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HEIDENHAIN

***DRO Encoder
LMF 9310***

***Install Notes
From the
Field***

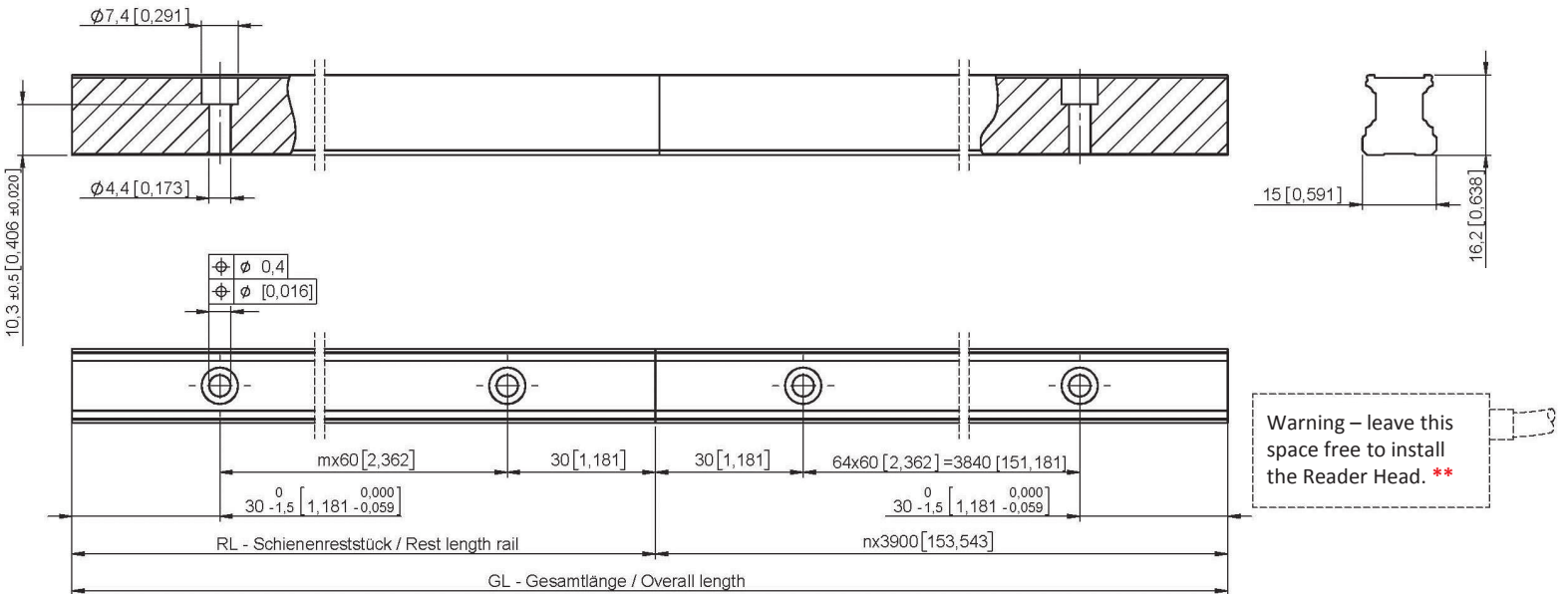




LMF 9310 Install Notes From the Field

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TFL/HC-Marketing

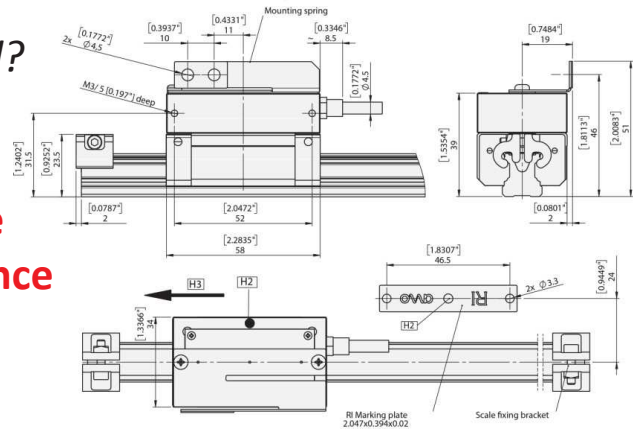


Scale Foot Print – how much Real Estate do I need?

51mm tall x 34mm wide x ML + 160mm long**

(2-1/8" tall x 1-3/8" wide x ML + 6-3/8" long**)

**** - you need at least 70mm (~2-3/8") free space on one end to slide on the Reader Head once the rail is installed**





Quoting Considerations

This product is a 2-man Install !!!

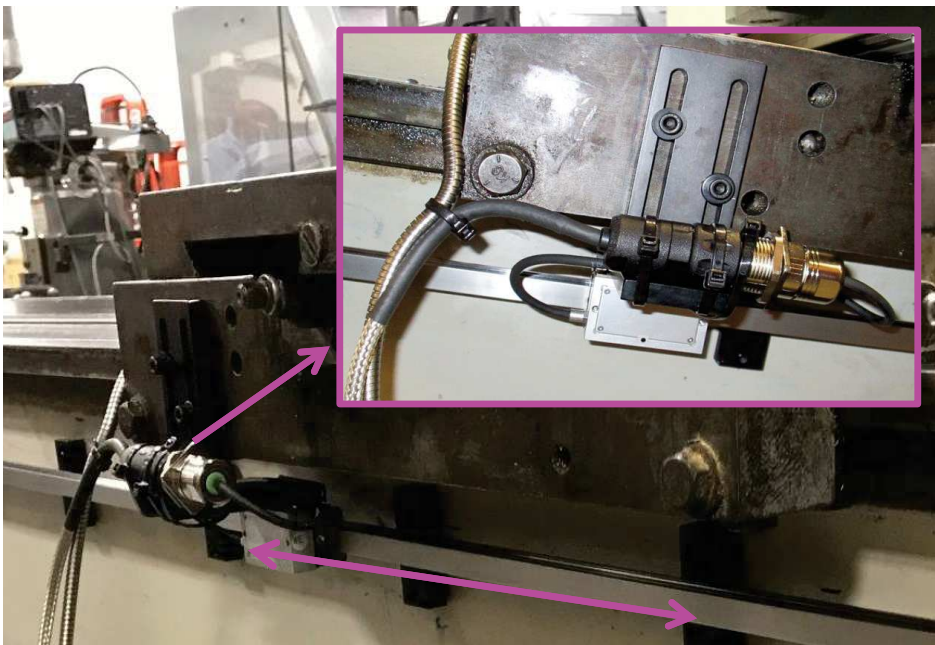
Minimum !!!



Quoting Considerations

- When deciding the ML needed – consider where you will install the Reader Head

*ML comes every 7" ...
This scale could have
been about 18" shorter
(\$200 LP1 difference)*



18"

13' LaBlonde Lathe





LMF 9310 Install Notes From the Field

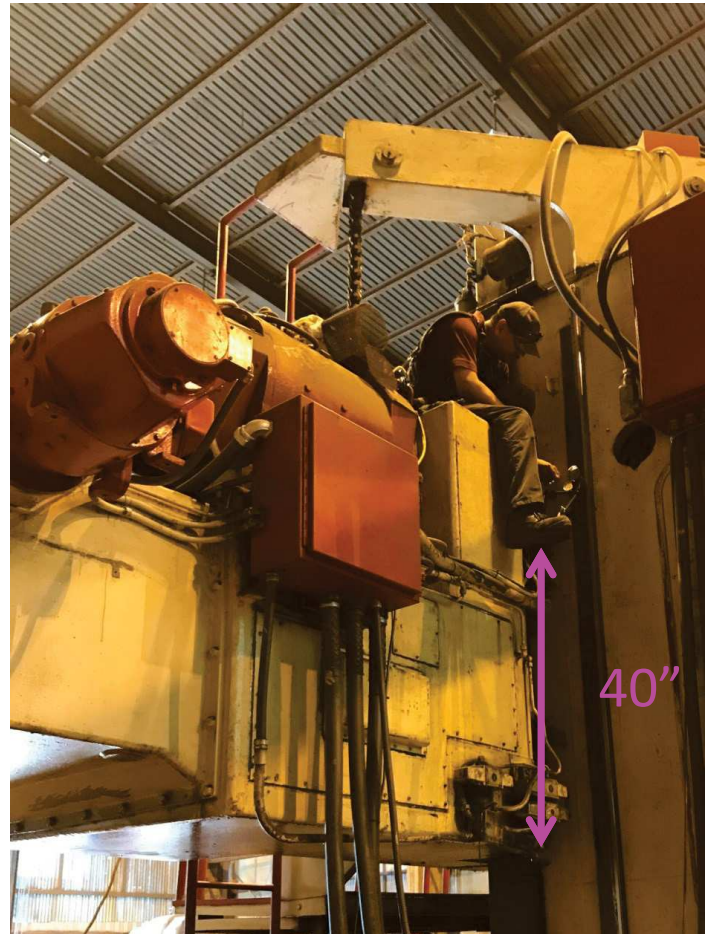
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Morton VBM 14'x24'

Quoting Considerations

\$500 LP1 Difference / axes





Quoting Considerations

Consider – access to the axis...



This lathe had about 5' behind it for us to work – but this Pipe was 12" from the saddle travel – it got in the way a lot



Quoting Considerations

Consider – access to the axis...

The **old ENC** was mounted on the Machine Leveling Pads on the right...

We decided to move the **LMF** to the center way.

When we dial indicated the way – it was well within the tolerance of .008”.

BUT – there was not enough room to install the **LMF** piece by piece – so we built it on the floor on a Backing Spar & installed it as one piece





Quoting Considerations

Consider – access to the axis...



We had to use this Cherry Picker to Lift the One-Piece Spar/Scale assembly.

We screwed in I-Bolts in the top Jacking screw holes and strapped it to the Basket Rail.



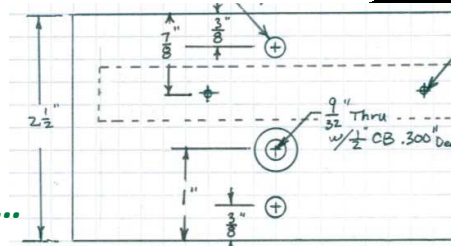
Quoting Considerations

Deciding on an Installation method... *

➤ On a Backing Spar **

** - Supplied by others

If the Spar is pre-made & CNC cut-
Figure 30-45 min / section install time...
Plus about 2 -3 hrs hanging time



➤ On Leveling Blocks

Figure 75-90 min / section install time
(drilling, tapping & dial indicating)



➤ Direct attachment

Figure 75-90 min / section install time
(drilling, tapping & dial indicating)

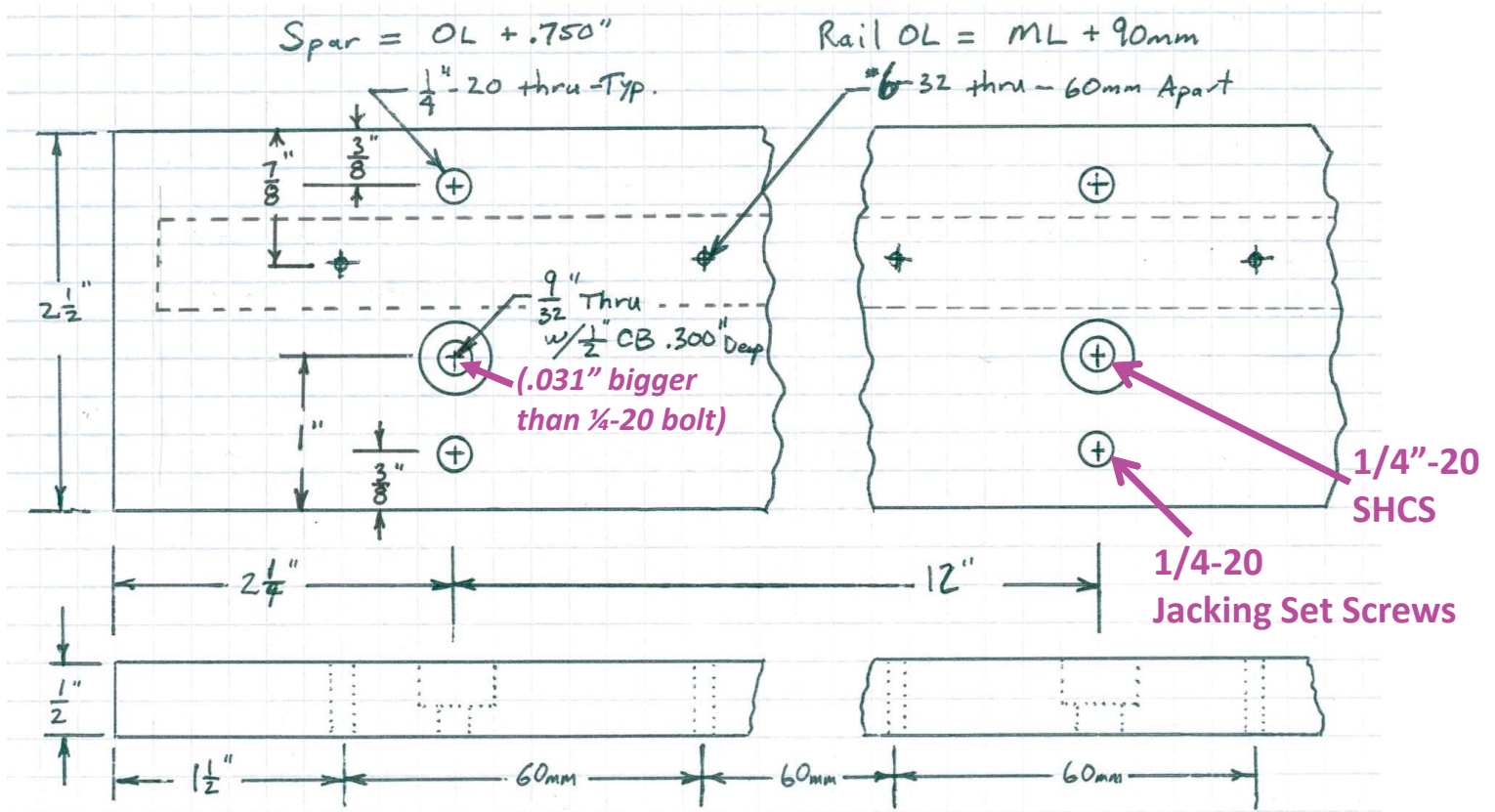


* - Rail must be mounted to within .008" of flat along its entire length



Recommended Backing Spar** for LMF 9310 Installs

1/2" x 2-1/2" 1018 CRS – with one edge true



** - Supplied by others



Quoting Considerations

Fasteners for Attachment (direct or to a Spar):

- Rail holes are optimized for M4 SHCS*
- For CNC Drilled holes use M4 or 8-32 SHCS*
- For Hand Drilled & Tapped holes use 6-32 SHCS*

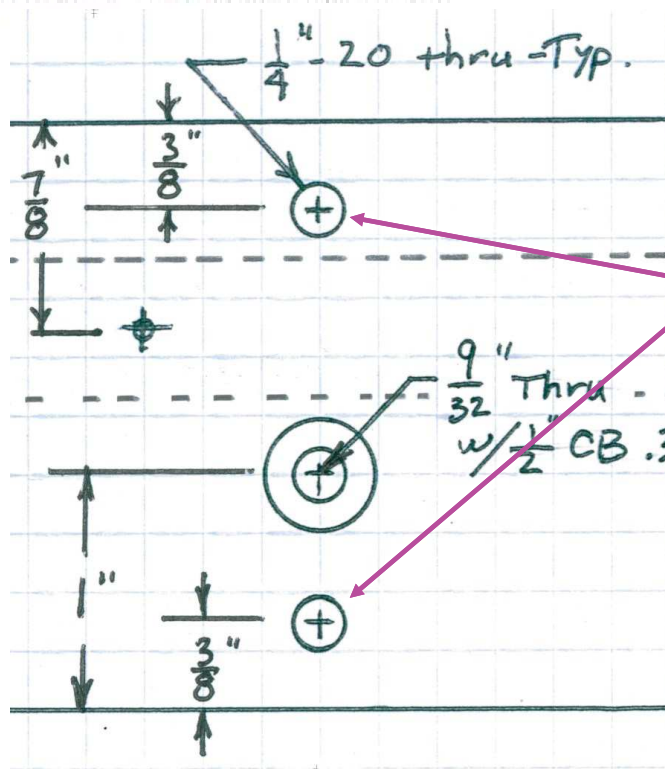
*** The original recommendation for Button or Round Head Cap Screws was wrong – Please disregard*



Quoting Considerations

Alloy Steel Cup-Point Set Screw (Same screws for Leveling Blocks)

Black Oxide, 1/4"-20 Thread, 1/2", 5/8", 3/4", & 1"



1/4"-20 Set Screws to be used as Jacking Screws... have several different lengths available in case the mounting surface is not flat.

Spar Supplied by others



Quoting Considerations

- ❑ For Manually Operated Machines – you can use every 3rd or 4th hole in the rail to fasten it to the machine – *plus* both end holes in every rail section

- ❑ For Motor Controlled Manual Machines - you need to use at least every other hole in the rails – *plus* both end holes in every rail section.

...Rails screw holes are every 60mm



Recommended Tools for the job...

Nonmarring Encased Magnetic Discs



1

A plastic case not only protects the magnetic material, but also the mounting surface. Magnets are made of ceramic (ferrite), which is corrosion resistant and resists demagnetization.

Warning: Maximum pull ratings are based on direct contact with rust-free and unpainted iron plate. Variations in material condition will significantly reduce these ratings. Do not use for lifting over people.

For technical drawings and 3-D models, click on a part number.

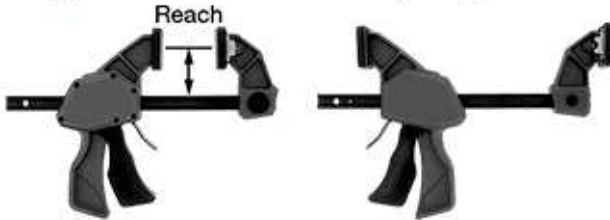
← Don't try to do this job without these!

1 magnet for every 2'-3' of rail



	Thick.	Dia.	Max. Pull, lbs.	Thick. Tolerance	Dia. Tolerance	Max. Temp., °F	Material	Case Material	Color	Each
1	0.24"	0.99"	2.8	-0.063" to 0.063"	-0.063" to 0.063"	140°	Ceramic (Ferrite)	Plastic	Gray	57005K84 \$2.53

Trigger-Action Bar Clamps/Spreaders



Shown as Spreader

Dowel Pin

Alloy Steel, 1/2" Diameter, 2-1/2" Long



Packs of 5

ADD TO ORDER

Cushion-Grip Ball-End T-Handle Keys



Hole-Location Transfer Punch

#15 wire gauge for Rail Holes





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Recommended for the job...

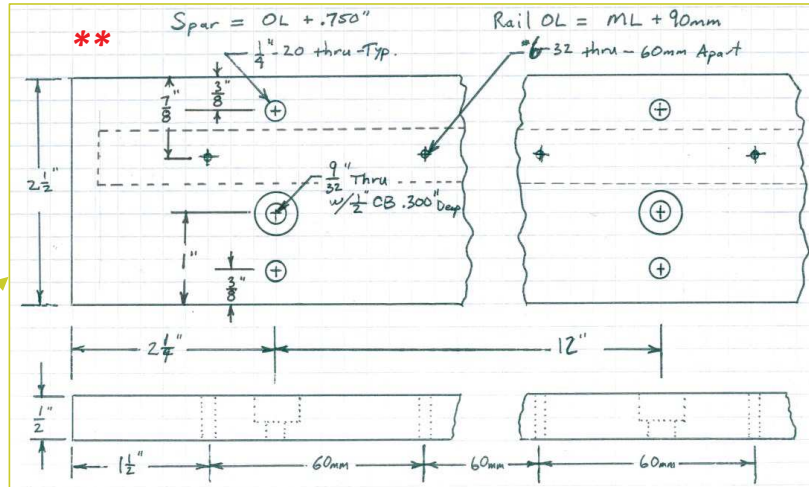
Low-Carbon Steel Sheets and Bars



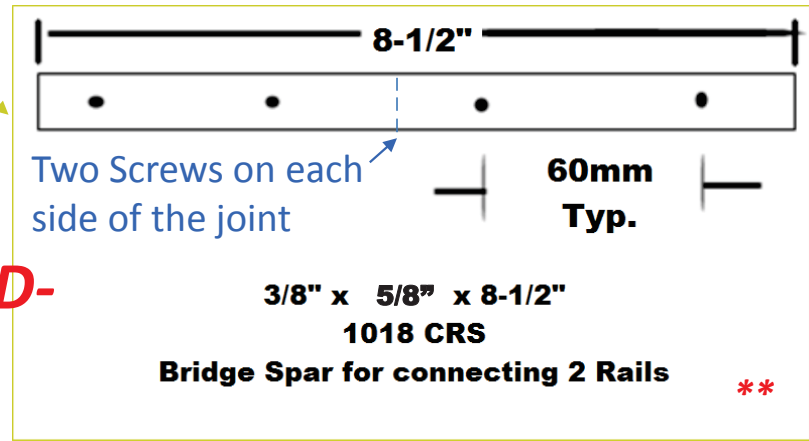
689418-11 (385039302)
Leveling Block \$5.00
 (Two 1/4-20 set screws Not included)

AR Price Book item >

**** - Supplied by others**



- OR -



- AND -



Install Activities

1. First thing is to find the HIGH Spot on the axes and write it all along the length of travel to know which jacking screws to use.
[This one was .100" out – here we set the screws about .020" out the back of the block in this spot & used varying lengths of screws along the length – as needed]
2. Start at one end... Transfer Punch, Drill & Tap the end then the 6th or 8th mounting Hole (for manual machine applications) – then zero & go back & do the 3rd or 4th hole in between.
[We clamped a spacer block to hold the rail approximately level as we moved along the length]
3. Repeat...

✿ *Rails may be slightly bent – But if you clamp them in place as you Transfer Punch, Drill & Tap you will be ok*





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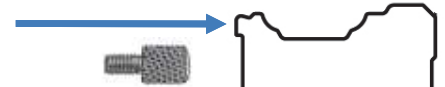


Install Activities

2 Dial indicators are required

- To be within .008" (.2mm) straightness & flatness

Flat Contact Point



Suggested
Contacts Tips



Conical Contact Point



When Attaching w/Leveling Blocks shown

This is Very Important!!!



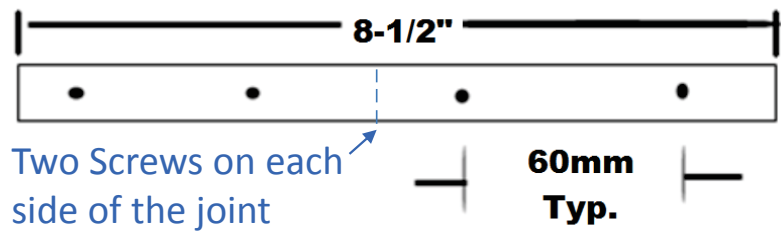
LMF 9310 Install Notes From the Field

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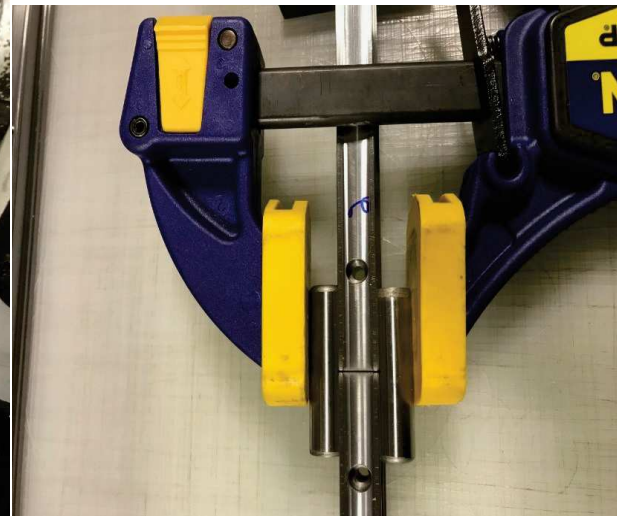
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Install Activities *For attaching w/Leveling Blocks*

Use Dowel Pins and a Clamp to align the Rail Joint – then tighten the 3/8" x 5/8" Bridge Spar... use 2 holes on each side of the joint



3/8" x 5/8" x 8-1/2"
1018 CRS
Bridge Spar for connecting 2 Rails

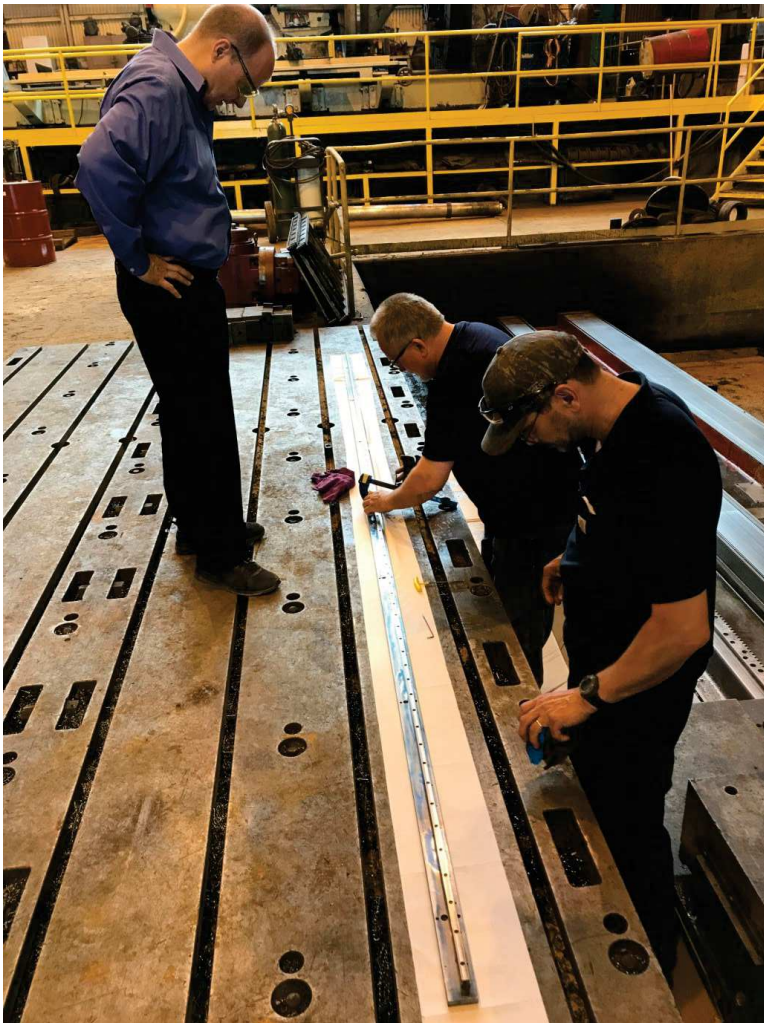




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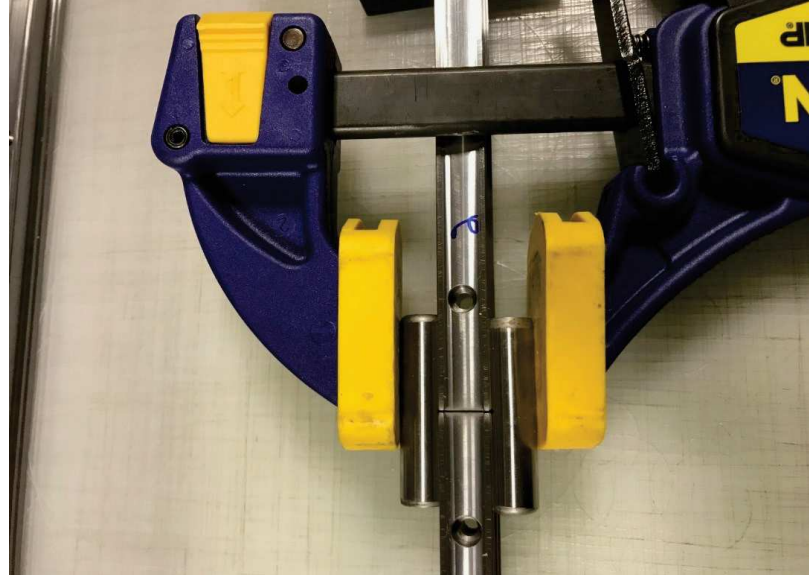


Install Activities

USING A BACKING SPAR

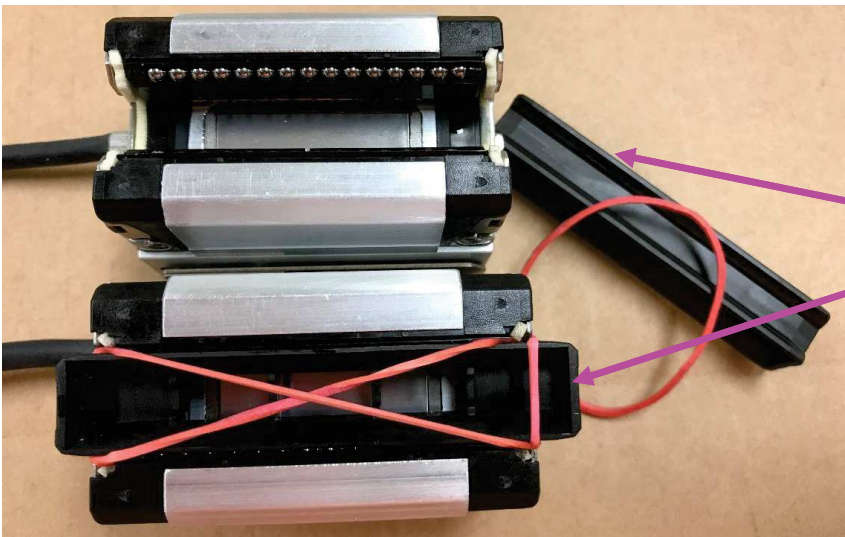
Build it on the flat surface...

Use Dowel Pins and a Clamp to align the Rail Joint

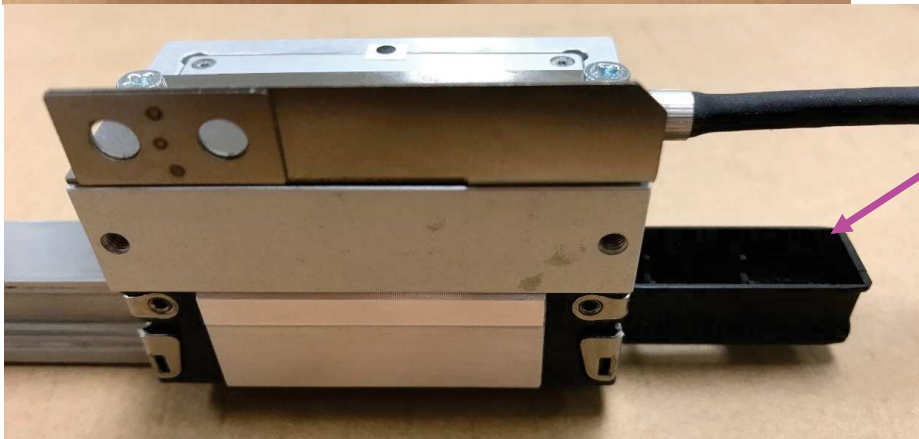




Reader Head Bearing Retainer

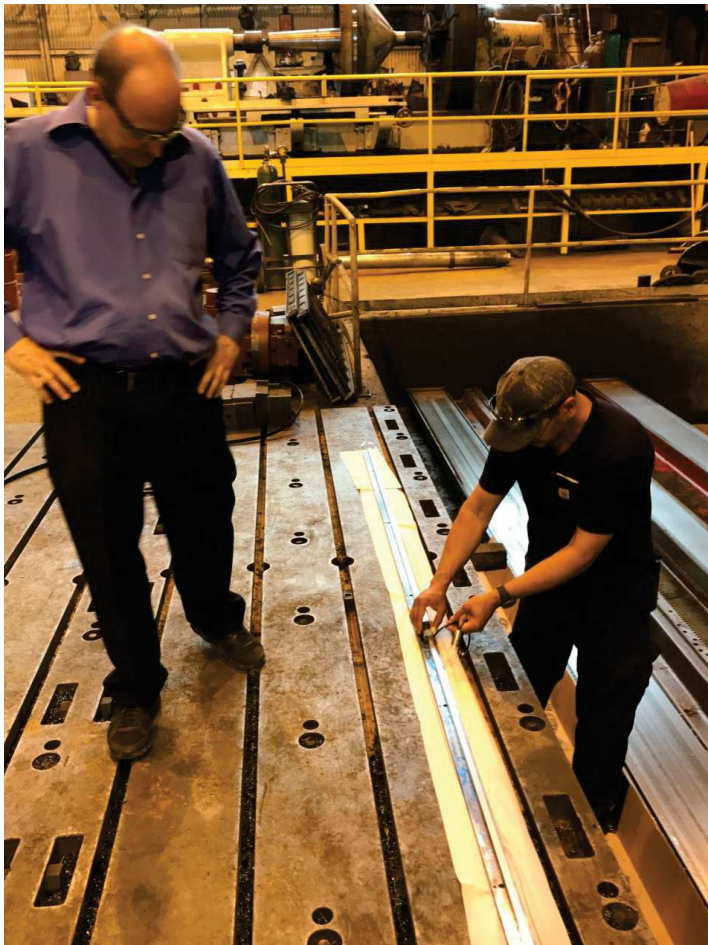


DO NOT
remove the
Bearing
Retainer !!!



Until... You align it with the
Rail and roll the Reader Head
onto the Rail.

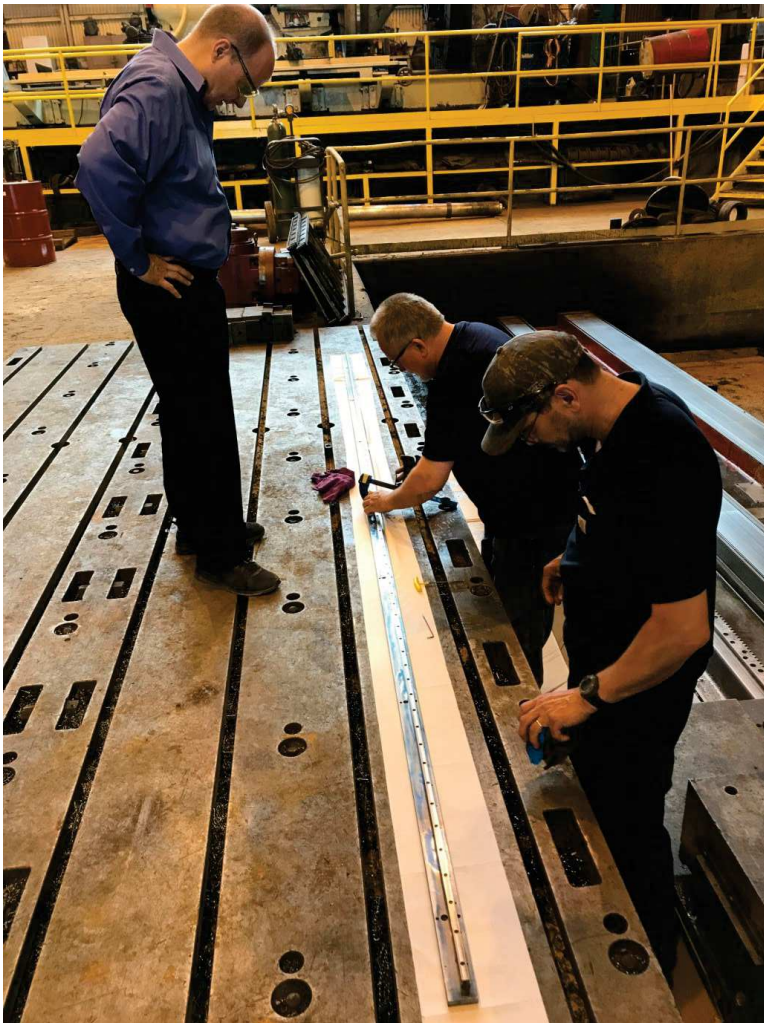
There are no replacement parts for
a reader head... your only option is
unit replacement... @ \$840 list



Install Activities

After the Tape & Cover are attached - - run the Reader Head along it's length to be sure it moves freely. If you encounter a rough spot – carefully peel back the cover to that point and gently re-attach it. ...Remember only press on the edges of the Snap Cover.

Always use the Bearing Retainer !



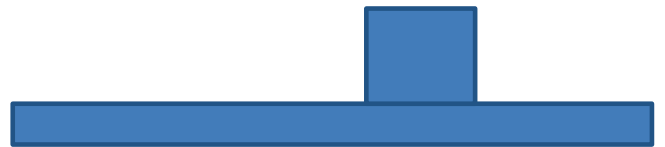
Install Activities

USING A BACKING SPAR

Build it on the flat surface...

Use **Non-Marring Magnets on the Tape – not Snap Cover Clips**

Insert the Jacking Set Screws of different lengths based on where you found the “high” spot.





Install Activities

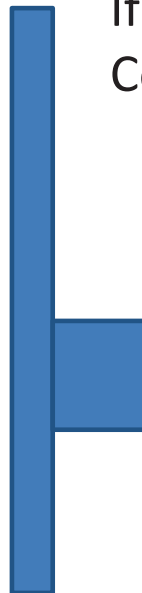
USING A BACKING SPAR

Build it on the flat surface...

Raise the entire assembly
very carefully...

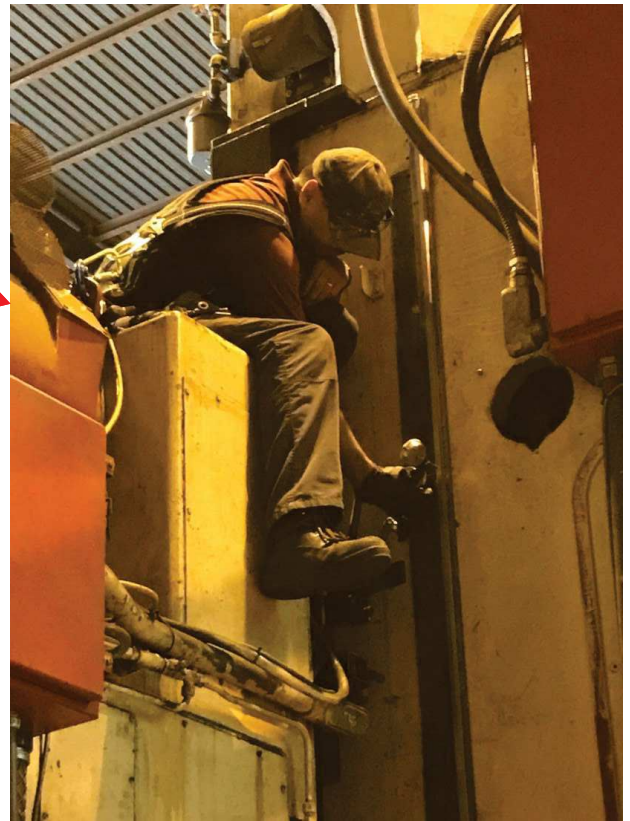
If you pop the Tape &
Cover loose – Start over

Rotate it 90° and
raise it on edge so
you don't pop the
snap cover/tape off.





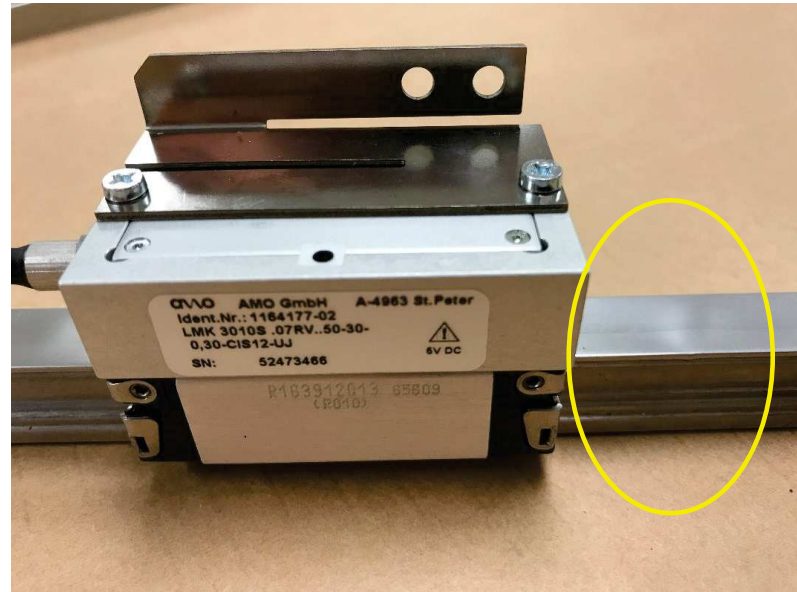
Install Activities Dial it in to within $\pm.008''$
Flat & Straight



2 Dial indicators



Snap Cover Perils



If you “kink” the Snap Cover (and that is VERY easy to do)
...the Reader Head may not roll over that spot.

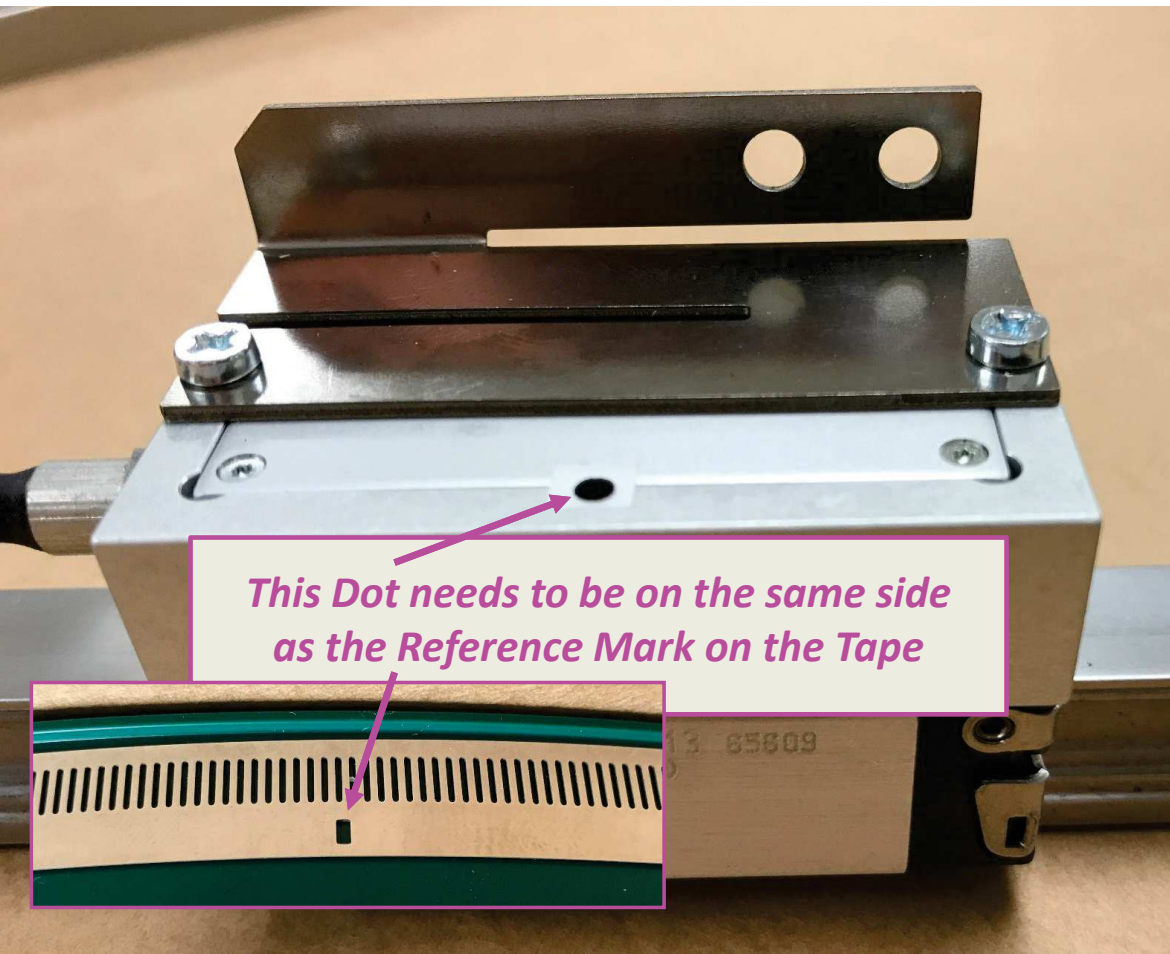
Replacement Snap Cover is \$36/meter list



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This Dot needs to be on the same side as the Reference Mark on the Tape

This spring steel mounting coupling – with its dual split design... allows for a lot of flexibility with the reader head bracket (about .030”).

Without it – Direct attachment of the reader head must be done within .008” of travel



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ALL new ACU-RITE DRO's and Only some of the old generation are plug & play with the LMF...
Call to verify the older ones with TechSupport

