



Model: T-Series Top Drives

Serial #: N/A

Jun. 3, 2022

Product Bulletin # TDS-237 Rev 1

Recommended Make-Up Torques and Saver Sub Limitations For T-Series Top Drives

Background

Canrig's T-Series (Tesco) Top Drives are configured with a mud saver valve (MSV, aka LWCV, Lower Well Control Valve) and a saver sub installed below the quill, as shown in Figure 1. The saver sub is a consumable part used to repeatedly thread into drill pipe and drill collars, and should not be confused with a crossover sub.

This bulletin presents the recommended torques that these connections should be make up to, prior to operating the equipment.

This bulletin also presents strength limitation for some of Canrig's standard saver subs. For some top drive models, the maximum torque output of the top drive exceeds the strength of Canrig's standard saver sub.

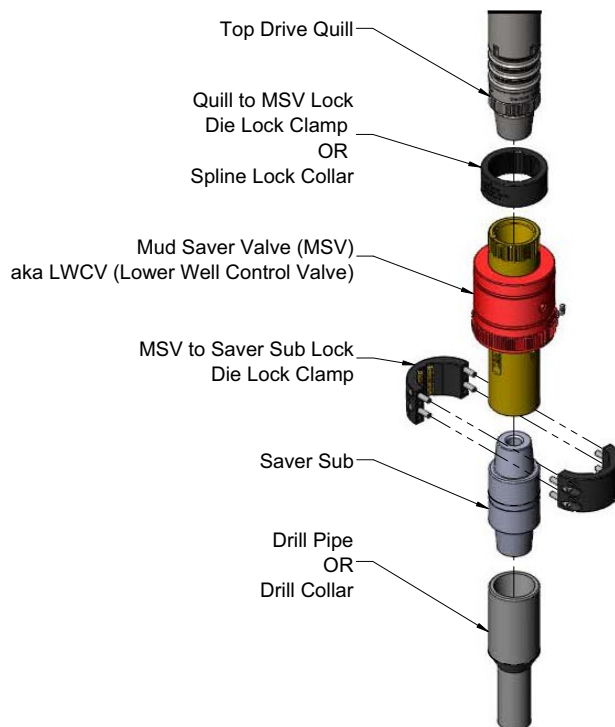


Figure 1: MSV, Saver Sub, and Connection Lock Layout on Top Drives



Model: T-Series Top Drives	Jun. 3, 2022
Serial #: N/A	

Connection locks (i.e., die lock clamps and spline lock collars) are used to secure these connections, and make sure that they do not accidentally back out when break-out torque is applied. They are not intended to allow a torque greater than the make-up torque to be transferred through the connection.

Affected Product Lines

Canrig Top Drive Models

- 250-HMI-475
- 150/250-HXI-700
- 250-EMI-400 (aka T250)
- 350/400-EXI-600/800 (aka T350/T350HT)
- 500/600-HCI-750/1205
- 500/600/750-ECI-900/1350
- 500/750-ESI-1000/1350 (aka T500/T500HT)

The above top drive models use a mud saver valve with one of the below Canrig part numbers:

- 720534
- 720475
- 720686
- 5005849
- 820265
- 5011671



Model: T-Series Top Drives Serial #: N/A	Jun. 3, 2022
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Recommendations

Refer to Table 1 for Canrig's recommendations for the make-up torque of the quill-to-MSV and MSV-to-saver sub connections for each top drive model. Verify that the top drive model, horsepower, gear ratio, MSV part number and thread size of your top drive match those shown in Table 1. If any of these top drive characteristics do not match what is shown, these recommended torque values are not applicable.

The 500-HCI, 500-ECI, 650-ECI-1350 and 500-ESI top drives can produce torque that exceeds the capacity of Canrig's standard saver subs, considering their hoisting rating. The following make-up torque recommendations take the torque capacity of the saver sub into consideration. For these effected top drives models, the torque capacity of standard saver subs are shown in the last line of Table 1. If your operations require forward drilling/make-up torque in excess of the limits shown in Table 1, contact RIGLINE 24/7™ for information on alternate saver subs and make-up torque recommendations.



Table 1: Recommended Make-Up Torque for Quill-to-MSV and MSV-to-Saver Sub Connections

Top Drive Model	250-HMI		150/250-HXI	250-EMI		500-HCI		500-ECI		650-HCI		650-ECI		350/400-EXI		500-ESI		750-ECIX	750-ESI
Horsepower	475 HP		700 HP	400 HP		750 HP	1205 HP	900 HP	1350 HP	750 HP	1205 HP	900 HP	1350 HP	600 HP	800 HP	1000 HP	1350 HP	1350 HP	1350 HP
Gearbox Ratio	2.19:1	1.64:1	2.28:1	10.96:1	12.47:1	2.76:1		18.61:1		2.76:1		18.61:1		11.11:1		8:1		18.61:1	8:1
Hoisting Rating through Load Collar	250 US Tons		150 or 250 US Tons	250 US Tons		500 US Tons		500 US Tons		650 US Tons		650 US Tons		350 or 400 US Tons		500 US Tons		750 US Tons	750 US Tons
Hoisting Rating through Quill/MSV	209 US Tons					350 US Tons		350 US Tons											
Max Drilling Torque (lb-ft)	18,136	13,602	24,000	21,166	22,940	44,600	52,800	39,000	58,500	44,600	52,800	39,000	58,500	30,000	37,500	52,000	72,000	58,500	72,000
Max Make-Up Torque (lb-ft)				27,848	30,975							46,500	69,500			46,500	69,500	39,000	48,000
Max Break-Out Torque (lb-ft)	20,727	15,545	32,000	30,729	34,417	55,150	59,400	57,000	85,500	55,150	59,400	57,000	85,500	45,000	56,000	78,000	100,000	85,500	100,000
MSV Part #	720534		720475						720686						5005849		820265	5011671	
Quill to MSV Thread	NC40 (4 FH)		NC50 (4-1/2 IF)						NC61						NC61		NC70	NC77	
MSV to Saver Sub Thread									6-5/8 Reg						6-5/8 Reg				
Recommended Make-Up Torque between Quill and MSV (lb-ft)	15,000	12,500	*20,000 to 25,000	*20,000 to 25,000	*22,000 to 27,000	*33,000 to 38,000				42,000	46,000	44,000	55,000	33,000	42,000	*50,000 to 60,000	*55,000 to 65,000	*60,000 to 68,000	
Recommended Make-Up Torque between MSV and Saver Sub (lb-ft)			**Same as above	**Same as above	**Same as above	**Same as above										**Same as above	**Same as above	**Same as above	**Same as above
Torque Limit of Standard Saver Sub (lb-ft)	N/A	N/A	N/A	N/A	N/A	38,000				N/A	N/A	N/A	55,000	N/A	N/A	60,000	N/A	N/A	

MSV = Mud Saver Valve

* For splined connections, a range is given for the recommended make-up torque. This is to facilitate the installation of the spline lock. Torque the connection to the lower value given. Try to install the spline lock. If it does not go, continue increasing torque while trying to install spline lock. If you reach the upper torque value and the spline lock cannot be installed, break out the connection and try again.

** Torque MSV to Saver Sub connection to the same torque that was applied to the Quill to MSV Connection.

Refer to Top Drive Maintenance Guide for procedure "Install the Mudsaver Valve".

Refer to Top Drive Operation Guide for procedure "Install the Saver Sub and Die Lock Clamp".

WARNING Verify the Top Drive Model, Horsepower, Gear Ratio, MSV Part # and the Thread Size. If any of these top drive characteristics do not match what is shown on the above table, these recommended torque values are not applicable.

Disclaimer:

The recommendations and ratings presented here relate to the Quill to MSV and MSV to Saver Sub connections only. As many Saver Subs have a reduced pin size on the lower end for connection to the drill pipe, the torque and hoisting ratings of those connections are separate from this report. We take no responsibility for the rating of the lower end of Saver Subs.