Operating and Maintenance Manual

Chenabore DTH Hammers
Models: Chenabore 400, 500 & 600

Chenalord
drilling supplies

Contents

1. Introduction

The Chenabore range of down the hole hammers are manufactured to the highest quality. The hammers have been designed to give longevity and fast, efficient performance that is un-paralleled.

The Chenabore hammers incorporates several different types of stress relieving and heat processing technologies which are carried out on each of the hammer's components enabling it to withstand the stresses of drilling in the most severe conditions.

The hammers runs excellent under water and handles foam and polymers with minimum reduction in performance.

2. Safety

The Chenabore Hammer is a high speed rotational tool which during it's operation will emit noise and discharges air and debris.

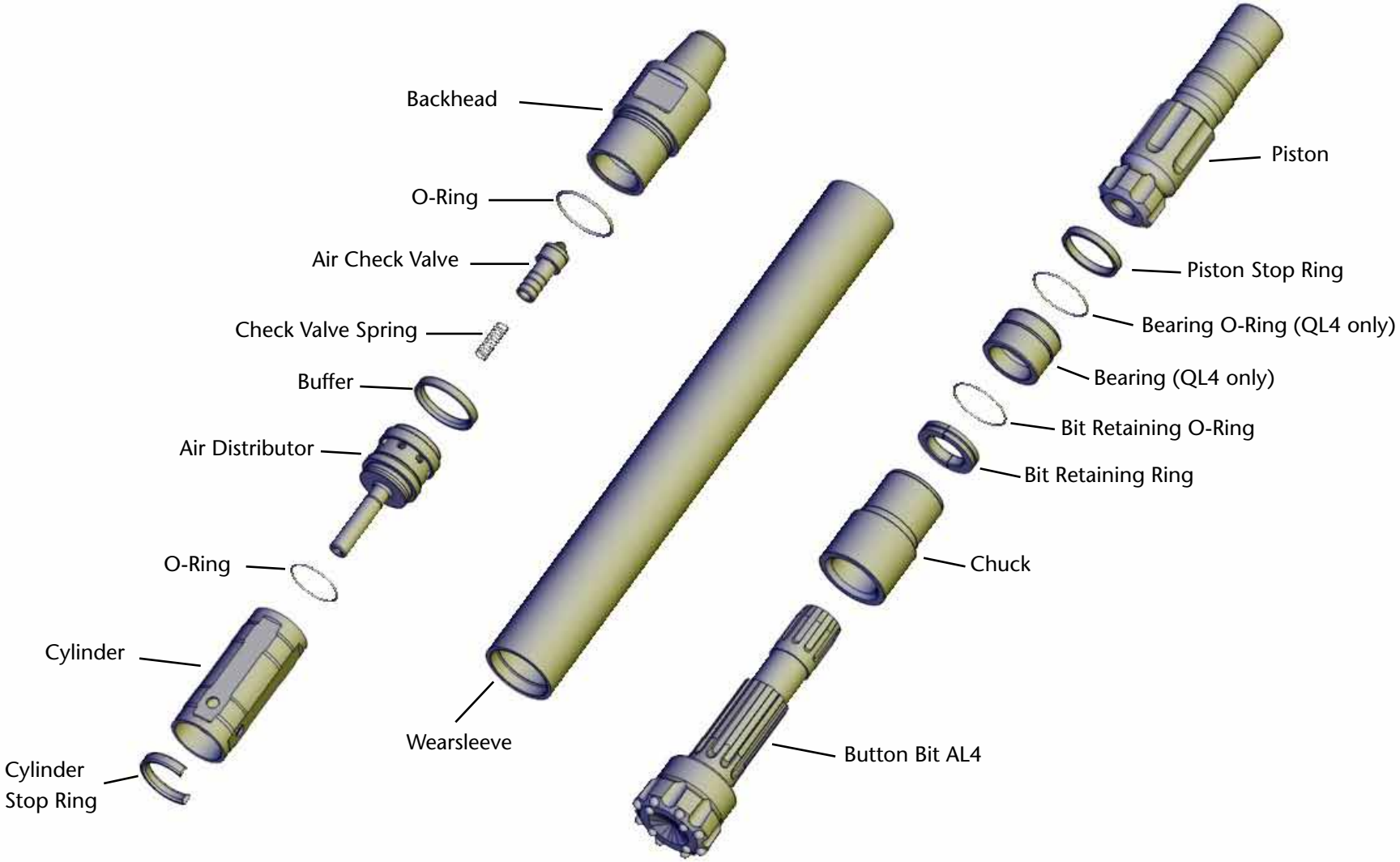
Always wear appropriate protective clothing and safety equipment and comply with health and safety guidelines issued by your employer or contractor on site.

We recommend the following:

- **Helmet**
- **Overalls —(No loose clothing to be worn that may get caught in fast moving rotational parts).**
- **Safety Gloves**
- **Ear Defenders**
- **Safety Glasses**
- **Safety Boots**

The weight of all the hammers exceed the recommended manual safe lifting guide. So the appropriate lifting equipment should be used when handling. Always use an approved lifting sub or nylon sling.

3. HAMMER COMPONENTS



4. HAMMER PARTS LIST

Chenabore Hammers exploded view — Parts list and description.

Chenabore Parts Lists

ITEM NO.	DESCRIPTION	CHENABORE 400		CHENABORE 500		CHENABORE 600	
		DHD 340	QL4	DHD350	QL5	DHD360	QL6
1	Backhead	CB401	CB401	CB501	CB501	CB601	CB601
2	Backhead O-Ring	CB402	CB402	CB502	CB502	CB602	CB602
3	Poly Buffer Ring	CB403	CB403	CB503	CB503	-	-
4	Air Guide	CB404	CB404	CB504	CB504	CB604	CB604
5	Air Check Valve (c/w Plug)	CB405	CB405	CB505	CB505	CB605	CB605
6	Check Valve Spring	CB406	CB406	CB506	CB506	CB606	CB606
7	Air Distributor	CB407	CB407	CB507	CB507	CB607	CB607
8	Air Distributor O-Ring	CB408	CB408	CB508	CB508	CB608	CB608
9	Cylinder	CB409	CB409	CB509	CB509	CB609	CB609
10	Cylinder Stop Ring	CB410	CB410	CB510	CB510	CB610	CB610
11	Wearswleeve	CB420	CB411	CB520	CB511	CB620	CB611
12	Piston	CB421	CB412	CB521	CB512	CB621	CB612
13	Piston Stop Ring	CB422	CB413	CB522	CB513	CB622	CB613
14	Bearing O-Ring	-	CB414	-	CB514	-	CB614
15	Bearing	-	CB415	-	CB515	-	CB615
16	Bit Retaining Ring O-Ring	CB424	CB416	CB524	CB516	CB624	CB616
17	Bit Retaining Ring	CB423	CB417	CB523	CB517	CB623	CB617
18	Chuck	CB425	CB418	CB525	CB518	CB625	CB618
19	Plug Set	CB419	CB419	CB519	CB519	CB619	CB619

Please note: Items 14 and 15 are only on the QL Bit Range.

5. CHENABORE HAMMER SPECIFICATIONS

	CHENABORE 400		CHENABORE 500		CHENABORE 600	
STANDARD TOP THREAD CONNECTIONS	2. 3/8" API REG PIN OPTIONAL 2.7/8"		3. 1/2" API REG PIN OPTIONAL 2.7/8"		3. 1/2 " API REG PIN	
STANDARD CHUCK CONNECTIONS	DHD 340	QL4	DHD 350	QL5	DHD 360	QL6
LENGTH WITHOUT DRILL BIT	40.55" (1,029.88MM)	48.18" (1,147.45MM)	49.8" (1,267MM)			
OUTSIDE DIAMETER	3.86" (98MM)		4.53" (115MM)		5.4" (137MM)	
WEIGHT WITHOUT BIT	84 ILBS (38 KG)		142 IBS (65KG)		216 IBS (98KG)	
CYLINDER BORE	3.23" (82MM)		3.74" (95MM)		4.48" (114MM)	
PISTON STROKE	3.74" (95MM)		3.35" (85MM)		3.94" (100MM)	
PISTON WEIGHT	24.5 ILBS (11KG)		29.5 IBS (13.5KG)		44 IBS (20KG)	
HOLE SIZES	4" (101MM)	6" (152.4 MM)	5" (127MM)	6.5" (165.10MM)	6" (152MM)	8" (203MM)
ACROSS FLATS	3.1/8" (80MM)		3.1/2" (88MM)		4" (101MM)	

6. AIR CONSUMPTION

Air Consumption Chart

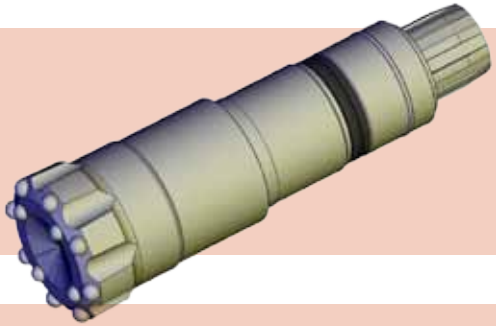
Size 4	**PSI**	100	150	200	250	300	-
	CFM	150	240	340	440	540	-
Size 5	**PSI**	100	150	200	250	300	350
	CFM	180	280	400	520	660	800
Size 6	**PSI**	150	200	250	300	350	400
	CFM	350	565	720	875	995	1130

Air Pressure Regulating with Choke

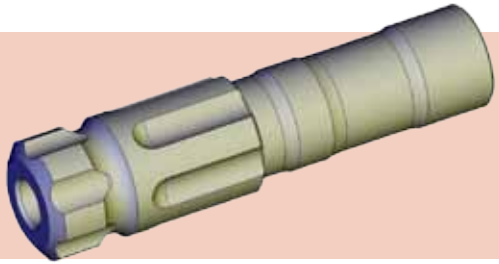
Size	150 PSI	200 PSI	250 PSI	300 PSI	350 PSI	400 PSI
1/8"	375	595	760	925	1060	1205
1/4"	425	665	845	1095	1270	1350

7. DISMANTLING OF CHENABORE HAMMERS

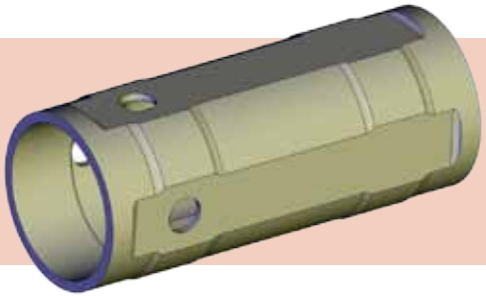
Step 1. Unscrew the chuck assembly containing the bit retaining rings.



Step 2. Lift the top sub end allowing the piston and the piston stop ring to slide to the chuck end of the wearsleeve.



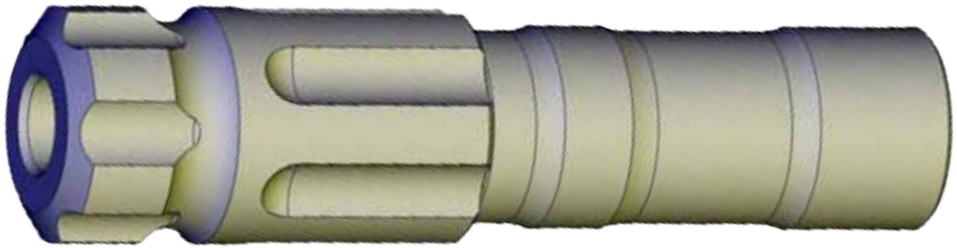
Step 3. Unscrew the top sub and remove it from the wearsleeve. Tilt the chuck end of the wearsleeve, releasing the cylinder and the air distributor and associated parts.



Step 4. Finally remove the cylinder stop ring

8. MAINTENANCE CHECKS FOR WEAR AND DAMAGE

It is recommended to change the appropriate parts when the wear limit has been reached.



1. Inspect the Piston for burn marks on the outside diameter. This is an indication of insufficient lubrication. Minor marks may be removed by polishing with an emery cloth.

2. Check clearances between the piston outside diameter and the cylinder internal diameter. The maximum recommended clearance is 0.011" (0.28mm).

3. The hammer's performance will drop with excessive piston to cylinder clearance.

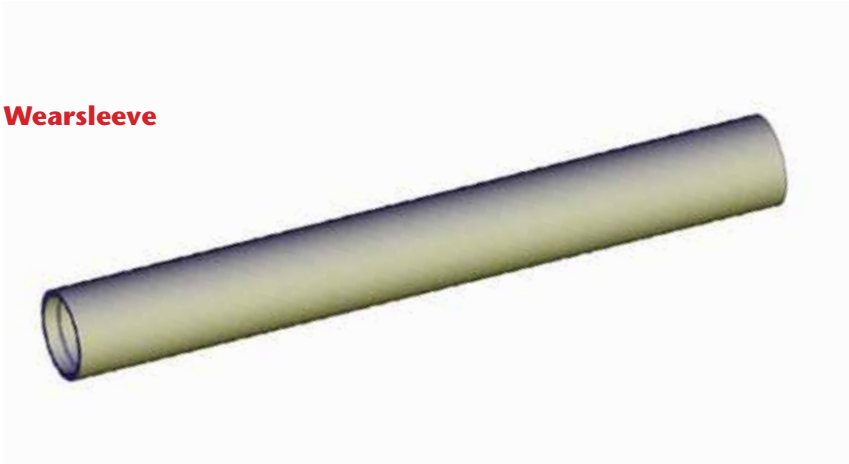
Hammer	Minimum Diameter
Chenabore 400	69.75mm
Chenabore 500	79.25mm
Chenabore 600	95.02mm

9. CHECKING FOR WEAR AND DAMAGE

Cylinder

Hammer	Minimum Diameter
Chenabore 400	69.873mm I/D
Chenabore 500	79.273mm I/D
Chenabore 600	95.173mm I/D

Wearsleeve



Hammer	Minimum Diameter
Chenabore 400	96.3mm O/D
Chenabore 500	111.6mm O/D
Chenabore 600	134.3mm O/D

10. REBUILDING OF CHENABORE HAMMER

Ensure that all maintenance procedures have been completed and if the hammer has been in storage that the guidelines have been followed.

Step 1. Coat all components liberally in rock drill oil. Coat all threads with a copper based thread grease.

Step 2. Position the Wearsleeve on the floor with the Chuck end facing upwards. Insert the Cylinder Stop Ring into the bore and hammer the ring until it is positioned in the recess groove of the Wearsleve's bore. Failure to position this correctly will result in hammer failure.

Step 3. Carefully clamp the Wearsleeve horizontally in a vice, ensuring that the jaws are not over-tightened. Assemble the Chuck and Bit Retaining Rings around the Bit making sure the Retaining Rings are fitted with a new O-Ring. Insert the Bearing and Piston Stop Ring the correct way onto the Bit. Then place the whole assembly into the Wearsleeve . Screw in the Chuck fully until there is no gap visible.

Step 4. Slide the Cylinder into the Backhead end of the Wearsleeve, ensuring that the outer holes are facing down towards the Chuck.

Step 5. Slide the Piston into the Backhead end of the Wearsleeve, ensuring that the striking face is facing down towards the Chuck.

Step 6. Fit a new O-Ring to the Air Distributor and assemble with the Air Guide and Buffer Ring. Insert the assembly into the Backhead end of the Wearsleeve.

Step 7. Insert the Check Valve Spring. Check the Check Valve Plug making sure it is not damaged and that it is the correct one you require (Blank fitted as standard, but 1/8" and 1/4" hole is also supplied). Then insert this over the Check Valve Spring.

Step 8. Fit a new O-Ring to the Backhead——. Tightly screw the Backhead into the Wearsleeve.

11. LUBRICATION GUIDE

The Chenabore Hammer is a precision made tool, manufactured to a high quality standard. Therefore, only the highest quality lubrication should be used and a constant flow of oil is to be maintained at all times. Failure to do so will result in premature, excessive component wear and in cases where the oil supply is completely cut off, this will cause the piston to seize inside the wearsleeve resulting in permanent damage to the components and hammer failure.

RECOMMENDED LUBRICATION AMOUNT = 1/3 PINT PER 100 CFM PER HOUR

Make	Light Duty	Heavy Duty
ESSO	AROX EP 65	AROX EP 150
MOBIL	ALMO No.3	ALMO No.5
SHELL	TORCULA 100	TORCULA 320
CASTROL	RD OIL DP 100	RD OIL DP 220
TEXACO	1542 EPM	1543 EPM

Heavy duty oil is recommended for all year round use, especially where the air supply to the hammer is at a high temperature. Where the hammer is operated in conditions of very low temperatures, the oil should be increased by 30%.

RECOMMENDED PULL DOWN

MINIMUM = 100 PSI — 500 ILBS / 227 KG **MAXIMUM = 350 PSI — 1800 IBS / 818 KG**

12. TROUBLESHOOTING

Fault	Possible Cause	Remedy
Hammer Does Not Operate	• Insufficient Or No Air • Hammer Incorrectly Assembled • Dirt in Hammer • Hammer Parts Seized, Broken Or Worn • Flushing Holes Blocked	• Check Compressor. • Strip and Reassemble Correctly. • Strip, Clean and Reassemble. • Strip, Inspect and Service. • Clean Out Holes
Slow Penetration	• Insufficient Air • Worn Drill Bit • Worn Drill Parts • Incorrect Amount of Lubrication • Slow Rotation	• Check Air Pressures • Change Bit • Replace Worn Parts • Check Oil Feeder • Increase To Recommended Rotation Speeds

13. STORAGE

If you intend to remove the Chenabore Hammer from service and place it into storage, then the following procedure should be followed to ensure the hammer is kept in optimum condition for it's return to service.

1. Strip down the hammer, clean and wipe away any moisture.
2. Coat all component parts in rock drill oil.
3. Re-assemble the hammer and fit end caps to both ends of the hammer to keep out any debris.
4. Store the hammer horizontally in a clean and dry environment.

If the hammer is stored for a long period of time, then we strongly recommend that steps 1 & 2 are repeated prior to use to ensure trouble free operation.

14. WARRANTY

Chenalord warrants it's product against faulty design, materials and workmanship only for a period of 3 months from initial operation and or 6 months from shipment date. Chenalord does not warrant defects arising as a result of misuse, negligence, normal wear and tear or where service, operation and maintenance procedures have not been adhered to.

At Chenalord's discretion where the product is found to be defective Chenalord may either agree to repair the defective part or issue a full or partial credit towards a replacement part.

PLEASE OBSERVE THE WARNING LABEL ATTACHED TO THE HAMMER

The Chenabore Hammer Warranty Will Be Voided Where The Following Occurs:

1. Damage caused to components from insufficient lubrication.
2. Evidence of welding or application of heat or impact.
3. Damage caused due to the use of incorrect tools.
4. Evidence of distortion of components.
5. The hammer or any of it's components have reached a reasonable amount of it's expected life.

Chenalord

drilling supplies

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