Decurl Unit DU5000 Machine Code: D457

Service Manual

20th January, 2009 Subject to change

Safety, Conventions, Trademarks

Conventions

Common Terms

Symbol	What it means
CII	Core Tech Manual
Ĩ	Screw
E	Connector
C	E-ring
\bigcirc	C-ring
	Harness clamp
FFC	Flexible Film Cable
JG	Junction Gate
LE	Leading Edge of paper
LEF	Long Edge Feed
SEF	Short Edge Feed
TE	Trailing Edge of paper
S31E	The "Emitter" sensor of a sensor pair
S31R	The "Receptor" sensor of a sensor pair

This is a list of symbols and abbreviations used in this manual.



The notations "SEF" and "LEF" describe the direction of paper feed, with the arrows indicating paper feed direction.

Warnings, Cautions, Notes

In this manual, the following important symbols and notations are used.

WARNING

• A Warning indicates a potentially hazardous situation. Failure to obey a Warning could result in death or serious injury.

• A Caution indicates a potentially hazardous situation. Failure to obey a Caution could result in minor or moderate injury or damage to the finisher or other property.

🔂 Important

• Obey these guidelines to avoid problems such as misfeeds, damage to originals, loss of valuable data and to prevent damage to the machine.

Note

• This information provides tips and advice about how to best service the machine.

General Safety Instructions

For your safety, please read this manual carefully before you use this product. Keep this manual handy for future reference.

Safety Information

Always obey the following safety precautions when using this product.

Safety During Operation

In this manual, the following important symbols and notations are used.

Switches and Symbols

Where symbols are used on or near switches on machines for Europe and other areas, the meaning of each symbol conforms with IEC60417.



Responsibilities of the Customer Engineer

Reference Material for Maintenance

- Maintenance shall be done using the special tools and procedures prescribed for maintenance of the machine described in the reference materials (service manuals, technical bulletins, operating instructions, and safety guidelines for customer engineers).
- In regard to other safety issues not described in this document, all customer engineers shall strictly obey procedures and recommendations described the "CE Safety Guide".
- Use only consumable supplies and replacement parts designed for use of the machine.

Before Installation, Maintenance

Power

- Always disconnect the power plug before doing any maintenance procedure. After switching off the machine, power is still supplied to the main machine and other devices. To prevent electrical shock, switch the machine off, wait for a few seconds, then unplug the machine from the power source.
- Before you do any checks or adjustments after turning the machine off, work carefully to avoid injury. After removing covers or opening the machine to do checks or adjustments, never touch electrical components or moving parts (gears, timing belts, etc.).
- After turning the machine on with any cover removed, keep your hands away from electrical components and moving parts. Never touch the cover of the fusing unit, gears, timing belts, etc.

Installation, Disassembly, and Adjustments

- After installation, maintenance, or adjustment, always check the operation of the machine to make sure that it is operating normally. This ensures that all shipping materials, protective materials, wires and tags, metal brackets, etc., removed for installation, have been removed and that no tools remain inside the machine. This also ensures that all release interlock switches have been restored to normal operation.
- Never use your fingers to check moving parts causing spurious noise. Never use your fingers to lubricate moving parts while the machine is operating.

Special Tools

- Use only standard tools approved for machine maintenance.
- For special adjustments, use only the special tools and lubricants described in the service manual. Using tools incorrectly, or using tools that could damage parts, could damage the machine or cause injuries.

During Maintenance

General

- Before you begin a maintenance procedure: 1) Switch the machine off, 2) Disconnect the power plug from the power source, 3) Allow the machine to cool for at least 10 minutes.
- Avoid touching the components inside the machine that are labeled as hot surfaces.

Safety Devices

WARNING

- Never remove any safety device unless it requires replacement. Always replace safety devices immediately.
- Never do any procedure that defeats the function of any safety device. Modification or removal of a safety device (fuse, switch, etc.) could lead to a fire and personal injury. Always test the operation of the machine to ensure that it is operating normally and safely after removal and replacement of any safety device.
- For replacements use only the correct fuses or circuit breakers rated for use with the machine. Using replacement devices not designed for use with the machine could lead to a fire and personal injuries.

Organic Cleaners

- During preventive maintenance, never use any organic cleaners (alcohol, etc.) other than those described in the service manual.
- Make sure the room is well ventilated before using any organic cleaner. Use organic solvents in small
 amounts to avoid breathing the fumes and becoming nauseous.
- Switch the machine off, unplug it, and allow it to cool before doing preventive maintenance. To avoid fire or explosion, never use an organic cleaner near any part that generates heat.
- Wash your hands thoroughly after cleaning parts with an organic cleaner to contamination of food, drinks, etc. which could cause illness.
- Clean the floor completely after accidental spillage of silicone oil or other materials to prevent slippery surfaces that could cause accidents leading to hand or leg injuries. Use "My Ace" Silicone Oil Remover (or dry rags) to soak up spills. For more details, please refer to Technical Bulletin "Silicone Oil Removal" (A024-50).

Ozone Filters

- Always replace ozone filters as soon as their service life expires (as described in the service manual).
- An excessive amount of ozone can build up around machines that use ozone filters if they are not replaced at the prescribed time. Excessive ozone could cause personnel working around the machine to feel unwell.

Power Plug and Power Cord

WARNING

- Before servicing the machine (especially when responding to a service call), always make sure that the power plug has been inserted completely into the power source. A partially inserted plug could lead to heat generation (due to a power surge caused by high resistance) and cause a fire or other problems.
- Always check the power plug and make sure that it is free of dust and lint. Clean it if necessary. A dirty plug can generate heat which could cause a fire.
- Inspect the length of the power cord for cuts or other damage. Replace the power cord if necessary. A frayed or otherwise damaged power cord can cause a short circuit which could lead to a fire or personal injury from electrical shock.
- Check the length of the power cord between the machine and power supply. Make sure the power cord is not coiled or wrapped around any object such as a table leg. Coiling the power cord can cause excessive heat to build up and could cause a fire.
- Make sure that the area around the power source is free of obstacles so the power cord can be removed quickly in case of an emergency.
- Make sure that the power cord is grounded (earthed) at the power source with the ground wire on the plug.
- Connect the power cord directly into the power source. Never use an extension cord.
- When you disconnect the power plug from the power source, always pull on the plug, not the cable.

After Installation, Servicing

Disposal of Used Items

• Always dispose of used items (developer, toner, toner cartridges, OPC drums, etc.) in accordance with the local laws and regulations regarding the disposal of such items.

• To protect the environment, never dispose of this product or any kind of waste from consumables at a household waste collection point. Dispose of these items at one of our dealers or at an authorized collection site.

Points to Confirm with Operators

At the end of installation or a service call, instruct the user about use of the machine. Emphasize the following points.

- Show operators how to remove jammed paper and troubleshoot other minor problems by following the procedures described in the operating instructions.
- Point out the parts inside the machine that they should never touch or attempt to remove.
- Confirm that operators know how to store and dispose of consumables.
- Make sure that all operators have access to an operating instruction manual for the machine.
- Confirm that operators have read and understand all the safety instructions described in the operating instructions.
- Demonstrate how to turn off the power and disconnect the power plug (by pulling the plug, not the cord) if any of the following events occur: 1) something has spilled into the product, 2) service or repair of the product is necessary, 3) the product cover has been damaged.
- Caution operators about removing paper fasteners around the machine. They should never allow paper clips, staples, or any other small metallic objects to fall into the machine.

Safety Instructions for this Machine

- 1. The installation must be done by trained service technicians.
- 2. This machine weighs 316 kg. (695 lb.). At least four persons are required to remove the machine from its pallet and position it for installation.
- 3. To prevent fire hazards never use flammable solvents around the machine.
- 4. Never place any object on the machine.
- 5. If anything falls into the machine, turn off the main power switch on the right side of the machine, then disconnect the power cord from the power source.
- 6. Locate the machine on a sturdy flat surface where it will not be exposed to excessive vibration.
- 7. To avoid fire hazard, confirm that the ventilation ports are not blocked, so air can flow freely.
- 8. Gas generated by the molten glue can irritate the eyes, throat, and nose. The machine should always be used in a well ventilated room.
- 9. To avoid the dangers of fire and electrical shock, make sure that the machine is never exposed to:
 - Excessive high temperatures and/or humidity

- Dust
- Water
- Direct sunlight
- Open flame
- Corrosive gases

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1. Replacement and Adjustment

Common Procedures

Preparation for Safe Servicing



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- The De-curl Unit is top heavy, has an extremely narrow base, and can fall easily.
- Always attach the stabilizers before servicing the De-curl Unit.
- Never leave the De-curl Unit unattended in the work area without the stabilizers ① and ② attached.
- The stabilizers must be installed on the left and right sides as shown above.

Disconnecting the Downstream Unit





- 1. Disconnect the De-curl Unit [A] and the downstream unit [B] from the main machine.
- 2. Remove the rear cover of the unit downstream of the De-curl Unit.





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3. At the right rear corner, remove the docking bracket screw [A].



d457i004

- 4. Open the front door of the downstream unit.
- 5. Remove the lock bar screw [A] ($\hat{\mathscr{F}} \times 1$).
- 6. Pull the lock bar out until it stops.
- 7. Pull the downstream unit away from the De-curl Unit.
- 8. Push the lock bar in and re-attach the screw removed in Step 5 so that you do not lose it.

Disconnecting the De-curl Unit



d457r005

1. Remove the joint bracket [A] from the left side of De-curl Unit ($\hat{\not} x4$).

- The corners and edges of the joint bracket are sharp.
- Remove the joint bracket to prevent injury while working around the De-curl Unit.
- We recommend that you ask someone to hold the top of the de-curl unit while you attach the stabilizers. (This procedure requires about 10 minutes.)



d457r006

- 2. On the left side, remove:
 - [A] Stabilizer leg (Ĝx2 Knob screws)
 - [B] Stabilizer leg (🌮x2, Knob screws)



d457r007

3. Set the stabilizers and the knob screws aside.



d457r008

- 4. Open the front door of the De-curl Unit.
- 5. Remove the lock bar screw [A] ($\hat{\beta}^2 \times 1$)
- 6. Pull out the lock bar until it stops.



d457r009

- 7. Pull the De-curl Unit away from the main machine until you can see the ends of the joint bracket [A], then stop.
- 8. Push in the lock bar, and re-attach the screw that you removed in **Step 5** so that you will not lose it.

Stabilizing the De-curl Unit



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- 1. For each stabilizer:.
 - Loosen screw [A] (do not remove it) so that the bracket moves freely from side to side.
 - Do not loosen the other screw!



d457r011

2. Pull the right rear corner [A] of the De-curl Unit a short distance away from the main machine.



d457r012

3. Set one stabilizer [A] under the rear left side, with the bracket [B] aligned with hole [C].



d457r013

- 4. On the right side:
 - Align the bracket [A] with the hole.
 - Hook the bracket onto the frame with the holes aligned.
 - Use a knob screw [B] to fasten the bracket.



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- 5. On the left side:
 - Attach knob screw [A]
 - Tighten screw [B]



d457r015

- 6. Pull the right front corner [A] of the De-curl Unit a short distance away from the main machine.
- 7. Do Steps 3 to 5 to attach the other stabilizer to the right side of the unit.
- 8. The De-curl Unit can now be moved safely for servicing.

De-curl Roller Unit



d457r019

- 1. Open the front door.
- 2. Push K2 [A] to the left.
- 3. Unscrew the chained screw [B] (leave the chain attached).





- 4. Pull out the de-curl roller unit [A] until it stops.
- 5. Push the release lever [B] to the left.



d457r021

6. Remove the de-curl roller unit.

Rear Covers



d457r022

Note

- The rear upper cover ${\rm (1)}$ must be removed before the rear lower cover ${\rm (2)}$.



d457r023

1. Remove the rear upper cover [A] (🖗 x4)



d457r024

- 2. Remove the screws of the rear lower cover [A] ($\hat{\mathscr{F}}$ x2)
- 3. Pull the top [B] of the cover away.



d457r025

4. Disconnect the bottom holes from the posts.

Re-installation



d457r026

- 1. The holes in the top edge of the rear lower cover are recessed, as shown above.
- 2. Engage the holes in the bottom of the cover with the posts below before re-attaching the screws at the top.

Front Door



d457r027

1. Remove the clamp (🕅 x1)



d457r028

- 2. Raise the bottom of the door [A] to lift it off its bottom post.
- 3. Lower the top of the door [B] to remove it from its top post.

Purge Tray



- 1. Open the front door.
- 2. Grip **K5** and slowly pull out the purge tray [A] until it stops and locks. The bottom of the tray should be parallel to the floor.



d457r030

3. Open the small flap tray [A] to make it easier to remove small paper sizes (postcards, etc.)

Motors

De-curl Pressure Adjustment Motor

Preparation

- Put both stabilizers on (
 "Stabilizing the De-curl Unit" in p.11 "Preparation for Safe Servicing")
- Pull the de-curl roller unit out



d457r031

The De-curl Pressure Adjustment Motor is on the right side, behind the bracket.



d457r032

- 1. Remove the screws [A] ($\hat{\mathscr{F}} x2$).
- 2. Disconnect timing belt [B].



d457r033

3. Pull the motor [A] out from the side from behind the bracket.



d457r034

4. Disconnect the motor (⊑ x1).

Transport Motor

Preparation

- Put both stabilizers on (
 "Stabilizing the De-curl Unit" in p.11 "Preparation for Safe Servicing")
- Pull the de-curl roller unit out
- Take the rear upper cover off



d457r035

The transport motor [A] is under the rear top edge of the unit.



d457r036

- 1. Remove the cover brace [A] ($\hat{\mathscr{F}}$ x2).
- 2. Disconnect the motor [B] (⇔ x1, 🗊 x1)



3. Disconnect the motor bracket [A] ($\hat{\mathscr{F}} x2$).





4. From the rear, raise the motor bracket, slide it up then to the right to disengage the hook [A] (as shown above), then remove the bracket and motor from the other side.



d457r039

5. Disconnect the motor from its bracket ($\hat{\mathscr{F}}$ x2).

Sensors

De-Curl Roller HP Sensor

Preparation

- Put both stabilizers on (
 "Stabilizing the De-curl Unit" in p.11 "Preparation for Safe Servicing")
- Pull the de-curl roller unit out
- Take the rear upper cover off
- Take the transport motor out



d457r040

The de-curler roller HP sensor [A] is located on the right side at the rear.



d457r041

1. Free the harness [A] (婦 x1)



d457r042

2. Remove the screw where the transport motor was removed.



d457r043

- 3. Pull out bracket [A].
- 4. Disconnect the sensor [B] (⊑[™] x1, Pawls x3)

Re-installation



d457r044

- 1. When re-attaching the bracket:
 - Confirm that hooks [A] and [B] are firmly inserted and locked in place.
 - The sensor will fail to operate correctly if the bracket is not positioned correctly.



- 2. Check the front of the unit where the de-curl roller unit was removed.
- 3. The plunger [A] should not be visible.

Comportant Comportant

• If the depressor is down and visible, it will interfere with the re-installation of the de-curl roller unit.



d457r046

4. To raise the depressor, rotate the timing belt [A] and drive gear of the De-curl Pressure Adjustment Motor until you can no longer see the plunger at [B].

Entrance Sensor

Preparation

• Put both stabilizers on (🖝 xref)



d457r047

The entrance sensor [A] is on the right side, behind the center of the paper guide [B].





1. Remove the paper guide [A] ($\hat{\mathscr{F}} x2$).



d457r049

- 2. Remove
 - [A] Entrance sensor bracket (ピ x1, 谷 x2)
 - [B] Entrance sensor (⊑[™] x1)

Exit Sensor

Preparation

• Put both stabilizers on (🖝 xref)


d457r050

The exit sensor [A] is on the left side behind the discharge brush [B].



d457r051

1. Remove the discharge brush [A] ($\hat{\beta}$ x2).



d457r052

2. Remove the exit sensor bracket [A] ($\hat{\beta}^2 \times 2$).



d457r053

3. Disconnect the sensor (⊑[™] x1, Pawls x3)

Purge Tray Paper Sensors 1, 2, 3

Preparation

- Put both stabilizers on (
 "Stabilizing the De-curl Unit" in p.11 "Preparation for Safe Servicing")
- 1. Open the front door.
- 2. Pull handle **K5** to pull out the purge tray until it stops.



d457r054

- 3. You can see the three sensors from either the left or right side.
 - The illustration above shows the sensors viewed from the right side.
 - The sensors are easier to clean and replace from the right side.



d457r055

4. Purge tray paper sensors ①, ②, ③ (斧 x1, ⊑╜ x1 each)

De-curl Roller Unit Set Sensor

Preparation

• Put both stabilizers on (
"Stabilizing the De-curl Unit" in p.11 "Preparation for Safe Servicing")

• Pull the de-curl roller unit out



d457r056

The de-curl roller unit set sensor [A] is on the rear side.

1. Make sure the de-curl roller unit is out.



d457r057

- 2. Remove:
 - [A] Sensor bracket (∦ x1)
 - [B] Sensor (🖾 x1, Pawls x 3)

Solenoids

Exit Guide Solenoid

Preparation

- Put both stabilizers on (
 "Stabilizing the De-curl Unit" in p.11 "Preparation for Safe Servicing")
- Pull the de-curl roller unit out
- Take the rear upper cover off
- Take the transport motor out



d457r058

The exit guide solenoid [A] and plunger [B] are at the left rear corner.



d457r059

1. Press up the bottom of the plunger [A] to drop the exit guide. (This relieves tension on the plunger and spring.)



d457r060

2. Remove cover brace [A] ($\hat{\not\!\!\!\!\!\!\!\!\!\!\!\!\!}^{2}x2).$



d457r061

3. Disconnect the solenoid [A] (🛱 x2, 🗊 x1)



d457r062

- 4. Loosen plunger screw [A] ($\hat{\mathscr{F}} \times 1$).
- 5. Remove three screws ①, ②, ③ (♂ x3).



d457r063

6. Remove the solenoid [A].



d457r064

- 7. Set the bracket on a flat surface.
- 8. Turn it over, remove the screws, and disconnect the bracket from the solenoid.

Paper Path JG Solenoid

Preparation

- Put both stabilizers on (
 "Stabilizing the De-curl Unit" in p.11 "Preparation for Safe Servicing")
- Pull the de-curl roller unit out

- Take the rear upper cover off
- Take the transport motor out



d457r065

The path junction gate solenoid [A] and plunger [B] are at the rear, below the transport motor



d457r066

1. Disconnect the harness [A] of the solenoid (eq x1).



d457r067

2. Remove plunger collar [A] (🌶 x1).



d457r068



d457r068

4. Pull the solenoid [A] out from the top.



d457r070

5. Disconnect plunger spring [A] from the junction gate [B] and remove the plunger from the bottom.

Main Board

Preparation

- Put both stabilizers on (
 "Stabilizing the De-curl Unit" in p.11 "Preparation for Safe Servicing")
- Take the rear upper cover off



d457r071

The main board [A] is on the rear, just above the top of the rear bottom cover.



d457r072

1. Remove cover brace [A] ($\hat{\mathscr{F}}$ x3)



d457r073

2. Remove the main board [A] ($\operatorname{P} x4, \operatorname{P} x4,$ Standoff x1)

Discharge Brush

Preparation

• Put both stabilizers on (
"Stabilizing the De-curl Unit" in p.11 "Preparation for Safe Servicing")



d457r074

The discharge brush is on the left side of the De-curl Unit.

Remove the discharge brush [A] (²/_ℓ x2).

Removing the Purge Tray

Preparation

- Put both stabilizers on (
 "Stabilizing the De-curl Unit" in p.11 "Preparation for Safe Servicing")
- Take the front door off

1



d457r075

- 1. Pull out the purge tray [A] until you can see the screw.
- 2. Remove screw [B] (∲ x1).



d457r076

3. Remove the screw and bracket.



d457r077

- 4. Raise the tray [A] to rotate it up slightly and disengage it from its rail and rollers below.
- 5. Remove the tray.

Re-installation

1. Set the stopper on the top rear corner [A] of the tray behind the stopper of the top rail.



d457r079

- 2. Set the bottom rear corner [A] of the tray in the rail.
- 3. Press down the roller [B] and slide the tray into the De-curl Unit.



d457r080

- 4. At [A] behind the door, slide the stopper through the slot ①.
- 5. Set the hook in the hole 2 and push it down.
- 6. At the front [B] with the purge tray pulled out, re-attach the screw.

Front Door Switch, Inner LED Board

1. Open the front door.



d457r081

The front door switch [A] is next to handle **K5** of the purge tray.



d457r082

2. Pinch the side releases of the magnet [A] and remove it.



d457r083

3. Remove cover [A] (∲ x4)



d457r084

4. Remove the switch bracket [A] ($\hat{\mathscr{F}}$ x2).



d457r085

5. Disconnect the switch [A] (\mathbb{Z} x2).



d457r086

6. Remove the LED PCB [B] ($\hat{\beta}^{2} x2$, 🗐 x1)

2. Details

Overview

Dual Function



The de-curl unit is the first peripheral unit downstream of the main machine in the wide selection of stackers and finishers available for this model.



A special connector is provided on the left side of the main machine exclusively for the de-curl unit. For this reason the de-curl unit must be the first peripheral device downstream of the main machine.

The de-curl unit has two functions:

- **Removing curl from paper.** A soft roller, pressed onto a hard metal roller, form a wide nip that corrects paper curl as each sheet passes between them. The pressure of the soft roller against the metal roller can be adjusted through 5 steps on the operation panel of the main machine to increase or reduce the pressure between these rollers. Eliminating paper curl is crucial to efficient operation of the high-capacity stacker installed downstream..
- Purging paper from the paper when jams occur. The paper feed path for this system is very long if the maximum number of peripheral devices is installed. The de-curl unit is designed to reduce the number of paper jam locations by dropping a "trapdoor" in the paper feed path after a jam occurs and shunting pages from the main machine into a purge tray below the de-curl unit.

Main Areas



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The three main areas of the unit are:

① **De-curl mechanism**. Contains the de-curl pressure adjustment motor, cam, cam follower, and lever that apply pressure to the rollers. The de-curl pressure adjustment motor applies pressure to the soft roller against the metal roller.

⁽²⁾ **De-curl roller unit**. Contains the soft roller and hard roller. Every sheet of paper passes through the nip of these rollers. This is where paper curl is removed. The de-curler roller unit set sensor detects when the de-curl roller unit is in or out of the unit. The unit will not operate unless the de-curl roller unit is in.

③ **Purge tray.** When a jam occurs downstream paper drops down into the purge tray. The capacity of the purge tray is limited and paper must be removed manually by the operator after every jam.

The entrance sensor detects paper as it enters the unit and switches on the transport motor. The transport motor drives the paper feed path rollers in the unit.

The exit guide solenoid drops the exit plate when a jam occurs. This has a "trapdoor" effect that drops paper that has fed past the junction gate into the purge tray. The path junction gate solenoid opens the junction gate that guides paper from the main machine into the purge tray after an error occurs down line.

Paper Path



The paper [1] enters the de-curl unit.

The entrance sensor [2] detects the leading and trailing edge of the paper from the main machine. The entrance rollers [3] feed the paper into the de-curl unit.

The paper goes through the nip of the metal roller [4] and soft roller [5]. The exit rollers [6] feed the paper out of the de-curl unit.

The exit sensor [7] detects the leading and trailing edge of the paper as it exits the de-curl unit and passes to the next unit downstream.

Operation Flow

The main board, connected directly to the main machine via the I/F harness, communicates with the main machine and controls operation of the de-curl unit.

Before a job can begin:

- The front door switch detects the front door closed.
- The de-curl roller unit set sensor detects that the de-curl roller unit is installed in the de-curl unit and set for operation.

Before the job starts:

- On the operation panel of the main machine, the operator selects the amount of pressure to be applied at the nip of the metal roller and soft roller to correct paper curl.
- The soft roller HP sensor detects the home position of the soft roller. The home position is used as the starting point ("O") for measuring the amount of pressure applied to the soft roller.

When the job starts:

- The de-curl pressure adjustment motor switches on and applies the selected pressure to the nip of the metal roller and soft roller.
- The entrance sensor detects the arrival of paper from the main machine and switches on the de-curl transport motor. The entrance sensor counts pulses between the leading and trailing edge of each sheet to check paper jams.



- The transport motor [1] drives all the rollers in the de-curl unit: [2] Entrance roller, [3] metal roller in the de-curl roller unit, [4] Exit roller.
- Each sheet of paper passes through the nip of the metal roller and soft roller. The paper de-curler mechanism controls the size and depth of the nip between the metal roller and soft roller.

• The exit sensor detects each sheet of paper as it leaves the de-curl unit and passes to the next unit downstream.

If a jam occurs at any point downstream of the de-curl unit and main machine this triggers the paper purge operation :

- The front door jam LED lights. This signals that a jam has occurred downstream.
- The exit guide solenoid switches on and drops the exit guide of the de-curl unit. Paper that has already passed the paper path junction gate near the entrance of the de-curl unit falls into the purge tray.
- As the next sheet enters the de-curl unit the purge tray JG solenoid opens the junction gate. This shunts paper fed from the main machine into the purge tray of the de-curl unit. The junction gate remains open until the last sheet exits the main machine. Paper that collects in the purge tray must be removed by the operator.
- One or more purge tray paper sensor detects paper in the purge tray. The inner jam LED lights. This alerts the operator that there is paper in the purge tray.

After the job ends:

- If no error has occurred the transport motor and de-curl pressure adjustment motors switch off.
- If an error has occurred the motors switch off and the operator must pull out the purge tray and remove the purged sheets. The capacity of the purge tray is limited to only 10 sheets.

Eliminating Paper Curl

De-curl Roller Unit

De-curl Roller Unit Installation



The de-curl roller unit can removed from the machine, turned upside down, and re-installed so the soft roller (the black sponge roller) is above or below the metal roller.

Paper Curl Correction: Concave Curl



This example shows paper with its ends curled up to form a concave curl. The de-curl roller unit must be installed in the de-curl unit with the soft roller above the metal roller to correct this type of curl.

The edge of the paper passes over the guide plate [1] and into the nip of the metal roller [2] and the soft roller [3].

Pressing the soft roller and metal roller together the surface of the soft roller to form the convex nip.

- The metal roller drives the soft roller.
- The force applied to the soft roller by the metal roller is determined by the operation of the de-curl pressure adjustment motor.

When the paper passes between the rollers, the convex nip bends the concave curl in the opposite direction. This eliminates the curl.

\rm Note

• The amount of pressure that the metal roller applies to the soft roller can be adjusted through five steps with a User Tool adjustment.

Paper Curl Correction: Convex Curl



This example shows paper with its ends curled down to form a convex curl. The de-curl roller unit must be installed in the de-curl unit with the soft roller below the metal roller to correct this type of curl.

The edge of the paper passes below the guide plate [1] and into the nip of the metal roller [2] and the soft roller [3].

Pressing the soft roller and metal roller together the surface of the soft roller to form the concave nip.

• The metal roller drives the soft roller.

• The force applied to the soft roller by the metal roller is determined by the operation of the de-curl pressure adjustment motor.

When the paper passes between the rollers, the concave nip bends the convex curl in the opposite direction. This eliminates the curl.

Note

• The amount of pressure that the metal roller applies to the soft roller can be adjusted through five steps with a User Tool adjustment.

Paper Guide Positioning



A very simple mechanism keeps the position of the paper guide at the same position, regardless of whether the de-curl roller unit is installed with the soft roller on the top or the bottom.

When the de-curl roller unit is installed with the soft roller on top:

- The paper guide [A] is raised by a sliding plate [B].
- When the de-curl roller unit is inserted, the guide rail forces the beveled edge of the up and pushes the guide plate up into position.
- The guide plate drops when the de-curl unit is removed from the machine.

When the de-curl unit is installed with the soft roller on the bottom:

- A spring positions the paper guide [C].
- The sliding plate [D] protrudes through a cutout in the rail. No pressure is applied to the paper guide.

De-curl Pressure Mechanism

Roller Pressure



The de-curl pressure adjustment motor [1] drives a worm gear [2] that rotates a large cam [3].

The number of rotations of the worm gear by the motor is determined by pressure setting selected on the operation panel of the main machine. This determines the amount of pressure applied to correct the paper curl.

Note

• The amount of pressure that the metal roller applies to the soft roller can be adjusted through five steps with a User Tool adjustment.

The cam presses down the arm [4] (cam follower) mounted on frame [5] (a shaft) which in turn applies pressure to the roller plate [6]. The roller plate is attached to a linkage that presses the soft roller [7] and metal roller [8] together. This forms the wide nip that eliminates paper curl from the paper passing between the entrance rollers [9] and exit rollers [10].

Soft Roller Home Position



At the end of a job, the de-curl pressure adjustment motor [1] reverses and returns the cam [2] to its home position. The feeler [3] of the soft roller HP sensor [4] detects when the cam, cam follower, and soft roller have returned to their home positions and turns the motor off. Returning the soft roller to its home position at the end of each job sets the soft roller at the zero adjustment position to provide a starting point for accurate pressure adjustment in the next job.

Pressure from de-curl roller unit



2

The roller plate [1], slide plate [2], and linkage [3] comprise the mechanism that press the soft roller and metal roller together, regardless of whether the de-curl roller unit is installed with the soft roller on above or below the metal roller.

- When the de-curl roller unit is installed with the soft roller above the metal roller, the force from the de-curl pressure adjustment mechanism is applied directly to the roller plate of the soft roller.
- When the de-curl roller unit is installed with the soft roller below the metal roller, the force from the de-curl adjustment mechanism is applied to a slide plate via a linkage that raises the roller plate and metal roller against the soft roller above.

Metal Roller Drive

The metal roller is the drive roller, and the soft roller is the idle roller.



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The metal roller drive is comprised of the metal roller, a forward gear [1], and reverse gear [2]. The metal roller is driven by either gear, depending on how the de-curl roller unit is installed in the machine (soft roller above, or soft roller below the metal roller).

Paper Purge



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The front door jam LED [1] lights as soon as an error occurs downstream.



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The exit plate solenoid [1] switches on and drops the exit plate [2]. The sheet of paper that has already passed over the purge tray junction gate drops into the purge tray. (If this first sheet has already entered the nip of the entrance rollers of the next unit downstream, you will have to clear the jam at the downstream unit.)



Once the trailing edge of the paper that was passing over the junction gate when the error occurred moves past the entrance sensor [1], the purge tray junction gate solenoid [2] switches on and opens the purge tray junction gate [3]. The solenoid remains on until all paper fed from the main machine goes into the purge tray below. After the last sheet goes into the purge tray, the solenoid goes off and the junction gate closes.

One or more of the purge tray sensors [4] detect paper in the purge tray. This switches on inner jam LED to indicate that there is paper in the purge tray. (This LED is not visible unless the front door is open.) The LED alerts the operator that paper is in the purge tray and must be removed.



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The operator opens the purge tray [1] and removes the paper. A small plate [2] can be opened for to remove smaller paper sizes (postcards, etc.) The purge tray has a capacity of only 10 sheets so it must be emptied immediately. The operator must re-set the exit tray by raising **K3** [3].
Electrical Components



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1.	Transport Motor	8.	Inner Jam LED
2.	Purge Tray JG Solenoid	9.	Purge Tray Sensors (x3)
3.	Soft Roller HP Sensor	10.	Exit Sensor
4.	De-curl Pressure Adjustment Motor	11.	Main Board
5.	Entrance Sensor	12.	De-curl Unit Set Sensor
6.	Front Door Jam LED	13.	Exit Guide Solenoid
7.	Front Door Switch		

Motors		
M2	De-curl Pressure Adjustment Motor	Operates the cam that presses the metal roller into the soft roller. The nip between the metal roller and soft roller is where curl is corrected. The more pressure applied by the metal roller, the wider and deeper the nip.
M1	Transport Motor	Drives the entrance roller, exit roller, and metal roller in the de-curl roller unit (the metal roller drives the soft roller.

Sensors			
S7	De-curl Roller Unit Set Sensor	Detects whether or not the de-curl roller unit is set and ready for operation.	
S1	Entrance Sensor	Detects the arrival of paper upstream of the entrance roller. Switches on the de-curl transport motor. Also counts pulses between the leading and trailing edge of each sheet to check paper jams.	
\$3	Exit Sensor	Detects each sheet of paper as it leaves the de-curl unit and passes to the next unit downstream.	
S4	Purge Tray Paper Sensor 1	Detect the presence (or absence) of paper inside the	
S5	Purge Tray Paper Sensor 2	purge tray. If one or more of these three sensors detect paper, this signals that there is paper in the	
S6	Purge Tray Paper Sensor 3	tray and the inner jam LED lights.	
S2	Soft Roller HP Sensor	Detects the home position of the soft roller. The home position is used as the starting point ("0") for measuring the amount of pressure applied to the soft roller. One of 5 levels of pressure can be selected on the main machine operation panel.	

Solenoid		
SOL2	Exit Guide Solenoid	Drops the exit guide of the de-curl unit when a jam occurs at any point downstream of the de-curl unit. Paper that has already passed the paper path junction gate falls into the purge tray.

Solenoid		
SOL1	Purge Tray JG Solenoid	Opens the junction gate that shunts paper fed from the main machine as soon as a jam occurs at any point downstream. Paper that collects in the purge tray must be removed by the operator.

LED		
LED 1	Front Door Jam LED	Lights when a jam occurs in any peripheral unit in the system paper feed path.
LED2	Inner Jam LED	Lights when there is paper in the purge tray. The front door of the de-curl unit must be open to see this sensor.

Switch		
SW1	Front Door Switch	An interlock switch that detects when the front door is open and closed. Opening the front door cuts the 24V power supply to the de-curl unit.

Board		
PCB1	Main Board	Controls operation of the de-curl unit and communicates directly with the main machine via the I/F connector.

MEMO

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