

HP LaserJet 5Si Family Printers Service Manual

Product: 1997 HP LaserJet 5Si Family Printer Service Repair Workshop Manual
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Service Manual

HP LaserJet 5Si (C3166A)
HP LaserJet 5Si MX (C3167A)
HP LaserJet 5Si NX (C3950A)
HP LaserJet 5Si HM (C3124A)
HP LaserJet 5Si Mopier
(C4076A/C4077A/C4176A)

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WARNING

Electrical Shock Hazard

To avoid electrical shock,
use only supplied power
cords and connect only to
properly grounded (3-hole)
wall outlets.

Conventions

This manual uses the following conventions:

The names of major printer parts and assemblies are Capitalized.

Color is used to emphasize items which are important to the material under discussion.

Bold is used for emphasis, particularly in situations where *italic* type would be confusing.

Italic type is used to indicate related documents or emphasis.

Note

Notes contain important information set off from the text.

Caution

Caution messages alert you to the possibility of damage to equipment or loss of data.

WARNING!

Warning messages alert you to the possibility of personal injury.

Chapter Descriptions

1 Product Information

Contains printer features and product overview, tray capacities and sizes, media specifications, service approach, and how to get technical assistance.

2 Site Requirements

Contains space and environmental requirements.

3 Operating Overview

Contains details about control panel menus, restoring factory defaults, and resetting and testing the printer.

4 Maintenance and Adjustments

Contains cleaning and preventive maintenance information, and adjustment procedures for Tray 2, Tray 3, and Tray 4.

5 Functional Overview

Contains block diagrams and basic theory of operation for the printer systems, paper paths, and paper handling accessories.

6 Removal and Replacement

Contains step-by-step procedures for replacing field replaceable units (FRUs) in the printer, 2000-Sheet Input Unit, Multi-Bin Mailbox, and the Mailbox with Stapler.

7 Troubleshooting

Contains a preliminary troubleshooting table, a table with descriptions and recommended actions for all control panel messages, image defect samples, and troubleshooting checks and tools.

8 Parts and Diagrams

Contains exploded view drawings and part number listings for all replaceable parts in the printer, 2000-Sheet Input Unit, Multi-Bin Mailbox, and Mailbox with Stapler.

A Parts Index

Contains two replaceable parts tables: one sorted alphabetically by part name, and one sorted numerically by part number. Both tables are cross referenced to the diagrams in Chapter 8.

B I\O Information

Contains basic cabling and configuration information for connecting the printer to supported networks.

C Regulatory Information

Contains required safety and compliance statements.

Subject Index

Contains an alphabetical, cross referenced listing of information found in the main body of the manual.

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Product Information

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Printer Features

Table 1-1
Printer Features

Features	LaserJet 5Si (C3166A)	LaserJet 5Si MX (C3167A)	LaserJet 5Si Mopier (C4076A/C4077A/ C4176A)
Print Speed	24 ppm letter or A4 13 ppm ledger (11x17) or A3	24 ppm letter or A4 13 ppm ledger (11x17) or A3	24 ppm letter or A4 13 ppm ledger (11x17) or A3
Duplex Speed	15 ppm legal or B4 9.5 ppm letter or A4 6.5 ppm ledger or A3 7.5 ppm legal or B4	15 ppm legal or B4 9.5 ppm letter or A4 6.5 ppm ledger or A3 7.5 ppm legal or B4	15 ppm legal or B4 9.5 ppm letter or A4 6.5 ppm ledger or A3 7.5 ppm legal or B4
Text & Graphics Resolution	600 dpi; plus Resolution Enhancement technology (REt)	600 dpi; plus Resolution Enhancement technology (REt)	600 dpi; plus Resolution Enhancement technology (REt)
Printer Language(s) Standard	Enhanced PCL 5	Enhanced PCL 5 Adobe PostScript Level 2	Enhanced PCL 5 Adobe PostScript Level 2
Optional	Adobe PostScript Level 2	None	None
Duty Cycle (Monthly Usage)	Up to 100,000 images	Up to 100,000 images	Up to 100,000 images
Memory: Standard¹ Optional (maximum)²	4 Mbyte 132 Mbyte total	12 Mbyte 76 Mbyte total ³	12 Mbyte 76 Mbyte total ³
Internal Typefaces	45 PCL	45 PCL, 35 PostScript	45 PCL, 35 PostScript
Cartridge Slots	0	0	0
Standard Interfaces	IEEE 1284 ECP Parallel	IEEE 1284 ECP Parallel JetDirect MIO	IEEE 1284 ECP Parallel JetDirect MIO
Power Control	PowerSave Mode	PowerSave Mode	PowerSave Mode
Control Panel	5 Keys, LCD Display (2-line, 20 characters per line)	5 Keys, LCD Display (2-line, 20 characters per line)	5 Keys, LCD Display (2-line, 20 characters per line)
EconoMode (toner saving)	Yes	Yes	Yes

¹ Printer memory is optimized with Memory Enhancement technology (MEt).

² SIMMS available for use include 2, 4, 8, 16, and 32 Mbyte Modules. See "Accessories & Supplies" in Chapter 8 for option product numbers. (32 Mbyte modules are compatible, but not available from Hewlett-Packard.)

³ If the 8 Mbyte module is removed and replaced with a 32 Mbyte module, the maximum can be 100 Mbytes.

Paper Capacities and Sizes

Tray 1

Table 1-2

Tray 1 Media Guidelines

Media Type (Feed Orientation)	Dimensions	Weight	Capacity
Maximum paper size	11.7 x 17.7 in (297 x 450 mm)	Single-sided: 16-lb bond to 53-lb bond (110-lb index); 60 to 199 g/m ² Two-sided: 16 to 28-lb bond (60 to 105 g/m ²)	100 sheets of 20-lb bond paper (Do not load to more than a maximum height of 10 mm—the paperfill mark.)
Minimum paper size	3.9 x 7.5 in (99 x 191 mm)		
Paper, Letter (Landscape)	8.5 x 11 in (216 x 279 mm)		
Paper, ISO A4 (Landscape)	8.3 x 11.7 in (210 x 297 mm)		
Paper, Executive (Portrait)	7.25 x 10.5 in (184 x 267 mm)		
Paper, Legal (Portrait)	8.5 x 14 in (216 x 356 mm)		
Paper, Ledger (Portrait)	11 x 17 in (279 x 432 mm)		
Paper, ISO A3 (Portrait)	11.7 x 16.5 in (297 x 420 mm)		
Paper, JIS B5 (Landscape)	7.16 x 10.12 in (182 x 257 mm)		
Paper, JIS B4 (Portrait)	10.12 x 14.33 in (257 x 364 mm)		
Transparency	See minimum and maximum paper sizes listed above	0.0039 - 0.0045 in. thick (0.099 to 0.114 mm)	Limit to paperfill mark on paper width guides
Label		0.005 - 0.007 in. thick (0.127 to 0.178 mm)	
Envelope, Commercial #10 (Com 10) (Portrait)	4.1 x 9.5 in (105 x 241 mm)	Should not exceed 28-lb bond (105 g/m ²)	Up to 10 at one time
Envelope, C5 (Portrait)	6.4 x 9.0 in (136 x 231 mm)		
Envelope, DL (Portrait)	4.3 x 8.7 in (109 x 218 mm)		
Envelope, Monarch and B5 (Portrait)	3.9 x 7.5 in (99 x 191 mm)		

Table 1-2 Tray 1 Media Guidelines (continued)

Media Type (Feed Orientation)	Dimensions	Weight	Capacity
Envelope, B5 (Portrait)	6.93 x 9.84 in (176 x 250 mm)	Should not exceed 28-lb bond (105 g/m ²)	Up to 10 at one time
Post Card, 2X	5.83 x 7.87 in (149 x 200 mm)	Should not exceed 110-lb index (199 g/m ²)	

Tray 2

Table 1-3 Tray 2 Media Guidelines

Media Type (Feed Orientation)	Dimensions	Weight	Capacity
Paper, Letter (Landscape)	8.5 x 11 in (216 x 279 mm)	Single-sided: 16 to 28-lb (60 to 105 g/m ²)	500 sheets of 20-lb bond paper (letter and A4 for Trays 2,3, and 4)
Paper, ISO A4 (Landscape)	8.3 x 11.7 in (210 x 297 mm)	Two-sided: 16 to 28-lb bond (60 to 105 g/m ²)	
Paper, Legal (Portrait)	8.5 x 14 in (216 x 356 mm)		
Paper, JIS B4 (Portrait)	10.12 x 14.33 in (257 x 364 mm)		

Note

The HP LaserJet 5Si HM (C3124A) supports 16-53 lb bond media from all trays. However, performance in Tray 2 may not be as good with heavier media due to the sharp turn in the paper path. For best performance, Tray 1, 3, or optional Tray 4 are recommended.

Caution

When using 16 lb bond media, **only** use fusing mode=STD PAPER.

Tray 3

Table 1-4

Tray 3 Media Guidelines

Media Type (Feed Orientation)	Dimensions	Weight	Capacity
Paper, Letter (Landscape)	8.5 x 11 in (216 x 279 mm)	Single-sided: 16 to 28-lb (60 to 105 g/m ²)	500 sheets of 20-lb bond paper (letter and A4 for Trays 2,3, and 4)
Paper, ISO A4 (Landscape)	8.3 x 11.7 in (210 x 297 mm)	Two-sided: 16 to 28-lb bond (60 to 105 g/m ²)	
Paper, Legal (Portrait)	8.5 x 14 in (216 x 356 mm)		
Paper, JIS B4 (Portrait)	10.12 x 14.33 in (257 x 364 mm)		
Paper, Ledger (Portrait)	11 x 17 in (279 x 432 mm)		
Paper, ISO A3 (Portrait)	11.7 x 16.5 in (297 x 420 mm)		

Tray 4 (2000 Sheet Input Unit)

Table 1-5

Tray 4 Media Guidelines

Media Type (Feed Orientation)	Dimensions	Weight	Capacity
Paper, Letter (Landscape)	8.5 x 11 in (216 x 279 mm)	Single-sided: 16 to 28-lb (60 to 105 g/m ²)	2000 sheets of 20-lb bond paper (letter and A4 for Trays 2,3, and 4)
Paper, ISO A4 (Landscape)	8.3 x 11.7 in (210 x 297 mm)	Two-sided: 16 to 28-lb bond (60 to 105 g/m ²)	
Paper, Legal (Portrait)	8.5 x 14 in (216 x 356 mm)		
Paper, JIS B4 (Portrait)	10.12 x 14.33 in (257 x 364 mm)		
Paper, Ledger (Portrait)	11 x 17 in (279 x 432 mm)		
Paper, ISO A3 (Portrait)	11.7 x 16.5 in (297 x 420 mm)		

Identification

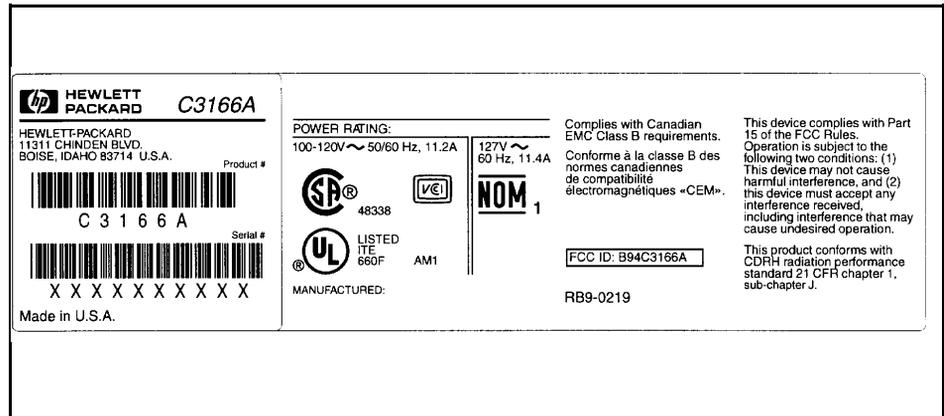
Model and Serial Numbers

The model number and serial numbers are listed on identification labels located on the rear of the printer. The model number is alphanumeric, such as C3166A for the HP LaserJet 5Si printer.

The serial number contains information about the Country of Origin, the Revision Level, the Production Code, and production number of the printer.

The rear labels also contain power rating and regulatory information as shown in Figure 1-1.

Figure 1-1



Sample Model and Serial Number Label

The identification labels for the 2000 Sheet High Capacity Input Tray are located on the back panel, directly below the identification labels on the printer.

To locate the identification labels for the 8 bin Multi-Bin Mailbox and 5 bin Multi-Bin Mailbox with Stapler, detach the unit from the printer. The identification labels are located on the bottom right of the front side (side that attaches to printer).

Specifications

This section contains information on physical and electrical characteristics of the printer. For information on the printer site and environmental requirements (such as operating temperature and humidity, ventilation, etc.) see Chapter 2.

Table 1-6

Printer Dimensions

Description	Dimension
Height	21.3 in. (541 mm)
Height of 2000 Sheet Input Unit (Tray 4)	18.9 in. (480 mm)
Width printer only with Multi-Bin Mailbox/Mailbox With Stapler attached ¹	46.75 in. (1187 mm) 66.25 in. (1683 mm)
Width of Multi-Bin Mailbox/Mailbox With Stapler	19.5 in. (495 mm)
Depth (body)	20.5 in. (520 mm)
Weight (without toner cartridge and with paper trays)	99 lbs. (45 kg)
Toner cartridge weight ² Full: Empty:	106 oz (3000 g) 80.5 oz (2200 g)

¹ Add 5.5 inches (140 mm) for the Multi-Bin Mailbox/Mailbox With Stapler. Refer to Chapter 2 for more details.

² Some quantity of toner will reside in the waste toner area of a toner cartridge when the toner supply is exhausted. Therefore toner cartridge weight may be an unreliable indication of remaining toner supply.

Table 1-7

Electrical Specifications

Volts	Freq	Amps*	Watts (typical)
Printer			
120 Vac \pm 10% 100 Vac \pm 10%	50/60 Hz \pm 2 Hz 50/60 Hz \pm 2 Hz	13.5 @ 120v	printing = 500 standby = 135 PowerSave Mode LaserJet 5Si =21 LaserJet 5Si MX=24
220 Vac \pm 10% 240Vac \pm 10%	50 Hz \pm 2 Hz 50 Hz \pm 2 Hz	6.0 @ 220v	printing = 500 standby = 135 PowerSave Mode LaserJet 5Si =21 LaserJet 5Si MX=24
2000-Sheet Input Unit (Tray 4)			
120 Vac \pm 10%	50/60 Hz \pm 2 Hz	0.5 maximum 0.3 average	45 Watts Maximum
240 Vac \pm 10%	50/60 Hz \pm 2 Hz	0.3 maximum 0.2 average	45 Watts Maximum
Multi-Bin Mailbox/Mailbox With Stapler			
100-240 Vac	50/60 Hz \pm 2 Hz	0.5 @ 120v 0.25 @ 240v	45 Watts Maximum

*Operating current requirements.

Table 1-8

Acoustic Emissions

Operation position (per ISO 9296)		Printer (stand alone)	Printer System*
Printing	L _{PA} dB(A)	54 db	56 db
Standby	L _{PA} dB(A)	42 db	42 db
Bystander 1m (per ISO 9296)			
Printing	L _{PA} dB(A)	50 db	55 db
Standby	L _{PA} dB(A)	38 db	42 db
Sound Power (per ISO 9296)			
Printing	L _{WAD}	6.6 bels (A)	7.1 bels (A)
Standby	L _{WAD}	5.5 bels (A)	5.5 bels (A)

* Printer System includes the 2000-Sheet Input Unit, Multi-Bin Mailbox/Mailbox With Stapler, Duplex Unit, and Envelope Feeder.

Media Selection Guidelines

Note

More detailed specifications are in the *HP LaserJet 5Si and 5Si MX User's Guide*, and the *HP LaserJet Printer Family Paper Specification Guide*. (See "Related Documentation and Training Media" later in this chapter.)

Paper

To achieve the best possible print quality and avoid paper jams, follow these guidelines for selecting paper:

- Use only copier grade paper that meets all specifications in the paper specification guide. Avoid paper with embossed lettering, perforations, or texture that is too smooth or too rough.
- Colored paper should be of the same high quality as white photocopy paper. The pigments must withstand the fusing temperature of 392° F (200° C) (215° C for HP LaserJet 5Si Heavy Media printers) for 0.1 second without deterioration. Do not use paper with a colored coating that was added after the paper was produced.
- Pre-printed forms must be printed with non-flammable, heat-resistant inks that do not melt, vaporize, or release hazardous emissions when subjected to the fusing temperature of 392° F (200° C) (215° C for HP LaserJet 5Si Heavy Media printers) for 0.1 second.
- A small sample of a new print media should be tested before purchasing large quantities.

Envelopes

Caution

To prevent severe printer damage, do not use envelopes that have windows, clasps, snaps, or synthetic materials.

Print Envelopes to the Face-Up Bin only

Envelopes can be printed from Tray 1 and from the optional Envelope Feeder. Choose envelopes that are well-constructed. They should lay flat and be sharply creased. They should not be wrinkled, nicked, or otherwise damaged. Envelope adhesive must be compatible with the heat and pressure of the fusing process.

Adhesive Labels

Use the following guidelines when selecting labels:

Caution

Tray 1 is required for printing adhesive labels.

Print labels to the Face-Up Bin only.

This printer does not support use of labels with any exposed spaces.

Do not attempt to print on label sheets after any of the labels have been removed from the sheet. Damage to the printer may result.

-
- Labels must be arranged on the carrier sheet so that there are no exposed spaces on the sheet. Using label stock with spaces between rows or columns of labels can often result in labels peeling off during printing, causing serious jamming and possible printer damage.
 - The top sheet (printing surface) must be of copier quality and provide good toner adhesion.
 - The carrier sheet (backing sheet) must be compatible with the temperatures and pressure of the fusing process, and must be coated for easy release of the top sheet.
 - The adhesive must be stable at the 392° F (200° C) temperatures encountered for 0.1 second in the fusing process, and must not produce emissions that exceed exposure levels or threshold limits established by OSHA and other safety agencies. Adhesives must not come into direct contact with any part of the printer.

A wide selection of suitable labels may be ordered through Hewlett-Packard. Available sizes are listed in the *HP LaserJet Printer Family Paper Specification Guide*.

Transparencies

Caution

Tray 1 (Multi Purpose) is required for printing transparencies.

Print transparencies to the Face-Up Bin only.

Overhead transparencies used in HP LaserJet printers must be able to withstand the 392° F (200° C) temperatures encountered in the printer's fusing process for 0.1 second. Suitable transparency film is available through Hewlett-Packard. Refer to the *HP LaserJet Printer Family Paper Specification Guide* for details.

Storing Print Media

Follow these guidelines when stacking and storing print media:

- Store paper in its ream wrapper until ready to use.
- Re-wrap partially used packages of media before storing.
- Stack each carton upright and squarely on top of the other.
- Store envelopes in a protective box to avoid damaging the envelope edges.
- Keep stored media away from temperature and humidity extremes.
- DO NOT store cartons or reams directly on the floor where they will absorb a higher moisture content. Instead, place cartons on a pallet or on shelves.
- DO NOT store individual reams in a manner that causes them to curl or warp along the edges.
- DO NOT stack more than six cartons on top of each other.
- DO NOT place anything on top of media, regardless of whether the paper is packaged or unpackaged.
- DO NOT store printed documents in vinyl folders (which may contain plasticizers) or expose the documents to petroleum based solvents.

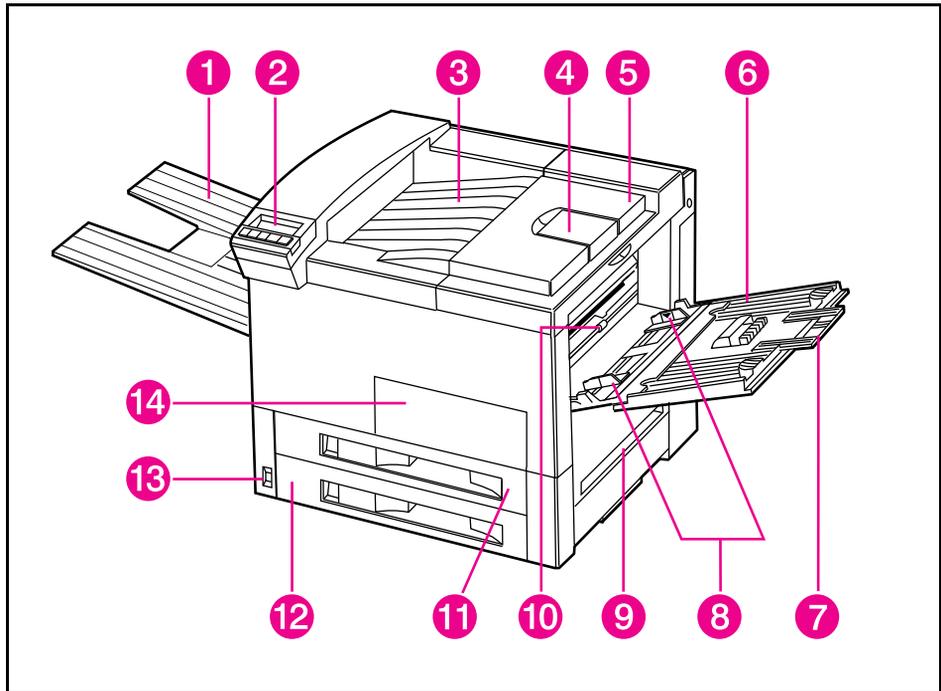
Shipping Print Media

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.

Product Overview

External View of HP LaserJet 5Si/5Si MX/NX and Mopier Engine

Figure 1-2

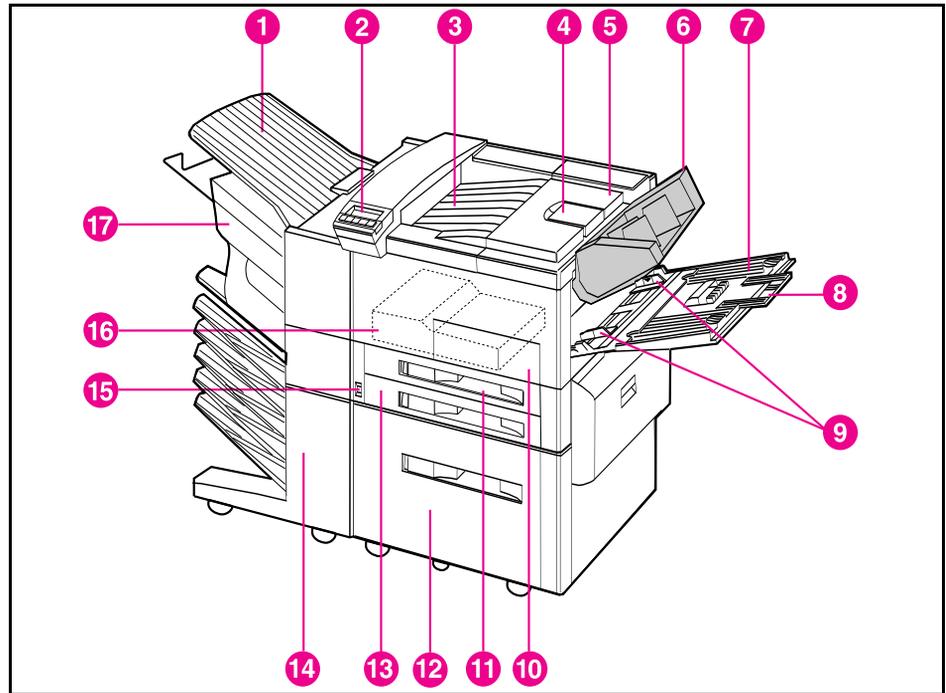


HP LaserJet 5Si/5Si MX/NX and Mopier Engine - Front and Right Side View with Tray 1 Open

- 1 Face-Up Bin
- 2 Control Panel
- 3 Face-Down Bin
- 4 Adjustable Paper Stop
- 5 Toner Cartridge Access Door
- 6 Tray 1
- 7 Tray 1 Extensions
- 8 Tray 1 Paper Width Guides
- 9 Input Slot for 2000-Sheet Input (Tray 4)
- 10 Tray 1 Pickup Roller
- 11 Tray 2
- 12 Tray 3
- 13 ON/OFF Switch
- 14 Front Access Door

External View of HP LaserJet 5Si Mopier

Figure 1-3

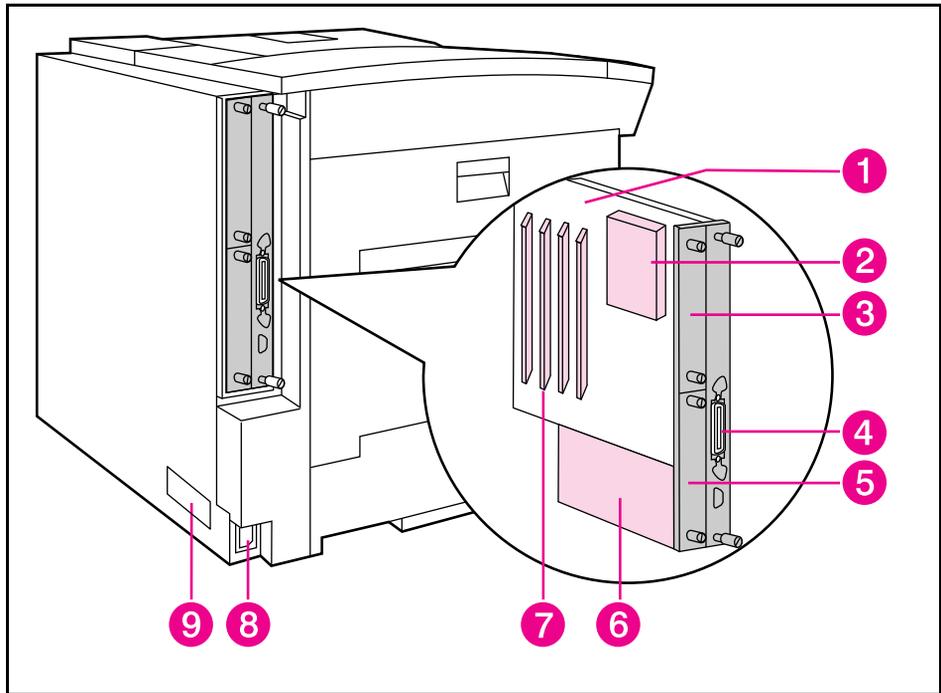


HP LaserJet 5Si Mopier - Front and Right Side View with Tray 1 Open

- 1** Left Output Bin
- 2** Control Panel
- 3** Top Output Bin
- 4** Adjustable paper stop
- 5** Top cover
- 6** Envelope Feeder (optional)
- 7** Tray 1 (multi-purpose)
- 8** Tray 1 extensions
- 9** Tray 1 paper width guides
- 10** Front door
- 11** Tray 2
- 12** HP 2000-Sheet Input Tray (Tray 4)
- 13** Tray 3
- 14** Mailbox with Stapler
- 15** On/Off switch
- 16** Duplexing Unit (internal)
- 17** Stapler Unit

Formatter Assemblies

Figure 1-4



Rear and Left Side View

- 1 Formatter Printed Circuit Assembly
- 2 Hard Disk Accessory Location (optional for LJ 5Si/5Si MX/5Si NX and standard for LJ 5Si Mopier and Mopier Engine)
- 3 MIO Card 1 Location
- 4 Parallel IEEE 1284 Interface Port
- 5 MIO Card 2 Location
- 6 External Paper Handling Controller Board Location
- 7 SIMM Slots
- 8 AC Power Connector
- 9 Model and Serial Number Label

Accessories and Options

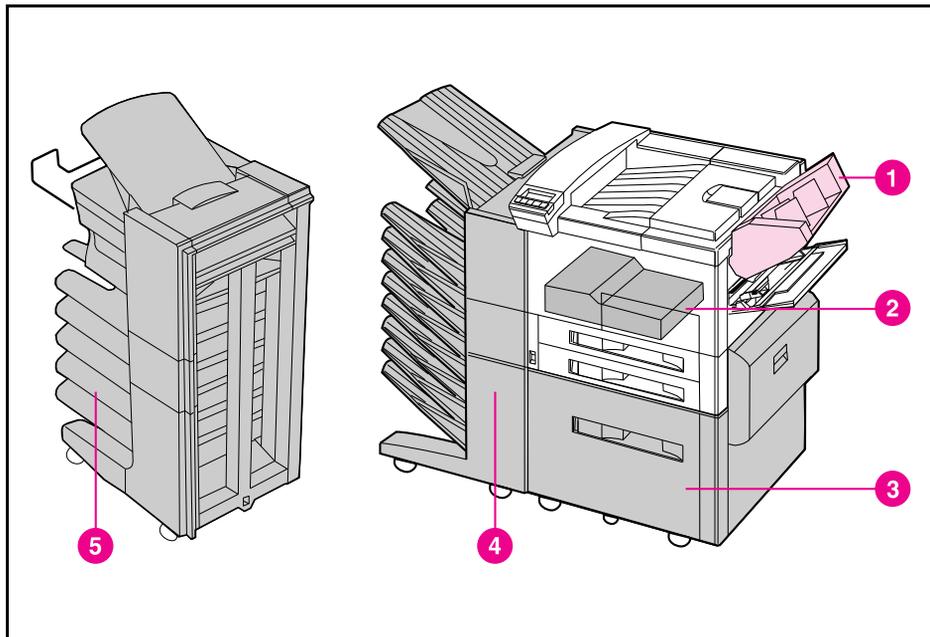
Product: 1997 HP LaserJet 5Si Family Printer Service Repair Workshop Manual

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~~-family-printer-service-repair-workshop-manual~~

The accessories and optional equipment for the LaserJet 5Si, 5Si MX, and 5Si NX printers are shown in Figure 1-5 and described in Table 1-9. For the LaserJet 5Si Mopier (C4076A), all the accessories in Figure 1-4 and in Table 1-9 are standard features, except for the Envelope Feeder and the Multi-Bin Mailbox (replaced with the Mailbox with Stapler).

Figure 1-5



HP LaserJet 5Si/5Si MX/NX Optional Paper Handling Accessories

- 1 Envelope Feeder
- 2 Duplex Unit
- 3 HP 2000-Sheet Input Unit (Tray 4)
- 4 Multi-Bin Mailbox (provides mailbox, job separation, and job stacking for the LaserJet 5Si family)
- 5 Mailbox with Stapler (provides mailbox, job separation, job stacking, and stapling for the LaserJet 5Si family)

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