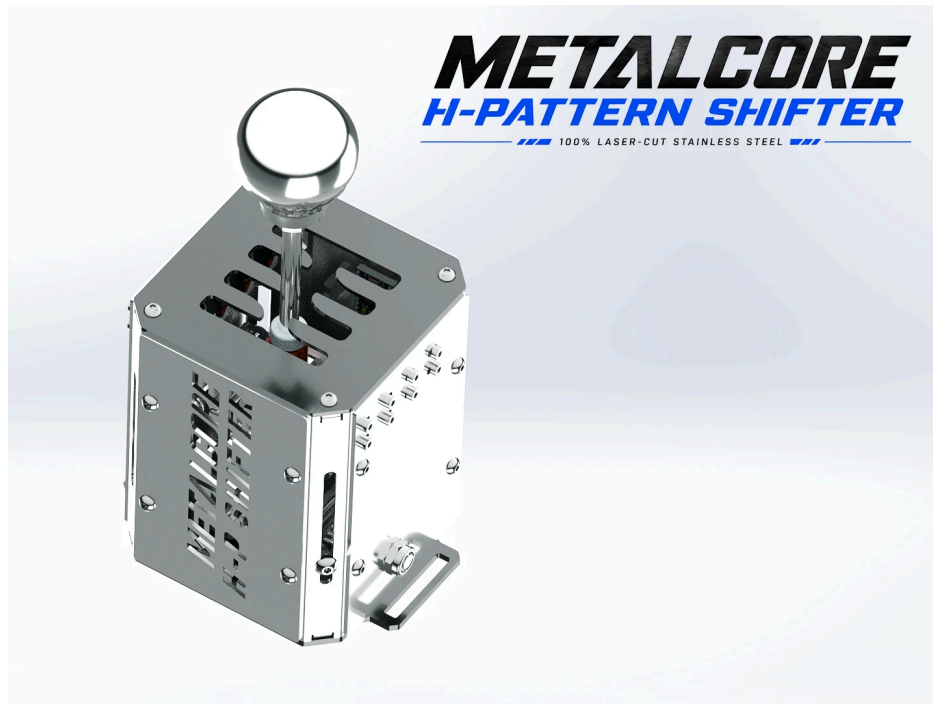


Readme

MetalCore H-Pattern Shifter - Sim Racing DIY Project

by DIY Sim Studio



How is this H Shifter designed?

It is primarily constructed from **2mm, 3mm and 5mm thickness Stainless Steel laser-cut parts** joined using **M6x40 threaded round spacers and screws**. Some parts require bending, but these involve only simple 90 or 45-degree bends.

Alternative parts are also available in STEP and STL formats.

How can you save money on manufacturing this H-Shifter assembly?

You should start by finding a supplier that offers affordable laser cutting and bending services. Alternatively, **JLCCNC's "Sheet Metal Fabrication Services"** is a great option in terms of pricing and production speed.

There are also several 3D-printable parts available that could help you cut costs—such as M6x40 connectors. You can find all of them in STL format.

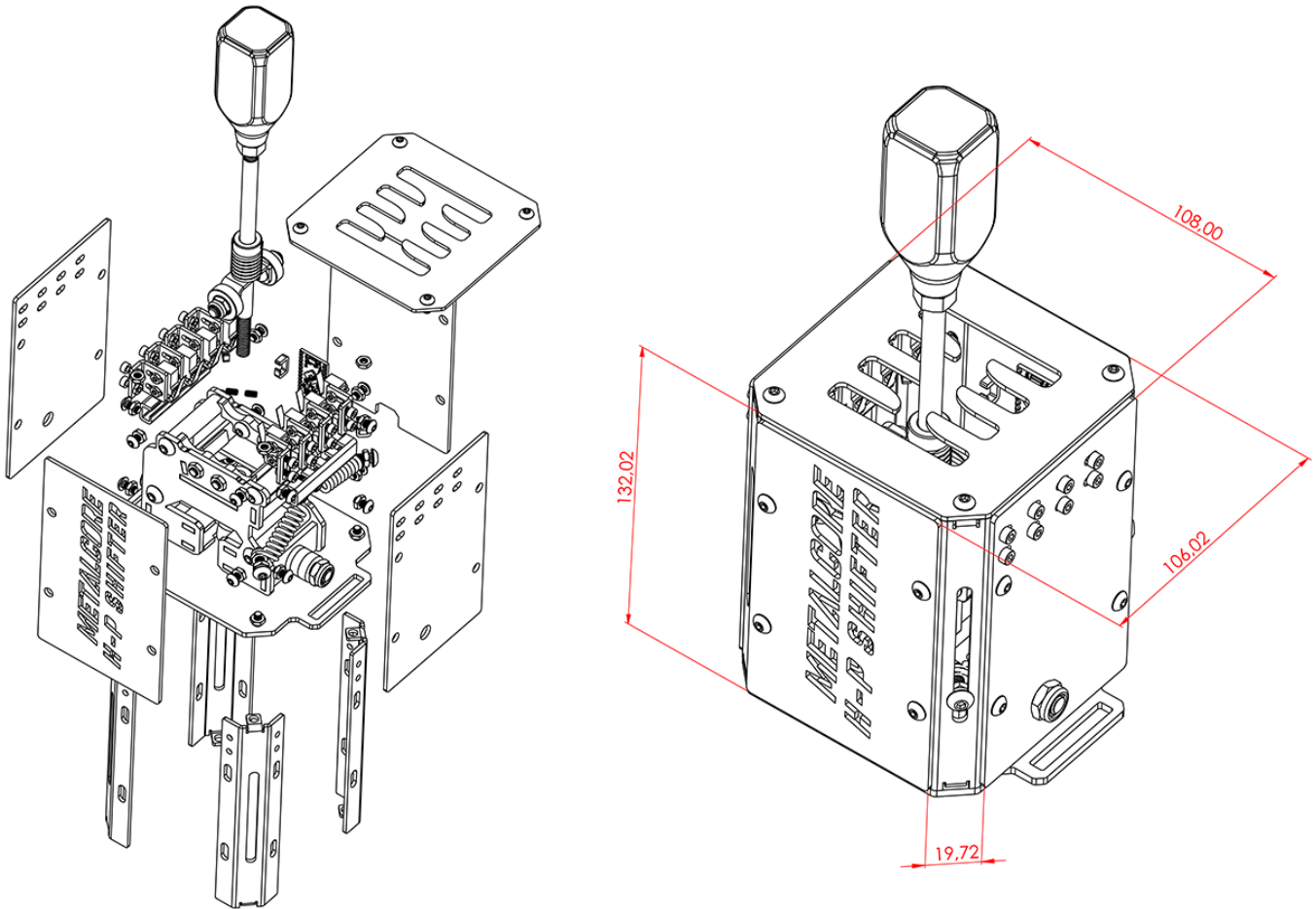
What is the tolerance for DXF and STEP files?

For files intended for Stainless Steel laser cutting, the tolerance is **0.2 mm**.

What are the dimensions of the H-Shifter?

The H-Shifter measures 132 mm in height (without the Knob). The width is 106 mm.

An image showing the dimensions is available directly on the product page.



Which ball bearings are used?

- Outer diameter: **Ø19mm**
- Inner diameter: **Ø6mm**
- Width: **6mm**

They can, of course, be found in the Bill of Materials.

What are the required parts?

To build a Shifter, you need to have all the parts in the "**DXF Files**" folder cut out. This does not include the "**Alternative DXF Files**" folder; as the name suggests, these are alternative parts.

The **quantity** is indicated in the filename, but if **no quantity is specified**, it means **a single piece is required**.

Which parts require folding?

There are three parts that require bending:

- Ball Bearing Support - 2mm Thickness
- Corner Fixing - 2mm Thickness - Quantity 4
- Microswitches Support - 2mm Thickness - Quantity 8

You will find the bending guide in the "**Folding Guide - A3 PDF Sheet**" folder, and a STEP version for each file.

The bends are very simple, involving only 90° or 45° angles.

What is the list of screws required to build a shifter?

Screws (Diameter x Length)	Quantity
M3 x 6	14
M4 x 8	20
M4 Nuts	24
M4 x 10 Countersunk Bolt	4
M6 x 12	8
M6 x 40 Threaded Round Spacers	4
M5 x 12	4
M5 Nuts	10
M5 x 16	6
M3 Nuts	32
M3 x 10	16
M3 x 8	4
M8 x 170 No Head Screw	1
M6 x 16	2
M6 Lock Nuts	2
M5 Lock Nuts	6
M8 x 115 (or M8 x 120) Half Thread Bolt	1

Important note: for each nut, try to use the thinnest one possible.

What are the required mechanical parts?

- 30mm Traction Spring (Quantity: 2)
- 20x10x20mm Spring (Quantity: 1)
- M8 Female Rod end SI8TK M8 Right (Quantity: 1)
- 19x6x6 Bearing (Quantity: 2)
- Ø8mm Drill Bit Stop Collar (Quantity: 1)

The list of required parts is in the Bill of Materials.

What is the thickness of the plates that need to be laser-cut?

Three thicknesses are used: 2 mm, 3 mm, and 5 mm.

The thickness of each part is **indicated in the file name** (3mm Thickness, 5mm Thickness, 2mm Thickness).

How do you attach the tension springs?

Simply slide the spring loops onto the M5 screws. You can see how it's done in our tutorial on the 3D Printed H-Shifter: https://www.diysimstudio.com/2024/05/23/diy-h-shifter/#Building_Guide

How can cable management be optimized?

Simply use the provided 3D-printable cable routing clips (STL files):

- Microswitch Wire Management – Quantity: 2
- Thin Wire Management – Quantity: 4

Route the microswitch wires through the clips and then connect them to the PCB (which should be mounted on the right, on the plate featuring the USB port).

You can watch the "**10 - Wire Management**" video for more details.