Bridgeport DRO Kit Install Guide

Doc P/N: PP-ME-26-EN
Version: 1.1

The M-DRO 2 axis DRO kit designed to fit onto the Bridgeport turret mill. The kit includes the brackets and fixings required for standard install and machine set up as covered by this guide.

This manual describes installation procedure for the M-DRO 2 axis digital readout kit for the Bridgeport mill. Depending on the age and attachments on the mill you are installing, you can configure the kit in several different ways. Some of the more frequently used install options are included in this install guide.

Please contact us if you require any further assistance.

Before commencing any installation or maintenance work, please disconnect the power supply from the machine.

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The information contained in this publication is subject to change without notice.

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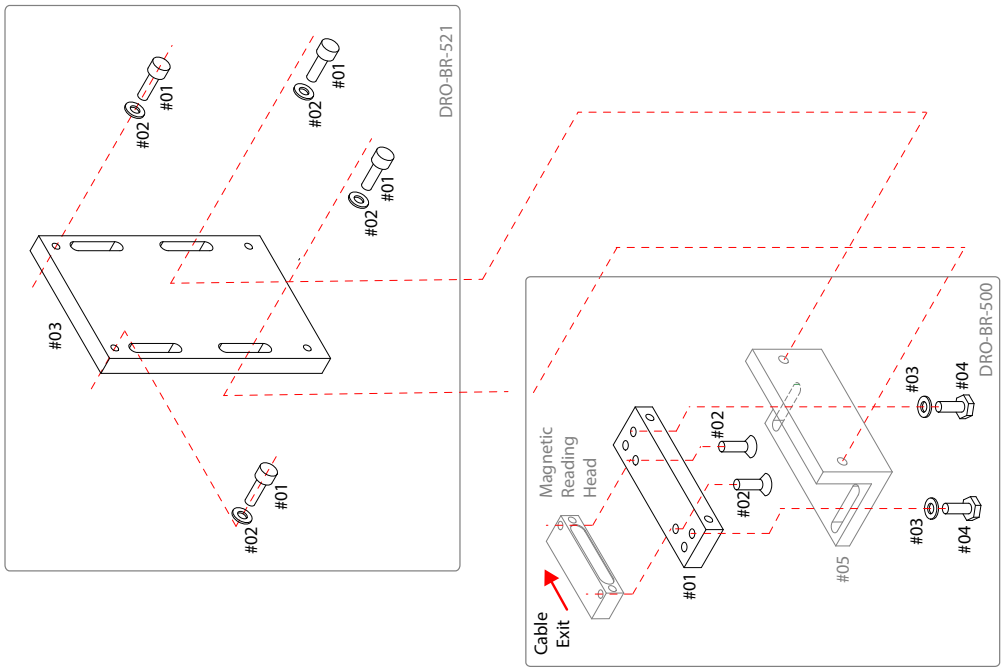
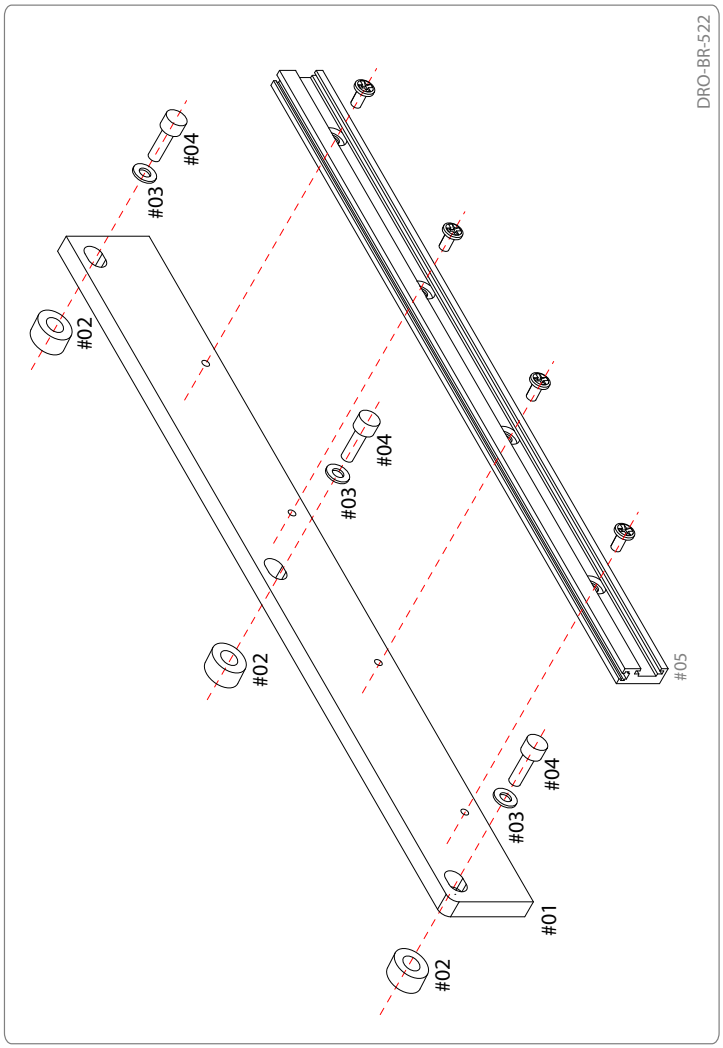
Assembly Diagram





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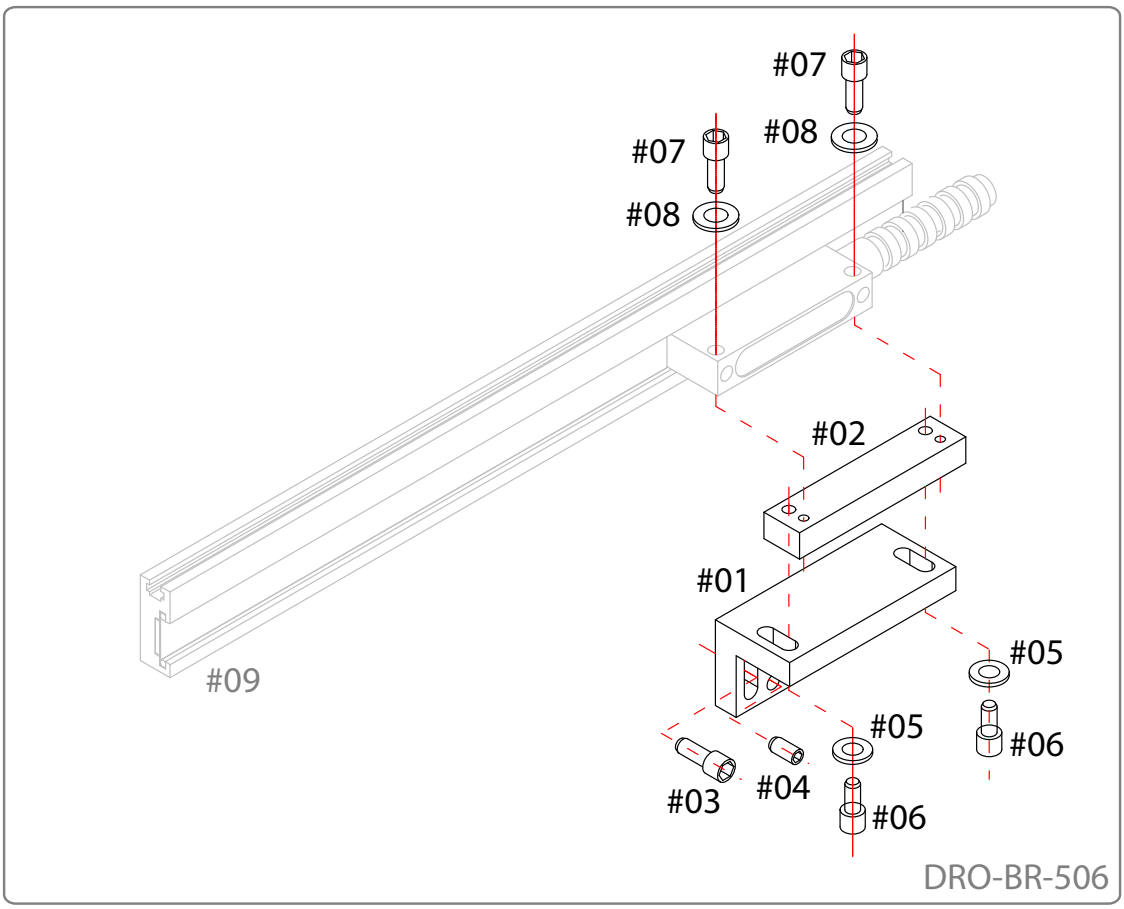

P/N	QTY	Description
DRO-MDC-700-2M	1	2 axis mill console
DRO-ARM-ST	1	Console mounting arm
DRO-MG-EH-05	2	Magnetic reading head
DRO-BR-015	1	Cable tie and P clip kit

DRO-BR-522

Ref	P/N	QTY	Description
#01	DRO-BR-064	3	10mm round spacer
#02	DRO-BR-065	1	Bridgeport Y axis mounting plate
#03	EC-FW-006	3	Washer
#04	EC-MISC-017	3	3/8" UNC X 1 1/4" cap head bolt
#05	DRO-MG-KT-400	1	400mm magnetic tape *(packaged separately)*

DRO-BR-500:

Ref	P/N	QTY	Description
#01	DRO-BR-020	1	EH series adaptor plate
#02	EC-FC-004	2	M4 x 12mm counter sunk bolt
#03	EC-FW-019	2	M5 washer (large)
#04	EC-FH-001	2	M5 x 16mm hex head bolt
#05	DRO-BR-016	1	Universal angle bracket *(packaged separately)*

DRO-BR-521:

Ref	P/N	QTY	Description
#01	EC-FS-011	2	M5 x 20 cap head bolt
#02	EC-FW-019	2	M5 Form C washer
#03	DRO-BR-019	1	Universal flat bracket *(packaged separately)*

DRO-BR-506:

Ref	P/N	QTY	Description
#01	DRO-BR-053	1	Reading head angle bracket
#02	DRO-BR-037	1	Reading head spacer
#03	EC-FS-013	2	M4 x 16mm cap head bolt
#04	EC-MISC-006	4	M5 x 10mm grub screw
#05	EC-FW-002	4	M4 Washer
#06	EC-FS-012	2	M4 x 12mm cap head bolt
#07	EC-FS-014	2	M3 x 16mm cap head bolt
#08	EC-FW-001	2	M3 washer
#09	DRO-MG-KT-800	1	800mm magnetic tape *(packaged separately)*

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Step 1:

Disconnect power supply from the machine. Please ensure the machine is cleaned down prior to starting kit installation.

Step 2:

The encoder can be fitted on the front or the back of the back of the table.

In the following instructions the encoder is fitted to the front.

Make a mark on the front of the table across the slide (A).

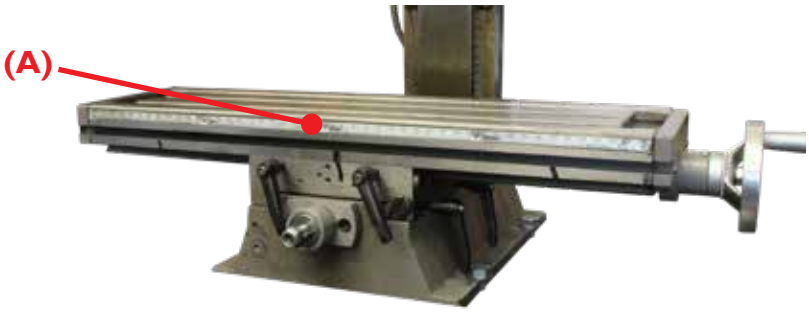
Step 3:

Travel the X axis to its full extent in opposite direction. Measure between the split mark and mark centre position of travel (A).

The length of the magnetic tape support profile can be calculated. This needs to be the axis travel length plus 50mm, which is the additional length of the reading head. The profile can be left longer is space is available. Cut the support profile to the required length.

Step 4:

Travel the X axis to the centre position of travel (A).



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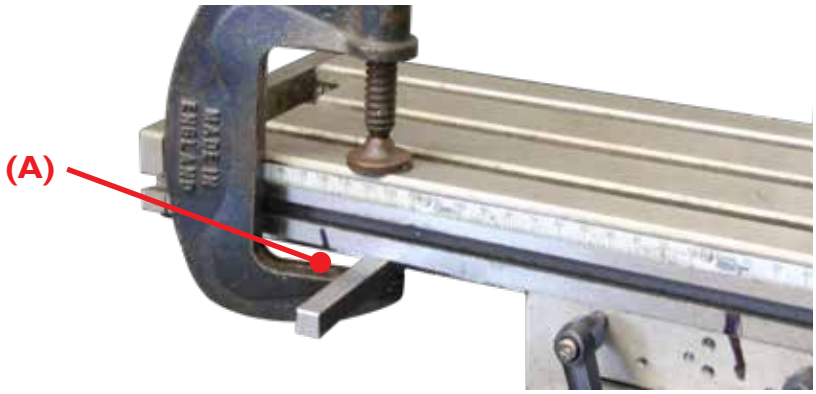
Step 6:

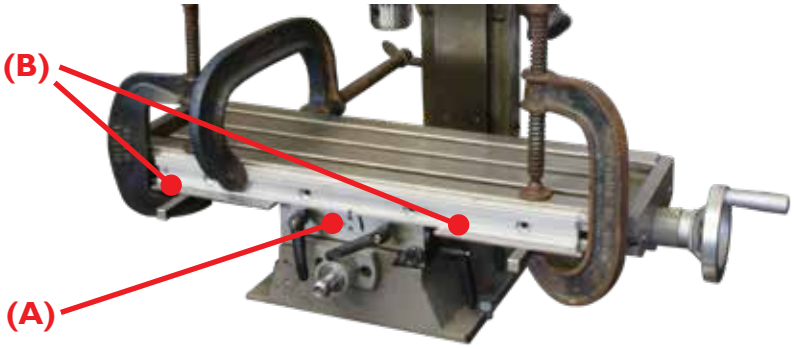
Clamp a flat piece of material to the underside of the table at each end (A).



Step 7:

Align the support profile central with the travel centre mark (A). On the top face of the clamped flat place a 1.5mm piece of shim/packing *(not included)* (B). Ensure the magnetic tape support profile is against the shim pieces and clamp.

NB: If T nuts are being used please note the gap between DRO-BR-053 and the underside of support profile is 3mm. It may be necessary to amend the shims being used.



Step 8:

Scribe or spot drill the support profile mounting. Then drill and tap M4.

Step 9:

With the shims in place (A) fit the support profile and secure with the M4 pan head bolts.

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Step 10:

Remove the shims. Measure from the top face of the table to the top of the support profile and check the profile is level.

Step 11:

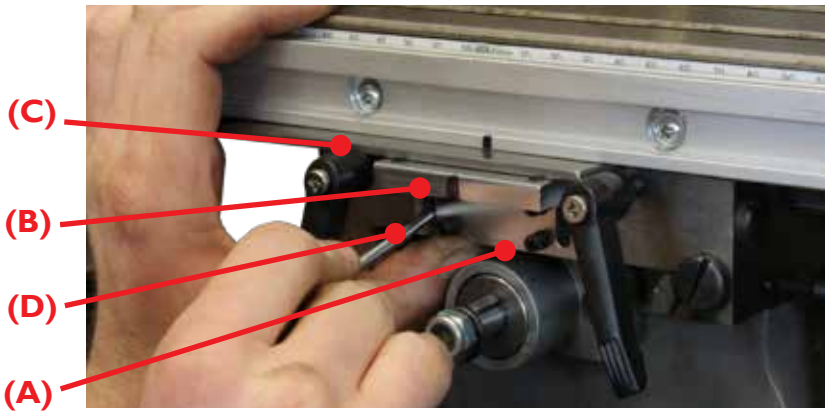
A dial gauge can also be used to check that the top and front face of the support profile are parallel with the travel of the axis.

Step 12:

Locate DRO-BR-053 reading head L bracket (A), mark the centre point (B).

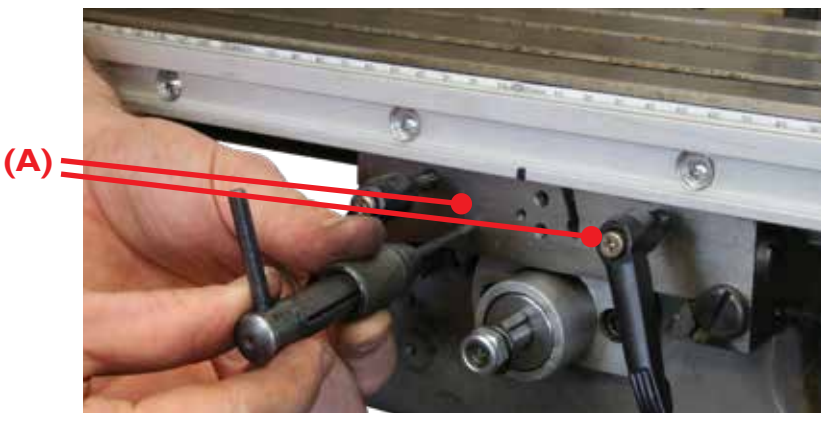
Between the underside of the support profile place a 3mm shim *(not included)* (C). Slide the DRO-BR-053 bracket against the shim and align the centre marks.

Mark the mounting slots (D).



Step 13:

Drill and tap the two mounting holes M4 (A).



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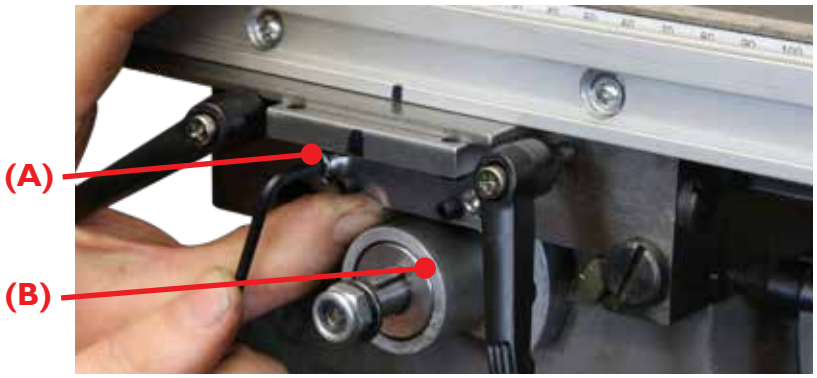
Step 14:

Locate DRO-BR-053 and place a 3mm (A) shim between the underside of the support profile and bracket. Secure the DRO-BR-053 with the two M4 x 12mm cap head bolts. The jacking screws can be used to adjust the bracket level if required (B).

Minor height adjustment may be needed later.



Step 15:

Cut the magnetic tape to match the length of the support profile, using tin snips.

Ensure the support profile is thoroughly degreased and clean, peel off the paper backing from the magnetic tape and stick along the 10mm wide slot on the profile.

Step 16:

Cut the stainless steel cover strip to match the length of the support profile and slide over the magnetic tape.

Step 17:

Secure with rubber gasket in the top and bottom slot of the support profile. The rubber can be stretched as its inserted into the slot (A).

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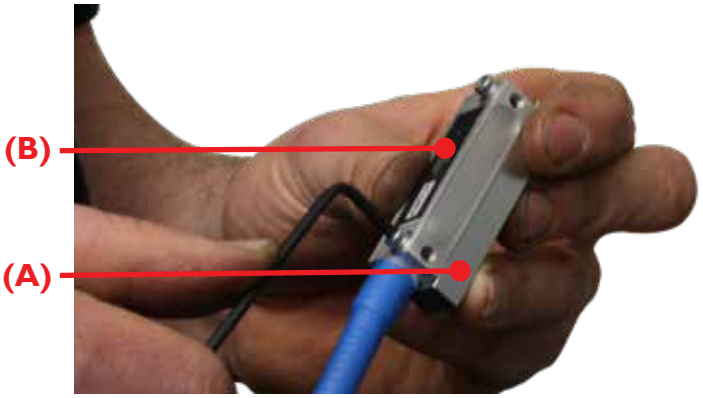
Step 18:

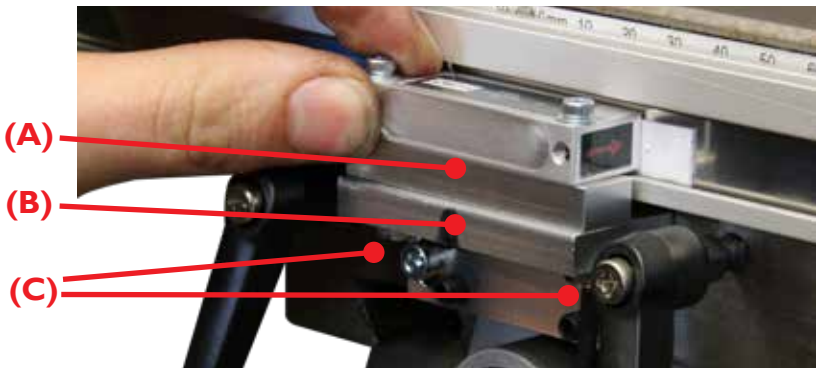
Locate and fit DRO-BR-037 (A) to the back of the magnetic reading head (B). Use two M3 x 16mm cap head bolts and M3 washers.

Tighten the M3 bolts.



Step 19:

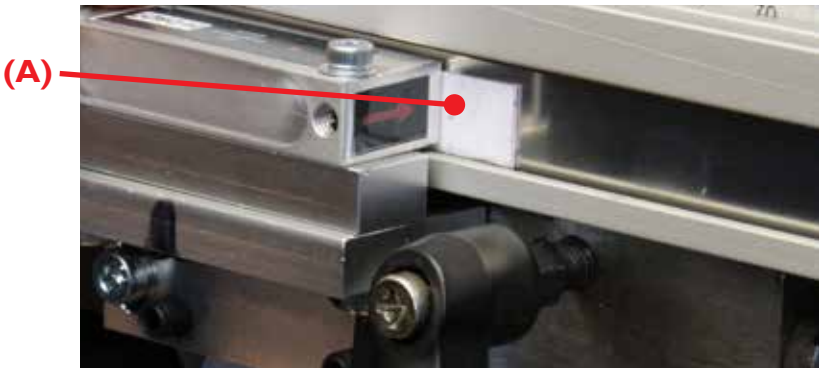
Locate and fit the magnetic reading head and DRO-BR-037 assembly (A) to DRO-BR-053 L bracket (B). Loosely secure with two M4 x 12mm cap head bolts and M4 washers (C).



Step 20:

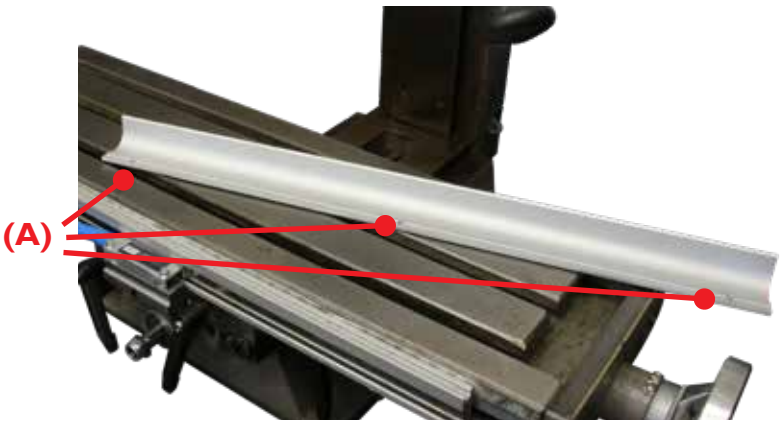
Insert a spacer shim between the reading head face & cover strip (A), we recommend several sheets of paper or card measuring a thickness of 0.25~0.5mm. The maximum gap from the surface of the magnetic tape is 1mm. The gap ideally needs to be as small as possible. reading head into position, to lightly compress the reading head against the shim and tighten fixing bolts.

Remove the shim ensuring the reading head does not contact the cover strip.



Step 21:

The profile cover can be cut to length and fitted. Drill 3mm clearance holes at each end and centre of the cover profile (A).



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Step 22:

Locate the DRO-BR-022 bolt kit and slide the M3 nuts along the T slot on the profile (A).

Step 23:

Secure the cover with M3 x 6mm button head bolts.

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Step 24:

Ensure the right hand side of the knee is clean.

Step 25:

Locate spacer DRO-BR-064 with the central slot DRO-BR-065 mounting plate using the 3/8" UNC bolts and washers.

Fit the mounting plate using the central fixing on the Bridgeport knee.

Ensure bolts are finger tight to allow for adjustment.

Step 26:

Fit the two remaining 3/8" UNC bolts.

Ensure bolts are finger tight to allow for adjustment.

Step 27:

Use an adjustable square or depth gauge to set one end of the mounting plate level.

Tighten end fixing.

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Step 28:

Adjust height at the opposite end of the mounting plate.

Tighten end and centre fixing.

Step 29:

Locate the 400mm long magnetic tape support profile. Fit to the mounting plate using four M4 x 12mm pan head screws.

Fit flush with the base of the support plate.

Ensure bolts are loose enough to allow for adjustment.

Step 30:

Set up a dial gauge on the underside of the support profile. Zero the gauge and travel along the length of the profile.

Adjust the support profile parallel with travel.

Tighten M4 pan head screws.

The front face can also be checked parallel.

Step 31:

Ensure the support profile is thoroughly degreased and clean, peel off the paper backing from the magnetic tape and stick along the 10mm wide slot on the profile.

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Step 32:

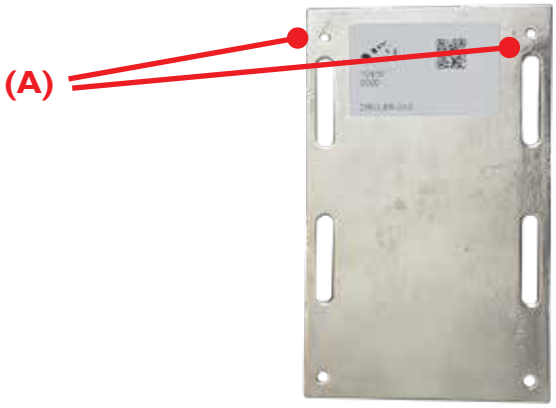
Cut the stainless steel cover strip to match the length of the support profile and slide over the magnetic tape.

Step 33:

Secure with the rubber gasket in the top and bottom slot of the support profile. The rubber needs to be stretched as its inserted into the slot.

Step 34:

Locate DRO-BR-019 and enlarge the holes two indicated (A) to 5.5mm diameter, M5 clearance.



Step 35:

Locate bracket DRO-BR-016 and enlarge the two existing M4 threaded holes to 4.2mm diameter.

Thread M5.

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Step 36:

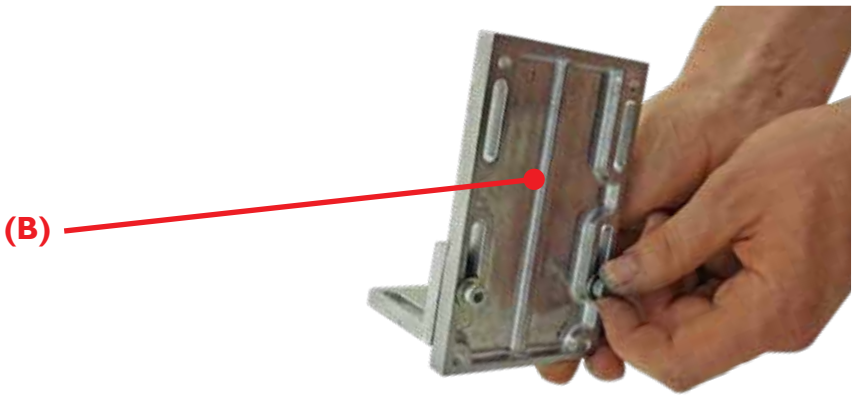
Locate the magnetic reading head (A) and fit to bracket DRO-BR-020 (B) using two M4 x 12mm counter sunk bolts.

Ensure bolts are tight.

Step 37:

Fit bracket DRO-BR-016 (A) to DRO-BR-019 (B). Using two M5 x 20mm cap head and larger diameter form C M5 washers.

Ensure bolts are finger tight, to allow for adjustment.



Step 38:

Fit the magnetic head asembly to DRO-BR-016 using two M5 x 16mm hex and larger diameter form C M5 washers.

Ensure bolts are finger tight, to allow for adjustment

Step 39:

Offer the reading bracket assembly onto the Y axis slide base (A) so that it is central with the X axis leadscrew.

Align the reading head with the centre of the tape slot in the profile (B).

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Step 40:

Mark the fixing holes.

Drill and tap M5.

Step 41:

Fit the reading head assembly and secure with two M5 x 20mm cap head bolts and washers.

Ensure bolts are tight.

Step 43:

Adjust the height of the reading head to align with the magnetic tape.

Ensure bolts are tight.

Step 44:

Insert a spacer shim between the reading head face & cover strip (A), we recommend several sheets of paper or card measuring a thickness of 0.25~0.5mm. The maximum gap from the surface of the magnetic tape is 1mm. The gap ideally needs to be as small as possible. Adjust reading head into position, to lightly compress the reading head against the shim and tighten fixing bolts.

Remove the shim ensuring the reading head does not contact the cover strip.

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Step 45:

Locate the support profile aluminium cover. Drill 3mm clearance holes at each end of the cover profile.

Step 46:

Locate the DRO-BR-022 bolt kit and slide the M3 nuts along the T slot on the profile.

Step 47:

Secure the cover with M3 x 6mm button head bolts.

Step 48:

Secure the reading head cable using cable ties and P clips, ensure there is a drip loop formed in the cable to prevent coolant traveling along the cable towards the reading head (A).

To complete install all cables need to be routed and fixed securely, with enough slack to allow for the machine travel in all planes. The cables must not interfere with any moving machine parts. Please refer to the console manual for connecting to the display.

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