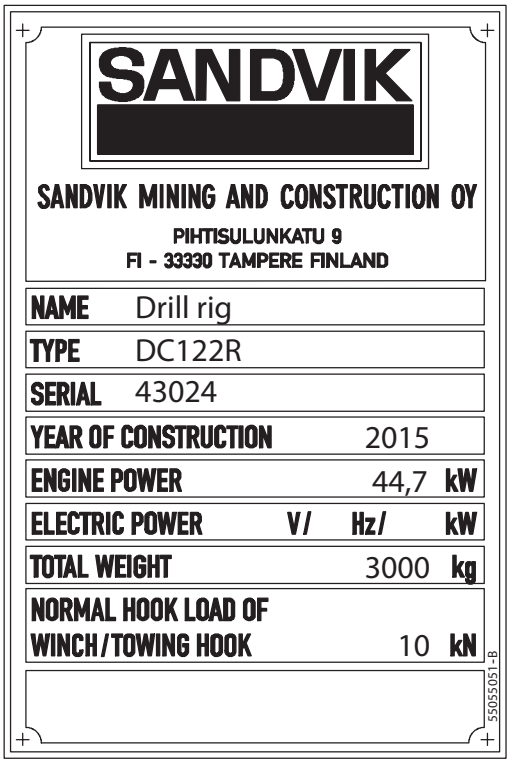
MAINTENANCE MANUAL



When there is a need for an operator or helper to work on the rig in the working area or danger zone and this involves activation of one or several machine functions such work shall only be done under the following conditions:

- there shall always be two people present, both being fully instructed on the safety issues. One of them shall supervise, from the main operator‘s position, the safety of the service man doing the work.
- the supervisor shall have immediate access to an emergency stop in all situations.
- the area where the service work is to be carried out shall be properly illuminated.
- communication between the service man and supervisor at the main operator’s position shall be established in a reliable manner.
- only when the drill rig is shut down completely and the means of starting are isolated is a person allowed to perform repair and maintenance work alone on the drill rig.

Original instructions

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Technical tables; Measurement conversions and tightening torques

SANDVIK

Technical tables; Measurement conversions and tightening torques

⚠ WARNING	
	**IGNORING INSTRUCTIONS HAZARD!** **To avoid death or injury you MUST read, understand and follow operator's and maintenance manuals before installing, inspecting, operating, servicing, testing, cleaning, transporting, storing, dismantling or disposing of the product or a part or accessory of the product.**

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1 TECHNICAL TABLES

1.1 Tightening torques for bolts and nuts

The table below shows tightening torques for the bolts and nuts. Don't exceed the given values.

Always use the good quality tools to avoid personal injuries.

Sandvik general tightening torques without any lubrication or thread lock.

Thread	Strength of bolt with Nordlock		
	8.8	**10.9**	**12.9**
M12	100 Nm	150 Nm	170 Nm
M14	160 Nm	240 Nm	270 Nm
M16	250 Nm	370 Nm	420 Nm
M18	340 Nm	510 Nm	580 Nm
M20	490 Nm	730 Nm	830 Nm
M22	660 Nm	990 Nm	1120 Nm
M24	840 Nm	1260 Nm	1430 Nm

Thread	Strength of bolt without Nordlock		
	8.8	**10.9**	**12.9**
M12	80 Nm	120 Nm	130 Nm
M14	125 Nm	188 Nm	210 Nm
M16	190 Nm	280 Nm	320 Nm
M18	260 Nm	390 Nm	440 Nm
M20	370 Nm	550 Nm	630 Nm
M22	500 Nm	750 Nm	850 Nm
M24	640 Nm	960 Nm	1090 Nm

- Values above are for bolts and nuts which have metric ISO - thread.

All specified tightening torques in other manuals are special cases, which must be used instead of these values.

1.2 Metric measurement conversions

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
in	inch	2,54	centimeter	cm
in	inch	25,4	millimeter	mm
ft	foot	30,48	centimeter	cm
ft	foot	0,3048	meter	m
mm	millimeter	0,04	inch	in
cm	centimeter	0,4	inch	in
m	meter	3,28	foot	ft
AREA				
in^2	square inch	645,16	square millim.	mm^2
ft^2	square foot	0,0929	square meter	m^2
MASS				
lb	pound	0,454	kilogram	kg
kg	kilogram	2,203	pound	lb
PRESSURE				
psi	pound/sq.in.	0,069	bar	bar
psi	pound/sq.in.	0,0069	mega pascal	MPa (N/mm^2)
bar	bar	14,5	pound/sq.in.	psi
TORQUE				
ft.lbs	foot pound	1,356	Newton-meter	Nm
Nm	Newton-meter	0,737	foot pound	ft.lbs
kNm	kiloNewton-m.	737	foot pound	ft.lbs
VOLUME				
gal	gallon (US)	3,79	liter	l
l	liter	0,26	gallon (US)	gal
in^3	cubic inch	16387	cubic millim.	mm^3
ft^3	cubic foot	0,02832	cubic meter	m^3
FLOW				
gal/min	gallon (US) / min	3,79	liter/min	l/min
l/min	liter/min	0,29	gallon (US) / min	gal/min

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Technical tables; Measurement conversions and tightening torques

Symbol	When You Know	Multiply By	To Find	Symbol
FORCE				
N	Newton	0,2245	pound	lb
kN	kiloNewton	224,5	pound	lb

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