EVERDIGM DURA WING OPERATION AND SERVICE GUIDE

Users should read this guide before using EVERDIGM concentric overburden system DURA WING.

EVERDIGM DURA WING

OPERATION AND SERVICE GUIDE

Head office & Factory I

332-3, Janggwan-Ri, Jincheon-Eub, Chungcheongbuk-Do, Korea

Tel_+82-43-530-3300 Fax_+82-43-530-3429

Factory II

300, Wanjusandan-5ro, Bongdong-Eup, Wanju-Gun, Jeobuk, Korea

Tel_+82-63-262-6900 Fax_+82-63-261-4483

Sales & Marketing Office

Room #1203, Woolim Lion's Valley 2, 680, Gasan-Dong, Geumcheon-Gu, Seoul, Korea

Tel_+82-2-801-0800 Fax_+82-2-801-0899

Web: www.everdigm.com

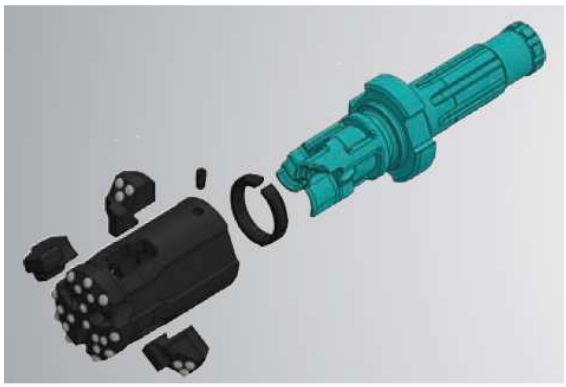
Email: rocktool@everdigm.com

1. INTRODUCTION

DURA WING is a concentric overburden system designed for casing installation drilling range of 4” to 32” diameter hole, specialized through various formations into bed rock.

The wing bits are enclosed on pocket area making it the most professional & efficient system in the market as it is free from clogging in loose overburden material while it goes down to bedrock. When the drilling starts wing bits come out with unique cam sliding mechanism. The key feature of DURA WING is the self actuating wing bit system that is not related with unpredictable ground condition.

2. STRUCTURE



DURA WING 90~315

DURA WING 365~745

1. Guide device

The guide device has unique cam design which allows to extend and to retract three wing bits inside of body by sliding mechanism. Users don’t need other effect for opening and closing wings. Since guide device always have control of the wings, there is no gravity issue that drops wings.

Shoulder-less type (without casing shoe) is available for duplex drilling. Should-less type does not have drive shoulder so it will not pull down casing and casing shoe.

2. Pilot bit

The pilot bit performs the drilling job as a main part. The full face design containing more tungsten carbide buttons allows drilling straight hole at any angel. Flushing holes at front face allow sludge and cuttings come out through three cutting channels on side.

Users can change only pilot bit when the carbide button tips are wore out. Do not need to change reusable Guide device.

3. Wing bit.

Three wing bits extend out larger than the casing in diameter while in the drilling position. The extendible three wings cover 360 degrees of the hole circumference which assures straight round hole. To pull the system out after drilling, slight reverse rotation of drill string will retract the three wing bits back into the pocket at pilot bit. Every DURA WING has three wing bits regardless of its size.

4. Retention devices

There are two type of retention device for DURA WING depending on its size. Smaller size uses retainer ring and locking pin system, and larger size use locking pin and spacers. Both retaining ring and locking pin connect its guide device and pilot bit inside of the bit body which is not concerned with wing bits.

3. SYSTEM FEATURES

[Easy opening and closing]

Users can easily control its retraction with just rotation. no need of operator's high skill for usage.

[Absolute workability]

DURA WING's unique sliding mechanism assures the secure retraction. The internal air holes blows out dirt or grit at wing bit area thus there will be no worry of jamming wings.

[Low running cost]

Achieve low running cost as user replaces only worn parts.

[Simple assembly and disassembly]

Replacing DURA WING's parts is simple and quick comparing to other system. Do not require other method for disassembly. Providing video how to assemble and disassemble.

4. SETTING CONDITION

Model	Bit Size(mm)		Casing(mm)		Applicable hammer	RPM		Air Supply(㎥/min)		Air Speed(m/min)	
	Extracted	Retracted	In dia	Out dia		Min	Max	Min	Max	Min	Max
90	125	90	101.6	114.3	3" Rocky hammer	20	30	4	8	1100	1500
129	164	128	132.5	152.5	4" Rocky hammer	20	25	7	16	1100	1500
140	185	139	153.2	168.3	5" Rocky hammer	15	20	8	17	1100	1500
190	237	189	202.3	222.0	6" Rocky hammer	10	15	19	35	1100	1500
240	290	238	254.5	273.1	8" Rocky hammer	10	15	27	49	1100	1500
280	340	281	301.7	323.9	8"/ 10" Rocky hammer	10	15	33	62	1100	1500
315	373	315	330.6	355.6	12" Rocky hammer	10	14	28	58	1100	1500
365	425	365	386.4	406.4	12" Rocky hammer	10	12	62	104	1100	1500
560	630	559	584.2	609.6	18"/ 24" Rocky hammer	5	8	57	113	1100	1500
745	842	744	780.8	812.8	24" Rocky hammer	4	6	289	453	1100	1500

- AIR CONSUMPION

- Set the air supply using the following formula.

$$Q = \frac{V(D^2 - d^2)}{1273500}$$

Q : Air supply (m^3 /min)

D : Inside diameter of casing (mm)

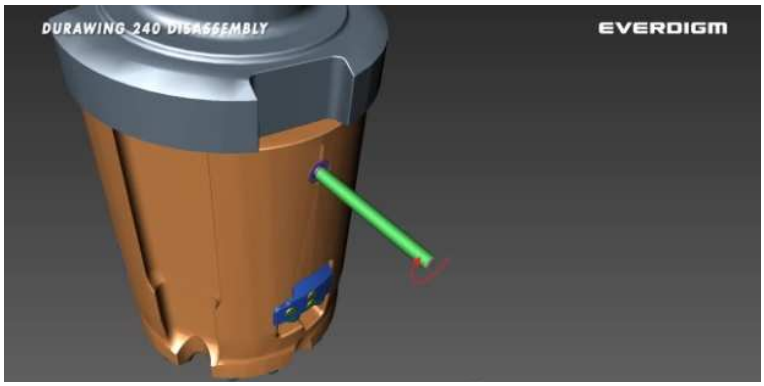
d : Outside diameter of jacket or hammer (mm)

V :Air speed 1,100-1,500 (m/min)

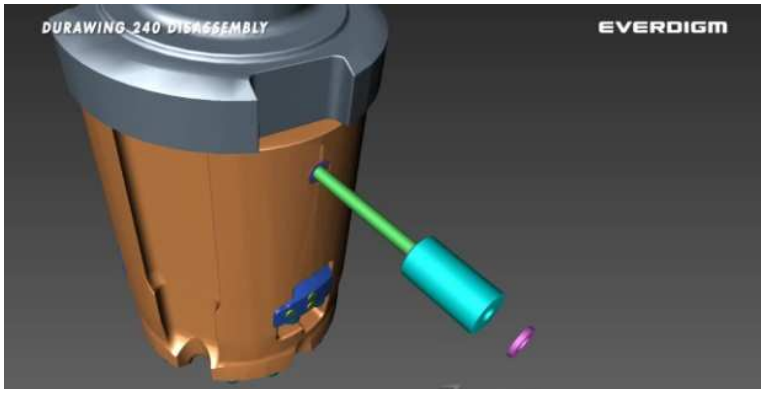
5. MAINTENANCE

DURA WING 90~315

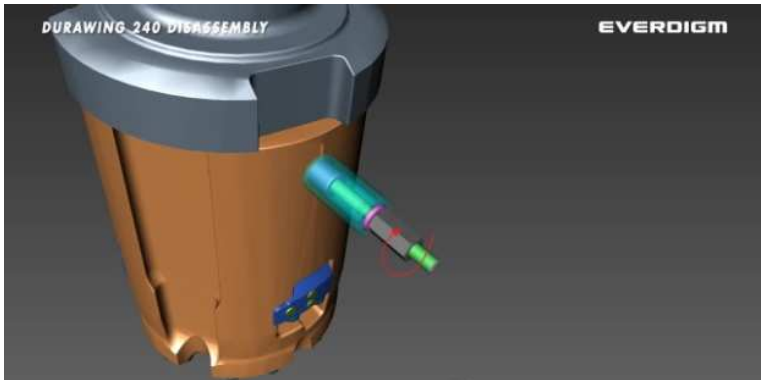
(1) DISASSEMBLY



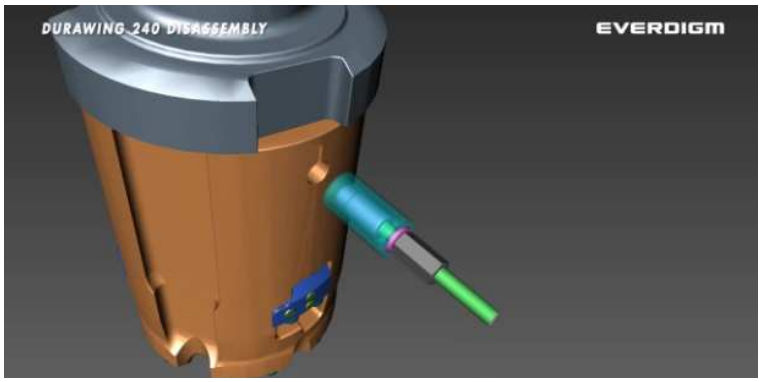
1. SCREW BOLT INTO LOCKING PIN



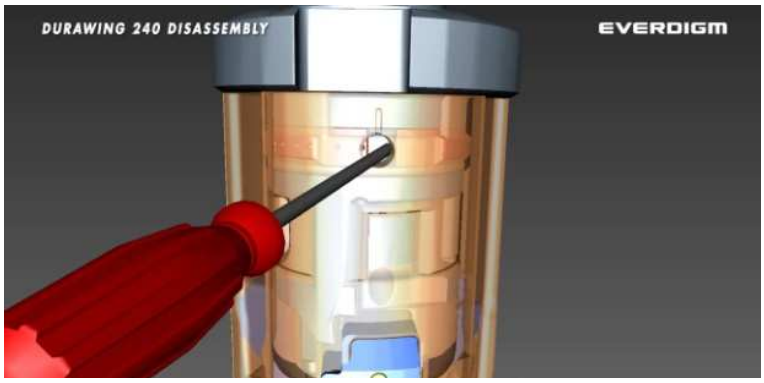
2. INSERT JIG AND WASHER.



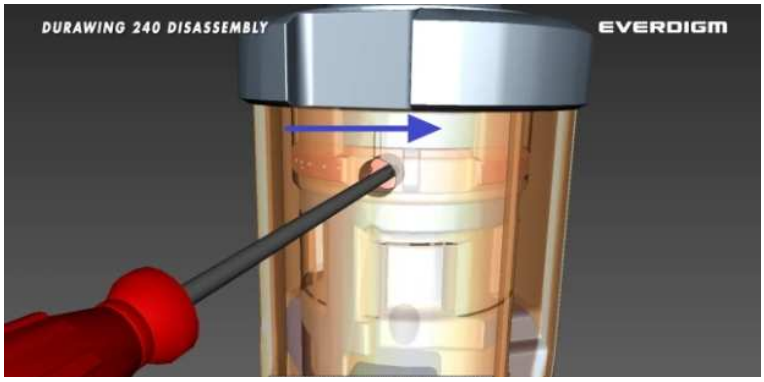
3. SCREW LONG NUT



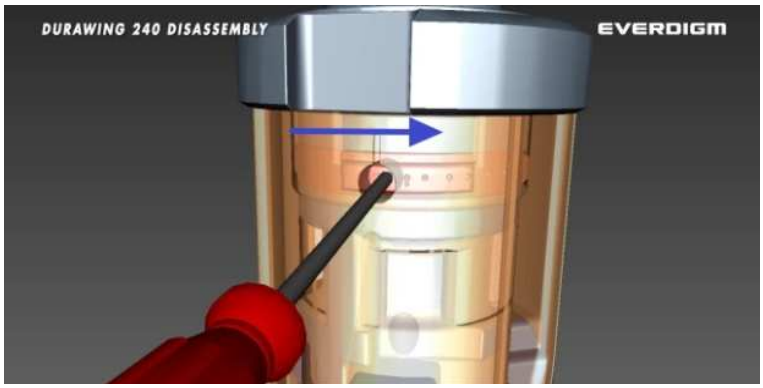
4. SCREW LONG NUT AND PULL OUT THE LOCKING PIN



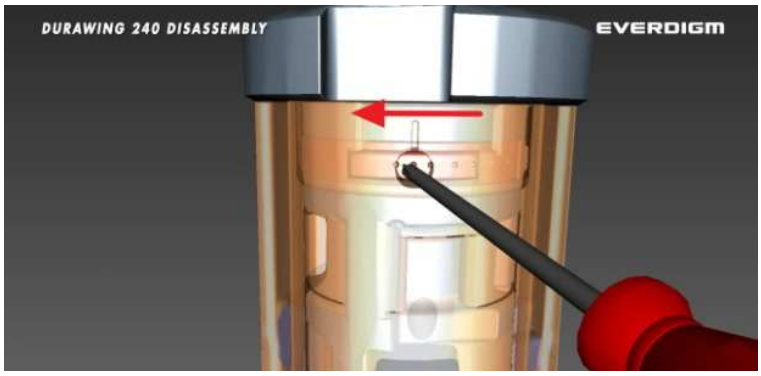
5. WITH A SCREWDRIVER TURN RETAINER RINGS TO THE RIGHT.



6. WITH A SCREWDRIVER PRESS POINTS AND TURN RETAINER RINGS TO THE RIGHT.

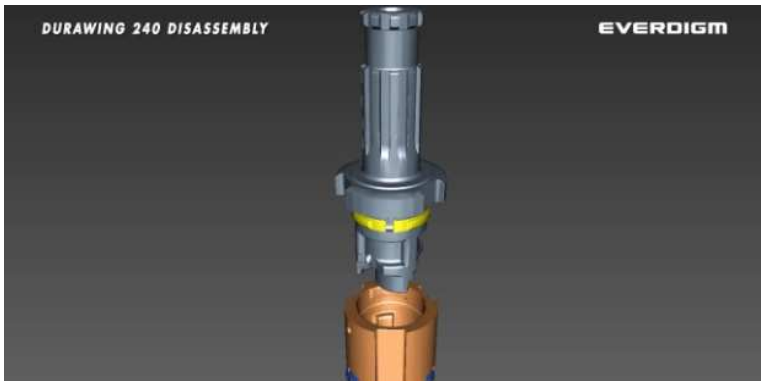


7. TURN RETAINER RINGS TO THE RIGHT UP TO **LAST POINT**.

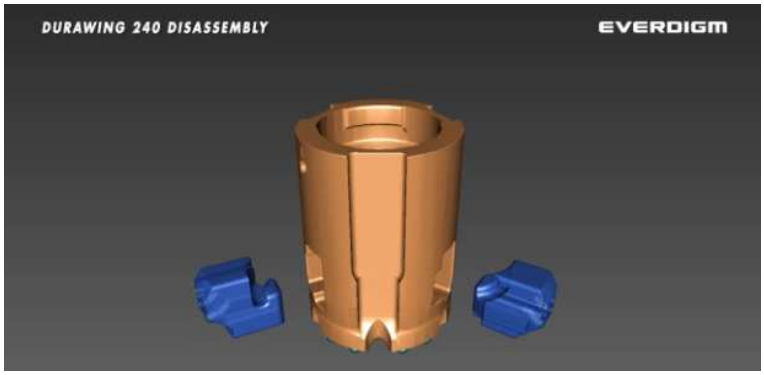


8. TURN IT **REVERSELY** A BIT UNTIL THE TWO POINTS AND MARKED LINE ARE IN A STRAIGHT LINE

9. MAKE THE TWO POINTS AND MARKED LINE IN A STRAIGHT LINE

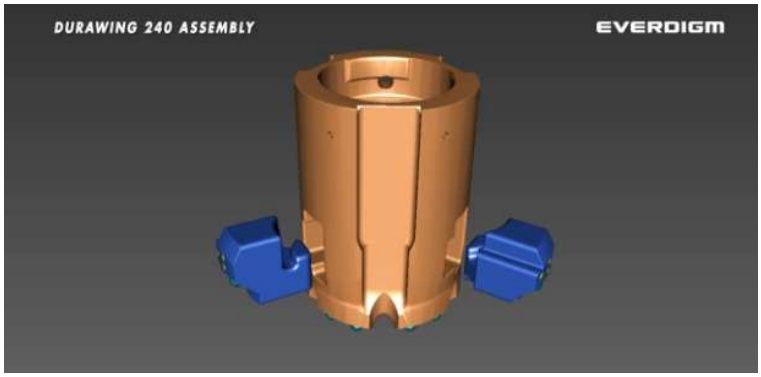


10. PULL OUT GUIDE DEVICE

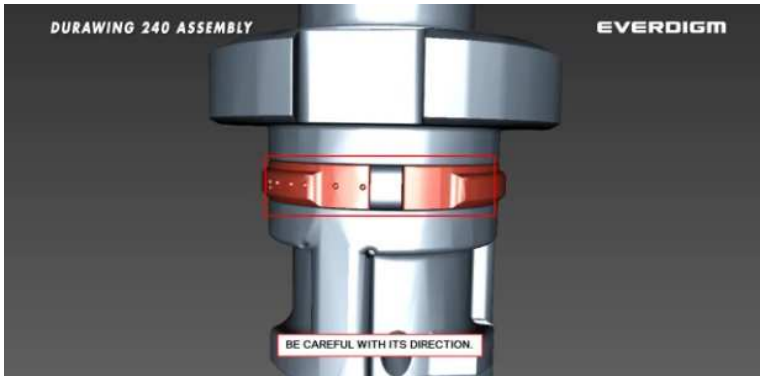


11. PULL OUT WING BITS

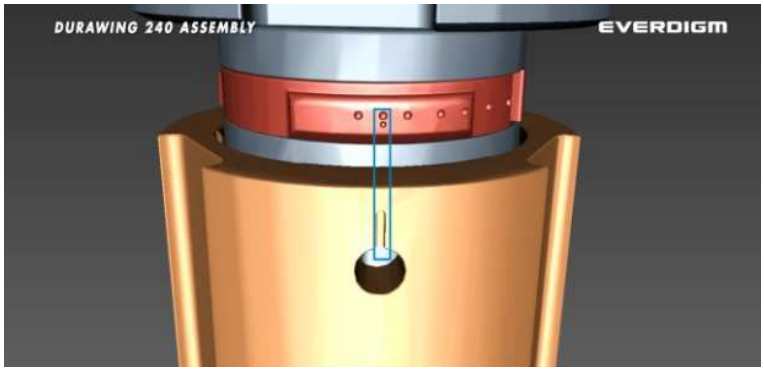
(2) ASSEMBLY



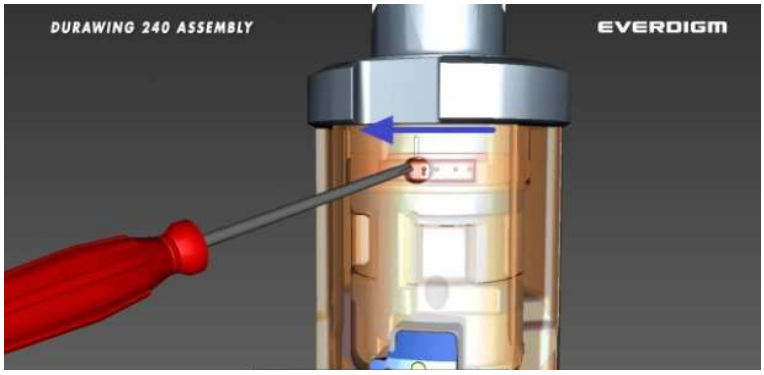
1. INSERT THREE WINGS INTO POCKETS



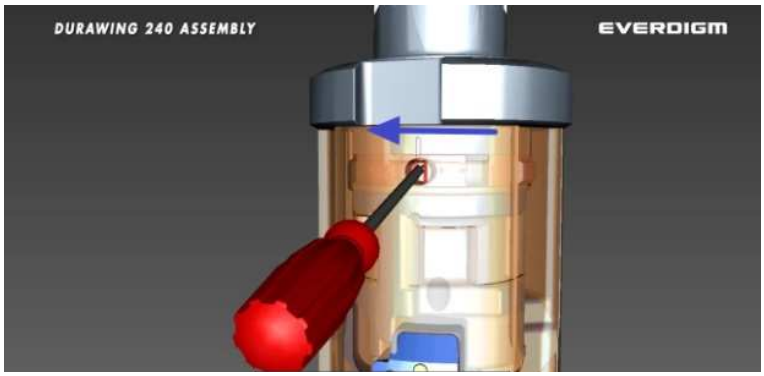
2. ASSEMBLE TWO RETAINER RINGS



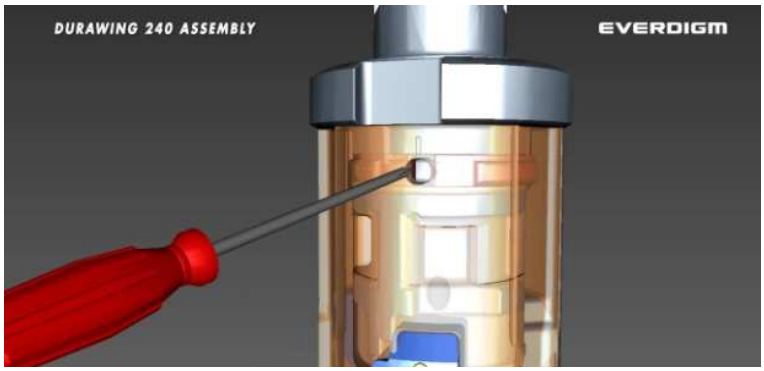
3. ADJUST RETAINER RINGS, MAKE THE TWO POINTS AND MARKED LINE IN A STRAIGHT LINE.



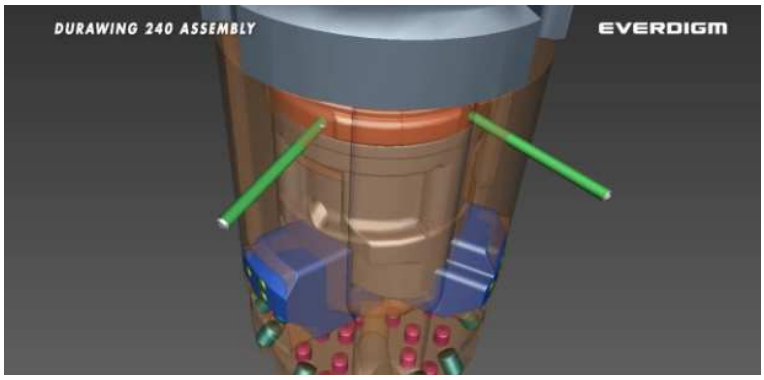
4. WITH A SCREWDRIVER PRESS POINT AND TURN RETAINER RINGS TO THE LEFT.



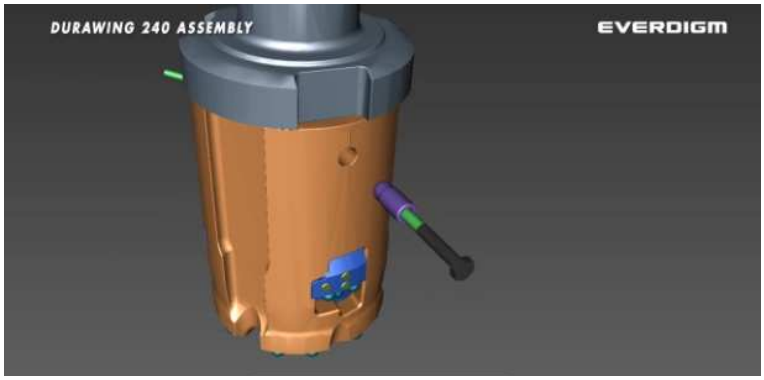
5. TURN RETAINER RINGS TO THE LEFT UNTIL SPACE APPEAR FOR LOCKING PIN.



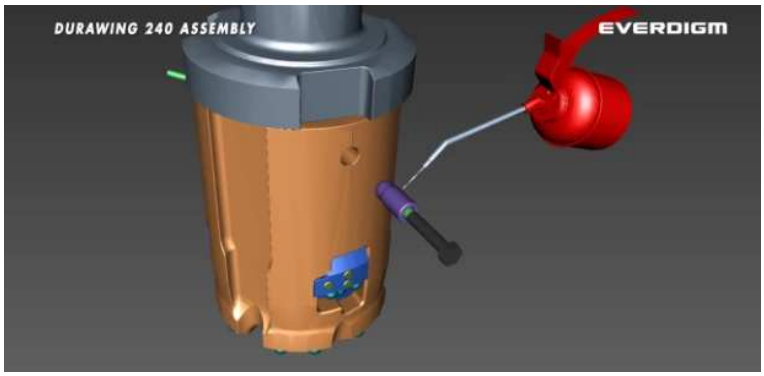
6. TURN RETAINER RINGS TO THE LEFT UNTIL SPACE APPEAR FOR LOCKING PIN.



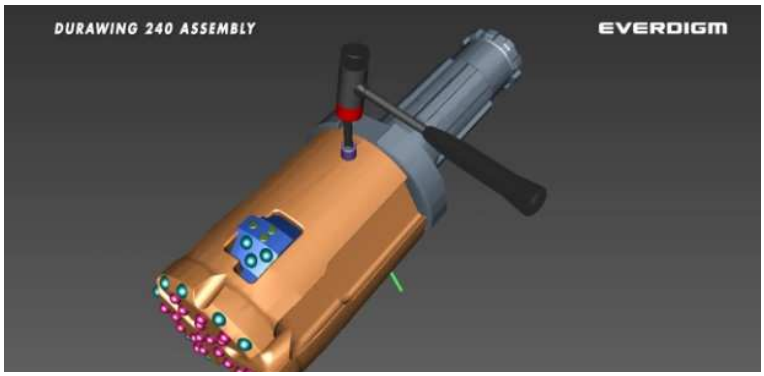
7. INSERT TWO SET SCREWS INTO THE LOCKING PIN.



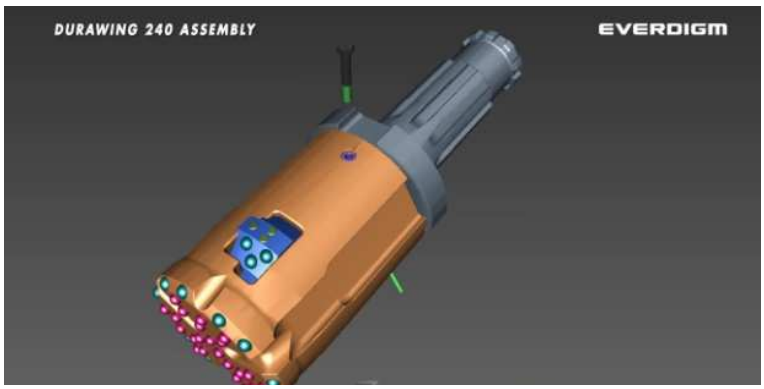
8. INSERT HEX BOLT INTO THE SIDE HOLES TO FIX RETAINER RINGS.



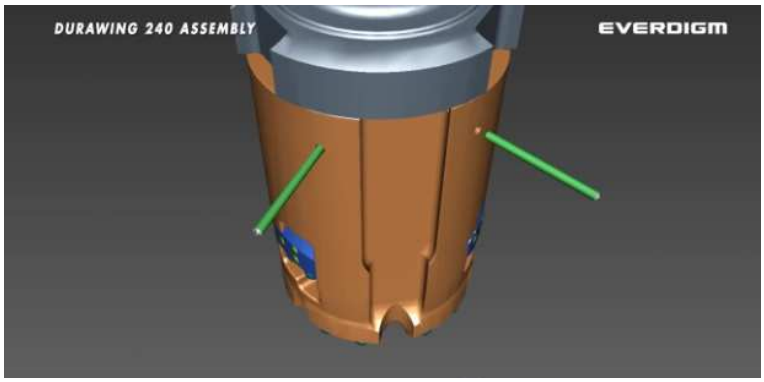
9. COVER OIL ON LOCKING PIN



10. INSERT LOCKING PIN INTO THE HOLE BY HAMMERING.



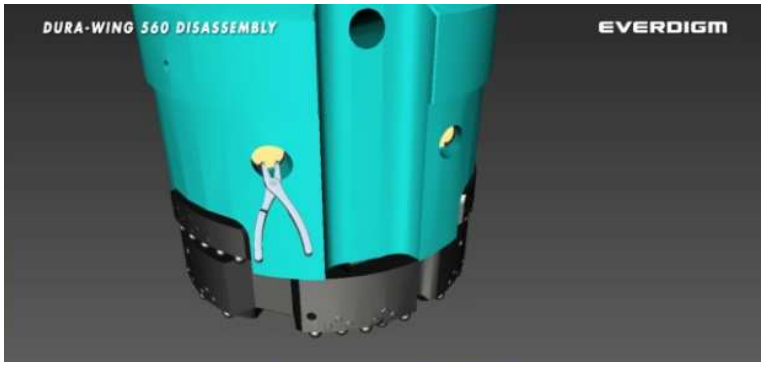
11. LOOSEN ALL BOTLS.



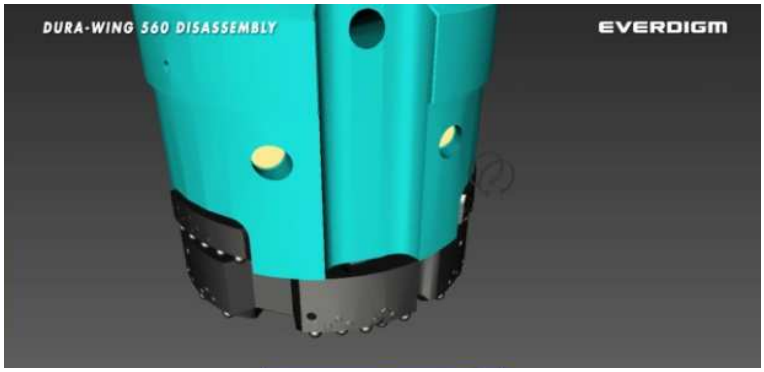
12. LOOSEN ALL BOLTS.

DURA WING 365~745

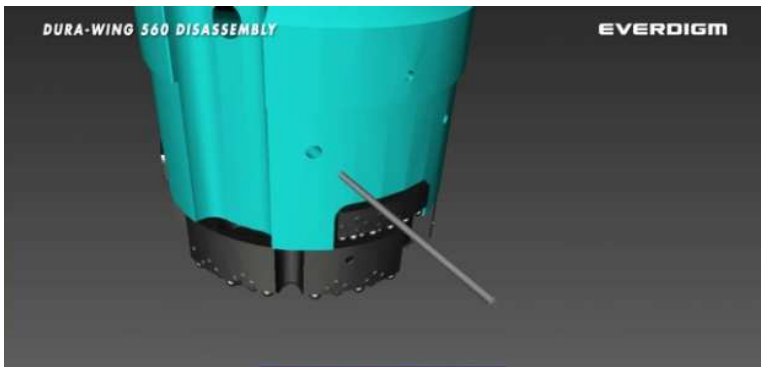
(1) DISASSEMBLY



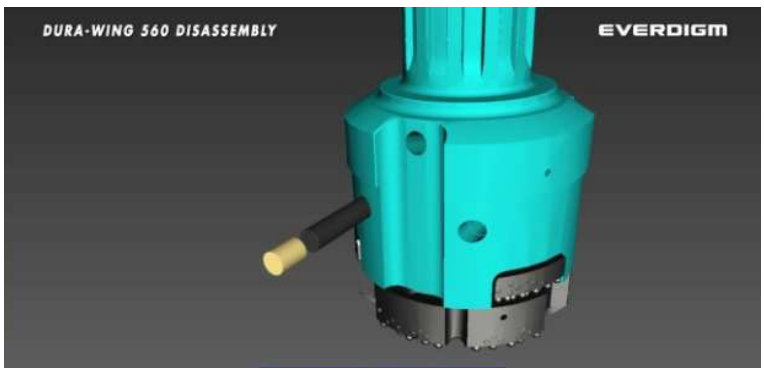
1. PULL OUT SNAP RINGS



2. PULL OUT SNAP RINGS (4PCS)



3. WITH A STICK PUSH INTO THE BACK SIDE HOLE

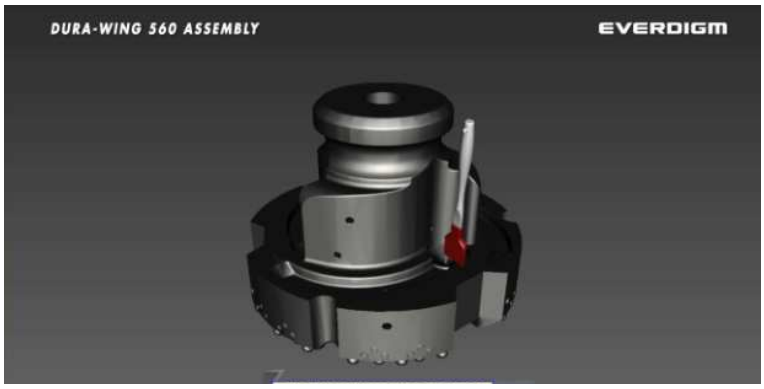


4. REMOVE THE LOCKING PIN AND SPACER

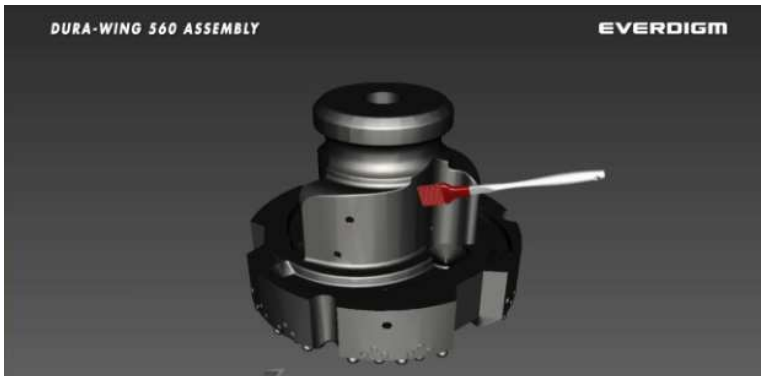
5. DISASSEMBLE GUIDE DEVICE

6. DISASSEMBLE WING BITS

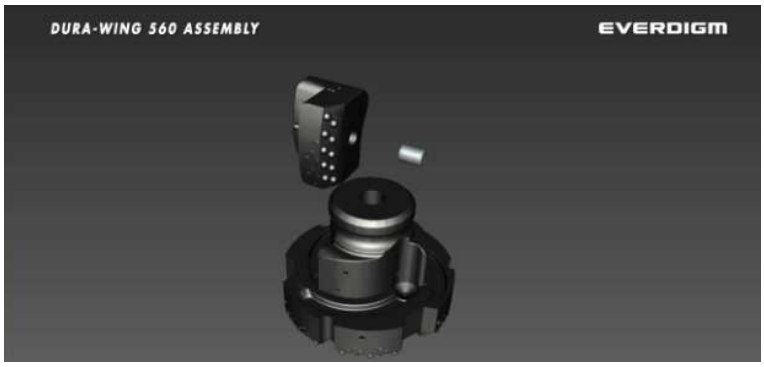
(2) ASSEMBLY



1. PUT GREASE ON UPPER AND SIDE PARTS OF PILOT BIT

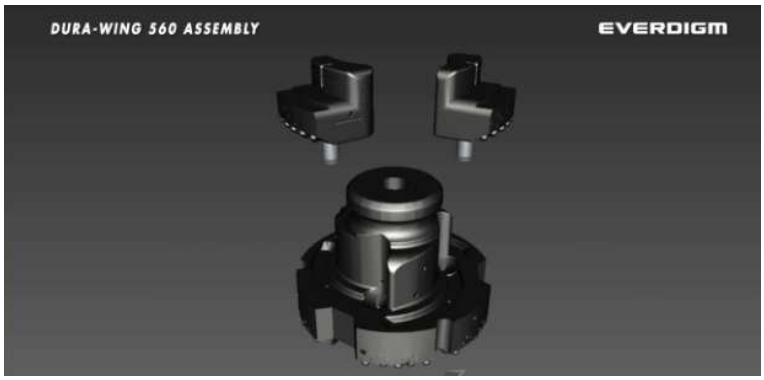


2. PUT GREASE ON THE OTHER TWO PARTS.

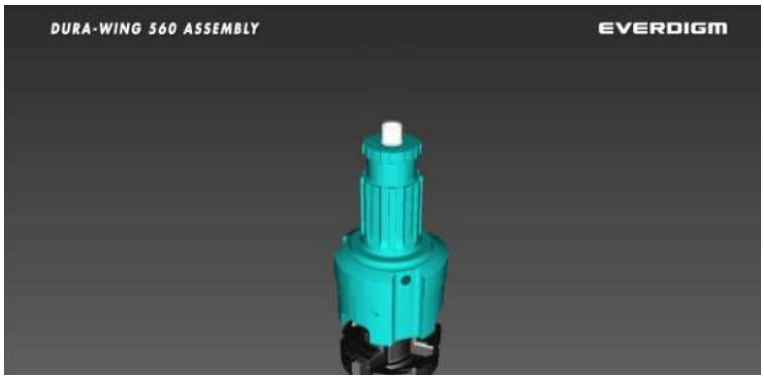


3. INSERT GUIDE PIN INTO THE HOLE AT THE BOTTOM OF WING BIT

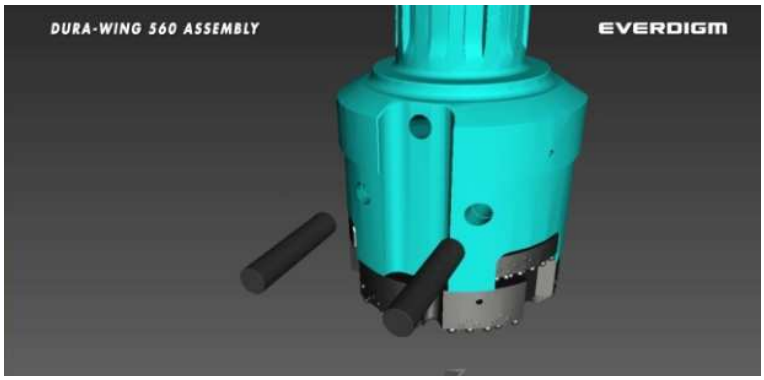
4. ASSEMBLE WING BITS AND PLACE AT THE CORNER



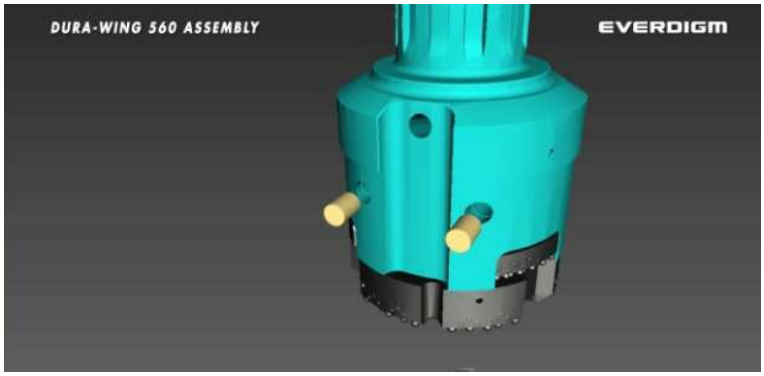
5. ASSEMBLE THE OTHER WINGS IN THE SAME WAY



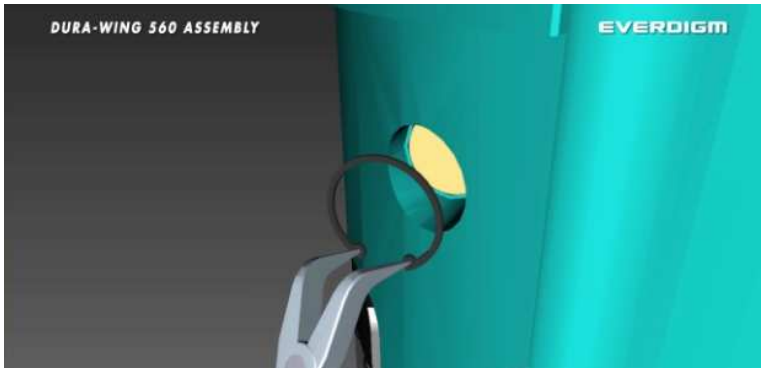
6. ASSEMBLE GUIDE DEVICE



7. INSERT TWO LOCKING PINS INTO THE SIDE HOLES AT GUIDE DEVICE



8. INSERT SPACERS



9. INSERT TWO SNAP RINGS AT EACH HOLE

6. WARRANTY

For EVERDIGM DURA WING and their associated parts

EVERDIGM Corporation (hereinafter called “EVERDIGM”), subject to the WARRANTY LIMITATIONS herein, warrants its products to be free of defects in materials and/or workmanship. If any parts shall fail by reason of poor materials and/or workmanship within a period six (6) months from the shipping date from EVERDIGM’s factory.

In order to be eligible for warranty service, the proper filled out claim form with good pictures is submitted and received by EVERDIGM within fifteen (15) days of the date of discovery of the defect.

(All goods returned to us, either new or used must be returned prepaid freight.)

EVERDIGM will, at its option, repair or furnish such part free of charge, which is found upon examination by EVERDIGM’s authorized service outlet or by EVERDIGM’s factory under the conditions listed in WARRANTY LIMITATIONS.

WARRANTY LIMITATION

Exceptions from warranty: Warranty is limited to replacement of defective parts only. Labor, mileage and travel time, meal, loss time, freight cost, import duty and documentation, and any other expenses incurred by warrantable failure are not covered by warranty.

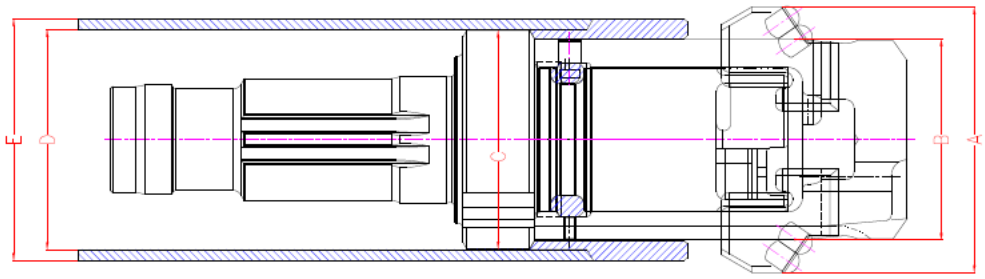
Improper Operation and/or Maintenance: Breakage or damages attributable to installation or operation or use not in accordance with EVERDIGM’s guidelines, operating instructions, and/or procedures, a failure to follow any scheduled maintenance or routine maintenance as outlined in the operation and maintenance are not covered by any warranty

Alterations & Modifications: No claim will be accepted by EVERDIGM if the product or part is altered or modified in any way without prior written approval by EVERDIGM.

Operation beyond published capacities: All obligations under this warranty shall be terminated if the product is operated or used beyond its published capacities such as excessive Air pressure and flow, excessive heat, or incorrect lubrication.

Common wear: Common wear or tear during normal drilling procedures is not covered by warranty

7. SIZE CHART

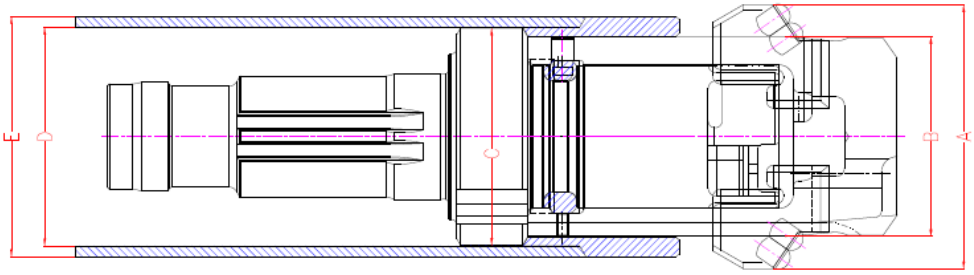


DURA WING 90~315

Shoulder type : ST - standard type SLT - shoulder less type.

PRODUCT	UNIT	SHOULDER TYPE	EXTENDED O.D.	PILOT O.D.	SHOULDER O.D.	CASING		Available Shank Type
						I.D. (MIN)	O.D. (MAX)	
			A	B	C	D	E	
DW 090	mm	ST	125	91	101	101.6	120	IR3.5
		SLT			91	91.6		
	inch	ST	4.92	3.58	3.98	4.00	4.72	
		SLT			3.58	3.61		
DW 110	mm	ST	145	110	118.7	119.7	140	SD4,QL40,DHD340,MACH44,M40
		SLT			110	111		
	inch	ST	5.71	4.33	4.67	4.71	5.51	
		SLT			4.33	4.37		
DW 115	mm	ST	150	115	125	126.6	145	SD4,QL40,DHD340,MACH44,M40
		SLT			115	116.6		
	inch	ST	5.91	4.53	4.92	4.98	5.71	
		SLT			4.53	4.59		
DW 129	mm	ST	164	129	137.5	139	159	SD4,SD5,QL40,QL50, DHD340,DHD350 MACH44,MACH50 M40,M50,MC55
		SLT			128	130.5		
	inch	ST	6.46	5.08	5.41	5.47	6.26	
		SLT			5.04	5.14		
DW 140	mm	ST	185	140	152	153.2	178	SD5,QL50,DHD350 MACH50,MC55,M50
		SLT			140	141.2		
	inch	ST	7.28	5.51	5.98	6.03	7.01	
		SLT			5.51	5.56		
DW 147	mm	ST	192	147	157	158	185	SD5,QL50,DHD350 MACH50,MC55,M50
		SLT			147	148		
	inch	ST	7.56	5.79	6.18	6.22	7.28	
		SLT			5.79	5.83		

* Shoulder less type is for dual rotary rigs. * Casing information (I.D. and O.D) is necessary for ordering.

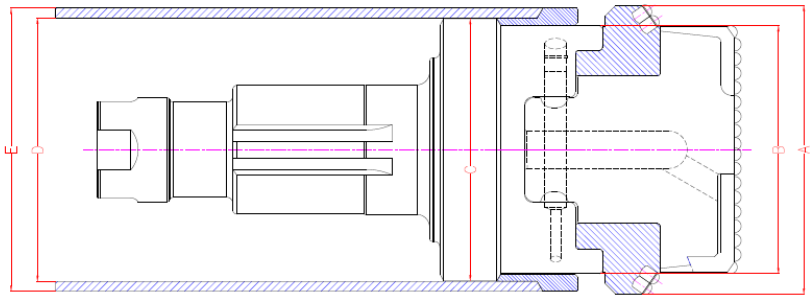


DURA WING 90~315

Shoulder type : ST - standard type SLT - shoulder less type.

PRODUCT	Unit	SHOULDER TYPE	Extended O.D.	PILOT O.D.	SHOULDER O.D.	CASING		Available Shank Type
						I.D. (MIN)	O.D. (MAX)	
			A	B	C	D	E	
DW 152	mm	ST	196	152	162	164	189	SD5,QL50,DHD350 MACH50,MC55,M50
		SLT			152	154		
	inch	ST	7.72	5.98	6.38	6.46	7.44	
		SLT			5.98	6.06		
DW 165	mm	ST	215	167	178	178.8	205	SD6,QL60,DHD360,M60
		SLT			167	167.8		
	inch	ST	8.46	6.57	7.01	7.04	8.07	
		SLT			6.57	6.61		
DW 190	mm	ST	237	190	201.5	202.3	227	SD6,DHD360,QL60,M60
		SLT			190	190.8		
	inch	ST	9.33	7.48	7.93	7.96	8.94	
		SLT			7.48	7.51		
DW 240	mm	ST	292	240	253	254.5	280	SD8,DHD380,QL80
		SLT			240	241.5		
	inch	ST	11.50	9.45	9.96	10.02	11.02	
		SLT			9.45	9.51		
DW 280	mm	ST	340	280	300	301.7	328	SD10,QL80
		SLT			280	281.7		
	inch	ST	13.39	11.02	11.81	11.88	12.91	
		SLT			11.02	11.09		
DW 315	mm	ST	373	318	334	336.6	360	SD12,QL120
		SLT			318	320.6		
	inch	ST	14.69	12.52	13.15	13.25	14.17	
		SLT			12.52	12.62		

* Shoulder less type is for dual rotary rigs. * Casing information (I.D. and O.D) is necessary for ordering.



DURA WING 365~745

Shoulder type : ST - standard type SLT - shoulder less type.

PRODUCT	Unit	SHOULDER TYPE	Extended O.D.	PILOT O.D.	SHOULDER O.D.	CASING		Available Shank Type
						I.D. (MIN)	O.D. (MAX)	
			A	B	C	D	E	
DW 365	mm	ST	425	365	386	387.4	412	SD12,QL120
		SLT			365	366.4		
	inch	ST	16.73	14.37	15.20	15.25	16.22	
		SLT			14.37	14.43		
DW 410	mm	ST	478	412	433	435	463	SD15,QL120
		SLT			412	414		
	inch	ST	18.82	16.22	17.05	17.13	18.23	
		SLT			16.22	16.30		
DW 460	mm	ST	530	460	480	482.6	515	SD15,SD18,N180
		SLT			460	462.6		
	inch	ST	20.87	18.11	18.90	19.00	20.28	
		SLT			18.11	18.21		
DW 510	mm	ST	580	510	531	533.4	562	SD15,SD18,QL200,N180
		SLT			510	512.4		
	inch	ST	22.83	20.08	20.91	21.00	22.13	
		SLT			20.08	20.17		
DW 560	mm	ST	630	560	580	584.2	612	SD18,N180,N240
		SLT			560	564.2		
	inch	ST	24.80	22.05	22.83	23.00	24.09	
		SLT			22.05	22.21		
DW 600	mm	ST	685	600	628	631.8	667	QL200,N240
		SLT			600	603.8		
	inch	ST	26.97	23.62	24.72	24.87	26.26	
		SLT			23.62	23.77		
DW 650	mm	ST	737	650	676	679.2	719	QL200,N240
		SLT			650	653.2		
	inch	ST	29.02	25.59	26.61	26.74	28.31	
		SLT			25.59	25.72		
DW 745	mm	ST	842	745	776	780.8	822	N240
		SLT			745	749.8		
	inch	ST	33.15	29.33	30.55	30.74	32.36	
		SLT			29.33	29.52		

* Shoulder less type is for dual rotary rigs. * Casing information (I.D. and O.D) is necessary for ordering.