Service Manual

Finisher, Sorter, DeliveryTray
Puncher Unit-P1

Canon

Feb 21 2005

Application

This manual has been issued by Canon Inc. for qualified persons to learn technical theory, installation, maintenance, and repair of products. This manual covers all localities where the products are sold. For this reason, there may be information in this manual that does not apply to your locality.

Corrections

This manual may contain technical inaccuracies or typographical errors due to improvements or changes in products. When changes occur in applicable products or in the contents of this manual, Canon will release technical information as the need arises. In the event of major changes in the contents of this manual over a long or short period, Canon will issue a new edition of this manual.

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Caution

Use of this manual should be strictly supervised to avoid disclosure of confidential information.

Symbols Used

This documentation uses the following symbols to indicate special information:

Symbol	Description
	Indicates an item of a non-specific nature, possibly classified as Note, Caution, or Warning.
	Indicates an item requiring care to avoid electric shocks.
	Indicates an item requiring care to avoid combustion (fire).
	Indicates an item prohibiting disassembly to avoid electric shocks or problems.
	Indicates an item requiring disconnection of the power plug from the electric outlet.
 Memo	Indicates an item intended to provide notes assisting the understanding of the topic in question.
 REF.	Indicates an item of reference assisting the understanding of the topic in question.
	Provides a description of a service mode.
	Provides a description of the nature of an error indication.

The following rules apply throughout this Service Manual:

1. Each chapter contains sections explaining the purpose of specific functions and the relationship between electrical and mechanical systems with reference to the timing of operation.

   In the diagrams, ▮▮▮▮ represents the path of mechanical drive; where a signal name accompanies the symbol , the arrow ⟶ indicates the direction of the electric signal.

   The expression "turn on the power" means flipping on the power switch, closing the front door, and closing the delivery unit door, which results in supplying the machine with power.

2. In the digital circuits, '1'is used to indicate that the voltage level of a given signal is "High", while '0' is used to indicate "Low".(The voltage value, however, differs from circuit to circuit.) In addition, the asterisk (*) as in "DRMD*" indicates that the DRMD signal goes on when '0'.

   In practically all cases, the internal mechanisms of a microprocessor cannot be checked in the field. Therefore, the operations of the microprocessors used in the machines are not discussed: they are explained in terms of from sensors to the input of the DC controller PCB and from the output of the DC controller PCB to the loads.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins and be able to identify and isolate faults in the machine."

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Chapter 1 Specifications

Chapter 2 Functions

Chapter 3 Parts Replacement Procedure

Chapter 4 Maintenance

Chapter 5 Error Code

Chapter 1 Specifications

Contents

1.1 Product Specifications

1.1.1 Specifications

0003-4694

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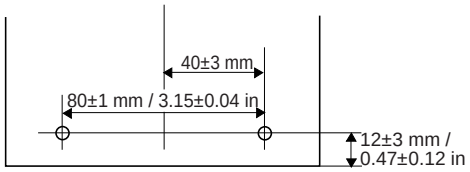
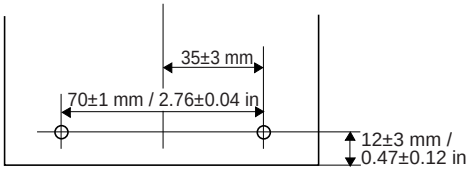
Item	Specifications	Remarks
Punching method	Reciprocating punching (Sequential punch-ing)	
Paper size	2 holes (Puncher Unit-L1): A3, A4, A4R, B4, B5, B5R 2 or 3 holes (Puncher Unit-M1): 2 holes/LGL, LTRR 3 holes/279mm x 432mm (11 x 17), LTR 4 holes (FRA)(Puncher Unit-N1): A3, A4 4 holes (SWD)(Puncher Unit-P1): A3, A4	
Paper weight	64g/m2 to 250g/m2	Transparenies not allowed
Punched hole diameter	2 holes : 6.5mm 2 or 3 holes : 8mm 4 holes : 6.5mm	
Punched scrap capacity	2 holes: 10,000 sheets or more 2 or 3 holes: 3,000 sheets or more 4 holes: 5,000 sheets or more	80 g/m2 or equivalent
Dimensions	107 x 615 x 378mm (W x D x H)	
Weight	Approx. 7.2 kg	
Power supply	From finisher unit (24 VDC / 5 VDC)	

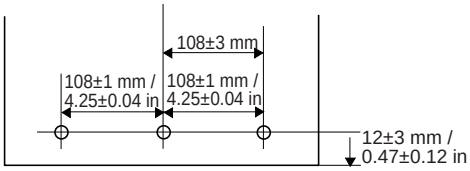
Hole position

[1] Puncher unit-L1 (2-Hole)

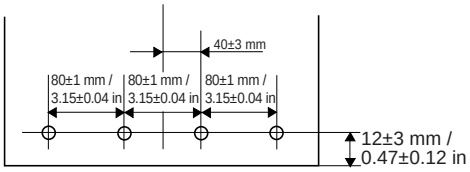


[2] Puncher unit-M1 (2-/3-Hole)

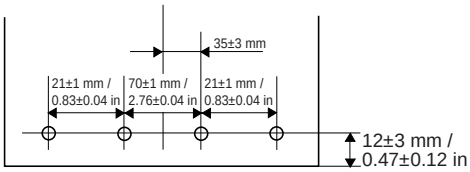




[3] Puncher unit-N1 (4-Hole (FRA))



[4] Puncher unit-P1 (4-Hole (SWD))



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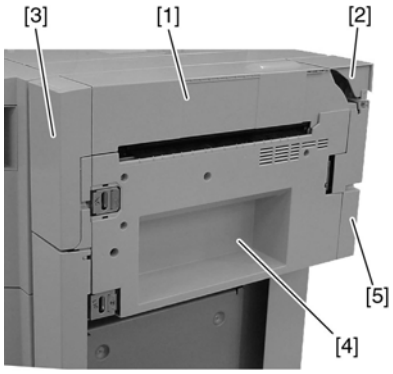
1.2 Names of Parts

1.2.1 External View

0003-4695



F-1-2

T-1-2

[1] Upper cover

[2] Upper cover 2

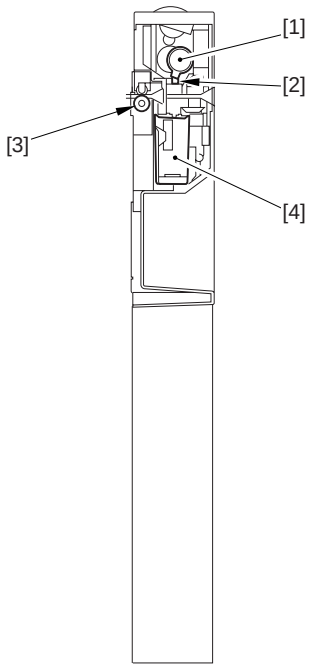
[3] Front door

[4] Right guide assembly

[5] Rear cover

1.2.2 Cross Section

0003-4696



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T-1-3

[1] Cam	[3] Punch feed roller
[2] Hole puncher (Punch blade)	[4] Punch waste case

Chapter 2 Functions

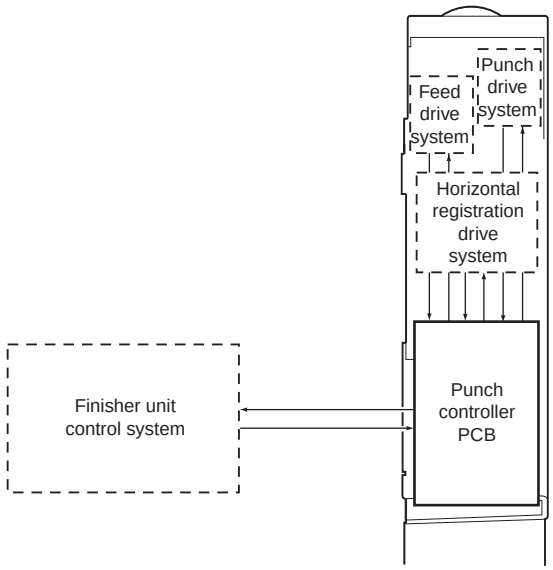
Contents

2.1 Basic Construction

2.1.1 Functional Construction

0003-8735

The puncher unit is optionally installed in the delivery path between the host machine and the finisher.
When the paper delivered from the host machine reaches the puncher unit, it is fed by the punch feed roller. Then when the trailing edge of the paper is detected, the paper is tempo-rarily stopped and the punch axis rotates to punch holes in the trailing edge of the paper. These operations are controlled by the finisher controller PCB and the punch controller PCB drives each puncher component.



F-2-1

2.2 Feed Drive System

2.2.1 Overview

0003-9479

The puncher unit is located on the feed path between the host machine and the finisher, and successively punches holes when the paper stops temporarily.
The paper delivered from the host machine is fed by the punch feed roller. The punch feed roller is driven by the punch feed motor. When the trailing edge of the paper reaches the puncher unit, the inlet roller of the finisher unit temporarily stops the paper and holes are punched on the trailing edge of the paper.
The following shows the names and functions of the motors and sensors used in punching operation:

T-2-1

Motor	Function
Punch motor (M61)	Drives the punch unit.
Horizontal registration motor (M62)	Drives the punch slide unit.
Punch feed motor(M63)	Drives the punch feed roller.

T-2-2

Sensor	Function
Horizontal registration home position sensor (PI61)	Detects the punch slide unit home position.
Punch motor clock sensor (PI62)	Detects the punch motor clock.
Punch home position sensor (PI63)	Detects the punch shaft home position.
Horizontal registration sensor (LED1 to LED4,PTR1 to PTR4)	Detects the position of the rear edge of paper.
Trailing edge sensor (LED5,PTR5)	Detects the trailing edge of paper.
Scrap full detector sensor (LED6,PTR6)	Detects the state of the punch waste case (full).

2.2.2 Constraction of the Control System

0003-4698

The puncher unit consists of a die and hole puncher (punch blade).
The hole puncher is driven by the punch motor (M61). The hole puncher is attached to the eccentric cam of the punch shaft, and rotary action of the punch shaft is converted to reciprocal motion to perform punching.
Punch motor (M61) is a DC motor. The home position of the punch shaft is detected by punch home position sensor

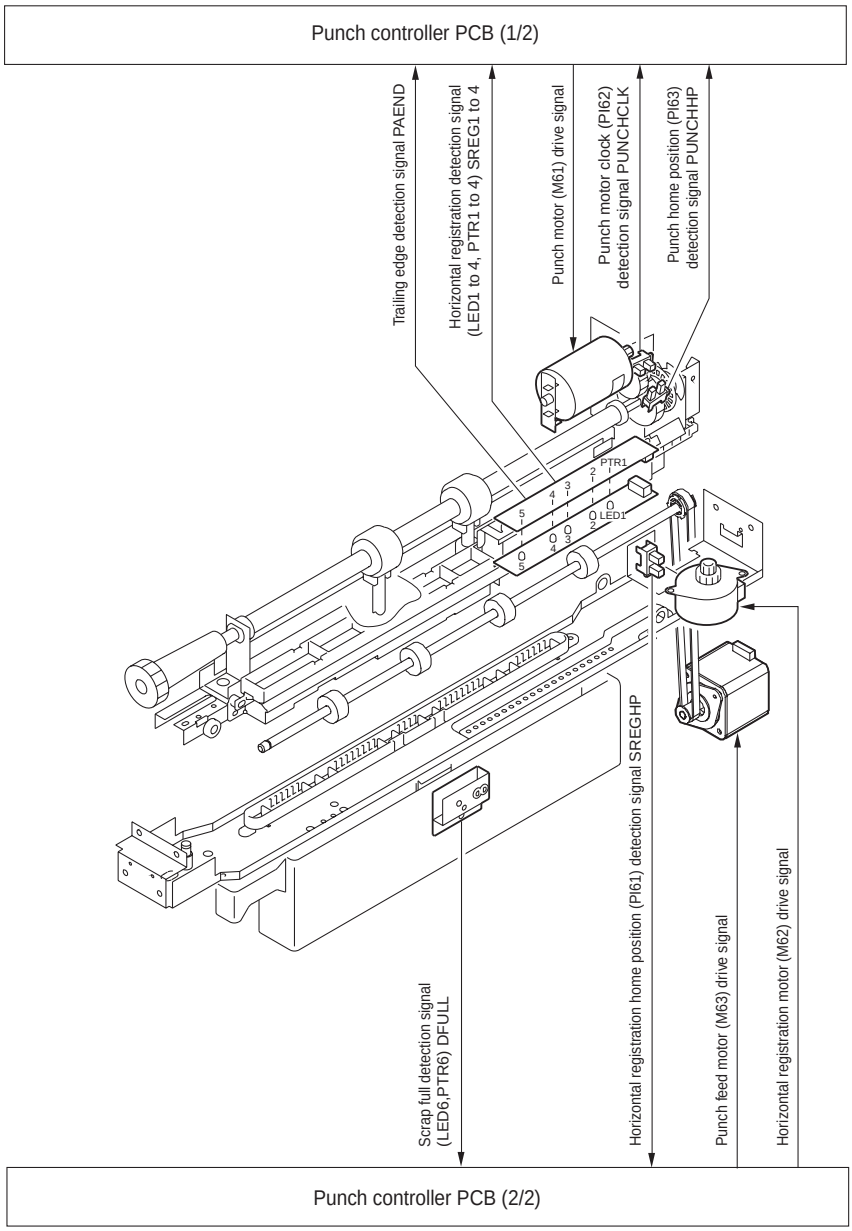
(PI63). To stop the DC punch motor accurately at its home po-sition, the punch motor clock sensor (PI62) counts a predetermined number of clock pulses to stop the punch motor. A single punch operation is performed by rotating the punch shaft 180° from its home position.

Five light sensors (photosensor PCB) are located at the upper side of the inlet paper feed path of the puncher unit and a set of five LEDs (LED PCB) are located at the lower side. These sensors and LEDs function as five sensors. The frontmost sensor (LED5, PTR5) are the trailing edge sensor and are used for detecting the trailing edge of the paper. The remaining sensors (LED1 to LED4, PTR1 to PTR4) are horizontal registration sensors, and are used for detecting the inner position of the paper for determining the hole punching position.

The punch motor, puncher unit and above sensors comprise the punch slide unit. This unit moves backwards and forwards according to the size of the paper. Backward and forward movement is driven by the horizontal registration motor (M62). The home position of the punch slide unit is detected by the horizontal registration home position sensor (PI61). The horizontal registration motor (M62) is a 2-phase stepping motor.

The punch motor and horizontal registration motor is driven by the punch controller PCB
according to control signals from the finisher controller PCB.

Punch scraps caused by punching are stored in the punched scrap container. Scrap full detection is performed by a reflective sensor (LED6 and PTR6 on the scrap full detector PCB unit).



F-2-2

2.2.3 Punch Operation

0003-4699

The hole puncher is driven by the punch motor (M61), and its position is monitored by the punch home position sensor (PI63).

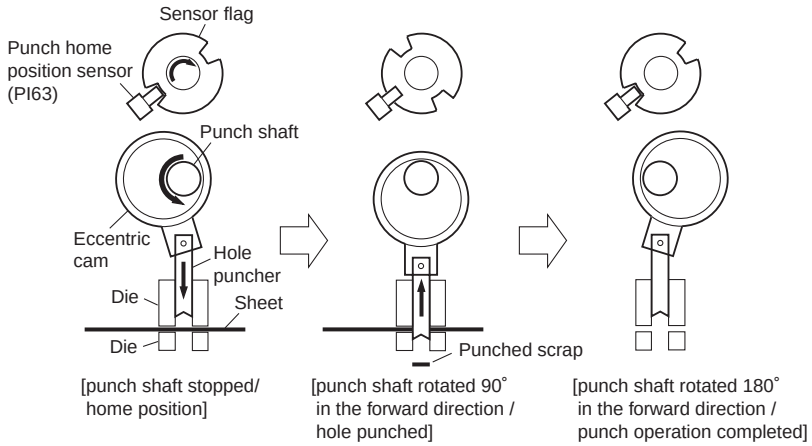
The hole puncher makes a single round-trip movement (punching) as the punch shaft rotates 180° from home position.

In the case of a 2-or-3 hole type, the half sector of the punch shaft is used when punching 2 holes while the half sector on the opposite side is used when punching 3 holes as instructed by the host machine.

<2-/4-hole Type>

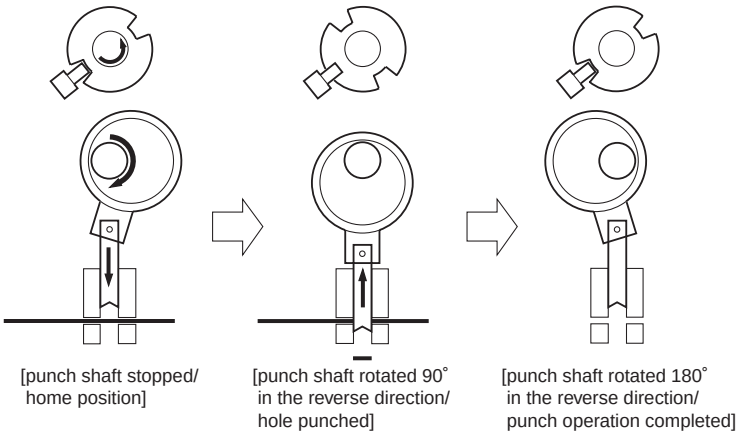
At the home position, the punch home position sensor is ON. Punching of the first sheet ends when the punch shaft has rotated in the forward direction 180°, and the state of the punch home position sensor has changed from OFF to ON. Punching of the second sheet ends when the punch shaft has rotated in the reverse direction 180° , and the state of the punch home position sensor has changed from OFF to ON.
The following illustrates punching when two sheets are punched.

1) A hole is punched in the trailing edge of the first sheet.



F-2-3

2) A hole is punched in the trailing edge of the second sheet.

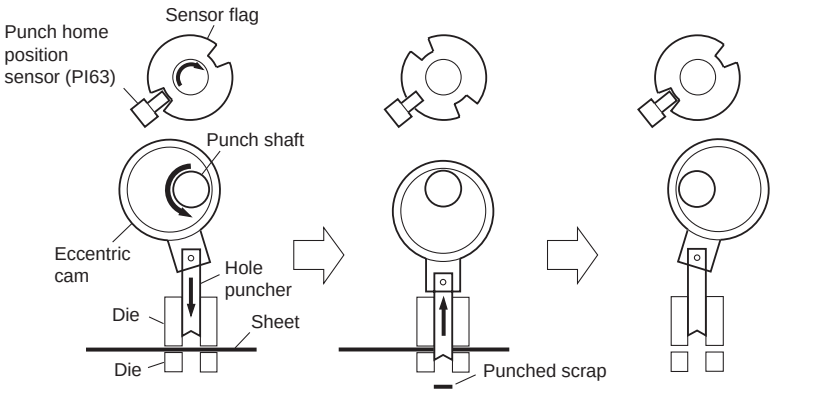


F-2-4

<2-/3-hole Dual Use Type>
At the home position, the punch home position sensor is ON. To punch two holes, punching of the first sheet ends when the punch shaft half peripheral area has rotated in the forward direction 180°, and the state of the punch home position sensor has changed from OFF to ON. At this time, the 3-hole puncher is moved reciprocally in the escape direction (hole puncher rise direction) on the remaining half peripheral area on the punch shaft. Punching of the second sheet ends when the punch shaft half peripheral area has rotated in the reverse direction 180°, and the state of the punch home position sensor has changed from OFF to ON. Also at this time, the 3-hole puncher is moved

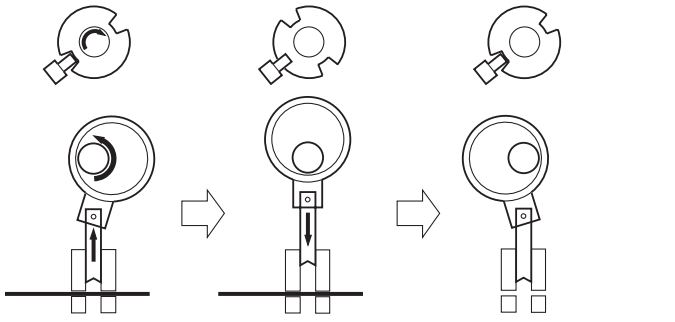
reciprocally in the escape direction (hole puncher rise direction) on the remaining half peripheral area on the punch shaft. To punch three holes, the 2-hole puncher is moved reciprocally in the escape direction (hole puncher rise direction).
The following illustrates punching when two sheets are punched with two holes.

1) A hole is punched in the trailing edge of the first sheet.



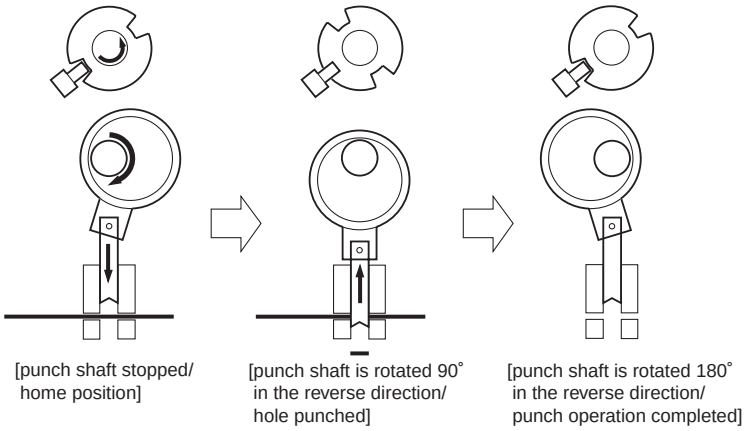
F-2-5

When two holes are punched, the 3-hole puncher is fed reciprocally in the escape direction (hole puncher rise direction) as shown below.



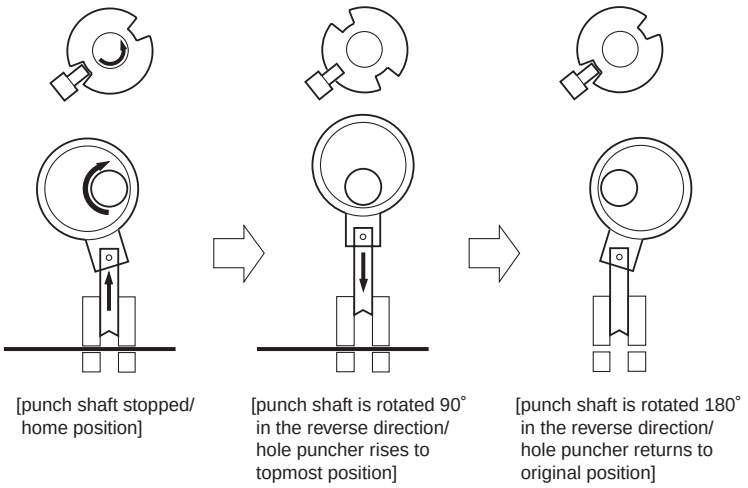
F-2-6

2) A hole is punched in the trailing edge of the second sheet.



F-2-7

When two holes are punched, the 3-hole puncher is fed reciprocally in the escape direction (hole puncher rise direction) as shown below.



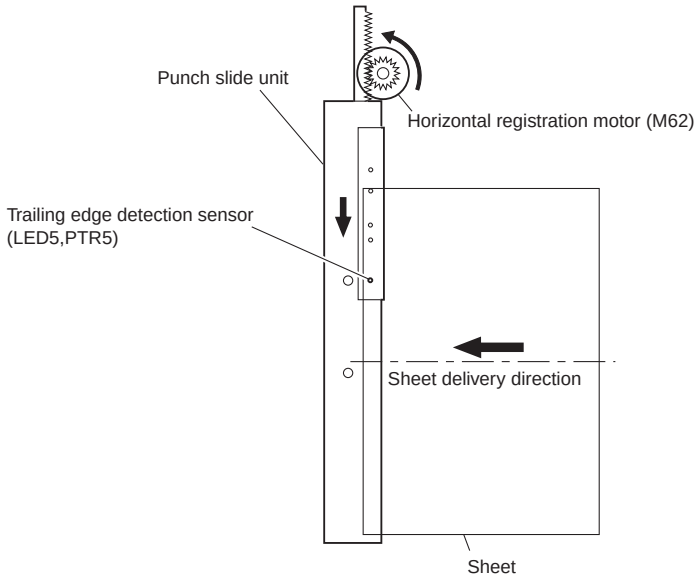
F-2-8

2.2.4 Horizontal Registration Operation

0003-4700

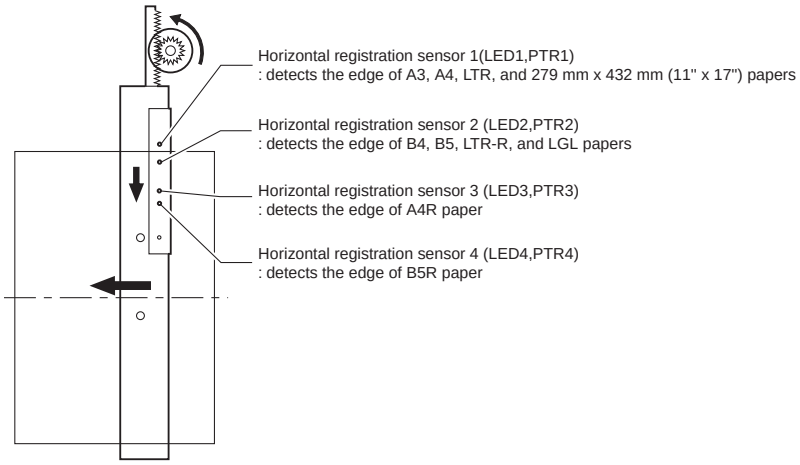
Horizontal registration drive of the punch slide unit is performed by the horizontal registration motor (M62). The home position of the punch slide unit is detected by the horizontal registration home position sensor (PI61). The punch slide unit detects the trailing edge of the paper by the trailing edge sensor (LED5, PTR5) and horizontal registration sensors (LED1 to 4, SREG1 to 4) and is moved to the trailing edge position matched to the paper size. The following shows horizontal registration operation.

1) When the leading edge of the paper from the host machine is detected by the trailing edge sensor (LED5, PTR5) on the puncher unit, the horizontal registration motor (M62) starts to move the punch slide unit towards the front.



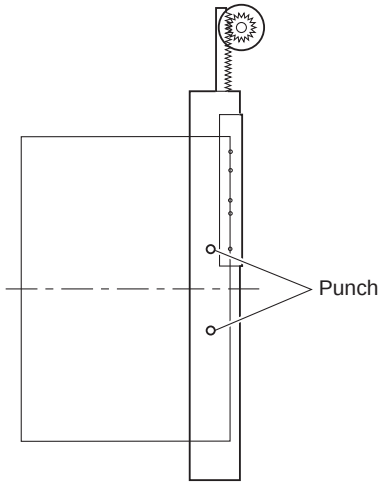
F-2-9

2) After the horizontal registration sensors (LED1 to 4, PTR1 to 4) detect the edge of the paper at its inner side in keeping with the paper size signals arriving from the host ma-chine, the horizontal registration motor (M62) drives the punch slide unit to a predetermined position further towards the front, and stops the unit at this position.



F-2-10

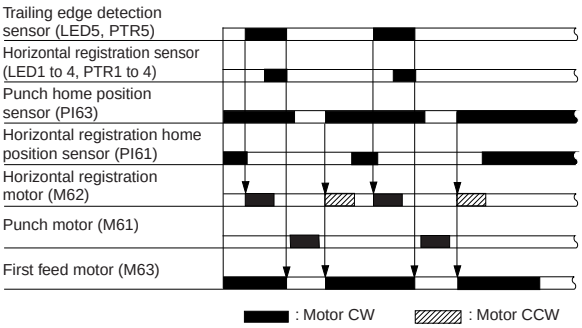
3) When the trailing edge sensor (LED5, PTR5) detects the trailing edge of the paper, drive of the punch feed motor (M63) is stopped to stop paper feed. Next, the punch motor (M161) is driven to punch holes in the paper.



F-2-11

4) When punching ends, drive of the punch feed motor (M63) is started, the horizontal registration motor (M62) is operated in the reverse direction, and the punch slide unit is returned to its home position where it comes to a stop.

5) Even if paper to be punched continues to arrive, the punch slide unit returns to its home position for each arriving sheet, and steps 1 to 4 are repeated.



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2.3 Detecting Jams

2.3.1 Detecting Jams

0003-4704

The finisher unit identifies any of the following conditions as a jam, and sends the jam signal to the host machine. In response, the host machine may stop copying operation and indicate the presence of a jam on its control panel.

T-2-3

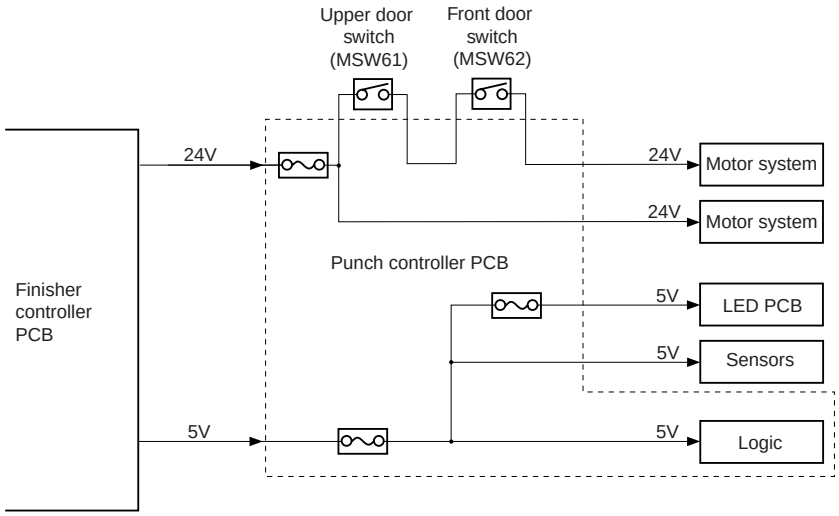
Jam type	Sensor	Jam Condition	Code
Feeding delay	LED,PTR5	When the rear end sensor (LED, PTR5) does not detect paper after a prescribed time (distance) has elapsed since receiving a delivery signal from the host machine.	1002
Feeding stationary	LED,PTR5	When paper does not exit the rear end sensor (LED, PTR5) after feeding for a prescribed time (distance) after the rear end sensor (LED, PTR5) has detected paper.	1102
Punch	PI63	When the punch home position sensor (PI63) does not turn on after a prescribe time has elapsed since it is turned off.	1644
Power-on	LED,PTR5	When paper is detected by the rear end sensor (LED, PTR5) during power on.	1645

2.4 Power Supply

2.4.1 Power Supply Route

0003-4702

24V power and 5V power are supplied from the finisher controller PCB when the power switch on the host machine is turned ON.
24V power is used for driving motors, while 5V power is used for driving sensors and the ICs on the punch controller PCB.
24V power to the motors is not supplied when either of the two door switches on the puncher unit is open.



F-2-13

2.4.2 Protection Function

0003-4703

The 24V power supplies are equipped with a fuse designed to blow when an overcurrent flows.

Chapter 3 Parts Replacement Procedure

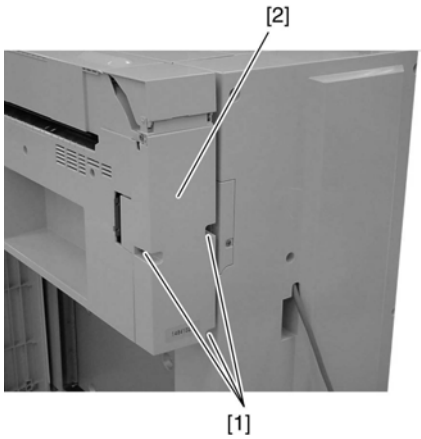
Contents

3.1 External Covers

3.1.1 Rear Cover

3.1.1.1 Removing the Rear Cover 0003-6789

1) Remove three screws [1] and remove the rear cover [2].

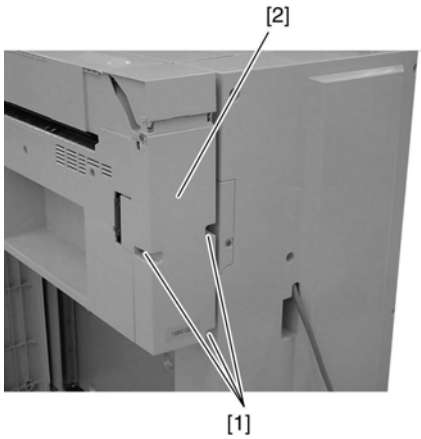


F-3-1

3.1.2 Upper Cover

3.1.2.1 Removing the Rear Cover 0003-6790

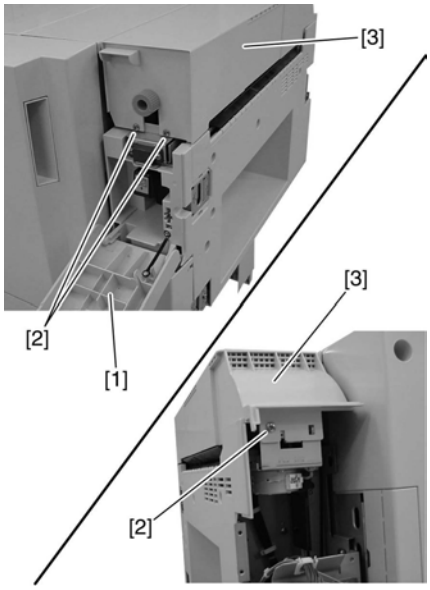
1) Remove three screws [1] and remove the rear cover [2].



F-3-2

3.1.2.2 Removing the Upper Cover 0003-6791

1) Open the front door [1], remove three screws [2], and remove the upper cover [3].

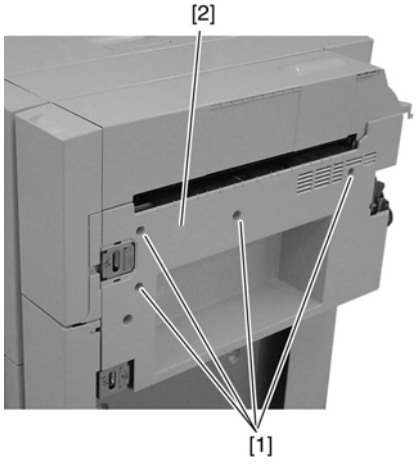


F-3-3

3.1.3 Right Guide Unit

3.1.3.1 Removing the Right Guide Unit 0003-6792

1) Remove four screws [1], and remove the right guide assembly [2].



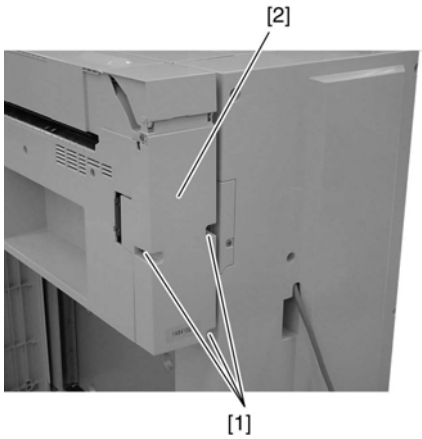
F-3-4

3.2 Drive System

3.2.1 Punch Motor

3.2.1.1 Removing the Rear Cover 0003-6793

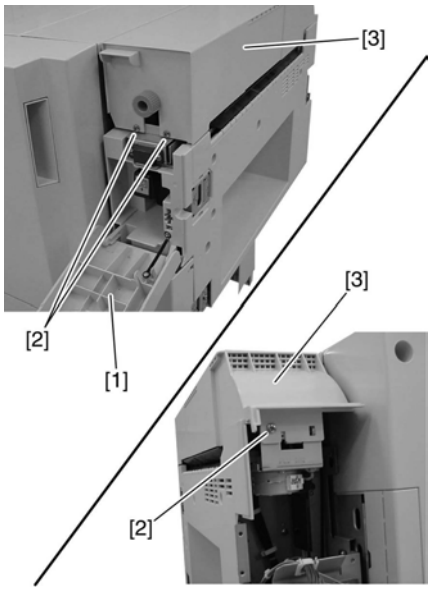
1) Remove three screws [1] and remove the rear cover [2].



F-3-5

3.2.1.2 Removing the Upper Cover 0003-6794

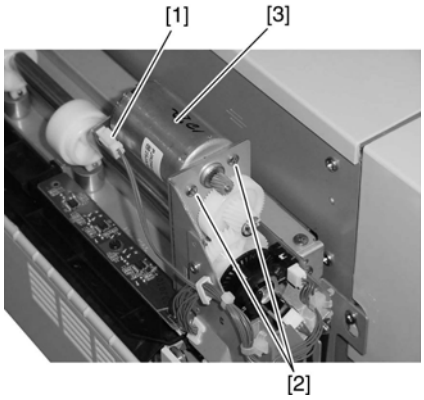
1) Open the front door [1], remove three screws [2], and remove the upper cover [3].



F-3-6

3.2.1.3 Removing the Punch Motor 0003-6795

1) Disconnect the connector [1].
2) Remove two screws [2] and remove the punch motor [3].

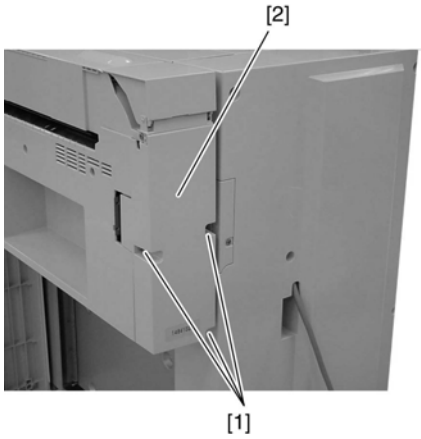


F-3-7

3.2.2 Horizontal Registration Motor

3.2.2.1 Removing the Rear Cover 0003-6796

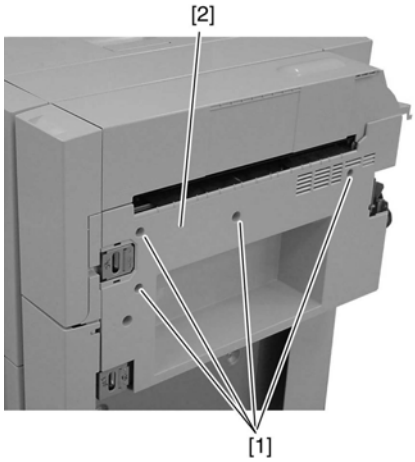
1) Remove three screws [1] and remove the rear cover [2].



F-3-8

3.2.2.2 Removing the Right Guide Unit 0003-6797

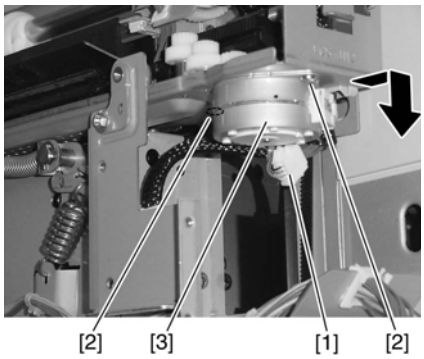
1) Remove four screws [1], and remove the right guide assembly [2].



F-3-9

3.2.2.3 Removing the Horizontal Registration Motor 0003-6798

1) Disconnect the connector [1].
2) Remove two screws [2] and slide the horizontal registration motor [3] in the direction of the arrow to remove.



F-3-10

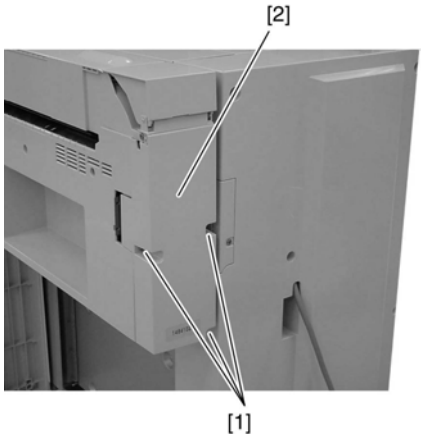
3.2.3 Punch Unit

3.2.3.1 Notification when dismounting the Punch Unit 0003-8233

⚠When removing the punch unit, the punch unit section sometimes opens. If necessary, perform work with the punch unit section in an open state.

3.2.3.2 Removing the Rear Cover 0003-6800

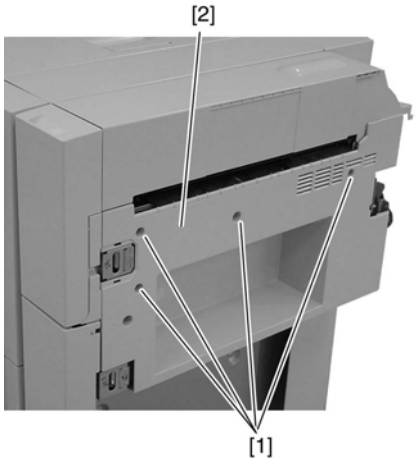
1) Remove three screws [1] and remove the rear cover [2].



F-3-11

3.2.3.3 Removing the Right Guide Unit 0003-6799

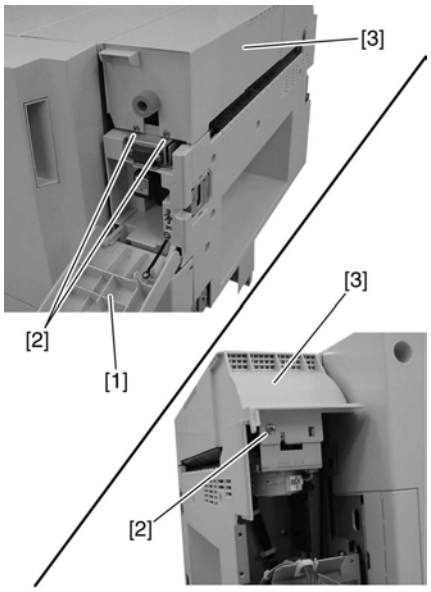
1) Remove four screws [1], and remove the right guide assembly [2].



F-3-12

3.2.3.4 Removing the Upper Cover 0003-6801

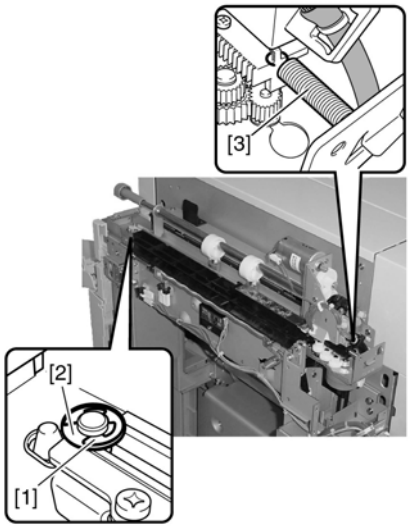
1) Open the front door [1], remove three screws [2], and remove the upper cover [3].



F-3-13

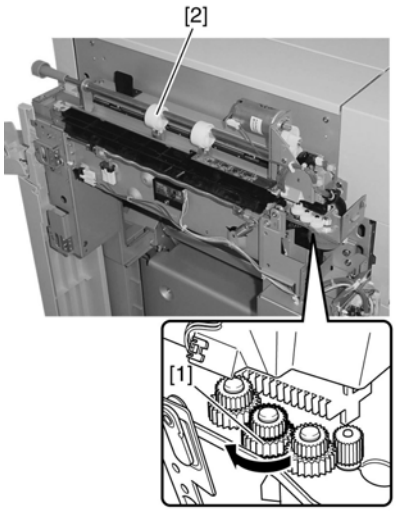
3.2.3.5 Removing the Punch Unit 0003-6802

1) Remove E-ring [1], washer [2], and puncher spring [3].



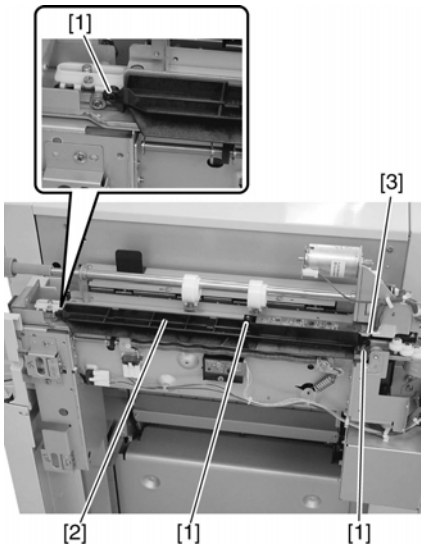
F-3-14

2) Turn the gear [1] in the direction of the arrow, and move the punch unit section [2] to the front side.



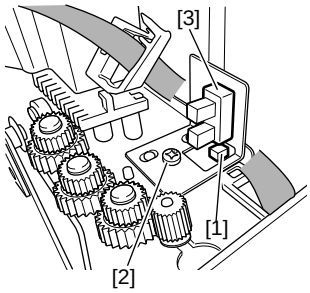
F-3-15

3) Remove the three screws [1], and remove the sensor mount (upper) [2]. Then, remove the connector [3] on the photosensor PCB.



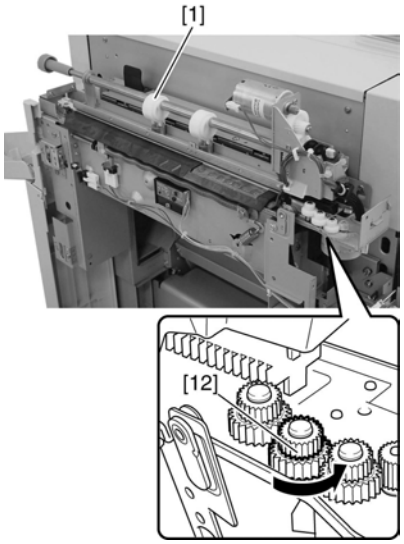
F-3-16

4) Disconnect the connector [1] and remove the screw [2], and remove the horizontal registration home position sensor [3].



F-3-17

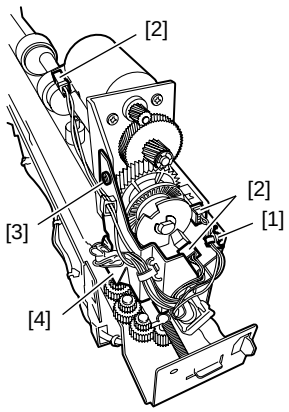
5) Turn the gear [1] in the direction of the arrow, and move the punch unit section [2] to the far side.



F-3-18

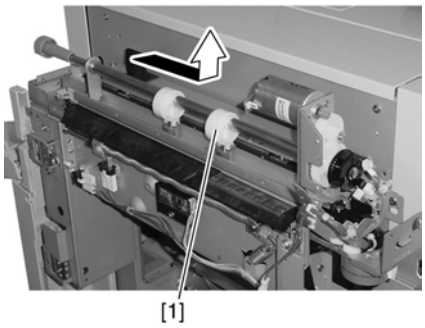
6) Remove the tie wrap with lock [1] while holding its claw between your fingers. (The tie wrap must be removed without being cut.)

7) Disconnect the three connectors [2] and remove the screw [3], and remove the harness guide [4].



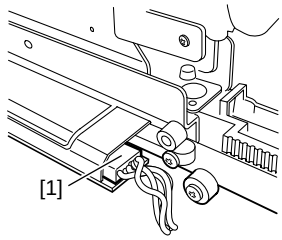
F-3-19

8) Lift up the front side of the punch unit section [1] first, then move in the direction of the arrow to remove the punch unit section [1].



F-3-20

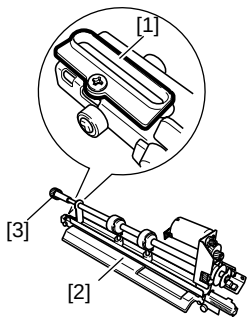
9) Disconnect the connector [1] on LED PCB.



F-3-21

10) Remove the slide shaft support [1], the sensor mount (lower) [2] and the puncher knob [3] from the punch unit section.

⚠The slide shaft support [1] is not attached to punch unit section that are currently set as service parts. When replacing the punch unit section, be sure to attach the slide shaft support that was in use beforehand. If you forget to attach the slide shaft support, the machine may malfunction.



F-3-22

3.3 Electrical System

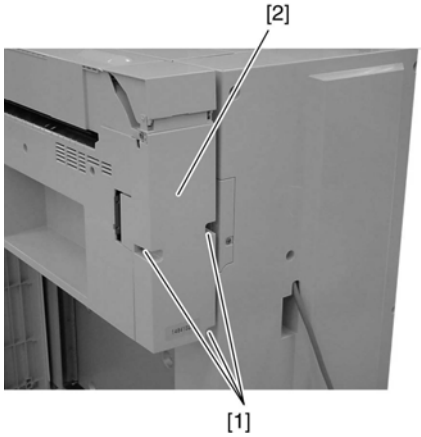
3.3.1 Punch Unit Harness

3.3.1.1 Notification when dismounting the Punch Unit Harness 0003-8728

⚠When removing the punch unit, the punch unit section sometimes opens. If necessary, perform work with the punch unit section in an open state.

3.3.1.2 Removing the Rear Cover 0003-6804

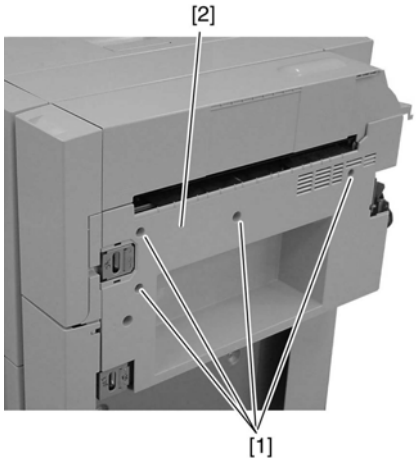
1) Remove three screws [1] and remove the rear cover [2].



F-3-23

3.3.1.3 Removing the Right Guide Unit 0003-6805

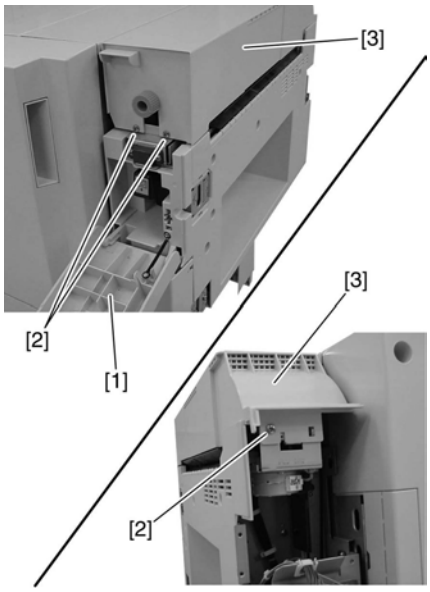
1) Remove four screws [1], and remove the right guide assembly [2].



F-3-24

3.3.1.4 Removing the Upper Cover 0003-6803

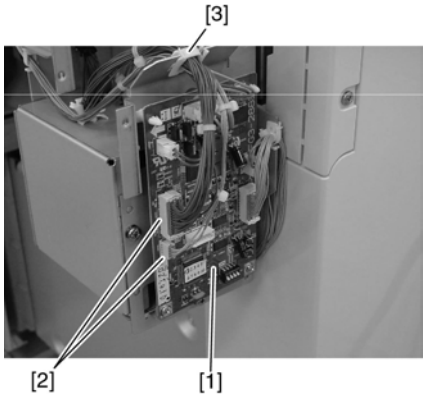
1) Open the front door [1], remove three screws [2], and remove the upper cover [3].



F-3-25

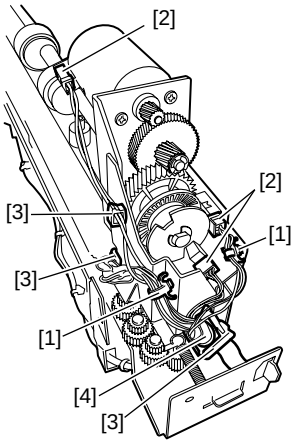
3.3.1.5 Removing the Punch Unit Harness 0003-6807

1) Disconnect the two connectors [2] on the punch controller PCB [1] and remove the harness from the edge saddle [3].



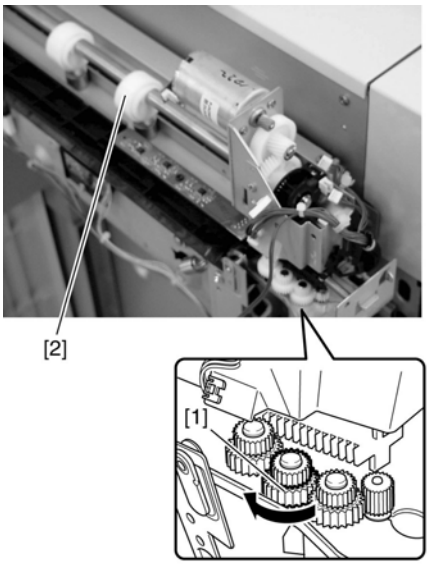
F-3-26

2) Remove the two tie wraps with lock [1] while holding its claw between your fingers. (The tie wraps must be removed without being cut.)
3) Disconnect the three connectors [2].
4) Free the harness [4] from the three harness stops [3].



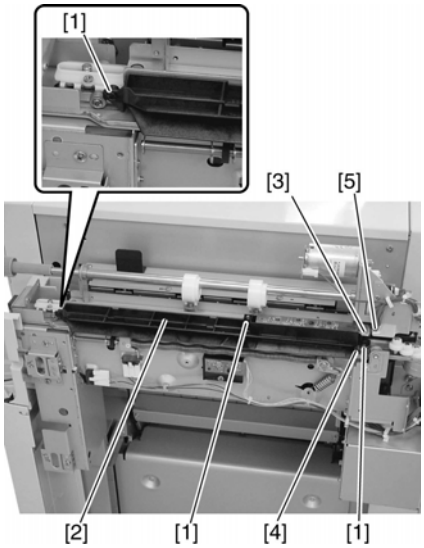
F-3-27

5) Turn the gear [1] in the direction of the arrow, and move the punch unit section [2] to the front side.



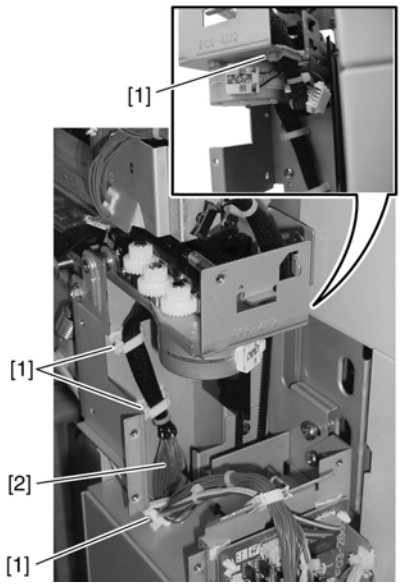
F-3-28

6) Remove the three screws [1] and sensor mount (upper) [2].
7) Disconnect the connector [3] on the photosensor PCB and the connector [4] on the LED PCB and remove the harness from the edge saddle [5].



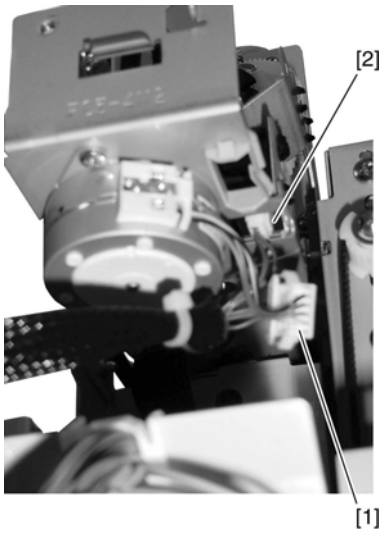
F-3-29

8) Free the harness [2] from the four harness stops [1].



F-3-30

9) Disconnect the connector [1] of the horizontal registration motor and the connector [2] of the horizontal registration home position sensor, and remove the punch unit harness.

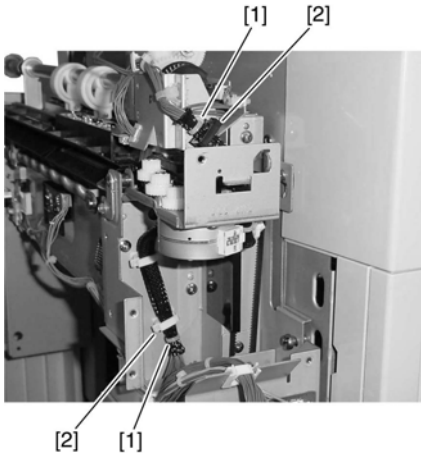


F-3-31

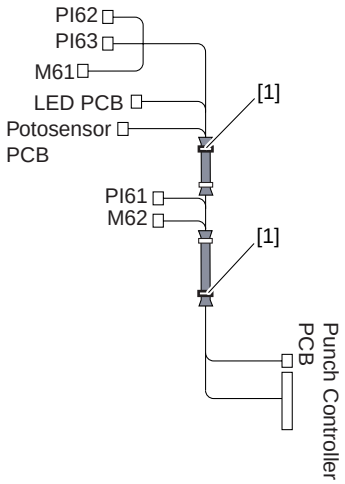
3.3.1.6 Installing the Punch Unit Harness 0003-6806

⚠Offset punch unit harnesses can cause malfunction. The punch unit harnesses must be firmly installed at the positions described below.

1) Fasten the punch unit harnesses so that the two tie wraps [1] of the punch unit harnesses are on the outside of the two respective clamps [2].



F-3-32

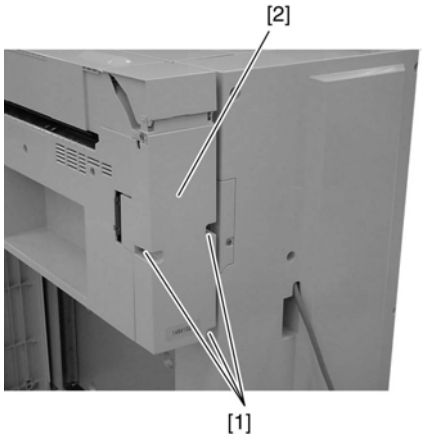


F-3-33

3.3.2 LED PCB

3.3.2.1 Removing the Rear Cover 0003-6809

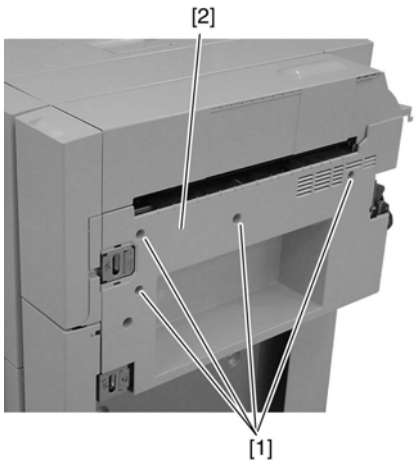
1) Remove three screws [1] and remove the rear cover [2].



F-3-34

3.3.2.2 Removing the Right Guide Unit 0004-0830

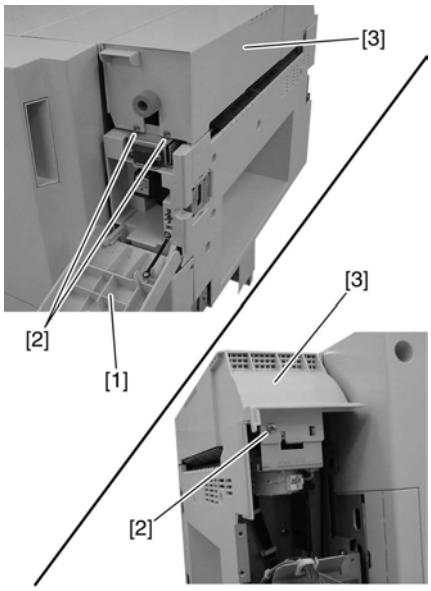
1) Remove four screws [1], and remove the right guide assembly [2].



F-3-35

3.3.2.3 Removing the Upper Cover 0003-6810

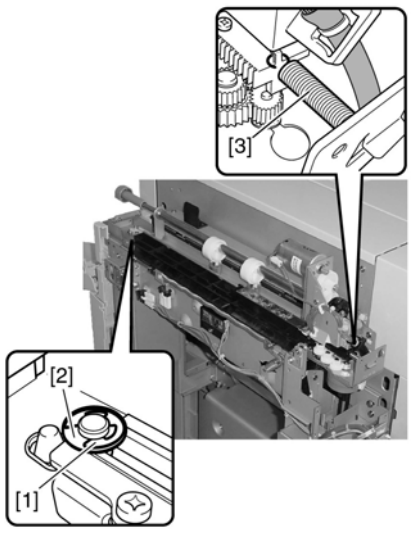
1) Open the front door [1], remove three screws [2], and remove the upper cover [3].



F-3-36

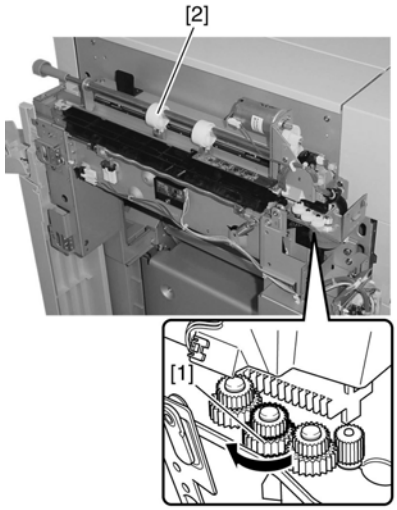
3.3.2.4 Removing the Punch Unit 0004-0831

1) Remove E-ring [1], washer [2], and puncher spring [3].



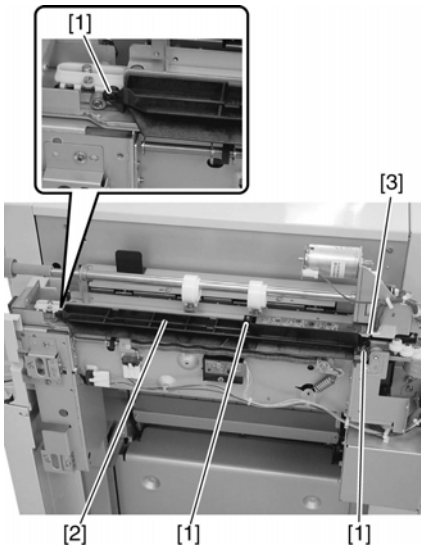
F-3-37

2) Turn the gear [1] in the direction of the arrow, and move the punch unit section [2] to the front side.



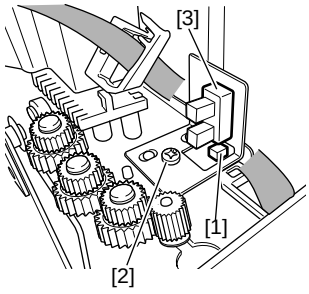
F-3-38

3) Remove the three screws [1], and remove the sensor mount (upper) [2]. Then, remove the connector [3] on the photosensor PCB.



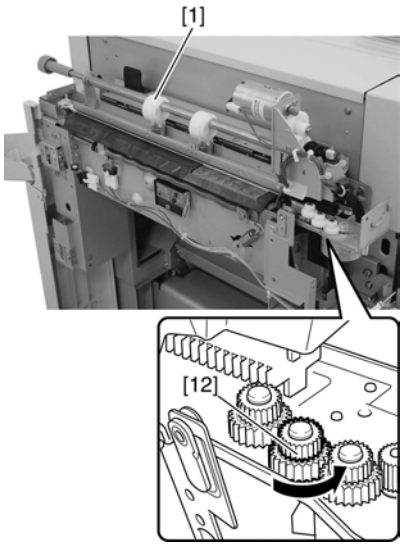
F-3-39

4) Disconnect the connector [1] and remove the screw [2], and remove the horizontal registration home position sensor [3].



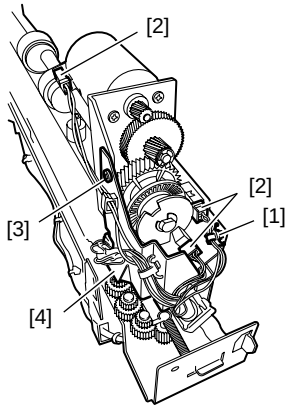
F-3-40

5) Turn the gear [1] in the direction of the arrow, and move the punch unit section [2] to the far side.



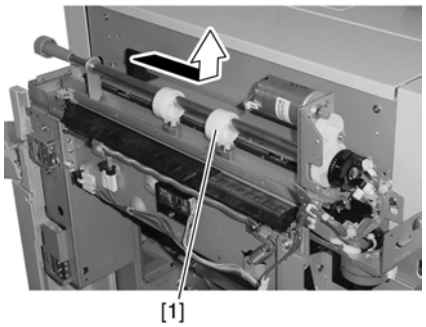
F-3-41

6) Remove the tie wrap with lock [1] while holding its claw between your fingers. (The tie wrap must be removed without being cut.)
7) Disconnect the three connectors [2] and remove the screw [3], and remove the harness guide [4].



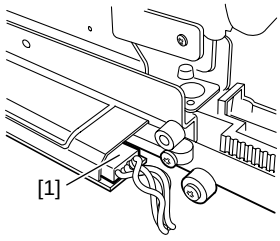
F-3-42

8) Lift up the front side of the punch unit section [1] first, then move in the direction of the arrow to remove the punch unit section [1].



F-3-43

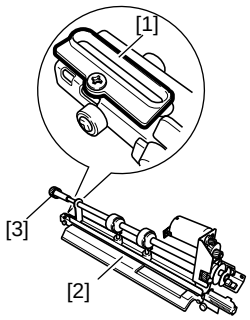
9) Disconnect the connector [1] on LED PCB.



F-3-44

10) Remove the slide shaft support [1], the sensor mount (lower) [2] and the puncher knob [3] from the punch unit section.

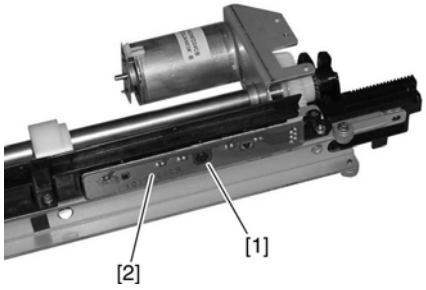
⚠The slide shaft support [1] is not attached to punch unit section that are currently set as service parts. When replacing the punch unit section, be sure to attach the slide shaft support that was in use beforehand. If you forget to attach the slide shaft support, the machine may malfunction.



F-3-45

3.3.2.5 Removing the LED PCB 0004-0827

1) Remove the screw [1], and remove the LED PCB [2].



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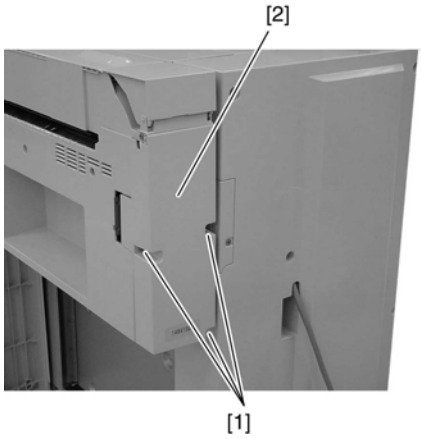
3.3.3 Photosensor PCB

3.3.3.1 Removing the Rear Cover 0003-6813

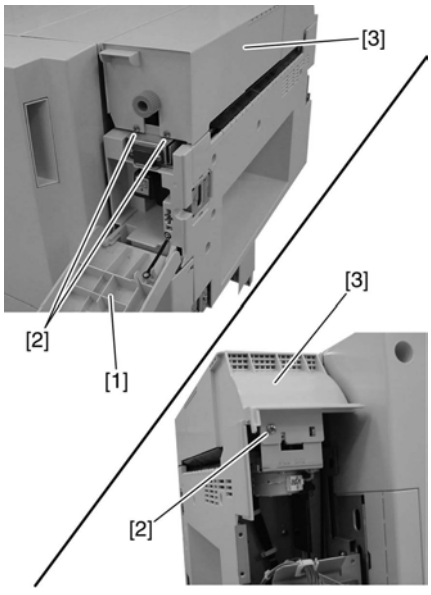
1) Remove three screws [1] and remove the rear cover [2].



F-3-47

3.3.3.2 Removing the Upper Cover 0003-6812

1) Open the front door [1], remove three screws [2], and remove the upper cover [3].



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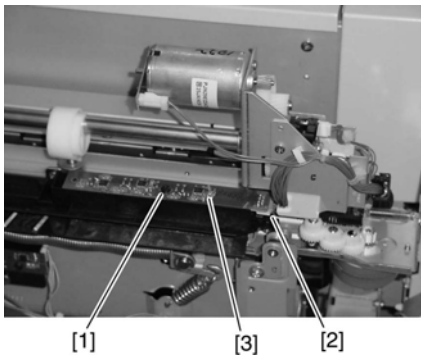
3.3.3.3 Removing the Photosensor PCB 0004-0829

1) Remove the screw [1].
2) Disconnect the connector [2] and the remove the Photosensor PCB [3].

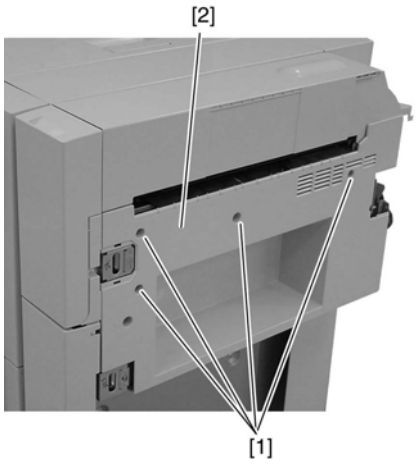


F-3-49

3.3.4 Scrap Full Detector PCB

3.3.4.1 Removing the Right Guide Unit 0003-6817

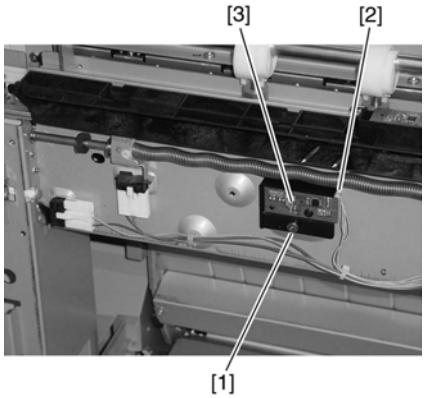
1) Remove four screws [1], and remove the right guide assembly [2].



F-3-50

3.3.4.2 Removing the Scrap Full Detector PCB 0003-6818

1) Remove the screw [1], disconnect the connector [2], and remove the scrap full detector PCB unit [3].



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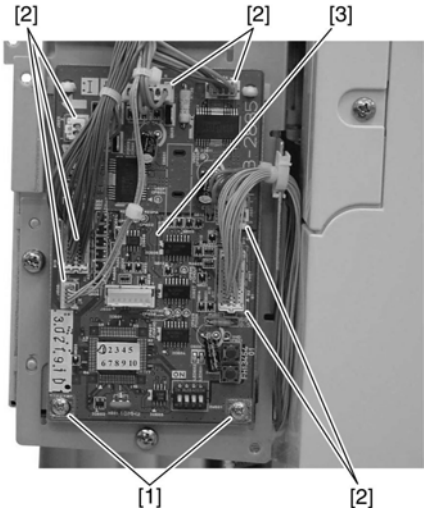
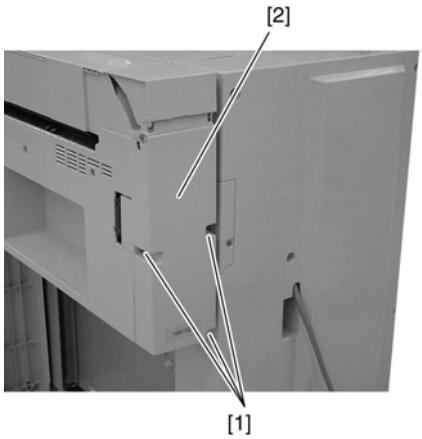


F-3-53

3.3.5 Punch Controller PCB

3.3.5.1 Removing the Rear Cover 0003-6819

1) Remove three screws [1] and remove the rear cover [2].



F-3-52

3.3.5.2 Removing the Punch Controller PCB 0003-6820

1) Remove the two screws [1], disconnect seven connectors [2], and remove the punch controller PCB [3].

Chapter 4 Maintenance

Contents

4.1 User Maintenance

4.1.1 User Maintenance

0003-4705

T-4-1

No.	Item	Timing
1	Punch waste removal	When prompted (indicator on host machine control panel)

4.2 Maintenance and Inspection

4.2.1 Periodically Replaced Parts

4.2.1.1 Periodically Replaced Parts 0003-4706

The Puncher unit does not have parts that must be replaced on a periodical basis.

4.2.2 Durables

4.2.2.1 Durables 0003-4707

There are no durables that require durables.

4.2.3 Periodical Servicing

4.2.3.1 Periodical Servicing 0003-4708

T-4-2

Item	Interval	Description	Remark
Transmittance sensor	25 million sheets	Cleaning	Wipe with dry cloth

4.3 Adjustment

4.3.1 Adjustment at Time of Parts Replacement

4.3.1.1 Adjusting the Punch Hole Position (feed direction) 0003-4709

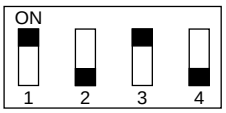
This adjustment is possible only with the host machine service mode.

4.3.1.2 Sensor Output Adjustment 0003-4710

Perform this adjustment when replacing the punch controller PCB, transmittance sensor (photosensor PCB/LED PCB), or deflection sensor (scrap full detector PCB unit).

1) Check that the power of the host machine is off and then remove the rear cover of the puncher.

2) Set SW601 on the punch controller PCB as shown below.



F-4-1

3) Turn on the power of the host machine.

4) Press SW602 on the punch controller PCB. Sensor output is adjusted automatically when the switch is pressed.

Adjustment is complete if LED601 and 602 on the punch controller PCB flashes alternately.

5) Press SW602 or 603 on the punch controller PCB to end the adjustment mode and set all bits of SW601 to OFF.

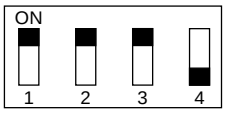
6) Turn off the power of the host machine.

4.3.1.3 Registering the Number of Punch Holes 0003-4711

This operation registers which puncher unit is attached to the IC on the punch driver PCB so that the puncher unit can be identified by the finisher. For this reason, this operation must be performed when the punch driver PCB has been replaced.

1) Check that the power of the host machine is off and then remove the rear cover of the puncher.

2) Set SW601 on the punch controller PCB as shown below.



F-4-2

3) Turn on the power of the host machine.

4) Press SW602 on the punch controller PCB to select the number of punch holes.

The items in the following table are displayed repeatedly from top to bottom each time SW602 is pressed.

T-4-3

Number of punch holes	**LED601/602**
2 hole(Puncher Unit-L1)	Flash 1 times per cycle
2/3 hole(Puncher Unit-M1)	Flash 2 times per cycle
4 hole(Puncher Unit-N1(FRA))	Flash 3 times per cycle
4 hole(Puncher Unit-P1(SWD))	Flash 4 times per cycle

5) Press SW603 on the punch controller PCB. The number of punch holes is registered to the punch controller PCB each time the switch is pressed.

Registration is complete if LED601 and 602 on the punch controller PCB flashes alternately.

6) Press SW602 or 603 on the punch controller PCB to end the adjustment mode and set all bits of SW601 to OFF.

7) Turn off the power of the host machine.

4.4 Troubleshooting

4.4.1 Error Code

4.4.1.1 E503; Puncher unit communication error 0003-4712

<Finisher controller PCB/Punch controller PCB>

1) Does it improve when the host machine power switch is turned OFF/ON?

YES : End

<Wiring>

2) Is the wiring between the finisher controller PCB and punch controller PCB normal?

NO : Repair the wiring.

<Finisher controller PCB/Punch controller PCB>

3) Does it improve when the finisher controller PCB and punch controller PCB are replaced?

YES : End

4.4.1.2 E505; Backup RAM error 0003-4713

<Punch controller PCB>

1) Does it improve when the host machine power switch is turned OFF/ON?

YES : End

No : Replace the punch controller PCB.

4.4.1.3 E590; Punch motor error 0003-4714

<Punch home position sensor (PI63)>

1) Check the punch home position sensor. Does the sensor operate normally?

NO : Replace the sensor.

<Punch motor clock sensor (PI62)>

2) Check the punch motor clock sensor. Does the sensor operate normally?

NO : Replace the sensor.

<Wiring>

3) Is the wiring between the punch controller PCB and sensors normal?

NO : Repair the wiring.

<Punch mechanism/Punch motor (M61)>

4) Is there any abnormality in the punch mechanism?

YES : Repair the punch mechanism.

NO : Replace the punch motor.

<Punch controller PCB/Finisher controller PCB>

5) Does it improve when the punch controller PCB is replaced?

YES : End

NO : Replace the finisher controller PCB.

4.4.1.4 E591; Scrap full detector sensor error 0003-8758

<Wiring>
1) Is the wiring between the scrap full detector PCB and the punch controller PCB normal?
NO : Repair the wiring.
<Scrap full detector PCB>
2) Does it improve when the scrap full detector PCB is replaced?
YES : End
NO : Replace the punch controller PCB.
<Punch controller PCB/Finisher controller PCB>
3) Does it improve when the punch controller PCB is replaced?
YES : End
NO : Replace the finisher controller PCB.

4.4.1.5 E592; Trailing edge/Horizontal registration sensor error 0003-8760

<Wiring>
1) Is the wiring between the LED PCB/photosensor PCB and the punch controller PCB normal?
NO : Repair the wiring.
<LED PCB/Photosensor PCB>
2) Does it improve when the LED PCB/photosensor PCB is replaced?
YES : End
NO : Replace the punch controller PCB.
<Punch controller PCB/Finisher controller PCB>
3) Does it improve when the punch controller PCB is replaced?
YES : End
NO : Replace the finisher controller PCB.

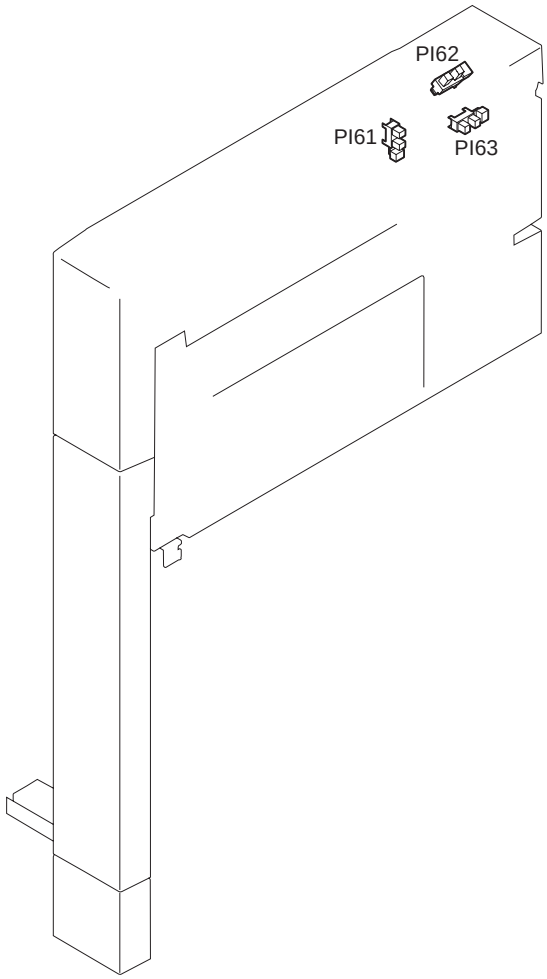
4.4.1.6 E593; Horizontal registration motor error 0003-4715

<Horizontal registration home position sensor (PI61)>
1) Check the horizontal registration home position sensor. Does the sensor operate normally?
NO : Replace the sensor.
<Wiring>
2) Is the wiring between the punch controller PCB and the sensor normal?
NO : Repair the wiring.
<Horizontal registration mechanism/ Horizontal registration motor (M62)>
3) Is there any abnormality in the horizontal registration mechanism?
YES : Repair the horizontal registration mechanism.
NO : Replace the horizontal registration motor.
<Punch controller PCB/Finisher controller PCB>
4) Does it improve when the punch controller PCB is replaced?
YES : End
NO : Replace the finisher controller PCB.

4.5 Outline of Electrical Components

4.5.1 Sensors

0005-8426



F-4-3

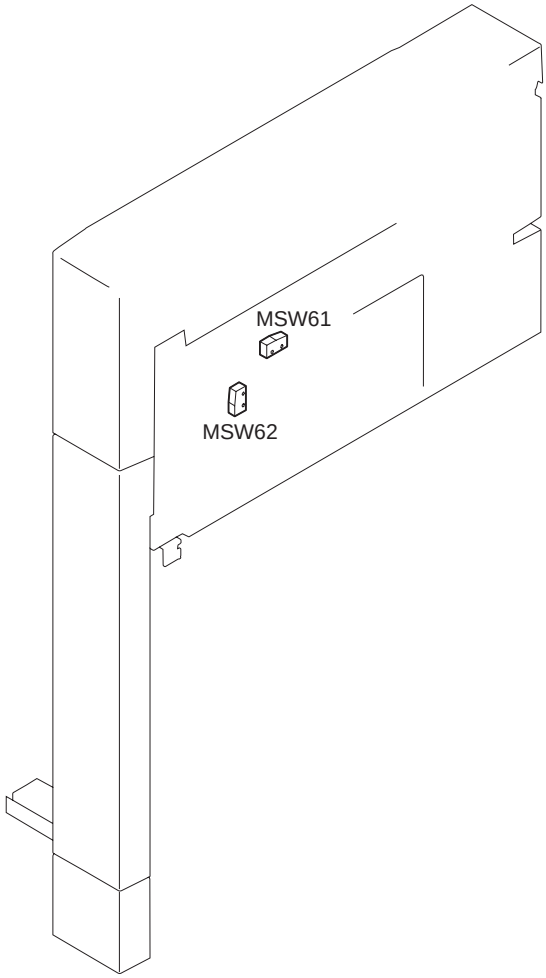
T-4-4

Ref.	Name	Parts number	Punch controller PCB	JAM	Error
PI61	Horizontal registration home position sensor	WG8-5593	J605		E593
PI62	Punch motor clock sensor	FK2-0149	J605		E590

Ref.	Name	Parts number	Punch controller PCB	JAM	Error
PI63	Punch home position sensor	FK2-0149	J605	1644	E590

4.5.2 Microswitches

0005-8427



F-4-4

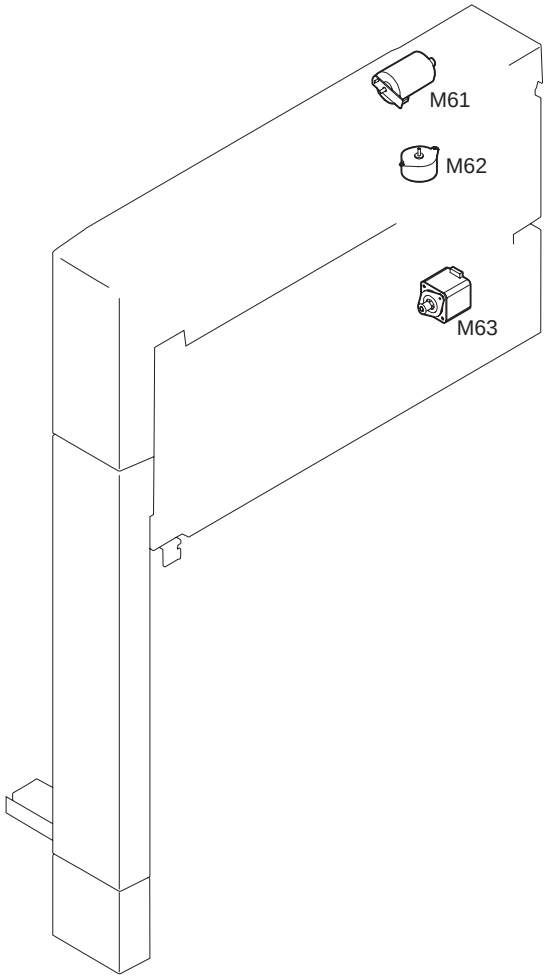
T-4-5

Ref.	Name	Parts number	Punch controller PCB
MSW 61	Upper door switch	WC4-5128	J602

Ref.	Name	Parts number	Punch controller PCB
MSW 62	Front door switch	WC4-5128	J602

4.5.3 Motors

0005-8428



F-4-5

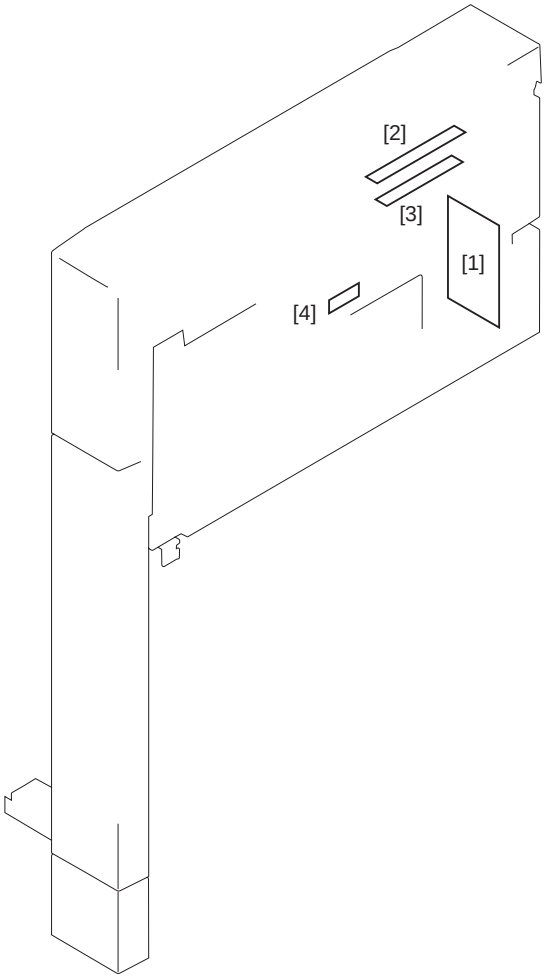
T-4-6

Ref.	Name	Parts number	Punch controller PCB	Error
M61	Punch motor	FH5-1074	J603	E590
M62	Horizontal registration motor	FH5-1075	J605	E593

Ref.	Name	Parts number	Punch controller PCB	Error
M63	Punch feed motor	FH5-1043	J604	

4.5.4 PCBs

0005-8429



F-4-6

T-4-7

Ref.	Name	Parts number	Punch controller PCB	JAM	Error
[1]	Punch controller PCB	FG3-2885			E505

Ref.	Name	Parts number	Punch controller PCB	JAM	Error
[2]	Photosensor PCB	FG3-3108	J605	1002,1102,1645	E592
[3]	LED PCB	FG3-3107	J605		E592
[4]	Scrap full detector PCB	FM2-1521	J606		E591

4.6 Variable Resistors (VR), Light-Emitting Diodes (LED), and Check Pins by PCB

4.6.1 Overview

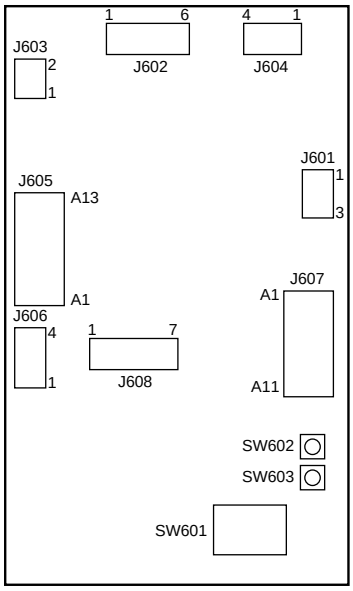
0003-4721

Of the LEDs and check pins used in the machine, those needed during servicing in the field are discussed.

⚠Do not touch the check pins not found in the list herein. They are exclusively for factory use, and require special tools and a high degree of accuracy.

4.6.2 Punch Controller PCB

0003-4722



F-4-7

T-4-8

Switch	Function
SW601	Used to set various adjustment mode settings.
SW602	Used to make adjustments, start input, and store the input.
SW603	Used to store input.

4.7 Upgrading

4.7.1 Upgrading

0003-8729

Overview

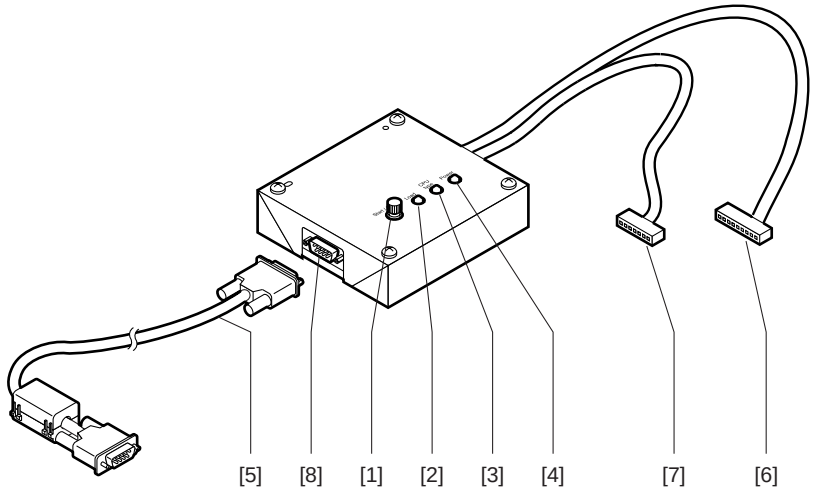
A flash ROM is used for the IC601 (CPU) of the Puncher unit. To upgrade this IC, the downloader PCB (FY9-2034) is used. The operating instructions for it are given below.

How to Use the Downloader PCB (FY9-2034)

1.When to Use the Downloader PCB

The downloader PCB is used when upgrading the CPU (IC601) of the Punch Controller PCB.

2.Member part of the downloader PCB



F-4-8

T-4-9

No.	Description	Function
[1]	START/STOP key	A key to be pressed when you start or stop download
[2]	LOAD LED	To be lit when download is available.
[3]	Model LED	To be lit when the Puncher is connected.
[4]	Power LED	To be lit when power is supplied from the Puncher to the downloader PCB
[5]	RS-232C cable (straight full wiring; 9 pins)	A cable to connect the downloader PCB and a PC.Be sure to connect the cable in a way that its ferrite core comes to the PC side.
[6]	Cable A (9 pins) Length: approx. 70cm	A cable to connect the downloader PCB and other products

No.	Description	Function
[7]	Cable B (9 pins)Length: approx. 50cm	A cable to connect the downloader PCB and the Puncher
[8]	RS-232C connector	A connector to connect an RS-232C cable to the downloader PCB

3. Necessary Tool

The following item needs to be prepared for download.

Computer (PC)

Prerequisite: The download tool (Ver. 1.73E or higher) must be downloaded to the PC.

4. Download Procedures

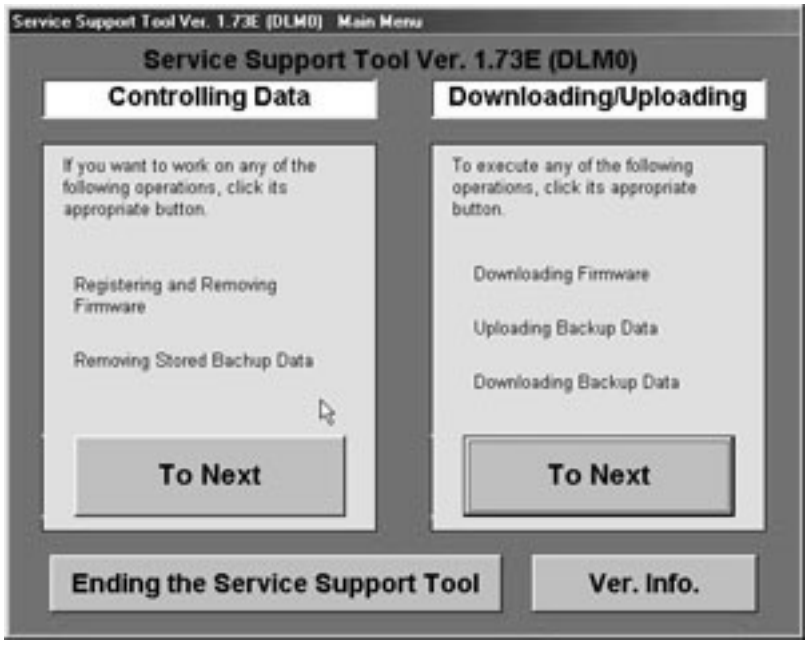
a. Addition of ROM data

1) Store ROM data to be downloaded in the 'C:\ServTool\NewROM' folder.

2) Start up the Service Support Tool.

C:\ProgramFiles\Service Support Tool\bpchost.exe

3) Select [Controlling Data].



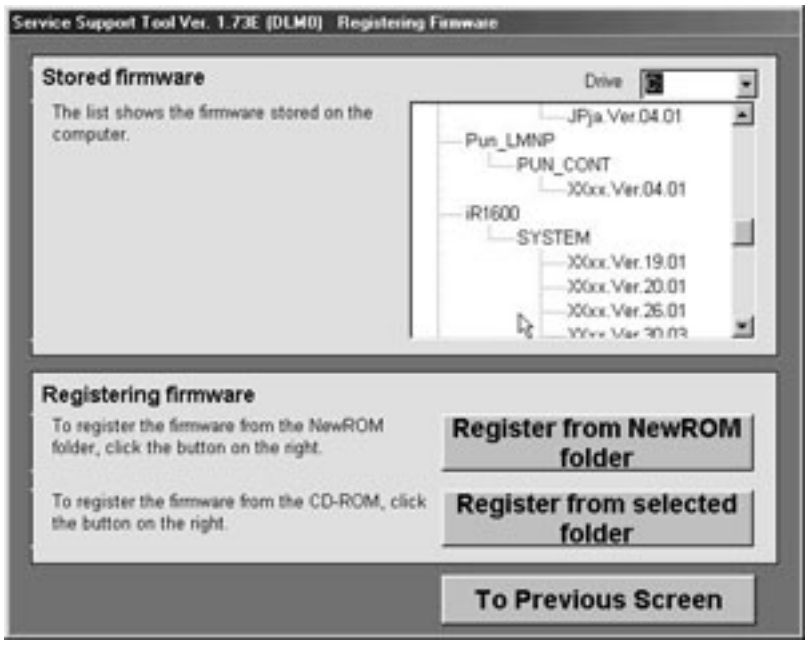
F-4-9

4) Select [Registering Firmware].

F-4-10

5) Select [Register from New ROM folder].

In response, the data will be registered, and the data inside the NewROM folder will be deleted.



F-4-11

b. Connection to the Puncher

1) Turn off the power of the host machine.

2) Remove the rear cover of the Puncher.

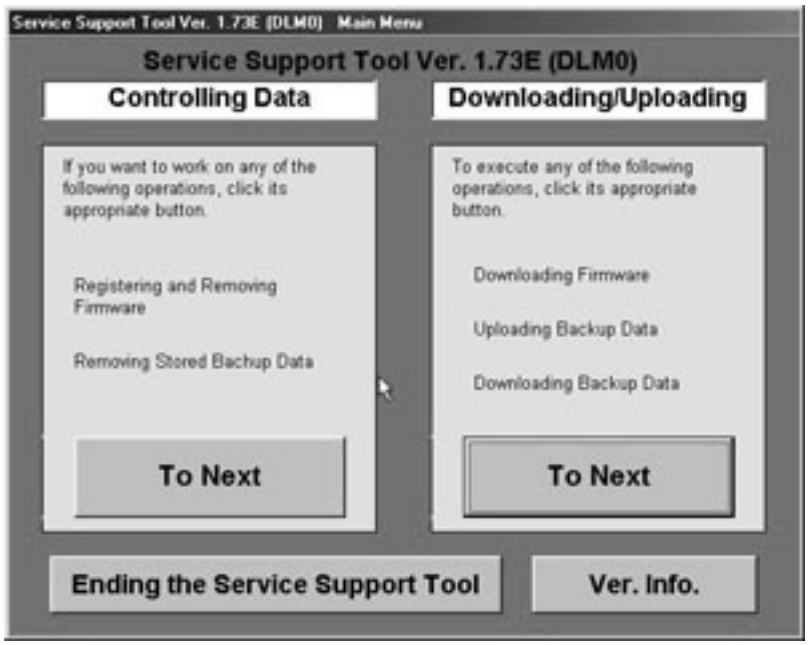
3) Insert the cable B to J608 on the Punch controller PCB.

4) Connect the RS-232C cable to the RS-232C connectors of the circuit board and the PC.
5) Turn on the power of the host machine.
The power LED on the circuit board is lit.
c. Download

⚠The error code E500 might occur during download. It does not affect the download operation and its results.

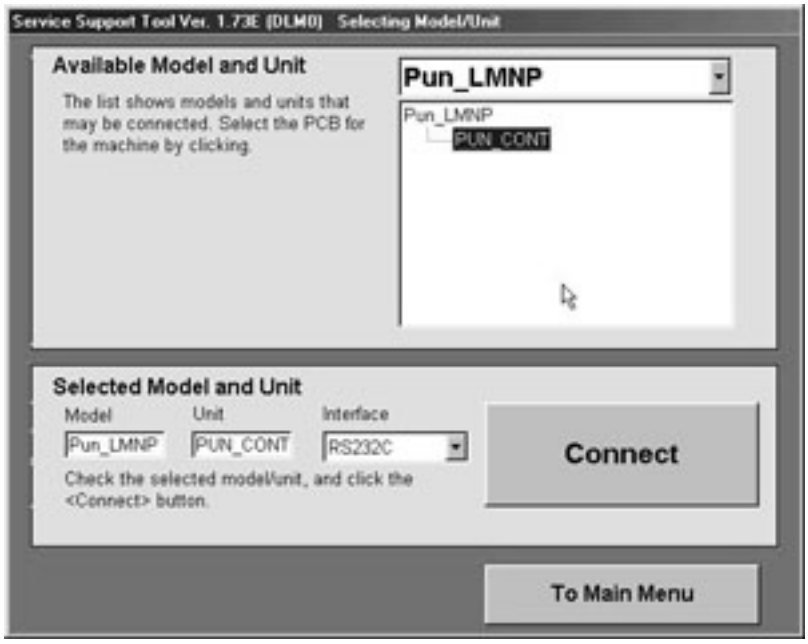
---

1) Start up the Service Support Tool.
C:\ProgramFiles\Service Support Tool\bpchost.exe
2) Select [Downloading/Uploading].



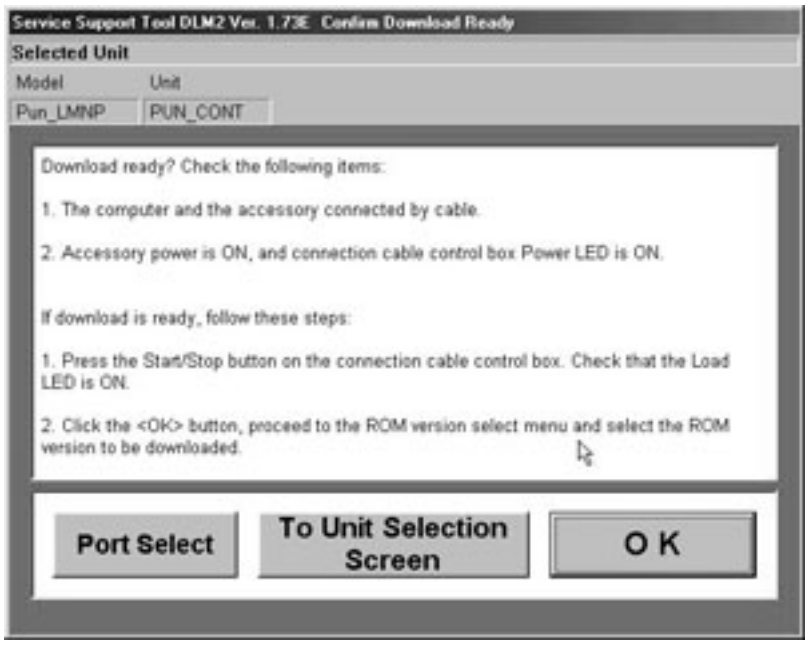
F-4-12

3) Press the START/STOP key.
LOAD LED is lit.
4) Select the Puncher.
When the model name you selected is highlighted, press the Connect key.



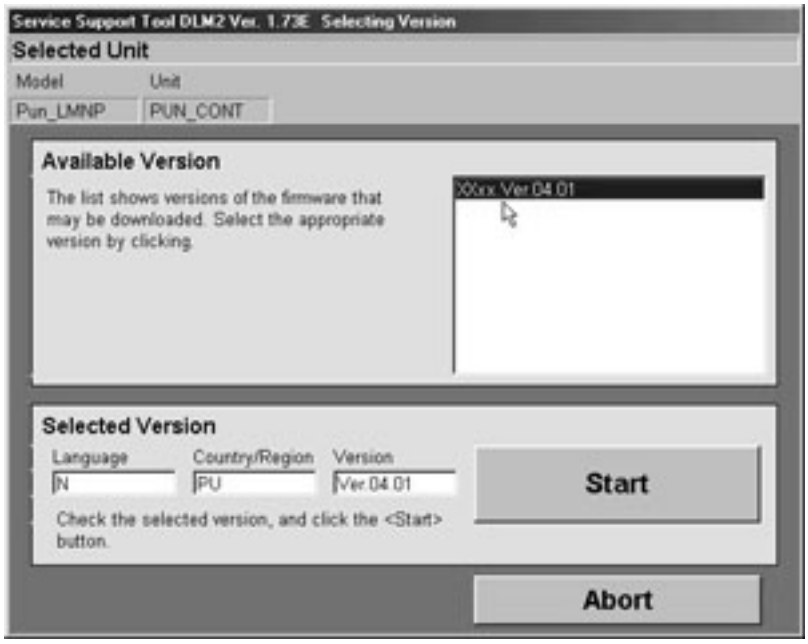
F-4-13

5) Follow the instructions on the screen to prepare for downloading.
A press on [OK] will bring up the next screen.



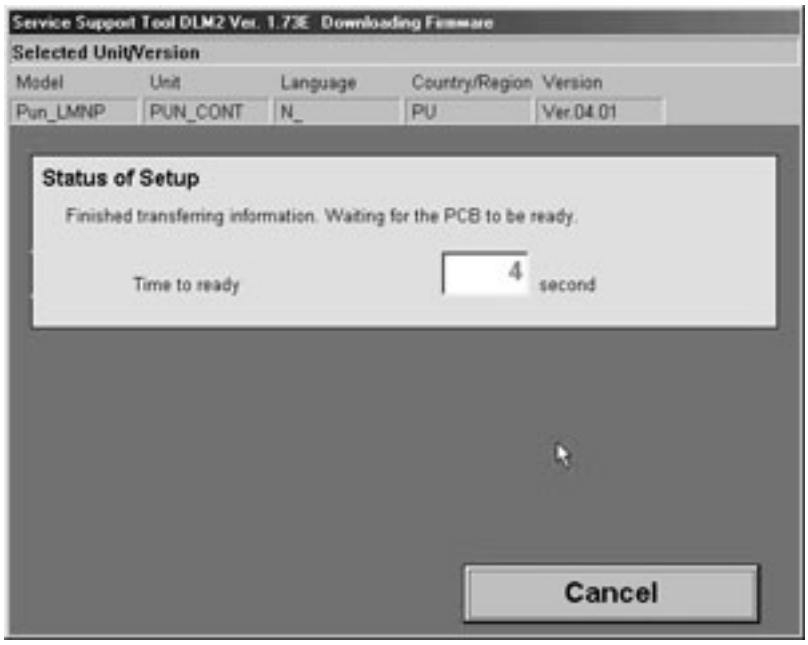
F-4-14

6) Select the version of the ROM to download.



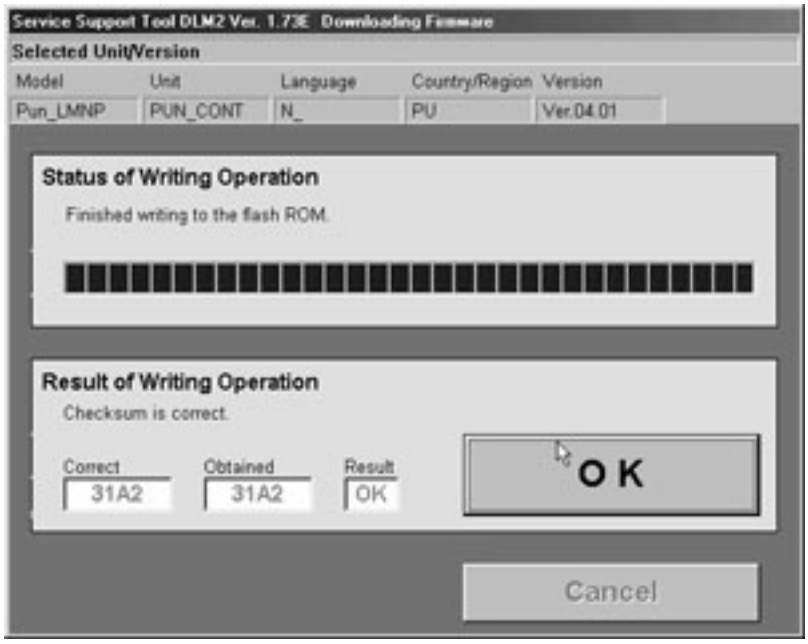
F-4-15

7) Press [Start] so that the computer and the downloaded PCB will start downloading the program.



F-4-16

8) If downloading ended normally, press [OK].



F-4-17

9) End the session as instructed on the screen.

F-4-18

5. Release of Connection

1) Press the START/STOP key.

LOAD LED is turned off.

2) Turn off the power of the host machine.

3) Disconnect the cable B from the Puncher.

4) Mount the rear cover to the Puncher.
5) Turn on the power of the host machine.

4.8 Service Tools

4.8.1 Solvents and Oils

0003-4723

T-4-10

No.	Name	Description	Composition	Remarks
1	Vic Clean	Cleaning: e.g., glass, plastic, rubber parts, external covers	Hydrocarbon(fluorine family) Alcohol Surface activating agent Water	Do not bring near fire. Procure locally. Isopropyl alcohol may be substituted.
2	Lubricant	Sliding units	Silicone oil	MOLYKOTE EM30-L

Chapter 5 Error Code

Contents

5.1 Overview

5.1.1 Overview

0003-4736

The finisher to which the unit is mounted is equipped with a mechanism (CPU on the finisher controller PCB) that runs a self check, communicating to the host machine any fault it detects in the form of a code and a detail code. In response, the host machine indicates the presence of a fault on its control panel using codes; the detail codes may be checked in the host machine's service mode.

5.2 User Error Code

5.2.1 Punch scrap full

0003-4737

T-5-1

Error Description	Occurs when	Detection timing	Machine operation	Reset
Punch scrap full	The amount of punch scraps has reached the scrap container capacity.	During punching	Normal operation will continue.	Empty the scrap container.

5.2.2 Punch scrap overflow

0003-4738

T-5-2

Error Description	Occurs when	Detection timing	Machine operation	Reset
Punch scrap overflow	The amount of punch scraps has exceeded the scrap container capacity.	During punching	Punching will be disabled.	Empty the scrap container.

5.3 Service Error Code

5.3.1 E503

0003-4739

T-5-3

Code	Detail	Error Description	Detection timing
E503	0003	Communication error	The communication with the puncher unit is interrupted.

5.3.2 E505

0003-4740

T-5-4

Code	Detail	Error Description	Detection timing
E505	0002	Backup RAM	The checksum for the punch controller PCB has an error when the power is turned on.

5.3.3 E590

0003-4741

T-5-5

Code	Detail	Error Description	Detection timing
E590	8001	Punch motor (M61)/ Punch motor clock sensor (PI62)/ Punch home position sensor (PI63)	The puncher does not detect the punch home position sensor when the puncher motor has been driven for 20 msec.
	8002		After the motor has been stopped at time of punch motor initialization, the puncher does not detect punch home position sensor.

5.3.4 E591

0003-8764

T-5-6

Code	Detail	Error Description	Detection timing
E591	8001	Scrap full detector sensor (LED6,PTR6)	The voltage of the light received is 3.0 V or less even when the light emitting duty of the scrap full detector sensor has been increased to 66% or more.
	8002		The voltage of the light received is 2.0 V or more even when the light emitting duty of the scrap full detector sensor has been decreased to 0%.

5.3.5 E592

0003-8767

Code	Detail	Error Description	Detection timing
E592	8001	Trailing edge sensor(LED5,PTR5)/ Horizontal registration sensor (LED1 to 4,PTR1 to 4)	The voltage of the light received is 2.5 V or less even when the light emitting duty of the trailing edge sensor has been increased to 66% or more.
	8002		The voltage of the light received is 2.0 V or more even when the light emitting duty of the trailing edge sensor has been decreased to 0%.
	8003		The voltage of the light received is 2.5 V or less even when the light emitting duty of the horizontal registration sensor 1 (LED1,PTR1) has been increased to 66% or more.
	8004		The voltage of the light received is 2.0 V or more even when the light emitting duty of the horizontal registration sensor 1 (LED1,PTR1) has been decreased to 0%.
	8005		The voltage of the light received is 2.5 V or less even when the light emitting duty of the horizontal registration sensor 2 (LED2,PTR2) has been increased to 66% or more.
	8006		The voltage of the light received is 2.0 V or more even when the light emitting duty of the horizontal registration sensor 2 (LED2,PTR2) has been decreased to 0%.
	8007		The voltage of the light received is 2.5 V or less even when the light emitting duty of the horizontal registration sensor 3 (LED3,PTR3) has been increased to 66% or more.
	8008		The voltage of the light received is 2.0 V or more even when the light emitting duty of the horizontal registration sensor 3 (LED3,PTR3) has been decreased to 0%.
	8009		The voltage of the light received is 2.5 V or less even when the light emitting duty of the horizontal registration sensor 4 (LED4,PTR4) has been increased to 66% or more.
	800A		The voltage of the light received is 2.0 V or more even when the light emitting duty of the horizontal registration sensor 4 (LED4,PTR4) has been decreased to 0%.

5.3.6 E593

0003-4742

T-5-8

Code	Detail	Error Description	Detection timing
E593	8001	Horizontal registration motor(M62)/ Horizontal registration home position sensor (PI61)	At time of horizontal registration motor initialization, the punch slide unit does not leave the horizontal home position sensor even when it has been driven for 9 mm.
	8002		At time of horizontal registration motor initialization, the punch slide unit does not return to the horizontal registration home position sensor even when the unit has been driven for 37 mm.

Feb 21 2005

Canon