SUPER FORMULA SF23

USER MANUAL

Table of Contents

CLICK TO VIEW A SECTION

GENERAL INFORMATION	
A Message From iRacing »	**4**
Tech Specs »	**5**
Introduction »	**6**
Getting Started »	6
Loading An iRacing Setup »	7
Dash Pages »	**8**
Engine Page »	8
Overtake »	9
TMS »	9
Tire Temps »	10
Brake Temperature Low »	10
Overtake System Active (Over 20s Remaining) »	12
Overtake System Active (Less Than 20s Remaining)»	12
Overtake System Reset »	13
Overtake System Available »	13
ADVANCED SETUP OPTIONS	
Overtake System »	**15**
Tires & Aero »	**17**
Tire Data »	17

Front Aero »	19
Rear Aero »	19
Aero Calculator »	20
Chassis »	21
Front »	21
Front Corners »	23
Rear Corners »	25
Rear »	27
Drivetrain »	28
Differential »	28
Engine In-Car Dials »	29

Dear iRacing User,

Congratulations on your purchase of the Super Formula SF23! From all of us at iRacing, we appreciate your support and your commitment to our product. We aim to deliver the ultimate sim racing experience, and we hope that you'll find plenty of excitement with us behind the wheel of your new car!

Debuting in the 2023 Super Formula season, the Dallara SF23 is the third open-wheel car developed by the Italian manufacturer for Japan's premier open-wheel racing series. From a visual standpoint, the SF23 evolves from its predecessor by introducing new aerodynamics designed to produce more overtaking. From a sustainability one, the new design reduces carbon dioxide emissions in raw materials and manufacturing by 75% thanks to new, natural materials, while even the Yokohama tires used on the car use significantly more renewable raw materials while maintaining the performance of previous tires.

Thanks again for your purchase, and we'll see you on the track!

CHASSIS

DOUBLE WISHBONE WITH PUSHROD-ACTUATED INBOARD SPRINGS

LENGTH	WIDTH	WHEELBASE	DRY WEIGHT	WET WEIGHT WITH DRIVER
5233 mm 206 in	**1910 mm** 75 in	**3115 mm** 123 in	**600 kg** 1322 lbs	**670 kg** 1477 lbs

POWER UNIT

TURBOCHARGED INLINE 4-CYLINDER

DISPLACEMENT	TORQUE	POWER	RPM LIMIT
2.0 Liters 122 cid	**354 lb-ft** 480 Nm	**550 bhp** 408 kW	**9400**

Introduction

The information found in this guide is intended to provide a deeper understanding of the chassis setup adjustments available in the garage, so that you may use the garage to tune the chassis setup to your preference.

Before diving into chassis adjustments, though, it is best to become familiar with the car and track. To that end, we have provided baseline setups for each track commonly raced by these cars. To access the baseline setups, simply open the Garage, click iRacing Setups, and select the appropriate setup for your track of choice. If you are driving a track for which a dedicated baseline setup is not included, you may select a setup for a similar track to use as your baseline. After you have selected an appropriate setup, get on track and focus on making smooth and consistent laps, identifying the proper racing line and experiencing tire wear and handling trends over a number of laps.

Once you are confident that you are nearing your driving potential with the included baseline setups, read on to begin tuning the car to your handling preferences.

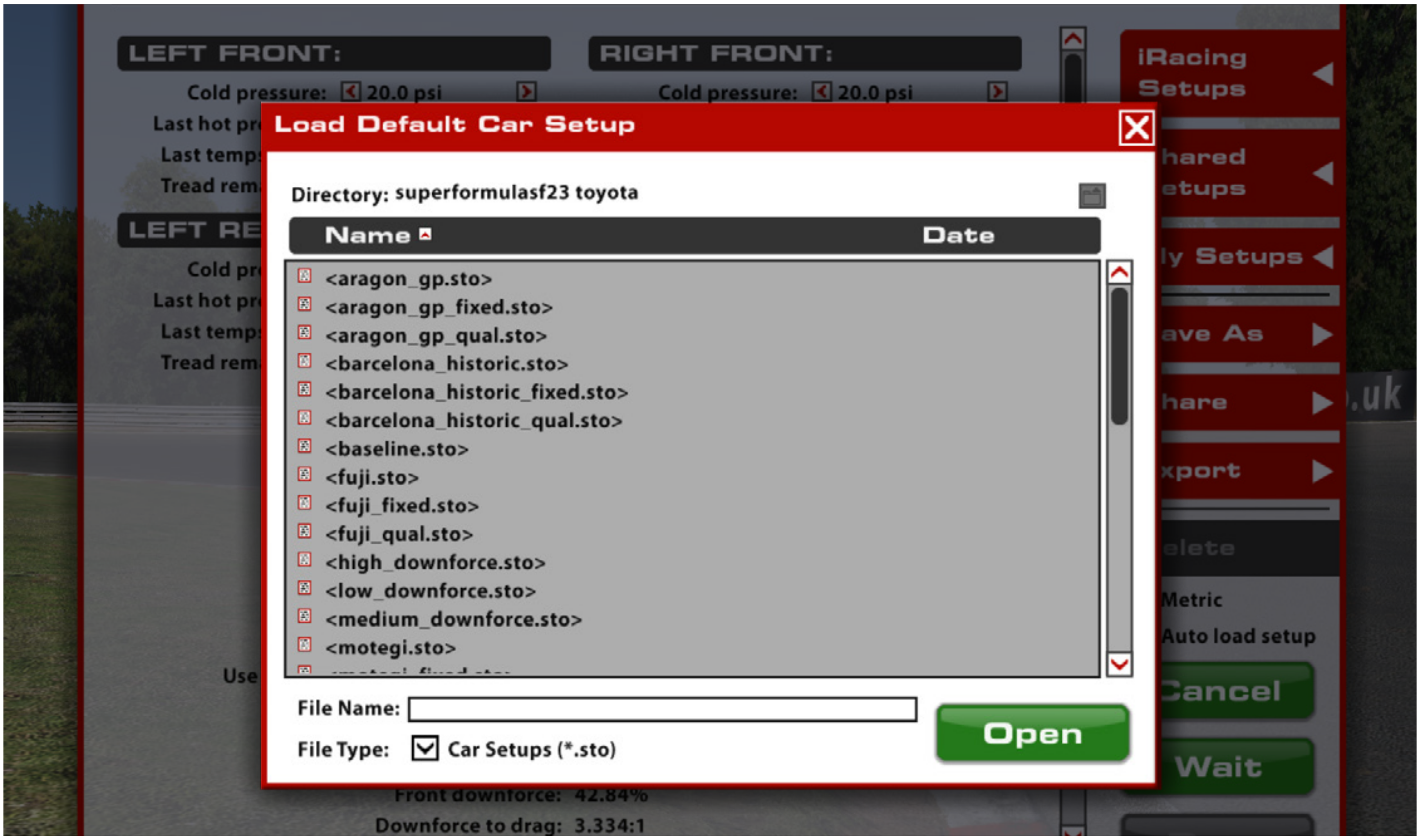
GETTING STARTED

Before starting the car, it is recommended to map controls for Brake Bias. While this is not mandatory, this will allow you to make quick changes to the brake bias to suit your driving while out on track.

Once you load into the car, getting started is as easy as pulling the “upshift” paddle to put it into gear, and hitting the accelerator pedal. This car uses an automated sequential transmission and does not require manual clutch operation to shift in either direction. However, the car’s downshift protection will not allow you to downshift if it feels you are traveling too fast for the gear requested. If that is the case, the downshift command will simply be ignored.

Upshifting is recommended when the shift lights on the dashboard are all fully illuminated. This is at approximately 9300 rpm.

LOADING AN iRACING SETUP



Upon loading into a session, the car will automatically load the iRacing Baseline setup [baseline.sto]. If you would prefer one of iRacing's pre-built setups that suit various conditions, you may load it by clicking Garage > iRacing Setups > and then selecting the setup to suit your needs.

If you would like to customize the setup, simply make the changes in the garage that you would like to update and click apply. If you would like to save your setup for future use click "Save As" on the right to name and save the changes.

To access all of your personally saved setups, click "My Setups" on the right side of the garage.

If you would like to share a setup with another driver or everyone in a session, you can select "Share" on the right side of the garage to do so.

If a driver is trying to share a setup with you, you will find it under "Shared Setups" on the right side of the garage as well.

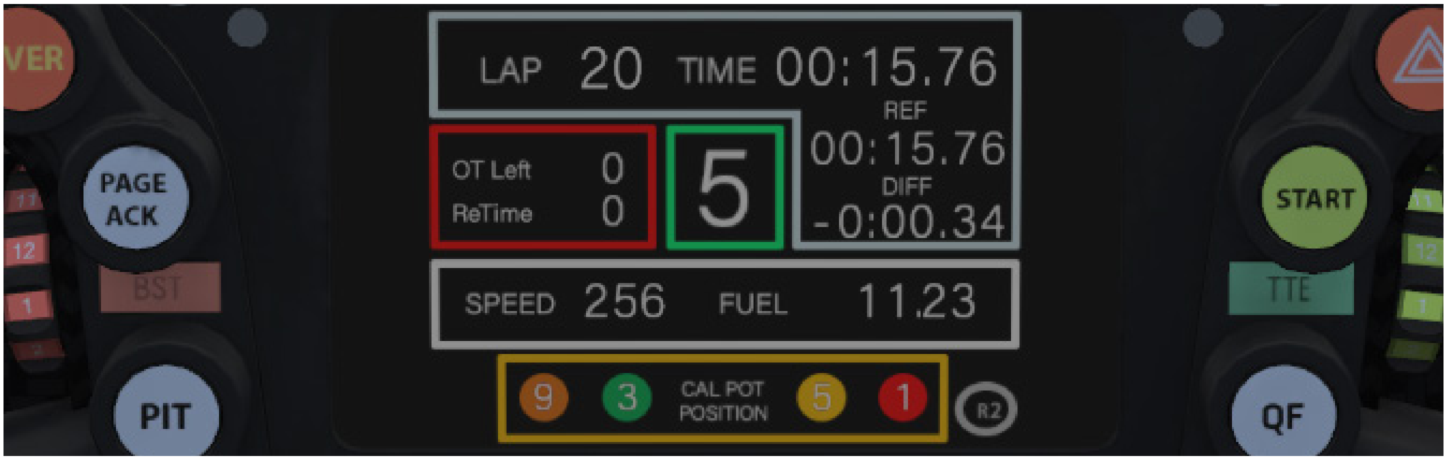
Dash Configuration

The steering wheel for the Super Formula SF23 cars features an integrated digital display to show the driver important engine and performance information while on track. The display features four display pages:

ENGINE PAGE

LAP	Number of laps completed (displays one less than the current lap)
TIME	Previously completed lap time
REF	Best lap time of the session
DIFF	Cumulative splits differential time to the best lap of the current session
Gear Indicator	The currently-selected gear is shown in the middle of the display in a green box
SPEED	Current speed in Miles-Per-Hour or Kilometers-Per-Hour depending on the units selected in the garage
FUEL	The amount of fuel burned since leaving the pits in gallons or liters, depending on the units selected in the garage
CAL POT POSITION	These values represent the various settings available in the car in numerical form. The only value that can be changed in the sim is the Orange value, which represents the current Throttle Shaping setting
ECT	Engine Coolant temperature in °F or °C
EOP	Engine Oil Pressure in psi or bar

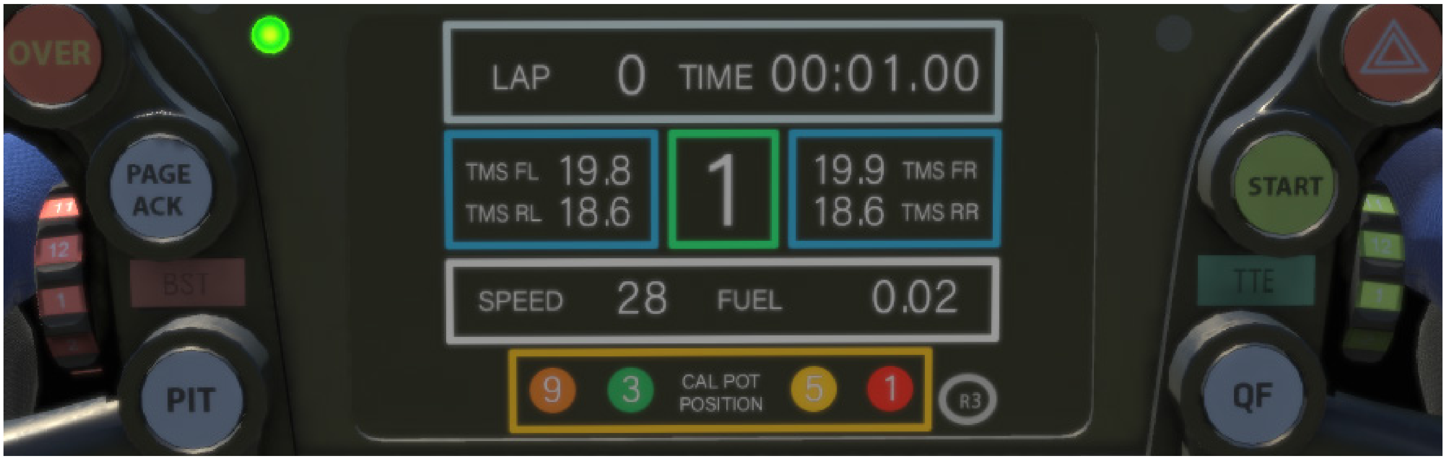
OVERTAKE



The Overtake page is the same as the Engine page, except the ECT and EOP values are replaced with information about the Overtake system:

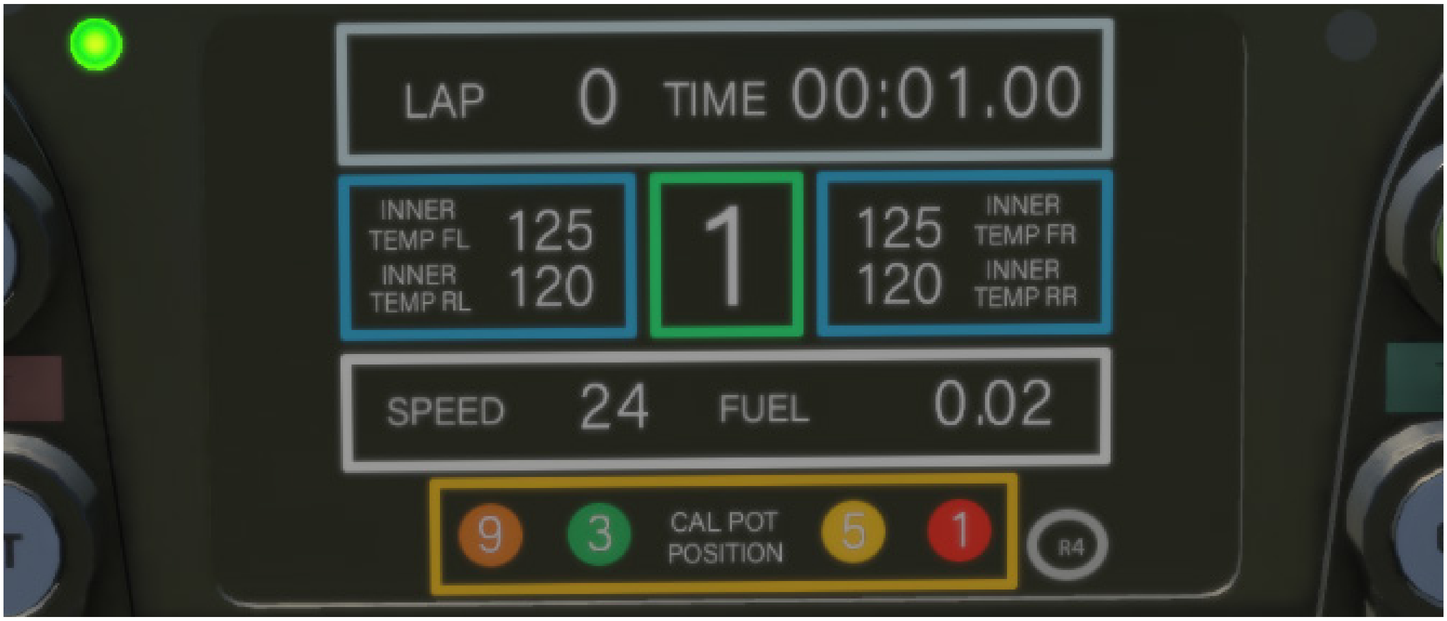
OT Left	Amount of time, in seconds, available before the system is disabled for the remainder of the session.
ReTime	Amount of time remaining until Overtake Mode can be enabled again. If this value is non-zero, the system cannot be activated.

TMS



The TMS page features Tire Pressure information in the center row of the display, replacing the Lap Time values on the right side of the dash with right-side tire pressure information. Each value (TMS FL, TMS FR, etc.) shows the current tire pressure in psi or Bar.

TIRE TEMPS



The Tire Temps page shows the internal temperature of all four tires in °F or °C. These values are the current internal air temperature, not the temperature of the tire's tread or surface.

LEFT-SIDE LED STATUS CLUSTER

A trio of LED lights on the left side of the steering wheel display various colors and patterns to deliver information to the driver:

BRAKE TEMPERATURE LOW

When the brakes are far below operating temperature the cluster will illuminate one LED in green to show how far below the optimum temperature the brakes are at a given moment:

A single green LED on the bottom indicates the brakes are far below optimum temperature and may be inconsistent or not as effective as may be expected.

A single green LED on the top indicates the brakes are close to their operating temperature but are slightly cooler than what would produce peak performance.

OVERTAKE SYSTEM ACTIVE (OVER 20S REMAINING)

When the Overtake system is activated and the time remaining is over 20 seconds the cluster will alternate left and right in green.

OVERTAKE SYSTEM ACTIVE (LESS THAN 20S REMAINING)

If the Overtake system has less than 20 seconds remaining before deactivation the LEDs will flash in the same pattern as normal operation but will show in red.

OVERTAKE SYSTEM RESET

After the Overtake system has been deactivated (but while there is still time remaining for the system to be used) the LED cluster will be illuminated in purple and flash until the system has reset and Overtake can be used again.

OVERTAKE SYSTEM AVAILABLE

Following the ReTime reset period after the Overtake system is deactivated the LEDs will display in blue to signal the system is available to be used again.

Advanced Setup Options

This section is aimed toward more advanced users who want to dive deeper into the different aspects of the vehicle's setup. Making adjustments to the following parameters is not required and can lead to significant changes in the way a vehicle handles. It is recommended that any adjustments are made in an incremental fashion and only singular variables are adjusted before testing changes.

Overtake System

The Super Formula SF23 features an on-demand Overtake system to provide an increase in maximum horsepower available. When the Overtake button is pressed, the fuel flow limit will increase to boost engine power by roughly 5%. This system can be activated at any time during a Test or Practice session (with no time limit), any time during a Race (with a time limit), but is disabled for Qualifying.

During a Race session the system can be active for a total of 200 seconds, at any time, but forces a 100 or 110-second (depending on track) delay between activations. When the system is active, the dash page will change to a green overlay to indicate the system is active and the left-side LED cluster will flash in green. This overlay will show a timer counting down how many sections the system can remain active in the race as well as a bar to graphically display how much activation time is left before complete deactivation.

When the system is deactivated following an activation, the display will return to the selected page and a blue/red bar will appear on the left side of the screen as well as the left-side LED cluster flashing purple to indicate the system is resetting and cannot be activated as well as the "ReTime" value counting down from 100 on display Page 2. When the bar on the left reaches the top of the screen and the ReTime value reaches zero (this will happen simultaneously), the system is available for activation again and the left-side LED cluster will change to blue.

If a full course caution period is activated during a race, the system will deactivate (if the system was active at the time of the caution) and ReTime will be reset and show "100". For the length of the caution period the system will be unavailable, but will be available immediately after green-flag racing resumes regardless of whether there was ReTime remaining at the start of the caution period.

As the system runs low on available time while it is active the green overlay will change to red and the left-side LED clusters that blink while the system is active will become red and flash in the same pattern.

Once the system is depleted, the display will return to the active display page and engine power will return to its standard output. The "OT Left" and "ReTime" values on the Overtake display page will both display "0" for the remainder of the session.

Tires/Aero

TIRE DATA

COLD PRESSURE

Air pressure in the tire when the car is loaded into the world. Higher pressures will reduce rolling drag and heat buildup, but will decrease grip. Lower pressures will increase rolling drag and heat buildup, but will increase grip. Higher speeds and loads will require higher pressures, while lower speeds and loads will see better performance from lower pressures.

LAST HOT PRESSURE

Air pressure in the tire after the car has returned to the pits. The difference between Cold and Hot pressures can be used to identify how the car is progressing through a run in terms of balance, with heavier-loaded tires seeing a larger difference between Cold and Hot pressures. Ideally, tires that are worked in a similar way should build pressure at the same rate to prevent a change in handling balance over the life of the tire, so Cold pressures should be adjusted to ensure that similar tires are at similar pressures once up to operating temperature. Careful attention should be paid to the Hot Pressures to extract the most performance out of the tires during a race.

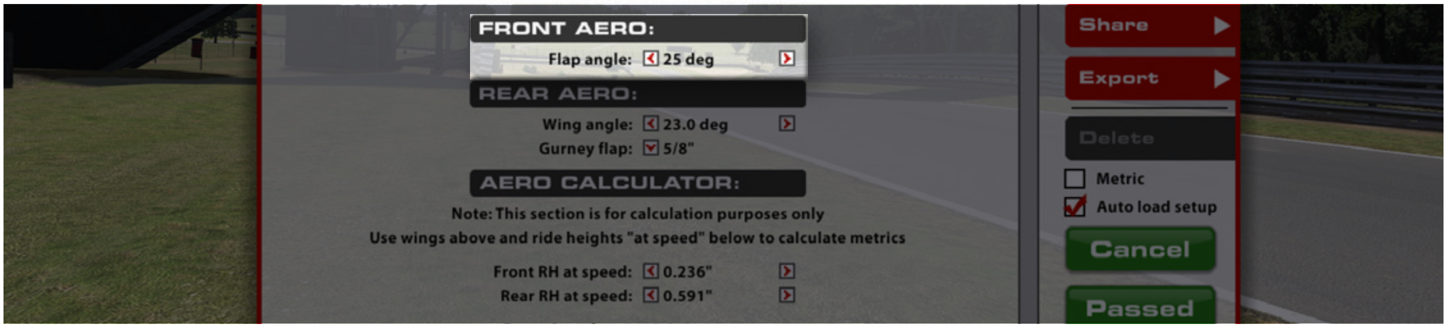
LAST TEMPS

The temperatures measured in the garage are tire carcass temperatures measured within the tread rubber itself. Wheel Loads and the amount of work a tire is doing on the track is reflected in the tire's temperature, and these values can be used to analyze the car's handling balance. Center temperatures are useful for directly comparing the work done by each tire, while the Inner and Outer temperatures are useful for analyzing the wheel alignment and tire air pressure while on track.

TREAD REMAINING

The amount of tread remaining on the tire once the car has returned from the pits. Tire wear is very helpful in identifying any possible issues with alignment, such as one side of the tire wearing excessively, but should never be prioritized over tire temperatures when analyzing handling balance.

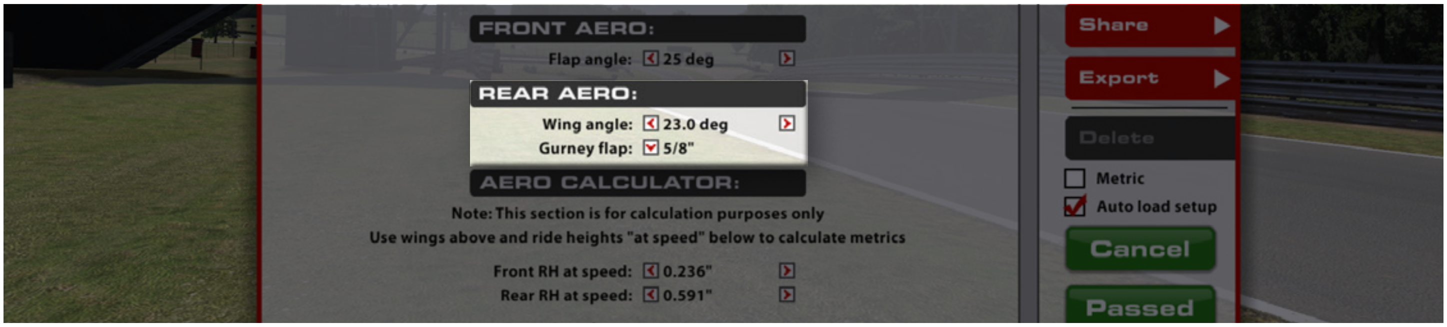
FRONT AERO



FLAP ANGLE

The Flap Angle setting changes the angle of the front wing's upper flap elements relative to horizontal. Higher angles will increase the downforce generated at the front wing, shift aero forward, and increase drag, while lower angles will decrease downforce, shift aero rearward, and reduce drag.

REAR AERO



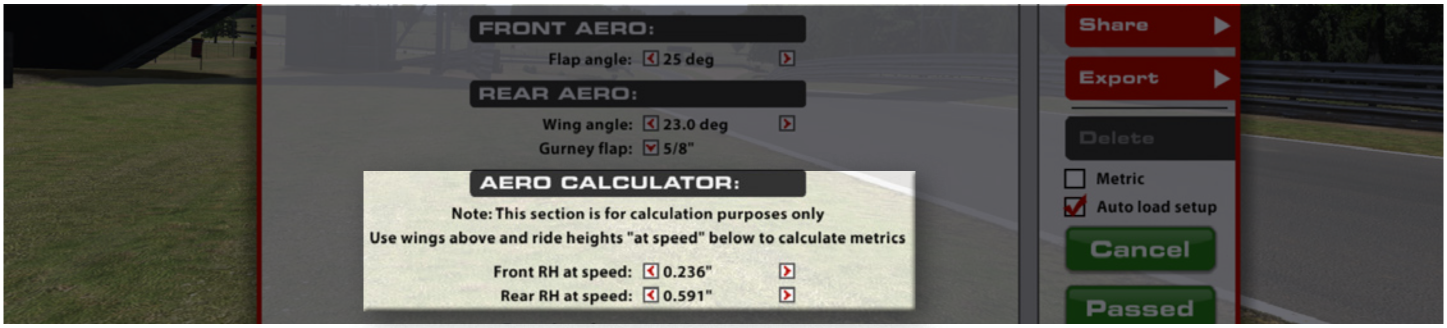
WING ANGLE

The Rear Wing Angle setting controls the angle of the rear wing's upper flap element. Higher angles will produce more downforce, more drag, and shift aero rearward, while lower angles will reduce both downforce and drag but shift aero forward.

GURNEY FLAP

A Gurney Flap, or wicker, can be installed on the trailing edge of the rear wing's upper flap. This will dramatically increase rear downforce but with a drag penalty. Available in two sizes, the larger wicker will produce more downforce and drag than the smaller wicker.

AERO CALCULATOR



The Aero Calculator is a quick way to get a general idea of the car's aero balance in the current configuration. Once the Front and Rear Aero settings have been chosen, the front and rear ride heights can be set to find the car's aero balance and Downforce-to-Drag ratio. This is very helpful for planning setup changes to either keep the same aerodynamic balance after a change or to understand how much the balance will shift with changes. Please note the settings chosen in this area of the garage do not affect the setup or on-track performance and are simply a way to understand how the car is performing.

FRONT/REAR RH AT SPEED

The Ride Height (RH) at Speed settings are inputs for the aero calculator to determine the approximate aero performance with the chosen aero package. Changing these values changes the displayed Front Downforce value as well as the Downforce-to-Drag ratio in the calculator. To check on-track performance, use the front ride height sensors (Front RH) and rear ride height sensors (Rear RH) found in telemetry output. These can also be changed to observe how rake will affect aerodynamic performance prior to ride height or spring changes.

FRONT DOWNFORCE

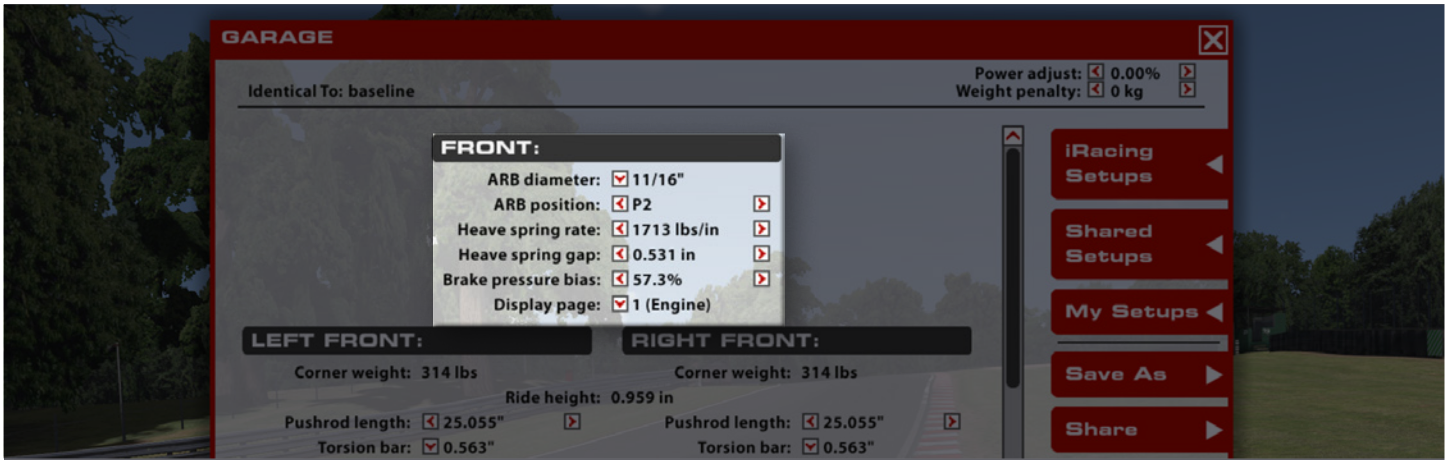
The Front Downforce value represents the percentage of total downforce that is working on the front axle. This value is calculated with the At Speed ride height values, as well as the chosen aerodynamic options, and should be monitored during the chassis setup process to prevent unexpected results. To ensure chassis adjustments don't become masked by aerodynamic changes, always refer to this value to ensure it remains constant before and after aerodynamic setup changes.

DOWNFORCE TO DRAG

The Downforce to Drag ratio is a relation of how much downforce is produced for one unit of drag. Generally, a larger Downforce to Drag ratio would imply the car is working efficiently and producing large amounts of downforce for given drag numbers, while a lower Downforce to Drag value is typically seen on more slippery, low-drag aerodynamic packages.

Chassis

FRONT



ARB DIAMETER

The front Anti-Roll Bar (ARB) is available in a 15mm (5/8"), 18mm (11/16"), or a 30mm (1 3/16") diameter with a 3mm (1/8") hollow bore through the center. Larger diameter options will stiffen the front suspension in roll, reducing mechanical grip and inducing understeer, but will try to keep the chassis flatter when cornering. The smaller diameter options will reduce roll stiffness, increasing mechanical grip across the front axle and reducing understeer, but will allow the chassis to roll more.

ARB POSITION

The ARB position changes the orientation of the ARB's arms. Higher numbers will stiffen the ARB assembly and increase front roll stiffness, lower numbers will soften the ARB assembly and decrease roll stiffness. This results in the same effects from ARB diameter changes, with higher roll stiffness inducing understeer and lower roll stiffness reducing understeer.

HEAVE SPRING RATE

The Heave Spring is a suspension element that handles loads when the chassis moves in a purely vertical direction and does not experience loads generated from chassis roll. The front Heave Spring will influence the chassis' handling balance during braking and over bumps, but is primarily intended to control increasing aerodynamic loads with higher speeds. Stiffer Heave Spring rates will stiffen the suspension in vertical travel and result in a more consistent aerodynamic platform but can reduce mechanical grip over rough surfaces. Softer Heave Springs will increase mechanical grip but could allow too much movement to keep the aerodynamic behavior consistent.

HEAVE SPRING GAP

The Heave Spring Gap is the amount of compression required in the Heave Spring Assembly before the Heave Spring begins carrying any load. This can be set directly but will also change as a result of other chassis settings that can alter ride height, and thus the suspension's static deflection. Positive values signify the Heave Spring is unloaded when the car is stationary and requires suspension compression before loading, while negative values indicate a preloaded Heave Spring in static conditions. Lower values will engage the spring sooner through suspension travel, higher values will delay the spring's engagement.

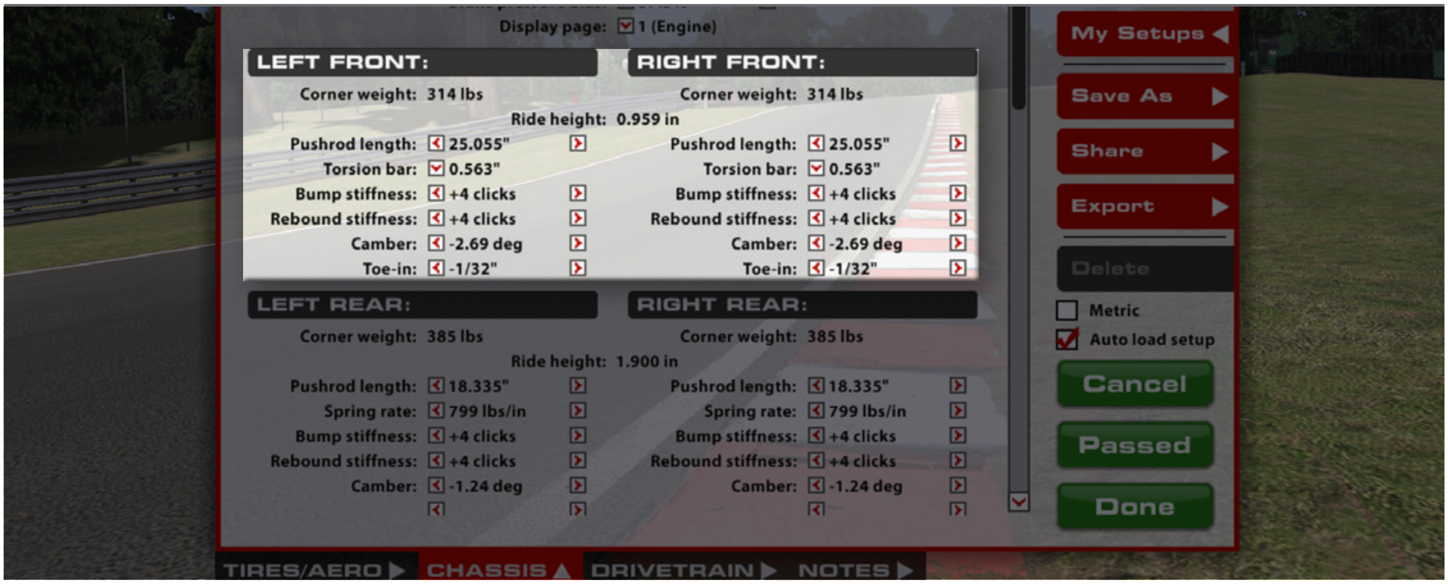
BRAKE PRESSURE BIAS

The Brake Pressure Bias setting determines how much of the overall brake line pressure is sent to the front wheels. Higher percentages apply more braking pressure to the front wheels, which can induce understeer under braking, while reducing the percentage will shift braking force rearward and induce oversteer under braking. If the bias is set too far forward or rearward it can cause wheel lockups under heavy braking, so it should be set to a value that allows for heavy braking without lockups on either axle.

DISPLAY PAGE

This sets the default page on the steering wheel's display when the car is started. This has no effect on car performance.

FRONT CORNERS



CORNER WEIGHT

Corner Weight represents the weight on each wheel when sitting in the garage. This can be used to visualize the weight distribution under static conditions and help with identifying changes to weight distribution through the setup process.

RIDE HEIGHT

Front Ride Height is a measurement from the ground to a reference point on the chassis along the centerline of the car. Since this value doesn't necessarily represent the lowest point on the chassis it does not specifically represent the chassis' ground clearance, but is instead a reference for setup and aero work. It is important to have the front ride height low for both aero and mechanical grip, but high enough that the chassis doesn't make significant contact with the race track over the course of a lap. Raising and lowering the front ride height will affect aerodynamic balance, overall downforce levels, and drag, so consult the Aero Calculator to see how a ride height change will influence handling when changing this value.

PUSHROD LENGTH

To adjust the Ride Height, a turnbuckle style adjuster is available to change the effective length of the pushrods. Longer pushrods will raise the front of the car and shorter pushrods will lower the front of the car, with both front pushrods being adjusted symmetrically.

TORSION BAR

The Torsion Bar setting changes the outer diameter of the front suspension torsion bars, which are used as spring elements. Springs are used to keep the chassis from contacting the track under the loads seen on track and to manage the chassis' aerodynamic attitude, but their stiffness also has a major influence on the car's handling characteristics. On the front end, stiffer springs can keep the front wing from moving too much under increasing aerodynamic loads but will decrease mechanical grip and can cause understeer in slower corners. Softer springs will result in more front end movement, which can hurt aero, but will increase mechanical grip in the front axle and reduce understeer (or cause oversteer, in extreme cases). Larger diameters will be stiffer, smaller diameters will be softer.

BUMP STIFFNESS

Front Bump Stiffness affects how resistant the shock is to compression (reduction in length) when the shock is moving at relatively low shock piston speeds, usually in chassis movements as a result of driver input and building aerodynamic forces. Higher values will increase compression resistance under these low-speed conditions, lower values will result in a more compliant shock. From a mechanical grip standpoint, more front low-speed compression will produce understeer under braking. Reducing front Bump Stiffness will reduce understeer at braking and turn-in. For aerodynamics, more low-speed compression will slow vertical chassis movement under braking, which can result in a more stable aerodynamic platform.

REBOUND STIFFNESS

Rebound Stiffness controls how resistant the shock is when extending at lower shock piston speeds, typically due to driver inputs and changing aerodynamic loads. Higher rebound values will resist expansion of the shock, lower values will allow the shock to extend faster. Higher rebound values can better control aerodynamic attitude but can result in the wheels being unloaded when the suspension can't expand enough to maintain proper contact with the track. When tuning for handling, higher front low-speed rebound can increase on-throttle mechanical understeer while lower values will maintain front end grip longer, helping to reduce understeer.

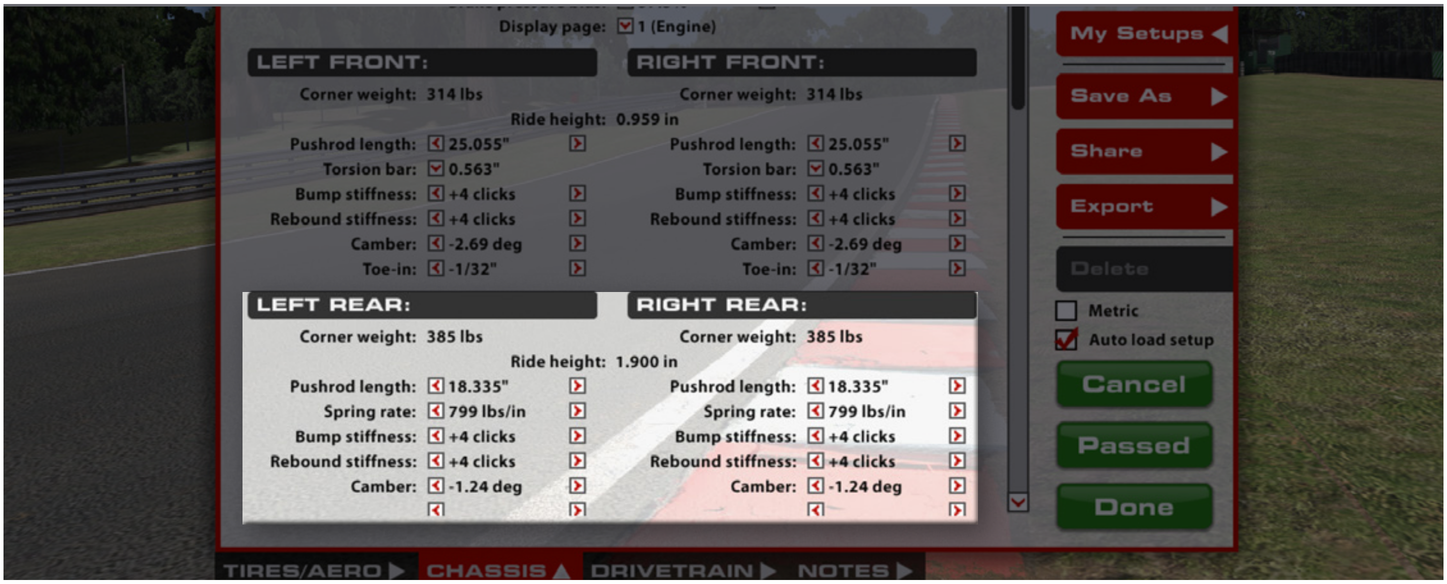
CAMBER

Camber is the vertical angle of the wheel relative to the center of the chassis. Negative camber is when the top of the wheel is closer to the chassis centerline than the bottom of the wheel, positive camber is when the top of the tire is farther out than the bottom. Higher negative camber values will provide more cornering forces in the direction of the tire's camber (more aggressive turn-in response), but may reduce braking capability at high camber angles.

TOE-IN

Toe is the angle of the wheels relative to the chassis centerline when viewed from above. Negative toe-in sets the front of the tires farther from the centerline than the rear of the tires while positive toe-in sets the front of the tires closer to the centerline than the rear of the tires. This setting can change the front tire slip angle in a turn, with toe-out providing more straight-line stability at the cost of increased tire temperature and wear due to higher slip angle. Lower toe values can provide a quicker steering response, but may produce an unstable steering feeling.

REAR CORNERS



CORNER WEIGHT

Corner Weight represents the weight on each wheel when sitting in the garage. This can be used to visualize the weight distribution under static conditions and help with identifying changes to weight distribution through the setup process.

RIDE HEIGHT

Rear Ride Height is a measurement from the ground to a reference point on the chassis along the centerline of the car. Since this value doesn't necessarily represent the lowest point on the chassis it does not specifically represent the chassis' ground clearance, but is instead a reference for setup and aero work. It is important to have the rear ride height set to optimize both aero and mechanical grip for a given track. Raising and lowering the rear ride height will affect aerodynamic balance, overall downforce levels, and drag, so consult the Aero Calculator to see how a ride height change will influence handling when changing this value.

PUSHROD LENGTH

To adjust the Ride Height, a turnbuckle style adjuster is available to change the effective length of the pushrods. Longer pushrods will raise the rear of the car and shorter pushrods will lower the rear of the car, with both rear pushrods being adjusted symmetrically.

SPRING RATE

Spring Rate is the stiffness of the suspension's corner springs controlling each wheel. The value is a representation of how much force (Pounds or Newtons) required to compress the spring a specific distance (inches of millimeters). Springs are used to keep the chassis from contacting the track under the loads seen on track and to manage the chassis' aerodynamic attitude, but their stiffness also has a major influence on the car's handling characteristics. On the rear end, stiffer springs can keep the rear of the car from moving too much under increasing aerodynamic loads but will decrease mechanical grip and can cause oversteer in slower corners. Softer springs will result in more rear end movement, which can hurt aero, but will increase mechanical grip across the rear axle and reduce oversteer (or cause understeer, in extreme cases).

BUMP STIFFNESS

Rear Bump Stiffness affects how resistant the shock is to compression (reduction in length) when the shock is moving at relatively low shock piston speeds, usually in chassis movements as a result of driver input and building aerodynamic forces. Higher values will increase compression resistance under these low-speed conditions, lower values will result in a more compliant shock. From a mechanical grip standpoint, more rear low-speed compression will produce understeer on throttle application. Reducing rear Bump Stiffness will reduce understeer on throttle. For aerodynamics, more low-speed compression will slow vertical chassis movement under throttle and increasing aerodynamic loads which can result in a more stable aerodynamic platform.

REBOUND STIFFNESS

Rebound Stiffness controls how resistant the shock is when extending at lower shock piston speeds, typically due to driver inputs and changing aerodynamic loads. Higher rebound values will resist expansion of the shock, lower values will allow the shock to extend faster. Higher rebound values can better control aerodynamic attitude but can result in the wheels being unloaded when the suspension can't expand enough to maintain proper contact with the track. When tuning for handling, higher rear low-speed rebound can increase mechanical understeer under braking while lower values can induce oversteer under braking.

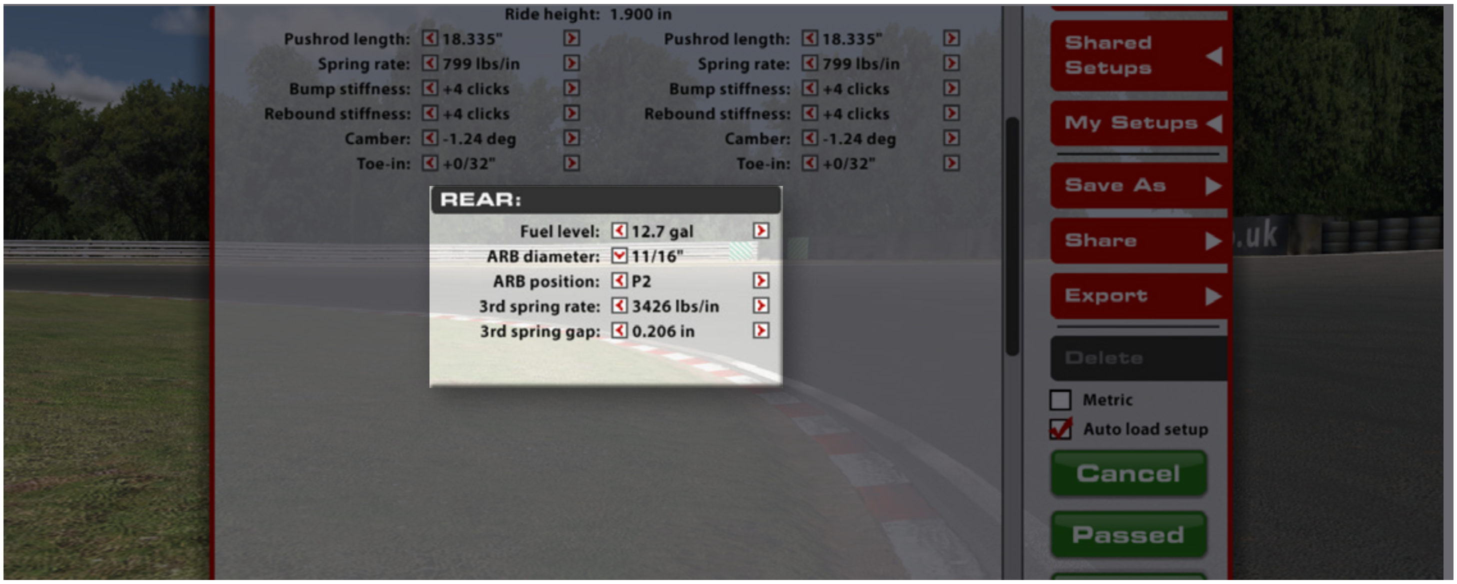
CAMBER

Camber is the vertical angle of the wheel relative to the center of the chassis. Negative camber is when the top of the wheel is closer to the chassis centerline than the bottom of the wheel, positive camber is when the top of the tire is farther out than the bottom. Higher negative camber values will provide more cornering forces in the direction of the tire's camber (more stability in high-speed cornering), but may reduce on-throttle traction at high camber angles.

TOE-IN

Toe is the angle of the wheels relative to the chassis centerline when viewed from above. Negative toe-in sets the front of the tires farther from the centerline than the rear of the tires while positive toe-in sets the front of the tires closer to the centerline than the rear of the tires. This setting can change the rear tire slip angle, with toe-in providing more straight-line stability but reducing the car's tendency to rotate into a corner. Lower toe-in values (moving towards toe-out) can provide a quicker steering response, but may produce an unstable steering feeling.

REAR



FUEL LEVEL

This shows how much fuel will be in the fuel tank when the car is loaded in the sim.

ARB DIAMETER

The rear Anti-Roll Bar (ARB) is available in 15mm (5/8") and 17mm (11/16") diameters. Larger diameter options will stiffen the rear suspension in roll, reducing mechanical grip and inducing oversteer, but will try to keep the chassis flatter when cornering. The smaller diameter options will reduce roll stiffness, increasing mechanical grip across the rear axle and reducing oversteer, but will allow the chassis to roll more.

3RD SPRING RATE

The 3rd Spring Rate controls the stiffness of a spring element that works only in heave (vertical suspension travel) and can be set to prevent the car from dropping too far under heavy aerodynamic loads or vertical forces from track shape, such as dips or turn banking. Using the 3rd Spring in this way allows for softer corner springs to be used (since they won't have to carry the full aerodynamic loads), increasing rear mechanical grip while cornering. Stiffer 3rd Spring Rates will resist vertical travel more than softer 3rd Spring Rates, producing a more consistent aerodynamic attitude but potentially reducing rear mechanical grip when aerodynamic loads at low speeds.

3RD SPRING GAP

The 3rd Spring Gap is the amount of compression required in the rear 3rd Spring Assembly before the spring begins carrying any load. This can be set directly but will also change as a result of other chassis settings that can alter ride height, and thus the suspension's static deflection. Positive values signify the 3rd Spring is unloaded when the car is stationary and requires suspension compression before loading, while negative values indicate a preloaded 3rd Spring in static conditions. Lower values will engage the spring sooner through suspension travel, higher values will delay the spring's engagement.

Drivetrain

DIFFERENTIAL

CLUTCH PLATES

The differential Clutch Plates are a way to greatly increase the forces from the differential that attempt to keep the two rear axles locked in sync. The number of clutch plates used will multiply the locking force by the number of plates in use when compared to a single set of clutch plates. For example, 4 clutch plates will have 4 times the locking force of one plate, 12 will have 12 times the force of one plate, etc. Higher locking forces (more plates) will increase the amount of understeer seen when off the throttle under deceleration for corner entry, but will increase oversteer on exit when applying the throttle. Fewer plates will increase oversteer on corner entry while decelerating but add understeer when applying the throttle.

PRELOAD

Differential Preload is a static amount of locking force that is always present in the differential regardless of acceleration or deceleration. Increasing the preload will add understeer under braking but oversteer on throttle application, while decreasing preload will add oversteer under braking but understeer on throttle application.

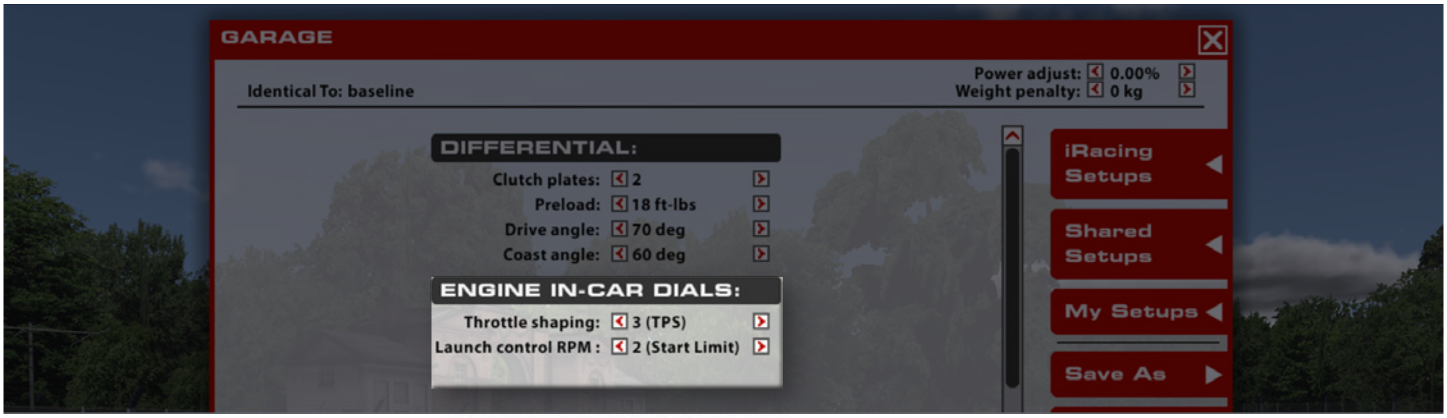
DRIVE ANGLE

The Drive Angle alters how much force is applied in the differential to lock the axles together during acceleration. Higher angles will produce less force, inducing oversteer initial throttle application out of a corner, while lower angles will produce more force and induce understeer in these situations.

COAST ANGLE

The Coast Angle alters how much force is applied in the differential to lock the axles together during deceleration. Higher angles will produce less force, inducing oversteer under braking, while lower angles will produce more force and induce understeer in these situations.

ENGINE IN-CAR DIALS



THROTTLE SHAPING

The Throttle Shaping option controls how torque is delivered from the engine through throttle pedal travel. Low settings will emulate a "butterfly"-style throttle with less torque given at lower throttle positions, a high increase in the middle portion of the throttle pedal's travel, and then a slower build at the higher percentage. The higher values will be more linear, with a consistent increase in torque for each amount of pedal travel. This setting can be changed in the car through the "TPS" setting.

LAUNCH CONTROL RPM

When the Launch Control system is armed, the Launch Control RPM setting ("Start Limit" in-car setting) will change the maximum RPM at full-throttle while the car is stationary. This can be set to help reduce wheelspin at the race start for low-grip track surfaces. Launch Control button mappings are available in the Options>Control menu listed under Traction Control.