Cylinder Parts
Identification and Seal Kits Data

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For Cylinder Division Plant Locations – See Section H.
Series 2MA – Mounting Kit Assembly & Dis-Assembly

Perform the following steps when dis-assembling, installing mounting kits and re-assembling Series 2MA cylinders

Dis-assembly of cylinder to add Mounting Kit*

1) Un-Torque cylinder mounting fasteners using corner to corner sequence until fasteners are finger tight.
2) Remove all fasteners.
3) Clean mating parts to remove oil, grease and dirt.
4) Fasteners should be clean, dry and burr free.
5) Brush mounting fastener threads thoroughly with anti-seize lubricant.
6) Follow the appropriate procedure below for the desired mounting.

Rear Pivot Mounting Kits - Style BB, BC and BE (Fig. 1)

Place pivot mount over end cap, lining up the four fastener holes in the end cap with the pivot mounting plate. Note that the pivot mount can be rotated allowing for different cylinder port locations. Secure mounting to cylinder cap (finger tight) using the four fasteners. Torque the fasteners to the specifications in the table below.

End Angle Mounting Kit - Style CB (Fig. 2)

The end angles bolt to the front and rear of the cylinder end caps. The spacer plate** provided is to be assembled at the rod end under the angle plate. Line up the two holes of the spacer plate and angle plate with the two fastener holes in the cylinder head. Secure (finger tight) using two fasteners. Repeat this assembly at the opposite end (less spacer). Place the assembly with the end angles down on a flat surface and torque the four fasteners to the specifications shown in the table below.

Flange Mounting Kits - Style J and H Single and Double Rod Cylinders (Fig. 3)

Place rectangular flange plate over appropriate end cap. Line up the four holes in the mounting plate with the four fastener holes in the cylinder end cap. Note that the rectangular mounting plate can be rotated to allow for different port locations. Secure the rectangular mounting plate to the end cap (finger tight) using the four fasteners. Then torque the four fasteners to the specifications shown in the table below.

Re-Assembly and Torquing of Cylinder After Maintenance

The following procedure is recommended to ensure the correct re-assembly of the cylinder.

A) Tighten the mounting fasteners in the opposite corner sequence to approximately 3/4 of final tightening torque.
B) Using a calibrated torque wrench, tighten the mounting fasteners to the final torque listed repeating the opposite corner sequence procedure.

** Spacer plate not used for 4" bore or double rod cylinders.

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Rod Dia.</th>
<th>J &amp; H (MP1 &amp; MP2)</th>
<th>BE (MP4)</th>
<th>BB (MP1)</th>
<th>BC (MP2)</th>
<th>CB† (MS1)</th>
<th>Fastener Torque</th>
<th>Minimum Stroke</th>
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</thead>
<tbody>
<tr>
<td>1 1/2&quot;</td>
<td>All</td>
<td>L074960150</td>
<td>L074980150</td>
<td>L074970150</td>
<td>L075000150</td>
<td>L074990150</td>
<td>32 + 4</td>
<td>1&quot;</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 1/2 + 4</td>
<td></td>
</tr>
<tr>
<td>2&quot;</td>
<td>All</td>
<td>L074960200</td>
<td>L074980200</td>
<td>L074970200</td>
<td>L075000200</td>
<td>L074990200</td>
<td>72 + 10</td>
<td>1&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8 + 1</td>
<td></td>
</tr>
<tr>
<td>2 1/2&quot;</td>
<td>All</td>
<td>L074960250</td>
<td>L074980250</td>
<td>L074970250</td>
<td>L075000250</td>
<td>L074990250</td>
<td>72 + 10</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>8 + 1</td>
<td></td>
</tr>
<tr>
<td>3 1/4&quot;</td>
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<td>L074960325</td>
<td>L074980325</td>
<td>L074970325</td>
<td>L075000325</td>
<td>L074990325</td>
<td>216 + 12</td>
<td>1 3/8&quot;</td>
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<tr>
<td></td>
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<td>24 + 1 1/4</td>
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<tr>
<td>4&quot;</td>
<td>All</td>
<td>L074960400</td>
<td>L074980400</td>
<td>L074970400</td>
<td>L075000400</td>
<td>L074990400</td>
<td>216 + 12</td>
<td>1 3/8&quot;</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>24 + 1 1/4</td>
<td></td>
</tr>
</tbody>
</table>

*Mounting kits on cylinders with stroke lengths shorter than those listed in the table below must be assembled by the factory to ensure proper fastener thread engagement.

For additional information – call your local Parker Cylinder Distributor.
Gland Seal Kits

(Gland Cartridges & Rod Seals)
For Series “2MA” Air Cylinders

Pneumatic Service Temperatures:
Nitrile Seals: –10° F. (–23° C.) to +165° F. (+74° C.)
Viton Seals: –10° F. (–23° C.) to +250° F. (+121° C.)

Service kits of expendable parts for fluid power cylinders are stocked in principal industrial locations across the U.S.A. and other countries. For prompt delivery and complete information, contact your nearest Parker distributor or office.

ROD SEAL KIT
RK Kit contains 1 each of the following:
symbol #40, Rod Lips / Wiper.
symbol #45, O-Ring, gland to head.

Installation
1) Reinspect the surface of the piston rod for scratches, dents and other surface damage and make the necessary repairs.
2) Clean and lubricate the surface of the piston rod with Lube-A-Cyl.
3) If replacing complete gland cartridge proceed to step #6. If gland (symbol #14) is not worn, replace seals only using appropriate rod seal kit (RK) and proceed as follows.
4) Lubricate gland seal groove and new Lips / Wiper (symbol #40) and install in gland groove. The seal should be installed oriented as shown in Figure A above.
5) Install new gland to head O-ring (symbol #45) in position on gland as pictured above. Be careful not to cut the O-Ring.
6) Lubricate all seals (including symbol #45) and inside bearing surfaces of gland with Lube-A-Cyl or clean light oil.
7) Slide the gland cartridge onto the piston rod, squaring it with the threads in the head, and tightening (clockwise) until seated firmly against the head.
8) Torque the gland cartridge to the specifications shown below.
NOTE: Make sure the gland is sufficiently tight. Failure to do so may result in loosening during operation.

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Rod Dia.</th>
<th>Rod No.</th>
<th>RG Rod Gland Cartridge Kit Consisting of: 1 ea. sym. # 14, 40, &amp; 45</th>
<th>RK Rod Seal Kit Consisting of: 1 ea. sym. # 40 &amp; 45</th>
<th>Gland Wrench</th>
<th>Spanner Wrench</th>
<th>Gland To Head Torque Units</th>
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</thead>
<tbody>
<tr>
<td>1-1/2&quot;</td>
<td>5/8&quot;</td>
<td>1</td>
<td>RG02MA0061 RG02MA0065</td>
<td>RK02MA0061 RK02MA0065</td>
<td>0695900000</td>
<td>0116760000</td>
<td>40-45 54-61</td>
</tr>
<tr>
<td>2&quot;</td>
<td>5/8&quot;</td>
<td>1</td>
<td>RG02MA0061 RG02MA0065</td>
<td>RK02MA0061 RK02MA0065</td>
<td>0695900000</td>
<td>0116760000</td>
<td>40-45 54-61</td>
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<tr>
<td>2-1/2&quot;</td>
<td>5/8&quot;</td>
<td>1</td>
<td>RG02MA0061 RG02MA0065</td>
<td>RK02MA0061 RK02MA0065</td>
<td>0695900000</td>
<td>0116760000</td>
<td>40-45 54-61</td>
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<td>3-1/4&quot;</td>
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<td>1</td>
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<td>40-45 54-61</td>
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<td>3-1/8&quot;</td>
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<td>0117030000</td>
<td>75-80 102-108</td>
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<td>0117030000</td>
<td>75-80 102-108</td>
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<td>1-3/4&quot;</td>
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<td>RK02MA0171 RK02MA0175</td>
<td>0695930000</td>
<td>0116770000</td>
<td>90-95 122-129</td>
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<td>1-3/4&quot;</td>
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<td>0695930000</td>
<td>0116770000</td>
<td>90-95 122-129</td>
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For Cylinder Division Plant Locations – See Section H.
Piston Seal Kits

(Piston & Cylinder Body Seals)

For Series “2MA” Air Cylinders

Service kits of expendable parts for fluid power cylinders are stocked in principal industrial locations across the U.S.A. and other countries. For prompt delivery and complete information, contact your nearest Parker distributor or office.

Magnetic Ring
(Order separately if required)

CYLINDER BODY END SEAL KIT
(CB) Kit contains 2 each of the following:
symbol #47, O-Ring, cylinder body to head & cap.

WARNING: The piston rod to piston threaded connections are secured with an anaerobic adhesive which is temperature sensitive. Cylinders specified with Viton seals are assembled with an anaerobic adhesive having a maximum operating temperature rating of +250°F (+121°C). Cylinders specified with other seal compounds are assembled with an anaerobic adhesive having a maximum operating temperature of +165°F (+74°C). These temperature limitations are necessary to prevent the possible loosening of the threaded connections. Cylinders originally manufactured with Class 1 seals that will be exposed to ambient temperatures above +165°F (+74°C.) must be modified for higher temperature service. Contact the factory immediately and arrange for the piston to rod connection to be properly reassembled to withstand the higher temperature service.

*Registered tradename of E.I. duPont de Nemours & Co., Inc.

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>PK Part No.</th>
<th>VITON Part No.</th>
<th>SYMBOL #159 Part No.</th>
<th>NITRILE Seals U.S.A.</th>
<th>VITON Seals U.S.A.</th>
<th>NITRILE Seals Metric</th>
<th>VITON Seals Metric</th>
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<td>1-1/2&quot;</td>
<td>PK1502MA01</td>
<td>PK1502MA05</td>
<td>0865130151**</td>
<td>CB1502MA01</td>
<td>CB1502MA05</td>
<td>32 + 4 in. lbs.</td>
<td>3.6 + 0.5 N.m</td>
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<td>2&quot;</td>
<td>PK2002MA01</td>
<td>PK1502MA05</td>
<td>0865130200</td>
<td>CB2002MA01</td>
<td>CB2002MA05</td>
<td>72 + 10 in. lbs.</td>
<td>8 + 1 N.m</td>
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<td>2-1/2&quot;</td>
<td>PK2502MA01</td>
<td>PK1502MA05</td>
<td>0865130250</td>
<td>CB2502MA01</td>
<td>CB2502MA05</td>
<td>72 + 10 in. lbs.</td>
<td>8 + 1 N.m</td>
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<td>PK3202MA01</td>
<td>PK1502MA05</td>
<td>0865130325</td>
<td>CB3202MA01</td>
<td>CB3202MA05</td>
<td>216 + 12 in. lbs.</td>
<td>24 + 1.3 N.m</td>
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<td>4&quot;</td>
<td>PK4002MA01</td>
<td>PK1502MA05</td>
<td>0865130400</td>
<td>CB4002MA01</td>
<td>CB4002MA05</td>
<td>216 + 12 in. lbs.</td>
<td>24 + 1.3 N.m</td>
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<td>PK5002MA01</td>
<td>PK1502MA05</td>
<td>0865130500</td>
<td>CB5002MA01</td>
<td>CB5002MA05</td>
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<td>41 + 1 N.m</td>
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<td>PK1502MA05</td>
<td>0865130600</td>
<td>CB6002MA01</td>
<td>CB6002MA05</td>
<td>35 + 1 ft. lbs.</td>
<td>48 + 1 N.m</td>
</tr>
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<td>8&quot;</td>
<td>PK8002MA01</td>
<td>PK1502MA05</td>
<td>0865130800</td>
<td>CB8002MA01</td>
<td>CB8002MA05</td>
<td>80 + 1 ft. lbs.</td>
<td>109 + 6 N.m</td>
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NOTE: Order Magnetic Ring symbol #159 separately if required.

For additional information – call your local Parker Cylinder Distributor.
Parker Lube-A-Cyl...

Is recommended for use in air cylinders during normal operation, and particularly when servicing and reassembling cylinders. It is a multipurpose lubricant in grease form that provides lubrication without deteriorating effects on synthetic seals. It produces a thin film which will not blow out with exhaust air. It provides piston, rod and seal lubrication, and has excellent resistance to water and mechanical breakdown with temperature range of –10° F. (–23° C.) to +350° F. (+177° C.). Lube-A-Cyl is packaged in 1.5 oz. tubes, a sufficient quantity for average size air cylinder. One application should last for a period of 6 to 18 months depending upon service. Order by part number 0761630000.

Servicing the Piston Seals

Disassemble the cylinder completely, remove the old seals and clean all the parts. The cylinder bore and piston should then be examined for evidence of scoring. (The light scratch marks usually present on both cylinder bore and piston will generally have no detrimental effects on the performance of the cylinder.)

Apply Parker “Lube-A-Cyl” to O.D. of piston and all grooves. Install one piston Lipseal (sym. # 42) in the groove nearest the rod. The two “lips” of this seal should face toward the rod end of the piston. If required, install the magnetic ring (sym. # 159) in the bottom of the middle groove. (See detail “1” below) Next, install the wear strip (sym. # 121) in the middle groove. (See detail “2” below).  

NOTE: Due to a piston design change, the 1 1/2” bore cylinder Piston Seal Kit contains two piston bearings (sym. # 121). The old style 1 1/2” bore piston bearing (cylinders furnished prior to Feb. 1994) is a 5/16” wide flat wear strip and the new style wear strip is a 3/8” wide molded bearing. To determine which wear strip is correct for the 1 1/2” bore cylinder being serviced, it will be necessary to check the width of the bearing groove on the piston O.D. Coat the inside of the cylinder body with Parker “Lube-A-Cyl” and insert the piston - cap end first - into the cylinder body as shown in detail “3” below.

Next, turn the cylinder body on its side and push the piston and rod assembly through the barrel just far enough to expose the groove for the second Lipseal. (See detail “4” below) Be careful not to move the piston too far so as to expose the wear strip (sym. # 121). If the piston should move too far, push the piston and rod assembly completely through the cylinder body and again start the piston from the original end. Now install the second Lipseal (sym. # 42) in the exposed groove with the two “lips” facing away from the rod and pull the piston into the cylinder body.

The piston and rod are securely locked together with anaerobic adhesive. This threaded connection should only be disassembled or reassembled by factory trained personnel.

NOTE: An extreme pressure lubricant (such as molybdenum disulphate) should be used on the tie rod threads and bearing faces to reduce friction and tie rod twist.

Assemble both cap and head, complete with cylinder body O-Rings (sym. # 47), to each end of the cylinder body. Install end cap fasteners and tighten to appropriate torque, using opposite corner to corner torquing sequence. (See table on side 1). After screws are torqued, firmly torque the rod gland against the head using a gland and spanner wrench. (See Service Bulletin #0995-M11)

In case of a “DD” - center trunnion - mounted cylinder, care must be taken to prevent binding the cylinder body when repositioning the trunnion collar. The proper method of assembling this type of cylinder is as follows:

After all the piston seals have been installed on the piston and the piston is in the cylinder body, fit the cap with its O-ring (sym. # 47) in position onto the cylinder body. Then "stud" into the trunnion collar the four tie rods that connect the cap to the trunnion collar. Hand tighten the four tie rod nuts at the cap. Distances from the inner face of the cap to the finished face of the trunnion collar should be made equal at all four tie rods when all four tie rod nuts are in contact with the cap.

When the assembly is ready for final torquing, it may be necessary to adjust the tie rods at the cap when torquing the tie rods at the head in order to position the trunnion collar in its final position.

As a check, to be certain the trunnion mount will not interfere with cylinder operation, move the piston and rod assembly by hand to determine whether there is any tendency for the piston to bind at the spot where the trunnion collar is located. If any binding is noticeable, readjust the tie rods.
Series 2MA
Air Cylinders

For additional information – call your local Parker Cylinder Distributor.
For Cylinder Division Plant Locations – See Section H.

Series 2MA Air Cylinders

Perform the following steps when Dis-assembling, installing mounting kits and reassembling Series 2MA cylinders (1½" - 4" Bores).

Dis-assembly of Cylinder to add Mounting Kit*

Un-Torque cylinder mounting fasteners using corner to corner sequence until finger tight then remove all four fasteners. Clean mating parts to remove oil, grease and dirt. Mounting fasteners should be clean, dry, and burr-free. Brush mounting fastener threads thoroughly with anti-seize lubricant. Follow the appropriate procedure for the desired mounting.

Choose the appropriate mounting kit instructions

Rear Pivot Mount Kits — Style BB, BC and BE Mount — Place pivot mount kit over end cap, lining up the four fastener holes in the end cap with the pivot mount plate. Note that the pivot mount can be rotated to the cylinder allowing for different port locations. Secure mounting to cap (finger tight) using the four fasteners. Torque the bolts to specifications below.

End Angle Mount Kits — Style CB — The end angles bolt to the front and rear of the end caps of the cylinder. The spacer plate provided is to be assembled at rod end under the angle plate. Line up the two holes of the spacer and angle plate with the two fastener holes of the head. Secure (finger tight) using the fasteners. Repeat this assembly at the end opposite the rod (less spacer). Place the assembly with the end angles down on a flat surface and torque the four fasteners to specification below.

Mounting Kit Assembly — Use for Single and Double Rod End Styles

Flange Mount Kits — Style J & H — Place rectangular flange plate over appropriate end cap. Line up the four holes in the plate with the four fastener holes in the end cap. Note that the rectangular plate can be rotated to allow for different port locations. Secure the rectangular plate to the end cap (finger tight) using the four fasteners. Then torque the four fasteners to specification.

Re-Assembly and Torquing of Cylinder Mounting Kits After Maintenance

The following procedure is recommended to ensure the correct re-assembly of the mounting kits. Tighten mounting fasteners in opposite corner sequence to approximately 3/4 of final tightening torque. Using a calibrated torque wrench, tighten mounting fasteners to the final torque listed repeating the opposite corner sequence procedure.

▲ Note: Spacer plate not used for 4" bore or double rod assemblies

* Note: Mounting Kits on cylinders with strokes shorter than those listed on minimum stroke chart must be added by factory to ensure proper fastener thread engagement.

Series 2MA Mounting Kits

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Fastener Torque</th>
<th>Fastener Torque</th>
</tr>
</thead>
<tbody>
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<td>32 + 4 inch lbs.</td>
<td>3½ + ½ nm</td>
</tr>
<tr>
<td>1 ½&quot;</td>
<td>32 + 4 inch lbs.</td>
<td>3½ + ½ nm</td>
</tr>
<tr>
<td>2&quot;</td>
<td>72 + 10 inch lbs.</td>
<td>8 + 1 nm</td>
</tr>
<tr>
<td>2 ½&quot;</td>
<td>72 + 10 inch lbs.</td>
<td>8 + 1 nm</td>
</tr>
<tr>
<td>3 ¼&quot;</td>
<td>216 + 12 inch lbs.</td>
<td>24 + 1½ nm</td>
</tr>
<tr>
<td>4&quot;</td>
<td>216 + 12 inch lbs.</td>
<td>24 + 1½ nm</td>
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For customer assembled mounting kits only!

Series 2MA Mounting Kits

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Rod Dia.</th>
<th>J(MF1)</th>
<th>H(MF2)</th>
<th>BB(MP1)</th>
<th>BE(MP4)</th>
<th>CB(MS1)</th>
<th>BC(MP2)</th>
<th>G(MS7)</th>
<th>Minimum Stroke</th>
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<tbody>
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<td>1 ¼&quot;</td>
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<td>–</td>
<td>L074960125</td>
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</tr>
<tr>
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(Ch) Head (Rod End) Cushion Kit

Consisting of: 1 Ea. – Sym. # 69, 70, 105 & 161

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<th>Rod No.</th>
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<th>Class 5 Fluorocarbon Seals</th>
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<th>Rod No.</th>
<th>Class 1 Nitrile Seals</th>
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For Cylinder Division Plant Locations – See Section H.
Gland Seal Kits

(Gland Cartridges & Rod Seals including TS-2000 Rod Seals)

For Series “2ML” Hydraulic Cylinders

Hydraulic Service Temperatures: -10° F. (-23° C.) to +165° F. (+74° C.)

For additional information – call your local Parker Cylinder Distributor.

GLAND CARTRIDGE KIT
(RG) Kit contains 1 each of the following:
- symbol #14, Gland, threaded cartridge type.
- symbol #40, Rod Wiper.
- symbol #41, Rod Lipseal.
- symbol #45, O-Ring, gland to head.

Servicing the Rod Gland
(Cylinder disassembly is not required)

Fluid leakage around the piston rod at the gland area will normally indicate a need to replace the gland seals.

The Parker series 2ML Gland is a unique cartridge design. It is threaded into the cylinder head and all sizes are removable without disturbing the end cap fasteners.

To Remove the Gland Cartridge
A) Inspect the piston rod to be sure it is free of burrs or other foreign material that would prevent sliding the cartridge off the rod.
B) Disconnect any attachments to the piston rod end thread.
C) Lubricate the rod with clean light oil.
D) Unscrew the gland cartridge from the head using appropriate gland and spanner wrench listed below.
E) Slide the cartridge off over the piston rod.
F) Make sure the gland to head O-Ring (symbol #45) is also removed from the assembly.
G) Remove all seals from the gland, inspect the gland (symbol #14) for wear & replace if necessary.

ROD SEAL KIT
(RK) Kit contains 1 each of the following:
- symbol #40, Rod Wiper.
- symbol #41, Rod Lipseal.
- symbol #45, O-Ring, gland to head.

Installation
1) Reinspect the surface of the piston rod for scratches, dents and other surface damage and make the necessary repairs.
2) Clean and lubricate the O.D. of the piston rod with clean light oil.
3) If replacing complete gland cartridge proceed to step #6. If gland (symbol #14) is not worn, replace seals only using appropriate rod seal kit (RK) and proceed as follows.
4) Lubricate the Gland (sym. #14) I.D., new Wiper (sym. #40) & new Lipseal (sym. #41) and install in appropriate gland groove. The seals should be installed orientated as shown in Figure A above.
5) Install new gland to head o-ring (symbol #45) in position on gland as pictured above. Be careful not to cut the O-Ring.
6) Lubricate all seals (including symbol #45) and inside bearing surfaces of gland with clean light oil.
7) Slide the gland cartridge onto the piston rod, squaring it with the threads in the head, and tightening (clockwise) until seated firmly against the head.
8) Torque the gland cartridge to the specifications shown below.

NOTE: Make sure the gland is sufficiently tight. Failure to do so may result in loosening during operation.

For additional information – call your local Parker Cylinder Distributor.
**Piston Seal Kits**  
(Piston & Cylinder Body Seals)  
For Series “2ML” Hydraulic Cylinders

---

**PISTON SEAL KIT**  
(PK) Kit contains 2 each of the following:  
symbol #42, Lipseal, piston.  
symbol #44, Back-Up Washer.  
symbol #47, O-Ring, cylinder body to head & cap.  
1 each - symbol #121, Wear Strip  
(See “Servicing the Piston Seals” on opposite side)

**CYLINDER BODY END SEAL KIT**  
(CB) Kit contains 2 each of the following:  
symbol #47, O-Ring, cylinder body to head & cap.

---

Service kits of expendable parts for fluid power cylinders are stocked in principal industrial locations across the U.S.A. and other countries. For prompt delivery and complete information, contact your nearest Parker distributor or office.

**Standard Seals - Class 1**  
Service are standard, and contain Nitrile seals for standard fluid service. These seals are suitable for use when air is the operating medium. The recommended operating temperature range for Class 1 seals is: -10° F. (-23° C.) to +165° F. (+74° C.)

---

**Table: Fastener Bolt/Tie Rod Torque Units**

<table>
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<tr>
<th>Bore Size</th>
<th>PK Part No.</th>
<th>SYMBOL #159 Part No.</th>
<th>CB Part No.</th>
<th>Fastener Bolt/Tie Rod Torque Units</th>
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<tbody>
<tr>
<td>1-1/2&quot;</td>
<td>PK1502ML01</td>
<td>0865130151</td>
<td>CB1502MA01</td>
<td>32 + 4 in. lbs. 3.6 + 0.5 N.m</td>
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<tr>
<td>2&quot;</td>
<td>PK2002ML01</td>
<td>0865130200</td>
<td>CB2002MA01</td>
<td>72 + 10 in. lbs. 8 + 1 N.m</td>
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<tr>
<td>2-1/2&quot;</td>
<td>PK2502ML01</td>
<td>0865130250</td>
<td>CB2502MA01</td>
<td>72 + 10 in. lbs. 8 + 1 N.m</td>
</tr>
<tr>
<td>3-1/4&quot;</td>
<td>PK3202ML01</td>
<td>0865130325</td>
<td>CB3202MA01</td>
<td>216 +12 in. lbs. 24 + 1.3 N.m</td>
</tr>
<tr>
<td>4&quot;</td>
<td>PK4002ML01</td>
<td>0865130400</td>
<td>CB4002MA01</td>
<td>216 +12 in. lbs. 24 + 1.3 N.m</td>
</tr>
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<td>5&quot;</td>
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<td>0865130500</td>
<td>CB5002MA01</td>
<td>30 + 1 ft. lbs. 41 + 1 N.m</td>
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<tr>
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<td>0865130600</td>
<td>CB6002MA01</td>
<td>35 + 1 ft. lbs. 48 + 1 N.m</td>
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<tr>
<td>8&quot;</td>
<td>PK8002ML01</td>
<td>0865130800</td>
<td>CB8002MA01</td>
<td>80 + 1 ft. lbs. 109 + 6 N.m</td>
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</table>

---

**Warning:** The piston rod to piston threaded connections are secured with an anaerobic adhesive which is temperature sensitive. Cylinders specified with Standard Class 1 seal compounds are assembled with an anaerobic adhesive having a maximum operating temperature of +165° F. (+74° C.). These temperature limitations are necessary to prevent the possible loosening of the threaded connections. Cylinders originally manufactured with Class 1 seals that will be exposed to ambient temperatures above +165° F. (+74° C.) must be modified for higher temperature service. Contact the factory immediately and arrange for the piston to rod connection to be properly reassembled to withstand the higher temperature service.
Servicing the Piston Seals
Disassemble the cylinder completely, remove the old seals and clean all the parts. The cylinder bore and piston should then be examined for evidence of scoring. (The light scratch marks usually present on both cylinder bore and piston will generally have no detrimental effects on the performance of the cylinder.)

Apply clean light oil to O.D. of piston and all grooves. Install one piston Lipseal (sym. # 42) & one Back-Up Washer (sym. #44) in the groove nearest the rod. The two “lips” of the Lipseal (sym. #42) should face toward the rod end of the piston and the Back-Up Washer (sym. #44) should be installed in the same piston groove as shown. If required, install the magnetic ring (sym. # 159) in the bottom of the middle groove. (See detail “1” below) Next, install the wear strip (sym. # 121) in the top of the middle groove - (See detail “2” below). Coat the inside of the cylinder body with clean light oil and insert the piston - cap end first - into the cylinder body as shown in detail “3” below.

Next, turn the cylinder body on its side and push the piston and rod assembly through the barrel just far enough to expose the piston groove for the second Lipseal. (See detail “4” below.) Be careful not to move the piston too far so as to expose the wear strip (sym. # 121). If the piston should move too far, push the piston and rod assembly completely through the cylinder body and again start the piston from the original end. Now install the second Lipseal (sym. # 42) & Back-Up Washer (sym. #44) in the exposed groove with the two “lips” of the Lipseal (sym. #42) facing away from the rod and the Back-Up Washer (sym. #44) positioned as shown. Then pull the piston into the cylinder body.

The piston and rod are securely locked together with anaerobic adhesive. This threaded connection should only be disassembled or reassembled by factory trained personnel.

NOTE: An extreme pressure lubricant (such as molybdelenum disulphate) should be used on the tie rod threads and bearing faces to reduce friction and tie rod twist.

Assemble both cap and head, complete with cylinder body O-Rings (sym. # 47), to each end of the cylinder body. Install end cap fasteners and tighten to appropriate torque, using opposite corner to corner torquing sequence. (See table on side 1). After screws are torqued, firmly torque the rod gland against the head using a gland and spanner wrench. (See Service Bulletin #0995-M13)

In case of a “DD” - center trunnion - mounted cylinder, care must be taken to prevent binding the cylinder body when repositioning the trunnion collar. The proper method of assembling this type of cylinder is as follows:

After all the piston seals have been installed on the piston and the piston is in the cylinder body, fit the cap with its O-ring (sym. # 47) in position onto the cylinder body. Then "stud" into the trunnion collar the four tie rods that connect the cap to the trunnion collar. Hand tighten the four tie rod nuts at the cap. Distances from the inner face of the cap to the finished face of the trunnion collar should then be made equal at all four tie rods when all four tie rod nuts are in contact with the cap.

When the assembly is ready for final torquing, it may be necessary to adjust the tie rods at the cap when torquing the tie rods at the head in order to position the trunnion collar in its final position.

As a check, to be certain the trunnion mount will not interfere with cylinder operation, move the piston and rod assembly by hand to determine whether there is any tendency for the piston to bind at the spot where the trunnion collar is located. If any binding is noticeable, readjust the tie rods.
Piston Seal Kits
(Piston & Cylinder Body Seals)
For Series “MP” Air Cylinders

Piston Seal Kits
(See “Servicing the Piston Seals” on opposite side)

Service kits of expendable parts for fluid power cylinders are available for either Class 1, or Class 5 fluid service.

Standard Seals - Class 1 Service are standard, and contain Nitrile seals for standard fluid service. These seals are suitable for use when air is the operating medium.

The recommended operating temperature range for Class 1 seals is:

\[-10^\circ\text{F.} (-23^\circ\text{C.})\text{ to } +165^\circ\text{F.} (+74^\circ\text{C.})\]

Viton* Seals - Class 5 Service kits contain Viton seals and are especially suited for elevated temperature service.

The recommended temperature range for Class 5 seals is:

\[-10^\circ\text{F.} (-23^\circ\text{C.})\text{ to } +250^\circ\text{F.} (+121^\circ\text{C.})\]

Warning - The piston rod to piston threaded connections are secured with an anaerobic adhesive which is temperature sensitive. Cylinders specified with Viton seals are assembled with an anaerobic adhesive having a maximum operating temperature rating of +250° F. (+121° C.). Cylinders specified with other seal compounds are assembled with an anaerobic adhesive having a maximum operating temperature of +165° F. (+74° C.).

These temperature limitations are necessary to prevent the possible loosening of the threaded connections. Cylinders originally manufactured with Class 1 seals that will be exposed to ambient temperatures above +165° F. (+74° C.) must be modified for higher temperature service. Contact the factory immediately and arrange for the piston to rod connection to be properly reassembled to withstand the higher temperature service.

*Registered trademark of E.I. duPont de Nemours & Co., Inc.

Service kits of expendable parts for fluid power cylinders are stocked in principal industrial locations across the U.S.A. and other countries. For prompt delivery and complete information, contact your nearest Parker distributor or office.

For Cylinder Division Plant Locations – See Section H.
Lube-A-Cyl...
Is recommended for use in air cylinders during normal operation, and particularly when servicing and reassembling cylinders. It is a multi-purpose lubricant in grease form that provides lubrication without deteriorating effects on synthetic seals. It produces a thin film which will not blow out with exhaust air. It provides piston, rod and seal lubrication, and has excellent resistance to water and mechanical breakdown with temperature range of –10° F. (–23° C.) to +350° F. (+177° C.). Lube-A-Cyl is packaged in 1.5 oz. tubes, a sufficient quantity for average size air cylinder. One application should last for a period of 6 to 18 months depending upon service. Order by part number 0761630000.

Servicing the Piston Seals
Disassemble the cylinder completely, remove the old seals and clean all the parts. The cylinder bore and piston should then be examined for evidence of scoring. (The light scratch marks usually present on both cylinder bore and piston will generally have no detrimental effects on the performance of the cylinder.)

Apply “Lube-A-Cyl” to O.D. of piston and all grooves. Install one piston Lipseal (sym. # 42) in the groove nearest the rod. The two “lips” of this seal should face toward the rod end of the piston. If required, install the magnetic ring (sym. # 159) in the bottom of the middle groove. (See detail “1” below) Next, install the wear strip (sym. # 121) in the top of the middle groove - (See detail “2” below). Coat the inside of the cylinder body with “Lube-A-Cyl” and insert the piston - cap end first - into the cylinder body as shown in detail “3” below.

Next, turn the cylinder body on its side and push the piston and rod assembly through the barrel just far enough to expose the groove for the second Lipseal. (See detail “4” below.) Be careful not to move the piston too far so as to expose the wear strip (sym. # 121). If the piston should move too far, push the piston and rod assembly completely through the cylinder body and again start the piston from the original end. Now install the second Lipseal (sym. # 42) in the exposed groove with the two “lips” facing away from the rod and pull the piston into the cylinder body.

The piston and rod are securely locked together with anaerobic adhesive. This threaded connection should only be disassembled or reassembled by factory trained personnel.

NOTE: An extreme pressure lubricant (such as molybdlenum disulphate) should be used on the tie rod threads and bearing faces to reduce friction and tie rod twist.

Assemble both cap and head, complete with cylinder body O-Rings (sym. # 47), to each end of the cylinder body. Install end cap fasteners or tie rods and tighten to appropriate torque, using opposite corner to corner torquing sequence. (See table on side 1). After screws are torqued, firmly torque the rod gland against the head using a gland and spanner wrench. (See Service Bulletin # 0995-M15)
### Gland Seal Kits

(Gland Cartridges & Rod Seals) 
For Series “MP” Air Cylinders

#### Service kits of expendable parts for fluid power cylinders are stocked in principal industrial locations across the U.S.A. and other countries. For prompt delivery and complete information, contact your nearest Parker distributor or office.

#### Servicing the Rod Gland
(Cylinder disassembly is not required)
Fluid leakage around the piston rod at the gland area will normally indicate a need to replace the gland seals.

#### To Remove the Gland Cartridge
A) Inspect the piston rod to be sure it is free of burrs or other foreign material that would prevent sliding the cartridge off the rod.
B) Disconnect any attachments to the piston rod end thread.
C) Lubricate the rod with Lube-A-Cyl.
D) Unscrew the gland cartridge from the head using appropriate gland and spanner wrench listed below.
E) Slide the cartridge off over the piston rod.
F) Make sure the gland to head O-Ring (symbol #45) is also removed from the assembly.
G) Remove all seals from the gland, inspect the gland (symbol #14) for wear & replace if necessary.

#### Installation
1) Reinspect the surface of the piston rod for scratches, dents and other surface damage and make the necessary repairs.
2) Clean and lubricate the surface of the piston rod with Lube-A-Cyl.
3) If replacing complete gland cartridge proceed to step 6. If gland (symbol #14) is not worn, replace seals only using appropriate rod seal kit (RK) and proceed as follows.
4) Lubricate gland seal groove and new Lipseal / Wiper (symbol #40) and install in gland groove. The seal should be installed orientated as shown in Figure A or Figure B above. If the seal kit contains a Retaining Ring (symbol #134) install it as shown in Figure B.
5) Install new gland to head o-ring (symbol #45) in position on gland as pictured above. Be careful not to cut the O-Ring.
6) Lubricate all seals (including symbol #45) and inside bearing surfaces of gland with Lube-A-Cyl or clean light oil.
7) Slide the gland cartridge onto the piston rod, squaring it with the threads in the head, and tightening (clockwise) until seated firmly against the head.
8) Torque the gland cartridge to the specifications shown below.

#### Gland Seal Kits

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Rod Dia.</th>
<th>Rod No.</th>
<th>RG-Rod Gland Cartridge Kit</th>
<th>RK-Rod Seal Kit</th>
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<td>VITON Seals</td>
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#### For Cylinder Division Plant Locations – See Section H.
Assembly Instructions

Mounting Kit Assembly Instructions for
ISO 6431 - VDMA 24562 Pneumatic Aluminum Cylinder (10 Bar Air Service Rating)

Perform the following steps when installing mounting kits.

Pivot Mounting Kits - Style MP2, MP4, MP6 and MP7
Place pivot mount over end cap, lining up the four fastener holes in the end cap with the pivot mounting plate. Note that the pivot mount can be rotated allowing for different cylinder port locations. Secure mounting to cylinder cap (finger tight) using the four fasteners. Torque the fasteners to the specifications shown in the table below.

End Angle Mounting Kit - Style MS1
The end angles bolt to the front and rear of the cylinder end caps. Line up the two holes of the angle plate with the two fastener holes in the cylinder head. Secure (finger tight) using two fasteners. Repeat this assembly at the opposite end. Place the assembly with the end angles down on a flat surface and torque the four fasteners to the specifications shown in the table below.

Flange Mounting Kits - Style MF1 and MF2 Single and Double Rod Cylinders
Place rectangular flange plate over appropriate end cap. Line up the four holes in the mounting plate with the four fastener holes in the cylinder end cap. Note that the rectangular mounting plate can be rotated to allow for different port locations. Secure the rectangular mounting plate to the end cap (finger tight) using the four fasteners. Then torque the four fasteners to the specifications shown in the table below.

⚠️ WARNING
FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from the Company, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products of system, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met. The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by the Company and its subsidiaries at any time without notice.

<table>
<thead>
<tr>
<th>Bore Size (mm)</th>
<th>Rod Dia (mm)</th>
<th>J &amp; H (MF1 &amp; MF2)</th>
<th>CB (MS1)</th>
<th>BC (MP2)</th>
<th>BJ (MP7)</th>
<th>BE (MP4)</th>
<th>SB (MP6)</th>
<th>Fastener Bolt Torque</th>
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<td>L0753700032</td>
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<td>L0754000032</td>
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<td>L075390044</td>
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<td>L075420044</td>
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<tr>
<td>50</td>
<td>20</td>
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<tr>
<td>63</td>
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<tr>
<td>80</td>
<td>25</td>
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<td>L075390080</td>
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<td>L075410080</td>
<td>L075420080</td>
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</tr>
<tr>
<td>100</td>
<td>25</td>
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<td>L075390100</td>
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<td>L075410100</td>
<td>L075420100</td>
<td>24-26 N-m</td>
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<tr>
<td>125</td>
<td>32</td>
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<td>L075390125</td>
<td>L075400125</td>
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<td>L075420125</td>
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<td>L075390160</td>
<td>L075400160</td>
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<td>L075420160</td>
<td>47-49 N-m</td>
</tr>
<tr>
<td>200</td>
<td>40</td>
<td>L075370200</td>
<td>L075380200</td>
<td>L075390200</td>
<td>L075400200</td>
<td>L075410200</td>
<td>L075420200</td>
<td>108-110 N-m</td>
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### P Series High Performance Air Cylinders

#### Parts Identification

<table>
<thead>
<tr>
<th>Sym. No.</th>
<th>Part Name</th>
<th>Qty Req’d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Head assembly – includes Sym. #12</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Cap</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Cylinder body</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Piston (O-ring type)</td>
<td>1</td>
</tr>
<tr>
<td>4A</td>
<td>Piston (Lipseal type)</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Piston rod (Non cush. or cush. cap end)</td>
<td>1</td>
</tr>
<tr>
<td>5A</td>
<td>Piston rod (Cush. head end or cush. both ends)</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Cushion sleeve (Head end)</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Cushion sleeve (Cap end)</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Cushion adjustment needle valve</td>
<td>*</td>
</tr>
<tr>
<td>10</td>
<td>Retaining ring</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Bushing</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Rod bearing – See Sym. #1</td>
<td>**</td>
</tr>
<tr>
<td>13</td>
<td>Piston retaining nut</td>
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<tr>
<td>15</td>
<td>End seal</td>
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<tr>
<td>16</td>
<td>Piston O-ring seal</td>
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<tr>
<td>19</td>
<td>Cushion check seal</td>
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<td>21</td>
<td>Needle valve O-ring</td>
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<tr>
<td>23</td>
<td>Piston lipseal</td>
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<tr>
<td>24</td>
<td>Rod O-ring – fits Sym. 31 only</td>
<td>1</td>
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<tr>
<td>25</td>
<td>Rod B.U. washer – fits Sym. #1 only</td>
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*1 pc. req’d per cushioned end  
** Not available separately

#### Cylinder Seal Kit

**“O” Ring Piston Type**

<table>
<thead>
<tr>
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<th>Standard Seal Kit***</th>
<th>Kit No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/8</td>
<td>L067680000</td>
<td></td>
</tr>
<tr>
<td>1 1/2</td>
<td>L067690000</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>L067700000</td>
<td></td>
</tr>
<tr>
<td>2 1/2</td>
<td>L067710000</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>L067720000</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>–</td>
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**Lipseal Piston Type**

<table>
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<th>Kit No.</th>
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<tbody>
<tr>
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**Cushion Seal Kit**

(includes the following)

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<th>Standard Seal Kit***</th>
<th>Kit No.</th>
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</thead>
<tbody>
<tr>
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<td>L067900000</td>
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</tr>
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</tr>
<tr>
<td>2</td>
<td>L067920000</td>
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</tr>
<tr>
<td>2 1/2</td>
<td>L067930000</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>L067930000</td>
<td></td>
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<tr>
<td>4</td>
<td>L067940000</td>
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***Hi Temp Seals available, consult factory and read  
**Danger** note in Section A, page 116.
## Seal Kits

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<thead>
<tr>
<th>Part</th>
<th>Style</th>
<th>Rod No.</th>
<th>3/4&quot; Bore Part No.</th>
<th>1&quot; Bore Part No.</th>
<th>1 1/8&quot; Bore Part No.</th>
<th>1 1/4&quot; Bore Part No.</th>
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</thead>
<tbody>
<tr>
<td>Piston Seal</td>
<td>Standard O-Ring</td>
<td>All</td>
<td>0104030048</td>
<td>0104030100</td>
<td>0104030108</td>
<td>0104030116</td>
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<td></td>
<td>Lipseal</td>
<td>All</td>
<td>0146230000</td>
<td>0141800000</td>
<td>0831760001</td>
<td>0142080000</td>
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<td></td>
<td>Standard O-Ring</td>
<td>All</td>
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<td>0100090100</td>
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<td>0490590050</td>
<td>0478860001</td>
<td>0831170001</td>
<td>0490590100</td>
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<td>Rod Seal</td>
<td>Standard All</td>
<td>1</td>
<td>0104030024</td>
<td>0104030028</td>
<td>0104030032</td>
<td>0104030032</td>
</tr>
<tr>
<td></td>
<td>All</td>
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<td>0104030028</td>
<td>0104030032</td>
<td>0477380002</td>
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<tr>
<td>Seal Kit includes End Seals Piston Seals Rod Seals</td>
<td>Std. O-Ring</td>
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<td>SK0075S025</td>
<td>SK0100S031</td>
<td>SK0125S037</td>
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<td></td>
<td>Lipseal</td>
<td>3</td>
<td>SKL075S025</td>
<td>SKL0100S031</td>
<td>SKL0125S037</td>
<td>SKL0125S037</td>
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<tr>
<td></td>
<td>Viton*</td>
<td>1</td>
<td>SK0075S025</td>
<td>SK0100S031</td>
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<tr>
<td></td>
<td>Lipseal</td>
<td>3</td>
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<td>SKL0100S031</td>
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### Parts Identification

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Part Name</th>
<th>No. Req’d.</th>
<th>3/4&quot; Bore Part No.</th>
<th>1&quot; Bore Part No.</th>
<th>1 1/8&quot; Bore Part No.</th>
<th>1 1/4&quot; Bore Part No.</th>
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<tbody>
<tr>
<td>A</td>
<td>Head – Style NS</td>
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<td>0179600000</td>
<td>0179610000</td>
<td>0179620000</td>
<td>0562310000</td>
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<tr>
<td>B</td>
<td>Head – Style US</td>
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<td>0179630000</td>
<td>0179640000</td>
<td>0179650000</td>
<td>0562320000</td>
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<td>C</td>
<td>Cap – All Styles</td>
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<td>0179670000</td>
<td>0179680000</td>
<td>0562330000</td>
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<tr>
<td>D</td>
<td>Tie Rod Nut</td>
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<td>0179690000</td>
<td>0179700000</td>
<td>0179710000</td>
<td>0179710000</td>
</tr>
<tr>
<td>E</td>
<td>Tie Rod</td>
<td>4</td>
<td>0179720000</td>
<td>0179730000</td>
<td>0179740000</td>
<td>0179740000</td>
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<tr>
<td>F</td>
<td>Piston and Rod Assembly</td>
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<td>0179760000</td>
<td>0179770000</td>
<td>0826460000</td>
</tr>
<tr>
<td>G</td>
<td>Cylinder Body</td>
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<td>0179780000</td>
<td>0179790000</td>
<td>0179800000</td>
<td>0826470000</td>
</tr>
<tr>
<td>H</td>
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<td>0179810000</td>
<td>0179820000</td>
<td>0179830000</td>
<td>0826480000</td>
</tr>
<tr>
<td>J</td>
<td>Rod Bushing</td>
<td>2</td>
<td>019840000</td>
<td>0179850000</td>
<td>0179860000</td>
<td>0179860000</td>
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<tr>
<td>K</td>
<td>Piston Seal</td>
<td>1</td>
<td>010403-0048</td>
<td>010403-0100</td>
<td>010403-0108</td>
<td>010403-0116</td>
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<tr>
<td>L</td>
<td>Rod Seal</td>
<td>1</td>
<td>010403-0024</td>
<td>010403-0028</td>
<td>010403-0032</td>
<td>010403-0032</td>
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<tr>
<td>H, K and L</td>
<td>Seal Kit</td>
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<td>SK0075S025</td>
<td>SK0100S031</td>
<td>SK0112S037</td>
<td>SK0125S037</td>
</tr>
</tbody>
</table>

**NOTE:** Consult factory for oversize rod, lipseal piston, springs, spring spacers and double rod end cylinder parts.

## Optional Feature

**Lipseal® Pistons**

For additional information – call your local Parker Cylinder Distributor.
Seal Kits for P1M Air Cylinders

12mm to 25mm Bores

<table>
<thead>
<tr>
<th>Qty</th>
<th>Part</th>
<th>Symbol</th>
<th>Qty</th>
<th>Part</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rod seal/wiper</td>
<td>#40</td>
<td>1</td>
<td>Wear band</td>
<td>#121</td>
</tr>
<tr>
<td>1</td>
<td>Z-Piston Seal</td>
<td>#42</td>
<td>(Only on 32-100 Bores)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>End Seals</td>
<td>#47</td>
<td>1</td>
<td>Cap End Bumper</td>
<td>#163</td>
</tr>
<tr>
<td>2</td>
<td>Transfer port seals</td>
<td>#14</td>
<td>1</td>
<td>Head End Bumper</td>
<td>#162</td>
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</table>

32mm to 100mm Bores

<table>
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<th>Qty</th>
<th>Part</th>
<th>Symbol</th>
<th>Qty</th>
<th>Part</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Rod seal/wiper</td>
<td>#40</td>
<td>1</td>
<td>Wear band</td>
<td>#121</td>
</tr>
<tr>
<td>1</td>
<td>Z-Piston Seal</td>
<td>#42</td>
<td>(Only on 32-100 Bores)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>End Seals</td>
<td>#47</td>
<td>2</td>
<td>Head End Bumper</td>
<td>#162</td>
</tr>
<tr>
<td>2</td>
<td>Transfer port seals</td>
<td>#14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Service kits of expendable parts for fluid power cylinders are stocked in principal industrial locations across the U.S.A. and other countries. For prompt delivery and complete information, contact your nearest distributor.

Service kits of expendable parts for fluid power cylinders are available for either Class 1, or Class 5 fluid service.

Standard Seals - Class 1 Service are standard, and contain a Nitrile piston seal and a polyurethane rod seal for standard fluid service. These seals are suitable for use when air is the operating medium.

The recommended operating temperature range for Class 1 seals is: -4°F. (-20°C.) to +176°F. (+80°C.)

Fluorocarbon Seals - Class 5 Service kits contain Fluorocarbon seals and are especially suited for elevated temperature service.

The recommended temperature range for Class 5 is: +14°F. (-10°C.) to +302°F. (+150°C.).

<table>
<thead>
<tr>
<th>Bore</th>
<th>Single Rod Cylinders</th>
<th>Double Rod Cylinders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class 1 Seals</td>
<td>Class 5 Seals</td>
</tr>
<tr>
<td>12</td>
<td>P1M-6DRN</td>
<td>P1M-6DRV</td>
</tr>
<tr>
<td>16</td>
<td>P1M-6HRN</td>
<td>P1M-6HVR</td>
</tr>
<tr>
<td>20</td>
<td>P1M-6HRN</td>
<td>P1M-6HVR</td>
</tr>
<tr>
<td>25</td>
<td>P1M-6JRN</td>
<td>P1M-6JVR</td>
</tr>
<tr>
<td>32</td>
<td>P1M-6JRN</td>
<td>P1M-6JVR</td>
</tr>
<tr>
<td>40</td>
<td>P1M-6LRN</td>
<td>P1M-6LVR</td>
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<td>50</td>
<td>P1M-6MRN</td>
<td>P1M-6MVR</td>
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<td>63</td>
<td>P1M-6MRN</td>
<td>P1M-6MVR</td>
</tr>
<tr>
<td>80</td>
<td>P1M-6PRN</td>
<td>P1M-6PRV</td>
</tr>
<tr>
<td>100</td>
<td>P1M-6QRN</td>
<td>P1M-6QRV</td>
</tr>
</tbody>
</table>

* No Bumpers Included
Rear Pivot Mounting Kits — Style A or B (Fig. 1)
Place pivot mount over end cap, lining up the appropriate two fastener holes for 12-50mm bore or four fastener holes for 63-100mm bore in the end cap with the pivot mounting plate. Note that the pivot mount can be rotated allowing for different cylinder port locations. Secure mounting to cylinder cap (finger tight), using the two or four fasteners. Torque the fasteners to the specifications in the table below.

End Angle Mounting Kit — Style F (Fig. 2)
The end angles bolt to the front and rear of the cylinder end caps. Line up the two fastener holes for 12-50mm bore or four fastener holes for 63-100mm bore of the angle plate with the two or four fastener holes in the cylinder head. Secure (finger tight) using two of four fasteners. Repeat this assembly at the opposite end. Place the assembly with the end angles down on a flat surface and torque the four or eight fasteners to the specifications shown in the table below.

Flange Mounting Kits — Style J and H (Fig. 3)
Place rectangular flange plate over appropriate end cap. Line up the appropriate two holes for 12-50mm bores or four holes for 63-100mm bores in the mounting plate with the two or four fastener holes in the cylinder end cap. Note that the rectangular mounting plate can be rotated to allow for different port locations. Secure the rectangular mounting plate to the end cap (finger tight) using the two or four fasteners. Then torque the two or four fasteners to the specifications shown in the table below.

<table>
<thead>
<tr>
<th>Bore</th>
<th>Style J &amp; H Kit Part No.</th>
<th>Style A Kit Part No.</th>
<th>Style B Kit Part No.</th>
<th>Style F Kit Part No.</th>
<th>Fastener Torque</th>
</tr>
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<td>P1M-4DMB</td>
<td>P1M-4DMT</td>
<td>P1M-4DME</td>
<td>P1M-4DMF</td>
<td>1.4-1.8</td>
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<tr>
<td>12</td>
<td></td>
<td></td>
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<td>12-16</td>
</tr>
<tr>
<td>16</td>
<td>P1M-4RMB</td>
<td>P1M-4RMT</td>
<td>P1M-4RME</td>
<td>P1M-4RMF</td>
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<td>12-16</td>
</tr>
<tr>
<td>20</td>
<td>P1M-4HMB</td>
<td>P1M-4HMT</td>
<td>P1M-4HME</td>
<td>P1M-4HMF</td>
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<td>32-36</td>
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<td>P1M-4JMB</td>
<td>P1M-4JMT</td>
<td>P1M-4JME</td>
<td>P1M-4JMF</td>
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<td>32-36</td>
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<td>P1M-4KMT</td>
<td>P1M-4KME</td>
<td>P1M-4KMF</td>
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<td>P1M-4LMT</td>
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<td>P1M-4LMF</td>
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<td>P1M-4MMF</td>
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<td></td>
<td></td>
<td>72-80</td>
</tr>
<tr>
<td>63</td>
<td>P1M-4NMB</td>
<td>P1M-4NMT</td>
<td>P1M-4NME</td>
<td>P1M-4NMF</td>
<td>3.6-4.0</td>
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<tr>
<td>80</td>
<td>P1M-4PMB</td>
<td>P1M-4PMT</td>
<td>P1M-4PME</td>
<td>P1M-4PMF</td>
<td>8.0-9.0</td>
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</tr>
<tr>
<td>100</td>
<td>P1M-4QMB</td>
<td>P1M-4QMT</td>
<td>P1M-4QME</td>
<td>P1M-4QMF</td>
<td>24.0-25.7</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>212-228</td>
</tr>
</tbody>
</table>

Note: These drawings represent bore sizes 12-50mm. The 63-100mm bore sizes will have four fasteners at each end of the cylinder. See General Assembly Instructions on reverse side for details.
General Assembly Instructions
Perform the following steps when dis-assembling, installing mounting kits and re-assembling Series P1M cylinders.

Dis-assembly of cylinder to add Mounting Kit
1) Un-torque cylinder mounting fasteners using corner to corner sequence until fasteners are finger tight.
2) Remove all fasteners.
3) Clean mating parts to remove oil, grease and dirt.
4) Fasteners should be clean, dry and burr free.
5) Brush mounting fastener threads thoroughly with anti-seize lubricant.
6) Follow the appropriate procedure below for the desired mounting.

Re-Assembly and Torquing of Cylinder after Maintenance
The following procedure is recommended to ensure the correct re-assembly of the cylinder.
A) Tighten the mounting fasteners in the opposite corner sequence to approximately 3/4 of final tightening torque. Refer to illustration for fastener position and quantity.
B) Using a calibrated torque wrench, tighten the mounting fasteners to the final torque listed repeating the opposite corner sequence procedure.

Mounting Screw Lengths
Please refer to following table for the appropriate screw lengths (L) with respect to the cylinder bore, mounting head and cap configuration.

<table>
<thead>
<tr>
<th>Bore (M Screw)</th>
<th>Clevis</th>
<th>Flange</th>
<th>Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>12mm Unported Cap</td>
<td>16</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Ported Cap</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>ELP Head</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Long Head</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>32mm Unported Cap</td>
<td>23</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Ported Cap</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>ELP Head</td>
<td>30</td>
<td>30</td>
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</tr>
<tr>
<td>Long Head</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>40mm Unported Cap</td>
<td>23</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Ported Cap</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>ELP Head</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Long Head</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>50mm Unported Cap</td>
<td>20</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Ported Cap</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>ELP Head</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Long Head</td>
<td>28</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>63mm Unported Cap</td>
<td>30</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Ported Cap</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>ELP Head</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Long Head</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

All lengths listed measured per above drawing in mm
Series RC
Rodless Cylinder
Maintenance Instructions

Note: Before attempting any repairs or modifications to the rodless cylinder, READ, UNDERSTAND and FOLLOW ALL maintenance instructions.

The integrity of the inner sealing band is critical to the proper performance of the rodless cylinder. Care must be exercised in the handling of this band.

Tools Required

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>25mm</th>
<th>32mm</th>
<th>40mm</th>
<th>50mm</th>
<th>63mm</th>
</tr>
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<tbody>
<tr>
<td>Tool</td>
<td>Tool Size</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screw Driver</td>
<td>Flat Blade Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socket Wrench</td>
<td>5/16&quot; &amp; 3/8&quot;</td>
<td>5/16&quot; &amp; 7/16&quot;</td>
<td>7/16&quot;</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
</tbody>
</table>

- Bore Sizes - 25mm, 32mm, 40mm, 50mm & 63mm
- Maximum Operating Pressure - 115 P.S.I. Air
NOTE: THE INTEGRITY OF THE INNER BAND IS CRITICAL TO THE PERFORMANCE OF THE RODLESS CYLINDER. THE EDGES OF THE INNER BAND MUST NOT BE DAMAGED.

Disassembly of Cylinder:
1) Remove carriage screws (sym. #1) and nuts (sym. #2). Loosen band wiper screws (sym. #3) and band wiper (sym. #4). Remove carriage (sym. #5) assembly from cylinder.
2) Remove outer band set screws (sym. #6) in band clamp (sym. #22). Remove outer band (sym. #7) from cylinder. Caution: The corners of the outer band material may be sharp. Care should be exercised when handling band material.
3) Loosen inner band set screws (sym. #8) by inserting an Allen wrench through the holes for the outer band set screws, removed in step #2 (Photo #1).
4) Repeat steps #2 & #3 on opposite end.
5) Remove the end cap screws (sym. #9) and end caps (sym. #10) from each end of the cylinder. NOTE: Do not twist caps to remove.

Removal of Piston and Inner Band:
\[ \text{CAUTION: Inner band edges are very sharp. Extreme care must be taken during disassembly and re-assembly to protect individuals handling band material. Protective equipment should be utilized to prevent injury to exposed areas; i.e., hands, face, neck.} \]
1) Using care not to damage the inner band, simultaneously slide the inner band (sym. #11) and piston assembly (sym. #12) out of the cylinder.
2) Carefully pull the inner band from the piston assembly.

Inspection of Cylinder:
1) Replacement seal kits (see Table A) are available for each bore size. Compare each of the parts of the seal kit to the corresponding part on the cylinder. Replace parts as required.
2) Inspect the inner band for nicks, kinks and any damage to the sharp edge. If any damage is evident, the inner band should be replaced. Inner bands can be ordered by specifying the model number and/or serial number of the cylinder. Bands (sym. #7 & #11) are not included in seal kits.
3) Inspect the I.D. of the cylinder body for scratches, grooves, scoring or any other imperfections. If the body is badly damaged, it should be replaced. A replacement body can be ordered by specifying the model number and/or serial number of the cylinder.
4) Inspect the piston carriage support rods (sym. #13, if applicable) or carriage spacers (sym. #13A), for any scoring or excessive wear. If damaged, they should be replaced (see Table B).

Table A

<table>
<thead>
<tr>
<th>Symbol #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Carriage Screw</td>
</tr>
<tr>
<td>2</td>
<td>Carriage Screw Nut</td>
</tr>
<tr>
<td>3</td>
<td>Band Wiper Screw</td>
</tr>
<tr>
<td>4</td>
<td>Band Wiper</td>
</tr>
<tr>
<td>5</td>
<td>Carriage</td>
</tr>
<tr>
<td>6</td>
<td>Outer Band Set Screw</td>
</tr>
<tr>
<td>7</td>
<td>Outer Band</td>
</tr>
<tr>
<td>8</td>
<td>Inner Band Set Screw</td>
</tr>
<tr>
<td>9</td>
<td>End Cap Set Screw</td>
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<tr>
<td>10</td>
<td>End Cap</td>
</tr>
<tr>
<td>11</td>
<td>Inner Band</td>
</tr>
<tr>
<td>12</td>
<td>Piston</td>
</tr>
<tr>
<td>13</td>
<td>Carriage Support Rod*</td>
</tr>
<tr>
<td>13A</td>
<td>Carriage Spacer (25mm bore only)</td>
</tr>
</tbody>
</table>

Table B

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Type</th>
<th>Part Number</th>
<th>Qty Req'd</th>
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<tbody>
<tr>
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<td>Standard</td>
<td>0864080025</td>
<td>2</td>
</tr>
<tr>
<td>32</td>
<td>Standard</td>
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<td>Standard</td>
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</tr>
<tr>
<td>63</td>
<td>Standard</td>
<td>0864080063</td>
<td>2</td>
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</table>

Carriage Support Rod Requirements

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Part Qty.</th>
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<tbody>
<tr>
<td>25</td>
<td>Not Required*</td>
</tr>
<tr>
<td>32</td>
<td>2 ea. sym. #17, 18 &amp; 23; 4 ea. sym. #4, 13A, 14, 20, 21</td>
</tr>
<tr>
<td>40</td>
<td>2 ea. sym. #4, 17, 18; 4 ea. sym. #14; #21-32mm - 4 ea.</td>
</tr>
<tr>
<td>50</td>
<td>40mm - 4 ea., 50mm - 6 ea.</td>
</tr>
<tr>
<td>63</td>
<td>6 ea., 63mm - 6 ea.</td>
</tr>
</tbody>
</table>

*Carriage spacers included in seal kits.

Cylinder Assembly:
A) Piston and Inner Band Assembly.
1) Insert the plastic strap supplied in the repair kit into one end of the piston assembly (Photo #2).

Photo #1

Photo #2

Table A

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Type</th>
<th>Part Number</th>
</tr>
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<tbody>
<tr>
<td>25</td>
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<td>Standard</td>
<td>0864080032</td>
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<tr>
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<td>50</td>
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<td>0864080050</td>
</tr>
<tr>
<td>63</td>
<td>Standard</td>
<td>0864080063</td>
</tr>
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</table>

2 ea. sym. #13A, 14, 20, 21 & 23; 4 ea. sym. #4, 13A, 17, 18, 20, 21 & 23; 4 ea. sym. #14; #21-32mm - 4 ea., 40mm - 4 ea., 50mm - 6 ea., 63mm - 6 ea.

Table B

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>Type</th>
<th>Part Qty.</th>
</tr>
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<tbody>
<tr>
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<td>Standard</td>
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<tr>
<td>32</td>
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<td>0864080050</td>
</tr>
<tr>
<td>63</td>
<td>Standard</td>
<td>0864080063</td>
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</table>

2 ea. sym. #17, 18 & 23; 4 ea. sym. #4, 13A, 14, 20, 21; 4 ea. sym. #4, 17, 18; 4 ea. sym. #14; #21-32mm - 4 ea., 40mm - 8 ea., 50mm - 6 ea., 63mm - 12 ea.

Carriage spacers included in seal kits.

211219
5) After the piston/band sub-assembly is completely inserted into the body, position the band so that an equal length of band protrudes from each end of the tube (Photo #8). Again, verify that both ends of the inner band are centered under the groove.

B) End Cap Re-assembly
1) Ensure transfer O-Rings (sym. #14) are in place.
2) Make sure the band is still positioned along the center of the tube slot; then install the end cap onto the cylinder body. The end caps must be oriented as they were in the original assembly. The cutout for the band should be properly oriented (in line with the band). Use a gentle but firm pushing motion, NOT a twisting motion to insert the cap into the tube (Photo #9).

2) Carefully insert the inner band, beveled side down, into the piston at the end opposite the plastic strap (Photo #3 & #4).

3) After the leading edge of the inner band travels past the piston seal at the opposite end (Photo #5), stop and remove the plastic strap.

4) With the inner band installed into the piston, insert end “L” (Photo #6) of the piston and band sub-assembly into the cylinder body making sure the band is centered under the groove (Photo #7).
Maintenance Instructions

3) Repeat the preceding two steps to install the opposite end cap.

4) Place the cylinder assembly on a flat surface so the end caps are aligned.

5) Insert the end cap mounting screws (sym. #9) at both ends and tighten to the recommended torque value (see Table C).

C) Final Assembly

1) Using a thin flat blade screwdriver, remove the slack of the inner band by pushing the slot at each end (Photo #10). NOTE: The goal is not to tension the band, merely to eliminate any slack. Use of excessive force may cause the band to move out of position and/or band damage.

2) Install the band clamp (sym. #22) on each end cap with the flat head fasteners (sym. #15). Tighten fasteners to the recommended torque value (see table C).

3) If the outer band set screws (sym. #6) have not already been removed, remove them now.

4) Insert the band clamp spacers (sym. #16) into each end cap with the set screws (sym. #8) pre-installed and with the hex side of the set screws facing up.

5) Insert a hex wrench through the outer band set screw holes (Photo #11) to access the set screws in the band spacer.

6) Tighten the inner band set screws at each end to the recommended torque value (Table C).

7) Test cylinder for audible leakage.

8) Install outer band through the piston carriage and into each end cap above the band spacer. Position the band so no band material protrudes from the face of either end cap.

9) Place carriage on piston.

10) Install carriage bolts and tighten on each end of carriage.

11) Install carriage support rods (sym. #13 if applicable) or carriage spacer #13A (25mm bore).

12) Install band wipers with button head screws. (On 25mm and 32mm bores with double carriage mounting, install thinner 2 band wipers on inner ends of carriages.)

13) Install outer band set screws into band clamp at each end and tighten to the recommended torque value (Table C).

Table C

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>End Cap Screws</th>
<th>Band Clamp Screws</th>
<th>Inner Band Screws</th>
<th>Outer Band Screws</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sym. #9</td>
<td>Sym. #15</td>
<td>Sym. #8</td>
<td>Sym. #6</td>
</tr>
<tr>
<td>25mm</td>
<td>35 + 5</td>
<td>10 + 2</td>
<td>10 + 5</td>
<td>10 + 5</td>
</tr>
<tr>
<td>32mm</td>
<td>35 + 5</td>
<td>10 + 5</td>
<td>10 + 5</td>
<td>10 + 5</td>
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<tr>
<td>40mm</td>
<td>60 + 10</td>
<td>15 + 5</td>
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<tr>
<td>50mm</td>
<td>40 + 10</td>
<td>15 + 5</td>
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</tr>
<tr>
<td>63mm</td>
<td>70 + 10</td>
<td>15 + 5</td>
<td>10 + 5</td>
<td>10 + 5</td>
</tr>
</tbody>
</table>

Rodless Cylinder Torque Values (inch - pounds)

<table>
<thead>
<tr>
<th>Bore Size</th>
<th>End Cap Screws</th>
<th>Band Clamp Screws</th>
<th>Inner Band Screws</th>
<th>Outer Band Screws</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sym. #9</td>
<td>Sym. #15</td>
<td>Sym. #8</td>
<td>Sym. #6</td>
</tr>
<tr>
<td>25mm</td>
<td>40 + 6</td>
<td>12 + 2</td>
<td>12 + 6</td>
<td>12 + 6</td>
</tr>
<tr>
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<td>12 + 6</td>
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<tr>
<td>40mm</td>
<td>69 + 12</td>
<td>17 + 6</td>
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<tr>
<td>50mm</td>
<td>46 + 12</td>
<td>17 + 6</td>
<td>12 + 6</td>
<td>12 + 6</td>
</tr>
<tr>
<td>63mm</td>
<td>81 + 12</td>
<td>17 + 6</td>
<td>12 + 6</td>
<td>12 + 6</td>
</tr>
</tbody>
</table>

Note: Rodless cylinder fasteners should be properly torqued using a calibrated torque wrench. Torquing of the end cap fasteners should be performed first using the opposite corner sequencing technique to approximately 75% of the final torque value shown in the table to the left. Then, continuing the opposite corner technique, torque to the final value.