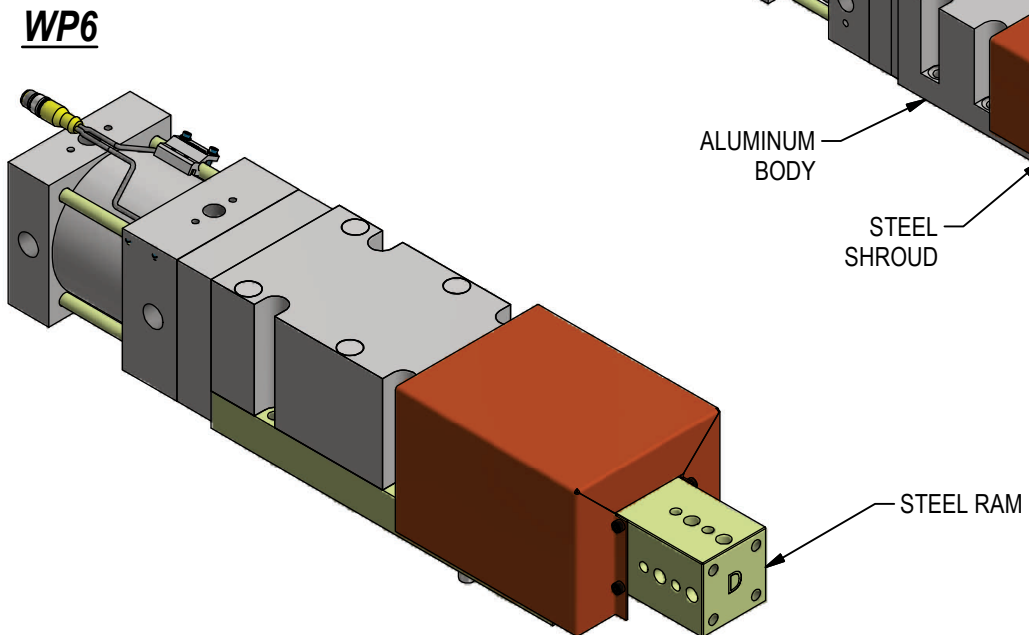
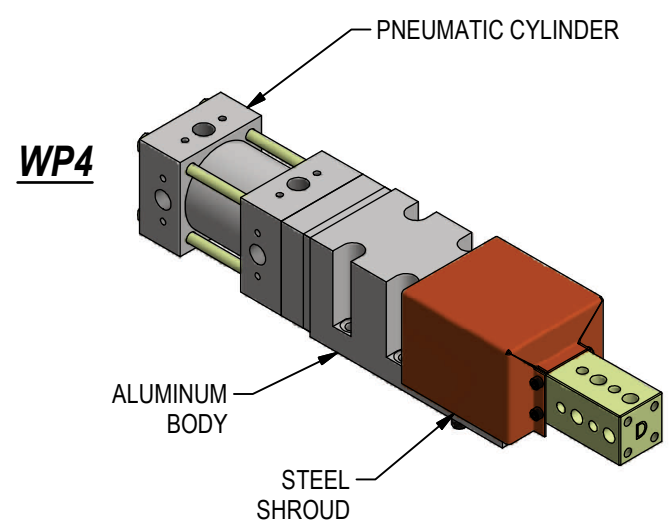
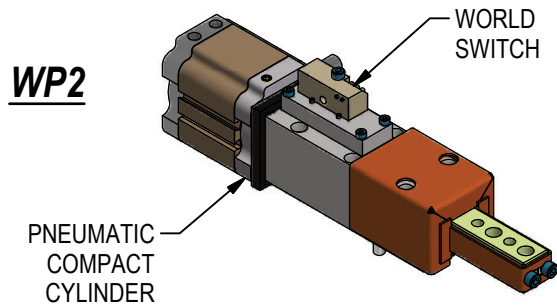


MAINTENANCE MANUAL WP SERIES INLINE SHOT PINS



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.

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.

WIPER: Welker recommends annual changing of urethane wiper. Wipers are maintenance items and are not covered under standard product warranty.

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

TROUBLESHOOTING

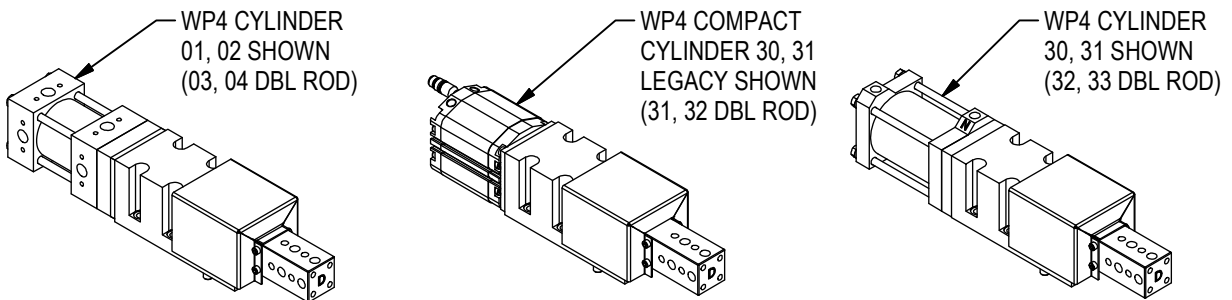
FAILURE	POSSIBLE CAUSE	SOLUTION
Unit does not extend/retract.	Cylinder failure Switch failure	Inspect unit for dirt/debris. Check plant air supply for proper pressure; too little will result in lack of cylinder movement. Seals may be worn, damaged or deteriorating. Replace as needed. If cylinder has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

REPLACEMENT PARTS

QTY	STOCK*	DESCRIPTION	CYLINDER	PART NUMBER
1	1	SWITCH		SEE CHART BELOW
1	1	WP2 WIPER		WIPER-24
	1	WP2 CYLINDER SEAL KIT	01, 02	WC-002-CSK
	1	WP2 CYLINDER SEAL KIT	03, 04	WC-007-CSK
	1	WP2 CYLINDER SEAL KIT	30-33	SEE NOTE A
1	1	WP4 WIPER		WIPER-40-KIT
	1	WP4 CYLINDER SEAL KIT	01, 02	SEE NOTE A
	1	WP4 CYLINDER SEAL KIT	03, 04	WC-007-CSK
	1	WP4 CYLINDER SEAL KIT	09, 10	WC-003-CSK
	1	WP4 CYLINDER SEAL KIT	11, 12	WC-047-CSK
	1	WP4 COMPACT CYLINDERS, LEGACY	30-33	SEE NOTE A
	1	WP4 CYLINDER SEAL KIT	30, 31	WCW-2169-CSK
	1	WP4 CYLINDER SEAL KIT	32, 33	WCW-2170-CSK
1	1	WP6 WIPER		WIPER-60
	1	WP6 CYLINDER SEAL KIT	01, 02	WC-1002-CSK
	1	WP6 CYLINDER SEAL KIT	03, 04	WC-2106-CSK
	1	WP6 CYLINDER SEAL KIT	9, 10	WC-1005-CSK
	1	WP6 CYLINDER SEAL KIT	11, 12	WC-2153-CSK
	1	WP6 CYLINDER SEAL KIT	30-33	SEE NOTE A

* RECOMMENDED SPARE PARTS TO KEEP IN STOCK

NOTE A: PLEASE CALL WELKER WITH THE SERIAL NUMBER OF THE CYLINDER AND/OR WELKER JOB NUMBER.



	Reorder #	Mfr. Part Number	Manufacturer	Description
World Switches	SWA	Ni2-Q6.5-AP6-0.1-FS 4.4X3/S304	Turck	4-Wire, 4-Pin, DC M12 X 1 (PNP) Quick Disconnect
	SWB	Ni2-Q6.5-ADZ32-0.1-FSB 5.4X4/S304	Turck	4-Wire, 5-Pin, AC/DC 1/2-20 (N.O.) Quick Disconnect
	SWD	NBN2-F581-100S6-E8-V 1	Pepperl & Fuchs	4-Wire, 4-Pin, DC M12 X 1 (PNP) Quick Disconnect
	SWJ	IN5374	Efector	3-Wire, 4-Pin, DC M12 X 1 (PNP) Quick Disconnect
	Reorder #	Mfr. Part Number	Manufacturer	Description
Cylinder Switches	SWITCH L3	SWITCH L3 L3 switch is weld field immune*, comparable to World Switches	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

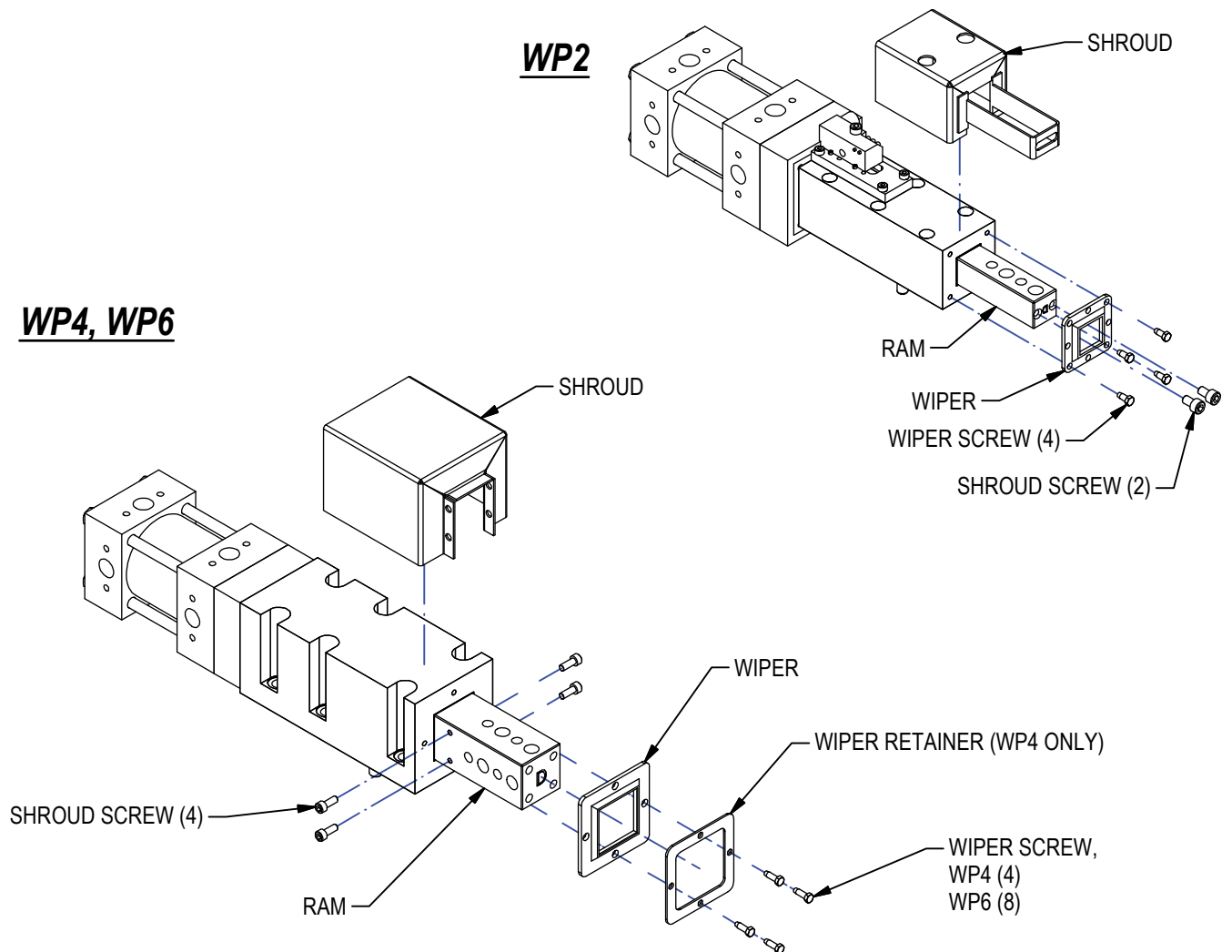
Standard Switch Option - All other options may affect price and delivery

*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.

RAM WIPER MAINTENANCE

Welker recommends annual changing of urethane wiper. Wipers are maintenance items and are not covered under standard product warranty. Steam cleaning or wiping contamination off during the course of normal machine maintenance is desirable.

1. Disengage plant air from unit. Remove tooling from unit ram.
2. Remove shroud screws. Remove shroud.
3. Remove wiper screws. Remove wiper retainer (WP4 only). Remove wiper.
4. Clean ram, removing residual debris.
5. Install new wiper using a small amount of Magnalube G grease.
6. Replace wiper retainer (WP4 only).
7. Install wiper screws.
8. Install shroud with shroud screws.
7. Install tooling on unit ram.
8. Engage plant air, making sure lines are free of contaminants.



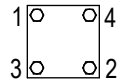
TIE ROD CYLINDER MAINTENANCE

TO REMOVE/REPLACE OR ROTATE CYLINDER:

1. Remove shroud. Loosen cylinder tie rods 1-2".
2. Pull cylinder back, retracting ram enough to slide coupler out of slot.
3. Hold cylinder in one hand.
4. Remove coupler and cylinder. **KEEP CYLINDER ASSEMBLED.** If unit has rigid coupler or is a double rod cylinder the rigid adapter will be in place.
5. Replace cylinder or rotate cylinder to desired orientation, ensuring coupler has been installed with permanent thread locker.
6. Secure tie rods evenly. Tighten in an "X" pattern to torque specifications.
7. Check for leaks.

Tie Rod Torque Specifications				
Shot Pin Series	Thread	ft-lbf	in-ibf	N-m
24	1/4-28"	6.5	78	8.8
40	5/16-24"	12	144	16.3
60	3/8-24"	22	264	29.8

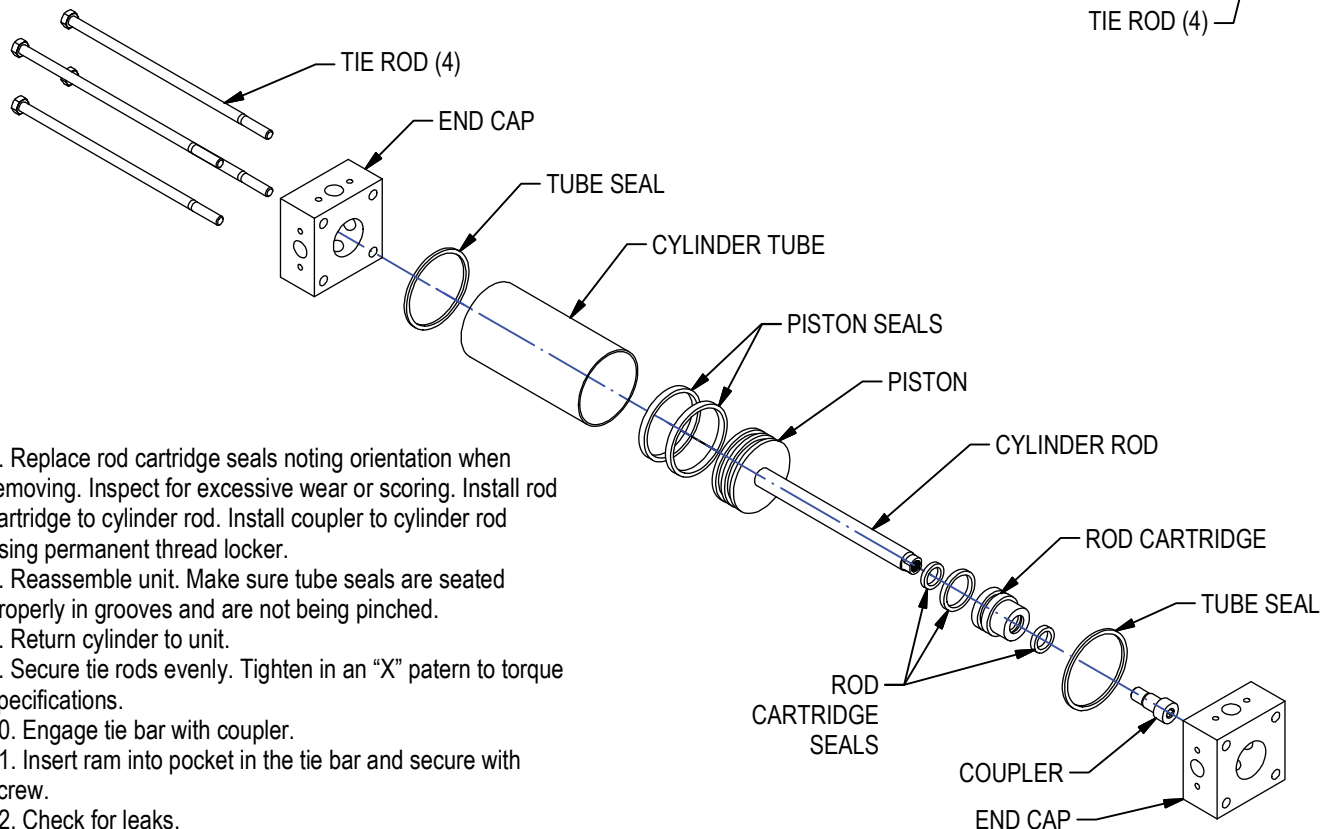
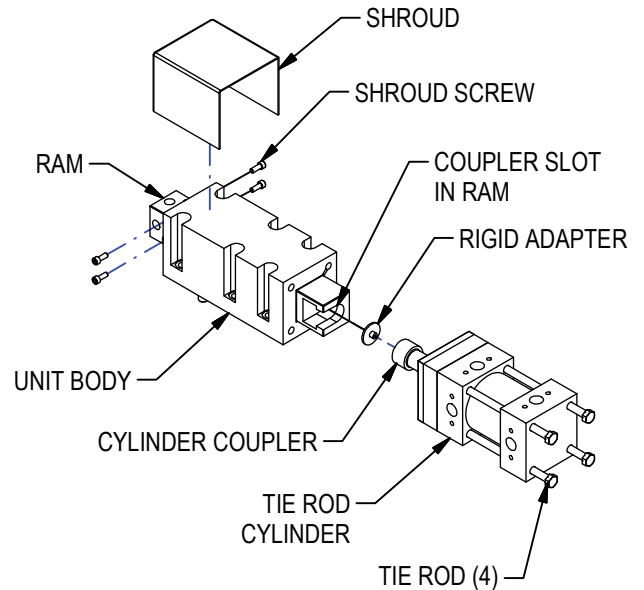
TORQUE PATTERN



FOR COMPACT CYLINDERS PLEASE CALL WELKER WITH THE SERIAL NUMBER OF THE CYLINDER AND/OR WELKER JOB NUMBER.

TO REPLACE TIE ROD CYLINDER SEALS:

1. Remove cylinder following steps above.
2. Remove end caps from tube. Clean seal grooves thoroughly. Replace tube seals.
3. Remove piston seals using plastic or brass tool. **NOTE ORIENTATION OF SEALS.** Inspect parts for wear. Clean piston and install new seals.
4. Lightly coat the piston seals and tube I.D. with Magnalube G grease.
5. Remove the coupler from cylinder rod using gentle heat, being careful not to melt seals. Remove rod cartridge.



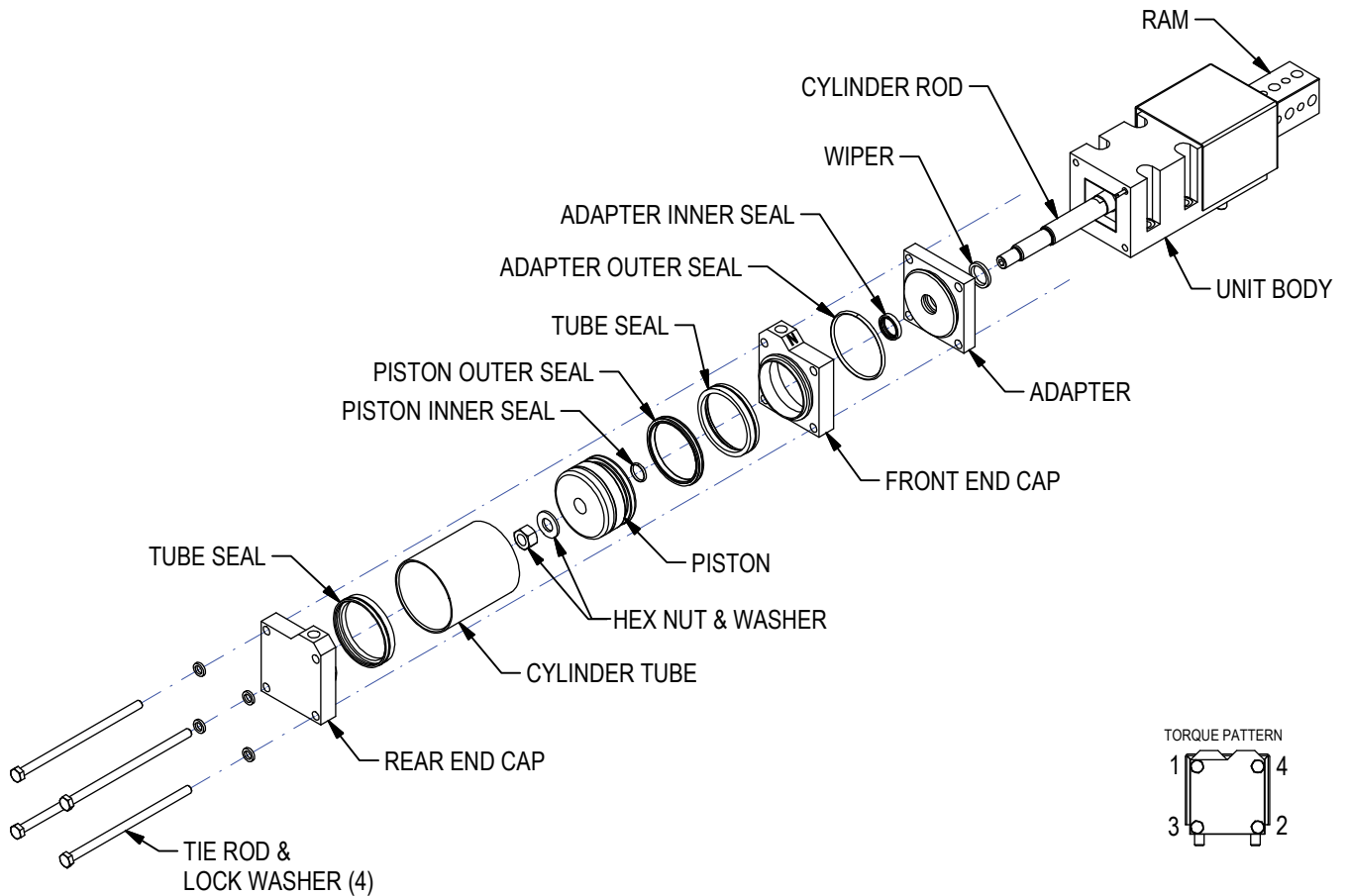
6. Replace rod cartridge seals noting orientation when removing. Inspect for excessive wear or scoring. Install rod cartridge to cylinder rod. Install coupler to cylinder rod using permanent thread locker.
7. Reassemble unit. Make sure tube seals are seated properly in grooves and are not being pinched.
8. Return cylinder to unit.
9. Secure tie rods evenly. Tighten in an "X" pattern to torque specifications.
10. Engage tie bar with coupler.
11. Insert ram into pocket in the tie bar and secure with screw.
12. Check for leaks.

WP4 CYLINDER 30 & 31 MAINTENANCE (70mm BORE)

WCW-2169-CSK includes tube seals (2), rod wiper, piston seals and adapter seals.

NOTE: Use *Magnalube G* or equivalent on all seals and wear rings.

1. Disengage plant air from unit.
2. Remove tie bolts & lock washers from rear end cap. Remove end cap noting port orientation. Remove cylinder tube & tube seals noting seal orientation..
3. Hex nut is installed with removable adhesive. Use belt or strap wrench to loosen hex nut, being careful not to scratch or damage piston or cylinder rod.
4. Remove piston. Replace outer and inner piston seal.
5. Remove front end cap noting port orientation. Replace tube seals on end caps.
6. Remove adapter. Replace outer and inner adapter seals.
7. Remove and replace rod wiper. Note orientation: grooved side faces unit.
8. Install adapter. Install front end cap.
9. Install piston to rod. Secure with hex nut & washer, using removable adhesive on threads.
10. Install cylinder tube and rear end cap. Be sure tube seals are properly seated. Secure with tie rods/lock washers. Tighten to torque shown.
11. Engage plant air, making sure lines are free of contaminants.



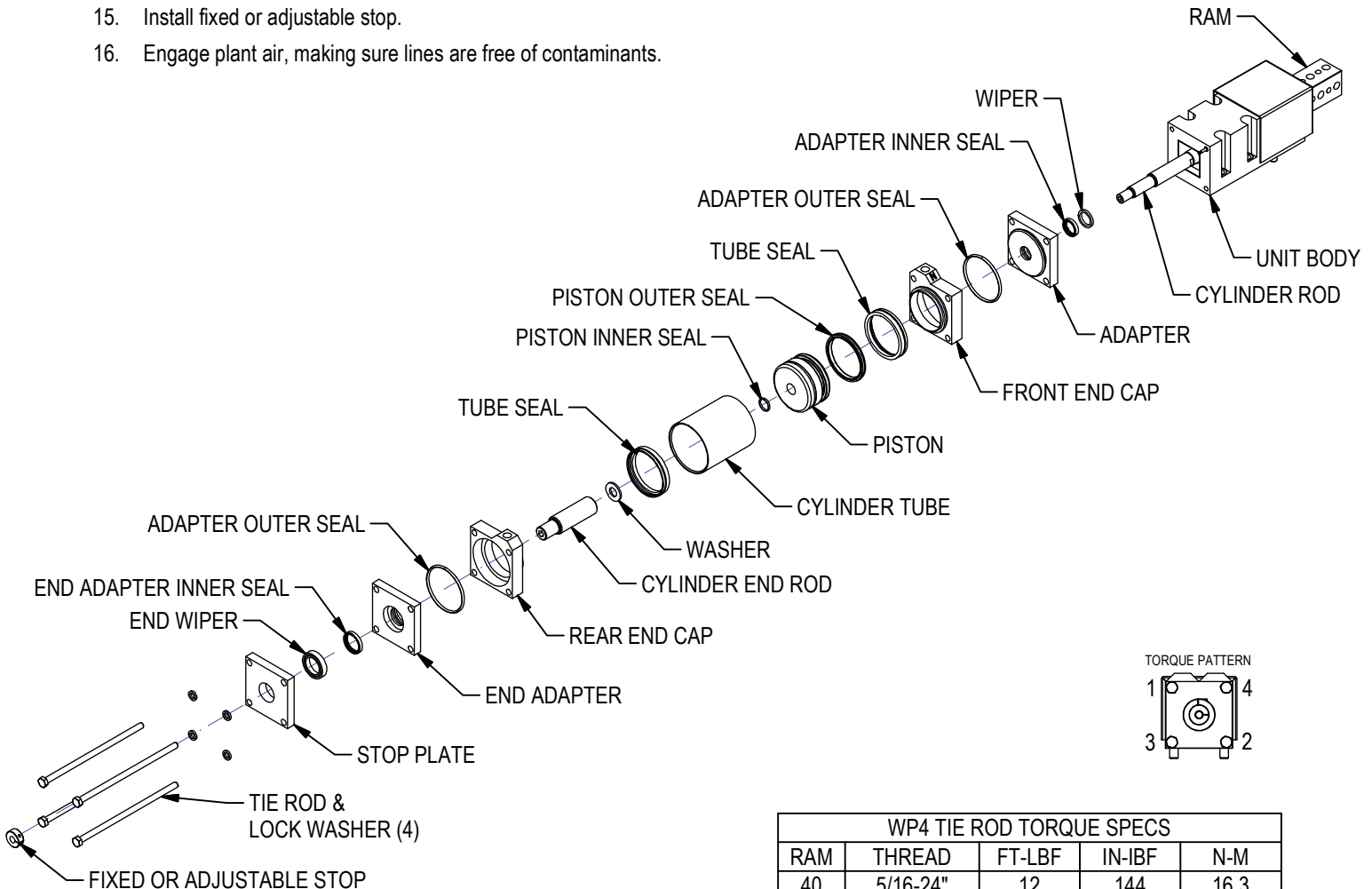
WP4 TIE ROD TORQUE SPECS				
RAM	THREAD	FT-LBF	IN-IBF	N-M
40	5/16-24"	12	144	16.3

WP4 CYLINDER 32 & 33 MAINTENANCE (70mm BORE)

WCW-2170-CSK includes tube seals (2), rod wipers, piston seals and adapter seals.

NOTE: Use Magnalube G or equivalent on all seals and wear rings.

1. Disengage plant air from unit.
2. Remove stop (fixed or adjustable) from cylinder end rod.
3. Remove tie bolts & lock washers from stop plate. Remove stop plate.
4. Remove end wiper and end adapter. Replace inner and outer adapter seals.
5. Remove rear end cap noting port orientation. Remove cylinder tube & tube seals noting seal orientation.
6. Cylinder end rod is installed with removable adhesive. Use belt or strap wrench to loosen hex nut, being careful not to scratch or damage. Remove washer.
7. Remove piston. Replace outer and inner piston seal.
8. Remove front end cap noting port orientation. Replace tube seals on end caps.
9. Remove adapter. Replace outer and inner adapter seals.
10. Remove and replace rod wiper. Note orientation: grooved side faces unit.
11. Install adapter. Install front end cap.
12. Install piston to rod. Secure with cylinder end rod & washer, using removable adhesive on threads.
13. Install cylinder tube and rear end cap. Be sure tube seals are properly seated. Install end adapter, wiper and stop plate.
14. Secure with tie rods/lock washers. Tighten to torque shown.
15. Install fixed or adjustable stop.
16. Engage plant air, making sure lines are free of contaminants.



WP4 TIE ROD TORQUE SPECS				
RAM	THREAD	FT-LBF	IN-IBF	N-M
40	5/16-24"	12	144	16.3