DLT – DIGITAL LOAD TRANSDUCER

Valid from Serial No. 011700101

Model			Part number
DLT 25 Nm	–	Digital Load Transducer	6159 351 580
DLT 60 Nm	–	Digital Load Transducer	6159 351 760

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⚠ WARNING

Read all safety warnings and instructions
Failure to follow the safety warnings and instructions may result in electric shock, fire and/or serious injury.
Save all warnings and instructions for future reference

Table of Contents

Product information

General information

WARNING Risk of injury

Read all safety warnings and all instructions.
Failure to follow the warnings and instructions may result in electric shock, fire and/or serious personal injury.

Ensure that you read and understand all instructions:

- Safety Information delivered together with the different parts of the system.
- Product Instructions for installation, operation and maintenance of the different part of the system.
- All locally legislated safety regulations with regard to the system and parts thereof.

Save all warnings and instructions for future reference.

Safety signal words

The safety signal words Danger, Warning, Caution, and Notice have the following meaning:

DANGER	DANGER indicates a hazardous situation which, if not avoided, **will** result in the death or serious injury.
WARNING	WARNING indicates a hazardous situation which, if not avoided, **could** result in the death or serious injury.
CAUTION	CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE!	NOTICE! is used to address practices not related to personal injury.

Warranty

- Product warranty will expire 12 months after the product is first taken into use but shall in any case expire at the latest 13 months after delivery.
- Normal wear and tear on parts is not included within the warranty.
  - Normal wear and tear is that which requires a part change during the standard tools maintenance for that period taking into consideration the number of tightenings and average applied torque.
- The product warranty relies on the correct use, maintenance, and repair of the tool and its component parts.
- Damage to parts that occurs as a result of inadequate maintenance or performed by parties other than Desoutter or their Certified Service Partners during the warranty period is not covered by the warranty.
- To avoid damage or destruction of tool parts, service the tool according to the recommended maintenance schedules and follow the correct instructions.
- Warranty repairs are only performed in Desoutter workshops or by Certified Service Partners.

Desoutter offers extended warranty and state of the art preventive maintenance through its ToolCover contracts. For further information contact your local Service representative.

For electrical motors:

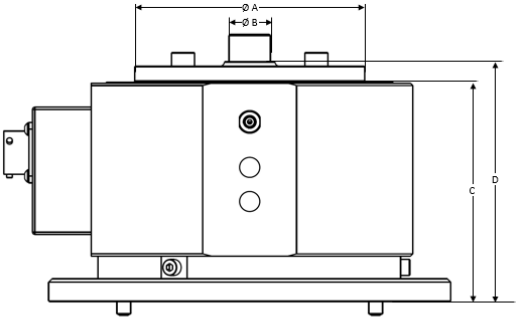
- Warranty shall only apply when the electric motor has not been opened.

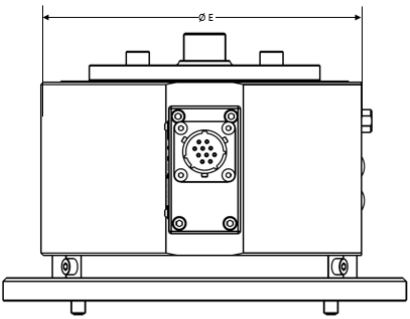
Website

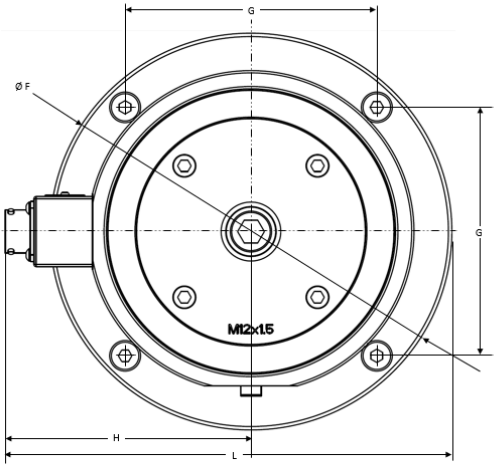
Log in to Desoutter: www.desouttertools.com

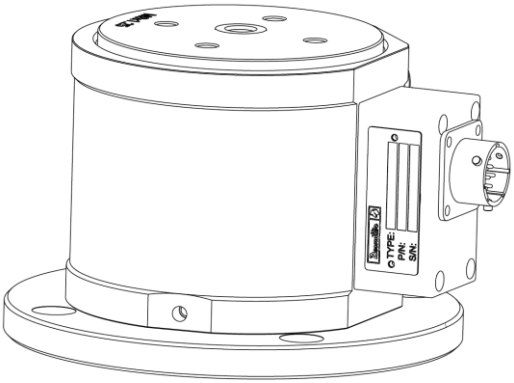
You can find information concerning our products, accessories, spare parts and published matters on our Website.

Dimensioning





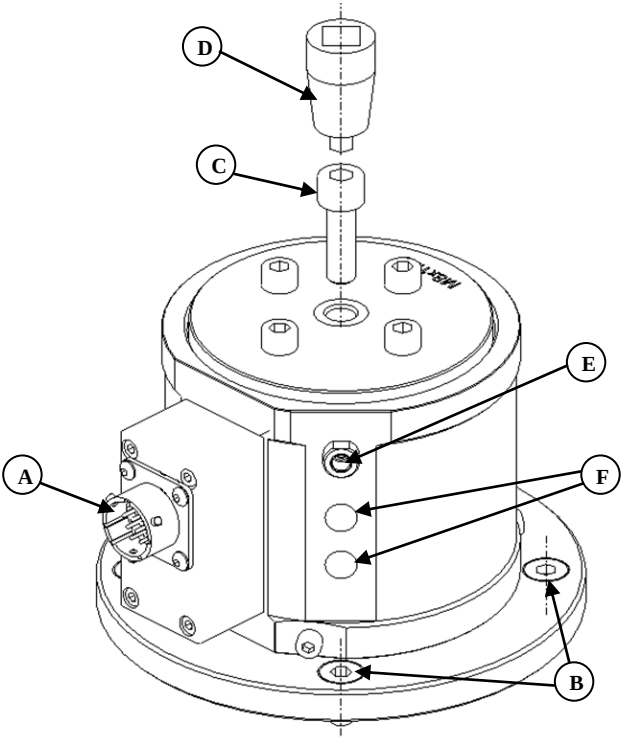




Product Description	Ø A (mm)	Ø B (mm)	C (mm)	D (mm)	Ø E (mm)	Ø F (mm)	G (mm)	H (mm)	L (mm)
DLT 25 Nm	84	15	91	92	97	135	79.9	83.5	151
DLT 60 Nm	100	21.5	96.5	105.5	142	175	109.6	107	194.5

Overview

Product description



A. Cable connector
B. Fixing bolts
C. Main screw
D. Screw adapter
E. Pipe adapter
F. Plastic Tap

Load range N

Product Description	*Min. Load range (N)*	*Min. Load range (lbs)*	*Max. Load range (N)*	*Max. Load range (lbs)*
DLT 25 Nm	*2000*	*449.6*	*20000*	*4496.2*
DLT 60 Nm	*4000*	*899.2*	*40000*	*8992.3*

Torque range Nm

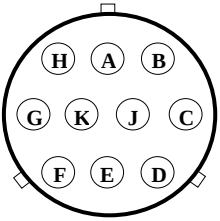
Product Description	*Min. Torque range (Nm)*	*Min. Torque range (ft lbs)*	*Max. Torque range (Nm)*	*Max. Torque range (ft lbs)*
DLT 25 Nm	*8*	*5.90*	*25*	*18.44*
DLT 60 Nm	*20*	*14.75*	*45*	*33.19*

Technical information

- Output sensitivity 1.7 mV/V
- Static accuracy ± 0.5% FSD (*full-scale detection*)

- Overload capacity (*130 % of the Max. Torque*)
  - *DLT 25 Nm* 32.5 Nm
  - *DLT 60 Nm* 78 Nm
- Operation to specifications over a temperature range of 5 °C to 40 °C (*41 °F to 104 °F*)
- IP Index (except connector) 40
- Weight
  - *DLT 25 Nm* 3.8 kg (*8.38 lbs*)
  - *DLT 60 Nm* 7.2 kg (*132.28 lbs*)

Connector PIN OUT



PIN	*FUNCTION*
H	**MISO**
A	**MOSI**
B	**CLOCK**
G	**CDE.CAL**
K	**AGN**

PIN	*FUNCTION*
J	**CS.ANGLE**
C	**CS.MEM**
F	**-15V**
E	**+15V**

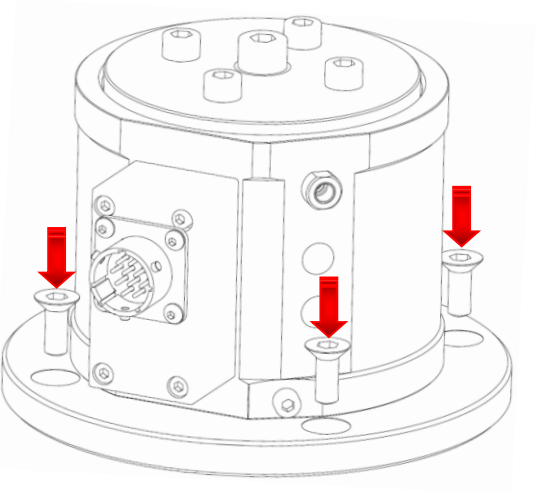
Accessories

Part Number	Item Description
387443	Grease Molykote BR2 Plus (TUBE)
315173	Grease Molykote BR2 (5kg DRUM)

Installation

Installation instructions

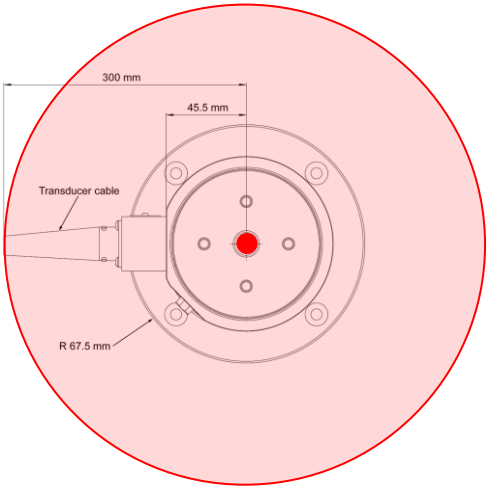
DLT - Digital Load Transducer is designed to measure clamp preload and relative torque applied to joints.
Select the correct size of DLT, which is within the maximum torque capacity of the tool used.
Make sure to mount the DLT base on a stable horizontal "working table" to avoid/minimise any vibration or movement of the system. Install the DLT on the stable horizontal "working table" with four fixing bolts M6 (see the figure on the right).



NOTICE! Tighten the four M6 fixing bolts up to approximately 10.5 Nm.

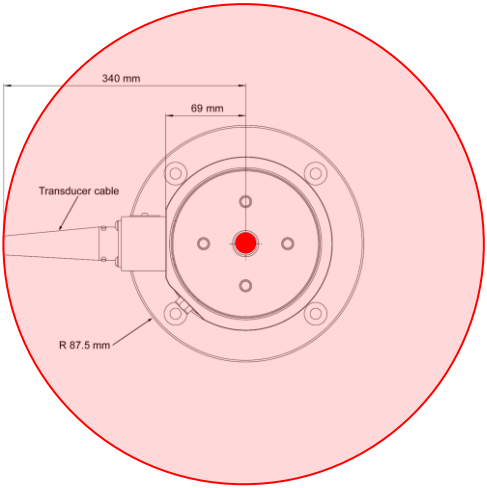
NOTICE! Do not install the DLT near any surface that could limit its action range. Respect the following guidelines in order to make sure that there is a clearance between the transducer cable and any external surface:

DLT 25 Nm



*Make sure that the operating area of the DLT 25 Nm is circular with a diameter of **600 mm** (with the center on the main screw of the DLT) – see the figure above*

DLT 60 Nm



*Make sure that the operating area of the DLT 60 Nm is circular with a diameter of **680 mm** (with the center on the main screw of the DLT) – see the figure above*

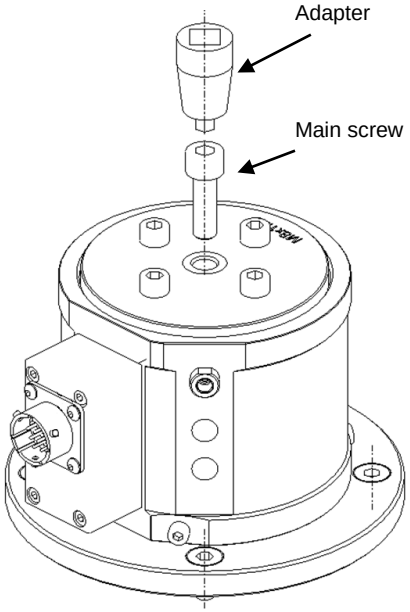
Connect the DLT to the measuring instrument (*Desoutter Delta*) through the transducer cable.
For more information about the *Desoutter Delta*, refer to "*Delta User Guide*" (Desoutter User Guides are available at *http://www.desouttertools.com/resource-centre*).

Operation

Configuration instructions

In sequence, vertically align the main screw and the adapter on the ratchet socket of the DLT.

NOTICE! Make sure that the grease is equally applied along the threaded surface of the main screw before inserting it inside the splined nutsert.



Operating instructions

Operate the tool on the joint making sure to align the tool/transducer to avoid any influence from side forces which may affect the measuring result. Failure to comply with this requirement and to exceed the maximum rating torque may cause irreversible damage to the DLT.

See *Spare Part List* for recommended screws.

*NOTICE! Lubricate the main screw at intervals of **100 tightenings**. Make sure that the grease is equally applied along the threaded surface of the main screw. Failure to comply with this requirement may result in decreased performances and accuracy of the tool, increased wear with possible damage of the main screw and the splined nutsert.*

*NOTICE! Replace the DLT 25 Nm – Main screw (M8) at intervals of **2000 tightenings**. Desoutter Delta shows the total number of tightenings of the main screw. For more information about the Desoutter Delta, refer to "Delta User Guide" (Desoutter User Guides are available at http://www.desouttertools.com/resource-centre).*

*NOTICE! Replace the DLT 60 Nm – Main screw (M12) at intervals of **2000 tightenings**. Desoutter Delta shows the total number of tightenings of the main screw. For more information about the Desoutter Delta, refer to "Delta User Guide" (Desoutter User Guides are available at http://www.desouttertools.com/resource-centre).*

*NOTICE! Replace the DLT 25 Nm – splined nutsert at intervals of **55000 tightenings**. Desoutter Delta shows the total number of tightenings of the splined nutsert. For more information about the Desoutter Delta, refer to "Delta User Guide" (Desoutter User Guides are available at http://www.desouttertools.com/resource-centre).*

*NOTICE! Replace the DLT 60 Nm – splined nutsert at intervals of **30000 tightenings**. Desoutter Delta shows the total number of tightenings of the splined nutsert. For more information about the Desoutter Delta, refer to "Delta User Guide" (Desoutter User Guides are available at http://www.desouttertools.com/resource-centre).*

Service

Maintenance Instructions

Cleaning

Keep the *DLT – Digital Load Transducer* clean.

After use, remove any trace of oil, grease and dust from the *DLT – Digital Load Transducer*.

Use an anti-static cleaning cloth to remove dust from the *DLT – Digital Load Transducer*.

Avoid using harsh detergents to clean the *DLT – Digital Load Transducer*.

Calibration

Calibration is a set of operations that compares the values indicated by a measuring system to the corresponding values realized by external standards.
The accuracy of electronic drifts with time and temperature, which can result in measurement inaccuracy.
Calibration restores the DLT components to their specified accuracy and ensures that the device still meets Desoutter standards.
Desoutter recommends performing a complete calibration at least once every year. You can shorten this interval based on the demands of your application.
To do a complete calibration, please contact a certified *Strength Test Laboratory*.

For more information about the calibration process, refer to the certificate delivered with the product.

Spare parts

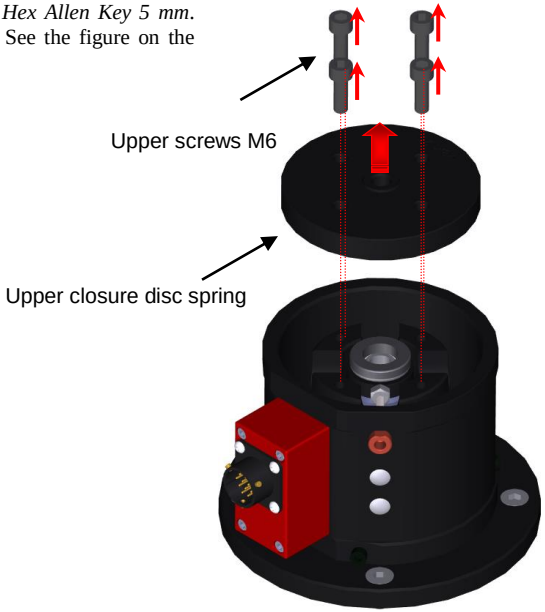
Exploded views and spare parts lists are available at *http://www.desouttertools.com/resource-centre*.

The use of spare parts other than those originally supplied by the manufacturer may result in a drop in performance or in increased maintenance and level of vibration and in the full cancellation of the manufacturer's liability.

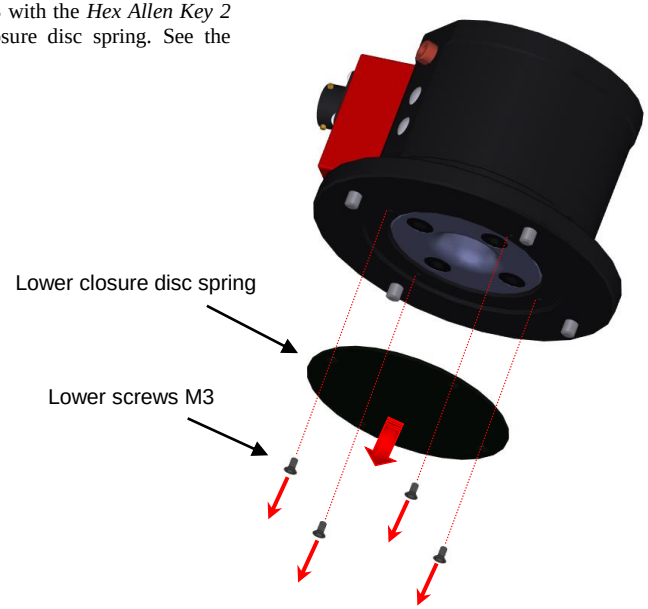
Splined Nutsert replacement

Do the instructions below to replace the splined nutsert.

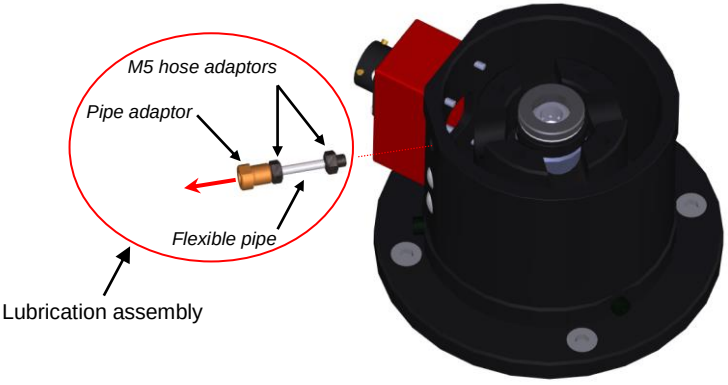
1. Remove the four upper screws M6 with the *Hex Allen Key 5 mm*. Then, remove the upper closure disc spring. See the figure on the right.



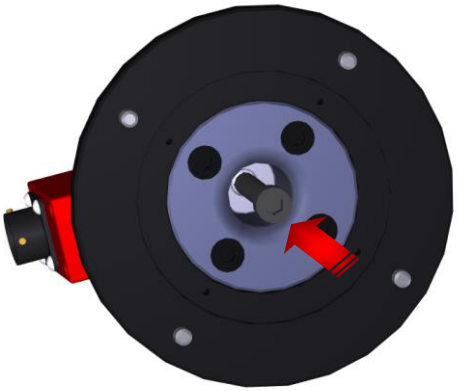
2. Remove the four lower screws M3 with the *Hex Allen Key 2 mm*. Then, remove the lower closure disc spring. See the figure on the right.

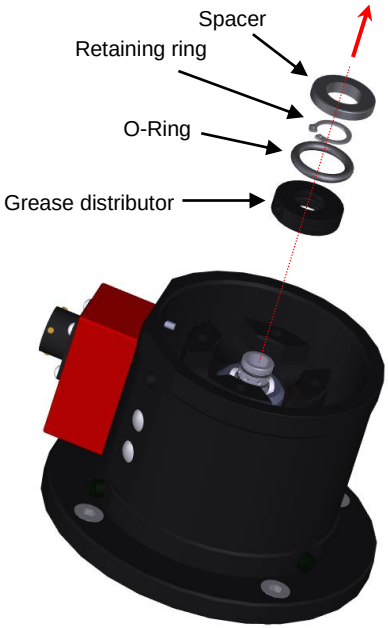


3. Remove the lubrication assembly (*M5 hose adaptor, flexible pipe and pipe adaptor*) from the *DLT – Digital Load Transducer*. See the figure on the right.



4. From the bottom side, carefully turn a M8x60 screw into the splined nutsert (see the figure on the right) until the M8x60 screw head matches the bottom side of the *DLT – Digital Load Transducer*.



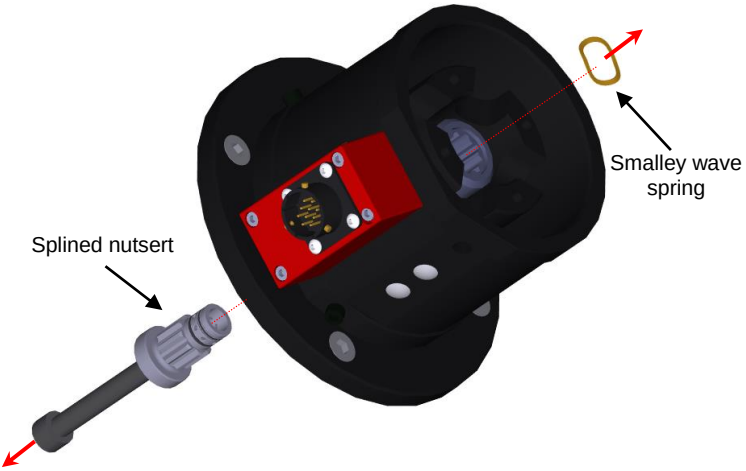


5. Make sure that the M8x60 screw (previously installed into the splined nutsert) is stable. Then, in sequence, remove the spacer (manually), the retaining ring (with a snap ring pliers), the O-Ring (manually) and the grease distributor (manually) from the upper side of the splined nutsert (see the figure on the left).

NOTICE! After removing the retaining ring, the splined nutsert does not fall down, since the M8x60 screw holds it from the bottom.

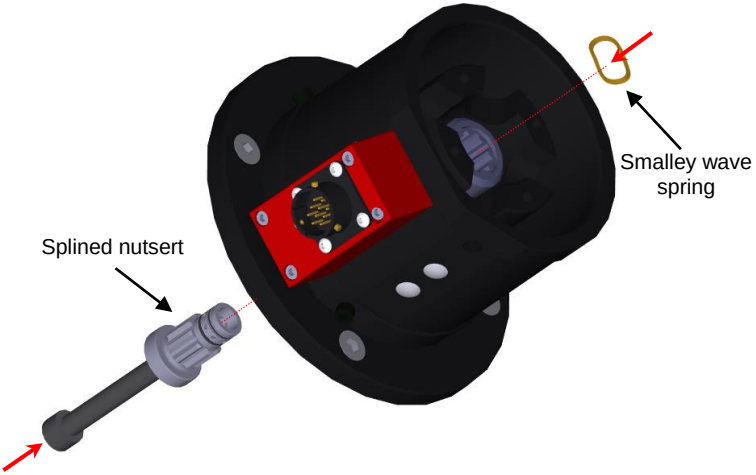
6. Carefully remove the splined nutsert from the lower side of the *DLT – Digital Load Transducer* through the M8x60 screw. At the same time, manually remove the smalley wave spring from the upper side of the *DLT – Digital Load Transducer*.

   See the figure on the right.

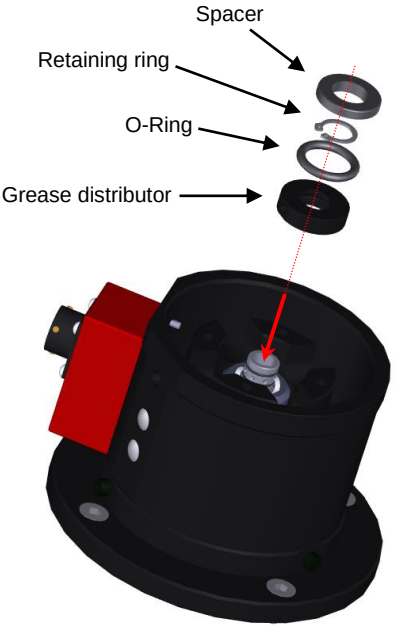


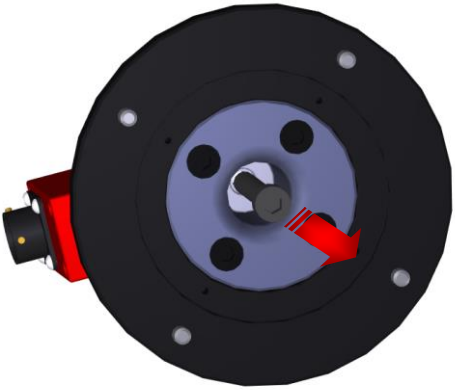
7. Turn a M8x60 screw into the bottom side of the new splined nutsert. Carefully insert the new splined nutsert from the lower side of the *DLT – Digital Load Transducer* through the M8x60 screw. At the same time, manually put the new smalley wave spring on the top of the transducer.

   See the figure on the right.



8. Make sure that the splined nutsert is in position. Then, in sequence, install the grease distributor (manually), the O-Ring (manually), the retaining ring (with a snap ring pliers) and the spacer (manually) on the upper side of the splined nutsert (see the figure on the right).

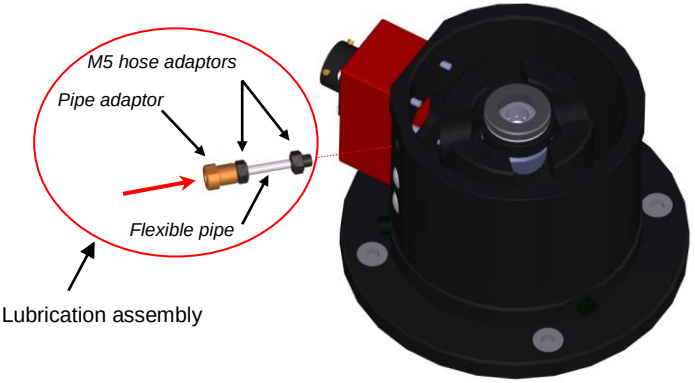




9. Remove the M8x60 screw from the bottom side of the splined nutsert (see the figure on the left).

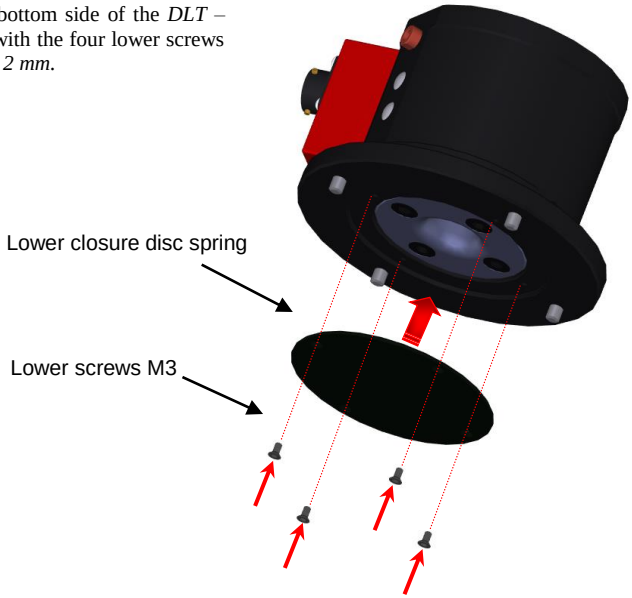
10. Install the lubrication assembly (*M5 hose adaptor*, *flexible pipe and pipe adaptor*) on the *DLT – Digital Load Transducer*. See the figure on the right.

> *NOTICE! Be careful to put the lubrication assembly on the same position as previously.*



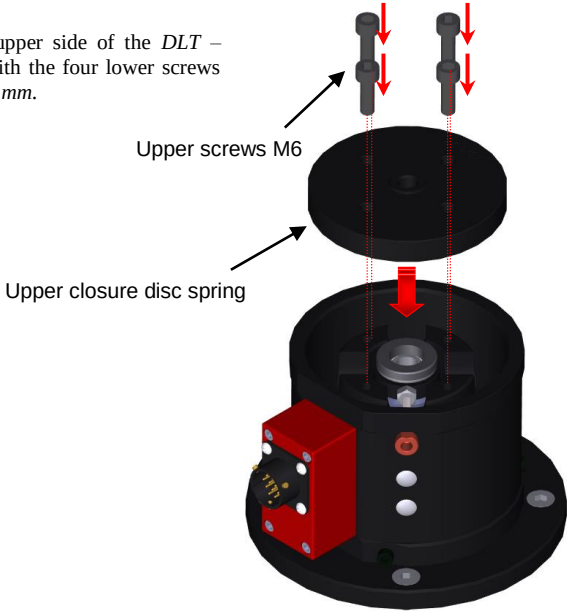
11. Put the lower closure disc spring on the bottom side of the *DLT – Digital Load Transducer*. Then, install it with the four lower screws M3: at this purpose, use the *Hex Allen Key 2 mm.*

    See the figure on the right.



12. Put the upper closure disc spring on the upper side of the *DLT – Digital Load Transducer*. Then, install it with the four lower screws M6: at this purpose, use the *Hex Allen Key 5 mm.*

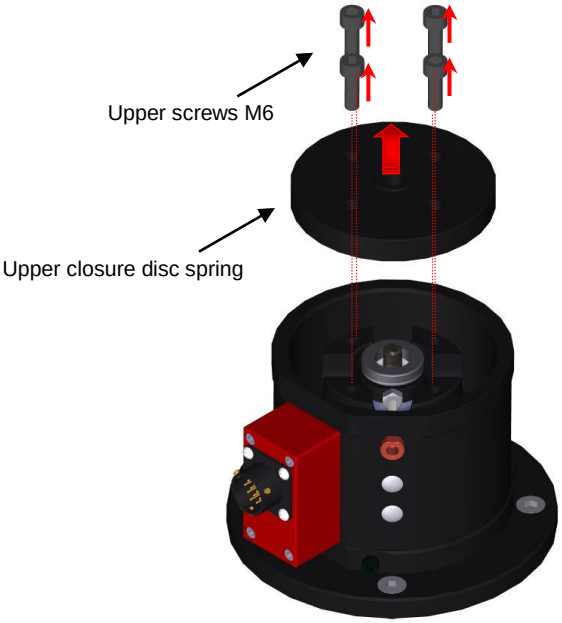
    See the figure on the right.



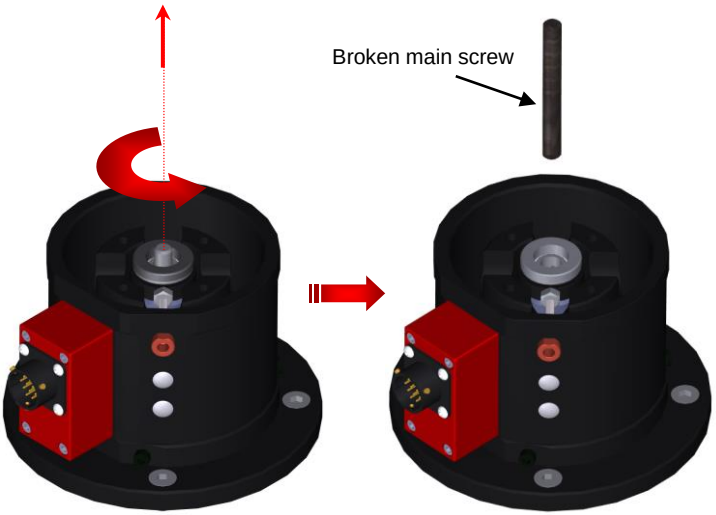
Broken main screw removal

If the main screw breaks, before starting a new test, do the following operations to remove the broken main screw from the splined nutsert.

1. Remove the four upper screws M6 with the *Hex Allen Key 5 mm* (see the figure on the right). Then, remove the upper closure disc spring.

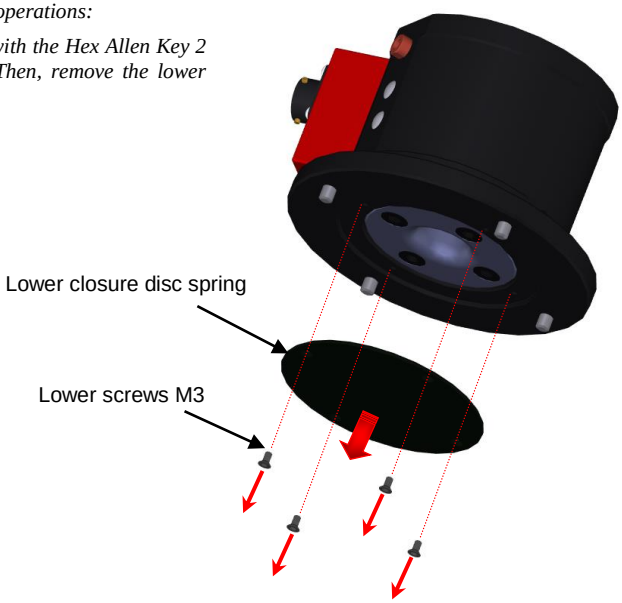


2. Manually, turn counterclockwise the broken main screw to remove it from the upper side of the *DLT – Digital Load Transducer*.

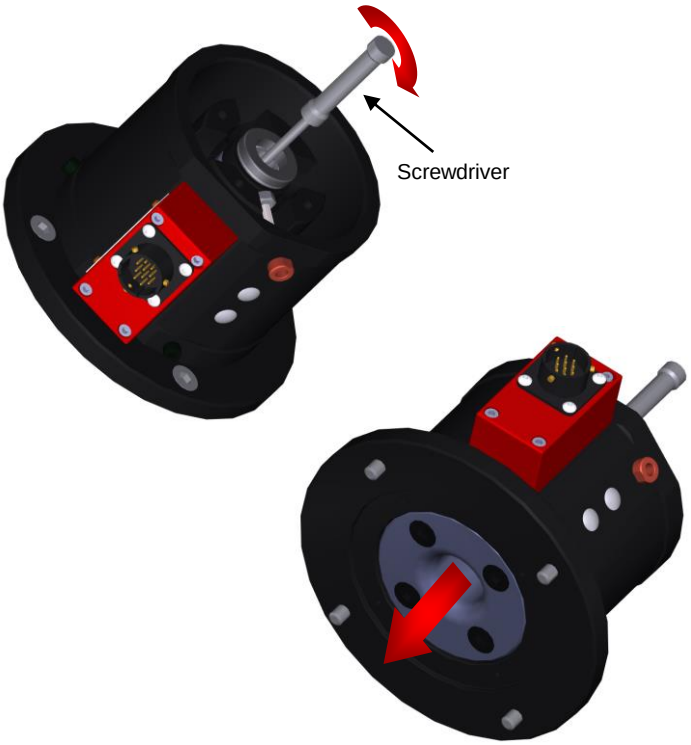


NOTICE! If it is not possible to manually remove the broken main screw (due to the fact the main screw does not break under the head), do the following operations:

a. *Remove the four lower screws M3 with the Hex Allen Key 2 mm (see the figure on the right). Then, remove the lower closure disc spring.*

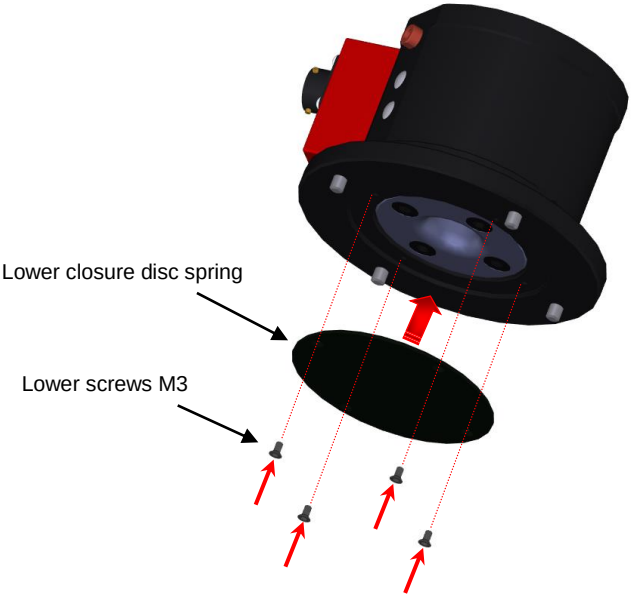


b. *From the upper side of the DLT – Digital Load Transducer, carefully insert a screwdriver into the splined nutsert. When the end of the screwdriver touches the "break point" of the main screw, pay close attention: with the screwdriver, carefully start rotating clockwise the broken main screw in order to remove it from the bottom side of the DLT – Digital Load Transducer (see the figures on the right).*



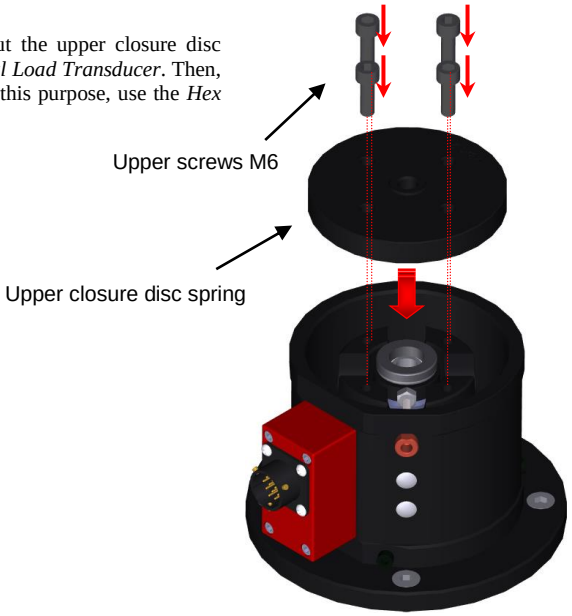
c. *After removing the broken main screw, put the lower closure disc spring on the bottom side of the DLT – Digital Load Transducer. Then, install it with the four lower screws M3: at this purpose, use the Hex Allen Key 2 mm.*

See the figure on the right.



3. After removing the broken main screw, put the upper closure disc spring on the upper side of the *DLT – Digital Load Transducer*. Then, install it with the four lower screws M6: at this purpose, use the *Hex Allen Key 5 mm.*

See the figure on the right.

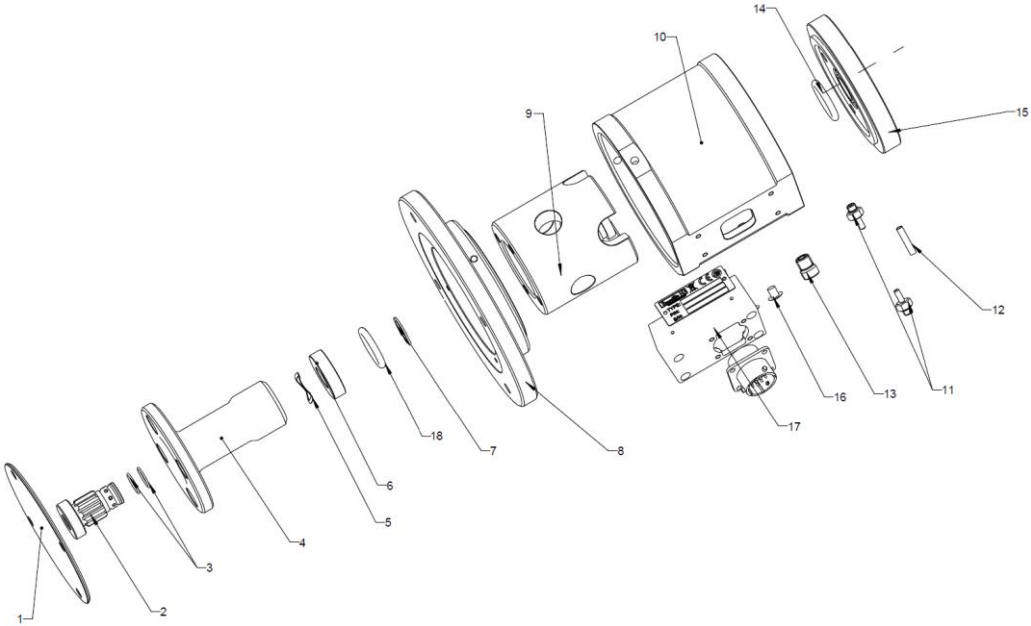


Decommissioning

Recycling instructions

When a product has served its purpose, it has to be recycled properly. Dismantle the product and recycle the components in accordance with local registration.

Recycling information



	PART	RECYCLE AS
1	*Closure Disc Spring*	*Aluminium*
2	*Splined Nutsert*	*Steel*
3	*O-Ring*	*Fluoroelastometer (FPM)*
4	*Transducer*	*Steel*
5	*Smalley Wave Spring*	*Steel*
6	*Grease Distributor*	*Steel*
7	*Retaining Ring*	*Steel*
8	*Fixing base*	*Steel*
9	*Spacer*	*Steel*
10	*Cover Tube*	*Steel*
11	*M5 Hose Adaptor*	*Steel*
12	*Flexible Pipe*	*Nylon*
13	*Pipe adaptor*	*Brass*

	PART	RECYCLE AS
14	*Spacer*	*Steel*
15	*Closure Disc Spring*	*Steel*
16	*Plastic Tap*	*Low-Density Polyethylene (LDPE)*
17	*Electronic Equipment*	*WEEE*
18	*O-Ring*	*Fluoroelastometer (FPM)*

Founded in 1914 and headquartered in France, Desoutter Industrial Tools is a global leader in electric and pneumatic assembly tools serving a wide range of assembly and manufacturing operations, including Aerospace, Automotive, Light and Heavy Vehicles, Off-Road, General industry.

Desoutter offers a comprehensive range of Solutions – tools, service and project – to meet the specific demands of local and global customers in over 170 countries.

The company designs, develops and delivers innovative quality industrial tool solutions, including Air and Electric Screwdriver, Advanced Assembly Tools, Advanced Drilling Units, Air Motors and Torque Measurement Systems.

Find more on www.desouttertools.com