Maintenance Bulletin
2A and 2AN
Pneumatic Cylinders

Parts Identification and Maintenance Instructions

RG Kits (2A) contain a rod gland cartridge complete with seals – items 14, 40, 41, 43 & 45
RG Kits (2AN) contain a rod gland cartridge complete with seals – items 14, 40, 41a & 45
RK Kits (2A) contain seals for the rod gland cartridge – items 40, 41, 43 & 45
RK Kits (2AN) contain seals for the rod gland cartridge – items 40, 41a & 45
CB Kits contain cylinder body end seals – item 47
PK Kits contain piston lipseals and cylinder body end seals – items 42 (2A) or 42a (2AN) & 47 (2 of each)

Key:
1  Head
7  Cap
14 Gland/bearing cartridge
15  Cylinder body
17  Piston (lipseal)
18  Cushion sleeve
19  Tie rod
23  Tie rod nut
27  Retainer
34-37 Piston rod
40  Wiperseal – for gland (2A & 2AN)
41  Lipseal – for gland (2A)
41a Rounded Lipseal – for gland (2AN)
42  Lipseal – for piston (2A)
42a Rounded Lipseal – for piston (2AN)
43 Back-up washer for gland lipseal 41 (2A)
45  O-ring – gland/head
47 O-ring – cylinder body
55 Locking pin – piston/rod
69 O-ring – needle valve and check valve screws
69a O-ring – cartridge-type needle valve
70 Needle valve, cushion adjustment (bore sizes above 63.5mm)
70a Needle valve assembly, cartridge type (bore sizes up to 63.5mm)
71 Ball – cushion check valve
72 Cushion check valve screw
73 Floating cushion bush
74 Retaining ring for cushion bush
## Service Kits Numbers for Groups 1 & 5 Gland Seals

<table>
<thead>
<tr>
<th>Rod Diameter</th>
<th>RG Kit – Rod Seals &amp; Gland for 2A Cylinders – Group 1*</th>
<th>RK Kit – Rod Seals for 2A Cylinders – Group 1*</th>
<th>RG Kit – Rod Seals &amp; Gland for 2AN Cylinders – Group 1</th>
<th>RK Kit – Rod Seals for 2AN Cylinders – Group 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.7 (1/2&quot;)</td>
<td>RG2AHL051</td>
<td>RG2AKH051</td>
<td>RG3AN0051</td>
<td>RK2AN0051</td>
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<td>15.9 (5/8&quot;)</td>
<td>RG2AHL061</td>
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<td>RG3AN0061</td>
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<td>25.4 (1&quot;)</td>
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<td>RG2AKH101</td>
<td>RG3AN00101</td>
<td>RK2AN00101</td>
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<td>34.9 (1 1/4&quot;)</td>
<td>RG2AHL131</td>
<td>RG2AKH131</td>
<td>RG3AN00131</td>
<td>RK2AN00131</td>
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<td>44.5 (1 1/2&quot;)</td>
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<td>RG2AKH171</td>
<td>RG3AN00171</td>
<td>RK2AN00171</td>
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<tr>
<td>50.8 (2&quot;)</td>
<td>RG2AHL201</td>
<td>RG2AKH201</td>
<td>RG3AN00201</td>
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<td>63.5 (2 1/2&quot;)</td>
<td>RG2AHL251</td>
<td>RG2AKH251</td>
<td>RG3AN00251</td>
<td>RK2AN00251</td>
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<td>76.2 (3&quot;)</td>
<td>RG2AHL301</td>
<td>RG2AKH301</td>
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<td>88.9 (3 1/2&quot;)</td>
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<tr>
<td>127.0 (5&quot;)</td>
<td>RG2AHLS01</td>
<td>RG2AKH501</td>
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<td>139.7 (5 1/2&quot;)</td>
<td>RG2AHLS51</td>
<td>RG2AKH551</td>
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## Service Kits Numbers for Piston Seal Kits and Cylinder Body Seal Kits

<table>
<thead>
<tr>
<th>Bore Ø</th>
<th>CB Body Seals for 2A Cylinders – Group 1*</th>
<th>CB Body Seals for 2AN Cylinders</th>
<th>PK Piston Seals for 2A Cylinders – Group 1*</th>
<th>PK Piston Seals for 2AN Cylinders</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.4 (1&quot;)</td>
<td>CB102HL001</td>
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<td>50.8 (2&quot;)</td>
<td>CB202HL001</td>
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<tr>
<td>63.5 (2 1/2&quot;)</td>
<td>CB252HL001</td>
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<td>PK2502A001</td>
<td>PK2502AN01</td>
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<td>152.4 (6&quot;)</td>
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<td>203.2 (8&quot;)</td>
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<td>355.6 (14&quot;)</td>
<td>CB942A001</td>
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<td>PK9402A001</td>
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</table>

## Tie Rod Nut Torque

<table>
<thead>
<tr>
<th>Nm</th>
<th>lb.ft</th>
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<tbody>
<tr>
<td>3-3.5</td>
<td>2-2.5</td>
</tr>
<tr>
<td>8-9</td>
<td>5-6</td>
</tr>
<tr>
<td>15-17</td>
<td>11-12</td>
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<td>33-36</td>
<td>25-26</td>
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<td>80-85</td>
<td>60-64</td>
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<td>150-155</td>
<td>110-114</td>
</tr>
<tr>
<td>200-205</td>
<td>148-152</td>
</tr>
<tr>
<td>230-235</td>
<td>170-175</td>
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<tr>
<td>370-375</td>
<td>275-280</td>
</tr>
</tbody>
</table>

## Service Kits

**Group 1 Service Kits** contain seals of Nitrile (Buna-N) elastomers. The temperature range for Group 1 seals is -20°C to +80°C.

**Group 5 Service Kits** contain seals of fluorocarbon elastomers and extend the working temperature from -15°C up to +150°C, or 204°F with reduced life. NB: **Group 5 seals are not available for use with the 2AN Series cylinder.**

*Seal Groups – Ordering*

The part numbers shown in the tables above are for Group 1 seals. For Group 5 seals, available for 2A Series cylinders only, substitute a '5' for the '1' at the end of the number sequence. For example, a Group 5 RG gland cartridge kit for a 50.8mm bore cylinder will be RG2AHL205.

## Parker ‘Lube-A-Cyl’ Air Cylinder Lubricant

Lube-A-Cyl is a supplement to normal lubrication methods for 2A cylinders, and is an essential lubricant for 2AN cylinders. It is recommended for use during reassembly of air cylinders after servicing, and to prevent damage to static and dynamic seals during assembly and operation.

Parker Lube-A-Cyl is available in 110g (4 oz) tubes, part no. 76163.
Servicing the Cylinder Gland Seals
Figs. 1, 3 & 5
The cylinder should, if possible, be removed for overhaul, or the piston rod disconnected from the machine member to which it is fastened.

Caution: Release all system pressure before disconnecting the supply line or disassembling.

The gland seals are housed within the Parker rod gland (item 14) which is threaded into the gland retainer (item 27). Glands may be removed using a gland wrench and spanner of the appropriate size – see table, page 2. All glands may be removed without affecting tie rod torque.

Removal
1 Inspect the piston rod to make sure it is free from burrs or damage which would prevent the gland sliding off the rod.
2 Unscrew the gland from the retainer using a gland wrench and spanner.
3 Slide the gland off the piston rod and remove the seals, using a sharp pointed instrument and taking care not to damage the gland.
4 Thoroughly clean and inspect the gland bore and seal grooves. If any wear is present, replace with a gland cartridge kit containing seals of the correct group for the conditions – see page 2.

Installation
Before installing a new gland, inspect the surface of the piston rod for signs of damage which could result in premature seal failure. When replacing a gland on a rod which is threaded to the full diameter, take care not to damage the seals against the rod threads. A piece of shim stock or other thin, tough material can be wrapped around the threads to protect the gland seals.

1 Ensure that the gland cartridge kit or gland seal kit contains seals of the correct group for the conditions.
2 Lubricate the gland seal grooves and all new seals with Lube-A-Cyl. Install one piston seal (item 42) in the groove nearest to the rod, with the lips of the seal facing towards the rod. Lubricate the seal and the inside of the cylinder body with Lube-A-Cyl and insert the piston into the body from the head end.
3 Install the second lipseal to face the opposite direction, as shown in Figure 7. Lubricate the seal and pull the piston back into the cylinder body.
4 Each gland cartridge kit contains an O-ring (item 45) which acts as a seal and torque prevailing lock between the gland and the head. This O-ring is a static seal and does not normally require replacement. The original O-ring may be left in place, unless it is known to be allowing pressure leakage around the gland thread.
5 Lubricate the bore of the gland and seals, and the O-ring, and slide the gland onto the piston rod. Thread the gland into the retainer and tighten using a gland wrench and spanner.

Servicing the Piston Seals
Figs. 1, 2 & 4
When a cylinder is to be overhauled, a new set of piston seals must be fitted. A PK Piston Seal Kit, which contains two piston lipseals (items 42 for Series 2A and 42a for Series 2AN) and two cylinder body O-rings (item 47) is required.

Cylinders should always be reassembled with new cylinder body O-rings (item 47). Older cylinders may originally have been fitted with a back-up washer behind the body O-rings but, with modern seal compounds, these are no longer required.

The cylinder must be fully dismantled and the old seals removed from the piston, taking care not to damage the seal groove. Carefully clean all parts. The cylinder bore and piston must be closely examined for signs of scoring and, if either is damaged, it must be replaced.

Installation
Figs. 2, 4, 6 & 7
1 Lubricate the seal grooves and piston with Lube-A-Cyl. Install one piston seal (item 42) in the groove nearest to the rod, with the lips of the seal facing towards the rod. Lubricate the seal and the inside of the cylinder body with Lube-A-Cyl and insert the piston into the body from the head end.
2 Turn the cylinder body on its side and push the piston through the barrel to expose the second seal groove. Be careful not to move the piston far enough to expose the first seal. If this occurs, the lip of the seal may be damaged when the piston is pulled back into the cylinder body. If the piston should move too far, pass the piston and rod completely through the cylinder body and start the piston again from the original end.
3 Install the second lipseal to face the opposite direction, as shown in Figure 7. Lubricate the seal and pull the piston back into the cylinder body.
Cylinder Assembly

1. Lubricate the body O-rings and press into the grooves in the head and cap, without twisting.

2. Fit the cylinder body, piston and rod assembly, to the cap by ‘rocking’ it down over the body O-ring until the body is in metal-to-metal contact with the cap.

3. Fit the head over the piston rod and rock gently until the body and head are in metal-to-metal contact.

4. Lubricate the gland cartridge bore and seals, and screw the gland loosely into the gland retainer. Slide the gland/retainer assembly onto the piston rod and position against the head. On 203.2–355.6mm bore cylinders only, secure the retainer loosely using the four screws removed during disassembly.

5. Keeping the head and cap in alignment, refit the tie rods and progressively tighten using a diagonal sequence. Torque the tie rod nuts to the figure shown on page 2.

Note: an extreme pressure lubricant such as molybdenum disulphide should be used on tie rod threads and nut bearing faces to control friction and reduce tie rod twist. Twist can be eliminated by chalking a straight line along each tie rod before torquing, and backing off the nut after torquing until the line is straight. This is particularly important on long stroke cylinders.

6. On 203.2–355.6mm bore cylinders only, securely tighten the four screws which attach the retainer to the head.

7. Tighten the gland assembly as described under ‘Installation’ paragraph 6, on page 3.

Where possible, the cylinder should be gently stroked by hand to ensure that it moves freely over its entire stroke.

Intermediate Trunnion Mountings

With style DD Series 2A and 2AN cylinders, care must be taken to prevent binding between the intermediate trunnion and cylinder body when repositioning the intermediate trunnion.

1. Place the intermediate trunnion in its approximate position on the cylinder body/piston assembly, and fit the cylinder body O-ring and cap, as described above.

2. Pass the four cap end tie rods through the cap and screw into the trunnion. Hand tighten the tie rod nuts at the cap, until the distance from the cap to the intermediate trunnion is equal at all points, with all four nuts in contact with the cap.

3. Repeat this process with the head and gland retainer at the other end of the cylinder.

4. On final torque tightening, the tie rod nuts may need to be adjusted at the head in order to locate the trunnion squarely on the tube in its correct position.

Gland Cartridge Wrenches

Parker’s exclusive gland cartridge design makes gland replacement quick and easy, and the Gland Cartridge Wrench set makes it even simpler. A specially designed face-type gland wrench with flared lugs slips into an exact fit on the gland, while a self-locking spanner wrench grips the gland wrench securely.

For part numbers, please refer to the table on page 2.

Repairs

For further information or repairs, please contact:

Parker Hannifin plc
Service Department
Greycaine Road
Watford, WD24 7QA
Tel. 01923 492000  Fax 01923 248557

Visit us at www.parker.com/uk

Need a Parker part?
Call Parker’s European Product Information Centre on 00800 27 27 5374