Chapter 7 Electricity

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7-1. Main control circuits

7-1-1. Toner density control

1. Toner density detection

The TNS signal detected by the toner sensor is relayed by the high voltage unit (UNIT HV) and connected to CN191-20 on the main CB (UNIT MAIN). After the TNS signal is changed to a partial voltage (TNS! signal) by the registance in the main CB, it is input into the IC121 (CPU) pin No. 77. The TNS! signal can be measured with the test point (TP103).

⚠1 2. Toner motor drive control

As the toner is consumed and the toner density becomes lighter than the optimum density, the TSM signal is output (HIGH -> LOW) from the IC121 No. 23 pin. The drive circuit in the high voltage PCB (UNIT HV) is activated to rotate the toner motor (pulse motor) and supply the toner.

Supply time: 3.5 sec.

⚠1 3. Forced toner supply mode

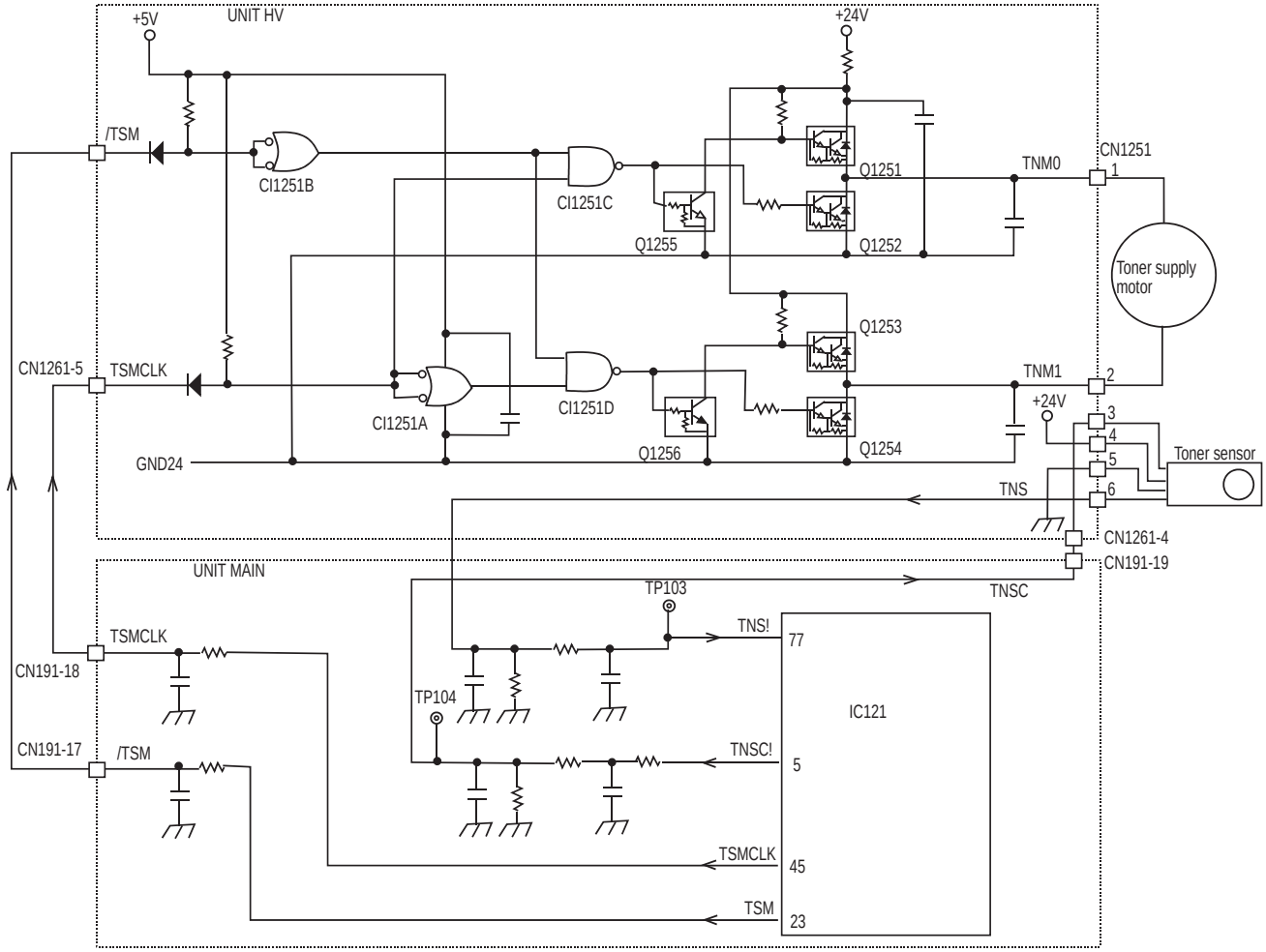
If the toner sensor detects a light density 1% less than the optimum density three times in succession, this unit will stop the copy operation, and forcibly supply toner. During this mode's operation, P25 will display (forcibly supplying toner).time: Max. 250 sec.

When the toner density is recovered (6.5%), the stopped copy job will automatically resume. However, if the density is not recovered, P25 will blink (toner empty), and after 30 copies, the copy operation will stop.

4. Initialization of developing unit

When the unit's power is turned on in the unused state (when installed), P26 will light (developer not initialized), and the standby state will not be entered. This is so that the compensation voltage TNSC signal (analog voltage) applied on the toner sensor can be calculated beforehand so that the TNS signal will become the reference voltage in the new developer (unused) state. When the initialization operation (user mode C-51) is carried out, the detected compensation data will be saved in the main PCB's EEPROM (IC123). (Note: The developing unit must be initialized also when it has been replaced.)

Initialization time: 6 min. (3 min. agitation + 3 min. reading & compensation data registration)



7-1-2 Fusing temperature control

The surface temperature of the heat roller is detected with a thermistor, and is kept to a constant optimum temperature (188ºC) by turning the fusing heater ON and OFF with the SSR circuit on the power supply PCB (UNIT PSU).

⚠1 **1. Temperature detection**

The temperature detection thermistor is contacted against the surface of the heat roller. The resistance value changes according to the temperature.

Low temperature (20ºC) : 95KΩ~145KΩ

Optimum temperature (188ºC) : 0.9KΩ~1.0KΩ

The FUTHM signal detected by the thermistor is relayed by the power supply PCB (UNIT PSU), and connected to CN151-B12 in the main PCB (UNIT MAIN). The signal is changed to a partial pressure (TEMP signal) by the registance in the main PCB. The TEMP signal is changed into a further partial voltage(FU TEMP signal) by the registance, and input into the IC121 (CPU) pin No. 76. The TEMP signal is approx. 4.14V at the optimum temperature (standard 188ºC), and can be measured with the test point (TP102).

2. Error detection

The TEMP signal is used also to monitor for thermistor errors. If an overheat (FUOVH) or thermistor open (FUTHOPN) is detected, the heater power is cut off by the safety circuit. If a fault (hardware circuit fault or software hang up) that causes the fusing heater to remain lit occurs, the thermostat connected in series to the fusing heater operates and cuts off the heater power.

(F34: High temperature error, F35: Low temperature error, F36: Thermistor error -> Must be released with service mode 25-47)

3. SSR circuit

If the fusing temperature drops below the optimum temperature (188ºC), the SSR signal (LOW-> HIGH) is output from the IC121 (CPU) pin No. 32, and reversed (HIGH->LOW) by the IC124. Then, the SSR circuit in the power supply PCB (UNIT PSU) is driven to light the fusing heater.

7-1-3. JAM detection

Paper jams are detected with the JAM1 sensor (photo coupler) installed at the paper feed section and the JAM2 sensor (switch) installed at the paper exit section. The JAM1 sensor is set before the slip roller, and also acts as the manual feed detection sensor.

1. JAM1 sensor

The JAM1 signal (HIGH->LOW when there is paper) output from the JAM1 sensor is relayed by the power supply PCB (UNIT PSU), and is connected to the main PCB (UNIT MAIN) CN151-B1. It is then input into the IC121 (CPU) pin No. 63.

2. JAM2 sensor

The JAM2 signal (HIGH->LOW when there is paper) output from the JAM2 sensor is relayed by the power supply PCB (UNIT PSU), and is connected to the main PCB (UNIT MAIN) CN151-B13. It is then input into the IC121 (CPU) pin No. 64.

3. JAM detection conditions

Display code	Detection conditions	Unit operation
J11	* Paper was incorrectly fed from unit standard cassette (upper cassette). * Paper did not reach the JAM1 sensor within 1.3 sec. after the upper cassette paper feed solenoid turned ON.	* Operation stops after the previous paper is exited.
J12	* Paper was incorrectly fed from option cassette feeder (lower cassette). * Paper did not reach the JAM1 sensor within 3.21 sec. after the lower cassette paper feed solenoid turned ON.	* Operation stops after the previous paper is exited.
J16	* There was paper on the JAM1 sensor when the power was turned ON or the upper cover closed.	* Instantaneous stop * Fusing heater turns OFF.
J31	* The JAM2 sensor did not turn ON within 2.85 to 3.54 sec. after the regist clutch turned ON.	* Instantaneous stop * Fusing heater turns OFF.
J32	* The JAM2 sensor did not turn OFF within 2.85 to 3.54 sec. after the JAM1 sensor turned OFF. * There was paper on the JAM2 sensor while waiting.	* Instantaneous stop * Fusing heater turns OFF.

JAM releasing method: Remove the jammed paper, and then open and close the upper cover.

* After the jam releasing procedure was carried out, J16 may occur again when the paper which was at the paper feed path was fed. In this case, release the jam again.

7-1-4. Safety circuit

With this unit, the interlock switch and upper cover open switch are turned OFF when the user opens the upper cover. The AC power for the fusing lamp and exposure lamp, and the DC power (+24) for the high voltage circuit shown in the circuit diagram and that for the main motor are cut off. The main relay is cut off in the same manner when an error signal is detected on the main PCB (UNIT MAIN).

1. Exposure lamp error

The exposure lamp lighting signal (AVRERR: this is not an error signal) is detected and regulated its waveform by the exposure lamp lighting detection circuit on the power supply PCB. The AVRERR signal is connected to the main PCB (UNIT MAIN) by the CN1031-B16, and monitors whether the lamp is continuously lit (approx. 15 sec.). If it is detected that the lamp is continuously lit for 15 sec. or more, the main relay is cut off by the AVRERR signal (LOW-> HIGH).

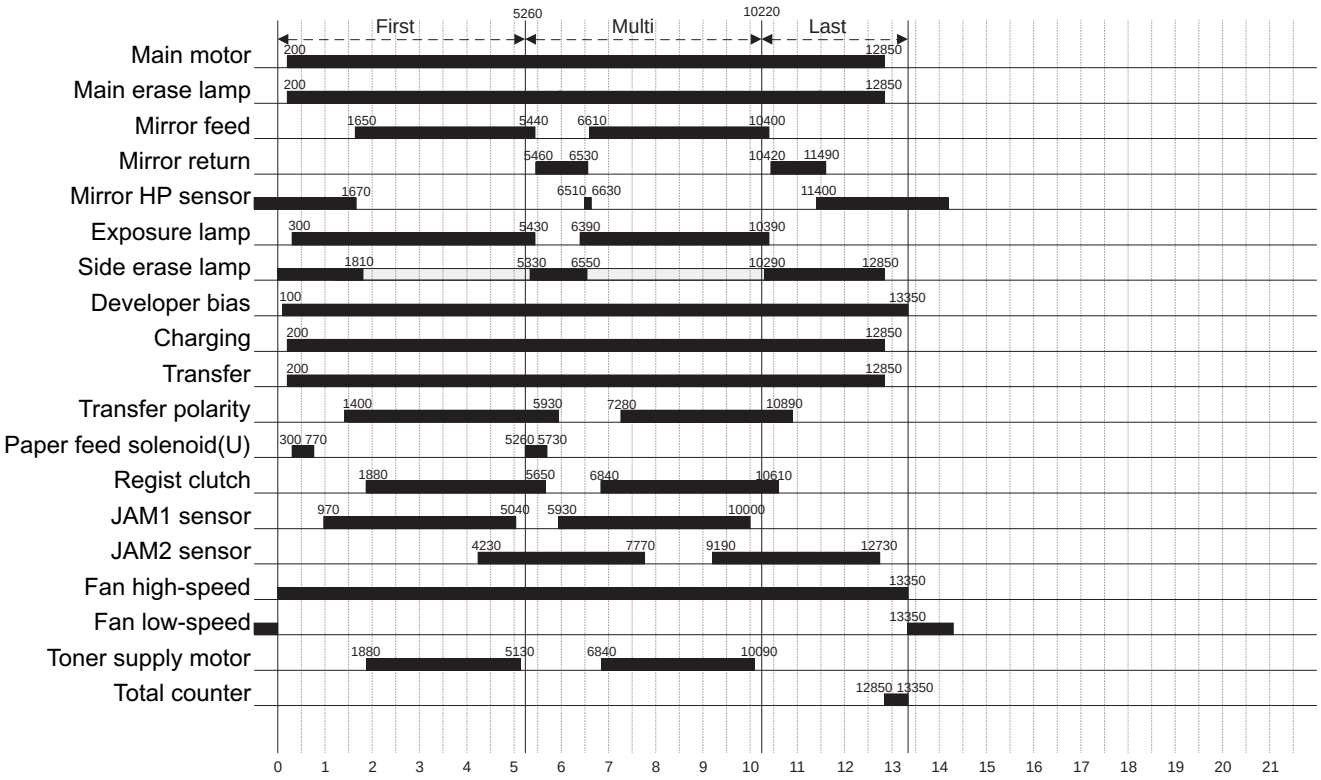
2. Fusing heater error

When an error signal (FUTHOPN: thermistor open, FUOVH: fusing overheat) is detected with the fusing temperature control circuit, the AVRERR signal (LOW->HIGH) is generated in the same manner as the exposure lamp error, and the main relay is cut off.

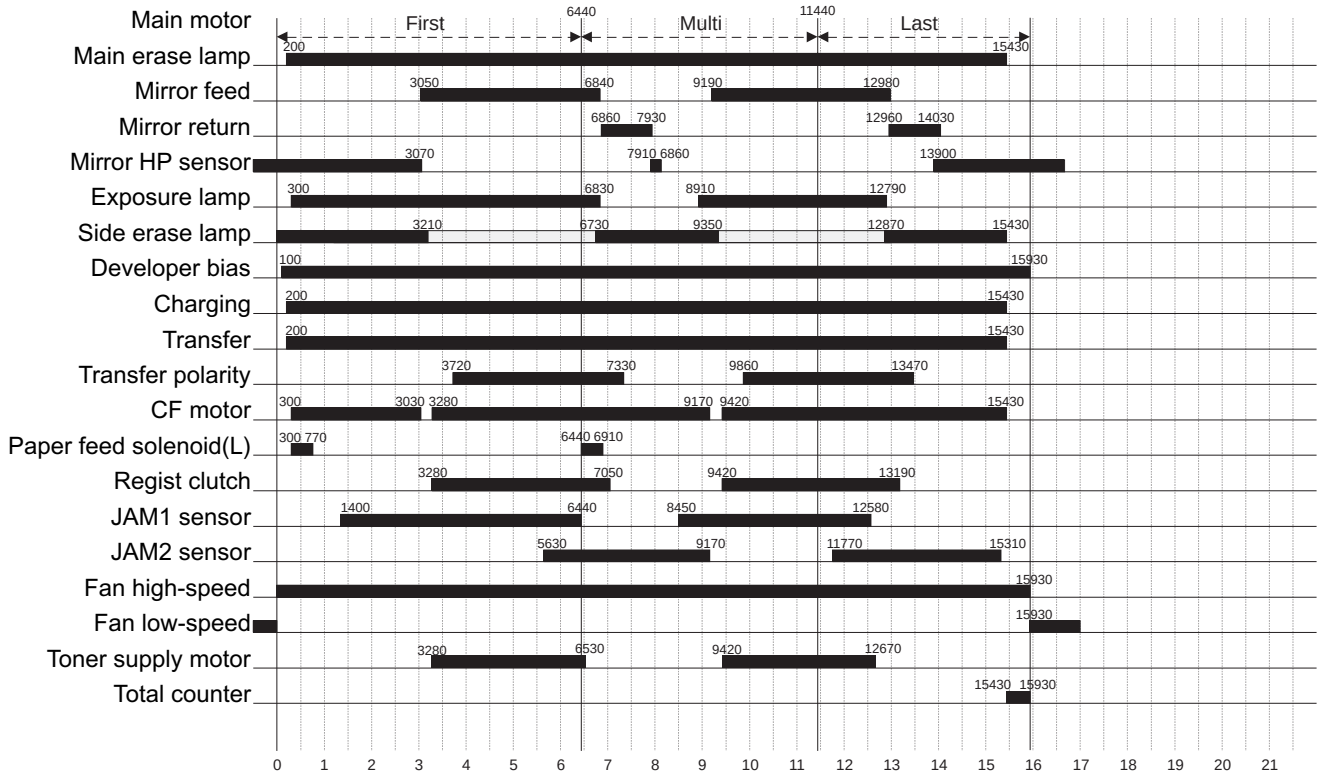
(F34: High temperature error, F35: Low temperature error, F36: Thermistor error -> Must be released with service mode 25-47)

7-2. Timing chart

⚠1 7-2-1. A4, TWO COPIES, CASSETTE PAPER FEED (UPPER)



⚠1 7-2-2. A4, TWO COPIES, CASSETTE PAPER FEED (LOWER)



7-3. Connector list

7-3-1. Main CB (UNIT MAIN)

CN - No.	Pin	Symbol	Details	IN/OUT	Active	Remarks
CN131	1	STBLED	Not used			
CN131	2	/E2000	Not used			
CN131	3	VRGND	Exposure density adjustment VR, analog ground for each key			
CN131	4	EXPVR	Exposure density adjustment VR signal	IN	Analog signal	
CN131	5	KEY2	Key switch No. 2 group	IN	Analog signal	
CN131	6	KEY1	Key switch No. 1 group	IN	Analog signal	
CN131	7	VR5V	Exposure density adjustment VR, +5V for each key			
CN131	8	/LEDLD	LED serial data load signal	OUT	Load at LOW	
CN131	9	LEDCKL	LED serial data transfer clock	OUT	Clock signal	Measurement not possible
CN131	10	LEDDO	LED lighting serial data	OUT	LED lights at HIGH	
CN131	11	DGND	Digital ground			
CN131	12	+5V	+5V power supply			
CN151	A1	/PRC	Paper regist clutch drive signal	OUT	Drive at LOW	
CN151	A2	/PSC	Paper feed solenoid(U) drive signal (Drive at Lo)	OUT	Drive at LOW	
CN151	A3	STB5	Not used			
CN151	A4	S24V	+24V power supply via cover open switch			
CN151	A5	GND24	+24V drive system ground			
CN151	A6	GND24	+24V drive system ground			
CN151	A7	+24V	+24V power supply			
CN151	A8	DGND	Digital ground			
CN151	A9	DGND	Digital ground			
CN151	A10	+5V	+5V power supply			
CN151	A11	+5V	+5V power supply			
CN151	A12	+5V	+5V power supply			
CN151	A13	+5V	+5V power supply			
CN151	A14	/PWR	Not used			
CN151	A15	/EXP	Exposure lamp lighting signal (Lights at Lo)	OUT	Lights at LOW	
CN151	A16	EXPCONT	Exposure lamp lighting voltage control signal (analog)	OUT	Analog signal	
CN151	B1	JAM1	JAM1 sensor signal	IN	Paper detected at LOW	
CN151	B2	/PE	Upper cassette out of paper signal	IN	HIGH when out of paper	
CN151	B3	S24V	+24V power supply via cover open switch			Upper cover open: OFF
CN151	B4	S24V	+24V power supply via cover open switch			Upper cover open: OFF
CN151	B5	GND24	+24V drive system ground			
CN151	B6	+24V	+24V power supply			
CN151	B7	+24V	+24V power supply			
CN151	B8	DGND	Digital ground			
CN151	B9	DGND	Digital ground			
CN151	B10	+5V	+5V power supply			
CN151	B11	/CSOPNU	Not used			
CN151	B12	FUTHM	Fusing temperature (thermistor) detection signal	IN	Analog signal	
CN151	B13	JAM2	JAM2 sensor signal	IN	Paper detected at LOW	
CN151	B14	/MRL	Main relay ON/OFF signal	OUT	Relay drive at LOW	

CN - No.	Pin	Symbol	Details	IN/OUT	Active	Remarks
CN151	B15	/SSR	SSR ON/OFF signal	OUT	Fusing heater drive at LOW	
CN151	B16	EXPERR	Exposure lamp lighting monitor signal	IN	HIGH when exposure lamp is lit	
CN152	1	S24V	S24V with ON/OFF control (+24V except power save mode)			Upper cover open: OFF
CN152	2	GND24	+24V drive system ground			
CN152	3	GND24	+24V drive system ground			
CN152	4	GND24	+24V drive system ground			
CN152	5	+24V	+24V power supply			
CN152	6	+24V	+24V power supply			
CN152	7	+24V	+24V power supply			
CN152	8	SDHFAN	SDH fan ON/OFF signal	OUT	Drive at HIGH	(8P, 9P, 15P: factory option)
CN152	9	FSLOCK	SDH fan lock signal	IN	HIGH when locked	
CN152	10	FOLOCK1	OP fan lock signal	IN	HIGH when locked	
CN152	11	FAN24	OP fan drive signal	OUT	OP fan drive at +24V	
CN152	12	MHP	Mirror home position sensor signal	IN	HIGH at set position	
CN152	13	DGND	Digital ground			
CN152	14	DRV5V	+5V with ON/OFF control	OUT	+5V when not in power save mode	
CN152	15	SDHTHM	SDH temperature detection (thermistor) signal	IN	Analog signal	
CN161	1	/MMLOCK	Main motor speed control lock signal	IN	LOW when locked	
CN161	2	/MMST	24/ Main motor drive signal	OUT	Drive at LOW	
CN161	3	DRV24V	Power supply (24V) with ON/FF control and safety circuit	OUT	0V during power save	Upper cover open: OFF
CN161	4	GND24	+24V drive system ground			
CN162	1	/TPC	Total paper counter drive signal	OUT	Count up at LOW	
CN162	2	+24V	+24V power supply			
CN171	1	/CSOPNL	Lower cassette not mounted signal		HIGH when no cassette is mounted	
CN171	2	DGND	Digital ground			
CN171	3	+5V	+5V power supply			
CN171	4	/LPE	Lower cassette out of paper signal		HIGH when out of paper	
CN171	5	DGND	Digital ground			
CN171	6	DGND	Digital ground			
CN171	7	+5V	+5V power supply			
CN171	8	PTM	Cassette feeder paper feed motor clock	OUT	Clock signal	Measurement not possible
CN171	9	/LMST	Cassette feeder paper feed motor ON/OFF signal	OUT	Drive at HIGH	
CN171	10	GND24	+24V drive system ground			
CN171	11	+24V	+24V power supply			
CN171	12	+24V	+24V power supply			
CN171	13	/LPSC	Paper feed solenoid (L)	OUT	Drive at LOW	
CN171	14	NC	Not connected			
CN191	1	/DRUM	Drum unit not mounted detection signal	IN	HIGH when on mounted	
CN191	2	/TSE	Not used			
CN191	3	/GRID	GRID terminal ON/OFF signal	OUT	GRID output at LOW	
CN191	4	/HVCC	CC terminal ON/OFF signal	OUT	CC output at LOW	
CN191	5	/HVTP	TC polarity changeover signal	OUT	TC + polarity at LOW	

CN - No.	Pin	Symbol	Details	IN/OUT	Active	Remarks
CN191	6	/HVTC	TC terminal ON/OFF signal	OUT	TC output at LOW	
CN191	7	/LMB	Lens motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible
CN191	8	/LMA	Lens motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible
CN191	9	LMB	Lens motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible
CN191	10	LMA	Lens motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible
CN191	11	/SMB	Mirror motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible
CN191	12	/SMA	Mirror motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible
CN191	13	SMB	Mirror motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible
CN191	14	SMA	Mirror motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible
CN191	15	LHP	Lens home position sensor signal	IN	HIGH at set position	
CN191	16	TRAYS	Not used			
CN191	17	/TSM	Toner motor drive signal	OUT	ON at LOW	
CN191	18	TSMCLK	Toner motor drive clock	OUT	60Hz pulse	
CN191	19	TNSC	Signal for toner sensor output adjustment	OUT	Analog signal	
CN191	20	TNS	Toner sensor output signal	IN	Analog signal	Voltage rises at low density
CN191	21	DGND	Digital ground			
CN191	22	AE	Not used			
CN192	1	CCL	Main erase lamp drive signal	OUT	Drive at +24V	
CN192	2	/SER6	Side erase lamp drive signal(D56,D66)	OUT	Lights at LOW	
CN192	3	/SER5	Side erase lamp drive signal(D55,D65)	OUT	Lights at LOW	
CN192	4	/SER4	Side erase lamp drive signal(D54,D64)	OUT	Lights at LOW	
CN192	5	/SER3	Side erase lamp drive signal(D53,D63)	OUT	Lights at LOW	
CN192	6	/SER2	Side erase lamp drive signal(D52,D62)	OUT	Lights at LOW	
CN192	7	/SER1	Side erase lamp drive signal(D51,D61)	OUT	Lights at LOW	
CN192	8	/SER0	Side erase lamp drive signal (D71 to D78,D81 to D88)	OUT	Lights at LOW	(9 to 12P, 14 to 18P : factory option)
CN192	9	/AMB	SDH motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible
CN192	10	/AMA	SDH motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible
CN192	11	AMB	SDH motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible
CN192	12	AMA	SDH motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible
CN192	13	MRM	Mirror motor, SDH motor exciting current changeover signal	OUT	Low current at HIGH	
CN192	14	SDHPC	SDH paper feed clutch drive signal	OUT	Clutch ON at HIGH	
CN192	15	SDHOPN	SDH open detection sensor signal	IN	HIGH at open	
CN192	16	/CS3	SDH B4 size detection sensor signal	IN	LOW at B4 detection	
CN192	17	/CS2	SDH document regist sensor signal	IN	LOW when original feed	
CN192	18	/CS1	SDH no original detection sensor signal	IN	LOW when original is detected	

7-3-2. High voltage unit (UNIT HV)

CN - No.	Pin	Symbol	Details	IN/OUT	Active	Remarks
CN1201	1	LMOA	Lens motor drive excitation signal (/A phase)Output	OUT	Clock signal	Measurement not possible
CN1201	2	LMOB	Lens motor drive excitation signal (/B phase)Output	OUT	Clock signal	Measurement not possible
CN1201	3	/LMOA	Lens motor drive excitation signal (/A phase)Output	OUT	Clock signal	Measurement not possible
CN1201	4	/LMOB	Lens motor drive excitation signal (/B phase)Output	OUT	Clock signal	Measurement not possible
CN1201	5	LM24V	Lens motor power supply			
CN1201	6	LM24V	Lens motor power supply			
CN1211	1	SMOA	Mirror motor drive excitation signal (/A phase)Output	OUT	Clock signal	Measurement not possible
CN1211	2	SMOB	Mirror motor drive excitation signal (/B phase)Output	OUT	Clock signal	Measurement not possible
CN1211	3	/SMOA	Mirror motor drive excitation signal (/A phase)Output	OUT	Clock signal	Measurement not possible
CN1211	4	/SMOB	Mirror motor drive excitation signal (/B phase)Output	OUT	Clock signal	Measurement not possible
CN1211	5	SM24V	Scanner motor power supply			
CN1231	1	+24V	+24V power supply			(factory option)
CN1231	2	/SDHPC	SDH shutter solenoid output		ON at LOW	
CN1231	3	+24V	+24V power supply			
CN1231	4	/SDHPC	SDH paper feed clutch output		ON at LOW	
CN1231	5	AMOA	SDH motor drive excitation signal (/A phase)Output	OUT	Clock signal	Measurement not possible
CN1231	6	AMOB	SDH motor drive excitation signal (/B phase)Output	OUT	Clock signal	Measurement not possible
CN1231	7	/AMOA	SDH motor drive excitation signal (/A phase)Output	OUT	Clock signal	Measurement not possible
CN1231	8	/AMOB	SDH motor drive excitation signal (/B phase)Output	OUT	Clock signal	Measurement not possible
CN1231	9	AM24V	SDH motor power supply			
CN1231	10	AM24V	SDH motor power supply			
CN1251	1	TNM0	Toner motor drive power supply output	OUT	60Hz pulse	
CN1251	2	TNM1	Toner motor drive power supply output	OUT	60Hz pulse	
CN1251	3	TNSC	Signal for toner sensor output adjustment	OUT	Analog signal	
CN1251	4	+24V	+24V power supply			
CN1251	5	DGND	Digital ground			
CN1251	6	TNS	Toner sensor output signal	IN	Analog signal	Voltage rises at low density
CN1261	1	AE	Not used			
CN1261	2	DGND	Not used			
CN1261	3	TNS	Toner sensor output signal	IN	Analog signal	Voltage rises at low density
CN1261	4	TNSC	Signal for toner sensor output adjustment	OUT	Analog signal	
CN1261	5	TSMCLK	Toner motor drive clock	OUT	60Hz pulse	Measurement not possible
CN1261	6	/TSM	Toner motor drive signal	OUT	ON at LOW	
CN1261	7	TRAYS	Not used			
CN1261	8	LHP	Lens home position sensor signal	IN	HIGH at set position	
CN1261	9	SMA	Mirror motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible
CN1261	10	SMB	Mirror motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible
CN1261	11	/SMA	Mirror motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible
CN1261	12	/SMB	Mirror motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible
CN1261	13	LMA	Lens motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible
CN1261	14	LMB	Lens motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible

CN - No.	Pin	Symbol	Details	IN/OUT	Active	Remarks
CN1261	15	/LMA	Lens motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible
CN1261	16	/LMB	Lens motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible
CN1261	17	/HVTC	TC terminal ON/OF signal	OUT	TC output at LOW	
CN1261	18	/HVTP	TC polarity changeover signal	OUT	TC + polarity at LOW	
CN1261	19	/HVCC	CC terminal ON/OF signal	OUT	TC output at LOW	
CN1261	20	/GRID	GRID terminal ON/OF signal	OUT	TC output at LOW	
CN1261	21	/TSE	Not used			
CN1261	22	/DRUM	Drum unit not mounted detection signal	IN	HIGH when not mounted	
CN1262	1	/CS1	SDH no original detection sensor signal	IN	LOW when original is detected	(1 to 5P: factory option)
CN1262	2	/CS2	SDH document regist sensor signal	IN	LOW when original feed	
CN1262	3	/CS3	SDH B4 size detection sensor signal	IN	LOW at B4 detection	
CN1262	4	SDHOPN	SDH open detection sensor signal	IN	HIGH when open	
CN1262	5	SDHPC	SDH paper feed clutch drive signal	OUT	Clutch ON at HIGH	
CN1262	6	MRM	Mirror motor, SDH motor exciting current changeover signal	OUT	Small current at HIGH	
CN1262	7	AMA	SDH motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible (pulse wave)
CN1262	8	AMB	SDH motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible (pulse wave)
CN1262	9	/AMA	SDH motor drive excitation signal (/A phase)	OUT	Clock signal	Measurement not possible (pulse wave)
CN1262	10	/AMB	SDH motor drive excitation signal (/B phase)	OUT	Clock signal	Measurement not possible (pulse wave)
CN1262	11	/SER0	Side erase lamp drive signal (D71 to D78,D81 to D88)	OUT	Lights at LOW	
CN1262	12	/SER1	Side erase lamp drive signal(D56,D66)	OUT	Lights at LOW	
CN1262	13	/SER2	Side erase lamp drive signal(D55,D65)	OUT	Lights at LOW	
CN1262	14	/SER3	Side erase lamp drive signal(D54,D64)	OUT	Lights at LOW	
CN1262	15	/SER4	Side erase lamp drive signal(D53,D63)	OUT	Lights at LOW	
CN1262	16	/SER5	Side erase lamp drive signal(D52,D62)	OUT	Lights at LOW	
CN1262	17	/SER6	Side erase lamp drive signal(D51,D61)	OUT	Lights at LOW	
CN1262	18	CCL	Main erase lamp drive signal	OUT		
CN1263	1	SDHTHM	SDH temperature detection (thermistor) signal	IN	Analog signal	(1 to 5P: factory option)
CN1263	2	DRV5V	+5V with ON/OFF control	OUT	+5V when not in power save mode	
CN1263	3	DGND	Digital ground			
CN1263	4	MHP	Mirror home position sensor signal	IN	HIGH at set position	
CN1263	5	FAN24	OP fan drive signal		OP fan drive at +24V	
CN1263	6	FOLOCK1	OP fan lock signal	IN	HIGH when locked	
CN1263	7	FSLOCK	SDH fan lock signal	IN	HIGH when locked	
CN1263	8	SDHFAN	SDH fan ON/OFF signal	OUT	Drive at HIGH	
CN1263	9	+24V	+24V power supply			
CN1263	10	+24V	+24V power supply			
CN1263	11	+24V	+24V power supply			
CN1263	12	GND24	+24V drive system ground			
CN1263	13	GND24	+24V drive system ground			
CN1263	14	GND24	+24V drive system ground			
CN1263	15	S24V	+24V power supply via cover open switch			Upper cover open: OFF

CN - No.	Pin	Symbol	Details	IN/OUT	Active	Remarks
CN1271	1	+5V	+5V power supply			
CN1271	2	LHP	Lens home position sensor signal	IN	HIGH at set position	
CN1271	3	DGND	Digital ground			
CN1271	4	NC	Not connected			
CN1272	1	+5V	+5V power supply			
CN1272	2	MHP	Mirror home position sensor signal	IN	HIGH at set position	
CN1272	3	DGND	Digital ground			
CN1273	1	GND24	Ground			
CN1273	2	FOLOCK1	OP fan 1 lock signal	IN	HIGH when locked	
CN1273	3	FAN24	OP fan drive signal	OUT	OP fan drive at +24V	
CN1274	1	+5V	+5V power supply			(Factory option)
CN1274	2	SDHTHM	SDH temperature detection (thermistor) signal	IN	Analog signal	
CN1275	1	+5V	Not used			
CN1275	2	AE	Not used			
CN1275	3	DGND	Not used			
CN1276	1	+24V	+24V power supply			
CN1276	2	SER0	Side erase lamp drive signal (D71~D78,D81~D88)	OUT	Lights at LOW	
CN1276	3	SER1	Side erase lamp drive signal(D51,D61)	OUT	Lights at LOW	
CN1276	4	SER2	Side erase lamp drive signal(D52,D62)	OUT	Lights at LOW	
CN1276	5	SER3	Side erase lamp drive signal(D53,D63)	OUT	Lights at LOW	
CN1276	6	SER4	Side erase lamp drive signal(D54,D64)	OUT	Lights at LOW	
CN1276	7	SER5	Side erase lamp drive signal(D55,D65)	OUT	Lights at LOW	
CN1276	8	SER6	Side erase lamp drive signal(D56,D66)	OUT	Lights at LOW	
CN1277	1	GND24	+24V drive system ground			(Factory option)
CN1277	2	FSLOCK	SDH fan lock signal	IN	HIGH when locked	
CN1277	3	SFAN24	SDH fan power supply output		SDH fan drive at +24V	
CN1278	1	+24V	+24V power supply			
CN1278	2	/CCL	Main erase lamp drive signal	OUT	Lights at LOW	
CN1281	1	/CS1	SDH no original detection sensor signal	IN	LOW when original is detected	(Factory option)
CN1281	2	DGND	Digital ground			
CN1281	3	+5V	+5V power supply		Detected when LOW	
CN1281	4	/CS2	SDH document regist sensor signal	IN	LOW when original feed	
CN1281	5	DGND	Digital ground			
CN1281	6	/CS3	SDH B4 size detection sensor signal	IN	LOW at B4 detection	
CN1281	7	DGND	Digital ground			
CN1281	8	SDHOPN	SDH open detection sensor signal	IN	HIGH when open	
CN1281	9	DGND	Digital ground			
CN1282	1	GND24	Ground			
CN1282	2	FOLOCK2	OP fan 2 lock signal	IN	HIGH when locked	
CN1282	3	FAN24	OP fan 2 power supply output			

7-3-3. Power supply board (UNIT PSU)

CN - No.	Pin	Symbol	Details	IN/OUT	Active	Remarks
CN1001	1	AC-L	Power supply input(L)	IN	AC primary circuit	
CN1001	2	NC	Not connected			
CN1001	3	AC-N	Power supply input(N)	IN	AC primary circuit	
CN1002	1	FU-L	Fusing heater output(L)	OUT	AC primary circuit	
CN1002	2	FU-N	Fusing heater output(N)	OUT	AC primary circuit	
CN1011	1	EXP-L	Exposure lamp output(L)	OUT	AC primary circuit	
CN1011	2	EXP-N	Exposure lamp output(N)	OUT	AC primary circuit	
CN1031	A1	/PRC	Paper regist clutch drive signal	OUT	Drive at LOW	
CN1031	A2	/PSC	Paper feed solenoid(U) drive signal (Drive at Lo)	OUT	Drive at LOW	
CN1031	A3	STB5	Not used			
CN1031	A4	S24V	+24V power supply via cover open switch			
CN1031	A5	GND24	+24V drive system ground			
CN1031	A6	GND24	+24V drive system ground			
CN1031	A7	+24V	+24V power supply			
CN1031	A8	DGND	Digital ground			
CN1031	A9	DGND	Digital ground			
CN1031	A10	+5V	+5V power supply			
CN1031	A11	+5V	+5V power supply			
CN1031	A12	+5V	+5V power supply			
CN1031	A13	+5V	+5V power supply			
CN1031	A14	/PWR	Not used			
CN1031	A15	/EXP	Exposure lamp lighting signal (Lights at Lo)	OUT	Lights at LOW	
CN1031	A16	EXPCONT	Exposure lamp lighting voltage control signal (analog)	OUT	Analog signal	
CN1031	B1	JAM1	JAM1 sensor signal	IN	Paper detected at LOW	
CN1031	B2	/PE	Not used			
CN1031	B3	S24V	+24V power supply via cover open switch			Upper cover open: OFF
CN1031	B4	S24V	+24V power supply via cover open switch			Upper cover open: OFF
CN1031	B5	GND24	+24V power supply			
CN1031	B6	+24V	+24V power supply			
CN1031	B7	+24V	+24V power supply			
CN1031	B8	DGND	Digital ground			
CN1031	B9	DGND	Digital ground			
CN1031	B10	+5V	+5V power supply			
CN1031	B11	/CSOPNU	Standard cassette not mounted signal	IN	No cassette mounted at HIGH	
CN1031	B12	FUTHM	Fusing temperature (thermistor) detection signal	IN	Analog signal	
CN1031	B13	JAM2	JAM1 sensor signal	IN	Paper detected at LOW	
CN1031	B14	/MRL	Main relay ON/OFF signal	OUT	Relay drive at LOW	
CN1031	B15	/SSR	SSR ON/OFF signal	OUT	Fusing heater drive at LOW	
CN1031	B16	EXPERR	Exposure lamp lighting monitor signal	IN	HIGH when exposure lamp is lit	
CN1032	1	+24V	+24V power supply			
CN1032	2	/PSC	Paper feed solenoid(U) drive signal	OUT	Drive at LOW	
CN1032	1	+24V	+24V power supply			
CN1032	2	/PRC	Regist clutch drive signal	OUT	Drive at LOW	

CN - No.	Pin	Symbol	Details	IN/OUT	Active	Remarks
CN1034	1	LEDJ1	+5V power supply for JAM1 sensor			
CN1034	2	JAM1	JAM1 sensor signal	IN	Paper detected at LOW	
CN1034	3	DGND	Digital ground			
CN1035	1	LEDPE	+5V power supply for PE sensor			
CN1035	2	/PE	Upper cassette out of paper signal		HIGH when out of paper	
CN1035	3	DGND	Digital ground			
CN1036	1	+24V	+24V power supply	OUT		
CN1036	2	S24V	+24V power supply via cover open switch	IN		Upper cover open: OFF
CN1037	1	+5V	+5V power supply			
CN1037	2	FUTHM	Fusing temperature (thermistor) detection signal	IN	1Analog signal	
CN1038	1	NC	Not connected			
CN1038	2	JAM2	JAM2 sensor signal	IN	Paper detected at LOW	
CN1038	3	DGND	Digital ground			

7-4. IC list

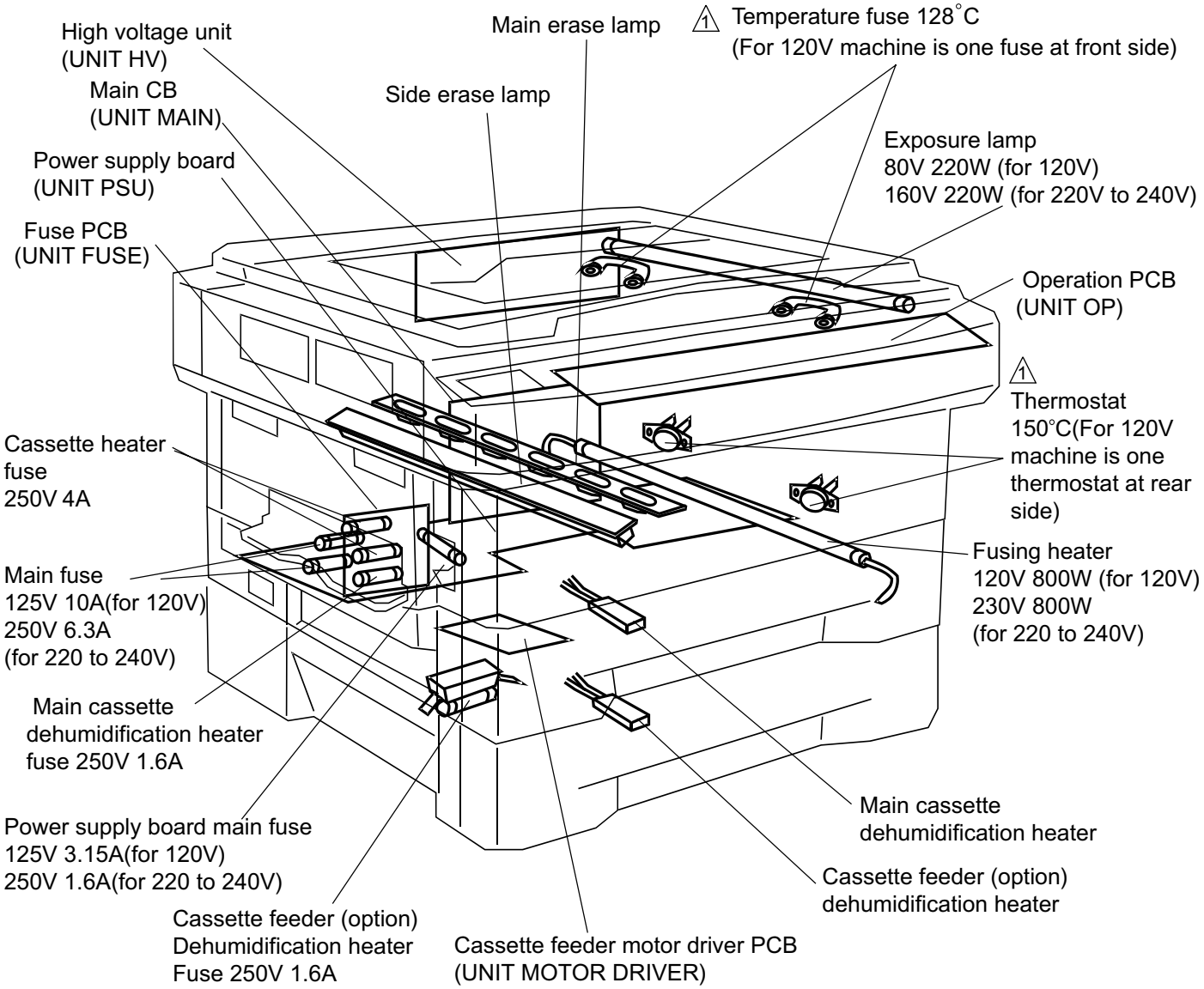
PCB	Location No.	Part name/type	Application
UNIT PSU	IC1031	LA6358NM-TP-T1	Operation amplifier (for exposure lamp lighting control (AVR))
UNIT PSU	IC1051	MC33262P	Switching power control
UNIT PSU	IC1071	UPC1093T-T1	Reference voltage IC (switching power section)
UNIT PSU	IC1081	MC34063AP1	DC-DC converter IC (+5V power supply)
UNIT OP	IC751	LC7932M-TE-R	Serial-parallel driver (for each LED lighting)
UNIT OP	IC770 IC780	LC7933M-TE-R	Serial driver (for 7-segment LED lighting)
UNIT MAIN	IC121	UPD78054FGC	CPU
UNIT MAIN	IC122	M51953BFP-600C	Reset IC
UNIT MAIN	IC123	S-29130AFJ-TB	EEPROM (for electronic counter, setting, adjustment data storage)
UNIT MAIN	IC124	TD62503F-TP1	Transistor array (for high voltage, exposure and fusing drive)
UNIT MAIN	IC125	TD62003AF-TP1	Transistor array (clutch, solenoid main relay drive)
UNIT MAIN	IC126	TC7W02F-TE12L	NOR gate (for main relay control signal)
UNIT MAIN	IC141	LA6393M-TP-T1	Comparator (for fusing temperature error detection)
UNIT MAIN	IC151	HD74HC132FP-TR	NAND gate (for exposure lamp lighting error detection)
UNIT MAIN	IC152	TC7W02F-TE12L	OR gate (for exposure lamp lighting error detection)
UNIT MAIN	IC181 IC182	HD74HC244FP-TR	Line buffer (stepping motor exciting output)
UNIT MAIN	IC191	HD74HC244FP-TR	Line buffer (optical section sensor input selector)
UNIT MAIN	IC192 IC193	HD74HC175FP-T	D-TYPE FF (Side erase lamp, mirror motor control output)
UNIT MAIN	IC194	HD74HC175FP-T	D-TYPE FF (SDH clutch, SDH fan control output)
UNIT MAIN	IC195	TD62503F-TP1	Transistor array (for side erase lamp drive)
UNIT HV	IC1121	MC33262P	Switching power control IC (charge, bias output)
UNIT HV	IC1122	TA78L012AP	12V 3-terminal regulator
UNIT HV	IC1171	LA6082M-TP-T1	Operation amplifier (for transfer output control)
UNIT HV	IC1211	MTD1120F	Stepping motor set current drive driver (mirror scanner)
UNIT HV	IC1251	HD74HC00FP-TR	NAND gate (toner motor section)

7-5. Test points and VR list

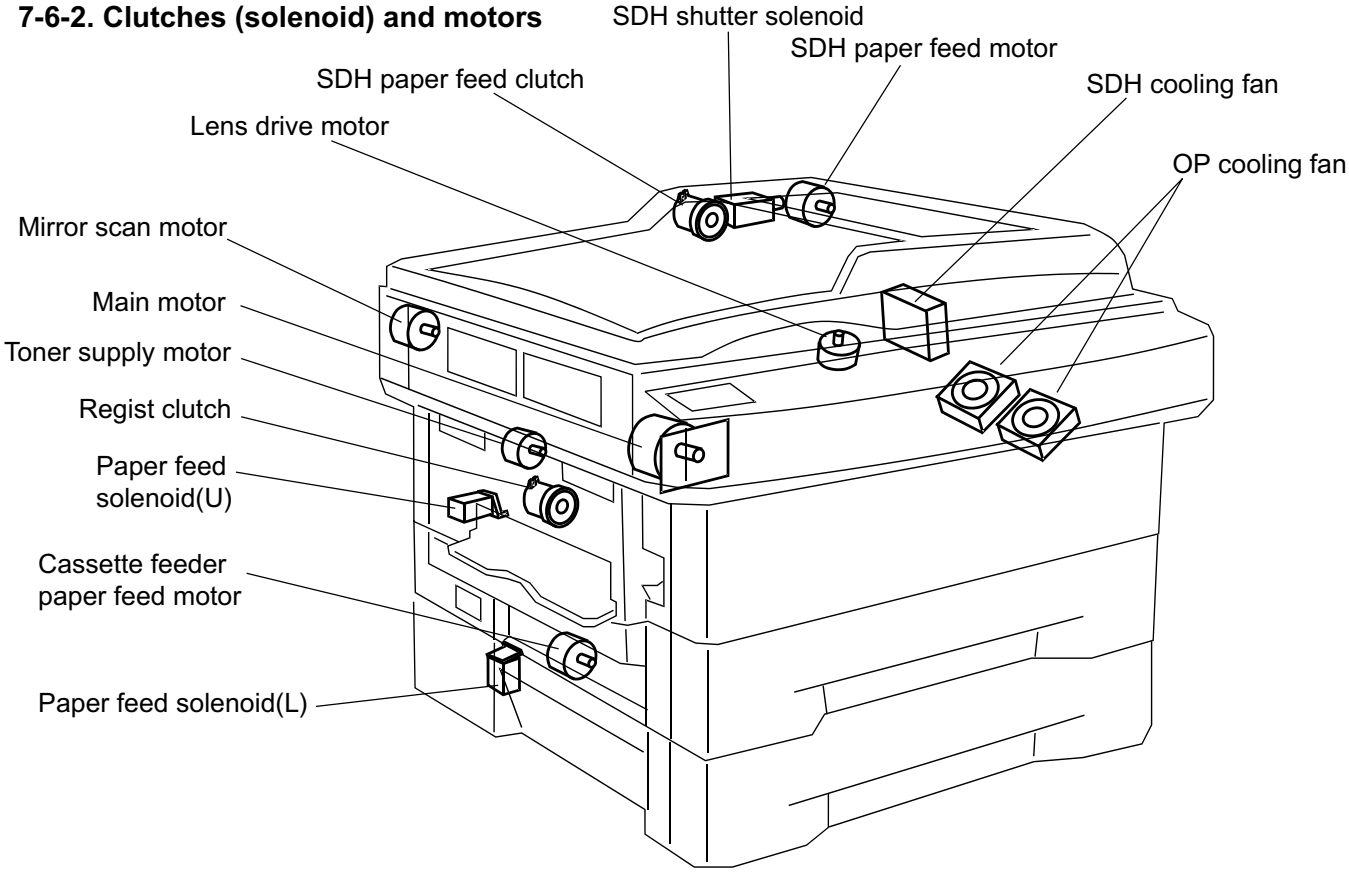
Location	Test point	Symbol	Details	Remarks
UNIT MAIN	TP101	DGND	Digital ground	
UNIT MAIN	TP102	TEMP	Fusing temperature detection signal	Refer to page 7-2.
UNIT MAIN	TP103	TNS!	Toner sensor output voltage	Refer to page 7-1.
UNIT MAIN	TP104	TNSC	Toner sensor control voltage	Refer to page 7-1.
UNIT MAIN	TP105	EXPCNT	Exposure lamp lighting voltage control signal (analog)	For factory use
UNIT MAIN	TP106	EXRVR	Exposure lamp lighting voltage adjustment input (analog)	For factory use
UNIT MAIN	TP107	KEY1	Key switches No. 1 group (analog)	For factory use
UNIT MAIN	TP108	KEY2	Key switches No. 2 group (analog)	For factory use
UNIT MAIN	TP109	AE!	Not used	-
UNIT PSU	VR1031	-	For exposure voltage output adjustment	For factory adjustment (cannot be used)
UNIT OP	VR723	-	For exposure voltage output adjustment	For user operations (operation panel)

7-6. Electrical parts layout drawing

7-6-1. PCB, lamp (heater), fuse (rating)



7-6-2. Clutches (solenoid) and motors



⚠1 7-6-3. Sensors and switches

