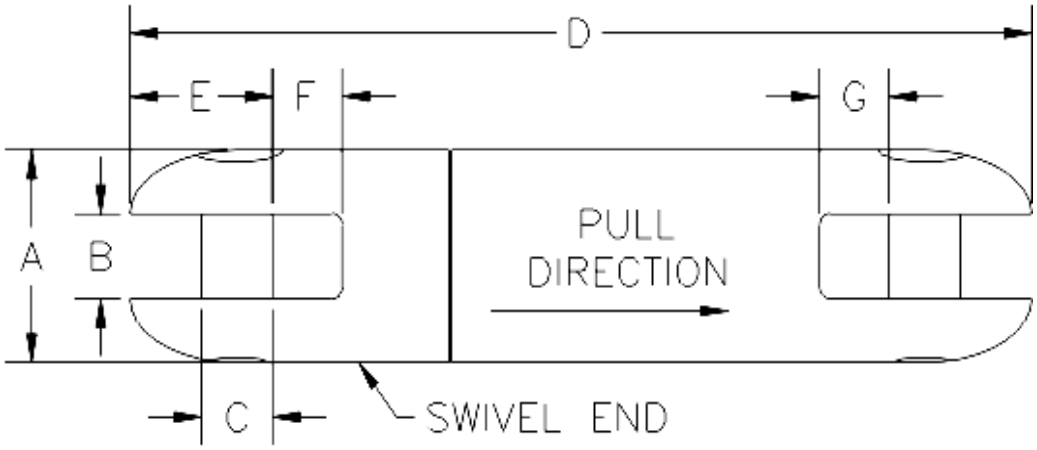
OPERATING SPECIFICATIONS

DCD Design & Manufacturing Ltd.

SERIES 00570 BREAKAWAY SWIVEL

1. The DUB-lite Breakaway swivel is intended as mechanical overload protection and swivel for directional drilling applications. It is intended for coupling the reamer head to the utility being pulled back. The swivel permits rotation of the drill pipe while protecting the utility from twisting. It is used in conjunction with series 00565 or 00566 breakaway pins. The breakaway pins can be assembled in any configuration, provided they are installed in a symmetrical pattern. Separation will occur at the value of the sum of the pin values.



Part Number	Safe Working Limit	Ultimate Load	A	B	C	D	E	F	G	Net Weight	Clevis Pin Kit
00570-208	**15,000 lb** 67 kN	**45,000 lb** 200 kN	**2-1/2”** 64 mm	**1”** 25 mm	**7/8”** 22mm	**12-3/16”** 309 mm	**1-3/4”** 44 mm	**7/8”** 22mm	**1”** 25 mm	**12.0 lb** 5.5 kg	**00040-HEX**

00570 BREAKAWAY PINS

PINS WITH POUND BREAK LOADS				
Pin Kit (5 Pins / Kit)	Break Value (+/- 5%)	Color Code	Torque (ft-lbs)	Preload (lbs)
00565-075	750 LB	YELLOW	2	540
00565-100	1,000 LB	ORANGE	3	720
00565-150	1,500 LB	RED	4	980
00565-200	2,000 LB	BLUE	6	1360
00565-250	2,500 LB	GREEN	7	1700

PINS WITH KILOGRAM BREAK LOADS				
Pin Kit (5 Pins / Kit)	Break Value (+/- 5%)	Color Code	Torque (ft-lbs)	Preload (lbs)
00566-030	300 KG	WHITE	2	440
00566-040	400 KG	BEIGE	3	600
00566-050	500 KG	TURQUOISE	3	740
00566-100	1,000 KG	PURPLE	6	1400
00566-120	1,200 KG	BLACK	7	1640

Dimensions and weights ubject to change without notice.

OPERATING INSTRUCTIONS

DCD Design & Manufacturing Ltd.

SERIES 00570 BREAKAWAY SWIVEL

READ AND UNDERSTAN THESE INSTRUCTIONS BEFORE USING THESE PRODUCTS

INSTALLATION

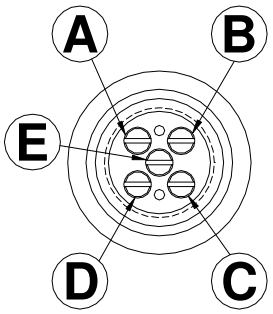
1. To install the pins in the unit, first select the break value required, then by referring to the load distribution tables on the following pages, select the proper pin combination.

2. Ensure all parts are clean; insert the pin chamber into the body locating the alignment pin into the small drilled hole.

3. Screw the required Breakaway Pins in the proper locations.

WARNING: Do not over tighten the pins and ensure they are assembled in a symmetrical manner. Failure to do this may result in distorted values.

4. To remove broken pins, use a Phillips screwdriver pressed firmly into the hole of each pin, unscrew broken end out of hole.



PIN LOCATION REFERENCE

OPERATION

WARNING

1. This product **must not** be used if the pulling mechanism functions in a **counter clockwise rotation**. This will cause the Breakaway Swivel to loosen its assembled condition.

2. Unscrew the clevis pins and remove from the swivel using the hex key provided.

2. Insert the items you want to attach into the clevis ends. Re-insert the clevis pins and ensure they are tightened down securely.

SAFETY

DANGER

1. An overload condition **will** cause the Breakaway Swivel to separate and release the stored energy of the duct, rope, chain or cable. Make sure that all components of the pulling system are able to withstand the maximum pulling loads. Components not rated for the pull force may break and release the stored energy of the pull. Never use a worn, defective or incomplete component.

2. **Use Breakaway pins once only.** Elongation or stretching of the pins may occur during the first use and we will not guarantee predictable results on subsequent usage.

3. Be prepared for the unexpected. Always use recognized safety practices and wear recognized safety equipment.

The DUB-Lite® breakaway swivel is designed to operate only within its specified safe working limit (see *Operating Specifications*). Operation of the DUB Lite® swivel at loads in excess of its **safe working limit** will void the warranty as that may cause permanent bearing damage even though separation due to failure will not occur until the specified **ultimate load** is reached.

DANGER

Rotating parts can cause death or serious injury! Stay well clear. Do not wear loose clothing.

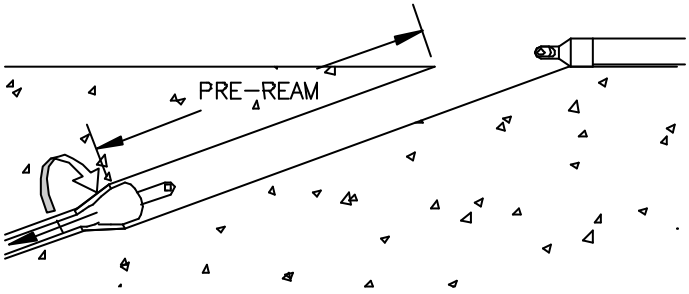
CAUTION

A swivel is not a universal joint! It is designed to be used under tension and in a straight line. Any use of this product that allows the swivel to fall away from the centerline of rotation will severely affect the life of the swivel.

OPERATING INSTRUCTIONS

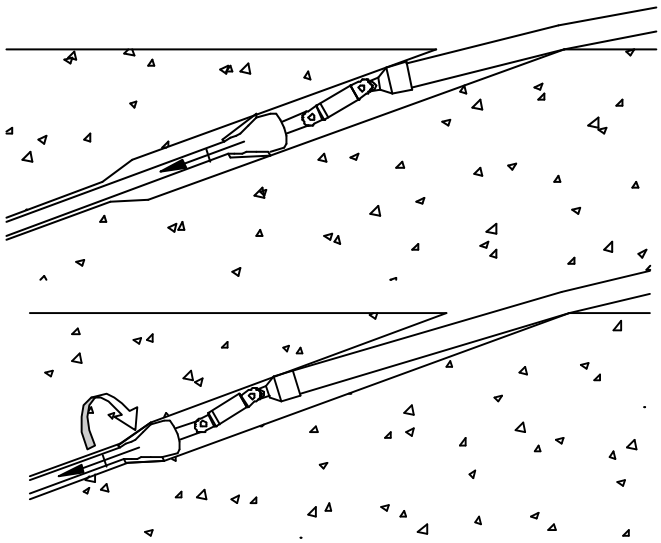
SAFETY – continued

Use the following procedure for attaching the swivel to the reamer. This procedure will ensure maximum safety for personnel in the area of operation and avoid unnecessary side loads on the swivel which may cause permanent damage.



Step 1 Pre-ream hole to minimum of one drill rod length.

Step 2 Push reamer back to surface. Attach Dub-Swivel and Duct Puller to reamer.



Step 3 Pull back **<u>without rotation</u>** for the length of the pre-reamed hole.

Step 4 Start rotation slowly and continue pullback.

Make sure that all components of the pulling system are able to withstand the maximum pulling loads. Components not rated for the pull force may break and release the stored energy of the pull. Never use a worn, defective or incomplete component.

Be prepared for the unexpected. Always use recognized safety practices and wear recognized safety equipment.

Replace worn or damaged clevis pins with only DCD parts. The Clevis Pin is designed specifically for this application. It is manufactured and heat treated in a manner to satisfy both design requirements and claimed capacities. Use of any other product as a replacement part will void the warranty and may result in property damage, severe bodily harm, or death to operators or persons nearby. In any instances, the DCD warranty will be avoided and DCD will accept no responsibility for product failure or personal injury.

Do not modify or dismantle the DUB-Lite® swivel. It has been assembled, and inspected and is only covered by a warranty in its “as shipped” form. Any attempt to dismantle or modify the swivel will result in the warranty becoming void.

SERVICE

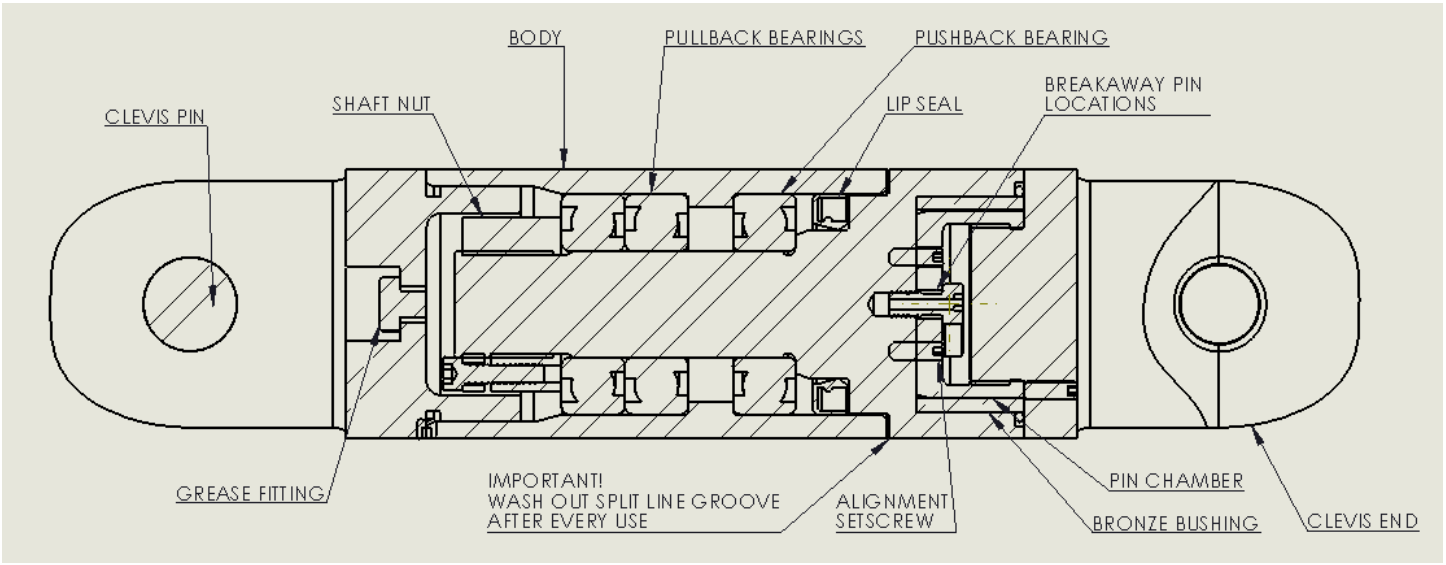
1. To maintain this product in the best possible condition, it must be thoroughly cleaned out after each use and a light smear of grease should be applied to the surfaces of the bronze bushing and the Pin Chamber after each use.

After each use, while the machine is still rotating, use a water hose to wash all dirt from the split line groove. Pour oil into the groove and rotate the swivel a couple of turns to protect the seal from drying out.

Assess the condition of the swivel checking for wear and external damage. Check for axial and radial play in the bearings. Replace worn or bent clevis pins.

Lubricate the swivel with lithium-based grease containing an extreme pressure (EP) additive (the swivel has been factory lubricated with Renolit S2TX grease). Do not mix with calcium or other based greases. Use a hand-operated grease gun with slow pumping action. Lack of proper lubrication will shorten the life of the bearings.

A replacement part kit containing bearings and seals is available for the DUB-Lite® swivel. Replacement of parts should only be done using this kit and must be installed as per instructions included with the kit. Use of this kit will not extend product warranty unless factory installed. Call the factory toll free at **1-888-794-8357** for factory rebuild service.

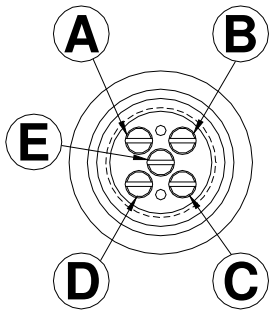


00560-010 BREAKAWAY PIN LOAD DISTRIBUTION TABLE

In the following table are suggested ways of arriving at required load values. There are usually several options other than those shown below. The five pin locations are designated as A, B, C, D & E. All numbers below are expressed in lb or kg.

Pin Location (See Pin Location Reference Diagram)					Break Value
A	B	C	D	E	lb
				750	**750**
				1,000	**1,000**
				1,500	**1,500**
1,000		750			**1,750***
				2,000	**2,000**
750		750		750	**2,250**
750		750		1,000	**2,500**
1,000		1,000		750	**2,750**
750	750	750	750		**3,000**
750	750	750	1,000		**3,250**
750	1,000	750	1,000		**3,500**
1,500		1,500		750	**3,750**
1,000	1,000	1,000	1,000		**4,000**
1,000	750	1,000	750	750	**4,250**
1,500		1,500		1,500	**4,500**
2,000		2,000		750	**4,750**
	2,500		2,500		**5,000**
1,500	750	1,500	750	750	**5,250**
2,000		2,000		1,500	**5,500**
1,000	1,500	1,000	1,500	750	**5,750**
1,500	1,500	1,500	1,500		**6,000**
2,000	750	2,000	750	750	**6,250**
1,500	750	1,500	750	2,000	**6,500**
1,500	1,500	1,500	1,500	750	**6,750**
1,500	2,000	1,500	2,000		**7,000**
2,000	1,000	2,000	1,500	750	**7,250***
	2,500		2,500	2,500	**7,500**
2,000	1,500	2,000	1,500	750	**7,750**
2,000	2,000	2,000	2,000		**8,000**
2,000	1,500	2,000	1,500	1,500	**8,500**
1,500	2,000	1,500	2,000	2,000	**9,000**
2,000	2,000	2,000	2,000	1,500	**9,500**
2,500	2,500	2,500	2,500		**10,000**
2,500	2,000	2,500	2,000	1,500	**10,500**
2,500	2,500	2,500	2,500	1,000	**11,000**
2,500	2,500	2,500	2,500	1,500	**11,500**
2,500	2,500	2,500	2,500	2,000	**12,000**
2,500	2,500	2,500	2,500	2,500	**12,500**

*Note! Uneven pin distribution may result in up to 10% higher breaking point.



PIN LOCATION REFERENCE

Patent # 5,599,129

Pin Location (See Pin Location Reference Diagram)					Break Value
A	B	C	D	E	kg
				300	**300**
				400	**400**
				500	**500**
300		300			**600**
300		400			**700***
400		400			**800**
400		500			**900***
				1,000	**1,000**
400		400		300	**1,100**
400		400		400	**1,200**
400		400		500	**1,300**
500		500		400	**1,400**
500		500		500	**1,500**
300		300		1,000	**1,600**
500	400	500	300		**1,700***
400		400		1,000	**1,800**
500	500	500	400		**1,900***
1000		1,000			**2,000**
500	400	500	400	300	**2,100**
500	400	500	400	400	**2,200**
500	400	500	400	500	**2,300**
1,200		1,200			**2,400**
500	500	500	500	500	**2,500**
1,000	300	1,000	300		**2,600**
1,200		1,200		300	**2,700**
1,200		1,200		400	**2,800**
1,200		1,200		500	**2,900**
1,000		1,000		1,000	**3,000**
1,000	400	1,000	400	300	**3,100**
1,000	400	1,000	400	400	**3,200**
1,000	400	1,000	400	500	**3,300**
1,200		1,200		1000	**3,400**
1,200	400	1,200	400	300	**3,500**
1,200		1,200		1200	**3,600**
1,200	400	1,200	400	500	**3,700**
1,000	400	1,000	400	1,000	**3,800**
1,200	500	1,200	500	500	**3,900**
1,000	1,000	1,000	1,000		**4,000**
1,000	400	1,000	500	1,200	**4,100***
1,200	400	1,200	400	1,000	**4,200**
1,000	1,000	1,000	1,000	300	**4,300**
1,000	1,000	1,000	1,000	400	**4,400**
1,000	1,000	1,000	1,000	500	**4,500**
1,200	500	1,200	500	1,200	**4,600**
1,000	1,200	1,000	1,200	300	**4,700**
1,200	1,200	1,200	1,200		**4,800**
1,000	1,200	1,000	1,200	500	**4,900**
1,000	1,000	1,000	1,000	1,000	**5,000**
1,200	1,200	1,200	1,200	300	**5,100**
1,200	1,200	1,200	1,200	400	**5,200**
1,200	1,200	1,200	1,200	500	**5,300**
1,200	1,000	1,200	1,000	1,000	**5,400**
1,200	1,000	1,200	1,000	1,200	**5,600**
1,200	1,200	1,200	1,200	1,000	**5,800**
1,200	1,200	1,200	1,200	1,200	**6,000**