ENERPAC

Instruction Sheet

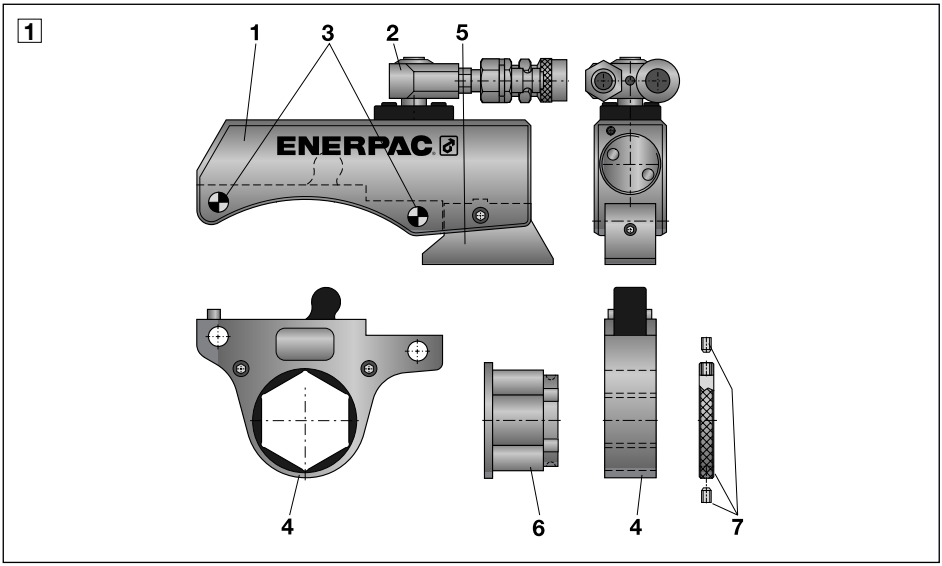
Hydraulic Torque Wrenches
HXD Series

EIS 59.112-2 05/01 Rev. B

CE

Index:

From left to right: **HR-46, CC-360, IN3-6046, HXD-30**



1.0 RECEIVING INSTRUCTIONS

Visually inspect all components for shipping damage. Shipping damage is not covered by warranty. If shipping damage is found notify carrier at once. The carrier is responsible for all repair and replacement costs resulting from damage in shipment.

SAFETY FIRST

Read all instructions, warnings and cautions carefully. Follow all safety precautions to avoid personal injury or property damage during system operation. Enerpac cannot be responsible for damage or injury resulting from unsafe use of product, lack of maintenance or incorrect product and/or system operation. Contact Enerpac when in doubt as to the safety precautions and applications. To protect your warranty, use only enerpac hydraulic oil.

A **CAUTION** is used to indicate correct operating or maintenance procedures and practices to prevent damage to, or destruction of equipment or other property.

A **WARNING** indicates a potential danger that requires correct procedures or practices to avoid personal injury.

A **DANGER** is only used when your action or lack of action may cause serious injury or even death.

✗ This icon is used in illustrations to express **WRONG**, not allowed and dangerous product use and application.

✓ This icon is used in illustrations to express the **CORRECT**, safe product use and application.

A box around a number or letter, such as 1 and B1, refers to an illustration or table number in this instruction sheet.

2.0 PRODUCT DESCRIPTION

The Enerpac HXD torque wrench is a double-acting hand-controlled hydraulic tool designed to tighten and loosen bolted connections. Any unauthorized change in design, construction or usage of the torque wrench is forbidden for safety reasons and will void the Enerpac warranty.

The hydraulic pressure applied to the wrench is converted into torque by means of a hydraulic cylinder and a drive lever.

See 1. The HXD torque wrench consists of a wrench body (1) with 360° swivel hose connection (2), two dowel pins (3) and integrated support arm (5).

The CC-Interchangeable Cassette (4) must be ordered separately as well as IN-Hexagon reducer inserts (6) and HR-Holding rings (7).

Advance and retract oil flow on the pump must be controlled by electric valves with cables or pneumatic valves with air hoses, so that at any time control is possible of the Enerpac wrench.

The advance pressure (**A or P**) from the pump to the wrench must be limited to a maximum 800 bar [11,600 psi]. The pressure relief valve at the retract side (**B or T**) of the pump must be set to a maximum 120 bar [1740 psi]. See tables A, B, C and D on the pages 12-19 for detailed information.

3.0 SAFETY ISSUES

Failure to comply with the following cautions and warnings could cause equipment damage and personal injury.

IMPORTANT: Minimum age of the operator must be 18 years. The operator must have read and understood all instructions, safety issues, cautions and warnings before starting to operate the Enerpac torque wrench. The operator is responsible for his activity towards other persons.

WARNING: To avoid personal injury and possible equipment damage, make sure all hydraulic components withstand the maximum pressure of 800 bar [11,600 psi].

IMPORTANT: Minimize the risk of overloading. Use hydraulic gauges in each hydraulic system to indicate safe operating loads. It is your window to what is happening in the system.

WARNING: Do not overload equipment. Overloading causes equipment failure and possible personal injury.

CAUTION: Make sure that all system components are protected from external sources of damage, such as excessive heat, flame, moving machine parts, sharp edges and corrosive chemicals.

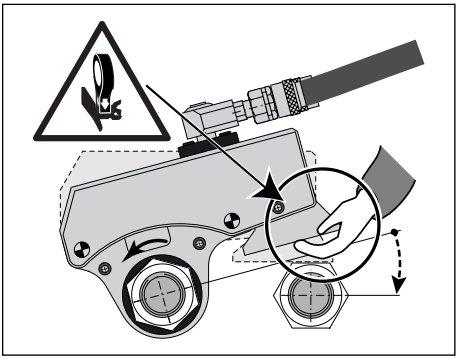
CAUTION: Avoid sharp bends and kinks that will cause severe back-up pressure in hoses. Bends and kinks lead to premature hose failure.

WARNING: Immediately replace worn or damaged parts with genuine Enerpac parts. Enerpac parts are designed to fit properly and withstand rated loads.

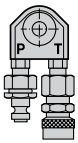
WARNING: Always wear safety glasses. The operator must take precaution against injury due to failure of the tool or workpiece.

DANGER: Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin, causing serious injury. If oil is injected under the skin, see a doctor immediately.

WARNING: Never pressurize uncoupled couplers. Only use hydraulic equipment in a coupled system.



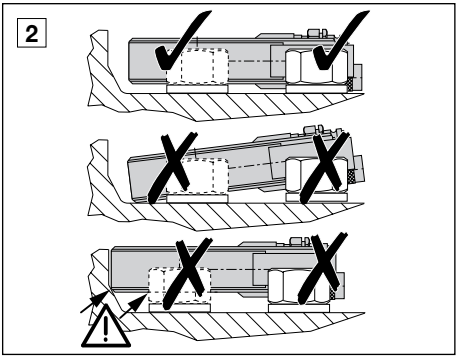
WARNING: To avoid personal injury, keep hands away from support arm and working area during operation.

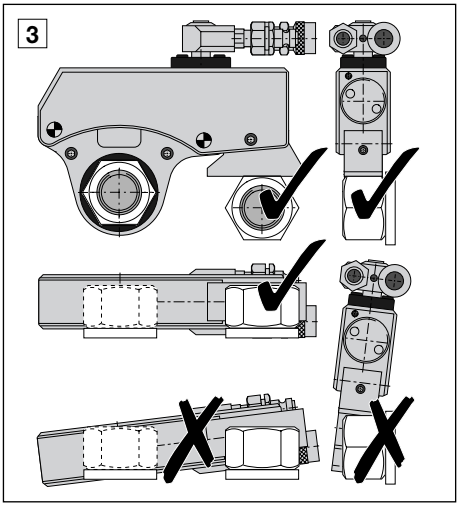


CAUTION: Incorrectly connected hoses cause malfunctions and are hazardous. See **10** on page 7. Do not change coupler positions on wrench equipment. Clean coupler halves before connecting. Use dustcaps after disconnecting.

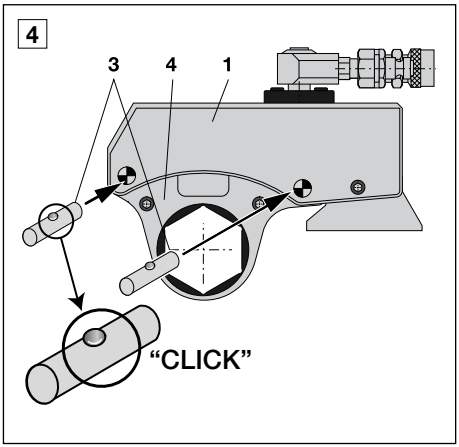
IMPORTANT: Enerpac THC-700 series 3,5:1 safety twin hoses must be used with double-acting torque wrenches.

IMPORTANT: Do not lift hydraulic equipment by the hoses or swivel couplers. Use the carrying case or other means of safe transport.

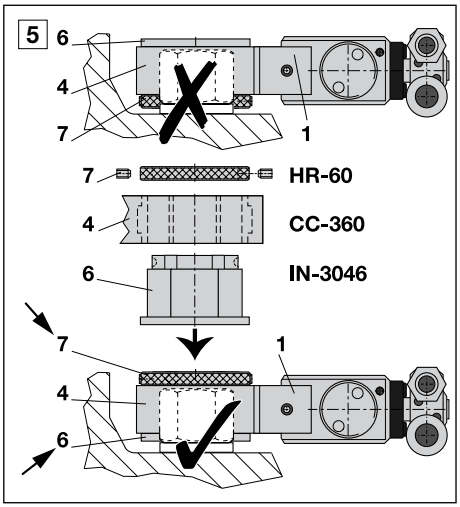




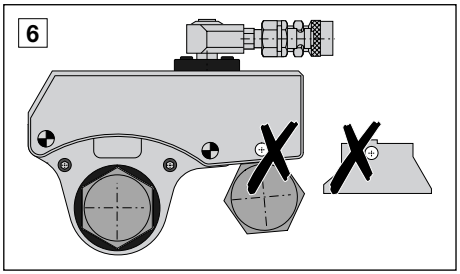
CAUTION: **2+3** Do not use worn or damaged cassettes or reducer inserts. They must fit precisely on the nut or bolt being torqued. Do not use metric size cassettes and reducer inserts on imperial bolt heads and nuts or reverse. Avoid tilting the wrench.



WARNING: **4** Always secure the interchangeable cassette (4) in the wrench (1) using the two dowel pins (3) to prevent from slipping off the wrench. Both dowel pins must "click" into the correct position.

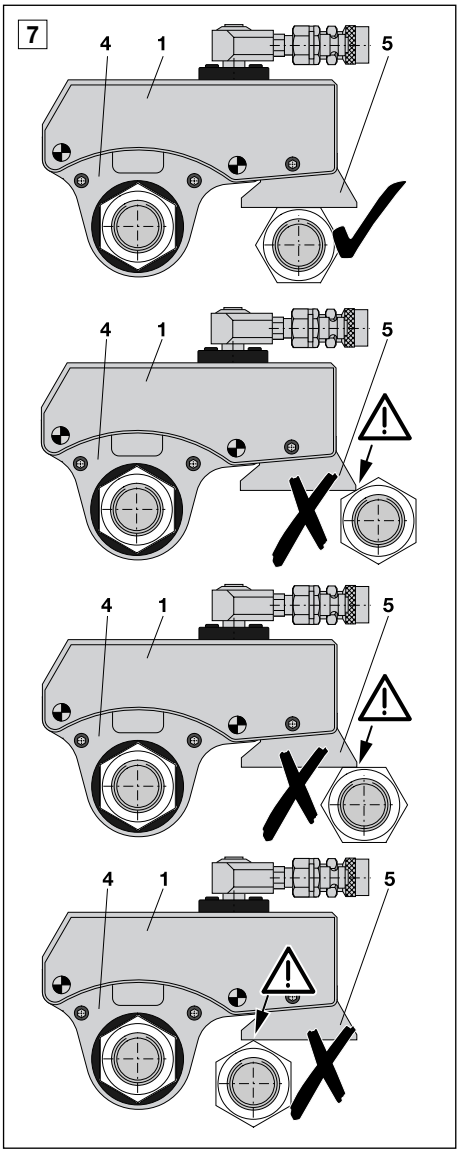


CAUTION: 5 Always secure the reducer insert (6) with the holding ring (7) to the cassette (4) to prevent from slipping. The collar of the reducer insert (6) must face the nut or bolt being torqued.



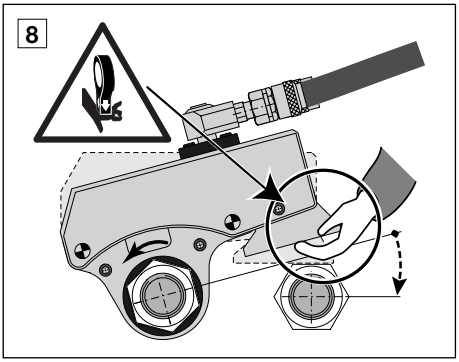
WARNING: 6 To avoid damage and personal injury, do not remove the support arm or modify the wrench, its accessories or change the safety valve setting on the swivel hose connection.

CAUTION: 6 + 7 The wrench must be properly positioned manually to make sure the reaction force is safely transmitted via the support arm (5) and not via other torque wrench parts. Do not use the torque wrench without the support arm.



IMPORTANT: 7 The wrench must react against a stationary object.

DANGER: Never react off loose pieces. The force of the wrench could cause loose pieces to become flying objects.



WARNING: 8 To avoid personal injury keep hands away from support arm and working area during operation.

IMPORTANT: 8 The torque wrench always rotates in the direction opposite the rotation of the cassette.

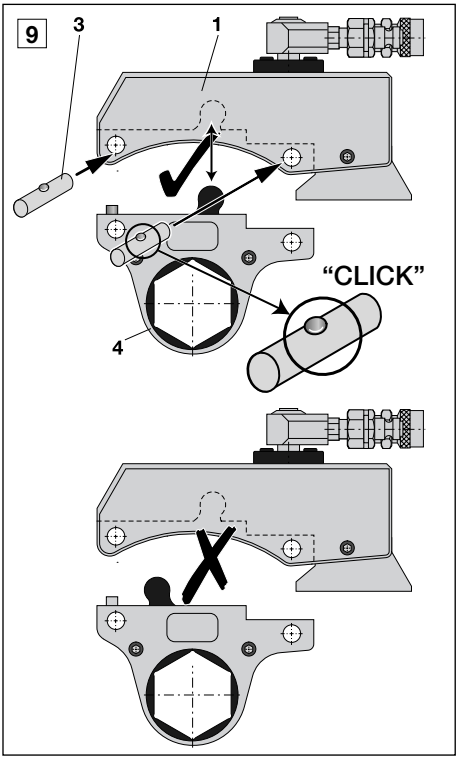
WARNING: Do not exceed maximum torque of cassettes and reducer inserts to avoid danger of cassette failure and bolt-shearing. Maximum torque of cassettes and reducer inserts are specified in tables A1 and A2 on pages 12-15.

WARNING: Exceeding the maximum torque for a bolt (nut) size will result in bolt shearing and potential parts failure. These failures could result in pieces being projected from the wrench or bolting site. Failures will also result in the torque wrench unit moving rapidly away from the torquing point causing potential injury to the operator.

IMPORTANT: When making bolted connections always consult the manufacturers instructions or the engineering recommendations.

4.0 ASSEMBLING THE WRENCH

See 9. All parts must be free of dirt and lubricated according TO paragraph 6.1. Follow steps 1-5 below:



1. Remove the two dowel pins (3) from the wrench unit (1).
2. The lever of the cassette (4) must face the contact surface in the wrench (1).
3. Insert the cassette (4) into the wrench unit (1).
4. Secure the cassette (4) to the wrench unit (1) using the two dowel pins (3). The dowel pins must "click" into the correct position.
5. When using reducer inserts, see illustration 5 on page 5, for correct position of insert and holding ring into the cassette.
6. Connect the Enerpac THC-700 series 3,5:1 safety twin hoses (10) to the swivel hose connection (2).

   WARNING: See 10 on page 7 for the correct way to connect the hoses between wrench and pump.

5.0 CONNECTING THE WRENCH TO THE PUMP

Enerpac torque wrenches can be powered by a range of electric or air-driven torque wrench pumps. For complete operating instructions, refer to the instruction sheet included with each Enerpac pump.

IMPORTANT: It is mandatory that the operator has a full understanding of all instructions, safety regulations, cautions and warnings, before starting to operate any of this high force tool equipment. To ensure correct pump and wrench control it is recommended to use an Enerpac torque wrench pump. When in doubt, contact Enerpac.

IMPORTANT: Minimum age of the operator must be 18 years. The operator is responsible for his activity towards other persons.

ATTENTION: In case of a interrupted current or a failure of the pump, switch off the motor and disconnect the wrench from the pump.

DANGER: Do not use electric-powered pumps in hazardous environments where explosion-proof equipment is required. Enerpac air driven torque wrench pumps can be used in this case.

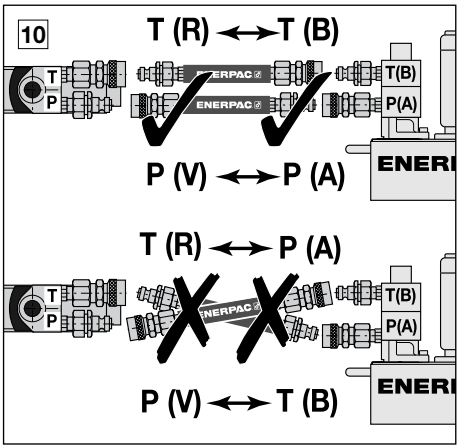
5.1 Follow the procedure below:

1. During initial operation or start-up.
2. When changing a wrench on same pump.
3. When different torque values are needed, using the same pump: for instance using various interchangeable cassettes or reducer inserts on the same wrench (tables **A1** and **A2** on pages 12-15).

5.2 Pump requirements

The advance pressure (**P or A**) from pump to wrench must be limited to a maximum 800 bar [11,600 psi]. The pressure relief valve at the retract side (**B or T**) of the pump must be set to a maximum 120 bar [1740 psi].

IMPORTANT: Maximum oil flow to the torque wrench: 12 l/min @ 140 bar [732 in^3/min @ 2030 psi] and 2 l/min @ 800 bar [122 in^3/min @ 11600 psi].



IMPORTANT: See **10**. Make sure all couplers and hoses are fully connected and oil can flow freely from (**P to P**) and (**T to T**). Incorrectly mounted couplers can still be closed, with the result that oil on the wrenchs' retract side (**T or R**) can be pressurized by the advance side (**P or V**). The safety valve in the retract side (**T or R**) of the wrench (2) will open and vent oil to prevent over-pressurization. This valve is factory set at 225 - 300 bar [3260 - 4350 psi].

5.3 Bleeding air from the system

During first-time operation, the hydraulic system is filled with air. Remove air by connecting the THC-700 series hoses to each other and cycling the pump using the remote control. If the torque wrench is connected, air can also be removed by cycling the wrench several times.

5.4 Pressure and torque setting

Read the pump instructions. Without placing the wrench on the bolt or nut, operate the pump in the advance direction.

IMPORTANT: Before using the pump with the torque wrench on a bolt or nut make a functional test at maximal 100 bar [1450 psi].

Set the required torque by adjusting the pressure relief valve on the advance side (**P**) of the pump and reading the value on the pressure gauge.

When making bolted connections always consult the manufacturers instructions or the engineering recommendations.

Pressure setting can be adjusted between 40 - 800 bar [580 - 11600 psi]. Adjust the pressure relief valve setting by turning the spindle on the pump:

- clockwise = higher pressure (torque)
- counter-clockwise = lower pressure (torque)

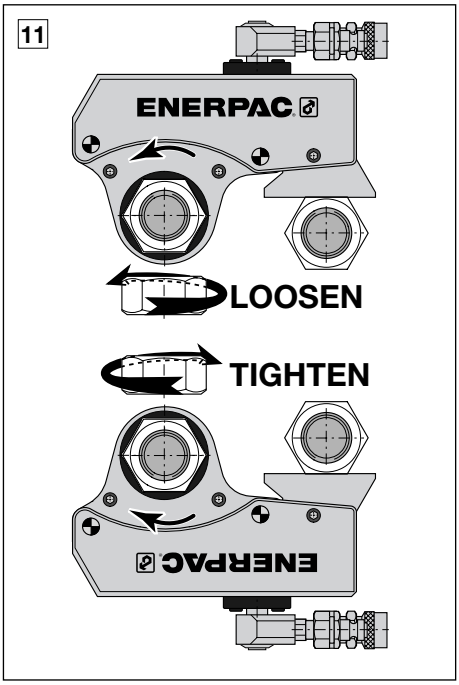
Set the torque by consulting the tables **A**, **B** and **C** on pages 12-18 in this instruction sheet, or pressure versus torque chart included with each wrench. If using various cassettes or reducer inserts on the same wrench consult the tables **A1** and **A2** on pages 12-15 for maximum torque.

5.5 Loosening and tightening

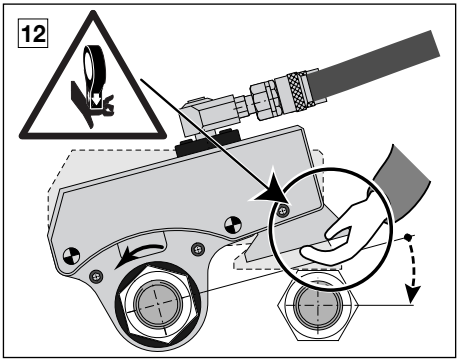
WARNING: Switch off the pump before changing cassettes, reducer inserts or wrench position.

Before positioning the wrench on the bolt or nut, assemble according to paragraph 4.0.

See **11** for correct wrench position. Make sure pump is not running. Pre-tension the bolt manually by using the wrench. See safety issues **2** to **10**. Place the wrench on the bolt connection so that the bolt head or nut is fully enclosed by the wrench.



5.6 Determining the reaction point



WARNING: **12** To avoid personal injury keep hands away from support arm and working area during operation.

DANGER: Never react off loose pieces. The force of the wrench could cause loose pieces to become flying objects.

IMPORTANT: The torque wrench always rotates in the direction opposite the rotation of the cassette. See 12.

CAUTION: 12 Do not obstruct the wrench movement against reaction point. Keep hands, hoses and swivel connection away from support arm area.

5.7 Loosening and tightening (continued)
To tighten, operate the pump in the advance direction by pressing the advance button – refer to pump instructions. The wrench performs it angular rotation until it reaches the end of its rotation cycle. When the wrench stops, release the advance button to allow the wrench to automatically retract. You will know when it have fully retracted as you will not hear a ratcheting (clicking) sound. Repeat this operation until the cassette no longer rotates.

ATTENTION: The cassette should not be rotating during retract cycle.

IMPORTANT: After reaching the preset pressure (torque), the torque wrench will no longer rotate while the gauge will read the preset pressure value. Monitor the pressure gauge on the pump to verify that the bolt/nut connection has been tightened to the preset torque values.

If a bolt or nut does not loosen, the torque (pressure) may be increased. Do not exceed:
- maximum torque for the bolt (nut) size to avoid danger of bolt-shearing;
- maximum pressure (torque) for the various cassettes and reducer inserts to avoid danger of bolt-shearing and cassette failure. Maximum torque of cassettes and reducer inserts are specified in tables A1 and A2.
- maximum pressure 800 bar [11,600 psi].

WARNING: Exceeding the maximum torque for a bolt (nut) size will result in bolt shearing and potential parts failure. These failures could result in pieces being projected from the wrench or bolting site. Failures will also result in the torque wrench unit moving rapidly away from the torquing point causing potential injury to the operator.

IMPORTANT: When making bolted connections always consult the manufacturers instructions or the engineering recommendations.

We recommend the use of special loosening liquids or sprays. Enerpac offers nutsplitters in case a nut can not be removed. Contact your Enerpac representative.

6.0 MAINTENANCE AND SERVICE

IIMPORTANT: To safeguard the accuracy of the torque values, the torque wrench and pressure gauge on the pump must be checked on a regular basis. Contact Enerpac for calibration.

Repairs must be made by the manufacturer, as after an exchange of parts, the accuracy of the torque and the wrench functions must be checked.

Maintenance is required when wear and/or leakage is noticed. Regularly inspect all components to detect any problem requiring service and maintenance. Contact Enerpac for repair and/or replacements.

To prolong the life of your torque wrench equipment, follow points below:
- Do not exceed oil temperature of 65˚C (150˚F).
- Regularly check the pump's oil level and condition. Consult pump instructions.

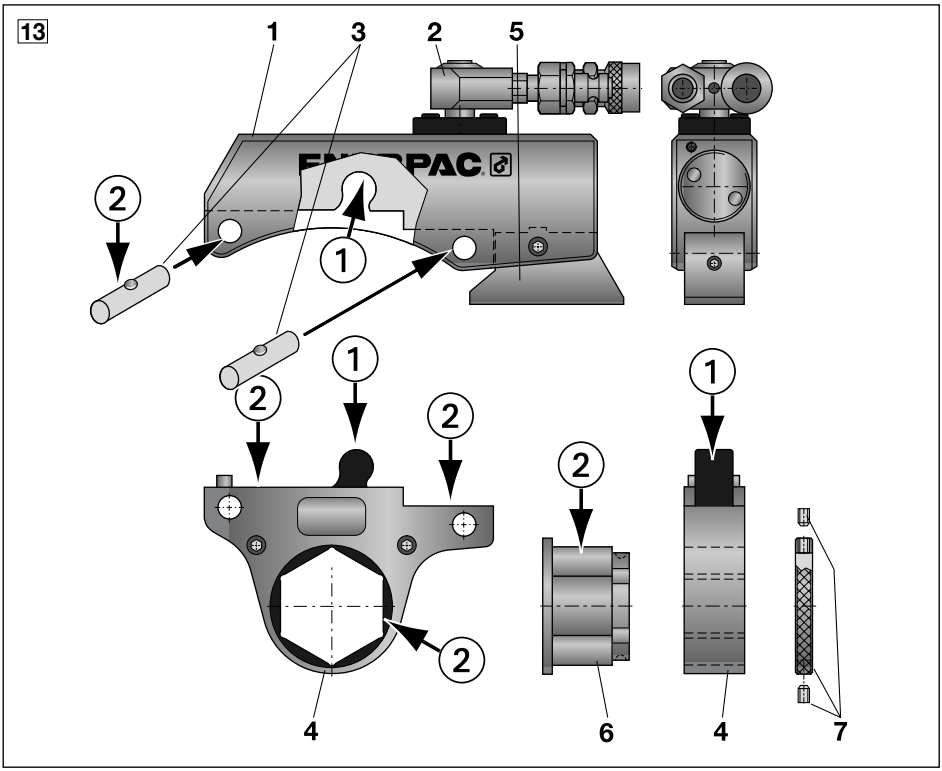
- Follow the lubrication scheme in paragraph 6.1.
- Lubrication may influence torque accuracy and life-time of the wrench. Always clean and lubricate after usage and store in the carrying case.
- Clean the cassette with each cassette change and lubricate the lever surface with Gleitmo 805 only.

6.1 Lubrication

Follow the scheme below. The icons ① and ② refer to parts or surfaces of the wrench in illustration **13**.

- Clean surface ① and grease with Gleitmo 805 only. Available at Enerpac as Torque Wrench Grease **EN-14010**.
- Keep surface ② clean and dry. Do not lubricate.

IMPORTANT: Do not disassemble the wrench unit (1) and the cassette (4). Do not immerse these parts in oil, kerosene or other cleaning liquid to prevent dirt from flushing in and grease from being dissolved.

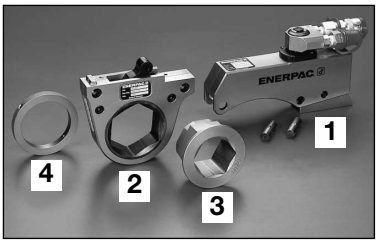


7.0 TROUBLESHOOTING

The table below is intended to be used as an aid in determining if a problem exists.

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. No pressure build-up at wrench, and/or wrench will not advance.	A. No power supply or air supply.	A. Plug in all connections.
	B. Pump motor does not rotate due to wrong voltage supply.	B. Check voltage setting
	C. Blown out fuses (E-motor)	C. Replace fuses.
	D. Direction of electric motor rotation not correct.	D. Change wiring of power cable.
	E. Couplers at pump and wrench side not completely connected.	E. Depressurize the hoses and switched off pump, retighten couplers by hand.
	F. Oil level in pump too low	F. Add oil. See pump instructions.
	G. Pressure setting of relief valve on pump too low.	G. Increase pressure by adjusting pump relief valve. Do not exceed max. pressure or torque.
	H. Leakage in pump or wrench.	H. Determine if leakage is in the pump or the wrench. Contact your Enerpac Service Center for assistance.
	I. Defective pressure gauge.	I. Connect a second glycerine filled pressure gauge, adjust pressure on pump and check both gauge values.
	J. Incorrectly mounted hoses.	J. Change hose positions according to illustration **10** on page 7: (**P** to **P**) and (**T** to **T**).
2. Safety valve at retract side (**T**) of wrench opens.	A. Couplers at retract side of wrench and pump not completely connected.	A. When pump is running, switch, using the remote control, the valve position from (**P or A**) to (**T or B**) and reverse to depressurize the system. Switch off the pump and tighten couplers by hand.
	B. Incorrectly mounted hoses.	B. Change hose positions according to illustration **10** on page 7: (**P** to **P**) and (**T** to **T**).
3. Hoses can not be disconnected from wrench or pump.	A. Pressure remaining in double-acting hydraulic system.	A. When pump is running, switch, using the remote control, the valve position from (**P or A**) to (**T or B**) and reverse to depressurize the system. Switch off the pump and disconnect the hoses.
	B. Hydraulic system too warm.	B. Cool the hydraulic system, protect it against heat and repeat solution 3A above to disconnect hoses.

From left to right: **HR-46, CC-360, IN3-6046, HXD-30**



Torque Wrench Selection in 4 steps:

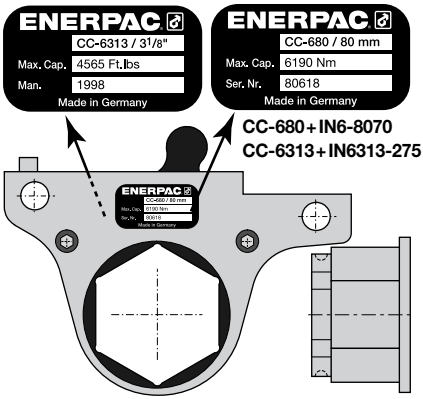
1. Select the HXD Drive Unit.
2. Select the CC Cassette.
3. Select the IN Reducer Insert that fits the CC Cassette.
4. Select the corresponding HR Holding Ring to secure the reducer insert in the Cassette.

TABLE A1, MAXIMUM TORQUE OF CASSETTES AND REDUCER INSERTS, METRIC

Drive Unit		Interchangeable Cassettes, metric						Reducer Inserts, metric			
Model Number	Torque Wrench Code	Hexagon Size (mm)	* Maximum Torque (Nm)	* Maximum Torque (Ft.lbs)	D (mm)	Model Number	Weight (kg)	Hexagon Size (mm)	Model Number	Hexagon Size (mm)	Model Number
		32	**1700**	1250	28,5	**CC-332**	0,55	–	**–**	–	**–**
		36	**2100**	1545	31,5	**CC-336**	0,65	–	**–**	–	**–**
HXD-30		41	**2500**	1840	34,5	**CC-341**	0,70	41 / 36	**IN3-4136**	41 / 32	**IN3-4132**
3290 Nm	**R**	46	**2890**	2130	38,5	**CC-346**	0,80	46 / 41	**IN3-4641**	46 / 36	**IN3-4636**
2425 Ft.lbs		50	**3290**	2425	42,0	**CC-350**	0,95	50 / 46	**IN3-5046**	50 / 41	**IN3-5041**
		55	**3290**	2425	45,0	**CC-355**	1,00	55 / 50	**IN3-5550**	55 / 46	**IN3-5546**
		60	**3290**	2425	47,5	**CC-360**	1,05	60 / 55	**IN3-6055**	60 / 50	**IN3-6050**
		41	**3840**	2830	34,5	**CC-641**	1,20	41 / 36	**IN6-4136**	–	**–**
		46	**4805**	3540	39,5	**CC-646**	1,30	–	**–**	–	**–**
		50	**5410**	3990	43,5	**CC-650**	1,45	50 / 46	**IN6-5046**	50 / 41	**IN6-5041**
HXD-60		55	**5410**	3990	46,5	**CC-655**	1,50	55 / 50	**IN6-5550**	55 / 46	**IN6-5546**
6190 Nm	**S**	60	**5410**	3990	48,5	**CC-660**	1,55	60 / 55	**IN6-6055**	60 / 50	**IN6-6050**
4565 Ft.lbs		65	**6190**	4565	52,5	**CC-665**	1,85	65 / 60	**IN6-6560**	65 / 55	**IN6-6555**
		70	**6190**	4565	55,5	**CC-670**	1,90	70 / 65	**IN6-7065**	70 / 60	**IN6-7060**
		75	**6190**	4565	57,5	**CC-675**	1,95	75 / 70	**IN6-7570**	75 / 65	**IN6-7565**
		80	**6190**	4565	60,5	**CC-680**	2,00	80 / 75	**IN6-8075**	80 / 70	**IN6-8070**
		55	**8000**	5900	46,5	**CC-1255**	2,65	55 / 50	**IN12-5550**	55 / 46	**IN12-5546**
		60	**8000**	5900	48,5	**CC-1260**	2,65	60 / 55	**IN12-6055**	60 / 50	**IN12-6050**
		65	**9800**	7225	52,5	**CC-1265**	2,75	65 / 60	**IN12-6560**	65 / 55	**IN12-6555**
		70	**9800**	7225	55,5	**CC-1270**	2,80	70 / 65	**IN12-7065**	70 / 60	**IN12-7060**
HXD-120		75	**9800**	7225	57,5	**CC-1275**	2,85	75 / 70	**IN12-7570**	75 / 65	**IN12-7565**
12500 Nm	**T**	–	**–**	–	–	**–**	–	–	**–**	–	**–**
9220 Ft.lbs		80	**10860**	8010	60,5	**CC-1280**	2,95	80 / 75	**IN12-8075**	80 / 70	**IN12-8070**
		85	**12500**	9220	64,5	**CC-1285**	3,55	85 / 80	**IN12-8580**	85 / 75	**IN12-8575**
		90	**12500**	9220	67,5	**CC-1290**	3,65	90 / 85	**IN12-9085**	90 / 80	**IN12-9080**
		95	**12500**	9220	70,5	**CC-1295**	3,70	95 / 90	**IN12-9590**	95 / 85	**IN12-9585**
		100	**12500**	9220	73,5	**CC-12100**	3,75	100 / 95	**IN12-10095**	100 / 90	**IN12-10090**
		80	**13890**	10245	62,0	**CC-2480**	5,1	80/75	**IN24-8075**	80/70	**IN24-8070**
		85	**16030**	11820	66,0	**CC-2485**	5,2	85/80	**IN24-8580**	85/75	**IN24-8575**
		90	**16560**	12215	69,0	**CC-2490**	5,2	90/85	**IN24-9085**	90/80	**IN24-9080**
		95	**17100**	12610	72,0	**CC-2495**	5,4	95/80	**IN24-9580**	95/85	**IN24-9585**
HXD-240		100	**18170**	13400	76,0	**CC-24100**	5,6	100/95	**IN24-10095**	100/90	**IN24-10090**
24210 Nm	**U**	105	**20840**	15370	80,0	**CC-24105**	5,7	105/100	**IN24-105100**	105/95	**IN24-10595**
17860 Ft.lbs		110	**24210**	17860	84,0	**CC-24110**	5,8	110/105	**IN24-110105**	110/100	**IN24-110100**
		115	**24210**	17860	87,0	**CC-24115**	7,1	115/110	**IN24-115110**	115/105	**IN24-115105**
		120	**24210**	17860	90,0	**CC-24120**	7,3	120/115	**IN24-120115**	120/110	**IN24-120110**
		125	**24210**	17860	93,0	**CC-24125**	7,3	125/120	**IN24-125120**	125/115	**IN24-125115**
		130	**24210**	17860	96,0	**CC-24130**	7,4	130/125	**IN24-130125**	130/120	**IN24-130120**

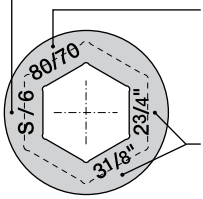
Reducer Inserts, metric			Holding Ring
Hexagon Size (mm)	Model Number	Torque Wrench Code	Model No.
–	–		–
–	–		–
41 / 30	IN3-4130		HR-41
46 / 32	IN3-4632	R	HR-46
50 / 36	IN3-5036		HR-50
55 / 41	IN3-5541		HR-55
60 / 46	IN3-6046		HR-60
–	–		HR-41
–	–		–
50 / 36	IN6-5036		HR-50
55 / 41	IN6-5541		HR-55
60 / 46	IN6-6046	S	HR-60
65 / 50	IN6-6550		HR-65
70 / 55	IN6-7055		HR-70
75 / 60	IN6-7560		HR-75
80 / 65	IN6-8065		HR-80
55 / 41	IN12-5541		HR-55
60 / 46	IN12-6046		HR-60
65 / 50	IN12-6550		HR-65
70 / 55	IN12-7055		HR-70
75 / 60	IN12-7560		HR-75
–	–	T	–
80 / 65	IN12-8065		HR-80
85 / 70	IN12-8570		HR-85
90 / 75	IN12-9075		HR-90
95 / 80	IN12-9580		HR-95
100 / 85	IN12-10085		HR-100
80/65	IN24-8065		HR-80
85/70	IN24-8570		HR-85
90/75	IN24-9075		HR-90
95/80	IN24-9580		HR-95
100/85	IN24-10085		HR-100
105/90	IN24-10590	U	HR-105
110/95	IN24-11095		HR-110
115/100	IN24-115110		HR-115
120/105	IN24-120105		HR-120
125/110	IN24-125110		HR-125
130/115	IN24-130115		HR-130

Cassette and Reducer Insert Torque Identification



Torque wrench code.
Refer to the **maximum torque** of each Cassette and Reducer Insert in Table B:

- **R/3** for HXD-30
- **S/6** for HXD-60
- **T/12** for HXD-120
- **U/24** for HXD-240



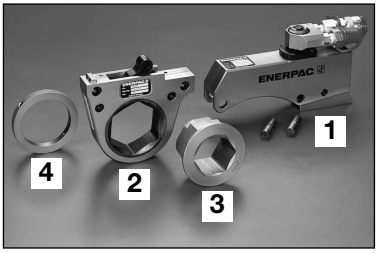
Reducer Insert size in millimeters

Reducer Insert size in inch

* **Determine maximum torque according to bolt (nut) size and grade.**

Consult the manufacturers instructions or engineering recommendations.

From left to right: **HR-46, CC-3181, IN3181-144, HXD-30**



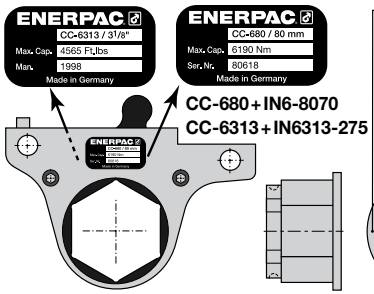
Torque Wrench Selection in 4 steps:

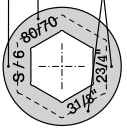
1. Select the HXD Drive Unit.
2. Select the CC Cassette.
3. Select the IN Reducer Insert that fits the CC Cassette.
4. Select the corresponding HR Holding Ring to secure the reducer insert in the Cassette.

TABLE A2, MAXIMUM TORQUE OF CASSETTES AND REDUCER INSERTS, IMPERIAL

Drive Unit		Interchangeable Cassettes, imperial						Reducer Inserts, imperial	
Model Number	Torque Wrench Code	Hexagon Size (inch)	* Maximum Torque (Ft.lbs)	* Maximum Torque (Nm)	D (inch)	Model Number	Weight (kg)	Hexagon Size (inch)	Model Number
HXD-30 2425 Ft.lbs 3290 Nm	R	1 1/4"	**1250**	1700	1.12"	**CC-3125**	1.2	–	**–**
		1 7/16"	**1545**	2100	1.24"	**CC-3144**	1.4	1 7/16" - 1 1/4"	**IN3144-125**
		1 5/8"	**1840**	2500	1.36"	**CC-3163**	1.5	1 5/8" - 1 7/16"	**IN3163-144**
		1 13/16"	**2130**	2890	1.52"	**CC-3181**	1.8	1 13/16" - 1 5/8"	**IN3181-163**
		2"	**2425**	3290	1.65"	**CC-3200**	2.1	2" - 1 13/16"	**IN3200-181**
		2 3/16"	**2425**	3290	1.77"	**CC-3219**	2.2	2 3/16" - 2"	**IN3219-200**
		2 3/8"	**2425**	3290	1.87"	**CC-3238**	2.3	2 3/8" - 2 3/16"	**IN3238-219**
HXD-60 4565 Ft.lbs 6190 Nm	S	1 5/8"	**2830**	3840	1.36"	**CC-6163**	2.6	–	**–**
		1 13/16"	**3540**	4805	1.56"	**CC-6181**	2.9	1 13/16" - 1 5/8"	**IN6181-163**
		2"	**3990**	5410	1.71"	**CC-6200**	3.2	2" - 1 13/16"	**IN6200-181**
		2 3/16"	**3990**	5410	1.83"	**CC-6219**	3.3	2 3/16" - 2"	**IN6219-200**
		2 3/8"	**3990**	5410	1.91"	**CC-6238**	3.4	2 3/8" - 2 3/16"	**IN6238-219**
		2 9/16"	**4565**	6190	2.07"	**CC-6256**	4.1	2 9/16" - 2 3/8"	**IN6256-238**
		2 3/4"	**4565**	6190	2.19"	**CC-6275**	4.2	2 3/4" - 2 9/16"	**IN6275-256**
		2 15/16"	**4565**	6190	2.26"	**CC-6293**	4.3	2 15/16" - 2 3/4"	**IN6293-275**
		3 1/8"	**4565**	6190	2.38"	**CC-6313**	4.4	3 1/8" - 2 15/16"	**IN6313-293**
HXD-120 9220 Ft.lbs 12500 Nm	T	2 3/16"	**5900**	8000	1.83"	**CC-12219**	5.8	2 3/16" - 2"	**IN12219-200**
		2 3/8"	**5900**	8000	1.91"	**CC-12238**	5.8	2 3/8" - 2 3/16"	**IN12238-219**
		2 9/16"	**7225**	9800	2.07"	**CC-12256**	6.1	2 9/16" - 2 3/8"	**IN12256-238**
		2 3/4"	**7225**	9800	2.19"	**CC-12275**	6.2	2 3/4" - 2 9/16"	**IN12275-256**
		2 15/16"	**7225**	9800	2.26"	**CC-12293**	6.3	2 15/16" - 2 3/4"	**IN12293-275**
		3"	**7225**	9800	2.26"	**CC-12300**	6.3	3" - 2 3/4"	**IN12300-275**
		3 1/8"	**8010**	10860	2.38"	**CC-12313**	6.5	3 1/8" - 2 15/16"	**IN12313-293**
		3 3/8"	**9220**	12500	2.54"	**CC-12338**	7.8	3 3/8" - 3"	**IN12338-300**
		3 1/2"	**9220**	12500	2.66"	**CC-12350**	8.0	3 1/2" - 3 1/8"	**IN12350-313**
		3 3/4"	**9220**	12500	2.78"	**CC-12375**	8.2	3 3/4" - 3 1/2"	**IN12375-350**
		3 7/8"	**9220**	12500	2.89"	**CC-12388**	8.3	3 7/8" - 3 1/2"	**IN12388-350**
HXD-240 17860 Ft. lbs. 24210 Nm	U	3 1/8"	**10325**	14000	2.44"	**CC-24313**	11,2	3 1/8" - 2 15/16"	**IN24313-293**
		3 3/8"	**11685**	15840	2.60"	**CC-24338**	11,4	3 3/8" - 3 1/8"	**IN24338-313**
		3 1/2"	**12225**	16570	2.71"	**CC-24350**	11,4	3 1/2" - 3 1/8"	**IN24350-313**
		3 3/4"	**12775**	17320	2.83"	**CC-24375**	11,9	3 3/4" - 3 1/2"	**IN24375-350**
		3 7/8"	**13315**	18050	2.99"	**CC-24388**	12,3	3 7/8" - 3 1/2"	**IN24388-350**
		4 1/8"	**15490**	21000	3.15"	**CC-24413**	12,5	4 1/8" - 3 7/8"	**IN24413-388**
		4 1/4"	**17860**	24210	3.30"	**CC-24425**	14,9	4 1/4" - 3 7/8"	**IN24425-388**
		4 5/8"	**17860**	24210	3.54"	**CC-24463**	16,0	4 5/8" - 4 1/4"	**IN24463-425**
		5"	**17860**	24210	3.78"	**CC-24500**	16,3	5" - 4 5/8"	**IN24500-463**

Cassette and Reducer Insert Torque Identification





Torque wrench code – Refer to the **maximum torque** of each Cassette and Reducer Insert in Table C.

R/3 for HXD-30 **S/6** for HXD-60

T/12 for HXD-120 **U/24** for HXD-240

Reducer Insert size in millimeters

Reducer Insert size in inch

*** Determine maximum torque according to bolt (nut) size and grade. Consult the manufacturers instructions or engineering recommendations.**

Reducer Inserts, imperial					Holding Ring
Hexagon Size (inch)	Model Number	Hexagon Size (inch)	Model Number	Torque Wrench Code	Model No.
–	**–**	–	**–**		**–**
–	**–**	–	**–**		**HR-36**
1 5/8" - 1 1/4"	**IN3163-125**	–	**–**		**HR-41**
1 13/16" - 1 7/16"	**IN3181-144**	–	**–**	**R**	**HR-46**
2" - 1 5/8"	**IN3200-163**	–	**–**		**HR-50**
2 3/16" - 1 13/16"	**IN3219-181**	–	**–**		**HR-55**
2 3/8" - 2"	**IN3238-200**	–	**–**		**HR-60**
–	**–**	–	**–**		**–**
–	**–**	–	**–**		**HR-46**
2" - 1 5/8"	**IN6200-163**	–	**–**		**HR-50**
2 3/16" - 1 13/16"	**IN6219-181**	–	**–**		**HR-55**
2 3/8" - 2"	**IN6238-200**	–	**–**	**S**	**HR-60**
2 9/16" - 2 3/16"	**IN6256-219**	–	**–**		**HR-65**
2 3/4" - 2 3/8"	**IN6275-238**	–	**–**		**HR-70**
2 15/16" - 2 9/16"	**IN6293-256**	–	**–**		**HR-75**
3 1/8" - 2 3/4"	**IN6313-275**	–	**–**		**HR-80**
2 3/16" - 1 13/16"	**IN12219-181**	–	**–**		**HR-55**
2 3/8" - 2"	**IN12238-200**	–	**–**		**HR-60**
2 9/16" - 2 3/16"	**IN12256-219**	–	**–**		**HR-65**
2 3/4" - 2 3/8"	**IN12275-238**	–	**–**		**HR-70**
2 15/16" - 2 9/16"	**IN12293-256**	–	**–**		**HR-75**
3" - 2 9/16"	**IN12300-256**	–	**–**	**T**	**HR-75**
3 1/8" - 2 3/4"	**IN12313-275**	–	**–**		**HR-80**
3 3/8" - 2 15/16"	**IN12338-293**	–	**–**		**HR-85**
3 1/2" - 3"	**IN12350-300**	–	**–**		**HR-90**
3 3/4" - 3 3/8"	**IN12375-338**	–	**–**		**HR-95**
3 7/8" - 3 3/8"	**IN12388-338**	–	**–**		**HR-100**
3 1/8" - 2 3/4"	**IN24313-275**	3 1/8" - 2 9/16"	**IN24313-256**		**HR-80**
3 3/8" - 3"	**IN24338-300**	–	**–**		**HR-85**
3 1/2" - 3"	**IN24350-300**	–	**–**		**HR-90**
3 3/4" - 3 3/8"	**IN24375-338**	3 3/4" - 3 1/8"	**IN24375-313**	**U**	**HR-95**
3 7/8" - 3 3/8"	**IN24388-338**	–	**–**		**HR-100**
4 1/8" - 3 3/4"	**IN24413-375**	–	**–**		**HR-105**
4 1/4" - 3 3/4"	**IN24425-375**	–	**–**		**HR-110**
4 5/8" - 4 1/8"	**IN24463-413**	–	**–**		**HR-120**
5" - 4 1/4"	**IN24500-425**	–	**–**		**HR-130**

TABLE B METRIC - PRESSURE VERSUS TORQUE HXD WITH CC-CASSETTES

	HXD-30	HXD-30	HXD-60	HXD-60	HXD-120	HXD-120	HXD-240	HXD-240
	CC-332 1) CC-336 2) CC-341 3) CC-346 4)	CC-350 1) CC-355 1) CC-360 1)	CC-641 1) CC-646 2) CC-650 3) CC-655 3) CC-660 3)	CC-665 1) CC-670 1) CC-675 1) CC-680 1)	CC-1255 1) CC-1260 1) CC-1265 2) CC-1270 2) CC-1275 2) CC-1280 3)	CC-1285 1) CC-1290 1) CC-1295 1) CC-12100 1)	CC-2480 1) CC-2485 2) CC-2490 3) CC-2495 4) CC-24100 5) CC-24105 6)	– CC-24110 1) CC-24115 1) CC-24120 1) CC-24125 1) CC-24130 1)
bar	**Nm**	**Nm**	**Nm**	**Nm**	**Nm**	**Nm**	**Nm**	**Nm**
40	140	160	295	355	555	640	1112	1200
60	210	240	440	530	833	960	1669	1808
80	290	325	565	675	1090	1270	2225	2426
100	360	410	710	845	1360	1590	2758	3052
120	435	490	850	1015	1630	1900	3310	3668
140	505	575	990	1165	1900	2210	3861	4285
160	580	655	1130	1330	2160	2520	4386	4901
180	650	740	1265	1480	2440	2840	4935	5517
200	720	820	1405	1645	2710	3150	5482	6138
220	790	905	1545	1810	2980	3470	6030	6734
240	865	975	1695	1970	3250	3770	6579	7325
260	940	1065	1835	2135	3520	4090	7059	7930
280	1010	1150	1950	2265	3790	4420	7602	8536
300	1080	1230	2090	2430	4050	4740	8144	9144
320	1155	1310	2225	2590	4320	5050	8687	9754
340	1230	1400	2350	2765	4600	5340	9230	10363
360	1300	1480	2490	2925	4880	5660	9619	10973
380	1375	1565	2630	3060	5170	5960	10154	11582
400	1450	1650	2765	3225	5450	6280	10688	12192
420	1520	1730	2905	3385	5720	6590	11222	12802
440	1595	1820	3035	3530	6000	6900	11757	13411
460	**1670** 1)	1910	3170	3690	6270	7220	12291	14021
480	1740	1985	3300	3860	6520	7540	12826	14630
500	1810	2070	3440	4020	6790	7860	13360	15240
520	1885	2150	3580	4185	7060	8170	**13894** 1)	15850
540	1955	2245	3700	4330	7330	8470	14429	16459
560	2025	2325	**3840** 1)	4490	7600	8780	14963	17069
580	**2100** 2)	2400	3960	4675	**7880** 1)	9090	15498	17678
600	2170	2480	4100	4840	8150	9400	**16032** 2)	18288
620	2240	2565	4230	5000	8420	9710	**16566** 3)	18898
640	2310	2650	4355	5120	8690	10040	**17101** 4)	19507
660	2385	2730	4490	5280	8940	10360	17635	20117
680	**2455** 3)	2810	4665	5365	9190	10640	**18170** 5)	20726
700	2525	2890	**4805** 2)	5525	9440	10950	18704	21336
720	2600	2970	4940	5680	**9710** 2)	11260	19238	21946
740	2670	3050	4995	5785	9990	11560	19773	22555
760	2745	3130	5130	5940	10280	11880	20307	23165
780	2815	3210	5275	6030	10560	12190	**20842** 6)	23774
800	**2890** 4)	**3290** 1)	**5410** 3)	**6190** 1)	**10860** 3)	**12500** 1)	21375	**24215** 1)

NOTE: **1)**, **2)**, **3)** and **4)** refer to table **A1** for maximum torque of cassettes and reducer inserts.

CONVERSION TABLE

Pressure:

1 bar = 14,514 psi

1 psi = 0,0689 bar

Torque:

1 Nm = 0,73756 Ft.lbs

1 Ft.lbs = 1,355818 Nm

TABLE C IMPERIAL - PRESSURE VERSUS TORQUE HXD WITH CC-CASSETTES

	HXD-30	HXD-30	HXD-60	HXD-60	HXD-120	HXD-120	HXD-240	HXD-240
	CC-3125 1) CC-3144 2) CC-3163 3) CC-3181 4)	CC-3200 1) CC-3219 1) CC-3238 1)	CC-6163 1) CC-6181 2) CC-6200 3) CC-6219 3) CC-6238 3)	CC-6256 1) CC-6275 1) CC-6293 1) CC-6313 1)	CC-12219 1) CC-12238 1) CC-12256 2) CC-12275 2) CC-12293 2) CC-12300 2) CC-12313 3)	CC-12338 1) CC-12350 1) CC-12375 1) CC-12388 1)	CC-24313 1) CC-24338 2) CC-24350 3) CC-24375 4) CC-24388 5) CC-24413 6)	CC-24425 1) CC-24463 1) CC-24500 1)
psi	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**
600	107	122	225	271	423	488	848	915
800	142	163	298	359	565	651	1132	1226
1000	178	203	373	449	706	814	1415	1532
1200	221	248	431	515	831	969	1697	1850
1400	256	292	506	602	968	1132	1963	2173
1600	293	333	578	688	1107	1294	2244	2487
1800	332	373	648	774	1243	1449	2525	2798
2000	367	418	719	846	1380	1606	2805	3113
2200	404	460	791	931	1518	1766	3067	3424
2400	442	499	862	1015	1648	1922	3346	3738
2600	477	544	929	1087	1792	2086	3625	4052
2800	513	584	1001	1171	1930	2247	3903	4370
3000	549	626	1072	1255	2067	2403	4181	4682
3200	584	670	1143	1339	2204	2567	4460	4980
3400	623	702	1221	1419	2341	2716	4740	5277
3600	660	744	1293	1503	2479	2876	5018	5587
3800	699	792	1364	1587	2616	3040	5246	5894
4000	734	835	1417	1646	2753	3211	5525	6201
4200	770	877	1487	1728	2891	3372	5802	6511
4400	806	917	1559	1812	3021	3535	6073	6820
4600	844	957	1627	1893	3158	3692	6350	7130
4800	881	999	1697	1976	3295	3852	6626	7440
5000	920	1047	1757	2068	3440	3993	6902	7750
5200	955	1088	1829	2149	3576	4158	7066	8060
5400	992	1129	1899	2231	3713	4317	7338	8370
5600	1031	1173	1971	2293	3874	4467	7609	8680
5800	1069	1217	2039	2378	4019	4631	7881	8990
6000	1104	1257	2110	2459	4155	4787	8153	9300

this table is continued on the next page

NOTE: **1)**, **2)**, **3)** and **4)** refer to table **A2** for maximum torque of cassettes and reducer inserts.

TABLE C IMPERIAL - PRESSURE VERSUS TORQUE HXD WITH CC-CASSETTES

	HXD-30	HXD-30	HXD-60	HXD-60	HXD-120	HXD-120	HXD-240	HXD-240
	CC-3125 1) CC-3144 2) CC-3163 3) CC-3181 4)	CC-3200 1) CC-3219 1) CC-3238 1)	CC-6163 1) CC-6181 2) CC-6200 3) CC-6219 3) CC-6238 3)	CC-6256 1) CC-6275 1) CC-6293 1) CC-6313 1)	CC-12219 1) CC-12238 1) CC-12256 2) CC-12275 2) CC-12293 2) CC-12300 2) CC-12313 3)	CC-12338 1) CC-12350 1) CC-12375 1) CC-12388 1)	CC-24313 1) CC-24338 2) CC-24350 3) CC-24375 4) CC-24388 5) CC-24413 6)	CC-24425 1) CC-24463 1) CC-24500 1)
psi	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**	**Ft.lbs**
6200	1141	1299	2181	2541	4294	4947	8424	9610
6400	1180	1346	2245	2611	4438	5104	8696	9920
6600	1219	1394	2313	2692	4575	5268	8968	10230
6800	**1255** 1)	1436	2383	2774	4713	5428	9239	10540
7000	1290	1472	2447	2863	4835	5592	9512	10849
7200	1325	1516	2519	2944	4972	5756	9783	11160
7400	1362	1556	2589	3026	5110	5916	10054	11470
7600	1401	1598	2661	3110	5247	6072	**10326** 1)	11780
7800	1436	1649	2718	3181	5384	6222	10598	12090
8000	1473	1692	**2788** 1)	3262	5522	6381	10870	12400
8200	1508	1747	2859	3343	5659	6538	11142	12710
8400	**1546** 2)	1767	2917	3443	5804	6695	11413	13019
8600	1584	1810	2986	3525	**5942** 1)	6854	**11686** 2)	13330
8800	1619	1850	3058	3610	6079	7011	11958	13640
9000	1654	1894	3123	3691	6216	7168	**12226** 3)	13950
9200	1689	1938	3184	3743	6353	7339	12501	14260
9400	1725	1980	3253	3824	6491	7499	**12773** 4)	14570
9600	1764	2020	3321	3906	6613	7663	13044	14880
9800	1799	2060	3419	3932	6735	7798	**13316** 5)	15189
10000	**1836** 3)	2102	**3489** 2)	4012	6873	7957	13588	15500
10200	1871	2142	3561	4094	6995	8114	13859	15810
10400	1910	2182	3629	4172	7132	8271	14131	16120
10600	1947	2224	3698	4254	**7270** 2)	8430	14404	16430
10800	1982	2264	3707	4294	7414	8580	14675	16739
11000	2020	2304	3778	4372	7566	8744	14947	17050
11200	2057	2346	3845	4452	7704	8903	15219	17359
11400	2092	2386	3921	4482	7849	9060	**15490** 6)	17670
11600	**2132** 4)	**2425** 1)	**3990** 3)	**4566** 1)	**8010** 3)	**9220** 1)	15765	**17860** 1)

NOTE: **1)**, **2)**, **3)** and **4)** refer to table **A2** for maximum torque of cassettes and reducer inserts.

CONVERSION TABLE

Pressure:

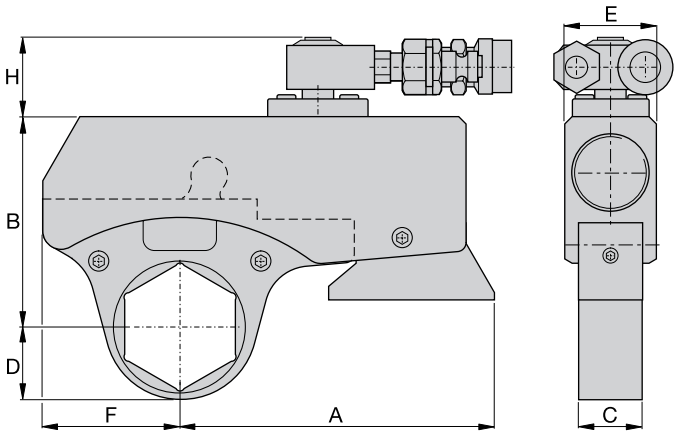
1 bar = 14,514 psi

1 psi = 0,0689 bar

Torque:

1 Nm = 0,73756 Ft.lbs

1 Ft.lbs = 1,355818 Nm



For dimension **D** see tables **A1** and **A2** on pages 12 and 14.

TABLE D SPECIFICATIONS

Torque Wrench Model Number	Torque at 800 bar 11,600 psi	Cassette Range	Oil Capacity		Dimensions							Weight
		(hexagon size)	Advance	Retract		A	B	C	E	F	H	
HXD-30	3290 Nm	32 - 60 mm	21 cm^3	12 cm^3	mm	135	91-103	28	40	60	38	1,6 kg
	2425 Ft.lbs	$1^1/4$ - $2^3/8$"	1.3 in^3	.7 in^3	inch	5.31"	3.58-4.06"	1.10"	1.57"	2.36"	1.50"	3.5 lbs
HXD-60	6190 Nm	41 - 80 mm	40 cm^3	24 cm^3	mm	156	115-130	35	50	75	38	2,5 kg
	4565 Ft.lbs	$1^5/8$ - $3^1/8$"	2.4 in^3	1.5 in^3	inch	6.14"	4.53-5.12"	1.38"	1.97"	2.95"	1.50"	5.5 lbs
HXD-120	12.500 Nm	55 - 100 mm	81 cm^3	45 cm^3	mm	200	141-156	47	65	96	38	4,8 kg
	9220 Ft.lbs	$2^3/16$ - $3^7/8$"	4.9 in^3	2.7 in^3	inch	7.87"	5.55-6.14"	1.85"	2.56"	3.78"	1.50"	10.6 lbs
HXD-240	24.210 Nm	80 - 130 mm	157 cm^3	93 cm^3	mm	259	182-202	56	82	125	50	8,2 kg
	17860 Ft.lbs	$3^1/8$ - 5"	9.6 in^3	5.7 in^3	inch	10.2"	6.8-7.95"	2.2	3.22	4.92	2	18.1 lbs

EC-DECLARATION OF CONFORMITY
(according attachment IIA of the machinery directive)

We **ENERPAC B.V.**

Storkstraat 25, 3905 KX Veenendaal, Holland

declare under our own responsibility that below mentioned product

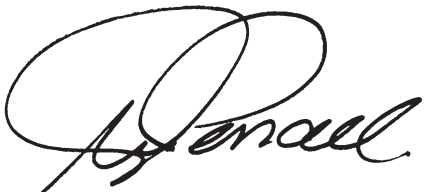
Torque Wrench, Types: HXD-30, HXD-60, HXD-120, and HXD-240

on which this declaration refers, is in accordance with

EN 982:1996
EN 292-1:1991
EN 292-2:1991
VBG 5:1993
ENERPAC and APPLIED POWER specifications and standards

according the guidelines of the

Machinery Directive 89/392/EEC, 91/368/EEC, 93/44/EEC and 93/68/EEC



Veenendaal, 28 december 1997

W. van de Vendel
Quality Assurance Manager

Ref: EC.2a

Australia
ENERPAC, Applied Power Australia Ltd.
Block V Unit 3
Regents Park Estate
391 Park Road
Regents Park NSW 2143
(P.O. Box 261) Australia
Tel: +61 297 438 988
Fax: +61 297 438 648

Canada
Applied Power Canada Ltd.
6615 Ordan Drive, Unit 14-15
Mississauga, Ontario L5T 1X2
Tel: +1 905 564 5749
Fax: +1 905 564 0305

Toll Free:
Tel: +1 800 268 4987
Fax: +1 800 461 2456

China
Applied Power China Ltd.
1F, 269 Fute N. Road
Waigaoqiao Free Trade Zone
Pudong New District
Shanghai, 200 131
China
Tel: +86 21 5866 9099
Fax: +86 21 5866 7156

France, Turkey, Greece, Africa, Middle East
ENERPAC S.A.
B.P. 200
Parc d'Activités
du Moulin de Massy
F-91882 Massy CEDEX (Paris)
France
Tel: +33 1 601 368 68
Fax: +33 1 692 037 50

Germany, Switzerland, Austria, Eastern Europe
ENERPAC
Applied Power GmbH
P.O. Box 300113
D-40401 Düsseldorf
Germany
Tel: +49 211 471 490
Fax: +49 211 471 49 28

Hong Kong
ENERPAC
Room 907 Workingberg
Commercial Building
41-47 Marble Road
North Point
Tel: +852-2561 6295
Fax: +852-2561 6772

India
ENERPAC
Hydraulics (India) Pvt Ltd
Plot No. A-571
MIDC, TTC Industrial Area
Mahape-400 701
Navi Mumbai, India
Tel: +91 22 769 47 78
Fax: +91 22 769 84 73

Italy
ENERPAC
Applied Power Italiana S.p.A.
Via Canova 4
20094 Corsico (Milano)
Tel: +39 2 486 111 00
Fax: +39 2 486 012 88

Japan
Applied Power Japan Ltd.
1-1-11, Shimomae
Toda-shi
Saitama Pref.
Japan 335-0016
Tel: +81-48-430-2311
Fax: +81-48-430-1117

Mexico
ENERPAC Applied Power
Mexico S.A. de C.V.
Avenida Principal
La Paz #100
Fracc. Industrial La Paz
42092 Pachuca, Hidalgo
Tel: +52 771 337 00
Fax: +52 771 838 00

The Netherlands, Belgium, Luxembourg, Sweden, Denmark, Norway, Finland
ENERPAC B.V.
Storkstraat 25
P.O. Box 269, 3900 AG Veenendaal
The Netherlands
Tel: +31 318 535 911
Fax: +31 318 525 613
+31 318 535 848

Singapore
Applied Power Asia Pte Ltd
No. 8, Ang Mo Kio,
Industrial Park 2
#01-00
Singapore 569500
Thomson Road
P.O. Box 114
Singapore 915704
Tel: +65 484 5108
Fax: +65 484 5669

South Korea
ENERPAC
Applied Power Korea Ltd.
163-12 Dodang-Dong
Wonmi-Ku, Buchun-shi
Kyunggi-Do
Republic of Korea
Tel: +82 32 675 08 36
Fax: +82 32 675 30 02/73

Spain, Portugal
ENERPAC
Applied Power International S.A.
Avda. Camino de lo Cortao
21 - Nave 3
San Sebastian de los Reyes
28709 Madrid
Spain
Tel: +34 91 661 11 25
Fax: +34 91 661 47 89

United Kingdom, Ireland
ENERPAC Limited
Unit 3, Colemeadow Road
North Moons Moat
Redditch
Worcester B98 9BP
United Kingdom
Tel: +44 01527 598 900
Fax: +44 01527 585 500

USA, Latin America and Caribbean
ENERPAC
P.O. Box 3241
6101 N. Baker Road
Milwaukee, WI 53209 USA
Tel: +1 262 781 6600
Fax: +1 262 781 1049

User inquiries:
+1 800 433 2766
Distributor inquiries/orders:
+1 800 558 0530

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