

6-2-3 Messages and errors detected in the system

Table 6-12
Messages and errors detected in the system

Error message	Meaning (Cause)	Countermeasure
4: PROGRAM DESTROYED	Error occurs in the system program. (Cause) Memory is wholly or partially broken by some accident.	<ul style="list-style-type: none"> Turn on the power again, and check the progression. If it frequently occurs, contact your dealer or our company.
5: POINT DESTROYED	Error occurs in the user data. (Cause) Memory is wholly or partially broken by some accident.	<ul style="list-style-type: none"> Turn on the power again, and check the progression. If it frequently occurs, contact your dealer or our company.
6: SECOND LIMIT OVER EMERGENCY	Axis arm runs beyond secondary limit. (Cause 1) Movable range of the arm is changed by some accident. (Cause 2) Software limit is poorly set. (Cause 3) Secondary limit sensor is defective, or cable is broken.	<ul style="list-style-type: none"> Turn off power, retreat the arm from the secondary limit, and turn on power again. (Countermeasure 1) Check whether each coordinate goes wrong or not. Check whether the drive unit of the arm operates smoothly or not. Correct if any looseness or tooth skip is found. Correct if the machine reference amount is 40 to 60% or more. (Countermeasure 2) Reset the software limit. (Countermeasure 3) Check the secondary limit sensor or cable.
10: CANNOT EXECUTE	A command sentence can not be executed. (Cause) A command sentence (on-line command, etc.) which can not be executed is tried.	<ul style="list-style-type: none"> Correct or erase the command sentence (on-line command, etc.) which can not be executed.
11: RUNNING	Program is running. (Cause) Press <u>RUN</u> key.	(It is not any error.)
15: TEMP. ALARM EMERGENCY	Thermosensor in the controller detects a trouble. (Cause 1) Cooling fan of controller is troubled. (Cause 2) Ambient temperature rises.	<ul style="list-style-type: none"> (Countermeasure 1) <ul style="list-style-type: none"> Clean the cooling fan or check its operation. (Countermeasure 2) Lower the ambient temperature.
16: WATCH-DOG EMERGENCY	CPU process monitor function (watch dog) detects a trouble. (Cause) It results from the strong electrical disturbance (power fluctuation noise, etc.). Or the system does not match CPU.	<ul style="list-style-type: none"> Turn on the power again, and check the progression. If it frequently occurs, contact your dealer or our company. Check the ground cable and power cable.
20: NUMBER ERR	An unsuitable value is input. (Cause) Wrong value is input from the keyboard.	<ul style="list-style-type: none"> Reinput the correct value.
25: PLEASE WAIT A MOMENT	Wait for a while.	(It is not any error.)
26: PLEASE INPUT HEAD Z OFFSET!	It can not be lowered since Z offset of the head 3 is 0.00.	Correct the value of Z offset of the head 3.

Table 6-12 (continued)

Error message	Meaning (Cause)	Countermeasure
123: M SOFT LIMIT OVER	M axis operates beyond the software limit. (Cause 1) Arm is moved beyond software limit. (Cause 2) Wrong position is input for loading of electronic part or suction of feeder. (Cause 3) Wrong image process is set.	(Countermeasure 1) <ul style="list-style-type: none">Check the setting value of software limit. (Countermeasure 2) <ul style="list-style-type: none">Adjust the next moving coordinate into the movable range.Check the head which is next used. (Countermeasure 3) <ul style="list-style-type: none">Readjust calibration of vision file. (Scale and shift)
125: COMMUNICATION ERR	Trouble occurs during communication. (Cause 1) Communication parameter does not match. (Cause 2) Influence of environmental factor (noise)	(Countermeasure 1) <ul style="list-style-type: none">Set correct communication parameter. (Countermeasure 2) <ul style="list-style-type: none">Take a countermeasure against noise.
126: CMU IS NOT READY	Mounter is ready for transmission. (Cause 1) Communication cable to the external equipment is broken. (Cause 2) External equipment is in the on-line state, or data remains in the transmission buffer since the external equipment is ready for data receiving. (Cause 3) After communication cable is connected to the mounter, power of the external equipment is turned on.	(Countermeasure 1) <ul style="list-style-type: none">Check the connection to the external equipment. (Countermeasure 2) <ul style="list-style-type: none">Reset automatic operation of mounter. (Countermeasure 3) <ul style="list-style-type: none">First, turn on power for external equipment.
129: PARITY ERR	A parity error occurs during communication. (Cause 1) Communication parameter does not match. (Cause 2) Influence of environmental factor (noise)	(Countermeasure 1) <ul style="list-style-type: none">Set correct communication parameter. (Countermeasure 2) <ul style="list-style-type: none">Take a countermeasure against noise.
141: CANNOT EXECUTE ROBOT IS RUNNING	Since mounter is in operation, on-line command can not be executed. (Cause) Mounter in operation inputs an on-line command which can not be executed.	<ul style="list-style-type: none">After the mounter is stopped, on-line command is executed.
143: NO RETURN CODE	When on-line command is input to the communication port, C/R(0DH) is not added. (Cause 1) Command which exceeds 40 letters is input. (Cause 2) Any other control command (00H thru 1FH) except C/R code is input.	(Countermeasure 1) <ul style="list-style-type: none">Input a command of 40 letters or less. (Countermeasure 2) <ul style="list-style-type: none">Set correct CR/CRLF parameter.
144: NO START CODE (@)	The start code is provided on the on-line command. (Cause) Input on-line command which is not provided with @ (40H) at the head.	Input the code in the correct format.
145: BUFFER OVERFLOW	The receiving buffer of communication port overflows. (Cause 1) Busy control of XON/XOFF or DTR is not used.	(Countermeasure 1) <ul style="list-style-type: none">Execute busy control. (Countermeasure 2) <ul style="list-style-type: none">When busy control is impossible, reduce baud rate to slow down transmission.

Table 6-12 (continued)

Error message	Meaning (Cause)	Countermeasure
67: VISION HEAD MULTI DEFINED	As the head specifications, vision heads are multiply set.	Select a vision head from the list of heads 1 thru 3 of the list of system - machine configuration - machine.
68: ANC HEAD MULTI DEFINED	As the head specifications, ANC heads are multiply set.	Select a ANC head from the list of heads 1 thru 3 of the list of system - machine configuration - machine.
74: UNDEFINED PCB NAME	Since no board name is present, work can not be executed. (Cause) No board name is specified but operation mode is tried.	<ul style="list-style-type: none"> In the board mode of data input, input the board name.
75: TOP CHARACTER MUST BE A_Z	Start the board name at the alphabetic letter. (Cause) Any other letter except alphabet is input as the head letter of the board name.	<ul style="list-style-type: none"> Start the board name at the alphabetic letter.
76: INPUT ORIGIN POINT	Origin point is not input to the board or block. (Cause) Origin point is not input to the board or block but it is tried to edit the loading data or similar.	<ul style="list-style-type: none"> Set the origin points of board and block.
77: PLEASE TEACH 2ND POINT	Teach 2nd points.	<ul style="list-style-type: none"> Teach 2nd point to position the target position at the center between two points. (2-point teaching mode)
79: OPERATION INTERRUPTED	Execution of program is interrupted. (Cause) During automatic operation, it shifts to another mode.	<ul style="list-style-type: none"> To interrupt loading a board, return it into the operation mode and reset it.
83: ILLEGAL CHARAC- TER	Use alphanumerical letters for the board name. (Cause) Any other letter except alphanumerical letters is used for the board name.	Use alphanumerical letters for the board name.
101: FORMAT ERR	Input format is wrong. (Cause) Without inputting nothing, press the enter key. Or a wrong value is input.	<ul style="list-style-type: none"> Reinput a value in the correct format.
102: DATA ERR	Value format is wrong. (Cause) Wrong value is input.	<ul style="list-style-type: none"> Reinput a value in the correct format.
119: MEMORY FULL	Memory area of user data is full. (Cause) When whole memory is used,	<ul style="list-style-type: none"> Back up unnecessary data, and erase it.

Error message	Meaning (Cause)	Countermeasure
29: EMG. STOP ON EMERGENCY	Emergency stop input signal is input. (Cause 1) Emergency stop button of main machine body is input. (D110=0) (Cause 2) Emergency stop button of HHK-SC is pressed.	<ul style="list-style-type: none"> After releasing the cause of emergency stop, press READY switch of HHK-SC, and the servo will be turned on and be recovered.
30: COVER OPEN OR LOW AIR PRESSURE!	The interlock signal of cover, air system and feeder floating is input. (Cause 1) The safety cover is opened. (Cause 2) The supply pressure of the air supply drops beyond the specified value. (Cause 3) The feeder is poorly set. Or the beam axis of the feeder floating sensor is deviated.	<ul style="list-style-type: none"> (Countermeasure 1) <ul style="list-style-type: none"> Check the safety cover switch. (Countermeasure 2) <ul style="list-style-type: none"> Check the air supply pressure. (Countermeasure 3) <ul style="list-style-type: none"> Check the setting of the feeder. Adjust the beam axis of sensor.
32: ORIGIN INCOMPLETE	Return to the mechanical origin point is not executed. (Cause 1) After power is turned on, origin-point is not executed. (Cause 2) Power voltage drop detection circuit resets CPU.	<ul style="list-style-type: none"> (Countermeasure 1) <ul style="list-style-type: none"> Execute origin-point return (Press the function key ORIGIN.). (Countermeasure 2) <ul style="list-style-type: none"> Strengthen power supply.
34: ORIGIN INCOMPLETE	Origin point of M axis is not detected. (Cause) Origin point sensor of M axis is defective or its cable is broken.	<ul style="list-style-type: none"> Check origin-point sensor and wiring of M axis.
37: HEAD LOWER POS. SENSOR OFF!	Since the lower-limit sensor of head is activated, arm can not be moved. (Cause 1) Head remains lowered but does not return. (Cause 2) Air supply pressure drops. (Cause 3) Head lower-limit sensor is troubled or its cable is broken. (Cause 4) Head which is not present is assigned in the machine configuration.	<ul style="list-style-type: none"> (Countermeasure 1) <ul style="list-style-type: none"> Repair or replace the head. (Countermeasure 2) <ul style="list-style-type: none"> In Z axis, return it to near origin point with HHK-SC. (Countermeasure 3) <ul style="list-style-type: none"> Supply the specified air pressure. (Countermeasure 4) <ul style="list-style-type: none"> Check the sensor and wiring. (Countermeasure 5) <ul style="list-style-type: none"> Check the setting of the machine configuration.
38: NOZZLE ST. IS UPPER POSITION!	Since the nozzle station rises, arm can not be moved. (Cause 1) Nozzle station remains raised but is not lowered. (Cause 2) In the nozzle station, the lower limit sensor is troubled, and the harness cable is broken. (Cause 3) Station which is not present is assigned in the machine configuration.	<ul style="list-style-type: none"> (Countermeasure 1) <ul style="list-style-type: none"> Repair or replace the station. (Countermeasure 2) <ul style="list-style-type: none"> Check the sensor or wiring. (Countermeasure 3) <ul style="list-style-type: none"> Check the setting of the machine configuration.
41: PALLET IS OUT- SIDE OF TRAY FEEDER!	Pallet swells out of the stacker of the feeder.	Put the pallet into the stacker, and prevent it from swelling out.
60: PCB INF. DESTROYED	Error occurs in the board data. (Cause) Memory is partially or wholly broken by some accident.	<p>Turn on power again, and check the progression. If it frequently occurs, contact your dealer or our company.</p>
63: WARNING: OVERFLOW	Empty memory of production control information runs short. (Cause) Production control data exceeds 90% of the maximum value.	<ul style="list-style-type: none"> Reset production control information. (It is not any error.)

Table 6-12 (continued)

Error message	Meaning (Cause)	Countermeasure
276: TRAY HANDLING NO GOOD	<p>When feeder stores a pallet during resetting of automatic operation, feeder operation is troubled.</p> <p>(Cause 1) Feeder head does not elevate.</p> <p>(Cause 2) Feeder hook does not move forward or backward.</p> <p>(Cause 3) Feeder ratchet is not opened or closed.</p> <p>(Cause 4) Pallet remains on the feeder stage.</p>	<p>(Countermeasure 1)</p> <ul style="list-style-type: none"> • Readjust parameter during system - coordinate - feed operation. <p>(Countermeasure 2)</p> <ul style="list-style-type: none"> • Check harnesses of feeder head elevation, feed hook forward/backward and feeder ratchet open-/closing. If the harness is not abnormal, replace the valve. <p>(Countermeasure 3)</p> <ul style="list-style-type: none"> • Check harnesses of sensors at the lower limit of feeder head elevation, at the hook forward limit of feed hook at the open-/closing limit of the feeder ratchet. If the harness is not abnormal, replace the sensor. <p>(Countermeasure 4)</p> <ul style="list-style-type: none"> • Check harness of the cargo-presence sensor in the feeder stage. If any hardness is not abnormal, replace the sensor.
277: HHK NO ACK. (RX)	Error occurs on the communication with HHK-SC.	<p>Install HHK-SC in proper position.</p> <ul style="list-style-type: none"> • Turn on the power again, and check the progression. • If it frequently occurs, contact our dealer or our company.
278: HHK NO ACK. (TX)	Same as 277.	Same as 277.
280: 24V (VPP) POWER OFF	<p>+24V (VPP system: emergency stop system) voltage of I/O board is abnormal.</p> <p>(Cause 1)</p> <ul style="list-style-type: none"> • +24V voltage is adjusted to be improper. • Switching power is defective. • Cable is defective between switching power supply and I/O board. • I/O board is defective. <p>(Cause 2) Switch power supply is improperly input.</p> <p>(Cause 3) Short circuit of +24V (VPP system)</p>	<p>(Countermeasure 1)</p> <ul style="list-style-type: none"> • Turn on power again, and check the progression. • If it frequently occurs, contact our dealer or our company. <p>(Countermeasure 2)</p> <ul style="list-style-type: none"> • Check the input voltage of switching power. • Replace input cable of switching power. <p>(Countermeasure 3)</p> <ul style="list-style-type: none"> • Turn off power, and correct short circuit.
281: 24V (VP) POWER OFF	<p>+24V (VPP system: emergency stop system) voltage of I/O board is abnormal.</p> <p>(Cause 1) I/O board is defective.</p> <p>(Cause 2) Short circuit of +24V (VP system)</p>	<p>(Countermeasure 1)</p> <ul style="list-style-type: none"> • Turn on power again, and check the progression. • If it frequently occurs, contact our dealer or our company. <p>(Countermeasure 2)</p> <ul style="list-style-type: none"> • Turn off power, and correct short circuit.
282: 24V (VP2) POWER OFF	<p>+24V (VP2 system: HHK-SC power system, VPI system: OFF power system during emergency stop) voltage of I/O board is abnormal.</p> <p>(Cause 1) I/O board is defective.</p> <p>(Cause 2) Short circuit of +24V (VP2, VP1 system)</p>	<p>(Countermeasure 1)</p> <ul style="list-style-type: none"> • Turn on power again, and check the progression. • If it frequently occurs, contact our dealer or our company. <p>(Countermeasure 2)</p> <ul style="list-style-type: none"> • Turn off power, and correct short circuit.

Table 6-12 (continued)

Error message	Meaning (Cause)	Countermeasure
215: SYSTEMERROR 60 EMERGENCY	Same as 210: system error 10	Same as 210: system error 10
216: SYSTEMERROR 70 EMERGENCY	Same as above	Same as above
240: POWER FAILURE	AC power voltage abnormally drops. (Note) When power is turned off, this error surely occurs.	Check power supply voltage.
242: ENCODER ZERO NO GOOD	Since 0-phase signal of M axis encoder is not input, origin point return is impossible. (Cause) M axis encoder is defective or 0-phase cable is broken.	<ul style="list-style-type: none"> Check M axis encoder cable. Replace M axis servo motor. If it frequently occurs, contact our dealer or our company.
250: DIP SWITCH ERR EMERGENCY	Software dip switches are wrongly set. (Cause) Mounter model or axis specifications are wrongly set.	<ul style="list-style-type: none"> Check the setting of the dip-switch. If it frequently occurs, contact our dealer or our company.
254: ROBOT DISCONNECTION	Since software dipswitches are set for type without motor, the arm can not be moved. (Cause) An attempt was made to move the arm with software DIP switches set for no motor connection.	If it frequently occurs, contact our dealer or our company.
260: DISK FULL!	Floppy disk is full of memory. (Cause) When disk is full of memory, data is stored from mounter.	<ul style="list-style-type: none"> Format new floppy disk, and store (save) data again. Take care for file distribution.
267: SCSI ACCESS ABORTED	When data is loaded from floppy disk, number of letters per line exceeds 50.	Load 50 or less letters per line.
270: FILE NOT FOUND	Access is impossible to the floppy disk. (Cause 1) No file is present in the floppy disk. (Cause 2) Floppy disk is not formatted. (Cause 3) Data in the floppy disk can not be read properly. (Cause 4) Media of floppy disk is broken.	<p>(Countermeasure 1)</p> <ul style="list-style-type: none"> Input necessary data to the floppy disk. <p>(Countermeasure 2)</p> <ul style="list-style-type: none"> After formatting floppy disk, input necessary data. <p>(Countermeasure 3)</p> <ul style="list-style-type: none"> Clean the head of the drive unit. <p>(Countermeasure 4)</p> <ul style="list-style-type: none"> After cleaning, use spare floppy disk. If it frequently occurs, contact our dealer or our company.
275: WAITING FOR TRAY HANDLING	Initialize the hook and ratchet of the feeder. It is done during restart of automatic operation or resetting of automatic operation.	(It is not any error.)

Table 6-12 (continued)

Error message	Meaning (Cause)	Countermeasure
150: STOP EXECUTED	Work program is completely executed. (It is not any error.)	
182: V-FILE UNDEFINED	Vision file is not registered.	• Registered vision file is selected.
183: V-MEMORY DESTROYED	Memory on the vision board is broken.	Turn on power again, and check the progression. As basic, the data are recovered by restart since the data are all stored in the floppy disk. If it occurs several times a day, contact our company.
184: VISION &	Error in the vision board (Cause) Data or command can not be received due to influence of noise or static electricity.	Turn on power again, and check the progression. If it occurs several times a day, contact our company.
185: V-INTERFACE &	Communication is troubled between the vision board and CPU board. (Cause) Wiring between CPU board and vision board is troubled. Vision board is broken.	Turn on power again, and check the progression. If it occurs several times a day, contact our company.
186: VISION ABORTED	Vision process is interrupted. (Cause) Machine is forcibly stopped during vision process. It is not any error if it occurs when STOP key is pressed.	Restart the operation. If it occurs several times a day, contact our company.
203: MEMORY DESTROYED	Voltage of back-up battery (on the CPU board) is not proper. (Cause 1) Voltage of back-up battery on the CPU board drops. (Cause 2) Memory is partially or wholly broken by some accident.	(Countermeasure 1) • Replace lithium battery. (Countermeasure 2) If it frequently occurs, contact your dealer or our company.
205: BATTERY NO GOOD	Voltage of back-up battery (on the CPU board) is not proper. (Cause) Lithium battery runs out. (Life: Approx. 10 years)	• Replace lithium battery. • Initialize the memory, and recover the memory which is previously backed up. • If it frequently occurs, contact our dealer or our company.
206: CANNOT EDIT	Parameter which can not be input is edited. (Cause) Parameter inhibited to be input is edited.	Interrupt editing the parameter.
210: SYSTEMERROR 10 EMERGENCY	An error in the system (Cause) System can not be processed.	• Turn on power again, and check the progression. • If it frequently occurs, contact our dealer or our company.
212: SYSTEMERROR 30 EMERGENCY	Same as above.	Same as above.
213: SYSTEMERROR 40 EMERGENCY	Same as above.	Same as above.
214: SYSTEMERROR 50 EMERGENCY	Same as above.	Same as above.

Table 6-12 (continued)

Error message	Meaning (Cause)	Countermeasure
283: LOGIC POWER OFF	DC power voltage of +5V, +12V or -12V is abnormal. (Cause 1) <ul style="list-style-type: none">• Any or all of 5V, +12V and -12V voltages are improperly adjusted.• Switching power is defective.• Cable across switching power and mother board is defective.• Mother board is defective.• CPU board is defective. (Cause 2) Switching power is improperly input.	(Countermeasure 1) <ul style="list-style-type: none">• Turn on power again, and check the progression.• If it frequently occurs, contact your dealer or our company. (Countermeasure 2) <ul style="list-style-type: none">• Check input voltage of switching power.• Replace input cable of switching power.
302: CANNOT DELETE FILE	Writing floppy disk is failed. (Cause 1) Data in the floppy disk is not properly read. (Cause 2) Media in the floppy disk is broken.	(Countermeasure 1) <ul style="list-style-type: none">• Clean head of drive unit. (Countermeasure 2) <ul style="list-style-type: none">• After cleaning, use a spare backed-up floppy disk.• If it frequently occurs, contact your dealer or our company.
303: CANNOT RENAME FILE	Writing floppy disk is failed. (Cause 1) Data in the floppy disk is not properly read. (Cause 2) Media in the floppy disk is broken.	(Countermeasure 1) <ul style="list-style-type: none">• Clean head of drive unit. (Countermeasure 2) <ul style="list-style-type: none">• After cleaning, use a spare backed-up floppy disk.• If it frequently occurs, contact your dealer or our company.
304: CANNOT FORMAT	Formatting the floppy disk is failed. (Cause 1) Wrong format is set on the floppy disk. (Cause 2) Media in the floppy disk is broken. (Cause 3) Floppy drive unit is defective.	(Countermeasure 1) <ul style="list-style-type: none">• Properly set floppy format of "system - machine configuration - software list". (Countermeasure 2) <ul style="list-style-type: none">• Clean the head of drive unit. (Countermeasure 3) <ul style="list-style-type: none">• After cleaning, use a spare floppy disk.• If it frequently occurs, contact your dealer or our company.
305: FDD ACCESS ERROR	When power is supplied, access is impossible to the floppy disk. (Cause) Wiring from floppy drive unit to CPU board is abnormal. CPU board or drive unit is broken.	Turn on power again, and check the progression. If it occurs several times per day, contact our company.
306: FD WRITE PROTECTED	Write protector is activated on the floppy disk. (Cause) Though write protector is activated on the floppy disk, writing is tried on the floppy disk.	Make writing possible on the floppy disk.
307: NO DISK IN FLOPPY DRIVE	Floppy disk is not inserted in the drive unit.	After inserting the floppy disk into the drive unit, retry it.

Table 6-12 (continued)

Error message	Meaning (Cause)	Countermeasure
418: WATCHDOG NO-GATE!	Error in the system	<ul style="list-style-type: none">• Turn on power, and check the progression.• Check ground cable and power voltage.• If it frequently occurs, contact your dealer or our company.
419: WATCHDOG TIME-OUT	Same as 418.	Same as 418.

Table 6-12 (continued)

Error message	Meaning (Cause)	Countermeasure
404: OVER LOAD!	Abnormal overload is detected on the drive of the servo motor. (Cause 1) Motor axis brake is poorly adjusted, (Cause 2) Software limit is poorly set. (Cause 3) Mechanical movement is not smooth.	(Countermeasure 1) <ul style="list-style-type: none">• Turn on power again, and check the progression.• Check motor axis brake. (Countermeasure 2) <ul style="list-style-type: none">• Reset software limit. (Countermeasure 3) <ul style="list-style-type: none">• Check mechanical system, (Seizure, deformation, etc.)• If it frequently occurs, contact your dealer or our company.
405: TR. OVER CURRENT	Abnormal current is generated in the transistor in the servo board.	<ul style="list-style-type: none">• Turn on power again, and check the progression.• If it frequently occurs, contact your dealer or our company.
406: OVER CURRENT	Servo board is internally abnormal.	<ul style="list-style-type: none">• Turn on power again, and check the progression.• Check ground line and power voltage.• If it frequently occurs, contact your dealer or our company.
407: MOTOR OVER HEAT!	Same as 406.	Same as 406.
408: TR. OVER HEAT!	Same as 406.	Same as 406.
409: WATCHDOG ERR 0!	Same as 406.	Same as 406.
410: WATCHDOG ERR 1!	Same as 406.	Same as 406.
411: DIVISION ERROR!	Same as 406.	Same as 406.
412: M. POWER DOWN!	It is failed in turning on the servo of servo board.	<ul style="list-style-type: none">• Turn on power again, and check the progression.• Check ground line and power voltage.• If it frequently occurs, contact your dealer or our company.
413: P11 CON. OFF!	Connector P11 or P13 on the servo board on the front panel of the controller is poorly connected.	<ul style="list-style-type: none">• Check P11 and P13 connectors.• If it frequently occurs, contact your dealer or our company.
414: P12 CON. OFF!	Connector P12 or P14 on the servo board on the front panel of the controller is poorly connected.	<ul style="list-style-type: none">• Check P12 and P14 connectors.• If it frequently occurs, contact your dealer or our company.
415: SERVO NO ACK!	Servo board abnormally responds.	<ul style="list-style-type: none">• Turn on power again, and check the progression.• Disconnect and reconnect servo board again.• Check ground cable and power voltage.• If it frequently occurs, contact your dealer or our company.
416: SRV NOT INSTALL	Servo board is not recognized.	<ul style="list-style-type: none">• Turn on power again, and check the progression.• Disconnect and reconnect servo board again.• Check ground cable and power voltage.• If it frequently occurs, contact your dealer or our company.
417: SRV VERSION MIS-MATCH!	The specifications of system board do not match those of servo board.	<ul style="list-style-type: none">• Turn on power again, and check the progression.• Check ground line and power voltage.• If it frequently occurs, contact your dealer or our company.

Table 6-12 (continued)

Error message	Meaning (Cause)	Countermeasure
308: AXIS SELECTION ERROR	<p>During teaching, wrong axis group is selected.</p> <p>(Cause 1) When suction coordinate of part data is taught, another group except MX, MY, ... is selected for a part on the machine or another group except LX, LY, ... is selected for a part on the feeder.</p> <p>(Cause 2) When the parameter in the system -coordinate -machine coordinate is taught, another group except LX, LY, ... is selected.</p> <p>(Cause 3) ???</p>	Select the correct axis group with AXIS key, and execute the teaching process.
309: CANNOT EXECUTE IN RUNNING	During execution of automatic operation, the monitor screen is switched to the ordinary menu screen.	Temporarily stop automatic operation, and press DISP key.
310: SYSTEM ERROR 61	An error in the system	<ul style="list-style-type: none"> Turn on power, and check the progression. If it frequently occurs, contact our dealer or our company.
311: SYSTEM ERROR 62	Same as 310.	Same as 310.
312: CANNOT EDIT AUTO SET POSITION	<p>In spite of the vacuum position of COMPONENT data is set to AUTO-SET, an attempt was made to edit the vacuum data.</p> <p>(Cause) Cannot edit the vacuum position of COMPONENT data which POS.DATA is set to AUTO-SET.</p>	<ol style="list-style-type: none"> Do not edit. Remove the auto-set.
313: CONVEYOR AUTOMATICALLY STOPPED	Conveyor motor stopped automatically, because 500 seconds past.	In case using manual function key, again push the function key.
400: CODE ERROR!	Internal servo board error.	<ul style="list-style-type: none"> Turn on power, and check the progression. If it frequently occurs, contact our dealer or our company.
401: INTERNAL ERROR!	Same as 400.	Same as 400.
402: FEEDBACK ERR 0!	<p>Servo motor does not respond to the command of the servo board sufficiently.</p> <p>(Cause 1) Wrong software limit is set.</p> <p>(Cause 2) Motor axis is mechanically locked.</p>	<ul style="list-style-type: none"> Turn on the power again, and check the progression. Reset software limit. Check servo motor. Check mechanical system, (Seizure, deformation, etc.) If it frequently occurs, contact your dealer or our company.
403: FEEDBACK ERR 1!	<p>Wire breakage is detected around the servo motor.</p> <p>(Cause 1) Motor power cable is abnormal.</p> <p>(Cause 2) Motor encoder cable is abnormal.</p>	<ul style="list-style-type: none"> Turn on the power again, and check the progression. Check motor power cable. Check motor encoder, harness and connector. If it frequently occurs, contact your dealer or our company.

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Fig. 6-8
Y axis motor

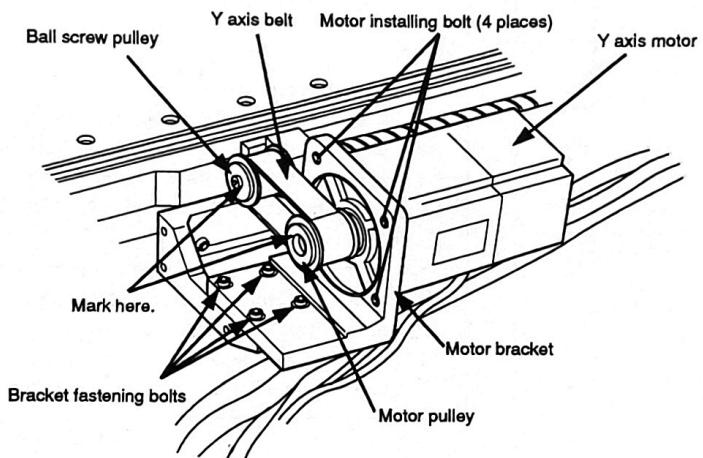
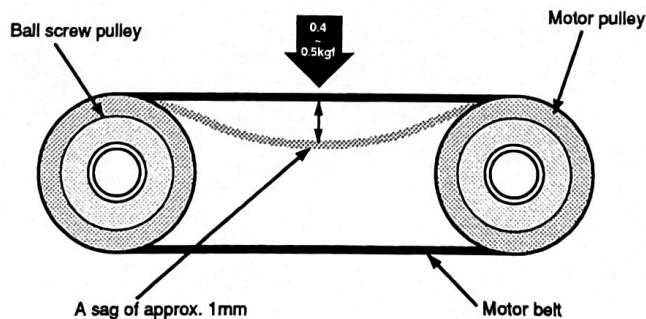


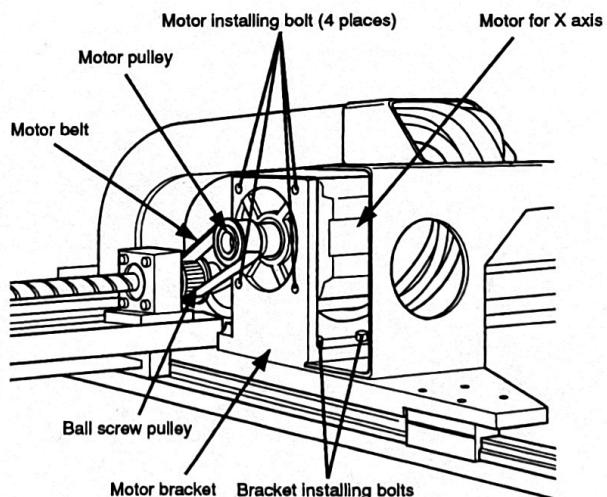
Fig. 6-9
Motor belt tension



No.	Replacing procedure
13	<p>Turn on the air and power supplies, and stand by the machine at the origin point. If the origin point can not be found, check the connector of the motor cable.</p> <p>When the origin-point positioning operation is completed, the machine reference amount (%) of each axis will be displayed on the CRT screen. It is proper if the machine reference amount of X and Y is between 40% and 60%. If it is out of 40 to 60%, loosen the belt tension, and change the tooth relationship between the belt and pulley. After giving a tension to the belt, execute the zero-point positioning operation, and check the machine reference amount. Repeat this work until the origin point is found.</p>
14	Retighten the bolts and set screws of each section. Then, install the sheet metal cover.
15	When the motor or belt is replaced or when the belt is tightened, the position data on the X-Y plane may vary. It is necessary to reset the data. After teaching the operation, check how much deviation wholly occurs between before and after replacement, and change the data.

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Fig. 6-7
X axis motor



6-3 Repair and Adjustment

6-3-1 X-Y axes section

✖ DANGER !!!

Before replacing or adjusting the X and Y axes, be sure to turn off the power supply.

- (1) Replacement of motors in the X-Y axes, (Motor belt tension, X-Y axis machine reference amount adjustment) refer to figures 6-7 to 6-9.

No.	Replacing procedure
1	Turn off the switch of the main power supply.
2	Remove the sheet metal cover from the right side (when viewed from the front) of the main machine body. The sheet metal cover is fastened with screws at several places.
3	Move the head to the mechanical stoppers in the minus direction of X axis and in the plus direction of Y axis.
4	Mark the matchmark on the ball screw pulley and belt and on the motor pulley and belt with paint.
5	The motor is fastened on the motor bracket with four bolts. Remaining the belt on the pulley on the ball screw side, remove the motor.
6	Trace the cable from the motor to the cable end, and disconnect the connector.
7	Loosen the set screws of the pulley which is installed at the tip of the motor, and pull out the pulley.
8	Prepare the new motor. Taking care for the positioning key at the tip of the motor shaft, install the pulley. Then, screw in the set screw.
9	Connect the tip connector of the motor cable. Route the cable on the same way as before.
10	Referring to the matchmark, set up the pulley and belt in the same position as before, and install the motor on the motor bracket. Tighten the bolts in the diagonal line pattern.
11	Route the cables and pipes on the same ways as before the motor was replaced. To prevent the cable and pipe from being seized by the pulley, motor, ball screws and so on, bundle them with insulock ties or similar.
12	If any belt tension is loose, dislocate the motor bracket to give a tension to the belt. As the reference of the suitable tension, it must be slackened approx. 1mm when a load of 0.4 to 0.5kgf is given to the center of the belt.

6-3-2 Conveyor section

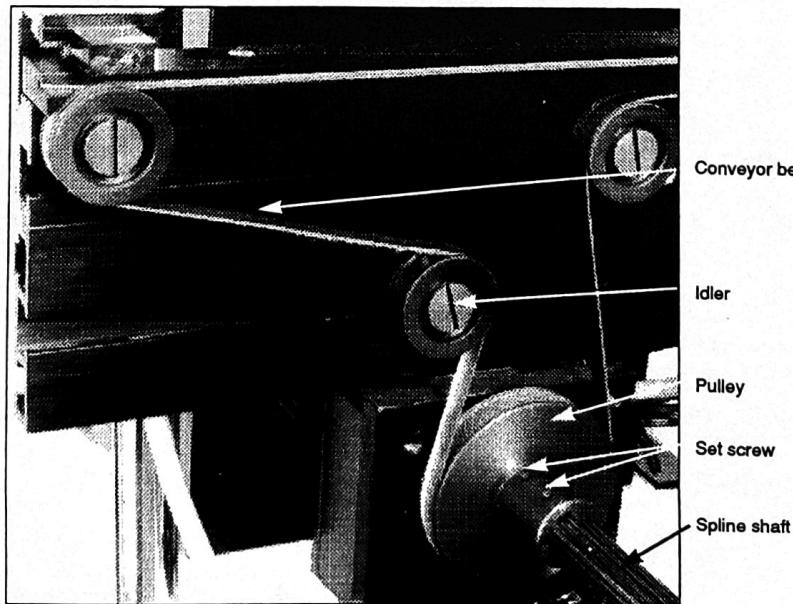
✖ DANGER !!!

Before replacing or adjusting the conveyor section, be sure to turn off the power supply.

- (1) Replacement of conveyor belt (Adjustment of belt tension) refer to figure 6-12.

No.	Replacing procedure
1	Using a flat-bladed screwdriver, loosen the idler.
2	Slide the idler leftward and rightward to adjust the tension of the conveyor belt. Loosen the tension, and remove the belt from the idler and pulley.
3	Loosen the set screws (at two places) which fasten the pulley and spline shaft.
4	Pull the spline shaft to separate it from the pulley.
5	Replace the conveyor belt.
6	Taking care for the direction of the positioning key, insert the spline shaft into the pulley, and screw in the set screw.
7	Run the conveyor belt on the idler and pulley, and fix the idler, generating the tension with the idler. Practically rotate the conveyor motor. It is proper if the belt smoothly runs without slip or seizure.

Fig. 6-12
Replacement of conveyor belt



(2) Replacement of secondary limit and origin point sensors of X and Y axes refer to figures 6-10 and 6-11.

No.	Replacing procedure
1	The secondary limit and origin point sensors of X axis are installed at two places in the vertical line (Upper side: Secondary limit switch Lower side: Origin point) near the rear side (when viewed from the rear side of the machine). The secondary limit and origin point sensors of Y axis are installed at two places in the vertical line (Upper side: Origin point Lower side: Secondary limit) on the end of the X axis frame on the left X axis (when viewed toward the front side of the machine).
2	The sensors are fastened with the screws. Remove the screws, and disconnect the connector at the end of the cable which is routed from the sensor. The connectors of the sensors for X axis are stored in the sheet metal box (black) on the rear side of the head section.
3	Replace the sensor. Connect the connector, and route the wiring on the same way as before. Fasten the sensors with the screws.

Fig. 6-10
Origin point and
secondary limit
switches of X axis

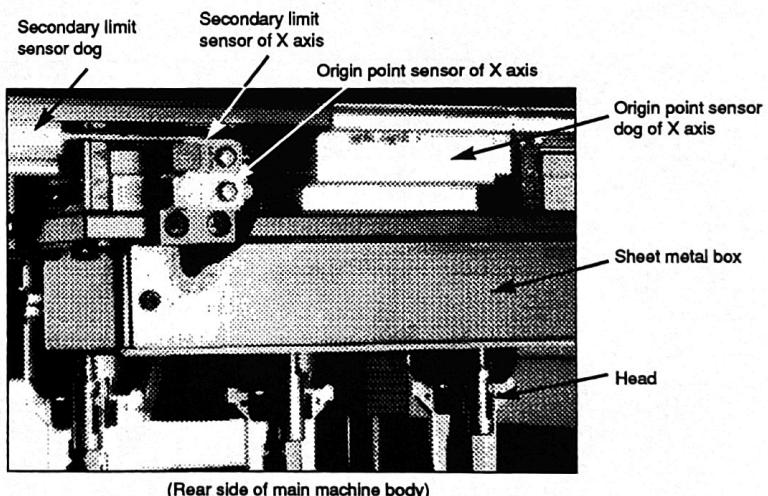
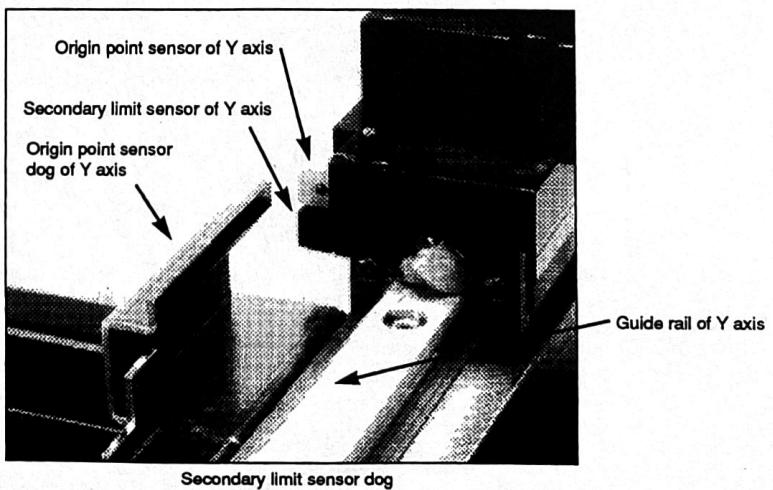


Fig. 6-11
Origin point and
secondary limit
switches of Y axis



6-3-3 Head section

✖ DANGER !!!

Before replacing or adjusting the head, be sure to turn off the power supply.

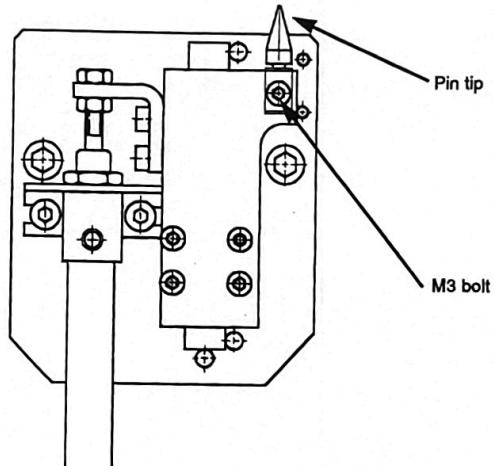
- (1) Replacement of R axis motor (Adjustment of motor belt tension and R axis machine reference amount) refer to figures 6-16 to 6-19.

No.	Replacing procedure
1	Turn off the air and power supplies.
2	The R axis motor is fastened on the bracket with M3 bolts and nuts (4 places). First separate the bolts and nuts. Don't remove the belt from the pulley and idler.
3	Remove the connector of the motor cable. The connector is housed in the black metal sheet box on the rear side of the head section.
4	Loosen the set screws (2 places) on the side of the pulley installed on the motor, and the motor will be ready for removal downward.
5	Prepare new R axis motor, and reverse the above removal procedure. When installing the motor on the pulley, direct the motor to allow the set screws to fasten the flat areas (2 places in the 90° directions) of the motor shaft.
6	In the replacement procedure 2, loosely screw in the nuts to on the bolts. Keeping the belts placed on all pulleys and idler, pull the motor toward you to apply a tension. At this time, it produces the same position as the previous one in which the wide jaws are directed in the longitudinal direction (the yellow mark which determines the nozzle position is on the right side). It is also important that the sensor dog on the motor pulley is near the origin point sensor of R axis.
7	Keeping the tension applied, fasten the R axis motor on the bracket by tightening M3 bolts and nuts (4 places). Tighten the belt to such a tension as a sag of approx. 1 to 2mm is gained when a load of 0.3kgf is applied to the center of the belt.
8	Connect the connectors of the motor cables, and arrange the cables in order.
9	Turn on the air and power supplies, and stand by the machine at the origin point. When the machine reference amount (%) of each axis is displayed on the CRT screen, check whether the value of R axis is between 40% and 60% or not. If it is out of 40 to 60%, slightly dislocate the sensor dog, stand by the machine at the origin point, and check the reference amount. Repeat the work until it is positioned between 40 and 60%.

(2) Replacement of tip of locator pin refer to figure 6-14.

No.	Replacing procedure
1	The pin tip (cone type) is fastened on the locator pin with M3 bolt. Loosen M3 bolt, and pull up the pin tip.
2	Replace the pin tip. After replacement, adjust the height to securely position the board.

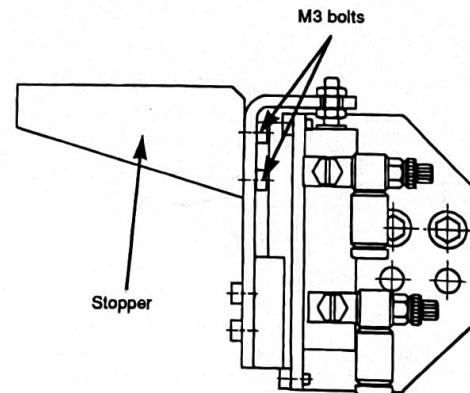
Fig. 6-14
Locator pin



(4) Replacement of stopper of main stopper refer to figure 6-15.

No.	Replacing procedure
1	The stopper of the main stopper is fastened with M bolts (two places). Remove M bolts.
2	Replace the stopper.

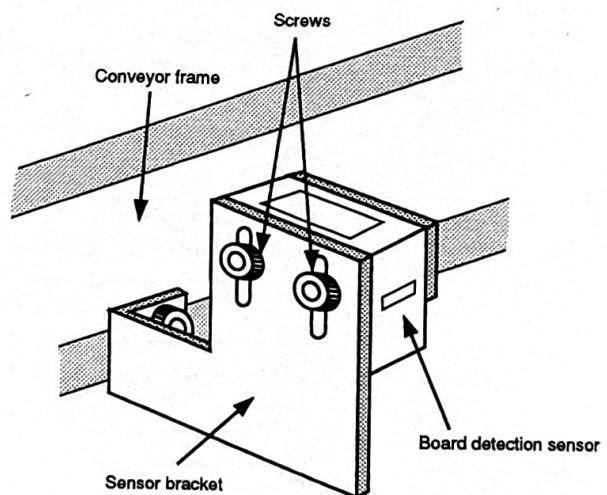
Fig. 6-15
Main stopper



- (2) Replacement of board detection sensors (inlet/outlet, work position and standby position) refer to figure 6-13.

No.	Replacing procedure
1	Remove two screws (bolts) which fasten the board detection sensor on the sensor bracket.
2	Remove the sensor connector which is positioned under the lower duct of the board push-up plate.
3	Replace the sensor.
4	Connect the connector, and arrange the cables in order.
5	Fasten the sensor on the sensor bracket. Positioning the sensor at the toppest position of the elongated hole, install the sensor to stand vertical to the board.

Fig. 6-13
Board detection sensor



- | | |
|----|---|
| 10 | When the machine stands by at the origin point, it is proper if the machine reference amount of R axis is within a range of 40 to 60% and the wide jaws of each head is in the longitudinal direction. |
| 11 | When the above adjustment is completed, input the R offset compensation value (how far the R direction is deviated from 0°). Practically set up the board. If it is deviated in the R direction, reinput the deviated amount. |

Fig. 6-16
Fixture of motor

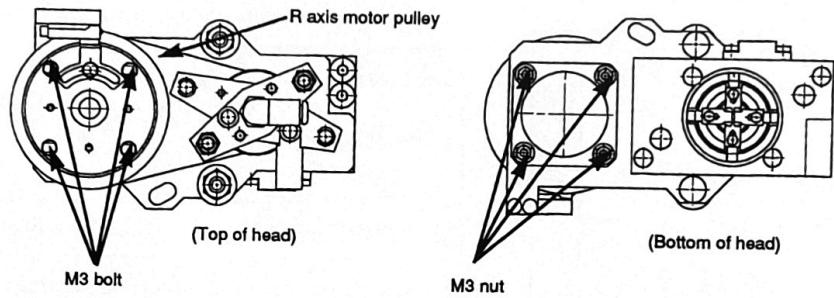


Fig. 6-17
Sheet metal box

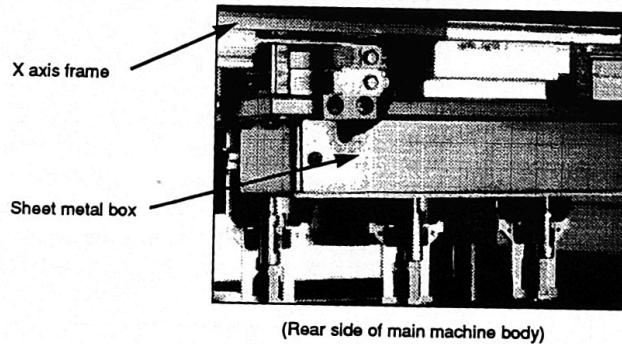


Fig. 6-18
Motor pulley section

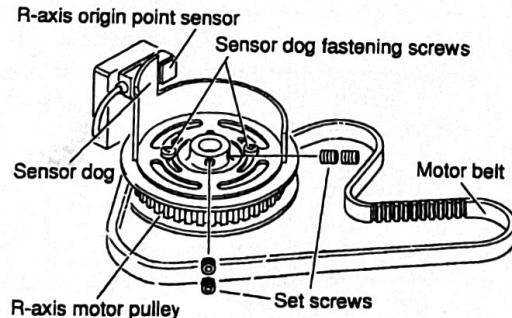
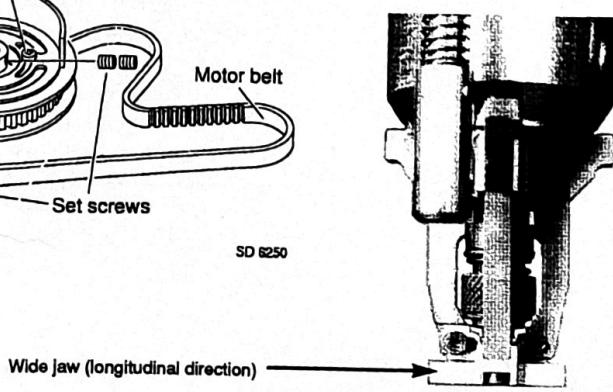


Fig. 6-19
Direction of each head when the machine stands by at the origin point



(3) Adjustment of R axis synchronous head refer to figures 6-22 and 6-23.

When the head is replaced or a suction error occurs, the following adjustment is necessary.

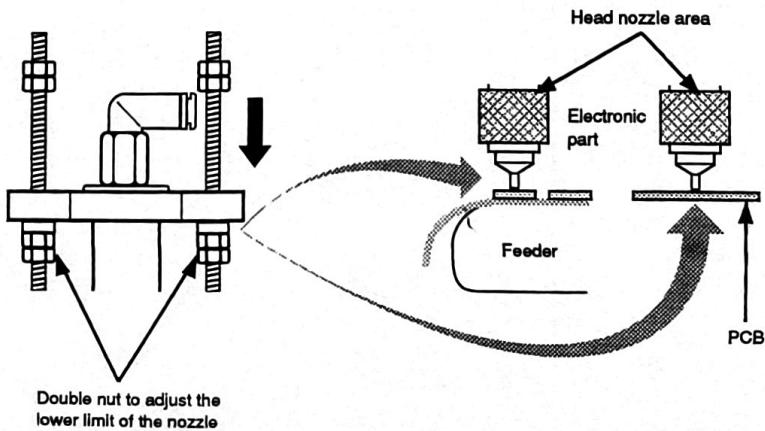
- 1) Adjustment of lower limit of nozzle
- 2) Adjustment of upper limit of nozzle
- 3) Adjustment of jaw
- 4) Adjustment of ascending and descending speeds
- 5) Adjustment of vacuum sensor

1) Adjustment of lower limit of nozzle

The lower limit of the nozzle is positioned where the nozzle is in light contact with the electronic part on the feeder and in contact with the top surface of the board positioned on the conveyor.

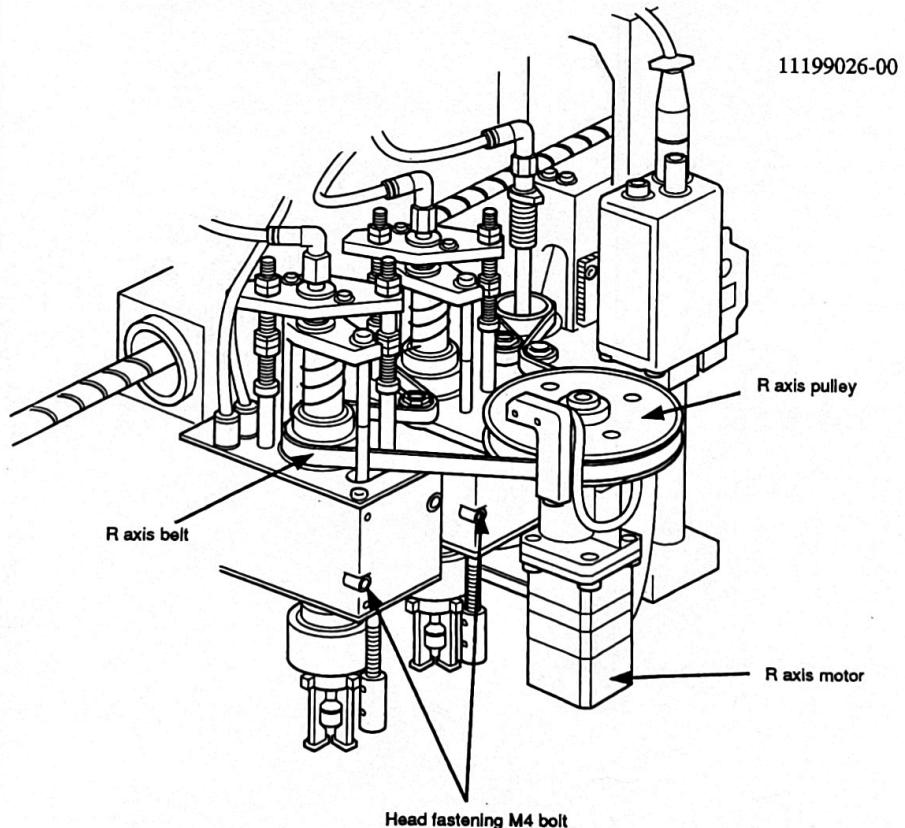
No.	Adjusting procedure
1	Among various kinds of electronic parts to be installed, the thinnest part or that stored in the emboss tape (Example: paper tape 1608 for Type 2 or emboss tape of mini-molded transistor) is set up on the feeder, and the feeder is set up on the feeder plate.
2	On the "START" screen, the function key is used to position the board. On the pin reference type, the locator pin and supporter are operated in the push-up motion for positioning. On the edge reference type, the main stopper and clamp are operated in the push-in and push-up for positioning.
3	Above the electronic part and board of the feeder, the nozzle of the head is lowered to come into light contact with the top surfaces of the electronic part and board. To gain this, the double nut is adjusted. As usual, it is adjusted to approx. 0.5mm below the top surface of the board.
4	Since the nozzle is continuously pressed by the spring, the electronic part is strongly pressed if the lower limit is excessively low. This may adversely influence the electronic part. If the lower limit is excessively high, the electronic part may not be sucked or the electronic part may be dropped to on the board.

Fig. 6-22
Lower limit of nozzle



No.	Replacing procedure
6	The head is fastened on the head holder of X axis with M4 bolts at two places. When these bolts are removed, the head can be separated from the head holder. Since the sensor cable and motor cable (on the No. 2 head alone) are provided on the head, previously remove all them. The connector of the motor cable is housed in the black sheet metal box on the rear side of the head section see figure 2-21.
7	Prepare the new head. On the new head, previously the parts which are shown in Steps 3, 4 and 5 in the replacement procedure in order to immediately set up the belt. Connect the connectors of the air tubes, sensors and motor, and arrange the tubes and cables in order.
8	Align the knock pin to the knock pin hole, and tighten two M4 bolts to fasten the head.
9	Set up the belt on the pulley of the new head. Also install the removed shaft and inverted ring into original position.
10	Set up all belts on the pulley and idler, and pull the motor toward you to apply a tension to the belt. In this state, tighten the bolts and nuts to fasten the motor on the bracket. Hereafter, adjust the tension of the belt and the R axis reference amount in the same procedure as described in "(1) Replacement of R axis motor".

Fig. 6-21
Removal and
installation of
head



(2) Replacement of R axis synchronous head refer to figure 6-20.

No.	Replacing procedure
1	Turn off the air and power supplies.
2	Loosen M3 bolts and nuts (4 places) which fasten the R axis motor on the bracket, and loosen the belt tension of R axis see figure 6-16.
3	Heads are arranged in the sequence of No. 1, No. 2 and No. 3 from the left side when they are viewed toward the front side of the machine. If the B shaft itself and the inverted ring on the top side of C and D are removed, the belt can be removed from the No. 1 head. Here, for removal with wrench, the width across flats are provided on the shafts A and B. The inverted rings on the tops of C and D are removed with the fine flat-bladed precision screwdriver or similar.
4	On the No. 2 head, remove the B shaft itself and the inverted ring on the top of C, and the belt will be ready for removal from No. 2 head.
5	On the No. 3 head, remove the A and B shafts themselves and the inverted ring on the top of C, and the belt will be ready for removal from No. 3 head.

Fig. 6-20
Setup of belt on
the head section

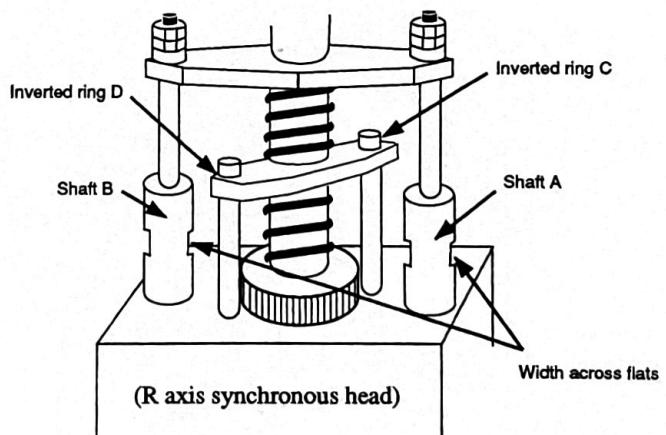
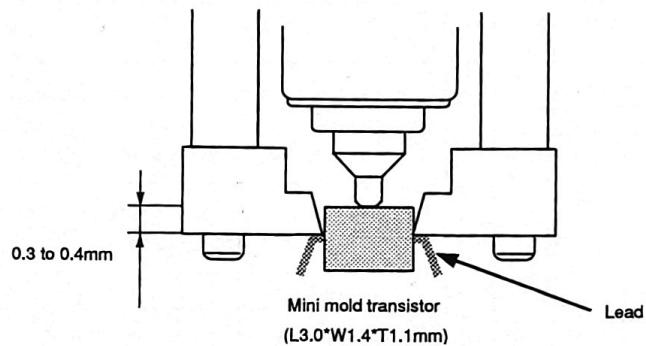


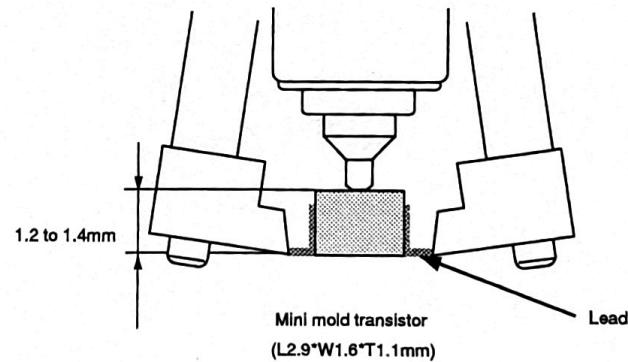
Fig. 6-25
Position of upper limit of nozzle of special type 2



Work content

If the mini mold transistor ($L2.9 \times W1.6 \times T1.1$) and S mini mold transistor ($L2.0 \times W1.2 \times T0.9$) are set up by the same head, the position is adjusted to chuck the tip of the lead of the mini mold transistor.

Fig. 6-26
Position of upper limit of nozzle when mini mold transistor and S mini mold transistor in type 2



2) Adjustment of upper limit of nozzle see figures 6-24 to 6-28.

The loading state may largely vary depending on what part of the electronic part sucked by the nozzle is clamped by the jaw. The upper limit of the nozzle takes a role to determine the position at which the jaws clamp the electronic part.

- Position of upper limit of nozzle of type 1, 2, 4 (Change of type 8, 9 or 10 to type 1, 2 or 4)

No.	Adjusting procedure
1	If any mini mold transistor, diode or similar is present among the electronic parts stocked by your company, prepare it. (Size: L2.9 × W1.6 × T1.1) If not, prepare the square chip 2125 or 3216.
2	In the manual operation screen, press (H1,2,3VAC) key to generate vacuum to suck the electronic part.
3	Turn the double nut which adjusts the upper limit of the nozzle, in order to adjust the position as shown in the following figure.

Fig. 6-24
Position of upper limit of nozzle of general type 1, 2 or 4

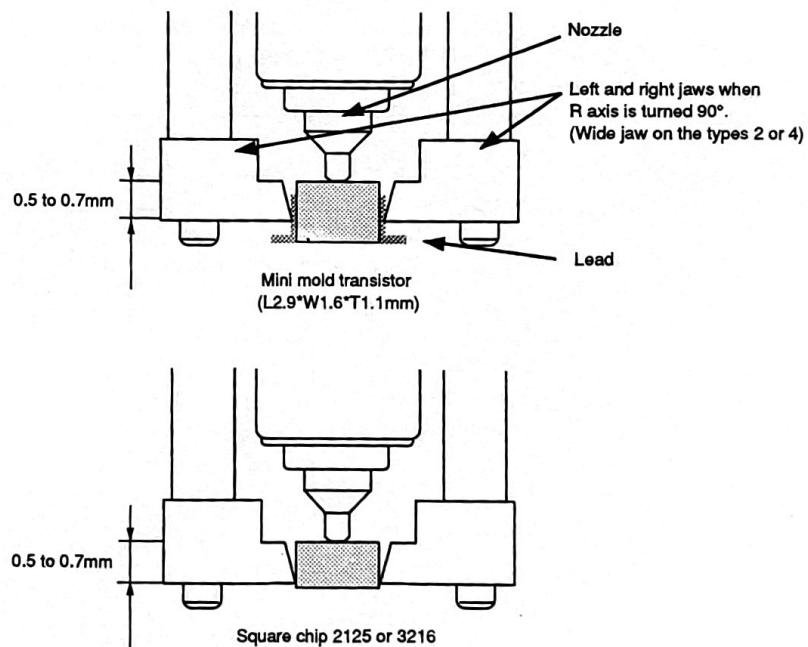


Fig. 6-23
Nozzle load

The relationship between the spring force applied to the tip by the nozzle spring and the lower limit is as shown below.

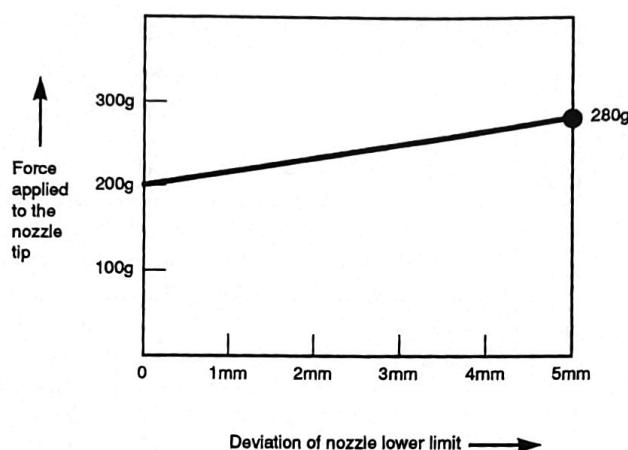


Fig. 6-29
Adjustment of jaw

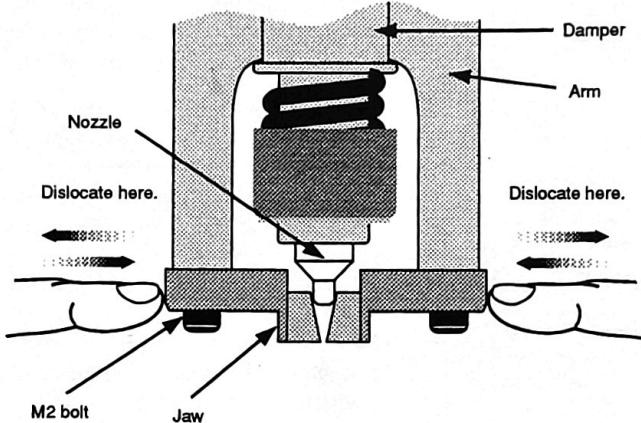


Fig. 6-30
Position where
electronic part is
chucked

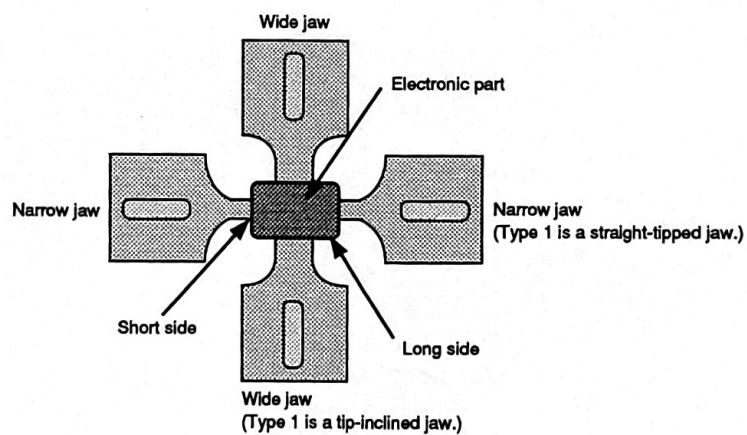
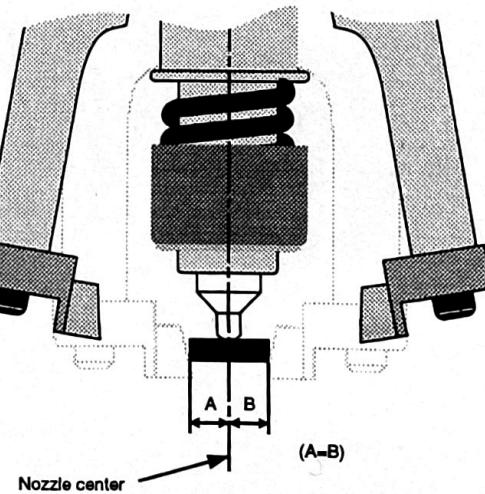


Fig. 6-31
Adjustment of jaw



Adjustment of jaw of type
1, 2 or 4 (Initial adjust-
ment)

 CAUTION !

Adjustment of jaw of type
8 or 9 (Initial adjustment)

- 3) Adjustment of jaw refer to figures 6-29 to 6-34.

If jaw is worn, adsorption is poor or loading is dislocated. For replacement and adjustment, proceed with the following.

If it is also necessary to adjust upper limit of nozzle, first refer to "2)

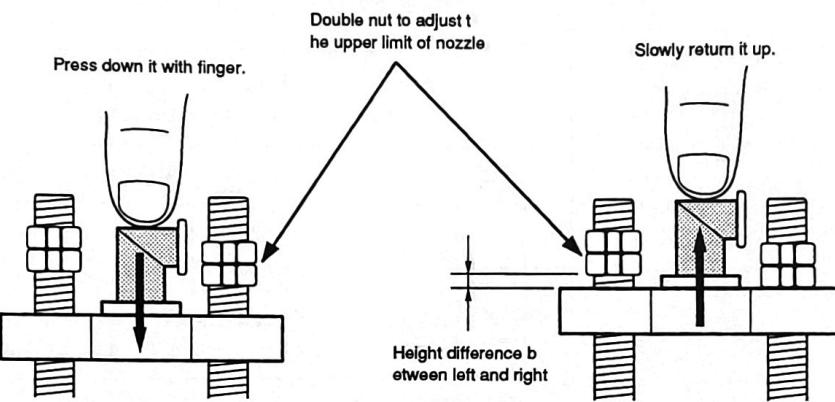
No.	Adjusting procedure
1	If it is necessary to replace the jaw since it is worn, remove the M2 bolts which install the jaw, and set up a new jaw. Make M2 bolt loose.
2	Install the chuck on the head, and tighten M2 bolt to bring all jaws into light contact with the nozzle when the damper is in contact with the arm.
3	Though the above jaw adjustment alone is sufficient for setup, finely adjust the jaws for fine setup.

Adjustment of upper limit of nozzle.".

When replacing the jaws, install the wide jaws on the arm on the inner sleeve side (with white paint) and the narrow jaws on the outer sleeve side.

No.	Adjusting procedure
1	On the chuck arm, position the wide jaw at the center of the chuck, and tighten M2 bolts.
2	On the narrow jaws, the installation position is different between types 8 and 9. Position the jaw of type 8 at the center of the chuck, and the jaw of type 9 at the outer side of the chuck.
3	Though the above jaw adjustment alone is sufficient for setup, finely adjust the jaws for fine setup.

Fig. 6-27
Position of upper limit of left and right nozzles



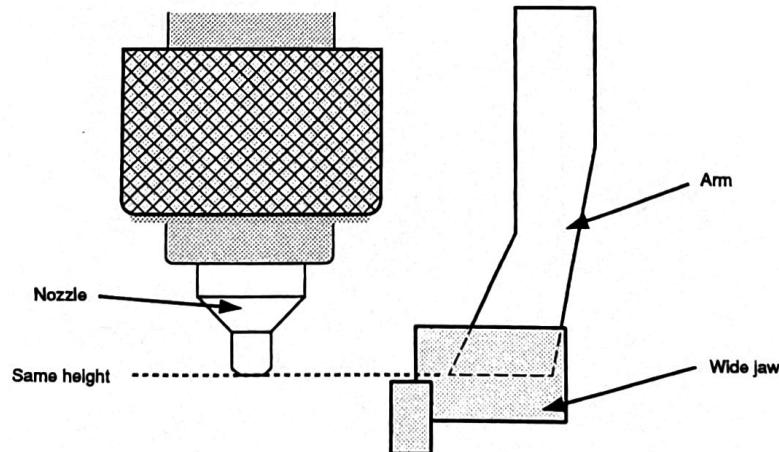
CAUTION !

The double nuts to adjust the upper limit of nozzle are provided at two left and right positions. If their positions (height) are different from each other, it will cause a trouble during setup. As shown in the figure, press it with finger for checking, and adjust them to eliminate a height difference between the left and right.

- Position of upper limit of nozzle of type 8, 9 or 10 (Change of type 1, 2 or 4 to type 8, 9 or 10)

No.	Working procedure
1	At the position of upper limit of nozzle of type 8, 9 or 10, the nozzle tip is nearly equal to the tip of the arm which is provided with the wide jaws. Using the wrench, move the double nut for adjustment.
2	After adjustment, make a suitable SOP or similar sucked to check whether it is proper or not.

Fig. 6-28
Position of upper limit of nozzle of type 8, 9 or 10



Adjustment of jaw with
feed-back of setup

Though the initial adjustment alone of the jaw allows the electronic part to be set up, the following adjustment is necessary for setup with CAD data and common use of data with other machines.

No.	Adjusting procedure
1	Prepare one board, and stick both-side sticky tape. In order to position the board, change the setup of the conveyor section.
2	Prepare the smallest parts among those to be set up. On the type 2, use the chip part 2125.
3	At the suitable position on the board, repeat the operation of 0° and 180° (rotation angle of R axis) in the +X direction (from left to right), and produce the data in order to set up the electronic part. Also repeat the operation of $+90^\circ$ and -90° to produce data in order to set up the electronic part.

Fig. 6-32
Produced data

