TOSHIBA

SERVICE MANUAL

REVERSING AUTOMATIC DOCUMENT FEEDER
MR-3018/3020/3021/3022
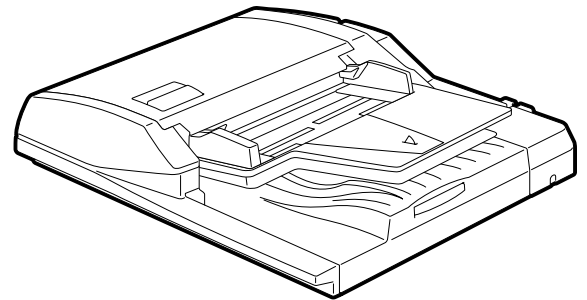
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General Precautions for Installation/Servicing/Maintenance for the MR-3018/3020/3021/3022

The installation and service shall be done by a qualified service technician.

1) When installing the MR-3018/3020/3021/3022 to the Equipment, be sure to follow the instructions described in the "Unpacking/Set-Up Procedure for the MR-3018/3020/3021/3022" booklet which comes with each unit of the MR-3018/3020/3021/3022.

2) The MR-3018/3020/3021/3022 should be installed by an authorized/qualified person.

3) The equipment must be grounded for safety.

4) Before starting installation, servicing or maintenance work, be sure to turn OFF and unplug the equipment first.

5) The equipment shall be installed near the socket outlet and shall be easily accessible.

6) Be sure to fix and plug in the power cable securely after the installation so that no one trips over it.

7) Unplug the power cable and clean the area around the prongs of the plug and socket outlet once a year or more. A fire may occur when dust lies on this area.

8) The MR-3018/3020/3021/3022 should be grounded to the specified positions on the machine frame.

9) When servicing or maintaining the MR-3018/3020/3021/3022, be careful about the rotating or operation sections such as gears, pulleys, sprockets, cams, belts, etc.

10) Reassembly of disassembled parts is the reverse of the disassembly unless otherwise noted in this manual or other related documents.
Care should be taken that small parts, such as screws, washers, pins, E-rings, star washers, harnesses are not installed in the wrong places.

11) Basically, the machine should not be operated with any parts removed or disassembled.

12) Delicate parts for preventing safety hazard problems (such as switches, sensors, etc. if any) should be handled/installed/adjusted correctly.

13) Use suitable measuring instruments and tools.

14) During servicing or maintenance work, be sure to check the serial No. plate and other cautionary labels (if any) to see if they are clean and firmly fixed. If not, take appropriate actions.

15) The PC board must be stored in an anti-electrostatic bag and handled carefully using a wristband, because the ICs on it may be damaged due to static electricity. Before using the wrist band, pull out the power cord plug of the equipment and make sure that there is no uninsulated charged objects in the vicinity.

16) For the recovery and disposal of used MR-3018/3020/3021/3022, consumable parts and packing materials, follow the relevant local regulations/rules should be followed.

17) After completing installation, servicing and maintenance of the MR-3018/3020/3021/3022, return the MR-3018/3020/3021/3022 to its original state, and check operation.

CONTENTS

1. SPECIFICATIONS

Item	MR-3018/3020	MR-3021/3022
Maximum number of originals on the original feeding tray	Up to 100 sheets or 16 mm in height. * 35 - 80 g/m^2 (9.3 - 21.3 lb. Bond)	←
Acceptable paper size	A5-R, A4, A4-R, B5, B5-R, B4, A3, FOLIO, ST-R, LT, LT-R, LG, LD, COM-PUTER	←
Acceptable paper weight	1-sided: 35 - 157 g/m^2 (9.3 lb. Bond - 58 lb. Cover) 2-sided: 50 - 157 g/m^2 (13.3 lb. Bond - 58 lb. Cover)	←
Dimensions	W600 x D523 x H135 (mm) * Excluding hinges and original tray	W575 x D528 x H135 (mm) * Excluding original tray
Weight	12.5 kg	←
Power consumption	Approx. 49.5 W	←
Power requirements	DC5 V, DC24 V * Supplied from the equipment	←
Co-packed items	Unpacking Instruction (1 set) Charts (A4/LT: 1 sheet each) Mounting screws (6 pcs) Positioning pins (2 pcs) Washer (1 pc)	Unpacking Instruction (1 set) Charts (A4/LT: 1 sheet each) Mounting screws (6 pcs) Positioning pins (2 pcs) Washer (1 pc) Stopper bracket (1 pc) Stopper bracket fixing screw (2 pcs)

Applicable models	MR-3018:
	e-STUDIO352/353/452/453
	e-STUDIO281c/351c/451c
	e-STUDIO2500c/3500c/3510c
	e-STUDIO2330C/2820C/2830C/3520C/3530C/4520C
	MR-3020:
	e-STUDIO202L/203L/232/233/282/283
		MR-3021: e-STUDIO205L/255/305,
		           e-STUDIO206L/256/306,
		           e-STUDIO2040C/2540C/3040C
		MR-3022: e-STUDIO355/455,
		           e-STUDIO356/456,
		           e-STUDIO3540C/4540C

Remarks		The differences between MR-3021 and MR-3022 are the RADF control PC board and connection cable.

2. GENERAL DESCRIPTION

2.1 Main Components

Original tray section

Drive/Control section

Original exit tray section

Feeding/Transporting section
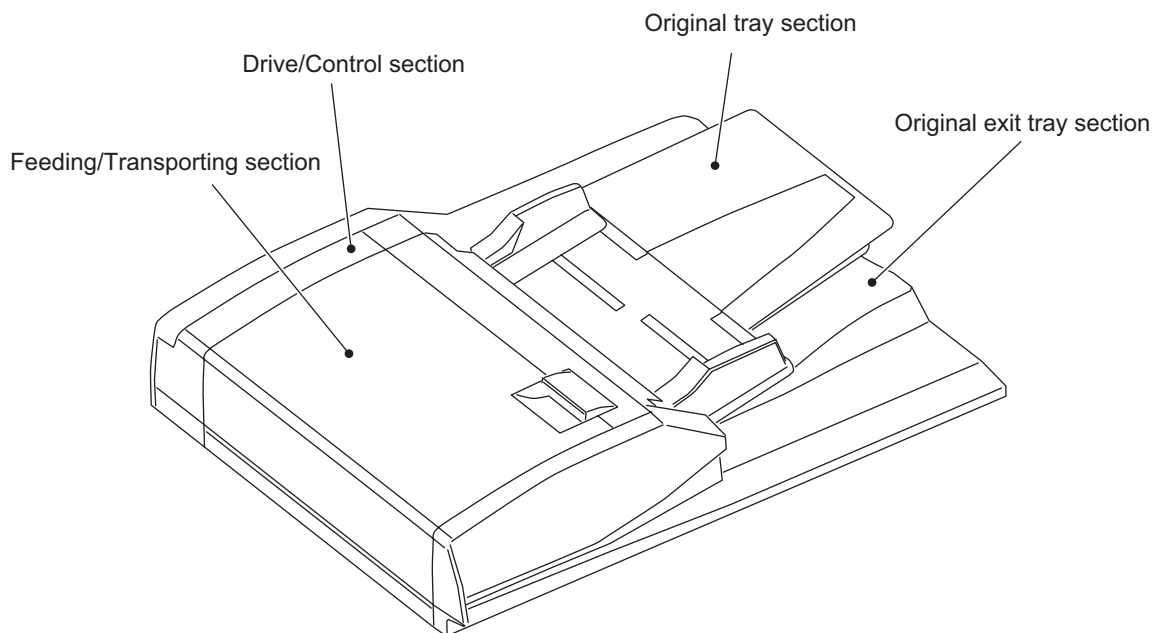
Fig. 2-1

Location	Components	
Feeding/Transporting section	Pickup roller Feed roller Separation roller Registration roller Intermediate transfer roller Pre-reading roller Post-reading roller Exit/reverse roller Reverse registration roller	Original empty sensor (S3) Original length detection sensor (S4) Original registration sensor (S5) Original width detection sensor-1 (S6) Original width detection sensor-2 (S7) Original intermediate transport sensor(S8) Read sensor (S9) Original exit/reverse sensor (S10) Jam access cover sensor (S11)
Original tray section	Original width guide Original tray Original reverse tray	Original tray sensor (S1) Original tray width sensor (S2)
Original exit tray section	Original exit tray	
Drive/Control section		Original feed motor (M1) Read motor (M2) Original exit/reverse motor (M3) Fan motor (M4) Original pickup solenoid (SOL1) Gate solenoid (SOL2) RADF opening/closing sensor (S12) Jam access cover opening/closing switch (SW1) RADF control PC board (ADF)

2.2 Sectional View
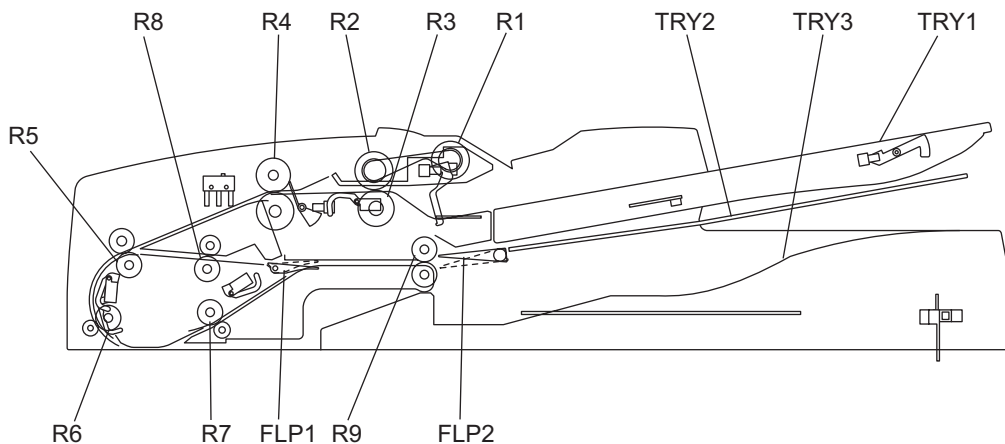
Fig. 2-2

TRY1	Original tray	R3	Separation roller
TRY2	Original reverse tray	R4	Registration roller
TRY3	Original exit tray	R5	Intermediate transfer roller
FLP1	Exit gate	R6	Pre-reading roller
FLP2	Reverse flap	R7	Post-reading roller
R1	Pickup roller	R8	Reverse registration roller
R2	Feed roller	R9	Exit/reverse roller

2.3 Electric Parts Layout
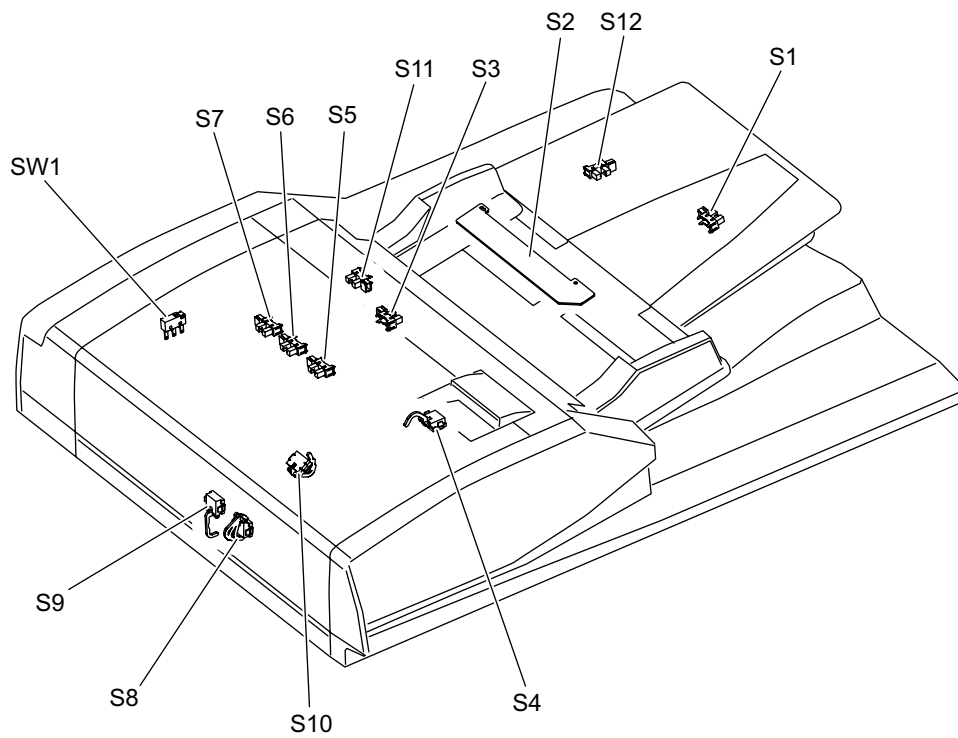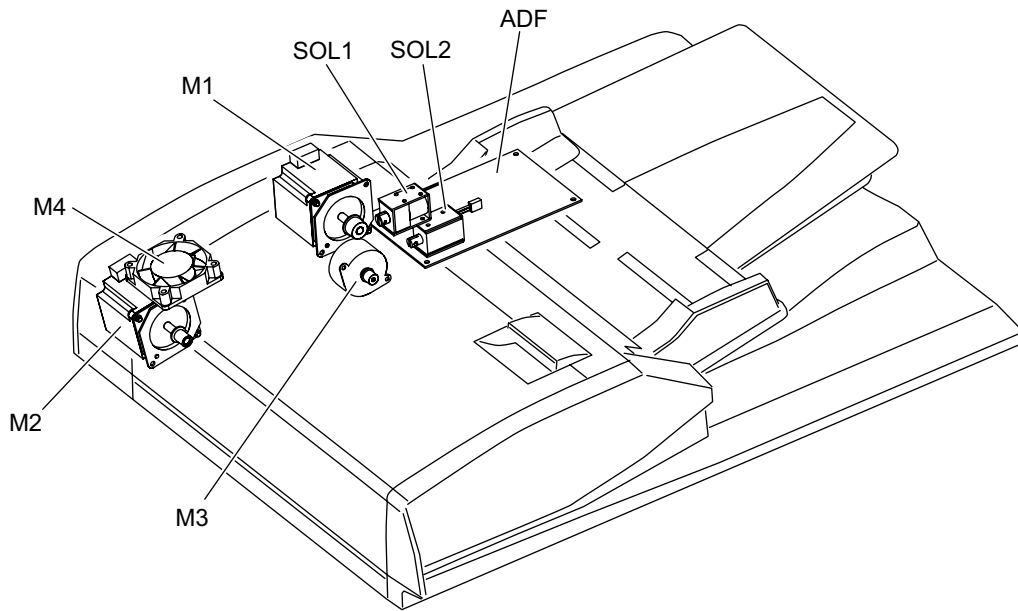
Fig. 2-3

2.4 Symbols and Functions of Various Components

1) Motors

Symbol	Name	Function
M1	Original feed motor	Drives the original feed roller, pickup roller and registration roller.
M2	Read motor	Transports originals by driving the intermediate transport roller, front read roller, rear read roller and reverse registration roller.
M3	Original exit/reverse motor	Drives the original exit/reverse roller.
M4	Fan motor	Cools off the ADF drive section and ADF board.

2) Sensors and Switches

Symbol	Name	Function
S1	Original tray sensor	Detects the length of the original set on the original tray.
S2	Original tray width sensor	Detects the width of the original set on the original tray.
S3	Original empty sensor	Detects the original set on the original tray.
S4	Original length detection sensor	Detects the length of the original.
S5	Original registration sensor	Detects transport of the original at the registration roller section.
S6	Original width detection sensor-1	Detects the width of the original.
S7	Original width detection sensor-2	Detects the width of the original.
S8	Original intermediate transport sensor	Detects the original transported to the Pre-scanning section.
S9	Read sensor	Detects the leading edge of the original at the original scanning section.
S10	Original exit/reverse sensor	Detects the exit (transit) of an original. Also detects the stop reference position for an original when in reverse.
S11	Jam access cover sensor	Detects opening/closing of the Jam access cover.
S12	RADF opening/closing sensor	Detects opening/closing of the RADF.
SW1	Jam access cover opening/closing switch	Switches between cutoff and supply state of the 24 V power by opening/closing of the jam access cover.

3) Solenoid

Symbol	Name	Function
SOL1	Original pickup solenoid	Drives up and down the original pickup roller.
SOL2	Gate solenoid	Drives the reverse flap. (Switches the flap to the reverse side when turned to ON.)

4) PC board

Symbol	Name	Function
ADF	RADF control PC board (ADF board)	Controls the RADF.

2.5   Diagram of Signal Blocks
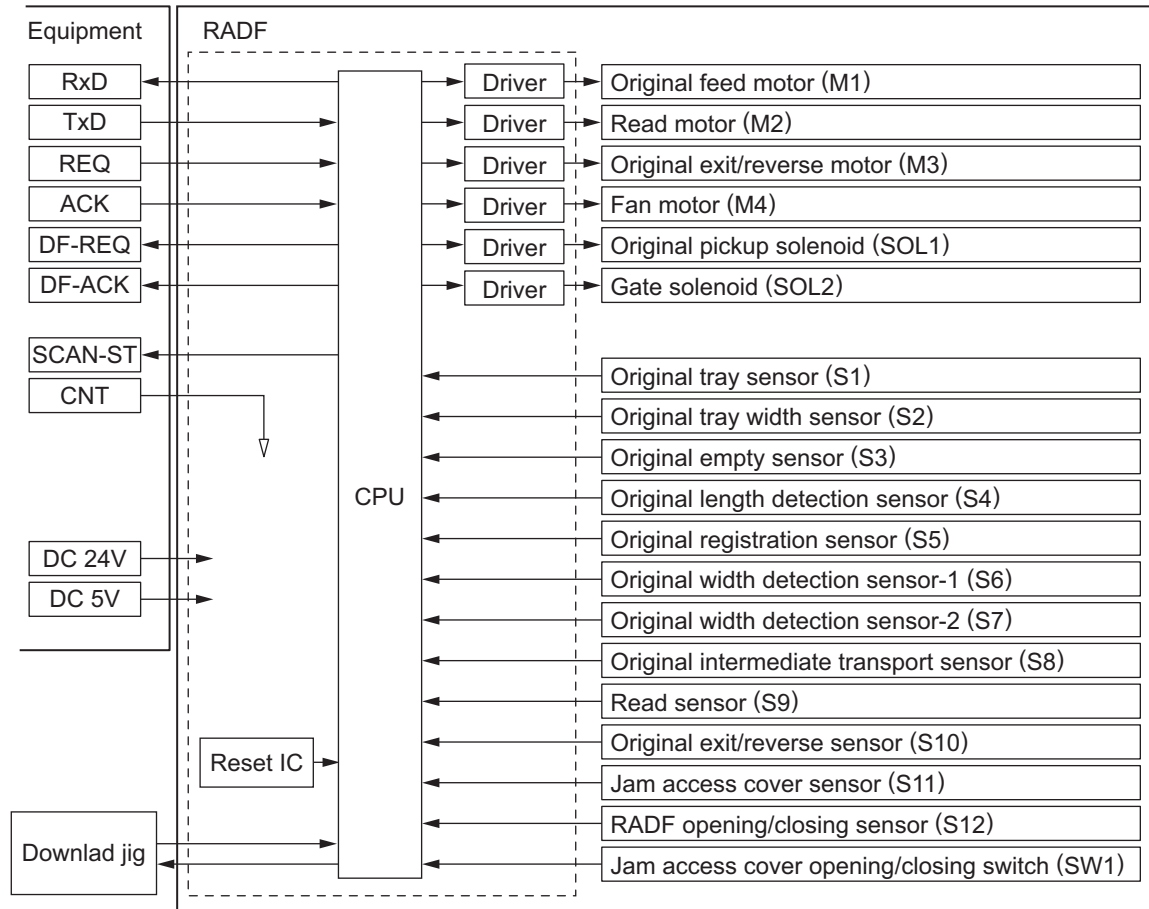
Fig. 2-4

2.6 Description of Interface Signals

The following 6 lines are used to transmit/receive signals between the equipment and the RADF.

REQ ....Communication request signal (from equipment to the RADF)
DF-REQ ....Communication request signal (from the RADF to equipment)
DF-ACK................Communication request acknowledging signal (from the RADF to equipment)
ACK......................Communication request acknowledging signal (from equipment to the RADF)
TxD ....Data transmitted from equipment to the RADF
RxD ....Data transmitted from the RADF to equipment

Data communication (RxD and TxD) between the scanner and the RADF has adopted the serial communication system which does not allow checking using testing devices to see whether the signals are transmitted/received properly in the field.
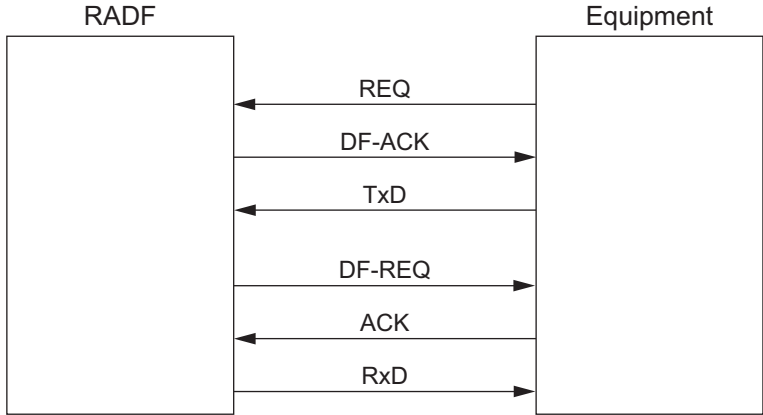
Fig. 2-5

3. DESCRIPTION OF OPERATIONS

3.1 DRIVE SYSTEM
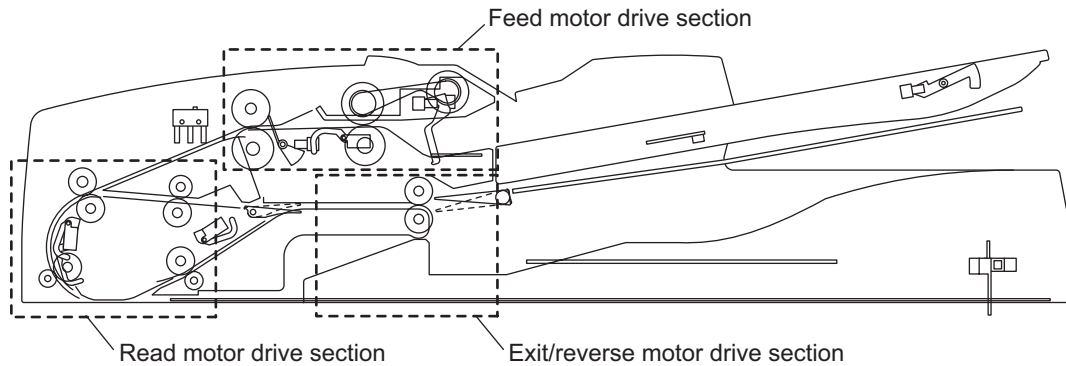
Fig. 3-1

3.1.1 Outline

Originals are transported by the original feed motor, read motor and original exit/reverse motor. Each motor has a drive section for the following operations:

Original feed motor drive section: picks up originals and drives the registration roller.
Read motor drive section: transports originals and drives parts such as the pre-reading roller.
Original exit/reverse motor drive section: exits and reverses originals, and drives the exit/reverse roller.

The Original feed motor rotates reversely when the originals are being transported at the registration roller, compared to its rotational direction when they are being picked up.
The original exit/reverse motor also rotates reversely when the originals are being reversed and transported, compared to its rotational direction when they are being exited.
The read motor always rotates in a constant direction.

3.1.2　Original feed motor drive section
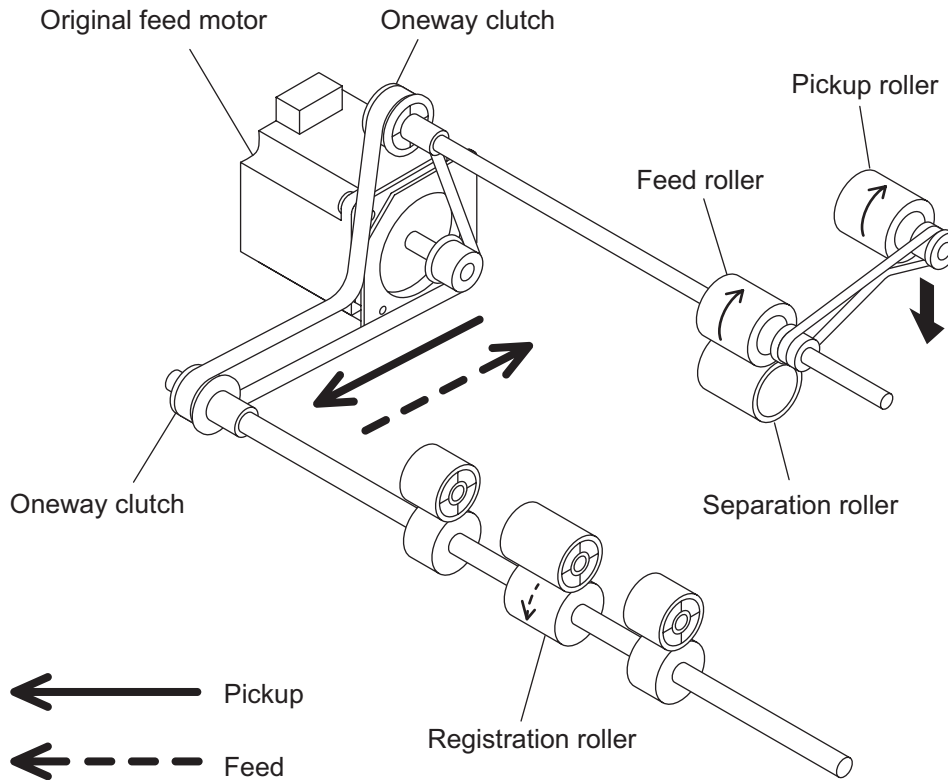
Fig. 3-2

When an original is placed on the original tray and the RADF receives a feed request signal from the equipment, the feeding of the original is started.

The original empty sensor detects the presence of the original, and then the pickup roller is lowered by the drive from the original pickup solenoid.

The Original feed motor rotates, and the pickup roller and the feed roller then rotate in a normal direction (shown in a solid line in the figure) to guide the original into the transport path. Then the original is transported to the registration roller to be aligned.

The original aligned with the registration roller is then transported by the reverse rotation of the Original feed motor (shown in a dotted line in the figure).

A one-way clutch is installed inside of each gear of the feed roller and the registration roller, so these gears will not be driven in a reverse rotation.

When the original empty sensor detects that there is no original on the original tray, the original pickup solenoid is turned OFF and the pickup roller is raised.

The original pickup solenoid is the one can operate both suction and recovery.

3.1.3   Read motor drive section
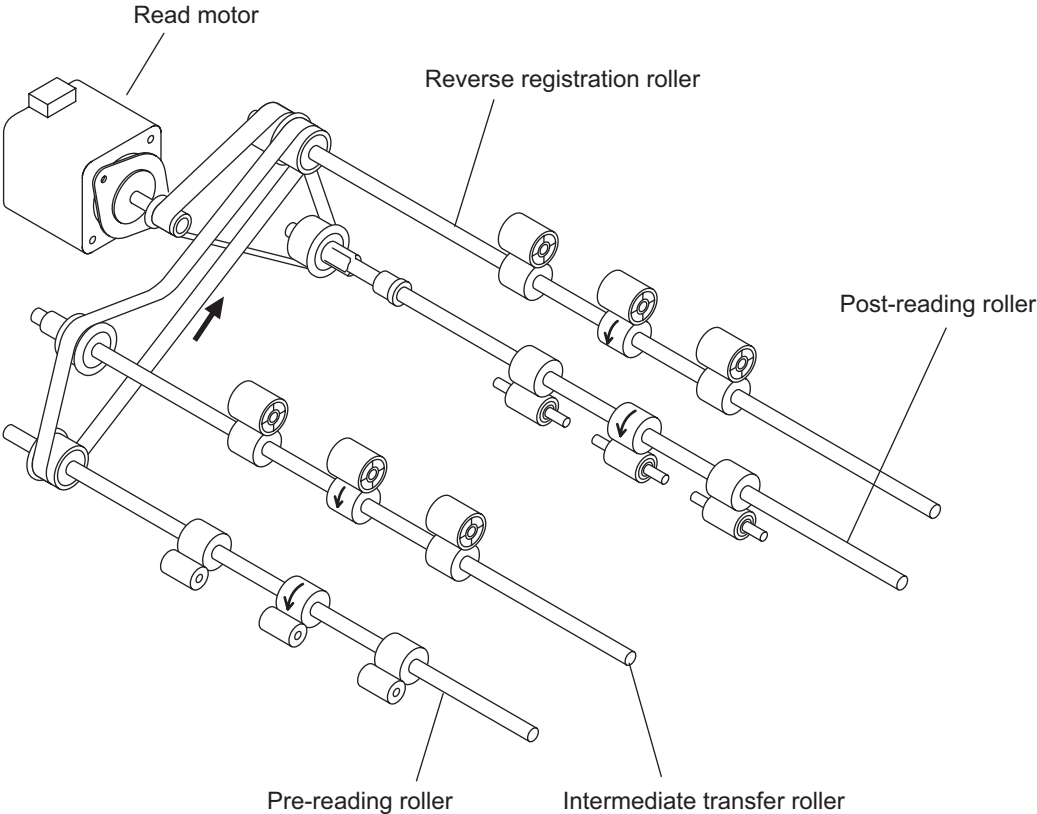
Fig. 3-3

The transported original is driven by the read motor.
Then the original is transported to a scanning start position by the intermediate transfer roller and pre-reading roller.
The original transported to the scanning start position is then scanned in the scanner function of the equipment.
When the data of the original have been scanned, the original is then transported to the original exit tray side by the post-reading roller.

3.1.4   Original exit/reverse motor drive section
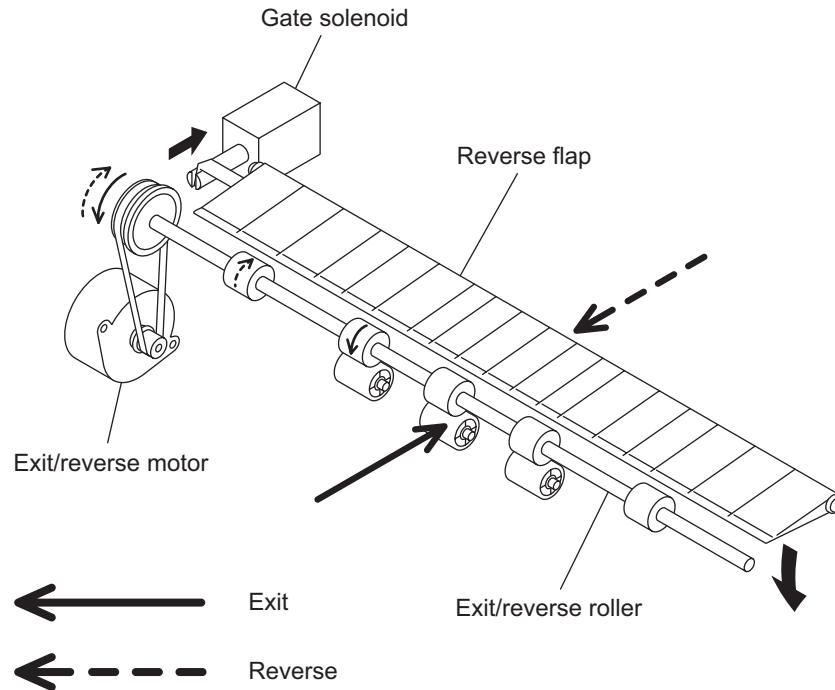
Fig. 3-4

When the data of the original have been scanned, the original is exited to the original exit tray by the exit/reverse roller driven by the exit motor (shown in a solid line in the figure).
In the duplex scanning mode, the gate solenoid is turned ON and the reverse flap is lowered to switch the transport path to the reverse tray side when the scanning of one side of the original is completed. When the reverse flap is lowered, the original is temporarily transported to the reverse tray, and then the exit motor rotates reversely to return the original to the transport path switched for reverse operation (shown in a dotted line in the figure).
The reversed original is aligned with the reverse registration roller, and then the other side of the original is scanned. When the scanning is completed, the original is exited to the original exit tray.

3.2 Original Size Detection

The original tray width sensor, original length detection sensor, and original width detection sensors-1 and -2 work in combination to detect the size of originals.

Fig. 3-5

3.2.1 Outline

When an original is placed on the original tray, the width of the original is detected by the positions of the original width guides. Then the original width sensors -1 and -2 and the original length detection sensor detect the size of the original being transported. Based on the detection result of these sensors, the size of the original is finally determined.
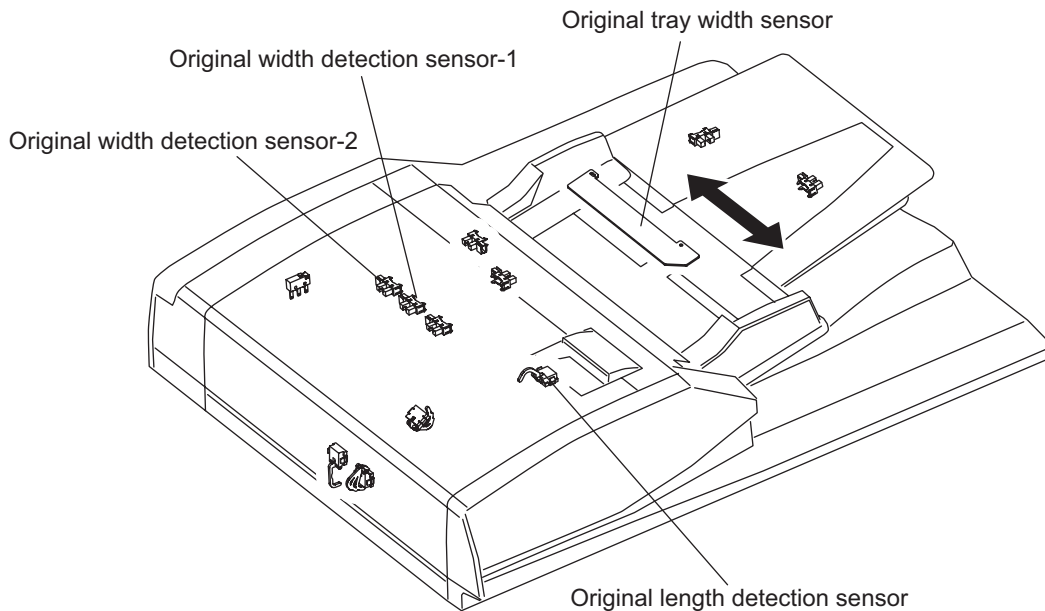
3.2.2 Original tray width sensor

The original tray width sensor detects the width of an original placed on the original tray.
It is detected by the brush attached to the rack moving on the original tray width sensor, which is a board with the different length of the patterns written.
This brush is moved as the original width guide is moved. Signals (TWID0S, TWID1S, TWID2S) are opened and shorted to SG by this movement.
The combination of these short (= low level) and open (= high level) can determine the width of the original.
Sizes detectable in combination of these open and short of the signals are as follows:

TWID2S	TWID1S	TWID0S	Original width size (LT series)	Original width size (A4 series)
L	H	H	-	B5-R
H	L	H	ST-R	A5-R
L	L	H	LD / LT	A3 / A4
L	H	L	8.5 x 8.5 / LT-R / LG / 13"LG	A4-R / FOLIO
L	L	L	COMPUTER	B4 / B5

H (= high level): Open   L (= low level): Short

3.2.3 Original width detection sensors-1 and -2 / Original length detection sensor

The size of the original is determined by the detection performed in combination of the original width detection sensors-1 and -2 and the original length detection sensor, as well as the detection performed by the original tray width sensor.

Sizes detectable in combination of these sensors are as follows:

A4 series (ORG-SRS: 1)

Original length detection sensor	Original width sensor-1	Original width sensor-2	Size determined	Original tray width
OFF	OFF	OFF	A5-R	-
	ON	OFF	B5	-
	ON	ON	A4	-
ON	OFF	OFF	B5-R	-
	ON	OFF	A4-R / FOLIO	Determined by a gap between guides
			B4	
	ON	ON	A3	-

A4 series (width sizes mixed at A3 / A4 standard)

Original length detection sensor	Original width sensor-1	Original width sensor-2	Size determined	Original tray width
ON	ON	ON	A3	A3 / A4
	OFF	OFF	A4-R / FOLIO	
	ON	OFF	B4	
OFF	ON	OFF	B5	
	ON	ON	A4	

A4 series (width sizes mixed at B4 / B5 standard)

Original length detection sensor	Original width sensor-1	Original width sensor-2	Size determined	Original tray width
ON	OFF	OFF	A4-R / FOLIO	B4/B5
	ON	OFF	B4	
OFF	ON	OFF	B5	
	OFF	OFF	A5-R	

A4 series (width sizes mixed at A4-R standard)

Original length detection sensor	Original width sensor-1	Original width sensor-2	Size determined	Original tray width
ON	OFF	OFF	B5-R	A4-R
	ON	OFF	A4-R / FOLIO	
OFF	OFF	OFF	A5-R	

A4 series (width sizes mixed at B5-R standard)

Original length detection sensor	Original width sensor-1	Original width sensor-2	Size determined	Original tray width
ON	OFF	OFF	B5-R	B5-R
OFF	OFF	OFF	A5-R	

LT series (ORG-SRS: 0)

Original length detection sensor	Original width sensor-1	Original width sensor-2	Size determined	Original tray width
OFF	OFF	OFF	ST-R	-
	ON	OFF	8.5x8.5	-
	ON	ON	A4	-
ON	ON	OFF	LT-R / LG / COMP / 13"LG	-
	ON	ON	LD	-

LT series (width sizes mixed at LD / LT standard)

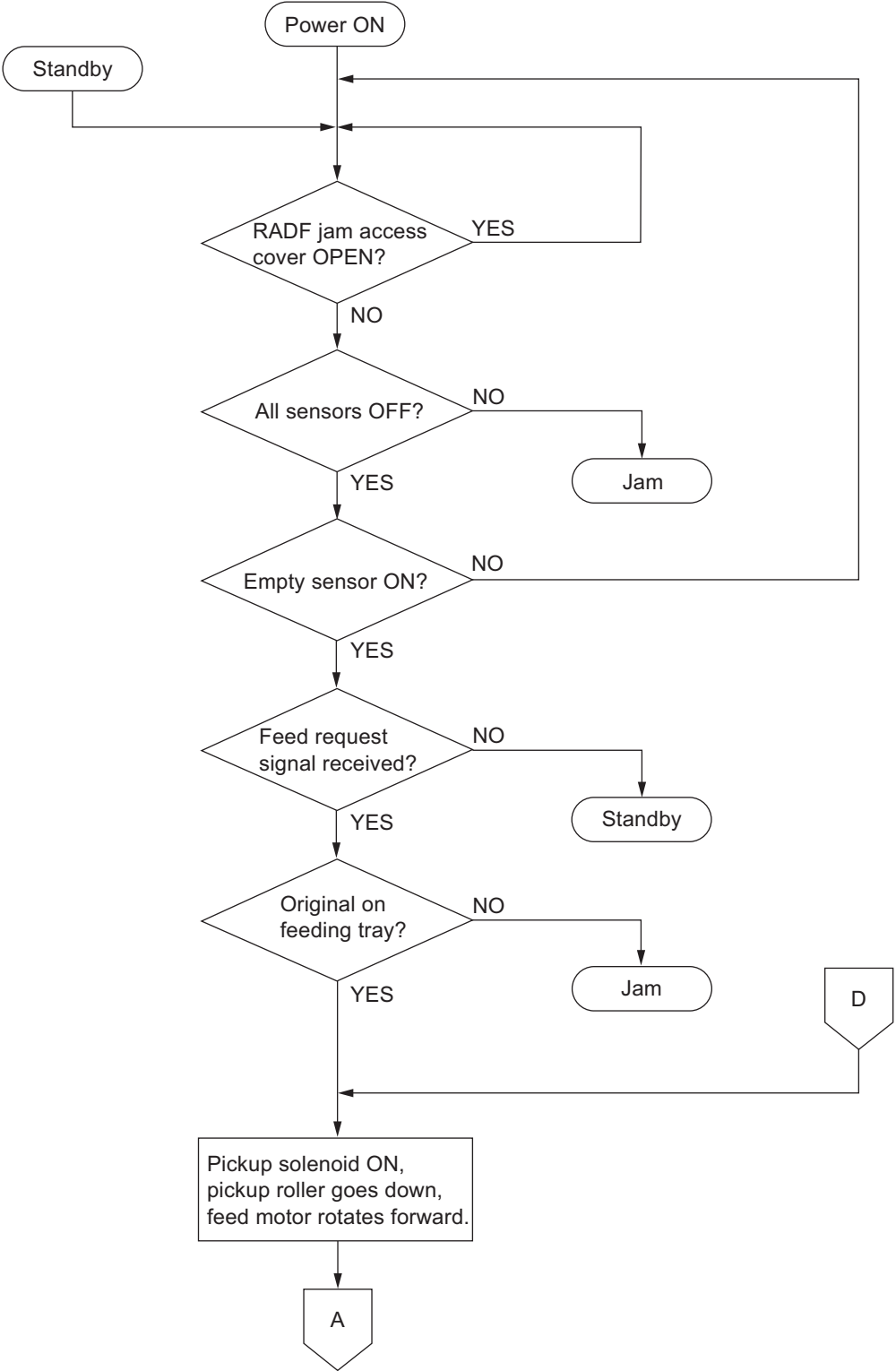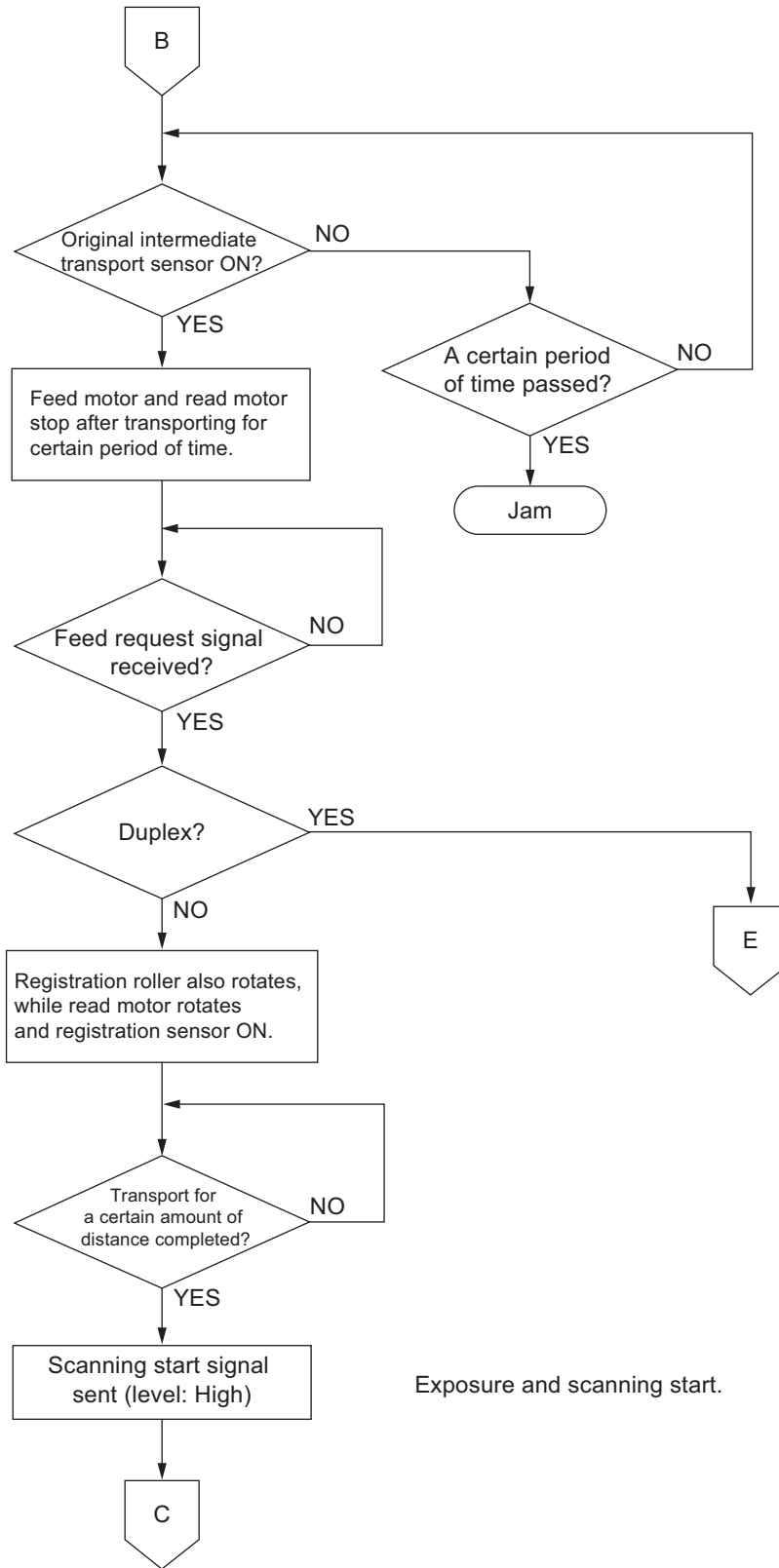| Original length detection sensor	Original width sensor-1	Original width sensor-2	Size determined	Original tray width
ON	ON	ON	LD	LD / LT
	ON	OFF	COMP	
	OFF	OFF	LT-R / LG / 8.5x8.5 / 13"LG	
OFF	ON	ON	LT	

LT series (width sizes mixed at LG / LT-R standard)

Original length detection sensor	Original width sensor-1	Original width sensor-2	Size determined	Original tray width
ON	ON	OFF	LT-R / LG / 8.5x8.5 / 13"LG	LD / LT
OFF	OFF	OFF	ST-R	

3

MR-3018/3020/3021/3022
DESCRIPTION OF OPERATIONS

3.3 FLOW CHART

```
                              ┌──────────┐
              ┌─────────┐     │ Power ON │
              │ Standby │     └────┬─────┘
              └────┬────┘          │
                   │               │◄─────────────────────────┐
                   └──────►├◄──────┘                           │
                           │                                   │
                           ▼                                   │
                      ╱─────────╲                              │
                     ╱  RADF jam  ╲      YES                   │
                    ╱ access cover ╲──────────────────────────┘
                     ╲   OPEN?     ╱
                      ╲─────────╱
                           │ NO
                           ▼
                      ╱─────────╲          ┌────────┐
                     ╱ All sensors╲   NO    │        │
                     ╲   OFF?     ╱─────────│  Jam   │
                      ╲─────────╱           └────────┘
                           │ YES
                           ▼
                      ╱─────────╲          
                     ╱  Empty    ╲   NO                  ───┐
                     ╲ sensor ON?╱──────────────────────────┘ (to Power ON)
                      ╲─────────╱
                           │ YES
                           ▼
                      ╱──────────╲         ┌──────────┐
                     ╱   Feed     ╲   NO    │ Standby  │
                    ╱ request      ╲────────│          │
                     ╲ signal      ╱        └──────────┘
                      ╲ received? ╱
                       ╲────────╱
                           │ YES
                           ▼
                      ╱──────────╲         ┌────────┐        ┌───┐
                     ╱ Original on ╲  NO    │  Jam   │        │ D │
                     ╲ feeding tray?╱───────│        │        └─┬─┘
                      ╲──────────╱          └────────┘          │
                           │ YES                                │
                           │◄───────────────────────────────────┘
                           ▼
              ┌──────────────────────────┐
              │ Pickup solenoid ON,      │
              │ pickup roller goes down, │
              │ feed motor rotates forward.│
              └─────────────┬────────────┘
                            │
                            ▼
                          ┌───┐
                          │ A │
                          └───┘
```

```
                    ┌───┐
                    │ A │
                    └─┬─┘
                      │
                      ▼
              ╱───────────────╲        NO
             ╱ Original registration ╲ ──────────┐
             ╲   sensor ON?    ╱                   │
              ╲───────────────╱                    ▼
                      │ YES                 ╱──────────────╲    NO
                      ▼                    ╱ A certain period ╲ ───┐
          ┌────────────────────┐          ╲  of time passed?  ╱    │
          │ Feed motor stops after │        ╲──────────────╱       │
          │ transporting for a     │               │ YES           │
          │ certain period of time.│               ▼               │
          └──────────┬─────────┘          ┌─────────────┐          │
                     │                     │    Jam      │          │
                     ▼                     └─────────────┘          │
          ╱───────────────╲        NO                               │
         ╱ A certain period ╲ ──────────┐                           │
         ╲  of time passed?  ╱           │                          │
          ╲───────────────╱             │                          │
                 │ YES                   │                          │
                 ▼                       │                          │
     ┌──────────────────────┐           │                          │
     │ Registration roller rotates. │    │                          │
     │ (Feed motor rotates reverse.) │   │                          │
     └──────────┬───────────┘           │                          │
                │                        │                          │
                ▼                        │                          │
     ┌──────────────────────┐           │                          │
     │  Read motor rotates.  │           │                          │
     └──────────┬───────────┘           │                          │
                │                        │                          │
                ▼                        │                          │
       ╱───────────────╲       NO        │                          │
      ╱ Paper transported ╲ ──────────┐  │                          │
      ╲ before the intermediate ╱      │  │                          │
      ╲ transport roller? ╱            │  │                          │
       ╲───────────────╱               │  │                          │
              │ YES                     │  │                          │
              ▼                         │  │                          │
   ┌──────────────────────────┐         │  │                          │
   │ Feed motor rotation speed switches. │ │ │                          │
   │ First scan: Highest speed       │    │ │                          │
   │ Second scan/later: Requested speed │ │ │                          │
   └──────────┬───────────────┘         │  │                          │
              │                          │  │                          │
              ▼                          │  │                          │
           ┌───┐                         │  │                          │
           │ B │                         │  │                          │
           └───┘                         │  │                          │
```

Monitoring registration
sensor by parallel processing.
Feed motor stops when registration
sensor detects trailing edge of
original. Skip to [D].

3

MR-3018/3020/3021/3022
DESCRIPTION OF OPERATIONS

```
                    ┌─────┐
                    │  B  │
                    └──┬──┘
                       │                                          ◄────────────────────┐
                       ▼                                                                │
                  ╱─────────╲                                                           │
                 ╱ Original  ╲          NO                                              │
                ╱ intermediate ╲──────────────────┐                                     │
                ╲ transport     ╱                  │                                     │
                 ╲ sensor ON?  ╱                   ▼                                     │
                  ╲─────────╱                  ╱─────────╲                               │
                       │ YES                  ╱ A certain  ╲       NO                    │
                       ▼                     ╱ period of    ╲──────────────────────────┘
            ┌──────────────────────┐        ╲ time passed? ╱
            │ Feed motor and read   │        ╲─────────────╱
            │ motor stop after      │             │ YES
            │ transporting for      │             ▼
            │ certain period of time.│        ╭─────────╮
            └──────────┬───────────┘        │   Jam   │
                       │                     ╰─────────╯
                       ▼        ◄──────────┐
                  ╱─────────╲              │
                 ╱  Feed      ╲     NO      │
                ╱ request signal ╲──────────┘
                ╲ received?      ╱
                 ╲─────────╱
                       │ YES
                       ▼
                  ╱─────────╲            YES
                 ╱  Duplex?   ╲──────────────────────────────┐
                 ╲───────────╱                               │
                       │ NO                                  │
                       ▼                                     ▼
            ┌──────────────────────┐                   ┌─────┐
            │ Registration roller   │                   │  E  │
            │ also rotates,         │                   └─────┘
            │ while read motor rotates│
            │ and registration      │
            │ sensor ON.            │
            └──────────┬───────────┘
                       ▼        ◄──────────┐
                  ╱─────────╲              │
                 ╱ Transport  ╲     NO      │
                ╱ for a certain ╲───────────┘
                ╲ amount of      ╱
                 ╲ distance     ╱
                  ╲ completed? ╱
                       │ YES
                       ▼
            ┌──────────────────────┐
            │ Scanning start signal │       Exposure and scanning start.
            │ sent (level: High)    │
            └──────────┬───────────┘
                       ▼
                    ┌─────┐
                    │  C  │
                    └─────┘
```

C

Original exit/reverse sensor ON? ── NO ──→ A certain period of time passed? ── NO ──↑

YES

Original exit/reverse motor rotates.

A certain period of time passed? ── YES ──→ Jam

NO ── Read sensor OFF?

YES

A certain period of time passed? ── NO ──↑

YES

Scanning start signal sent (level: High)   Scanning completed.

Original exit/reverse sensor OFF? ── NO ──→ A certain period of time passed? ── NO ──↑

YES

Read motor stops.

A certain period of time passed? ── YES ──→ Jam

Transport for a certain amount of distance completed? ── NO ──↑

YES

Original exit/reverse motor stops.

END

```
                          ┌─────┐
                          │  E  │
                          └──┬──┘
                             │
                             ▼
         ┌──────────────────────────────────┐
         │ Registration roller also rotates, │
         │ while read motor rotates          │
         │ and registration sensor ON.       │
         └──────────────────┬───────────────┘
                            │
                            ▼
         ┌──────────────────────────────┐
         │       Gate solenoid ON        │
         └──────────────────┬───────────┘
                            │           ◄────────────┐
                            ▼                        │
                      ╱──────────────╲               │
                     ╱  Transport for  ╲    NO        │
                    ╱ a certain amount of ╲───────────┘
                    ╲ distance completed? ╱
                     ╲──────────────────╱
                            │ YES
                            ▼
         ┌──────────────────────────────┐
         │    Scanning start signal       │      Exposure and scanning start.
         │    sent (level: High)          │
         └──────────────────┬───────────┘
                            │            ◄──────────────────────────────────┐
                            ▼                                                │
                      ╱──────────────╲                                       │
                     ╱ Original exit/reverse ╲   NO                          │
                    ╱    sensor ON?    ╲────────────────────┐                │
                     ╲──────────────╱                       │                │
                            │ YES                           ▼                │
                            ▼                         ╱──────────────╲       │
         ┌──────────────────────────┐               ╱ A certain period ╲ NO  │
         │  Original exit/reverse    │              ╱  of time passed?   ╲────┘
         │    motor rotates.         │              ╲──────────────────╱
         └──────────────┬───────────┘                      │ YES
                        │                                  ▼
                        ▼                            ┌───────────┐
                  ╱──────────────╲  ◄─────┐          │    Jam    │
                 ╱ Read sensor OFF? ╲     │          └───────────┘
                  ╲──────────────╱        │
                        │ YES             │
                        ▼                 │
                  ╱──────────────╲        │
                 ╱ A certain period ╲ NO  │
                ╱  of time passed?   ╲────┘
                 ╲──────────────────╱
                        │ YES
                        ▼
         ┌──────────────────────────┐
         │   Scanning start signal    │        Scanning completed.
         │   sent  (level: Low)       │
         └──────────────┬───────────┘
                        │
                        ▼
                    ┌─────┐
                    │  F  │
                    └─────┘
```

```
                              ┌───┐
                              │ F │
                              └─┬─┘
                                │ ◄──────────────────────────────┐
                                ▼                                 │
                          ╱──────────╲                            │
                         ╱ Original    ╲      NO                  │
                        ╱ exit/reverse   ╲──────────┐             │
                        ╲ sensor OFF?    ╱           │            │
                         ╲──────────────╱            ▼            │
                                │ YES         ╱─────────────╲     │
                                ▼            ╱ A certain      ╲ NO │
          ┌──────────►╱──────────────╲     ╱  period          ╲───┘
          │          ╱  Transport for  ╲   ╲  of time passed? ╱
          │   NO    ╱  a certain amount  ╲  ╲────────────────╱
          └────────╲  of distance         ╱         │ YES
                    ╲ completed?         ╱          ▼
                     ╲─────────────────╱       ╭─────────╮
                            │ YES             │  Jam     │
                            ▼                  ╰─────────╯
               ┌──────────────────────────┐
               │ Original exit/reverse motor│
               │ and read motor stop.       │
               └─────────────┬──────────────┘
                             ▼
    ┌───────────────────────────────────────────────┐
    │ After a certain period of time,                 │
    │ original exit/reverse motor reverses,           │
    │ read motor starts, reverse roller               │
    │ aligns original, and then system reboots.       │
    └────────────────────────┬────────────────────────┘
                             │ ◄──────────────────────────────┐
                             ▼                                 │
                        ╱──────────╲                           │
                       ╱ Original     ╲     NO                 │
                      ╱ intermediate    ╲──────────┐           │
                      ╲ transport         ╱         │          │
                       ╲ sensor ON?     ╱           ▼          │
                        ╲─────────────╱      ╱─────────────╲   │
                             │ YES          ╱ A certain      ╲ NO│
                             ▼             ╱  period          ╲──┘
          ┌─────────────────────────┐    ╲  of time passed? ╱
          │ Exit/reverse and read    │    ╲────────────────╱
          │ motor stop after          │            │ YES
          │ transporting for          │            ▼
          │ a certain amount of       │       ╭─────────╮
          │ distance.                 │      │  Jam     │
          └────────────┬──────────────┘       ╰─────────╯
                       │ ◄──────────────┐
                       ▼                │
                  ╱──────────╲          │
                 ╱ Transport    ╲   NO  │
                ╱ request signal  ╲─────┘
                ╲ received?       ╱
                 ╲──────────────╱
                       │ YES
                       ▼
          ┌─────────────────────────┐
          │ Read motor and           │
          │ exit/reverse motor rotate│
          │ at requested speed.      │
          └────────────┬─────────────┘
                       │ ◄──────────────┐
                       ▼                │
                  ╱──────────╲          │
                 ╱ Transport for ╲  NO  │
                ╱ a certain amount ╲────┘
                ╲ of distance       ╱
                 ╲ completed?      ╱
                  ╲──────────────╱
                       │ YES
                       ▼
                    ┌───┐
                    │ G │
                    └───┘
```

3

```
                          G

         ┌─────────────────────┐
         │  Scanning start signal │       Exposure and scanning start.
         │  sent (level: High)    │
         └─────────────────────┘
                    │
         ┌──────────┴──────────────────────────────────────┐
         │                                                   │
         ▼                                                   │
    ╱──────────╲                NO                           │
   ╱ Original    ╲───────────────────────┐                  │
   ╲ exit/reverse ╱                       │                  │
    ╲ sensor ON? ╱                        ▼                  │
        ╲────╱                       ╱──────────╲     NO     │
           │ YES                    ╱ A certain   ╲──────────┘
           ▼                        ╲ period of   ╱
   ┌──────────────┐                  ╲ time passed?╱
   │ Original      │                     ╲────╱
   │ exit/reverse  │                        │ YES
   │ motor rotates.│                        ▼
   └──────────────┘                    ╭─────────╮
           │                           │   Jam   │
           ▼                           ╰─────────╯
       ╱──────────╲
  NO  ╱ Read sensor╲
 ┌────╲  OFF?      ╱
 │     ╲────╱
 │        │ YES
 │        ▼
 │   ╱──────────╲
 │  ╱ A certain   ╲  NO
 └──╲ period of   ╱──┐
     ╲ time passed?╱  │
        ╲────╱        │
           │ YES      │
           ▼          │
   ┌──────────────┐   │
   │ Scanning start│   │     Scanning completed.
   │ signal sent   │   │
   │ (level: Low)  │   │
   └──────────────┘   │
           │          │
    ┌──────┴──────────────────────────────────────┐
    │                                               │
    ▼                                               │
 ╱──────────╲              NO                       │
╱ Original    ╲────────────────────┐               │
╲ exit/reverse ╱                    │               │
 ╲ sensor OFF? ╱                    ▼               │
    ╲────╱                     ╱──────────╲   NO    │
       │ YES                  ╱ A certain   ╲───────┘
       ▼                      ╲ period of   ╱
   ╱──────────╲                ╲ time passed?╱
  ╱ Transport   ╲   NO            ╲────╱
 ╱ for a certain ╲──┐                │ YES
 ╲ amount of     ╱  │                ▼
  ╲ distance     ╱  │            ╭─────────╮
   ╲ completed? ╱   │            │   Jam   │
      ╲────╱        │            ╰─────────╯
         │ YES
         ▼
         H
```

```
                    ┌───────┐
                    │   H   │
                    └───┬───┘
                        │
                        ▼
        ┌───────────────────────────────┐
        │  Original exit/reverse motor   │
        │     and read motor stop.       │
        └───────────────┬───────────────┘
                        │
                        ▼
        ┌───────────────────────────────┐
        │ After a certain period of time,│
        │ original exit/reverse motor    │
        │ reverses, read motor starts,   │
        │ reverse roller aligns original,│
        │ and then system reboots.       │
        └───────────────┬───────────────┘
                        ▼
              ◇ Original intermediate ◇  ──NO──►  ◇ A certain period ◇ ──NO──┐
              ◇   transport sensor ON? ◇          ◇ of time passed?  ◇        │
                        │ YES                           │ YES
                        │                               ▼
                        │                        ( Jam )
                        ▼
              ◇ Original exit/reverse ◇  ──NO──►  ◇ A certain period ◇ ──NO──┐
              ◇      sensor OFF?       ◇          ◇ of time passed?  ◇        │
                        │ YES                           │ YES
                        ▼                               ▼
         NO ◇ Transport for a certain ◇         ( Jam )
       ┌────◇   amount of distance     ◇
       │    ◇      completed?          ◇
       │              │ YES
       │              ▼
       │  ┌───────────────────────────────┐
       │  │  Original exit/reverse motor   │
       │  │     and read motor stop.       │
       │  └───────────────┬───────────────┘
       │                  ▼
       │  ┌───────────────────────────────┐
       │  │        Gate solenoid OFF       │
       │  └───────────────┬───────────────┘
       │                  ▼
       │             ( END )
```

Original exit/reverse motor and read motor stop.

After a certain period of time, original exit/reverse motor reverses, read motor starts, reverse roller aligns original, and then system reboots.

Original intermediate transport sensor ON? — NO / YES

A certain period of time passed? — NO / YES — Jam

Original exit/reverse sensor OFF? — NO / YES

A certain period of time passed? — NO / YES — Jam

Transport for a certain amount of distance completed? — NO / YES

Original exit/reverse motor and read motor stop.

Gate solenoid OFF

END

MR-3018/3020/3021/3022
DESCRIPTION OF OPERATIONS

3

3.4 DESCRIPTION OF CIRCUIT

3.4.1 Drive Circuit for Feed Motor

Fig. 3-6

This circuit controls the rotation/stoppage and the direction of rotation, excitation mode and motor current of the feed motor.

A drive clock signal (FMOT-CLK) and rotation direction signal (FMOT-CW/$\overline{\text{CCW}}$) are input to control the speed and direction of the motor rotation.

When the level of the enabling signal (FMOT-Enable) is set to "L", motor current is turned OFF regardless of the state of other signals.

For the excitation mode, either of 2 phase excitation, 1-2 phase excitation, W1-2 phase excitation, 2W1-2 phase excitation or the 4W1-2 phase excitation can be selected using the excitation switching signal (FMOT-Mode1/FMOT-Mode2).

The edge switching signal (FMOT-Mode3) is used to specify the switching timing for excitation phase either from when both the rise and decay edge of the CLK input are detected or when only the rising edge is detected.

Motor current value can be set discretionary by changing the level of the reference setting signal (FMOT-REF).

3.4.2 Drive Circuit for Read Motor
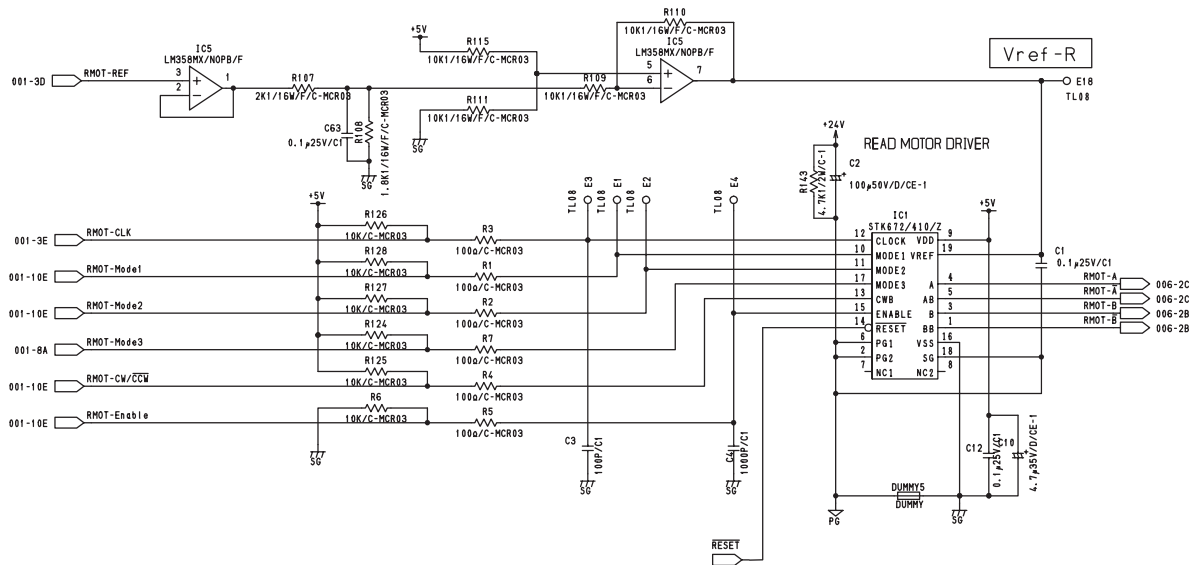
Fig. 3-7

This circuit controls the rotation/stoppage and the direction of rotation, excitation mode and motor current of the read motor.

A drive clock signal (RMOT-CLK) and rotation direction signal (RMOT-CW/$\overline{CCW}$) are input to control the speed and direction of the motor rotation.

When the level of the enabling signal (RMOT-Enable) is set to "L", motor current is turned to OFF regardless of the state of other signals.

For the excitation mode, either of 2 phase excitation, 1-2 phase excitation, W1-2 phase excitation, 2W1-2 phase excitation or the 4W1-2 phase excitation can be selected using the excitation switching signal (RMOT-Mode1/RMOT-Mode2).

The edge switching signal (RMOT-Mode3) is used to specify the switching timing for excitation phase either from when both the rise and decay edge of the CLK input are detected or when only the rising edge is detected.

Motor current value can be set discretionary by changing the level of the reference setting signal (RMOT-REF).

3.4.3 Drive Circuit for Exit Motor
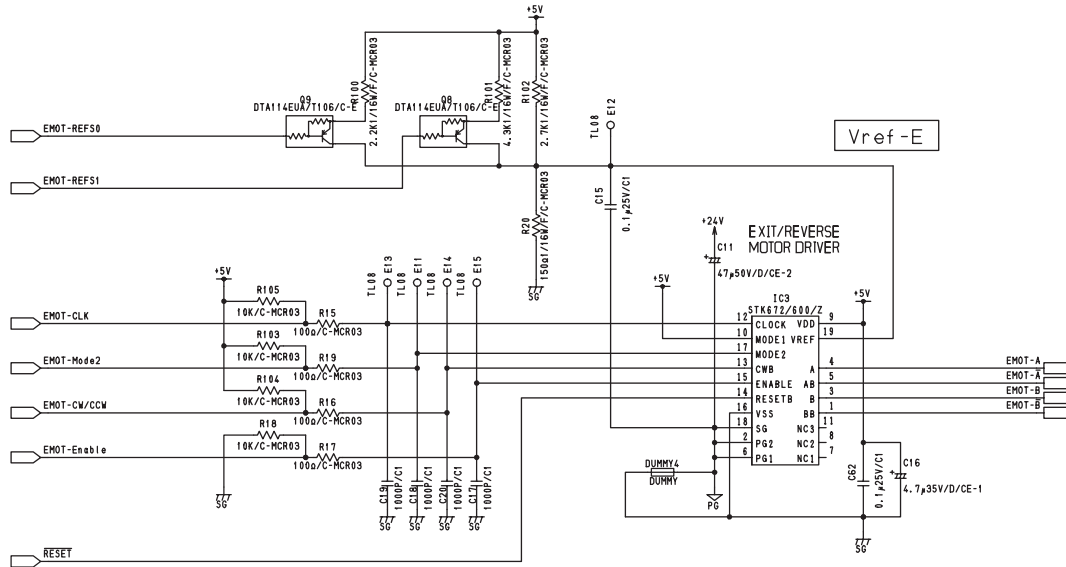
Fig. 3-8

This circuit controls the rotation/stoppage and the direction of rotation, excitation mode and motor current of the exit motor.

A drive clock signal (EMOT-CLK) and rotation direction signal (EMOT-CW/$\overline{\text{CCW}}$) are input to control the speed and direction of the motor rotation.

When the level of the enabling signal (EMOT-Enable) is set to "L", motor current is turned OFF regardless of the state of other signals.

As IC3-10pin (MODE1) is connected to +5V, excitation mode is applied at 1-2 phase excitation.

The edge switching signal (EMOT-Mode3) is used to specify the switching timing for excitation phase either from when both the rise and decay edge of the CLK input are detected or when only the rising edge is detected.

Motor current value can be set discretionary by switching the level of the reference switching signal (EMOT-REFS0,EMOT-REFS1).

3.4.4 Drive Circuit for FAN Motor
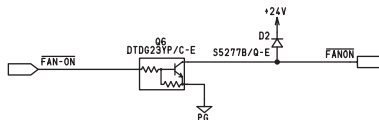
Fig. 3-9

This circuit controls the rotation/stoppage of the fan motor. The FAN starts to rotate when the FAN motor drive signal level is set to "H", and stops when the level is set to "L".

3.4.5 Reset Circuit
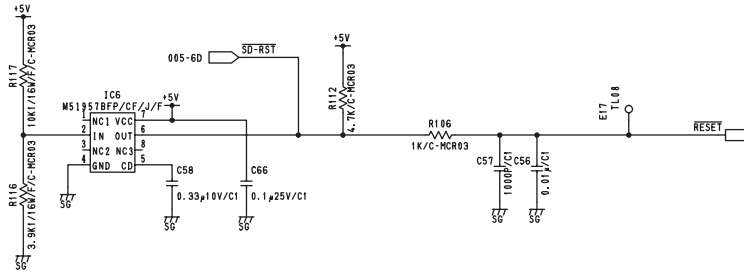
Fig. 3-10

This circuit generates a reset signal when the power is turned ON and the power voltage is blocked or cut off/lowered temporarily.

At the power-ON, the circuit shifts the level of the reset signal from "L" to "H" to put the CPU in a operative state after the reset pulse duration (Tpd) determined by the capacitance of C58 has passed from when the power voltage has reached the supervisory voltage (Vs) divided by R116 and R117.

When a power voltage drop (cutoff, temporary cutoff, temporary low voltage) occurs and the power voltage becomes lower than the set value for the supervisory voltage for the power, the circuit sets the level of the reset signal ($\overline{RESET}$) to "L" to put the CPU in a halt state.

3.4.6 Drive Circuit for Pickup Solenoid
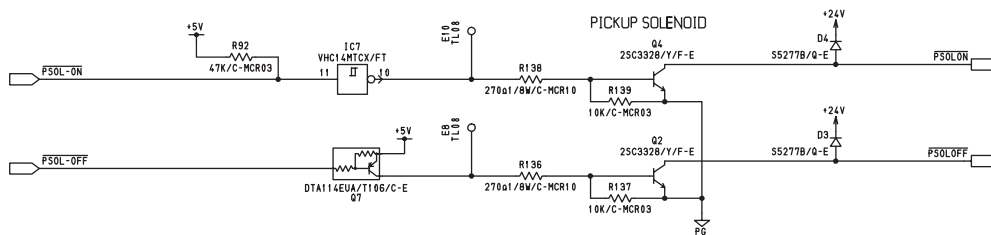
Fig. 3-11

Pick up solenoid is a two-way solenoid that can be operated both in suction and recovery, and driven by two transistors (Q4 and Q2) for each operation respectively.

When the PSOL-ON-Signal level is set to "L", Q4 is turned ON, the power of 24V is applied to the coil for suction operation, the solenoid is turned ON, and then the pickup roller goes down.

When the PSOL-ON-Signal level is set to "L", Q2 is turned ON, the power of 24V is applied to the coil for recovery operation, the solenoid is turned OFF, and then the pickup roller goes up.

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DESCRIPTION OF OPERATIONS

3.4.7 Drive Circuit for Gate Solenoid
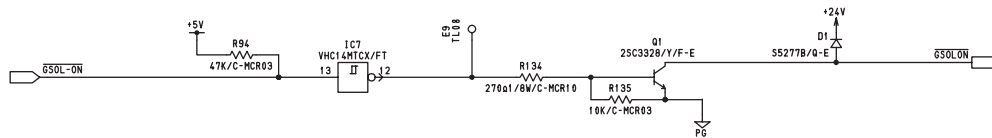
Fig. 3-12

Gate solenoid driven by the driver transistor (Q1) is a solenoid which is used to switch an original into the reverse tray when in the duplex scanning mode.
When the GSOL-ON-Signal level is set to "L", the reverse flap goes down and the original is transported to the reverse tray.

4. DISASSEMBLY AND ASSEMBLY

4.1   Cover

[A]   Front cover

(1)   Open the RADF and remove 3 screws.
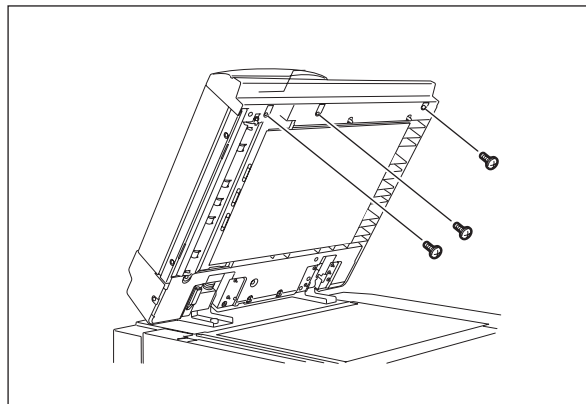
Fig. 4-1

(2)   Close the RADF.
(3)   Open the jam access cover and remove 2 screws.
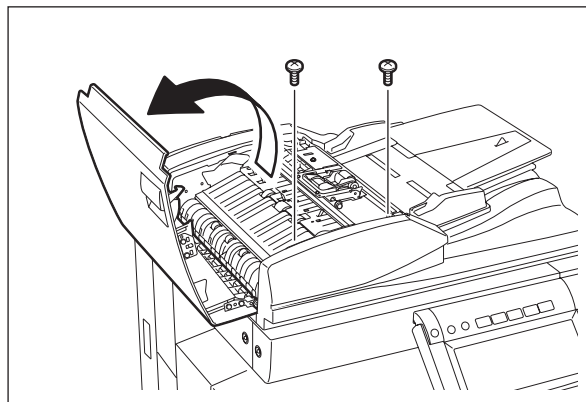
Fig. 4-2

(4)   Take off the front cover toward you.
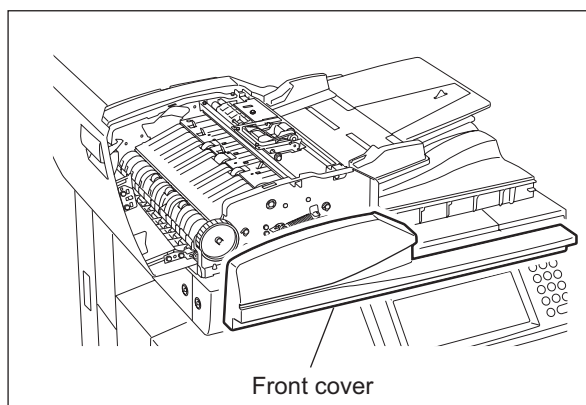
Front cover

Fig. 4-3

[B] Rear cover

(1) Open the jam access cover and remove 4 screws.
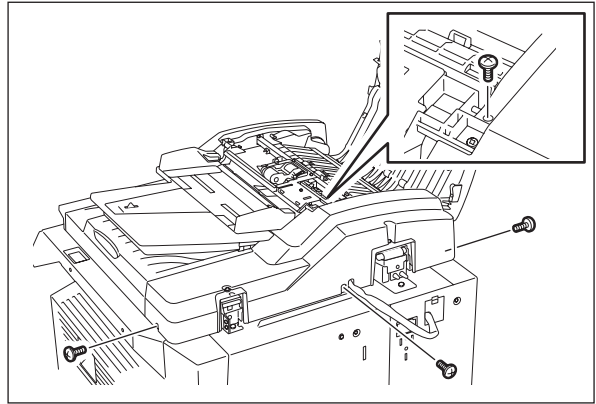
Fig. 4-4

(2) Raise the original tray and take off the rear cover upward.
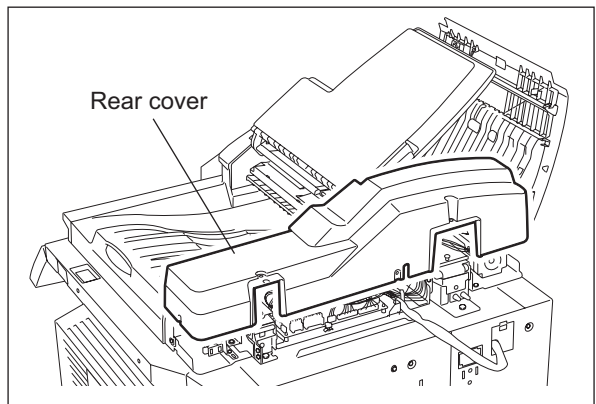
Rear cover

Fig. 4-5

[C] Jam access cover

(1) Take off the front cover.
     (📖 P. 4-1 "[A] Front cover")
(2) Take off the rear cover.
     (📖 P. 4-2 "[B] Rear cover")
(3) Remove 1 clip and then the dial and pin.

Pin   Dial

Clip
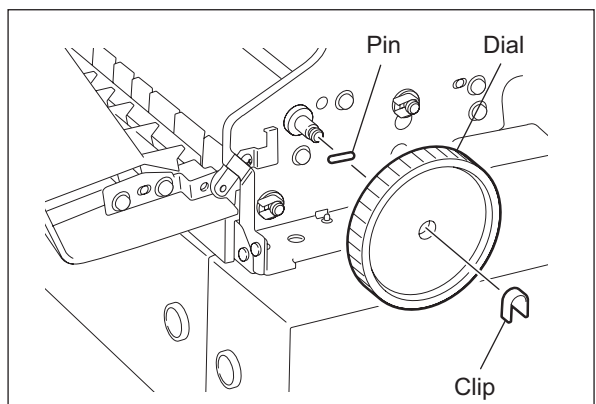
Fig. 4-6

(4) Remove 1 screw and the hinge pin.

Hinge pin
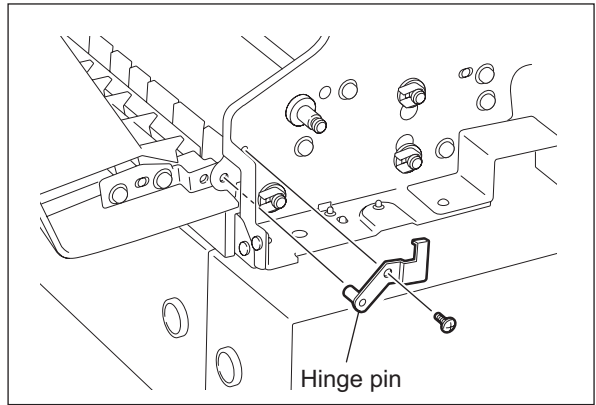
Fig. 4-7

(5) Take off the jam access cover by sliding it.

Jam access cover
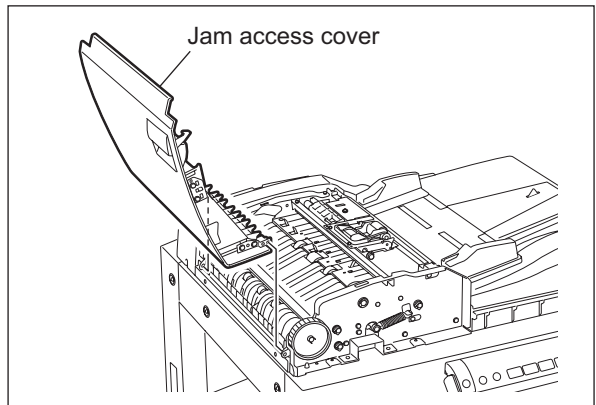
Fig. 4-8

[D] Left cover

(1) Remove 2 screws and take off the left cover.

Left cover

Fig. 4-9

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DISASSEMBLY AND ASSEMBLY
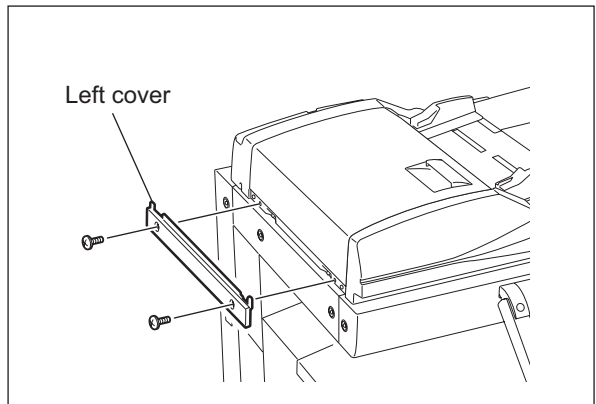
[E] Original tray

(1) Take off the front cover.
   (📖 P. 4-1 "[A] Front cover")
(2) Take off the rear cover.
   (📖 P. 4-2 "[B] Rear cover")
(3) Take off the paper feeder unit.
   (📖 P. 4-6 "[A] Paper feeder unit")
(4) Remove 2 screws. Lift up the feeder upper guide by sliding it to the right.

Note:
   Do not pull the harness too strong.

Feeder upper guide
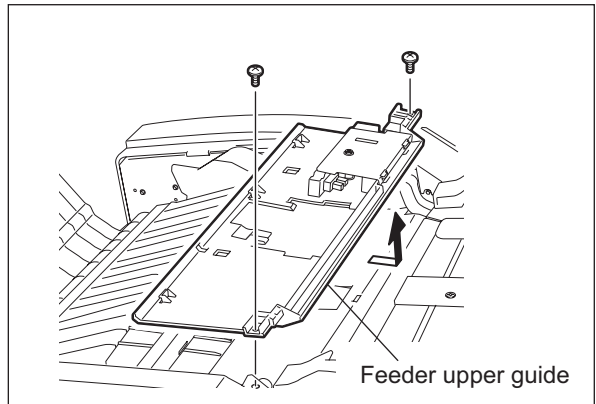
Fig. 4-10

(5) Disconnect 1 connector from the RADF control PC board.
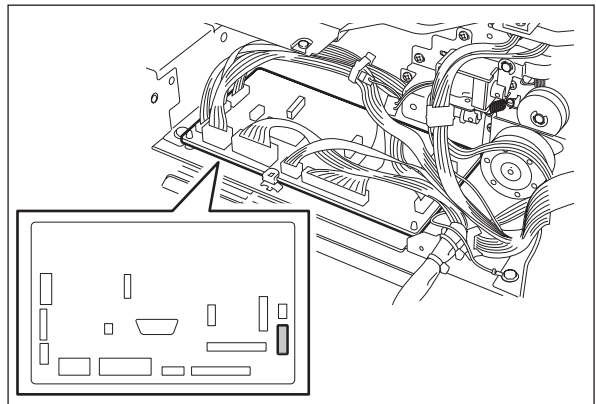
Fig. 4-11

(6) Remove 1 screw and take off the bushing.
(7) Take off the original tray.

Original tray

Bushing   Screw
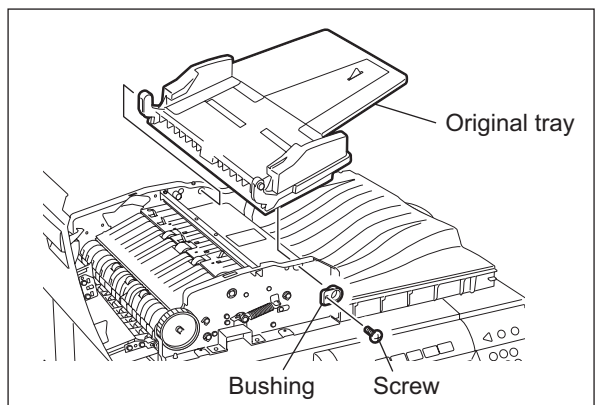
Fig. 4-12

[F] Original reverse tray

(1) Take off the original tray.
   (📖 P. 4-4 "[E] Original tray")
(2) Remove 1 screw and take off the original reverse tray.

Fig. 4-13

4

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DISASSEMBLY AND ASSEMBLY
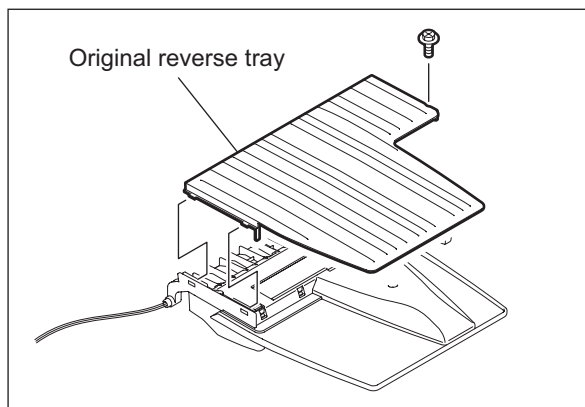
4.2 Roller

[A] Paper feeder unit

(1) Open the jam access cover.
(2) Remove 2 screws and take off the bracket.
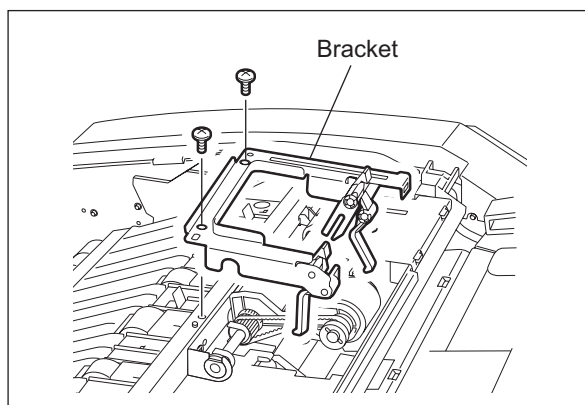
Fig. 4-14

(3) Remove 1 clip and slide 2 bushings.
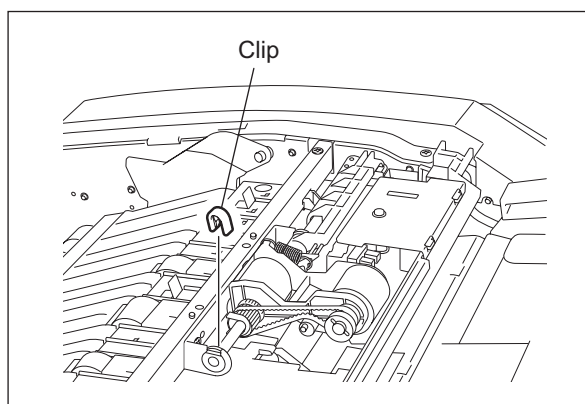
Fig. 4-15

(4) Take off the paper feeder unit.
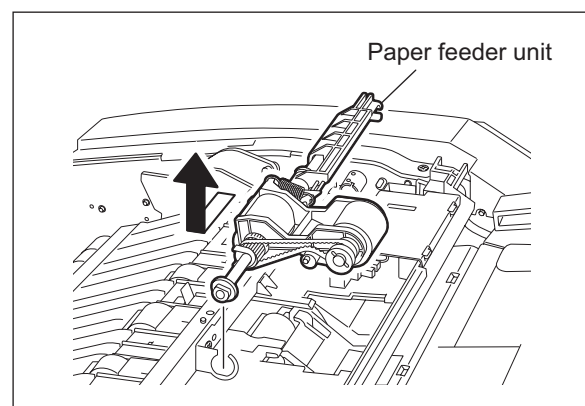
Fig. 4-16

[B] Pickup roller [PM]

(1) Take off the paper feeder unit.
   (📖 P. 4-6 "[A] Paper feeder unit")
(2) Remove 1 clip and pull out the shaft. Take off the pickup roller.
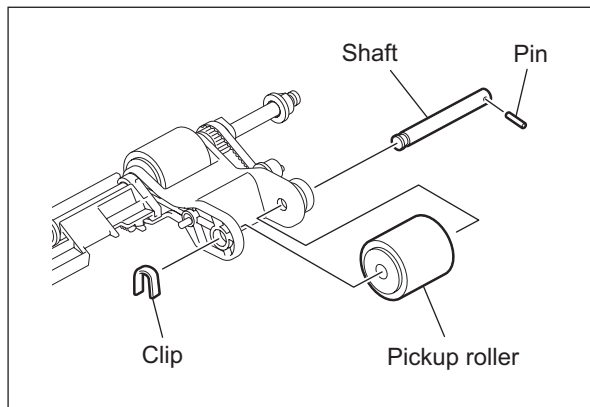
Fig. 4-17

Notes:
1. Be careful not to drop the pin because it will come off when the shaft is pulled out.
2. Make sure you assemble the pickup roller with the one-way clutch in the correct direction.
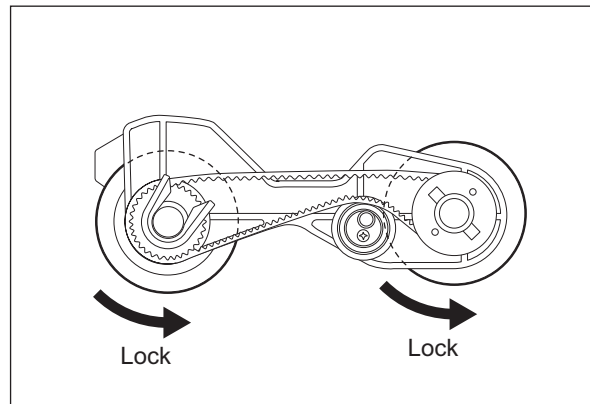
Fig. 4-18

[C] Feed roller [PM]

(1) Take off the paper feeder unit.
   (📖 P. 4-6 "[A] Paper feeder unit")
(2) Remove 1 clip.
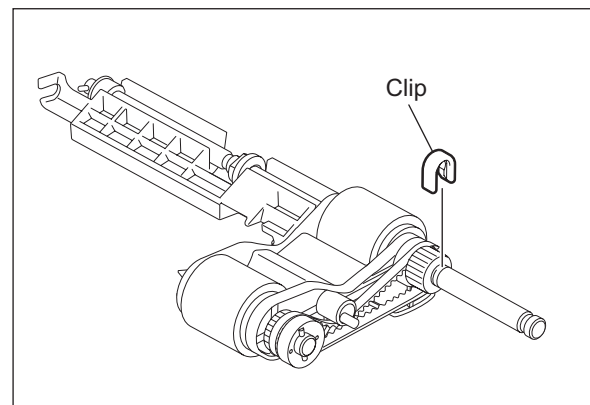
Fig. 4-19

(3)　Slide the pulley and remove 1 pin.
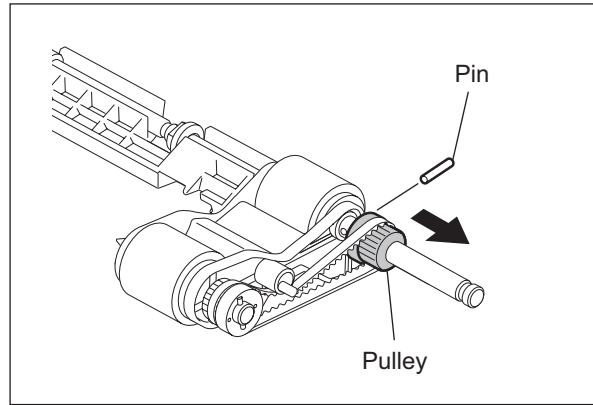
Fig. 4-20

(4)　Pull out the shaft and take off the feed roller.
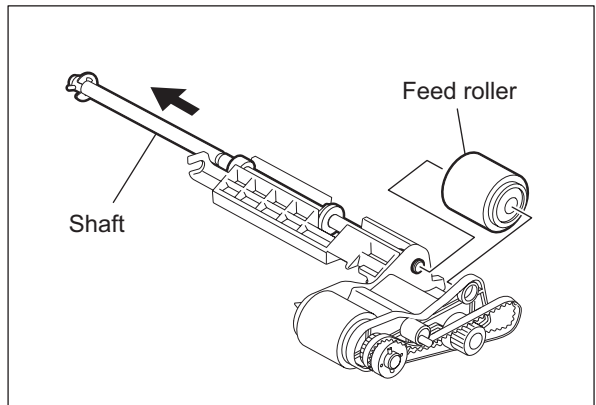
Fig. 4-21

Note:
　　Make sure you assemble the feed roller with the one-way clutch in the correct direction.
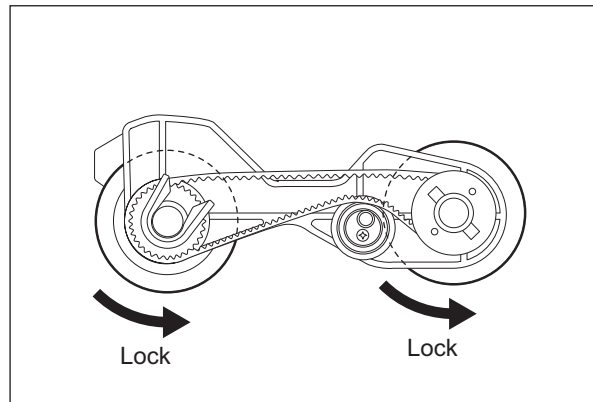
Fig. 4-22

[D] Separation roller [PM]

(1) Take off the paper feeder unit.
($\square$ P. 4-6 "[A] Paper feeder unit")

(2) Remove 2 screws. Slide the feeder upper guide to the right and raise it.

Note:
Do not pull the harness out with too much force.

Feeder upper guide
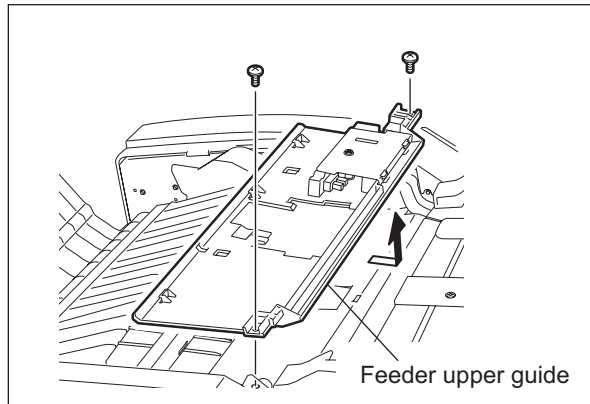
Fig. 4-23

(3) Remove 2 screws and take off the separation roller holder and separation roller unit.

Separation roller unit

Separation roller holder
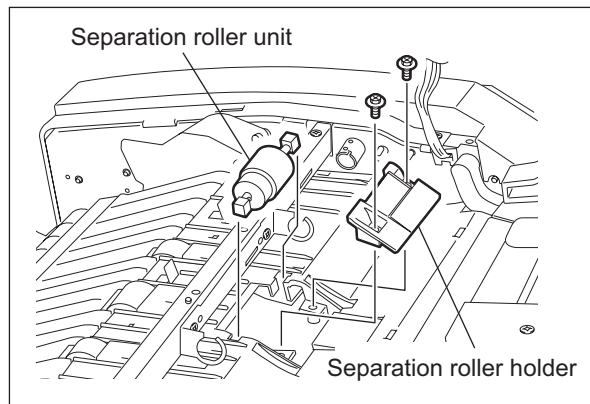
Fig. 4-24

(4) Remove 1 bushing and clip, and then take off the separation roller.

Separation roller

Bushing

Clip

Fig. 4-25

MR-3018/3020/3021/3022
DISASSEMBLY AND ASSEMBLY
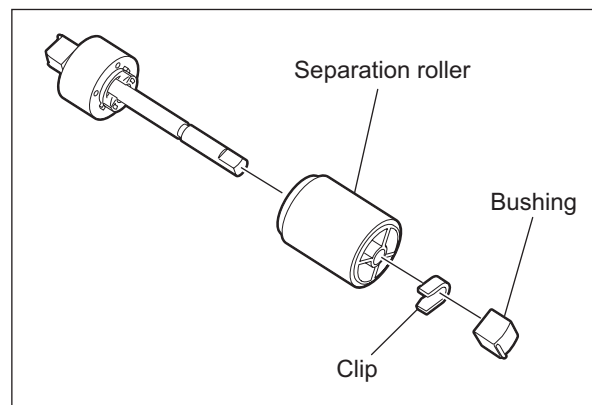
[E] Feeder lower guide

(1) Take off the original tray.
    (📖 P. 4-4 "[E] Original tray")
(2) Take off the paper feeder unit.
    (📖 P. 4-6 "[A] Paper feeder unit")
(3) Remove 2 screws and take off the stay.
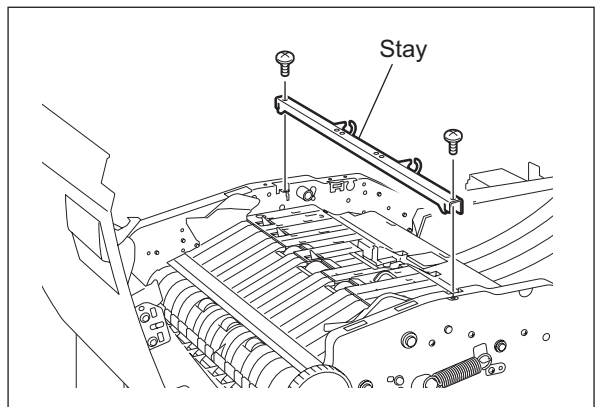
Fig. 4-26

(4) Take off the jam access guide.
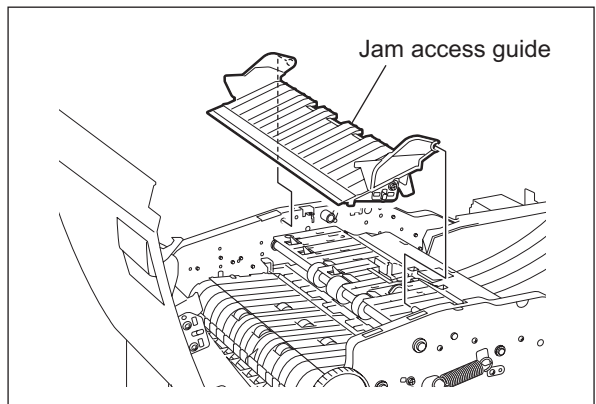
Fig. 4-27

(5) Remove 4 screws. Disconnect 1 connector and take off the feeder lower guide.
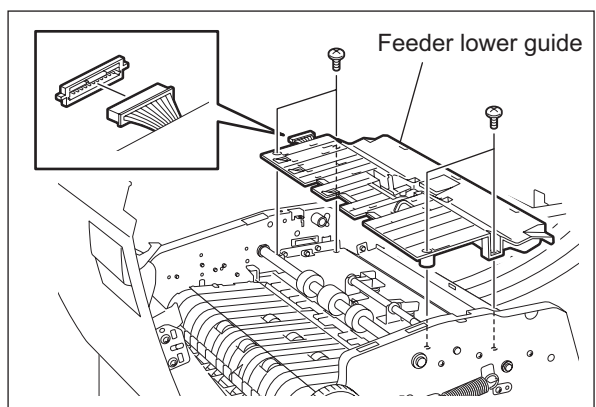
Fig. 4-28

[F] Registration roller

(1) Take off the feeder lower guide.
  (📖 P. 4-10 "[E] Feeder lower guide")
(2) Take off the original feed motor drive section.
  (📖 P. 4-21 "[E] Original feed motor drive section")
(3) Remove 1 E-ring and 1 bushing from the front side of the registration roller shaft. Also, remove 1 bushing, 1 pulley, 1 E-ring and 1 bushing from the rear side of the shaft, and then take off the registration roller.
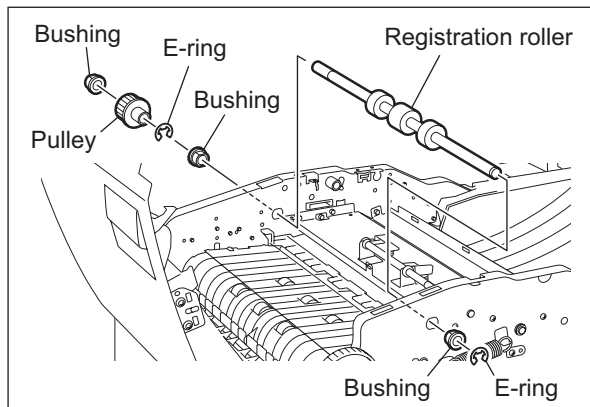
Fig. 4-29

[G] Exit/reverse roller

(1) Take off the front cover.
  (📖 P. 4-1 "[A] Front cover")
(2) Take off the original exit/reverse motor.
  (📖 P. 4-23 "[F] Original exit/reverse motor (M3)")
(3) Remove 1 clip, 1 pulley, 1 pin and 1 bushing from the rear side of the exit/reverse roller shaft.
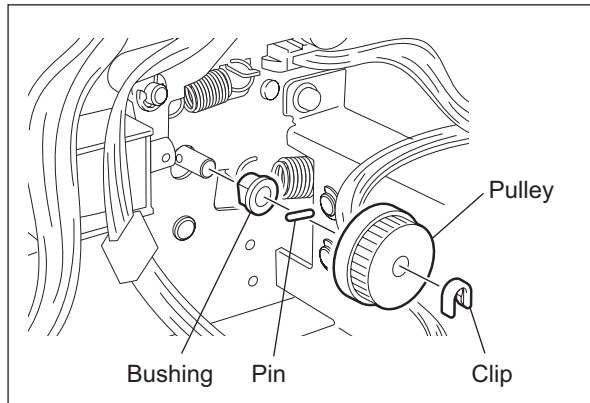
Fig. 4-30

(4) Remove 1 screw and take off the leaf spring.
(5) Remove 1 clip and 1 bushing from the front side of the exit/reverse roller shaft.
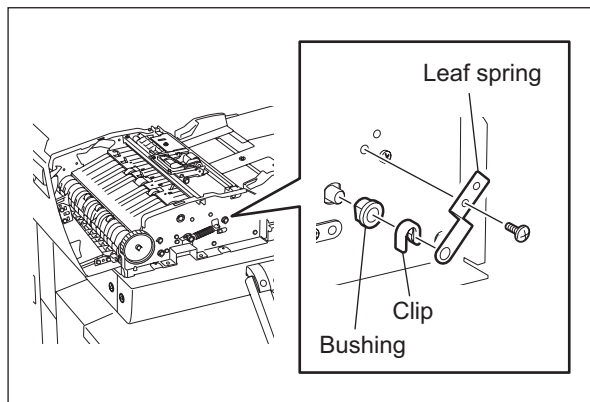
Fig. 4-31

(6)   Take off the jam access guide.
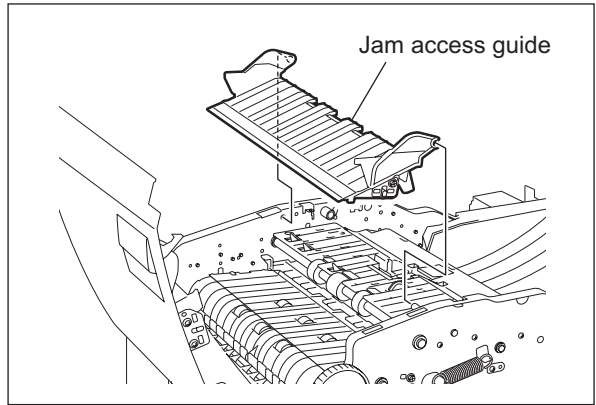
Jam access guide

Fig. 4-32

(7)   Pull out the exit guide.

Exit guide
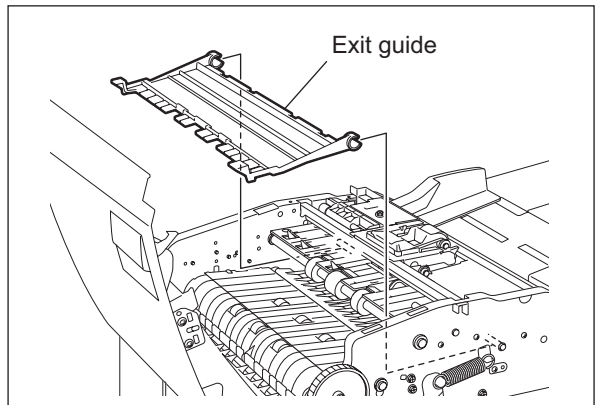
Fig. 4-33

(8)   Take off the exit/reverse roller.

Exit/reverse roller
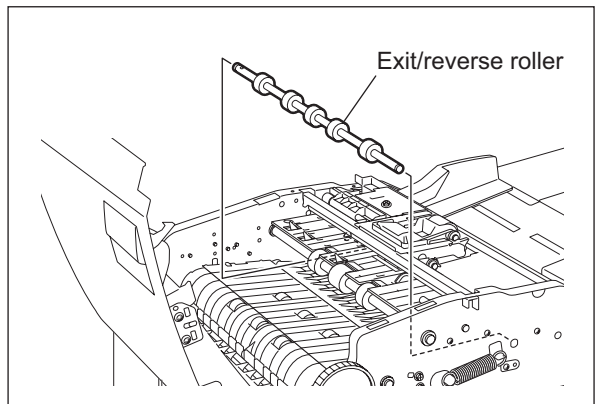
Fig. 4-34

[H] Pre-reading guide

(1) Take off the front cover.
(📖 P. 4-1 "[A] Front cover")
(2) Take off the rear cover.
(📖 P. 4-2 "[B] Rear cover")
(3) Take off the jam access cover.
(📖 P. 4-2 "[C] Jam access cover")
(4) Take off the left cover.
(📖 P. 4-3 "[D] Left cover")
(5) Remove 1 screw and take off the hinge pin.
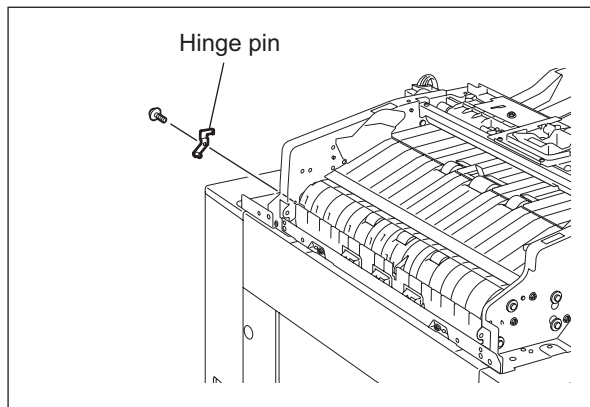
Fig. 4-35

(6) Disconnect 2 connectors. Remove 2 screws and take off the pre-reading guide.
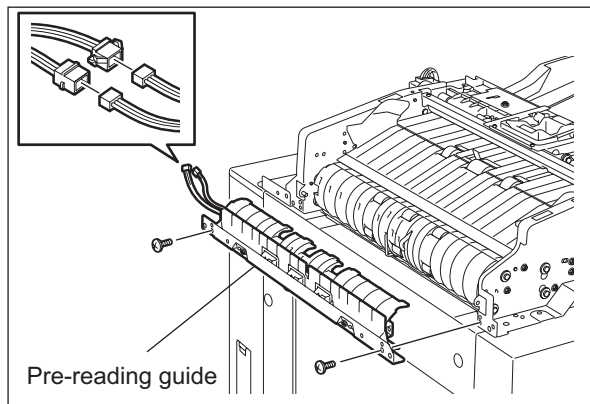
Fig. 4-36

[I] Intermediate transport roller

(1) Take off the pre-reading guide.
(📖 P. 4-13 "[H] Pre-reading guide")
(2) Take off the read motor drive section.
(📖 P. 4-19 "[C] Read motor drive section")
(3) Remove 1 bushing, 1 screw, 1 pulley and 1 bushing from the rear side of the intermediate transport roller shaft.
(4) Remove 1 bushing from the front side of the intermediate transport roller shaft.
(5) Take off the intermediate transport roller.
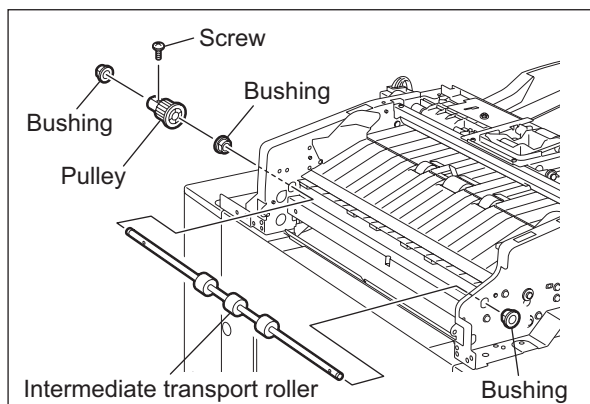
Fig. 4-37

[J] Pre-reading roller

(1) Take off the pre-reading upper guide.
(📖 P. 4-13 "[H] Pre-reading guide")
(2) Take off the read motor drive section.
(📖 P. 4-19 "[C] Read motor drive section")
(3) Remove 1 bushing, 1 screw, 1 pulley and 1 bearing from the rear side of the pre-reading roller shaft.
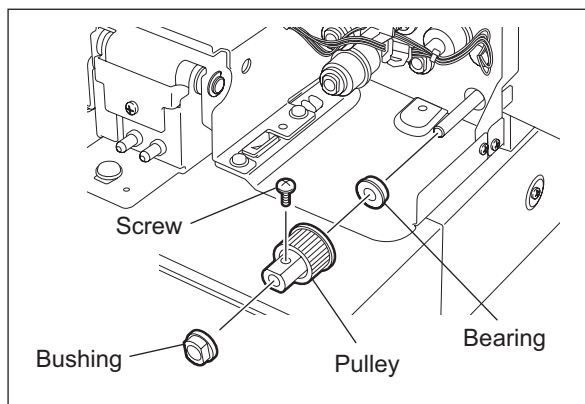
Fig. 4-38

(4) Remove 1 clip and 1 bushing from the front side of the pre-reading roller shaft.
(5) Take off the pre-reading roller.
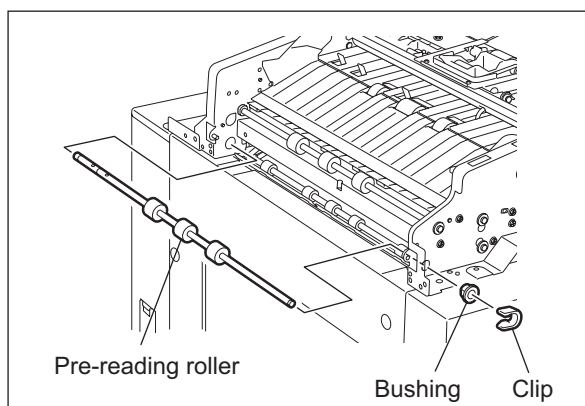
Fig. 4-39

[K] Post-reading roller

(1) Take off the pre-reading lower guide.
(📖 P. 4-13 "[H] Pre-reading guide")
(2) Disconnect 1 connector.
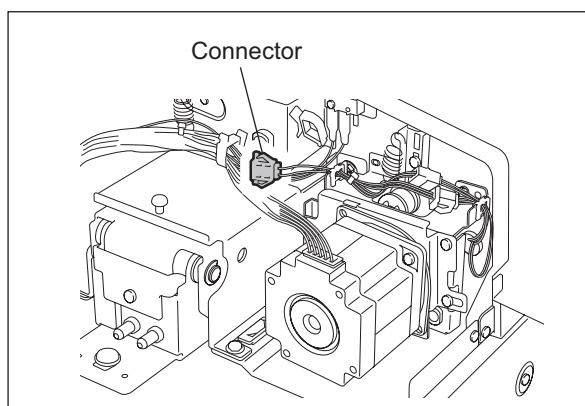
Fig. 4-40

(3) Take off the read motor drive section.
(📖 P. 4-19 "[C] Read motor drive section")

(4) Remove 1 bushing, 1 E-ring and 1 pulley from the rear side of the post-reading roller shaft. Loosen 2 setscrews and take off 1 flange. Take off 1 bearing.
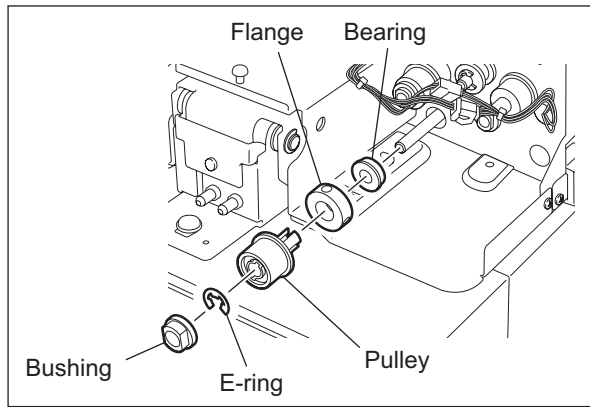
Fig. 4-41

(5) Remove 1 clip and 1 bushing from the front side of the post-reading roller shaft.
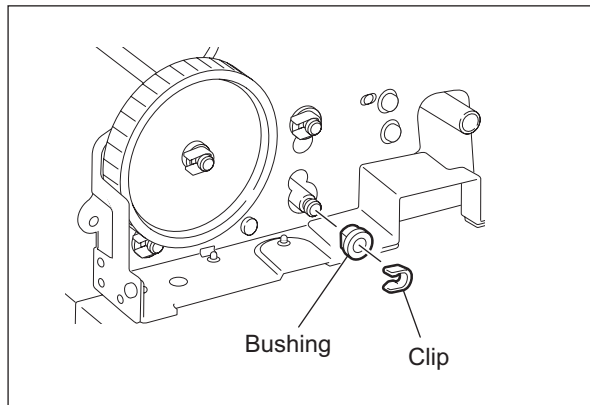
Fig. 4-42

(6) Open the RADF. Remove 4 screws, take off 2 holders and platen guide.
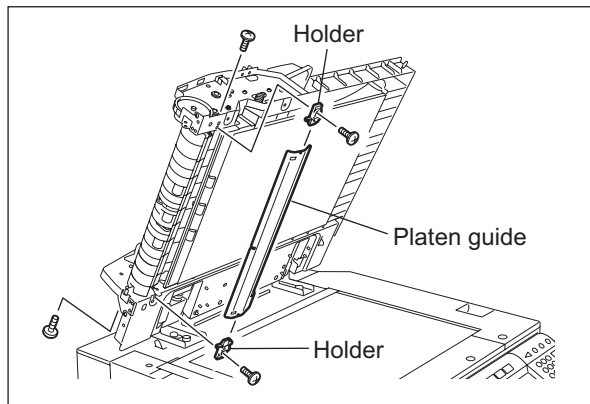
Fig. 4-43

(7) Remove 2 screws. Open the post-reading lower guide and take off the post-reading upper guide.

Post-reading upper guide
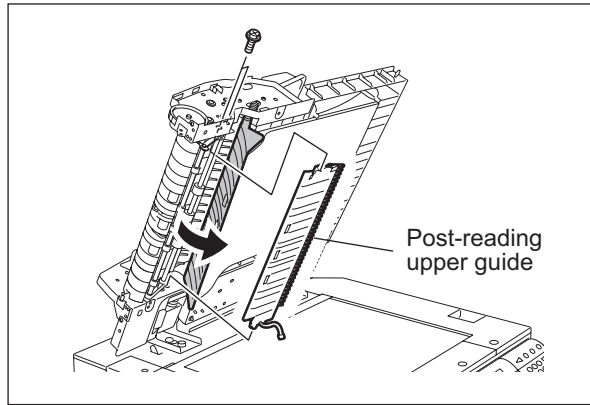
Fig. 4-44

(8) Take off the post-reading roller.

Post-reading roller
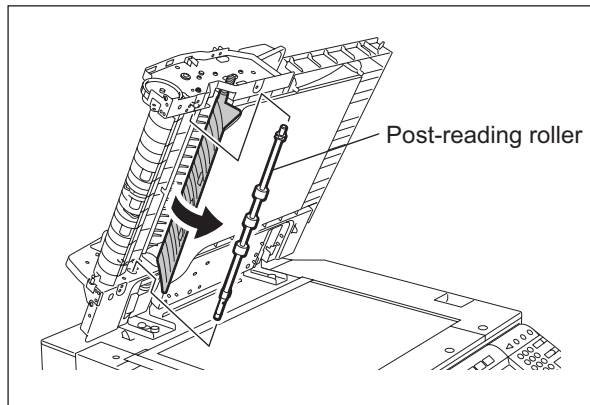
Fig. 4-45

[L] Reverse registration roller

(1) Take off the post-reading roller.
(📖 P. 4-14 "[K] Post-reading roller")
(2) Remove 1 E-ring, 1 pulley, 1 pin and 1 bushing from the rear side of the reverse registration roller shaft.

Pin   Bushing

Pulley

Bushing   E-ring
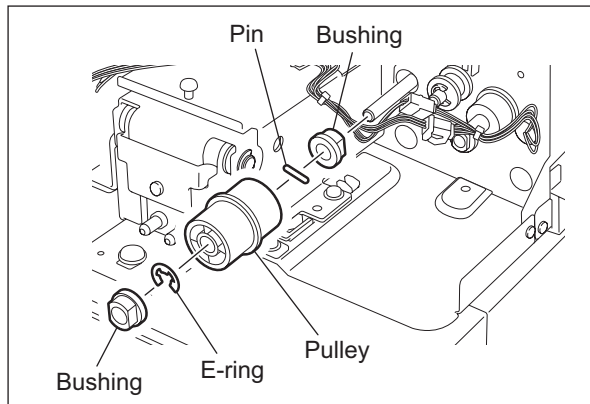
Fig. 4-46

(3) Remove 1 clip and 1 bushing from the front
     side of the reverse registration roller shaft.

Bushing   Clip
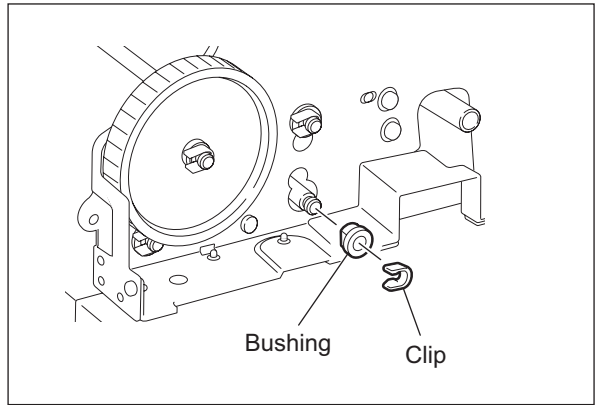
Fig. 4-47

(4) Open the RADF. Take off the reverse regis-
     tration roller.

Reverse registration
roller

Fig. 4-48

MR-3018/3020/3021/3022
DISASSEMBLY AND ASSEMBLY
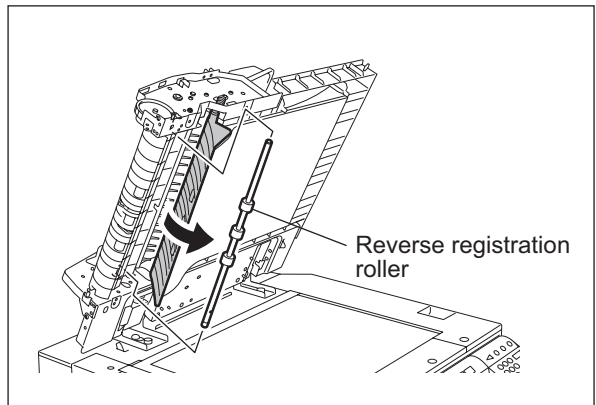
4.3 Motor / Motor drive section

[A] Fan motor (M4)

(1) Take off the rear cover.
    (📖 P. 4-2 "[B] Rear cover")
(2) Disconnect 1 connector. Then remove 2 screws to take off the fan motor.
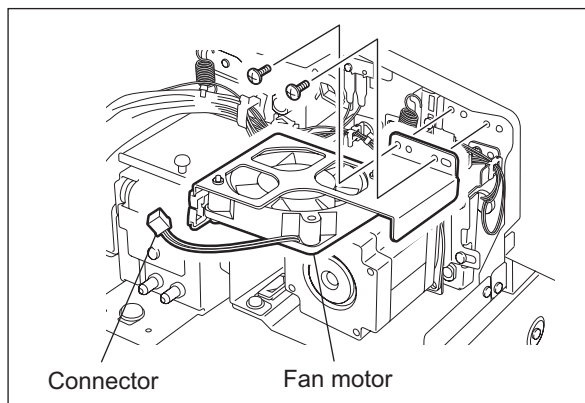
Fig. 4-49

[B] Read motor (M2)

(1) Take off the rear cover.
    (📖 P. 4-2 "[B] Rear cover")
(2) Take off the fan motor.
    (📖 P. 4-18 "[A] Fan motor (M4)")
(3) Disconnect 1 connector. Then remove 2 screws to take off the read motor.
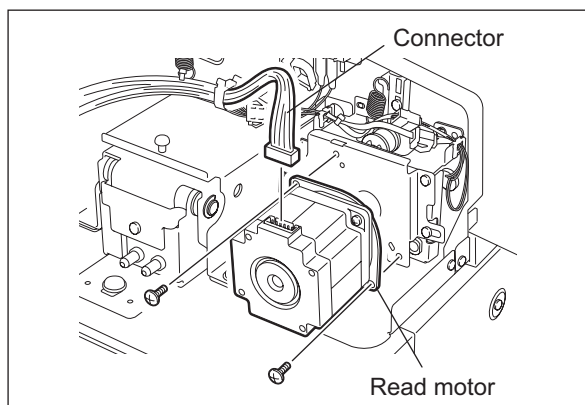
Fig. 4-50

[C] Read motor drive section

(1) Take off the rear cover.
   (📖 P. 4-2 "[B] Rear cover")
(2) Take off the fan motor.
   (📖 P. 4-18 "[A] Fan motor (M4)")
(3) Disconnect 1 connector, and then remove 1 spring. (Spring: Outside diameter of coil – ø10.2 mm, active coils – 12.5)
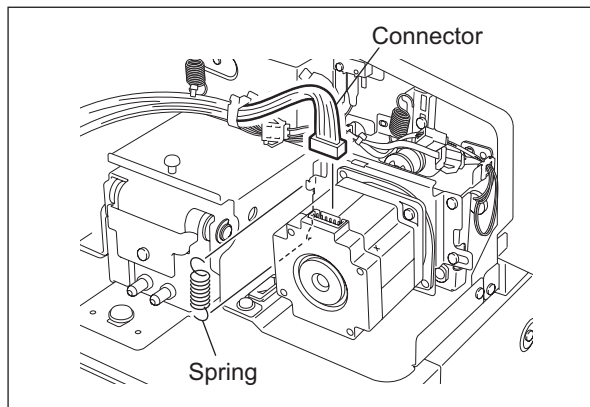
Fig. 4-51

(4) Remove 3 screws, and then take off the read motor with its bracket.

   Note:
   When the unit is being assembled, temporarily tighten the screws removed at step (3), and then attach the spring removed at step (2). Then fully tighten these screws.
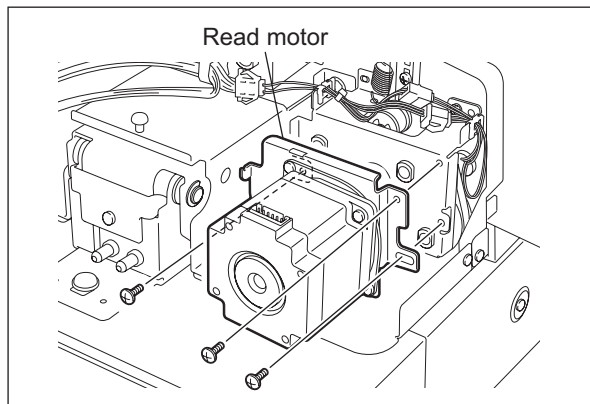
Fig. 4-52

(5) Remove 1 spring. (Spring: Outside diameter of coil –ø8.8 mm, active coils – 12.5)
(6) Release the harness from 2 harness clamps.
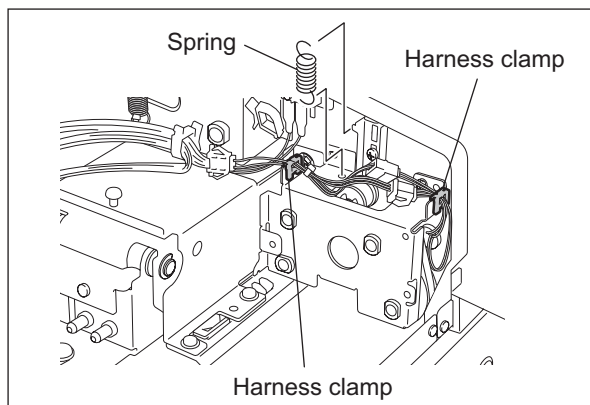
Fig. 4-53

(7) Remove 3 screws and then take off the bracket.

Bracket
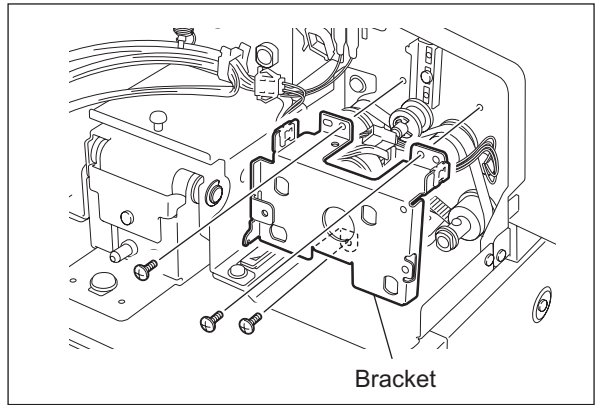
Fig. 4-54

(8) Take off 1 timing belt and 4 bushings.

Timing belt

Bushing   Bushing
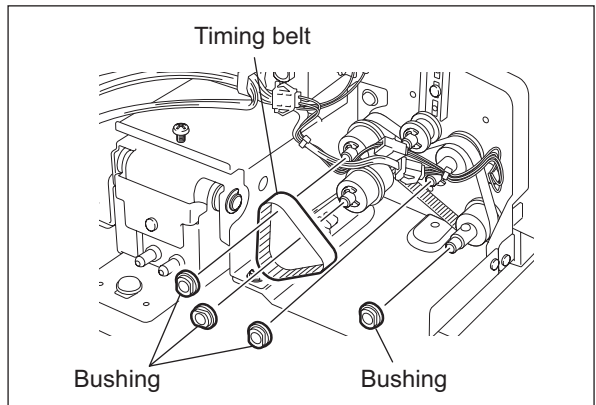
Fig. 4-55

(9) Loosen 1 screw of the belt tensioner.
(10) Remove the 2 E-rings, and then take off the pulley and timing belt.

Note:

When the unit is being assembled, first install the parts removed at steps (5), (6), (7) and (9), and attach the spring removed at step (4) next. Then tighten the screw loosened at step (8).

Screw   Tensioner

E-ring   Timing belt
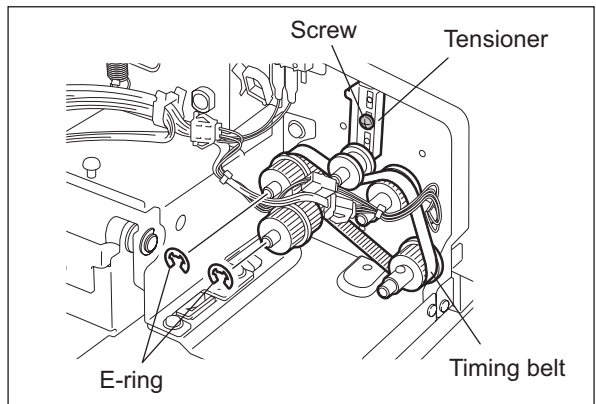
Fig. 4-56

[D] Original feed motor (M1)

(1) Take off the rear cover.
    (📖 P. 4-2 "[B] Rear cover")
(2) Disconnect 1 connector. Then remove 2
    screws to take off the original feed motor.
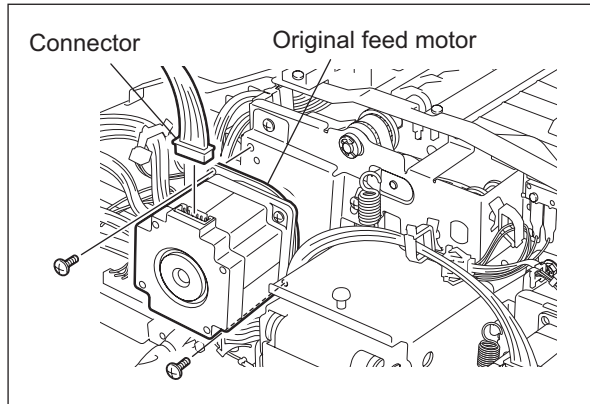
Fig. 4-57

[E] Original feed motor drive section

(1) Take off the rear cover.
    (📖 P. 4-2 "[B] Rear cover")
(2) Disconnect 1 connector, and then remove 1
    spring. (Spring: Outside diameter of coil –
    ø9.6 mm, acceptable turns of coil – 12 turns)
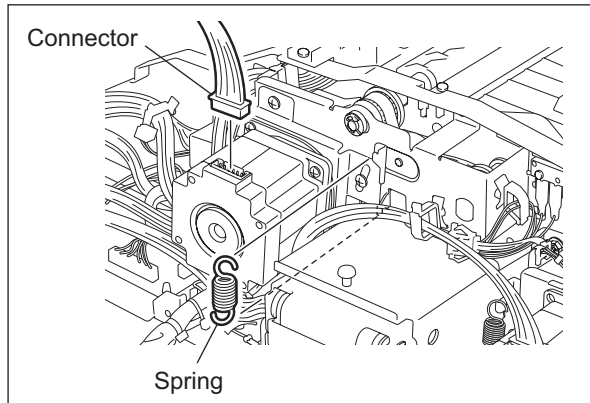
Fig. 4-58

(3) Remove 3 screws, and then take off the orig-
    inal feed motor with its bracket.

Note:
    When the unit is being assembled, tempo-
    rarily tighten the screws removed at step (3)
    and then attach the spring removed at step
    (2). Then fully tighten these screws.
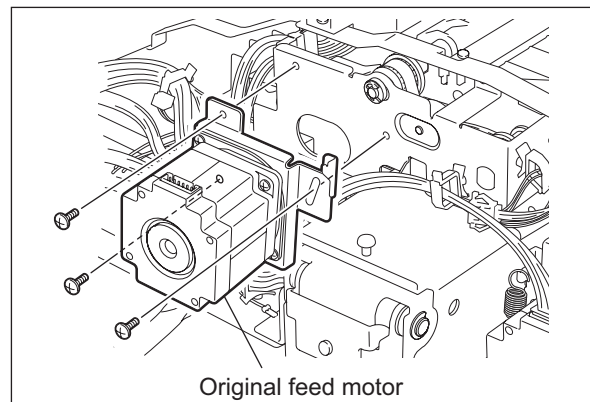
Fig. 4-59

(4) Release the harness from 3 harness clamps.
(5) Remove 1 E-ring and take off the bushing.
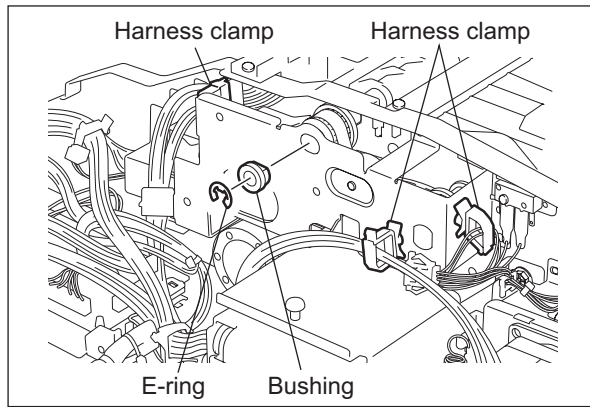
Fig. 4-60

(6) Disconnect 3 terminals of the switch.
(7) Remove 4 screws, and then take off the bracket.

Note:
When connecting the terminal, make sure that the color of the harness is correct.
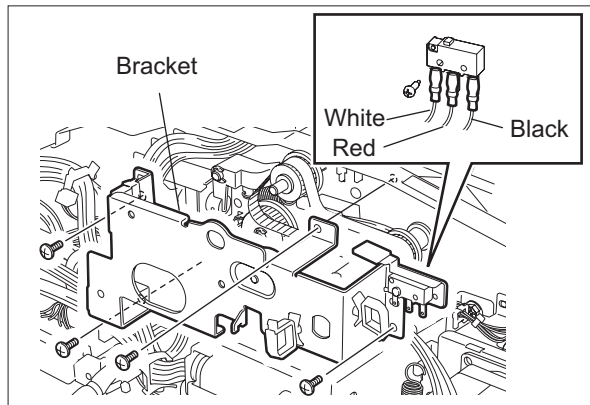
Fig. 4-61

(8) Take off the timing belt, bushings and pulley.
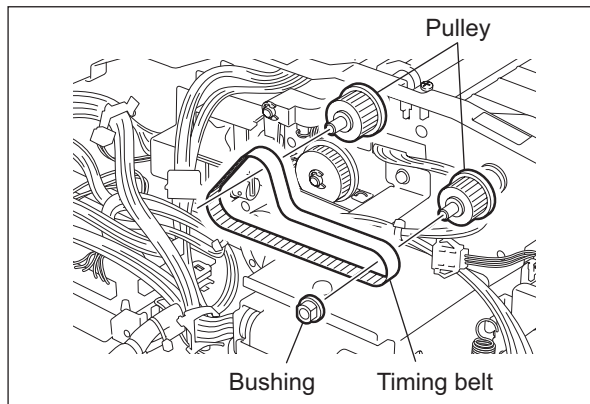
Fig. 4-62

[F] Original exit/reverse motor (M3)

(1) Take off the original feed motor drive section. (📖 P. 4-21 "[E] Original feed motor drive section")

(2) Disconnect 1 connector from the RADF control PC board.
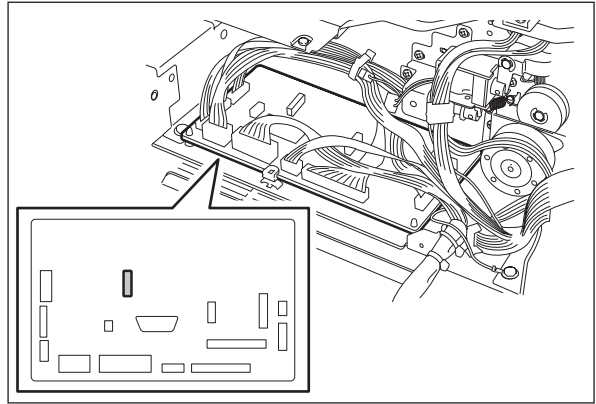
Fig. 4-63

(3) Remove 2 screws, and then take off the original exit/reverse motor with its bracket.
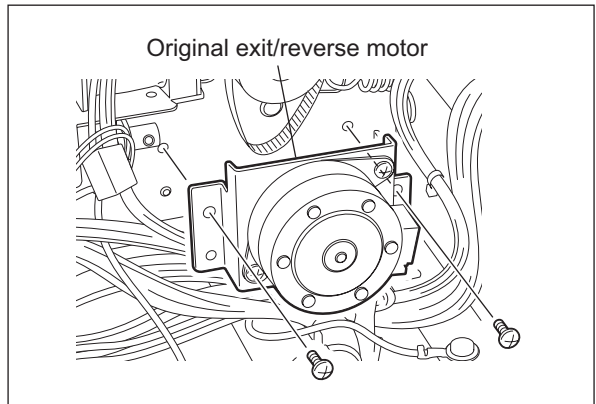
Fig. 4-64

(4) Remove 2 screws, and then take off the original exit/reverse motor by sliding it from the bracket.
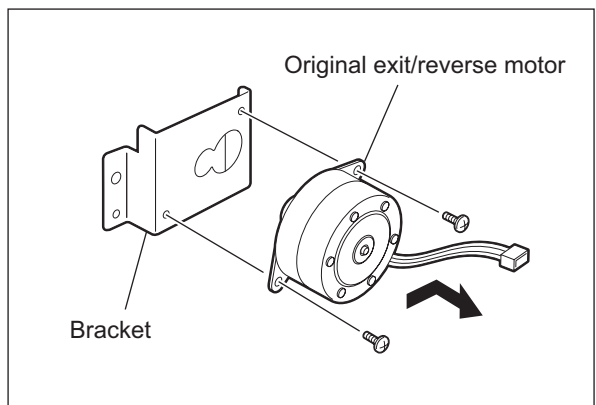
Fig. 4-65

4.4   Solenoid

[A]   Original pickup solenoid (SOL1)

(1)   Take off the original feed motor drive section. (📖 P. 4-21 "[E] Original feed motor drive section")

(2)   Disconnect one connector. Remove 2 screws and take off the original pickup solenoid with the bracket.

Connector   Original pickup solenoid
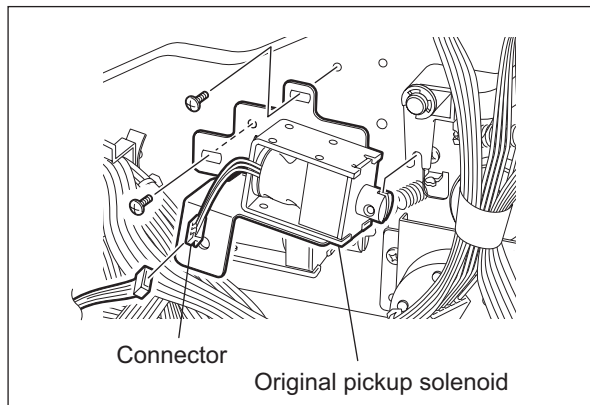
Fig. 4-66

(3)   Remove 2 screws and take off the original pickup solenoid from the bracket.

Original pickup solenoid

Bracket
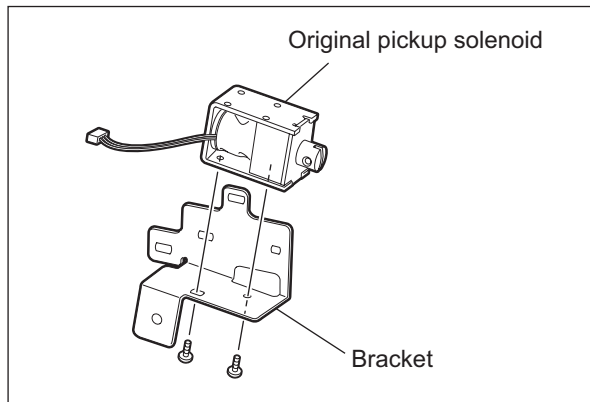
Fig. 4-67

Note:
When installing the original pickup solenoid, be sure to align the edge of the original pickup solenoid with the mark-off line on the frame.

Mark-off line
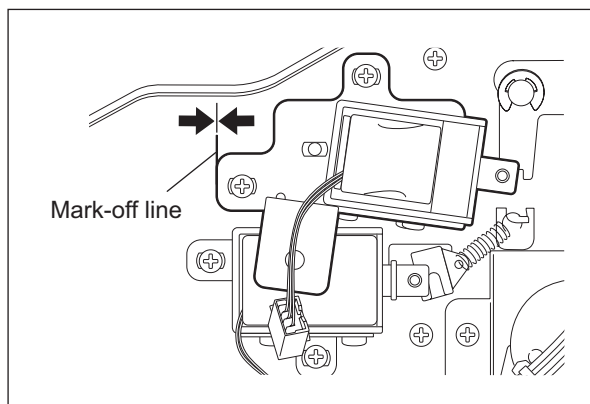
Fig. 4-68

[B]　Gate solenoid (SOL2)

(1) Take off the original pickup solenoid.
(📖 P. 4-24 "[A] Original pickup solenoid
(SOL1)")

(2) Disconnect one connector. Remove 2
screws and take off the gate solenoid with
the bracket.
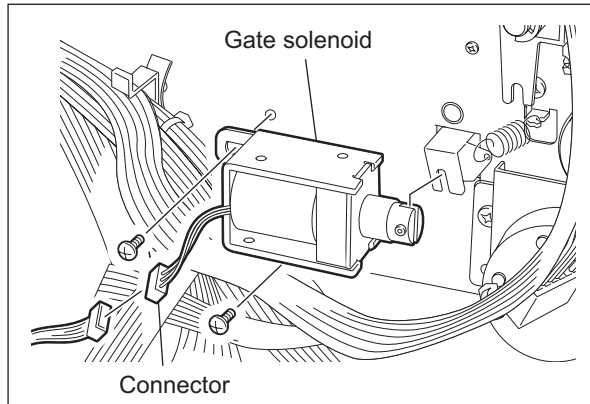
Fig. 4-69

(3) Remove 2 screws and take off the gate sole-
noid from the bracket.
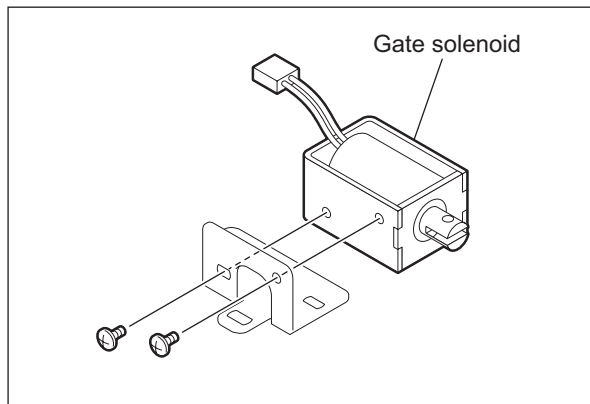
Fig. 4-70

Note:
When installing the gate solenoid, be sure to
align the edge of the bracket with the mark-
off line on the frame.
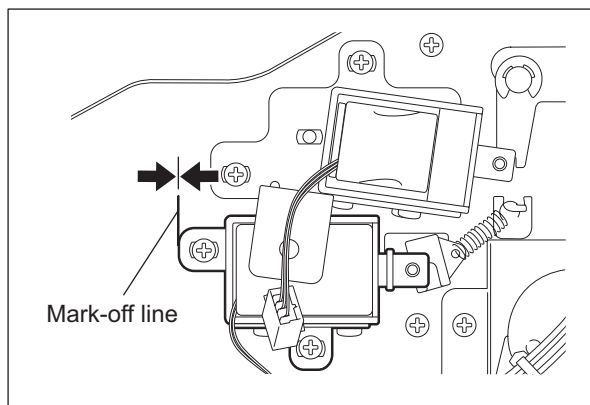
Fig. 4-71

4.5   Sensor/switch

[A]   Original tray width sensor (S2)

(1)   Take off the original reverse tray.
         (📖 P. 4-5 "[F] Original reverse tray")
(2)   Remove 2 screws. Release 8 latches and
         separate the original tray into 2 parts.
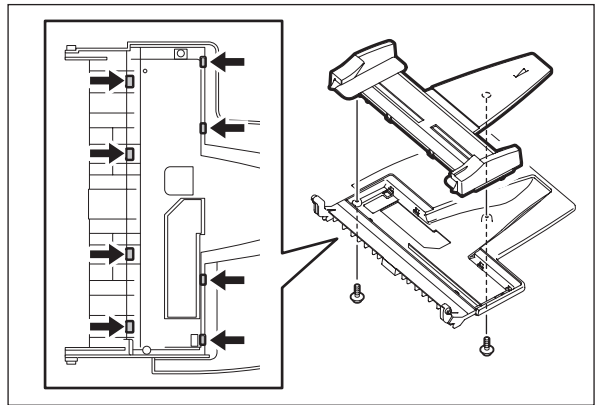
Fig. 4-72

(3)   Remove 1 screw and take off the cover.
(4)   Disconnect 1 connector and take off the orig-
         inal tray width sensor.
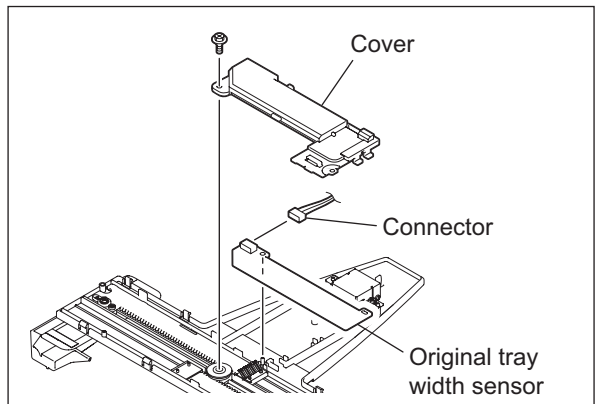
Fig. 4-73

Note:
    If washers (3 pcs) and a pinion come off,
    assemble them in the order as shown in the
    illustration.
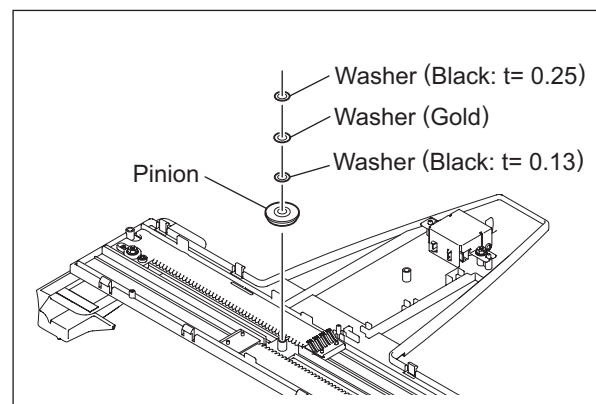
Fig. 4-74

[B]   Original tray sensor (S1)

(1)   Take off the original reverse tray.
      (📖 P. 4-5 "[F] Original reverse tray")
(2)   Remove 2 screws. Release 8 latches and
      separate the original tray into 2 parts.
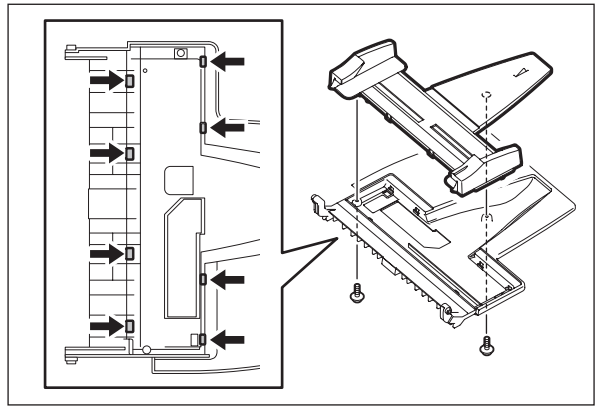
Fig. 4-75

(3)   Remove 2 screws and take off the holder.

Holder
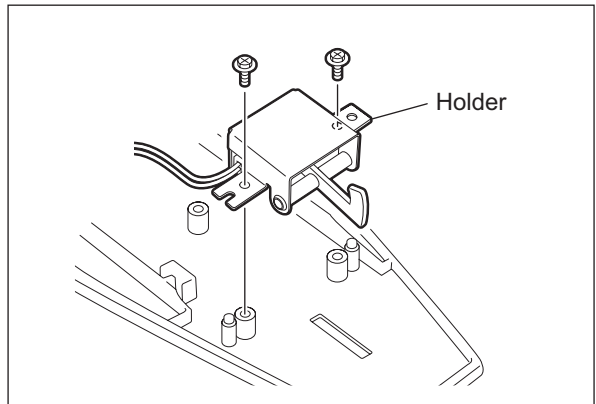
Fig. 4-76

(4)   Release 2 latches and take off the original
      tray sensor.

Original tray sensor
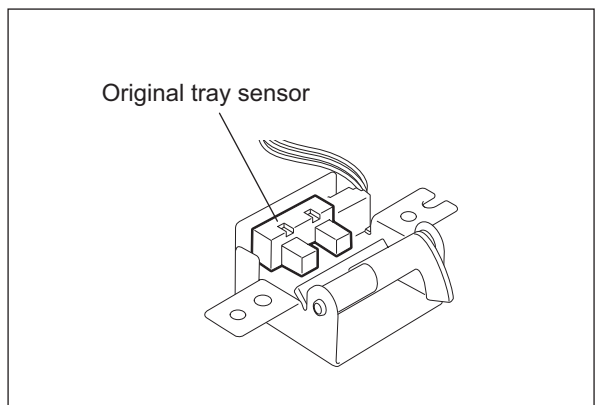
Fig. 4-77

[C] Jam access cover sensor (S11)

(1) Open the jam access cover.
(2) Remove 1 screw and take off the metal plate cover.
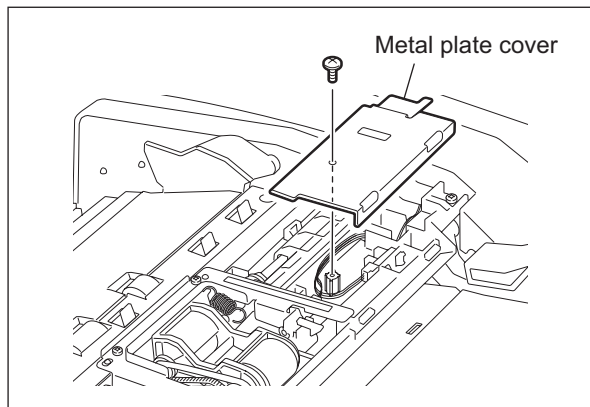
Metal plate cover

Fig. 4-78

(3) Disconnect 1 connector. Release 2 latches and take off the jam access cover sensor.

Jam access cover sensor
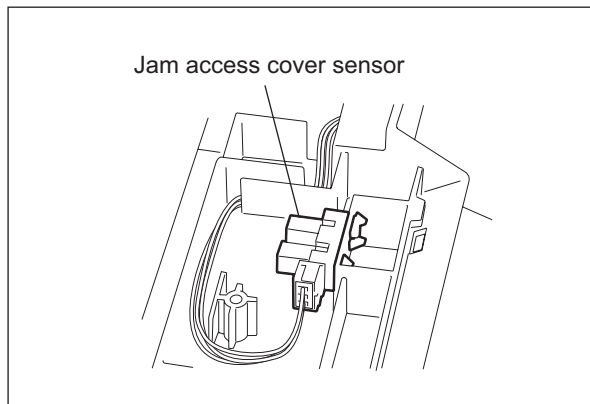
Fig. 4-79

[D] Original empty sensor (S3)

(1) Open the jam access cover.
(2) Remove 1 screw and take off the metal plate cover.

Metal plate cover
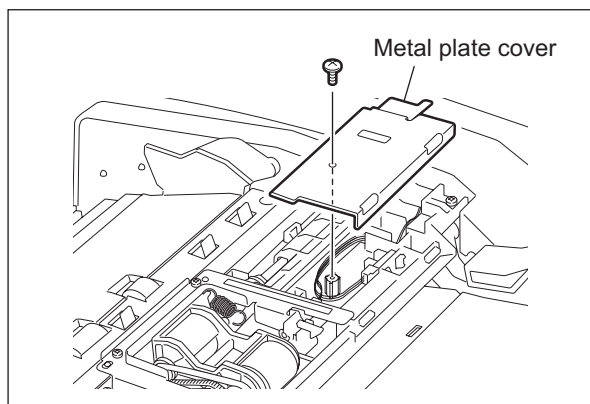
Fig. 4-80

(3)　Remove 2 screws and take off the bracket.
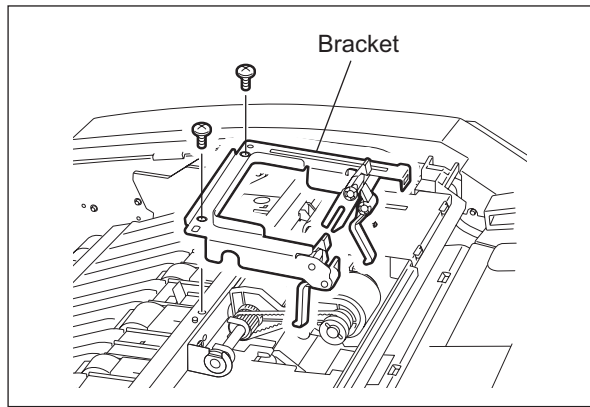
Fig. 4-81

(4)　Disconnect 1 connector. Release 2 latches and take off the original empty sensor.

Original empty sensor
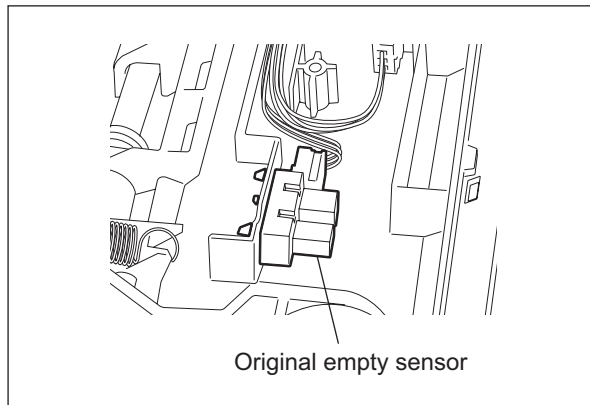
Fig. 4-82

[E]　Original length detection sensor (S4)

(1)　Take off the feeder lower guide.
　　　(📖 P. 4-10 "[E] Feeder lower guide")
(2)　Disconnect 1 connector. Release 2 latches and take off the original length detection sensor.

Original length detection sensor
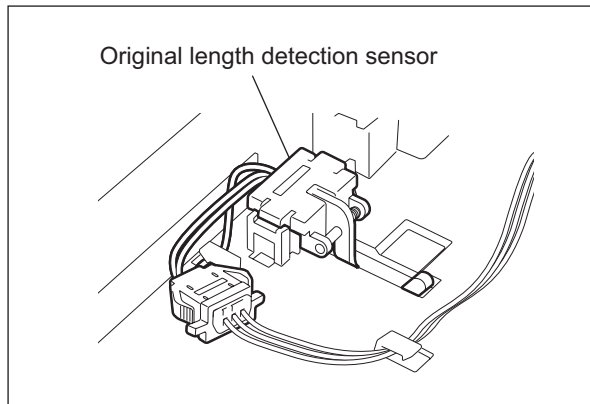
Fig. 4-83

[F] Original registration sensor (S5)

(1) Take off the feeder lower guide.
($\Box$ P. 4-10 "[E] Feeder lower guide")
(2) Disconnect 1 connector. Release 2 latches and take off the original registration sensor.

Original registration sensor
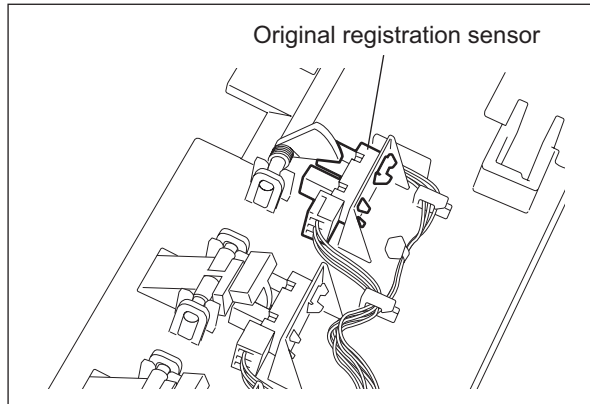
Fig. 4-84

[G] Original width detection sensor-1 (S6)

(1) Take off the feeder lower guide.
($\Box$ P. 4-10 "[E] Feeder lower guide")
(2) Take off the actuator.
(3) Disconnect 1 connector. Release 2 latches and take off the original width detection sensor-1.

Actuator   Original width detection sensor-1
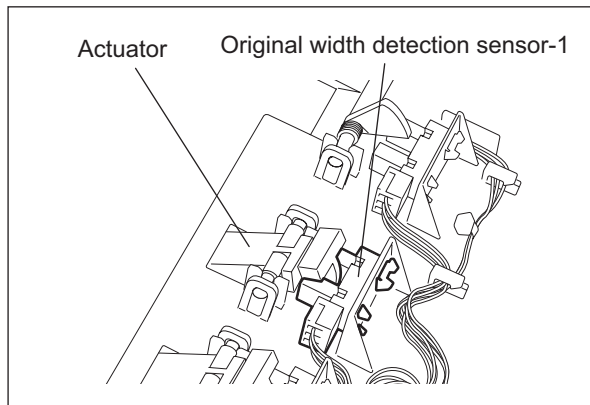
Fig. 4-85

[H] Original width detection sensor-2 (S7)

(1) Take off the feeder lower guide.
($\Box$ P. 4-10 "[E] Feeder lower guide")
(2) Take off the actuator.
(3) Disconnect 1 connector. Release 2 latches and take off the Original width detection sensor-2.

Actuator   Original width detection sensor-2
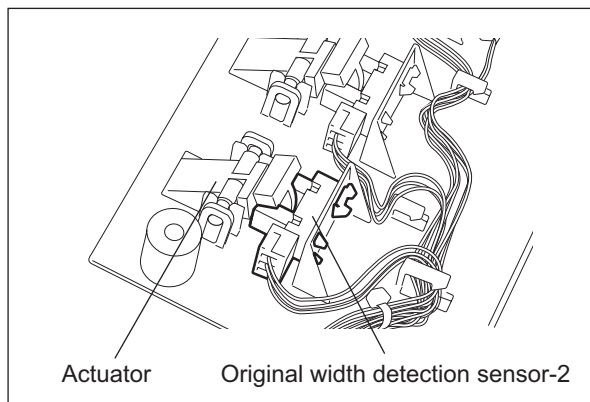
Fig. 4-86

[I] Read sensor (S9)

(1) Take off the pre-reading upper guide.
   (📖 P. 4-13 "[H] Pre-reading guide")
(2) Release 2 latches and take off the read sensor from the pre-reading upper guide.

Read sensor
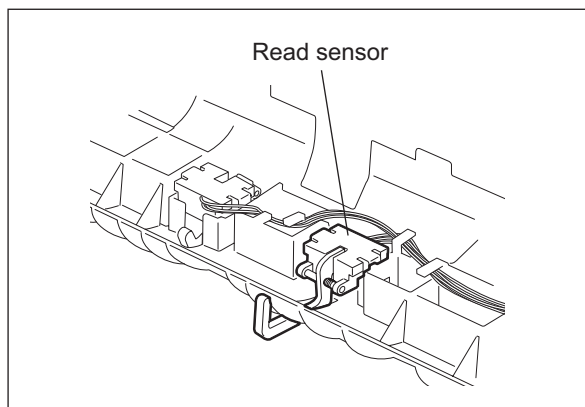
Fig. 4-87

[J] Original intermediate transport sensor (S8)

(1) Take off the pre-reading upper guide.
   (📖 P. 4-13 "[H] Pre-reading guide")
(2) Release 2 latches and take off the original intermediate transport sensor from the pre-reading upper guide.

Original intermediate transport sensor
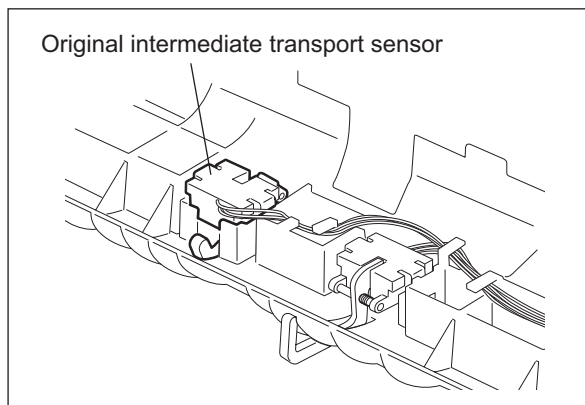
Fig. 4-88

[K] Original exit/reverse sensor (S10)

(1) Take off the pre-reading lower guide.
   (📖 P. 4-13 "[H] Pre-reading guide")
(2) Disconnect 1 connector.

Connector
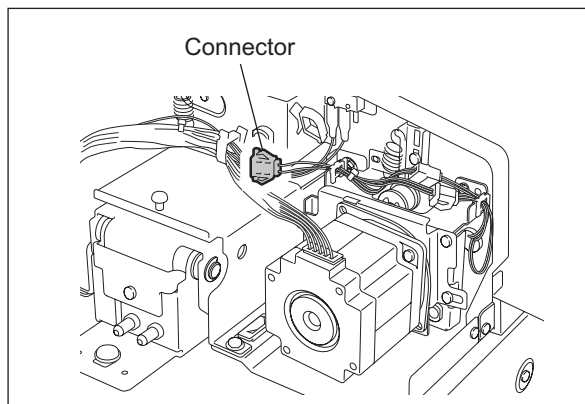
Fig. 4-89

(3) Open the RADF. Remove 2 screws, and then take off 2 holders and platen guide.
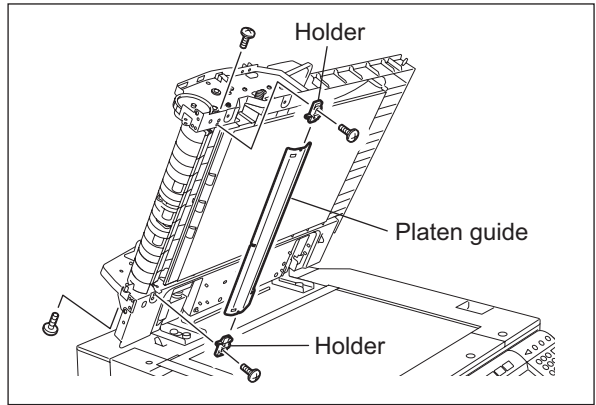
Fig. 4-90

(4) Remove 2 screws. Open the post-reading lower guide and take off the post-reading upper guide.
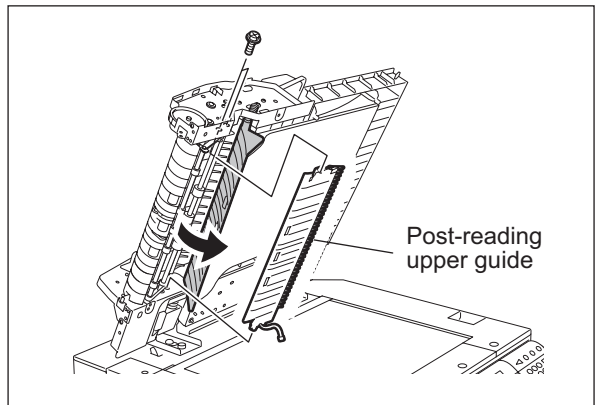
Fig. 4-91

(5) Release 2 latches and take off the Original exit/reverse sensor from the post-reading upper guide.
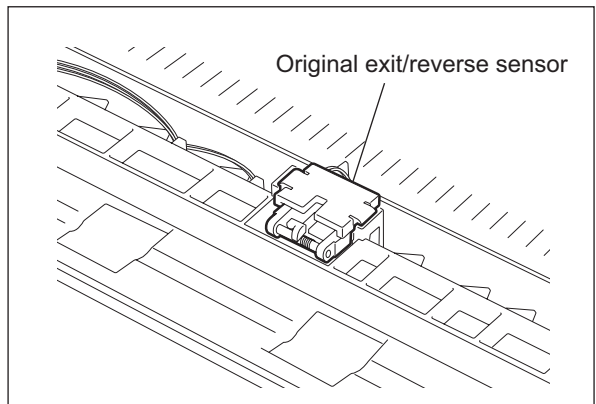
Fig. 4-92

[L] RADF opening/closing sensor (S12)

(1) Take off the rear cover.
   (P. 4-2 "[B] Rear cover")
(2) Disconnect 1 connector. Release 2 latches and take off the RADF opening/closing sensor.

RADF opening/closing sensor
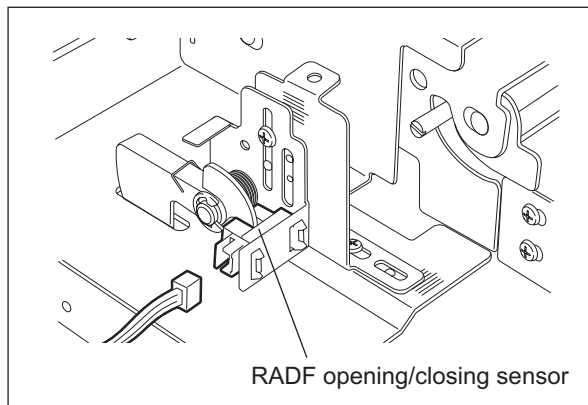
Fig. 4-93

[M] Original jam access cover opening/closing switch (SW1)

(1) Take off the bracket of the original feed motor drive section.
   (P. 4-21 "[E] Original feed motor drive section")
(2) Disconnect 3 terminals. Remove 1 screw and take off the original jam access cover opening/closing switch.

   Note:
   When connecting the terminal, make sure that the color of the harness is correct.

Bracket

Jam access cover opening/closing switch

White
Red
Black

Fig. 4-94

MR-3018/3020/3021/3022
DISASSEMBLY AND ASSEMBLY
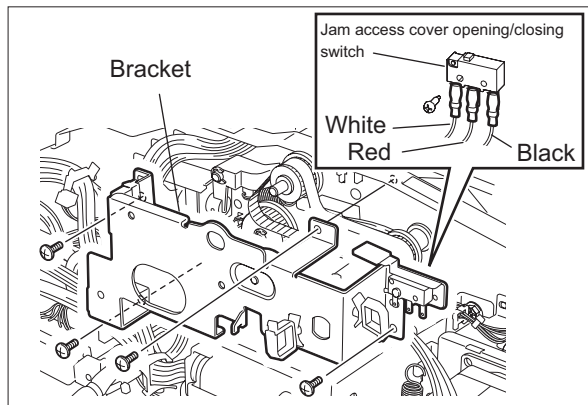
4.6   PC Board

[A]   RADF control PC board (ADF board)

(1)   Take off the rear cover.
      (📖 P. 4-2 "[B] Rear cover")
(2)   Disconnect 11 connectors.
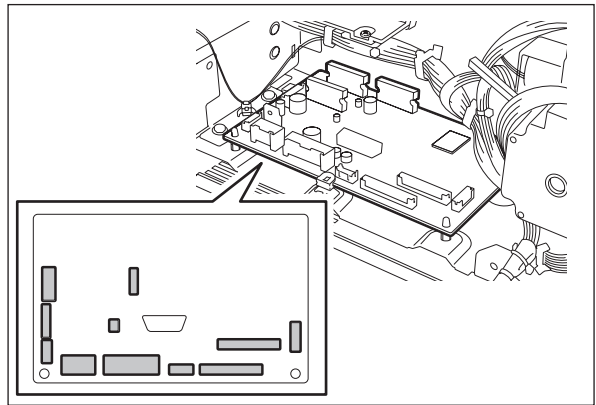
Fig. 4-95

(3)   Release 2 lock supports and 3 edge spacer.
      Take off the ADF board.
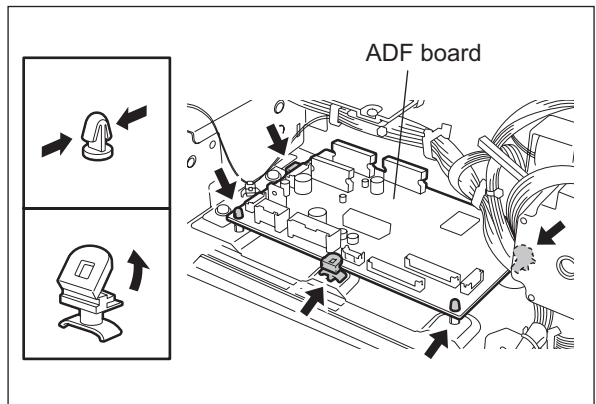
Fig. 4-96

4.7 Others

[A] Hinge stopper

(1) Remove 1 screw and then take off the hinge stopper.
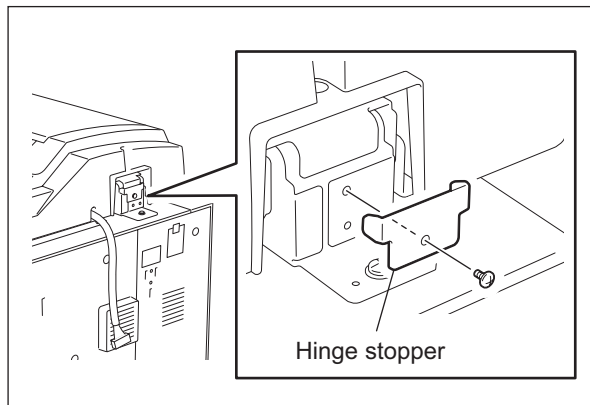
Hinge stopper

Fig. 4-97

Note:
When the hinge stopper is taken off, the opening angle for the RADF becomes approx. 90 degrees. Take off the hinge stopper only when it is needed for installation, maintenance service, etc.

Fig. 4-98

MR-3018/3020/3021/3022
DISASSEMBLY AND ASSEMBLY
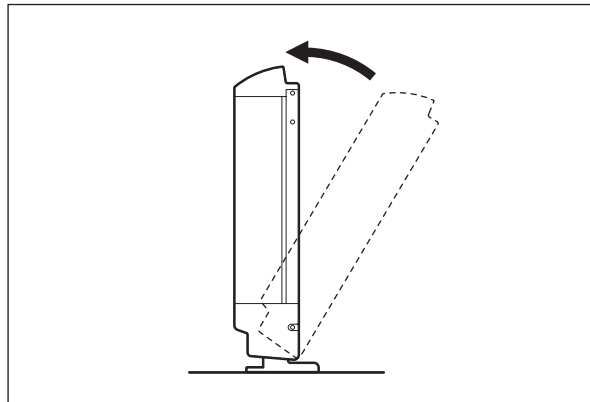
5. ADJUSTMENT

5.1 Adjustment of Position

Perform this adjustment when the RADF is not installed in the correct position.

Note:
 Check if the image adjustment for the equipment is performed properly before this adjustment of the RADF. (See the Service Manual or Service Handbook of the applicable equipment.)

[A] Checking

(1) Open the RADF and install 2 positioning pins (the positioning pins are installed to the back side of the hinge which is on the left side of the RADF).
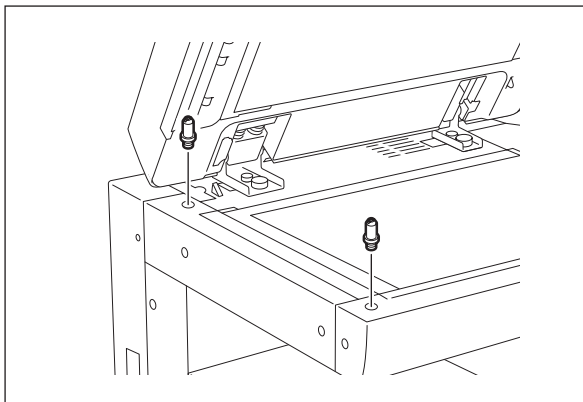
Fig. 5-1

(2) Remove the platen sheet.

Fig. 5-2

MR-3018/3020/3021/3022
ADJUSTMENT
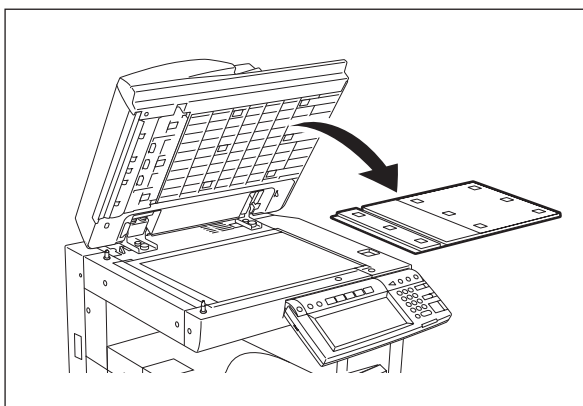
(3) Close the RADF and check if the positioning pins fit the holes on the RADF.
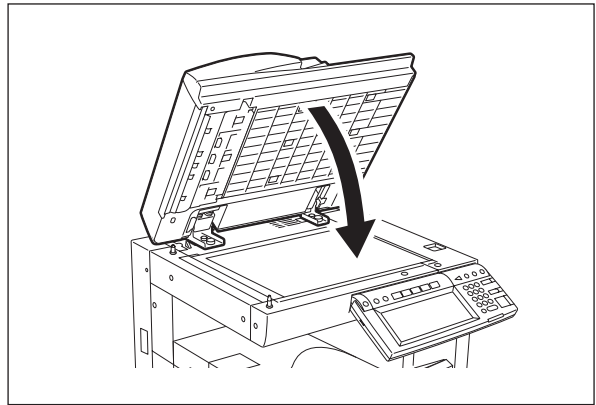
Fig. 5-3

[B] Adjustment

If the pins cannot be fitted into the holes, perform the adjustment according to the following procedure.

(1) Remove the right-hand hinge screw at the rear side.
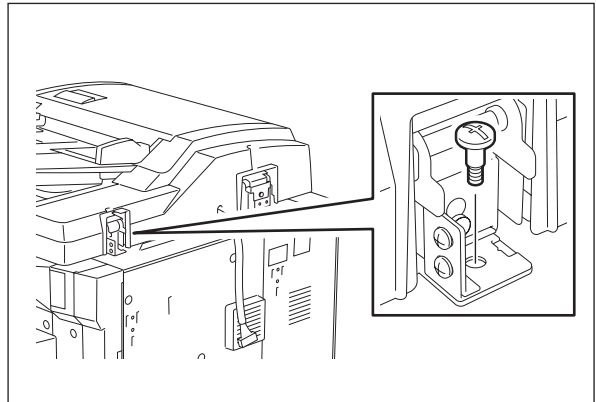
Fig. 5-4

(2) Remove the bracket on the left-hand hinge. (MR-3021/3022 only)
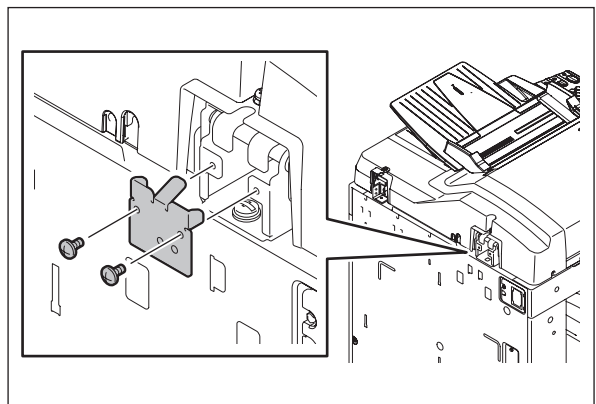
Fig. 5-5

(3) Loosen the left-hand hinge screw at the rear side.
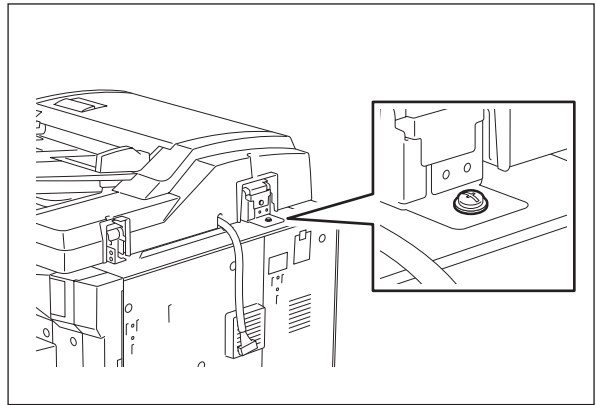
Fig. 5-6

(4) Loosen the hinge screws at the front side.
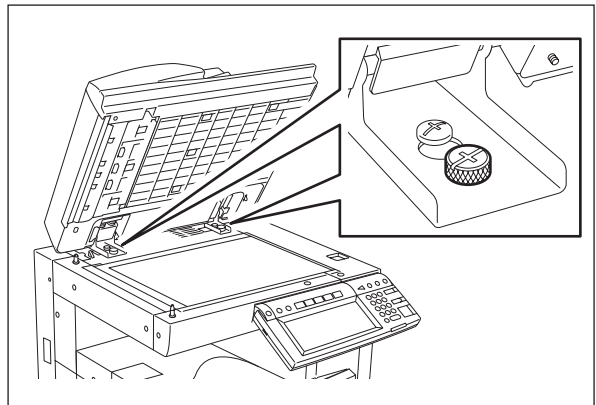
Fig. 5-7

(5) Position the pins with the holes on the RADF by moving it so that the pins fit into the holes when the RADF is closed.

Fig. 5-8

MR-3018/3020/3021/3022
ADJUSTMENT
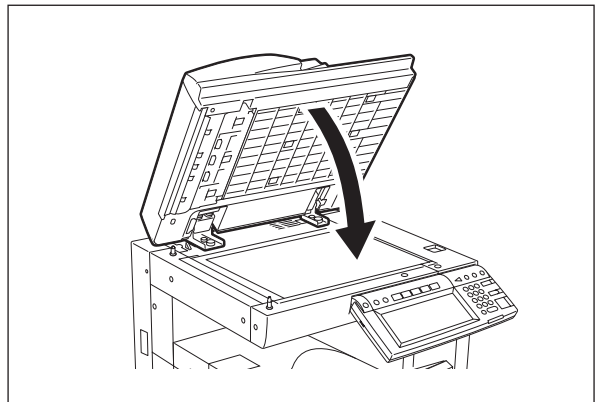
(6) Tighten the left-hand hinge screw at the rear side.
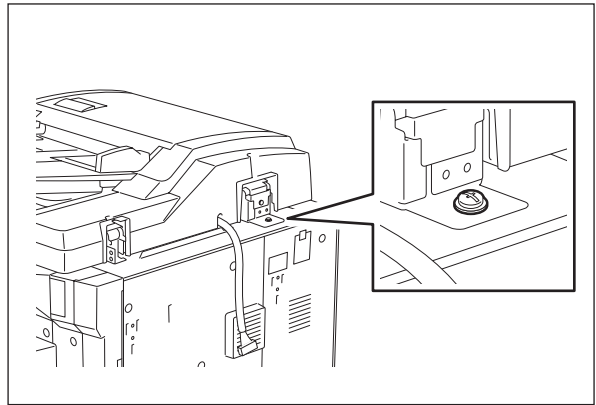
Fig. 5-9

(7) Loosen the hole position adjustment screws on the right hand side.
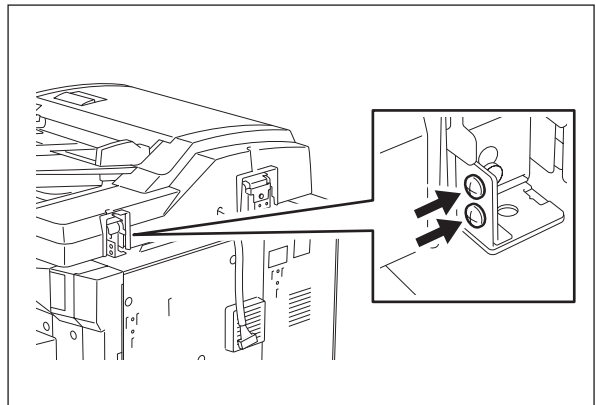
Fig. 5-10

(8) Match the screw hole positions.
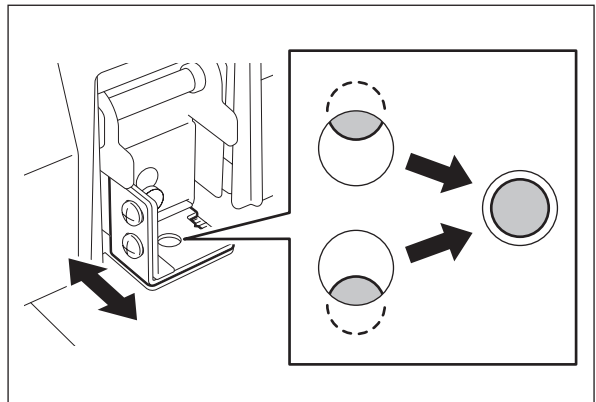
Fig. 5-11

(9) Install the right-hand hinge screw at the rear side.
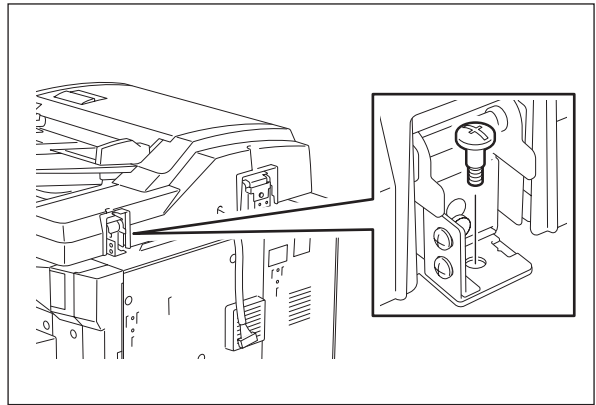
Fig. 5-12

(10) Install the bracket on the left-hand hinge. (MR-3021/3022 only)
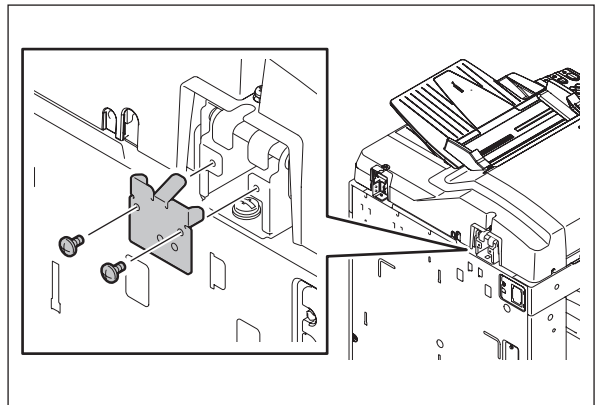
Fig. 5-13
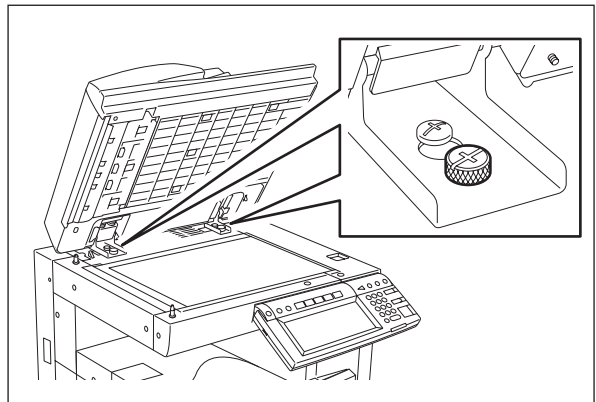
(11) Loosen the hinge screws at the front side.

Fig. 5-14

(12) Place the platen sheet on the original glass and align it to the top left corner.
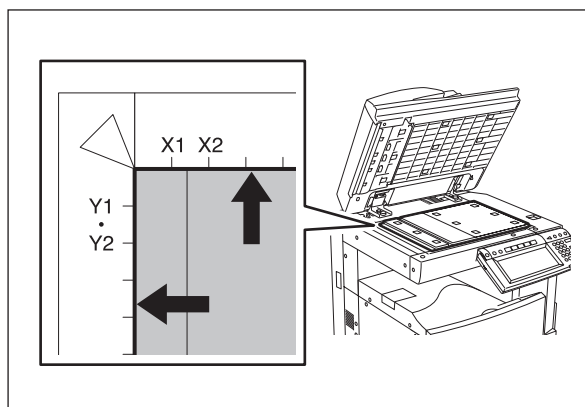Close the RADF gently and open it to check if the platen sheet is attached properly.

Fig. 5-15

5.2　Adjustment of Height

Note:

Check if the image adjustment for the equipment is performed properly before this adjustment of the RADF. (See the Service Manual or Service Handbook of the applicable equipment.)

[A]　Checking

(1)　Close the RADF.
(2)　Light the exposure lamp.
   • Turn the power ON while pressing [0] and [3] simultaneously.
   • Key in [267] and then press the [START] button. The exposure lamp is turned ON for a given length of time.
(3)　Visually check the gap between platen guide holder "A" and upper surface of the original glass "B" from the left hand side of the equipment. If the value is not within the tolerance, perform the adjustment according to the following procedure.

[Tolerance of the gap]
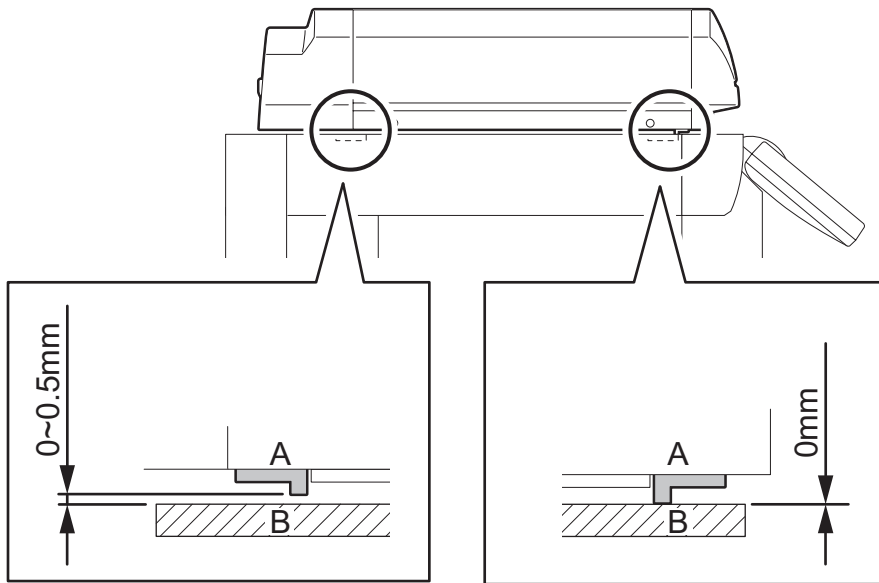Rear side: 0 - 0.5 mm
Front side: 0 mm

Fig. 5-16

[B] Adjustment

(1) Close the RADF.
(2) Adjust it by turning the adjustment screws on the hinges.
- Adjust the height on the rear side by means of the screw on the hinge on the feed side of the RADF.

Turn it clockwise .... Heightened
Turn it counterclockwise ...... Lowered

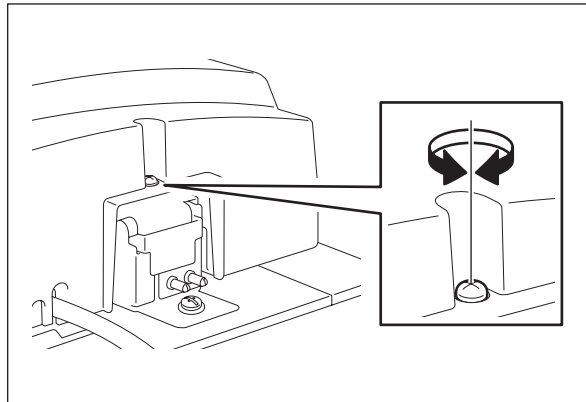**Fig. 5-17**

- Adjust the gap on the rear side by means of the screw on the hinge on the feed side of the RADF.

Turn it clockwise .... Lowered
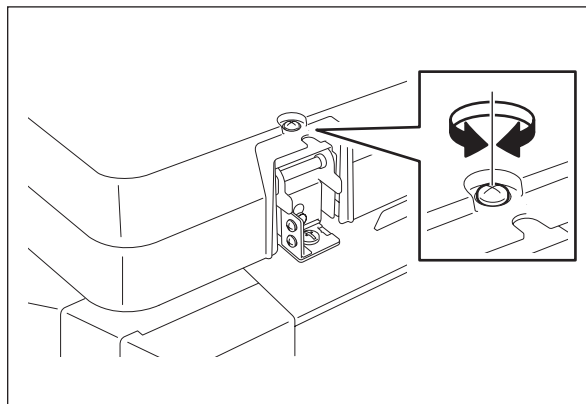Turn it counterclockwise ...... Heightened

Fig. 5-18

5.3　Adjustment of Skew

Note:
　Check if the image adjustment for the equipment is performed properly before this adjustment of the RADF.
　(See the Service Manual or Service Handbook of the applicable equipment.)
　Also, the RADF position and height shall be adjusted properly.

[A]　Checking

Check the image using the chart (original) with vertical and horizontal lines in the following procedure.
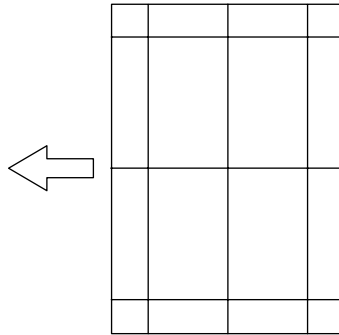

Fig. 5-19 Chart (Original)

Simplex copying:

(1) Place the chart provided as an original with its face up on the original tray of the RADF, select [1 Sided -> 1 Sided] and press the [START] button.
(2) Superimpose the chart on the copy and check the inclination of the copy image.

Duplex copying:

(1) Place the chart provided as an original with its face up on the original tray of the RADF, select [2 Sided -> 2 Sided] and press the [START] button.
(2) Superimpose the chart on the copy and check the inclination of the copy image.

[B] Adjustment

Simplex copying:

(1) Shift the aligning plate with the scale as the guide shown in the figure below to adjust the skew.
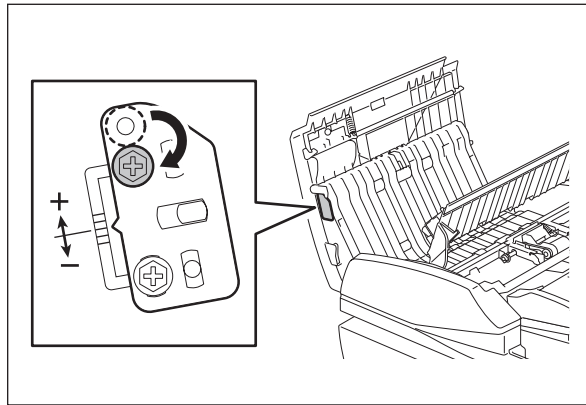

Fig. 5-20

(2) If the image skew is "C" as shown in the figure below, shift the aligning plate in the direction of "+", and if "D", shift it to "-".

Fig. 5-21

Shift the aligning plate in the direction of "+".

Fig. 5-22

Shift the aligning plate in the direction of "-".

<u>Duplex copying:</u>

(1)   Shift the aligning plate with the scale as the guide shown in the figure below to adjust the skew.

Fig. 5-23

(2)   If the image skew is "C" as shown in the figure below, shift the aligning plate in the direction of "-", and if "D", shift it to "+".
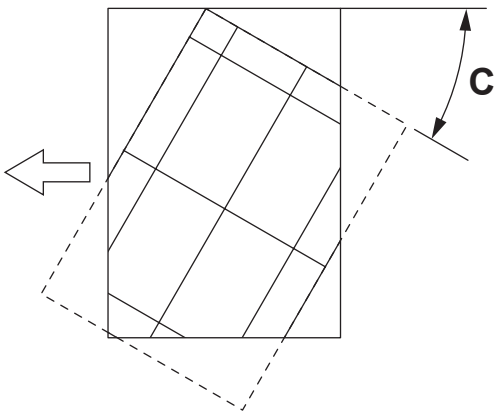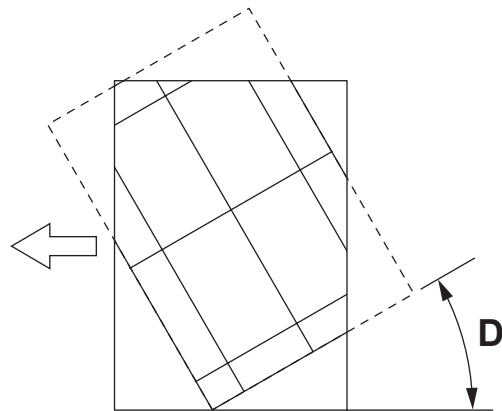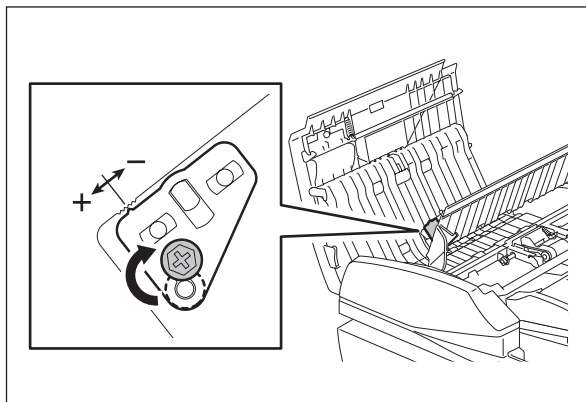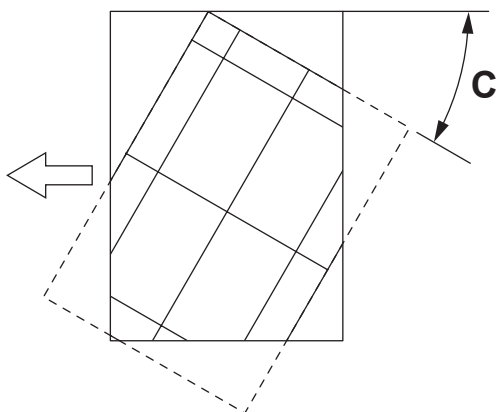

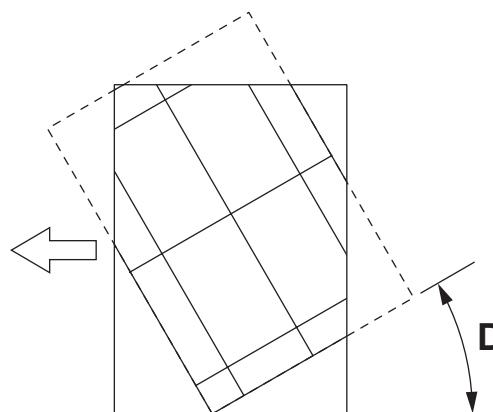| **Fig. 5-24**	**Fig. 5-25**
Shift the aligning plate in the direction of "-".	Shift the aligning plate in the direction of "+".

5.4 Adjustment of the Leading Edge Position

Note:
Check if the image adjustment for the equipment is performed properly before this adjustment of the RADF.
(See the Service Manual or Service Handbook of the applicable equipment.)
Also, the RADF position and height shall be adjusted properly.

[A] Checking

Check the image using the chart (original) with vertical and horizontal lines in the following procedure.

Simplex copying:

(1) Place the chart provided as an original with its face up on the original tray of the RADF, select [1 Sided -> 1 Sided] and press the [START] button.
(2) Superimpose the chart on the copy and check the leading edge E of the chart and F of the copy.

Duplex copying:

(1) Place the chart provided as an original with its face up on the original tray of the RADF, select [2 Sided -> 2 Sided] and press the [START] button.
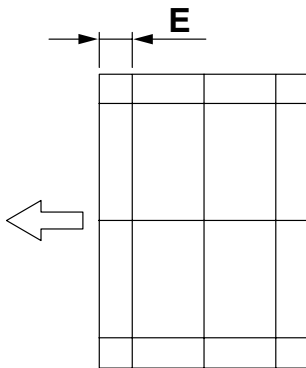(2) Superimpose the chart on the copy and check the leading edge E of the chart and F of the copy.
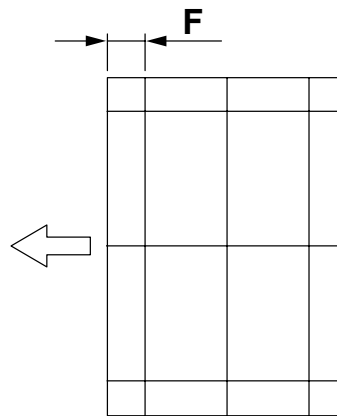
Fig. 5-26 Chart (Original)

Fig. 5-27 Copy

[B]   Adjustment

Simplex copying:

(1)   Turn the power ON while pressing [0] and [5] simultaneously, key in [365]*1 / [3044] *2 and then press the [START] button.

      *1 : For e-STUDIO352/353/452/453
          e-STUDIO281c/351c/451c,
          e-STUDIO2500c/3500c/3510c,
          e-STUDIO2330C/2820C/2830C/3520C/3530C/4520C,
          e-STUDIO202L/203L/232/233/282/283,
          e-STUDIO205L/255/305/355/455

      *2 : For e-STUDIO2040C/2540C/3040C/3540C/4540C,
          e-STUDIO206L/256/306/356/456

(2)   Enter the value.
    •   If the leading edge (F) margin of the copy image is larger than the (E) margin of the chart, enter a value smaller than the current one.
  Note:
  Changing one value shifts the copy image by 0.1 mm.

    •   If the leading edge (F) margin of the copy image is smaller than the (E) margin of the chart, enter a value larger than the current one.
  Note:
  Changing one value shifts the copy image by 0.1 mm.

(3)   Press the [ENTER] *1/ [OK] *2 button.
      *1 : For e-STUDIO352/353/452/453
          e-STUDIO281c/351c/451c,
          e-STUDIO2500c/3500c/3510c,
          e-STUDIO2330C/2820C/2830C/3520C/3530C/4520C,
          e-STUDIO202L/203L/232/233/282/283,
          e-STUDIO205L/255/305/355/455

      *2 : For e-STUDIO2040C/2540C/3040C/3540C/4540C,
          e-STUDIO206L/256/306/356/456

Duplex copying:

(1)   Turn the power ON while pressing [0] and [5] simultaneously, key in [366] *1 / [3045] *2 and then press the [START] button.
      *1 : For e-STUDIO352/353/452/453
          e-STUDIO281c/351c/451c,
          e-STUDIO2500c/3500c/3510c,
          e-STUDIO2330C/2820C/2830C/3520C/3530C/4520C,
          e-STUDIO202L/203L/232/233/282/283,
          e-STUDIO205L/255/305/355/455

      *2 : For e-STUDIO2040C/2540C/3040C/3540C/4540C,
          e-STUDIO206L/256/306/356/456

5

(2) Enter the value.
- If the leading edge (F) margin of the copy image is larger than the (E) margin of the chart, enter a value smaller than the current one.

Note:
Changing one value shifts the copy image by 0.1 mm.

- If the leading edge (F) margin of the copy image is smaller than the (E) margin of the chart, enter a value larger than the current one.

Note:
Changing one value shifts the copy image by 0.1 mm.

(3) Press the [ENTER] *1 / [OK] *2 button.
    *1 : For e-STUDIO352/353/452/453
        e-STUDIO281c/351c/451c,
        e-STUDIO2500c/3500c/3510c,
        e-STUDIO2330C/2820C/2830C/3520C/3530C/4520C,
        e-STUDIO202L/203L/232/233/282/283,
        e-STUDIO205L/255/305/355/455

    *2 : For e-STUDIO2040C/2540C/3040C/3540C/4540C,
        e-STUDIO206L/256/306/356/456

5.5   Adjustment of Horizontal Position

Note:
    Check if the image adjustment for the equipment is performed properly before this adjustment of the RADF.
    (See the Service Manual or Service Handbook of the applicable equipment.)
    Also, the RADF position and height shall be adjusted properly.

[A]   Checking

Check the image using the chart (original) with a center line in the following procedure.

(1)   Place the chart provided as an original with its face up on the original tray of the RADF.
(2)   Press the [START] button.
(3)   Fold the copy in half and check if the center line is misaligned.

[B]   Adjustment

(1)   Turn the power ON while pressing [0] and [5] simultaneously.
(2)   Key in [358]*1 / [3043] *2 and then press the [START] button.
    *1 : For e-STUDIO352/353/452/453
        e-STUDIO281c/351c/451c,
        e-STUDIO2500c/3500c/3510c,
        e-STUDIO2330C/2820C/2830C/3520C/3530C/4520C,
        e-STUDIO202L/203L/232/233/282/283,
        e-STUDIO205L/255/305/355/455

    *2 : For e-STUDIO2040C/2540C/3040C/3540C/4540C,
        e-STUDIO206L/256/306/356/456

- If the center line of the copy image is shifted to the front side of the equipment, enter a value larger than the current one.

Note:
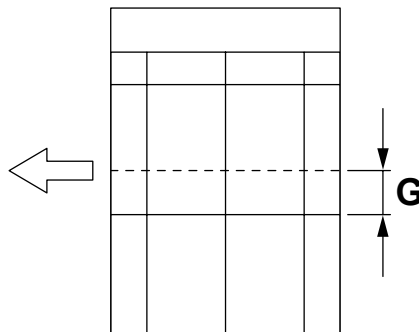   Changing one value shifts the copy image by 0.0423 mm.

Fig. 5-28

- If the center line of the copy image is shifted to the rear side of the equipment, enter a value smaller than the current one.

Note:
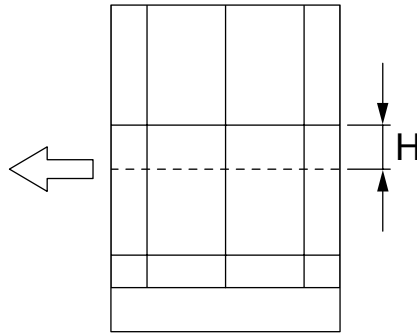Changing one value shifts the copy image by 0.0423 mm.

Fig. 5-29

(3) Press the [ENTER]*1 / [OK] *2 button.
　　*1 : For e-STUDIO352/353/452/453
　　　　e-STUDIO281c/351c/451c,
　　　　e-STUDIO2500c/3500c/3510c,
　　　　e-STUDIO2330C/2820C/2830C/3520C/3530C/4520C,
　　　　e-STUDIO202L/203L/232/233/282/283,
　　　　e-STUDIO205L/255/305/355/455

　　*2 : For e-STUDIO2040C/2540C/3040C/3540C/4540C,
　　　　e-STUDIO206L/256/306/356/456

5.6 Adjustment of Copy Ratio

Note:

Check if the image adjustment for the equipment is performed properly before this adjustment of the RADF.
(See the Service Manual or Service Handbook of the applicable equipment.)
Also, the RADF position and height shall be adjusted properly.

[A] Checking

Check the image using the chart (original) with vertical and horizontal lines in the following procedure.

(1) Place the chart provided as an original with its face up on the original tray of the RADF.
(2) Press the [START] button.
(3) Superimpose the chart on the copy and check the image dimension "I".

[B] Adjustment

(1) Turn the power ON while pressing [0] and [5] simultaneously.
(2) Key in [357] *1 / [3042] *2 and then press the [START] button.
   *1 : For e-STUDIO352/353/452/453
       e-STUDIO281c/351c/451c,
       e-STUDIO2500c/3500c/3510c,
       e-STUDIO2330C/2820C/2830C/3520C/3530C/4520C,
       e-STUDIO202L/203L/232/233/282/283,
       e-STUDIO205L/255/305/355/455

   *2 : For e-STUDIO2040C/2540C/3040C/3540C/4540C,
       e-STUDIO206L/256/306/356/456

   • If the copy image dimension "I" is larger than the chart dimension, enter a value smaller than the current one.
   • If the copy image dimension "I" is smaller than the chart dimension, enter a value larger than the current one.
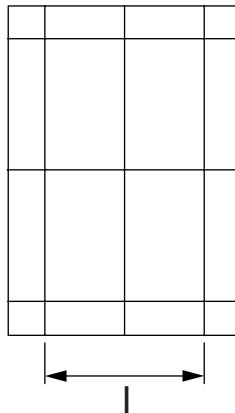

Fig. 5-30

(3)　Press the [ENTER] *1 / [OK] *2 button.
　　　*1 : For e-STUDIO352/353/452/453
　　　　　e-STUDIO281c/351c/451c,
　　　　　e-STUDIO2500c/3500c/3510c,
　　　　　e-STUDIO2330C/2820C/2830C/3520C/3530C/4520C,
　　　　　e-STUDIO202L/203L/232/233/282/283,
　　　　　e-STUDIO205L/255/305/355/455

　　　*2 : For e-STUDIO2040C/2540C/3040C/3540C/4540C,
　　　　　e-STUDIO206L/256/306/356/456

5.7 Adjustment of RADF Opening/Closing Sensor

Adjust the bracket position so that the sensor is turned ON when the height "A" becomes 100 mm or less (within the empty weight falling limit).
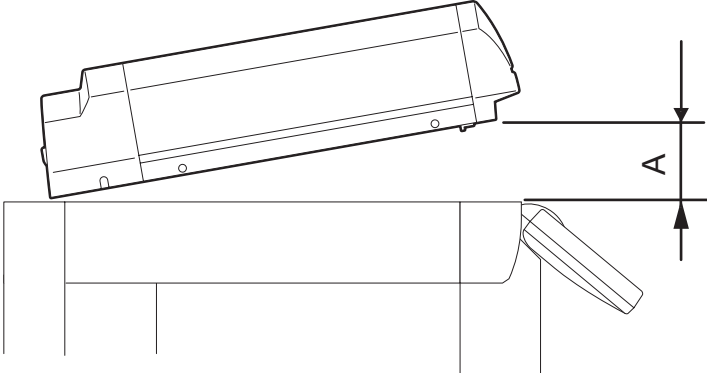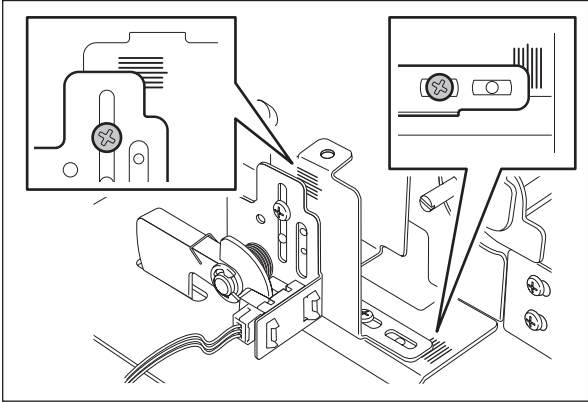

Fig. 5-31

Fig. 5-32

6. TROUBLESHOOTING

6.1 Troubleshooting for Mechanical Errors

1) Multiple originals are transported simultaneously
   Original abnormally curled or folded?
   ↓   YES→   Flatten the original and set it again
   NO
   Separation roller is dirty?
   ↓   YES→   Clean the roller with alcohol
   NO
   Replace the separation rollers with new ones

2) Original is not transported to registration roller
   Original thicker than specified?
   | YES→   Use originals with permissible thickness.
   ↓   Place thick originals manually on the platen cover to make a copy
   NO
   Pickup roller and feed roller are dirty?
   ↓   YES→   Clean the rollers with alcohol
   NO
   Transport power of pickup roller and feed roller is weak?
   ↓
   YES
   Replace the rollers with new ones

3) Leading edge of original is skewed
   Front and rear protrusions at bottom of RADF are out of contact with glass?
   ↓   YES→   Adjust the height of the left hinge
   NO
   Transport rollers are dirty?
   ↓   YES→   Clean the rollers with alcohol
   NO
   Is the right hinge out of place?
   ↓
   YES
   Make a copy and adjust the position of the hinge

4) Edges of original and copied image are not aligned
   Width between slides too wide compared to that of original?
   ↓   YES→   Move the slides so that they contact the edges of the original
   NO
   Check the scanner adjustment

5) Black streaks appear on copied image
   ADF original glass is dirty?
   ↓   YES→   Clean the glass with a dry/squeezed cloth
   NO
   Check the scanner unit

6

6.2　Troubleshooting for Electrical Errors

1) RADF does not work (except in the case of a paper jam or when the cover is open)
   Interface harness connected properly?
   ↓　　　NO→　　Connect the harness properly or replace it
   YES
   DC+5V supplied to CN70-2, 3pin?
   ↓　　　NO→　　Connect the harness properly or replace it
   YES
   DC+24V supplied to CN70-6, 7pin?
   ↓　　　NO→　　Connect the harness properly or replace it
   YES
   DC+24V supplied to CN72-4pin?
   ↓　　　NO→　　Check or replace the jam access cover switch
   YES
   Empty sensor is ON when there is paper?
   ↓　　　NO→　　Check or replace the empty sensor
   YES
   Check or replace the RADF board

2) Communication error
   Interface cable normal?
   ↓　　　NO→　　Replace the interface cable
   YES
   Check or replace the RADF board and check the equipment

3) Size detection error
   Original tray sensor is ON when there is paper?
   ↓　　　NO→　　Replace the sensor or harness
   YES
   Registration roller does not catch the original?
   ↓　　　YES→　Clean the roller with alcohol or replace
   NO
   Original width detection sensor-1 is ON when there is paper?
   ↓　　　NO→　　Replace the sensor or harness
   YES
   Original width detection sensor-2 is ON when there is paper?
   ↓　　　NO→　　Replace the sensor or harness
   YES
   Check or replace the RADF board

6.3   Jam

Jam not reaching the original registration sensor
1) Clean the pickup roller, feed roller and separation roller if they are stained.
2) Flatten the original if it is folded or excessively curled and place it again.
3) Is the original registration sensor working? (Perform the input check)
   *   If it is working properly, proceed to 7. If not, check 4 to 6.
4) Check if the connector CN74 on the RADF board is disconnected from the original registration sensor or the harnesses are open circuited. Correct if any.
5) Replace the original registration sensor.
6) Replace the RADF board.
7) Is the original pickup solenoid working?
   *   If it is working properly, proceed to 12. If not, check 8 to 11.
8) Check if the solenoid is installed at the center of the scale. (The scale is longer in the center.)
9) If it is not, correct the position, aligning with the center of the scale.
10)Check if the connector CN79 on the RADF board is disconnected from the original pickup solenoid or the harnesses are open circuited. Correct if any.
11)Replace the original pickup solenoid.
12)Replace the RADF board.
13)Replace the pickup roller, feed roller and separation roller if they are worn out.

Feed signal reception jam
1) Is the empty sensor working? (Perform the input check)
2) Check if the lever of empty sensor is working normally.
3) Check if the connector CN75 on the RADF board is disconnected from the empty sensor or the harnesses are open circuited. Correct if any.
4) Replace the empty sensor.
5) Replace the RADF board.

Jam not reaching the read sensor
1) Clean the registration roller and the read roller if they are stained.
2) Is the read sensor working? (Perform the input check)
   *   If it is working properly, proceed to 6. If not, check 3 to 5 below.
3) Check if the connector CN75 on the RADF board is disconnected from the read sensor or the harnesses are open circuited. Correct if any.
4) Replace the read sensor.
5) Replace the RADF board.
6) Replace the registration roller and the read roller if they are worn out.

Jam not reaching the exit sensor (during scanning)
1) Clean the read roller if it is stained.
2) Is the original exit/reverse sensor working? (Perform the input check)
   *   If it is working properly, proceed to 6. If not, check 3 to 5 below.
3) Check if the connector CN75 on the RADF board is disconnected from the original exit/reverse sensor or the harnesses are open circuited. Correct if any.
4) Replace the original exit/reverse sensor
5) Replace the RADF board.
6) Replace the read roller if it is worn out.

6

Stop jam at the original registration sensor
1) Clean the registration roller if it is stained.
2) Are the original registration sensor, original width detection sensor-1, original width detection sensor-2, original length detection sensor working? (Perform the input check)
   * If it is working properly, proceed to 9. If not, check 3 to 8 below.
3) Check if the connector CN74 on the RADF board is disconnected from the original registration sensor or the harnesses are open circuited. Correct if any.
4) Check if the connector CN74 on the RADF board is disconnected from the original width detection sensor-1 or the harnesses are open circuited. Correct if any.
5) Check if the connector CN74 on the RADF board is disconnected from the original width detection sensor-2 or the harnesses are open circuited. Correct if any.
6) Check if the connector CN74 on the RADF board is disconnected from the original length detection sensor or the harnesses are open circuited. Correct if any.
7) Replace the original registration sensor.
8) Replace the original width detection sensor-1.
9) Replace the original width detection sensor-2.
10) Replace the original length detection sensor.
11) Replace the RADF board.
12) Replace the registration roller if it is worn out.

Stop jam at the read sensor
1) Clean the read roller if it is stained.
2) Are the read sensor and original intermediate transport sensor working? (Perform the input check)
   * If it is working properly, proceed to 6. If not, check 3 to 5 below.
3) Check if the connector CN75 on the RADF board is disconnected from the read sensor or the harnesses are open circuited. Correct if any.
4) Check if the connector CN75 on the RADF board is disconnected from the Original intermediate transport sensor or the harnesses are open circuited. Correct if any.
5) Replace the read sensor.
6) Replace the original intermediate transport sensor.
7) Replace the RADF board.
8) Replace the read roller if it is worn out.

Stop jam at the original exit/reverse sensor
1) Clean the exit roller if it is stained.
2) Is the original exit/reverse sensor working? (Perform the input check)
   * If it is working properly, proceed to 6. If not, check 3 to 5 below.
3) Check if the connector CN4 on the RADF board is disconnected from the original exit/reverse sensor or the harnesses are open circuited. Correct if any.
4) Replace the original exit/reverse sensor.
5) Replace the RADF board.
6) Replace the exit roller if it is worn out.

RADF jam access cover open jam
1) Close the RADF jam access cover if it is opened. Remove if there is any original before closing it.
2) Is the RADF jam access cover opening/closing switch working? (Perform the input check)
   * If it is working properly, proceed to 6. If not, check 3 to 5 below.
3) Check if the connector CN72 on the RADF board is disconnected from the RADF jam access cover opening/closing switch or the harnesses are open circuited. Correct if any.
4) Replace the RADF jam access cover opening/closing switch.
5) Replace the RADF board.

RADF open jam
  1) Close the RADF if it is opened. Remove if there is any original before closing it.
  2) Is the RADF opening/closing sensor working? (Perform the input check)
     * If it is working properly, proceed to 6. If not, check 3 to 5 below.
  3) Check if the connector CN75 on the RADF board is disconnected from the RADF opening/closing sensor or the harnesses are open circuited. Correct if any.
  4) Replace the RADF opening/closing sensor.
  5) Replace the RADF board.
  6) Is the RADF opening/closing sensor adjusted within the specified range?

Cover open jam in the read ready status
  1) Close the RADF jam access cover or the front cover if they are opened in the read ready status.
  2) Is the RADF jam access cover sensor working? (Perform the input check)
  3) Check if the connector CN75 on the RADF board is disconnected from the RADF jam access cover sensor or the harnesses are open circuited. Correct if any.
  4) Replace the RADF jam access cover sensor.
  5) Replace the RADF board.

6

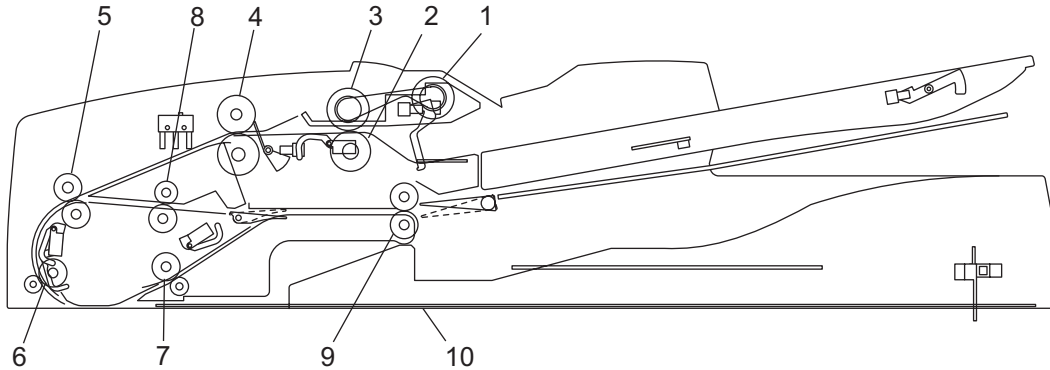# 7. MAINTENANCE AND REWRITING ROM

7.1 Periodic Maintenance

Fig. 7-1

Symbols used in the checklist

Cleaning	Lubrication/Coating	Replacement	Operation check
A: Clean with alcohol B: Clean with soft pad, cloth or vacuum cleaner	L: Launa 40 SI: Silicon oil W: White grease (Molykote EM-30L) AV: Alvania No.2	The number of sheets consumed before replacement (Value x 1,000). R: Replace if deformed or damaged	O: After cleaning or replacement, confirm there is no problem

Preventive Maintenance Checklist

Note:
Page-Item (P-I) is described in the column of the Parts list.

	Item to check	Cleaning (30K)	Lubrica-tion/ Coating	Replace-ment (x1,000)	Operation check	Parts list (P-I)	Remarks
1	Pickup roller	A		120		5-1	
2	Separation roller	A		120		4-10	
3	Feed roller	A		120		5-1	
4	Registration roller	A				4-30	
5	Intermediate transfer roller	A				3-13	
6	Front read roller	A				3-14	
7	Rear read roller	A				3-1	
8	Reverse registration roller	A				3-10	
9	Exit/reverse roller	A				4-25	
10	Platen sheet	B or A				1-25	

7

7.2 Rewriting ROM (Firmware Updating)

It is feasible to update the firmware automatically by connecting the download jig to the PC board and turning the power of the equipment ON. The download jig K-PWA-DLM-320 is used.

< Procedure >

- (1) Turning OFF the power of the equipment and take off the RADF rear cover.
- (2) Connect the download jig with the connector (CN81) on the PC board.
- (3) While pressing [0] and [8] simultaneously, turn ON the power. (rewriting data starts)
- (4) During the data is rewritten, the LED on the download jig lights. When the data rewriting is completed, the LED blinks slowly (at an interval of 0.8 sec.). If the LED blinks fast (at an interval of 0.1 sec.), the rewriting has been failed.
- (5) Turn OFF the power of the equipment and remove the download jig.
- (6) Install the RADF rear cover.
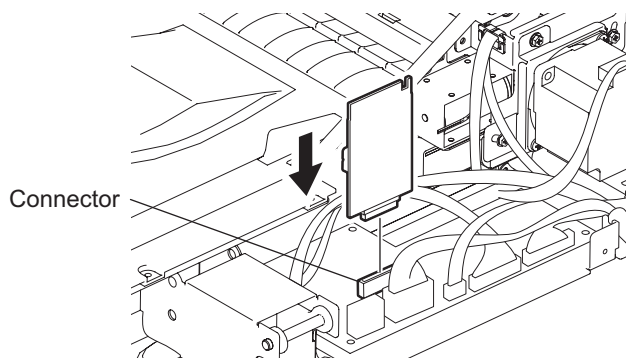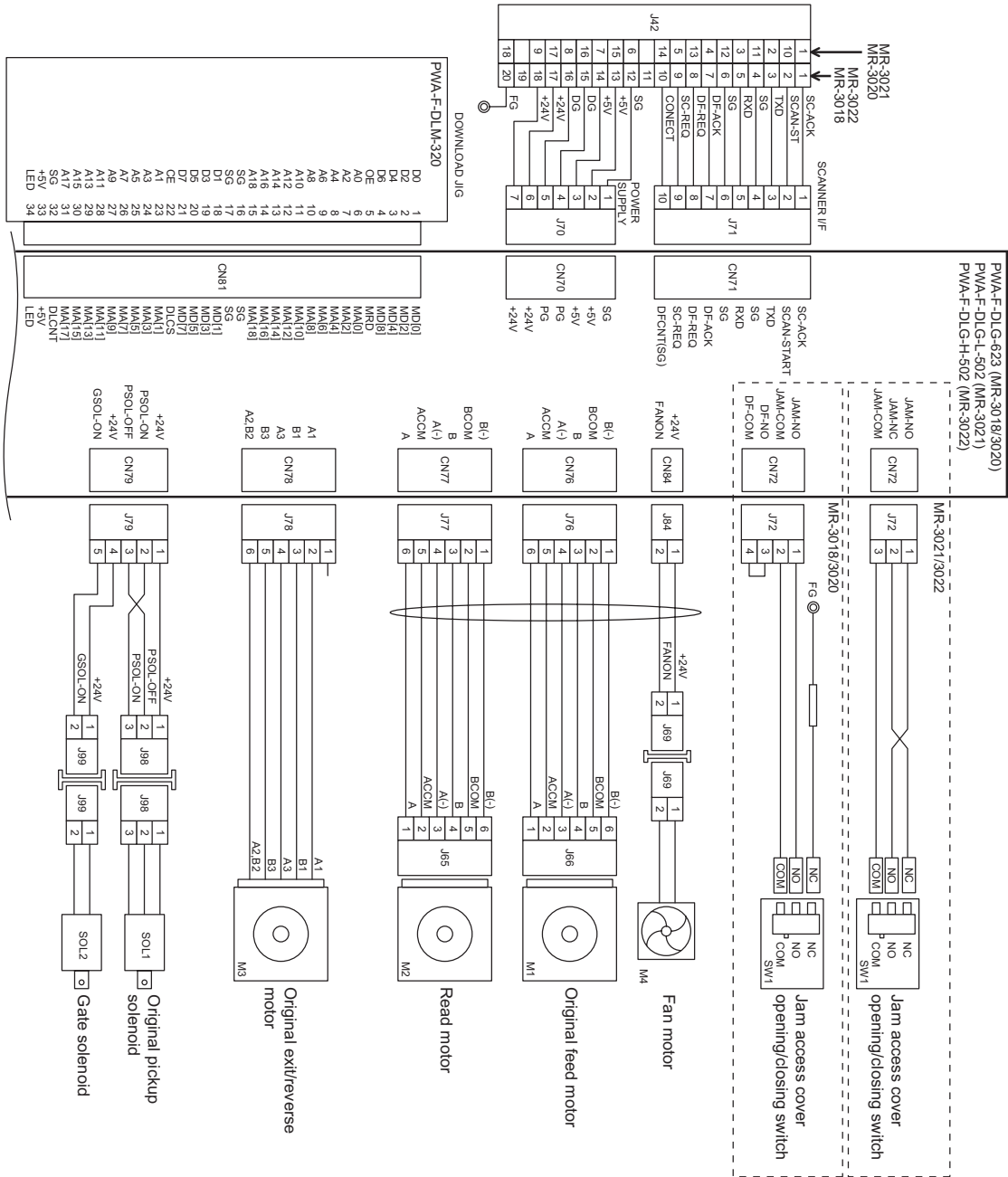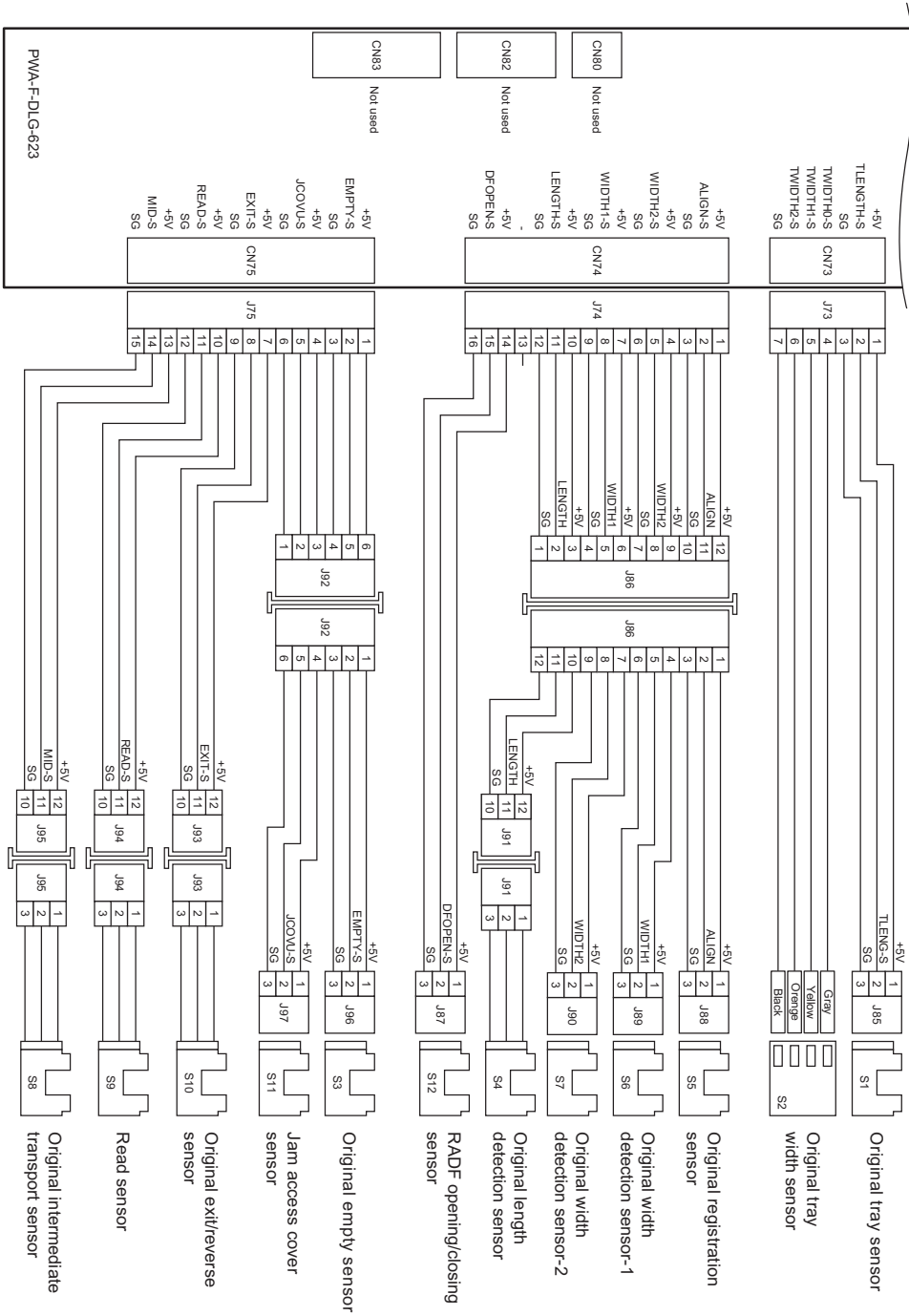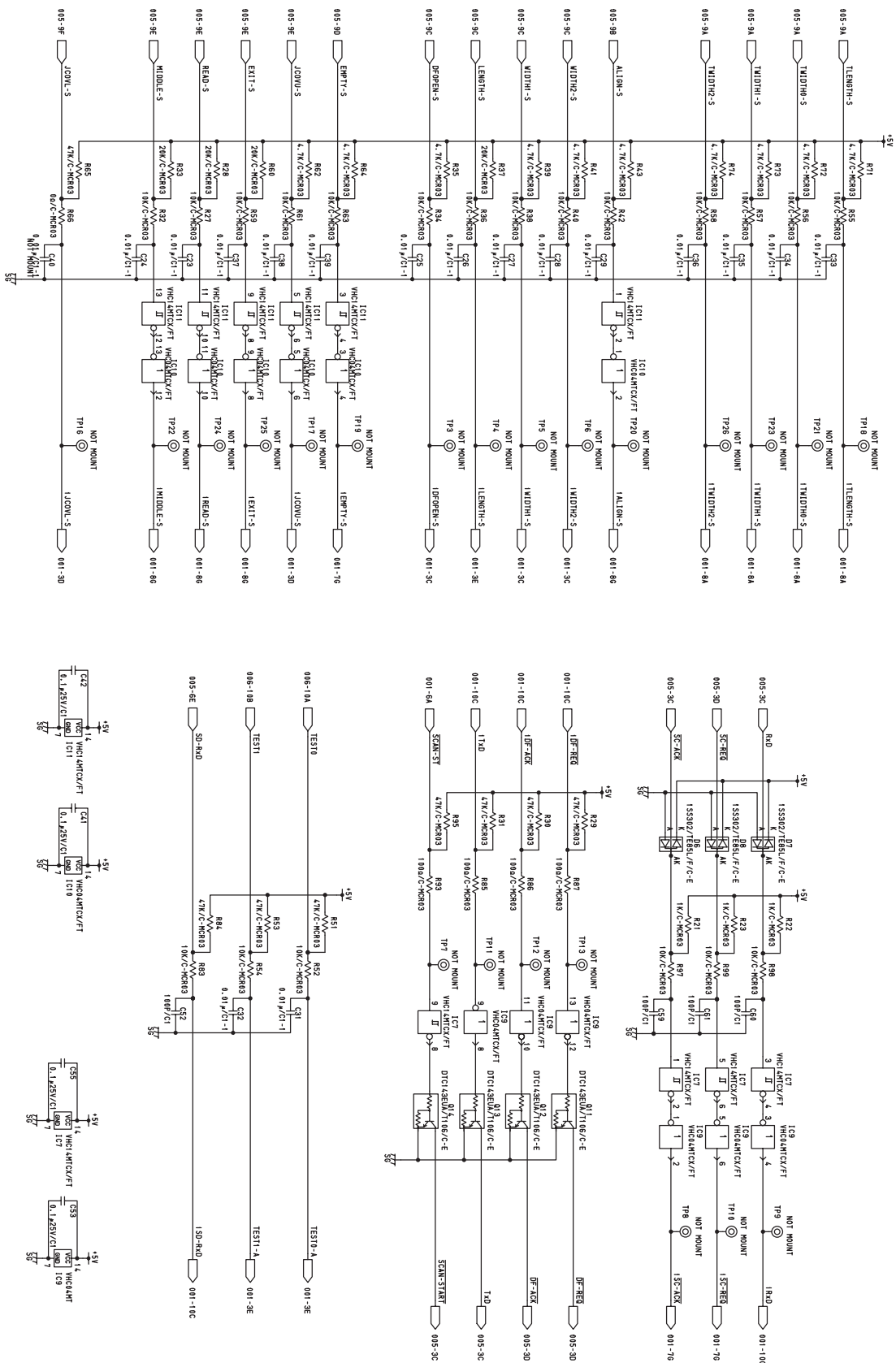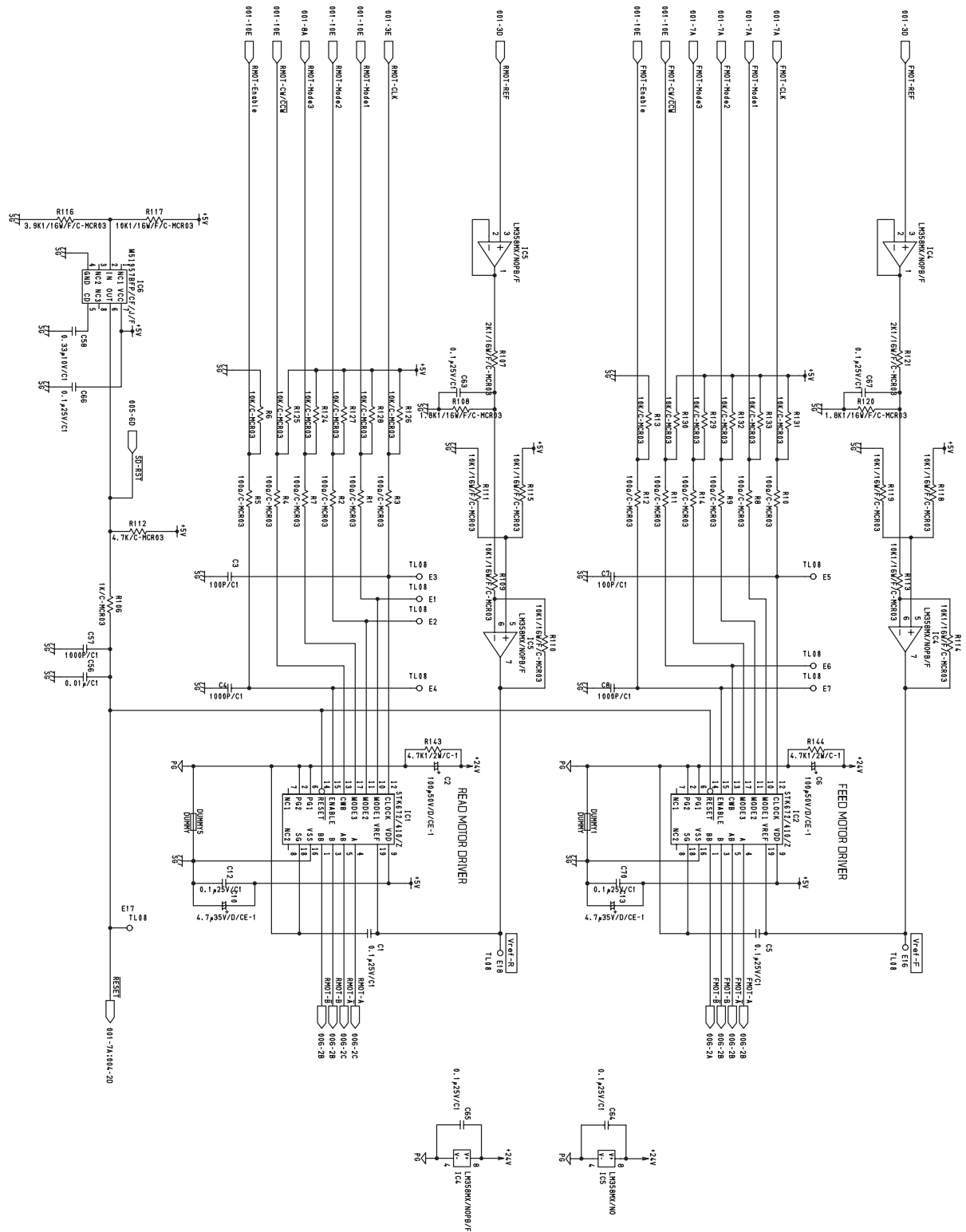- * If rewriting data is failed, turn OFF the power and repeat the procedure.

Connector

Fig. 7-2

8. CIRCUIT DIAGRAM / HARNESS DIAGRAM

8.1 Assembly of PC Board

• Component side

Fig. 8-1

• Soldered side

Fig. 8-2

8.2 Circuit Diagram

MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

PWA-F-DLG-623

CN83 Not used
CN82 Not used
CN80 Not used

CN75 | J75 | 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
CN74 | J74 | 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
CN73 | J73 | 7 6 5 4 3 2 1

CN75 pins: SG, MID-S, +5V, SG, READ-S, +5V, SG, EXIT-S, +5V, SG, JCOVU-S, +5V, SG, EMPTY-S, +5V
CN74 pins: SG, DFOPEN-S, +5V, SG, LENGTH-S, +5V, SG, WIDTH1-S, +5V, SG, WIDTH2-S, +5V, SG, ALIGN-S, +5V
CN73 pins: SG, TLENGTH-S, +5V, SG, TWIDTH2-S, TWIDTH1-S, TWIDTH0-S

J92 | 1 2 3 4 5 6
J92 | 6 5 4 3 2 1

J86 | +5V ALIGN SG +5V WIDTH2 SG +5V WIDTH1 SG +5V LENGTH SG | 12 11 10 9 8 7 6 5 4 3 2 1
J86 | 12 11 10 9 8 7 6 5 4 3 2 1

J95 | MID-S +5V SG | 10 11 12
J95 | 3 2 1
S8 — Original intermediate transport sensor

J94 | READ-S +5V SG | 10 11 12
J94 | 3 2 1
S9 — Read sensor

J93 | EXIT-S +5V SG | 10 11 12
J93 | 3 2 1
S10 — Original exit/reverse sensor

J97 | JCOVU-S +5V SG | 3 2 1
S11 — Jam access cover sensor

J96 | EMPTY-S +5V SG | 3 2 1
S3 — Original empty sensor

J91 | LENGTH SG +5V | 10 11 12
J91 | 1 2
J87 | DFOPEN-S +5V SG | 3 2 1
S12 — RADF opening/closing sensor
S4 — Original length detection sensor

J90 | WIDTH2 SG +5V | 3 2 1
S7 — Original width detection sensor-2

J89 | WIDTH1 SG +5V | 3 2 1
S6 — Original width detection sensor-1

J88 | ALIGN SG +5V | 3 2 1
S5 — Original registration sensor

S2 — Original tray width sensor (Black, Orange, Yellow, Gray)

J85 | TLENG-S SG +5V | 3 2 1
S1 — Original tray sensor

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MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

8.3 Control PC Board Circuit

8.3.1 MR-3018/3020

MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

8

MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

8 - 6

MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

8

CN81

DHB/PB34/S13NNA/FA

DOWNLOAD JIG

CN71
B10B/PHDS5/LF

SCANNER I/F

CN70
B7P/VH/FB/B/LF

POWER SUPPLY

JAM ACCSESS COVER SWITCH

CN82
B06B/CZHK/B/1/LF

N.C.

CN75
B15B/PH/K/S/LF

CN74
B16B/PH/K/S/LF

CN73
B7B/PH/K/S/LF

CN80
B3B/PH/K/S/LF

N.C.

ORIGINAL INTERMEDIATE TRANSPORT SENSOR

ORIGINAL REGISTRATION SENSOR

EXIT/REVERSE SENSOR

JAM ACCSESS COVER SENSOR

EMPTY SENSOR

RADF OPENING/CLOSING SENSOR

ORIGINAL LENGTH DETECTION SENSOR

ORIGINAL WIDTH DETECTION SENSOR-2

ORIGINAL WIDTH DETECTION SENSOR-1

REGISTRATION SENSOR

ORIGINAL TRAY SENSOR
ORIGINAL TRAY WIDTH SENSOR

FAN MOTOR

GATE SOLENOID

PICKUP SOLENOID

EXIT/REVERSE MOTOR

READ MOTOR

FEED MOTOR

CN84 B2B/PH/K/S/LF

CN79 B5B/PH/K/S/LF

CN78 292161/6

CN77 B06B/XASK/1/LF

CN76 B6B/EH/LF

N.C.

CN83 B9B/PH/K/S/LF
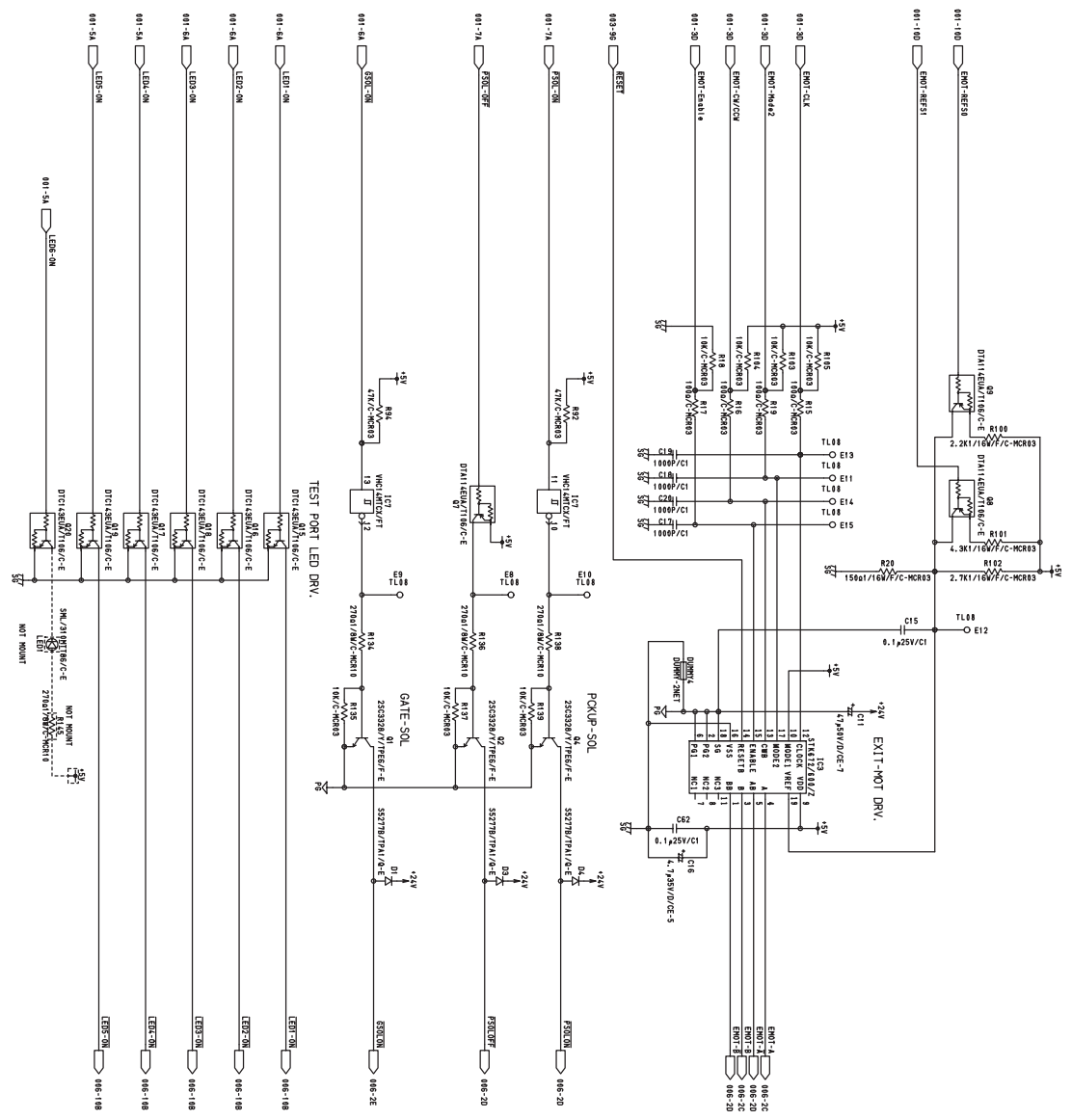
MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

8.3.2 MR-3021

MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

8

MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

8

MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

FAN MOTOR

GATE SOLENOID

PICKUP SOLENOID

EXIT/REVERSE MOTOR

READ MOTOR

FEED MOTOR

CN84

CN79

CN78

CN77

CN76

CN83

N.C.

MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

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8.3.3 MR-3022

MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

FAN MOTOR

GATE SOLENOID

PICKUP SOLENOID

EXIT/REVERSE MOTOR

READ MOTOR

FEED MOTOR

N.C.

MR-3018/3020/3021/3022
CIRCUIT DIAGRAM / HARNESS DIAGRAM

8

TOSHIBA