

SERVICE MANUAL



EPSON EPL-N1600 Option
500 Sheets Feeder



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PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1) Personal injury and 2) damage to equipment.

DANGER Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

WARNING Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/ RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.
3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.
4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.
5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of the 500 Sheets Feeder for the EPL-N1600. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Contents

This manual consists of six chapters and Appendix.

CHAPTER 1. PRODUCT DESCRIPTIONS

Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES

Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3. TROUBLESHOOTING

Provides the step-by-step procedures for troubleshooting.

CHAPTER 4. DISASSEMBLY AND ASSEMBLY

Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5. ADJUSTMENTS

Provides Epson-approved methods for adjustment.

CHAPTER 6. MAINTENANCE

Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

APPENDIX Provides the following additional information for reference:

- Connector pin assignments
- Electric circuit boards components layout
- Exploded diagram
- Electrical circuit boards schematics

Symbols Used in This Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read WARNING, CAUTION or NOTE messages.



Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.



Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.



May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.

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CHAPTER

1

PRODUCT DESCRIPTIONS

1.1 OVERVIEW

This section describes the specification of the 500 Sheets feeder.

BASIC SPECIFICATION

Paper Separation:	By paper separation claw
Drive Source:	Driven by the base printer
Speed:	<With single side printing> A4 = 15.2PPM / Letter = 16.0PPM <With duplex printing> A4 = 7.8PPM / Letter = 8.0PPM
Paper Feed Origin:	Left edge of sheet

PAPER SPECIFICATION

Paper Type:	<Standard Paper> Xerox 4024DP 20 lb. (75g/m ²) paper <Normal Paper> 60 - 105 g/m ² (16 - 28 lbs.) - PPC Paper - Bond paper - Recycled paper
Paper Size:	A4 (210 x 297mm) Letter (8.5 x 11 inch) G-Legal (8.5 x 13 inch) Legal (8.5 x 14 inch)

RELIABILITY/DURABILITY/SERVICEABILITY

MPBF:	120,000 sheets or more
MTBF:	3,000 hours or more
Life:	300,000 sheets or 5 years (whichever comes first)
Paper Feed Reliability *1:	<Jam rate> 1/3000 sheets or less (1/2000 or less : Duplex printing) <Misfeed> 1/3000 sheets or less (1/2000 or less: Duplex printing) <Multiple sheet feed> 1/800 sheets or less <Folded coners> 1C or more at 1/1000 sheets or less (1C or less is not included)

NOTE:

*1: With recommended paper and normal conditions

MTTR:	30 minutes or less
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DEMENSION AND WEIGHT

Dimension:	396 x 389 x 114 mm (W x D X H)
Weight:	4.6 Kg (Feeder + Cassette)

CHAPTER

2

OPERATING PRINCIPLES

2.1 OVERVIEW

This section describes the operating principles of the 500 Sheets feeder unit.

2.1.1 Paper Transportation

Paper that is fed from the 500 Sheet Feeder is transported through the printer along the paper path shown in the Figure right.

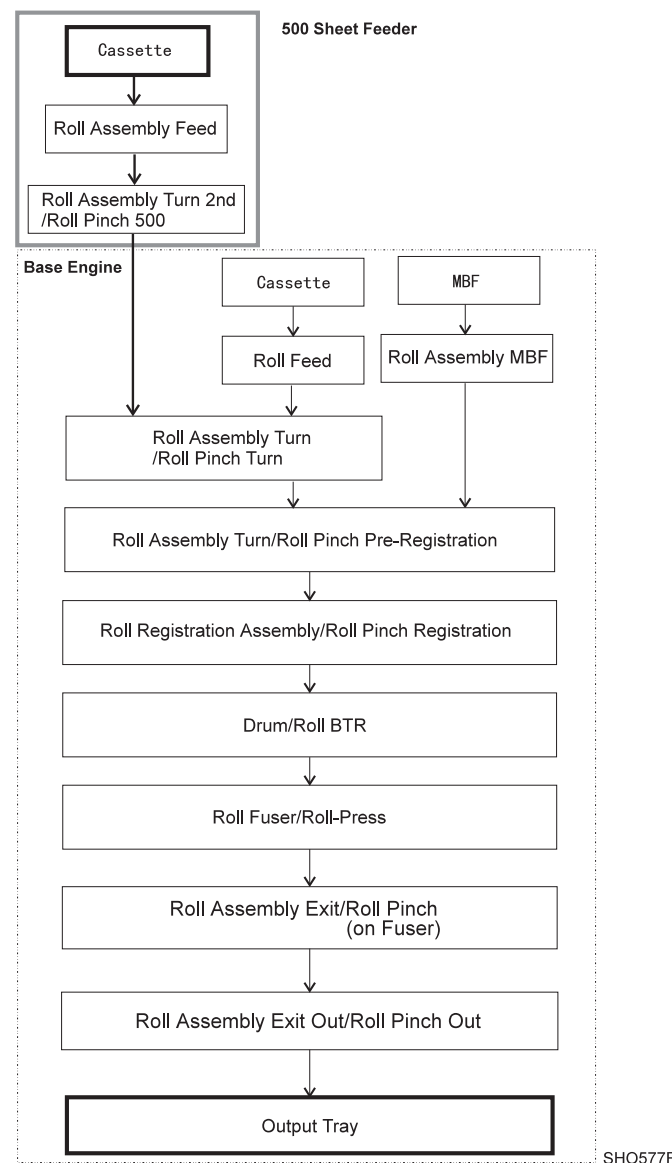
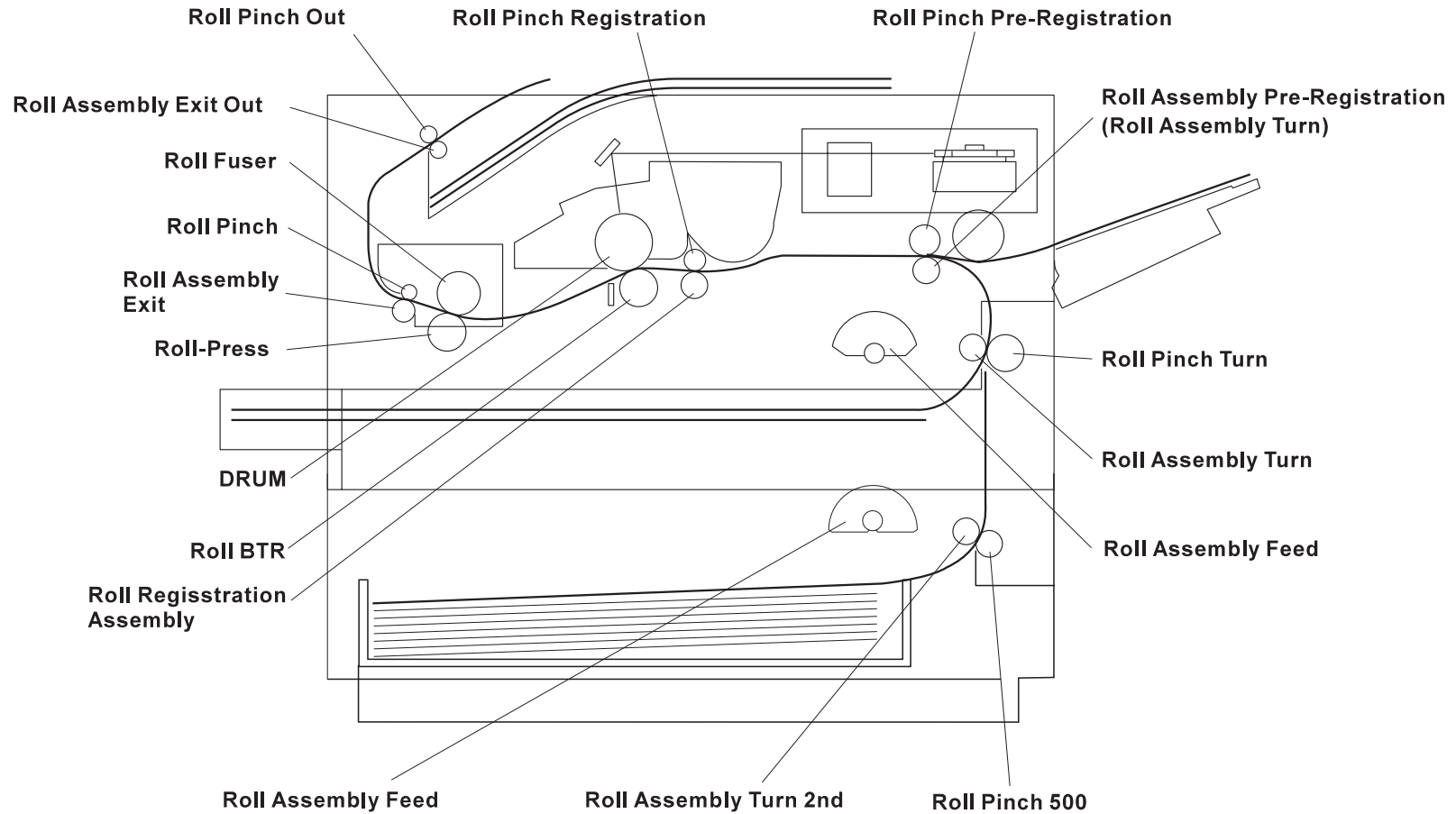


Figure 2-1. Paper Path

The Figure below is a cut-away side view of the EPL-N1600 with the optional 500 Sheet Feeder attached that shows the paper paths and the major components directly related to the paper transportation.



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Figure 2-2. 500 Sheet Feeder Paper Path

2.1.2 Drive Power Transmission

The drive power to operate the 500 Sheet Feeder is supplied by the Paper Handling Motor of the Base Engine through the Drive Assembly.

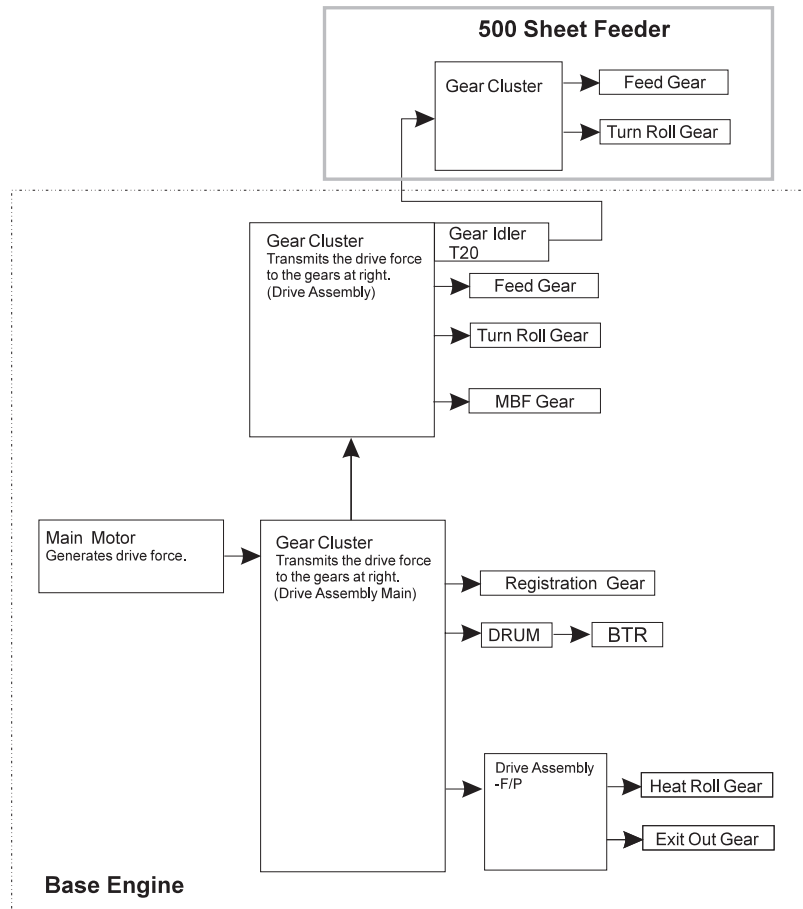


Figure 2-3. 500 Sheet Feeder Drive Power Transmission

The figure below shows the drive power transmission to 500 Sheet Feeder.

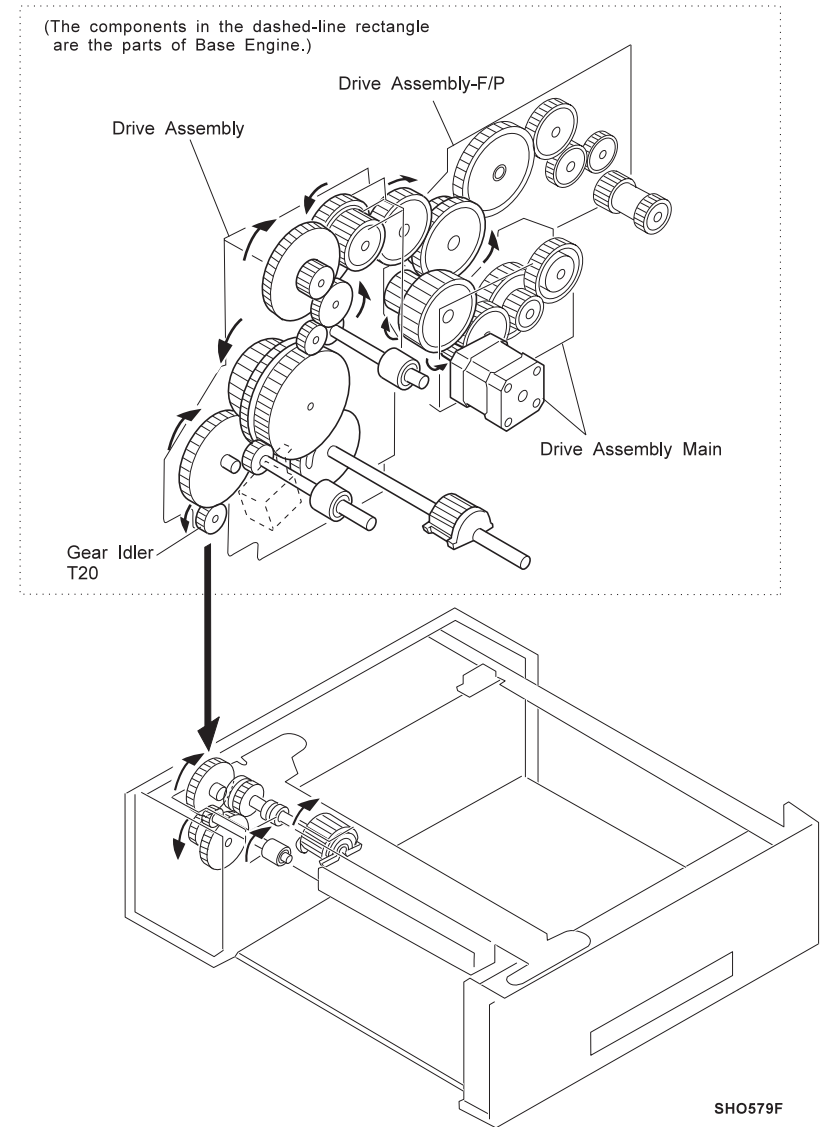
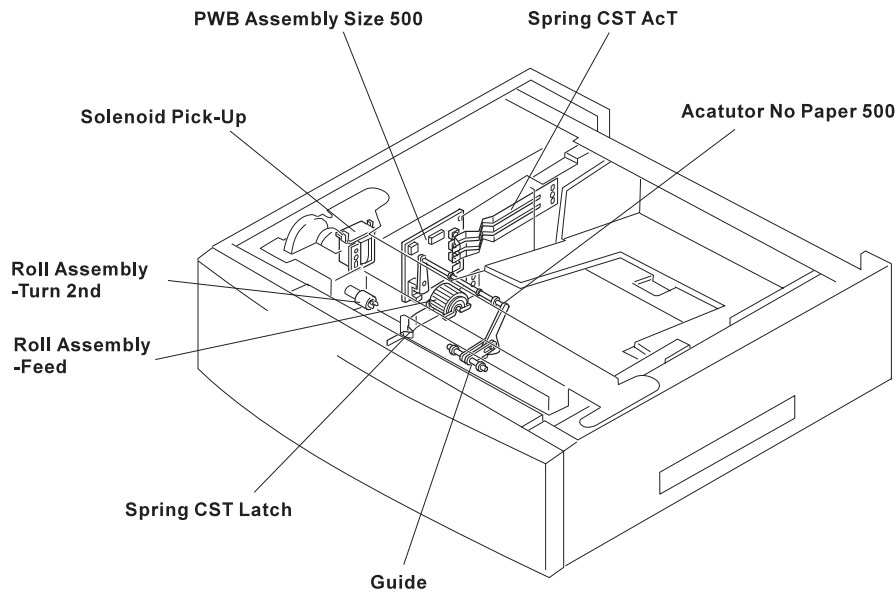


Figure 2-4. Drive Power Transmission

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2.1.3 Function of Major Components



500 Sheet Universal Cassette Universal paper cassette that holds 500 plain paper cut sheets of various regular sizes. You adjust the Cassette Guides to accommodate different paper sizes. Adjusting the Back Guide changes the position of the Actuators that are located along the left side of the cassette. When the cassette with paper loaded is installed in the Feeder, the Actuators press against the Size Spring.

Envelope/Postcard Cassette Holds standard envelopes and postcards. See Section 16 500 Sheet Feeder Specification.

PWB Assembly Size 500 A Spring CST Act, three Paper Size Switches, and the No-Paper Sensor are mounted on the Size PWB.

Spring CST Act: has three prongs. The Actuators on the side of the Paper Cassette press against individual prongs. Each prong in turn press against a Paper Size Switch.

Paper Size Switches: A Size Switch is On when the corresponding spring prong presses against it, and Off when the corresponding spring prong does not press against it. The combination of On and Off Size Switches represents the size of the paper that is loaded in the Cassette.

No Paper Sensor: When the Paper Cassette is empty, the Actuator No Paper 500 actuates the No Paper Sensor.

Spring CST Latch Secures the 500 Sheet Feeder in place in the Feeder.

Solenoid Pick-Up Releases the Gear Feed to allow it to engage with the drive gear and rotate one turn when actuated, and latches the Feed Gear after one turn. This causes the Roll Assembly Feed to rotate one turn.

Roll Assembly Feed Is a D-shaped roll that is driven to rotate one turn each time the Solenoid Pick Up is actuated.

Roll Assembly Turn 2nd Transports, along with the Roll Pinch that is located in the Cassette, paper out of the Cassette into the Base Engine paper path.

2.1.4 Paper Jam Detection

A paper jam between the 500 Sheet Feeder and the Sensor Pre-registration (Misfeed jam) is detected using the E_{2-1} time. The E_{2-1} time is a time interval from Solenoid Pick-Up actuation to Sensor Pre-registration actuation. If the paper fed from the 500 Sheet Feeder do not actuate the Sensor Pre-registration within this time interval, the MCU interprets that a Misfeed jam has occurred and displays Error (Feed jam).

The E_{2-1} time for the 500 Sheet Feeder (cassette 2) is 2.036 seconds.

CHAPTER

3

TROUBLESHOOTING

This chapter is not applicable to the 500 sheets Feeder.

CHAPTER

4

DISASSEMBLY AND ASSEMBLY

4.1 OVERVIEW

This section contains the removal and replacement procedures of major parts or subsystems within optional Feeder Assembly 500 of the EPL-N1600.

4.1.1 Precautions

Be sure to carry out all work in accordance with the precautions provided below to avoid damaging the unit during disassembly and assembly.



- Names of parts that appear in this chapter may not be exactly the same as the name appears in Parts List. For example, Roll Assembly Exit on the Parts List may appear as Roll Exit or Exit Roll in the RRP, so far as it does not cause confusion. This is because of readability or conventions.
- Always use correct type and size screws. Using a wrong screw can damage a tapped hole. Do not over-tighten screws.
- Do not use excessive force to either remove or install a part.

4.1.2 Tools

The following table lists the tools you need to disassemble and reassemble the printer.

Table 4-1. Required Tools

Tool	Market Availability	Code
Phillips screwdriver	Yes	B743800200
Tweezers	Yes	B641000100
Round nose pliers	Yes	B740400100

4.1.3 Removing Feeder Assembly 500

1. Disconnect the AC power cord to the rear of the printer.
2. Disconnect all interface Cables to the rear of the printer.
3. Remove the Paper Cassette from the Feeder Assembly 500.
4. Remove the 250 Sheet Paper Cassette (2). Remove the Duplex Chute Cover Assembly (2), if optional Duplex Unit is installed.
5. Press the Joint Feeder clips together and remove the two rear Joint Feeder clips securing the Feeder Assembly 500 to the printer or the Duplex Unit (1).
6. Press the Joint Feeder clips together and remove the two front Joint Feeder clips securing the Feeder Assembly 500 to the printer or the Duplex Unit (3).
7. Lift the base engine off of the Feeder Assembly 500. If the optional Duplex Unit is installed, first lift the base engine off of the Duplex Unit, then lift the Duplex Unit off of the Feeder Assembly 500.

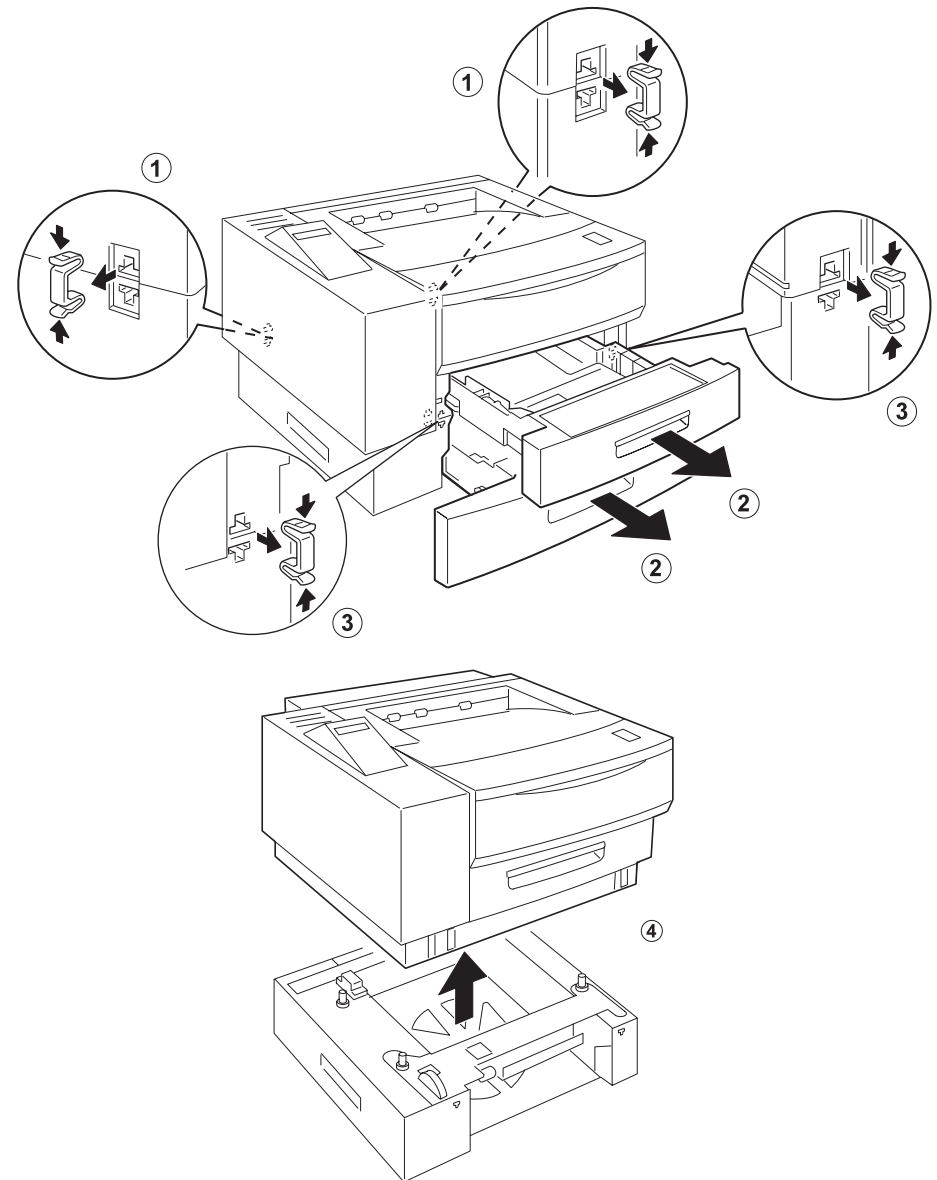


Figure 4-1. Removing Feeder Assembly 500

4.1.4 Frame 500 Removal

1. Remove the Feeder Assembly 500.
2. Remove the four screws that are securing the Frame Subassembly 500 to the Frame 500.
3. Push up on the Actuator No Paper 500 and raise the Subassembly off of the Frame 500.
4. Unhook the Solenoid Pick-Up wire harness from the harness clip.
5. Disconnect J322 on the Solenoid Pick-Up wire harness from the PWB Assembly Size 500.
6. Remove the Frame Subassembly.

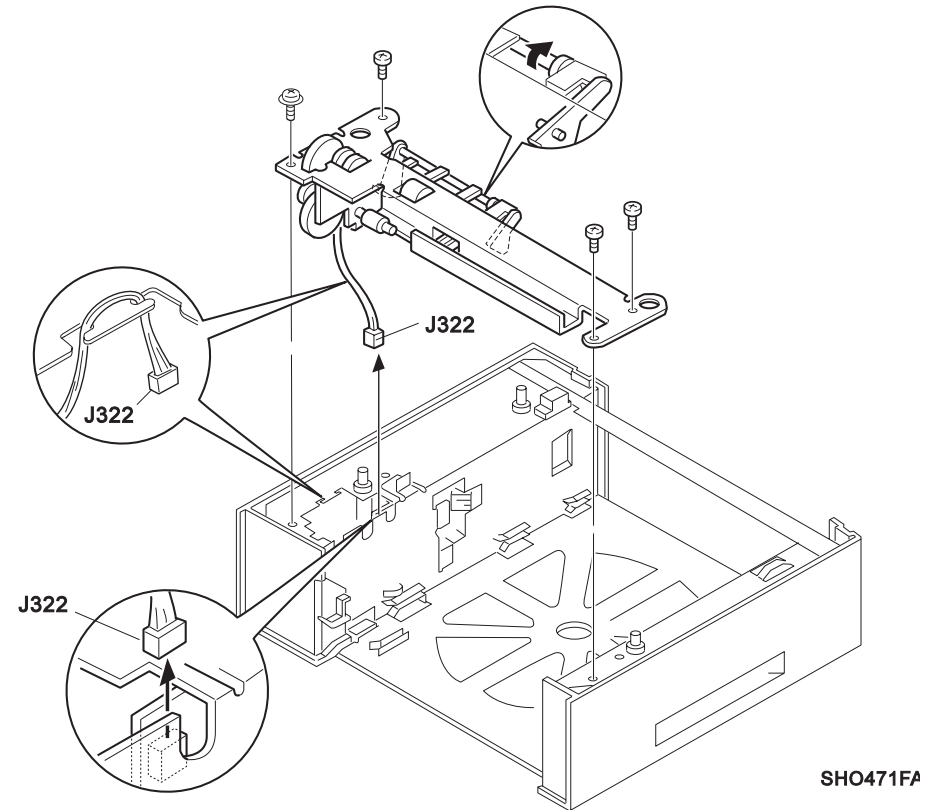


Figure 4-2. Frame 500 Removal

4.1.5 Solenoid Pick-Up Removal

1. Remove the Feeder Assembly 500.
2. Remove the Frame 500.
3. Remove the one screw that is securing the Solenoid Pick-Up to the Frame Subassembly 500.
4. Remove the Solenoid Pick-Up.

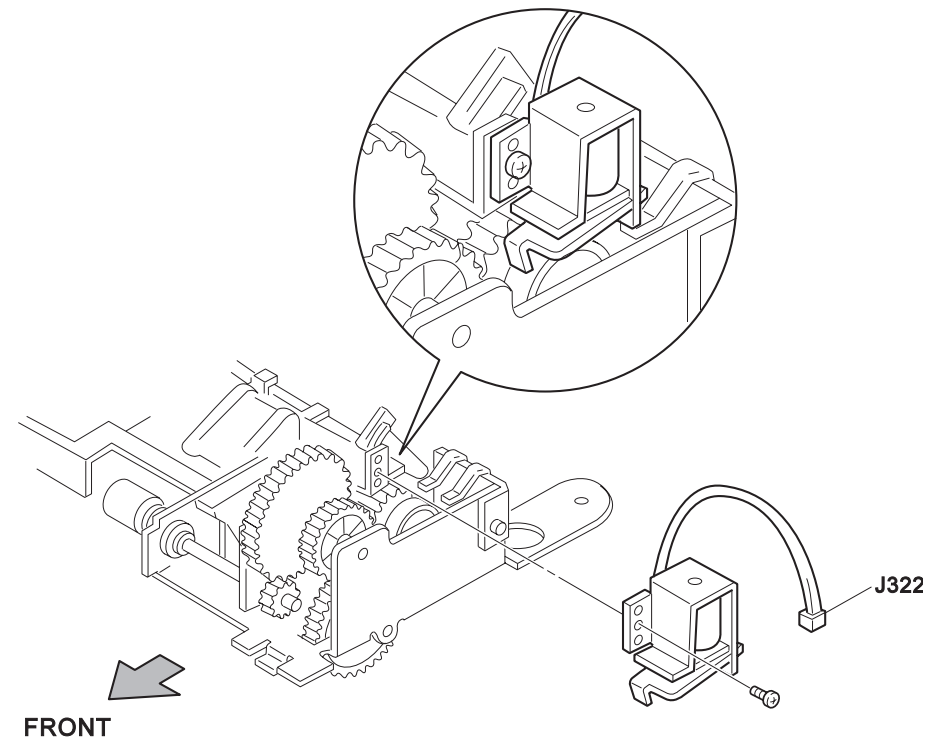


Figure 4-3. Solenoid Pick-Up Removal

4.1.6 Cover-L 500

1. Remove the Feeder Assembly 500.
2. Set the Feeder Assembly 500 on the right side (the Cover R 500 side).
3. Remove the two machine screws (screws with a flange), located on the bottom of the Feeder, that secure Cover-L 500 to the Frame 500.
4. Remove the three self-tapping screws, located on the top of the Feeder, that secure Cover-L 500 to the Frame 500.
5. If the Paper Cassette is installed, remove it from the Feeder Assembly 500.
6. Pull Cover-L 500 away from the Frame 500.

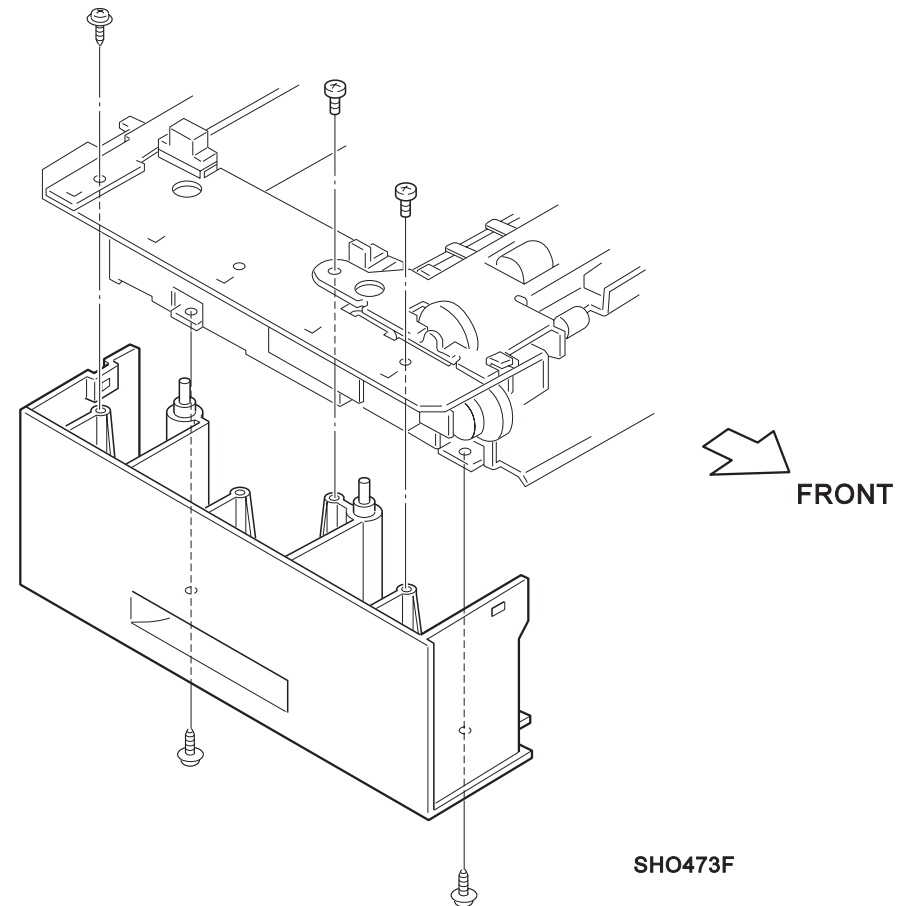


Figure 4-4. Cover-L 500 Removal

4.1.7 PWB Assembly Size 500 Removal

1. Remove the Feeder Assembly 500.
2. Remove the Cover-L 500.
3. Disconnect J302 from J292. Remove the two screws that secure the connector J292 bracket to the Frame 500, and cut the wire harness (1).
4. Remove the two screws that secure the PWB Assembly Size 500 to the Frame 500.
5. Slide the PWBA Size out of the retaining clips.
6. Remove the PWBA Size.
7. Disconnect J285 from the PWBA Size.

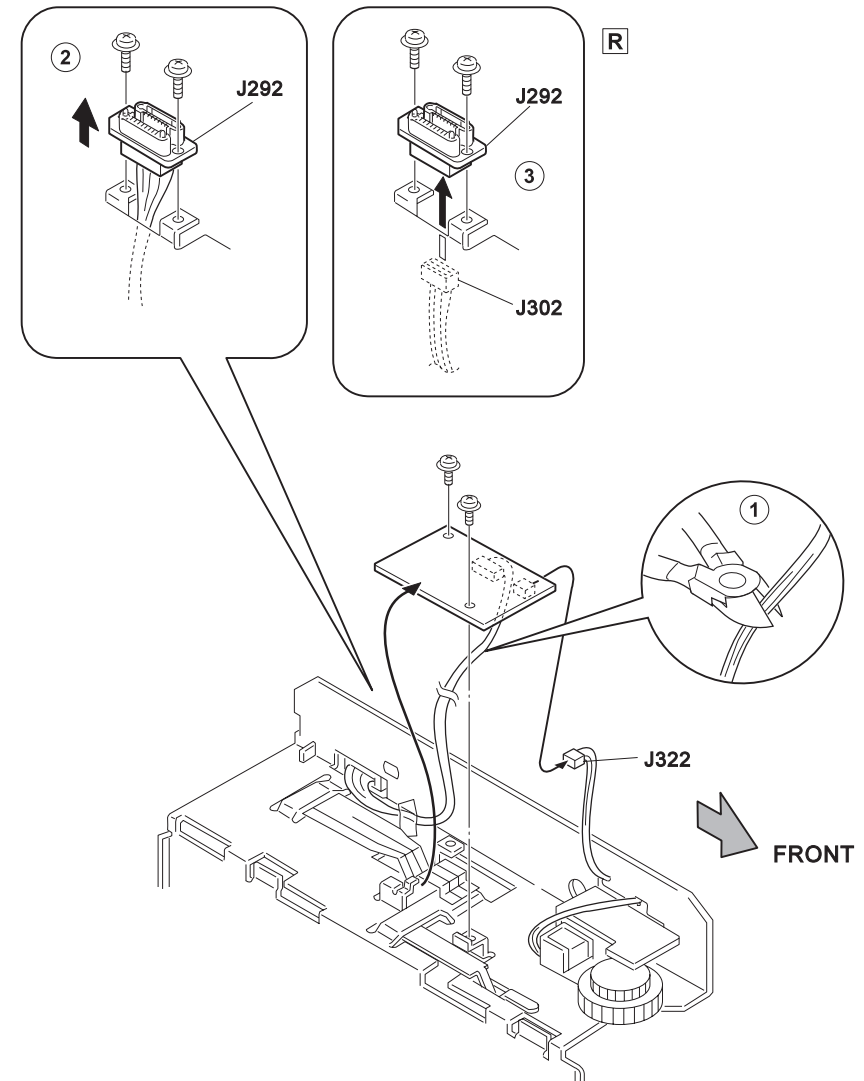


Figure 4-5. PWB Assembly Size 500 Removal

CHAPTER

5

ADJUSTMENT

There is no specific adjustment required for 500 sheets feeder.

CHAPTER

6

MAINTENANCE

No specific maintenance is required on the 500 Sheets Feeder.

CHAPTER

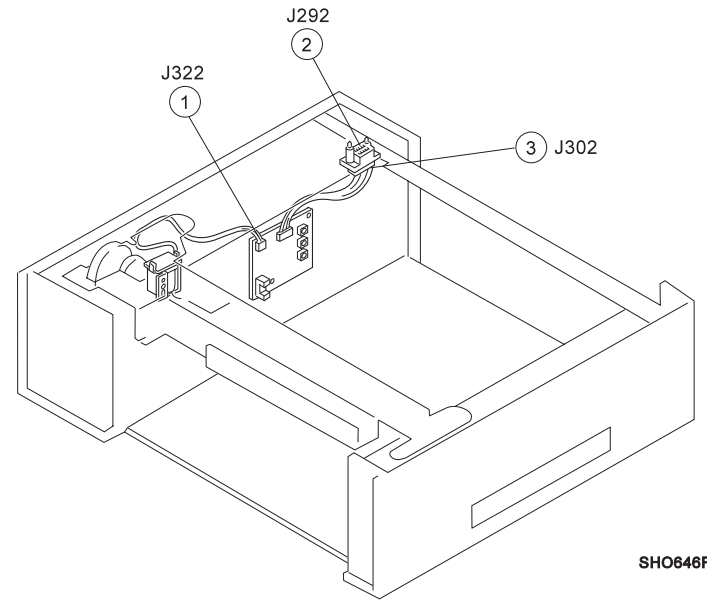
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APPENDIX

7.1 Connector Location

Connector	Location	Harness
J292	E2	Connects the 500 Sheet Feeder to the PWB Assembly-Size 1 or PWBA Assembly Duplex.
J302	E3	Connects the 500 Sheet Feeder to the PWB Assembly-Size 1 or PWBA Assembly Duplex.
P/J322	E1	Connects the Solenoid Pick-Up to the PWB Assembly Size 500.

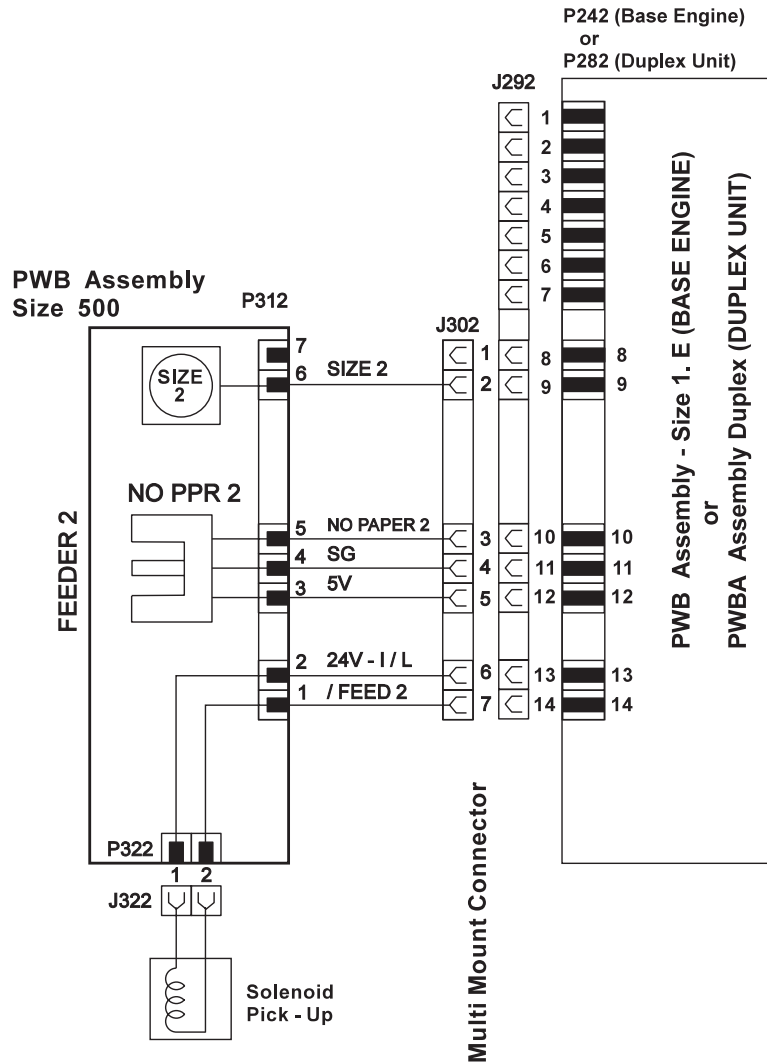
*1: "@" mark at the beginning of a harness name indicates that the subject harness is a part of the component from where the harness extends.



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Figure 7-1. Connector Location Diagram

7.2 Master Wiring Diagram



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Figure 7-2. Wiring Diagram - 500 Sheets Feeder

Signal names for the Base Engine or Duplex Unit ↔ PWB Assembly Size 500 ↔ Solenoid Pick Up path

Signal Name	Description
/SIZE2	Signal for indicating the detected size of paper in the Cassette in Feeder 2. (Analog value)
NO PAPER	Signal for monitoring paper in Feeder 2 (High when paper is present and Low when paper is not present)
/FEED2	Signal for actuating the Solenoid feeding paper in Feeder 2.

Pin numbers and voltage levels for the Base Engine or Duplex Unit

↔ PWB Assembly Size 500 ↔ Solenoid Pick-Up path

P312	P242 or P282	Signal Name	Signal Direction		High Level	Low Level
			M: PWBA MMCU	S: PWBA Size 500		
6	9	SIZE2	M ← S	-	*	*
5	10	NO PAPER2	M → S	Level	TTL	TTL
1	14	/FEED2	M → S	Level	24 V	0 V

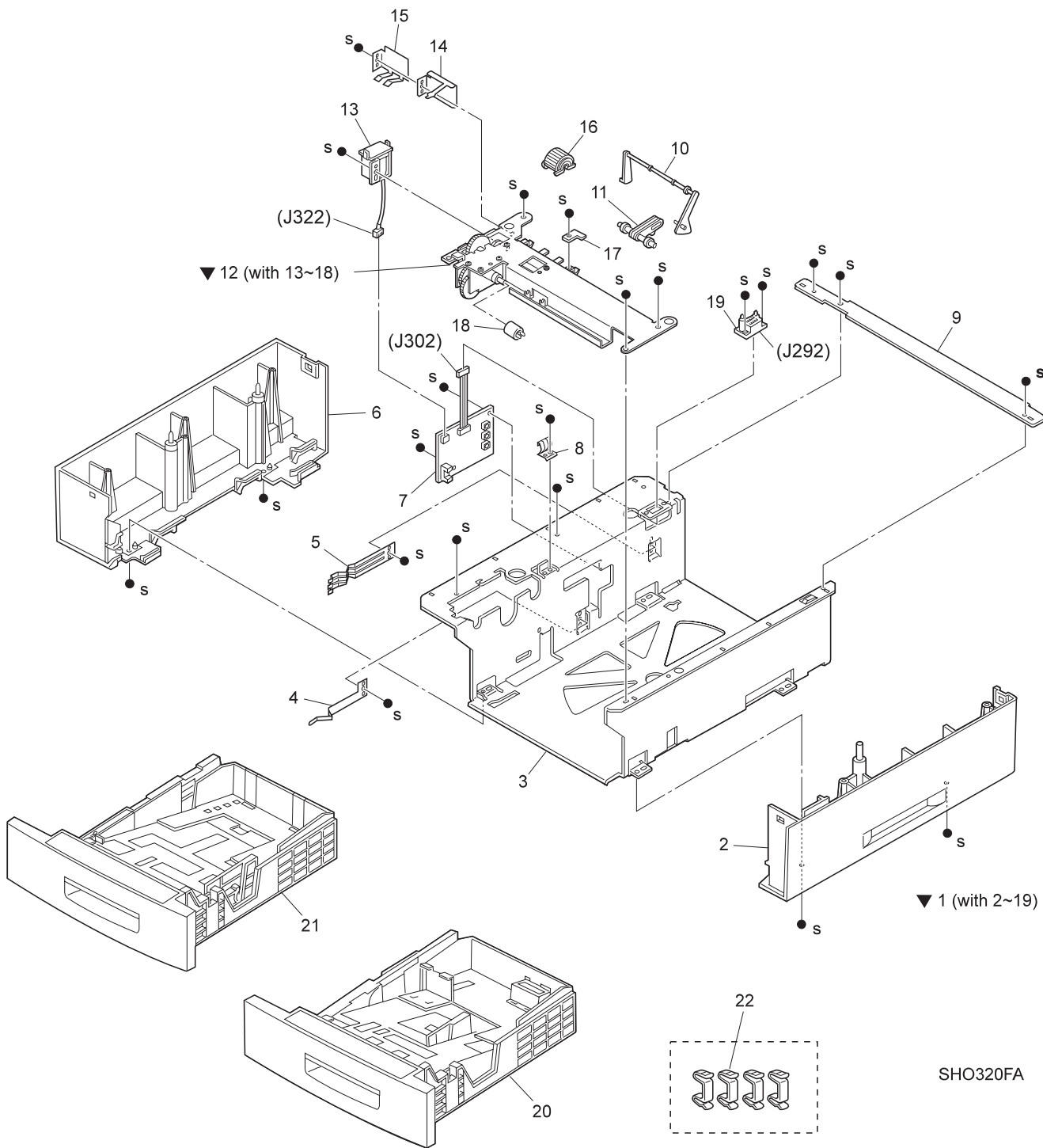
Relationship between paper sizes, pattern of actuated Paper SizeSwitches, and voltage of the SIZE signal for 500 Sheet Feeder

Paper Size	SW1	SW2	SW3	Signal Voltage (VDC)
Cassette not in place	0	0	0	0.45
Letter SEF	0	0	1	2.19
A4 SEF	0	1	1	2.82
Legal 13"	1	1	0	2.40
Legal 14"	1	1	1	3.08

7.3 Exploded Diagram

500 SHEET FEEDER (OPTIONAL)

1. Feeder Assembly 500 (with 2-19) \$
2. Cover R 500
3. Frame 500
4. Spring CST Latch
5. Spring CST Act
6. Cover-L 500
7. PWB Assembly Size 500 \$
8. Spring-Earth Feeder
9. Tie Bar 500
10. Actuator No Paper 500
11. Guide
12. Frame Subassembly 500 (with 13-18) \$
13. Solenoid Pick-Up (PL3.1.14) \$
14. Spring Feed 500
15. Support Spring Feed
16. Roll Assembly Feed
17. Plate N/P
18. Roll Assembly Turn 2nd
19. Connector
20. Envelope/Postcard Cassette
21. 500 Sheet Universal Cassette
22. Joint Feeder (PL10.1.8) \$



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