

# DiscovOre and Arrow 3S

In-The-Hole tools





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# DiscovOre and Arrow 3S In-The-Hole Tools

## We hunt, we gather and we explore

We've been doing it for thousands of years. You have to be strong, fast and precise. And so do your tools. Beautiful in their simplicity, robust in their strength and unmatched in speed.

For today's explorers, Epiroc is proud to introduce DiscovOre head assembly and Arrow 3S auto-lock overshoot. Speed, Safety, Simplicity.

### Application product highlights

### Patent pending

- No spring pins
- No spearhead
- Reduced risk of jammed inner tubes
- Automatic locking overshoot
- Robust latches
- Reduced length
- Improved latch engagement
- Quick conversion head for all hole orientations
- Robust spindle
- Stabilized bearing assembly
- Latch lock

# Highlights

## No spring pins

The innovative design of the DiscovOre head assembly eliminates all spring pins. The latch pins are replaced with a patent pending hook design. The retracting case pin is replaced with an assembly rod and bolt. As for the spear head pin, we've eliminated the spear head altogether.

## No spearhead

With no spear head, the DiscovOre head eliminates one of the most common failure points of current head assemblies. Without the spearhead, we are able to use a loading tool at the end of the head assembly to hold the latches in and provide a comfortable surface to push the inner tube into the drill rod.

## Reduced risk of jammed inner tubes

With its leveraged latch design, the DiscovOre head increases your chances of releasing an inner tube jammed in the core barrel. Just like adding a cheater bar to a wrench for a stuck bolt, the DiscovOre latch is extended past the engagement surface to apply a substantially greater amount of force to unlatch. This is achieved without adding extra parts or links that complicate the assembly.

## P DiscovOre head assembly & Arrow 3S overshoot



## Arrow 3S overshoot



### Automatic locking overshoot

In fast paced production, it's easy to forget to manually engage a lock. The Arrow 3S Overshoot will automatically lock onto the head assembly. No tools are required to unlock and release; even under tension. Disengage the lock and release the overshoot from the head assembly with one hand. The double length release sleeve will reach the head faster if you need to release the overshoot in the hole. With a pointed end and fluid passage grooves along the length of the body, the overshoot will reach the bottom of the hole faster.

### Robust latches

The innovative DiscovOre latch design eliminates many of the problems of current head assemblies, while providing added benefits:

- Wide engagement surface ensures the head assembly will stay in contact with the locking coupling.
- Thick, single piece design is simple to assemble and can handle more abuse.
- Independent latches. At least one latch will always engage the locking coupling.
- Spring loaded. The spring acts directly on the latch so it can easily conform to the surface of internal variable diameter drill rods. The latches will also self-adjust as they wear down.

### Reduced length

The DiscovOre head is nearly 10" shorter than current underground head assemblies.

### Improved latch engagement

The DiscovOre adapter coupling does not have a drive tang; ensuring nothing will prevent the latches from engaging. Instead, there is a window in the locking coupling to engage a drive key in the DiscovOre head assembly to ensure it rotates with the drill string. This also reduces wear and stress on the latches, increasing service life and reliability.

### Quick conversion head for all hole orientations

The DiscovOre head can be used for all hole orientations. Just change the mid body to suit your needs. The overall length for both surface and underground head assemblies are 30". This allows you to use the same adapter coupling for both applications; eliminating the need to pull the rods when converting.

### Robust spindle

The DiscovOre head is built to take a beating. The increased diameter of the spindle will reduce the chances of bending when dropped or subjected to rough handling.

### Stabilized bearing assembly

The bearings are spread further apart to reduce the vibrations while drilling. This results in a higher percentage of consolidated core recovery.

### Latch lock

The latches lock are a standard feature in the DiscovOre underground head; holding the latches engaged into the adapter coupling until the retracting case is pulled by the overshoot.

# Product features and functionalities

The DiscovOre head assembly and Arrow 3S overshot incorporates design features that eliminate many of the common problems found on other head assemblies.

## Assembly rod

The DiscovOre Head Assembly is held together with an assembly rod and bolt instead of the more common spring pins. The use of a hammer and punch is not needed to assemble or disassemble the head assembly.



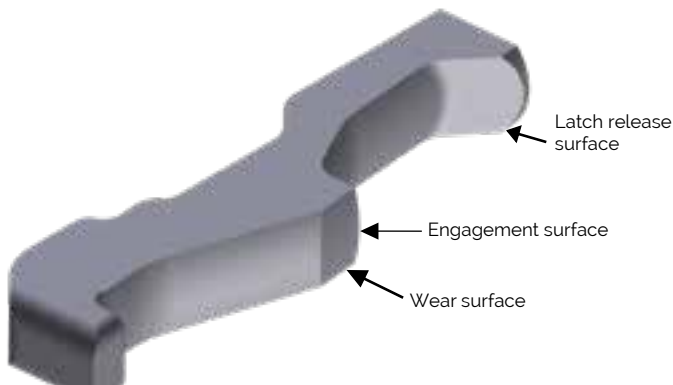
The assembly bolt uses a special wedge lock washer to prevent it from unthreading.



## Leveraged latches

The latches are held in place by hooking them into the window in the latch body. There are no spring pins. The latches are rotated into the latch body with a spring in between them to ensure consistent engagement with the locking coupling.

The latch release surface is above the locking coupling increases engagement surface. This increases the force applied to disengage the latches and increase your chances of unjamming an inner tube stuck in the core barrel. The ability to unjam an inner tube stuck in the core barrel is dependent on many factors, including; wireline diameter and condition, wireline hoist capacity, hoist drum diameter and spooled wireline diameter. These are the factors that will limit the ability to release a stuck DiscovOre head assembly.



## Landing indicator

The DiscovOre head assembly uses a ball and bushing landing indicator system. We recommend using the Epiroc reset tool to reset the valve to avoid head and valve damage and to safely apply the required leverage to reset the valve. This valve can be changed for a fluid retention system when required. The DiscovOre reset tool has a socket embedded into the handle for the assembly bolt.

## Positive latch engagement

The independent latches will always engage the locking coupling even if one is obstructed by the drive tang. For underground, a drive key is used, instead of the latch, to rotate the head. This helps to ensure 100% latch engagement by removing the drive tang on the DiscovOre locking coupling while ensuring the head will rotate with the drillstring to reduce wear on the latches.

## Compatibility

The surface head assembly is compatible with existing spearhead type core barrel outer tube assemblies. The underground head assembly uses the same adapter coupling that is used for surface applications. The DiscovOre underground locking coupling is needed to engage the drive key and ensure head rotation and proper latch engagement.

Application	Compatibility with spearhead type system	
	Outer tube assembly	Inner tube assembly
Surface	100%	100%
Underground	Required: Adapter coupling - Surface type Locking coupling - DiscovOre design	100%

## Loading tool

The latch lock is standard on all underground head assemblies. It can be removed for down holes while underground or installed on surface for extra security and for dry hole lowering. When the latch lock is installed, the use of the DiscovOre loading tool may be required. The loading tool will hold the latch lock

disengaged so the head assembly can be inserted into the drill string. It will automatically disengage when the latches are fully inserted. If the latch lock is installed on a down hole, it is recommended to use the overshot to lower the inner tube assembly into the drill string until the latches are past the rod threads, then release the overshot.



## Conversion

Whether your DiscovOre head assembly is in the surface or underground configuration, it can easily be converted by changing a few parts. The DiscovOre core barrel uses the same adapter coupling in all hole orientations, so it is not required to pull rods to change it after converting the heads. This is convenient when drilling surface holes that are horizontal and pumping in the inner tube assembly is required or when underground and drilling a down hole.

## Stabilized bearing

The bearing assembly contains an addition bearing at the end of the spindle to reduce play and for less vibration during drilling, resulting in more consolidated core inside the inner tube and reducing the chances of core blockage.

## Robust spindle

The DiscovOre lower body is externally threaded to accept a large diameter spindle. The increased diameter greatly increase the strength of the spindle to avoid bending during rough handling. The inner tube length is adjusted at this connection.



## Locking overshot

Based on our popular Safety overshot, the DiscovOre overshot will automatically lock onto the head assembly once it is connected. The slim body with grooves will cut through the water more efficiently for a faster drop speed, increasing your production. The extended length release sleeve has extra weight to reach the head assembly faster and to ensure the overshot is released. The pivoting body makes for easier handling outside of the drill string. The simple, robust design will give you consistent reliable performance.



## Arrow 3S overshot

Based on our popular Safety overshot, the Arrow 3S overshot will automatically lock onto the head assembly once it is connected. The slim body with grooves will cut through the water more efficiently for a faster drop speed, increasing your production. The extended length release sleeve has extra weight to reach the head assembly faster and to ensure the overshot is released. The pivoting body makes for easier handling outside of the drill string. The simple, robust design will give you consistent reliable performance.

	Standard Overshot	Arrow 3S Overshot	Reduced Arrow 3S area
B size rods			-18%
N size rods			-13%
H size rods			-56%
P size rods			-5%



# DiscovOre latch advantages

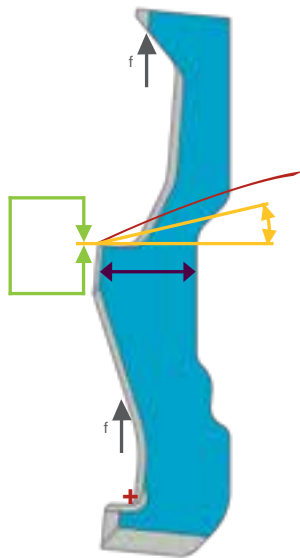
Thick, robust design can withstand rough handling and the toughest conditions.

More than 50% less interference with locking coupling to unlatch compared to center pivot head assemblies.

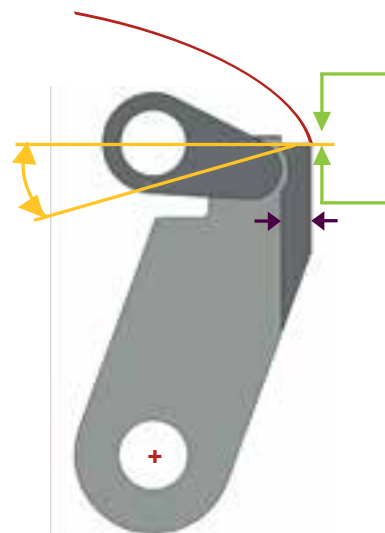
Smaller angle of interference reduces wear on engaging surfaces.

Leveraged latch arm increases unlatch force substantially compared to standard head assemblies.

Independent latch pivots create a flatter arc path, decreasing the force required to unlatch.



DiscovOre latch

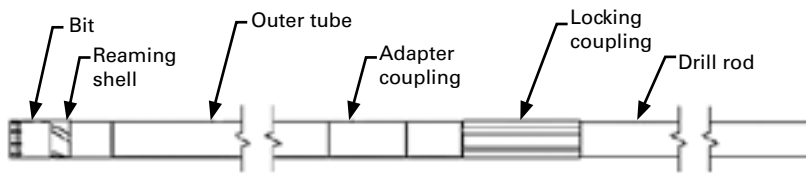


Competitor latch

# DiscovOre compatibility with other designs

The DiscovOre core barrel is compatible with most core barrel designs existing on the market. Most components are interchangeable. To convert other design core barrel into DiscovOre in most cases there is only need to replace head assembly and overshot head (surface application). In underground application (horizontal and up-hole drilling) additionally there is requirement to change locking coupling (DiscovOre design) and make sure that surface type adapter coupling is used (or the type with welded drive key). See explanation of different types of locking and adapter couplings on next page. DiscovOre core barrels are compatible ONLY with Arrow 3S overshots.

Core barrel set up



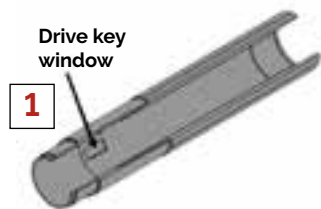
Surface drilling

Underground drilling

	Surface drilling				Underground drilling				
	DiscovOre Surface	Excore Surface	O-series & copies Surface	Link latch Surface	DiscovOre Underground	Excore Underground	O-series & copies Underground	Link latch Underground	
Head assembly									
Locking coupling	2	2	2	2	1	3	4	4	
Adapter coupling	5	5	5	5	5	6	7	6	
		✓	✓	✓		✗	✓	✗	
						✗	✓	✗	
									✓ Compatible ✗ Not compatible

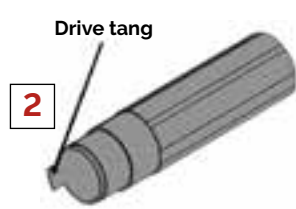
# Locking and adapter couplings – compatibility with DiscovOre

## Locking couplings



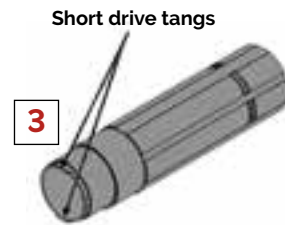
### DiscovOre locking coupling

- Window in locking coupling engages drive key in DiscovOre head assembly to ensure rotation.
- Head assembly latches will always fully engage the locking coupling, reducing mismatches.
- Used for drilling underground drilling and optionally for surface.



### Existing surface locking coupling

- DiscovOre head assembly is 100% compatible.
- DiscovOre latches are independent, if one latch lands on the drive tang, the other will still engage the locking coupling, reducing the chances of a mismatch.
- Used for surface drilling only.



### Existing underground locking coupling

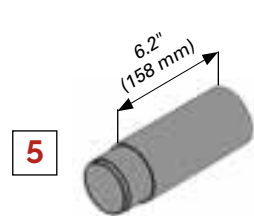
- DiscovOre head assembly is NOT compatible with this locking coupling.
- Used for underground drilling only.



### O-Series underground locking coupling

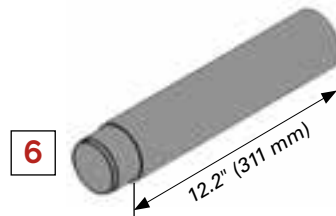
- DiscovOre head assembly is compatible with this locking coupling ONLY if it is used with the welded drive key coupling (7).
- Used for underground drilling only.

## Adapter/drive couplings



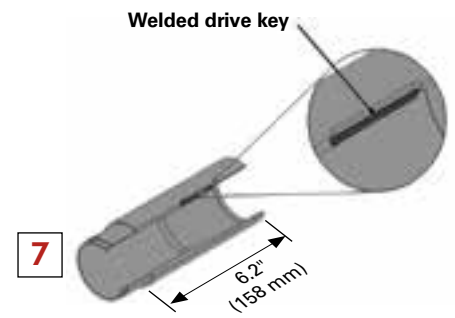
### Existing surface adapter coupling

- The DiscovOre head assembly uses this adapter coupling for both surface and underground configurations.



### Long underground adapter coupling

- This adapter coupling is NOT compatible with the DiscovOre head assembly.
- CAUTION: If the core barrel in the hole has this installed, the DiscovOre head assembly will not latch properly. Replace this with the proper adapter coupling prior to using the DiscovOre head assembly.
- The DiscovOre underground head assembly is 10" shorter than most existing underground systems. This length must be compensated for at the adapter coupling. It is important to ensure the core barrel has the correct adapter coupling installed prior to using the DiscovOre head assembly underground.



### Existing underground drive coupling

- The DiscovOre head assembly is compatible with this drive coupling.
- Although it is recommended to use the DiscovOre locking coupling and adapter coupling for optimal performance and safety.

**DiscovOre and Arrow 3S  
In-The-Hole tools**

**Surface**



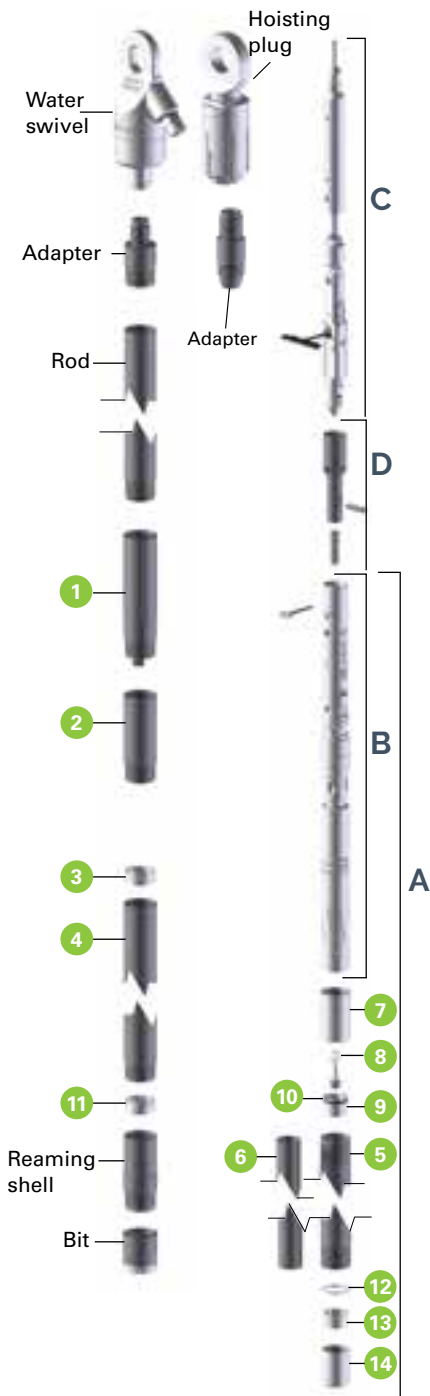
# DiscovOre head assembly – B surface



Item	Description	Part Number	Qty
-	B-D Head Assembly – Surface	3760017400	1
1	Retracting case	3760017418	1
2	Assembly bolt	3760017439	1
3	Wedge lock washer	3760017235	1
4	Spring – Retracting case	3760017462	1
5	Assembly rod	3760017424	1
6	Spring – Latch	3760017334	1
7	Latch	3760017417	2
8	Latch body	3760017433	1
9	Mid body – Surface	3760017425	1
10	Landing shoulder	3760005796	1
11	22 mm ball	3760012099	1
12	Landing indicator bushing	3760012100	1
13	Lower body	3760017411	1
14	Locknut – Spindle	3760017410	1
15	Spindle	3760017422	1
16	Shut off valve	3760008340	2
17	Valve adjusting washer	3760006222	2
18	Thrust bearing	3760006470	2
19	Spindle bearing housing	3760017423	1
20	Compression spring	3760006475	1
21	Ball bearing	3760017434	1
22	Nyloc nut	3760017431	1
23	Inner tube cap assembly	3760017415	1
24	Safety pin	3760017291	1
25	Thread protector	3760017472	1

Description	Part Number	Qty
<b>B Head assy spare parts kit (2000 m / 6600 ft)</b>	<b>3760017447</b>	
B-D Latch	3760017417	2
B-D Assembly pin	3760017424	1
Assembly bolt	3760017439	2
Wedge lock washer	3760017235	2
Retracting case spring	3760017462	2
BO Landing shoulder	3760005796	1
BO Hard shut off valve –Yellow	3760008340	2
22 mm stainless steel ball	3760012099	1
Landing indicator bushing	3760012100	6
Latch spring	3760017334	2

# DiscovOre core barrel assemblies – B surface

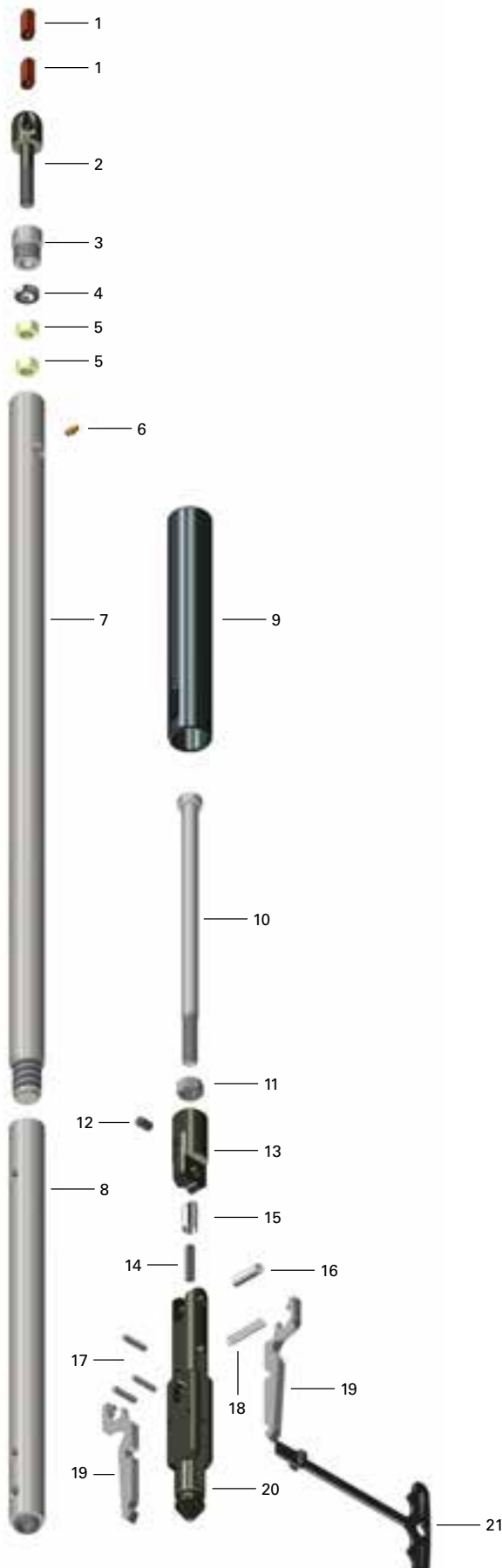


Item	Description	Remarks	Part number
<b>Drill string component</b>			
W.S.	5000TC (5k Lbs) Water Swivel, BW rod box	25000TC (25k Lbs) as option	3760003627
W.S. adapter	Drill rod adapter AW rod pin to BO pin	Select one to match rod type	3760006008
	Drill rod adapter AW rod pin to BT pin		3760006009
	Drill rod adapter AW rod pin to BMO pin		3760015743
	Drill rod adapter AW rod pin to BR pin		3760014209
H.P.	BNHP (30k Lbs) Hoisting Plug, NW rod box	55k (Lbs) HP as option	3760006010
H.P. adapter	Drill rod adapter NW rod pin to BO rod pin	Select one to match rod type	3760015808
	Drill rod adapter NW rod pin to BT rod pin		3760015804
	Drill rod adapter NW rod pin to BMO rod pin		3760015251
	Drill rod adapter NW rod pin to BR rod pin		3760014211
Rod	Wireline Drill Rod	Different thread options	See page 43 for available options
1	Locking coupling Full Hole - BO rod box	Select one to match drill rod thread type	3760006012
	Locking coupling Full Hole - BT rod box		3760006013
	Locking coupling Full Hole - BMO rod box		3760015646
	Locking coupling Full Hole - BR rod box		3760014035
B,2-14	1.5 m / 5 ft Core barrel assy	w/o Locking Coupling (order separately)	3760017407
	3.0 m / 10 ft Core barrel assy		3760017406
A	1.5 m / 5 ft inner tube assy complete		3760017403
	3.0 m / 10 ft inner tube assy complete		3760017402
B	Head assembly complete		3760017400
C	Overshot assembly complete		3760017450
D	Dry hole kit (optional)		N/A
2	Adapter coupling		3760006014
3	Landing ring		3760006228
4	1.5 m / 5 ft outer tube		3760 004831
	3.0 m / 10 ft outer tube		3760 004832
5	1.5 m / 5 m inner tube		3760 004830
	3.0 m / 10 ft inner tube		3760 004829
6	1.5 m / 5 m Split inner tube	Triple tube components	N/A
	3.0 m / 10 ft Split inner tube		N/A
7	Adapter		N/A
8	Piston plug		N/A
9	Piston		N/A
10	O-ring		N/A
11	Inner tube stabilizer		3760006229
12	Stop ring		3760006225
13	Core lifter		3760006226
14	Core lifter case		3760006227
Rshell	Reaming Shell RS++ - STD	Other types available	3760955420
Bit	Coring bit	Different options	See diamond tools catalogue
<b>Spare Part Kits (2000m/6600ft drilling)</b>			
	Spare parts kit head assembly		3760017447
	Spare parts kit overshot		3760017465
	Consumables kit core barrel		3760017449
<b>Universal components common for most DCDMA core barrels</b>			

**Note:** Core barrel assemblies does not include locking coupling which needs to be ordered separately.

Description	Part Number	Qty
<b>B core barrel consumables kit (2000 m / 6600 ft)</b>	<b>3760017449</b>	
Core lifter	3760006226	40
Core lifter case	3760006227	8
Landing ring	3760006228	4
Inner tube stabilizer	3760006229	4
Stop ring	3760006225	8

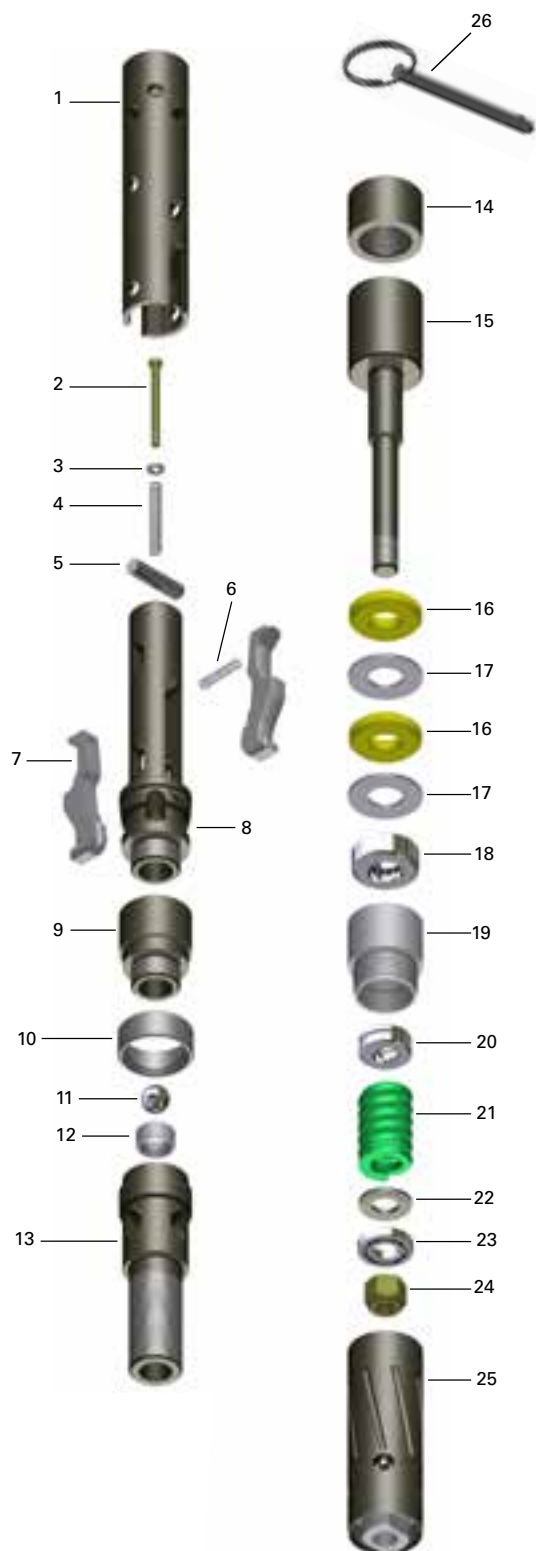
# Arrow 3S overshoot assembly – B surface



Item	Description	Part Number	Qty
-	B-Arrow 3S Overshot – Surface	3760017450	1
1-5	Cable swivel assembly	3760016262	1
12-20	Arrow 3S Overshot head assembly	3760017452	1
1	Nicopress sleeve	3760008244	2
2	Eye bolt	3760016265	1
3	Cable swivel collar	3760007216	1
4	Bearing	3760006467	1
5	Nut	3760012331	2
6	Grease fitting	0544110023	1
7	Sinking bar body	3760006376	1
8	JarTube/Sinking Bar Adapter	3760015559	1
9	Release sleeve	3760017742	1
10	Jar staff	3760015556	1
11	Jam nut	0268413826	1
12	Set screw	3760007085	1
13	Pivot body	3760017458	1
14	Spring – Detent	3760017279	1
15	Detent	3760017280	1
16	Spring pin	3760017460	1
17	Coiled pin	3760017459	3
18	Lifting dog Spring	3760006373	1
19	Lifting dog – Surface	3760017454	2
20	Overshot body – Surface	3760017455	1
21	Release tool	3760017262	1

Description	Part Number	Qty
<b>B-A3S spare parts kit (2000 m / 6600 ft)</b>	<b>3760017465</b>	
B-A3S Lifting dog	3760017454	2
BO NO HO Lifting dog spring	3760006373	2
Coiled pin	3760017459	3
Spring pin	3760017460	1
Round detent plunger	3760017280	1
B-A3S Detent spring	3760017279	1
Nicopress sleeve oval	3760008244	2

# DiscovOre head assembly – N and N2 surface



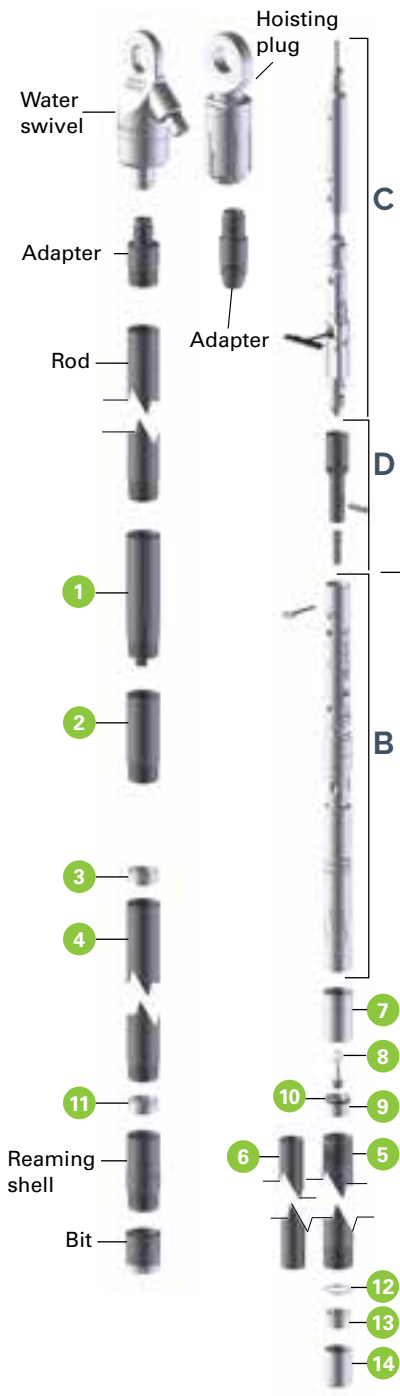
Item	Description	Part Number		Qty
		N Size	N2 Size	
-	N Head Assembly – Surface	3760017200	3760017221	1
1	Retracting case	3760017233		1
2	Assembly bolt	3760017239		1
3	Wedge lock washer	3760017235		1
4	Spring – Retracting case	3760017236		1
5	Assembly rod	3760017228		1
6	Spring – Latch	3760017237		1
7	Latch	3760017222		2
8	Latch body	3760017220		1
9	Mid body – Surface	3760017223		1
10	Landing shoulder	3760005100	3760005241	1
11	22 mm ball	3760012099		1
12	Landing indicator bushing	3760012100		1
13	Lower body	3760017211		1
14	Locknut – Spindle	3760017212		1
15	Spindle	3760017217		1
16	Shut off valve –Yellow	3760008328		2
17	Valve adjusting washer	3760006237		2
18	Thrust bearing	3760006461		1
19	Spindle bearing	3760017219		1
20	Hanger bearing	3760006462		1
21	Compression spring	3760006463		1
22	Washer – Bearing	3760017230		1
23	Ball bearing	3760017234		1
24	Nyloc nut	3760017240		1
25	Inner tube cap assembly	3760017232	3760017243	1
26	Safety pin	3760017291		1

N Head Assy spare parts kit (2000 m / 6600 ft)	3760017247	Qty
N-D Latch	3760017222	2
N-D Assembly rod	3760017228	1
Assy bolt 1/4" x 20" flanged	3760017239	2
Wedge lock washer 1/4"	3760017235	2
Spring 0.360" x 0.051" x 3"	3760017236	2
NO Landing shoulder 3PLB	3760005100	1
NO Hard shut off valve –Yellow	3760008328	2
22 mm Stainless steel ball	3760012099	1
Landing indicator bushing	3760012100	6
Spring 0.300" x 0.030" x 1.50"	3760017237	2

N2 Head Assy spare parts kit (2000 m / 6600 ft)	3760017256	Qty
N-D Latch	3760017222	2
N-D Assembly rod	3760017228	1
Assy bolt 1/4" x 20" flanged	3760017239	2
Wedge lock washer 1/4"	3760017235	2
Spring 0.360" x 0.051" x 3"	3760017236	2
NO2 Landing shoulder 3PLB	3760005241	1
NO Hard shut off valve –Yellow	3760008328	2
22 mm Stainless steel ball	3760012099	1
Landing indicator bushing	3760012100	6
Spring 0.300" x 0.030" x 1.50"	3760017237	2



# DiscovOre core barrel assemblies – N, N2 & N3 surface



Item	Description	Remarks	Part number		
			N3 core barrel	N core barrel	N2 core barrel
W.S.	25000TC (25k Lbs) Water Swivel, BW rod box	5000 TC (5k Lbs) as option	3760000376		
W.S. adapter	Drill rod adapter BW rod pin to NO pin	Select one to match rod type	3760006022		
	Drill rod adapter BW rod pin to NT pin		3760006023		
	Drill rod adapter BW rod pin to NMO pin		3760012623		
	Drill rod adapter BW rod pin to NR pin		3760014253		
H.P.	BNHP (30k Lbs) Hoisting Plug, NW rod box	55k (Lbs) HP as option	3760006010		
H.P. adapter	Drill rod adapter NW rod pin to NO pin	Select one to match rod type	3760015809		
	Drill rod adapter NW rod pin to NT pin		3760015805		
	Drill rod adapter NW rod pin to NMO pin		3760015501		
	Drill rod adapter NW rod pin to NR pin		3760014256		
Rod	Wireline Drill Rod	Different thread options	See page 43 for available options		
1	Locking coupling Full Hole - NO rod box	Select one to match drill rod thread type	3760006026		
	Locking coupling Full Hole - NT rod box		3760006027		
	Locking coupling Full Hole - NMO rod box		3760012737		
	Locking coupling Full Hole - NR rod box		3760014037		
B,2-14	1.5 m / 5 ft Core barrel assy 3.0 m / 10 ft Core barrel assy	w/o Locking Coupling	3760017484 3760017485	3760017480 3760017481	3760017482 3760017483
A	1.5 m / 5 ft inner tube assy compl.		3760017297	3760017203	3760017353
	3.0 m / 10 ft inner tube assy compl.		3760017296	3760017202	3760017352
B	Head assembly complete		3760017200	3760017200	3760017221
C	Overshot assembly complete		3760017250		
D	Dry hole kit (optional)		3760017249		
2	Adapter coupling		3760006028		
3	Landing ring		3760006243	3760006243	3760006329
4	1.5 m / 5 ft outer tube		3760004837		
	3.0 m / 10 ft outer tube		3760004839		
5	1.5 m / 5 m inner tube		3760004835	3760004835	3760006136
	3.0 m / 10 ft inner tube		3760004836	3760004836	3760006137
6	1.5 m / 5 m Split inner tube	Triple tube components	3760006076	Not Applicable	Not Applicable
	3.0 m / 10 ft Split inner tube		3760008294	Not Applicable	Not Applicable
7	Adapter		3760006293	Not Applicable	Not Applicable
8	Piston plug		3760006283	Not Applicable	Not Applicable
9	Piston		3760006294	Not Applicable	Not Applicable
10	O-ring		0663919600	Not Applicable	Not Applicable
11	Inner tube stabilizer		3760006244	3760006244	3760008317
12	Stop ring		3760006285	3760006240	3760006326
13	Core lifter		3760006286	3760006241	3760006327
14	Core lifter case		3760006287	3760006242	3760006328
Rshell	Reaming Shell RS++ - STD	Other types available	3760955435		
Bit	Coring bit	Different options	See diamond tools catalogue		
<b>Spare Part Kits (2000m/6600ft drilling)</b>					
	Spare parts kit head assembly		3760017247	3760017247	3760017256
	Spare parts kit overshot		3760017265		
	Consumables kit core barrel		3760016576	3760016574	3760016575
<b>Universal components common for most DCDMA core barrels</b>					

**Note:** Core barrel assemblies does not include locking coupling which needs to be ordered separately.

# DiscovOre core barrel assemblies – N, N2 & N3 surface – cont.

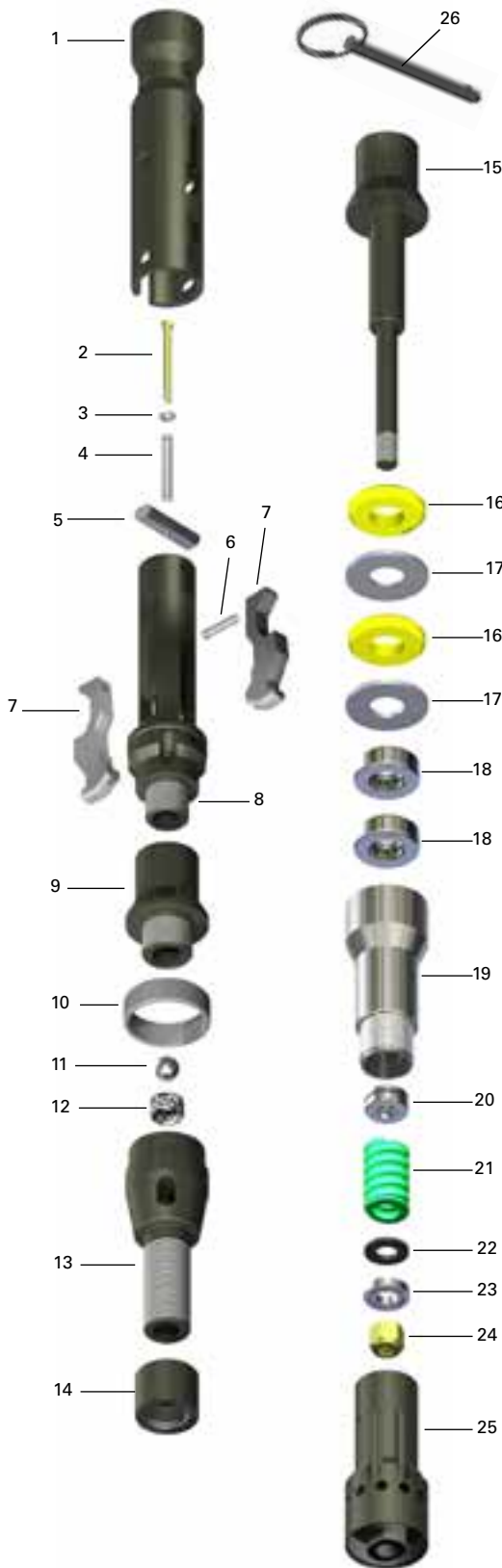
N core barrel consumables kit 2000 m/ 6600 ft 3760016574		
Description	Part Number	Qty
Core lifter	3760006241	40
Core lifter case	3760006242	8
Landing ring	3760006243	4
Inner tube stabilizer	3760006244	4
Stop ring	3760006240	8

N2 core barrel consumables kit 2000 m/ 6600 ft 3760016575		
Description	Part Number	Qty
Core lifter	3760006327	40
Core lifter case	3760006328	8
Landing ring	3760006329	4
Inner tube stabilizer	3760008317	4
Stop ring	3760006326	8

N3 core barrel consumables kit 2000 m/ 6600 ft 3760016576		
Description	Part Number	Qty
Core lifter	3760006286	40
Core lifter case	3760006287	8
Landing ring	3760006243	4
Inner tube stabilizer	3760006244	4
Stop ring	3760006285	8

Conversion kits from N to N3 core barrel		
Conversion kits includes all parts needed to convert N inner tube assembly to N3 inner tube assembly		
Description	Part number	Qty
<b>Conversion kit from N to N3 1,5m/5ft core barrel</b>	3760004729	
Stop ring	3760006285	1
Core lifter	3760006286	1
Core lifter case	3760006287	1
Piston plug	3760006283	1
O-ring	0663919600	1
Piston	3760006294	1
Adapter	3760006293	1
1.5 m / 5 m Split inner tube	3760006076	1
<b>Conversion kit from N to N3 3m/10ft core barrel</b>	3760009554	
Stop ring	3760006285	1
Core lifter	3760006286	1
Core lifter case	3760006287	1
Piston plug	3760006283	1
O-ring	0663919600	1
Piston	3760006294	1
Adapter	3760006293	1
3.0 m / 10 ft Split inner tube	3760008294	1

# DiscovOre head assembly – H surface

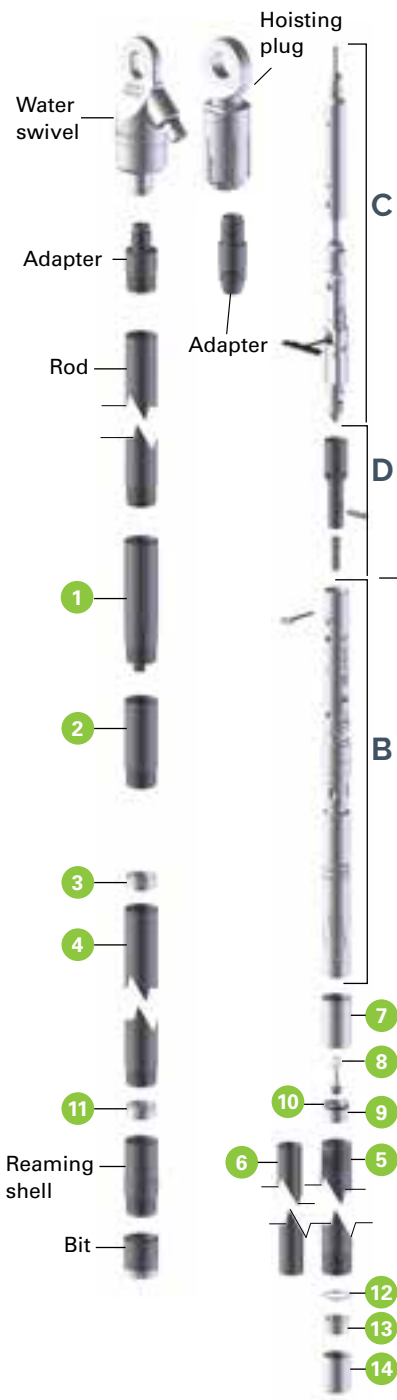


Item	Description	Part Number	Qty
-	H Head Assembly – Surface	3760017300	1
1	Retracting case	3760017318	1
2	Assembly bolt	3760017239	1
3	Wedge lock washer	3760017235	1
4	Spring – Retracting case	3760017236	1
5	Assembly rod	3760017324	1
6	Spring – Latch	3760017334	1
7	Latch	3760017317	2
8	Latch body	3760017333	1
9	Mid body – Surface	3760017325	1
10	Landing shoulder	3760005150	1
11	22 mm ball	3760012099	1
12	Landing indicator bushing	3760012100	1
13	Lower body	3760017311	1
14	Locknut – Spindle	3760017212	1
15	Spindle	3760017322	1
16	Shut off valve –Yellow	3760008379	2
17	Valve adjusting washer	3760006252	2
18	Thrust bearing	3760006471	2
19	Spindle bearing	3760017323	1
20	Hanger bearing	3760006462	1
21	Compression spring	3760006463	1
22	Washer – Bearing	3760017230	1
23	Ball bearing	3760017234	1
24	Nyloc nut	3760017240	1
25	Inner tube cap assembly	3760017315	1
26	Safety pin	3760017291	1

Description	Part Number	Qty
<b>H Head assy spare parts kit (2000 m / 6600 ft)</b>	<b>3760017347</b>	
H-D Latch	3760017317	1
H-D Assembly rod	3760017324	2
Assembly bolt 1/4" x 20"	3760017239	2
Wedge lock washer -1/4"	3760017235	2
Spring 0.360" x 0.051" x 3"	3760017236	3
Spring 0.36" x 0.042 x 1.750	3760017334	2
22 mm Stainless steel ball	3760012099	1
Landing indicator bushing	3760012100	6
HO Landing shoulder 3PLB	3760005150	1
HO Hard shut off valve –Yellow	3760008379	2

Part number	Description	Qty	Item in H head assembly
<b>3760017561</b>	<b>H DiscovOre Surface head assembly conversion kit to P DiscovOre Surface</b>		
<b>Item to be replaced in H head to complete conversion to P DiscovOre</b>			
3760017236	Spring – Retracting case	1	3760017334
3760017517	Latch	2	3760017317
3760017529	Landing shoulder	1	3760005150
3760016290	Valve adjusting washer	1	3760006252
3760016291	Shut off valve –Yellow	2	3760008379
3760017514	Inner tube cap assembly	1	3760017315
<b>Item to be added to H head to complete conversion to P DiscovOre</b>			
3760017512	Taper washer	2	
3760017516	Inner tube adapter	1	

# DiscovOre core barrel assemblies – H and H3 surface



Item	Description	Remarks	Part number	
			H3 core barrel	H core barrel
W.S.	25000TC (25k Lbs) Water Swivel, BW rod box	5000TC (5k Lbs) as option	3760000376	
W.S. adapter	Drill rod adapter BW rod pin to HO pin	Select one to match rod type	3760006039	
	Drill rod adapter BW rod pin to HT pin		3760006040	
	Drill rod adapter BW rod pin to HMO pin		3760013440	
	Drill rod adapter BW rod pin to HR pin		3760014290	
H.P.	BNHP (30k Lbs) Hoisting Plug, NW rod box	55k (Lbs) HP as option	3760006010	
H.P. Adapter	Drill rod adapter NW rod pin to HO rod pin	Select one to match rod type	3760015810	
	Drill rod adapter NW rod pin to HT rod pin		3760015806	
	Drill rod adapter NW rod pin to HMO rod pin		3760015250	
	Drill rod adapter NW rod pin to HR rod pin		3760014132	
Rod	Wireline Drill Rod	Different thread options	See page 43 for options	
1	Locking coupling Full Hole - HO rod box	Select one to match drill rod thread type	3760006043	
	Locking coupling Full Hole - HT rod box		3760006044	
	Locking coupling Full Hole - HMO rod box		3760011909	
	Locking coupling Full Hole - HR rod box		3760014039	
B,2-14	1.5 m / 5 ft Core barrel assy	w/o Locking Coupling	3760017488	3760017486
	3.0 m / 10 ft Core barrel assy		3760017489	3760017487
A	1.5 m / 5 ft inner tube assy complete		3760017397	3760017303
	3.0 m / 10 ft inner tube assy complete		3760017396	3760017302
B	Head assembly complete		3760017300	
C	Overshot assembly complete		3760017250	
D	Dry Hole Kit (optional)		3760017249	
2	Adapter coupling		3760006045	
	Landing ring		3760006258	
4	1.5 m / 5 ft outer tube		3760006046	
	3.0 m / 10 ft outer tube		3760006047	
5	1.5 m / 5 m inner tube		3760006048	
	3.0 m / 10 ft inner tube		3760006049	
6	1.5 m / 5 m Split inner tube	Triple tube components	3760005641	Not Applicable
	3.0 m / 10 ft Split inner tube		3760005640	Not Applicable
	Adapter		3760006295	Not Applicable
	Piston plug		3760006283	Not Applicable
8	Piston		3760006296	Not Applicable
9	O-ring		0663210093	Not Applicable
11	Inner tube stabilizer		3760006259	
12	Stop ring		3760006288	3760006255
13	Core lifter		3760006289	3760006256
14	Core lifter case		3760006290	3760006257
Rshell	Reaming Shell RS++ - STD	Other types available	3760955427	
Bit	Coring bit	Different options	See diamond tools catalogue	
<b>Spare Part Kits (2000m/6600ft drilling)</b>				
	Spare parts kit head assy		3760017347	
	Spare parts kit overshot		3760017265	
	Consumables kit core barrel		3760016578	3760016577
<b>Universal components common for most DCDMA core barrels</b>				

**Note:** Core barrel assemblies does not include locking coupling which needs to be ordered separately.

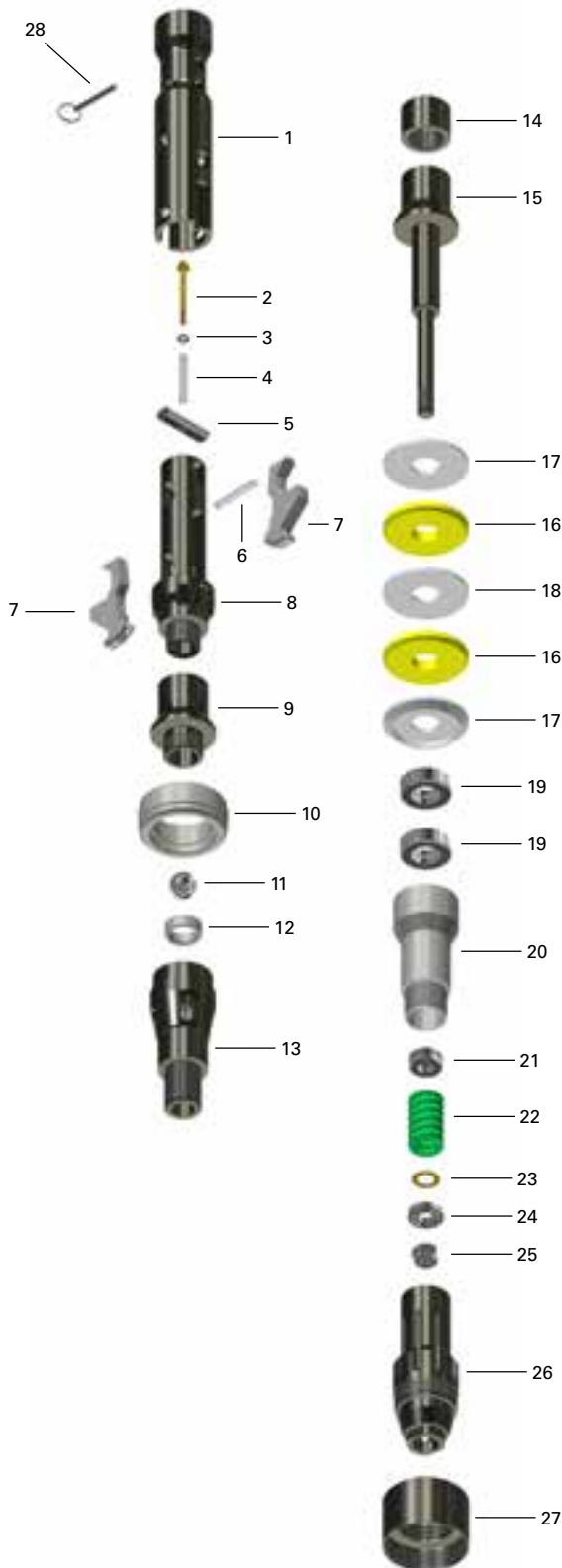
# DiscovOre core barrel assemblies – H and H3 surface – cont.

Conversion kits from H to H3 core barrel		
Conversion kits includes all parts needed to convert H inner tube assembly to H3 inner tube assembly		
Description	Part Number	Qty
<b>Conversion kit from H to H3 1,5m/5ft core barrel</b>	<b>3760009556</b>	
Stop ring	3760006288	1
Core lifter	3760006289	1
Core lifter case	3760006290	1
Piston plug	3760006283	1
O-ring	0663210093	1
Piston	3760006296	1
Adapter	3760006295	1
1.5 m / 5 m Split inner tube	3760005641	1
<b>Conversion kit from H to H3 3m/10ft core barrel</b>	<b>3760009555</b>	
Stop ring	3760006288	1
Core lifter	3760006289	1
Core lifter case	3760006290	1
Piston plug	3760006283	1
O-ring	0663210093	1
Piston	3760006296	1
Adapter	3760006295	1
3.0 m / 10 ft Split inner tube	3760005640	1

H core barrel consumables kit 2000 m / 6600 ft 3760016577		
Description	Part Number	Qty
Core lifter	3760006256	40
Core lifter case	3760006257	8
Landing ring	3760006258	4
Inner tube stabilizer	3760006259	4
Stop ring	3760006255	8

H3 core barrel consumables kit 2000 m / 6600 ft 3760016578		
Description	Part Number	Qty
Core lifter	3760006289	40
Core lifter case	3760006290	8
Landing ring	3760006258	4
Inner tube stabilizer	3760006259	4
Stop ring	3760006288	8

# DiscovOre head assembly – P surface



Item	Description	Part Number	Qty
–	<b>P Head Assembly – Surface</b>	3760017500	1
1	Retracting case	3760017318	1
2	Assembly bolt	3760017239	1
3	Wedge lock washer	3760017235	1
4	Spring – Retracting case	3760017236	1
5	Assembly rod	3760017324	1
6	Spring – Latch	3760017236	1
7	Latch	3760017517	2
8	Latch body	3760017333	1
9	Mid body – Surface	3760017525	1
10	Landing shoulder - standard	3760017529	1
	Offset Landing shoulder (option for P-EX type outer tube and adapter coupling)	3760017528	1
11	1-1/4" ball	3760017523	1
12	1-1/4" Landing indicator bushing - Low PSI	3760017531	1
	1-1/4" Landing indicator bushing - High PSI (optional)	3760017530	1
13	Lower body	3760017511	1
14	Locknut – Spindle	3760017212	1
15	Spindle	3760017322	1
16	Shut off valve –Yellow	3760016291	2
17	Taper washer	3760017512	2
18	Valve adjusting washer	3760016290	1
19	Thrust bearing	3760006471	2
20	Spindle bearing	3760017323	1
21	Hanger bearing	3760006462	1
22	Compression spring	3760006463	1
23	Washer – Bearing	3760017230	1
24	Ball bearing	3760017234	1
25	Stover nut	3760013004	1
26	Spindle cap assembly	3760017514	1
27	Inner tube adapter	3760017516	1
28	Safety pin	3760017291	1

**Common parts with H DiscovOre Surface head assembly 3760017300**

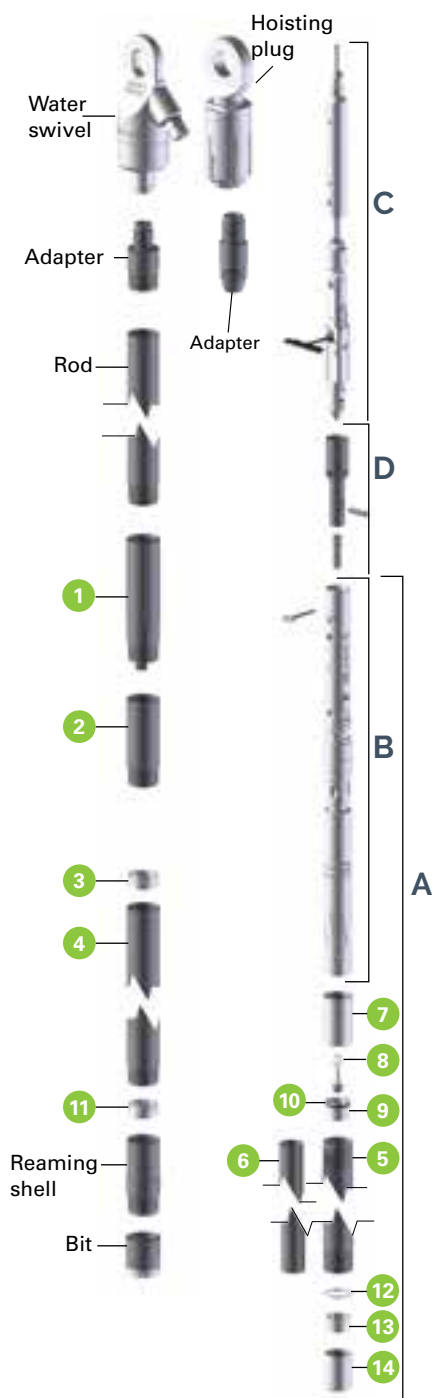
P DiscovOre Head Spare Part Kit (2000m/6600ft) -3760017519		
Part Number	Description	Qty
3760017239	Assembly bolt	2
3760017235	Wedge lock washer	2
3760017236	Spring – Retracting case	4
3760017324	Assembly rod	1
3760017517	Latch	2
3760017531	1-1/4" Landing indicator bushing - Low PSI	6
3760016291	Shut off valve –Yellow	1
3760017523	1-1/4" ball	2

3760017560 Head assembly conversion kit from P to H DiscovOre			
Part Number	Description	Qty	Item in P head assembly
<b>Item to be replaced in P DiscovOre head to convert to H DiscovOre</b>			
3760017334	Spring – Retracting case	1	3760017236
3760017317	Latch	2	3760017517
3760005150	Landing shoulder	1	3760017529
3760006252	Valve adjusting washer	2	3760016290
3760008379	Shut off valve –Yellow	2	3760016291
3760017315	Inner tube cap assy	1	3760017514
<b>Item to be removed from P head to complete conversion to H DiscovOre</b>			
	Taper washer	2	3760017512
	Inner tube adapter	1	3760017516

For damaged InnerTube thread on head assembly replace Inner Tube thread adapter 3760017516.

Conversion of P DiscovOre head to be used with P-EX outer tube and adapter coupling (parallel thread)			
Part Number	Description	Qty	Item in P head assembly
3760017528	Offset Landing shoulder	1	3760017529

# DiscovOre core barrel assemblies – P and P3 surface



Item	Description	Remarks	Part number	
			P3 core barrel	P core barrel
W.S.	25000TC (25k Lbs) Water Swivel, BW rod box	5000TC (5k Lbs) as option	3760000376	
W.S. adapter	Drill rod adapter BW rod pin to PO pin	Select one to match rod type	3760013320	
	Drill rod adapter BW rod pin to PT pin		3760006055	
	Drill rod adapter BW rod pin to PMO pin		3760005541	
H.P.	BNHP (30k Lbs) Hoisting Plug, NW rod box	55k (Lbs) HP as option	3760006010	
H.P. adapter	Drill rod adapter NW rod pin to PO rod pin	Select one to match rod type	3760014125	
	Drill rod adapter NW rod pin to PT rod pin		3760014121	
	Drill rod adapter NW rod pin to PMO rod pin		3760014129	
Rod	Wireline Drill Rod	Different thread options	See page 43 for available options	
1	Locking coupling TCWeld - PO rod box	Select one to match drill rod thread type	3760017124	
	Locking coupling TCWeld - PT rod box		3760017125	
	Locking coupling TCWeld - PMO rod box		3760017126	
B,2-14	1.5 m / 5 ft Core barrel assy	w/o Locking Coupling	3760017599	3760017505
	3.0 m / 10 ft Core barrel assy		3760017598	3760017504
A	1.5 m / 5 ft inner tube assy complete		3760017597	3760017503
	3.0 m / 10 ft inner tube assy complete		3760017596	3760017502
B	Head assembly complete		3760017500	
C	Overshot assembly complete		3760017550	
D	Dry Hole Kit (optional)		3760017249	
2	Adapter coupling		3760017524	
3	Landing ring		3760017508	
4	1.5 m / 5 ft outer tube		3760017507	
	3.0 m / 10 ft outer tube		3760017506	
5	1.5 m / 5 m inner tube		3760006064	
	3.0 m / 10 ft inner tube		3760006065	
6	1.5 m / 5 m Split inner tube	Triple tube components	3760005629	Not Applicable
	3.0 m / 10 ft Split inner tube		3760008293	Not Applicable
7	Adapter		3760006282	Not Applicable
8	Piston plug		3760006283	Not Applicable
9	Piston		3760006284	Not Applicable
10	O-ring		0663921600	Not Applicable
11	Inner tube stabilizer		3760006275	
12	Stop ring		3760006291	3760006271
13	Core lifter		3760006292	3760004185
14	Core lifter case		3760006273	
Rshell	Reaming Shell RS++ - STD	Other types available	3760955439	
Bit	Coring bit	Different options	See diamond tools catalogue	
<b>Spare Part Kits (2000m/6600ft drilling)</b>				
	Spare parts kit head assembly		3760017519	
	Spare parts kit overshot		3760017265	
	Consumables kit core barrel		3760017521	3760017520
<b>Universal components common for most DCDMA core barrels</b>				

**Note:** Core barrel assemblies does not include locking coupling which needs to be ordered separately.

Core barrel assembly and head assembly are compatible with Boart Longyear PHD outer tube (HWT taper box thread) and adapter coupling (HWT taper pin thread). Head assembly can be used with standard parallel thread outer tube P-EX type by replacing landing shoulder with Off-set type (see previous page).

# DiscovOre core barrel assemblies – P and P3 surface – cont.

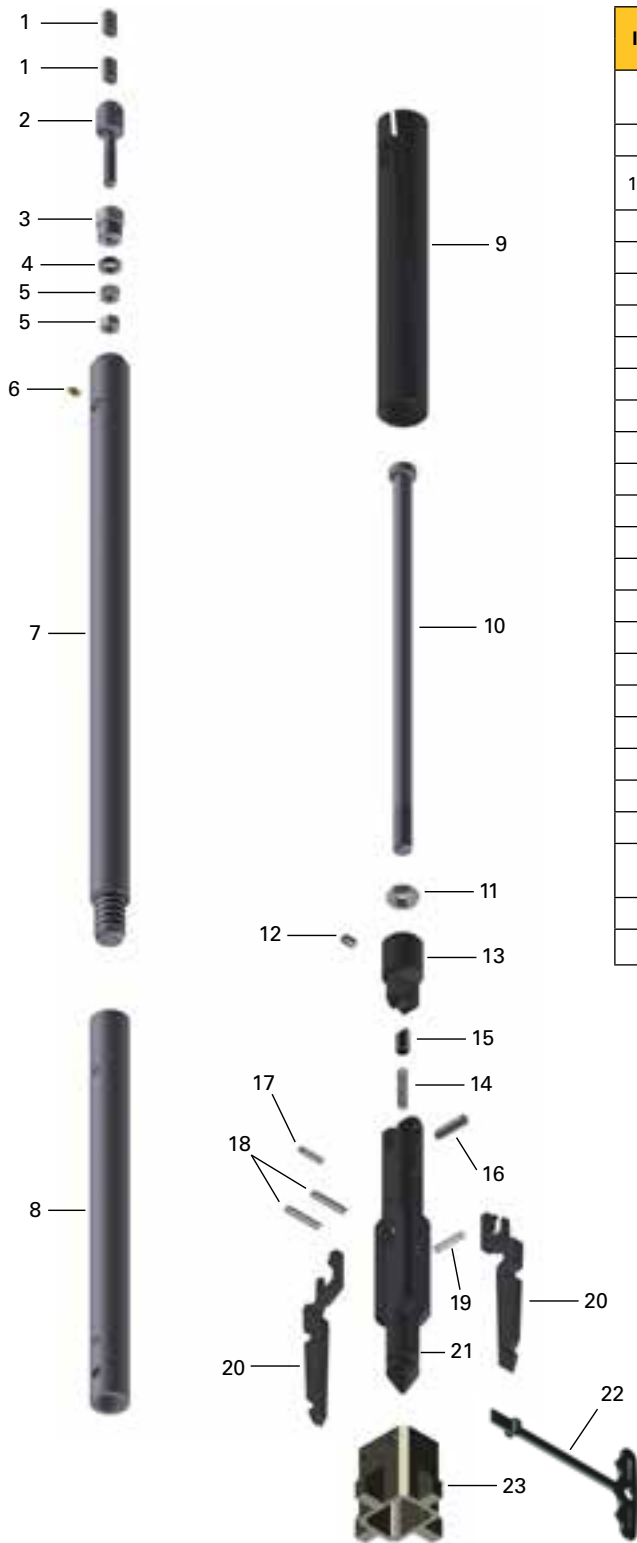
P core barrel consumables kit 2000 m / 6600 ft			3760017520
Description	Part Number	Qty	
Core lifter	3760004185	40	
Core lifter case	3760006273	8	
Landing ring	3760017508	4	
Inner tube stabilizer	3760006275	4	
Stop ring	3760006271	8	
1-1/4" Landing indicator bushing - Low PSI	3760017531	6	
Shut off valve –Yellow	3760016291	1	
1-1/4" ball	3760017523	2	

P core barrel consumables kit 2000 m / 6600 ft			3760017521
Description	Part Number	Qty	
Core lifter	3760006292	40	
Core lifter case	3760006273	8	
Landing ring	3760017508	4	
Inner tube stabilizer	3760006275	4	
Stop ring	3760006291	8	
1-1/4" Landing indicator bushing - Low PSI	3760017531	6	
Shut off valve –Yellow	3760016291	1	
1-1/4" ball	3760017523	2	

Conversion kits from P to P3 core barrel		
Conversion kits includes all parts needed to convert P inner tube assembly to P3 inner tube assembly		
Description	Part Number	Qty
<b>Conversion kit from P to P3 1,5m/5ft core barrel</b>	<b>370017557</b>	
Stop ring	3760006291	1
Core lifter	3760006292	1
Piston plug	3760006283	1
O-ring	0663921600	1
Piston	3760006284	1
Adapter	3760006282	1
1.5 m / 5 m Split inner tube	3760005629	1
<b>Conversion kit from P to P3 3m/10ft core barrel</b>	<b>3760017558</b>	
Stop ring	3760006291	1
Core lifter	3760006292	1
Piston plug	3760006283	1
O-ring	0663921600	1
Piston	3760006284	1
Adapter	3760006282	1
3.0 m / 10 ft Split inner tube	3760008293	1



# Arrow 3S overshoot assembly – NHP surface



Item	Description	Part Number			Qty
		NH size	P size	NH Short	
	Arrow 3S Overshot – Surface	3760017250	3760017550	3760017290	1
1-5	Cable swivel assembly	3760016262			1
12-21	Arrow 3S Overshot head assembly	3760017252	3760017552	3760017252	1
1	Nicopress sleeve	3760008244			2
2	Eye bolt	3760016265			1
3	Cable swivel collar	3760007216			1
4	Bearing	3760006467			1
5	Nut	3760012331			2
6	Grease fitting	0544110023			1
7	Sinking bar body	3760006384			1
8	JarTube	3760015660		3760015935	1
9	Release sleeve	3760006381			1
10	Jar staff	3760015663		N/A	1
11	Jam nut	5530616400		N/A	1
12	Set screw	3760015495			1
13	Pivot body	3760017258			1
14	Spring – Detent	3760017279			1
15	Detent	3760017280			1
16	7/16" Coiled pin	3760017260			1
17	1/4" x 1 1/4" Spring pin	0108169134			1
18	5/16 x 1 1/2" Coiled pin	3760017259	3760017559	3760017259	2
19	Spring	3760006373			1
20	Lifting dog – Surface	3760017254			2
21	Overshot body – Surface	3760017255			1
22	Release tool	3760016230			1
23	P size Adapter	N/A	3760017570	N/A	



NHP Arrow 3S Overshot standard Surface total length – 1980 mm / 78"

NHP Arrow 3S Short total length 1190 mm / 47"

Use Short overshoot for down holes with limited space. (Underground or Surface). The extra weight of the sinking bar and no drag from the propulsion seals will result in faster round trips. The release sleeve will give you the ability to release the overshoot in the event of a jammed inner tube.

# Arrow 3S overshoot assembly – NHP surface

NHP-A3S spare parts kit (2000 m / 6600 ft)		3760017265
Description	Part Number	Qty
NHP-A3S Lifting dog	3760017254	2
BO NO HO Lifting dog spring	3760006373	2
Pin coiled spring 5/16 x 1 1/2	3760017259	2
Pin coiled spring 7/16 x 1 1/2	3760017260	1
Round detent plunger	3760017280	1
NH-A3S Detent spring	3760017279	1
Spring pin 1/4" x 1 3/4" LG	010869187	1
3/16" Nicopress sleeve oval	3760008244	2
<b>Add below item to complete Spare Parts kit for P size overshoot</b>		
P size Conversion kit	3760017570	1

3760015935 NH Std to NH Overshot conversion kit			
Part Number	Description	Qty	Item in NH Std Overshot
<b>Item to be replaced in NH A3S Std Overshot to convert to NH Short Overshot</b>			
3760015935	Sinking bar adapter	1	3760015660
<b>Item to be removed from NH A3S Std Overshot to compl. conversion to NH Short</b>			
	Jar staff	1	3760015663
	Jam nut	1	5530616400

3760017570 NH A3S Std/Short to P A3S Overshot conversion kit			
Part Number	Description	Qty	Item in NH Std Overshot
<b>Item to be replaced in NH A3S Std/Short Overshot to convert to P A3S Overshot</b>			
3760017559	Spiral roll pin 5/16 x 2 " LG	2	3760017259
<b>Item to be added to NH A3S Std or Short Overshot to compl. conversion to P A3S</b>			
3760017570	P size Adapter	1	

# Operation

For safety, it is recommended to use the wireline and overshot to handle the inner tube assembly outside of the drill string. It is not recommended to drop an inner tube assembly into the drill string. Doing so may damage the head assembly, latches and drill string threads.

## Lowering



1. Attach the DiscovOre Locking Overshot to the DiscovOre Head Assembly by inserting the overshot head into the top of the retracting case.
2. Once attached, the overshot is locked onto the back end of the inner tube assembly. The inner tube assembly can be safely maneuvered above the drill string.

### DANGER

Personnel should avoid being directly under a hanging inner tube assembly.



3. Lower the inner tube assembly into the drill string until the latches are past the threads.
4. Insert the release tool horizontally, into the opening in the middle of the overshot body
5. Push down on the release tool to pry open the lifting dogs to disconnect the head assembly from the overshot.

### CAUTION

The head will drop into the drill string, keep hands clear to avoid injury.

## Retrieval

1. Insert the overshot into the drill string and lower it until it hits the back end of the inner tube. Once connected, the head and overshot are automatically locked together.
2. Reverse the wireline and pull the overshot to disengage the latches of the head assembly from the core barrel.
3. At the surface, maneuver the inner tube assembly into position
6. To release the overshot, insert the overshot into the retracting case of the head assembly to slightly compress the lifting dogs. Maintain some slack in the wireline.
7. Squeeze the lifting dogs while maintaining the overshot inserted in the retracting case, then pull the overshot out of the retracting case while squeezing the lifting dogs.

### CAUTION

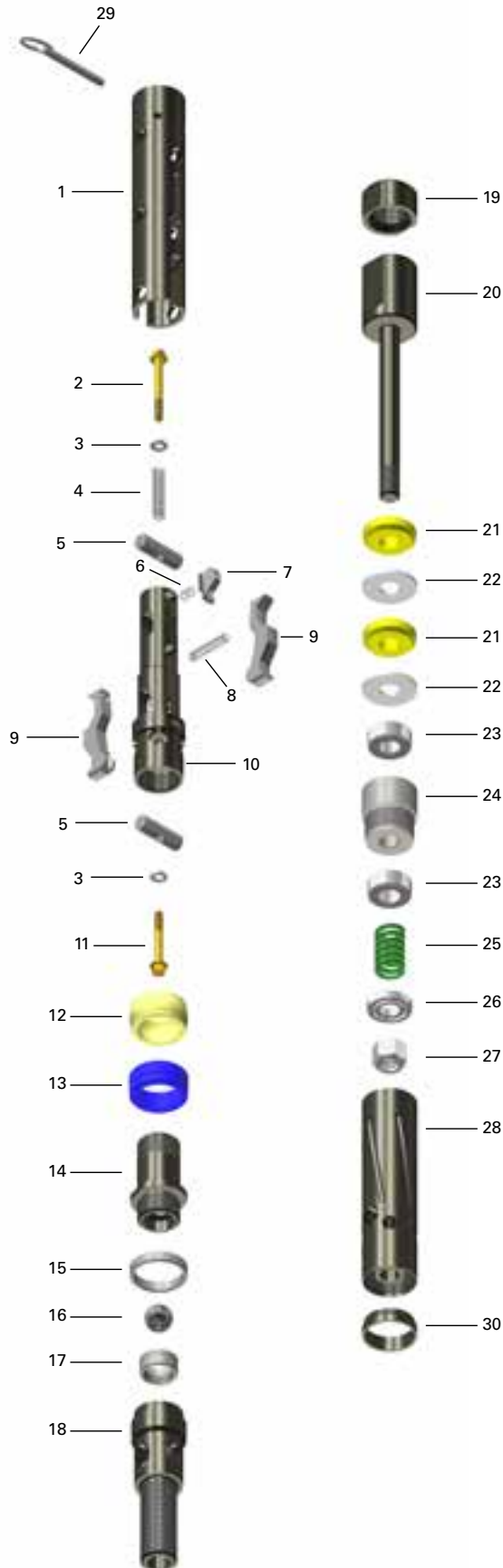
The head will drop if it is not supported.



**DiscovOre and Arrow 3S  
In-The-Hole tools**

**Underground**

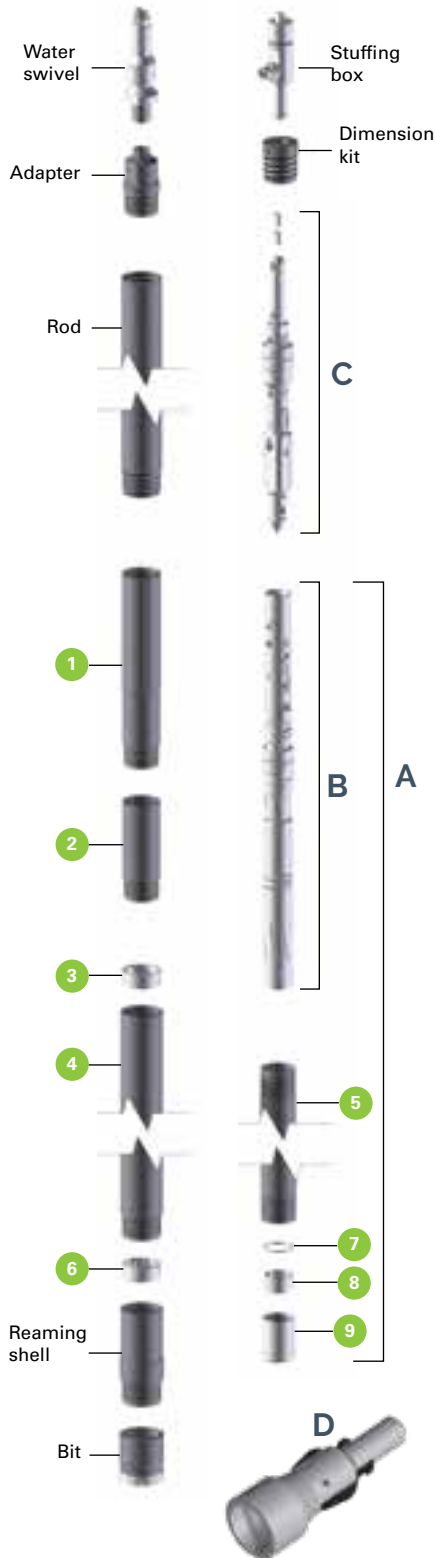
# DiscovOre head assembly – BU underground



Item	Description	Part Number	Qty
		N Size	
-	BU-D Head Assembly – Surface	3760017401	1
1	Retracting Case	3760017418	1
2	Assembly Bolt	3760017439	1
3	Wedge Lock Washer	3760017235	2
4	Spring – Retracting Case	3760017462	1
5	Assembly Pin	3760017424	2
6	Drive key spring	3760017438	1
7	BD Drive Key	3760017414	1
8	Spring – Latch	3760017237	1
9	Latch	3760017417	2
10	Latch Body	3760017433	1
11	Assembly bolt	3760017437	1
12	BU-D Upper propulsion seal	3760017420	1
13	Lower Propulsion seal	3760017479	1
14	Mid Body – Underground	3760017419	1
15	BU-D Landing Shoulder	3760017421	1
16	22 mm Ball	3760012099	1
17	Landing Indicator Bushing	3760012100	1
18	Lower Body	3760017411	1
19	Locknut – Spindle	3760017410	1
20	Spindle	3760017422	1
21	Shut Off Valve	3760008340	2
22	Valve Adjusting Washer	3760006222	2
23	Thrust Bearing	3760006470	2
24	Spindle bearing housing	3760017423	1
25	Compression Spring	3760006475	1
26	Ball Bearing	3760017434	1
27	Nyloc Nut	3760017431	1
28	Inner Tube Cap Assembly	3760017415	1
29	Safety pin	3760017291	1
30	Thread protector	3760017472	1

B Head Assy spare parts kit (2000 m / 6600 ft)	3760017448	Qty
BD Latch	3760017417	2
BD Drive key	3760017414	2
BD Assembly rod	3760017424	2
Assy bolt	3760017439	4
Wedge lock washer	3760017235	4
Retracting case spring	3760017462	2
Drive key spring	3760017438	2
BO Landing shoulder 3PLB	3760005796	1
BO Hard shut off valve –Yellow	3760008340	2
22 mm Stainless steel ball	3760012099	1
Landing indicator bushing	3760012100	6
Spring	3760017237	2
Upper propulsion seal	3760017420	2
Lower propulsion seal	3760017479	2

# DiscovOre core barrel assemblies – BU underground

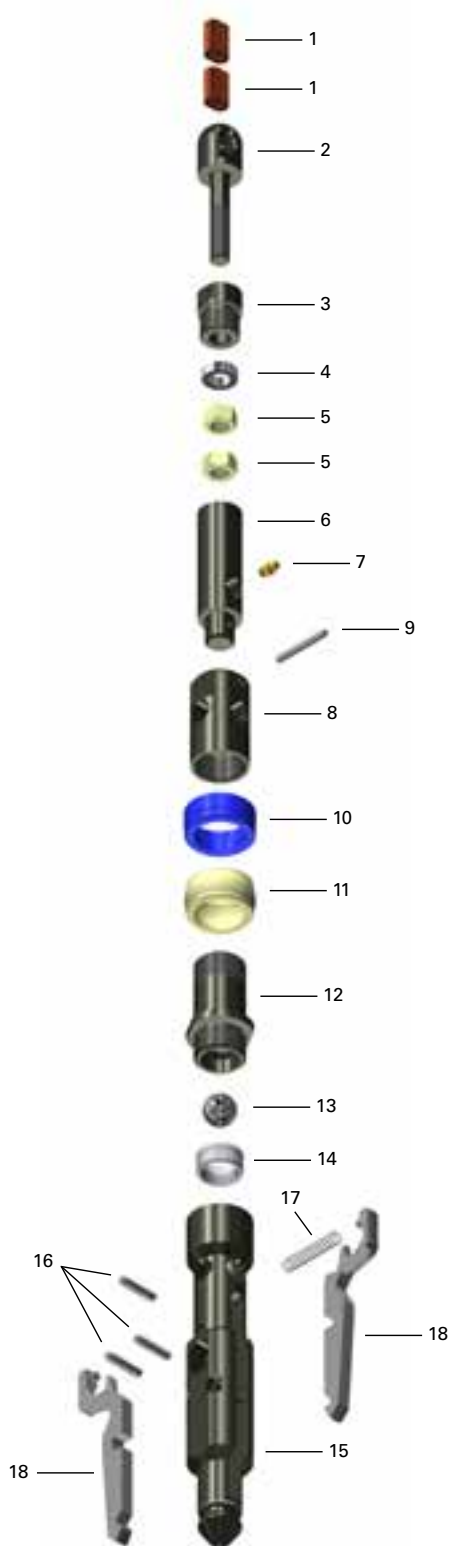


Item	Description	Remarks	Part number
<b>Drill string component</b>		<b>Remarks</b>	<b>B core barrel</b>
Water swivel	PRO18+ WS with BO pin	Select one to match rod type	3760016545
	PRO18+ WS with BT pin		3760016546
	PRO18+ WS with BMO pin		3760016563
	PRO18+ WS with BR pin		3760016547
Stuffing box	Stuffing box body	w/o rod adapter	8393081965
Stuffing box dimension kit	Dimension kit for BO rod	Select one to match rod type	8393081986
	Dimension kit for BT rod		3760015114
	Dimension kit for BMO rod		3760015750
	Dimension kit for BR rod		3760015755
Rod	Wireline Drill Rod	Different thread options	See page 43 for available options
1	Locking coupling UG - BO rod box	Select one to match drill rod thread type	3760017426
	Locking coupling UG - BT rod box		3760017427
	Locking coupling UG - BMO rod box		3760017429
	Locking coupling UG - BR rod box		3760017430
B,2-9	1.5 m / 5 ft Core barrel assy	w/o Locking Coupling	3760017409
	3.0 m / 10 ft Core barrel assy		3760017408
A	1.5 m / 5 ft inner tube assy complete		3760017405
	3.0 m / 10 ft inner tube assy complete		3760017404
B	Head assembly complete		3760017401
C	Overshot assembly complete		3760017451
D	B Loading Tool		3760017470
2	Adapter coupling		3760006014
3	Landing ring		3760006228
4	1.5 m / 5 ft outer tube		3760004831
	3.0 m / 10 ft outer tube		3760004832
5	1.5 m / 5 m inner tube		3760004830
	3.0 m / 10 ft inner tube		3760004829
6	Inner tube stabilizer		3760006229
7	Stop ring		3760006225
8	Core lifter		3760006226
9	Core lifter case		3760006227
Rshell	Reaming Shell RS++ - STD	Other types available	3760955420
Bit	Coring bit	Different options	See diamond tools catalogue
<b>Spare Part Kits (2000m/6600ft drilling)</b>			
	Spare parts kit head assembly		3760017448
	Spare parts kit overshot		3760017466
	Consumables kit core barrel		3760017449
<b>Universal components common for most DCDMA core barrels</b>			

**Note:** Core barrel assemblies does not include locking coupling which needs to be ordered separately.

<b>B core barrel consumables kit 2000 m / 6600 ft</b>		<b>3760017449</b>
Description	Part Number	Qty
Core lifter	3760006226	40
Core lifter case	3760006227	8
Landing ring	3760006228	4
Inner tube stabilizer	3760006229	4
Stop ring	3760006225	8

# Arrow 3S overshoot – B underground



Item	Description	Part Number	Qty
-	BU-Arrow 3S Overshoot – Under-ground	3760017451	1
1-7	Cable swivel assy	3760016415	1
1	Nicopress sleeve	3760008244	2
2	Eye bolt	3760016265	1
3	Cable swivel collar	3760007216	1
4	Bearing	3760006467	1
5	Nut	3760012331	2
6	Cable swivel body	3760007767	1
7	Grease fitting	0544110023	1
8	BU A3S valve body	3760017463	1
9	BOTWU Shear pin 3/16 x 1 11/16	3760006416	1
10	BU-D upper propulsion seal	3760017420	1
11	BU A3S lower propulsion seal	3760017479	1
12	BU-D mid body	3760017419	1
13	22 mm stainless stell ball	3760012099	1
14	Landing indicator bushing	3760012100	1
15	BU A3S overshoot body	3760017461	1
16	Pin coiled spring 1/4 X 1-1/8	3760017459	3
17	BO NO HO lifting dog spring	3760006373	1
18	B A3S lifting dog	3760017454	2

BU-A3S spare parts kit (2000 m / 6600 ft)	3760017466	Qty
B-A3S Lifting dog	3760017454	2
BO NO HO Lifting dog spring	3760006373	2
22 mm Stainless steel ball	3760012099	1
Landing indicator bushing	3760012100	6
BOTWU Shear pin 3/16 x 1 11/16	3760006416	4
BU-D Upper propulsion seal	3760017420	2
BU A3S Lower propulsion seal	3760017479	2
Nicopress sleeve	3760008244	2
Pin coiled spring 1/4 x 1-1/8	3760017459	3

# DiscovOre head assemblies – NU and N2U underground



Item	Description	Part Number		Qty
		NU size	N2U size	
-	NU DiscovOre Head Assy	3760017201	3760017245	1
1	Retracting case	3760017233		1
2	Assembly bolt	3760017239		1
3	Wedge lock washer	3760017235		1
4	Spring – Retracting case	3760017236		1

Item	Description	Part Number		Qty
		NU size	N2U size	
5	Assembly rod	3760017228		1
6	Spring – Drive key	3760017238		1
7	Drive key	3760017229		1
8	Spring – Latch	3760017237		1
9	Latch	3760017222		2
10	Latch body	3760017220		1
11	Propulsion seal	3760017225		2
12	Seal spacer	3760017226		1
13	Mid Body – UG	3760017224		1
14	Landing shoulder UG	3760017264	3760017241	1
15	22 mm ball	3760012099		1
16	Landing indicator bushing	3760012100		1
17	Lower body	3760017211		1
18	Locknut – Spindle	3760017212		1
19	Spindle	3760017217		1
20	Shut Off Valve – Yellow	3760008328		2
21	Valve adjusting washer	3760006237		2
22	Thrust bearing	3760006461		1
23	Spindle bearing	3760017219		1
24	Hanger bearing	3760006462		1
25	Compression spring	3760006463		1
26	Washer – Bearing	3760017230		1
27	Ball bearing	3760017234		1
28	Nyloc nut	3760017240		1
29	Inner tube cap assembly	3760017232	3760017243	1

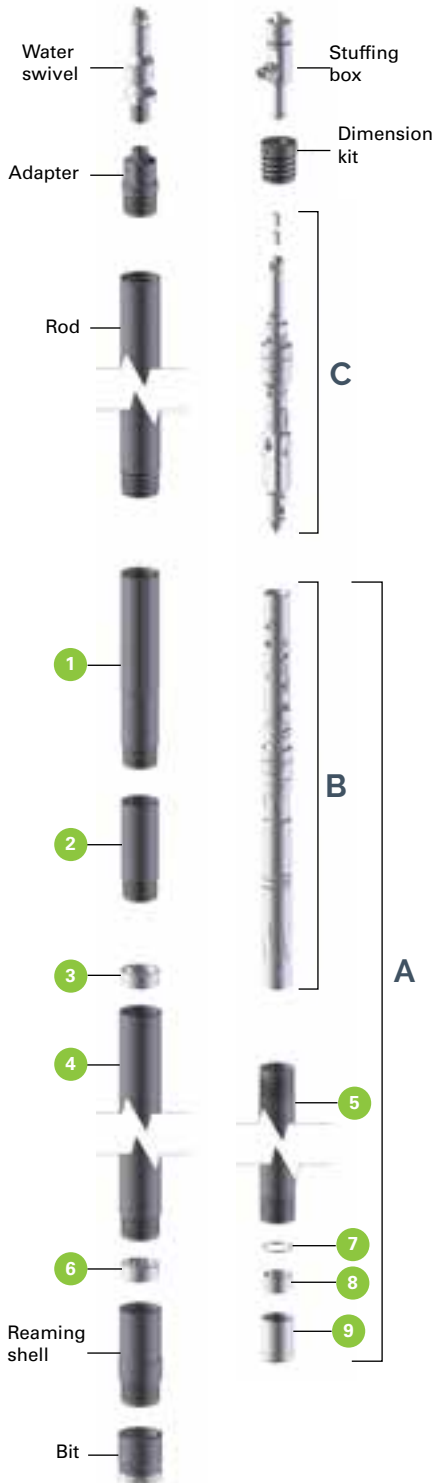
NOTE: Loading tool is required to insert head into the drill string.

NU Head spare parts kit (2000 m / 6600 ft)	3760017248	Qty
N-D Latch	3760017222	2
N-D Drive key	3760017229	2
N-D Assembly rod	3760017228	2
Assy bolt 1/4" x 20" flanged	3760017239	4
Wedge lock washer 1/4"	3760017235	4
Spring 0.360" X 0.051" X 3"	3760017236	3
Spring 0.360"X 0.041"X 0.5"	3760017238	3
Spring 0.300" X 0.030" X 1.50"	3760017237	3
NO Hard shut off valve yellow	3760008328	2
22 mm Stainless steel ball	3760012099	1
Landing indicator bushing	3760012100	6
NU-D Landing shoulder	3760017264	1
NU-D Propulsion seal	3760017225	2

N2U Head spare parts kit (2000 m / 6600 ft)	3760017257	Qty
N-D Latch	3760017222	2
N-D Drive key	3760017229	2
N-D Assembly rod	3760017228	2
Assy bolt 1/4" x 20" flanged	3760017239	4
Wedge lock washer 1/4"	3760017235	4
Spring 0.360" x 0.051" x 3"	3760017236	3
Spring 0.360"x 0.041"x 0.5"	3760017238	3
Spring 0.300" x 0.030" x 1.50"	3760017237	3
NO Hard shut off valve –Yellow	3760008328	3
22 mm Stainless steel ball	3760012099	1
Landing indicator bushing	3760012100	6
N2U-D Landing shoulder	3760017241	1
NU-D Propulsion seal	3760017225	2



# DiscovOre core barrel assemblies – NU and N2U underground



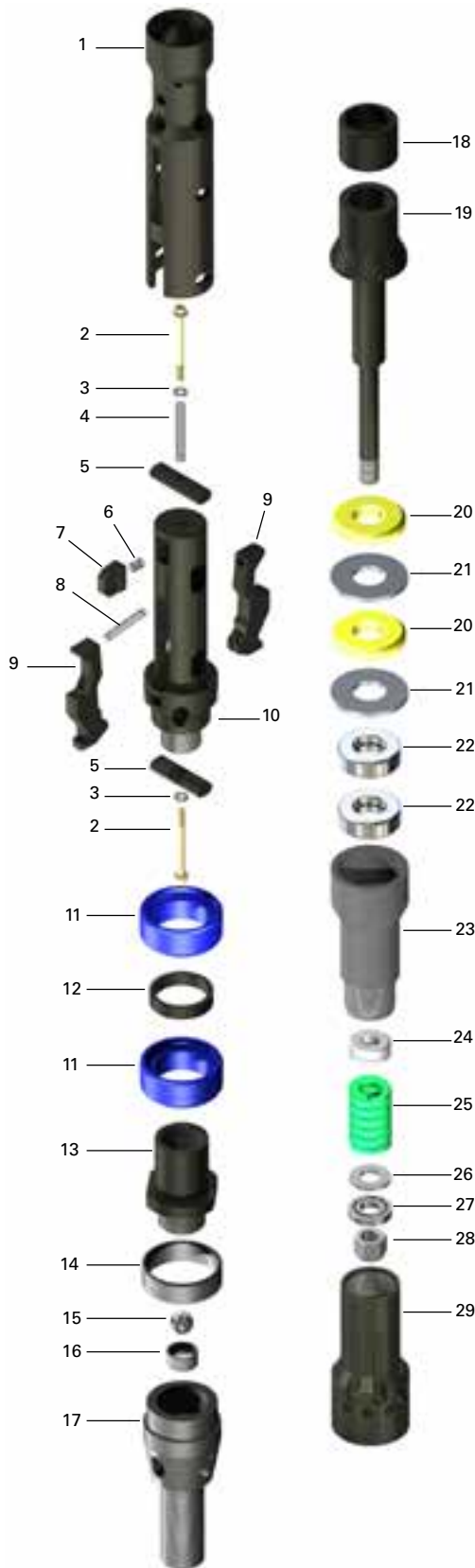
Item	Description	Remarks	Part number	
			N core barrel	N2 core barrel
<b>Drill string component</b>				
Water swivel	PRO18+ WS with NO pin	Select one to match rod type	3760016540	
	PRO18+ WS with NT pin		3760016541	
	PRO18+ WS with NMO pin		3760016542	
	PRO18+ WS with NR pin		3760016543	
Stuffing box	Stuffing box body	w/o rod adapter	8393081965	
Stuffing box dimension kit	Dimension kit for NO rod	Select one to match rod type	8393081988	
	Dimension kit for NT rod		3760015115	
	Dimension kit for NMO rod		3760015752	
	Dimension kit for NR rod		3760015756	
Rod	Wireline Drill Rod	Different thread options	See page 43 for available options	
1	Locking coupling UG - NO rod box	Select one to match drill rod thread type	3760017213	
	Locking coupling UG - NT rod box		3760017215	
	Locking coupling UG - NMO rod box		3760017214	
	Locking coupling UG - NR rod box		3760017218	
B,2-9	1.5 m / 5 ft Core barrel assy	w/o Locking Coupling (order separately)	3760017490	3760017492
	3.0 m / 10 ft Core barrel assy		3760017491	3760017493
A	1.5 m / 5 ft inner tube assy complete		3760017283	3760017359
	3.0 m / 10 ft inner tube assy complete		3760017282	3760017358
B	Head assembly complete		3760017201	3760017245
C	Overshot assembly complete		3760017251	
D	NH Loading Tool		3760017443	
2	Adapter coupling		3760006028	
3	Landing ring		3760006243	3760006258
4	1.5 m / 5 ft outer tube		3760004837	
	3.0 m / 10 ft outer tube		3760004839	
5	1.5 m / 5 m inner tube		3760004835	3760006136
	3.0 m / 10 ft inner tube		3760004836	3760006137
6	Inner tube stabilizer		3760006244	3760008317
7	Stop ring		3760006240	3760006326
8	Core lifter		3760006241	3760006327
9	Core lifter case		3760006242	3760006328
Rshell	Reaming Shell RS++ - STD	Other types available	3760955435	
Bit	Coring bit	Different options	See diamond tools catalogue	
<b>Spare Part Kits (2000m/6600ft drilling)</b>				
	Spare parts kit head assembly		3760017248	3760017257
	Spare parts kit overshot		3760017266	
	Consumables kit core barrel		3760016574	3760016575
<b>Universal components common for most DCDMA core barrels</b>				

**Note:** Core barrel assemblies does not include locking coupling which needs to be ordered separately.

N/NU core barrel consumables kit 2000 m / 6600 ft 3760016574		
Description	Part Number	Qty
Core lifter	3760006241	40
Core lifter case	3760006242	8
Landing ring	3760006243	4
Inner tube stabilizer	3760006244	4
Stop ring	3760006240	8

N2/NU2 core barrel consumables kit 2000 m / 6600 ft 3760016575		
Description	Part Number	Qty
Core lifter	3760006327	40
Core lifter case	3760006328	8
Landing ring	3760006329	4
Inner tube stabilizer	3760008317	4
Stop ring	3760006326	8

# DiscovOre head assembly – HU underground

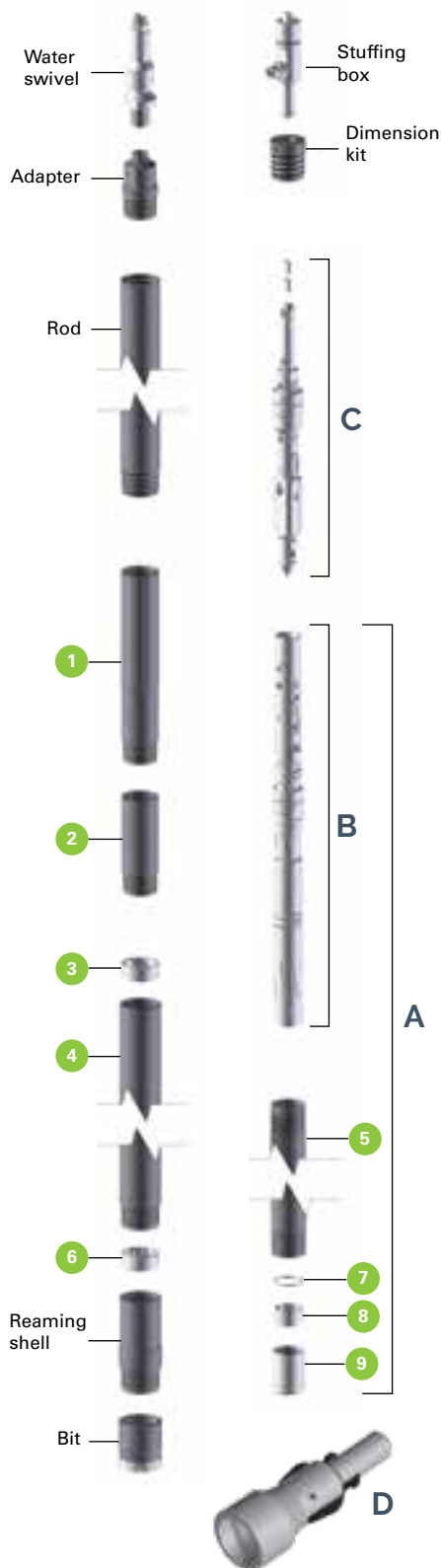


Item	Description	Part Number	Qty
-	HU DiscovOre Head assembly	3760017301	1
1	Retracting case	3760017318	1
2	Assembly bolt	3760017239	1
3	Wedge lock washer	3760017235	1
4	Spring – Retracting case	3760017236	1
5	Assembly rod	3760017324	1
6	Spring – Drive key	3760017238	1
7	Drive key	3760017314	1
8	Spring – latch	3760017334	1
9	Latch	3760017317	2
10	Latch body	3760017333	1
11	Propulsion seal	3760017320	2
12	Seal spacer	3760017321	1
13	Mid body – Underground	3760017319	1
14	Landing shoulder	3760006150	1
15	22 mm ball	3760012099	1
16	Landing indicator bushing	3760012100	1
17	Lower body	3760017311	1
18	Locknut – Spindle	3760017212	1
19	Spindle	3760017322	1
20	Shut off valve – Yellow	3760008379	2
21	Valve adjusting washer	3760006252	2
22	Thrust bearing	3760006471	2
23	Spindle bearing	3760017323	1
24	Hanger bearing	3760006462	1
25	Compression spring	3760006463	1
26	Washer - Bearing	3760017230	1
27	Ball bearing	3760017234	1
28	Nyloc nut	3760017240	1
29	Inner tube cap assembly	3760017315	1

NOTE: Loading tool is required to insert the head into the drill string.

HU Head spare parts kit (2000 m / 6600 ft)	3760017348	Qty
H-D Latch	3760017317	2
H-D Drive key	3760017314	2
H-D Assembly rod	3760017324	2
Assy bolt 1/4" x 20" flanged	3760017239	4
Wedge lock washer 1/4"	3760017235	4
Spring 0.360" x 0.051" x 3"	3760017236	3
Spring 0.360"x 0.041"x 0.5"	3760017238	3
Spring 0.360 x 0.042 x 1.750	3760017334	3
HO Hard shut off valve yellow	3760008379	2
22 mm Stainless steel ball	3760012099	1
Landing indicator bushing	3760012100	6
HO Landing shoulder 3PLB	3760005150	1
HU-D Propulsion seal	3760017320	2

# DiscovOre core barrel assemblies – HU underground

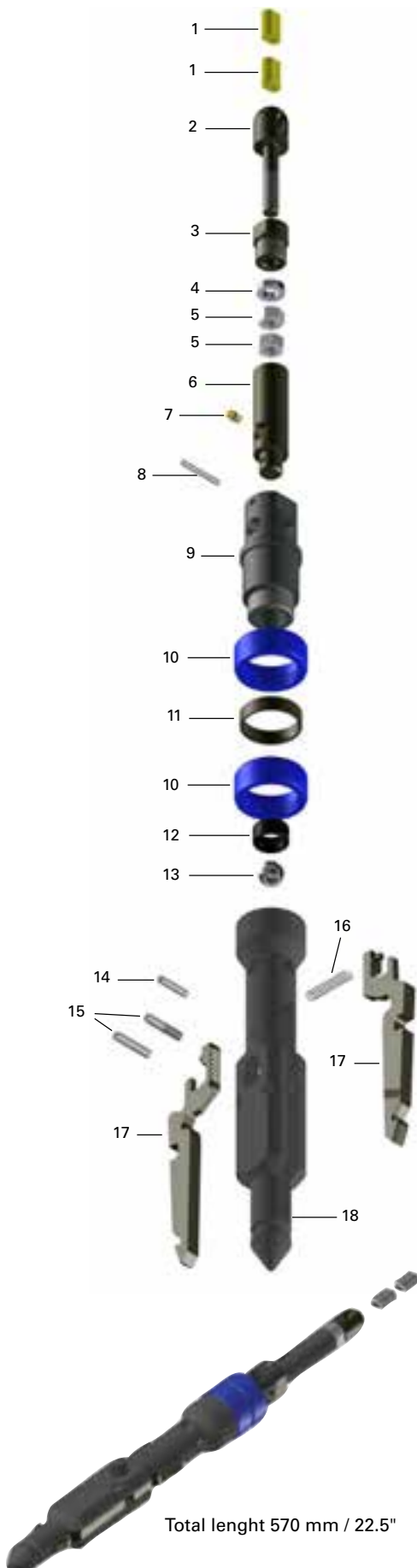


Item	Description	Remarks	Part number
<b>Drill string component</b>		<b>Remarks</b>	<b>H core barrel</b>
Water swivel	PRO18+ WS with HO pin	Select one to match rod type	3760016550
	PRO18+ WS with HT pin		3760016551
	PRO18+ WS with HMO pin		3760016552
	PRO18+ WS with HR pin		3760016553
Stuffing box	Stuffing box body	w/o rod adapter	8393081965
Stuffing box dimension kit	Dimension kit for HO rod	Select one to match rod type	8393081990
	Dimension kit for HT rod		3760015205
	Dimension kit for HMO rod		3760015754
	Dimension kit for HR rod		3760015757
Rod	Wireline Drill Rod	Different thread options	See page 43 for available options
1	Locking coupling UG - HO rod box	Select one to match drill rod thread type	3760017327
	Locking coupling UG - HT rod box		3760017329
	Locking coupling UG - HMO rod box		3760017328
	Locking coupling UG - HR rod box		3760017330
B,2-9	1.5 m / 5 ft Core barrel assy	w/o Locking Coupling (order separately)	3760017494
	3.0 m / 10 ft Core barrel assy		3760017495
A	1.5 m / 5 ft inner tube assy complete		3760017383
	3.0 m / 10 ft inner tube assy complete		3760017382
B	Head assembly complete		3760017301
C	Overshot assembly complete		3760017351
D	NH Loading Tool		3760017443
2	Adapter coupling		3760006045
3	Landing ring		3760006258
4	1.5 m / 5 ft outer tube		3760006046
	3.0 m / 10 ft outer tube		3760006047
5	1.5 m / 5 m inner tube		3760006048
	3.0 m / 10 ft inner tube		3760006049
6	Inner tube stabilizer		3760006259
7	Stop ring		3760006255
8	Core lifter		3760006256
9	Core lifter case		3760006257
Rshell	Reaming Shell RS++ - STD	Other types available	3760955427
Bit	Coring bit	Different options	See diamond tools catalogue
<b>Spare Part Kits (2000m/6600ft drilling)</b>			
	Spare parts kit head assembly		3760017348
	Spare parts kit overshot		3760017367
	Consumables kit core barrel		3760016577
<b>Universal components common for most DCDMA core barrels</b>			

**Note:** Core barrel assemblies does not include locking coupling which needs to be ordered separately.

H/HU core barrel consumables kit 2000 m / 6600 ft 3760016577		
Description	Part Number	Qty
Core lifter	3760006256	40
Core lifter case	3760006257	8
Landing ring	3760006258	4
Inner tube stabilizer	3760006259	4
Stop ring	3760006255	8

# Arrow 3S overshoot – NH underground



Total length 570 mm / 22.5"

Item	Description	Part Number	Qty
-	NU Overshot Assembly	3760017251	1
-	HU Overshot Assembly	3760017351	1
1-7	Cable Swivel Assembly	3760016415	1
1	Nicopress	3760008244	2
2	Eye bolt	3760016265	1
3	Cable swivel collar	3760007216	1
4	Thrust bearing	3760006467	1
5	Nut 1/2-20	3760012331	2
6	Cable swivel body	3760007767	1
7	Grease fitting	0544110023	1
8	Shear pin	3760006416	1
12	Landing indicator bushing	3760012100	1
13	22 mm ball	3760012099	1
14	1/4" Spring pin	0108169187	1
15	5/16" Coiled pin	3760017259	2
16	Spring - Lifting dog	3760006373	1
17	Lifting dog - Underground	3760017262	2
18	Overshot body - Underground	3760017261	1

## HU to NU Overshot conversion

Item	Description	Part Number	Qty
9	NU Valve body	3760017263	1
10	NU Propulsion seal	3760017225	2
11	NU Seal spacer	3760017226	1

## NU to HU Overshot conversion

Item	Description	Part Number	Qty
9	HU Valve body	3760017362	1
10	HU Propulsion seal	3760017320	2
11	HU Seal spacer	3760017321	1

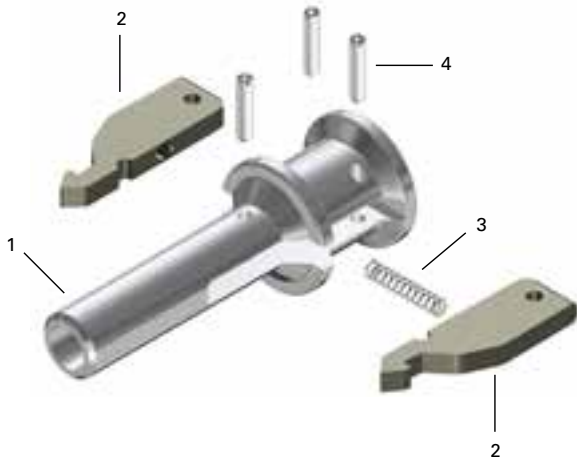
Item	Description	Part Number	Qty
<b>NU-A3S O/S Spare parts kit (2000 m / 6600 ft)</b>			
	NH-A3S Lifting dog	3760017254	2
	BO NO HO Lifting dog spring	3760006373	2
	22 mm Stainless steel ball	3760012099	1
	Landing indicator bushing	3760012100	6
	Botwu shear pin 3/16 x 1 11/16	3760006416	4
	NU-D Propulsion seal	3760017225	2
	3/16" Nicopress sleeve oval	3760008244	2
	Pin coiled spring 5/16 x 1 1/2	3760017259	2

Item	Description	Part Number	Qty
<b>HU-A3S O/S Spare parts kit (2000 m / 6600 ft)</b>			
	NH-A3S Lifting dog	3760017254	2
	BO NO HO Lifting dog spring	3760006373	2
	22 mm Stainless steel ball	3760012099	1
	Landing indicator bushing	3760012100	6
	Botwu shear pin 3/16 x 1 11/16	3760006416	4
	HU-D Propulsion seal	3760017320	2
	3/16" Nicopress sleeve oval	3760008244	2
	Pin coiled spring 5/16 x 1 1/2	3760017259	2

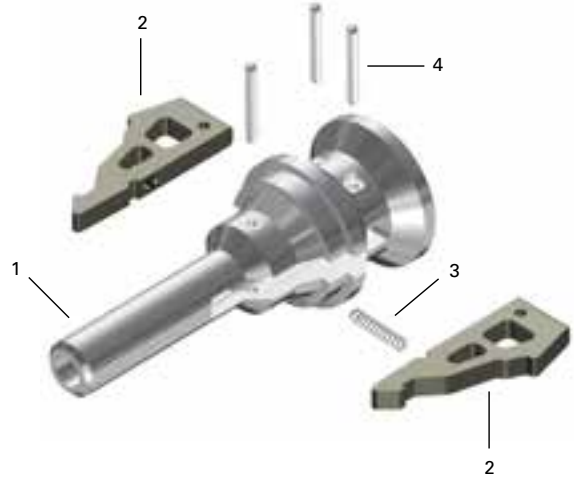
# DiscovOre accessories

## Loading tools

Item	Description	Part Number	Qty
	<b>B Loading Tool Assembly</b>	<b>3760017470</b>	
1	B Loading Tool body	3760017467	1
2	B Loading Tool latch	3760017468	2
3	Latch spring	3760017237	1
4	Spring pins	3760017459	3



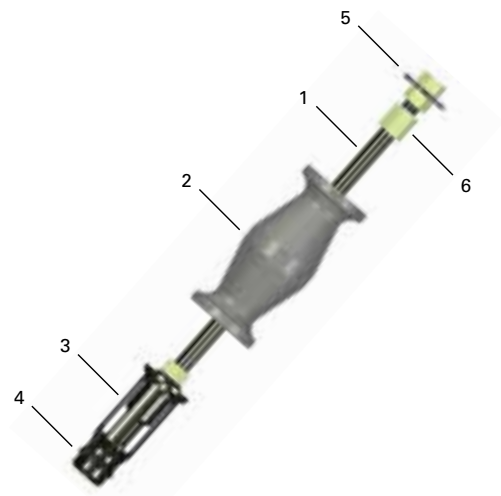
Item	Description	Part Number	Qty
	<b>NH Loading Tool Assembly</b>	<b>3760017443</b>	
1	NH Loading Tool body	3760017444	1
2	NH Loading Tool latch	3760017445	2
3	Latch spring	3760017237	1
4	Spring pins	5530832600	3



## Loading indicator bushing removal tool

Item	Description	Part Number	Qty
	<b>Landing Indicator Busing Removal Tool Assembly</b>	<b>3760017157</b>	
1	Bushig Puller Rod	3760017151	1
2	Bushig Puller Slide	3760017152	1
3	Bushig Puller Shaft	3760017153	1
4	Bushig Puller Collet	3760017154	1
5	Bushig Puller Install Washer	3760017155	1
6	Hex Nut	3760017156	5

To easy replace landing indicator bushing in head assembly use above removal tool.



## Survey instrument spearhead replacement assembly

Description	Part Number
<b>B Spearhead replacement assembly</b>	<b>3760017534</b>
<b>N Spearhead replacement assembly</b>	<b>3760017540</b>
<b>H/P Spearhead replacement assembly</b>	<b>3760017544</b>

To use Arrow 3S overshoot with existing borehole survey instruments, use above Arrow 3S adapter assembly.



# DiscovOre head assembly conversion kits

## Surface to underground kits

3760017446 – B TO BU HEAD ASSY CONVERSION KIT		
Part Number	Description	Qty
3760017419	BUD mid body	1
3760017421	BUD landing shoulder	1
3760017420	BUD upper propulsion seal	1
3760017479	BUD lower propulsion seal	1
3760017437	Assembly bolt	1
3760017424	Assembly rod	1
3760017235	Wedge lock washer	1
3760017414	Drive key	1
3760017438	Drive key spring	1

3760017337 – N2 TO N2U HEAD ASSY CONVERSION KIT		
Part Number	Description	Qty
3760017224	NUD mid body	1
3760017241	NU2D landing shoulder	1
3760017226	NUD seal spacer	1
3760017225	NUD propulsion seal	1
3760017239	Assembly bolt	1
3760017228	Assembly rod	1
3760017235	Wedge lock washer	1
3760017229	Drive key	1
3760017238	Drive key spring	1
3760006329	N2 landing ring	1

3760017336 – N TO NU HEAD ASSY CONVERSION KIT		
Part Number	Description	Qty
3760017224	NUD mid body	1
3760017264	NUD landing shoulder	1
3760017226	NUD seal spacer	1
3760017225	NUD propulsion seal	2
3760017239	Assembly bolt	1
3760017228	Assembly rod	1
3760017235	Wedge lock washer	1
3760017229	Drive key	1
3760017238	Drive key spring	1

3760017344 – H TO HU HEAD ASSY CONVERSION KIT		
Part Number	Description	Qty
3760017319	HUD mid body	1
3760017321	HUD seal spacer	1
3760017320	HUD propulsion seal	2
3760017239	Assembly bolt	1
3760017324	Assembly rod	1
3760017235	Wedge lock washer	1
3760017314	Drive key	1
3760017238	Drive key spring	1

## Underground to surface kits

3760017246 – NU TO N HEAD ASSY CONVERSION KIT		
Part Number	Description	Qty
3760017223	N-D mid body	1
3760005100	NO landing shoulder 3PLB	1

3760017346 – HU TO H HEAD ASSY CONVERSION KIT		
Part Number	Description	Qty
3760017325	H mid body	1

3760017338 – N2U TO N2 HEAD ASSY CONVERSION KIT		
Part Number	Description	Qty
3760017223	ND mid body	1
3760005241	NO2" landing shoulder 3PLB	1

3760017244 – N TO N2 HEAD ASSY CONVERSION KIT		
Part Number	Description	Qty
3760017243	N2-D innertube cap assembly	1
3760005241	NO2" landing shoulder 3PLB	1
3760006329	N2 landing ring	1

To convert underground head assembly (NU, N2U or HU) to down hole version, replace the mid body on the head assembly (and landing shoulder on N and N2) to eliminate the drag from the propulsion seals for faster round trips.

# DiscovOre head assembly conversion kits – cont.

## N vs N2 kits

3760017335 – N2 TO N HEAD ASSY CONVERSION KIT		
Part Number	Description	Qty
3760005100	NO landing shoulder 3PLB	1
3760017332	N D inner tube cap assembly	1

3760017244 – N TO N2 HEAD ASSY CONVERSION KIT		
Part Number	Description	Qty
3760017243	N2-D innertube cap assembly	1
3760005241	NO2" landing shoulder 3PLB	1
3760006329	N2 landing ring	1

## H vs P kits

3760017561 – H Surface head assembly conversion kit to P Surface			
Part Number	Description	Qty	Item in H head assembly
<b>Item to be replaced in H DiscovOre head to convert to P DiscovOre</b>			
3760017236	Spring – Retracting case	1	3760017334
3760017517	Latch	2	3760017317
3760017529	Landing shoulder	1	3760005150
3760016290	Valve adjusting washer	1	3760006252
3760016291	Shut off valve –Yellow	2	3760008379
3760017514	Spindle cap assembly	1	3760017315
<b>Item to be added to H head to complete conversion to P DiscovOre</b>			
3760017512	Taper washer	2	
3760017516	Inner tube adapter	1	

3760017560 – Head assembly conversion kit from P to H DiscovOre			
Part Number	Description	Qty	Item in H head assembly
<b>Item to be replaced in P DiscovOre head to convert to H DiscovOre</b>			
3760017334	Spring – Retracting case	1	3760017236
3760017317	Latch	2	3760017517
3760005150	Landing shoulder	1	3760017529
3760006252	Valve adjusting washer	2	3760016290
3760008379	Shut off valve –Yellow	2	3760016291
3760017315	Inner tube cap assembly	1	3760017514
<b>Item to be removed from P head to complete conversion to H DiscovOre</b>			
	Taper washer	2	3760017512
	Inner tube adapter	1	3760017516

Conversion of P DiscovOre head to be used with P-EX outer tube and adapter coupling (parallel thread)			
Part Number	Description	Qty	Item in H head assembly
3760017528	Offset Landing shoulder	1	3760017529

# Operation

## Loading tool

The DiscovOre underground head assembly comes with the latch lock already installed. If you have converted your surface head to underground configuration, please ensure that the latch lock is properly installed. With the latch lock installed, the loading tool is required to disengage the latches so it can be inserted into the drill string.



1. Verify that the landing indicator valve has been reset. If the ball can be seen in the lower latch body, it needs to be reset before inserting the inner tube assembly. Using the Epiroc reset tool, place the blade under the ball and lift

it against the bushing. Apply enough pressure on the handle to push the ball past the bushing.

2. Insert the loading tool into the top of the retracting case of the head assembly.

3. Hold the loading tool stationary while pulling on the retracting case until it engages the loading tool latches. The loading tool will now stay connected to the head assembly.

4. Insert the inner tube assembly into the drill string. Push the end of the loading tool to fully insert the inner tube assembly.

5. Hold onto the loading tool once fully inserted. It will automatically disconnect from the head assembly.

• To manually release the head from the loading tool, ensure the latches are inserted past the drill rod threads. Squeeze the loading tool latches to disconnect it from the retracting case.

6. Remove the loading tool from the drill string.

7. Install the water swivel and start pumping in the inner tube assembly.

## Underground overshoot

The DiscovOre underground overshoot has an automatic locking mechanism.

1. To release the overshoot, push the overshoot into the retracting case of the head assembly to slightly compress the lifting dogs. Maintain some slack in the wireline.

2. Squeeze the lifting dogs while maintaining the overshoot inserted in the retracting case, then pull the overshoot out of the retracting case while squeezing the lifting dogs.

Verify that the landing indicator valve has been reset before inserting the overshoot into the drill string. If the ball can be seen in the overshoot body, it needs to be reset. Using the Epiroc reset tool, place the blade under the ball and lift it against the bushing. Apply enough pressure on the handle to push the ball past the bushing.



HU Arrow 3S Overshot – 3760017351



# Maintenance

## Replacing latches and drive key

Periodically inspect the latches for wear and damage during use. Replace them if cracked or excessively worn. The latches should be replaced when the bottom side start to wear into the top engagement surface.



## Remove latches and drive key



1. Use 3/8" or 10 mm socket to remove the assembly bolt on top of the head assembly.
2. Remove the assembly bolt, lock washer and spring as one.
3. Remove the assembly rod.
4. Squeeze the latches together with one hand and press in the drive key with the thumb of the other hand.
5. Partially slide out the retracting case while maintaining the latches and drive key until they line up with the cut-outs on the retracting case.
6. Slowly release the latches and drive key so that they do not pop out.
7. Remove the latches by un-hooking them from the latch body and remove the latch spring.
8. Remove the drive key and spring.
9. Remove the retracting case completely.

## Installing latches and drive key

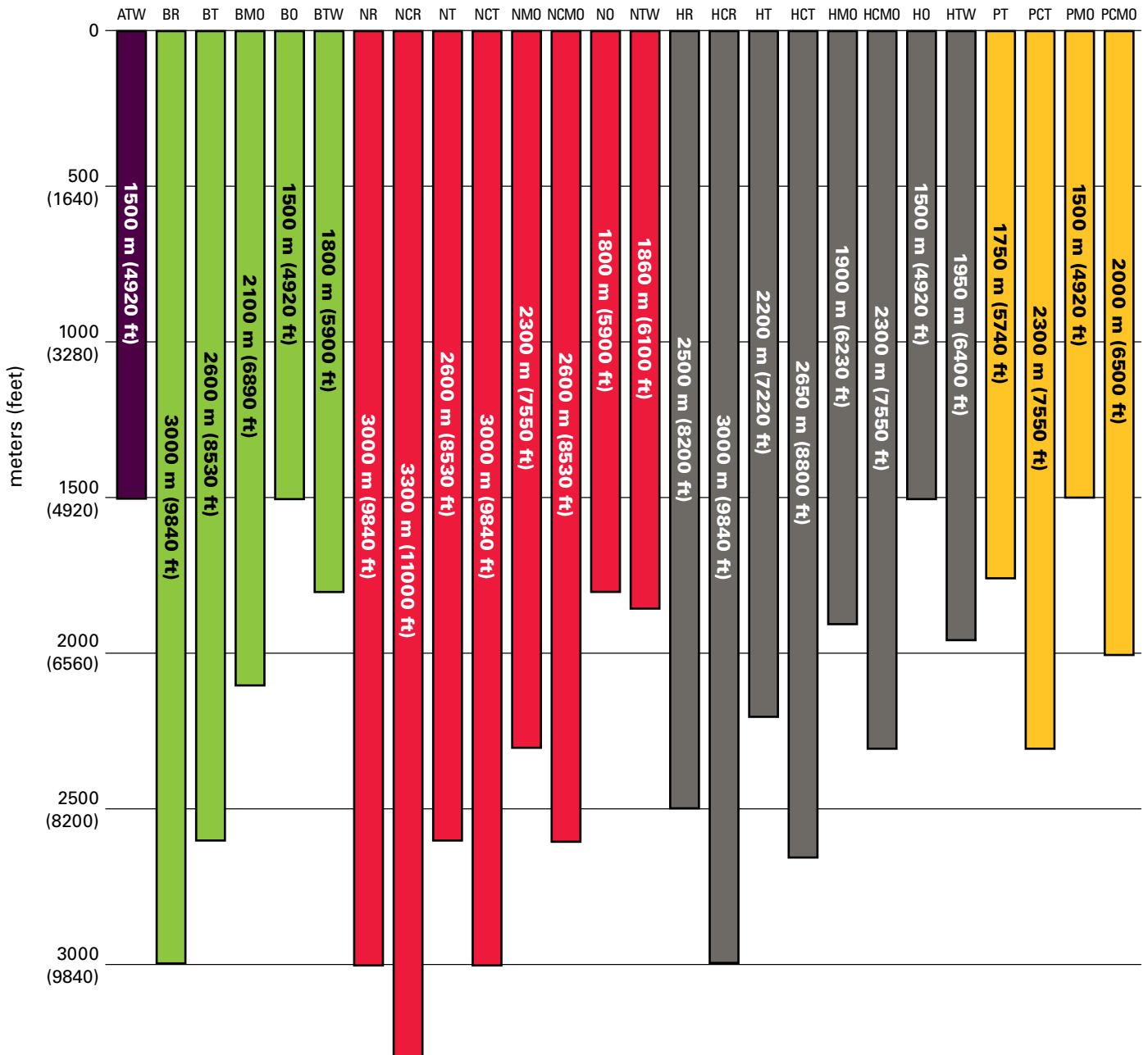


1. Slide the retracting case over the latch body so that the cut-out for the drive key lines up with the pocket in the latch body.
2. Install the drive key and spring.
3. Press in the drive key and slide in the retracting case until the latch cut-out lines up with the latch body slot.
4. Install the latch spring in one latch and hook it into the latch body.
5. Hook the second latch into the latch body.
6. Ensure the spring is inserted into the spring pocket of both latches.
7. Squeeze the latches together with one hand and press in the drive key (not needed for downhole drilling if used with standard tang type locking coupling), with the thumb of the other hand.
8. Slide in the retracting case while maintaining the latches and drive key until the retracting case is fully inserted on the latch body.
9. Install the assembly rod.
10. Install the lock washer on the assembly bolt.
11. Install the retracting case spring on the assembly bolt.
12. Install the bolt, washer and spring as one, through the top of the latch body. The bolt must pass through the hole in the assembly rod. Use the line on the end of the assembly rod to adjust alignment.
13. Use a 3/8" or 10 mm socket to tighten the assembly bolt. Pressure must be applied to compress the retracting case spring before the bolt will start to thread into the latch body. A spacer may need to be installed in the socket to ensure the bolt threads reach the latch body.

### CAUTION

Do not overtighten the assembly bolt.

# Wireline drill rod depth capacity



## Depth capacities for vertical and straight holes filled with water

\* Do not mix drill rods from different procedures or specifications. This may lead to failure or loss of drill string down the hole.

\*\* The use of high quality drill rod thread grease is essential to drill rod thread performance and durability. Failure to use it will cause premature wear and galling. For best results we recommend the use of thread grease containing metal particulate, ideally zinc, copper or graphite compositions.

# Wireline drill rods

O Rod Metric	Length m	Part No.	T Rod Metric	Length m	Part No.	MO Rod Metric	Length m	Part No.	R Rod Metric	Length m	Part No.	Tube Walls
BO	0,6 m	3760 0034 36	BT	0,6 m	3760-0012-23				BR	0,6 m	3760014014	Parallel
BO	1,5 m	3760 0012 50	BT	1,5 m	3760-0012-24	BMO	1,5 m	3760 0155 53	BR	1,5 m	3760014015	Parallel
BO	3,0 m	3760 0012 51	BT	3,0 m	3760-0012-25	BMO	3,0 m	3760 0134 25	BR	3,0 m	3760014016	Parallel
NO	0,6 m	3760 0034 40	NT	0,6 m	3760-0012-29				NR	0,6 m	3760014020	Parallel
NO	1,5 m	3760 0012 54	NT	1,5 m	3760-0012-30	NMO	1,5 m	3760 0152 11	NR	1,5 m	3760014021	Parallel
NO	3,0 m	3760 0012 55	NT	3,0 m	3760-0012-31	NMO	3,0 m	3760 0152 07	NR	3,0 m	3760014022	Parallel
			NCT	3,0 m	3760 0053 13	NCMO	3,0 m	3760 0126 36	NCR	3,0 m	3760014030	Internally Upset
HO	0,6 m	3760 0034 38	HT	0,6 m	3760 0012 35				HR	0,6 m	3760014026	Parallel
HO	1,5 m	3760 0012 58	HT	1,5 m	3760 0012 36	HMO	1,5 m	3760 0152 12	HR	1,5 m	3760014027	Parallel
HO	3,0 m	3760 0012 59	HT	3,0 m	3760 0012 37	HMO	3,0 m	3760 0134 38	HR	3,0 m	3760014028	Parallel
			HCT	3,0 m	3760 0152 08	HCMO	3,0 m	3760 0134 39	HCR	3,0 m	3760014050	Internally Upset
PG	0,5 m	8393 0528 00	PT	0,6 m	3760 0012 38	PMO	0,6 m	3760 0152 49				Parallel
PG	1,5 m	8393 0528 20	PT	1,5 m	3760 0012 39	PMO	1,5 m	3760 0152 44				Parallel
PG	3,0 m	8393 0528 30	PT	3,0 m	3760 0012 40	PMO	3,0 m	3760 0152 45				Parallel
			PCT	3,0 m	3760 0151 32	PCMO	3,0 m	3760 0151 33				Internally Upset
Imperial	ft	Part No.	Imperial	ft	Part No.	Imperial	ft	Part No.	Imperial	ft	Part No.	Tube Walls
BO	2 ft	3760 0034 37	BT	2 ft	3760-0012-20				BR	2 ft	3760014011	Parallel
BO	5 ft	3760 0012 48	BT	5 ft	3760-0012-21	BMO	5 ft	3760 0152 13	BR	5 ft	3760014012	Parallel
BO	10 ft	3760 0012 49	BT	10 ft	3760-0012-22	BMO	10 ft	3760 0134 27	BR	10 ft	3760014013	Parallel
NO	2 ft	3760 0034 41	NT	2 ft	3760-0012-26				NR	2 ft	3760014017	Parallel
NO	5 ft	3760 0012 52	NT	5 ft	3760-0012-27	NMO	5 ft	3760 0152 14	NR	5 ft	3760014018	Parallel
NO	10 ft	3760 0012 53	NT	10 ft	3760-0012-28	NMO	10 ft	3760 0103 36	NR	10 ft	3760014019	Parallel
			NCT	10 ft	3760 0151 41	NCMO	10 ft	3760 0101 32	NCR	10 ft	3760014029	Internally Upset
HO	2 ft	3760 0034 39	HT	2 ft	3760 0012 32				HR	2 ft	3760014023	Parallel
HO	5 ft	3760 0012 56	HT	5 ft	3760 0012 33	HMO	5 ft	3760 0152 15	HR	5 ft	3760014024	Parallel
HO	10 ft	3760 0012 57	HT	10 ft	3760 0012 34	HMO	10 ft	3760 0132 22	HR	10 ft	3760014025	Parallel
			HCT	10 ft	3760 0151 42	HCMO	10 ft	3760 0047 67	HCR	10 ft	3760014049	Internally Upset
						PMO	2 ft	3760 0152 46				Parallel
						PMO	5 ft	3760 0152 47				Parallel
						PMO	10 ft	3760 0152 48				Parallel
			PCT	10 ft	3760 0151 43	PCMO	10 ft	3760 0151 37				Internally Upset



CT rods have the same thread design as T rods, where CMO rods have the same thread design as MO rods. Wall thickness varies between joint section (where it is the same as for parallel MO, T, R & O rods) and mid body where is thinner to reduce overall weight (13 - 30%) of drill string, although provides same as MO or T rod yield and tensile strengths.

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