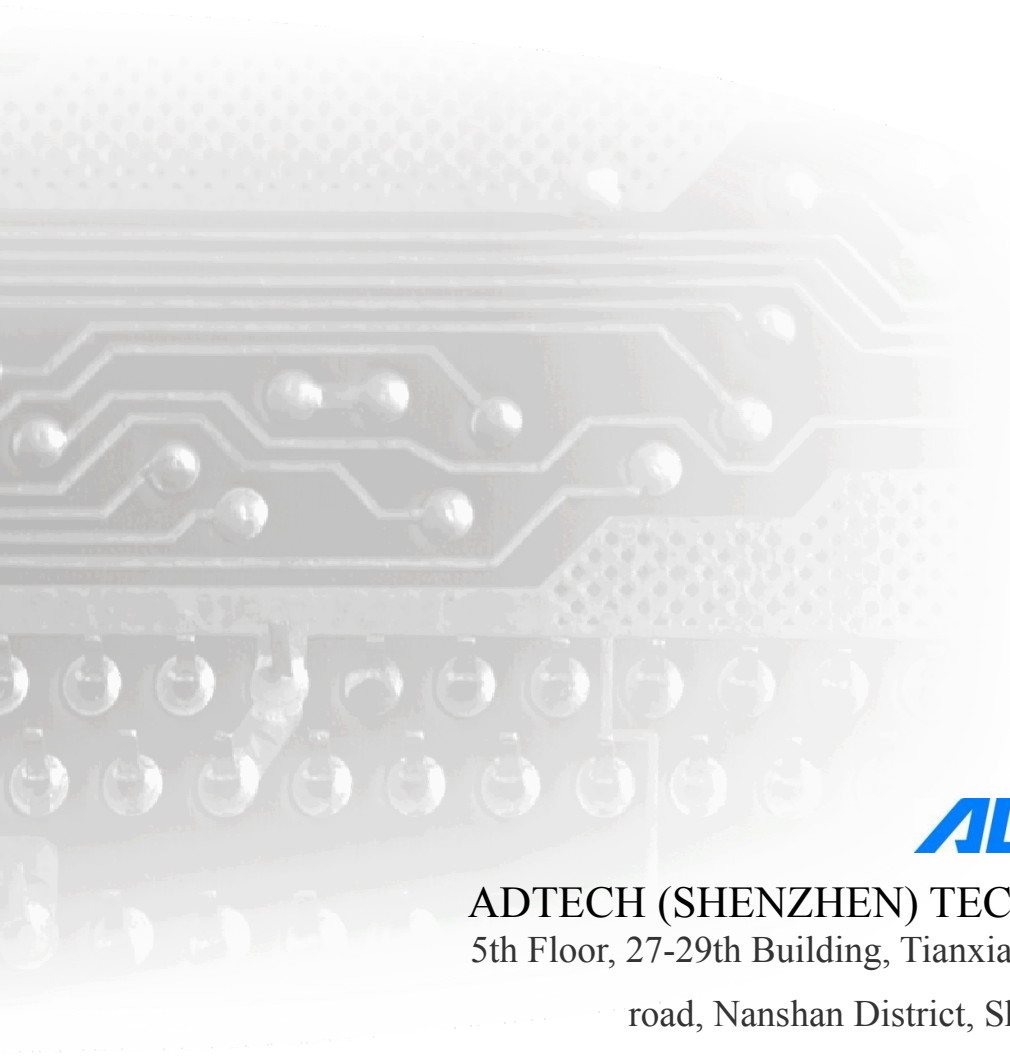

NCT-04/03/02

Punch CNC System (Commissioning)

User Manual



ADTECH 众为兴

ADTECH (SHENZHEN) TECHNOLOGY CO., LTD
5th Floor, 27-29th Building, Tianxia IC Industrial Park, Yiyuan

road, Nanshan District, Shenzhen Post code: 518052

Tel: 0755-26099116 Fax: 0755-26722718

E-mail: export@machine-controller.com www.machine-controller.com

Copyright Notice

The property rights of all the parts of the manual belong to Adtech (Shenzhen) CNC Technology Co., Ltd. (Adtech for short), and any form of imitation, copying, transcription or translation by any company or individual without the permission is prohibited. This manual does not include any form of assurance, standpoint expression, or other intimations. Adtech and the stuffs have no responsibility for any direct or indirect disclosure of the information, benefit loss or business termination of this manual of the quoted product information. In addition, the product and the information mentioned in this manual are for reference only, and the content is subject to change without notice.

ALL RIGHTS RESERVED!

Adtech (Shenzhen) Technology Co., Ltd.

Basic Information

[illegible]

Precautions and Explanations

※Transport and storage:

- Do not stack product package more than six layers;
- Do not climb, stand on or place heavy stuff on the product package;
- Do not pull the cable still connecting with machine to move product.
- Forbid impact and scratch on the panel and display;
- Prevent the product package from humidity, sun exposure, and rain.

※Open-box inspection:

- Open the package to confirm the product to be purchased by you.
- Check damages situation after transportation;
- Confirm the integrity of parts comparing with the parts list or damages situation;
- Contact our company promptly for discrepant models, shortage accessories, or transport damages.

※Wiring

- Ensure the persons involved into wiring and inspecting are specialized staff;
- Guarantee the product is grounded with less than 4Ω grounding resistance. Do not use neutral line (N) to substitute earth wire.
- Ensure grounding to be correct and solid, in order to avoid product failures or unexpected consequences;
- Connect the surge absorption diodes to the product in the required direction, otherwise, the product will be damaged;
- Ensure the power switch is OFF before inserting or removing plug, or disassembling chassis.

※Overhauling

- Ensure the power is OFF before overhauling or components replacement;
- Make sure to check failures after short circuit or overloading, and then restart the machine after troubleshooting
- Do not allow to frequently connect and disconnect the power, and at least one minute interval between power-on and power-off.

※Miscellaneous

- Do not open housing without permit;
- Keep power OFF if not in use for a long time;
- Pay close attention to keep dust and ferrous powder away from control;
- Fix freewheel diode on relay coil in parallel if non-solid state relay is used as output relay. Check whether power supply meets the requirement to ensure not burning the control.
- Install cooling fan if processing field is in high temperature, due to close relationship between service life of the control and environmental temperature. Keep proper operative temperature range for the control: $0^{\circ}\text{C} \sim 60^{\circ}\text{C}$.
- Avoid to use the product in the overheating, humid, dusty, or corrosive environments;
- Add rubber rails as cushion on the place with strong vibration.

※Maintenance:

Please implement routine inspection and regular check upon the following items, under the general usage conditions (i.e. environmental condition: daily average 30°C , load rate: 80%, and operating rate: 12 hours/ day)

Routine Inspection	Routine	Confirm environmental temperature, humidity, dust, or foreign objects. Confirm abnormal vibration and noise; Check whether vents are blocked by yarn etc.
Regular Check	One year	Check whether solid components are loose Confirm whether terminal block is damaged

Contents

1Preparation	5
1.1 Power Requirements	5
1.2 Relationship between Self-diagnosis and Voltage Level	5
1.3 Parameter Description	5
2Commissioning	6
2.1 Preparation before Commissioning.....	6
2.2 Debugging Motion Axes (X/Y).....	6
2.3 Zero Point Switch Installation and Commissioning	7
2.4 Commissioning of Punch Related Signals	7
2.5 Turret Commissioning and Mold Parameter Settings.....	13
2.6 Establishing Coordinate System	15
2.7 Trial Processing.....	16
3Operation	19
3.1 Controller Operation Sequence and Processes	19
3.2 Platform Feeder Blowing Control.....	20
3.3 NCT-02 Blanking Control.....	21
3.4 Automatic Lubrication Function.....	22
3.5 Handheld Box Associated Button	
Configuration (pedal, positioning blocks, etc.).....	23
3.6 Relocation Setup and Operation	24
3.7 Punching Status Display Interface	25
4Document Revision History.....	28

1 Preparation

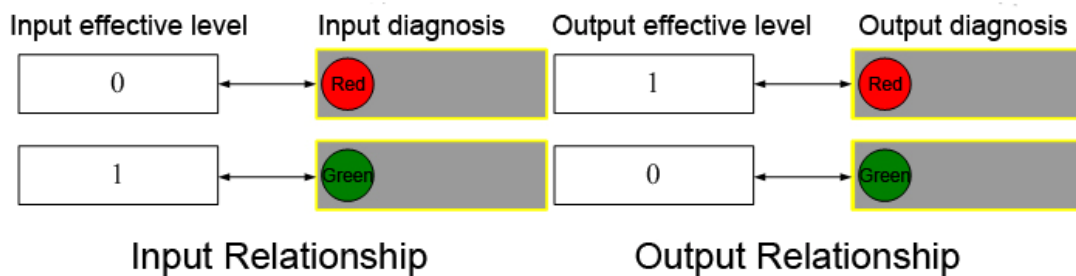
1.1 Power Requirements

Output voltage: DC24V/6A, precision error $\pm 10\%$;

Power lines should be placed separately, and away from the welding machine, and other equipment that has larger impact on current fluctuations; add filter if necessary;

For specific anti-jamming measures, refer to "Maintenance Manual" 11.1.3 Installation Considerations;

1.2 Relationship between Self-diagnosis and Voltage Level



1.3 Parameter Description

P1 - P5 indicate comprehensive, axis configuration, management, mold, and port respectively;

Example

P5.061 indicates No. 061 "port" parameter, external start 2 detection port number;

Port settings are invalid

Input "8888" in the "Input" mode;

2 Commissioning

2.1 Preparation before Commissioning

Before commissioning motion axes, adjust the emergency stop signal, hard limit and soft limit function to prevent machine tool crash due to misuse in the commissioning process of other features; for details, please refer to "NCT-XX Maintenance Manual": 8 Safe Operation;

2.1.1 Emergency Stop

Emergency stop button: Control Panel

Reset

Reset; additional panel:



External emergency stop port configuration: P5.058;

External emergency stop port effective level: P1.056;

2.1.2 Hard Limit

Hard limit port number: X-: 17, X +: 18, Y-: 19, Y+: 20

X hard limit effective level: P2.019;

Y hard limit effective level: P2.022;

2.1.3 Soft Limit

If the hard limit isn't installed, soft limit must be set to protect the machine;

Related parameters: P1.021 - P1.024



Note

Soft limit coordinates are based on mechanical coordinates;

2.2 Debugging Motion Axes (X/Y)

Basic functions commissioning of X, Y-axis and the drive;

X axis for example;

Given: the minimum resolution of the controller is 0.01mm; requires servo alarm function and alarm clear function; please set the relevant parameters;

2.2.1 Drive Connections

Controller X-axis output port: XS1; for port definition, see "NCT-XX Maintenance Manual" 11.2.1 Control

Interface of Motor Drive;

11.3.3 Servo drive connection diagram;



Note

Connect the cable of XS1; it is prohibited to short unused lines!

2.2.2 System Gear Ratio Setting

For the setting of system gear ratio, refer to "NCT-XX Maintenance Manual" 10.2 Comprehensive Parameters (P1.) 001 ~ 008;

According to the requirement, the minimum resolution should be 0.01mm, and P1.001 X-axis command multiplier is 1;

P1.002 X axis command division factor: 10

That is, if the system X axis coordinates change 10mm, the system will send 1000 pulses;

Note

- When setting the gear ratio, consider the maximum speed and the drive's maximum acceptable pulse frequency when the controller is running;

For example: a servo pulse port maximum acceptable pulse frequency is 200KHZ; controller's minimum resolution is 0.001mm

The actual maximum operating speed of the servo is 12m/min; if the feed rate of the controller is set greater than 12m/min, the motor will accelerate for a period of time and then stop;

- Controller maximum output pulse is 2MHz;
- Controller interpolation maximum output pulse is 500KHz;

2.2.3 Commissioning

After setting up the system and drive gear ratio, check if the gear ratio is set accurately in "metering" approach;

The specific operation is as follows:

- 1) Press the  button to switch to "step" mode;
- 2) Press  /  to switch single-step increment;
- 3) Manually press "X+", and measure whether the distance traveled by the machine is consistent with the set single-step increment;
- 4) If not, reset the gear ratio;

Note

Set the gear ratio of other axes in the same method;

2.3 Zero Point Switch Installation and Commissioning

Zero point detection port of X, Y, T, C axis: IN0-IN3;

External zero point detection level: P2.031, P2.032, P2.033, P2.034;

Home direction parameter of each axis: P1.044-P1.047;

Home speed setting: P1.048-P1.051;

Home acceleration setting: P2.067-P2.070;

2.4 Commissioning of Punch Related Signals

Punch signals, including clutch output, feed signal, single punch stopping top dead center, nibbling

stopping dead point;

2.4.1 Machine Main Drive CNC Punch

2.4.1.1 Parameter settings:

P1.085: Punch control: mechanical

P1.078: Punching mode: Continuous - distance

P5.014: Clutch output port

P1.081: Clutch pull-effective level <O>;

2.4.1.2 Shared by Feeding Signal and Stopping Top Dead Center Signal

Feeding signal port: P5.011,

Feeding signal level: P1.080,

Note

Single punching stopping top dead center input port: P5.012 must be set to invalid and does not allow pin assignment, or else the system cannot close the punch;

Example

Example: Feeding signal port: IN (14), feeding effective level: 0

Feeding time is: moment that input pin level from 0 to 1;

That is: during input diagnostics, the red - green moment;

Off clutching time is same as above;

Scope of Application

This control method can be applied in occasions with relatively low punch frequency;

Advantage: save cost, reduce the risk of damage when a plurality of switches is used;

Disadvantage: Switch mounting location should be considered, the feeding timing and stopping top dead center position should be accurate;

2.4.1.3 Using Single Punch Stopping Top Dead Center

P5.011, Feeding signal port: P5.011,

Feeding signal level: P1.080,

Single punch stopping top dead center input port: P5.12;

Single punch effective level settings: P1.112;

Note:

In this mode, you need to set “P5.013 Nibbling stopping top dead center input port” to invalid;

Example

Example: P5.011: IN (14) P1.080: 0

P5.12: IN (15) P1.112: 0

Feeding time is: jump of pin 14 level from 0 to 1;

That is: during input diagnostics, the red - green moment;

Stopping top dead center time: jump of pin 15 level from 0 to 1;

2.4.1.4 Using Single Punch and Nibbling Stopping Top Dead Center Function

Since the single punching and continuous punching have different speed, the braking distances are also different,

If the continuous punching clutch is off and continue to use single punching signal to control, the punch position will be different after stopping; therefore, a separate sensor switch should be added for continuous punching

Feeding signal port: P5.011,

Feeding signal level: P1.080,

Single punching stopping top dead center input port: P5.12;

Single punching effective level setting: P1.112;

Nibbling stopping top dead center input port: P5.13;

Nibbling effective level setting: P1.112;

Note:

In this mode, you must assign P5.13 port number; otherwise, nibbling stopping top dead center signal is invalid;

Example

Example: P5.011: IN (14) P1.080: 0

P5.012: IN (15) P1.112: 0

P5.013: IN (16) P1.112: 0

Feeding time is: moment of pin 14 level from 0 to 1;

That is: during input diagnostics, the red - green moment;

Stopping top dead center time: moment of pin 15, 16 level from 0 to 1;

2.4.1.5 Manual Punching Sensor Switch Position

P1.078 punching mode: Continuous - distance

Connect top dead center sensor switch (relevant parameters P 5.010, P1.079);

Connect the clutch output signal;

Set P1.124 manual punching times;

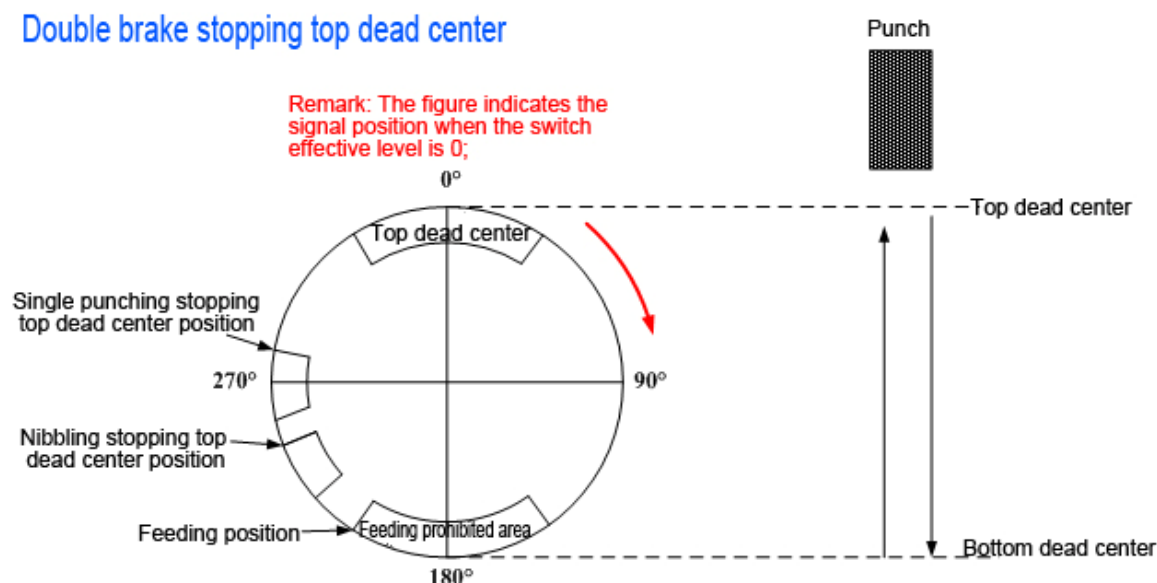
Manually press  button to open the punch; the feeding signal, single punch stopping top dead center, and nibbling stopping top dead center sensor switch position can be adjusted;

Note:

If P1.124 Manual punching frequency is greater than 1, be sure to install the top dead center sensor signal; otherwise the system cannot determine the number of punching.

2.4.1.6 Mechanical Punching Crank Switch Position Indication (double brake for example)

Double brake stopping top dead center

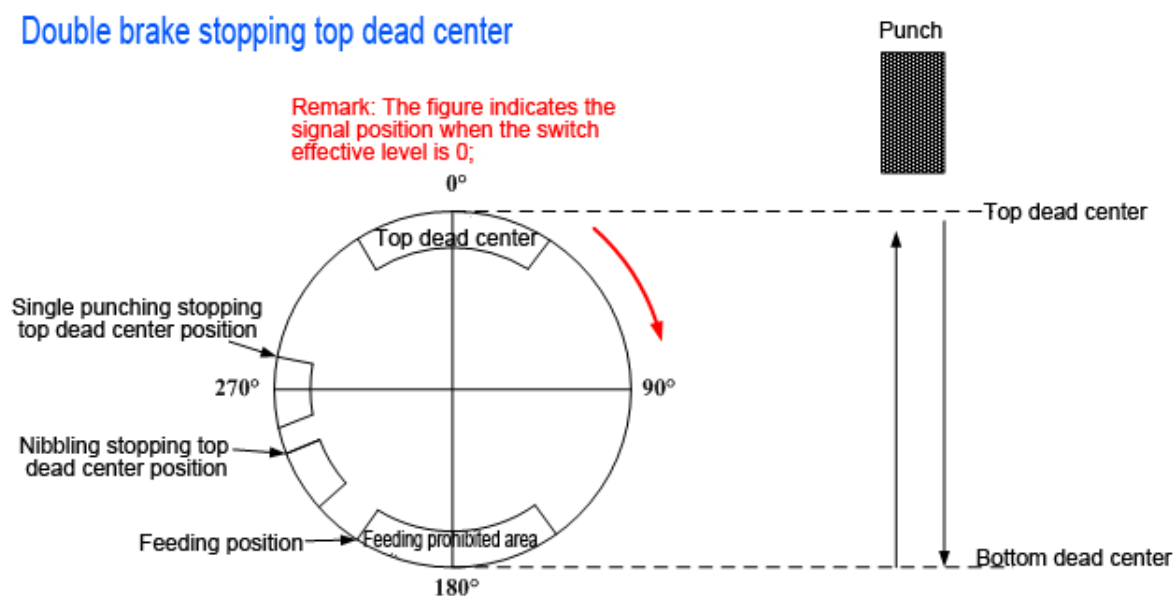


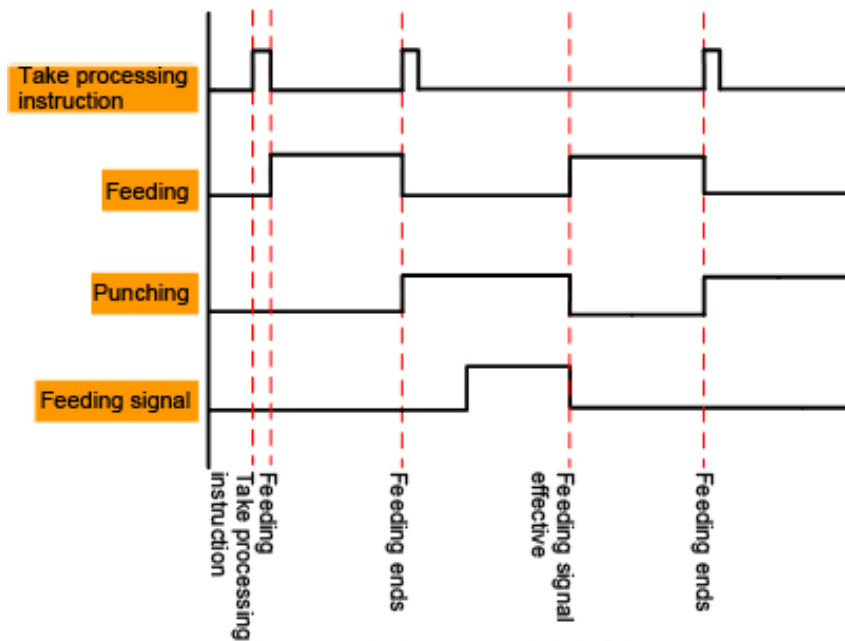
This is a mechanical punching running diagram, stopping top dead center and feeding zone are schematic only, and the range of feeding prohibited area is smaller than shown. The position of the brake pad depends on the clearance of the clutch and pressure.

Pay special attention that: the top dead center position is unique; when the punch is at the highest point, the top dead center sensing block aligns with the top dead center switch.

2.4.1.7 Punch Signal Installation Diagram and Corresponding Punch Control Timing

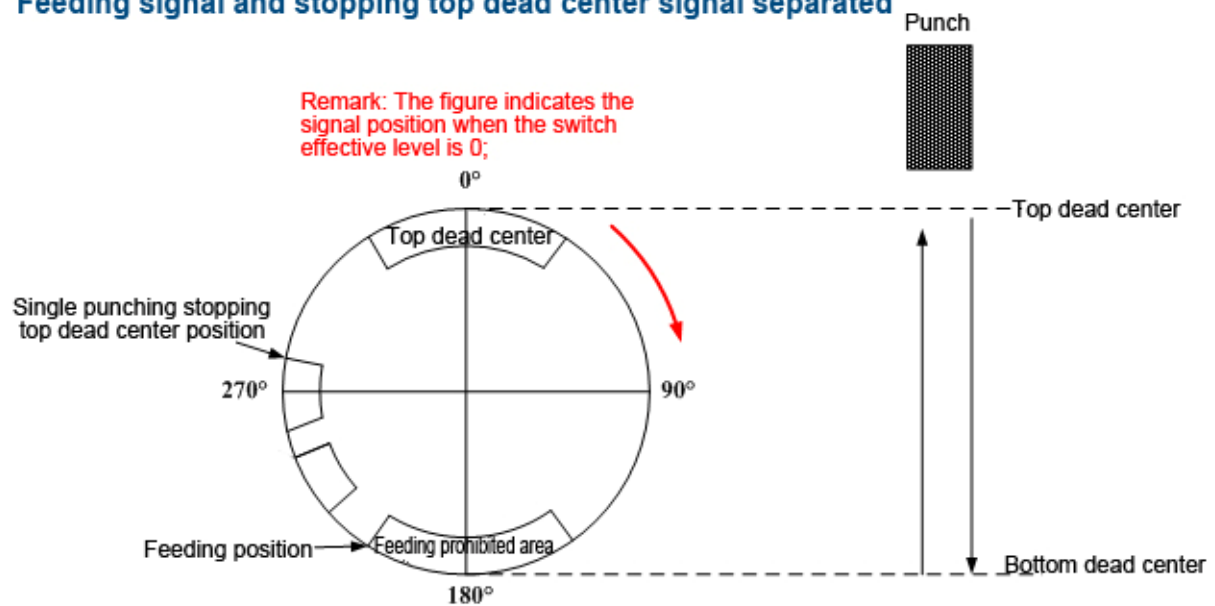
Double brake stopping top dead center

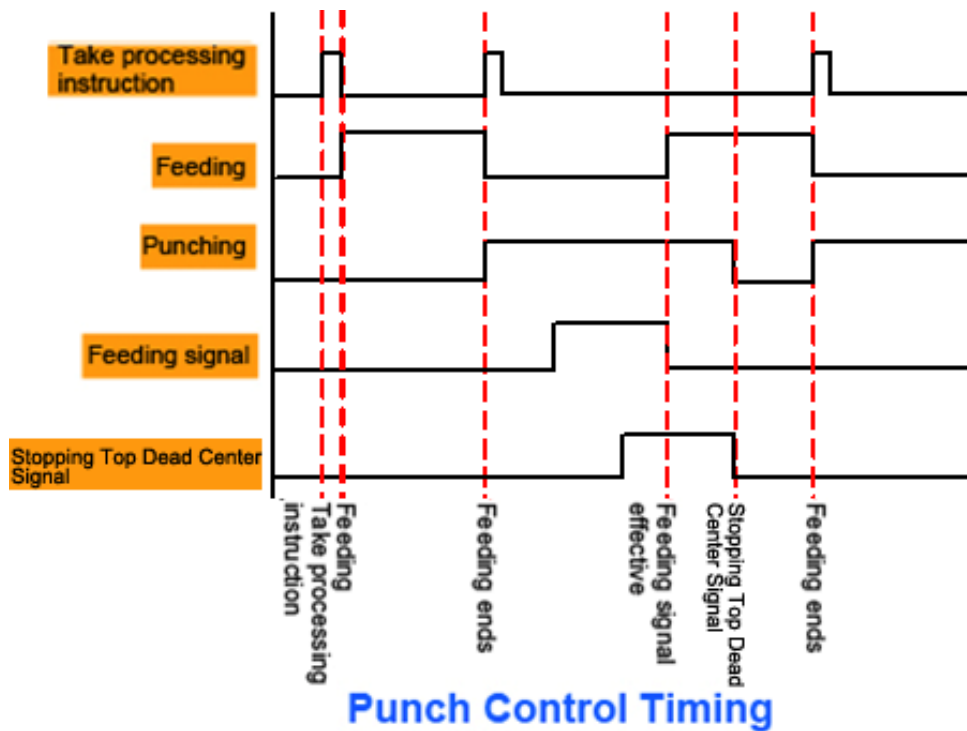




Punch Control Timing

Feeding signal and stopping top dead center signal separated





2.4.2 Hydraulic Drive CNC Turret Punch Press

2.4.2.1 Parameter Settings:

P1.085 punch control: Hydraulic

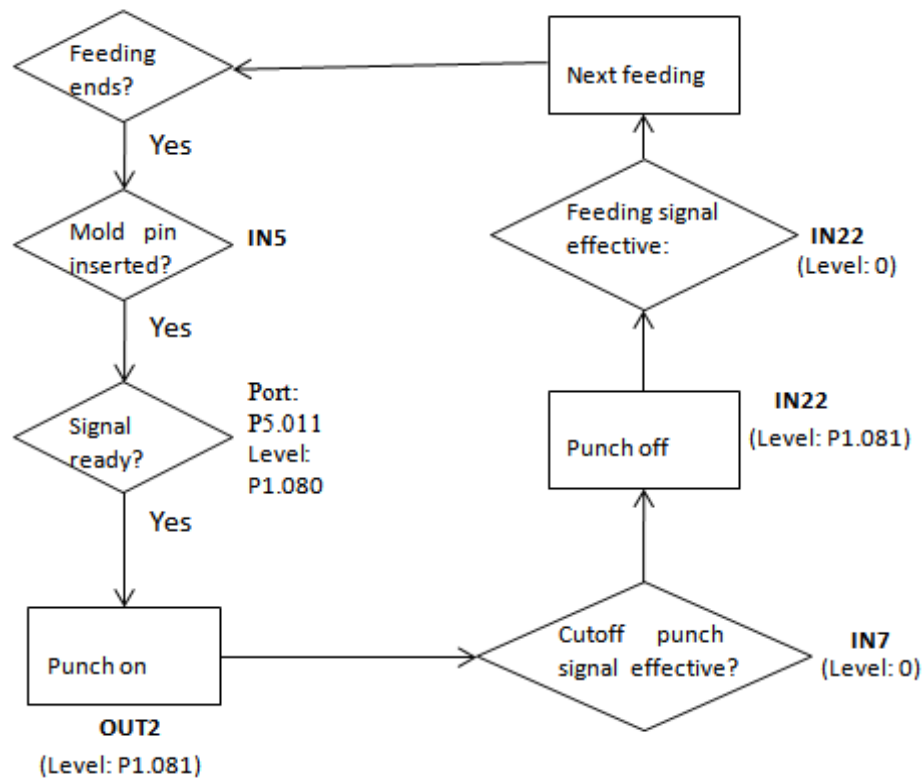
P1.078 punching mode: Hydraulic - single punch

Feeding sensor switch port: IN (22) (internally fixed)

Ready signal: P5.01 1;

Cutoff punch signal: IN (7) (internally fixed);

2.4.2.2 Punching Process Flow Diagram;



Hydraulic Drive Punching Flow Diagram

2.5 Turret Commissioning and Mold Parameter Settings

2.5.1 Mold Parameter Settings

- 1) Select "Parameters" - "Mold" to enter the Mold Parameter Settings interface;
- 2) T1 as the reference, input the angle value of other station mold relative T1 to "Turret position";
- 3) Enter the total mold count to "Turret" - "002 Total turret mold number";
- 4) Select "Coordinates" - "Offset" to enter mold offset setting;

Note:

- 1) T1 turret position value must be 0,
- 2) "Turret" - "Total turret mold number" parameter: total tool number can't be 0, or else alarm occurs when the mold is changed;

2.5.2 Mold Pin Debugging

- 1) Connect the mold pin output and the detection switch; (mold pin output port: OUT (3), mold pin release input port: IN (04), mold pin lock input port IN (05));

- 2) Manually press  to check whether the diagnosis results are same as the actual; if not, change the effective level;

- 3) Mold pin output clamping effective level: P1.090;
- 4) Mold pin insertion detection effective level: P1.086;
- 5) Mold pin unplug detect effective level: P1.087;

2.5.3 T-axis Home Debugging

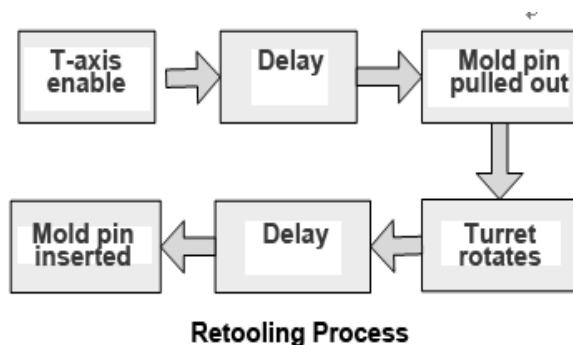
- 1) Install the home detection switch;
- 2) Set T-axis offset; related parameter: P1.039 T-axis zero point offset;
- 3) Set T-axis direction clearance compensation; related parameter: P1.030;
- 4) Set T-axis home speed: related parameter: P1.050;
- 5) Set T-axis home acceleration: related parameter: P2.069;

2.5.4 Turret Trial Run

- 1) Press the  button to switch the work mode to "Retool";
- 2) Press T+/T- to move the turret for a station;
- 3) In MDI, enter the code to test retooling

Note:

- 1) The system integrates turret retooling debugging function; P1.1 10 Turret retooling debugging enabled;
 1: When the turret is in position, the mold pin is not inserted; it can be inserted manually;
 0: When the turret is in position, the mold pin is automatically inserted;
- 2) P2.099 servo T-axis enable control is 1; the retooling process is



2.5.5 Retooling Speed Adjustment

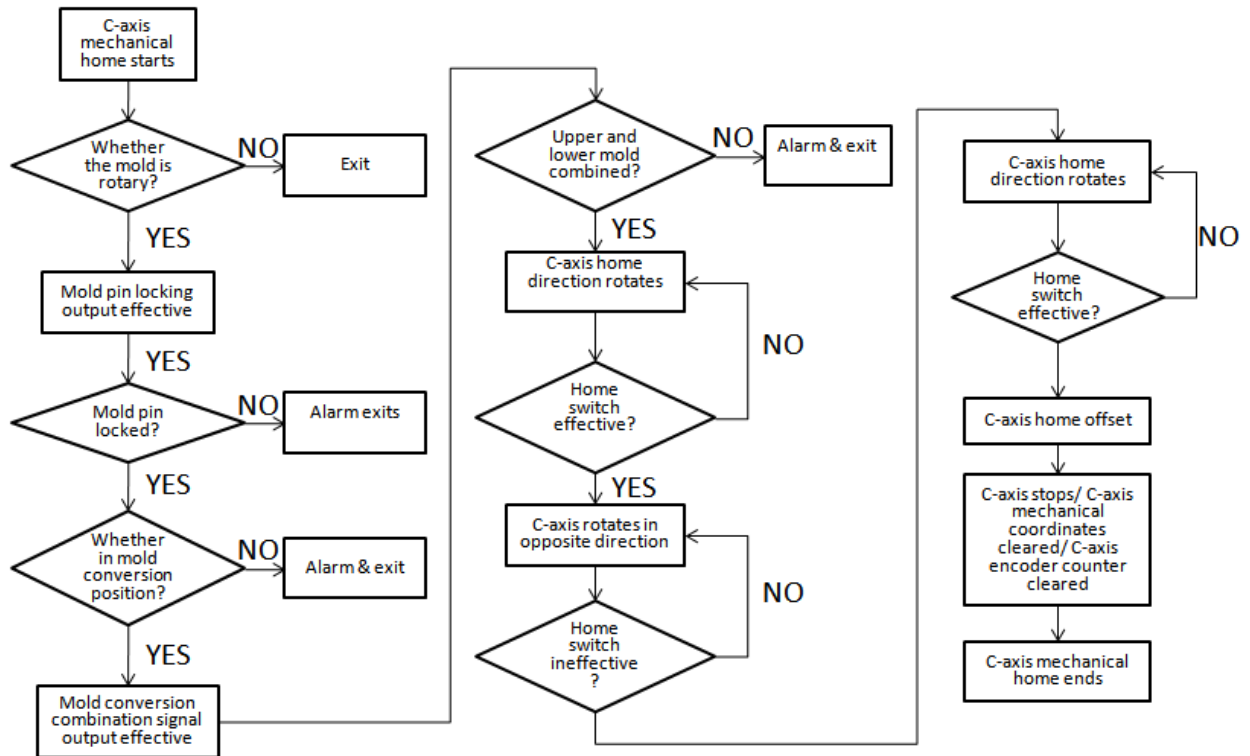
T-axis parameters

Speed: P1.011 T-axis rapid traverse rate;

Initial speed: P1.015 T axis starting rate;

Acceleration: P1.019 T-axis acceleration;

2.5.6 C-axis Mechanical Home Flow Chart

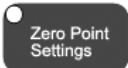


2.6 Establishing Coordinate System

2.6.1 Clearing Workpiece Coordinate System

Method 1: Clear via additional panel

- 1) Connect the additional panel;
- 2) Enable additional panel function; related parameter P3.0120 Additional panels enable;

- 3) Press the  key on the additional panel;
- 4) Then, the absolute coordinate values will be cleared;

Method 2: Clear via external handheld box

- 1) Set the coordinate system clearing port: P5.042 default effective level is 0;
- 2) Connect the external switch, and enter the diagnose interface;
- 3) Move the machine tool, press the button, and then the coordinate values will be cleared;

Method 3: Clear via controller

- 1) Enter "Coordinates" - "Coordinate Settings" interface;
- 2) Switch to the "Manual" mode;
- 3) Move the machine tool to set the workpiece zero position;
- 4) Press "EOB"; follow the prompts;

2.7 Trial Processing

2.7.1 Processing Parameter Settings (mechanical for example)

P1.085 punch control mode: Mechanical

P1.078 punching mode: Continuous - distance

P1.084 maximum punching step;

P1.083 punching movement mode;

P1.025 feed rate;

P1.026 feed initial speed;

P1.027 feed acceleration;

P1.035 maximum feed rate;

For the above parameters, see "Maintenance Manual" for details;

2.7.2 Trial Run under MDI

Add the following G codes to the MDI, and press "Start" to process;

G90G54 // absolute coordinate programming, coordinate system G54;

T2 // retooling

G00 X100 Y100; // punch at position (100,100);

G91 G28 X0 Y0 //XY reference point

M30 // End program and return to the program header

2.7.3 Operation Sequence in Auto Mode

2.7.3.1 Punching Center Distance Settings

1.Press [Coordinates] to enter the coordinate system setting interface;

2.Set G54 coordinate offset

3.XY is the offset of workpiece origin relative to the machine zero

2.7.3.2 Machine Tool Reference Point

4.Press the [Home] key to enter the home mode,

5.Press [Start], and the system performs T, XY axis reference point operation respectively;

6.Clamp the sheet metal after returning to reference point;

2.7.3.3 Copy Processing Files with USB Disk

Copy the program from external USB disk to the CNC memory directly

Follow the steps below:

7.Insert USB disk;

8.Press [PROG] and [FILE] in the menu to enter the file operation screen;

9.Select data traveler (U) disk, and press [EOB] to enter the USB disk;

10.Move the cursor to select the file on the USB disk;

11.Press [Copy] to copy the file;

12. Press [Cancel] to enter the main menu, D drive, and PROG folder

13. Press [Paste] to copy the file from the USB disk to the controller system;

2.7.3.4 Automatic Operation

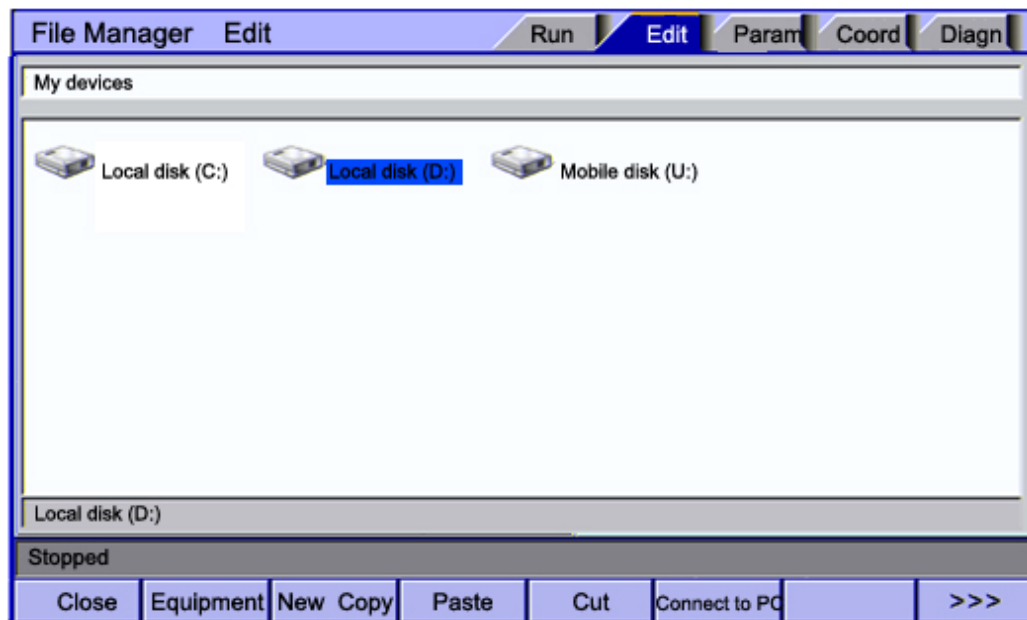
The program is previously stored in the memory, select a program through the operation panel and load

successfully, and press the  key to start automatic operation. Thereafter press the  key to pause, press  again to resume running; while running, press the  key to stop running immediately.

Memory operation steps are as follows:

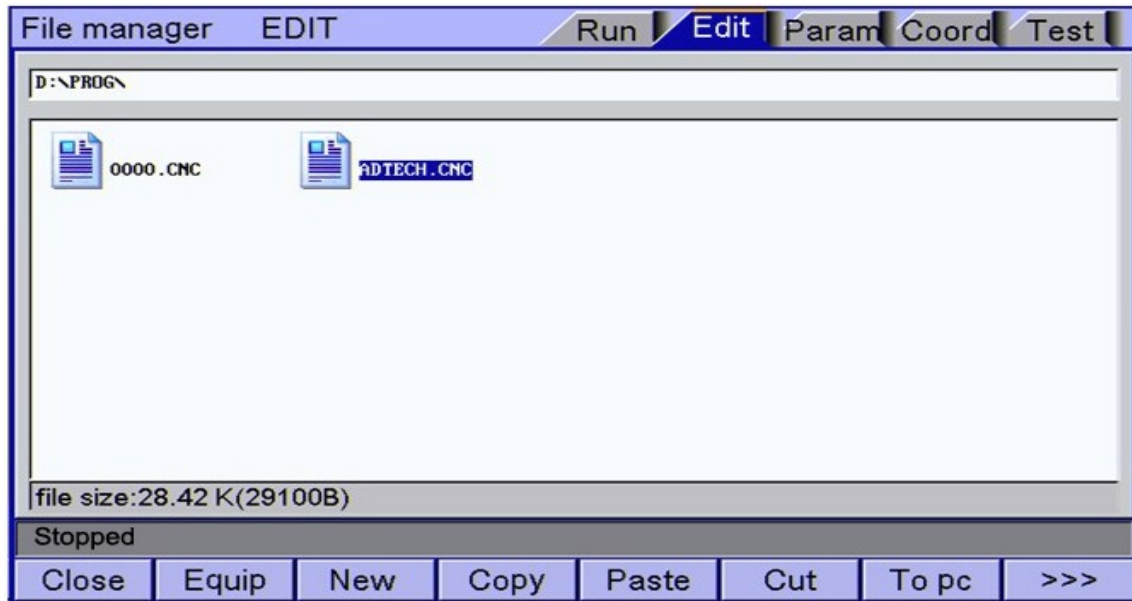
14. Programs are stored in memory (see 3.1 Copying Processing File with USB Disk);

15. Select [Edit] - [File] to enter the file operation screen, or switch to the file operation screen quickly from [File] on the panel, as shown below.



C drive uses YAFS file system. D disk uses FAT system, user processing files and system settings and PC interaction data disk. Removable U disk is for the external user data.

16. Press , , ,  to move the cursor, select a folder or file and press  to open a folder or select process, and load the processing file into the work area, as shown below



17. Press the operating mode selection key  and switch to automatic operating mode;

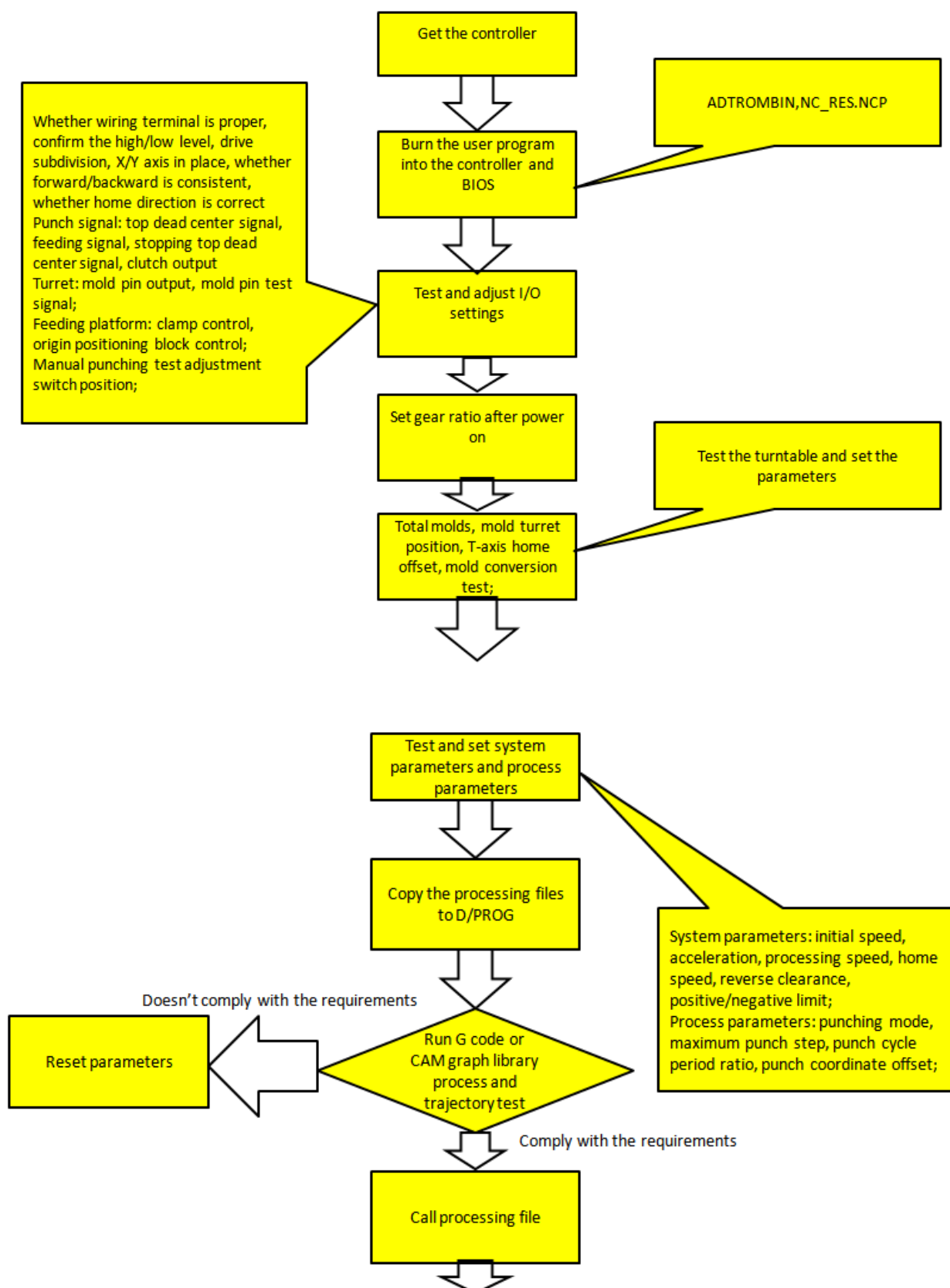
18. Press  to run the program, start indicator is lit, and the program begins running.

19. Press Reset directly if exception occurs during running, and the system will reset and continue processing; **Repeat steps 4-18;**

20. If the program aborts, press [Punch Lock] in the next processing to locate the punching until the position that operation was aborted, and then cancel punching lock;

3 Operation

3.1 Controller Operation Sequence and Processes



3.2 Platform Feeder Blowing Control

3.2.1 Process Requirements

- 1) Working mode 0: always blow material during processing
- 2) Working mode 1: in the punching process, when "blowing begins (travel switch)" signal is detected, start blowing for set period of time "t1".
- 3) Working mode 2: in the punching process, when "blowing begins (travel switch)" signal is detected, start blowing until "blowing ends (travel switch)" signal is detected.
- 4) Working mode 3: in the punching process, when "blowing begins (travel switch)" signal is detected, start blowing until "blowing ends (travel switch)" signal is detected. The punching pauses if "blowing ends (travel switch)" signal isn't detected after blowing for a period of "t2".

3.2.2 Procedure

- 1) Load CSV user profile; Copy "SYSTABLE.CSV" file to "ADT" directory on "D" disk; enter "Management" interface "013 Import CSV System Configuration Table", and press [EOB] in the [Entry] mode
- 2) Set blowing material parameters; [Parameter] - [Comprehensive] "130 Blowing control enable" is set to "1"; enter [Run] - [Macro Variables] and set the relevant parameters;

3.2.3 Parameter Description

Parameter	Description
Blowing mode (0-3)	Refer to the process requirements
Blowing hold time t1(S)	Blowing holding time is in seconds
Maximum blowing time t2(S)	Work mode 3 is effective in seconds
Blowing output port	Output: OUT0-OUT24, NO
Blowing start signal port	Input: start blowing when effective, effective level is 0;
Blowing end signal port	Input: end blowing when effective, effective level is 0;

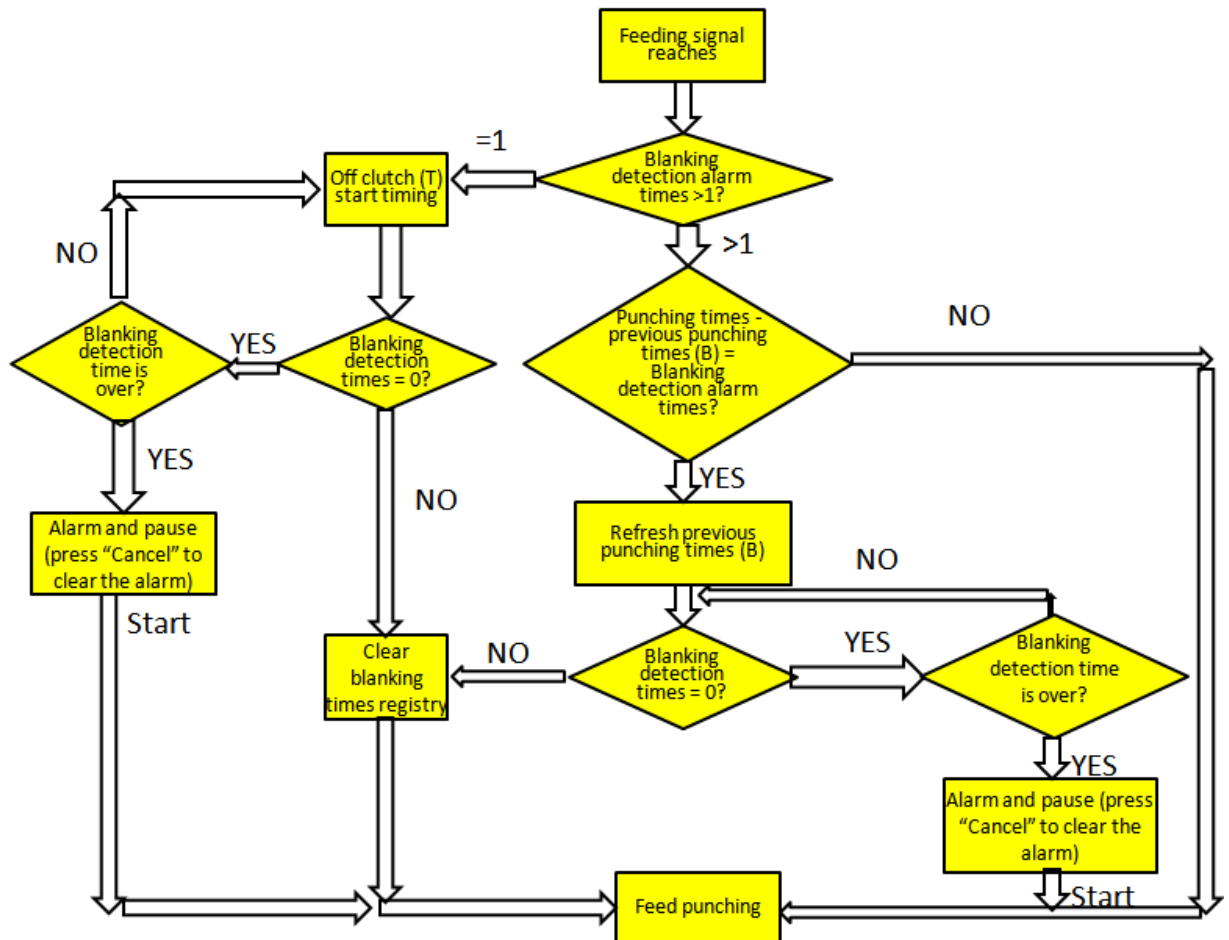
Remark: To avoid affecting other ports, please disable the blowing function if it won't be used;

Note:

If the effective level is always effective after blowing starts, blowing will output continuously in punching process;

3.3 NCT-02 Blanking Control

3.3.1 Process



Blanking Control Flow Chart

3.3.2 Procedure

- 1) Load CSV user profile; Copy "SYSTABLE.CSV" file to "ADT" directory on "D" disk; enter "Management" interface "013 Import CSV System Configuration Table", and press [EOB] in the [Entry] mode
- 2) Set blowing parameters; [Parameter] - [Comprehensive] "132 blanking detection alarm frequency" to appropriate value; enter [Run] - [Macro Variable] and set the relevant parameters;

Note: If 132 blanking detection alarm frequency is set to "0", the system will not start blanking control function;

3.3.3 Parameter Description

Parameter	Description
Blanking detection ports (0-33)	Detection port number, select an alternate port
Blanking detection effective level (0/1)	0: Falling edge effective; 1: Rising edge effective

Blanking detection time ms	Unit: ms; alarm and pause if not detected within this time
----------------------------	--

3.4 Automatic Lubrication Function

System integrates two sets of automatic lubrication systems, progressive and displacement;

3.4.1 Progressive

Parameter	Description
A: lubrication cycle	P1.052
B: lubrication time	P1.053
C: lubrication output port	P5.023
D: lubrication detection input port	P5.061
E: lubrication oil pressure detection level	P1.055

A: lubrication cycle, B: lubrication time, C: lubrication output port and D: lubrication detection input port (if lubrication pulse signal is not detected within the specified time, the lubrication indicator will flash and alarm)

Note: If P1.052 is non-zero, the system automatically starts lubrication

If no alarm is detected by the lubrication detection port, press and hold "Cancel" to clear;

Set P5.061 to 8888 to shield the alarm;

3.4.2 Displacement

Parameter	Description
A: lubrication cycle	P1.137
B: lubrication time	P1.138
C: lubrication output port	P5.062
D: lubrication detection input port	P5.062
E: lubrication oil pressure detection level	P1.140

A: lubrication cycle, B: lubrication time, C: lubrication output port and D: lubrication detection input port (if lubrication pulse signal is not detected within the specified time, the lubrication indicator will flash and alarm)

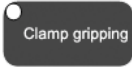
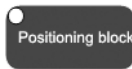
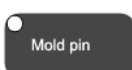
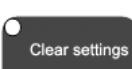
Note: If P1.137 is non-zero, the system automatically starts lubrication

If no alarm is detected by the lubrication detection port, press and hold "Cancel" to clear;

Set P5.062 to 8888 to shield the alarm;

3.5 Handheld Box Associated Button Configuration (pedal, positioning blocks, etc.)

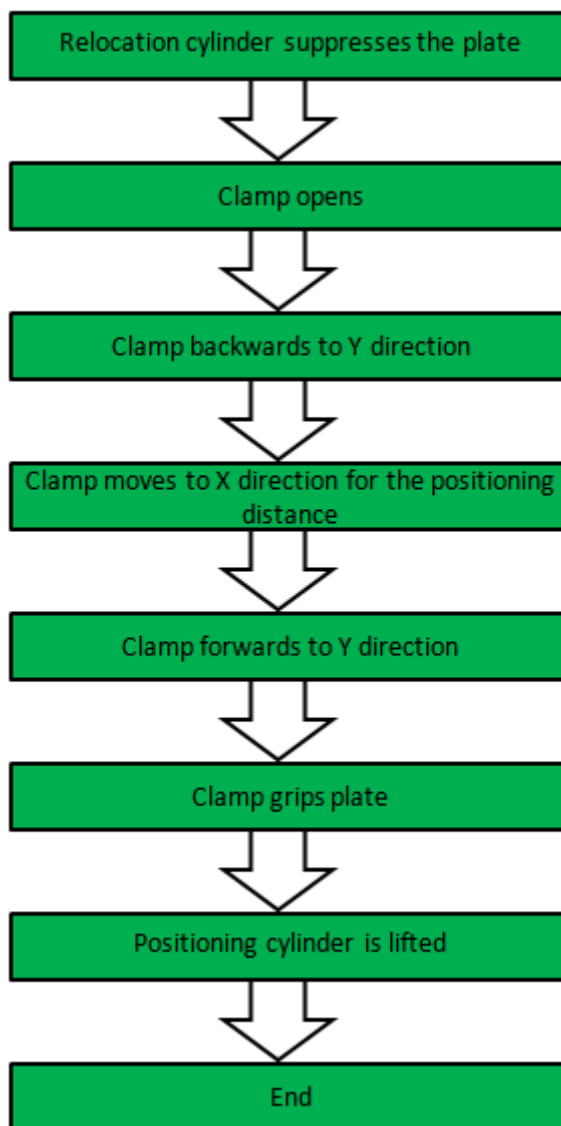
The following table shows the handheld box switch settings

Function	Input port No.	Input effective level	Control output port No.	Remark
Pedal clamp control	P5.015	Default: 0(NO)	P5.017	
Origin positioning block control	P5.018	Default: 0(NO)	P5.019	
Mold pin manual control	P5.025	Default: 0(NO)	P5.026	
Clear coordinate system	P5.042	Default: 0(NO)	---	
Single/Continuous switch	P5.043	Default: 0(NO)	---	
Jog/Continuous switch	P5.044	Default: 0(NO)	---	 
JOG X+	P5.036	Default: 0(NO)	---	
JOG X-	P5.037	Default: 0(NO)	---	
JOG Y+	P5.038	Default: 0(NO)	---	
JOG Y-	P5.039	Default: 0(NO)	---	
JOG T-	P5.040	Default: 0(NO)	---	
JOG T+	P5.041	Default: 0(NO)	---	
Start	P5.007	P1.058	---	
Pause	P5.008	P1.059	---	

Emergency stop	P5.009	P1.056	---	 

3.6 Relocation Setup and Operation

3.6.1 Relocation Process



3.6.2 Related Port Settings

Function	Parameter	Remark
Relocation cylinder output control port	P5.029	Connect relocation cylinder
Positioning cylinder compression test port	P5.030	Check whether positioning cylinder is pressed down
Positioning cylinder release detection port	P5.031	Check whether the positioning cylinder is lifted
Relocation clamp backward distance	P1.097	

Relocation clamp forward distance	P1.098	
-----------------------------------	--------	--

3.6.3 Test Code

Refer to "Programming Manual" 7. Relocation instructions for details

3.7 Punching Status Display Interface

3.7.1 Interface Introduction

The following Fig. 3 - 1 shows the punch status display interface:

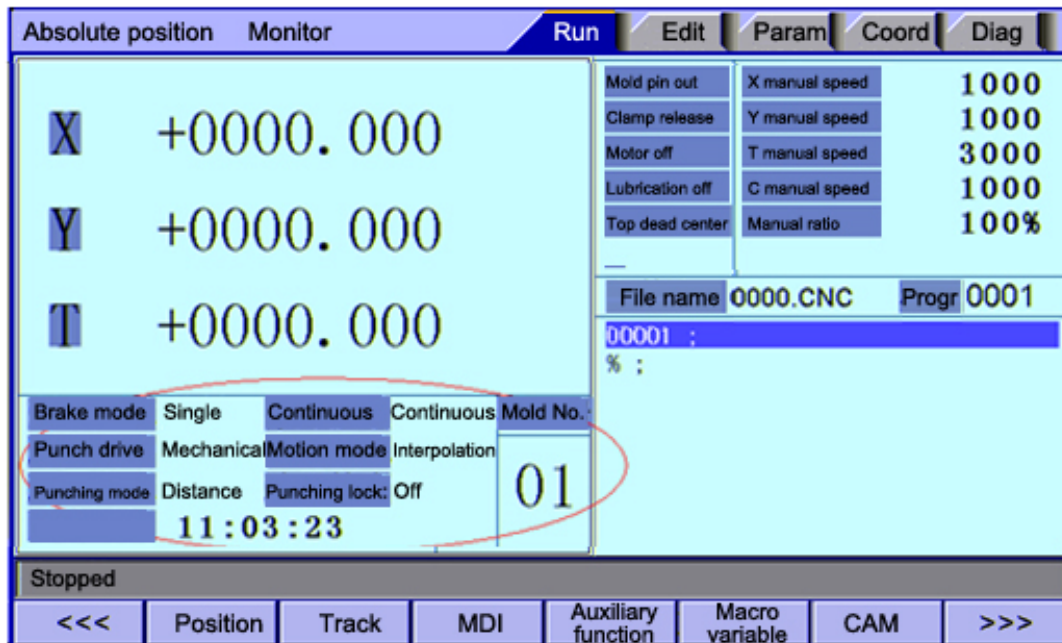


Fig. 3-1

Table 3 - 1 is the punch state description:

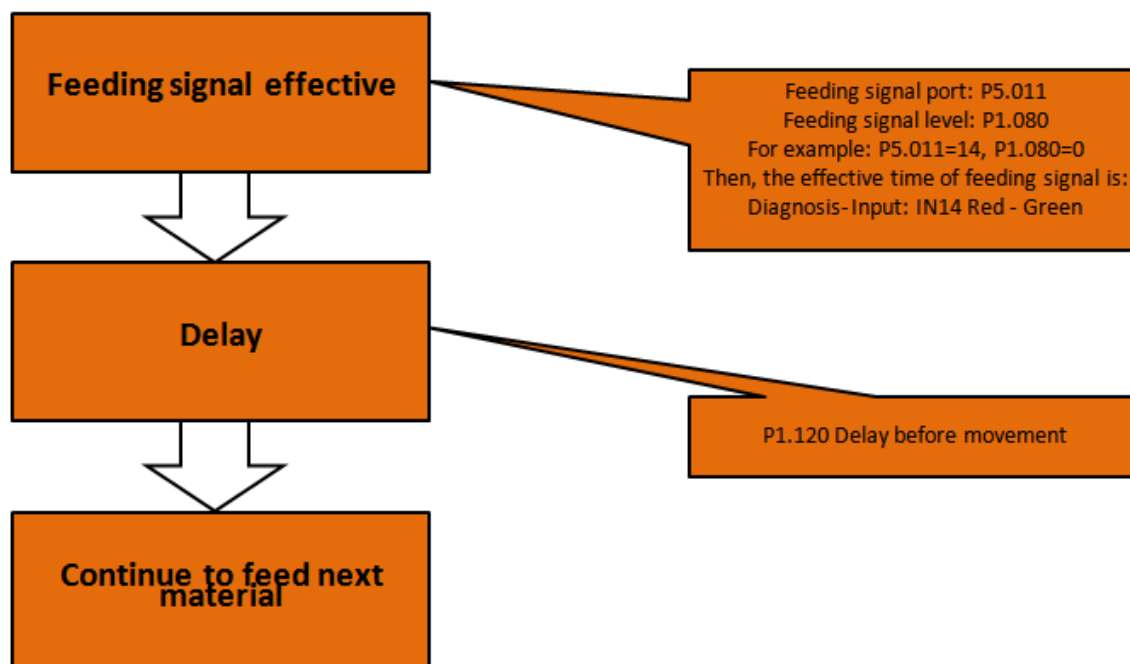
Table 3-1

Function	Parameter	Introduction
Brake mode	Feeding	Feeding signal as the off clutch signal
	Single stop	Single stopping top dead center as off clutch signal
	Double stop	Single / continuous punching off clutch is controlled by a separate switch signal
Single/Continuous	Single	The system will pause after punching a hole
	Continuous	Punching process does not stop until the end of the program
Punch drive	Mechanical	The punch main drive is mechanical
	Hydraulic	The punch main drive is mechanical flywheel
Running mode	Point	The starting speed, acceleration and rapid traverse speed can be set for each feeding axis individually.
	Interpolation	Feeding axes arrive simultaneously

Punching mode	Single	Mechanical, see P1.078 for details
	Time	Mechanical, see P1.078 for details
	Hydraulic	Hydraulic, see P1.078 for details
	Distance	Mechanical, see P1.078 for details
Punching lock	Off	Feeding & punching
	ON	Feeding only

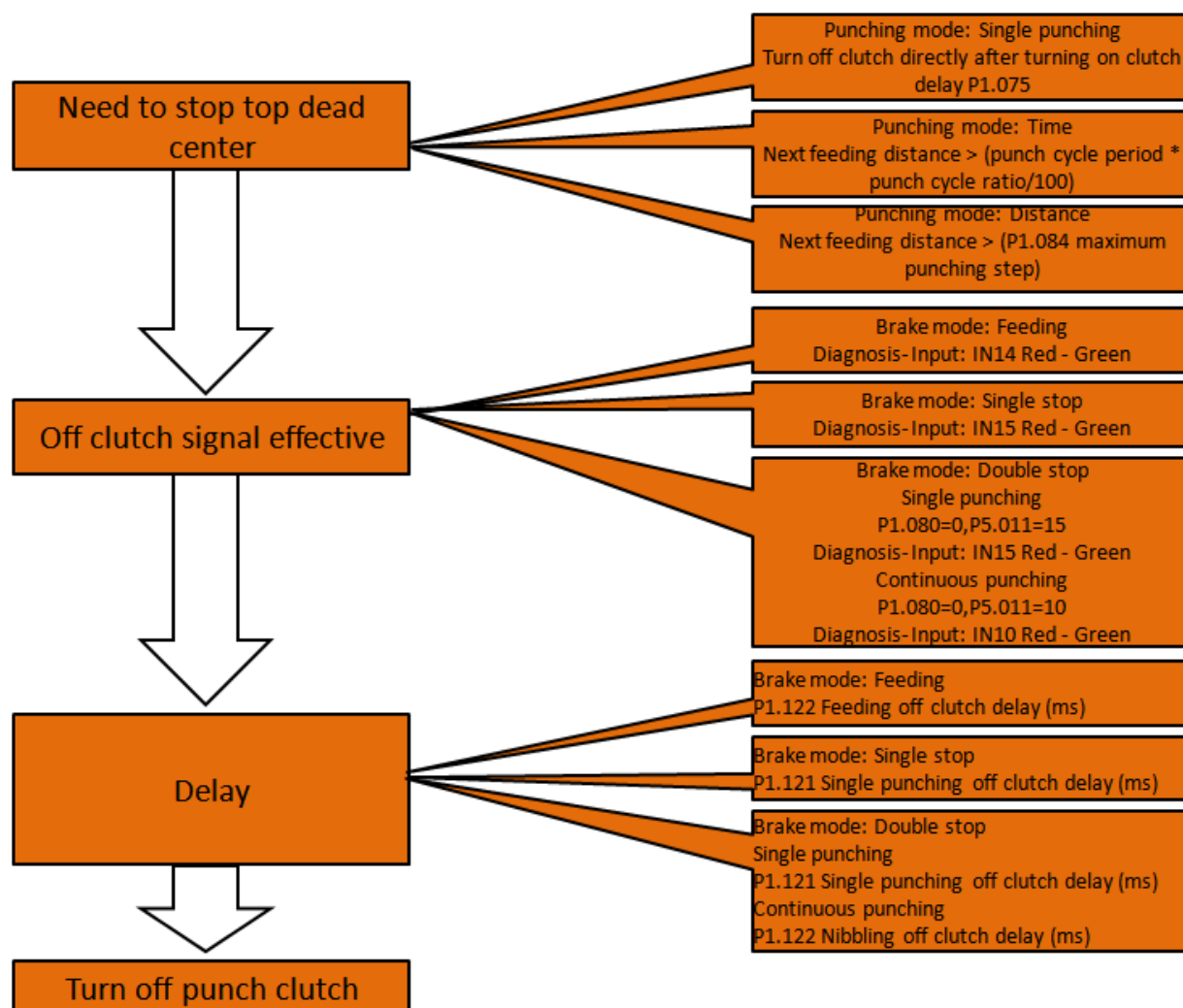
3.7.2 When to start feeding? When to off the clutch?

Fig. 3-2 is mechanical feeding flow chart, and Fig. 3-3 is mechanical off clutch flow chart.



Mechanical feeding flow chart

Fig. 3-2



Mechanical off clutch flow chart

Fig. 3-3

4 Document Revision History

[illegible]