High Capacity, Part Present Sensing

CONFIRM YOUR PART IS PRESENT EVERY TIME!

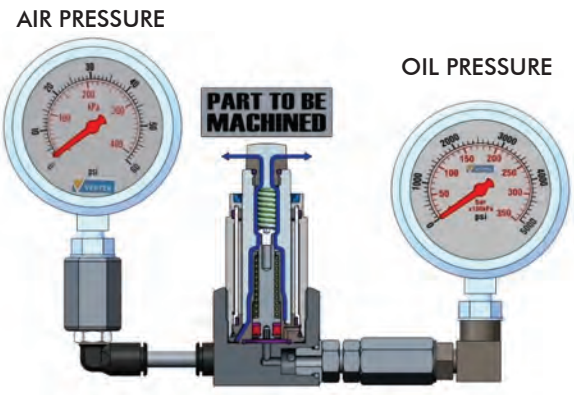
With Our Part Present Sensing Work Support

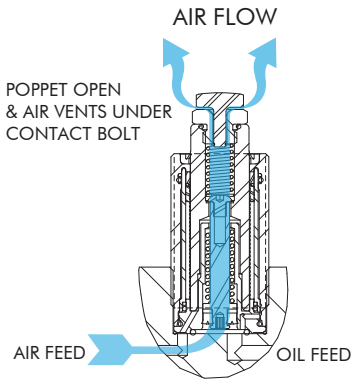
HOW IT WORKS

WATCH "HOW IT WORKS" VIDEO ON OUR WEBSITE

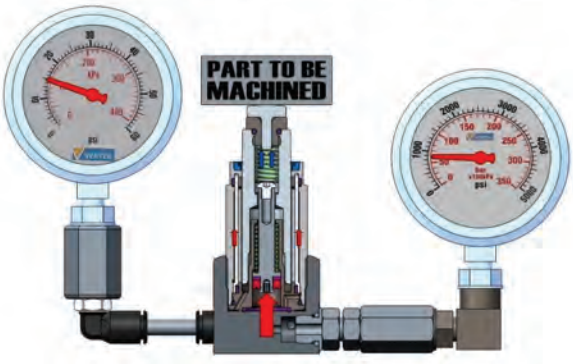
www.vektek.com

Phase 1: Air pressure escapes under contact bolt until contact is made with part.



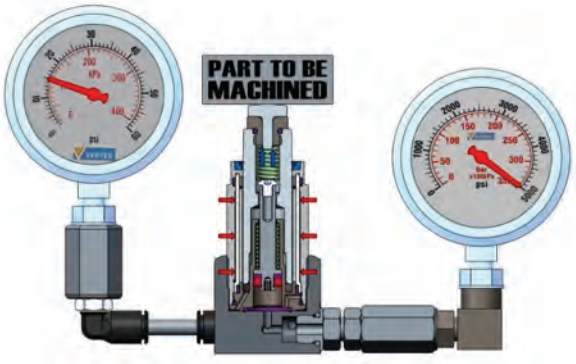


Phase 2:
Work support touches part, with light spring force, closing poppet. Air pressure builds confirming part is present.



Phase 3:
Sleeve squeezes plunger and locks it in place.

TURN THE PAGE

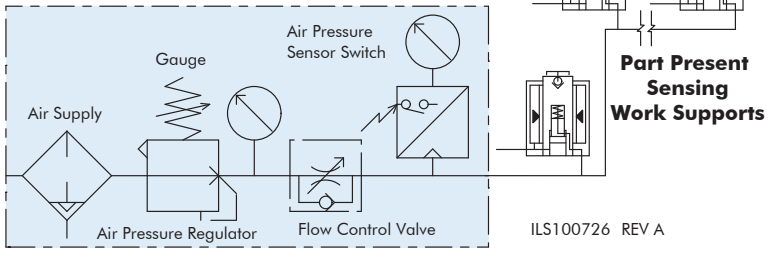


Air Sensing Control Kit for Pneumatic Confirmation Systems

Ready-to-use kit with everything you need to feedback a confirmation signal of your choice!

See Section: M

Air Sensing Control Kit 50-8240-00



High Capacity, Part Present Sensing

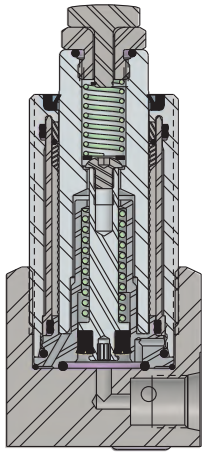
NEW

Confirm part is present and contacted even on as-cast surfaces!

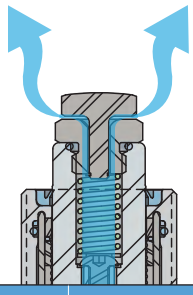
Plungers stay retracted during part loading while air flow travels through the work support. Hydraulic pressure advances the plunger exerting only spring force as it makes contact with the part. This closes the integral air valve to indicate part is present and contacted. Hydraulic pressure then automatically sequences, "freezing" the plunger.

- Available in 2,000, 4,000 and 8,000 lb. capacity.
- Order with four bolt base or cartridge only.
- Once support is locked, air sensing positively confirms both contact and part present.
- Use Vektek's Air Sensing Control Kit 50-8240-00 for easy setup.
- Four bolt base is compatible with Vektek In-Port flow control and In-Port sequence valves.
- Uses Vektek's BHC technology to guard against corrosion.
- O-Ring face seal design makes machining cavities easier.
- Max air operating pressure is 15 PSI.

Standard SAE porting and alternate O-Ring manifold face seal is located in the base of the support for bolt down installation. The base can be removed for direct cartridge mounting.



HIGH CAPACITY TuffGrip™ WORK SUPPORTS



ILS100721 REV D
U.S. PATENT NO. 10,799,992

Model No.	Support Capacity (lbs.)*	Mounting Style***	Contact Force (lbs.)	Stroke (in.)	Base Dimensions (in.)	Retracted Height (in.)	Oil Capacity (cu. in.)**	Port X Depth for Optional In-Port Valves****
Fluid Advance Work Supports, hydraulic pressure pushes a spring which lifts plunger, hydraulic pressure locks in place.								
10-0706-10-PS	2000	Cartridge	1-6	0.25	N/A	2.28	0.05	N/A
10-0806-20-PS		SAE/Manifold			1.19 X 1.31 X 1.31	2.93		SAE 4 X 0.58
10-0706-16-PS		Cartridge		0.50	N/A	2.78	0.07	N/A
10-0806-26-PS		SAE/Manifold			1.19 X 1.31 X 1.31	3.43		SAE 4 X 0.58
10-0708-10-PS	4000	Cartridge	3-10	0.25	N/A	3.04	0.20	N/A
10-0808-20-PS		SAE/Manifold			1.50 X 1.63 X 1.63	3.69		SAE 4 X 0.58
10-0708-16-PS		Cartridge		0.50	N/A	3.54	0.23	N/A
10-0808-26-PS		SAE/Manifold			1.50 X 1.63 X 1.63	4.19		SAE 4 X 0.58
10-0710-10-PS	8000	Cartridge	4-13	0.63	N/A	4.28	0.57	N/A
10-0810-20-PS		SAE/Manifold			1.63 X 2.13 X 2.13	4.91		SAE 4 X 0.750

* Support capacities are listed at 5,000 psi maximum pressure. Support capacities for other pressures are shown in the fluid advance High Capacity and Part Present Sensing load capacity chart.

** Restrict flow rate to a maximum of 130 cu. in./minute.

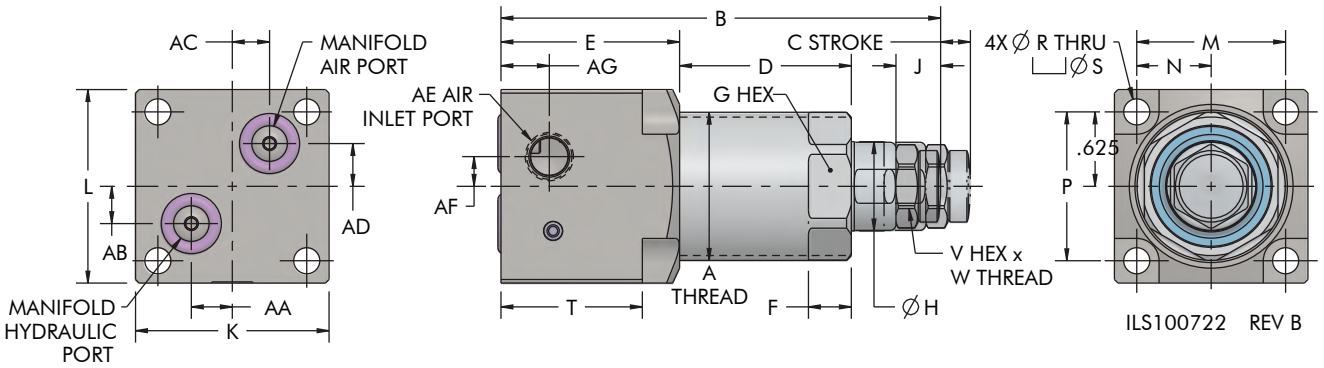
*** For cartridge mount models, see cavity dimensions drawings in this catalog section.

**** In-Port Valves require the use of manifold mount ports.

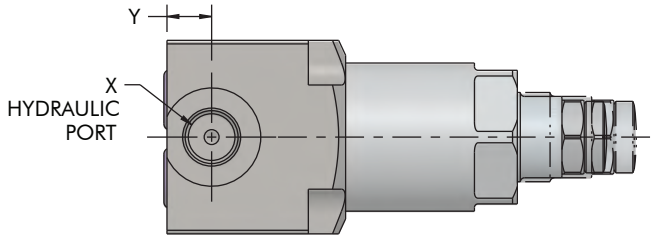
NOTE: The maximum system back-pressure a fluid advance work support can overcome is 10 psi. Returning back-pressure greater than 10 psi may cause slow or failed retraction.

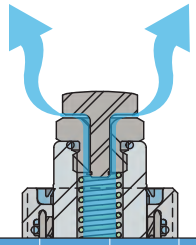
PORT DEVICE READY

High Capacity, Part Present Sensing



For proper sealing, mating surface must be flat within 0.003 in with a maximum 63 μ in. R_a surface finish.



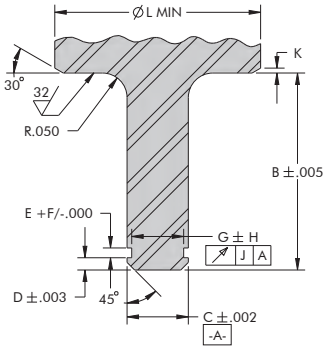


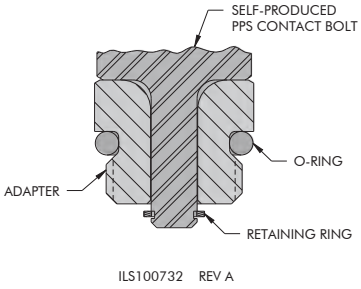
Dimensions

Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
10-0806-20-PS	1-16	2.93	0.25	1.19	1.19	0.21	0.88	0.56	0.28	1.31	1.31	1.00	0.50	1.00	0.50
10-0806-26-PS		3.43	0.50	1.65											
10-0808-20-PS	1 1/4-16	3.69	0.25	1.44	1.50	0.36	1.13	0.75	0.38	1.63	1.63	1.25	0.63	1.25	0.63
10-0808-26-PS		4.19	0.50	1.83											
10-0810-20-PS	1 3/4-16	4.91	0.63	3.22	1.63	0.40	1.50	1.00	0.59	2.13	2.13	1.69	0.84	1.69	0.84

Model No.	R	S	T	V	W	X	Y	AA	AB	AC	AD	AE	AF	AG
10-0806-20-PS	0.19	0.30	0.94	0.43	5/16-18 X .20	SAE 4	0.38	0.31	0.16	0.14	0.36	1/8 NPT	0.16	0.38
10-0806-26-PS														
10-0808-20-PS	0.22	0.38	1.19	0.62	7/16-14 X .25			0.34	0.31	0.31	0.36		0.25	0.41
10-0808-26-PS														
10-0810-20-PS	0.28	0.44	1.25	0.81	5/8-11 X .31			0.31	0.56	0.63	0.19		0.19	0.41

Self Produced Part Present Sensing Contact Bolt

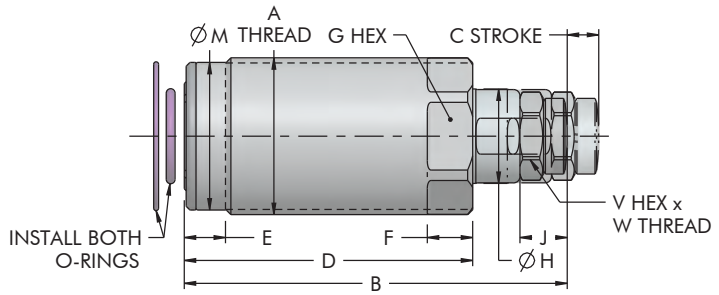




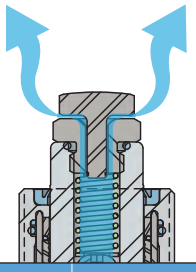
Model No.	Retaining Ring No.*	Adapter No.*	O-Ring No*	Max Weight (lbs)	B	C	D	E	F	G	H	J	K	L
10-0706-10-PS	23-0100-07	81-0606-01	39-0510-59 (0.236 x 0.059)	.25	.402	.125	.025	.020	.002	.1060	.0015	.0015	.010	.405
10-0806-20-PS														
10-0706-16-PS		81-0606-03	39-0000-69 (0.301 x 0.064)											
10-0806-26-PS														
10-0708-10-PS	23-0100-08	81-0608-01	55-2500-05 (0.301 x 0.070)	.27	.502	.156	.025	.020	.002	.1350	.0015	.0015	.015	.600
10-0808-20-PS														
10-0708-16-PS														
10-0808-26-PS														
10-0710-10-PS	23-0100-06	81-0610-01	39-0511-76 (0.472 x 0.079)	.45	.720	.250	.030	.029	.003	.220	.002	.002	.020	.685
10-0810-20-PS														

*Retaining ring, adapter, and O-ring may be ordered as needed

High Capacity, Part Present Sensing



ILS100725 REV C
U.S. PATENT NO. 10,799,992



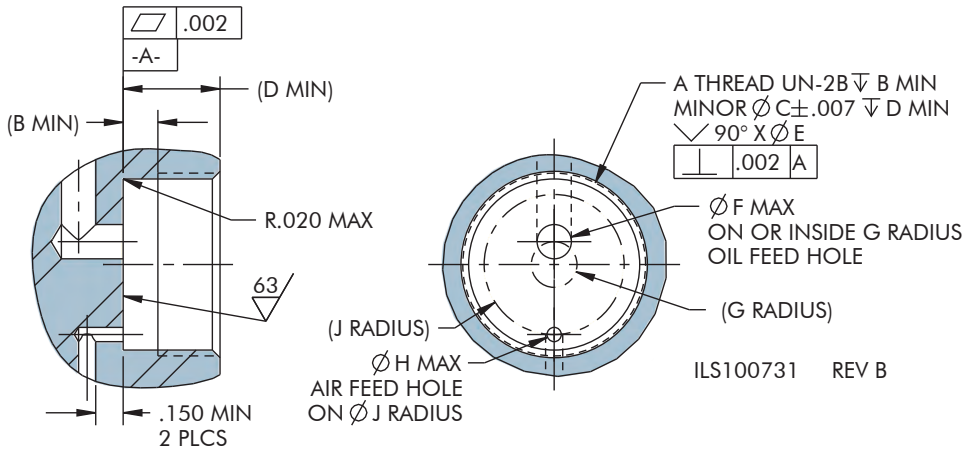
Dimensions

Model No.	A	B	C	D	E	F	G	H	J	M	V	W
Cartridge Mount, High Capacity Fluid Advance Work Support												
10-0706-10-PS	1-16	2.28	0.25	1.72	0.24	0.21	0.88	0.56	0.28	0.92	0.43	5/16-18 X .20
10-0706-16-PS		2.78	0.50	2.18								
10-0708-10-PS	1 1/4-16	3.04	0.25	2.29	0.33	0.36	1.13	0.75	0.38	1.17	0.62	7/16-14 X .25
10-0708-16-PS		3.54	0.50	2.67								
10-0710-10-PS	1 3/4-16	4.28	0.63	3.22	0.33	0.40	1.50	1.00	0.59	1.67	0.81	5/8-11 X .31

Fluid Advance High Capacity Part Present Sensing Cartridge Mount

Cavity Check List

- ☐ Confirm capacity of item selected.
- ☐ Note the sealing surface finish requirements.
- ☐ Minimum depth specification represents the nominal depth of the standard Vektek base dimension.
- ☐ Confirm cavity drawing is appropriate for the model number used.
- ☐ Note specified thread depth when cutting threads.
- ☐ When using a bottoming tap tool, modifications may be required.
- ☐ When hand tapping threads, perpendicularity is essential.

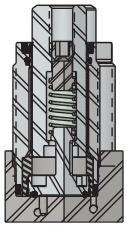


ILS100731 REV B

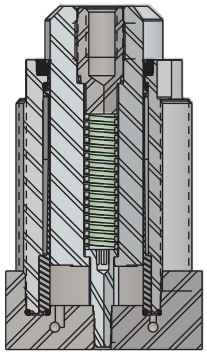
Cavity Dimensions

Model No.	A	B	C	D	E	F	G	H	J	Installation Torque
Cartridge Mount, High Capacity Fluid Advance Work Support										
10-0706-10-PS	1-16	0.170	0.939	0.53	1.03	0.188	0.125	0.078	0.383	35 ft-lb
10-0706-16-PS										
10-0708-10-PS	1 1/4-16	0.260	1.189	0.85	1.28	0.188	0.187	0.125	0.476	50 ft-lb
10-0708-16-PS										
10-0710-10-PS	1 3/4-16	0.290	1.689	1.00	1.78	0.250	0.297	0.188	0.688	100 ft-lb

Spring Advance



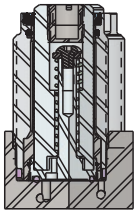
1000 & 2500 lb.



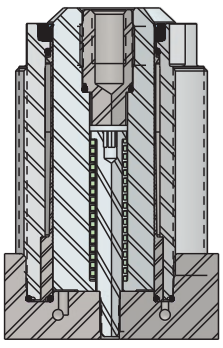
7500, 12500 & 20000 lb.

ILS100500 REV L

Air Advance



1000 & 2500 lb.



7500, 12500 & 20000 lb.

ILS100600 REV N

Standard Features

- Highly repeatable; plus or minus 0.0002 inches.
- Standard Work Supports may be bolted up or down to mount directly on fixture plates. They may also be installed through a hole in the fixture and locked in place using retaining collars for easy adjustment.
- Standard SAE porting is located in the base of the support for easy access to both the clamp and vent ports (bronze filter installed before shipping).
- Design features ensure VektorFlo® work supports last longer, stand up to harsh environments and abuse better than other models without these features.
- Proprietary wiper and seal designs reduce contamination and drag for longer lasting, better performing work supports.
- Special corrosion resistant plungers and sleeves reduce the tendency to stick.
- Special large diameter plungers and sleeves provide greater rigidity.
- Cartridge mount work supports available in all styles for installation into customer machined cavities.

For Supporting Most Parts

- Available in four capacities from 1,000 to 12,500 lbs, these units adapt to support fragile parts, heavy parts or "hog out" applications.
- When using the 3-2-1 locating principles, you often need additional support for a 4th, 5th or even more areas on your part. A work support will give you "floating" locators which won't interfere with your 3, 2 or 1 locators. Clamp over your locators then lock the supports.
- Spring extended plungers maintain contact with the part during loading, exerting only spring force against the part. When hydraulic pressure is applied the plunger freezes without exerting any additional force on the part.

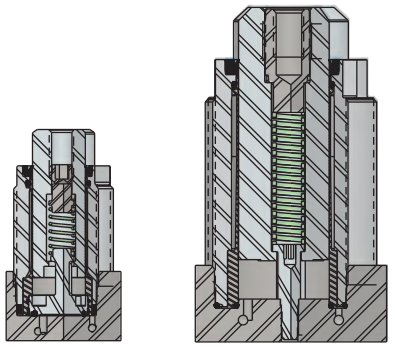
Proprietary wiper and seal designs reduce contamination and drag for longer lasting, better performing Work Supports.

Stainless steel plunger and sleeve assemblies help guard against corrosion in most machining environments.

Precision fit plunger/sleeve assemblies allow VektorFlo® Work Supports to begin to lock at lower pressures and build support faster.

If spring advance supports are to be used in flood coolant environments (consider air advance) attach tubing to the vent port and route to clean, dry air to keep coolant from being drawn in and becoming sticky on internal surfaces.

Standard SAE porting and alternate O-Ring manifold face seal is located in the base of the support for bolt down installation. The base can be removed for direct cartridge mounting.



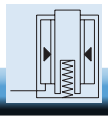
1000 & 2500 lb. 7500, 12500, & 20000 lb.

ILS100500 REV L

Model No.	Support Capacity* (lbs.)	Mounting Style **	Contact Force (lbs.)	Stroke (in.)	Base Dimensions (in.)	Extended Height (in.)	Oil Capacity (cu. in.)
Spring Advance Work Supports, spring lifts plunger, part weight depresses plunger, hydraulic pressure locks in place							
10-0506-10		Cartridge			N/A	1.87	0.05
10-0506-11	1,000	SAE	1-2	0.25	0.85 X 1.25 X 1.75	2.18	0.12
10-0506-12		Manifold			0.90 X 1.31 X 1.75	2.24	0.13
10-0509-06		Cartridge			N/A	2.44	0.08
10-0509-07	2,500	SAE	2-6	0.38	0.91 X 1.50 X 2.31	2.78	0.13
10-0509-08		Manifold			0.91 X 1.50 X 2.31	2.78	0.10
10-0515-06	7,500	SAE	9-18	0.50	1.00 X 2.50 X 3.00	4.38	0.81
10-0520-07	12,500	SAE	11-16	0.75	1.25 X 3.50 X 3.81	5.25	1.79
10-0529-10	20,000	SAE	38-72	0.82	1.99 x 4.75 x 4.88	6.97	3.37

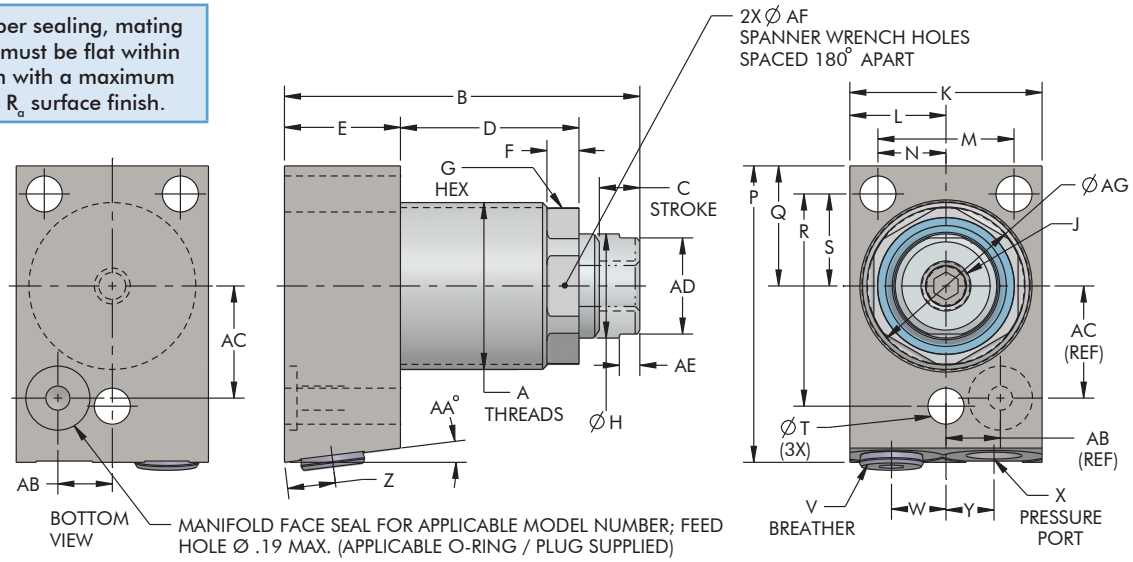
* Support capacities are listed at 5,000 psi maximum operating pressure. Support capacities for other pressures must be determined by consulting the capacity graph on the next page.

** For cartridge mount models, see cavity dimensions on page B-18.



Base & Capacity Graphs

For proper sealing, mating surface must be flat within 0.003 in with a maximum 63 μ in. R_a surface finish.



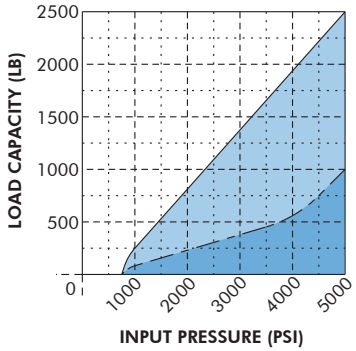
ILS100501 REV K

Dimensions

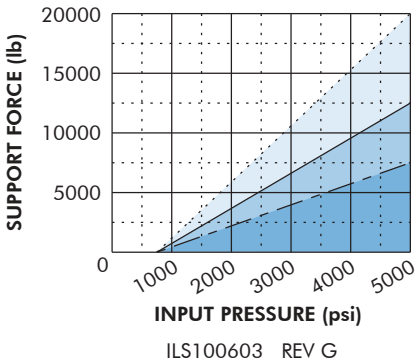
All dimensions are in inches

Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P
Spring Advance Work Supports, spring lifts plunger, part weight depresses plunger, hydraulic pressure locks in place														
10-0506-11 10-0506-12	1-16	2.18 2.24	0.25	1.06	0.85 0.90	0.21	0.87	0.63	5/16-18 X 0.27	1.25 1.31	0.63 0.66	0.90	0.45	1.75
10-0509-07 10-0509-08	1 5/16-16	2.78	0.38	1.39	0.91	0.25	1.12	0.81	3/8-16 X 0.46	1.50	0.75	1.06	0.53	2.31
10-0515-06	2 1/4-16	4.38	0.50	2.67	1.00	0.50	1.99	1.50	1/2-13 X 0.63	2.50	1.25	2.06	1.03	3.00
10-0520-07	3-16	5.24	0.75	3.00	1.24	0.53	2.74	2.00	5/8-11 X 0.63	3.50	1.75	2.87	1.44	3.81
10-0529-10	4 1/4-16	6.96	0.82	3.97	1.99	0.80	N/A	2.85	3/4-16 x .87	4.75	2.38	4.00	2.00	4.88

Model No.	Q	R	S	T	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG
10-0506-11 10-0506-12	0.69	1.20	0.51	0.22	SAE 2	0.33	SAE 2 N/A	0.33 N/A	0.37	7°	N/A 0.38	N/A 0.69	N/A	N/A	N/A	0.92
10-0509-07 10-0509-08	0.94	1.66	0.72	0.28	SAE 4	0.43	SAE 4 N/A	0.43 N/A	0.38	7°	N/A 0.43	N/A 0.88	N/A	N/A	N/A	1.22
10-0515-06	1.25	2.41	1.03	0.28	SAE 4	0.63	SAE 4	0.63	0.38	N/A	N/A	N/A	1.13	0.16	N/A	2.16
10-0520-07	1.75	3.22	1.44	0.34	SAE 4	0.94	SAE 4	0.94	0.38	N/A	N/A	N/A	1.63	0.16	N/A	2.91
10-0529-10	2.38	4.00	2.00	0.41	SAE 4	1.25	SAE 4	1.25	0.37	N/A	N/A	N/A	2.13	N/A	0.39	4.16



ILS100503 REV H



ILS100603 REV G

Model No.					
1,000 lb.	2,500 lb.		7,500 lb.	12,500 lb.	20,000 lb.
10-0506-1X	10-0509-0X		10-0515-06	10-0520-07	10-0529-10
			10-0615-06	10-0620-07	10-0629-10

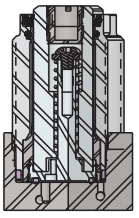
For Supporting Fragile Parts Or Use In Harsh Environments

- Available in four capacities from 1,000 to 12,500 lbs.
- For harsh environments (where contaminants such as aluminum or cast iron fines and corrosive or tacky coolants are present), we suggest running a constant "air-spring" to keep the plunger extended and the problem contaminants out. (You should observe air bubbles escaping around the plunger when used in this manner.)
- Normally retracted plungers provide additional clearance for part loading. Advance them with air pressure, exerting ONLY the force needed to "kiss" the part, then "freeze" the plunger in place hydraulically.
- Heavier end effectors may be used with air advance supports because of their additional air powered lifting/contact force.

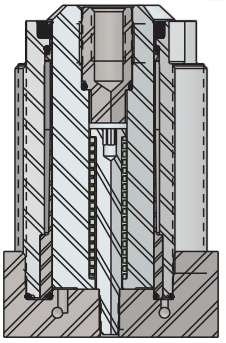
Special large diameter plungers and sleeves provide greater rigidity.

Stainless steel plunger and sleeve assemblies help guard against corrosion in most machining environments.

Standard SAE porting and alternate O-Ring manifold face seal are located in the base of the support for bolt down installation. The base can be removed for direct cartridge mounting.



1000 & 2500 lb.



7500, 12500 & 20000 lb.

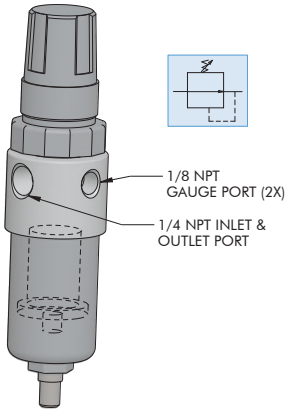
ILS100600 REV N

Model No.	Support Capacity* (lbs.)	Mounting Style ***	Hydraulic Connection	Contact Force** (lbs.)	Stroke (in.)	Base Dimensions (in.)	Retracted Height (in.)	Oil Capacity (cu. in.)	Min. Pressure To Fully Extend (psi.)
Air Advance Work Supports, air pressure lifts plunger against part; hydraulic pressure locks in place, spring retracts plunger									
10-0606-10		Cartridge	Cavity			N/A	1.62	.05	7
10-0606-11	1,000	Base	SAE Ports	4	.25	.85 X 1.25 X 1.75	1.93	.12	7
10-0606-12		Base	Manifold			.90 X 1.31 X 1.75	1.99	.13	7
10-0609-06		Cartridge	Cavity			N/A	2.06	.08	10
10-0609-07	2,500	Base	SAE Ports	8	.38	.91 X 1.50 X 2.31	2.40	.13	10
10-0609-08		Base	Manifold			.91 X 1.50 X 2.31	2.40	.10	10
10-0615-06	7,500	Base	SAE Ports	20	.50	1.00 X 2.50 X 3.00	3.87	.81	15
10-0620-07	12,500	Base	SAE Ports	57	.75	1.25 X 3.50 X 3.81	4.50	1.79	7
10-0629-10	20,000	Base	SAE Ports	116	1.00	1.99 x 4.75 x 4.88	6.15	3.37	10

* Support capacities are listed at 5,000 psi maximum operating pressure. Support capacities for other pressures must be determined by consulting the capacity graph on the next page.

** The maximum air pressure for advancing the plunger is 25 psi. Order air regulator separately. Model No. 50-0440-01 (0 to 25 psi) to more precisely control plunger advance force.

*** For cartridge mount models, see cavity dimensions in this section.



AIR FILTER REGULATORS:
50-0440-01 * 0-25 PSI OUTPUT
50-0440-02 * 0-125 PSI OUTPUT

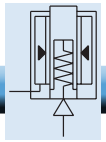
ILS500400 REV E

Air Filter Regulator

Model No.	PSI Output
50-0440-01	0-25 psi
50-0440-02	0-125 psi

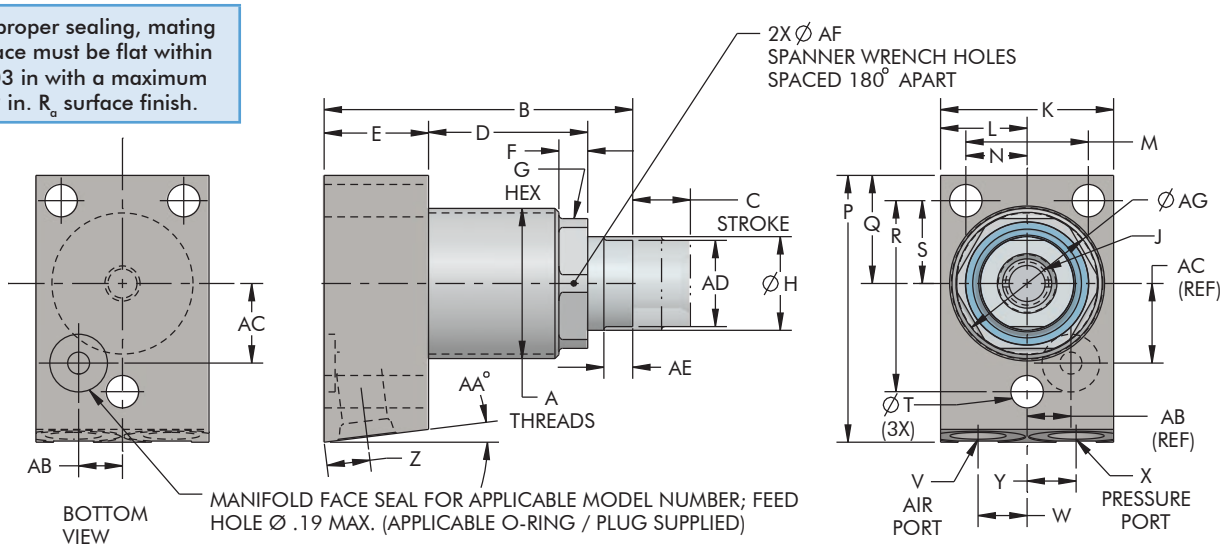
The maximum air pressure recommended for advancing the Air Advance Work Support plunger is 25 psi. Order air regulator (0 to 25 psi) to more precisely control plunger advance force.

Ask us about air valves to manually or electrically control your work supports.



Base & Capacity Graphs

For proper sealing, mating surface must be flat within 0.003 in with a maximum 63 μ in. R_a surface finish.

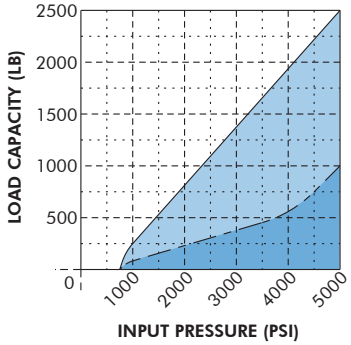


ILS100601 REV J

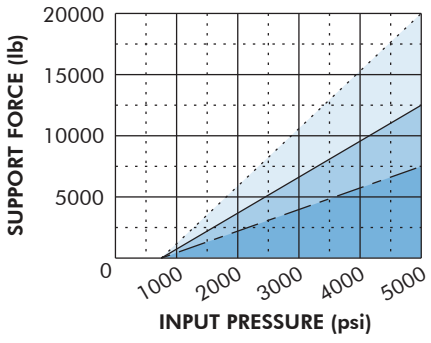
Dimensions All dimensions are in inches.

Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P
Air Advance Work Supports, air pressure lifts plunger against part; hydraulic pressure locks in place, spring retracts plunger														
10-0606-11 10-0606-12	1-16	1.93 1.99	0.25	1.06	0.85 0.90	0.21	0.87	0.63	5/16-18 X 0.29	1.25 1.31	0.63 0.66	0.90	0.45	1.75
10-0609-07 10-0609-08	1 5/16-16	2.40	0.38	1.39	0.91	0.25	1.13	0.81	3/8-16 X 0.24	1.50	0.75	1.06	0.53	2.31
10-0615-06	2 1/4-16	3.87	0.50	2.67	1.00	0.50	1.99	1.50	1/2-13 X 0.63	2.50	1.25	2.06	1.03	3.00
10-0620-07	3-16	4.49	0.76	3.00	1.24	0.53	2.74	2.00	5/8-11 X 0.63	3.50	1.75	2.87	1.44	3.81
10-0629-10	4 1/4-16	6.15	1.00	3.97	1.99	0.80	N/A	2.85	3/4-16 x 0.87	4.75	2.38	4.00	2.00	4.88

Model No.	Q	R	S	T	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG
10-0606-11 10-0606-12	0.69	1.20	0.51	0.22	SAE 2	0.33	SAE 2 N/A	0.33 N/A	0.37	7°	N/A 0.38	N/A 0.69	N/A	N/A	N/A	0.92
10-0609-07 10-0609-08	0.94	1.66	0.72	0.28	SAE 4	0.43	SAE 4 N/A	0.43 N/A	0.38	7°	N/A 0.43	N/A 0.88	N/A	N/A	N/A	1.22
10-0615-06	1.25	2.41	1.03	0.28	SAE 4	0.63	SAE 4	0.63	0.38	N/A	N/A	N/A	1.13	0.16	N/A	2.16
10-0620-07	1.75	3.22	1.44	0.34	SAE 4	0.94	SAE 4	0.94	0.38	N/A	N/A	N/A	1.63	0.16	N/A	2.91
10-0629-10	2.38	4.00	2.00	0.41	SAE 4	1.25	SAE 4	1.25	0.37	N/A	N/A	N/A	0.39	4.16	0.39	4.16



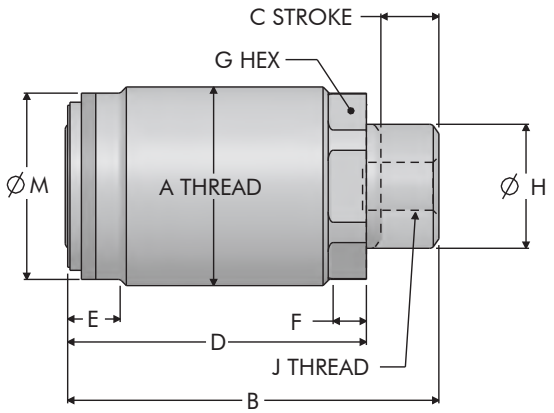
ILS100503 REV H



ILS100603 REV G

Model No.				
1,000 lb.	2,500 lb.	7,500 lb.	12,500 lb.	20,000 lb.
10-0606-1X	10-0609-0X	10-0615-06	10-0620-07	10-0629-10

Spring Advance Cartridge

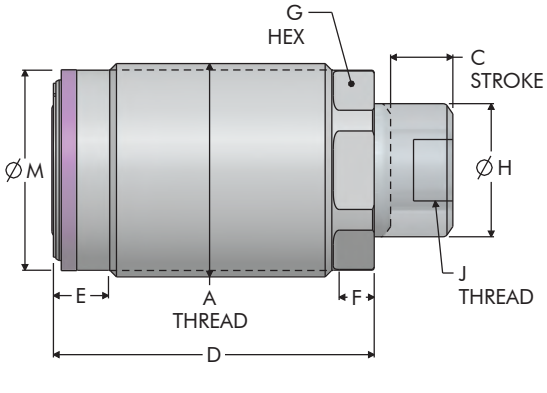


ILS100502 REV H

Cartridge Dimensions

Model No.	A	B	C	D	E	F	G	H	J	M
Work Support, Spring Rise, Cartridge										
10-0506-10	1-16	1.87	0.25	1.59	0.27	0.21	0.87	0.63	5/16-18 X 0.27	0.95
10-0509-06	1 5/16-16	2.43	0.38	1.96	0.34	0.25	1.12	0.81	3/8-16 X 0.46	1.22

Air Advance Cartridge



ILS100602 REV H

Cartridge Dimensions

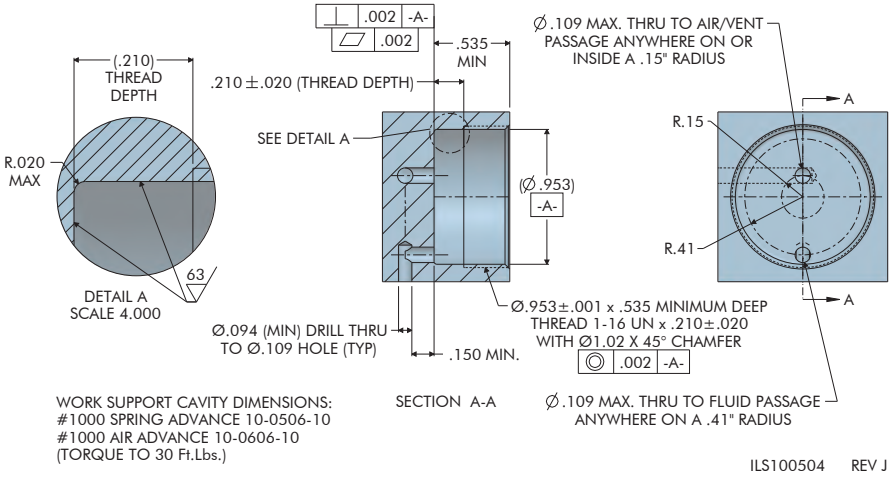
Model No.	A	B	C	D	E	F	G	H	J	M
Work Support, Air Rise, Cartridge										
10-0606-10	1-16	1.62	0.25	1.59	0.27	0.21	0.87	0.63	5/16-18 X 0.29	0.95
10-0609-06	1 5/16-16	2.06	0.38	1.96	0.34	0.25	1.12	0.81	3/8-16 X 0.24	1.22

Spring Advance and Air Advance Cartridge Mount

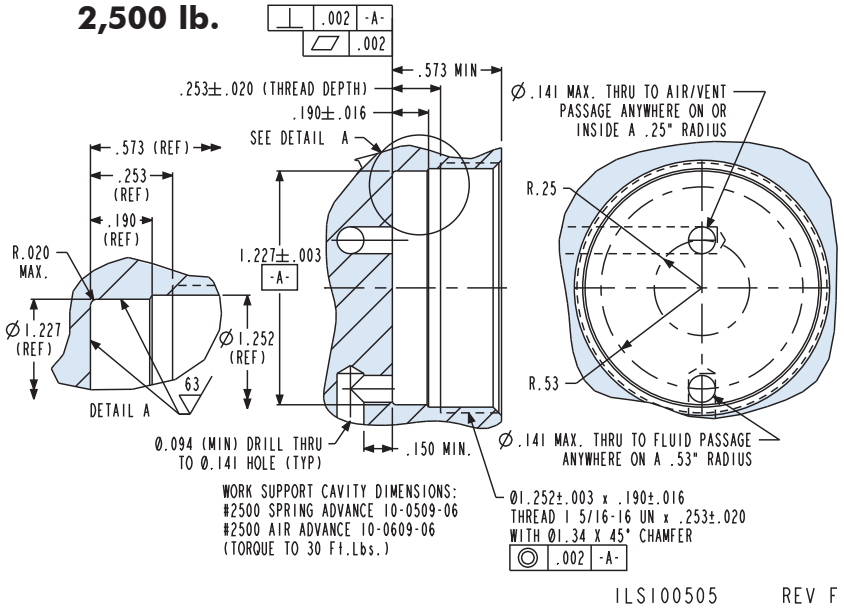
Cavity Check List

- ☐ Confirm capacity of item selected.
- ☐ Note the sealing surface finish requirements.
- ☐ Minimum depth specification represents the nominal depth of the standard Vektek base dimension.
- ☐ Confirm cavity drawing is appropriate for the model number used.
- ☐ Note specified thread depth when cutting threads.
- ☐ When using a bottoming tap tool, modifications may be required.
- ☐ When hand tapping threads, perpendicularity is essential.
- ☐ The "fluid" passage is located on the outer diameter and "vent" passage is in the center.

1,000 lb.



2,500 lb.



Frequently Asked Questions, Operation

When do I need to use Double-Acting Work Supports as opposed to other work supports?

You will want to use Double Acting Work Supports whenever your application requires positive retraction of the work support plunger such as in automatic/unattended applications. The support plunger is retracted when hydraulic pressure reduction pulls back the shuttle cylinder. You will not be relying on a mechanical spring to return the plunger to its initial starting position.

Consider Double Acting Work Supports whenever your application requires extremely tight tolerances. When pressurized, the Double Acting Work Support sets the industry standard for minimizing elastic deformation and maximizing uniformity in clamping surface stability.

You will want to use Double Acting Work Supports in applications where the single acting fluid advanced work support might **kick** your part out of position when unclamp occurs. The hydraulic pressure on the sleeve gripping the plunger is maintained until the double-acting positioning piston retracts. An internal check valve opens to release the pressure on the sleeve. The plunger is released only after it has been pulled back from the workpiece. This "shuttle" action prevents "workpiece ejection" that might be experienced with single acting fluid advanced Work Supports.

I understand that this work support has two (2) strokes, a shuttle stroke and a work support stroke. Do these strokes add one upon the other resulting in a total stroke of 0.875 inches?

No, the support plunger stroke is contained within the piston shuttle stroke. Because the work support plunger is spring advanced, it is extended while the sleeve is unlocked. The shuttle strokes forward causing the extended plunger to contact the part and compress the spring. Finally, the internal sleeve locks the plunger in place.

Does the shuttle extend and stroke the full 0.50 inches every time?

Yes, the advance shuttle will travel a full stroke every time. However, it stops on an internal component allowing the inside sequencing to lock the work support plunger.

Where do I position my part so it is in the work support plunger "working zone"?

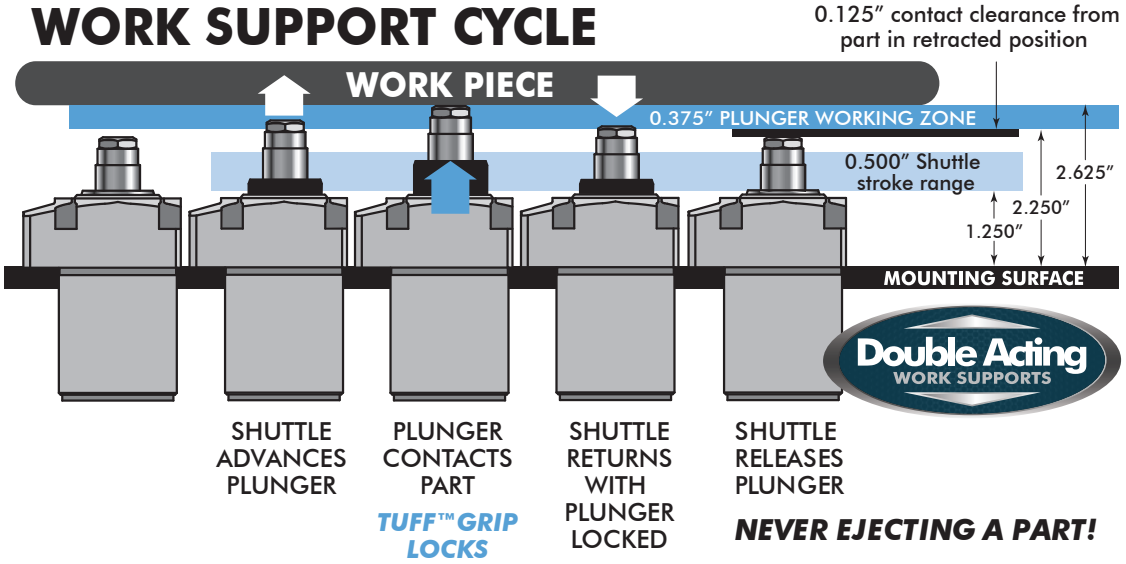
Position the part in the middle of the plunger stroke. The catalog chart lists a dimension that represents the fully extended length. For best performance, position your part at the fully extended shuttle stroke minus half of the plunger stroke.

I thought it was wrong to clamp over a column of fluid! How can I clamp over a work support that is inside a cylinder supported by hydraulic fluid?

While it is not the best option to clamp over a column of fluid, neither is it always wrong. Certain considerations must be addressed and adhered to when this is done. In this application, the work support is supported by the advance cylinder which is held firmly against a shoulder inside the body. This positioning is maintained by a 3:1 ratio of seating force verses the support force of the work support plunger. This advance/support ratio has shown to be the most stable combination and has the least elastic deformation compared to other units on the market.

Double Acting WORK SUPPORTS

2750 lb TOP FLANGE DOUBLE ACTING WORK SUPPORT CYCLE



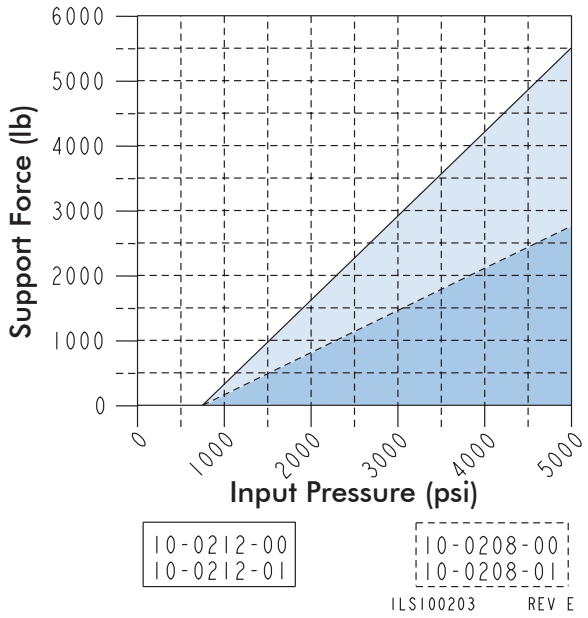
Double Acting Work Support Features

- All Double Acting Work Supports styles are available in 2,750 lbs and 5,500 lbs capacities at 5,000 psi.
- Exclusive Vektek design eliminates part ejection of any workpiece and the need for ancillary part retention devices.
- Innovative design features a spring advanced work support within a double-acting shuttle cylinder.
- A wiper at the shuttle and at the plunger keep chips out and your work support running smoothly.
- Double Acting Work Supports sleeve design is 2.5 times thicker than other work support models on the market. This sleeve efficiently closes and uniformly grips the plunger making it superior in precision applications.
- BHC™ (Black Hard Coat) body, hardened chrome shuttle piston and stainless steel plunger promote long life in harsh machining environments. The Position Sensing option is an aluminum housing that is Black Anodized for corrosion resistance.

U.S. Patent No. 8,444,128

Double Acting
WORK SUPPORTS

Double Acting Work Support Capacity Chart



Double Acting Work Support Operation

Advance: Hydraulic pressure extends the shuttle cylinder to the full stroke position, moving the work support plunger to the part. The spring advanced plunger will contact the part during the shuttle extension applying only spring force. Internal sequencing occurs after the shuttle is fully extended allowing hydraulic pressure to lock the plunger inside the sleeve.

Retract: The sleeve maintains its locked condition while hydraulic pressure retracts the shuttle. On reaching the full retracted position, the sleeve unclamps and the plunger returns to its spring advance state at least 0.125 inches below the part (may be separated from the part by as much as 0.50 inches).

Top Flange

Double Acting Work Support

- Available in 2,750 and 5,500 lb capacity at 5,000 psi.
- Innovative design featuring a spring advanced work support integrated within a double acting shuttle cylinder.
- The sleeve design is 2.5 times thicker than other work support models on the market. This sleeve efficiently closes and uniformly grips the plunger making it superior in precision applications.
- After the shuttle has retracted and the plunger been released to its spring advanced state, the plunger will clear the part by a minimum of 0.125 inches, eliminating ejection of a work piece.
- Top flange style body allows for hydraulic connection through face sealed o-rings or through SAE ports.
- Sealed design and two wipers keep chips and debris out so unit operates smoothly.
- BHC (Black Hard Coating) body, hard chrome plated shuttle piston and stainless steel plunger promote long life in harsh machining environments.
- Optional in-port flow control is a meter-in device with reverse free flow check valve.
- Optional in-port sequence valve is a sequencing device with reverse free flow check valve.

U.S. Patent No. 8,444,128

Double Acting WORK SUPPORTS

Model No.	Support Capacity (lbs.)*	Contact Force (lbs.)	Work Support Stroke (in.)	Shuttle Stroke (in.)	Body Dia.	Piston Area (sq. in.)		Oil Capacity (cu. in.)		Maximum Oil Flow Rate (cu. in. /min)	Port X for Optional In-Port Valves**
						Extend	Retract	Extend	Retract		
Double Acting (D/A) Cylinders, actuated hydraulically both directions.											
10-0208-00	2750	3.5-7.0	0.38	0.50	2.12	1.62	0.52	0.81	0.26	70	SAE 4 X .58
10-0212-00	5500	4.4-8.1	0.38	0.50	2.99	3.55	0.79	1.78	0.40	150	SAE 4 X .58

*Support Capacities are listed at 5,000 PSI maximum operating pressure. Support capacities for other pressures must be determined by consulting capacity chart.

**In-port valves require the use of manifold mount ports.

PORT DEVICE READY

Dimensions

Model No.***	A	B*	C**	D	E	F	G	H	J	K	L	M	N	P
Double Acting (D/A)***														
10-0208-00	2.63	0.38	0.50	2.32	1.13	1.75	2.12	1.19	0.75	2.90	1.13	2.25	1.13	0.94
10-0212-00	2.75	0.38	0.50	2.69	1.13	1.75	2.99	1.88	1.25	3.69	1.56	3.13	1.56	1.28

* Plunger Stroke "B" is the available work zone of the plunger. The workpiece must be positioned inside this window.

** Shuttle Stroke "C" is the stroke the shuttle travels to position the work support plunger relative to the workpiece. The shuttle moves the full range of this stroke every cycle.

*** The difference between "C" and "B" (C-B) equals the minimum distance the plunger is below the part in the retracted position.

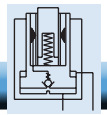
Note: If you would like to produce your own springs for these Work Supports see dimensions drawing on Page B-6.

Device Operation

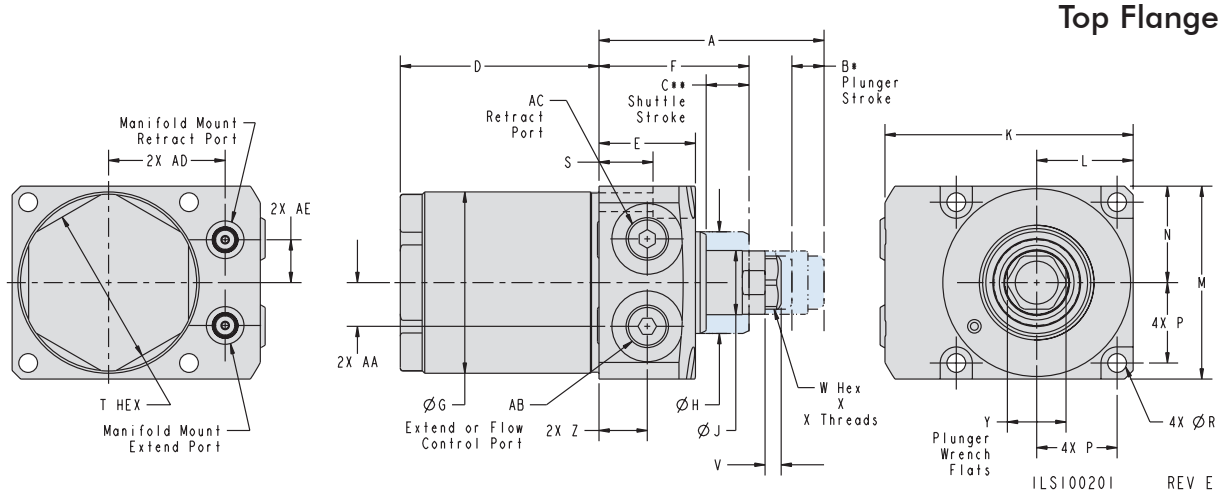
Advance: Hydraulic pressure extends the shuttle cylinder to full stroke position, moving the work support plunger out to the part. The spring advanced plunger will contact the part during shuttle extension applying only spring force. Internal sequencing occurs after shuttle is fully extended and allows hydraulic pressure to lock plunger inside sleeve.

Retract: The sleeve maintains its locked condition on the plunger while hydraulic pressure retracts the shuttle. On reaching the retracted position, the sleeve unclamps and the plunger returns to its spring advanced state at least 0.125 inches below the part.

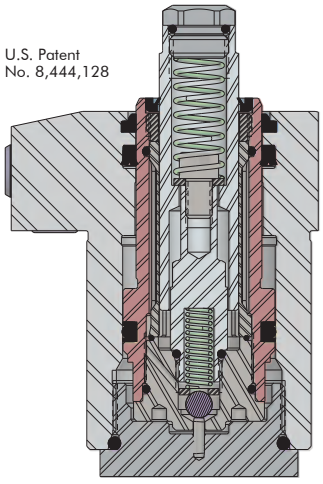
VEKTEK



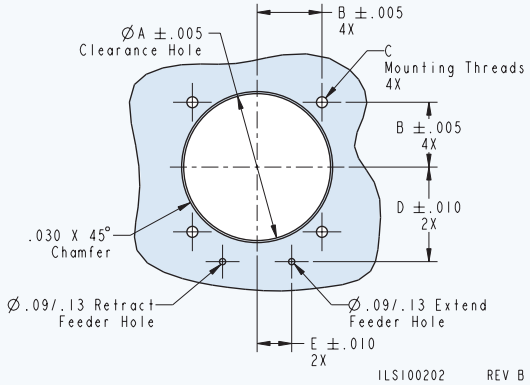
Top Flange



For proper sealing, mating surface must be flat within 0.003 in with a maximum 63 μ in. R_a surface finish.



ILS100200 REV F



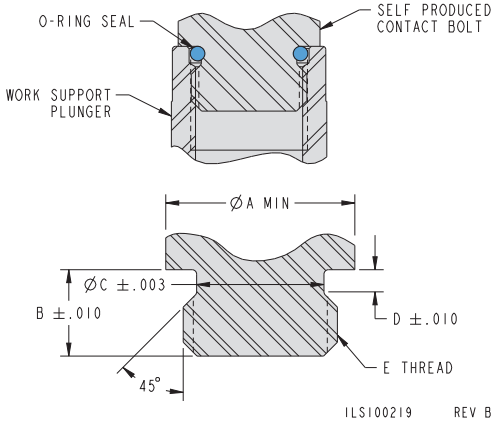
Manifold Port/Bolt Mounting Dimensions

Model No.	A	B	C	D	E
10-0208-00	2.130	0.938	10-32 UNF	1.360	0.500
10-0212-00	3.005	1.281	1/4-28 UNF	1.750	0.750

	R	S	T	V	W	X	Y	Z	AA	AB	AC	AD	AE
								Cylinders, actuated hydraulically both directions.					
	0.22	0.63	1.88	0.19	0.63	9/16-18 X 0.31	0.69	0.56	0.51	SAE 4	SAE 4	1.36	0.50
	0.28	0.70	N/A	0.25	1.00	3/4-16 X 0.50	1.13	0.56	0.63	SAE 4	SAE 4	1.75	0.75

Custom Contact Bolt

Model No.	Capacity	O-Ring Part No.	A	B	C	D	E
Work Support, D/A							
10-0208-00 10-0208-01	2750	39-0000-72 (-013)	0.625	0.312	0.460	0.080	9/16-18 UNF-2A
10-0212-00 10-0212-01	5500	39-0510-66 (-016)	0.875	0.500	0.650	0.080	3/4-16 UNF-2A



Work Supports / Double Acting, Position Sensing

Frequently Asked Questions

U.S. Patent No. 8,444,128

We are already using Double Acting Work Supports; why would we need to use the Return Position Sensor?

Extended Work Supports could cause a crash. Use the Return Position Sensor in any automated system where work support retraction is critical before the unload/load cycle begins. Monitor the position of Work Supports and confirm all is clear before unloading/loading the part.

Does the Return Position Sensor also tell me that the work support is extended and locked?

No, the Return Position Sensor only communicates that the Work Supports have retracted. Even though the pressure drops when the supports extend, it does not indicate that all the Work Supports have extended or are locked.

Can I add a Return Position Sensor to my existing double-acting work support?

No, adding the Return Position Sensor requires a specific body, a longer plunger and different contact spring. Adding the Return Position Sensor also increases the work support length from the mounting flange to the contact bolt. Please contact your Vektek Customer Support Specialist for more information.

How many Work Supports with Return Position Sensors can I put on one pneumatic circuit?

The maximum number of Return Position Sensors in one circuit is a function of the circuit design and pressure drop over the length of the circuit path. Vektek has tested ten devices plumbed in parallel with excellent results.

What if I want to run a different pneumatic pressure switch than what Vektek engineers recommend?

Any programmable pneumatic switch that interfaces with the machine tool logic can monitor air pressure in the Return Position Sensor circuit. Also see Air Sensing Control Kit 50-8240-00.

Is it okay to route my air through a rotary union?

Yes, size the rotary union so that there is a separate path for the air circuit.

Do I need a pneumatic pressure switch for each work support on my fixture?

No, connect all the Work Supports (that are on the same hydraulic circuit) with an air circuit feeding the Return Position Sensor to one pneumatic pressure switch.

Double Acting
WORK SUPPORTS

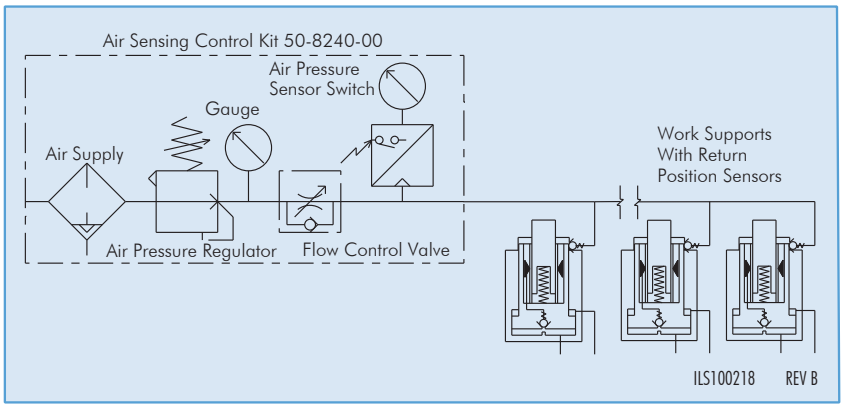
Device Operation

The Return Position Sensor unit requires continuous and regulated air pressure. In the retracted position, air pressure will build in the system to the regulated set pressure. An air logic switch detects the "retracted" pressure condition and signals the controller that Work Supports have retracted. When the work support extends, the internal check opens and vents air from the device. The system air pressure falls to the "extended" preset pressure and an air logic switch resets. When the support retracts, the internal check closes and air pressure again builds to the regulated value. The air pressure switch detects "retracted" pressure and again signals the controller that the device is in the retracted position.

Position Sensing Circuit Design and Parameters

Recommended Pneumatic Circuit Design

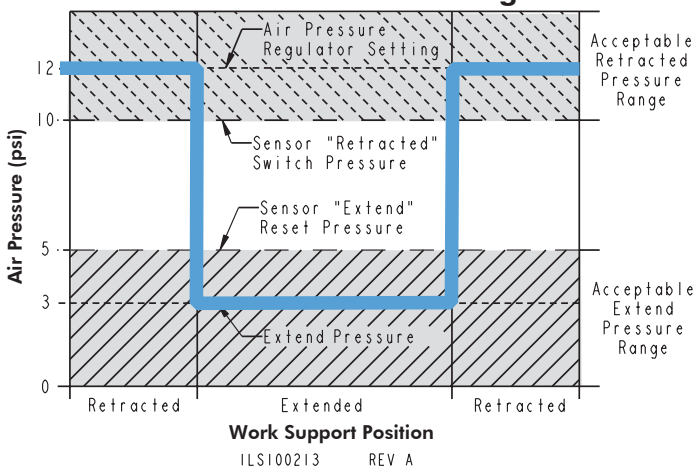
- Use Vektek Air Sensing Control Kit (Model # 50-8240-00).
- Parallel circuit design with minimum of 0.125" inside diameter feed line size.
- Circuit design should be simple and free from flow restrictions that can cause excessive pressure drop.
- The maximum number of Return Position Sensors in one circuit is a function of the circuit design and pressure drop over the length of the circuit path. Vektek has tested 10 devices plumbed in parallel with excellent results.

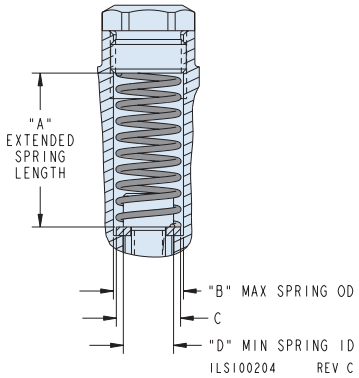


Recommended System Setup:

- Set air pressure regulator to 12 psi when all Work Supports in the system are in the retracted position.
- Adjust and set air flow control so that air pressure falls to 3 psi when the work support at the furthest point of the pneumatic circuit is in the extended position and all other supports in the circuit are retracted.
- Set the air pressure sensor "Retract" switch point to 10 psi.
- Set the air pressure sensor "Extend" reset switch point to 5 psi.

Return Position Sensor Logic





Custom Contact Spring

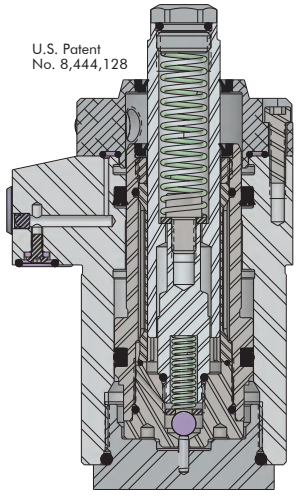
Cavity Dimensions					Standard Spring			
Work Support Series	A	B	C	D	OD	Wire Ø	Free Length	Rate (lbs/in)
10-0208-00	1.13	0.51	0.46	0.38	0.48	0.045	1.50	9.4
10-0208-01	1.69	0.51	0.46	0.38	0.48	0.051	2.25	9.3
10-0212-00	1.13	0.68	0.62	0.47	0.59	0.055	1.56	10.0
10-0212-01	1.78	0.68	0.62	0.47	0.60	0.059	2.5	9.6

NOTE: Vektek recommends only 17-7 stainless steel springs. Too light of custom spring force may not actuate the plunger, especially if a custom contact bolt is used. Too heavy of a custom spring may cause damage to the device's internal components. Vektek cannot guarantee that custom springs will provide proper plunger actuation.

Top Flange

Return Position Sensing for D/A Top Flange Work Support

- The Double Acting Return Position Sensors use air pressure to communicate that the work support has retracted and that the fixture can be unloaded/loaded.
- Sensor monitors work support position to prevent crashes in automated systems.
- Fail safe design requires air pressure to build before sensing the retracted position.
- Dual wipers keep chips and debris from invading support.
- Pressure Relief Vent keeps unit sealed and free from foreign material.
- Air connection through face sealed O-ring of top flange body or externally plumbed through NPT ports on sensor housing.
- Top flange body style allows for hydraulic connection through face sealed o-rings or through SAE ports.
- Aluminum sensor housing is Black anodized for superior corrosion resistance.
- Optional in-port flow control is a meter-in device with reverse free flow check valve.
- Optional in-port sequence valve is a sequencing device with reverse free flow check valve.



ILS100209 REV E

Double Acting WORK SUPPORTS

Model No.**	Support Capacity (lbs.)*	Contact Force (lbs.)	Work Support Stroke (in.)	Shuttle Stroke (in.)	Body Dia.	Piston Area (sq. in.)		Oil Capacity (cu. in.)		Max Oil Flow Rate (cu. in./min.)	Port X Depth for Optional In-Port Valves***
						Extend	Retract	Extend	Retract		
Double Acting (D/A) Cylinders, actuated hydraulically both directions.											
10-0208-01	2750	5.2-8.6	0.38	0.50	2.12	1.62	0.52	0.81	0.26	70	SAE 4 X .58
10-0212-01	5500	6.9-10.5	0.38	0.50	2.99	3.55	0.79	1.78	0.40	150	SAE 4 X .58

* Support capacities are listed at 5,000 psi maximum operating pressure. Support capacities for other pressures must be determined by consulting the capacity graph at the start of Section B.

** Use Return Position Sensor to monitor retracted position only and not plunger advance or plunger lock.

*** In-Port valves requires the use of manifold mount ports.

PORT DEVICE READY

Device Operation

The return position sensor unit requires continuous regulated air pressure. In the retracted position, air pressure will build in the system to the regulated set pressure. The air logic switch detects "retracted" pressure and signals that work supports have retracted. When the work support extends, the internal check is opened and air vents from the device. The system air pressure falls to the "extended" pressure and the air logic switch resets. When the support is then retracted, the internal check is closed and air pressure again builds to regulated value. Air pressure switch detects "retracted"pressure and again signals device is in retracted position.

Dimensions

Model No.***	A	B*	C**	D	E	F	G	H	J	K	L	M	N	P	Q
Double Acting (D/A) ***															
10-0208-01	3.19	0.38	0.50	2.32	1.72	1.91	2.12	1.25	0.75	2.90	1.13	2.25	1.13	0.94	2.25
10-0212-01	3.41	0.38	0.50	2.69	1.72	1.91	2.99	2.00	1.25	3.69	1.56	3.13	1.56	1.28	3.12

* Plunger Stroke "B" is the available work zone of the plunger. The workpiece must be positioned inside this window to prevent part ejection.

** Shuttle Stroke "C" is the stroke the shuttle travels to position the work support plunger relative to the workpiece. The shuttle moves the full range of this stroke every cycle.

*** The difference between "C" and "B" (C-B) equals the minimum distance the plunger is below the workpiece in the retracted position.

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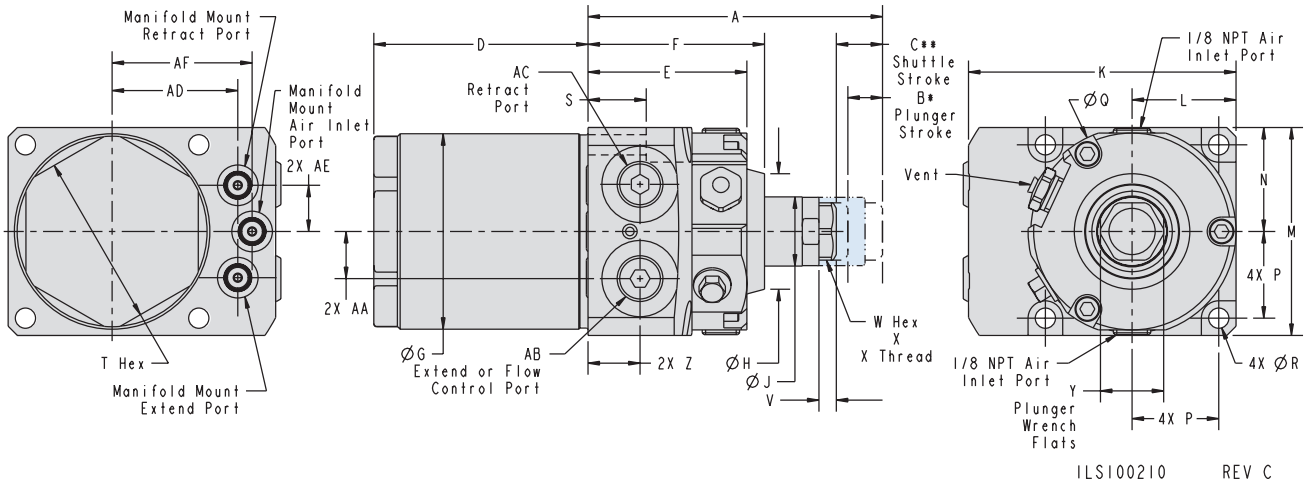
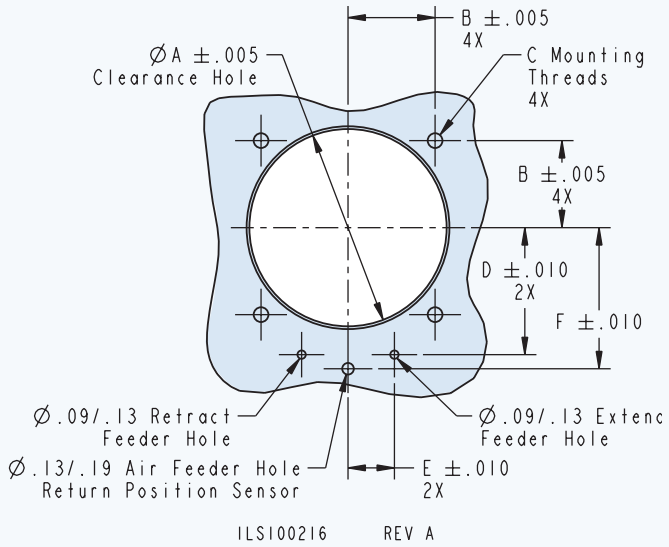


For proper sealing, mating surface must be flat within 0.003 in with a maximum 63 μ in. R_a surface finish.



Cavity Mounting Dimensions

Model No.	A	B	C	D	E	F
10-0208-01	2.130	0.938	10-32 UNF	1.360	0.500	1.52
10-0212-01	3.005	1.281	1/4-28 UNF	1.750	0.750	1.86

	R	S	T	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
														Cylinders, actuated hydraulically both directions.
	0.22	0.63	1.88	0.19	0.63	9/16-18 X 0.31	0.69	0.56	0.51	SAE 4	SAE 4	1.36	0.50	1.52
	0.28	0.70	N/A	0.25	1.00	3/4-16 X 0.50	1.13	0.56	0.63	SAE 4	SAE 4	1.75	0.75	1.86

Note: If you would like to produce your own springs for these Work Supports see dimensions drawing on Page B-6