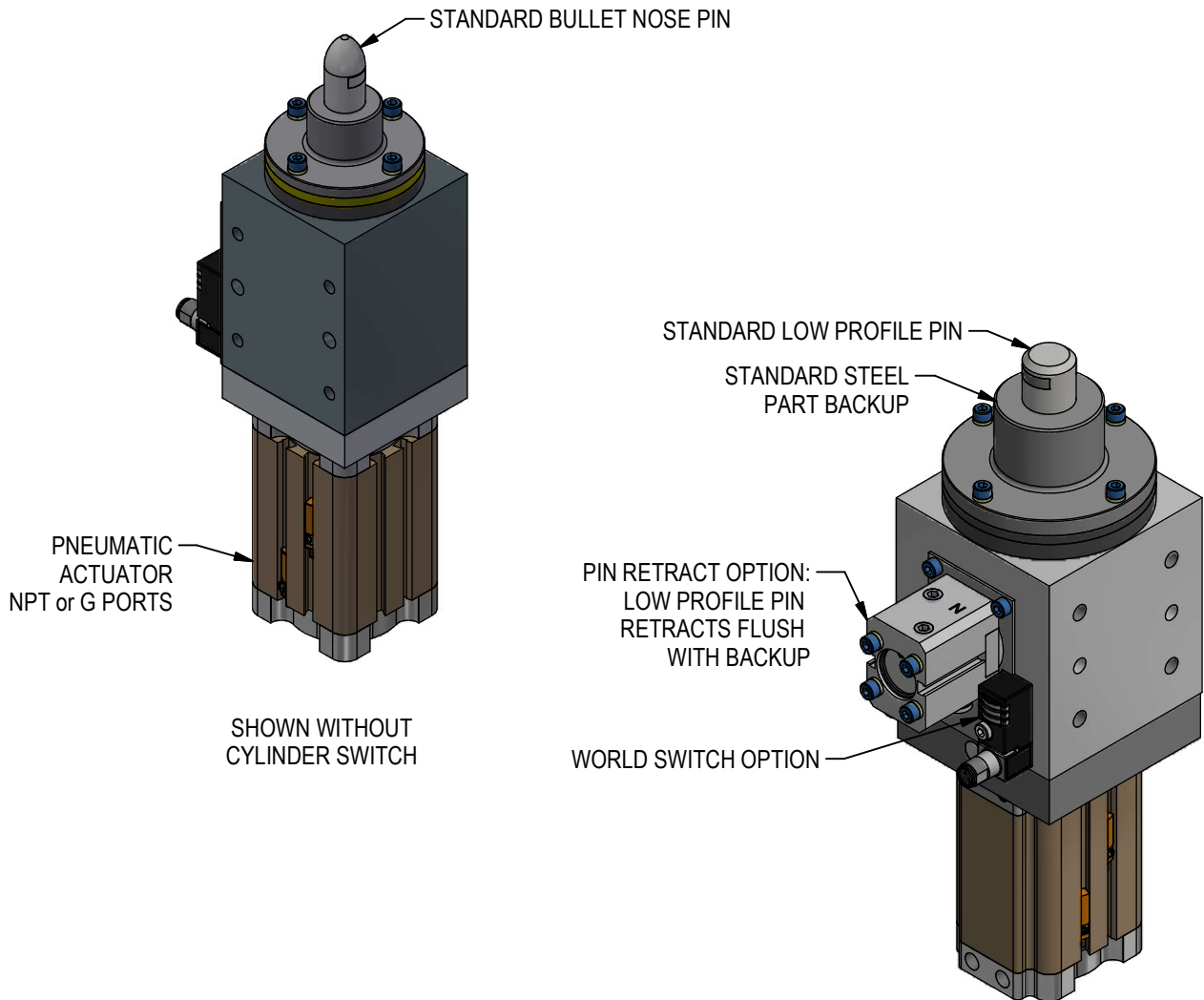


PIN CLAMP MAINTENANCE MANUAL PCS, PCT, PCM



RELEASED 5/1/2024

MAINTENANCE

SAFETY FIRST!

MAINTENANCE SHOULD ONLY BE PERFORMED BY QUALIFIED PERSONNEL. PROPER SAFETY GEAR AND PROCEDURES MUST BE USED AT ALL TIMES. BEFORE PERFORMING MAINTENANCE, CUT OFF AIR SUPPLY TO THE UNIT, ENSURE THAT ALL AIR IS REMOVED AND THAT THERE ARE NO "TRAPPED AIR" CONDITIONS.

PREVENTATIVE MAINTENANCE: Regularly inspect unit to verify proper operation. Check for debris build up and clean as needed. Inspect all pneumatic, electrical, and mounting connections, making sure all connections are tight and secure. Routine replacement of cylinder seals is recommended.

CYLINDER: Welker pneumatic cylinders are lube free and require very little maintenance. Check for abnormal wear or damage. Plant air supply to the cylinder should be free of contaminants, filtered to a minimum of 50micron and have a water separator. Be sure fittings are in good condition. Seals are subject to wear under normal operating conditions. It is recommended to keep a spare cylinder seal kit or repair kit on hand.

PINS: Pins are subject to wear under normal operating conditions and should be replaced when worn.

BACKUPS: Replace when damaged or worn.

SWITCH: Switches may fail and need replacement; it is recommended to keep a spare switch on hand.

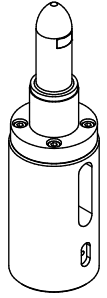
WELKER RECOMMENDS IN-PLANT RECERTIFICATION AFTER SERVICE/REPAIR/REPLACEMENT.

TROUBLESHOOTING

Failure	Possible Cause	Solution
Pin clamp does not clamp or unclamp	Insufficient air pressure	Check/confirm air pressure
	Contamination build up on clamp fingers	Regularly clean particulate from unit by cycling pin up and down while applying compressed air. Do not use oil or lube. Replace pin cartridge if needed.
	Cylinder failure	Repair or replace cylinder
Pin fails to extend Pin & fingers remain retracted	Too tight of fit on part hole	Proper pin size: Refer to catalog for <u>recommended pin diameter</u> .
	Side load too high from improper shimming.	Correct shims to fit metal.
	Side load too high due to part shift when welding.	Better part control during process.
Clamp fingers do not actuate	Contamination build up on clamp fingers Fingers worn	Regularly clean particulate from unit by cycling pin up and down while applying compressed air. Do not use oil or lube. Replace pin cartridge if needed.
	Part rest (backup) worn	Inspect under regular scheduled maintance. Wear item. Replace if needed.
Broken or worn locating pin	Improper application. Misalignment of tooling-to-part.	Inspect under regular scheduled maintance. Wear item. Replace pin cartridge if needed.
	Loose pin clamp mount to main bracket	Check pin clamp mount
Switch failure	Switch failure, loose wire	Check switch for proper operation and connection. Replace switch if required.

REPLACEMENT PIN CLAMP CARTRIDGES

SEE CATALOG FOR PIN TYPES AND FINGER ORIENTATION



Series

- T PCT Body
- C PCS Body
- M PCM Body

Pin Diameter*

- 12.00-16.00 T Series
- 16.01-25.00 C Series
- 25.01-40.00 M Series

*Pin diameter to 2 decimal places

Pin Type

- A Bullet Nose Pin w/ fingers at 0°
- B Bullet Nose Pin w/ fingers at 90°
- C Bullet Nose 2-way Pin w/ fingers @ 0° **
- D Bullet Nose 2-way Pin w/ fingers @ 90° **
- E Low Profile Pin w/ fingers at 0°
- F Low Profile Pin w/ fingers at 90°
- G Low Profile 2-Way Pin w/ fingers @ 0° **
- H Low Profile 2-Way Pin w/ fingers @ 90° **

** Not available on PCT with pin diameters 12.00 - 12.99

Options

- T Retractable Cartridge
- V Retractable Cartridge w/ Secondary Cylinder Sewnsing

Backup

- Std Standard Backup
 - Long Long Backup
- (Backups must be ordered separately)

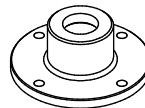
Cartridge ordering examples:

- C-CRT-16.00-A-STD
- M-CRT-40.00-B-LONG
- C-CRT-19.00-A-STD-T

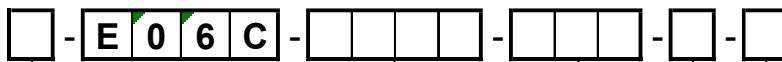
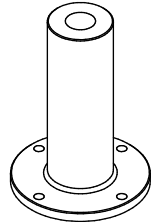
REPLACEMENT BACKUP

INCLUDES A BACK UP ONLY

OPTION A
STANDARD
BACKUP



OPTION B
LONG
BACKUP



Series

- T PCT Body
- C PCS Body
- M PCM Body

Pin Diameter*

- 12.00-16.00 T Series
- 16.01-25.00 C Series
- 25.01-40.00 M Series

*Pin diameter to 2 decimal places

Backup Diameter

- 035-050 (Ø35-Ø50mm) C & T Series
- 051-075 (Ø51-Ø75mm) M Series

Backup ordering example:

CE06C-16.00-035-K-A

Options

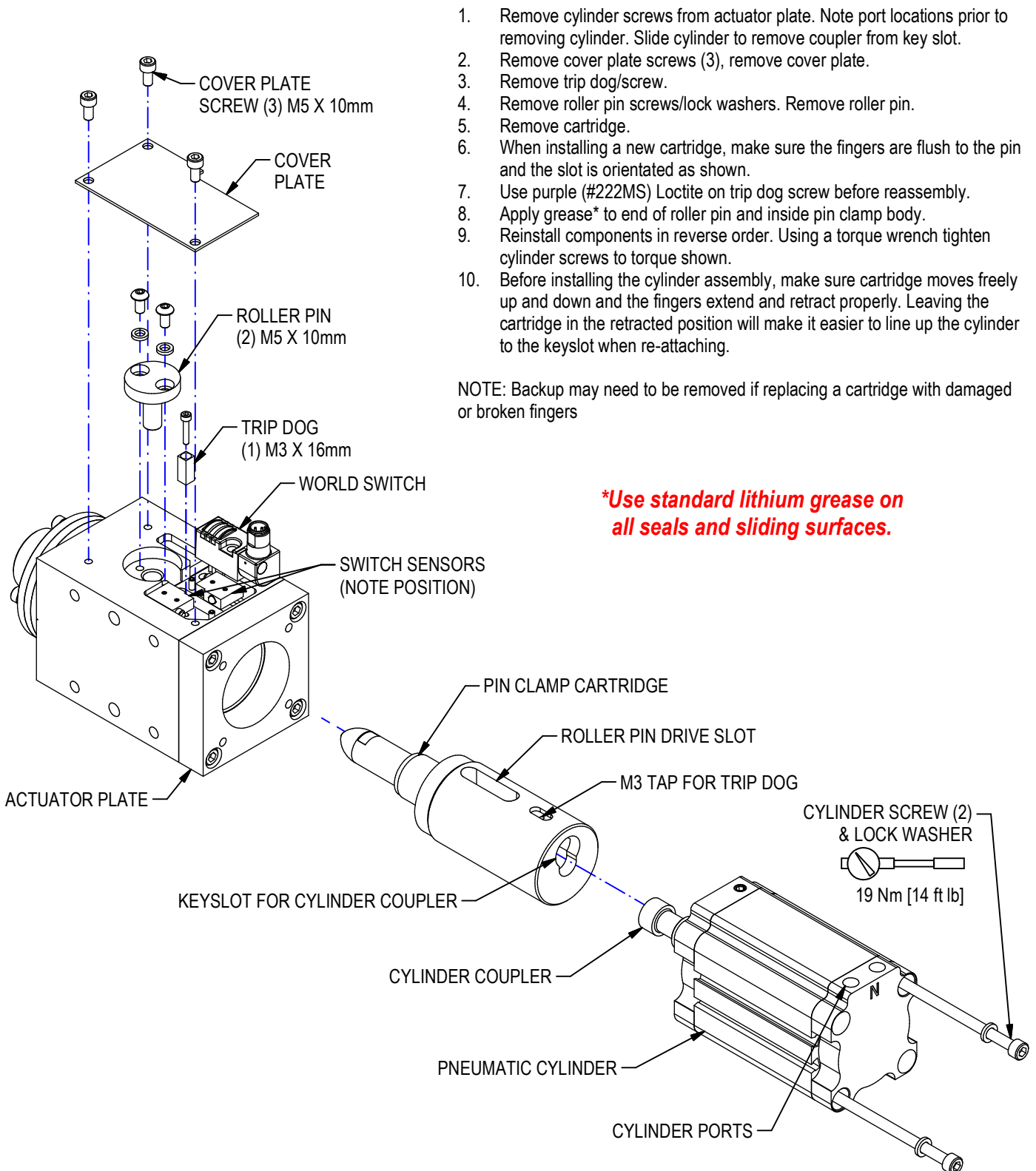
- A Std Steel Backup
- B Steel Long Backup

Backup Distance

- K 14mm (for clamping range 0.1 - 4mm)
- N 17mm (for clamping range 4.1 - 7mm)

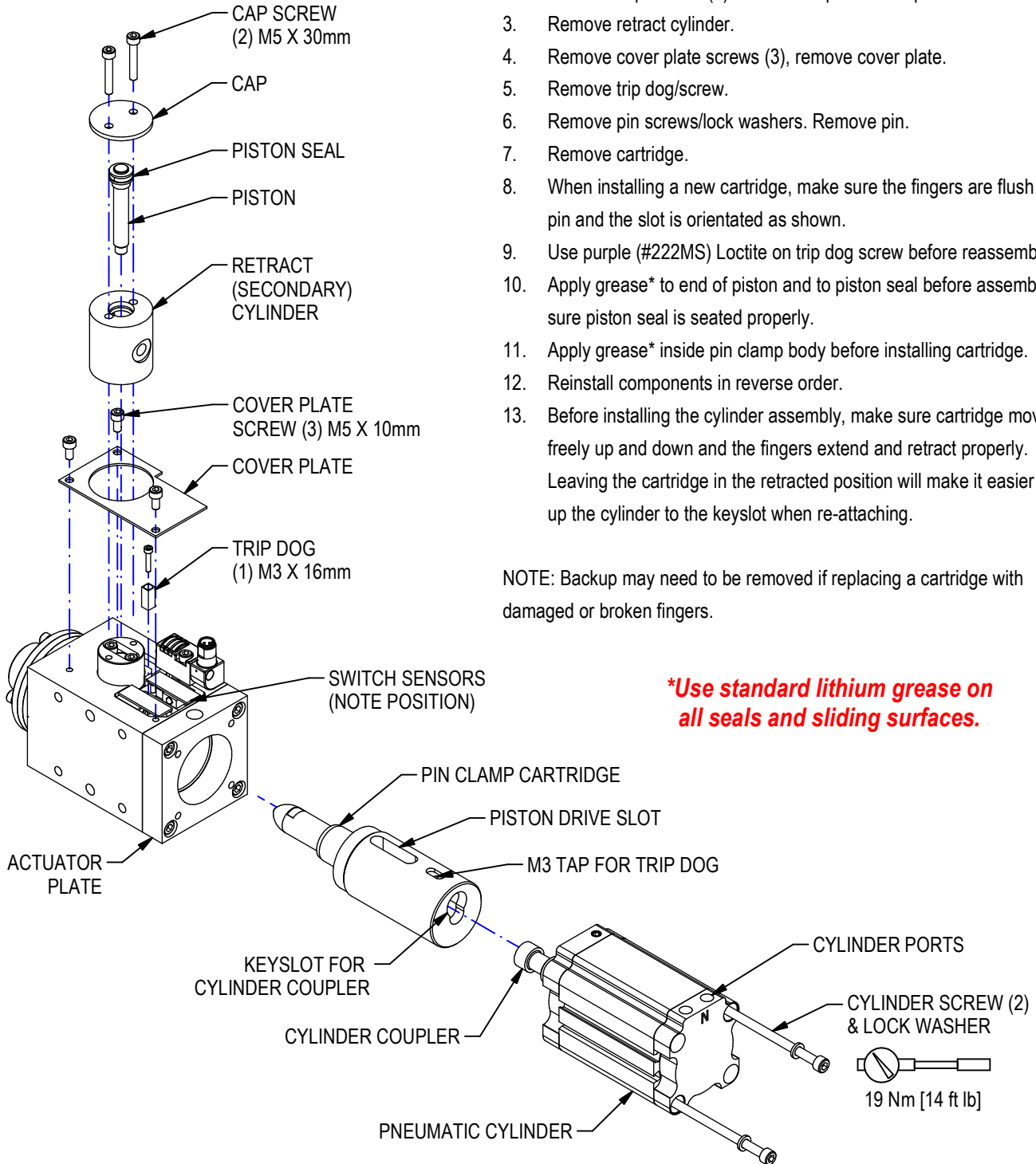
CARTRIDGE REPLACEMENT

BEFORE REMOVAL, PIN MUST BE IN THE EXTENDED POSITION AND CLAMP FINGERS BELOW FLUSH. MAINTAINING AIR ON THE CYLINDER HELPS OPERATION, ESPECIALLY WITH A SPRING RETRACT CYLINDER.



CARTRIDGE REPLACEMENT FOR UNITS WITH RETRACT CYLINDER (LEGACY)

BEFORE REMOVAL, PIN MUST BE IN THE EXTENDED POSITION AND CLAMP FINGERS BELOW FLUSH. MAINTAINING AIR ON THE CYLINDER HELPS OPERATION, ESPECIALLY WITH A SPRING RETRACT CYLINDER.



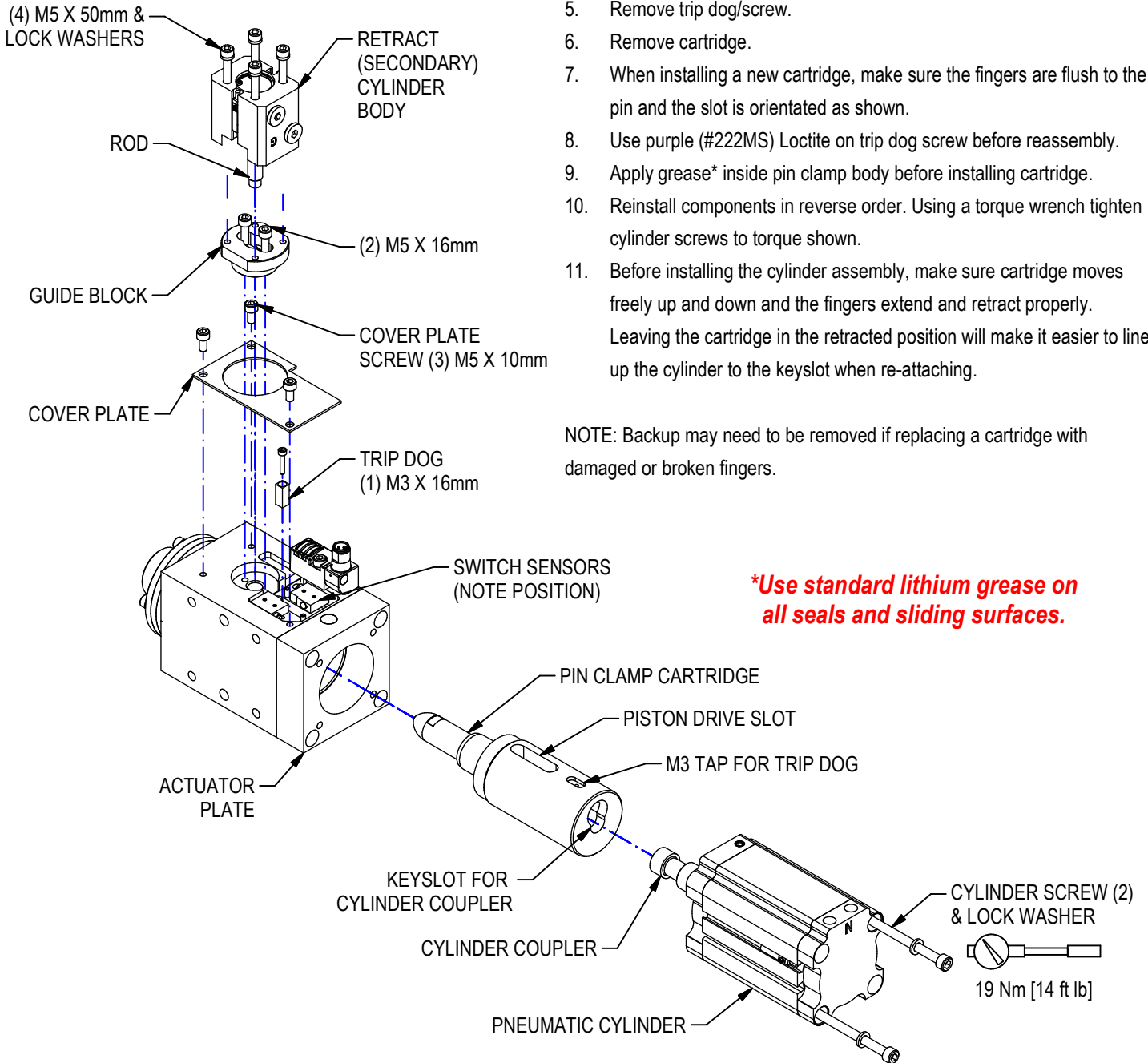
1. Remove cylinder screws from actuator plate. Note port locations prior to removing cylinder. Slide cylinder to remove coupler from key slot.
2. Remove cap screws (2). Remove cap. Remove piston.
3. Remove retract cylinder.
4. Remove cover plate screws (3), remove cover plate.
5. Remove trip dog/screw.
6. Remove pin screws/lock washers. Remove pin.
7. Remove cartridge.
8. When installing a new cartridge, make sure the fingers are flush to the pin and the slot is orientated as shown.
9. Use purple (#222MS) Loctite on trip dog screw before reassembly.
10. Apply grease* to end of piston and to piston seal before assembly. Be sure piston seal is seated properly.
11. Apply grease* inside pin clamp body before installing cartridge.
12. Reinstall components in reverse order.
13. Before installing the cylinder assembly, make sure cartridge moves freely up and down and the fingers extend and retract properly. Leaving the cartridge in the retracted position will make it easier to line up the cylinder to the keyslot when re-attaching.

NOTE: Backup may need to be removed if replacing a cartridge with damaged or broken fingers.

***Use standard lithium grease on all seals and sliding surfaces.**

CARTRIDGE REPLACEMENT FOR UNITS WITH RETRACT CYLINDER

BEFORE REMOVAL, PIN MUST BE IN THE EXTENDED POSITION AND CLAMP FINGERS BELOW FLUSH. MAINTAINING AIR ON THE CYLINDER HELPS OPERATION, ESPECIALLY WITH A SPRING RETRACT CYLINDER.

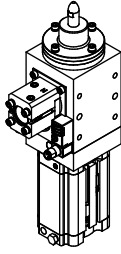


1. Remove cylinder screws from actuator plate. Note port locations prior to removing cylinder. Slide cylinder to remove coupler from key slot.
2. Remove screws and lock washers (4), remove retract cylinder body.
3. Remove cap screws (2), remove retract cylinder guide block.
4. Remove cover plate screws (3), remove cover plate.
5. Remove trip dog/screw.
6. Remove cartridge.
7. When installing a new cartridge, make sure the fingers are flush to the pin and the slot is orientated as shown.
8. Use purple (#222MS) Loctite on trip dog screw before reassembly.
9. Apply grease* inside pin clamp body before installing cartridge.
10. Reinstall components in reverse order. Using a torque wrench tighten cylinder screws to torque shown.
11. Before installing the cylinder assembly, make sure cartridge moves freely up and down and the fingers extend and retract properly. Leaving the cartridge in the retracted position will make it easier to line up the cylinder to the keyslot when re-attaching.

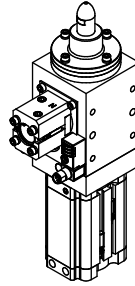
NOTE: Backup may need to be removed if replacing a cartridge with damaged or broken fingers.

***Use standard lithium grease on all seals and sliding surfaces.**

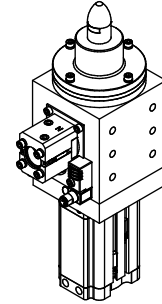
REPLACEMENT ACTUATORS



PCT



PCS



PCM

PIN CLAMP ACTUATORS:

SERIES	ACTUATOR OPTION	DESCRIPTION	PORT OPTION	PORT TYPE	ACTUATOR (PRIMARY)	RETRACT ACTUATOR (SECONDARY)
PCT	A	DOUBLE ACTING AIR CYLINDER	A,B,C,D	1/4 NPT	WCW-2164-N-26 ¹ W COUPLER	N/A
			J,K,L,M	1/4 G	WCW-2164-N-26 ¹ W COUPLER	N/A
PCT, PCS, PCM	B	DOUBLE ACTING AIR CYLINDER W/ SPRING RETRACT	A,B,C,D	1/4 NPT	WCW-2163-N-26 ¹ W/COUPLER	N/A
			J,K,L,M	1/4 G	WCW-2163-G-26 ¹ W/COUPLER	N/A
PCT, PCS, PCM	T	DBL ACTING AIR CYL W/ SPRING ASSIST & RETRACTABLE PIN	A,B,C,D	1/4 NPT	WCW-2163-N-26 ¹	PCX-T-N
			J,K,L,M	1/4 G	WCW-2163-G-26 ¹	PCX-T-G
PCT, PCS, PCM	T	DBL ACTING AIR CYL W/ SPRING ASSIST & RETRACTABLE PIN	A,B,C,D	1/4 NPT	WCW-2094-N-26 ³	PCX-T-N
			J,K,L,M	1/4 G	WCW-2094-G-26 ³	PCX-T-G
PCT	V	DBL ACTING AIR CYL W/ SPRING ASSIST, RETRACTABLE PIN, & SECONDARY CYL SENSING	A,B,C,D	1/4 NPT	WCW-2163-N-26 ¹	PCT-RCK-N ²
			J,K,L,M	1/4 G	WCW-2163-G-26 ¹	PCT-RCK-G ²
PCS	V	DBL ACTING AIR CYL W/ SPRING ASSIST, RETRACTABLE PIN, & SECONDARY CYL SENSING	A,B,C,D	1/4 NPT	WCW-2163-N-26 ¹	PCS-RCK-N ²
			J,K,L,M	1/4 G	WCW-2163-G-26 ¹	PCS-RCK-G ²
PCM	V	DBL ACTING AIR CYL W/ SPRING ASSIST, RETRACTABLE PIN, & SECONDARY CYL SENSING	A,B,C,D	1/4 NPT	WCW-2163-N-26 ¹	PCM-RCK-N ²
			J,K,L,M	1/4 G	WCW-2163-G-26 ¹	PCM-RCK-G ²

¹PRIMARY CYLINDER SEAL KIT AVAILABLE, ORDER #WCW2163-CSK

²SECONDARY CYLINDER SEAL KIT AVAILABLE, ORDER #PCX-RC-CSK

³PLEASE CONTACT WELKER FOR UPDATED ACTUATOR REPLACEMENT

CYLINDER SEAL REPLACEMENT: WCW2163-CSK

Cylinder seal kit includes end cap seals (2), rod wipers (2), piston seal (1), internal port seal (2), Igus rod bearing. Seals should be replaced routinely to avoid cylinder failure.

For spring assist actuators (B and V) extend coupler using air.

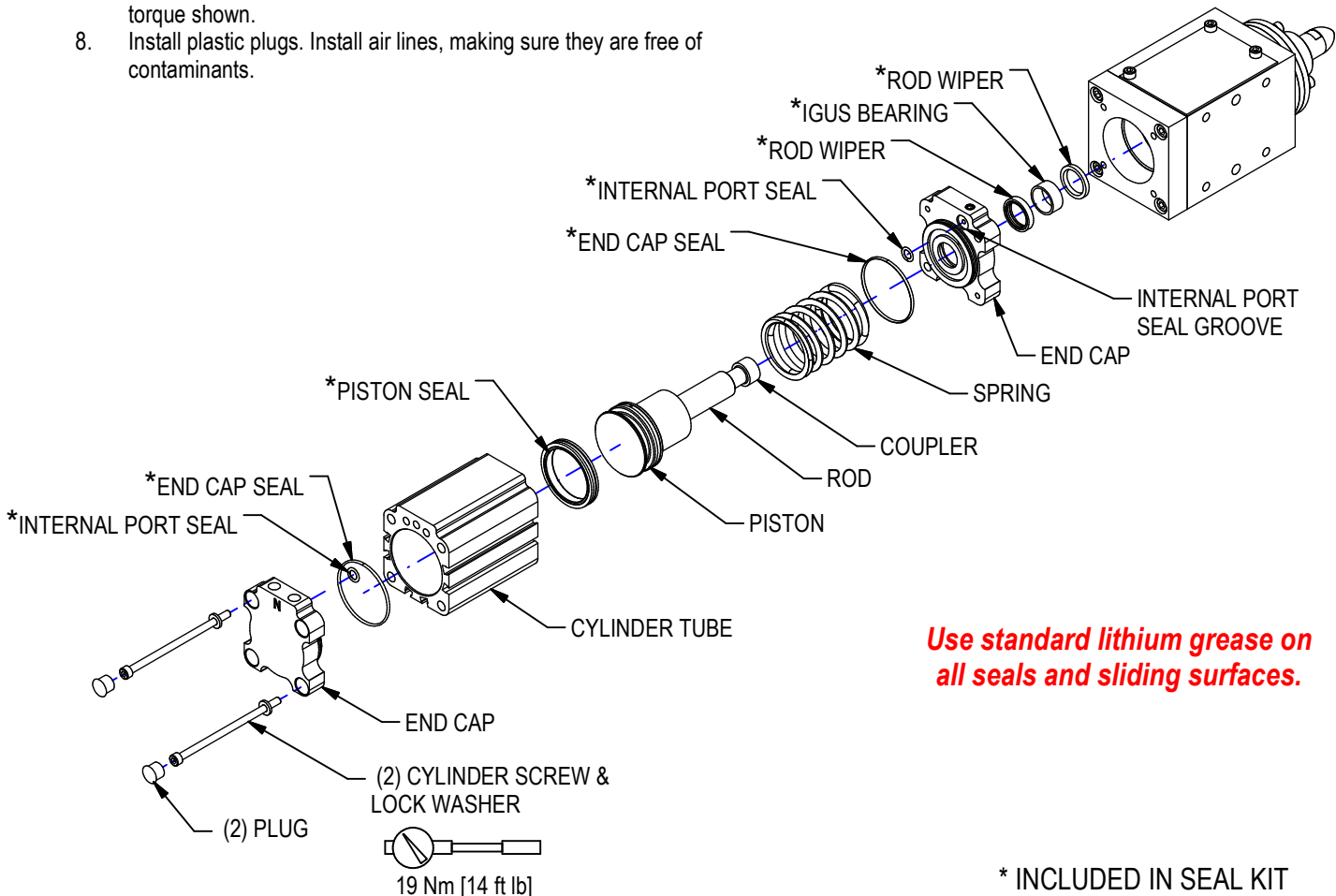
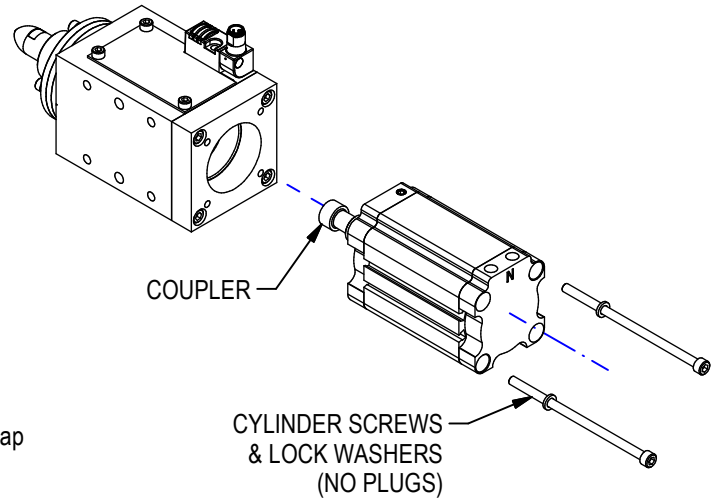
Disconnect air lines to cylinder, release any trapped air conditions.

Remove cylinder screws from actuator plate. Note port locations prior to removing cylinder. Slide cylinder to remove coupler from key slot. (See cartridge replacement sheet for detail)

TO REPLACE SEALS

Use standard lithium grease on all seals and sliding surfaces.

1. Remove plastic plugs (2). Loosen screws enough to release tube/end cap assembly.
2. Replace end cap seals (2).
3. Replace piston seal.
4. Replace internal port seals (2).
5. Remove and replace piston seal.
6. Remove Igus bearing and wipers via front of end cap, noting orientation. Replace.
7. Reassemble unit making sure internal port seals are in place and cylinder tube is aligned correctly. Using torque wrench tighten cylinder screws to torque shown.
8. Install plastic plugs. Install air lines, making sure they are free of contaminants.



* INCLUDED IN SEAL KIT

RETRACT CYLINDER SEAL REPLACEMENT: PCX-RC-CSK

Before retract cylinder removal, pin must be in extended position.

For spring assist actuators (B and V) extend coupler using air.

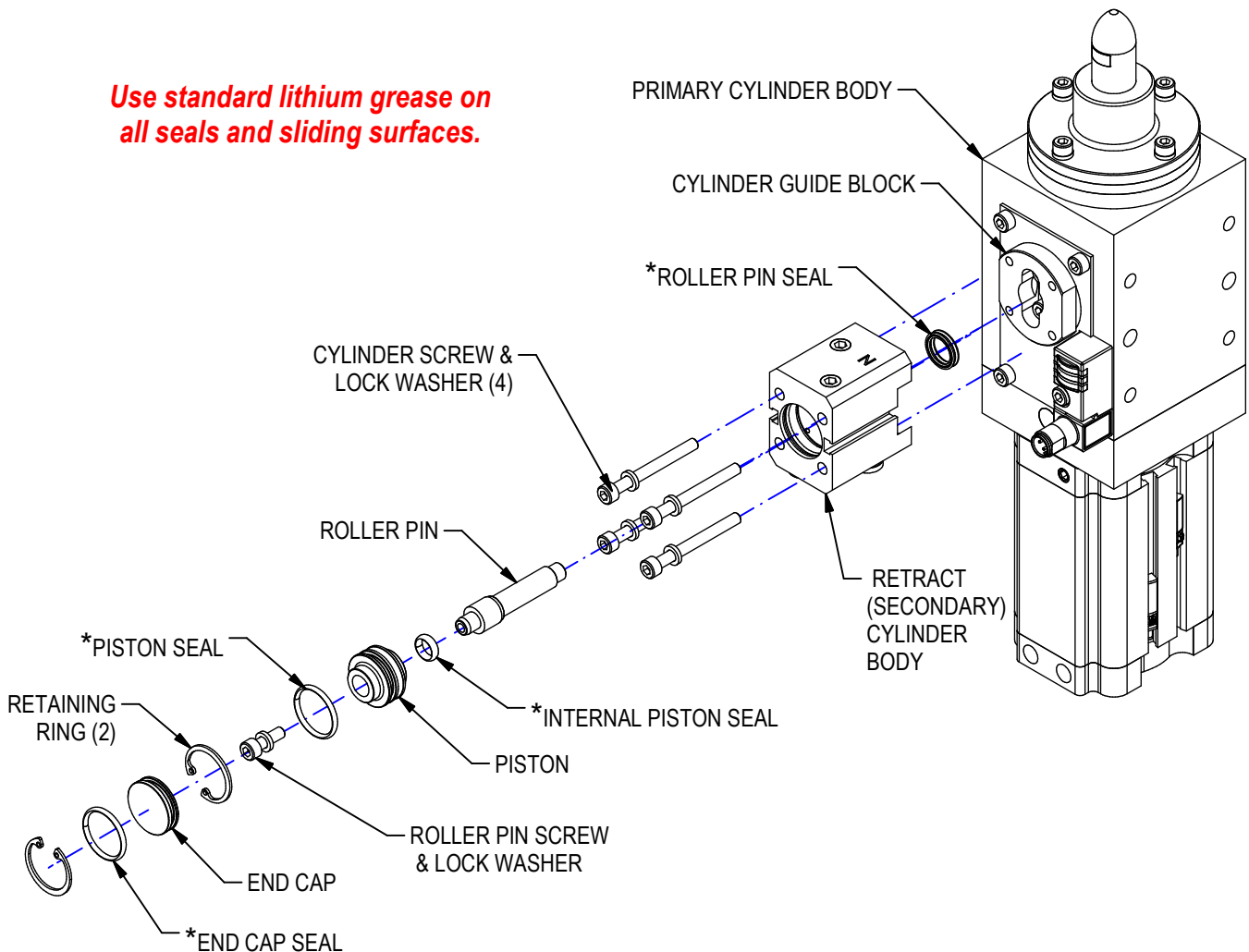
Disconnect air lines to cylinder, release any trapped air conditions.

Remove cylinder screws from actuator plate. Note port locations prior to removing cylinder. Slide cylinder to remove coupler from key slot. (See cartridge replacement sheet for detail)

TO REPLACE SEALS IN RETRACT (SECONDARY) CYLINDER

Use standard lithium grease on all seals and sliding surfaces.

1. Remove screws and lock washers from cylinder body. Remove cylinder body from cylinder guide block, note port locations before removing cylinder
2. Remove first retaining ring from cylinder body.
3. Remove end cap and replace end cap seal, note orientation of end cap in cylinder body.
4. Remove second retaining ring.
5. Remove piston and attached roller pin from cylinder body.
6. Remove roller pin screw and lock washer.
7. Install new piston seals in piston and roller pin seal in cylinder body.
8. Reinstall components in reverse order.



* INCLUDED IN SEAL KIT

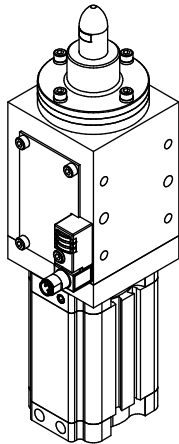
SWITCH INFORMATION

	Reorder #	QTY	Mfr. Part Number	Manufacturer	Description
World Switches	SWITCH SWA	1	Ni2-Q6.5-AP6-0.1-FS 4.4X3/S304	Turck	4-Wire, 4-Pin, DC M12 X 1 (PNP)
	SWITCH SWB	1	Ni2-Q6.5-ADZ32-0.1-FSB 5.4X4/S304	Turck	4-Wire, 5-Pin, AC/DC 1/2-20 (N.O.)
	SWITCH SWC	1	Ni2-Q6.5-AN6-0.1-FS 4.4X3/S304	Turck	4-Wire, 4-Pin, DC M12 X 1 (NPN)
	SWITCH SWD	1	NBN2-F581-100S6-E8-V1	Pepperl & Fuchs	4-Wire, 4-Pin, DC M12 X 1 (PNP)
	SWITCH SWE	1	BES-Z02KR2-PSC20F-P100-S04-V	Balluff	3-Wire, 4-Pin, DC M12 X 1 (PNP)
	SWITCH SWJ	1	IN5374	Efector	3-Wire, 4-Pin, DC M12 X 1 (PNP)
	SWITCH SWZ	1	WWS001A	Welker	4-Wire, 4-Pin, DC M12 X 1 (PNP)
Cylinder Switches	SWITCH L3	1	SWITCH L3: Weld field immune*, comparable to World Switches. Dual sensor	Welker	4-Wire, 4-Pin, DC M12 X 1 (PNP)
	SWITCH L3S	1	SWITCH L3S: Weld field immune*. Single sensor switch for retract cylinder	Welker	3-Wire, 4-Pin, DC M12 X 1 (PNP)
	SWITCH L5	1	MK5113 Single sensor switch: 2 required per cylinder; 1 required for retract cylinder	ifm Efector	3-Wire, 4-Pin, DC M12 X 1 (NPN)

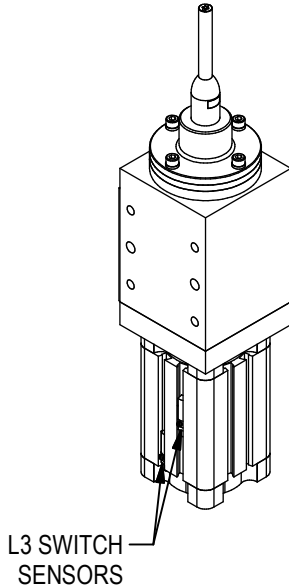
Standard Switch Option - All other options may affect price and delivery

*Note that some mid and low frequency DC resistance applications (i.e. aluminum resistance welding applications) may cause a fault. In these applications, it is recommended that the sensor be ignored/bypassed during the welding cycle.

PCS WITH ACTUATOR B AND WORLD SWITCH



PCS WITH ACTUATOR B AND L3 SWITCH



PCM WITH ACTUATOR V (RETRACT OPTION) AND L3 SWITCHES

