WORLD BILL ACCEPTOR

WBA-24-SS2
WBA-25-SS2

Model Numbers
Specifications

1. Model Classification

How to read the Model Classification Number

Model Numbers

WBA - ** - SS(2) - ***(*) - *** - **

(1) (2)(3) (4) (5) (6) (7)(8)(9) (10)

(1) WBA Bill Acceptor

(2) Type of acceptor head
1 - 1x head (magnetic sensors enhanced)
2 - 2x head (optical sensors enhanced)

(3) Type of CPU board
0 - EPROM (1M)
1 - Flash ROM (1M)
2 & 4 - Flash ROM (4M)
3 & 5 - EPROM (4M)

(4) Type of Cash Box
SS - SS Down Stacker (80mm width)
SS2 - SS2 Down Stacker (82mm width for Euro banknotes)

(5) Country Code

(6) Denominations to be accepted
(Example) Euro banknotes

Country Code \ Denomination	€5	€10	€20	€50	€100	€200	€500
EUR1	*	*	*				
EUR2	*	*	*	*			
EUR3	*	*	*	*	*		
EUR4	*	*	*	*	*	*	
EUR5	*	*	*	*	*	*	*

(7) Cash Box Capacity
4 - 400 notes
5 - 500 notes (standard)
A - 1,000 notes

(8) Faceplate
0 - without faceplate (standard)
1 - with faceplate

(9) Guide Width
1 - 66mm
2 - 70mm
3 - 76mm
4 - 80mm
5 - 82mm

(10) Interface
01 - ID001: Parallel Interface
02 - ID002: Pulse Interface
03 - ID003: Bidirectional Serial Interface (standard)
44 - ID044/045: Serial & Pulse Interface
0A2 - ID-0A2: Serial & Pulse Selectable Interface

Contact JCM for other I/F.

EXAMPLE

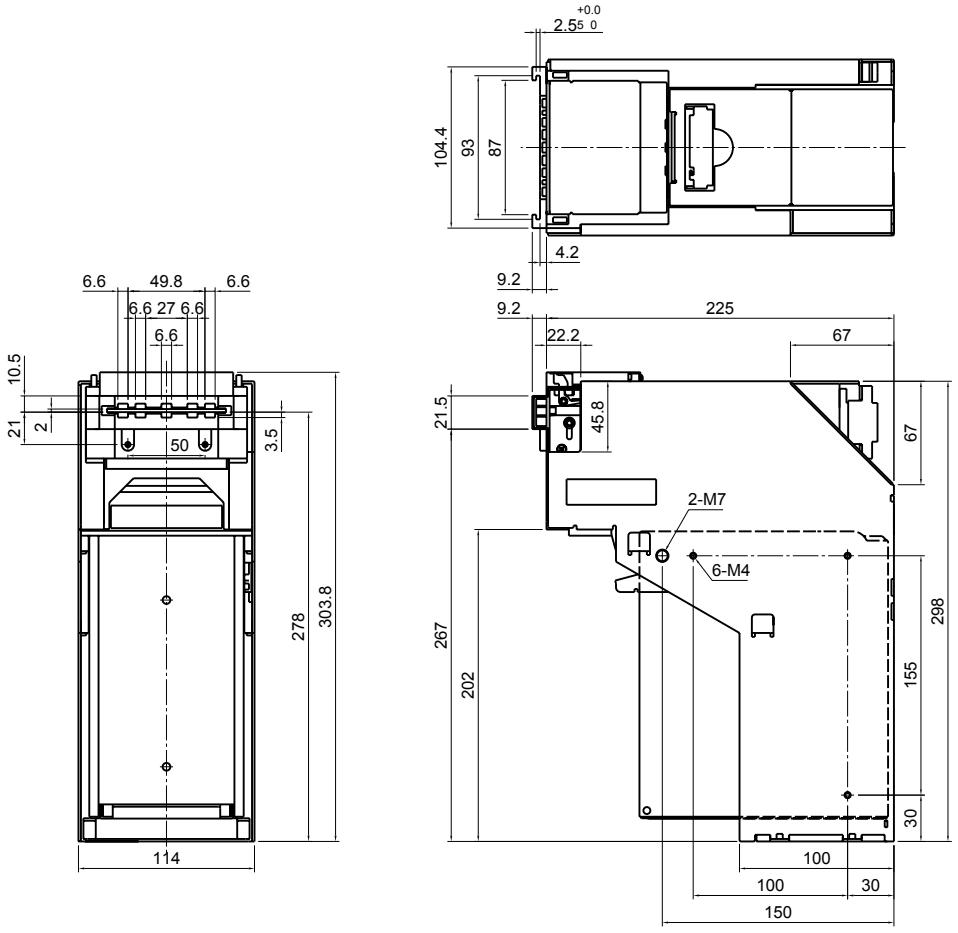
WBA-25-SS2-EUR5-505-03

WBA model bill acceptor for Euro banknotes accepting up to 500 Euro, with 2x head, EPROM, SS2 stacker, 500-note cash box, 82mm width bill guides and ID-003 I/F without faceplate.

2. General Specifications

Accepted Bill Denominations:	Refer to the software specifications of each unit.
Bill insertion:	Refer to the software specifications of each unit.
Acceptance rate:	90% or more (Including the 1st return and 2nd acceptance. The following bills, however, are excluded.) a) Dirty, worn, wet, torn, or extremely wrinkled bills. b) Bill with a folded corner or edge. c) Bill with a noticeable cutting size difference or printing displacement.
Validation Time:	Within 2 seconds (Time until the output of the vend signal.)
Standard Interface:	ID-003 bi-directional serial interface (Photocoupler isolation)
Cash box:	Security (lockable) box Capacity --- Average 500 bills (Coupons)
Note:	The lock shall be installed by a user (the catch is supplied with the unit.)
Escrow:	One bill or one barcode coupon
Power requirements:	DC +12V (+-5%), capacity 2.5A or more
Power consumption:	Standby status --- 2.8VA Operation status --- 14VA (MAX. 24VA)
Environment:	Operating temperature --- 0 ºC to 45 ºC Storage temperature --- -20 ºC to 60 ºC Relative humidity --- 30% to 80% No direct sunlight
Outside dimensions:	Refer to the drawing below.
Weight:	Main unit(with cash box)--- Approx. 4.8 Kg Cash box alone --- Approx 1.5 Kg
Installation:	Horizontal and indoor installation

3. Dimensions



WORLD BILL ACCEPTOR

WBA-12-SS
WBA-13-SS
WBA-22-SS
WBA-23-SS
WBA-24-SS2
WBA-25-SS2

OPERATION MANUAL

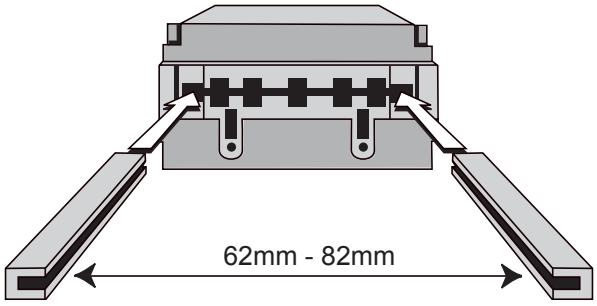
Operation Manual

Contents

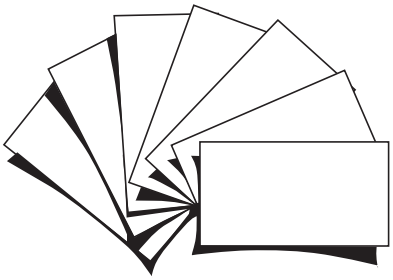
1. Features

The WBA has the following features.

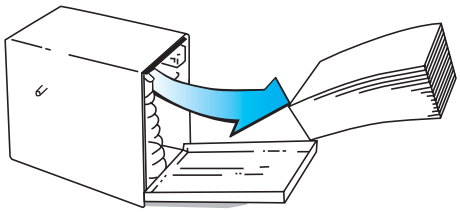
· Able to read a wide range of bill sizes
Four types of bill guides are available for the WBA. Switching the bill guides allows the unit to read bills ranging from 62mm to 82mm wide. The length of bills read are from 125mm to 170mm.



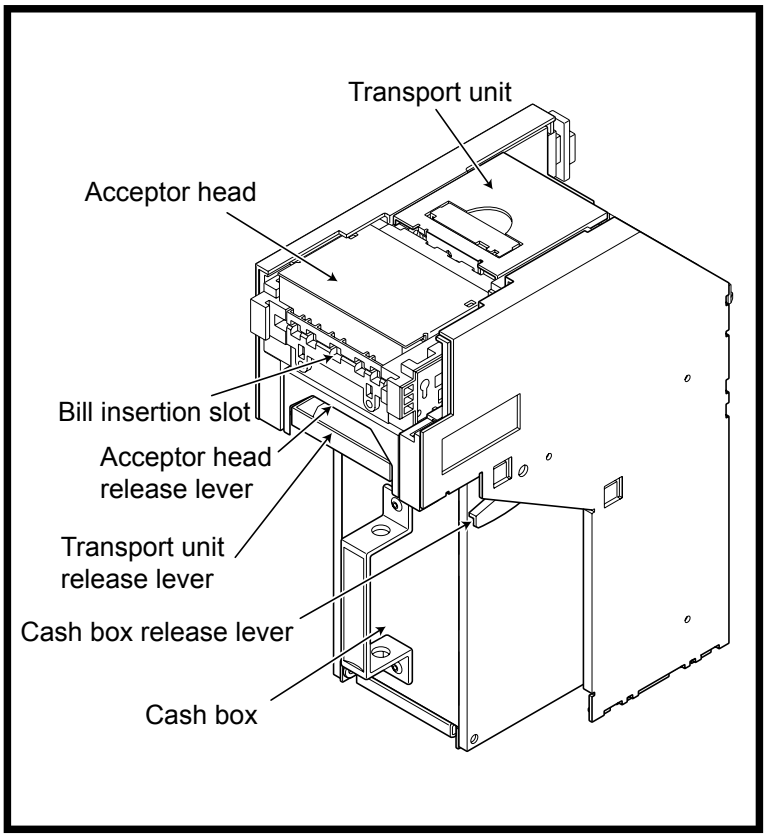
· DIP switch settings to accept/reject bills
Up to 7 denominations are accepted. Accept / reject of each denomination is Dip-switch selectable.



· Easy bill retrieval
The cash box can be detached from the main unit to withdraw deposited bills.
The machine can be equipped with a lock for higher security. Each SS and SS2 cash box stores up to 500 bills.

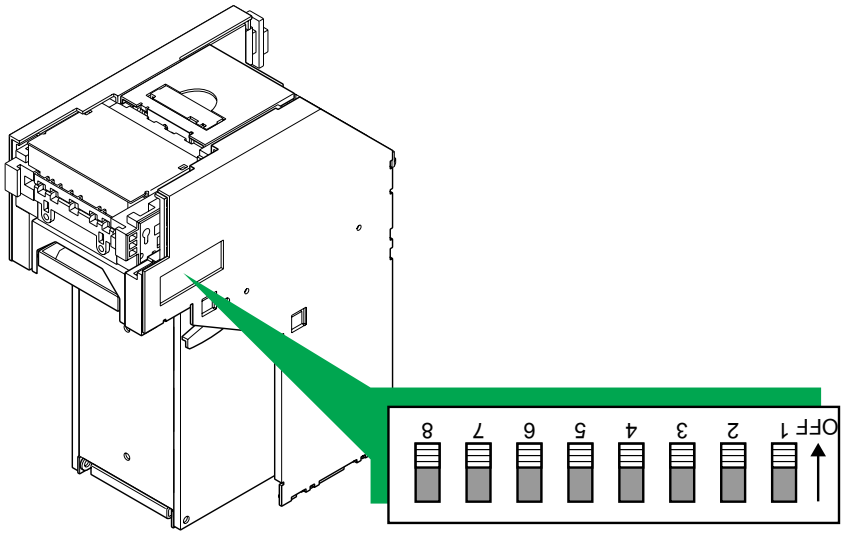


2. Component Names



3. Dipswitch Settings

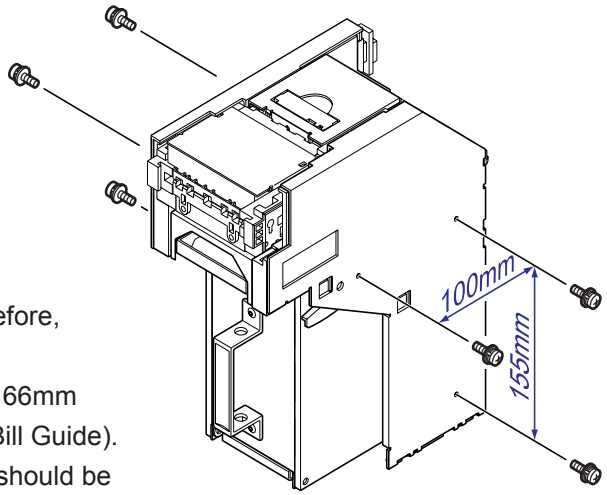
Verify the software in the WBA before installing it. The DIPswitch settings are determined by the software.
See software specifications proivded separately for DIPswitch settings of your software.



4. Installation

1. Installation

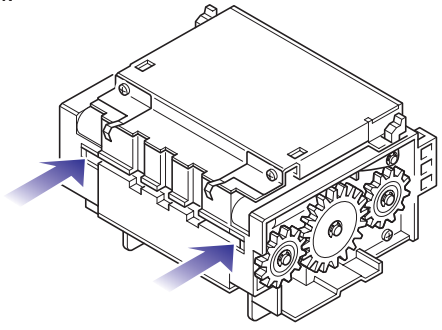
There are three mounting holes on each side
(a total of six mounting holes).

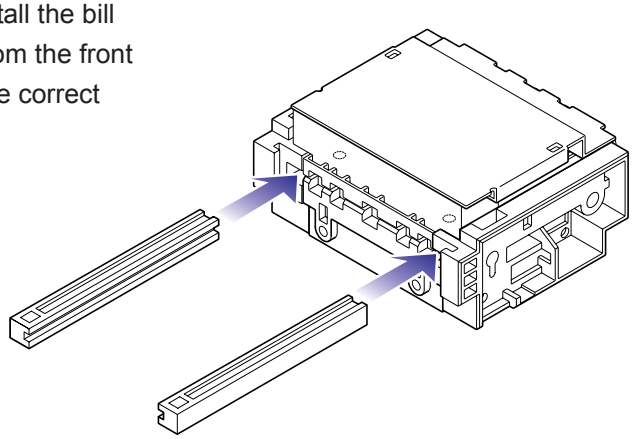


2. Switching the bill guides

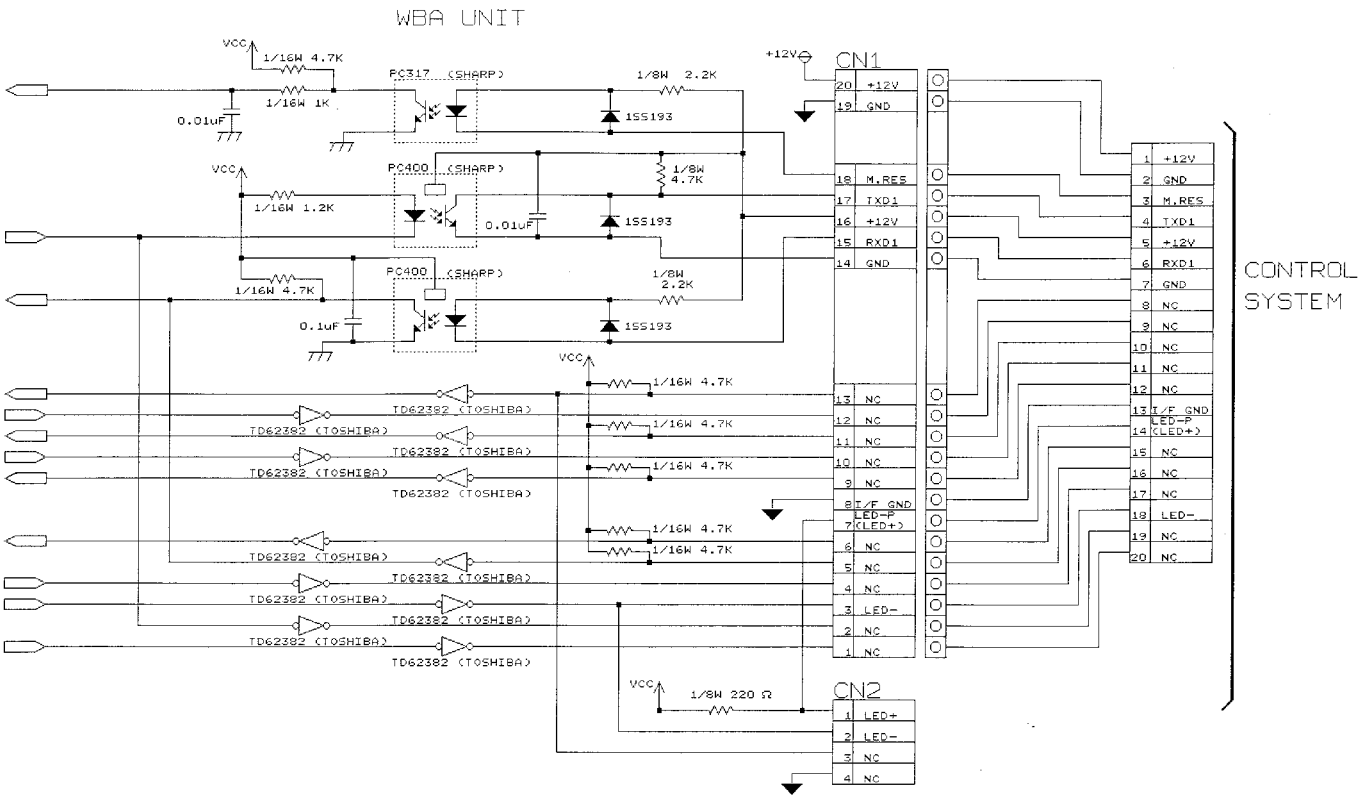
Unless your WBA has been used with another software before, correct bill guides should be installed in the acceptor unit .
Each software has designated bill guide types (ex. USA = 66mm width = Type 1 Bill Guide, EUR5 = 82mm width = Type 5 Bill Guide).
Refer to the software specification to find which bill guide should be installed.

To remove the bill guides, first remove the acceptor head from the main unit and then push out the bill guides from the back of the acceptor head with a Phillips-head screwdriver. To install the bill guides, push the guides into the acceptor head slot from the front until you hear a click. Be sure to push the guides in the correct direction.

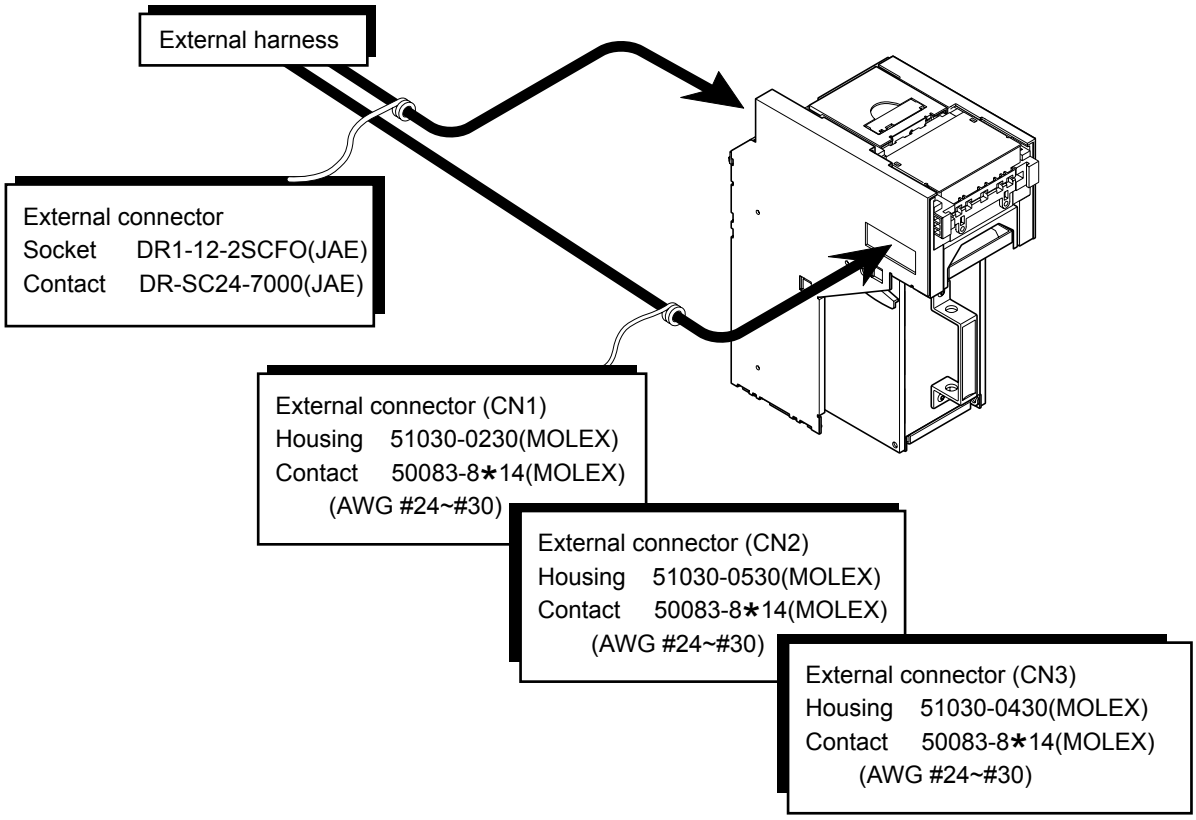




5. Input/Output Circuits

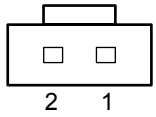


6. Cabling



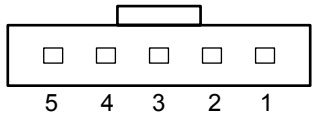
7. Pin Assignment - ID-003 I/F (Standard)

CN 1



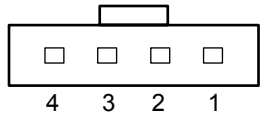
Pin No.	Signal Name	Function
1	+ 12V	DC +12V power supply
2	GND	Ground

CN 2



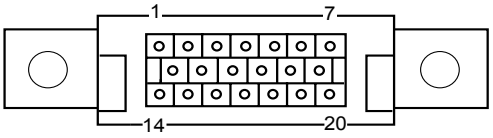
Pin No.	Signal Name	Function
1	M. RES	Acceptor reset signal
2	TXD	Data transmission
3	+ 12V	Interface Power supply (DC+12V)
4	RXD	Data reception
5	GND	Ground

CN 3



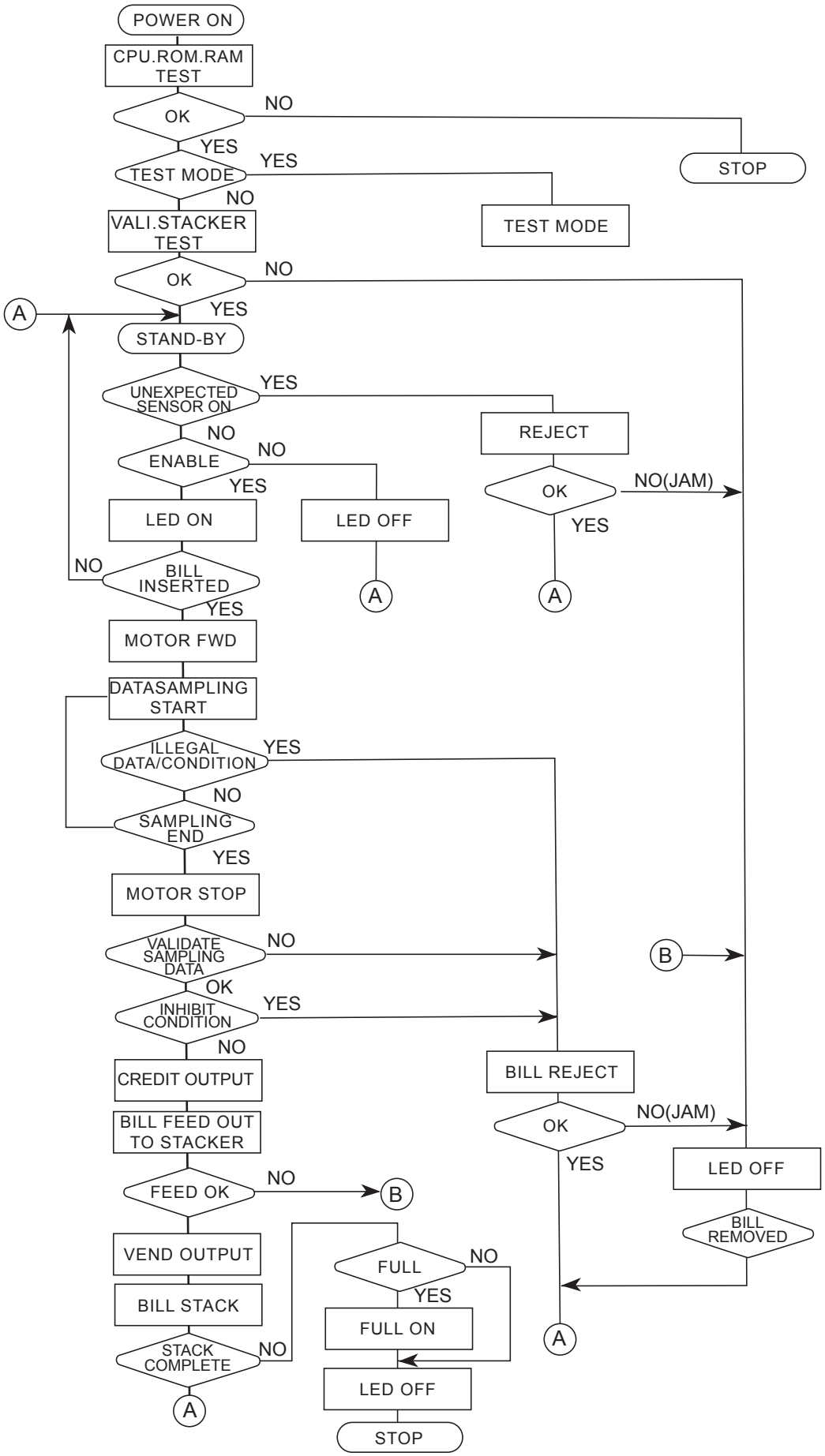
Pin No.	Signal Name	Function
1	LED +	LED drive (anode)
2	LED -	LED drive (cathode)
3	NC	Reserved
4	NC	Reserved

Connector

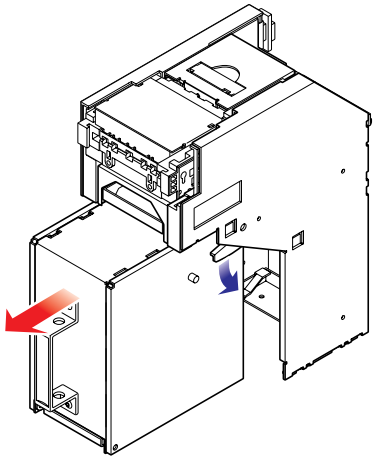


Pin No.	Signal Name	Function
1	+ 12V	DC +12V power supply
2	GND	Ground
3	M. RES	Acceptor reset signal
4	TXD	Data transmission
5	+ 12V	Interface Power supply (DC+12V)
6	RXD	Data reception
7	GND	Ground
8	NC	Do not use this pin
9	NC	Do not use this pin
10	NC	Do not use this pin
11	NC	Do not use this pin
12	NC	Do not use this pin
13	GND	Ground
14	LED +	LED Drive (Anode)
15	NC	Do not use this pin
16	NC	Do not use this pin
17	NC	Do not use this pin
18	LED -	LED Drive (Cathode)
19	NC	Do not use this pin
20	NC	Do not use this pin

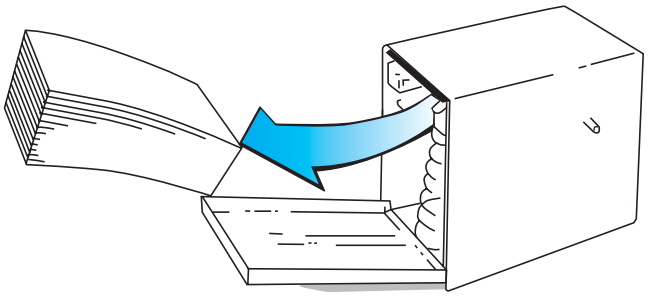
8. Operation Flowchart - ID-003 I/F (Standard)



9. Retrieving Bills



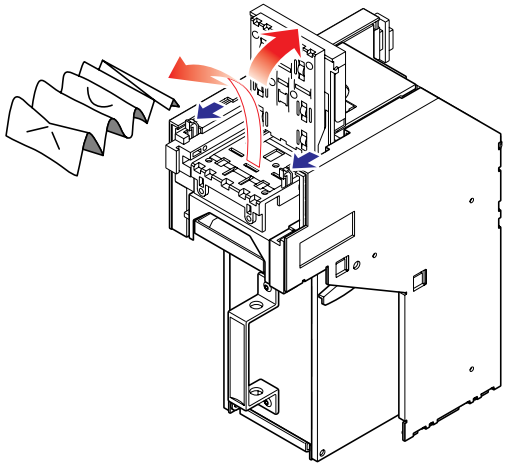
1. Push the release lever down and pull the cash box forward.



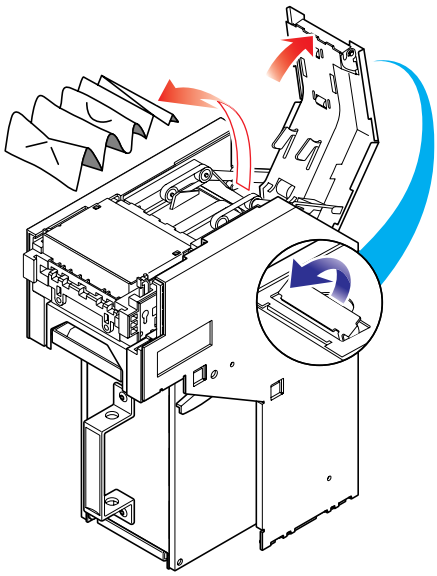
2. Open the cash box cover and remove the bills.

10. Clearing Bill Jam

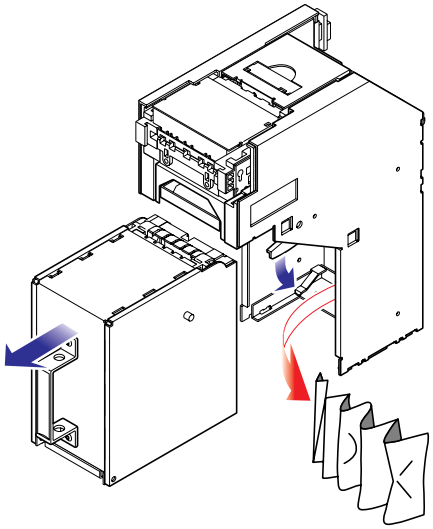
1. Pull the tabs on both sides of the acceptor forward to open the acceptor head. Remove the jammed bill.



2. If the jammed bill cannot be removed by opening the acceptor, pull the transport unit open/close lever to open the transport cover and remove the jammed bill.



3. When a bill is jammed near the inlet of the cash box, push the release lever down to pull out the cash box and remove the jammed bill.

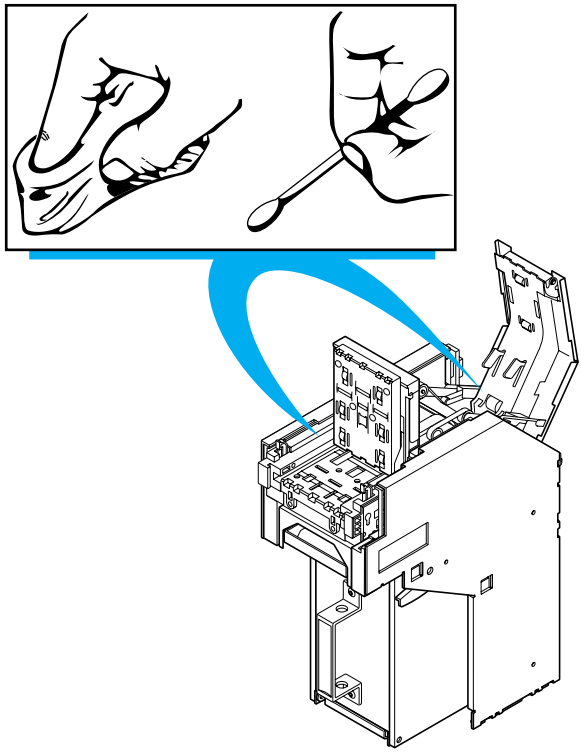


11. Preventive Maintenance

It is important to keep the bill path, rollers, and belts clean. The sensor lenses are transparent, and made of polymer material. Handle them with care.

To clean the lenses, use a lint-free cloth and mild non-abrasive detergent such as liquid dish soap mixed with water.

Do not use alcohol or thinner for cleaning.



Note: JCM does not recommend cleaning cards, cleaning pads, or cleaning solutions of any kind.

Cash box Preventive Maintenance (P/M)
Do periodic P/M on the cash boxes to ensure proper operation. Use compressed air to blow out the paper fibers and other debris that builds up over time. Check the belts and all moving parts for wear and proper positioning. If the unit does not operate properly, it can cause bill jams.

After completing the P/M, Auto-Calibration is recommended (Refer to Chapter 7).

WORLD BILL ACCEPTOR

WBA-12-SS
WBA-13-SS
WBA-22-SS
WBA-23-SS
WBA-24-SS2
WBA-25-SS2

COMMUNICATION SPECIFICATIONS

ID-003 Communication Specifications

Contents

ID-003 Communication specifications

1 Outline

This specification describes specifications at the data level of interfacing between the ACCEPTOR and CONTROLLER. In regard to electrical connections and operation, refer to the specification manuals for each model.
ID-003 interface is a 2-way serial interface. Control over the status and operation of the ACCEPTOR is made by polling [STATUS REQUEST] and by commands ([OPERATION COMMAND] [SETTING COMMANDS]) from the CONTROLLER and also setting and confirming of functions can be made.

2 Transmission specifications

(1) Transmission method	Full duplex transmission	
(2) Transmission speed	9600 bps/19200 bps (Depending on the model, setting by DIP switches is possible.)	
(3) Synchronizing method	Asynchronous method	
(4) Connection control method	Polling method	
(5) Data fornat	Start bit	1
	Data bit	8
	Parity bit	EVEN
	Stop bit	1
	X parameter	None

(6) Message format

SYNC	LNG	CMD	DATA	CRC

SYNC	1 byte	:	Message transmission start code [FCH] fixed
LNG	1 byte	:	Data length (Total number of bytes from SYNC to CRC)
CMD	1 byte	:	Command status
DATA	0 to 250 byte	:	Data necessary for command (omitted by CMD)
CRC	2 byte	:	Check code by CRC method Object secion to be from SYNC to end of DATA (Inttial value = 0)

(7) Error control method — Error detection — CRC method

CRC - CCITT
$P(x) = X^{16}+X^{12}+X^{5}+1$

3 Transmission, reception message format

Transmission and reception message format is divided into the following five types.

(1) Polling format (CONTROLLER → ACCEPTOR)

SYNC	LNG	CMD	CRC

SYNC : [FCH]
LNG : [05H]
CMD : [11H] (Status request)
CRC : Check code by CRC method

(2) ACK format (CONTROLLER → ACCEPTOR/ACCEPTOR → CONTROLLER)

SYNC	LNG	CMD	CRC

SYNC : [FCH]
LNG : [05H]
CMD : [50H]
CRC : Check code by CRC method

(3) Command format (CONTROLLER → ACCEPTOR)

SYNC	LNG	CMD	DATA	CRC

SYNC : [FCH]
LNG : Data length
CMD : Command
DATA : Data necessary for command (Omitted by CMD)
CRC : Check code by CRC method

(4) Response format I (ACCEPTOR → CONTROLLER)

SYNC	LNG	SST	CRC

SYNC : [FCH]
LNG : Data length
SST : Status code
CRC : Check code by CRC

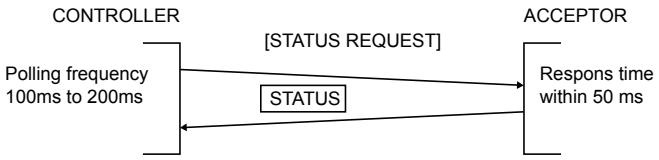
(5) Response format II (ACCEPTOR → CONTROLLER)

SYNC	LNG	CMD	DATA	CRC

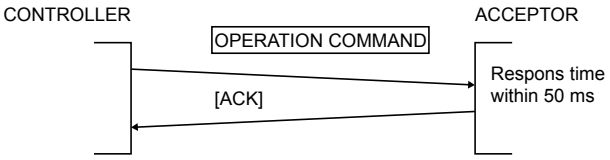
SYNC : [FCH]
LNG : Data length
CMD : Response
DATA : Data necessary for command (Omitted by CMD)
CRC : Check code by CRC method

4 Communication flow

(1) Transmission of STATUS REQUEST

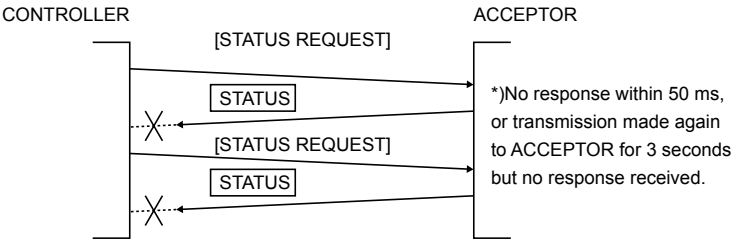


(2) Transmission command to ACCEPTOR



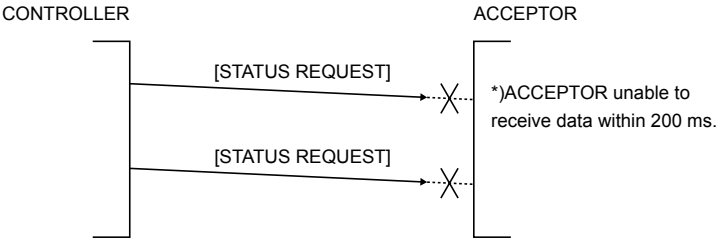
(3) Communication error ①

(Failure of communication system and power source OFF, failure etc. of acceptor)

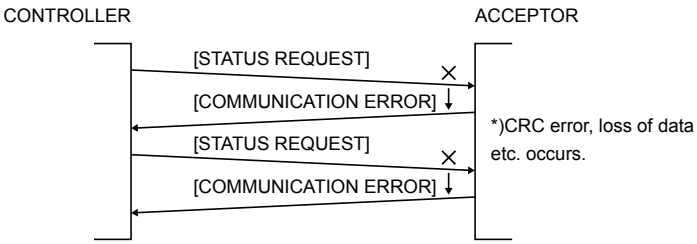


Communication error ②

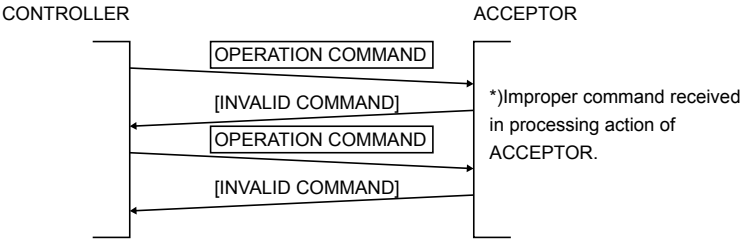
(Failure etc. of communication system)



Communication error ③



Communication error ④



5 Command/response list

CONTROLLER → ACCEPTOR	
STATUS	
STATUS REQUEST	11H
RESPONSE TO [VEND VALID]	
ACK	50H
OPERATION COMMAND	
RESET	40H
STACK-1	41H
STACK-2	42H
RETURN	43H
HOLD	44H
WAIT	45H
SETTING COMMAND	
ENABLE/DISABLE (DENOMI)	C0H+DATA
SECURITY (DENOMI)	C1H+DATA
INHIBIT (ACCEPTOR)	C3H+DATA
DIRECTION	C4H+DATA
OPTIONAL FUNCTION	C5H+DATA
SETTING STATUS REQUEST	
ENABLE/DISABLE (DENOMI)	80H
SECURITY (DENOMI)	81H
INHIBIT (ACCEPTOR)	83H
DIRECTION	84H
OPTIONAL FUNCTION	85H
VERSION REQUEST	88H
BOOT VERSION REQUEST	89H

ACCEPTOR → CONTROLLER	
STATUS	
ENABLE (IDLING)	11H
ACCEPTING	12H
ESCROW	13H+DATA
STACKING	14H
VEND VALID	15H
STACKED	16H
REJECTING	17H+DATA
RETURNING	18H
HOLDING	19H
DISABLE (INHIBIT)	1AH
INTIALIZE	1BH
POWER UP STATUS	
POWER UP	40H
POWER UP WITH BILL IN ACCEPTOR	41H
POWER UP WITH BILL IN STACKER	42H
ERROR STATUS	
STACKER FULL	43H
STACKER OPEN	44H
JAM IN ACCEPTOR	45H
JAM IN STACKER	46H
PAUSE	47H
CHEATED	48H
FAILURE	49H+DATA
COMMUNICATION ERROR	4AH
RESPONSE TO OPERATION COMMAND	
ACK	50H
INVALID COMMAND	4BH
RESPONSE TO SETTING COMMAND	
ENABLE/DISABLE (DENOMI)	C0H+DATA
SECURITY (DENOMI)	C1H+DATA
INHIBIT (ACCEPTOR)	C3H+DATA
DIRECTION	C4H+DATA
OPTIONAL FUNCTION	C5H+DATA
SETTING STATUS	
ENABLE/DISABLE (DENOMI)	80H+DATA
SECURITY (DENOMI)	81H+DATA
INHIBIT (ACCEPTOR)	83H+DATA
DIRECTION	84H+DATA
OPTIONAL FUNCTION	85H+DATA
VERSION INFORMATION	88H+DATA
BOOT VERSION REQUEST	89H+DATA

6 Command/response details

6-1 STATUS REQUEST (CONTROLLER → ACCEPTOR)

Request from CONTROLLER to ACCEPTOR on status of ACCEPTOR

By the [STATUS REQUEST], the CONTROLLER monitors operation status, resetting from error status etc. of the ACCEPTOR.

Response : Status response

[11H] : STATUS REQEST

11H

a. Frequency of polling shall be 100 msec to 200 msec.
b. Response time of the ACCEPTOR shall be within 50 msec.
c. The CONTROLLER must resend the message in case a communication error response is received and when a response is not received within 200 msec. (Refer to 4-(3))

6-2 STATUS (ACCEPTOR → CONTROLLER)

Response in reply to [STATUS REQUEST] from the CONTROLLER

Expresses the present status of the ACCEPTOR which is normally divided into normal status, power-up status and error status.

6-2-1 Normal status (ACCEPTOR → CONTROLLER)

(1) [11H] : ENABLE (IDLING)

11H

Bill accepting standby and operation able status

(2) [12H] : ACCEPTING

12H

Status in which bills are taken in and validating is being conducted

(3) [13H] : ESCROW

13H	DATA

Status in which bill validation is completed and command from the CONTROLLER is awaited (The bill is held inside the ACCEPTOR).
[ESCROW DATA] (accepted denomination) of 1 byte is added.
If [STATUS REQUEST] cannot be received from the ACCEPTOR within 3 seconds while in the [ESCROW] status, and when an operation command from the CONTROLLER is not transmitted within 10 seconds after transmission, the bill is returned.

ESCROW DATA (Accepted denomination)

DATA	Denomination
61h	01
62h	02
63h	03
64h	04
65h	05
66h	06
67h	07
68h	08

*) The accepted denominations are described in the [DATA setting specifications] for each model.

(4) [14H] : STACKING

14H

Status in which bills are conveyed to the stacker and stored in accordance with OPERATION COMMANDs [STACK-1] and [STACK-2] from the CONTROLLER.
(Refer to 6-3, 7-2)

(5) [15H] : VEND VALID

15H

Confirming signal of bill acceptance
Against [VEND VALID], the ACCEPTOR holds its status until [ACK] is sent from the CONTROLLER.
The CONTROLLER conducts credit up by [VEND VALID].
(Refer to 7-2)

(6) [16H] : STACKED

16H

Status from the time bill is stored up to the time accepting of the next bill from [VEND VALID] becomes possible ([ENABLE] status).

(7) [17H] : REJECTING

17H	DATA

A Status in which unacceptable bills as the result of bill validating by the ACCEPTOR or bills by an [INHIBIT] command from the CONTROLLER are returned.
(Refer to 7-3)
[REJECT DATA] (description of rejection) of 1 byte is added.

REJECT DATA (Rejection description)

DATA	Description
71h	Insertion error
72h	Mag srror
73h	Rejection action by remaining of bills etc. (ACCEPTOR head section)
74h	Compensation error multiplying factor error
75h	Conveying error
76h	Denomination assessing error
77h	Photo pattern error ①
78h	Photo level error
79h	Return by inhibit/insertion direction, denomination error In case a command against escrow is not transmitted
7Ah	
7Bh	Operation error
7Ch	Rejecting action by remaining of bills and such (stacker section)
7Dh	Length error
7Eh	Photo pattern error ②

(8) [18H] : RETURNING

18H

Against [ESCROW], a status in which a bill is returned by a [RETURN] command from the CONTROLLER.
(Refer to 7-4)

(9) [19H] : HOLDING

19H

Against [ESCROW], a status in which a bill is held inside the ACCEPTOR by a [HOLD] command from the CONTROLLER.

(10) [1AH]: DISABLE (INHIBIT)

1AH

A Status in which acceptance of bills by the ACCEPTOR is inhibited by a [INHIBIT] command from the CONTROLLER.(Refer to 7-5)
Also a status in which all acceptable denominations are in a disable status by [ENABLE/DISABLE] command or where all receiving directions are in an inhibit status by a [DIRECTION] command.

(11) [1BH] : INITIALIZE

1BH

Status in which the ACCEPTOR is conducting initializing action by [RESET] from the CONTROLLER.
The setting command from the CONTROLLER is effective only in this status. (Refer to 7-1)

6-2-2 Power up status (ACCEPTOR → CONTROLLER)

By the power supply ON status, the ACCEPTOR returns the following status.
Also, this status is held until a [RESET] command is sent from the CONTROLLER. (Refer to 7-2)

(1) [40H] : POWER UP

40H

A status in which status inside the ACCEPTOR is normal with the ACCEPTOR power on

(2) [41H] : POWER UP WITH BILL IN ACCEPTOR

41H

A status in which bills remain in the ACCEPTOR head conveying section (a return possible position) with the power supply on.
By a [RESET] command from the CONTROLLER, the ACCEPTOR returns the bill and conducts initializing.

(3) [42H] : POWER UP WITH BILL IN STACKER

42H

A status in which bills remain in the stacker conveying section (a return possible position) with the power supply on.
By a [RESET] command from the CONTROLLER, the ACCEPTOR stores the bill and conducts initializing.

6-2-3 Error status (ACCEPTOR → CONTROLLER)

Method for releasing error status differs by model.

For details, refer to the [Specification manual] and [DATA setting specification manual] by model.

(1) [43H] : STACKER FULL

43H

A stacker box full condition (Refer to 7-6)

(2) [44H] : STACKER OPEN (STACKER BOX REMOVE)

44H

The stacker door is open or the stacker box is not mounted.

(3) [45H] : JAM IN ACCEPTOR

45H

Jamming has occurred inside the ACCEPTOR.

(4) [46H] : JAM IN STACKER

46H

Jamming has occurred in the stacker conveying section.

An abnormal condition has developed at the time of storing.

(5) [47H] : PAUSE

47H

A condition in which the ACCEPTOR cannot operate because a second bill has been inserted while the first bill is being stored or conveyed

(When the second bill is removed, conveying is started.)

(6) [48H] : CHEATED

48H

An action thought to be mischievous against the ACCEPTOR has been committed.

(7) [49H] : FAILURE

49H	DATA

A status in which normal operation cannot be made because of a failure, an abnormal condition, or incorrect setting of the ACCEPTOR.
[FAILURE DATA] of 1 byte are added.

FAILURE DATA (abnormal contents)

DATA	Contents
A2h	Stack motor failure
A5h	Transport (feed) motor speed failure
A6h	Transport (feed) motor failure
ABh	Cash box not ready
AFh	Validator head remove
B0h	Boot ROM failure
B1h	External ROM failure
B2h	ROM failure
B3h	External ROM writing failure

(8) [4AH] : COMMUNICATION ERROR

4AH

An error has developed in the communication data. (Refer to 4-(3)- ③)

(9) [4BH] : INVALID COMMAND

4BH

Command from the CONTROLLER is not valid. (Refer to 4-(3)- ④)

6-3 OPERATION COMMAND (CONTROLLER → ACCEPTOR)

Operation command from the CONTROLLER to the ACCEPTOR
Response : ACK response

(1) [40H] : RESET

40H

A command for resetting the ACCEPTOR. The ACCEPTOR accepts this command regardless of its status.
After the power supply is turned on (power up status), transmission is required without fail.

(2) [41H] : STACK-1

41H

A bill in an escrow status is conveyed to the stacker section and stored.
The ACCEPTOR becomes in a [VEND VALID] status when the bill passes the stacker lever.
Valid only when in [ESCROW] status
＊) The position of STACK-1 may differ by model.

(3) [42H] : STACK-2

42H

A bill in escrow status is conveyed to the stacker and stored.
The ACCEPTOR becomes in a [VEND VALID] status when a bill is stored. (Pushed in position)
Valid only when in [ESCROW] status.
*) The position of STACK-2 may differ by model.

(4) [43H] : RETURN

43H

Returns a bill in an escrow status.
Valid on when in [ESCROW] status

(5) [44H] : HOLD

44H

A bill in escrow status is made to be held for 10 seconds. For continued holding, resending of a [HOLD] command is necessary.
Valid only when in [ESCROW] status

(6) [45H] : WAIT

45H

Status of ACCEPTOR is made to be held for 3 seconds. To continued holding this status, resending of a
[WAIT] command is necessary.

6-4 ACK (Affirmative response)
[50H] : ACK

50H

[ACCEPTOR → CONTROLLER]
Response against an [OPERATION COMMAND] from the CONTROLLER.
[CONTROLLER → ACCEPTOR]
Response against [VEND VALID] from the ACCEPTOR.

6-5 SETTING COMMAND (CONTROLLER → ACCEPTOR)

A command to set (change) function of the ACCEPTOR by the CONTROLLER.
Setting of each denomination is made by the respective bits of data of 2 bytes to be added.
Receiving is possible only when ACCEPTOR is initialized. (However INHIBIT is excluded.)

(1) [C0H] : ENABLE/DISABLE

C0H	DATA

Accepting by each denomination is set.
[ENABLE/DISABLE DATA] of 2 bytes are added. (Refer to 6-7-(1))
Response : ECHO BACK (ACCEPTOR → CONTROLLER)

C0H	DATA

(2) [C1H] : SECURITY

C1H	DATA

Validating level by each denomination is set.
[SECURITY DATA] of 2 bytes is added. (Refer to 6-7-(2))
Response : ECHO BACK (ACCEPTOR → CONTROLLER)

C1H	DATA

(3) [C3H] : INHIBIT

C3H	DATA

Status of ACCEPTOR is temporarily made acceptance inhibit.
[INHIBIT DATA] of 1 byte are added. (Refer to 6-7-(3))
Response : ECHO BACK (ACCEPTOR → CONTROLLER)

C3H	DATA

* INHIBIT can be accepted in any status.

Set during acceptance of bill	Return bill and becomes in INHIBIT status.
Set during validating of bill	
Set while in escrow status	
Set during storing of bill	After storing bill, becomes in INHIBIT status.
Set while in vend valid	

(4) [C4H] : DIRECTION

C4H	DATA

Sets accepting direction of bill.
[DIRECTION DATA] of 1 byte are added. (Refer to 6-7-(4))
Response : ECHO BACK (ACCEPTOR → CONTROLLER)

C4H	DATA

(5) [C5H] : OPTIONAL FUNCTION

C5H

Sets option function of ACCEPTOR.
[OPTIONAL FUNCTION DATA] of 2 bytes is added. (Refer to 6-7-(7))
Response : ECHO BACK (ACCEPTOR → CONTROLLER)

C5H	DATA

6-6 SETTING STATUS REQUEST (CONTROLLER → ACCEPTOR)

By a [SETTING] command, the CONTROLLER requests transmission of the set status of the ACCEPTOR.

(1) [80H] : ENABLE/DISABLE

80H

Transmission request for set acceptance status of acceptor by each denomination.
Response : SETTING STATUS (ACCEPTOR → CONTROLLER)
[ENABLE/DISABLE] commands as well as status of accepting denominations set by DIP switches are added as [ENABLE/DISABLE DATA] of 2 bytes. (Refer to 6-7-(1))

80H	DATA

*) Settings of DIP switches are described in the [Specification manual] for each model.

(2) [81H] : SECURITY

81H

Request for transmission of set status of validating level by each denomination.
Response : SETTING STATUS (ACCEPTOR → CONTROLLER)
[SECURITY DATA] of 2 bytes are added. (Refer to 6-7-(2))

81H	DATA

(3) [83H] : INHIBIT

83H

Transmission request for set status of acceptance inhibit of the ACCEPTOR.
Response : SETTING STATUS (ACCEPTOR → CONTROLLER)
[INHIBIT DATA] of 1 byte are added. (Refer to 6-7-(3))

83H	DATA

(4) [84H] : DIRECTION

84H

Request for transmission of set status of bill acceptance direction.
Response : SETTING STATUS (ACCEPTOR → CONTROLLER)
[DIRECTION DATA] of 1 byte are added. (Refer to 6-7-(4))

84H	DATA

(5) [88H] : VERSION REQUEST

88H

Request for transmission of ACCEPTOR MODEL ID VERSION.
Response : SETTING STATUS (ACCEPTOR → CONTROLLER)
ASCII data of 36 bytes are added. (Refer to 6-7-(5))

88H	DATA

(6) [89H] : BOOT VERSION REQUEST

89H

Request for transmission of BOOT VERSION of ACCEPTOR.
Response : SETTING STATUS (ACCEPTOR → CONTROLLER)
ASCII data of 4 bytes are added. (Refer to 6-7-(6))

89H	DATA

(7) [85H] : OPTIONAL FUNCTION

85H

Request for transmission of setting status of [OPTIONAL FUNCTION] command.
Response : SETTING STATUS (ACCEPTOR → CONTROLLER)
[OPTIONAL FUNCTION DATA] of 2 bytes are added. (Refer to 6-7-(7))

85H	DATA

6-7 DATA (SETTING STATUS/SETTING COMMAND)

Data formats for SETTING STATUS and SETTING COMMANDS are described.

For details, refer to [DATA setting specifications] for each model.

(1) ENABLE/DISABLE DATA

CONTROLLER → ACCEPTOR

C0h + DATA1 + DATA2

80h

ACCEPTOR → CONTROLLER

C0h + DATA1 + DATA2 [echo back]

80h + DATA1 + DATA2

	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0	
DATA1	08	07	06	05	04	03	02	01	← Denomination
DATA2	0	0	0	0	0	0	0	0	

0 : enable

1 : disable (default : 00h)

(2) SECURITY DATA

CONTROLLER → ACCEPTOR

C1h + DATA1 + DATA2

81h

ACCEPTOR → CONTROLLER

C1h + DATA1 + DATA2 [echo back]

81h + DATA1 + DATA2

	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0	
DATA1	08	07	06	05	04	03	02	01	← Denomination
DATA2	0	0	0	0	0	0	0	0	

0 : normal

1 : security level hight (default : 00h)

(3) INHIBIT DATA

CONTROLLER → ACCEPTOR

C3h + DATA (1byte)

83h

ACCEPTOR → CONTROLLER

C3h + DATA (1byte) [echo back]

83h + DATA (1byte)

	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
DATA	0	0	0	0	0	0	0	inh

0 : not inhibit

1 : inhibit (default : 01h)

(4) DIRECTION DATA

CONTROLLER → ACCEPTOR

C4h + DATA (1byte)

84h

ACCEPTOR → CONTROLLER

C4h + DATA (1byte) [echo back]

84h + DATA (1byte)

	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0	
DATA	0	0	0	0	04	03	02	01	← Direction

0 : not inhibit

1 : inhibit

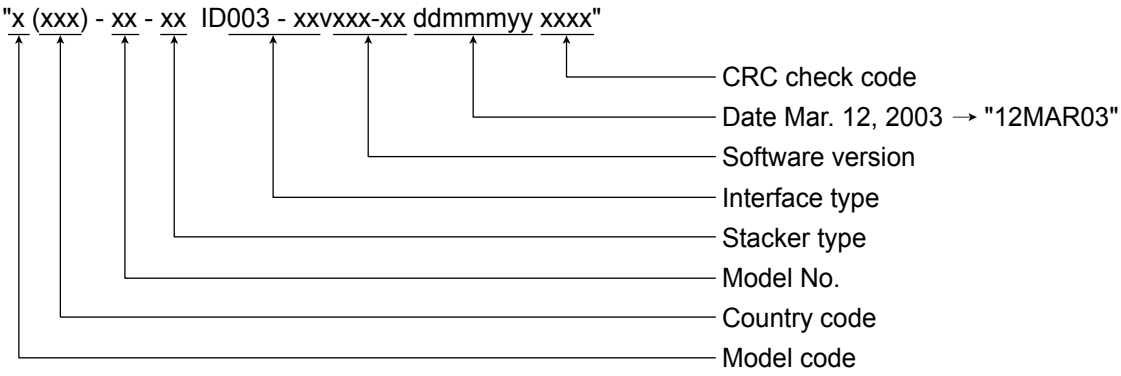
(5) VERSION DATA

CONTROLLER → ACCEPTOR	ACCEPTOR → CONTROLLER
88h	88h + DATA

DATA

The ACCEPTOR responds to MODEL/ID/VERSION/CRS etc. by ASCII data.

Data length expresses the following meanings from the top, as ([LNG]-5) bytes (variable).



(6) BOOT DATA

CONTROLLER → ACCEPTOR	ACCEPTOR → CONTROLLER
89h	89h + DATA (4byte)

DATA

The ACCEPTAOR responds to the BOOT VERSION by 4 byte ASCII data.

(7) OPTIONAL FUNCTION DATA

CONTROLLER → ACCEPTOR	ACCEPTOR → CONTROLLER
C5h + DATA1 + DATA2	C5h + DATA1 + DATA2 [echo back]
85h	85h + DATA1 + DATA2

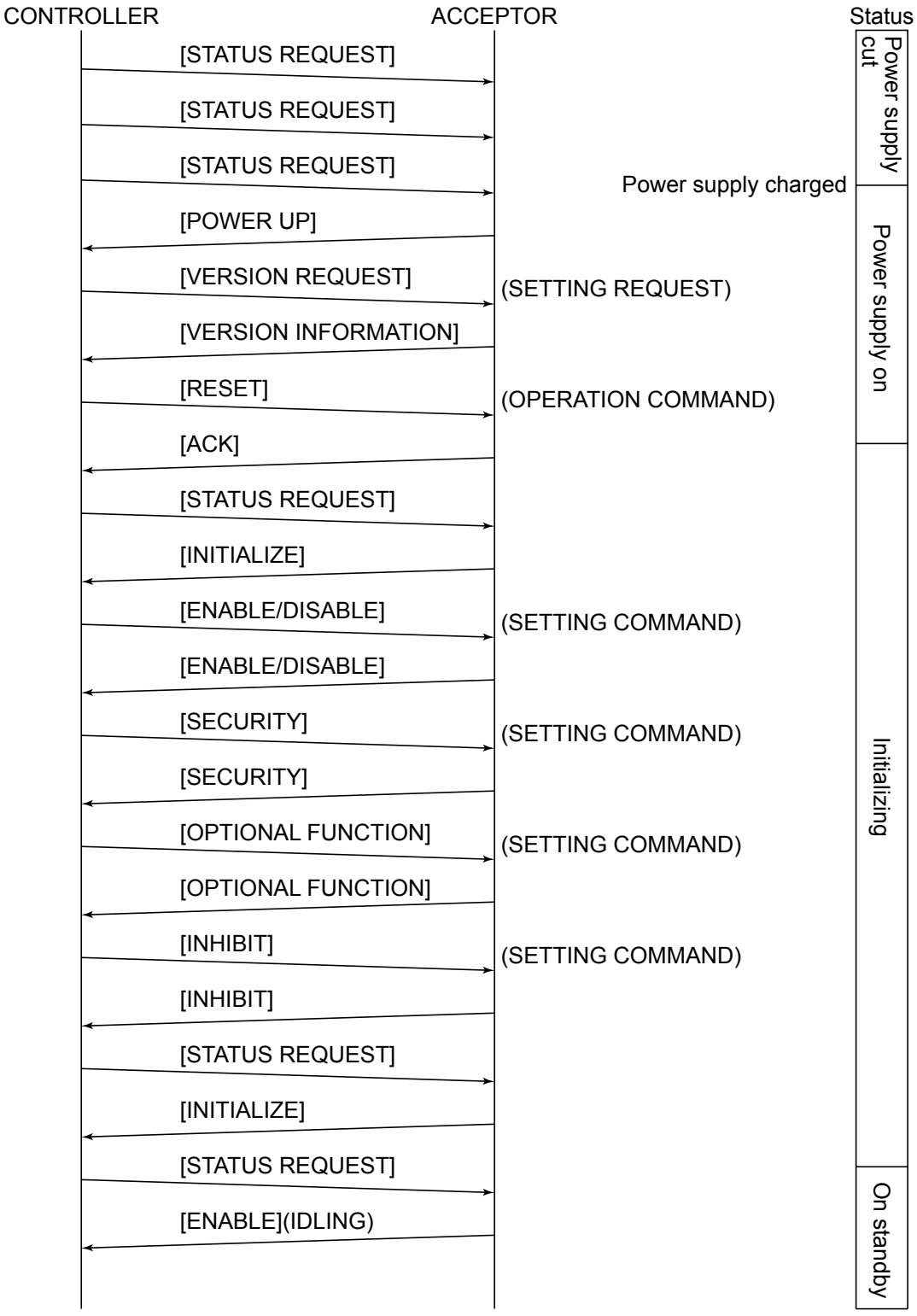
	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0	
DATA1	08	07	06	05	04	03	02	01	← OPTION
DATA2	0	0	0	0	0	0	0	0	

0 : disable
1 : enable (default : 00h)

7 Timing chart

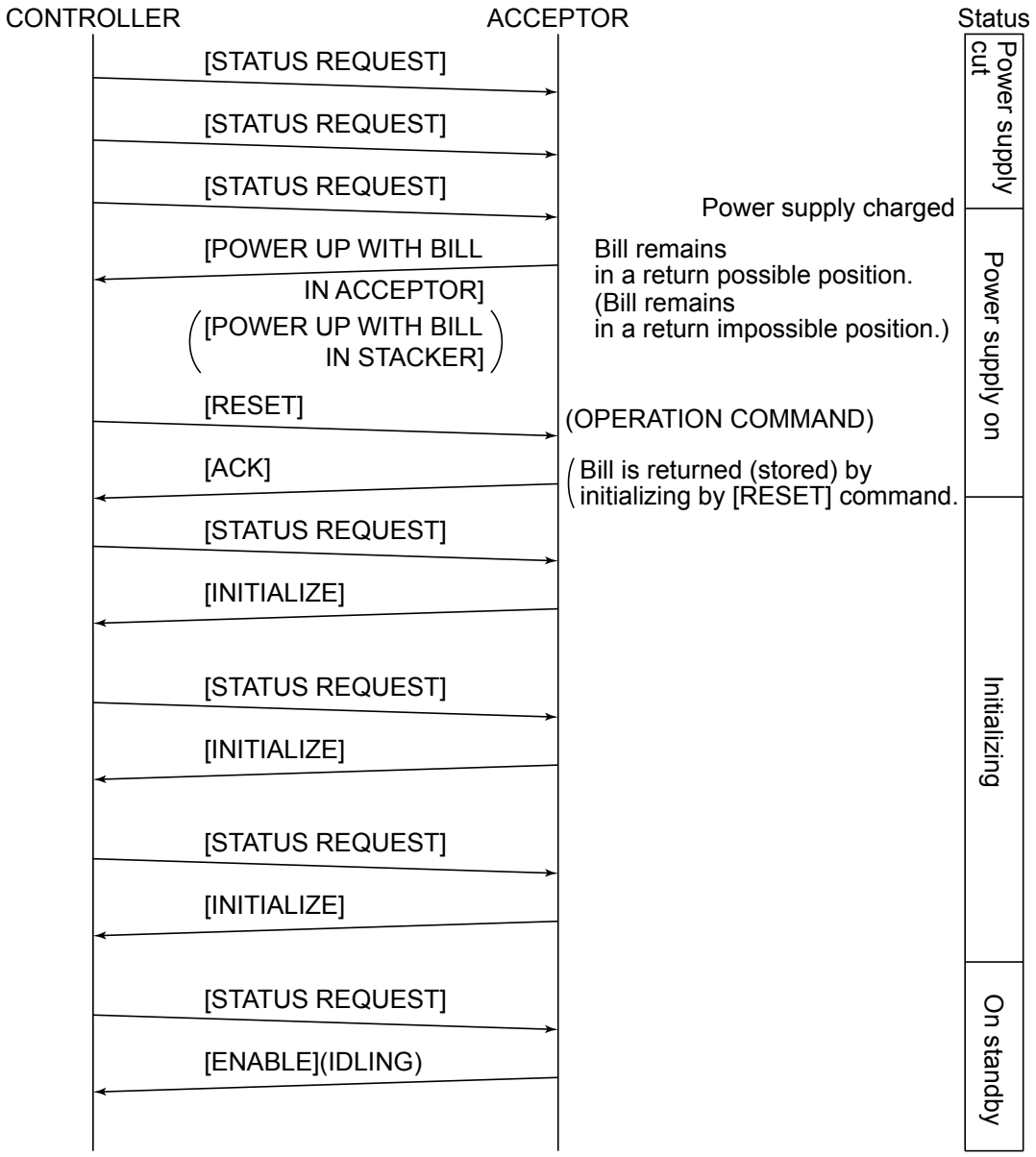
7-1 POWER UP

(1) From charging of power supply to standby status



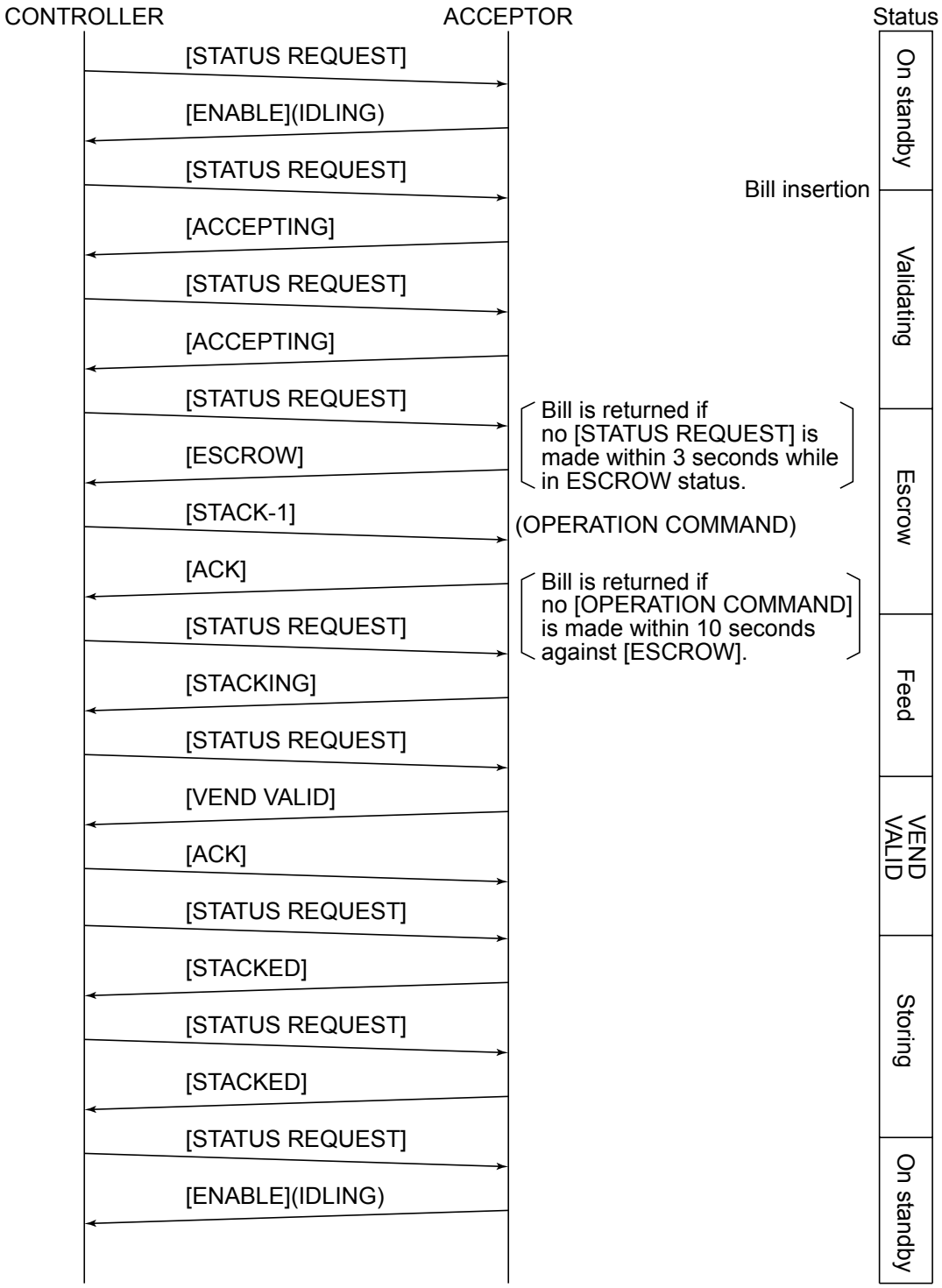
(2) From charging of power supply to standby status

When bill remains inside the ACCEPTOR at the time of power charging

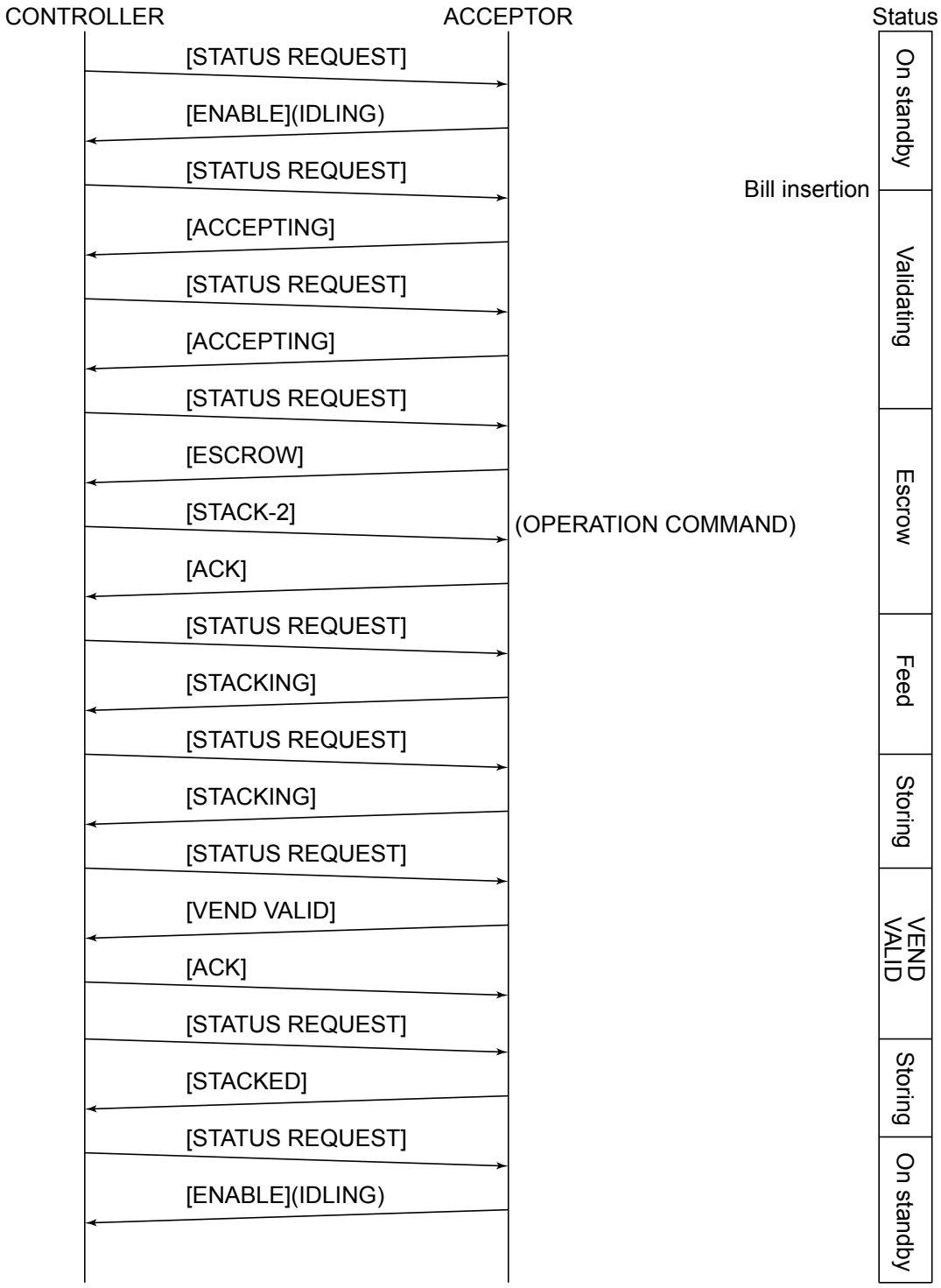


7-2 Accepting of bill

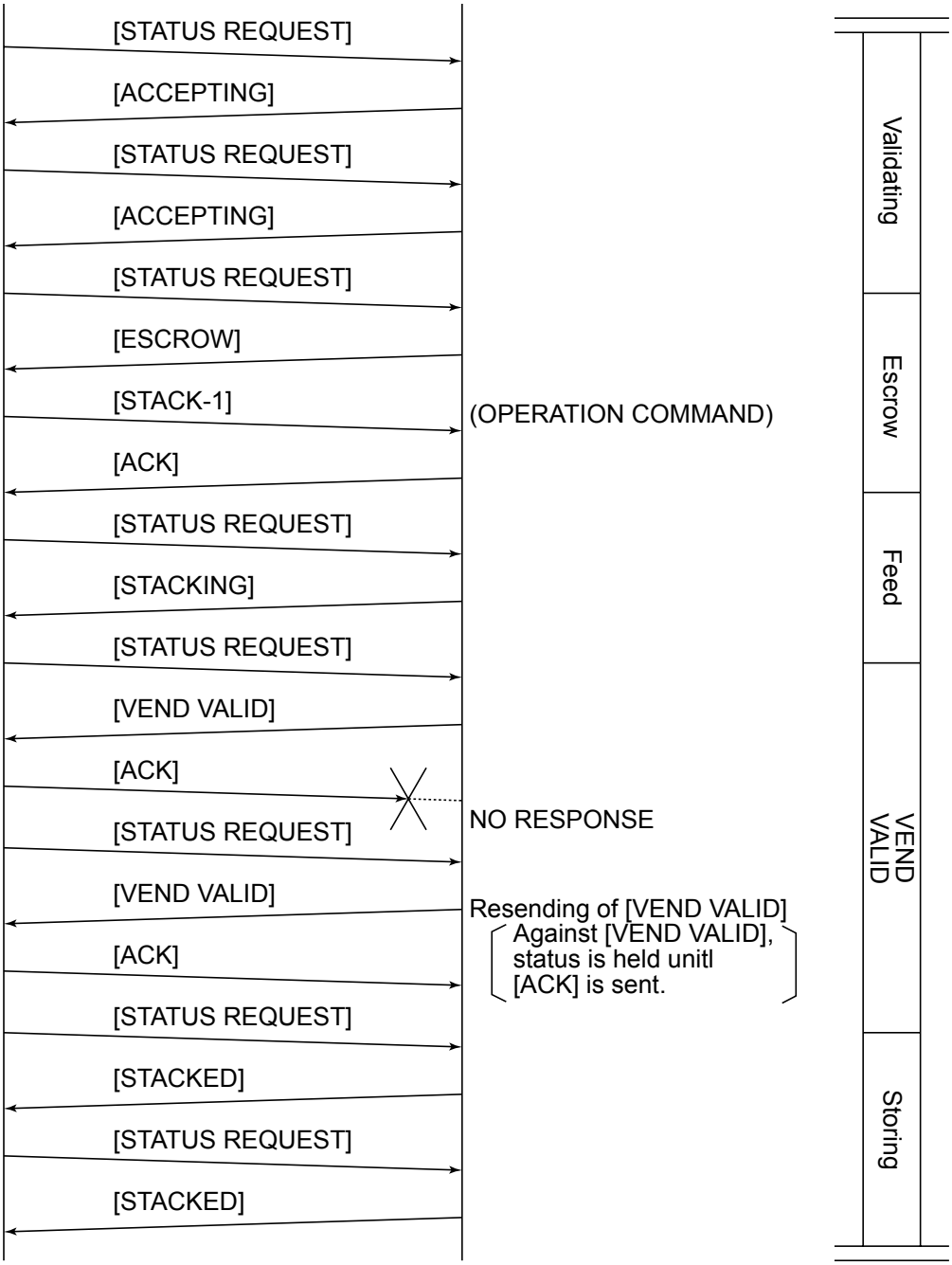
(1) Accepting of bill by [STACK-1] command



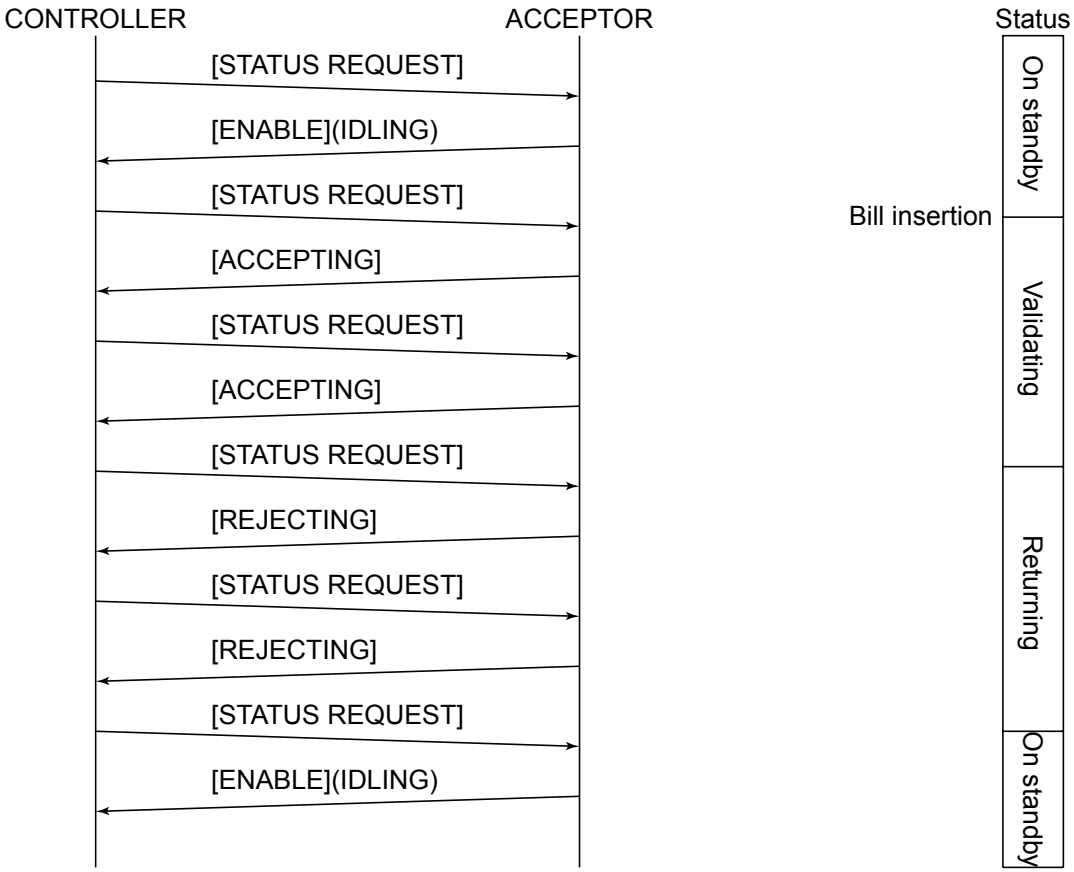
(2) Accepting of bill by [STACK-2] command



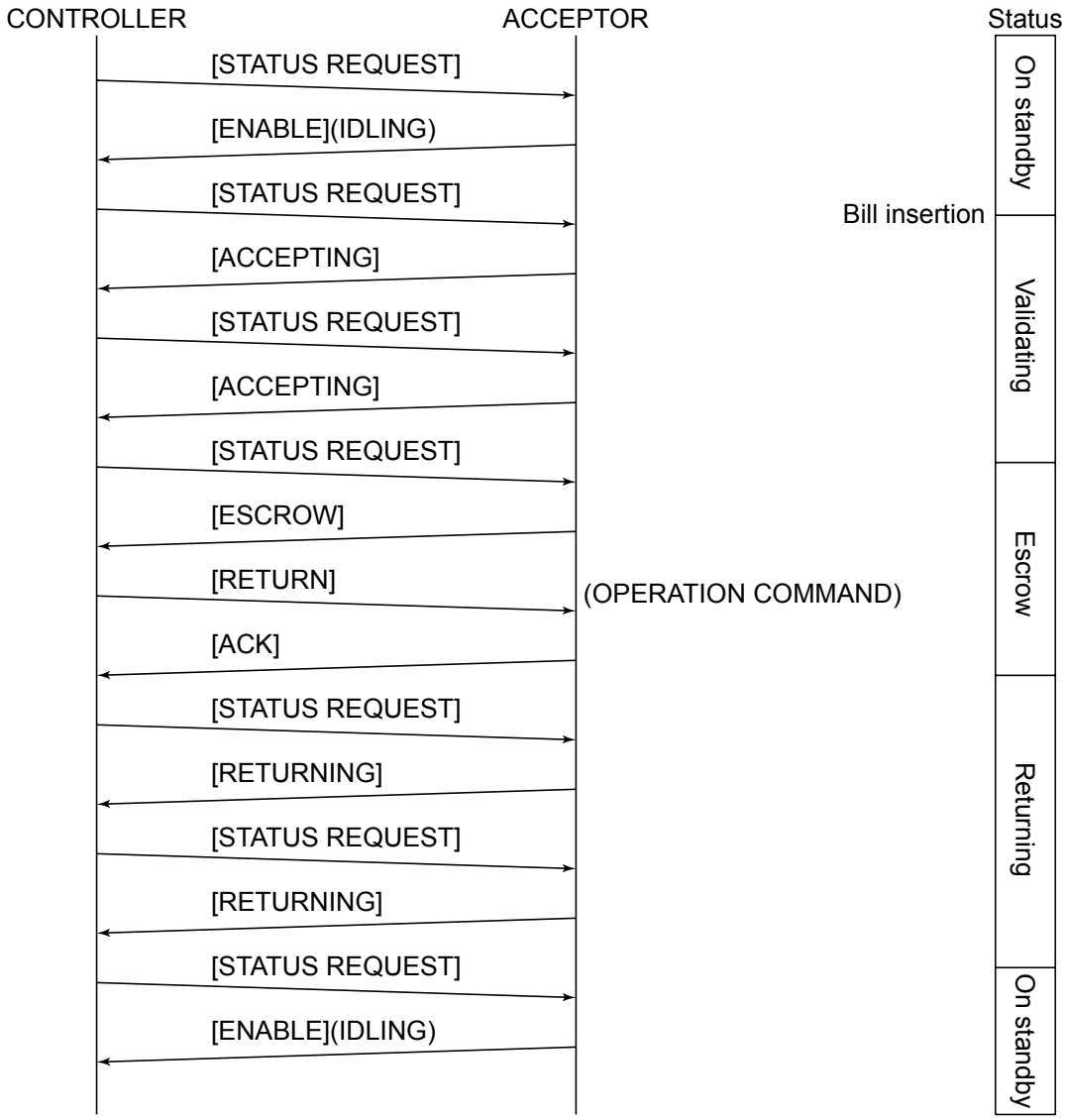
(3) Resending of [VEND VALID]



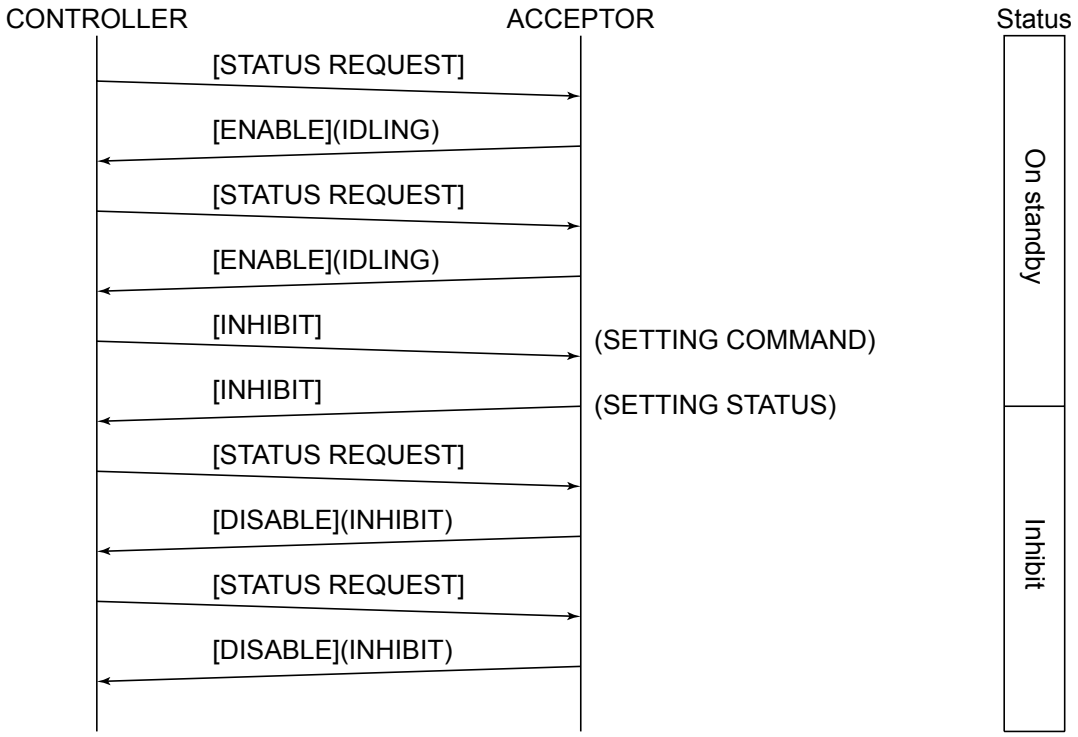
7-3 Return of bill by validating



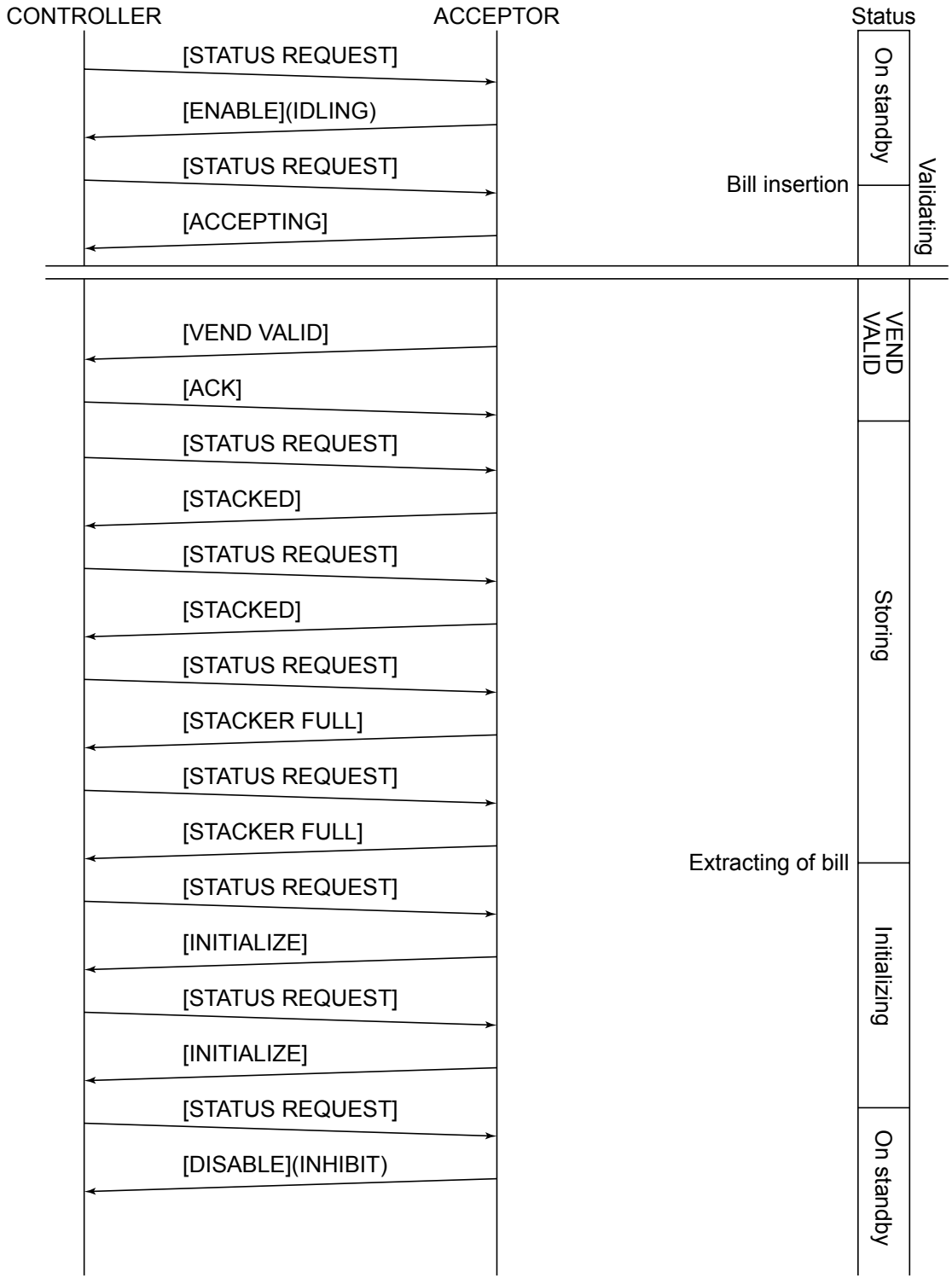
7-4 Returning of bill by [RETURN] command



7-5 Inhibit of accepting by ACCERTOR

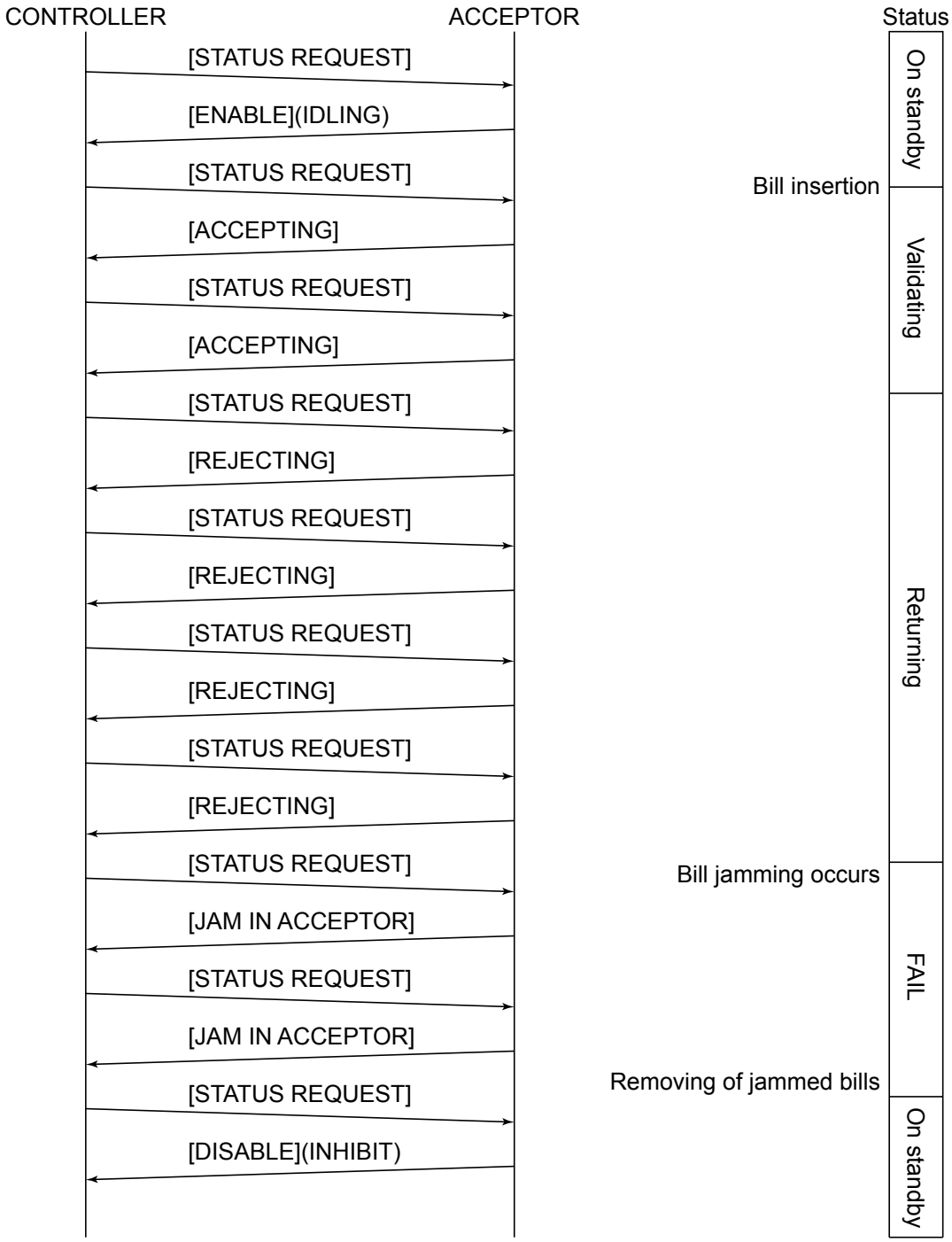


7-6 Stacker full (STACK-1)



* Releasing method of [STACKER FULL] status differsby model.

7-7 Bill jamming at the time of returning



WORLD BILL ACCEPTOR

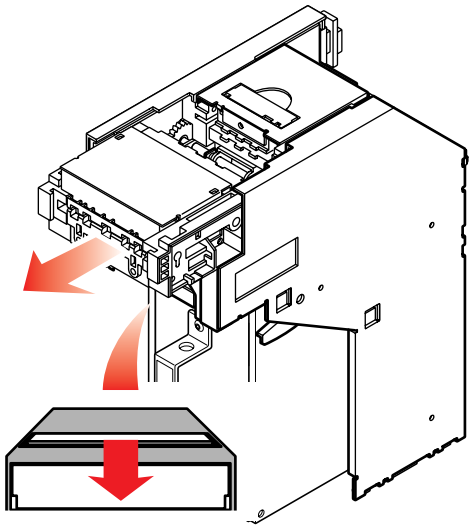
WBA-12-SS
WBA-13-SS
WBA-22-SS
WBA-23-SS
WBA-24-SS2
WBA-25-SS2

Disassembly and Assembly

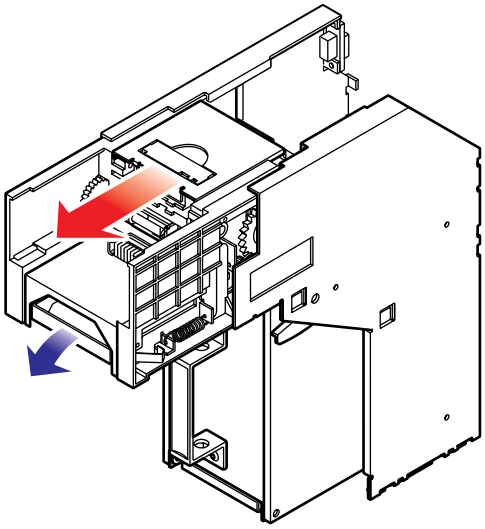
Contents

1 Disassembly of Unit

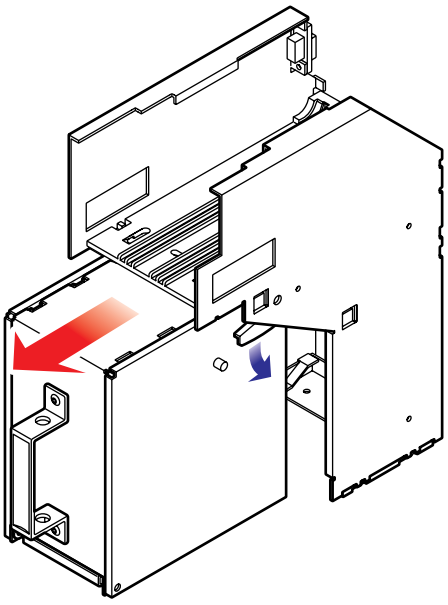
1. Pull down the acceptor head release lever to pull out the acceptor head.



2. Pull down the transfer unit release lever and pull out the transfer unit.



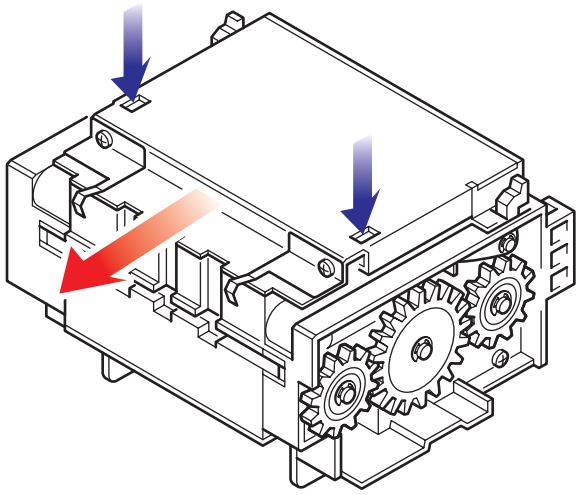
3. Press down the cash box release lever to pull out the cash box.



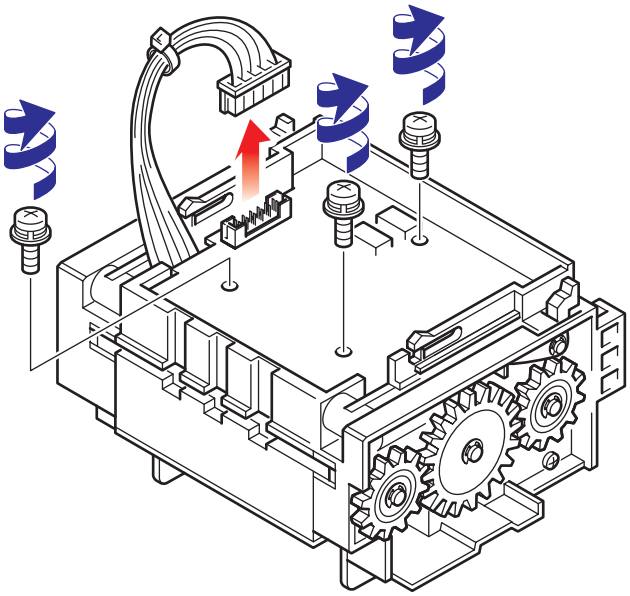
2 Disassembly of Validator Unit

1. Removing the upper sensor board

(1) While pushing down latches using a small screwdriver, slide the metal cover off. The latches are located inside recess on the metal cover (2 locations).

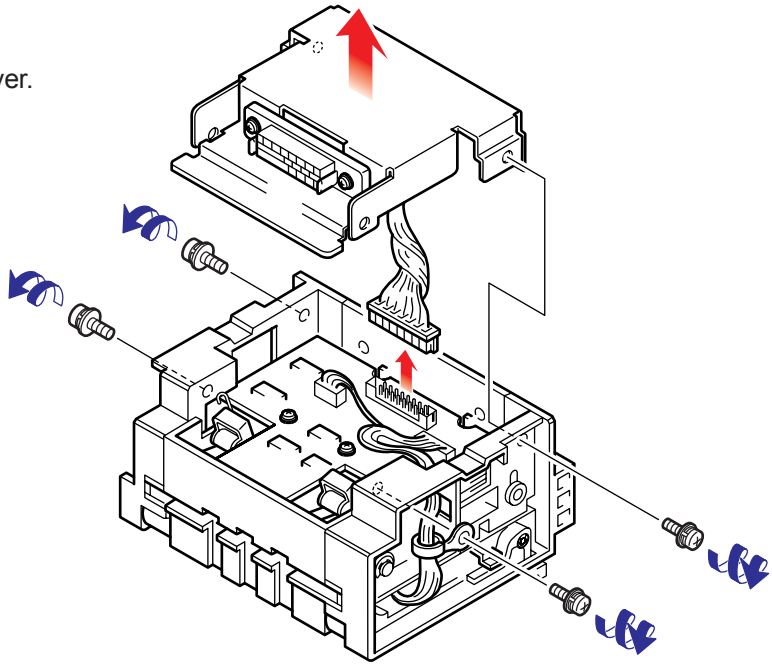


(2) Disconnect the harness from the sensor board and remove 3 screws to remove the sensor board.

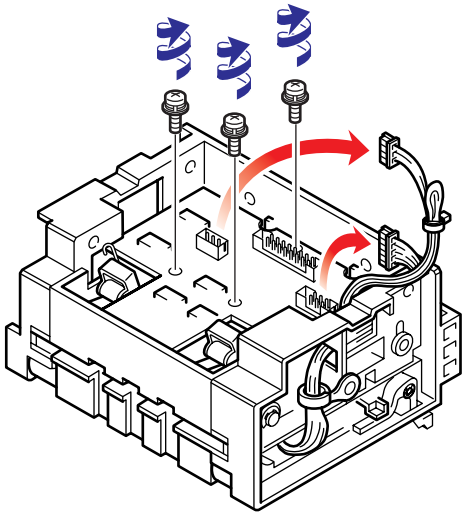


2. Removing the lower sensor board

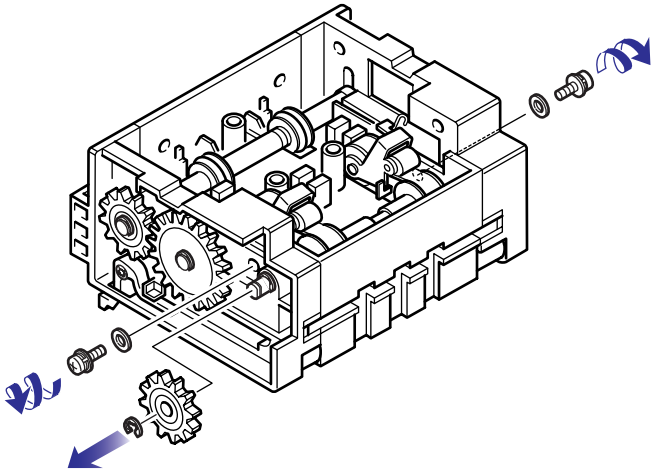
(1) Remove 4 screws on each side and disconnect the harness to remove the cover.



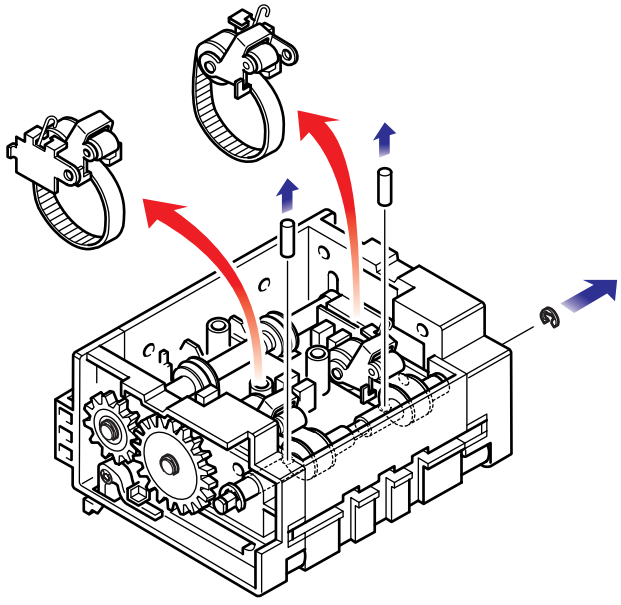
(2) Remove 3 screws securing the lower sensor board and remove the sensor board.



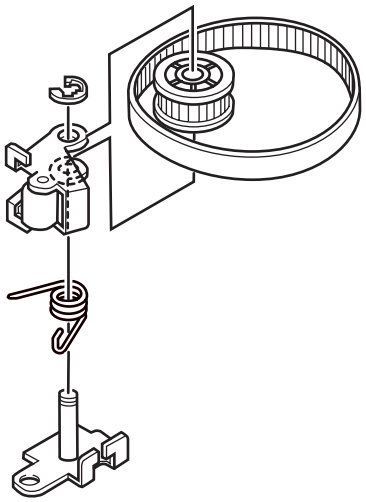
(3) Remove the E-ring from the shaft and remove the gear. Remove 2 screws and 2 washers which secure the belt tension assembly on both sides.



(4) Remove the E-ring from the shaft and shift the shaft toward the opposite side. At this time, two pins which fix the gear will pop up. Remove these pins. Pull out the shaft completely and remove the 2 belt tension assembly units.



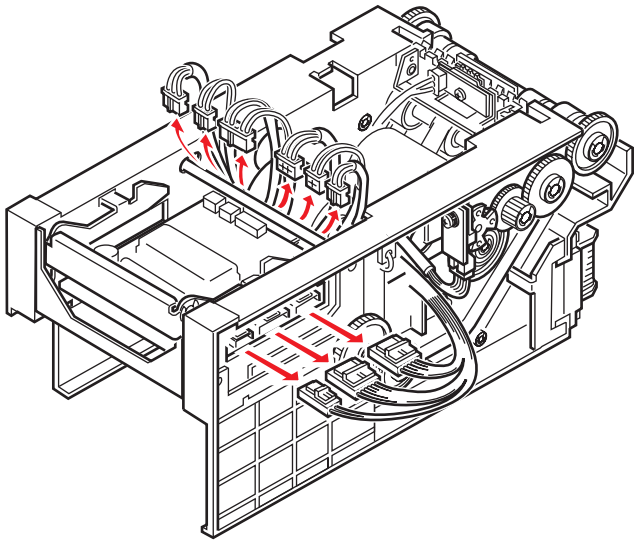
(5) Remove the E-ring and disassemble the unit into belts, tension rollers, pulleys, tension springs, and shaft.



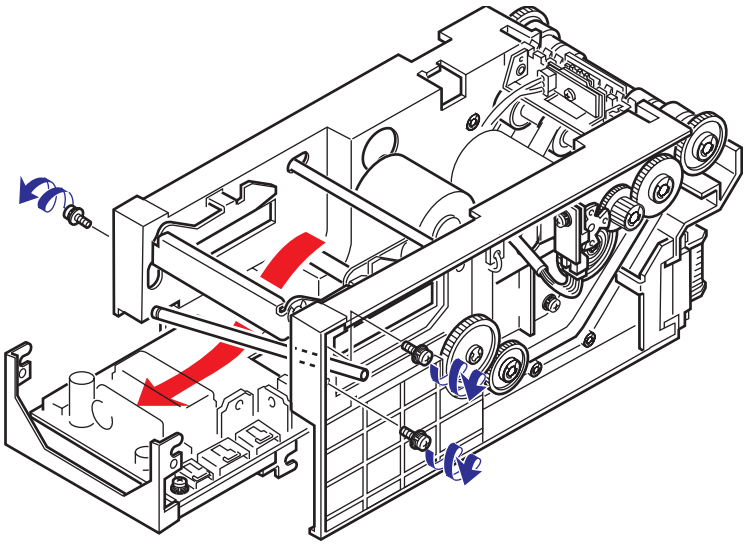
3. Disassembly of Transport Unit

1. Removing the CPU board assembly

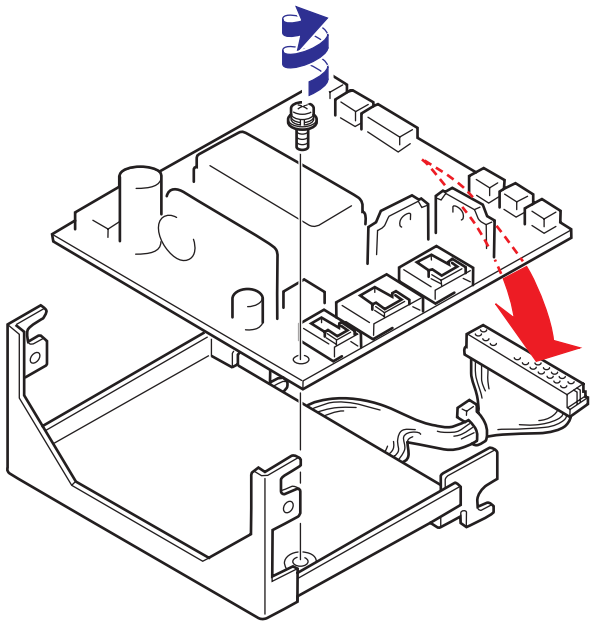
(1) Disconnect 9 connectors from the CPU board.



(2) Remove 2 screws securing the CPU board assembly on both sides and remove 1 screw from the validator catch to remove the beam. Then, pull out the CPU board.

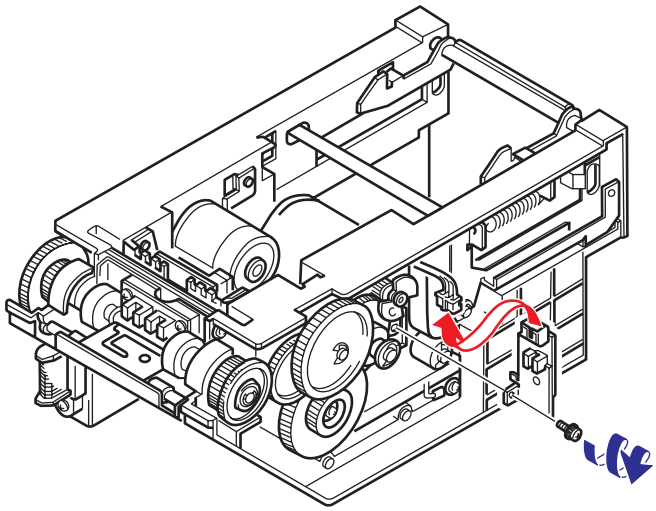


(3) Remove 1 screw from the CPU board and disconnect the harness to the underside of the board.

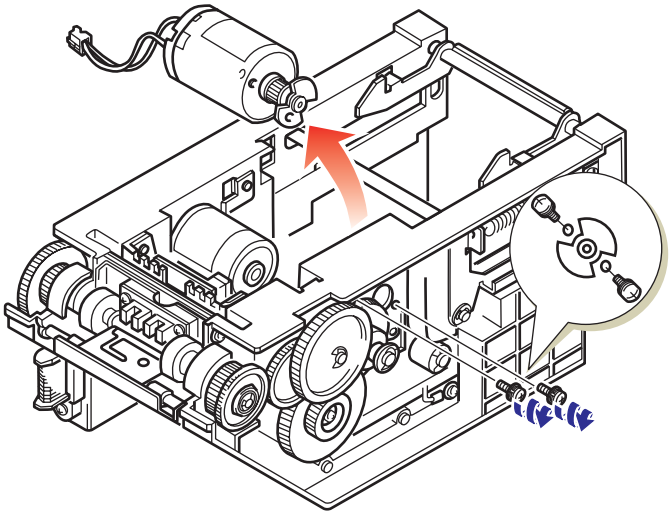


2. Removing the stack motor and encoder sensor board

(1) Remove 1 mounting screw of the encoder sensor board and pull out the encoder sensor board. Then, disconnect the harness of the encoder sensor board.

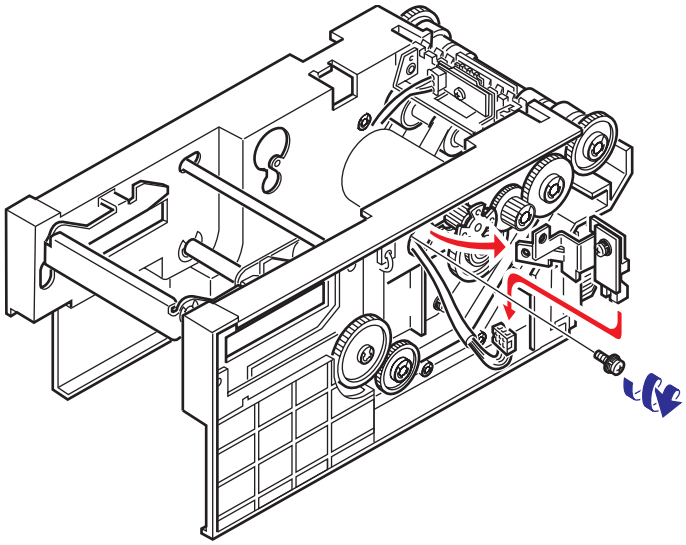


(2) Insert a screwdriver into the notch of the stack motor encoder and remove 2 mounting screws to remove the motor.

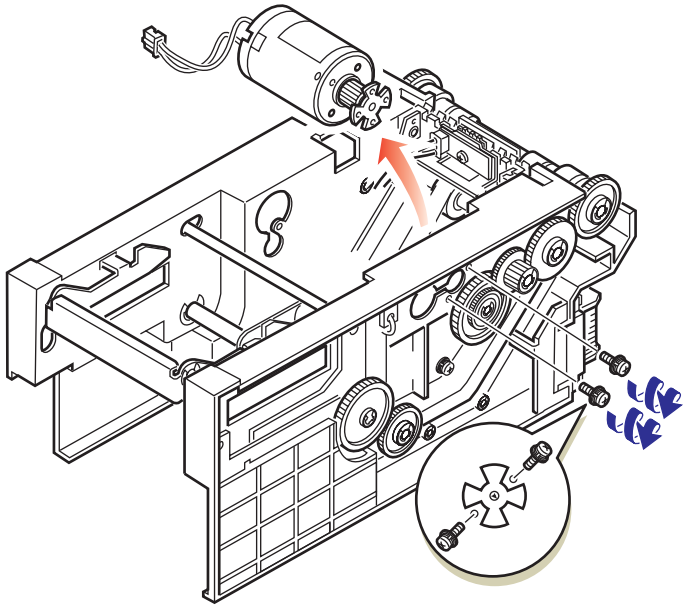


3. Removing the driving motor, encoder sensor board, and lever sensor board

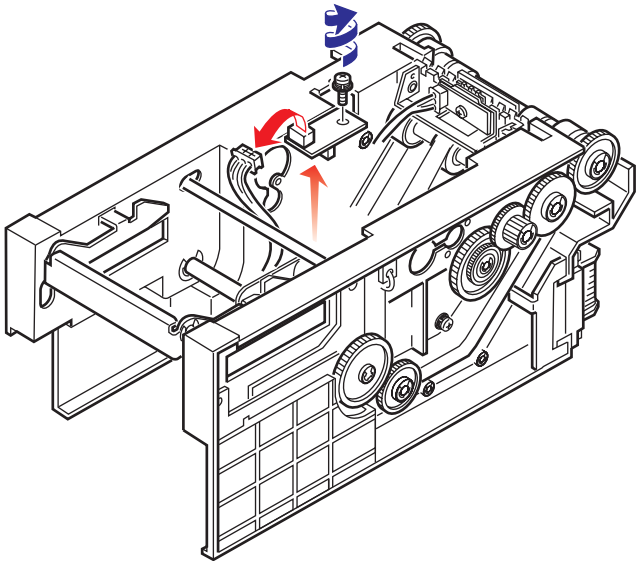
(1) Remove 1 mounting screw of the encoder sensor board and pull out the encoder sensor board. Disconnect the harness on the encoder sensor board.



(2) Insert the screwdriver into the notch of the driving motor encoder and remove 2 mounting screws to remove the motor.

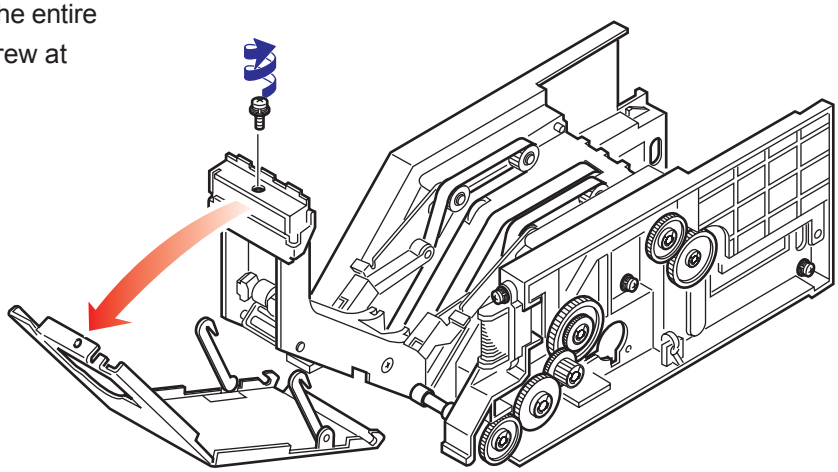


(3) Remove 1 screw and disconnect the harness to remove the lever sensor board.

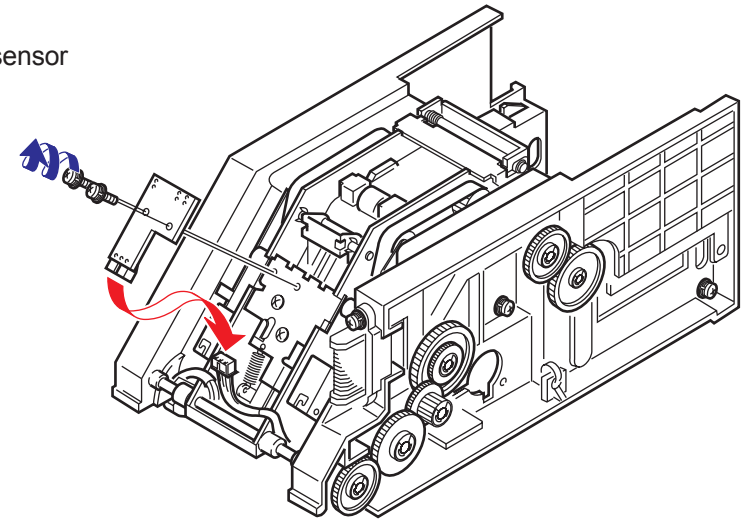


4. Removing the solenoid lever assembly and solenoid lever sensor board

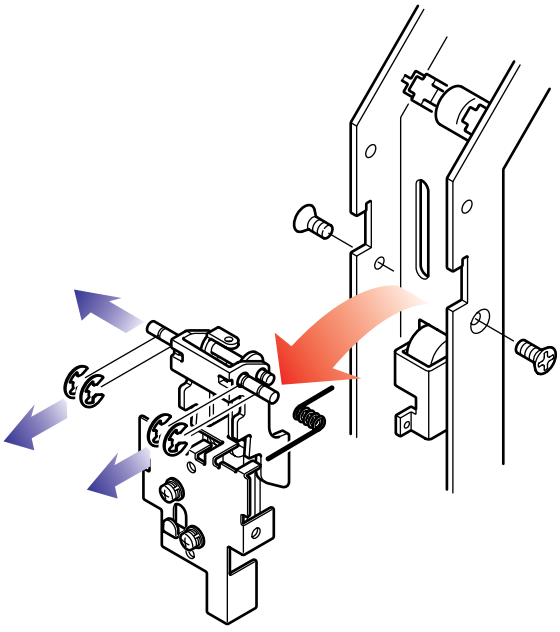
(1) Pull out the latch lever and pull up the entire solenoid lever cover. Remove 1 screw at the tip to remove the TR cover.



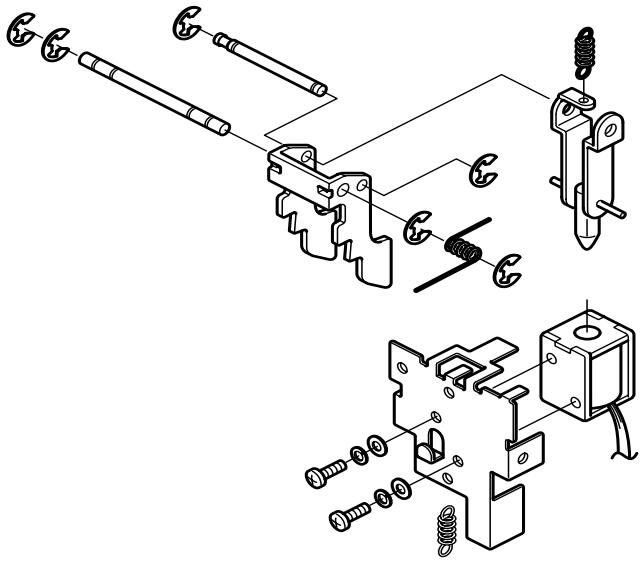
(2) Remove 2 screws and disconnect the harness to remove the solenoid lever sensor board.



(3) Remove the spring at the lower portion of the solenoid lever assembly. Remove 2 screws on both sides and 4 E-rings, and pull out the shaft to remove the solenoid lever assembly.

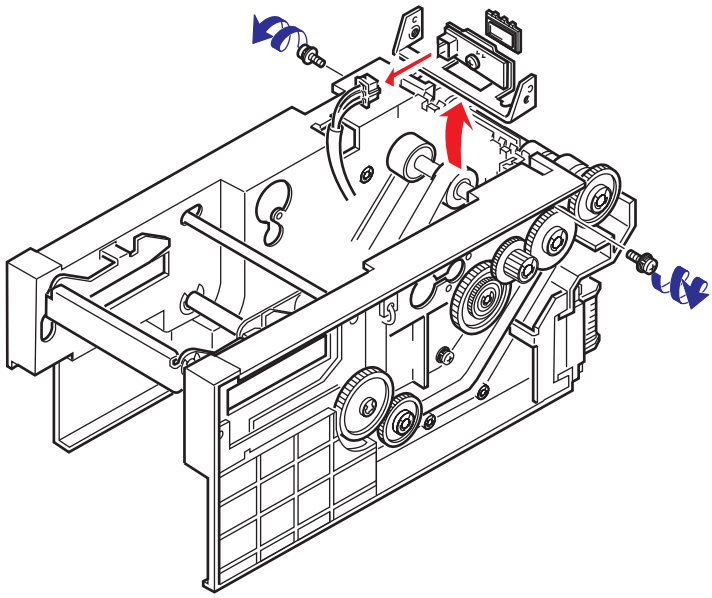


(4) Disassembly diagram of solenoid lever assembly.

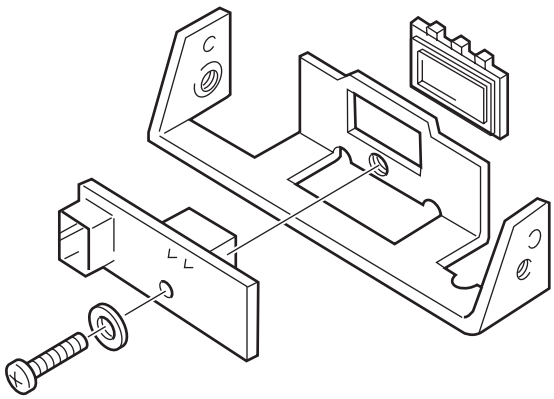


5. Removing the feed-out sensor board assembly

(1) Remove 2 screws, one each side, and disconnect the harness to remove the feed-out sensor board.

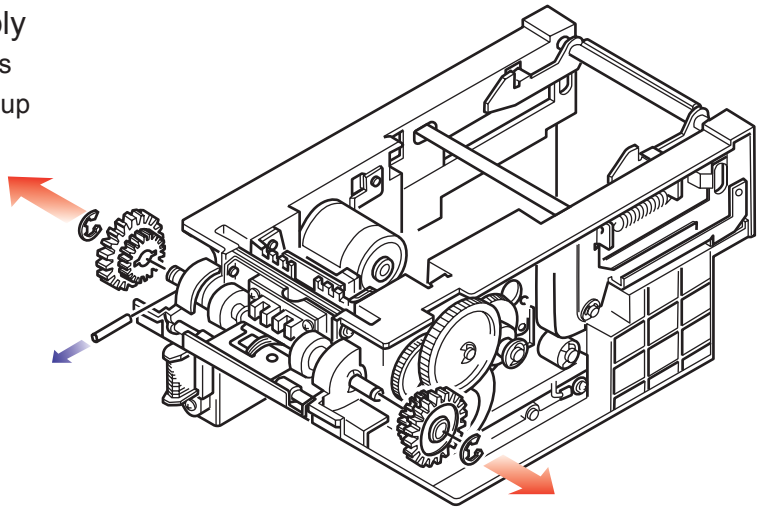


(2) Disassembly diagram of feed-out sensor board assembly.

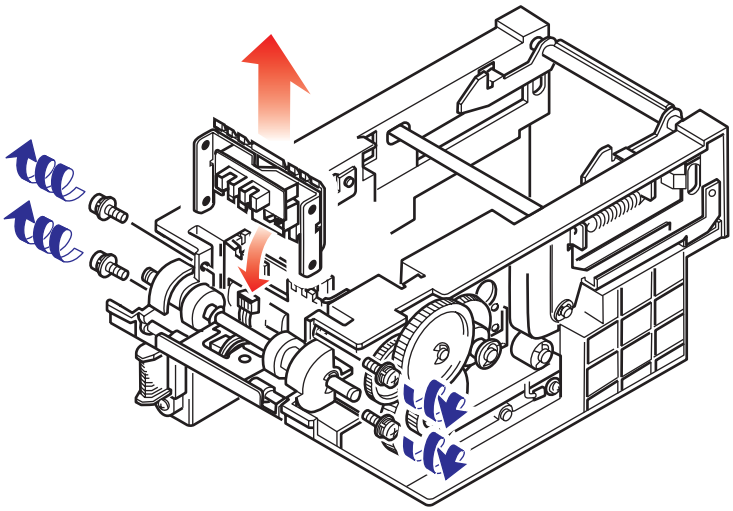


6. Removing the upper timing belt and home position sensor board assembly

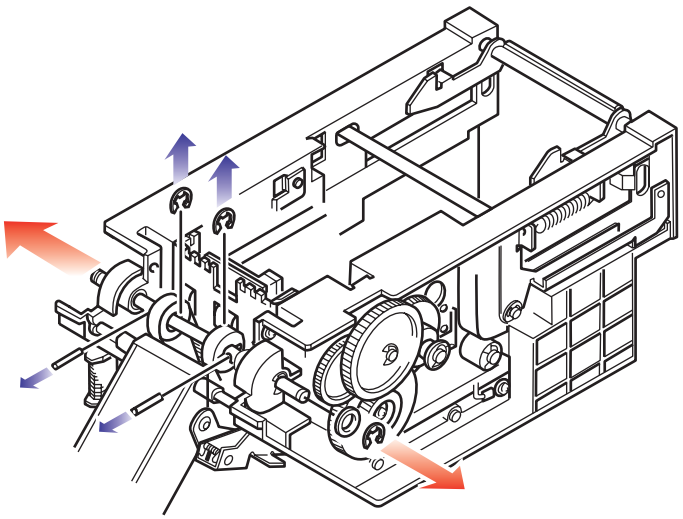
(1) Remove the E-ring and remove the gears on both sides. At this time, a pin will pop-up from the left gear. Remove this pin.



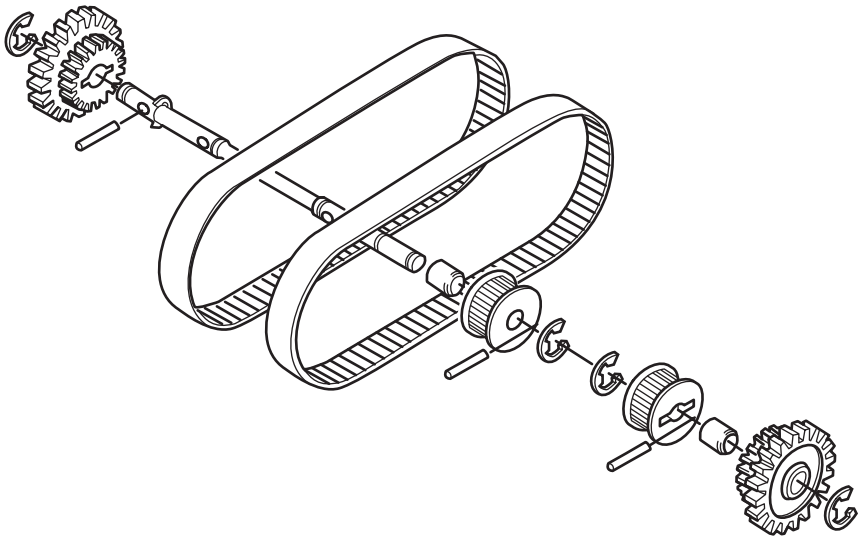
(2) Remove 4 screws, 2 each side, and pull out the home position sensor board to disconnect the harness.



(3) Remove 3 E-rings and a washer. Next, shift the timing belt wheel toward the inner side and pull out 2 pins. The shaft can be removed from the left side. Remove the timing belt.

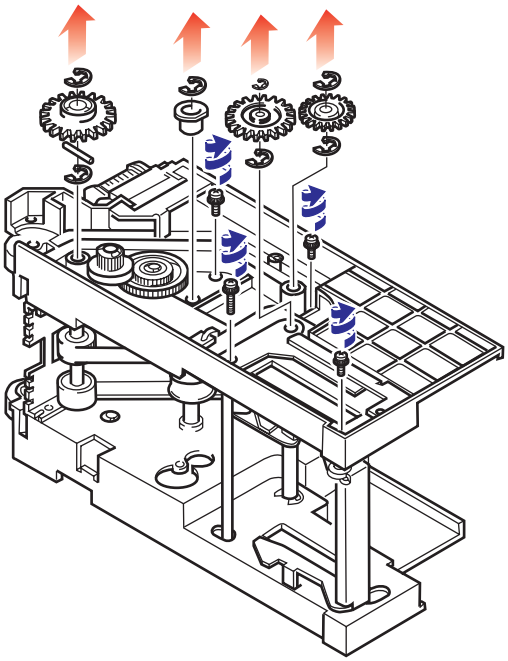


(4) Disassembly diagram of shaft

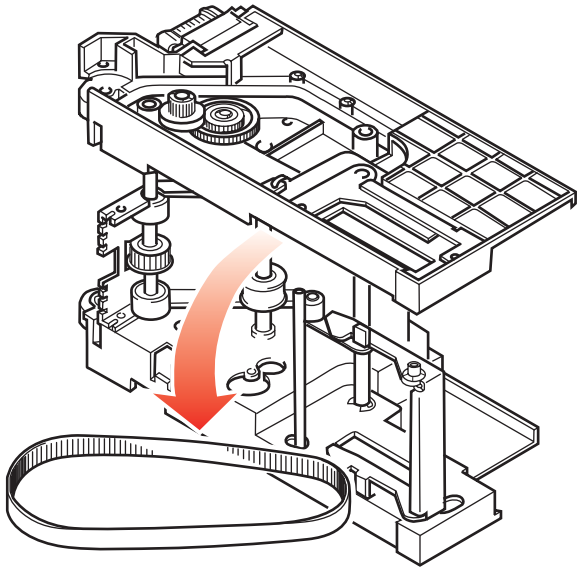


7. Removing the lower timing belt

(1) Remove 7 E-rings. 3 gears, 1 pin, and 4 screws.



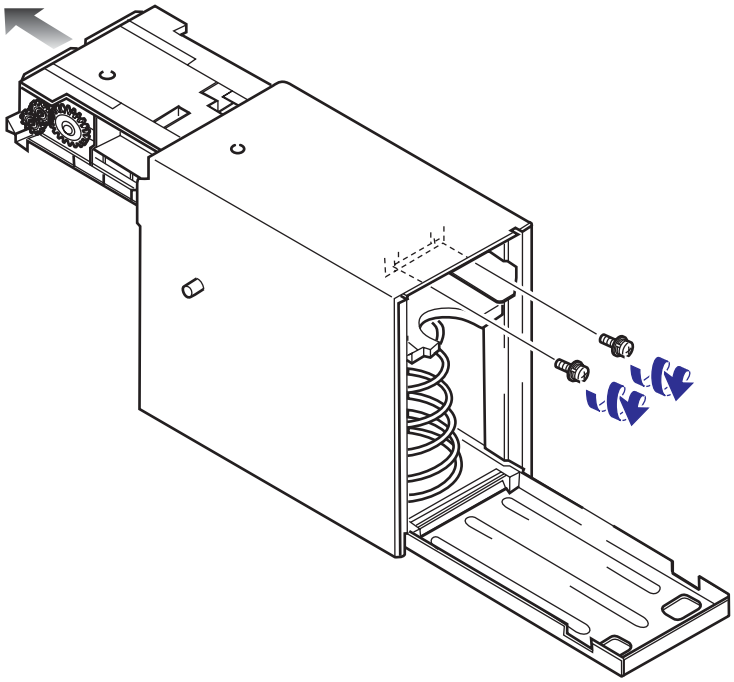
(2) Separate the transfer unit to remove the timing belt.



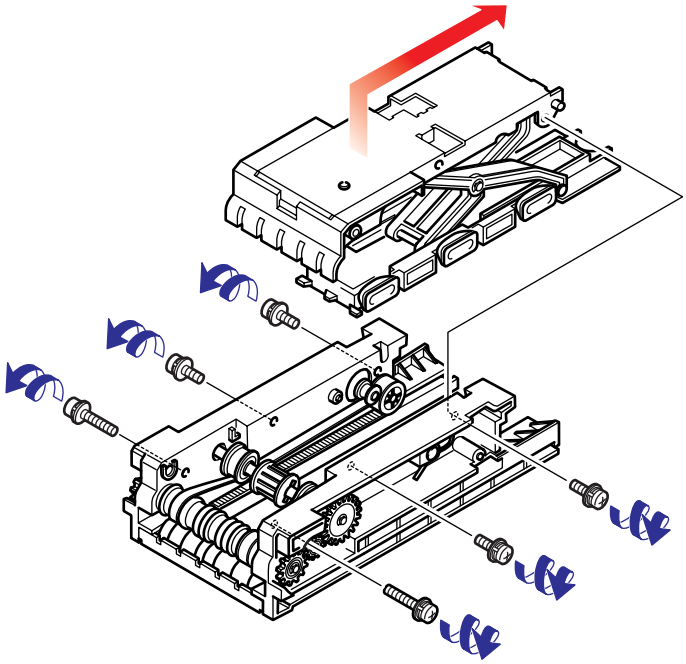
4 Disassembly of Cash Box

1. Removing the pusher mechanism unit

(1) Remove 2 screws and pull out the pusher mechanism unit.

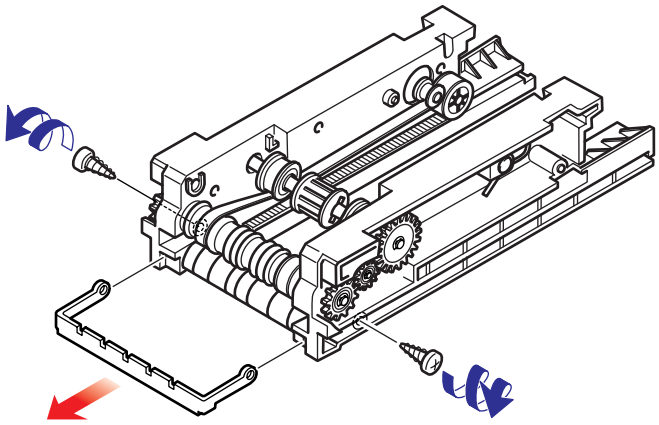


(2) Remove 6 screws on both sides to remove the pusher mechanism.

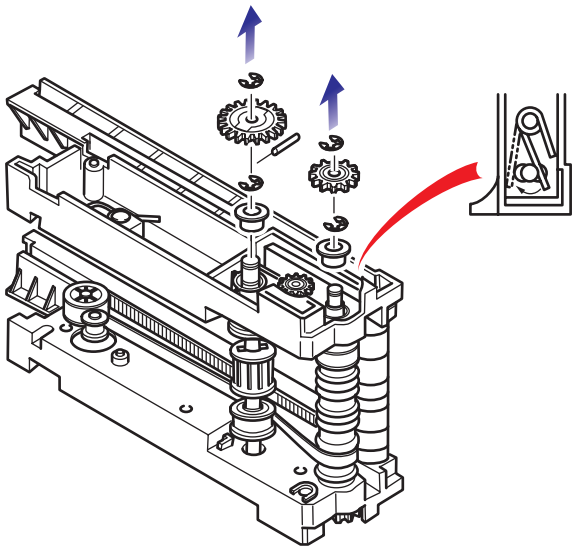


2. Removing the timing belt

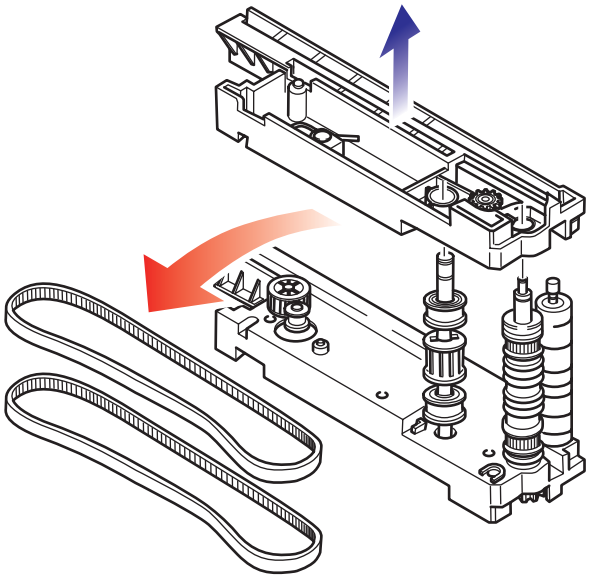
(1) Remove 2 screws on both sides to remove the coupling bracket.



(2) Remove 4 E-rings, 2 gears, 1 pin, and 2 bearings to remove the spring fixed on the shaft.



(3) Separate the pusher mechanism to remove the timing belt.



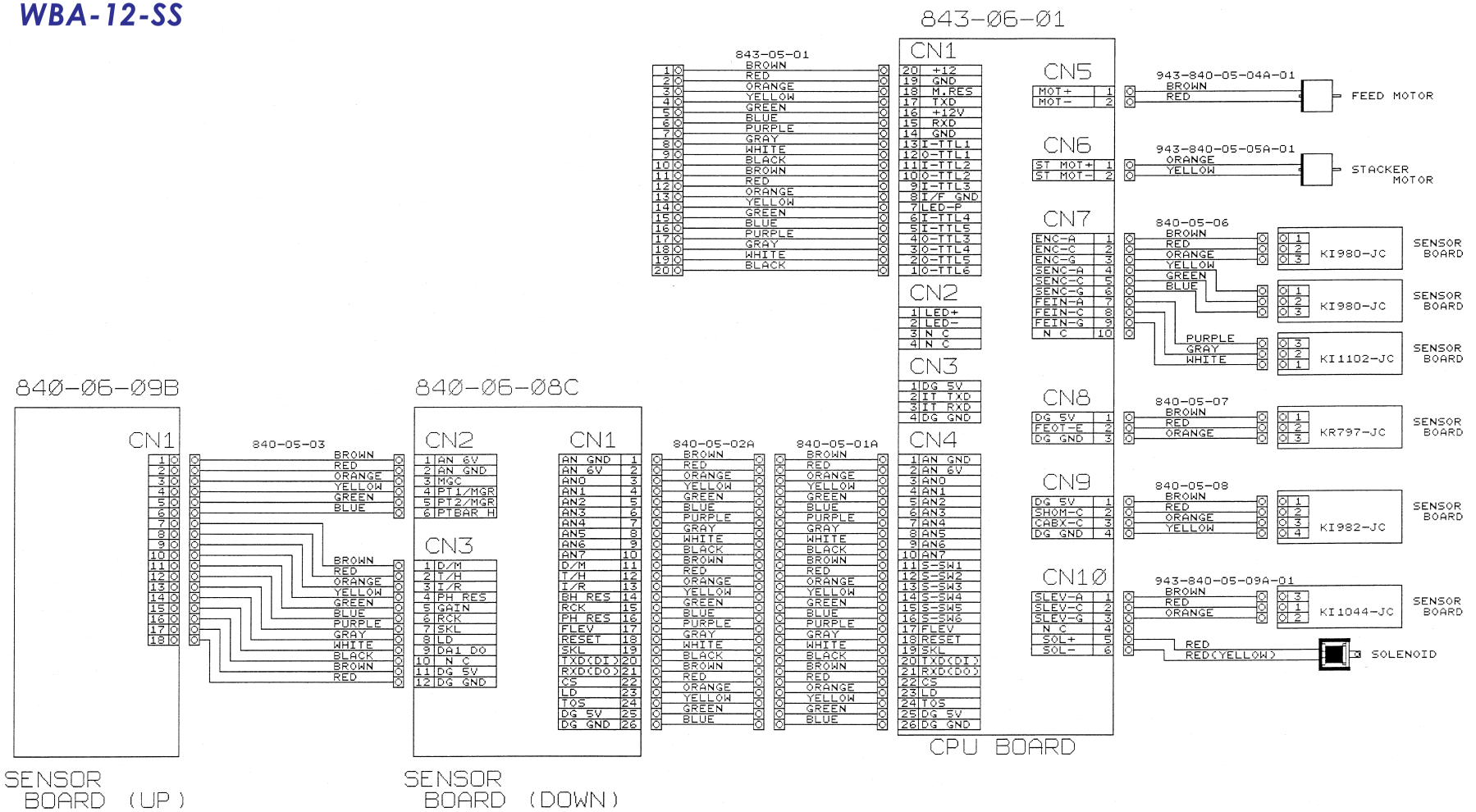
WORLD BILL ACCEPTOR

WBA-12-SS
WBA-13-SS
WBA-22-SS
WBA-23-SS
WBA-24-SS2
WBA-25-SS2

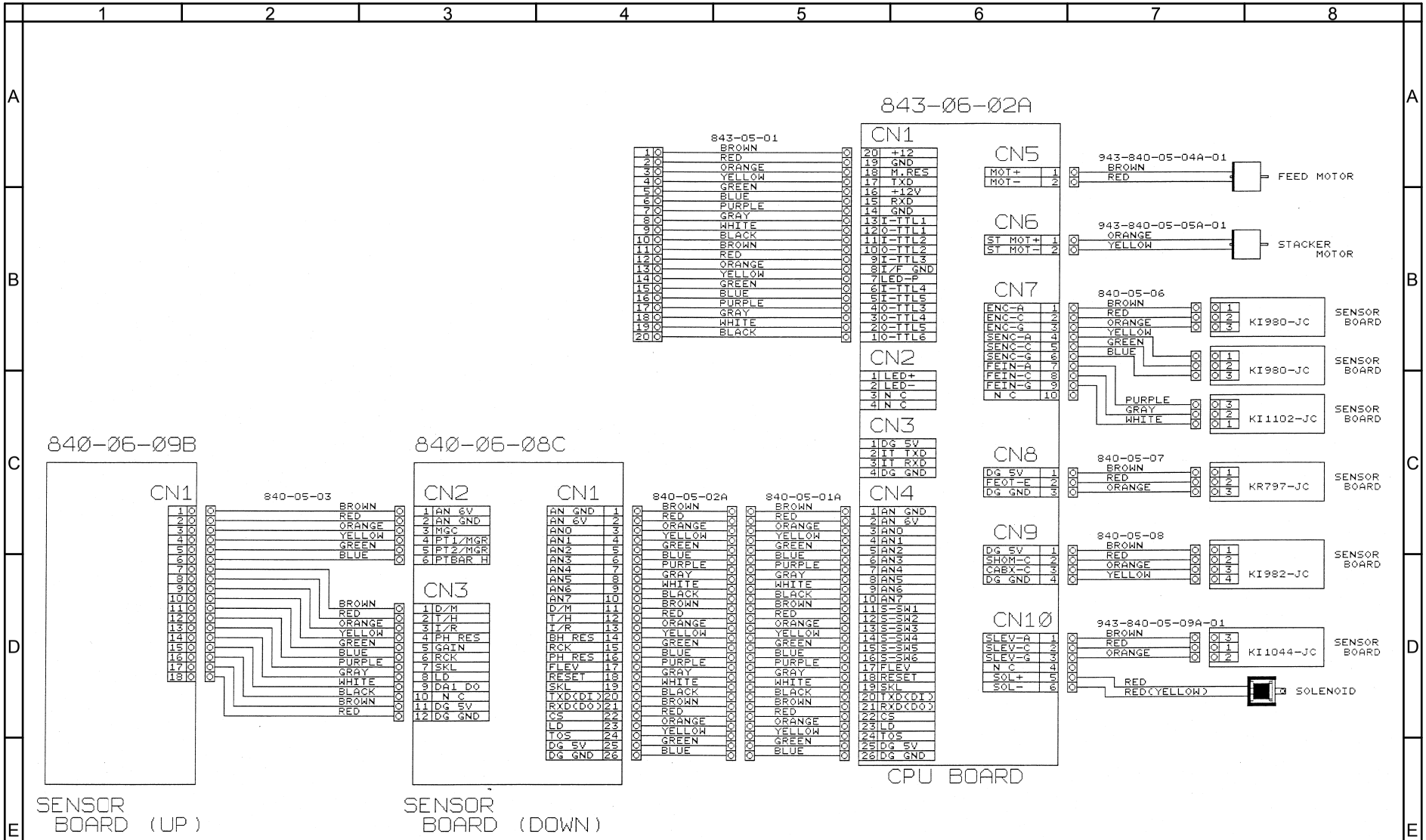
Wiring Diagram

Contents

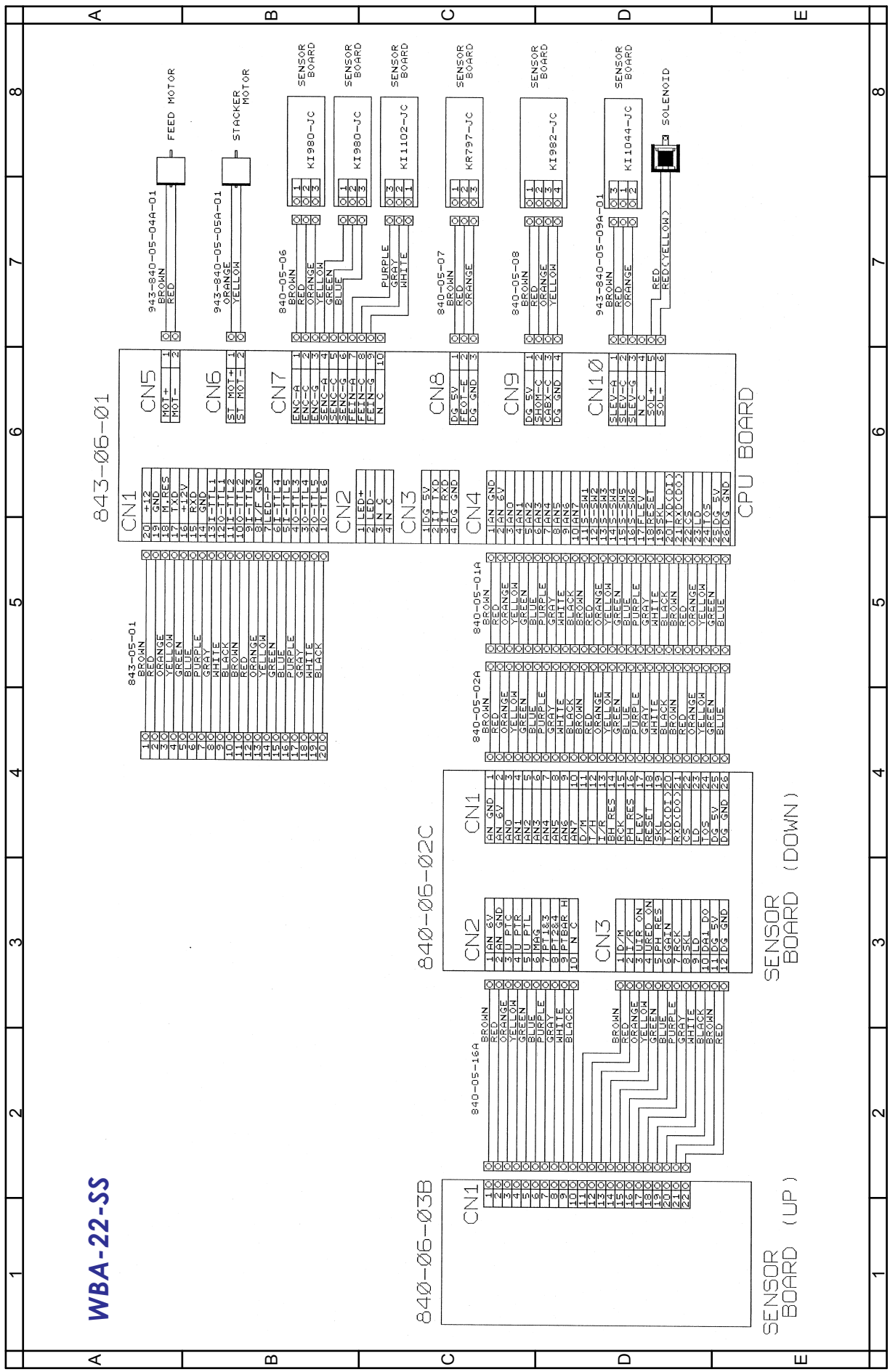
WBA-12-SS

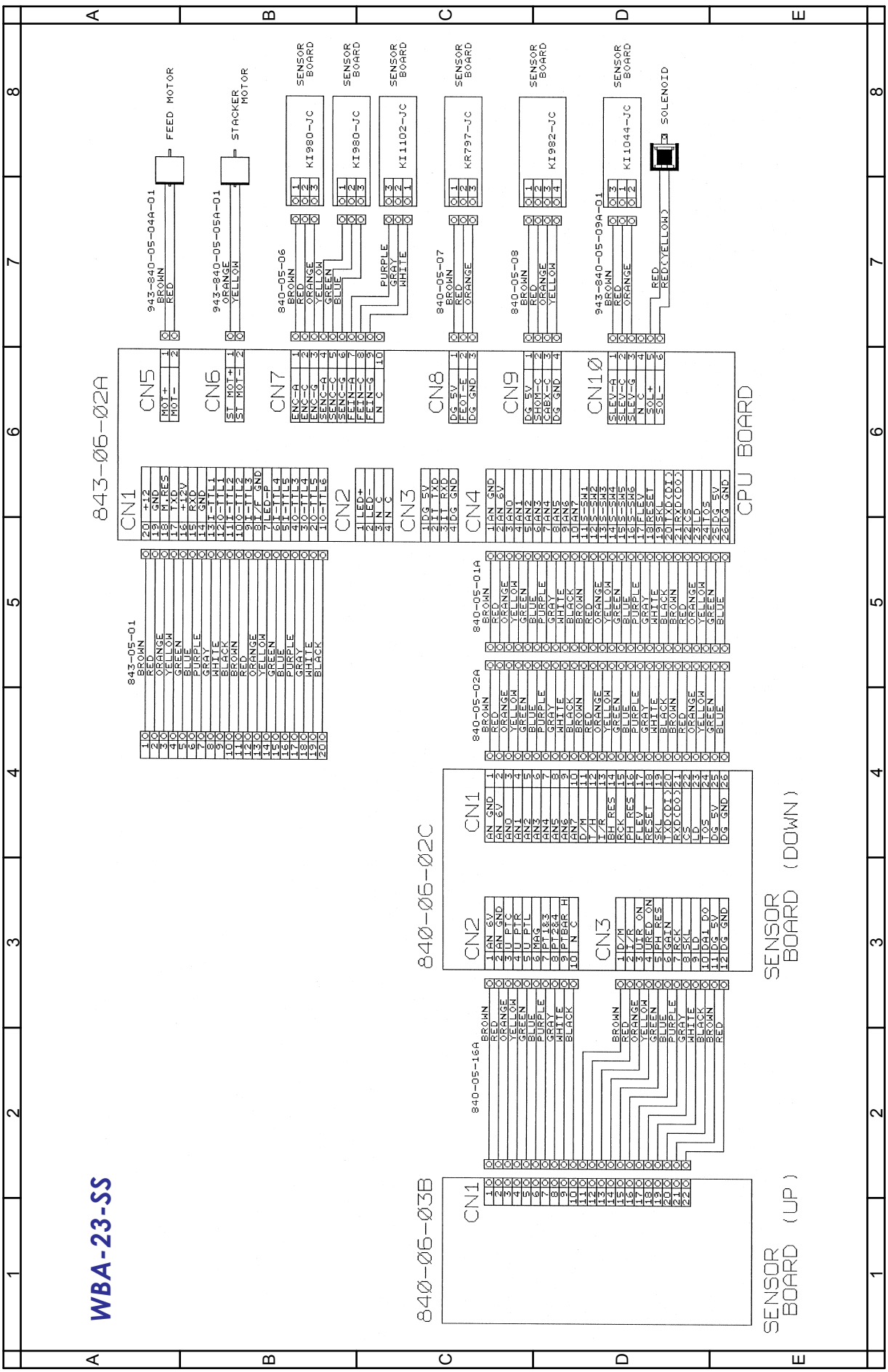


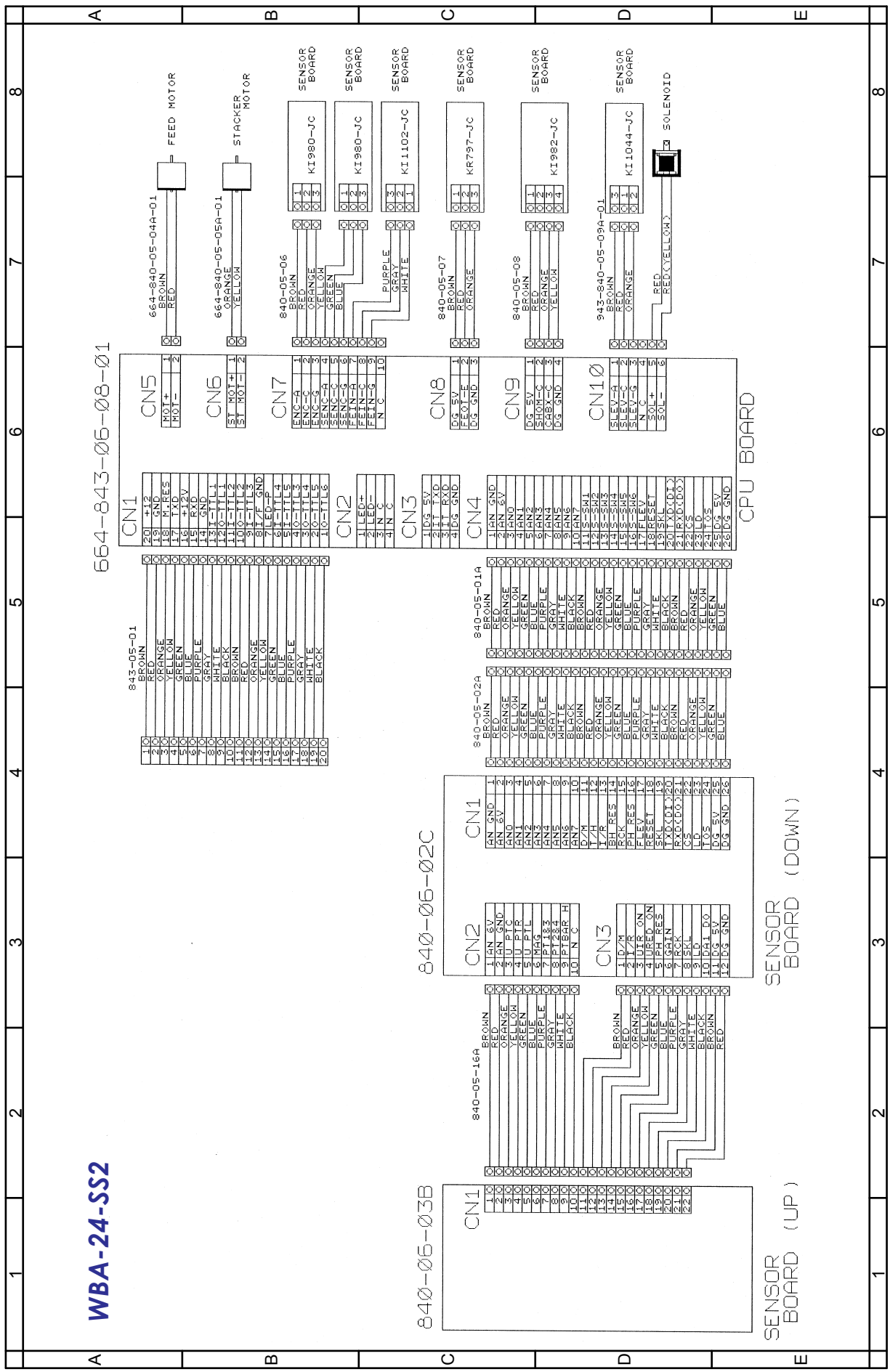
WIRING DIAGRAM

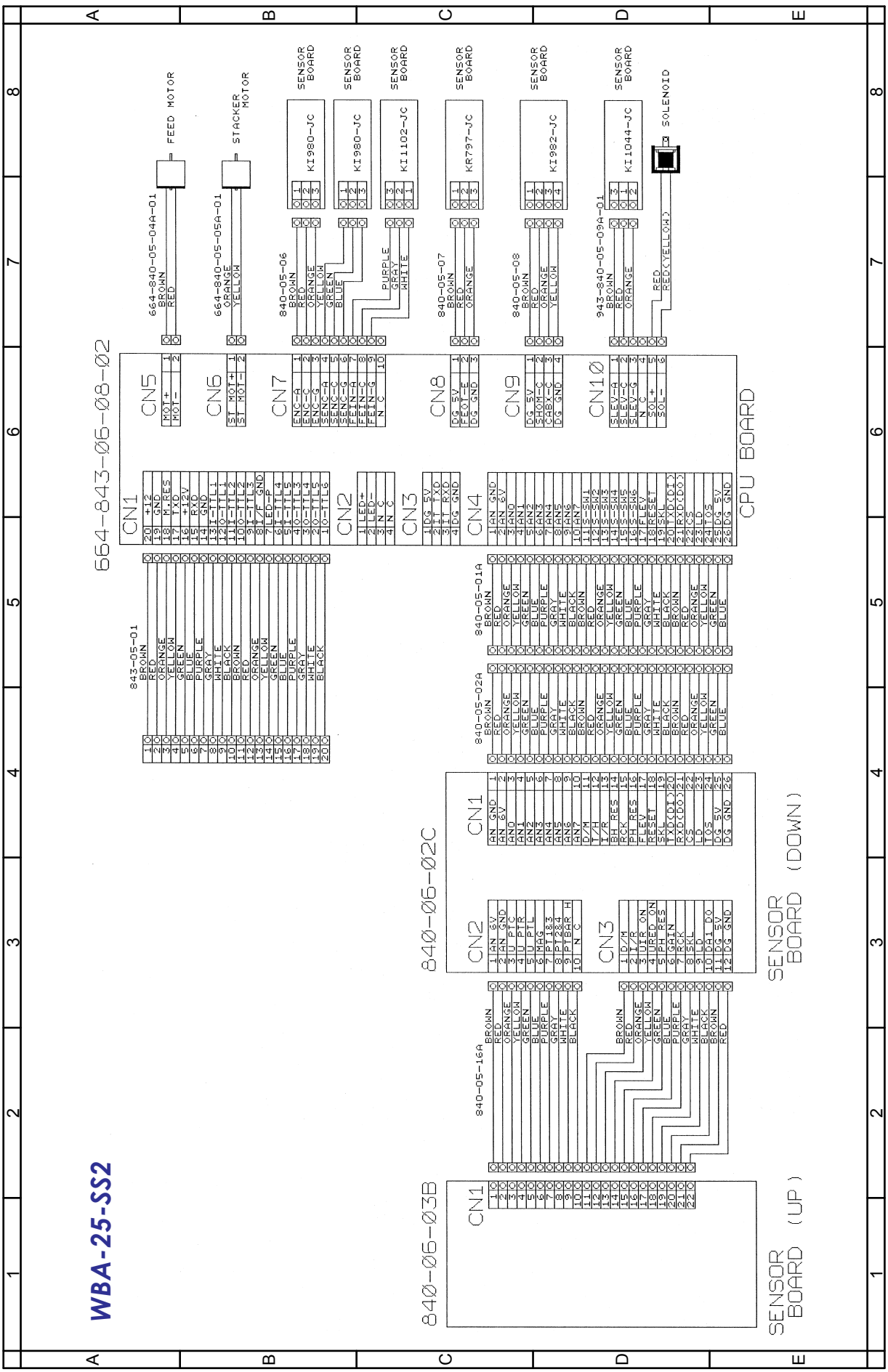


WIRING DIAGRAM


WBA-22-SS
843-06-01
CPU BOARD
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
FEED MOTOR
STACKER MOTOR
SOLENOID
SENSOR BOARD
840-06-02C
840-06-03B
SENSOR BOARD (DOWN)
SENSOR BOARD (UP)


WBA-23-SS
843-06-02A
CPU BOARD
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
FEED MOTOR
STACKER MOTOR
SOLENOID
SENSOR BOARD
KI980-JC
KI1102-JC
KR797-JC
KI982-JC
KI1044-JC
840-06-03B
840-06-02C
SENSOR BOARD (UP)
SENSOR BOARD (DOWN)


WBA-24-SS2
664-843-06-08-01
CPU BOARD
FEED MOTOR
STACKER MOTOR
SOLENOID
SENSOR BOARD
KI980-JC
KI1102-JC
KR797-JC
KI982-JC
KI1044-JC
840-06-02C
840-06-03B
SENSOR BOARD (DOWN)
SENSOR BOARD (UP)


WBA-25-SS2
664-843-06-08-02
CPU BOARD
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
FEED MOTOR
STACKER MOTOR
SOLENOID
SENSOR BOARD
KI980-JC
KI1102-JC
KR797-JC
KI982-JC
KI1044-JC
840-06-02C
840-06-03B
SENSOR BOARD (DOWN)
SENSOR BOARD (UP)

WORLD BILL ACCEPTOR

WBA-12-SS
WBA-13-SS
WBA-22-SS
WBA-23-SS
WBA-24-SS2
WBA-25-SS2

Trouble Shooting

[INTRODUCTION]

Most failures in the acceptor occur due to a minor cause. It is important to check that the connector is properly connected and that the harness is not disconnected, before replacing parts.

Poorly accepting of bills by the acceptor is often due to a fact that iron content adheres to the magnetic head or the magnetic head roller. Therefore the acceptor should be cleaned.

To determine the cause of the failure and fine defective parts, it is important to observe in detail the operating state of the acceptor when the power is turned on.

The use of the test mode of WBA also allows the cause of the failure to be checked.

When the acceptor head has been disassembled to repair or when the sensor board has been replaced, the sensor should be adjusted.

The repair should be performed referring to the adjustment manual, the wiring diagram and the disassembling procedures.

[CLASSIFICATION OF FAILURE]

The cause of failure can be broadly classified into the following four failures. Check the operating state.

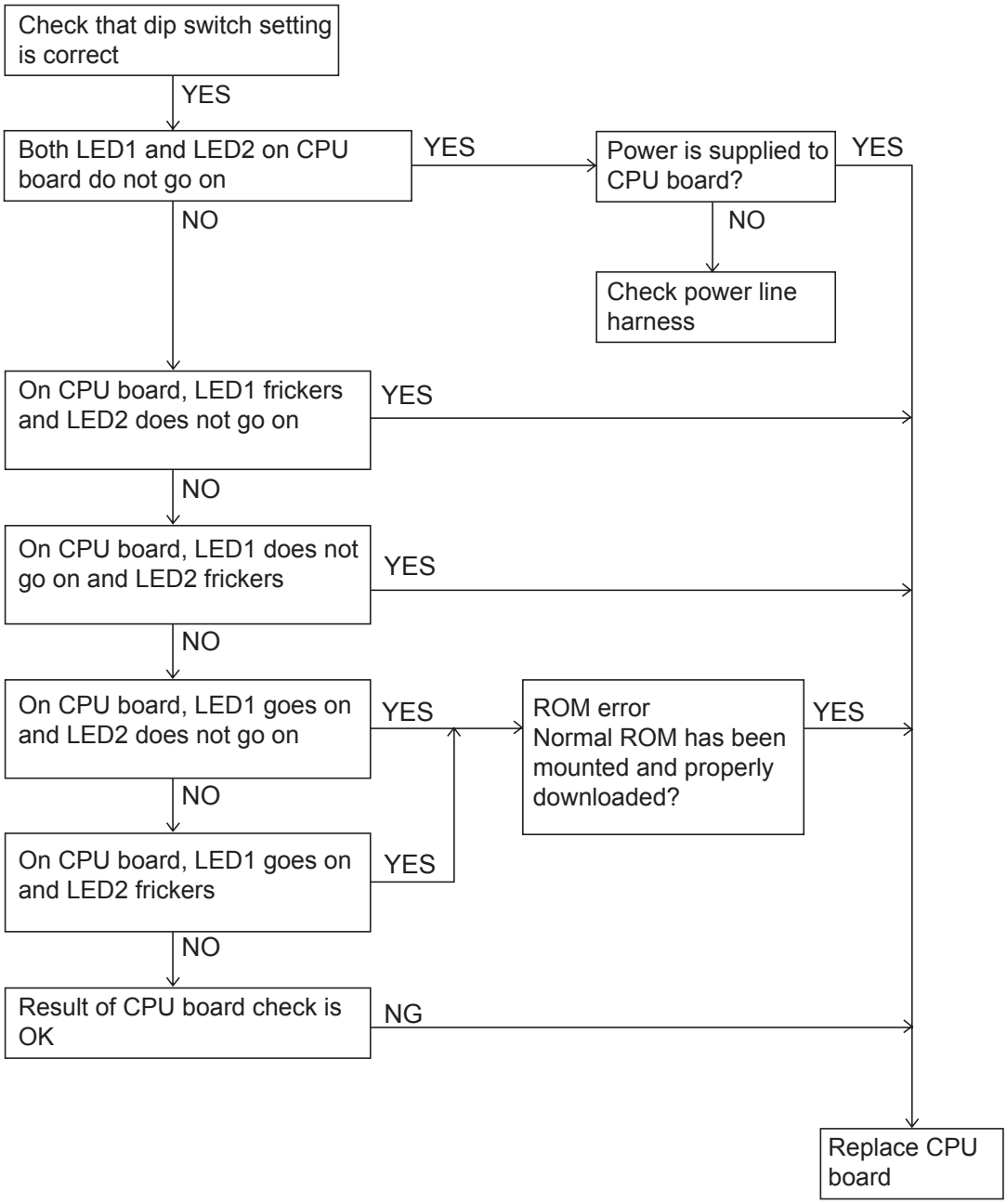
(1) Test mode fails to be entered.

(2) Initial operation is error.

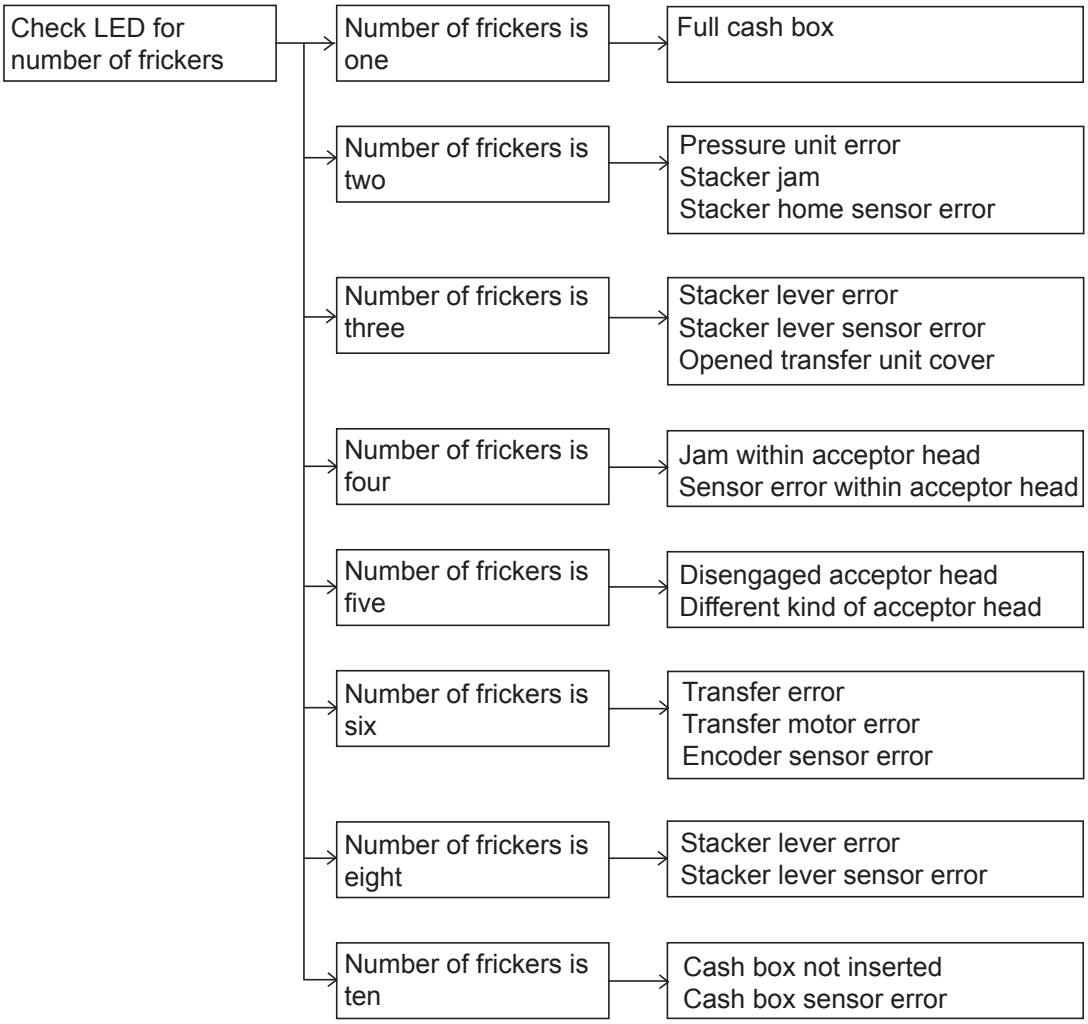
(3) Bills are rejected or poorly accepted.

(4) Bills are transferred not smoothly.

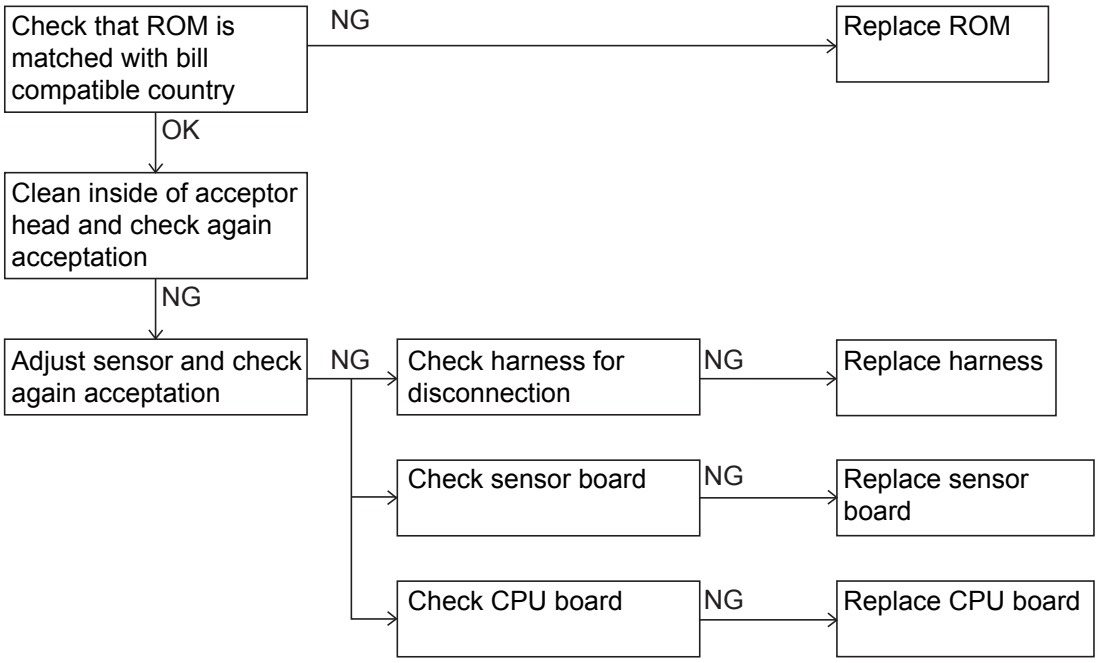
(1) Test mode fails to be entered



(2) Initial operation is error



(3) Bills are rejected or poorly accepted



(4) Bills are transferred not smoothly