



The Voice of Torque Control



HANDTORQUE MINI BROCHURE

2021

LEGEND

GENERIC		
Accuracy (%)	Torque & Angle	Digital Display
Single Scale	Dual Scale	Multi Scale
Calibration Certificate	UKAS Accredited Certification	IP Rated
Bluetooth Enabled	Case Included	
MANUAL TORQUE MULTIPLIERS		
Adjustable Reaction	Anti Wind-up Ratchet	

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ABOUT NORBAR - THE VOICE OF TORQUE CONTROL

United Kingdom + 44 (0)1295 753600 sales@norbar.com	China + 86 21 6145 0368 sales@norbar.com.cn
USA + 1 866 667 2272 inquiry@norbar.us	Singapore + 65 6841 1371 enquires@norbar.sg
FASTORQ + 1 281 449 6466 esales@fastorq.com	Australia + 61 (0)8 8292 9777 norbar@norbar.com.au
India + 91 22 2778 8480 enquiry@norbar.in	New Zealand + 64 (0)9 579 8653 norbarnz@norbar.com.au

GLOBAL SERVICE

We are the world’s leading specialist in torque control and we are engaged solely in the design, development and production of torque tightening and measuring equipment. Our customers include manufacturers and engineering services in such diverse sectors as aerospace, energy, oil and gas, mining and sub-sea. There are sales and service branches as shown above. In addition, we have distributors of our torque control products in more than 60 countries around the world.

We continue to invest in the very latest design, manufacturing and quality control technology to achieve the highest level of innovation and precision in the field of torque control and equipment.

A FAMILY BUSINESS

The Brodey family has been a part of Norbar since Bill Brodey and his partner Ernest Thornitt incorporated the company in 1943. They are now the third generation of the family to participate in the business and are passionate about its every aspect. From our humble beginnings in a small workshop in North Bar, Banbury town centre, Norbar has grown into an international group of companies that leads the field of torque control. However, what has not changed in over 75 years is that our product range is still substantially manufactured in Banbury with many suppliers in the surrounding area and we are still dedicated to being the best at what we do.

Norbar is now a member of the Snap-on Incorporated family of companies and is proud to be part of a business which has beliefs, values and a vision closely aligned with those that Norbar was founded on.



We are excited to inform you that the well-regarded brand FASTORQ is now a part of the Norbar family. Based in New Caney, Texas, FASTORQ are a global provider of precision bolt loading and removal solutions and offer a range of products well suited to complement Norbar’s existing product range. FASTORQ are a pioneer in the hydraulic tools industry and today design, manufacture and sell a revolutionary line of bolting solutions and specialty bolting lubricants delivering timely resolution to bolting challenges of all sizes on land or sea. FASTORQ’s highly skilled team of engineers and bolting technicians have over 100 combined years of bolting technology aiding us in our mission; ‘To be the best torque tool company in the world. Respected, profitable and a great place to work!’



INTRODUCTION TO TORQUE

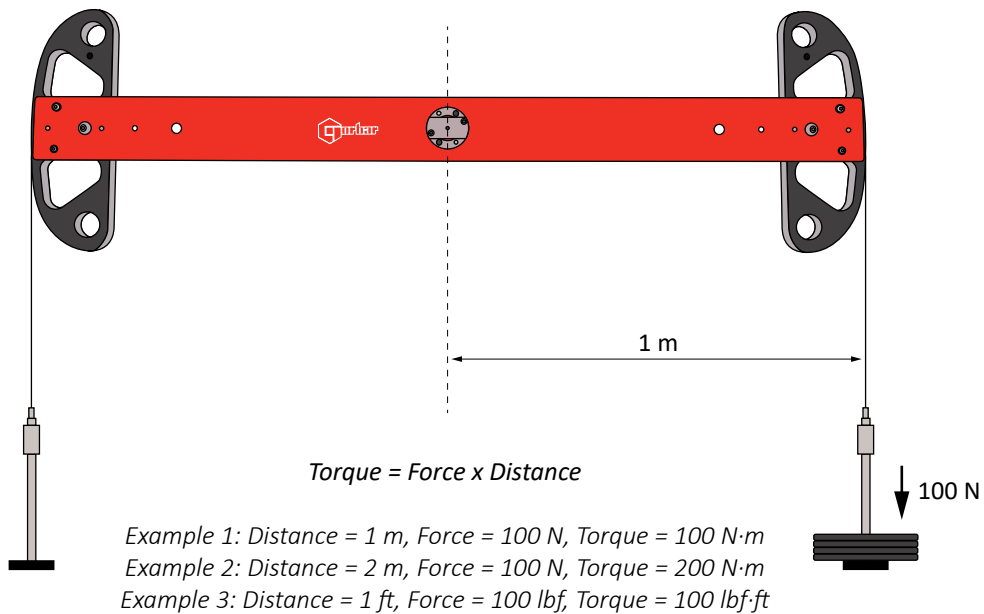
What is Torque?

Torque is any force or system of forces that tends to cause rotation about an axis.

Measurement of Torque

Imagine someone tightening a bolt using a socket attached to a meter (m) long bar. If they apply 10 kg of force (kgf) perpendicular to the bar they will produce a torque of 10 kgf·m at the axis (the centre of the bolt).

However, under the S.I. system of measurement, force is expressed in Newtons (N) rather than kgf. The conversion between kgf and N is x 9.807 so the person is applying 98.07 N·m of torque.



The Importance of Torque Control

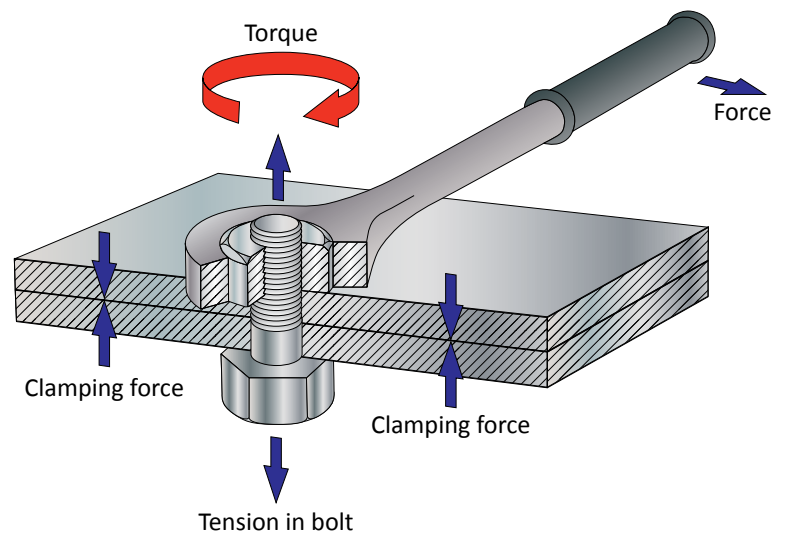
Although many methods exist to join two or more parts together, the ease of assembly and disassembly provided by threaded fasteners make them the ideal choice for many applications.

The object of a threaded fastener is to clamp parts together with a tension greater than the external forces tending to separate them. The bolt then remains under constant stress and is immune from fatigue. However, if the initial tension is too low, varying loads act on the bolt and it will quickly fail. If the initial tension is too high, the tightening process may cause bolt failure. Reliability therefore depends upon correct initial tension. The most practical way of ensuring this is by specifying and controlling the tightening torque.

Bolt Tension

When an assembly is clamped by tightening a nut and bolt, the induced tension causes the bolt to stretch. An equal force acts to compress the parts which are thus clamped.

The proof load of a bolt, normally established by test, is the load which just starts to induce permanent set – also known as the yield point. Typically bolts are tightened to between 75% and 90% of yield.

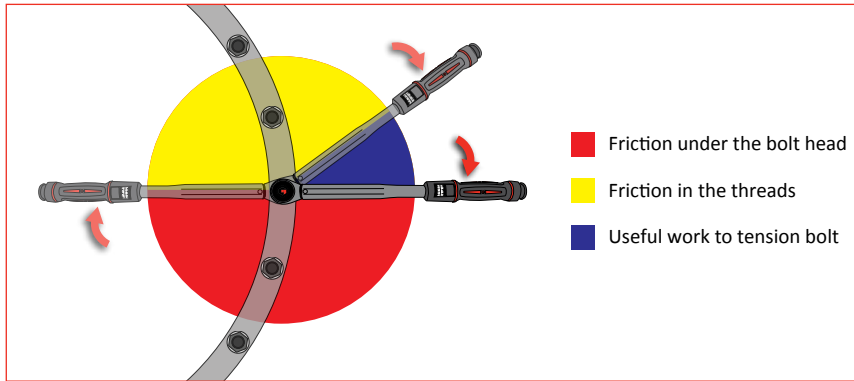




INTRODUCTION TO TORQUE

Friction in the Bolted Joint

When a threaded fastener is tightened, the induced tension results in friction under the head of the bolt and in the threads. It is generally accepted that as much as 50% of the applied torque is expended in overcoming friction between the bolt head and the abutting surface and another 30% to 40% is lost to friction in the threads. As little as 10% of the applied torque results in useful work to tension the bolt.



Given that up to 90% of the applied torque will be lost to friction, it follows that any changes in the coefficient of friction resulting from differences in surface finish, surface condition and lubrication can have a dramatic effect on the torque versus tension relationship. Some general points can be made:

- Most torque tightened joints do not use washers because their use can result in relative motion between the nut and washer or the washer and joint surface during tightening. This has the effect of changing the friction radius and hence affects the torque-tension relationship. Where a larger bearing face is required then flange nuts or bolts can be used. If washers are to be used, hard washers with a good fit to the shank of the bolt give lower and more consistent friction and are generally to be preferred.
- Degreasing fasteners of the film of oil usually present on them as supplied will decrease the tension for a given torque and may result in shear of the fastener before the desired tension is achieved.
- Super lubricants formulated from graphite, molybdenum disulphide and waxes result in minimal friction. Unless allowance is made in the specified tightening torque, the induced tension may be excessive causing the bolt to yield and fail. However, used in a controlled manner, these lubricants serve a useful purpose in reducing the torque to produce the desired tension meaning that a lower capacity tightening tool can be used.
- For reasons of appearance or corrosion resistance, fasteners may be plated. These treatments affect the coefficient of friction and therefore the torque versus tension relationship.
- Friction is often deliberately introduced into the fastener to reduce the possibility of loosening due to vibration. Devices such as lock-nuts must be taken into account when establishing the correct tightening torque.

As a rough guide, the calculated tightening torque should be multiplied by the factor from the table below according to surface treatment and lubrication.

		Surface Condition of Bolt			
		Untreated	Zinc	Cadmium	Phosphate
Surface Condition of Nut	Untreated	1.00	1.00	0.80	0.90
	Zinc	1.15	1.20	1.35	1.15
	Cadmium	0.85	0.90	1.20	1.00
	Phosphate and oil	0.70	0.65	0.70	0.75
	Zinc with wax	0.60	0.55	0.65	0.55



INTRODUCTION TO TORQUE

Tightening to Yield

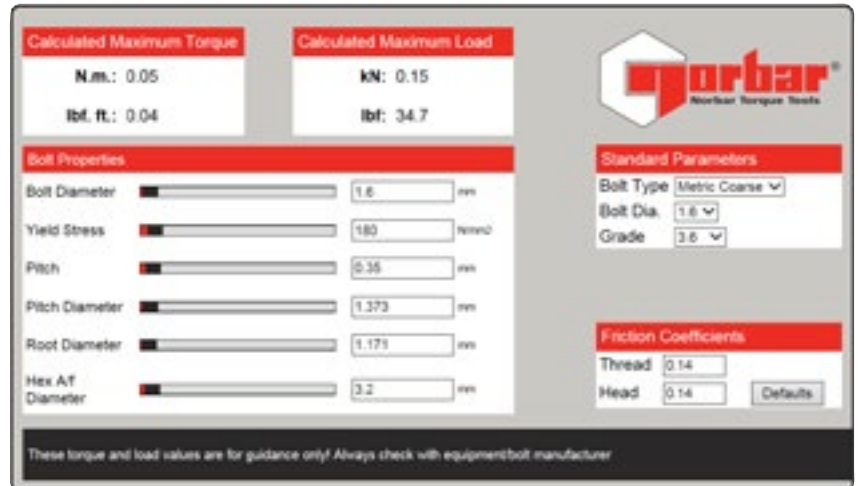
Bolts tightened to yield provide consistently higher preloads from smaller diameter bolts. The reduced fastener stiffness reduces the fatigue loading to which the bolt is subjected under repeated external load reversals, e.g. cylinder heads and connecting rods.

In theory, a bolt tightened to its yield point will provide the strongest and most fatigue-resistant joint possible, within the physical limitations of the bolt material and manufacturing process.

The downside of this method is the cost of the sophisticated equipment necessary to determine when the bolt goes into yield.

Torque Tension Calculator

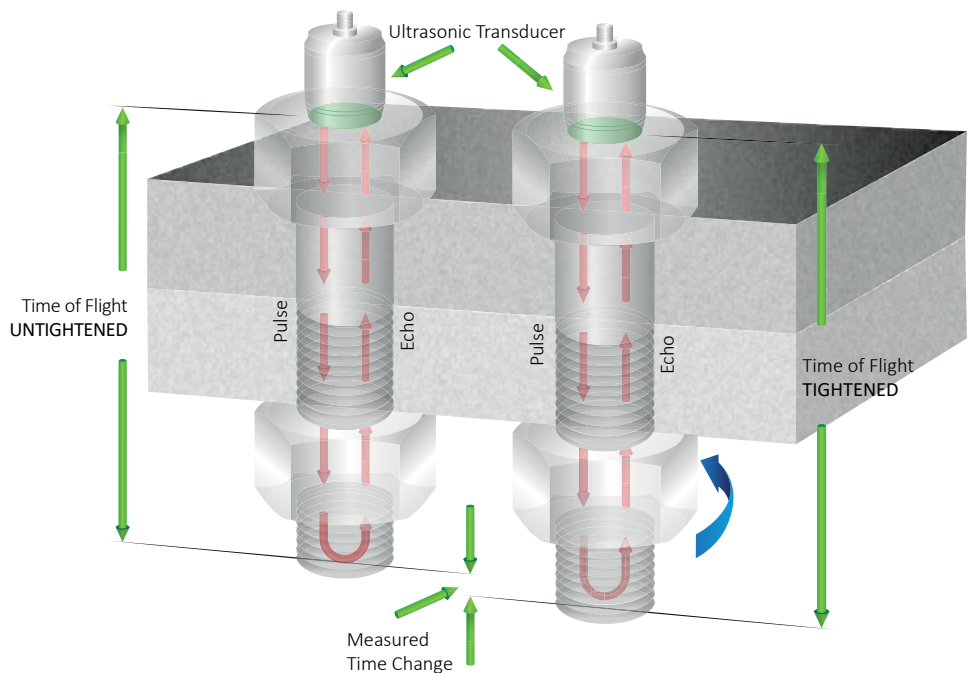
For further information and guidance on establishing the correct tightening torque for a fastener, see Norbar’s web based calculator, www.norbar.com/Home/Torque-Tension-Calculator



When Torque Doesn't Equal Tight

As we have established, it is the tension in a fastener rather than the torque that is the critical factor. Torque is an indirect means of establishing tension and in a correctly engineered joint and with a controlled tightening process, it is a satisfactory method under the majority of circumstances.

However, in joints that are highly critical due to safety or the cost and implications of machine down-time, a more direct means of establishing tension is needed. Various methods exist including several types of load indicating bolts or washers. However, one of the most versatile methods is to measure the extension of the bolt due to the tightening process using ultrasound.







INTRODUCTION TO TORQUE

Recommended Maximum Torque Values

The information supplied here is intended to be an acceptable guide for normal conditions. For critical applications, further information and research will be necessary. The following basic assumptions have been made:

- Bolts are new, standard finish, uncoated and not lubricated (other than the normal protective oil film)
- The load will be 90% of the bolt yield strength
- The coefficient of friction is 0.14
- The final tightening sequence is achieved smoothly and slowly

If lubrication is to be applied to the nut/bolt, multiply the recommended torque by the appropriate factor shown in the table on page 4. Alternatively, use the Torque/Tension Calculator on the Norbar website (shown on page 5) which enables fastener and friction conditions to be modified with ease.

 M	BOLT GRADE									 mm
	3.6	4.6	5.6	5.8	6.8	8.8	9.8	10.9	12.9	
	Torque in N·m									
M 1.6	0.05	0.07	0.09	0.11	0.14	0.18	0.21	0.26	0.31	3.2
M 2	0.11	0.14	0.18	0.24	0.28	0.38	0.42	0.53	0.63	4
M 2.5	0.22	0.29	0.36	0.48	0.58	0.78	0.87	1.09	1.31	5
M 3	0.38	0.51	0.63	0.84	1.01	1.35	1.52	1.9	2.27	5.5
M 4	0.71	0.95	1.19	1.59	1.91	2.54	2.86	3.57	4.29	7
M 5	1.71	2.28	2.85	3.8	4.56	6.09	6.85	8.56	10.3	8
M 6	2.94	3.92	4.91	6.54	7.85	10.5	11.8	14.7	17.7	10
M 8	7.11	9.48	11.9	15.8	19	25.3	28.4	35.5	42.7	13
M 10	14.3	19.1	23.8	31.8	38.1	50.8	57.2	71.5	85.8	17
M 12	24.4	32.6	40.7	54.3	65.1	86.9	97.9	122	147	19
M 14	39	52	65	86.6	104	139	156	195	234	22
M 16	59.9	79.9	99.8	133	160	213	240	299	359	24
M 18	82.5	110	138	183	220	293	330	413	495	27
M 20	117	156	195	260	312	416	468	585	702	30
M 22	158	211	264	352	422	563	634	792	950	32
M 24	202	270	337	449	539	719	809	1,011	1,213	36
M 27	298	398	497	663	795	1,060	1,193	1,491	1,789	41
M 30	405	540	675	900	1,080	1,440	1,620	2,025	2,430	46
M 33	550	734	917	1,223	1,467	1,956	2,201	2,751	3,301	50
M 36	708	944	1,180	1,573	1,888	2,517	2,832	3,540	4,248	55
M 39	919	1,226	1,532	2,043	2,452	3,269	3,678	4,597	5,517	60
M 42	1,139	1,518	1,898	2,530	3,036	4,049	4,555	5,693	6,832	65
M 45	1,425	1,900	2,375	3,167	3,800	5,067	5,701	7,126	8,551	70
M 48	1,716	2,288	2,860	3,813	4,576	6,101	6,864	8,580	10,296	75
M 52	2,210	2,947	3,684	4,912	5,895	7,859	8,842	11,052	13,263	80
M 56	2,737	3,650	4,562	6,083	7,300	9,733	10,950	13,687	16,425	85
M 60	3,404	4,538	5,673	7,564	9,076	12,102	13,614	17,018	20,422	90
M 64	4,100	5,466	6,833	9,110	10,932	14,576	16,398	20,498	24,597	95
M 68	4,963	6,617	8,271	11,029	13,234	17,646	19,851	24,814	29,777	100



INTRODUCTION TO TORQUE

Torque Conversion Factors

Units to be converted	S.I. Units		Imperial Units			Metric Units	
	cN·m	N·m	ozf·in	lbf·in	lbf·ft	kgf·cm	kgf·m
1 cN·m =	1	0.01	1.416	0.088	0.007	0.102	0.001
1 N·m =	100	1	141.6	8.851	0.738	10.20	0.102
1 ozf·in =	0.706	0.007	1	0.0625	0.005	0.072	0.0007
1 lbf·in =	11.3	0.113	16	1	0.083	1.152	0.0115
1 lbf·ft =	135.6	1.356	192	12	1	13.83	0.138
1 kgf·cm =	9.807	0.098	13.89	0.868	0.072	1	0.01
1 kgf·m =	980.7	9.807	1389	86.8	7.233	100	1

FORCE

$$\text{lbf} \times 4.45 = \text{N}$$

$$\text{N} \times 0.225 = \text{lbf}$$

FLOW

$$\text{l/s} \times 2.119 = \text{cu-ft/min}$$

$$\text{cu-ft/min} \times 0.472 = \text{l/s}$$

PRESSURE

$$\text{lbf/in}^2 \times 0.069 = \text{bar}$$

$$\text{bar} \times 14.504 = \text{lbf/in}^2$$

POWER

$$\text{hp} \times 0.746 = \text{kW}$$

$$\text{kW} = \frac{\text{N}\cdot\text{m} \times \text{rev/min}}{9,546}$$

Formulae

Accepted formulae relating torque and tension, based on many tests are:-

For Imperial Sizes

$$M = \frac{P \times D}{60}$$

M = torque lbf·ft
P = bolt tension lbf
D = bolt diameter (ins)

For Metric Sizes

$$M = \frac{P \times D}{5000}$$

M = torque N·m
P = bolt tension Newtons
D = bolt diameter (mm)

These formulae may be used for bolts outside the range of the tables.

Formula for Calculating the Effect of Torque Wrench Extensions

$$M1 = M2 \times L1/L2$$

Where L1 is the normal length and L2 is the extended length, M1 is the set torque and M2 the actual torque applied to the nut.

Example

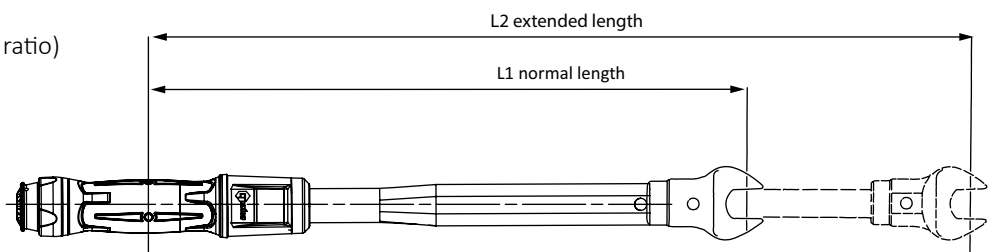
The required torque on the fastener is 130 N·m (M2) but what do you set on the torque wrench scale?

$$L1 = 500 \quad L2 = 650$$

(units of length not important, this is ratio)

$$M1 = 130 \times 500/650$$

$$M1 = 100$$



For further information and guidance on converting torque and calculating the effect of torque wrench extensions download our purpose-built applications for iPhone and Android.



HANDTORQUE® TORQUE MULTIPLIERS

Torque wrench design offers just two solutions to the challenge of applying higher torques: either the load at the handle must be higher or the lever length must be greater. Clearly there are practical and safety limits to both of these solutions. For example, a Norbar model 1000 (1,000 N·m) torque wrench is 1.7 m long with the extension handle fitted. As this is already quite long, how would one apply 2,000 N·m? Often there will not be the space to operate a torque wrench of sufficient length to comfortably apply such high torques and the chance that the wrench might slip off the nut increases as length increases.

Norbar's solution is to use a compact, epicyclic gearbox called a HandTorque® multiplier to accurately multiply the input torque provided by a torque wrench by a fixed ratio. This fixed ratio might be in the order of 5:1, 27:1 or even up to 135:1 for very high torque application. This means that a much smaller torque wrench can be used for a given torque application and the combined weight of the torque multiplier and torque wrench will often be lower than for a single large torque wrench. For example, one could apply 1,000 N·m using a Norbar Model 1000 torque wrench weighing 5.8 kg or an HT-52/22.2 combined with a NorTorque® 60 with a total weight of just under 2 kg and a lever length of just 310 mm.

The Norbar HandTorque® multiplier range is the most comprehensive available. Standard products are available up to 47,500 N·m (35,000 lbf·ft) and 'specials' to 300,000 N·m (220,000 lbf·ft). A range of 'nose extensions' for reaching difficult to access bolts and a full range of torque transducers for highly accurate torque monitoring are available.

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 HandTorque® Standard Series 15
 HandTorque® Small Diameter Series 17
 UKAS Accredited Calibration Certification 17





HANDTORQUE® TORQUE MULTIPLIERS

What is a Torque Multiplier?

A torque multiplier is a device that increases the torque that can be applied by an operator. This is because the power output cannot exceed the power input, the number of output revolutions will be lower than the number of input revolutions (Torque x rpm = Power).

How HandTorque® Torque Multipliers Work

HandTorque® multipliers incorporate an 'epicyclic' or 'planetary' gear train having one or more stages. Each stage of gearing increases the torque applied, allowing Norbar to offer multipliers typically in ratios of 5:1, 27:1 and 135:1.

In the planetary gear system, torque is applied to the input gear or 'sun' gear. Three or four planet gears whose teeth are engaged with the 'sun' gear therefore rotate. The outside casing of the multiplier, or 'annulus' is also engaged with the planet gear teeth, and would normally rotate in the opposite direction to the 'sun' gear. A reaction arm prevents the annulus from rotating, and this causes the planet gears to orbit around the 'sun'. The planet gears are held in a 'planetary' carrier which also holds the output square drive, therefore as the planet gears orbit around the sun gear, the carrier and so the square drive turns. Without the reaction arm to keep the annulus stationary, the output square will not apply torque.

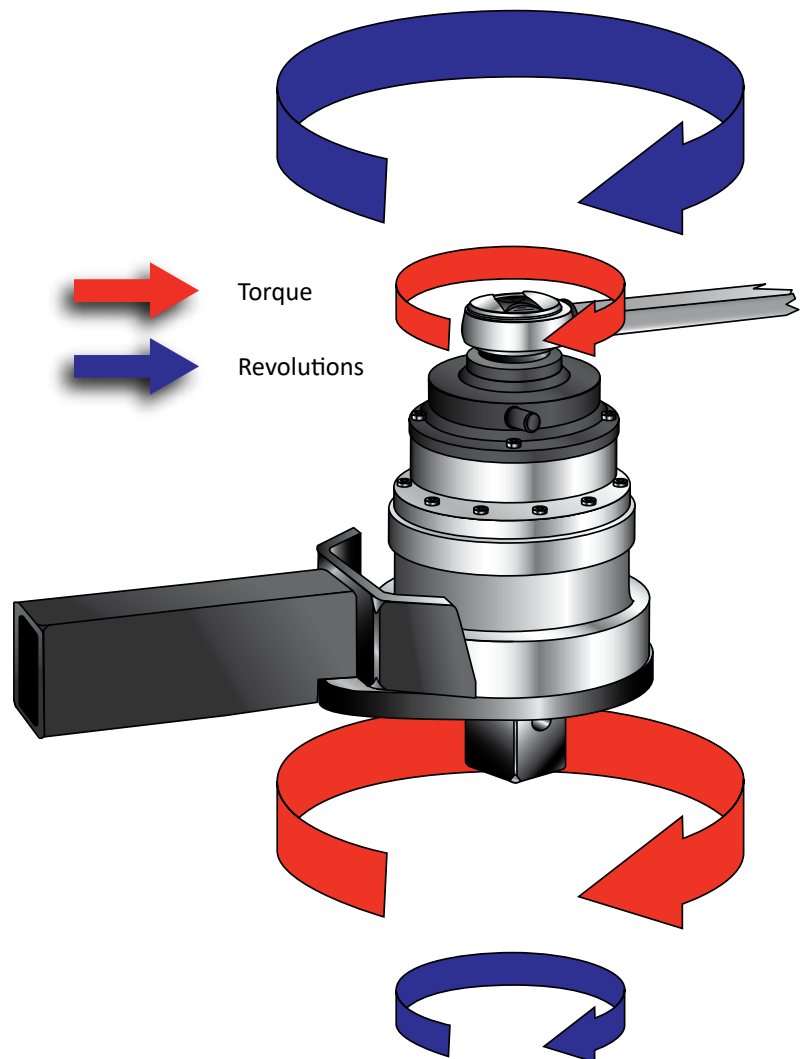
No gearbox is 100% efficient, and so the velocity ratio (the number of turns that the input has to make to achieve one revolution of the output) is not the same as the torque multiplication ratio. Norbar multipliers are engineered such that each gear stage typically has a nominal 5:1 ratio, this means a velocity ratio of typically 5.45:1 which results in a true torque multiplication factor of 5.2:1.



Without a torque multiplier



With a torque multiplier

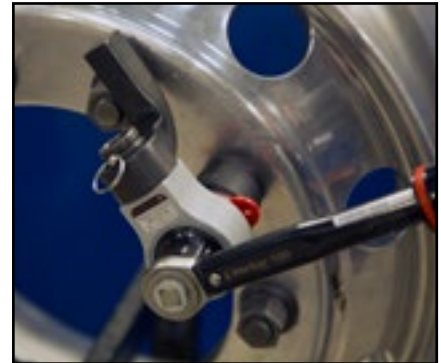




HANDTORQUE® TORQUE MULTIPLIERS

Why use a HandTorque® Multiplier?

- **Safety** – use of long levers can be dangerous. Torque multipliers allow for a reduction in the lever length or operator effort
- **Space limitation** – the use of a long lever may be impossible due to the available space
- **Accuracy** – torque will be applied most accurately when it is applied smoothly and slowly. Torque multipliers enable this by removing much of the physical effort from the tightening task

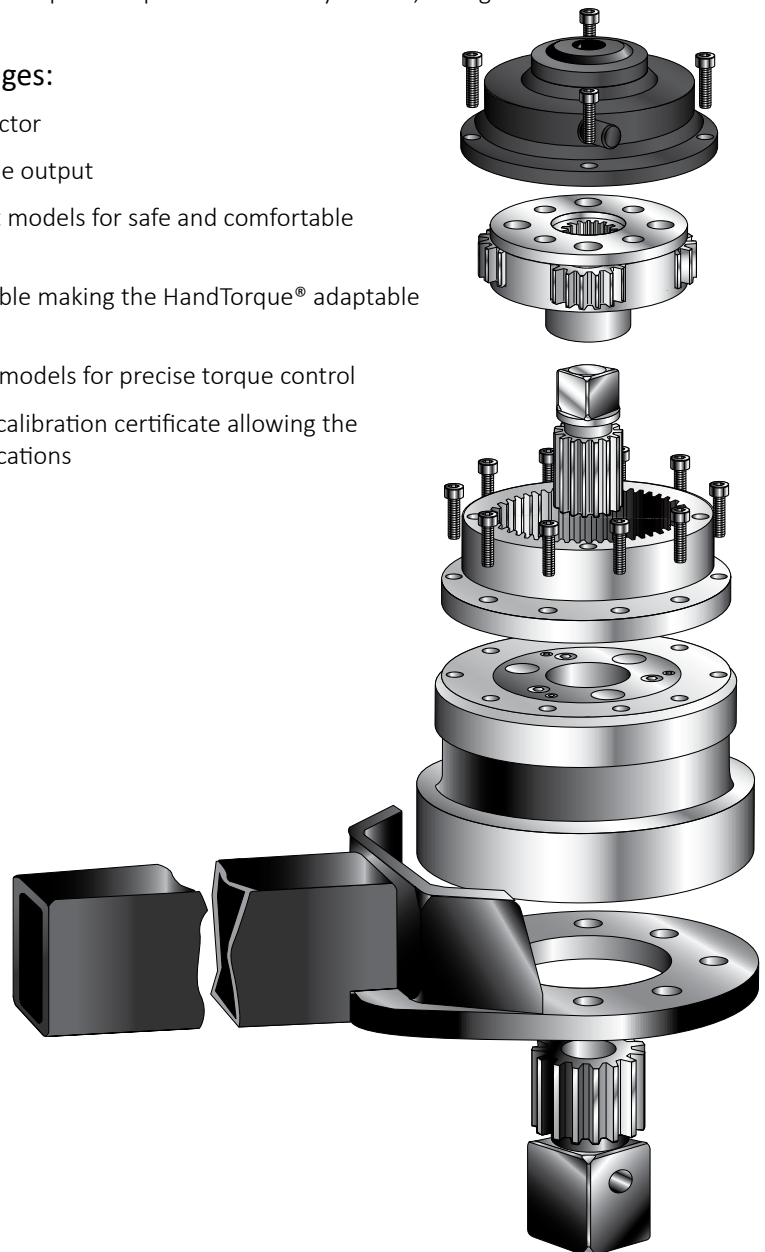


Advantages of the Norbar HandTorque® System

Norbar gearboxes are built to an extremely high standard of precision. All gears rotate on needle roller bearings about hardened and ground journal pins. As a result, Norbar HandTorques can be relied upon to have a mean torque multiplication accuracy of $\pm 4\%$, taking the uncertainty out of high torque tightening.

Summary of Norbar torque multiplier advantages:

- The ratio stated is the mean torque multiplication factor
- No correction charts are needed to determine torque output
- Strong, safe Anti Wind-Up Ratchet available on most models for safe and comfortable operation
- A wide range of alternative reaction styles are available making the HandTorque® adaptable to many applications
- Electronic torque transducers are available on most models for precise torque control
- Compact Series are supplied with their own unique calibration certificate allowing the accurate calculation of input torque for critical applications





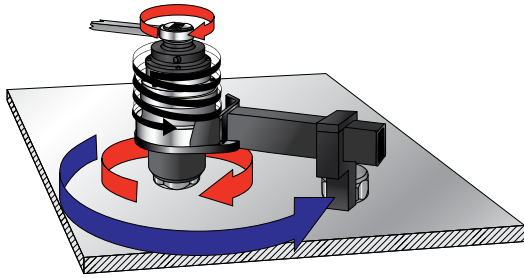
ANTI WIND-UP RATCHETS (AWUR)



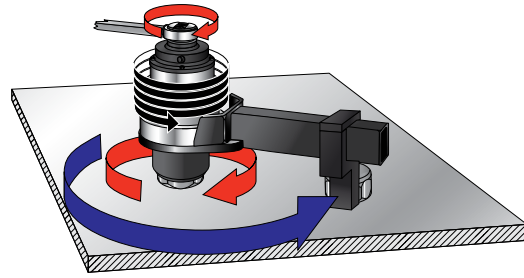
Norbar Anti Wind-Up Ratchets (AWUR)

Most multipliers with ratios of 15:1 and over are fitted with an Anti Wind-Up Ratchet. The multiplier can be thought of as a spring which must be fully wound before any tightening/untightening work can be applied to the bolt.

The AWUR ensures that the 'spring' stays wound and that any further torque input to the multiplier is applied directly to the bolt.



Multiplier behaves like a very stiff 'spring'

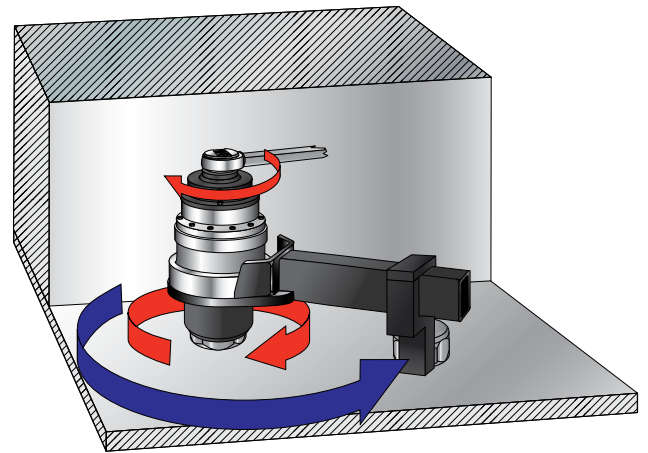


Multiplier will achieve maximum torque only after the 'spring' has been taken up



AWUR benefits include:

1. The torque input device cannot fly backwards against the direction of operation if it is suddenly released.
2. Without an Anti Wind-Up Ratchet, it will often be necessary to continue to make 360° sweeps with the torque input device otherwise the multiplier will 'unwind'. However, obstructions will often make this impossible (as demonstrated in this example).



AWUR set to counter-clockwise operation



AWUR set to neutral



AWUR set to clockwise operation



HANDTORQUE® HT3-1000



- 5:1 nominal torque multiplication, reaction dependant. Mean ratio with cranked foot is 4.8:1; with straight reaction is 4.9:1
- ±4% mean torque multiplication accuracy
- Small and compact design
- Updated aesthetics with tough silver metallic powder coat
- Supplied with 2 reaction bar styles for maximum versatility
- Quick-change cranked reaction with improved flexibility allowing reaction in 8 orientations
- Robust construction means minimal maintenance and long life
- If calibration is required, a UKAS accredited calibration certificate may be ordered (at extra cost)

2	HT3-1000
180260	HT3-1000, 1,000 N·m Kit, ½" input x ¾" output

HANDTORQUE® HT3 SERIES

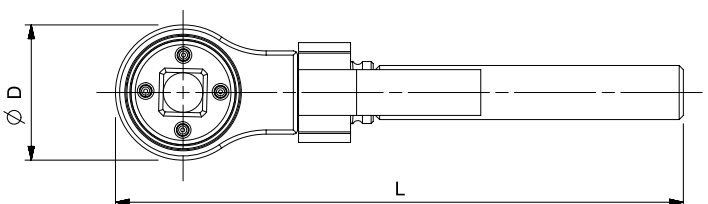
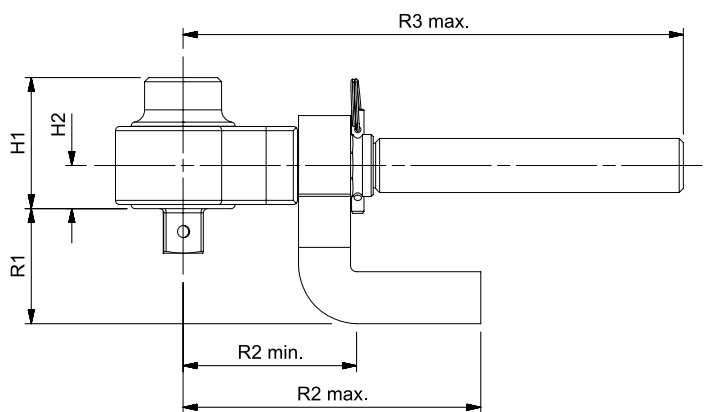


- 5:1 mean torque multiplication, accuracy ±4%
- Supplied with two reaction bar styles for maximum versatility
- Robust construction means minimal maintenance and long life
- Supplied in a carry case, the Highwayman is ideal for inclusion in the heavy vehicle tool kit
- 1,300 N·m version has a spare ¾" output square included in the kit
- Multiplier head only (no reaction bars or plastic box) also available
- 1,300 N·m version, part no. 17218
- 2,700 N·m version, part no. 17219
- If calibration is required, a UKAS accredited calibration certificate may be ordered (at extra cost)

2	HT3 SERIES
17220	HT3 1,300 N·m Kit, ½" input x ¾" output
17221	HT3 2,700 N·m Kit, ¾" input x 1" output

Kits are supplied in a carry case with a reaction bar and a reaction foot (17220 also contains a spare ¾" sq. dr.)

Model	HT3-1000	HT3 1,300 N·m	HT3 2,700 N·m
Part Number	180260	17220	17221
Mean Multiplication Ratio	Nominal	5:1	5:1
	With Cranked Reaction	4.8:1	N/A
	With Straight Reaction	4.9:1	N/A
Dimensions (mm)	ØD	65	108
	H1	63	103
	H2	21	44
	L	273	398
	R1	55	77
	R2 min.	83	140
	R2 max.	143	212
	R3 max.	240	344
Tool Weight (kg)	2.7	3.8	3.8
Reaction Weight (kg)	Cranked	0.5	1.36
	Straight	0.7	1.1



HT3 1300/2700 on left shown in comparison with HT3 1000





HANDTORQUE® HT4 SERIES



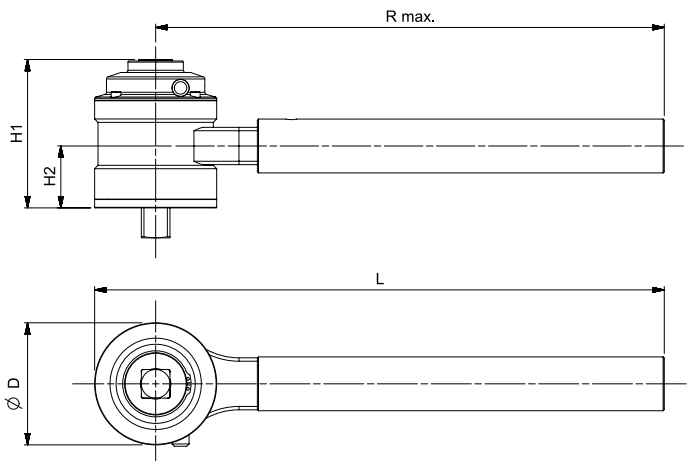
- Robust construction means minimal maintenance and long life
- Mean 15.5:1 (3,000 N·m) or 26:1 (4,500 N·m) torque multiplication, accuracy ±4%
- High ratios allow the use of a small torque wrench
- Supplied in carrying case with replacement square drive
- Anti Wind-Up Ratchet fitted to allow safer and more practical operation
- Angle protractor for easy torque and angle tightening
- If calibration is required, a UKAS accredited calibration certificate may be ordered (at extra cost)



4	HT4 SERIES
17022	HT4 3,000 N·m ½" in 1" out AWUR
17021	HT4 4,500 N·m ½" in 1" out AWUR



Model	HT4/15.5 AWUR	HT4/26 AWUR	
Part Number	17022	17021	
Mean Multiplication Ratio	15.5:1	26:1	
Dimensions (mm)	ØD	108	108
	H1	131	149
	H2	55	55
	L	498	498
	R max.	444	444
Tool Weight (kg)	6.1	7.0	
Reaction Weight (kg)	1.9	1.9	





HANDTORQUE® COMPACT SERIES



HT92/25

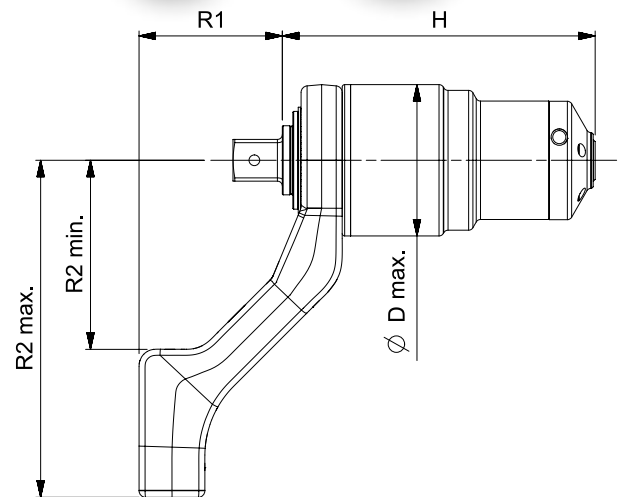


- Compact dimensions allow excellent access to applications and easy, safe handling
- Lightweight for torque capacity
- Supplied as standard with an aluminium reaction arm (steel reactions for HT-52). Other options are available on request, including customised reactions
- Mean torque multiplication accuracy $\pm 4\%$
- Robust, 48 tooth Anti Wind-Up Ratchet (AWUR) contains the forces generated during tightening for safe and easy operation
- Each multiplier is supplied with its own unique traceable calibration certificate allowing the accurate calculation of input torque for critical applications
- If you order a UKAS accredited calibration certificate (available at extra cost), this certificate will be provided in place of the traceable calibration certificate.



From left to right
HT-52 and HT-72
AWUR
(sockets not included)

4	COMPACT SERIES
180200	HT-52/4.7, 1,000 N·m, ½" in ¾" out
180201	HT-52/22.2, 1,000 N·m, ¾" in ¾" out
180202	HT-52/22.2, 1,000 N·m, ½" in ¾" out
180203	HT-52/22.2, 1,000 N·m, ¾" in ¾" out AWUR
180204	HT-52/22.2, 1,000 N·m, ½" in ¾" out AWUR
180205	HT-52/22.2, 1,000 N·m, ¾" in 1" out AWUR
180206	HT-52/22.2, 1,000 N·m, ½" in 1" out AWUR
180208	HT-72/5.2, 1,500 N·m, ½" in 1" out
180209	HT-72/5.2, 1,000 N·m, ¾" in ¾" out
180210	HT-72/5.2, 2,000 N·m, ¾" in 1" out
180212	HT-72/27, 2,000 N·m, ½" in 1" out
180214	HT-72/27, 2,000 N·m, ½" in 1" out AWUR
180215	HT-92/25, 4,000 N·m, ½" in 1" out AWUR
180216	HT-119/25.5, 7,000 N·m, ½" in 1½" out AWUR



Model	HT-52/4.7	HT-52/22.2	HT52/22.2 AWUR	HT-72/5.2	HT-72/5.2	HT-72/27	HT-72/27 AWUR	HT-92/25 AWUR	HT-119/25.5 AWUR
Part Number	180200	180201 180202	180203 180204 180205 180206	180208 180209	180210	180212	180214	180215	180216
Mean Multiplication Ratio	4.7:1	22.2:1	22.2:1	5.2:1	5.2:1	27:1	27:1	25:1	25.5:1
Dimensions (mm)	ØD max.	52	52	72	72	72	72	92	119
	H	91	116	130	140	135	137	154	212
	R1	58	58	58	67	72	72	87	117
	R2 min.	71	71	71	91	91	91	91	115
	R2 max.	131	131	131	166	166	166	166	205
Tool Weight (kg)	1.0	1.3	1.4	2.7	2.7	2.7	3.2	5.4	9.3
Reaction Weight (kg)	0.9	0.9	0.9	0.7	0.7	0.7	0.7	1.4	2.1



HANDTORQUE® COMPACT SERIES KITS



SpinNor (1/2") included
Part No. 19253

Multiplier & Torque Wrench Kits

For convenience, it is now possible to purchase a torque multiplier from the 'Compact Series' packaged with the appropriate torque wrench, up to 4,000 N·m. This allows the operator to arrive at the bolting application with everything needed in one robust carry case. Space has also been allowed in the carry case for accessories such as sockets.

The torque multiplier is supplied with its own unique calibration certificate and the torque wrench is supplied with a Declaration of Conformance, allowing accurate calculation of input torque to the multiplier for critical applications.

- All kits include a 'SpinNor' which aids fast reaction location
- All models include an Anti Wind-up Ratchet on the multiplier

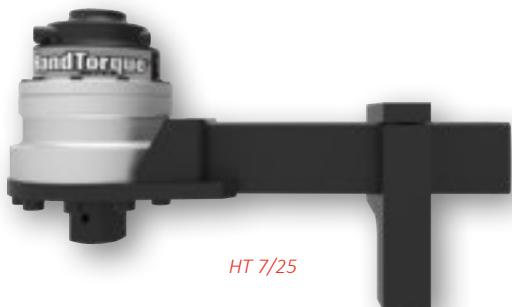
4	HT COMPACT SERIES & TORQUE WRENCH KITS
18186	HT-52, 1,000 N·m, 3/4" out + NorTorque 60 1/2" Dual Scale
18192	HT-72, 2,000 N·m, 1" out + NorTorque 100 1/2" Dual Scale
18195	HT-92, 4,000 N·m, 1" out + NorTorque 200 1/2" Dual Scale

HANDTORQUE® STANDARD SERIES



HT 5/25

- Mean torque multiplication accuracy ±4%
- High ratios allow the use of a small torque wrench, multipliers can be used where access is limited
- Anti Wind-Up Ratchet available on high ratio models
- Other reaction styles can be designed to suit specific applications
- Electronic torque transducers can be fitted for precise torque monitoring
- Other models available up to 300,000 N·m
- If calibration is required, a UKAS accredited calibration certificate may be ordered (at extra cost) up to 6,000 N·m



HT 7/25

4	STANDARD SERIES
16010	HT 1/5, 1,700 N·m, 1/2" in 3/4" out
16012.HD	HT 2/5, 1,700 N·m, 3/4" in 1" out
16034.HD	HT 2/25, 1,700 N·m, 1/2" in 1" out
16089.HD	HT 2/25, 1,700 N·m, 1/2" in 1" out AWUR
16014	HT 5/5, 3,400 N·m, 3/4" in 1" out
16028	HT 5/25, 3,400 N·m, 1/2" in 1" out
16090	HT 5/25, 3,400 N·m, 1/2" in 1" out AWUR
16016	HT 6/5, 3,400 N·m, 3/4" in 1 1/2" out
16024	HT 6/25, 3,400 N·m, 1/2" in 1 1/2" out
16092	HT 6/25, 3,400 N·m, 1/2" in 1 1/2" out AWUR
16093	HT 6/125, 3,400 N·m, 1/2" in 1 1/2" out AWUR
16067	HT 7/5, 6,000 N·m, 3/4" in 1 1/2" out
16018	HT 7/25, 6,000 N·m, 1/2" in 1 1/2" out
16065	HT 7/25, 6,000 N·m, 1/2" in 1 1/2" out AWUR
16068	HT 7/125, 6,000 N·m, 1/2" in 1 1/2" out AWUR
16059	HT 9/25, 9,500 N·m, 3/4" in 1 1/2" out
16070	HT 9/25, 9,500 N·m, 3/4" in 1 1/2" out AWUR
16071	HT 9/125, 9,500 N·m, 1/2" in 1 1/2" out AWUR
16082	HT 11/25, 20,000 N·m, 3/4" in 2 1/2" out
16049	HT 11/125, 20,000 N·m, 1/2" in 2 1/2" out AWUR
16053	HT 13/125 47,500 N·m, 1/2" in 2 1/2" out AWUR

Other gear ratios may be available upon request.

If AWUR is not required please enquire for part number.

HT 13/125 fitted with weld prepared reaction ring as standard.

AWUR = Anti Wind-Up Ratchet. See page 11

NOTE: Model name does not reflect multiplication ratios, see mean multiplication ratios on page 16

For spares kits for Norbar multipliers, please see Norbar catalogue.

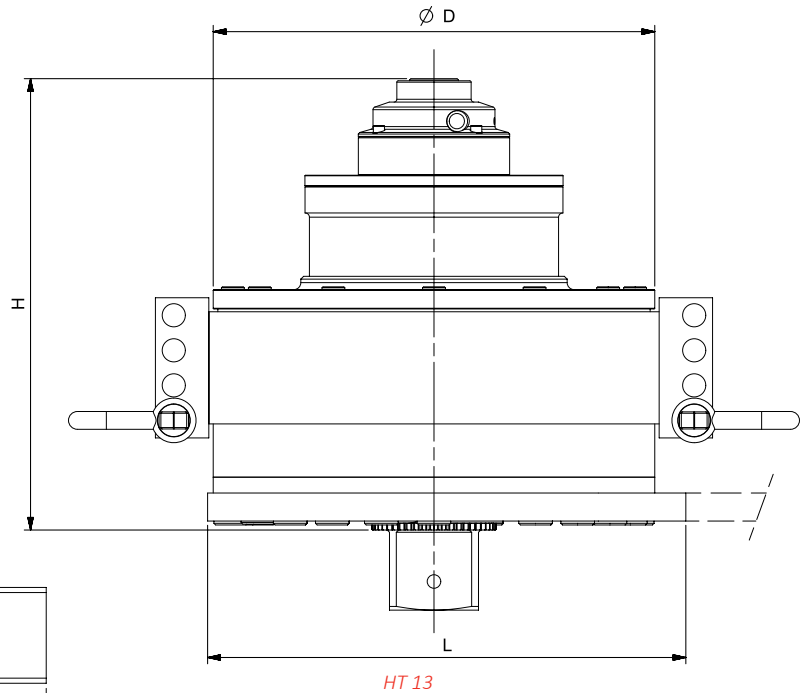
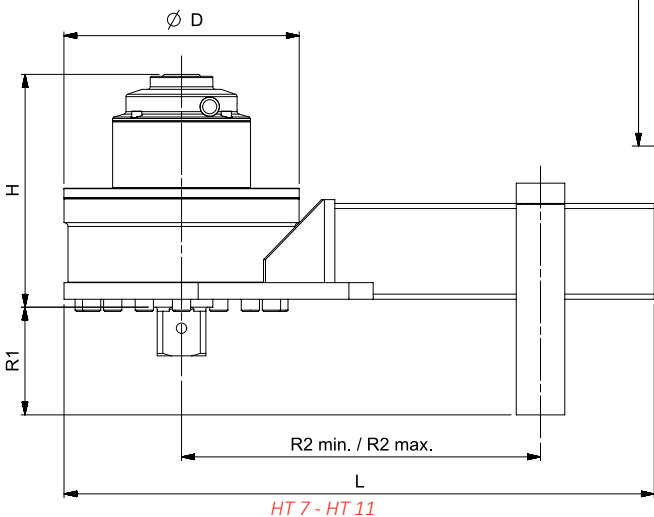
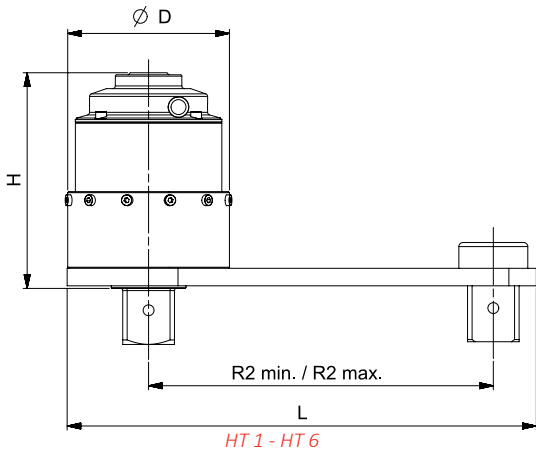


HANDTORQUE® STANDARD SERIES



Model	HT 1/5	HT 2/5	HT 2/25	HT 2/25 AWUR	HT 5/5	HT 5/25	HT 5/25 AWUR	HT 6/5	HT 6/25	HT 6/25 AWUR	HT 6/125 AWUR
Part Number	16010	16012.HD	16034.HD	16089.HD	16014	16028	16090	16016	16024	16092	16093
Mean Multiplication Ratio	5.2:1	5.2:1	27:1	27:1	5.2:1	27:1	27:1	5.2:1	27:1	27:1	135:1
Dimensions (mm)	∅D	108	108	108	108	119	119	119	119	119	119
	H	83	98	98	114	106	127	106	128	134	159
	L	303	303	303	303	355	355	355	355	355	355
	R1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2 min.	83	83	83	83	86	86	86	86	86	86
	R2 max.	216	216	216	216	263	263	263	263	263	263
Tool Weight (kg)	3.0	3.2	4.6	6.7	4.7	6.4	7.5	4.7	6.4	7.5	9.0
Reaction Weight (kg)	2.2	2.2	2.2	2.2	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Model	HT 7/5	HT 7/25	HT 7/25 AWUR	HT 7/125 AWUR	HT 9/25	HT 9/25 AWUR	HT 9/125 AWUR	HT 11/25	HT 11/125 AWUR	HT 13/125 AWUR	
Part Number	16067	16018	16065	16068	16059	16070	16071	16082	16049	16053	
Mean Multiplication Ratio	5.2:1	27:1	27:1	135:1	27:1	27:1	135:1	27:1	135:1	135:1	
Dimensions (mm)	∅D	144	144	144	184	184	184	212	212	315	
	H	136	157	162	188	166	162	182	208	322	
	L	423	423	423	423	448	448	448	609	609	341
	R1	84	84	84	84	84	84	84	N/A	N/A	N/A
	R2 min.	150	150	150	150	175	175	175	320	320	N/A
	R2 max.	331	331	331	331	351	351	351	500	500	N/A
Tool Weight (kg)	8.1	9.6	10.7	12.2	16.3	17.4	18.9	31.7	32.1	95.2	
Reaction Weight (kg)	6.3	6.3	6.3	6.3	8.3	8.3	8.3	13.3	13.3	6.9	

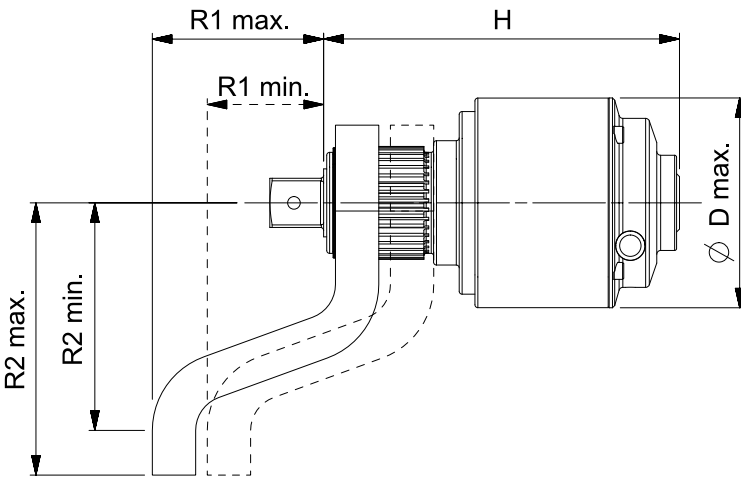




HANDTORQUE® SMALL DIAMETER SERIES



- HandTorque® models HT 30 and 60 have a higher torque output for a given gearbox diameter than the Standard Series
- Reduced diameter enables better access, particularly on pipe flanges
- Reaction taken from high strength spline
- Reaction foot can slide on the spline to allow sockets of various lengths
- If calibration is required, a UKAS accredited calibration certificate may be ordered (at extra cost)



4 SMALL DIAMETER SERIES

18006	HT 30/25, 3,000 N·m, ½" in 1" out AWUR
18008	HT 60/25, 6,000 N·m, ½" in 1½" out AWUR

HT 30s and 60s are supplied with a cranked reaction foot. Most small diameter gearboxes are available without AWUR. Please enquire for part numbers.

NOTE: Model name does not reflect multiplication ratios, see mean multiplication ratios below

Model	HT 30/25 AWUR	HT 60/25 AWUR
Part Number	18006	18008
Mean Multiplication Ratio	27:1	27:1
Dimensions (mm)	∅D max.	108
	H	183
	R1 min.	60
	R1 max.	88
	R2 min.	117
	R2 max.	140
Tool Weight (kg)	7.0	10.6
Reaction Weight (kg)	2.0	4.0

UKAS ACCREDITED CALIBRATION CERTIFICATION

The part numbers shown below are for 'As Found', for new manual torque multiplying gearboxes up to the maximum capacity shown.

12	ONE DIRECTION
HTCC2.CW	Up to 6,000 N·m / 5,000 lbf·ft
12	TWO DIRECTIONS
HTCC2.CW+CCW	Up to 6,000 N·m / 5,000 lbf·ft





2021 NORBAR SHUTDOWN PERIODS

THE FACTORY WILL BE CLOSED ON THE FOLLOWING DATES (INCLUSIVE)

Friday 1 st January - New Year's Day
Friday 2 nd April to Monday 5 th April - Easter Bank Holiday
Monday 3 rd May - Early May Bank Holiday
Monday 31 st May - Spring Bank Holiday
Monday 30 th August - Summer Bank Holiday
Monday 27 th December to Monday 3 rd January 2022 - Christmas Shutdown

NORBAR PROMOTIONAL MATERIAL

CATALOGUES & LEAFLETS

07571	NorTorque® Sales Leaflet
07563	Professional Torque Wrench Sales Leaflet
07594	Industrial Torque Wrench- New Generation Sales Leaflet
07606	ProTronic® Sales Leaflet
07607	ProTronic® Plus Sales Leaflet
07436	NorTronic® Sales Leaflet
07579	HandTorque® HT3-1000 Sales Leaflet
07570	EvoTorque® 2 Sales Leaflet
07591	EvoTorque® Battery Tool Sales Leaflet
07581	PneuTorque® PTS™ Sales Leaflet
07585	Right Angle Gearbox Sales Leaflet
07597	TruCheck™ 2 Sales Leaflet
07598	T-Box™ 2 Sales Leaflet
07589	TWC Sales Leaflet
07512	Aerospace Leaflet
07515	Energy Generation Leaflet
07510	Oil & Gas Leaflet

PROMOTIONAL ITEMS

07532	Norbar Torque Wrench Display Board Contact Norbar for slat wall adaptors
07539	Norbar Branded Pen
07551	Norbar Branded Pocket Notepad
07555	Norbar Branded Baseball Cap
07590	Norbar Branded Beanie Hat
07587	Norbar Branded USB Stick
07573	Norbar Branded Construction Pen
07574	Norbar Branded 2 Ring White Ring Binder
07576	Norbar Branded Screen Saver Cloth / Mouse Mat

NORBAR PRODUCT PORTFOLIO



Torque Screwdrivers



Torque Wrenches



Electronic Torque Wrenches



Manual Torque Multipliers



Pneumatic Torque Tools



Electronic Torque Tools



Battery Torque Tools



Torque Measurement Instruments



Torque Transducers



Calibration Services

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CUSTOMER RELATIONS

OFFICE OPENING HOURS

Monday - Thursday	07:30 - 17:30
Friday	07:30 - 16:15

CONTACT DETAILS

New Sales
Direct Tel +44 (0)1295 753600
Email sales@norbar.com

After Sales Service
+44 (0)1295 753635
service@norbar.com

Norbar Torque Tools Ltd
Wildmere Road, Banbury
Oxfordshire, OX16 3JU
UNITED KINGDOM
www.norbar.com