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INSPECTION & CALIBRATION OF TORQUE WRENCHES



LIFTING AND HANDLING SERVICES
TEST HOUSE
SOLUTIONS FOR INDUSTRY



Company Profile

Lifting and Handling Services is an independent Test House, carrying out statutory inspection and certification of materials handling and safety equipment since 1990, see enclosed listing. Our company takes inspection to the next level by combining the right people, processes and experience with personal attention to provide our clients with an unrivalled quality of service.

We were the first company of our kind in Ireland to develop a state of the art bespoke online safety management programme which our clients can access 24/7 to view a comprehensive suite of reports surrounding statutory inspection history, plant failures, repairs and statistical analysis.



Services Provided by Lifting and Handling

Lifting and Handling Services provide the following services to our clients nationwide:

✓ Statutory Inspection and Certification of Materials Handling & Safety Equipment	✓ Calibration and Certification of Torque Measuring Devices
✓ Product Investigation & Reporting	✓ P.A.T. (Portable Appliance Testing) Solutions
✓ Non Destructive Testing Services	✓ Static Testing
✓ Safety Management Consultation & Training	✓ Fuel Dispense / Pump Testing
✓ Accident & Incident Investigation	✓ Air Receivers & Pressure Vehicles
✓ Expert Witness	✓ Fire Extinguishers Inspection
✓ Safety Audits & Risk Assessments	✓ Access Equipment including ladders
✓ Ergonomics – Work Risk Analysis & Solutions	✓ CAD Design & Simulations for steel structures
✓ Fire Safety Risk Assessment / Audits	✓ Pallet Racking and Storage Systems
✓ Load Testing – Safety Equipment	✓ Load Testing – Structural



Tool Testing and Calibration Service

Lifting and Handling Services offers the following services on site or in house. We also supply a wide range of tools and testing systems.

1. Calibration checks including dismantling for high frequent use
2. Repair, re-calibration and certification of all torque tool types
3. Exchange system of factory rebuilt torque tools
4. Torque testing calibration equipment and re-calibration
5. Consultancy on all aspects of torque tools and measurement testing equipment
6. Supply & Re-Calibration of torque measurement and testing equipment

Contact us for advice or a quotation at 045-868342



Calibration of Torque Wrenches



Calibration Periods for Torque Wrenches

The calibration integrity of torque wrenches depends largely on the use and environment in which the tool is subjected.

In test conditions, the torque wrench should remain within the tolerances laid down by BS EN ISO 6789:2003 for at least 5000 cycles. However, this may be reduced by dust causing wear, or by using the tool to loosen fasteners which can lead to damage, or by dropping the unit regularly. Providing your operators are trained in the use of torque wrenches, and the manufacturer's instructions are followed, a period of **six months** is reasonable for torque wrenches used in non-safety critical areas.



Torque Wrench Calibration



Calibration Guidance for Torque Wrenches

Non Safety Critical use of Torque Tools

Infrequent Use: 12 Months
Frequent Use: 6 Months

Safety Critical use of Torque Tools

Infrequent Use: 6 Months
Frequent Use: 3 Months*

*High Frequent use should include the dismantling of the torque wrench for full inspection

Calibration and Certification of Torque Tool Testing Equipment

Non Safety and Safety Critical use of Torque Tool Testers: 12 Months*

*Or depending on the internal or external examining body and their requirements.

General Guidance based on BS EN ISO 6789 : 2003 (5000 cycles)

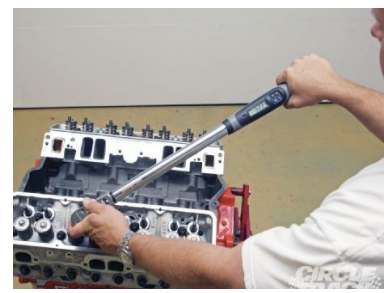
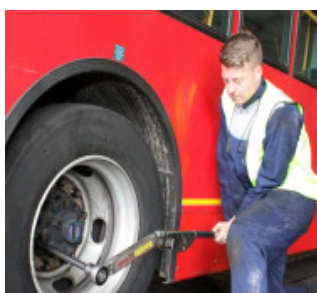
1 Cycle: 1 Nut or Bolt tested with torque tool

1 Wheel: 8 to 10 nuts per wheel by 4 to 6 wheels per vehicle = 32 to 60 cycles per vehicle

Number of vehicles to be tested based on 4 wheels @ 32 cycles = 156 vehicles

Number of vehicles to be tested based on 6 wheels @ 60 cycles = 83 vehicles

The torque wrench should then be tested with a torque tool tester by a competent person.





Calibration Guidance for Torque Testers

Torque Test Instruments and Servicing

The accuracy of Torque Test Instruments is a complicated subject with a number of factors to take into consideration, including gravitational effects and buoyancy effects. In simple terms the following shows the route of the calibration equipment standard which starts at the highest level of accuracy for the testing equipment and works down to the individual tool.

- Manufacturers of Torque Measurements Equipment and Torque Tools
- Manufacturers Agents & Test Houses (**LHS Services**)
- Client Torque Testing
- Torque Tools

Manufacturers of this category of equipment operate to BS EN ISO/IEC 17025:2005. This document sets out relevant standards for the technical competency of the laboratory.

Services offered by Lifting and Handling Services

Electronic Torque Measurement Devices

In accordance with the current standards for calibration of torque measurement devices, it is desirable to calibrate transducers. The calibration service that LHS offer is valid for the transducer for 12 months. Calibration certificates are issued in accordance with the current standard for measuring devices BS7882:2008, and show the nominal torque applied, and the measured torque readings. Details of the standard are available on request.

Torque Wrenches

Calibration of all Torque Wrenches can be carried out by Lifting and Handling Services. If the results do not fall within specification the wrench will either be adjusted or a service exchange offered (Norbar only). Calibration Certificates are in accordance with the current standard for hand torque tools BS EN ISO 6789:2003. The nominal torque applied and the measured torque readings are recorded for each torque wrench tested by Lifting and Handling Services.

Notes of Torque Wrench Testing

In general torque finishing wrenches have an accuracy of $\pm 3\%$ while industrial torque wrenches have an accuracy of $\pm 4\%$, even in arduous working conditions.

When testing a torque wrench on a torque testing device it is important to note that the wrench must be exercised in accordance with the manufacturers requirements, generally the first three torque readings should be disregarded prior to the actual readings recorded. The torque wrench tester should be mounted correctly ensuring it can take the full load to be applied and fitted at the correct height for operator ease of use.

Training on the use of all Electronic and Manual Torque Measurement Devices and the safe use of torque tools can be provided by LHS.





Measurement of Torque

What is Torque?

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

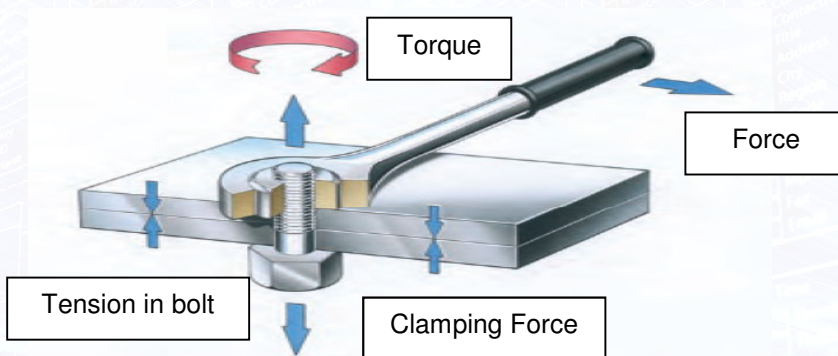
Imagine someone tightening a bolt using a socket attached to a metre long bar. If they apply 10 kgf of force (kgf) perpendicular to the bar they will produce a torque of 10 kgf.m at the axis (the centre of the bolt). However, under the S.I. system of measurement, force is expressed in Newton's (N) rather 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

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.

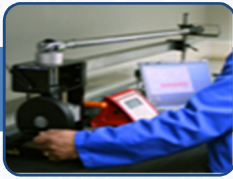


Torque = Force x Distance

Example 1: Distance = 1 m, Force = 100 N, Torque = 100 N.m.

Example 2: Distance = 2 m, Force = 100 N, Torque = 200 N.m.

Example 3: Distance = 1 ft, Force = 100 lbf, Torque = 100 lbf.ft (or 100 ft.lb)



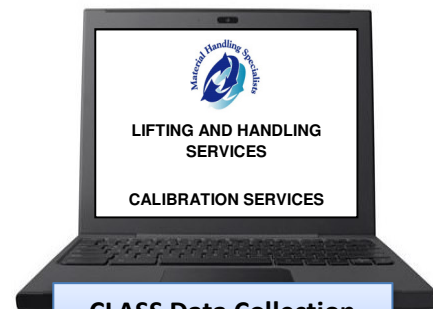
Inspection, Repair and Certification



Repair test and calibration of all torque tools followed by certification and online results.



Torque Tool Testing System



CLASS Data Collection Software



Data Collection and Certification



**CLASS Online Reports
Accessible 24/7**

Default Location Lifting and Handling Services - Clane - County Kildare

Default Date 15/03/2012

Inspection Time 0 Mins

Default Surveyor SEAMUS PHELAN

Repair Time

	Total	Repair	Repaired	Lockouts	Scrapped	In Service	Not in Service	New Plant
0								
Total	12				8	4		
Inspected	4	2			4			
Pass	2	2			4			
Fail								
Remainder	8				4	4		

Plant Item Code	Plant Serial Number	In Service	Plant Description	Plant Location	Result
UHFTK034024814984	101666	NO	Torque Wrench	HARRISTOWN	Not Inspected
UHSP0087930832447	104457	YES	Torque Wrench	HARRISTOWN	Not Inspected
DUBLPB82008101747	115996	NO	Torque Wrench	HARRISTOWN	Not Inspected
UHSTT71101911636	115173	YES	Torque Wrench	HARRISTOWN	Passed Inspection Including Repair
UHSTT0118363d9dt	193346	YES	Torque Wrench	HARRISTOWN	Passed Inspection
DUBLPB82008101777	193367	YES	Torque Wrench	HARRISTOWN	Not Inspected
UHSTT0117788d9dt	217132	YES	Torque Wrench	HARRISTOWN	Not Inspected
DUBLPB82008101769	236655	YES	Torque Wrench	HARRISTOWN	Not Inspected
BERNATK12007022657	246302	YES	Torque Wrench	HARRISTOWN	Passed Inspection Including Repair
UHSTT01106635J5	246624	YES	Torque Wrench	HARRISTOWN	Passed Inspection
UHSTK03790832447	006438	NO	Torque Wrench	HARRISTOWN	Not Inspected
BERNATK12007022665	LHS1110/3934324	NO	Torque Wrench	HARRISTOWN	Not Inspected

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Contact us for free advice or a quotation at 045-868342 or sales@liftingandhandling.ie

Calibration of Torque Wrenches



Health & Safety Issues

A risk assessment will highlight the following issues when working with large torque wrenches.

1. Rubber handles slipping or coming off the wrench
2. Ratchet or sprocket failing or coming adrift of the wrench
3. Cam Rivet failure of the wrench
4. Incorrect connection with the bolt/nut or bolt shear



Misuse or failure of a torque wrench during use could lead to wrist, elbow, shoulder or back injuries

Note: Working at heights i.e. working at any height where there is a risk of a fall: In a scenario such as working on an engine while using the torque wrench, when the wrench mechanically breaks or if it fails the person could easily lose his/her balance and fall.

Best Practice: Always ask for your wrench to be dismantled while carrying out the calibration of same.



Norbar Calibration Equipment Available



Torque Wrenches
and Screwdrivers



Hand and Powered
Torque Multipliers



Ultrasonic Bolt
Measurement



Norbar Torque Calculator

Norbar has launched a handy multi-lingual torque conversion calculator as a free download on Android, iPhone & Blackberry systems. The new app offers instant conversion across a full range of SI, Metric and Imperial Units.



Torque and Bolt
Measurement
Equipment



Calibration of Torque Wrenches