mastip
hot runner solutions

MVG40 Headed Pin Valve Gate

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Assembly Overview

IMPORTANT!!

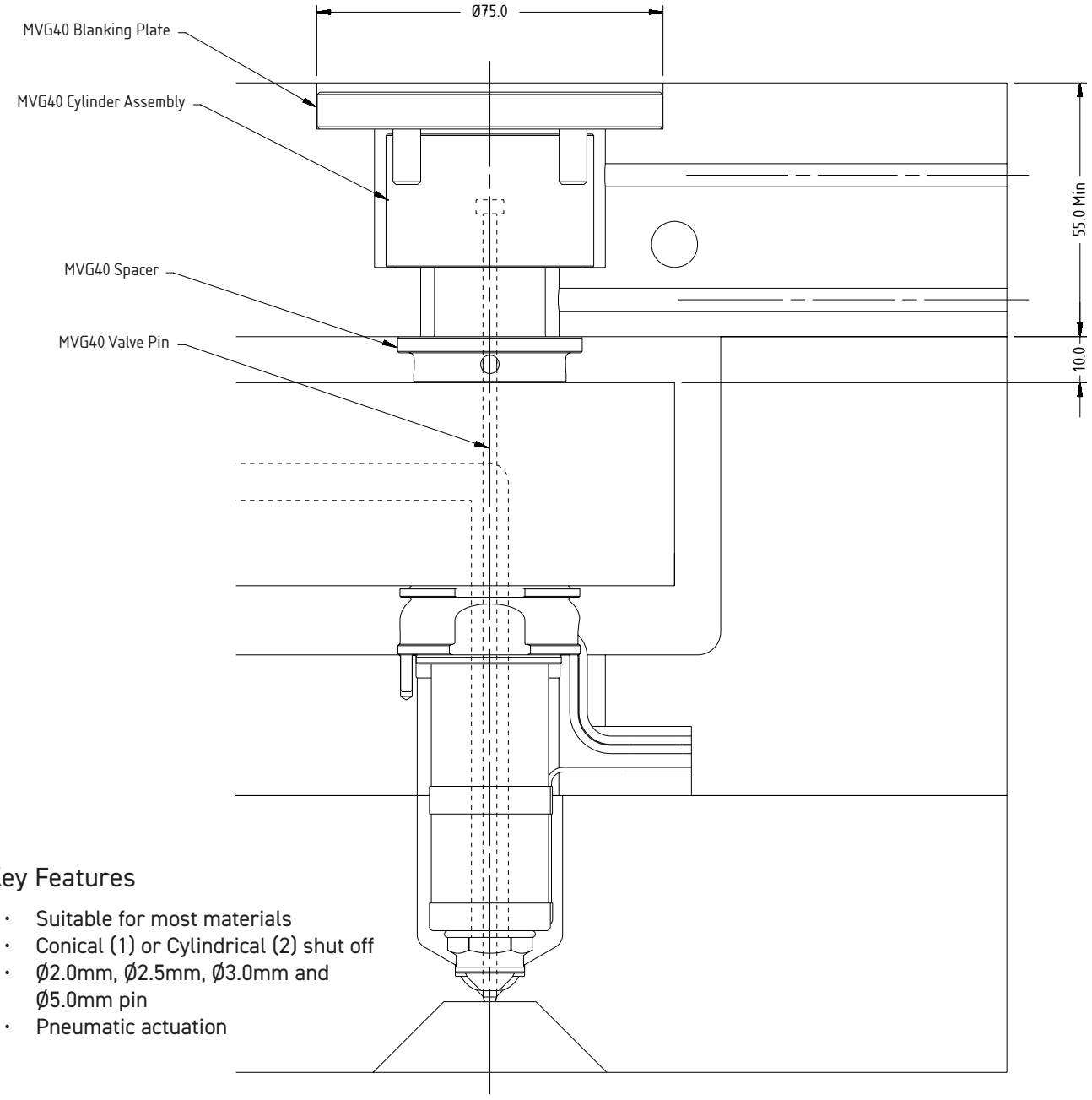
The back plate must be cooled and must not exceed 150˚C.

The cylinder should be in the closed position at all times except during injection and packing.

Air quality: Filtered to 40 µM and lubricated

Minimum air: pressure 4 Bar

Maximum air: pressure 10 Bar



Key Features

- Suitable for most materials
- Conical (1) or Cylindrical (2) shut off
- Ø2.0mm, Ø2.5mm, Ø3.0mm and Ø5.0mm pin
- Pneumatic actuation

figure. 1

Spacing Layout

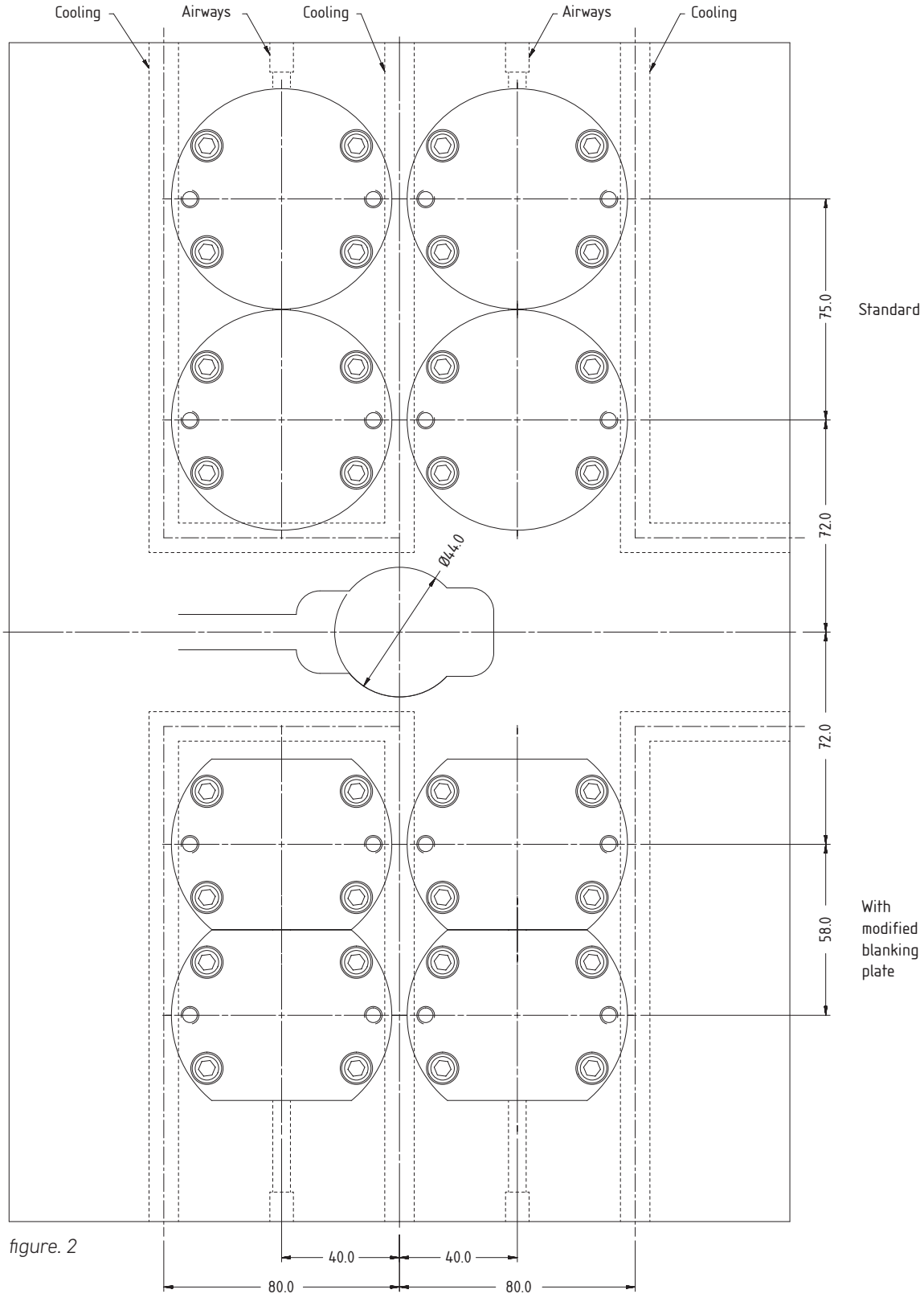


figure. 2

MVG40 Headed Pin Overall Dimensions

Note: Pins are supplied in standard length and must be cut to required length before installation.

Pins can be supplied finished ready to use by Mastip

→ Refer to page MVG40-6 Pin Calculations section to calculate required final pin lengths

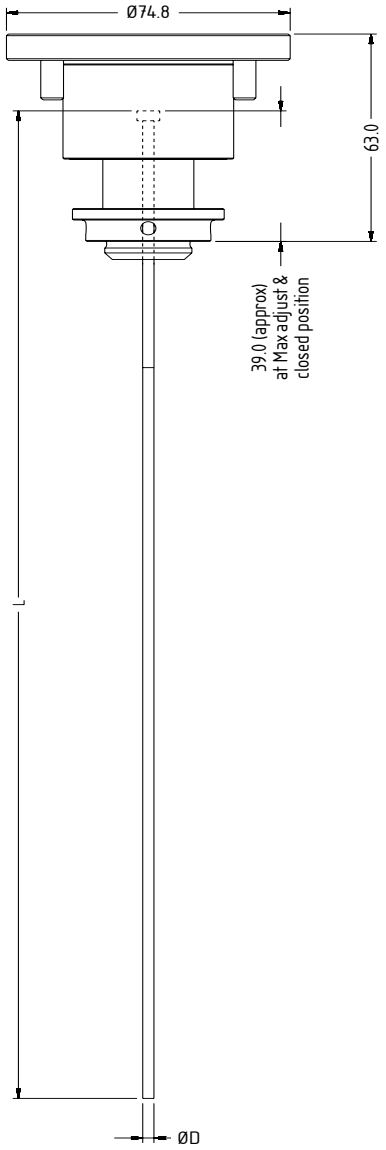


figure. 3

Nozzle Compatibility			
Description	Nozzle	Nozzle Length	Supplied Pin Size
MVG40-P1 Headed Pin	MX13 / BX13	45 - 225	Ø2.0
	MX16 / BX16	45 - 250	Ø2.5
	MX19 / BX19	45 - 300	Ø3.0
	BX27	75 - 450	Ø5.0

Fitment

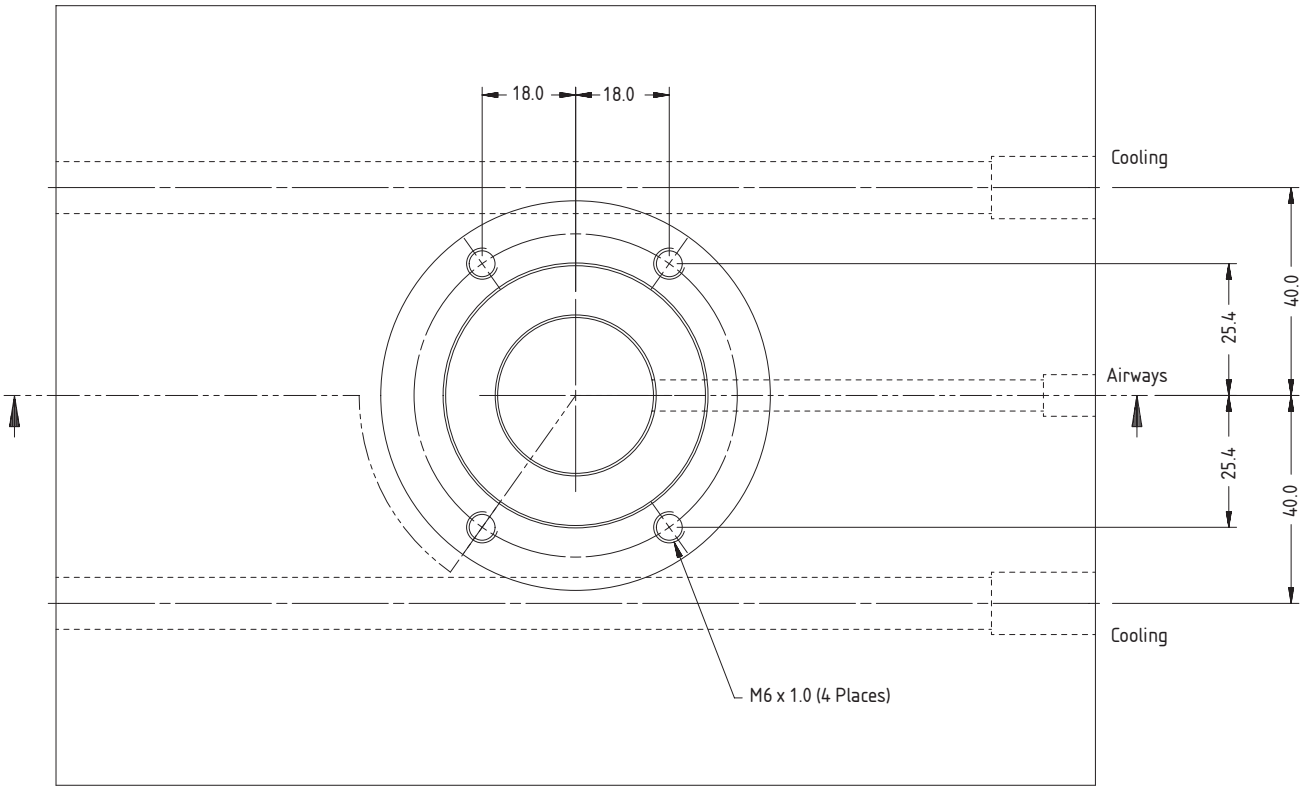


figure. 4

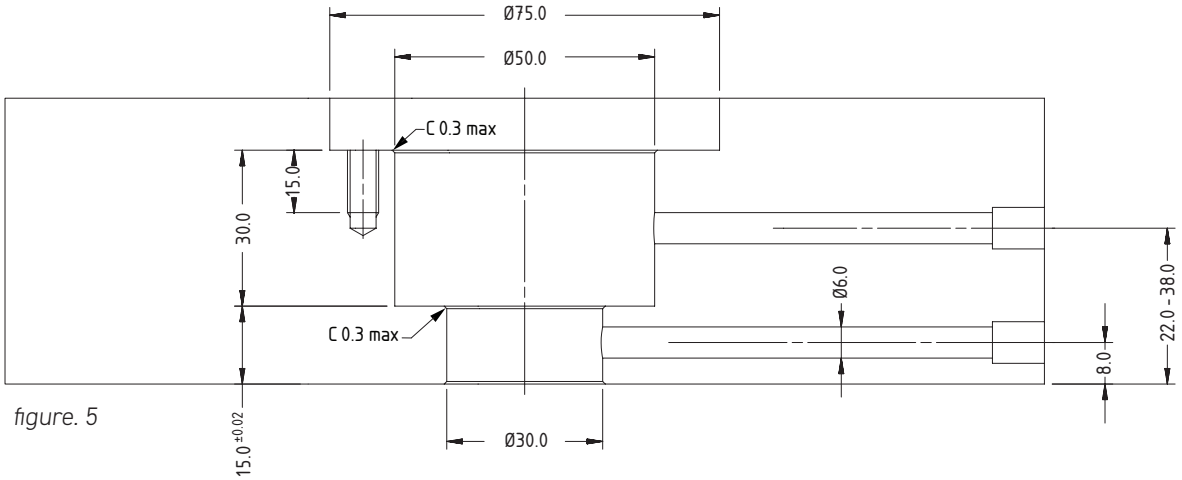


figure. 5

Pin Details

Caution: The gap between the gate and the pin in a hot state is critical. If the gap is too large there will be a poor gate vestige and drooling from the nozzle may occur. If the gap is too small, the pin can strike the gate and may decrease the gate life.

To calculate final pin length use the following equation:

MVG40-P1 – D2.0
MVG40-P1 – D2.5
MVG40-P1 – D3.0
Pin Length = (Y=28.75) + 10.0 + X + L4 + L + 0.05

MVG40-P1 – D5.0
Pin Length = (Y=29.00) + 10.0 + X + L4 + L + 0.05

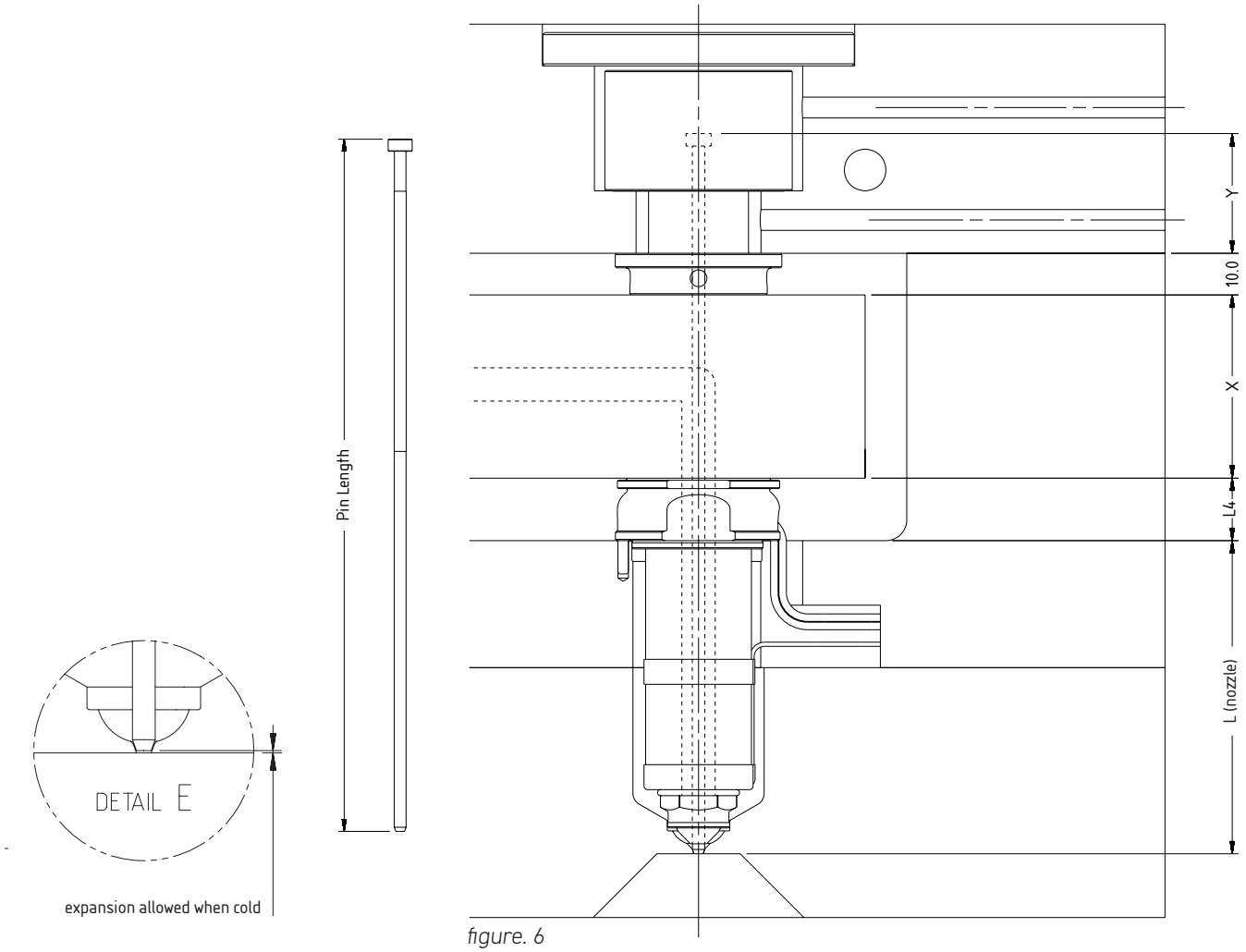


figure. 6

Conical and Cylindrical Valve Gate Recommendations

	Conical Valve Gate	Cylindrical Valve Gate
Gate Quality	***	***
Pin Cooling	***	*
Filled Materials	*	***
Material with Small Moulding Window	*	***
Ease of Pin Setup	*	***
Ease of Gate Manufacture	***	**
Gate Life	***	*

Key	Value
*	Lowest Rating
***	Highest Rating

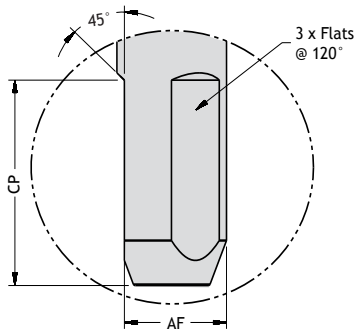
Conical Valve Gate

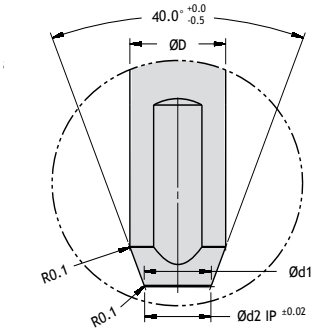
D	d1	d2	AF	CP	AT	qT	HP
2.0	1.3	1.25	1.80	8	1.30	0.8	1.0
2.5	1.8	1.75	2.30	8	1.80	1.0	2.0
3.0	2.2	2.15	2.75	8	2.20	1.2	2.5
5.0	3.5	3.45	4.65	10	3.50	2.0	3.0

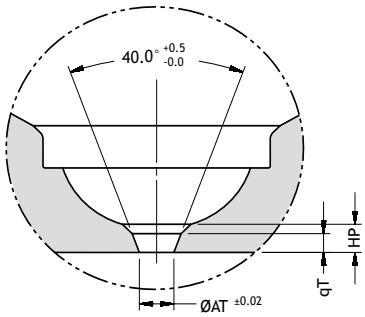
The pin will form a 0.1mm deep dimple on the part.

Pin and gate to be lapped to ensure clean shutoff.

Recommended for amorphous polymers.





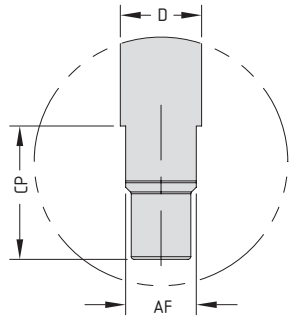


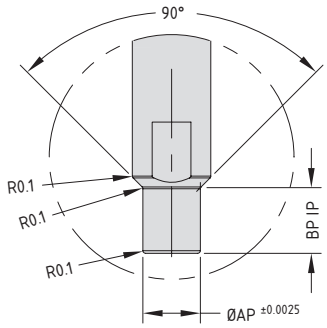
Cylindrical Valve Gate

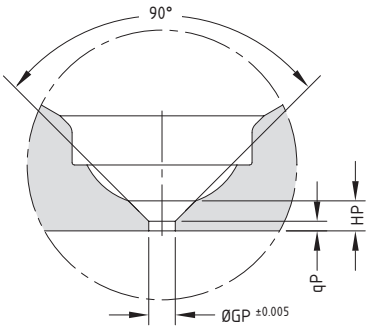
Description	D	AP	BP	AF	CP	GP	qP	HP
MVG40-P1 Headed Pin	2.0	1.292	2.0	1.6	5	1.305	0.5	1.0
MVG40-P1 Headed Pin	2.5	1.792	2.0	2.1	5	1.805	0.7	2.0
MVG40-P1 Headed Pin	3.0	2.192	2.0	2.6	5	2.205	0.8	2.5
MVG40-P1 Headed Pin	5.0	3.492	2.5	4.4	8	3.505	1.3	3.0

The pin will form a 0.1mm deep dimple on the part.

Recommended for semi-crystalline and filled polymers.



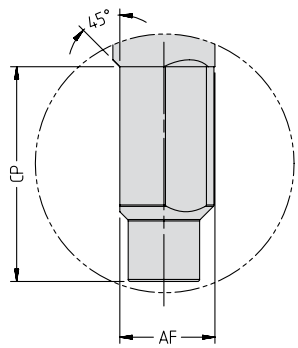


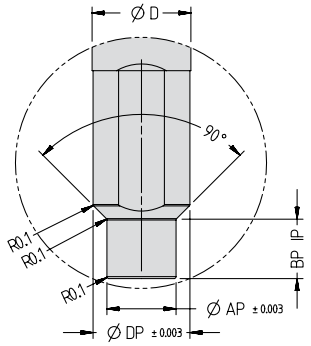


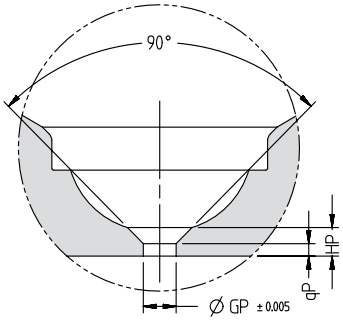
Guided Cylindrical Valve Gate (GVG5) or YV2 Nut

Description	D	AP	BP	AF	CP	DP	GP	qP	HP
MVG40-P1 Headed Pin	2.0	1.292	2.0	1.70	8	1.892	1.305	0.5	1.0
MVG40-P1 Headed Pin	2.5	1.792	2.2	2.20	8	2.392	1.805	0.7	2.0
MVG40-P1 Headed Pin	3.0	2.192	2.5	2.65	8	2.892	2.205	0.8	2.5
MVG40-P1 Headed Pin	5.0	3.492	3.0	4.55	10	4.892	3.505	1.3	3.0

The pin will form a 0.1mm deep dimple on the part. Recommended for semi-crystalline and filled polymers.

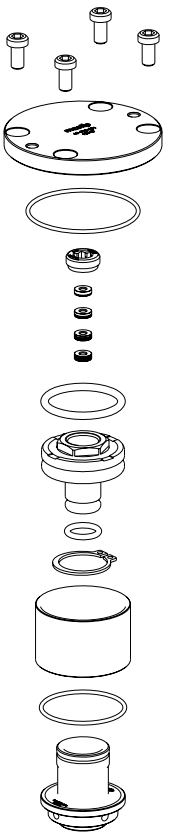




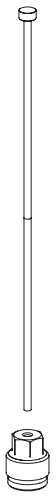


As Supplied

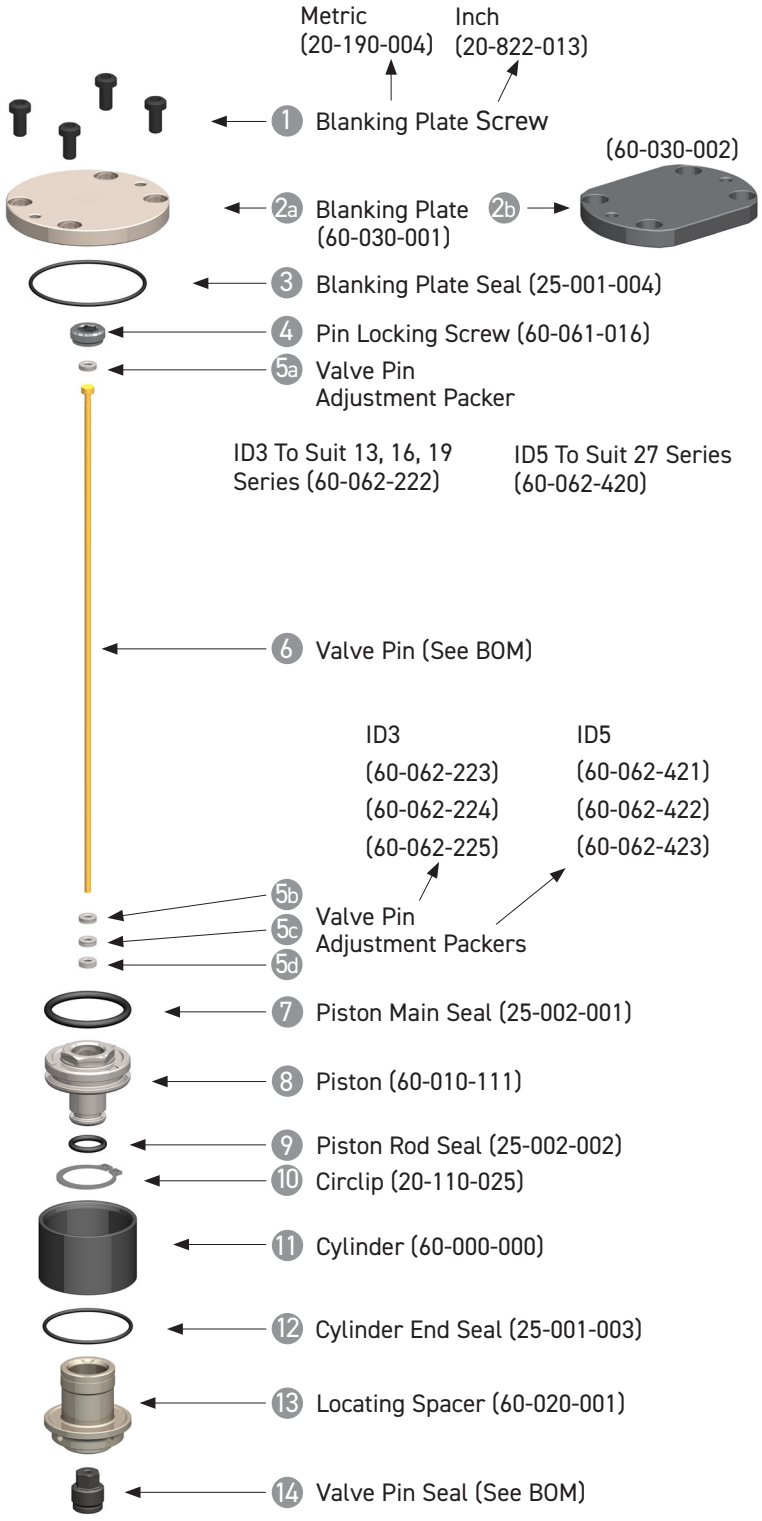
A MVG40 CYLINDER ASSEMBLY



B MVG40 VALVE PIN + SEAL



Exploded Diagram



Note

1. MVG40 Spares Kit (80-000-100). Includes Seals, Circlip and Grease
2. Piston Hex Socket Tool (60-085-222)
3. Piston Extraction Tool (60-085-015)

Installation and Pin Adjustment Guide

PRE INSTALLATION

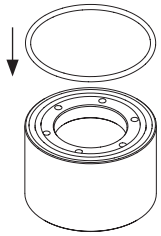
1. Verify the actuator pockets and air circuits are machined in the back plate as shown in figure 5.
2. Ensure there are no sharp edges or burrs in the actuator pockets.
3. Ensure the actuator pocket and air circuits are clean.
4. Cut pins to length and profile end to conical or cylindrical (refer nozzle approval drawing)
5. Assemble the fixed half of the mould including hot runner nozzles and manifold excluding backplate.
   → Refer to the Technical Specifications section of the Technical Guide
   Pin and seal are a matched set and must remain paired.

INSTALLATION

ONE

Ensure all components are clean

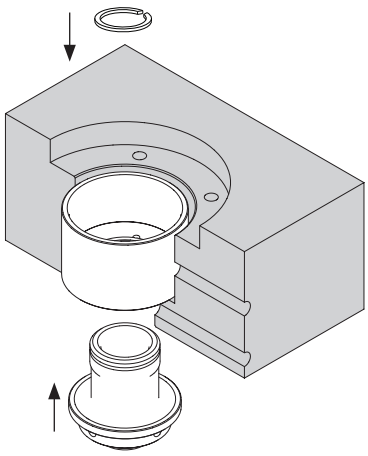
TWO



Fit the **Cylinder End Seal** ⑫ to the **Cylinder** ⑪

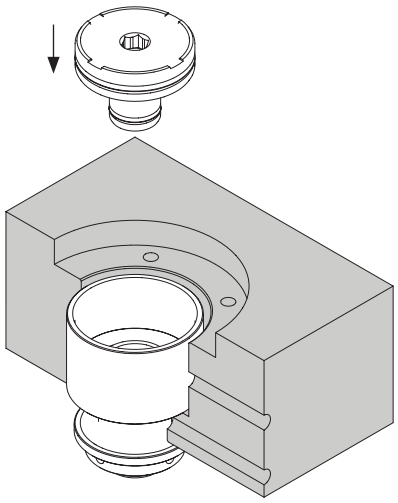
Apply grease* to **Cylinder End Seal** ⑫

THREE



Fit the **Cylinder** ⑪ and **Locating Spacer** ⑬ to the mould backplate and retain using the **Circlip** ⑩ Ensure **Cylinder** ⑪ is compressing **Cylinder End Seal** ⑫ to fit **Circlip** ⑩ securely in groove on **Locating Spacer** ⑬

FOUR



Apply grease* to the sealing bores of the **Locating Spacer** ⑬ and **Cylinder** ⑪ and to the pre fitted **Piston Seals** ⑦ & ⑨

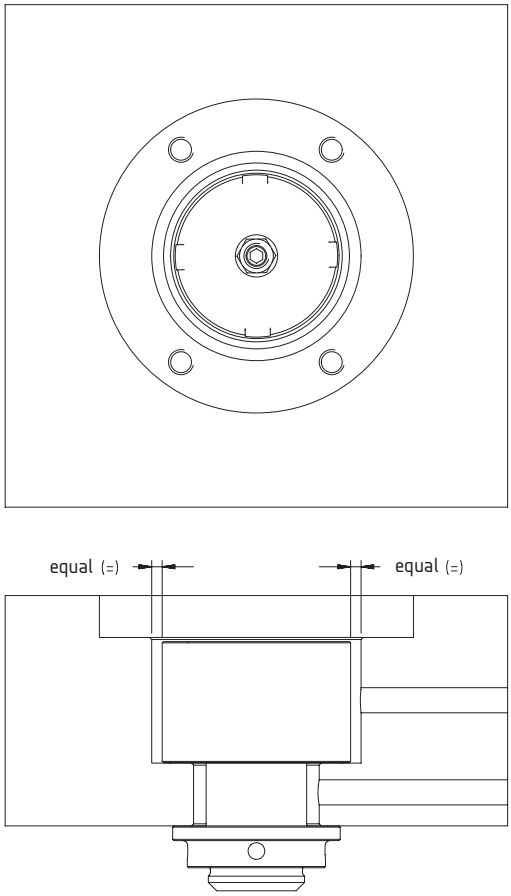
Fit **Piston** ⑧ to the **Cylinder** ⑪

Note

* Mastip recommends using high temperature silicon grease

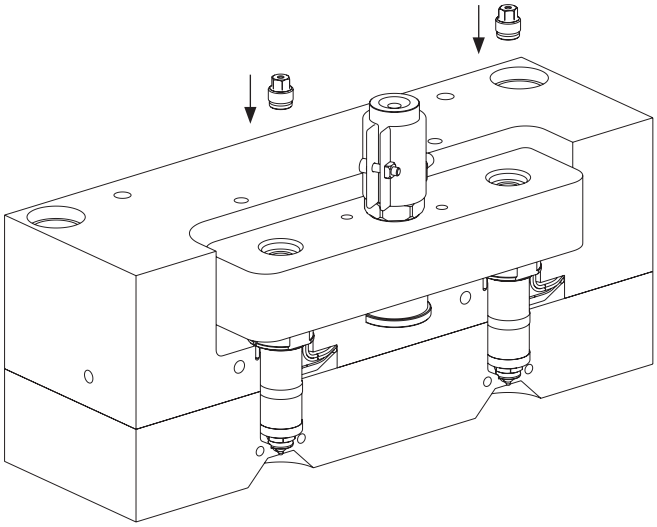
INSTALLATION CONT.....

FIVE



Centralise **Cylinder Assembly** A to the Actuator pocket.

SIX



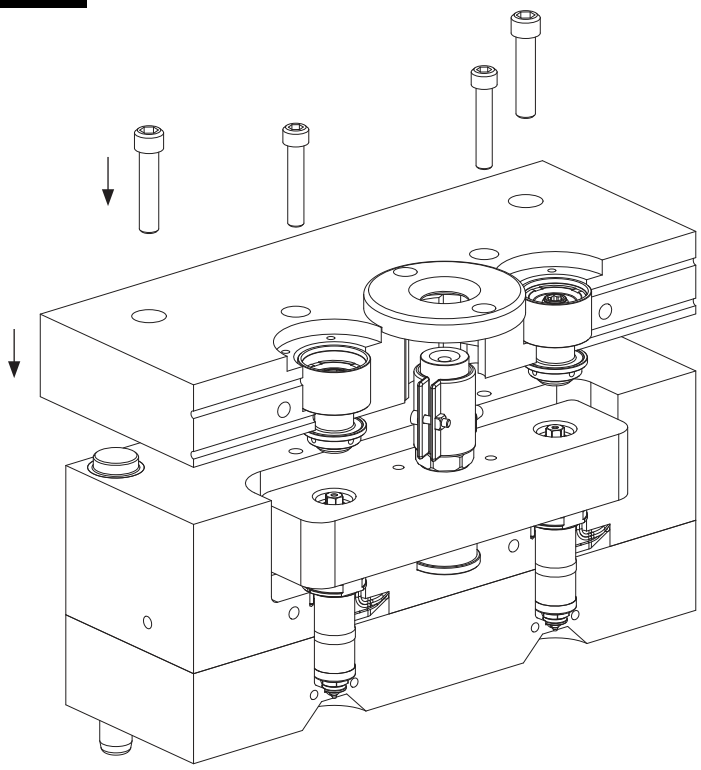
Clean any residual material from the pin seal pocket and thread in the manifold.

Apply heat resistant nickel based anti-seize to the thread of the new pin seal and screw into the manifold and tighten to 20Nm.

Ensure pins slide smoothly through the pin seal after tightening.

INSTALLATION CONT.....

SEVEN

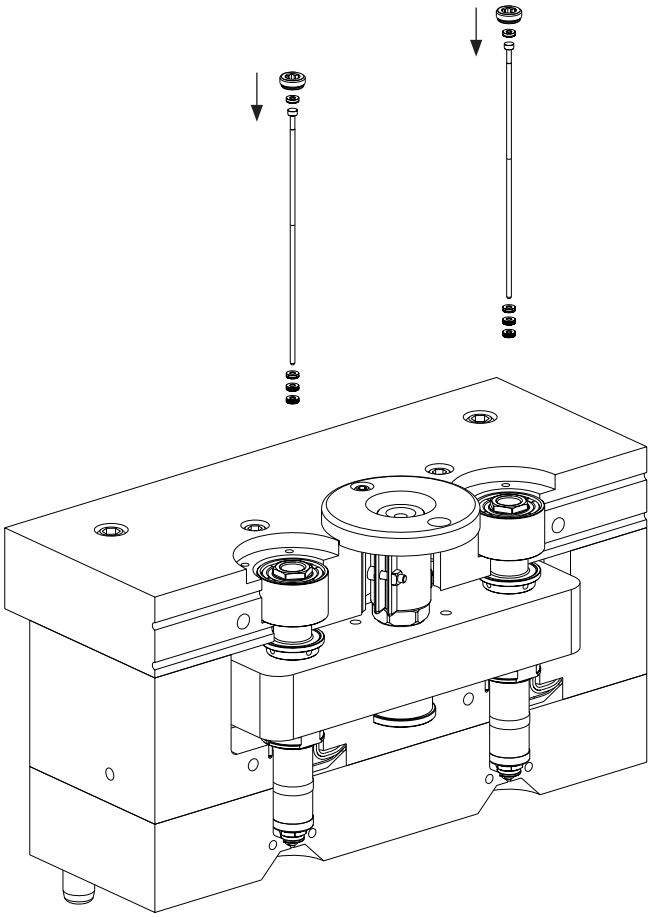


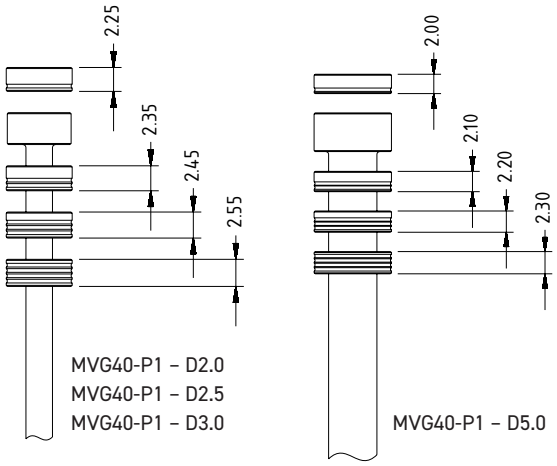
Fit mould backplate to mould and fasten.

Note: If backplate location guides start to locate first, then the cylinder assembly should self locate to the manifold. However in some cases it may be necessary to move the cylinder assemblies in the actuator pocket to locate them with the manifold.

INSTALLATION CONT.....

EIGHT



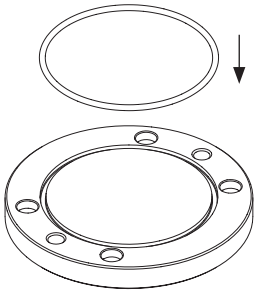


Insert the **Valve Pin Adjustment Packers** 5b, 5c & 5d onto the **Valve Pin** 6

Ensure the correct packer thickness is in the correct position. (Recommend starting with the thinnest packer above the pin head, then adjust to suit if necessary).

Fit the **Valve Pin** 6 to **Piston** 8
Fit the remaining **Valve Pin Adjustment Packer** 5a above pin head
Fit the **Pin Locking Screw** 4 to the **Piston** 8 and tighten to 40Nm

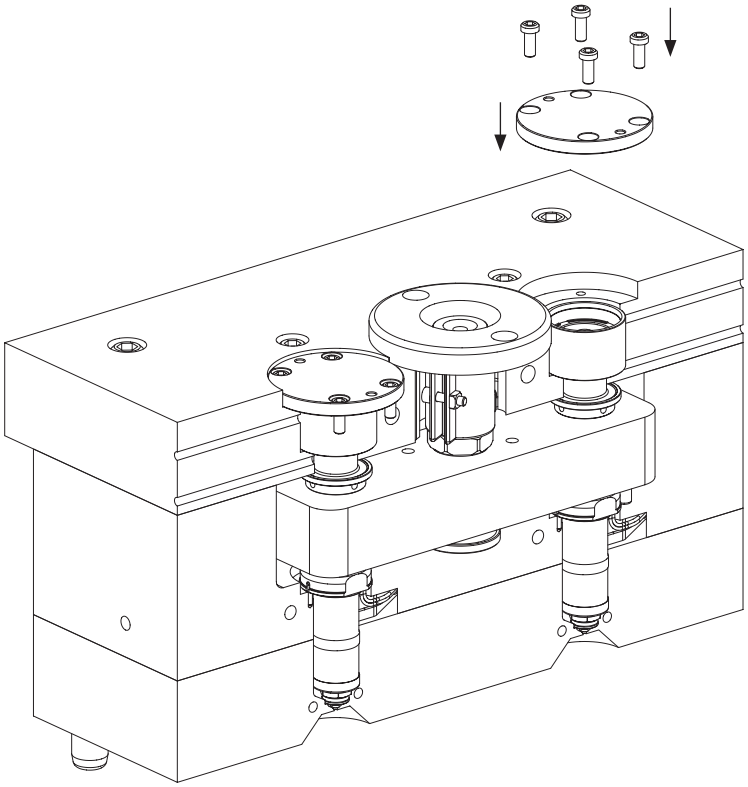
NINE



Fit **Blanking Plate Seal** 3 to **Blanking Plate** 2a or 2b

INSTALLATION CONT.....

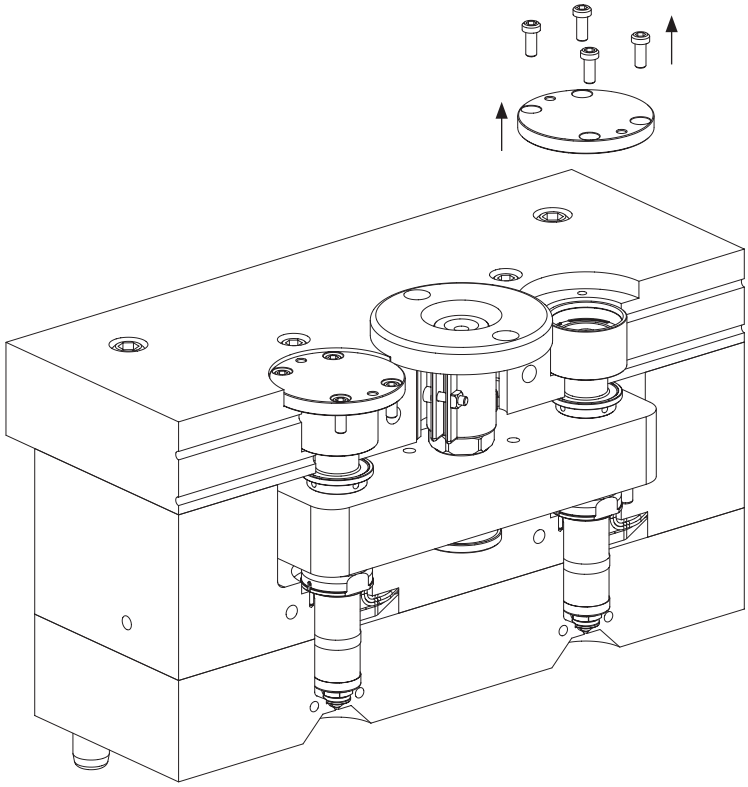
TEN



Fit **Blanking Plate** 2a or 2b to the mould backplate and fasten using **Blanking Plate Screws** 1

PIN HEIGHT ADJUSTMENT

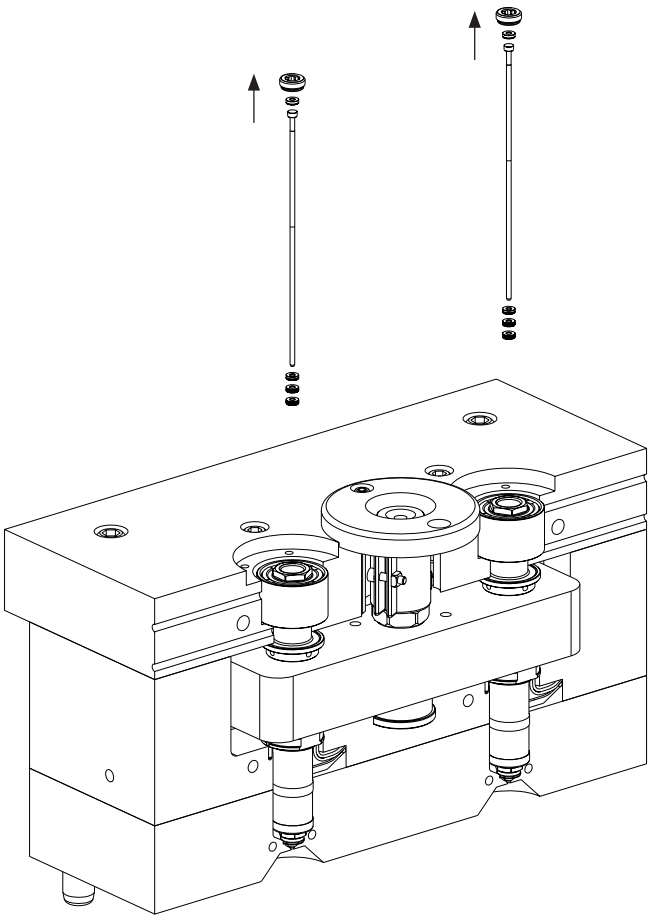
ONE



Remove **Blanking Plate** 2a or 2b

PIN HEIGHT ADJUSTMENT CONT.....

TWO

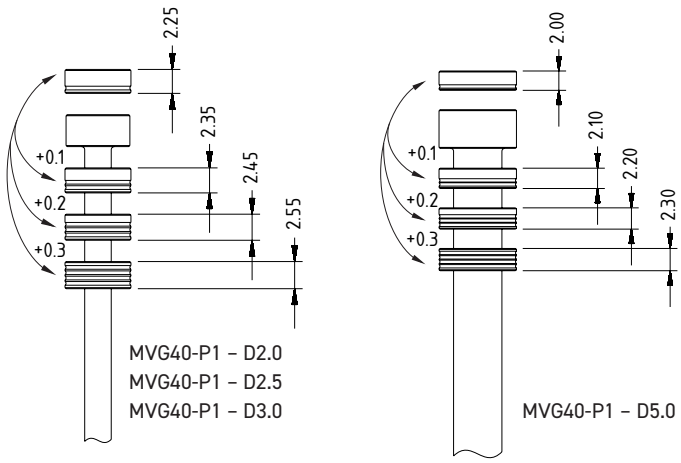


Remove the **Pin Locking Screw** 4
Remove the **Valve Pin Adjustment Packer** 5a
Remove the **Valve Pin** 6
Remove the remaining **Valve Pin Adjustment Packers** 5b, 5c & 5d

PIN HEIGHT ADJUSTMENT CONT.....

THREE

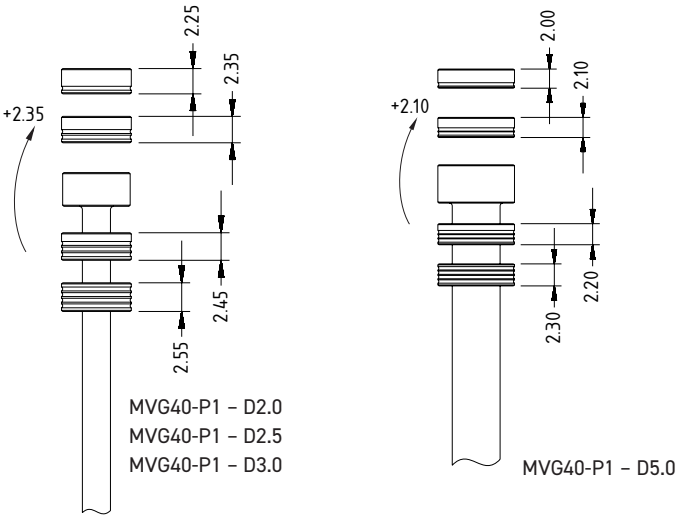
Minor Adjustment



Swap **Valve Pin Adjustment Packers** 5a, 5b, 5c & 5d to achieve small pin adjustments (different packer = different height)

FOUR

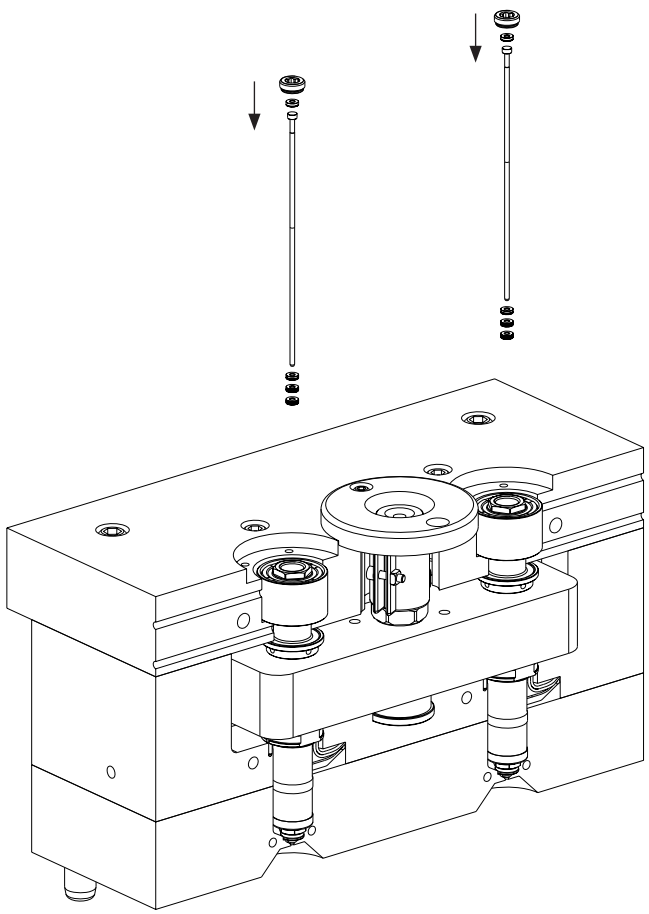
Major Adjustment



Move one or more **Valve Pin Adjustment Packers** 5a, 5b, 5c & 5d from below the pin head to above the pin head to achieve large pin adjustment

PIN HEIGHT ADJUSTMENT CONT.....

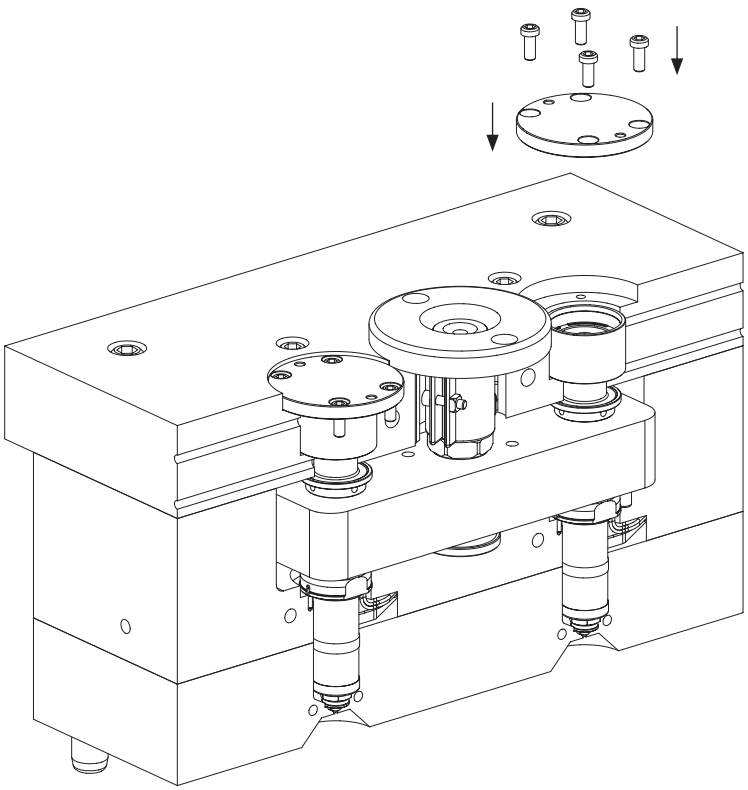
FIVE



Assemble **Valve Pin** 6 (ensure pin are matched to seals), **Valve Pin Adjustment Packers** 5a, 5b, 5c & 5d and the **Pin Locking Screw** 4 and tighten to 40Nm

PIN HEIGHT ADJUSTMENT CONT.....

SIX



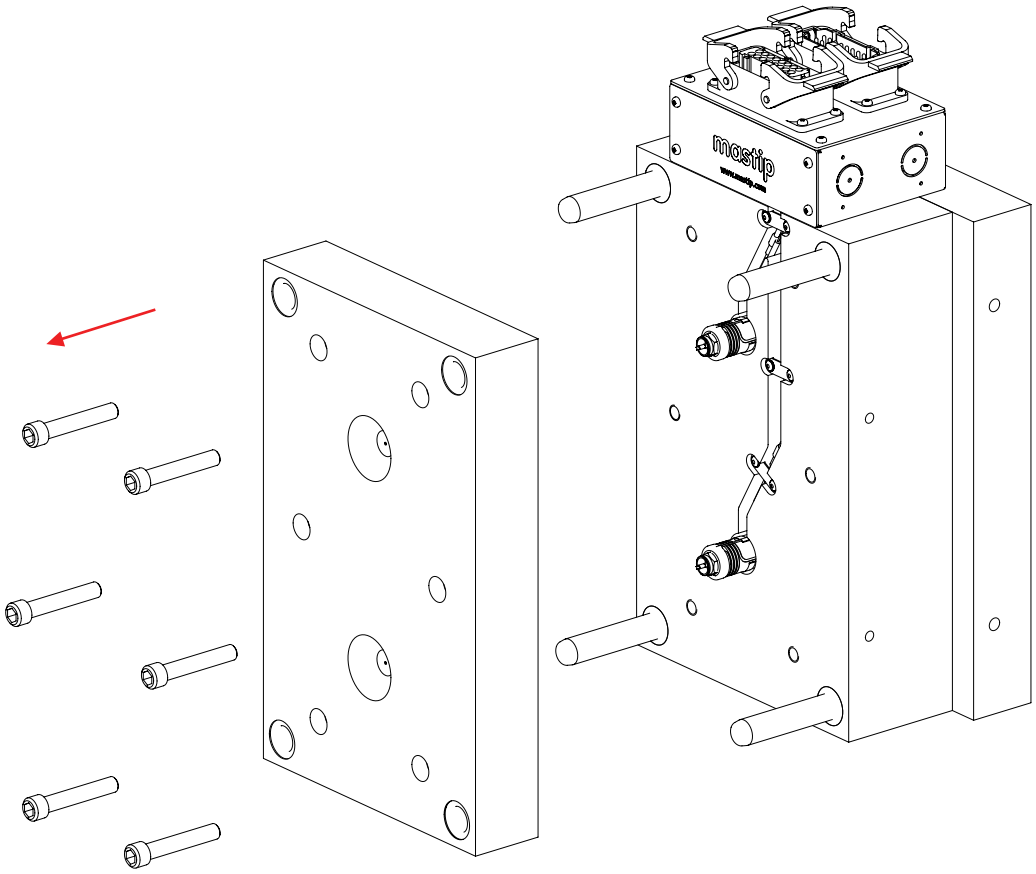
Fit **Blanking Plate** 2a or 2b to the mould backplate and fasten using **Blanking Plate Screws** 1

Valve Pin Guide Replacement

Caution: Where possible Mastip recommends removing and assembling the valve pin guide from the front (Nut/Tip) side of the mould.

→ **Guide replacement from the front (cavity side) of the mould**

ONE



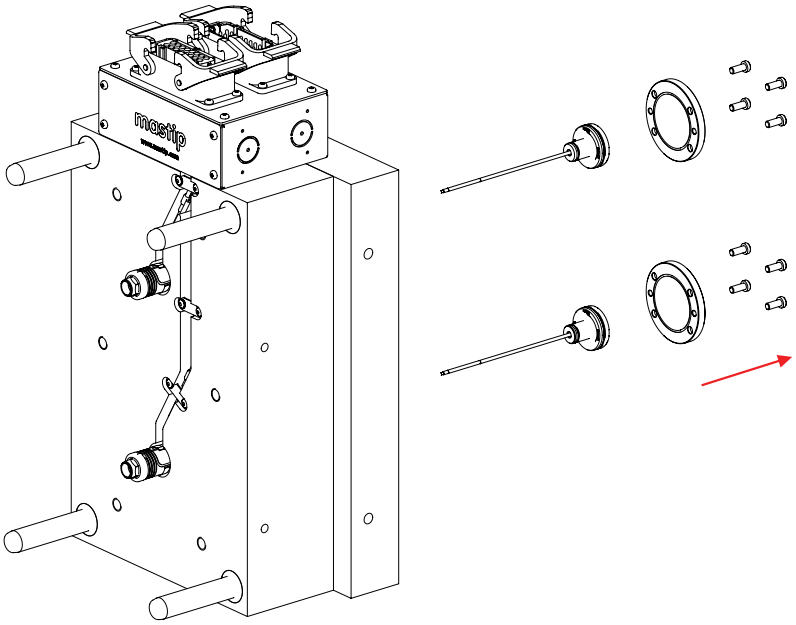
Remove the mould plates to expose the nozzle nut and tip

Heat up the nozzle to the melt temperature of the plastic inside

(⚠ Care must be taken not to touch any of the heated components ⚠)

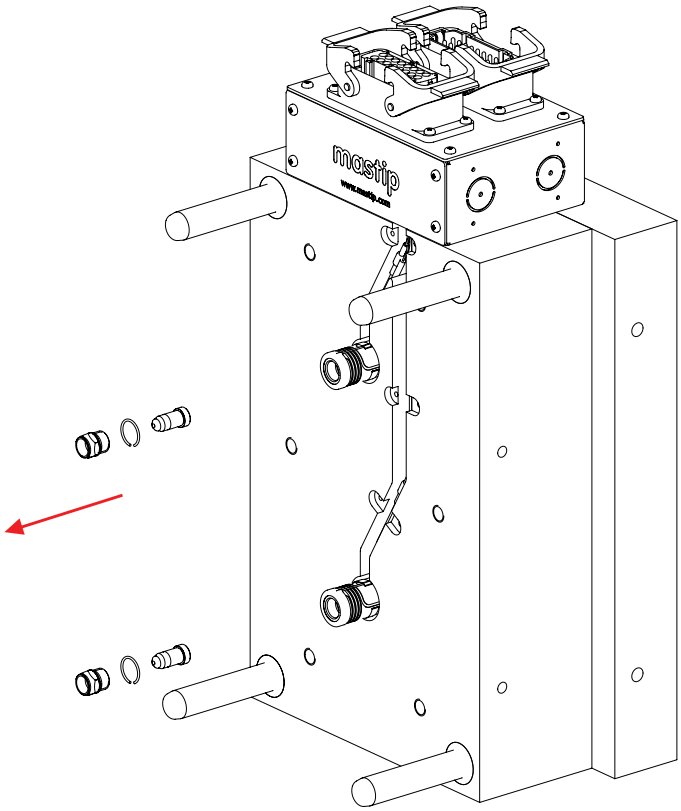
VALVE PIN GUIDE REPLACEMENT CONT.....

TWO



Remove the valve pin from the system

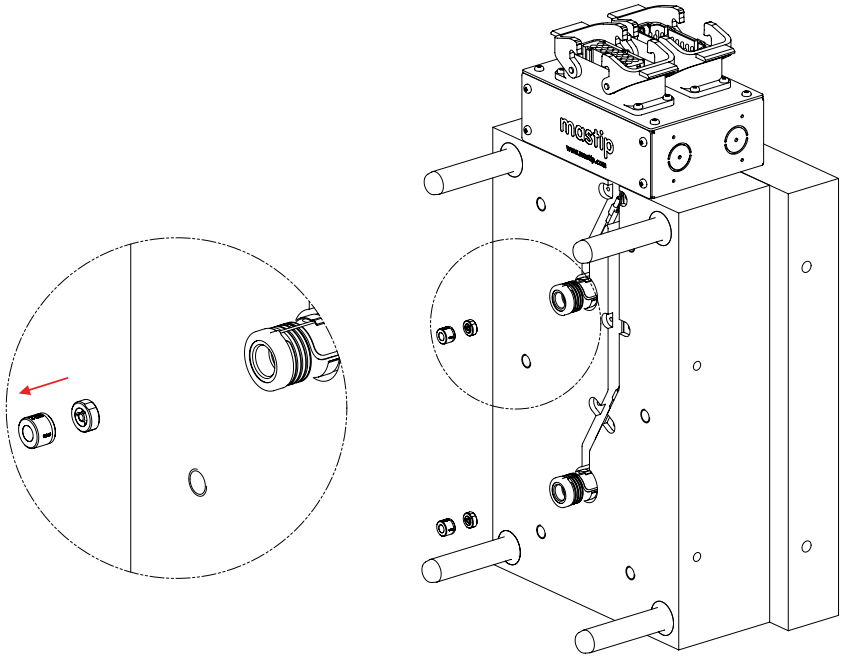
THREE



Allow the manifold and nozzles to cool, then remove the nozzle nut and tip, taking care not to cause any damage to the components

VALVE PIN GUIDE REPLACEMENT CONT.....

FOUR



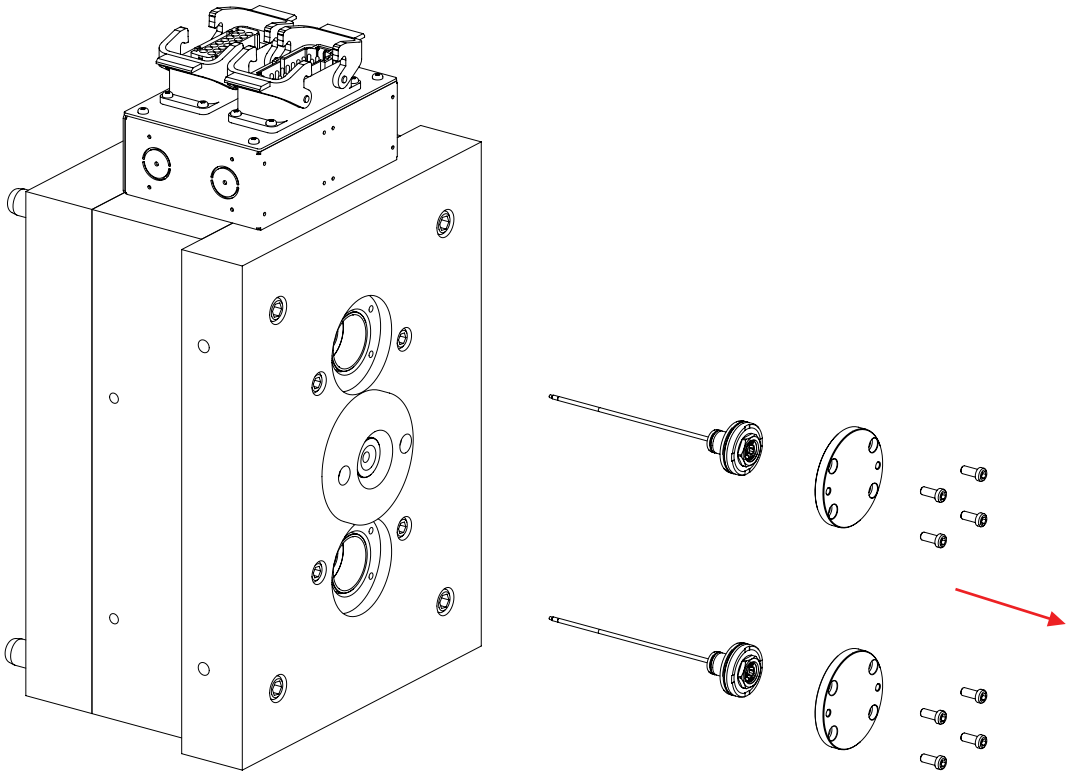
Using a hook carefully remove the packer and valve pin guide from the nozzle taking care not to cause any damage

Reassemble in the reverse order

→ **Guide replacement from the back (platen side) of the mould**

REMOVAL

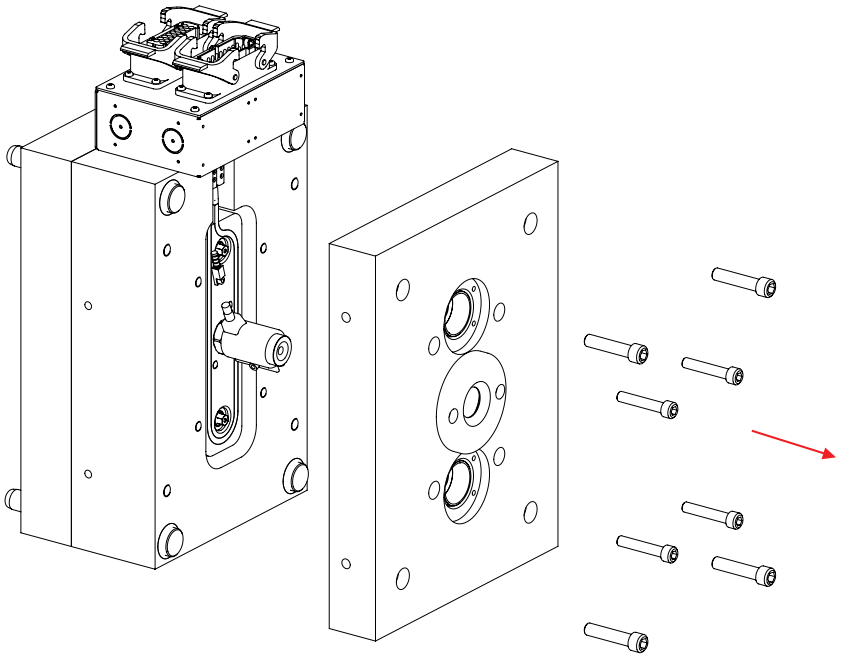
ONE



Heat up the manifold and nozzles to the melt temperature of the plastic inside
(⚠ Care must be taken not to touch any of the heated components ⚠)
Remove the valve pins from the system

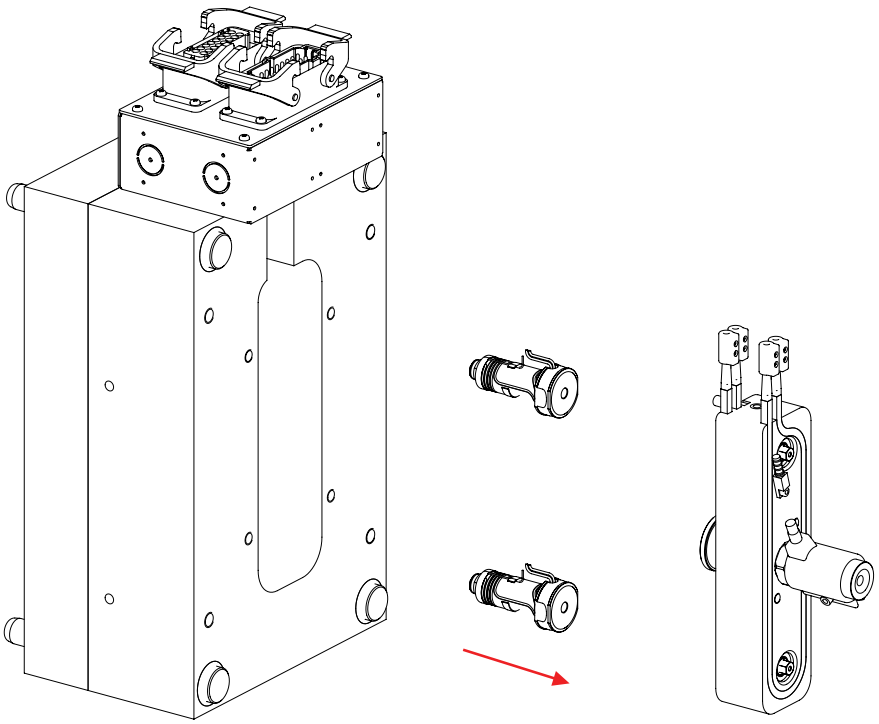
VALVE PIN GUIDE REPLACEMENT CONT.....

TWO



Allow the manifold and nozzles to cool, then remove the mould back plate

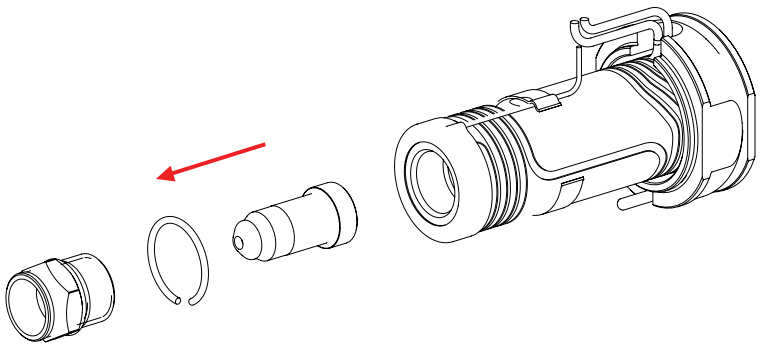
THREE



Remove the manifold and nozzles from the mould

VALVE PIN GUIDE REPLACEMENT CONT.....

FOUR

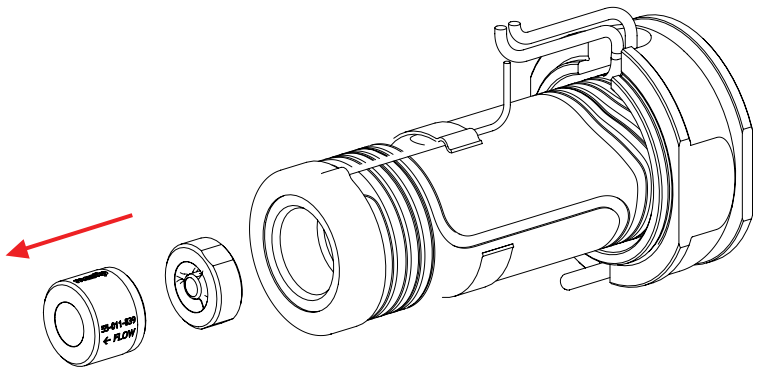


Secure the nozzle and heat up the nozzle to the melt temperature of the plastic inside

(⚠ Care must be taken not to touch any of the heated components ⚠)

Remove the nozzle nut and tip, taking care not to cause any damage to the components

FIVE

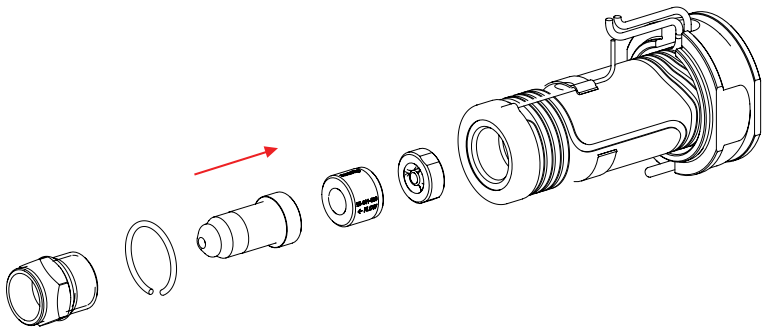


Using a hook carefully remove the packer and valve pin guide from the nozzle, taking care not to cause any damage

Alternatively, a soft punch (e.g. copper) may be inserted from the head of the nozzle to push the guide out

ASSEMBLY

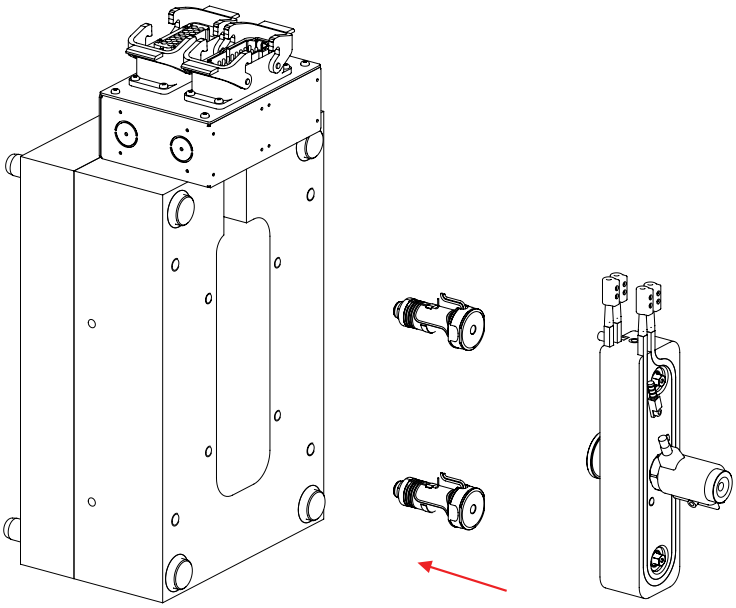
ONE



Ensure the nozzle nut and tip pocket is clean and free of any plastic or debris

Assembly the nozzle tip packer, valve pin guide and tip into the nozzle, ensuring they are in the correct orientation. Fit the nut and torque it to the recommended torque settings

TWO

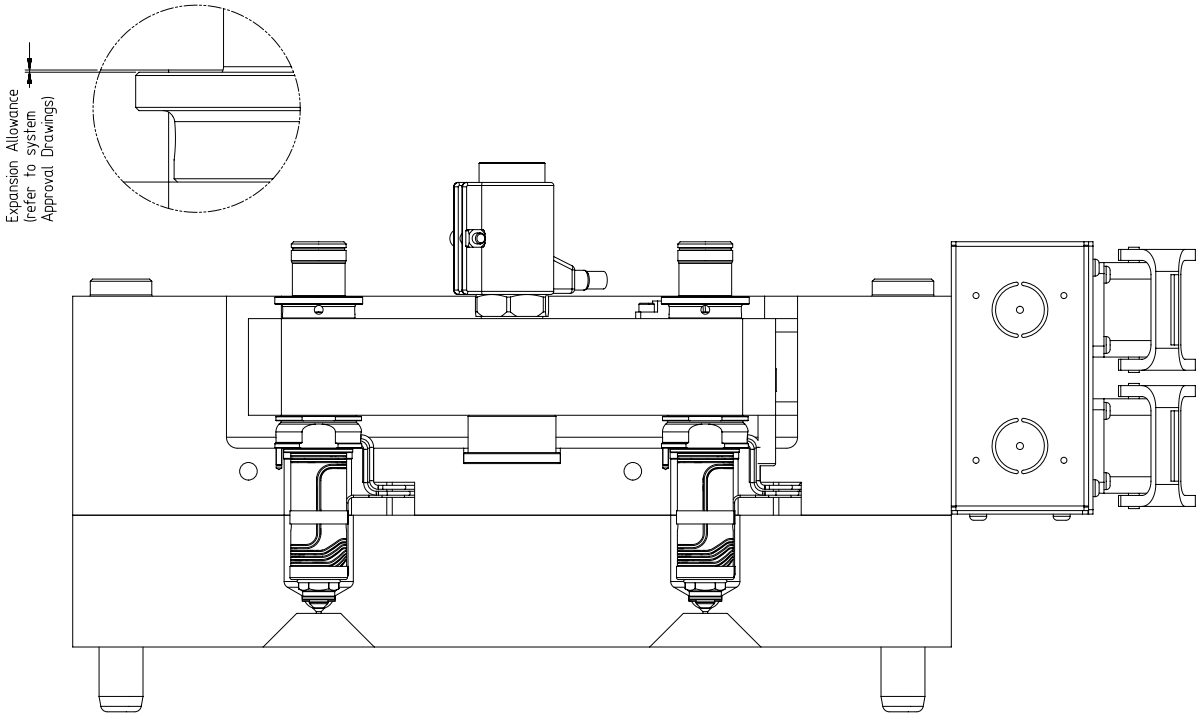


Ensure the nozzle seating faces are clean and free of debris, and fit the nozzle to the mould

Ensure the manifold and nozzle mating faces are clean and free of debris and fit the manifold to the mould

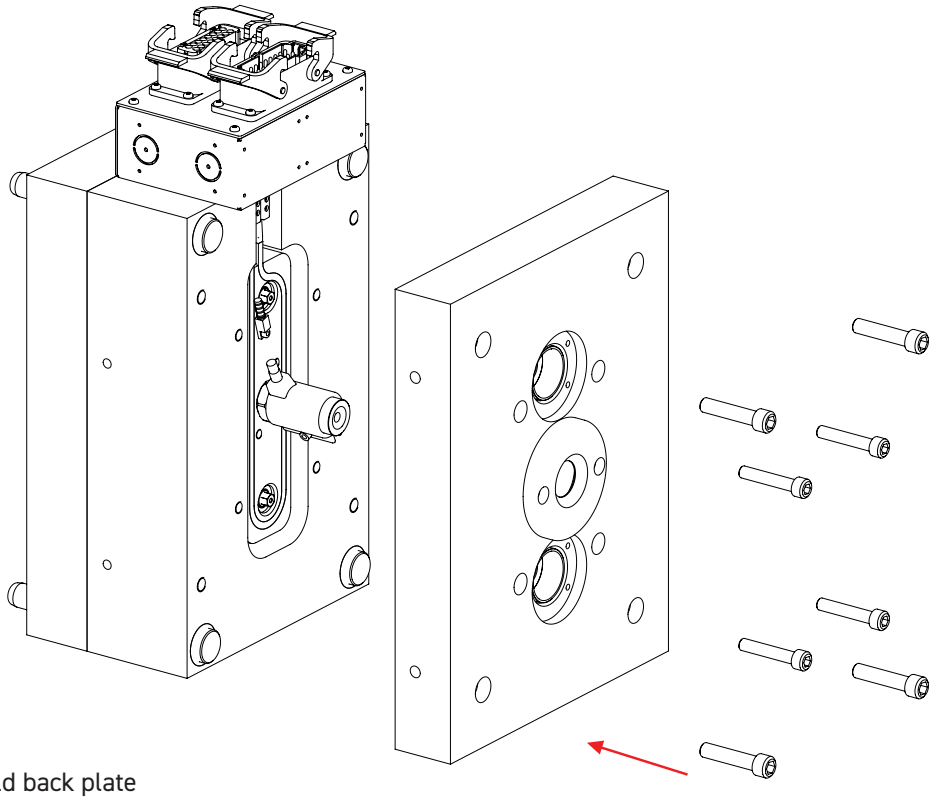
ASSEMBLY CONT.....

THREE



Measure all manifold and mould fitting heights to ensure correct expansion allowance is maintained

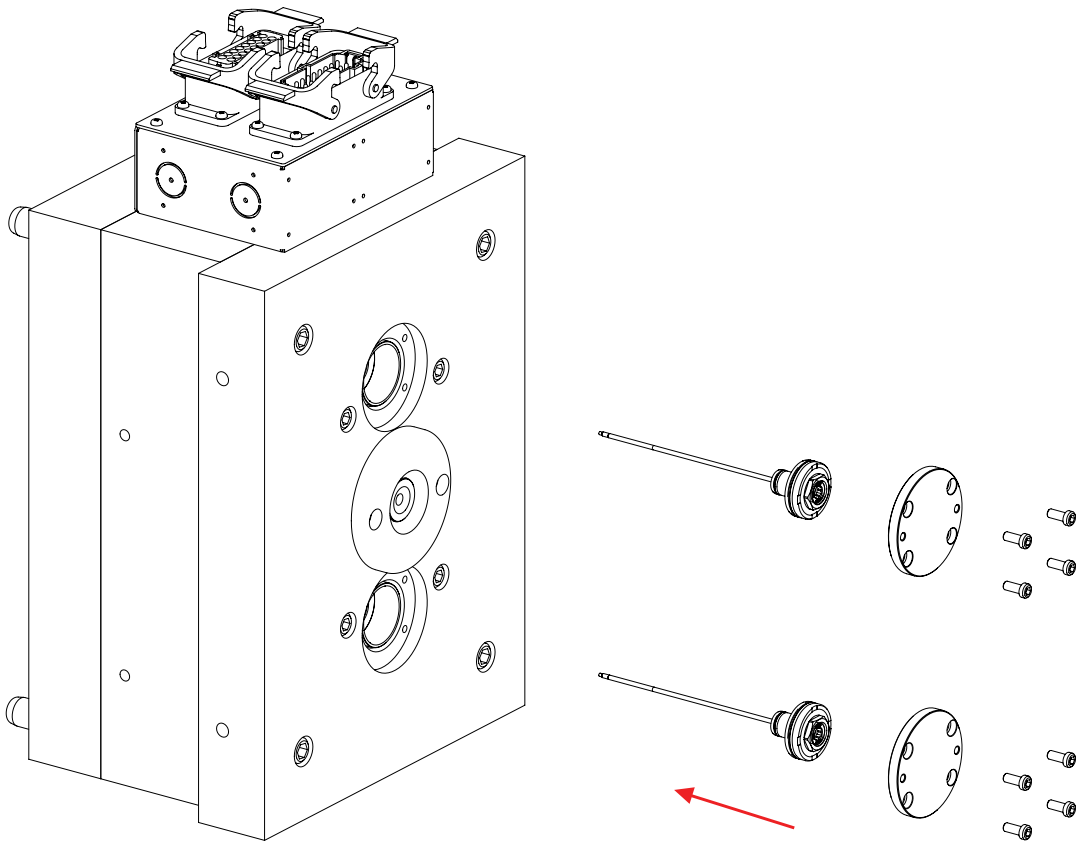
FOUR



Fit the mould back plate

ASSEMBLY CONT.....

FIVE



Heat up the manifold and nozzles to the melt temperature of the plastic inside to ensure correct thermal expansion has taken place

(⚠ Care must be taken not to touch any of the heated components ⚠)

Fit the valve pins and components

mastip™
hot runner solutions

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