

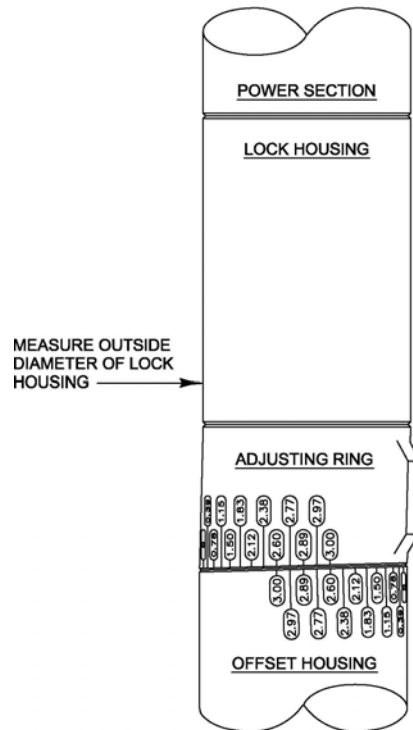
These operating instructions apply to 2 degree, 3 degree and 4 degree adjustable housings.

1.0 Determine the size and type of the drilling motor

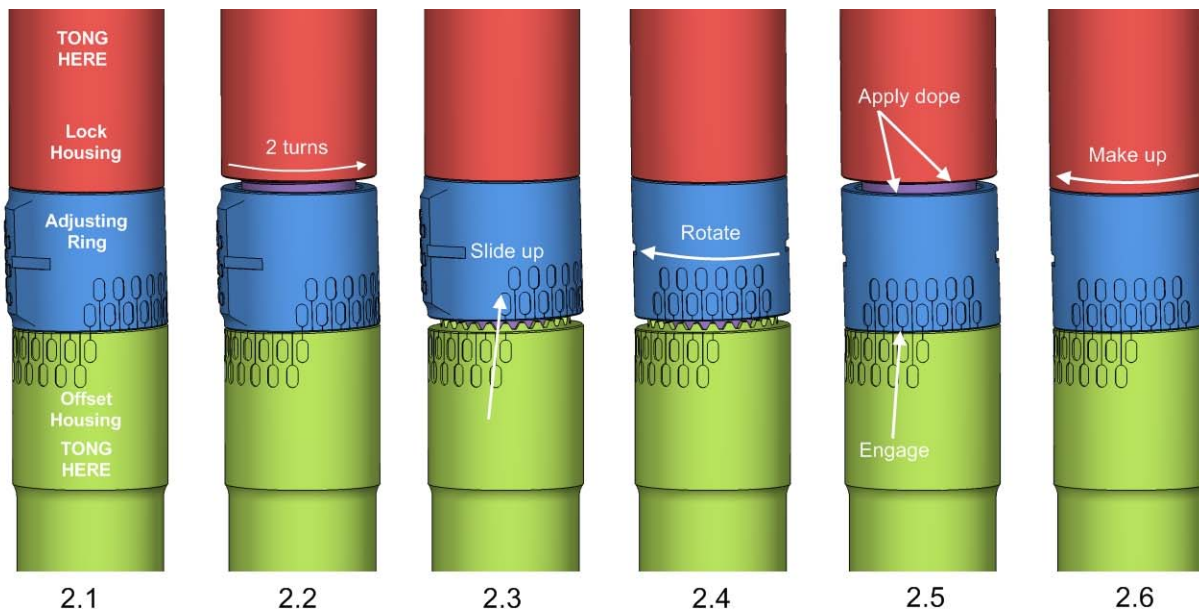
Before adjusting the bend setting of a drilling motor, the drilling operator should first identify the size and type of the drilling motor. This will determine the correct make-up torque to be used on the adjustable housing connection.

- 1.1 Using an OD tape, measure the OD of the lock housing where specified.
- 1.2 Use the table below to determine the corresponding size and type of the drilling motor.

Locking Housing OD	Motor Size
2.38"	2 3/8"
3.00/3.03"	2 7/8"
3.13"	3 1/8"
3.38"	3 3/8"
3.50"	3 1/2"
3.75"	3 3/4"
4.88"	4 3/4" & 5"
5.13"	5" XH
6.38"	6 1/4"
6.50"	6 1/2" XH
6.88/7.00/7.13"	6 3/4" & 7" XH
7.75"	7 3/4" & 8"
8.13"	8" XH
9.63"	9 5/8" & 9 5/8" XH
11.25/11.50"	11 1/4"



2.0 Adjust Bend Setting



- 2.1 Break joint with tongs on tong areas shown above.
- 2.2 Keep Adjusting Ring engaged with Offset Housing and back off Lock Housing 2 turns.
- Note: Teeth must stay engaged during the back off procedure. (See Section 3.0)**
- 2.3 Slide the Adjusting Ring up to disengage teeth.
- 2.4 To adjust bend angle, rotate adjusting ring until the required angle marked on the adjusting ring and offset housing match.
- Note: Do not rotate counterclockwise beyond the 0° setting. (See Section 3.0)**
- 2.5 Engage teeth of Adjusting Ring at chosen angle setting. Apply thread dope to mating faces of the Lock Housing and Adjusting Ring. Matched number indicates angle of bend and exact short side of motor.
- 2.6 Make up Lock Housing to recommended value listed in the table below based on size and type of drilling motor that was determined earlier.

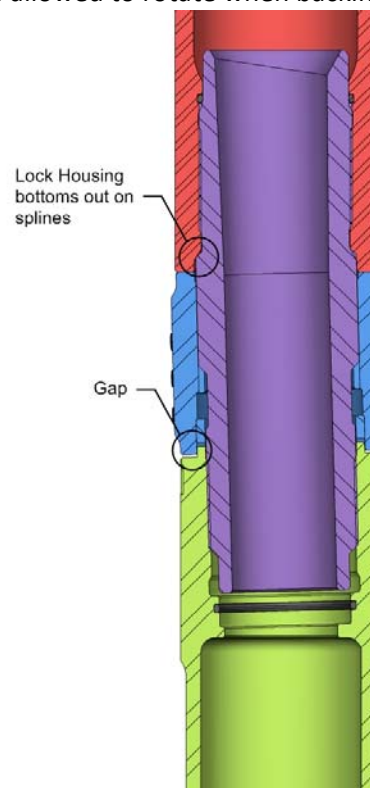
Lock Housing Make-Up Torque

Motor Size	Imperial	Metric
2 3/8"	1,600 lb-ft	2,200 N.m
2 7/8"	4,000 lb-ft	3,000 N.m
3 1/8"	4,500 lb-ft	6,100 N.m
3 3/8"	4,500 lb-ft	6,100 N.m
3 1/2"	5,000 lb-ft	6,800 N.m
3 3/4"	5,300 lb-ft	7,200 N.m
4 3/4" & 5"	11,300 lb-ft	13,500 N.m
5" XH	17,000 lb-ft	23,000 N.m
6 1/4"	23,000 lb-ft	31,000 N.m
6 1/2" XH	26,000 lb-ft	35,000 N.m
6 3/4" & 7" XH	28,000 lb-ft	38,000 N.m
7 3/4" & 8"	43,000 lb-ft	58,000 N.m
8" XH	50,000 lb-ft	68,000 N.m
9 5/8" & 9 5/8" XH	68,000 lb-ft	92,000 N.m
11 1/4"	80,000 lb-ft	108,000 N.m

3.0 Consequences of rotating the Adjusting Ring counterclockwise beyond the 0° setting

If the Adjusting Ring teeth are not kept engaged and the ring is allowed to rotate when backing off the Lock housing, the internal Splined Mandrel will back off. This can also occur if the Adjusting Ring is rotated counterclockwise beyond the 0° bend setting. If the Splined Mandrel backs off too far, the Lock Housing will bottom out on the splines when making up this connection. Because of this, the connection is not properly preloaded, which can lead to the Lock Housing or Splined Mandrel backing off down hole. In extreme cases, it is possible that the teeth can be sheared off when trying to torque up the connection.

Refer to Section 4.0 to reset the Adjusting Ring position if back off occurs.



4.0 Reset Adjusting Ring Position

In the event that the adjusting ring disengages from the offset housing and rotates with the lock housing, the procedure outlined below should be followed to reset the adjusting ring to the proper position prior to setting the bend angle:


- 4.1 Slide the adjusting ring up until teeth disengage from the offset housing, if not already done.
- 4.2 Screw the adjusting ring (and the splined mandrel) clockwise into the offset housing until the splined mandrel stops.
- 4.3 Back off 2 turns (counterclockwise rotation).
- 4.4 Rotate the adjusting ring clockwise until the "0" markings align.

The adjustable housing is now reset and can be set to the desired bend angle as indicated in section 2.0.

The following table shows the available bend settings for the 2°, 3° and 4° adjustable housings.

Adjustable Housing Bend Settings

2 Degree	3 Degree	4 Degree
0.00	0.00	0.00
0.26	0.39	0.35
0.52	0.78	0.69
0.77	1.15	1.04
1.00	1.50	1.37
1.22	1.83	1.69
1.41	2.12	2.00
1.59	2.38	2.29
1.73	2.60	2.57
1.85	2.77	2.83
1.93	2.89	3.06
1.98	2.97	3.28
2.00	3.00	3.46
		3.63
		3.76
		3.86
		3.94
		3.98
		4.00

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ADJUSTABLE HOUSING OPERATING INSTRUCTIONS			Page 5 of 5

Revision Record:

REV	DATE	BY	REVISION MADE
B	29 SEP 2008	LAS	Document updated to current format, and steps to identify type and size of drilling motor added in.
C	05 MAY 2009	TJD	Added Section 3.0 detailing consequences of over rotating adjusting ring when changing bend setting. Changed document layout. ECN-2684