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Hewlett Packard® LaserJet® 4000 (HP4000)
Remanufacturing Instructions

About the Cartridge

In November 1997, Hewlett-Packard® launched the LaserJet® 4000 Series (HP4000), its newest line of network laser printers. The printers, rated at 17 pages per minute, offer 3 user-selectable resolution settings, including true 1200 dpi (rated at half engine speed). The HP4000 is designed for improved productivity in both small and large workgroups. The instant-on fuser outputs the first page in just 15 seconds; up to five paper sources offer printing flexibility for entire workgroups. Optional accessories include a duplex assembly, 500-sheet media tray, and envelope feeder. In addition to the standard HP4000 model, HP also offers three versions of the printer that vary in networking capabilities, paper handling, and memory. *For more information regarding printer and cartridge specifications, refer to SSS 160-C, Cartridge/Printer Specifications.*

HP's UltraPrecise toner cartridge, used with the HP4000 printers, features a new toner formulation, greater OPC sensitivity, new drum helical drive gear, end magnets (instead of mag roller felts), and a pull tab with the HP logo etched on the surface.

The UltraPrecise cartridge is available in two sizes to meet the varied printing demands of end users. *For more information regarding the two cartridges, refer to page 3 of this manual.*

Remanufacturing the HP4000 is, in many respects, similar to remanufacturing the EX and WX cartridges. The cartridge consists of two distinct sections: waste bin section and toner hopper section. The drum shutter, however, is located on the hopper section instead of the waste bin section.

The two cartridge sections are held together by a cartridge pin installed at each end of the cartridge. The pin and casing design is such that the pins cannot be removed by tapping them through the casing to the interior of the cartridge. The pin casing in the pivot arm of the hopper is a smaller diameter than that of the waste bin pivot arm, creating a step between the two sections. Tapping the pins through the casing can cause the casing to split, as well as break the PCR saddle support bracket. SCC has developed a pair of pin removal pliers specifically designed to remove the pins from the cartridge without damage to the cartridge or components. *Refer to page 2 of SSS 160-E, Critical Issues for additional information.*

SCC's replacement cartridge pins are designed to speed up subsequent remanufacturing process. Designed with a slim-line head, the pin installs flush against the exterior of the cartridge, but can be easily removed using a pair of side cutters.

The waste bin houses the drum, wiper blade,

continued on page 2

HP4000 Quick Reference

Toner Weight	305 grams (6,000 page-C4127A) 500 grams (10,000 page-C4127X)
Toner Class	Magnetic, Monocomponent
Seal Type	Split Hopper
Estimated Remanufacturing Time	15-30 minutes
Recommended Test Printer	HP LaserJet 4000

Table of Contents

World Wide Web

www.scc-inc.com

If you need additional information or technical assistance, please contact the Technical Support Group.

1.800.948.1072 (USA)
+44 (0) 118 935 1888 (UK)
email: techservices@scc-inc.com

first edition

About the Cartridge

recovery blade and PCR. The OEM drum features a new type of helical drive gear designed to eliminate gear chatter that contributes to noise and poor print quality.

For best results against field failures in the second cycle, SCC recommends replacing the OEM drum after the initial cycle and replacing the aftermarket drum every cartridge cycle. SCC gives you a choice of system-qualified drums to help meet the requirements of your HP4000 application.

Drum life can vary depending on your customer's cartridge usage. Shorter print runs of one or two pages causes more wear to the drum than long, continuous print runs. Understanding your customer's usage can better help you manage component replacement schedules in your business. *For more information about drum life, please refer to SSS 35, Photoreceptors.*

Since the introduction of the cartridge, our imaging laboratories have identified two styles of PCRs: a tapered-end style and straight-end style. Initial testing has also indicated several wear and recoating issues. *For more information about the PCR, refer to page 4 of SSS 160-E, Critical Issues.*

Sealing components in the waste bin include wiper blade sealing foam, wiper blade end foam and felts. The recovery blade is available in mylar and SCC's branded PolyBlade™.

The hopper section houses the drum shutter, mag roller, doctor blade, and a 500-gram load of toner for the 27X cartridge (305 grams for the 27A cartridge).

Toner is available from SCC in two gram weights: 305 grams for the 6,000-page yield 27A cartridge and 500 grams for the 10,000-page yield 27X cartridge. When remanufacturing your cartridges, make sure you are using the gram weight for the hopper capacity you are using.

The drum shutter must be removed from the hopper body to remove the gear housing end plate or to split the hopper. Be sure to follow the detailed instructions in this manual in order to remove the shutter correctly. SCC also recommends installing a drum shutter felt to protect the drum from potential damage caused by the shutter.

SCC is conducting tests to determine the recoatibility of the OEM mag roller. A new mag roller sleeve, as well as a replacement doctor blade are currently under development. *For additional information regarding the mag roller, refer to page 4 of SSS 160-E, Critical Issues.*

Sealing components in the hopper section include a mag roller sealing blade, doctor blade sealing and end foams, mag roller seal foams, and mag roller end magnets. A replacement mag roller sealing blade is available from SCC, along with an installation tool to ease installation. The mag roller sealing end foams, small foam components installed underneath the blade and adjacent to the mag roller end magnets, are under development as replacement items.

The HP4000 cartridge features end magnets in place of the traditional mag roller felts used in other cartridges. The end magnets are shaped to fit the mag roller saddle and use a magnetic field to contain toner in the hopper and prevent leakage.

The end magnets have worked quite well in testing and do not appear to have any wear issues regarding the magnet material or the journals of the mag roller.

The design of the hopper sections indicates that splitting and installing an adhesive-mounted seal will achieve the most affective seal against leakage. A step incorporated into the sealing channel makes insertable usage virtually impossible. *For more information, refer to page five of SSS 160-E, Critical Issues.*

A powered cartridge splitter and WhiteSeal™ split hopper seal are available. Additional split hopper seal designs are under development. Contact a member of your SCC Sales Team for additional product information.

For your best protection against leakage during shipping, SCC recommends installing a seal. Tumble testing conducted in the SCC Imaging Lab showed significant leakage in unsealed, filled cartridges. If you plan to hand deliver cartridges, a seal is optional. However, when transporting unsealed, filled cartridges, take care not to drop or excessively jar the cartridges. *For more information about tumble test results, refer to page 3 of SSS 160-E, Critical Issues.*

Technical Notes

Page Yield

Data from multiple yield testing trials of new OEM cartridges averages 10,000 pages, agreeing with HP's rated page yield for the 27X cartridge. Toner usage per page is about 45 mg with a 5% text-based test target.

Character Formation

The HP4000 produces slightly thinner characters than previous generation engines. It requires different text-based test targets to achieve 5% yield than previous generation engines.

Hopper Capacity

Standard toner load for the 27A is 305 grams. It will not hold a 27X-level 500 gram load. Updating 27A cartridges to 27X capacity will require a new hopper. The waste bin capacity of both cartridges is identical.

Two Cartridge Capacities Available

The UltraPrecise cartridge is available in two sizes to meet the varied printing demands of end users. The 27A cartridge yields 6,000 pages at approximately 5% page coverage; HP recommends this cartridge for end users that use 1-2 cartridges per year. The maximum capacity 27X cartridge yields 10,000 pages at approximately 5% page coverage. This cartridge is recommended as the most cost-effective choice for end users who use more than two cartridges a year and is also shipped with the printer.

The main difference between the 27A and 27X cartridges is in the physical design of the hopper. The outer dimension of the hopper is essentially the same for both styles; however, in the 27A hopper, part of the hopper cavity is closed, leaving the part of the handle on the exterior of the hopper hollow. Figures A and B at the right show the differences between the two cartridges.

Cartridge Popularity

Early information from both empty collections and new cartridge sales indicate that the 10,000 page 27X version of the HP4000 cartridge will be the most popular by far. Estimates of market share for the 27X versus 27A are 70/30%. This is completely different than the EX 98A/98X situation where the 98A exceeds 90% of the new HP OEM cartridge sales. Several factors have influenced this market flip-flop. First, the 27X existed from day one, whereas the 98X was created five years after the original printer introduction–companies get used to buying the same SKU and don't readily switch. Second, the 27X ships with the new printer. Third, HP has done a better job of clearly communicating to the business user that the 27X is the superior value.

C4127A (6,000-Page Yield)

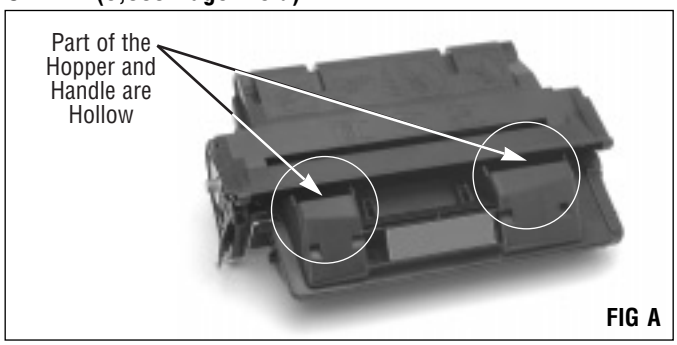


FIG A

C4127X (10,000-Page Yield)

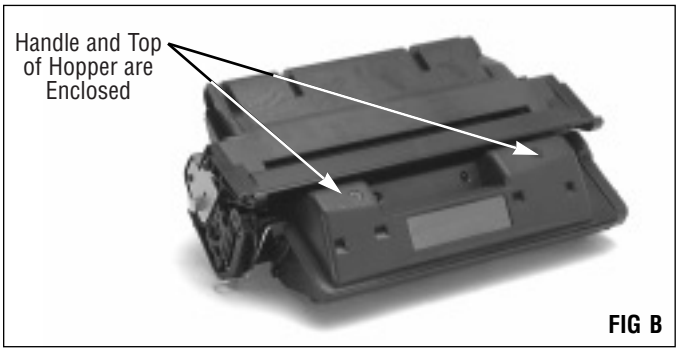


FIG B

Tools and Supplies You Will Need

Use of Compressed Air

As of April 28, 1971, the Occupational Safety & Health Administration (OSHA) Standard, 29 CFR 1910.242 paragraphs a & b for general industry requires effective chip guarding and personal protective equipment (PPE) when using compressed air. When cleaning residual toner particles from cartridges using a compressed air system, you must use air nozzles meeting OSHA requirements. Air nozzles that regulate air pressure to a maximum of 30 psi comply with this standard. Refer to the OSHA publication for any updates or changes that have occurred since the date noted above.

Use of Isopropyl Alcohol

For best results, we recommend using ONLY 91-99% for cleaning as directed in these instructions. 91% isopropyl alcohol is available at most major drug stores; 99% isopropyl alcohol is available through distributors of chemical products. Follow the alcohol manufacturer's safety instructions.

Tools and Supplies You Will Need

For Basic Remanufacturing:

- Phillips Screwdriver
- Standard Flat-Blade Screwdriver
- Small-Tipped Flat-Blade Screwdriver
- Needlenose Pliers
- Funnel for Toner Bottle
- Compressed Air for Cleaning . . . . . *(See left)*
- 91-99% Isopropyl Alcohol . . . . . *(See left)*
- Lint-Free Foam Tip Swab . . . . . LFSWAB
- Lint-Free Cleaning Cloth . . . . . LFCCLOTH
- Cotton Swab . . . . . QTIP
- Conductive Cartridge Lubricant . . . . . CONCLUBE
- Kynar® Lubricating Powder . . . . . KPOW
- Shallow Trough for Dipping the Wiper Blade
- SCC HP4000 Pin Removal Kit 4KPRKIT
- HP4000 Cartridge Pins 4KPIN
- Plexiglass Hopper Fixture 4KHJIG

Item Codes for additional replacement items are included in the body of the instructions.

For Seal Installation:

- HP4000 WhiteSeal™ Split Hopper Sealing Kit 4KWHSLKIT
  (Includes foam removal tool assembly, hopper jig, hopper rail assembly jig, t-handle rail removal tool, blackened stainless-steel locking rails, toner seal channel open and closed end foams, seal channel rail foam, OEM-type seal pull tab with adhesive, and WhiteSeal™.

- HP4000 RapidSplitter™ Split Hopper Sealing System 4KRSCSS

HP4000 Reference Materials:

SSS 160-E, HP4000 Critical Issues
Provides important information and issues surrounding the HP4000 cartridge.

Separating the Cartridge

1. **Place the cartridge in the plexiglass holding fixture.**
   The Cartridge Holding Fixture (4KPRJIG) is specially designed to facilitate removing the drum and cartridge pins from the HP4000 cartridge.

   Place the cartridge in the fixture with the drum shutter face up as shown in FIG 1. Note that the side flange on the waste bin should rest against the tall fixture support as shown in FIG 1, A. The flange on the bottom of the hopper should rest against the short fixture support as shown in FIG 1, B.

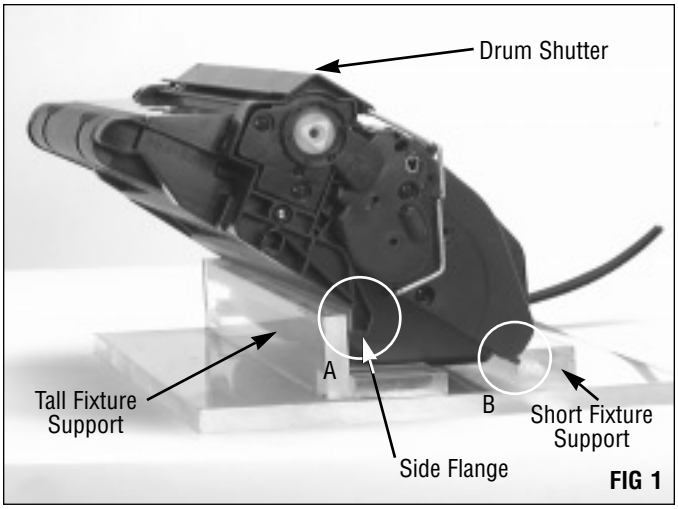


FIG 1

   When properly installed in the cartridge fixture, the drum and mag roller gears will separate slightly allowing you to remove the drum more easily (FIG 2).

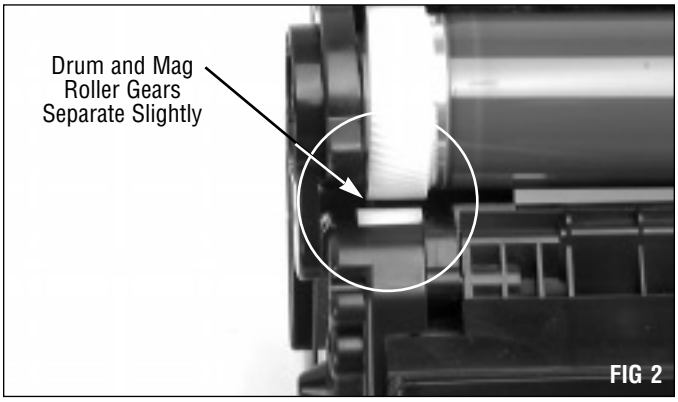


FIG 2

   Pull the drum shutter back to its "open" position (FIG 3). Secure the drum shutter actuator arm to the fixture, using the Velcro™ strap, to keep the drum shutter out of your way while you remove the drum and PCR.

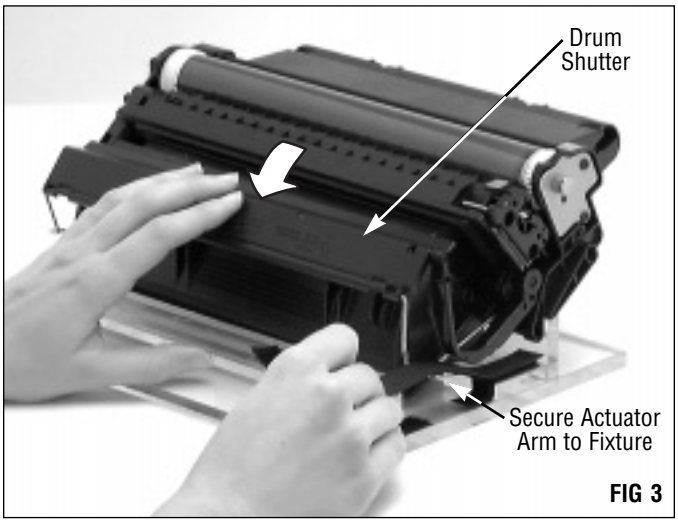


FIG 3

Separating the Cartridge

2. **Remove the drum spur gear axle.**
The drum spur gear axle is located adjacent to the drum spur gear. Remove two screws that secure the axle, then remove the axle (FIGs 4 and 5).

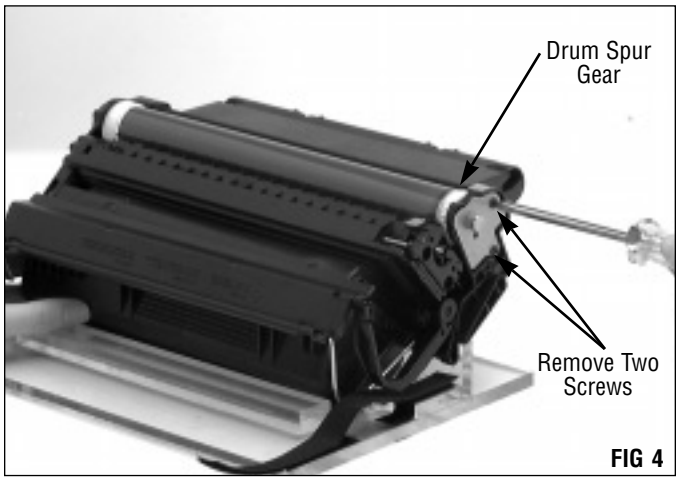


FIG 4

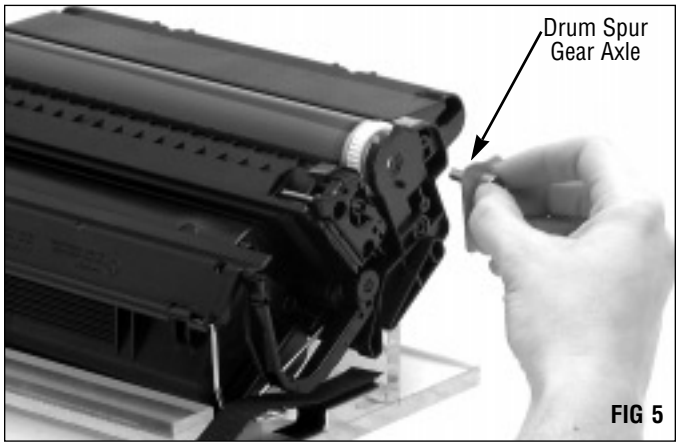


FIG 5

3. **Remove the waste bin bearing plate.**
The bearing plate (black in color) is located adjacent to the drum helical gear. Remove two screws that secure the bearing (FIG 6).

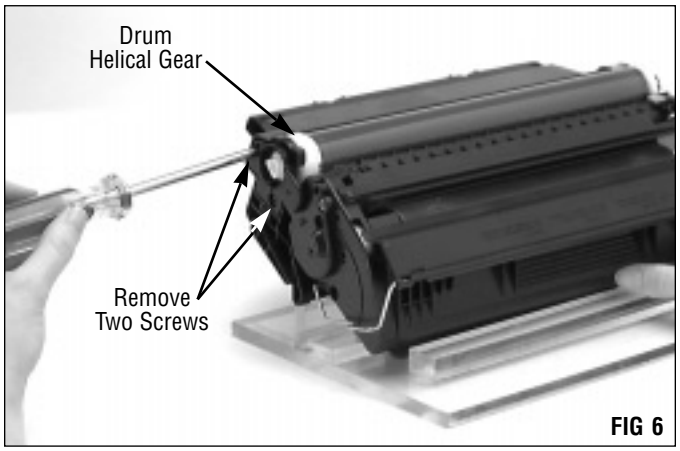


FIG 6

Remove the bearing (FIG 7).

FIG 7

4. **Remove the drum.**
Grasp the drum by the spur gear, shift the drum to the drive gear side of the cartridge, and lift the drum from the cartridge (FIG 8). If you plan to reuse the drum, store it in an area where it is protected from light and impact damage.

To minimize the risk of second cycle field failures, SCC recommends using the OEM drum, as well as any SCC HP4000 system-qualified drum only one cycle. Drum life can vary depending on your customer's usage. For more information about drum life, refer to *SSS 35, Photoreceptors*.

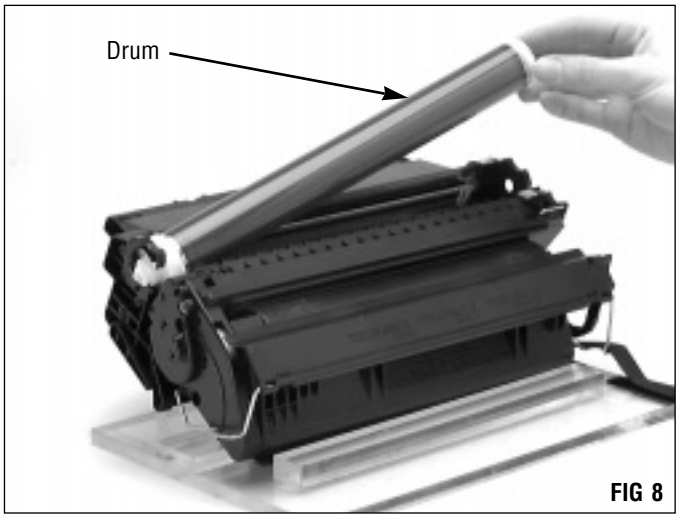


FIG 8

CAUTION Once the drum is removed from the cartridge, the surface of the mag roller is exposed. Take extreme caution not to touch or scratch the mag roller when removing the cartridge pins and separating the cartridge. For added protection against damage, place a clean, Lint-Free Cloth (LFCCLOTH) over the mag roller.

5. **Remove the Primary Charge Roller (PCR).**
Use a pair of needlenose pliers to grasp the PCR shaft (FIG 9) and lift the PCR from the cartridge (FIG 10). Handle the PCR by the axle or use clean latex gloves. If you plan to reuse the PCR, store it on a flat uniform surface.

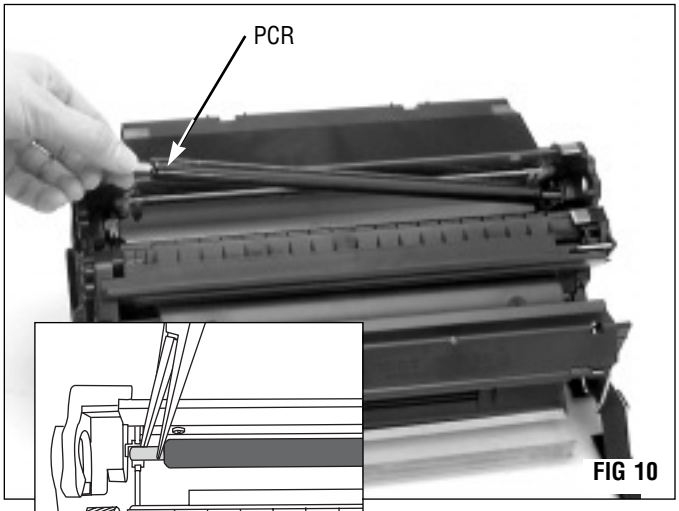


FIG 10

FIG 9

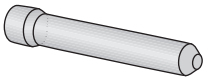
CAUTION Do not stack PCRs, lay anything on top of them, wrap them with rubber bands or touch the surface of the PCR with your bare fingers.

Separating the Cartridge

6. Remove the cartridge pins.

CAUTION Do not attempt to remove the cartridge pins by tapping them into the casing toward the interior of the cartridge. The pins will lodge in the casing and potentially break the casing and PCR support bracket. *See page 2 of SSS 160-E, Critical Issues, for more information.*

The OEM cartridge pin is installed completely into the cartridge casing, preventing easy removal from the exterior of the cartridge. Furthermore, a step incorporated into the pin design prevents the pin from being pushed through the pin casing to the interior of the cartridge. SCC has developed a Pin Removal Kit (4KPRKIT) that features a pair of pliers to remove the pin without damage to the cartridge (FIG 11).



OEM Cartridge Pin

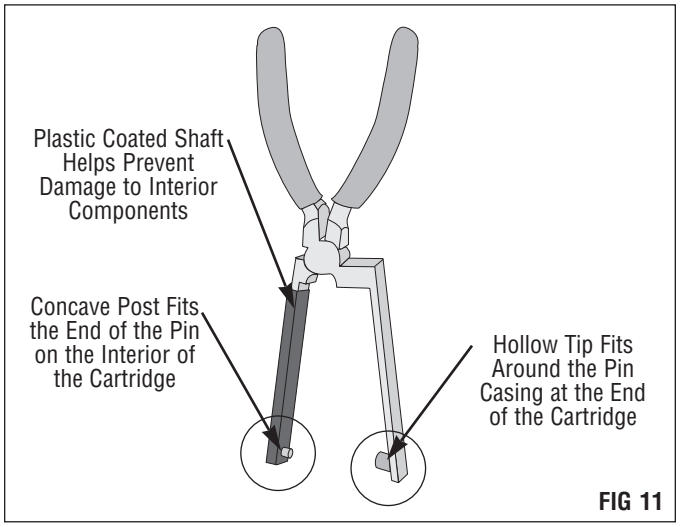


FIG 11

Position the cartridge as shown in FIG 12.

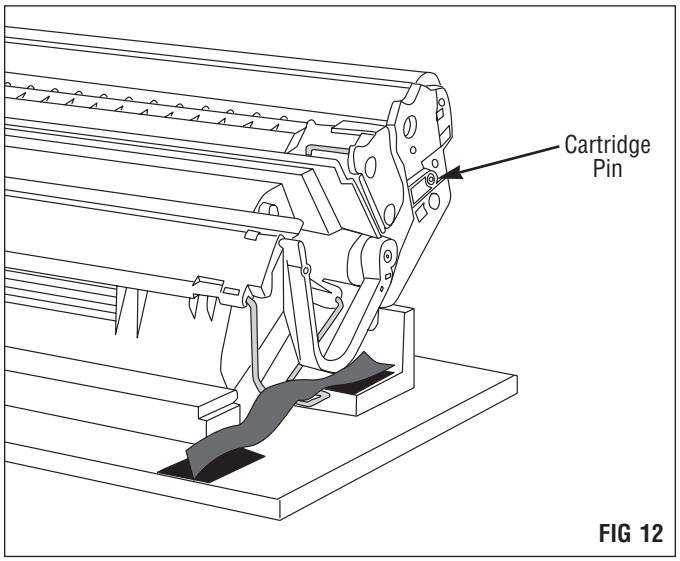


FIG 12

Place the hollow tip of the pliers around the cartridge pin casing at the end of the cartridge (FIGs 13 and 14).

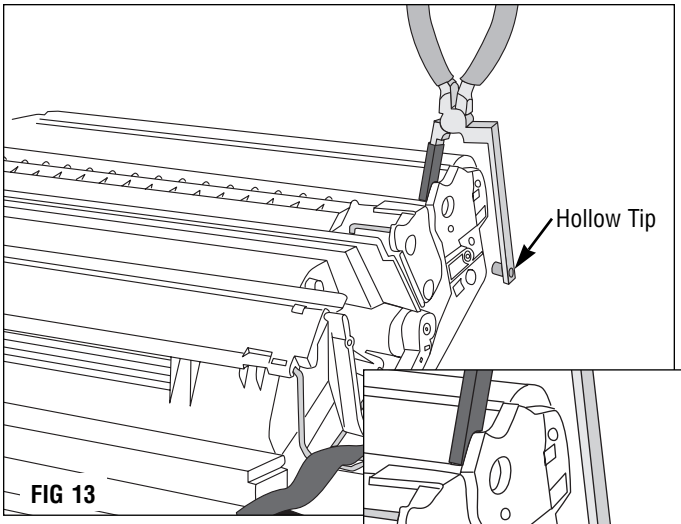


FIG 13

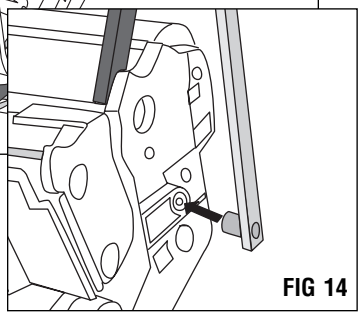


FIG 14

Place the concave post on the pliers at the tip of the cartridge pin on the interior of the cartridge (FIG 15).

Squeeze the pliers together to remove the pin from the casing. The concave post will drive the pin through the casing and the pin will exit at the end of the cartridge.

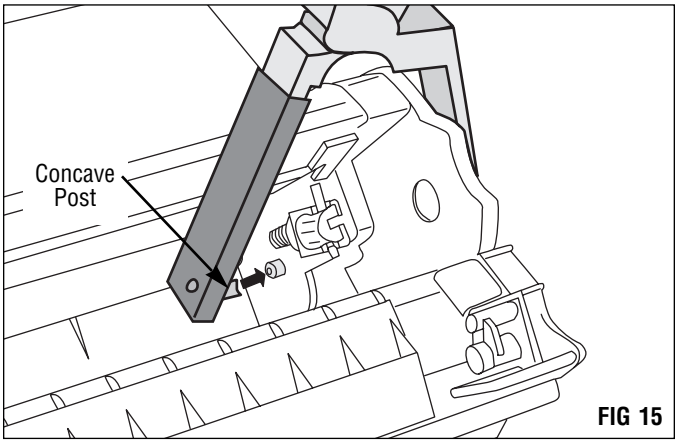


FIG 15

Using needlenose pliers, remove a cartridge pin from each end of the cartridge (FIGs 16 and 17).

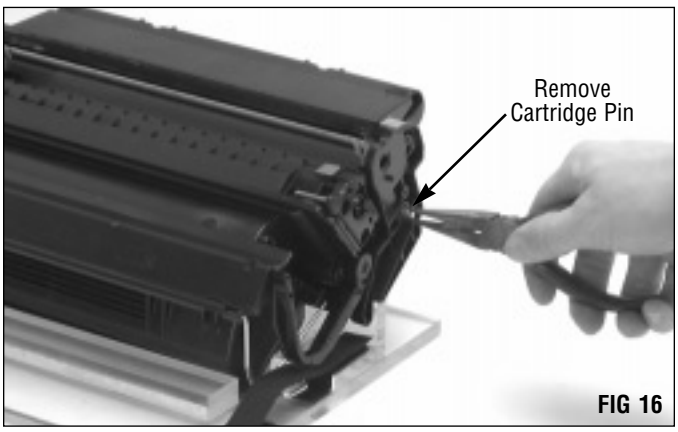
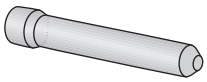


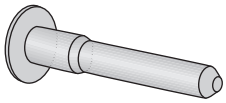
FIG 16

Separating the Cartridge

To facilitate cartridge disassembly during subsequent remanufacturing cycles use SCC HP4000 Cartridge Pins (4KPIN) to rejoin the cartridge sections. SCC's cartridge pins, designed specifically for the HP4000 cartridge, install flush to the cartridge, but can be removed easily using a pair of side cutters.



OEM Cartridge Pin



SCC HP4000 Cartridge Pin

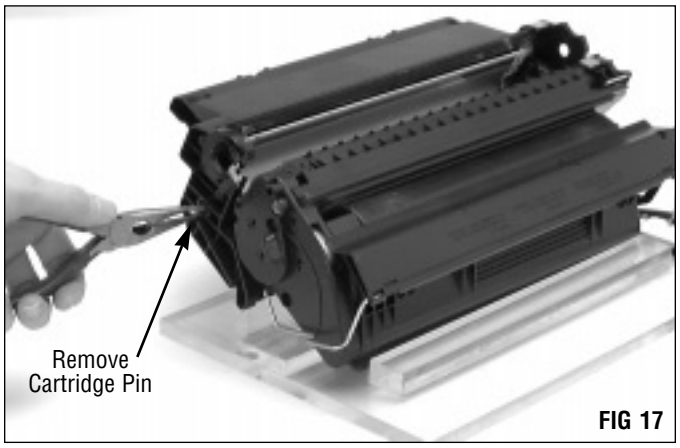


FIG 17

7. **Remove the cartridge from the fixture.**
Release the drum shutter actuator arm by removing the Velcro strip, and guide the drum shutter back to its closed position (FIG 18).

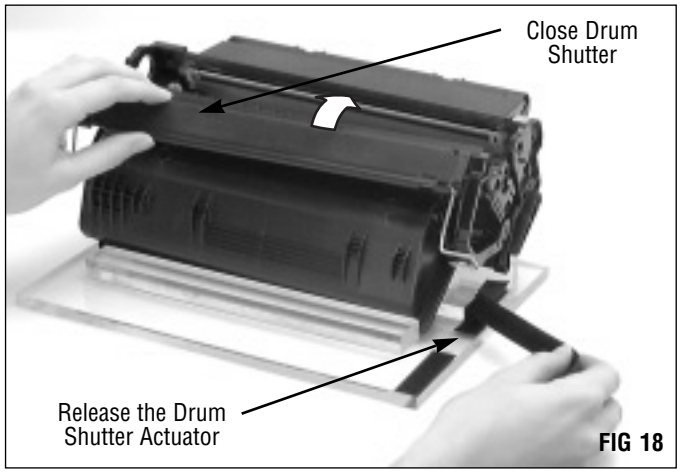


FIG 18

8. **Separate the cartridge (FIG 19).**
Note that the drum shutter is attached to the hopper section.

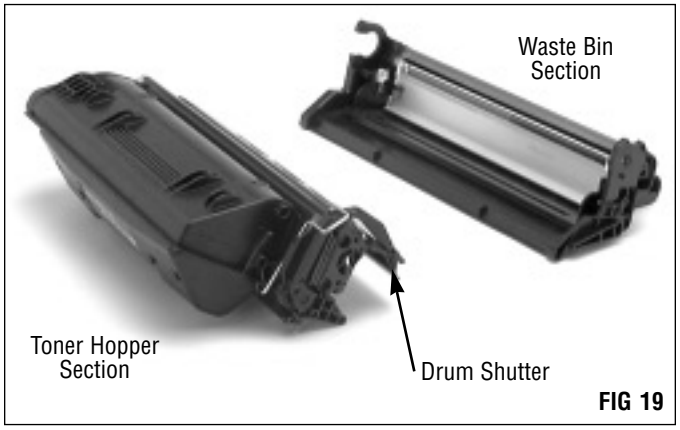


FIG 19

Disassembling the Toner Hopper Section

1. **Remove the drum shutter.**
   The drum shutter should be removed if you plan to remove the gear housing end plate or split the hopper.

   Position the hopper section so that the mag roller end plate is facing you (FIG 20). Rotate the drum shutter actuator arm in the direction indicated by the arrow in FIG 20 to position the actuator arm tab to the left of the actuator spring (FIG 20 inset).

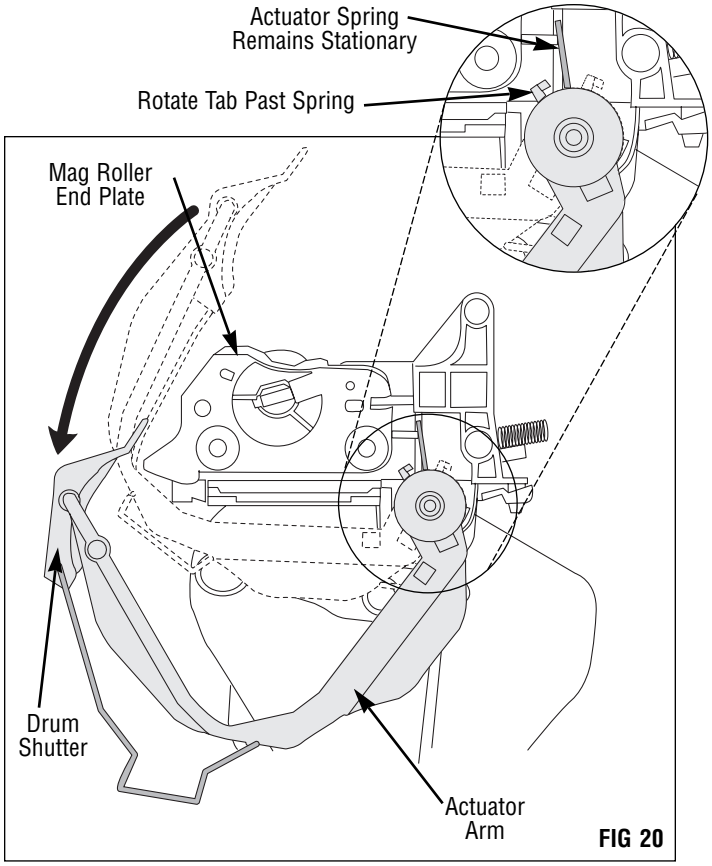


FIG 20

Using a pair of needlenose pliers, place the spring on actuator arm tab as shown in FIG 21. This keeps the spring installed on the actuator arm when the arm is removed from the hopper.

A replacement Actuator Arm Spring (4KDSAS) is available in case the original spring is lost or damaged.

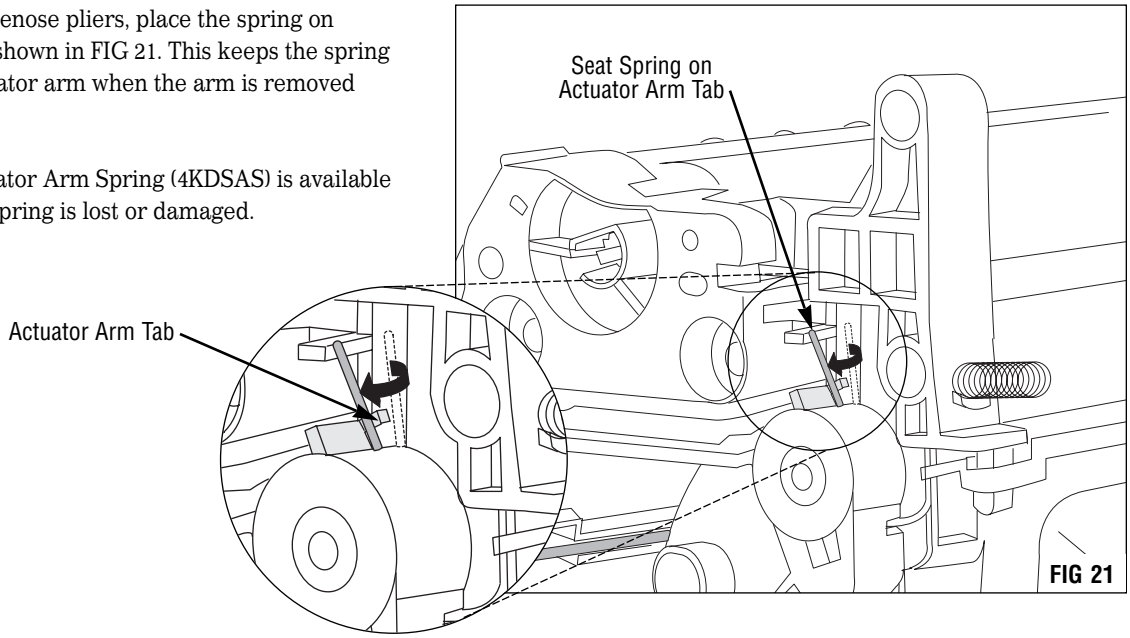


FIG 21

Disassembling the Toner Hopper Section

Use a flat head screwdriver to carefully pry the actuator arm from the hopper (FIGs 22 and 23). Note that a small locking clip secures the actuator arm to the hopper body.

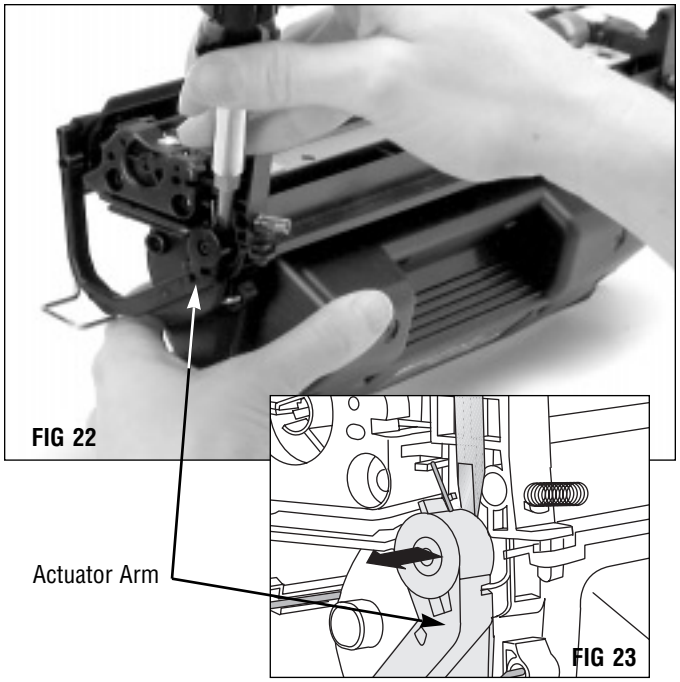


FIG 22

FIG 23

Remove the actuator arm from the hopper body (FIG 24).

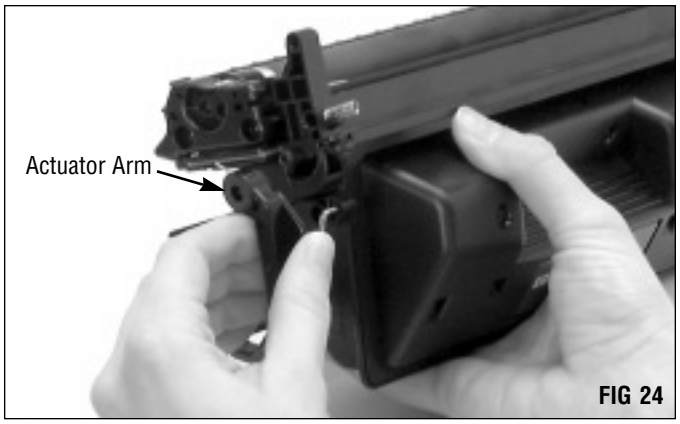


FIG 24

Remove the actuator arm support bar from the hopper body (FIG 25).

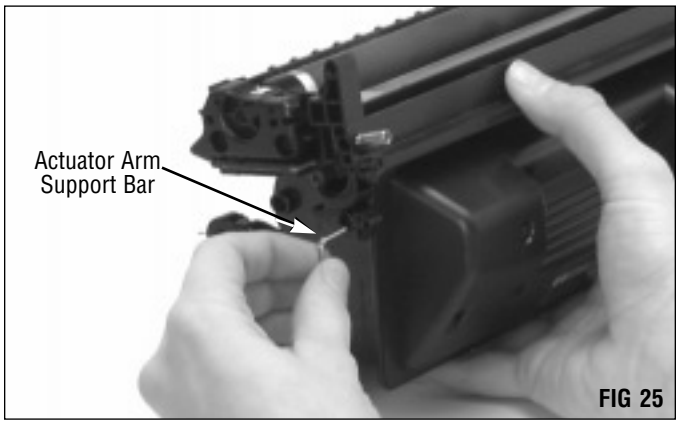


FIG 25

Turn the hopper so that the gear housing end plate is facing you. The support bar is installed in a keyed positioner bushing. Position the support bar as shown in FIG 26, then remove the bar from the gear housing end plate (FIG 26 inset).

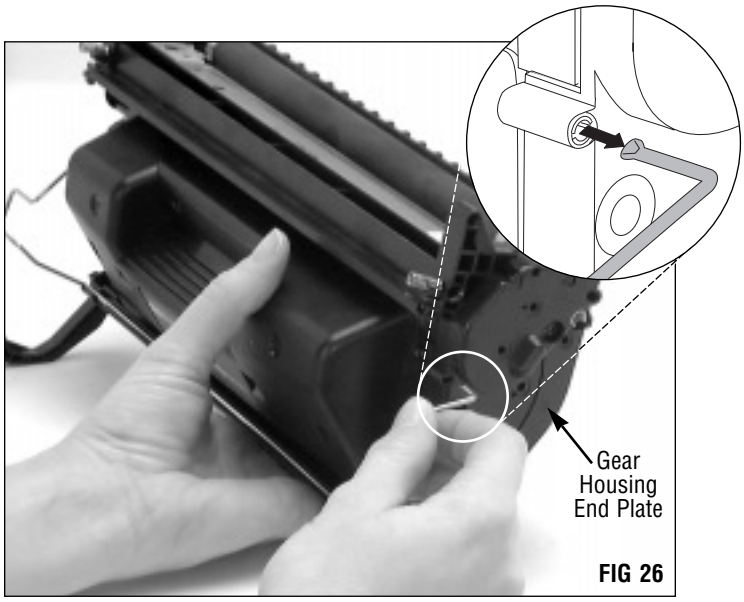


FIG 26

2. **Place the hopper in a hopper fixture.**
SCC offers an HP4000 Plexiglass Hopper Fixture (4KHJIG) to facilitate hopper assembly and disassembly. Secure the fixture to your work surface with bolts or C-clamps.

   Note the orientation of the hopper in relation to the tall and short fixture supports (FIG 27).

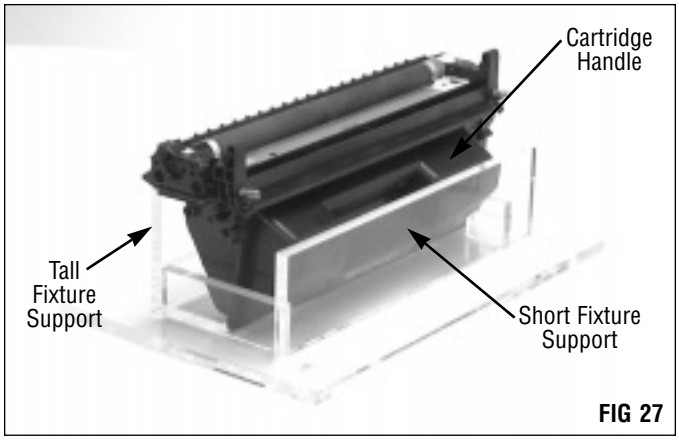


FIG 27

3. **Remove the mag roller end plate.**
Remove two screws that secure the end plate (FIG 28).

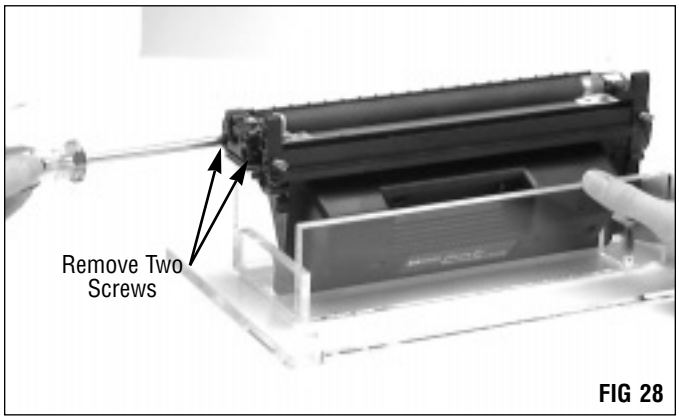


FIG 28

Disassembling the Toner Hopper Section

A small locking clip secures the end plate to the hopper body (FIG 29).

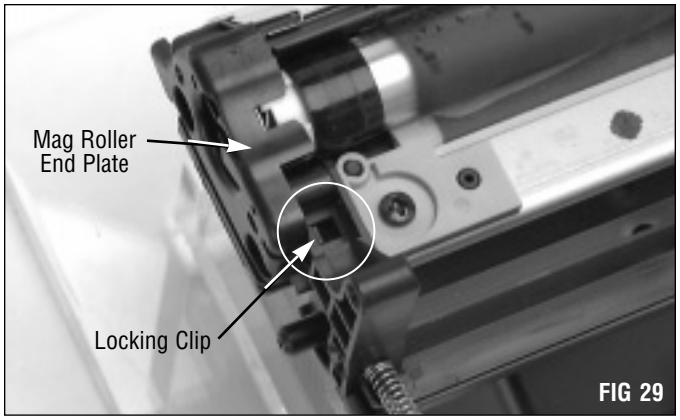


FIG 29

Use a small-tipped flat blade screwdriver to release the clip and carefully remove the end plate (FIGs 30-32).

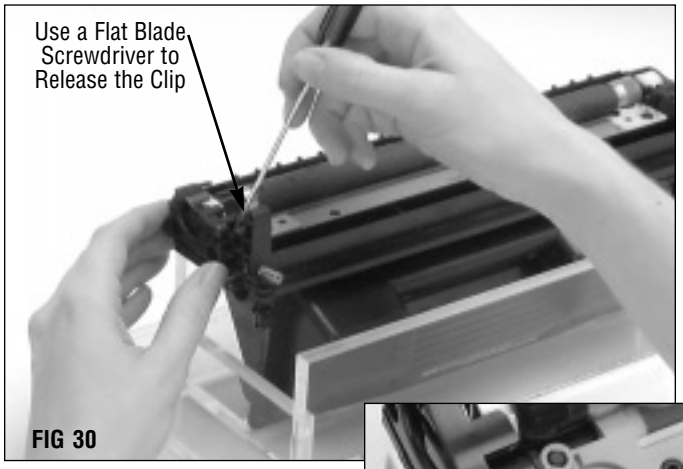


FIG 30

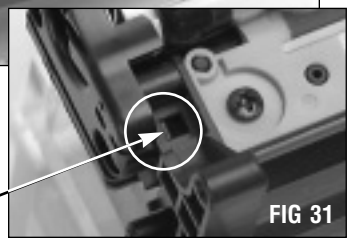


FIG 31

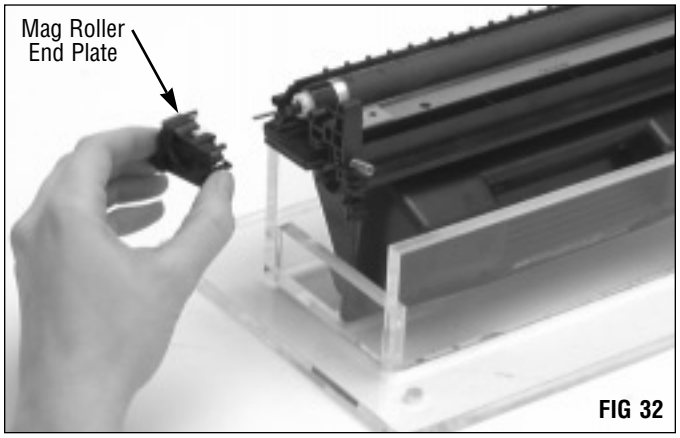


FIG 32

4. **Remove the gear housing end plate.**
Remove two screws from the end plate (FIG 33).

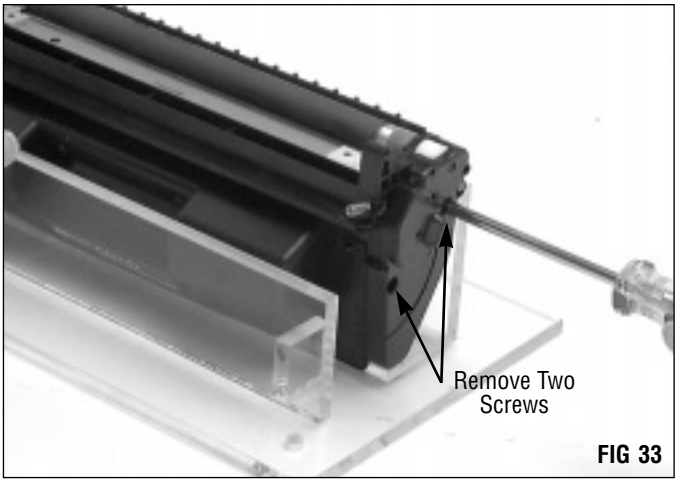


FIG 33

A small locking clip secures the end plate to the hopper body (FIG 34). Use a small flat-blade screwdriver to release the clip (FIG 35).

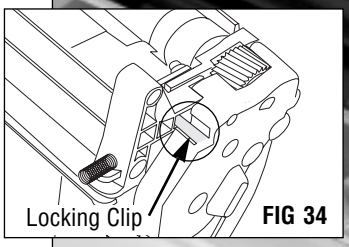


FIG 34

FIG 35

Remove the end plate from the hopper (FIG 36). Note that the four gears in the hopper drive train stay attached to the end plate when it's removed.

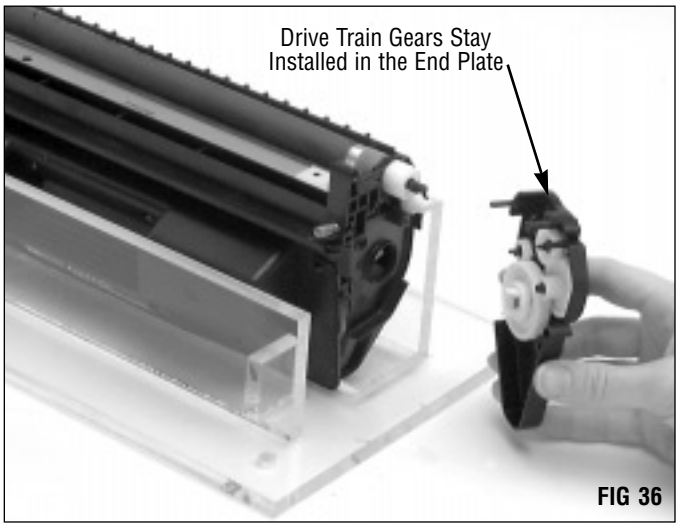


FIG 36

Disassembling the Toner Hopper Section

5. **Remove the mag roller drive gear (FIG 37).**

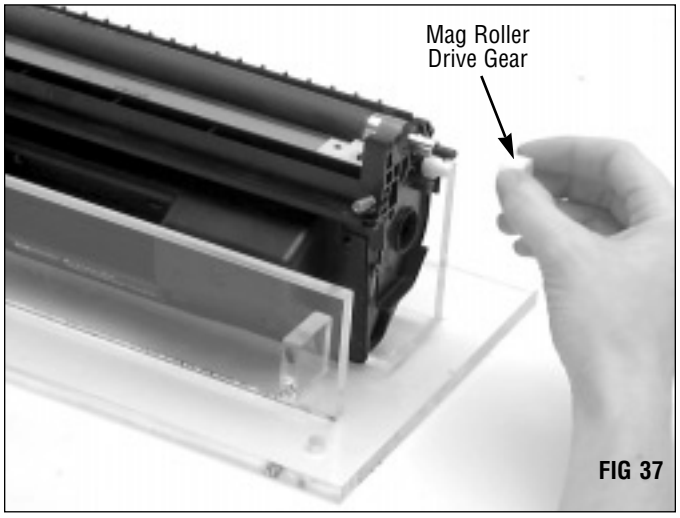


FIG 37

6. **Remove the mag roller.**
Grasp each end of the mag roller as shown in FIG 38 and lift it from the hopper. If you plan to reuse the mag roller, store it on a soft surface.

DO NOT touch the surface of the mag roller with your fingers or scratch the surface. Store the mag roller on a soft surface, but DO NOT stack the rollers on top of each other.

A factory-new Mag Roller Sleeve (4KMDR) is available. *Contact a member of your SCC Sales Team for product availability.*

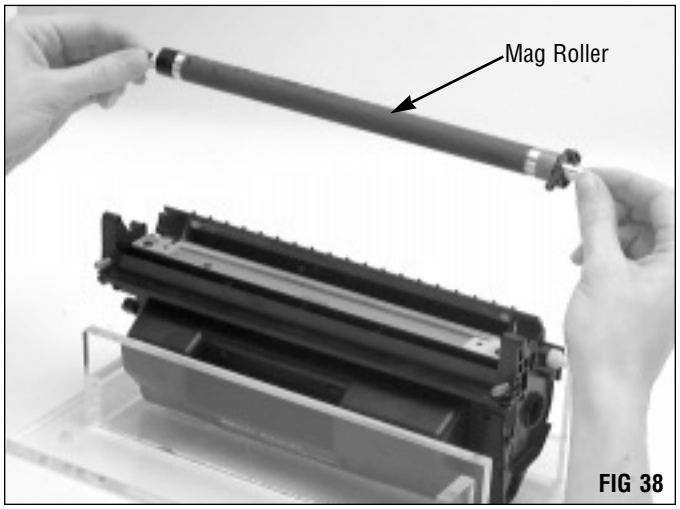


FIG 38

7. **Remove the mag roller bushings and stabilizer (FIG 39).**

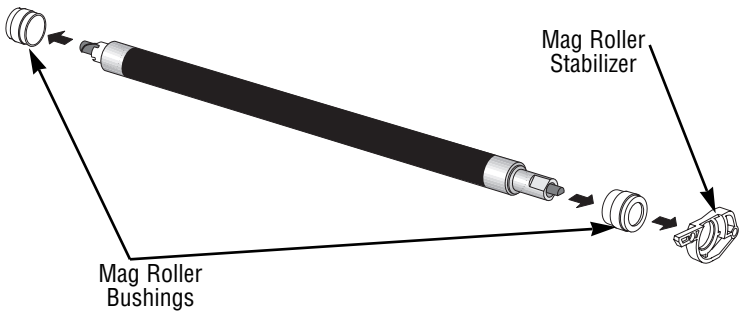


FIG 39

8. **Remove the doctor blade.**
Remove two screws from the doctor blade stamping (FIG 40).

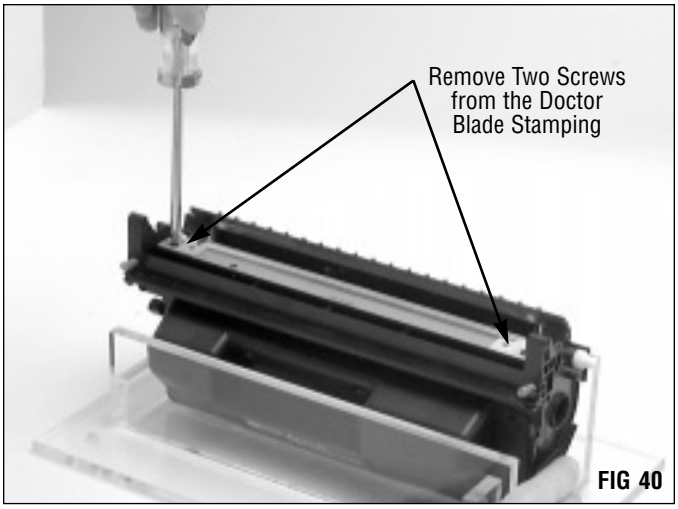


FIG 40

Use a flat blade screwdriver to carefully pry up the ends of the doctor blade and remove (FIG 41). Take care not to break the locator posts on the hopper body.

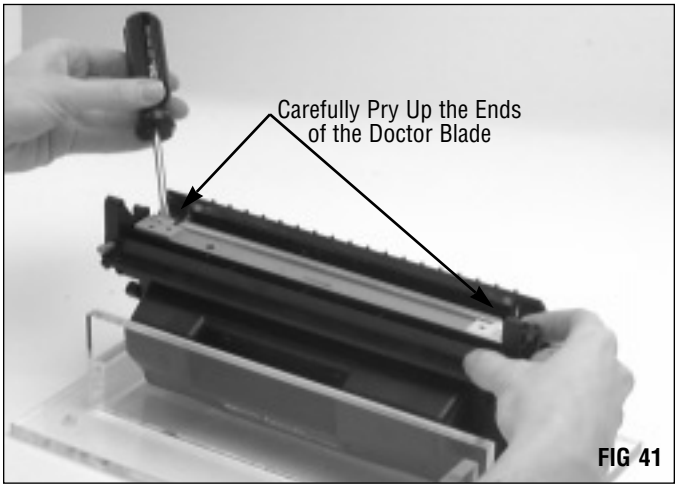


FIG 41

Then, lift the blade from the hopper as shown in FIG 42. Do not lose the plastic wipers on the doctor blade. You will reuse these if you install a replacement blade.

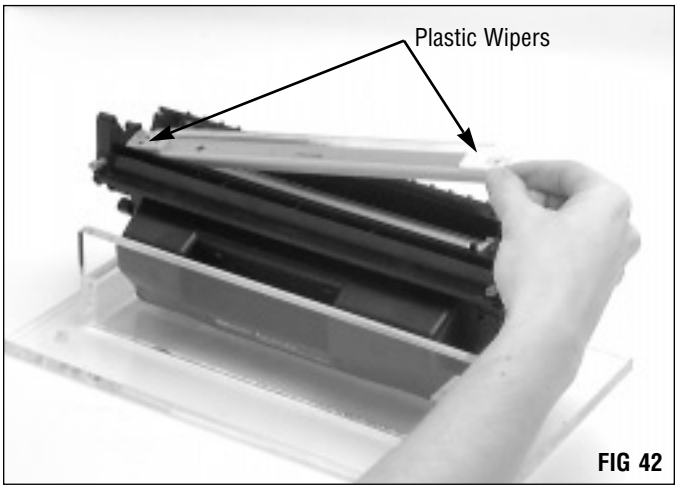


FIG 42

Disassembling the Toner Hopper Section

9. **Clean the hopper.**
   Dump the toner from the hopper and clean thoroughly with dry, filtered compressed air (FIG 43). Clean toner and debris from the foam and felt sealing components.

CAUTION **Take care not to bend the toner agitator bar or toner low sensor bar.**

10. **Inspect the sealing components in the hopper section and replace as required (FIG 44).**
    Foam components such as the Doctor Blade End Foam (LJ4DBEFOAM) and Doctor Blade Sealing Foam (4KDBSFOAM) should display a smooth, clean surface. Make sure the foam materials are secured in the correct position. Replace the foam components that are ripped, pitted or dislodged.

    Mag Roller Sealing End Foams (4KMRSFOAM) should be replaced if torn, pitted or missing. Note that foam replacement requires removal of the mag roller sealing blade.

    The Mag Roller Sealing Blade (LJ4MRSBLADE) should exhibit a smooth, flat surface along the entire length of the blade. Make sure the blade is fully attached to the cartridge and that the ends of the blade overlap the mag roller end magnets. Otherwise leakage can occur.

    Several components listed above were under development at the publishing of this manual. Contact your SCC Sales Team for product availability. Installation instructions are included in the packaging of the individual products.

    The Hopper Compression Springs (4KHCS) should be secured to the mounting posts on the hopper. Stretched or missing compression springs can be the cause of light print problems. To maintain uniform compression on both sides of the hopper, we recommend replacing both springs even if only one spring appears to be damaged or is missing.

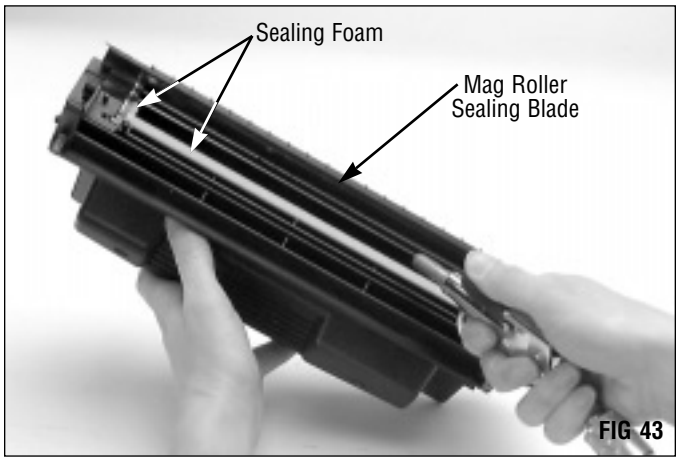


FIG 43

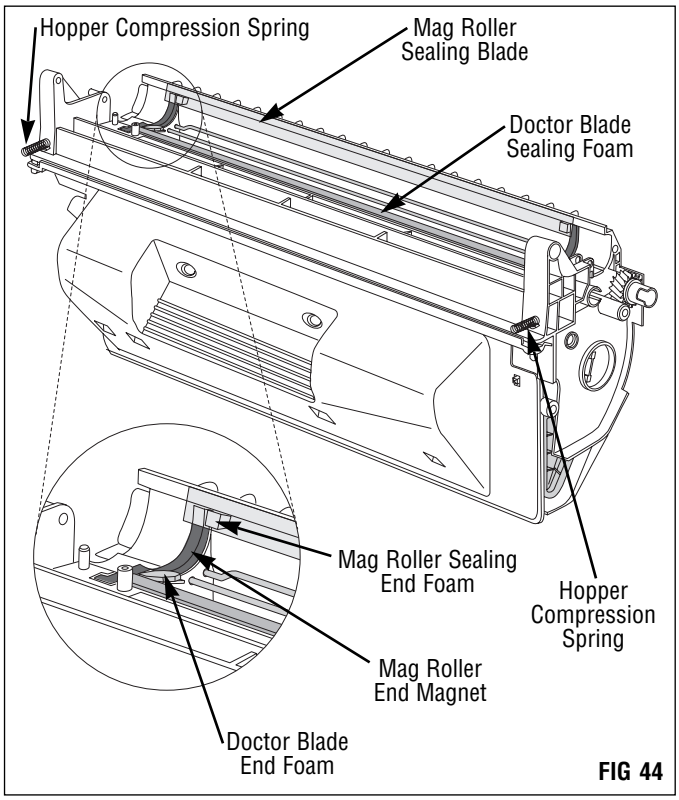


FIG 44

Install a Seal (Optional) and Fill the Hopper

If you plan to ship the cartridge, SCC recommends sealing the hopper as your best protection against toner leakage. The design of the hopper prohibits the use of insertable seals; therefore the hopper should be split and sealed to achieve the most effective seal. For splitting and sealing system information, contact your SCC Sales Team for availability and product information. *For more information regarding HP4000 sealing issues refer to page 3 of SSS 160-E, Critical Issues.*

If you do not seal the cartridge, fill the hopper through the toner port with 500 grams of toner (4K-500B). Due to the potential for leakage, SCC does not recommend shipping unsealed cartridges. *Refer to page 3 of SSS 160-E, Critical Issues, for details regarding cartridge tumble test results.* When filling the cartridge take care not to bend the toner low sensor bar or the agitator bar. After filling the cartridge, follow the hopper assembly instructions in the next section.

Assembling the Toner Hopper Section

1. **Clean and inspect the doctor blade.**
   Replace the Doctor Blade (4KDBLADE) if pre-test prints indicate doctor blade-related print defects. Otherwise, clean the blade with dry, filtered compressed air (FIG 45).

CAUTION Do not use alcohol or alcohol-based cleaners to clean the silicon blade.

If you replace the doctor blade, remove the plastic wipers from the stamping of the old blade and install on the new blade.

Use a flat blade screwdriver to carefully pry the wiper from the stamping (FIG 46).

Install the plastic wipers on the stamping of the new wiper blade when you install the new blade in the hopper, noting the orientation of each wiper (FIG 47). The locating posts and screws used in the next step will secure the wiper.

Note that the plastic wipers are not interchangeable. *Refer to page 4 of SSS 160-B, Cartridge Components for an illustration of the doctor blade and orientation of the plastic wipers.*

2. **Install the doctor blade.**
   Position the doctor blade stamping over the locating posts on the toner hopper section (FIG 48). Secure the blade with two Phillips screws.

3. **Clean and inspect the mag roller.**
   If you plan to reuse the OEM mag roller, clean it with dry, filtered compressed air (FIG 49).

CAUTION Be careful not to scratch the coated surface of the mag roller or touch the surface with your bare fingers.

Replace the mag roller if it is damaged or causes light print problems. SCC offers a replacement factory-new Mag Roller (4KMDR). *Contact a member of your SCC Sales team for product availability.*

4. **Clean the mag roller electrical contact.**
   Clean the wire contact on the mag roller with a cotton swab dampened with 91-99% isopropyl alcohol (FIG 50).

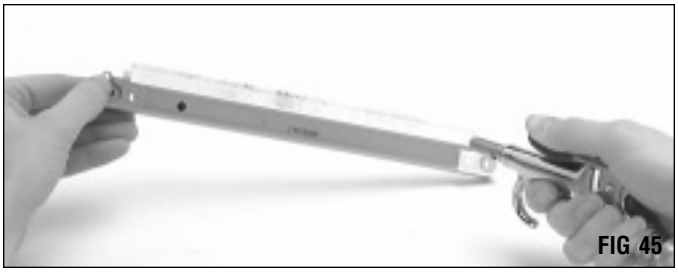


FIG 45

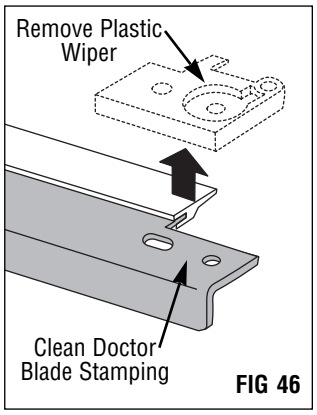


FIG 46

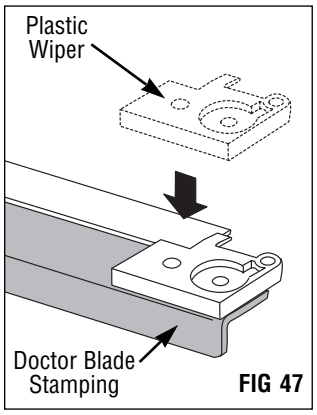


FIG 47

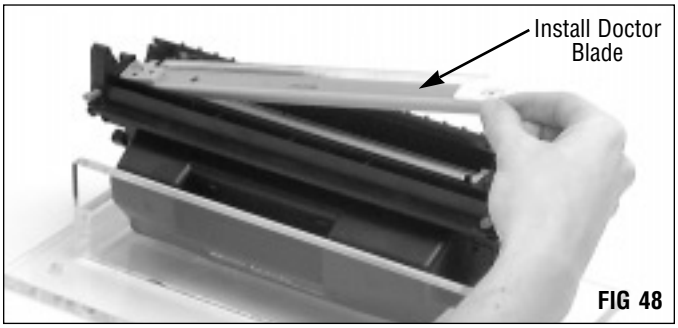


FIG 48

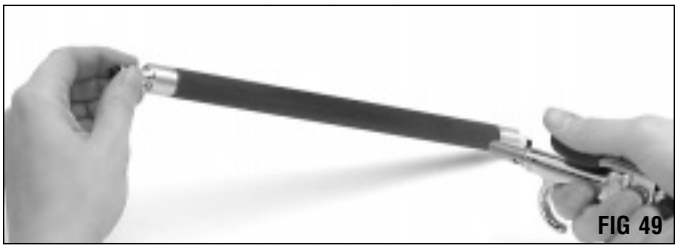


FIG 49

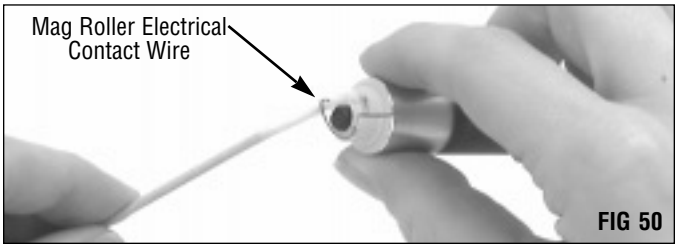


FIG 50

Assembling the Toner Hopper Section

5. **Clean the mag roller bushings.**
Clean the bushings with a Lint-Free Swab (LFSWAB) or a Lint-Free Cleaning Cloth (LFCCLOTH) (FIG 51).

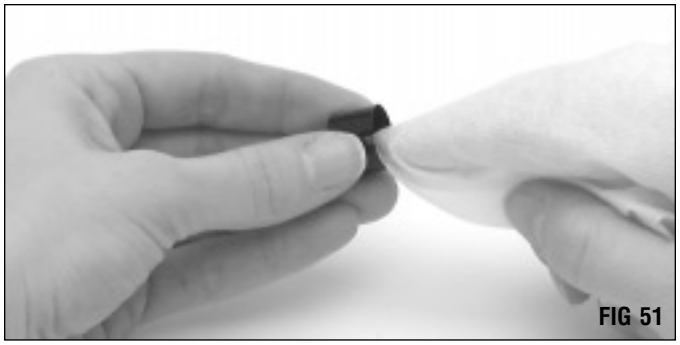


FIG 51

6. **Install the mag roller bushings, stabilizer bearing and stabilizer.**
Note that the green mag roller bushing is installed on the drive gear end of the mag roller; the black bushing is installed on the contact end of the mag roller (FIG 52). Replacement mag roller bushings are under development. *Contact a member of your SCC Sales Team for availability.*

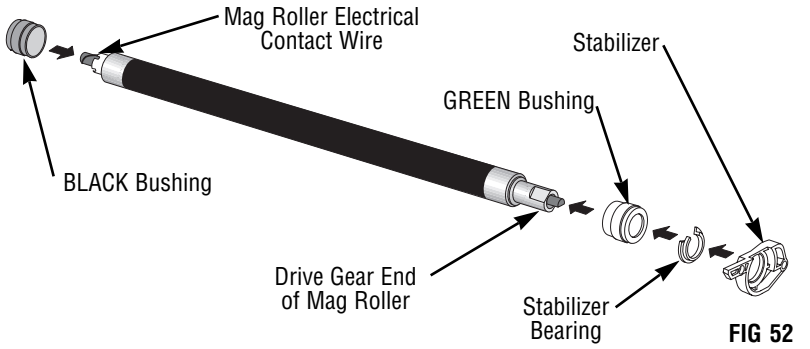


FIG 52

7. **Install the mag roller.**
The mag roller is installed with the electrical contact wire on the contact end of the cartridge and the stabilizer on the drive gear end of the cartridge (FIG 53).

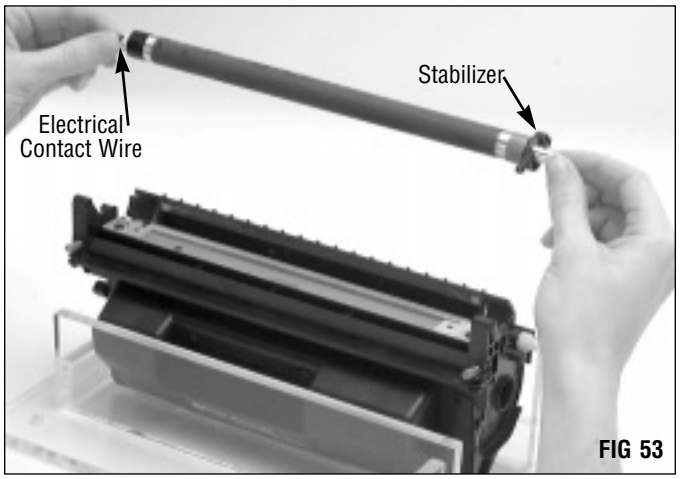


FIG 53

The mag roller stabilizer should seat in a slot in the hopper body as shown in FIG 54.

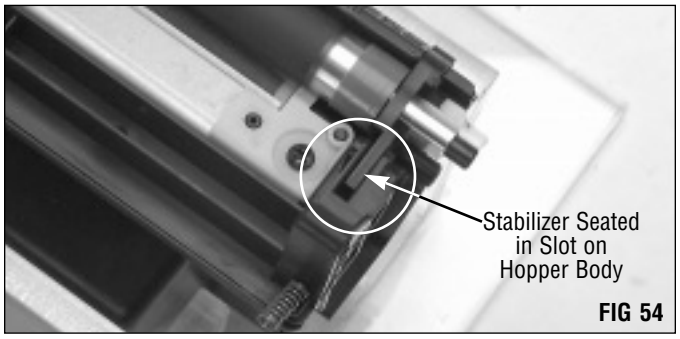


FIG 54

8. **Install the mag roller drive gear (FIG 55).**
Note the proper orientation of the gear. It will fit on the mag roller in either direction. The end of the gear should be flush with the end of the mag roller axle.

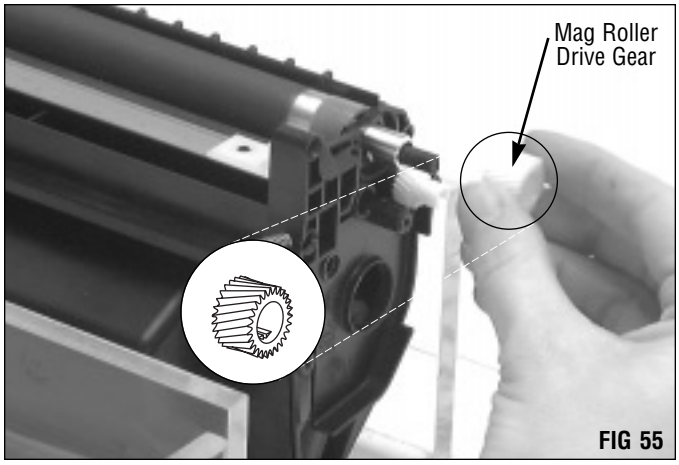


FIG 55

9. **Install the gear housing end plate (FIG 56).**
Note that the gears in the drive train should already be installed and secured in the end plate. The mag roller axle is keyed and fits into a keyed positioner bushing on the end plate. Make sure the mag roller axle is fully installed in the end plate.

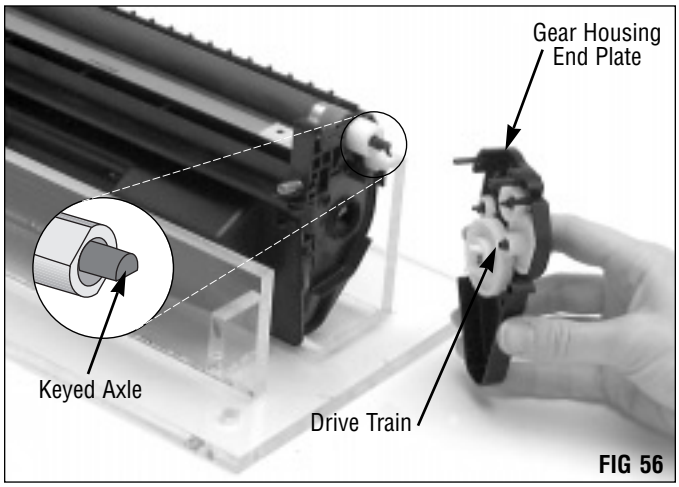


FIG 56

Secure the end plate with two Phillips screws (FIG 57).

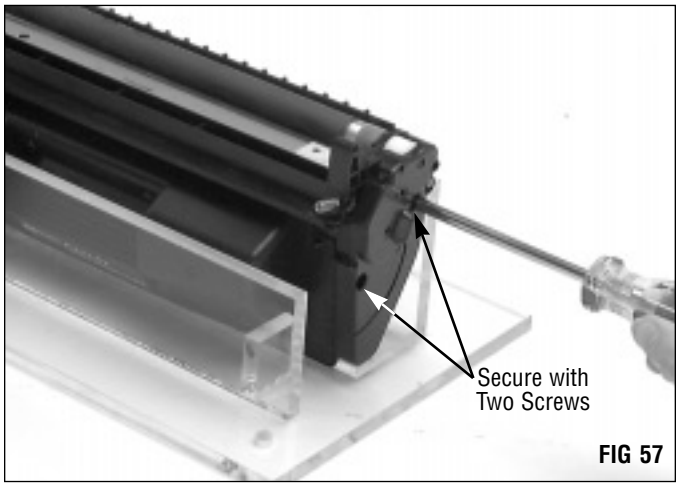


FIG 57

Assembling the Toner Hopper Section

10. Clean the mag roller electrical contact.
The contact is located in the mag roller end plate. Clean the contact with a Lint-free Swab (LFSWAB) dampened with isopropyl alcohol (FIG 58).

Apply a thin layer of Conductive Cartridge Lubricant (CONCLUBE) to the electrical contact (FIG 59). Use the wooden end of a swab as an applicator. For additional information about the use and application of cartridge lubricant, refer to SSS 100, *Cleaning Tools, Tips and Techniques*.

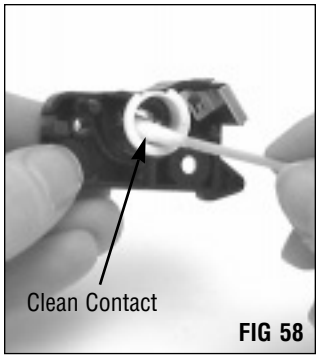


FIG 58

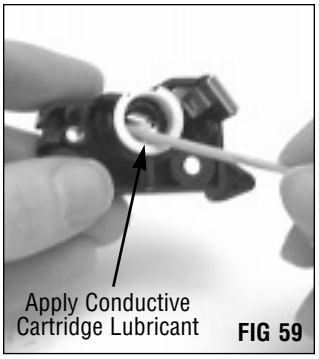


FIG 59

11. Make sure the mag roller end plate is completely assembled.
A white bearing installed in the mag roller end plate is easily lost when the cartridge is disassembled. Make sure the bearing is properly installed on the end plate, as illustrated in FIG 60.

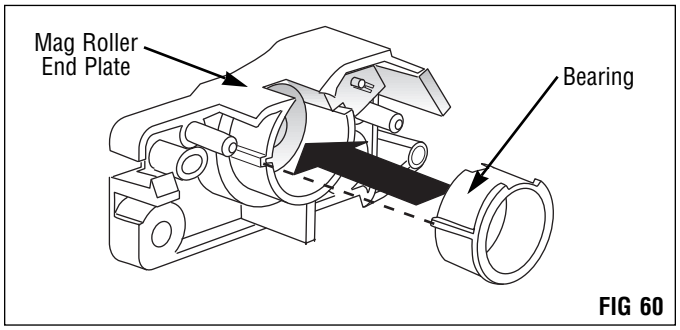


FIG 60

12. Install the mag roller end plate (FIG 61).
The locking clip on plate should lock into place on the hopper body (FIG 62).

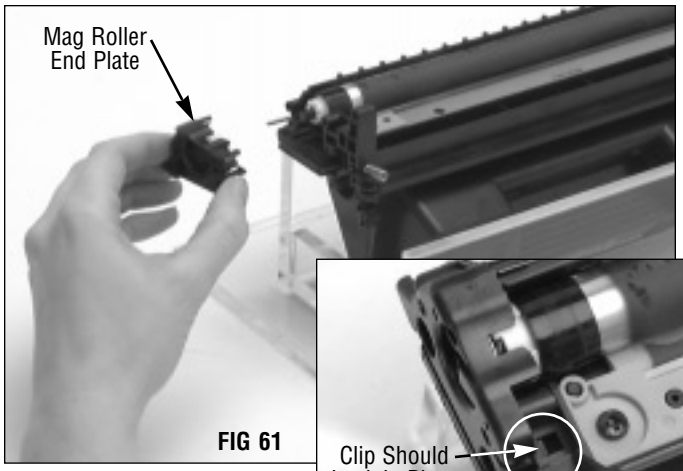


FIG 61

FIG 62

Secure the end plate with two screws (FIG 63).

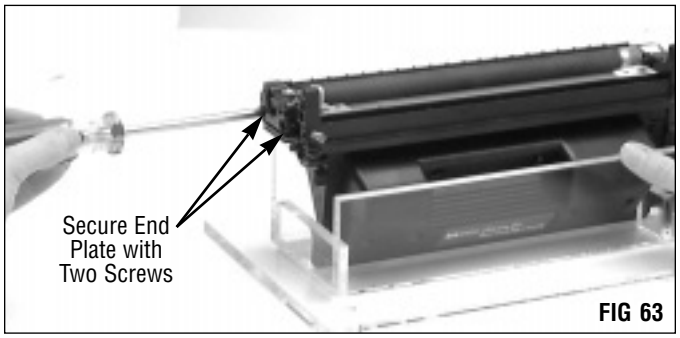


FIG 63

13. Install a Drum Shutter Felt (4LDSFELT).
Installing a drum shutter felt can minimize damage to the drum caused by the drum shutter. For best installation results, remove the drum shutter from the toner hopper section, as shown.

Remove the release liner from the drum shutter felt (FIG 64).

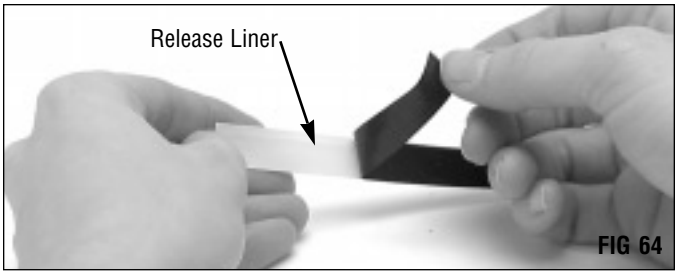


FIG 64

Center the felt on the inside of the shutter as shown in FIG 65 and align the long edge of the felt with the long edge of the shutter. An installed felt is shown in FIG 66.

Complete installation instructions are included with the drum shutter felt packaging.

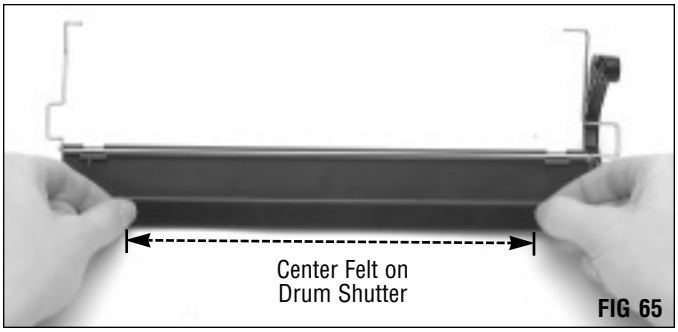


FIG 65

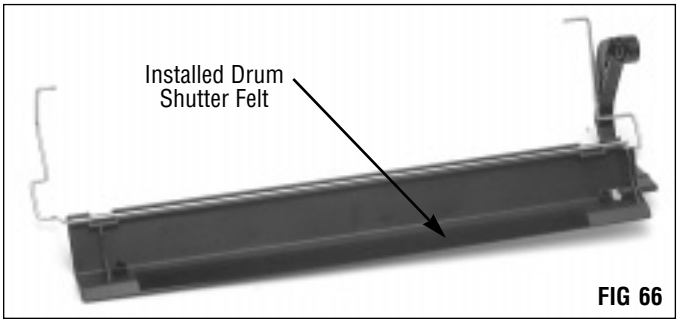


FIG 66

14. Install the drum shutter.
First, make sure the Actuator Arm Spring (4KDSAS) is properly positioned in the actuator arm as shown in FIG 67A. A replacement spring is available if the original spring is lost or damaged.

Position the shutter underneath the hopper as shown in FIG 67. Install the drum shutter support arm in the keyed positioner bushing on the gear housing end plate (FIG 67 inset).

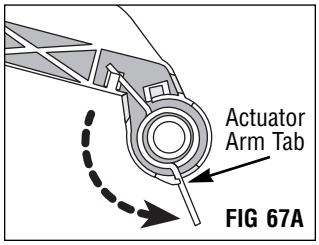


FIG 67A

Use a Pair of Needlenose Pliers to Rotate the Leg of the Spring and Set it Behind the Tab.

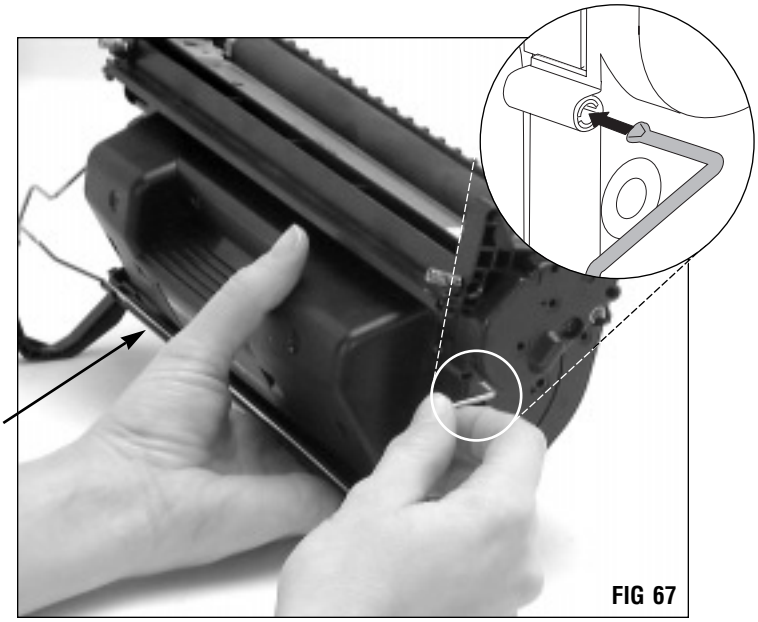


FIG 67

Assembling the Toner Hopper Section

At the opposite end of the hopper, install the support arm in the corresponding receptacle on the hopper body (FIG 68).

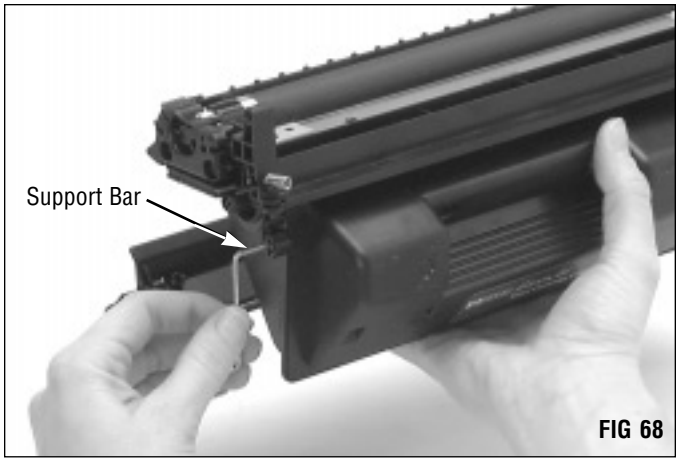


FIG 68

Install the actuator arm. A locking clip holds the arm in place on the hopper body; make sure the actuator arm snaps securely in place (FIG 69).


FIG 69

Rotate the actuator arm until the spring is positioned to the right of the support bar on the hopper body (FIG 70).

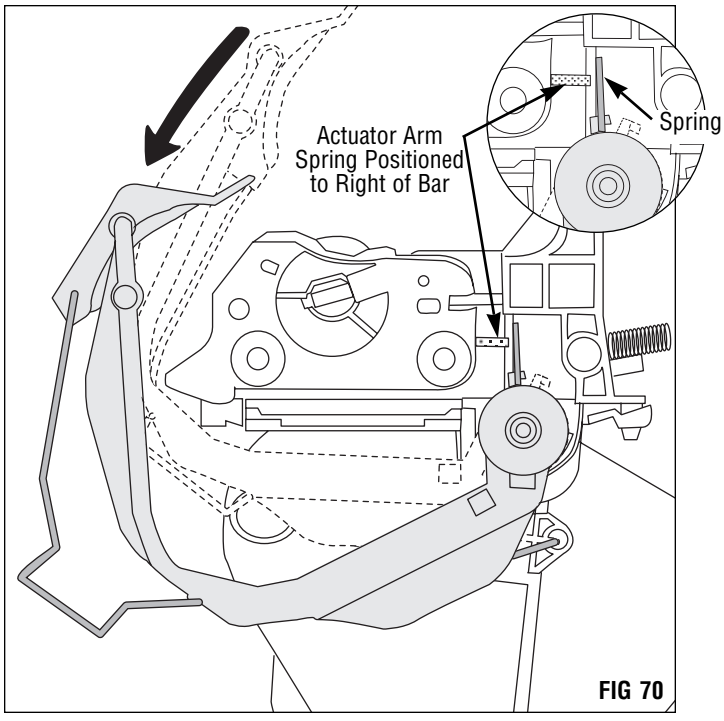


FIG 70

Using a pair of needlenose pliers, pull the end of the actuator arm spring over to the support bar (FIGs 71 and 72).

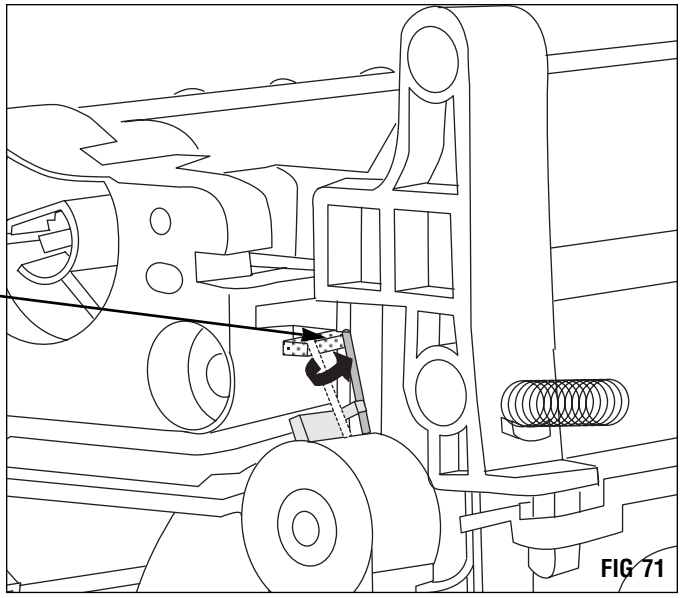


FIG 71

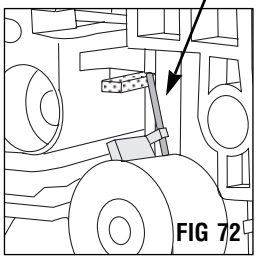


FIG 72

With the end of the spring seated against the support bar, tension is applied to the actuator arm allowing the drum shutter to close automatically (FIG 73).

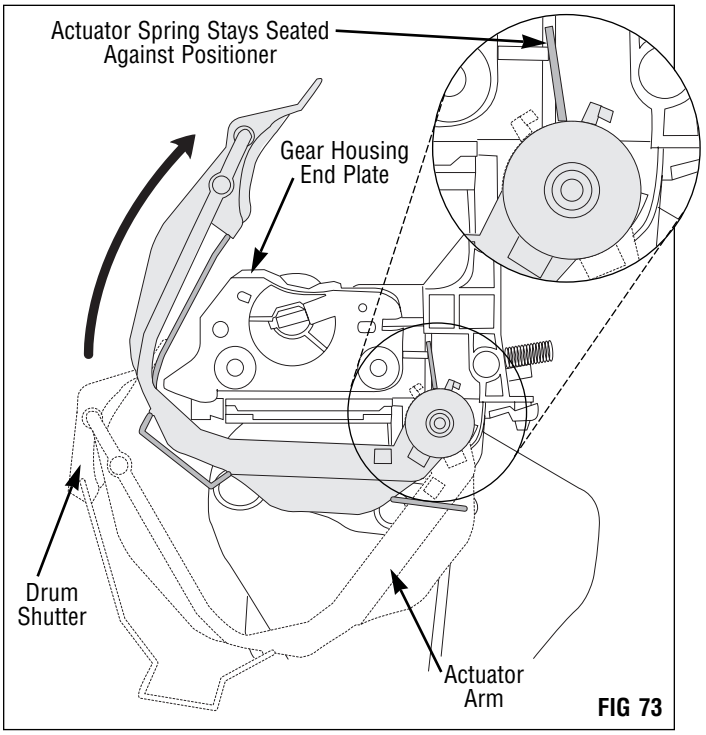


FIG 73

Disassembling/Assembling the Waste Bin Section

1. **Remove the wiper blade.**
   Remove two screws that secure the wiper blade (FIG 74).

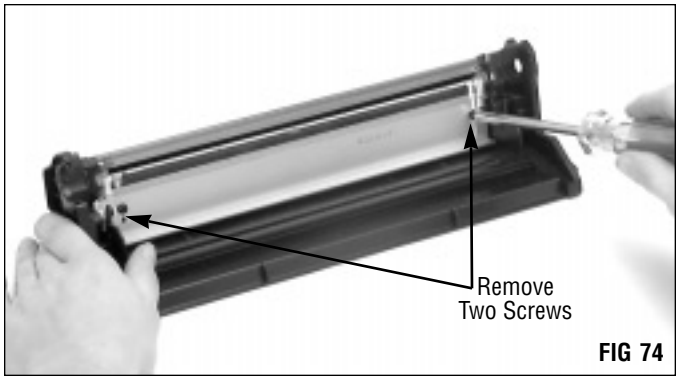


FIG 74

   Use a pair of needlenose pliers to grasp the stamping and remove the wiper blade from the waste bin (FIG 75).

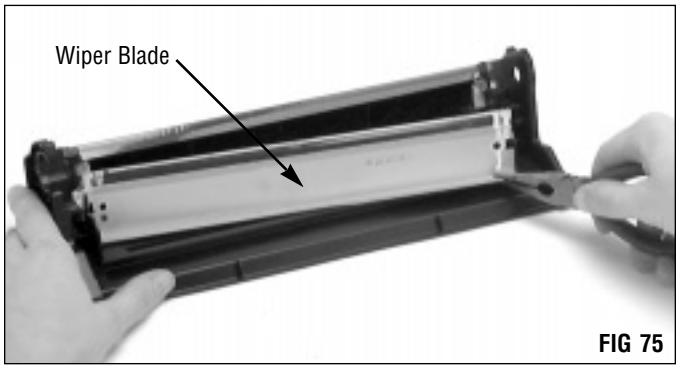


FIG 75

2. **Clean the waste bin with dry, filtered compressed air.**
   Direct compressed air on and around foam and felt sealing components to remove as much toner and debris as possible (FIG 76).

CAUTION **Take care not to bend or dislodge the recovery blade.**

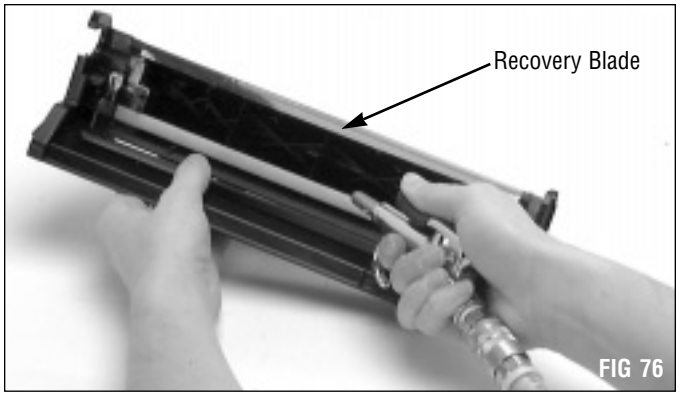


FIG 76

3. **Clean the PCR saddles.**
   Clean toner residue from the saddles with a Lint-Free Swab (LFSWAB) or Cotton Swab (QTIP) dampened with 91-99% isopropyl alcohol (FIG 77).

CAUTION **Do not apply conductive lubricant to the PCR saddles.**


FIG 77

4. **Inspect the wiper blade sealing foam, recovery blade, wiper blade end foams and wiper blade end felts (FIG 78).**
Foam components, such as the Wiper Blade Sealing Foam (4KWBSFOAM) and Wiper Blade End Foam (4KWBEFOAM) should display a smooth surface without pits or tears in the material. Replace the foam if damaged or missing. Tears in the material can allow toner leakage.

   Felt components, such as the Wiper Blade End Felts (4KWBEFELT), should appear clean, intact and secured to the cartridge. Replace the felts that are compacted with toner or display a shiny surface. Make sure the felt is securely attached to the cartridge. The wiper blade end felt and foam are also packaged together in a kit (4KWBEFMKT).

   The recovery blade should display a smooth, flat surface without kinks or waviness along the edge. Replace the Recovery Blade (LJ4RECBLADE-Mylar or PRECB-LJ4-Poly) if it is damaged, dislodged or missing.

   Contact your SCC Sales Team for availability of those products mentioned as "under development". Complete instructions detailing the installation of the components mentioned above are included with the product.

5. **Clean and inspect the wiper blade.**
To avoid damaging the working edge of the blade, SCC recommends cleaning the wiper blade only with dry, filtered compressed air (FIG 79). For best results, replace the Wiper Blade (4KBLADE) each time you replace the drum.

CAUTION For best results, we do not recommend using alcohol or any alcohol-based solvent to clean the polyurethane blade.

6. **Dip the edge of the wiper blade in Kynar.**
Kynar® Lubricating Powder (KPOW) applied to the working edge of the blade will help prevent blade "flip overs" during the first drum rotations of the remanufactured cartridge. Pad the wiper blade regardless of whether you are using a new replacement blade or reusing the old blade.

   Dip the edge of the blade in a long, shallow container of Kynar lubricating powder as shown in FIG 80. Examine the blade to ensure even coverage. Repeat.

7. **Install the wiper blade.**
Position the wiper blade stamping over the locating posts in the waste bin (FIG 81).

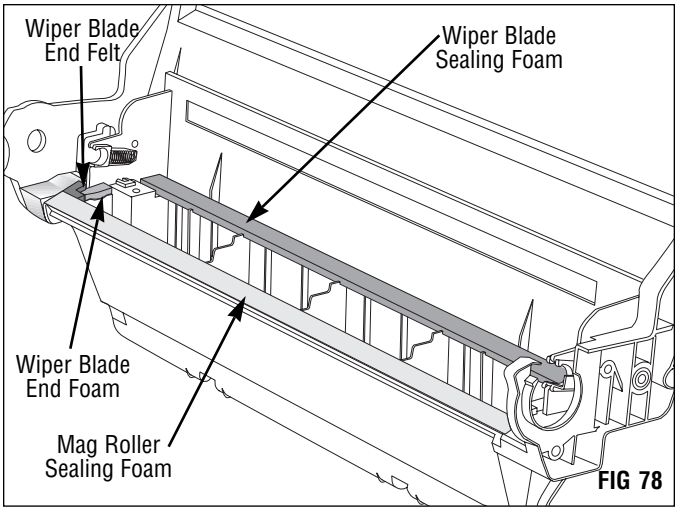


FIG 78


FIG 79

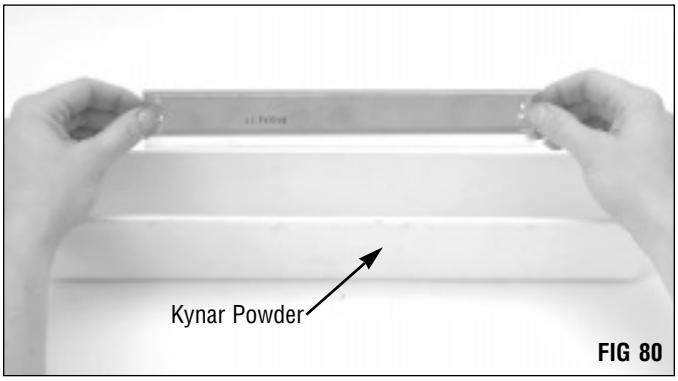


FIG 80

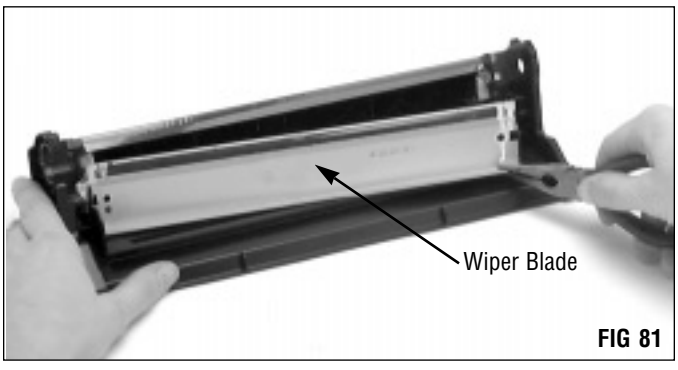


FIG 81

Disassembling/Assembling the Waste Bin Section

Secure the wiper blade with two screws (FIG 82).

8. **Clean and inspect the PCR.**
If you are reusing the OEM PCR, clean the roller using a soft, lint-free cloth dampened with water.

Gently wipe the PCR in one direction. Be careful not to pinch or dent the surface of the PCR, as the material has poor memory (FIG 83).

Concentric wear lines can contribute to print defects. *For additional information regarding the PCR, refer to page 1 of SSS 160-E, Critical Issues.*

A dedicated replacement for the HP4000 PCR is under development. We have qualified our 5/15 cycle recoated NX PCR in the HP4000 application. Although the shaft length of the NX PCR is shorter and allows lateral movement of the PCR in its mounting saddles, this has not created any imaging problems during extensive testing. *For additional information, refer to page 4 of SSS 160-E, Critical Issues.*

9. **Install the PCR (FIG 84).**
The PCR shafts should be firmly installed in the PCR saddles at each end of the waste bin.

10. **Clean and evaluate the drum.**
If you plan to reuse the drum, clean it with compressed air or a soft, lint-free cloth (FIG 85).

To minimize the risk of second cycle failures, we recommend replacing the OEM drum after the OEM cycle with SCC's system-qualified geared Odyssey™ OPC (OS4KDRGR) or geared Odyssey drum with silencer insert (OS4KDRGR-1) and after each remanufacturing cycle. (A member of your SCC Sales Team can help you select the drum that is best for your HP4000 application.)

If you are using a PCR other than the HP4000 OEM PCR, we recommend using an aftermarket drum with a drum silencer insert to eliminate humming/whining noises. *For additional information regarding the drum insert, refer to page 1 of SSS 160-E, Critical Issues.*

IMPORTANT For best results, do not use cleaning agents or coatings on the drum. Be careful not to nick the surface of the drum with the air nozzle.

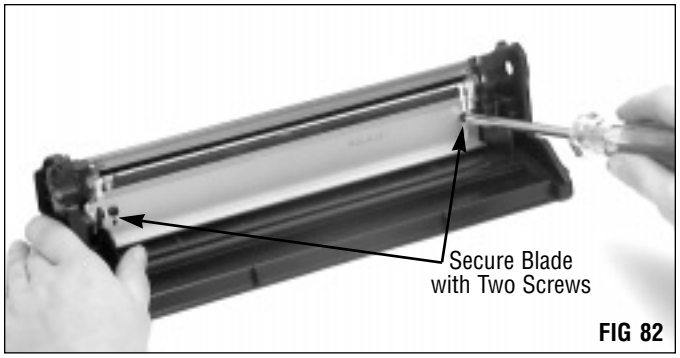


FIG 82

FIG 83

FIG 84


FIG 85

11. **Pad the coated area of the drum with Kynar Lubricating Powder (KPOW).**
Be careful to avoid powder on the gears (FIG 86).

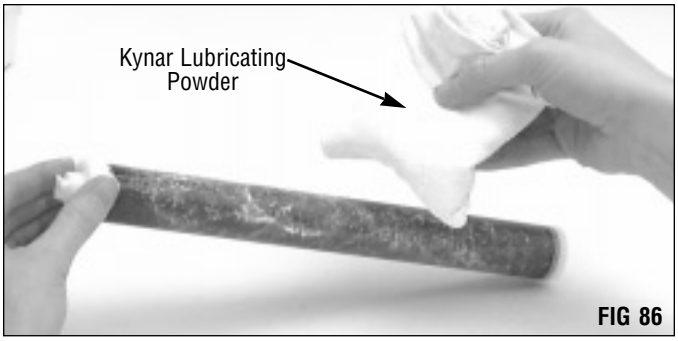


FIG 86

12. **Install the drum.**
Position the drum in the waste bin with the helical gear on the left as shown in FIG 87.

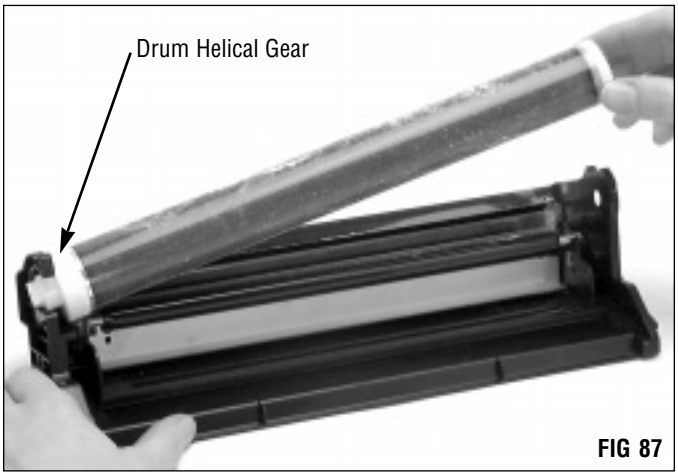


FIG 87

13. **Install the waste bin bearing plate.**
Note the orientation of the plate in FIG 89; secure the plate to the waste bin with two screws (FIG 90).

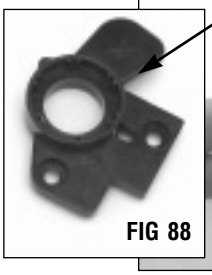


FIG 88

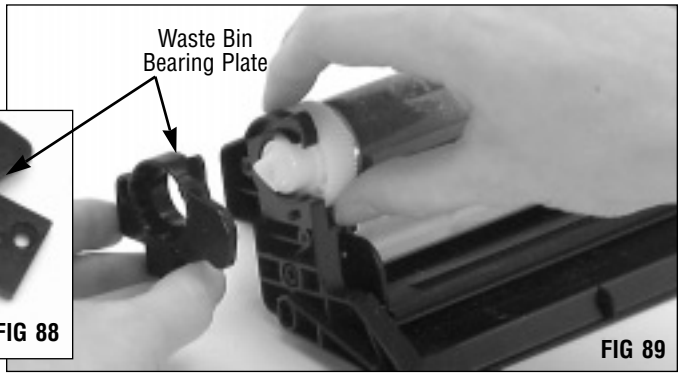


FIG 89

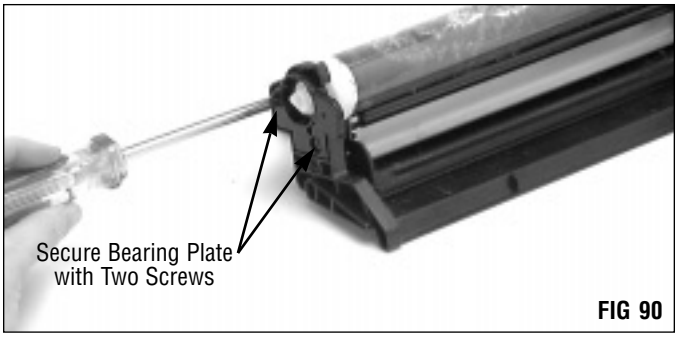


FIG 90

Disassembling/Assembling the Waste Bin Section

14. Install the drum spur gear axle.
Install the drum axle in the waste bin housing (FIG 92).

It is important to properly seat the drum spur axle against the waste bin housing before tightening the screws. The step on the inside of the axle should mate with the step on the waste bin housing as shown in FIG 92A. When the end plate is correctly installed, the positioning post on the waste bin housing will align in the center of the oblong slot in the end plate as shown FIG 92B.

Improperly seated axles may cause print defects. *Refer to SSS 160-E, Critical Issues for important details.*

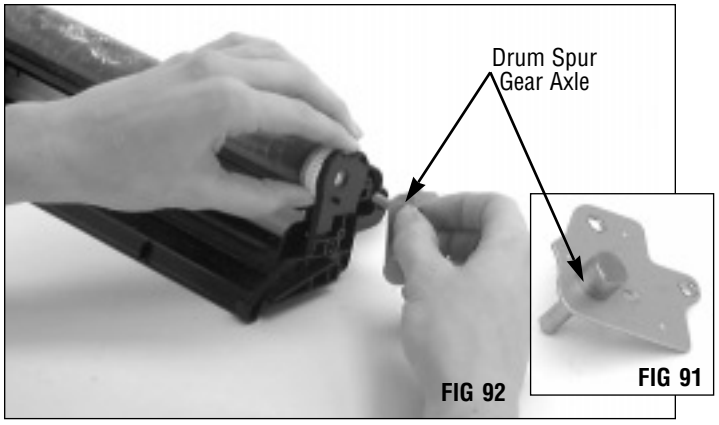


FIG 92

FIG 91

Drum Axle Seated Correctly

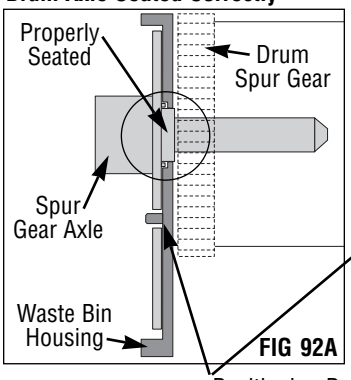


FIG 92A

Positioning Post Aligned Correctly

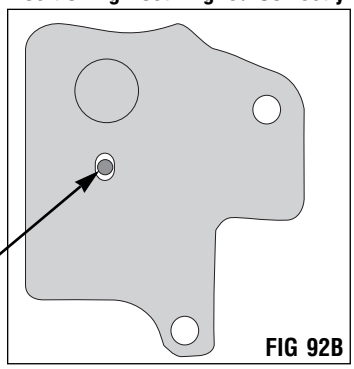


FIG 92B

Positioning Post Aligned in
Center of Oblong Slot

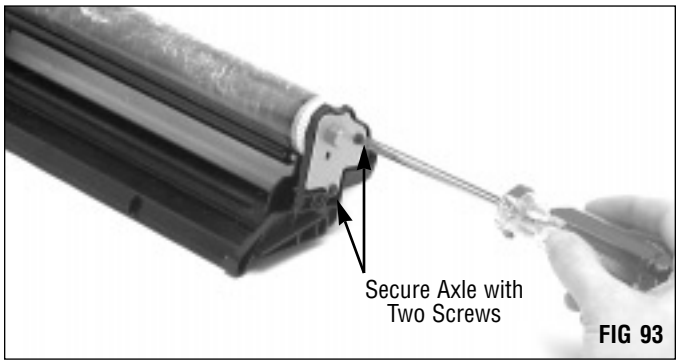


FIG 93

15. Rotate the drum.
Rotate the drum in its normal rotational direction, as indicated by the arrow in FIG 94, at least six full drum rotations. Rotating the drum will help lubricate the wiper blade and prevent the potential of blade "flip overs". The lubricating powder wiped from the drum by the wiper blade will deposit in the waste bin.


FIG 94

16. Wipe the lubricating powder from PCR.
After you have rotated the drum to remove the powder, rotate the drum again in small increments to clean the Kynar from the PCR. As you rotate the drum in its normal rotational direction, wipe the powder from the PCR with a Lint-Free Cleaning Cloth (LFCCLOTH) as shown in FIG 95.

You can also use dry, filtered compressed air instead of the lint-free cloth to remove the powder from the PCR.

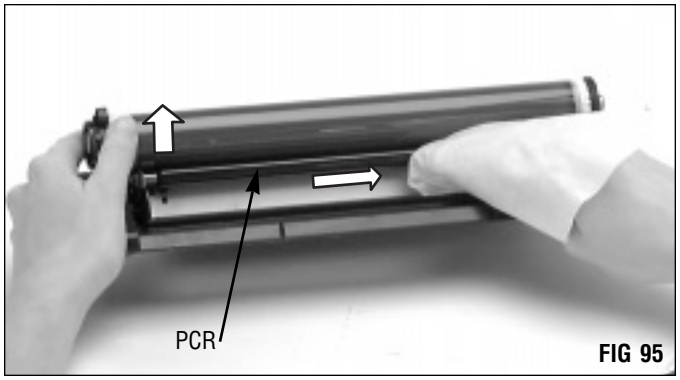


FIG 95

IMPORTANT Make sure there is no lubricating powder present on the PCR, otherwise repeating voids in solid print areas at the PCR interval may result.

Assembling the Cartridge

1. **Bring the cartridge sections together.**
   Hold the drum shutter in the "open" position as shown in FIG 96. Bring the sections together.

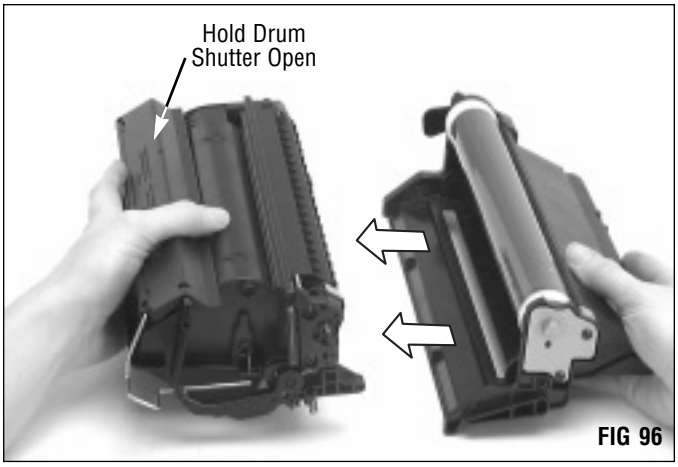


FIG 96

2. **Close the drum shutter (FIG 97).**


FIG 97

3. **Install the cartridge pins (FIGs 99 and 100).**
   To facilitate disassembly during subsequent remanufacturing cycles, use SCC HP4000 Cartridge Pins (4KPIN) to rejoin the cartridge sections. SCC's cartridge pins, designed specifically for the HP4000 cartridge, can be removed easily using a pair of side cutters. After installing the cartridge pins, make sure the hopper compression springs are in their correct position

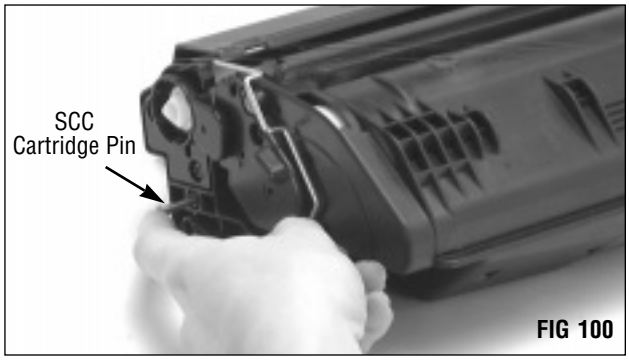


FIG 100

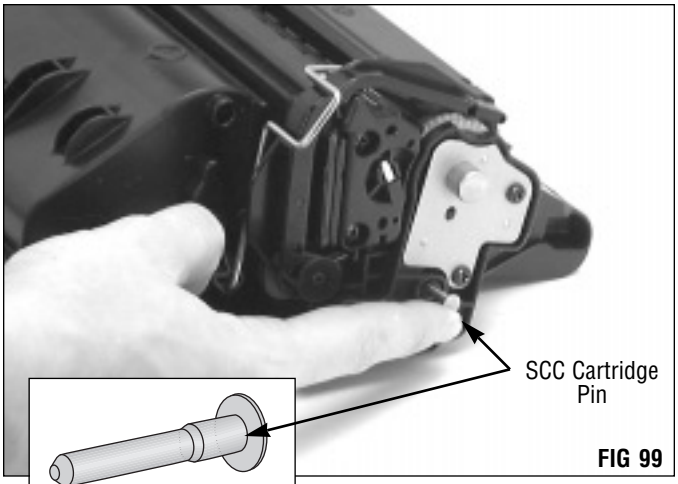
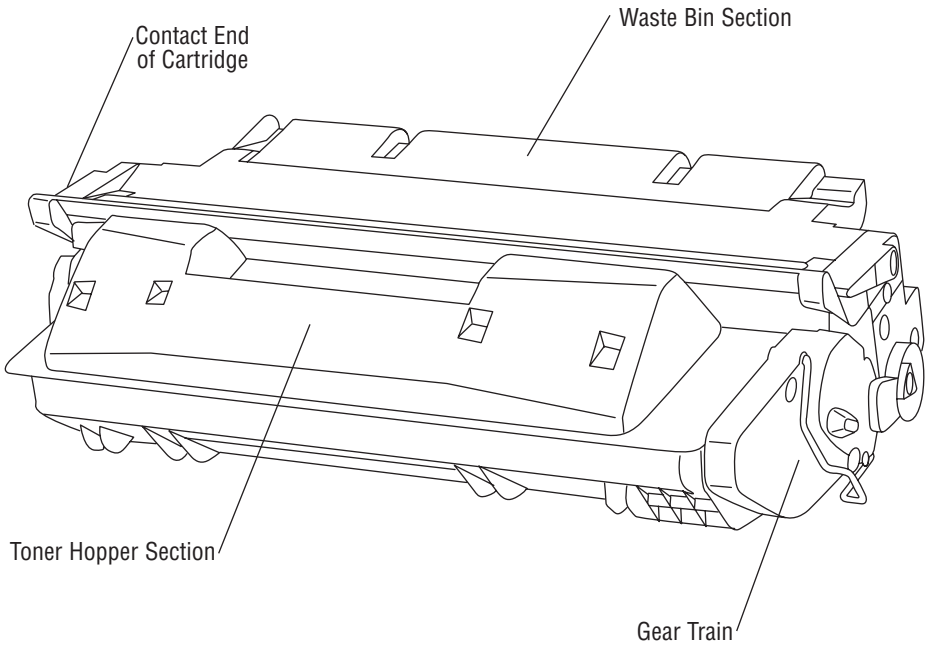


FIG 99

FIG 98

Hewlett Packard® LaserJet® 4000 (HP4000)
Cartridge Components

Top View of Cartridge



This fully illustrated **Cartridge Components** *guide gives you a complete breakdown of all cartridge components, along with component terms and definitions. Use the illustrations for training or referencing replacement components.*

Table of Contents

World Wide Web

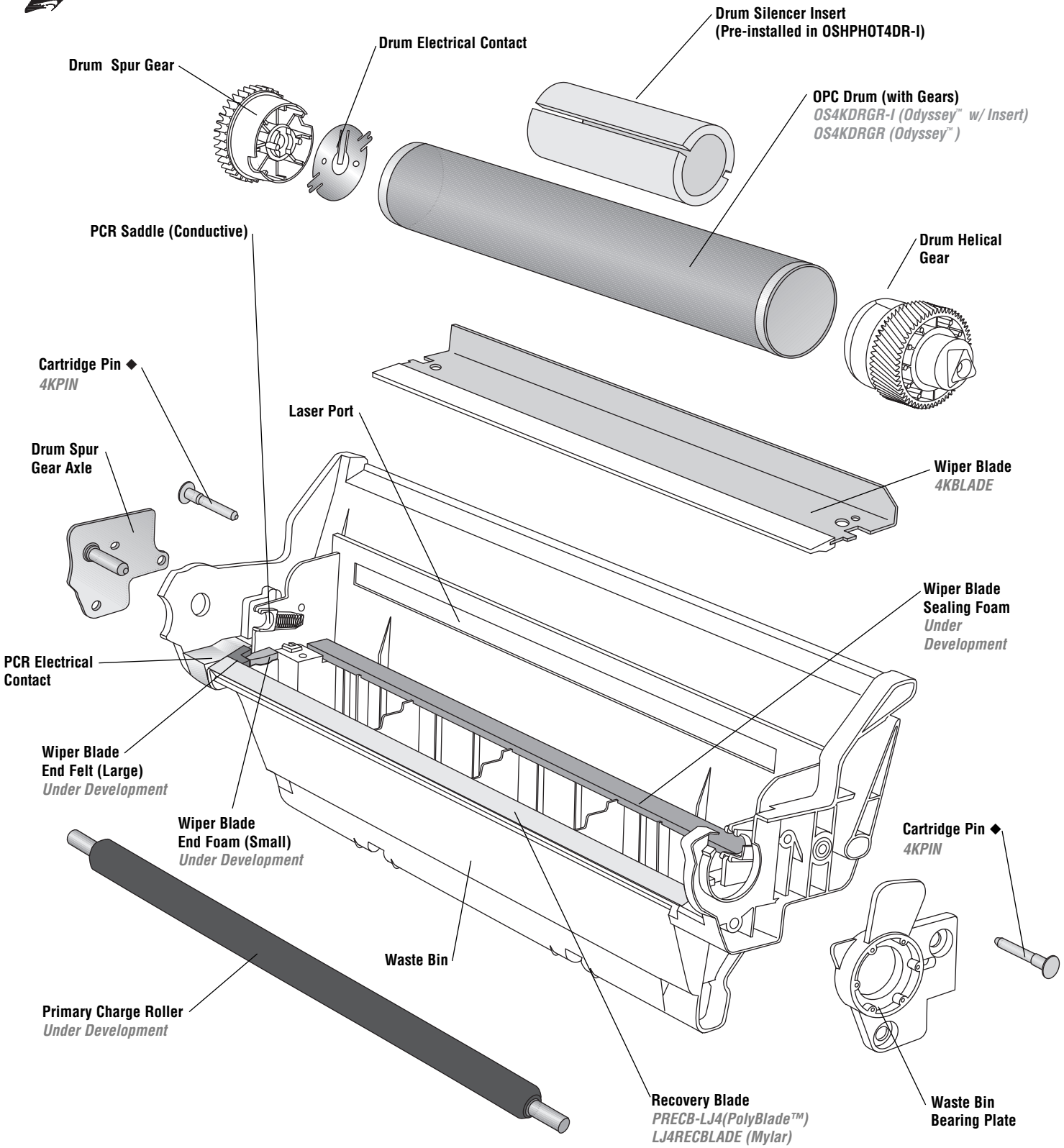
www.scc-inc.com

If you need technical assistance or additional information about products listed in this document, please contact the Technical Support Group or SCC Sales Team.

1.800.948.1072 (USA)
+44 (0) 118 935 1888 (UK)
email: techservices@scc-inc.com

first edition

Waste Bin Section–Terms and Definitions



◆ **Tool, Kit or System Available. Contact your SCC Sales Team.** *SCC PARTS INDICATED IN GRAY.*

Cartridge Pins (2)
Installed at each end of the cartridge to hold the waste bin and toner hopper sections together.

Drum Spur Gear Axle
Installed at the contact end of the waste bin section to provide support for the gear.

Drum Electrical Contact
Provides electrical contact between the drum and printer; makes contact with the drum spur gear axle when it is installed in the drum.

Drum Gears (Helical and Spur)
The spur gear, located at the contact end of the waste bin section, houses the drum electrical contact. The other gear is the helical gear.

Drum Silencer Insert
Installed in the drum to dampen drum vibrations that result in humming noises.

Laser Port
An opening in the waste bin section through which the laser from the printer writes to the drum in the cartridge.

Organic Photo Conductor (OPC) Drum
An aluminum cylinder coated with light-sensitive organic photoconductive material used to retain an image written to it by a laser beam. (Also called OPC, drum, photoreceptor)

Primary Charge Roller
Uniformly charges the OPC drum. (Also called PCR, charge roller)

PCR Electrical Contact
Provides electrical contact between the printer and the PCR.

PCR Saddles
Two saddles support the PCR at each end of the shaft. One saddle, located at the contact end of the cartridge, is made of conductive material. The other saddle is non-conductive. The springs at the base of the saddles maintain tension on the PCR so that it will make constant and uniform contact with the drum.

Recovery Blade
Acts as a dam at the base of the waste bin, keeping the toner from falling out of the waste bin onto the paper. (Also called catcher blade, scavenger blade)

Waste Bin
A receptacle that catches toner wiped from the drum. (Also called waste hopper or dust bin)

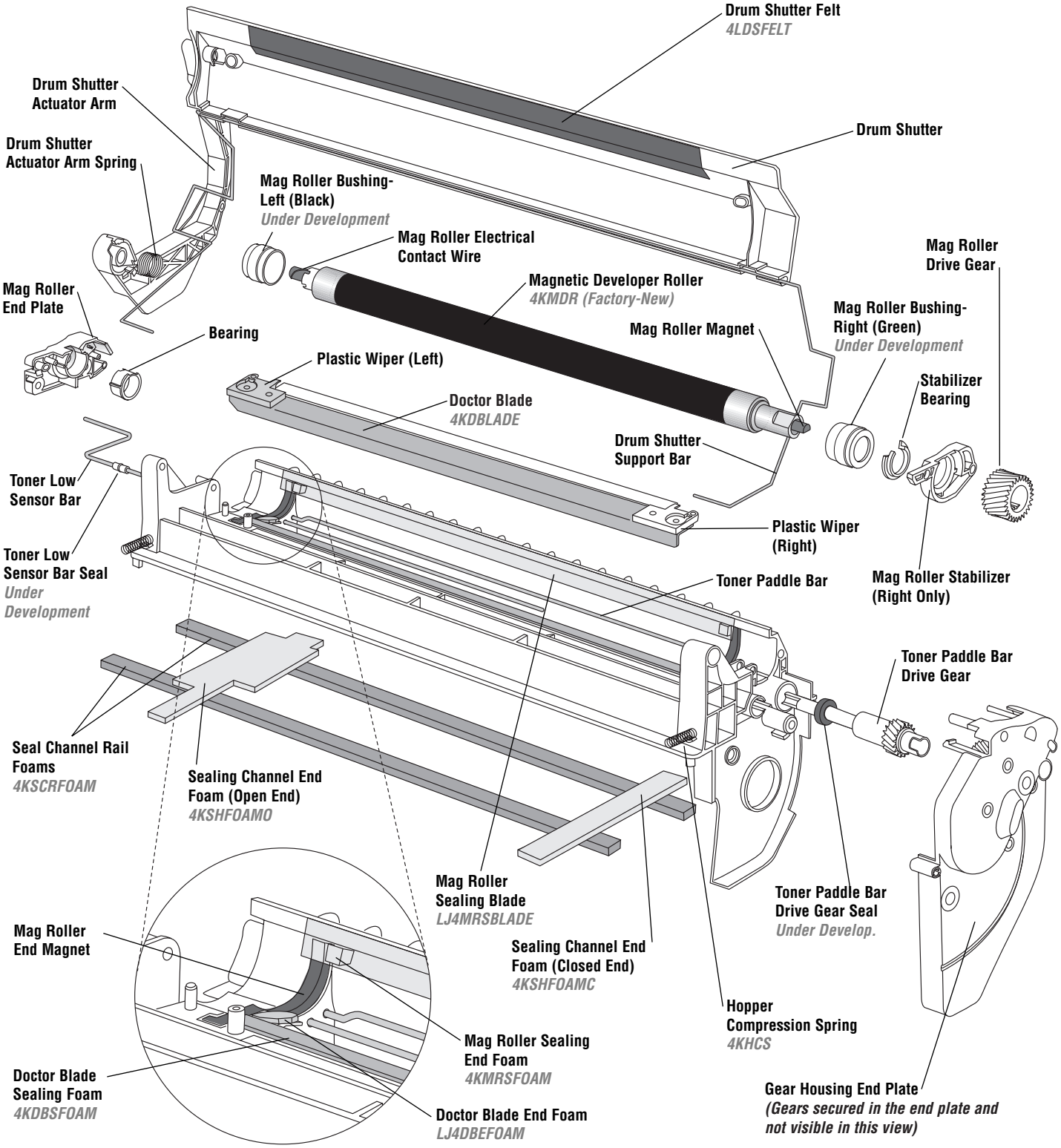
Waste Bin Bearing Plate
Serves as a bearing surface and supports the drum drive (helical) gear.

Wiper Blade
Cleans the drum by wiping away toner that was not transferred to the paper. Constructed of a metal stamping (base) and polyurethane blade. (Also called cleaning blade)

Wiper Blade End Foam and Felt
Layers of foam and felt seal the area at the ends of the wiper blade; prevents leakage from the waste bin.

Wiper Blade Sealing Foam
A strip of foam that seals the area between the wiper blade and waste bin; prevents leakage from the waste bin.

Mag Roller Housing–Terms and Definitions



◆ **Tool, Kit or System Available. Contact your SCC Sales Team.** ***SCC PARTS INDICATED IN GRAY.***

Doctor Blade
Uniformly meters the amount of toner on the mag roller. The doctor blade is constructed of a metal stamping (base) and a flexible blade. (Also called metering blade)

Doctor Blade End Foam
Small half moon-shaped pieces of foam that seal the ends of the doctor blade and prevent leakage from the toner hopper.

Doctor Blade Sealing Foam
A strip of foam that seals the area between doctor blade stamping and mag roller housing; prevents leakage from the toner hopper.

Drum Shutter
Protects the drum from light damage when the cartridge is out of the printer. When the cartridge is installed in the printer, the shutter opens so that the drum is exposed to the paper.

Drum Shutter Actuator Arm
Opens the drum shutter when the cartridge is installed in the printer.

Drum Shutter Actuator Arm Spring
Installed in the actuator arm to provide tension to the drum shutter.

Drum Shutter Felt
Shutter felt is an aftermarket component installed on the interior of the drum shutter. It protects the drum from potential damage caused by the opening and closing of the shutter.

Drum Shutter Support Bar
Supports the length of the drum shutter; the ends of the bar are installed at the ends of the cartridge.

Gear Housing End Plate
A removable end plate that covers the drive train on the mag roller section of the cartridge. The end plate also provides a positioner bushing that supports the magnet inside the mag roller sleeve and keeps the magnet stationary.

Hopper Compression Spring
Two springs attached to the hopper section to apply pressure to the waste bin so that the drum is properly seated on the mag roller bushings, maintaining the proper air gap between the drum and mag roller.

Magnetic Developer Roller
A rotating coated aluminum sleeve around a stationary magnet. The mag roller attracts toner magnetically and applied AC/DC voltage charges the toner and transfers it to the OPC. A doctor blade meters the toner before it is delivered to the OPC. (Also called mag roller, developer roller)

Mag Roller Bushing (Left/Right)
Placed on each end of the mag roller sleeve to establish a consistent air gap between the mag roller and drum when the cartridge is assembled. The black bushing is installed on the contact end of the mag roller sleeve; the green bushing is installed on the non-contact end of the mag roller sleeve. For best results, do not interchange the bushings.

Mag Roller Drive Gear
Rotates the mag roller sleeve around the permanent magnet.

Mag Roller Electrical Contact Wire
Installed on the end of the mag roller sleeve; contacts the metal contact plate in the mag roller end plate and provides electrical contact between the mag roller and printer.

Mag Roller End Magnet
The end magnets use a magnetic field to contain toner in the hopper. Functions similar to the mag roller felts in providing protection against leakage from the hopper during cartridge operation.

Mag Roller End Plate
Installed on the left side of the assembled hopper section to cover the end of the mag roller. The mag roller electrical contact is housed in this end plate.

Mag Roller End Plate Bearing
Serves as a bearing surface and supports the hub of the mag roller sleeve on the electrical contact end of the cartridge.

Mag Roller Sealing Blade
A thin blade, similar in appearance to the recovery blade, that seals the area between the mag roller and mag roller section; prevents leakage from the development station.

Mag Roller Seal Foam
A foam seal that prevents leakage from the ends of the mag roller sealing blade.

continued on page 6

Mag Roller Section–Terms and Definitions

Mag Roller Stabilizer
Prevents lateral movement of the mag roller. A stabilizer is placed on the drive gear end of the mag roller axle and secured in place by screws and locating posts in the hopper section.

Mag Roller Stabilizer Bearing
Serves as a bearing surface and supports the hub of the mag roller sleeve on the drive gear side of the cartridge. Prevents lateral movement of the mag roller.

Plastic Wiper (Left/Right)
Removable wipers installed on each end of the doctor blade stamping; wipes toner from the ends of the mag roller that ride on the mag roller end magnets. The wipers prevent toner from adhering to sleeve. Right and left plastic wipers are NOT interchangeable.

Sealing Channel End Foam (Open/Closed End)
Rectangular pieces of foam adhered to the mag roller section of the hopper. Open foam (contact end of hopper) and closed end foam (drive gear end of hopper) seal the ends of the hopper where the toner reservoir and mag roller sections are not ultrasonically welded together. Right and left seal channel foams are NOT interchangeable.

Seal Channel Rail Foams
Narrow strips of foam installed on the underside of the mag roller section. The foam is an aftermarket component used with the RapidSeal™ split hopper sealing system to seal the long sides of a split hopper section.

Toner Low Sensor Bar
Acts as an antenna to detect low toner volume in the hopper. Once a signal from the antenna reaches a specified value, the printer displays a toner low warning for the printer operator.

Toner Low Sensor Bar Seal
Plastic seal installed on the toner low sensor bar used to seal the area between the bar and the casing in which the bar is installed.

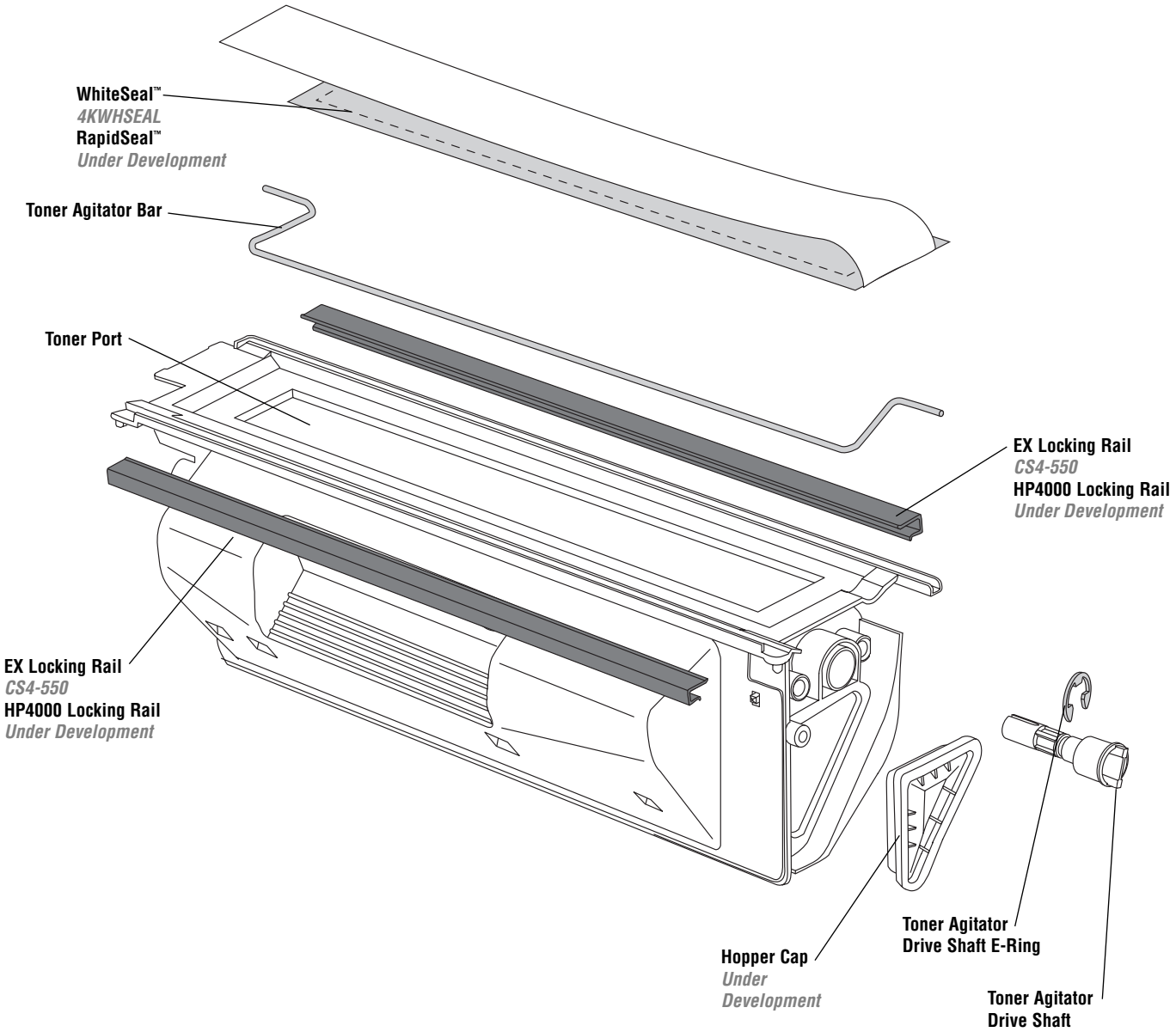
Toner Paddle Bar
Thin metal bar located near the opening of the development station; rotates inside the toner hopper to move toner toward the development station.

Toner Paddle Bar Drive Gear
Rotates the toner paddle bar; located at the drive train end of the mag roller housing.

Toner Paddle Bar Drive Gear Seal
Seals the area between the mag roller housing and paddle bar drive assembly.

Notes

Toner Reservoir–Terms and Definitions



◆ **Tool, Kit or System Available. Contact your SCC Sales Team.** ***SCC PARTS INDICATED IN GRAY.***

WhiteSeal™

SCC's HP4000 WhiteSeal™ is based on the OEM design; the seal uses peel-to-expose adhesive on the side that secures to the toner reservoir section.

Toner Agitator Bar

A metal paddle bar that rotates inside the toner hopper to move the toner toward the development station.

Toner Port

An opening, occupied by the seal, that runs along the length of the hopper. Once the seal is removed, toner travels through this opening to the development station.

Locking Rail

Aftermarket component used to reassemble and secure the mag roller and toner sections after splitting. Used in combination with seal channel rail foam.

Hopper Cap

Plugs the fill opening of the hopper. The hopper can only be filled through the fill opening if the hopper is split. Otherwise, the hopper is filled through the toner port.

Toner Agitator Drive Shaft E-Ring

Secures the toner agitator drive shaft in the hopper section.

Toner Agitator Drive Shaft

Rotates the toner agitator bar in the hopper; located at the drive train end of the hopper section.

Component Management Chart

COMPONENT	CODE	CLEAN	LUBRICATE
OPC Drum	OS4KDRGR Odyssey or OS4KDRGR-I Odyssey (with Inserts)	Dry, filtered compressed air	Pad the coated area of the drum with Kynar lubricating powder; install the drum in the cartridge and rotate against the wiper blade at least six full rotations
Primary Charge Roller (PCR) OEM	NA	Water and lint-free cleaning cloth	NA
Wiper Blade	4KBLADE	Dry, filtered compressed air	Pad the working edge of the wiper blade with Kynar lubricating powder
Wiper Blade End Foam	4KWBEFOAM	Dry, filtered compressed air	NA
Wiper Blade End Felt	4KWBEFELT	Dry, filtered compressed air	NA
Wiper Blade Sealing Foam	4KSFOAM	Dry, filtered compressed air	NA
Doctor Blade	4KDBLADE	Dry, filtered compressed air	NA
Doctor Blade Sealing Foam	4KDBSFOAM	Dry, filtered compressed air	NA
Doctor Blade End Foams	LJ4DBEFOAM	Dry filtered compressed air	NA

EVALUATE	REPLACE
Use a drum with inserts if you plan to use the drum in combination with PCRs other than the OEM HP4000 PCR.	For best results, replace the OEM drum after the OEM cycle; replace SCC's HP4000 system-qualified drum each remanufacturing cycle.
There are two types of OEM PCRs. Testing is continuing to determine whether the OEM PCR is recoatable. In our testing, OEM PCRs have failed in the first remanufacturing cycle. For more information, refer to page 3 of SSS 160-E, Critical Issues.	An NX PCR can be used in the HP4000 application. However, when using an NX PCR in your HP4000 cartridge, also use a drum with inserts. For additional information, refer to page 1 of SSS 160-E, Critical Issues. A new HP4000 PCR is also under development.
Vertical streaks can be an indication of wiper blade-related defects. Use pre-test prints to evaluate.	For optimum performance, replace the wiper blade each time you replace the drum.
The foam should display a smooth surface and be completely secured to the mounting surface. Tears in the foam material or missing foam can allow leakage from the ends of the wiper blade.	Replace the end foam if ripped, pitted, dislodged or missing.
The felt should display a plush surface and be completely secured to the mounting surface.	Replace the felt if dislodged, missing, becomes excessively frayed, compacted with toner or shiny in appearance.
The foam should display a smooth surface and be completely secured to the mounting surface. Rips or pits in the foam material can allow leakage from underneath the base of the wiper blade.	Replace the foam if missing, dislodged, ripped, or pitted.
Use test prints to evaluate print quality. Background or side-to-side variations in print quality can be an indication of doctor blade problems.	When replacing the OEM doctor blade, remove the plastic wipers from each end of the stamping and install on the replacement blade. Adhesive or double-faced tape is not necessary; screws that secure the doctor blade will also secure the wipers in place. For the correct orientation of the wipers, refer to page 4 of this document.
The foam should display a smooth surface and be completely secured to the mounting surface. Tears in the foam material or missing foam can allow leakage from underneath the base of the doctor blade.	Replace the foam if missing, dislodged, ripped, or pitted.
The foam should display a smooth surface and be completely secured to the mounting surface. Tears or missing foam can allow leakage from the ends of the doctor blade.	Replace the foam if missing, dislodged, ripped, or pitted.

Component Management Chart

COMPONENT	CODE	CLEAN	LUBRICATE
OEM Magnetic Developer Roller (Mag Roller)	NA	Dry, filtered compressed air	NA
SCC Factory-New Magnetic Developer Roller (Mag Roller)	4KMDR	Contact your member of your SCC Sales Team for cleaning and maintenance information.	NA
Mag Roller Electrical Contact	NA	Clean the electrical contact wire on the mag roller and the contact in the mag roller end plate with a lint-free swab dampened with 91-99% isopropyl alcohol	Apply a thin layer of conductive cartridge lubricant to the electrical contact in the mag roller end plate
Mag Roller Bushings	Under Development	Lint-free cleaning cloth	NA
Mag Roller Sealing Blade	LJ4MRSBLADE	Dry, filtered compressed air	NA
Mag Roller Sealing End Foam	4KMRSFOAM	Dry, filtered compressed air	NA
Recovery Blade	PRECB-LJ4 (PolyBlade™) LJ4RECBLADE (Mylar)	Dry, filtered compressed air	NA
Toner	4K500B 4K305B	Clean the toner reservoir with dry, filtered compressed air or a toner vacuum.	NA

EVALUATE	REPLACE
The OEM mag roller coating is very fragile and susceptible to nicks and scratches. Initial testing has also indicated that the mag roller may not be as durable as previous generation mag rollers. For additional information, refer to page 3 of SSS 160-E, Critical Issues	A factory-new mag roller is available. Contact a member of your SCC Sales Team for product information.
Contact a member of your SCC Sales Team for product information and availability.	
Make sure the mag roller electrical contact wire contacts the electrical contact in the mag roller end plate when the hopper is assembled.	NA
The OEM mag roller bushings are green and black in color. For best results, install the bushings according to how they are installed on the OEM cartridge: the green bushing is installed on drive gear end of the mag roller; the black mag roller bushing is installed on the contact end of the mag roller. Both bushings should be intact with no breakage.	Replace the bushings if excessively worn, broken, or missing.
The blade should display a smooth surface free of bends or waviness along the length of the blade.	Replace the blade if dislodged, missing or bent.
The foam material should display a smooth surface free of rips.	Replace the foam material if missing, dislodged or ripped. Note that the mag roller sealing blade must be removed in order to replace the seal foam. The mag roller sealing blade cannot be reused; a new replacement blade is required.
The blade should display a smooth surface and be completely secured to the mounting surface.	Replace the blade if bent, dislodged, missing, or if the surface is wavy.
Take care not to bend the toner low sensor bar when cleaning or filling the toner reservoir through the toner port. Make sure you are using the correct amount of toner for the capacity of the hopper. See page 3 of SSS 160-A, Remanufacturing Instructions, for more information regarding the two hopper capacities.	NA

Component Management Chart

COMPONENT	CODE	CLEAN	LUBRICATE
Seal	4KWHSEAL (WhiteSeal) HP4000 RapidSeal is under development	Remove the OEM/aftermarket seal from the sealing channel. Clean the sealing surface with 91-99% isopropyl alcohol.	NA
Sealing Channel End Foam-Open	4KSCEFM-O	Dry, filtered compressed air	NA
Sealing Channel End Foam-Closed	4KSCEFM-C	Dry, filtered compressed air	NA
Sealing Channel Rail Foam	4KSCRFOAM	Dry, filtered compressed air	NA
Locking Rails	CS4-550	Dry, filtered compressed air; lint-free cleaning cloth	NA
	4KPIN	NA	NA
Pin Removal Kit	4KPRKIT	NA	NA
Drum Shutter Felt	4LDSFELT	Dry, filtered compressed air	NA
Hopper Compression Springs	4KHCS	Dry, filtered compressed air or lint-free cleaning cloth	NA
Drum Shutter Actuator Arm Spring	4KDSAS	Dry, filtered compressed air or lint-free cleaning cloth	NA

EVALUATE	REPLACE
The hopper must be split to install the seal. For best results against leakage, make sure the seal is securely installed in the sealing channel.	Install a new seal each time the cartridge is remanufactured.
The foam material should display a smooth surface free of rips or pits in the material.	Replace the end foam if missing, dislodged, ripped, or pitted.
The foam material should display a smooth surface free of rips or pits in the material.	Replace the end foam if missing, dislodged, ripped, or pitted.
Sealing channel rail foam is an aftermarket component installed on split hoppers and used in combination with locking rails. The foam is installed along each long side of the mag roller section. The foam should display a smooth surface.	Both rail foams should be installed on the mag roller section. Replace the foam if ripped, pitted, dislodged, or missing.
Locking rails are installed on each long side of the hopper to rejoin the split mag roller and hopper sections. For best results, follow the installation instructions carefully.	Replace the rail if bent or otherwise damaged.
Do not attempt to tap the OEM pins through the pin casing to the inside of the cartridge. SCC's pin removal tool will allow you to remove the pins safely and quickly. The drum and PCR must be removed to gain access to the pin base inside the cartridge.	Replacing the OEM cartridge pin with SCC's HP4000 system-qualified pin will speed up remanufacturing processes. The pin is easily installed and removed from the exterior of the cartridge.
The pin removal kit includes pin removal pliers, a cartridge fixture, and replacement cartridge pins. The HP4000 pin removal pliers are designed to drive the cartridge pin from the inside to the outside of the cartridge where the pin can be easily removed.	NA
A drum shutter felt installed on the interior surface of the drum shutter helps to protect the drum from damage caused by the opening and closing of the drum shutter.	Replace the felt if missing or peeling away from the drum shutter surface.
A hopper tension spring should be secured to the mounting post at each end of the mag roller housing. Stretched or bent springs can contribute to print problems.	Replace the springs if bent or excessively stretched.
Follow the spring positioning instructions carefully when removing or installing the drum actuator arm. Refer to pages 11 and 23-24 of SSS 160-A, Remanufacturing Instructions for detailed instructions.	Replace the spring if bent, stretched or missing.

Hewlett Packard® LaserJet® 4000 (HP4000)
Cartridge/Printer Specifications

About the LaserJet® 4000 Printer

In November 1997, HP introduced the LaserJet® 4000 (HP4000) series of printers to replace the popular EX engine-based LaserJet 4, 4+ and 5 printers. The printers are available in a total of five configurations: the basic 4000 model features a single paper tray, the 4000T features a dual paper tray, the 4000N ships network-ready, the 4000TN is network-ready and includes the dual paper tray, the 4000se is the same as the standard 4000, but features a LaserJet Publishing Internet kit.

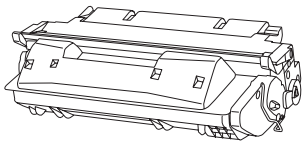
All HP4000 printers feature 17 page-per-minute print speed, 41% faster than the 12 ppm LJ5, and true 1200 dpi resolution. The FastRes mode, which actually runs in the 600 dpi mode, uses laser modulation to simulate 1200 dpi and allows the end user to print at the full 17 ppm print speed. The printer's ProRes mode allows the end user to print true 1200 dpi resolution, but at only about half the speed.

An instant-on fuser allows faster first page output, lower energy consumption, and flexibility in printing a variety of media. The instant-on fuser heats up much faster than a conventional halogen lamp, allowing faster first page output–about 15 seconds for the HP4000. The fuser also features three fusing modes for adjusting heating temperatures to the type of media used in the printer.

The introduction of the LaserJet 4000 also marked several significant changes in branding and naming. The new cartridge, branded UltraPrecise, features a new toner formulation, greater OPC sensitivity, a new drum helical gear, mag roller end magnets, and an HP-branded pull tab. It is apparent from sales and marketing collaterals that HP is strongly positioning the cartridge as an "added value" item with true benefits for the end user, instead of marketing the cartridge as just another supply item.

Starting with the new LaserJet 4000 and 5000 printers, HP instituted a new naming structure for their LaserJet printers. Instead of progressive numbers such as LaserJet 2, 3, 4, etc., HP printer names will feature four-digit numbers that will describe the printer's positioning or "class" in relation to other HP printers; a two-letter suffix will describe the options. For example, the name LaserJet 4000N tells the end user that the "4000" is mid-range printer when compared to a 2000 or 8000, for example, while the "N" signifies that the printer is network-ready. Additional information about HP's new naming structure can be found on their website.

LaserJet 4000



Printer Compatibility

LaserJet 4000
LaserJet 4000se
LaserJet 4000T
LaserJet 4000N
LaserJet 4000TN

World Wide Web

www.scc-inc.com

If you need additional information or technical assistance, please contact the Technical Support Group.

1.800.948.1072 (USA)
+44 (0) 118 935 1888 (UK)
email: techservices@scc-inc.com

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About the Cartridge and Printer

Cartridge Information

	Low Yield	High Yield
OEM Part Number	C4127A	C4127X
OEM Published Yield[1]	6,000 pages	10,000 pages
Price (Retail List-US)[2]	$119	$168

[1] Yield is based on 5% page coverage unless noted otherwise.
[2] Prices as December 1997

Printer Information

	LaserJet® 4000
Introduction List Price	$1,425 (4000)/$1,425 (4000se)/$1,615 (4000 T)/ $1,835 (4000 N)/$2,025 (4000 TN)
Street Price[3]	$1,099 (4000)/$1,150 (4000se)/$1,249 (4000 T)/ $1,415 (4000 N)/$1,565 (4000 TN)
First Ship Date	November 1997
Pages Per Minute (ppm)	17 pages per minute first page out in 15 seconds
Engine Duty Cycle	65,000 pages/month
Processor	100 MHz NEC Vr4300
Resolution (dpi)	300(H) x 300(V); 600(H) x 600(V) 1,200(H) x 1,200(V) (ProRes) Fast Res 1200 dpi quality at full engine speed using laser modulation
Page Size	letter, legal, executive, A4, A5, B5
Target Market	Small- to medium-size workgroups

[3] Estimated prices as of November 1997

STATIC CONTROL COMPONENTS, INC.

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Hewlett Packard® LaserJet® 4000 (HP4000)
Troubleshooting

Establishing Baseline Performance Benchmarks

We recommend that you perform a comprehensive series of test prints to establish the performance standards of your cartridges using SCC's HP4000 Imaging System Components. Listed below is a series of print targets that we developed for system evaluation. This test series will establish the normal print characteristics of the HP4000 cartridge for comparison with your subsequent remanufactured cartridges. We further recommend that you retain the baseline cartridge as your standard to simplify future performance verification.

The test series also allows you to visually inspect a printed page and diagnose many printer and cartridge problems. Listed in the chart below are some of the problems that may be diagnosed using each page in the test series.

The Series One Analyzer™ EPROM print series also includes four 5% coverage test targets scientifically developed and calibrated for major printer models. The 5% coverage pages along with a measuring procedure are used to determine toner usage per page and accurate page yield results. *(See next page.)*

The Series One Analyzer EPROM is used with the G80 SmartBox® and can be purchased as a kit from SCC. *Contact your SCC Sales Team for more details.*

SCC Series One Analyzer EPROM Print Targets

Test Print	Problems That May be Diagnosed Using the Test Print
Main Test Page	Drum Ghosting, Developer Roller Ghosting, Vertical Black Lines, Horizontal Black Lines, Toner Smear
Blank Page	Pin Hole Defects, Blasting
Black Page	Pin Hole Defects, Developer Roller Defect
BP80 Page	Improperly Formed Characters, Gear Defects, Fuser Offset, Bubble Print (or grapes)
Gray Page	Substrate Defects, Dropouts (faded areas)
5% Coverage Page	Toner Usage Testing

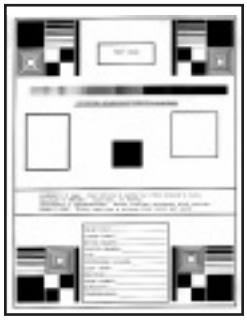
Table of Contents

World Wide Web

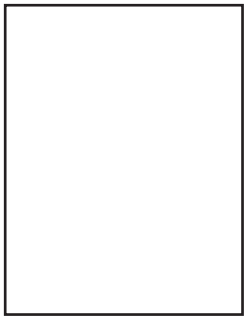
www.scc-inc.com

Need help troubleshooting print defects? Call Technical Support.

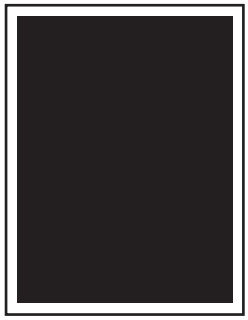
1.800.948.1072 (USA)
+44 (0) 118 935 1888 (UK)
email: techservices@scc-inc.com



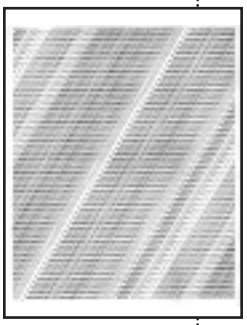
Main Test Page



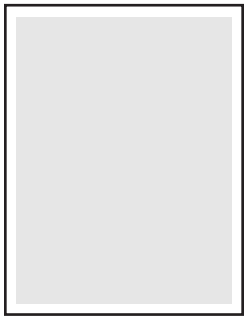
Blank Page



Black Page



BP80 Page



Gray Page

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Measuring Toner Usage (Page Yield)

Toner usage (or page yield) information is often needed by a cartridge remanufacturer to determine cost per page in their remanufactured cartridges or to run page yield tests. An important aspect of determining toner usage is using the proper test target.

Our system development lab developed a set of standardized test prints using the letter E to determine toner usage for 12 of the most popular printer models. Different printers have different dot sizes determined by the manufacturer. You may have noticed that some printers appear to have darker text than others. For this reason, each printer system can require different number of E's to produce a 5% coverage page.

The necessity for engine-specific E-pages is best illustrated by comparing the difference between EX and SX 5% coverage pages arranged in business letter format as shown below. The EX machine requires a certain number of E's to reach 5% coverage. In comparison, the SX machine requires a different number of E's to reach 5% coverage. The business letter format is used for comparison only and should not be used for testing purposes. The 5% coverage page designed for yield testing features the letter E spread out over the normal printed area of 8" x 10" in order to avoid continuous printing in any one area.

SCC's Series One Analyzer EPROM, used with the G80 Anacom SmartBox®, includes four E-pages and five print performance evaluation targets. *For more information, contact your SCC Sales Team.*

The figures above illustrate how 5% coverage might look in a business letter format. The left page was printed on an EX printer and the right page printed on an SX printer

5% Coverage Test Targets available for:

- HP LaserJet® II, III, IIP, IIIP, IBM/Lexmark® 4019, 4029, 4039, Optra® R, Optra L (Target #1)
- HP LaserJet 4/5, IIISi/4Si, 4L/4P, 5L, 5P/5MP (Target #2)
- HP LaserJet 5Si, 4V, IBM® Network Printer 24 (Target #3)
- Lexmark Optra N (Target #4)

A 5% Coverage Test Target for the HP4000 cartridge is under development. *Contact a member of your SCC Sales Team for product information and availability.*

Product Information

G80 Smart Box with Analyzer™ . . . . . .(ANACOMG80-1US)
Includes: G80 Smart Box with Analyzer, Top Switch Pad, Anacom G80 Power Supply, Anacom G80 RS-232C/Cable, Anacom G80 Manual, Analyzer™ Users Guide, Test Pattern Reader 5% Reader Cards

Analyzer Chip Series 1 . . . . . .(ANLZS1)
Includes: Analyzer Yield Test-Standard, Laminate 5% Coverage Samples, Insertion Instructions, SCC Users Guide, Disposable Grounding Wrist Strap

For additional product and ordering information, call a member of your SCC Sales Team.

To learn more about about page yield and toner usage, refer to SSS 112, Page Yield for Printer Cartridges.

How to Measure Repetitive Defects

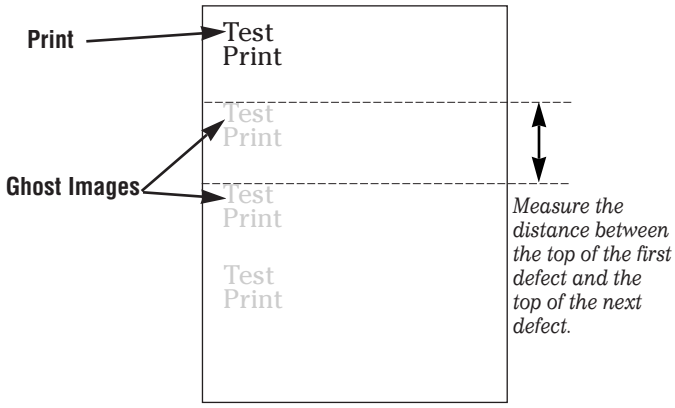
1. Find the repeating defect. Defects may appear as horizontal banding, dots, lines or hazing. Note that with HP4000 cartridges, the repetitive defect will appear vertically on letter size pages.

2. Measure the distance between the defects. To get an accurate measurement, measure from the top or bottom of the first defect to the top or bottom of the next defect. Make sure you are measuring like defects. It is possible to have two sets of repetitive defects that overlap each other on the page.

3. Find the interval number in the table below and the corresponding component. Interval measurements are provided in both inches and millimeters. Some probable causes of the defect are listed to help with troubleshooting. This is not an exclusive list. Some repetitive defects may be the result of a combination of factors. If you have trouble locating a defect, call Technical Support at the telephone numbers listed on the back of this manual or use their email address, techservices@scc-inc.com.

   Repetitive Defect Rulers (RDRULER-PK) are available for the top print engines. *Contact a member of your SCC Sales Team to order.*

Example of Repetitive Ghosting Defect on HP4000 printer **letter size** paper; note that letter size paper exits the printer in a portrait orientation



Repetitive Defect Troubleshooting Guide

Interval	Component	Probable Cause of Defect
@ 94mm, 3.70 inches Intervals	OPC Drum	OPC wear, OPC damage, OPC contact, elliptical drum rotation, OPC light exposure degradation, PCR defect
@ 38mm, 1.48 inches Intervals	Primary Charge Roller	PCR wear, PCR contamination, toner properties, poor electrical contact, low RH% conditions, dry paper
@ 43mm, 1.70 inches Intervals	Mag Roller	Mag roller wear, mag roller electrical contact, mag roller cleaning damage, mag roller bushing wear, doctor blade failure, toner properties, mag roller contamination,
@ 75mm, 2.95 inches Intervals	Upper Fusing Belt (Fixing Film)	Toner offsetting, fixing film/pressure roller incompatibility, toner properties upper fusing belt/lower pressure roller wear/contamination
@ 63mm, 2.48 inches Intervals	Lower Pressure Roller	Toner/pressure roller incompatibility, pressure roller wear/contamination (defect will appear on backside of page)
@ 47mm, 1.85 inches Intervals	Transfer Roller	Repeating interval of light print

Print Defect Troubleshooting Tips

The following table is a list of common print defects you may encounter during print testing. Included in the table is a general listing of probable causes for each type of defect; this listing will help direct you to the source of the defect.

If you have questions or require further assistance, call SCC's Technical Support Staff at the telephone numbers listed on the front page.

Print Defect	Probable Cause of Defect
Background	Inadequate drum charging/erasing, OPC wear, PCR wear, toner properties, low RH% conditions, dry paper
Ghosting	Inadequate drum charging/erasing, OPC wear, PCR wear, PCR contamination, low RH% conditions, toner properties, dry paper, upper fusing belt (toner offsetting)
Light Print	Magnetic roller, electrical contacts, OPC wear, PCR wear, toner properties, high RH% conditions, damp paper, doctor blade, stretched hopper compression springs (right/left side light print)
Streaking/Lines	Wiper blade (sharp-edged lines), upper fusing belt/lower pressure roller, PCR contamination or wear (vertical lines), missing/damaged doctor blade end foam or mag roller end magnets (page edge lines)
Random Sprinkles	Recovery blade, magnetic roller end magnets, mag roller sealing blade
Smudges	OPC contamination, upper fusing belt, magnetic roller contamination
Toner Offsetting	Upper fusing belt, lower pressure roller, toner properties

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Hewlett Packard® LaserJet® 4000 (HP4000)
Critical Issues

Aftermarket Component Noise Issues

A highly audible whining noise has been noted during print testing with replacement PCRs when used with both OEM and aftermarket drums. This noise level is potentially annoying in many office environments.

The noise is caused by using a PCR that is harder than the HP4000 OEM PCR, which is a soft, foam-substrate three-layer design. The noise, however, is not apparent when testing HP4000 OEM PCRs with aftermarket drums. Tests indicate that using NX PCRs will cause this loud, whining noise with either OEM or aftermarket drums. It is also probable that new, replacement HP4000 PCRs would be the "hard" variety, and would also exhibit the noise problem. It is possible to use "hard" PCRs in the HP4000 and eliminate the whining noise by adding a drum silencer insert in the aftermarket OPC.

The HP4000 OEM drum does not contain a drum insert whereas previous generation Canon® OPCs featured drum inserts. Adding a drum silencer insert in aftermarket OPC drums, as shown in FIG 1, returned the operational noise level to normal (as compared to the OEM drum and OEM PCR combination).

Remanufacturers have several options for controlling aftermarket component noise:

- **Use only HP4000 OEM PCRs.** This can be a limited option since the OEM PCR will eventually wear out and ultimately require replacement. There are unresolved issues on whether HP4000 OEM PCRs can be recoated. In addition, testing results at this point indicate that these PCRs are not as durable as previous generation three-layer rollers.

- **Use aftermarket drums with silencer inserts.** The primary advantage of this option is that it allows the use of any type of PCR, including NX and future, new replacement HP4000 rollers.

- **Use drums without inserts with OEM PCRs and drums with inserts with other PCRs.** This is possible, but potentially difficult to manage in your production process, especially as the volume of HP4000 cartridges grows.

PRODUCT INFORMATION

Odyssey™ Drum with Gears, Insert OS4KDRGR-I

Odyssey™ Drum with Gears OS4KDRGR

Continued on the next page

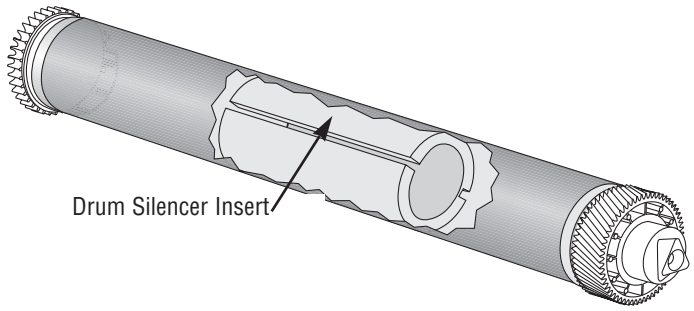

FIG 1

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For updates on HP4000 critical issues, call SCC Technical Support Group.

1.800.948.1072 (USA)
+44 (0) 118 935 1888 (UK)
email: techservices@scc-inc.com

first edition

Toner Compatibility with the Fuser Assembly

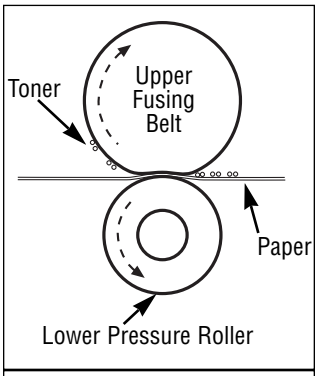
Toner Buildup on Fuser Rollers

A potential exists for a serious print defect and fuser assembly service claim when using toners that are not properly formulated for the HP4000. In our development testing, we observed print defects with prototype HP4000 formulations and with existing aftermarket Canon® toner formulations (such as toners for the EX and WX).

Toner builds up on the fuser's lower pressure roller and flakes off, resulting in large random splotches of toner on the printed side of output pages. This buildup occurs over several thousand pages. In our testing with multiple prototype toners, the first evidence of lower pressure roller toner buildup was seen at 8,000 to 10,000 pages. The buildup was substantial at 21,000 pages, and the flaking print defect started at 31,000 pages. The page count at which the defect occurs will vary with the toner formulation.

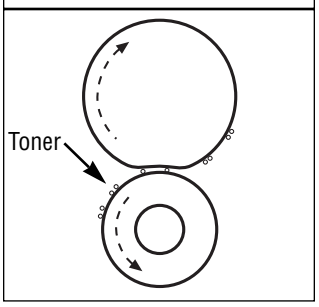
Instant-on Fuser Design and Toner Formulation Requirements

The HP4000 has an instant-on fuser assembly with a conventional lower pressure roller and an upper fusing belt (fixing film). The printer transitions from a sleep state to printing in less than 15 seconds when a print job is received. The toner resin formulation required dictates a different fusing temperature window than normal Canon-type aftermarket toner resins designed for standard fusers (not instant-on). The earlier instant-on Canon applications, such as the 5L and 6P, have a much slower process speed at 4ppm to 8ppm. The HP4000's 17ppm process speed requires a different resin formulation than the pre-existing AX and VX applications.



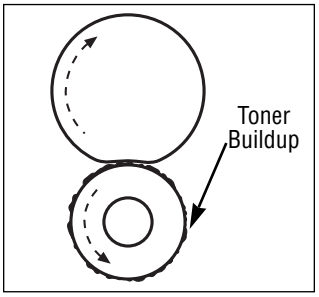
Step 1

Toner offsets onto the upper fusing belt.



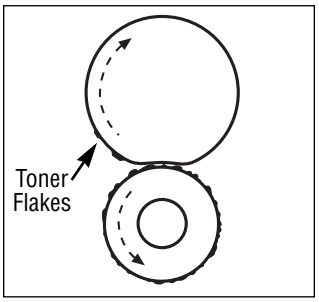
Step 2

This toner then transfers and sticks to the lower pressure roller.



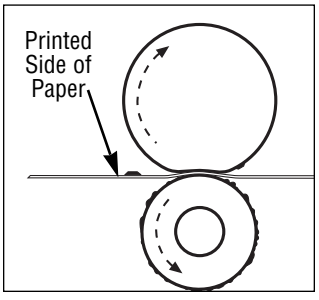
Step 3

Toner continues to build up on the lower pressure roller.



Step 4

Toner flakes off the lower pressure roller and the flakes transfer to the upper fusing belt.



Step 5

The toner flakes can then be fused to the printed side of the paper.

Mag Roller and Primary Charge Roller Issues

Magnetic Developer Roller Limitations

The HP4000 roller is visually similar to previous generation Canon black mag rollers, however, important differences in the durability, sensitivity and recoatability have been observed in our failure analysis testing and system development process:

1) The surface texture is extremely smooth compared to previous generation rollers such as the EX, WX, PX, etc.

2) The HP4000 imaging system print performance is more sensitive to any surface texture changes in the mag roller than previous engines. The impact of these changes materializes on test output sooner and more prominently.

3) Testing to this point indicates that the OEM roller may not be as durable as previous generation rollers. Some OEM rollers have demonstrated substantial image density degradation in the first remanufacturing cycle. Our current recommendation would be to not reuse the OEM mag roller once a replacement sleeve is available.

4) The OEM HP4000 mag roller may not be able to be retextured and recoated without sacrificing correct imaging properties. An excessively rough surface can be created when removing the black OEM coating material. Our testing with recoated OEM mag rollers demonstrated that an improper surface finish can cause multiple print problems regarding density, yield and ghosting. Further testing is being conducted to ultimately determine the recoatability of the OEM mag roller.

5) The required surface finish of a replacement HP4000 mag roller is best achieved starting with a new sleeve so that the texturing process does not create an excessively rough surface. Also, this texturing process must be capable of delivering the necessary surface finish within a tight range of allowable tolerances.

6) Using a "hot" toner that exhibits extreme solid black density to cover-up the image density degradation of a worn mag roller creates serious imaging problems in the HP4000 application. The Instant-On fuser design dictates a very narrow operating window regarding toner formulation and image development characteristics. Our testing has shown that excessively black toners can aggravate toner offsetting and buildup defects.

PRODUCT INFORMATION

Factory-New HP4000 Mag Roller
. . . . . .4KMDR

Please contact a member of your SCC Sales Team for availability.

Primary Charge Roller Limitations

Testing results are still preliminary at this stage. The PCR is a three-layer design with a foam substrate and an outer protective coating. Several observations made from our testing and recoating experiments are:

Two PCR Styles Identified

Two styles have been identified, a tapered-end style and a straight-end style (FIG 2). The recoatability of either style of the OEM PCR has not been determined at this time. Additional recoating trials are being conducted at this time.

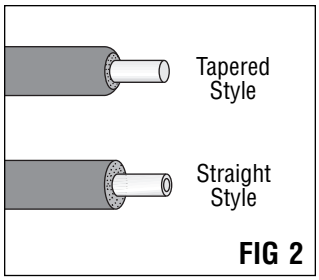


FIG 2

PCR Durability

Testing to this point indicates that this roller may not be as durable as previous generation three-layer type rollers, and that durability may not be consistent. One OEM test roller failed in a continuous print testing environment at a page count that would marginally support the initial OEM cycle in worst case conditions of short print runs and low average toner usage per page. Other OEM rollers have run the equivalent of two, worst-case cycles in continuous print runs.

Concentric Wear Rings

Concentric wear rings have developed in some OEM rollers and eventually caused a visible print defect. The frequency of occurrence is still undetermined as is the number of pages at which such wear lines could develop.

NX PCR Qualified in HP4000 Application

SCC's Imaging Technology Laboratories have qualified our 5/15 cycle recoated NX PCR in the HP4000 application. Although the shaft length of the NX PCR is shorter and allows lateral movement of the PCR in its mounting saddles, this has not created any imaging problems during extensive testing. A new, dedicated replacement HP4000 PCR is currently in development.

PRODUCT INFORMATION

NX 5/15 Cycle Primary Charge Roller 3SIRMPCR
New, Replacement HP4000 PCR . . . . . .Under Development
Please contact a member of your SCC Sales Team for availability.

Removing the Cartridge Pins

Removing the HP4000 OEM cartridge pins can be both challenging and problematic. The pin is installed completely in the pin casing, making it impossible to remove the pin with a pair of side cutters or needlenose pliers (FIG 3). The pin casing in the pivot arm of the hopper is smaller in diameter than that of the waste bin pivot arm, creating a step between the two sections (FIG 4). Attempting to tap the pins through the casing may crack the pin casing in the hopper section, as well as the PCR saddle support bracket in the waste bin section (FIGs 5 and 6).

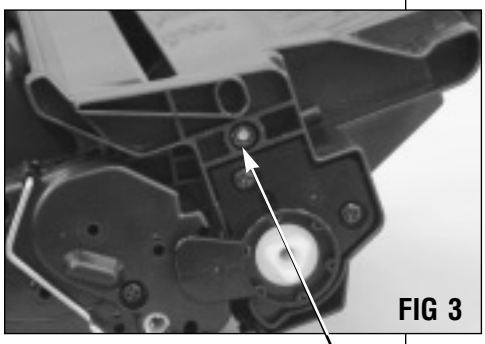


FIG 3

FIG 4

The pins are best removed by driving the pin from the INSIDE of the cartridge outward. First, the drum and PCR must be removed to gain access to the tip of the pin inside the cartridge. The mag roller, however, is still installed in the cartridge and susceptible to impact damage from tools you may use to tap out the pin. To help protect the mag roller, place a soft, clean, lint-free cloth over the roller. Even with the drum and PCR removed, there is only a small space in the cartridge in which to maneuver your tools or hands.

Fortunately, removing the OEM pins need only be a one-time process. Aftermarket replacement cartridge pins that can be removed from the exterior of the cartridge will speed subsequent remanufacturing processes. Specialty aftermarket tools, including SCC's Pin Removal Pliers, have been developed to assist in OEM pin removal.

SCC's HP4000 pin removal pliers are designed to quickly and safely remove the OEM pin in a simple one-step operation. A specially-designed fixture holds the cartridge in place and slightly separates the waste bin and hopper sections to allow easy removal of the drum. SCC's replacement cartridge pin, designed with a slim-line head, installs flush against the exterior of the cartridge, but can be easily removed using a pair of side cutters. The pins are made of blackened steel that make the pin virtually invisible on the cartridge.

PRODUCT INFORMATION

HP4000 Pin Removal Kit 4KPRKIT
(Includes pin removal pliers, cartridge pin removal fixture, cartridge pins)

Cartridge Pins 4KPIN
Refer to the detailed instructions included with the kit for installation and usage.

Toner Hopper Section–Pivot Arm Casing

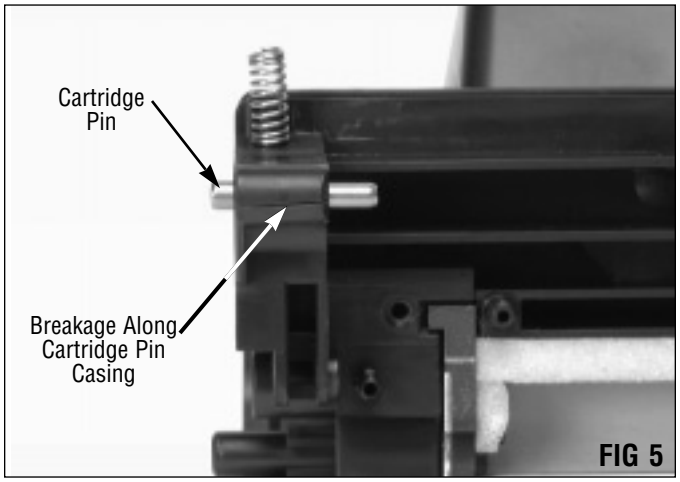


FIG 5

Waste Bin Section–PCR Support Bracket

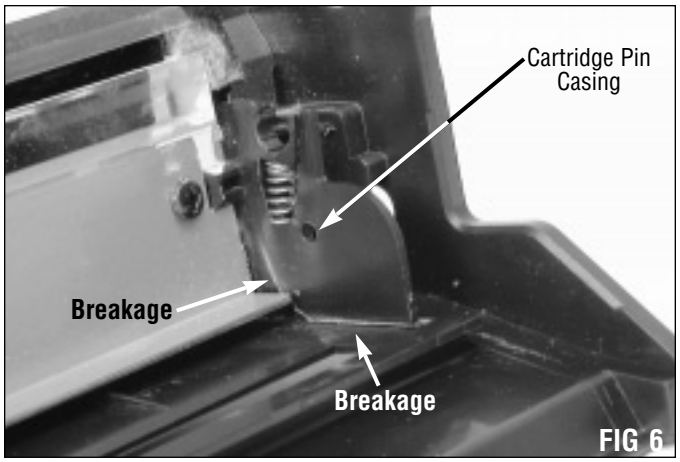


FIG 6

Splitting, Sealing and Leakage

Sealing Limitations

The HP4000 cartridge has some of the same sealing limitations associated with the EX and WX cartridges. The hopper is designed in a way that insertable seals, such as heat seals or hard cards, cannot be installed to effectively seal the cartridge. The seal exit end of the hopper, in which insertable seals are typically inserted, is blocked by the axle for the actuator arm (Fig. 7). Inside the hopper, a step in the seal channel prevents the seal from being inserted straight into the channel. The contour of the mag roller section illustrated in FIGs 8 and 9 blocks the insertion of the seal and insertion tool.

Split Hopper Seal Technology for the HP4000 Application

Split hopper seal technology appears to be the only feasible solution for this cartridge and effective splitting will require a powered rotary-blade splitting system. The design the mag roller to hopper section weld joint is similar to the current WX cartridge. In the HP4000, an extremely strong ultrasonic weld has been applied to this joint. This high-strength weld effectively prevents handsplitting the HP4000. We would conclude from an engineering standpoint that splitting with a fixed blade system in the HP4000 will not be feasible due to unacceptably high rates of hopper damage and loss.

Toner Leakage and Unsealed Cartridges

The HP4000 cartridge also demonstrates a high potential for heavy toner leakage during shipping. While conducting tumble tests designed to simulate shipping and handling conditions, severe toner leakage was experienced testing unsealed, filled HP4000 cartridges. A large volume of toner leaked past the mag roller sealing blade causing the blade to fold back over itself and crease. The cartridge and interior of the cartridge bag were coated with toner that had leaked from the hopper.

Many remanufacturers do not seal locally delivered cartridges. With the HP4000, safeguards should be taken to prevent dropping or excessive jarring unsealed cartridges during transport.

PRODUCT INFORMATION

HP4000 WhiteSeal™ Installation Kit 4KWHSLKIT
(Includes foam removal tool assembly, hopper jig, hopper rail assembly jig, t-handle rail removal tool, blackened stainless-steel locking rails, toner seal channel open and closed end foams, seal channel rail foam, OEM-type seal pull tab with adhesive, and WhiteSeal™.

HP4000 RapidSplitter™ Power Splitting System 4KRSCSS
HP4000 WhiteSeal™ Ribbon-Type Seal 4KWHSEAL
HP4000 WhiteSeal™ Pack 4KWHSLPK
HP4000 Rigid Base RapidSeal™ . . . . . .Under Development

Toner Hopper Section Contact End

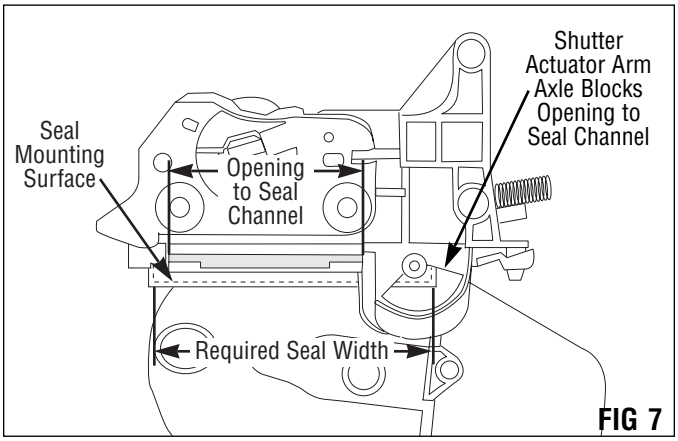


FIG 7

Split Hopper Toner Reservoir

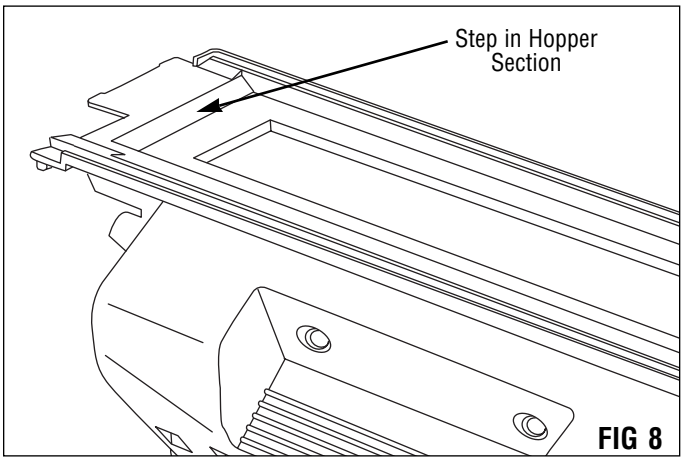


FIG 8

Toner Hopper Section Seal Exit End

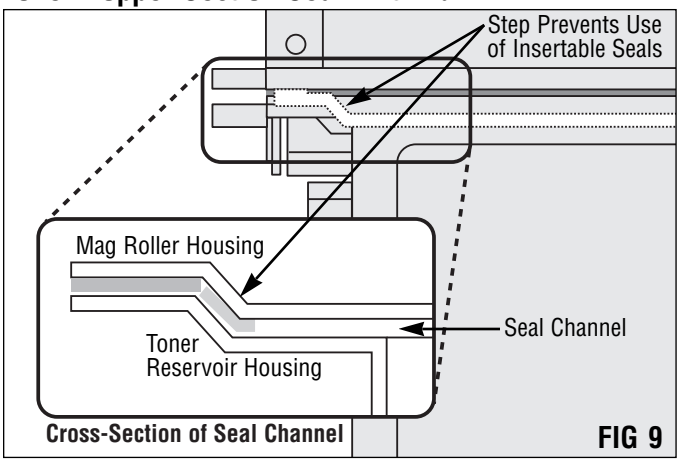


FIG 9

Spur Gear Drum Axle Positioning

Incorrect Positioning Can Lead to Print Defects

An incorrectly positioned drum spur gear axle can cause light print defects at the drum interval (94 mm/3.70 inches). The print defect occurs most prominently on the right side of the printed page, corresponding to the drive gear end of the cartridge, although the actual source of the problem is on the spur gear end of the cartridge. Incorrect positioning of the drum spur gear axle causes misalignment of the drum.

Engineers in our imaging lab found that the print defects occurred only with remanufactured cartridges where the axle was not correctly positioned. When the axle was repositioned correctly in the waste bin housing, the print defect disappeared.

Solution

Avoiding or solving this type of print defect is simply a matter of paying special attention to the positioning of the spur gear axle during your remanufacturing processes.

The axle features a step that mates with a corresponding inverted step in the waste bin housing, as shown in FIG 10. When the axle is correctly installed, a positioning post on the waste bin housing will align in the center of an oblong slot on the axle end plate as shown in FIGs 11 and 12.

In cases when the step on the axle is not fully seated in the step in the waste bin housing, the axle is misaligned as shown in FIG 13. Looking at the end plate of the axle, you will also see that the positioning post is misaligned at the top or bottom of the oblong slot (FIG 14). When the screws are installed to secure the axle, the slight angle of the axle forces the waste bin housing to bend toward the drum gear as shown in FIG 13. The absence of a gap between the drum spur gear and waste bin housing is another indication that the axle is not positioned correctly.

Recommendation:

- Install the drum spur gear axle.
- Check the alignment of the positioning post in the oblong slot in the axle end plate. If the post is centered in the oblong slot, the axle is properly seated in the waste bin housing.

  If the post is positioned at the bottom or top of the oblong slot, the axle is NOT properly seated in the waste bin housing. Reposition the axle until the positioning post is centered in the slot.
- Secure the axle with two screws.
- Make sure there is a gap between the drum spur gear and waste bin housing.

Drum Spur Gear Axle

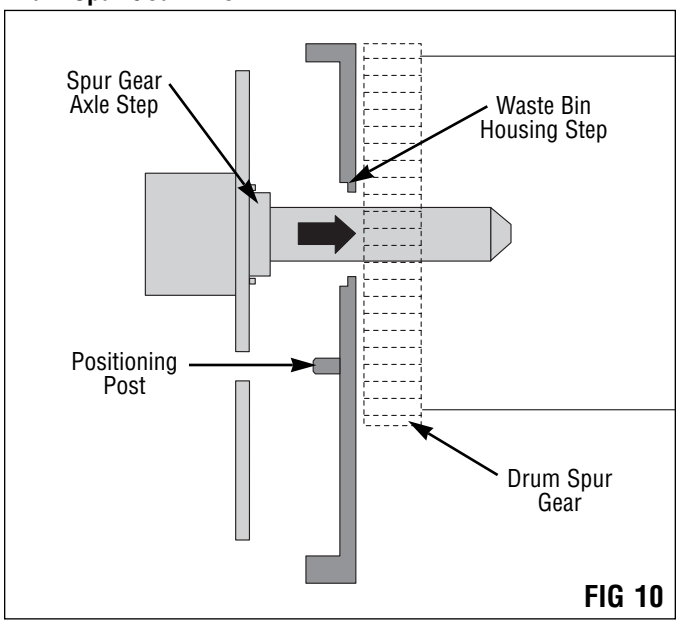
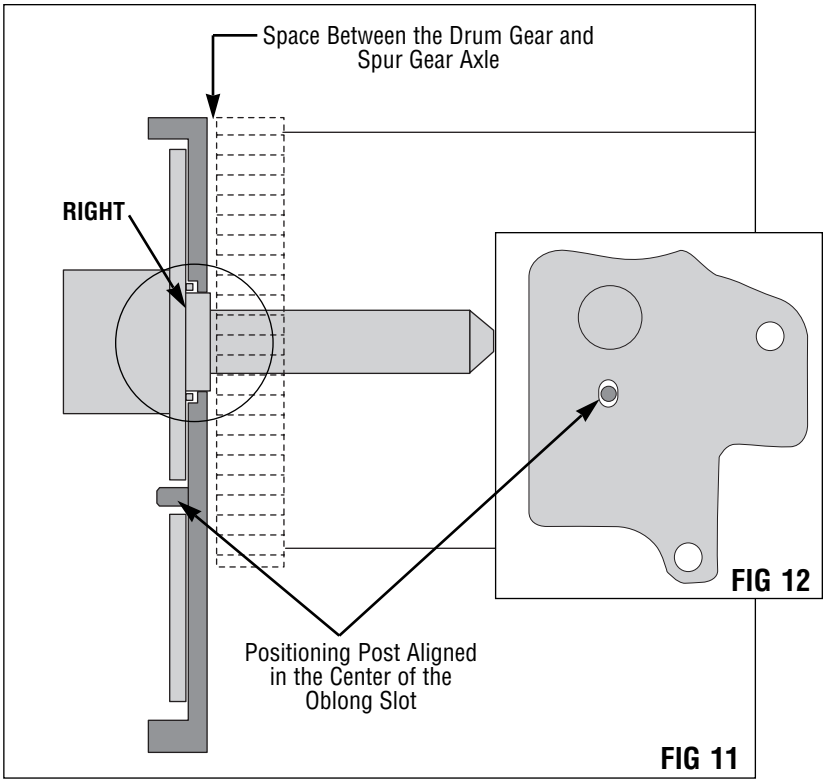


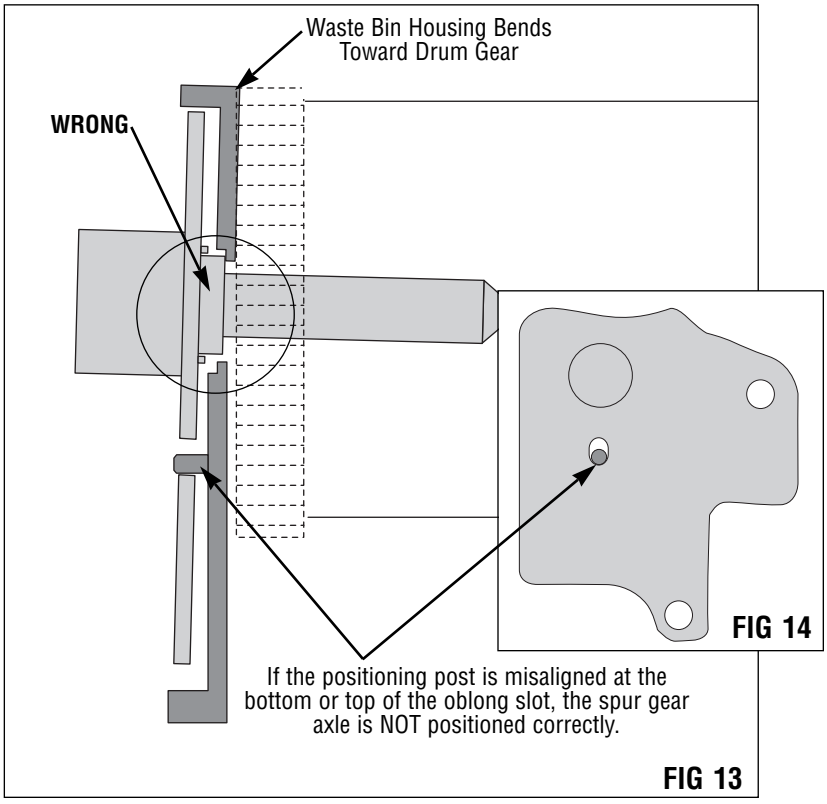
FIG 10

Notes

Correct Drum Axle Positioning



INCORRECT Drum Axle Positioning



Imaging System Technology You Can Count On!

The development of cartridge imaging systems, such as the HP4000 Imaging System, is the primary mission of our technology laboratories. Through extensive testing and research, we develop the optimum combination of matched components for each cartridge system. Our engineering and manufacturing expertise provides us with total control in design, quality and development to produce products from the ground up. The result is a system of components that seamlessly work together in each cartridge application.

This dedication and commitment results in integrated cartridge systems that Static Control fully supports, allowing you to quickly attack new market opportunities with complete confidence in the reliability and performance of your cartridges.

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