

# NEWALL

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## Spherosyn Installation for Knee Type Milling Machine

To be used in conjunction with Newall's  
Installation Manual 023-12620 UK



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## INTRODUCTION

This manual is to be used in conjunction with Newall's Spherosyn™ Installation Manual, 023-12620. Please read and understand both of these manuals prior to beginning the installation.

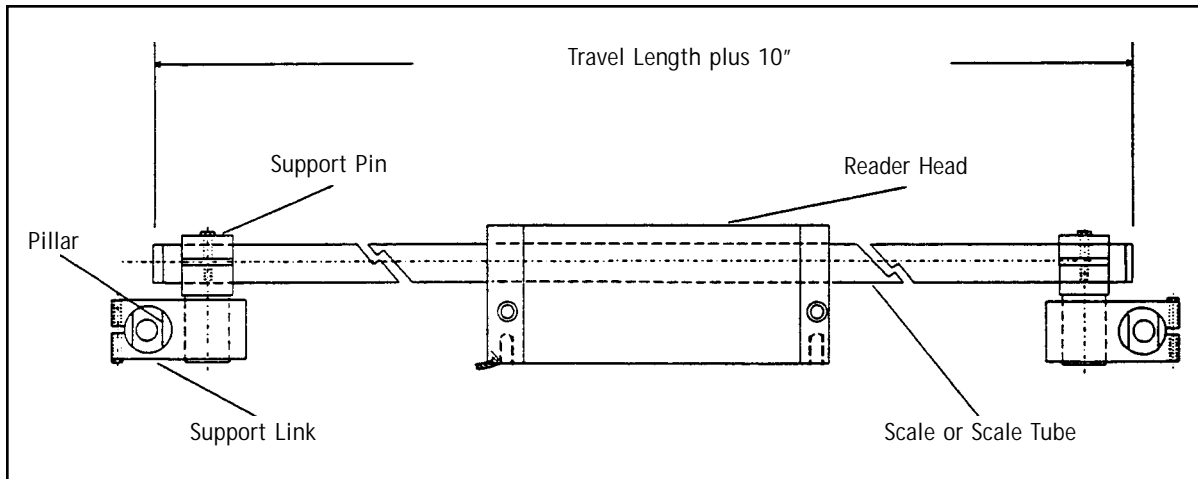
Due to the wide variety of knee type manual milling machines, modification to the bracketry may become necessary. Some manufacturers of milling machines have provided for DRO systems by pre-tapping holes in the table, saddle and knee. You may find that you are able to use these pre-tapped holes during the installation.

If during the installation, you would like to speak directly with our technical support personnel, call **1-800-229-4376**. The Technical Support Department is open Monday through Friday, 8:30 a.m. to 5:00 p.m., Eastern Standard Time. When calling, please provide the technician with the machine make and model, and the scale travel sizes.

**IMPORTANT:** In order to ensure prompt service on any warranty requests, the enclosed Warranty Registration card must be filled out and returned to Newall Electronics, Inc. within three days of the installation. **Failure to return the Warranty Registration card may cause delays in processing any warranty requests.**

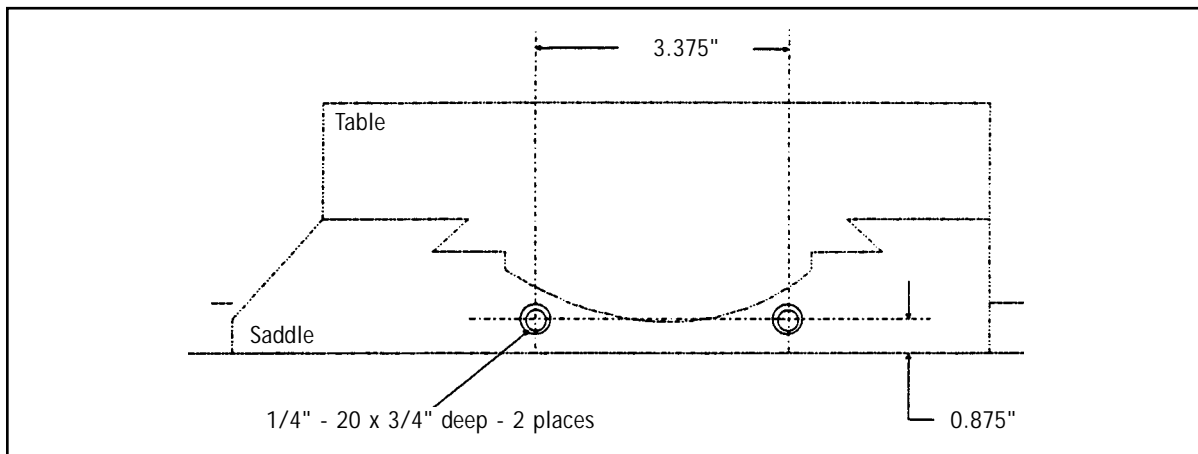
## DEFINITIONS

See page 5 in Newall's Spherosyn™ Installation Guide (023-12620 UK) for a detailed description and part numbers.

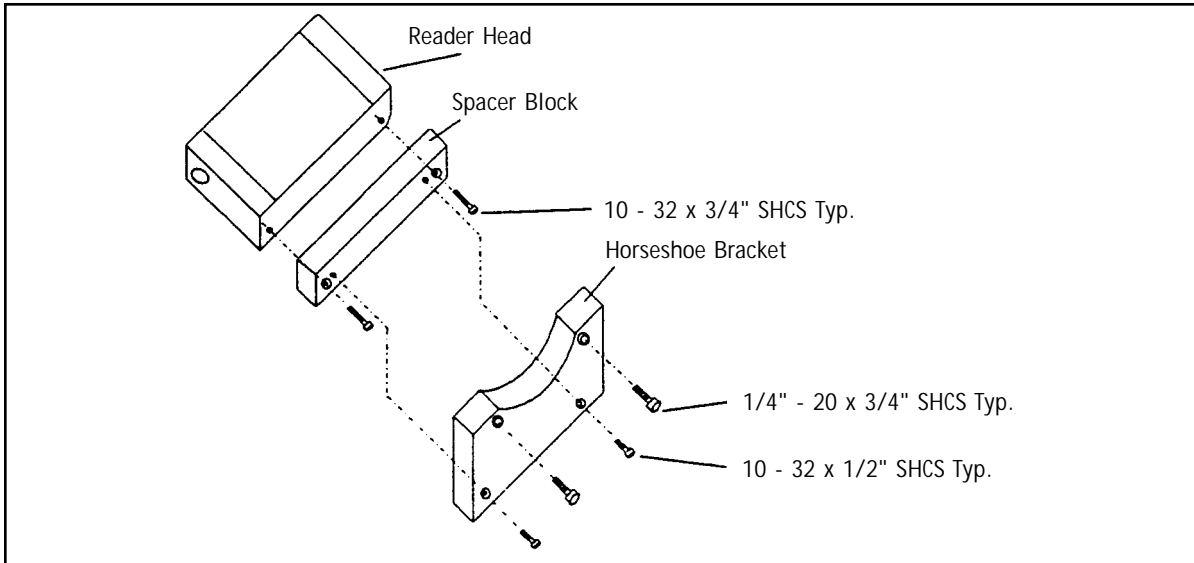


## 1.0 INSTALLING CROSS TRAVEL (Y-AXIS) READER HEAD

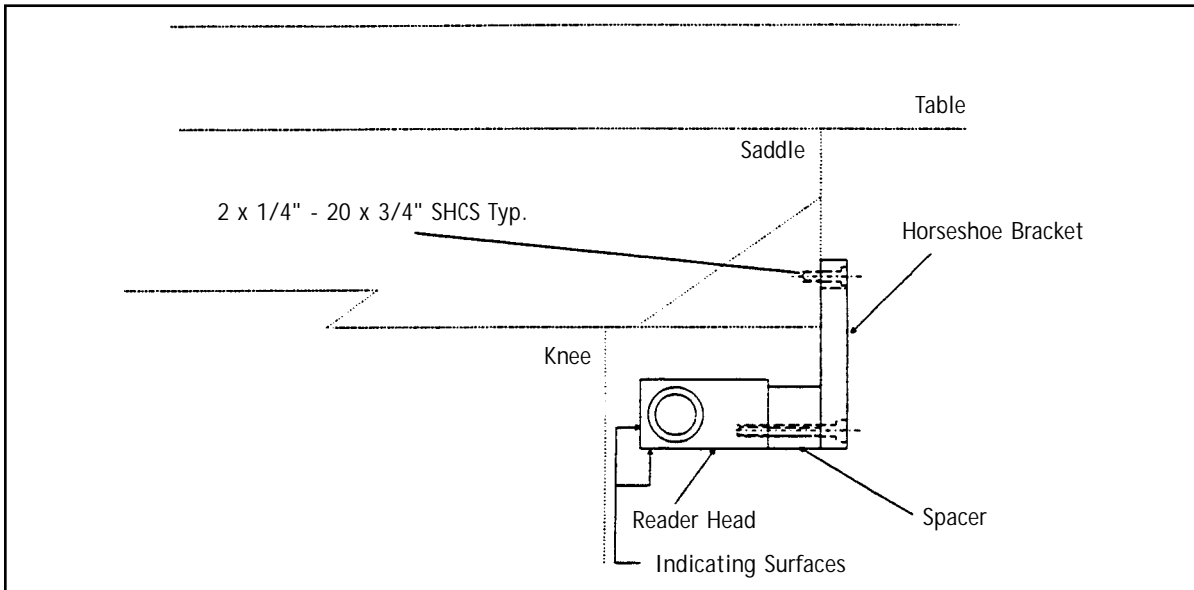
1.1 Drill and tap two 1/4" - 20 x 3/4" deep in the side of saddle.



1.2 Attach reader head to bracket assembly.



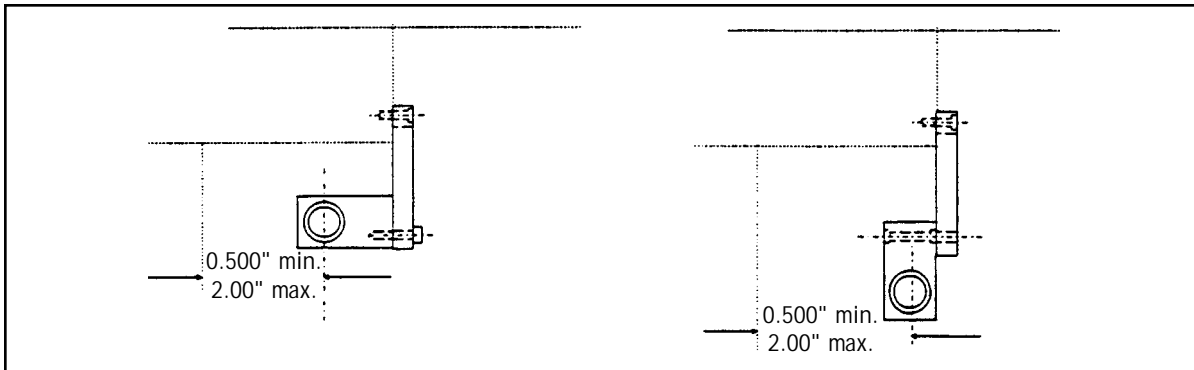
1.3 Attach bracket/reader head assembly to the machine saddle using two 1/4\" - 20 x 3/4\" SHCS and indicate reader head machined pads to within +/- 0.002\" TIR to machine travel in both parallel planes.



**Note:** Laminated shim stock ED 1515 is provided for any final adjustments. Each layer of shims equal 0.002\".

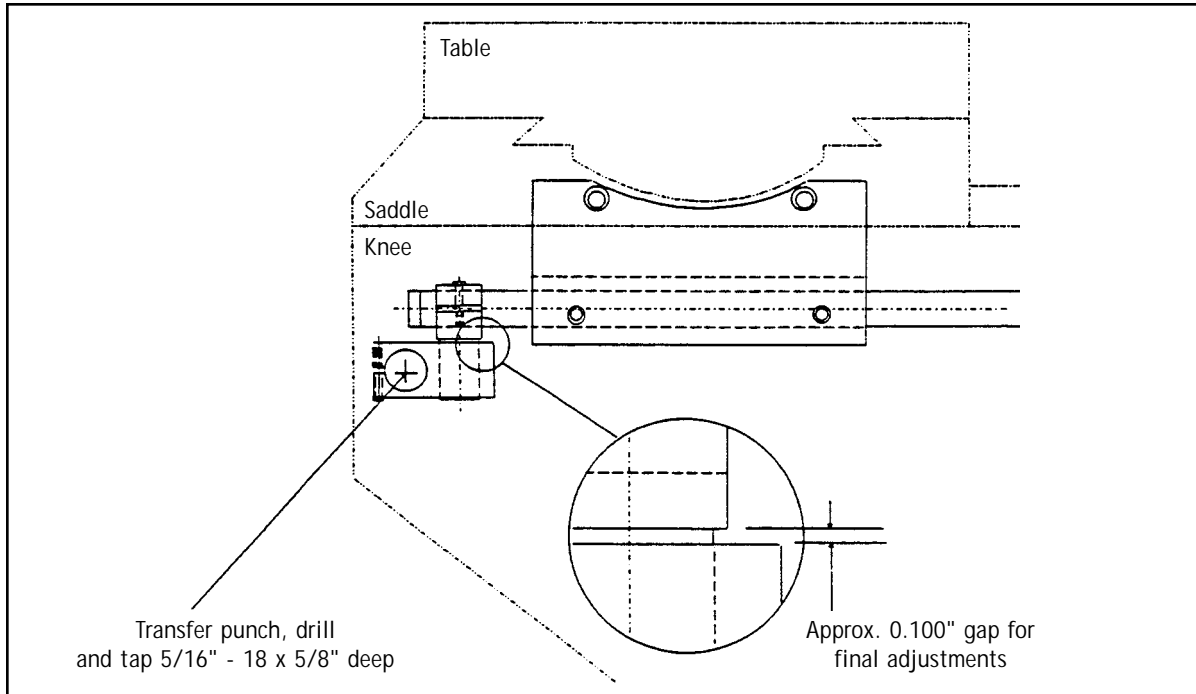
**Note:** Prior to proceeding, make certain that all SHCS are properly tightened.

Alternate Reader Head Mounting:



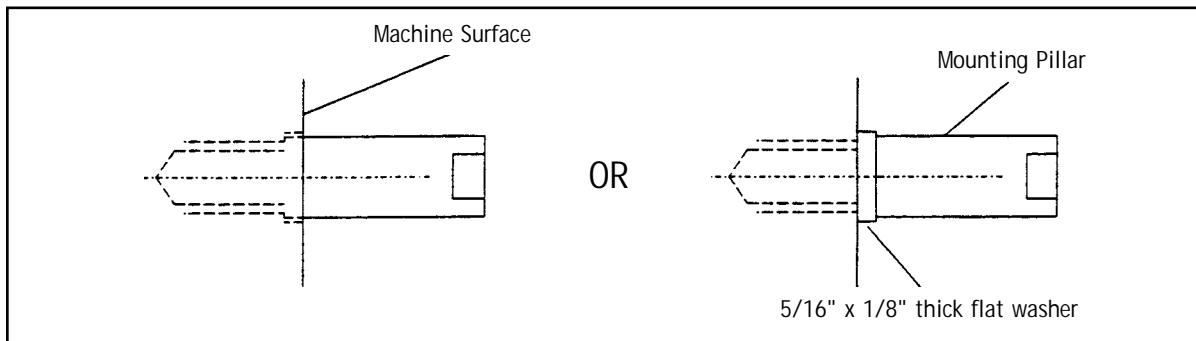
## 2.0 INSTALLING OF CROSS TRAVEL (Y-AXIS) SCALE

- 2.1 Position the saddle to its most positive (front) position.
- 2.2 Assemble the scale support pin to the support link.
- 2.3 Slide the scale tube through the reader head and into the support pin. Do not tighten the pin's M5 hex screw to the scale tube.
- 2.4 Align the support link square to the knee and transfer punch through the link and into the machine surface.



- 2.5 Remove the scale support assembly and the scale tube from the reader head and tap an M8 x 3/4" deep into the machine surface.

Counterbore 11/32" x 1/8" deep or insert one 5/16" x 1/8" thick flat washers between the pillar shoulder and the machine surface.



- 2.6 Insert the 1-1/2" long mounting pillar, ED3081-2, into the machine casting. The mounting pillar should set flush and square against the knee surface.
- 2.7 Loosen the two M5 hex screws on the support link and mount the assembly to the mounting pillar. Slide the scale through the support bracket and into the reader head.

**Note:** Do not force the scale through the reader head.

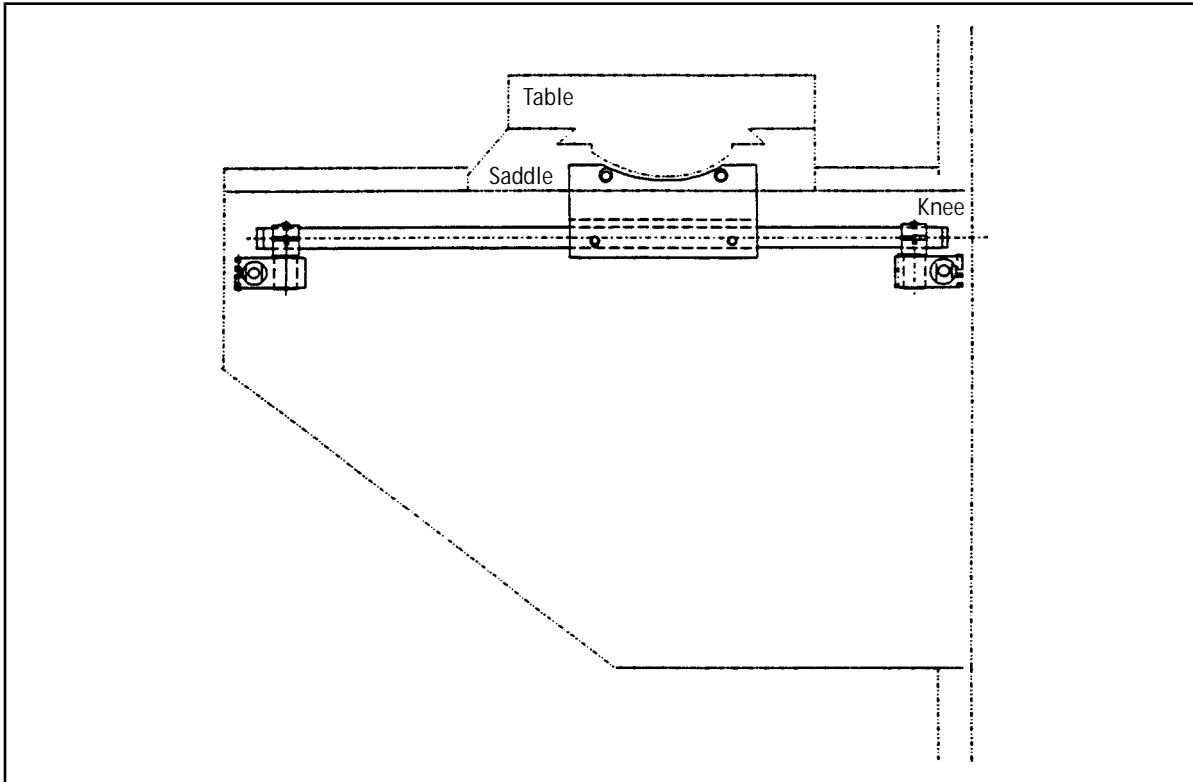
2.8 Carefully tighten the M5 hex screws on the support link, verifying at all times that the scale tube slides smoothly through the reader head and into the support pin. If interference or deflection is felt then repeat this step.

Do not tighten the M5 hex screw on the support pin at this time.

2.9 Traverse the saddle to the most negative position (toward the column) and repeat steps 2.2 through 2.8.

2.10 Slide the scale tube through the front scale support pin, through the reader head and into the rear scale support pin.

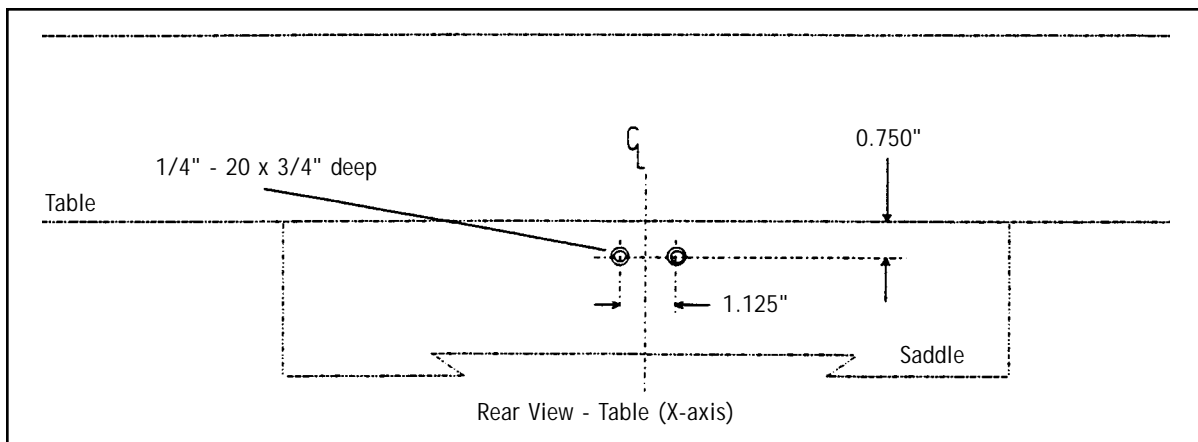
2.11 Secure the scale to the support bracket by tightening the M5 hex screws on the support pins.



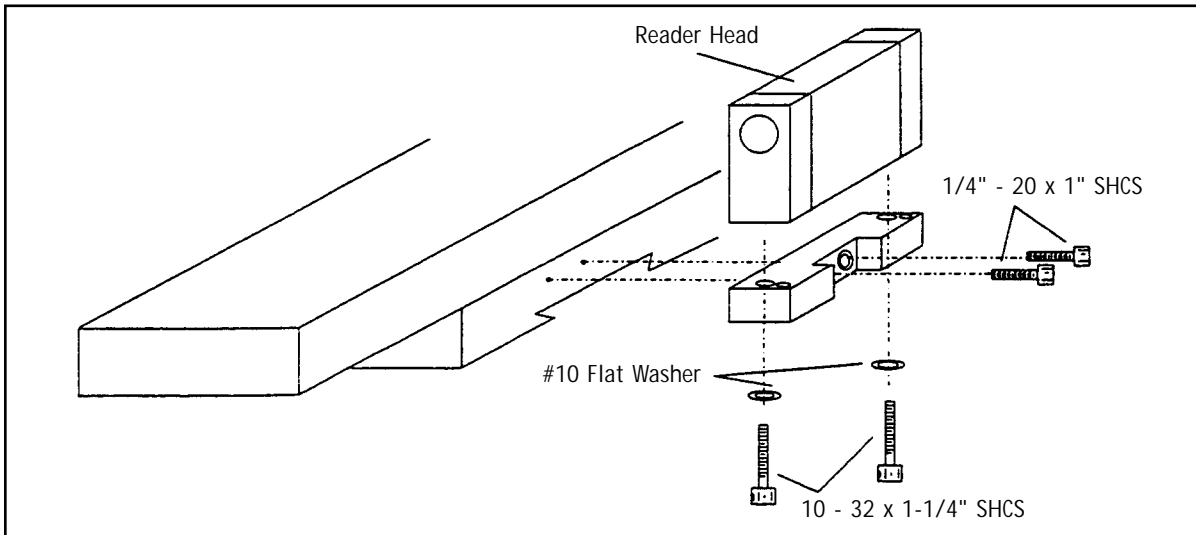
**IMPORTANT: IF THE ACTUAL MACHINE TRAVEL IS GREATER THAN THE SCALE TRAVEL, THEN A POSITIVE STOP MUST BE ATTACHED TO ELIMINATE DAMAGE CAUSED BY OVER TRAVEL.**

### 3.0 INSTALLING LONGITUDINAL (X-AXIS) READER HEAD - REAR TABLE MOUNTING

3.1 Drill and tap two 1/4" - 20 x 3/4" deep into the saddle as indicated.



- 3.2 Fasten the X-axis bracket to the reader head using two 10 - 32 x 1-1/4" SHCS. Attach the reader head/bracket assembly to the saddle using two 1/4" - 20 x 1" SHCS.

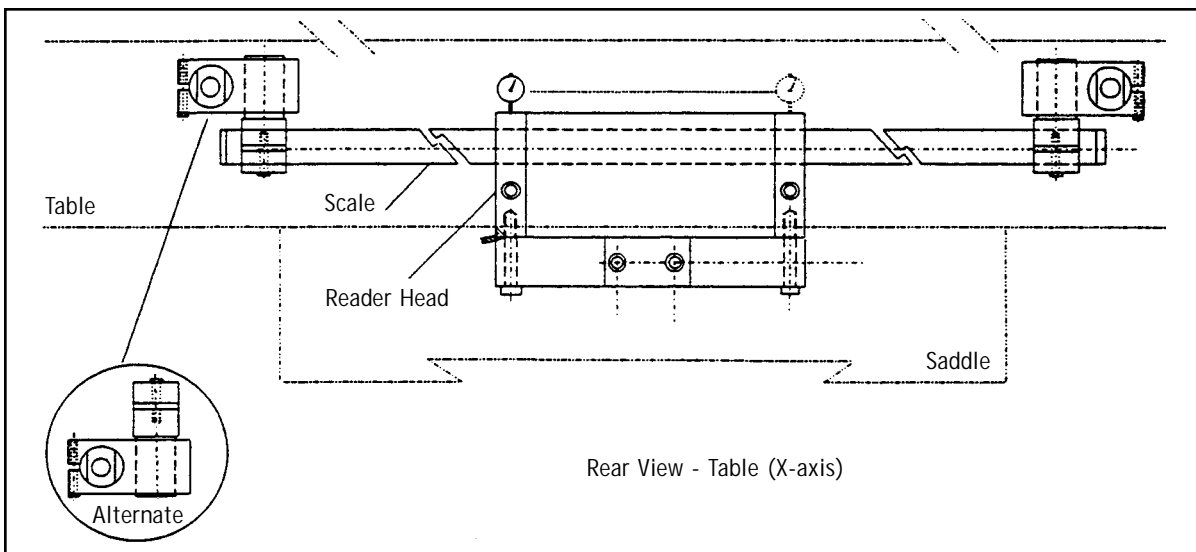
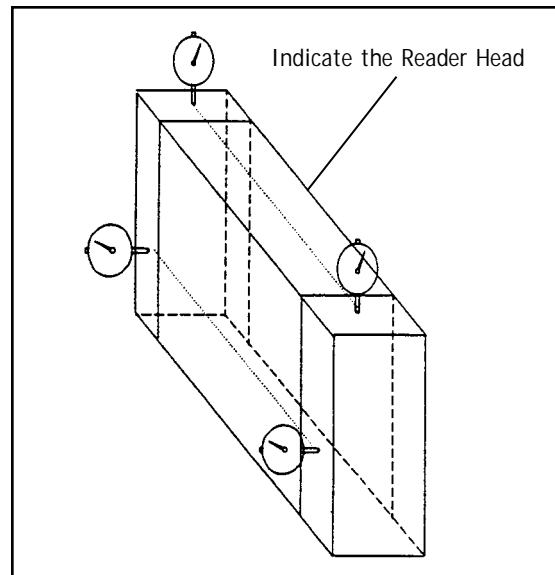


- 3.3 Indicate the reader head to within  $\pm 0.002$ " TIR to table travel in both parallel planes.

**Note:** Prior to proceeding, make certain that all SHCS are securely tightened.

#### 4.0 INSTALLING LONGITUDINAL (X-AXIS) SCALE - REAR TABLE MOUNTING

- 4.1 Traverse the table to its most positive (left) position. Repeat steps 2.2 through 2.8.
- 4.2 Traverse the table to its most negative (right) position. Repeat steps 2.2 through 2.8.
- 4.3 Slide the scale tube through the left support pin, through the reader head and into the right support pin.
- 4.4 Secure the scale to the support pin by tightening the M5 hex screws on the support pins.



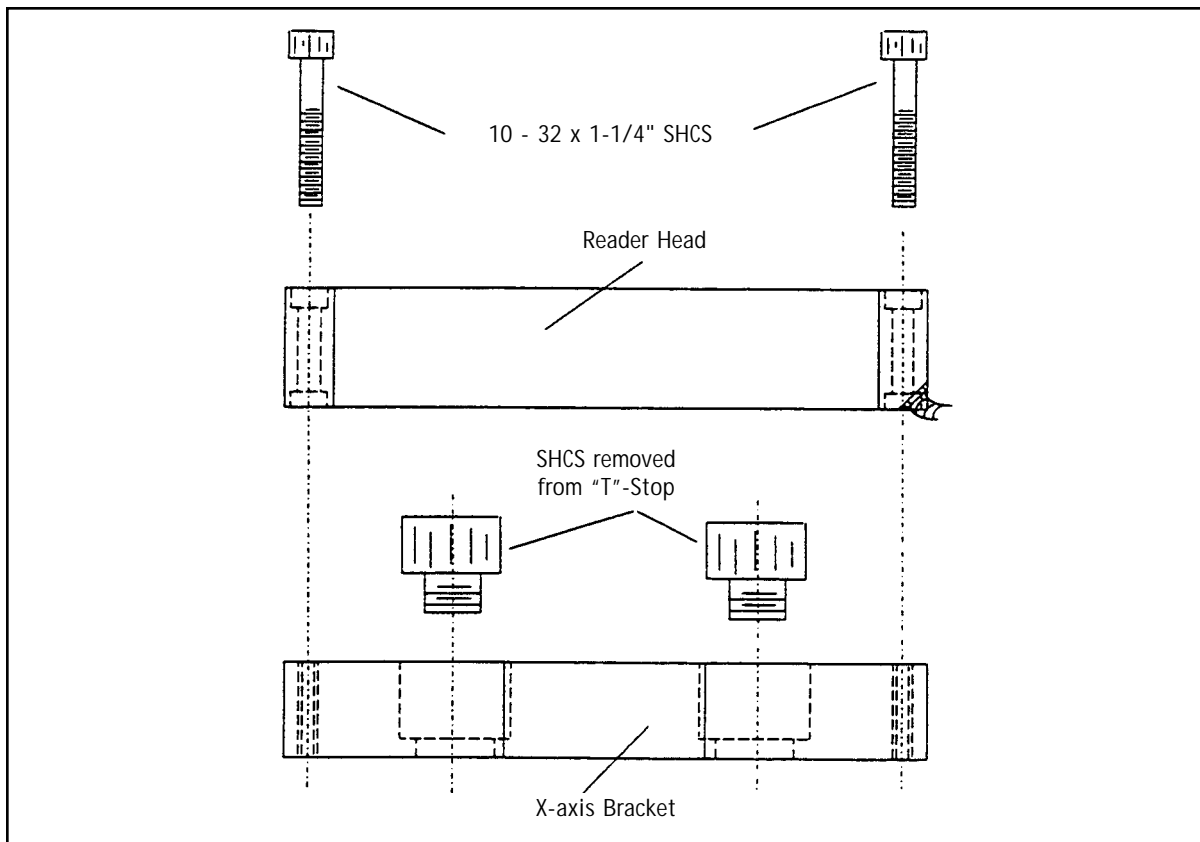
**Note:** Make certain that the scale support brackets do not protrude above the table surface.

**IMPORTANT: IF THE ACTUAL MACHINE TRAVEL IS GREATER THAN THE SCALE TRAVEL, THEN A POSITIVE STOP MUST BE ATTACHED TO ELIMINATE DAMAGE DUE TO OVER TRAVEL.**

## 5.0 INSTALLING LONGITUDINAL SCALE AND READING HEAD - FRONT TABLE MOUNTING

The bracket kit makes provisions for those who desire a front mounted longitudinal scale.

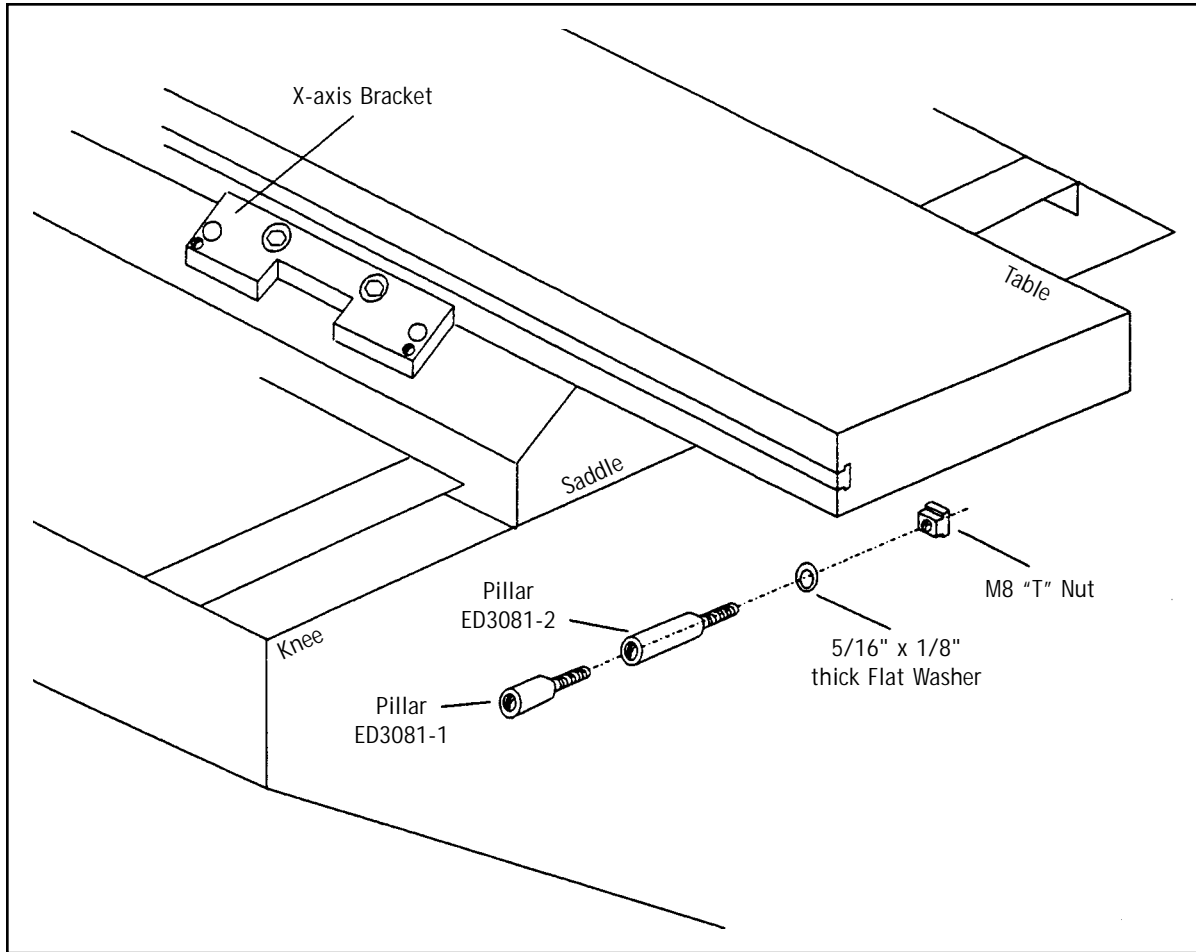
- 5.1 Remove the "T"-Stop located on the saddle and attach the X-axis bracket using the SHCS that held the "T"-Stop. The bolt pattern may vary depending on make and model of the machine. Modifications to the bracket may be necessary.
- 5.2 Attach the reader head to the X-axis bracket using two 10 - 32 x 1-1/4" SHCS and indicate the reader head to within +/- 0.002" TIR to the table travel in both parallel planes.



- 5.3 Insert the two "T" nuts into the "T" slot in the front of the table.
- 5.4 Mount the scale by using the same installation procedure as in the section 2.2 through 2.9.



Front Table Mounting:



## 6.0 CABLE ROUTING

One of the most important elements of the installation is proper cable routing. Loose and dangling cables can be snagged or crushed causing undue damage to the equipment. "P" clips and nylon tie wraps are provided to secure the cables to the machine.

## 7.0 FINAL CHECK

**PRIOR TO PUTTING THE DRO IN SERVICE, TRAVERSE THE TABLE, SADDLE, KNEE AND RAM TO BOTH OF THEIR EXTREME TRAVEL LIMITS. THIS WILL ENSURE THAT THE SCALE TRAVELS DO NOT EXCEED THEIR LIMITS AND THAT THE ARMORED CABLES ARE NOT STRESSED.**

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