



DYNATECH ELECTROMECHANICAL WEIGHING DEVICE

“ECO”

CONTENTS:

1. Introduction.
2. Features of the weighing device.
3. Main components and dimensions of the weighing device.
4. Location of weighing device.
5. Calibration.
6. Connections.
7. Feeding.
8. Warning.

“ECO” Electromechanical weighing device

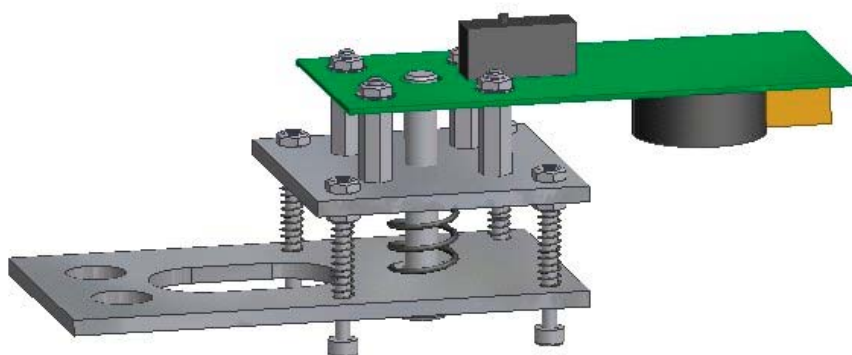
1. INTRODUCTION.

“ECO” by Dynatech is an electromechanical weighing device for lifts. ECO’s measuring system is based upon the deformations produced in the car silentblocks which are usually made of synthetic rubber.

Working Principle

Synthetic rubber bends with weight in such a way that we can tell how much each silentblock is deformed for a certain amount of kilos. Thus, a device that gives out a signal when said silentblock is deformed by a given length corresponding to a known weight may be made.

On the contrary, said deformation is not gradual with regard to the weight applied, which is why there will be only one signal: Overload.



2. FEATURES OF WEIGHING DEVICE.

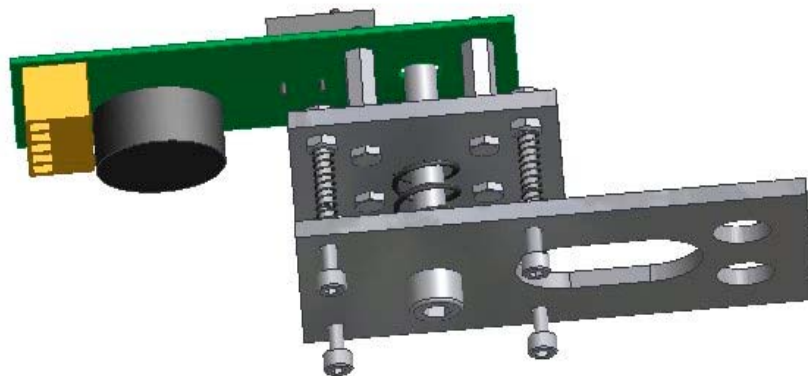
Basically, the sensor consists of a microswitch which is able to detect very small variations in silentblock deformation with its button.

This microswitch is placed on a plate incorporating the electronics required for a buzzer to emit a sound, if the microswitch button is activated; it also has a relay built-in which is activated at the same time as the buzzer.

Said microswitch has a reduced hysteresis guaranteeing that the difference between the shooting position of the microswitch and the rest position is minimum.

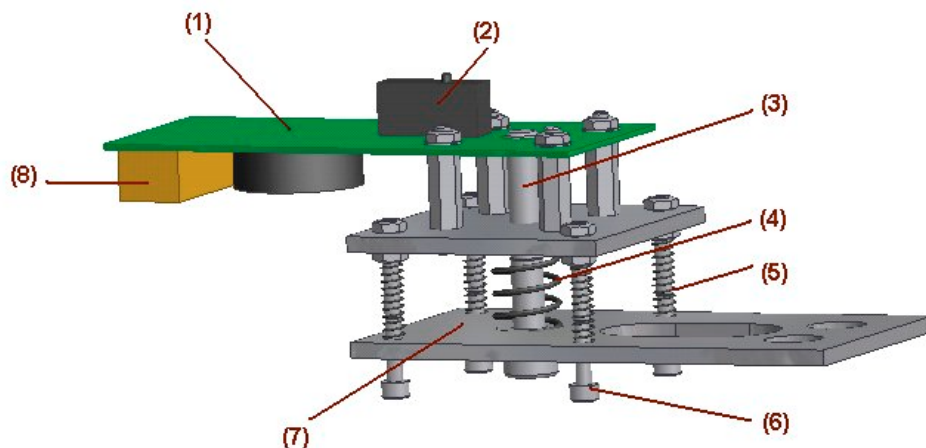
The electronics have a filter against vibration and sudden starting-up of the lift so that, when a silentblock deformation occurs due to these unwanted vibrations, the weighing device will not give off any sound nor activate the relay.

Apart from electronics, the device incorporates a simple mechanism enabling the calibration of weighing device by means of an adjusting screw. The microswitch is protected against overweight with this mechanism, thanks to the spring and guides incorporated in the sensor, as, in spite of the microswitch high resistance, overweight could produce high pressure on the microswitch and cause its breakage.



3. MAIN COMPONENTS AND DIMENSIONS OF THE WEIGHING DEVICE.

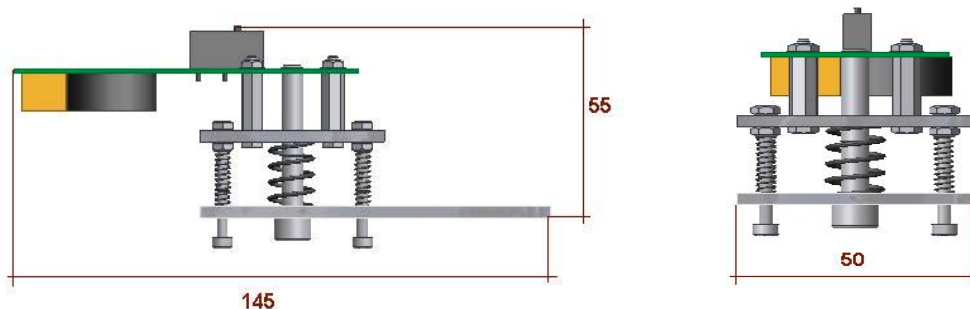
Below is shown a diagram including a description which indicates the main components of Eco.



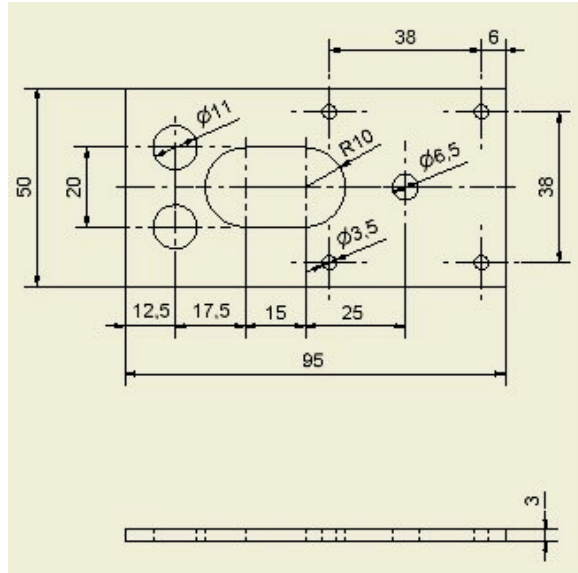
Components:

- (1)- Electronic plate.
- (2)- Microswitch
- (3)- Adjusting screw.
- (4)- Retrieving spring.
- (5)- Stabilising springs.
- (6)- Guiding screw.
- (7)- Frame joining plate.
- (8)- Feeding input and relay output.

Pictures of the weighing device with basic dimensions in millimetres.



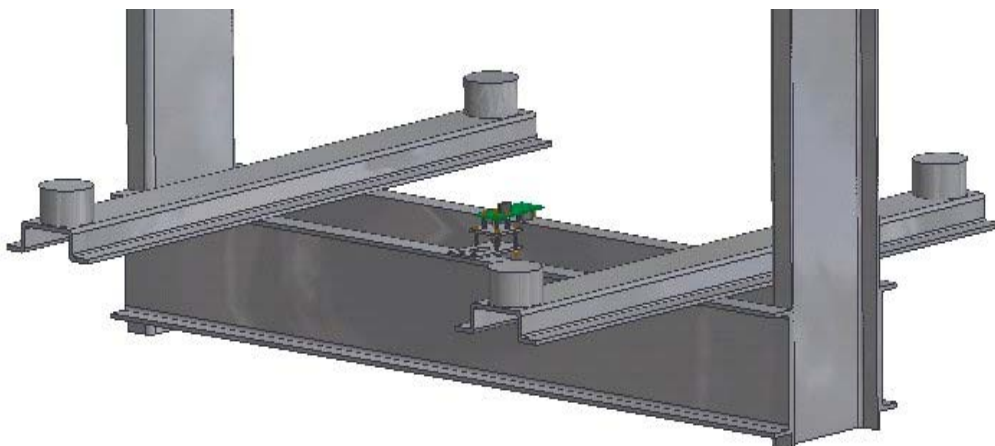
Picture of the plan of the frame joining plate with marks in millimetres:



4. LOCATION OF WEIGHING DEVICE.

The Ideal layout to obtain as accurate a measurement as possible is the one in which the weighing device are placed under the geometrical centre of the car floor.

Below is attached a picture indicating a possible location of the weighing device with regard to the frame.

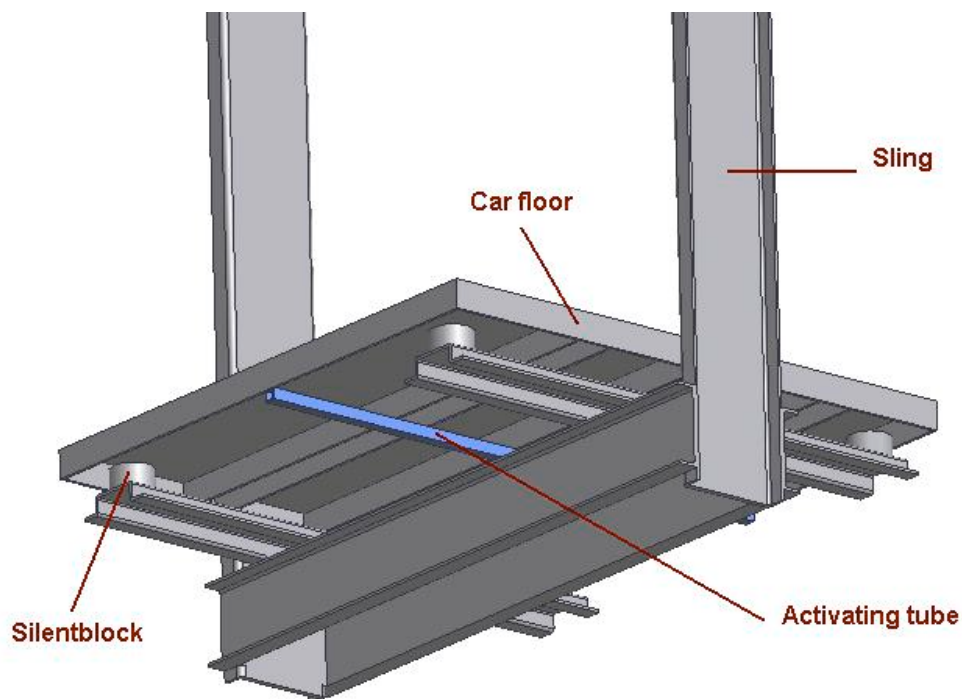


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In order to take correct measurements, the microswitch must not be activated through direct contact with the car floor. The reason being that the car floor may suffer deformations resulting in a false measurement. (If the manufacturer knew that the floor does not bend, or bends very little in time, measurements could be taken by activating the weighing device directly on the car floor).

In order to solve this, measurement must be taken by incorporating tooling which simply consists of a rigid tube which will be named "activating tube".

Below is shown a picture representing the activating tube location with regard to the car, and, further down, a brief explanation of the reason for this layout is given.



As may be noted, the activating tube links opposite sides of the car floor, and is integrally attached to them, passing through the geometrical centre of the

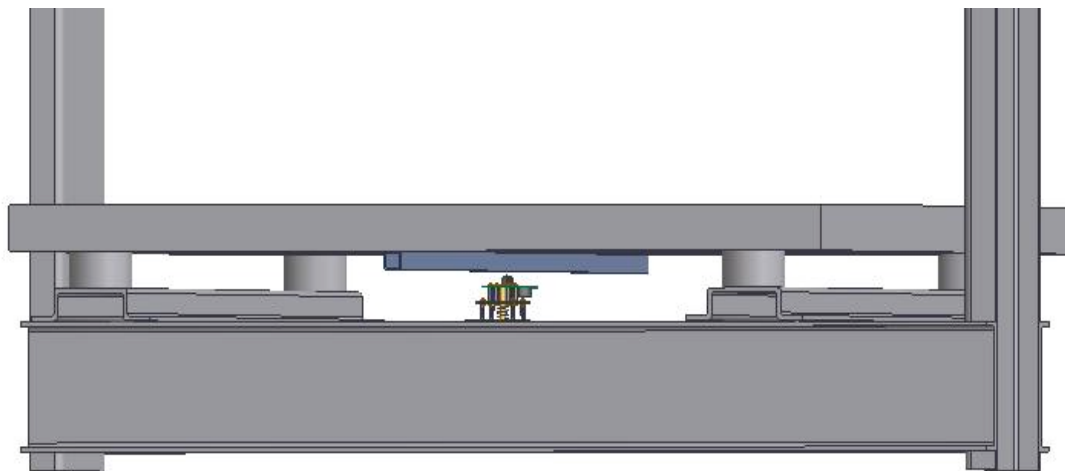
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floor. The reason why a solid join is established at this point is that there will be fixed points which do not bend on these sides.

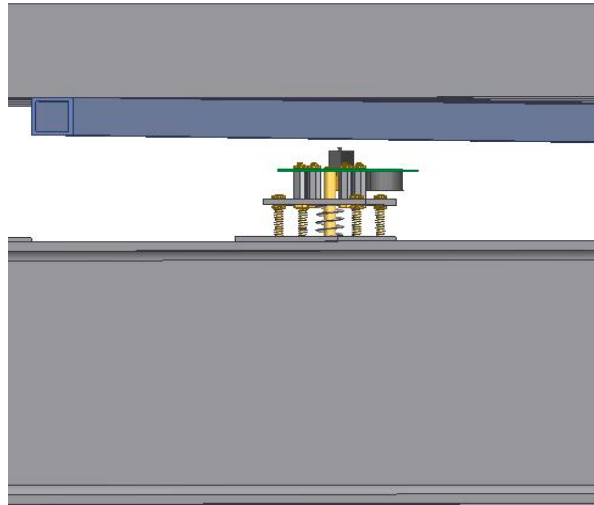
This, together with tube rigidity, will provide approximate measurement of overall silentblock deformation, as these are also attached integrally with the car floor.

It is also very important that the tube is positioned perpendicularly to the direction of car floor cores, as represented in the previous picture. The reason is that the floor tends to deform much less in the previously described direction.

Below are included details in which may be observed the weighing device layout within the unit, once the corresponding tooling has been assembled.



A more detailed view would be:

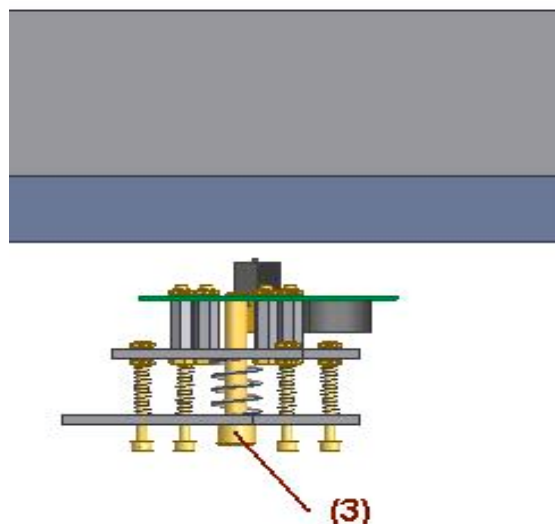


All the above-mentioned is a guideline. Each manufacturer may opt for another solution if it is considered better or more operative. Whatever the option selected is, it is essential that the element that must carry out the activating function does not bend, as, in such a case, measurements would be completely distorted.

5. CALIBRATION.

Once the weighing device are in position, as shown in the previous section, the calibration of the weighing device will be carried out.

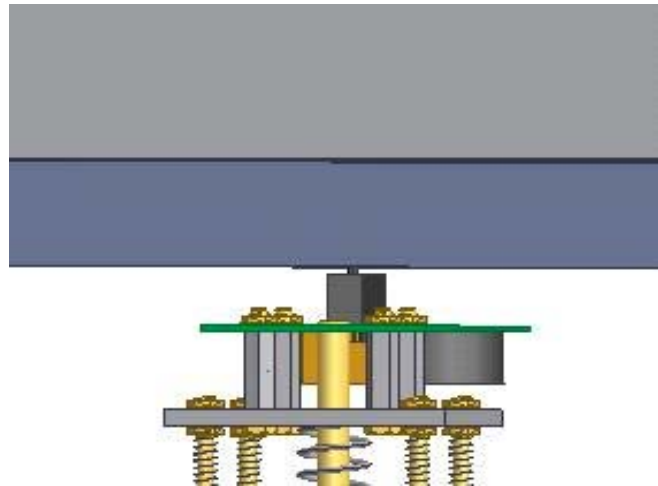
First, the overload weight will be uniformly distributed on the car surface.



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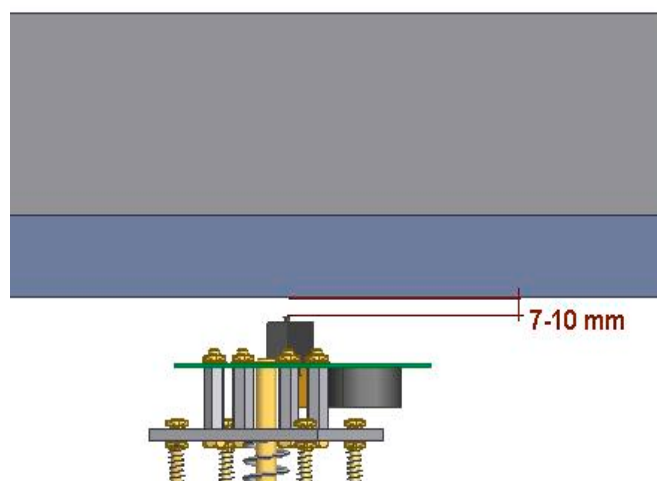
Where (3) is the adjusting screw, calibration will consist of turning said screw with a wrench until a “click” from the microswitch can be heard hitting against the activating tube. At this point, pressure applied on the microswitch will be enough to set it off.

The situation at this moment will be the following:



Once it is placed, the car mass is withdrawn and it is ready to work.

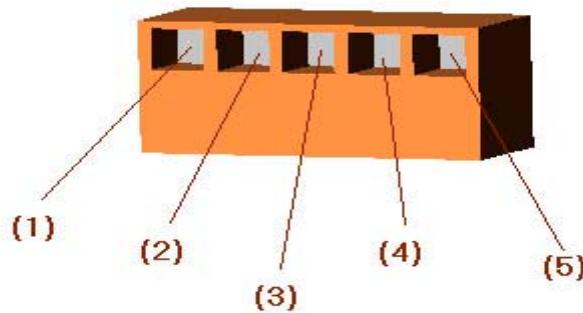
The weighing device are ready to have a calibration range of 7 to 10 mm for their correct functioning. Take this picture as an example:



6. CONNECTIONS.

The weighing device have three outputs corresponding to a relay and two inputs corresponding to feeding, placed on the electronic plate.

Front views are as follows:



Where connections are as follows, (1) and (2) are feeding connections and (3), (4), (5) are relay outputs.

Codes are as follows:

- (1)- GND. (0 volts)
- (2)- VCC+. (from 12 to 30 volts)
- (3)- NC. (Normally closed)
- (4)- C. (Common)
- (5)- NA. (Normally open)

7. FEEDING.

Feeding tension range is from 12 to 30 volts DC.

GND input will be connected at 0 volts.

VCC+ input to positive feeding (12 to 30 volts DC).

8. WARNING.

It is very important not to weld anything to the frame while the weighing device are connected. The welder may cause overcurrents which damage electronic components.