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## **iRacing JS P320 Motorsport Simulations**



## Specifications

|                               |   |
|-------------------------------|---|
| <b>CHASSIS</b>                | DOUBLE WISHBONE WITH PUSHROD ACTUATED INBOARD SPRINGS |
| <b>LENGTH</b>                 | 4605 mm (181 in)                                      |
| <b>WIDTH</b>                  | 1900 mm (75 in)                                       |
| <b>WHEELBASE</b>              | 2860 mm (112 in)                                      |
| <b>DRY WEIGHT</b>             | 950 kg (2094 lbs)                                     |
| <b>WET WEIGHT WITH DRIVER</b> | 1115 kg (2458 lbs)                                    |
| <b>POWER UNIT</b>             | NATURALLY ASPIRATED NISSAN V8                         |
| <b>DISPLACEMENT</b>           | 5.6 Liters (341 CID)                                  |
| <b>RPM LIMIT</b>              | 7000  |
| <b>TORQUE</b>                 | 402 lb-ft (545 Nm)                                    |

|              |                  |
|--------------|------------------|
| <b>POWER</b> | 460 bhp (343 kW) |
|--------------|------------------|

### Product Usage Instructions

- The Ligier JS P320 user manual provides guidance on chassis setup adjustments available in the garage.
- Before adjusting the chassis, it is recommended to get familiar with the car and track.
- Baseline setups are provided for common tracks to start with.
- Prior to starting the car, map controls for Brake Bias and Traction Control settings.
- To start the car, press the clutch, pull the upshift paddle to engage gear, and accelerate while releasing the clutch. Manual clutch operation is not required for shifting.
- Upon loading into a session, the car will automatically load the iRacing Baseline setup.
- To load a pre-built setup or customize one, go to Garage > iRacing Setups. Save your changes by clicking Apply or Save As for future use. Share setups with others by selecting Share in the garage.

### DEAR iRacing USER

- Ligier’s latest design to compete under global LMP3 regulations, the Ligier JS P320, launched in the summer of 2019. The JS P320 succeeded the JS P3 that had been running since 2015, scoring hundreds of wins and multiple championships across global and international series. It represented major changes from its predecessor in bodywork and suspension, and added traction control and a new, more powerful Nissan V8 engine as part of a new generation of LMP3 regulations.
- In its first two seasons as a part of the top-level IMSA WeatherTech SportsCar Championship, Ligier entries dominated the LMP3 class. Riley Motorsports finished first and third in the standings in 2021, led by driver’s champion Gar Robinson, while the CORE Autosport duo of Colin Braun and Jon Bennett finished second in that inaugural season before winning the title in 2022. For 2024 and beyond, the JS P320 and all other LMP3s will compete exclusively in the
- IMSA VP Racing SportsCar Challenge, where it will be the fastest car in multi-class racing, exclusively alongside GT4 cars.

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



## INTRODUCTION

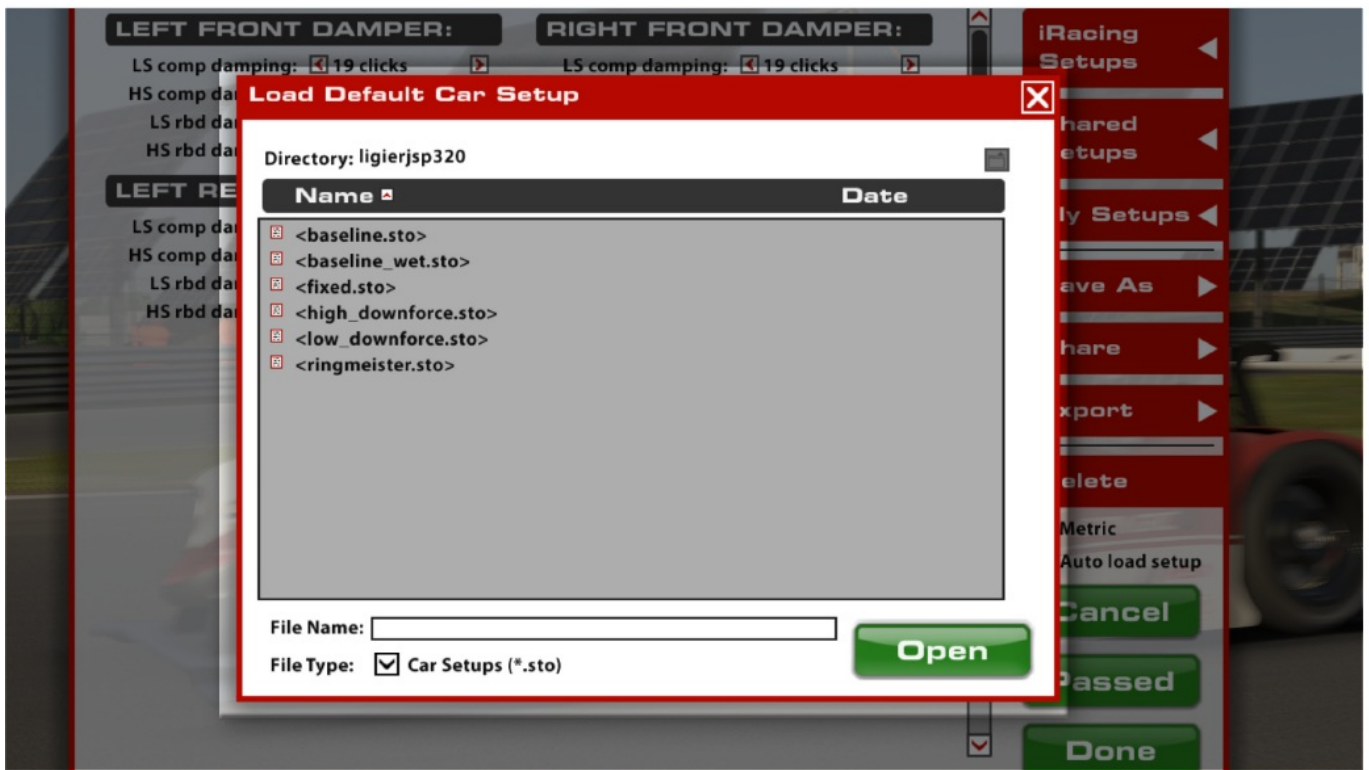
- The information found in this guide is intended to provide a deeper understanding of the chassis setup adjustments available in the garage, so that you may use the garage to tune the chassis setup to your preference.
- Before diving into chassis adjustments, though, it is best to become familiar with 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, 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 and Traction Control settings.
- While this is not mandatory, this will allow you to make quick changes to the brake bias and traction control systems to suit your driving style and track conditions while out on track.
- Once you load into the car, getting started is as easy as pressing the clutch and pulling the “upshift” paddle to put it into gear, and hitting the accelerator pedal while releasing the clutch.
- The Ligier JS P320 does not require manual clutch operation to shift in either direction.
- Upshifting is recommended when the shift lights on the dashboard are all fully illuminated, around 6600rpm.

## **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's integrated digital display shows all relevant information to the driver in an easy-to-read, single-page format.

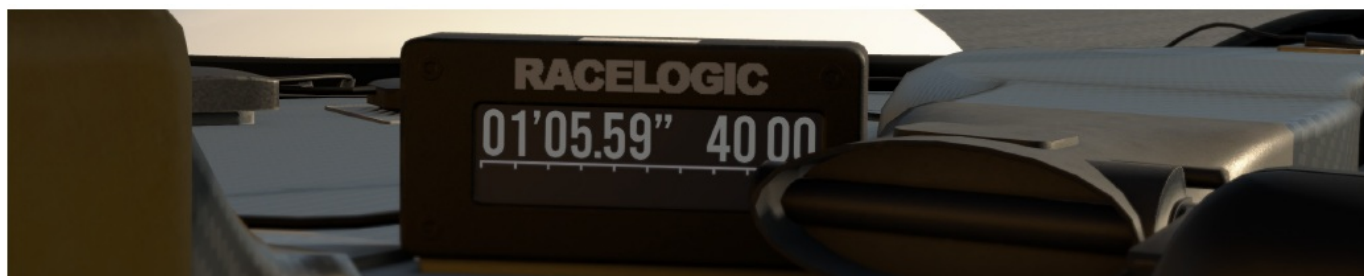




|                  |  |
|------------------|--|
| Dash Page Layout |  |
| Last             | The previously completed lap time is shown in the upper left of the display in blue  |
| Best             | The session's best lap is shown in the upper right of the display in pink  |
| Gear Indicator   | The currently selected gear is located in the middle of the display  |
| RPM              | Engine RPM is located just beneath the gear indicator  |
| Tyre Press       | Live pressures are shown in the center of the display in units based on what is selected in the garage. Imperial units will display pounds per square inch, and Metric units will display Bar. |
| Fuel Used        | How much fuel has been used since leaving pit road is shown on the left side of the display. Imperial units will show US Gallons, and Metric units will show Liters                            |
| Fuel Lap         | After completing each lap, the amount of fuel that was used in the previous lap will be displayed beneath the Fuel Used value in US Gallons or Liters  |

|         |   |
|---------|---|
| DIFF    | A live split time is shown on the right side of the display underneath the Best Lap display. This will compare the current lap against the Best lap, displaying a faster lap in green and a slower lap in red   |
| Speed   | The vehicle's speed is shown on the right side of the display in miles per hour for Imperial units and kilometers per hour for Metric units   |
| OIL P   | The engine oil system pressure is shown on the bottom left in pounds per square inch for Imperial units and Bar for Metric units  |
| TC      | The currently-selected Traction Control setting is shown in a yellow box on the bottom of the display. This value will match the TC option in the F8 black box unless the setting is "0", when this will display "OFF" to indicate the system is disabled |
| PPS     | The currently selected throttle shape setting is shown on the bottom right of the display in a purple box   |
| Water T | The engine's cooling water temperature is displayed in the bottom right, in °F for Imperial and °C for Metric units   |

## RACELOGIC



- To the left of the driver, mounted on top of the dash, is a Racelogic Split and Laptime display.
- During a lap this display will show the current split time relative to the session best lap time, as well as a graphical bar representing the displayed time difference.



- A positive split and a bar displayed to the right of center will indicate a lap slower than the reference, while a negative split and a bar to the left of center indicates a faster lap.
- When a lap is completed, the display will show the previously completed lap time as well as a split for the new lap.

**PIT LIMITER**



| Pit Limiter Page Layout |   |
|-------------------------|---|
| Gear                    | The currently selected gear will be shown in the upper left with a large number |
| Speed                   | Current vehicle speed is shown in the upper right, in kph or mph                |
| TC Map                  | Currently selected Traction Control (TC) mapping                                |
| Fuel Used               | Volume of fuel used since the car was last pitted, in Liters or Gallons         |
| Brake Balance           | Current Brake Balance setting   |
| Pedal %                 | Live throttle pedal position  |
| Tyre Pressure           | Live tire pressures, in bar or PSI  |

|         |   |
|---------|---|
| Water T | Engine cooling water temperature, in °C or °F |
| PPS Map | Currently selected Throttle Shape setting     |

## SHIFT LIGHTS



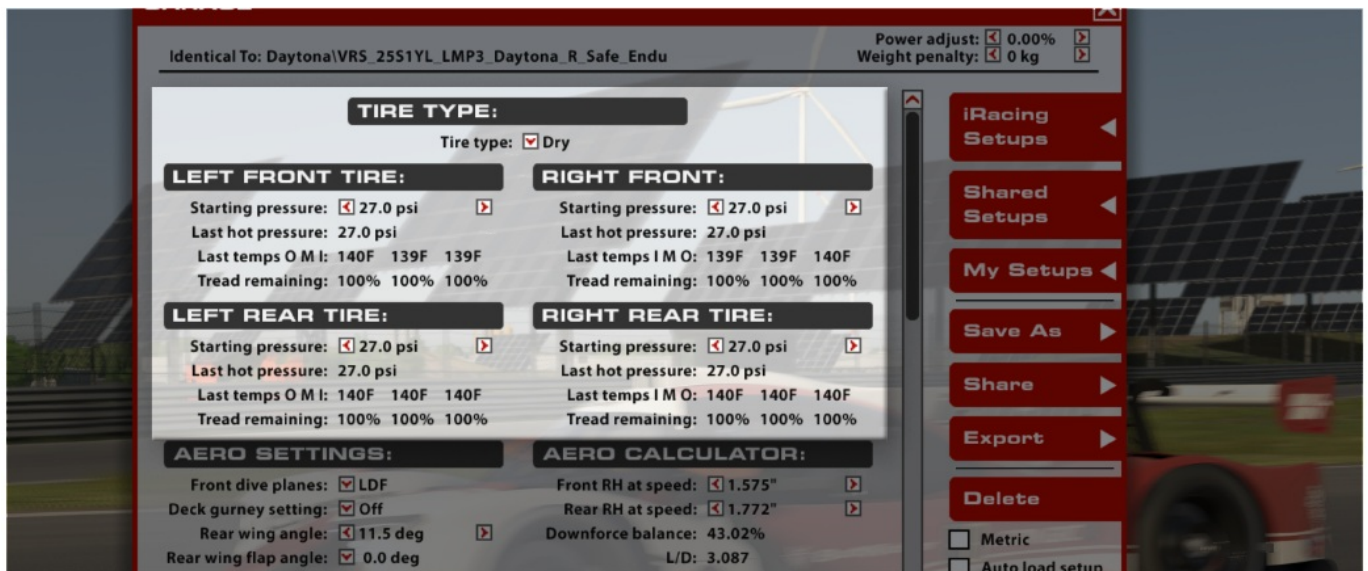
- The shift lights for the Ligier JS P320 are not tied directly to a specific RPM value, but are instead timed to begin illuminating based on the engine RPM acceleration to where the shift indication is shown at the optimum shift point based on how aggressively the car is accelerating.

## 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.

## TIRES & AERO

### TIRE DATA



## TIRE TYPE

- Selects which type of tire is installed on the car when loaded into the world.
- Dry, or slick, tires are used for dry racing conditions, while Wet tires are intended for rainy and wet track conditions.

## STARTING PRESSURE

- This sets the air pressure in the tires when the car is loaded into the world. Lower pressures will produce more mechanical grip with more rolling drag and heat buildup, while higher pressures will reduce heat buildup and rolling drag, but will also reduce the available grip.
- Generally, higher pressures will perform better at tracks with high speeds and high loads, while slower tracks with tighter corners will see better performance out of lower tire pressures.

## LAST HOT PRESSURE

- The Last Hot Pressure displays the air pressure in the tire when the car is returned to the garage.
- 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.

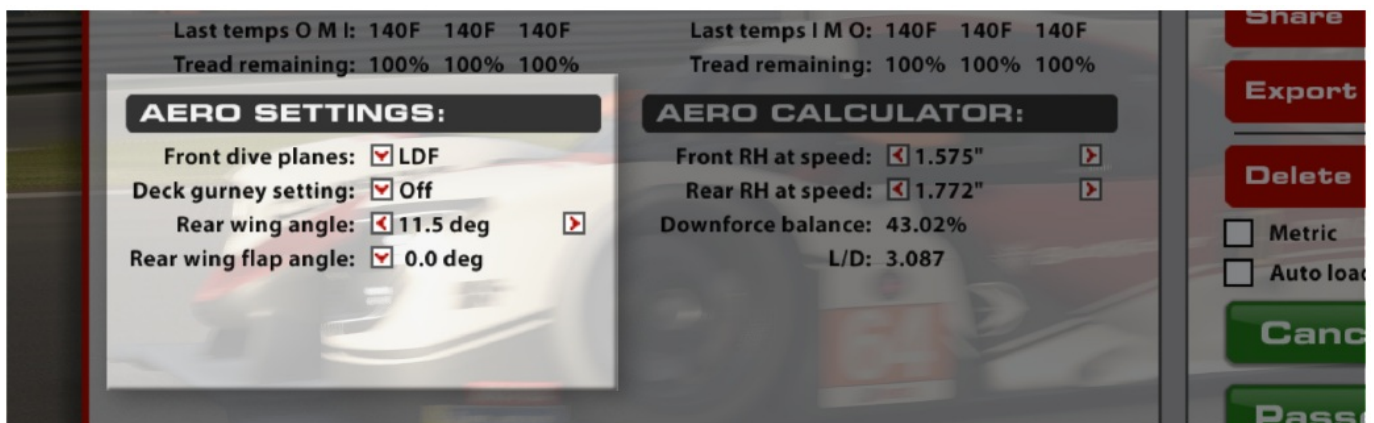
## LAST TEMPS

- Tire carcass temperatures once the car has returned to the pits or the driver has gotten out of the car. Wheel Loads and the amount of work a tire is doing on track are 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 (predominantly camber) while on track.
- These values are measured in three zones across the tread of the tire. Inside, Middle and Outer relative to the chassis centerline.

## TREAD REMAINING

- The amount of tread remaining on the tire once the car has returned to the pits or the driver has gotten out of the car.
- Tire wear is very helpful in identifying any possible issues with alignment, such as one side of the tire wearing excessively, and can be used in conjunction with tire temperatures to analyze the car's handling balance. These values are measured in the same zones as those of temperature.

## AERO SETTINGS



## FRONT DIVE PLANES

- The Front Dive Planes are aerodynamic surfaces attached to the front fenders beneath the headlights. These can dramatically increase the downforce produced at the front of the car while shifting the aero balance forward but will increase drag slightly.
- Three variations are available: The High Downforce (HDF) option will install a full dive plane and greatly increase downforce and drag. The Medium Downforce (MDF) will install a partial dive plane, reducing drag over the HDF option but with less downforce.
- The Low Downforce (LDF) option will remove the dive planes completely, an option for when top speed is absolutely crucial for best performance.

## **DECK GURNEY SETTING**

- The Deck Gurney is a small flap installed at the rear of the car to increase overall downforce. Using this aerodynamic device will increase rear downforce as well as total downforce, but will also increase drag.

## **REAR WING ANGLE**

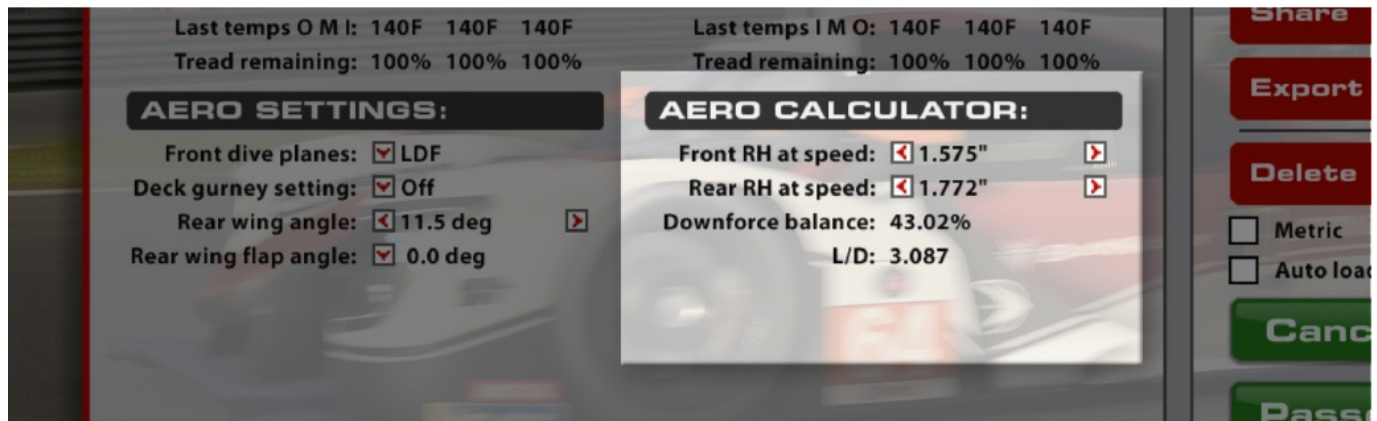
- Changing the Rear Wing Angle will alter the angle of attack of the entire rear wing assembly.
- Higher angles will increase downforce and shift aero balance rearward but will also increase drag. Lower angles will reduce drag and downforce while shifting the aero balance forward.
- It's very important to tune the Rear Wing angle to suit the track characteristics for optimum performance: Higher-speed tracks will usually benefit from the reduced drag of a lower wing angle while slower, twisty tracks will see better performance with a high wing angle and increased downforce.

## **REAR WING FLAP ANGLE**

- The rear wing features a second element that can be adjusted independently of the rear wing mainplane to fine-tune the downforce level at the rear of the car.
- Just like the Rear Wing Angle adjustment, higher angles will increase downforce and drag at the rear of the car and lower angles will reduce downforce and drag.
- This adjustment value is an offset to a reference angle and can be set to a negative

angle value, with these negative values still producing downforce.

## AERO BALANCE CALCULATOR



- The Aero Calculator is a tool provided to aid in understanding the shift in aerodynamic balance associated with adjustment of the rear wing setting and front and rear ride heights.
- It is important to note that the values for front and rear ride height displayed here DO NOT result in any mechanical changes to the car itself; however, changes to the rear wing angle here WILL be applied to the car.
- This calculator is a reference tool ONLY.

### FRONT RH AT SPEED

- The Ride Height (RH) at Speed is used to give the Aero Calculator heights to reference for aerodynamic calculations.
- When using the aero calculator, determine the car's Front Ride height via telemetry at any point on track and input that value into the "Front RH at Speed" setting.

### REAR RH AT SPEED

- The Ride Height (RH) at Speed is used to give the Aero Calculator heights to reference for aerodynamic calculations.
- When using the aero calculator, determine the car's Rear Ride height via telemetry at any point on track and input that value into the "Front RH at Speed" setting.

### DOWNFORCE BALANCE

- Displayed in percent of Front downforce, this value shows how much of the car's total downforce is over the front axle.
- A higher percentage value indicates an increase in front downforce, increasing oversteer in mid- to high-speed corners.
- A lower percentage value indicates an increase in rear downforce, increasing understeer in mid- to high-speed corners.

## **(L/D)**

- The "L/D" value is the ratio of Lift (downforce) to Drag.
- This quantifies how efficiently the car's bodywork is producing downforce in terms of how much drag is being produced as a result. A higher L/D value means more downforce is being produced for each unit of drag, meaning the bodywork is being more efficient.
- Having a higher L/D value without sacrificing overall downforce will result in a faster, more efficient car. Optimum values for L/D can vary based on the aerodynamic configuration and track type.

## **CHASSIS**

### **FRONT**

#### **HEAVE SPRING**

The front Heave Spring is a suspension element that handles external loads from purely vertical loads and doesn't control loads that would induce chassis roll when cornering. Generally, these loads are present for increasing downforce loads at higher speeds, dips and crests in the track, or under heavy braking. Higher rate values will stiffen the suspension in heave, which is good for controlling ride heights to maintain a good aerodynamic platform, but can produce a bouncing effect on rough surfaces. Lower rates will absorb bumps and loads more easily, but will hurt the aerodynamic platform due to excessive chassis movement.

#### **HEAVE PERCH OFFSET**

- The Heave Perch Offset is used to adjust preload on the Heave Spring.



- This is one of two methods to adjust ride height through the front Heave element, with lower values preloading the spring more and raising front ride heights.
- Conversely, higher values will unload the spring and reduce front ride heights.

## **HEAVE SPRING DEFLECTION**

Heave Spring Deflection represents the amount the Heave Spring is compressed under static conditions, essentially a display of the preload on the Heave Spring. This can change as a result of adjusting almost everything else on the chassis, so special attention should be paid to ensure the deflection, and thus the spring preload, remains the same after making setup changes. This setting is directly adjustable through the Heave Perch Offset setting, with higher deflection values indicating more static compression and higher spring preload.

## **HEAVE SLIDER DEFLECTION**

The Heave Slider is a mechanism that keeps the Heave Spring assembly moving in a linear fashion without producing the forces that a damper would produce. The Slider Deflection is how far this slider mechanism is mounted on has compressed from fully extended. This has no influence on the chassis handling, but is a way to see how much travel is available before the slider bottoms out.

## **PUSHROD LENGTH ADJUSTMENT**

- This adjusts the length of both front suspension pushrods together, shown as an offset from a baseline length figure. This is a great way to adjust front ride height without altering the preload on the Heave Spring or either front Torsion Bars.

## **ARB SIZE**

The ARB (Anti-Roll Bar) size alters the stiffness of the front suspension in roll. Increasing the ARB size will increase the roll stiffness of the front suspension, resulting in less body roll but increasing mechanical understeer. This can also, in some cases, lead to a more responsive steering feel from the driver. Conversely, reducing the ARB size will soften the suspension in roll, increasing body roll but decreasing mechanical understeer. This can result in a less-responsive feel from the steering, but grip across the front axle will increase.

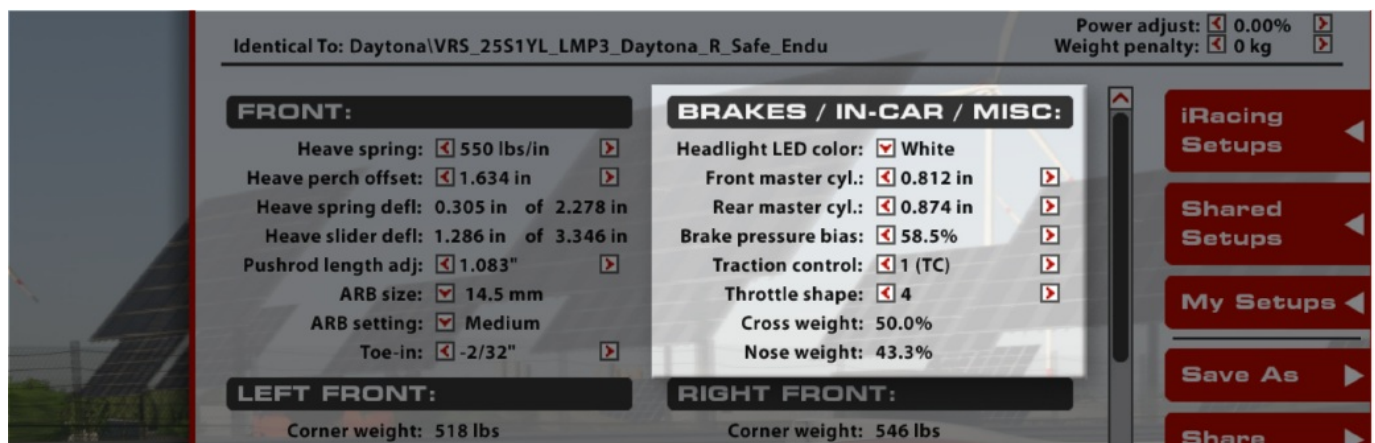
## ARB SETTING

The ARB Setting is a fine-tuning adjustment that alters the overall stiffness of the front ARB assembly. The Soft setting will provide the least roll resistance and induce some oversteer while cornering, while the Hard setting will provide the most roll resistance and shift the mechanical balance towards understeer. The Medium option falls between the two settings in both roll stiffness and handling balance.

## TOE-IN

Toe is the angle of the wheel, looking from vertical, relative to the chassis centerline. Toe-in is when the front of the wheels are closer to the centerline, while Toe-out is when the front of the wheels are farther from the centerline than the rear of the tires. On the front end, Toe will alter how quickly the tires respond to steering inputs and influence how stable the car is in a straight line. Toe-out settings (negative garage value) will increase turn-in response and make the car less stable in a straight line, while Toe-in (positive garage value) will increase straight-line stability while making initial steering response more sluggish.

## BRAKES / IN-CAR / MISC



## HEADLIGHT LED COLOR

This changes the color of the LED light strip around the outside of the headlights, useful for identifying a specific car on track when multiple cars share the same livery. This has no effect on vehicle performance.

## FRONT MASTER CYLINDER

The Front Brake Master Cylinder size can be changed to alter the line pressure to the front brake calipers. A larger master cylinder will reduce the line pressure to the front

brakes, which will shift the brake bias rearwards and increase the pedal effort required to lock the front wheels. A smaller master cylinder will increase brake line pressure to the front brakes, shifting brake bias forward and reducing required pedal effort to lock the front wheels.

## **REAR MASTER CYLINDER**

The Rear Brake Master Cylinder size can be changed to alter the line pressure to the rear brake calipers. A larger master cylinder will reduce the line pressure to the rear brakes, which will shift the brake bias forwards and increase the pedal effort required to lock the rear wheels. A smaller master cylinder will increase brake line pressure to the rear brakes, shifting brake bias rearward and reducing required pedal effort to lock the rear wheels.

## **BRAKE PRESSURE BIAS**

Brake Bias is the percentage of braking force that is being sent to the front brakes. Values above 50% result in more pressure being sent to the front, while values less than 50% send more force to the rear. This should be tuned for both driver preference and track conditions to get the optimum braking performance for a given situation.

## **TRACTION CONTROL**

This setting alters how much the Traction Control system will cut engine torque to prevent wheelspin in heavy throttle application or low-grip conditions. Higher values will be more aggressive with torque cut to reduce wheelspin, while lower values will allow slightly more wheelspin before intervening. Setting this value to "0" will disable the Traction Control. This value is adjustable from the in-car F8 black box.

## **THROTTLE SHAPE**

The Throttle Shape setting will adjust how linear the torque delivery is based on the throttle pedal position. Setting "1" is purely linear, with a given percent of throttle delivering a similar percentage of max torque (25% throttle = 25% torque). As settings are increased, the torque delivery becomes more non-linear, similar to a butterfly-style throttle: less torque increase at very low and very high throttle percentages and more torque increase in the throttle's mid-range. This will change the feel of the car when the throttle is initially applied and is a good tool for drivers with various driving styles.

## **CROSS WEIGHT**

Cross weight is the amount of weight on the car's Left-Rear and Right-Front tires relative to the total weight of the car, displayed in percent. This is adjusted via the corner spring preload adjustments (Front Torsion Bar Turns and Rear Spring Perch Offset). This

value should be around 50% for most tracks, with the garage tech limiting the value between 49.5% and 50.5%.

## NOSE WEIGHT

Nose Weight is the amount of weight on the car's front axle relative to the total weight of the car, displayed in a percentage. This is not directly adjustable, aside from varying fuel loads, but can have an effect on the chassis handling balance: Higher nose weight values will lead to understeer in slower corners, while lower values will trend towards oversteer.

## FRONT CORNERS



## CORNER WEIGHT

The weight underneath each tire under static conditions in the garage. The correct weight arrangement around the car is crucial for optimizing a car for a given track and conditions. Individual wheel weight adjustments and crossweight adjustments are made via the Spring Perch Offset settings.

## RIDE HEIGHT

Distance from ground to a reference point on the chassis. Since these values are measured to a specific reference point on the car, these values may not necessarily reflect the vehicle's ground clearance, but instead provide a reliable value for the height of the car off of the race track at static values. Adjusting Ride Heights is key for optimum performance, as they can directly influence the vehicle's aerodynamic performance as well as mechanical grip. Increasing the front ride height will decrease overall downforce and shift the aerodynamic balance rearward, but will decrease drag slightly. Conversely,

reducing front ride height will increase downforce and shift aero balance forward while slightly increasing overall drag.

### **SPRING PERCH OFFSET**

Used to adjust the ride height at a corner of the car by changing the installed position of the spring's upper perch. Increasing the spring perch offset will reduce spring preload, lowering the corner of the car. Reducing the spring perch offset will increase spring preload and raise the corner of the car. These changes should be kept symmetrical across the axle (left to right) to ensure the same corner ride heights and no change in cross weight.

### **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) is required to compress the spring a specific distance. 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 splitter 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). Due to homologation rules, front spring rates must be symmetrical across the rear axle and can only be changed in pairs.

### **SPRING RATE**

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front spring rates must be symmetrical across the rear axle and can only be changed in pairs.

## SHOCK DEFLECTION

Similar to Spring Deflection, Shock Deflection is how much the shock is compressed from its fully extended length. While this is not a representation of any kind of loading on the shock, it is a way to see how much travel is available in the suspension before the shock runs out of available travel and contacts any travel-limiting devices. Be careful to pay attention to how much deflection is available for suspension extension, as the tire will become unloaded when shock deflection reaches zero.

## 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. Due to suspension geometry and corner loads, negative camber is desired on all four wheels. Higher negative camber values will increase the cornering force generated by the tire, but will reduce the amount of longitudinal grip the tire will have under braking. Excessive camber values can produce very high cornering forces but will also significantly reduce tire life, so it is important to find a balance between life and performance.

## REAR CORNERS



## CORNER WEIGHT

The weight underneath each tire under static conditions in the garage. The correct weight arrangement around the car is crucial for optimizing a car for a given track and conditions. Individual wheel weight adjustments and crossweight adjustments are made via the Spring Perch Offset setting.

## RIDE HEIGHT

Distance from ground to a reference point on the chassis. Since these values are measured to a specific reference point on the car, these values may not necessarily reflect the vehicle's ground clearance, but instead provide a reliable value for the height of the car off of the race track at static values. Adjusting Ride Heights is key for optimum performance, as they can directly influence the vehicle's aerodynamic performance as well as mechanical grip. Raising the rear ride height will increase overall downforce and shift aero to the front of the car but will increase drag. Decreasing rear ride height will do the opposite, with aero shifting rearward and overall downforce and drag decreasing.

### **SPRING PERCH OFFSET**

Used to adjust ride height and corner weight, adjusting this setting applies a preload to the spring under static conditions. Decreasing the value increases preload on the spring, adding weight to its corner and increasing the ride height at that corner. Increasing the value does the opposite, reducing height and weight on a given corner. These should be adjusted in pairs (left and right, for example) or with all four spring preload adjustments in the car to prevent crossweight changes while adjusting ride height.

### **SPRING RATE**

Spring Rate changes how stiff the spring is, represented in a force per unit of displacement. Primarily responsible for maintaining ride height and aerodynamic attitude under changing wheel loads, stiffer springs will maintain the car's aero platform better while sacrificing mechanical grip. Softer springs will deal with bumps better and increase mechanical grip, but will cause the car's aerodynamic platform to suffer. Due to homologation rules, rear spring rates must be symmetrical across the rear axle and can only be changed in pairs.

### **SPRING DEFLECTION**

The Spring Deflection value is how far the spring has compressed from its length when unloaded. This is a way to see how much each spring is preloaded and whether or not the chassis setup has any kind of asymmetry that could lead to inconsistent handling characteristics.

### **SHOCK DEFLECTION**

Similar to Spring Deflection, Shock Deflection is how much the shock is compressed from its fully extended length. While this is not a representation of any kind of loading on the shock, it is a way to see how much travel is available in the suspension before the shock runs out of available travel and contacts any travel-limiting devices. Be careful to pay attention to how much deflection is available for suspension extension, as the tire



will become unloaded when shock deflection reaches zero. This is especially important for the rear of the car during braking and high-rake configurations, since running out of shock travel could cause sudden oversteer.

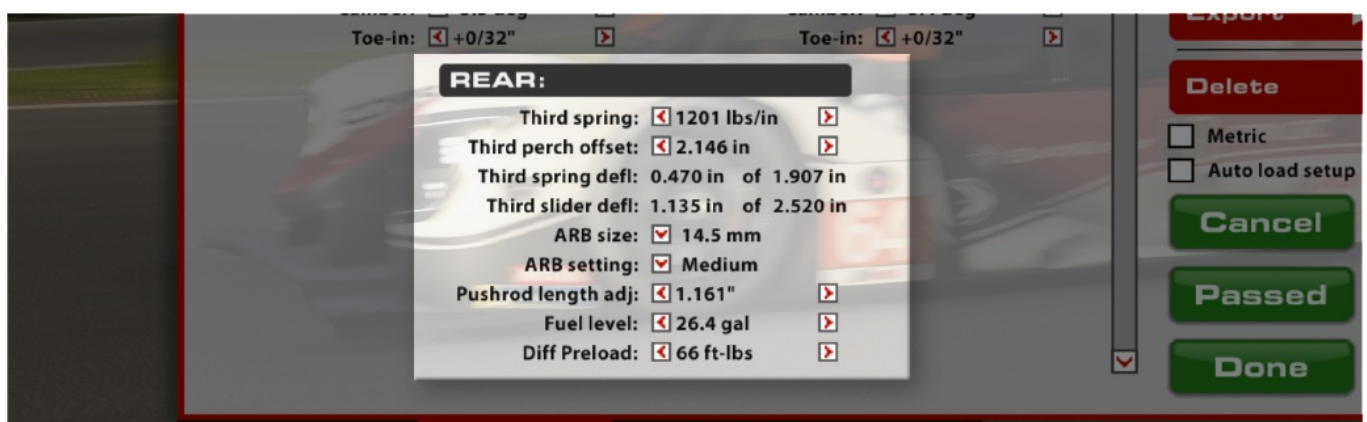
## CAMBER

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. Due to suspension geometry and corner loads, negative camber is desired on all four wheels. Higher negative camber values will increase the cornering force generated by the tire, but will reduce the amount of grip the tire will have under braking. Excessive camber values can produce very high cornering forces but will also significantly reduce tire life, so it is important to find a balance between life and performance. Higher rear camber values can increase cornering stability but reduce straight-line stability under braking, while lower rear camber values can often increase traction out of low-grip corners.

## TOE-IN

The toe is the angle of the wheel, when viewed from above, relative to the centerline of the chassis. Toe-in is when the front of the wheel is closer to the centerline than the rear of the wheel, and Toe-out is the opposite. On the rear end, adding toe-in will increase straight-line stability but may hurt how well the car changes direction.

## REAR



## THIRD SPRING

The Third Spring, similar to the front Heave Spring, is a spring element configured to provide resistance only in vertical suspension movement without affecting roll stiffness. This spring element is helpful with controlling increasing aerodynamic loads and

maintaining the proper aerodynamic attitude around a circuit. The rear end's third spring is crucial in maintaining and controlling the rear ride height around a circuit to maximize the downforce produced by the rear bodywork.

### **THIRD PERCH OFFSET**

The Third Perch Offset is used to adjust preload on the rear Third Spring. This is one of two methods to adjust ride height through the rear Third Spring element, with lower values preloading the spring more and raising front ride heights. Conversely, higher values will unload the spring and lower front ride heights.

### **THIRD SPRING DEFLECTION**

Third Spring Deflection represents the amount the rear Third Spring is compressed under static conditions. This is not directly adjustable but will change with adjustments to the Third Perch Offset and rear Spring settings.

### **THIRD SLIDER DEFLECTION**

The Slider Deflection is how far the slider mechanism the Third Spring is mounted on has compressed from fully extended. Similar to a shock but without any damping forces produced, this doesn't influence the suspension's behavior.

### **ARB SIZE**

The ARB (Anti-Roll Bar) size alters the stiffness of the rear suspension in roll. Increasing the ARB size will increase the roll stiffness of the rear suspension, resulting in less body roll but increasing mechanical oversteer. Conversely, reducing the ARB size will soften the suspension in roll, increasing body roll but decreasing mechanical oversteer. This can result in a less-responsive feel from the steering, but grip across the rear axle will increase.

### **ARB SETTING**

The ARB Setting is a fine-tuning adjustment that alters the overall stiffness of the rear ARB assembly. The Soft setting will provide the least roll resistance and induce some understeer while cornering, while the Hard setting will provide the most roll resistance and shift the mechanical balance towards oversteer. The Medium option falls between the two settings in both roll stiffness and handling balance.

### **PUSHROD LENGTH ADJUSTMENT**

This adjusts the length of both rear suspension pushrods together, shown as an offset from a baseline length figure. This is a great way to adjust rear ride height without altering the preload on the Heave Spring or either of the rear corner springs.

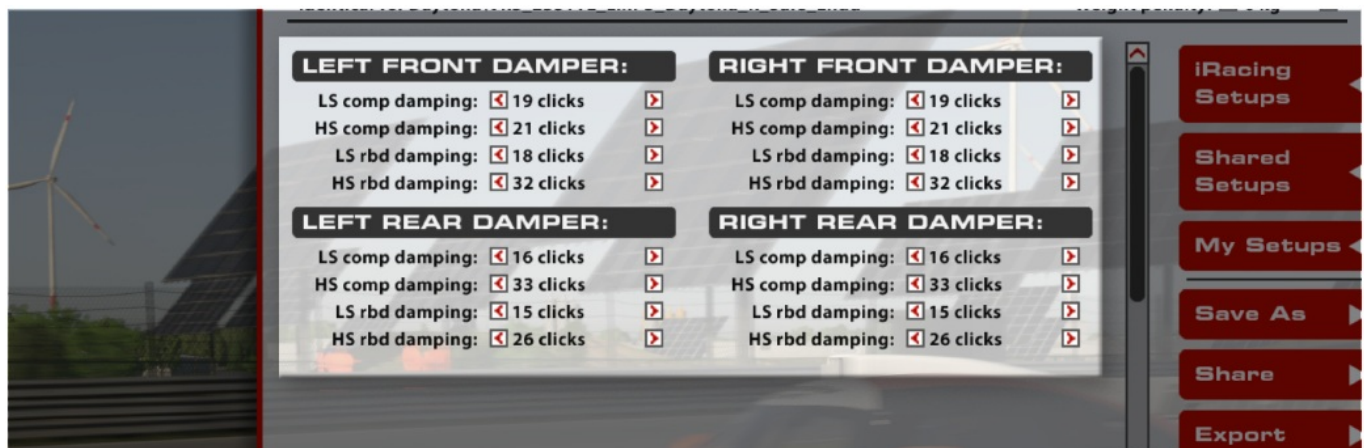
### **FUEL LEVEL**

Fuel level is the amount of fuel in the fuel tank when the car leaves the garage.

## DIFF PRELOAD

The differential can be set with a static load applied. Higher values produce more locking force in the differential in all conditions, producing more understeer under acceleration and deceleration. This value will also affect mid-corner performance, with higher values not allowing the differential to unlock as much, increasing mid-corner understeer.

## DAMPERS



### LS COMPRESSION DAMPING

Low Speed Compression affects how resistant the shock is to compression (reduction in length) when the shock shaft is moving at relatively low speeds, usually during movement caused by driver input (steering, braking, & throttle) and typical cornering forces. Higher values will increase compression resistance and transfer load onto a given tire under these low-speed conditions more quickly.

### HS COMPRESSION DAMPING

High compression affects the shock's behavior in high-speed travel, usually attributed to curb strikes and bumps in the track's surface. Higher compression values will cause the suspension to be stiffer in these situations, while lower values will allow the suspension to absorb these bumps better but may hurt the aerodynamic platform around the track and risk the bottom of the chassis coming into contact with the track surface.

### LS REBOUND DAMPING

Low-speed Rebound damping controls the stiffness of the shock while extending at lower speeds, typically during body movement as a result of driver inputs. 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 wheel being unloaded when the suspension can't expand fast enough to maintain proper contact with the track. Excessive rebound can lead to unwanted oscillations due to the wheel bouncing off of the track surface instead of staying in contact.

## **HS REBOUND DAMPING**

High-speed rebound adjusts the shock in extension following large bumps and curb strikes. Higher values will reduce how quickly the shock will expand, while lower values will allow the shock to extend more easily. Despite not having as much of an effect on handling in response to driver inputs, High-speed rebound can produce similar results in terms of aerodynamic control and uncontrolled oscillations if set improperly.

## **SETUP TIPS**

- This section is aimed toward helping users who want to dive deeper into the different aspects of the vehicle's setup.

## **SETUP TIPS**

- This car has third and heavy springs, allowing you to adjust pitch motion (and dynamic ride heights) without affecting roll stiffness. Use these in conjunction with the corner springs to set the dynamic ride heights of the car.
- The provided baseline setups have their ride heights and springs set to take advantage of the aerodynamic properties of the car. You are encouraged to experiment and optimize them further, but keep in mind that settings that stray far from the existing dynamic ride heights are likely to generate less downforce.

## **ADJUSTING THE IRACING BASELINE SETUPS**

- This setup and other setups that have been provided are intended to be raceable setups as well as a good place to start while making your own adjustments.
- These notes will give you a starting point to help you make appropriate setup choices.
- A framework you can use to start making adjustments is to understand whether a tweak affects aerodynamic balance or mechanical balance characteristics of the car, and to try to achieve a neutral (no oversteer or understeer) balance on both.

- In high speed corners, aero balance has a large effect compared to mechanical balance, so we can use high-speed corners to tweak our aero balance for a rough baseline that we can trust while tweaking other parts of the setup.
- Starting out, it's easiest to set the aero balance first before dialing in the mechanical balance.

## **AERODYNAMIC BALANCE**

- There are two parts to setting the correct aerodynamic balance for your car: the options that affect aerodynamic balance directly in the garage (wing angles and garage ride heights) as well as options that affect the car's dynamic ride heights at speed (heave, third, and corner springs) and transient motions (dampers).
- These settings all interact to determine what overall aero balance the car has through different types of corners.
- Keep in mind that aero balance is still in effect in low-speed corners – although its effect is diminished, it will have an impact on the car's handling.
- Also, consider that some options that affect aero balance, particularly those that affect the car's dynamic ride heights, will also have an effect on roll behavior and therefore, mechanical balance.
- For example, softening the front corner springs will allow the front to sink lower at speed.
- This increases the difference between front and rear ride heights, which pushes aero balance further forward (more oversteer) while also lowering the total roll resistance of the front as if you had softened the anti-roll bar.
- On the other hand, third and heavy springs (and their corresponding dampers) only affect pitch motion of the car.
- These are used to tweak dynamic ride heights without affecting roll behavior or general mechanical balance.
- In high speed corners, aero balance has a large effect compared to mechanical balance, so we can use high-speed corners to tweak our aero balance for a rough baseline that we can trust while tweaking other parts of the setup.
- Starting out, it's easiest to set the aero balance first before dialing in the mechanical balance.

## **MECHANICAL BALANCE**

- Options that affect the chassis's roll stiffness (anti-roll bars, corner springs, and dampers in transient motions) and differential settings play into what is felt as mechanical balance.
- As you are adjusting roll stiffness, be aware of the total roll stiffness as well as the balance between front and rear roll stiffness.
- The balance between front and rear stiffness can be felt as balance shifts between turn-in and on-throttle behavior, while total roll stiffness affects the overall responsiveness and pliability of the car while turning.
- In the Ligier JS P320, the only differential adjustment available is the preload adjustment.
- As a driver, this adjustment is the easiest to understand: less preload will make the car oversteer more on corner entry and understeer on corner exit and vice versa.

## **TIRE CONTACT PATCH**

- The last consideration is the tire contact patch. Settings that affect the tire contact patch (camber and toe) behave mostly independently of other settings, which makes them easy to tweak at any point along the setup process.
- However, they can be difficult to optimize if other parts of the car's balance are inducing undesirable behaviors.
- Use toe adjustments to adjust how much resistance the tires provide to your initial turn-in – for example, if you want more braking stability, you can add positive toe in the rear.
- For camber, consider the trade-off between camber thrust (the additional lateral force that the angled tire provides) and contact patch size.
- The more camber used, the more lateral force will be generated at the cost of longitudinal grip (grip under braking and acceleration, due to the smaller contact patch).

## **FINAL NOTE**


- As you make changes to each setup option, it is likely that you will reach a point where you are unsure if a change is helping the car's balance or not.

- That often happens when another option is inducing an undesirable behavior and covering up details of the option you are currently adjusting.
- When this happens, try experimenting with another setting and see if it is more effective in optimizing the car's balance.

## FAQ


- **Q: How do I access baseline setups for different tracks?**
  - **A:** Open the Garage, click iRacing Setups, and choose the appropriate setup for your track. If not available, select a setup for a similar track.
- **Q: Is manual clutch operation required for shifting?**
  - **A:** No, manual clutch operation is not required for shifting in the Ligier JS P320.

## Documents / Resources

|  |   |
|--|---|
|  | <p><a href="#">iRacing JS P320 Motorsport Simulations [pdf]</a> User Manual</p> <p>V2, JS P320 Motorsport Simulations, JS P320, Motorsport Simulations, Simulations</p> |
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## References

- [User Manual](#)

 iRacing, JS P320, JS P320 Motorsport Simulations, Motorsport Simulations, Simulations,

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