



ENGINEER TO ORDER

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Norbar's wide range of standard equipment may not meet your exact requirements as there are applications when something special is required.

As an ISO 9001 accredited company, Norbar will undertake the design and manufacture of special equipment against agreed customer specifications.

These projects range from modified torque wrench end fittings to complete torque and angle control of valve testing kits. Relevant safety directives are applied where appropriate, leading to well engineered reliable products that are designed to make tasks safer and easier.

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*Class 4 to 20,000 N-m subsea torque multiplier & verification kit, for pipe clamp actuation*



*Model 60 'P' Type torque wrench, HandTorque® HT-52/22 and a 5 gear Offset Gearbox Kit for tightening Pintle Bolts*



## ETO EXAMPLE 1 - SPECIALIST REACTION TO ASSIST RAIL TRACK BOLTING

Project Number: Q5321

### Introduction & Application

Specialist reaction to assist in the assembly and disassembly of rail track bolts (assembled using an impact tool) used to secure stock during transit. This is to replace a heavy electric impact tool that was no longer preferred by the end user. Long studding made this a unique application therefore a bespoke reaction design was required.

### Solution

EBT-80-2700 was fitted with a special reaction and a deep socket. The reaction can be placed over the stud and nut prior to engaging with the tool, allowing the tool to be more manoeuvrable. As the reaction engages with the application, the bespoke lock ring ensures that the tool does not disengage with the reaction.



### Technical Specification / Data Highlights

We were able to take advantage of our in-house 3D printing facility to ensure compliance with both the customers expectations, and of course the application.

## ETO EXAMPLE 2 - OFFSET GEARBOX TO FIT PTS-72-2000 FOR TRAIN TRACTION LINKS

Project Number: Q4191

### Introduction & Application

Railway maintenance application for removal & re-fitting of train traction link bolts, where bolt access is obstructed by the anti-roll bar.

### Solution

PTS-72-2000 with offset gearbox kit.



### Technical Specification / Data Highlights

M36 – 55 mm A/F hexagon head bolts tighten to 980 N·m / untighten at up to 2,000 N·m.

Q4191 kit includes offset gearbox having 3 gears, LH & RH reaction arms, PTS-72-2000 & Lubro control unit # 16074.



ETO EXAMPLE 3 - CUSTOM CLASS 7 MULTIPLIER KIT WITH HYDRAULIC LATCHING FOR SUBSEA

Project Number: Q3730

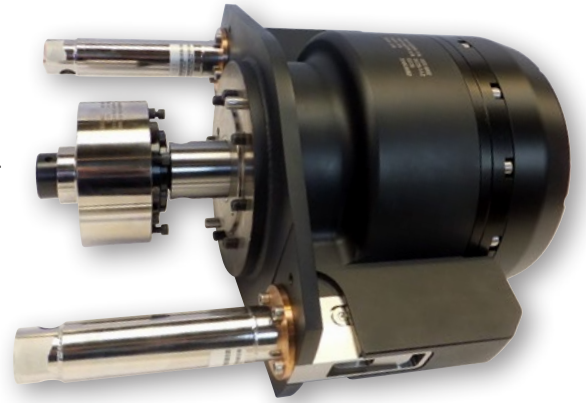
Introduction & Application

Oil & Gas industry requirement for a custom Class 7 torque multiplier kit with hydraulic latching, for integration into a pressure compensated subsea intervention tool.

Solution

Custom torque multiplier kit comprising:-

- Custom Class 7 nose housing with 2-stage torque multiplication gearing.
- HT5 / 5 torque multiplier & connecting input shaft.
- Hydraulic latching system with fail-safe spring return cylinders.



Technical Specification / Data Highlights

Class 7; 34,000 N-m (25,000 lbf-ft) with 61:1 torque multiplication.

Customised nose to suit end user’s special receptacle (non-standard narrow reaction wings).

Sealed for use to 3,000 m (except input end), for connection to customer pressure compensation system.

High strength, lightweight materials for total weight in air of 59.9 kg.

ETO EXAMPLE 4 - SUBSEA VERTICAL USE INTERVENTION TORQUE MULTIPLIER

Project Number: Q5227

Introduction & Application

Oil & Gas industrial requirement for a subsea intervention torque multiplier (Super Duplex) with valve protection for vertical use only.

INPUT	OUTPUT INTERFACE	OUTPUT RATED
Class 4 to API 17D/ISO 13628-8 (2,700 N-m max. input)	Class 7 (short) to API 17D (1st edition) - 45,000 N-m normal operation / 67,500 N-m overload torque	45,000 N-m normal operation / 67,500 N-m overload torque

Technical Specification / Data Highlights

- Torque Multiplication: 25:1 (28.41:1 true gear ratio)
- Depth rating: 1,500 m with integral pressure compensation
- Weights air/water: 160/135 kg
- Latching: Class 4 receptacle latching flange/No latching on class 6/7 (available as an option)
- Materials: Outside components Super Duplex (Norsok M-630/650)/Stainless Steel and POM nose bumper





**ETO EXAMPLE 5 - SUBSEA VERTICAL & HORIZONTAL USE INTERVENTION TORQUE MULTIPLIER KIT**

Project Number: Q4636

**Introduction & Application**

Oil & Gas industrial requirement for a subsea intervention torque multiplier kit, for horizontal and vertical use, and with the following interfaces/ratings:

INPUT	OUTPUT INTERFACE	OUTPUT RATED
Class 4 to API 17D/ ISO 13628-8	Class 7 (long) to API 17D (2nd edition) / ISO 13628-8	33,895 N·m / 25,000 lbf-ft
	Class 7 (short) to API 17D (1st edition)	33,895 N·m / 25,000 lbf-ft
	Class 6 to API 17D (2nd edition) / ISO 13628-8	13,558 N·m / 10,000 lbf-ft



**Solution**

Custom torque multiplier kit comprising:-

- Custom Class 7 nose housing with 2-stage torque multiplication gearing.
- HT5/5 torque multiplier & connecting input shaft.
- Hydraulic latching system with fail-safe spring return cylinders.

**Technical Specification / Data Highlights**

Torque Multiplication: 12.93:1  
 Depth rating: 3,000 m with integral pressure compensation

Weights air/water: Class 7 long 79.5/60.5 kg  
 Class 6 66.5/51.8 kg  
 Class 7 short 61.5/48.9 kg  
 Latching: Class 4 receptacle latching flange/  
 No latching on class 6/7 (available as an option)

**ETO EXAMPLE 6 - SPECIAL CRANKED SLIDING REACTION FOR USE WITH A PTS-119-6000**

Project Number: Q4780

**Introduction & Application**

Customer required a reaction arm to work with a powered multiplier, to drive a series of pins positioned around a diameter, where the only point of reaction was the adjacent pin.

**Solution**

Special cranked sliding reaction for use with a PTS-119-6000

**Technical Specification / Data Highlights**

Solution includes a slave socket with a plain bore to clear 1½” AF hexagon.

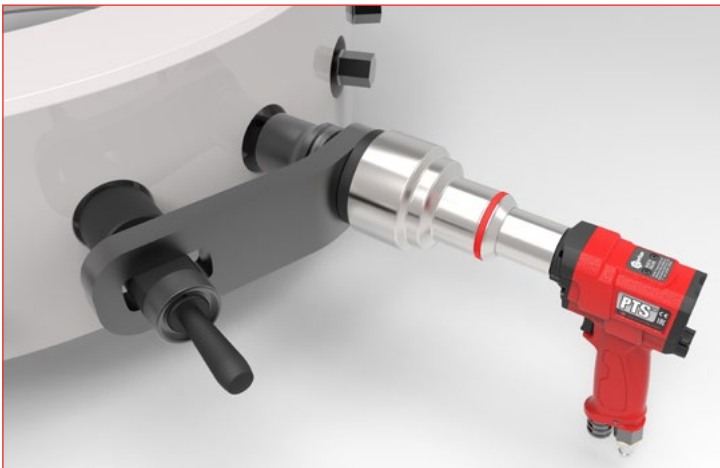
Reaction angled at 20° to the tool axis, with travelling centres to suit reaction off adjacent pin.

The axial travel is incorporated to accommodate potential pin movement on future wellhead designs.

The solution is designed to be used both in a workshop, and topside. Provided with a chemical black finish, the reaction will be cleaned and oiled after use if used in an offshore environment.

Max torque – 4,000 N·m

Weight – approx. 10.5 kg





ETO EXAMPLE 7 - ET2 WITH REMOTE CONTROL PANEL FOR MANUFACTURING INDUSTRY

Project Number: Q4523

Introduction & Application

Manufacturing assembly line torque & angle bolt tightening station.

Remote operated electric torque tool required having up to 6,000 N·m torque capacity with angle.

Technical Specification / Data Highlights

Supply of a kit for integration into customer assembly machinery (having emergency stop isolator).

Fits to customer manipulator arm.

Second trigger switch could be supplied for two handed start function if preferred.

Other sizes of ET2 can be supplied for similar remote operation applications (see Q4940 for ET-72-1350).

Solution

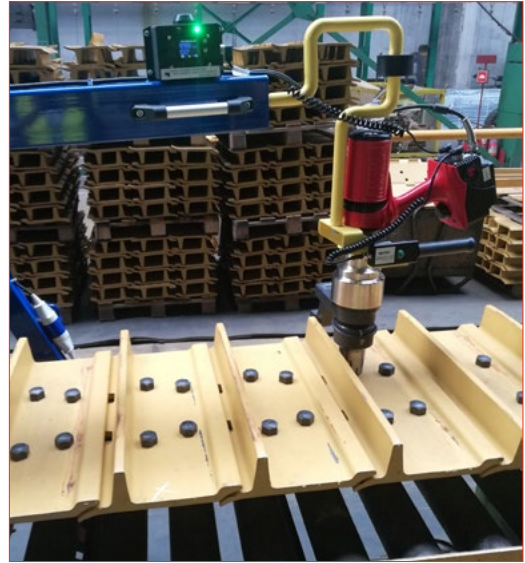
EvoTorque®2-119-6000 tool modified as follows:

- Display module removed (but used in remote control panel).
- Blanking plate fitted in lieu of display, and housing sockets for trigger & communication leads.
- Handle indexing (relative to gearbox) locked.

Special control panel housing the ET2 display module taken from ET2 tool & 3.5 m communication lead.

Remote trigger handle assembly & 3.5 m lead.

Standard cranked reaction used (contacts vertical ribs on yellow sections).



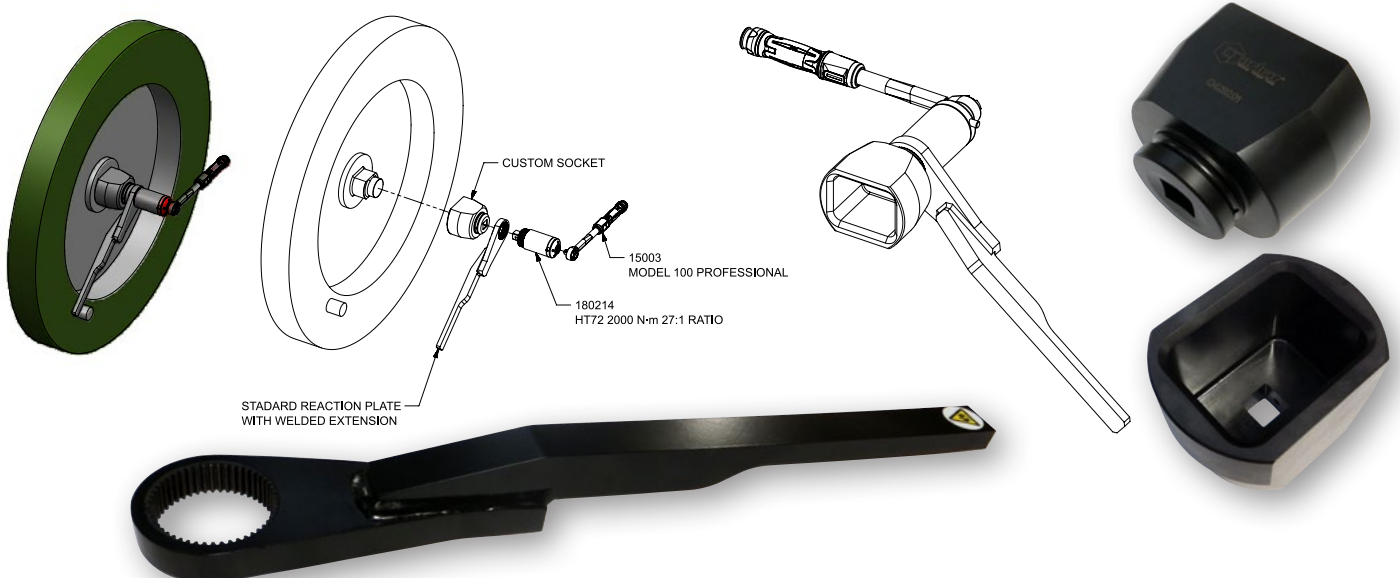
ETO EXAMPLE 8 - HT-72 SPECIAL REACTION & SOCKET FOR CERAMICS INDUSTRY

Project Number: Q4292

Introduction & Application

Ceramics industry maintenance requirement to tighten mill centre nut weekly to 1,700 N·m.

Solution



Technical Specification / Data Highlights

Special reaction arm & 1" square drive socket for use with HT-72-2000 27:1 & Model 100 torque wrench.