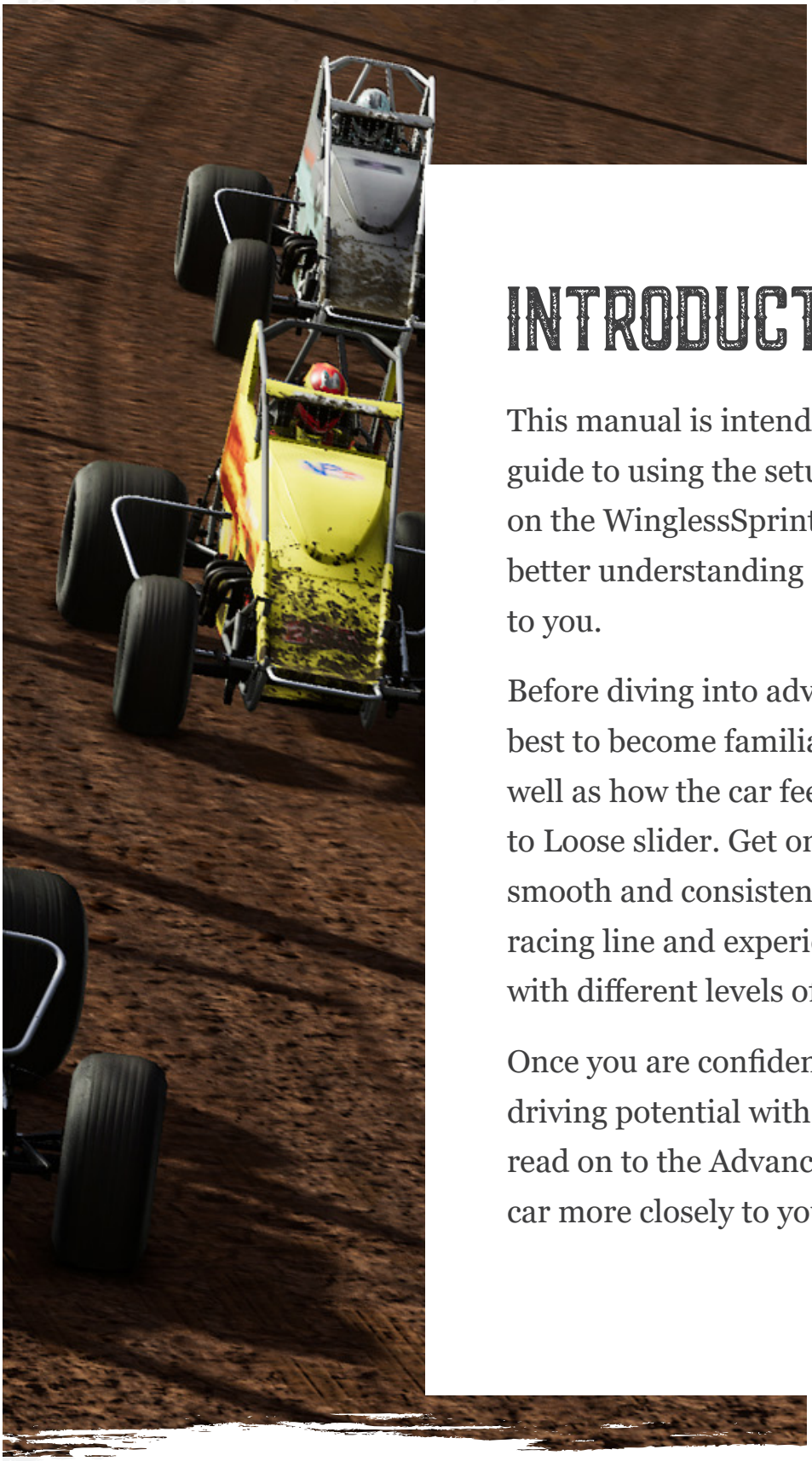
WORLD OF OUTLAWS DIRT RACING 24

OWNERS' WORKSHOP MANUAL

GET TO KNOW YOUR 410 NON-WING SPRINT CAR



INTRODUCTION

This manual is intended to provide you with a guide to using the setup adjustments available on the WinglessSprint Car so that you can have a better understanding of the adjustments available to you.

Before diving into advanced setup changes, it is best to become familiar with the car and track as well as how the car feels when you adjust the Tight to Loose slider. Get on track and focus on making smooth and consistent laps, identifying the proper racing line and experiencing the handling of the car with different levels of Tight to Loose.

Once you are confident that you are nearing your driving potential with the Tight to Loose slider, read on to the Advanced section to begin tuning the car more closely to your handling preferences.

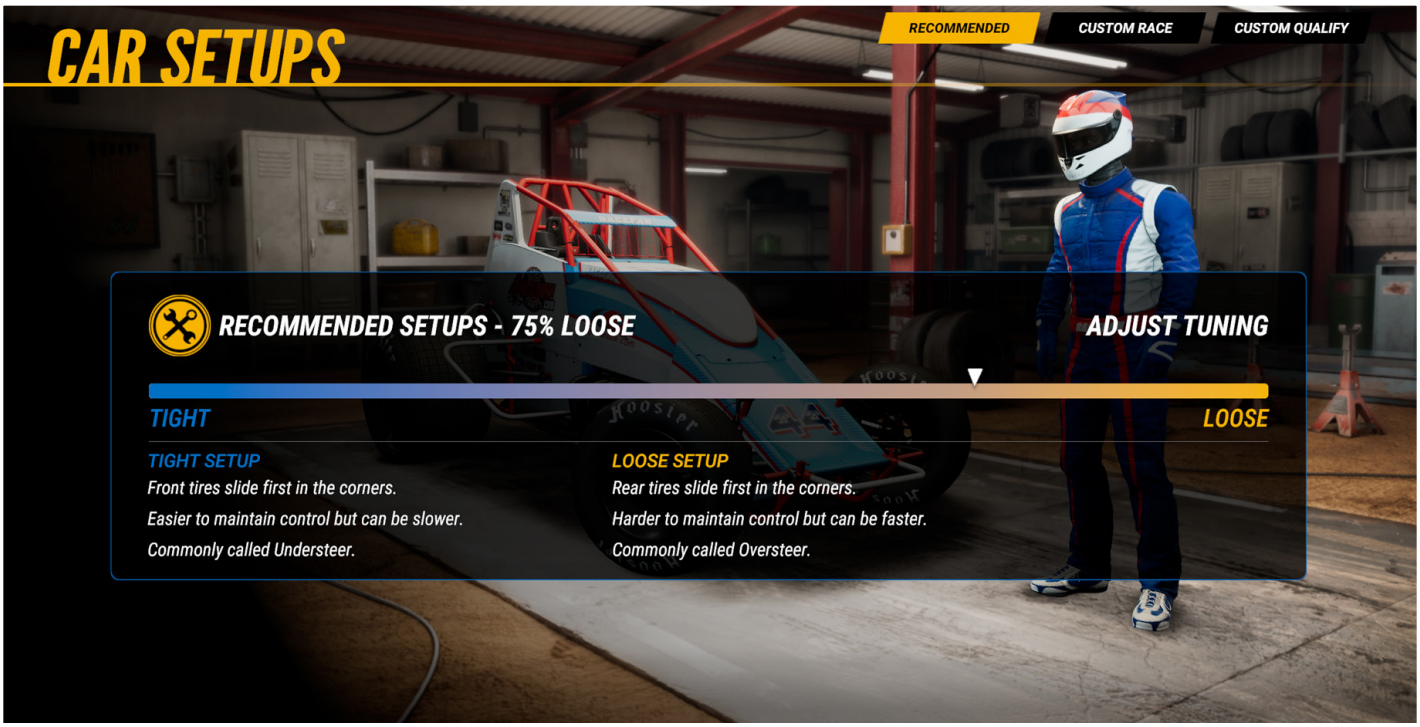
TECH SPECS

CHASSIS		
DESCRIPTION	4-link solid axle front and rear with torsion bars	
LENGTH	120 in	3048 mm
WIDTH	78 in	1981 mm
WHEELBASE	90 in	2286 mm
DRY WEIGHT	1300 lbs	590 kg
WET WEIGHT W/ DRIVER	1583 lbs	718 kg

POWER UNIT		
DESCRIPTION	Naturally aspirated steel block pushrod V8	
CAR	410 Non-Wing Sprint Car	
DISPLACEMENT	410 cid	6.7 Liter
TORQUE	540 lb-ft	732 Nm
POWER	720 bhp	537 kW

BASIC CAR SETUP

For those who wish to change the car's handling characteristics without diving into the Custom Setup options, the Recommended setups can be adjusted with the Tight/Loose slider in the Car Setups menu. Changing the slider setting towards either Loose or Tight will automatically adjust the car's setup to behave that way.



TIGHT SETUP

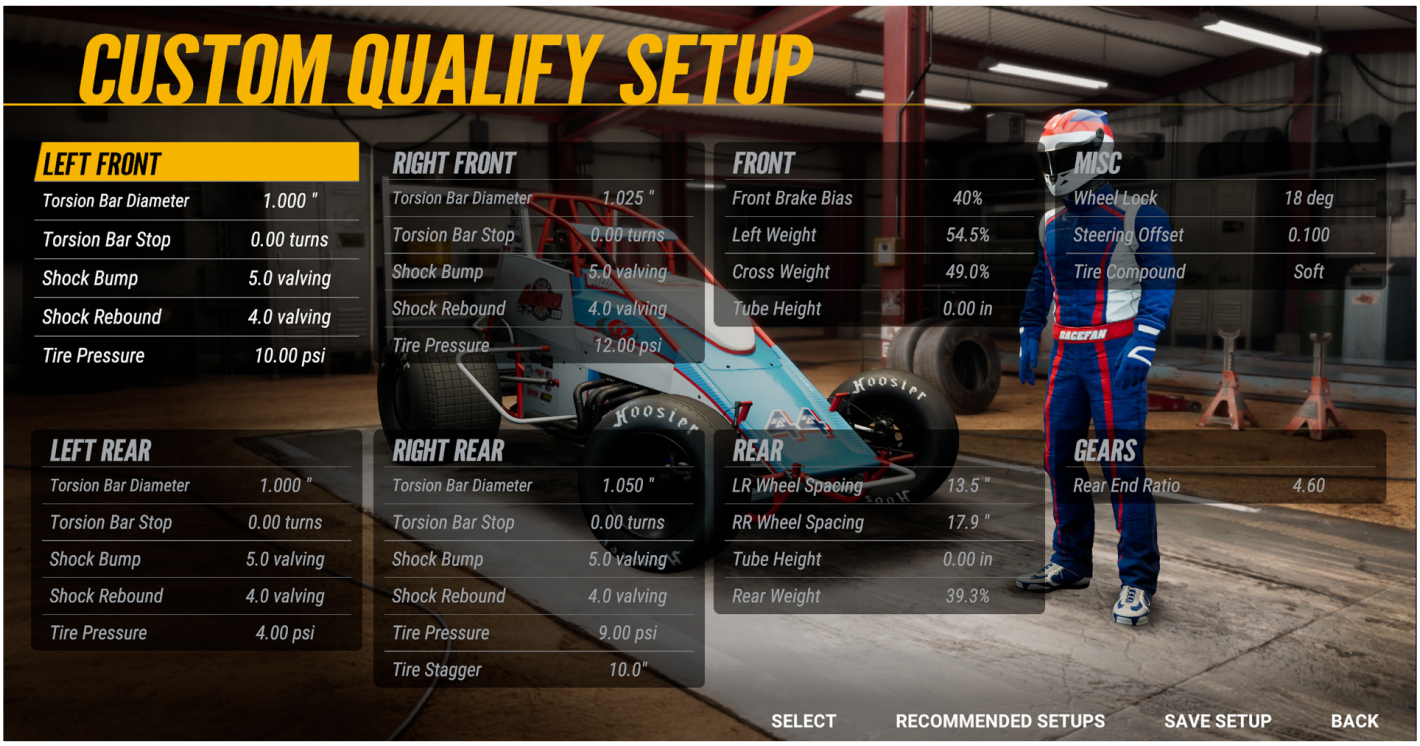
A Tighter setup will generally be easier to control, especially on throttle. Generally, tight setups will lose front grip while cornering,a condition known as Understeer. These setups will not turn as easily, and can sometimes be slower, but will be easier to apply the throttle with.

LOOSE SETUP

A Loose setup will be more difficult to control because it will tend to lose rear grip when cornering, a condition known as Oversteer. These setups will turn better and be more difficult to apply the throttle due to the reduced grip, but can be faster in some cases. However, an excessively loose setup can be slower due to the lack of rear grip.

ADVANCED CAR SETUP

Once you are confident that you are nearing your driving potential with the Tight to Loose slider, begin tuning the car more closely to your handling preferences with the following adjustments.



CORNERS

TORSION BAR DIAMETER

This changes how large the torsion bar is on each corner of the car, which serves as the spring stiffness for the suspension. Smaller diameters (softer spring rate) allow for more mechanical grip and deal with bumps better, while larger diameters (stiffer spring rate) produce better response to driver inputs. Smaller, slower tracks will benefit from smaller bars while larger bars will work better at fast, high-banked tracks.

LEFT FRONT

LARGER	LOOSER ON TURN-IN
SMALLER	TIGHTER ON TURN-IN

RIGHT FRONT

LARGER	TIGHTER ON TURN-IN
SMALLER	LOOSER ON TURN-IN

LEFT REAR

LARGER	TIGHTER ON EXIT
SMALLER	LOOSER ON EXIT

RIGHT REAR

LARGER	LOOSER ON EXIT AND THROTTLE
SMALLER	TIGHTER ON EXIT

TORSION BAR STOP

The Torsion Bar Stop adjustment adjusts the preload on the torsion bars for each corner, which changes the load on the tire while cornering. More turns increases load on the tire, fewer turns decreases the load on the tire.

LEFT FRONT

MORE TURNS	LOOSER
FEWER TURNS	TIGHTER

RIGHT FRONT

MORE TURNS	TIGHTER
FEWER TURNS	LOOSER

LEFT REAR

MORE TURNS	TIGHTER
FEWER TURNS	LOOSER

RIGHT REAR

MORE TURNS	LOOSER
FEWER TURNS	TIGHTER

SHOCK BUMP

Shock Bump affects how stiff the shock is in compression (reduction in length). Higher values will make the shock harder to compress (good for smooth conditions), while lower values make the shock easier to compress (good for bumpy conditions). Differences between corner bump stiffnesses change the overall balance of the car on corner entry and exit, but not in the center of the corner.

FRONT

HIGHER	TIGHTER ON ENRTY
LOWER	LOOSER ON ENTRY

REAR

HIGHER	TIGHTER ON EXIT
LOWER	LOOSER ON EXIT

SHOCK REBOUND

Shock Rebound affects how stiff the shock is during expansion (increase in length). Higher rebound values will slow expansion of the shock, which is good for aero and smooth conditions, while lower values will allow the shock to extend faster, which is good for bumpy conditions to prevent unloading the tires. Differences between corner rebound stiffnesses change the overall balance of the car on corner entry and exit, but not in the center of the corner.

LEFT FRONT

HIGHER	TIGHTER ON EXIT
LOWER	LOOSER ON EXIT

RIGHT FRONT

HIGHER	LOOSER ON EXIT
LOWER	TIGHTER ON EXIT

LEFT REAR

HIGHER	LOOSER ON ENTRY
LOWER	TIGHTER ON ENTRY

RIGHT REAR

HIGHER	TIGHTER ON ENTRY
LOWER	LOOSER ON ENTRY

TIRE PRESSURE

Air pressure in the tire. Higher pressures will reduce grip while lower pressures will increase grip. Higher speeds and loads will require higher pressures, while lower speeds and loads will see better performance from lower pressures. Pressures should be set to track characteristics for best performance.

LEFT FRONT

HIGHER	LOOSER ON TURN-IN
LOWER	TIGHTER ON TURN-IN

RIGHT FRONT

HIGHER	TIGHTER ON TURN-IN
LOWER	LOOSER ON TURN-IN

LEFT REAR

HIGHER	TIGHTER ON EXIT
LOWER	LOOSER ON EXIT

RIGHT REAR

HIGHER	LOOSER ON EXIT AND THROTTLE
LOWER	TIGHTER ON EXIT

TIRE STAGGER

Stagger is the difference in size of the left-rear and right-rear tire.

HIGHER STAGGER

BETTER TURN-IN
MORE OVERSTEER THROUGH CENTER AND EXIT

LOWER STAGGER

MORE UNDERSTEER ON TURN-IN AND CENTER
BETTER TRACTION ON EXIT

FRONT

FRONT BRAKE 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 driver preference and track conditions.

HIGHER BRAKE BIAS	LOWER BRAKE BIAS
MORE UNDERSTEER UNDER BRAKING	MORE OVERSTEER UNDER BRAKING

LEFT WEIGHT

The percentage of vehicle weight that is over the left-side tires.

HIGHER LEFT WEIGHT	LOWER LEFT WEIGHT
LOOSER HANDLING	TIGHTER HANDLING

CROSS WEIGHT

Percentage of total weight in the right front and left rear tires.

HIGHER CROSS WEIGHT	LOWER CROSS WEIGHT
MORE TRACTION ON THROTTLE MORE UNDERSTEER THROUGH THE CORNER	MORE OVERSTEER THROUGH THE CORNER LESS TRACTION ON CORNER EXIT

TUBE HEIGHT

Distance from ground to a reference height on the front end. A lower front ride height can increase front grip, but can also make the car too loose.

LOWER FRONT RIDE HEIGHT	HIGHER FRONT RIDE HEIGHT
MORE OVERALL OVERSTEER	MORE OVERALL UNDERSTEER

REAR

LR WHEEL SPACING

The Left-Rear wheel can be moved inboard or outboard to change the load on the tire while cornering. Higher values move the wheel farther out, lower values move the wheel in.

HIGHER WHEEL SPACING	LOWER WHEEL SPACING
MORE LEFT REAR LOAD CAR IS TIGHTER	LESS LEFT REAR LOAD CAR IS LOOSER

RR WHEEL SPACING

The Right-Rear wheel can be moved inboard or outboard to change the load on the tire while cornering. Higher values move the wheel farther out, lower values move the wheel in.

HIGHER WHEEL SPACING	LOWER WHEEL SPACING
MORE RIGHT REAR LOAD CAR IS LOOSER	LESS RIGHT REAR LOAD CAR IS TIGHTER

TUBE HEIGHT

Distance from ground to a reference height on the rear end. A lower front ride height can increase front grip, but can also make the car too loose.

LOWER FRONT RIDE HEIGHT	HIGHER FRONT RIDE HEIGHT
MORE OVERALL OVERSTEER	MORE OVERALL UNDERSTEER

REAR WEIGHT

Percentage of total weight on the rear tires.

HIGHER REAR WEIGHT	LOWER REAR WEIGHT
MORE OVERSTEER IN HIGH-SPEED CORNERS MORE TRACTION OUT OF LOW-SPEED CORNERS	MORE UNDERSTEER IN HIGH-SPEED CORNERS LESS TRACTION OUT OF LOW-SPEED CORNERS

MISC

WHEEL LOCK

The amount of steering range available at maximum input.

MORE WHEEL LOCK	LESS WHEEL LOCK
HIGHER STEERING RANGE FASTER STEERING RESPONSE	LOWER STEERING RANGE SLOWER STEERING RESPONSE

STEERING OFFSET

This is used to compensate for chassis settings which cause the car to pull in one direction by re-centering the steering wheel to eliminate steering input on the straights.

TIRE COMPOUND

Tire compound changes the softness of the tires on the car. This directly affects grip and will impact handling.

SOFT	MEDIUM	FIRM
HIGH GRIP CAN INDUCE UNDERSTEER	BALANCED GRIP AND HANDLING	LOWER GRIP CAN INDUCE OVERSTEER

GEARS

REAR END RATIO

The Rear End Ratio is the gear ratio between the driveshaft pinion and the differential ring gear. This will affect top speed and acceleration, and should be changed to reach maximum engine RPM by the end of the track's longest straight.

HIGHER RATIO	LOWER RATIO
LOWER TOP SPEED BETTER ACCELERATION	HIGHER TOP SPEED LESS ACCELERATION