Hydraulic Locking Core Pull Cylinders For Plastics and Die Cast Tools

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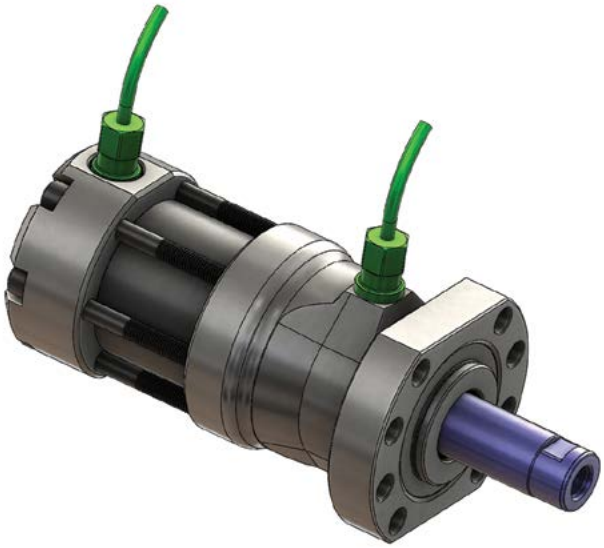
Enabling cost-saving movement of sliding cores



Product Benefits

- Withstands high loads
- Large locking surfaces promote extended service life
- Pulls sliding cores in injection molds and die cast tools
- Withstands temperatures up to 356°F (180°C)*
- Proximity sensors recognize full forward and full reverse

System Cost Savings

Cost savings achieved when the Hydraulic Locking Core Pull Cylinder is used instead of traditional methods:

- Mold design and manufacturing time
- Mold fitting and assembly time
- Mold maintenance time
- Material cost (smaller mold base required)
- Cycle time reduction

*

- *When using proximity sensors standard to Core Pull Cylinders, the cylinder assembly will withstand temperatures up to 176°F (80°C).*
- *When an external method for sensing sliding core position is used, the cylinder assembly will withstand temperatures up to 356°F (180°C).*
- *(Proximity sensors are replaced by plugs)*

Product Overview

When designing molds with sliding cores, the mold designer is often faced with the challenge of fitting all traditional components in as small a mold base as possible. There are different methods of actuating a sliding core, the most common of which uses horn or angle pins (Fig. 1) to move the slide when the mold opens or closes. Heel blocks are normally used behind the sliding core to withstand injection pressure acting on the sliding core. Not only do these components use up precious mold space, but they are tied to the movement of the platen. Some molded parts also require that the sliding core be moved prior to opening a mold. While it is possible to use standard cylinders (Fig. 2) to actuate the sliding core or heel block, typical designs require additional mold design and machining, and waste mold space.

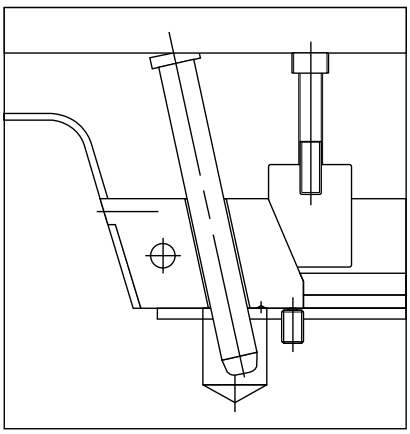


Fig. 1. Slide Movement example using an angle pin and locking with a heel block (wedge).

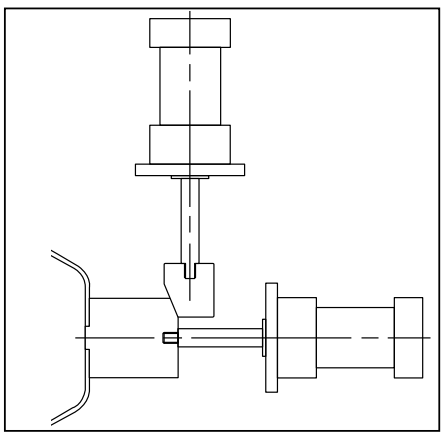


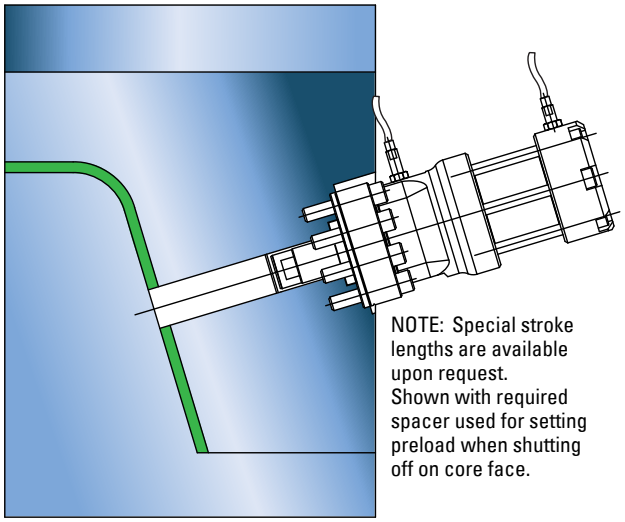
Fig. 2. Slide Movement example using a hydraulic cylinder to actuate slide, and a separate cylinder to actuate the heel block.

Get the HLCP Cylinder Advantage!

The Hydraulic Locking Core Pull (HLCP) Cylinder replaces traditional slides and heel blocks, enabling independent movement of the sliding core while eliminating the need for a heel block. By using a segmented ring that presses into an internal groove inside the cylinder assembly while in closed position, the injection pressure from the part cavity acts against the cross section of the segmented ring, eliminating the need for heel blocks.

Eliminating separate heel blocks or additional cylinders can result in a smaller mold base size, simplifying mold designs and increasing cost savings!

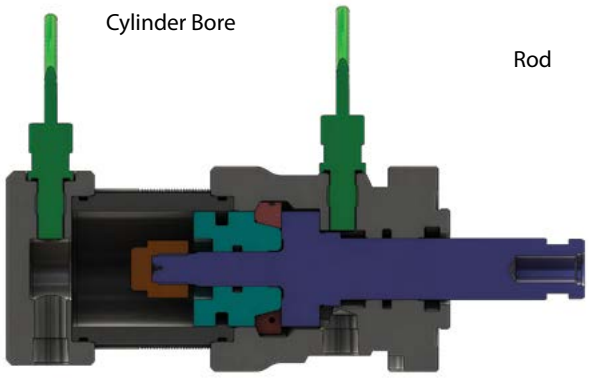
The HLCP Cylinder is a robust, compact design. Available in seven sizes, each size has two available standard strokes. Due to the modular design of the HLCP Cylinder, special strokes are available upon request with quick delivery. The cylinder is constructed of hardened steel for extra long service life. Because of the cylinder's special design and breadth of assembly sizes available, a wide range of holding forces are possible with a hydraulic holding pressure of only 870 PSI (60 Bar).



NOTE: Special stroke lengths are available upon request. Shown with required spacer used for setting preload when shutting off on core face.

Fig. 3. Slide Movement example using the Hydraulic Locking Core Pull Cylinder.

ITEM NUMBER		STROKE	ROD DIA.	CYLINDER BORE DIA.
NPN TYPE	PNP TYPE			
HLCP060-1000DW	HLCP060-1000DWP	1.00"	16 mm	30 mm
HLCP060-2000DW	HLCP060-2000DWP	2.00"		
HLCP100-1250DW	HLCP100-1250DWP	1.25"	20 mm	36 mm
HLCP100-2500DW	HLCP100-2500DWP	2.50"		
HLCP150-1375DW	HLCP150-1375DWP	1.375"	25 mm	45 mm
HLCP150-2750DW	HLCP150-2750DWP	2.75"		
HLCP200-1750DW	HLCP200-1750DWP	1.75"	32 mm	56 mm
HLCP200-3500DW	HLCP200-3500DWP	3.50"		
HLCP300-2000DW	HLCP300-2000DWP	2.00"	42 mm	71 mm
HLCP300-4000DW	HLCP300-4000DWP	4.00"		
HLCP500-2500DW	HLCP500-2500DWP	2.50"	50 mm	84 mm
HLCP500-5000DW	HLCP500-5000DWP	5.00"		
HLCP750-3000DW	HLCP750-3000DWP	3.00"	60 mm	105 mm
HLCP750-6000DW	HLCP750-6000DWP	6.00"		

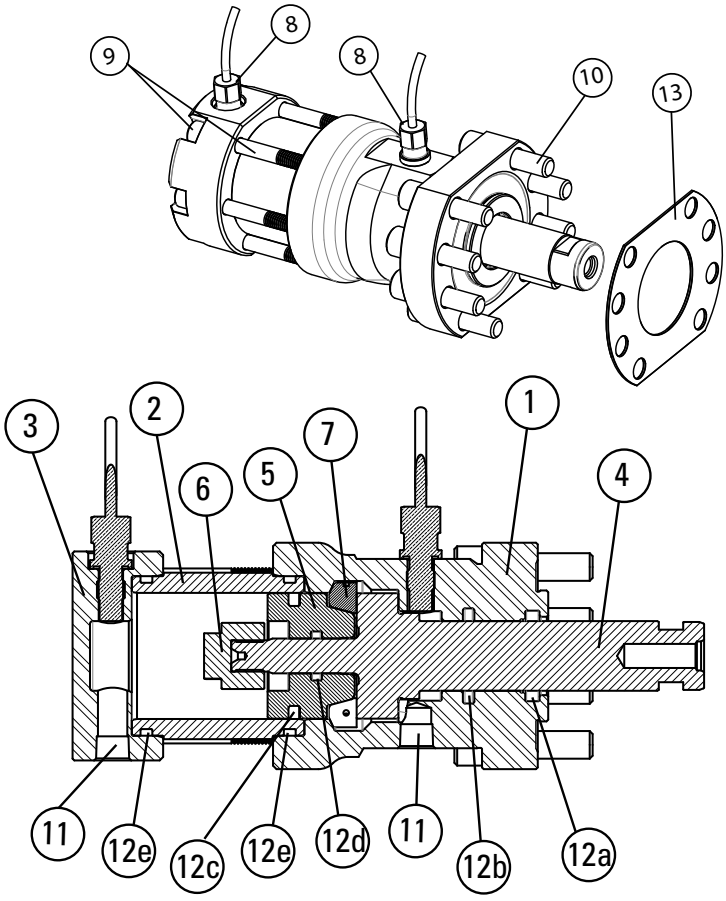


ITEM NUMBER		AT 160 BAR (2321 PSI) PRELOAD [mm]	HOLDING FORCE IN KILO NEWTON [kN]		HOLDING FORCE IN POUND FORCE [bf]		HOLDING FORCE IN METRIC TON [ton]		HOLDING FORCE IN UK (troy) TON [ton]		HOLDING FORCE IN US (avdp) TON [ton]	
NPN TYPE	PNP TYPE		WITHOUT PRELOAD	WITH MAX PRELOAD	WITHOUT PRELOAD	WITH MAX PRELOAD	WITHOUT PRELOAD	WITH MAX PRELOAD	WITHOUT PRELOAD	WITH MAX PRELOAD	WITHOUT PRELOAD	WITH MAX PRELOAD
HLCP060-1000DW	HLCP060-1000DWP	0.15	60	35	13,488	7,868	6.12	3.57	5.46	3.19	6.74	3.93
HLCP060-2000DW	HLCP060-2000DWP	0.20										
HLCP100-1250DW	HLCP100-1250DWP	0.15	100	50	22,480	11,240	10.2	5.10	9.11	4.55	11.24	5.62
HLCP100-2500DW	HLCP100-2500DWP	0.20										
HLCP150-1375DW	HLCP150-1375DWP	0.10	150	65	33,720	14,612	15.3	6.63	13.65	5.91	16.86	7.31
HLCP150-2750DW	HLCP150-2750DWP	0.15										
HLCP200-1750DW	HLCP200-1750DWP	0.15	200	110	44,960	24,728	20.39	11.21	18.20	10.01	22.48	12.36
HLCP200-3500DW	HLCP200-3500DWP	0.20										
HLCP300-2000DW	HLCP300-2000DWP	0.15	300	160	67,440	35,968	30.59	16.31	27.31	14.57	33.72	17.98
HLCP300-4000DW	HLCP300-4000DWP	0.20										
HLCP500-2500DW	HLCP500-2500DWP	0.20	500	300	112,400	67,440	50.98	30.59	45.51	27.31	56.20	33.72
HLCP500-5000DW	HLCP500-5000DWP	0.30										
HLCP750-3000DW	HLCP750-3000DWP	0.20	750	400	168,600	89,920	76.48	40.79	68.27	36.41	84.30	44.96
HLCP750-6000DW	HLCP750-6000DWP	0.30										

The HLCP Cylinder operates between fully opened and fully closed positions, both of which are sensed by high pressure proximity sensors without any mechanical contact. The HLCP Cylinder has a built-in cushion at the fully retracted end of the piston stroke, extending the service life of the cylinder.

The HLCP Cylinder's integral flange allows easy installation and mounts to the mold using socket head cap screws. Socket head cap screw sizes used for mounting the HLCP Cylinder to the mold are UNC-type. A spacer plate (shim) is supplied with the HLCP Cylinder for installation beneath the HLCP Cylinder flange, enabling fine adjustment in the mold. The spacer plate also provides important preload on the cylinder rod, particularly when the sliding core must shut off against the opposing wall of the core. Hydraulic fittings are NPTF-type fittings.

Due to the nature of the flange mounting design, the same size HLCP Cylinders are easily interchangeable. The cylinder's flange and screw mounting method ensures that the proximity sensors will always be positioned in the same orientation when the HLCP Cylinder is installed to the side of the mold.



Item	Part Name	Notes
1	Body	
2	Sleeve	
3	Cap	
4	Rod	
5	Piston	
6	Piston Bushing	
7	Segment kit	
8	Sensor	HLCPNPN-M8 (NPN TYPE) HLCPPNP-M8 (PNP TYPE)
9	Assembly screw	
10	Mounting screw	
11	Oil cap	
12	Sealing kit	See installation instructions on www.dme.net
12a	Excluder	
12b	Step seal	
12c	Glyd ring	
12d	O-ring	
12e	O-ring	
13	Spacer	

NOTE: Sensors supplied are NPN type as standard. PNP type sensors are available upon request. Larger size HLCP cylinders use additional retainers with proximity Sensors.

Sensors require power.*

* NPN and PNP sensors function in a similar manner, except the power supply polarities are reversed for each type. NPN inductive sensors are more common in North America, while PNP is more common in Asia and Europe. If PNP is not requested, the cylinders will be delivered with NPN sensors, even for special orders.

Mold Design & Installation Considerations

Available in seven sizes, each size of the Hydraulic Locking Core Pull Cylinder has two available "standard" stroke lengths.

If a stroke is required that is different than the available standard strokes, then a non-standard stroke design is required. When ordering this product, specify the required stroke if the available standard strokes are not suitable for the intended application.

Hydraulic Locking Core Pull Cylinder Assembly Sizes

ITEM NUMBER		STROKE	ROD DIA.	CYLINDER BORE DIA.	NPTF TAP
NPN TYPE	PNP TYPE				
HLCP060-1000DW	HLCP060-1000DWP	25.4 mm (1.00 in)	16 mm (0.63 in)	30 mm (1.18 in)	1/8
HLCP060-2000DW	HLCP060-2000DWP	50.8 mm (2.00 in)			
HLCP100-1250DW	HLCP100-1250DWP	31.8 mm (1.25 in)	20 mm (0.79 in)	36 mm (1.42 in)	1/8
HLCP100-2500DW	HLCP100-2500DWP	63.5 mm (2.50 in)			
HLCP150-1375DW	HLCP150-1375DWP	34.9 mm (1.375 in)	25 mm (0.98 in)	45 mm (1.77 in)	1/4
HLCP150-2750DW	HLCP150-2750DWP	69.9 mm (2.75 in)			
HLCP200-1750DW	HLCP200-1750DWP	44.5 mm (1.75 in)	32 mm (1.26 in)	56 mm (2.20 in)	1/4
HLCP200-3500DW	HLCP200-3500DWP	88.9 mm (3.50 in)			
HLCP300-2000DW	HLCP300-2000DWP	50.8 mm (2.00 in)	42 mm (1.65 in)	71 mm (2.80 in)	3/8
HLCP300-4000DW	HLCP300-4000DWP	101.6 mm (4.00 in)			
HLCP500-2500DW	HLCP500-2500DWP	63.5 mm (2.50 in)	50 mm (1.97 in)	84 mm (3.31 in)	3/8
HLCP500-5000DW	HLCP500-5000DWP	127.0 mm (5.00 in)			
HLCP750-3000DW	HLCP750-3000DWP	76.2 mm (3.00 in)	60 mm (2.36 in)	105 mm (4.13 in)	1/2
HLCP750-6000DW	HLCP750-6000DWP	152.4 mm (6.00 in)			

The HLCP Cylinder maintains a sliding core in full back (retracted) or full forward (extended) positions. In order for the cylinder assembly to "lock", the piston must be full extended forward. This product's provided spacer plate is placed between the front of the body flange and pocket installation. The spacer plate must be properly ground to ensure suitable fit at the desired mold operation temperature. The adjustment of the spacer plate is important for when the sliding core must "shut off" against an opposing core wall or face, so that plastic flashing is avoided.

Positional alignment of the cylinder assembly is achieved by aligning the forward collet of the cylinder body (protrudes forward of the mounting flange) into the mold plate via the outer diameter of the collet. The collet will protrude past the spacer plate. Rotational alignment of the overall assembly is achieved via the mounting screws, as rotational alignment is only used to position the proximity sensors and hydraulic fitting connections and/or hoses within the overall installation. The piston may freely rotate; therefore, if rotational alignment of the sliding core is required, rotational alignment of the sliding core must be achieved via other means.

While recommended installation pocket details are based on the cylinder assembly being recessed into the side of the mold plate, it is possible to have the cylinder assembly mounted fully "proud" of the side of the mold plate. However, positional alignment of the cylinder assembly to the mold plate requires the forward collet (protruding forward of the mounting flange of the cylinder body) to be recessed partially into the side of the mold. An overall installation adjustment is required to fit each application, while maintaining minimum clearances for the hydraulic fitting connections and/or hoses, as well as maintaining clearances for the proximity sensors.