# How to Identify a Rigid Tapping System

There are 2 primary types of tapping on a CNC machine; floating and rigid. Rigid tapping uses a feedback signal from the spindle system and synchronizes the spindle motion with the Z axis motion. This allows for consistent threads and precise control for blind holes, amongst many other benefits.

There are several items that need to be in place on a Fadal machine in order for it to rigid tap, as follows:

1) Spindle motor with encoder feedback.
2) Rigid tapping capable spindle drive (Inverter, or Vector Drive).
3) Spindle controller card that is rigid tapping capable (1010-4, 1010-5 and 1010-6).
4) Rigid tapping e-proms installed in the spindle controller card.
5) All necessary interconnecting cables between the Spindle motor, drive and controller card.

The quickest method for determining if a machine is already rigid tapping capable is as follows:

1) Locate the spindle controller card located in slot #14 of the Fadal controller card logic rack (Fig.1)
2) Look at the bottom portion of the controller card to determine if there are 2 small rectangular receptacles available on the card (Fig. 1).
3) Determine if there is a multi-wire cable that is plugged into the upper receptacle.
   a. If the wire is present, the machine is most likely Rigid Tapping enabled (Fig. 1).
   b. If the wire is not present, the machine is not rigid tapping enabled.
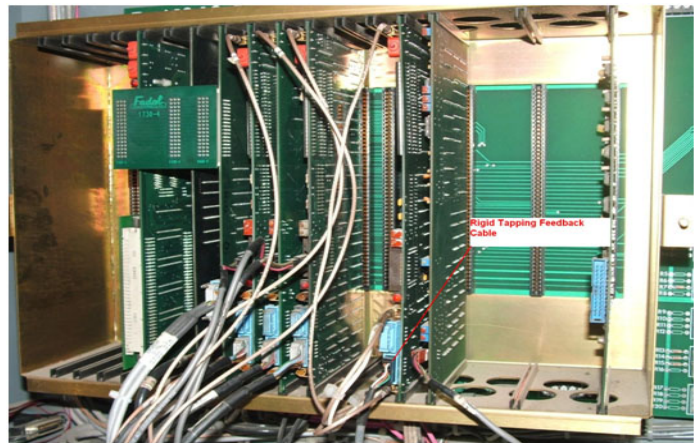
Fig. 1

How to determine what your machine needs to add rigid tapping:

1) Determine if your machine has an encoder on the spindle motor (Fig. 2). Remove the top motor cover that holds the cooling fan and look directly at the top surface of the motor
   a. The US Digital Encoder is a small black plastic horseshoe ENC-0007
   b. The encoder products encoder is a small metal pot ENC-0004.
      i. If your machine already has an encoder and a cable that runs down to your spindle drive, move onto step 2.
   c. If there is at least a ¼" diameter shaft on top of the motor (Fig. 2).
      i. If your machine does not have an encoder, but has a ¼" diameter shaft protruding from the top of the spindle motor, you will need to add an encoder and cable to run down to the Spindle Drive.
      ii. Use the following items to add an encoder:

      ENC-0004   Encoder

      STM-0148   Encoder mount plate

      WIR-0168   Encoder cable to spindle drive

   d. The top of the motor is completely flat.

Fig. 2

2) Determine if you have a rigid tapping capable spindle drive.
    a. Look at your spindle drive and determine if it has an allowance for an encoder feedback hookup (Fig. 3). The connector will be a small square connector with 9 pins and multi colored wires.

Encoder feedback connector
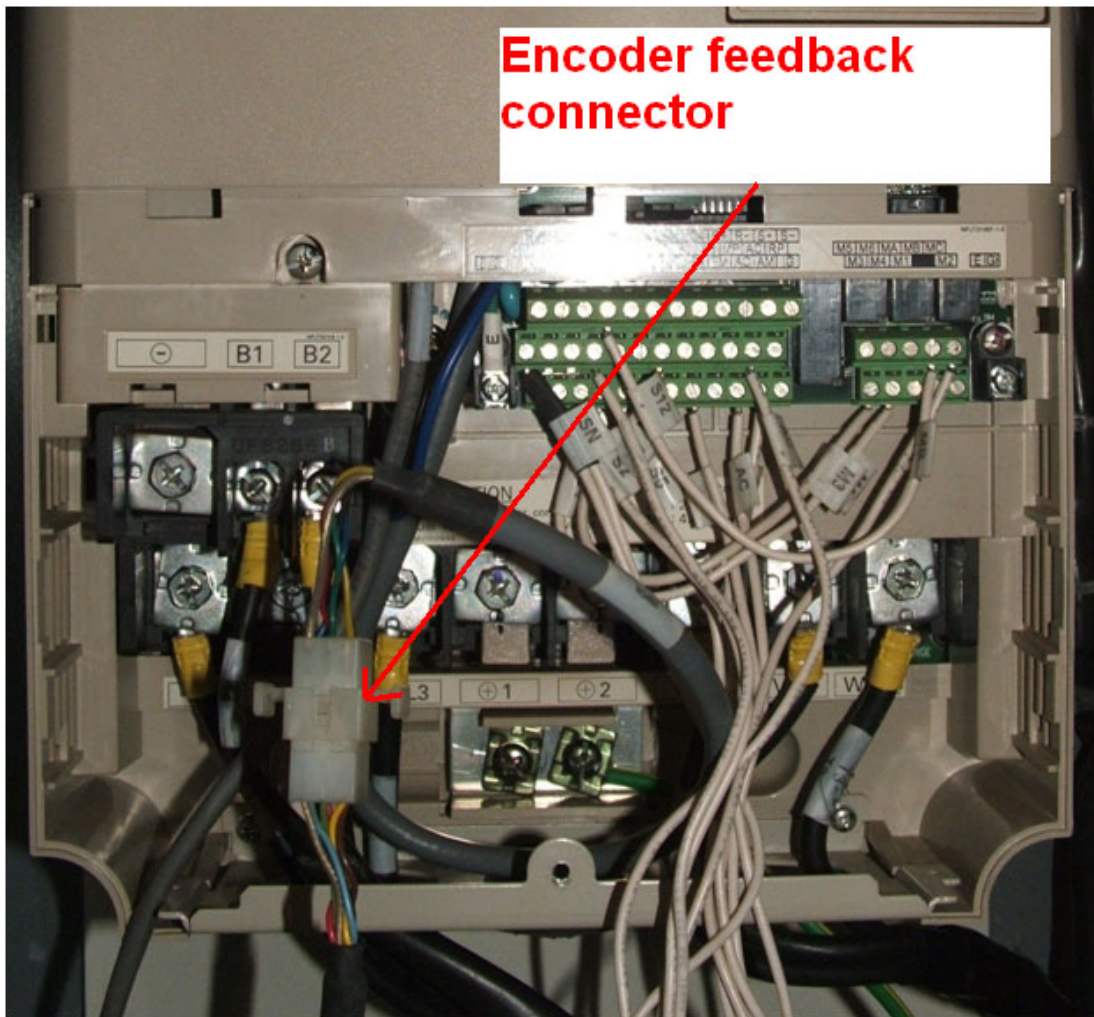
Fig. 3

3) Determine if you have a rigid tapping capable controller card (Fig. 4).
   a. 1010-4, 1010-5 and 1010-6 (PCB-0217) are all rigid tapping capable with the correct e-proms installed.
   b. 1010-1 spindle cards are not rigid tapping capable and will not have the connectors.

Rigid Tapping Connection

1010-4 SPINDLE

Fig. 4

For any other questions regarding Rigid Tapping, or other issues, please feel free to contact our technical support department at 208-855-9426.