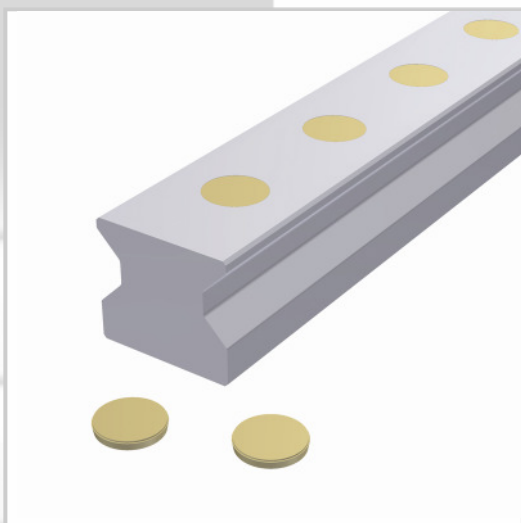


SCHNEEBERGER
LINEAR TECHNOLOGY



Installation Instructions

**Brass Plugs MRS
for MONORAIL MR**



Version data

Date written	Description	Author	Released by
07.12.2007	First release	JS	KG

Version	Date	Description	Released by

Notes for users

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The Installation Instructions MRS for MONORAIL MR can be obtained free of charge from your Schneeberger Partner, or downloaded as a pdf-file from **www.schneeberger.com**.

Document No.: **826 003 061**

Printed in Germany

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1 About these Installation Instructions

1.1 Function and validity

The Installation Instructions for Brass Plugs MRS for MONORAIL MR describes the installation of MRS brass plugs to cover the rail mounting holes on MONORAIL MR guideways using the MWH hydraulic installation tool. These instructions supplement the MONORAIL Installation Instructions and are only valid in conjunction with them.

1.2 Target audience

These Installation Instructions are intended for the fitters and service personnel who have to install brass plugs or replace them during servicing operations.

1.3 Further reading

- MONORAIL catalogue
- MONORAIL Installation Instructions
- Hydraulic cylinder operating instructions (included in scope of supply)

Catalogues and installation instructions can be obtained from SCHNEEBERGER representatives or downloaded from **www.schneeberger.com**.

2 For your safety

2.1 Authorised persons

MRS brass plugs may only be installed by specialist personnel who have read and understood these Installation Instructions and the operating instructions for the hydraulic components.

2.2 General safety and accident prevention measures



Caution:

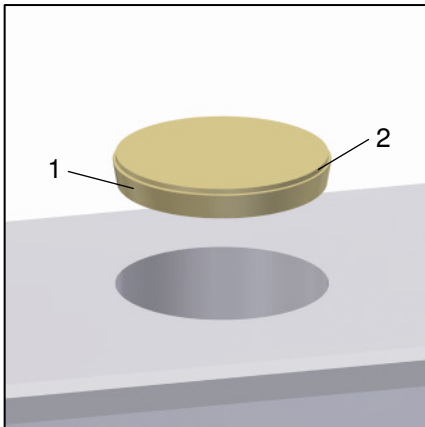
Danger of injury from sharp-edged bores in guide rails and from sheared off or ejected brass chips when installing plugs.

- ➔ Wear gloves
- ➔ Wear protective goggles when working with compressed air

Hydraulic components

Observe the relevant manufacturer's installation, operation and maintenance instructions without fail at all times to prevent injury and damage to property when operating hydraulic components.

3 Operating principle



MRS brass plugs are tapered externally (1). The outside diameter is slightly larger than the bore diameter in the rail. During installation, material is displaced and sheared off; this is assisted by a stepped ring adjacent to the upper surface of the plug (2). This creates a gap-free, liquid-tight interference fit between the plug and the bore in the rail. This ensures, besides a secure fit for the plug, an optimum running surface for the carriage wipers.

4 Preparing for installation

4.1 Tools, materials and equipment required

- Commercially-available hydraulic unit
- Hydraulic installation tool, type MWH, including hydraulic cylinder MZH
- Hexagon key, 8 A/F, for assembling installation tool MWH
- Mounting rail MRM
- Compressed air gun
- Scalpel or pointed knife
- Brass brush
- Polishing pad
- Lubricant
- Soft rag

4.2 Hydraulic unit

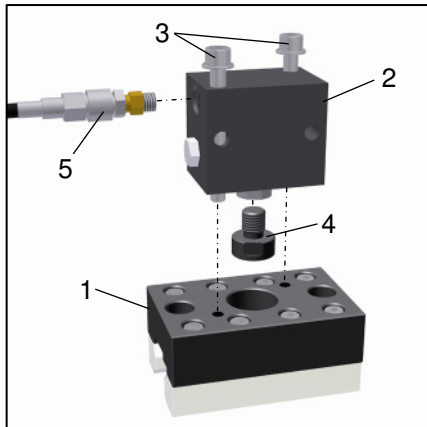


A normal, commercially-available hydraulic unit is required to supply pressure for the installation tool. As a rule, this consists of an electric motor driving a pump (1), an oil reservoir (2), a pressure regulator with a pressure gauge (3) and an operating panel (4).

Recommended performance data:

- Nominal working pressure 200 to max. 350 bar
- Flow rate > 0,5 l/min.

4.3 Installation tool MWH



For correct installation of brass plugs, SCHNEEBERGER recommends the hydraulic installation tool MWH. This consists of a size-dependent MWH sliding shoe with punch and the universal hydraulic cylinder MZH; it must be ordered separately. The cylinder is a single-acting block cylinder with spring return. .

Order code for sliding shoe: **MWH xx**
xx = size; ordering example: 1 x MWH 45

Order code for hydraulic cylinder: **MZH**
Ordering example: 1 x MZH

Assembly

Screw the punch (4) by hand into the hydraulic cylinder (2) up to the shoulder and tighten it gently. Then fasten the hydraulic cylinder to the sliding shoe (1) using the screws (3) supplied. Use a commercial quick connector (5) (not included in scope of supply) to connect the hydraulic unit to the 1/4" hydraulic thread on the cylinder.

Dimensions of the installation tool see chapter 8.2.

4.4 Preparing the rail

- Install the rail according to the MONORAIL Installation Instructions and tighten the screws securely.
- Remove the carriage from the rail using mounting rail MRM if necessary.



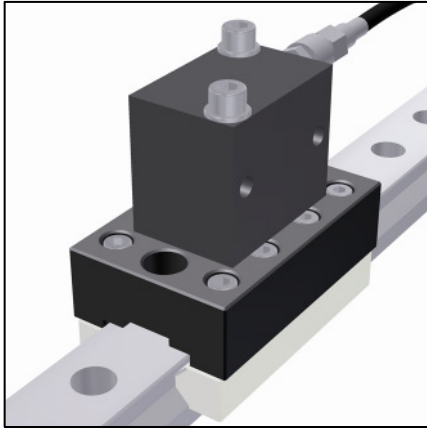
Notice:

Before moving the carriage, ensure that the corrosion protection coating applied in our works has been removed completely; see MONORAIL Installation Instructions. The corrosion protection can stick the rolling elements together, thus cause a damage on the carriage.

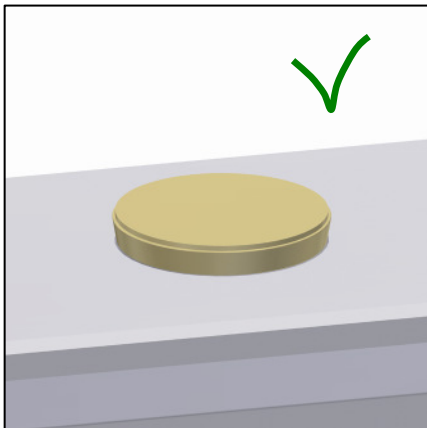
- Clean the upper surface of the rail and the mounting holes. There must be no large particles of dirt or swarf in the rail mounting holes.
- Make sure that the edges of the rail mounting holes have sharp edges and are not damaged.
- Apply a light coating of oil to the upper surface of the rails and mounting holes if necessary.

5 Installation

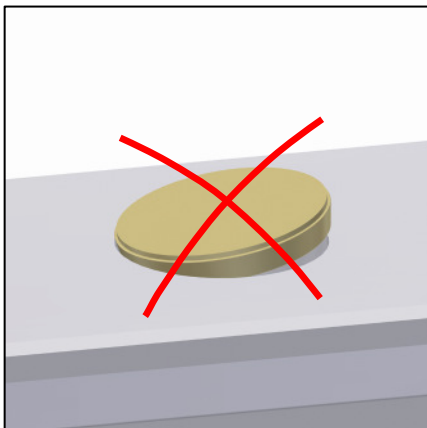
5.1 Preliminary fitting of plugs



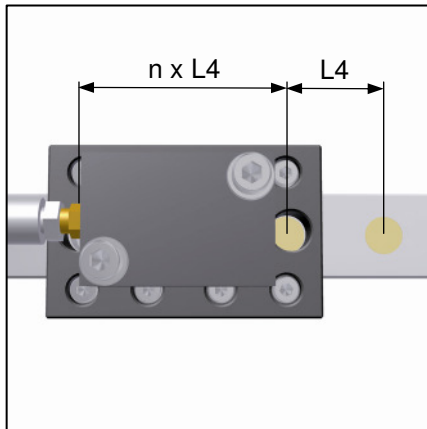
Slide the installation tool on to the rail. To do this, we recommend using a mounting rail MRM.



Place the plugs in the rail holes with the smaller end of their taper downwards.



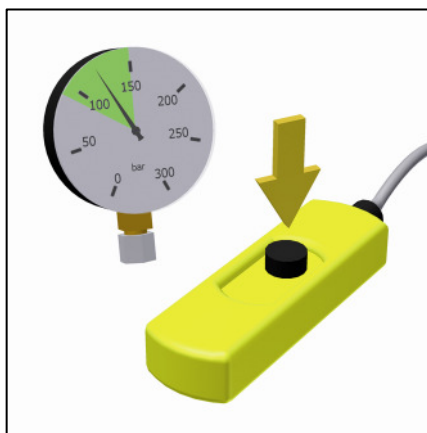
Ensure that the face of the plug is plane parallel to the upper surface of the rail.



Slide the installation tool over the plug and position it centrally. The pressing position is reached when the two external inspection holes, or the cut-outs in the tool are over a rail mounting hole. Depending on the size, the inspection holes may be one or two pitches ($L4$) from the installation position.

Please note:

For installing the plug at the extreme end of the rail, the installation tool can be positioned so that it partly overhangs the rail end.



Switch on the hydraulic unit and set the desired pressure on the pressure regulator.

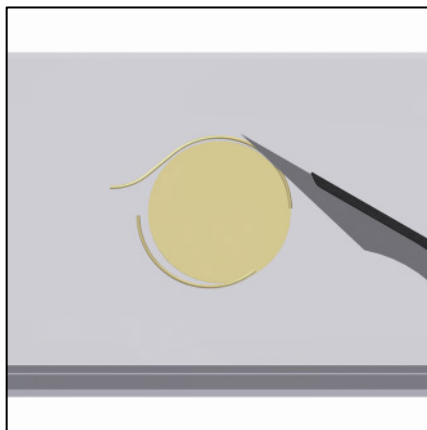
The required pressure can change depending on the size and due to manufacturing tolerances. Depending on the size, we recommend a pressure between 80 and 120 bar. Occasionally, a higher pressure may be necessary.

Start with a low pressure and increase in steps according to the installation results.



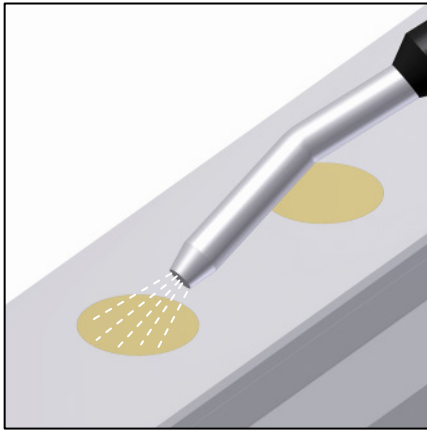
Caution:

The permissible operating pressure of the hydraulic cylinder is 350 bar. This pressure must never be exceeded.

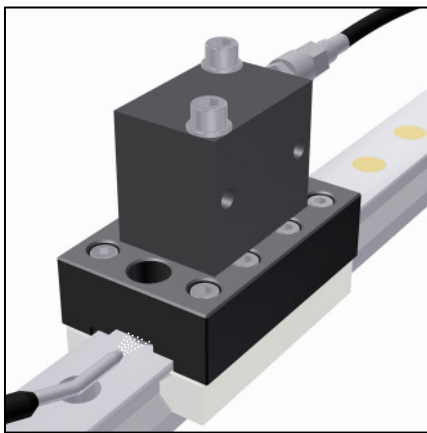


Operate the hydraulic cylinder for just a short period from the control panel until a click can be clearly heard. Then release the operating button immediately so that the cylinder returns to its original position. Push the installation tool to one side. The plug is now pre-installed and projects 0.2-0.3 mm above the upper surface of the rail.

During the pressing operation, plug material is sheared off in the form of a circular "chip", which will now lie around the plug on the rail top surface. Use a scalpel or pointed knife to separate the chip if it is still connected to the plug. Take care that neither the plug nor the rail are scratched during this operation.



Use compressed air to blow the loose chip from the upper surface of the rail. If necessary remove any residual swarf with a brass brush. Check that all swarf has been removed completely.

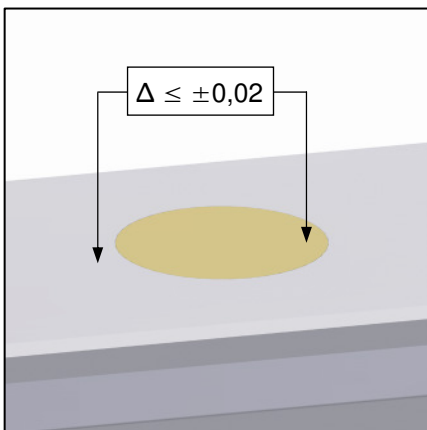


Blow compressed air through the gap between the sliding shoe and the upper surface of the rail to clear any swarf adhering to the punch.

5.2 Final installation of plugs

Slide the installation tool over the plug again and position it. Repeat the pressing operation as described in Section 5.1 and press the plug in until it is flush.

5.3 Completion of installation



After pressing in all the plugs, check that they are correctly seated. The maximum permissible difference in height between the rail and surface of a plug is ± 0.02 mm measured at the edge of the plug. If necessary, repeat the pressing operation at a higher pressure until the correct position is reached.

Ensure that there are no residual chips or burrs. If necessary, clean up the plugs and the upper surface of the rail with a polishing pad.

6 Removing brass plugs

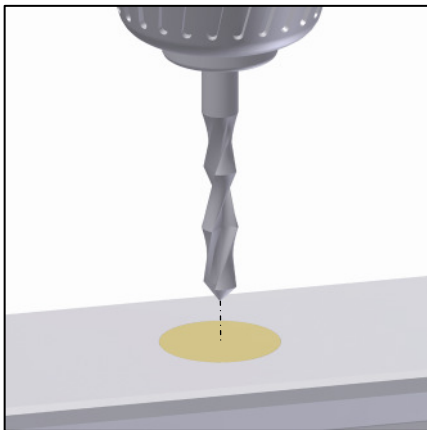
6.1 Tools required

- Electric drill
- Thread-cutting tap
- Drill
- Centre punch
- Hexagon socket screw e.g. to DIN 912 / ISO 4762
- Hexagon key

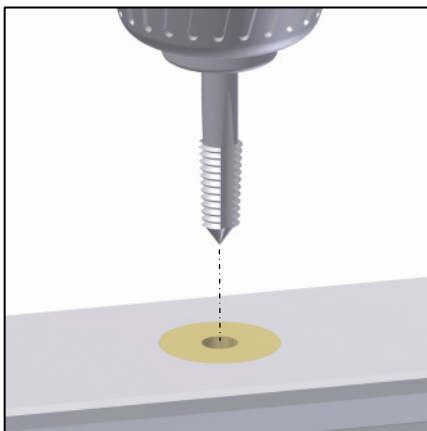
6.2 Operating principle

If they have been correctly installed, brass plugs are very securely retained in the rail holes. We therefore recommend removing them with the aid of an extraction screw. A standard hexagon socket screw can be used for this purpose. The recommended screw sizes and tapping hole diameters are given in a table in chapter 6.4.

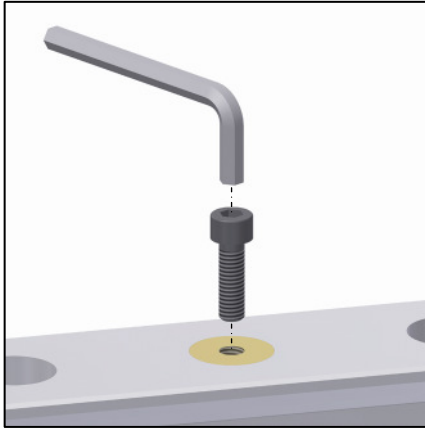
6.3 Procedure



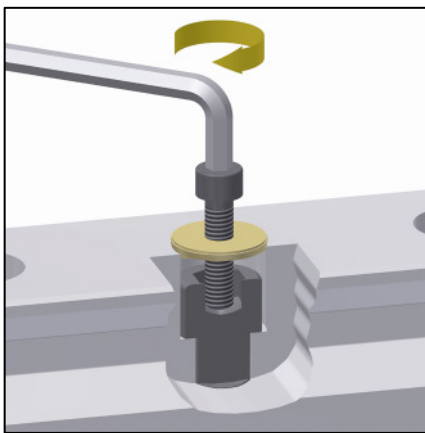
Make a centre-punch dot in the middle of the plug to be removed and drill carefully through the centre of the plug using an electric drill. Take care not to damage the rail mounting screw. The drill diameter should be the core diameter of the thread to be cut in the plug.



Use a suitable tap to cut a metric thread in the plug. Then clean any remaining swarf from the thread and hole.



Screw a hexagon socket screw into the plug by hand until the end of the screw contacts the rail mounting screw.



Turn the screw further with a suitable hexagon key. This action will draw the plug upwards out of the bore, see figure on the left. Continue to turn the screw until the plug has been extracted and can be removed by hand.

Finally, make sure that neither the hole in the rail nor the mounting screw has been damaged. If necessary, clean up the bore with a grinding tool and replace the mounting screw.

6.4 Recommended screw sizes

Brass plug	Screw	Ø Core hole
MRS 25 – MRS 35	M4	3,3
MRS 45 – MRS 65	M6	5

All dimensions in mm

7 Maintenance

7.1 Installation tool MWH

The installation tool MWH is, in principle, maintenance free, but, after a long period of use, the punch may exhibit signs of wear. This may result in the position tolerance for the plugs being exceeded. The punch should be inspected at regular intervals and replaced if necessary.

The punch can be purchased from SCHNEEBERGER as a spare part.

Order code for punch: **SP xx-MWH**

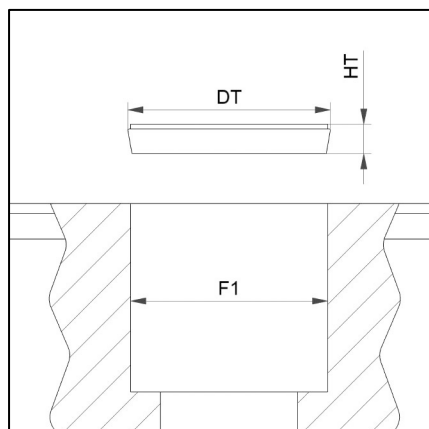
xx = size; ordering example: 1 x SP 45-MWH

7.2 Hydraulic cylinder MZH

Follow the maintenance instructions in the manufacturer's operating instructions.

8 Appendix

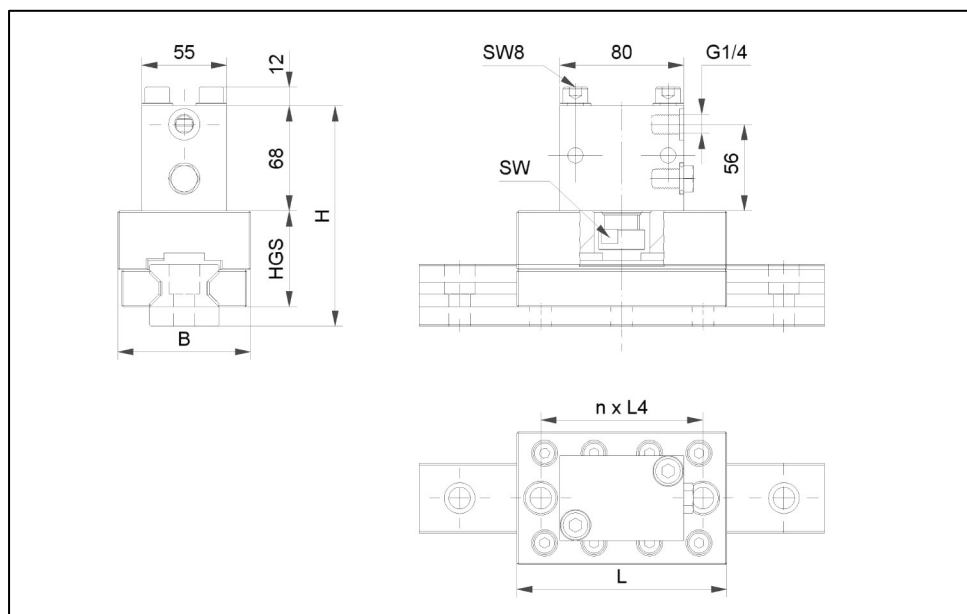
8.1 Dimensions of brass plugs



Size	Ø DT	HT	F1
MRS 25	11,5	2,5	11
MRS 35	15,5	3	15
MRS 45	20,5	3	20
MRS 55	24,5	3	24
MRS 65	26,5	3	26

All dimensions in mm

8.2 Dimensions of installation tool



Size	L	B	H	HGS	SW	n x L4
MR 25	120	55	128	52	20	120
MR 35	150	70	135,5	58	20	160
MR 45	136	86	142,5	62	27	105
MR 55	156	98	150	67	30	120
MR 65	150	118	158	72	32	150

All dimensions in mm

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