POWERED TORQUE TOOLS

Electronic Tools

EvoTorque® are electronic torque tools designed for applying torque to threaded fasteners. The unique 'Intelligent Joint Sensing' technology will accurately tighten to the correct torque without the risk of excess overshoot or undershoot that is common in other electric tools. EvoTorque® tools give continuous (not impacting) rotation and are quiet in use.

EvoTorque® tools utilise patented technology to give unprecedented joint control from hard through to soft joints. They are available in both mains-electric and battery-powered ranges.

On a given joint they will consistently achieve accurate, repeatable results of ±3% of the setting within the calibrated range.

Pneumatic Tools

PneuTorque® operation is quiet with absolutely no impacting. These two factors make PneuTorques comfortable for the operator to use, reducing fatigue and consequently increasing safety.

PneuTorques provide accurate torque control – on a given joint they will stall repeatably to within ±5% (PTS tools, ±3%). Using electronic shut off, this repeatability can be improved to ±2%.

The PneuTorque® consists of a robust air motor driving a Norbar multiplier with three or more stages of epicyclic gearing. This gives the advantage of smooth, continuous rotation (versus an impulsing action or the hammer action in an impacting tool). The benefits include :

- more consistent bolting,
- less damage to bolt, socket and joint, and
- reduced operator injury & fatigue

Torque control is achieved by adjustment of the air pressure. An air pressure versus torque graph and a calibration certificate are both supplied with each tool and allows specific torque values to be set. For more critical applications, PneuTorques can be fitted with a torque transducer and the precise torque output displayed. The tool can then be shut off at the desired torque either manually or automatically using suitable control circuitry.

Models are available up to 300,000 N·m (220,000 lbf·ft).

EVOTORQUE® BATTERY TOOL (EBT)

The EvoTorque® Battery Tool (EBT) features a new brushless motor, data memory and data transfer capabilities. Norbar has combined this with our respected gearboxes to deliver a range of fast, reliable, accurate torque tools that retain key features from our EvoTorque® 2 range (see page 55).

Fast: EBT uses a powerful motor coupled with either a single speed or auto two speed gearbox for rapid joint completion times.

Durable: The industrial motor used by the EBT gives long life with minimal motor service requirement.

Accurate: EBT is a transducer controlled battery powered torque tool designed for accurately applying torque to threaded fasteners. The unique 'intelligent joint sensing' technology continually measures the joint during tightening and when necessary, employs dynamic braking to avoid torque over-shoot due to motor inertia. Both accuracy and repeatability of ±3% of the setting within the calibrated range.

- Tool is not constrained by power cable or hose, improving safety, convenience and versatility
- 18V, 5.0Ah battery and efficient motor give outstanding fastening performance per charge
- 'Safe to start' button ensures hands are safely positioned at start up

  Note: In some circumstances it can be difficult to support and operate the tool while simultaneously pressing the trigger and 'safe to start' button. For this reason, single trigger models are also available.
- OLED display ensures visibility in all conditions
- High powered LED to illuminate application
- Optional 'Ease of Use' functionality when in 'Torque Only' mode, minimising operator error
- Optional 'Relax Mode' feature automatically reverses tool following joint completion until the tool becomes free or the trigger is released, minimising the chance of fastener and reaction 'locking' in place
- Supplied with a traceable calibration certificate for torque and angle as standard. Calibrated ranges shown in the table on page 53, clockwise only
- Available in single speed ideal for torque with angle control
- Auto two speed configurations available for rapid joint completion
- Torque, Torque & Angle and Torque Audit modes available
- In Torque & Angle Mode and Audit Mode, torque can be set from a lower percentage of tool maximum on single speed tools compared to their auto two speed equivalents. Single speed tools are therefore recommended for angle operation
- Software can be updated remotely, without the need to return the product to Norbar
- Quiet : Noise level : 79.1dB(A), with an uncertainty K = 3dB, when free-running
- Vibration : Does not exceed 2.5m/s² (highest measured under test : 0.9m/s²)

EBT display panel and 'safe to start' button

EVOTORQUE® BATTERY TOOL (EBT)

13	EBT SERIES - SINGLE SPEED - 'SAFE TO START' MODELS
180349	¾" sq. dr., 160 - 800 N·m, 118 - 600 lbf·ft, **Kit**
180350	¾" sq. dr., 160 - 800 N·m, 118 - 600 lbf·ft, Bare
180445†	1" sq. dr., 200 - 1,350 N·m, 150 - 1,000 lbf·ft, **Kit**
180446†	1" sq. dr., 200 - 1,350 N·m, 150 - 1,000 lbf·ft, Bare
180493*	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft, **Kit**
180494*	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft, Bare
180541	1" sq. dr., 400 - 2,700 N·m, 295 - 2,000 lbf·ft, **Kit**
180542	1" sq. dr., 400 - 2,700 N·m, 295 - 2,000 lbf·ft, Bare
180637	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft, **Kit**
180638	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft, Bare

13	EBT SERIES - AUTO TWO SPEED - 'SAFE TO START' MODELS
180469†	1" sq. dr., 338 - 1,350 N·m, 250 - 1,000 lbf·ft, **Kit**
180470†	1" sq. dr., 338 - 1,350 N·m, 250 - 1,000 lbf·ft, Bare
180565	1" sq. dr., 676 - 2,700 N·m, 499 - 2,000 lbf·ft, **Kit**
180566	1" sq. dr., 676 - 2,700 N·m, 499 - 2,000 lbf·ft, Bare
180661	1" sq. dr., 1,000 - 4,000 N·m, 738 - 2,950 lbf·ft, **Kit**
180662	1" sq. dr., 1,000 - 4,000 N·m, 738 - 2,950 lbf·ft, Bare

Tool ranges shown above are calibrated ranges, see table on page 53 for operating ranges.

*Currently in development, expected release end of quarter 1.

†1,350 N·m models come supplied with both ¾" and 1" sq. dr.

NOTE: Kit versions come with tool, 2 batteries, charger and a secondary handle in a carry case. 800 N·m tools do not come with a secondary handle.

Bare tools are supplied in a cardboard box without batteries, charger and secondary handle.

Other tool variations are available, please contact Norbar for details.

When the tool is to be used for untightening bolts, Norbar recommends the selection of single speed versions. In the case of prevailing torque lock-nuts or partially tightening bolts, the Auto Two Speed version of the tools will generally give no advantage and single speed tools should be selected.

13	EBT SERIES - SINGLE SPEED - SINGLE TRIGGER MODELS
180850	¾" sq. dr., 160 - 800 N·m, 118 - 600 lbf·ft, **Kit**
180851	¾" sq. dr., 160 - 800 N·m, 118 - 600 lbf·ft, Bare
180898†	1" sq. dr., 200 - 1,350 N·m, 150 - 1,000 lbf·ft, **Kit**
180899†	1" sq. dr., 200 - 1,350 N·m, 150 - 1,000 lbf·ft, Bare
181305*	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft, **Kit**
181306*	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft, Bare
180946	1" sq. dr., 400 - 2,700 N·m, 295 - 2,000 lbf·ft, **Kit**
180947	1" sq. dr., 400 - 2,700 N·m, 295 - 2,000 lbf·ft, Bare
180994	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft, **Kit**
180995	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft, Bare

13	EBT SERIES - AUTO TWO SPEED - SINGLE TRIGGER MODELS
180922†	1" sq. dr., 338 - 1,350 N·m, 250 - 1,000 lbf·ft, **Kit**
180923†	1" sq. dr., 338 - 1,350 N·m, 250 - 1,000 lbf·ft, Bare
180970	1" sq. dr., 676 - 2,700 N·m, 499 - 2,000 lbf·ft, **Kit**
180971	1" sq. dr., 676 - 2,700 N·m, 499 - 2,000 lbf·ft, Bare
181018	1" sq. dr., 1,000 - 4,000 N·m, 738 - 2,950 lbf·ft, **Kit**
181019	1" sq. dr., 1,000 - 4,000 N·m, 738 - 2,950 lbf·ft, Bare

8	EBT SERIES - ACCESSORIES
266148	EBT Plastic Case with inserts
60334.EBT	EBT Battery Pack
60335.KIT	EBT Battery Charger

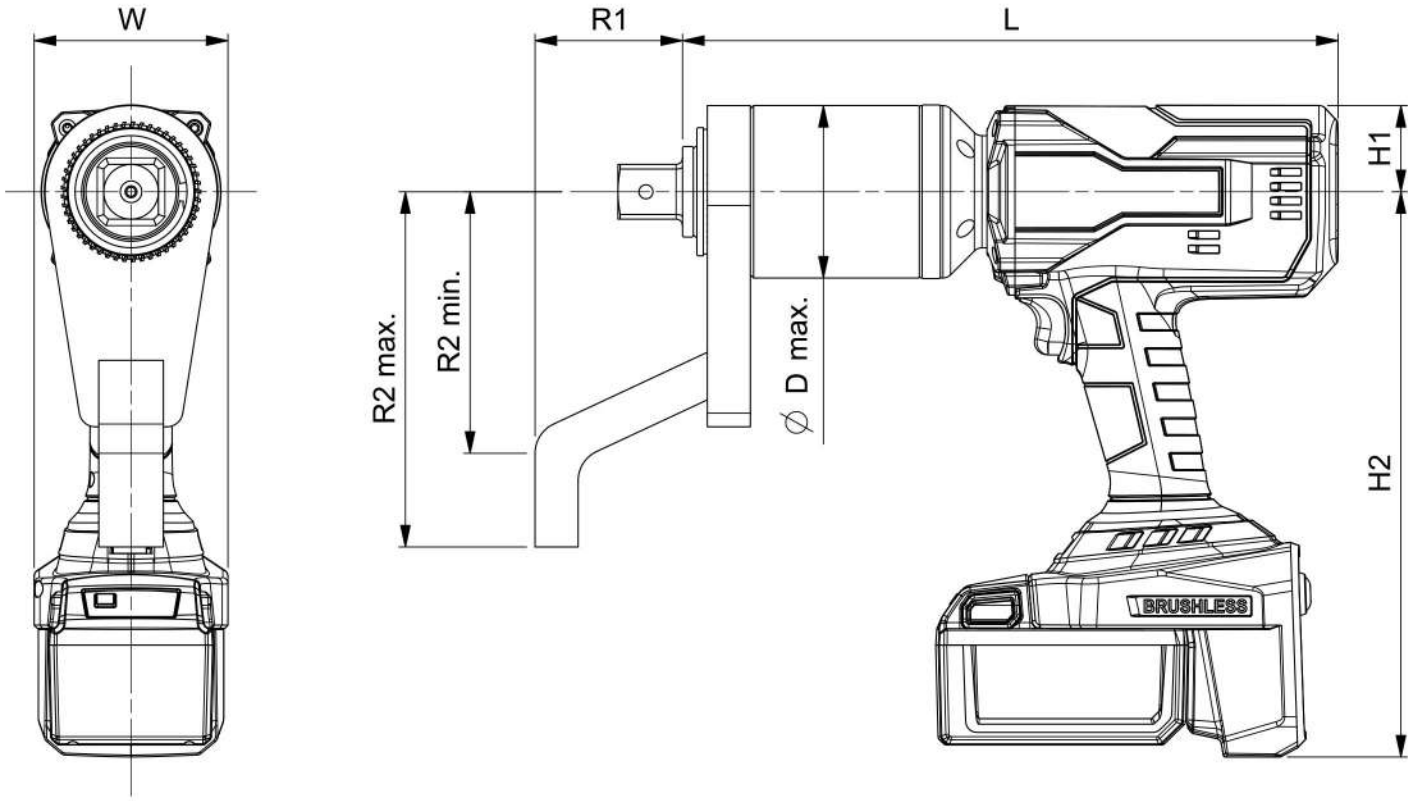
Single Trigger EBT display panel

EVOTORQUE® BATTERY TOOL (EBT)

EBT-52 Series | EBT-72 Series | EBT-68 Series | EBT-80 Series | EBT-92 Series

Model		EBT-52-800	EBT-72-1350	EBT-72-1350 Auto Two Speed	EBT-68-2000	EBT-80-2700	EBT-80-2700 Auto Two Speed	EBT-92-4000	EBT-92-4000 Auto Two Speed
Part Number		180349 180350 180850 180851	180445 180446 180898 180899	180469 180470 180922 180923	180493 180494 181305 181306	180541 180542 180946 180947	180565 180566 180970 180971	180637 180638 180994 180995	180661 180662 181018 181019
Operating Range (N·m)		100 - 800	120 - 1,350	338 - 1,350	200 - 2,000	270 - 2,700	676 - 2,700	400 - 4,000	1,000 - 4,000
Calibrated Range (N·m)		160 - 800	200 - 1,350	338 - 1,350	400 - 2,000	400 - 2,700	676 - 2,700	800 - 4,000	1,000 - 4,000
Output Speed (rpm)		11.2	6.5	32	4.2	3.3	13	2.3	9.5
Dimensions (mm)	ØD max.	52	72	72	68	80	80	92	92
	H1	40	40	40	40	40	40	40	40
	H2	262	262	262	262	262	262	262	262
	L	271	298	317	294	298	333	352	387
	R1	59	76	76	75	76	76	70	70
	R2 min.	68	124	124	133	124	124	125	125
	R2 max.	131	167	167	165	167	167	175	175
	W	90	90	90	90	90	90	90	90
Tool Weight (kg)*		3.7	5.7	5.9	4.9	5.9	6.8	7.9	8.3
Reaction Weight (kg)		0.8	1.4	1.4	1.1	1.4	1.4	2.5	2.5

* Tool weight excludes both reaction and battery. The battery weighs 0.8 kg.



Patent applied for

EVOTORQUE® BATTERY TOOL & EVOTORQUE® 2 RIGHT ANGLE GEARBOX

Right Angle Gearbox fitted to EBT

13	EBT SERIES - SINGLE SPEED - 'SAFE TO START' - RIGHT ANGLE GEARBOX
180353	¾" sq. dr., 160 - 800 N·m, 118 - 600 lbf·ft, **Kit**
180354	¾" sq. dr., 160 - 800 N·m, 118 - 600 lbf·ft, Bare
180449⁺	1" sq. dr., 200 - 1,350 N·m, 150 - 1,000 lbf·ft, **Kit**
180450⁺	1" sq. dr., 200 - 1,350 N·m, 150 - 1,000 lbf·ft, Bare
180497*	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft, **Kit**
180498*	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft, Bare
180545	1" sq. dr., 400 - 2,700 N·m, 295 - 2,000 lbf·ft, **Kit**
180546	1" sq. dr., 400 - 2,700 N·m, 295 - 2,000 lbf·ft, Bare
180641	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft, **Kit**
180642	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft, Bare

*Currently in development, expected release end of quarter 1.

⁺1,350 N·m models come supplied with both ¾" and 1" sq. dr.

13	EBT SERIES - AUTO TWO SPEED - 'SAFE TO START' - RIGHT ANGLE GEARBOX
180473⁺	1" sq. dr., 338 - 1,350 N·m, 250 - 1,000 lbf·ft, **Kit**
180474⁺	1" sq. dr., 338 - 1,350 N·m, 250 - 1,000 lbf·ft, Bare
180569	1" sq. dr., 676 - 2,700 N·m, 499 - 2,000 lbf·ft, **Kit**
180570	1" sq. dr., 676 - 2,700 N·m, 499 - 2,000 lbf·ft, Bare
180665	1" sq. dr., 1,000 - 4,000 N·m, 738 - 2,950 lbf·ft, **Kit**
180666	1" sq. dr., 1,000 - 4,000 N·m, 738 - 2,950 lbf·ft, Bare

NOTE:

Kit versions come with tool, 2 batteries, charger and a secondary handle in a carry case.

Bare tools are supplied in a cardboard box without batteries, charger and secondary handle.

Right Angle Gearbox fitted to EvoTorque®2

11	EVOTORQUE 2 - 110 V - RIGHT ANGLE GEARBOX
180230.B06.RA	ET2-72-1000-110, ¾" sq. dr., 200 - 1,000 N·m
180231.B06.RA	ET2-72-1350-110, ¾" sq. dr., 270 - 1,350 N·m
180232.B08.RA	ET2-72-2000-110, 1" sq. dr., 400 - 2,000 N·m
180239.B08.RA	ET2-80-2700-110, 1" sq. dr., 540 - 2,700 N·m
180238.B08.RA	ET2-92-4000-110, 1" sq. dr., 800 - 4,000 N·m
180236.B12.RA	ET2-119-7000-110, 1½" sq. dr., 1,400 - 7,000 N·m

11	EVOTORQUE 2 - 230 V - RIGHT ANGLE GEARBOX
180220.B06.RA	ET2-72-1000-230, ¾" sq. dr., 200 - 1,000 N·m
180221.B06.RA	ET2-72-1350-230, ¾" sq. dr., 270 - 1,350 N·m
180222.B08.RA	ET2-72-2000-230, 1" sq. dr., 400 - 2,000 N·m
180229.B08.RA	ET2-80-2700-230, 1" sq. dr., 540 - 2,700 N·m
180228.B08.RA	ET2-92-4000-230, 1" sq. dr., 800 - 4,000 N·m
180226.B12.RA	ET2-119-7000-230, 1½" sq. dr., 1,400 - 7,000 N·m

The EvoTorque®2 Right Angle Gearbox is supplied in a cardboard box as standard, if a sturdier case is required Norbar can provide a Peli Case at an additional charge. Please add .PEL on to the end of the part number when ordering.

EVOTORQUE®2

The EvoTorque®2 is an electronic torque tool designed to accurately apply torque to threaded fasteners. Tools are factory calibrated to ±3% of reading. The unique 'intelligent joint sensing' technology continually measures the joint during tightening and when necessary, employs dynamic braking to avoid torque over-shoot due to motor inertia. Consequently, EvoTorque®2 can apply torque accurately over a wide range of joint rates from hard (high torque rate) through to soft (low torque rate). All EvoTorque®2 tools are highly tolerant of supply voltage and frequency variation. If the supply voltage is outside of tolerance then, as a safety feature, the tool will be prevented from starting.

The EvoTorque®2 has the ability to memorise multiple targets, work IDs, user IDs and readings. A work sequence (flow) can be performed on the EvoTorque®2, taking the user through a pre-defined tightening sequence. The tool has four modes of operation: Torque, Torque & Angle, Torque & Angle with Final Torque and Torque Audit. The unique Audit Mode is a sophisticated feature for testing pre-tightened bolts with minimal impact on the original fastening torque and can provide quality control data for monitoring joint performance over time. With accuracy and repeatability of ±3% of the setting, EvoTorque®2 offers many features including:

- Multiple units of torque measurement, N·m, lbf·ft, ft·lb and kgf·m
- Calibrated from 20% to 100% of tool range
- Torque, Torque & Angle and Torque Audit modes available
- In Torque & Angle Mode and Audit Mode, torque can be set from 10% of tool maximum
- Display and on-board storage of final torque or torque and angle values
- Memory capacity for 3,000 readings, time and date stamped
- Clear indication of successful joint application
- USB and Bluetooth® 4.0 data transfer (also called Bluetooth® Smart)
- Complementary PC software 'EvoLog' for data management and tool configuration
- 12 user IDs can be downloaded to the tool and results can be stored against individual users
- 20 unique stand-alone targets plus 20 unique work group targets for each work group
- Results can be output in CSV (comma-separated values) format for users not able to use EvoLog
- Very quiet : Noise level : <70dB(A)
- Vibration : Does not exceed 2.5m/s² (highest measured under test : 0.304m/s²)
- Ability to produce and store real time graphs via EvoLog
- Torque & Angle with Final Torque
- 'Usage' counter gives the ability to see the amount of times the tool has been used since the last reset
- 'Operation Direction' feature designed primarily for undoing bolts. When doing sequence tightening, it is now possible to undo an incorrectly tightened bolt without interrupting the sequence
- Two stage tightening gives faster application of a Snug Torque & Angle Target
- 'Turn Angle' option can be used to check if bolts have already been tightened in an assembly process
- Tool can be integrated into third party control systems
- Two different lock levels, lock level 1 as per previous lock, lock level 2 will not allow user to exit the run screen or change the target
- Maximum Audit Mode target angle of 720°
- Supplied with a traceable calibration certificate for torque and angle as standard. Calibrated from 20% to 100% of tools maximum torque capacity, clockwise only

EVOTORQUE®2

Colour OLED display shows torque and angle values

Display can be powered up independently of tool for data transfer (via USB)

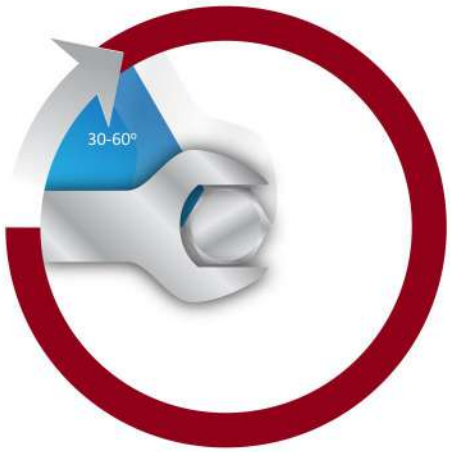
Built in Bluetooth® for wireless data transfer

Communication between tool and PC either wirelessly using Bluetooth® 4.0 or wired using supplied USB cable

EvoTorque®2's intelligent joint sensing technology always detects which type of bolt you are working with.

Hard joints

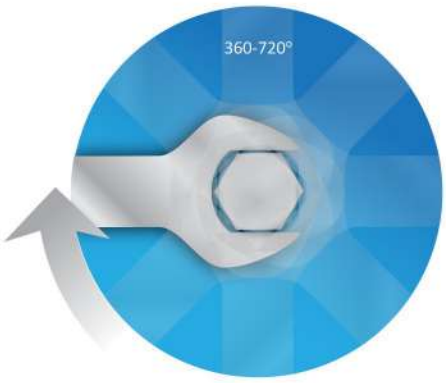
(High Torque Rate*)



Joints completed within the range 30° - 60°

Soft joints

(Low Torque Rate*)



Joints completed within the range 360° - 720°

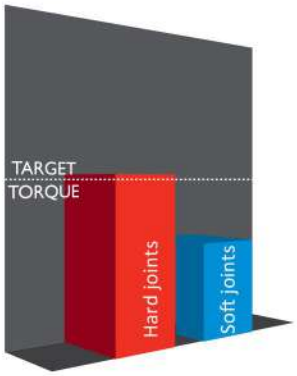
*High torque rate and low torque rate as defined by ISO 5393 'Rotary tools for threaded fasteners- Performance test method'

The EvoTorque®2 has been designed to complete joints of 30° and above to within the tools ±3% accuracy. For joints below 30° use the tools audit mode feature.

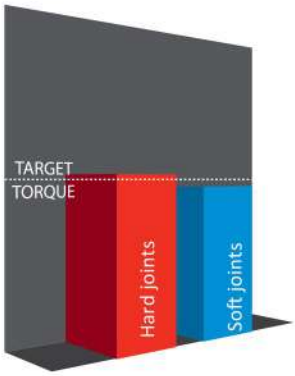
EVOTORQUE®2

Traditional electronic torque tools give vastly different results depending on the joint type. Norbar's 'intelligent joint sensing' technology eliminates these issues so that you can be confident in your bolting work.

Typical of present generation



New generation EvoTorque®2



ET2-72 (1000 & 1350) *ET2-68 (2000)* *ET2-80 (2700)* *ET2-92 (4000)* *ET2-119 (7000)*

11	EVOTORQUE 2 - 110 V
180230.B06	ET2-72-1000-110, ¾" sq. dr., 200 - 1,000 N·m
180231.B06	ET2-72-1350-110, ¾" sq. dr., 270 - 1,350 N·m
180232.B08	ET2-72-2000-110, 1" sq. dr., 400 - 2,000 N·m
181472*	ET2-68-2000-110, 1" sq. dr., 400 - 2,000 N·m
180239.B08	ET2-80-2700-110, 1" sq. dr., 540 - 2,700 N·m
180238.B08	ET2-92-4000-110, 1" sq. dr., 800 - 4,000 N·m
180236.B12	ET2-119-7000-110, 1½" sq. dr., 1,400 - 7,000 N·m

11	EVOTORQUE 2 - 230 V
180220.B06	ET2-72-1000-230, ¾" sq. dr., 200 - 1,000 N·m
180221.B06	ET2-72-1350-230, ¾" sq. dr., 270 - 1,350 N·m
180222.B08	ET2-72-2000-230, 1" sq. dr., 400 - 2,000 N·m
181471*	ET2-68-2000-230, 1" sq. dr., 400 - 2,000 N·m
180229.B08	ET2-80-2700-230, 1" sq. dr., 540 - 2,700 N·m
180228.B08	ET2-92-4000-230, 1" sq. dr., 800 - 4,000 N·m
180226.B12	ET2-119-7000-230, 1½" sq. dr., 1,400 - 7,000 N·m

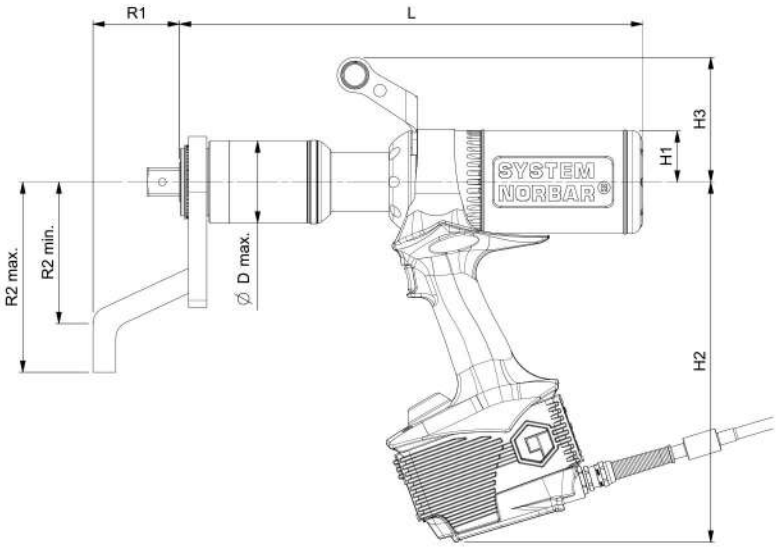
*Currently in development, expected release end of quarter 1

The EvoTorque®2 is supplied in a cardboard box as standard, if a sturdier case is required Norbar can provide a Peli Case at an additional charge. Please add .PEL on to the end of the part number when ordering. For tools fitted with a Right Angle Gearbox, add .RAPEL.

Standard Box

Optional Peli Case
Part No. 26969 or 26971

EVOTORQUE®2



Model		ET2-72-1000 ET2-72-1350	ET2-68-2000	ET2-72-2000	ET2-80-2700	ET2-92-4000	ET2-119-7000
Part Number		180230.B06 180220.B06 180231.B06 180221.B06	181472 181471	180232.B08 180222.B08	180239.B08 180229.B08	180238.B08 180228.B08	180236.B12 180226.B12
Output Speed (rpm)		21 (ET-72-1000) 17 (ET-72-1350)	TBC	11	10	6	3.3
Dimensions (mm)	ØD max.	72	68	72	80	92	119
	H1	45	45	45	45	45	45
	H2	317	317	317	317	317	317
	H3	109	109	109	109	109	109
	L	366	355	407	363	417	440
	R1	71	75	76	76	70	90
	R2 min.	124	120	124	124	125	162
	R2 max.	167	165	167	167	175	210
Tool Weight (kg)		10.4	TBC	10.8	10.8	12.9	16.8
Reaction Weight (kg)		1.5	TBC	1.5	1.5	2.6	3.9

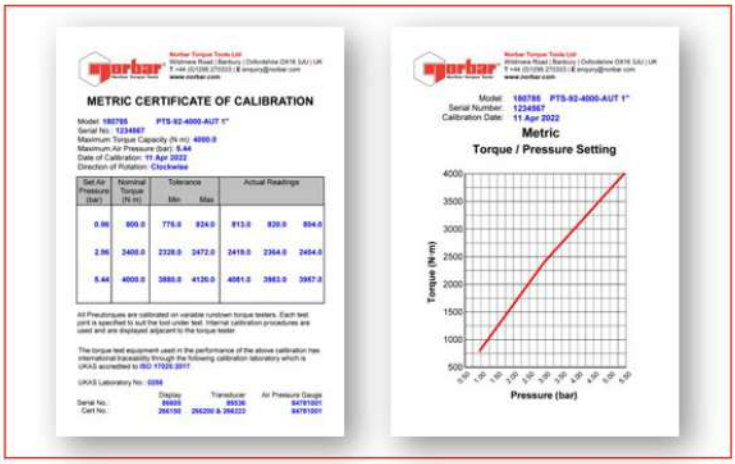
Patented in the UK and Germany (EP2699389) and in the USA (US9676086).

PNEUMATIC TORQUE TOOLS

What is a PneuTorque® Pneumatic Torque Tool?

The PneuTorque® consists of a robust air motor driving a Norbar multiplier with three or more stages of epicyclic gearing.

Torque control is achieved through adjustment of the air pressure. An air pressure versus torque graph and a calibration certificate is supplied with each tool and allows specific torque values to be set. For more critical applications, PneuTorques can be fitted with a torque transducer and the precise torque output displayed. The tool can then be shut off at the desired torque either manually or automatically using suitable control circuitry.



Why use PneuTorque® Pneumatic Torque Tools?

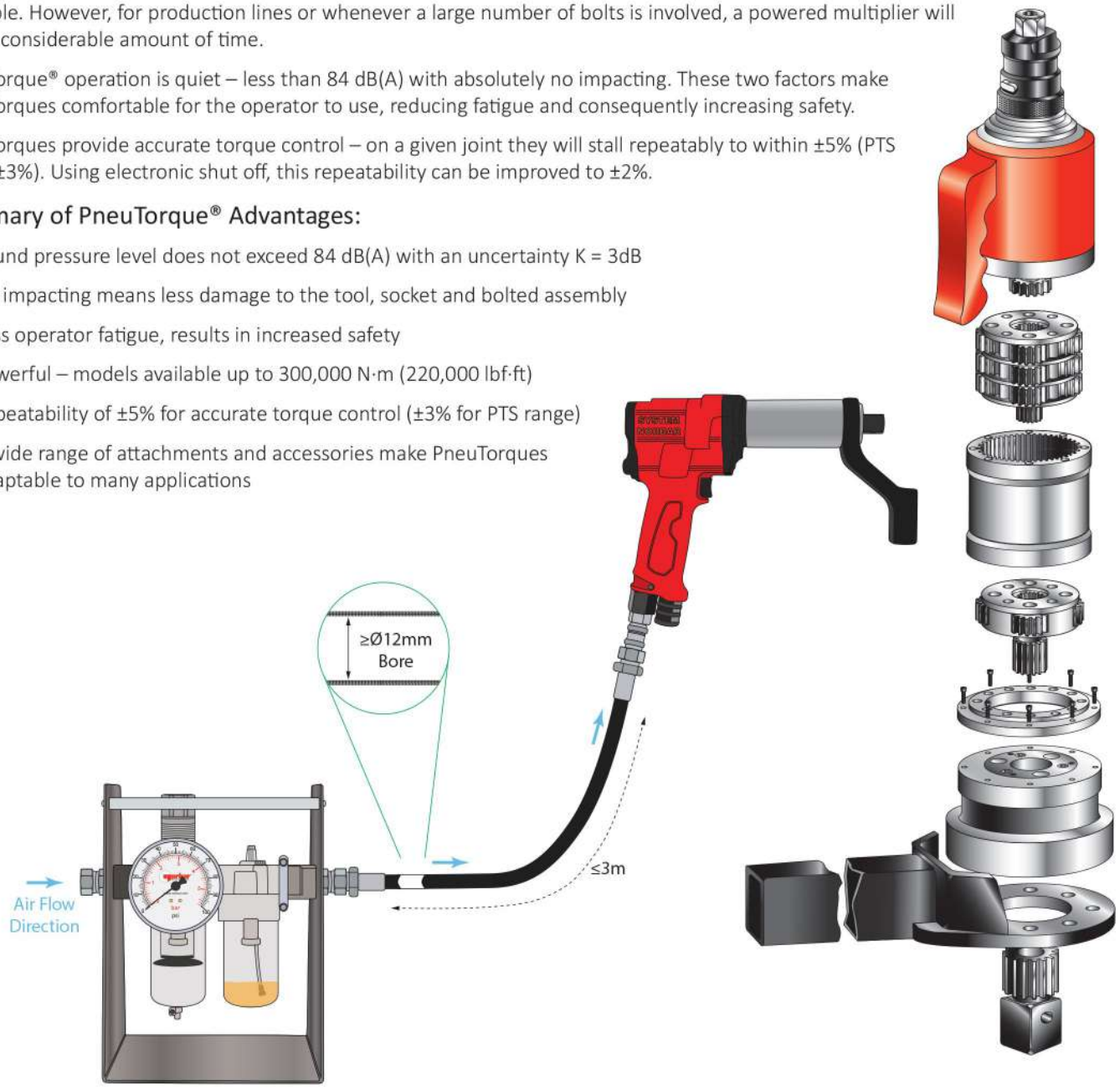
Hand operated torque multipliers are ideal for low volume or intermittent use or when there is no power source available. However, for production lines or whenever a large number of bolts is involved, a powered multiplier will save a considerable amount of time.

PneuTorque® operation is quiet – less than 84 dB(A) with absolutely no impacting. These two factors make PneuTorques comfortable for the operator to use, reducing fatigue and consequently increasing safety.

PneuTorques provide accurate torque control – on a given joint they will stall repeatably to within ±5% (PTS tools, ±3%). Using electronic shut off, this repeatability can be improved to ±2%.

Summary of PneuTorque® Advantages:

- Sound pressure level does not exceed 84 dB(A) with an uncertainty K = 3dB
- No impacting means less damage to the tool, socket and bolted assembly
- Less operator fatigue, results in increased safety
- Powerful – models available up to 300,000 N·m (220,000 lbf·ft)
- Repeatability of ±5% for accurate torque control (±3% for PTS range)
- A wide range of attachments and accessories make PneuTorques adaptable to many applications



PNEUMATIC TORQUE TOOLS

PneuTorque® Applications

The smooth and continuous torque output of the PneuTorque® makes these tools suitable for a wide range of bolting and non-bolting applications.

Bolting

PneuTorques are ideally suited to tightening and untightening bolts of up to 150 mm diameter. The following is just a small selection of applications:

- Wheel nuts on trucks, buses and large machinery
- Structural steelwork
- High pressure joints e.g. Pipelines, boiler feed pumps and pressure vessels
- Engine head bolts
- Injector heads on plastic injection moulding machines
- Heat exchangers
- Heavy vehicle production eg. chassis and suspension bolts

Non-bolting

Whenever a high continuous torque is needed, PneuTorques can be used as the power source. Typical applications include:

- Valve Actuation and valve grinding
- Powering wagons and gantries
- Barring of large diesel engines (turning the crankshaft) during build
- Weld testing by applying test torques
- Roller adjustment in steel mills and paper mills
- Valving of gas bottles

PNEUTORQUE® PTS™ SERIES

The PTS™ is the result of an extensive design project to produce an efficient air motor in an accurate torque tool. The air motor is then married to Norbar's respected gearbox range, sharing common torque reaction accessories with PTM, EvoTorque® 2 and EBT.

- Pistol grip handle for operator comfort
- Designed to offer excellent power-to-weight ratio
- Easily accessible switch for forward and reverse operation
- ±3% repeatability of reading from 20% to 100% of range
- Air coupling designed for safety and rapid operation
- Quiet operation - The sound pressure level is 77 dB(A) [the PTS™ 4000 is 79 dB(A)]. Uncertainty K =3 dB
- Directional exhaust barrel directs exhaust away from operator
- Replaceable square drive
- Fast operation for rapid bolt rundown.
- Non-impacting - exceptionally low vibration levels (0.343 m/s^2), make these tools comfortable and safe for operator use
- Steel reactions supplied as standard. Bespoke reactions available upon request

11	PTS SERIES - STALL TOOLS - BI-DIRECTIONAL - SINGLE SPEED
180241.B06	¾" sq. dr., 100 - 500 N·m, 74 - 370 lbf·ft
180242.B06	¾" sq. dr., 160 - 800 N·m, 118 - 590 lbf·ft
180243.B06	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf·ft
180244.B08	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf·ft
181454	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft
180246.B08	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft
180250.B08	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180249.B12	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft

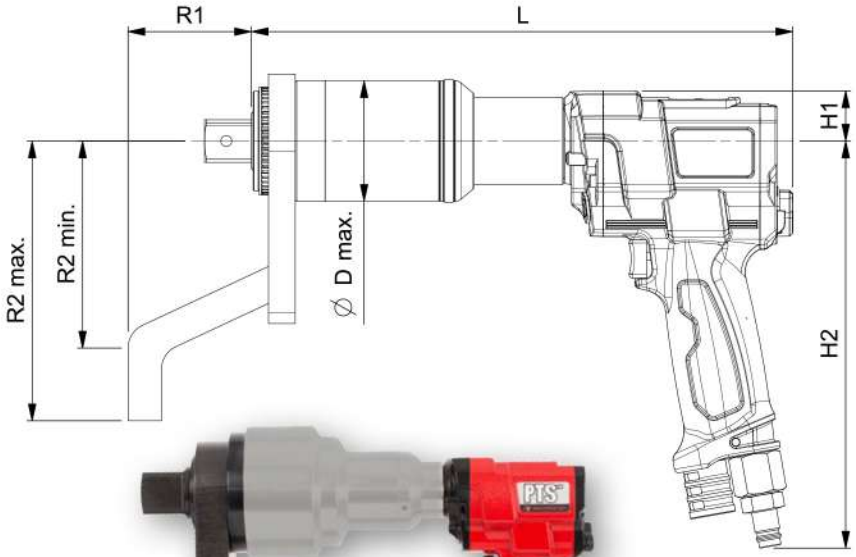
11	PTS SERIES - STALL TOOLS - BI-DIRECTIONAL - AUTO TWO SPEED
180781	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf·ft
180782	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf·ft
180784	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft
180785	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180788	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft

When the tool is to be used for untightening bolts, Norbar recommends the selection of single speed versions. In the case of prevailing torque lock-nuts or partially tightening bolts, the Auto Two Speed version of the tools will generally give no advantage and single speed tools should be selected.

PNEUTORQUE® PTS™ SERIES

Model		PTS-52-500 PTS-52-800	PTS-72-1000 PTS-72-1350	PTS-72-1000 Auto Two Speed PTS-72-1350 Auto Two Speed	PTS-68-2000	PTS-80-2700	PTS-80-2700 Auto Two Speed	PTS-92-4000	PTS-92-4000 Auto Two Speed	PTS-119-7000	PTS-119-7000 Auto Two Speed
Part Number		180241.B06 180242.B06	180243.B06 180244.B08	180781 180782	181454	180246.B08	180784	180250.B08	180785	180249.B12	180788
Output Speed (rpm)		35.5 (PTS-52-500) 25.7 (PTS-52-800)	20.4 (PTS-72-1000) 14.7 (PTS-72-1350)	100 (PTS-72-1000) 75 (PTS-72-1350)	9.2	7.3	30	5.3	22	2.6	13
Dimensions (mm)	ØD max.	52	72	72	68	80	80	92	92	119	119
	H1	30	30	30	30	30	30	30	30	30	30
	H2	243	243	243	243	243	243	243	243	243	243
	L	264	292	310	285	291	327	343	374	369	369
	R1	59	74	74	74	74	74	74	75	90	90
	R2 min.	71	124	124	120	124	124	125	125	162	162
	R2 max.	131	165	167	165	165	167	175	175	210	210
Tool Weight (kg)		4.2	6.2	6.28	5.35	6.2	7.45	8.59	8.89	12.5	12.80
Reaction Weight (kg)		0.9	1.4	1.4	1.1	1.4	1.4	2.5	2.5	3.8	4.0

PTS™-52



PTS™-80

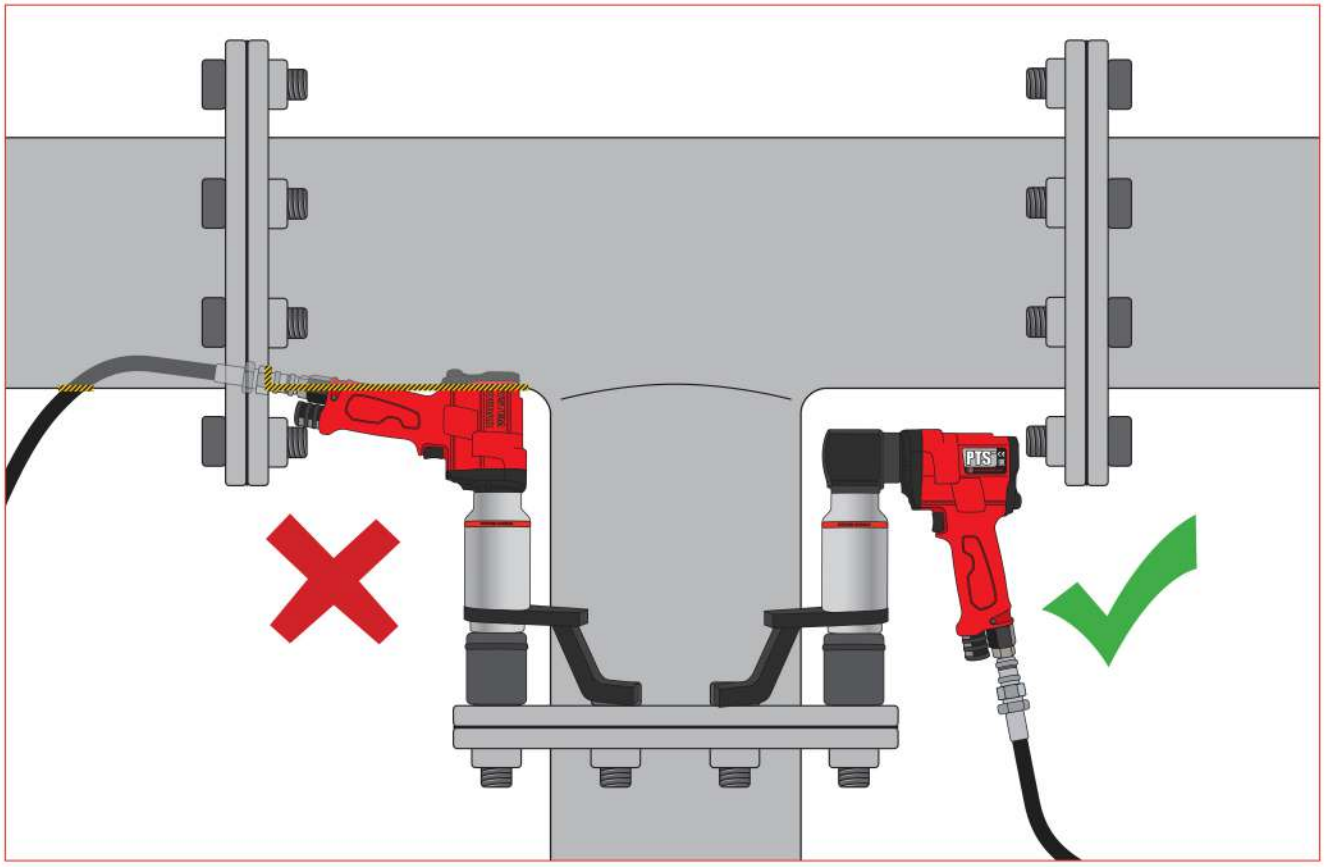
PTS™-119

PNEUTORQUE® PTS™ RIGHT ANGLE GEARBOX

Right Angle Gearbox fitted to PTS™

11	PTS SERIES - STALL TOOLS - BI-DIRECTIONAL - SINGLE SPEED - RIGHT ANGLE GEARBOX
180241.B06.RA	¾" sq. dr., 100 - 500 N·m, 74 - 370 lbf·ft
180242.B06.RA	¾" sq. dr., 160 - 800 N·m, 118 - 590 lbf·ft
180243.B06.RA	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf·ft
180244.B08.RA	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf·ft
181454.RA	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft
180246.B08.RA	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft
180250.B08.RA	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180249.B12.RA	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft

11	PTS SERIES - STALL TOOLS - BI-DIRECTIONAL - AUTO TWO SPEED - RIGHT ANGLE GEARBOX
180781.RA	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf·ft
180782.RA	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf·ft
180784.RA	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft
180785.RA	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180788.RA	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft



PNEUTORQUE® PTS™ REMOTE SERIES

Remote control versions have no direction control on the tool but rely on external pneumatic circuitry to provide this function. This opens up numerous application possibilities for the PneuTorque® ranging from simple stall shut-off in a hazardous working environment to sophisticated, multi-spindle torque and angle shut-off systems.

- Designed to offer excellent power-to-weight ratio
- ±3% repeatability of reading from 20% to 100% of range
- Replaceable square drive

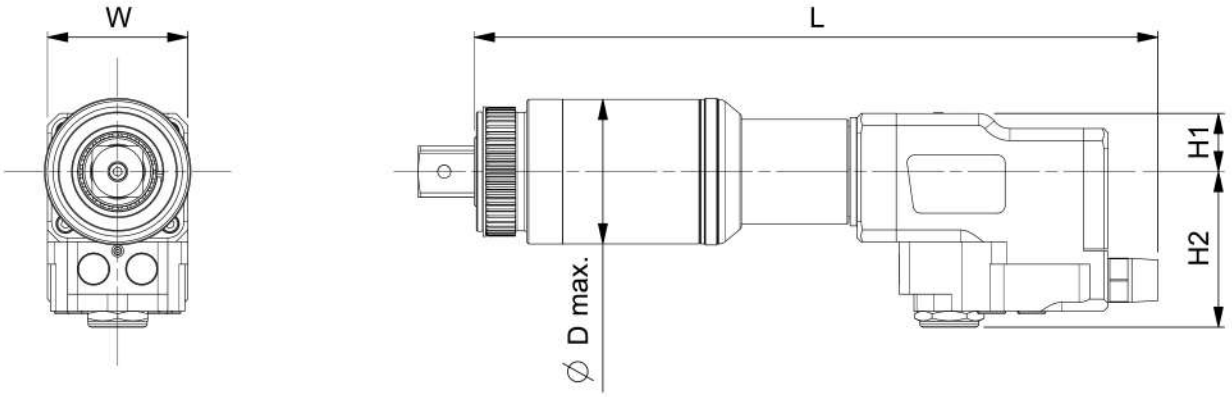
NOTE: For full versatility, PTS™ Remotes are supplied without reaction see pages 69 - 72 for options or discuss bespoke engineered options with Norbar.

11	PTS REMOTE SERIES
180271.B06	¾" sq. dr., 100 - 500 N·m, 74 - 370 lbf·ft
180272.B06	¾" sq. dr., 160 - 800 N·m, 118 - 590 lbf·ft
180273.B06	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf·ft
180274.B08	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf·ft
181455	1" sq. dr., 400 - 2,000 N·m, 295 - 1,475 lbf·ft
180276.B08	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft
180295.B08	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180279.B12	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft

11	PTS REMOTE SERIES - AUTO TWO SPEED
180789	¾" sq. dr., 200 - 1,000 N·m, 147 - 738 lbf·ft
180790	1" sq. dr., 270 - 1,350 N·m, 200 - 1,000 lbf·ft
180792	1" sq. dr., 540 - 2,700 N·m, 398 - 1,991 lbf·ft
180793	1" sq. dr., 800 - 4,000 N·m, 590 - 2,950 lbf·ft
180796	1½" sq. dr., 1,400 - 7,000 N·m, 1,030 - 5,200 lbf·ft

Model		PTS REMOTE 52-500	PTS REMOTE 52-800	PTS REMOTE 72-1000	PTS REMOTE 72-1350	PTS REMOTE 68-2000	PTS REMOTE 80-2700	PTS REMOTE 92-4000	PTS REMOTE 119-7000
Part Number		180271.B06	180272.B06	180273.B06	180274.B08	181455	180276.B08	180295.B08	180279.B12
Output Speed (rpm)		27.8	20.1	16	11.5	7.2	5.7	4.1	2
Dimensions (mm)	ØD max.	52	52	72	72	68	80	92	119
	H1	29	29	29	29	29	29	29	29
	H2	78	78	78	78	78	78	78	78
	L	284	284	311	311	302	311	362	385
	W	70	70	70	70	70	70	70	70
Tool Weight (kg)		4.1	4.1	6.1	6.1	5.25	6.1	8.9	12.4

Model		PTS REMOTE 72-1000 Auto Two Speed	PTS REMOTE 72-1350 Auto Two Speed	PTS REMOTE 80-2700 Auto Two Speed	PTS REMOTE 92-4000 Auto Two Speed	PTS REMOTE 119-7000 Auto Two Speed
Part Number		180789	180790	180792	180793	180796
Output Speed (rpm)		78	56	22	20	10
Dimensions (mm)	ØD max.	72	72	80	92	119
	H1	29	29	29	29	29
	H2	78	78	78	78	78
	L	330	330	344	395	422
	W	70	70	70	70	70
Tool Weight (kg)		6.2	6.2	7.0	9.3	12.78



ET, ET2, PTS™ AND PTM NOSE EXTENSIONS

Special nose extension reaction devices are available for use in situations where the tool access is restricted. A typical application is the rear wheel nuts on heavy vehicles.

11	SPLINED NOSE EXTENSIONS FOR 72/92 SERIES 1" DRIVE
19285.006	ET2/EBT/PTS/PTM-72 6" long, 1" sq. dr.
19285.009	ET2/EBT/PTS/PTM-72 9" long, 1" sq. dr.
19285.012	ET2/EBT/PTS/PTM-72 12" long, 1" sq. dr.
19047.006	ET2/EBT/PTS/PTM-92 6" long, 1" sq. dr.
19047.009	ET2/EBT/PTS/PTM-92 9" long, 1" sq. dr.
19047.012	ET2/EBT/PTS/PTM-92 12" long, 1" sq. dr.

11	SPLINED NOSE EXTENSIONS FOR 52 SERIES
19045.006	6" long
19045.009	9" long
19045.012	12" long

11	SPLINED NOSE EXTENSIONS FOR 72 SERIES ¾" DRIVE
19046.006	6" long, ¾" sq. dr.
19046.009	9" long, ¾" sq. dr.
19046.012	12" long, ¾" sq. dr.

11	NOSE EXTENSIONS FOR 52 SERIES
18601.006	6" long, F/M ¾" sq. dr.
18601.009	9" long, F/M ¾" sq. dr.
18601.012	12" long, F/M ¾" sq. dr.

F/M = Female input square/Male output square

11	NOSE EXTENSIONS FOR 72 SERIES
19007.006	6" long, SPM/M 1" sq. dr.
19007.009	9" long, SPM/M 1" sq. dr.
19007.012	12" long, SPM/M 1" sq. dr.

11	NOSE EXTENSIONS FOR 80 SERIES
19480.009	9" long, SPM/M 1" sq. dr.
19480.012	12" long, SPM/M 1" sq. dr.

SPM/M = Spline Male input/Male output square

The TrukTorque™ nose extension features a special curved reaction arm designed to handle bolt tightening on the front and rear wheels of trucks and buses. The design easily accommodates wheel trims and deeply recessed wheel bolts.

11	NOSE EXTENSIONS FOR TRUCK AND BUS WHEELS (Fits PTM-72)
19087.009	1,000 N·m, 9" long, ¾" sq. dr
19087.012	1,000 N·m, 12" long, ¾" sq. dr
19089.009	1,000 N·m, 9" long, 1" sq. dr
19089.012	1,000 N·m, 12" long, 1" sq. dr

PNEUTORQUE® STANDARD SERIES

Based on the original PneuTorque®, the 'Standard Series' range is a direct result of over 50 years of refinement and development necessary to keep pace with the requirements of industry today.

In use in many thousands of applications worldwide PneuTorque® wrenches continue to represent the foundation of Norbar's powered tool range. Two speed models offer all the advantages of single speed versions but with the additional benefit of a run-down speed five times greater than the high torque speed setting.

- Models available for almost every bolting and torque application, up to 300,000 N·m. Models above 6,000 N·m are Manufactured to Order, for more information please contact Norbar
- Forward and reverse operation
- Quiet : Noise level : 81dB(A), with an uncertainty K = 3dB, when free running
- Vibration : Does not exceed 2.5m/s² (highest measured under test: 0.444m/s²)
- Stall control gives repeatability of ±5% on a given joint
- Other reaction styles can be designed to suit specific applications
- Electronic torque transducers can be fitted for precise torque monitoring

PNEUTORQUE® STANDARD SERIES

From left to right PT 5 Remote,
PT 5 Single Speed, PT 5 Automatic Two Speed and PT 5 Manual Two Speed

11	SINGLE SPEED
16031	PT 1 ¾" sq. dr., 160 - 680 N·m, 120 - 500 lbf·ft
16011	PT 1 1" sq. dr., 160 - 680 N·m, 120 - 500 lbf·ft
16098	PT 1A ¾" sq. dr., 270 - 1,200 N·m, 200 - 900 lbf·ft
16097	PT 1A 1" sq. dr., 270 - 1,200 N·m, 200 - 900 lbf·ft
16013	PT 2 1" sq. dr., 515 - 1,700 N·m, 380 - 1,250 lbf·ft
16015	PT 5 1" sq. dr., 880 - 3,400 N·m, 650 - 2,500 lbf·ft
16017	PT 6 1½" sq. dr., 880 - 3,400 N·m, 650 - 2,500 lbf·ft
16066	PT 7 1½" sq. dr., 1,762 - 6,000 N·m, 1,300 - 4,500 lbf·ft

11	AUTOMATIC TWO SPEED
16031.AUT	PT 1 ¾" sq. dr., Auto 2SP 160 - 680 N·m, 120 - 500 lbf·ft
16011.AUT	PT 1 1" sq. dr., Auto 2SP 160 - 680 N·m, 120 - 500 lbf·ft
16098.AUT	PT 1A ¾" sq. dr., Auto 2SP 400 - 1,200 N·m, 295 - 900 lbf·ft
16097.AUT	PT 1A 1" sq. dr., Auto 2SP 400 - 1,200 N·m, 295 - 900 lbf·ft
16013.AUT	PT 2 1" sq. dr., Auto 2SP 700 - 1,700 N·m, 516 - 1,250 lbf·ft
16015.AUT	PT 5 1" sq. dr., Auto 2SP 880 - 3,400 N·m, 650 - 2,500 lbf·ft
16017.AUT	PT 6 1½" sq. dr., Auto 2SP 880 - 3,400 N·m, 650 - 2,500 lbf·ft
16066.AUT	PT 7 1½" sq. dr., Auto 2SP 2,200 - 6,000 N·m, 1,622 - 4,500 lbf·ft

11	MANUAL TWO SPEED
16031.MTS	PT 1 ¾" sq. dr., MTS 160 - 680 N·m, 120 - 500 lbf·ft
16011.MTS	PT 1 1" sq. dr., MTS 160 - 680 N·m, 120 - 500 lbf·ft
16098.MTS	PT 1A ¾" sq. dr., MTS 270 - 1,200 N·m, 200 - 900 lbf·ft
16097.MTS	PT 1A 1" sq. dr., MTS 270 - 1,200 N·m, 200 - 900 lbf·ft
16013.MTS	PT 2 1" sq. dr., MTS 515 - 1,700 N·m, 380 - 1,250 lbf·ft
16015.MTS	PT 5 1" sq. dr., MTS 880 - 3,400 N·m, 650 - 2,500 lbf·ft
16017.MTS	PT 6 1½" sq. dr., MTS 880 - 3,400 N·m, 650 - 2,500 lbf·ft
16066.MTS	PT 7 1½" sq. dr., 1,762 - 6,000 N·m, 1,300 - 4,500 lbf·ft

PT 9 and larger models are available as Manufacture to Order, please contact Norbar for more details

MTS = Manual Two Speed. Auto 2SP = Automatic Two Speed.

Angle Encoders are available for Standard Series PTs please contact Norbar for further details.

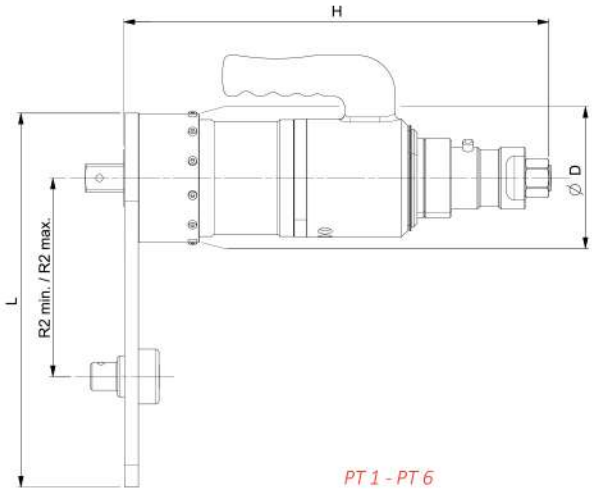
NB: PneuTorque® PT 11 - PT 18 are supplied with a Lubro Control Unit as standard equipment. PneuTorques PT 12, 13 and 14 are also supplied with a weld prepared reaction ring as standard. PT 13 and 14 are also supplied with a transporting trolley. PT 15 - 18 do not include output drive or reaction. These components will be engineered uniquely for each application. Remote PT part numbers are designated with an .X

e.g. PT 1 Remote is 16031.X

e.g. PT 1 Remote Auto is 16031.XAUT

For remote models, consult Norbar for prices

PNEUTORQUE® STANDARD SERIES



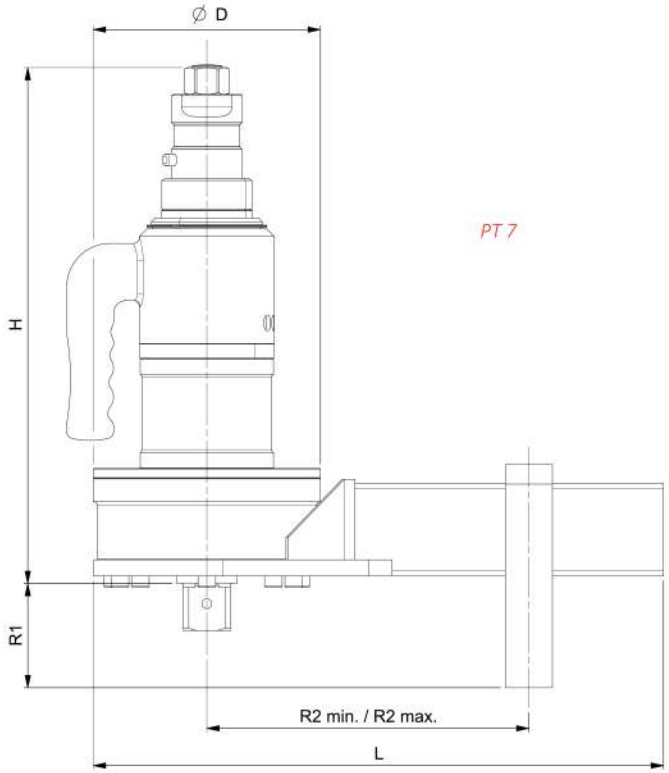
PT 1 - PT 6

PneuTorque® Standard Series Single Speed

Model		PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7
Part Number		16031 16011	16098 16097	16013	16015	16017	16066
Output Speed (rpm)		30	15	9	5	5	2.5
Dimensions (mm)	ØD	108	108	108	119	119	144
	H	350	350	350	393	395	423
	L	303	303	303	355	355	423
	R1	N/A	N/A	N/A	N/A	N/A	84
	R2 min.	83	83	83	86	86	150
	R2 max.	216	216	216	263	263	331
Tool Weight (kg)		10.6	11.1	11.1	14.0	14.0	19.7
Reaction Weight (kg)		2.2	2.2	2.2	2.5	2.5	6.3

PneuTorque® Standard Series Manual Two Speed

Model		PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7
Part Number		16031.MTS 16011.MTS	16098.MTS 16097.MTS	16013.MTS	16015.MTS	16017.MTS	16066.MTS
Output Speed (rpm)		150	75	45	25	25	12.5
Dimensions (mm)	ØD	108	108	108	119	119	144
	H	436	436	436	479	481	509
	L	303	303	303	355	355	423
	R1	N/A	N/A	N/A	N/A	N/A	84
	R2 min.	83	83	83	86	86	150
	R2 max.	216	216	216	263	263	331
Tool Weight (kg)		14.1	14.6	14.6	17.5	17.5	23.2
Reaction Weight (kg)		2.2	2.2	2.2	2.5	2.5	6.3



PT 7

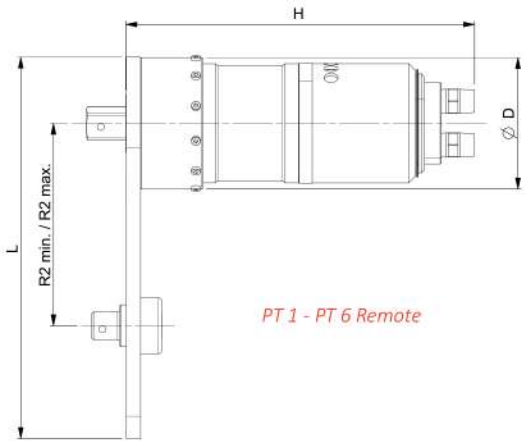
PneuTorque® Standard Series Automatic Two Speed

Model		PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7
Part Number		16031.AUT 16011.AUT	16098.AUT 16097.AUT	16013.AUT	16015.AUT	16017.AUT	16066.AUT
Output Speed (rpm)		150	75	45	25	25	12.5
Dimensions (mm)	ØD	108	108	108	119	119	144
	H	419	419	419	462	464	492
	L	303	303	303	355	355	423
	R1	N/A	N/A	N/A	N/A	N/A	84
	R2 min.	83	83	83	86	86	150
	R2 max.	216	216	216	263	263	331
Tool Weight (kg)		14.1	14.6	14.6	17.5	17.5	23.2
Reaction Weight (kg)		2.2	2.2	2.2	2.5	2.5	6.3

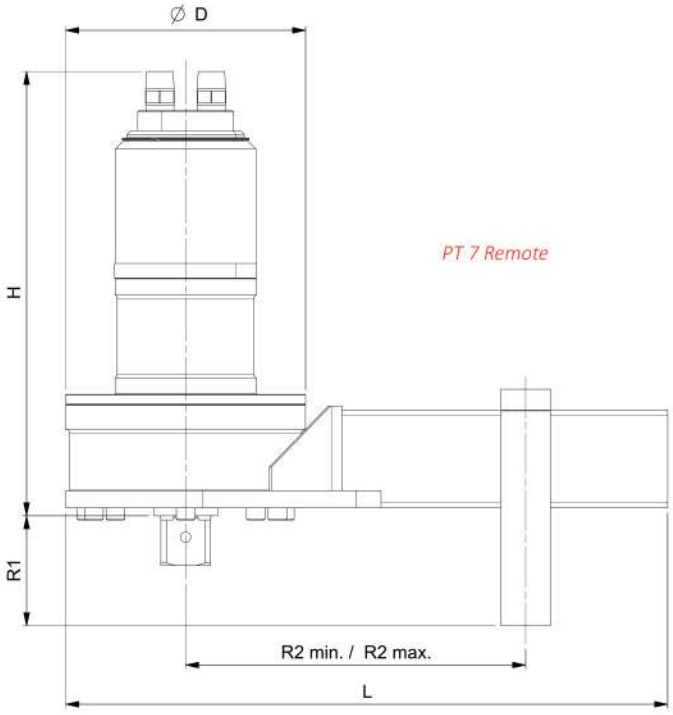
PNEUTORQUE® STANDARD SERIES

PneuTorque® Standard Series Automatic Two

Model		PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7
Part Number		16031.XAUT 16011.XAUT	16098.XAUT 16097.XAUT	16013.XAUT	16015.XAUT	16017.XAUT	16066.XAUT
Output Speed (rpm)		150	75	45	25	25	12.5
Dimensions (mm)	ØD	108	108	108	119	119	144
	H	339	339	339	382	383	412
	L	303	303	303	355	355	423
	R1	N/A	N/A	N/A	N/A	N/A	84
	R2 min.	83	83	83	86	86	150
	R2 max.	216	216	216	263	263	331
Tool Weight (kg)		14.1	14.6	14.6	17.5	17.5	23.2
Reaction Weight (kg)		2.2	2.2	2.2	2.5	2.5	6.3



PT 1 - PT 6 Remote



PT 7 Remote

PneuTorque® Standard Series Single Speed - Remote

Model		PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7
Part Number		16031.X 16011.X	16098.X 16097.X	16013.X	16015.X	16017.X	16066.X
Output Speed (rpm)		30	15	9	5	5	2.5
Dimensions (mm)	ØD	108	108	108	119	119	144
	H	270	270	270	313	314	343
	L	303	303	303	355	355	423
	R1	N/A	N/A	N/A	N/A	N/A	84
	R2 min.	83	83	83	86	86	150
	R2 max.	216	216	216	263	263	331
Tool Weight (kg)		10.6	11.1	11.1	14.0	14.0	17.9
Reaction Weight (kg)		2.2	2.2	2.2	2.5	2.5	6.3

PneuTorque® Standard Series Manual Two Speed - Remote

Model		PT 1	PT 1A	PT 2	PT 5	PT 6	PT 7
Part Number		16031.XMTS 16011.XMTS	16098.XMTS 16097.XMTS	16013.XMTS	16015.XMTS	16017.XMTS	16066.XMTS
Output Speed (rpm)		150	75	45	25	25	12.5
Dimensions (mm)	ØD	108	108	108	119	119	144
	H	356	356	356	399	400	429
	L	303	303	303	355	355	423
	R1	N/A	N/A	N/A	N/A	N/A	84
	R2 min.	83	83	83	86	86	150
	R2 max.	216	216	216	263	263	331
Tool Weight (kg)		14.1	14.6	14.6	17.5	17.5	23.2
Reaction Weight (kg)		2.2	2.2	2.2	2.5	2.5	6.3

* Available on request

TORQUE REACTION

This page applies to both HandTorque® multipliers and powered torque tools

Principles of Torque Reaction

Newton's law dictates that for every applied force there is an equal and opposite reactive force. For applications requiring relatively low torques that can be applied with a torque wrench, this does not present a problem as the reactive force is absorbed by the operator. However, if the desired torque necessitates the use of a multiplier, the resultant reactive force can only be absorbed using an appropriate reaction device.

For this reason all Norbar multipliers are supplied with a reaction plate or reaction foot fitted as standard.

All of the standard reaction plates and feet supplied with standard Norbar tools have been designed to enable the multiplier's use in a variety of environments. However, due to an infinite number of bolting arrangements, it is impossible to have one reaction device that will satisfy every customer's requirement. See pages 71 to 72 for when the supplied standard reaction is not suitable.

In the above example, 1,000 N·m torque output will result in a reactive force of 6,667 N at a point 0.15 m from the axis of rotation or 2,000 N at 0.5 m.

Avoiding Torque Reaction Problems

It has already been mentioned that the reaction force is equal to the force being applied. However, the magnitude of the reaction force is dependent upon the perpendicular distance between the point of reaction and the centre line of the multiplier, ie. the greater the distance the lower the force.

For this reason the point of reaction should be kept as far away from the centre line of the gearbox as is practical.

Customers using or modifying reaction plates for Standard Series multipliers up to a capacity of 3,400 N·m should note that if the reaction is taken on the radiused part, the reaction force is perpendicular to the tangent of the curve. Consequently, the further around the radius the reaction is taken, the smaller the perpendicular distance and therefore the greater the force.

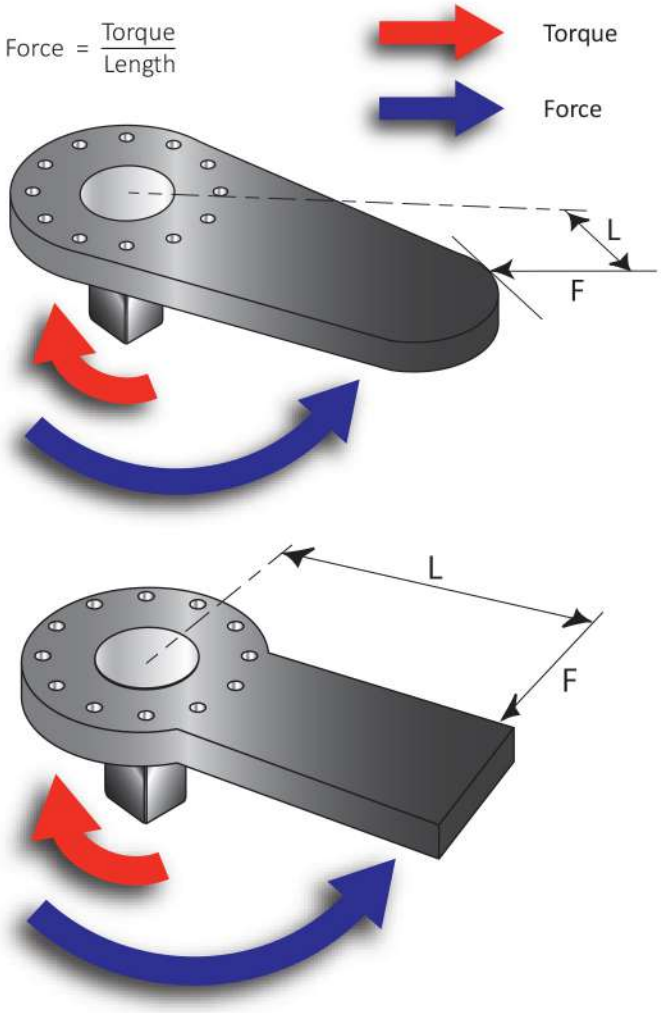
Although a longer reaction plate may mean lower forces, the bending moment close to the multiplier will increase.

Customers extending the length of Norbar's standard reaction plates should be aware that an increase in overall length will result in a larger induced bending stress and should not assume that because the reaction plate is strong enough at one length it will remain so when extended.

Excessive side loading, resulting from poor reaction, increases frictional forces inside the multiplier. This can lead to lower multiplication ratios (outside ±4%).

The ideal reaction arrangement has the centre of the reaction bar and the centre of the nut on a perpendicular line to the centre line of the tool.

$$\text{Force} = \frac{\text{Torque}}{\text{Length}}$$



TORQUE REACTION

This page applies to both HandTorque® multipliers and powered torque tools

Red shading indicates ideal area for torque reaction.

It is not advised to react outside of the shaded area.

Signs of poor reaction are evident on this damaged foot. Reaction was taken at the wrong point on the foot and burring indicates that the foot was slipping off the reaction point.

Points to remember

- Take the reaction as far away from the multiplier as practical
- Ensure that the reaction point remains square to the multiplier wherever possible as this will minimise any additional stress in the output square, which could result in premature failure. If the multiplier tilts under load, the reaction may not be square
- For applications that do not allow the reaction to be taken securely it is advisable to use a double-sided or balanced reaction plate

Reaction Force

When using multipliers and PneuTorques the reaction point must be capable of withstanding the reaction force. Therefore, great care must be exercised where the reaction is taken when applying high torques to studs and bolts.

By using the following formula you can calculate the force at the point of reaction. The greater the distance the lower the force.

D = Stud Diameter

Formula to calculate Area of Stud $= \frac{\pi \times D^2}{4}$

Formula to calculate shear force: Shear Force $= \frac{\text{Reaction Force}}{\text{Area of Stud}}$

What to do if the standard reaction device is not suitable

For those applications that do not permit the use of a standard reaction plate the customer has three options.

- Norbar or an authorised Norbar distributor will design and manufacture a special purpose reaction plate to the customer's requirements
- The customer can modify the standard reaction plate to suit their requirements
- The customer can fabricate their own reaction device after liaison with Norbar's technical department or a Norbar distributor

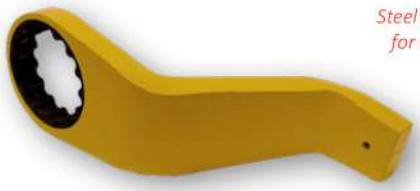
Customers wishing to either modify the original reaction plate or fabricate their own device should read the above information on how to avoid common torque reaction problems.

TORQUE REACTION

A variety of reaction plates, manufactured in Steel or Aluminium for HandTorque®, EvoTorque®, EvoTorque® Battery Tool and PneuTorque®. Norbar also offer a range of specific reactions for the Wind Energy Generation Industry.

11	REACTION FOR HT/PTS/PTM-52 SERIES
18646	Steel Cranked Reaction for 52 mm

11	REACTION FOR ET/EBT/PTS/PTM-68 SERIES
19611	Steel Cranked Reaction for 68 mm

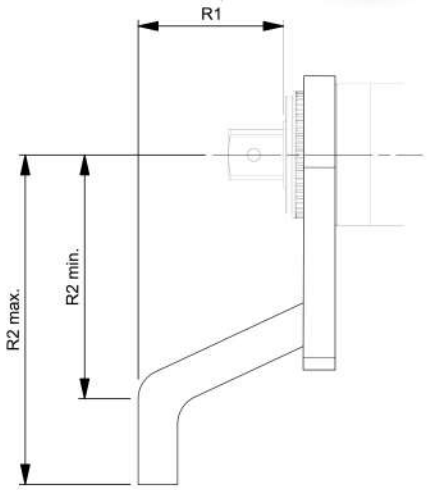


Steel Cranked Reaction for 68 mm Gearbox

11	SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-72 & 80 SERIES				
19289	Steel Cranked Reaction for 72 mm and 80 mm		18494	Aluminium Cranked Reaction for 72 mm and 80 mm	

11	SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-92 SERIES				
19291	Steel Cranked Reaction for 92 mm		18936	Aluminium Cranked Reaction for 92 mm	

11	SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-119 SERIES				
19293	Steel Cranked Reaction for 119 mm (Max. 7,000 N·m)		18961	Aluminium Cranked Reaction for 119 mm (Max. 6,000 N·m)	



Part Number	R1	R2 min	R2 max
18646	59 mm	71 mm	131 mm
19289	76 mm	124 mm	167 mm
18494	68 mm	91 mm	165 mm
19291	70 mm	125 mm	175 mm
18936	87 mm	115 mm	205 mm
19293	90 mm	162 mm	210 mm
18961	118 mm	150 mm	199 mm

11	SPECIAL SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-92 SERIES
78028	Steel Cranked Reaction for 92 mm

11	SPECIAL SPLINED REACTION FOR HT/ET/EBT/PTS/PTM-119 SERIES
78027	Steel Cranked Reaction for 119 mm

11	SPECIAL SPLINED REACTION FOR API FLANGES
78029	HT/ET/EBT/PTS/PTM-72 & 80 Series Steel Crowfoot Reaction for 1¼" – 1½"(M30 – M39) nuts/bolts
78028	HT/ET/EBT/PTS/PTM-92 Series Steel Cranked Reaction (see image above) for 1⅝" – 1⅞"(M42 – M48) nuts/bolts
78030	HT/ET/EBT/PTS/PTM-119 Series Steel Crowfoot Reaction for 2" – 2½"(M52 – M64) nuts/bolts

Part Number	R1	R2 min	R2 max
78027	90 mm	148 mm	248 mm
78028	70 mm	57 mm	145 mm
78029	76 mm	45 mm	115 mm
78030	110 mm	70 mm	156 mm

TORQUE REACTION

A variety of steel reaction plates and adaptors, together with ancillary feet, blades and heads to aid their use are available for HandTorque®, EvoTorque®, EvoTorque® Battery Tool and PneuTorque®.

11	SPECIAL SPLINED REACTION FOR RAIL
Q4714	HT/ET/EBT/PTS/PTM-52 Series Pegged Reaction Plate Max Torque 500 N·m
Q5000	HT/ET/EBT/PTS/PTM-72 Series Pegged Reaction Plate Max Torque 1,500 N·m

Q4714 Pegged Reaction Plate for rail

11	FOR HT/PTS/PTM-52 SERIES
18590	Double-Sided Reaction Plate
18576	Straight Reaction Plate
62236	Reaction Plate Spline Adaptor

11	FOR ET/EBT/PTS/PTM-68 SERIES
19783	Double-Sided Reaction Plate

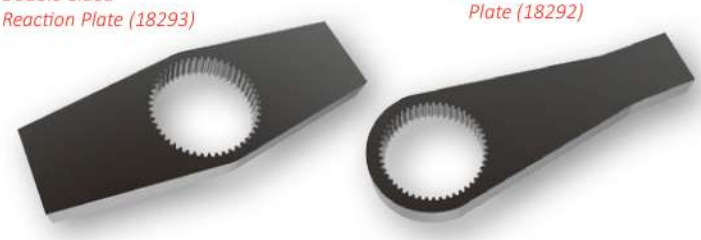
11	FOR HT/ET/EBT/PTS/PTM-72 & 80 SERIES
18293	Double-Sided Reaction Plate
18292	Straight Reaction Plate

11	FOR ET/EBT/PTS/PTM-92 SERIES
18979	Straight Reaction Plate
18980	Double-Sided Straight Reaction Plate

11	FOR ET/EBT/PTM-119 SERIES
16687	Straight Reaction Plate
18981	Double Sided Straight Reaction Plate

Double-Sided Reaction Plate (18293)

Straight Reaction Plate (18292)



11	LIGHT WEIGHT REACTIONS
19214	ET/EBT/PT/PTS/PTM-72 API Class 4 Light Weight Reaction

Light Weight Reaction (19214)

Reaction Weld Ring

11	REACTION WELD RINGS
18694	For HT/PTS/PTM-52
19784	For ET/EBT/PTS/PTM-68
18695	For HT/ET/EBT/PTS/PTM-72 & 80
18696	For HT/ET/EBT/PTS/PTM-92
18697	For HT/ET/EBT/PTS/PTM-119

Straight Reaction with Peg (18298)
Short Reaction Foot (18241)
Straight Reaction (18291)

11	ANCILLARY ITEMS FOR USE WITH 18290 OR 18558
18558	Reaction Adaptor for HT/ET/EBT/PTS/PTM-52 Series
18290	Reaction Adaptor for HT/ET/EBT/PTS/PTM-72 Series
18298	Straight Reaction with Peg
18291	Straight Reaction
18241	Short Reaction Foot
18358	Sliding Reaction Blade (to be used with 18291)
18359	Sliding Reaction Spigot Head (to be used with 18291)

Sliding Reaction (180300.092.B08)

11	SLIDING REACTIONS
180300.052.B06	52 mm diameter Sliding Reaction ¾" sq.
19785.068.B06	68 mm diameter Sliding Reaction ¾" sq.
19785.068.B08	68 mm diameter Sliding Reaction 1" sq.
180300.072.B06	72 mm diameter Sliding Reaction ¾" sq.
180300.072.B08	72 mm diameter Sliding Reaction 1" sq.
180300.080.B08	80 mm diameter Sliding Reaction 1" sq.
180300.092.B08	92 mm diameter Sliding Reaction 1" sq.
180300.092.B12	92 mm diameter Sliding Reaction 1 ½" sq.
180300.119.B12	119 mm diameter Sliding Reaction 1 ½" sq.

Sliding Spigot Reaction Plate (18436)

11	FOR HT 60 / PT 4500 / PT 5500
16687	Single Sided Straight Reaction Plate
18436	Sliding Spigot Reaction Plate

11	FOR FOR ET/EBT/PTS/PTM-68 SERIES
19782	Single Sided Straight Reaction Plate

11	FOR HT 30 / PT 2700
16686	Single Sided Straight Reaction Plate

PTS™ AND PTM DUAL TRIGGER MODULE (DTM)

Dual Trigger Module (19286)

A secondary trigger for use with all PTS and PTM tools that easily attaches between the tool's air inlet port and hose. This requires the operator to use both hands to run the tool and so reduces the risk of hands getting trapped between the reaction bar and reaction point.

- Inlet ½" BSPP Female
- Outlet ½" BSPP Male

11	DUAL TRIGGER MODULE
19286	Dual Trigger Module for use with any PneuTorque

To order a pre-assembled tool add the suffix .DTM onto the end of the part number.

NOTE: When fitting a DTM the torque tool must be recalibrated with the DTM in place, contact Norbar for details.

SECONDARY HANDLE

The secondary handle is an easy to fit and versatile accessory which offers additional support and ease of handling when applying torque with Norbar's powered tools. The secondary handle is designed to fit directly to all new powered tools which have a handle location groove in the annulus which is covered by a red rubber band (see inset image to the right).

11	SECONDARY HANDLE
19363	For use with ET2/EBT/PTS/PTM 72, 92 & 119 Series
19448	For use with ET2/EBT/PTS/PTM 80 Series

Not suitable for use with ET2/EBT/PTS/PTM 52 and 68 Series

RIGHT ANGLE GEARBOX MODULE

Right Angle Gearbox (180280)

Right Angle Gearbox (180280) fitted to EBT

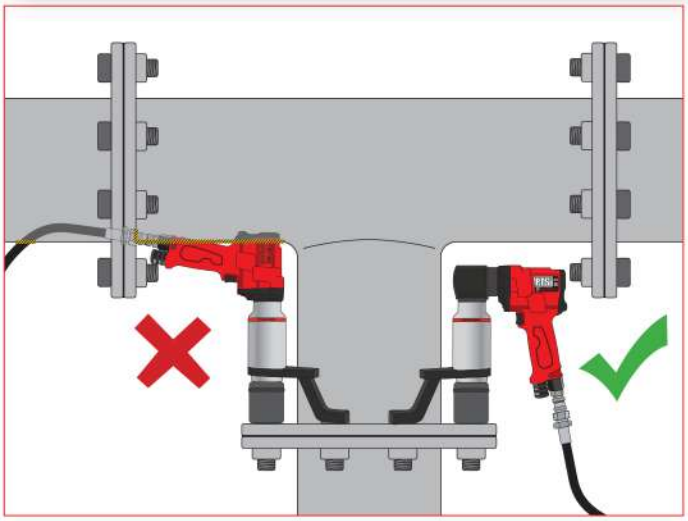
11	RIGHT ANGLE GEARBOX
180280	Right Angle Gearbox Module

To order a pre-assembled ET2 or PTS tool add the suffix .RA onto the end of the part number. Part numbers for a pre-assembled EBT can be found on page 54.

The EvoTorque®2 can also be supplied in a Peli Case pre-assembled to a Right Angle Gearbox at an additional charge. Please add .RAPEL onto the end of the EvoTorque®2 part number.

The Right Angle Gearbox Adaptor will provide most ET, EBT, PTS™ and PTM tools with a 90° angle of operation, enabling the benefits of Norbar's pneumatic and electric torque tools to be brought to a host of applications from which they are currently excluded due to space restrictions.

- Allows more comfortable operation of these tools on vertical bolting applications at chest height and above as the pistol grip is presented correctly to the operator
- The tool handle can rotate 360° in relation to the Right Angle Gearbox allowing the most comfortable and safest position to be found
- The handle and Right Angle Gearbox can index in relation to the tool gearbox meaning that reaction forces are not passed back to the operator
- Manufactured from steel, the Right Angle Gearbox is robustly constructed for durability and long life
- The Right Angle Gearbox can be purchased as a stand-alone product and retrofitted to existing Norbar tools by suitably qualified technicians. Norbar recommend tool recalibration after a Right Angle Gearbox has been fitted but where this is not possible, an efficiency of 97% can be assumed



LUBRO CONTROL UNITS

Lubro Control Unit, part numbers 16074

Norbar's standard filter, regulator, lubricator unit 16074 features a 100 mm diameter gauge for easy and accurate setting of air pressure with ergonomic placement of air pressure adjustment control. Supplied with 3 metres of robust, steel braided air hose with fittings to connect to PneuTorque® wrenches.

Twin Regulator Lubro Control Unit, part number 16075

The 'Twin Lubro' has the same features as Norbar's standard filter, regulator, lubricator unit but has the benefit of two regulators and a switch that allows quick selection between two air pressure settings. A typical application for this would be a PneuTorque® user wishing to quickly select between two applications requiring different torque settings. For example, this might be controlled torque in the forward direction and maximum torque allowed by the tool in the reverse direction.

16074

16075

11	LUBRO CONTROL UNITS
16074	Lubro Control Unit with 3 m hose
60339	MPa only gauged Lubro Control Unit with 3 m hose
16075	Twin Lubro Control Unit with 3 m hose

See page 130 for Lubro Control Unit spares.

SOCKET RETAINERS

These socket retaining clips make attaching sockets to square drives easy and quick.

8	SOCKET RETAINING CLIPS
19556	Socket Retaining Clip for ¾" sq. dr. (Yellow) - Pack of 10
19557	Socket Retaining Clip for 1" sq. dr. (Red) - Pack of 10
19558	Socket Retaining Clip for 1½" sq. dr. (Green) - Pack of 10
19559	Socket Retaining Clip for 2½" sq. dr. (Blue) - Pack of 10

This product is intended for general purpose use at ground level. It is not intended as a solution for socket retention when working at height or where FOD (foreign object damage) could cause a safety and/or commercial risk.

Not recommended for use with impact tools.