PHASER® 780
COLOR LASER PRINTER
Service Quick Reference Guide

Tektronix

Users safety summary

Terms in manual: CAUTION   Conditions that can result in damage to the product.
WARNING   Conditions that can result in personal injury or loss of life.

Power source: For 110 VAC printers, Do not apply more than 130 volts RMS between the supply conductors or between either supply conductor and ground. Use only the specified power cord and connector. For 220 VAC printers, Do not apply more than 250 volts RMS between the supply conductors or between either supply conductor and ground. Use only the specified power cord and connector.Refer to a qualified service technician for changes to the cord or connector.

Operation of product: Avoid electric shock by contacting a qualified service technician to replace fuses inside the product. Do not operate without the covers and panels properly installed. Do not operate in an atmosphere of explosive gases.

> WARNING   Turning the power off using the On/Off switch does not de-energize the printer. You must remove the power cord to disconnect the printer from the mains. Keep the power cord accessible for removal in case of an emergency.

Safety instructions: Read all installation instructions carefully before you plug the product into a power source.

Terms on product: CAUTION   A personal injury hazard exists that may not be apparent. For example, a panel may cover the hazardous area. Also applies to a hazard to property including the product itself.

DANGER   A personal injury hazard exists in the area where you see the sign.

Care of product: Disconnect the power plug by pulling the plug, not the cord. Disconnect the power plug if the power cord or plug is frayed or otherwise damaged, if you spill anything into the case, if product is exposed to any excess moisture, if product is dropped or damaged, if you suspect that the product needs servicing or repair, and whenever you clean the product.

Ground the product: Plug the three-wire power cord (with grounding prong) into grounded AC outlets only. If necessary, contact a licensed electrician to install a properly grounded outlet.

Symbols as marked on product:

DANGER high voltage:

Protective ground (earth) terminal:

Use caution. Refer to the manual(s) for information:

Laser use caution. Refer to the manual(s) for information:

WARNING: If the product loses the ground connection, usage of knobs and controls (and other conductive parts) can cause an electrical shock. Electrical product may be hazardous if misused.

Service safety summary

For qualified service personnel only: Refer also to the preceding Users Safety Summary.

Do not service alone: Do not perform internal service or adjustment of this product unless another person capable of rendering first aid or resuscitation is present.

Use care when servicing with power on: Dangerous voltages may exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on.

Disconnect power before removing the power supply shield, soldering, or replacing components.

Do not wear jewelry: Remove jewelry prior to servicing. Rings, necklaces, and other metallic objects could come into contact with dangerous voltages and currents.

Power source: This product is intended to operate from a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

This product is certified under IEC 825 as a Class 1 Laser Product.

DANGER: Invisible laser radiation when open and interlock defeated. AVOID DIRECT EXPOSURE TO BEAM.	CAUTION: Invisible laser radiation when open and interlocks defeated. AVOID DIRECT EXPOSURE TO BEAM.	VORSICHT: Unsichtbare Laserstrahlung, wenn Abdeckung geöffnet und Sicherheitsverriegelung überbrückt. NICH DEM STRAHL AUSSETZEN.	ATTENTION: Rayonnement laser invisible dangereux en cas d'ouverture et lorsque la sécurité est neutralisée. EXPOSITION DANGEREUSE AU FAISCEAU.	Class 3B
PELIGRO: Cuando se abre y se invalida el bloqueo, se producen radiaciones invisibles de láser. EVITESE LA EXPOSICIÓN DIRECTA A TALES RAYOS.	VARNING: Osynlig laser-strålning när denna del är öppnad och spärrar är urkopplade. STRÅLEN ÄR FARLIG.	VAROI: Näkymätön avattaessa ja suojalukitus ohitettaessa olet alttiina lasersäteilylle. ÄLÄ KATSO SÄTEESEN.	VARNING: Osynlig laserstrålning när denna del är öppnad och spärrar är urkopplade. BETRAKTA EJ STRÅLEN.	ADVARSEL: Usynlig laserstråling ved abning når sikkerhedsafbrydere er ude af funktion. UNDGÅ UD ÆTTELSE FOR STRÅLING.	ADVARSEL: Usynlig laserstraling nar deksel åpnes og sikkerhedslas brytes. UNNGÅ EKSPONERING FOR STRÅLEN.

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Contents

Key FRU Disassembly 81

Figures

Tables

General Information

This service guide contains information useful to verify operation, troubleshoot, repair, adjust, and maintain a Tektronix Phaser® 780 Color Printer.

To ensure complete understanding of the product, we recommend participation in Phaser 780 service training, if available.
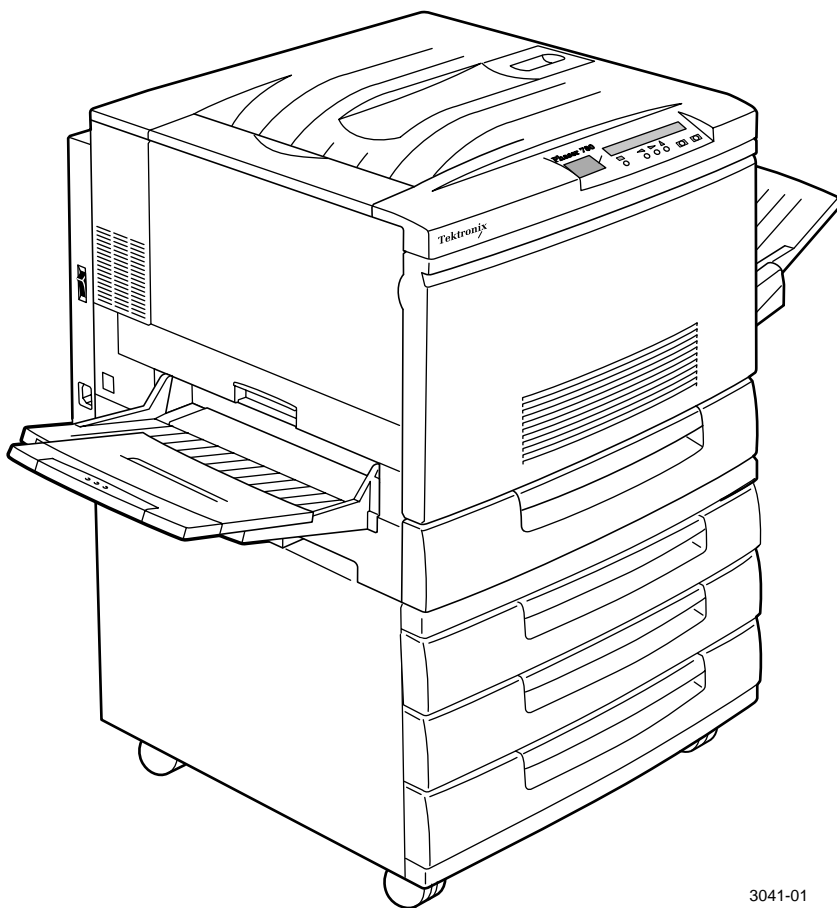
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The Phaser 780 printer (shown with optional Lower Tray Assembly)

Phaser 780 overview

The Phaser 780 Color Printer combines a color laser, continuous-tone print engine with an image processor supporting Adobe's PostScript 3 page description language. The image processor features a bi-directional parallel interface and a 10baseT Ethernet port for host communication. Optional network adapter cards to the image processor allow the printer to communicate on networks using LocalTalk, Ethernet 100baseT or Token Ring protocols. The Ethernet network card supports EtherTalk 100baseT, Novell and TCP/IP. With the Token Ring network card, the printer supports Token Ring protocols. The network cards are sometimes referred to as "smart cards" because each houses its own processor for executing specific on-board protocols; only data is transferred from the installed smart card to the printer's image processor board. The PCL printer language is also supported.

The printer is marketed in three versions:

The **Phaser 780 N** (Standard) comes standard with 64 Mbytes of RAM. The printer contains 136 standard, built-in fonts. The standard Phaser 780 prints at a resolution of 600 x 600 dots-per-inch on A and B-size media. The base printer does not support grayscale printing.

The **Phaser 780 GN** (Graphics) features 96 Mbytes of RAM and can print at 600 x 1200 dpi. It also contains 136 fonts. The graphics printers supports 16 level grayscale printing as well as printing oversize-B images.

The **Phaser 780 P** (Plus) features 192 Mbytes of RAM and supports the same features as the GN printer. In addition, the Plus version Phaser 780 supports image pipelining for greater throughput, a print collation mode, and a "check print before proceeding with job" mode. The plus printer also feature a SCSI-compatible interface to connect to an external hard disk drive for additional font storage. The hard disk drive is also required for print collation of multiple copy multi-page prints. A scanner can also be connected to the Plus printer's SCSI port to give the printer the ability to optically copy color images.

RAM memory in the printers can be supplemented with one or two additional 32-, 64-, or 128-Mbyte RAM DIMMs; the maximum usable capacity is 192 Mbytes

Print speeds depend on the chosen resolution and selected media. For resolutions of 600 x 600 (standard), in color, the printer prints at 4 A-size pages per minute (ppm) on paper. Monochrome printing (Fast Monochrome) is at 16 ppm on paper. Transparency film printing is always 2 ppm.

The printers support printing on A-, A4-, A5-, B-, B4, B5, SRA3, A3-, 13 x 19 in. and Legal-sized paper from a 250-sheet tray. An optional three-tray second feeder (called the Lower Tray Assembly) is available with additional 250-sheet standard media trays. The printer features a built-in multi-purpose tray from which specialty media, cardstock and envelopes can be fed. The printer also supports manual feeding using the multi-purpose tray.

After being idle for the selected amount of time the printer switches into its Energy Star mode where it consumes less than 45 watts of power. It "awakens" upon receiving data at any of its ports.

Memory considerations

The base printer features 32 Mbytes of RAM in one connector and features two additional DIMM connectors which accept 16-, 32-, 64-, or 128 Mbytes RAM DIMMs. The printer can use any off-the-shelf RAM meeting these specifications:

- 168 pin DIMM

- Synchronous DRAM

- 3.3 volt

- 9 nsec speed

- Valid on-board Serial Presence Detect ROM.

Upon power-up, the image processor interrogates the 256 byte Serial Presence Detect ROM which describes the DIMM in great detail, with details such as data width, clock delay, number of address columns and row, refresh rate and more. If the DIMM does not meet the required specifications it will be ignored; no error message will be reported.

With more memory the printer gains the capabilities of printing at higher resolutions, printing without having to use image compression (which trades off less installed RAM for longer image processing time) and dual frame buffers for printing one image while processing a second image (which gives greater printing throughput). With additional RAM memory, the printer's capabilities increase as detailed in the following table:

Table 1   Memory and features sets

Configuration/ options	"Standard" printer w/ 64 Mbyte RAM	"Graphics" printer w/ 96 Mbyte RAM	"Plus" printer w/ 192 Mbyte RAM
600 x 600 with full image area	Yes	Yes	Yes
600 x 1200 with full image area	No	Yes	Yes
Check Print/ PhaserMatch	No	No	Yes
Job Pipelining	No	No	Yes - 2 pages
Parallel port buffer	256 kbytes	256 kbytes	512 kbytes
Print Collation - requires hard drive option	No	No	Yes
Fonts available	136	136	136

Print the Configuration Page and check the item "installed RAM" to see what type of RAM is installed.

For example:

Installed RAM: 96 Mbytes
    Mem slot 1: SDRAM/parity/64 MB/KMM366S824AT
    Mem slot 1: empty

This is a list of DRAM SIMMs that are branded for use by Tektronix at the time this guide was published:

Size	Maker	Part Number
16 Mbyte	Samsung	KMM366S203BT
32 Mbyte	Samsung	KMM366S403BT
64 Mbyte	Samsung	KMM366S824AT
128 Mbyte	Samsung	KMM366S1623AT
32 Mbyte	Smart Module	SM564043574N6AA
64 Mbyte	Smart Module	SM564088574N6AA
32 Mbyte	NEC	MC-454AD645F-A10B
64 Mbyte	NEC	MC-454CB645FA-A10B
128 Mbyte	NEC	MC-4516CD645FZ-A10B
16 Mbyte	Micron Tech.	MT8LSDT264AG-66CL2
32 Mbyte	Micron Tech.	MT16LSDT264AG-10BC4
32 Mbyte	Micron Tech.	MT16LSDT264AG-662C1
64 Mbyte	Micron Tech.	MT8LSDT864AG-662D3
64 Mbyte	Micron Tech.	MT8LSDT864AG-10BD2
128 Mbyte	Micron Tech.	MT16LSDT1664AG-662DT

Print engine assemblies

Developer assemblies

Laser unit

Carousel assembly

Paper feeder

Fuser

Media tray 1

Accumulator belt cleaner

Second bias transfer roller

Accumulator belt assembly

Multi-purpose tray

Imaging unit
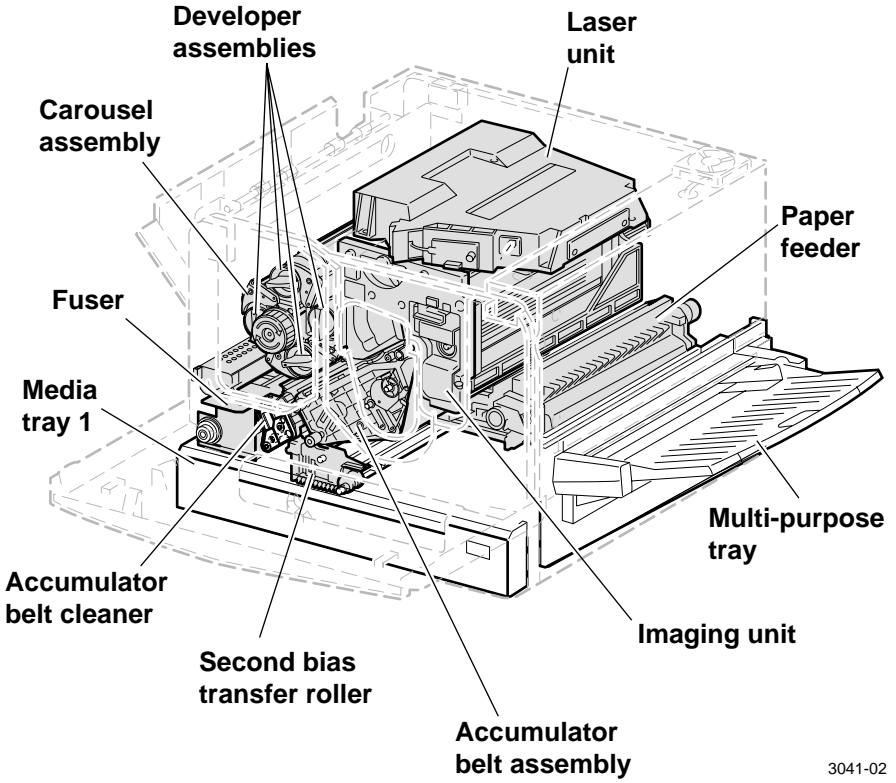
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Internal features of the print engine

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Image processor board

Engine control board

Carousel motor board

Network card

High Voltage board

Low Voltage Power Supply (LVPS)
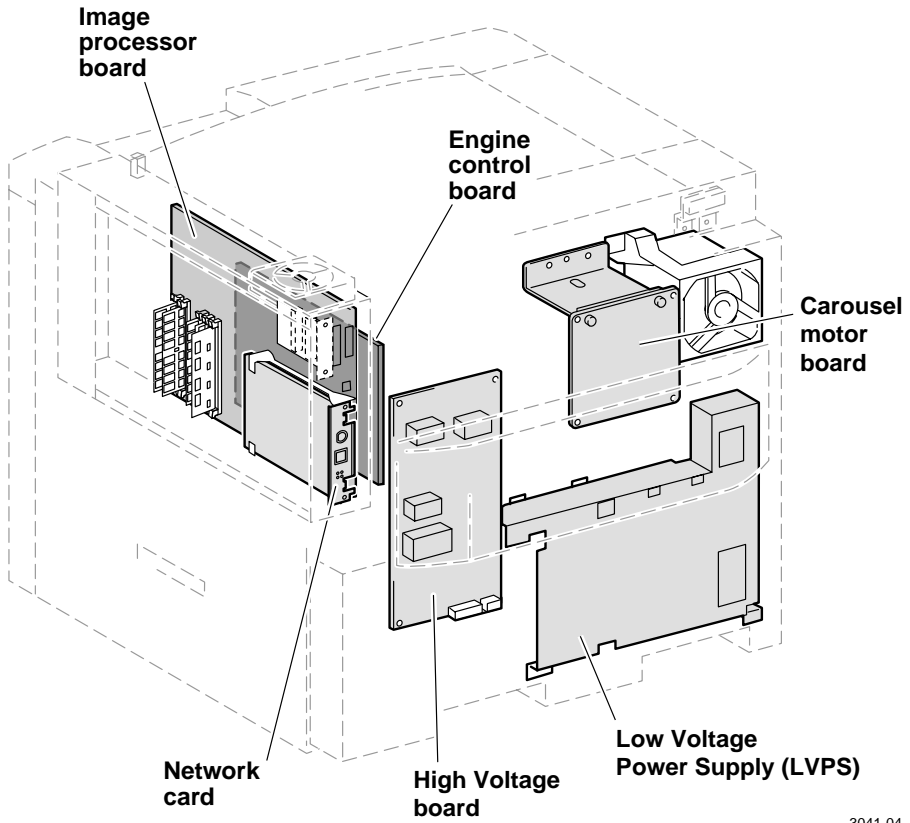
3041-04

Circuit boards of the print engine

Image processor fan

Process drive assembly

Toner dispense motor

Developer fan

Fuser fan

Carousel motor

Paper feed drive gear train

Process motor

Paper feed motor
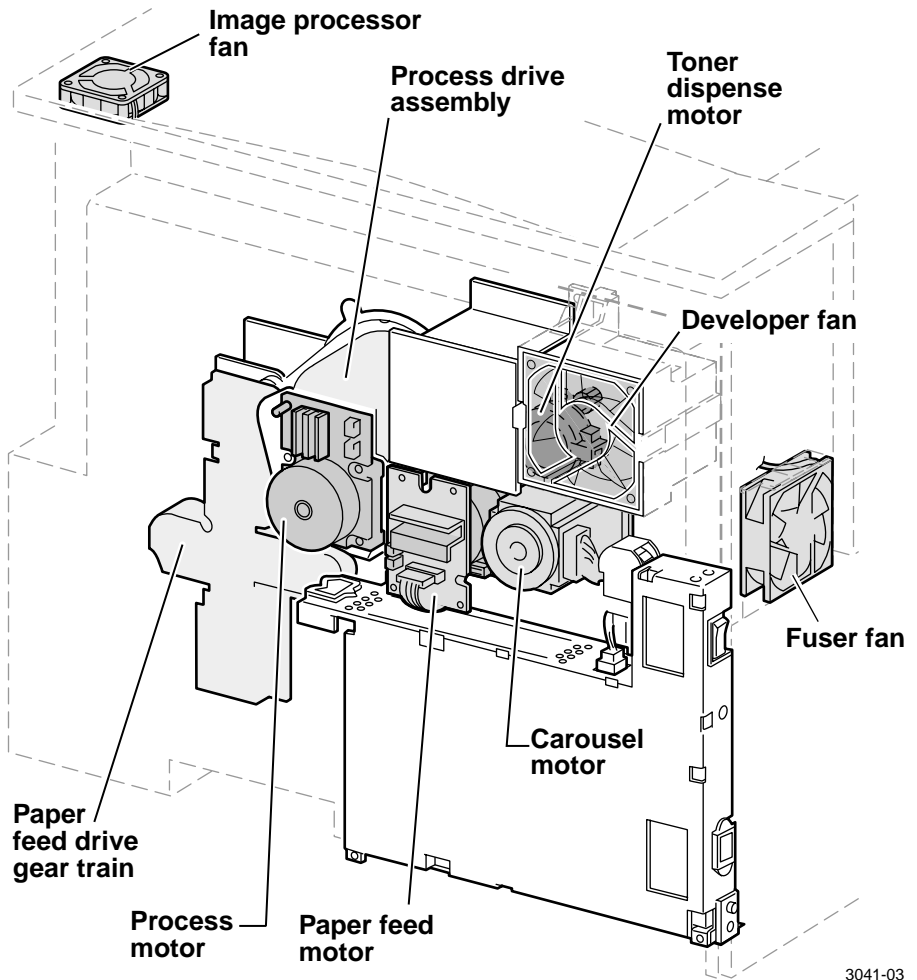
3041-03

Motors of the print engine

Exit
sensor

Exit door
sensor

Top cover
switch

Carousel
sensor

Auto-density
calibration
sensor

Right front
cover switch

Used toner
cartridge
sensor

Waste cartridge
full sensor

Full
stack
sensor

Waste cartridge
sensor

Left front
cover
switch

Accumulator
belt home
sensor

Toner
cartridge
presence
sensor

Paper size
sensor

Fuser
temperature
sensor

Edge
sensor

Fuser exit
sensor

Multi-purpose
tray paper
present sensor

Environment
sensor

Long paper
sensor

Low paper
sensor

Registration
sensor

Paper empty
sensor

3041-05

Sensors and switches on the print engine

Registration clutch

Second bias transfer roller solenoid

Developer clutch

Pre-Registration clutch

Registration brake clutch

Multi-purpose pick-up solenoid

Multi-purpose tray clutch
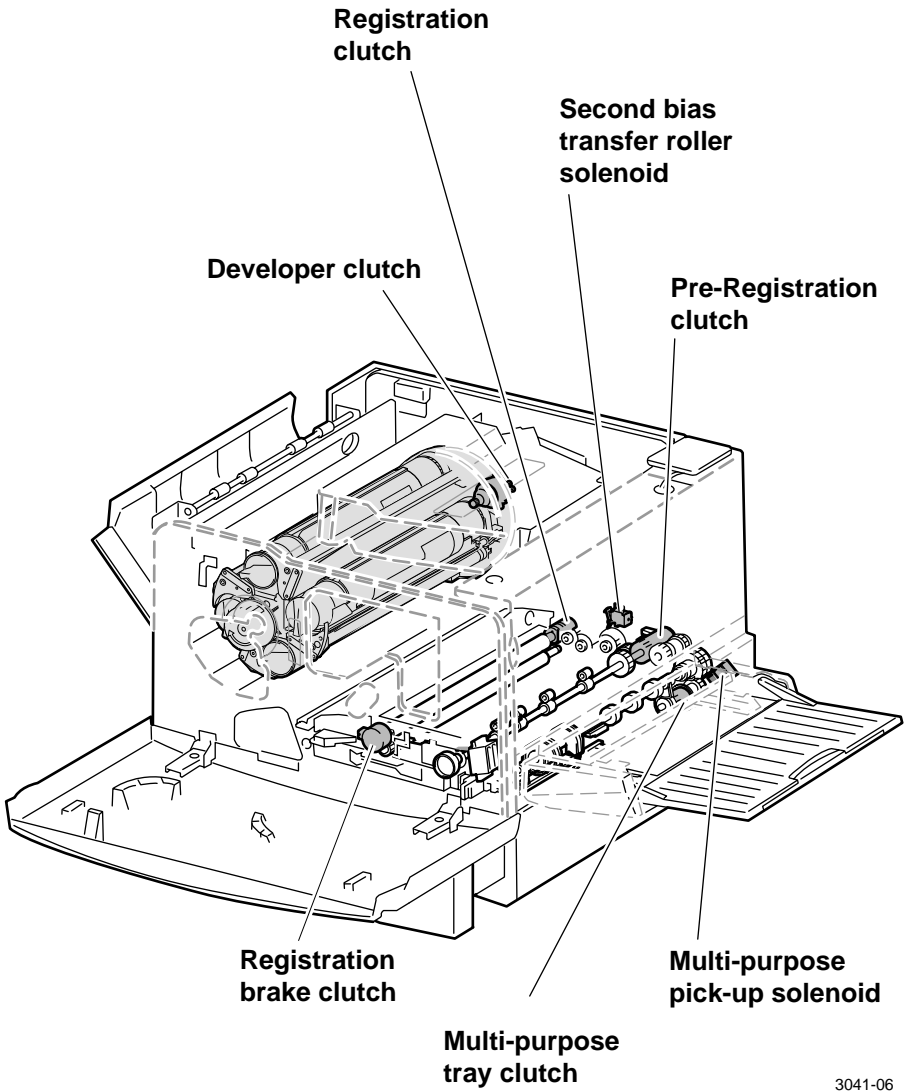
3041-06

Solenoids and clutches on the print engine

The image processor

Real Time Clock / NVRAM

RAM
DIMMS

SCSI
riser
card

NVRAM

Network
card

Font
DIMM

Boot
ROM

Postscript
code ROM
DIMM
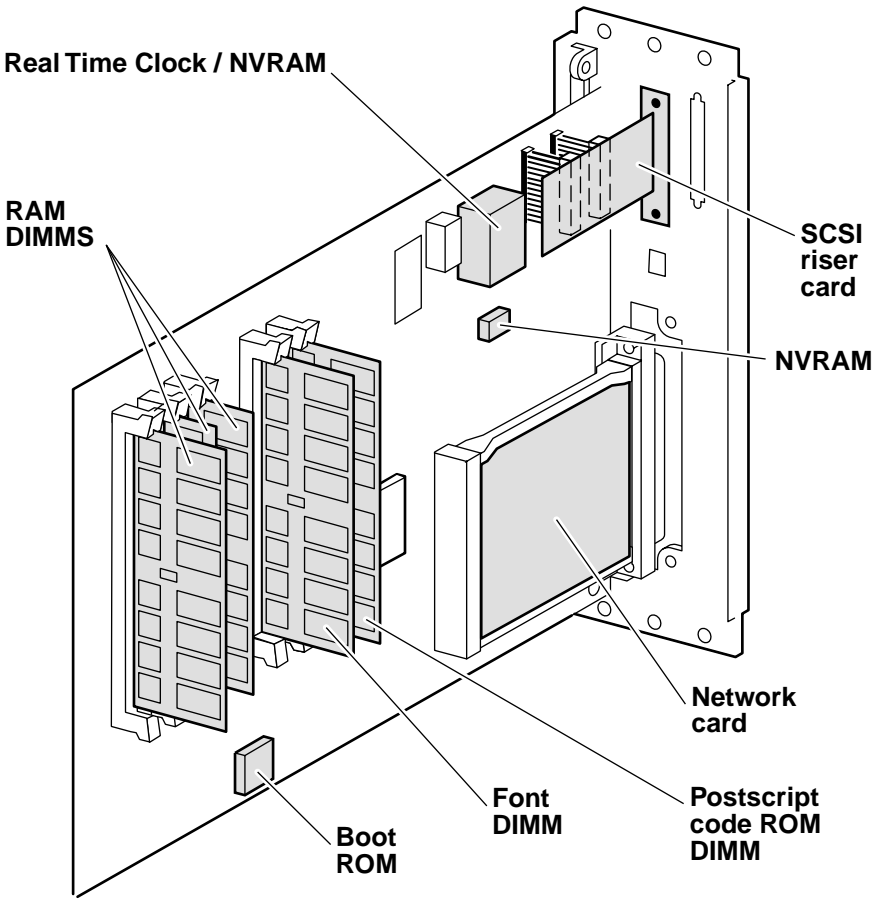
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Features of the image processor board

Front panel

These front panel features are found on the printer:

■ A two-line, 40-character LCD

■ Six push buttons

■ Five LEDs

LCD. The LCD serves two purposes: Displaying current image processor and print engine status information and displaying an interactive menu. Status information includes image processor status such as `Ready`, `Processing` and `Printing`. Print engine status includes messages such as `Out of paper`, `Paper Jam`, and `Toner Low`.

The interactive menu can only be entered while the printer is idle and ready. The interactive menu has two modes, review and modify. Customers can review and modify certain NVRAM, I/O ports and peripheral parameters.

Buttons. Button 6, the left-most button, is an **Exit** key used to cancel an operation while in the interactive menu. The functions of the remainder of the buttons are defined by the particular menu or function being displayed on the LCD. The bottom row of the LCD labels the current function of each button.
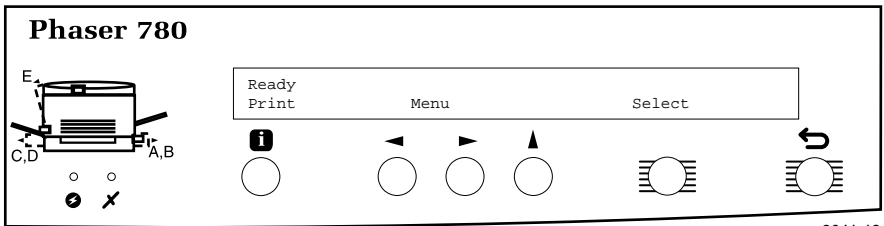
Printer front panel

Rear panel

Connectors

The rear panel of the printer features the host interface connectors:

■ Bi-directional parallel (high-density connector).

■ Twisted Pair 10baseT Ethernet connector. RX indicator (green); *blinks* while the network card is receiving data. The LED is *off steady* while no data is being received. If the LED is *on steady*, then a problem (probably hardware) has occurred at the network hub.

■ SCSI high-density connector (external hard disk drive or optical scanner only).

With the addition of a network card, the printer can feature either of these groups of connectors:

■ ThinNet (100base2) and Twisted Pair (100baseT) Ethernet connectors. This is Option P1.

■ LocalTalk connector. This is Option P3.

■ Unshielded Twisted Pair (10baseT) and shielded Twisted Pair (DB-9) Token Ring connectors. This is Option P4.

Network card LEDs

The Ethernet network card has four LED indicators:

■ TX indicator (yellow); blinks while data is transmitted to the host. The LED is off while no data is being sent.

■ Twisted Pair (100baseT) and ThinNet (100base2). RX indicator (green); *blinks* while the network card is receiving data. The LED is *off steady* while no data is being received. If the LED is *on steady*, then a problem (probably hardware) has occurred at the network hub.

■ TP Link. On steady indicates good circuit to nearest port; off indicates no circuit.

■ 100 MBS. Ethernet speed is 100 MBS when lit.

Note   *Do not use both Ethernet connectors at the same time. With a Ethernet or Token Ring network card installed, the 10baseT port is disabled.*

The Token Ring network card has two LED indicators:

- Connection (yellow); *off* when the printer is not inserted into the Token Ring, *blinks* while the printer is attempting to insert itself into the Token Ring, *on* when the printer is properly inserted in the ring.

- Ring Speed (green); *off* when the card is set for 4 megabits-per-second (MBPS), *on* when the card is set for 16 MBPS.

- When both LEDs blink, a network card failure has occurred.

The following figure illustrates the rear panel of the printer.
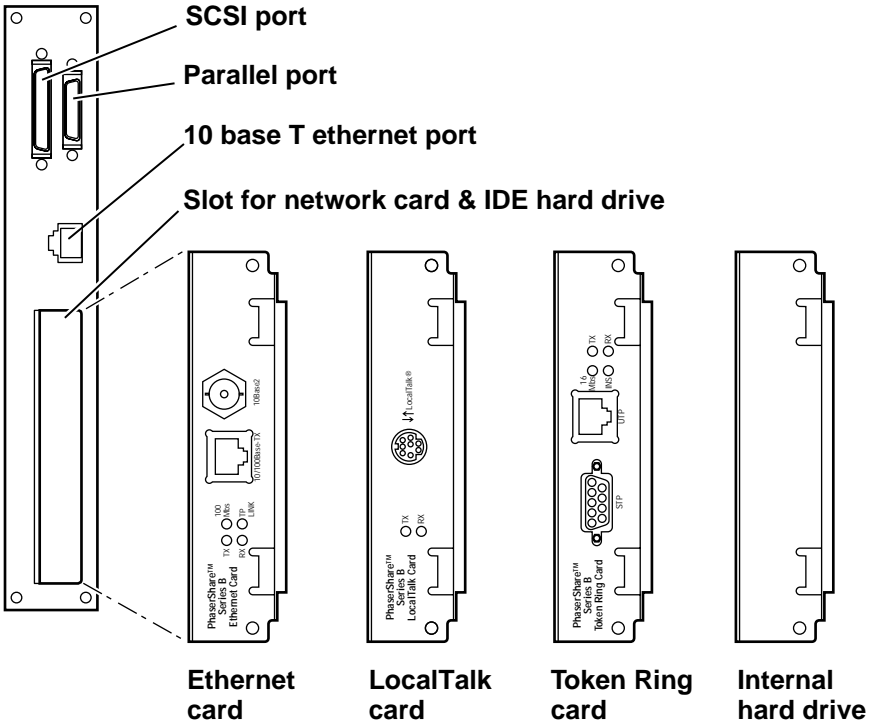
Printer rear panel with the optional Ethernet card

Specifications

Table 1 Physical dimensions of printer

Dimension	Value
Height	49.2 cm (19 in) without lower tray feeder 90.6 (36 in) with lower tray feeder
Width	69.1 cm (27.2 in)
Depth	64.1 cm (24.2 in)
Weight	73.6 kg (161 lbs) with consumables installed 97.1 kg (213 lbs) with lower tray feeder and consumables

Table 2 Physical dimensions of lower tray feeder

Dimension	Value
Height	41.4 cm (16.3 in)
Width	56 cm (22 in)
Depth	56 cm (22 in)
Weight	23.5 kg (52 lbs)

Table 3 Printer clearances

Dimension	Value
Top	40.0 cm (15.7 in)
Left	50.3 cm (20 in)
Right	55.1 cm (21.5 in)
Front	83.5 cm (33 in)
Rear	15.0 cm (6 in)
Bottom	No obstructions underneath that could block cooling vents
Mounting surface flatness	Front feet less than 5 mm above or below rear feet Left feet less than 10 mm above or below right feet
Mounting surface dimensions	Level surface with dimensions of at least 79 cm (31 in.) by 152 cm (60 in.).

Table 4 Functional specifications

Characteristic	Specification
Printing process	Electro-photographic, four color (CMYK), two transfer printing using modulated (on/off) laser beam scanning. Imaged is fused to paper using heat and pressure with silicone oil lubricant.
Color medium	Four toner cartridges each containing one of four colors: cyan, magenta, yellow or black. The toner is a nonmagnetic, dual component contact medium.
Addressability	600 x 600 dpi and 600 x 1200 dpi

Print speed	Time from paper load to paper eject:
	A-size:
	  Four color: 4 pages per minute
	  Monochrome: 16 pages per minute
	  Transparency: 2 pages per minute
	B-size:
	  Four color: 2 pages per minute
	  Monochrome: 8 pages per minute
	  Transparency: 1 page per minute

Minimum margins	5 mm(0.2 in.) on all sides, except for Tabloid Plus (13 x 19 in.) media which has a bottom margin of 25 mm (1 in.)
Usable papers sizes	**Paper**: 3.5x5.5, minimum size **Envelope**: US #10 8.5x11, Letter Euro Standard 8.5x14, Legal A4 11x17, Tabloid C4 12x18, Tabloid Extra C5 13x19, Tabloid Plus C6 A3 C65 A4 A5 B4 B5 Avery label: 5164, 5663, 7330, 7348
Usable paper weights	75 to 105 g/m^2 (20 to 24 lb) thru paper tray. 64 to 220 g/m^2(80 lb) using the multi-purpose tray

Tray capacities	Main tray:
	  Standard paper: 250 sheets
	  Transparency: 100 sheets
	Lower feeder trays:
	  Standard paper: 250 sheets
	Multi-purpose tray:
	  Standard paper/Letterhead: 150 sheets
	  Transparency: 50 sheets
	  Label: 50 sheets
	  Postcard: 75
	  Envelope: 30
	  Glossy/Coated: 75
	  Index: 30
	  Fabric Transfer: one at a time

Table 5 Electrical specifications

Characteristic	Specification
Primary line voltage	100/120 VAC (+/- 10%) 220/240 VAC (+/- 10%)
Primary voltage frequency range	47 to 63 Hz

Power consumption	EnergyStar: 20 watts
	
	Standby: 100 watts
	    1000 watts with fuser on
	
	Ready: 100 watts
	    1000 watts with fuser on
	
	Printing: 1100 watts

Table 6 Environmental specifications

Characteristic	Specification

Temperature:
  Operating
  Non-operating
  Storage
	
	0 to 32°C (41 to 90°F)
	-20 to40^{o}C (-4 to 104°F)
	-20 to40^{o}C (-4 to 104°F)

Humidly:
  Operating
  Non-operating
  Storage
	
	15 to 85% relative humidity
	5 to 85% relative humidity
	5 to 85% relative humidity

Altitude
  Operating:
  Non-operating
	
	0 to 3000 m (9900 ft.) at 25°C
	0 to 15000 m (50,000 ft.)

Vibration
  Operating:
 	
  Non-operating
 	
  Shock-non-operating
	
	Will withstand 0.5G excitation, 5 to 100 Hz, 3 axes for up to 50 minutes with no impairment or subsequent damage.
	0.5 g, 25 minute sweep, 5-100 Hz, 100-200 sec/sweep cycles
	The printer may have any corner raised and dropped 5 cm (2 in.) without impairment of operation.

Acoustic Noise
  Idle:
  Printing:
	
	38.3 db
	54.8 db with impulse noise of 63.3 db

Regulatory specifications

Safety

- EN60950 CB Report by Third Party GOST and TUV certification
- UL1950 Nationally Recognized Test Lab (NRTL) certified
- CSA 950 SCC recognized test lab certified

EMC

- EN55022 (CISPR 22) Class B
- EN50082-1:1994 Susceptibility
- EN61000-3-2 AC Mains Harmonic Distortion
- EN61000-3-3 AC Mains Voltage Flicker
- EN61000-4-2:1993 ESD
- EN61000-4-4:1993 Fast Burst Transients
- EN61000-4-5:1993 Line Surge
- EN61000-4-11;1993 Voltage Dips and Interruptions
- ENV50140:1993 Radiated RF Immunity

Energy Star certification

After 1-hour period of inactivity, the printer enters an standby mode, as required by Energy Star. The wait time is a user-definable parameter (via the front panel or by using PhaserLink). Energy Star default is "ON" and the time-out default is one hour. The printer enters a READY condition within 5 minutes after power-on.

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Error Codes and Messages

The following table list error codes and messages reported by the print engine control board.

Error code and message	Description	Corrective action
Laser Unit Error (Error 10)	There is a problem with the laser unit. The engine control board did not receive a signal from the laser start-of-scan sensor within the specified time	1. Test the top cover and right front cover switches for proper operation. Power for the laser unit is routed through both switches 2. Replace the laser unit. 3. Replace the engine control board
Image Density Error (Error 11)	The image density readings indicate a problem. The engine control board detected that the printer image density was unusually low and attempts to raise the density have failed. **Note** *If the top cover is removed, light can leak into the printer and cause a auto-density calibration sensor error.*	1. Power cycle the printer 2. Inspect the toner cartridges. 3. Inspect the four developer housings. Each magnetic roller should be evenly coated with toner. Replace a suspect developer assembly. 4. Test the toner/developer dispense motor. Replace it if it does not run 5. Inspect and reseat the auto-density calibration sensor. Ensure the senor's solenoid-activated cleaning blade is in place and moves freely. 6. Test the auto-density calibration sensor. If bad, replace the auto-density calibration sensor 7. Replace the imaging unit 8. Replace the engine control board 9. Replace the high voltage board

Error code and message	Description	Corrective action
Image Density Error (Error 12)	The image density readings indicate a problem. The engine control board detected that the printer image density was unusually high and attempts to lower the density have failed.	1. Power cycle the printer 2. Ensure the toner cartridges are fully functional and relatively full of toner. 3. Test the toner dispense motor. 4. Check the auto-density calibration sensor for contamination from toner. Replace the sensor, if necessary. 5. Inspect and reseat the auto-density calibration sensor. Ensure the senor's solenoid-activated cleaning blade is in place and moves freely. 6. Test the auto-density calibration sensor. If bad, replace the auto-density calibration sensor 7. Replace the engine control board 8. Inspect the four developer housings. Each magnet roller should be evenly coated with toner. Replace a suspect developer assembly. 9. Replace the imaging unit 10. Replace the high voltage board

Error code and message	Description	Corrective action
Auto-density Calibration Error (Error 13)	There is problem with the auto-density calibration. The engine control board detected that the auto-density calibration sensor LED output signal is below specified range.	1. Power cycle the printer 2. Check the auto-density calibration sensor for contamination from toner. Replace the sensor, if necessary. 3. Inspect and reseat the auto-density calibration sensor. Ensure the senor's solenoid-activated cleaning blade is in place and moves freely. 4. Test the auto-density calibration sensor. If bad, replace the auto-density calibration sensor 5. Replace the engine control board 6. Replace the low voltage power supply
Toner Carousel Error (Error 21)	There is a problem with the carousel home sensor. The engine control board detected that the carousel home sensor did not actuate within six seconds after the start of the carousel motor.	1. Power cycle the printer 2. Manually rotate the carousel assembly several revolutions 3. Check for contamination that may cause binding. 4. Test the carousel home sensor. Replace if needed 5. Replace the carousel motor 6. Replace the engine control board
PCDC Error (Error 22)	There is a problem with PCDC calibration. The engine control board detected that PCDC calibration value is much lower than set specifications.	1. Power cycle the printer 2. Inspect the process drive. Ensure the drum rotates 3. Replace the engine control board 4. Replace the image processor board
Environment Sensor Error (Error 23)	There is a problem with the environment sensor circuit. The engine control board detected an open environment sensor circuit	1. Power cycle the printer 2. Replace the environment sensor 3. Replace the engine control board

Error code and message	Description	Corrective action
Second Bias Transfer Roller Error (Error 24)	The engine control board detected that the measured current value thru the second bias transfer roller was not within specification.	1. Check the wiring from the high voltage power supply to the second bias transfer roller 2. Replace the second bias transfer roller 3. Replace the high voltage power supply 4. Replace the accumulator belt assembly 5. Replace the engine control board
Fuser Temperature Error (Error 40)	There is a problem with the temperature of the fuser. The engine control board detected that the fuser temperature did not reach 110°C within six minutes after the printer was turned on.	1. Open the fuser door and ensure the fuser connectors are properly seated. 2. Close the fuser and power cycle the printer. Check that the fuser heats up 3. Check for line voltage at P/J 71 pins 1 and 2. If no voltage is present replace the power supply 4. Replace the fuser 5. Replace the engine control board
Fuser Temperature Error (Error 41)	There is a problem with the fuser heat rod control. The engine control board detected that the fuser heat rods remained on longer than the specified time.	1. Open the fuser door and ensure the fuser connectors are properly seated. 2. Close the fuser and power cycle the printer. Check that the fuser heats up 3. Check for line voltage at P/J 71 pins 1 and 2. If no voltage is present replace the power supply 4. Replace the fuser 5. Replace the engine control board

Error code and message	Description	Corrective action
Fuser Temperature Error (Error 42)	There is a problem with the fuser. The engine control board senses an open temperature sensor circuit.	1. Open the fuser door and ensure the fuser connectors are properly seated. 2. Close the fuser and power cycle the printer. Check that the fuser heats up 3. Check for line voltage at P/J 71 pins 1 and 2. If no voltage is present replace the power supply 4. Replace the fuser 5. Replace the engine control board
Fuser Temperature Error (Error 43)	There is problem with the fuser. The engine control board detected that the fuser did not reach ready temperature during the specified time.	1. Open the fuser door and ensure the fuser connectors are properly seated. 2. Close the fuser and power cycle the printer. Check that the fuser heats up 3. Check for line voltage at P/J 71 pins 1 and 2. If no voltage is present replace the power supply 4. Replace the fuser 5. Replace the engine control board
Fuser Temperature (Error 44)	The thermistor sensor indicates that the fuser had reached the set overheat temperature, The engine control board has shutdown fuser temperature operation.	1. Allow the fuser to cool for 30 minutes 2. Ensure the fuser wiring harnesses are plugged in. 3. Check the fuser fan 4. Replace the fuser 5. Replace the engine control board 6. Replace the low voltage power supply

Error code and message	Description	Corrective action
Process Motor Error (Error 61)	There is a problem with the process motor. the engine control board did not receive a signal from the accumulator belt home sensor signal in the specified time.	1. Test the process drive assembly 2. Test the +24 VDC at P/J 32-11 and frame ground. 3. Test the accumulator belt home sensor 4. Replace the process motor. 5. Replace the accumulator belt assembly 6. Replace the engine control board 7. Replace the imaging unit
Paper Handling Motor Error (Error 62)	There is a problem with the paper feed motor. The engine control board received a failed signal from the paper feed motor circuitry.	1. Power cycle the printer 2. Replace the paper feed motor 3. Replace the engine control board 4. Check for mechanical binding in the paper feed drive gear train
Imaging Unit ID Error (Error 69)	The engine control board detected a used CRUM	1. Reseat the imaging unit 2. Power cycle the printer 3. Replace the imaging unit 4. Replace the engine control board
Imaging Unit ID Error (Error 70)	There is a CRU Memory problem. The engine control board detected that the memory initial value of the installed imaging unit is wrong.	1. Reseat the imaging unit 2. Power cycle the printer 3. Replace the imaging unit 4. Replace the engine control board
Imaging Unit ID Error (Error 71)	An incompatible imaging unit is installed in the printer. The engine control board detected that the memory device in the installed imaging unit is incompatible with the printer.	1. Power cycle the printer 2. Reseat the imaging uni 3. Switch the printer power off, then on 4. Replace the engine control board
Imaging Unit Count Error (Error 72)	There is a CRU memory problem. The engine control board could not read the CRUM counter value.	1. Power cycle the printer 2. Replace the imaging unit with a new cartridge 3. Replace the engine control board

Error code and message	Description	Corrective action
Imaging Unit ID Error (Error 73)	The wrong imaging unit is installed in the printer. The engine control board detected that the installed imaging unit is incompatible with the printer.	1. Power cycle the printer 2. Replace the imaging unit with a new cartridge 3. Replace the engine control board
Imaging Unit Comm Error (Error 74)	There is a CRU memory problem. The engine control board could not write to the CRUM.	1. Power cycle the printer 2. Reseat the imaging unit in the printer 3. Replace the imaging unit with a new cartridge 4. Replace the engine control board
Imaging Unit Comm Error (Error 75)	There is a CRU Memory problem. The engine control board could not communicate with the CRUM.	1. Power cycle the printer 2. Replace the imaging unit with a new cartridge 3. Replace the engine control board
Engine Board Error (Error 76)	The engine control board detected a corrupted NVRAM during power-on self test	1. Power cycle the printer 2. Replace the NVRAM chip 3. Replace the engine control board
ROM/ RAM Error (Error 77)	There is a problem in reading information from ROM or RAM on the engine control board. The engine control board could not read information on the ROM or RAM.	1. Power cycle the printer 2. Check if +5 VDC is supplied at P/J33-3 and frame ground. If not, replace the low voltage power supply 3. Replace the engine control board

Error code and message	Description	Corrective action
Image Contains Too Much Coverage	Image density exceeded design specifications. The engine control board detected that the first 70mm of the lead edge of the four color image about to be printed exceeds the design specification for total image density. The specification is 280% or less image density. For example, a density setting of 100% for each of the four colors creates a layered four color image with a combined density of 400%.	1. Power cycle the printer 2. Print a less complex, color image to determine if it is overly dense. 3. Replace the engine control board
Replace Fuser Roll Cartridge	The fuser oil roll has reached end of life. The engine control board detected that the fuser oil roll has processed the equivalent of 20,000 sheets of paper since it was installed.	1. Replace the fuser roll cartridge 2. Power cycle the printer 3. Ensure the fuser connectors are properly seated 4. Test the fuser using internal diagnostics 5. Replace the engine control board
Waste Cartridge Full	The waste cartridge is full. The engine control board detected that the waste cartridge sensor was on for 1250 print cycles.	1. Replace the waste cartridge 2. Test the waste cartridge full sensor using internal diagnostics 3. Inspect the electrical contacts and wiring Replace the waste cartridge full sensor 4. Replace the engine control board
Replace Black Toner Cartridge	Black image density is too low. The engine control board detected that the auto-density calibration sensor reads the black patch density as being below specification and that the reading is either slow to raise or does not raise after the printer attempts to increase density.	1. Replace the black toner cartridge 2. Test the toner/developer dispense motor 3. Test the auto-density calibration sensor 4. Replace the engine control board

Error code and message	Description	Corrective action
Replace Cyan Toner Cartridge	Cyan image density is too low. The engine control board detected that the auto-density calibration sensor reads the cyan patch density as being below specification and that the reading is either slow to raise or does not raise after the printer attempts to increase density.	1. Replace the cyan toner cartridge 2. Test the toner/developer dispense motor 3. Test the auto-density calibration sensor 4. Replace the engine control board
Replace Magenta Toner Cartridge	Magenta image density is too low. The engine control board detected that the auto-density calibration sensor reads the magenta patch density as being below specification and that the reading is either slow to raise or does not raise after the printer attempts to increase density.	1. Replace the magenta toner cartridge 2. Test the toner/developer dispense motor 3. Test the e auto-density calibration sensor 4. Replace the engine control board
Replace Yellow Toner Cartridge	Yellow image density is too low. The engine control board detected that the auto-density calibration sensor reads the yellow patch density as being below specification and that the reading is either slow to raise or does not raise after the printer attempts to increase density.	1. Replace the yellow toner cartridge 2. Test the toner/developer dispense motor 3. Test the auto-density calibration sensor 4. Replace the engine control board
Replace Imaging Unit	The imaging unit has reached end of life. The engine control board detected that the installed imaging unit has reached end of life.	1. Replace the imaging unit 2. Switch the printer power off, then on 3. Inspect the CRUM for damage or contamination. clean or replace if necessary. 4. Replace the engine control board
Fuser Roll Cartridge Low	The fuser oil roll is nearing end of life. The engine control board detected that the fuser oil roll is nearing the 20,000 mark.	1. Replace the fuser oil roll 2. Replace the engine control board

Error code and message	Description	Corrective action
Waste Cartridge Almost Full	The waste toner box is almost full. The engine control board detected that the waste toner box is almost full and will soon need to be replaced.	1. Replace the waste toner box 2. Replace the engine control board
Black Toner Low	The black toner cartridge is low on toner. The engine control board switched on the dispense motor for more than 980 seconds in order to raise the image density to normal.	1. Replace the black toner cartridge 2. Test the dispense motor 3. Test the auto-density calibration. Replace it, if necessary. 4. Replace the engine control board
Cyan Toner Low	The cyan toner cartridge is low on toner. The engine control board switched on the Dispense Motor for more than 800 seconds in order to raise the image density to normal.	1. Replace the cyan toner cartridge 2. Test the dispense motor 3. Test the auto-density calibration. Replace it, if necessary. 4. Replace the engine control board
Magenta Toner Low	The magenta toner cartridge is low on toner. The engine control board switched on the Dispense Motor for more than 800 seconds in order to raise the image density to normal.	1. Replace the magenta toner cartridge 2. Test the dispense motor 3. Test the auto-density calibration. Replace it, if necessary. 4. Replace the engine control board
Yellow Toner Low	The yellow toner cartridge is low on toner. the engine control board switched on the Dispense Motor for more than 1150 seconds in order to raise the image density to normal.	1. Replace the yellow toner cartridge 2. Test the dispense motor 3. Test the auto-density calibration. Replace it, if necessary. 4. Replace the engine control board

Error code and message	Description	Corrective action
Media Low in Tray 4	The engine control board detected that the tray 4 low paper sensor is actuated.	1. Add paper to tray 4 2. Check for a damaged or missing sensor actuator. 3. Replace the tray 4 low sensor 4. Replace the engine control board
Media Low in Tray 3	The engine control board detected that the tray 3 low paper sensor is actuated.	1. Add paper to tray 3 2. Check for a damaged or missing sensor actuator. 3. Replace the tray 3 low sensor 4. Replace the engine control board
Media Low in Tray 2	The engine control board detected that the tray 2 low paper sensor is actuated.	1. Add paper to tray 2 2. Check for a damaged or missing sensor actuator. 3. Replace the tray 2 low sensor 4. Replace the engine control board
Media Low in Tray 1	The engine control board detected that the Tray 1 Low Paper Sensor is actuated.	1. Add paper to tray 1 2. Check for a damaged or missing sensor actuator. 3. Replace the tray 1 low sensor 4. Replace the engine control board
Load Media in Multi-purpose Tray	The multi-purpose tray is out of paper. The engine control board detected that the long multi-purpose tray paper sensor is not actuated.	1. Load paper into the multi-purpose tray 2. Test the multi-purpose tray paper sensors 3. Replace the engine control board
Load Media in Tray 4	Tray 4 is out of paper. The engine control board detected that the paper empty sensor in tray 4 is actuated.	1. Load paper into Tray 4 2. Test the paper empty sensor 3. Replace the lower feeder circuit board 4. Replace the lower feeder assembly 5. Replace the engine control board

Error code and message	Description	Corrective action
Load Media in Tray 3	Tray 3 is out of paper. The engine control board detected that the paper empty sensor in tray 3 is actuated.	1. Load paper into Tray 3 2. Test the tray's paper empty sensor 3. Replace the lower feeder circuit board 4. Replace the lower feeder assembly 5. Replace the engine control board
Load Media in Tray 2	Tray 2 is out of paper. The engine control board detected that the paper empty sensor in tray 2 is actuated.	1. Load paper into Tray 2 2. Test the tray's paper empty sensor 3. Replace the lower feeder circuit board 4. Replace the lower feeder assembly 5. Replace the engine control board
Load Media in Tray 1	Tray 1 is out of paper. The engine control board detected that the paper empty sensor in tray 1 is actuated.	1. Load paper into Tray 1 2. Test the tray's paper empty sensor 3. Replace the lower feeder circuit board 4. Replace the engine control board
Clear Jam At A, B	The engine control board detected that the registration sensor was actuated while the printer was in standby.	1. Clear jammed paper from the printer 2. Test the feeder registration exit sensor 3. Replace the engine control board

Error code and message	Description	Corrective action
Clear Jam At A, B	There is a problem near the registration sensor. The engine control board detected that the registration sensor did not actuate within the specified time after paper feed.	1. Clear jammed paper from the printer 2. Check that the media tray and ensure it is correctly loaded 3. Test the pre-registration clutch 4. Test the registration clutch 5. Test the paper feed motor 6. Check the operation of the paper pick solenoid 7. Inspect the paper path 8. Clean the feed rollers 9. Test the registration sensor 10. Run the paper path test 11. Replace the engine control board
Clear Jam At C, D	There is problem at the fuser exit sensor. The engine control board detected that the fuser exit sensor was actuated while the printer was in standby.	1. Clear jammed paper from the printer 2. Test the fuser exit sensor 3. Replace the engine control board
Clear Jam At C, D	There is problem near the fuser exit sensor. The engine control board detected that the fuser exit sensor did not actuate within the specified time after the fuser entrance sensor was actuated.	1. Clear jammed paper from the printer 2. Test the fuser exit sensor 3. Inspect the paper path 4. Inspect the fuser chute fan 5. Replace the fuser 6. Inspect the fuser drive gear train. Replace if necessary 7. Replace the paper feed motor. 8. Replace the engine control board
Clear Jam at E	There is problem at the media exit sensor. The engine control board detected that the top exit sensor was actuated while the printer was in standby.	1. Clear jammed paper from the printer 2. Test the feeder media exit sensor 3. Inspect the paper exit path 4. Replace the engine control board

Error code and message	Description	Corrective action
Clear Jam At E	The engine control board detected that the media exit sensor did not actuate within the specified time after the fuser exit sensor actuated.	1. Clear jammed paper from the printer 2. Inspect and clean the exit rollers 3. Test the media exit sensor 4. Inspect and test the paper feed gear train and paper motor 5. Test the fuser drive gear train and exit guide 6. Replace the engine control board
Media Size Mismatch	The engine control board detected that the paper that was fed into the printer was not the same size that was detected by the tray size sensors. The registration sensor monitors the timing of the paper as it runs through the printer.	1. Set paper tray guides or use another paper tray 2. Inspect the actuators at the rear of the paper tray. 3. Test the paper tray size sensors 4. Replace the paper tray size sensor board. 5. Replace the engine control board
Install Black Toner Cartridge	The black toner cartridge is either not installed or not installed correctly. The engine control board did not receive a signal from the cartridge sensor when the carousel frame moved the black developer housing into position.	1. Reseat the black toner cartridge. Power cycle the printer 2. Replace the black toner cartridge 3. Replace the toner cartridge presence sensor. 4. Replace the engine control board.
Install Cyan Toner Cartridge	The cyan toner cartridge is either not installed or not installed correctly. The engine control board did not receive a signal from the cartridge sensor when the carousel frame moved the cyan developer housing into position.	1. Reseat the cyan toner cartridge. Power cycle the printer 2. Replace the cyan toner cartridge 3. Replace the toner cartridge presence sensor.

Error code and message	Description	Corrective action
Install Magenta Toner Cartridge	The magenta toner cartridge is either not installed or not installed correctly. The engine control board did not receive a signal from the cartridge sensor when the carousel frame moved the magenta developer housing into position.	1. Reseat the magenta toner cartridge. Power cycle the printer 2. Replace the magenta toner cartridge 3. Replace the toner cartridge presence sensor.
Install Yellow Toner Cartridge	The yellow toner cartridge is either not installed or not installed correctly. The engine control board did not receive a signal from the cartridge sensor when the carousel frame moved the yellow developer housing into position.	1. Reseat the yellow toner cartridge. Power cycle the printer 2. Replace the yellow toner cartridge 3. Replace the toner cartridge presence sensor. 4. Replace the engine control board.
Install Waste Cartridge	The waste toner box is not installed. The engine control board detected that the waste toner box sensor was deactuated.	1. Reseat waste cartridge 2. Power cycle the printer 3. Test the waste toner sensor 4. Check the sensor wiring 5. Replace the sensor 6. Replace the engine control board
Install Tray 1	The engine control board did not detect a paper tray installed in Tray 1 slot.	1. Reseat the tray into the main feeder slot 2. Inspect the tray's switch actuators for damage 3. Replace the paper size sensor assembly 4. Replace the engine control board
Install Tray 2	The engine control board did not detect a Paper Tray installed in Tray 2 slot.	1. Reseat the tray into the second feeder slot 2. Inspect the tray's switch actuators for damage 3. Replace the paper size sensor assembly 4. Inspect the lower feeder-to-printer connections at the back of the printer. 5. Replace the engine control board

Error code and message	Description	Corrective action
Install Tray 3	The engine control board did not detect a Paper Tray installed in Tray 3 slot.	1. Reseat the tray into the third feeder slot 2. Inspect the tray's switch actuators for damage 3. Inspect the lower feeder-to-printer connections Replace the paper size sensor assembly 4. Replace the engine control board
Install Tray 4	The engine control board did not detect a Paper Tray installed in Tray 4 slot.	1. Reseat the tray into the fourth feeder slot 2. Inspect the tray's switch actuators for damage 3. Inspect the lower feeder-to-printer connections Replace the paper size sensor assembly 4. Replace the engine control board
Install Imaging Unit	The imaging unit is either not installed or not installed correctly. The engine control board did receive a signal from the customer replaceable unit memory.	1. Reseat the imaging unit 2. Inspect the CRUM connector for damage or contamination. Clean or replace if necessary 3. Replace the imaging unit 4. Replace the engine control board
Install Fuser Roll Cartridge	The engine control board detected that the fuser oil roll assembly circuit is open.	1. Reseat the fuser oil roll 2. Inspect the fuser roll contacts and connectors. Ensure they are clean and seated correctly 3. Replace the fuser roll 4. Replace the engine control board

Error code and message	Description	Corrective action
Second Bias Transfer Roller Error	The engine control board detected that the measured current value across second bias transfer roller was not within specifications.	1. Power cycle the printer 2. Replace the high voltage power supply 3. Replace the engine control board 4. Replace the second bias transfer roller 5. Replace the accumulator belt assembly
Replace Fuser	The fuser has reached end of life. The engine control board detected that the fuser has processed 250,000 images or the toner dispense motor has accumulated more than 70,564 x 100ms of running time.	1. Use diagnostics to verify the print count 2. Replace the fuser 3. Replace the engine control board
Printer Maintenance Required - Replace the Accumulator Belt Cleaner	The accumulator belt cleaner is nearing end of life. The engine control board detected that the accumulator belt cleaner processed 100,000 sheets of paper.	1. Use diagnostics to verify the print count 2. Replace the accumulator belt cleaner 3. Replace the engine control board
Printer Maintenance Required	The accumulator cleaner belt has reached end of life. The engine control board detected that the accumulator belt cleaner has processed over 102,000 belt clean cycles.	1. Use diagnostics to verify the print count 2. Replace the accumulator belt cleaner 3. Replace the engine control board
Printer Maintenance Required - Replace the Second Bias Transfer Roller	The second bias transfer roller is nearing the end of its life. The engine control board detected that the second bias transfer roller has processed 100,000 sheets of paper.	1. Use diagnostics to verify the print count 2. Replace the second bias transfer roller 3. Replace the engine control board

Error code and message	Description	Corrective action
Printer Maintenance Required	The second bias transfer roller has reached end of life. The engine control board detected that second bias transfer roller has completed over 100,000 images.	1. Use diagnostics to verify the print count 2. Replace the second bias transfer roller 3. Replace the engine control board
Printer Maintenance Required Soon - Imaging Unit Life Almost Over	The imaging unit has reached end of life. The engine control board detected that the drum inside the imaging unit has exceeded 90,000 revolutions.	1. Replace the imaging unit 2. Replace the engine control board
Fuser Life Almost Over	The fuser is nearing end of life. The engine control board detected that the fuser processed 237,500 images or the toner dispense motor has accumulated more than 67,036 x 100ms of running time.	1. Replace the fuser 2. Replace the engine control board
Replace the imaging unit	The imaging unit has reached end of life. The engine control board detected that the imaging unit has printed 110,000 images.	1. Replace the imaging unit 2. Check the CRUM connector for damage or contamination. Clean or replace if necessary 3. Replace the engine control board
Close Lower Tray Assembly Cover	The engine control board detected that the lower feeder cover interlock switch is deactuated.	1. Close the feeder cover 2. Inspect the interlock switch. Replace if necessary 3. Replace the feeder control board 4. Inspect the lower feeder-to-printer connections at the rear of the printer 5. Replace the feeder 6. Replace the engine control board

Error code and message	Description	Corrective action
Close Left Fuser Unit	The engine control board detected that the fuser interlock circuit is open.	1. Reseat the fuser 2. Inspect the fuser mating connectors for proper fit 3. Replace the engine control board
Close Exit Cover	The engine control board detected that the exit door switch is deactuated.	1. Close the exit cover 2. Replace the exit chute switch 3. Replace the upper exit assembly 4. Replace the engine control board
Close Right Feed Unit	The engine control board detected that the paper feeder Interlock circuit is open.	1. Close the paper feeder assembly 2. Inspect the mating connectors of the paper feeder 3. Replace the paper feed harness 4. Replace the paper feeder 5. Replace the engine control board
Close Front Cover	The engine control board detected that the front cover interlock switch is deactuated.	1. Close the front cover 2. Inspect the cover's switch actuators. Replace the cover if damaged 3. Test for +24 VDC at Pins P32-8 and 3. You should measure 24 VDC at pin 3 through the right and left cover interlock switches back to pin 8. 4. Test for 5 VDC between P33-1 and frame ground It should switch between 5 and 0 VDC when the front cover is opened and closed. If not replace the left front cover switch 5. Replace the low voltage power supply

Error code and message	Description	Corrective action
Empty the Top Output Tray	The engine control board detected that the full stack sensor is actuated for more than 12 seconds.	1. Remove the prints from output tray 2. Inspect for damage the output tray full sensor. Replace if necessary 3. Replace the engine control board

Troubleshooting

System power-up sequence

1. The main power switch is turned on. (Or the front cover is opened and then closed or diagnostics are exited.)

2. The print engine reads the Customer Replaceable Unit Memory (CRUM).

3. The print engine determines that all the CRUs are in place, except for the toner cartridges.

4. The print engine checks its sensors for any static jam errors.

5. The print engine reads all life counters in NVRAM.

6. The print engine applies voltage to the fuser to bring it up to standby temperature.

7. The process motor energizes and then a 1/4 second later, the paper feed motor is energized.

8. The print engine powers on the carousel motor and checks the presence of the four toner developer assemblies.

9. The print engine verifies proper operation of the image process components. The auto-density calibration sensor checks the density levels.

10. The print engine initiates a cleaning cycle of the accumulator belt.

11. The process motor is de-energized.

12. The print engine updates the NVRAM

13. The print engine updates the CRU memory.

14. The paper feed motor is de-energized.

The print engine is initialized.

Print engine troubleshooting

Printer will not power up

When you switch on the printer, the control panel does not light, the fans do not rotate, the carousel motor does not cycle, and the printer does not go into warm-up.

1. 110VAC IN Check

   a. Inspect the AC Power Cord. Is the AC Power Cord plugged into the printer, and is the other end plugged into an AC wall outlet?

   b. Check the voltage at the AC wall outlet. Is there approximately 110 VAC (or 220 VAC if the printer is the 220 VAC model) at the AC wall outlet?

   c. Remove the rear cover.

   d. Measure the voltage between the two low voltage power supply solder points located next to the AC power jack. Is there 110 VAC between the two points?

2. Low voltage power supply check

   a. Measure the voltage between P33-3 on the low voltage power supply and frame ground. Is there +5 VDC between P33-3 and frame ground. If not, replace the low voltage power supply.

   a. Check for +24VDC between P32-3 on the low voltage power supply and frame ground. Replace the low voltage power supply. Check for +24VDC between P32-8 and frame ground. If voltage is at pin 3 but not at pin 8, check the front cover, fuser and paper feeder interlock switches. Is there +24VDC between P32-11 and frame ground? If not, replace the power supply. Check for a short in the 24 volt components (particularly on the paper feed motor circuit board).

3. Low voltage power supply loading check

   a. Disconnect P32 and P33 from the low voltage power supply.

   b. Measure the voltage between P33-3 on the low voltage power supply and frame ground, and between P32-11 on the low voltage power supply and frame ground. Is there +5 VDC between P33-3 and frame ground, and is there +24 VDC between P32-11 and frame ground? If not, replace the low voltage power supply.

4. Engine control board loading check

   a. Reconnect P32 and P33 to the low voltage power supply.

   b. Refer to "Wiring Diagrams" on page 185 and one by one disconnect components that are connected to the engine control board.

c. Measure the voltage between P33-3 on the low voltage power supply and frame ground, and between P32-11 on the low voltage power supply and frame ground. Do you eventually measure +5 VDC between P33-3 and frame ground, and +24 VDC between P32-11 and frame ground? If yes, replace the component that is loading down the power supply. If no, replace the engine control board.

5. Image processor check

   a. Turn off the printer.

   b. Remove the image processor board.

   c. Turn on the printer. Does the printer go into warm-up? If yes, replace the image processor board. If not, replace the engine control board.

Erratic printer operation

The printer has a variety of intermittent problems, but generally does not complete a print cycle. The problems are generally not identified by displayed error codes.

1. Does the printer frequently fail to enter printer warm-up or is the front panel frequently inoperative? If yes, follow the earlier procedure "Printer will not power up" on page 40.

2. Run print engine test prints, which print independently of the image processor, to determine if the image processor is the problem. Refer to "Making a print engine only test print" on page 42.

3. Low voltage power supply loading check

   a. Run 50 test prints from the image processor's built in test prints.

   b. Measure the voltage between P33-3 on the low voltage power supply and frame ground, and between P32-11 on the low voltage power supply and frame ground. Is there a steady +5 VDC between P33-3 and frame ground, and is there at steady +24V DC between P32-11 and frame ground? If no, Replace the low voltage power supply.

4. If test prints from the image processor print reliably, reload the host's printer driver software or the host application software. Does the printer still exhibit erratic operation?

5. Try printer from another application. Ensure that the host computer prints reliable to a different printer. Also try printing from another computer to the Phaser 780.

6. Replace the interface cable connecting the host to the printer.

7. Replace the engine control board.

8. Replace the image processor board.

Making a print engine only test print

Using the image processor.

1. Turn off the printer.

2. Remove the right side panel to access the image processor board.

3. Locate switch 4 of S930 on the image processor board. Closing switch 4 bypasses the image processor board and places the engine control board into test mode upon power up.

4. Turn on the printer.

5. The printer generates process black (all four colors layered) grid patterns. The printer feeds from the first tray that has paper - in this order; Tray 1, Tray 2, Tray 3, Tray 4, and multi-purpose feeder. The printer sends the test prints to the face down output tray. The printer generates test prints until you stop the test.

6. Switch off printer main power to stop generating test prints.

7. Move the S930 switch 4 to the off (open) position.

Using the print engine board. To generate a test print without the image processor installed.

1. Turn off the printer.

2. Remove the image processor so you can access the engine control board.

3. Locate JP3, just below the ROM chip on the engine control board.

4. Move the switch to the ON position.

5. Turn on the printer.

6. The printer generates test prints just as it does in the previous procedure.

7. Switch off printer main power to stop generating test prints.

8. Move the switch to the 1 position.

Printing and print quality problems

Initial checks and actions

1. Does the printer display an error code? If so go to "Error Codes and Messages" on page 19.

2. Is the AC power provided at the wall outlet within recommended specifications?

3. Is the printer properly gounded through the AC wall outlet?

4. Is the printer located in an area where the temperature and humidity are stable and within specifications?

5. Is the printer located in an area free of dust?

6. Is the printer located away from water outlets, steamers, electric heaters, volatile gases, open flames and strong radio frequency sources?

7. Is the printer shielded from the direct rays of the sun?

8. Does the printer have adequate clearances on all sides for proper ventilations?

9. Is the printer installed on a level, stable surface?

10. Is the correct paper stock being used in the printer?

11. Is the customer using the printer correctly as explained in the user documentation?

12. Have the consumables been replaced correctly at the required intervals?

13. Is the problem a failure or the result of improper use, incorrect media type/weight, excessive use or a limitation of the duty cycle?

Light (undertone) prints
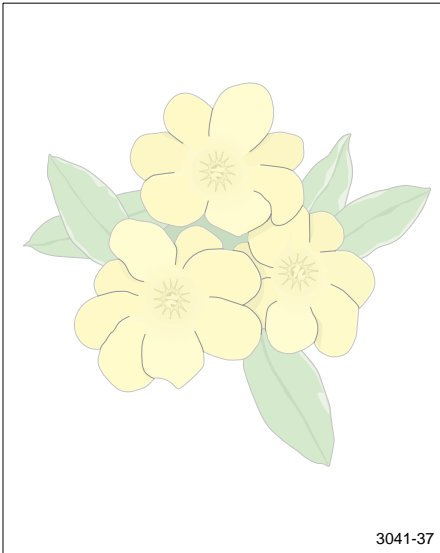
The overall image density is too light. The printer displays no error code.

1. Inspect the paper that is loaded in the paper tray. Check that the paper is not wrinkled or moist. Also ensure it is the correct weight. Card stock must be feed from the multi-purpose tray. Recycled paper and paper less than 24 lbs may produce less than optimum quality.

2. Clean and inspect the auto-density calibration sensor. Test the sensor using the printer's built-in diagnostics. If an error 11, 12, or 13 is detected, replace the auto-density calibration sensor.

3041-37

3. Print Service Test Print 1 on B-size paper and open the front cover just as the sheet of paper starts to exit the fuser. Inspect the image on the sheet of paper *before* it reaches the fuser rollers. Is the image density normal before it reached the fuser rollers? If no, go to Step 4. If yes, go to Step 7.

4. Remove the imaging unit.

5. Inspect the test print image on the accumulator belt. Does the image appear completely transferred to the accumulator belt? If yes, replace the second bias transfer roller. If not, replace the accumulator belt.

6. Print Service Test Print 1 and inspect the image on the sheet of paper. Is the image density now normal? If not, replace the high voltage power supply.

7. Print Service Test Print 1 again and inspect the image on the sheet of paper *after* it exits the fuser rolls. Is the image light when it exits the fuser? If yes, replace the oil roll cartridge.

8. Generate a test print.

9. Inspect the image on the sheet. Is the image density now normal as it exits the fuser? If not, replace the fuser.

Blank prints
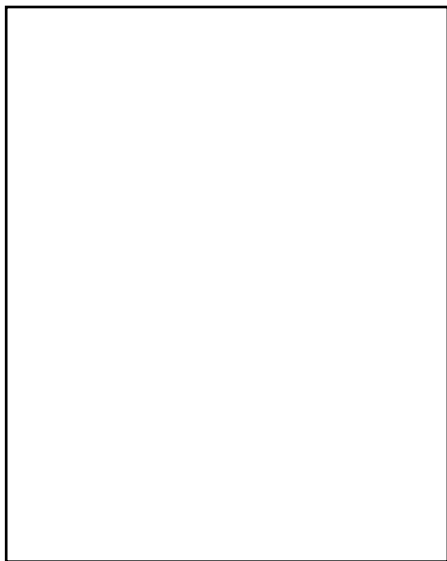
The entire image area is blank. The printer displays no error code.

1. Generate a test print. Is the test print blank? If no, reload the printer driver software or replace the image processor board.

2. Remove the imaging unit.

3. Inspect the empty imaging unit cavity for a sheet of paper that could be blocking the laser window.

4. Generate a test print and open the front cover just before the sheet of paper enters the fuser.

5. Remove the imaging unit.

6. Inspect the image on the drum. Is there an image visible on the drum? If not, make an engine-only test print. If a test print is printed, replace the image processor board. If not, replace the imaging unit.

7. Generate a test print. Is the test print blank? If yes, replace the high voltage power supply.

8. Inspect the image on the surface of the accumulator belt? Is there an image visible on the surface of the accumulator belt? If yes, replace the second bias transfer roller. If not replace the accumulator belt.

9. Replace the engine control board.

Monochrome prints
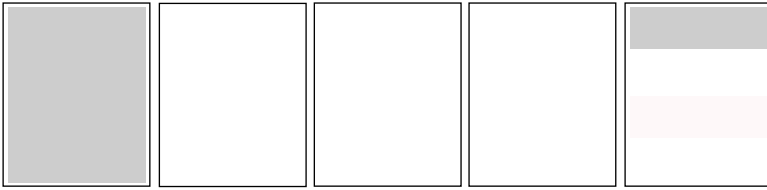
3041-38

No color is present in a color print, only the black layer is printed. The printer displays no error code. In some cases, depending on the nature of the failure, only a portion of the print may be monochrome while the remainder of the print is in color.

1. Check the accumulator belt cleaner for correct installation. The cleaning blade may be in constant contact with the accumulator belt, scraping off each layer of color toner soon after it is transferred.

2. Inspect the cleaner cam guides and holders located at the front and back of the fuser assembly. Are the cleaner cam holders seated properly? If not, reseat them as necessary.

3. Manually actuate the cleaner cam solenoid and rotate the fuser input gear to cycle the cleaner cam through its cycle of operation. Does the cleaner cam operate the cleaner cam guides properly? If not, replace the fuser assembly.

4. Replace the accumulator belt cleaner.

Black prints
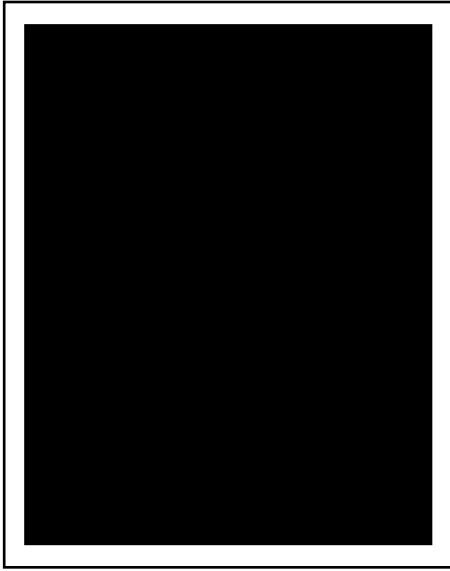
The entire image area is black. The printer displays no error code.

1. Power cycle the printer, if an error 10 is detected replace the laser scanner unit.

2. Replace the engine control board.

3. Print Service Test Print 1.

4. Is the test print completely black? If no, reload the printer driver software or replace the image processor board.

5. Generate a test print and open the front door just before the sheet of paper enters the fuser.

6. Remove the imaging unit.

7. Inspect the image on the drum. Is there a developed test print image visible on the drum? If no, replace the imaging unit.

8. Generate a test print. Is the test print black? Replace the high voltage power supply.

One color is faded
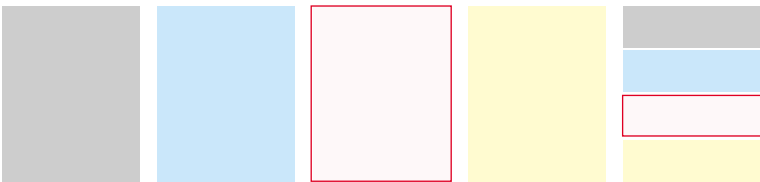
3041-39

Toner cartridge is depleted or the toner developer is defective.

1. Replace the defective toner cartridge.

2. Replace the toner developer of the defective color.

Missing band in direction of paper travel
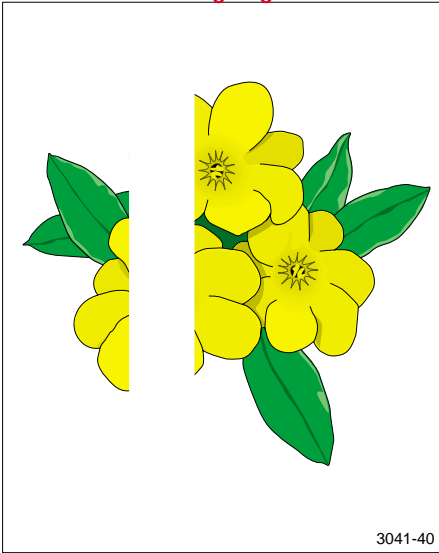
Leading Edge

3041-40

There are areas of the image that are extremely light or are missing entirely. These missing areas form wide bands that run along the page from leading edge to trailing edge in the direction of paper travel (B-size print shown). The printer displays no error code.

Note *A-size prints are processed through the printer with the short edge of the print parallel to the direction of the paper path making print artifacts parallel to the short edge of the print.*

In B-size prints are processed through the printer with the long edge of the print parallel to the paper path making artifacts parallel to the long axis of the print.

1. Is the paper wrinkled, dimpled, or show any signs of having a high moisture content? Load fresh, dry paper.

2. Print Service Print 1. Do the bands appear in all four colors, If yes, go to Step 3, If not, go to Step 7.

3. Remove the imaging unit. Inspect the empty cavity for a scrap of paper or a toner blotch that could be blocking the laser window.

4. Generate a test print and open the front cover just before the sheet of paper enters the fuser.

5. Remove the imaging unit.

6. Inspect the image on the drum. Is there a normal test print image, without any vertical band deletions, visible on the drum? If yes, go to Step 9. If no, go to Step 7.

7. Remove the top cover.

8. Turn the carousel frame and inspect the magnetic rollers of each of the four developer assemblies. Do the magnetic rollers of each developer assembly appear smooth, evenly formed, without any low spots, and without obvious contamination? If yes, replace the imaging unit. If not, replace the faulty developer assembly.

9. Inspect the image on the surface of the accumulator belt? Is there a normal test image, without any band deletions, visible on the surface of the accumulator belt? If no, replace the accumulator belt.

10. Generate a test print and open the front cover just before the sheet of paper enters the fuser.

11. Inspect the image on the paper just before the paper enter the fuser. Is there a normal test print image, without any band deletions, visible on the sheet of paper? If not, replace the second bias transfer roller.

12. Generate a test print and slide the fuser assembly out of the printer just as the sheet of paper exits the fuser.

13. Inspect the image on the sheet of paper just after the paper exits the fuser. Is there a normal test print image on the sheet of paper before entering the fuser but the image has visible band deletions after it exits the fuser? If yes, replace the oil roll cartridge.

14. Generate a test print.

15. Inspect the image on the sheet. Is the image now normal, without band deletions as it exits the fuser? If no, replace the fuser.

Missing bands in parallel to the leading edge
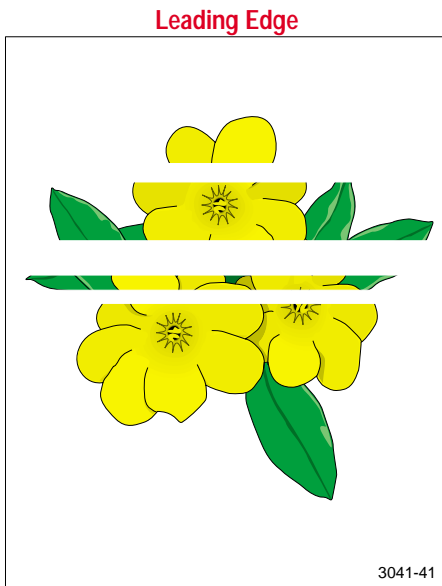
Leading Edge

3041-41

There are areas of the image that are extremely light or are missing entirely. These missing areas form wide bands that run across the page parallel with the leading edge of the print, perpendicular with the direction of paper travel (B-size print shown). The printer displays no error code.

Note *A-size prints are processed through the printer with the short edge of the print parallel to the direction of the paper path making print artifacts parallel to the long edge of the print.*

In B-size prints are processed through the printer with the long edge of the print parallel to the paper path making artifacts parallel to the short axis of the print.

1. Inspect the paper that is loaded in the paper tray. Is the paper wrinkled, dimpled, or show any signs of having a high moisture content?

2. Print Service Print 1. Do the bands appear in all four colors, If yes, go to Step 3, If not, go to Step 11.

3. Generate a test print and open the front cover just before the sheet of paper enters the fuser.

4. Remove the imaging unit.

5. Inspect the image on the drum. Is there a normal test print image, without any band deletions, visible on the drum? If yes, go to Step 6. If not, replace the imaging unit.

6. Inspect the image on the surface of the accumulator belt? Is there a normal test print image, without any horizontal band deletions, visible on the surface of the accumulator belt? If no, replace the accumulator belt.

7. Inspect the image on the sheet of paper just before the paper enter the fuser. Is there a normal test print image, without any band deletions, visible on the sheet of paper? If not, replace the second bias transfer roller.

8. Generate a test print and open the front cover just as the sheet of paper exits the fuser.

9. Inspect the image on the sheet of paper just after the paper exits the fuser. Is there a normal test print image on the sheet of paper before entering the fuser but the image has visible horizontal band deletions after it exits the fuser? If yes, replace the fuser roll cartridge.

10. Make another test print. If the problem still occurs, replace the fuser.

11. Remove the top cover.

12. Turn the carousel frame and inspect the magnet roller of each of the four developer assemblies. Do the magnet rollers of each developer assembly appear smooth, evenly formed, without any low spots, and without obvious contamination? If not, replace the defective developer assembly.

13. Replace the high voltage power supply.

14. Replace each of the four developer assemblies, one at a time.

Streaks in direction of paper travel

Leading Edge

3041-42
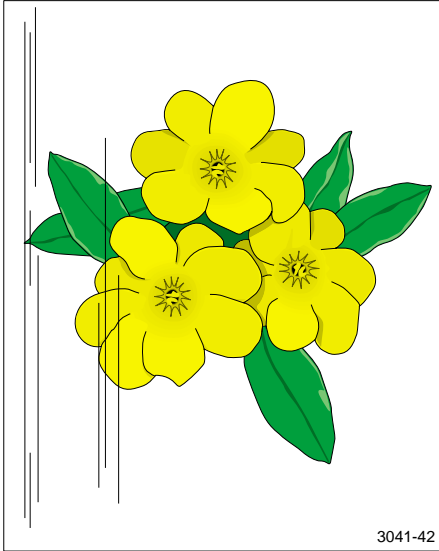
There are dark lines running along the page in the direction of paper travel from the leading edge to the trailing edge (B-size print shown). The printer displays no error code.

Note *A-size prints are processed through the printer with the short edge of the print parallel to the direction of the paper path making horizontal print artifacts parallel to the shot edge of the print.*

In B-size prints are processed through the printer with the long edge of the print parallel to the paper path making horizontal artifacts parallel to the long axis of the print.

1. Inspect the paper path, between feed and exit, for contamination or obstructions. Is the paper path free of contamination or obstructions?

2. Check for dirty fuser guide rollers. Also look for toner contamination on the fuser's temperature sensor.

3. Print Service Print 4 and open the front cover just before the sheet of paper enters the fuser.

4. Remove the imaging unit.

5. Inspect the image on the drum. Is there a normal test print image, without any streaks, visible on the drum? If yes, go to Step 6. If not, replace the imaging unit.

6. Inspect the image on the surface of the accumulator belt. Is there a normal test print image, without any streaks, visible on the surface of the accumulator belt? If no, replace the accumulator belt. If yes, inspect the accumulator belt cleaner's plastic shield for damage; replace the belt cleaner, if necessary. Replace the second bias transfer roller.

7. Generate a test print and open the front cover just as the sheet of paper exits the fuser.

8. Inspect the image on the sheet of paper just after the paper exits the fuser. Is there a normal test print image on the sheet of paper before entering the fuser but the image has visible streaks after it exits the fuser? If yes, replace the fuser roll cartridge. If streaks continue to occur, replace the fuser.

9. Remove the top cover.

10. Turn the carousel frame and inspect the magnet roller of each of the four developer assemblies. Do the magnet rollers of each developer assembly appear smooth, evenly formed, without any low spots, and without obvious contamination? If not, replace the defective developer assembly.

11. Replace the high voltage power supply.

Streaks parallel with the leading edge

Leading Edge

3041-43
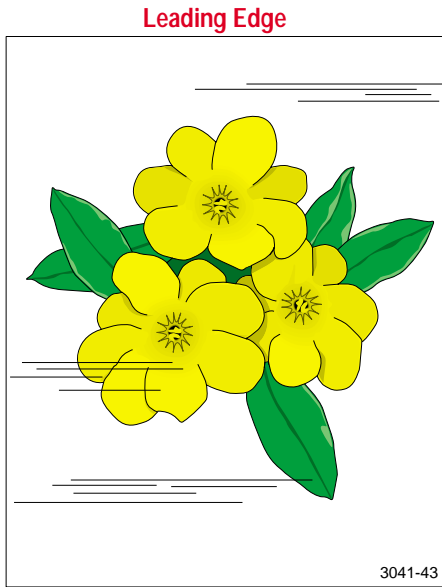
There are dark lines running parallel with the leading edge of the print, perpendicular to direction of paper travel (B-size print shown). The printer displays no error code.

Note   *A-size prints are processed through the printer with the short edge of the print parallel to the direction of the paper path making print artifacts parallel to the long edge of the print.*

In B-size prints are processed through the printer with the long edge of the print parallel to the paper path making artifacts parallel to the short axis of the print.

1. Print Service Print 1. Do the streaks appear in all colors? If not, go to Step 8.

2. Print Service Print 4 and open the front cover just before the sheet of paper enters the fuser.

3. Remove the imaging unit.

4. Inspect the image on the drum. Is there a normal test print image, without any horizontal streaks, visible on the drum? If yes, go to Step 4. If not, replace the imaging unit.

5. Inspect the image on the surface of the accumulator belt. Is there a normal test print image, without any streaks, visible on the surface of the accumulator belt? If no, replace the accumulator belt. If yes, inspect the accumulator belt cleaner's plastic shield for damage; replace the belt cleaner, if necessary. Replace the second bias transfer roller.

6. Print Service Print 4 and slide the fuser out of the printer just as the sheet of paper exits the fuser.

7. Inspect the image on the sheet of paper just after the paper exits the fuser. Is there a normal test print image on the sheet of paper before entering the fuser but the image has visible streaks after it exits the fuser? If yes, replace the fuser roll cartridge. If streaks continue to occur, replace the fuser.

8. Remove the top cover. Turn the carousel frame and inspect the magnet roller of each of the four developer assemblies. Do the magnet rollers of each developer assembly appear smooth, evenly formed, without any low spots, and without obvious contamination? If not, replace the defective developer assembly.

9. Replace the high voltage power supply.

Banding
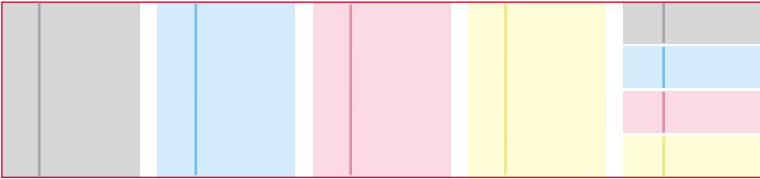
3041-44

There are three kinds of banding:

1. If a dark band appears every 364 mm from the leading edge of a B-size print or occasionally on A-size print, reseat the imaging unit and print again. If the problem persists perform the procedure "Adjusting for impulse banding" on page 74.

2. If a dark band appears at a 1.3 to 1.7 mm pitch throughout solid fills, replace the process drive assembly.

3. Dark bands appearing randomly in solid fills at pitches such as 44 mm, 88 mm or 104 mm. Replace the process drive assembly.

Edge of print is wrinkled with an area of ragged discoloration.
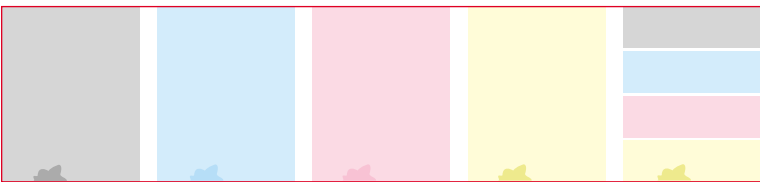
3041-45

The fuser roll cartridge is out of position.

1. Reseat the fuser roll cartridge

Random missing spots

3041-46
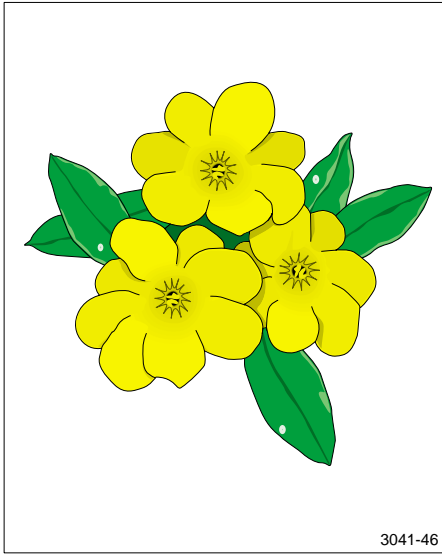
There are small areas of the image that are extremely light or are missing entirely. These missing areas form spots that are localized to small areas of the page. The printer displays no error code. A small number of occasional missing spots is normal.

1. Inspect the paper that is loaded in the paper tray. Ensure the paper is not wrinkled nor moist?

2. Random white spots with a small grit-like center, usually occurring in cyan and magenta, can be caused by compacted toner. Print Service Print 5, 6, 7, or 8, which ever color applies, to purge out the toner of the affective color.

3. Replace the affected toner cartridge. If problem continues replace that color's developer.

4. Generate a test print and open the front cover just before the sheet of paper enters the fuser.

5. Remove the imaging unit. Inspect the image on the drum. Is there a normal test print image, without any spot deletions, visible on the drum? If yes, go to Step 6. If not, replace the imaging unit.

6. Inspect the image on the surface of the accumulator belt? Is there a normal test print image, without any spot deletions, visible on the surface of the accumulator belt? If no, replace the accumulator belt.

7. Inspect the image on the sheet of paper just before the paper enter the fuser. Is there a normal test print image, without any spot deletions? If no, replace the second bias transfer roller.

8. Print Service Print 2 and open the front cover just as the sheet of paper exits the fuser.

9. Inspect the image on the sheet of paper just after the paper exits the Fuser. Is there a normal test print image on the sheet of paper before entering the fuser but the image has visible spot deletions after it exits the fuser? If yes, replace the fuser roll cartridge.

10. Make another test print. If the problem still occurs, replace the fuser.

11. Make a test print and the remove the top cover.

12. Turn the carousel frame and inspect the magnet roller of each of the four developer assemblies. Do the magnet rollers of each developer assembly appear smooth, evenly formed, without any low spots, and without obvious contamination? If not, replace the defective developer assembly.

Random spotting
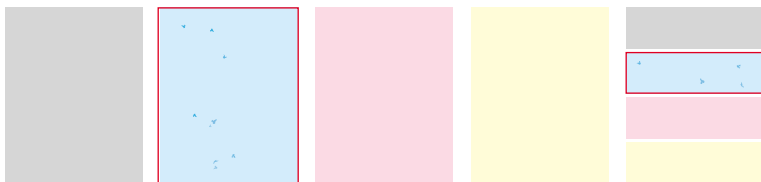
3041-47

There are spots of toner randomly scattered across the page. The printer displays no error code.

1. Slide the paper feeder out of the printer and inspect the top of the registration chute assembly. Is the top of the registration chute assembly free of toner and foreign debris? If not, remove and inspect the waste toner cartridge. Make sure the cartridge is not damaged or leaking.

2. If the spots appear in a single color, run 20 prints to consume the clumped toner. If necessary, replace the toner cartridge.

3. Remove and inspect the imaging unit. Is the exterior of the imaging unit clean and with no obvious toner leakage? If not, remove and inspect the waste toner cartridge. Make sure the cartridge is not damaged or leaking.

4. Remove the top cover.

5. Turn the carousel frame and inspect the four developer assemblies. Does each developer assembly appear clean, without any obvious toner on the exterior of the assembly or falling from the magnetic brush? Clean the dirty developer assembly. If the problem reoccurs, replace the faulty developer assembly.

6. Inspect the fuser. Is the fuser free of toner? Clean the fuser, if necessary by processing 10 sheets of B-size paper though it.

7. Remove and inspect the accumulator belt cleaner assembly. Is the accumulator belt cleaner assembly clean and with no obvious toner leakage? If not clean or replace the accumulator belt cleaner assembly, if necessary.

8. With the accumulator belt cleaner assembly removed, inspect the accumulator belt cleaner end of the auger. Is the auger clogged? Clean the printer interior.

9. Remove the rear cover.

10. With the accumulator belt cleaner assembly removed, watch the auger drive gear as you manually rotate the paper feed motor. Does the fuser drive assembly rotate the auger drive gear? If not, replace the fuser drive assembly.

11. As you manually rotate the paper feed motor place your finger inside the auger opening and feel the movement of the auger spring. Does the auger spring rotate when you manually rotate the paper feed motor? If not, replace the auger assembly.

12. Replace the imaging unit.

Repetitive mark appears on each print
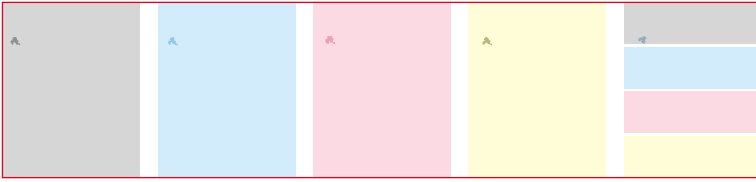
3041-48

An identical mark or image appears on each, or every other, printed image.

1. If spots repeat every 264 mm (10.4 in.) or appear to move in the direction of paper travel from print to print, replace the imaging unit. If a defect repeats in exactly the same place on successive prints, replace the accumulator belt assembly.

2. If a problem repeats every 117 mm (4.5 in.), replace the fuser. If a problem repeats every 107 mm (4.25 in.), replace the fuser roll cartridge.

3. An 88 mm (3.5 in.) smear may occur on the first print made after a new imaging unit is installed due to the misalignment of the imaging unit's gear teeth with its drive gear. Once printing starts, the teeth will mesh properly and the problem will disappear.

4. A defect every 58 mm (2.5 in.) or less is related to the feed or exit rollers.

Residual image or ghosting

3041-49
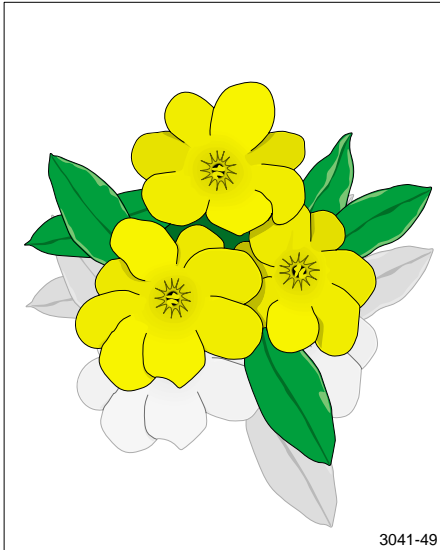
There are faint, ghostly images appearing on the page. The images may be either from a previous page or from the page currently being printed. The printer displays no error code.

1. Was the customer printing numerous copies of the same image? Avoid printing numerous copies of the same image.

2. Generate a test print and open the front cover just before the sheet of paper enters the fuser.

3. Remove the imaging unit.

4. Inspect the image on the drum. Is there a normal image, without ghosts, visible on the drum? If no, replace the erase lamp. (A failing high-voltage power supply can also cause ghosting.)

5. If the customer is consistently printing 250 B-size (500 A-size) prints a day, recommend the Hi-Duty Fuser Roll Cartridge. If fuser damage is excessive, replace fuser and install Hi-duty Fuser Roll Cartridge.

6. Replace the imaging unit. Excessive duplexing of the same image can cause ghost images on the imaging unit drum from fuser oil contamination.

7. Inspect the image on the surface of the accumulator belt? Is there a normal test print image, without ghosts, visible on the surface of the accumulator belt? If a ghost is present, visually inspect the operation of the cleaner cam solenoid and the cleaner cam guides located on the fuser assembly. If no ghost is present, replace the accumulator belt cleaner assembly.

8. Generate a test print and open the front cover just as the sheet of paper exits the fuser.

9. Inspect the image on the sheet of paper just after the paper exits the Fuser. Is there a normal test print image on the sheet of paper before entering the fuser but the image has ghost images after it exits the fuser? If yes, replace the fuser roll cartridge.

10. If ghosting continues, replace the fuser.

Background contamination
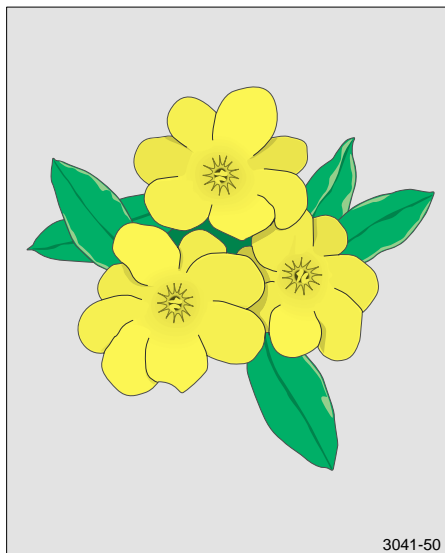
There is toner contamination on all or most of the page. The contamination appears as a very light gray dusting. The printer displays no error code.

1. Print Service Print 2 and open the front cover just before the sheet of paper enters the fuser.

2. Remove the imaging unit. Inspect the image on the drum. Is there a normal test print image, without background contamination, visible on the drum? If not, replace the high voltage power supply.

3. Inspect the image on the surface of the accumulator belt? Is there a normal test print image, without background, visible on the surface of the accumulator belt? If not replace the accumulator belt assembly.

3041-50

4. Print service Print 2 and open the front cover just as the sheet of paper exits the fuser.

5. Inspect the image on the sheet of paper just after the paper exits the fuser. Is there a normal test print image on the sheet of paper before entering the fuser but the image has background after it exits the fuser? If so, replace the fuser roll cartridge.

6. If background contamination continues to occur after 20 prints, replace the fuser.

Unfused image or image easily rubs off of page

3041-51
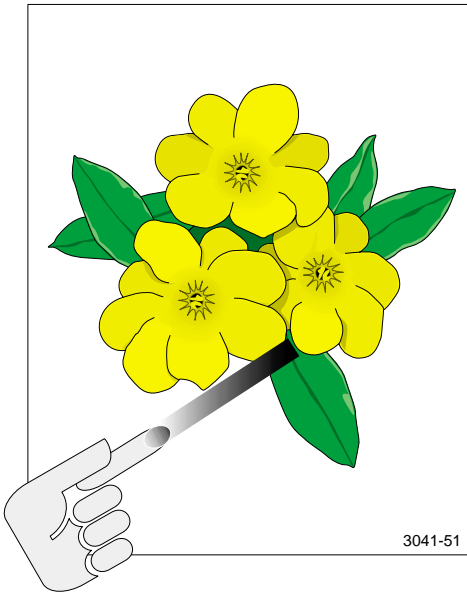
The toner image is not completely fused to the paper. The image easily rubs off. The printer displays no error code.

1. Is the image density very light? If light, but not blank, go to the earlier topic "Light (undertone) prints" on page 44.

2. Check the media weight and settings at the printer driver.

3. Check the defaults set at the front panel for media size and type.

4. Is the printed image fused to the paper. If not, replace the fuser.

5. Replace the low voltage power supply

6. Replace the engine control board

Toner on back of print

3041-52
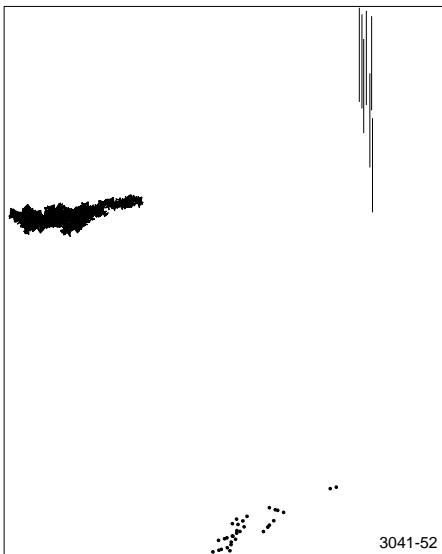
There is toner on the back of the printed sheet of paper.

1. Clean the printer interior

2. Inspect the paper that is loaded in the paper trays. Is the paper clean and free of toner?

3. Generate a test print and open the front cover just before the sheet of paper reaches the second bias transfer roller, about one second after the registration solenoid actuates.

4. Slide the paper feeder out of the printer and inspect the back of the sheet of paper. Is the back of the sheet of paper clean and free of toner? If not clean the paper feeder and its metal and rubber registration rollers.

5. Generate a test print and open the front cover just before the sheet of paper reaches the fuser.

6. Open the front cover and inspect the back of the sheet of paper. Is the back of the sheet clean and free of toner? If not, replace the second bias transfer roller and if necessary also replace the accumulator belt cleaner assembly.

7. Generate a test print and open the front cover just as the sheet of paper exits the fuser.

8. Slide the fuser out of the printer and inspect the back of the sheet of paper. Is the back of the sheet of paper clean and free of toner when it exits the fuser? If not, clean the fuser rollers, by processing 10 sheets of B-size paper through the printer, or replace the fuser.

9. Generate a test print and open the upper exit cover just as the sheet of paper reaches exit roller.

10. Inspect the back of the sheet of paper. Is the back of the sheet of paper clean and free of toner as it nears the exit roller? If not, clean or replace the upper exit assembly.

Print is mottled

3041-53

The printed image has a mottled appearance.

1. Ensure good quality laser paper is being used.

2. Check the media settings at the printer driver and at the front panel default settings for media size and type.

3. Does mottling occur on only one color? If yes, remove the top cover and inspect the magnetic rollers of the affected color's developer assembly. Ensure there is no buildup. Replace the developer if necessary.

4. Print Service Print 2 and open the front cover just before the sheet of media exits the fuser. Remove the imaging unit and inspect the image on the drum. Is there a normal image without mottling. If not replace the imaging unit.

5. Inspect the image on the accumulator belt. Is there a normal image without mottling on the belt? If not, replace the accumulator belt assembly.

6. Print a test print and open the front cover just before the sheet of media reaches the fuser. Is there a normal image on the print without mottling. If not replace the second bias transfer roller.

7. If the image on a print is normal before it passes through the fuser but mottled afterwards, replace the fuser roll cartridge. If the problem persists, replace the fuser.

Image mis-registered on paper

3041-54
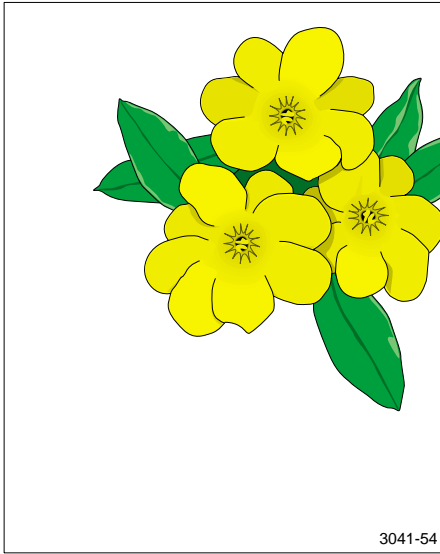
The image area is not centered on the page or the image is bleeding off of the page. The printer displays no error code.

1. Is the correct weight paper correctly loaded in the tray(s) or multi-purpose tray? Ensure the paper guides are correctly set.

2. Clean or replace the pick rollers.

3. Print Service Print 3 and slide the paper feeder out about 10 seconds after pressing **Print**. The paper should be evenly pre-registered 6 mm (1/4 in.) from the mylar registration guide. If correctly registered, test the registration clutch. Clean the registration rollers. If not, test the pick solenoid of the tray being used. Replace if needed.

4. Replace the paper feeder.

5. Replace the engine control board.

Color layer not correctly registered

3041-55
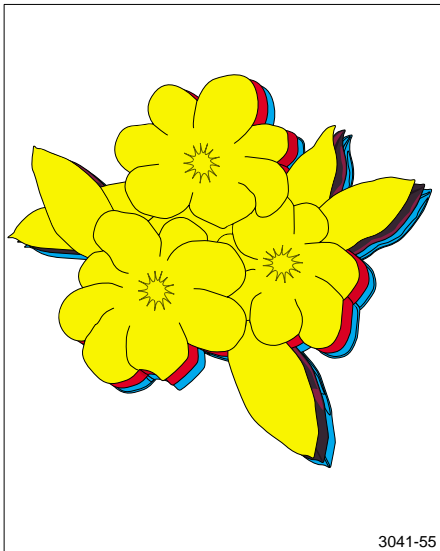
The four color images are not registered correctly and do not form a clean, four color image on the page. The printer displays no error code.

1. Ensure the shipping blocks are removed from the paper feeder.

2. Test the accumulator belt home sensor. Replace it if necessary.

3. Replace the engine control board.

4. Replace the image processor.

5. Replace the accumulator belt assembly.

Color representation not correct

3041-56
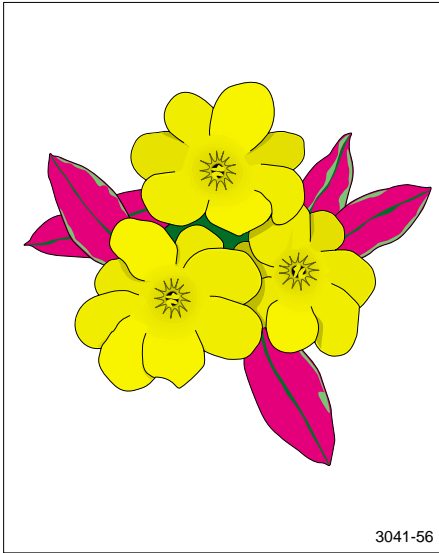
The color of the printed image is *completely* different than the computer image. The printer displays no error code.

1. Ensure driver settings are correct. Reload the printer driver software.

2. Clean and inspect the auto-density calibration sensor. Test the sensor using the printer's built-in diagnostics.

3. Replace the image processor.

4. Replace the engine control board.

5. Replace the carousel home sensor.

Oil stain or gloss variation on print

3041-57

Variations in glossiness in solid fills may occur near the oil roll cartridge end of life or with printers running excessively high daily print volumes. If the customer is consistently running a high volume of prints per day, they should user the high-capacity fuser roll cartridge.

1. An oil stain may occur on first print after the printer has been idle for an extended period. If the problem persists on sucessive prints, replace the oil roll cartridge. Look for excessive oil around the fuser.

2. Check the media in the tray. Try new media.

3. Glossiness variations in solid fills may occur near the oil roll cartridge end of life or with printers running high daily print volumes. On coated paper, a variation in glossiness may occur 118 mm from the print's leading edge.

Random spotting
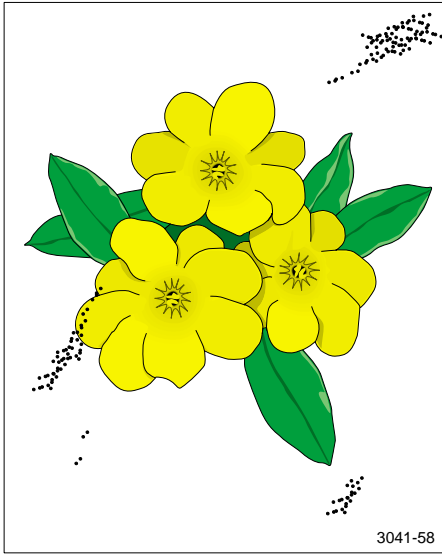
There are spots of toner randomly scattered across the page.

1. Slide the paper feeder out of the printer and inspect the top of the registration chute assembly. Is the top of the registration chute assembly free of toner? If not, remove and inspect the waste toner cartridge. Make sure the cartridge is not damaged or leaking.

2. Remove and inspect the imaging unit. Is the exterior of the imaging unit clean and with no obvious toner leakage? If not, remove and inspect the waste toner cartridge. Make sure the cartridge is not damaged or leaking.

3. Turn the carousel frame and inspect the four developer assemblies. Does each developer assembly appear clean, without any obvious toner on the exterior of the assembly or falling from the magnetic brush? Clean the dirty developer assembly. If the problem reoccurs, replace the faulty developer assembly.

4. Inspect the fuser. Is the fuser free of toner? Clean the fuser, if necessary.

5. Remove and inspect the accumulator belt cleaner assembly. Is the accumulator belt cleaner assembly clean and with no obvious toner leakage? If not clean or replace the accumulator belt cleaner assembly, if necessary.

6. With the accumulator belt cleaner assembly removed, inspect the accumulator belt cleaner end of the auger. Is the auger clogged? Clean the printer interior.

7. Remove the rear cover. With the accumulator belt cleaner assembly removed, watch the auger drive gear as you manually rotate the paper feed motor. Does the fuser drive assembly rotate the auger drive gear? If not, replace the fuser drive assembly.

8. As you manually rotate the paper feed motor place your finger inside the auger opening and feel the movement of the auger spring. Does the auger spring rotate when you manually rotate the paper feed motor? If not, replace the auger assembly.

9. Replace the imaging unit.

Media jams and the paper path

Skewed image

The image area is twisted or is not parallel with the sides of the page. The printer neither jams nor displays an error code.

1. Check that the paper tray's metal hooks (at the corners of the leading edge of the paper in the tray) are not bent or deformed.

2. Feed paper out of each of the available paper feeders. Does the image skew when fed out of one tray but not when fed out of the others? If yes, Inspect the paper and tray of the feeder that is skewing to ensure the tray is correctly loaded and the paper is good.

3. Replace the multi-purpose tray pick-up roller or the main tray feed roller.

4. Print a test print and slide the paper feeder out about 10 seconds after pressing PRINT. Carefully slide the paper feeder out of the printer and inspect the position of the sheet of paper. Is the sheet of paper parallel to the edges of the paper feeder? If not, replace the turn roller assembly.

5. Generate a test print and slide the fuser out of the printer just as the sheet of paper is moving through the registration rollers. Carefully slide the paper feeder out of the printer and inspect the position of the sheet of paper. Is the sheet of paper parallel to the edges of the paper feeder as it leaves the registration rollers? If no, clean or replace the feeder rubber registration roller.

6. Remove second bias transfer roller. Manually raise and lower the cam levers at the ends of the second bias transfer roller. Are the cam levers undamaged? When you raise the levers does the second bias transfer roller lower and when you release the levers does the second bias transfer roller raise? Do the cam levers have a strong spring action? If not, replace the second bias transfer roller.

Damaged prints

The printed page exits the printer either wrinkled, creased, or torn. The printer neither jams nor displays an error code.

The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem, replace each component listed below, one at a time, until the problem disappears. Check the media settings at the printer driver.

- Paper feeder (usually appears without toner in creases or wrinkles)

- Fuser)

- Accumulator belt (usually appears with toner in creases or wrinkles)

1. Check that the paper tray's metal hooks (at the corners of the leading edge of the paper in the tray) are not bent or deformed.

2. Feed paper out of each of the available paper feeders. Is the paper damaged when fed out of one tray but not when fed out of the others? If so, inspect the tray for damage and check the paper to ensure it is correct.

3. Is the paper damaged when fed out of multi-purpose tray? Inspect the multi-purpose tray for debris or obviously broken components that could be damaging the paper as it feeds out of the assembly and into the printer.

4. Inspect the paper feeder for debris or broken components?

5. Generate a test print and open the front cover just as the sheet of paper is moving through the registration rollers (about 1 second after you hear paper feeding start).

6. Carefully slide the paper feeder out of the printer and inspect the sheet of paper. Is the sheet of paper undamaged as it leaves the registration rollers? If yes, replace the metal registration roller and the rubber registration roller.

7. Generate a test print and open the front cover just before the sheet of paper reaches the fuser. Open the front cover and inspect the sheet of paper. Is the sheet of paper undamaged as it leaves the second bias transfer roller? If yes, replace the second bias transfer roller.

8. Generate a test print and open the front cover just as the sheet of paper exits the fuser. Inspect the sheet of paper. Is the sheet of paper damaged as it exits the fuser? If yes, replace the fuser.

9. Generate a test print and open the upper exit cover just as the sheet of paper reaches exit roller. Inspect the sheet of paper. Is the sheet of paper undamaged as it nears exit roller? If no, clean or replace the lower exit assembly and the upper exit assembly. Is the sheet of paper undamaged until it reaches exit roller? If yes, replace exit roller.

Inoperative lower tray feeder

The lower tray feeder does not work at all, the lower tray feeder does not attempt to feed paper, and the problem is not identified by a displayed error code.

1. Ensure the printer driver is configured with the "optional trays" installed.

2. Try printing using a different application program.

3. Try printing using a different printer driver.

4. Try printing from another computer.

5. Check the wire harness that is running between the paper feeder circuit board to the engine control board. Ensure the wire harnesses are connected to P/J131 and 132 on the lower feeder circuit interface board

6. Generate test prints from Tray 2, Tray 3, and Tray 4. Does the printer generate a test print from any of the lower feeder trays? If no, go to Step 10.

7. Remove the lower feeder rear cover.

8. Measure the voltage between P/J133-B5 and frame ground on the lower feeder circuit board. Is there +5VDC between P/J133-B5 and frame ground on the lower feeder circuit board? If not, verify that +5 VDC on P33-10 the low voltage power supply.

9. Measure the voltage between P/J133-B1 and frame ground and between P/J133-B2 and frame ground on the lower feeder circuit board. Is there +24VDC between P/J133-B1 and ground and between P/J133-B2 and FG? If not, verify the +24VDC on pins 13 and 14 of the low voltage power supply and the engine control board.

10. Replace the lower tray feeder circuit board.

11. Replace the engine control board.

Power problems

All front panel indicators remain off. The printer does not initialize upon power-up

1. Check to see if the printer is plugged in.

2. Check the power on/off switch.

3. Reset the fuser and the paper feeder.

4. Refer to the topic "Printer will not power up" on page 40.

Front panel indications

Media tray indicates missing or empty when it is not

1. If there is media in the tray, then check the media sensors. If the lower feeder is available, switch trays to verify the source of the problem

2. Check to see if the paper-empty sensor is broken.

3. Run service diagnostics on the media sensors.

4. Check the media selection switch actuators on the rear of the paper tray. Also check the paper size switches at the rear of the printer frame or the lower feeder.

Macintosh printing problems

Image never prints

Printer acts as if it is receiving data, but nothing comes out of printer or it goes back to "Ready" mode without printing image.

1. Power cycle the printer and print again.

2. Make sure that the correct Phaser 780 printer icon was selected in the **Chooser**. Try printing the job again.

3. In the **Chooser** or the print dialog, switch background printing to *off*. Try printing the job again.

4. Ensure that the printer can print by printing an internal front panel test print.

5. Enable the Error Handler through the front panel and try printing the job again. If an error page is printed after printing the job again, call the Customer Support Hotline for further assistance. Please have the error page in hand.
   If available, try printing to a black-and-white PostScript printer (such as an Apple LaserWriter). If the file does not print on the black-and-white PostScript printer, this may mean that the problem may be application- or network-related.

Image prints in black-and-white

1. In the print driver dialog box, make sure the **Color/Grayscale** option has been selected.

2. Check the version of your LaserWriter driver to ensure that it is version 6.0.7 or higher. Earlier versions of the driver do not support color PostScript. The application may require special instructions to print.

3. Ensure the driver setting TekColor is not set to Monochrome mode.

Image is rotated 90 degrees

1. In the application's **Page Setup**, make sure that the image is selected to print in portrait or landscape orientation to match the document. Also ensure the selected paper size is correct.

2. Ensure that the printer can print by printing an internal front panel test print.

3. Enable the Error Handler through the front panel and try printing the job again. If an error page is printed after printing the job again, call the Customer Support Hotline for further assistance. Please have the error page in hand.
    If available, try printing to a black-and-white PostScript printer (such as an Apple LaserWriter). If the file does not print on the black-and-white PostScript printer, this may mean that the problem may be application- or network-related.

Windows printing problems

Image never prints

Printer acts as if it is receiving data, but nothing comes out of printer or the printer goes back to "Ready" mode with out printing image.

1. Under the printer's setup options, set **RETRY = 850**

2. Try printing from the printer driver.

3. Try printing from another application.

4. Try printing to another printer.

5. Try printing from another computer.

6. Try printing an internal front panel test print.

Blue color on the screen is printing too purple.

Many applications describe color as percentages of a video display screen's primary colors: red, green, and blue (RGB). When a printer translates these RGB colors into its own primaries of cyan, magenta, and yellow (CMY), blue is often printed as purple.

1. To adjust blue from within Microsoft Windows: Within the Tektronix PostScript Windows driver you have an option, **Vivid Color**, that alters to blue colors that are appearing purple.

    To Access this option, select:
    Printer Control Panel
    Right click **Printer Driver**
    Choose **Properties**
    Choose **Color Corrections**
    Select **Vivid Color**

Printing from Windows 3.1 produces the message "Problem writing device LPT1: Cancel or Retry".

Option #1:

1. Select **Printers**, and click **Configure**.

2. Change the port selection from **LPT1** to **LPT1.OS2**.

3. The **MODE** command disables DOS timeouts. The LPT1.OS2 selection forces Windows to print through DOS instead of directly to the printer.

Option #2: The solution above does not allow users to spool documents using the PrintManager. To use the PrintManager as well as correcting time-out problems, edit the following line in the *win.ini* file:

```
TransmissionRetryTimeout=45 to:
TransmissionRetryTimeout=850
```

In Windows 3.1:

1. Follow the above instructions for issuing the **MODE** command in DOS.

2. Start Windows.

3. Select the **Control Panel** from the **Main** menu.

4. Select **Printers**

5. Select the appropriate printer and click on **Connect**.

6. Uncheck the **Fast Printing Direct to Port** box.

Workstation printing problems

Image never prints

Printer acts as if it is receiving data, but nothing comes out of the printer or the printer goes back to "Ready" mode without printing an image.

For serial or parallel printing. Ensure that the print file ends with a "CTRL-D" character. CTRL-D indicates the end-of-file, which the printer responds to by closing host-to-printer communications and then processing and printing the file. Use a text editor to open and examine the file. There is a utility file that you can use to tag or remove a CTRL-D to the end of a print file. TCP/IP and Novell protocols do not accept CTRL-D with the print files. Refer to the network user manual.

Running built-in diagnostics

The printer diagnostic interface consists of a front panel containing a 2 line by 40 character LCD display and six buttons. For diagnostics, the front panel switches are identified as 1 through 6 with switch 1 being the left-most switch and switch 6 being the right-most switch.

To place the printer in service diagnostics mode. Turn on the printer and wait for a string of "∗" to appear on the front panel display, as they appear, press and hold button 3 for five seconds. You select individual test by navigating a tree-structure with three buttons defined as **Prev**, **Next**, and **Select**.

Help Mode. You can enter a Help mode at the top level by pressing **Prev** or **Nest** until `Help Mode On/Off` is displayed. Once you select Help mode and "H" is displayed on the lower-right corner of the display. With help mode enabled, once you select a test, information about the test is displayed in the top line of the display. Buttons 3 and 4 are relabeled as **Quit** and **More**. Pressing **More** displays additional information about the test. Pressing **Quit** leaves the test description and asks if you want to run the test.

Table 1   Diagnostic tests

Test	Sub-tests	Detail
Service Print	Source	Tray 1
		Tray 2
		Tray 3
		Tray 4
		MPT
	Output	Right Side
		Top Cover
	Media	Paper
		Transparency
		Label
		Cover
	Print	Black Grid
		Color Grid
		Black Patch
		Color Patch
	Paper Path Test	
Image Processor	Kernel, DIMMs, ROMs, I/O	
Engine ROM Revision		

Table 1   Diagnostic tests

Test	Sub-tests	Detail
Sensors	Belt Home Sensor	
	Carousel Home Sensor	
	Waste Cartridge Sensor	
	Waste Cartridge Full Sensor	
	Full Stack Sensor	
	Exit Sensor	
	New Toner Sensor	
	Toner Cartridge Present Sensor	
	Paper Feeder Interlock	
	MPT Long Paper Sense	
	MPT Paper Sensor	
	MPT Edge Sensor	
	Registration Sensor	
	Oil Roller Switch	
	New Oil Roller Switch	
	Fuser Interlock Switch	
	Fuser Entry Sensor	
	Fuser Exit Sensor	
	Front Cover Interlock	
	Lower Feeder Interlock	
	Tray 1 Present	Indicates Missing or Size of media selection
	Tray 2 Present	
	Tray 3 Present	
	Tray 4 Present	

Table 1 Diagnostic tests

Test	Sub-tests	Detail
Sensors (cont.)	Tray 1 Low Sensor	
	Tray 1 Empty	
	Tray 2 Low Sensor	
	Tray 2 Empty	
	Tray 3 Low Sensor	
	Tray 3 Empty	
	Tray 4 Low Sensor	
	Tray 4 Empty	
	Auto-density Calibration Sensor	Pass/Fail test of sensor and its wiper solenoid; for solenoid portion of test, listen for clicks of sensor wiper solenoid.
Motors/Solenoids	Process Motor	Slow/Fast
	Paper Feed Motor	On/Off
	Laser Motor	On/Off
	Toner Dispense Motor	One Time
	Lower Feeder Motor	On/Off
	MPT Feed Clutch	
	MPT Pick Solenoid	
	MPT Pre-Registration Clutch	
	MPT Registration Clutch	
	Developer Clutch	
	Second Bias Transfer Clutch	
	Oil Roller Solenoid	
	Belt Cleaner Solenoid	
	Tray 2 Pick Solenoid	
	Tray 3 Pick Solenoid	
	Tray 4 Pick Solenoid	
	Tray 2 Feed Clutch	

Table 1 Diagnostic tests

Test	Sub-tests	Detail
Motor/Solenoids (cont.)	Tray 3 Feed Clutch	
	Tray 4 Feed Clutch	
	Rear Fan	Slow/Fast Speed
	Fuser Fan	Slow/Fast Speed
	Erase lamp	On/Off
	Fuser Lamp (heater)	On/Off
Front Panel	Front Panel Display	
	Front Panel LEDs	
Life Data	Save Life Count	The Save function copies all consumable and FRU counts from the engine control board NVRAM to the image processor board. The Restore function returns the values to the engine control board NVRAM. The Save function must be performed prior to replacing the engine control board. Perform the Restore function after the replacement
	Restore Life Count	
	Drum Unit Life	
	Yellow Toner Life	
	Magenta Toner Life	
	Black Toner Life	
	Cyan Toner Life	
	Printer Life	
	Bias Transfer Roller Life	
	Belt Cleaner Life	
	Fuser Oil Life	
	Fuser Unit Life	
	Reset Fuser Life	Perform the appropriate reset function whenever one of these FRUs is replaced to return that FRUs copy count to zero
	Reset Bias Transfer Roller Life	
	Reset Belt Cleaner Life	

Adjustments

This topic discusses using the front panel's interactive mode to review and change the printer's operation. It also contains the procedures to calibrate the printer after you replace key Field Replaceable Units and to evaluate the printer's functionality.

Printing test prints

The prints printed via the front panel the are generated by the image processor. While the printer is idle you can use the front panel to print an image stored in the image processor such as the configuration page.

Print service test prints

The service prints allow you to evaluate the printer's print quality.

1. Press the **Printer Menu Select** button.

2. Select the `Help Pages`.

3. Scroll to either `Service Print 1` or `Service Print 2` and press **Print**.

Printing the configuration page

The configuration page shows a great deal of information regarding the data and set-up values stored in NVRAM. In the same Help pages menu you can also print the startup page.

1. Press the **Printer Menu Select** button.

2. With the `Help pages` menu displayed, scroll to the `Configuration Page` menu item. Press **Print**.

Printing the demonstration pages

Demo pages demonstrate the capabilities of the printer.

1. Press the **Printer Menu Select** button.

2. With the `Help pages` menu displayed, scroll to the `Demonstration Page` item. Press **Print**.

Print engine calibration

Generally, only one print engine calibration is required. Usually, if you note a print defect, replacing a toner cartridge, a developer or the imaging unit or perhaps the paper feeder corrects the problem.

Adjusting for impulse banding

Impulse banding is a print artifact that occurs on prints when the developer roller comes into contact with the drum. This adjustment adds shims to the carousel assembly to slightly alter the position of each developer assembly relative to the drum.

Note   *The shims used in this adjustment permanently clip into place and can be difficult to remove. You should modify a set of shims by cutting the clips off of the shims so they can be inserted and removed easily. Once you determine the correct shims required, install permanent shims in their place.*

1. Ensure the printer is in a ready-to-operate condition.

2. Turn off the printer.

3. Remove the top cover.

4. With a pen or marker (no pencil), scribe a line across the white tracking roller located at the front of the developer roller.

5. Position the white roller so the mark is even with the edge of the nearly developer frame.

6. Hold the carousel lock so it will not impede the carousel's movement.

7. With a slow, smooth action, rotate the carousel assembly 180°.   Do not allow the carousel to stop as the developer pass the drum surface. Continue rotating the carousel to bring the marked developer to its starting position.

8. As the developer roller contacts and passes the drum surface, the developer should rotate about 2 mm. Too much rotation, caused by the roller contacting the drum too soon, causes impulse banding.

   Inspect the white tracking roller for movement. If the mark is within 2 mm of its original position, no adjustment is needed.

   If the mark is rotated beyond 2 mm, a shim is required.

9. Generally, a 1 mm shim usually corrects impulse banding. Install a shim in the side of the carousel assembly for the developer being tested.

10. Repeat the procedure from Step 5 until the rotation is about 2 mm. If rotation is not enough, use a smaller shim. Too much, use a larger shim.

11. Repeat for each developer.
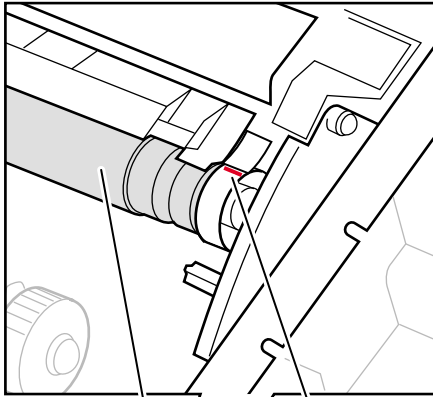
Developer roller

Place mark on white roller
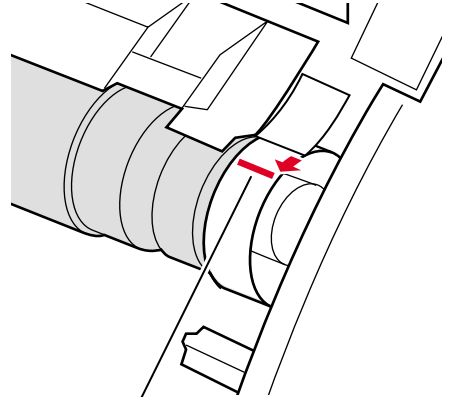
After carousel rotation mark should move 2mm
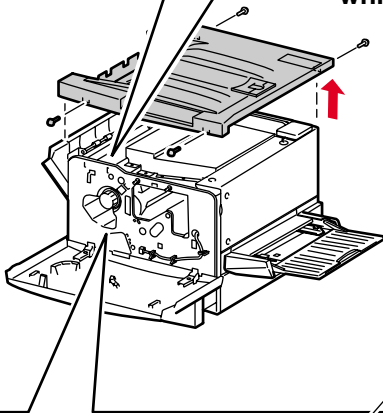
Install shim
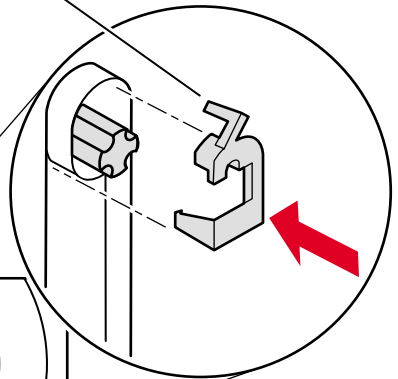
Lift up slightly to install shim
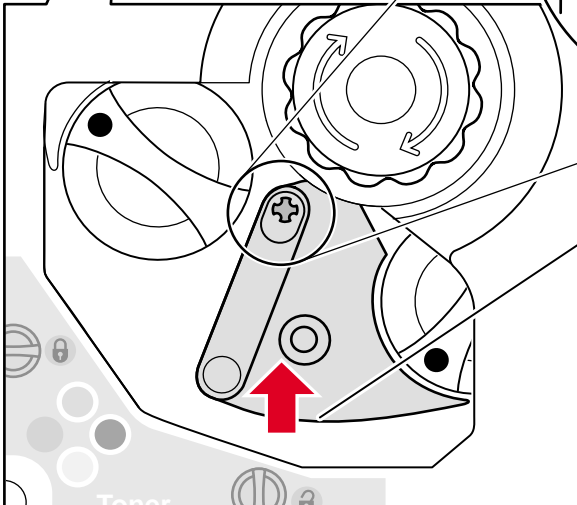
3041-32

Adjusting for impulse banding

Cleaning and Maintenance

Service preventive maintenance procedure

Whenever you check, service, or repair a printer, you should perform the following procedures. Cleaning the printer, as outlined in the following steps, assures proper operation of the printer and reduces the probability of having to service the printer in the future.

The frequency of use and the type of paper a customer prints on will, in large part, determine how critical cleaning the machine is. Users of ordinary Bond paper (copier paper) should have very few problems since this paper is smooth and relatively dust-free. You should thoroughly inspect and clean these printers.

Ask each printer customer about the type of paper he or she uses so that you can be sure to clean the parts of the printer that particular paper may affect. If a customer is printing on the more unusual or dustier papers, then you should pay particular attention to these printer parts:

- The standard pick roller
- The multi-purpose pick roller
- The feed rollers
- The cabinet interior
- The exit rollers

Recommended tools

- Toner vacuum cleaner
- Suction bulb (air blower)
- Cleaning water
- Lint-free wipes
- Cotton swabs
- Imaging unit cover
- Isopropyl alcohol (greater than 90% pure)

Cleaning

Never *apply alcohol on the second bias transfer roller.*
Never *apply alcohol to the fuser rollers.*

1. Turn off the printer.

2. Remove the imaging unit and cover it to protect it from the light.

3. Remove the toner cartridges.

4. Slide out the fuser.

5. Remove the paper tray.

6. Slide out the paper feeder.

7. Clean all printer rollers, except the second bias transfer roller and the fuser rollers, with alcohol-dampened wipes only.

8. Clean the laser window with puffs of air from the suction bulb. Alternately, you can vacuum the window clean.

9. Wipe off the pre-exposure erase lamp with a lint-free wipe.

10. Vacuum out the interior of the printer.

11. Vacuum loose toner out of the carousel assembly.

12. Remove and clean the accumulator belt cleaner assembly. Removing the accumulator belt cleaner assembly is explained on the *Phaser 780 Service CD-ROM*. Once removed, gently vacuum the cleaner assembly using a vacuum with a brush attachment. Do not touch the cleaner blade with your hands nor bend or crease the film seal.

13. If you must clean the fuser rollers, *never* clean them with alcohol. First clean the fuser rollers by processing 10 sheets of paper through the printer. If more cleaning is needed, clean the rollers with a soft, lint-free cloth with either fuser oil or water.

Resetting NVRAM

Resetting NVRAM returns all the image processor's NVRAM-stored parameters to their factory defaults except the print counts and the Adobe firmware serial number.

Caution   *Resetting NVRAM will also reset the network card's NVRAM. If possible, copy down all network parameters or print the Configuration Page.*

To reset the image processor to its factory default values, follow this procedure:

1. Turn on the printer

2. When the row of "✳", begins to be displayed on the front panel, press and release button 1 and then press and release button 4.

3. When the front panel displays "Password?", press and release button 1, then press and release button 3. The display responds with the message "Resetting NVRAM." Following NVRAM reset, the print powers up normally.

Key FRU Disassembly

This topic illustrates how to remove and replace key printer Field Replaceable Units (FRUs). Refer to the later topic "FRU List" on page 137 for a list of the printer's FRUs. For more detailed removal/replacement procedures refer to the *Phaser 780 Service CD-ROM.*

Paper feeder

1. Slide the paper feeder far enough out of the printer so you can reach the assembly rails.

2. Push in on the front rail latch as you slide the front of the paper feeder out far enough to disengage the latch.

3. Push in on the rear rail latch as you slide the rear of the paper feeder out far enough to disengage the latch.

4. Slide the paper feeder out of the printer.

Reverse these steps to install the paper feeder.
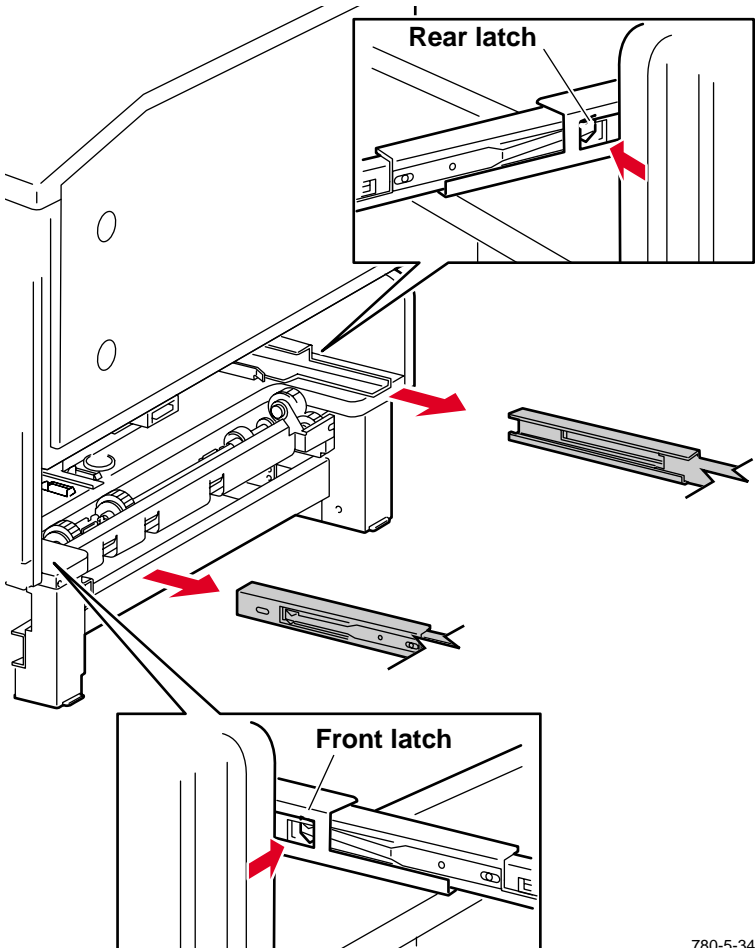
780-5-34

Removing the paper feeder

Feeder registration chute

1. Slide the paper feeder out of the printer. You do not need to remove the paper feeder.

2. Remove the E-ring securing the rear arm of the registration chute to the paper feeder.

3. Remove the screw securing the ground wire to the chute. Remove the wire.

4. Open the registration chute.

5. Slide the chute to the rear and remove the chute.

Reverse these step to install the registration chute.
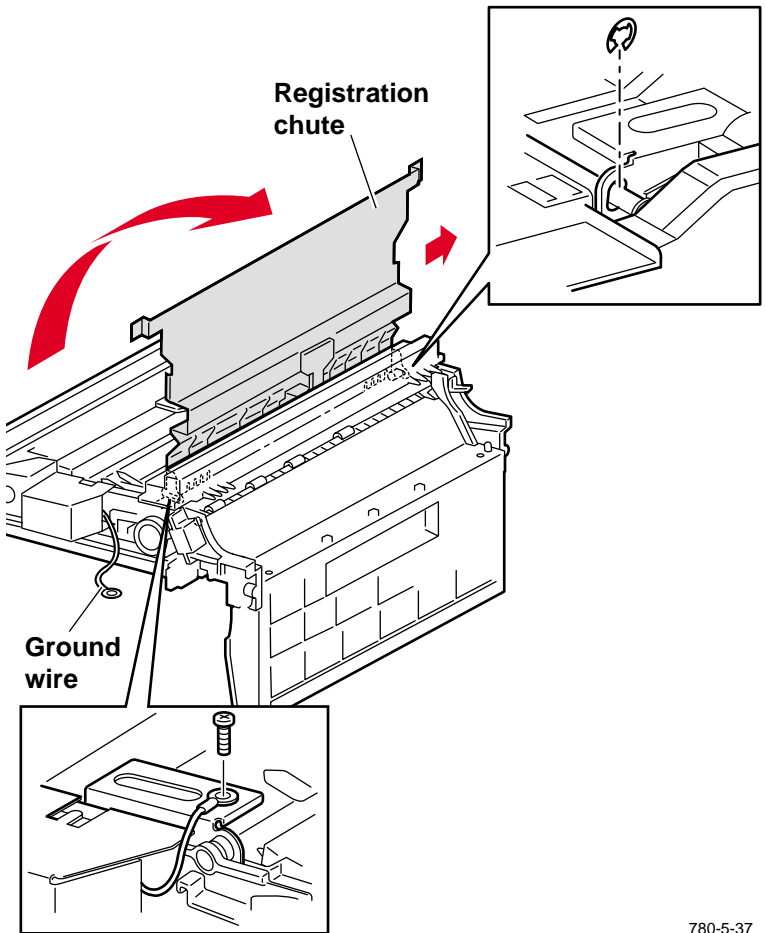
Registration chute

Ground wire

780-5-37

Removing the registration chute

Feeder registration clutch

1. Remove the paper feeder as described in "Paper feeder" on page 82.

2. Turn over the paper feeder and disconnect the wiring harness from the registration clutch.

3. Open the registration chute.

4. Remove the E-ring securing the registration clutch to the rear of the metal registration roller. Remove the registration clutch from the roller.

Reverse these steps to install the registration clutch.

Registration clutch
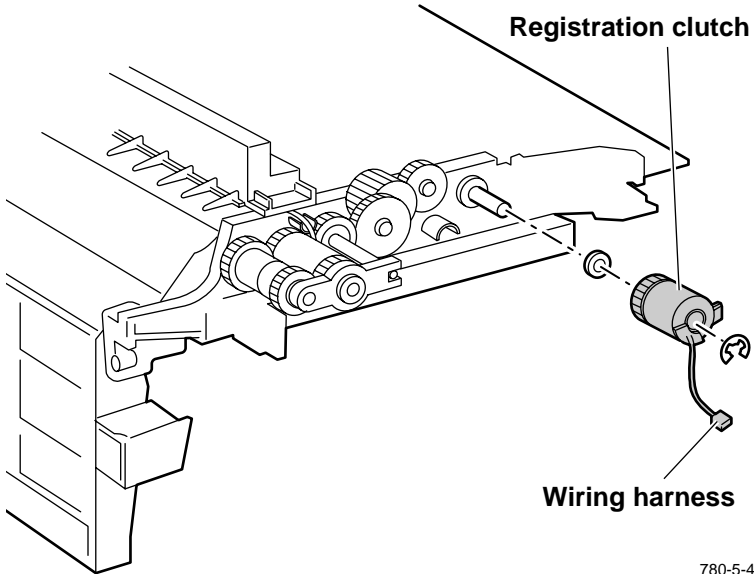
Wiring harness

780-5-40

Removing the registration clutch

Registration brake clutch

1. Remove the paper feeder as described in "Paper feeder" on page 82.

2. Turn the paper feeder over and disconnect the wiring harness from the registration brake clutch.

3. Remove the three screws securing the registration brake clutch assembly to the side of the paper feeder. Remove the assembly.

4. Remove the E-ring securing the registration brake clutch to the clutch shaft and remove the clutch.

5. Remove the E-ring securing the registration brake gear to the gear shaft. Remove the gear.

Reverse these steps to install the registration brake clutch.

Wiring harness

Registration brake assembly

Registration brake gear

Registration brake clutch

780-5-46
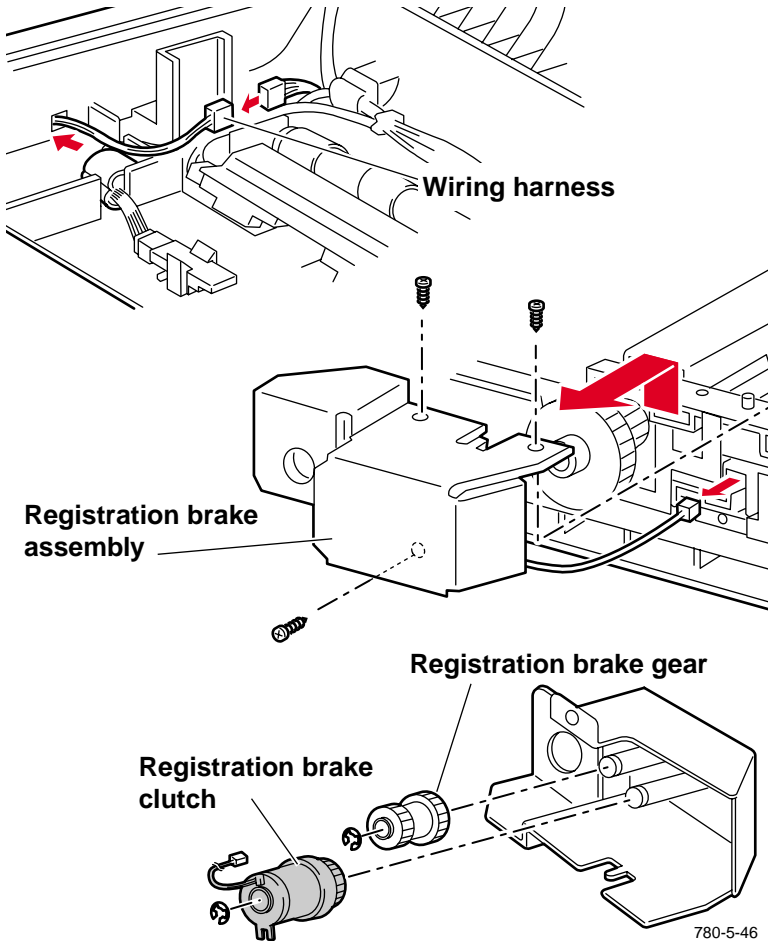
Removing the registration brake clutch

Feeder metal registration roller

1. Remove the feeder registration clutch as described in "Feeder registration chute" on page 83.

2. Remove the registration brake clutch as described in "Registration brake clutch" on page 85.

3. Remove the E-ring securing the out gear at the front end of the metal registration roller. Remove the gear.

4. Remove the rear bearing from the metal registration roller.

5. Slide the metal registration roller to the rear, slide the front of the roller out of the front bearing, and remove the roller from the main paper feeder.

Reverse these steps to install the feeder metal registration roller.
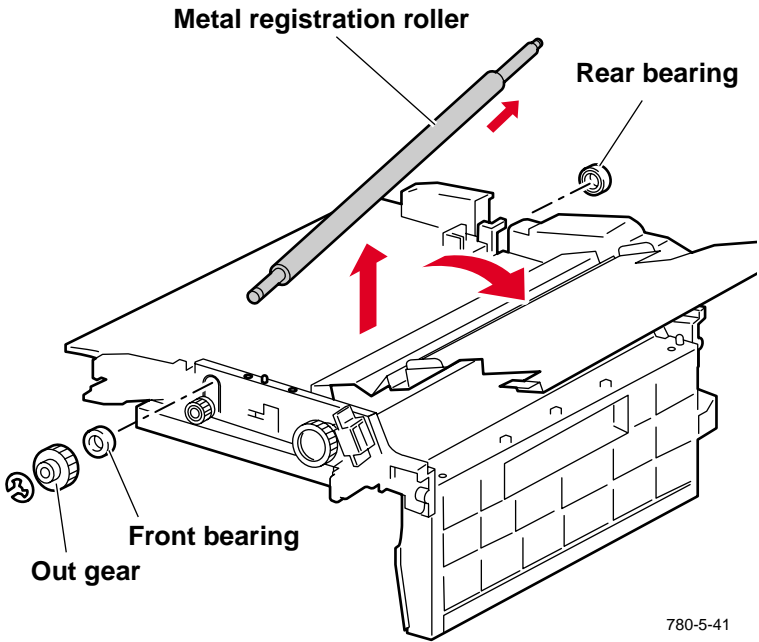
780-5-41

Removing the metal registration roller

Feeder rubber registration roller

1. Remove the feeder metal registration roller.

2. Remove the E-ring at the front of the rubber registration roller securing the gear to the roller. Remove the gear.

3. Remove the E-ring securing the rear of the rubber registration roller to the paper feeder.

4. Remove the rear bearing and *black* spring from the rear end of the rubber registration roller.

5. Slide the rubber registration roller out of the paper feeder. Note the *silver* spring and bearing on the front end of the roller.

Reverse these steps to install the feeder rubber registration roller. The front portion of the shaft is longer than the rear.
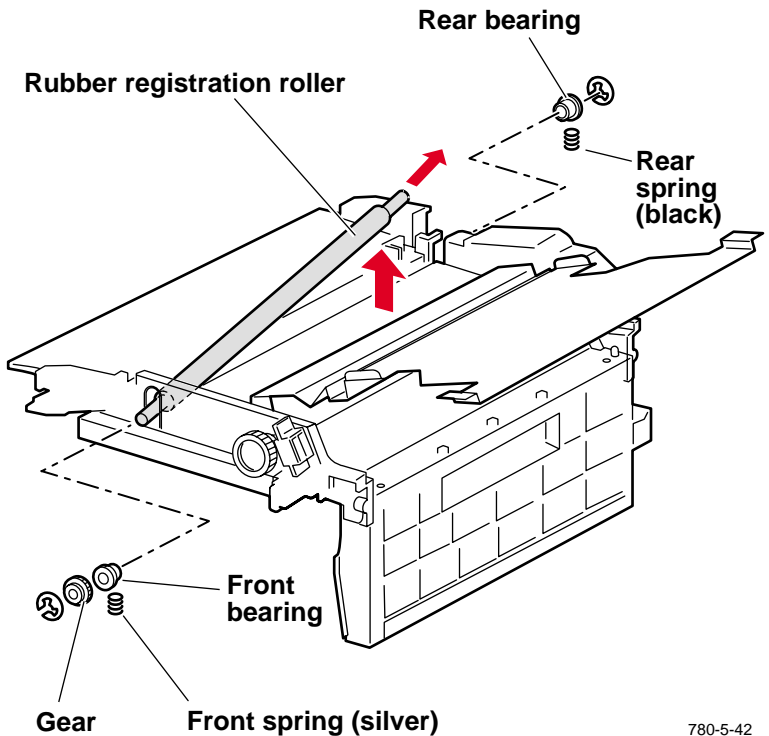
780-5-42

Removing the rubber registration roller

Feeder pre-registration clutch

1. Remove the paper feeder.

2. Remove the feeder registration chute.

3. Turn over the paper feeder and disconnect the wiring harness from the feeder pre-registration clutch.

4. Remove the two screws securing the feeder pre-registration gear assembly to the paper feeder. Remove the gear assembly.

5. Remove the E-rings securing the feeder pre-registration clutch and the pre-registration gear to the pre-registration support. Remove the support.

6. Slide the feeder pre-registration gear off the shaft.

7. Undress the J95 wiring harness and slide the feeder pre-registration clutch off the feeder pre-registration shaft.
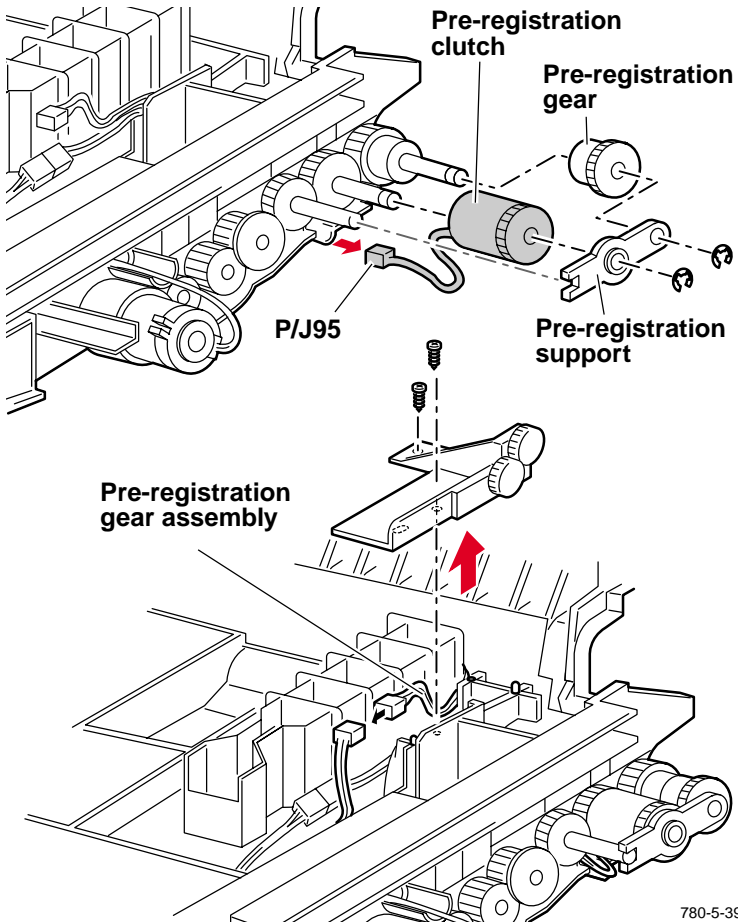
Removing the feeder pre-registration clutch

Feeder pre-registration rollers

1. Remove the feeder pre-registration clutch as explained in the previous procedure.

2. Slide the blue feeder pre-registration knob off the feeder pre-registration shaft.

3. Remove two screws securing the multi-purpose tray out holder to the paper feeder. Pull the holder away from the feeder.

4. Remove the E-ring and front bearing securing the front of the feeder registration shaft to the paper feeder frame.

5. Remove the E-ring and rear bearing securing the idler gear to the rear of the feeder pre-registration shaft. Remove the idler gear.

6. Lift the pre-registration roller up.

7. Slide the feeder pre-registration roller to the rear of the paper feeder, freeing the front of the shaft from front of the paper feeder.

8. Slide the feeder pre-registration roller to the front, free the rear of the shaft from the rear of the paper feeder.

9. Slide the feeder pre-registration roller free of feeder pre-registration gear 2. Remove the shaft.

Note   *For reassembly, ensure the shaft pin lines up with the slot in pre-registration gear 2.*

Front bearing

Idler gear

Pre-registration knob

Out holder

Pre-registration gear 2

Pre-registration roll shaft

780-5-38
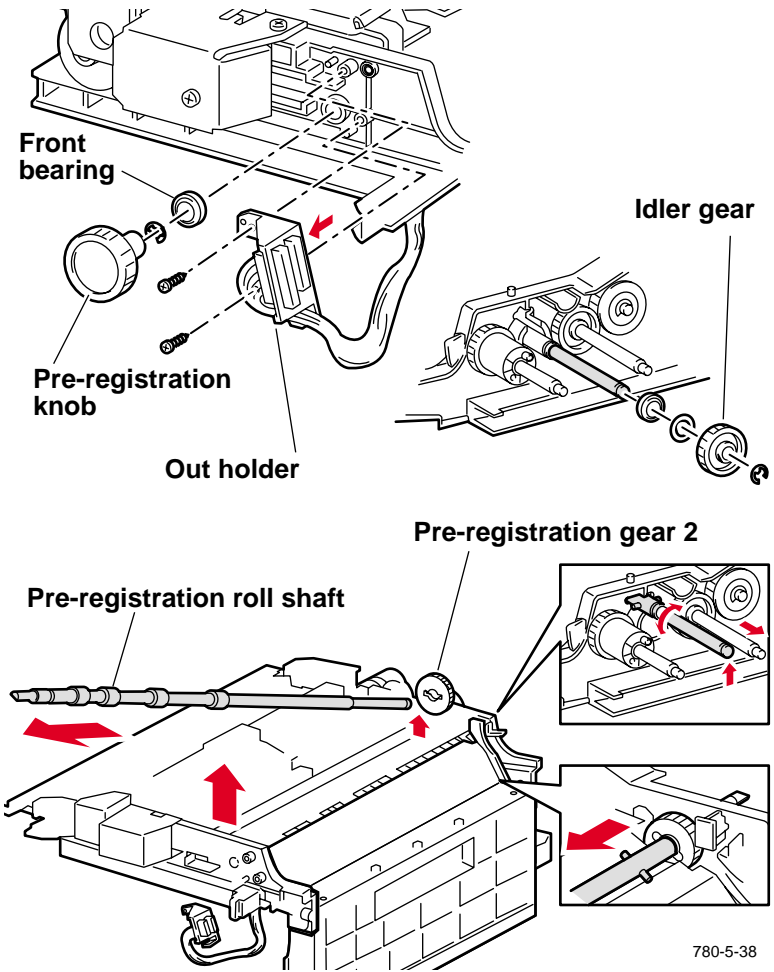
Removing the feeder pre-registration roller

Paper-pick turn roller

1. Remove Tray 1 from the printer.

2. Remove the paper feeder.

3. Remove the two screws securing the turn chute to the printer frame. Remove the turn chute.

4. Remove the paper-pick turn chute.

5. Remove the two screws securing the tray stopper to the printer frame. Remove the stopper.

6. Remove the E-ring securing the front of the turn roller shaft to the front bearing.

7. Disconnect the turn arm spring from the printer frame.

8. Remove the E-ring securing the round cover over the turn-arm gear. Remove the cover.

9. Slide the rear of the turn roller shaft out of the turn-arm assembly.

10. Slide the front of the turn roll shaft out of the front bearing. Remove the turn roller.
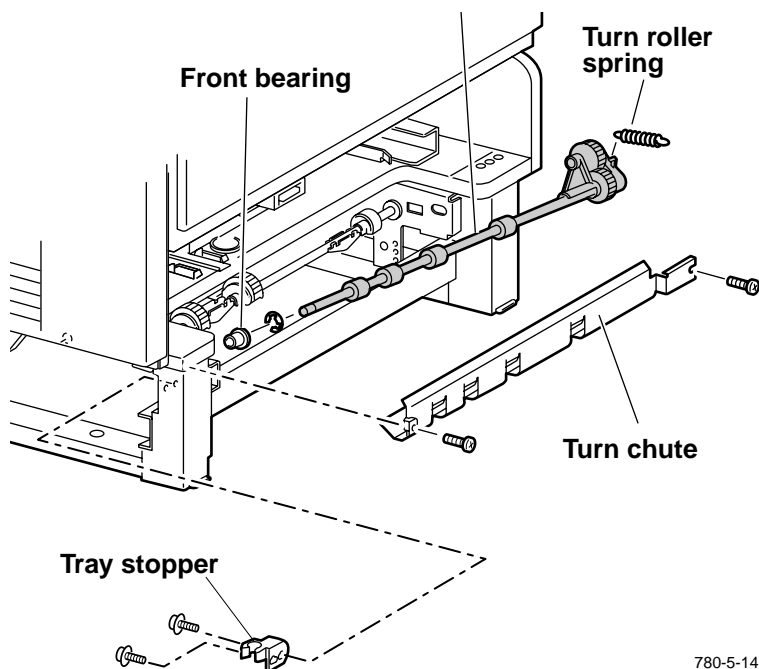
Removing the paper-pick turn roller

Paper feed drive gear train

1. Remove the high voltage poser supply as described in "High voltage power supply" on page 132.

2. Slide the paper feeder out of the printer.

3. Remove the screw securing the wire clip to the paper-feed drive gear train. Move the clip and harness out of the way.

4. Remove the five screws securing the paper-feed drive gear train to the printer frame. Remove the gear train.

5. Remove the two wire clamps from the paper-feed drive gear train.

Reverse these steps to install the paper-feed drive gear train.

Wire clip

Wire clamps

Paper feed drive gear train

780-5-73
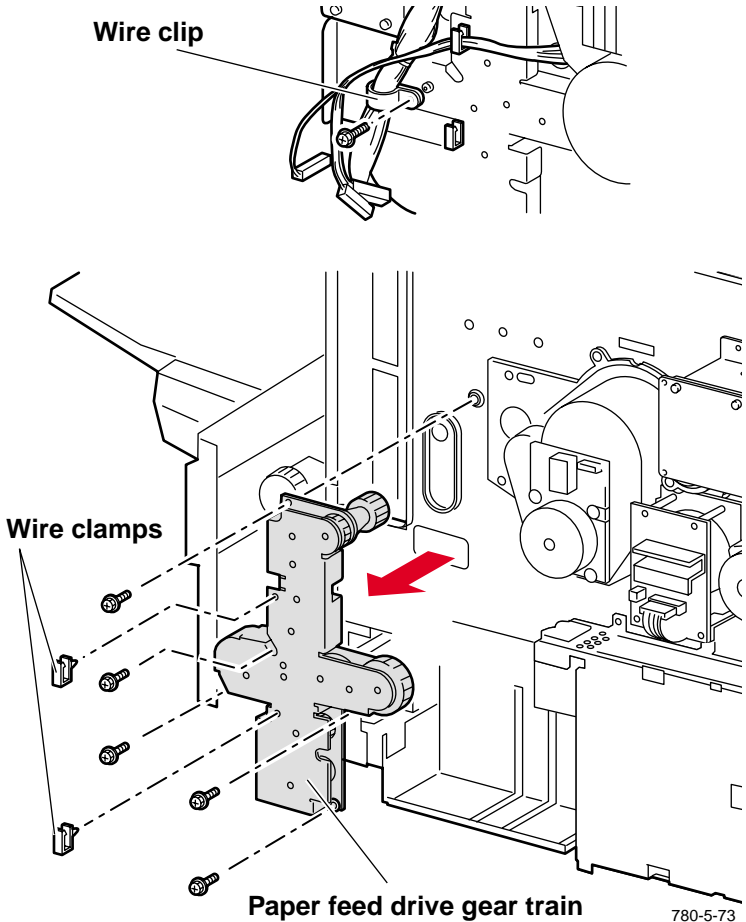
Removing the paper-feed drive gear train

Paper-feed motor

1. Remove the rear cover.

2. Disconnect the wiring harness from the paper-feed motor.

3. Remove the four screws securing the paper-feed motor to the fuser drive gear train. Remove the motor.

4. Remove the two motor supports.

Reverse these steps to install the paper-feed motor.

Paper feed motor

Motor supports

Wiring harness

780-5-75
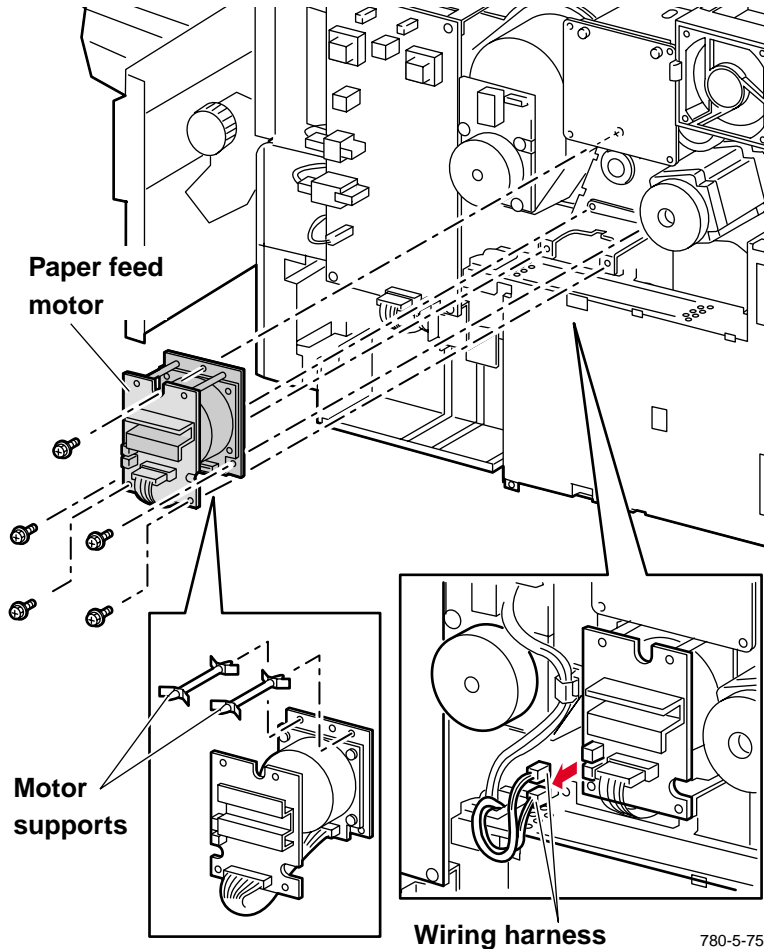
Removing the paper-feed motor

Multi-purpose tray roller assembly

1. Remove the multi-purpose tray top, front and rear covers.

2. Unhook the pick-up spring from the pick-up gear.

3. Release the latches holding the pick-up gear to the pick-up shaft. Slide the pick-up gear, pick-up cam gear, and lever stopper off the shaft.

4. Remove the E-ring securing the rear shaft bearing to the rear of the multi-purpose tray.

5. Remove the E-ring securing the front shaft bearing to the front of the multi-purpose tray.

6. Slide the multi-purpose tray roller assembly out of the multi-purpose tray assembly.
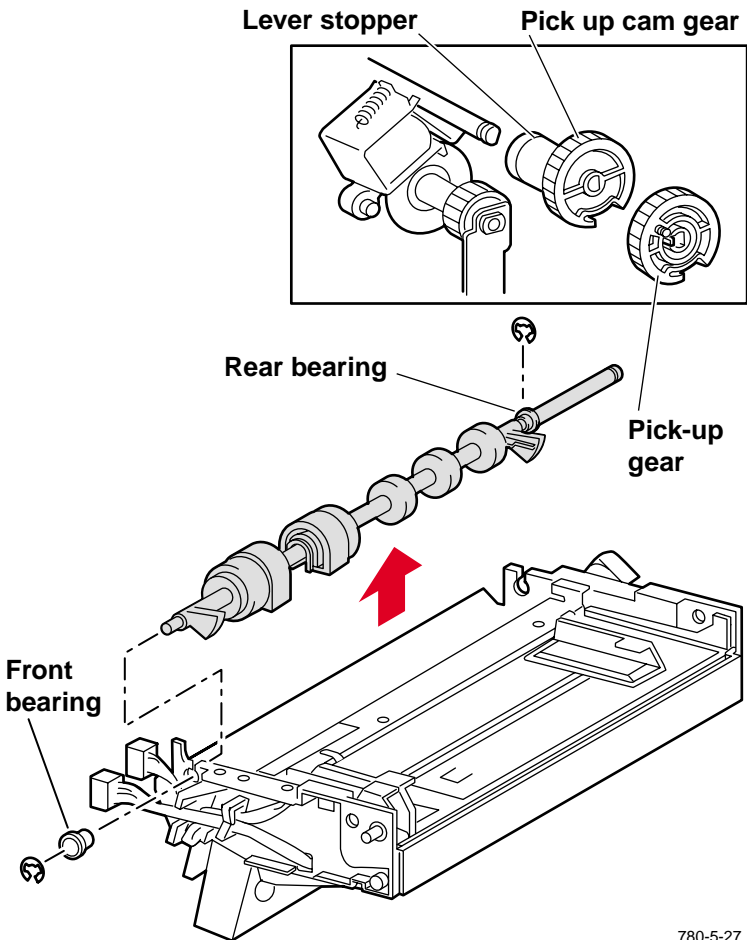
780-5-27

Removing the multi-purpose tray roller assembly

Multi-purpose tray pick rollers

Note   *Replace the pick rollers as a set.*

1. Remove the multi-purpose tray top cover.

2. Release the latch holding the front pick roller core to the pick up shaft and slide the core away from the front pick roller.

3. Slide the front pick roller toward the front roller core, so the pick up roll clears the locking pin. Remove the front pick roller.

4. Release the latch holding the rear roller core to the pick roller shaft and slide the roller away from the rear pick roller.

5. Slide the rear pick up roller toward the rear roller core, so the pick roller clears the locking pin. Remove the rear pick roller.

Reverse these steps to install the multi-purpose tray pick rollers. Note the arrows molded into the sides of the pick roller; ensure they are oriented the correct direction upon installation.
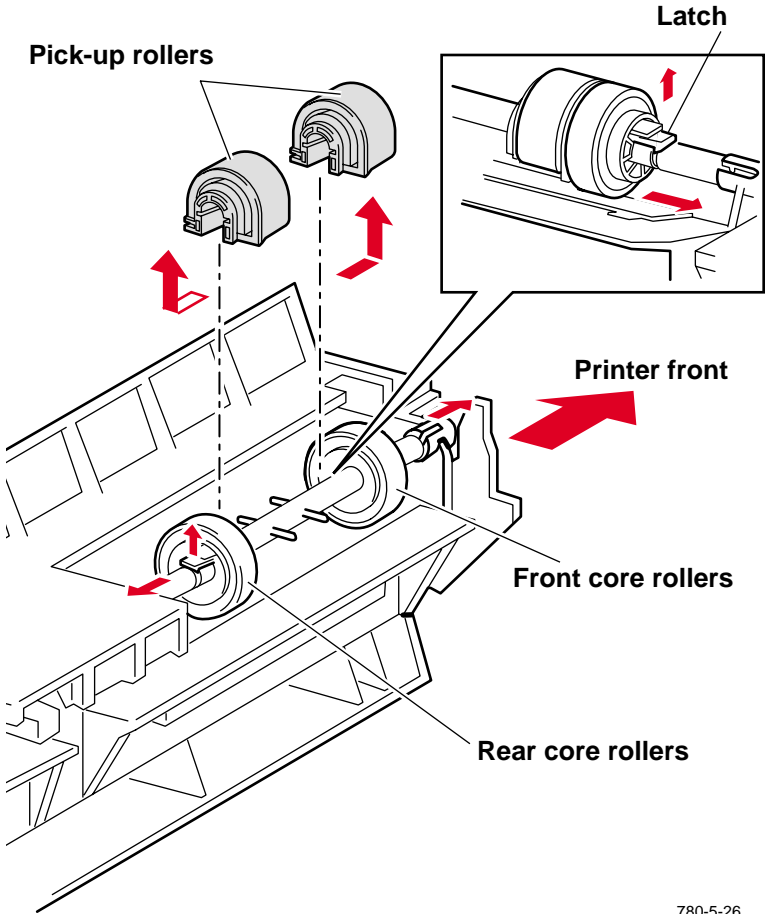
780-5-26

Removing the multi-purpose tray pick rollers

Auto-density calibration sensor

Caution   *Protect the accumulator belt with a sheet of paper.*

1. Remove the imaging unit. Remove the inner cover.

2. Disconnect the wiring harness from the auto-density calibration sensor.

3. Remove the E-ring securing the front of the auto-density calibration sensor to the front of the printer frame.

4. Reach inside the printer cavity and slide the front end of the auto-density calibration sensor out of the hole at the front of the printer.

5. Pull the wiring harness out through the grommet hole.

Caution   *Do not touch or scratch the accumulator belt when removing the auto-density calibration sensor.*

6. Lift the rear end of the auto-density calibration sensor out of the cutout at the rear of the printer. Remove the sensor.

For reassembly, ensure the rear of the sensor is fully installed in the rear cutout.

Rear cutout

Auto-density calibration sensor

780-5-48
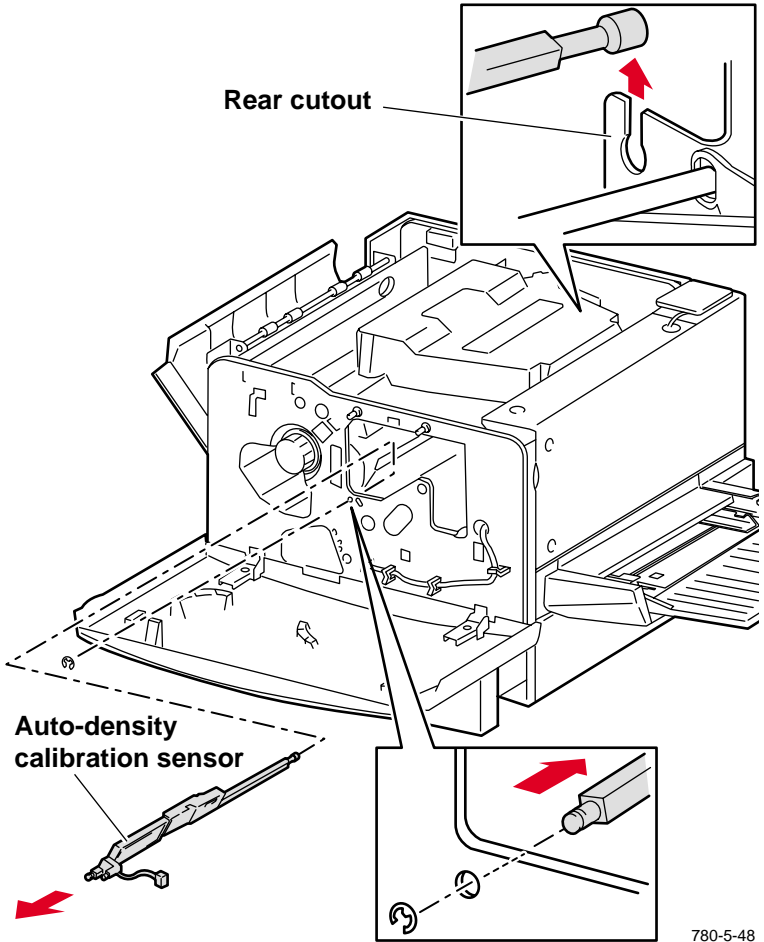
Removing the auto-density calibration sensor

Developer assembly

1. Open the front cover. Remove the toner cartridge of the developer assembly to be removed. Remove the imaging unit.

2. Remove the top cover and inner cover.

3. Remove the screw securing the carousel latch to the front of the printer frame. Remove the latch.

4. Turn the carousel knob until the large shoulder screw, securing the desired developer assembly to the carousel frame, appears through the access hole a few inches above the carousel knob.

5. Remove the shoulder screw securing the developer assembly to the carousel frame. Keep the carousel in this position.

6. Reach in through the top of the printer; slide the developer assembly to the front of the printer to free the gears at the rear of the developer assembly.

7. Lift the front of the developer assembly to free the front of the assembly from the front of the printer frame. Remove the assembly. Each developer is keyed to its position in the carousel.

Carousel latch

Developer assembly

Shoulder screw

Remove shipping developer cover before installing new developer assembly

780-5-53
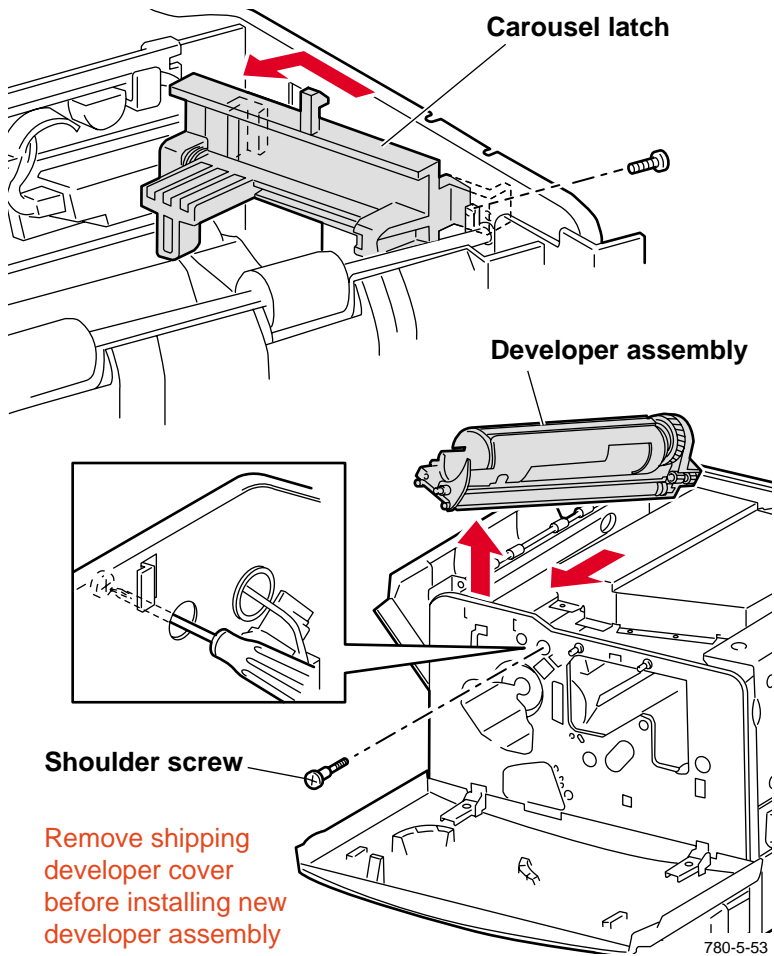
Removing a developer assembly

Developer clutch

1. Remove the carousel motor board as described in "Carousel motor board" on page 108.

2. Disconnect the wiring harness from the developer clutch.

3. Remove the fuser drive train gear as described in "Fuser drive gear train" on page 126.

4. Remove the four screws securing the developer clutch to the printer frame. Remove the clutch.

Reverse these steps to install the developer clutch.

Wiring harness

Developer clutch　　780-5-81
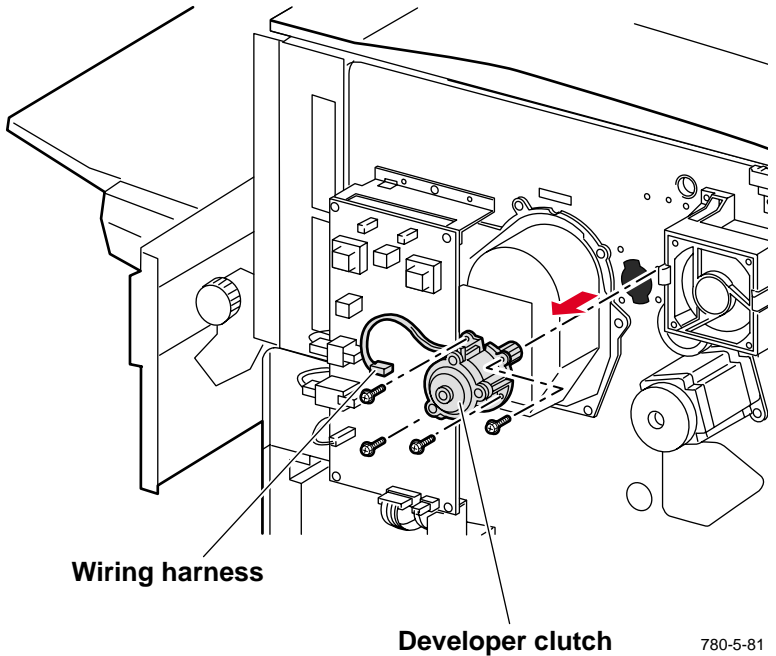
Removing the developer clutch

Developer tie plate

1. Remove the lower exit assembly as described in "Lower exit assembly" on page 128.

2. Remove the rear cover.

3. Remove the inner cover.

4. Remove the wire and wire clamp from the developer tie plate.

5. Remove the two screws securing the developer tie plate to the rear of the printer frame.

6. Remove the two screws securing the developer tie plate to the front of the printer frame.

7. Slide the tie plate up and out of the printer frame.

Reverse these steps to install the developer tie plate.

Developer tie plate

Wire clamp

780-5-82
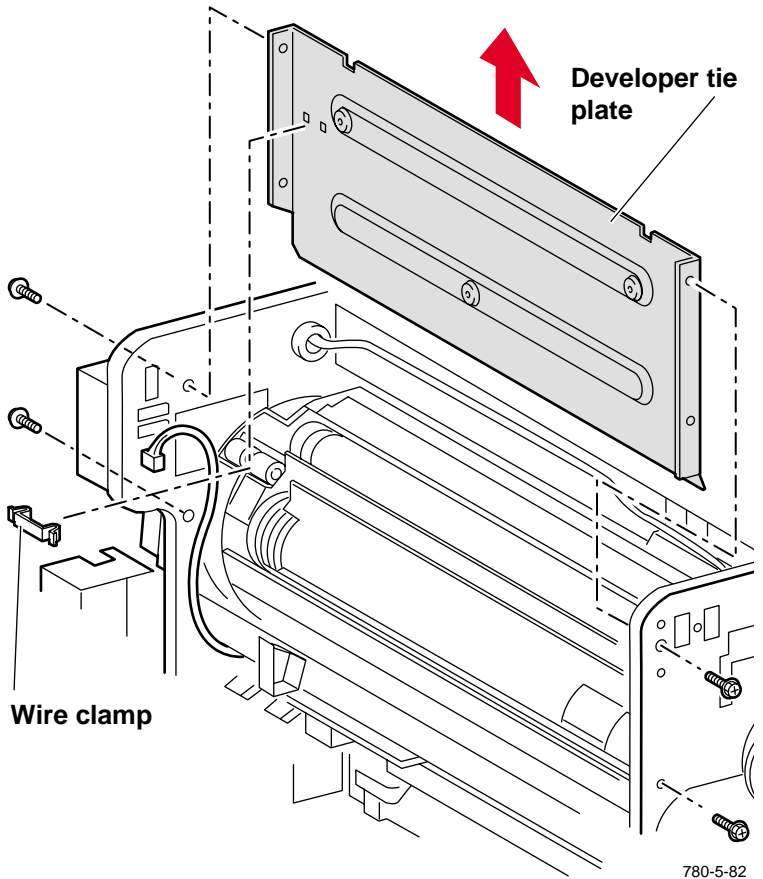
Removing the developer tie plate

Toner/developer dispense motor

1. Remove the carousel motor board as described in "Carousel motor board" on page 108.

2. Remove the two screws securing the toner/developer dispense motor to the printer frame.

3. Slide the toner/developer dispense motor up and slightly to the left to free the motor shaft gear from the frame. Remove the motor.

4. Disconnect the wiring harness from the toner/developer dispense motor.

Note   *Install the motor using the two left-side mounting screw holes.*

Reverse these steps to install the toner/developer dispense motor.

Wiring harness

Toner / developer dispense motor

780-5-80
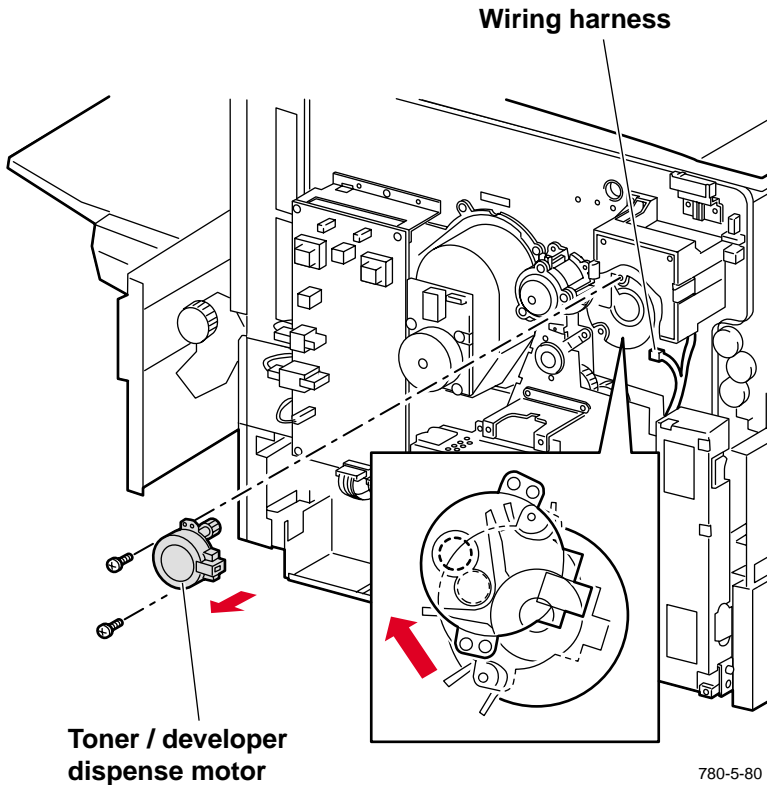
Removing the toner/developer dispense motor

Carousel assembly

1. Remove each developer assembly.

2. Remove the knob screw.

3. Remove the screw securing the knob in place. Release the knob latch by inserting a screwdriver blade through the slot in the front of the knob.

4. Remove the carousel motor.

5. Remove the toner/developer dispense motor.

6. Pull the fuser unit a few inches out of the printer.

7. Remove the low voltage power supply.

8. Remove the fuser drive gear train.

9. Remove the developer clutch.

10. Remove the developer tie plate.

11. Remove the carousel sensor.

12. Remove the large E-ring securing the rear carousel bearing to the rear of the printer frame. Slide the rear bearing off the carousel frame shaft.

13. Slide the front carousel bearing off of the carousel frame shaft.

14. Slide the carousel frame assembly to the front of the printer frame.

15. Pull the rear of the carousel frame assembly free of the rear frame; swing the rear of the assembly out of the printer. Remove the assembly.

Screw

Carousel assembly

Rear bearing

Front bearing
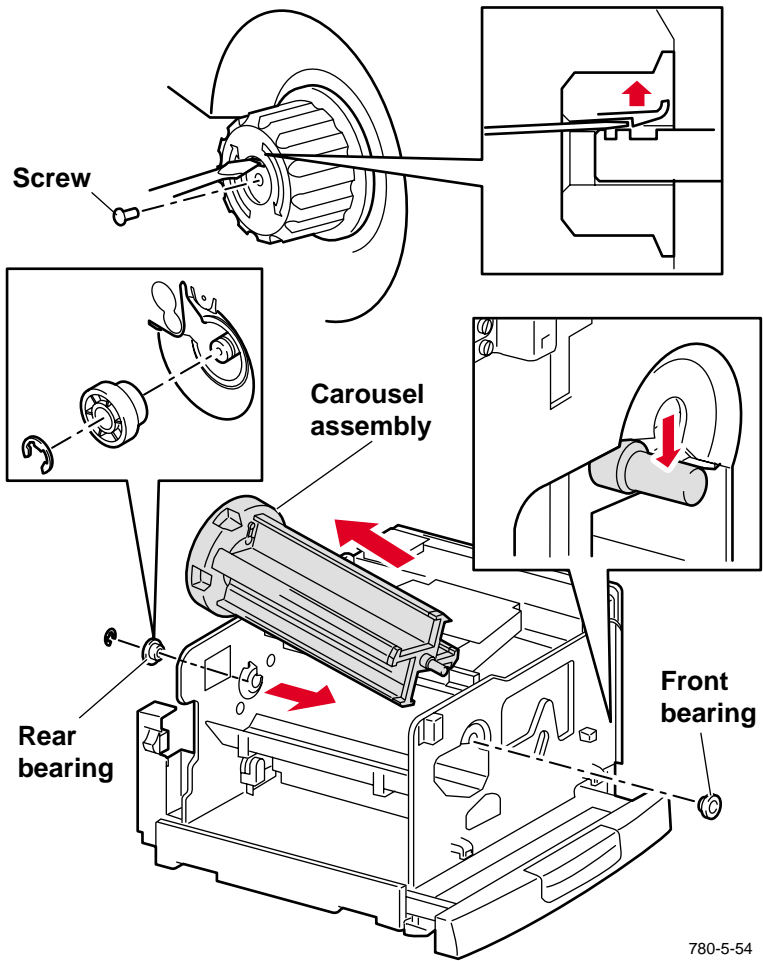
780-5-54

Removing the carousel assembly

Carousel motor

1. Remove the rear cover.

2. Disconnect the wiring harness from the carousel motor.

3. Remove the three screws securing the carousel motor to the printer frame. Remove the motor.

Reverse these steps to install the carousel motor.

Wiring harness

Carousel motor

780-5-78
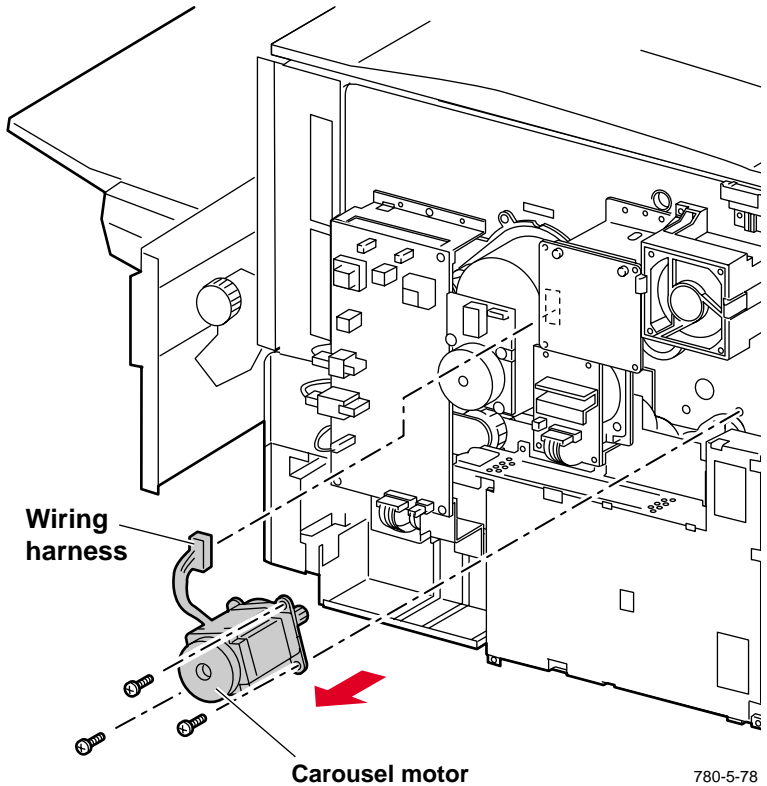
Removing the carousel motor

Carousel motor board

1. Remove the rear cover.

2. Remove the wiring harnesses from the carousel motor board.

3. Remove the screw securing the carousel motor board to the printer frame. Remove the board.

Reverse these steps to install the carousel motor board.

Wiring harness

Carousel motor board

780-5-79
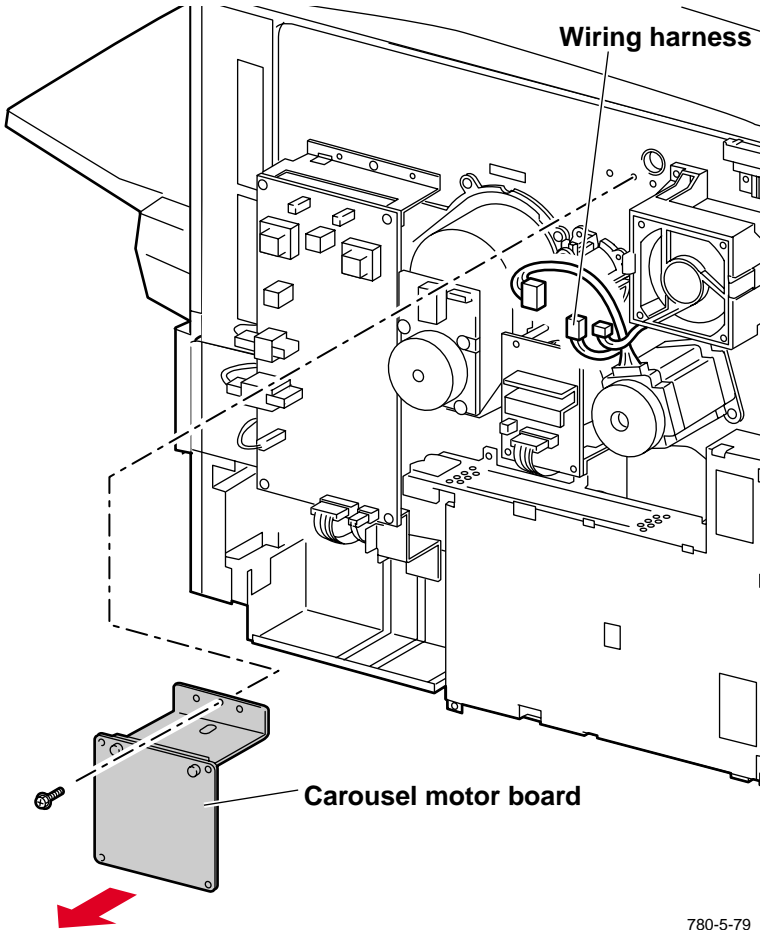
Removing the carousel motor board

Carousel sensor

1. Remove the developer fan duct.

2. Remove the screw securing the carousel sensor plate to the printer frame. Remove the plate, along with the attached carousel sensor, from the frame.

3. Disconnect the wiring harness from the carousel sensor.

4. Squeeze the three latches securing the sensor to the plate and remove the sensor.

Reverse these steps to install the carousel sensor.
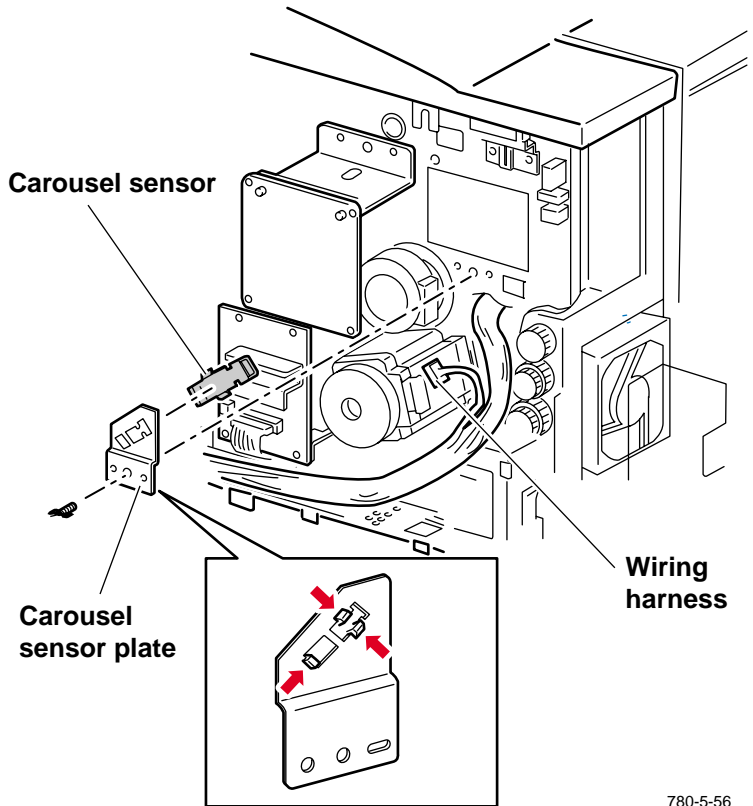
780-5-56

Removing the carousel sensor

Laser unit

1. Remove the top cover.

2. Remove the eight screws securing the laser unit cover to the printer frame and remove the cover.

3. Disconnect the wiring harnesses from the laser diode board.

4. Disconnect the wiring harness from the start-of-scan sensor board.

5. Remove the four screws securing the laser unit to the printer frame.

6. Carefully lift the laser unit off the printer frame. Reach under the unit and disconnect the wiring harness from the laser unit motor board.

7. Remove the laser unit.

Reverse these steps to install the laser unit.

Laser cover
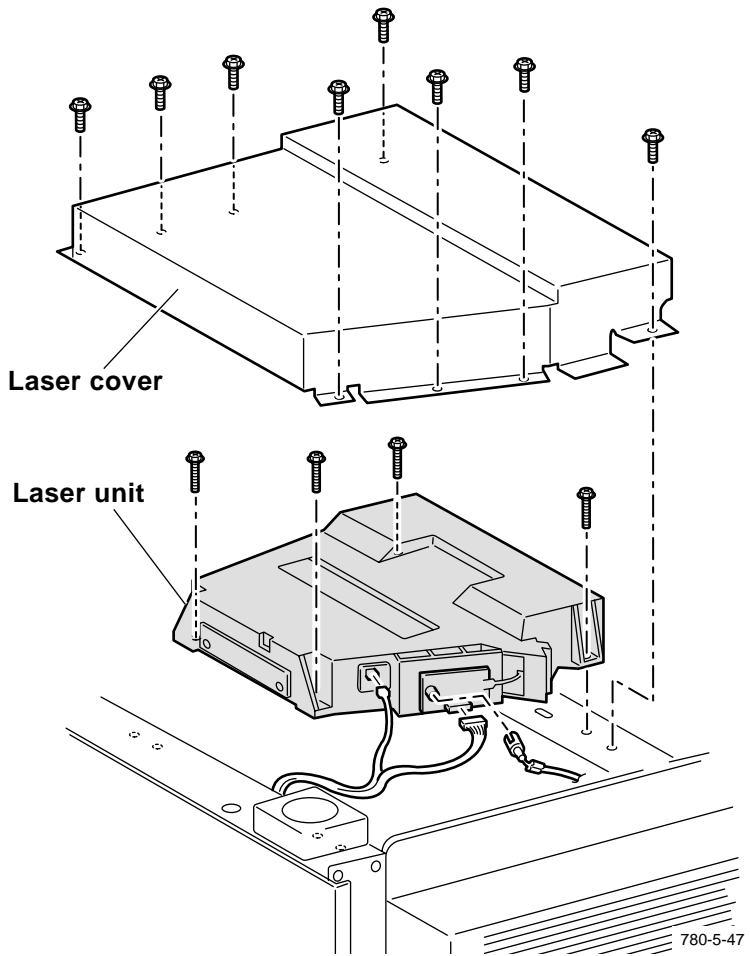
Laser unit

780-5-47

Removing the laser unit

Erase lamp rail assembly

1. Remove the imaging unit.

2. Remove the laser unit as described in "Laser unit" on page 110.

3. Disconnect the wiring harness from the waste cartridge full sensor.

4. Disconnect the wiring harness from the waste cartridge sensor.

5. Free the wiring harnesses from the wire clamps.

6. Disconnect the wiring harness from the erase lamp.

7. Remove the two screws securing the erase lamp rail assembly to the front of the printer frame.

Caution   *Be careful not to damage the accumulator belt underneath the erase lamp rail assembly.*

8. Lift the erase lamp rail assembly up through the top of the printer frame.

Reverse these steps to install the erase lamp rail assembly.

Disconnect wiring harnesses

Wire clamps

**Erase lamp
rail assembly**
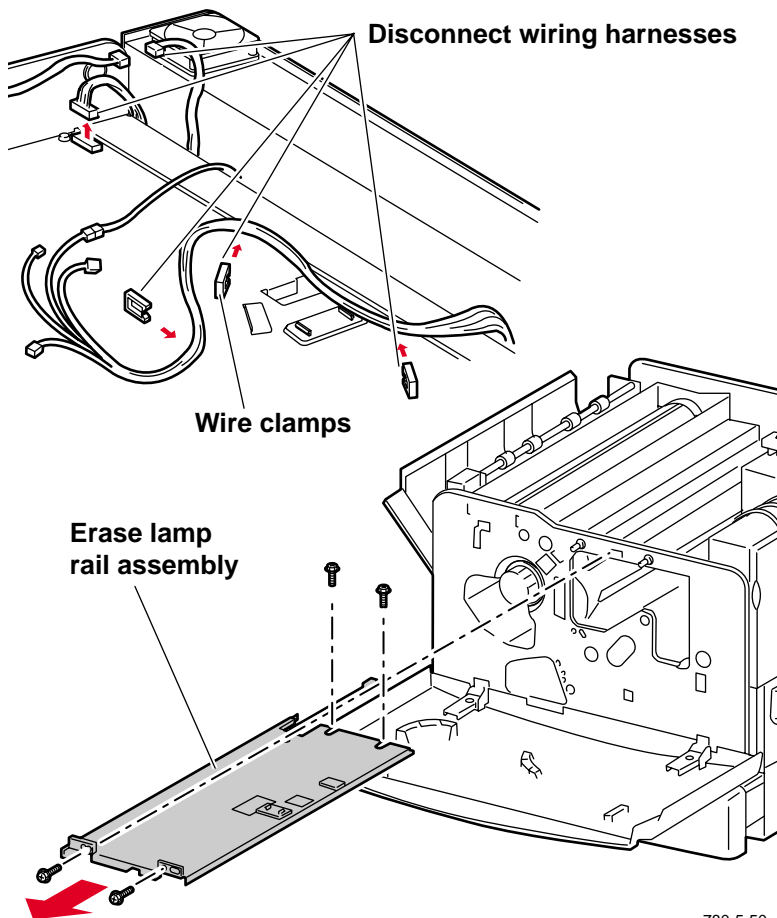
780-5-50

Removing the erase lamp rail assembly

Erase lamp

1. Remove the erase lamp rail assembly as described in "Erase lamp rail assembly" on page 112.

2. Release the three latches holding the erase lamp assembly to the erase lamp rail assembly. Remove the lamp.

Reverse these steps to install the erase lamp.

Erase lamp

Erase lamp latch
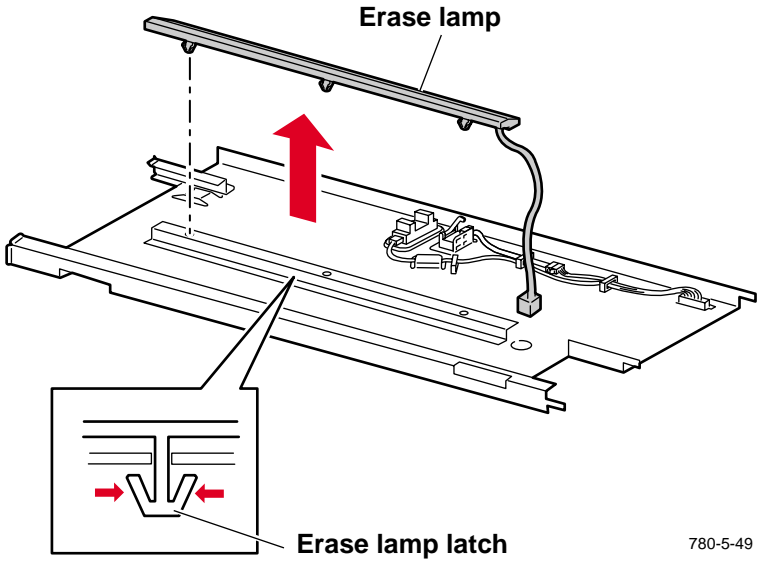
780-5-49

Removing the erase lamp

Process drive unit

1. Remove the imaging unit.

2. Remove the paper feeder.

3. Remove the paper feeder drive assembly.

4. Remove the erase lamp rail assembly.

5. Disconnect the wiring harness leading to the process motor. Unhook the wires from the wire harness clip attached to the process drive unit.

6. Remove the screw securing the high voltage power supply bracket. Move the bracket out of the way.

7. Inside the printer frame, remove the two screws securing the process drive unit to the rear of the accumulator belt assembly.

8. Hold the process drive gear train, it is heavy, while you remove the seven screws securing the drive unit to the printer frame. Carefully pull the assembly away from the frame.

Reverse these steps to install the process drive unit. Ensure the front bearing of the accumulator belt assembly is inserted fully into its receiver hole of the printer frame.

Accumulator belt bracket

Process drive unit

High voltage power supply bracket

Wiring harness
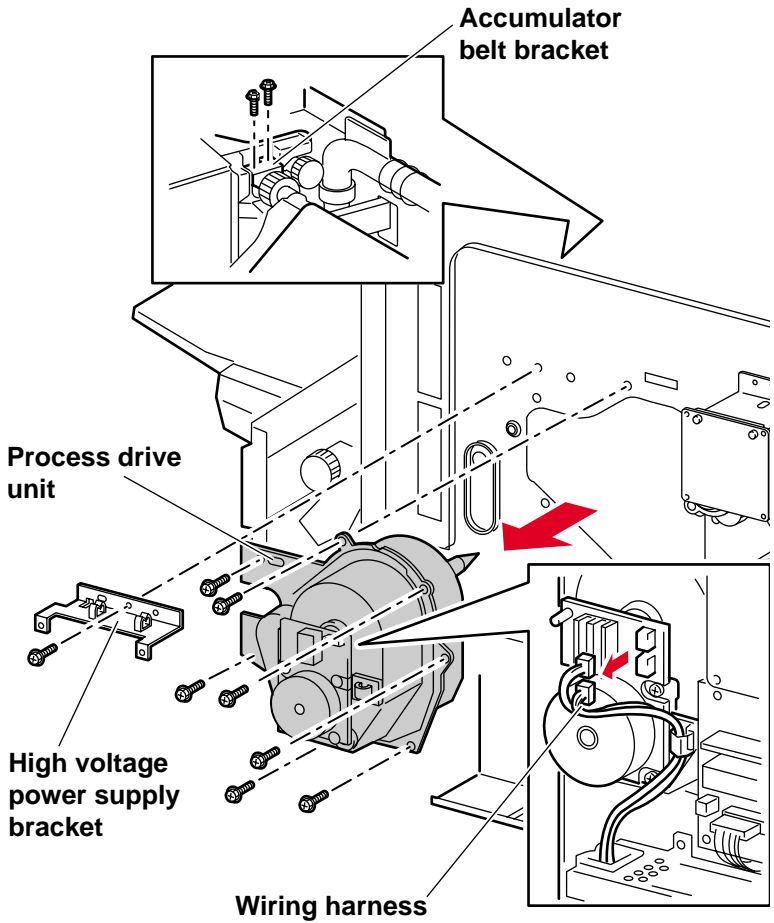
780-5-77

Removing the process drive unit

Waste auger assembly

Caution   *Be careful not to spill waste toner from the auger assembly.*
Vacuum the auger before removal.

1. Remove the accumulator belt assembly.

2. Remove second bias transfer roller assembly.

3. Remove the paper-feed motor.

4. Remove the fuser drive gear train to access the screw securing the plastic bracket holding the water auger housing.

5. Remove the low voltage power supply.

6. Remove the two screws securing the accumulator belt rear bracket to the rear of the printer frame. Remove the bracket.

7. Remove the screw securing the auger drive assembly to the printer frame.

8. Remove the screw securing the auger tube to the rear of the printer frame.

9. Remove the screw securing the auger assembly bracket to the rear of the printer frame.

10. Remove the auger assembly from the printer.

Reverse these steps to install the waste auger assembly.

Waste auger drive assembly

Waste auger assembly

780-5-64
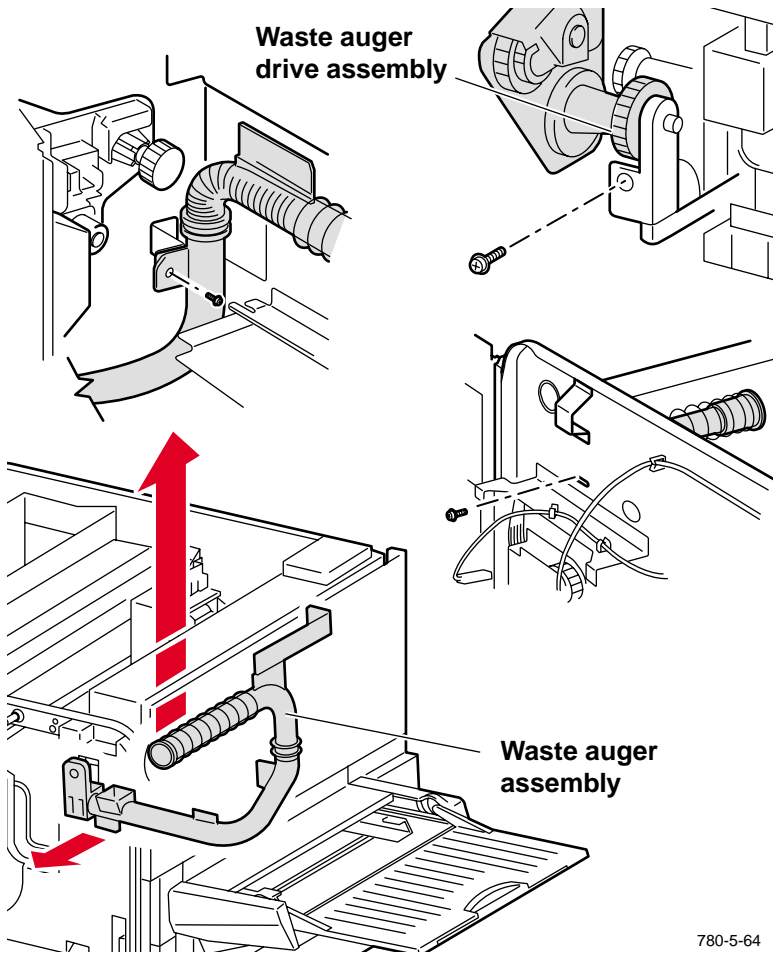
Removing the waste auger assembly

Accumulator belt assembly

1. Remove the high voltage power supply.

2. Remove the erase lamp rail assembly.

3. Remove the paper feeder.

4. Remove the process drive unit.

5. Remove the auto-density calibration sensor.

6. Reach through the paper feeder cavity and disconnect the wiring harness from the accumulator belt sensor.

7. Move the waste auger assembly for clearance. Refer to "Waste auger assembly" on page 117.

8. Remove the two screws securing the accumulator belt assembly bracket to the rear of the printer frame. Remove the bracket.

Caution   *The accumulator belt is easily scratched, be careful when removing it.*

9. Hold on to the front and the rear of the accumulator belt assembly shaft. Note, for reassembly, the orientation of the spring collar and K-clip. Push in on the spring loaded collar to release the front of the accumulator belt assembly drive shaft from the front of the printer frame.

10. Lift up the accumulator belt assembly; free the two high voltage wires from the grommet hole at the rear of the frame, and remove the accumulator belt assembly out of the printer frame.

11. Place the accumulator belt assembly on a clean, flat, and stable work surface. Do not allow the belt itself to touch any foreign surfaces.

On reassembly, remove the shipping restraints from the front and rear of the new accumulator belt assembly. Ensure that the front bearing of the accumulator belt assembly squarely fits into its receiver hole in the frame.

Spring loaded collar

Bearing fits in hole

Accumulator belt assembly

Accumulator belt assembly

780-5-59
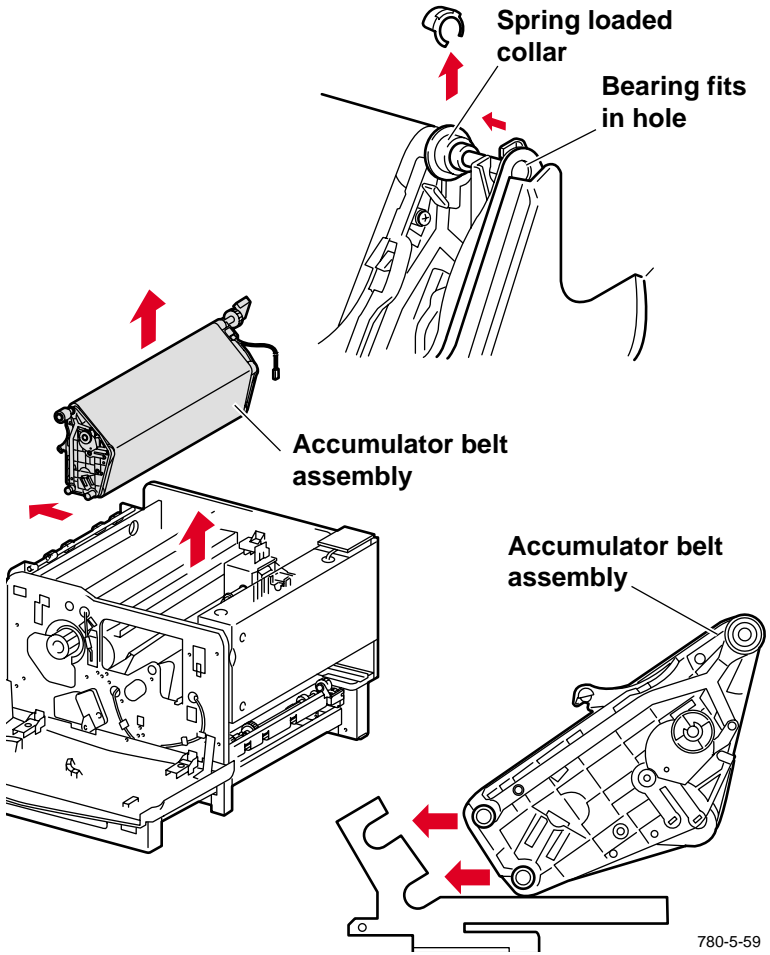
Removing the accumulator belt assembly

Accumulator belt cleaner assembly

1. Remove the fuser assembly as described in "Fuser assembly" on page 125.

2. Open the front cover.

3. Reach through the empty fuser cavity and hold the bottom of the belt cleaner assembly.

4. Loosen the two screws securing the cleaner support to the printer frame. Remove the cleaner support while retaining the spring on the cleaner support.

5. Slide the belt cleaner assembly to the front of the printer and remove the assembly through the fuser cavity.

Reverse these steps to install the accumulator belt cleaner assembly. Enter diagnostics and select `Reset Accumulator Belt Cleaner Life.`

Cleaner support

Accumulator belt cleaner assembly
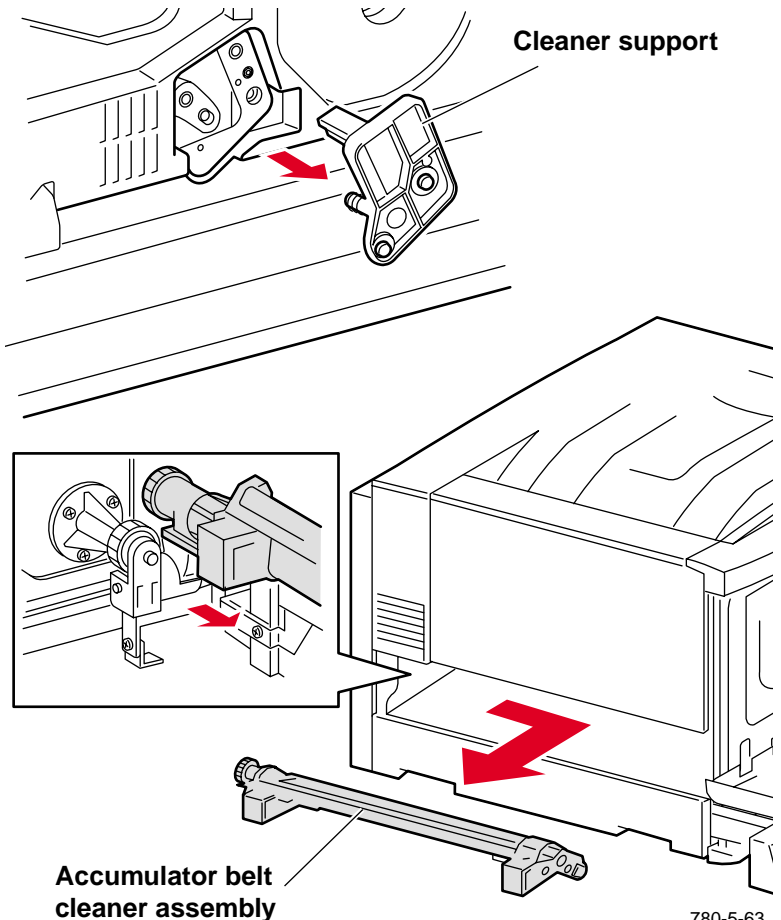
780-5-63

Removing the accumulator belt cleaner assembly

Second bias transfer roller assembly

1. Remove the fuser assembly as described in "Fuser assembly" on page 125.

2. Remove the accumulator belt cleaner assembly as described in the topic "Accumulator belt cleaner assembly" on page 121.

3. Reach through the empty fuser cavity and slide the second bias transfer roller assembly out of the second bias transfer roller front and rear brackets and out of the printer.

Reverse these steps to install the second bias transfer roller assembly.

Second bias transfer roller assembly

780-5-62
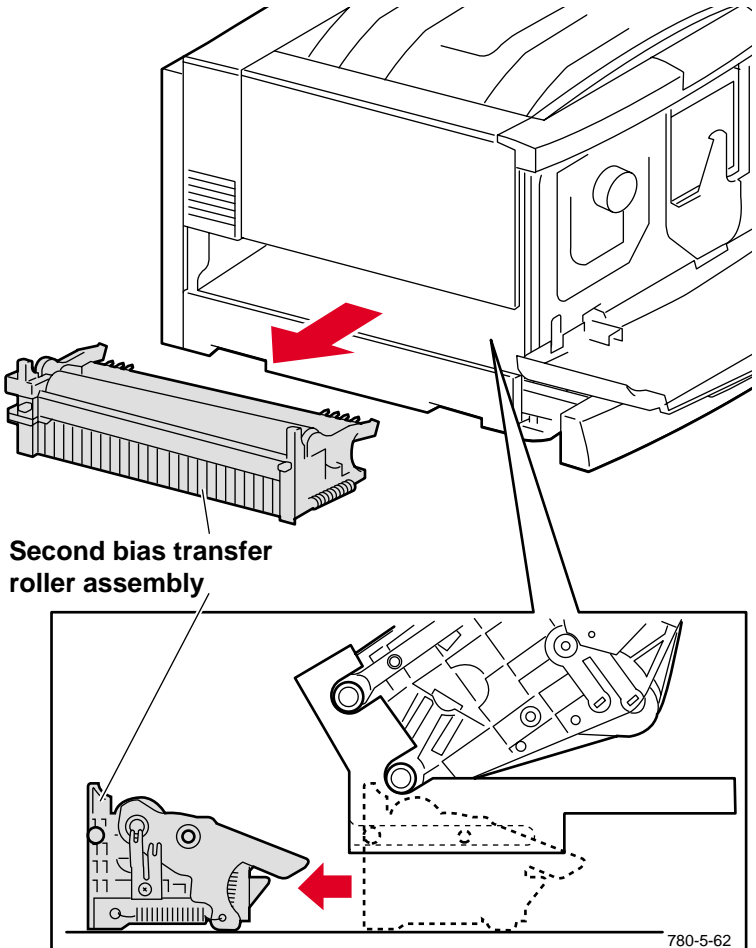
Removing the second bias transfer roller assembly

Second bias transfer roller cam assembly

1. Remove the second bias transfer roller assembly as described in "Second bias transfer roller assembly" on page 122.

2. Remove the second bias transfer roller cam assembly as described in "Second bias transfer roller cam assembly" on page 123.

3. Remove the waste auger assembly as described in "Waste auger assembly" on page 117.

4. Remove the three screws securing the second bias transfer roller cam assembly to the printer frame. Pull the assembly a few inches away from the rear frame.

5. Disconnect the wiring harness running to the second bias transfer roller cam assembly.

6. Remove the second bias transfer roller cam assembly.

Reverse these steps to install the second bias transfer roller cam assembly.

Wiring harness

Second bias transfer roller cam assembly
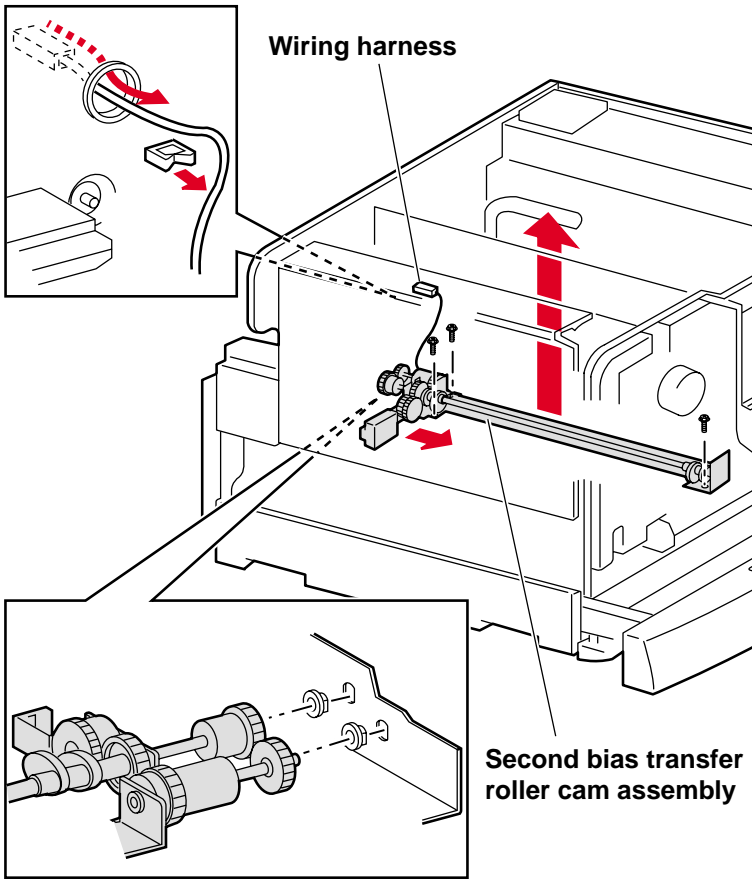
780-5-60

Removing the second bias transfer roller cam assembly

Fuser assembly

1. Turn off the printer and open the top media tray.

2. Remove the screw securing the fuser assembly to the printer frame.

3. Slide the fuser assembly a few inches out of the printer.

4. Lift the end of the fuser assembly and pull the assembly out of the printer.

To install the fuser assembly in the printer, lift the end of the fuser assembly as you insert the assembly side rails into the guide wheels inside the printer. Lower the end of the fuser assembly and slide the assembly into the printer. Reinstall the screw to secure the fuser assembly to the printer frame.
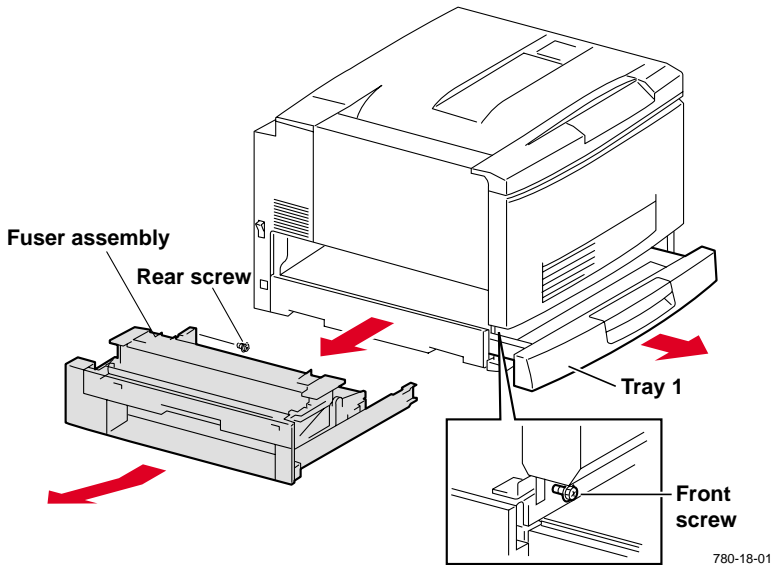
Removing the fuser assembly

Fuser drive gear train

1. Remove the fuser unit.

2. Remove the low voltage power supply.

3. Remove the paper feed drive gear train.

4. Remove the wire harness from the paper-feed motor bracket.

5. Remove the screw securing the paper-feed motor bracket to the fuser-drive gear train and remove the bracket.

6. Reach inside the empty fuser assembly cavity and remove the E-ring securing the fuser drive gear shaft to the auger drive assembly.

7. Remove the five screws securing the fuser-drive gear train to the printer frame. Remove the gear train.

Reverse these steps to install the fuser drive gear train.

Fuser drive gear train

Paper feed motor bracket

E ring

Auger assembly

780-5-74
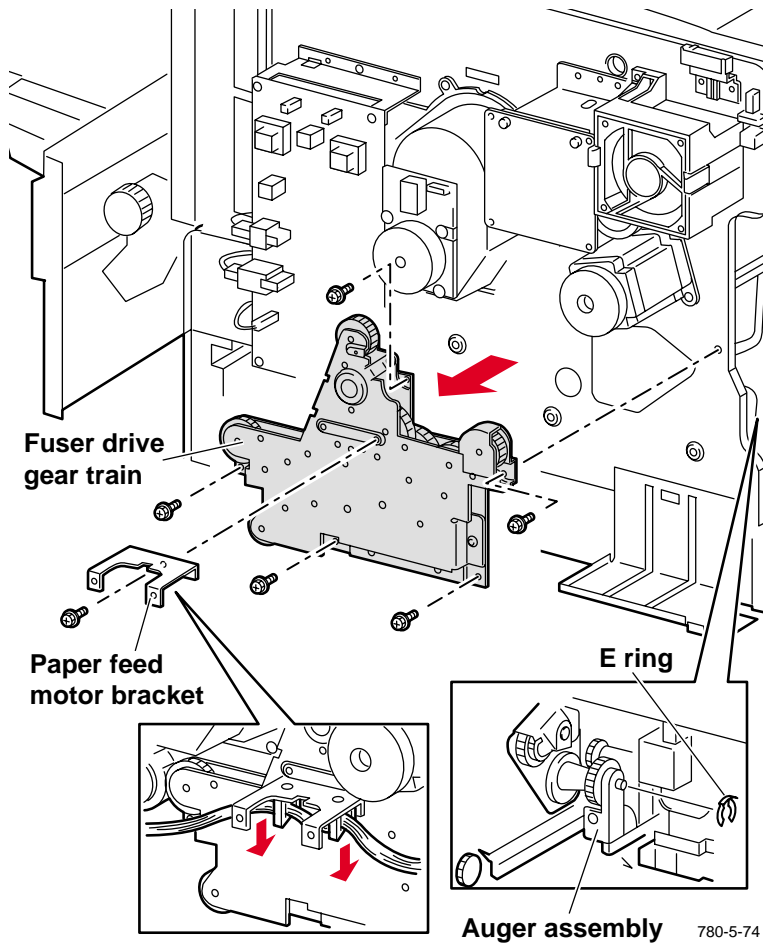
Removing the fuser-drive gear train

Lower exit assembly

1. Remove the left door by pushing in on its front hinge to free it from the printer.

2. Disconnect the wiring harnesses near the top rear of the lower exit assembly.

3. Remove the five screws securing the lower exit assembly to the printer frame.

4. Lift the lower exit assembly to unhook the top of the assembly from the printer frame. Remove the assembly.

5. Disconnect the wiring harness from the top exit sensor and the wiring harness from the exit chute switch, both located on the back of the lower exit assembly.

6. Remove the wires from the wire clips that are molded into the side of the lower exit assembly.

Reverse these steps to install the lower exit assembly.

Lower exit assembly

Wiring harness
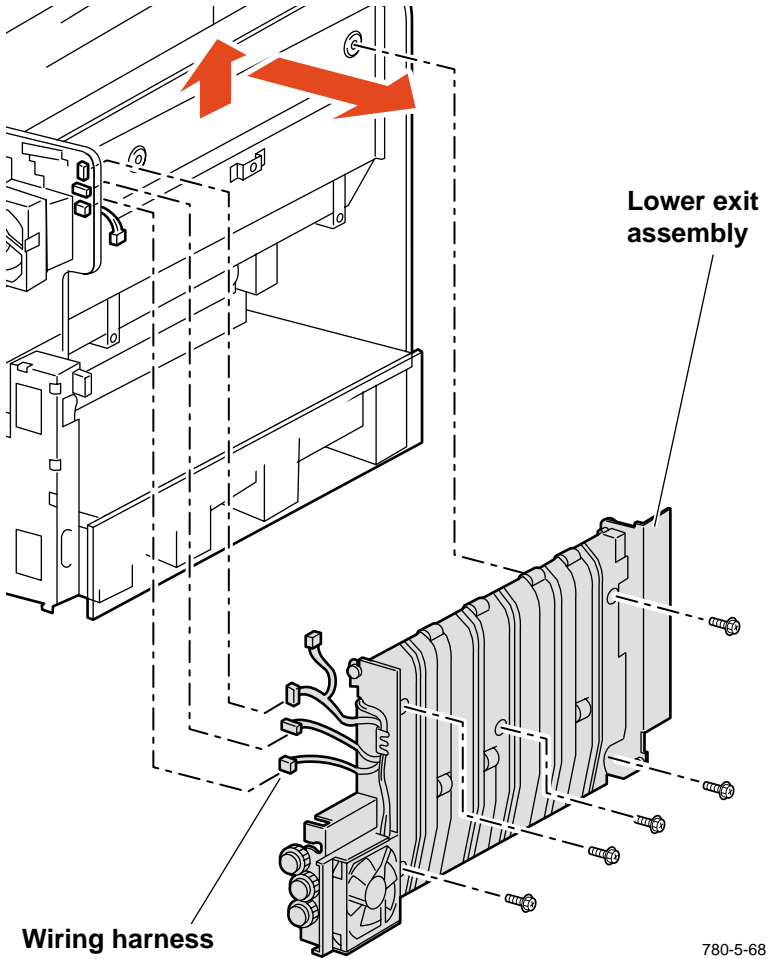
780-5-68

Removing the lower exit assembly

Full stack sensor

1. Open the left door.

2. Remove the screw securing the full stack sensor and its bracket.
    Squeeze the four latches securing the full stack sensor to the bracket.

3. Disconnect the sensor's connector P/J 167

Reverse these steps to install the full stack sensor.

Full stack sensor
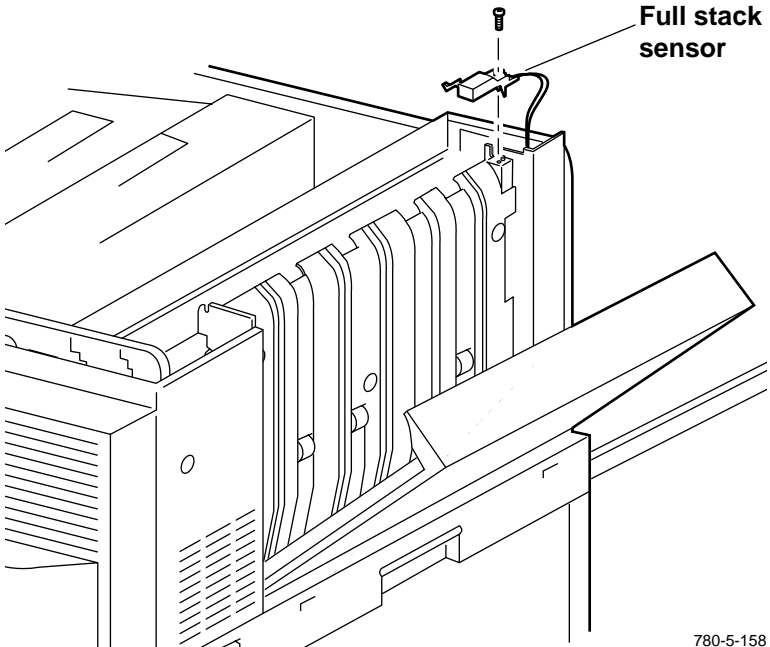
780-5-158

Removing the stack full sensor

Low voltage power supply

1. Remove the rear cover.

2. Disconnect the wiring harness from the top of the low voltage power supply. All the wiring harnesses plugs are held in place with locking levers.

3. Disconnect the remaining wiring harnesses from the low voltage power supply.

4. Release the wiring harness from the wire clip located at the top left of the low voltage power supply.

5. Remove the four screws securing the low voltage power supply to the printer frame. Lift and remove the low voltage power supply from the printer frame.

Reverse these steps to install the low voltage power supply.

Printer frame

Wiring harness

Low voltage power supply
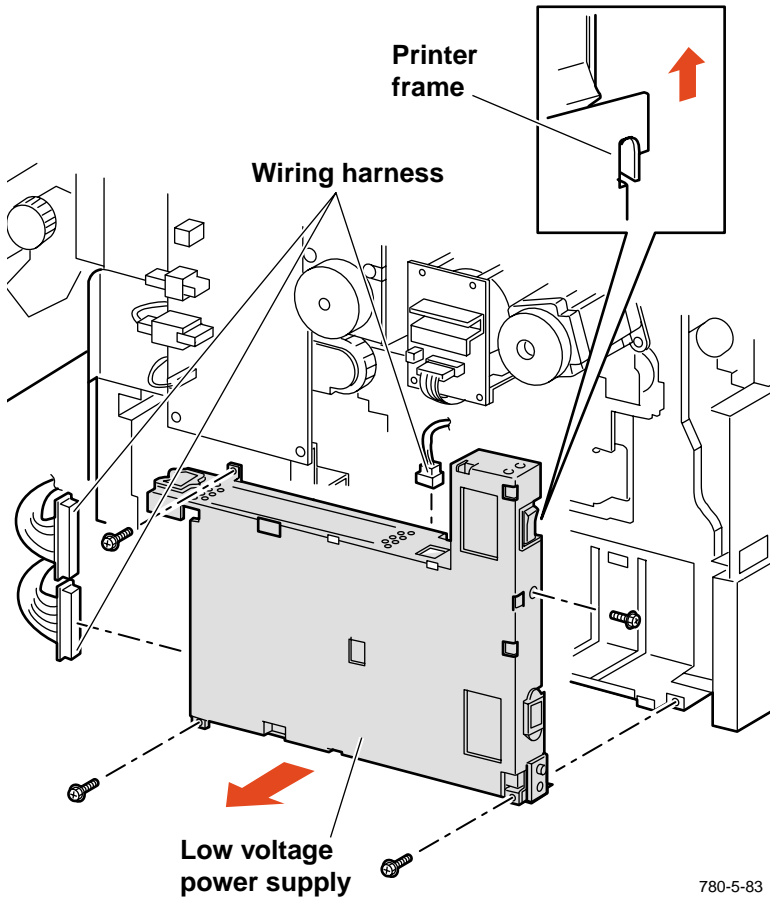
780-5-83

Removing the low voltage power supply

High voltage power supply

1. Remove the rear cover.

2. Disconnect the wiring harnesses from the bottom of the high voltage power supply.

3. Disconnect the five high-voltage wiring harness from the high voltage power supply.

4. Remove the four screws securing the high voltage power supply to the high voltage power supply brackets. Remove the high voltage power supply.

Reverse these steps to install the high voltage power supply.

High voltage power supply

Wiring harness

780-5-84
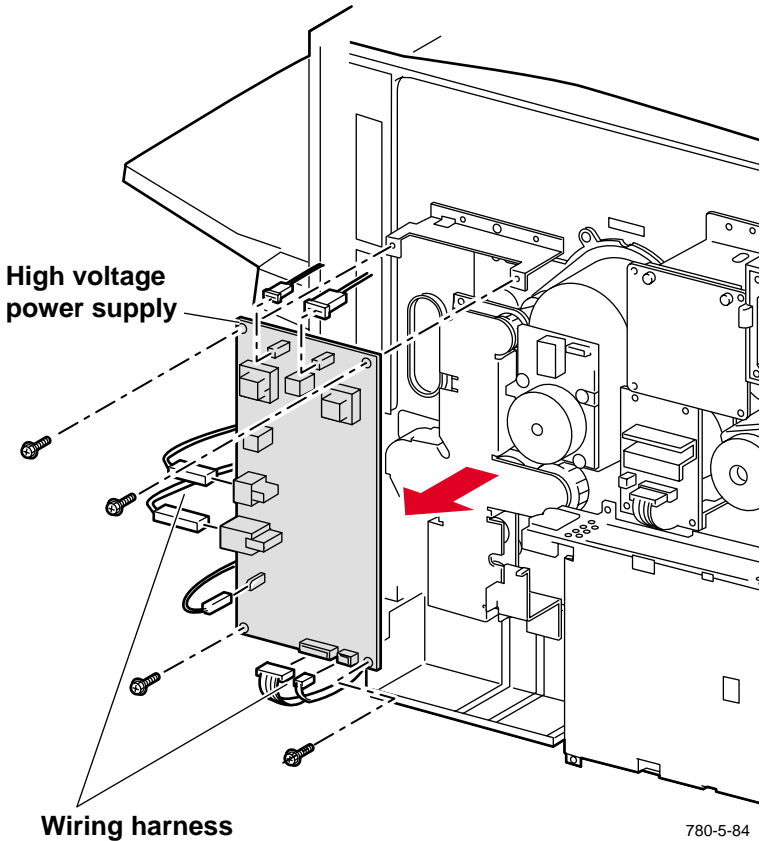
Removing the high voltage power supply

Image processor

1. Disconnect all interface cables connecting to the image processor.

2. Remove the right cover.

3. Disconnect all wiring harnesses from the image processor.

4. Remove the 10 screws securing the image processor to the image processor chassis. Pull the image processor away from the chassis, disconnecting the image processor from the engine control board.

Swap components. If you are replacing the image processor board, exchange:

- The Boot ROM (PLCC)

- The NVRAM chip (DIP)

- The Real Time Clock module

The components contains important customer-created parameters. The printer may not operate correctly without the components being swapped.

Also transfer from the old board to the new board.

- The RAM DIMMs

- The PhaserShare card

- The SCSI card
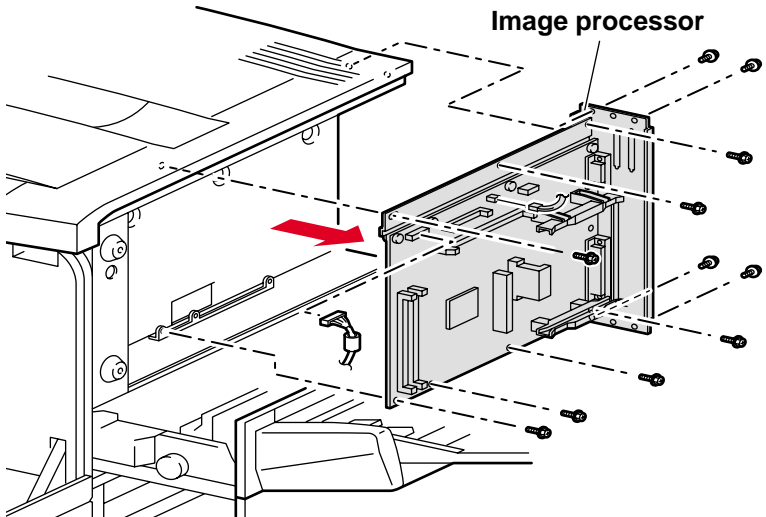
Image processor

Removing the image processor

Image processor chassis

1. Remove the image processor fan.

2. Remove the image processor as descried in "Image processor" on page 133.

3. Loosen, but do not remove, the four screws securing the bottom of the image processor chassis assembly to the printer frame.

4. Remove the five screws securing the top of the image processor chassis assembly to the printer frame.

5. Lift the image processor chassis assembly up and off the four loosened screws located at the bottom of the chassis. Remove the chassis from the printer frame.

Reverse these steps to install the image processor chassis.

Image processor chassis

Loosen these screws
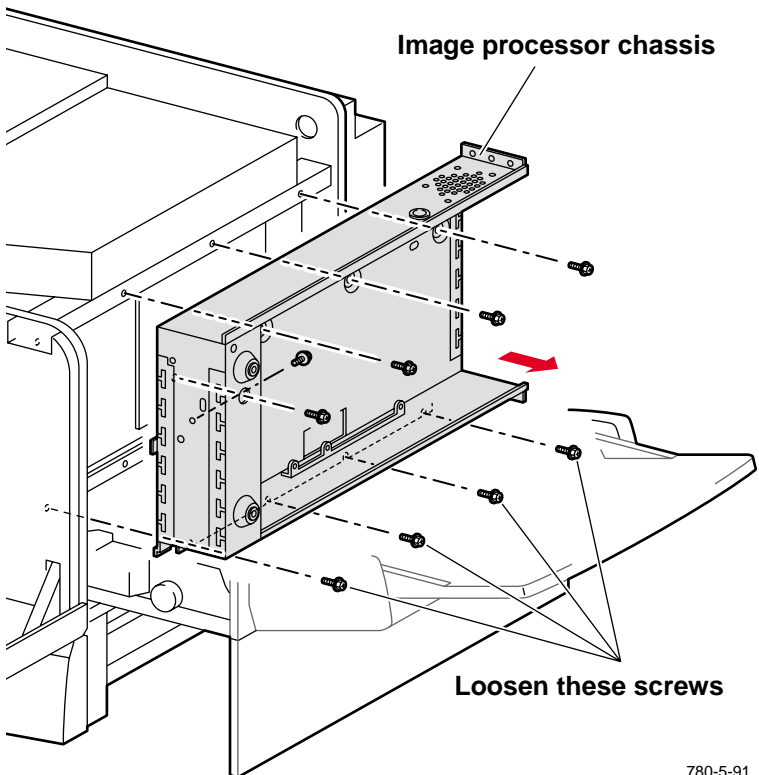
780-5-91

Removing the image processor chassis

Print engine control board

1. Perform the **Life Date: Save Life Count** described in "Running built-in diagnostics" on page 69 to save the information stored in the print engine control board NVRAM in the image processor board.

2. Remove the image processor chassis.

3. Disconnect the nine wiring harnesses connected to the print engine control board.

4. Remove the screw securing the ground wire to the print engine control board. Remove the wire.

5. Remove the three other screws securing the print engine control board to the printer frame. Remove the board.

Reverse these steps to install the engine control board. Perform the **Life Date: Restore Life Count** to restore the counts to the engine control board NVRAM.
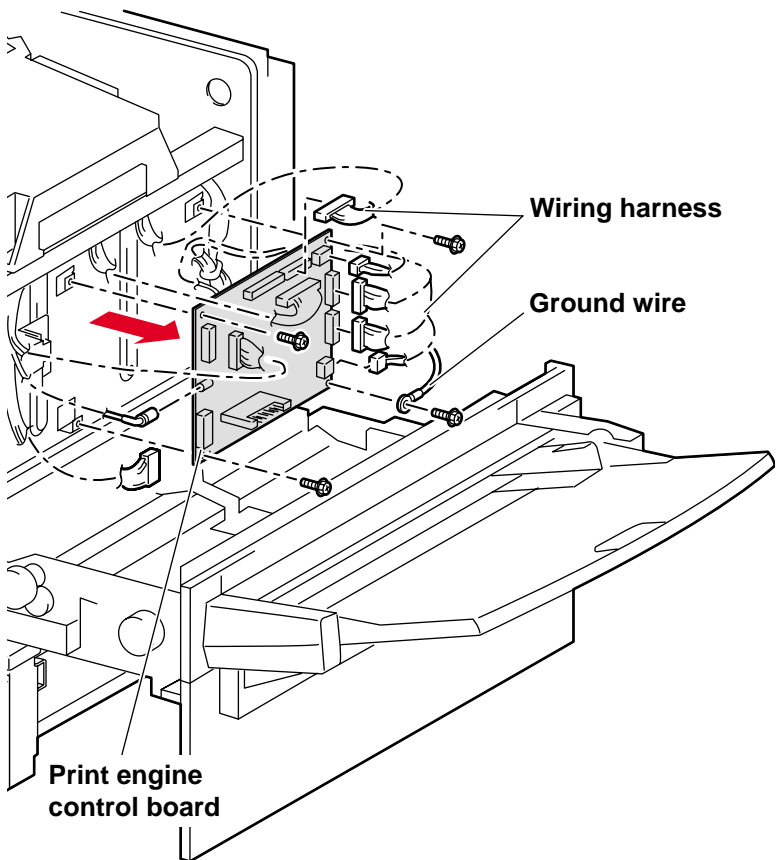
780-5-87

Removing the print engine control board

FRU List

This topic provides a list of field replaceable units for the Phaser 780 Color Printer.

Changes to Tektronix products are made to accommodate improved components as they become available. It is important when ordering parts to include the following information:

- Component's part number

- Product type or model number

- Serial number of the printer

Serial numbering. Particular fields in the serial number indicate the modification level of the printer, the date of its manufacture and the sequence number of the printer produced on that day. The serial number is coded as follows:

JLxxDMY

J indicates the headquarter country of the manufacturing company, Japan.

L indicates the modification level of the printer, ranging alpha-numerically from 0 to Z.

xx alpha-numerically indicates the sequence of the printer among the printers produce on that day of manufacture, ranging from 01 to ZZ representing
1 to 1296 (the letters I and O are not used).

D alpha-numerically indicates the day of manufacture, ranging from 1 to X representing 1 to 31 (the letters I and O are not used).

M alpha-numerically indicates the month of manufacture, ranging from 1 to C representing 1 to 12.

Y numerically indicates the last digit of the year of manufacture, ranging from 0 to 9.
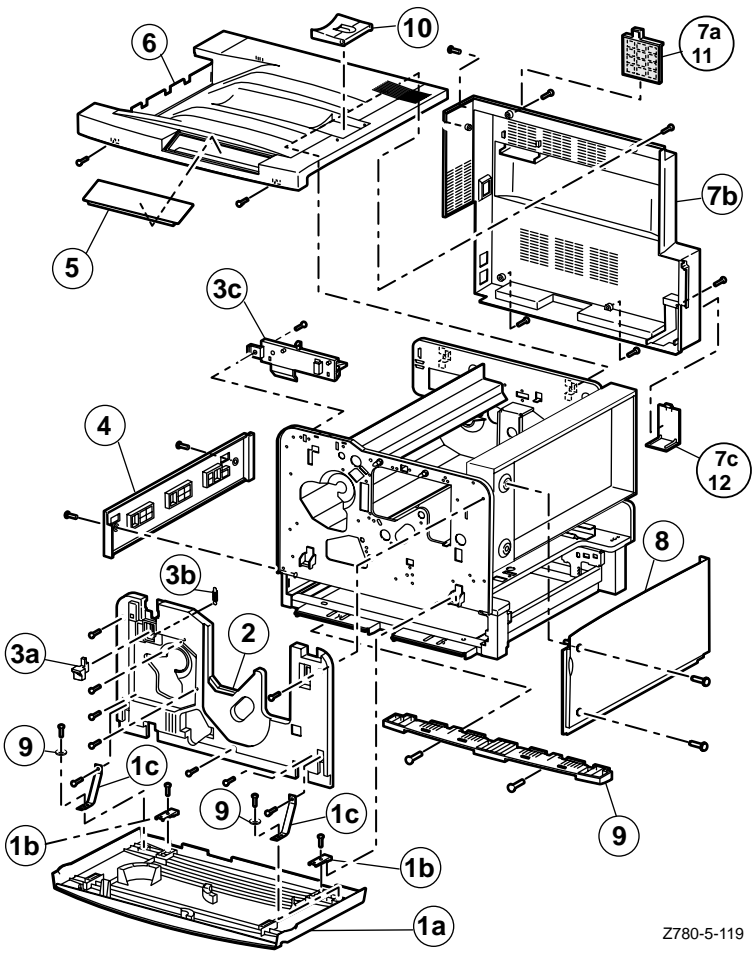
Z780-5-119

Printer cabinet FRUs

Table 1 Printer cover FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description

1
1a
1b
1c
	118-9714-00			
				1
				2
				2
					Front cover assembly kit
					  Front cover
					  Hinge plate
					  Front cover strap
					  Hardware

2	118-9733-00			1	Inner cover (includes 3a and 3b)

3
3a
3b
3c
	118-9715-00			
				1
				1
				1
					Carousel latch kit
					  Carousel latch lever
					  Carousel latch spring
					   Carousel latch assembly

4	118-9737-00			1	Left lower cover
5	118-9739-00			1	Front LCD panel
6	118-9734-00			1	Top cover and stopper

7
7a
7b
7c
	118-9716-00
	
	118-9864-00
				
				1
				1
				1
					Rear cover assembly kit
					  Toner Filter
					  Rear cover
					  Access cover

8	118-9738-00			1	Right cover with shield
9	118-9884-00			1	Front lower cover
10	118-9735-00			1	Stopper
11	118-9736-00			1	Toner filter
12	118-9864-00			1	Access cover
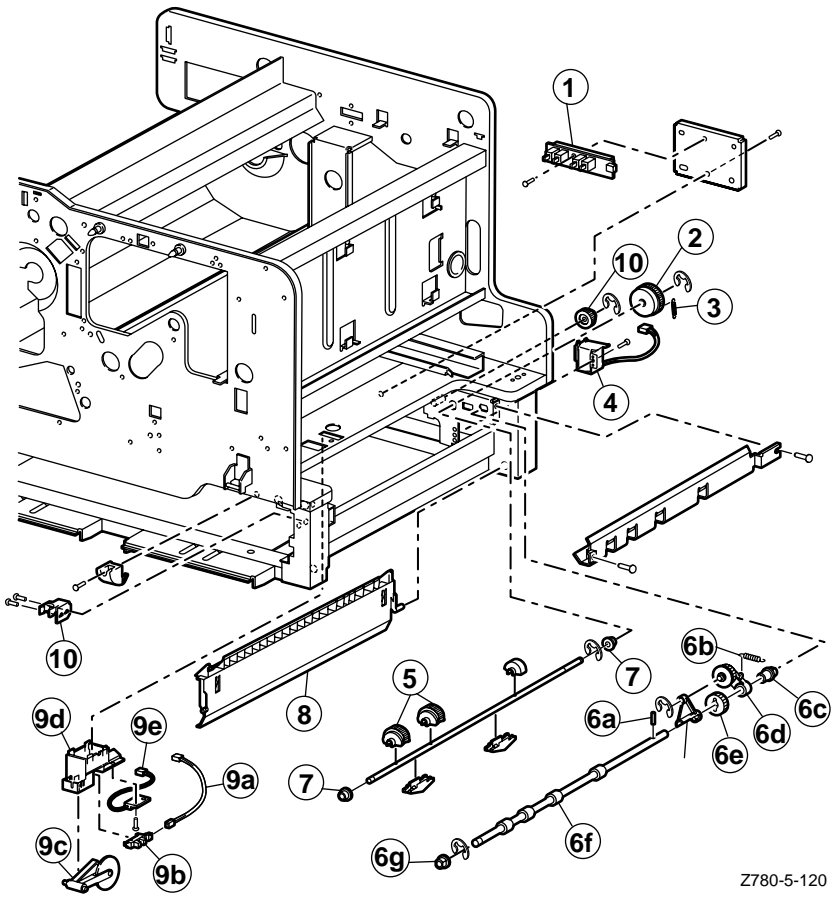
Paper feeder FRUs

Table 2 Paper feeder FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9747-00			1	Size switch board
2	118-9742-00			1	Feed gear
3	118-9743-00			1	Feed spring
4	118-9744-00			1	Feed solenoid
5	118-9717-00			2	Paper pick rollers
6 6a 6b 6c 6d 6e 6f	118-9718-00			 1 1 1 1 1 1 1	Turn roller assembly kit Turn gear pin Turn arm spring Turn rear bearing Turn assembly Turn gear Turn roller shaft Turn front bearing
7	118-9983-00			1	Feed roller bearing
8	118-9745-00			1	Turn chute
9 9a 9b 9c 9d 9e	118-9719-00			 1 1 1 1 1	Paper empty sensor assembly kit Empty sensor harness Empty sensor Sensor actuator Sensor bracket Low paper sensor
10	118-9746-00			1	Tray stopper
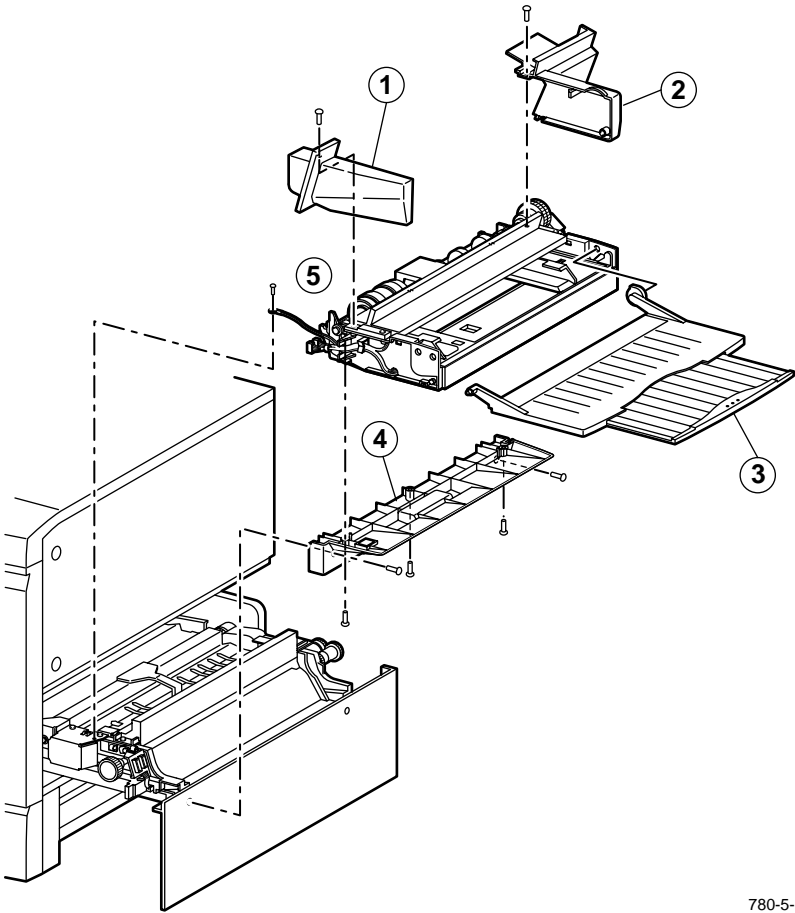
780-5-121

Multi-purpose tray cover FRUs

Table 3 Multi-purpose tray cover FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9748-00			1	Multi-purpose tray left (front) cover
2	118-9749-00			1	Multi-purpose tray right (rear) cover
3	118-9751-00			1	Multi-purpose tray/extender
4	118-9750-00			1	Multi-purpose tray holder
5	118-9720-00			1	Multi-purpose tray assembly (items 1 thru 4)
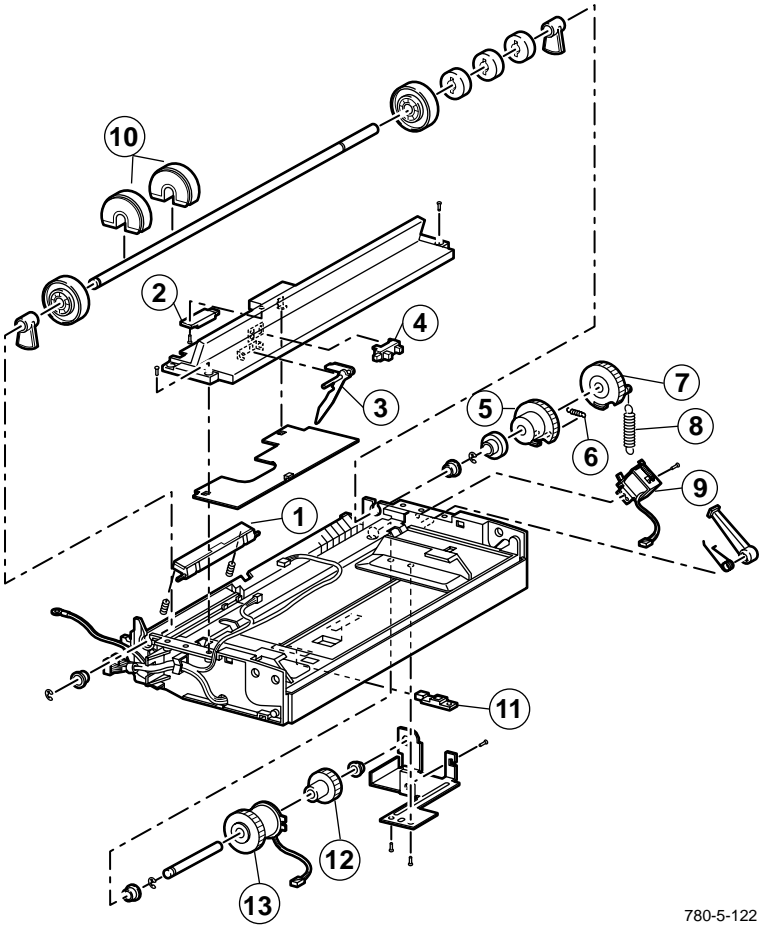
780-5-122

Multi-purpose tray FRUs

Table 4   Multi-purpose tray FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9763-00			1	Multi-purpose tray pad kit
2	118-9752-00			1	Multi-purpose tray edge sensor
3	118-9754-00			1	Multi-purpose tray paper sensor actuator
4	118-9827-00			1	Multi-purpose tray paper sensor
5	118-9756-00			1	Multi-purpose tray pick-up cam gear
6	118-9757-00			1	Multi-purpose tray cam gear spring
7	118-9758-00			1	Multi-purpose tray pick-up gear
8	118-5759-00			1	Multi-purpose tray pick-up spring
9	118-5760-00			1	Multi-purpose tray pick-up solenoid
10	118-9755-00			2	Multi-purpose pick roller kit
11	118-9752-00			1	Multi-purpose tray long paper sensor
12	118-9762-00			1	Multi-purpose tray gear
13	118-9761-00			1	Multi-purpose tray clutch
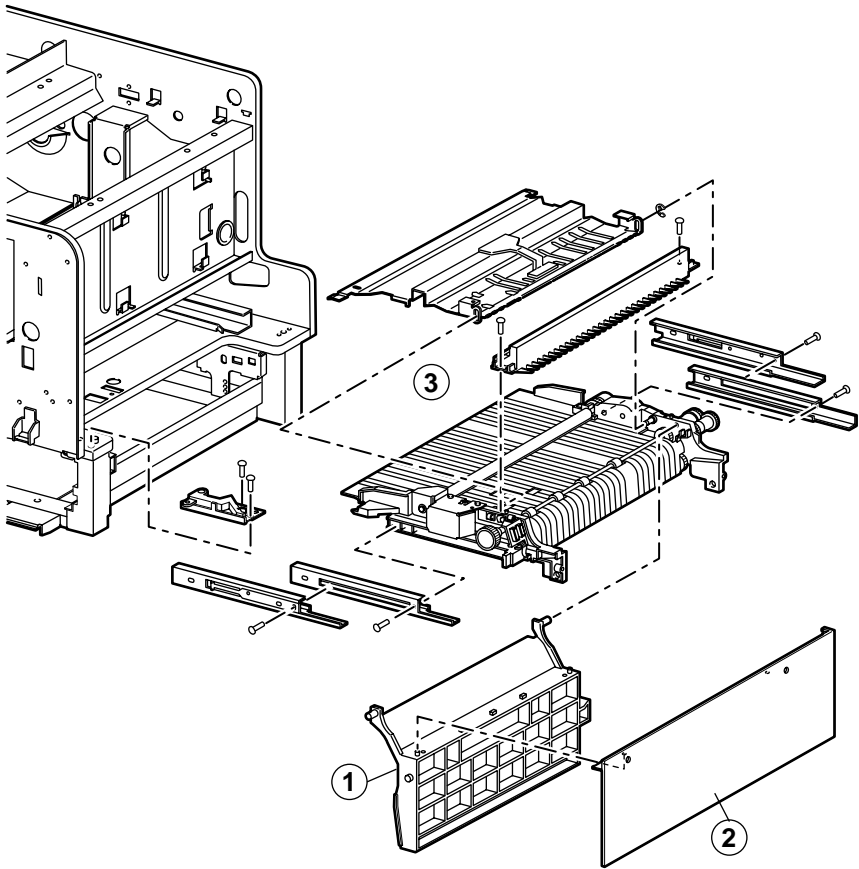
780-5-123

Paper feeder cover FRUs

Table 5 Paper feeder cover FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9766-00			1	Paper feeder turn chute
2	118-9765-00			1	Paper feeder cover
3	118-9865-00			1	paper feeder assembly
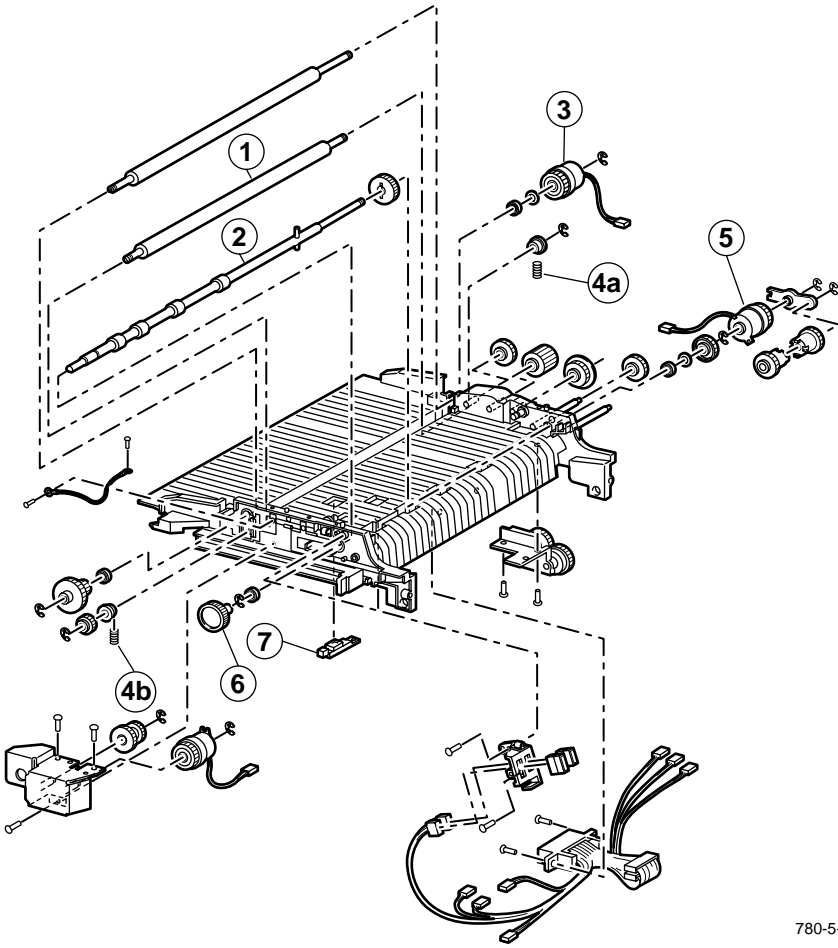
780-5-124

Paper feeder FRUs

Table 6 Paper feeder FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9771-00			1	Registration rubber roller
2	118-9768-00			1	Feeder pre-registration roller
3	118-9770-00			1	Registration clutch
4 4a 4b	118-9721-00			1	Registration spring kit Rear spring (black) Front spring (silver)
5	118-9769-00			1	Pre-registration clutch
6	118-9767-00			1	Pre-registration knob
7	118-9752-00			1	Registration sensor
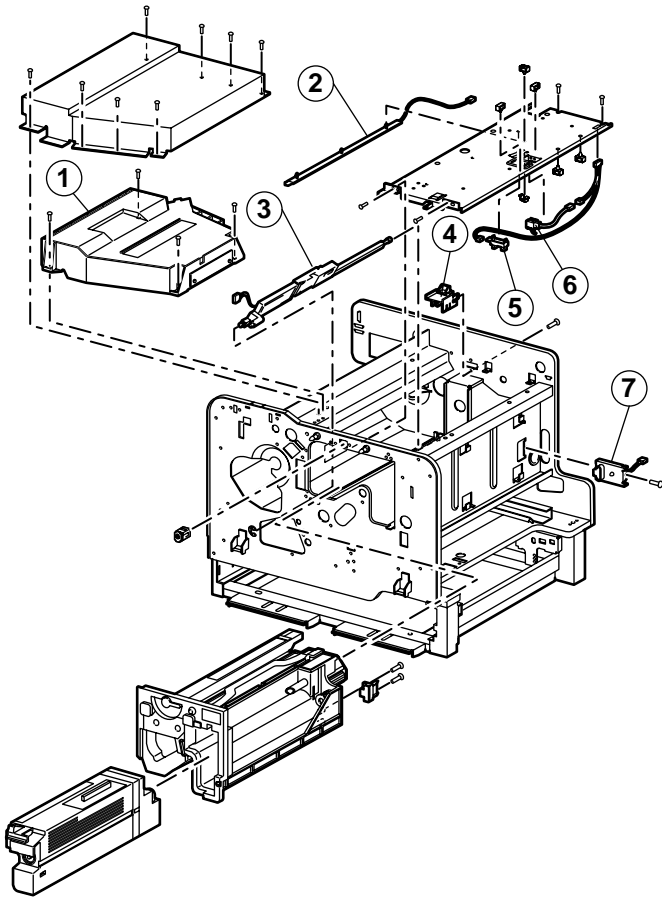
780-5-125

Imaging FRUs

Table 7 Imaging FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9774-00			1	Laser unit
2	118-9778-00			1	Erase lamp
3	118-9777-00			1	Auto-density calibration sensor assembly
4	118-9722-00			1	Bias charge roller connector kit with wiring harness
5	118-9779-00			1	Waste cartridge full sensor
6	118-9780-00			1	Waste cartridge installed sensor
7	118-9781-00			1	Imaging unit connector
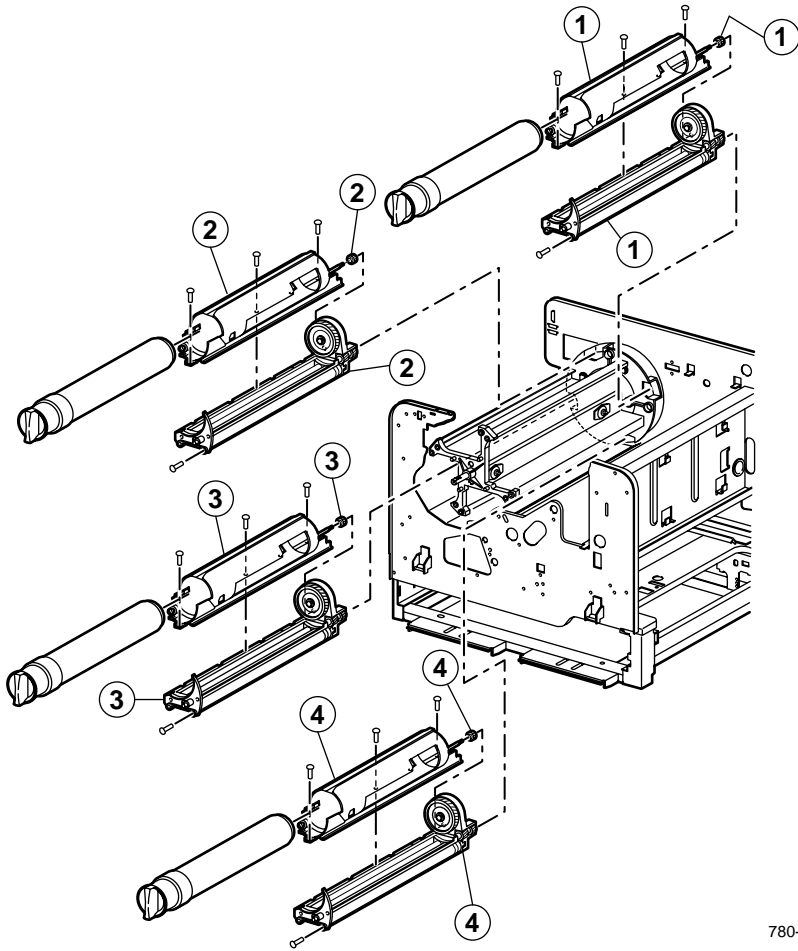
780-5-126

Developer FRUs

Table 8 Developer FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9782-00			1	Developer assembly, Black
2	118-9783-00			1	Developer assembly, Cyan
3	118-9784-00			1	Developer assembly, Magenta
4	118-9785-00			1	Developer assembly, Yellow
	116-0073-00				Developer shim kit (1 each of 4 sizes)
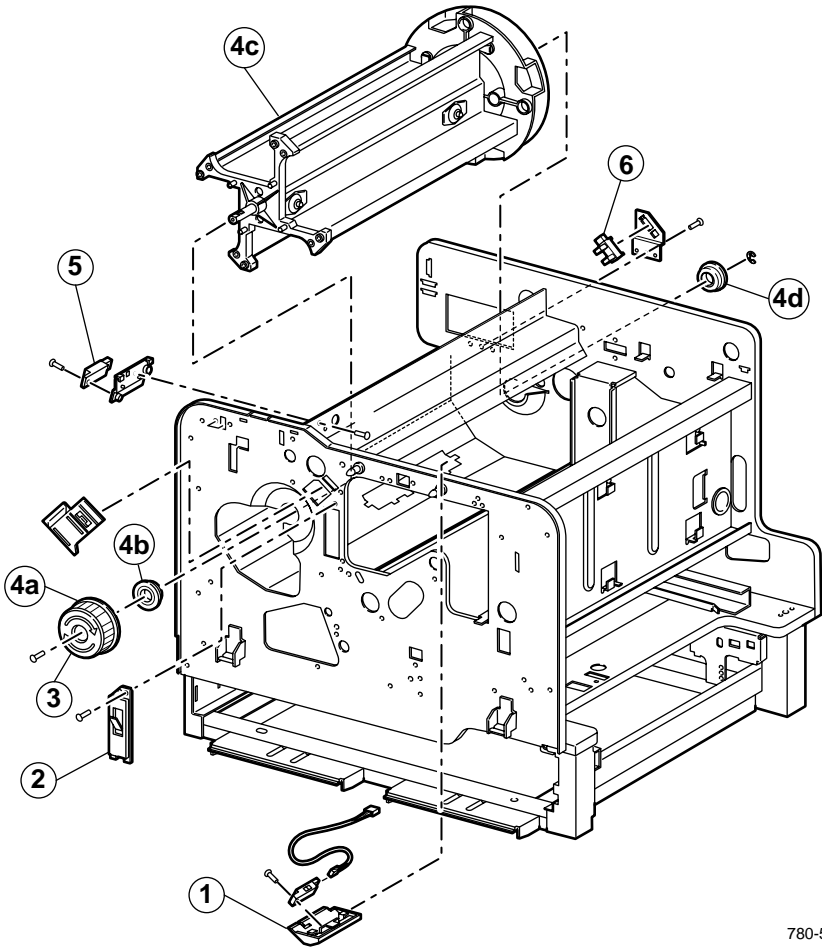
780-5-127

Carousel FRUs

Table 9 Carousel FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9787-00			1	Toner cartridge presence sensor
2	118-9724-00			1	Developer contact assembly
3	118-9820-00			1	Carousel knob
4 4a 4b 4c 4d	118-9723-00			 1 1 1 1	Carousel assembly kit Carousel knob Carousel front bearing Carousel frame Carousel rear bearing
5	118-9788-00			1	New toner cartridge sensor
6	118-9786-00			1	Carousel home sensor
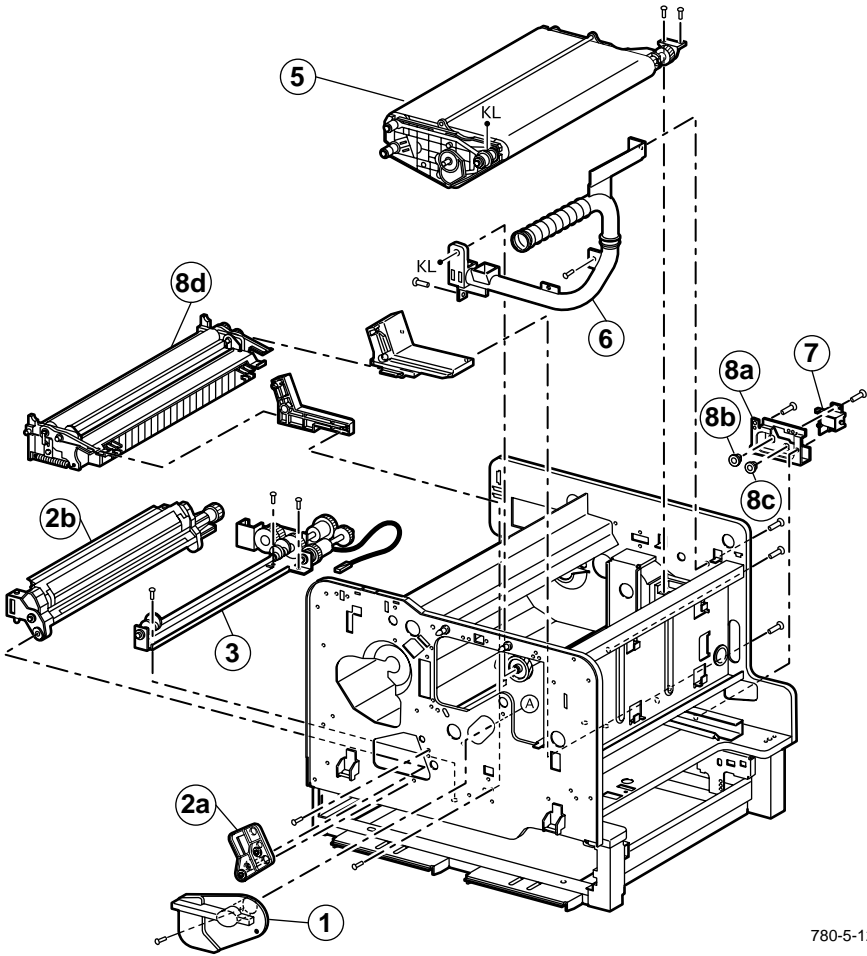
Accumulator belt assembly FRUs

780-5-128

Table 10 Accumulator belt assembly FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9790-00			1	Tension lever
2	118-9726-00				Belt cleaning assembly kit
2a				1	Cleaner support assembly
2b				1	Belt cleaner
3	118-9791-00			1	Second bias transfer roller cam assembly
5	118-9789-00			1	Accumulator belt assembly
6	118-9793-00			1	Waste auger assembly
7	118-9792-00			1	Transfer roller cam solenoid
8	118-9725-00				Second bias transfer roller assembly kit
8a				1	Second bias transfer bracket
8b				1	Second bias transfer bearing-6
8c				1	Second bias transfer bearing-4
8d				1	Second bias roller transfer assembly
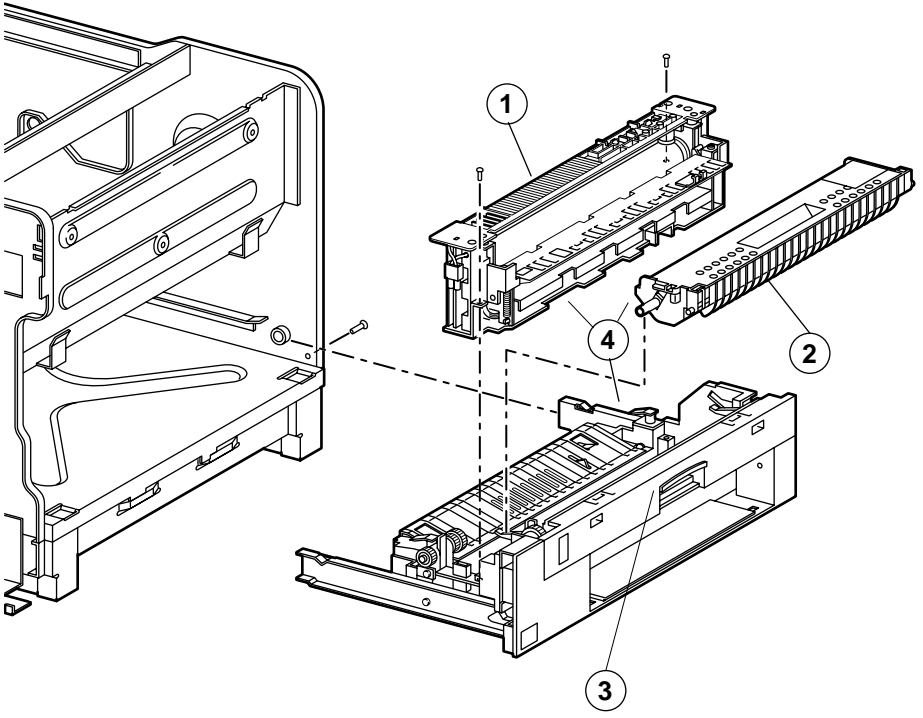
780-5-129

Fuser assembly FRUs

Table 11 Fuser assembly FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9886-01 118-9887-01			1 1	Fuser, 110 VAC Fuser, 220 VAC
2	016-1866-00			1	Fuser roll cartridge
3	118-9986-00			1	Fuser tray release lever
4	118-9727-00 118-9728-00			1	Fuser assembly 110V Fuser assembly 220V
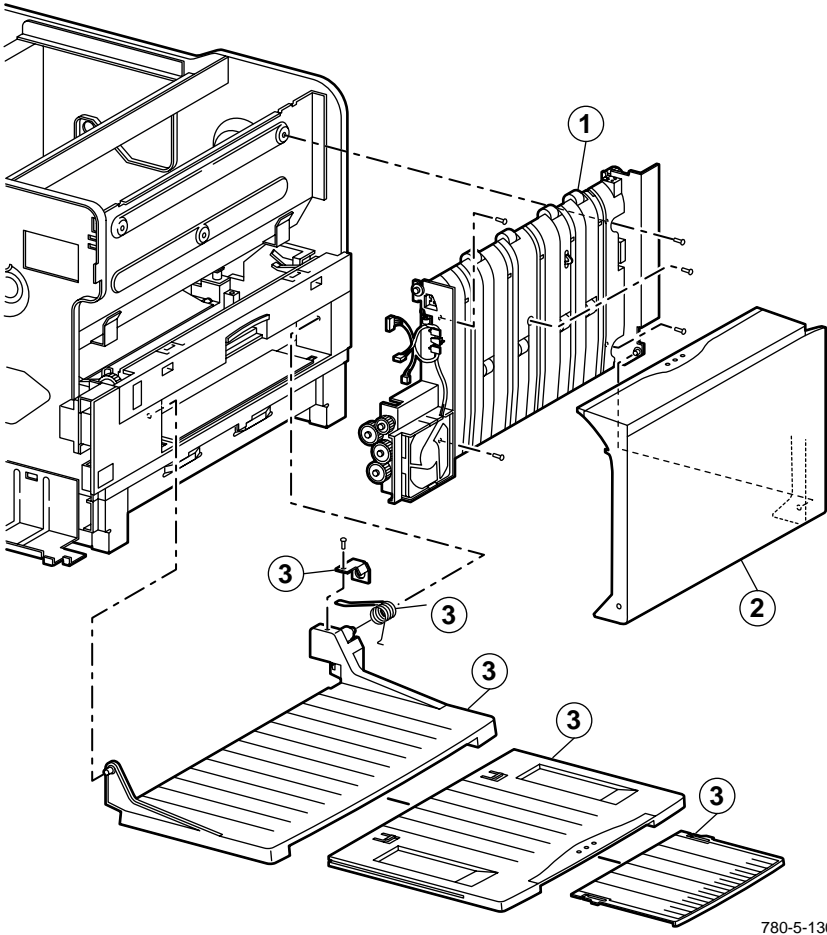
780-5-130

Paper exit FRUs

Table 12 Paper exit FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9798-00			1	Lower exit assembly
2	118-9799-00			1	Upper exit assembly
3	118-9800-00			1	Exit tray assembly
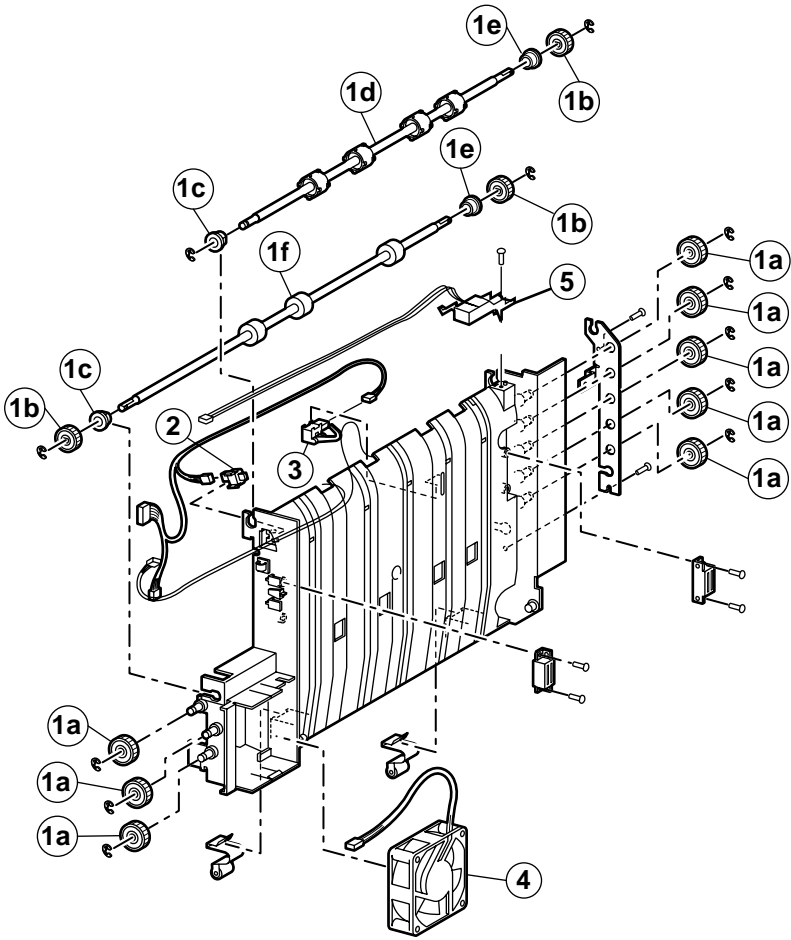
780-5-131

Paper exit FRUs

Table 13 Paper exit FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1 1a 1b 1c 1d 1e 1f	118-9729-00			1	Exit upper roller kit Exit idler gear Exit spur gear Exit rear bearing Exit-3 roller Exit front bearing Exit-2 roller
2	118-9802-00			1	Exit door switch
3	118-9801-00			1	Media exit sensor with flag
4	118-9803-00			1	Fuser fan
5	116-0050-00			1	Full stack sensor
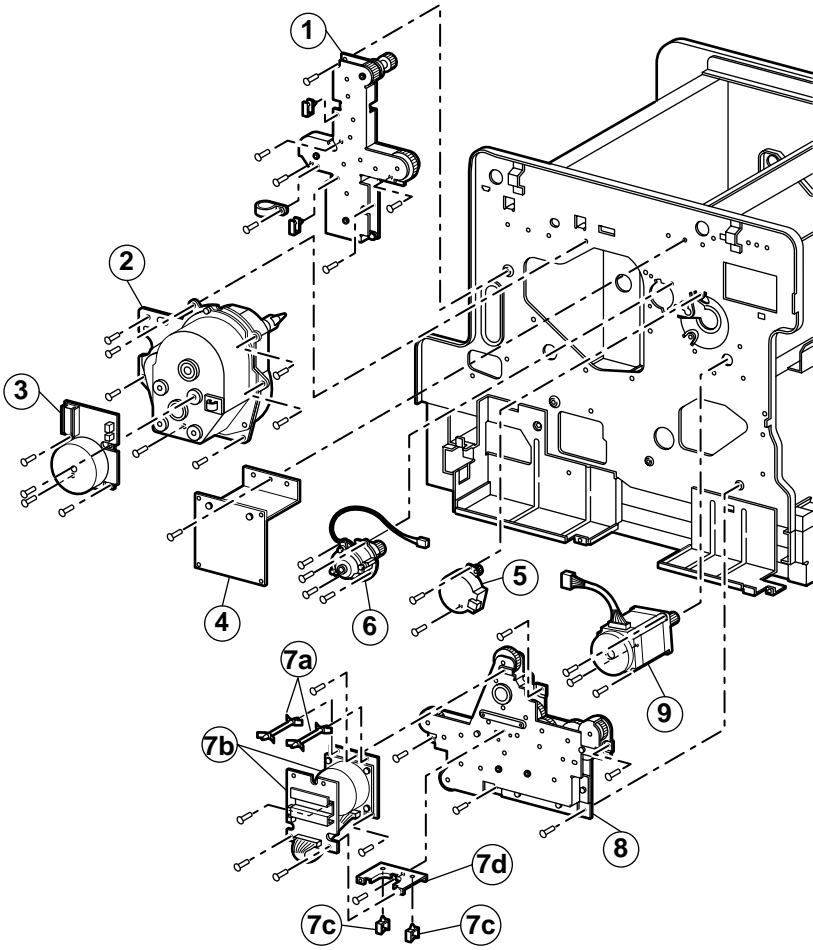
780-5-132

Drive FRUs

Table 14 Drive FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9804-00			1	Paper feed drive assembly
2	118-9806-00			1	Process drive assembly
3					Process motor (part of process drive assembly)
4	118-9809-00			1	Carousel motor board
5	118-9810-00			1	Toner/developer dispense motor
6	118-9811-00			1	Developer clutch
7 7a 7b 7c 7d	118-9730-00				Paper feed motor assembly kit Paper feed motor support Paper feed motor Harness clamp Paper feed bracket
8	118-9805-00				Fuser drive assembly
9	118-9808-00				Carousel motor

**Part of Carousel
FRU Part 2**

**Part of Imaging
FRU Part 4**

1

2a

2b

3

4

A

5

6

A
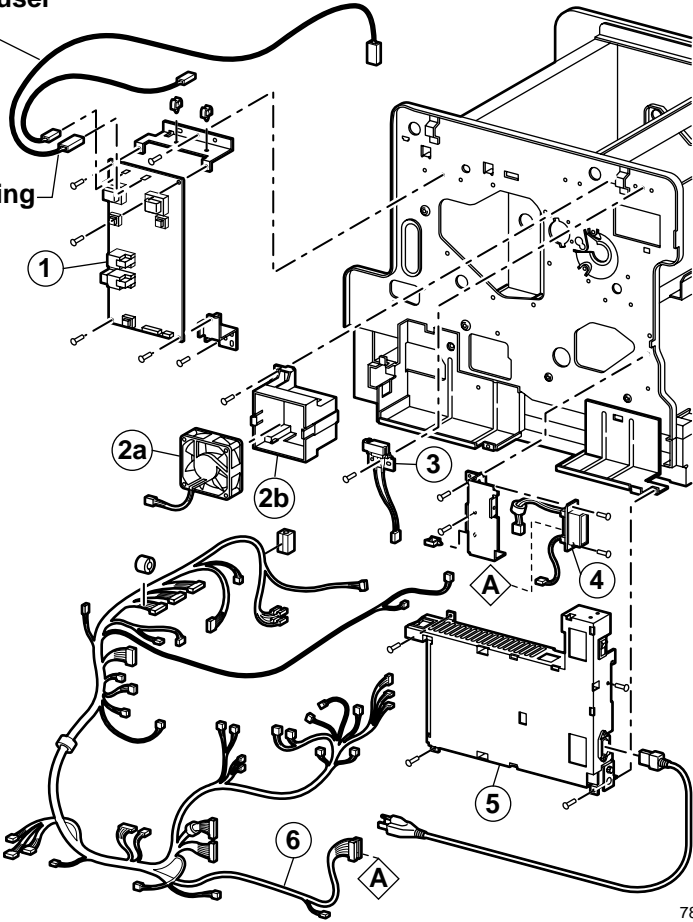
780-5-133

Electronic (rear) FRUs

Table 15 Electronic (rear) FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9873-00			1	High voltage power supply board
2	118-9731-00				Developer fan kit
2a				1	Developer fan
2b				1	Developer fan duct
3	118-9816-00			1	Top cover switch
4	118-9817-00			1	Fuser connector, Main
5	119-5871-00			1	Low voltage power supply, 110 VAC
	119-5872-00			1	Low voltage power supply, 220 VAC
6	118-9819-00				Main harness, DC
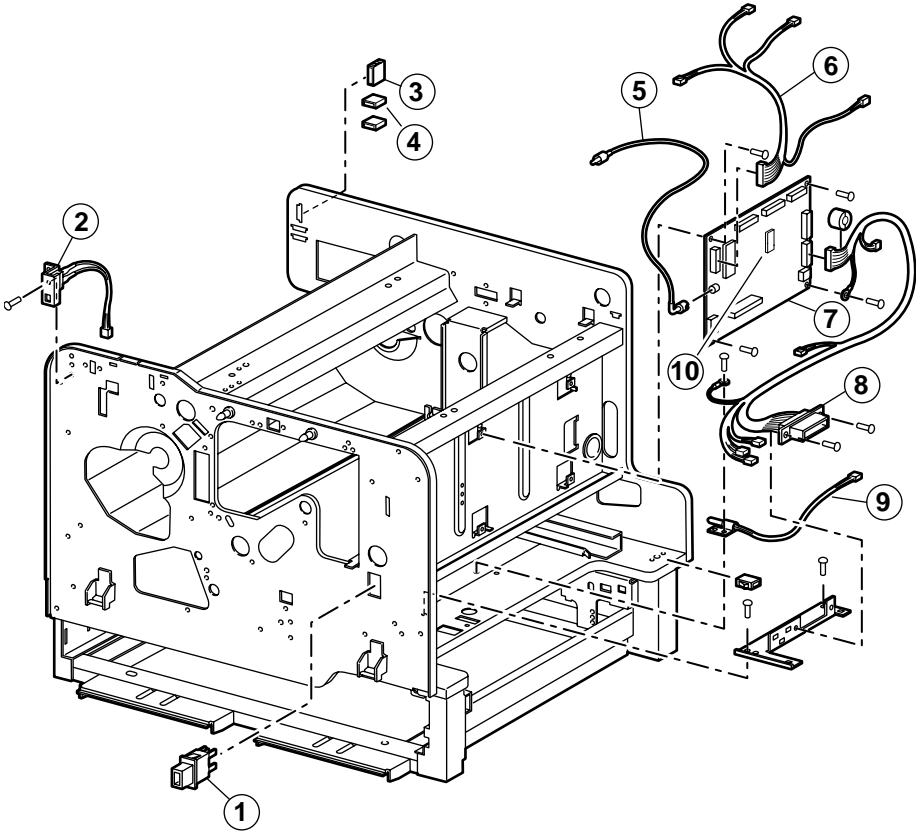
780-5-134

Electronics (front) FRUs

Table 16 Electronic (front) FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9822-00			1	Front cover switch, right
2	118-9821-00			1	Front cover switch, left
3	118-9815-00			1	Exit connector-8
4	118-9814-00			1	Exit connector -4
5	118-9824-00			1	Video harness
6	118-9825-00			1	Laser unit harness
7	118-9796-00			1	Engine control board
8	118-9823-00			1	Paper feeder harness
9	118-9863-00			1	Environmental sensor
10	163-1283-00			1	Print engine NVRAM chip
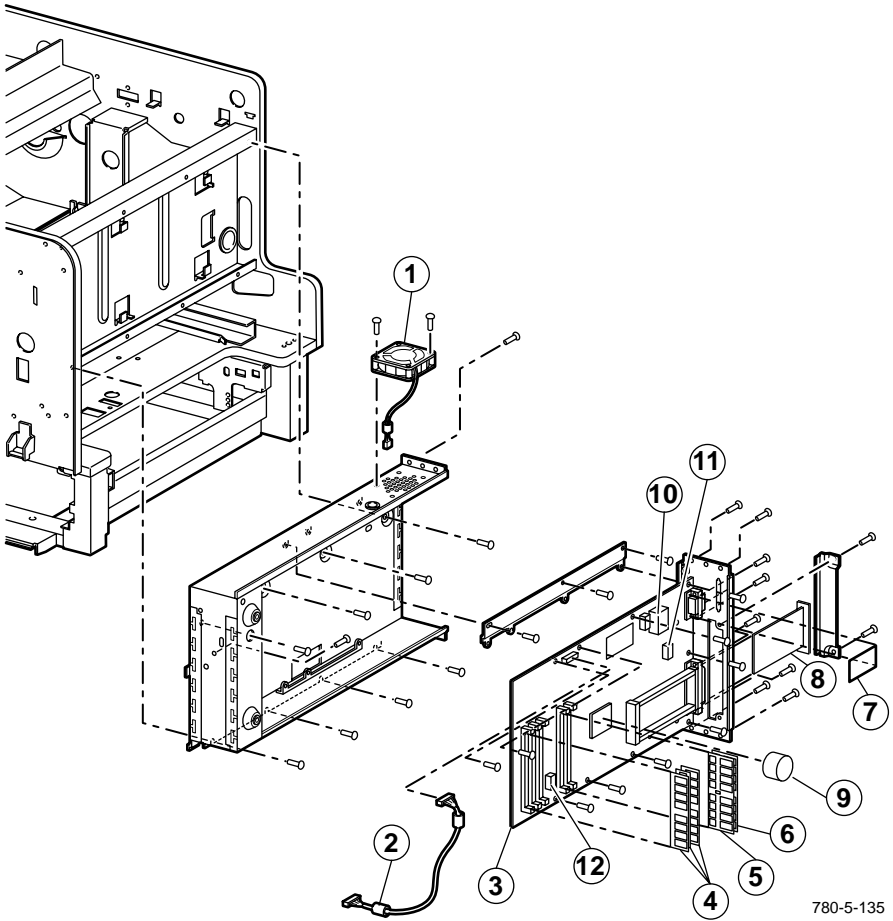
Image processor FRUs

780-5-135

Table 17 Image processor FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9826-00			1	Image processor fan
2	118-9885-00			1	Front panel harness
3	671-4303-80			1	Image processor board
4	156-4759-00 156-4765-00 156-4780-00			1	RAM DIMM, 32 Mbytes RAM DIMM, 64 Mbyte RAM DIMM, 128 Mbyte
5	671-4759-00 671-4687-00 671-4688-00 671-4686-00			1 1 1 1	Font ROM SIMM, Kanji Font ROM SIMM, Simplified Chinese Font ROM SIMM, Traditional Chinese Font ROM SIMM, Korean
6	671-4672-51 671-4673-51				PostScript Code SIMM, Base (v2.86) PostScript Code SIMM, Graphics and Plus (v2.86)
7	671-4306-50				SCSI riser board
8	671-3994-00 671-3932-00 671-4034-00 386-6998-00 213-1090-00			1 1 1 1 2	Ethernet 100baseT Network card TokenRing card LocalTalk card Blank panel, net card Screws, 4-40 x .312
9	119-6032-00			1	CPU Fan
10	650-3886-01			1	Dallas Real Time Clock
11	156-4768-00			1	NVRAM
12	163-1148-00			1	Boot ROM/Product ID
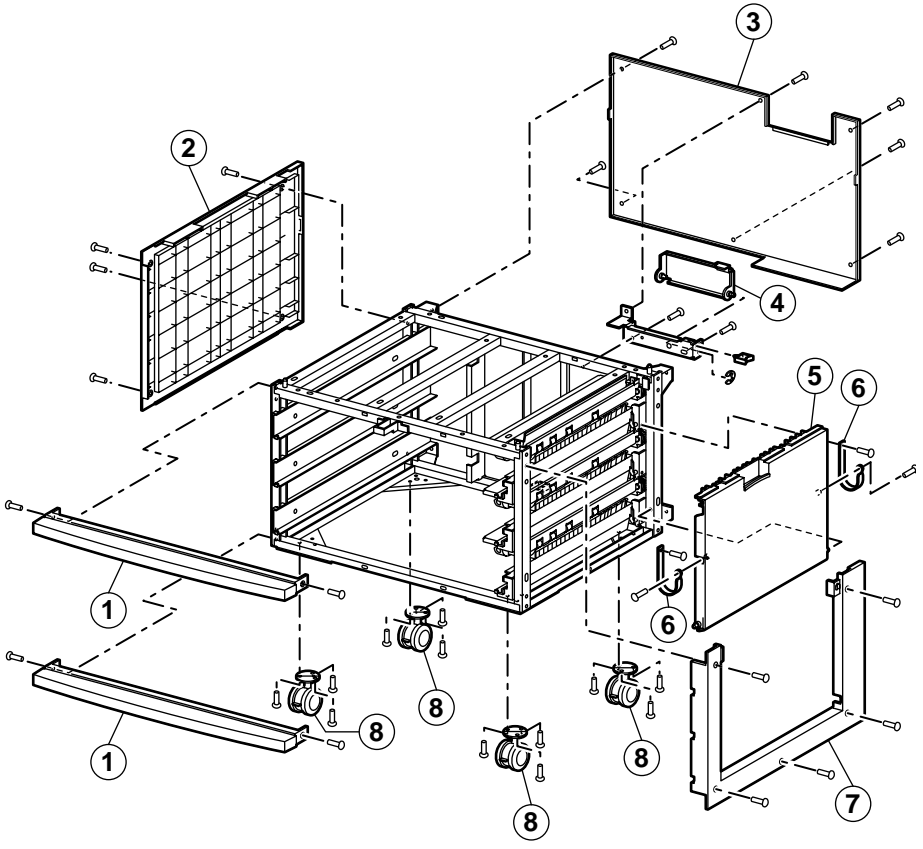
780-5-136

Optional lower feeder cabinet FRUs

Table 18 Optional lower feeder cabinet FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9923-00			1	Lower feeder front cover
2	118-9926-00			1	Lower feeder left cover
3	118-9924-00			1	Lower feeder rear cover
4	118-9925-00			1	Lower feeder harness cover
5	118-9928-00			1	Lower feeder chute assembly
6	118-9929-00			1	Lower feeder chute support
7	118-9927-00			1	Lower feeder right cover
8	118-9930-00			1	Lower feeder caster

10: Items 1 thru 9
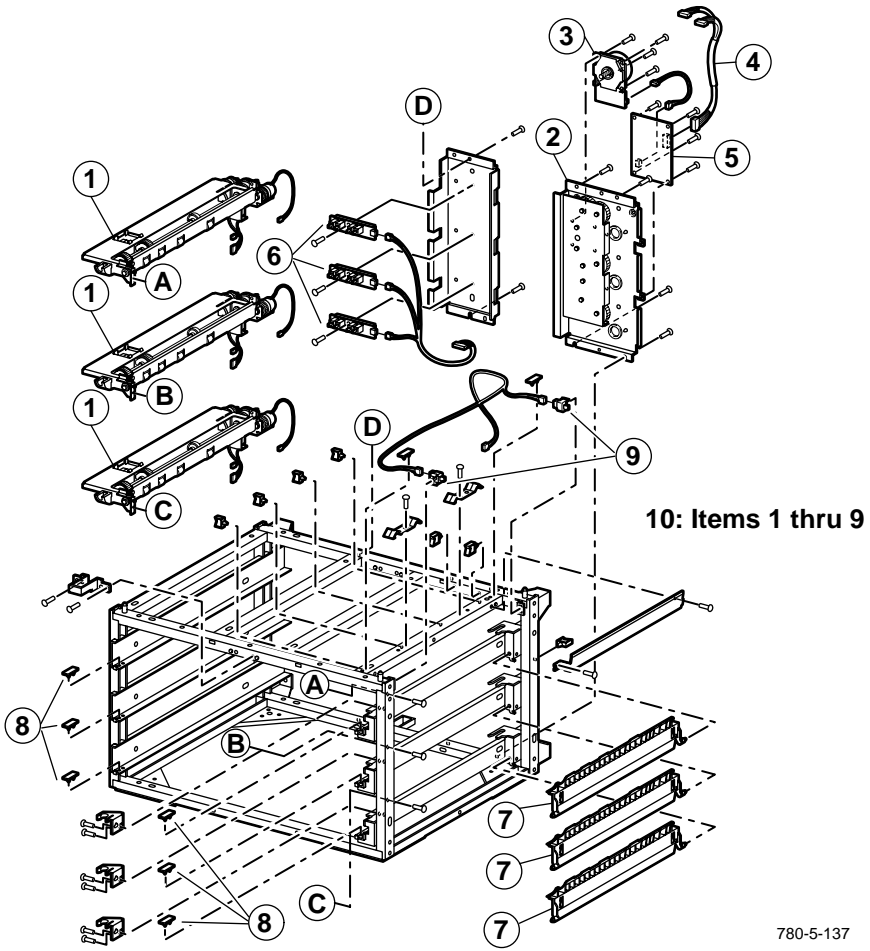
780-5-137

Optional Feeder FRUs

Table 19 Optional feeder FRUs

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
1	118-9931-00			1	Lower feeder assembly
2	118-9934-00			1	Lower feeder gear assembly
3	118-9933-00			1	Lower feeder motor
4	118-9936-00			1	Lower feeder interface harness
5	118-9935-00			1	Lower feeder circuit board
6	118-9747-00				Lower feeder paper size sensor
7	118-9932-00			1	Lower feeder turn-in chute
8	118-9985-00			1	Tray spacer
9	118-9802-00			1	Lower feeder chute switch
10	436-0367-00			1	Lower tray assembly (optional feeder)

Supplies and accessories

Table 20   Supplies and accessories

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
	016-1678-00				Toner Cartridge, Black
	016-1679-00				Toner Cartridge, Cyan
	016-1680-00				Toner Cartridge, Magenta
	016-1681-00				Toner Cartridge, Yellow
	016-1864-00				Imaging Unit Cartridge
	016-1865-00				Imaging Unit Waste Cartridge
	016-1866-00				Standard Fuser Roll Cartridge
	016-1717-00				High Duty Fuser Roll Cartridge
	016-1369-00				A4 Size Paper, 500 Sheets
	016-1697-00				Tab Plus Glossy, 100#, 50 Sheets
	016-1699-00				Plain Paper,24#,b,500 Sheets
	016-1700-00				Plain Paper,24#,a3,500 Sheets
	016-1701-00				Transparency, A, 50 Sheets
	016-1702-00				Transparency, A4, 50 Sheets
	016-1703-00				Paper, Image Transfer, B, 100 Sheets
	016-1704-00				Paper, Glossy, A, 100#, 100 Sheets
	016-1705-00				Paper, Glossy, A4, 100#, 100 Sheets
	016-1706-00				Transparency, Tab Extra, 50 Sheets
	016-1709-00				Paper, Tab Plus, 24#, 500 Sheets
	016-1718-00				Paper, Glossy Coated, B, 100 #, 50 sheets
	063-3039-00				CD, ROM, English
	063-3039-10				CD, ROM, French
	063-3039-20				CD, ROM, Italian
	063-3039-30				CD, ROM, German
	063-3039-40				CD, ROM, Spanish
	063-3039-70				CD, ROM, Simplified Chinese
	063-3039-80				CD, ROM, Traditional Chinese
	063-3039-90				CD, ROM, Korean
	063-3040-00				User Guide, English
	063-3040-10				User Guide, French

Table 20 Supplies and accessories

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
	063-3040-20				User Guide, Italian
	063-3040-30				User Guide, German
	063-3040-40				User Guide, Spanish
	063-3040-05				User Guide, Russian
	063-3041-00				Quick Reference Guide, Service
	063-3094-00				Setup Guide, English
	063-3094-10				Setup Guide, French
	063-3094-20				Setup Guide, Italian
	063-3094-30				Setup Guide, German
	063-3094-40				Setup Guide, Spanish
	063-3094-05				Setup Guide, Russian
	063-3116-00				Phasershare Setup Guide
	063-3116-10				Phasershare Setup Guide, French
	063-3116-20				Phasershare Setup Guide, Italian
	063-3116-30				Phasershare Setup Guide, German
	063-3116-40				Phasershare Setup Guide, Spanish
	063-3126-00				CD, Adobe Type Manager
	063-3181-00				CD, Phaser Match, Color Match
	070-9925-00				Advanced Features & Troubleshooting, English
	161-0066-00				Power Cord, 115v
	161-0066-09				Power Cord, 220v
	161-0066-10				Power Cord, U.K.
	161-0066-11				Power Cord, Aust.
	161-0154-00				Power Cord, Swiss
	161-0240-00				Power Cord, Danish
	436-0366-00				Universal Size Paper Tray (Std)
	436-0368-00				Labels & Transparency Tray
	013-0297-00				Cable, Adapter, SCSI 1 TO SCSI 2
	118-9921-00				Hardware Kit
	116-0073-00				Developer shim kit (4 sets of 3 sizes)
	003-0619-00				I.C. Extractor, SCSI Board removal tool

Table 20   Supplies and accessories

Parts	Part number	Serial number Effective	Discont'd	Qty	Name and description
	003-1633-00				IC PLCC Extractor Tool
	065-0574-00				Repackaging Kit
	650-3572-01				Rebanding Kit
	650-3971-00				Recycle kit for developer assemblies, California only
	003-1496-00 003-1497-00				Vacuum cleaner, 110/115 VAC Vacuum cleaner, 220/240 VAC
	003-1498-00				Vacuum cleaner filter, Type 2, 3M
	004-4845-00				Shipping Box
	003-0602-00				#1 Pozidrive screwdriver tip
	006-7971-00				Imaging unit lightshield

Test Prints

This topic illustrates the test prints produced by the print engine. It also illustrates a number of defective prints and the reason for the defects. The topic "Printing and print quality problems" on page 43 discusses solutions to the problems shown in this appendix.

Consumables Print consists of four 25% tint primary color bands and "gas gauges" for each consumable. Service Print 1 prints out four 25% tint full page fills, each page one primary color.

1 Replace Magenta Toner Cartridge
        Press i for information

2 Help Pages
        Consumable Pages   Print

3 Help Pages
        Service Print 1   Print
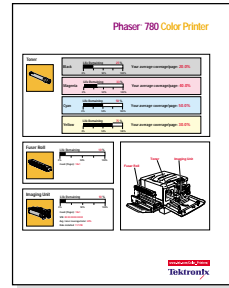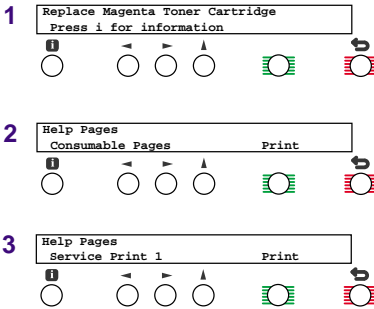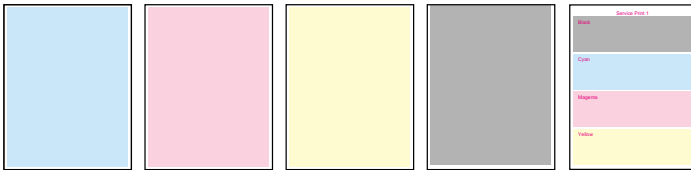
Service Print 1

Interpreting Service Print 2

Service print 2 should always be printed on B-size paper.

1. **Color registration**. The thin lines should not be above or below the think line. Preferable they should be centered.
2. **Blur.** The lines should be crisp and sharp with no "fuzzy" appearance.
3. **Ghosting.** No ghost images of the square patterns should appear in the gray bar below the square patterns.
4. **Uniform RGB.** The secondary color squares should be uniformly colored with no mottling.
5. **Resolutions**. The thin lines should be fully separated from each other
6. **Text**. The text should be sharp with no discernible voids.
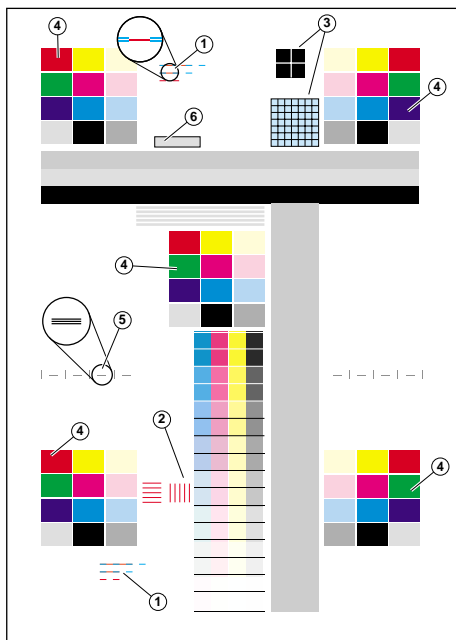
Interpreting Service Print 3

Service print 3 should always be printed on B-size paper.

1. **Skew**. The difference between the values measured at each corner of the leading edge of the print should be no greater than +/- 2 mm.
2. **Leading edge**. The value measure from the leading edge to the indicated line should be 14.9 mm (+/-2 mm).
3. **Side edge.** The value measure from the side edge to the center should be 148.5 mm (+/-2.5 mm). (When the print is accurately folded in half lengthwise, the center line should be in the center of the crease.)
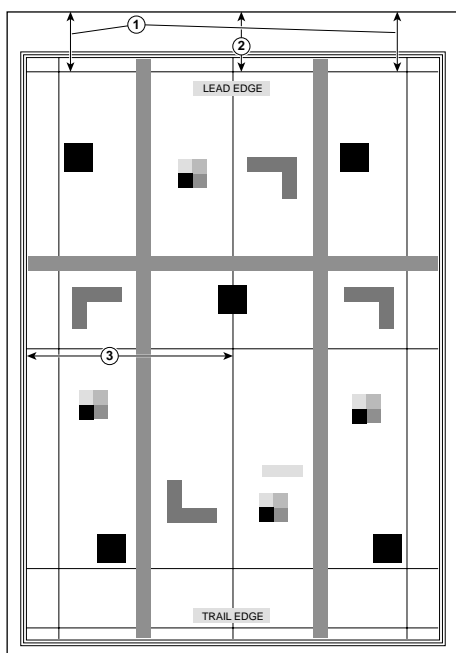
3041-35
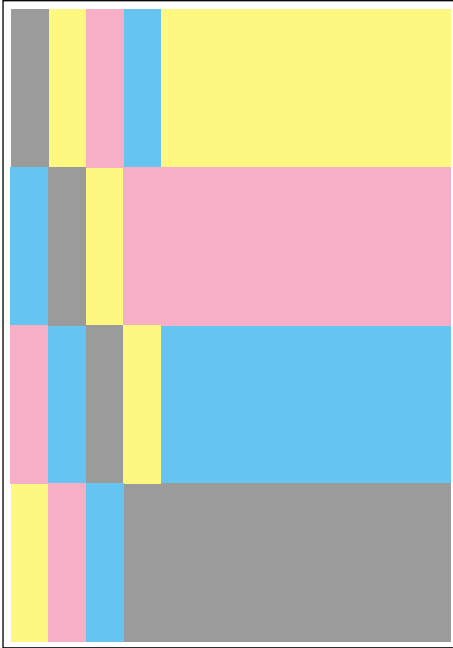
3041-36

Interpreting Service Print 4

Service print 2 should always be printed on B-size paper. The print reveals repeating defects that can be traced back to defects on the printers belts, drum or rollers.

1. Look for repeating defects inline down the print.

Refer to the topic "Repetitive mark appears on each print" on page 56. It discusses caused of repeating spots based on the distance between the spots.
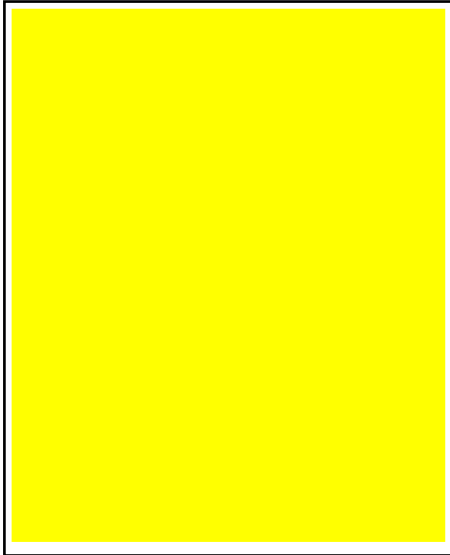
Interpreting Sevice Print 5: Yellow Calibration Page

Service print 5 is a 100% yellow solid fill. Refer to the topic "Printing and print quality problems" on page 43 for solution to any print problems detected. Look for voids, repeating spots and banding. This solid fill is also useful for flushing out defective yellow toner.

Interpreting Sevice Print 6: Magenta Calibration Page

Service print 6 is a 100% magenta solid fill. Refer to the topic "Printing and print quality problems" on page 43 for solution to any print problems detected. Look for voids, repeating spots and banding. This solid fill is also useful for flushing out defective magenta toner.
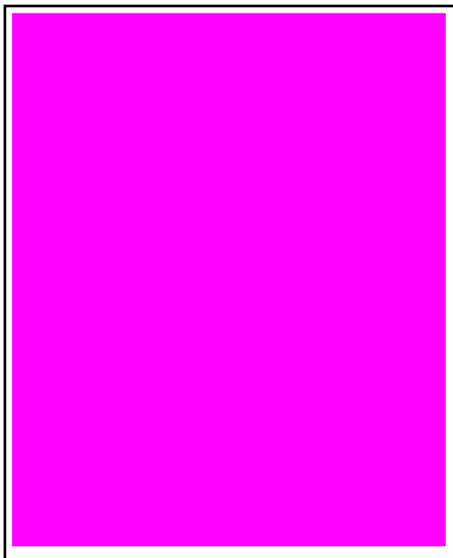
Interpreting Sevice Print 7: Cyan Calibration Page

Service print 7 is a 100% cyan solid fill. Refer to the topic "Printing and print quality problems" on page 43 for solution to any print problems detected. Look for voids, repeating spots and banding. This solid fill is also useful for flushing out defective cyan toner.
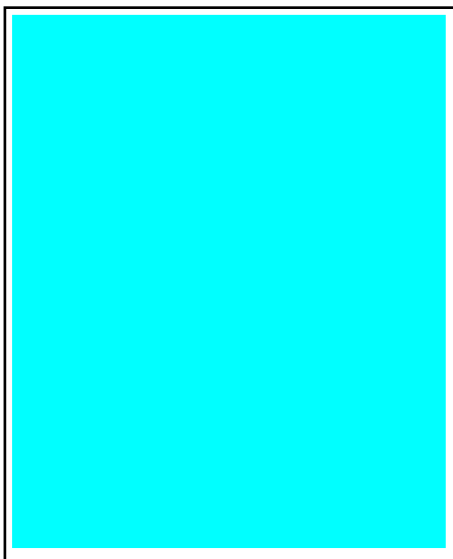
Interpreting Sevice Print 8: Black Calibration
Page
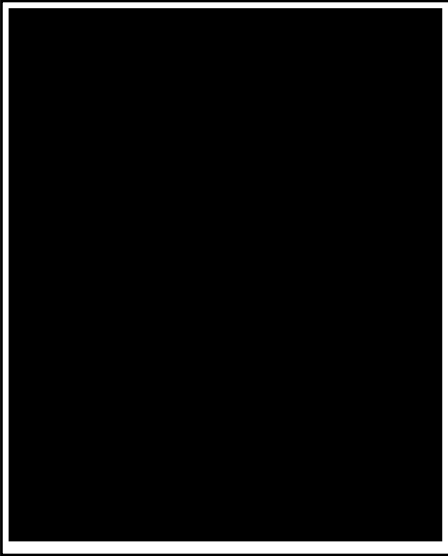
Service print 8 is a 100% black solid fill.
Refer to the topic "Printing and print quality
problems" on page 43 for solution to any
print problems detected. Look for voids,
repeating spots and banding. This solid fill is
also useful for flushing out defective black
toner.

Service Print 9: Fuser Cleaning Page

Service print 9 is a blank sheet of paper
used to clean the fuser rollers as well as test
the operation of the paper feed components.

Wiring Diagrams

LOW VOLTAGE POWER SUPPLY

J35 · J32 · J33

F · H G C B

MAIN FUSER ASSY
- H/R HEATER | P/R HEATER — J79
- Thermostat | Thermal Fuse
- TEMP SENSOR ASSY — J72
- FUSER EXIT SENSOR — J75

J71 · J19 · E · F

- OIL ROLL ASSY | CRU SWITCH ASSY — J77 / J78

FUSER TRAY ASSY
- OIL CAM SOLENOID — J73 — J18
- EXCHANGE SOLENOID — J74
- CLEANER CAM SOLENOID — J62
- FUSER CHUTE FAN — J80
- FUSER IN SENSOR — J117 / J76 — J19

- ENVIRONMENT SENSOR — J105 — J20

- SIZE SWITCH ASSY — J102 — J19
- FEED SOLENOID — J103
- TRAY **EMPTY** SENSOR — J107 / J101 — J20
- LOW PAPER SENSOR — J106
- J104

ENGINE CONTROL BOARD

J21 · J12 · J70 · J97 · J191 · J192 · J193 · J194 · J195 · J196
TOP COVER SWITCH · A
RIGHT FRONT COVER SWITCH

J19 · J197 · **LEFT** FRONT COVER SWITCH

J13 · J122 Laser Scanner Assy — **LASER SCANNER**
J14 · A · J121
J123 Scanner Assy
J124 **Start of Scan**

(ADC) AUTO-DENSITY CALIBRATION

J17 · J81 — ADC SENSOR ASSY
J86 — ERASE LAMP ASSY

J18 · J116 · J88 — WASTE TONER SENSOR
J83 — TONER BOX SENSOR

J16 · J22 — COMMUNICATION ASSY
J84 · J85 — CRUM ASSY

MAIN PAPER FINDER ASSY
- REGI.SENSOR — J93
- FRONT OHP SENSOR — J98
- REAR OHP SENSOR — J99
- PRE-REGI.CLUTCH — J95
- REGI.CLUTCH — J94
- REGI.BRAKE CLUTCH — J94
- J90

J91 · J20 · D · J20

MUTI-PURPOSE ASSY
- MUTI-PURPOSE EDGE SENSOR — J204 — J92
- MUTI-PURPOSE OHP SENSOR — J205
- MUTI-PURPOSE SONG N/P SENSOR — J206
- MUTI-PURPOSE LHORT N/P SENSOR — J203 — J113
- MUTI-PURPOSE PICK UP SOLENOID — J201
- MUTI-PURPOSE MSI CLUTCH — J202

- TOP EXIT SENSOR — J165 — J161 — J17
- EXIT CHUTE SWITCH — J166
- FULL STACK SENSOR — J167 — J163
- FUSER FAN — J111 — J19

HIGH VOLTAGE POWER SUPPLY
J16 · J42 · J41
A · C · D · F · G
F421 · F422 · T3 · T4 · F423

(BCR) BIAS CHARGE ROLLER

- BCR CONNECTOR ASSY
- DRUM CARTRIDGE
- DEVE. CONTACT ASSY
- Developer Assy
- 1ST BIAS PLATE
- 1ST BTR PL.8.2.13
- CONTACT PLATE
- CONTACT ROLL
- BACK UP ROLL
- DTS PLATE
- **SECOND BTR CAM ASSY**
- TRANSFER ASSY
- **ACCUMULATOR BELT ASSY**

(BTR) BIAS TRANSFER ROLLER
- **SECOND BTR ASSY** · **SECOND BTR** · Detack Saw

J17 · J87 — USED CART. SENSOR
J161 · J89 · J168 — **TONER** CARTRIDGE SENSOR

J19 · J58 — **CAROUSEL** SENSOR
J56 — DEVE. CLUTCH
J82 — DEVE. FAN

J18 · J55 — **TONER** DISPENSE MOTOR ASSY

J16 · J245 — **CAROUSEL BOARD** MOTOR · J246 · B — **CAROUSEL** MOTOR ASSY · J247

J19 · J63 — BTR CAM SOLENOID

J17 · J57 — ACCUMULATOR BELT SENSOR
J50 — PAPER FEED MOTOR ASSY — J49 — G
J52 — PROCESS MOTOR ASSY — J51 — H

J11 · IMAGE PROCESSOR — J310 — J317 — FRONT PANEL
J314 — IMAGE PROCESSOR

3041-09

Print engine wiring diagram

Plug/Jack Locations - 1

P/J	Map & Coordinates	Connected to...	Other end connected to...
10	Map 2-D205	Engine control board	--
11	Map 2-E205	Engine control board	Image processor board
12	Map 2-D205	Engine control board	Low voltage power supply P/J33
13	Map 2-D205	Engine control board	Laser Diode board P/J122
14	Map 2-D204	Engine control board	Laser Unit P/J121, P/J123, P/J124
16	Map 2-D204	Engine control board	CRUM
17	Map 2-E204	Engine control board	Auto-density calibration Sensor P/J81 Erase Lamp P/J86
18	Map 2-E203	Engine control board	Waste Toner Sensor P/J88 Toner Box Sensor P/J83
19	Map 2-F203	Engine control board	Fuser Assembly P/J71
20	Map 2-F204	Engine control board	Paper feeder P/J91
21	Map 2-F204	Engine control board	Low voltage power supply P/J32
22	Map 2-C204	Communications Assembly	Engine control board P/J18
22A	Map 2-C204	P/J22	Engine control board P/J16
32	Map 6-D609	Low voltage power supply	Engine control board P/J21
33	Map 6-D610	Low voltage power supply	Engine control board P/J12
35	Map 6-G609	Low voltage power supply	Fuser Assembly P/J71
41	Map 6-C609	High voltage power supply	Low voltage power supply P/J32
42	Map 6-C609	High voltage power supply	Engine control board P/J16
49 CN1	Map 6-E609	Paper feed Motor	Low voltage power supply P/J32
50 CN2	Map 6-608	Paper feed Motor	Engine control board P/J17

Plug/Jack Locations - 2

P/J	Map & Coordinates	Connected to...	Other end connected to...
CN3	Map 6-E609	Mounted on Paper feed motor board	--
CN4	Map 6-E608	Mounted on Paper feed motor board	--
51	Map 6-D608	Process Motor	Low voltage power supply P/J32
52	Map 6-D607	Process Motor	Engine control board P/J17
55	Map 7-E708	Dispense Motor	Engine control board P/J18
56	Map 7-F708	Developer Clutch	Engine control board P/J19
56A	Map 7-F708	P/J56	Engine control board P/J19
57	Map 5-C509	Accumulator belt Sensor	Engine control board P/J17
58	Map 7-F708	Carousel Sensor	Engine control board P/J19
62	Map 8-E812	Cleaner Cam Solenoid	Fuser Tray Assembly P/J71
62A	Map 8-E812	Cleaner Cam Solenoid P/J62	Fuser Tray Assembly P/J71
63	Map 7-C710	BTR Cam Solenoid	Engine control board P/J19
63A	Map 7-C710	P/J63	Engine control board P/J19
68	Map 6-B610	--	Optional high capacity feeder
68A	Map 6-B610	P/J68	Option high capacity feeder
69A	Map 8-H813	Option high capacity feeder	--
69B	Map 8-H813	--	Option high capacity feeder
70	Map 7-F711	Fuser Assembly P/J71	Low voltage power supply P/J32
71	Map 7-F710	Fuser Assembly	P/J70
71A	Map 7-F710	Fuser Tray Assembly P/J71	Engine control board P/J18
72A	Map 8-G812	P/J72B	Fuser Assembly P/J71
72B	Map 8-G812	P/J72A	Temperature Sensor Assembly
73	Map 8-I812	Oil Cam Solenoid	P/J73A
73A	Map 8-I812	P/J73 Oil Cam Solenoid	Fuser Tray Assembly P/J71
74	Map 8-I813	Exchange Solenoid	P/J74A

Plug/Jack Locations - 3

P/J	Map & Coordinates	Connected to...	Other end connected to...
74A	Map 8-I813	P/J74	Fuser tray assembly P/J71
75	Map 8-H807	Fuser exit sensor	Fuser assembly P/J72B
76	Map 8-F813	P/J117 fuser entry sensor	Fuser assembly P/J76A
76A	Map 8-F813	P/J76	Fuser tray assembly P/J71
77	Map 8-G808	CRU switch assembly	Fuser assembly P/J77A
77A	Map 8-G808	P/J77	Fuser assembly P/J71
78A	Map 8-I813	P/J78B	Fuser assembly P/J71
78B	Map 8-I813	P/J78A	Loop
79	Map 8-F812	Pressure roller heat rod	Fuser assembly P/J71
80	Map 8-D813	Fuser chute fan	Fuser tray assembly P/J80A
80A	Map 8-D813	P/J80	Fuser tray assembly P/J71
81	Map 1-C110	Auto-density calibration sensor assembly	P/J81A
81A	Map 1-C110	P/J81	Engine control board P/J17
82	Map 6-G608	Developer Fan	P/J82A
82A	Map 6-G608	P/J82A	Engine control board P/J17
83	Map 1-G106	Toner box sensor	P/J83A
83A	Map 1-G106	P/J83	P/J116
84	Map 1-I107	CRUM assembly P/J85	P/J84A
84A	Map 1-I107	P/J84A	Engine control board P/J16
85	Map 1-H107	CRUM assembly	P/J84
86	Map 1-I105	Erase lamp	P/J86A
86A	Map 1-I105	P/J86A	Engine control board P/J17
87	Map 5-I506	Used cartridge sensor	Engine control board P/J17
88	Map 1-F106	Waste toner sensor	P/J116
89	Map 8-D805	Cartridge sensor P/J168	P/J89A
89A	Map 8-D805	P/J89	P/J161B

Plug/Jack Locations - 4

P/J	Map & Coordinates	Connected to...	Other end connected to...
90A	Map 4-G409	P/J90B	Paper feeder P/J91
90B	Map 4-G409	P/J90A	Loop
91	Map 2-D211 Map 4-E408	Paper feeder	Engine control board P/J20
92A	Map 4-E409	Multi-purpose tray assembly P/J92B	Paper feeder P/J91
92B	Map 4-E409	Multi-purpose tray assembly	Paper feeder P/J92A
93	Map 4-D408	Registration sensor	Paper feeder P/J91
94	Map 4-F408	Registration clutch	P/J94A
94A	Map 4-F408	P/J94	Paper feeder P/J110B & P/J115
95	Map 4-G408	Pre-Registration clutch	P/J95A
95A	Map 4-G408	P/J95	Paper feeder P/J110B & P/J115
97	Map 2-F204	Paper feeder P/J 91	Front cover switch R P/J191 & P/J70
98	Map 4-D409	Front OHP sensor	Paper feeder P/J91
99	Map 4-E408	Rear OHP sensor	Paper feeder P/J91
101	Map 2-D212	Tray no paper sensor P/J107	P/J101A
101A	Map 2-D212	P/J101	Engine control board P/J20
102	Map 7-D711	Size Switch assembly	Engine control board P/J19
103A	Map 2-F206	P./J103B	Engine control board P/J19
103B	Map 2-F206	Feed solenoid	P/J103A
104	Map 2-D212	P/J104A	Terminated
104A	Map 2-D212	P/J104	Engine control board P/J20
105	Map 2-D205	Environment sensor	P/J105A
105A	Map 2-D205	P/J105	Engine control board P/J20
106	Map 2-E211	Low Paper sensor	P/J106A
106A	Map 2-E211	P/J106	Engine control board P/J20

Plug/Jack Locations - 5

| P/J	Map & Coordinates	Connected to...	Other end connected to...
107	Map 2-E213	Tray no paper sensor	P/J 101
109	Map 4-D409	Registration brake clutch	P/J109A
109A	Map 4-D409	P/J109	Paper feeder P/J91
110A	Map 4-G408	P/J110B	Paper feeder P/J91
110B	Map 4-G408	P/J94A, P/J95A, & P/J115	P/J110A
111A	Map 7-G70 Map 8-D805	P/J111B	Engine control board P/J17
111B	Map 8-D806	P/J111A	Fuser Fan
113A	Map 4-E409	Multi-purpose tray assembly P/J113B	Paper feeder P/J91
113B	Map 4-E409	P/J113A	Multi-purpose tray short no paper sensor P/J203 Multi-purpose tray clutch P/J202A-P/J202B Pick up solenoid P/J201A-P/J202B
115	Map 4-H408	P/J94A & P/J95A	Terminated
116	Map 1-H106	P/J83A Waste toner sensor P/J88	P/J116A
116A	Map 1-H106	P/J116	Engine control board P/J18
117	Map 5-D507	Fuser In Sensor	P/J76
121	Map 5-D507	Laser diode assembly	Engine control board P/J14 P/J196
122	Map 5-D506	Laser diode assembly	Engine control board P/J13
123	Map 5-E506	Laser unit	Engine control board P/J14
124	Map 5-C506	Star-of-scan sensor	Engine control board P/J14
131	Map 6-B610	Option connection	not on schematic
131A	Map 6-B610	Option connection	not on schematic
132	Map 6-B610	Option connection	not on schematic
132A	Map 6-B610	Option connection	not on schematic
161A	Map 7-G707 Map 8-D805	P/J161B	Engine control board P/J17

Plug/Jack Locations - 6

P/J	Map & Coordinates	Connected to...	Other end connected to...
161B	Map 8-D805	P/J161A	Top Exit sensor P/J165
			Exit Chute switch P/J166
163A	Map 7-G707	P/J163B	Engine control board P/J17
	Map 8-D805		
163B	Map 8-D805	P/J163A	Full Stack sensor P/J167
165	Map 8-F804	Top exit sensor	P/J161B
166	Map 8-E804	Exit chute switch	P/J161B
167	Map 8-G802	Full stack sensor	P/J163B
168	Map 8-J802	Cartridge sensor	P/J89
191	Map 1-E109	Right front cover switch	P/J97
192	Map 1-E109	Right front cover switch	P/J33
193	Map 1-E109	Right front cover switch	P/J33
194	Map 1-E109	Right front cover switch	P/J195
195	Map 6-H607	Top cover switch	P/J195A
195A	Map 6-H607	P/J195	P/J194
			P/J196
196	Map 2-F203	Laser diode assembly P/J121	P/J195
			Low voltage power supply P/J33
197	Map 5-H506	Left front cover switch	P/J197A
197A	Map 5-H506	P/J197	Engine control board P/J19
201A	Map 4-I408	P/J201B	Multi-purpose tray assembly P/J113B
201B	Map 4-I408	Pick-up solenoid	P/J201A
202A	Map 4-H408	P/J202B	Multi-purpose tray assembly P/J113B
202B	Map 4-H408	Multi-purpose tray pick-up solenoid	P/J201A
203	Map 4-G409	Multi-purpose tray short no paper sensor	Multi-purpose tray assembly P/J 113B
204	Map 4-G408	Multi-purpose tray edge sensor	Multi-purpose tray assembly P/J92B
			P/J207
205	Map 4-H409	Multi-purpose tray OHP sensor	Multi-purpose tray assembly P/J92B
			P/J207

P/J	Map & Coordinates	Connected to ...	Other end connected to ...
206	Map 4-G409	Multi-purpose tray long no paper sensor	Multi-purpose tray Assembly P/J92B P/J207
207	Map 4-F409	Multi-purpose tray assembly P/J92B	P/J204 P/J205 P/J206
245	Map 6-F608	Carousel motor board	Engine control board P/J16
246	Map 6-F607	Carousel motor board	Low voltage power supply P/J32
247	Map 6-E607	Carousel motor board	Carousel Motor
F421	Map 5-D508	Bias charge roller connector	High voltage power supply P/J-A
F422	Map 1-B108	Developer contact assembly	High voltage power supply P/J-C
F423	Map 5-D511	DTS Plate	High voltage power supply P/J-G
F791	Map 8-F807	Pressure roller heat rod	Heat roller heat rod
A	Map 6-B606	High voltage power supply	P/J F421
C	Map 6-C607	High voltage power supply	P/J F422
D	Map 6-B609	High voltage power supply	First bias transfer roller bias plate
F	Map 6-B608	High voltage power supply	Second bias transfer roller contact plate
G	Map 6-B608	High voltage power supply	P/J F423
T1	Map 8-G811	Heat roller heat rod	
T2	Map 8-I806	Pressure roller heat rod	
T3	Map 5-D510	First bias transfer roller bias plate	
T4	Map 5-E510	Second bias transfer roller contact plate	
T5	Map 8-I806	Not on schematic	
310	Map 3-F306	Image processor board	Front panel P/J317
314	Map 3-G306	Image processor board	Image processor fan
317	Map 3-C306	Front panel	Image processor board P/J314

The following illustrations detail the proper means of routing and dressing printer wiring. Incorrect wiring dressing can result in wires pinched by cabinet panels or damaged by moving parts of the printer.
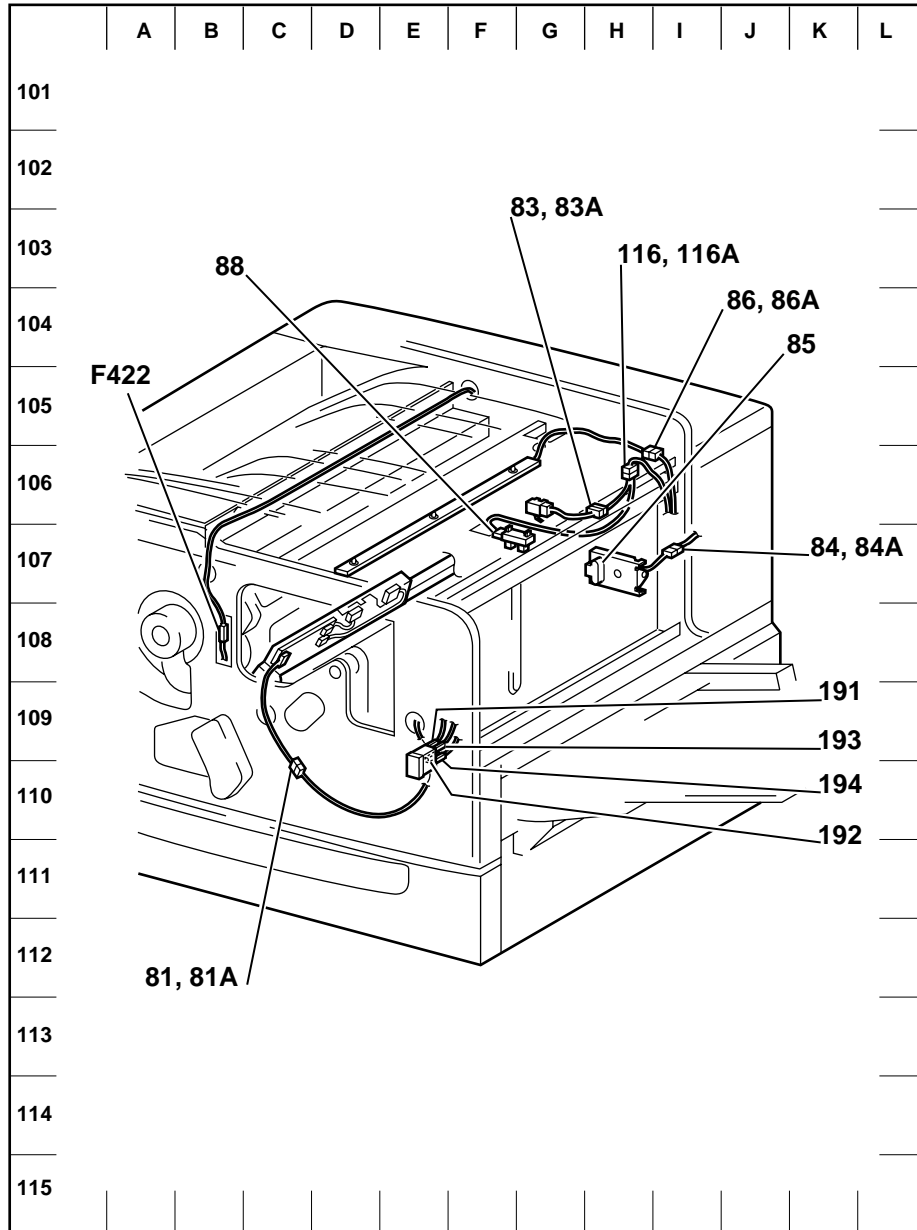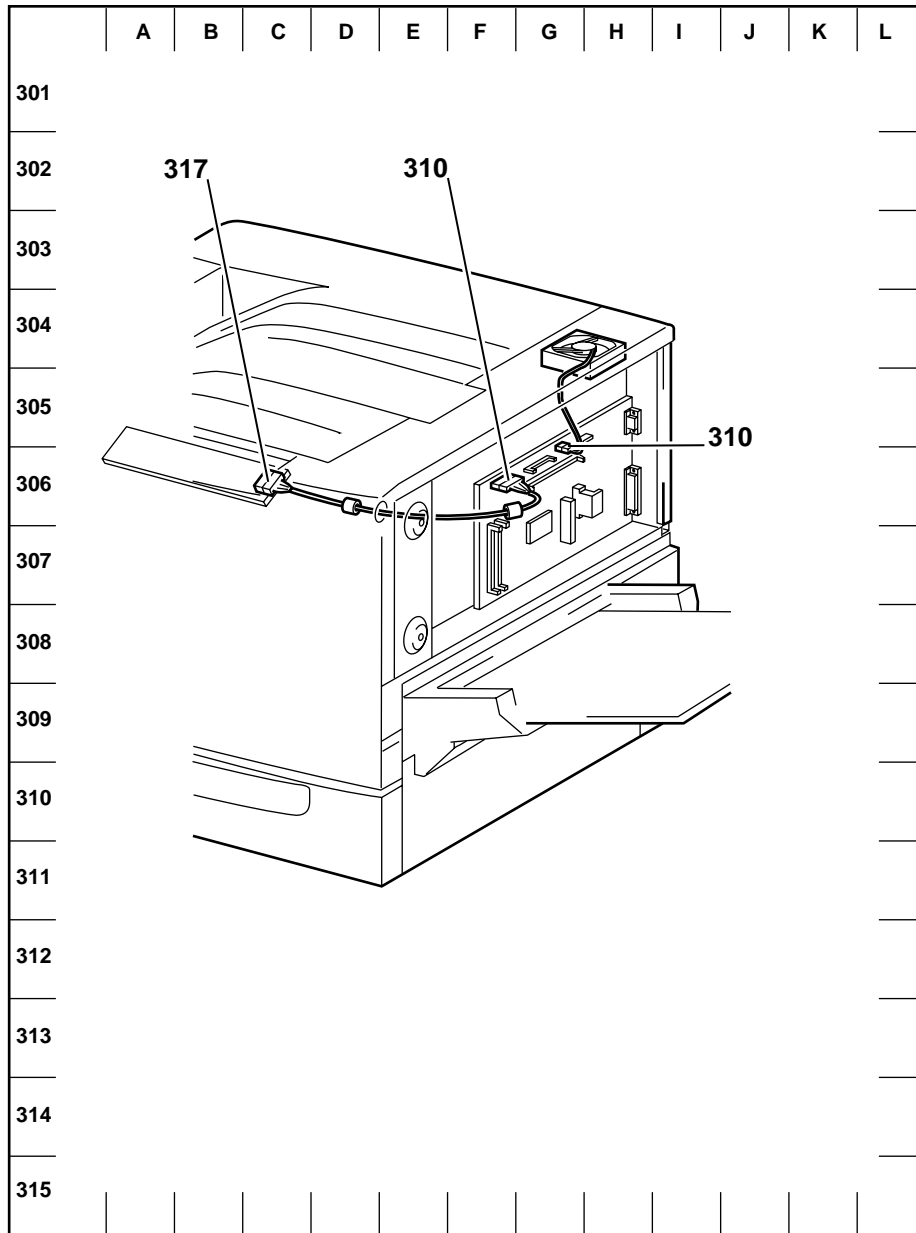

3041-10

Map 1 – Wiring routing at the top and front of the printer
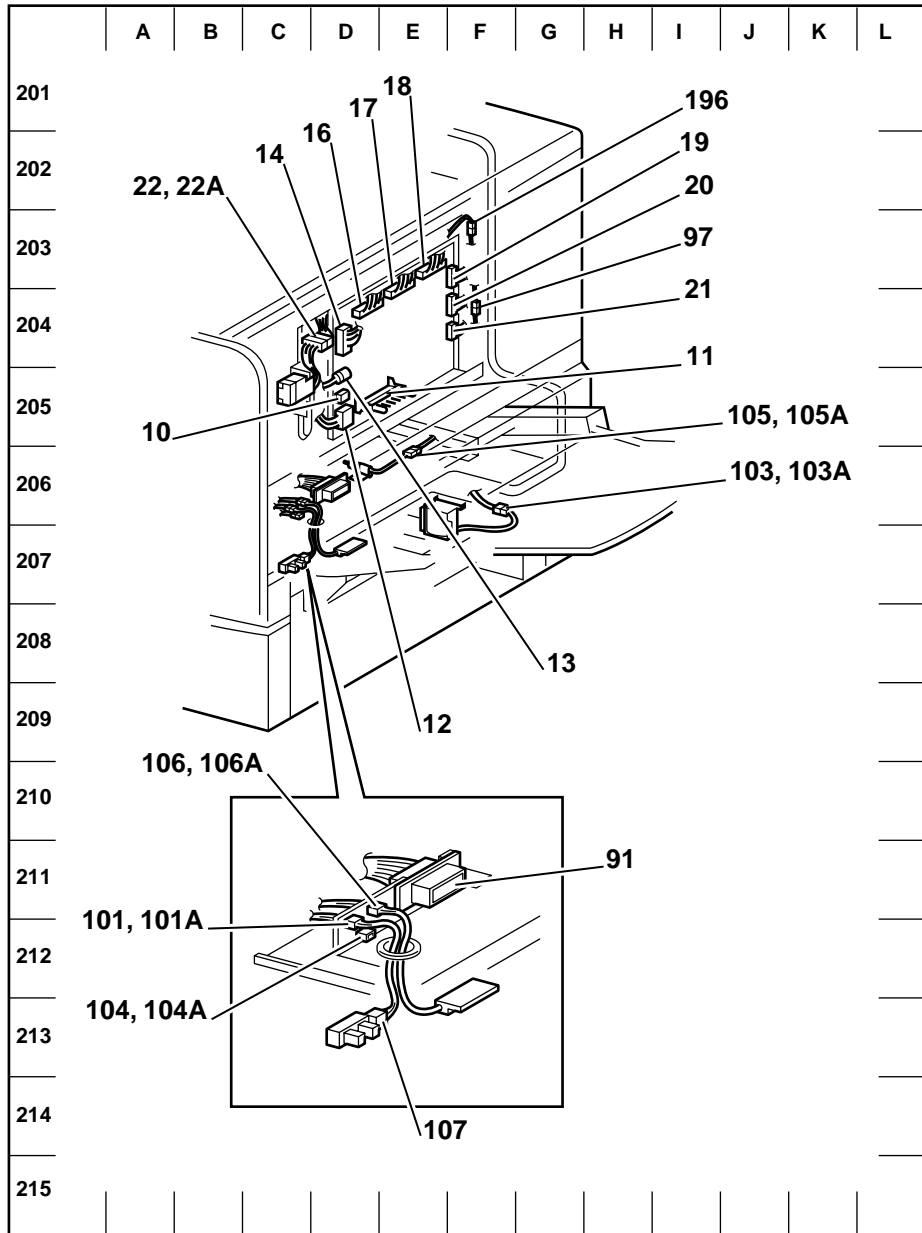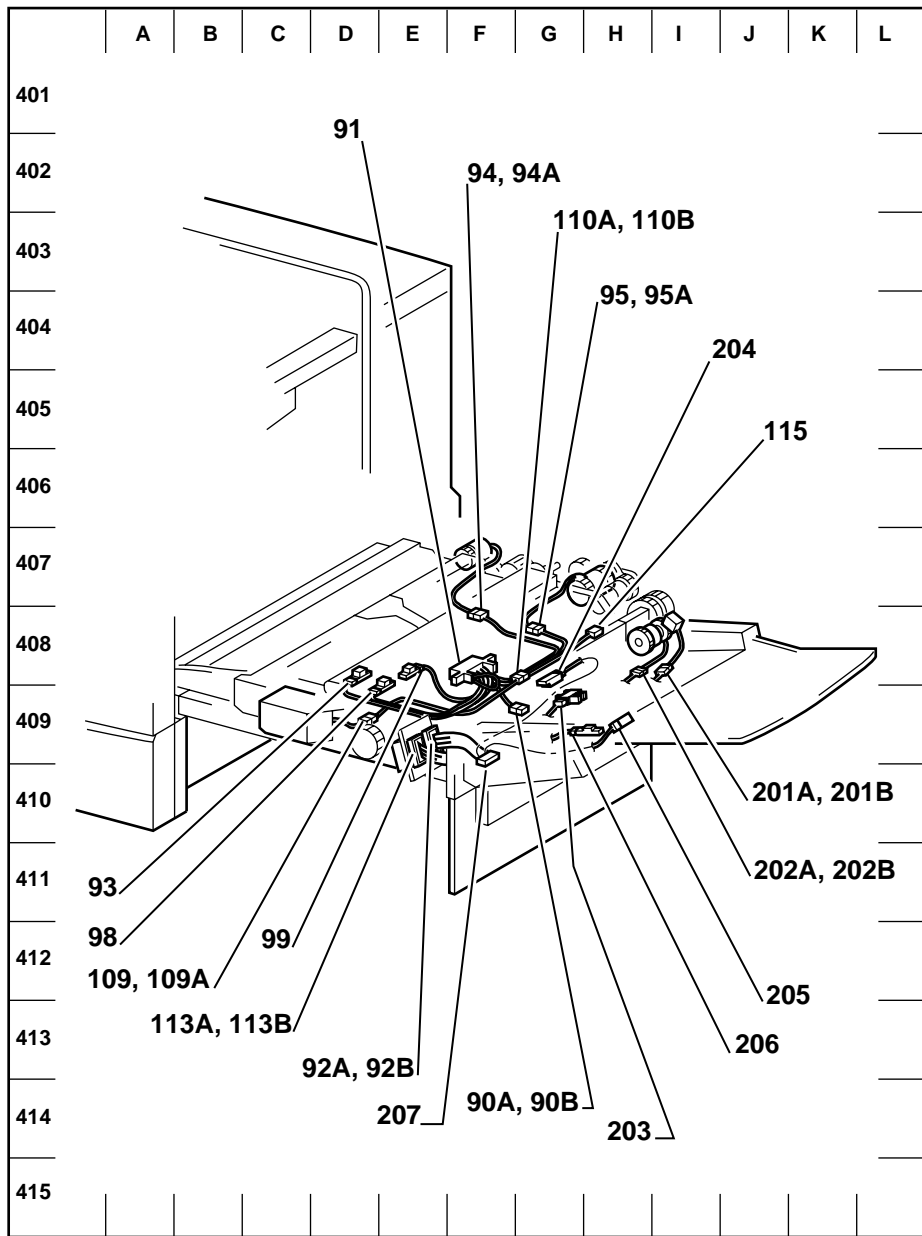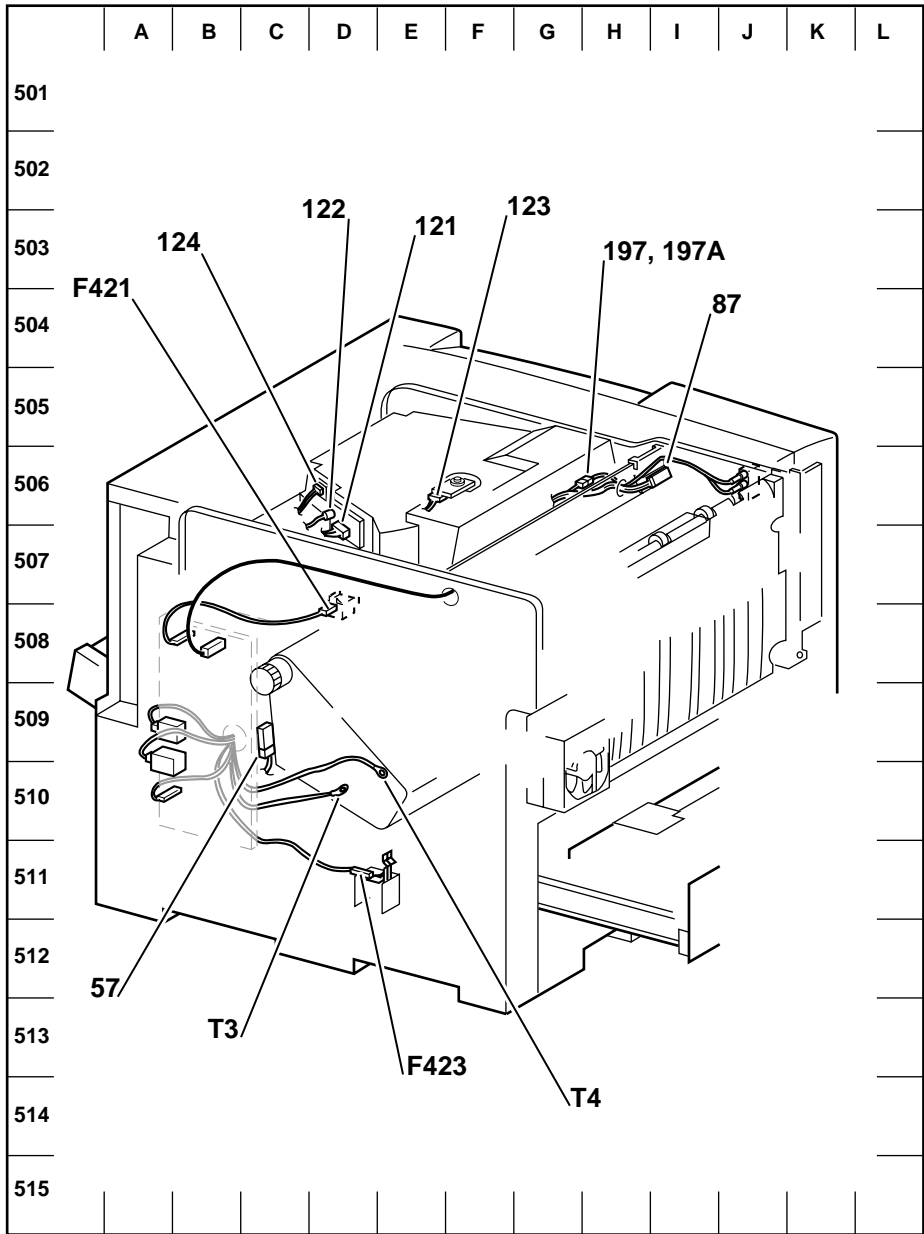
Map 2 – Wire routing around the engine control board

A B C D E F G H I J K L

301
302 **317** **310**
303
304
305 **310**
306
307
308
309
310
311
312
313
314
315

3041-12

Map 3 – Wiring routing around the image processor board

	A	B	C	D	E	F	G	H	I	J	K	L

91

94, 94A

110A, 110B

95, 95A

204

115

201A, 201B

202A, 202B

93

98

99

109, 109A

205

113A, 113B
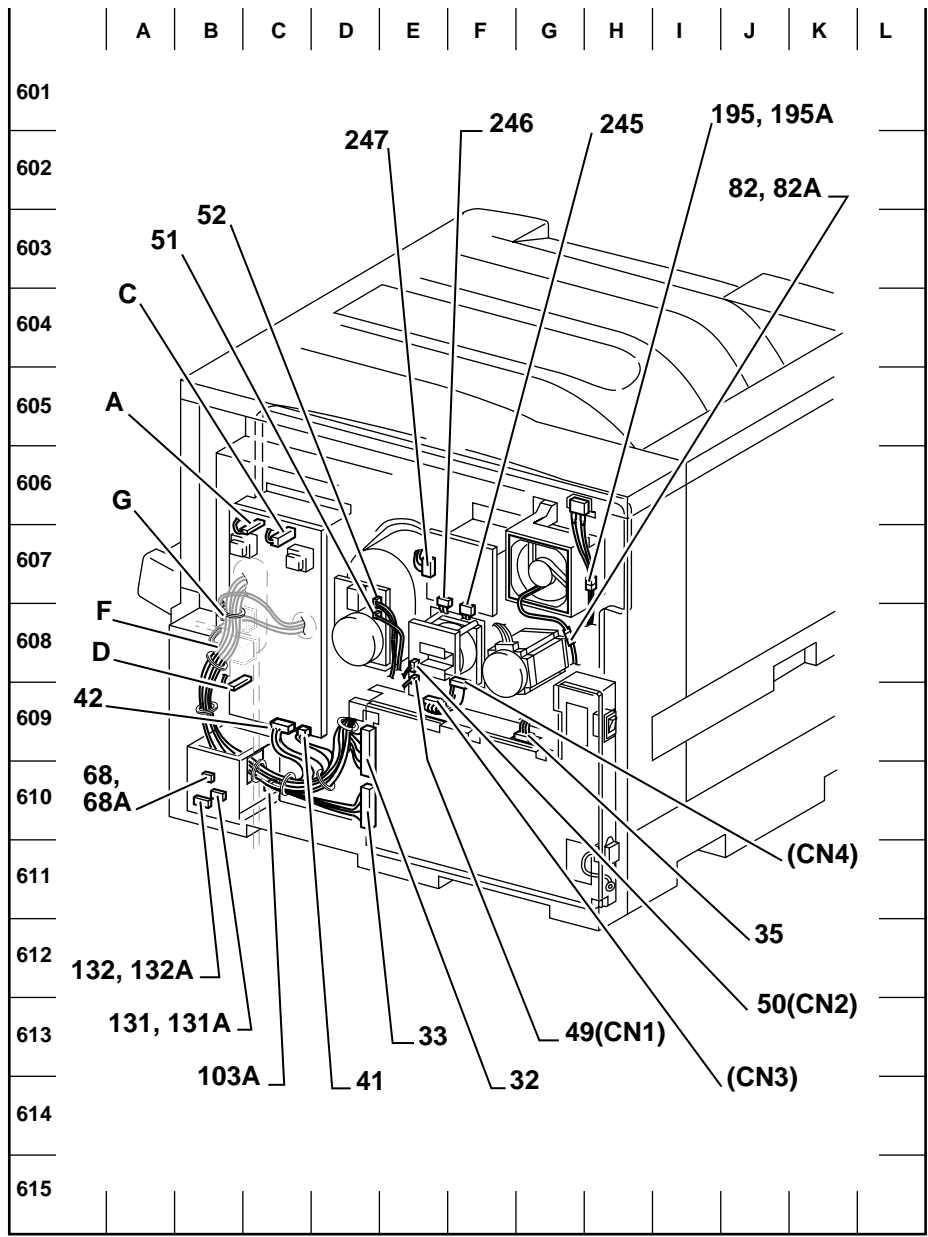
206

92A, 92B

207

90A, 90B

203

3041-13

Map 4 – Wiring routing around the paper feeder
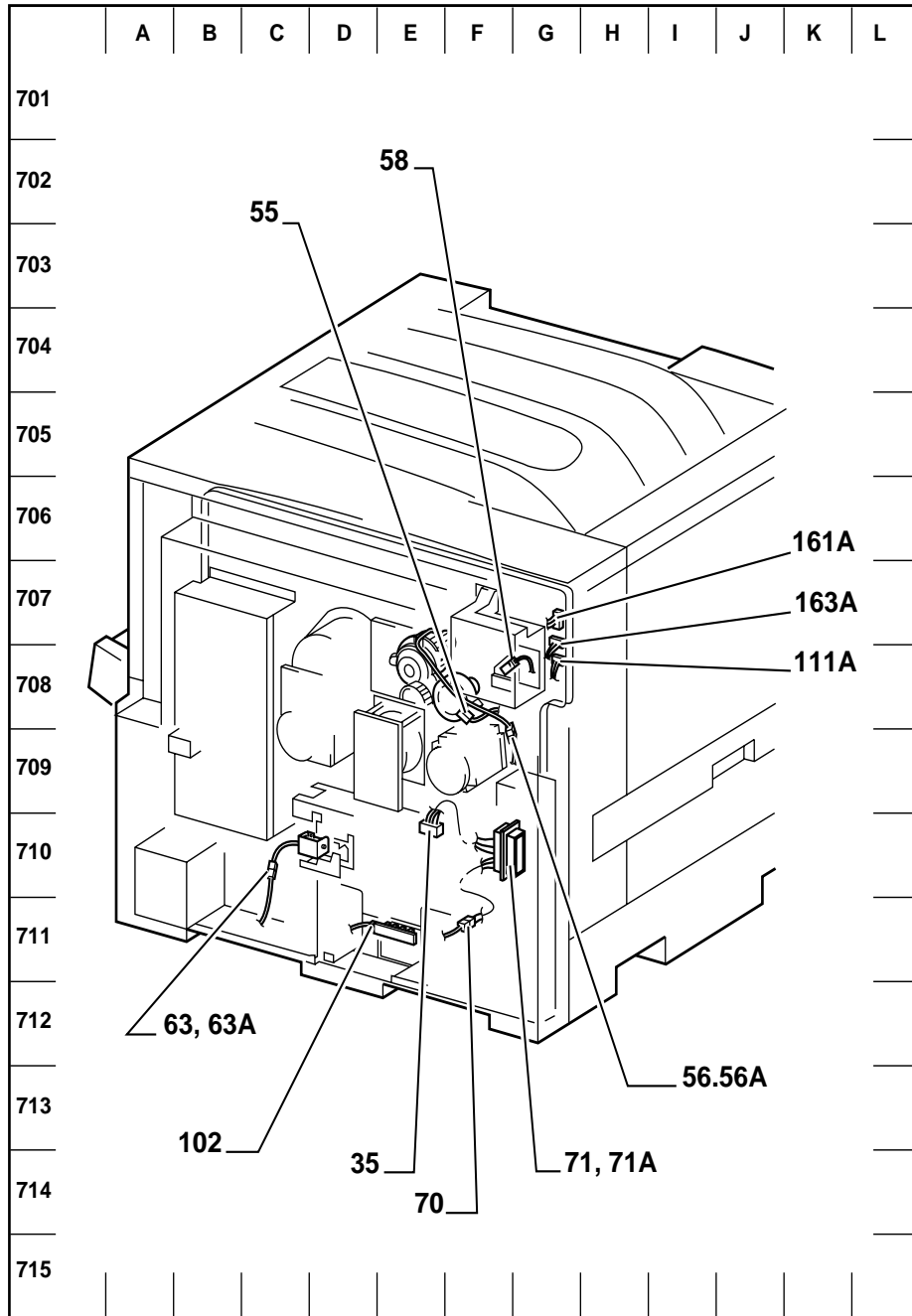
Map 5 – Wire routing around the laser scanner and high voltage power supply

3041-14

Map 6 – Wire routing at the rear of the printer

Diagram labels:

Grid	
A B C D E F G H I J K L	(columns)
701–715	(rows)

Callouts:
- 58
- 55
- 161A
- 163A
- 111A
- 63, 63A
- 102
- 35
- 70
- 71, 71A
- 56.56A

3041-16

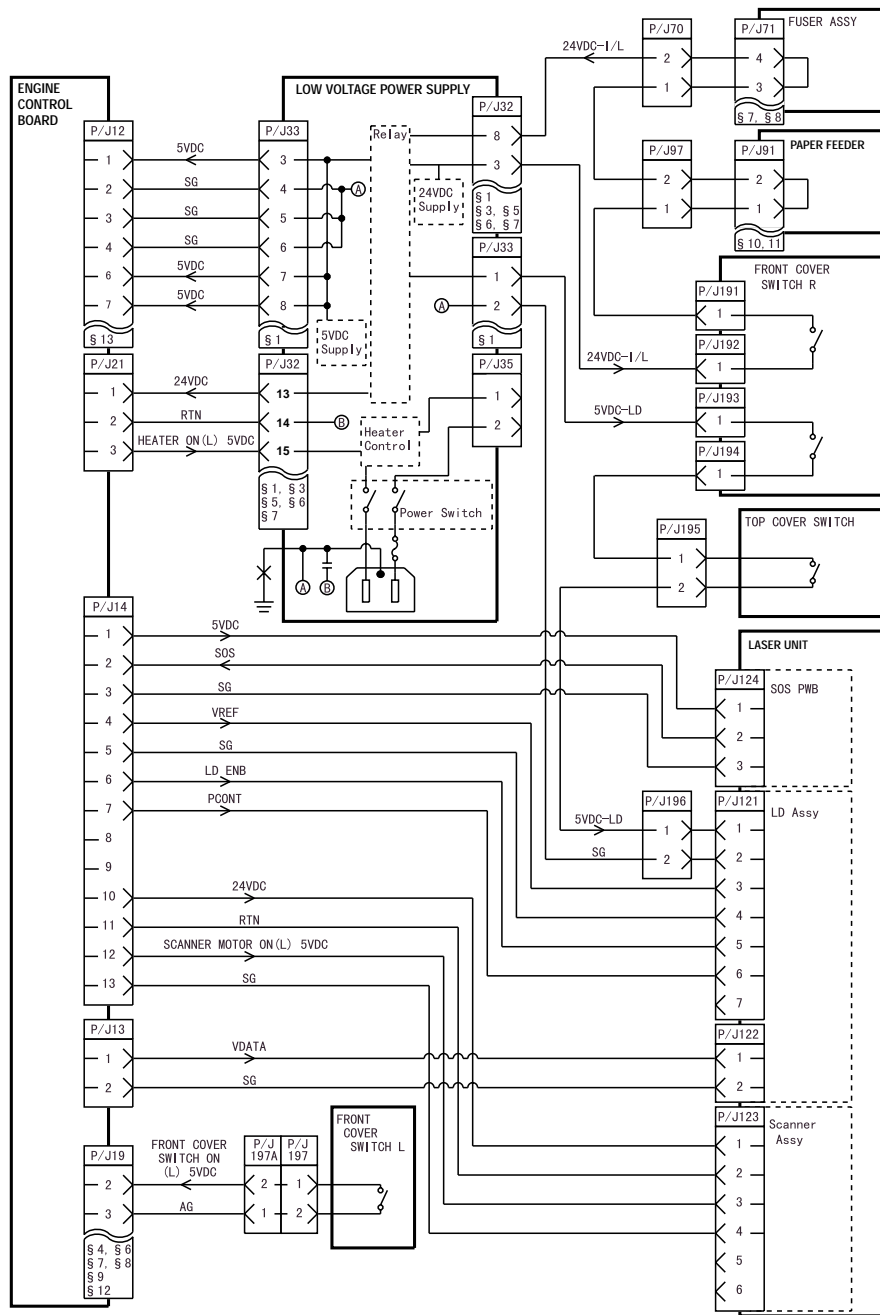**Map 7 – Wire routing around the power supply**
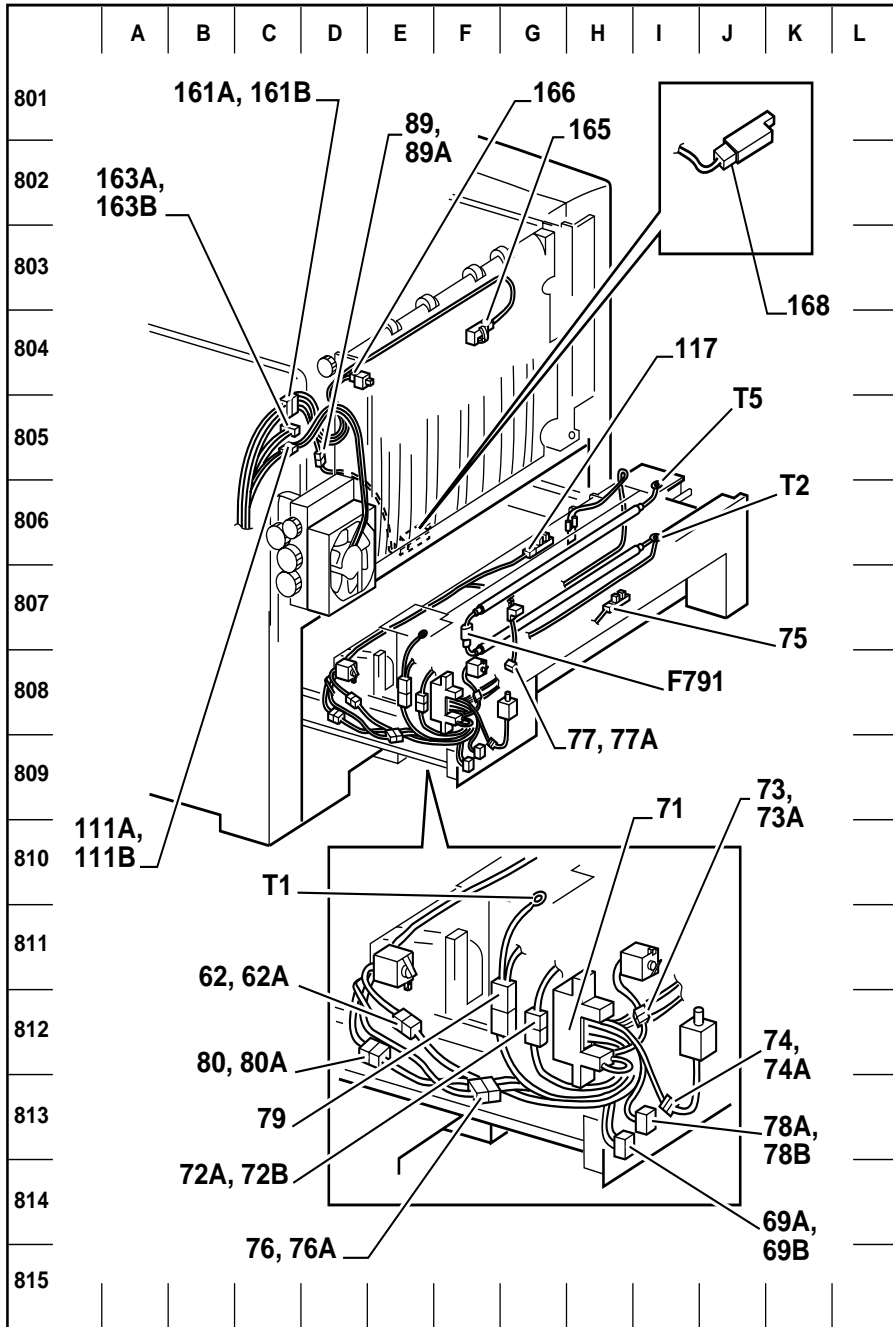
Map 8 – Wire routing around the fuser

3041-17

Wiring 1 – Low voltage power supply, laser unit, and interlock switches

3041-19
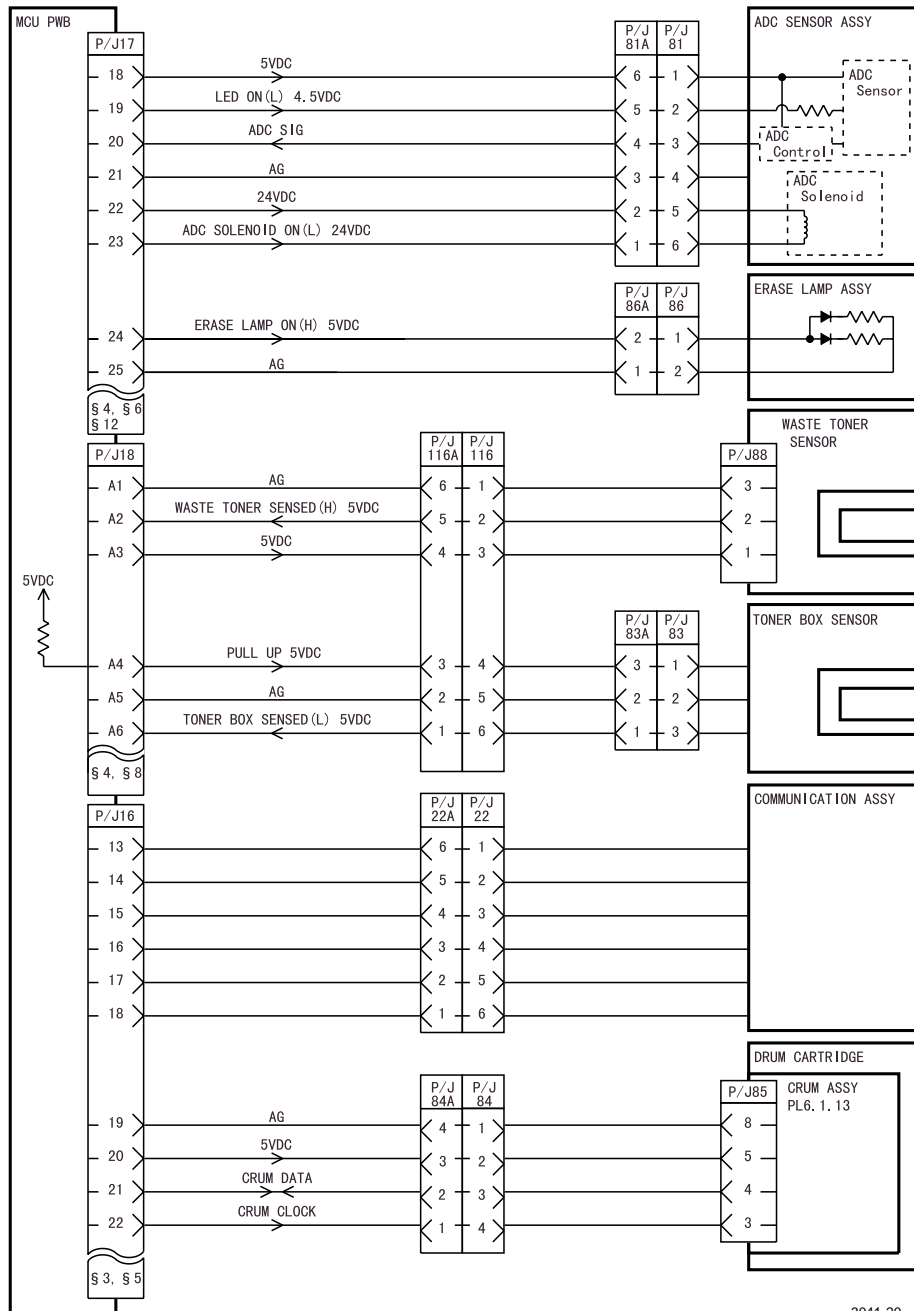
Wiring 2 – Engine control board, auto-density calibration sensor, erase lamp, waste toner sensor
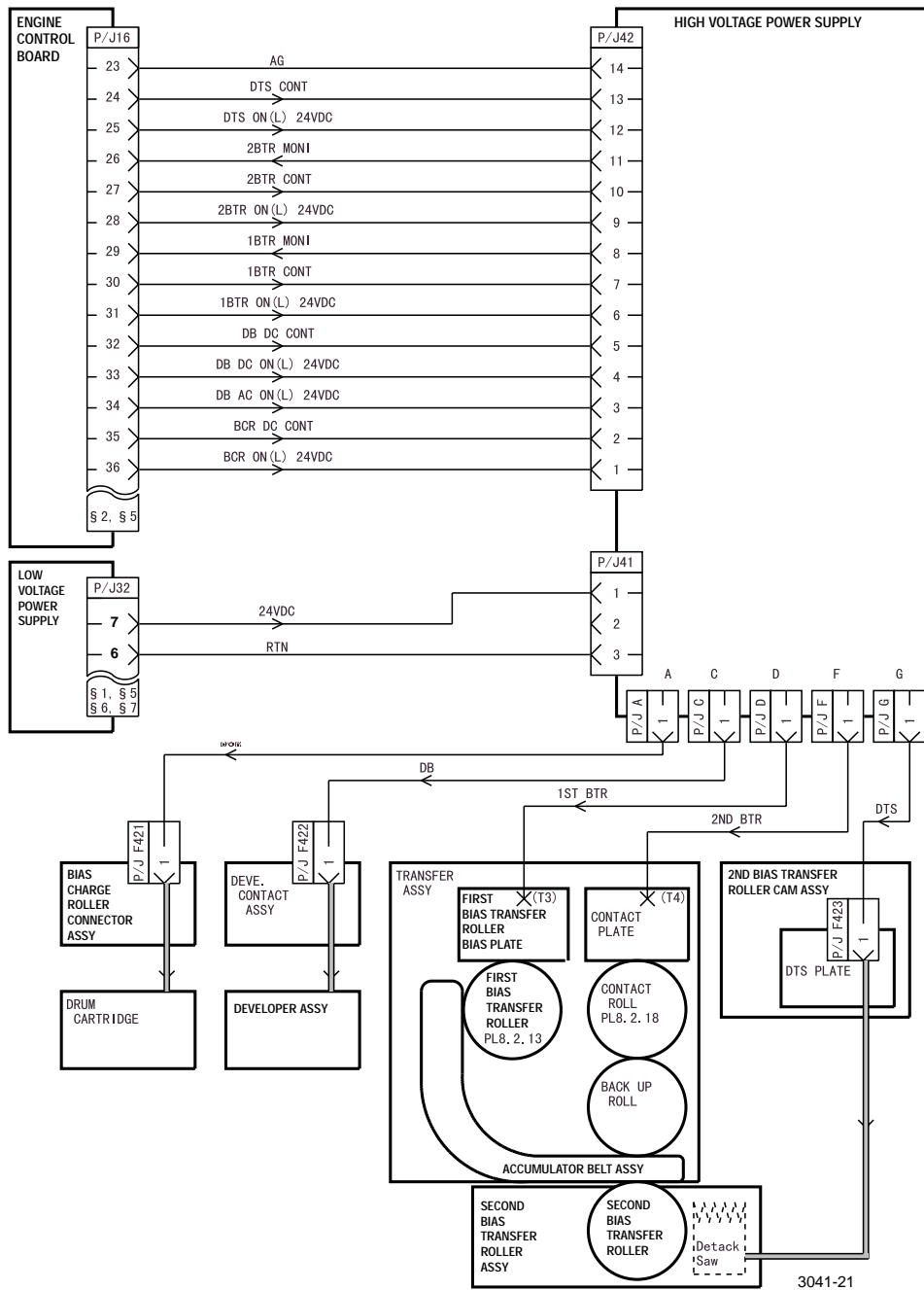
Wiring 3 – Low voltage power supply, engine control board, high-voltage power supply and imaging components
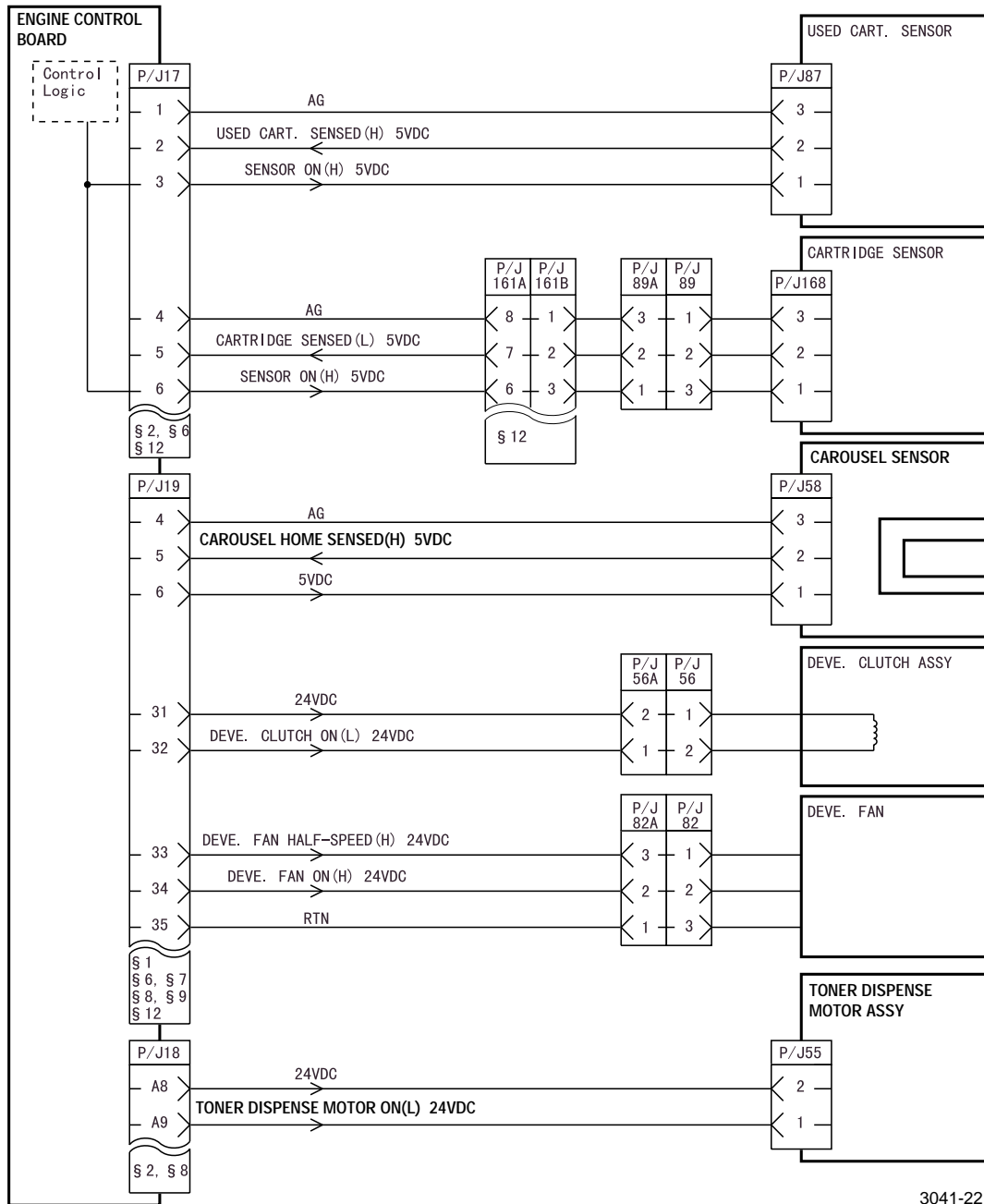
Wiring 4 – Engine control board, used cartridge sensor, cartridge sensor, carousel sensor, developer clutch, developer fan, toner dispense motor

ENGINE CONTROL BOARD

P/J16

8	CAROUSEL MOTOR HOLD (L) 5VDC	5
9	CAROUSEL MOTOR ON (L) 5VDC	4
10	CAROUSEL MOTOR CLOCK	3
11	AG	2
12	5VDC	1

§ 2, § 3

CAROUSEL MOTOR BOARD

P/J245

P/J247

CAROUSEL MOTOR ASSY

1	24VDC
2	A
3	/A
4	/B
5	B

P/J246

| 1 |
| 2 |
| 3 |

LOW VOLTAGE POWER SUPPLY

P/J32

| 4 | 24VDC |
| 5 | RTN |

§ 1, § 5
§ 6, § 7
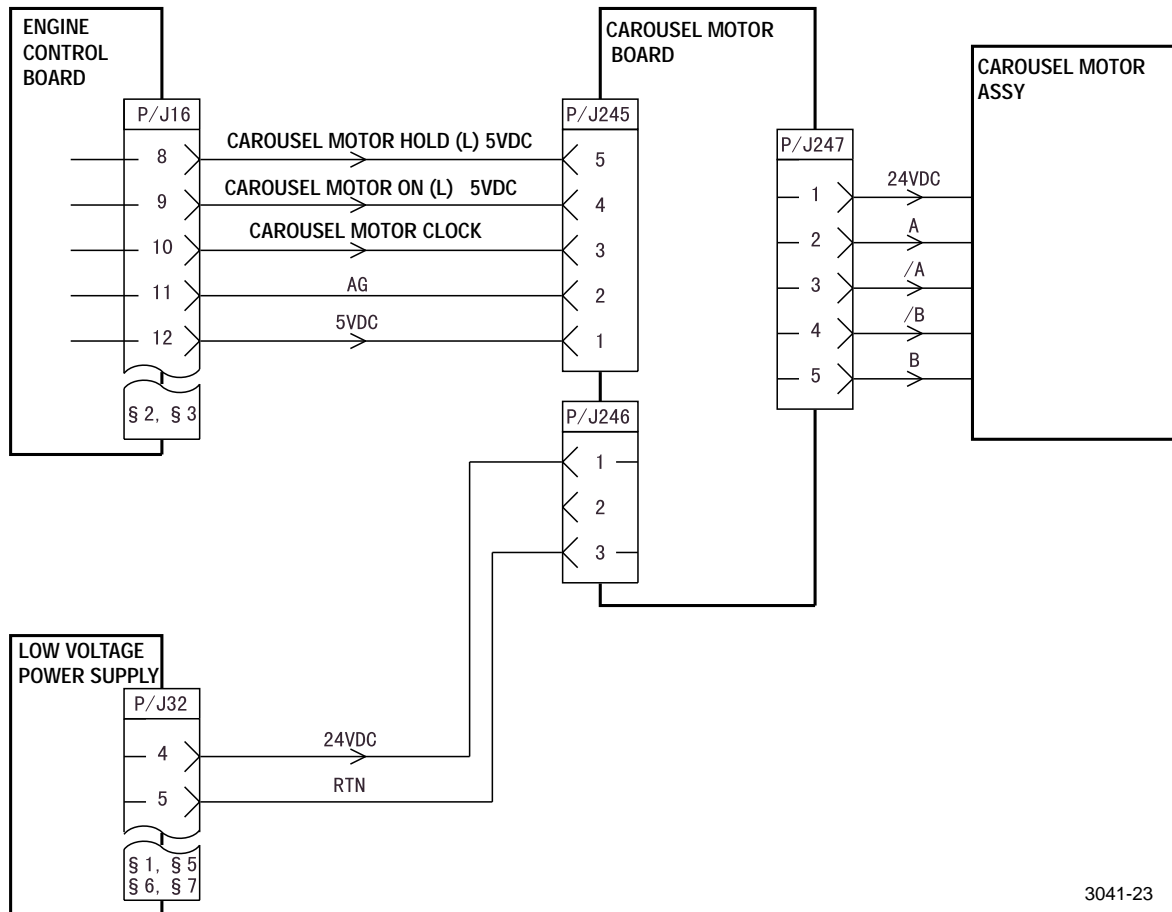
3041-23

Wiring 5 – Engine control board, low voltage power supply, carousel motor board, rotary motor
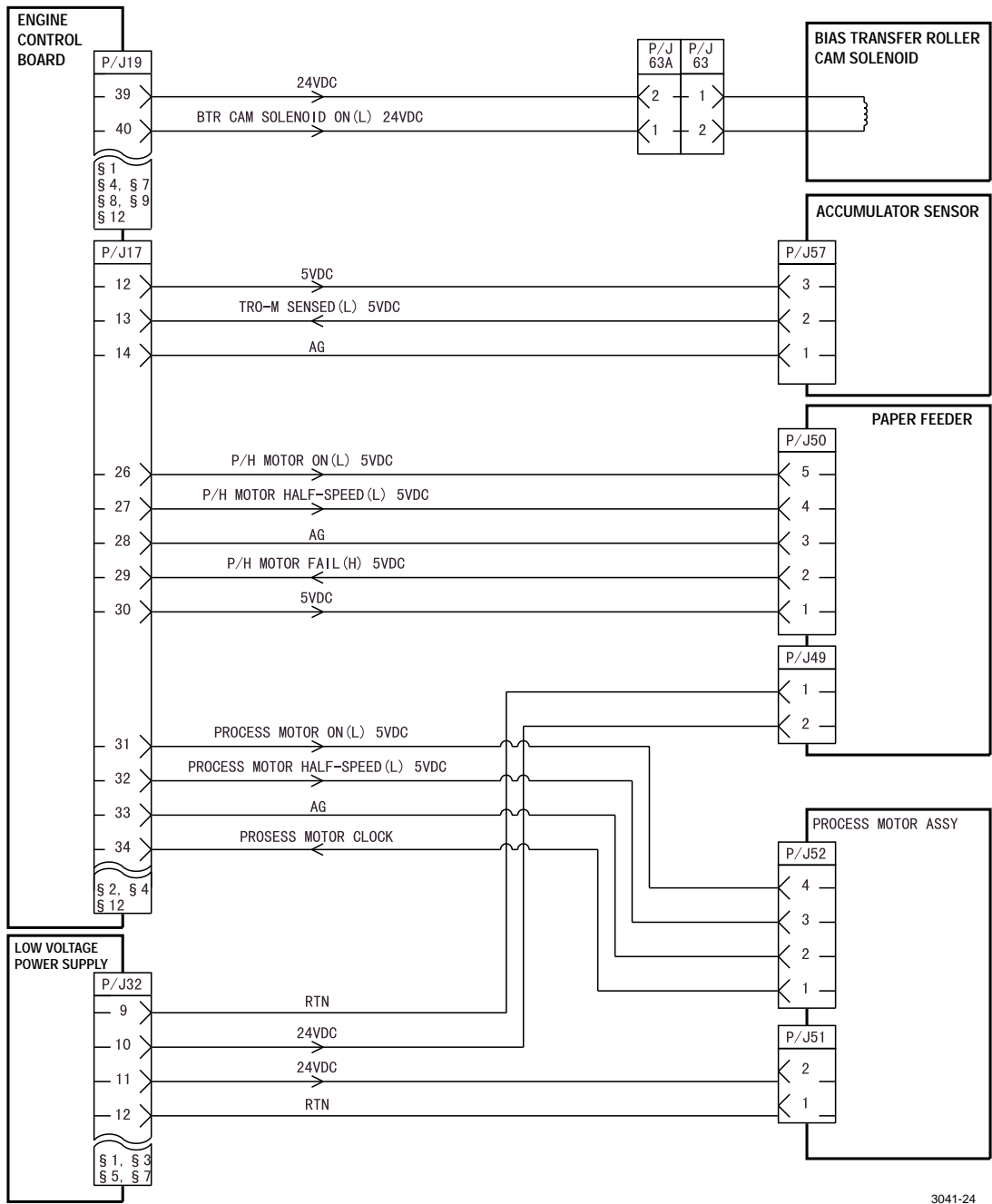
Wiring 6 – Engine control board, low voltage power supply, bias transfer roller cam solenoid accumulator belt sensor, paper feeder motor, process motor
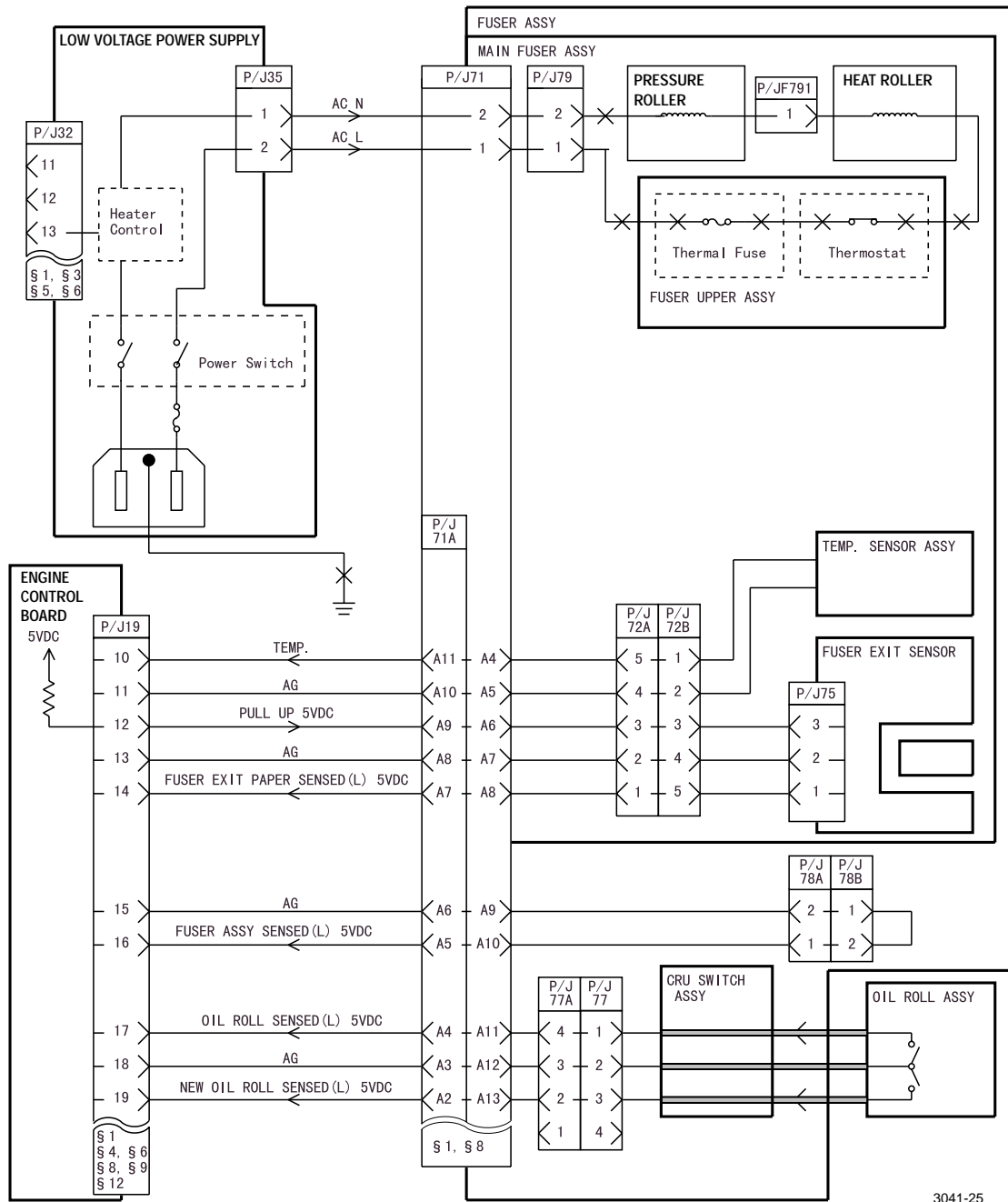
Wiring 7 – Engine control board, low voltage power supply, fuser, oil roll assembly
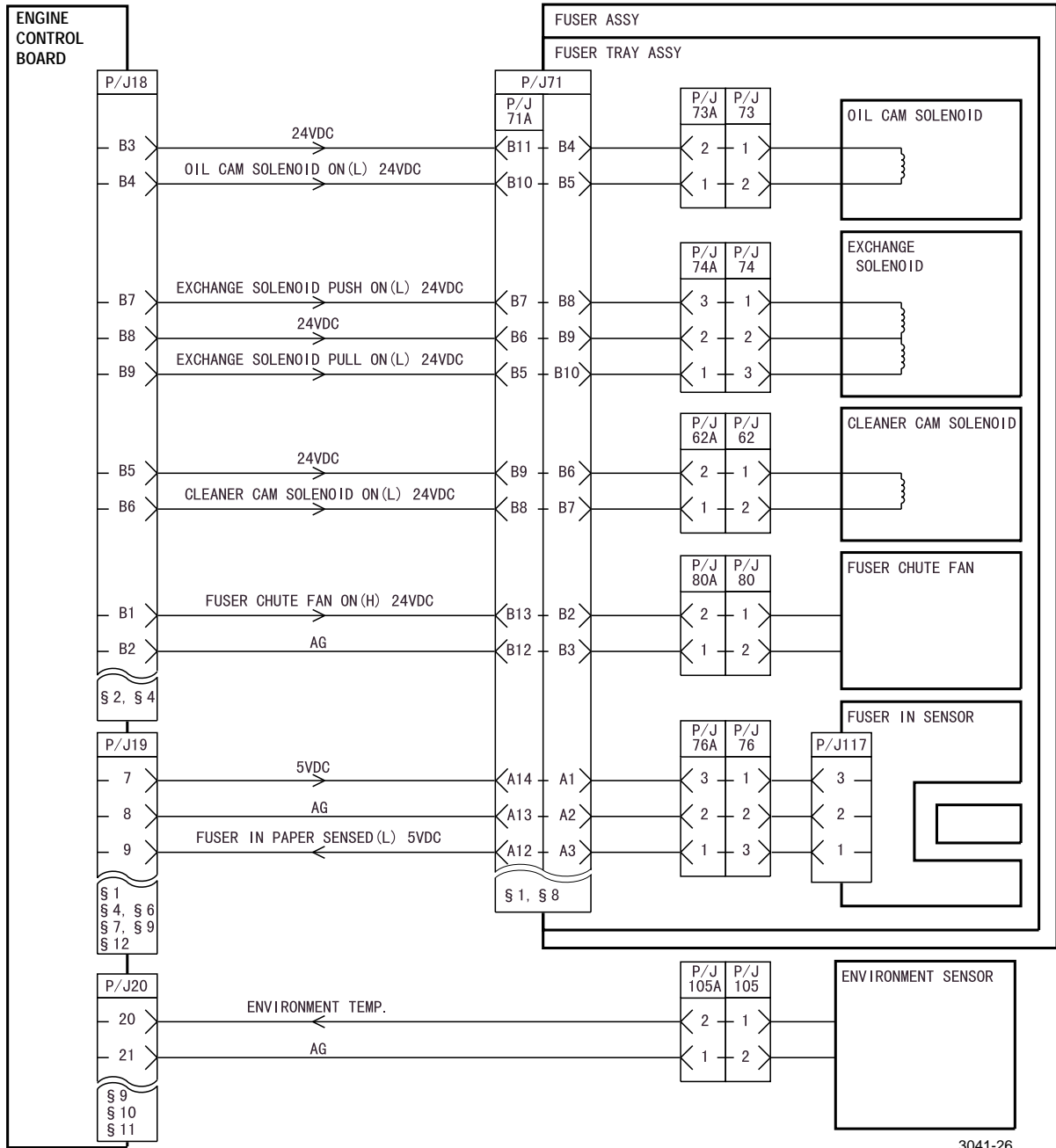
Wiring 8 – Engine control board, fuser assembly, environment sensor
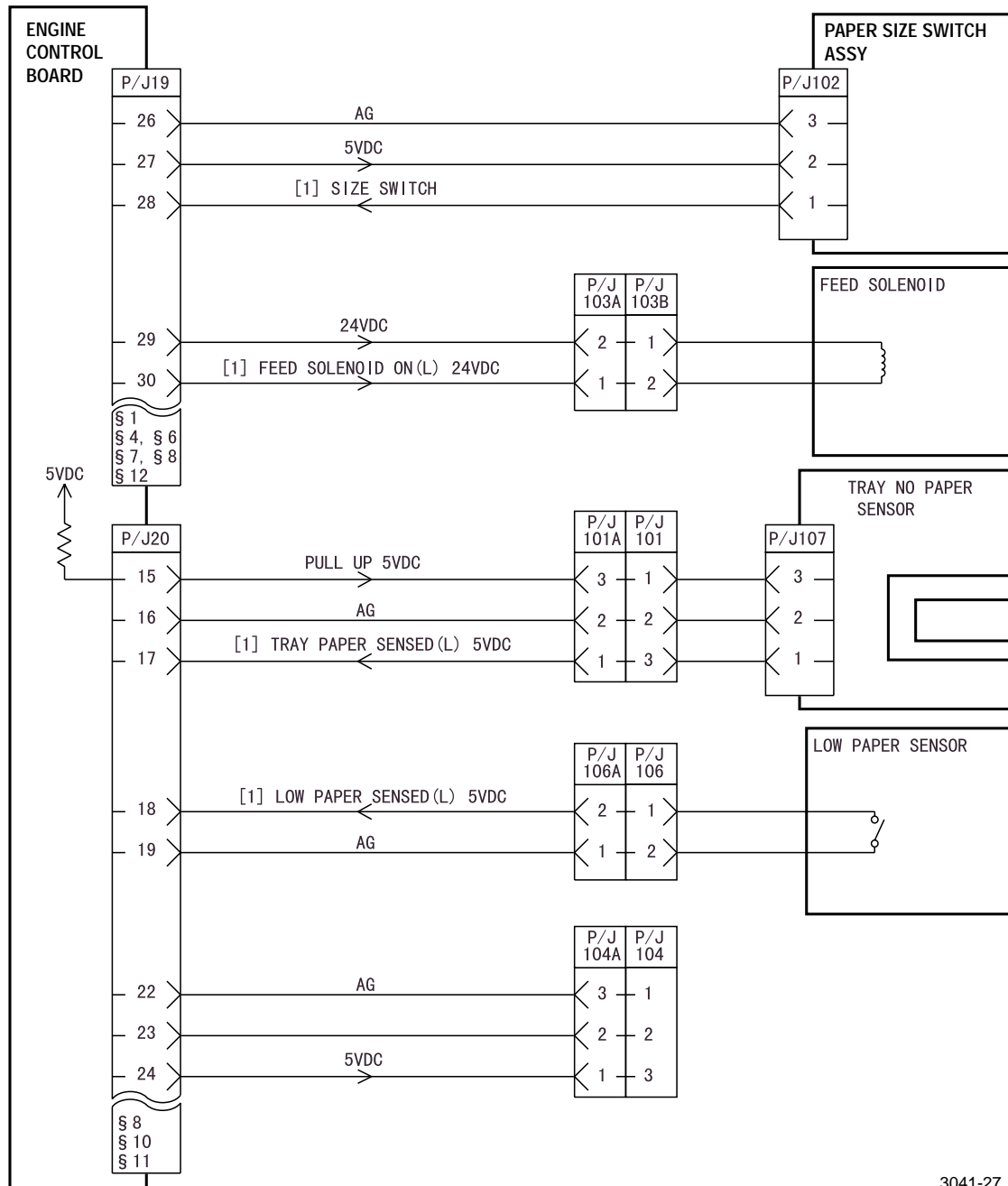
Wiring 9 – Engine control board, paper size switch board, feed solenoid, no paper sensor, low paper sensor
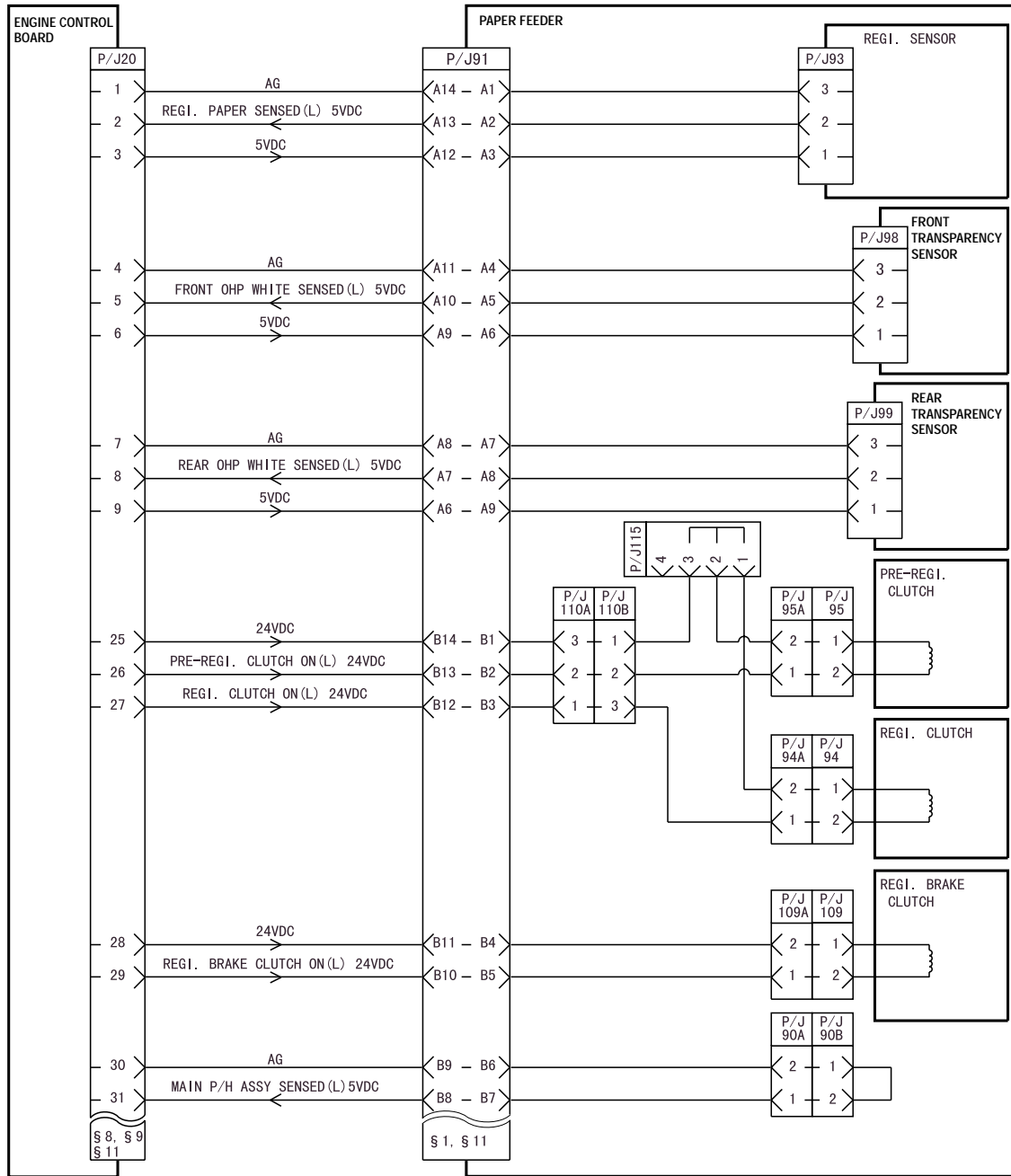
3041-27

Wiring 10 – Engine control board, paper feeder
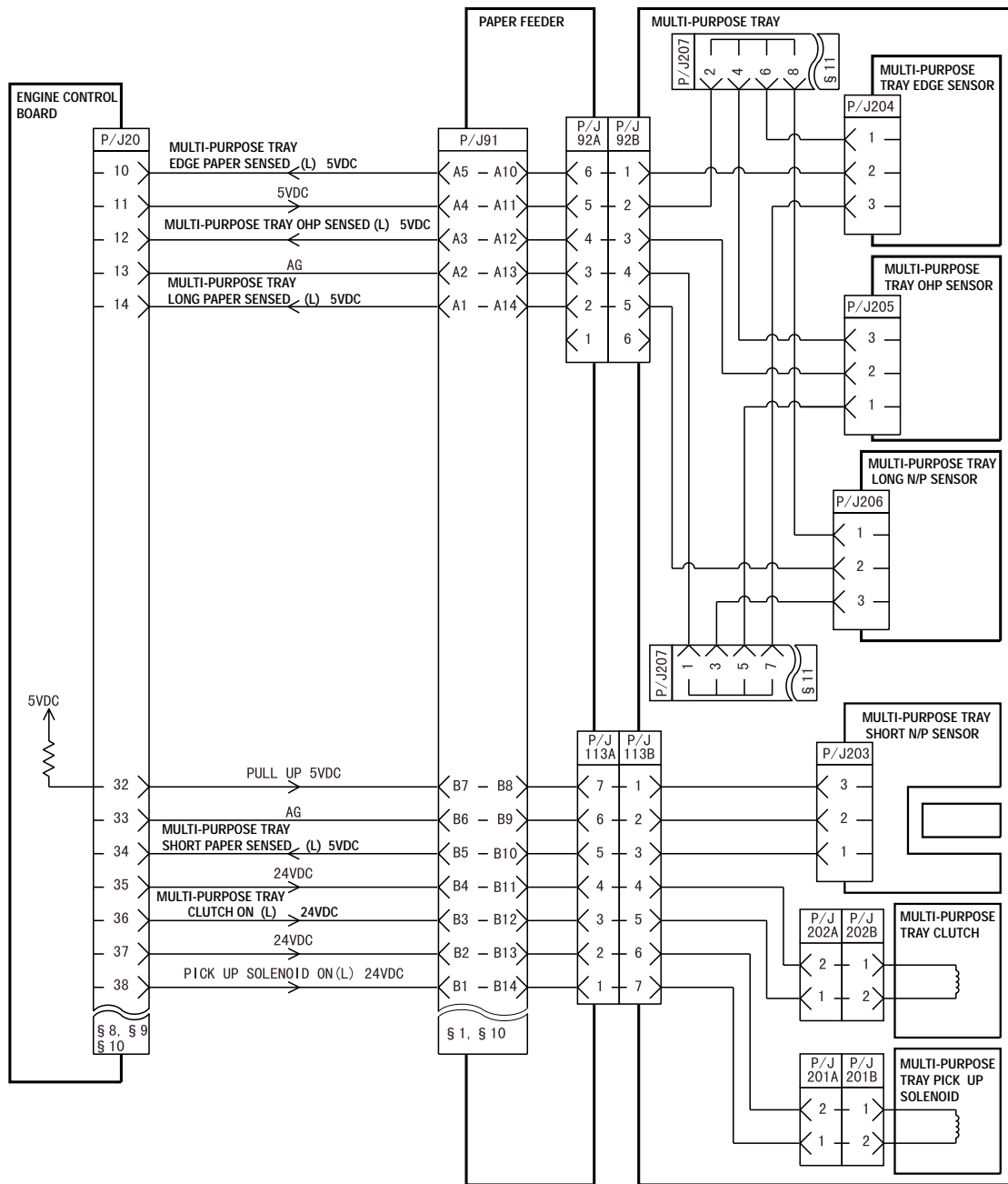
Wiring 11 – Engine control board, paper feeder, multi-purpose tray

ENGINE CONTROL BOARD

5VDC

P/J17
7 — PULL UP 5VDC
8 — AG
9 — TOP EXIT PAPER SENSED(L) 5VDC

P/J 161A   P/J 161B
5 — 4
4 — 5
3 — 6

P/J165
3
2
1

TOP EXIT SENSOR

EXIT CHUTE SWITCH

MEDIA EXIT SWITCH ON (L) 5VDC

10 —
11 — AG
12
5VDC
13
14

P/J 161A   P/J 161B
2 — 7
1 — 8

P/J166
2
1

§ 4

FULL STACK SENSOR

15 — PULL UP 5VDC
16 — AG
17 — FULL STACK SENSED(L) 5VDC

P/J 163A   P/J 163B
4 — 1
3 — 2
2 — 3
1 — 4

P/J167
3
2
1

§ 2, § 4
§ 6

FUSER FAN

P/J19
36 — FUSER FAN HALF-SPEED(H) 24VDC
37 — FUSER FAN ON(H) 24VDC
38 — RTN

P/J 111A   P/J 111B
3 — 1
2 — 2
1 — 3

§ 1, § 4
§ 6, § 7
§ 8, § 9

3041-30

Wiring 12 – Engine control board, top exit sensor, media exit switch, full stack sensor, fuser fan
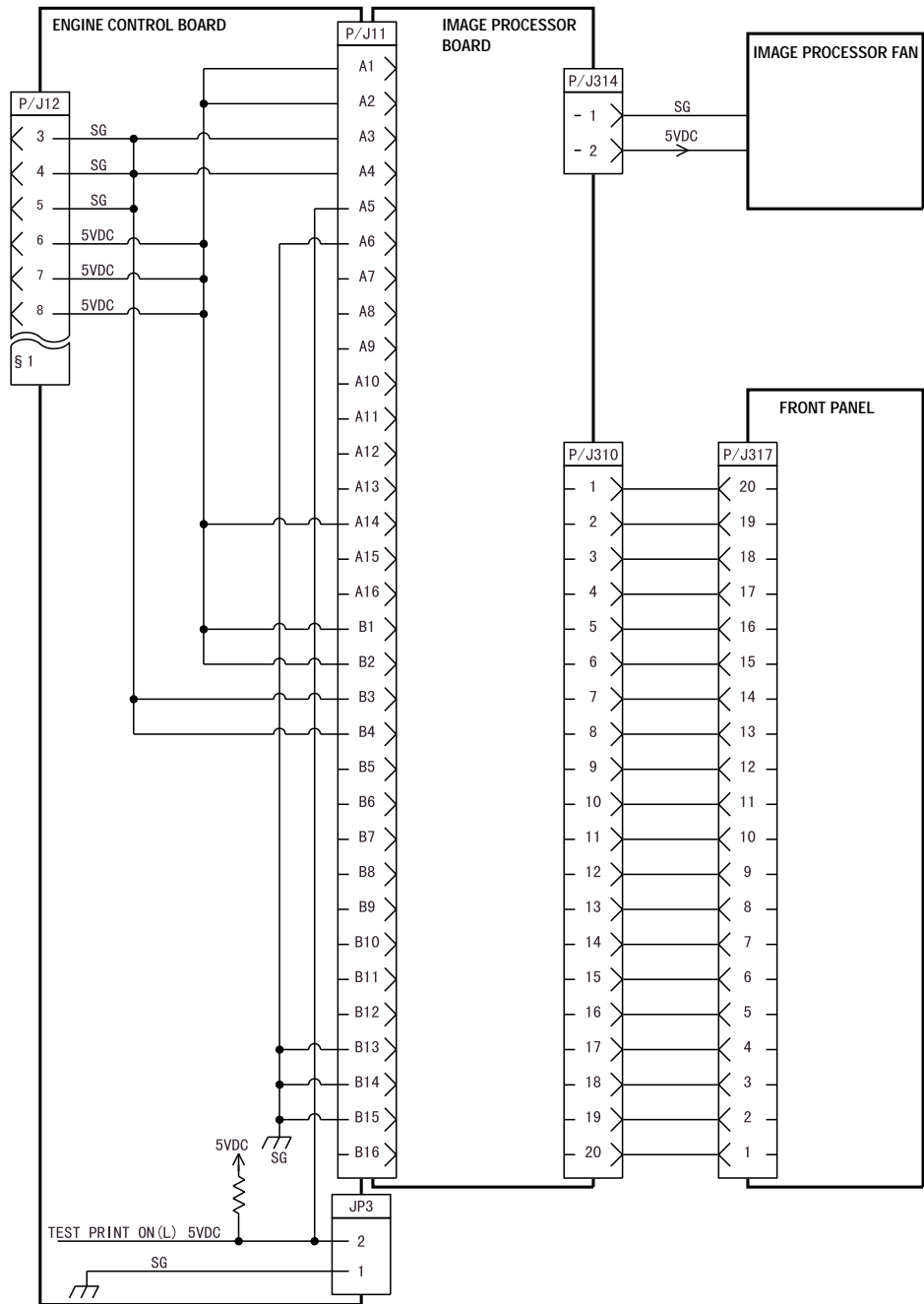
Wiring 13 – Engine control board, image processor board, front panel, image processor fan

3041-31

BOARD 1

ENGINE CONTROL BOARD

P/J16 — P/J132 — P/J133

LOW VOLTAGE POWER SUPPLY

P/J33 — P/J131

LOWER TRAY ASSEMBLY BOARD

BOARD 2

P/J211 — P/J175 FEEDER CHUTE SWITCH

P/J174 FEEDER CHUTE SWITCH

P/J212 — P/J177 SIZE SWITCH ASSY

P/J181 SIZE SWITCH ASSY

P/J172 SIZE SWITCH ASSY

P/J171 — P/J183 FEEDER MOTOR

BOARD 4

FEED SOLENOID-3T — P/J182

FEED SOLENOID-3T — P/J178

FEED SOLENOID-3T — P/J216

TURN CLUTCH-3T — P/J189

TURN CLUTCH-3T — P/J190

TURN CLUTCH-3T — P/J217

BOARD 3

P/J213 — P/J176 TRAY NO PAPER SENSOR

P/J187 LOW PAPER SENSOR

P/J214 — P/J180 TRAY NO PAPER SENSOR

P/J188 LOW PAPER SENSOR

P/J215 — P/J218 TRAY NO PAPER SENSOR

P/J219 LOW PAPER SENSOR

3041-59

Wiring 14 – Lower Tray Assembly master wiring diagram

ENGINE CONTROL BOARD

FEEDER BOARD

P/J16

	TRAY	P/J 132A	P/J 132	P/J133
1	TRAY	7	1	A9
2	HTX	6	2	A8
3	HRX	5	3	A7
4	READY	4	4	A6
5	START	3	5	A5
6	AG	2	6	A4
7	FUSER EXIT	1	7	A3

A9
A8
A7
A6
A5
A4
A3
A2
A1
B9
B8
B7

LOW VOLTAGE POWER SUPPLY

P/J33

		P/J 131A	P/J 131	
9	AG	6	1	B6
10	5VDC	5	2	B5
11	RTN	4	3	B4
12	RTN	3	4	B3
13	24VDC	2	5	B2
14	24VDC	1	6	B1
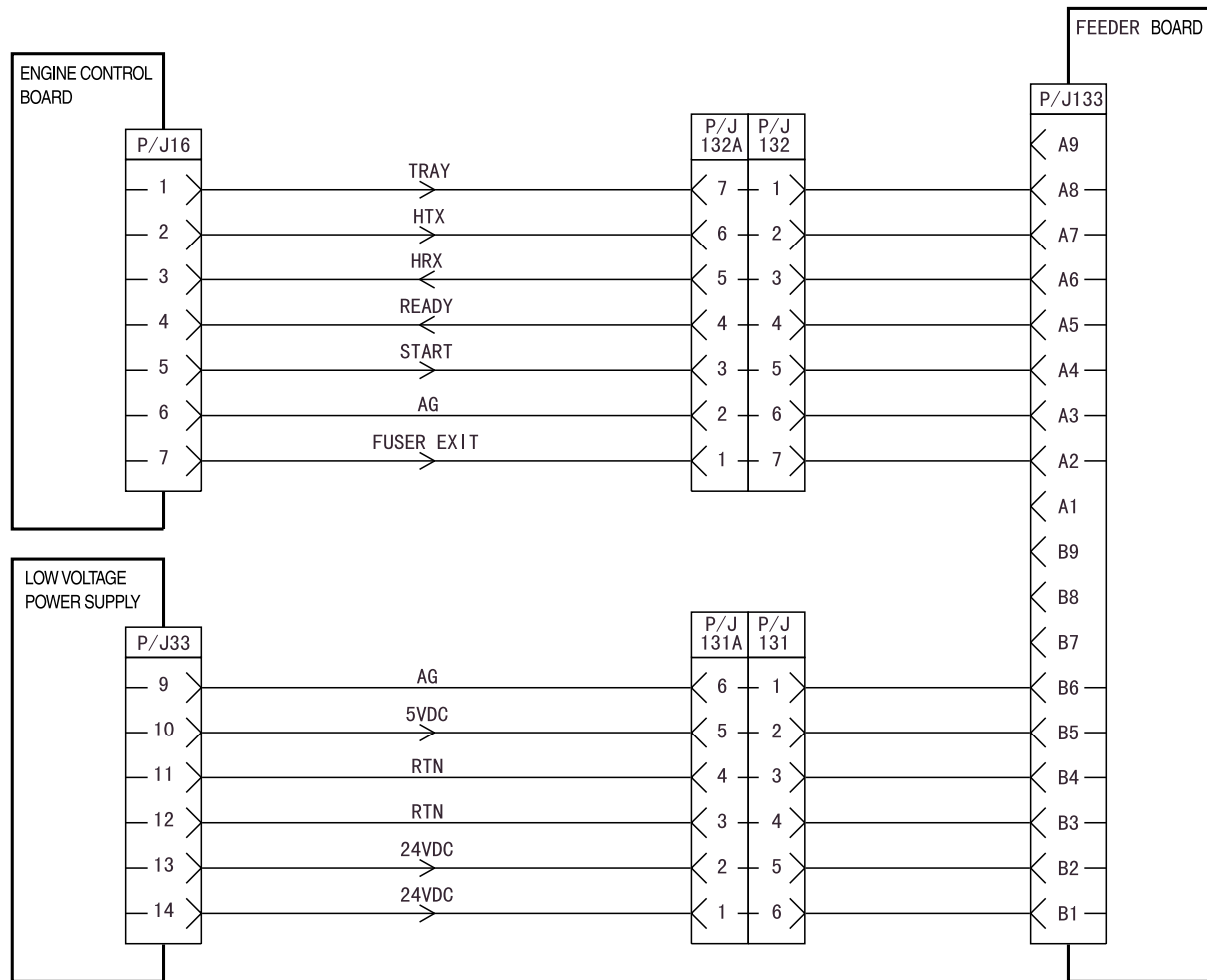
3041-60

Wiring 15 – Engine control board and low voltage power supply to Lower Tray Assembly feeder board
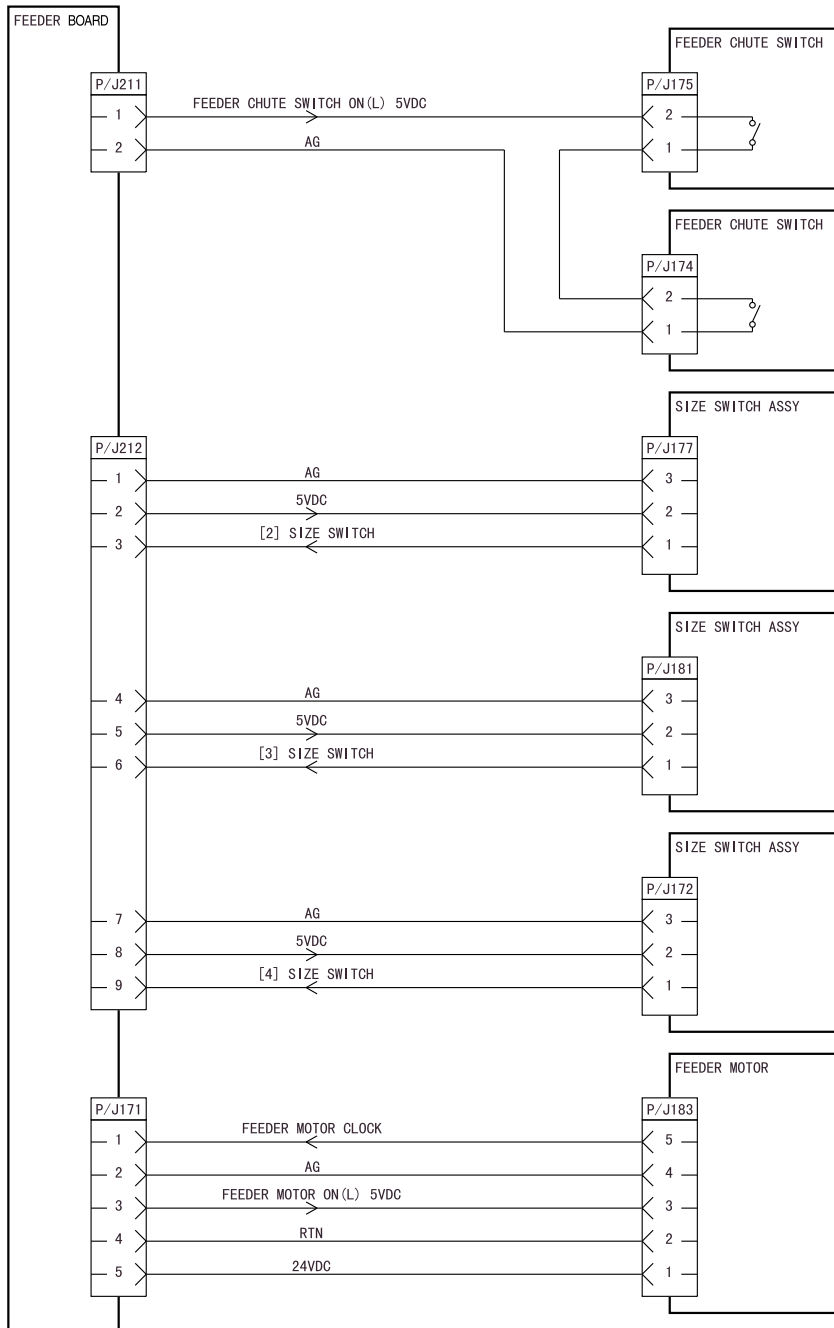
3041-61

Wiring 16 – Lower Tray Assembly feeder board to feeder chute switch, size switches and feeder motor

FEEDER BOARD

5VDC

P/J213

PULL UP 5VDC

AG

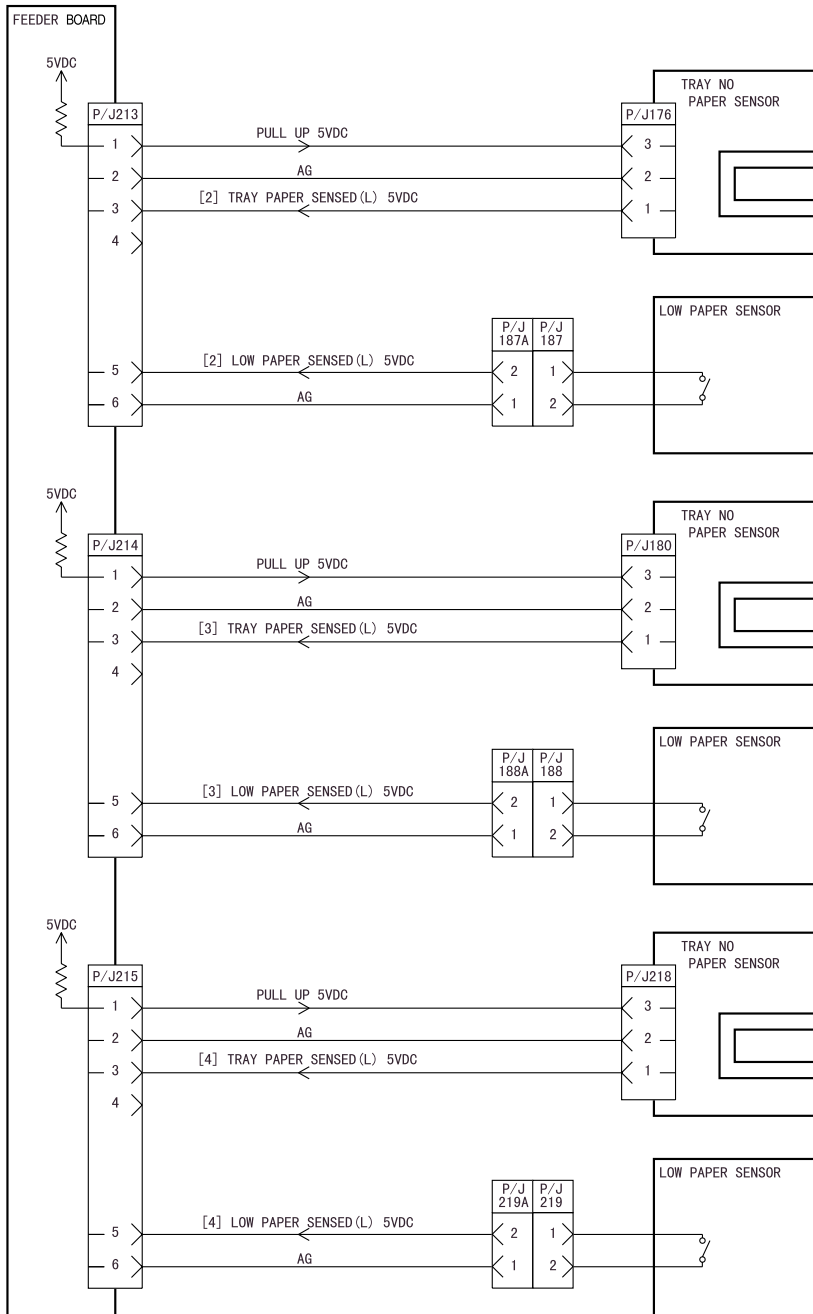[2] TRAY PAPER SENSED(L) 5VDC

TRAY NO
PAPER SENSOR

P/J176

3

2

1

1

2

3

4

LOW PAPER SENSOR

[2] LOW PAPER SENSED(L) 5VDC

AG

P/J
187A

P/J
187

2

1

1

2

5

6

5VDC

P/J214

PULL UP 5VDC

AG

[3] TRAY PAPER SENSED(L) 5VDC

TRAY NO
PAPER SENSOR

P/J180

3

2

1

1

2

3

4

LOW PAPER SENSOR

[3] LOW PAPER SENSED(L) 5VDC

AG

P/J
188A

P/J
188

2

1

1

2

5

6

5VDC

P/J215

PULL UP 5VDC

AG

[4] TRAY PAPER SENSED(L) 5VDC

TRAY NO
PAPER SENSOR

P/J218

3

2

1

1

2

3

4

LOW PAPER SENSOR

[4] LOW PAPER SENSED(L) 5VDC

AG

P/J
219A

P/J
219

2

1

1

2

5

6

3041-62

Wiring 17 – Lower Tray Assembly feeder board to no paper sensors and low paper sensors

FEEDER BOARD

P/J182

1

2

24VDC

[2] FEED SOLENOID ON(L) 24VDC

FEED SOLENOID-3T

P/J178

1

2

24VDC

[3] FEED SOLENOID ON(L) 24VDC

FEED SOLENOID-3T

P/J216

1

2

24VDC

[4] FEED SOLENOID ON(L) 24VDC

FEED SOLENOID-3T

P/J189

1

2

24VDC

[2] TURN CLUTCH ON(L) 24VDC

TURN CLUTCH-3T

P/J190

1

2

24VDC

[3] TURN CLUTCH ON(L) 24VDC

TURN CLUTCH-3T

P/J217

1

2

24VDC

[4] TURN CLUTCH ON(L) 24VDC

TURN CLUTCH-3T
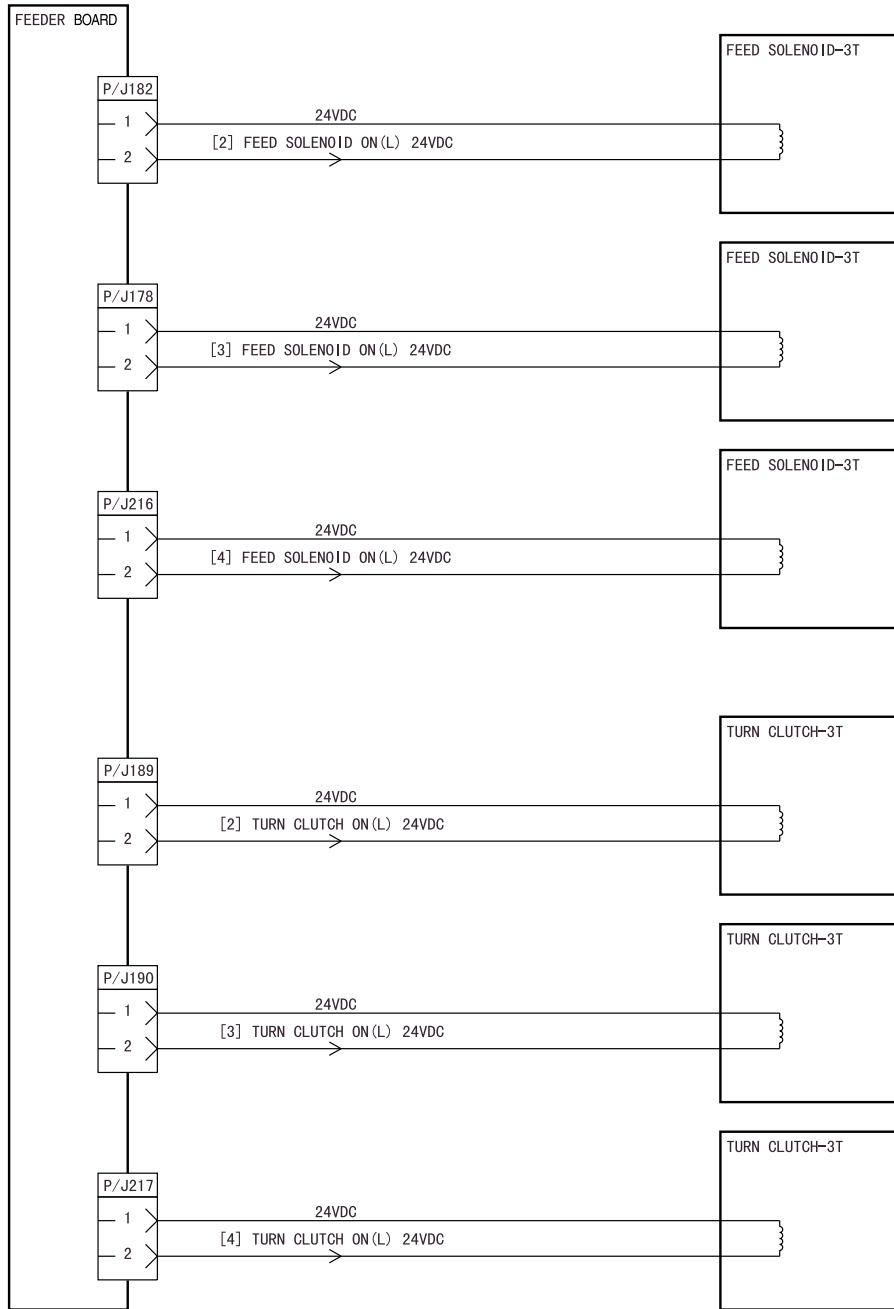
3041-63

Wiring 18 – Lower Tray Assembly feeder board to feed solenoids and turn chutes