

Read Me

SteelForce Control Handbrake

Hydraulic Damper Ready

Premium CAD Plans for DIY Sim Racing Project

By DIY Sim Studio



Is the Red Aesthetic Cover mandatory for the assembly?

No! The Red Cover ("**Fixed Part Cover**") is purely optional. It was designed to give the handbrake set a "Pro-Racing" look. The handbrakes are 100% structurally functional without it. You can choose not to install it for a more "industrial/raw" look.

Is there a specific software required to calibrate the Load Cells?

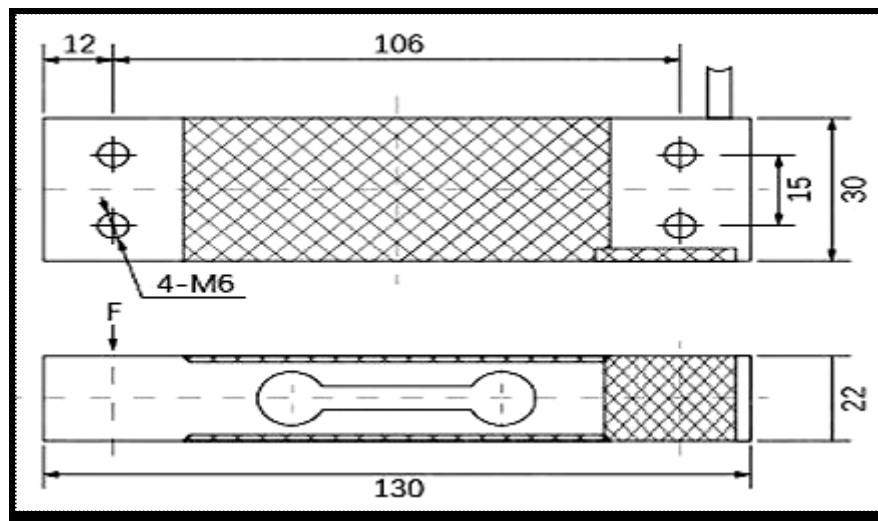
It depends on your electronics. If you use an Arduino with our recommended sketch, you can use **Windows Joystick**, **DIVIEW** or **FreeJoy** for calibration. If you choose a Leo Bodnar or AliExpress Plug & Play board, they are recognized as standard Windows Game Controllers and can be calibrated directly in-game or via Windows settings.

To calibrate your handbrake set, feel free to follow [our Youtube guide here](#)

Recommended Load Cell Weights

A **20kg Load Cell** is ideal. Since these handbrakes are travel-based, a 20kg sensor offers extreme precision and durability without requiring excessive hand force.

Load Cell Dimensions



Is the hydraulic damper required?

No, the handbrakes work perfectly with the included spring or/and elastomer system. The Hydraulic Damper is an **optional upgrade** for those seeking a more “viscous” and realistic hydraulic feel on the handbrakes.

What kind of dampers can I use?

The handbrakes are designed to be compatible with two types of dampers:

1. **Standard Gas Struts:** Affordable and effective for consistent resistance.
2. **Adjustable Hydraulic Dampers:** For those who want to fine-tune the “viscous” damping effect to their exact preference.

How do I prevent damaging the hydraulic dampers?

To ensure the longevity of your dampers, please follow these three critical rules:

1. **Perfect Alignment:** Ensure the actuator rod is perfectly straight during the stroke. It should not deflect left or right when pressure is applied.
2. **Structural Integrity:** The “**Hydraulic Damper Support**” part must be printed with **100% infill** to handle the mechanical load without flexing.
3. **Mechanical Stops:** This is the most important step. Your handbrake’s physical travel must be limited by the “**Fixed Part**” **stop (the M6x40 spacer)** *before* the hydraulic damper reaches its internal end-of-stroke. **Never use the gas damper as a mechanical stop.** Forcing the handbrake against a fully compressed damper will lead to immediate failure.
4. For the screws securing the Rodend and which screws onto the M6x40 fitting, **we recommend using a thread-locking compound** to prevent them from **coming loose** due to vibration. This adhesive.

First of all, we invite you to carefully check your soldering, as well as the installation of the Joystick and HX711 libraries.

Issue: I got an error message when compiling my sketch.

- Use another USB cable (a data transfer cable)
- Change the USB port
- Connect the USB board directly to the PC
- Make sure you have chosen the right PORT and the right Board in the Arduino software ("Tools" menu).

Issue: My load cell pressure is reversed

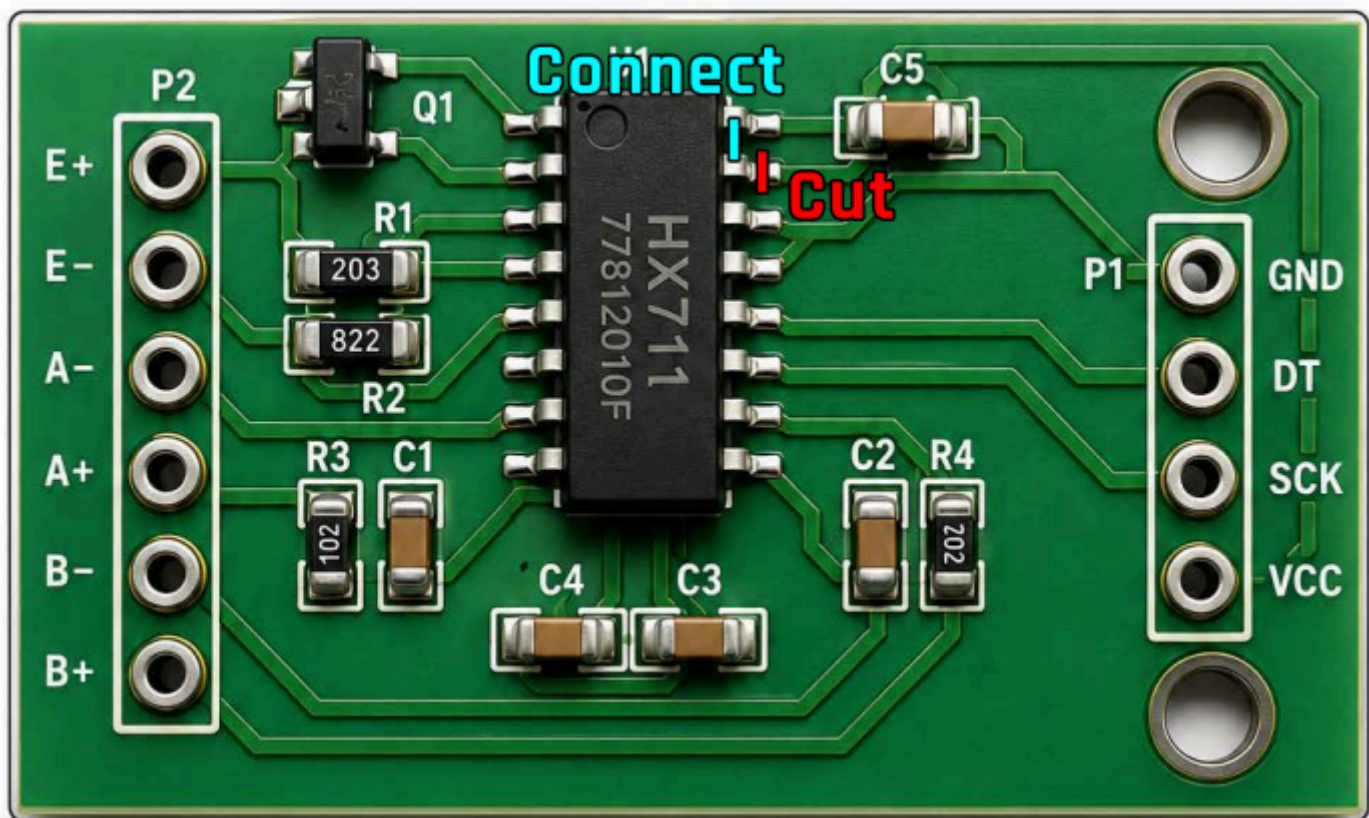
Edit a line of the Arduino sketch, you need to remove or add the - just before **scale**

Issue: I have a dead zone when pressing my load cell

Slightly adjust the tightness of the four M4 and M5 lock nuts which support the loadcell.

Issue: There is a lack of responsiveness on my load cell, a slight delay.

The HX711 sensor needs a slight modification; a connection needs to be cut and an image reconnected. Here's an image to help you:



And a video: <https://www.youtube.com/watch?v=0cxS-a837bY>

What are the recommended dimensions for dampers, springs and rubbers?

To ensure a perfect fit with the internal mechanisms, please follow these specifications when sourcing your hardware:

- **Hydraulic/Gas Damper:**
 - **Maximum Outer Diameter:** Ø15mm
 - **Maximum Length:** 140 mm
- **Springs:**
 - **Minimum Inner Diameter:** Ø8mm (to slide freely over the M8 rods).
- **Elastomers (Rubbers):**
 - **Minimum Inner Diameter:** Ø8mm
 - **Maximum Outer Diameter:** Ø35mm (to fit within the handbrake housing/washers).

Which parts need to be bent?

Only the cover plate (decorative) and the brackets for the handbrake rests need to be bent. Rest assured, these are purely optional parts and are not required for the handbrake unit to function. The bends are simple (90°).

What are the thicknesses and tolerances of the stainless steel plates?

The thickness is generally 3 mm, though there are some that are 5 mm and 2 mm thick.

The tolerance is 0,2 mm.

What fasteners are required?

Here is the list of hardware needed to build a handbrake. The list does not include the hydraulic cylinder, which are optional part.

- M6x12 Bolt - Quantity 18
- M8x40 Bolt - Quantity 1
- M8x45 Bolt - Quantity 1
- M8 Lock Nut - Quantity 2
- M8 Nut - Quantity 2
- M6x55 Bolt - Quantity 1
- M6 Lock Nut - Quantity 1
- M6 Washer - Quantity 2
- M6x40 Threaded Round Spacers - Quantity 10 (3D Printed Alternative is available)
- 8mm Drill Bit Collar - Quantity 1 (3D Printed Alternative is available)
- M8 Female Rodend - Quantity 1 (3D Printed Alternative is available)
- M8x180 Half Thread Bolt - Quantity 1
 - Note: M8x170 is also accepted
- M5x40 Bolt - Quantity 2

- M5x35 Bolt - Quantity 2
- Self-Lubricating Bearing - Quantity: 2

What is the difference between "Fixed Part B" and "Fixed Part A"

The fixed section of the handbrake assembly consists of two parts:

- Fixed Part A - 3mm Thickness - Quantity 1
- Fixed Part B - 3mm Thickness - Quantity 1

Part A is the side plate that supports the hydraulic damper.

Part B is the side plate that does **not support** a hydraulic damper.

If you do not wish to use a hydraulic damper, you should use two of Part B; if you wish to use hydraulic dampers on both sides, you can use two of Part A for your handbrake.

We recommend using the standard configuration: Part A + Part B.

What parts are needed to build our handbrake?

Everything is in the **/DXF Files** folder. These files are named according to the thickness and quantities required for a single handbrake.

You can find the handles in the **/Optional 3D Printed Parts** folder for STL format.

The other files are optional, recommended, or alternative parts.