear end of the middle roller until its shaft clears the hole in the gear assembly (callout 1).
- Step 4 Slide the roller out of the mounting post (end with no gears).
- Step 5 Lift out the middle roller.
- Step 6 Lift out the remaining belts and rollers.

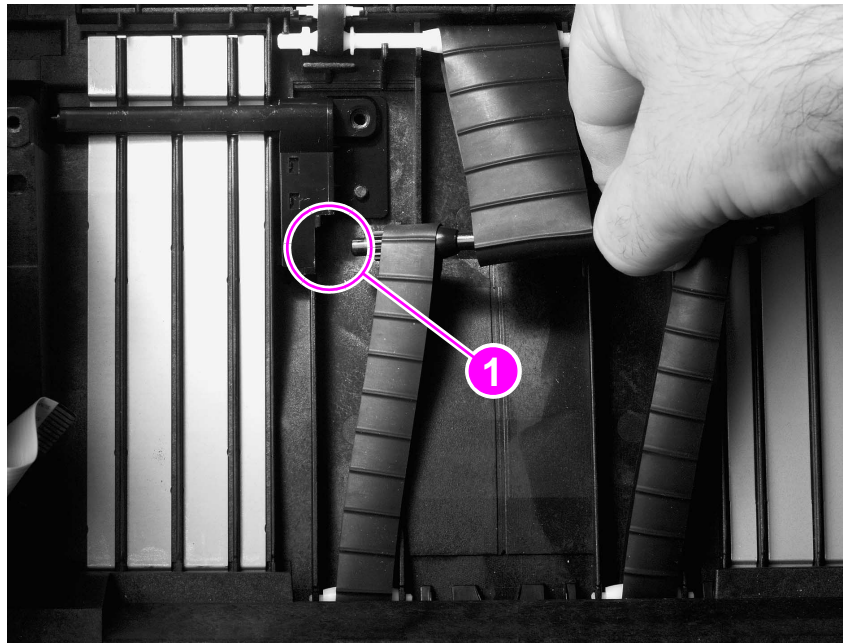


Figure 103. Remove center roller

- Step 7 Verify the correct installation of the transport belts and rollers, using figure 103.

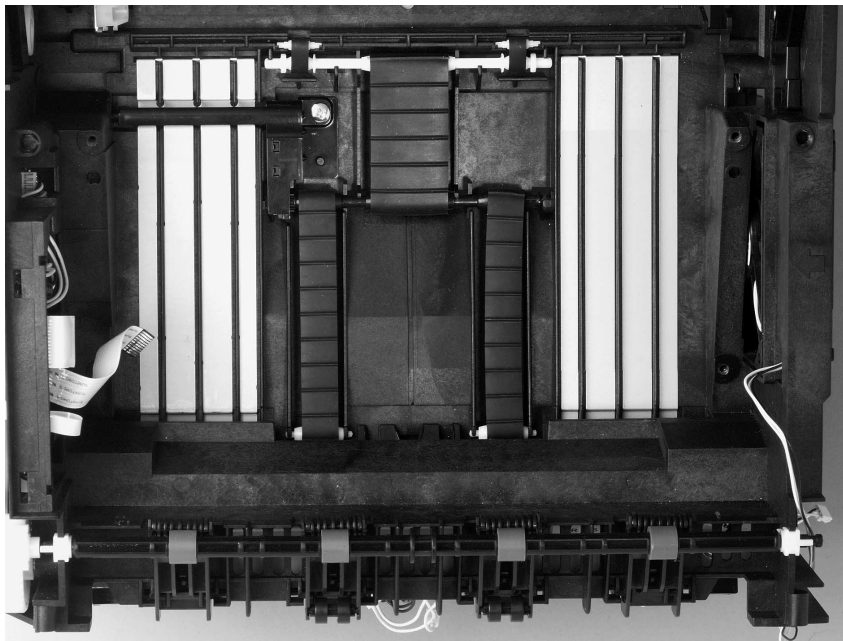


Figure 104. Transport rollers and belts installed

Remove ribbon cable harness

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.

Step 2 Unplug the two ribbon cables (callout 1).

Step 3 Feed the cables through the opening towards the harness cover.

Step 4 Lift the harness cover locking tab away from the printer chassis and slide the cover away from the duplexer reverse motor.

Step 5 Lift off the harness and cover.

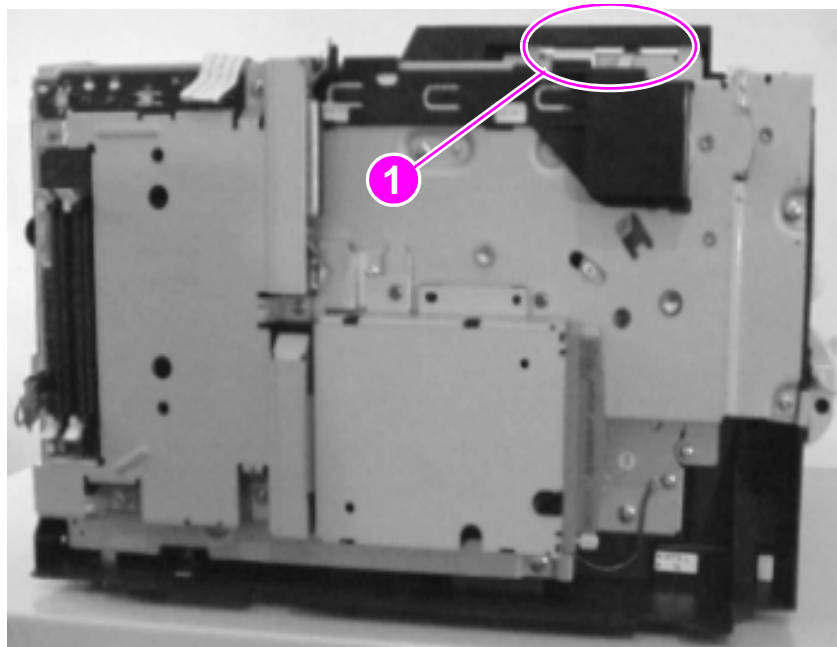


Figure 105. Unplug the ribbon cables

Note

When installing the ribbon cable harness (callout 1), feed the cables through the opening in the chassis.

Remove duplexer reverse motor

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the ribbon cable harness. See “Remove ribbon cable harness” on page 136.

Step 2 Remove the two duplexer reverse motor mounting screws (callout 1).

Step 3 Lift off the motor.

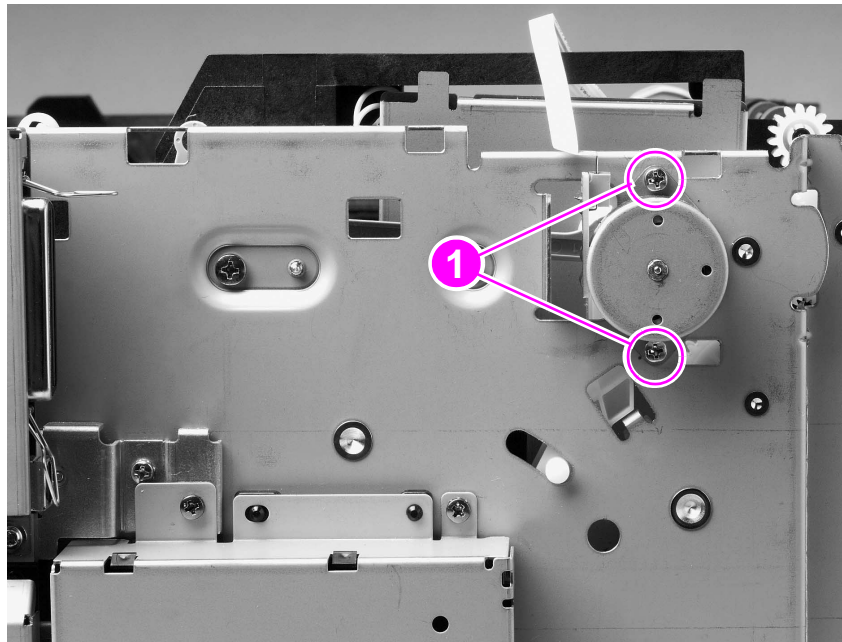


Figure 106. Remove duplexer reverse motor

Remove printer drive assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the EIO card (if installed). See “Remove EIO card” on page 102.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Unplug the two ribbon cables. See “Remove ribbon cable harness” on page 136.

Step 1 Remove the five self-tapping mounting screws (callout 1) and three ground screws (callout 2).

Step 2 Tilt the printer drive assembly away from the chassis and unplug all harness connectors and the I/F ribbon cable.

Step 3 Lift off the printer drive assembly.

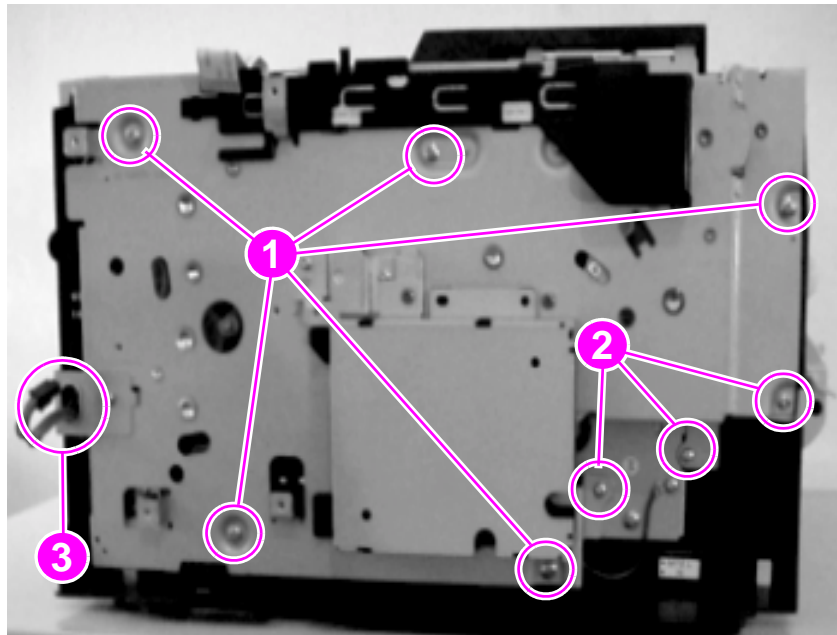


Figure 107. Remove mounting and ground screws

Note

When replacing the printer drive assembly, feed the formatter power harness (callout 3) through the shield.

Remove engine controller assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the EIO card (if installed). See “Remove EIO card” on page 102.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Unplug the two ribbon cables. See “Remove ribbon cable harness” on page 136.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.

CAUTION

The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

Step 2 Remove the single mounting screw (callout 1) and ground cable screw (callout 2), and unplug the harness connector (callout 3).

Step 3 Lift off the engine controller assembly.

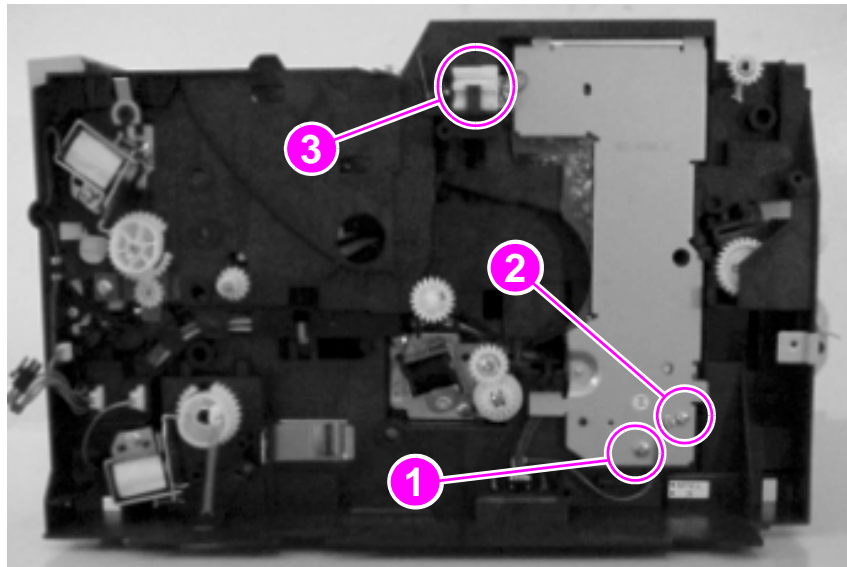


Figure 108. Remove mounting screw (shown from threaded side)

Remove main motor

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the EIO card (if installed). See “Remove EIO card” on page 102.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Unplug the two ribbon cables. See “Remove ribbon cable harness” on page 136.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.

Step 2 Remove the three mounting screws (callout 1).

Step 3 Lift off the main motor.

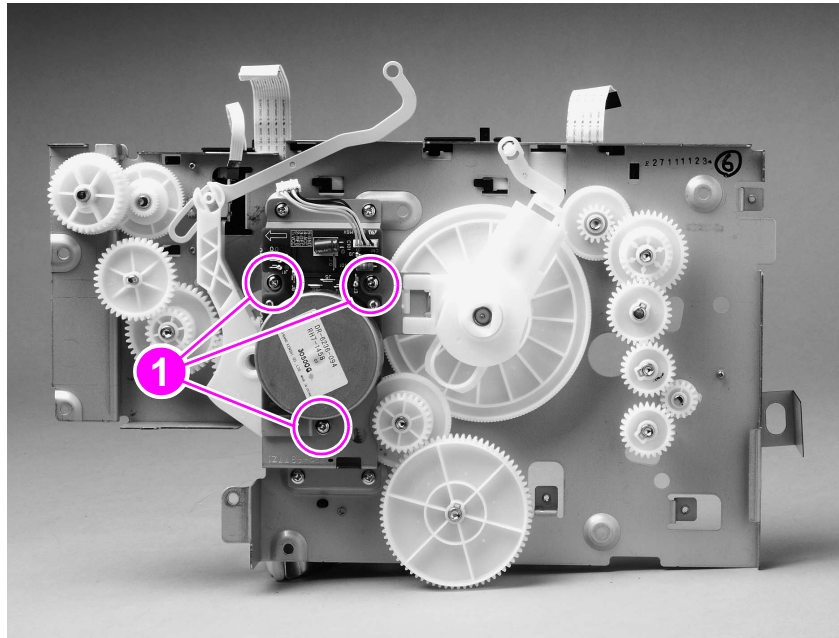


Figure 109. Remove main motor

Remove motor plate

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the EIO card (if installed). See “Remove EIO card” on page 102.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Unplug the two ribbon cables. See “Remove ribbon cable harness” on page 136.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.

Step 2 Remove the four screws (callout 1).

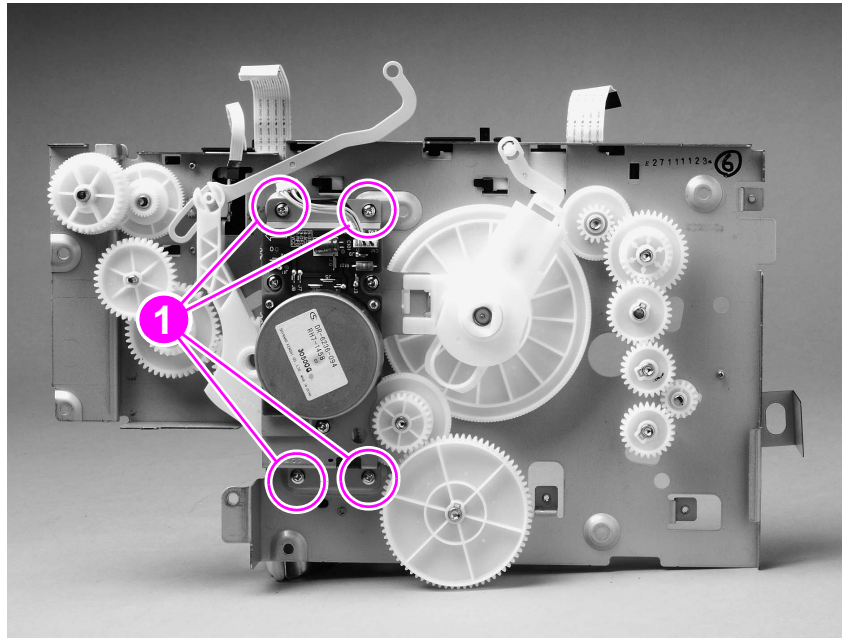


Figure 110. Remove motor plate

Step 3 Press and hold the retaining clip (callout 1), and then slide the motor plate out of the plastic holder while holding the bushing down with the other hand.

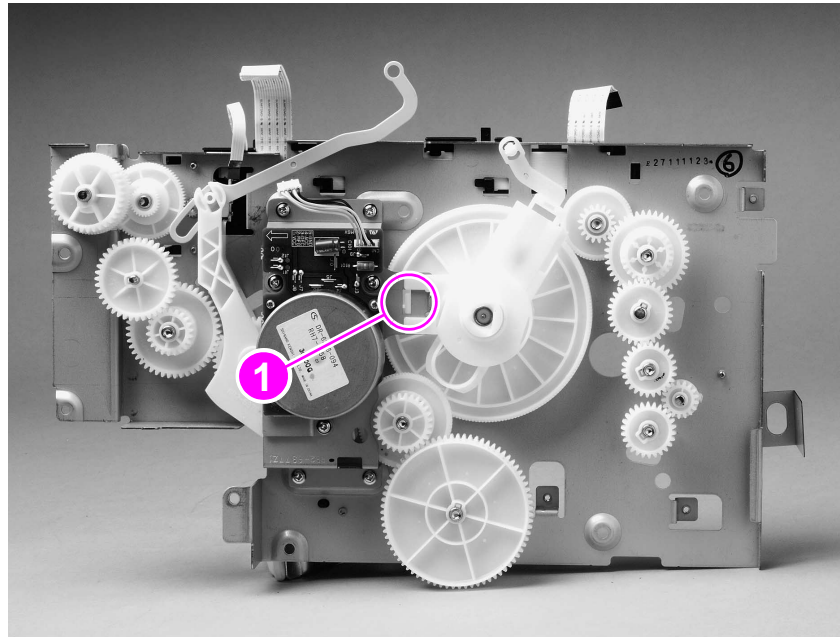


Figure 111. Motor plate retaining clip

Remove printer drive assembly gears

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the EIO card (if installed). See “Remove EIO card” on page 102.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Unplug the two ribbon cables. See “Remove ribbon cable harness” on page 136.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.
- Remove the motor plate. See “Remove motor plate” on page 141.

Note

The drive assembly gears are secured to the drive assembly plate by either the motor plate or a keyed master gear positioned at the top of a gear cluster.

Step 2 Lift off the printer drive assembly gears.

- Remove the keyed master gear to free gears in a gear cluster (some gear clusters contain more than one keyed master gear).

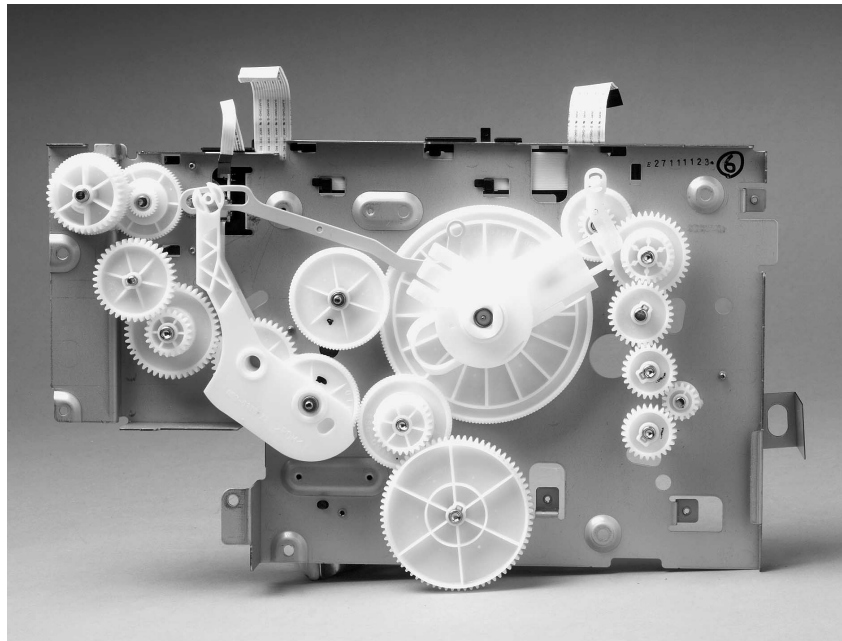


Figure 112. Remove printer drive-assembly gears

Remove tray 1 pickup roller

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the left cover. See “Remove left cover” on page 109.
- Remove tray 1. See “Remove tray 1” on page 110.

Step 2 Rotate the left idler roller (callout 1) (on the cooling fan side) until its release tab is exposed.

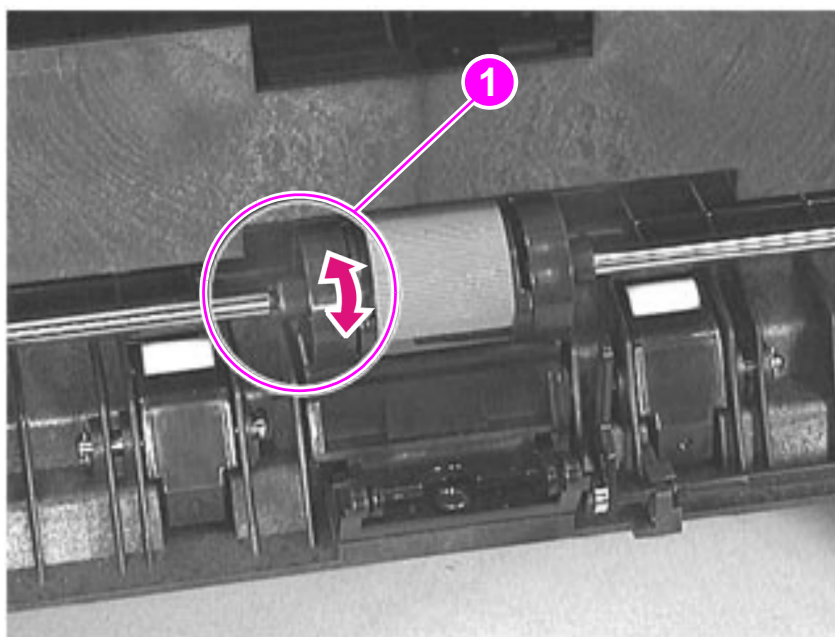


Figure 113. Locate left idler roller release tab

- Step 3 Press and hold down the separation pad.
- Step 4 Grasp the roller, as shown below. Press and hold the release tab.
- Step 5 Slide the idler roller to the left (toward the fan side).
- Step 6 Repeat steps 2 through 5 for the right roller with all actions oriented toward the printer-drive assembly side.

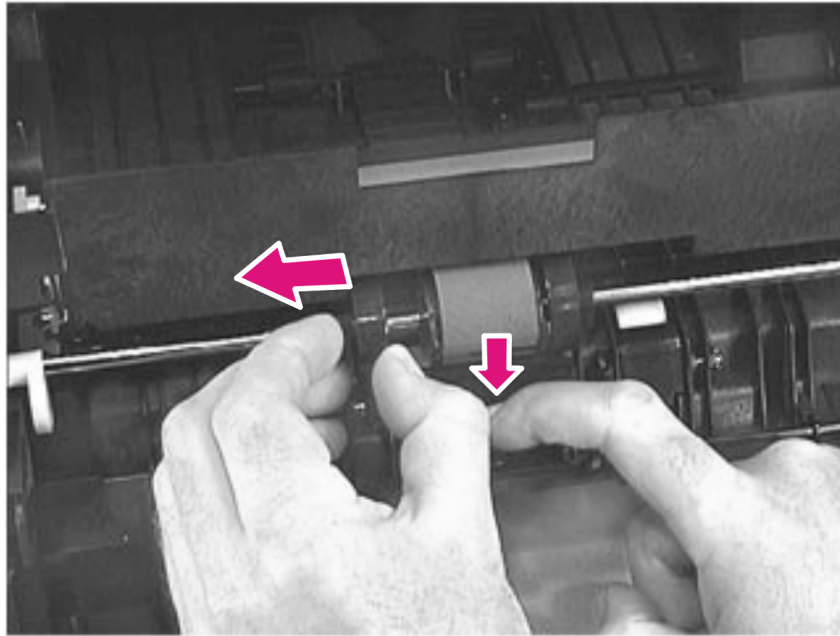


Figure 114. Release roller

- Step 7 Press and hold the roller release tab that was exposed when the right roller was moved.
- Step 8 Move the roller slightly to the right (toward the printer-drive assembly), and rotate it forward and out.

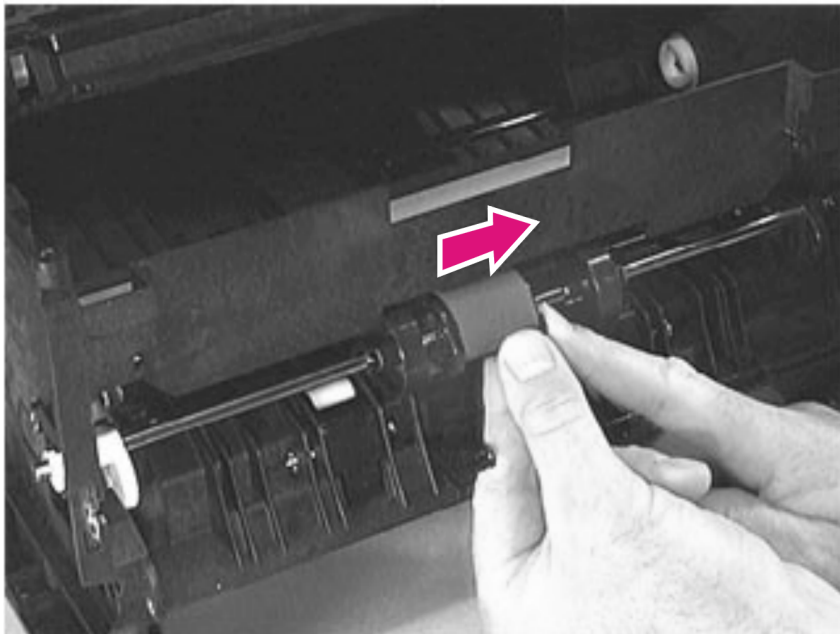


Figure 115. Release tray 1 separation roller

Remove tray 1 pickup roller assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the left cover. See “Remove left cover” on page 109.
- Remove tray 1. See “Remove tray 1” on page 110.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.

Step 2 Rotate the pickup-roller gear (callout 1) to clear the solenoid arm, and press the gear's locking tab.

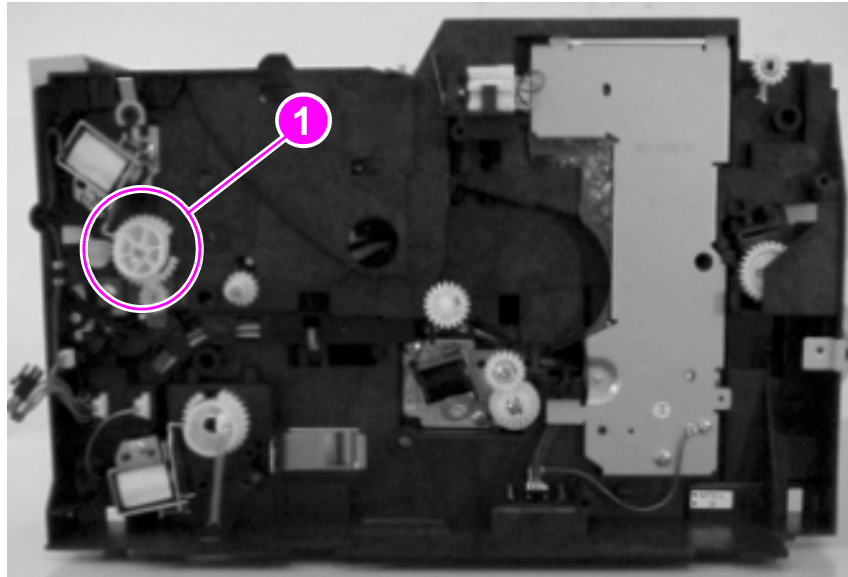


Figure 116. Remove tray 1 pickup-roller gear

Step 3 Unsnap the locking lever on the black bushing (callout 1). Rotate the bushing until its locking tab aligns with the slot in the chassis. Remove the bushing.

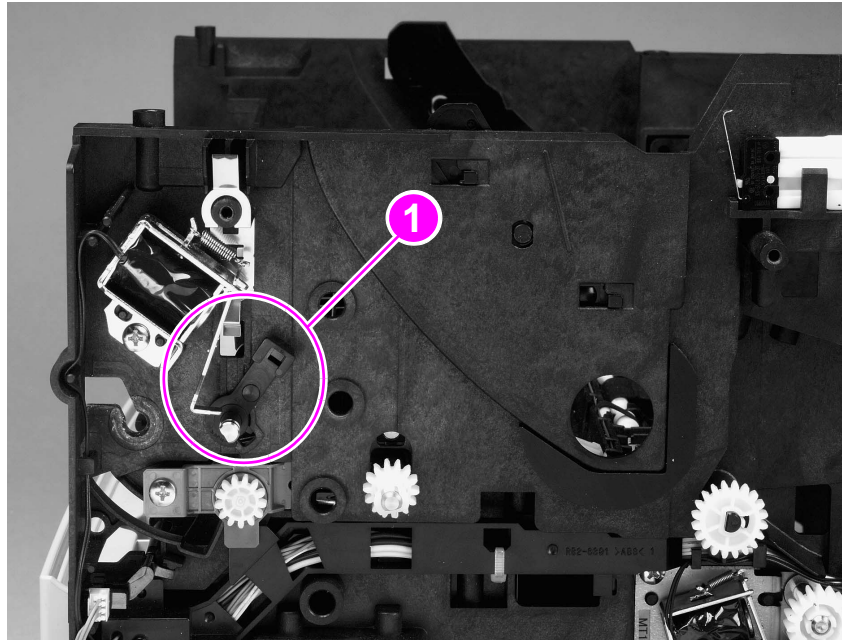


Figure 117. Remove black bushing

Step 4 Unsnap the locking lever on the white bushing (callout 1) (located on the opposite side of the printer chassis). Rotate the bushing until its locking tab aligns with the slot in the chassis. Remove the bushing.

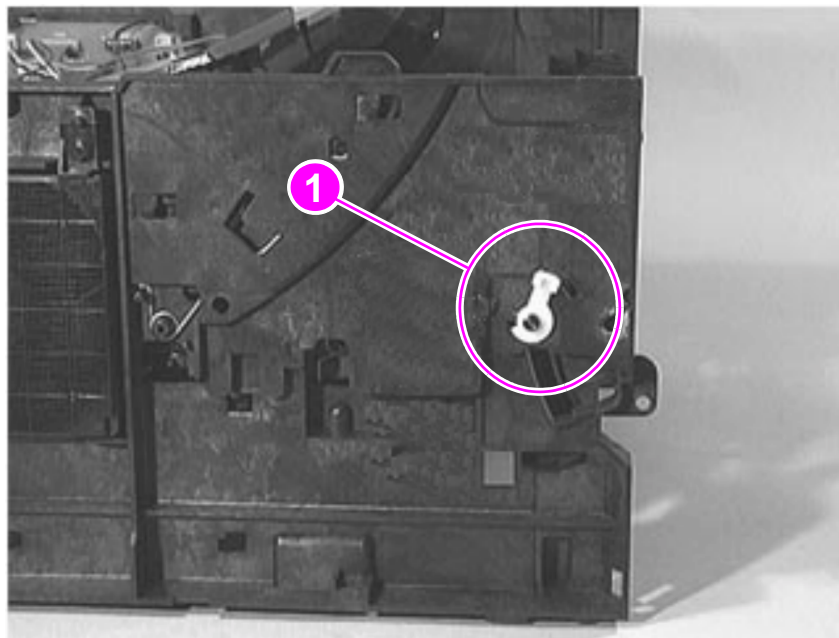


Figure 118. Remove white bushing

Step 5 Slide the tray 1 pickup roller assembly towards the roller solenoid side of the printer until the it clears the opening.

Step 6 Rotate the tray 1 pickup roller assembly away from the printer. Lift it off.

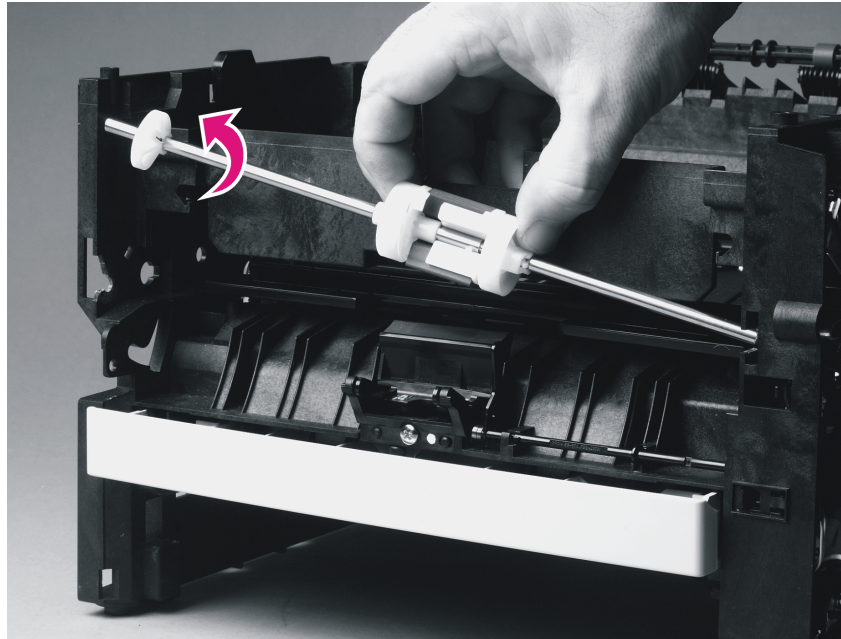


Figure 119. Remove tray 1 pickup roller assembly

Remove tray 1 separation pad assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the left cover. See “Remove left cover” on page 109.
- Remove tray 1. See “Remove tray 1” on page 110.
- Remove the tray 1 pickup roller assembly. See “Remove tray 1 pickup roller” on page 144.

Step 2 Rotate the separation pad fully forward.

Step 3 Gently squeeze the mounting feet of the assembly to release it from the pivot pins.

Step 4 Lift off the tray 1 separation-pad assembly.

Step 5 If required, remove the single separation-pad mounting bracket mounting screw and remove the mounting bracket.

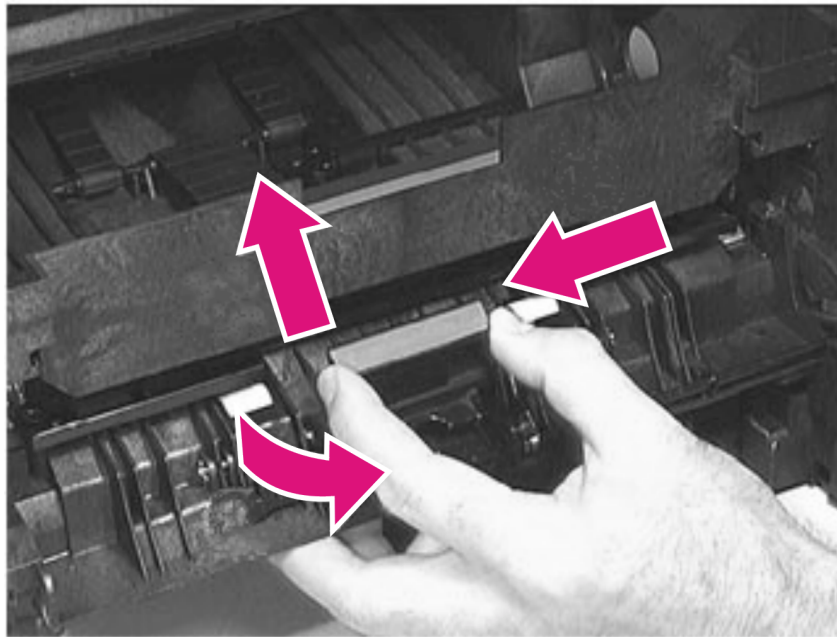


Figure 120. Remove tray 1 separation-pad assembly

Remove tray 1 paper-sensor lever

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove the left cover. See “Remove left cover” on page 109.
- Remove tray 1. See “Remove tray 1” on page 110.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.

Step 2 Unplug the paper-sensor lever optic harness (callout 1).

Step 3 Grasp the paper sensor by the harness connector and squeeze the two locking tabs.

Step 4 Rotate the paper-sensor harness-connector away from the chassis.

Step 5 Lift off the paper sensor.

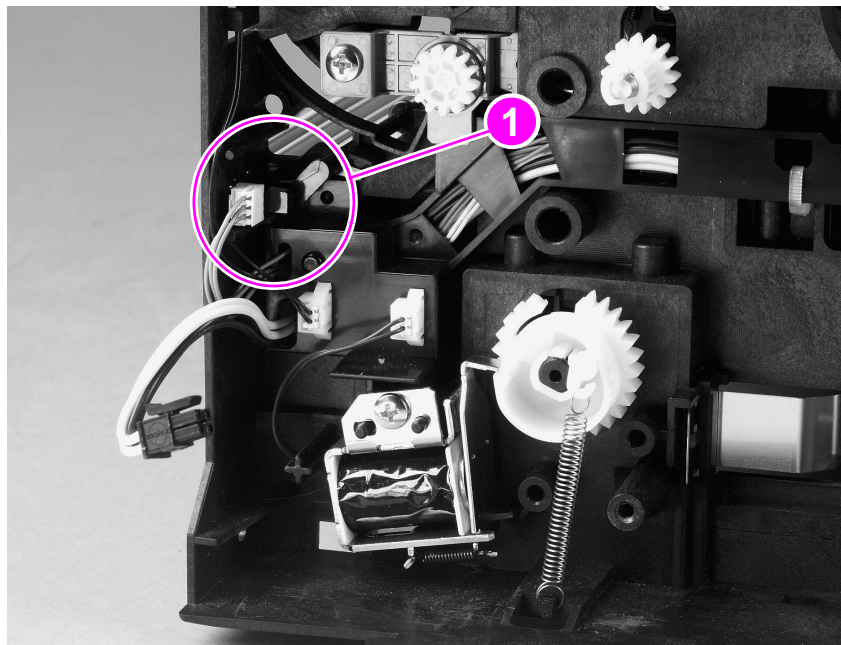


Figure 121. Remove paper sensor

Step 6 Pull the center of the paper-sensor lever outward, and then slide it toward the printer drive side of the printer until it stops.

Step 7 Rotate the paper-sensor lever to the horizontal position and lift it out.

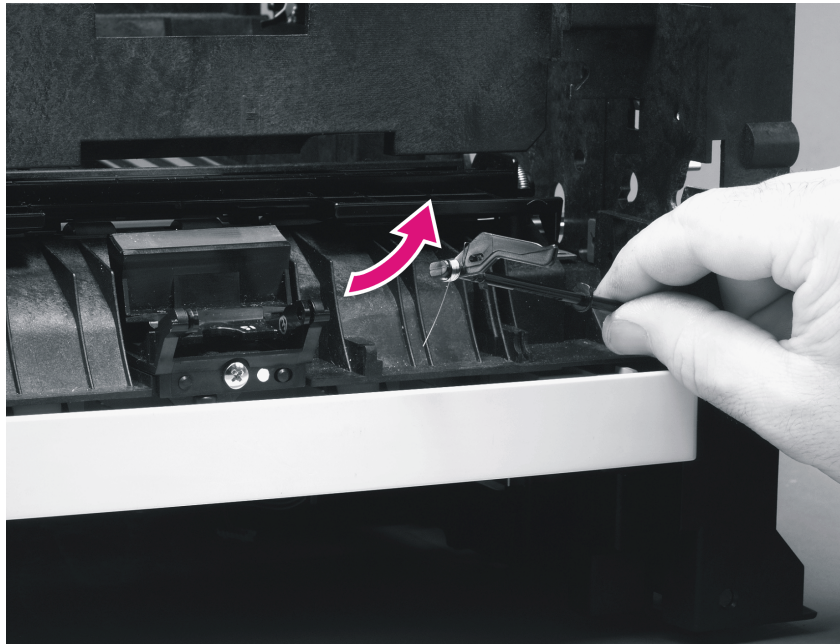


Figure 122. Remove the tray 1 paper-sensor lever

Note

When replacing the paper-sensor lever, verify that the tail of the lever spring is correctly positioned to produce a positive forward force on the lever and ensure correct paper-sensor lever operation. Verify that the sensor lever moves freely after the paper-sensor lever or sensor optic has been replaced.

Remove tray 1 solenoid

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove left cover. See “Remove left cover” on page 109.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.

Step 2 Trace the two-pin solenoid wire harness (callout 1) and unplug it from the connector.

Step 3 Unlace the wire harness from the loops.

Step 4 Remove the mount screw (callout 2).

Step 5 Lift off the tray 1 solenoid.

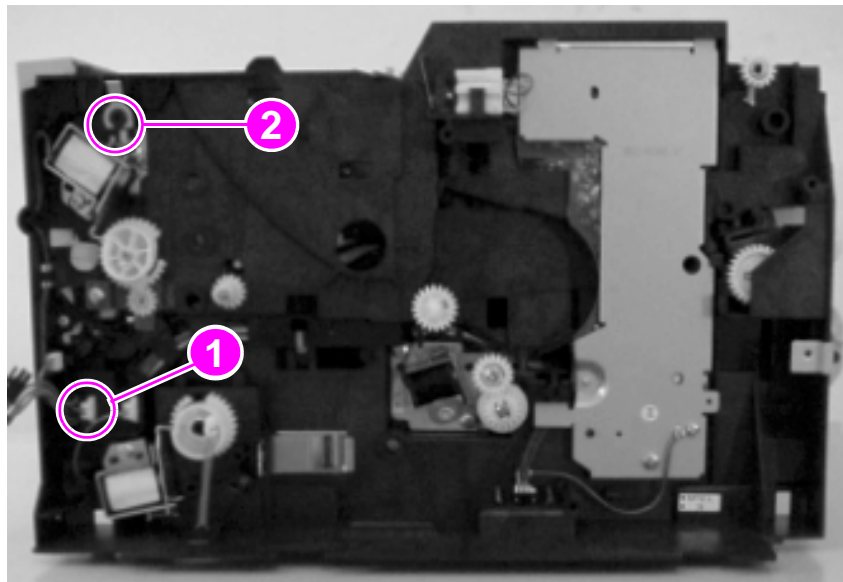


Figure 123. Remove tray 1 solenoid

Remove tray 2 pickup roller assembly

Note

Do not touch the surface of the pickup roller with bare hands. Skin oils can damage the roller.

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.

Step 2 Place the printer top down with the infrared sensor port facing forward.

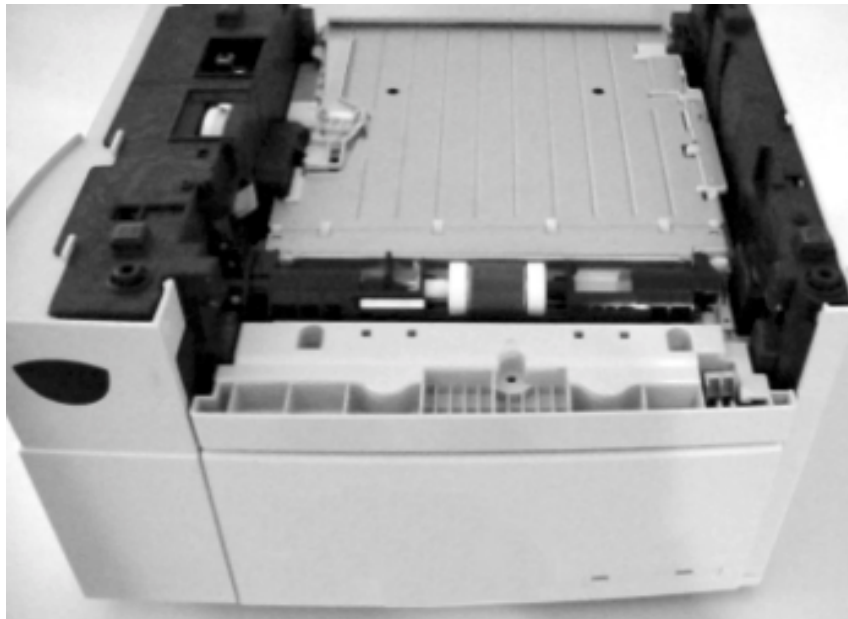


Figure 124. Top down with infrared sensor port facing forward

Step 3 Unsnap and rotate the locking lever of the white bushing (callout 1).

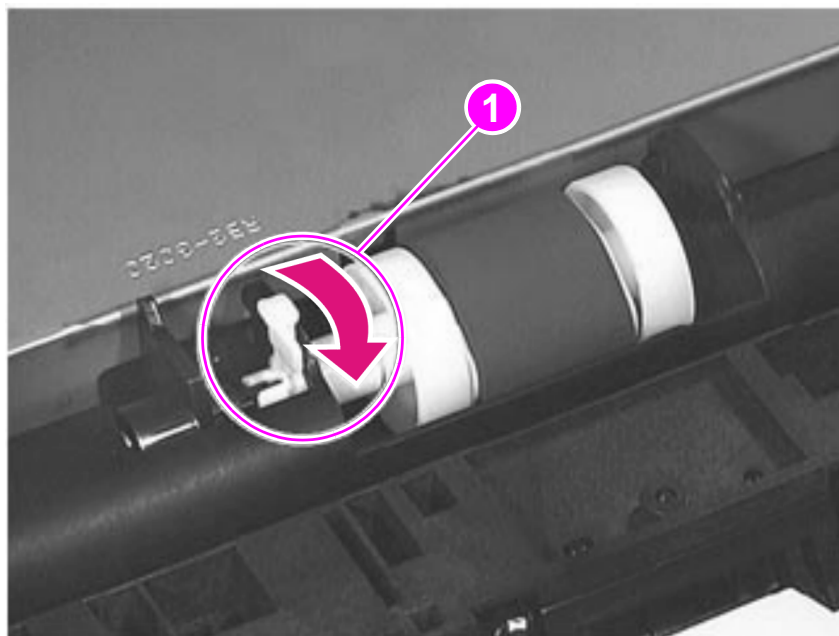


Figure 125. Unlock and rotate the white bushing

Step 4 Align the locking tab bushing with the opening in the roller carriage.

Step 5 Slide the bushing away from the roller assembly.

Note

To make the bushing slide more easily, rotate the bushing lever toward the rear of the printer (after the locking tab clears the carriage opening).

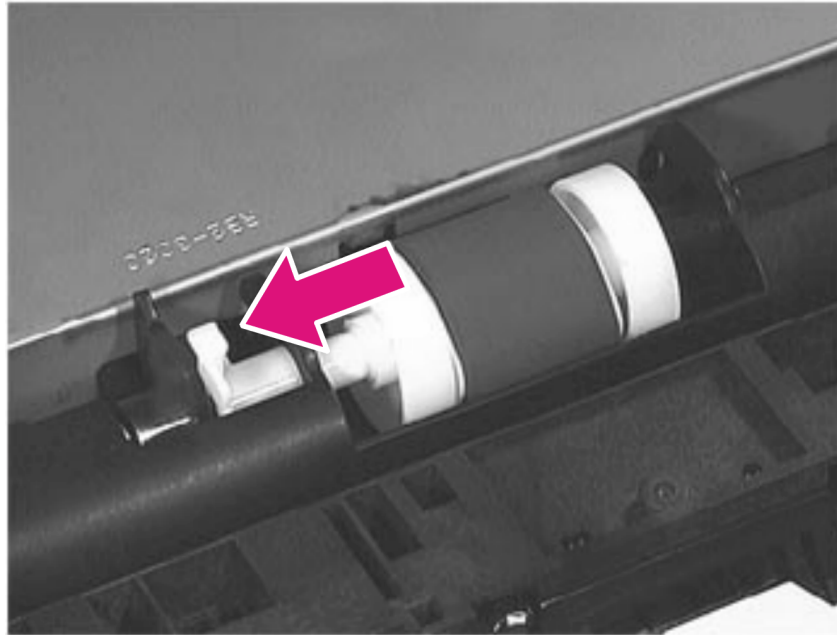


Figure 126. Slide the bushing away from roller assembly

Step 6 Unsnap the locking lever of the black bushing (callout 1) and rotate to align the bushing's locking tab with the opening in the roller carriage.

Step 7 Slide the bushing away from the roller assembly and remove it from the roller assembly shaft.

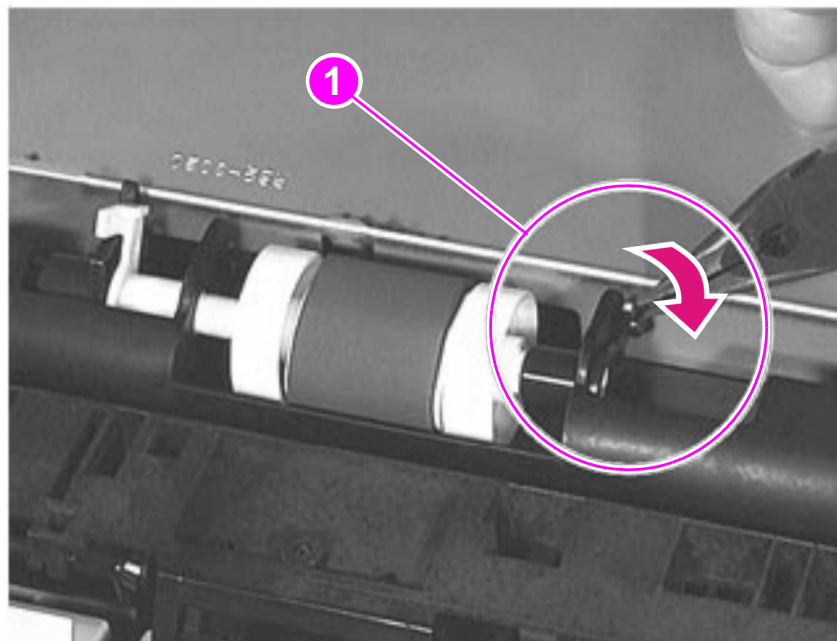


Figure 127. Remove black bushing

Step 8 Slide the roller assembly away from the white bushing (allow the shaft extend into the mounting hole of the black bushing).

Step 9 Tilt the roller assembly shaft out of the carriage, and lift it out.

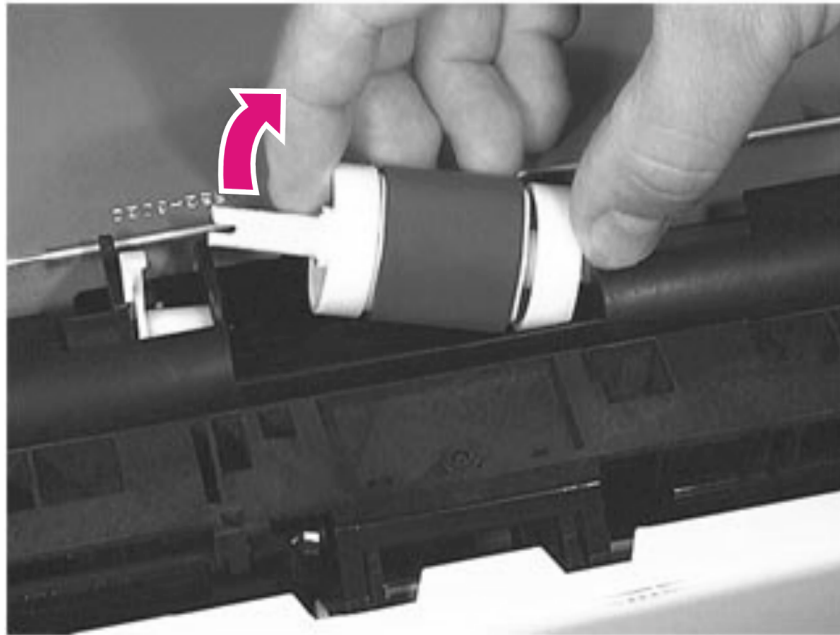


Figure 128. Remove the pickup roller assembly

Note

When replacing the pickup roller assembly, verify that the paper-to-tray sensor arm moves freely and is correctly positioned. Verify that the pickup roller assembly completely engages the drive shaft.

Replace tray 2 pickup roller

Step 1 Remove the two rollers from the pickup roller.

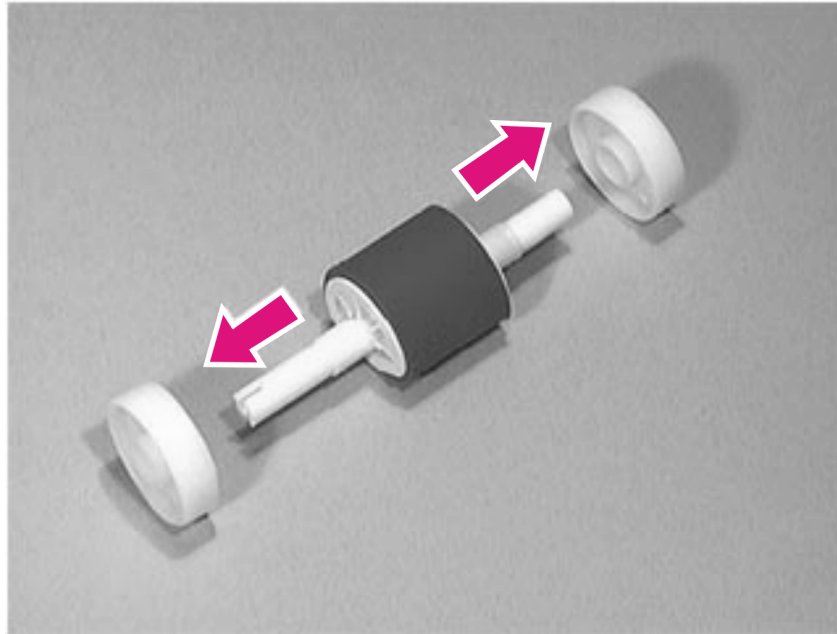


Figure 129. Remove rollers

Step 2 Place the two rollers on the ends of the replacement pickup roller.

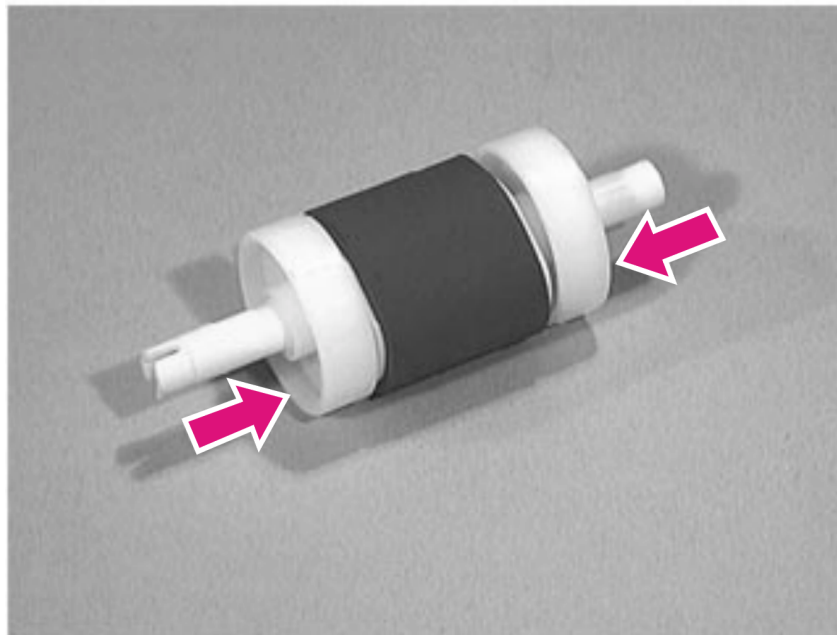


Figure 130. Replace rollers

Remove tray 2 pickup roller and refeeder assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove left cover. See “Remove left cover” on page 109.
- Remove the EIO card. See “Remove EIO card” on page 102.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Remove duplexer tray. See “Remove duplexer tray” on page 124.
- Remove the power supply. See “Remove power supply assembly” on page 126.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.

Note

The following step is only required if the refeeder sensor lever is being removed.

- Remove the registration assemble. See “Remove registration assembly” on page 162.

Step 2 Rotate the gear (callout 1) to clear the solenoid arm then remove the gear and spring.

Note

To remove the tray 2 pickup-roller drive shaft, release the locking tab of the white bushing at the solenoid end and slide the shaft out of the roller carriage.

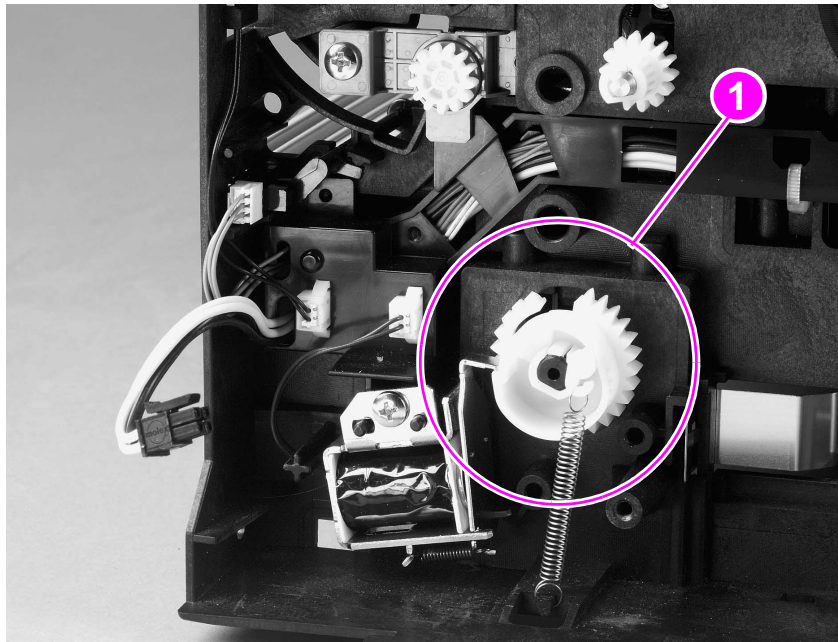


Figure 131. Remove tray 2 pickup-roller gear and spring

Note

When replacing the shaft, verify the tray 2 paper-sensor lever moves freely.

Step 3 Place the printer top-down with the infrared port facing forward.

Step 4 Remove the two mounting screws from the duplex cover, disengage the duplexer release lever from the refeeder assembly, and remove the lever.

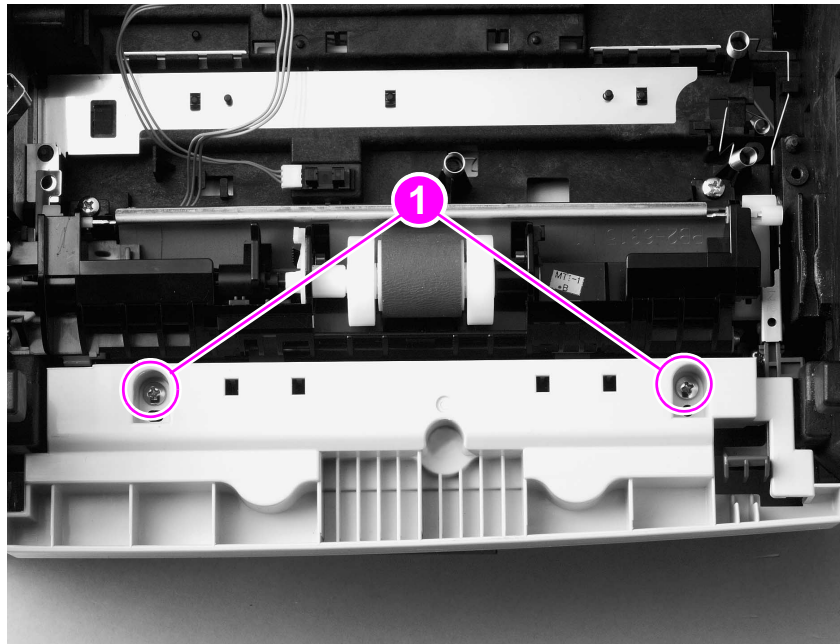


Figure 132. Remove the duplex cover

Step 5 Unplug the refeeder three-pin harness.

Step 6 Remove the five mounting screws (callout 1) from the tray 2 pickup roller and refeeder assembly.

Step 7 Lift off the tray 2 pickup roller and refeeder assembly.

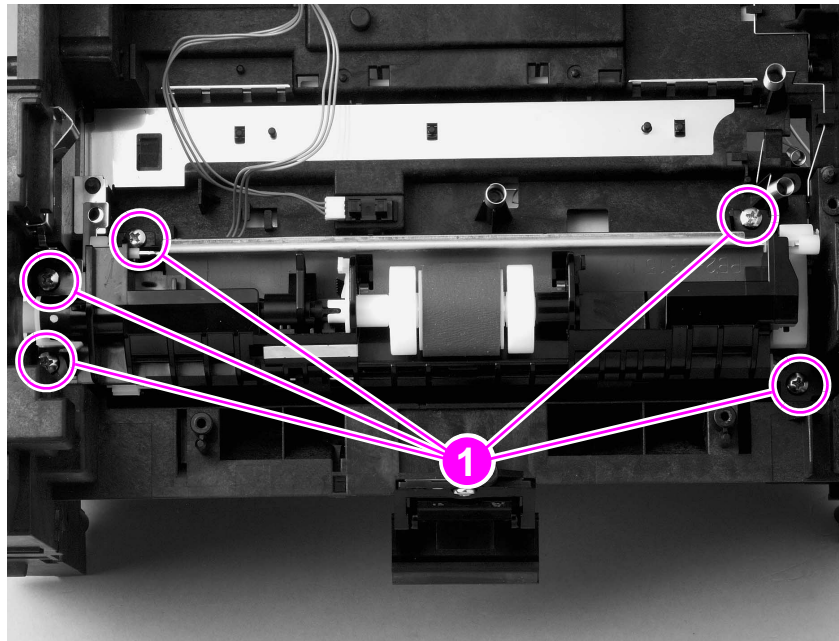


Figure 133. Remove tray 2 pickup-roller and refeeder assembly

Step 8 Unplug the optic sensor three-pin harness from the optic sensor.

Step 9 Grasp the optic sensor (callout 1) by the harness connector and squeeze the two locking tabs. Rotate the sensors harness connector away from the chassis.

Step 10 Lift out the sensor.

Step 11 Squeeze the locking tabs of the sensor lever arm and push down on the lever (towards the laser/scanner side).

Step 12 Lift out the paper-sensor lever.

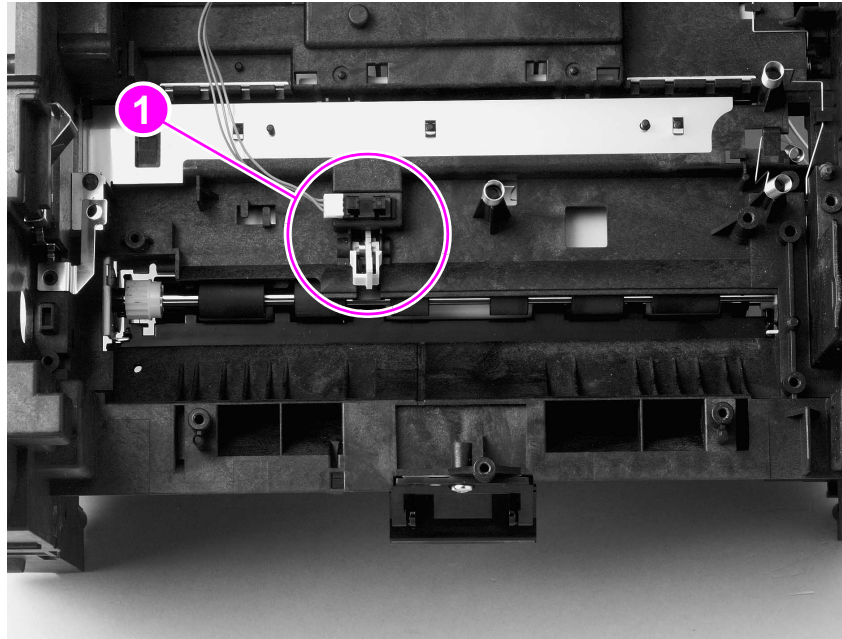


Figure 134. Remove tray 2 optic sensor and lever

Note

When replacing the paper-sensor lever, verify that the tail of the lever spring is correctly positioned to produce a positive forward force on the lever and ensure correct paper-sensor lever operation. Verify that the sensor lever moves freely after the paper-sensor lever or sensor optic has been replaced.

Remove tray 2 solenoid

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove left cover. See “Remove left cover” on page 109.
- Remove the EIO card. See “Remove EIO card” on page 102.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.

Step 2 Trace the two-pin solenoid wire harness and unplug it from the connector.

Step 3 Remove the screw, as shown.

Step 4 Lift out the tray 2 solenoid.

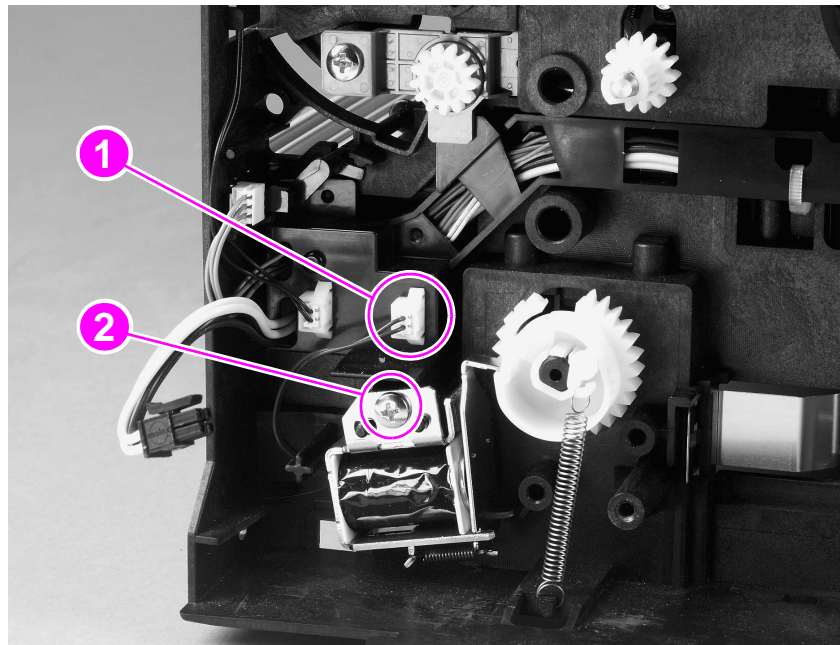


Figure 135. Remove the tray 2 solenoid

Remove duplexer drive gears and solenoid

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove left cover. See “Remove left cover” on page 109.
- Remove the EIO card. See “Remove EIO card” on page 102.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.

Step 2 Gently pry apart the two locking tabs on the topmost duplexer drive gear (callout 1) and remove the gear. Repeat for the remaining drive gear.

Step 3 Unlace the 2-pin solenoid wire harness from the loops and disconnect the connector (callout 2) (if an earlier printer driver assembly removal was performed, the connector was previously unplugged).

Step 4 Remove the mount screw (callout 3).

Step 5 Lift out the duplexer solenoid.

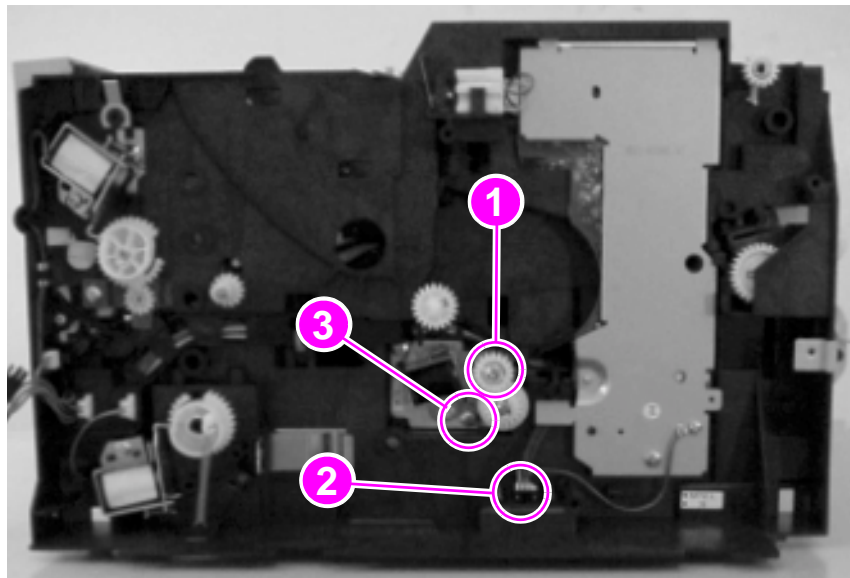


Figure 136. Remove duplexer drive gears and solenoid

Remove registration assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove left cover. See “Remove left cover” on page 109.
- Remove the EIO card. See “Remove EIO card” on page 102.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.

Step 2 Remove the registration-assembly drive gear (callout 1).

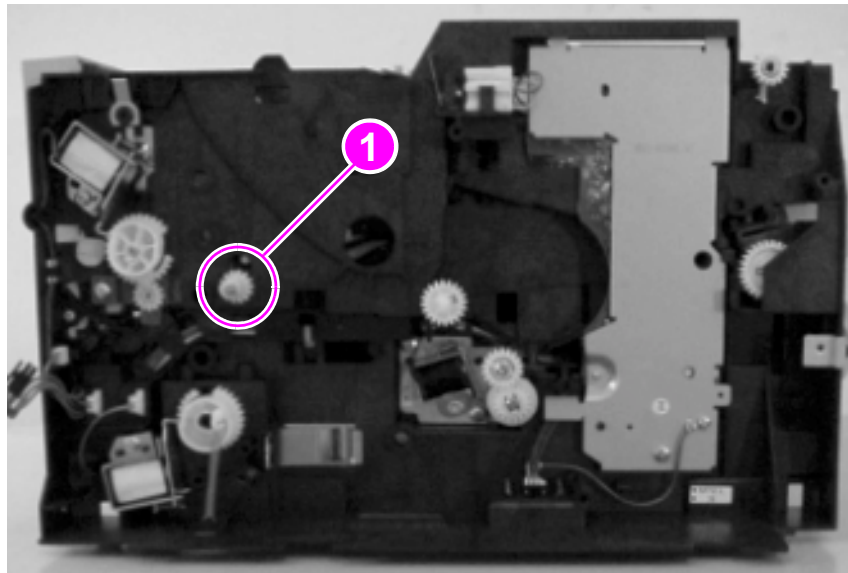


Figure 137. Remove registration-assembly drive gear

Step 3 Remove the six mounting screws (callout 1).

Step 4 Lift the assembly to the left (the cooling-fan side), and then to the right (the printer-drive assembly side) to free it.

Step 5 Lift out the registration assembly.

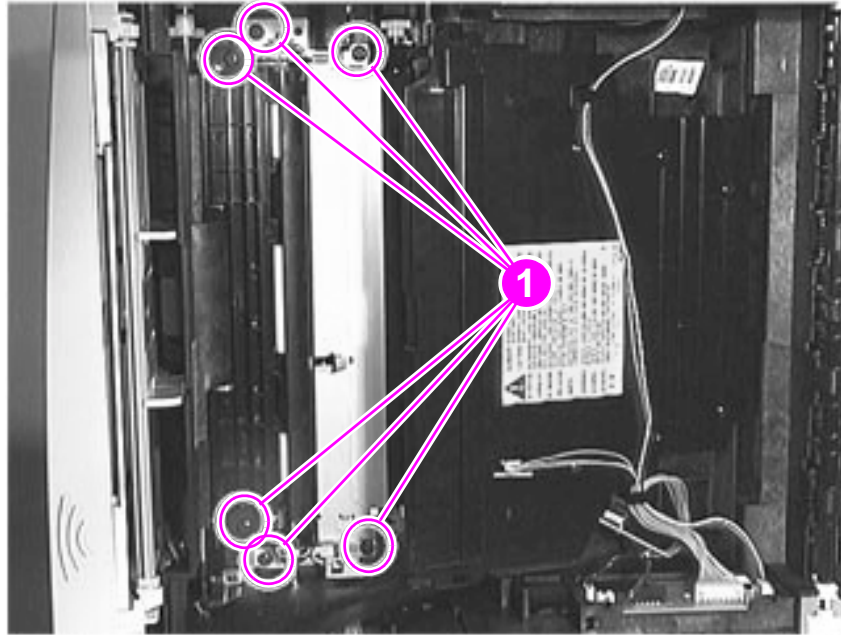


Figure 138. Registration assembly

Remove tray 3 assembly connector

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove left cover. See “Remove left cover” on page 109.
- Remove the EIO card. See “Remove EIO card” on page 102.
- Remove the formatter PCB. See “Remove formatter PCB” on page 116.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 138.

Step 2 Unplug the four-pin and three-pin tray 3 harness connectors (callout 1).

Step 3 Squeeze the wing nuts with needle-nose pliers, and push the connector through the opening.

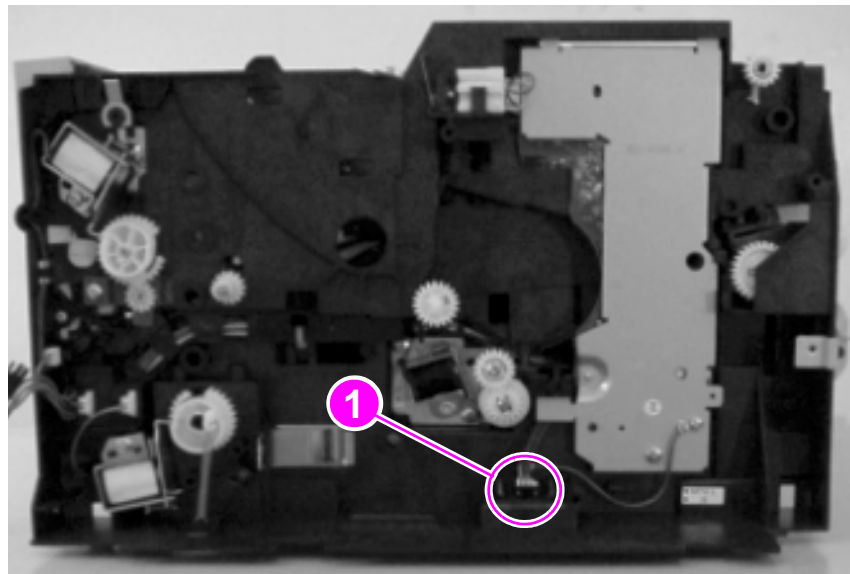


Figure 139. Remove the tray 3 connector

Remove cooling fan

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove left cover. See “Remove left cover” on page 109.

Step 2 Trace the 3-pin fan wire harness and unplug its connector (callout 1).

Step 3 Unlace the harness from the loops (callout 2) on the scanner assembly.

Step 4 Remove the two fan mounting screws (callout 3) and lift out the fan.

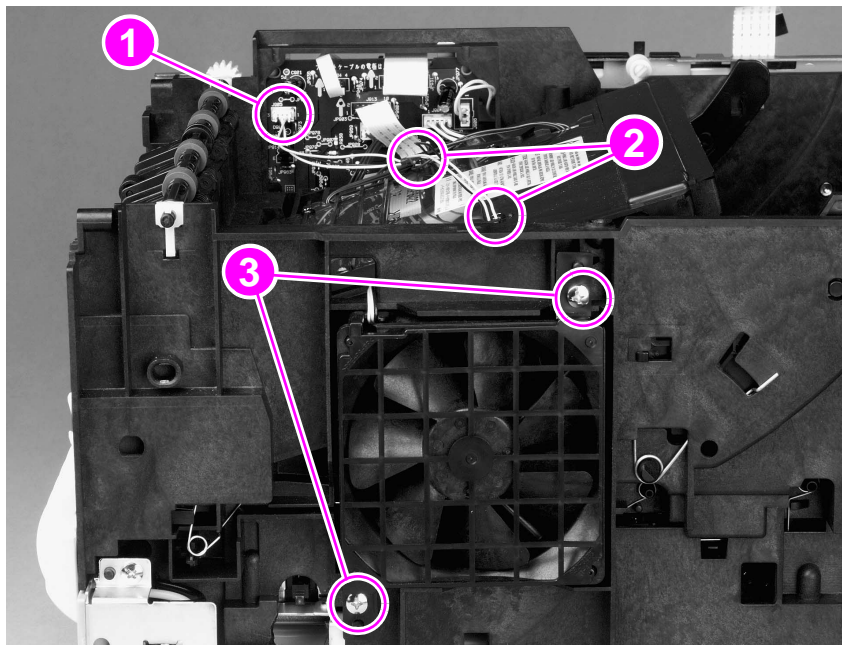


Figure 140. Remove cooling fan

CAUTION

When replacing the fan, verify that the air flow is directed into the printer cabinet (the fan is marked with a air flow directional arrow located at the top of the fan housing).

Remove toner-cartridge guide

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove left cover. See “Remove left cover” on page 109.

Step 2 Press and hold in the toner-cartridge guide pin (callout 1).

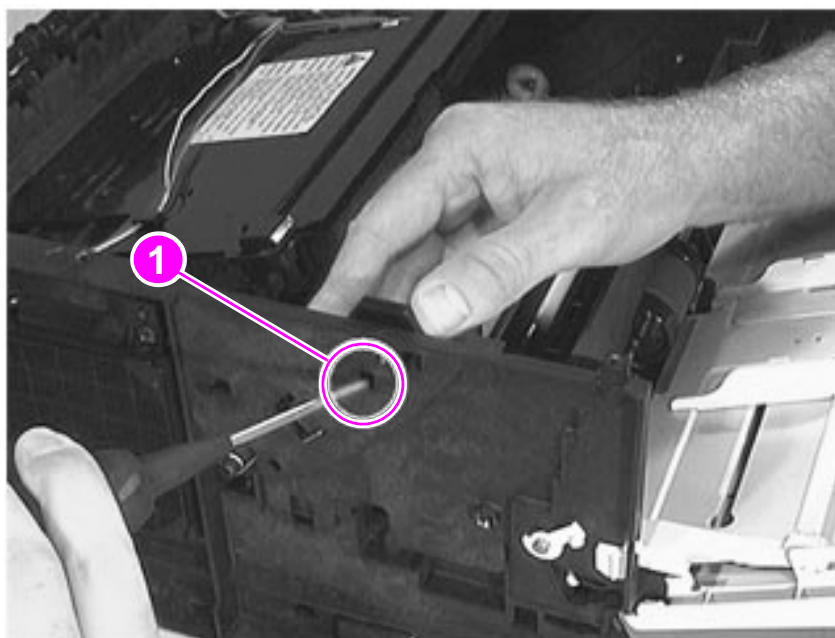


Figure 141. Release toner-cartridge guide pin

Step 3 Slide the guide forward (away from the laser/scanner assembly) and lift it out.

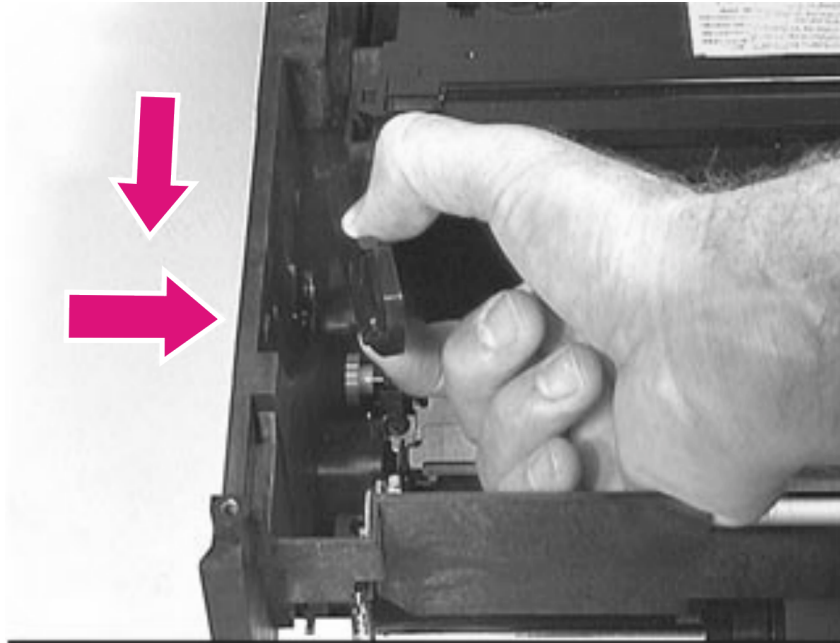


Figure 142. Remove toner-cartridge guide

Remove dc bias voltage contacts (leaf springs)

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 100.
- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 101.
- Remove the DIMM cover. See “Remove DIMM cover” on page 103.
- Remove the rear cover. See “Remove rear cover” on page 104.
- Remove the top cover. See “Remove top cover” on page 106.
- Remove left cover. See “Remove left cover” on page 109.
- Remove the duplexer tray and media handling assembly. See “Remove duplexer tray” on page 124.
- Remove the power supply assembly. See “Remove power supply assembly” on page 126.

Step 2 Identify the dc bias contact components.

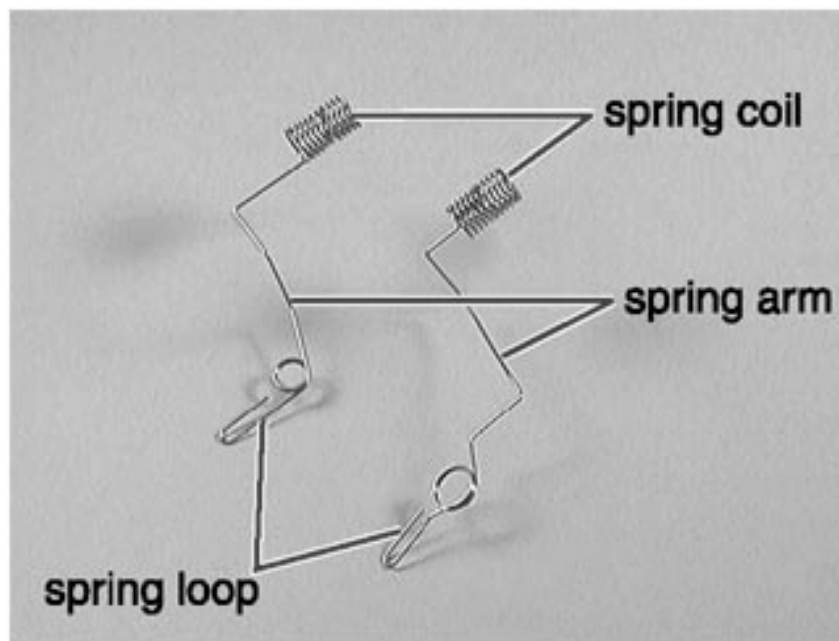


Figure 143. Identify dc bias contacts

- Step 3 Release the spring coil (callout 1) from the retaining clip located on the bottom of printer.
- Step 4 Remove the spring arm from the adjacent retaining clip.

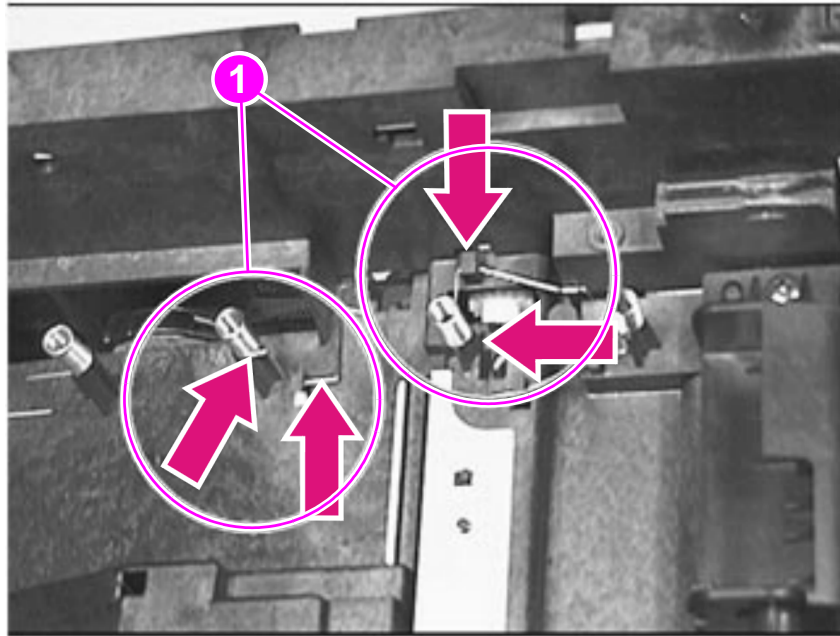


Figure 144. Release dc bias spring coil and spring arm

- Step 5 Remove the spring arm (callout 1) from the post on the fan side of printer. This releases spring tension.
- Step 6 Squeeze the spring loop and slide it out of its slot.
- Step 7 Remove the spring from the side pivot pin.
- Step 8 Lift out the dc bias voltage contact. Repeat for the remaining contact.

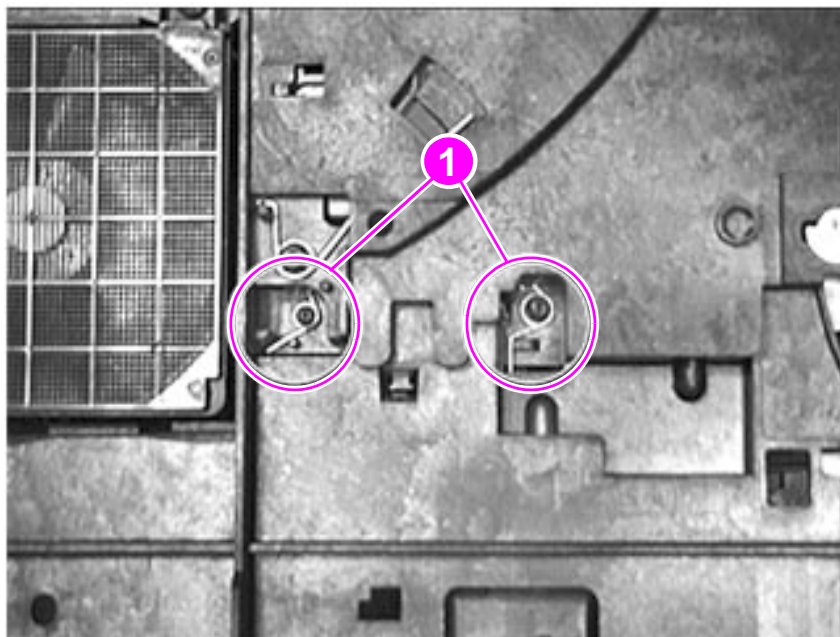


Figure 145. Spring loop

Tray 3 disassembly and assembly

Remove tray 3 (250-sheet feeder) cassette

Step 1 If installed, remove tray 3. See “Remove tray 3” on page 101.

Step 2 Firmly pull the cassette forward and out of the sheet-feeder.

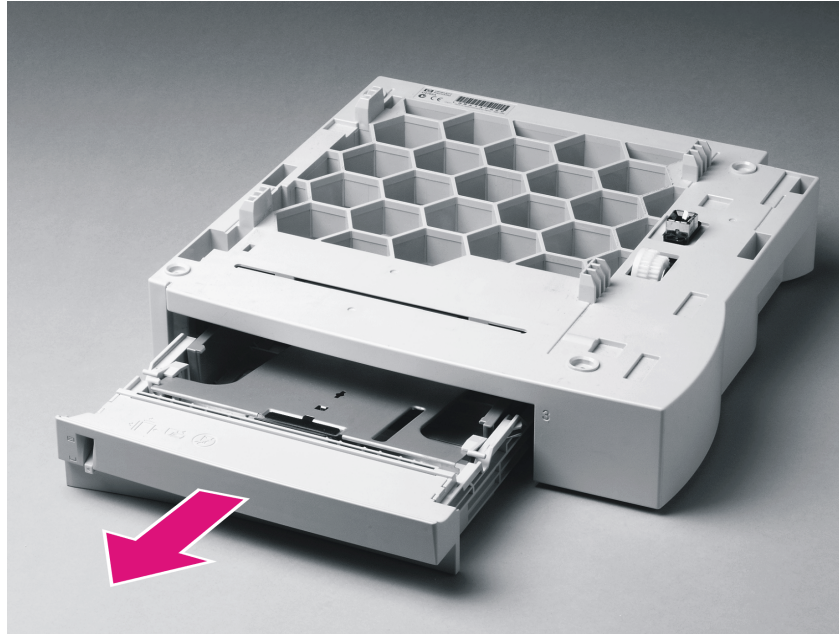


Figure 146. Remove tray 3 (250-sheet feeder)

Remove tray 3 (250-sheet feeder) pickup roller

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette. See “Remove tray 3 (250-sheet feeder) cassette” on page 170.

Step 2 Place the sheet feeder top-down with the front facing outward.

Step 3 Place the blade of a small flat blade screwdriver in the slots (callout 1). Pop each cover off the cassette body.

Step 4 Follow steps 3 through 6 in “Remove tray 2 pickup roller assembly” on page 6-153 to complete removal.

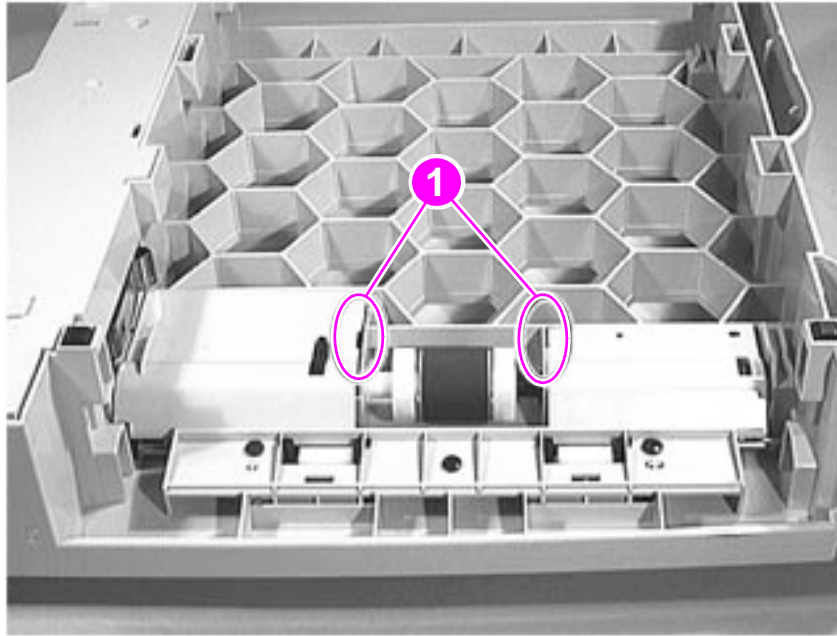


Figure 147. Tray 3 (250-sheet feeder) roller

Remove tray 3 (250-sheet feeder) feeder drive assembly

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette. See “Remove tray 3 (250-sheet feeder) cassette” on page 170.

Step 2 Place the sheet feeder top-down with the front facing outward.

Step 3 Use a small flatblade screwdriver to disengage the cover's locking tabs (callout 1).

Step 4 Lift the cover off the cassette.

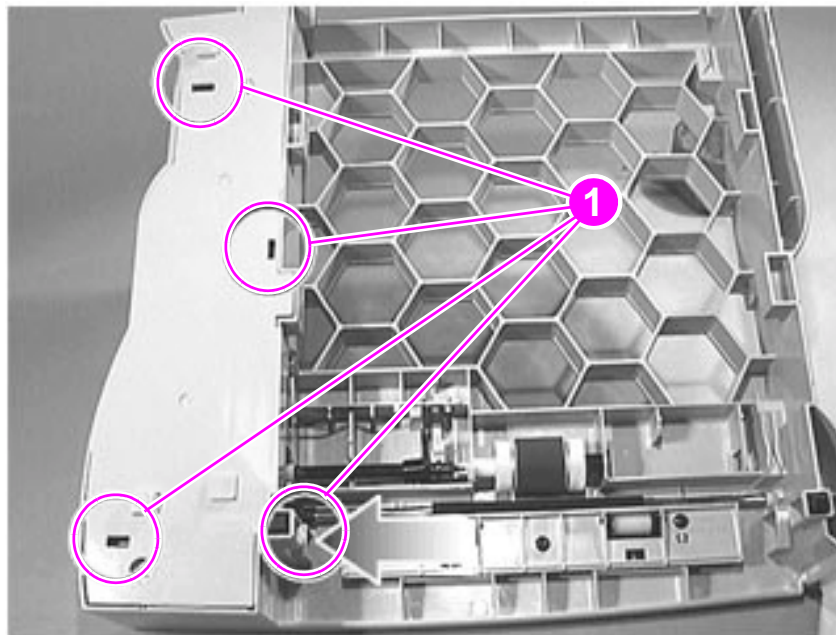


Figure 148. Remove tray 3 (250 sheet-feeder) drive cover

- Step 5 Unplug the one-pin, two three-pin, and four-pin wire harnesses (callout 1) at the PCB.
- Step 6 Unlace the harnesses from loops as required.
- Step 7 Remove the four drive assembly mounting screws (callout 2).
- Step 8 Depress the metal retaining latch (callout 3) (located on the tray side of the assembly).
- Step 9 Lift out the drive assembly.

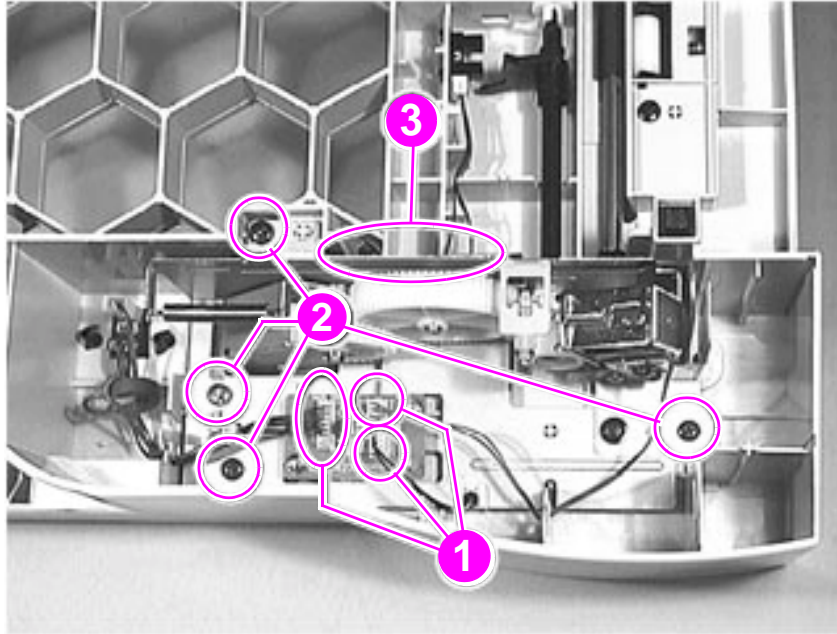


Figure 149. Remove tray 3 (250 sheet-feeder) drive assembly

Remove tray 3 (250 sheet-feeder) drive solenoid

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette. See “Remove tray 3 (250-sheet feeder) cassette” on page 170.
- Remove the tray 3 feeder drive assembly. See “Remove tray 3 (250-sheet feeder) feeder drive assembly” on page 172.

Step 2 Unplug the two-pin solenoid harness connector.

Step 3 Remove the single solenoid mounting screw.

Step 4 Lift out the solenoid.

Remove tray 3 (500-sheet feeder) cassette

Step 1 If installed, remove tray 3. See “Remove tray 3” on page 101.

Step 2 Firmly pull the cassette forward and out of the sheet-feeder.

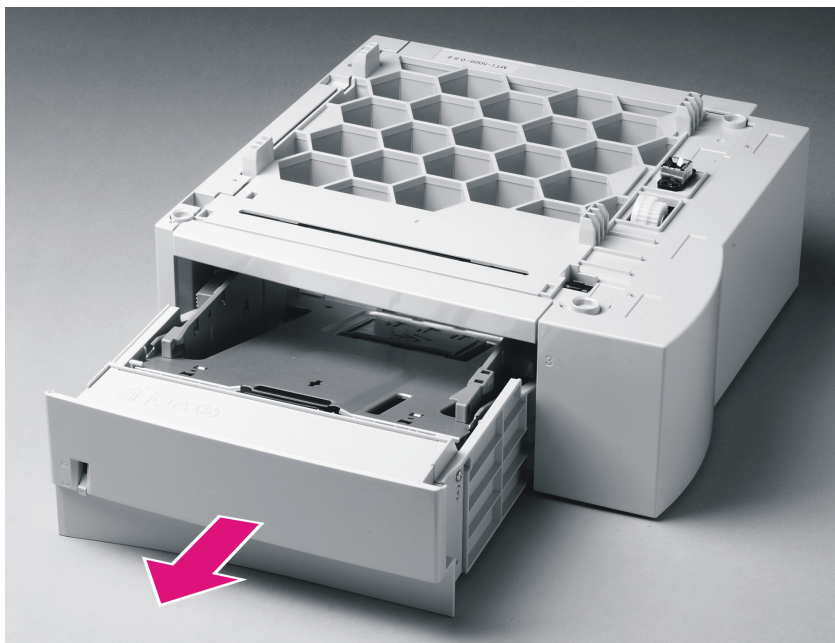


Figure 150. Remove tray 3 (500-sheet feeder) cassette

Remove tray 3 (500-sheet feeder) pickup roller

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette. See “Remove tray 3 (500-sheet feeder) cassette” on page 175.

Step 2 Place the sheet feeder top-down with the front facing outward.

Step 3 Place the blade of a small flatblade screwdriver in the slots (callout 1). Pop each cover off the cassette body.

Step 4 Remove the forward brace located directly over the pickup roller for easy access to the pickup roller assembly.

Step 5 Follow steps 3 through 6 in "Remove tray 2 pickup roller assembly" page 153 to complete removal.

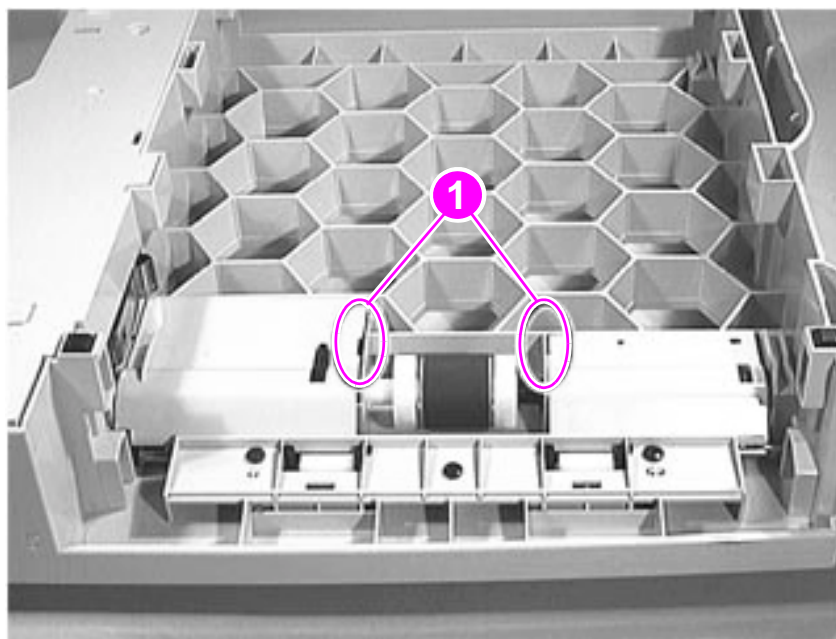


Figure 151. Tray 3 (500-sheet feeder) pickup roller

Remove tray 3 (500-sheet feeder) feeder drive assembly

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette. See “Remove tray 3 (500-sheet feeder) cassette” on page 175.

Step 2 Press down on the two locking pins (callout 1).

Step 3 Rotate the top of the cover away and down from the cassette.

Step 4 Lift the cover away from the cassette.

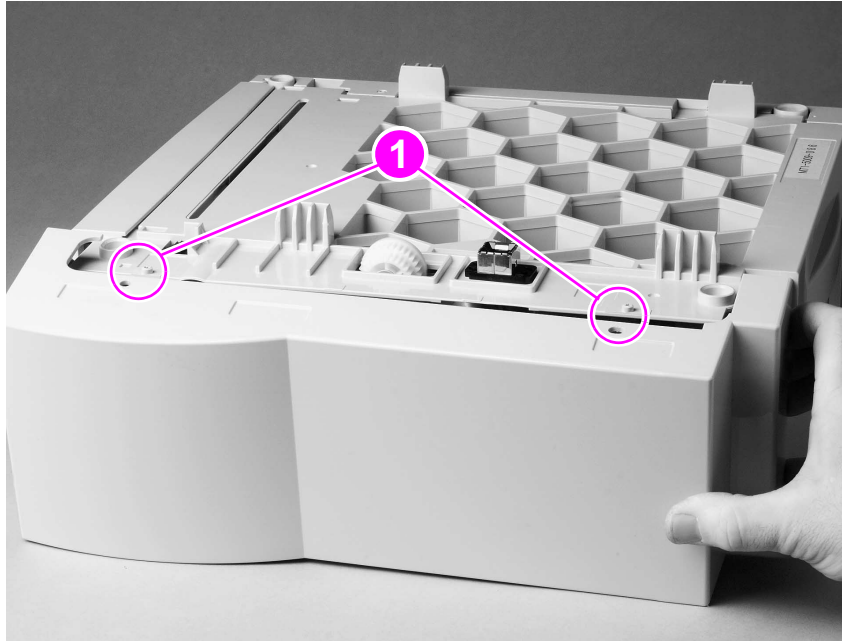


Figure 152. Remove tray 3 (500 sheet-feeder) drive cover

- Step 5 Unplug the one-pin, three-pin, and four-pin cassette docking plug wire harnesses (callout 1) at the docking plug.
- Step 6 Unplug three-pin optic sensor connector (callout 2) at the PCB.
- Step 7 Unlace the harnesses from loops as required.
- Step 8 Remove the three drive assembly mounting screws (callout 3).
- Step 9 Depress the metal retaining latch (located on the tray side of the assembly).
- Step 10 Lift out the drive assembly.

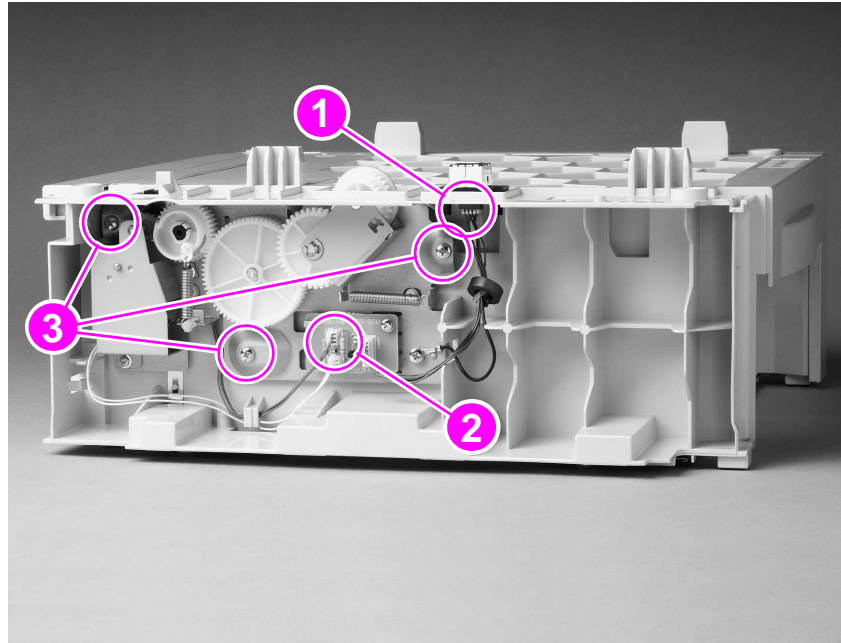


Figure 153. Remove tray 3 (500 sheet-feeder) drive assembly

Remove tray 3 (500 sheet-feeder) drive solenoid

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 101.
- Remove the cassette. See “Remove tray 3 (500-sheet feeder) cassette” on page 175.
- Remove the tray 3 feeder drive assembly. See “Remove tray 3 (500-sheet feeder) feeder drive assembly” on page 177.

Step 2 Unplug the two-pin solenoid harness connector.

Step 3 Remove the two solenoid bracket-mounting screws.

Step 4 Turn the bracket over to expose the solenoid and remove the single solenoid mounting screw.

Step 5 Lift out the solenoid.

7

Troubleshooting

Chapter contents

Troubleshooting process	182
Preliminary operating checks	182
Basic fault isolation	182
Troubleshooting process flow	184
Power-on	185
Troubleshooting with control-panel messages.	186
Control panel LEDs.	186
Control-panel LED messages.	186
Media-handling problems	196
Print test pages.	196
Engine test	196
Self-test/configuration page	196
Jam troubleshooting	197
Media problems	201
Evaluate the test pages.	202
Status-log messages	202
Verify installed options	202
Image-formation troubleshooting.	203
Image defect tables.	205
Repetitive defect ruler.	211
Half self-test functional check	212
Drum-rotation functional check	212
Media troubleshooting	213
Determine the problem source: print media or printer	213
Isolate a paper path	213
Isolate a media brand	214
Isolate a media type	215
Evaluate media use practices	219
Evaluate environmental conditions	219
Communication troubleshooting	221
Communications check.	221
Test message	221
EIO troubleshooting	221
JetDirect configuration-page elements	223
JetDirect configuration	223
Reference diagrams	224

Troubleshooting process

Preliminary operating checks

Make sure that the following conditions are met before troubleshooting a specific printer problem:

- The printer is plugged in and power is delivered to the outlet specified on the power rating label.
- The selected tray contains media that has been properly loaded.
- The toner cartridge is installed properly.
- The printer is receiving maintenance on a regular basis.
- Any I/O devices are properly installed.
- The customer is using acceptable print media.
- The printer is positioned on a solid, level surface.
- The line voltage does not vary more than 10 percent from the nominal rated value specified on the power rating label.
- The operating environment for the printer is within the temperature and humidity specifications.
- The printer is never exposed to ammonia fumes such as those produced by diazo copiers or office cleaning materials.
- The printer is not exposed to direct sunlight.
- Non-HP components (such as refilled toner cartridges, font cartridges, and memory boards) are removed from the printer.

Note

Sudden changes in the printer's environment can cause image defects and media-handling problems. Always make sure the printer is not exposed to direct sunlight or to heating or cooling vents. Allow time for the printer and media to acclimate whenever changing environments (for example, moving from a cold environment to a warm one). Acclimation can take anywhere from 3 to 24 hours depending on the ambient conditions.

Basic fault isolation

The troubleshooting process is a systematic approach that first addresses the major problems first and then other problems to discover the causes for printer malfunctions and errors. The "Troubleshooting process flow" page 184 illustrates the major steps for troubleshooting the printing system. Each heading depicts a major troubleshooting step. A "YES" answer to the questions allows troubleshooting to proceed to the next major step.

A "NO" answer indicates that additional testing and correction is needed. Proceed to the referenced location in the chapter and follow the directions there. After completing the additional testing and correcting the problem, proceed to the next major step.

Note

It is important to always follow this process in sequence. Failure to do so can result in increased repair time, difficulty, and expense.

This list describes the basic questions for the customer to answer and the corresponding troubleshooting section to help quickly define the problem(s).

Table 26. Major steps for troubleshooting

<p>"Power-on" on page 7-185</p>	<p>Does the printer perform the initialization and power-on sequence?</p> <p>This section contains the procedures for correcting power supply problems.</p>
<p>"Troubleshooting with control-panel messages" on page 7-186</p>	<p>Does the control panel LED message indicate an error condition?</p> <p>This section contains the procedures for clearing control panel messages.</p>
<p>"Media-handling problems" on page 7-196</p>	<p>Is it possible to print a test page?</p> <p>This section contains information about troubleshooting paper-path and print-media problems.</p>
<p>"Evaluate the test pages" on page 7-202</p>	<p>Is there information in the status log?</p> <p>This section contains the procedures for printing the information pages and evaluating and correcting the printer's configuration.</p>
<p>"Image-formation troubleshooting" on page 7-203</p>	<p>Does the print quality meet the customer's expectations?</p> <p>This section contains toner cartridge checks, information about EconoMode, image defect examples, and the repetitive-defect ruler.</p>
<p>"Media troubleshooting" on page 7-213</p>	<p>This section contains information about how to determine print-media problems and correct them.</p>
<p>"Communication troubleshooting" on page 7-221</p>	<p>Can the customer print from the host system successfully?</p> <p>This section describes how to determine whether the printer is communicating properly with the host system.</p>

Troubleshooting process flow

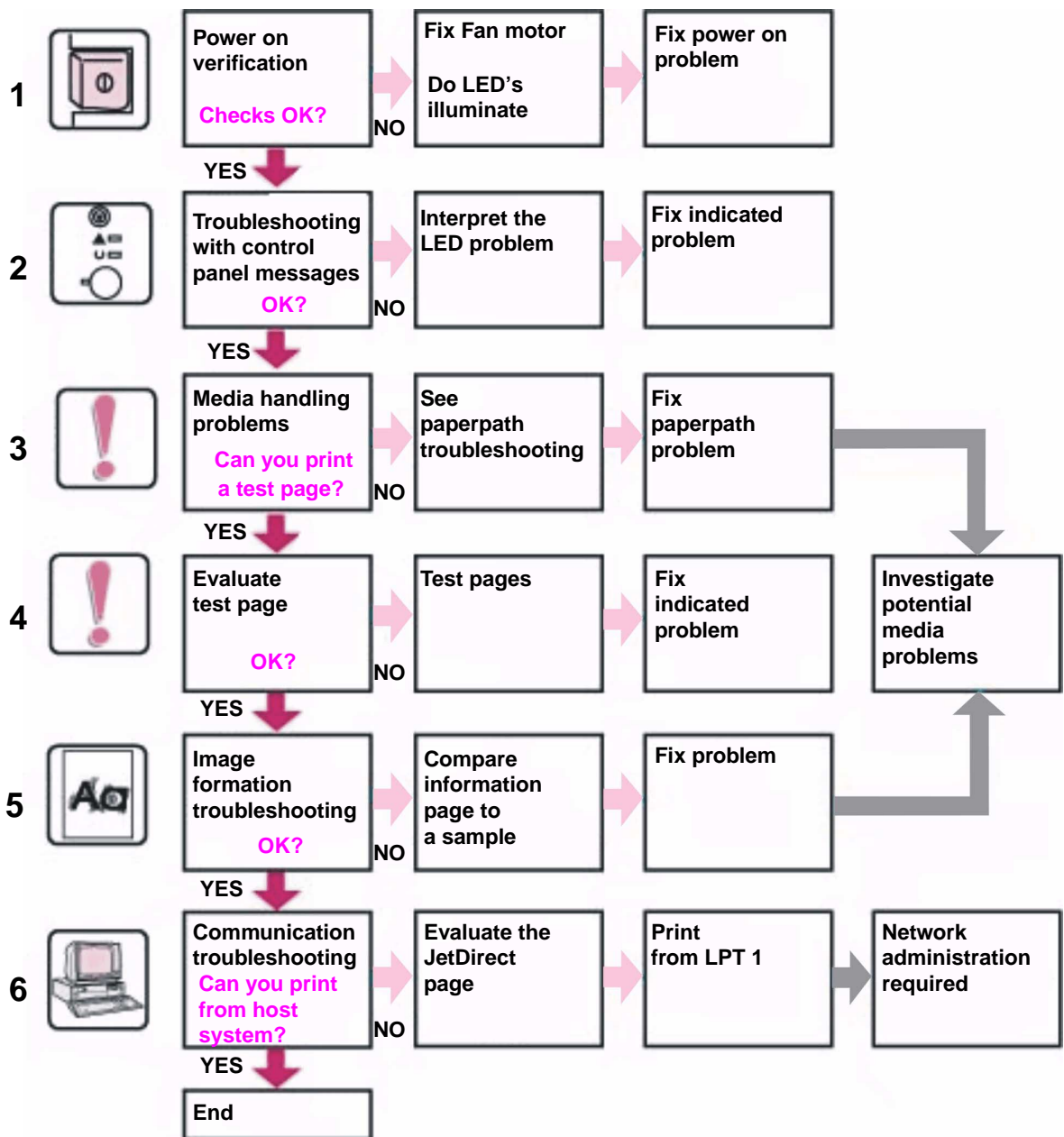


Figure 154. Troubleshooting process flow

Power-on

It is important to have the printer control panel LEDs functional as soon as possible in the troubleshooting process so that the printer's diagnostics can assist in locating printing errors.

Follow these steps to pinpoint power problems quickly.

- Step 1 Confirm that the printer is plugged in to a reliable power source and the power switch is on.
- Step 2 Verify that the fan and motors rotate.
- Step 3 Verify that the formatter cables are connected properly.
- Step 4 Verify that the control panel light pipes in the DIMM cover are not broken or damaged.
- Step 5 Verify that the DIMM cover is installed properly.
- Step 6 Verify that all connections to the power supply assembly are intact and the assembly is not damaged. If the power supply assembly is damaged, replace it.
- Step 7 Check that connections to the engine controller assembly. If necessary, replace the engine controller assembly.
- Step 8 Check fuser connectors, fan and main motor connectors, and the laser/scanner connector.

Troubleshooting with control-panel messages

Control panel LEDs

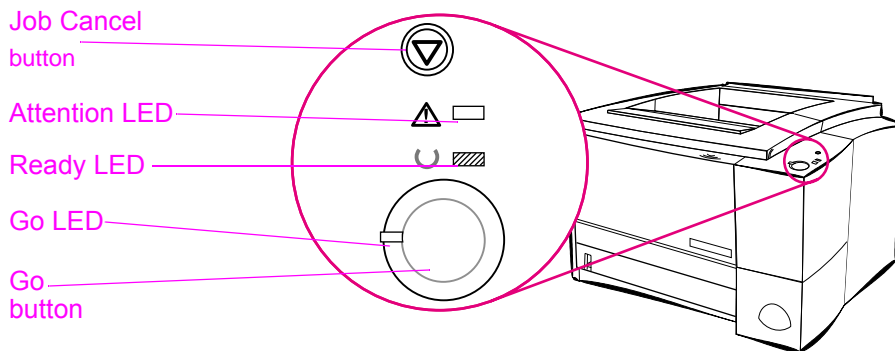


Figure 155. Control panel layout

Control-panel LED messages

LED patterns provide status and error messages. The LEDs can be in any one of the following states:

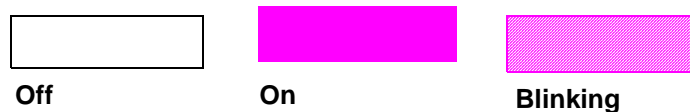


Figure 156. LED states

The following control-panel LED patterns indicate various conditions of the printer in preparation for, or during, printing. If the Attention LED is blinking, the printer is experiencing an error. The messages are grouped according to error type: status, attendance, continuable, fatal, and accessory errors. In many cases the error provides specific information about the defective component.





If the printer LEDs indicate a continuable, fatal, or accessory error, press **Go** and **Job Cancel** simultaneously to display additional error information. The LEDs flash briefly to indicate transitions in error states before displaying the next pattern.

See "Continuable, fatal, and accessory errors" page 188 for secondary information about each of these three types of errors.

Note

Secondary information about 79 fatal errors (unrecoverable firmware errors) is not included in the scope of this document. If a 79 fatal error occurs, replace the formatter.

Table 27. Primary status codes

Control-panel LED pattern	Primary status message	Recommended action
	Start-up. The go, ready, and attention LEDs cycle one after another.	<ul style="list-style-type: none"> No action is needed. <p>Note Pressing Go or Job Cancel has no effect until the printer is ready.</p>
	Ready. The ready LED is on and the printer is ready to print.	<ul style="list-style-type: none"> No action is needed. <p>Note Pressing Go prints a demo page.</p>
	Processing. The printer is receiving or processing data.	<ul style="list-style-type: none"> No action is needed. <p>Note Pressing JOB CANCEL cancels the current job. One or two pages might print as the printer clears the print job. The printer returns to the ready state after the job is cancelled.</p>
	<p>Attention. The printer requires attention for one of the following reasons:</p> <ul style="list-style-type: none"> - a door is open - the toner cartridge is missing - print media is jammed in the printer - paper out 	<ul style="list-style-type: none"> Pressing Go causes the printer to attempt to clear the jam. It might be necessary to clear the jam manually and push Go or close the top cover.

Continuable, fatal, and accessory errors

Additional information in the form of a secondary error message is available for each of the following three types of errors. The first entry in each of the following tables shows the primary error LED pattern. The remaining entries illustrate the secondary error messages. The tables also contain information that typically appears in the status log area of the self-test/configuration page.

Table 28. Continuable attention error codes


Control-panel LED pattern	Continuable attention error message	Status log code	Recommended action
	Continuable error or tray 1 is out of paper. Pressing Go causes the printer to attempt to recover from the error and print whatever it can. If the recovery is unsuccessful, the printer will return to the continuable error state.		<ul style="list-style-type: none"> Press Go to attempt an error recovery and continue printing. If the error persists, press Go and JOB CANCEL simultaneously to view the secondary continuable error information. See table 29, "Continuable attention error secondary codes" on page 188.

Table 29. Continuable attention error secondary codes

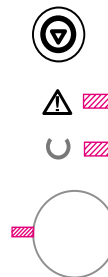

Control-panel LED pattern	Continuable attention error secondary message	Status log code	Recommended action
	General continuable error		<ul style="list-style-type: none"> Verify that all of the power-supply wire harness connections are connected correctly and fully seated. Replace the formatter PCB. Replace the engine controller.
	Memory overflow/memory full (20)	30016	<ul style="list-style-type: none"> The printer memory is full. Press Go to resume printing. If you lose some data, try to free some printer memory by removing any unnecessary fonts, macros, or any other data currently in the printer memory. If you continue to lose data, you might need to add more printer memory. For a temporary solution, simplify the image or print at a lower resolution.

Table 29. Continuable attention error secondary codes (continued)





Control-panel LED pattern	Continuable attention error secondary message	Status log code	Recommended action
	Temporary engine error (41.x)	30034	<ul style="list-style-type: none"> Press Go. The page containing the error will be printed. If the error persists, reseal the connections to the laser/scanner, formatter, and engine controller. Replace the laser/scanner. Replace the formatter. Replace the engine controller.
	Print overrun (21)	30017	<ul style="list-style-type: none"> The print job was too complex for available printer memory. Press Go to resume printing. If you lose some data, you might need to add more printer memory. For a temporary solution, simplify the image or print at a lower resolution.
	Buffer flow error (22)	30027	<ul style="list-style-type: none"> Verify that the printer cable is connected properly and fully seated at connections. Always use a high-quality cable. Some non-HP cables might be missing pin connections, or might otherwise not conform to IEEE-1284 specifications. Replace the formatter
	Bad connection (40)	30018	<ul style="list-style-type: none"> The connection between the printer and the EIO card is bad. Press Go to clear the error message and continue printing. If the error message persists, turn the printer off and reset the EIO card. Turn the printer on. Replace the EIO card.

Table 29. Continuable attention error secondary codes (continued)

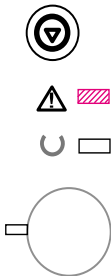
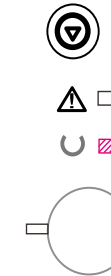
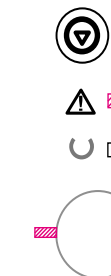
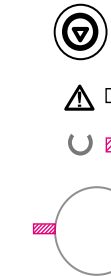
Control-panel LED pattern	Continuable attention error secondary message	Status log code	Recommended action
	NVRAM Error (68)	30035 or 30036	<ul style="list-style-type: none"> There is a memory error resulting in on or more printer settings has been reset to factory defaults. Print a configuration page and verify that the printer setting are set correctly. Turn the printer off. Press and hold Job Cancel and turn the printer on. Keep Job Cancel depressed until all of the Control-panel LEDs illuminate. Release Job Cancel and send the print job again. Replace the formatter.
	I/O error (81)		<ul style="list-style-type: none"> The EIO accessory has encountered a critical error. Turn the printer off and then on. If the error message persists, turn the printer off and reset the EIO card. Turn the printer on. Replace the EIO card.
	Memory configuration Error		<ul style="list-style-type: none"> Perform a “Cold reset”. <p>Note If both the attention and ready LEDs come on before you release Go, then you must repeat the procedure.</p> <ul style="list-style-type: none"> If the error persists, remove or replace DIMM(s). Replace the formatter.
	Personality or job related error	30076	<ul style="list-style-type: none"> Perform a “Cold reset”. <p>Note If both the attention and ready LEDs come on before you release the Go button, then you must repeat the procedure.</p> <ul style="list-style-type: none"> If the error persists, remove or replace language DIMM. Replace the formatter.

Table 29. Continuable attention error secondary codes (continued)

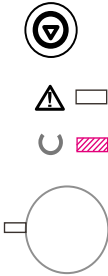


Control-panel LED pattern	Continuable attention error secondary message	Status log code	Recommended action
	EIO port error		<ul style="list-style-type: none"> Turn the printer off and reseal the EIO accessory. Turn the printer on. Replace the formatter.
	DIMM slot 1 incompatible error		<ul style="list-style-type: none"> Turn the printer off. Reseat DIMM 1. Turn the printer on. If the problem persists, replace DIMM 1. Replace the formatter.
	DIMM slot 2 incompatible error		<ul style="list-style-type: none"> Turn the printer off. Reseat DIMM 2. Turn the printer on. If the problem persists, replace DIMM 2. Replace the formatter.

Table 30. Fatal error codes


Control-panel LED pattern	Fatal error message	Status Log Code	Recommended action
	The printer has experienced an error and cannot recover. All the LEDs are on.		<ul style="list-style-type: none"> View the fatal error secondary codes. To clear the error, turn the printer off, and then turn it on. If the error persists, turn the printer off for 15 minutes and then turn it on. <p>Note Pressing Go and JOB CANCEL shows the fatal secondary error codes.</p>

Table 31. Fatal error secondary codes






Control-panel LED pattern	Fatal error secondary message	Status log code	Recommended action
	General fatal error		<ul style="list-style-type: none"> • Turn power off and back on. • If the error persists, turn off power. Remove all accessories (for example DIMM, EIO card). Turn on the printer. • Replace the formatter. • Replace the engine controller. • Replace the power supply.
	Engine communication error (55)	40055	<ul style="list-style-type: none"> • A printer error has occurred. Press Go to clear the error message. • Check the connections to the formatter and the engine controller Assembly. • Replace the formatter. • Replace the engine controller. • Replace the power supply.
	Scanner Error (52)	40052	<ul style="list-style-type: none"> • Press Go. The page containing the error will automatically be reprinted. • Turn the printer off and reseal the laser scanner cables. • Replace the laser scanner.
	Bad beam detect error (51)	40051	<ul style="list-style-type: none"> • Press Go. The page containing the error will automatically be reprinted. • Turn the printer off and reseal the laser scanner cables. • Replace the laser/scanner.
	Scan motor error (57)	40057	<ul style="list-style-type: none"> • Turn the printer off, then turn it back on. • Turn the printer off, then reseal the connection between the laser scanner assembly and the engine controller. • Replace the laser/scanner. • Replace the engine controller.

Table 31. Fatal error secondary codes (continued)






Control-panel LED pattern	Fatal error secondary message	Status log code	Recommended action
	Bad fuser error (50)	40050	<ul style="list-style-type: none"> Be sure that the fuser is installed correctly and is fully seated. Reseat the fuser cables. Replace the fuser. Replace the engine controller assembly. Replace the power supply.
	Formatter internal RAM or ROM error.		<ul style="list-style-type: none"> Turn the printer off, then turn it back on. Replace the formatter.
	Fan motor error (58)	40058	<ul style="list-style-type: none"> Turn the printer off, then turn it back on. Turn the printer off, then reseat the connection between the fan and the formatter. Replace the fan. Replace the engine controller assembly.
	NVRAM error (68)		<ul style="list-style-type: none"> Turn the printer off, then turn it back on. Replace the formatter.
	Scan buffer error (64)	40064	<ul style="list-style-type: none"> Turn the printer off, then turn it back on. If the message persists, replace the formatter.

Table 31. Fatal error secondary codes (continued)



Control-panel LED pattern	Fatal error secondary message	Status log code	Recommended action
	Dynamic Ram controller error (65)	40065	<ul style="list-style-type: none"> Turn the printer off, then turn it back on. Replace the formatter.
	Miscellaneous interface hardware error (67)	40067	<ul style="list-style-type: none"> Check the I/O connections. Verify that the cable is IEEE 1284 compliant (if applicable).

Table 32. Accessory error codes


Control-panel LED patterns	Accessory error message	Status log code	Recommended action
	An error has occurred with either the EIO port or the DIMM (memory) slots.		<ul style="list-style-type: none"> Press GO and JOB CANCEL simultaneously to view the secondary information. See table 29, "Continuable attention error secondary codes" on page 188. See table 33, "Accessory errors secondary codes" on page 194.

Table 33. Accessory errors secondary codes




Control-panel LED patterns	Accessory secondary error message	Status log code	Recommended action
	EIO port error		<ul style="list-style-type: none"> Turn the printer off and reseal the EIO accessory. Turn the printer on. Replace the formatter.

Table 33. Accessory errors secondary codes

Control-panel LED patterns	Accessory secondary error message	Status log code	Recommended action
	DIMM slot 1 incompatible error		<ul style="list-style-type: none"> • Turn the printer off. Reseat DIMM in slot 1. Turn the printer on. • If the problem persists, replace DIMM in slot 1. • Replace the formatter.
	DIMM slot 2 incompatible error		<ul style="list-style-type: none"> • Turn the printer off. Reseat DIMM in slot 2. Turn the printer on. • If the problem persists, replace DIMM in slot 2. • Replace the formatter.

Media-handling problems

Print test pages

To confirm that the printer can pick and move print media, generate a self-test/configuration page by pressing **GO** and **JOB CANCEL** simultaneously when the printer is in a ready state. If the printer cannot produce a self-test/configuration page, generate an engine-test page. If an engine-test page does not print, see "Jam troubleshooting" on page 197.

Engine test

The engine test verifies that the print engine is functioning correctly. This test is very useful for isolating printer problems, because it does not involve the formatter. Since the engine test prints a full page of lines across the entire printable area, it is also useful for checking and adjusting registration.

The engine test prints from the first tray found that contains media and can be activated with the formatter installed or removed. See "Engine test" in chapter 3 for engine test procedures.

Note Make sure that the toner cartridge is installed in the printer. Also, the print motor must be idle and the printer must be in standby mode.

In order to produce an engine test print, media must be loaded into the printer. The system checks for media in tray 2, then in tray 1, and finally in tray 3 (if installed). If media is loaded in both tray 1 and tray 2 the media will be duplexed. The engine test print is pulled from the first tray found that contains media.

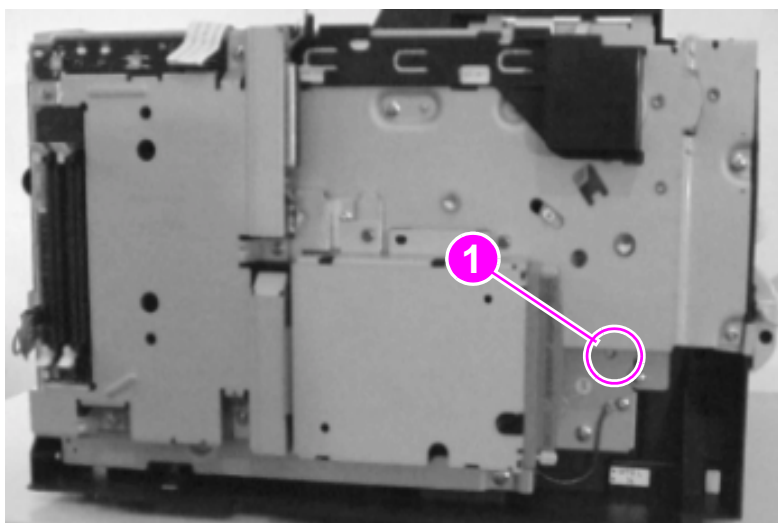


Figure 157. Engine test button

Self-test/configuration page

Use the configuration page to view the current printer settings, to help troubleshoot printer problems, or to verify installation of optional accessories such as memory (DIMMs), JetDirect cards, and printer languages. See "Self-test/configuration page" in chapter 3 for a sample page.

Note If status log information exists, it will print in the status area of the configuration page. If an HP JetDirect print server EIO card is installed, a JetDirect configuration page will also be generated.

Jam troubleshooting

Jams occur in the printer when print media does not reach or clear a photosensor along the printer paper path within a specific amount of time. The following table contains general questions and topics to explore before troubleshooting.

Table 34. General jam troubleshooting questions

Problem	Action
What is the frequency of the jams (e.g. continuous, one jam per 100 pages, one jam per 1000 pages, and so forth)?	Verify with the customer. See page "Troubleshooting with control-panel messages" on page 186 and "Status-log messages" on page 7-202 and evaluate the Status Log.
Do jams occur with a specific type of media?	Try using media that you know is of good quality. See "Media troubleshooting" on page 213.
Where does the leading edge of the first sheet of media in the printer paper path stop when a jam occurs? Are any sheets damaged or torn?	Attempt to duplicate the problem. Inspect the paper path and all paper path mechanical assemblies located before the leading edge of the jam. Use the chapter 3 to aid in locating jams.
Is the customer loading the trays or cassettes correctly?	Observe the customer loading media. Instruct the customer to break the ream, and not to fan the media. See "Media troubleshooting" on page 213..
Is the customer overfilling the trays or cassettes?	Observe the customer loading media in the trays or cassettes. Make sure that the media is not over the maximum fill marks in the trays or cassettes.
Are the tray guides set correctly?	Make sure all front and rear tray 2 and optional 250-sheet or 500-sheet feeder guides are set correctly.
Does the printer need cleaning?	Inspect the paper path and paper-path rollers.

Locating and correcting jams

See "Pickup/feed system" in chapter 5 for an account of the operation of the paper-feed system. After reading that section, use the diagrams listed below to locate and troubleshoot the possible causes of the jam.

- See figure 166, "Printer paper path, sensors, and signals," on page 225.
- See figure 167, "Tray 3 paper path, sensors, and signal lever," on page 226.
- See figure 168, "General printer-component locations (1 of 2)," on page 227.

The process of correcting paper jams might be simplified by categorizing jams according to frequency, location, and type of jam. See figure 158, "Frequency of jams process flow," on page 198 and figure 159, "Location of jams" on page 199.

Frequency of jams process flow

Use the troubleshooting process flow figure to help determine the cause of jams. See figure 154, “Troubleshooting process flow,” on page 184. Jams in the paper path that occur intermittently are most often related to a deficiency in the media or environment. See “Media troubleshooting” on page 7-213 for information about these defects.

Paper-path jams that occur frequently, and in the same location of the printer, are most likely the result of a hardware problem.

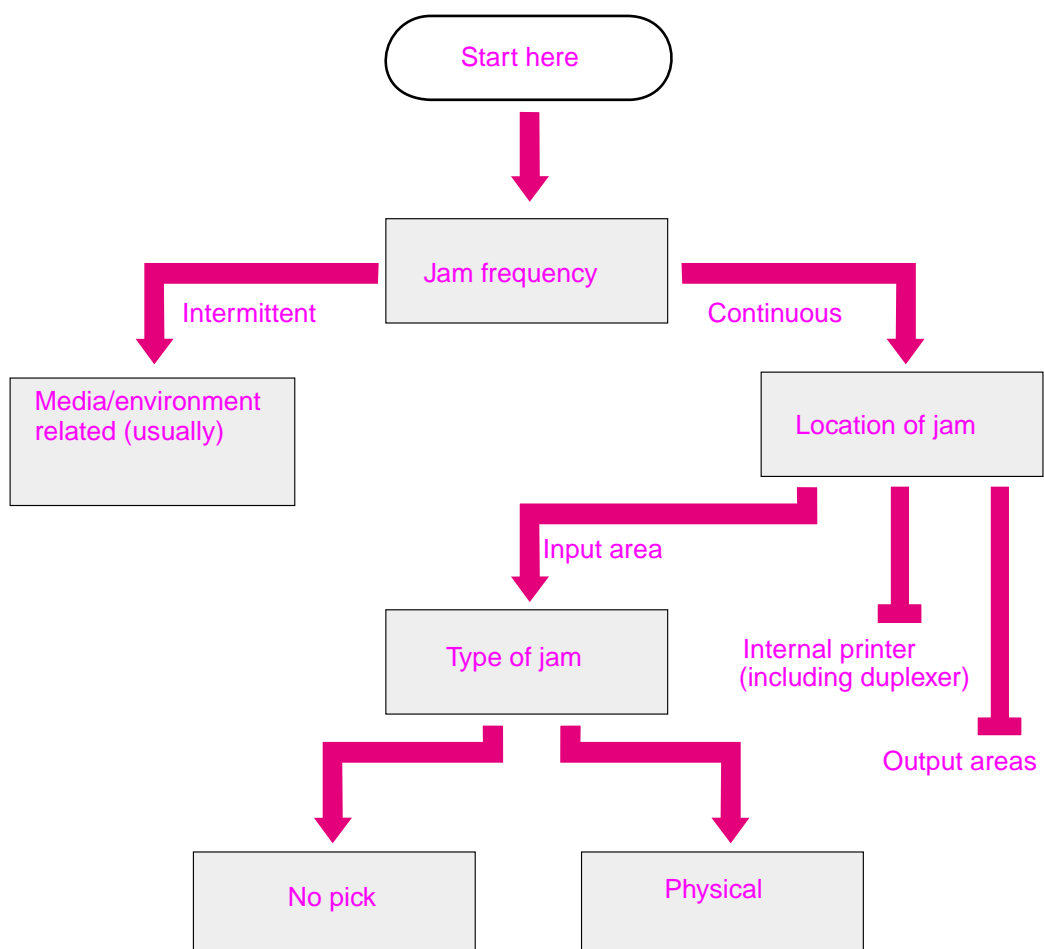


Figure 158. Frequency of jams process flow

Location of jams

Frequently occurring jams can be further categorized by their location in the printer. The four major areas of the printer are the input area, the internal area, the duplexer, and the output area. Because the pick-and-feed operation is almost identical for trays 1, 2, and 3, jams in the input area follow the same pattern, and can be broken into two additional categories.

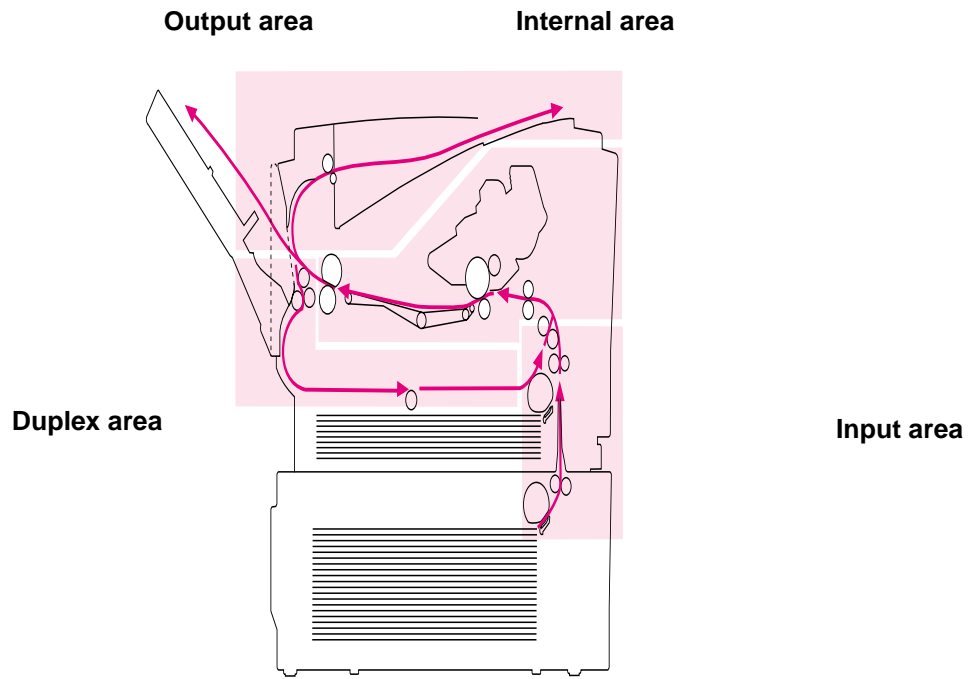


Figure 159. Location of jams

Type of jam

Input jams can result from either the failure of the printer to pick the media from a tray, or the failure to move the media through the input area of the printer. Failure to pick up the media can result from either a defect in the pickup roller or in the separation pad.

The following tables summarize the actions for input, internal, duplexer, and output jams.

Table 35. Input jams

Possible cause	Recommended action
Tray photo sensors are blocked or inoperative	Inspect and replace if necessary PS23005 (tray 1) PS1305 (tray 2) PS2001 (250 sheet tray 3) PS2103 (500 sheet tray 3)
Pickup roller is dirty or inoperative	Clean or replace RB2-2900-000CN (tray 1) RB2-2891-000CN (tray 2) RB2-2891-000CN (250-sheet feeder, tray 3) RB2-6304-000CN (500-sheet feeder, tray 3)
Pickup assembly is defective	Replace RG5-4128-000CN (tray 1) RG5-5551-000CN (tray 2)
Separation pad	Inspect and replace if necessary RF5-3272-000CN (tray 1) RB2-6349-000CN (tray 2) RB2-3008-000CN (250-sheet tray 3) RB2-6474-000CN (500-sheet tray 3)
Feed rollers	Inspect and replace if necessary RB2-3490-0000CN (tray 2 and 250-sheet feeder, tray 3) RB2-6476-0000CN (500 sheet feeder, tray 3)
Solenoids	Inspect and replace if necessary SL2901908501 (tray 2) SL2001 (250 sheet tray 3) SL2002 (500 sheet tray 3)
Paper feeder PCB (250-sheet tray 3) defective Paper feeder PCB (500-sheet tray 3) defective	Replace RG5-4277-000CN (250 sheet tray 3) Replace RG5-5630-000CN (500 sheet tray 3)
Engine controller PCB	Replace RG5-5567-000CN
Power supply assembly	Replace RG5-5563-000CN (110 V) Replace RG5-5573-000CN (220 V)

Table 36. Internal jams

Possible cause	Recommended action
Tray photo sensors are blocked or inoperative	Inspect and replace if necessary PS23005 (tray 1) PS1305 (tray 2) PS2001 (250-sheet tray 3) PS2103 (500-sheet tray 3)
Registration assembly is defective	Replace RG5-5556-000CN
Transfer Roller assembly is defective	Replace RG5-5581-000CN
Toner cartridge is defective	Inspect and replace if necessary C4096A
Transport assembly is defective	Inspect and replace if necessary RB2-6272-000CN (belt) RB2-6272-000CN (belt)

Table 36. Internal jams (continued)

Possible cause	Recommended action
Engine controller PCB	Replace RG5-5567-000CN
Power supply assembly	Replace RG5-5563-000CN (110 V) Replace RG5-5573-000CN (220 V)
Fusing assembly is defective	Replace (includes PS2301) RG5-5559-000CN (110 V) RG5-5569-000CN (220 V)

Table 37. Duplex jams

Possible cause	Recommended action
Unlatched duplexer tray	Latch duplexer tray
Reverse-paper sensor Duplexer pickup paper sensor	Replace PS501 Replace PS503
Position guide assembly	Replace RG5-5553-000CN
Engine controller PCB	Replace RG5-5567-000CN
Power supply assembly	Replace RG5-5563-000CN (110 V) Replace RG5-5573-000CN (220 V)

Table 38. Output jams

Possible cause	Recommended action
Fusing assembly is defective	Replace (includes PS503) RG5-5559-000CN (110 V) RG5-5569-000CN (220 V)
Upper/lower face-down delivery rollers	RG5-5541-000CN RG5-5542-000CN RF5-3275-000CN
Engine controller PCB	Replace RG5-5567-000CN
Power supply assembly	Replace RG5-5563-000CN (110 V) Replace RG5-5573-000CN (220 V)

Media problems

If jams persist, even when the print engine is fully functional, the problem might be with the quality and type of media being used. See “Media troubleshooting” on page 213.

Evaluate the test pages

Status-log messages

Use the status log to diagnose and troubleshoot intermittent printer errors, or to gain information about multiple error conditions that occur simultaneously. You can either display or print the event log.

Status log information prints automatically on the self-test/configuration page. The status log retains the printer's last 10 error messages. (The status log only appears when errors have been registered.)

Status-log messages are listed in "Control-panel LED messages" on page 7-186, according to their corresponding error LED configuration. For a complete listing of status codes, see the *HP LaserJet 2200 series printer software technical reference*, (C7058-90937). The complete PDL status code listing is contained in the appendix of the *printer job language technical reference*. Also refer to Hewlett-Packard's website: www.hp.com.

Hint

If the message requesting that you load a tray persists, or if a message indicates that a previous print job is still in the printer's memory, press **GO** to print or press **CANCEL JOB** to clear the job from the printer memory.

Verify installed options

Verify all options installed in the printer are reflected in the configuration page. If an installed device is not shown, reseal the device and print a new configuration page.

Image-formation troubleshooting

When working with customers, obtain a print sample before troubleshooting the printer. Ask the customer to describe the quality expected from the printer. The print sample also helps clarify the customer's description of the problem.

Often an image-formation problem can be linked to media that is outside the specifications Hewlett-Packard has established for optimum printer performance. See "Media troubleshooting" on page 7-213 for help with persistent image-formation problems.

Table 39. Image quality checks

Image quality checks	Action
Does the problem repeat on the page?	Use the "Repetitive defect ruler" on page 7-211.
Is the toner cartridge full and is it manufactured by HP?	See "Check the toner cartridge" on page 7-204.
Is the customer using print media that meets all HP specification standards?	See "Media specifications" in chapter 2.
Is the print sample similar to those in the image defect tables?	Compare the sample to the tables and perform the actions recommended in the "Image defect tables" on page 7-205.
Is the problem on the toner cartridge or the transfer roller?	Perform the "Half self-test functional check" on page 7-212 to determine the location of the defect. If a dark and distinct toner image is present on the drum's surface, assume that the first four functions of the electrophotographic process are functioning (cleaning, conditioning, writing, and developing—See "Image formation system" in chapter 5), and troubleshoot the failure as a transfer or fusing problem.
Is the customer using a media type recommended for this product?	See "Media troubleshooting" on page 7-213.

Check the toner cartridge

Image-formation defects are often the result of problems with the toner cartridge. Use the following list to verify that the toner cartridge is still operating correctly.

Perform all of the following checks before replacing the toner cartridge.

- Verify that the toner cartridge has toner. The full toner cartridge weight is approximately 1105 grams; empty weight is approximately 900 grams.
- Check the toner cartridge to see if it has been disassembled or refilled.
- Verify that the toner cartridge is seated properly in the printer cavity.
- Inspect the cartridge for toner leaking through worn seals. (Manual rotation of the drum can cause internal damage and toner spills can result.)
- White areas on the page can indicate the drum has been exposed to light for too long.

Note

The toner cartridge is rated for 5,000 images at 5 percent coverage. Check the surface of the photosensitive drum in the cartridge to see if it has been damaged or scratched. Touching the drum will contaminate the photosensitive surface and may cause spotting and defects during printing.

EconoMode

EconoMode creates draft-quality printing by reducing the amount of toner on the printed page by up to 50 percent. Advise the customer to turn EconoMode on or off either from the printer driver or a software application.

CAUTION

Hewlett-Packard does not recommend full-time use of EconoMode. If EconoMode is used full-time, it is possible the toner supply will outlast the mechanical parts in the toner cartridge.

Image defect tables

The printer output quality is subject to user judgment. This section of the manual helps define print-quality defects and the factors that affect print quality.

The print samples shown in the following figures illustrate some print-quality defects. Keep copies of print-quality defects you encounter in the field and an explanation of their causes to use for future reference.

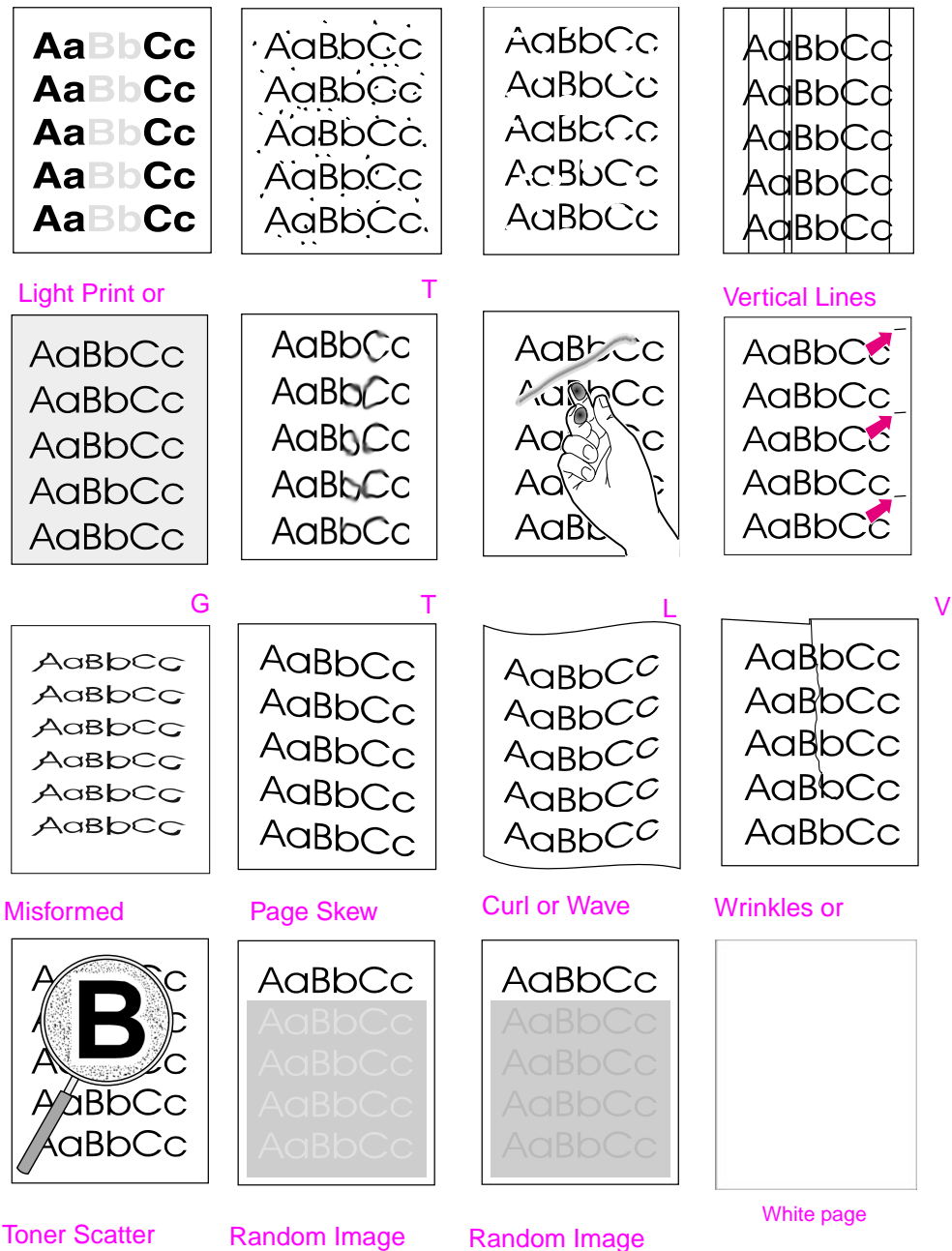


Figure 160. Image defects examples

Table 40. Image defects

Problem	Cause	Solution
<p>Light print, dark print, or fade</p> <p>AaBbCc AaBbCc AaBbCc AaBbCc AaBbCc</p>	Wrong toner density setting.	<ul style="list-style-type: none"> From the control panel, adjust the toner density setting. Make sure EconoMode is off.
	Print media does not meet printer specifications or is stored improperly.	<ul style="list-style-type: none"> Print a few more pages to see if the problem corrects itself. Turn over the stack of media in the tray. Also try rotating the media 180°. If the print media does not meet HP specifications, replace the media and advise the customer to use the recommended print media and store it properly.
	The toner supply is low	<ul style="list-style-type: none"> Temporarily extend the toner cartridge life by redistributing the toner. If this does not improve the print quality, install a new toner cartridge.
<p>Toner specks</p> <p>AaBbCc AaBbCc AaBbCc AaBbCc AaBbCc</p>	The transfer roller is dirty.	<ul style="list-style-type: none"> Clean the inside of the printer or use the printer's cleaning page.
	Print media does not meet printer specifications or is stored improperly.	<ul style="list-style-type: none"> Print a few more pages to see if the problem corrects itself. Turn over the stack of media in the tray. Also try rotating the media 180°. If the print media does not meet HP specifications, replace the media and advise the customer to use the recommended print media and store it properly.
	The paper path is dirty.	<ul style="list-style-type: none"> Clean the inside of the printer or use the printer's cleaning page.
<p>Dropouts</p> <p>AaBbCc AaBbCc AaBbCc AaBbCc AaBbCc</p>	Single sheet of paper is defective.	<ul style="list-style-type: none"> Try to reprint the job.
	Moisture content of the paper is uneven or the paper has moist spots on it.	<ul style="list-style-type: none"> Try paper from a different source.
	Paper lot is bad.	<ul style="list-style-type: none"> Try a different kind or brand of paper.
	The toner cartridge might be defective.	<ul style="list-style-type: none"> Check vertical repetitive defects. Replace the toner cartridge.
<p>Vertical lines</p> <p>AaBbCc AaBbCc AaBbCc AaBbCc AaBbCc</p>	Defective toner cartridge.	<ul style="list-style-type: none"> Replace the toner cartridge.
	Contaminated fuser entrance guide.	<ul style="list-style-type: none"> Clean the guide.
	Scratches on the fuser.	<ul style="list-style-type: none"> Replace the fuser.

Table 40. Image defects (continued)

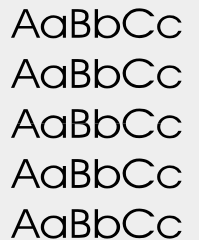

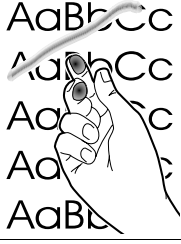

Problem	Cause	Solution
Gray background 	Print media does not meet printer specifications or is stored improperly.	<ul style="list-style-type: none"> Print a few more pages to see if the problem corrects itself. Turn over the stack of media in the tray. Also try rotating the media 180°. If the print media does not meet HP specifications, replace the paper.
	Printer's operating environment does not meet specifications.	<ul style="list-style-type: none"> Make sure the printer's operating environment meets specifications.
	Wrong toner density setting.	<ul style="list-style-type: none"> From the control panel, adjust the toner density setting. Make sure EconoMode is off.
	Faulty toner cartridge.	<ul style="list-style-type: none"> Replace the toner cartridge.
Toner smear 	Contamination in the printer.	<ul style="list-style-type: none"> Print a few more pages to see if the problem corrects itself. Clean the inside of the printer or use the printer's cleaning page.
	Paper might be too smooth.	<ul style="list-style-type: none"> Check the paper (or other print media) type and quality.
	Defective toner cartridge.	<ul style="list-style-type: none"> Replace the toner cartridge. (See instructions with the toner cartridge.)
	Wrong fuser setting for paper type.	<ul style="list-style-type: none"> From the control panel, change the fuser mode setting or choose another paper type from the printer driver.
Loose toner 	Contamination in the printer.	<ul style="list-style-type: none"> Print a few more pages to see if the problem corrects itself. Clean the inside of the printer.
	Toner cartridge is defective.	<ul style="list-style-type: none"> Replace the toner cartridge.
	Paper might be too smooth.	<ul style="list-style-type: none"> Check the paper (or other print media) type and quality.
	Defective fuser.	<ul style="list-style-type: none"> Replace the fuser.
Vertical repetitive defects 	Contamination or defect on internal parts.	<ul style="list-style-type: none"> Try printing additional pages. Clean the inside of the printer.
	Toner cartridge is damaged.	<ul style="list-style-type: none"> See the "Repetitive defect ruler" on page 212. Replace the toner cartridge.
	Defective fuser.	<ul style="list-style-type: none"> Replace the fuser.

Table 40. Image defects (continued)




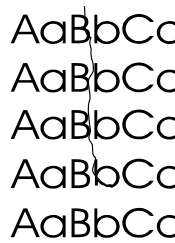
Problem	Cause	Solution
Misformed characters 	Maintenance due	<ul style="list-style-type: none"> Print a few more pages to see if the problem corrects itself. Make sure that the environmental specifications for the printer are being met. Print a demo page to verify problem persists. Perform maintenance actions as required.
	Paper might be too smooth.	<ul style="list-style-type: none"> Check the paper (or other print media) type and quality.
Page skew 	Print media does not meet printer specifications or is stored improperly.	<ul style="list-style-type: none"> Print a few more pages to see if the problem corrects itself. Verify that there are no torn pieces of media inside the printer. Turn over the stack of media in the tray. Also try rotating the media 180°. If the print media does not meet HP specifications, replace the media.
	Print media is not loaded correctly or trays are not adjusted properly.	<ul style="list-style-type: none"> Make sure print media is loaded correctly and that the guides fit properly against the media stack.
	Registration assembly is improperly installed.	<ul style="list-style-type: none"> Be sure that the registration assembly is installed correctly.
Curl or wave 	Print media does not meet printer specifications or is stored improperly.	<ul style="list-style-type: none"> Print a few more pages to see if the problem corrects itself. Turn over the stack of media in the tray. Also try rotating the media 180°. If the print media does not meet HP specifications, replace the media.
	Printer's operating environment does not meet specifications.	<ul style="list-style-type: none"> Make sure the printer's operating environment meets specifications.
	Wrong output bin.	<ul style="list-style-type: none"> Print to a different output bin (top or rear output bin).
Wrinkles or creases 	Print media does not meet printer specifications or is stored improperly.	<ul style="list-style-type: none"> Print a few more pages to see if the problem corrects itself. Turn over the stack of media in the tray. Also try rotating the media 180°. If the print media does not meet hp specifications, replace the paper.
	Print media is loaded incorrectly.	<ul style="list-style-type: none"> Make sure print media is loaded correctly and that the guides fit properly against the media stack.
	Wrong tray.	<ul style="list-style-type: none"> Print from a different tray (such as tray 1).
	Wrong output bin for print media type.	<ul style="list-style-type: none"> Print to a different output bin (top or rear output bin).

Table 40. Image defects (continued)

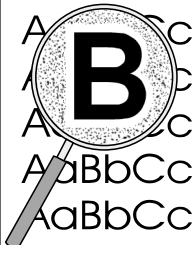


Problem	Cause	Solution
<p>Toner scatter outline</p> 	<p>Print media does not meet printer specifications or is stored improperly.</p> <p>Maintenance due</p>	<ul style="list-style-type: none"> ● Print a few more pages to see if the problem corrects itself. ● Turn over the stack of media in the tray. Also try rotating the media 180°. ● If the print media does not meet hp specifications, replace the paper.
<p>Random image repetition (light)</p> 	<p>This type of defect might occur when using preprinted forms, a large quantity of narrow media, or a fuser mode that is set too high for your media.</p>	<ul style="list-style-type: none"> ● Print a few more pages and see if the problem corrects itself. ● Make sure that print media type and quality meet HP specifications. ● If the defect occurs later in a print job, turn the printer off for ten minutes, and then turn the printer on to restart the print job. ● Check your fuser mode.
<p>Random image repetition (dark)</p> 	<p>This type of defect might occur when using preprinted forms, a large quantity of narrow media, or a fuser mode that is set too high for your media.</p>	<ul style="list-style-type: none"> ● Print a few more pages and see if the problem corrects itself. ● Make sure that print media type and quality meet HP specifications. ● If the defect occurs later in a print job, turn the printer off for ten minutes, and then turn the printer on to restart the print job. ● Check your fuser mode.

Table 40. Image defects (continued)

Problem	Cause	Solution
White page	No toner is available for print.	<ul style="list-style-type: none"> Remove sealing tape or replace the toner cartridge.
	Defective laser shutter.	<ul style="list-style-type: none"> Check the laser shutter for free operation when inserting the toner cartridge.
	Toner cartridge guide damaged, improperly positioned, or missing.	<ul style="list-style-type: none"> Make sure the guide is installed properly above the toner cartridge.
	No transfer roller voltage.	<ul style="list-style-type: none"> Without transfer roller voltage, toner cannot be attracted from the surface of the drum to the print media. Perform the half self-test functional to check all other electrophotographic processes. See "Half self-test functional check" on page 7-212. Replace the transfer roller if necessary.
	No developing bias.	<ul style="list-style-type: none"> Clean the high-voltage power supply contacts. With no developing bias charge, toner is not attracted to the drum. Replace the power supply.
	No drum ground path.	<ul style="list-style-type: none"> With no ground path, the drum cannot discharge. The negative charge on the drum repels toner, and leaves a white page with bubble print. Check the drum ground spring and reconnect it, if necessary. Replace the power supply PCB.
	Defective laser scanner cable assembly.	<ul style="list-style-type: none"> Low-level signals exchanged between the laser/scanner assembly and the engine controller PCB might be affecting laser output. Replace the laser/scanner cable assembly.

Repetitive defect ruler

Repetitive print defects are usually caused by a specific roller in the printer or the toner cartridge. Use the figure below to isolate the cause of repetitive print defects. Align the first occurrence of the defect with the top of the “ruler” (at the top or bottom of the misprinted page), and measure to the next occurrence of the defect to determine the roller in question. When the defect pattern matches the pattern of the ruler, replace the indicated roller.

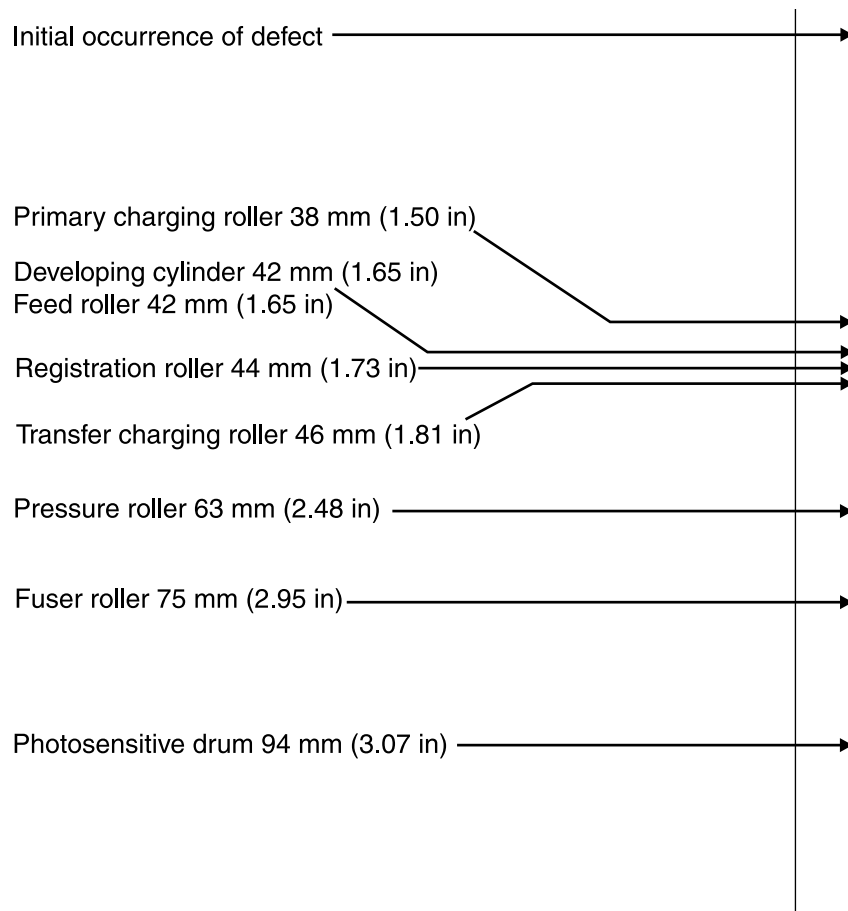


Figure 161. Repetitive defect ruler

Half self-test functional check

The electrophotographic process can be subdivided into the following stages:

- Cleaning (removes excess toner from drum surface)
- Conditioning (places a uniform electrical charge on drum)
- Writing (laser strikes surface of drum to create latent image)
- Developing (forms the toner image on drum)
- Transferring (charges transfer the image to paper)
- Fusing (heat and pressure produces a permanent image)

The purpose of the half self-test check is to determine which process is malfunctioning. Perform the test as follows:

Step 1 Print a configuration page from tray 1.

Step 2 Open the top cover after the trailing edge of the paper enters the printer. At this point, the leading edge of the paper should have advanced beyond the toner cartridge.

Step 3 Remove the toner cartridge.

Step 4 Open the toner cartridge drum shield to view the drum surface.

If a dark and distinct toner image is present on the drum's surface, assume that the first four functions of the electrophotographic process are functioning (cleaning, conditioning, writing, and developing) and troubleshoot the failure as a transfer or fusing problem.

If no image is present on the photosensitive drum, perform the drum rotation functional check.

Drum-rotation functional check

The photosensitive drum, located in the toner cartridge, must rotate for the print process to work. The photosensitive drum receives its drive from the main drive assembly. To verify whether the drum is rotating:

- 1 Open the top cover.
- 2 Remove the toner cartridge.
- 3 Mark the cartridge drive gear with a felt-tipped marker. Note the position of the mark.
- 4 Install the toner cartridge and close the top cover. The start-up sequence should rotate the drum enough to move the mark.
- 5 Open the printer and inspect the gear that was marked in step 3. Verify that the mark moved. If the mark did not move, inspect the main drive assembly to make sure it is meshing with the toner cartridge gears. If the drive gears function and the drum does not move, replace the toner cartridge.

Note

This test is especially important when the customer is using refilled toner cartridges.

Media troubleshooting

Media defects can cause jams and image defects. If the previously described conditions are corrected and do not eliminate the printing problem, continue to investigate the media as the source of the defect.

Problems with print media are sometimes difficult to detect. Follow a standard troubleshooting procedure to help isolate media-related problems. The steps to follow are:

- “Determine the problem source: print media or printer” on page 7-213.
- “Isolate a paper path” on page 7-213.
- “Isolate a media brand” on page 7-214.
- “Isolate a media type” on page 7-215.
- “Evaluate media use practices” on page 7-219.
- “Evaluate environmental conditions” on page 7-219.

Determine the problem source: print media or printer

When determining the cause of a printer failure, a distinction must be made between problems that relate to the printer itself and those that involve print media. Often a problem that seems to be related to the printer is actually a matter of poor print-media selection or handling. To determine if a problem is caused by the printer or by the media, try a few simple steps to remedy the situation:

- Turn media over in the tray to print on the reverse side.
- Rotate sheets 180 degrees (end to end) to feed with a different leading edge.

If the symptoms cease, or change in some way, it can be assumed that the problems are caused by the print media.

Isolate a paper path

Try using the straightest paper path

Some problems can be avoided by using the straightest available paper path. Usually this means paper feeds from the upper paper tray or manual feeder, and exits into the rear output bin (if available). This path is recommended for envelopes and media with a heavy basis weight.

Determine if the problem is caused by duplexing

Paper that has just made a pass through the printer can show increased media curl. Media curl increases image dropout, and creates pickup and stacking problems. When the second pass is made, print media might not meet the specifications for moisture and curl. Dry paper can hold static charges that affect print quality and stacking of the duplexed page. Media shrinkage resulting from a second pass through the printer can cause image misalignment on the duplexed page.

Isolate the source of the jam

Define the source of the media that is jamming:

- tray 1
- tray 2
- tray 3 (250-sheet or 500-sheet)
- duplexer

Determine where media jams occur

Check where media stops when a jam occurs. Types of jams include:

- input paper jams
- internal paper-path jams
- duplexer
- output-tray jams

Determine whether the printer is experiencing misfeeds or multifeed jams

The following are some possible causes of misfeeds or multifeed jams:

- The media might be too stiff. Check basis weight and measure caliper. See "Basis-weight field test" in chapter 9 and "Caliper field test" in chapter 2.
- The paper might be too smooth. Check the finish.
- The paper might be too heavy or too light. Check basis weight.
- The customer might be attempting to print embossed paper, pre-printed forms, or perforated paper that does not meet HP specifications. See "Isolate a media brand" on page 7-214 below or details about issues involved in printing on embossed paper.
- The paper might be loaded incorrectly. Turn over the sheets in the paper tray to determine if in-ream curl is causing misfeeds.
- The customer might be fanning media before loading it into the tray.
- The customer might be adding media in small amounts. Do not add small amounts of media or mix types of media in the tray.
- The printer or media storage environment might be too humid or too dry. (As a result, media might be too moist or too dry.) Determine if this is the case and advise the customer.

Isolate a media brand

If the printer jams with only one brand of media:

- Try switching media brands.
- If the paper ream in use appears to be old, open a fresh ream of the same paper and load it properly into the printer. If the problem disappears, investigate storage and handling conditions.

Isolate a media type

When jams and other problems occur frequently, it is often because the customer is using a special paper. Customers must only use print media that conforms to all Hewlett-Packard specifications, and should always test media before purchasing large quantities. Media should be tested before storage to verify quality printing results. Then, if problems arise, storage or handling conditions can isolate the most likely cause. Some types of media that might cause problems are:

- preprinted forms and special letterhead
- embossed paper
- perforated paper
- adhesive labels
- envelopes
- transparencies
- chemically treated paper
- synthetic paper
- coated paper
- other special media

Preprinted forms and special letterhead

Many preprinted forms and special letterhead papers perform well in HP LaserJet printers. However, these papers undergo processes that alter their original characteristics, and care must be taken to ensure they conform to HP specifications. All special papers should be wrapped in moisture-proof wrapping when purchased from the paper converter or printing house.

Forms and letterhead must be printed with inks that conform to the following specifications:

- Only use ink that is heat-resistant, and that will not melt, scorch, or release hazardous emissions when subjected to 200 degrees C (392 degrees F) for 0.1 second.
- Inks must have resistance to silicon oils, and must not be affected by resin components in toner.
- Inks must not be flammable.
- Inks must not “offset” (transfer from the printed paper onto the printer, contaminating internal printer components). The principle cause of offset is ink that is not fully dried or that cannot withstand the printer fusing temperature.

Note

Do not use low-temperature inks (the kind used with thermography).

Hint

Do not purchase more media than can be easily used in a short time (about 3 months). Media stored for long periods experiences heat and moisture extremes that can be damaging. Planning is important to prevent damage to a large supply of media.

Hewlett-Packard neither warrants nor recommends the use of a particular brand of paper or print media. Media properties are subject to manufacturing changes, and Hewlett-Packard has no control over such changes. The customer assumes all responsibility for the quality and performance of media. Although testing media helps to characterize its performance, process quality control by the manufacturer.

Embossed media

Embossed media is not recommended for use in HP LaserJet printers. Media is embossed by stamping an image into the media by compressing the media fibers together at approximately 200 degrees C (392 degrees F), and sometimes by applying a thin metal foil to the surface. The printer fusing process can loosen the foil; loose foil can interfere with the mechanical and electronic operation of the printer.

Embossed paper, with or without foil, can also cause multifeed jams. Multiple embossed print media sheets tend to stick to one another.

Media with cutouts or perforations

Avoid media with cutouts or perforations for these reasons:

- Cut fibers absorb more moisture and can increase waviness and media curl. This decreases the print quality near the cutout or perforated area.
- The cutting knife leaves a sharp edge on the cutout or perforation. If this sharp edge is facing the toner cartridge drum during printing it can scratch the drum surface.
- If printing occurs over a cutout hole the transfer roller is contaminated with unused toner. Light streaks can result on the paper from the contaminated roller.

Adhesive labels

Labels are defined as media with a pressure-sensitive adhesive backing. Label stock includes the top sheet, the adhesive, and the carrier sheet (also referred to as the backing). To prevent media jams and feed problems, always use the rear output tray when printing on labels. You must use the following guide lines when using labels:

- Labels must be cut long grain (as opposed to short grain).
- Labels must totally cover the carrier sheet (no spaces between the labels).
- Labels must contain only acrylic based adhesives.
- Labels must contain no excessive adhesive. (Adhesive from some labels can cause jamming resulting from buildup in the printer mechanism. The adhesive should not come into direct contact with the printer at any time.)
- Labels must meet Hewlett-Packard specifications for fusing compatibility.
- Labels must meet Hewlett-Packard specifications for caliper.
- Labels must have a carrier sheet that is not too smooth (which can cause the feed rollers to slip).

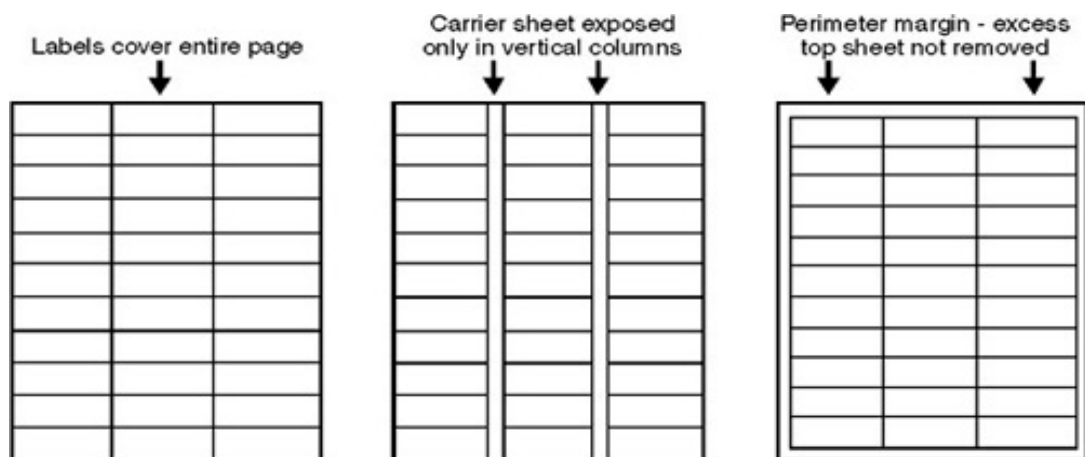


Figure 162. Adhesive labels

Envelopes

Because of the variety of folds and cuts available it is difficult to specify the types of envelopes that will perform well with HP LaserJet printers. It is very important to test a sample envelope before purchasing a large quantity. The specifications for media also apply to envelopes. Avoid envelopes that contain contact adhesives.

Following are a few recommendations for feeding envelopes:

- Closely inspect the leading edge of the envelopes before feeding them into the printer. Verify the leading edge is flat. Watch for envelope curl and loose folds. If necessary, flatten the leading edge of the envelope before feeding.
- Be patient! In manual-feed mode, the printer displays a message when prepared to accept the next envelope. Always wait for this message to appear before loading or feeding envelopes into the printer.
- Do not allow a large quantity of envelopes to accumulate in the output tray. If too many envelopes accumulate, they can interfere with the output path.
- Use the rear output tray when printing envelopes.

The main causes of problems with envelopes on HP LaserJet printers are:

- folds (two or more thicknesses of paper)
- edge creases (sharp or rounded)
- glued edges (sealing when fused)
- uneven printing surfaces

For fewer problems, follow these guidelines:

- Corner folds must be well-creased, and contain no more than two thicknesses of paper.
- Envelopes must lie flat.
- Paper grain should be diagonal.
- Adhesives must meet HP specifications for fusing compatibility.
- Basis weight must not exceed 11 kg (28 lb).
- Under no circumstances should envelopes have clasps, snaps, or windows, or use synthetic materials. Severe damage to the printer can result.

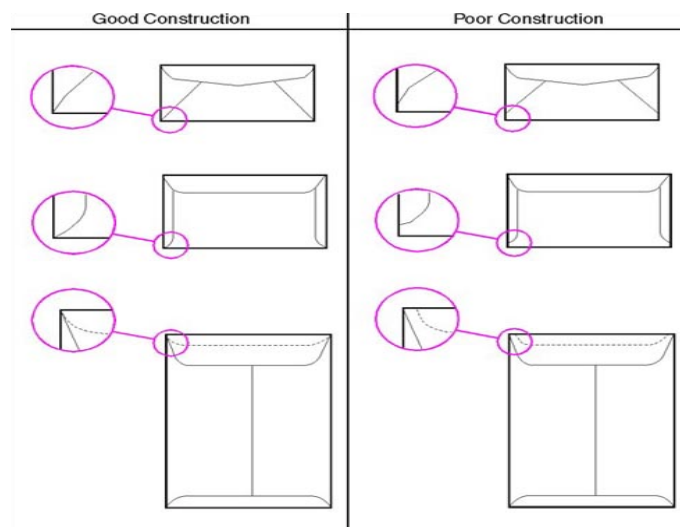


Figure 163. Envelope sample

Transparencies

Printing on transparencies presents a special set of challenges. The surface resistance of a transparency can be infinite, causing the transparency to act like paper with 0 percent moisture content. This can result in streaks and smudging. Static charges can accumulate on some transparent stock and cause multifeed jams. Also, certain brands and types of transparencies do not tolerate exposure to the fuser.

The user should only select transparencies that meet HP specifications. Among the common precautions are:

- Print transparencies to the top output bin to avoid jams.
- Transparencies must have correct resistivity (not built-up static charge).
- Transparencies must meet HP specifications for fusing compatibility.
- Each sheet should be removed from the tray and placed on a flat surface before printing the next sheet. This will keep the toner from rubbing off from the one sheet to the sheet before it has had time to cool.

Chemically treated media

Coatings such as lacquers, polymers, laminations, or other chemicals protect the paper but can cause problems in the fuser and transfer areas of Hewlett-Packard LaserJet printers. The surface resistivity and moisture content can be greatly altered, resulting in print-quality problems. Hard surface coatings increase wear on the rollers and media guides. All chemically treated media must meet Hewlett-Packard specifications for fusing compatibility.

Synthetic media

Synthetic medias (those manufactured from man-made fibers) do not perform as well as bond media in any printer, especially Hewlett-Packard LaserJet printers. All synthetic media must meet Hewlett-Packard specifications, especially for caliper and fusing compatibility.

Coated media

Do not use coated media. Most coated media does not meet specifications for fusing compatibility and other specifications for HP LaserJet printers.

Other special media

- 1 Odd sizes. Check minimum and maximum supported sizes in chapter 2.
- 2 Carbonless media. No carbon required (NCR) media is not supported by HP LaserJet printers.
- 3 Recycled media. Choose recycled media that meets Hewlett-Packard specifications. Note that recycled media might not be as bright as indicated in the specifications. Hewlett-Packard recommends that recycled media contain no more than 5 percent groundwood. See chapter 2 for testing information.

Evaluate media use practices

Handling and loading

Often differences in techniques, missed steps, or media handling methods are responsible for problems. Be sure the media is loaded correctly in the printer.

Note

Make sure that all printer users are observing these guidelines.

Printer maintenance

General cleanliness of the printer is the most important part of printer maintenance. Printers using media that creates a lot of dust and debris might require an aggressive maintenance schedule. Media dust accumulates in the following areas:

- pickup rollers
- media guides

Take extra time to clean and inspect the paper path. If problems continue after cleaning, inspect for wear or damage.

Media stacking

Consider the following guidelines when advising the customer about stacking media:

- Do not store cartons of reams directly on the floor; cartons should be placed on a pallet or on shelves.
- Do not stack cartons more than six on top of one another.
- Stack each carton squarely on top of the other.
- Stack each carton upright.
- Do not store individual reams in such a manner that they will curl or warp along the edges.
- Do not place anything on top of stored media.
- Do not place the media close to heating or air conditioning vents or open windows.

Evaluate environmental conditions

Printing environment

Ideally, the printing environment should be at room temperature and not too dry or too humid. Print media absorbs and loses moisture rapidly.

Temperature extremes and excessive humidity can damage print media. Heat causes the moisture in the media to evaporate. Cold causes the moisture in the media to condense. Heating systems and air conditioners remove most humidity. When media loses moisture, streaks and smudging result. When paper absorbs moisture, light print and dropouts result.

Media storage environment

Media storage environmental conditions directly affect the feed operation.

Hint

Do not purchase more media than can be easily used in a short time (about 3 months). Media stored for long periods experiences heat and moisture extremes that can be damaging. Planning is important to prevent damage to a large supply of media.

Hewlett-Packard neither warrants nor recommends the use of a particular brand of paper or print media. Media properties are subject to manufacturing changes Hewlett-Packard has no control over such changes. The customer assumes all responsibility for the quality and performance of media. Although testing media helps to characterize its performance, process quality control by the manufacturer.

Unconverted media in sealed reams can remain stable for several months before use. Converted media has greater potential for environmental damage, especially if it is not wrapped with a moisture-proof barrier.

The media storage environment should be properly maintained to ensure optimum printer performance. The required condition is 20 degrees to 24 degrees C (68 degrees to 75 degrees F), with a relative humidity of 45 percent to 55 percent. The following guidelines should be considered when evaluating the customer's media storage environment:

- Media should be stored at or near room temperature.
- The air should not be too dry or too humid.
- The best way to store an opened ream of paper is to rewrap it tightly in its moisture-proof wrapping. If the printer environment is subject to extremes, unwrap only the amount of media to be used during the day's operation to prevent unwanted moisture changes.

Communication troubleshooting

Communications check

Note

Communication problems are normally the customer's responsibility. Time spent attempting to resolve these problems might not be covered by the Hewlett-Packard warranty.

Refer the customer to the network administrator for assistance in troubleshooting network problems.

Test message

After the printer is installed, verify communications between the printer and the IBM-compatible computer. Enter the following at the DOS prompt:

C:\DIR>LPT1 **ENTER** (for printing to parallel port #1)

The printer should print a directory listing of the C:\ directory.

EIO troubleshooting

See "JetDirect configuration" on page 7-223 for information regarding the current status of the EIO accessories. Before attempting to troubleshoot a network problem or notifying the network consultant of a problem, always print a configuration page.

See the *HP JetDirect Print Server Software Installation Guide* for detailed explanations of network issues (go to <http://www.hp.com/go/JetDirect>).



HP LaserJet 2200

JetDirect Page

HP JetDirect Configuration		1	
Status:	I/O Card Not Ready	Port Config:	Disconnected
LAN ERROR - LOSS OF CARRIER		Auto Negotiation:	On
Model Number:	J4169A	Manufacturing ID:	4240429C 007
Hardware Address:	0001E6236D12	Date Manufactured:	10 2000
Firmware Version:	L20.24	SNMP Set Cmty Name:	Not Specified
Port Select:	None		

Network Statistics		2	
Total Packets Received:	0	Total Packets Transmitted:	0
Unicast Packets Received:	0	Unsendable Packets:	0
Bad Packets Received:	0	Transmit Collisions:	0
Framing Errors Received:	0	Transmit Late Collisions:	0

Protocol Information		3	
TCP/IP		Novell/Netware	
Status:	Initializing	Status:	NOT CONFIGURED
Host Name:	Not Specified	Node Name:	NI 1236D12
IP Address:	0.0.0.0.	Netware Mode:	Queue Server
Subnet Mask:	0.0.0.0.	NDS Tree Name:	
Default Gateway:	0.0.0.0.	NDS Context:	
Config By:	Not Configured	Attached Server:	
BOOTP/DHCP Server:	0.0.0.0.	Queue Poll Interval:	2 sec
TFTP Server:	0.0.0.0.	SAP Interval:	60 sec
Config File:	Not Specified		
Domain Name:	Not Specified	AppleTalk	
DNS Server:	Not Specified	Status:	Initializing
WINS Server:	Not Specified	Name:	
Syslog Server:	Not Specified	Zone:	*
Idle Timeout:	90 sec	Type 1:	LaserJet 2200
SLP:	Enabled	Type 2:	LaserWriter
Access List:	Not Specified	Network Number:	0
Web JetAdmin URL:	Not Specified	Node Number:	0
IPX/SPX		DLC/LLC	
Status:	Ready	Status:	Ready
Primary Frame Type:	Auto Select		
Network Frame Type:	Rcvd		

Figure 164. JetDirect configuration page

JetDirect configuration-page elements

- 1 **General information** lists the HP JetDirect number, firmware revision, LAN hardware address, selected port, manufacturing ID, I/O card status, and network statistics (unicast packets, total packets, bad packets, framing errors received, packets transmitted, unsendable packets, transmit collisions, and transmit late collisions).
- 2 Network statistics lists total packets received, unicast packets received, bad packets received, framing errors received, total packets received, unsendable packets, transmit collisions, transmit late collisions.
- 3 **Protocol information** lists TCP/IP status and configuration, the HP Web JetAdmin server name, Novell NetWare status and configuration, AppleTalk status and configuration, and DLC/LLC status.

JetDirect configuration

- If the EIO JetDirect card has started successfully and completed its internal diagnostics, the I/O CARD READY message appears on the JetDirect configuration page. If communication is lost, an I/O NOT READY message appears followed by a two-digit error code. See the *HP JetDirect Network Interface Configuration Guide* for further details and recommended action (go to <http://www.hp.com/go/JetDirect>).
- The "Network Statistics" column indicates that network activity has been occurring. Bad packets, framing errors, unsendable packets, and collisions should be minimal. If a high percentage (greater than one percent) of these occur, contact the network administrator. All of the statistics are set to zero when the printer is turned off.
- The "Novell Status" block should state the Novell printer server name to which the printer is connected. If the node name reads "NPIxxxxxx" (xxxxxx=last six digits of the EIO's LAN address), the EIO card has not been configured for a Novell server. This could indicate that the card is operating under an IPX protocol other than Novell. Consult with the network administrator if the node name is not present.
- In the TCP/IP protocol block, the default IP address is "0.0.0.0." It is acceptable to operate the printer with this default address. The error message "ARP DUPLICATE ADDRESS" might appear in this block. This is also an acceptable error code if the TCP/IP protocol is not being used. Check with the network administrator to determine the correct IP address for the printer.

Reference diagrams

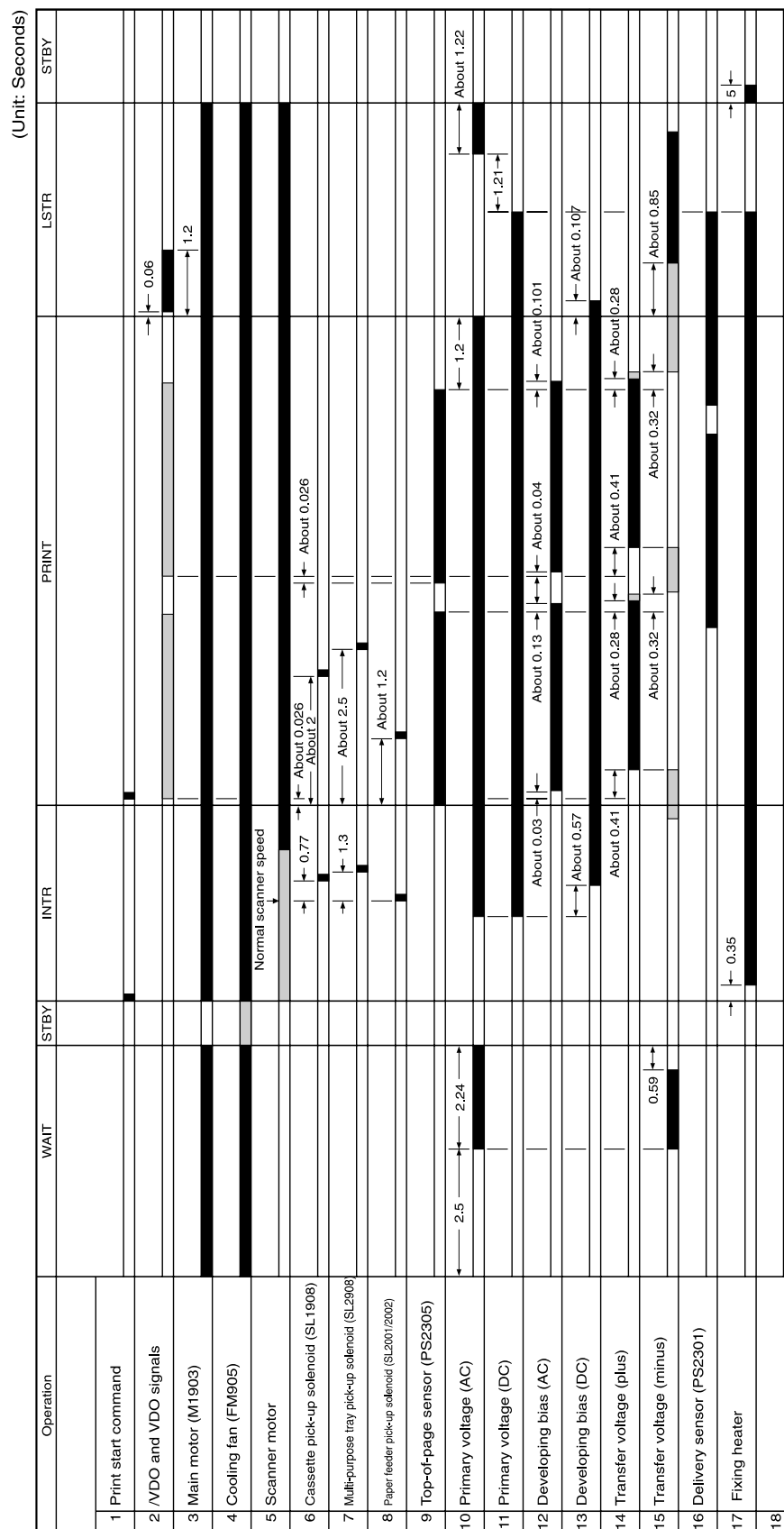


Figure 165. Timing diagram

This drawing shows key components, sensors, and switches that control the operation of the printer.

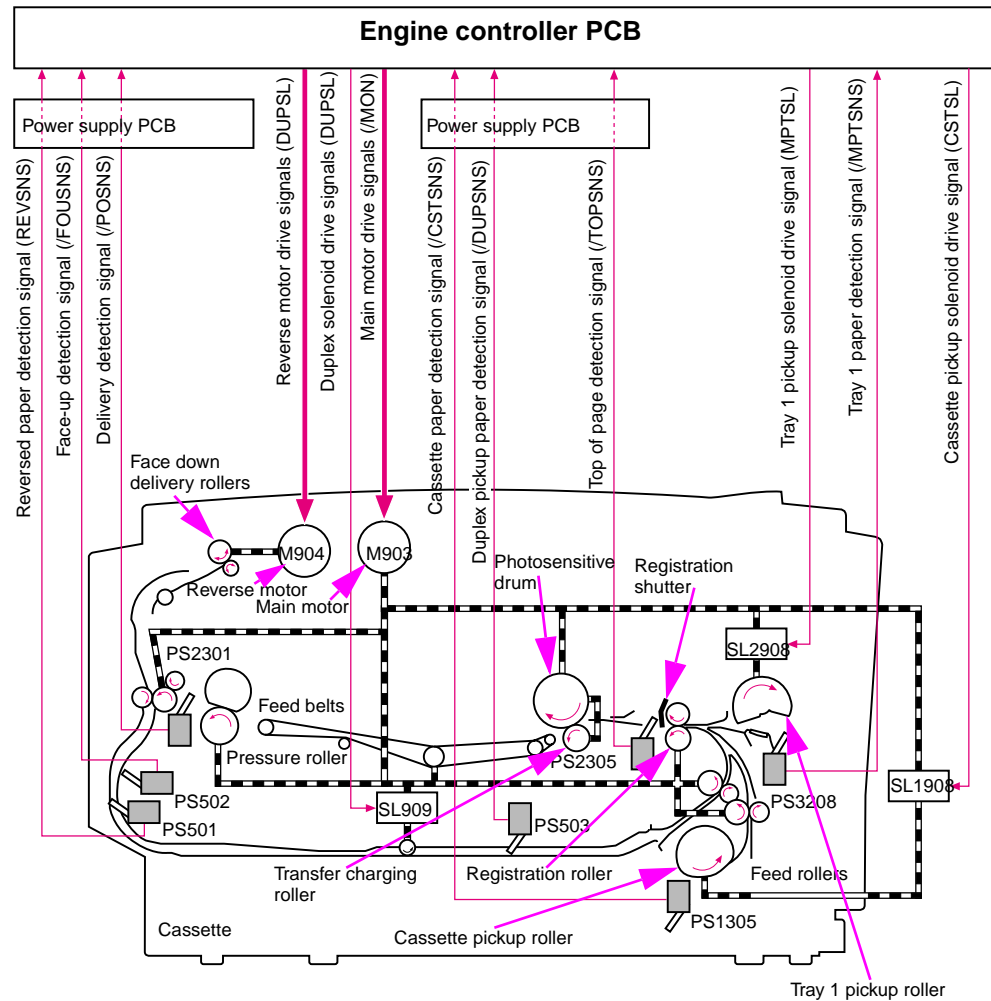


Figure 166. Printer paper path, sensors, and signals

PS501: Reversed paper sensor
 PS503: Duplex pickup paper sensor
 PS2301: Delivery sensor
 PS3208: Tray 1 paper sensor
 SL1908: Cassette pickup solenoid

PS502: Face-up sensor
 PS1305: Cassette paper sensor
 PS2305: Top-of-page sensor
 SL909: Duplex solenoid
 SL2908: Tray 1 pickup solenoid

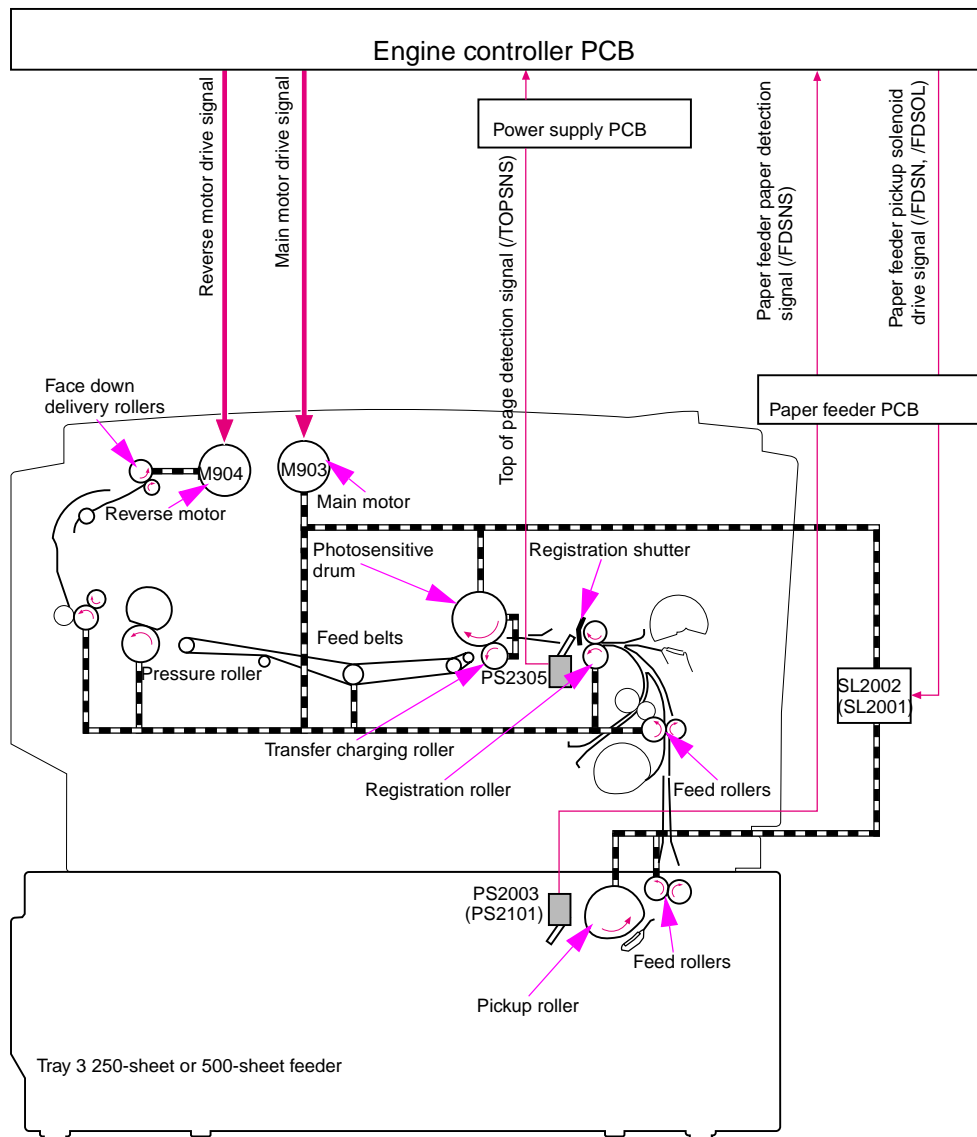


Figure 167. Tray 3 paper path, sensors, and signal lever

PS2305: Top-of-page sensor (printer)

PS2001: Paper feeder paper sensor (250-sheet)

PS2003: Paper feeder paper sensor (500-sheet)

SL2001: Paper feeder pickup solenoid (250-sheet)

SL2001: Paper feeder pickup solenoid (500-sheet)

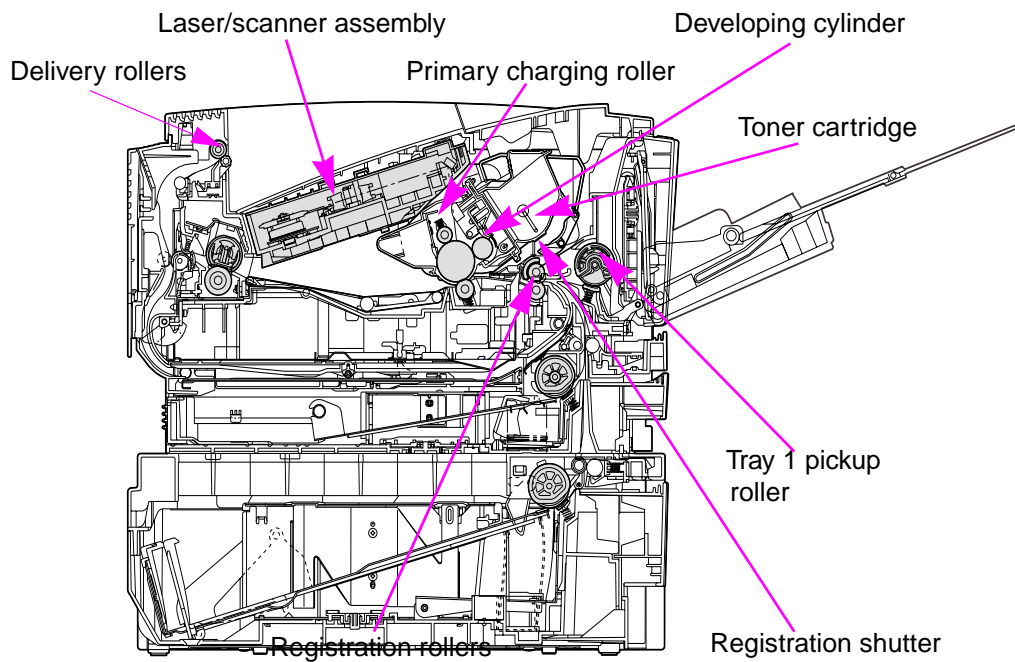


Figure 168. General printer-component locations (1 of 2)

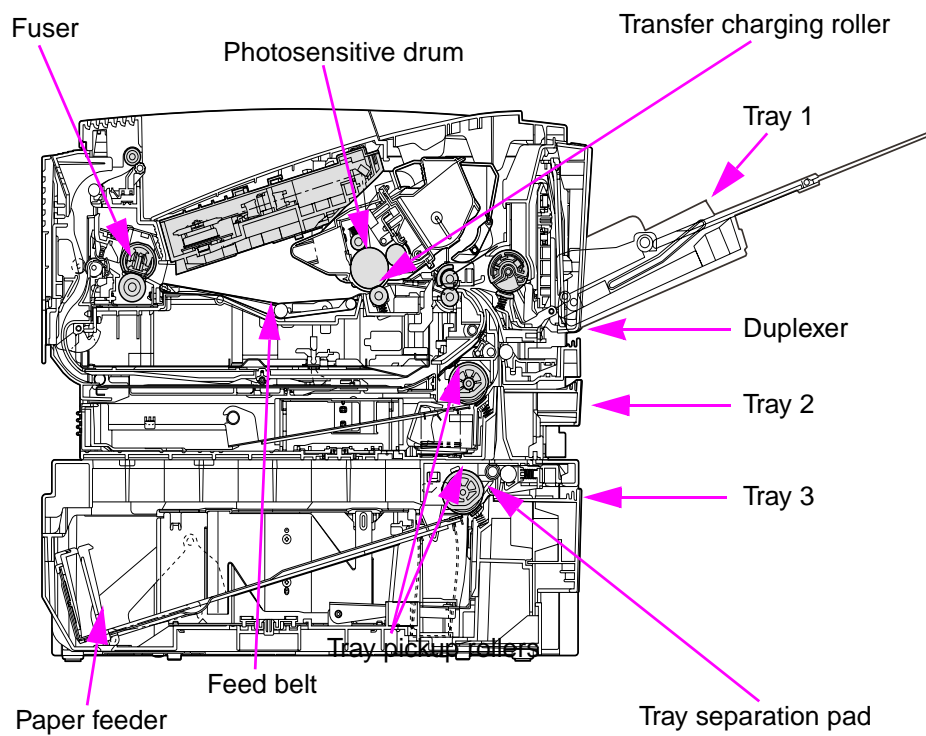


Figure 169. General printer-component locations (2 of 2)

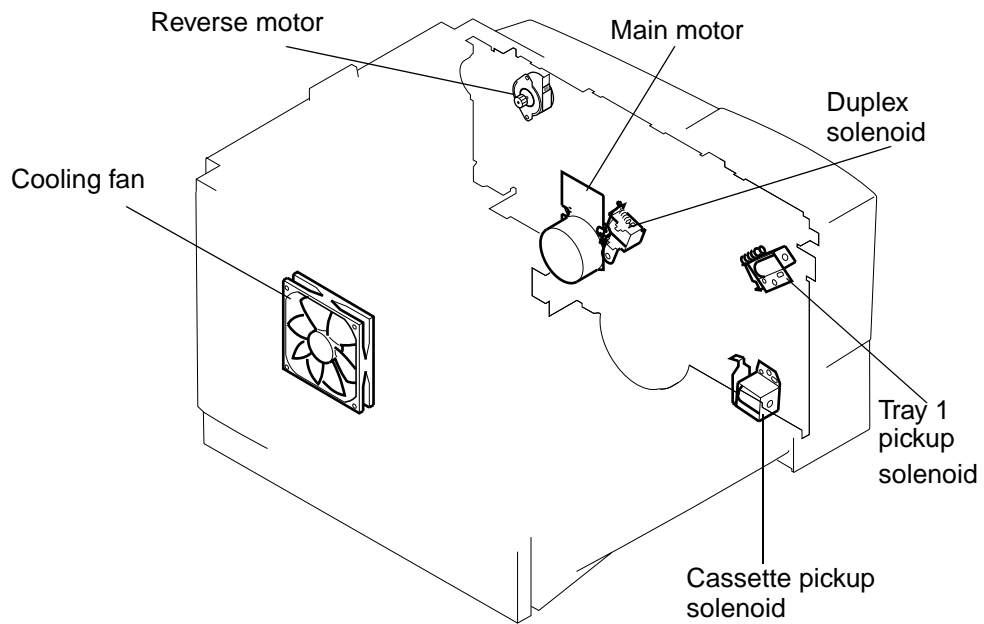


Figure 170. Motor, fan, and solenoid locations

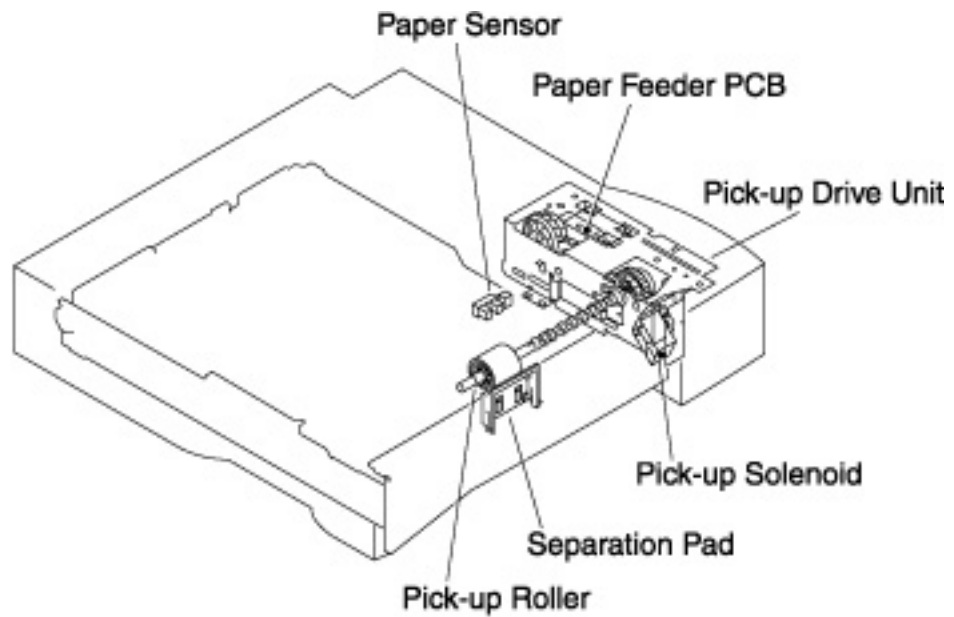


Figure 171. 250-sheet and 500-sheet tray 3 component locations

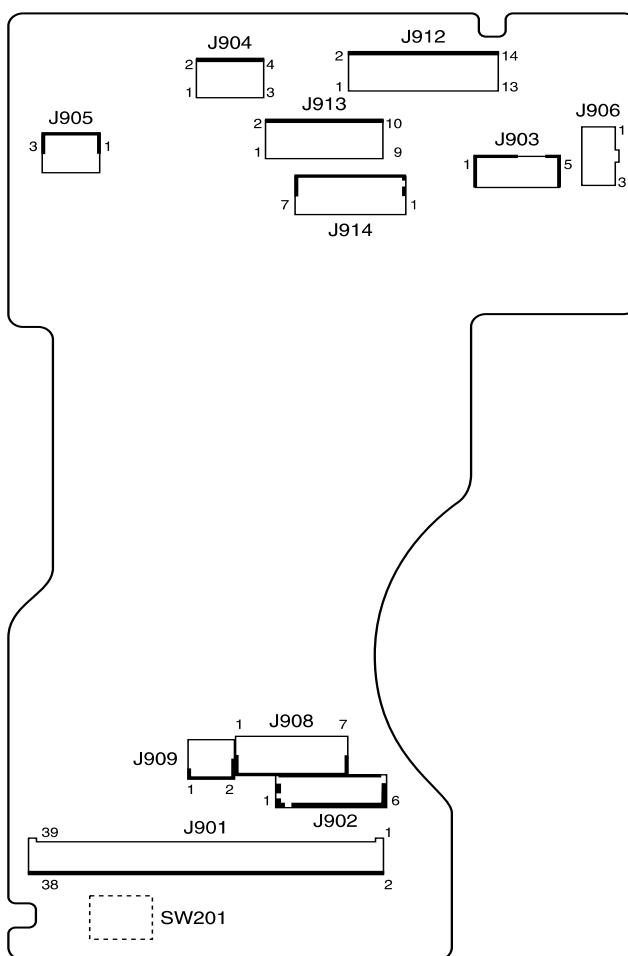


Figure 172. Engine controller PCB

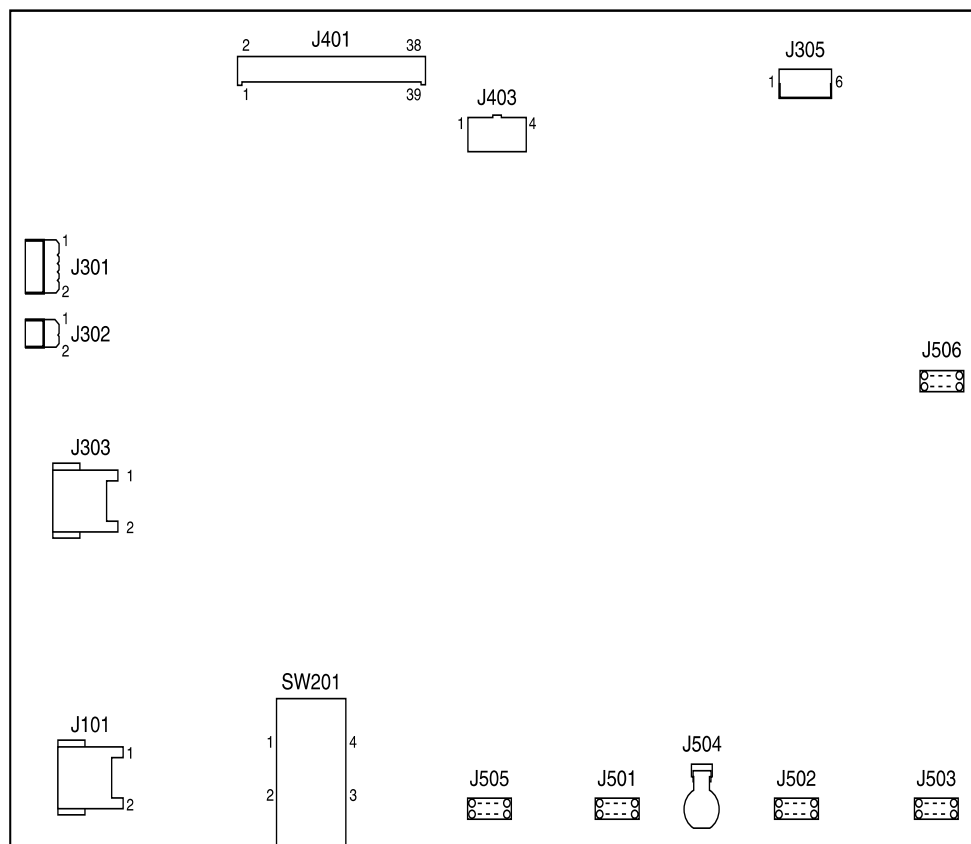


Figure 173. Power supply PCB

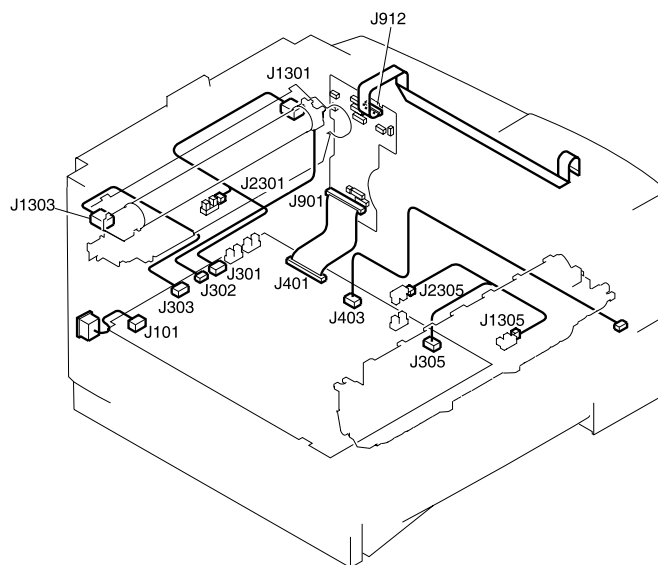


Figure 174. Location of connectors (1 of 3)

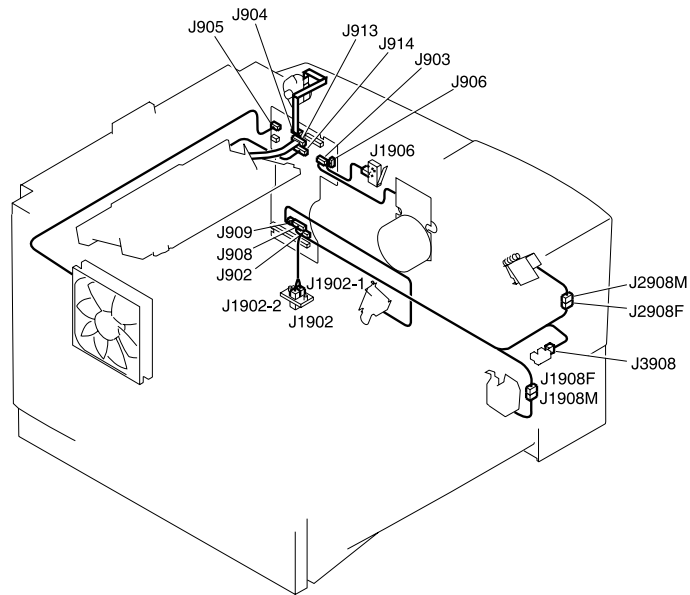


Figure 175. Location of connectors (2 of 3)

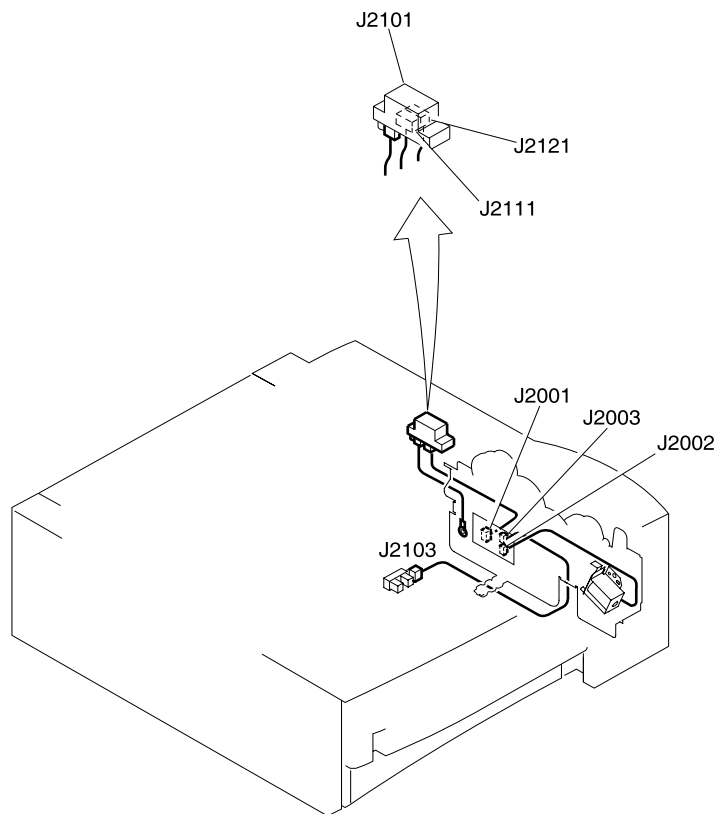


Figure 176. Location of connectors (3 of 3)

8

Parts and diagrams

Chapter contents

Introduction	234
Ordering parts	234
Ordering consumables	234
Consumables, accessories, and supplies	235
Common fasteners and torque values	236
Illustrations and parts lists	238
External covers and panels	238
Top cover assembly	240
Internal components	242
Power supply assembly	252
Printer drive assembly	254
Tray 2 and 250-sheet feeder cassette	264
Cassette pickup assembly	256
Fusing assembly	258
Fusing assembly	258
PCB assembly location	260
250-sheet feeder external covers	262
Tray 2 and 250-sheet feeder cassette	264
250-sheet feeder internal components	266
250-sheet feeder drive assembly	268
250-sheet feeder PCB assembly location	270
500-sheet feeder external covers	272
500-sheet feeder cassette	274
500-sheet feeder internal components	276
500-sheet feeder drive assembly	278
500-sheet feeder PCB assembly location	280
Alphabetical parts list	282
Numerical parts list	291

Introduction

The figures in this chapter illustrate the major subassemblies in the printer and their component parts. A table accompanies each exploded-view diagram. Each table lists the item number for the replaceable part, the associated part number for the item, the quantity, and a description of the part.

Note

When looking for a part number, pay careful attention to the voltage listed in the description column to ensure that the part number selected is for the correct printer model.

Ordering parts

All standard part numbers listed are stocked and can be ordered from HP's Customer Services and Support Center.

Hewlett-Packard Company
Customer Services and Support Center
8050 Foothills Blvd.
Roseville, CA 95678
Parts Direct Ordering: (1) (800) 227-8164 (U.S. Only)

Hewlett-Packard Company
Customer Services and Support Center
Wolf-Hirth Strasse 33
D-7030
Boblingen, Germany
(49 7031) 14-2253

Ordering consumables

Consumables and accessories like those listed in table 41 can be ordered from Hewlett-Packard.

The phone numbers are:

- In the U.S.: (1) (800) 538-8787
- In Canada: (1) (800) 387-3154
- In Toronto: (1) (516) 671-8383
- In the United Kingdom: 0734-441212
- In Germany: 0130-3322

Contact your local HP Parts Coordinator for other phone numbers.

Note

Parts that have no item number or part number listed are not field replacement parts (FRUs) and cannot be ordered. See "Reference materials" page 235 for documentation part numbers.

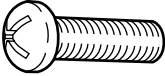

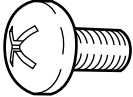
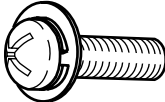
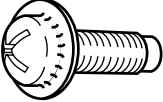

Consumables, accessories, and supplies

Table 41. Consumables, accessories, and supplies

Product number	Part number	Description
C4096A		Ultra Precise toner cartridge
C4097A		Pallet Quantity
C2950A		2 m (5 ft) parallel cable (IEEE-1284)
C2951A		3 m (9 ft) parallel cable (IEEE-1284)
C6518A CPC		USB
C7842AX		8 MB
C7843AX		16 MB
C7845AX		32 MB
J3110A		HP JetDirect 600N Ethernet (10 Base-T [RJ-45])
J3111A		HP JetDirect 600N Ethernet (10 Base-T [RJ-45], 10 Base-2 [BNC])
J4169A	J4169-69001	HP JetDirect 610N Fast Ethernet (10/100 Base-TX [RJ-45])
J4135A		USB
	RG5-4137-000CN	tray 2 or 250-sheet feeder replacement
	R75-5001-000CN	250-sheet feeder and tray assembly
	R75-5009-000CN	500-sheet feeder and tray assembly
	5963-7863	HP LaserJet Printer Family Print Media Guide
	5961-0976	HP PCL/PJL Reference Set
	5969-6818	HP JetDirect Print Server Administrator's Guide
	5969-3412	HP JetDirect Print Server JetAdmin Setup Guide
	C7058-90915	HP LaserJet 2200 series printers user guide (English version)
	C7058-00901	HP LaserJet 2200 series printers getting started guide (English version)
	C7058-60102	HP LaserJet 2200 series printers users CD-ROM (English version)
	C7058-60103	HP LaserJet 2200 series printers users CD-ROM (XXXXXX version)
	C7058-60104	HP LaserJet 2200 series printers users CD-ROM (XXXXXX version)
	C7058-60101	HP LaserJet 2200 series printers users CD-ROM (XXXXXX version)

Common fasteners and torque values

Table 42. Common fasteners

Example	Description	Sizes	Uses
	Screw	M3 by 6 mm M4 by 8 mm	To hold plastic to plastic
	Screw, tapping	M3 by 4 mm M3 by 6 mm M4 by 6 mm M4 by 12 mm	To hold plastic to metal (excluding the control panel)
	Screw, pan head	M4 by 10 mm	To hold plastic to plastic
	Screw, w/washer	M3 by 6 mm M3 by 8 mm M3 by 7 mm M4 by 6 mm M4 by 12 mm	To hold plastic to metal (excluding the covers)
	Screw, truss head	M3 by 6 mm M3 by 8 mm M4 by 8 mm M4 by 20 mm	To hold sheet metal to metal (excluding the Formatter)
	E-ring		To hold gears in place

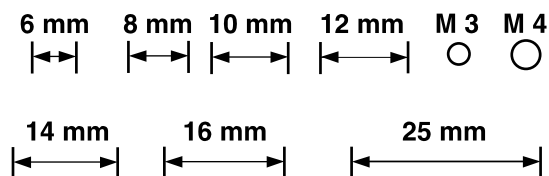


Table 43. Common torque values

Material	Canon recommended torque value	Conversion	HP recommended torque value
Plastic to metal	8 kg-cm	6.94 lb-in	5.5 lb-in
Metal to metal	10 kg-cm	8.68 lb-in	10 lb-in
PCBA	8 kg-cm	6.94 lb-in	5.5 lb-in
Plastic to plastic	8 kg-cm	6.94 lb-in	5.5 lb-in

Illustrations and parts lists

The following illustrations and parts tables list the field replaceable units (FRU) for this printer. Two tables at the end of this chapter list all of the parts shown in this chapter: table 66 lists the parts in alphabetical order, and table 67 lists the parts in numerical order by part number. Both tables list the appropriate figure in this chapter that shows the part.

External covers and panels

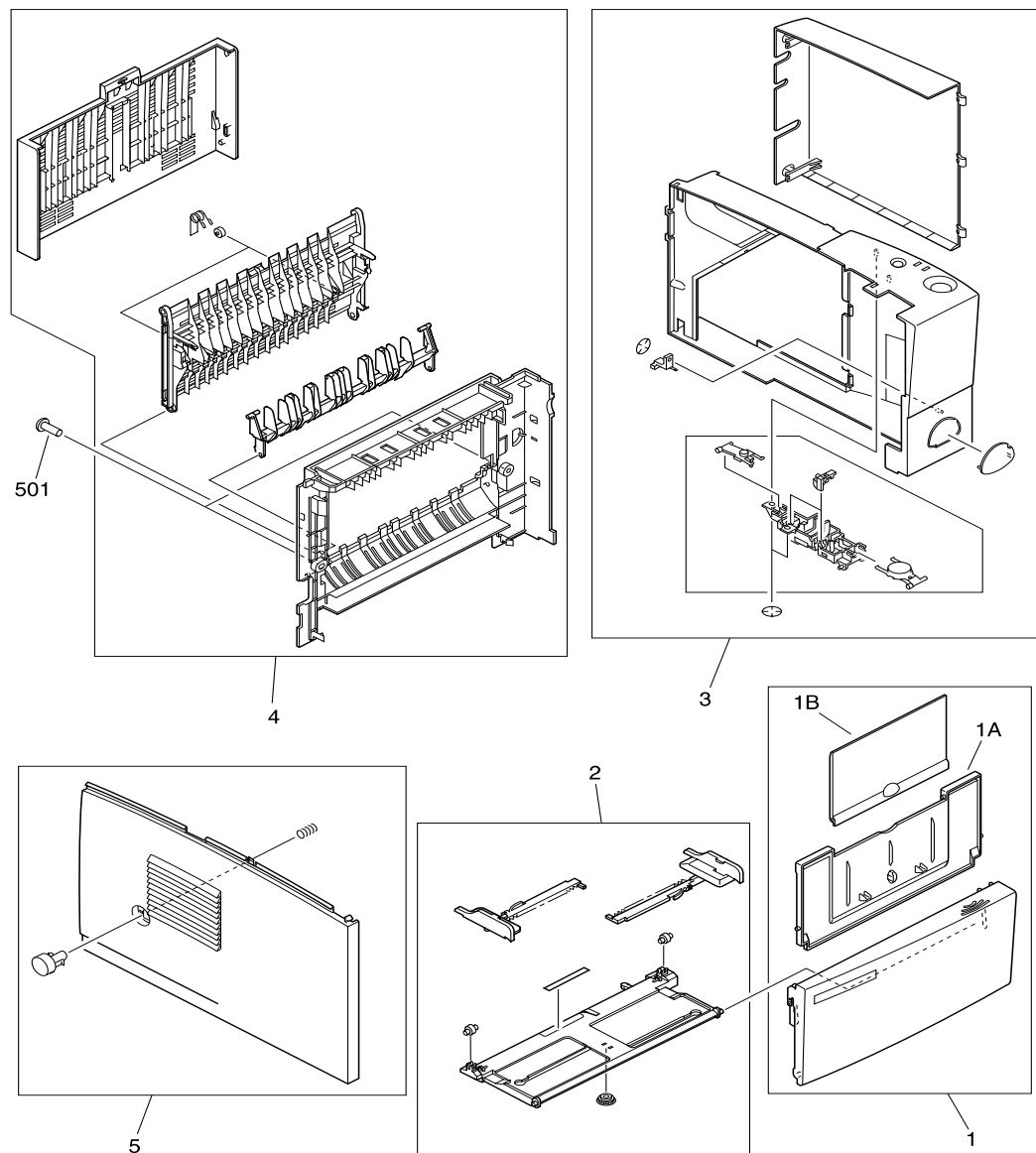


Figure 177. Printer external covers and panels

Table 44. Printer external covers and panels

Ref	Description	Part number	Qty
1	Cover assembly, tray 1	RG5-4121-000CN	1
1A	Expansion, tray 1	RB2-3036-000CN	1
1B	Expansion, tray 1	RB2-3037-000CN	1
2	Tray assembly (tray 1)	RG5-5576-000CN	1
3	DIMM cover assembly	RG5-5545-000CN	1
4	Rear cover assembly	RG5-5546-000CN	1
5	Left cover assembly	RG5-5549-000CN	1
501	Screw, TP, Pan Head, m4 by 10	XB4-7401-007CN	2

Top cover assembly

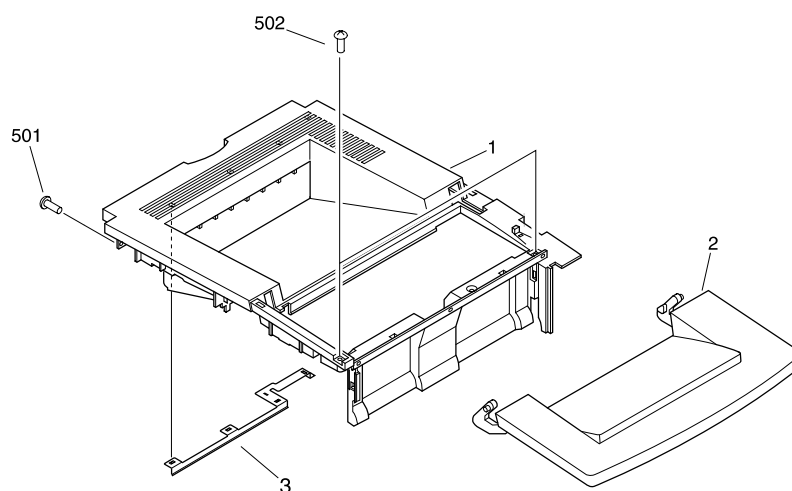


Figure 178. Top cover assembly

Table 45. Top cover assembly

Ref	Description	Part number	Qty
1	Top cover	RB2-6280-000CN	1
2	Cover, cartridge	RB2-2856-000CN	1
3	Static charge eliminator	RB2-6281-000CN	1
501	Screw, TP, Pan Head, M4 by 10	XB4-7401-007CN	2
502	Screw, TP, Truss Head, M4 by 20	XB4-7402-007CN	2

Internal components

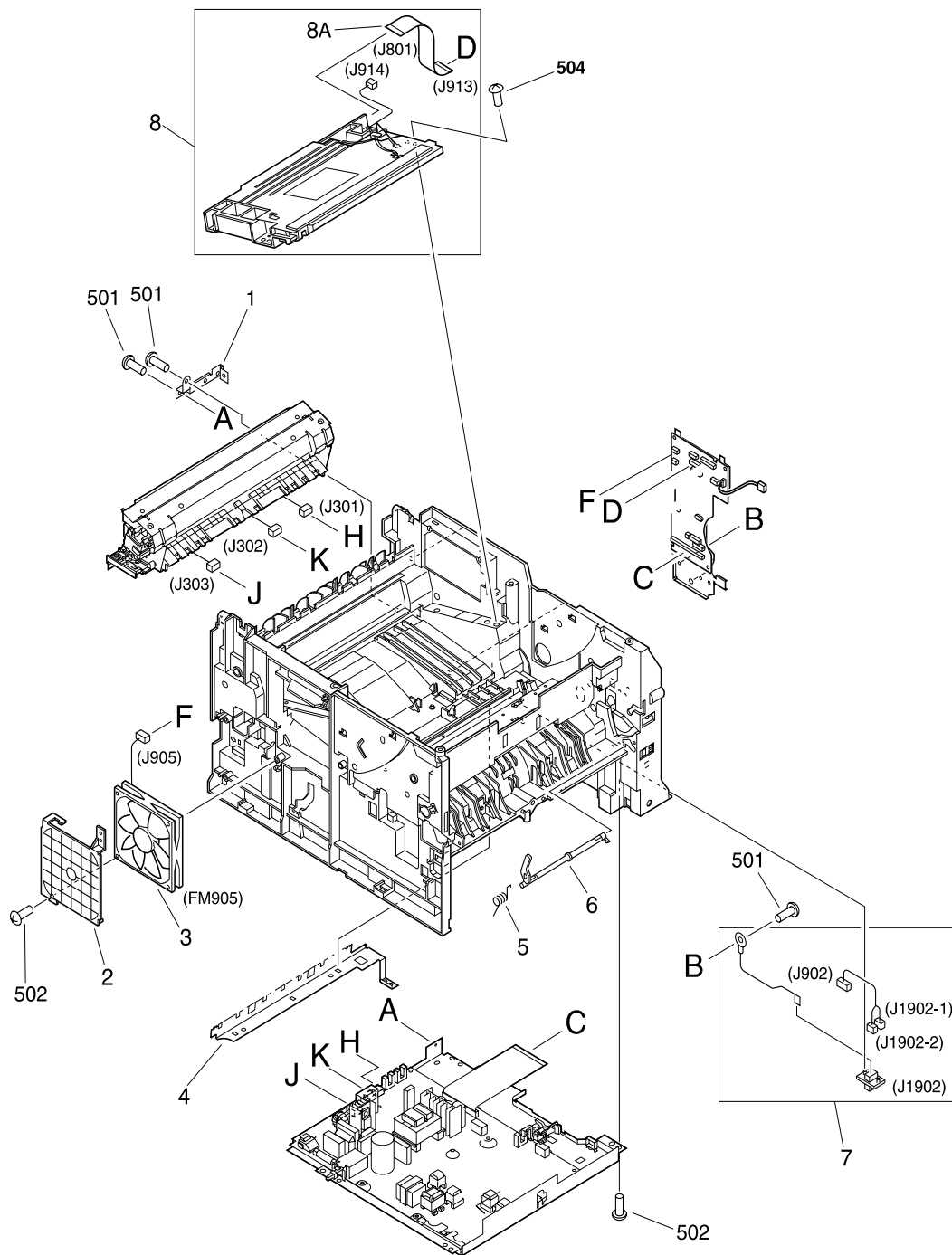


Figure 179. Internal components (1 of 5)

Table 46. Internal components (1 of 5)

Ref	Description	Part number	Qty
1	Plate, grounding	RB2-6246-000CN	1
2	Mount, fan	RB2-6255-000CN	1
3	Fan	RH7-1463-000CN	1
4	Eliminator, static charge	RB2-6261-000CN	1
5	Spring, torsion	RB2-2837-000CN	1
6	Lever, sensor	RB2-2836-000CN	1
7	Paper-feed cable	RG5-5598-000CN	1
8	Laser/scanner assembly	RG5-5591-000CN	1
8A	Flat cable, laser	RH2-5427-000CN	1
501	Screw, w/washer, M3 by 6	XB2-7300-607CN	3
502	Screw, TP, Pan Head, M4 by 10	XB4-7401-007CN	5
503	Screw, M3 by 4	XB6-7300-407CN	2
504	Screw, TP, M4 by 12	XA9-1273-000CN	4

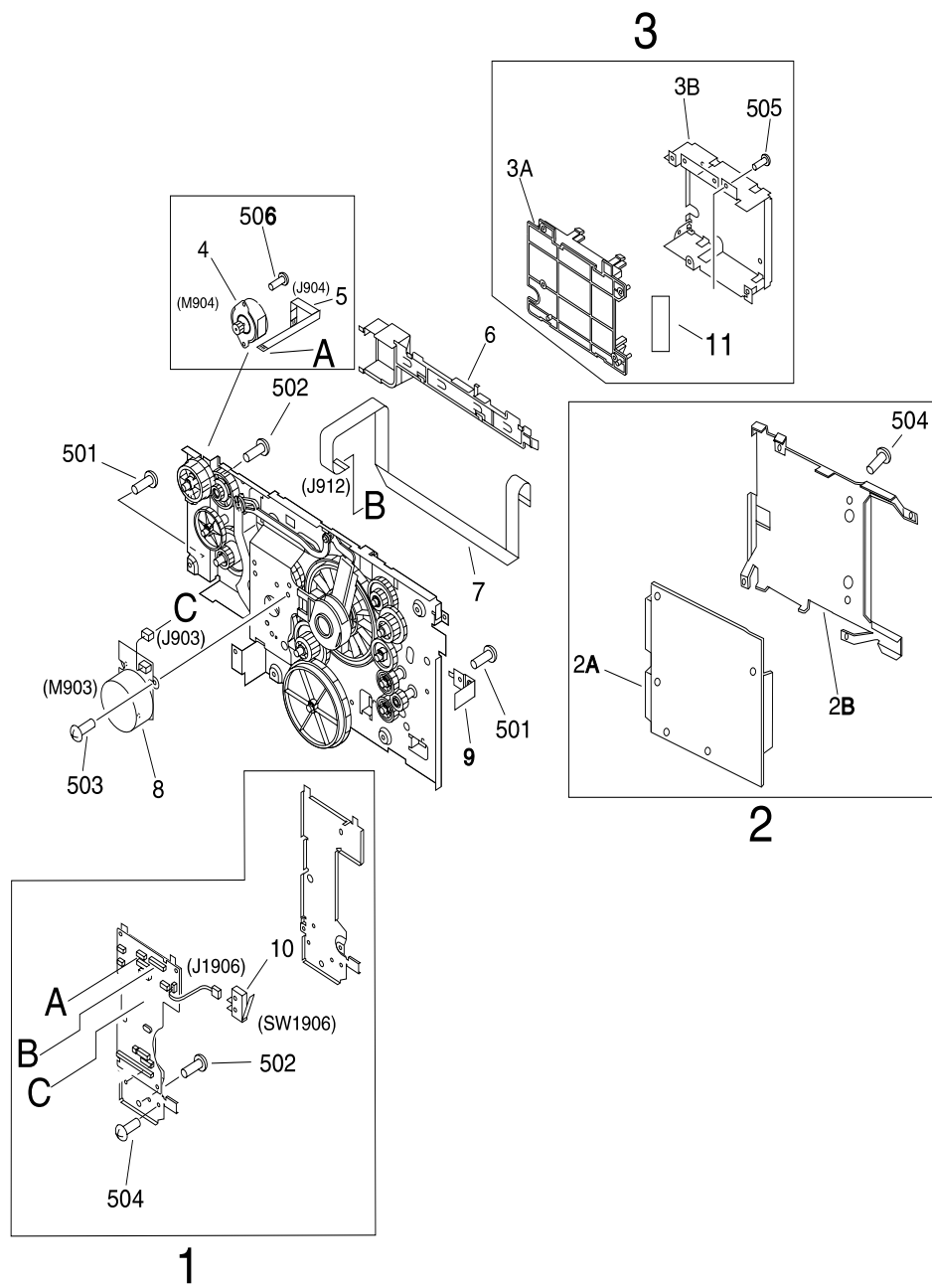


Figure 180. Internal components (2 of 5)

Table 47. Internal components (2 of 5)

Ref	Description	Part number	Qty
1	Engine control assembly	RG5-5566-000CN	1
2	Formatter assembly		
2A	Formatter PCB	C4209-60001	1
2B	Formatter RFI shield	C7058-00001	
3	EIO adapter		
3A	Guide, EIO	RB2-2944-000CN	1
3B	Plate, mount, EIO	RB2-2945-000CN	1
4	Reverse motor, 23 V dc	RH7-1461-000CN	1
5	Flat cable, reverse motor	RH2-5425-000cn	1
6	Guide, flat cable	RB2-6247-000CN	1
7	Flat cable, I/F	RH2-5423-000CN	1
8	Motor, dc	RH7-1458-000CN	1
9	Plate, protection	RB2-6252-000CN	1
10	Microswitch	RH7-6051-000CN	1
11	RFI clip	C7058-00010	1
501	Screw, w/washer, M3 by 6	XB2-7300-607CN	2
502	Screw, TP, Pan Head, M4 by 10	XB4-7401-007CN	6
503	Screw, M3 by 4	XB6-7300-407CN	4
504	Screw, TP, M3 by 6	XA9-1223-000CN	6

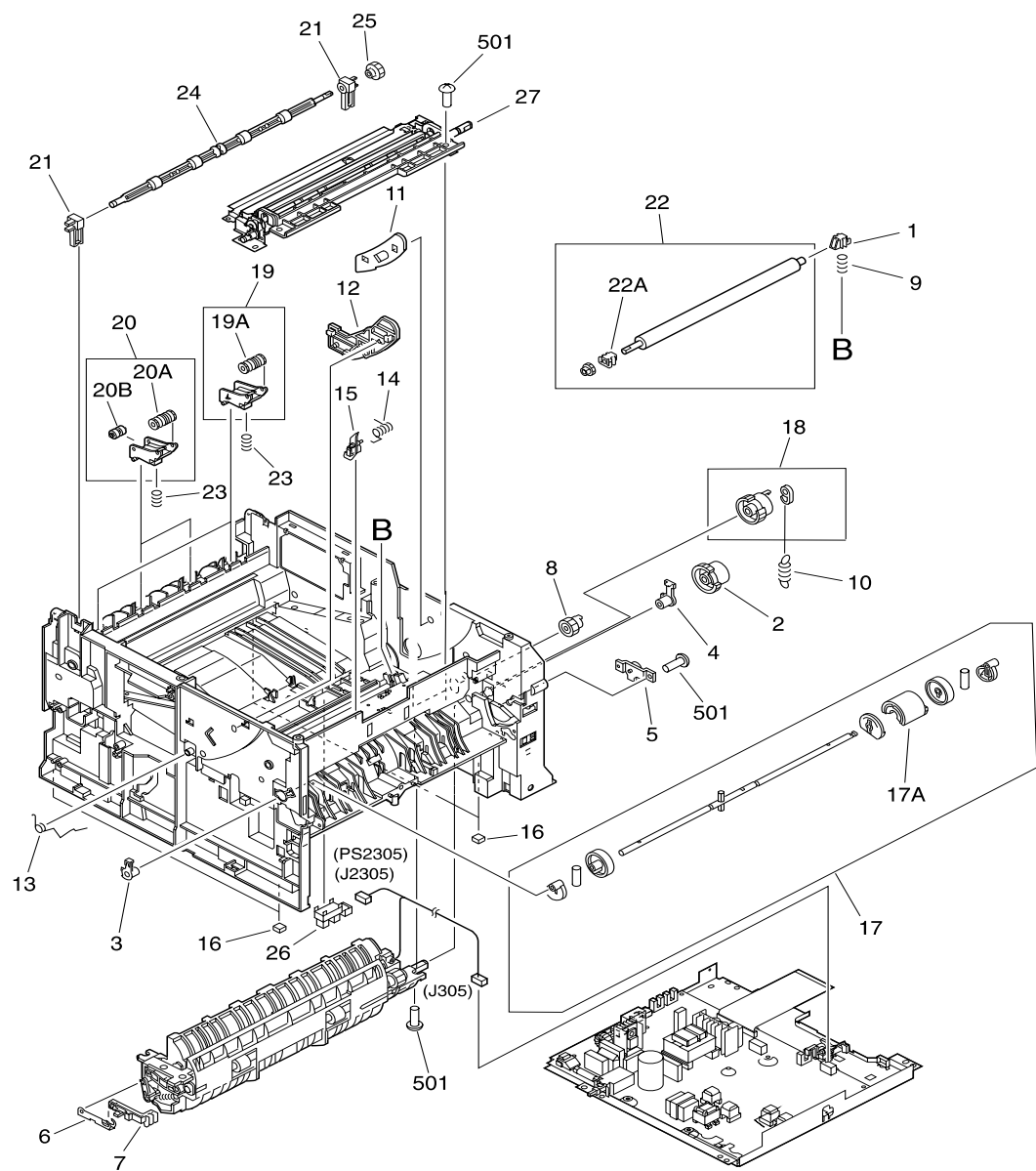


Figure 181. Internal components (3 of 5)

Table 48. Internal components (3 of 5)

Ref	Description	Part number	Qty
1	Bushing, transfer, right	RB2-2926-020CN	1
2	Gear, 26T	RB2-3040-000CN	1
3	Bushing, left	RB2-3043-000CN	1
4	Bushing, right	RB2-3044-000CN	1
5	Damper	RB2-6248-000CN	1
6	Rod, jam clearing	RB2-6250-000CN	1
7	Lever, jam clearing	RB2-6251-000CN	1
8	Gear, 14T	RS6-0445-000CN	1
9	Spring, compression	RS6-2022-000CN	1
10	Spring, tension	RS6-2025-000CN	1
11	Guide, cartridge, right	RB2-2830-020CN	1
12	Guide, cartridge, left	RB2-2831-020CN	1
13	Spring, compression	RB2-2832-000CN	1
14	Spring, torsion	RB2-2843-000CN	1
15	Arm, sensor	RB2-6264-000CN	1
16	Foot, rubber	RB2-6297-000CN	4
17	Tray 1 pick-up assembly	RG5-4128-000CN	1
17A	Roller, pick-up	RB2-2900-000CN	1
18	Cassette pick-up gear assembly	RG5-4156-000CN	1
19	FD delivery roller assembly	RG5-5541-000CN	2
19A	Roller, face-down, lower 1	RB2-2849-000CN	1
20	FD delivery roller assembly	RG5-5542-000CN	2
20A	Roller, face-down, lower 1	RB2-2849-000CN	1
20B	Roller, face-down, lower 2	RB2-6277-000CN	1
21	Bushing	RB2-2850-000CN	2
22	Transfer roller assembly	RG5-5581-000CN	1
23	Spring, compression	RS6-2375-000CN	4
24	Roller, face-down, upper	RF5-3275-000CN	1
25	Gear, 15T	RS6-0441-000CN	1
26	Photo interrupter TLP1242	WG8-5382-000CN	1
27	Registration assembly	RG5-5556-000CN	1
501	Screw, TP, Pan Head, M4 by 10	XB4-7401-007CN	12

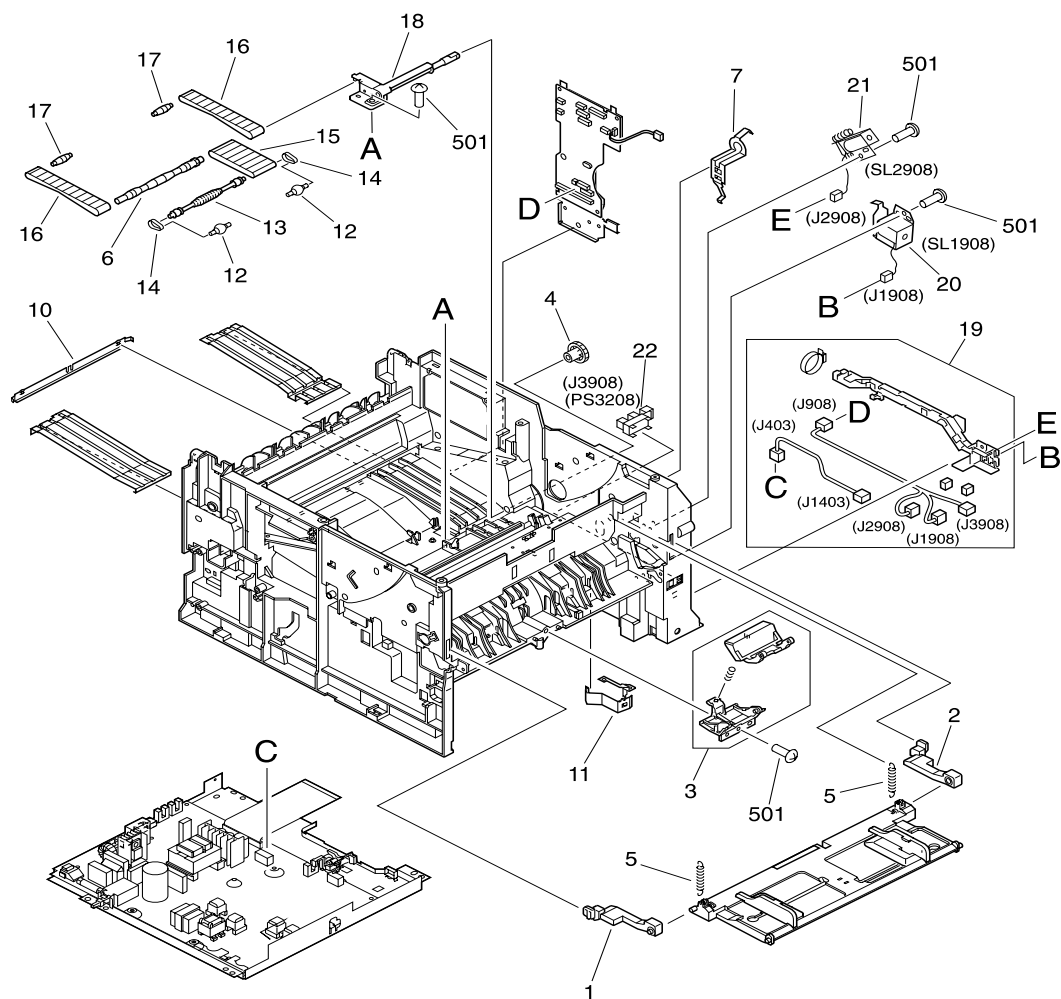


Figure 182. Internal components (4 of 5)

Table 49. Internal components (4 of 5)

Ref	Description	Part number	Qty
1	Hinge, left	RB2-3041-020CN	1
2	Hinge, right	RB2-3042-020CN	1
3	Pad, separation	RF5-3272-000CN	1
4	Gear, 20T	RS6-0464-000CN	1
5	Spring, tension	RS6-2030-000CN	2
6	Shaft, drive, 1	RB2-3073-000CN	1
7	Spring, leaf, grounding	RB2-3075-000CN	1
10	Plate, grounding	RB2-3080-000CN	1
11	Spring, leaf	RB2-6266-000CN	1
12	Pulley	RB2-6268-000CN	2
13	Shaft, drive, front	RB2-6269-000CN	1
14	Belt, paper feed, 3	RB2-6270-000CN	2
15	Belt, paper feed, 1	RB2-6272-000CN	1
16	Belt, paper feed, 2	RB2-6273-000CN	2
17	Shaft, drive, rear	RB2-6274-000CN	2
18	Gear assembly	RG5-5577-000CN	1
19	Cable guide assembly	RG5-5568-000CN	1
20	Solenoid	RH7-5270-000CN	1
21	Solenoid	RH7-5273-000CN	1
22	Photo interrupter TLP1242	WG8-5382-000CN	1
501	Screw, TP, pan head M4 by 10	XB4-7401-007CN	4

Table 50. Internal components (5 of 5)

Ref	Description	Part number	Qty
1	Spring, compression	RB2-6262-000CN	1
2	Spring, compression	RB2-6263-000CN	1
3	Spring, compression	RB2-6265-000CN	1
4	Spring, compression	RB2-6267-000CN	1
5	Spring, compression	RB2-6271-000CN	1
6	Duplex solenoid assembly	RG5-5552-000CN	1
6B	Screw, RS, M3 by 6	XA9-0686-000CN	1
7	Reverse guide assembly	RG5-5548-000CN	1
8	Position guide assembly	RG5-5553-000CN	1
9	Duplex feed guide assembly	RG5-5554-000CN	1
10	Feed roller assembly	RG5-5555-000CN	1
11	Hinge, feed guide	RB2-6249-000CN	1
12	Inlet cable unit	RG5-5565-000CN	1
13	Screw, w/washer, M4 by 12	XA9-1206-000CN	2
501	Screw, TP, Pan Head, M4 by 10	XB4-7401-007CN	5
502	Screw, w/washer, M3 by 6	XB2-7300-607CN	1

Power supply assembly

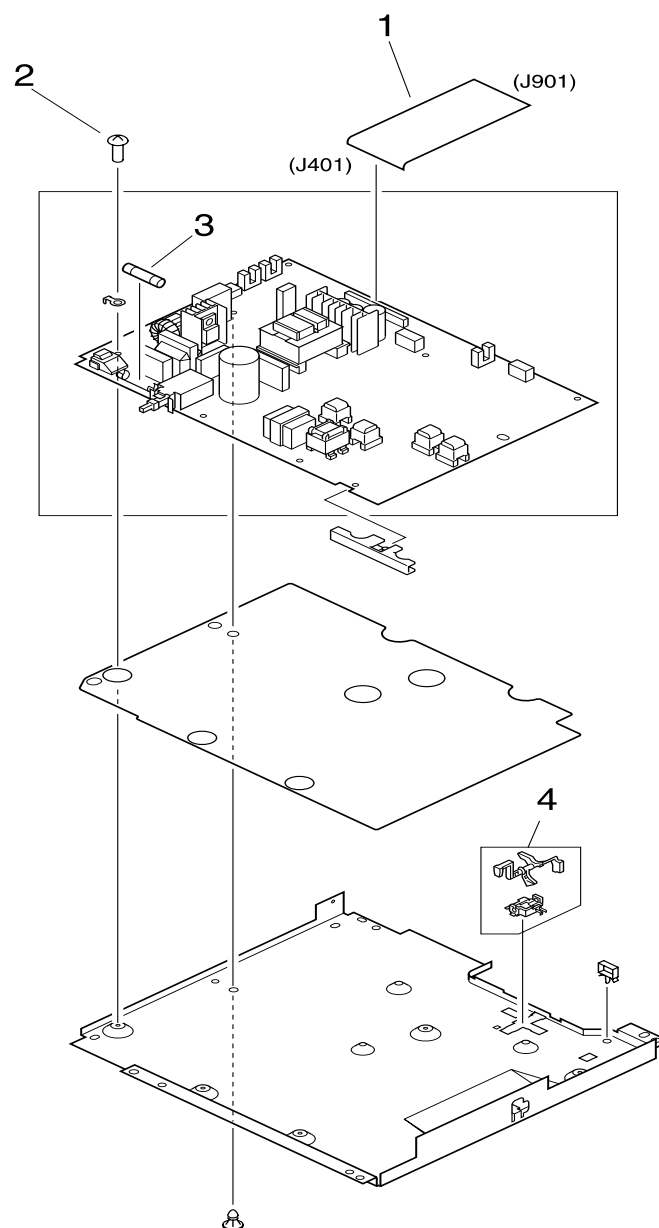


Figure 184. Power supply assembly

Table 51. Power supply assembly

Ref	Description	Part number	Qty
	Power supply assembly, 100 to127 V	RG5-5563-000CN	1
	Power supply assembly, 220 to240 V	RG5-5573-000CN	1
1	Cable, flat	RH2-5421-000CN	1
2	Screw, w/washer, M3 by 8	XA9-1226-000CN	5
3	Fuse, 250 V, 15 A	WD1-0268-000CN	1
3	Fuse, 250 V, 8 A	RH3-8006-000CN	1
4	Holder, sensor lever	RF5-3279-000CN	1

Printer drive assembly

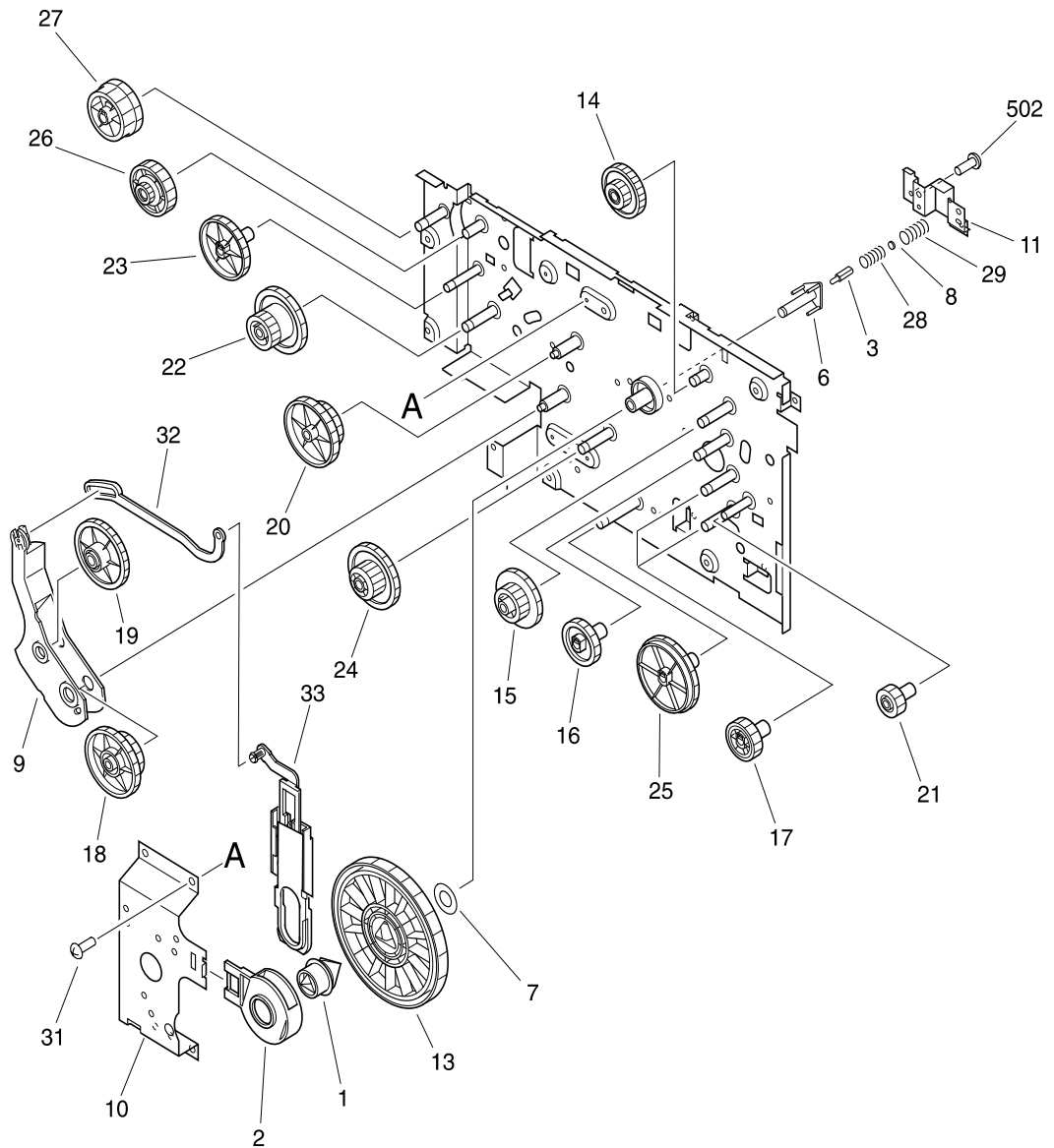


Figure 185. Printer drive assembly

Table 52. Printer drive assembly

Ref	Description	Part number	Qty
	Printer drive assembly	RG5-5562-000CN	1
1	Shaft, coupling	RB2-2935-000CN	1
2	Bushing	RB2-2936-000CN	1
3	Pin	RB2-2943-000CN	1
6	Holder, pin	RB2-2947-000CN	1
7	Washer	RB2-2949-000CN	1
8	Flange, spring	RB2-2950-000CN	1
9	Arm, drive	RB2-6376-000CN	1
10	Plate, motor	RB2-6377-000CN	1
11	Plate, spring	RB2-6378-000CN	1
13	Gear, 201T	RS6-0446-000CN	1
14	Gear, 17T/68T	RS6-0448-000CN	1
15	Gear, 25T/41T	RS6-0449-000CN	1
16	Gear, 31T	RS6-0450-000CN	1
17	Gear, 26T	RS6-0451-000CN	2
18	Gear, 91T/28T	RS6-0910-000CN	1
19	Gear, 42T	RS6-0911-000CN	1
20	Gear, 93T/73T	RS6-0912-000CN	1
21	Gear, 17T	RS6-0913-000CN	1
22	Gear, 46T/22T	RS6-0914-000CN	1
23	Gear, 39T	RS6-0915-000CN	1
24	Gear, 28T/88T	RS6-0916-000CN	1
25	Gear, 75T	RS6-0917-000CN	1
26	Gear, 75T/28T	RS6-0918-000CN	1
27	Gear, 79T/36T	RS6-0919-000CN	1
28	Spring, compression	RS6-2031-000CN	1
29	Spring, compression	RS6-2379-000CN	1
30	Screw, M3 by 6	XA9-0904-000CN	4
31	Screw, TP, M3 by 6	XA9-1223-000CN	4
32	Lever, drive release	RB9-0641-000CN	1
33	Coupling assembly	RG9-1473-000CN	1
501	Screw, machine, truss head, M3 by 6	XB1-2300-605CN	2
502	Screw, with star washer, M3 by 7	XB2-7300-407CN	2

Cassette pickup assembly

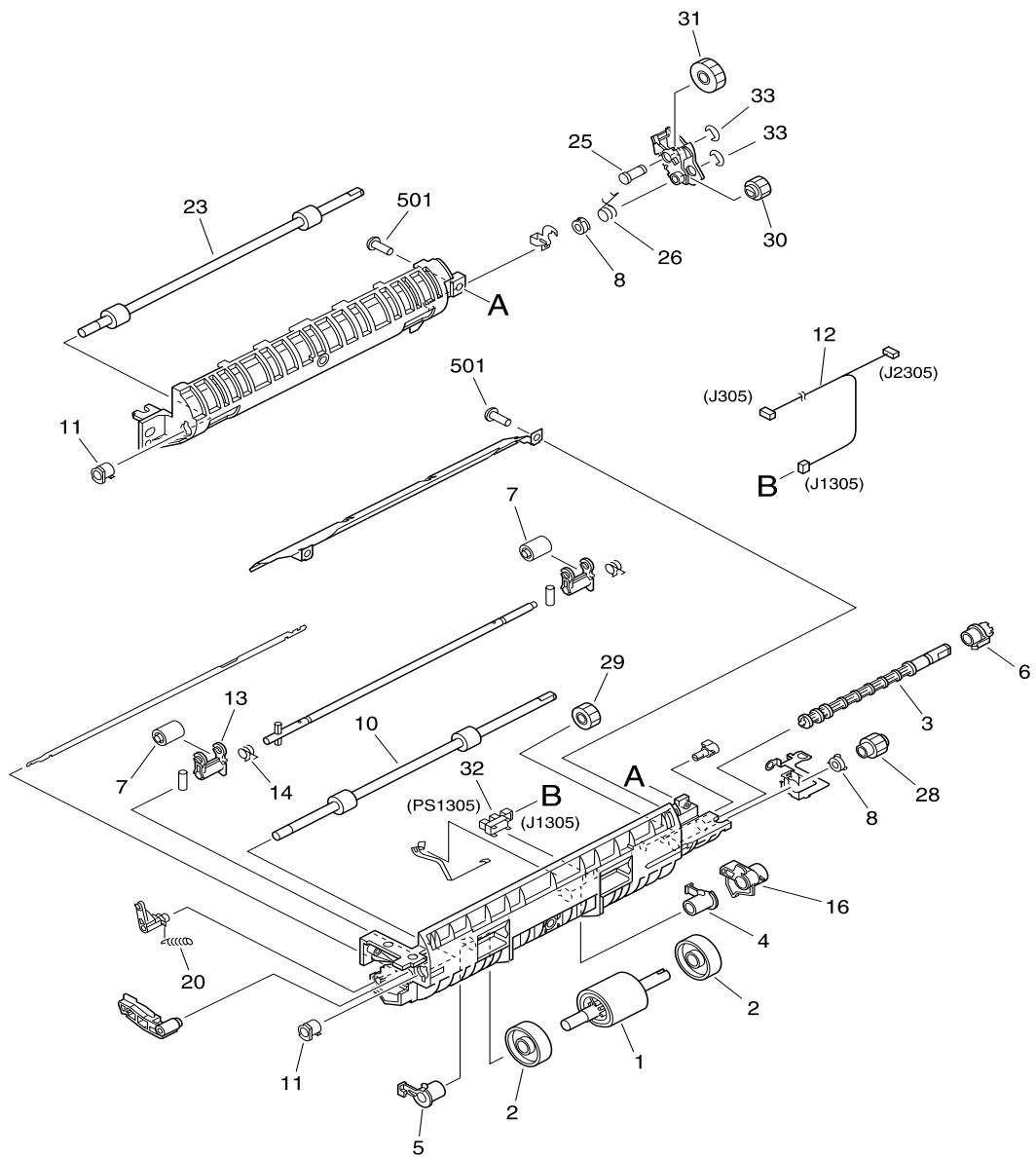


Figure 186. Cassette pickup assembly

Table 53. Cassette pickup assembly

Ref	Description	Part number	Qty
	Cassette pick-up assembly	RG5-5551-000CN	1
1	Roller, paper pick-up	RB2-6304-000CN	1
2	Roller	RB2-2892-000CN	2
3	Shaft, drive	RB9-0681-000CN	1
4	Bushing, right	RB2-2895-000CN	1
5	Bushing, left	RB2-2896-000CN	1
6	Bushing	RB2-2897-020CN	1
7	Roller	RB2-3046-000CN	2
8	Bushing	RB2-3081-000CN	2
10	Roller, feed	RB2-6302-000CN	1
11	Bushing	RB2-6303-000CN	2
12	Sensor cable	RG5-5583-000CN	1
16	Arm, paper sensor	RB2-6310-000CN	1
20	Spring, tension	RB2-6314-000CN	1
23	Roller, feed	RB2-6318-000CN	1
25	Shaft, gear	RB2-6320-000CN	1
26	Spring, torsion	RB2-6321-000CN	1
28	Gear, 15T	RS6-0904-000CN	1
29	Gear, 16T	RS6-0905-000CN	1
30	Gear, 15T	RS6-0906-000CN	1
31	Gear, 24T	RS6-0907-000CN	1
32	Photo-interrupter, GP1SQ73P	WG8-5364-000CN	1
33	E-ring	XD9-0135-000CN	2
501	Screw, TP, truss head, M4 by 8	XB4-7400-809CN	5

Fusing assembly

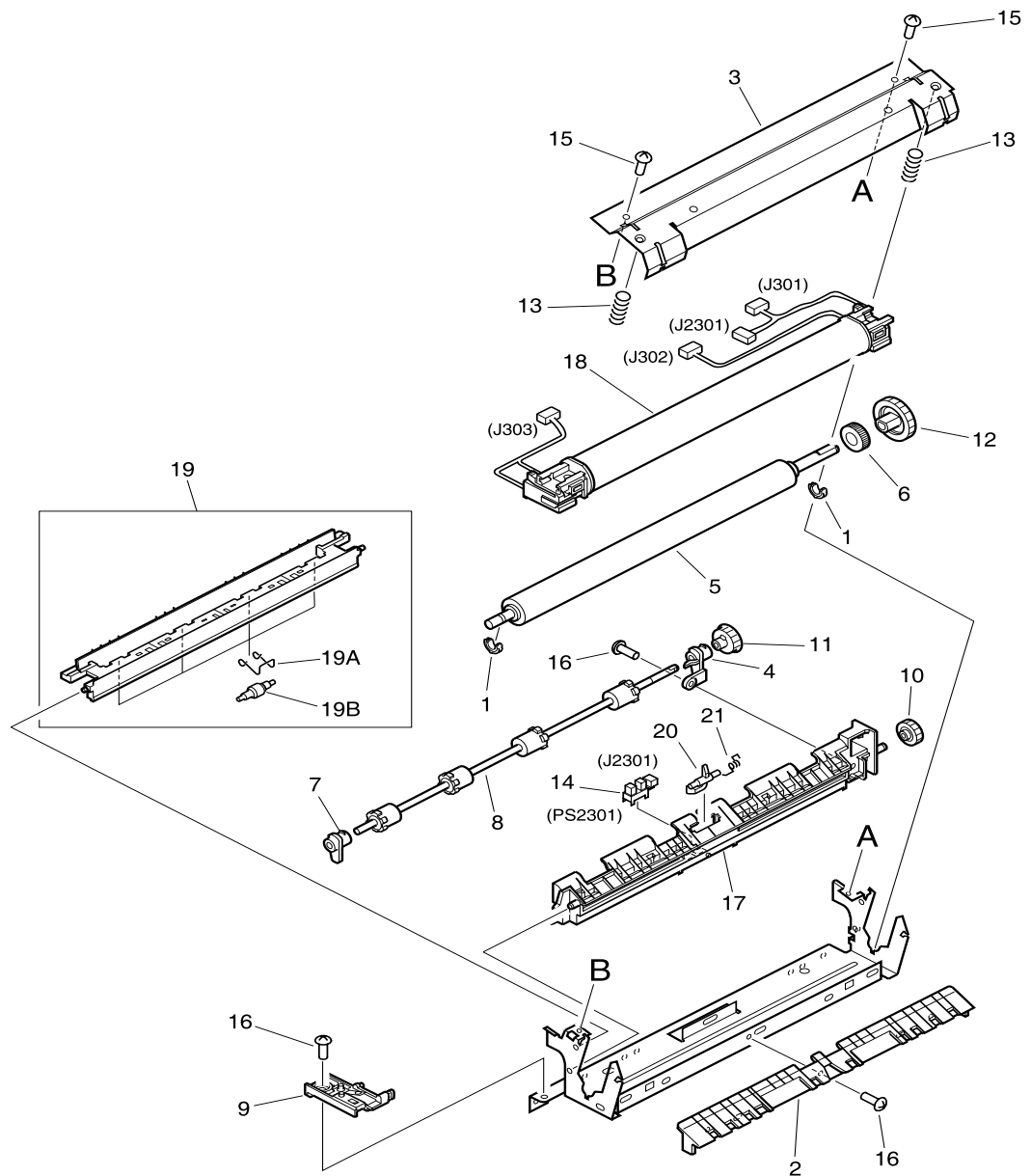


Figure 187. Fusing assembly

Table 54. Fusing assembly

Ref	Description	Part number	Qty
	Fusing assembly, 100-127 V	RG5-5559-000CN	1
	Fusing assembly, 220-240 V	RG5-5569-000CN	1
1	Bushing	RB2-2973-000CN	2
2	Guide, entrance	RB2-6357-000CN	1
3	Plate, pressure	RB2-6358-000CN	1
4	Bushing	RB2-6359-000CN	1
5	Roller, pressure	RB2-6368-000CN	1
6	Bushing	RB2-6370-000CN	1
7	Bushing	RB2-6371-000CN	1
8	Roller, delivery	RB2-6372-000CN	1
9	Holder, contact	RF5-2609-000CN	1
10	Gear, 14T	RS6-0921-000CN	1
11	Gear, 16T	RS6-0922-000CN	1
12	Gear, 27T	RS6-0923-000CN	1
13	Spring, compression	RS6-2378-000CN	2
14	Photo-interrupter, TLP1242	WG8-5382-000CN	1
15	Screw, TP, M3 by 6	XA9-1223-000CN	2
16	Screw, w/washer, M3 by 8	XA9-1226-000CN	3
17	Guide, delivery, lower	RB2-6350-000CN	1
18	Fuser film assembly, 100-127 V	RG5-5560-000CN	1
18	Fuser film assembly, 220-240 V	RG5-5570-000CN	1
19	Guide, delivery upper	RG5-5561-000CN	1
19A	Spring, compression	RB2-2978-000CN	4
19B	Roller, delivery	RB2-6374-000CN	4
20	Lever, delivery	RB2-6351-000CN	1
21	Spring, torsion	RB2-6352-000CN	1

PCB assembly location

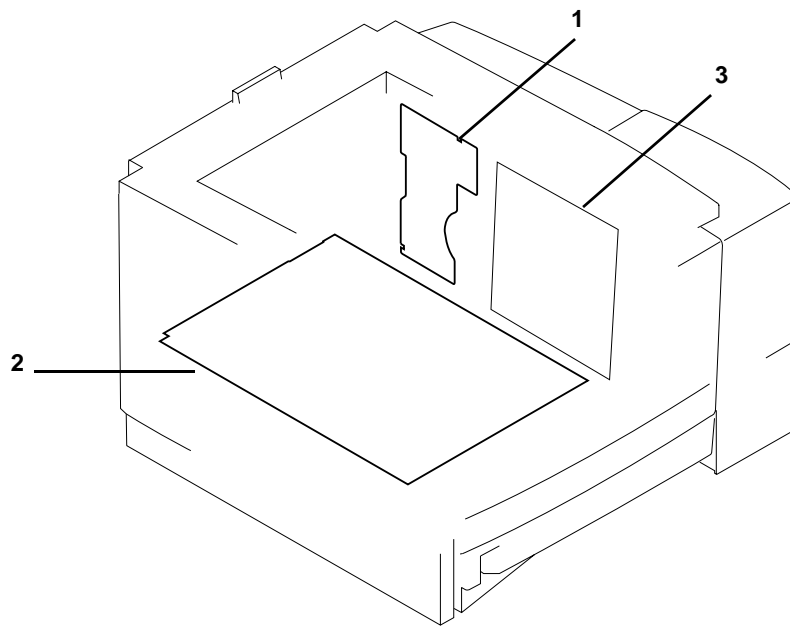


Figure 188. PCB assembly location

Table 55. PCB assembly location

Ref	Description	Part number	Qty
1	Engine controller assembly	RG5-5566-000CN	1
2	Power supply assembly, 100-127 V	RG5-5563-000CN	1
	Power supply assembly, 220-240 V	RG5-5573-000CN	1
3	Formatter assembly	C4209-60001	1

250-sheet feeder external covers

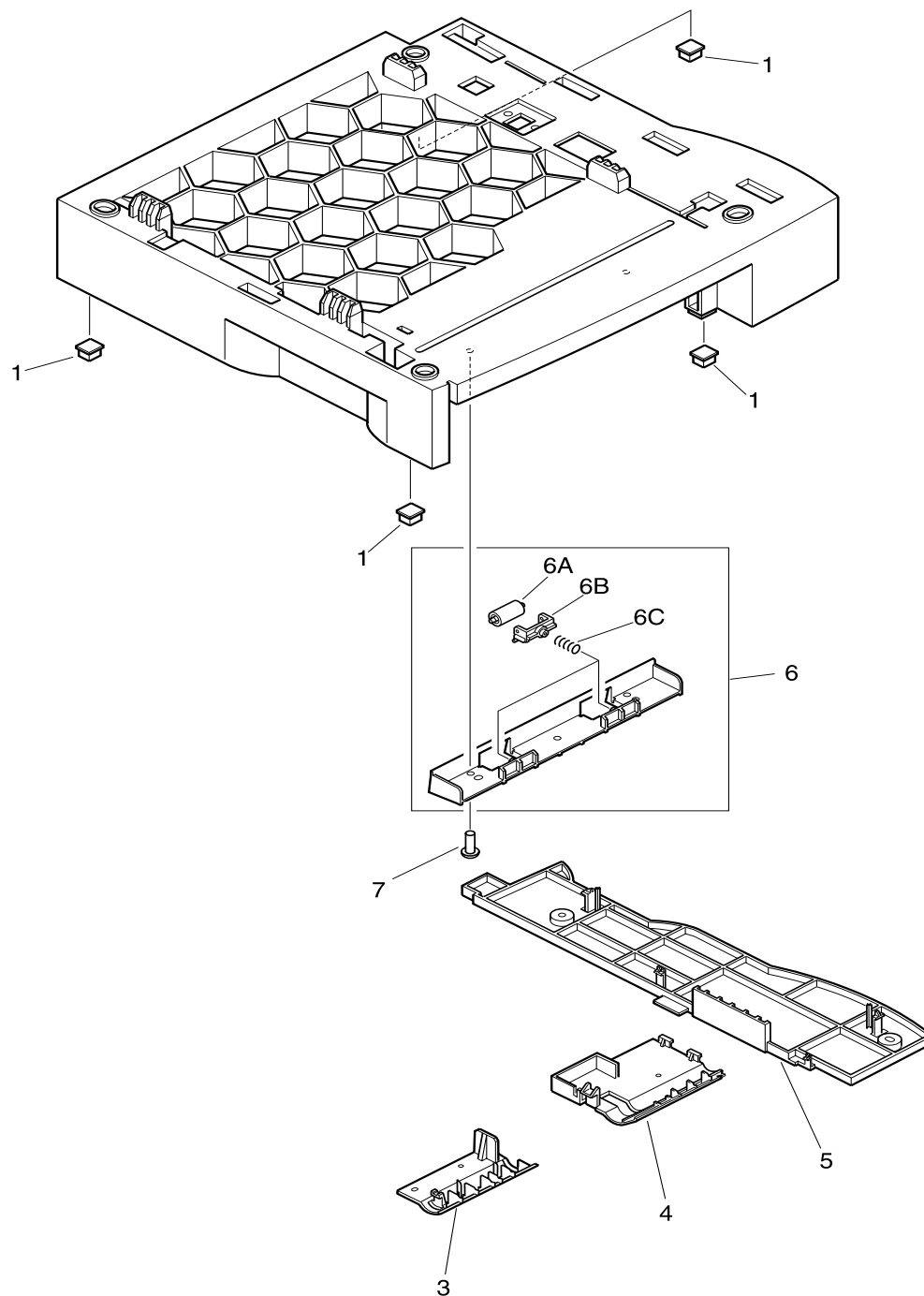


Figure 189. 250-sheet feeder external covers

Table 56. 250-sheet feeder external covers

Ref	Description	Part number	Qty
1	Foot	RB2-2816-000CN	4
3	Cover, lower left	RB2-3489-000CN	1
4	Cover, lower right	RB2-3479-000CN	1
5	Cover, drive	RB2-3480-000CN	1
6	Lower feed roller assembly	RG5-4394-000CN	1
6A	Roller	RB2-3484-000CN	2
6B	Holder, roller	RB2-3485-000CN	2
6C	Spring, compression	RS6-2063-000CN	2
7	Screw, M4 by 8	XA9-0605-000CN	3

Tray 2 and 250-sheet feeder cassette

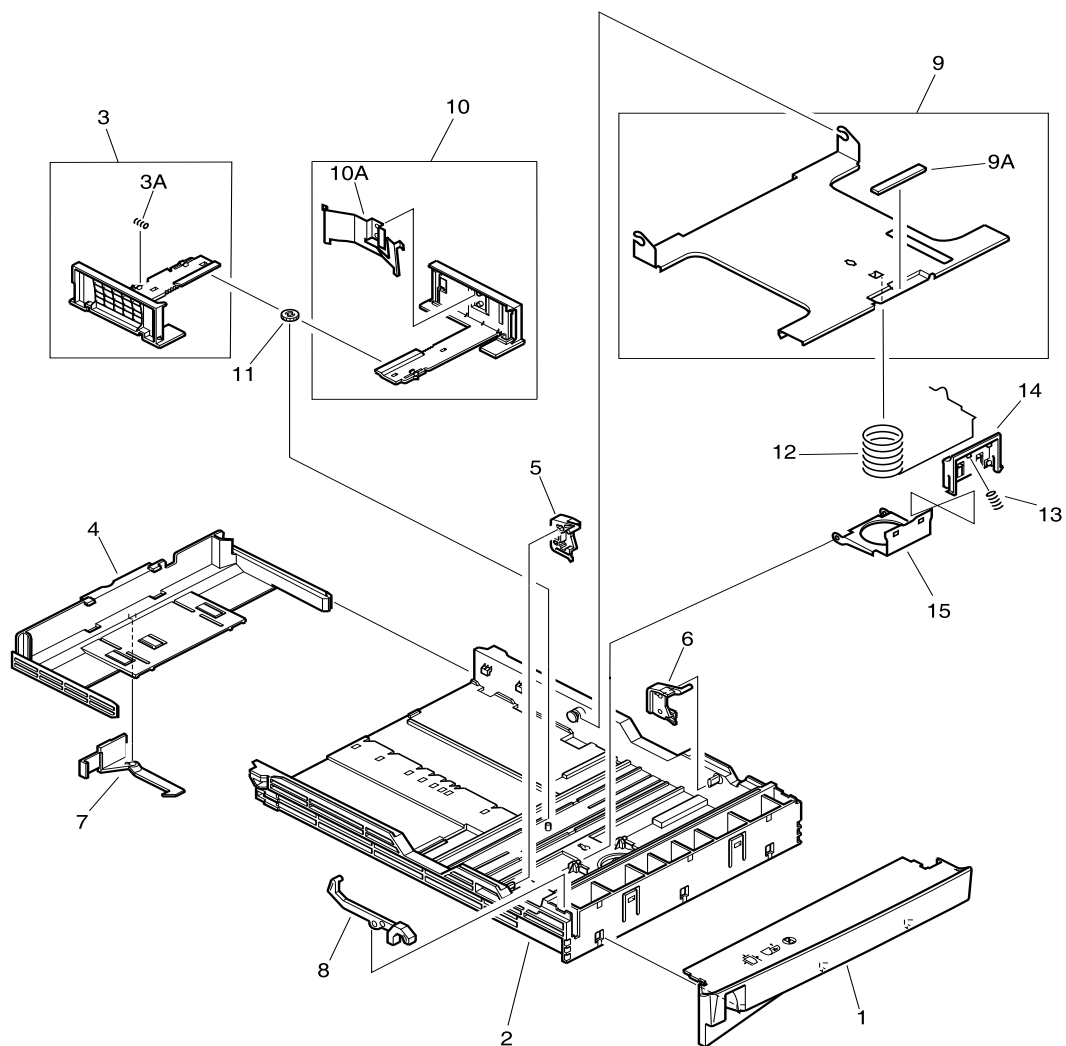


Figure 190. Tray 2 and 250-sheet feeder cassette

Table 57. Tray 2 and 250-sheet feeder cassette

Ref	Description	Part number	Qty
	Cassette assembly (250-sheet)	RG5-5580-000CN	1
1	Cover, front	RB2-3000-000CN	1
2	Body, cassette	RB2-3001-040CN	1
3	Left side plate assembly	RG5-4159-000CN	1
3A	Spring, compression	RS6-2035-000CN	1
4	Plate, end	RB2-6349-000CN	1
5	Arm, release, left	RB2-3004-000CN	1
6	Arm, release, right	RB2-3005-000CN	1
7	Arm, lock	RB2-3009-000CN	1
8	Arm, paper level	RB2-3010-000CN	1
9	Plate, paper lifting	RF5-2599-000CN	1
9A	Sheet, separation	RB2-3007-000CN	1
10	Right side plate assembly	RF5-2606-020CN	1
10A	Spring, leaf	RB2-3012-000CN	1
11	Gear, 10T	RS6-0440-000CN	1
12	Spring, compression	RS6-2020-000CN	1
13	Spring, compression	RS6-2021-000CN	1
14	Pad, separation	RB2-3008-000CN	1
15	Holder, separation pad	RB2-3013-000CN	1

250-sheet feeder internal components

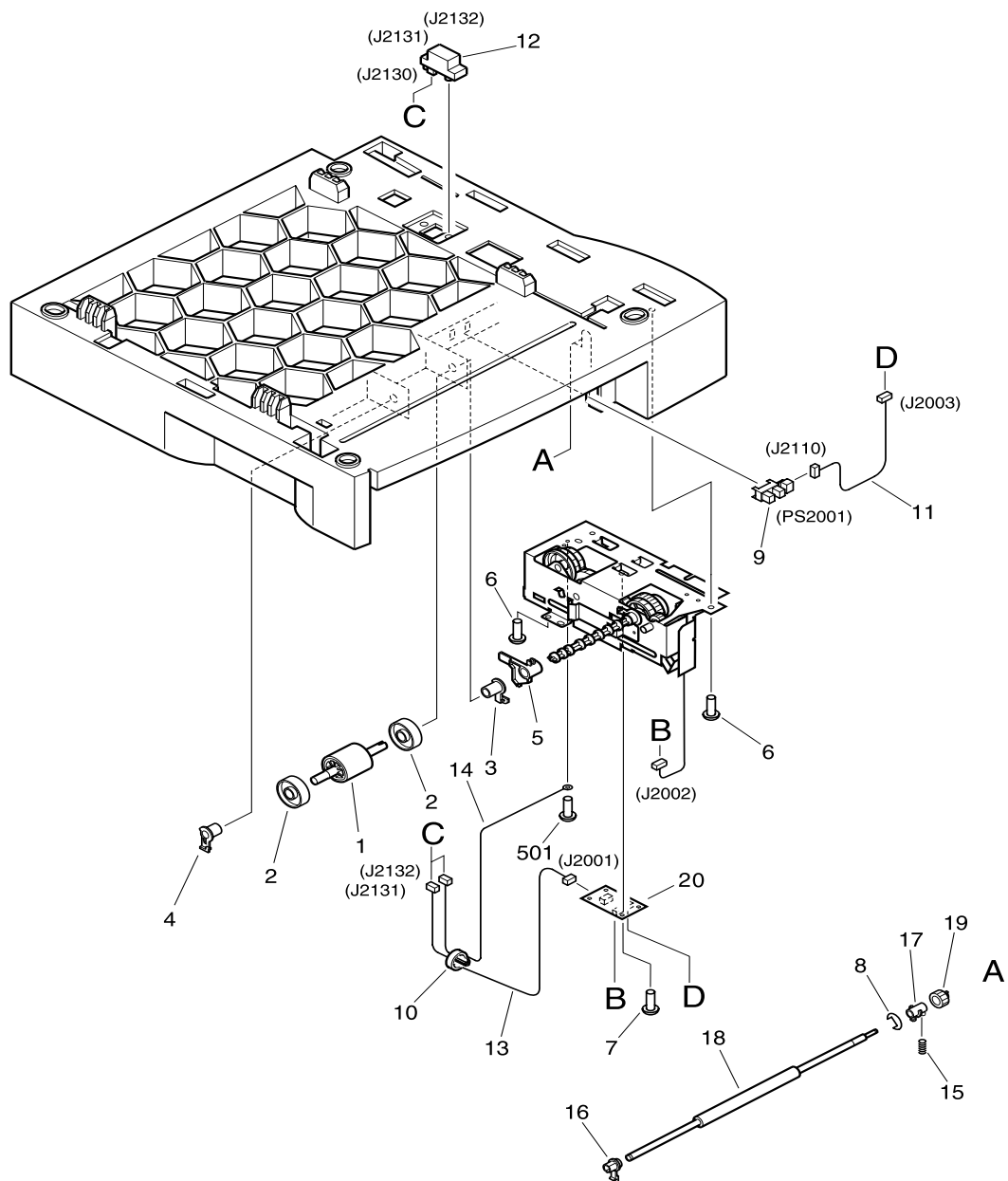


Figure 191. 250-sheet feeder internal components

Table 58. 250-sheet feeder internal components

Ref	Description	Part number	Qty
1	Roller, paper pick-up	RB2-2891-000CN	1
2	Roller	RB2-2892-000CN	2
3	Bushing, right	RB2-2895-000CN	1
4	Bushing, left	RB2-2896-000CN	1
5	Lever, sensor	RB2-3474-000CN	1
6	Screw, M4 by 8	XA9-0605-000CN	3
7	Screw, w/washer M3 by 8	XA9-0924-000CN	2
8	E-ring	XD9-0136-000CN	1
9	Photo-interrupter TLP1242	WG8-5382-000CN	1
11	Sensor cable	RG5-4278-000CN	1
12	Connector, 6P	VS1-6174-006CN	1
13	Relay cable	RG5-4280-000CN	1
14	FG cable	RG5-4281-000CN	1
15	Spring, compression	RS6-2064-000CN	1
16	Bushing, left	RB2-6470-000CN	1
17	Bushing, right	RB2-3487-000CN	1
18	Roller, feed	RB2-3490-000CN	1
19	Gear, 15T	RS6-0501-000CN	1
20	Drive PCB, paper feeder	RG5-4277-000CN	1
501	Screw, w/washer M4 by 6	XB2-7400-607CN	1

250-sheet feeder drive assembly

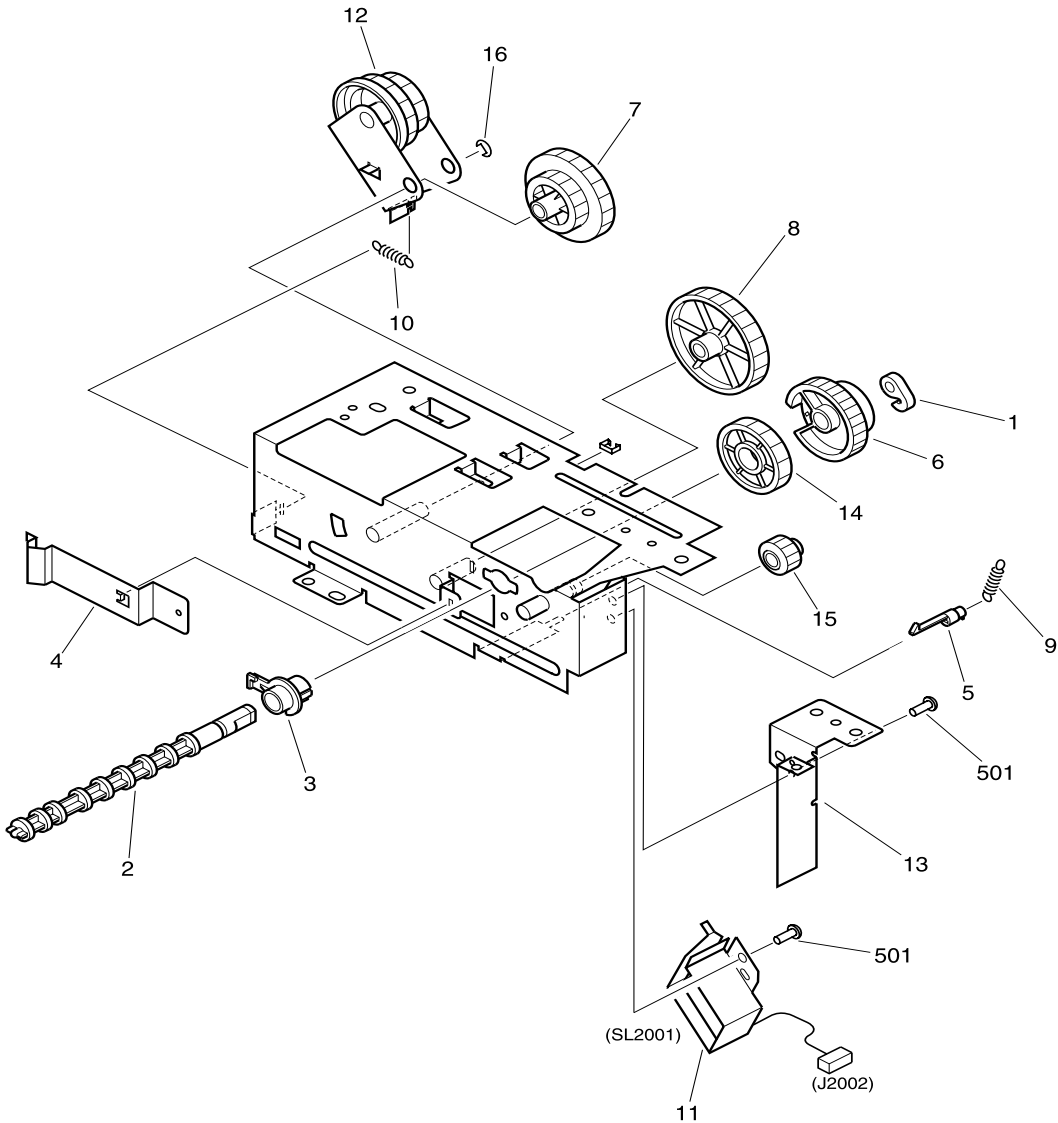


Figure 192. 250-sheet feeder drive assembly

Table 59. 250-sheet feeder drive assembly

Ref	Description	Part number	Qty
	Paper feeder drive assembly	RG5-4391-040CN	1
1	Collar, spring	RB1-2190-000CN	1
2	Shaft, drive	RB2-2893-000CN	1
3	Bushing	RB2-3475-000CN	1
4	Spring, leaf	RB2-3478-000CN	1
5	Holder, spring	RB1-6133-000CN	1
6	Gear, 27T	RS6-0495-000CN	1
7	Gear, 39T/34T	RS6-1497-000CN	1
8	Gear, 45T	RS6-0498-000CN	1
9	Spring, tension	RS6-2061-000CN	1
10	Spring, tension	RS6-2062-000CN	1
11	Solenoid	RH7-5213-000CN	1
12	Swing gear assembly	RF5-2755-000CN	1
13	Plate	RB2-3481-020CN	1
14	Gear, 39T	RS6-0499-000CN	1
15	Gear, 17T	RS6-0500-000CN	1
16	E-ring	XD9-0136-000CN	1
501	Screw, TP, M4 by 6	XB6-7400-609CN	3

250-sheet feeder PCB assembly location

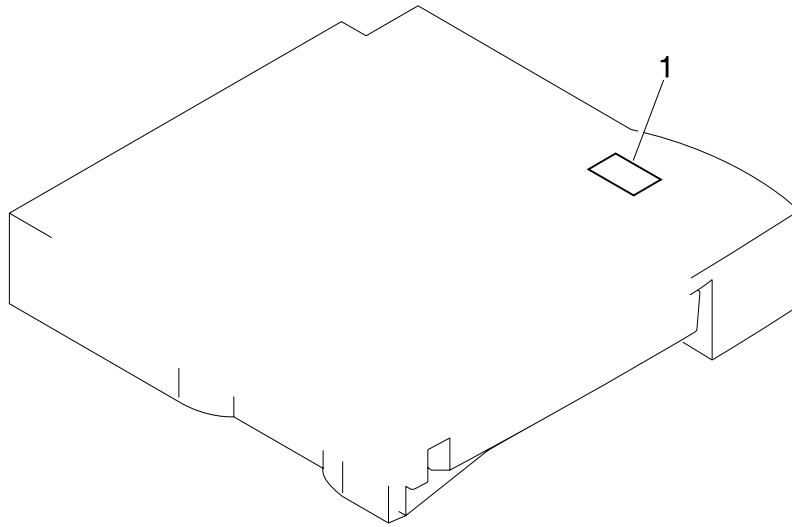


Figure 193. 250-sheet feeder PCB assembly location

Table 60. 250-sheet feeder PCB assembly location

Ref	Description	Part number	Qty
1	Paper feeder driver PCB assembly	RG5-4277-000CN	1

500-sheet feeder external covers

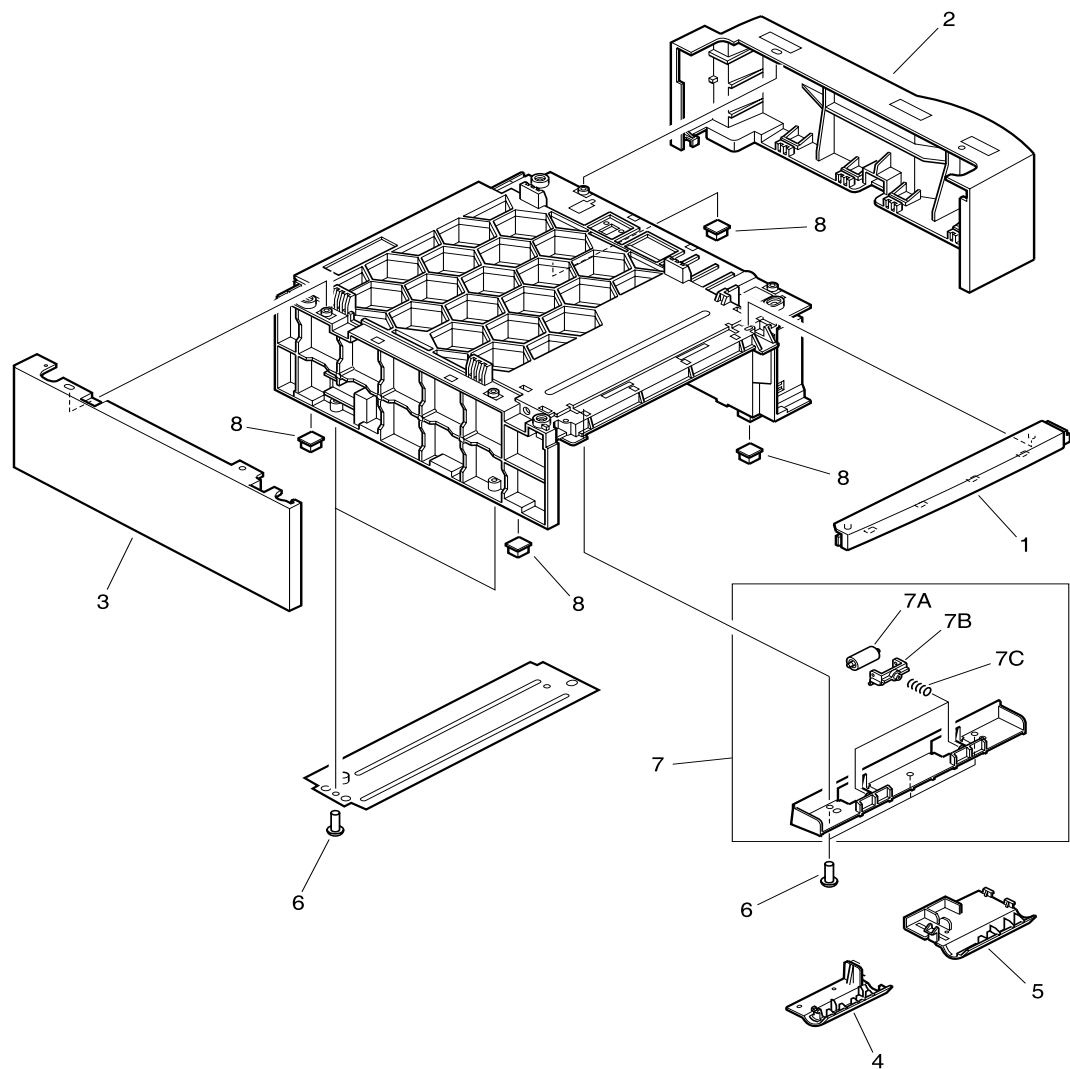


Figure 194. 500-sheet feeder external covers

Table 61. 500-sheet feeder external covers

Ref	Description	Part number	Qty
1	Cover, front	RB2-6454-000CN	1
2	Cover, right	RB2-6456-000CN	1
3	Cover, left	RB26457-000CN	1
4	Cover, lower left	RB2-3489-000CN	1
5	Cover, sensor	RB2-6453-000CN	1
6	Screw, M4 by 8	XA9-0605-000CN	7
7	Lower feed roller assembly	RG5-4394-020CN	1
7A	Roller	RB2-3484-020CN	2
7B	Holder, roller	RB2-3485-000CN	2
7C	Spring, compression	RB2-2063-000CN	2
8	Foot	RB2-6297-000CN	4

500-sheet feeder cassette

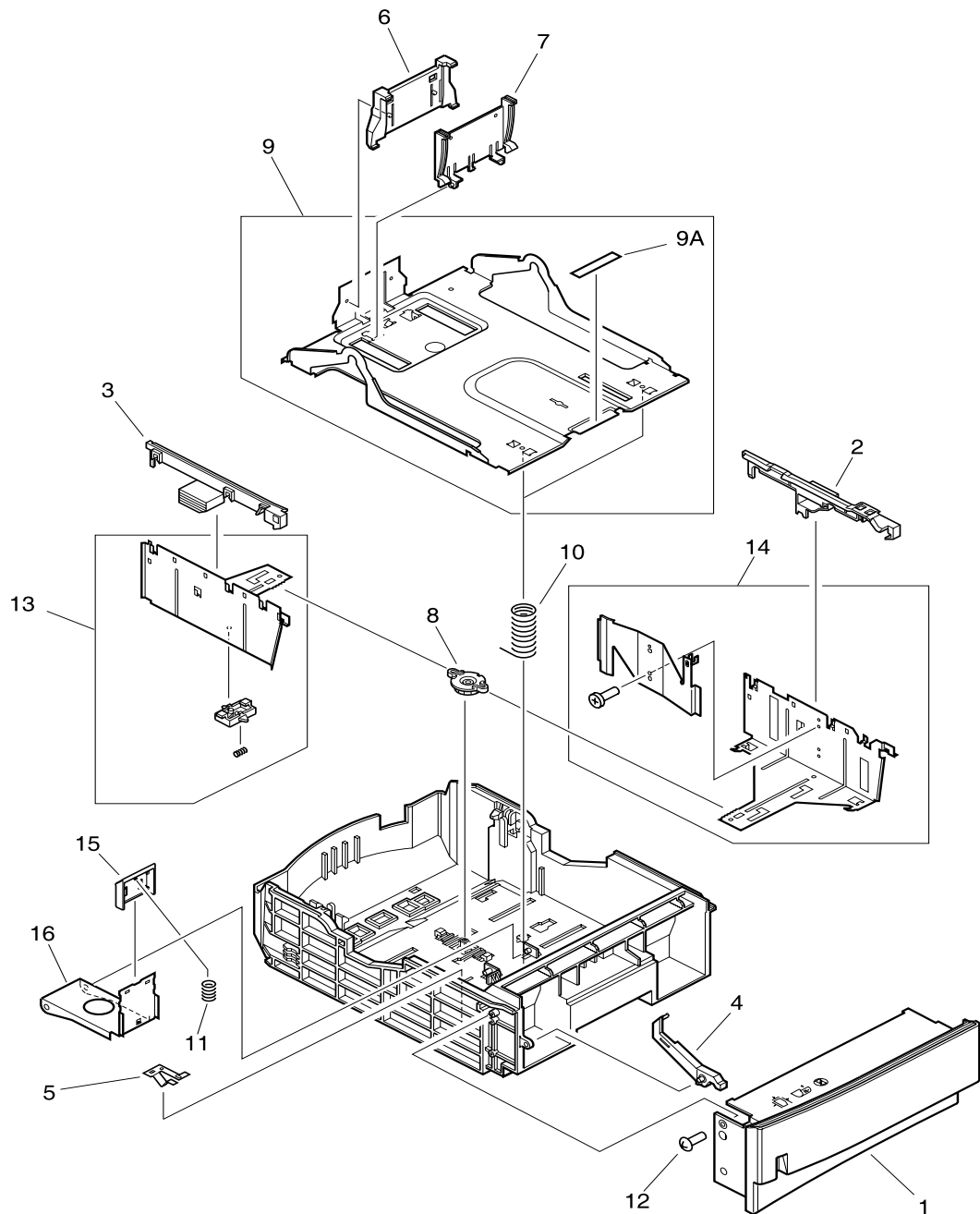


Figure 195. 500-sheet feeder cassette

Table 62. 500-sheet feeder cassette

Ref	Description	Part number	Qty
	Cassette	RG5-5623-000CN	1
1	Cover, front	RB2-6468-000CN	1
2	Cover, right edge	RB2-6463-000CN	1
3	Cover, left edge	RB2-6464-000CN	1
4	Arm, paper level	RB2-6465-000CN	1
5	Plate, grounding	RB2-6466-000CN	1
6	Cover, rear edge	RB2-6467-000CN	1
7	Plate, end	RB2-6469-000CN	1
8	Gear, 20T	RB2-6471-000CN	1
9	Plate, paper lifting	RF5-3303-000CN	1
9A	Sheet, separation	RB2,3007-000CN	1
10	Spring, compression	RS6-2395-000CN	2
11	Spring, compression	RS6-2396-000CN	1
12	Screw, M4 by 10	XA9-0606-000CN	2
13	Left side, plate assembly	RG5-5626-000CN	1
14	right side, plate assembly	RG5-5627-000CN	1
15	Pad, separation	RB2-6474-000CN	1
16	Arm, pad	RB2-6459-000CN	1

500-sheet feeder internal components

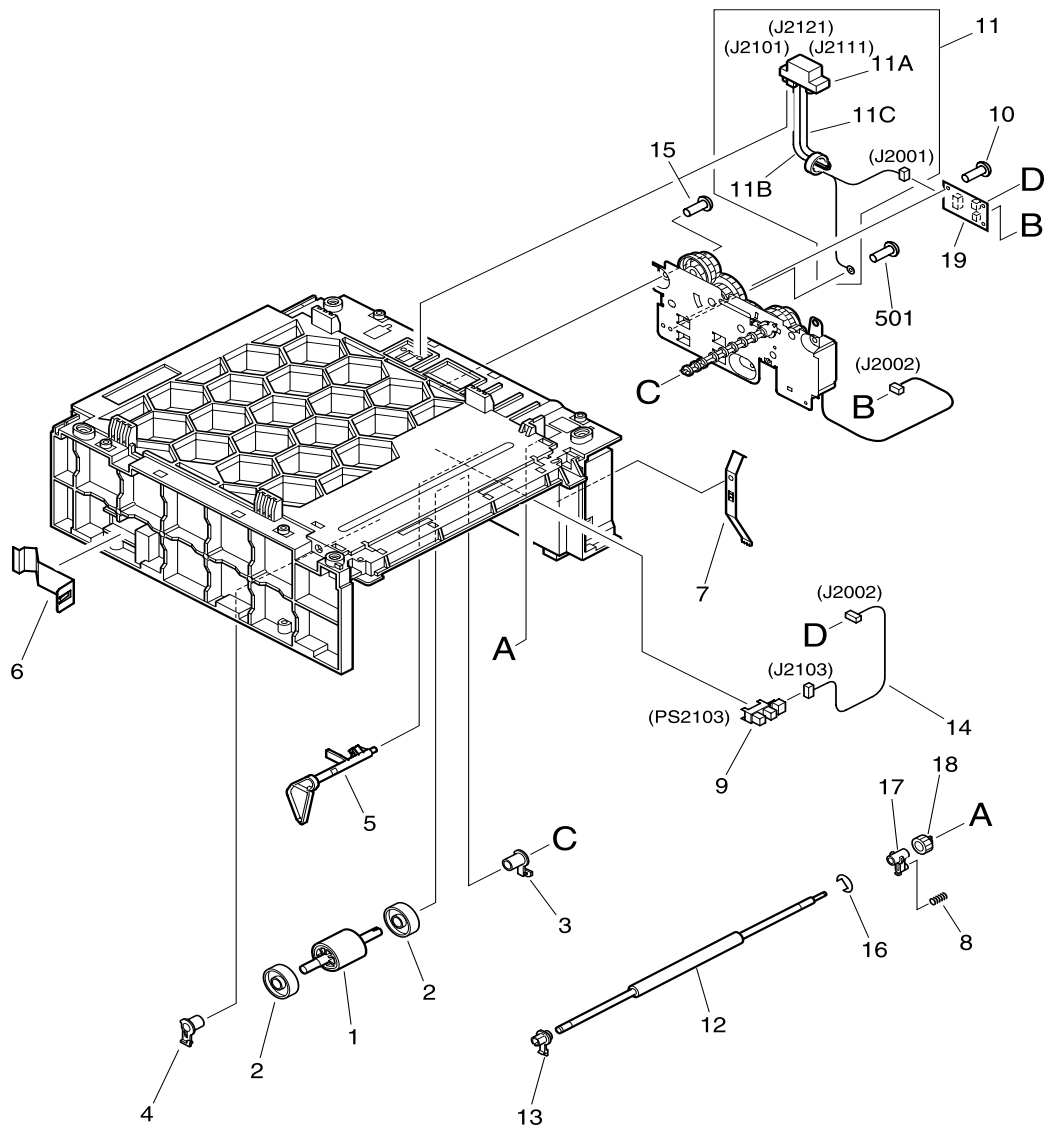


Figure 196. 500-sheet feeder internal components

Table 63. 500-sheet feeder internal components

Ref	Description	Part number	Qty
1	Roller, paper pick-up	RB2-6304-000CN	1
2	Roller	RB2-2892-000CN	2
3	Bushing, right	RB2-2895-000CN	1
4	Bushing, left	RB2-2896-000CN	1
5	Arm, sensor	RB2-6448-000CN	1
6	Spring, leaf	RB2-6450-000CN	1
7	Spring, leaf	RB2-6451-000CN	1
8	Spring, compression	RS6-2064-000CN	1
9	Photo-interrupter GP1SQ73P	WG8-5364-000CN	1
10	Screw w/washer M3 by 8	XA9-1226-000CN	1
11	Paper feeder cable	RG5-4279-000CN	1
11A	Connector 6P	VS1-6174-006CN	1
11B	Relay cable	RG5-4280-000CN	1
11C	FG cable	RG5-4281-000CN	1
12	Roller, feed	RB2-6476-000CN	1
13	Bushing	RB2-6447-000CN	1
14	Sensor Cable	RG5-5631-000CN	1
15	Screw, M4 by 8	XA9-0605-000CN	3
16	E-ring	XD9-0136-000CN	1
17	Bushing	RB2-6470-000CN	1
18	Gear, 15T	RS6-0501-000CN	1
19	Drive PCB, paper feeder	RG5-5630-000CN	1
501	Screw, w/washer, M4 by 6	XB2-7400-607CN	1

500-sheet feeder drive assembly

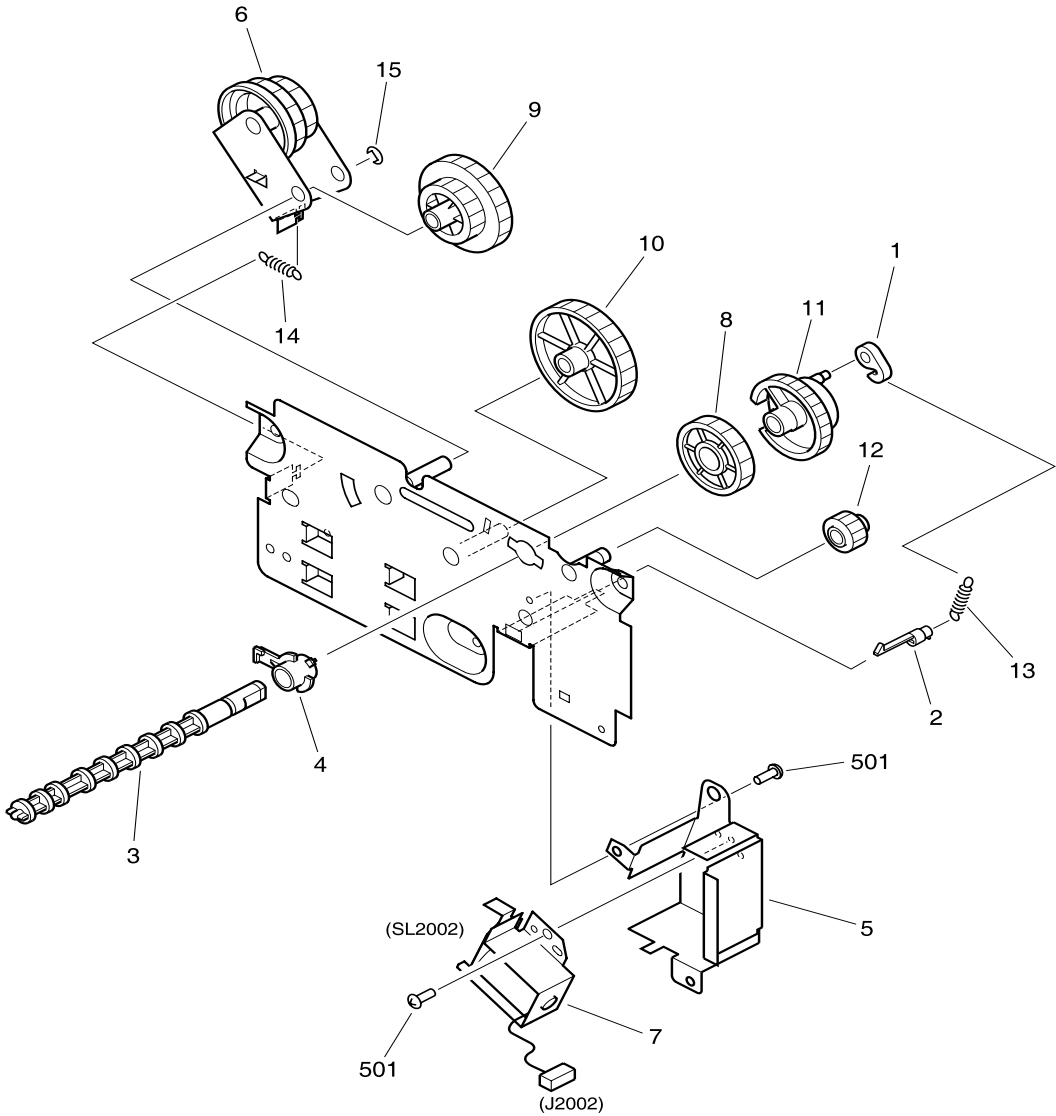


Figure 197. 500-sheet feeder drive assembly

Table 64. 500-sheet feeder drive assembly

Ref	Description	Part number	Qty
	Paper feeder drive assembly	RG5-5622-000CN	1
1	Collar, spring	RB1-2190-000CN	1
2	Holder, spring	RB1-6133-000CN	1
3	Shaft, drive	RB2-2893-000CN	1
4	Bushing	RB2-6455-000CN	1
5	Plate, solenoid cross member	RB2-6473-000CN	1
6	Gear, 31T/26T	RF5-3304-000CN	1
7	Solenoid	RH7-5276-000CN	1
8	Gear, 39T	RS6-0499-000CN	1
9	Gear, 40T/24T	RS6-0945-000CN	1
10	Gear, 70T	RS6-0946-000CN	1
11	Gear, 34T	RS6-0947-000CN	1
12	Gear, 17T	RS6-0948-000CN	1
13	Spring, tension	RS6-2061-000CN	1
14	Spring, tension	RS6-2397-000CN	1
15	E-ring	XD9-0136-000CN	1
501	Screw, TP, M4 by 8	XB6-7400-809CN	3

500-sheet feeder PCB assembly location

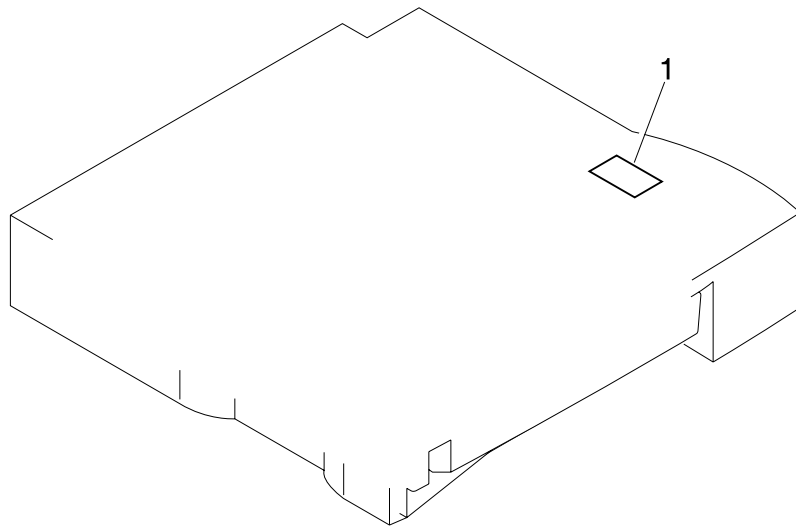


Figure 198. 500-sheet feeder PCB assembly location

Table 65. 500-sheet feeder PCB assembly location

Ref	Description	Part number	Qty
1	Paper feeder driver PCB assembly	RG5-5630-000CN	1

Alphabetical parts list

Table 66. Alphabetical parts list

Description	Part number	Table and page
Arm, drive	RB2-6376-000CN	Table 52 on page 8-255
Arm, lock	RB2-3009-000CN	Table 57 on page 8-265
Arm, pad	RB2-6459-000CN	Table 62 on page 8-275
Arm, paper level	RB2-3010-000CN	Table 57 on page 8-265
Arm, paper level	RB2-6465-000CN	Table 62 on page 8-275
Arm, paper sensor	RB2-6310-000CN	Table 53 on page 8-257
Arm, release, left	RB2-3004-000CN	Table 57 on page 8-265
Arm, release, right	RB2-3005-000CN	Table 57 on page 8-265
Arm, roller holder	RB2-6309-000CN	Table 53 on page 8-257
Arm, sensor	RB2-6264-000CN	Table 48 on page 8-247
Arm, sensor	RB2-6448-000CN	Table 63 on page 8-277
Belt, paper feed, 1	RB2-6272-000CN	Table 49 on page 8-249
Belt, paper feed, 2	RB2-6273-000CN	Table 49 on page 8-249
Belt, paper feed, 3	RB2-6270-000CN	Table 49 on page 8-249
Body, cassette	RB2-3001-040CN	Table 57 on page 8-265
Bushing	RB2-2850-000CN	Table 48 on page 8-247
Bushing	RB2-2936-000CN	Table 52 on page 8-255
Bushing	RB2-2897-000CN	Table 53 on page 8-257
Bushing	RB2-3081-000CN	Table 53 on page 8-257
Bushing	RB2-6303-000CN	Table 53 on page 8-257
Bushing	RB2-2973-000CN	Table 54 on page 8-259
Bushing	RB2-6359-000CN	Table 54 on page 8-259
Bushing	RB2-6370-000CN	Table 54 on page 8-259
Bushing	RB2-6371-000CN	Table 54 on page 8-259
Bushing	RB2-6470-000CN	Table 58 on page 8-267
Bushing	RB2-3475-000CN	Table 59 on page 8-269
Bushing	RB2-6447-000CN	Table 63 on page 8-277
Bushing	RB2-6470-000CN	Table 63 on page 8-277
Bushing	RB2-6455-000CN	Table 64 on page 8-279
Bushing, left	RB2-3043-000CN	Table 48 on page 8-247
Bushing, left	RB2-2896-000CN	Table 53 on page 8-257
Bushing, left	RB2-2896-000CN	Table 58 on page 8-267
Bushing, left	RB2-3487-000CN	Table 58 on page 8-267
Bushing, left	RB2-2896-000CN	Table 63 on page 8-277
Bushing, right	RB2-3044-000CN	Table 48 on page 8-247
Bushing, right	RB2-2895-000CN	Table 53 on page 8-257

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Bushing, right	RB2-2895-000CN	Table 58 on page 8-267
Bushing, right	RB2-2895-000CN	Table 63 on page 8-277
Bushing, transfer, right	RB2-2926-020CN	Table 48 on page 8-247
Cable, flat	RH2-5421-000CN	Table 51 on page 8-253
Cassette	RG5-5623-000CN	Table 62 on page 8-275
Cassette assembly (250-sheet)	RG5-5580-000CN	Table 57 on page 8-265
Cassette pick-up assembly	RG5-5551-000CN	Table 53 on page 8-257
Cassette pick-up gear assembly	RG5-4156-000CN	Table 48 on page 8-247
Collar, spring	RB1-2190-000CN	Table 59 on page 8-269
Collar, spring	RB1-2190-000CN	Table 64 on page 8-279
Connector 6P	VS1-6174-006CN	Table 63 on page 8-277
Connector, 6P	VS1-6174-006CN	Table 58 on page 8-267
Coupling assembly	RG9-1473-000CN	Table 52 on page 8-255
Cover assembly, tray 1	RG5-4121-000CN	Table 44 on page 8-239
Cover rear	RG5-5546-000CN	Table 44 on page 8-239
Cover, cartridge	RB2-2856-000CN	Table 45 on page 8-241
Cover, drive	RB2-3480-000CN	Table 56 on page 8-263
Cover, front	RB2-3000-000CN	Table 57 on page 8-265
Cover, front	RB2-6454-000CN	Table 61 on page 8-273
Cover, front	RB2-6468-000CN	Table 62 on page 8-275
Cover, left	RB2-6457-000CN	Table 61 on page 8-273
Cover, left edge	RB2-6464-000CN	Table 62 on page 8-275
Cover, lower left	RB2-3489-000CN	Table 56 on page 8-263
Cover, lower right	RB2-3479-000CN	Table 56 on page 8-263
Cover, lower, left	RB2-3489-000CN	Table 61 on page 8-273
Cover, rear edge	RB2-6467-000CN	Table 62 on page 8-275
Cover, right	RB2-6456-000CN	Table 61 on page 8-273
Cover, right edge	RB2-6463-000CN	Table 62 on page 8-275
Cover, sensor	RB2-6453-000CN	Table 61 on page 8-273
Cover, top	RB2-6280-000CN	Table 45 on page 8-241
Damper	RB2-6248-000CN	Table 48 on page 8-247
DIMM cover assembly	RG5-5545-000CN	Table 44 on page 8-239
Duplex feed guide assembly	RG5-5554-000CN	Table 50 on page 8-251
Duplex solenoid assembly	RG5-5552-000CN	Table 50 on page 8-251
Eliminator, static charge	RB2-6261-000CN	Table 46 on page 8-243
Engine control assembly	RG5-5566-000CN	Table 47 on page 8-245
E-ring	XD9-0135-000CN	Table 53 on page 8-257
E-ring	XD9-0136-000CN	Table 58 on page 8-267
E-ring	XD9-0136-000CN	Table 59 on page 8-269
E-ring	XD9-0136-000CN	Table 63 on page 8-277

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
E-ring	XD9-0136-000CN	Table 64 on page 8-279
Expansion, tray 1	RB2-3036-000CN	Table 44 on page 8-239
Expansion, tray 1	RB2-3037-000CN	Table 44 on page 8-239
Fan	RH7-1463-000CN	Table 46 on page 8-243
FD delivery roller assembly	RG5-5541-000CN	Table 48 on page 8-247
FD delivery roller assembly	RG5-5542-000CN	Table 48 on page 8-247
Feed roller assembly	RG5-5555-000CN	Table 50 on page 8-251
FG cable	RG5-4281-000CN	Table 58 on page 8-267
FG cable	RG5-4281-000CN	Table 63 on page 8-277
Flange, spring	RB2-2950-000CN	Table 52 on page 8-255
Flat cable, I/F	RH2-5423-000CN	Table 46 on page 8-243
Flat cable, laser	RH2-5427-000CN	Table 46 on page 8-243
Flat cable, reverse motor	RH2-5425-000CN	Table 47 on page 8-245
Foot	RB2-2816-000CN	Table 56 on page 8-263
Foot, rubber	RB2-6297-000CN	Table 48 on page 8-247
Foot, rubber	RB2-6297-000CN	Table 61 on page 8-273
Formatter PCB	C4209-60001	Table 47 on page 8-245
Frame, feeder	RB2-3471-000CN	Table 56 on page 8-263
Fuse, 125 V, 15A, 100 to 127 V	WD1-0268-000CN	Table 51 on page 8-253
Fuse, 250 V, 8 A, 220 to 240 V	RH3-8006-000CN	Table 51 on page 8-253
Fuser assembly 110 V	RG5-5559-000CN	Table 54 on page 8-259
Fuser assembly 220 V	RG5-5569-000CN	Table 54 on page 8-259
Fuser film assembly 110 V	RG5-5560-000CN	Table 54 on page 8-259
Fuser film assembly 220 V	RG5-5570-000CN	Table 54 on page 8-259
Gear assembly	RG5-5577-000CN	Table 49 on page 8-249
Gear assembly	RG5-5577-000CN	Table 49 on page 8-249
Gear, 10T	RS6-0440-000CN	Table 57 on page 8-265
Gear, 14T	RS6-0445-000CN	Table 48 on page 8-247
Gear, 14T	RS6-0921-000CN	Table 54 on page 8-259
Gear, 15T	RS6-0441-000CN	Table 48 on page 8-247
Gear, 15T	RS6-0904-000CN	Table 53 on page 8-257
Gear, 15T	RS6-0906-000CN	Table 53 on page 8-257
Gear, 15T	RS6-0501-000CN	Table 58 on page 8-267
Gear, 15T	RS6-0501-000CN	Table 63 on page 8-277
Gear, 16T	RS6-0905-000CN	Table 53 on page 8-257
Gear, 16T	RS6-0922-000CN	Table 54 on page 8-259
Gear, 17T	RS6-0924-000CN	Table 48 on page 8-247
Gear, 17T	RS6-0913-000CN	Table 52 on page 8-255
Gear, 17T	RS6-0500-000CN	Table 59 on page 8-269
Gear, 17T	RS6-0948-000CN	Table 64 on page 8-279

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Gear, 17T/68T	RS6-0448-000CN	Table 52 on page 8-255
Gear, 201T	RS6-0446-000CN	Table 52 on page 8-255
Gear, 20T	RS6-0464-000CN	Table 49 on page 8-249
Gear, 20T	RB2-6471-000CN	Table 62 on page 8-275
Gear, 24T	RS6-0907-000CN	Table 53 on page 8-257
Gear, 25T/41T	RS6-0449-000CN	Table 52 on page 8-255
Gear, 26T	RB2-3040-000CN	Table 48 on page 8-247
Gear, 26T	RS6-0451-000CN	Table 52 on page 8-255
Gear, 27T	RS6-0923-000CN	Table 54 on page 8-259
Gear, 27T	RS6-0495-000CN	Table 59 on page 8-269
Gear, 28T/88T	RS6-0916-000CN	Table 52 on page 8-255
Gear, 31T	RS6-0450-000CN	Table 52 on page 8-255
Gear, 31T/26T	RF5-3304-000CN	Table 64 on page 8-279
Gear, 34T	RS6-0947-000CN	Table 64 on page 8-279
Gear, 39T	RS6-0915-000CN	Table 52 on page 8-255
Gear, 39T	RS6-0499-000CN	Table 59 on page 8-269
Gear, 39T	RS6-0499-000CN	Table 64 on page 8-279
Gear, 39T/34T	RS6-0497-000CN	Table 59 on page 8-269
Gear, 40T/24T	RS6-0945-000CN	Table 64 on page 8-279
Gear, 42T	RS6-0911-000CN	Table 52 on page 8-255
Gear, 45T	RS6-0498-000CN	Table 59 on page 8-269
Gear, 46T/22T	RS6-0914-000CN	Table 52 on page 8-255
Gear, 70T	RS6-0946-000CN	Table 64 on page 8-279
Gear, 75T	RS6-0917-000CN	Table 52 on page 8-255
Gear, 75T/28T	RS6-0918-000CN	Table 52 on page 8-255
Gear, 79T/36T	RS6-0919-000CN	Table 52 on page 8-255
Gear, 91T/28T	RS6-0910-000CN	Table 52 on page 8-255
Gear, 93T/73T	RS6-0912-000CN	Table 52 on page 8-255
Guide	RB2-2944-000CN	Table 52 on page 8-255
Guide, cable	RG5-5568-000CN	Table 49 on page 8-249
Guide, cartridge, left	RB2-2831-000CN	Table 48 on page 8-247
Guide, cartridge, right	RB2-2830-000CN	Table 48 on page 8-247
Guide, delivery, lower	RB2-6350-000CN	Table 54 on page 8-259
Guide, delivery, upper	RG5-5561-000CN	Table 54 on page 8-259
Guide, entrance	RB2-6357-000CN	Table 54 on page 8-259
Guide, flat cable	RB2-6247-000CN	Table 46 on page 8-243
Hinge, feed guide	RB2-6249-000CN	Table 50 on page 8-251
Hinge, left	RB2-3041-000CN	Table 49 on page 8-249
Hinge, right	RB2-3042-000CN	Table 49 on page 8-249
Holder, contact	RF5-2609-000CN	Table 54 on page 8-259

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Holder, pin	RB2-2947-000CN	Table 52 on page 8-255
Holder, roller	RB2-3485-000CN	Table 56 on page 8-263
Holder, roller	RB2-3485-000CN	Table 61 on page 8-273
Holder, sensor lever	RF5-3279-000CN	Table 46 on page 8-243
Holder, separation pad	RB2-3013-000CN	Table 57 on page 8-265
Holder, spring	RB1-6133-000CN	Table 59 on page 8-269
Holder, spring	RB1-6133-000CN	Table 64 on page 8-279
Inlet cable unit	RG5-5565-000CN	Table 46 on page 8-243
Laser/scanner assembly	RG5-5591-000CN	Table 46 on page 8-243
Left cover assembly	RG5-5549-000CN	Table 44 on page 8-239
Left side plate assembly	RG5-4159-000CN	Table 57 on page 8-265
Left side, plate assembly	RG5-5626-000CN	Table 62 on page 8-275
Lever, delivery	RB2-6351-000CN	Table 54 on page 8-259
Lever, drive release	RB9-0641-000CN	Table 52 on page 8-255
Lever, jam clearing	RB2-6251-000CN	Table 48 on page 8-247
Lever, sensor	RB2-2836-000CN	Table 46 on page 8-243
Lever, sensor	RB2-3474-000CN	Table 58 on page 8-267
Lower feed roller assembly	RG5-4394-000CN	Table 56 on page 8-263
Lower feed roller assembly	RG5-4394-020CN	Table 61 on page 8-273
Microswitch	RH7-6051-000CN	Table 46 on page 8-243
Motor, 23 V, dc	RH7-1461-000CN	Table 52 on page 8-255
Motor, dc, 5 to 76W	RH7-1458-000CN	Table 46 on page 8-243
Mount, fan	RB2-6255-000CN	Table 46 on page 8-243
MP pick-up assembly	RG5-4128-000CN	Table 48 on page 8-247
Pad, separation	RF5-3272-000CN	Table 49 on page 8-249
Pad, separation	RB2-3008-000CN	Table 57 on page 8-265
Pad, separation	RB2-6474-000CN	Table 62 on page 8-275
Paper feeder cable	RG5-4279-000CN	Table 63 on page 8-277
Paper feeder drive assembly	RG5-4391-000CN	Table 59 on page 8-269
Paper feeder drive assembly	RG5-5622-000CN	Table 64 on page 8-279
Paper feeder drive PCB assembly	RG5-4277-000CN	Table 58 on page 8-267
Paper feeder drive PCB assembly	RG5-4277-000CN	Table 60 on page 8-271
Paper feeder driver PCB assembly	RG5-5630-000CN	Table 65 on page 8-281
Paper-feed cable	RG5-5598-000CN	Table 46 on page 8-243
Photo-interrupter GP1SQ73P	WG8-5364-000CN	Table 63 on page 8-277
Photo-interrupter, GP1SQ73P	WG8-5364-000CN	Table 53 on page 8-257
Photo-interrupter, TLP1242	WG8-5382-000CN	Table 48 on page 8-247
Photo-interrupter, TLP1242	WG8-5382-000CN	Table 49 on page 8-249
Photo-interrupter, TLP1242	WG8-5382-000CN	Table 54 on page 8-259
Photo-interrupter, TLP1242	WG8-5382-000CN	Table 58 on page 8-267

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Pin	RB2-2943-000CN	Table 52 on page 8-255
Plate	RB2-3481-000CN	Table 59 on page 8-269
Plate, end	RB2-6349-000CN	Table 57 on page 8-265
Plate, end	RB2-6469-000CN	Table 62 on page 8-275
Plate, feeding, left	RB2-3078-000CN	Table 49 on page 8-249
Plate, feeding, right	RB2-3079-000CN	Table 49 on page 8-249
Plate, grounding	RB2-6246-000CN	Table 46 on page 8-243
Plate, grounding	RB2-3080-000CN	Table 49 on page 8-249
Plate, grounding	RB2-6466-000CN	Table 62 on page 8-275
Plate, motor	RB2-6377-000CN	Table 52 on page 8-255
Plate, mount	RB2-2945-000CN	Table 52 on page 8-255
Plate, paper lifting	RF5-2599-000CN	Table 57 on page 8-265
Plate, paper lifting	RF5-3303-000CN	Table 62 on page 8-275
Plate, Pressure	RB2-6358-000CN	Table 54 on page 8-259
Plate, protection	RB2-6252-000CN	Table 46 on page 8-243
Plate, solenoid cross member	RB2-6473-000CN	Table 64 on page 8-279
Plate, spring	RB2-6378-000CN	Table 52 on page 8-255
Position guide assembly	RG5-5553-000CN	Table 50 on page 8-251
Power supply assembly 220 to 240 V	RG5-5573-000CN	Table 51 on page 8-253
Power supply assembly, 100 to 127 V	RG5-5563-000CN	Table 51 on page 8-253
Printer drive assembly	RG5-5562-000CN	Table 52 on page 8-255
Pulley	RB2-6268-000CN	Table 49 on page 8-249
Registration assembly	RG5-5556-000CN	Table 48 on page 8-247
Relay cable	RG5-4280-000CN	Table 58 on page 8-267
Relay cable	RG5-4280-000CN	Table 63 on page 8-277
Reverse guide assembly	RG5-5548-000CN	Table 50 on page 8-251
RFI shield, formatter	C7058-00001	Table 47 on page 8-245
Right side plate assembly	RF5-2606-000CN	Table 57 on page 8-265
right side, plate assembly	RG5-5627-000CN	Table 62 on page 8-275
Rod, jam clearing	RB2-6250-000CN	Table 48 on page 8-247
Roller	RB2-2892-000CN	Table 53 on page 8-257
Roller	RB2-3046-000CN	Table 53 on page 8-257
Roller	RB2-3484-000CN	Table 56 on page 8-263
Roller	RB2-2892-000CN	Table 58 on page 8-267
Roller	RB2-2892-000CN	Table 63 on page 8-277
Roller, delivery	RB2-6372-000CN	Table 54 on page 8-259
Roller, delivery	RB2-6374-000CN	Table 54 on page 8-259
Roller, face-down lower 1	RB2-2849-000CN	Table 48 on page 8-247
Roller, face-down lower 1	RB2-2849-000CN	Table 48 on page 8-247
Roller, face-down lower 2	RB2-6277-000CN	Table 48 on page 8-247

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Roller, face-down, upper	RF5-3275-000CN	Table 48 on page 8-247
Roller, feed	RB2-6302-000CN	Table 53 on page 8-257
Roller, feed	RB2-6318-000CN	Table 53 on page 8-257
Roller, feed	RB2-3490-000CN	Table 58 on page 8-267
Roller, feed	RB2-6476-000CN	Table 63 on page 8-277
Roller, feed	RB2-6476-000CN	Table 63 on page 8-277
Roller, paper pick-up	RB2-2891-000CN	Table 53 on page 8-257
Roller, paper pick-up	RB2-6304-000CN	Table 53 on page 8-257
Roller, paper pick-up	RB2-6304-000CN	Table 63 on page 8-277
Roller, pick-up	RB2-2900-000CN	Table 48 on page 8-247
Roller, pressure	RB2-6368-000CN	Table 54 on page 8-259
Screw, M3 by 6	XA9-0904-000CN	Table 52 on page 8-255
Screw, M4 by 10	XA9-0606-000CN	Table 46 on page 8-243
Screw, M4 by 8	XA9-0605-000CN	Table 56 on page 8-263
Screw, M4 by 8	XA9-0605-000CN	Table 58 on page 8-267
Screw, M4 by 8	XA9-0605-000CN	Table 61 on page 8-273
Screw, M4 by 8	XA9-0605-000CN	Table 63 on page 8-277
Screw, machine, truss head, M3 by 6	XB1-2300-605CN	Table 52 on page 8-255
Screw, RS, M3 by 6	XA9-0686-000CN	Table 50 on page 8-251
Screw, TP, M3 by 4	XB6-7300-407CN	Table 46 on page 8-243
Screw, TP, M3 by 6	XA9-1223-000CN	Table 47 on page 8-245
Screw, TP, M3 by 6	XA9-1223-000CN	Table 52 on page 8-255
Screw, TP, M4 by 12	XA9-1273-000CN	Table 46 on page 8-243
Screw, TP, M4 by 6	XB6-7400-609CN	Table 59 on page 8-269
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 44 on page 8-239
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 45 on page 8-241
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 46 on page 8-243
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 48 on page 8-247
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 49 on page 8-249
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 50 on page 8-251
Screw, TP, truss head M4 by 20	XB4-740-007CN	Table 45 on page 8-241
Screw, TP, truss head M4 by 8	XB4-7400-809CN	Table 53 on page 8-257
Screw, TP, truss head, M3 by 8	XB6-7400-809CN	Table 64 on page 8-279
Screw, w/washer M3 by 8	XA9-0924-000CN	Table 58 on page 8-267
Screw, w/washer, M3 by 6	XB2-7300-607CN	Table 46 on page 8-243
Screw, w/washer, M3 by 6	XB2-7300-607CN	Table 50 on page 8-251
Screw, w/washer, M3 by 8	XA9-1226-000CN	Table 51 on page 8-253
Screw, w/washer, M3 by 8	XA9-1226-000CN	Table 54 on page 8-259
Screw, w/washer, M3 by 8	XA9-1226-000CN	Table 63 on page 8-277
Screw, w/washer, M4 by 12	XA9-1206-000CN	Table 50 on page 8-251

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Screw, w/washer, M4 by 6	XB2-7400-607CN	Table 58 on page 8-267
Screw, w/washer, M4 by 6	XB4-7400-607CN	Table 63 on page 8-277
Screw, with star washer, M3 by 7	XB2-7300-407CN	Table 52 on page 8-255
Sensor cable	RG5-5583-000CN	Table 53 on page 8-257
Sensor cable	RG5-4278-000CN	Table 58 on page 8-267
Sensor Cable	RG5-5631-000CN	Table 63 on page 8-277
Shaft, coupling	RB2-2935-000CN	Table 52 on page 8-255
Shaft, drive	RB2-3073-000CN	Table 49 on page 8-249
Shaft, drive	RB2-2893-000CN	Table 53 on page 8-257
Shaft, drive	RB9-0681-000CN	Table 53 on page 8-257
Shaft, drive	RB2-2893-000CN	Table 64 on page 8-279
Shaft, drive, front	RB2-6269-000CN	Table 49 on page 8-249
Shaft, drive, rear	RB2-6274-000CN	Table 49 on page 8-249
Shaft, gear	RB2-6320-000CN	Table 53 on page 8-257
Sheet, separation	RB2-3007-000CN	Table 57 on page 8-265
Sheet, separation	RB2-3007-000CN	Table 62 on page 8-275
Solenoid	RH7-5270-000CN	Table 46 on page 8-243
Solenoid	RH7-5273-000CN	Table 46 on page 8-243
Solenoid	RH7-5213-000CN	Table 59 on page 8-269
Solenoid	RH7-5276-000CN	Table 64 on page 8-279
Spring, compression	RB2-2832-000CN	Table 48 on page 8-247
Spring, compression	RS6-2022-000CN	Table 48 on page 8-247
Spring, compression	RS6-2375-000CN	Table 48 on page 8-247
Spring, compression	RB2-6262-000CN	Table 50 on page 8-251
Spring, compression	RB2-6263-000CN	Table 50 on page 8-251
Spring, compression	RB2-6265-000CN	Table 50 on page 8-251
Spring, compression	RB2-6271-000CN	Table 50 on page 8-251
Spring, compression	RS6-2031-000CN	Table 52 on page 8-255
Spring, compression	RS6-2379-000CN	Table 52 on page 8-255
Spring, compression	RB2-2978-000CN	Table 54 on page 8-259
Spring, compression	RS6-2378-000CN	Table 54 on page 8-259
Spring, compression	RS6-2063-000CN	Table 56 on page 8-263
Spring, compression	RS6-2020-000CN	Table 57 on page 8-265
Spring, compression	RS6-2021-000CN	Table 57 on page 8-265
Spring, compression	RS6-2064-000CN	Table 58 on page 8-267
Spring, compression	RS6-2063-000CN	Table 61 on page 8-273
Spring, compression	RS6-2395-000CN	Table 62 on page 8-275
Spring, compression	RS6-2396-000CN	Table 62 on page 8-275
Spring, compression	RS6-2064-000CN	Table 63 on page 8-277
Spring, leaf	RB2-6266-000CN	Table 49 on page 8-249

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Spring, leaf	RB2-3012-000CN	Table 57 on page 8-265
Spring, leaf	RB2-3478-000CN	Table 59 on page 8-269
Spring, leaf	RB2-6450-000CN	Table 63 on page 8-277
Spring, leaf	RB2-6451-000CN	Table 63 on page 8-277
Spring, leaf, grounding	RB2-3075-000CN	Table 49 on page 8-249
Spring, tension	RS6-2025-000CN	Table 48 on page 8-247
Spring, tension	RS6-2030-000CN	Table 49 on page 8-249
Spring, tension	RB2-6314-000CN	Table 53 on page 8-257
Spring, tension	RS6-2061-000CN	Table 59 on page 8-269
Spring, tension	RS6-2062-000CN	Table 59 on page 8-269
Spring, tension	RS6-2061-000CN	Table 64 on page 8-279
Spring, tension	RS6-2397-000CN	Table 64 on page 8-279
Spring, torsion	RB2-2837-000CN	Table 46 on page 8-243
Spring, torsion	RB2-2843-000CN	Table 48 on page 8-247
Spring, torsion	RB2-6308-000CN	Table 53 on page 8-257
Spring, torsion	RB2-6321-000CN	Table 53 on page 8-257
Spring, torsion	RB2-6352-000CN	Table 54 on page 8-259
Static charge eliminator	RB2-6281-000CN	Table 45 on page 8-241
Swing gear assembly	RF5-2755-000CN	Table 59 on page 8-269
Transfer roller assembly	RG5-5581-000CN	Table 48 on page 8-247
Tray assembly, (tray 1)	RG5-5576-000CN	Table 44 on page 8-239
Washer	RB2-2949-000CN	Table 52 on page 8-255

Numerical parts list

Table 67. Numerical parts list

Part number	Description	Table and page
C4209-60001	Formatter PCB	Table 47 on page 8-245
C7058-00001	RFI shield, formatter	Table 47 on page 8-245
RB1-2190-000CN	Collar, spring	Table 59 on page 8-269
RB1-2190-000CN	Collar, spring	Table 64 on page 8-279
RB1-6133-000CN	Holder, spring	Table 59 on page 8-269
RB1-6133-000CN	Holder, spring	Table 64 on page 8-279
RB2-2816-000CN	Foot	Table 56 on page 8-263
RB2-2830-020CN	Guide, cartridge, right	Table 48 on page 8-247
RB2-2831-020CN	Guide, cartridge, left	Table 48 on page 8-247
RB2-2832-000CN	Spring, compression	Table 48 on page 8-247
RB2-2836-000CN	Lever, sensor	Table 46 on page 8-243
RB2-2837-000CN	Spring, torsion	Table 46 on page 8-243
RB2-2843-000CN	Spring, torsion	Table 48 on page 8-247
RB2-2849-000CN	Roller, face-down lower 1	Table 48 on page 8-247
RB2-2849-000CN	Roller, face-down lower 1	Table 48 on page 8-247
RB2-2850-000CN	Bushing	Table 48 on page 8-247
RB2-2856-000CN	Cover, cartridge	Table 45 on page 8-241
RB2-2891-000CN	Roller, paper pick-up	Table 58 on page 8-267
RB2-2892-000CN	Roller	Table 53 on page 8-257
RB2-2892-000CN	Roller	Table 58 on page 8-267
RB2-2892-000CN	Roller	Table 63 on page 8-277
RB2-2893-000CN	Shaft, drive	Table 53 on page 8-257
RB2-2893-000CN	Shaft, drive	Table 64 on page 8-279
RB2-2895-000CN	Bushing, right	Table 53 on page 8-257
RB2-2895-000CN	Bushing, right	Table 58 on page 8-267
RB2-2895-000CN	Bushing, right	Table 63 on page 8-277
RB2-2896-000CN	Bushing, left	Table 53 on page 8-257
RB2-2896-000CN	Bushing, left	Table 58 on page 8-267
RB2-2896-000CN	Bushing, left	Table 63 on page 8-277
RB2-2897-020CN	Bushing	Table 53 on page 8-257
RB2-2900-000CN	Roller, pick-up	Table 48 on page 8-247
RB2-2926-020CN	Bushing, transfer, right	Table 48 on page 8-247
RB2-2935-000CN	Shaft, coupling	Table 52 on page 8-255
RB2-2936-000CN	Bushing	Table 52 on page 8-255
RB2-2943-000CN	Pin	Table 52 on page 8-255
RB2-2944-000CN	Guide	Table 52 on page 8-255

Table 67. Numerical parts list (continued)

Part number	Description	Table and page
RB2-2945-000CN	Plate, mount	Table 52 on page 8-255
RB2-2947-000CN	Holder, pin	Table 52 on page 8-255
RB2-2949-000CN	Washer	Table 52 on page 8-255
RB2-2950-000CN	Flange, spring	Table 52 on page 8-255
RB2-2973-000CN	Bushing	Table 54 on page 8-259
RB2-2978-000CN	Spring, compression	Table 54 on page 8-259
RB2-3000-000CN	Cover, front	Table 57 on page 8-265
RB2-3001-040CN	Body, cassette	Table 57 on page 8-265
RB2-3004-000CN	Arm, release, left	Table 57 on page 8-265
RB2-3005-000CN	Arm, release, right	Table 57 on page 8-265
RB2-3007-000CN	Sheet, separation	Table 57 on page 8-265
RB2-3007-000CN	Sheet, separation	Table 62 on page 8-275
RB2-3008-000CN	Pad, separation	Table 57 on page 8-265
RB2-3009-000CN	Arm, lock	Table 57 on page 8-265
RB2-3010-000CN	Arm, paper level	Table 57 on page 8-265
RB2-3012-000CN	Spring, leaf	Table 57 on page 8-265
RB2-3013-000CN	Holder, separation pad	Table 57 on page 8-265
RB2-3036-000CN	Expansion, tray 1	Table 44 on page 8-239
RB2-3037-000CN	Expansion, tray 1	Table 44 on page 8-239
RB2-3040-000CN	Gear, 26T	Table 48 on page 8-247
RB2-3041-020CN	Hinge, left	Table 49 on page 8-249
RB2-3042-020CN	Hinge, right	Table 49 on page 8-249
RB2-3043-000CN	Bushing, left	Table 48 on page 8-247
RB2-3044-000CN	Bushing, right	Table 48 on page 8-247
RB2-3046-000CN	Roller	Table 53 on page 8-257
RB2-3073-000CN	Shaft, drive	Table 49 on page 8-249
RB2-3075-000CN	Spring, leaf, grounding	Table 49 on page 8-249
RB2-3080-000CN	Plate, grounding	Table 49 on page 8-249
RB2-3081-000CN	Bushing	Table 53 on page 8-257
RB2-3474-000CN	Lever, sensor	Table 58 on page 8-267
RB2-3475-000CN	Bushing	Table 59 on page 8-269
RB2-3478-000CN	Spring, leaf	Table 59 on page 8-269
RB2-3479-000CN	Cover, lower right	Table 56 on page 8-263
RB2-3480-000CN	Cover, drive	Table 56 on page 8-263
RB2-3481-020CN	Plate	Table 59 on page 8-269
RB2-3484-020CN	Roller	Table 56 on page 8-263
RB2-3484-020CN	Roller	Table 61 on page 8-273
RB2-3485-000CN	Holder, roller	Table 56 on page 8-263
RB2-3485-000CN	Holder, roller	Table 61 on page 8-273
RB2-3487-000CN	Bushing, left	Table 58 on page 8-267

Table 67. Numerical parts list (continued)

Part number	Description	Table and page
RB2-3489-000CN	Cover, lower left	Table 56 on page 8-263
RB2-3489-000CN	Cover, lower, left	Table 61 on page 8-273
RB2-3490-000CN	Roller, feed	Table 58 on page 8-267
RB2-6246-000CN	Plate, grounding	Table 46 on page 8-243
RB2-6247-000CN	Guide, flat cable	Table 46 on page 8-243
RB2-6248-000CN	Damper	Table 48 on page 8-247
RB2-6249-000CN	Hinge, feed guide	Table 50 on page 8-251
RB2-6250-000CN	Rod, jam clearing	Table 48 on page 8-247
RB2-6251-000CN	Lever, jam clearing	Table 48 on page 8-247
RB2-6252-000CN	Plate, protection	Table 46 on page 8-243
RB2-6255-000CN	Mount, fan	Table 46 on page 8-243
RB2-6261-000CN	Eliminator, static charge	Table 46 on page 8-243
RB2-6262-000CN	Spring, compression	Table 50 on page 8-251
RB2-6263-000CN	Spring, compression	Table 50 on page 8-251
RB2-6264-000CN	Arm, sensor	Table 48 on page 8-247
RB2-6265-000CN	Spring, compression	Table 50 on page 8-251
RB2-6266-000CN	Spring, leaf	Table 49 on page 8-249
RB2-6267-000CN	Spring, compression	Table 50 on page 8-251
RB2-6268-000CN	Pulley	Table 49 on page 8-249
RB2-6269-000CN	Shaft, drive, front	Table 49 on page 8-249
RB2-6270-000CN	Belt, paper feed, 3	Table 49 on page 8-249
RB2-6271-000CN	Spring, compression	Table 50 on page 8-251
RB2-6272-000CN	Belt, paper feed, 1	Table 49 on page 8-249
RB2-6273-000CN	Belt, paper feed, 2	Table 49 on page 8-249
RB2-6274-000CN	Shaft, drive, rear	Table 49 on page 8-249
RB2-6277-000CN	Roller, face-down lower 2	Table 48 on page 8-247
RB2-6280-000CN	Cover, top	Table 45 on page 8-241
RB2-6281-000CN	Static charge eliminator	Table 45 on page 8-241
RB2-6297-000CN	Foot, rubber	Table 48 on page 8-247
RB2-6297-000CN	Foot, rubber	Table 61 on page 8-273
RB2-6302-000CN	Roller, feed	Table 53 on page 8-257
RB2-6303-000CN	Bushing	Table 53 on page 8-257
RB2-6304-000CN	Roller, paper pick-up	Table 53 on page 8-257
RB2-6304-000CN	Roller, paper pick-up	Table 63 on page 8-277
RB2-6308-000CN	Spring, torsion	Table 53 on page 8-257
RB2-6309-000CN	Arm, roller holder	Table 53 on page 8-257
RB2-6310-000CN	Arm, paper sensor	Table 53 on page 8-257
RB2-6314-000CN	Spring, tension	Table 53 on page 8-257
RB2-6318-000CN	Roller, feed	Table 53 on page 8-257
RB2-6320-000CN	Shaft, gear	Table 53 on page 8-257

Table 67. Numerical parts list (continued)

Part number	Description	Table and page
RB2-6321-000CN	Spring, torsion	Table 53 on page 8-257
RB2-6349-000CN	Plate, end	Table 57 on page 8-265
RB2-6350-000CN	Guide, delivery, lower	Table 54 on page 8-259
RB2-6351-000CN	Lever, delivery	Table 54 on page 8-259
RB2-6352-000CN	Spring, torsion	Table 54 on page 8-259
RB2-6357-000CN	Guide, entrance	Table 54 on page 8-259
RB2-6358-000CN	Plate, Pressure	Table 54 on page 8-259
RB2-6359-000CN	Bushing	Table 54 on page 8-259
RB2-6368-000CN	Roller, pressure	Table 54 on page 8-259
RB2-6370-000CN	Bushing	Table 54 on page 8-259
RB2-6371-000CN	Bushing	Table 54 on page 8-259
RB2-6372-000CN	Roller, delivery	Table 54 on page 8-259
RB2-6374-000CN	Roller, delivery	Table 54 on page 8-259
RB2-6376-000CN	Arm, drive	Table 52 on page 8-255
RB2-6377-000CN	Plate, motor	Table 52 on page 8-255
RB2-6378-000CN	Plate, spring	Table 52 on page 8-255
RB2-6447-000CN	Bushing	Table 63 on page 8-277
RB2-6448-000CN	Arm, sensor	Table 63 on page 8-277
RB2-6450-000CN	Spring, leaf	Table 63 on page 8-277
RB2-6451-000CN	Spring, leaf	Table 63 on page 8-277
RB2-6453-000CN	Cover, sensor	Table 61 on page 8-273
RB2-6454-000CN	Cover, front	Table 61 on page 8-273
RB2-6455-000CN	Bushing	Table 64 on page 8-279
RB2-6456-000CN	Cover, right	Table 61 on page 8-273
RB2-6457-000CN	Cover, left	Table 61 on page 8-273
RB2-6459-000CN	Arm, pad	Table 62 on page 8-275
RB2-6463-000CN	Cover, right edge	Table 62 on page 8-275
RB2-6464-000CN	Cover, left edge	Table 62 on page 8-275
RB2-6465-000CN	Arm, paper level	Table 62 on page 8-275
RB2-6466-000CN	Plate, grounding	Table 62 on page 8-275
RB2-6467-000CN	Cover, rear edge	Table 62 on page 8-275
RB2-6468-000CN	Cover, front	Table 62 on page 8-275
RB2-6469-000CN	Plate, end	Table 62 on page 8-275
RB2-6470-000CN	Bushing, left	Table 58 on page 8-267
RB2-6470-000CN	Bushing, left	Table 63 on page 8-277
RB2-6471-000CN	Gear, 20T	Table 62 on page 8-275
RB2-6473-000CN	Plate, solenoid cross member	Table 64 on page 8-279
RB2-6474-000CN	Pad, separation	Table 62 on page 8-275
RB2-6476-000CN	Roller, feed	Table 63 on page 8-277
RB2-6476-000CN	Roller, feed	Table 63 on page 8-277

Table 67. Numerical parts list (continued)

Part number	Description	Table and page
RB9-0641-000CN	Lever, drive release	Table 52 on page 8-255
RB9-0681-000CN	Shaft, drive	Table 53 on page 8-257
RF5-2599-000CN	Plate, paper lifting	Table 57 on page 8-265
RF5-2606-000CN	Right side plate assembly	Table 57 on page 8-265
RF5-2609-000CN	Holder, contact	Table 54 on page 8-259
RF5-2755-000CN	Swing gear assembly	Table 59 on page 8-269
RF5-3272-000CN	Pad, separation	Table 49 on page 8-249
RF5-3275-000CN	Roller, face-down, upper	Table 48 on page 8-247
RF5-3279-000CN	Holder, sensor lever	Table 46 on page 8-243
RF5-3303-000CN	Plate, paper lifting	Table 62 on page 8-275
RF5-3304-000CN	Gear, 31T/26T	Table 64 on page 8-279
RG5-4121-000CN	Cover assembly, tray 1	Table 44 on page 8-239
RG5-4128-000CN	MP pick-up assembly	Table 48 on page 8-247
RG5-4156-000CN	Cassette pick-up gear assembly	Table 48 on page 8-247
RG5-4159-000CN	Left side plate assembly	Table 57 on page 8-265
RG5-4277-000CN	Paper feeder drive PCB assembly	Table 58 on page 8-267
RG5-4277-000CN	Paper feeder drive PCB assembly	Table 60 on page 8-271
RG5-4278-000CN	Sensor cable	Table 58 on page 8-267
RG5-4279-000CN	Paper feeder cable	Table 63 on page 8-277
RG5-4280-000CN	Relay cable	Table 58 on page 8-267
RG5-4280-000CN	Relay cable	Table 63 on page 8-277
RG5-4281-000CN	FG cable	Table 58 on page 8-267
RG5-4281-000CN	FG cable	Table 63 on page 8-277
RG5-4391-040CN	Paper feeder drive assembly	Table 59 on page 8-269
RG5-4394-020CN	Lower feed roller assembly	Table 56 on page 8-263
RG5-4394-020CN	Lower feed roller assembly	Table 61 on page 8-273
RG5-5541-000CN	FD delivery roller assembly	Table 48 on page 8-247
RG5-5542-000CN	FD delivery roller assembly	Table 48 on page 8-247
RG5-5545-000CN	DIMM cover assembly	Table 44 on page 8-239
RG5-5546-000CN	Cover, rear	Table 44 on page 8-239
RG5-5548-000CN	Reverse guide assembly	Table 50 on page 8-251
RG5-5549-000CN	Left cover assembly	Table 44 on page 8-239
RG5-5551-000CN	Cassette pick-up assembly	Table 53 on page 8-257
RG5-5552-000CN	Duplex solenoid assembly	Table 50 on page 8-251
RG5-5553-000CN	Position guide assembly	Table 50 on page 8-251
RG5-5554-000CN	Duplex feed guide assembly	Table 50 on page 8-251
RG5-5555-000CN	Feed roller assembly	Table 50 on page 8-251
RG5-5556-000CN	Registration assembly	Table 48 on page 8-247
RG5-5559-000CN	Fuser assembly 110 V	Table 54 on page 8-259
RG5-5560-000CN	Fuser film assembly 110 V	Table 54 on page 8-259

Table 67. Numerical parts list (continued)

Part number	Description	Table and page
RG5-5561-000CN	Guide, delivery, upper	Table 54 on page 8-259
RG5-5562-000CN	Printer drive assembly	Table 52 on page 8-255
RG5-5563-000CN	Power supply assembly, 100 to 127 V	Table 51 on page 8-253
RG5-5565-000CN	Inlet cable unit	Table 46 on page 8-243
RG5-5566-000CN	Engine control assembly	Table 47 on page 8-245
RG5-5568-000CN	Guide, cable	Table 49 on page 8-249
RG5-5569-000CN	Fuser assembly 220 V	Table 54 on page 8-259
RG5-5570-000CN	Fuser film assembly 220 V	Table 54 on page 8-259
RG5-5573-000CN	Power supply assembly 220 to 240 V	Table 51 on page 8-253
RG5-5576-000CN	Tray assembly (tray 1)	Table 44 on page 8-239
RG5-5577-000CN	Gear assembly	Table 49 on page 8-249
RG5-5577-000CN	Gear assembly	Table 49 on page 8-249
RG5-5580-000CN	Cassette assembly (250-sheet)	Table 57 on page 8-265
RG5-5581-000CN	Transfer roller assembly	Table 48 on page 8-247
RG5-5583-000CN	Sensor cable	Table 53 on page 8-257
RG5-5591-000CN	Laser/scanner assembly	Table 46 on page 8-243
RG5-5598-000CN	Paper-feed cable	Table 46 on page 8-243
RG5-5622-000CN	Paper feeder drive assembly	Table 64 on page 8-279
RG5-5623-000CN	Cassette	Table 62 on page 8-275
RG5-5626-000CN	Left side, plate assembly	Table 62 on page 8-275
RG5-5627-000CN	right side, plate assembly	Table 62 on page 8-275
RG5-5630-000CN	Paper feeder driver PCB assembly	Table 65 on page 8-281
RG5-5631-000CN	Sensor Cable	Table 63 on page 8-277
RG9-1473-000CN	Coupling assembly	Table 52 on page 8-255
RH2-5421-000CN	Cable, flat	Table 51 on page 8-253
RH2-5423-000CN	Flat cable, I/F	Table 46 on page 8-243
RH2-5425-000CN	Flat cable, reverse motor	Table 47 on page 8-245
RH2-5427-000CN	Flat cable, laser	Table 46 on page 8-243
RH3-8006-000CN	Fuse, 250 V, 8 A, 220 to 240 V	Table 51 on page 8-253
RH7-1458-000CN	Motor, dc, 5 to 76W	Table 46 on page 8-243
RH7-1461-000CN	Motor, 23 V, dc	Table 52 on page 8-255
RH7-1463-000CN	Fan	Table 46 on page 8-243
RH7-5213-000CN	Solenoid	Table 59 on page 8-269
RH7-5270-000CN	Solenoid	Table 46 on page 8-243
RH7-5273-000CN	Solenoid	Table 46 on page 8-243
RH7-5276-000CN	Solenoid	Table 64 on page 8-279
RH7-6051-000CN	Microswitch	Table 46 on page 8-243
RS6-0440-000CN	Gear, 10T	Table 57 on page 8-265
RS6-0441-000CN	Gear, 15T	Table 48 on page 8-247
RS6-0445-000CN	Gear, 14T	Table 48 on page 8-247

Table 67. Numerical parts list (continued)

Part number	Description	Table and page
RS6-0446-000CN	Gear, 201T	Table 52 on page 8-255
RS6-0448-000CN	Gear, 17T/68T	Table 52 on page 8-255
RS6-0449-000CN	Gear, 25T/41T	Table 52 on page 8-255
RS6-0450-000CN	Gear, 31T	Table 52 on page 8-255
RS6-0451-000CN	Gear, 26T	Table 52 on page 8-255
RS6-0464-000CN	Gear, 20T	Table 49 on page 8-249
RS6-0495-000CN	Gear, 27T	Table 59 on page 8-269
RS6-0497-000CN	Gear, 39T/34T	Table 59 on page 8-269
RS6-0498-000CN	Gear, 45T	Table 59 on page 8-269
RS6-0499-000CN	Gear, 39T	Table 59 on page 8-269
RS6-0499-000CN	Gear, 39T	Table 64 on page 8-279
RS6-0500-000CN	Gear, 17T	Table 59 on page 8-269
RS6-0501-000CN	Gear, 15T	Table 58 on page 8-267
RS6-0501-000CN	Gear, 15T	Table 63 on page 8-277
RS6-0904-000CN	Gear, 15T	Table 53 on page 8-257
RS6-0905-000CN	Gear, 16T	Table 53 on page 8-257
RS6-0906-000CN	Gear, 15T	Table 53 on page 8-257
RS6-0907-000CN	Gear, 24T	Table 53 on page 8-257
RS6-0910-000CN	Gear, 91T/28T	Table 52 on page 8-255
RS6-0911-000CN	Gear, 42T	Table 52 on page 8-255
RS6-0912-000CN	Gear, 93T/73T	Table 52 on page 8-255
RS6-0913-000CN	Gear, 17T	Table 52 on page 8-255
RS6-0914-000CN	Gear, 46T/22T	Table 52 on page 8-255
RS6-0915-000CN	Gear, 39T	Table 52 on page 8-255
RS6-0916-000CN	Gear, 28T/88T	Table 52 on page 8-255
RS6-0917-000CN	Gear, 75T	Table 52 on page 8-255
RS6-0918-000CN	Gear, 75T/28T	Table 52 on page 8-255
RS6-0919-000CN	Gear, 79T/36T	Table 52 on page 8-255
RS6-0921-000CN	Gear, 14T	Table 54 on page 8-259
RS6-0922-000CN	Gear, 16T	Table 54 on page 8-259
RS6-0923-000CN	Gear, 27T	Table 54 on page 8-259
RS6-0924-000CN	Gear, 17T	Table 48 on page 8-247
RS6-0945-000CN	Gear, 40T/24T	Table 64 on page 8-279
RS6-0946-000CN	Gear, 70T	Table 64 on page 8-279
RS6-0947-000CN	Gear, 34T	Table 64 on page 8-279
RS6-0948-000CN	Gear, 17T	Table 64 on page 8-279
RS6-2020-000CN	Spring, compression	Table 57 on page 8-265
RS6-2021-000CN	Spring, compression	Table 57 on page 8-265
RS6-2022-000CN	Spring, compression	Table 48 on page 8-247
RS6-2025-000CN	Spring, tension	Table 48 on page 8-247

Table 67. Numerical parts list (continued)

Part number	Description	Table and page
RS6-2030-000CN	Spring, tension	Table 49 on page 8-249
RS6-2031-000CN	Spring, compression	Table 52 on page 8-255
RS6-2035-000CN	Spring, compression	Table 57 on page 8-265
RS6-2061-000CN	Spring, tension	Table 59 on page 8-269
RS6-2061-000CN	Spring, tension	Table 64 on page 8-279
RS6-2062-000CN	Spring, tension	Table 59 on page 8-269
RS6-2063-000CN	Spring, compression	Table 56 on page 8-263
RS6-2063-000CN	Spring, compression	Table 61 on page 8-273
RS6-2064-000CN	Spring, compression	Table 58 on page 8-267
RS6-2064-000CN	Spring, compression	Table 63 on page 8-277
RS6-2375-000CN	Spring, compression	Table 48 on page 8-247
RS6-2378-000CN	Spring, compression	Table 54 on page 8-259
RS6-2379-000CN	Spring, compression	Table 52 on page 8-255
RS6-2395-000CN	Spring, compression	Table 62 on page 8-275
RS6-2396-000CN	Spring, compression	Table 62 on page 8-275
RS6-2397-000CN	Spring, tension	Table 64 on page 8-279
VS1-6174-006CN	Connector, 6P	Table 58 on page 8-267
VS1-6174-006CN	Connector 6P	Table 63 on page 8-277
WD1-0268-000CN	Fuse, 125 V, 15A, 100 to 127 V	Table 51 on page 8-253
WG8-5364-000CN	Photo-interrupter, GP1SQ73P	Table 53 on page 8-257
WG8-5364-000CN	Photo-interrupter GP1SQ73P	Table 63 on page 8-277
WG8-5382-000CN	Photo-interrupter TLP1242	Table 48 on page 8-247
WG8-5382-000CN	Photo-interrupter, TLP1242	Table 49 on page 8-249
WG8-5382-000CN	Photo-interrupter, TLP1242	Table 54 on page 8-259
WG8-5382-000CN	Photo-interrupter, TLP1242	Table 58 on page 8-267
XA9-0605-000CN	Screw, M4 by 8	Table 56 on page 8-263
XA9-0605-000CN	Screw, M4 by 8	Table 58 on page 8-267
XA9-0605-000CN	Screw, M4 by 8	Table 61 on page 8-273
XA9-0605-000CN	Screw, M4 by 8	Table 63 on page 8-277
XA9-0606-000CN	Screw, M4 by 10	Table 62 on page 8-275
XA9-0686-000CN	Screw, RS, M3 by 6	Table 50 on page 8-251
XA9-0904-000CN	Screw, M3 by 6	Table 52 on page 8-255
XA9-0924-000CN	Screw, w/washer M3 by 8	Table 58 on page 8-267
XA9-1206-000CN	Screw, w/washer, M4 by 12	Table 50 on page 8-251
XA9-1223-000CN	Screw, TP, M3 by 6	Table 47 on page 8-245
XA9-1223-000CN	Screw, TP, M3 by 6	Table 52 on page 8-255
XA9-1226-000CN	Screw, w/washer, M3 by 8	Table 51 on page 8-253
XA9-1226-000CN	Screw, w/washer, M3 by 8	Table 54 on page 8-259
XA9-1226-000CN	Screw, w/washer, M3 by 8	Table 63 on page 8-277
XA9-1273-000CN	Screw, TP, M4 by 12	Table 46 on page 8-243

Table 67. Numerical parts list (continued)

Part number	Description	Table and page
XB1-2300-605CN	Screw, machine, truss head, M3 by 6	Table 52 on page 8-255
XB2-7300-407CN	Screw, with star washer, M3 by 7	Table 52 on page 8-255
XB2-7300-607CN	Screw, w/washer, M3 by 6	Table 46 on page 8-243
XB2-7300-607CN	Screw, w/washer, M3 by 6	Table 50 on page 8-251
XB2-7400-607CN	Screw, w/washer, M4 by 6	Table 58 on page 8-267
XB2-7400-607CN	Screw, w/washer, M4 by 6	Table 63 on page 8-277
XB4-7400-809CN	Screw, TP, truss head, M4 by 8	Table 53 on page 8-257
XB4-7401-007CN	Screw, TP, Pan Head, M4 by 10	Table 44 on page 8-239
XB4-7401-007CN	Screw, TP, Pan Head, M4 by 10	Table 45 on page 8-241
XB4-7401-007CN	Screw, TP, Pan Head, M4 by 10	Table 46 on page 8-243
XB4-7401-007CN	Screw, TP, Pan Head, M4 by 10	Table 48 on page 8-247
XB4-7401-007CN	Screw, TP, Pan Head, M4 by 10	Table 49 on page 8-249
XB4-7401-007CN	Screw, TP, Pan Head, M4 by 10	Table 50 on page 8-251
XB4-7402-007CN	Screw, TP, Truss Head, M4 by 20	Table 45 on page 8-241
XB6-7300-407CN	Screw, M3 by 4	Table 46 on page 8-243
XB6-7400-609CN	Screw, TP, M4 by 6	Table 59 on page 8-269
XB6-7400-809CN	Screw, TP, truss head, M3 by .8	Table 64 on page 8-279
XD9-0135-000CN	E-ring	Table 53 on page 8-257
XD9-0136-000CN	E-ring	Table 58 on page 8-267
XD9-0136-000CN	E-ring	Table 59 on page 8-269
XD9-0136-000CN	E-ring	Table 63 on page 8-277
XD9-0136-000CN	E-ring	Table 64 on page 8-279

Index

Numerics

- 250-sheet feeder
 - assembly connector, removing 164
 - cassette, diagrams and part numbers 264
 - cassette, removing 170
 - components 228
 - drive assembly, diagrams and part numbers 268
 - drive assembly, removing 172
 - drive solenoid, removing 174
 - external covers, diagrams and part numbers 262
 - feeding operations 30, 91
 - internal components 266
 - jam detection operations 95
 - locating 8
 - media supported 32
 - models including 5
 - ordering 235
 - PCB, diagrams and part numbers 270
 - removing 101
 - sensors 92, 93
- 500-sheet feeder
 - assembly connector, removing 164
 - cassette, diagrams and part numbers 274
 - cassette, removing 175
 - components 228
 - drive assembly, diagrams and part numbers 278
 - drive assembly, removing 177
 - drive solenoid, removing 179
 - external covers, diagrams and part numbers 272
 - feeding operations 30, 91
 - internal components 276
 - jam detection operations 95
 - locating 9
 - media supported 32
 - models including 5
 - ordering 235
 - PCB, diagrams and part numbers 280
 - pickup roller, removing 176
 - removing 101
 - sensors 92, 93
- 79 service errors 186

A

- accessory errors 194
- acclimating printer 182
- acoustic specifications 6
- address, IP 223
- adhesion, toner 207
- adhesive labels
 - sizes supported 31
 - specifications 35
 - troubleshooting 216
- adhesives, envelopes 33, 34
- agreements, service 17
- alphabetical parts list 282
- AppleTalk status 223
- ARP duplicate address, error message 223
- Attention LED
 - blinking 186
 - error messages 187
 - locating 44
- authorized resellers 17

- automatic language switching 3

B

- background, gray 207
- base memory 3
- basis weight
 - See *also* weight
 - calculating 37
 - envelope specifications 33
 - metric 38
- beam detect errors 192
- beam operations 85
- belts
 - cleaning 63
 - operations 89
 - removing 134
- bench repair warranty 15
- bidirectional communications
 - operations 77
 - troubleshooting 221
- bins, output
 - capacities 2
 - feeding operations 89
 - jams, troubleshooting 201
 - locating 7
- black dots, troubleshooting 206
- black lines, troubleshooting 206
- blade, cleaning 83
- blank pages, troubleshooting 210
- blinking lights 186
- brands, media 214
- buffer
 - errors 189, 193
 - operations 78
- bulk returns, recycling 14
- bushings
 - transfer roller 113, 114
 - tray 1 pickup roller assembly 147
 - tray 2 pickup roller assembly 153, 154
- buttons
 - control panel 44
 - engine test 52
- bypassing formatter 52

C

- cable harness, removing 136
- cables
 - connectivity options 3
 - part numbers 235
- caliper
 - envelope specifications 33
 - label specifications 35
 - measuring 39
 - transparency specifications 36
- canceling print jobs 44
- capacity
 - output bins 2
 - toner cartridge 2
 - tray 1 31
 - tray 2 32
 - tray 3 32

- cardstock, sizes supported 31
- cartons, media 219
- cartridge door
 - opening 100
 - swing arm 106, 108
- cartridge guide, removing 166
- cartridges, toner
 - capacity 2
 - components 82
 - detection switch 80
 - handling instructions 67
 - image formation operations 82
 - inspecting 204
 - locating 8
 - Material Safety Data Sheet (MSDS) 11
 - part numbers 235
 - recycling 14, 68
 - redistributing toner 69
 - refilled 68
 - removing 100
 - safety information 11
 - storing 67
 - weight 68
- case sensitivity, P/L commands 53
- cassette paper sensor (PS1305) 90, 93
- cassette pickup assembly, diagrams and part numbers 256
- cassette pick-up solenoid (SL1908) 90, 228
- cassettes. *See* trays
- CD-ROMs
 - HP support assistant 17
 - part numbers 16
 - service parts information 17
- central processing unit. *See* CPU
- characters, P/L commands 53
- characters, troubleshooting print quality 206, 208
- charge eliminator 83, 87
- charging rollers
 - locating 10
 - operations 82, 84
- checklist, troubleshooting 184
- checks
 - engine 52
 - half self-test 212
 - media 37
 - power-on 72
 - self-test, continuous 51
- chemicals, paper 37, 218
- circuit capacity 5
- cleaning
 - engine 66
 - internal 64
 - media dust 219
 - precautions for 63
 - spilled toner 11
- cleaning stage, image formation operations 83
- clip gasket, handling precautions 99
- clothing, toner on 11
- coated media, troubleshooting 218
- cold reset
 - default paper size, setting 55
 - performing 56
- Coldfire processor. *See* processor
- commands, service mode 53
- communications
 - operations 76, 77
 - troubleshooting 221
- compact discs
 - HP support assistant 17
 - service parts information 17
- user documentation 16
- comparison, features 5
- complex pages, storing in memory 78
- compression features, memory management 88
- conditioning stage, image formation 84
- configuration page
 - information on 49
 - JetDirect 222
 - printing 48
- conformity, declaration of 12
- connection errors 189
- connectivity features 3
- connectors, locating 230
- consumables
 - ordering 234
 - recycling 14
- consumption, power 5, 13
- context-sensitive switching 78
- continuable errors 188
- continuous self-test 51
- control panel
 - accessory error messages 194
 - buttons 44
 - continuable error messages 188
 - demo page, printing from 45
 - fatal error messages 191
 - LED safety 12
 - light patterns 186
 - locating 7
 - operations 76
 - primary error messages 187
 - secondary error messages 188
- cooling fan
 - locating 228
 - power-on sequence 72
 - removing 165
- coordination, systems 75
- cotton bond paper 41
- count, page
 - report 49
 - resetting 54
- countries, sales and service offices 18
- country of origin 4
- covers, removing
 - 250-sheet feeder, diagrams 262
 - 500-sheet feeder, diagrams 272
 - DIMM 103
 - I/O 102
 - left 109
 - parts and diagrams 238
 - rear 104
 - top 106
- CPU
 - initialization sequence 72
 - jam detection operations 94
 - operating sequences 73
 - speed 2
- creases, troubleshooting 208
- crooked pages, troubleshooting 208
- CSSO (Customer Services and Support Organization) 16
- curl
 - envelope specifications 33
 - label specifications 35
 - testing media 40
 - troubleshooting 208, 213
- current capacity, minimum 5
- custom media sizes, tray 1 31
- Customer Care centers
 - HP Express Exchange program 15

- reseller sales and service support 17
- sales and service offices, worldwide 18
- Customer Services and Support Center 234
- Customer Services and Support Organization (CSSO) 16
- cut-edge condition test 40
- cut-off pages, preventing 78
- cutouts, troubleshooting media with 216
- cylindrical lens 85

D

- dark print, troubleshooting 206
- data
 - compression features 78
 - processing operations 76
- datecode, firmware 49
- dc bias voltage contacts, removing 168
- declaration of conformity 12
- default size, paper 55
- defaults, NVRAM initialization 56
- defect tables 205
- defects, repetitive
 - ruler 211
 - troubleshooting 207
- delay jams 94, 95
- delivery delay jams 94
- delivery rollers, output
 - disassembling upper 130
 - locating 10
 - removing lower 131
 - removing upper 129
- delivery sensor (PS2301)
 - diagram 90
 - jam detection 94
 - media detection 93
 - operations 89
- delivery stationary jams 94
- demo page, printing 45
- density
 - operations 77, 86
 - troubleshooting 206
- depth, printer 5, 27
- detection operations
 - jams 94
 - media 93
 - toner cartridge 80
- developing cylinder
 - locating 10
 - operations 82, 86
- developing stage, image formation 86
- dimensions, printer 5, 27
 - See also size
- DIMM cover
 - locating 7
 - removing 103
- DIMMs
 - errors 191, 194
 - ordering 235
 - removing 115
 - self-test/configuration page information 49
 - slots 3
- disconnecting power supply 99
- diverter pins, rear cover 104
- DLC/LLC status 223
- documentation 16
- door, toner cartridge 100
- door-open check 72
- DOS, PJL commands 53
- dots per inch 2
- dots, troubleshooting 206

- double side seams, envelopes 34
- downloading printer drivers 17
- dpi 2
- draft mode 68, 204
- DRAM errors 194
- drive assembly
 - 250-sheet feeder, removing 172
 - 500-sheet feeder, removing 177
 - gears, removing 143
 - printer, diagrams and part numbers 254
 - printer, removing 138
- drive gears, duplexer 161
- drive solenoids, removing
 - 250-sheet feeder 174
 - 500-sheet feeder 179
- drivers, downloading 17
- dropouts, troubleshooting 206
- drum
 - cleaning operations 83
 - conditioning stage 84
 - image development operations 86
 - image transfer operations 87
 - inspecting 204
 - laser/scanner operations 85
 - locating 10
 - Material Safety Data Sheet (MSDS) 11
 - properties 83
 - rotation test 212
- duplex page count 49
- duplex pick-up paper sensor (PS503)
 - diagram 90
 - jam detection 94
 - media detection 93
- duplex solenoid (SL909) 90, 228
- duplexer
 - drive gears, removing 161
 - feeding operations 89
 - jam detection operations 94
 - jams, troubleshooting 199, 201
 - locating 8
 - media guide, removing 125
 - media supported 32
 - models including 5
 - pick-up delay jams 95
 - pick-up stationary jams 95
 - reverse motor, removing 137
 - solenoid, removing 161
 - speed 2
 - tray, removing 124
- duty cycle 3
- dynamic RAM controller errors 194

E

- EconoMode 68, 204
- EIO cards
 - errors 189
 - features 77
 - installing 57
 - removing 102
 - resetting 56
 - troubleshooting 221, 223
- EIO port errors 191, 194
- EIO shield and guide, removing 117
- EIO slots
 - included 3
 - self-test/configuration page information 49
- electrical specifications 5
- electrophotographic system. See image formation system
- electrostatic discharge (ESD), precautions for 99

- eliminator, static charge 83, 87
- embossed media, troubleshooting 216
- end-of-life recycling programs 13
- energy consumption 5, 13
- Energy Star compliance 13
- engine cleaning 66
- engine control system
 - block diagram 79
 - coordination with other systems 75
 - subsystems 80
- engine controller assembly, removing 139
- engine controller PCB
 - diagrams 229
 - image formation operations 85
 - operating sequences 73
 - operations 79, 80
 - pick-up/feed system operations 89
- engine errors 189, 192
- engine test
 - performing 52
 - troubleshooting 196
- envelopes
 - margins 34
 - sizes supported 31
 - specifications 33
 - troubleshooting 217
- environment changes, acclimating to 182
- environmental specifications
 - media storage 219, 220
 - printer 6, 26
 - toner cartridges 67
- environmental stewardship 13
- equivalence table, paper weight 38
- e-rings 236
- error log 49
- error messages
 - accessory 194
 - continuable 188
 - control panel lights 186
 - fatal errors 191
 - primary 187
 - secondary 188
- escape characters, P/L commands 53
- ESD (electrostatic discharge), precautions for 99
- Ethernet networks, supported 77
- expansion, memory 5
- expiration date, toner cartridges 67
- exposure, drum 85
- Express Exchange 15
- extensions, tray 1 7
- eye contact, toner 11

F

- face-up sensor (PS502)
 - diagram 90
 - media detection 93
 - operations 89
- factory defaults, NVRAM initialization 56
- faded print, troubleshooting 206
- failures, power-on check 72
- fan
 - locating 228
 - power-on sequence 72
 - removing 165
- fan motor
 - errors 193
 - rotation periods 80
- Fast Ethernet networks, supported 77
- Fast Infrared Receiver (FIR) port
 - features 3
 - locating 8
 - using 59
- fasteners 236
- fatal errors 191
- FCC regulations 12
- features
 - model comparisons 5
 - printer 2
- feed belts
 - cleaning 63
 - locating 10
 - operations 89
- feed rollers, replacement intervals 62
- feed system
 - control 80
 - coordination with other systems 75
 - jam detection 94
 - paper feeding operations 89
 - sensors 90
 - sheet feeder operations 91
- feeder trays. *See* 250-sheet feeder; 500-sheet feeder
- feeding problems
 - See also* jams
 - envelopes 217
 - troubleshooting 214
- fiber composition test, media 41
- field replaceable units
 - ordering 234
 - removal and replacement strategies 99
- field tests, media 37
- fillers, paper 37
- film, transparency. *See* transparencies
- finish, media 39
- FIR port
 - features 3
 - locating 8
 - using 59
- firmware
 - datecode 49
 - errors, unrecoverable 186
 - revision number 223
- first aid, toner safety 11
- first page out 2
- flaps, envelopes 34
- flashing lights 186
- flowchart, troubleshooting 184
- fonts
 - compression features 78
 - included 3
 - storage operations 77
- formatter
 - bypassing 52
 - components, system 77
 - coordination with other systems 75
 - default paper size, resetting 55
 - handling precautions 99
 - number 49
 - operations 76
 - page count 54
 - pick-up/feed system operations 89
 - removing 116
- frequency, jams 198
- FRUs (field replaceable units)
 - ordering 234
 - removal and replacement strategies 99
- furnish test, media 41
- fuser assembly
 - diagrams and part numbers 258

- errors 193
- locating 10
- removing 118
- replacement interval 62
- replacing 120
- temperature control 80
- fuser film
 - heater assembly, removing 121
 - operations 88
- fuser stage, image formation 88
- fuses, overheated 80
- fusing assembly entrance guide, cleaning 63
- fusing compatibility
 - envelopes 33
 - labels 35
 - test 41
 - transparencies 36

G

- gasket, handling precautions 99
- gears, printer drive assembly 143
- getting started guide 16
- ghosting, troubleshooting 209
- GL/2 vector graphics 3
- gloves, parts requiring 99
- Go button
 - demo page, printing with 45
 - displaying secondary error messages 186
 - locating 44
 - self-test/configuration page, printing with 48
- Go LED
 - error messages 186
 - locating 44
- grain, paper 39
- graphics, compression features 78
- gray background, troubleshooting 207
- groundwood, recycled paper 41
- group characters, PJI commands 53
- guide, duplex 125

H

- half self-test functional check 212
- handling precautions
 - parts removal 99
 - toner cartridges 67
- harnesses
 - replacing 99
 - ribbon cable, removing 136
- heater assembly, removing 121
- heating operations, fuser assembly 80
- heavy media, sizes supported 31
- height, printer 5, 27
- high-voltage power supply 81
- host computer, communications
 - operations 76
 - troubleshooting 221
- HP authorized resellers 17
- HP Customer Care centers
 - Express Exchange 15
 - reseller sales and service support 17
 - sales and service offices, worldwide 18
- HP Customer Services and Support Center 234
- HP Express Exchange 15
- HP Fast Infrared Receiver (FIR) port
 - features 3
 - locating 8
 - using 59
- HP JetDirect EIO cards

- errors 189
- features 77
- installing 57
- removing 102
- troubleshooting 221, 223
- HP JetDirect print servers
 - configuration page 222
 - installation guide 221
 - models including 3
 - ordering 235
- HP LaserJet printer family print media guide 16
- HP Printing Supplies Returns and Recycling 14
- HP service agreements 17
- HP Service Center, Express Exchange 15
- HP support assistant CD-ROM 17
- HP UltraPrecise toner cartridges. *See* toner cartridges
- HP Web JetAdmin information 223
- HP-GL/2 vector graphics 3
- humidity
 - changes, acclimating printer to 182
 - labels, storing 35
 - media, storing 36, 219, 220
 - printer requirements 6
 - toner cartridges, storing 67

I

- I/O buffer
 - errors 189
 - operations 78
- I/O cover
 - locating 7
 - removing 102
- I/O errors 190
- I/O operations 76
- I/O switching, dynamic 78
- Image Adapt 78
- image defect tables 205
- image formation system
 - cleaning stage 83
 - conditioning stage 84
 - coordination with other systems 75
 - developing stage 86
 - fuser stage 88
 - operations 82
 - transferring stage 87
 - troubleshooting 212
 - writing stage 85
- image quality, troubleshooting 203, 205
- images, repeating 209
- in-country support 18
- indicator lights. *See* lights, control panel
- Infrared port
 - features 3
 - locating 8
 - using 59
- ingestion, toner 11
- inhalation, toner 11
- inks, troubleshooting 215
- input jams 199, 200
- input trays
 - cassette pickup assembly, diagrams 256
 - feeding operations 30, 89
 - jam detection operations 94
 - jams, troubleshooting 200
 - locating 7
 - media detection 93
 - media supported 31
 - models including 5
 - ordering 235

- removing 101, 110
- separation pad, locating 10
- inspecting parts 62
- installation requirements 26
- installed personalities and options 49
- instant-on fuser 2
- Intellifont 3
- interface
 - errors 194
 - operations 76, 77
- internal components, parts and diagrams 242
- internal jams 199, 200
- international support 18
- INTR (initial rotation) period 73
- IP address 223
- IR port. *See* Infrared port
- IrDA-compliant devices, printing from 3, 59
- isolating job settings 78
- isolating problems 52

J

- jams
 - causes of 197, 198
 - detection operations 94
 - locations 199
 - residual paper check 72
 - types of 200
- JetAdmin, HP Web 223
- JetDirect EIO cards
 - errors 189
 - features 77
 - installing 57
 - removing 102
 - troubleshooting 221, 223
- JetDirect print servers
 - configuration page 222
 - installation guide 221
 - models including 3
 - ordering 235
- JetSend IR-enabled devices. *See* Fast Infrared Receiver (FIR) port
- Job Cancel button
 - canceling print jobs 44
 - displaying secondary error messages 186
 - self-test/configuration page, printing with 48
- jobs, isolating settings 78

K

- keys. *See* buttons

L

- labels
 - sizes supported 31
 - specifications 35
 - troubleshooting 216
- LAN hardware address 223
- languages, documentation 16
- languages, printer
 - errors 190
 - features 3
 - list of installed 49
 - switching 78
- laptops, printing from 59
- laser safety 12
- laser/scanner assembly
 - errors 192
 - locating 10
 - operations 80, 85

- precautions 99
- removing 132
- replacing 133
- LaserJet printer family print media guide 16
- LaserJet supplies, recycling 14
- latent electrostatic image 85, 86
- leading edge, detection operations 89, 94
- leaf springs, removing 168
- LED safety 12
- LEDs, control panel
 - accessory error messages 194
 - continuable error messages 188
 - fatal error messages 191
 - locating 44
 - primary error messages 187
 - secondary error messages 188
 - states 186
- left cover, removing 109
- lenses, image formation operations 85
- letterhead, troubleshooting 215
- levers, paper-sensor
 - media detection 93
 - tray 1, removing 150
 - tray 2, removing 159
- life expectancies
 - parts 62
 - toner cartridges 68
- light print, troubleshooting 206
- light, Fast Infrared Receiver (FIR) status 59
- lights, control panel
 - accessory error messages 194
 - continuable error messages 188
 - fatal error messages 191
 - locating 44
 - primary error messages 187
 - secondary error messages 188
 - states 186
- lines per inch 2
- lines, troubleshooting 206
- lists, parts
 - alphabetical 282
 - numerical 291
- localized documentation 16
- LocalTalk networks, supported 77
- loose toner, troubleshooting 207
- lower output delivery rollers, removing 131
- low-voltage power supply 81
- lpi (lines per inch) 2
- LSTR (last rotation) period 73

M

- macros, downloaded 77
- main motor (M903)
 - image formation operations 82
 - locating 228
 - power-on sequence 72
 - print-period sequences 73
 - removing 140
 - rotation periods 80
 - sheet feeder operations 91
- maintenance
 - cleaning precautions 63
 - inspecting parts 62
- manuals, ordering 16
- margins, envelopes 34
- Material Safety Data Sheet 11, 14
- media
 - brands, troubleshooting 214
 - chemically treated, troubleshooting 218

- coated 218
 - detection operations 93
 - duplexer, supported sizes 32
 - dust, cleaning 219
 - envelope specifications 33
 - equivalence table 38
 - fusing compatibility 33
 - grain test 39
 - HP LaserJet printer family print media guide 16
 - input options 30
 - label specifications 35
 - recycled 14, 41
 - reducing use 13
 - shipping 37
 - size detection 93
 - special, troubleshooting 215
 - specifications 28
 - storing 36, 219, 220
 - tests 37
 - tools, testing 41
 - transparencies 36
 - tray 1, supported sizes 31
 - tray 2, supported sizes 32
 - tray 3, supported sizes 32
 - troubleshooting process 29, 213
 - media guide, duplexer 125
 - media jams. *See* jams
 - memory
 - base 3
 - configuration errors 190
 - full, errors 188, 189
 - management features 78
 - maximum 5
 - NVRAM 56, 77
 - ordering 235
 - RAM operations 77
 - ROM operations 77
 - self-test/configuration page information 49
 - Memory Enhancement technology (MEt) 78
 - messages, error. *See* error messages
 - MEt (Memory Enhancement technology) 78
 - metal
 - handling precautions 99
 - torque values 236
 - metric equivalents 38
 - microprocessor
 - initialization sequence 72
 - jam detection operations 94
 - operations sequences 73
 - speed 2
 - microswitch control 80
 - mirrors, image formation operations 85
 - misfeeds, troubleshooting 214
 - See also* jams
 - misformed characters, troubleshooting 208
 - model number, locating 4
 - models, printer
 - feature comparison 5
 - media handling 2
 - moisture content, measuring 39
 - See also* humidity
 - motor plate, removing 141
 - motors
 - image formation operations 82
 - locating 228
 - main, removing 140
 - operations 80
 - paper feeding operations 89
 - power-on sequence 72
 - print-period sequences 73
 - reverse, removing 137
 - MS-DOS, PJI commands 53
 - MSDS (Material Safety Data Sheet) 11, 14
 - multifeeds, troubleshooting 214
 - See also* jams
 - multipurpose tray. *See* tray 1
- ## N
- NetWare, Novell 223
 - network cards. *See* EIO cards
 - networks
 - features for 3
 - statistics 223
 - troubleshooting 221
 - nickel, safety precautions 99
 - noise-level specifications 6
 - non-HP toner cartridges 68
 - nonvolatile memory (NVRAM)
 - errors 190, 193
 - initializing 56
 - operations 77
 - Novell NetWare status 223
 - numerical list, part numbers 291
 - NVRAM
 - errors 190, 193
 - initialization 56
 - operations 77
- ## O
- oblique roller 89
 - OPC (organic-photoconductive material) 83
 - operating environment, specifications 6, 26
 - operations
 - engine control system 79
 - formatter system 76
 - image formation system 82
 - jam detection 94
 - media detection 93
 - pick-up/feed system 89
 - power supplies 81
 - power-on sequence 72
 - print-period sequences 73
 - systems overview 75
 - timing diagram 74
 - optic sensor, tray 2 159
 - ordering
 - consumables 234
 - documentation 16
 - parts 16, 234
 - organic-photoconductive material (OPC) 83
 - out of paper error 188
 - output bins
 - capacities 2
 - feeding operations 89
 - jams, troubleshooting 201
 - locating 7
 - output delivery rollers
 - disassembling upper 130
 - removing lower 131
 - removing upper 129
 - output feed rollers, replacement intervals 62
 - output jams 199, 201
 - output quality, troubleshooting 203, 205
 - overcurrent/overvoltage protection 81
 - overhead transparencies. *See* transparencies
 - overheating, fuser assembly control 80
 - ozone emissions 13

P

- packaging media 37
- packet information, network statistics 223
- page count
 - report 49
 - resetting 54
- Page Protect 78
- pages per minute 2
- pages per month 3
- pan head screws 236
- panels. *See* covers
- paper
 - brands, troubleshooting 214
 - chemically treated, troubleshooting 218
 - coated 218
 - cold reset default size 55
 - detection operations 93
 - duplexer, supported sizes 32
 - dust, cleaning 219
 - fillers 37
 - fusing compatibility 33
 - grain test 39
 - HP LaserJet printer family print media guide 16
 - input options 30
 - recycled 14, 41
 - reducing use 13
 - shipping 37
 - size detection 93
 - special, troubleshooting 215
 - specifications 28
 - storing 36, 219, 220
 - tests 37
 - tools, testing 41
 - tray 1, supported sizes 31
 - tray 2, supported sizes 32
 - tray 3, supported sizes 32
 - troubleshooting process 29, 213
 - weight equivalence table 38
- paper feeder paper sensors (PS2001, PS2003) 92, 93
- paper feeder pick-up solenoids (SL2001, SL2002)
 - diagrams 92, 93
 - operations 91
- paper input trays
 - cassette pickup assembly, diagrams 256
 - feeding operations 30, 89
 - jam detection operations 94
 - jams, troubleshooting 200
 - locating 7
 - media detection 93
 - media supported 31
 - models including 5
 - ordering 235
 - removing 101, 110
 - separation pad, locating 10
- paper jams
 - causes of 197, 198
 - detection operations 94
 - locations 199
 - residual paper check 72
 - types of 200
- paper output bins
 - capacities 2
 - feeding operations 89
 - jams, troubleshooting 201
 - locating 7
- paper path
 - See also* jams
 - 500-sheet feeder 91
 - cleaning 64, 66
 - feeding operations 89
 - jam detection 94
 - troubleshooting 213
- paper-sensor levers
 - media detection 93
 - tray 1, removing 150
 - tray 2, removing 159
- parallel cables, part numbers 235
- parallel interface operations 77
- parallel port 3
- parameterized characters, PJI commands 53
- part numbers
 - alphabetical list 282
 - documentation 16
 - numerical list 291
- parts
 - CD-ROM information 17
 - ordering 16, 234
 - removing and replacing 99
- path, paper
 - See also* jams
 - 500-sheet feeder 91
 - cleaning 64, 66
 - feeding operations 89
 - jam detection 94
 - troubleshooting 213
- PCBA torque values 236
- PCBs, diagrams and part numbers 260
- PCL 6 printer language 3
- PCL commands 53
- PDAs, printing from 59
- perforated media, troubleshooting 216
- periodic replacement, parts 62
- personal digital assistants, printing from 59
- personalities. *See* languages, printer
- phone numbers
 - authorized resellers 17
 - Customer Services and Support Organization 16
 - ordering parts 234
 - reseller sales and service support 17
 - worldwide sales and service offices 18
- photosensitive drum
 - cleaning operations 83
 - conditioning stage 84
 - image development operations 86
 - image transfer operations 87
 - inspecting 204
 - laser/scanner operations 85
 - locating 10
 - Material Safety Data Sheet (MSDS) 11
 - properties 83
 - rotation test 212
- physical specifications 5
- pick-up delay jams 94
- pick-up/feed system
 - control 80
 - coordination with other systems 75
 - jam detection 94
 - paper feeding operations 89
 - sensors 90
 - sheet feeder operations 91
- pick-up roller and refeeder assembly (tray 2), removing 157
- pick-up roller assemblies, removing
 - tray 1 146
 - tray 2 153
- pick-up rollers
 - 250-sheet feeder, removing 171
 - 500-sheet feeder, removing 176
 - cleaning 63

- locating 10
 - operations 91
 - replacement intervals 62
 - tray 1, removing 144
 - tray 2, replacing 156
 - pick-up solenoids, sheet feeders (SL2001, SL2002)
 - diagrams 92, 93
 - operations 91
 - pick-up stationary jams 94
 - pivot arms, tray 1 111, 112
 - PJL
 - commands 53
 - features 78
 - Planet Partners website 14
 - plastics
 - recycling 13
 - torque values 236
 - pliers, required 99
 - ports
 - FIR 59
 - included 3
 - locating 8
 - postcards
 - sizes supported 31
 - weight equivalence table 38
 - PostScript emulation 3
 - power
 - consumption 5, 13
 - specifications 5
 - troubleshooting 185
 - power receptacle, locating 7
 - power supply
 - diagrams 230, 252
 - disconnecting 99
 - operations 81
 - removing 126
 - replacing 128
 - power switch, locating 7
 - power-on sequence 72
 - PowerSave mode
 - noise specifications 6
 - power consumption 5
 - ppm (pages per minute) 2
 - precautions
 - parts removal 99
 - toner cartridges 67
 - preprinted media, troubleshooting 215
 - pressure plate, removing 122
 - pressure roller
 - operations 88
 - removing 123
 - primary charging roller
 - locating 10
 - operations 82, 84
 - primary error messages 187
 - print cartridges. *See* toner cartridges
 - print density
 - operations 77, 86
 - troubleshooting 206
 - print media. *See* media
 - PRINT period 73
 - print quality, troubleshooting 203, 205
 - print servers, JetDirect
 - configuration page 222
 - installation guide 221
 - models including 3
 - ordering 235
 - Printer Command Language (PCL) commands 53
 - printer drive assembly
 - diagrams and part numbers 254
 - gears, removing 143
 - removing 138
 - printer drivers, downloading 17
 - Printer Job Language
 - commands 53
 - features 78
 - processing state, LEDs 187
 - processor
 - initialization sequence 72
 - jam detection operations 94
 - operations sequences 73
 - speed 2
 - product information, self-test/configuration page 49
 - production code 4
 - protocol information 223
 - PS emulation 3
 - PS wait timeout 49
- Q**
- quality, troubleshooting 203, 205
- R**
- radiation, laser 12
 - radio frequency interference (RFI) shield, handling
 - precautions 99
 - RAM
 - errors 193, 194
 - operations 77
 - random access memory (RAM)
 - errors 193, 194
 - operations 77
 - read-only memory (ROM)
 - errors 193
 - operations 77
 - Ready LED
 - locating 44
 - status messages 187
 - reams, paper 36, 219
 - rear cover, removing 104
 - rear output bin
 - capacity 2
 - feeding operations 89
 - jams, troubleshooting 201
 - locating 7
 - special media, using with 31
 - recycled paper 14, 41
 - recycling
 - plastics 13
 - supplies 14
 - toner cartridges 68
 - redistributing toner 69
 - refeeder assembly (tray 2), removing 157
 - refilled toner cartridges 68
 - registration assembly, removing 162
 - registration rollers
 - locating 10
 - operations 89
 - registration shutter
 - cleaning 63
 - operations 89
 - registration, checking 52
 - regulatory information 12
 - relative humidity. *See* humidity
 - relays, fuser assembly 80
 - removing parts 99
 - repair centers, worldwide 18
 - repair warranty 15

- repeating images, troubleshooting 209
- repetitive defects
 - ruler 211
 - troubleshooting 207
- replacement intervals
 - parts 62
 - toner cartridges 68
- replacing parts 99
- reports
 - demo page 45
 - JetDirect configuration page 222
 - self-test/configuration page 48
 - status log 202
- reseller sales and service support 17
- reset default, paper size 55
- resetting printer 56
- residual paper check 72
- residual toner, cleaning operations 83
- resistivity specifications
 - labels 35
 - transparencies 36
- Resolution Enhancement technology (REt) 77
- resolution specifications 2
- REt (Resolution Enhancement technology) 77
- returns, recycling program 14
- reverse motor
 - locating 228
 - operations 89
 - power-on sequence 72
 - removing 137
 - rotation periods 80
- reversed paper sensor (PS501)
 - diagram 90
 - jam detection 94
 - media detection 93
 - operations 89
- reversing delay jams 95
- reversing stationary jams 95
- revision level 4
- RFI shield, handling precautions 99
- ribbon cable harness, removing 136
- rollers
 - 250-sheet feeder, removing 171
 - 500-sheet feeder, removing 176
 - cleaning 63
 - image defects, troubleshooting 211
 - image formation operations 82
 - locating 10
 - lower output delivery, removing 131
 - paper feed operations 89
 - replacement intervals 62
 - transfer, removing 113
 - transport, removing 134
 - tray 1 pick-up, removing 144, 146
 - tray 2 pick-up, removing 153
 - tray 2 pick-up, replacing 156
 - upper output delivery, disassembling 130
 - upper output delivery, removing 129
- ROM
 - errors 193
 - operations 77
- rotation
 - drum test 212
 - motors 80
- ruler, repetitive defect 211

S

- safety precautions
 - parts removal 99
 - toner cartridges 11
- sales and service offices
 - United States 17
 - worldwide 18
- scalable fonts, included 3
- scan buffer errors 193
- scanner assembly. *See* laser/scanner assembly
- scanner errors 192
- scanner motor
 - errors 192
 - rotation periods 80
- scattered toner, troubleshooting 209
- screwdrivers, required 99
- screws
 - self-tapping, installing 99
 - types of 236
- seams, envelopes 34
- secondary error messages
 - accessory errors 194
 - continuable errors 188
 - displaying 186
 - fatal errors 191
- selecting paper 29
- self-tapping screws 99, 236
- self-test, continuous 51
- self-test/configuration page
 - information on 49
 - JetDirect 222
 - printing 48
- sensor levers, paper
 - media detection 93
 - tray 1, removing 150
 - tray 2, removing 159
- sensors
 - media detection 93
 - optic, tray 2 159
 - pick-up/feed system 89, 90
 - sheet feeders 92
- separation pads
 - cleaning 63
 - locating 10
 - operations 89, 91
 - removing (tray 1) 149
 - replacement intervals 62
- sequences
 - power-on 72
 - print periods 73
- serial number, locating 4
- servers, JetDirect
 - configuration page 222
 - installation guide 221
 - models including 3
 - ordering 235
- service agreements 17
- service and support CD-ROM 16
- service centers, Express Exchange 15
- service errors 186
- service ID 49
- service mode 53
- service offices, worldwide 18
- service parts CD-ROM 17
- settings
 - cold reset default, paper size 55
 - factory defaults, restoring 56
 - isolating print job 78
 - page count 54
 - print quality 77
 - self-test/configuration page 49
- setup requirements 26

- 79 service errors 186
 - sheet metal
 - handling precautions 99
 - torque values 236
 - sheet-feeders. *See* 250-sheet feeder; 500-sheet feeder
 - Sheffield rating, media 31, 39
 - shelf life, toner cartridges 67
 - shield, EIO 117
 - shipping media 37
 - signals
 - laser/scanner system 85
 - pick-up/feed system 90
 - sheet feeder 92
 - site requirements 26
 - size
 - cold reset default, paper 55
 - duplexer media 32
 - envelopes 33
 - media, detection operations 93
 - printer 5, 27
 - tray 1 media 31
 - tray 2 media 32
 - tray 3 media 32
 - skew
 - correction operations 89
 - troubleshooting 208
 - skin contact, toner 11
 - slots 3
 - smear toner, troubleshooting 207
 - smoothness, media 31, 39
 - solenoids
 - drive, removing (250-sheet feeder) 174
 - drive, removing (500-sheet feeder) 179
 - duplexer, removing 161
 - locating 228
 - pick-up/feed system 90
 - sheet feeder 91, 92
 - tray 1, removing 152
 - tray 2, removing 160
 - sound specifications 6
 - space requirements 27
 - special media
 - envelopes 33
 - labels 35
 - sizes supported 31
 - transparencies 36
 - troubleshooting 215
 - specifications
 - electrical 5
 - envelopes 33
 - environmental 6
 - labels 35
 - media 28
 - physical 5
 - resolution 2
 - site requirements 26
 - speed 2
 - transparencies 36
 - specks, toner 206
 - speed
 - Fast Infrared Receiver (FIR) port 59
 - printer 2
 - spilled toner 11, 63
 - springs, leaf 168
 - stages, image formation
 - cleaning 83
 - conditioning 84
 - developing 86
 - fuser 88
 - transferring 87
 - troubleshooting 212
 - writing 85
 - standby mode, power consumption 5
 - startup, LED sequence 187
 - static charge eliminator 83, 87
 - static discharge, precautions for 99
 - stationary jams 94, 95
 - status light, Fast Infrared Receiver (FIR) port 59
 - status lights, control panel. *See* lights, control panel
 - status log
 - accessory error codes 194
 - continuable error codes 188
 - fatal error codes 192
 - information on 49
 - printing 202
 - status messages. *See* error messages
 - STBY (standby) period 73
 - stopping print jobs 44
 - storing
 - envelopes 34
 - labels 35
 - media 36, 219, 220
 - printer 6
 - toner cartridges 67
 - supplemental documentation 16
 - supplies
 - media tests 41
 - ordering 234
 - recycling 14
 - support assistant CD-ROM 17
 - support, customer
 - HP Express Exchange 15
 - reseller sales and service 17
 - sales and service offices, worldwide 18
 - websites 17
 - surface resistivity specifications
 - labels 35
 - transparencies 36
 - swing arm 106, 108
 - switches
 - control operations 80
 - power, locating 7
 - switching, language 3
 - synthetic media, troubleshooting 218
 - systems, printing operations 75
- T**
- TCP/IP status 223
 - technical support 17, 18
 - telephone numbers
 - authorized resellers 17
 - Customer Services and Support Organization 16
 - ordering parts 234
 - reseller sales and service support 17
 - worldwide sales and service offices 18
 - temperature
 - changes, acclimating printer to 182
 - fuser assembly operations 80
 - fusing compatibility, media 33
 - labels, storing 35
 - media, storing 36, 219, 220
 - printer requirements 6
 - toner cartridges, storing 67
 - temporary engine errors 189
 - termination character, P/L commands 53
 - tests
 - engine 52
 - half self-test functional check 212

- media 37
- power-on 72
- self-test, continuous 51
- text, troubleshooting 206, 208
- theory of operations. *See* operations
- thermistor, fuser assembly 80
- timeout settings 49
- timing diagram 74, 224
- Token Ring networks, supported 77
- toner
 - fusing operations 88
 - image formation operations 86
 - loose, troubleshooting 207
 - redistributing 69
 - safety information 11
 - scatter, troubleshooting 209
 - smeared, troubleshooting 207
 - specks, troubleshooting 206
 - vacuuming 63
 - waste cleaning operations 83
- toner cartridge door
 - opening 100
 - swing arm 106, 108
- toner cartridges
 - capacity 2
 - components 82
 - detection switch 80
 - handling instructions 67
 - image formation operations 82
 - inspecting 204
 - locating 8
 - Material Safety Data Sheet (MSDS) 11
 - part numbers 235
 - recycling 14, 68
 - redistributing toner 69
 - refilled 68
 - removing 100
 - safety information 11
 - storing 67
 - weight 68
- toner-cartridge guide, removing 166
- tools
 - media tests 41
 - service, required 99
- top cover
 - locating 7
 - parts and diagrams 240
 - removing 106
- top door, switch control 80
- top output bin
 - capacity 2
 - feeding operations 89
 - jams, troubleshooting 201
 - locating 7
- top-of-page sensor (PS2305)
 - diagram 90
 - jam detection 94
 - media detection 93
 - operations 89
- torque values, fasteners 236
- total pages printed 49
- trailing edge, detection operations 89, 94
- transfer charging roller
 - cleaning operations 72
 - locating 10
 - operations 82
- transfer guide unit, cleaning 63
- transfer roller
 - cleaning 63
 - operations 87
 - removing 113
 - replacement interval 62
- transferring stage, image formation 87
- transparencies
 - engine cleaning, using for 66
 - sizes supported 31
 - specifications 36
 - troubleshooting 218
- transport belts and rollers
 - removing 134
 - replacement intervals 62
- tray 1
 - capacity 31
 - extensions, locating 7
 - feeding operations 30, 89
 - jam detection operations 94
 - locating 7
 - media supported 31
 - out of paper error 188
 - paper sensor (PS3208) 90, 93
 - paper-sensor lever, removing 150
 - pick-up roller assembly, removing 146
 - pick-up roller, locating 10
 - pick-up roller, removing 144
 - pick-up solenoid (SL2908) 90, 228
 - removing 110
 - separation pad, removing 149
 - solenoid, removing 152
- tray 2
 - capacity 32
 - cassette, diagrams and part numbers 264
 - drive assembly, diagrams and part numbers 268
 - external covers, diagrams and part numbers 262
 - feeding operations 30, 89
 - internal components 266
 - jam detection operations 94
 - locating 8
 - media supported 32
 - ordering 235
 - PCB, diagrams and part numbers 270
 - pick-up roller and refeeder assembly, removing 157
 - pick-up roller assembly, removing 153
 - pick-up roller, replacing 156
 - removing 101
 - solenoid, removing 160
- tray 3
 - assembly connector, removing 164
 - capacity 32
 - cassette (250-sheet feeder) 170, 264
 - cassette (500-sheet feeder) 175, 274
 - components 228
 - drive assembly (250-sheet feeder) 172, 268
 - drive assembly (500-sheet feeder) 177, 278
 - drive solenoid, removing (250-sheet feeder) 174
 - drive solenoid, removing (500-sheet feeder) 179
 - external covers (250-sheet feeder) 262
 - external covers (500-sheet feeder) 272
 - feeding operations 30, 89
 - internal components (250-sheet feeder) 266
 - internal components (500-sheet feeder) 276
 - jam detection operations 94
 - locating 8, 9
 - media supported 32
 - models including 5
 - ordering 235
 - PCB (250-sheet feeder) 270
 - PCB (500-sheet feeder) 280
 - pick-up roller, removing (250-sheet feeder) 171

- pickup roller, removing (500-sheet feeder) 176
- removing 101
- sensors 92, 93
- trays
 - cassette pickup assembly 256
 - feeding operations 30, 89
 - jam detection operations 94
 - jams, troubleshooting 200
 - locating 7
 - media detection 93
 - media supported 31
 - models including 5
 - ordering 235
 - removing 101, 110
 - separation pad, locating 10
- troubleshooting
 - communications 221
 - continuable errors 188
 - control panel LED messages 186
 - drum rotation functional check 212
 - engine test 52, 196
 - envelopes 217
 - fatal errors 191
 - flowchart 184
 - half self-test functional check 212
 - image quality 203, 205
 - jams 197
 - labels 216
 - media 29, 213
 - power-on 185
 - preliminary operating checks 182
 - process 182
 - repetitive defect ruler 211
 - special media 215
 - status log 202
 - transparencies 218
- TrueType fonts, included 3
- truss head screws 236
- two-way communications
 - operations 77
 - troubleshooting 221
- typefaces, included 3

U

- UltraPrecise toner cartridges. *See* toner cartridges
- unplugging printer 99
- upper output delivery roller
 - disassembling 130
 - removing 129
- USB
 - cables, part numbers 235
 - interface operations 77
 - port 3
- user guide 16

V

- vacuuming toner 11, 63
- value field, PJI commands 53
- vector graphics, features 3
- ventilation requirements 26
- vertical lines, troubleshooting 206
- voltage
 - part numbers 234
 - power supplies 81
 - specifications 5
- voltage contacts (dc bias), removing 168
- volume resistivity specifications
 - labels 35

- transparencies 36

W

- WAIT period 73
- wait timeout 49
- warranty 15
- washing off toner 11
- waste toner 83
- wave. *See* curl
- Web JetAdmin information 223
- websites
 - drivers 17
 - Energy Star 13
 - HP JetDirect installation guide 221
 - Material Data Safety Sheet (MSDS) 11, 14
 - parts information 17
 - print media guide 28
 - recycling information 14
 - support information 17
- weight
 - envelopes 33
 - equivalence table, paper 38
 - media, calculating 37
 - media, duplexer 32
 - media, tray 1 31
 - media, tray 2 32
 - media, tray 3 32
 - printer 5
 - toner cartridges 68
- white pages, troubleshooting 210
- width, printer 5, 27
- wire harnesses, replacing 99
- wireless printing 3, 59
- wood-pulp test kits 41
- worldwide sales and service offices 18
- wrinkled pages, troubleshooting 208
- writing stage, image formation 85



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C7058-90936