

L-08: Reference Axes/Perform MDI Commands (Fanuc 15)**SAFETY FIRST**

- Follow all Caterpillar facility safety standards when performing this task.
- Follow all machine safety instructions when entering MDI commands.

EQUIPMENT

- machine control panel

RESOURCES

- machine manufacturer's manual with MDI (T, M, and G codes)



Reference Axes

Caution: This is a generic procedure. Refer to the operator's manual for specific referencing procedures for each machine.

1. Move all axes toward the work area.

Note: "Towards the work area" means in the negative (-) axis direction on most machines.

- Jog or manually move the axes towards the work area.

Caution: Be careful not to wreck the machine, which could damage the spindle, tooling, or piece part.

- Monitor the control panel to determine the actual position.

2. Place the machine into the zero return (reference) mode.



Zero Return Mode

Note: Many machines automatically reference all axes in the proper sequence when the Cycle Start push button (PB) is pressed.

Note: Perform step 3 if the machine does not automatically reference.

3. **Zero return or reference axis in proper sequence as shown in the Operator's manual.**

- Check the machine screen for the required reference location.



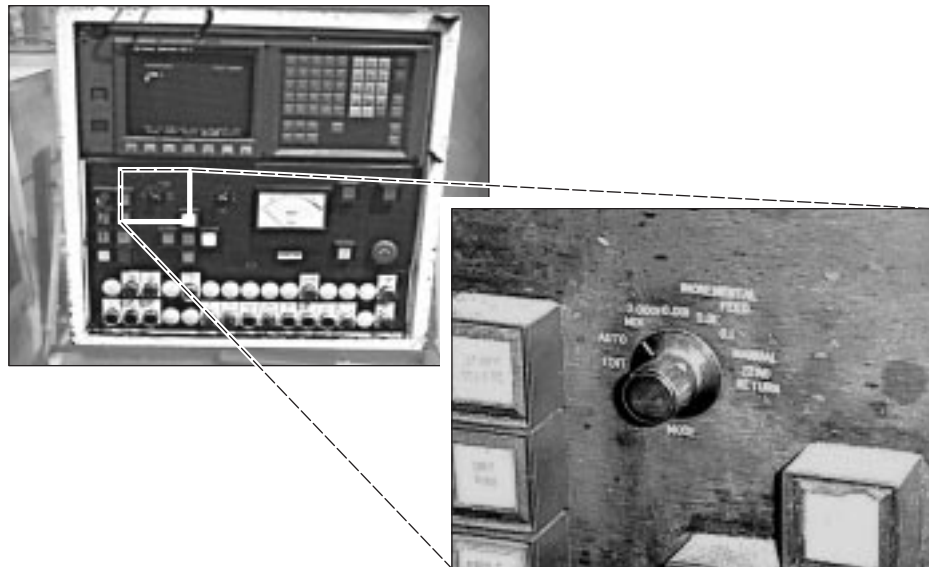
Perform MDI Commands (Fanuc 15)

Warning! Syntax and data entry listed in these steps are specific to the Saginaw Machining Center and will be different with other machines. T, G, and M codes listed in these steps are specific to the Saginaw Machining Center that is programmed for the codes. Different CNC machines will have different codes assigned to them. Always follow the specified machine manufacturer's codes found in the manual. Failure to enter the correct codes may result in damage to the machine or injury to personnel.

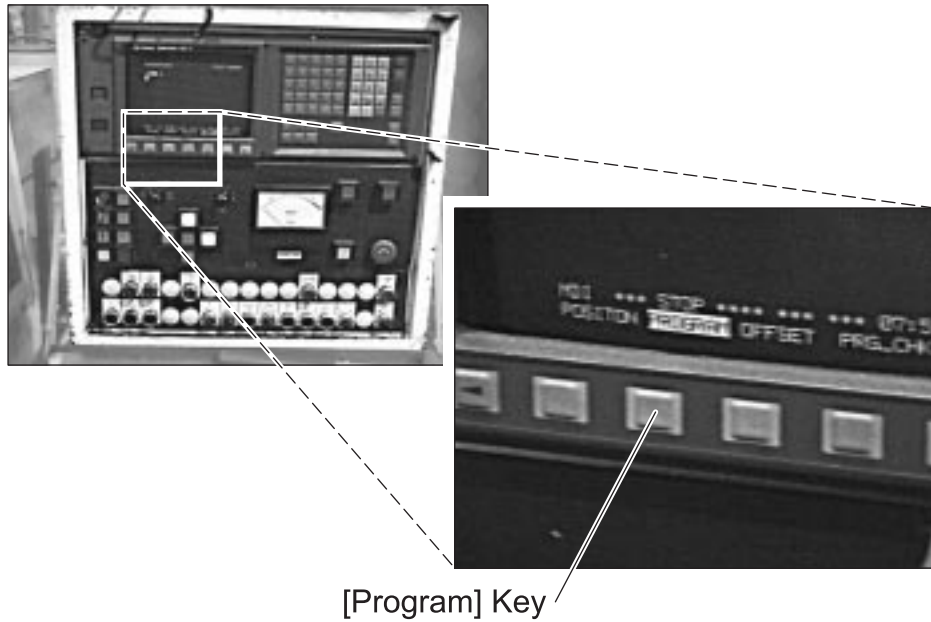
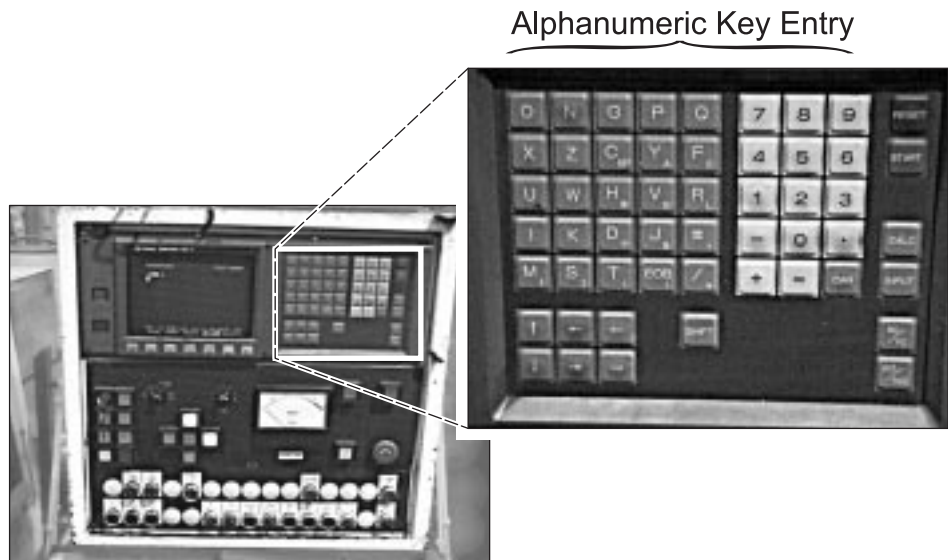


Select Tool

1. Set the mode select switch to MDI.



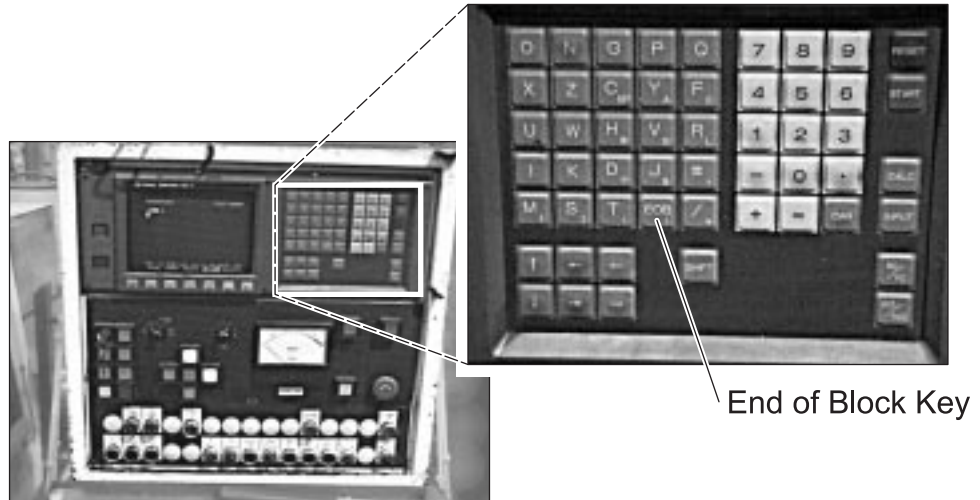
MDI Mode Selected

2. Press the [Program] key.**3. Enter the desired tool number.**

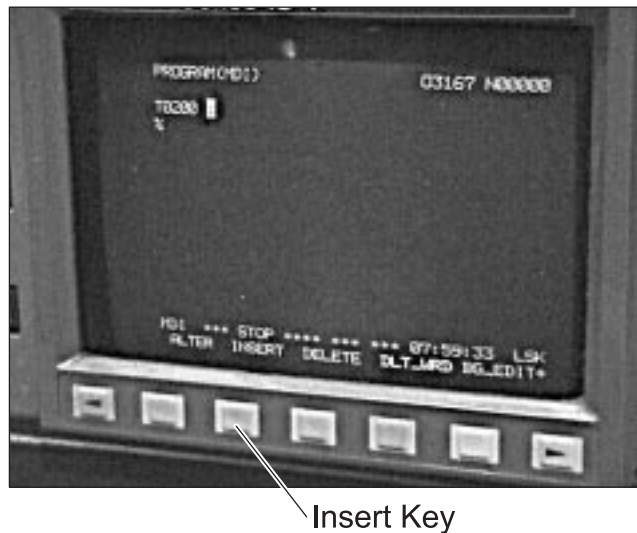
Note: Refer to the machine manual for the required tool number format (i.e., 2, 4, or 6 digit number).

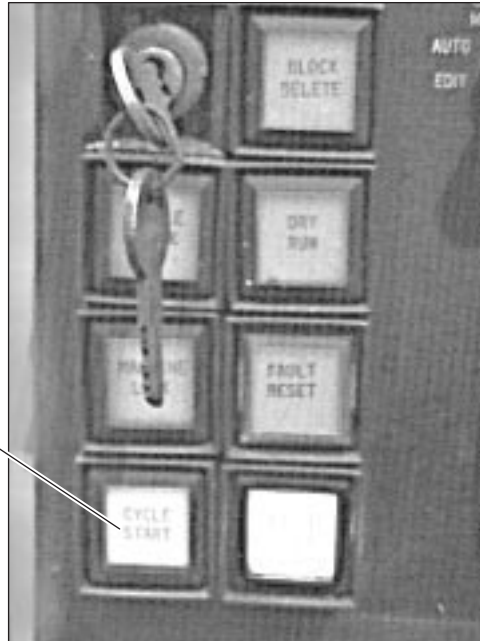
- An example for the Saginaw Machining Center: Type T300 to select tool 3.

4. Press the [EOB] (end of block) key.



5. Press the [Insert] key.



6. Press the [Cycle Start] key.

[Cycle Start] Key

- The tool changer should rotate to the selected tool.

Operate Spindle

1. **Verify that the chuck closed light is on.**

Warning: Failure to close the chuck may cause a part to fly out and damage the machine or injure personnel.

2. **Verify that the door to the machine is closed.**
3. **Set the spindle range.**

- Press the [Program] key.

Note: Check the machine manual for the required M code.

- Type M40 to set the spindle to low speed.
- Press the [EOB] key.
- Press the [Insert] key.
- Press the [Cycle Start] key.

4. **Set the spindle direction and speed.**

- Press the [Program] key.

Note: Check the machine manual for the required M code.

- Type M03 to set the spindle direction clockwise.

Note: Check the machine manual for the required S code.

- Type S100 to set the spindle speed to 100 rpm.
- Press the [EOB] key.
- Press the [Insert] key.
- Press the [Cycle Start] key.

5. **Stop the spindle and change direction.**

- Type M05, press [EOB], and press insert to turn off the spindle.
- Type M04 to set the spindle direction to counterclockwise.
- Type S100 to set the speed to 100 rpm.
- Press the [EOB] key.



- Press the [Insert] key.
- Press the [Cycle Start] key.

Note: The spindle should run in the opposite direction at 100 rpm.

Change Measuring Unit

1. Set the mode select switch to MDI.
2. Press the [Program] key.
3. Type G70 to change the measuring unit to inches, or type G71 to change the measuring unit to metric.
 - Check the machine manufacturer's manual to verify the G codes for the specific machine on which you are working.
4. Press the [EOB] key.
5. Press the [Insert] key.
6. Press the [Cycle Start] key.
7. Check the position screen to verify that the measuring unit has changed.
8. Set the measuring unit back to the original unit.

