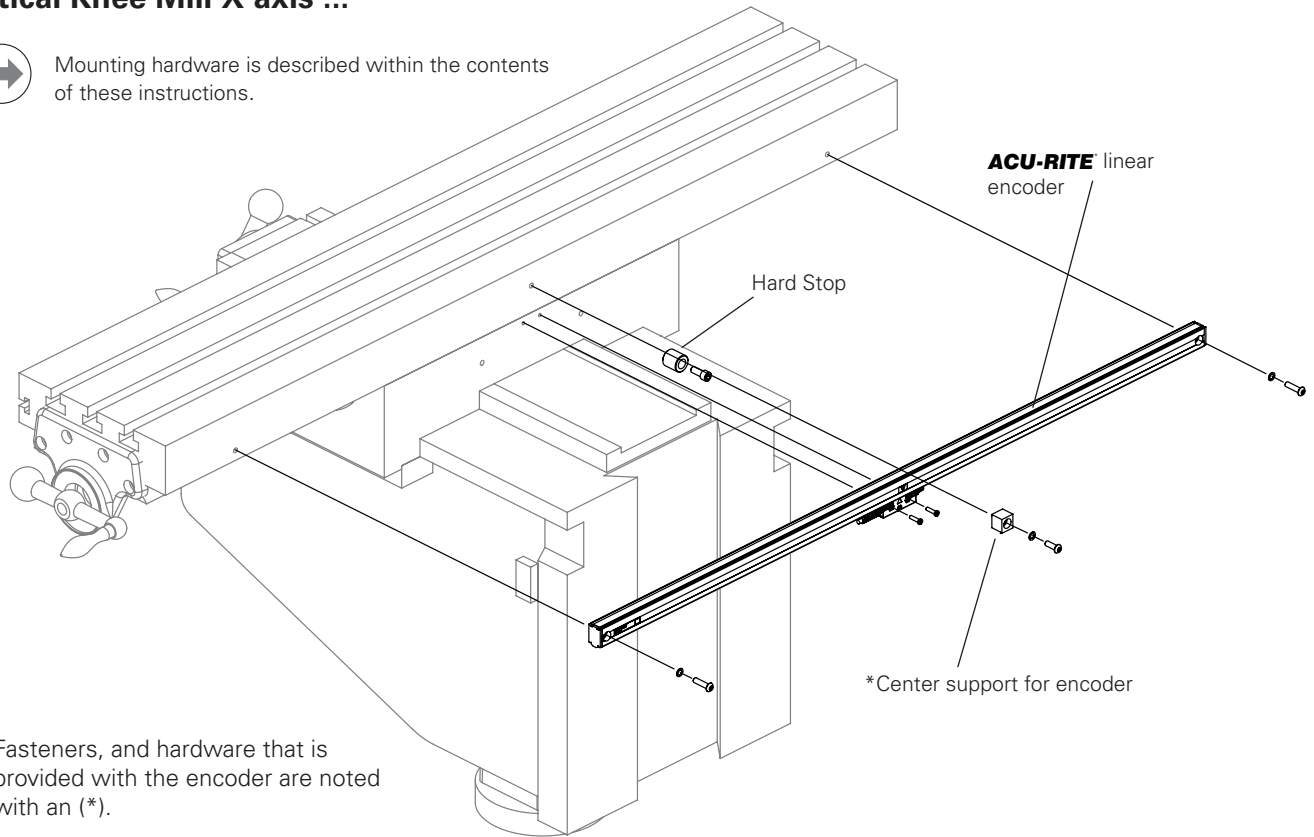


SENC 150 Encoder Installation

Vertical Knee Mill X axis ...



Mounting hardware is described within the contents of these instructions.



- Fasteners, and hardware that is provided with the encoder are noted with an (*).

Mounting Information:

These installation instructions are for mounting the SENC 150 encoder to the X axis longitudinal travel on the rear of the table.

- ▶ Use the included Y axis kit for the cross feed installation.



The X axis must be installed prior to the Y axis installation.

Before proceeding:

- ▶ Become familiar with these instructions prior to installing the encoder.
- ▶ Ensure that the correct length encoder is being used for the complete travel of the axis.
- ▶ Clean all mounting surfaces removing any debris and paint.
- ▶ Save the alignment brackets with the Encoder Reference Manual after the installation is completed.



Installation of the encoder requires the reading head to be centered on the scale case, and the table at its center of travel.

First Steps:

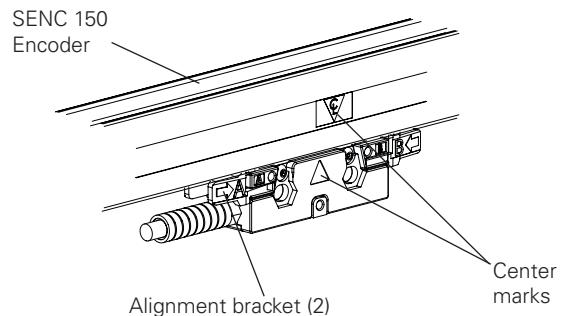
Machine ...

- ▶ Move the Table to its center of travel.
- ▶ Place a pencil mark on the table (e.g. inline with the end of the saddle), so that the table can be moved back to the center of travel easily.

Encoder ...

- Unpack encoder in a safe, convenient location.
- The reading head alignment brackets are not removed until after the installation is completed.

Center reading head ...

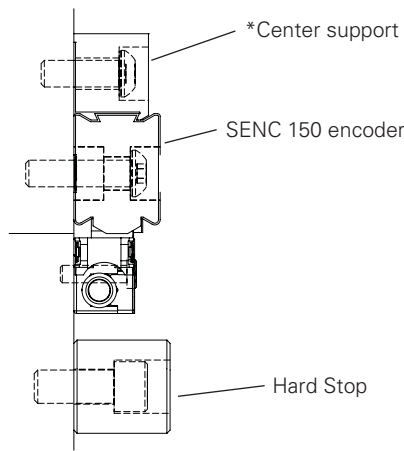


- ▶ Center the reading head on the scale case by sliding the reading head with the brackets attached along the scale case until the center marks are in alignment.

Installation information:

Encoder orientation ...

Viewed from the right end of the table

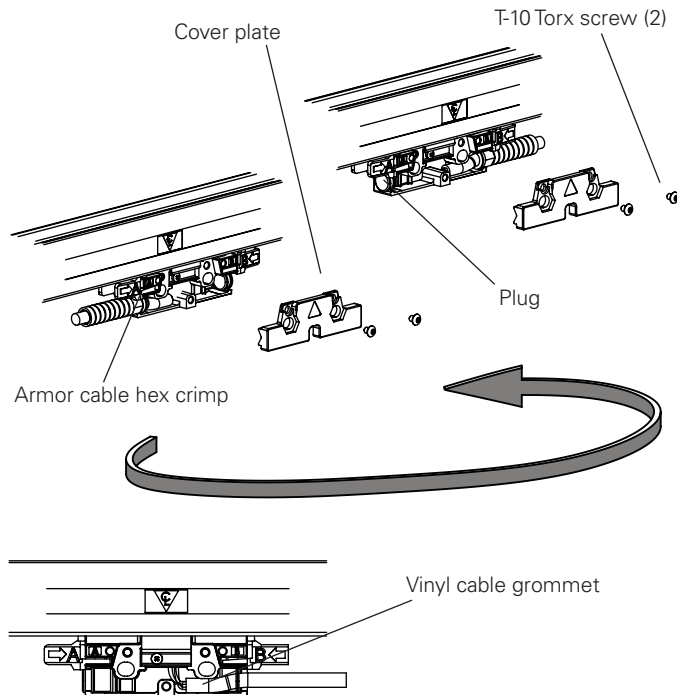


- These instructions will guide you through installing the encoder as shown in this view.

Cable exit ...



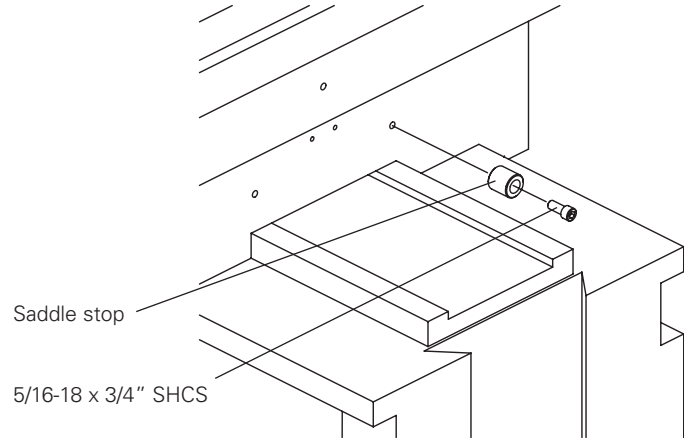
The cable exit direction must be set before installing the encoder.



- Exit the cable out of the reading head to the same side of the machine as where the read out will be mounted. If the DRO is to be mounted on the right hand side of the machine, then the cable should exit to the right side of the machine as well (e.g. left side exit from side A & B).
- To change the exit direction, remove the cover plate, and plug. Rotate the cable 180° to the opposite end of the reading head. Insert the plug at the other end, and re-attach the cover plate.

Starting the installation:

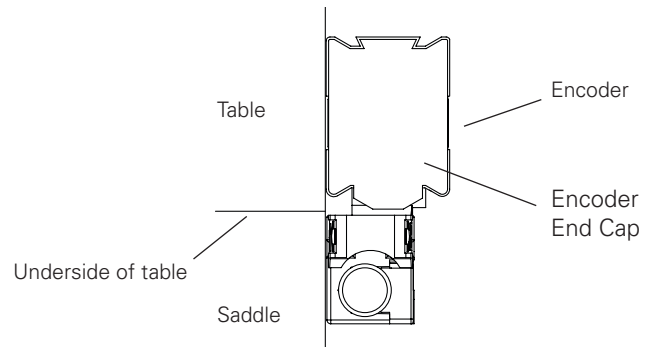
Saddle stop ...



- Locate the stop approximately 1" to 1-1/2" down from the top edge of the saddle, in line with the "column way".
- Drill and tap location for 5/16-18 x 1/2" deep.
- Attach saddle stop securely, and confirm that it contacts the column way when the saddle is drawn fully back.

Encoder installation:

Encoder location.



- The encoder will be positioned to the table and saddle as shown in this view. The underside of the end caps will be positioned flush with the underside of the table.

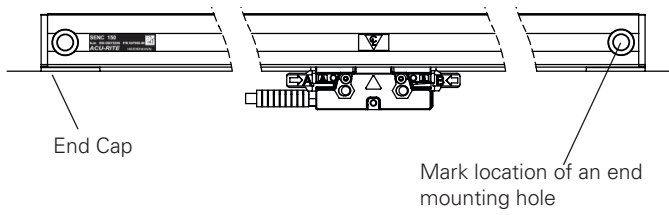


Move the table to the center of its travel. The encoder will set against the back side of the table, and saddle with side A & B facing outward.



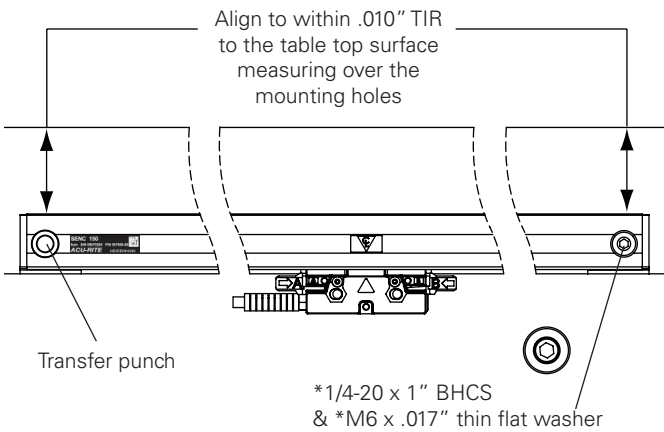
Clamping a flat bar on the underside of the table at each end to set the scale end caps on can assist with the scale case installation, and alignment.

First mounting hole location ...



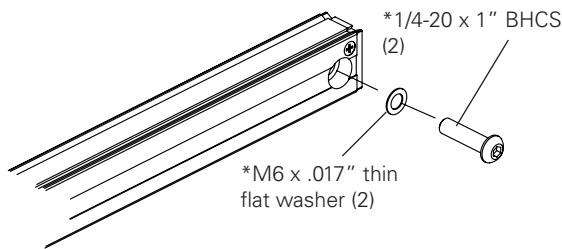
- ▶ Center the encoder on the back side of the table from end to end. Position the underside of the end caps flush with the underside of the table.
- ▶ Mark location of one end mounting hole on the table, and remove the assembly.
- ▶ Drill and tap hole location for a 1/4-20 x 1/2" deep.

Second mounting hole location ...



- ▶ Temporarily attach the encoder assembly at one end to the table.
- ▶ Align the top of the scale case to the **table top surface**.
- ▶ Transfer punch the other end hole location to the table.
- ▶ Remove the encoder. Drill and tap the hole location for a 1/4-20 x 1/2" deep.

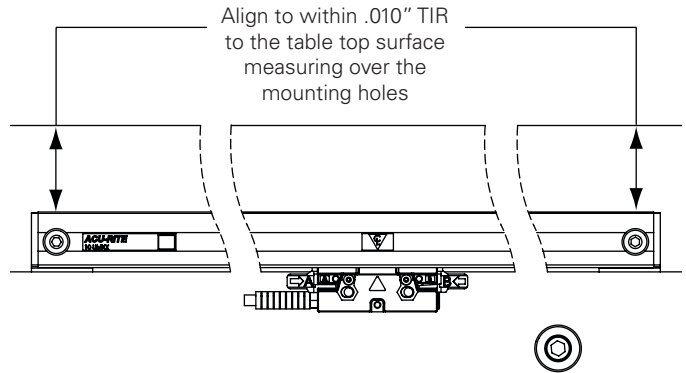
Attaching the encoder ...



- ▶ Attach the encoder to the table, but do not tighten the fasteners.

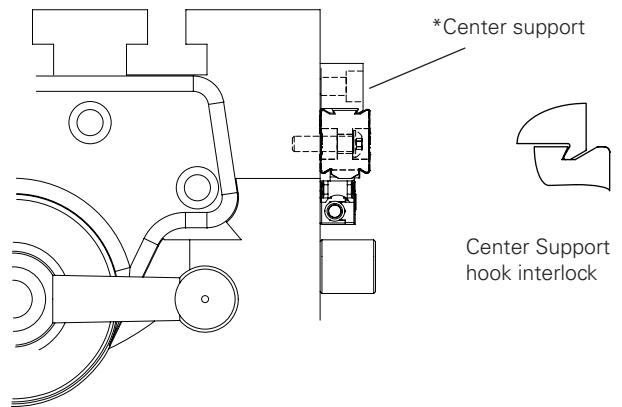
Encoder alignment:

Top surface alignment ...



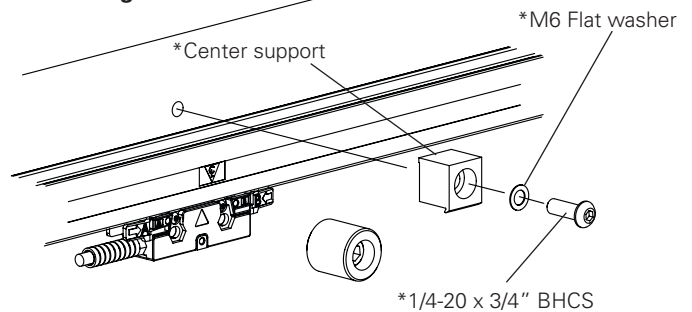
- ▶ Align the top of the scale case to the **table top surface**.
- ▶ Secure the encoder in place maintaining this alignment.

Center support installation ...



- ▶ Hook the center support in the top of the scale case above the center location tag.
- ▶ Ensure that the center support interlocks with the scale case.

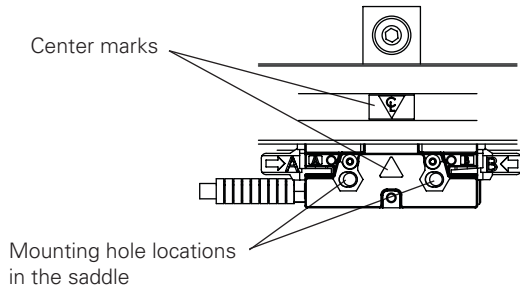
Center alignment



- ▶ Align the top of the scale case at the center support location to within .010" to one end of the case, and transfer punch the center support hole location.
- ▶ Remove the center support, drill and tap the hole location for an 1/4-20 x 1/2" deep.
- ▶ Attach the center support to the scale case and table. Align the center of the scale case to within .010" to the end of the case, and secure in place.

Reading head installation:

Reading head mounting holes ...



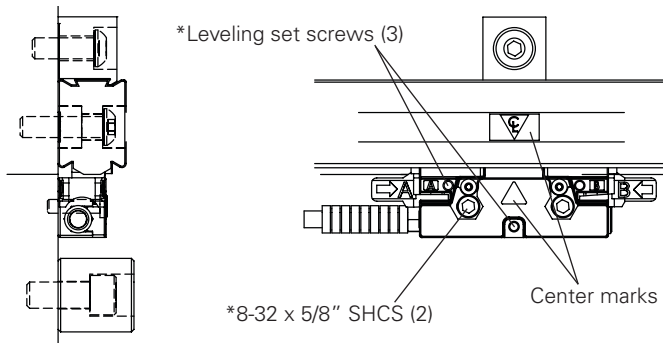
- ▶ Return the table to its center of travel.
- ▶ Align the center mark on the reading head with the scale case center mark.
- ▶ Transfer punch the head mounting holes to the saddle.



Clearance for the screw heads can only be achieved if the tapped holes align with the head mtg. slots.

- ▶ Slide the reading head to one side. Drill and tap the two hole locations for a 8-32 x 1/2" deep.

Attach the reading head...

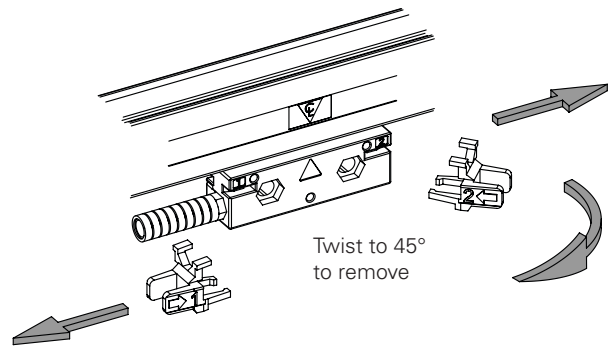


- ▶ Re-align the scale and reading head center marks.
- ▶ Insert the two 8-32 SHCS through the front of the reading head casting into the saddle but **do not tighten**.
- ▶ Insure that screw head clearance is provided in the reading head. Evenly tighten the two 8-32 SHCS.
- Leveling screws in the reading head are not needed when mounting surfaces are flush within .005".



If mounting surfaces are not flush to within .005", refer to the encoder manual on page 10, "Adjust the leveling screws".

Alignment bracket removal ...

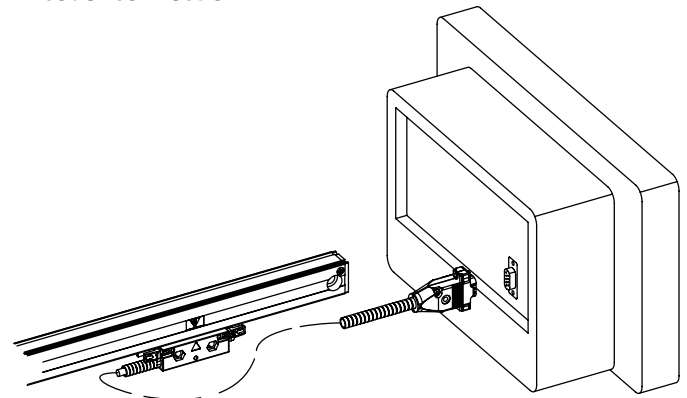


- Alignment brackets are always removed from the exposed side of the encoder (either side 1-2, or side A-B).
- ▶ Use the allen wrench provided as a tool to slide the alignment brackets away from the reading head.
- ▶ Twist the brackets 45° as shown to remove them.
- Save Alignment brackets for possible future use.



Move the axis through its full travel. Confirm that the assembly does not interfere with the machine movement.

Encoder connection ...



- ▶ Instructions for routing, and attaching the reading head cable with sufficient slack loops for machine movement to the DRO are included with the Y axis instructions.



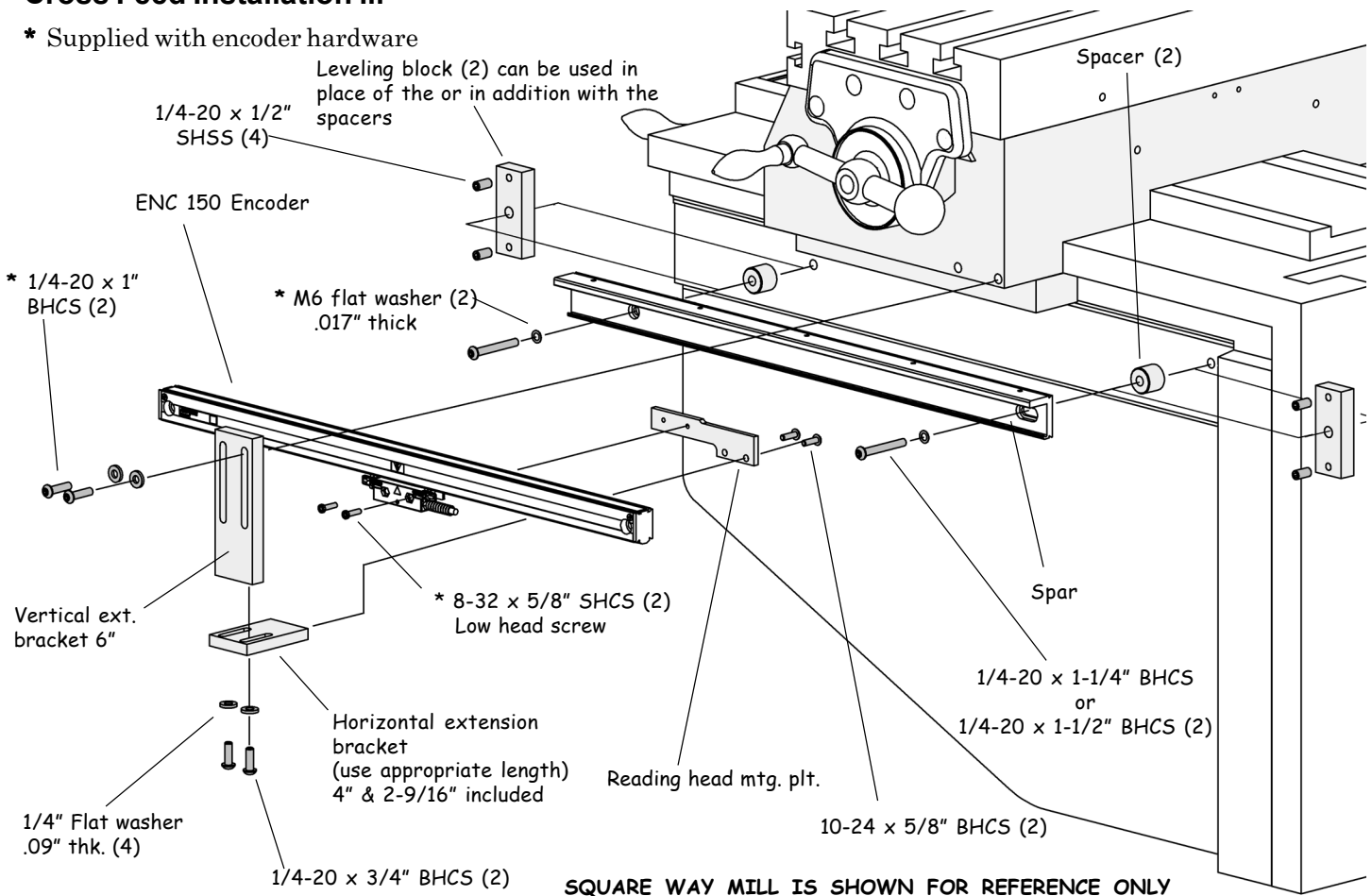
Proceed with the **Y** axis installation, followed by installing the DRO.

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Cross Feed Installation ...

* Supplied with encoder hardware



SQUARE WAY MILL IS SHOWN FOR REFERENCE ONLY

Mounting Information...

These are application instructions for mounting the cross feed “Y” axis SENC 150 encoder. This is a universal kit that includes optional mounting brackets to best address the mill application.

Before proceeding:

- Please read the Procedure completely.
- Mount X axis prior to installing the cross feed.
- Insure that the correct length encoder is being used for the total axis travel.
- Keep the reading head centered during installation.
- Clean the mounting surfaces.
- Save the alignment brackets with the Encoder Reference Manual after installation is completed.

First Steps ...

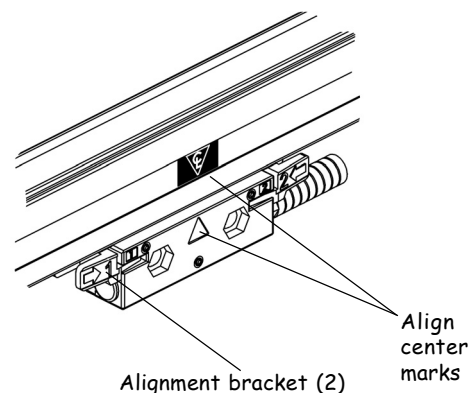
Machine

- ✓ Move the table to its center of travel.
- ✓ Mark the axis so that it can be re-centered easily.
- ✓ Move the table completely to the left.

Encoder

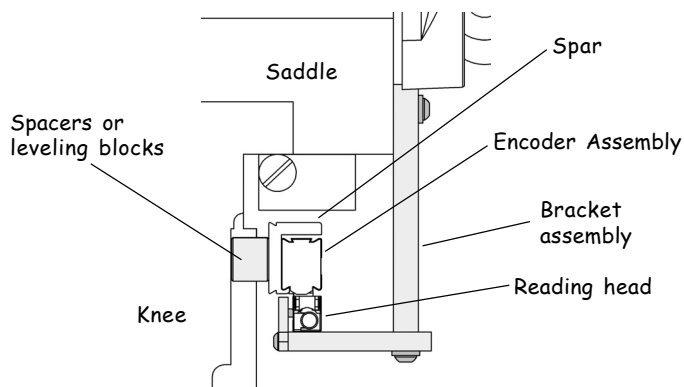
- ✓ Unpack encoder in a safe, convenient location.
- ✓ Do not remove the reading head alignment brackets until instructed.

Center reading head ...



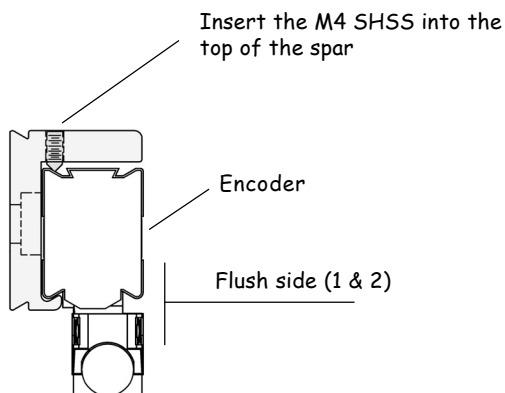
- Slide the reading head and brackets along the scale case until the center marks on the scale case and reading head are aligned.

Encoder orientation ...



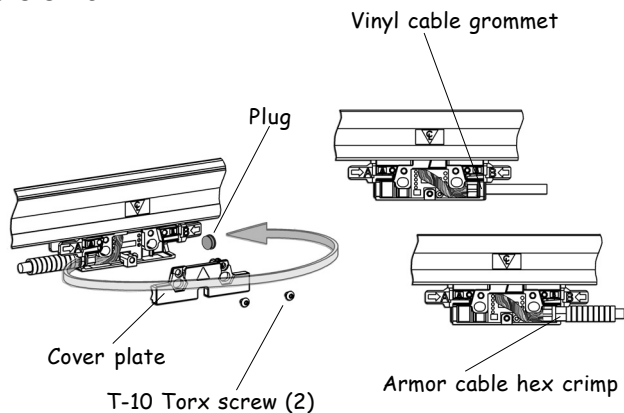
- These instructions will guide you through installing the encoder as shown in this view.

Encoder/Spar assembly ...



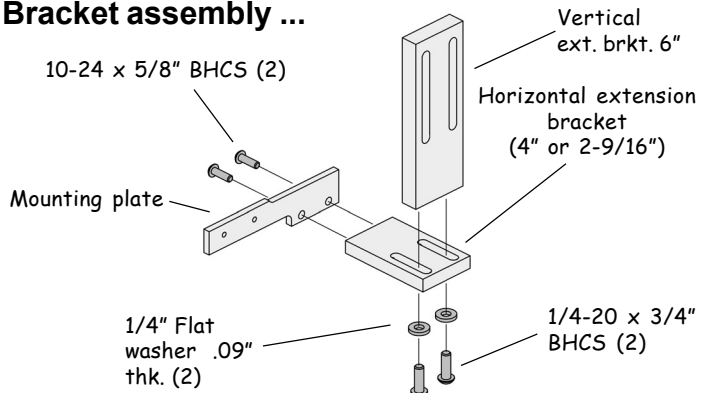
- Insert the encoder into the spar as shown, and center from end to end. Tighten the center set screw only.

Cable exit ...

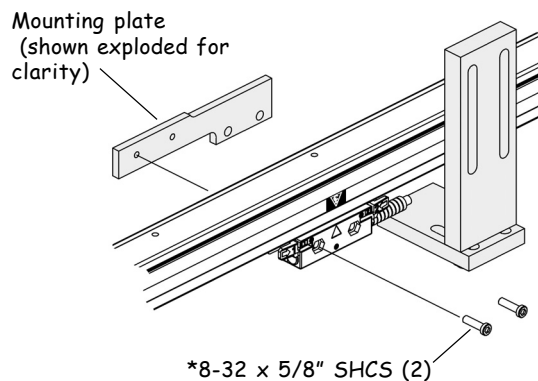


- Determine the cable exit direction before installing the encoder.
- To change the cable exit direction, remove the cover plate and rotate the cable 180°.

Bracket assembly ...

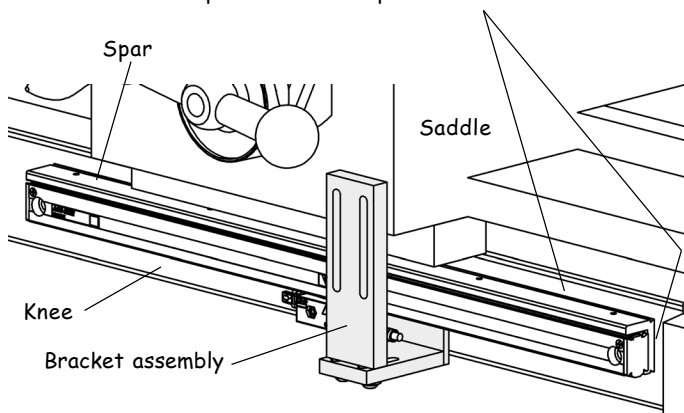


- Assemble the brackets; fully extend the horizontal extension plate.



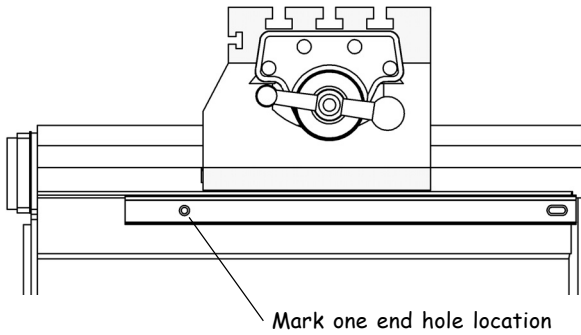
- Temporarily attach the bracket assembly to the reading head.

Scribe lines along the top and one end of the spar to locate its position on the knee.

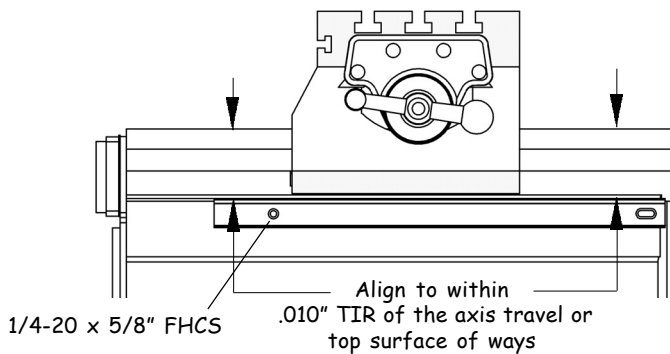


- With the saddle at its center of travel, position the spar on the knee, and the bracket assembly to the saddle.
- Locate the assembly so that a suitable mounting position is provided for both the encoder w/spar to the knee, and the bracket assembly to the saddle.
- With the spar parallel to the top of the knee, scribe spar location reference lines on the knee. Remove the assembly.

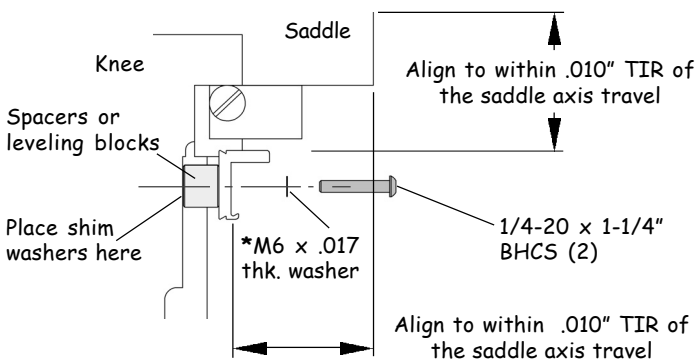
Spar installation ...



- Remove the bracket assembly from the reading head, and the encoder from the spar.
- Position the spar to the scribed lines and mark one end mounting hole location to the knee.
- Drill and tap location for a 1/4-20 x 1/2" deep.

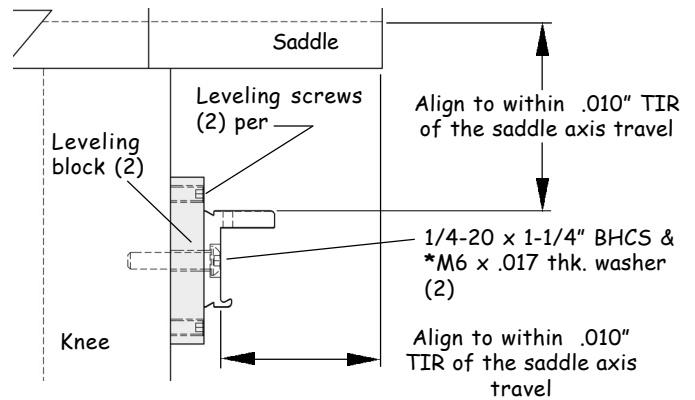


- Temporarily fasten the spar to the knee at one end with a 1/4-20 x 5/8" FHCS provided.
- Align the top of the spar to the saddle travel.
- Transfer punch the second mounting hole.
- Remove the spar, drill and tap location for a 1/4-20 x 1/2" deep.

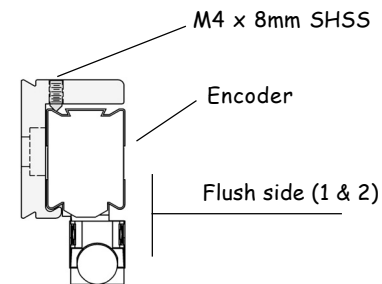


- Attach the spar with spacers to the knee.
- Align the front surface of the spar.
- Use shim washers provided between spar and spacer for front surface alignment as required.
- Align the top surface of the spar and secure in place.

Option using leveling blocks ...

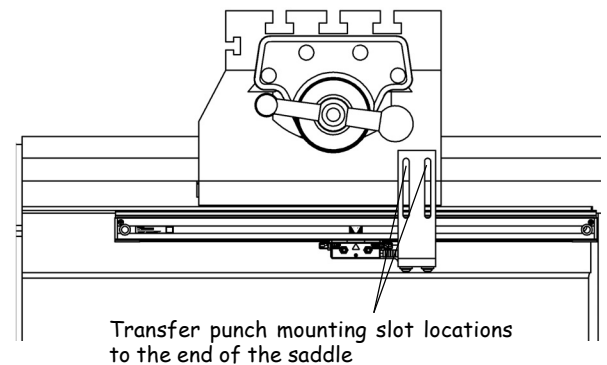


- Attach the spar with the leveling blocks to the knee.
- Align the front surface of the spar using the leveling screws to aid with front surface alignment.
- Align the top surface of the spar and secure in place.

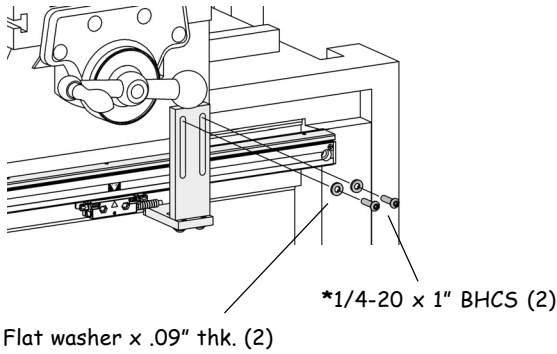


- Insert and center the encoder in the spar from end to end as done previously.
- Tighten set screws to secure in place.

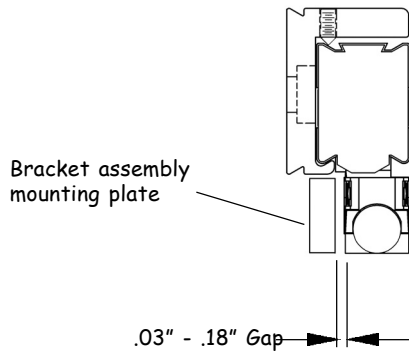
Reading head installation ...



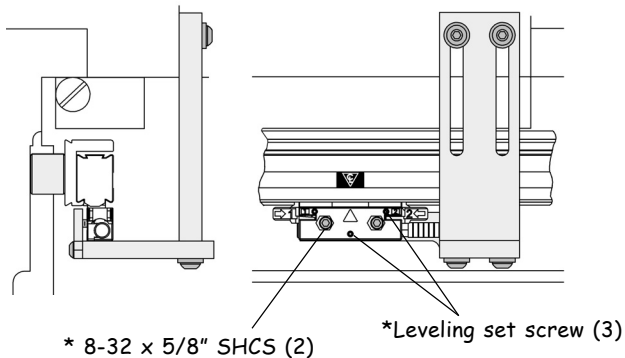
- With the axis at the center of travel, attach the bracket assembly to the reading head.
- Position the assembly to the saddle, and transfer punch the two mounting slot locations.
- Remove the assembly from the reading head, drill and tap the locations for 1/4-20 x 1/2" deep.



- Loosely attach the bracket assembly to the saddle.

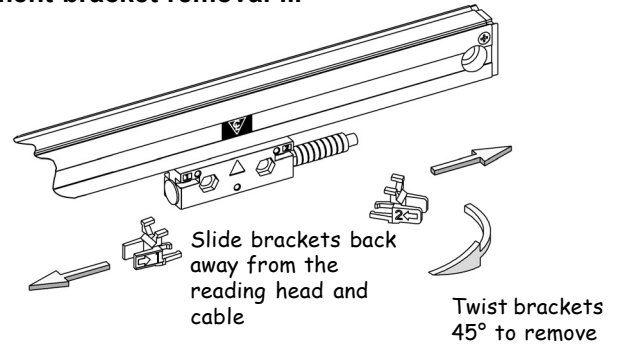


- Adjust the mounting plate clearance so that a gap of .03" - .18" exist.
- Align the reading head mounting holes with the mounting plate tapped holes.
- Secure the bracket assembly in place.

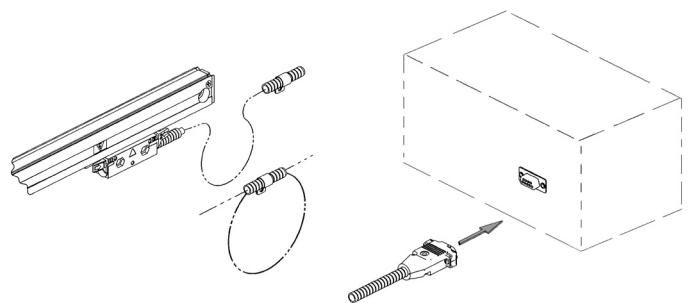


- Insert the two *8-32 x 5/8" SHCS. Insure the bracket assembly is adjusted to provide proper screw head clearance. **Do Not Tighten Screws** at this time.
- Set each leveling set screw by placing a .001" - .003" feeler gage between the set screw and the bracket.
- Adjust each set screw until a slight drag is felt on the feeler gage.
- Evenly tighten** the two 8-32 SHCS.

Alignment bracket removal ...



- Use allen wrench from set screw adjustment to slide alignment brackets away from the reading head.
- Remove alignment brackets and save for possible future use.
- Move the axis through its full travel. Confirm that the assembly does not interfere with the machine movement.



- With the longitudinal axis installation complete, route the cables providing sufficient slack loops for machine movement to the readout.
- Secure cables by fastening with clips or ties.
- Attach the linear encoder connectors to the readout.
- Complete the installation by following the steps in "Checking Your Installation" section in the encoder "Reference Manual".