

Z4 LATCH LOCKS OPERATING INSTRUCTION

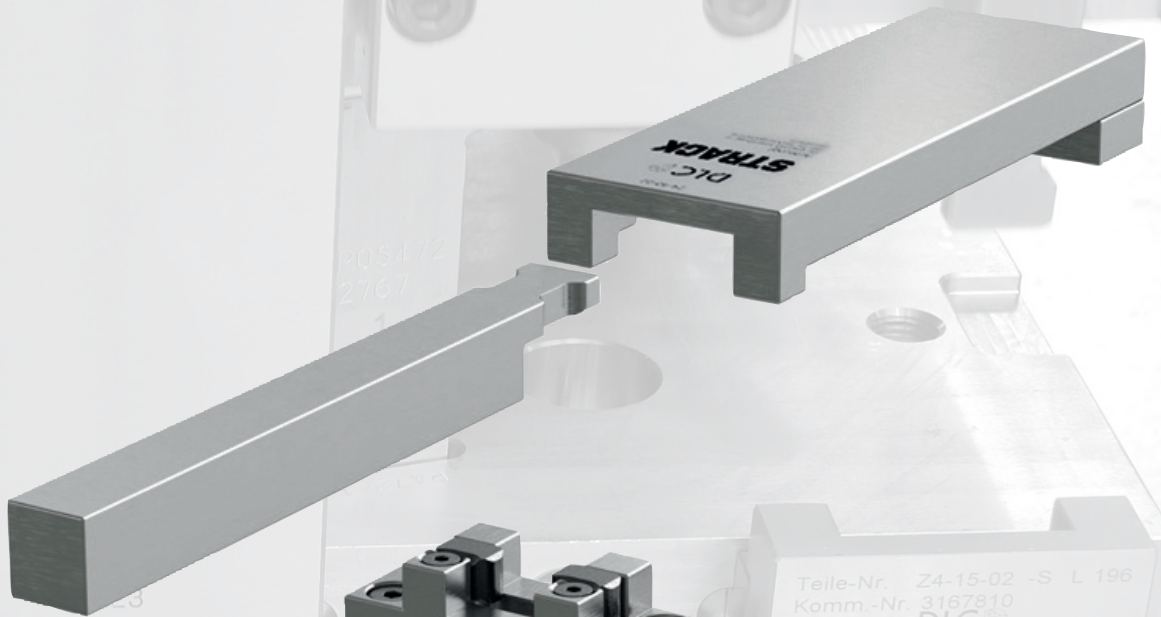


Teile-Nr. Z4-15-02-S L 270
Komm.-Nr. 3167810
DLC

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KL4
180 mm Weg



180 mm Weg

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Operating instruction - Latch locks Z4

Application examples

Production and design features:

1. Increased Production

The Z4 latch lock permits high opening and closing speeds - faster moulding cycles are possible.

2. Safe Function

The actuated plate is stopped and locked mechanically in the limit position. It can only move back into its initial position when the latch bar has returned into the latch housing.

No additional limitstops are required.

3. Solid

Reduction of wear and higher tractive power owing to

- concentric power transmission by two catches
- solid design
- all parts hardened in wear areas.

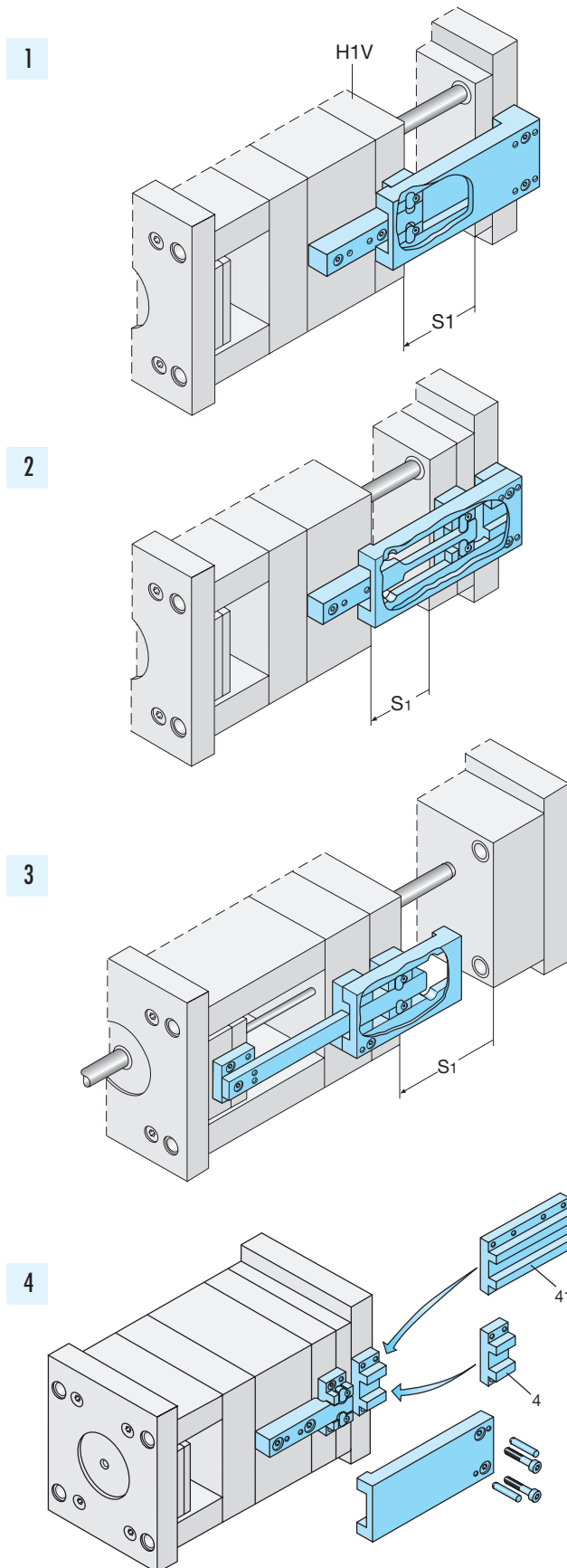
4. Simple Mounting

Easy mounting and adjustment. (See page Info 6.124)

5. Wide Range of Applications

Different latch locks of the Z4 line can be combined to permit a great variety of possible movements within the mould tool:

- 1) Latch lock without delay; stripper plate is actuated directly.
- 2) Latch lock with delay; stripper plate is only actuated after a predetermined opening stroke of the main parting plane.
- 3) Combination of two latches into a two-stage ejector.
- 4) Alternative installation of an extended cross-beam to improve the bolt-on feature in special designs.



Operating instruction – Latch locks Z4-1 to Z4-40

no delay

Principle of operation:

Figure 1

Injection mould is closed, catches (6) locked only to the latch housing (1) and the latch bar (3).

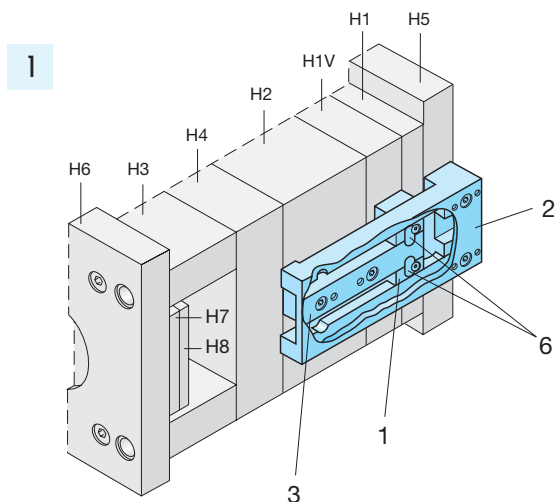


Figure 2

When the injection mould is opened, the mould plate (H1V) to be actuated is drawn along at the same time in the direction of the arrow by the stroke (S1) determined by the design until the latch housing (1) comes to a stop against the control plate (2).

In this position, the catches (6) unlock and recess into the cutouts in the control plate (2), releasing the latch bar (3).

Simultaneously the actuated mould plate (H1V) is locked by the latch housing (1), the catches (6) and the control plate (2) with the stop (5) (see also figure 3)

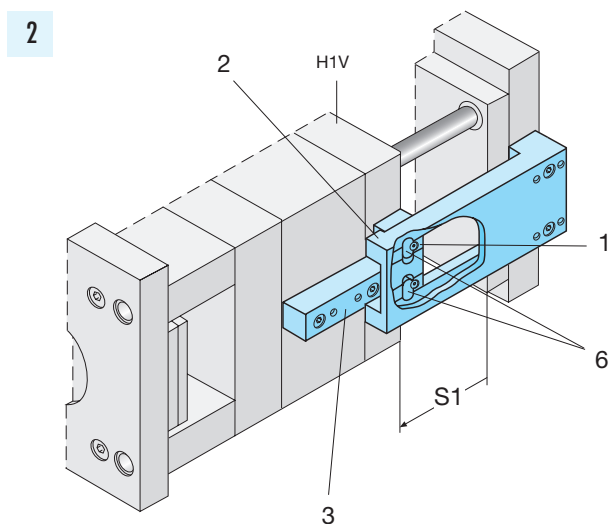
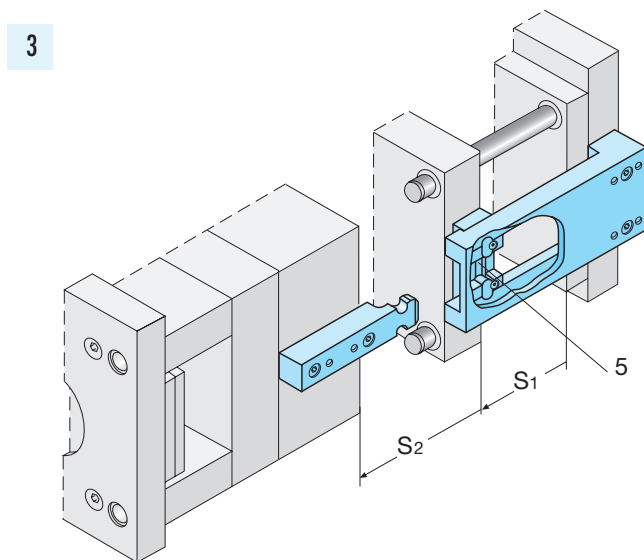


Figure 3

The main parting plane is opened by moving the closure or ejector side further backwards by the stroke (S2) in the direction of the arrow.

The closing process is effected in reverse order.



Operating instruction – Latch locks Z4-1-25 to Z4-40

with delay

Principle of operation:

Figure 1

Injection mould is closed, catches (6) locked only to the latch housing (1).

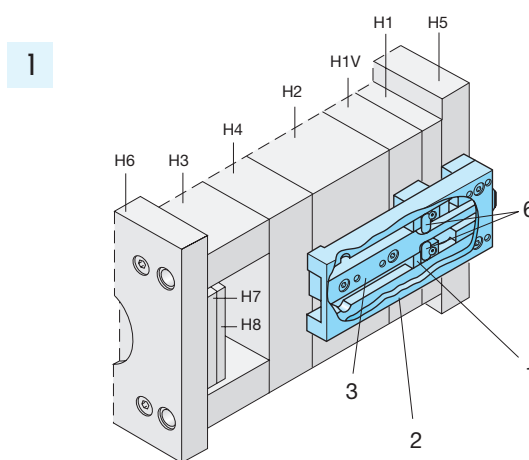


Figure 2

When the mould tool opens, the closure or ejector side first travels backwards by "S1" in the direction of the arrow, i. e. by the delay of the latch bar (3), until the latch bar (1) is stopped at the catches (6).

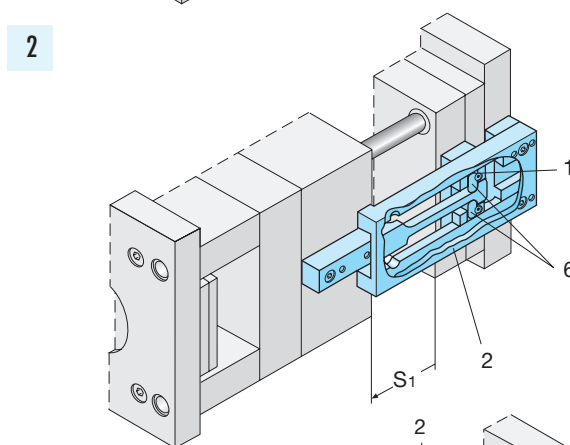


Figure 3

As the ejector side moves further backwards, the mould plate (H1V) to be actuated is carried along by the specified travel "S2" until the latch housing (1) is stopped by the control plate (2).

In this position the catches (6) unlock, enter the cutout in the control plate (2) and thus release the latch bar (3).

Simultaneously, the actuated mould plate is locked by the latch housing (1) and the catches (6) with stop (5) (see also figure 4).

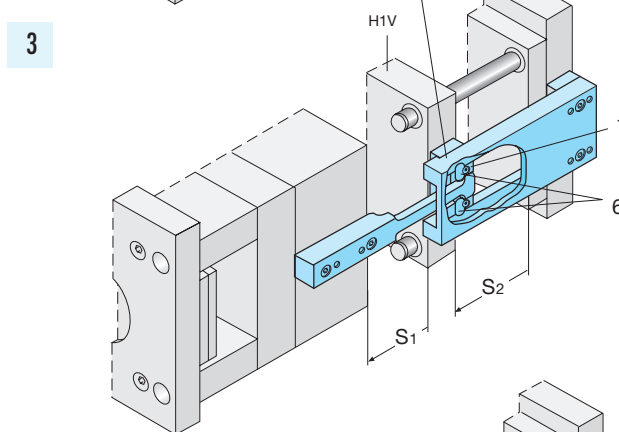
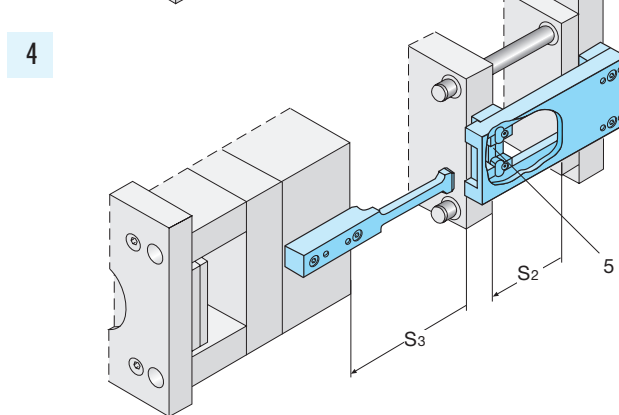


Figure 4

Further mould parting is effected by further retraction of the closing and ejector side by the stroke (S3) in the direction of the arrow.



6

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Operating instruction – Latch locks Z4-1-1 to Z4-42

Two stage ejector; stripper plate combined with ejector plates

Principle of operation:

Figure 1

The ejector bar (10) is bolted to the ejector set (H7 and H8). The latch housing (1) is bolted to the stripper plate (H2V). The ejector bar (10) is positively locked to the latch housing (1) by the catches (6).

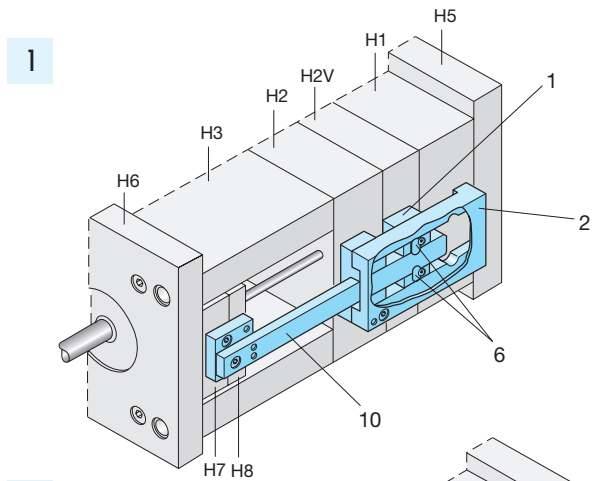


Figure 2

When the injection mould opens, the closure side first travels by the specified travel "S1" in the direction of the arrow. At this stage the latch lock does not perform any function.

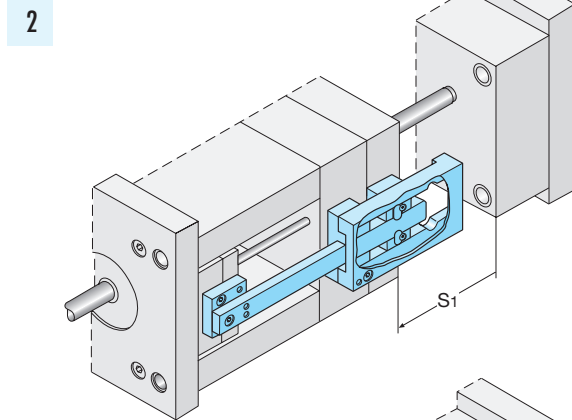


Figure 3

Now, as the hydraulic ejector of the moulding machine advances the ejector rod (Z144) which is connected to the ejector set (H7 + H8), the ejector set (H7 and H8) as well as the stripper plate (H2V) move forward synchronously by "S2" until the latch housing (1) is stopped at the control plate (2).

In this position, the catches (6) enter the cutouts in the control plate (2) and release the ejector bar (10). At this point, the stripper plate (H2V) is locked.

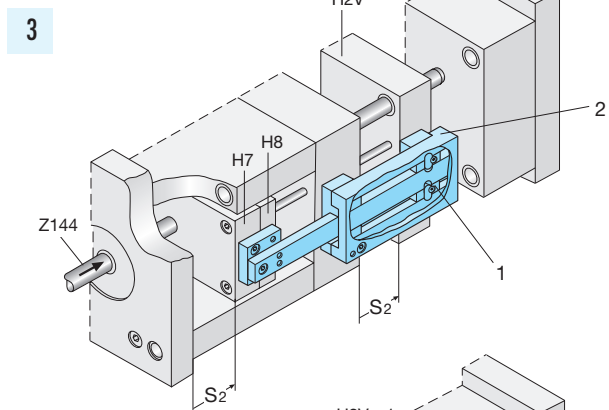
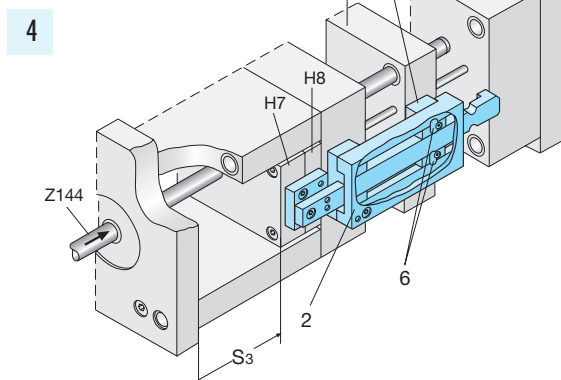


Figure 4

The continued forward movement of ejector rod (Z144) increases the ejection stroke of ejector set (H7 + H8) to stroke end "S3" so that the ejector pins can eject the moulding from the stripper plate.

The closing process is effected in reverse order.



Operating instruction – Latch locks Z4-1-1 to Z4-42

Two stage ejector; double ejector set combination

Principle of operation:

Figure 1

The ejector bar (10) is bolted to the ejector set (H7+H8). The latch housing (1) is bolted to the ejector set (H7' + H8'). The ejector bar (10) is positively locked to the latch housing (1) by the catches (6).

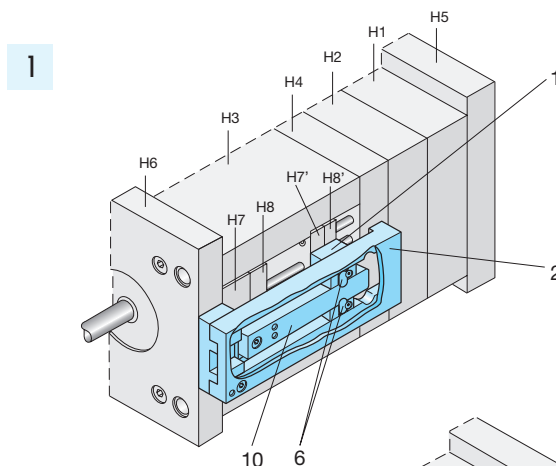


Figure 2

When the mould opens, the closure side first travels by "S1" in the direction of the arrow. At this stage the latch lock does not perform any function.

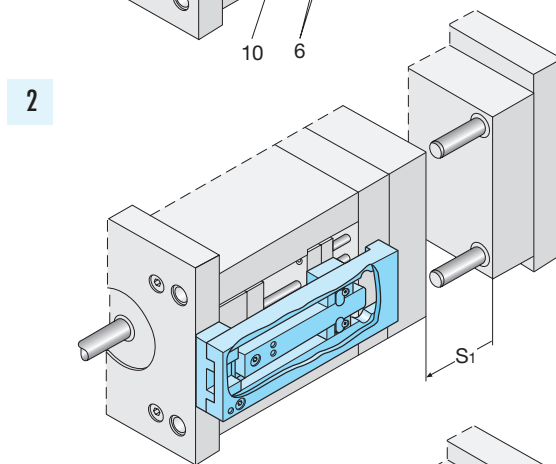


Figure 3

Now, as the hydraulic ejector of the moulding machine advances the ejector rod (Z144) which is connected to the ejector set (H7 + H8), the two ejector sets (H7 + H8) as well as (H7' und H8') move forward synchronously until the ejector set (H7' und H8') is stopped at the mould plate (H4).

In this position, the latch housing (1) simultaneously reaches the stops of the control plate (2). The catches (6) enter the cutouts in the control plate (2) and release the ejector bar (10).

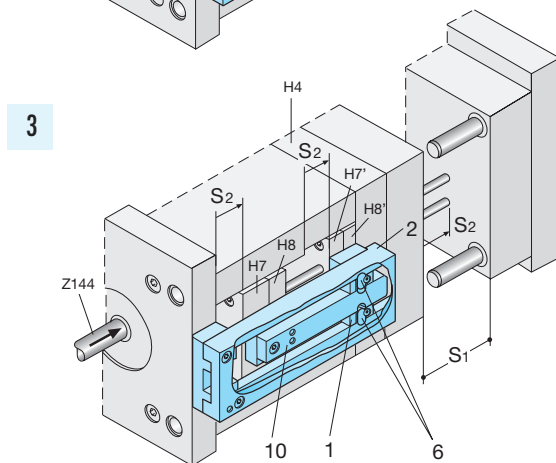
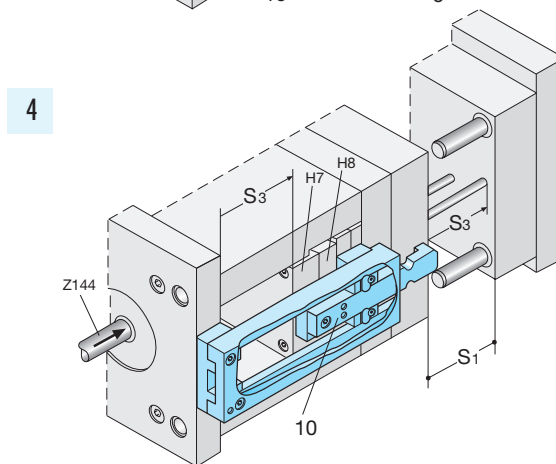


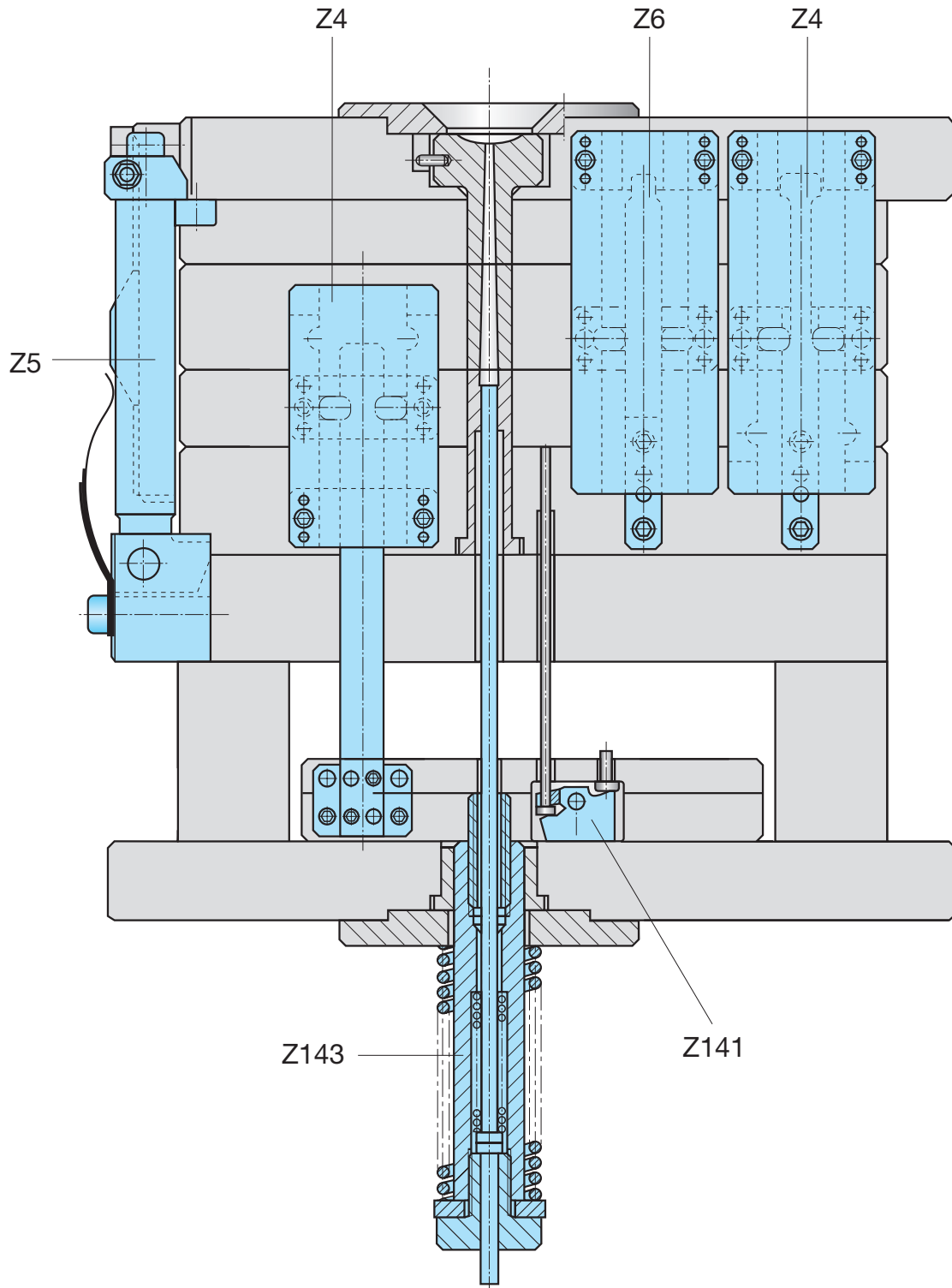
Figure 4

By further forward movement of the ejector rod (Z144) the ejector set (H7 + H8) continues to advance by travel "S3" so that the ejector pins in ejector set (H7' + H8') can eject the moulding.

The closing process is effected in reverse order.



Operating instruction - Latch locks Z4 to Z6



Operating instruction – Latch locks Z4

1. Choice

At least two latch locks must be used.

The choice of latch lock is determined by the stripping forces, the weights moved and the forces acting on the latch lock (symmetrical or unsymmetrical).

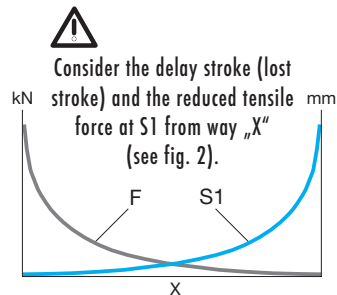
Z4-11, -12, -16, -17, -21 and -22 latch locks vary, having a more stable latch housing and reinforced threaded joint, they can also be mounted on much thinner mould plates.

Recommended mould sizes, not binding

Type	Mould sizes	Stroke* S1 min. (mm)	Stroke* S1 max. (mm)	Tensile force max.	Locking force max.
Z4/Z4-11(12)	up to 196x196	4.0	96/91	10 kN	1 kN
Z4-15/Z4-16(17)	up to 296x296	5.5	121/116	30 kN	3 kN
Z4-2/Z4-21(22)	up to 596x596	7.0	159/154	40 kN	4 kN
Z4-30	from 596x596	15.0	264	60 kN	6 kN
Z4-40	from 996x996	25.0	564	80 kN	8 kN

* longer strokes on request

From the way "X" the stroke "S2" already opens.
This must absolutely be considered at the stroke determination "S1".



If in doubt, always choose the next larger latch lock. A comparison of forces and costs shows that it is often better to use two large units instead of 4 smaller ones. Care must be taken to ensure that all latch locks are set uniformly and that the plate to be actuated is pulled evenly, in order to avoid skewing of the plate.

2. Locking Function

The lock (5) locks the catches (6). This prevents uncontrolled return travel of the pulled mould plate (H1V) (see figs. 1 and 3). This safety function is cancelled during the closing operation, as soon as the latch bar (3) has entered the latch housing (1) to the point that the catches (6) can be guided back into the cutouts in the latch bar (unlocking) (see fig. 4).

3. Locking Force

The locking force is the force required to push back the pulled mould plate (H1V) forcibly (prematurely); see section 1, choice.

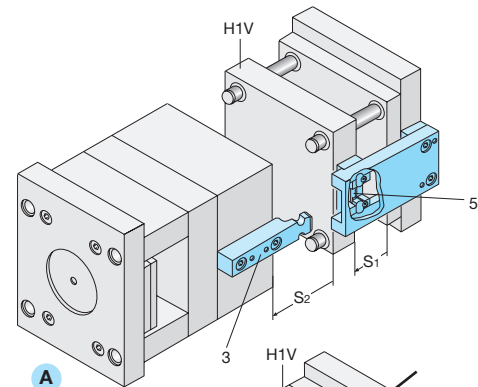
4. Mould Safety Device

Before being unlocked by the latch bar (3), the locked mould plate (H1V) must be protected against unacceptably high locking forces in stroke "S2" by the mould safety device of the injection moulding machine (see fig. 1).

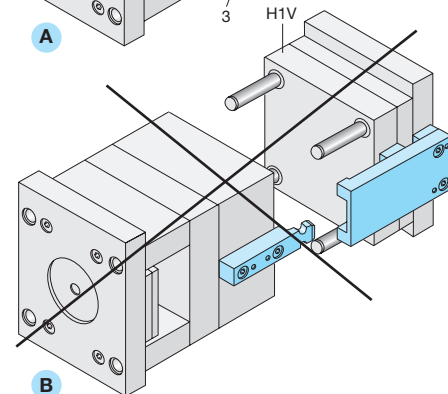
If there are mould slides with angle pins within the "S2" stroke range, the mould safety device must respond even before the angle pins enter the mould slides.

If the two mould halves are to be mounted separately, it is important to ensure that the drawn mould plate (H1V) is in the limit position of the fully drawn stroke "S1" and that the lock is active before the injection mould closes (see fig. 1).

1



A

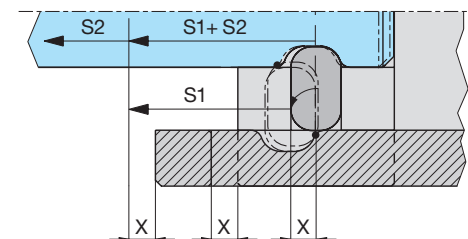


B

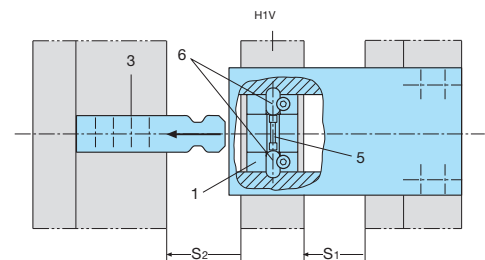
A = Right;

B = Wrong

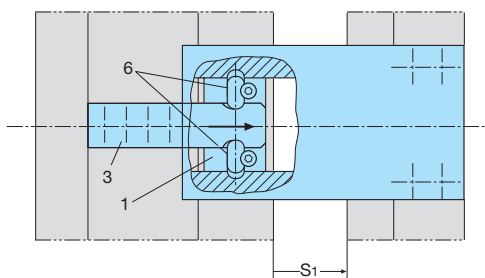
2



3



4



6

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Operating instruction – Latch locks Z4

Notes on mounting and assembly

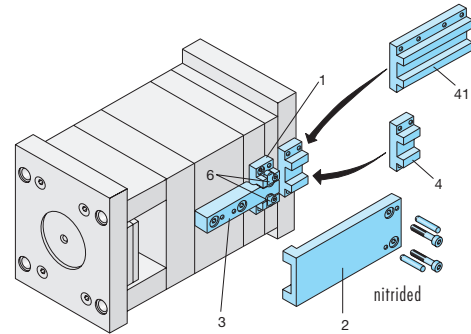
Mount the latch locks so that they are symmetrical, parallel and square to the mould guide pins, using the reference surfaces of the individual latch lock elements (see fig. 6).

Secure all screws with spring washers or Z9092 adhesive.

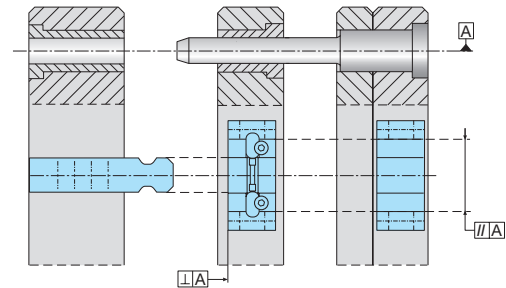
The control plate and the latch bar are nitrided on $\sim 630\text{HV } 10$, thickness of hardened layer = 0.4 - 0.6 mm

The zero points shown in the following diagrams (⊕ positioning points) are there to help match the dimensions when designing the mould. It should be noted in this context that adjustment of the latch lock to a position with no play must be performed before the latch bar is dowelled.

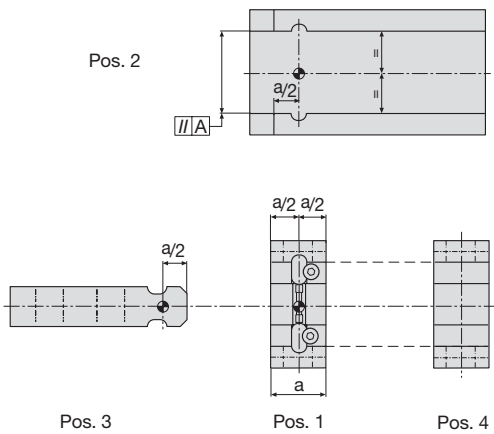
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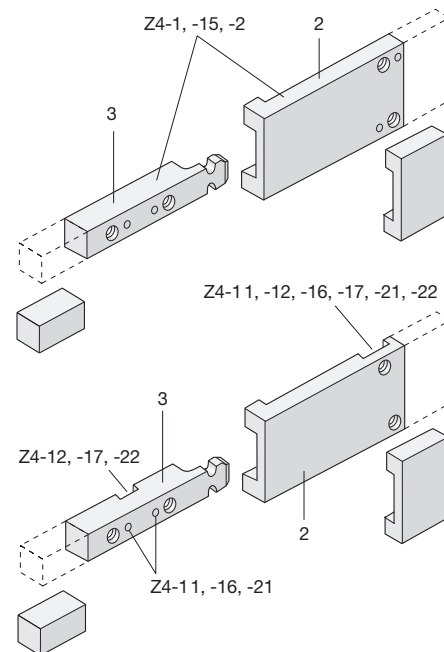
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6



7



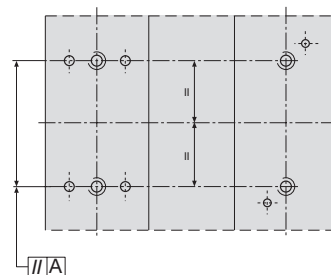
1. Preparatory work

Match the length of the control plate (2) and the latch bar (3) in accordance with the mould design and shorten, if necessary. If the control plate and latch bar are to be shortened, the hardened layer on the side faces must first be ground down (see fig. 7).

According to the type drill respectively grind fixing borings respectively sparings in the latch bar (3), control plate (2) and steady (4/41) (see fig. 5 and 7).

According to the type drill respectively mill fixing borings respectively sparings for the latch bar (3), latch housing (1), as well as the control plate including the steady (4/41) in the mould plate (see fig. 8 and 9).

8



Operating instruction – Latch locks Z4

Notes on mounting and assembly (continued)

For Z4-11, -16 and -21 designs latch locks with location lugs on the latch housing (11) and steady (42), the required machining in the mould plates should be carried out at right angles to reference line A (see figs. 6, 9, 10 and 11).

This design of the latch locks Z4-12, -17 and -22 is an alternative to the latch locks Z4-11, Z4-16 and Z4-21. Apart from the latch bar (Item 3), the dimensions of Z4-12 are identical to those of Z4-11, the dimensions of Z4-17 are identical to those of Z4-16 and the dimensions of Z4-22 are identical to those of Z4-21. The height of the latch bar (Item 3) is changed, so that it can be fitted into the mould plate. The cylindrical pins for locking and fastening are dispensed with. For this purpose, a feather key (Item 31) is inserted in the mould plate and the latch bar (see fig. 11).

! A machined recess must be provided in the control plate (see Fig. 11). This applies only to the Z4-11 designs (12, 16, 17, 21 and 22). For the models Z4-12, -17 and -22 also fit the latch bar.

Please see catalogue, section 6 (pages 6.12 - 6.31) for dimensions.

2. Mounting and adjustment work with mould assembled

Proceed as follows:

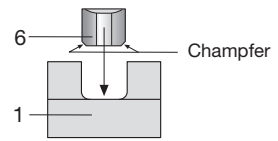
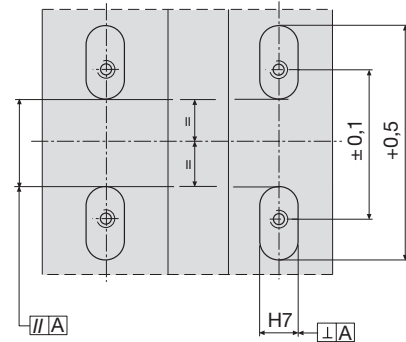
Screw down latch housing (1/11) and also attach dowels to latch housing (1).

Check the position of the catches (6). Insert the edges, which are chucked at the sides, downwards into the latch housing (1/11) (see figs. 5 and 10).

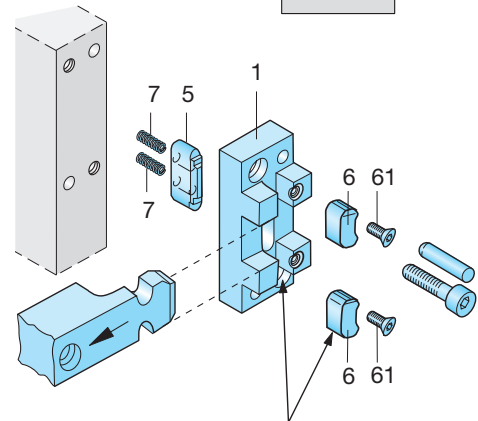
Screw the countersunk screw (61) in and tighten it. The holdings may not be clamped.

Insert the latch bar (3), place against the catches (6) and screw on gently parallel to the mould guide pins. Screw on the control plate (2) together with the steady (4/41/42), taking into consideration the stroke S1 determined by the design. Use gauge blocks if required (see figs. 5 and 13)

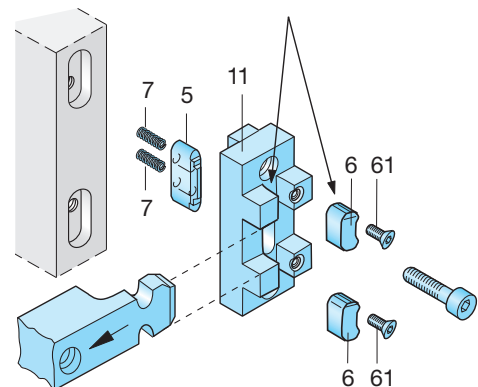
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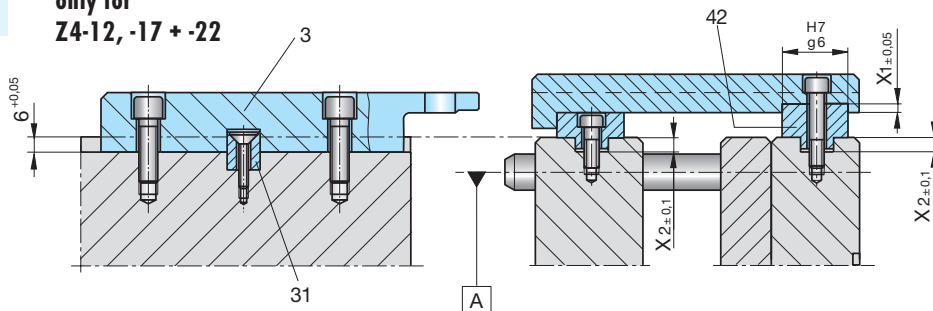


! Please observe the mounting position!



11

* only for
Z4-12, -17 + -22

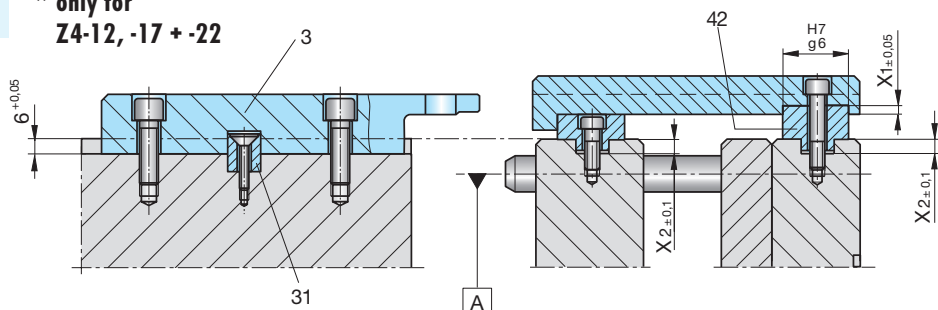


Type	X1	X2
Z4-11	3.0	4.5
Z4-16	4.5	5.5
Z4-21	6.0	6.5
Z4-12	3.0	4.5
Z4-17	4.5	5.5
Z4-22	6.0	6.5

Operating instruction - Latch locks Z4

11

* only for
Z4-12, -17 + -22



Type	X1	X2
Z4-11	3.0	4.5
Z4-16	4.5	5.5
Z4-21	6.0	6.5
Z4-12	3.0	4.5
Z4-17	4.5	5.5
Z4-22	6.0	6.5

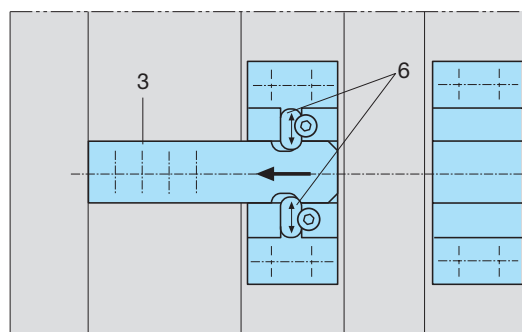
Notes on mounting and assembly (continued)

Adjust the latch bar (3) by pulling back onto the catches (6). Screw in loosely. Eliminate the play on the catches by further pulling on the latch bar. Tighten the screws and dowel the latch bar, according to type (see fig. 12). (Shown without mounted control plate (2)).

Use gauge blocks for fine adjustment of stroke "S1", dowel the control plate (2) and steady (4/41). This does not apply to steady (42), which must be subsequently inserted into the control plate (2) (see figs. 11 and 13).

Check manually for correct functioning.

12



6

3. Installation of a latch bar with delay (Item Nos. 325, 350, 375)

Procedure as latch bar (3-L1) without delay, except that the mould separation "S2" must first be opened by the exact delay stroke, so that the play on the catches (6) can be eliminated (see fig. 14). (Shown without mounted control plate (2)).

4. Attachment of a two-stage ejector (e. g. Z4-1-1)

See Section 1-2 for installation and setting procedures.

The two-stage ejector must be adjusted so there is absolutely no play at all, because the mouldings will otherwise be damaged on ejection.

To adjust the catches (6) to "no play", the ejector bar (10) is drawn forwards in the direction of the arrow (see fig. 15).

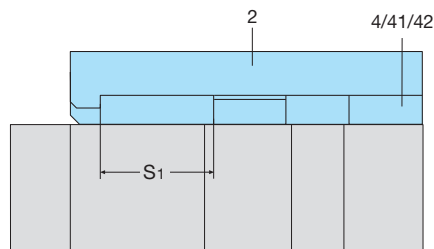
5. Maintenance

All functional components of the latch locks must be lubricated regularly.

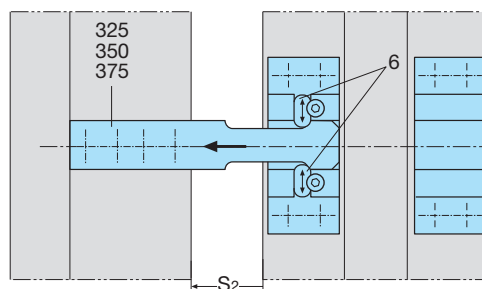


The mounting screws must be checked regularly and tightened.

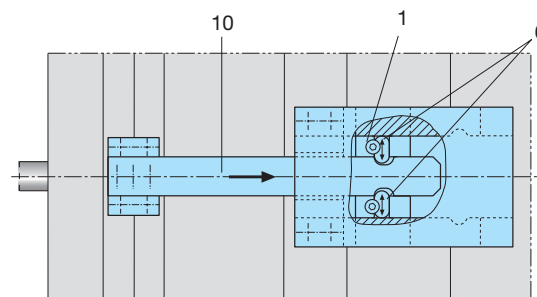
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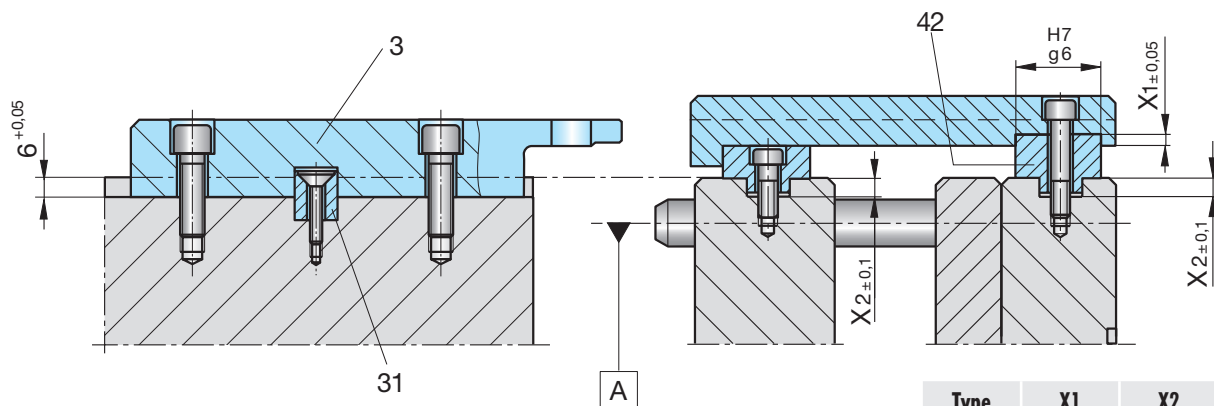


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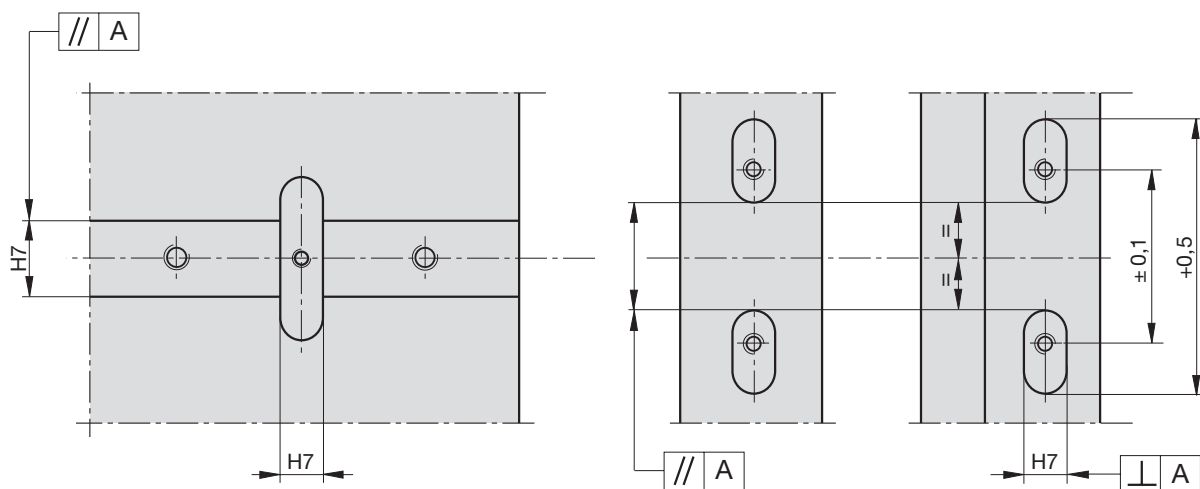


Operating instruction - Latch locks Z4-12, Z4-17 and Z4-22

Notes on mounting and assembly




Type	X1	X2
Z4-12	3.0	4.5
Z4-17	4.5	5.5
Z4-22	6.0	6.5



This design of the latch locks Z4 is an alternative to the latch locks Z4-16 and Z4-21. Apart from the latch bar (Item 3), the dimensions of Z4-12 are identical to those of Z4-11, the dimensions of Z4-17 are identical to those of Z4-16 and the dimensions of Z4-22 are identical to those of Z4-21.

The height of the latch bar (Item 3) is changed, so that it can be fitted into the mould plate. The cylindrical pins for locking and fastening are dispensed with. For this purpose, a feather key (Item 31) is inserted in the mould plate and the latch bar.

A further change to the latch bar (Item 3) relates to the control cam. This region has been changed so that in the front and rear regions the latch bar is machined so as to fit accurately and thus can also be used as a double ejector.

 The machined areas in the mould plates for positioning are to be formed symmetrically, parallel and at right angles to the mould guide. All screws are to be secured with spring washers or with adhesive Z9092.

Why a changed latch bar?

As is known, current latch bars are positioned by means of cylindrical pins. This causes problems if the plates have to be reground after hardening. A certain degree of play then arises in the region of the latch bars and the catches. The feather key now allows you to machine a groove for accommodating the feather key at the appropriate location in the mould plate. After hardening, when all the plates have been ground, the actual dimension is taken from the plates and transferred to the latch bar. The latch bar is then provided with the cutout for the feather key, so that the latch bar can be attached without play when installing the latch lock.

For further information on the mounting and assembly, please see pages Info 6.125 - 6.128 and Info 6.132.