

DURAPAC
ENGINEERED FOR RELIABILITY

Instruction Manual

Single Acting Hydraulic Cylinder,
Collar Threads - RG Series



This is a safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid injury or death.

1.0 Product Description

DURAPAC – RG Hydraulic Cylinders are engineered to meet ANSI/ASME B30.1 Standards for Performance and Safety. This cylinder series has been designed for general purpose applications that require the cylinder to be collar or base mounted.

This cylinder can be used in all positions and features a spring return piston rod; hard chrome bore for corrosion resistance and a hardened load cap.





Special skill, knowledge and training may be required for a specific task and the product may not be suitable for all the jobs. The user must ultimately make the decision regarding suitability of the product for any given task and assume the responsibility of safety for him/her and others in the work area. Contact Durapac if you are unsure of your cylinders suitability for a particular application.

2.0 Receiving Instructions

It is recommended that, prior to use, an inspection be done by qualified personnel and that any missing or damaged parts, decals, warning / safety labels or signs be replaced with Durapac authorised replacement parts only. Any cylinder that appears to be damaged in any way, is worn, leaking or operates abnormally shall be removed from service immediately until such time as repairs can be made. Any cylinder that has been or suspected to have been subject to a shock load, shall be removed from service immediately until inspected by a Durapac authorised service centre. Owners and operators of this equipment shall be aware that the use and subsequent repair of this equipment may require special training and knowledge.

3.0 Safety

Save these instructions. For your safety, read and understand the information contained within. The owner and operator shall have an understanding of this product and safe operating procedures before attempting to use this product. Instructions and safety information shall be conveyed in the operator's native language before use of this product is authorised. Make certain that the operator thoroughly understands the inherent dangers associated with the use and misuse of the product. If any doubt exists as to the safe and proper use of this product as outlined in this factory authorised manual, remove from service immediately. Fail to comply with the following warnings or cautions could cause equipment damage and personal injury.

-  **DANGER:** To avoid personal injury keep hands and feet away from cylinder and work piece during operation.
-  **DANGER:** Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin causing serious injury. If oil is injected under the skin, see a doctor immediately.
-  **WARNING:** To avoid personal injury and possible equipment damage, make sure all hydraulic components withstand the maximum pressure of 700 Bar (10,000psi).
-  **WARNING:** Do not overload equipment. Overloading can cause equipment failure and possible personal injury. The cylinders are designed for a maximum pressure of 700 Bar (10,000psi).

⚠ WARNING: BE SURE SETUP IS STABLE BEFORE LIFTING LOAD. Cylinders should be placed on a flat surface that can support the load. Where applicable, use a cylinder base for added stability. Do not weld or otherwise modify the cylinder to attach a base or other support.

Avoid situations where loads are not directly centred on the cylinder plunger. Off-centre loads produce considerable strain on cylinder and plungers. In addition, the load may slip or fall, causing potentially dangerous results.

Distribute the load evenly across the entire saddle surface. Always use a saddle to protect the plunger.

⚠ WARNING: Always wear safety glasses. The operator must take precaution against injury due to failure the tool or work piece.

⚠ WARNING: Stay clear of loads supported by hydraulics. A cylinder, when used as a load lifting device, should never be used as a load holding device. After the load has been raised or lowered, it must always be blocked mechanically.

⚠ WARNING: USE ONLY RIGID PIECES TO HOLD LOAD. Carefully select steel or wood blocks that are capable of supporting the load. Never use a hydraulic cylinder as a shim or spacer in any lifting or pressing application.

⚠ WARNING: The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. Install pressure gauges in the system to monitor operating pressure. It is your window to what is happening in the system.

⚠ WARNING: Never pressurize uncoupled couplers. Only use hydraulic equipment in a coupled system.

⚠ WARNING: Immediately replace worn or damaged parts with genuine DURAPAC parts. DURAPAC parts are designed to fit properly and withstand rated loads.

⚠ IMPORTANT: Minimum age of the operator must be 18 years. The operator must have read and understood all instructions, safety issues, cautions and warnings before starting to operate the equipment. The operator is responsible for this activity towards other persons.

⚠ IMPORTANT: Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Durapac Service Centre in your area. To protect your warranty, use only high quality hydraulic oil.

⚠ IMPORTANT: Do not lift hydraulic equipment by the hoses or couplers. Use the carrying handle or other means of safe transport.

⚠ CAUTION: KEEP HYDRAULIC EQUIPMENT AWAY FROM FLAMES AND HEAT. Excessive heat will soften packing's and seals, resulting in fluid leaks. Heat also weakens hose materials and packing's. For optimum performance do not expose equipment to temperatures of 65°C (150°F) or higher. Protect hoses and cylinders from weld spatter.

⚠ CAUTION: Avoid sharp bends and kinks that will cause severe back-up pressure in hoses. Bends and kinks lead to premature hose failure.

⚠ CAUTION: DO NOT drop heavy objects on hose. A sharp impact may cause internal damage to damaged hose may cause it to rupture.

4.0 Installation

- ⚠ **WARNING:** Hoisting Cylinder - always use all of the eye bolts when hoisting cylinder. Failure to use all of the eyebolts could cause the cylinder to drop unexpectedly. Lifting straps must be at a 45 degree or greater angle from horizontal. See Figure 1 (below).

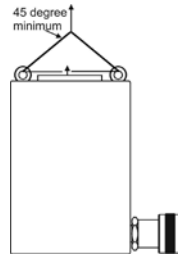


Figure 1.

- ⚠ **CAUTION:** DO NOT allow the piston rod to rotate when installing adaptors. Damage to the spring may result in rotating the piston rod preventing retraction.
- 4.1 **Make hydraulic connections**, use a pump release valve or a 3-way valve and one hose for single-acting cylinder.
- ⚠ **IMPORTANT:** Fully hand tighten all couplers. Loose coupler connections will block the flow of oil between the pump and the cylinder.
- 4.2 **Remove air from the cylinder** - Position the cylinder so that the piston rod is pointed down and the cylinder lower than the pump. Advance and retract the cylinder several times avoiding pressure build-up. Air removal is complete when the cylinder motion is smooth.

5.0 Operation

- ⚠ **IMPORTANT:** It is mandatory that the operator has a full understanding of all instructions, safety regulations, cautions and warnings, before starting to operate any of this high force tool equipment. Always use a flat, hard surface as a cylinder support plate.
- ⚠ Cylinder stop ring is designed to take the full load, to reduce cylinder wear, use less than the full stroke where possible.

5.1 Advancing and retracting the cylinder

For complete operating instructions refer to the instruction sheet included with each pump. These cylinders are a spring return cylinder and the speed of retraction is affected by the length of the hose and other restrictions in the line.

5.2 Power pumps

Shift the valve on the pump to the advance position and run the pump to advance the cylinder. To retract the cylinder, shift the valve to the retract position.

5.3 Side Load

- ⚠ Eliminate the presence of side load forces when using high tonnage cylinders. Side load can occur through:
1. An eccentric load on the piston rod
 2. A horizontal load on a structure
 3. A structure and / or cylinder misalignment
 4. Non stable cylinder base support

- ⚠ Always use a flat, hard surface as a cylinder support plate. To reduce cylinder offset loading, optional tilt saddles are available. Always use grease underneath swivel saddles (see Figure 2).

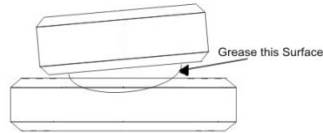


Figure 2 – Tilt Saddle.

6.0 Maintenance

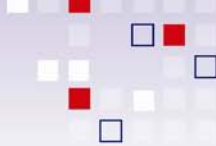
Important: Use only good quality hydraulic fluid. Never use brake fluid, transmission fluid, turbine oil, motor oil, alcohol, glycerine etc. Use of other than good quality hydraulic oil will void warranty and damage the cylinder and application.

Maintenance is required when wear or leakage is noticed. Periodically inspect all components to detect any problem required service and maintenance. Important equipment must only be serviced by a qualified hydraulic technician. For repair service, contact your local Durapac service centre.

1. Check for loose connections and leaks
2. Replace damaged parts immediately
3. Do not exceed oil temperature above 60°C
4. Keep all hydraulic components clean
5. Use dust caps when cylinder is disconnected from the hose. Keep entire cylinder clean to prolong cylinder life
6. Wipe clean, thoroughly and store cylinders upright (to prevent seal distortion) in clean, dry environment. Avoid temperature extremes
7. Change hydraulic oil in your system as recommended in the pump instruction sheet

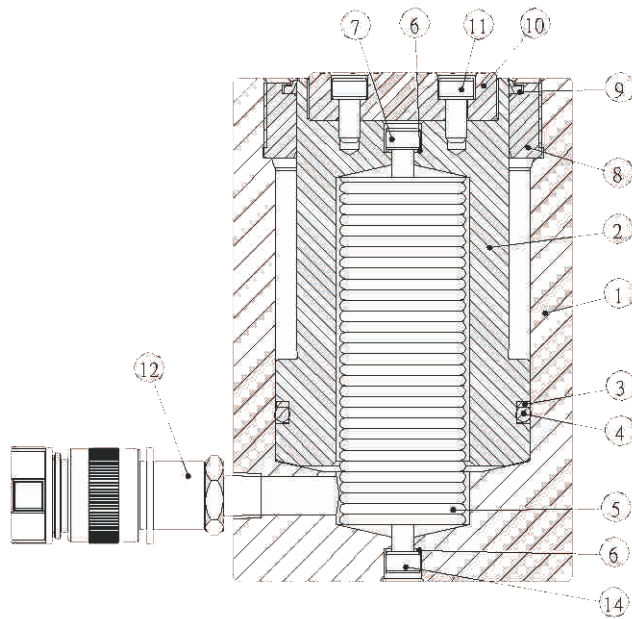
7.0 Troubleshooting

Problem	Cause	Solution
Cylinder / Ram moves but does not maintain pressure.	<ol style="list-style-type: none"> 1. Leaking connection 2. Cylinder seals leaking 3. Pump / Valve malfunctioning 	<ol style="list-style-type: none"> 1. Clean, reseal with thread sealant and tighten connection 2. Replace worn seals. Check for excessive contamination or wear. Replace contaminated fluid as necessary 3. Check pump or valve operating instructions
Cylinder / Ram leaks hydraulic fluid	<ol style="list-style-type: none"> 1. Worn or damaged seals 2. Loose connections 	<ol style="list-style-type: none"> 1. Replace worn seals. Check for excessive contamination or wear. Replace contaminated fluid as necessary 2. Clean, reseal with thread sealant and tighten connection
Cylinder / Ram will not retract or retracts slower than normal	<ol style="list-style-type: none"> 1. Pump release valve closed 2. Loose couplers 3. Blocked hydraulic lines 4. Weak or broken retraction springs 5. Cylinder damaged internally 6. Pump reservoir too full 	<ol style="list-style-type: none"> 1. Open pump release valve 2. Tighten couplers 3. Clean and flush 4. Send to service centre for repair 5. Send to service centre for repair 6. Drain hydraulic fluid to correct level
Erratic Action	<ol style="list-style-type: none"> 1. Air in system or pump cavitation 2. External leakage 3. Cylinder sticking or binding 	<ol style="list-style-type: none"> 1. Add fluid, bleed air and check for leaks 2. Replace worn packings. Check for excessive contamination fluid as necessary 3. Check for dirt or leaks. Check for bent, misaligned, worn parts or defective packings
Cylinder / Ram does not move	<ol style="list-style-type: none"> 1. Loose couplers 2. Faulty coupler 3. Improper valve position 4. Low or no hydraulic fluid in pump reservoir 5. Air-locked pump 6. Pump not operating 7. Load is above the capacity of the system 	<ol style="list-style-type: none"> 1. Tighten couplers 2. Verify that female coupler is not locked up (ball wedged into seat). Replace both male and female couplers 3. Close release valve or shift to new position 4. Fill and bleed the system 5. Prime pump per pump operating instructions 6. Check pump's operating instructions 7. Use the correct equipment



Problem	Cause	Solution
Cylinder / Ram extends only partially	<ol style="list-style-type: none"> 1. Pump reservoir is low or has no hydraulic fluid 2. Load is above the capacity of the system 3. Cylinder sticking or binding 	<ol style="list-style-type: none"> 1. Fill and bleed the system 2. Use the correct equipment 3. Check for dirt or leaks. Check for bent, misaligned, worn parts or defective packings
Cylinder / Ram moves slower than normal	<ol style="list-style-type: none"> 1. Loose couplers 2. Restricted hydraulic line or fitting 3. Pump not operating correctly 4. Cylinder seals leaking 	<ol style="list-style-type: none"> 1. Tighten couplers 2. Clean and replace if damaged 3. Check pump's operating instructions 4. Replace worn seals. Check for excessive contamination or wear. Replace contaminated fluid as necessary

8.0 Parts Breakdown and List



Item	Description	Quantity
1	Cylinder	1
2	Piston	1
* 3	Back-up Ring	1
* 4	O-Ring	1
5	Spring Component	1
* 6	Copper Washer	2
* 7	Bolt	1
8	Stop Ring	1
* 9	Wipers	1
10	Saddle	1
* 11	Bolt	2
12	Fast Coupler	1
13	Handle	1
* 14	Bolt	1

Fig. 3 - RG 50/75/100 Ton Series

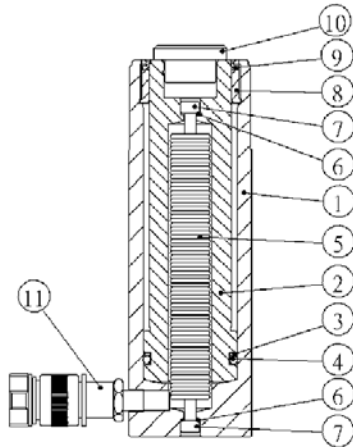


Fig. 4 - RG 5/10/15/25 Ton Series (except RG-50)

Item	Description	Quantity
1	Cylinder	1
2	Piston	1
* 3	Back-up Ring	1
* 4	O-Ring	1
5	Spring Component	1
* 6	Copper Washer	2
* 7	Bolt	1
8	Stop Ring	1
* 9	Wipers	1
10	Saddle	1
11	Fast Coupler	2

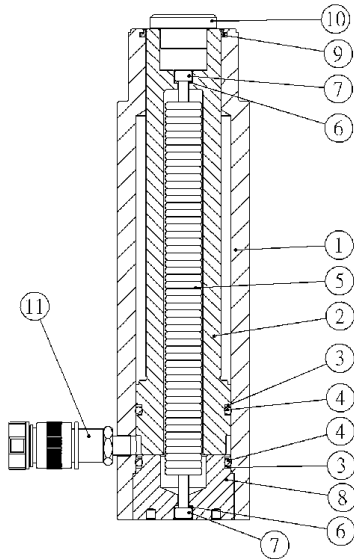


Fig. 5 - RG 30 Ton Series

Item	Description	Quantity
1	Cylinder	1
2	Piston	1
* 3	Back-up Ring	1
* 4	O-Ring	1
5	Spring Component	1
* 6	Copper Washer	2
* 7	Bolt	1
8	Stop Ring	1
* 9	Wipers	1
10	Saddle	1
11	Fast Coupler	2

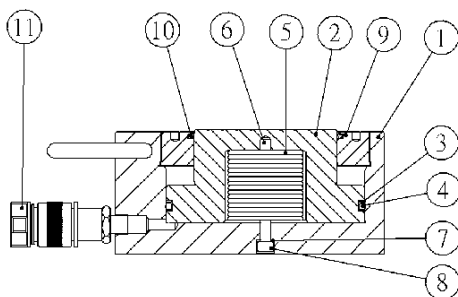


Fig. 6 - RG 50

Item	Description	Quantity
1	Cylinder	1
2	Piston	1
* 3	Back-up Ring	1
* 4	O-Ring	1
5	Spring Component	1
* 6	Copper Washer	2
* 7	Bolt	1
8	Stop Ring	1
* 9	Wipers	1
10	Saddle	1
11	Fast Coupler	2

Items marked with a * are contained within a standard Repair Kit – Serial number and model need to be quoted when ordering parts.