



# Operation Manual

Maintenance  
Settings  
Advice

nGAS $\alpha$   
PEDAL



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# Electronics

## Hall sensors

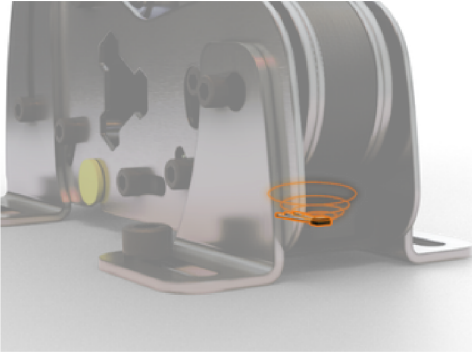


Figure 1 – Hall sensor

### Reliability

Throttle and Clutch pedals have been equipped with **hall sensors**; this increases the reliability because **unlike potentiometers** there are no moving parts, so it's wear free.

### Signal resolution

Hall analogue signal is digitalized at 12-bit in order to **maximize axis resolution** and increase the **modulation and the precision** of the pedal.

## Load cell

### Feel

The Load cell simulates the effect of the braking force **as close as possible to a real brake pedal**.

Real vehicle deceleration depends on the **pressure of the braking system** which is proportional to the force applied to the pedal.

### Signal resolution

The Load cell signal is sampled at **16-bit**. This accentuates the feel and **modulation** of the brake pedal in order to perform **Trail Braking** at best.

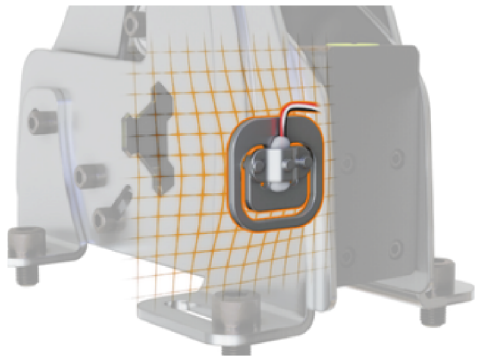


Figure 2 – Load cell

# **CBF system**



Figure 3 – CBF system

The CBF system is an **innovative mechanism** fully developed by 3DRap meant to highlight the **feel of the throttle and the clutch pedals**.

CBF allows to **simulate** the feel of multiple types of vehicles:

- **Vintage:** it simulates the throttle and clutch actuation mechanism of 1970s and 1980s vehicles in which the pedals used a mechanical control system.
- **Modern:** it simulates the pedals of modern cars in which the connection between the pedal and the throttle body is of the drive by wire type or with a hydraulic system in the case of the clutch.

The CBF system allows to **customize the feel of the pedals** thanks to the “cam profile” design; it is possible to test **different cams**, each one with a diverse feel, according to their distinct **profiles**.



Figure 4a – Clutch 90's Cam



Figure 4b – Clutch Vintage Cam

# Load Cell



Figure 5 – Brake Load Cell

Braking modulation **is the key to improve your lap time**; it depends on two main parameters:

- Pedal excursion
- Force

The Ngasa brake pedal is **the sum of our racing experience in real motorsport**; thanks to drivers' and engineers' feedback it has been possible to understand exactly how a real brake pedal must be, and how to optimize it.

For example you can replicate the **two main type of feel** expected on a brake pedal which are related to the respective racing car categories:

- **Formula**: reduced pedal travel and high hardness (up to 80 kgf); the braking system often does not have a brake servo system.
- **90's**: large pedal travel and less resistance due to the presence of a brake servo system.

**Rally cars**, for example, need to be driven by exploiting load transfer, so high travel on pedal brake is reached.

It is possible to vary the **force** of the pedal from 30 [kgf] to 80 [kgf] and the **feeling** by acting on the in-depth **regulations** in the dedicated section of the manual.

# Brake Elastomers



Figure 6 – Brake elastomers

The **elastomers** for the brake pedal are designed with **different fillings and geometries**, they can have different stiffness and a **linear or progressive** behavior.

# Clutch regulations

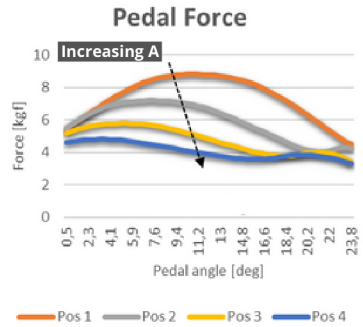
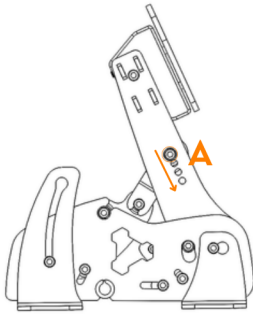


Figure 7a – A regulation - clutch

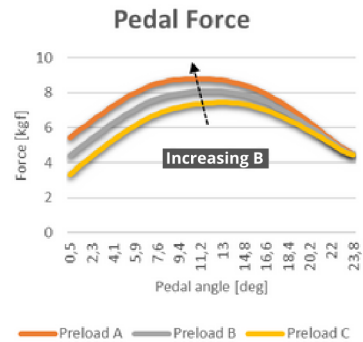
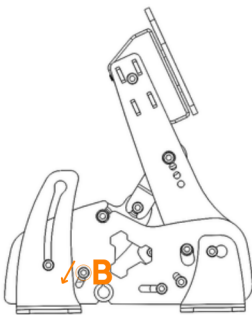


Figure 7b – B regulation - clutch

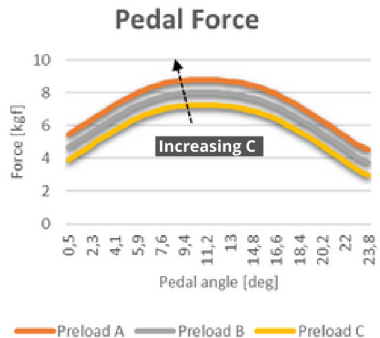
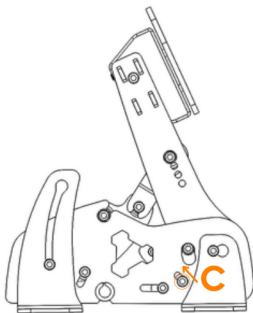


Figure 7c – C regulation - clutch

# Throttle regulations

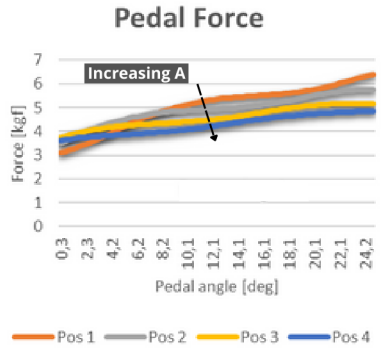
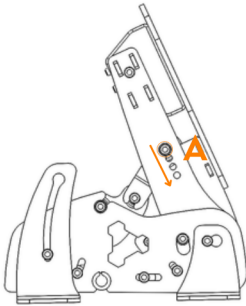


Figure 8a – A regulation - throttle

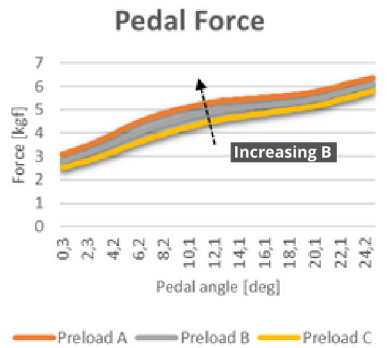
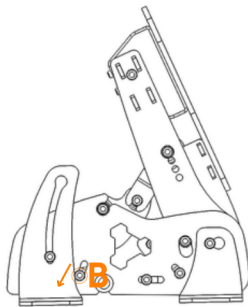


Figure 8b – B regulation - throttle

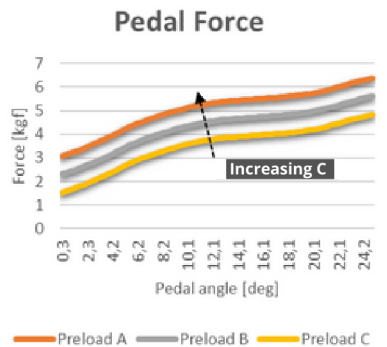
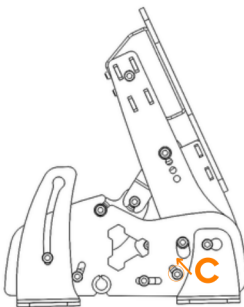


Figure 8c – C regulation - throttle



# Brake regulations

Standard Elastomer    Progressive Elastomer

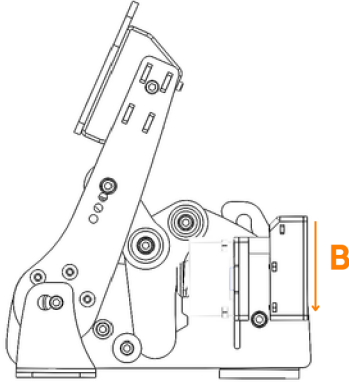


Figure 9 - Regulation B - brake

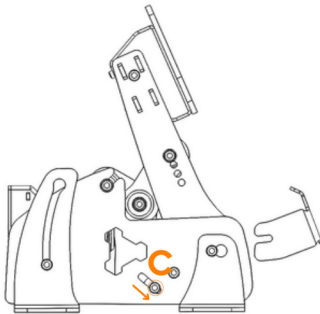
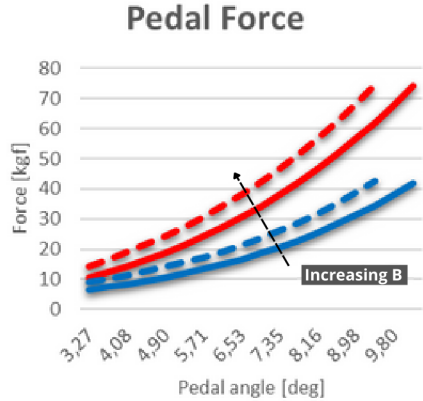
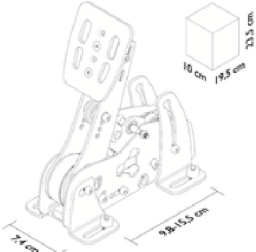


Figure 10 - Regulation C - brake

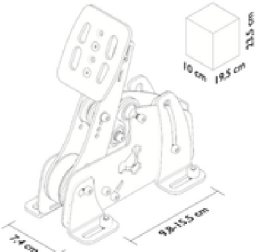
By moving the screw C downwards  
**increase the stroke.**

It is possible to make the adjustment of the register to the **extreme**, thus separating the presser from the pad and creating an **initial mechanical dead zone** like the one that can be found in many real cars.

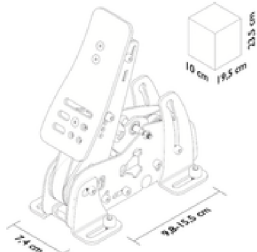
# Weight and size



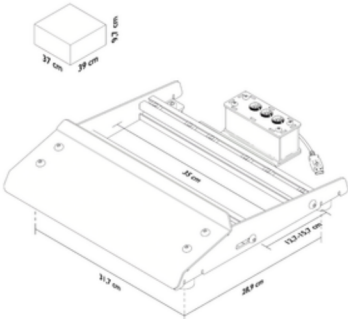
Weight: 1.8 [kg]



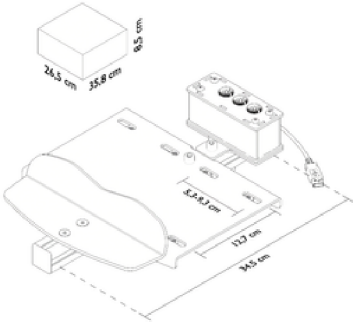
Weight: 1.8 [kg]



Weight: 1.9 [kg]



Weight: 3.0 [kg]



Weight: 2.0 [kg]

Figure 11 – Sizes and weight of nGASa components

# Other information: brake

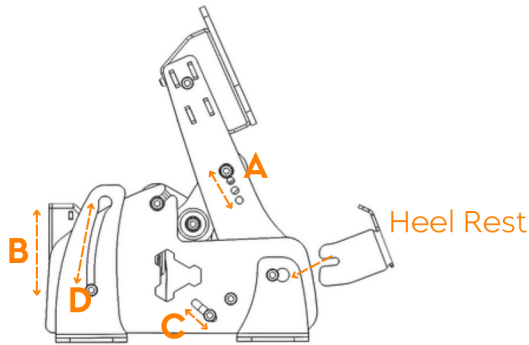


Figure 12 – Brake regulation screws

## What you need

1. Use an **M8 hex key** for pedal installation on **our GT/F1 base**.
2. Use an **M5 hex key** for **all the pedals regulations**.

## Brake pedal regulations

- A.** Here you can choose among 4 different positions. Going from 1st to 4th position, you can change the starting position of the pedal.
- B.** Here you can change the position of the load cell. If the load cell is on the top, the pedal has a normal travel, and the maximum pedal load is about 30kgf. If the load cell is on the bottom, the pedal has a reduced travel, and the maximum pedal load is about 100kgf.
- C.** Here you can change the pedal excursion and the preload on the buffer.
- D.** Here you can change the inclination angle of the pedal. You can set an inclination angle that ranges between 0° and 25°.

## Use and maintenance

Lubricate with **grease** the highlighted part in figure 13.

Notes:

- Heel rest has to be removed if the pedal is mounted on our GT / Formula Ngasa base
- Do not apply any excessive force to the regulation screws.

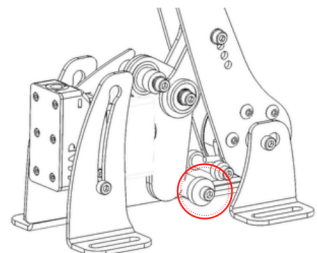


Figure 13 – Lubricating zones

# Other information: clutch & throttle

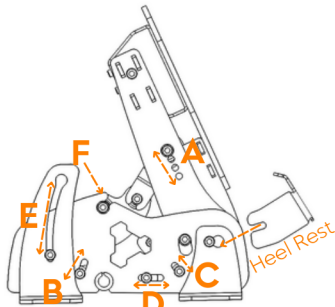


Figure 14a - Regulation screws  
Throttle

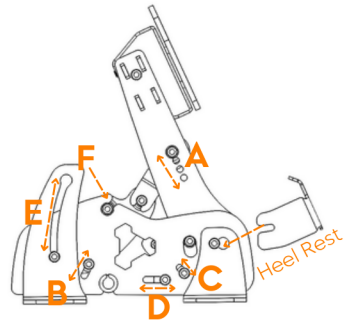


Figure 14b - Regulation screws  
Clutch

## What you need

1. Use an **M8 hex key** for pedal installation on **our GT/F1 base**.
2. Use an **M5 hex key** for **all the pedals regulations**.

## Throttle/Clutch configurations

- A.** Here you can choose among 4 different positions. Going from 1st to 4th position you can modify the pedal load curve, changing your feel on the pedal.
- B. and C.** You can change the spring preload in order to have a different pedal reaction.
- D.** Here you can change the pedal travel limits.
- E.** Here you can change the inclination angle of the pedal. You can set an inclination angle between 0° and 25°.
- F.** Here you can change the pedal cam. Different cams are available on our website.

## Use and maintenance

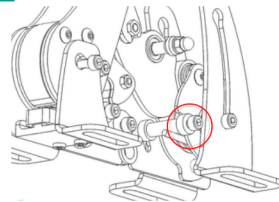
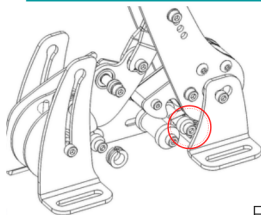


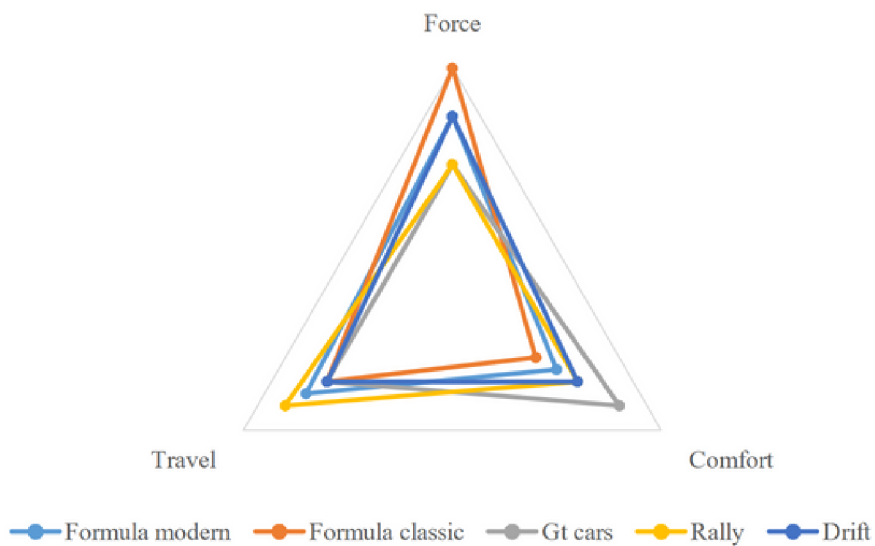
Figure 15 - Lubricating zones

Lubricate with **grease** the highlighted part in figure 16.

Notes:

- Heel rest has to be removed if the pedal is mounted on our GT / Formula Ngasa base
- Do not apply any excessive torque to screw regulation screws.

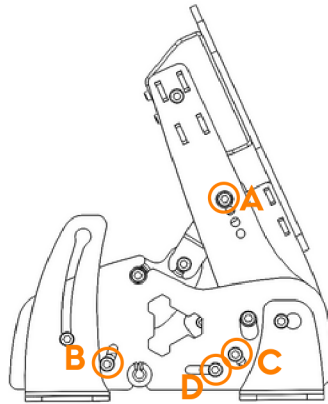
# Presets



## Formula - Modern

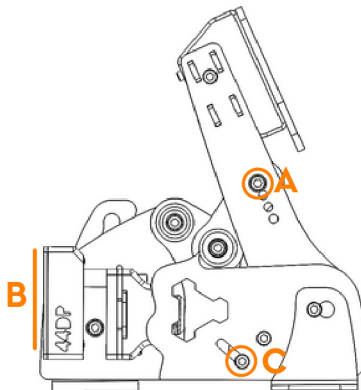
This is the ideal configuration for modern formula cars simulation.

The throttle has its travel reduced to a minimum (screw C) to increase reactivity in each maneuver.



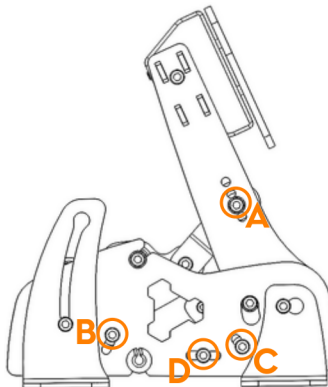
**throttle**

The Brake has the charge cell positioned at half height in order to have the best compromise between force and excursion, to exploit the grip of the tires in each braking section, maximizing thermal management.



**brake**

The Clutch is neutral, since it is used only in special situations on modern formula cars.

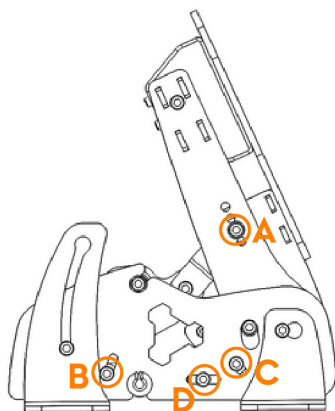


**clutch**

## Formula - Vintage

This is the ideal configuration for vintage formula cars simulation.

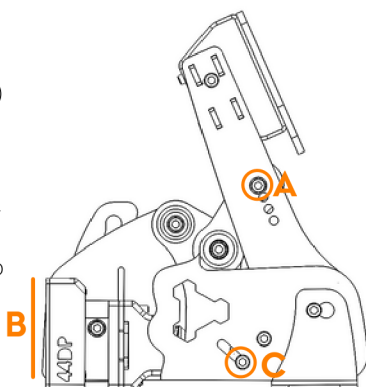
The throttle has a deep travel. The A screw is in third position to make the pedal more linear and to help you in typical vintage techniques like heel-toe, mainly used in rear-wheel drive cars.



**throttle**

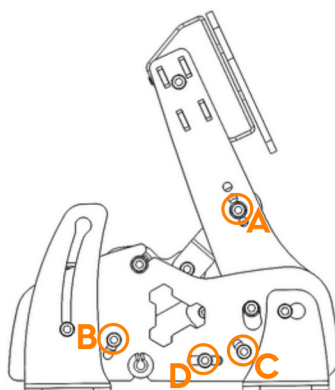
The brake load cell (regulation B) is in the lowest position, to maximize brake force, and to simulate the braking action of vintage cars that don't have anti-lock systems.

Screw C is completely lowered to ensure a minimum of mechanical movement before the buffer is activated.



**brake**

The Clutch has screw A in third position to anticipate the double detachment effect typical of vintage cars.

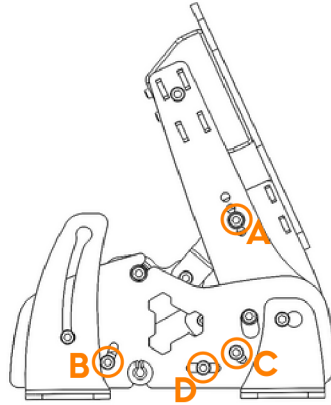


**clutch**

## GT

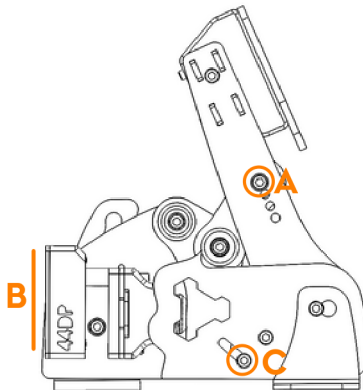
This is the ideal configuration for GT cars simulation.

The Throttle pedal has a long travel. Screw A is in the third position to ensure a linear response. The screws B and C are in the position of maximum preload for the best modulation.



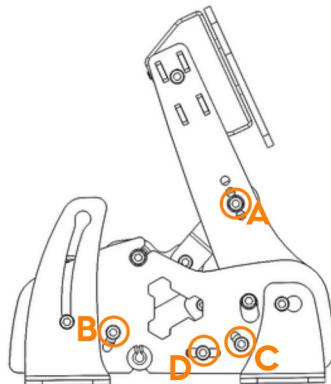
**throttle**

The Brake has the load cell in middle position to achieve the best compromise between travel and force, perfect with this type of car.



**brake**

The Clutch is in a neutral configuration, which is well suited for several GT cars.



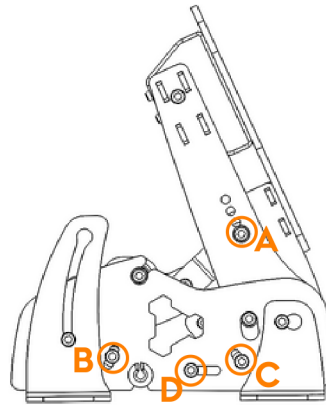
**clutch**



# Rally

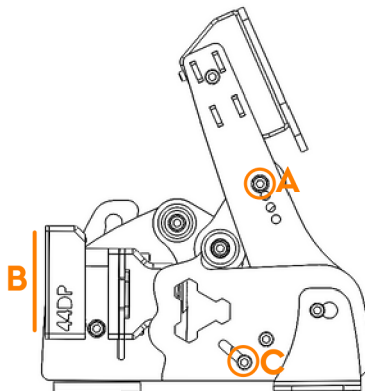
This is the ideal configuration for Rally cars simulation.

Throttle has the maximum travel to obtain the best modulation during a typical rally Pendulum Turn technique. Screw B is in the middle, for the half of the preload. Screw A is all the way down to ensure more linearity.



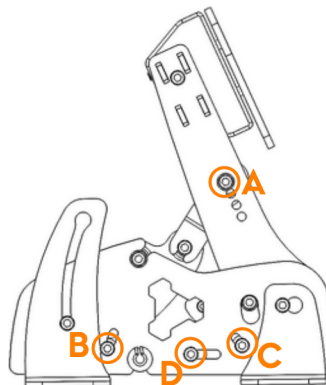
**throttle**

The Brake has the load cell in the highest position to reduce the braking force and maximize the pedal travel. In this way it is possible to manage all the typical rally techniques, such as the Pendulum Turn and Trail Braking, avoiding blocking on cars without ABS.



**brake**

The Clutch has screw B set to achieve maximum preload and to enhance the effect of the cam. Pedal travel is at its maximum: this allows you to make lightning-fast starts by disconnecting the clutch at the right point.

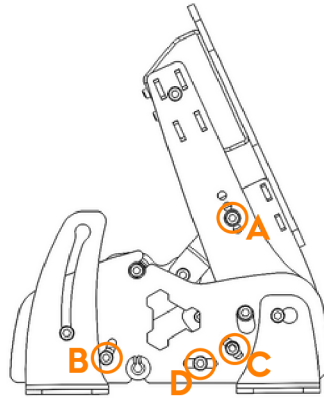


**clutch**

# Drift

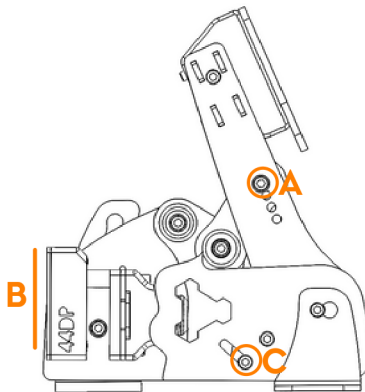
This is the ideal configuration for Drift cars simulation.

The Throttle is configured to have half of the travel, with the screw C positioned halfway. Screw A is at the third hole in order to make the pedal smoother and more linear, essential to achieve maximum control of the car in every Power Slide or Pendulum Turn.



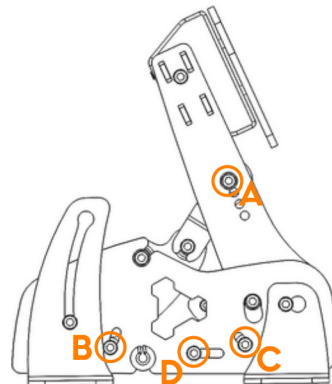
**throttle**

The Brake has the load cell positioned at half height to have the best compromise between force and travel, this way it is possible to better control the Pendulum Turn technique.



**brake**

The Clutch has its maximum travel (screw C is fully forward). Screw B is all the way down to have better modulation, perfect with Power Slide and Pendulum Turn techniques.



**clutch**

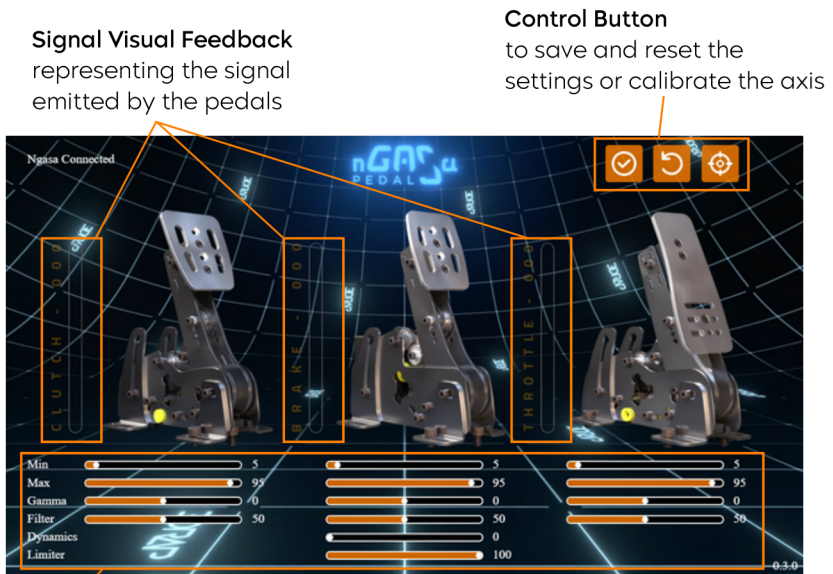
# Ngasa Software

# Overview

**Ngasa GUI** is the interface that let you **customize** and fine tune your pedals before hitting the track.

In the software you've the graphical representation of the pedals signals and the possibility to set, store the settings.

The settings remain **saved** and are automatically applied by the Control Center as soon as the device is connected.



**Signal Visual Feedback**  
representing the signal emitted by the pedals

**Control Button**  
to save and reset the settings or calibrate the axis

**Parameters settings**  
to adjust minimum, maximum and other pedals parameters

## Tip:

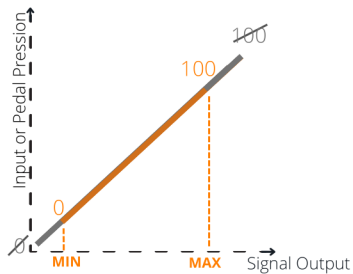
nGASa GUI interacts directly with the firmware: this gives the opportunity to apply every setting in real-time, without USB disconnection or reset.

**Configurations can be applied without interrupt the racing session** (for example **you can apply pedal settings during 24h race without leaving the event**).

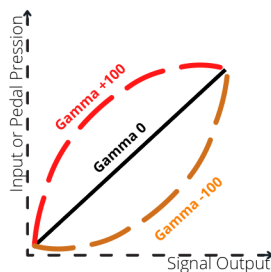
# Parameters



- **Min:** minimum pedal signal. It adds a dead zone below.
- **Max:** maximum pedal signal. It adds a dead zone above.

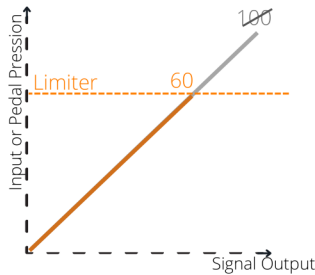


- **Gamma:** pedal signal curve, that you can set from -100 (*exponential-like* modulation) to 0 (*linear* modulation) to 100 (*logarithmic-like* modulation)

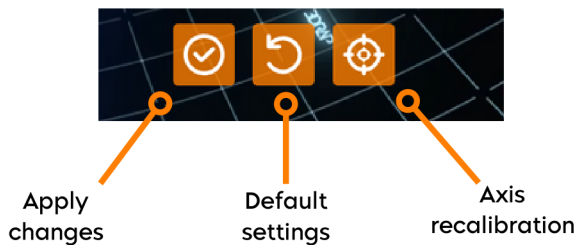


- **Filter:** a filter that let you reduce any interference or fluttering of the signal caused by electromagnetic fields of near devices. Increase the filter value to increase the signal stability

- **Dynamics:** brake release time delay; this feature simulates the braking release time of an hydraulic system, where the braking system doesn't stop working when the pedal is lifted, but disappears gradually. Increase the value to increase the delay, **up to 3 tenths of a second**
- **Limiter:** limit the maximum output of brake axis. This is useful to avoid wheels locking while braking for cars which are not equipped with ABS



## Control Buttons



- **Apply changes:** apply and save the actual settings
- **Default settings:** come back to the default values
- **Axis reset:** Ngasa is designed with an auto-tune system; you can use the axis reset to force the calibration

# Warranty & Support



## Supporto tecnico

support@3drap.it | +39 0825 1687801

Il supporto tecnico di 3DRap s.r.l. è disponibile per dubbi, consigli o per chiedere intervento sulla risoluzione di problemi.

Call center attivo **dal lunedì al venerdì, dalle 10.00 alle 12.00.**

Ricambi e riparazione gratuita nei 2 anni (1 anno per le aziende), eventuali spese di Ricambi e riparazione gratuita nei 2 anni (1 anno per le aziende), eventuali spese di spedizione a carico del cliente.

3DRap s.r.l. non è responsabile del malfunzionamento del prodotto in riferimento alle situazioni di utilizzo anomalo:

- Deformazione di parti meccaniche dovuta ad un eccessivo serraggio dei registri di regolazione evidenziati nella brochure allegata al prodotto oppure dovuta ad un errato assemblaggio dei pedali.
- Malfunzionamento legato ad una carente manutenzione ordinaria (sporcizia sui sensori Hall, usura anomala causata da una scarsa lubrificazione dei componenti).
- Problemi ai segnali degli assi in seguito a smontaggio non autorizzato, manomissione ed alterazione dei componenti elettronici installati all'interno del prodotto (i.e. cella di carico, sensori hall, connettori).

L'azienda 3DRap s.r.l. non è inoltre responsabile di malfunzionamenti provocati dall'utilizzo di software di terze parti e dall'impiego di hardware non proprietario.

## Technical support

support@3drap.it | +39 0825 1687801 (Italian only)

Contact the technical support of 3DRap s.r.l. to clarify doubts regarding use or to ask for intervention on troubleshooting.

Call center active from **Monday to Friday, from 10.00am to 12.00am (Italian time).**

Spare parts and repair are free within 2 years (1 year for company), any shipping costs to Spare parts and repair are free within 2 years (1 year for company), any shipping costs to be paid by the customer.

3DRap s.r.l. is not responsible for product malfunctions with reference to situations of abnormal use:

- Deformation of mechanical parts due to excessive tightening of the adjustment registers - Deformation of mechanical parts due to excessive tightening of the adjustment registers highlighted in the brochure attached to the product or due to incorrect assembly of the pedals.
- Malfunctions related to poor ordinary maintenance (dirt on Hall sensors, abnormal wear caused by poor lubrication of components).
- Axis signal problems following unauthorized disassembly, tampering and alteration of the electronic components installed inside the product (i.e. load cell, hall sensors, connectors).

3DRap s.r.l. is also not responsible for malfunctions caused by the use of third-party 3DRap s.r.l. is also not responsible for malfunctions caused by the use of third-party software and the use of non-proprietary hardware.





# 3DRAP

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## SIM RACING EQUIPMENTS



3DRAP.IT