

HEUSINKVELD ENGINEERING

HE Sim Pedals

Professional race simulator pedals.

Product Information v20121101

You may know me from the physics I made for various rFactor mods and from my work at Reiza Studios. Professional racing teams such as Addax (gp2), Arden (gp2, gp3), and Carlin (f3) as well as various drivers (GT, Gp2, F1) use simulators where I optimized the physics parameters. My degree is actually in mechanical engineering!

In 2005 I pioneered the use of load cells in simulator brake pedals, and made affordable 'do it yourself' kits available, with help from the simracing community. Experience with real teams and drivers showed however that there is not a pedal set on the market that performs well enough. That is why I designed a new high end simulator pedal set with race teams and professional drivers in mind.

Of course there may be a few hardcore simracers interested as well. That is why I'm going to sell 6 sets to this market. Read on to find out if you want one of these very few!





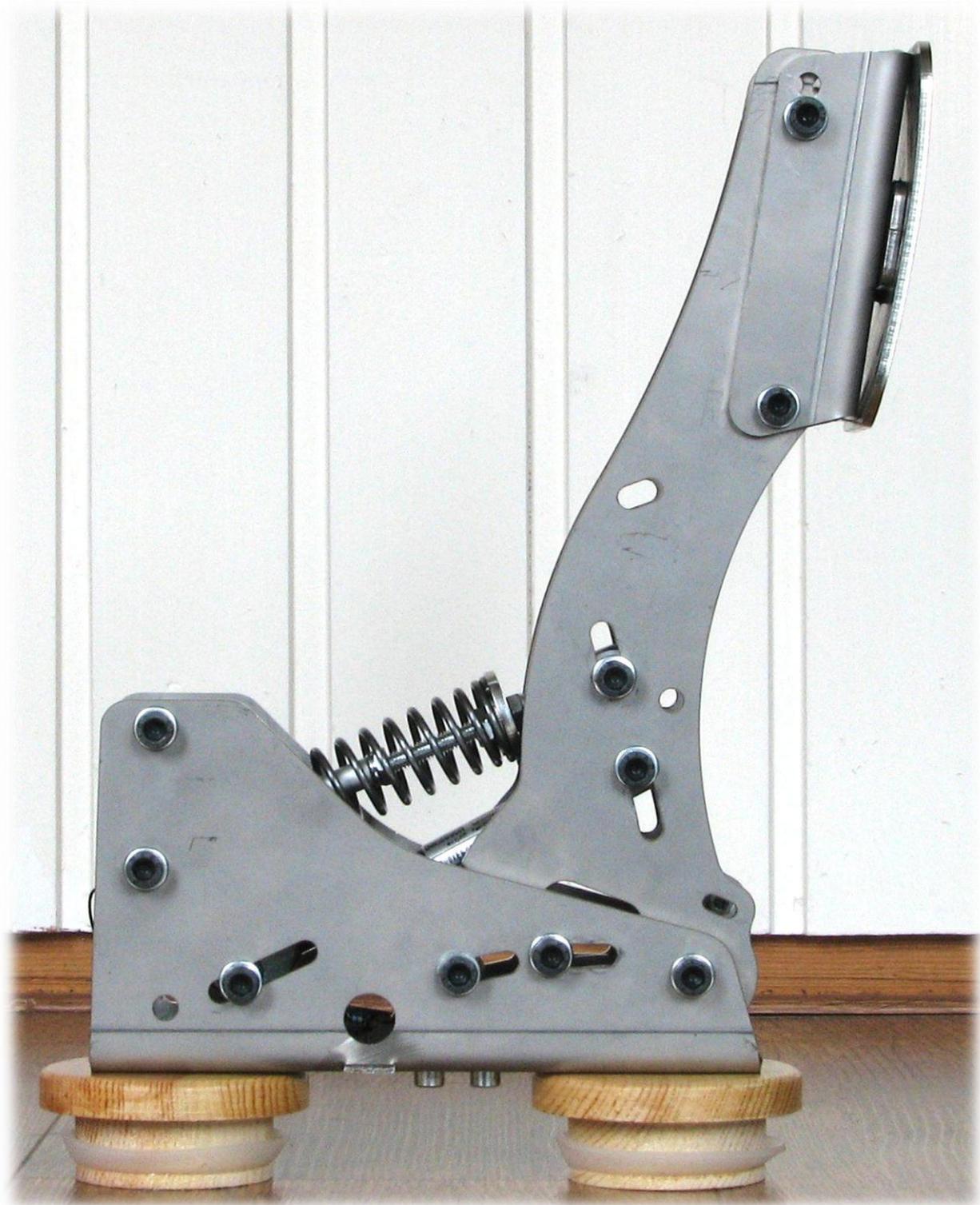
The pedals were designed to my best ability, using CAD, finite element calculation and complex spreadsheets predicting all the forces felt by the driver to 95% accuracy. Before individually looking at the pedals, these are some common features:

- CNC laser cut stainless steel ultra-strong, stiff and durable construction
- No wearing potentiometers or sensitive hall sensors
- Load cells on all 3 pedals for excellent durability and linearity with no moving parts
- 12 bit (4096 step) electronics (actual range depends on pedal travel and desired brake force)
- Adjustable travel by independently adjustable 'up' and 'down' stops
- Adjustable damping on all pedals
- Greatly adjustable pedal feel and required effort
- Adjustable pedal face 'upright' angle -3, 0 and 3 degrees
- Adjustable pedal height in 5 steps for foot size 5 to 13
- Solid individual cables from pedal to electronics box

THROTTLE

throt•tle *n.*

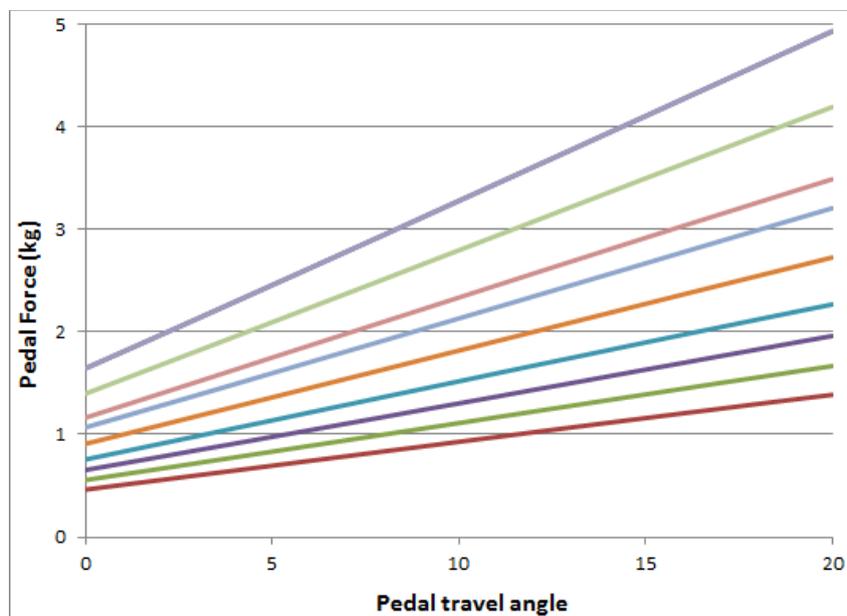
1. A valve that regulates the flow of a fluid, such as the valve in an internal-combustion engine that controls the amount of vaporized fuel entering the cylinders.
2. A lever or pedal controlling such a valve.



Getting the power down requires good throttle control. The pedal should be smooth and precise but also adjustable to the wishes of the driver. Damping, found in more and more real racing cars, improves the throttle application speed for improved accuracy and consistency. There is no damping on the release stroke. More features of the throttle pedal are:

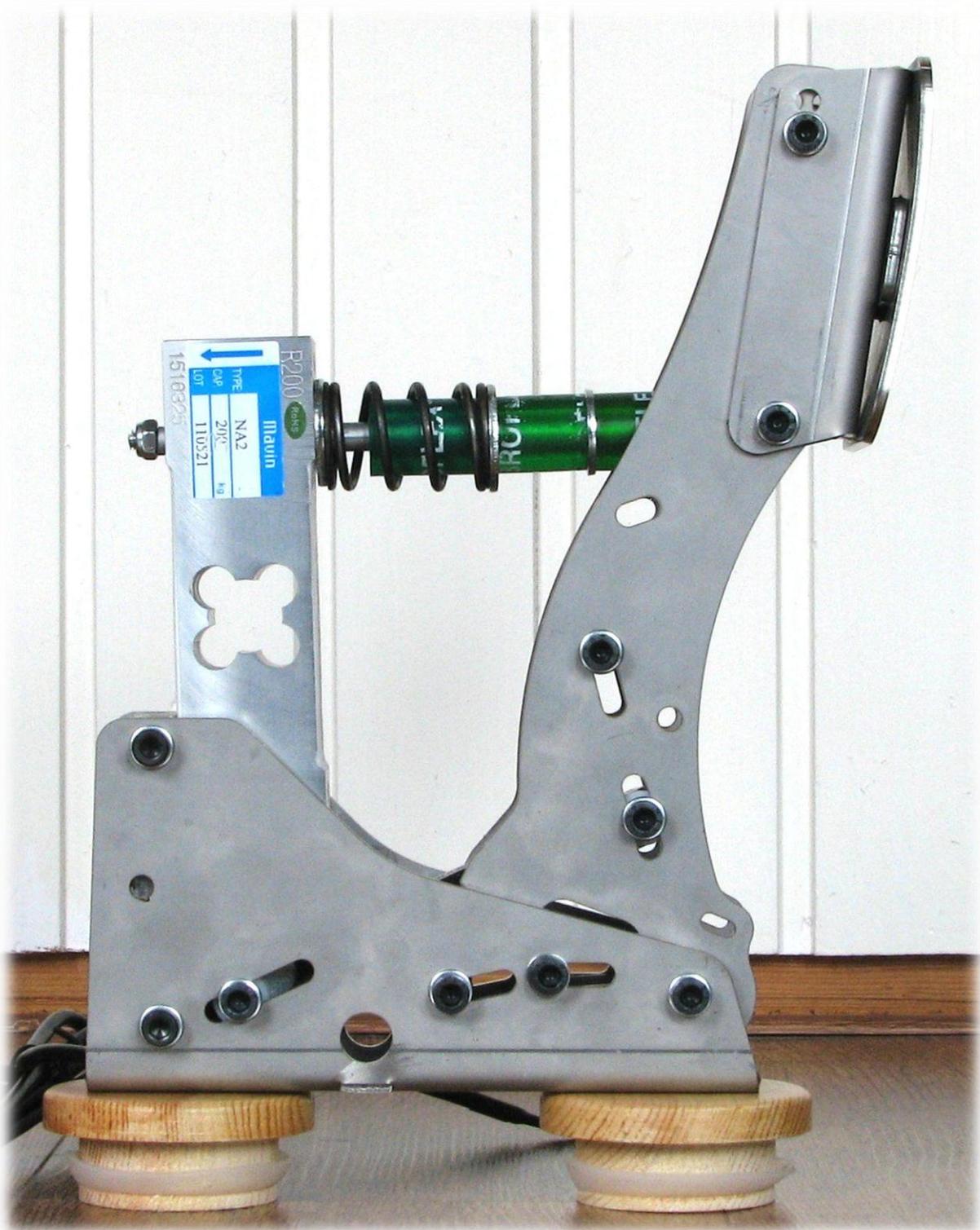
- Travel adjustable from 10 to 20 degrees (45 to 90mm, 1.8 to 3.6in)
- Individually adjustable 'up' and 'down' end stops
- Adjustable spring preload
- Adjustable spring force by + - 20% by adjusting mounting point
- Adjustable spring force by selecting the supplied soft, medium or stiff spring
- Adjustable damping
- Adjustable damping force by + - 50% by adjusting mounting point
- Adjustable damping by physically adjusting the damper setting

Almost any pedal effort is achievable. Below are the pedal forces with a 33% preload, with the soft, medium and hard spring, each in the lowest, middle and highest mounting point. The mounting point is freely adjustable, allowing fine tuning of the preferred pedal resistance. The final force is between 1.5 and 5 kg or 3.3 to 11 lbs.



brake *n.*

1. A device for slowing or stopping motion, as of a vehicle, especially by contact friction.
2. Something that slows or stops action.

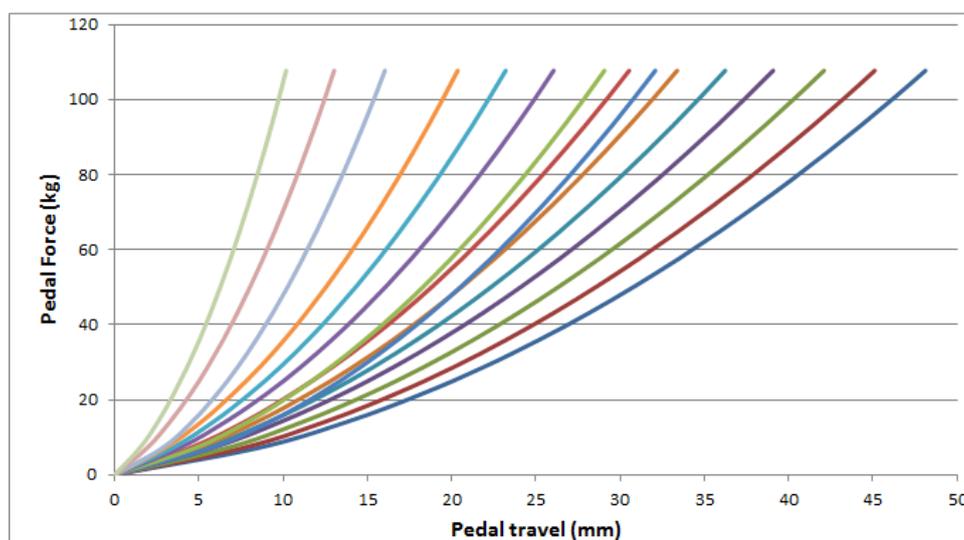


1510325	R200	MAWIN
LOT	TYPE	NA2
110521	CAP	200
	kg	

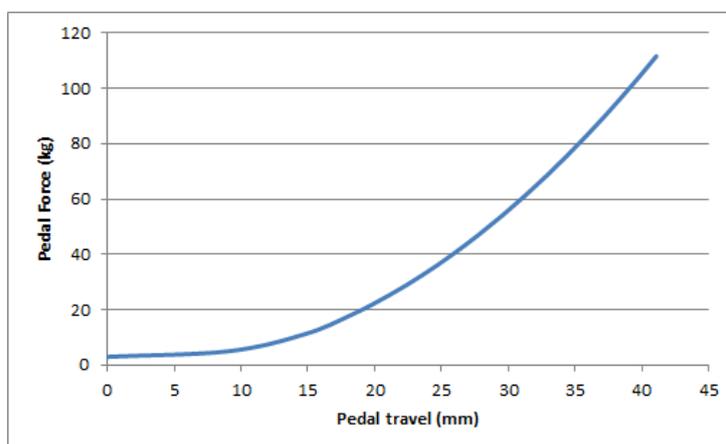
Arguably the most important pedal is the one slowing the car down. Brake pedal forces in real race cars can be extremely high. Forces can easily exceed 100kg (220lbs). The simulator pedal uses a 200kg (440lbs) rated load cell, which due to leverage is some 150kg (330lbs) maximum pedal force. Some features are:

- Two stage brake feel
- First you feel a regular spring with adjustable preload
- Then there is an adjustable amount of travel where you feel just this spring
- Finally contact is made with progressive rubber springs
- 15 different rubber spring combinations create highly adjustable pedal firmness
- Supplied rubbers go up to 110 kg (243 lbs) pedal force
- Rubbers for lower or higher maximum forces are available on request.
- Adjustable damping simulates the hydraulic nature of a real brake system

The 15 different rubber combinations result in 8 to 48 mm (0.3 to 1.9 inch) travel measured at the ball of the foot:

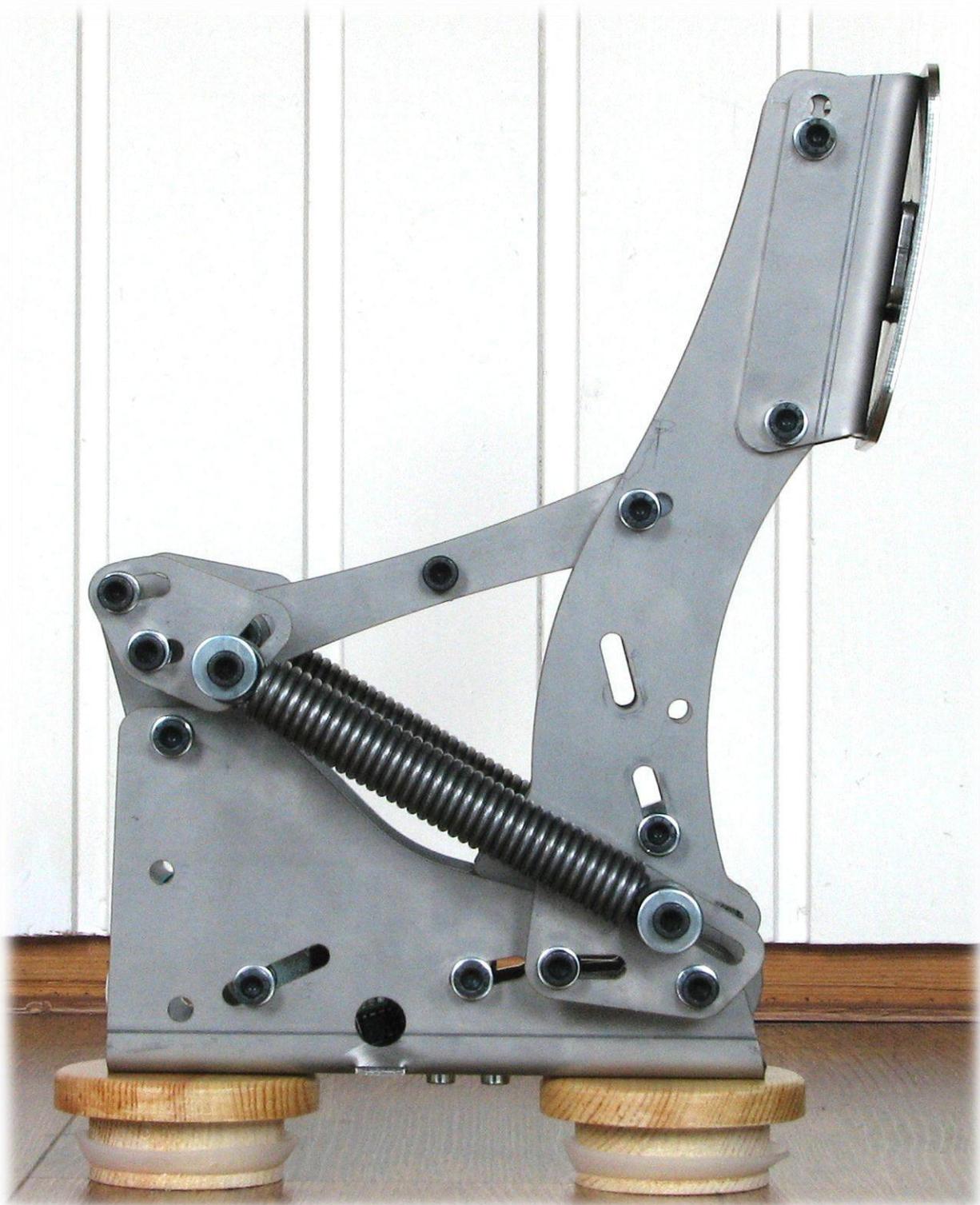


The total pedal force curve with the average rubber spring setting and the initial spring with 10mm free travel looks like this:



Clutch v.

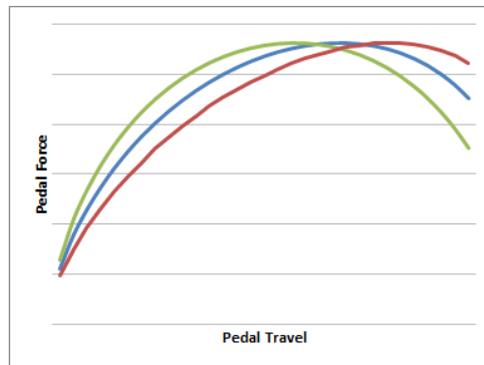
- a. Any of various devices for engaging and disengaging two working parts of a shaft or of a shaft and a driving mechanism.
- b. The apparatus, such as a lever or pedal, that activates one of these devices.



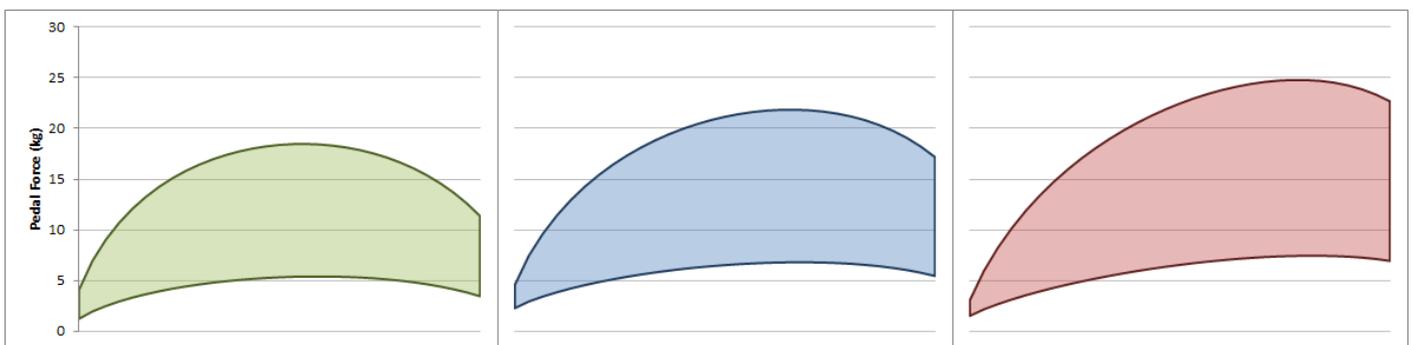
The clutch pedal may look unusual. It can simulate a modern passenger car or a heavy supercar clutch pedal; adjustable in less than a minute. The curve shapes represent typical clutch pedal feel, where pedal resistance increases, but stops increasing at a certain point, after which it can drop.

- Unique realistic clutch feel
- Adjustable clutch 'feel shape'
- Highly adjustable clutch maximum effort between 5 and 25 kg (11 to 55 lbs)
- Adjustable preload
- Damping on the return stroke simulates the hydraulic nature of (most) real clutch pedals

The shape of the resistance curves can be anything between the red and green curves below, blue being the average:

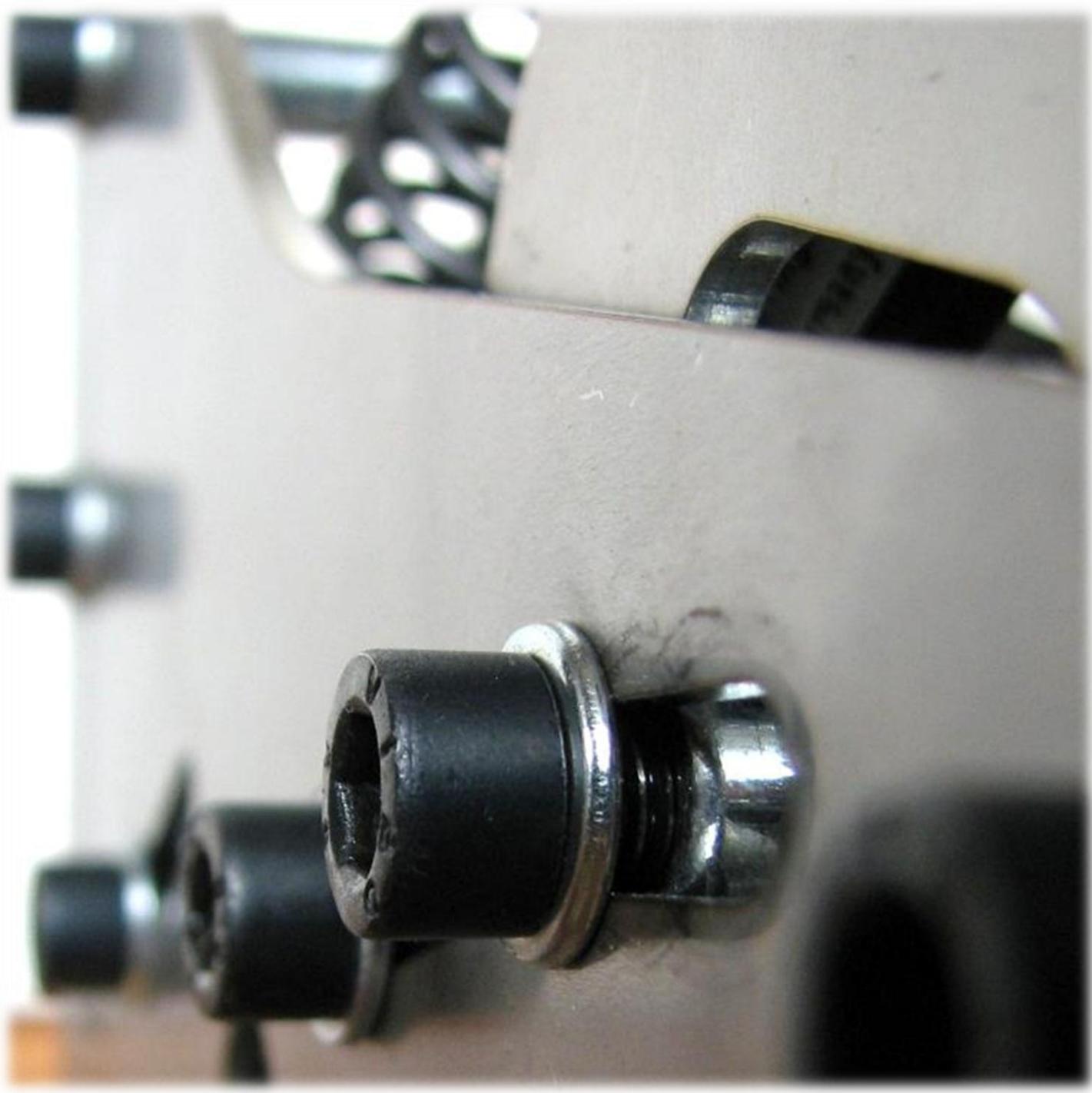


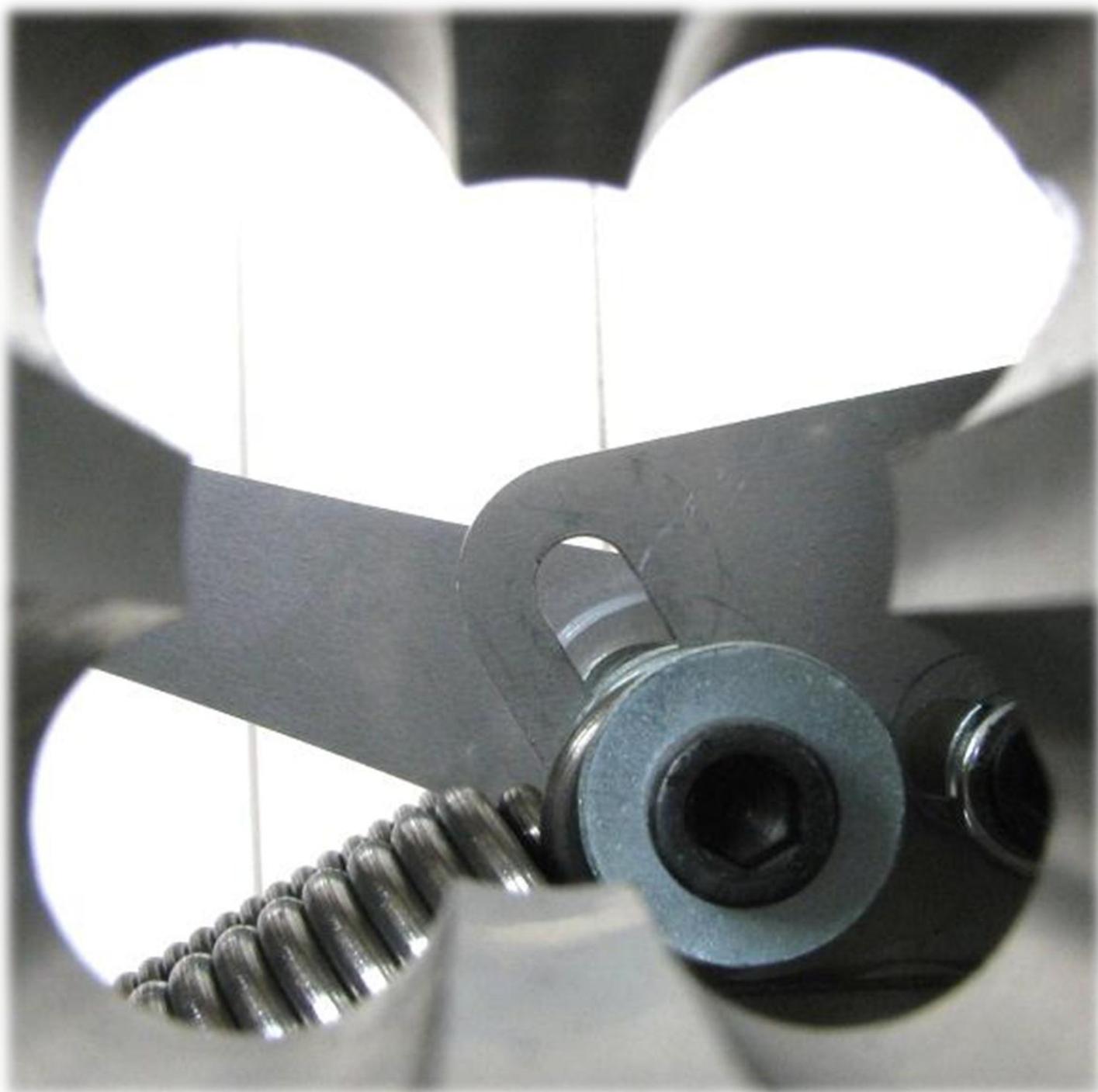
The shape can be scaled up or down to change the maximum pedal effort. There are no steps, this is infinitely adjustable as seen below, set with slight preload:



- The green 'round' shape results in pedal effort adjustable between 5 and 18 kg (11 to 40 lbs)
- The blue 'medium' shape pedal effort adjusts between 7kg and 22kg (15 to 49 lbs)
- The red 'flatter' shape pedal effort adjusts between 7.5 and 25kg (17 to 55 lbs)

For all situations you can adjust the preload: the effort required before the pedal starts to move. All adjustments are fast and easy to do with a wrench and Allen key, and require no disassembly. A high quality adjustable damper damps the return stroke of the clutch pedal according to real data where the return stroke takes less effort than the ingoing stroke. This helps smooth release and gives a very convincing feel of a hydro/mechanical linkage being operated by the pedal.







Solid Hardware Required

In order to use the pedals as intended, you need a very solid race frame or cockpit. Each pedal has four 6.5 mm (0.25 inch) mounting holes in the bottom, laid out in a 185 x 19.5 mm square (7.28 x 0.77 inch). Solid may not be solid enough as 100kg braking forces will add never seen before forces and moments to your simulator. As mentioned however, the pedals are very adjustable. If you wish to use less realistic braking forces, or only drive cars that have low brake pedal efforts in real life, you can do so.

Prices

- Set of throttle and brake pedals: € 799
- Set of throttle, brake and clutch pedals: € 1149
- 50% deposit on order, 50% paid before shipping
- 12 bit USB electronics and cables included
- 3 throttle springs included
- 9 brake rubbers included for 15+ possible response curves included

Buyers from the European Union have to add 21% VAT. Other countries most likely don't pay VAT to me, but are likely to pay import duties + VAT to the customs. Prices exclude shipping costs.

Note that dampers cost € 130 (ex VAT) each. Wear rate depends greatly on the style and frequency of use as well as the damper stiffness used. I can't provide warranty on the dampers. Springs, rubbers, load cells and bearings are replaceable, contact me for price estimates.

Naturally a printed manual will be included, clearly explaining how to adjust each pedal

Procedure

- Interested or got a question? Contact me at info@h-engineering.nl
- After gathering the orders I'll order remaining parts and assemble your pedals
- Some of these parts may require a long time before they are delivered which is why:
- Estimated shipping of your pedals is January 2013

Heusinkveld Engineering can't guarantee the estimated shipping date is met, despite it being set realistically. There are many suppliers, leaving the slight chance of complications. You will be notified of the expected actual shipping date the moment I have news. Before shipping, you can cancel your order and get your deposit back. After shipping, should for some reason you be unsatisfied, I'll try to resolve issues. If you remain unhappy, there is a 3 month money back guarantee. In this case you return the product and after inspection and testing, I'll refund the money. Shipping is your cost and I reserve the right to decline a refund should the product be damaged or otherwise altered.

Heusinkveld Engineering can't accept responsibility should there be personal injury from regular or irregular use or installation of the pedals. Forces on the body and on the simulator can be considerable and injury can't 100% be avoided. It is the responsibility of the customer to install and use the product with care.