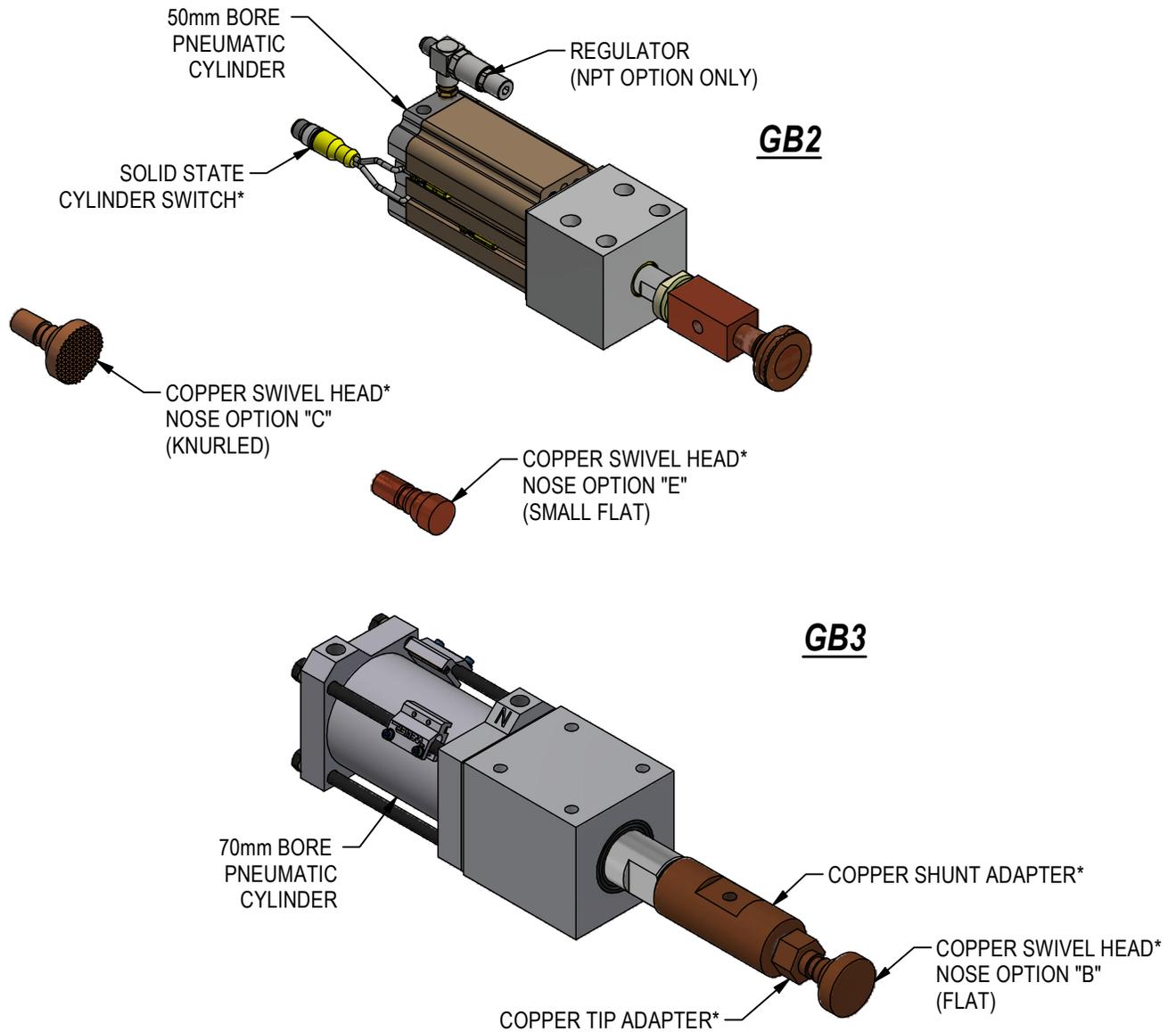


MAINTENANCE MANUAL

GROUND BLOCK CYLINDERS GB2 & GB3



*OPTIONAL

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 on hand.

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

SWIVEL TIP: Copper swivel tip may wear and need replacement.

TROUBLESHOOTING

FAILURE	POSSIBLE CAUSE	SOLUTION
Unit does not extend/retract.	Cylinder failure Switch failure	Inspect unit for dirt/debris. Check plant air supply for proper pressure; too little will result in lack of cylinder movement. Seals may be worn, damaged or deteriorating. Replace as needed. If cylinder has been serviced, be sure tie rod nuts have been tightened to torque specifications. Check switch for proper operation. Replace as needed.

GB2 REPLACEMENT PARTS

QTY	STOCK*	DESCRIPTION	PART NUMBER
1	1	GB2 CYLINDER SEAL KIT	GB2-CSK
1	1	CYLINDER SWITCH	SEE CHART BELOW
1	1	NOSE ONLY	SEE BELOW
1	1	NOSE WITH SHUNT ADAPTER	SEE BELOW
1	1	ROD END INSULATOR	GB2-INSULATOR-KIT
1		REGULATOR (NPT ONLY)	AVD7209-108
1	1	WIPER KIT	GB2-WIPER-KIT

* RECOMMENDED SPARE PARTS TO KEEP IN STOCK

Reorder #	Mfr. Part Number	Manufacturer	Description
SWITCH L3	SWITCH L3 Weld field immune*, comparable to World Sw itches	Welker	4-Wire, 4-Pin, DC M12 X 1 (PNP) Quick Disconnect
SWITCH L5	MK5113	ifm Efactor	3-Wire, 4-Pin, DC M12 X 1 (NPN) Quick Disconnect

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

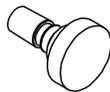
*Note that some mid and low frequency DC resistance applications (i.e. aluminum resistance welding applications) may cause a fault. In these applications, it is recommended that the sensor be ignored/bypassed during the welding cycle.

GB2 REPLACEMENT NOSES

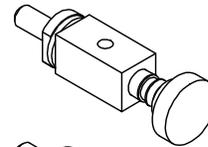
NOSE ONLY

NOSE WITH SHUNT ADAPTER

STYLE "B" FLAT SWIVEL HEAD



ORDER AS: SN-1512

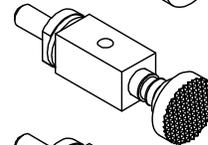


ORDER AS: GB2-KIT-B

STYLE "C" FLAT SWIVEL HEAD



ORDER AS: GB3E25

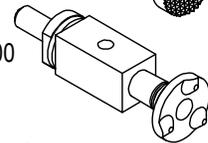


ORDER AS: GB2-KIT-C

STYLE "D" FLAT SWIVEL HEAD



ORDER AS: GBPH25E150200

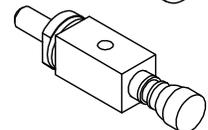


ORDER AS: GB2-KIT-D

STYLE "E" FLAT SWIVEL HEAD

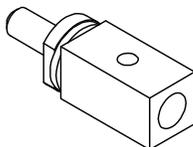


ORDER AS: SN-157



ORDER AS: GB2-KIT-E

SHUNT ADAPTER ONLY



ORDER AS: GB2-KIT-0

ROD END INSULATOR



ORDER AS: GB2-INSULATOR-KIT

GB3 REPLACEMENT PARTS

QTY	STOCK*	DESCRIPTION	TYPE	PART NUMBER
1	1	GB3 CYLINDER SEAL KIT		GB3-CSK
1	1	CYLINDER SWITCH		SEE CHART BELOW
1	1	NOSE		SEE BELOW
1	1	NOSE WITH SHUNT ADAPTER		SEE BELOW
2	2	WIPER		MC1375X1875-312U

* RECOMMENDED SPARE PARTS TO KEEP IN STOCK

Reorder #	Mfr. Part Number	Manufacturer	Description
SWITCH L3	SWITCH L3 Weld field immune*, comparable to World Sw itches	Welker	4-Wire, 4-Pin, DC M12 X 1 (PNP) Quick Disconnect
SWITCH L5	MK5113	ifm Efector	3-Wire, 4-Pin, DC M12 X 1 (NPN) Quick Disconnect

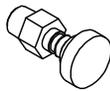
Standard Switch Option - All other options may affect price and delivery

*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.

GB3 REPLACEMENT NOSES

NOSE (INCLUDES TIP ADAPTER)

STYLE "B" FLAT SWIVEL HEAD



ORDER AS: GB3-D

STYLE "C" SERRATED SWIVEL HEAD



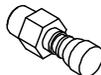
ORDER AS: GB3-E

STYLE "D" PROJECTION SWIVEL HEAD



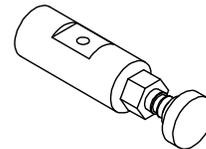
ORDER AS: GB3-F

STYLE "E" SMALL FLAT SWIVEL HEAD

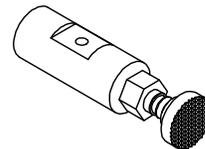


ORDER AS: GB3-G

NOSE WITH SHUNT ADAPTER

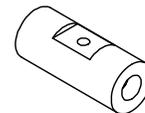


ORDER AS: GB3-B



ORDER AS: GB3-C

SHUNT ADAPTER ONLY

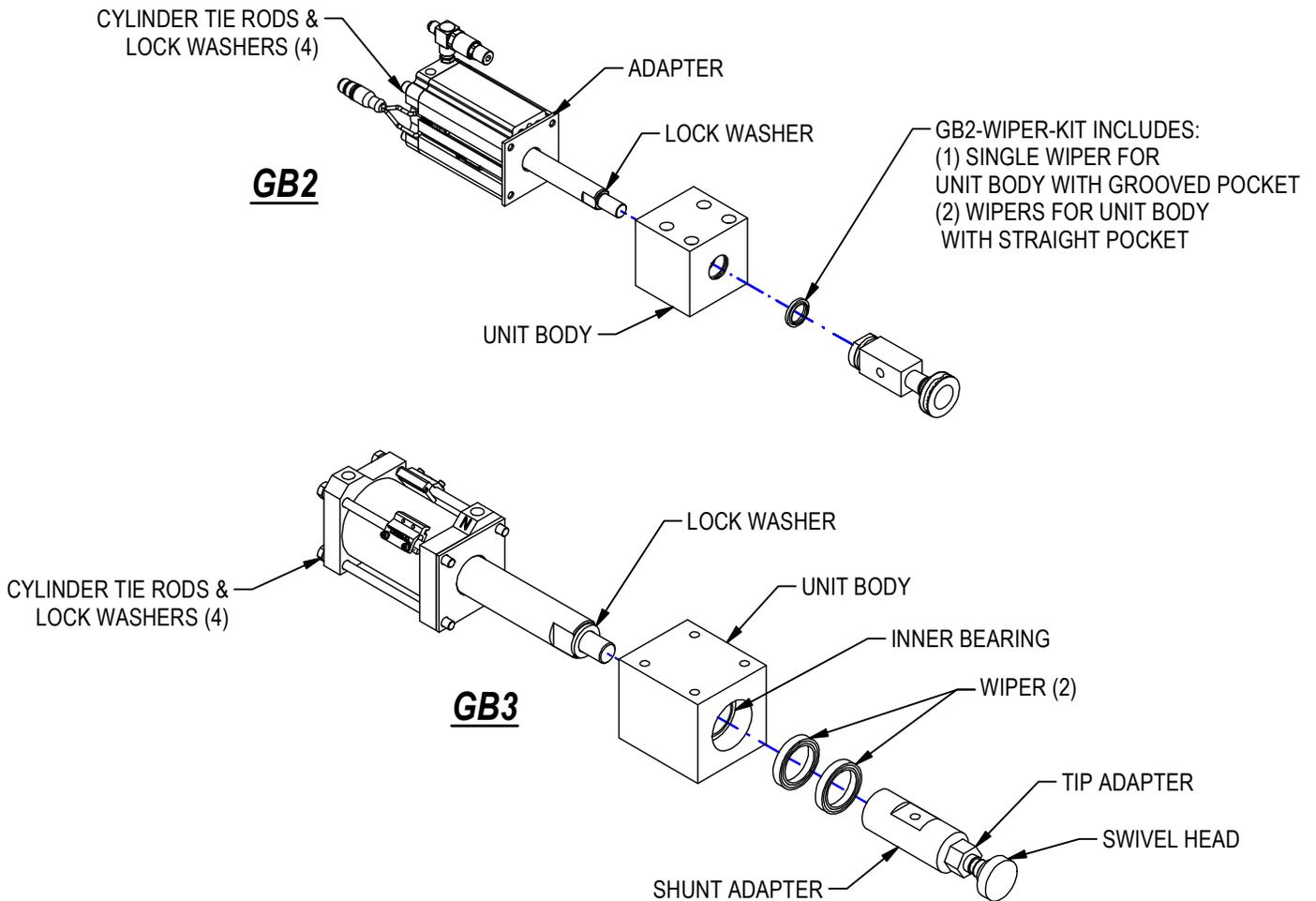


ORDER AS: GB3-A

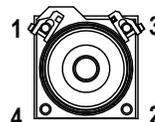
TO REPLACE WIPER

1. Remove air lines from the cylinder. Remove unit from mount. Remove cylinder switch if necessary.
2. Remove shunt adapter assembly.
3. Loosen (4) cylinder tie rods enough to free unit body. Remove unit body.
4. Remove existing wiper(s), being careful to note orientation of groove.
5. Install new wiper(s) in unit body**, groove placement same as old wiper(s). For GB2 or GB3 unit body requiring 2 wipers: Use a flat surface/plate to install wiper; a hand press is recommended. Press first wiper into unit until it makes contact with inner bearing. Press second wiper into unit until flush with surface, leaving desired gap between wipers. For GB2 unit body requiring 1 wiper: Install single wiper into unit's grooved pocket.
6. Reassemble unit body and cylinder. Using torque wrench tighten tie rods to torque and pattern shown.
7. Install cylinder switch if applicable. Install unit to mount. Install air lines, making sure they are free of contaminants.

**** Grease all seals with dielectric grease: super lube silicone lubricating grease #92016 or 92150**
(available from Applied Material)



Tightening Torques for Metric Bolts (installed dry)				
	Steel		Aluminum	
M5	10 Nm	7.375 ft lb.	5 Nm	3.6875 ft lb.
M6	19 Nm	14.014 ft lb.	9.5 Nm	7.007 ft lb.
M8	45 Nm	33.19 ft lb.	22.5 Nm	16.595 ft lb.
M10	89 Nm	65.643 ft lb.	44.5 Nm	32.8215 ft lb.
M12	156 Nm	115.06 ft lb.	78 Nm	57.53 ft lb.

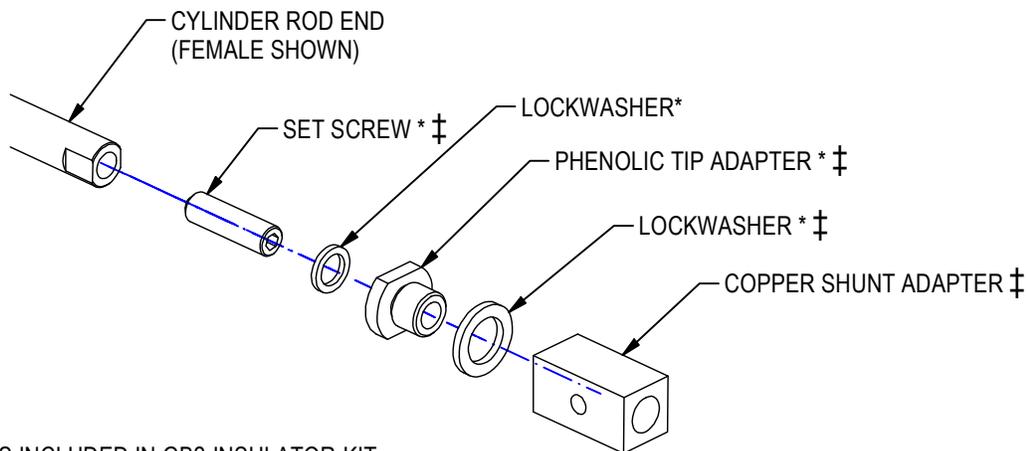


GB2 ROD END INSULATOR REPLACEMENT

Instructions for replacing Rod End Insulator using replacement parts kit GB2-INSULATOR-KIT and replacing the Shunt Adapter using replacement parts kit GB2-KIT-{NOSE STYLE}..

1. Remove existing set screw rod end and discard. Note: set screw is installed with permanent thread locker. Apply heat to remove, using caution not to overheat and damage rod seals.
2. Install replacement set screw from the kit into rod and with thread locker.
3. Install replacement phenolic tip adapter and lock washer to rod end.
4. Assemble existing copper shunt adapter to rod end with lock washer.

NOTE: In the case that the cylinder has a male threaded rod end, skip steps 1 and 2. Discard unused set screw from replacement parts kit.



* ITEMS INCLUDED IN GB2-INSULATOR-KIT

‡ ITEMS INCLUDED IN GB2-KIT-{NOSE STYLE}

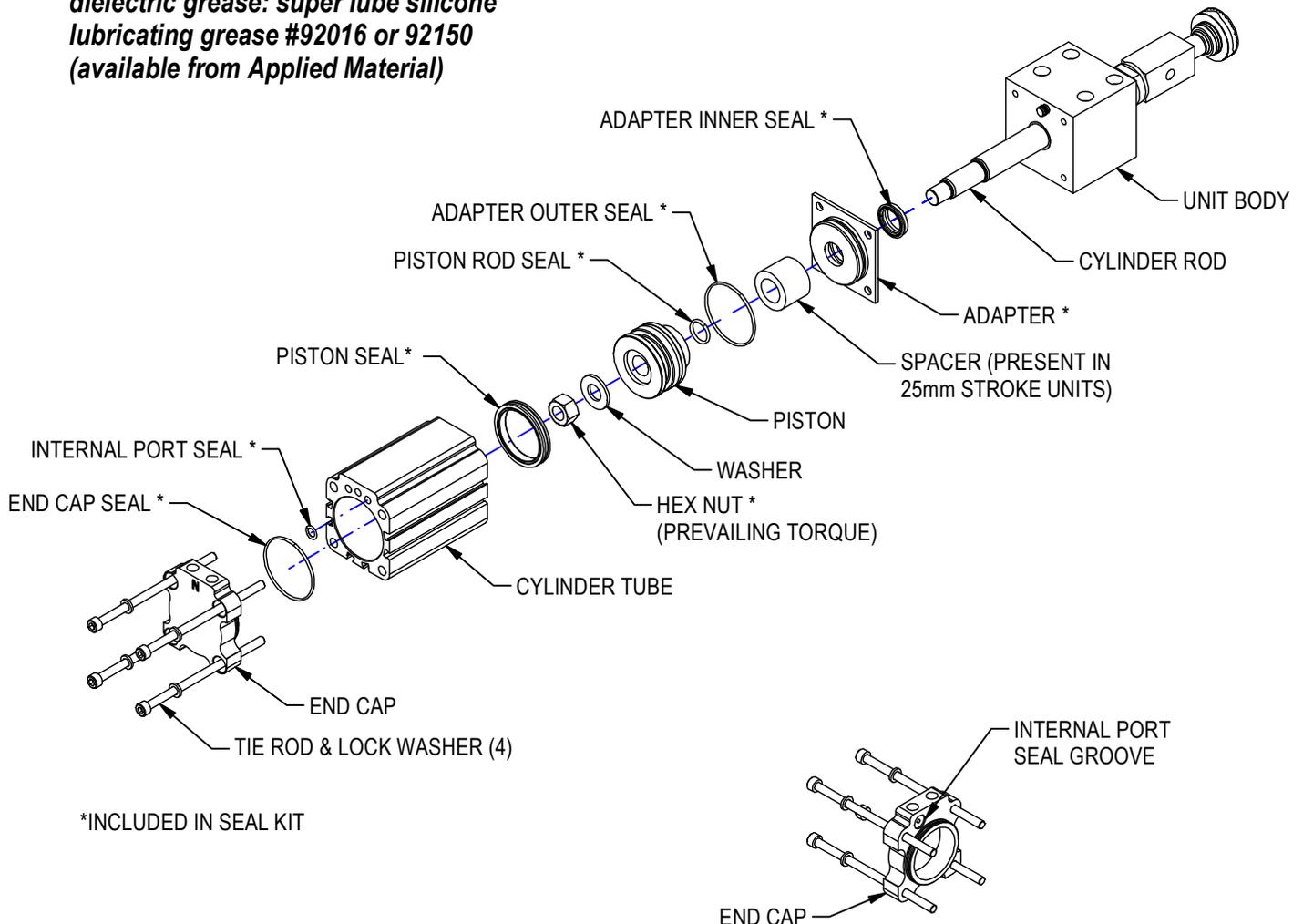
GB2 CYLINDER SEAL MAINTENANCE

Cylinder seal kit (GB2-CSK) includes: End cap seal, piston/rod seal, piston seal, adapter with inner & outer seals, internal port seal, and prevailing torque hex nut.

Seals should be replaced routinely to avoid cylinder failure.

1. Disconnect air lines to cylinder, release any trapped air conditions.
2. Loosen tie rods enough to release tube/end cap assembly.
3. Replace end cap seals. Replace piston seal. Replace internal port seals.**
4. To replace piston/rod seal, remove hex nut. Hex nut is affixed to cylinder rod with permanent Loctite. To remove, first extend the cylinder rod to move the nut away from unit body. Then apply heat to the nut to soften the thread locker. Use caution so as not to overheat the piston or seals! Remove and dispose hex nut.
5. Piston/rod seal is located inside piston. Remove piston from rod and replace seal**. Reinstall washer and hex jam nut to cylinder rod using permanent Loctite.
6. Remove and replace adapter. Note the the adapter comes pre-installed with the inner and outer seals
7. Reassemble unit making sure internal port seal is in place and cylinder tube is aligned correctly. Using torque wrench tighten cylinder tie rods to pattern and torque shown on Sheet 5.
8. Install air lines, making sure they are free of contaminants.

**** Grease all seals, piston, and interior of cylinder tube with dielectric grease: super lube silicone lubricating grease #92016 or 92150 (available from Applied Material)**



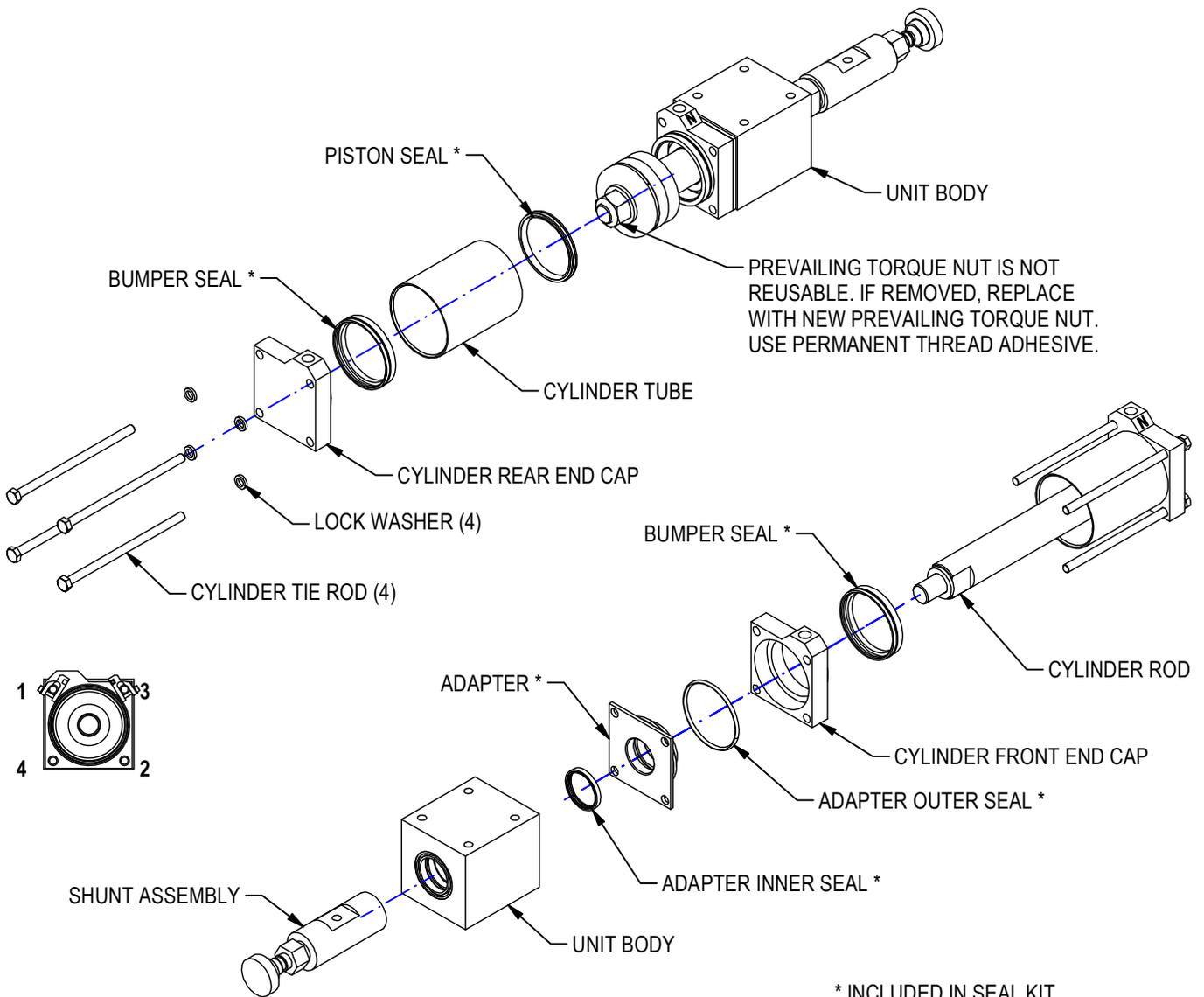
*INCLUDED IN SEAL KIT

GB3 CYLINDER SEAL MAINTENANCE

Seals should be replaced routinely to avoid cylinder failure.

1. Remove air lines from the cylinder. Remove unit from mount. Remove cylinder switch if applicable.
2. Remove the cylinder tie rods & lock washers. Remove end cap & tube noting port position.
3. Clean seal groove thoroughly. Replace bumper seal.**
4. Remove piston seal using plastic or brass tool. NOTE ORIENTATION OF SEALS. Inspect parts for wear. Clean piston and install new seal.**
5. To access front bumper seal and adapter seals, remove shunt assembly. Slide unit body off cylinder rod. Remove & replace adapter. Note that the adapter comes with seal pre-installed.
6. Remove front end cap & bumper seal noting port position. Clean seal groove thoroughly. Replace bumper seal.**
7. Reassemble unit with cylinder tie rods & lock washers. Be sure cylinder ports are in proper position. Using torque wrench tighten bolts to pattern shown. Tighten bolts to torque & pattern shown on Sheet 5.
8. Install cylinder switch if applicable. Install unit to mount. Install air lines, making sure they are free of contaminants.

**** Grease all seals, piston, and interior of cylinder tube with dielectric grease: super lube silicone lubricating grease #92016 or 92150 (available from Applied Material)**



REPLACING TIE ROD CYLINDER SWITCH

1. BEFORE REMOVING OLD SWITCH: NOTE SENSOR PLACEMENT! FOR SWITCHES WITH TWO SENSORS, EACH WILL BE TAGGED WITH A BAND AROUND THE WIRE INDICATING S1 AND S2 (OR S01 AND S02).
2. TO REMOVE SWITCH, REMOVE BOLTS AND WASHERS FROM BRACKET. SLIDE BRACKET OUT FROM TIE ROD.
3. SENSOR IS SNAPPED INTO BRACKET. REMOVE.
4. INSTALL NEW SWITCH SENSOR FLUSH INTO BRACKET, BEING CAREFUL TO MATCH SENSOR CORRECTLY TO LOCATION ON CYLINDER.
5. LOCATE BRACKET TO CYLINDER, SLIDE ON TO TIE ROD. SECURE WITH BOLTS & WASHERS.

