

DILLON®

Mechanical AP Dynamometers



Installation Instructions

*AWT35-501027
Issue AD*

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1 General information and warnings

1.1 About this manual

This manual is divided into chapters by the chapter number and the large text at the top of a page. Subsections are labeled as shown by the 1.1 and 1.1.1 headings. The names of the chapter and the next subsection level appear at the top of alternating pages of the manual to remind you of where you are in the manual. The manual name and page numbers appear at the bottom of the pages.

1.2 Special messages

Examples of special messages you will see in this manual are defined below. The signal words have specific meanings to alert you to additional information or the relative level of hazard.



WARNING! This is a Warning symbol. Warnings mean that failure to follow specific practices and procedures may have major consequences such as injury or death.



CAUTION! This is a Caution symbol. Cautions give information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.



NOTE: This is a Note symbol. Notes give additional and important information, hints and tips that help you to use your product.

1.3 Safe Operation



WARNING: If you overload this dynamometer you could suffer severe injuries or death. The total load on the dynamometer should NEVER exceed the rated capacity.

Keep all the following in mind as you use the dynamometer.

The system capacity is equal to the rating of the dynamometers. The shackle rating should not be used to determine lift capacity of the system.

The shackles are rated in metric tonnes. Thus the 12-tonne shackles are rated to 26,450 lbf and are suitable for use on the 25,000 lbf dynamometer.

Any zeroed deadload must be considered as part of the ultimate load.

Although this instrument has a substantial overload protection rating, the instrument should not be used above the rated capacity. Doing so can significantly impact fatigue life of the instrument and cause premature and abrupt failure. If a higher capacity reading is needed, Dillon insists that a larger instrument be used.

Safety is always a concern in overhead lifting and tensioning applications. To limit your liability always insist upon factory supplied shackles and pins and factory tested and certified safe optional equipment. All DILLON products are designed to meet the published Safe Working Load (SWL) and Ultimate Safety Factor (USF) standards of the United States Military. All CE marked models meet the SWL and ULL (Ultimate Load Limit) requirements of the European Machinery Directive.

Do not grind, stamp, drill or deform the metal on the dynamometer body in any way. Protect the instrument from impact in use and storage.

Any significant damage or deformation to the loading element is cause for evaluation by Dillon.

Relieve all torsional and off axis loads.

Apply load in the center of the shackle bow with this instrument.

Off center loading results in substandard performance.

Instrument requires time to stabilize when changing temperatures.

Use only the hardware supplied with this instrument. If no hardware was supplied, insure that the mating pin and shackle bow is equivalent to the hardware used at calibration. Otherwise substandard performance or failure can result.

Dillon recommends only using qualified rigging hardware and cannot be responsible for unapproved hardware.

This instrument is not designed for the following:

- Applications that see rapid, dramatic temperature swings or thermal shock. Wide variation in readings can occur.
- Intrinsically safe environments. This unit has not been Factory Mutual or ATEX tested.

1.4 Routine maintenance



IMPORTANT: This equipment must be routinely checked for proper operation and calibration.

Application and usage will determine the frequency of calibration required for safe operation.

1.5 Cleaning the Dynamometer

Cleaning DOs and DON'Ts

- DO - Wipe down the outside of standard products with a clean cloth, moistened with water and a small amount of mild detergent
- DO NOT - Attempt to clean the inside of the machine
- DO NOT - Use harsh abrasives, solvents, scouring cleaners or alkaline cleaning solutions

1.6 Training

Do not attempt to operate or complete any procedure on a machine unless you have received the appropriate training or read the instructions.

2 Introduction

2.1 General description

A dynamometer is an instrument that displays the tension force exerted between the two attached shackles. It is generally used to determine tension in a line/cable or for suspended weighing.



The 50,000 lb dynamometer is not CE approved.

Figure 2.1 shows one model of dynamometer.

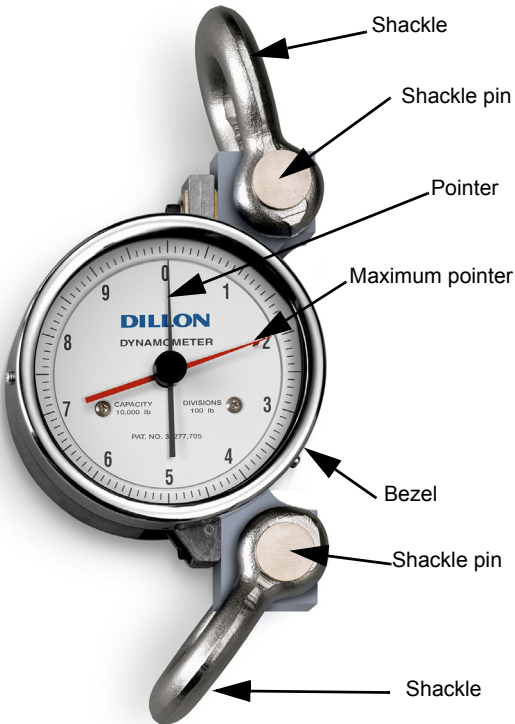


Figure 2.1 Dynamometer with shackles



CAUTION: Dillon Dynamometers are not designed for measurement of dynamic shock loads and should not be subjected to sudden force. Load or weight should be applied in a gradual manner to avoid damaging the Dynamometer. Torque loads applied to the dynamometer should be relieved or avoided.

Figure 2.2 shows an optional klaxon alarm attached to an AP dynamometer.

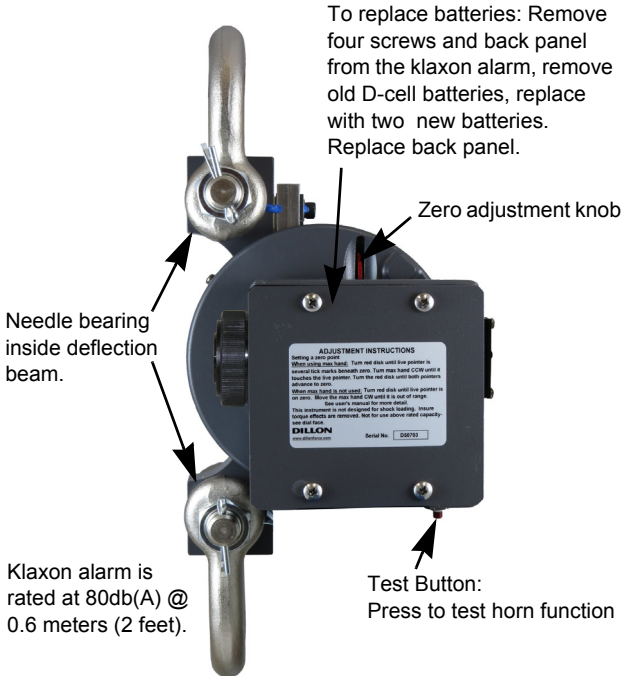


Figure 2.2 AP Dynamometer with optional klaxon alarm (rear view)



The klaxon alarm is rated at 80db(A) @ 0.6 meters (2 feet).

Heavy duty needle bearings inserted in each end of the Dynamometer deflection beam (or into both sides of the shackles ears) allow the shackle pin to rotate as force is applied. See [Figure 2.2](#). Bearings should be cleaned periodically in a suitable solvent. After drying, the bearings should be treated with a coat of light machine oil (SAE-5W non-detergent oil or lighter).



CAUTION: DO NOT allow oil to run into the mechanism case. The mechanism should never be oiled as this tends to attract dust or dirt.

The case is not water-tight and if the Dynamometer should be accidentally immersed, hold it so that water is free to run out through the openings in the bottom of the case and allow to dry.

2.2 Third-party shackles and attachments

Dillon supplies shackles and pins with the dynamometers that have been confirmed to properly work with our mechanical dynamometers. Do not use shackles or shackle pins that have not been qualified by Dillon. Lower profile non-machined spots can often be observed and are normal.

If any type of accessory fitting is made for use with the Dillon Dynamometer, be sure to machine this from high grade aircraft alloy (E4340 steel or equivalent) and heat treat it in order to ensure maximum safety.



Dillon / Avery Weigh-Tronix is not responsible for failure of attachment fittings furnished by others.

2.3 Maintenance and handling

The Dillon Dynamometer is a precision instrument and will provide many years of dependable service if given reasonable care and suitable protection. Many firms make it a regular practice to return Dynamometers to their distributors at 6 to 8 month intervals (depending upon how much they are used) to have accuracy recertified. We recommend this at least once a year. Consult with your Dillon distributor concerning any questions you may have about recalibration intervals. Your area may require periodic proof testing. Consult your local regulations.

Transport and store the dynamometer in the supplied storage case when not in use.

2.4 Operation

Zero the dynamometer for best accuracy. To properly zero the instrument when using the max pointer, adjust the black needle below the desired zero point using the zero adjustment wheel on the rear of the case. Move the red maximum pointer counterclockwise until it contacts the black needle. Use the zero adjustment wheel to simultaneously move both pointers to the desired zero point. This procedure will prevent the slight drag of the max pointer from influencing the displayed reading. If the max pointer is not required, rotate the red pointer clockwise until it reaches the zero position and operate normally.



WARNING: Failure to adjust the max hand prior to use of the Dynamometer WILL affect the readings if the max hand is used.

Dillon Mechanical Dynamometers permit zeroing of up to 20% of instrument capacity. Do not zero off a deadload and then use the instrument to capacity.

AUTHORIZED DISTRIBUTORS

Ask the experts. Dillon distributors offer complete service capabilities from application assistance to sales and product support. Their experienced representatives are the most knowledgeable experts that you will find in the force measurement industry. We recommend that you consult these capable specialists for all of your measuring needs.

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