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MAINTENANCE
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Issued: January, 1995
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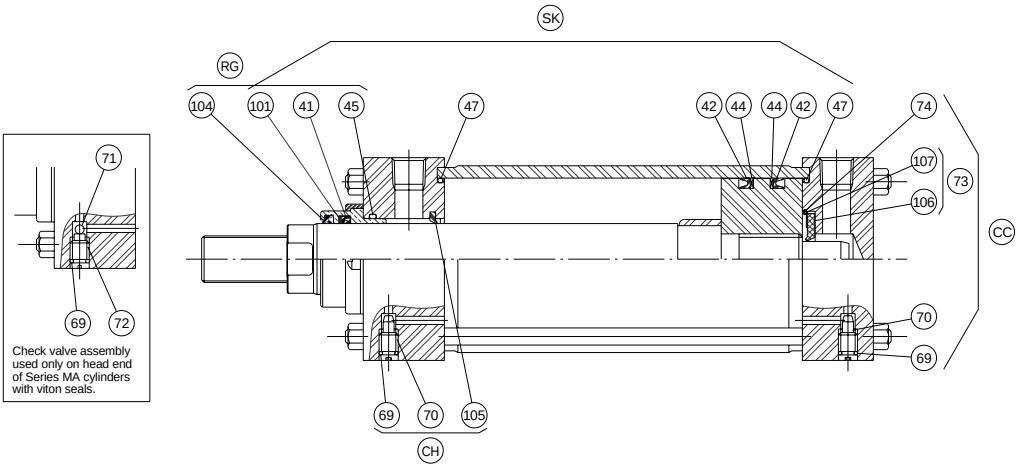
Parker Series MA Air Cylinders

Parts Identification and Maintenance Instructions



Parts Identification

Sym.	Part Name
41	Lipseal Rod Gland
42	Lipseal, Piston
44	Backup Washer, Piston
45	O-Ring, Gland to Head
47	O-Ring, End Seal
69	O-Ring, Cush. Adj.
70	Needle, Cush. Adj.
71	Check Valve Ball
72	Check Valve Screw
73	Cushion Bushing
74	Retaining Ring
101	Gland
104	Wiper, Rod
105	Check Seal, Rod End
106	Check Seal, Cap End
107	Washer Seal

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

Operating fluids and temperature range Series MA cylinders are designed for use with pressurized air, within a temperature range of -10°F (-23°C) to +165°F (+74°C). For temperatures to +250°F (+121°C) viton seals are required.

Buna-N Seals
Buna-N seals are supplied on all standard pneumatic cylinders. They are suitable for use with pressured air or nitrogen. The recommended operating temperature range for Buna-N seals is -10°F (-23°C) to +165°F (+74°C).

Viton Seals
Viton seals can be supplied, on request, and are especially suitable for higher temperature service.

When using Viton seals for high temperature service within a temperature range of -10°F (-23°C) to +250°F (+121°C) specify Class 5 seals. For elevated temperature service above +250°F (+121°C) specify Class 5 seals plus a non-studded piston rod end thread and a pinned piston to rod connection. This recommendation should also be followed when ordering spare piston and rod assemblies. Series MA cylinders are not recommended for temperatures in excess of +300°F (+149°C).

The piston rod stud and the piston rod to piston threaded connections are secured with an anaerobic adhesive which is temperature sensitive. Cylinders with Buna-N seals are assembled with anaerobic adhesive having a maximum operating temperature rating of +165°F (+74°C). Cylinders with Viton seals are assembled with anaerobic adhesive having a maximum operating temperature rating of +250°F (+121°C). These temperature limitations must be strictly followed to prevent loosening of the threaded connections. When cylinders are intended to be used above +250°F (+121°C) specify a non-studded piston rod end thread and a pinned piston to rod connection.

			RG – Rod Gland Cartridge Kit		SK – Seal Kit	
			Includes 1 each Symbol 41, 45, 101 & 104		Includes 1 each Symbol 41, 45, 104 and 2 each Symbol 42 & 47	
Bore Size	Rod Dia.	Rod No.	Class 1 Part No.	Class 5 Part No.	Class 1 Part No.	Class 5 Part No.
1 1/2	5/8	1	RGL6948MA1	RGL6948MA5	SKL7000MA1	SKL7000MA5
2	5/8	1	RGL6948MA1	RGL6948MA5	SKL7001MA1	SKL7001MA5
	1	3	RGL6949MA1	RGL6949MA5	SKL7002MA1	SKL7002MA5
2 1/2	5/8	1	RGL6948MA1	RGL6948MA5	SKL7003MA1	SKL7003MA5
	1	3	RGL6949MA1	RGL6949MA5	SKL7004MA1	SKL7004MA5
3 1/4	1	1	RGL6949MA1	RGL6949MA5	SKL7005MA1	SKL7005MA5
	1 3/8	3	RGL6950MA1	RGL6950MA5	SKL7006MA1	SKL7006MA5
4	1	1	RGL6949MA1	RGL6949MA5	SKL7007MA1	SKL7007MA5
	1 3/8	3	RGL6950MA1	RGL6950MA5	SKL7008MA1	SKL7008MA5
5	1	1	RGL6949MA1	RGL6949MA5	SKL7009MA1	SKL7009MA5
	1 3/8	3	RGL6950MA1	RGL6950MA5	SKL7010MA1	SKL7010MA5
6	1 3/8	1	RGL6950MA1	RGL6950MA5	SKL7098MA1	SKL7098MA5

			CH – Head End Cushion Kit		CC – Cap End Cushion Kit	
			Includes 1 each Symbol 69, 70, 105	Includes 2 each Symbol 69 & 1 each Symbol 70, 71, 72	Includes 1 each Symbol 69, 70, 74, 106 & 107	Includes 1 each Symbol 69, 70, 73 & 74
Bore Size	Rod Dia.	Rod No.	Class 1 Part No.	Class 5 Part No.	Class 1 Part No.	Class 5 Part No.
1 1/2	5/8	1	CHL7011MA1	L070740001	CCL7016MA1	L070750010
2	5/8	1	CHL7012MA1			
	1	3	CHL7013MA1			
2 1/2	5/8	1	CHL7012MA1			
	1	3	CHL7013MA1			
3 1/4	1	1	CHL7014MA1	L070740002	CCL7017MA1	L070750011
	1 3/8	3	CHL7015MA1			
4	1	1	CHL7014MA1			
	1 3/8	3	CHL7015MA1			
5	1	1	CHL7014MA1			
	1 3/8	3	CHL7015MA1			
6	1 3/8	1	CHL7170MA1	L070740003	CCL71710000[s]	L070750012

[s]This 6" Bore Class 1 Cushion Kit contains 1 each Symbol 69, 70, 73 & 74.

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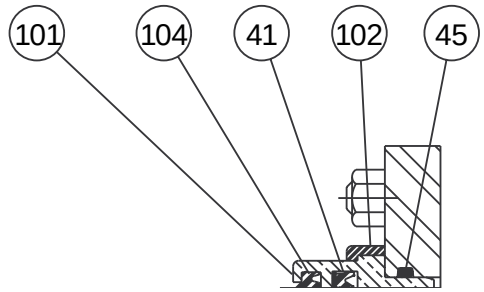
Servicing The Gland Seals

Fluid leakage around piston rod at the gland area will normally indicate a need to replace gland seals. First, remove cylinder from machine to which it is mounted, or, if this is not feasible, disconnect the piston rod from rod clevis, knuckle or machine member to which it is fastened.

The Parker Hannifin Series MA gland is a unique cartridge design. It is held in place with a gland retainer, and all sizes are removable without disturbing the tie rod torque.

To remove the gland:

Inspect the piston rod to make sure it is free of burrs or other displaced metal which would prevent sliding the gland off of the rod.



Remove the retainer screws and retainer, Sym. 102. Slide the gland off of the piston rod and remove the seals. Thoroughly clean the gland and seal grooves. Inspect gland bore for wear. If bore is worn, replace using gland cartridge kit of proper size. (See opposite side.)

If gland is not worn, replace seals only, using seal kit containing seals for proper size. (See opposite side.) Lubricate gland seal grooves and all new seals. Install rod wiper Sym. 104 in groove closest to end of gland. Install lipseal, Sym. 41, in seal groove. **Lips of seal should point toward the long bearing side of gland.**

An O-ring, Sym. 45, is supplied with each gland cartridge kit. It serves as a seal 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 leaking.

Installation

Before installing a new gland, inspect the surface of the piston rod for scratches, burrs, dents or other damage. A damaged piston rod surface will result in premature rod seal failure.

Lubricate the bore of the gland and the seals with Parker "Lube-A-Cyl," and slide the gland over the end of the piston rod until it is seated firmly against the head. Install the gland retainer, using the two retainer screws.

THE SEALS ARE PRESSURE ACTUATED, SO NO FURTHER ADJUSTMENTS ARE NECESSARY.

When replacing a gland on a rod which is threaded to the full diameter or so shaped that it could damage the seals, a slight rotary motion of the gland will help prevent damage. In addition, because full-diameter threads are usually supplied with the crest of the threads slightly truncated, a piece of shim stock or other thin, tough material can be wrapped around the threads to help protect the gland seals when they are being passed over the threads.

Servicing The Piston Seals

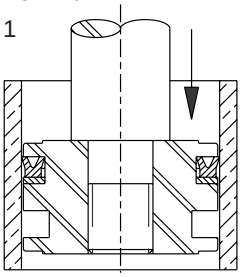
Disassemble the cylinder completely, remove the old seals and clean all of the parts. The cylinder bore and the piston should then be examined for evidence of scoring. (The light scratch marks usually present on both cylinder bore and piston will generally cause no difficulty.)

Apply Parker "Lube-A-Cyl" to O.D. of piston and to both grooves. Install one piston seal in the groove nearest the rod. The "lips" of this Lipseal should face toward the rod end of the piston. 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 (1) below.

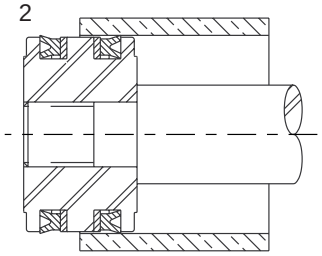
Next, turn the cylinder body on its side and push the piston through the barrel just far enough to expose the groove for the second seal. (See 2 below.) Be careful not to move the piston too far so as to expose the first seal.

Now install the second Lipseal in the exposed groove with the "lips" facing away from the rod and pull piston into the cylinder body.

1



2



If the piston or piston rod is badly scored or otherwise damaged, they should be replaced as a complete assembly. To order a piston and rod assembly, specify serial number, bore size, stroke and model number shown on the cylinder name plate. If the piston and rod are salvageable, proceed as follows.

Assemble the head and cap, complete with cylinder body seal to each end of the cylinder body. Insert the four tie rods and tighten the tie rod nuts "finger tight." Slide the rod gland with its seals over the piston rod until it seals against the head. Install the gland retainer screws, torque to 5 inch lbs. for cylinders with $^5/_8$" and 1" dia. rods and 8 inch lbs. for $1^3/_8$" dia. rods. Torque the tie rod nuts to the torque value shown in table below.

If the cylinder has a rectangular flange or a detachable clevis mount, be sure to thread the tie rods into the mounting member to full thread engagement.

In the case of an intermediate trunnion mount, the trunnion is held in place by the tie rods. To reassemble, thread the tie rods into each side of the trunnion. Slide this sub-assembly over the cylinder body (to which the piston and rod have been assembled). Install the head, with body seal to the cylinder body. Install the cap to opposite end of cylinder body. Install tie rod nuts and tighten to make sure trunnion hubs are square with centerline axis of cylinder. Torque tie rod nuts to the torque value shown in table below.

Tie Rod Nut Torque – Foot Pounds Series MA Cylinders

Cylinder Bore Size					
$1^1/_2$"	60	in.-lbs.	69	cm-kg	Steel Tube Tie Rod Nut Torque*
2"	11	ft.-lbs.	15	N-m	
$2^1/_2$"	11	ft.-lbs.	15	N-m	
$3^1/_4$"	25	ft.-lbs.	34	N-m	
4"	25	ft.-lbs.	34	N-m	
5"	60	ft.-lbs.	81	N-m	
6"	60	ft.-lbs.	81	N-m	
$1^1/_2$"	20	in.-lbs.	23	cm-kg	Aluminum Tube Tie Rod Nut Torque*
2"	72	in.-lbs.	83	cm-kg	
$2^1/_2$"	72	in.-lbs.	83	cm-kg	
$3^1/_4$"	18	ft.-lbs.	24	N-m	
4"	18	ft.-lbs.	24	N-m	
5"	37	ft.-lbs.	50	N-m	
6"	37	ft.-lbs.	50	N-m	

*(-0%, +5% tolerance). When assembling the cylinder, be sure to torque the tie rods evenly.

Parker Motion & Control

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