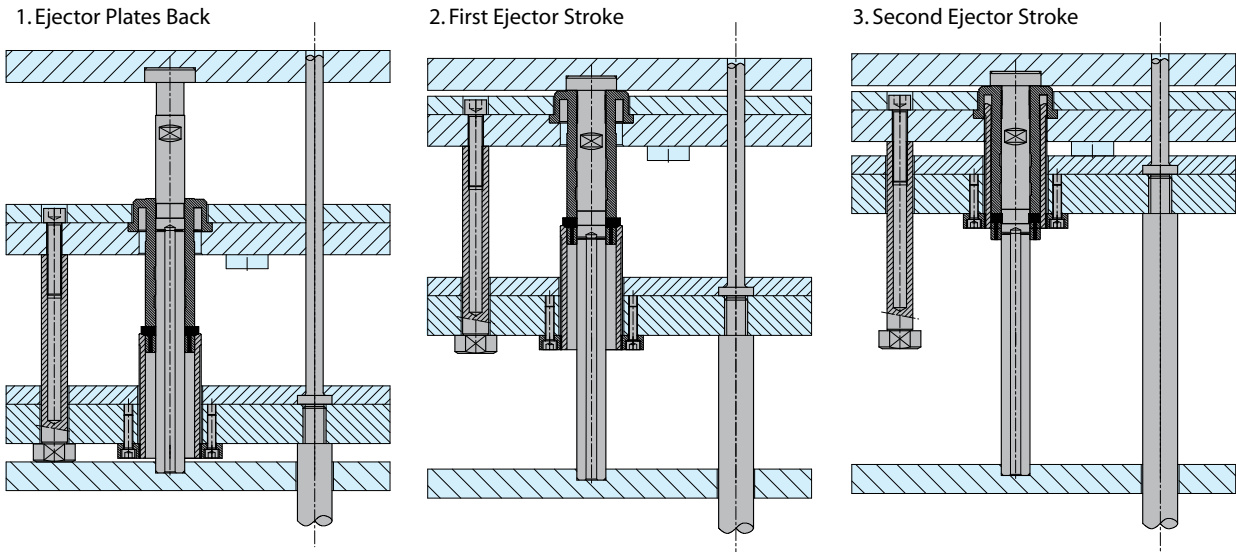
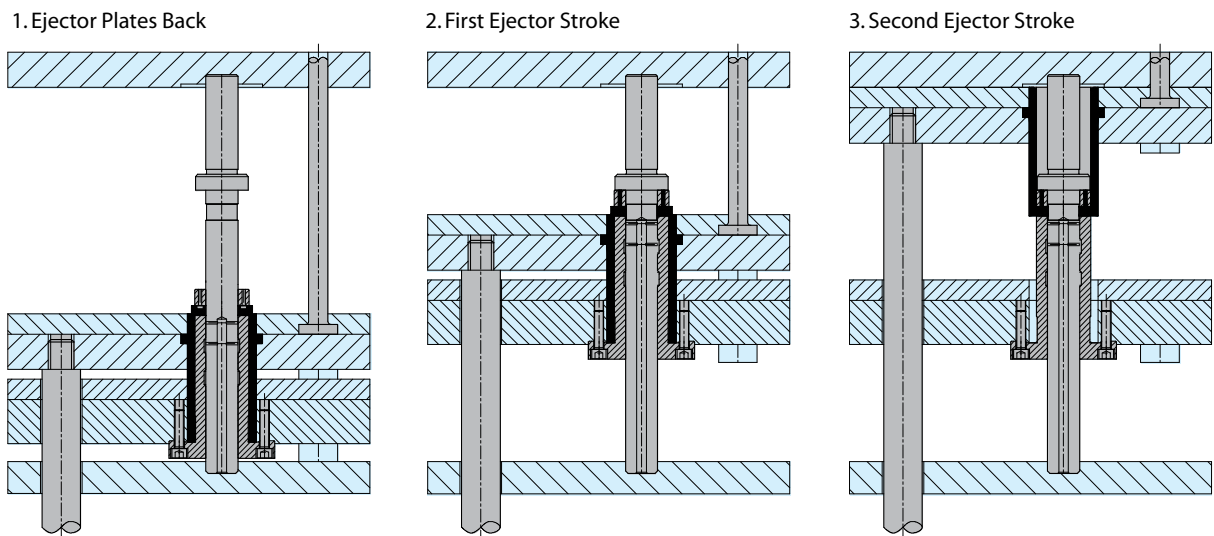


## FW1800

2-stage ejectors are used in situations where two ejection sequences are required, for example, to demold undercuts with inclined cores or ensure that slides do not collide with ejector pins. **DME's** range of two-stage ejectors systems offer two types of functionality.

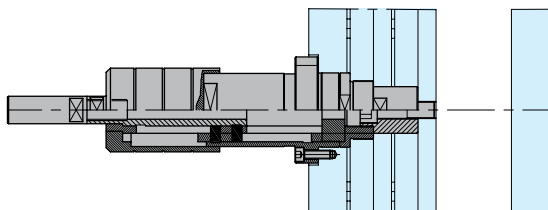


“Bottom last” using FW 1850 and TSBL types: 1st movement: both sets of ejector plates, 2nd movement: bottom set of ejector plates.

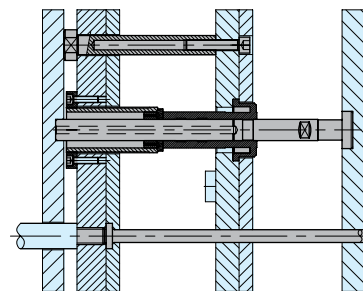


“Top last” using FW 1800 and TSTL types: 1st movement: both sets of ejector plates, 2nd movement: top set of ejector plates.

FW1800 & FW1850



TSTL & TSBL



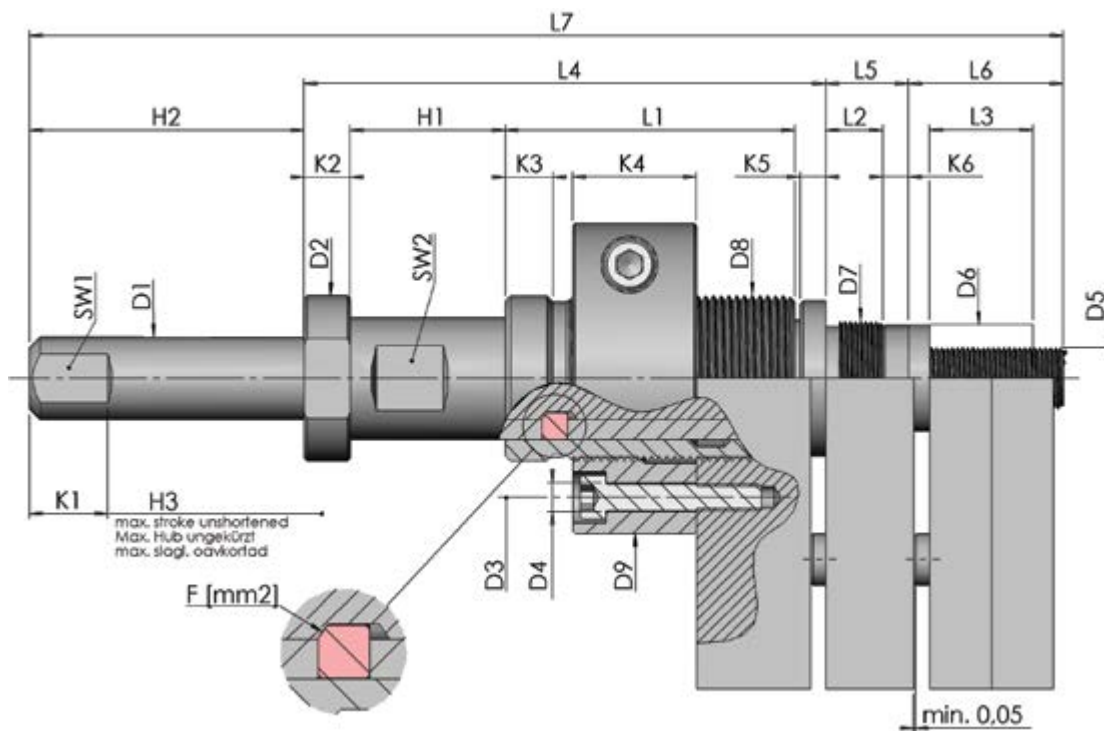
**Furthermore, two versions of installation are available:**

Central mounted using FW 1800 and FW 1850: this is the simplest installation for smaller, less complex molds. A single unit (FW 1800 or FW 1850) is connected directly to the machine ejector rod.

Off-centre mounted using TSTL and TSBL: fully contained inside the mold preventing interference and accidental tampering. Useful where the central space is not available. Two or four units are used allowing larger molds.

FW1800

Two-Stage Single-Stroke ejector

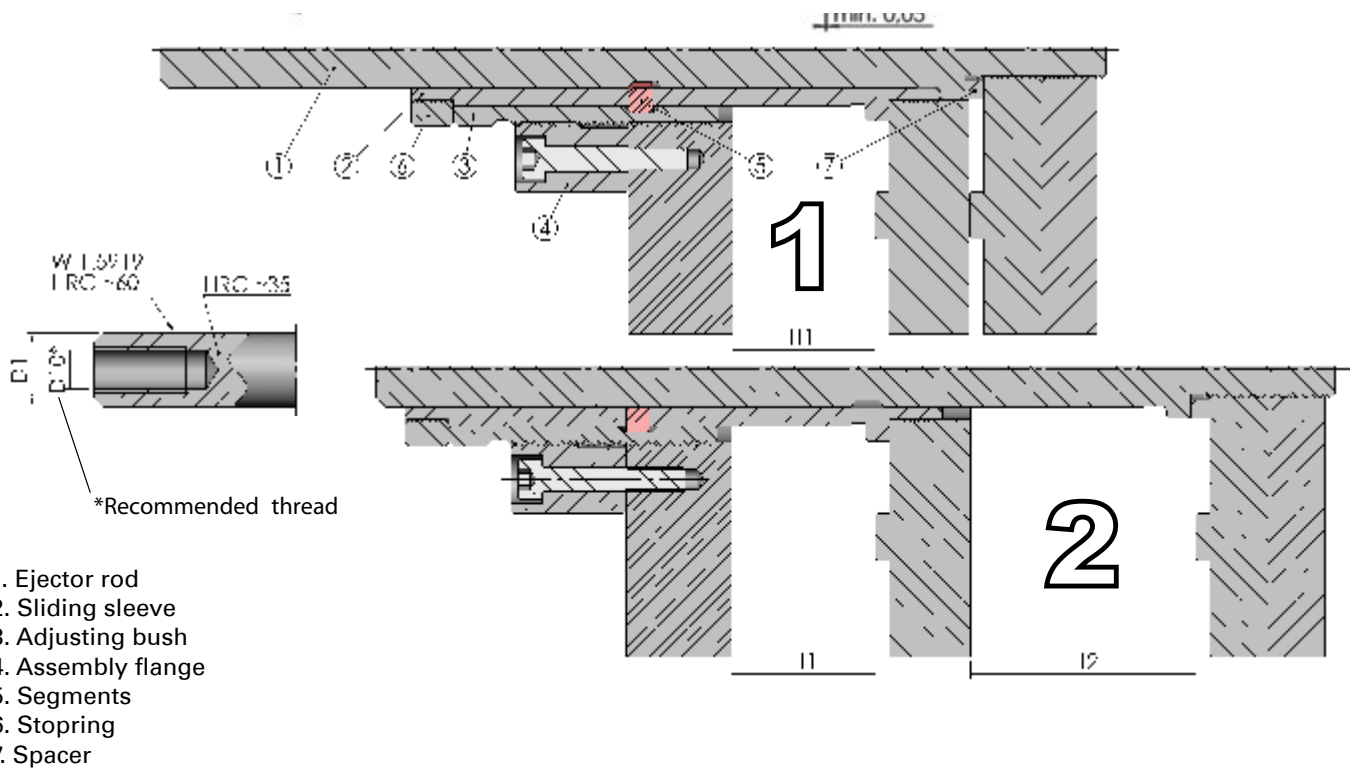


REF	D8	D1	D5	D7	D9	D3	D4	D2	D6
FW1800 M32x1,5	M32x1,5	16	M12x1,0	M22x1,0	60	46	M5	32	20,6
FW1800 M42x1,5	M42x1,5	22	M16x1,5	M30x1,5	80	62	M6	42	28,0
FW1800 M52x1,5	M52x1,5	28	M20x1,5	M38x1,5	90	72	M8	53	36,0
FW1800 M62x1,5	M62x1,5	37	M24x1,5	M48x1,5	120	80	M8	63	44,0

REF	L7	L6	L4	L2	L1	L3	L5	H1	H2	K1	K6	K2	K5	K3	K4	SW1	SW2	A mm <sup>2</sup>
FW1800 M32x1,5	200	30	101	11	56	20	16	5-30	50	16	5	9,0	5	8	24	13	20	56
FW1800 M42x1,5	266	40	132	16	75	30	22	10-40	70	20	6	9,0	6	10	30	17	27	100
FW1800 M52x1,5	285	45	134	16	75	35	22	10-40	80	22	6	10,5	8	12	30	22	35	152
FW1800 M62x1,5	300	50	140	16	80	40	22	10-40	80	22	6	10,5	8	12	30	30	44	215

Two-Stage Single-Stroke ejector

Assembly FW1800



1. Ejector rod
2. Sliding sleeve
3. Adjusting bush
4. Assembly flange
5. Segments
6. Stopring
7. Spacer

**Fitting:**

1. Mount ejector rod no. 1 together with ejector plate. For safety please use LOCTITE C 242.
2. Move over parts no. 2, 3 and 4 together and tighten up part no. 3 (SW2 see chart).
3. Tighten up adjusting bush no. 3 with assembly flange no. 4.
4. Fix assembly flange.

**Recommended lubricants:** C 135, C 138/139, C 170, etc.

**Installation instructions:**

This device is preferably screwed together with the hydraulic machine ejector.

The required internal or external thread of part no. 1 has to be made adequately. The ejector rod no. 1 may not be shortened by more than length  $k_1$ , if the total stroke  $h_3$  ( $h_3 = h_1 + h_2$ ), including a possible deeper run in of part no. 1 into part no. 2, is not be maintained.

By rotating adjustment of bush no. 3 the first stroke  $h_1$  is continuously adjusted. With stroke  $h_1$  both ejector pin plates are moved simultaneously. On the following stroke  $h_2$  only the second ejector pin plate movement is continued. Choose the thickness of the spacer ring no. 7 so, that there is at least 0,05 mm clearance between the ejector pin plates (see fig. 1).

FW1850

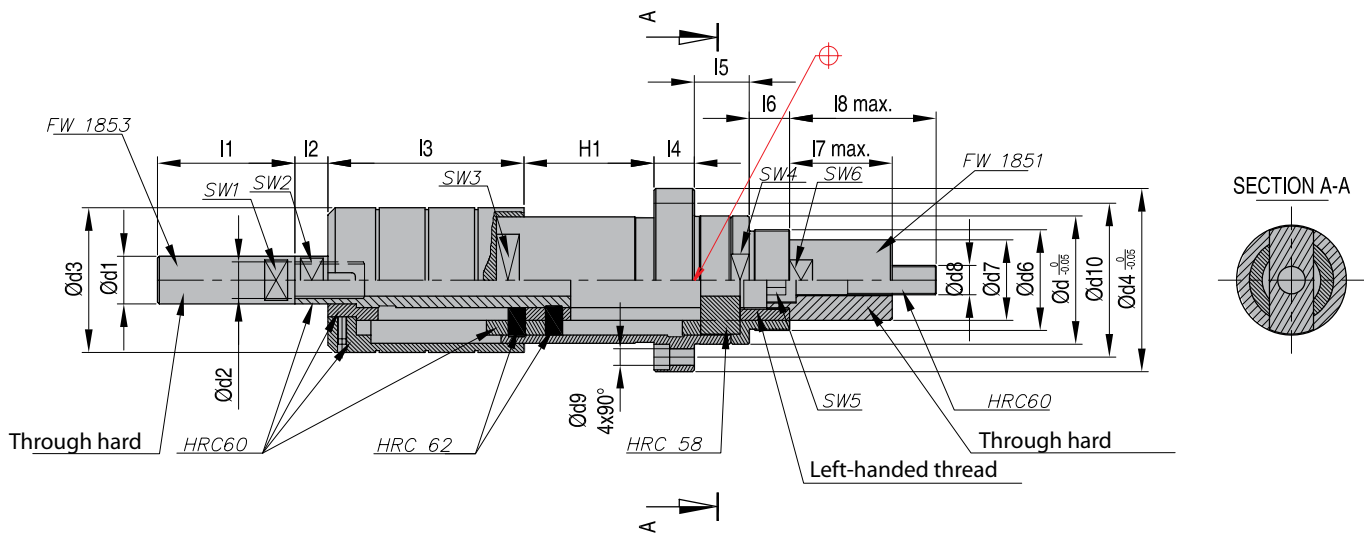
Two-stage single-stroke ejector



The two-stage single-stroke ejector can be integrated into injection molding tools.

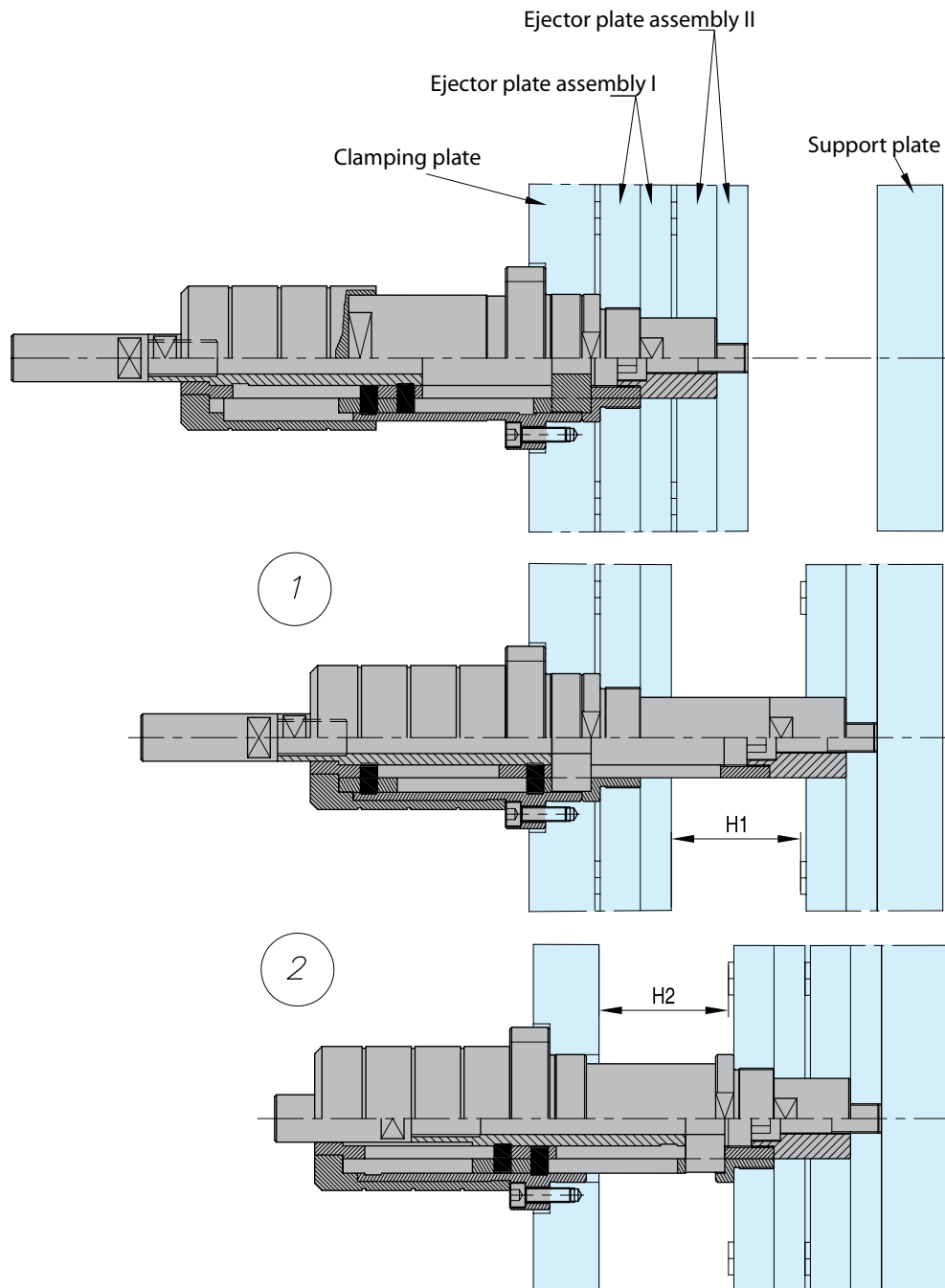
This ejector automatically divides the motion into two sequential strokes.

The functional sequence associated with this makes it possible to create new mold ejection mechanisms.



REF d x H1 max	H1 max	H2	d1	d2	d3	d4	d6	d7	d8	d9	d10
<b>FW1850 50x32</b>	5-32	12-32	18	M12	56	75	M40x1,5	31,5	M12x1,25	M6x16	62
<b>FW1850 58x40</b>	5-40	15-40	22	M16	64	90	M45x1,5	36,0	M14x1,50	M8x20	72
<b>FW1850 58x56</b>	5-56	25-65	22	M16	64	90	M45x1,5	36,0	M14x1,50	M8x20	72
<b>FW1850 70x71</b>	10-71	20-71	26	M20	79	100	M55x1,5	44,0	M16x1,50	M8x25	84

REF	l2	l3	l4	l5	l6	l7 max.	l8 max.	SW1	SW2	SW3	SW3 Nm	SW4	SW5	SW6
<b>FW1850 50x32</b>	12	58	14	25	17	36	50	14	14	36	120	46	6	27
<b>FW1850 58x40</b>	15	68	16	25	17	45	66	18	18	41	160	55	8	32
<b>FW1850 58x56</b>	15	84	16	25	17	45	66	18	18	41	120	55	8	32
<b>FW1850 70x71</b>	18	107	22	30	22	56	80	22	24	50	200	65	10	38



**Features:**

- Secured position of the ejector plates due to built-in-low-wear interlocks.
- Infinitely variable strokes
- High operational reliability of the ejector components due to forced-controlled stroke actions
- Simplified operations of angled and rotating mold ejection components.
- Space-saving installation in the ejector bolt area.
- The tool height remains unchanged.

**Design considerations:**

A detachable fixed connection between ejector bolt (FW 1850) and the machine ejector is necessary, preferably using the pneumatic rapid-action coupling PN 1680. The ejector plates cannot be pushed by return pins due to the tool closing movement! Ejector plate guidance by four guides in the ejector plates to prevent tilting. A stroke limitation is preferable to keep the ejector plates separate in the end position. Centre misalignment compensation between machine ejector and tool preferably by pneumatic rapid-action coupling PN 1680. Adapter for tool on MAP will be made, as necessary, preferably from centering flange R 19.

## TSTL

### 2-stage Ejector Top Last



#### Positive, precise plate control:

**DME 2-stage Ejectors (TS)** adapt to a number of mold base size and plate thicknesses. They are available in two ejection sequences: Top Last (TS) and Bottom Last (BS). Each ejection sequence is available in three sizes to accommodate most standard **DME** mold bases. The stroke range for each ejection stage is determined and fixed by the customer by cutting the Center Rod to the desired length (both TSTL and TSBL types) and by also cutting the Travel Sleeve to the desired length (TSBL type only). Once installed, the **DME 2-stage Ejector** assures positive, precise control of the sequence and distance of each stroke of the two ejector plates. Once installed, there are no adjustments that can be accidentally changed.

#### Benefits:

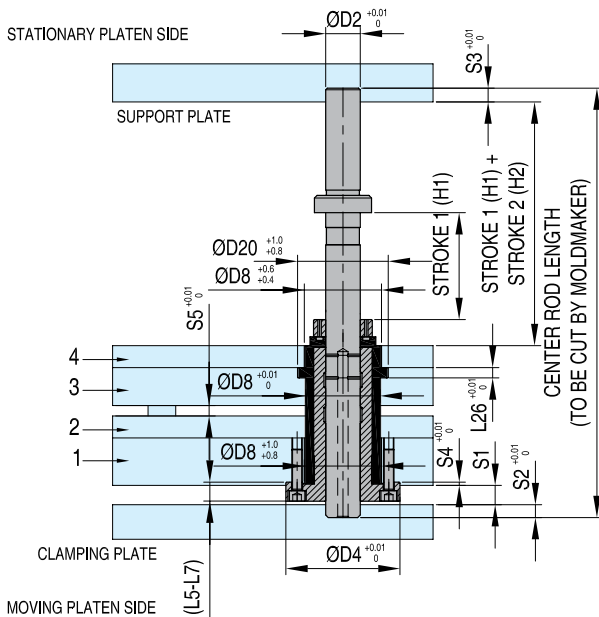
Both the first stage and second stage strokes are set independently. Easy set-up and installation. Fixed strokes cannot be tampered with or accidentally modified. Internal installation avoids interferences with water line connectors and externally mounted components. Utilizes latching mechanism similar to **DME** Internal

Latch lock for smooth operation and guidance. Three sizes, for each style, to choose from to accommodate most standard **DME** mold bases. Hardened steel components for long life. **DME 2-stage Ejectors** are considerably more compact and may be centrally located, the preferred method for locating **DME 2-stage Ejectors** is in pairs, offset from mold center. For more details, assembly guidelines see [www.dme.net](http://www.dme.net).

#### Selection and design guidelines:

Select 20 mm Ø (small), 26 mm Ø (medium), or 23 mm Ø (large) 2-Stage Ejector based on the width of the mold base (large molds, thick plates or heavy load applications may require the next size assembly). Determine the travel range for each ejection stroke (first and second), being very careful not to exceed the maximum stroke specified for the chosen 2-Stage Ejector style and size. this selection is based on the specific application. In general, a minimum of two 2-stage Ejectors are required. For larger molds, thick plates, or a application where loads are near maximum, additional assemblies and/or larger assemblies may be required. An application must never exceed the maximum recommended load values. A balanced load must be maintained to avoid cocking and binding which could cause severe overloading. Only one size of 2-stage Ejectors should be used in each mold base.

REF	Basic center rod dia	H1-Stroke 1		H2-Stroke 2		Max. mold base width	Max. load values static	Max. load values dynamic
		Min.	Max.	Min.	Max.			
<b>TSTL 20 A</b>	20mm	4	79	4	79	Up to 196mm, 1 TSTL 20	600 kg, 5,8 kN	60 kg, 0,58 kN
						Up to 446mm, 2 TSTL 20		
<b>TSTL 26 A</b>	26mm	6	84	6	84	Up to 446mm, 1 TSTL 26	6100 kg, 10,8 kN	110 kg, 1,08 kN
						Up to 596mm, 2 TSTL 26		
<b>TSTL 32 A</b>	32mm	8	92	8	92	Up to 596mm, 1 TSTL 32	2000 kg, 19,6 kN	200 kg, 1,96 kN
						Up to 796mm, 2 TSTL 32		



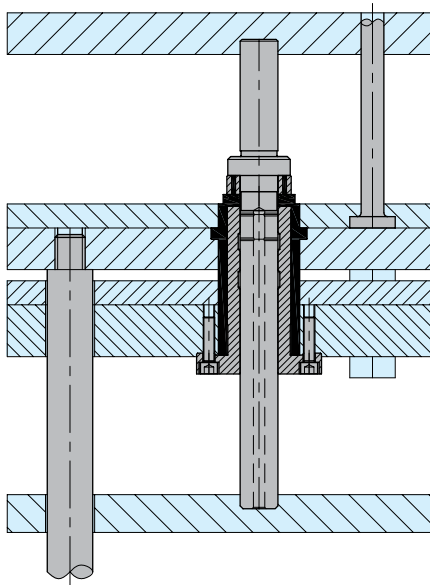
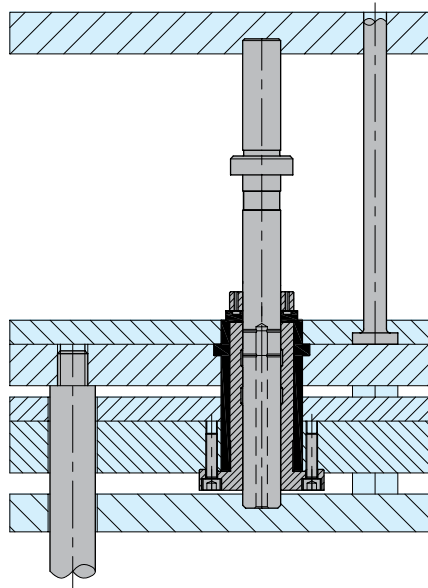
#### Assembly & installation guidelines

The moldmaker is responsible to cut and/or grind the Center Rod to the required length prior to installation of the 2-Stage Ejector assembly into the mold base. Do not cut off more than the minimum stroke (H2). The recommended tolerance on the Center Rod length after the customer has cut the Center Rod is +0/-0,02 mm or less. Stroke 1 (H1) is reduced by cutting and/or grinding the moving plates end of both the Center Rod. Stroke 2 (H2) is reduced by cutting and/or grinding the stationary platen end of the Center Rod. Minimum H2 specified in chart does not include additional stop pins to stationary-side spacer plate. To reduce H2 even further than what is specified in chart, add stop pins. All 2-stage Ejectors in a mold must be cut to the same strokes. It is recommended that guided ejection be used. Ejector speed must be controlled, ensuring that excessive shock loading does not occur. 2-Stage Ejectors are not suitable for severe load conditions. 2-Stage Ejectors must not be exposed to temperatures that exceed 150°C at any time. Lubricate all metal-to-metal contact areas initially and periodically as required. A good grade of moldmakers non-melting type grease for the appropriate temperature should be used.

REF	Center rod length	Stroke 1		Stroke 2		1	2	3	4	S1	S2	S3	S4	S5
		Min.	Max.	Min.	Max.									
<b>TSTL 20 A</b>	262,96	4	79	4	79	26	12	26	12	8	8	8	3	4,26
<b>TSTL 26 A</b>	285,32	6	84	6	84	26	12	26	12	10	10	10	4	10,62
<b>TSTL 32 A</b>	316,68	8	92	8	92	26	16	26	16	15	12	12	4	9,80

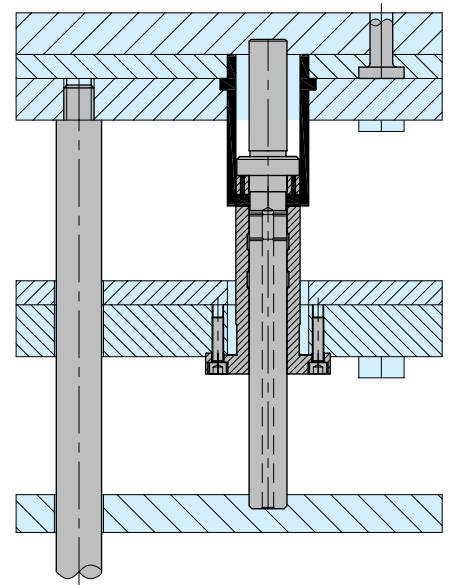
TOP LAST SEQUENCING

1 EJECTOR PLATES BACK



2 FIRST EJECTOR STROKE

After a predetermined amount of travel, the latch mechanism latches onto the Center Rod, thereby fixing the position of the bottom (moving platen side) ejector plate assembly.

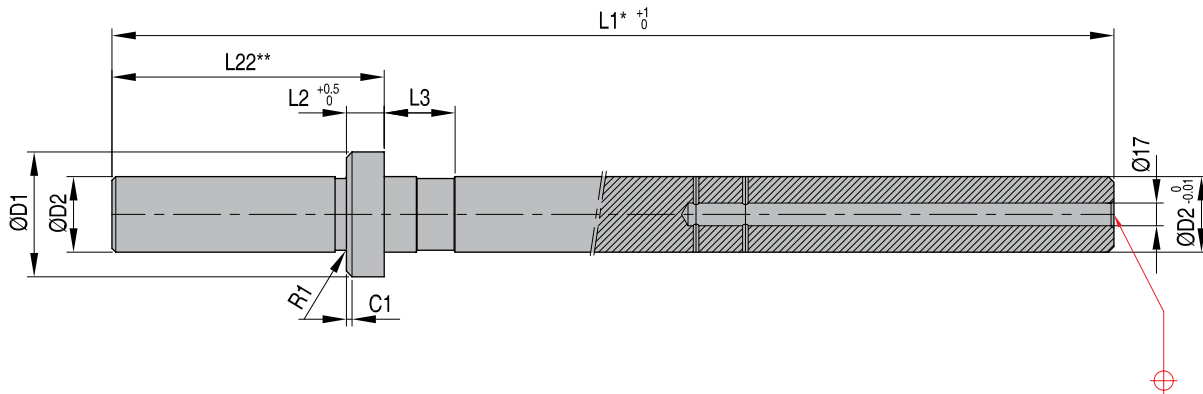


3 SECOND EJECTOR STROKE

The top (stationary platen side) ejector plate assembly continues to move through the "second" or remaining stroke until the top ejector plate assembly contacts the top of the ejector box housing.

## TSTLCR

### Center rod



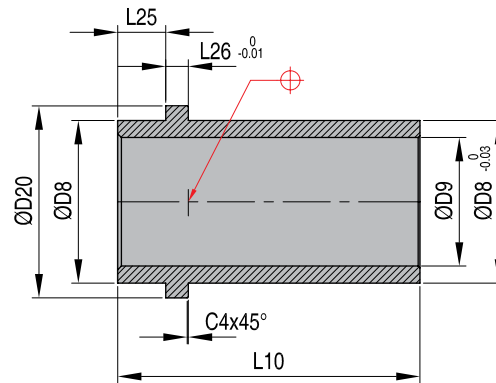
REF	D1	D2	D17	L1*	L2	L3	L22**	C1	R1
TSTL 20 CR	33	20 0 -0,01	5	265	10	18,74	72 +0,5 0	1,5	0,4
TSTL 26 CR	42	26 0 -0,01	6	290	12	22,93	76 +0,5 0	2	0,8
TSTL 32 CR	53	32 0 -0,01	6	320	15	28,25	82 +0,5 0	2,5	0,8

\* Cutoff on both ends of center pin only per installation data.

\*\* Final length must have tolerance of 0/-0,2mm after moldmaker has cut the center pin to the desired length.

## TSTLTS

### Travel Sleeve

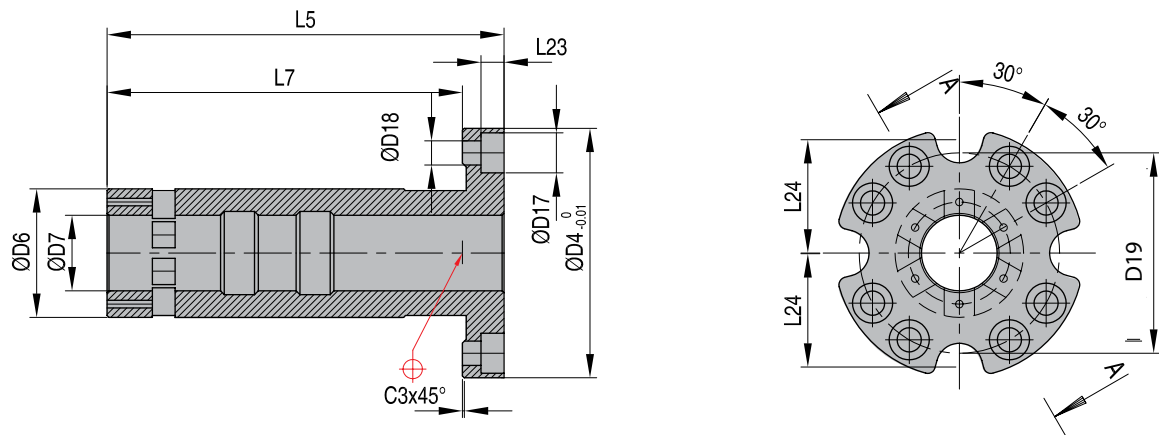


REF	D8	D9	D20	L10	L25	L26	C4
TSTL 20 TS	43	34	50,8	79,96	12,70	6,00	0,5
TSTL 26 TS	54	43	63,0	85,32	12,70	8,00	0,5
TSTL 32 TS	68	54	78,0	93,68	15,88	10,00	0,5



Body For Cam Fingers

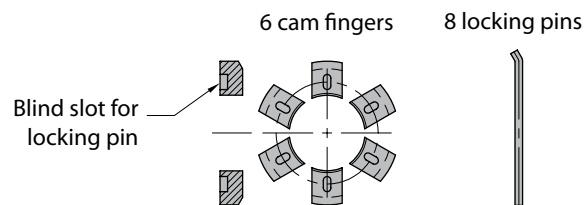
TSTLBD



REF	D4	D6	D7	D17	D18	D19	L5	L7	L23	L24	C3
TSTL 20 BD	66	34	20	10,6	6,4	53	104	94,0	6,1	30	0,5
TSTL 26 BD	84	43	26	13,8	8,7	67	116	103,0	8,2	37	0,5
TSTL 32 BD	105	54	32	16,8	10,8	85	131	113,4	10,2	47	0,6

Cam Finger Replacement Kit (with 6 cam fingers, and 8 locking pins)

TSTLKT



REF
TSTL 20 KT
TSTL 26 KT
TSTL 32 KT

## TSBL

### 2-stage Ejector Bottom Last



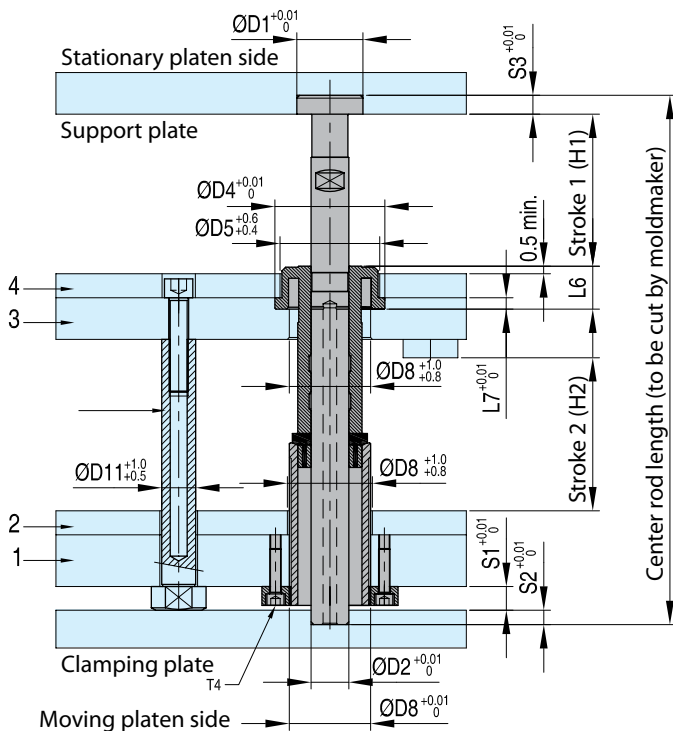
At end of second stroke, body for cam fingers must seat firmly against center rod head or spacer plate as shown.

- Tolerances depicted here are installation tolerances.
- See component detail drawings for specific component tolerances
- Refer to applicable charts for nominal dimension

REF	Basic center rod dia	Stroke 1		Stroke 2		Max. mold base width	Max. load values static	Max. load values dynamic
		Min.	Max.	Min.	Max.			
TSBL 20 A	20mm	8	82	12	82	Up to 196mm, 1 TSTL 20	600 kg 5,8 kN	60 kg 0,58 kN
						Up to 446mm, 2 TSTL 20		
TSBL 26 A	26mm	10	92	18	92	Up to 446mm, 1 TSTL 26	1100 kg 10,8 kN	110 kg 08 kN
						Up to 596mm, 2 TSTL 26		
TSBL 32 A	32mm	12	102	24	102	Up to 596mm, 1 TSTL 32	2000 kg 19,6 kN	200 kg 1,96 kN
						Up to 796mm, 2 TSTL 32		

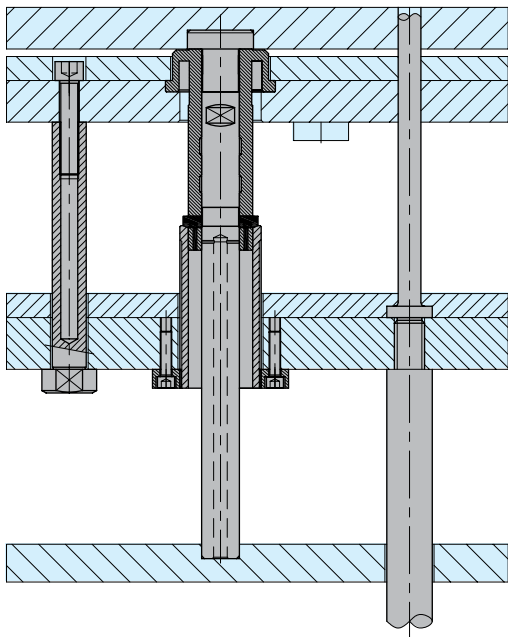
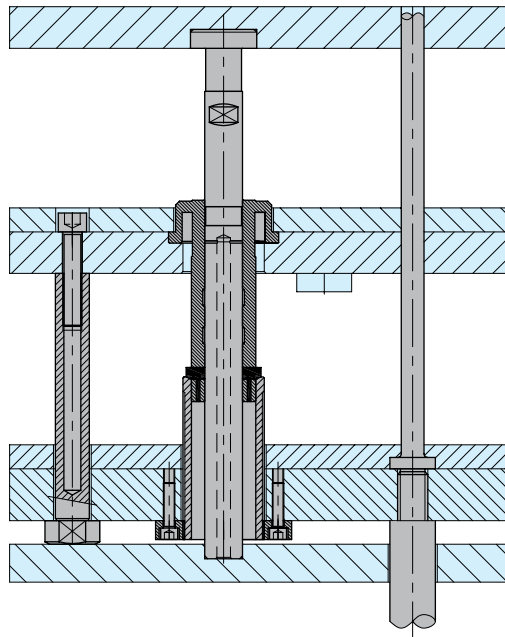
#### Assembly & installation guidelines:

- All 2-Stage Ejectors in a mold must be cut to the same strokes.
- It is recommended that guided ejection be used.
- Ejector speed must be controlled, ensuring that excessive shock loading does not occur.
- 2-Stage Ejectors are not suitable for severe load conditions.
- 2-Stage Ejectors must not be exposed to temperatures that exceed 150°C (300°F) at any time.
- Lubricate all metal-to-metal contact areas initially and periodically as required. A good grade of moldmakers non-melting type grease for the appropriate temperature should be used.
- A minimum of (4) Puller Pins should be used with each mold. Larger molds may require additional Puller Pins.
- The moldmaker must cut and/or grind the Puller Pins to the required length.
- Puller Pins are not included with Bottom Last Assemblies and must be ordered separately. At end of second stroke, Body for Cam Fingers must seat firmly against Center Rod head or spacer plate.
- The moldmaker must cut and/or grind the Center Rod to the required length prior to installation of the 2-Stage Ejector assembly into the mold base. Do not cut off more than the minimum stroke (H2). The recommended tolerance on the Center Rod length after the customer has cut the Center Rod is +0/-0.02mm or less.
- The moldmaker must cut and/or grind the Travel Sleeve to the required length prior to installation of the 2-Stage Ejector assembly into the mold base. Do not cut off more than the minimum stroke (H2).
- Stroke 1 (H1) is reduced by adding stop buttons to the stationary platen side spacer plate in order to restrict motion of the top (stationary platen side) ejector plate assembly. The moldmaker must manufacture a suitable set of stop buttons that are of the required height to achieve the desired stroke (H1).
- Stroke 2 (H2) is reduced by cutting and/or grinding the moving platen end of both the Center Rod and the Travel Sleeve.



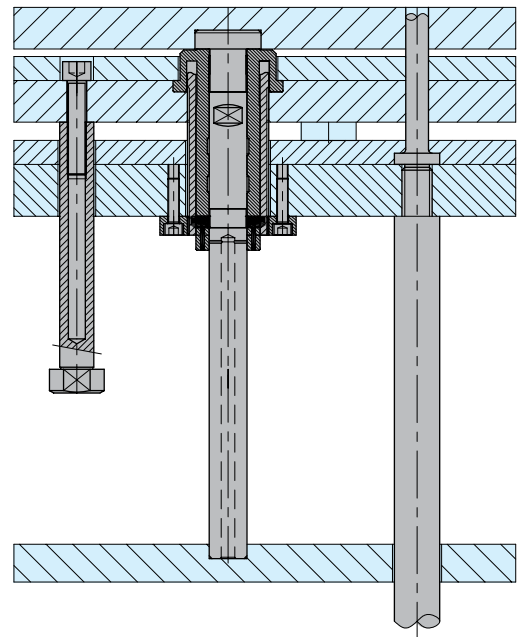
REF	Center rod length	H1-Stroke 1		H2-Stroke 2		1	2	3	4	S1	S2	S3	S4
		Min.	Max.	Min.	Max.								
TSBL 20 A	262,96	8	82	12	82	26	12	26	12	11	8	10	4
TSBL 26 A	285,32	10	92	18	92	26	12	26	12	14	10	12	9
TSBL 32 A	316,68	12	102	24	102	26	16	26	16	17	12	14	10

1 Ejector Plates Back



2 First Ejector Stroke

After a predetermined amount of travel, the latch mechanism latches onto the Center Rod, thereby fixing the position of the bottom (moving platen side) ejector plate assembly.

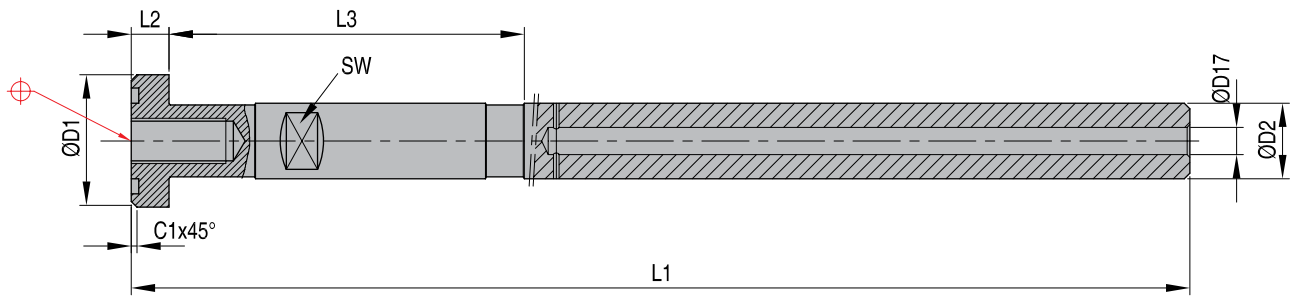


3 Second Ejector Stroke

The top (stationary platen side) ejector plate assembly continues to move through the "second" or remaining stroke until the top ejector plate assembly contacts the top of the ejector box housing.

## TSBLCR

Center rod



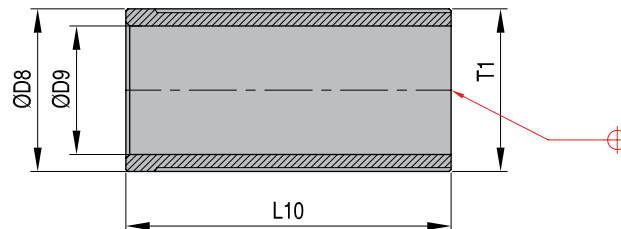
REF	D1	D2	D17	L1*	L2	L3	C1
<b>TSBL 20 CR</b>	34 <sup>0</sup> <sub>-0,01</sub>	20 <sup>0</sup> <sub>-0,01</sub>	7,2	280 <sup>+0,5</sup> <sub>0</sub>	10 <sup>+0,02</sup> <sub>0</sub>	93,66	1,0
<b>TSBL 26 CR</b>	44 <sup>0</sup> <sub>-0,01</sub>	26 <sup>0</sup> <sub>-0,01</sub>	8,5	314 <sup>+0,5</sup> <sub>0</sub>	12 <sup>+0,02</sup> <sub>0</sub>	105,67	1,0
<b>TSBL 32 CR</b>	58 <sup>0</sup> <sub>-0,01</sub>	32 <sup>0</sup> <sub>-0,01</sub>	10,5	354 <sup>+0,5</sup> <sub>0</sub>	14 <sup>+0,02</sup> <sub>0</sub>	118,18	1,5

\* Cutoff on both ends of center pin only per installation data.

\*\* Final length must have tolerance of 0/-0,2mm after moldmaker has cut the center pin to the desired length.

## TSBLTS

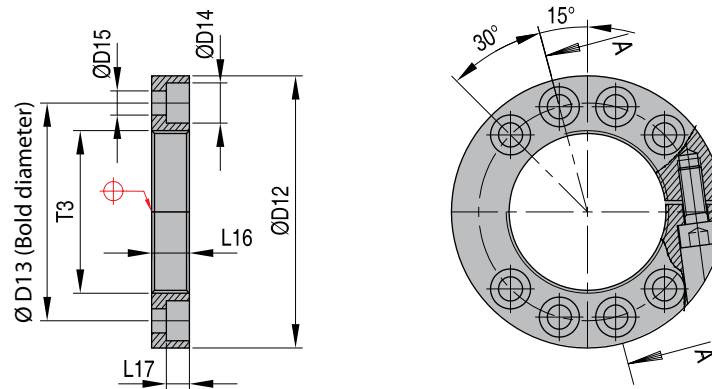
Travel Sleeve



REF	D8	D9	L10	T1
<b>TSBL 20 TS</b>	43 <sup>0</sup> <sub>-0,03</sub>	34	86 <sup>+0,2</sup> <sub>0</sub>	M43,5x1,25
<b>TSBL 26 TS</b>	54 <sup>0</sup> <sub>-0,03</sub>	43	94 <sup>+0,2</sup> <sub>0</sub>	M54,5x1,25
<b>TSBL 32 TS</b>	68 <sup>0</sup> <sub>-0,03</sub>	54	105 <sup>+0,2</sup> <sub>0</sub>	M68,6x1,5

Locking Ring

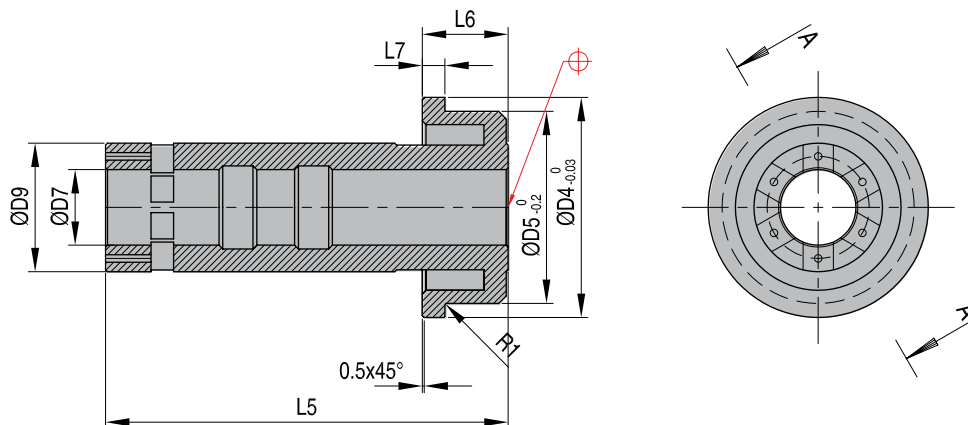
TSBLLR



REF	D12	D13	D14	D15	L16	L17	T3
<b>TSBL 20 LR</b>	72,0	57,4	10,6	6,4	10,0	6,0	M43,2 x 1,25
<b>TSBL 26 LR</b>	90,0	72,0	13,7	8,6	13,0	8,1	M54,2 x 1,25
<b>TSBL 32 LR</b>	112,0	90,0	16,8	10,8	16,0	10,1	M68,25 x 1,5

Body For Cam Fingers

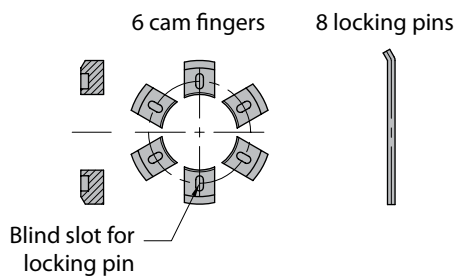
TSBLBD



REF	D4	D5	D6	D7	L5	L6	L7	C2	R1
<b>TSBL 20 BD</b>	58,2	50,8	34,0	20,0	106,46	22,7	6,0	0,3	0,4
<b>TSBL 26 BD</b>	70,0	62,8	43,0	26,0	121,22	22,7	6,0	0,4	0,4
<b>TSBL 32 BD</b>	87,0	78,0	54,0	32,0	139,7	28,88	7,0	0,5	0,4

## TSBLKT

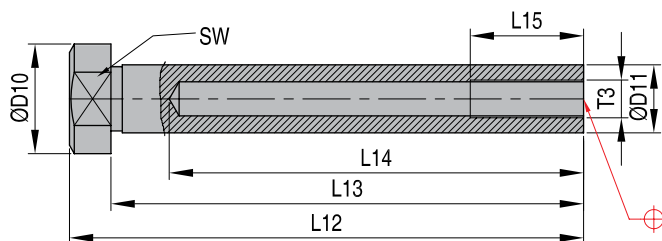
Cam Finger Replacement Kit (with 6 cam fingers, and 8 locking pins)



REF
TSBL 20 KT
TSBL 26 KT
TSBL 32 KT

## TSBLPP

Puller Pin



REF	D10	D11	L12	L13	L14	L15	SW	T3
TSBL 20 PP	29	18	136	125	107	30	26	M10
TSBL 26 PP	34	21	153	139	120	40	30	M12
TSBL 32 PP	43	26	171	154	138	50	36	M16