DILLON

Dillon Mechanical Force Gauge User's Guide

Principal Parts

For easy identification of Force Gauge parts*, the following illustration has been prepared. Correspondence with our Service Department should refer to this illustration, and a rough pencil sketch of your particular setup will be helpful.

1 “U” SHAPED DEFLECTION BEAM

2 DIAL INDICATOR

3 BEZEL (FOR ZERO ADJUSTMENT PURPOSES)

4 PRESSURE BUTTON

5 ANVIL

6 DIAL INDICATOR GAUGE MOVEMENT PLUNGER

7 ANVIL SET SCREW

8 DIAL INDICATOR MOUNTING BRACKET

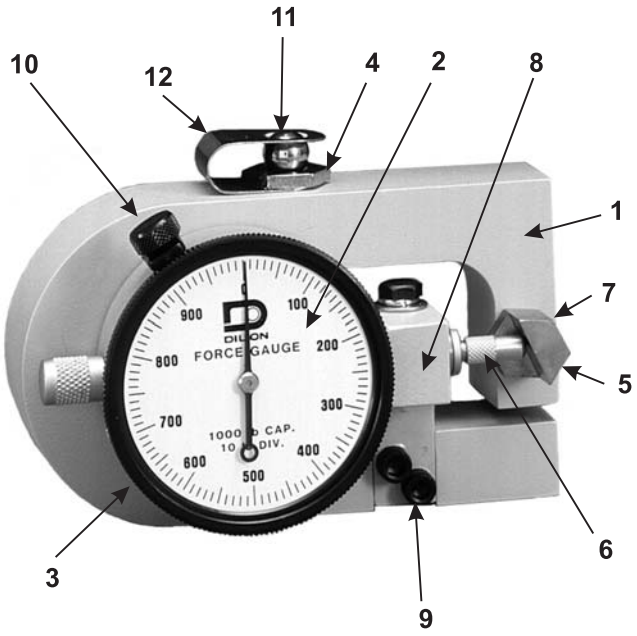
9 MOUNTING BRACKET SCREWS

10 BEZEL LOCKING SCREW

11 LOADING BALL

12 SPRING RETAINER CLIP

* an optional MAXIMUM POINTER is available but not shown.



Operational Data

IMPORTANT
When adjusting bezel locking screw, #10, only tighten as much as is necessary to hold bezel in proper position.

***DO NOT OVERTIGHTEN**, as this will distort the thin housing of the dial indicator gauge, affect the smooth action of the movement and produce false readings!*

Your Dillon Force Gauge is ready to go to work for you without any special assembly. Upon removing it from the storage case, it is only necessary to check the zero setting. This is done by placing the unit on a flat table with the pressure button, #4, at the top. Note that the dial bezel, #3, is locked lightly by a knurled thumb screw, #10. Simply loosen this knurled screw and then revolve the bezel in either direction, depending upon which way zero may be off. Revolving the bezel causes the dial to follow. With zero positioned directly under the pointer tip, again tighten the locking screw, and the instrument is ready to use.

Because of the sensitivity of the Dillon Gauge, zero should always be set with the unit resting on the lower or thicker portion of the deflection beam as illustrated. This is the same position it occupies during calibration. Ordinarily, zero will be retained indefinitely. However, under repeated stress or through accidental banging around, it may go off slightly. Thus, it is a good plan to check zero occasionally.

The small anvil, #6, against which the dial indicator plunger rides, should never be altered except by factory technicians. This anvil has nothing to do with zero setting. By careful adjustment, it has been positioned in such a way that, for full load application within the range of the instrument, the pointer will revolve 360°. TAMPERING WITH THE SETTING OF THIS ANVIL AUTOMATICALLY VOIDS THE ACCURACY GUARANTEE. If the anvil should be accidently thrown out of position by dropping or striking against another object, the entire gauge should be returned to the factory for resetting and calibration check.

Helpful Pointers

It is a good plan to test the tightness of the hardened dial indicator plunger, #6, occasionally. This part is screwed into a finely threaded seat and may sometimes work loose. This would cause the gauge to read high and might be mistaken for an off zero condition. Be sure not to force the plunger tip too tightly when screwing it down since, as explained, the threads are fairly delicate and might break off.

Note that threaded mounting holes have been provided in opposite faces of the “U” shaped deflection beam, #1. In the upper mounting hole, a spherically recessed pressure button, #4, is screwed. This button is hardened and plated. It receives the loading ball, #11. Force should be applied directly against this ball. In operation, the deflection beam bends inward slightly, and the ball revolves, tending to keep the line of force vertical. A drop of light oil on the ball assists this action.

Never fasten the “U” shaped deflection beam in such a way that the free movement of the upper portion will be retarded. The lower or thicker “leg”, however, may be tightened as securely as desired, using a stud or bolt through the threaded mounting hole.

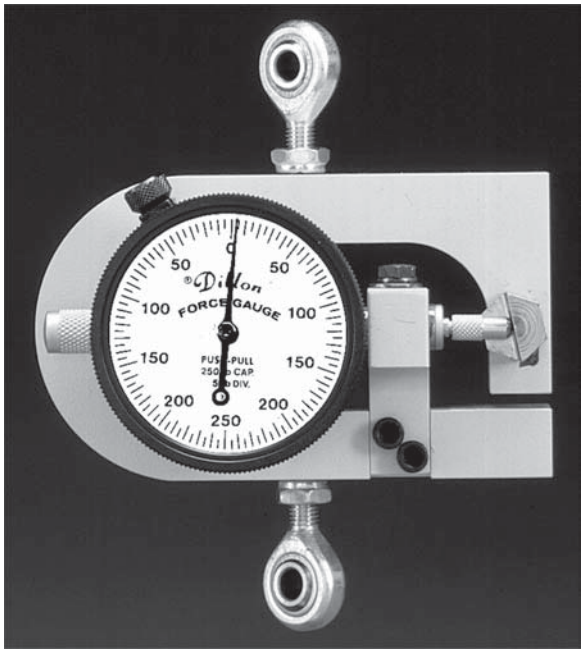
Since the deflection beam is hardened, it is not possible nor would it be recommended, to drill and tap it once it is in the field. If special mounting holes are desired, these can be provided during early stages of manufacture, but must be specified at that time.

If a particular test calls for load application through a pulley, roller or chuck, etc., due care should be taken to see that the load is applied in a true vertical line through the center of the top mounting hole #4. Off-center loading would introduce leverage, thereby increasing or decreasing readings from their true value. Universal joints or hinged fittings should be carefully machined to obviate side slop or play. If in doubt about the best method of applying load for specific arrangement, don't hesitate to consult our Engineering Department. Remember, a rough pencil sketch or snapshot will aid tremendously in understanding your problem. Never oil the dial indicator at any point. It is unnecessary. If oil or other fluids should get on the unit, wipe off gently, but well. Foreign matter lodging on the plunger, #6 will retard its free action, resulting in inaccurate readings.

If accidental overload is anticipated, a solid steel rod about 3/4 inch in diameter can be inserted at the center point of the Gauge between the "U" shaped bar. Length of this rod should be figured so that the upper, flexible half of beam will bottom against it, once the full capacity of the instrument has been reached. Further load will then pass through this solid path without harm to the Force Gauge. Note the method of mounting the dial indicator to the supporting bracket on the reverse side of the case. Allen screws are used. Be sure to check these screws at intervals, making sure that they are always tight. Vibration may in time loosen them slightly, and it is best to take this precaution.

Tensile Model

Generally speaking, the same requirements and suggestions applying to the compression model Force Gauge also apply to the tensile unit. The main exception, of course, is that on the tensile model, load is applied through the use of special end rod bearings.



These bearings are available for all tensile models as standard equipment. They are a perfect fit and without any side play. Bearing pins can be machined from drill rod to suit your particular test plan. Remember that if you require a special adapter of some kind in place of these bearings, be sure that such adapters are self-aligning so that applied force is always able to assume a vertical line.

Because there is the possibility that in service the ball-socket connectors can become unscrewed from the beam, the operator should check these parts at intervals to make sure that some of the threaded shank is ALWAYS showing on the inside of the “U” shaped beam. If it is not showing, no further loads should be applied until the connector is screwed down to its normal position.

Do not attempt to weld, cotter pin, or otherwise make tensile connectors a solid part of the bar since every requirement is different as to the length of the shank that has to be utilized. In summation, we must emphasize that Dillon will not be liable for any incident that might result from accidental or intentional screw-out or break-away of the ball-socket connectors. For your own protection, keep these parts properly seated at all time.

Tare settings cannot be made on the Force Gauge without a slightly resultant loss in accuracy. This is due to the fact that the dial layout is not 100% linear. Each unit is individually machined and thus must be individually calibrated. While this makes for split-hair accuracy, division marks are not equidistant and hence do not lend themselves to tare adjustment. Instead, any tare weight encountered in a typical test should simply be deducted.

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