SETTING UP THE HUDY WAY

Top competition off road Buggies and Truggies are precision racing machines that feature multiple adjustments allowing you to set up for any track condition. Most modern off road Buggies and Truggies include innovative set up features that allow you to change adjustments quickly to achieve a full range of adjustment. The **HUDY OFF ROAD SETUP BOOK** describes how to adjust your off road vehicle to suit your driving style. This month, with the involvement of the company, we kick off a new column based on the Hudy book as a serialisation.

IN THIS series, we will describe the effects of changing the adjustment and how to make each adjustment.

When setting up the vehicle, it is very important the car sits on an ultra flat surface.

Hudy strongly recommend using the high quality HUDY professional set up tools, including an ultra flat set up board and marking decal which is ideal for every set up adjustment.

The Basic Set Up Sheet for your vehicle is always a very good starting point.

After rebuilding the chassis, or in case you become lost with your set up, always return to the basic starting set up.

If you choose to experiment with set up, make small adjustments one at a time and see if you find any improvement with each adjustment.

When you are at a track, you'll know within a couple of laps whether that adjustment has worked or not.

Bring the car in and think some more if that adjustment hasn't done what you had hoped–there's no point keeping circulating, you're just wasting time and often, especially at a race meeting, practice time is often limited to just a few runs.

Hudy strongly advise you to record and keep track of your set up changes, record which set ups work best at different race tracks under different conditions.

This procedure is called building up experience, something which will become valuable as your racing career gathers pace.

SEVERAL years ago, following the launch of the original XRAY 808 1:8 GP Off Road Buggy, Chief Designer, Juraj Hudy, travelled with his team to USA to race major events in the lead up to the 2008 IFMAR GP Off Road World Championships in USA.

He reported his trip in a column soon after, commenting he was surprised just how little setup knowledge many drivers, including top factory drivers, had.

In typical fashion, he set about righting what he saw as appalling ignorance by producing the Hudy Off Road Setup Guide booklet in which he outlined the principals of setup.

He saw it as a way of assisting all off road drivers, not just those with an XRAY and as a way of increasing the enjoyment of driving and racing a car properly set up.

As any racer will tell you, driving an ill handling car is no pleasure!

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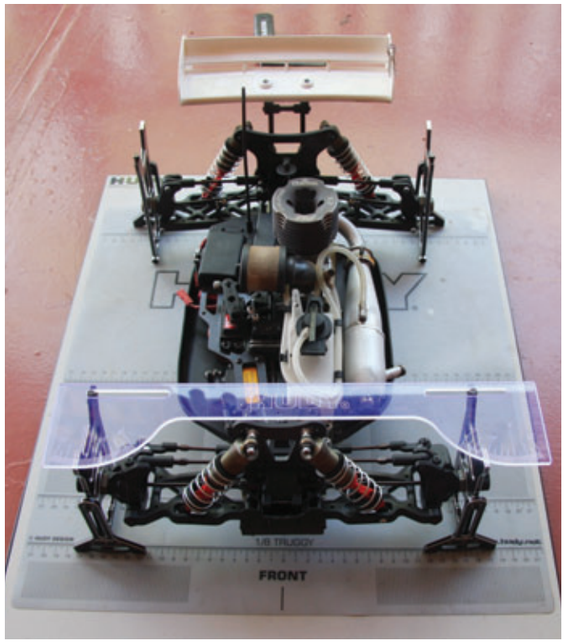
It is something which should be part of every Buggy and Truggy owner's pit bench, whether at home or at the races.



Hudy's Setup Board and Setup Station (left and above) are great investments if you plan to tackle seriously competition racing. Should racing not be on your agenda but you still want a good handling and performing car, these are equally a good investment. As any tradesman will tell you, quality tools are the best investment you can make.

Should you own an XRAY car then you can use blank XRAY Setup Sheets to record your data and setups or use the unique Virtual Online Database setup sheets at the XRAY website, www.teamxray.com.

This way you can upload and share your setup sheets and search for other setup sheets posted by factory team drivers or search particular setup for your track.

The XRAY Virtual Online Database features thousands of setup sheets and is the world's most unique setup sheet source for your reference.

Please note the adjustment possibilities and methods of adjustment shown in this series are particular to the XRAY XB808 series of 1:8 GP Off Road Buggies.

The general theory behind the adjustments applies to all off road vehicles, though the manner in which the measurements and adjustments are made may differ on other vehicles.

Always refer to the manufacturers documentation.

THE BEST EQUIPMENT FOR THE JOB

WHEN setting up, operating and maintaining your off road vehicle, Hudy make a superb range of high quality set up equipment and tools.

Here we highlight a few of those pieces and recommend you seriously consider purchasing some or all.

HUDY SETUP SYSTEM (#108805)
CNC machined aluminium and acrylic components, fully ball bearing equipped and precision engraved.

When you are measuring and adjusting track width, camber and camber rise, caster, toe, steering throw symmetry and tweak, you will need to assemble and install these set up stands.

Once assembled, you will place them on a flat surface such as the Hudy Setup Board.

You will need a Hudy Setup Board Decal (#108212) to complete the system.

DROP GAUGE SUPPORT BLOCKS (#107703)
CNC machined aluminium and precision engraved, these Chassis Droop Gauge Support Blocks allow adjustment of front/rear droop when used with #107711 Hudy Chassis Droop Gauge.

CHASSIS RIDE HEIGHT AND DROOP GAUGE (#107717)
This Chassis Ride Height and Droop Gauge is used in conjunction with #107703 Support Blocks to set and check these important measurements.

UPSIDE MEASURE PLATE (#108841)
Used for the adjustment of camber, caster, front and rear toe, steering throw symmetry and other measurements

SETTING UP THE HUDY SYSTEM

THE HUDY Setup System enables you to measure and adjust the track width, camber and camber rise, caster, toe, steering throw symmetry and tweak on your car.

You will need to assemble and install the Setup Stands.

Note, when you are measuring downstops and ride height, you do not need to use the Setup Stands.

The Setup Board

Hudy's Setup Board is exceptionally flat and warp free and comes with the all important Setup Board Decal which has all the measurements pre-printed onto it.

Setting the decal is the first job and although it doesn't take long, it is important to get it right.

Placing the decal is much the same as using decals on a polycarbonate body–peel off the backing paper and position it on the Setup Board.

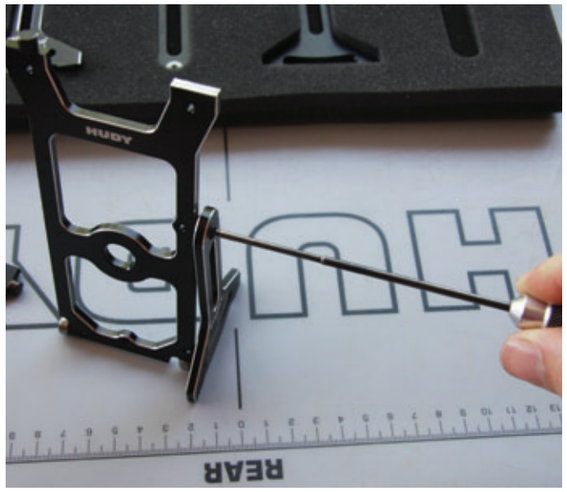
Press down on the Setup Board Decal and slowly work out to the edges, eliminating all air bubbles etc., until it sits perfectly flat.

Setup Stands

The Setup Stands consist of four items: front alloy Side Plates (2), rear alloy Side Plates (2), alloy Camber Gauges (4) and an acrylic Toe Gauge.

Again, installation is straightforward, attach a Camber Gauge to a side plate using a screw through the ball bearing at the top of the Camber Gauge.

We recommend using a Hudy



2.0mm Allen Wrench for this job.

Tighten the screw until snug, making sure the stand operates freely without binding.

Installing the Setup Stands

After you have assembled the four Setup Stands, you will need to mount them to your car.

To do this, remove the wheels from your car.

In place of the wheels, mount a Setup Stand on each of the four axles.

Be careful here, Hudy mark the front and rear Stands, just make sure you use the front Side Plates (with scale) and the rear Side Plates (without scale) correctly.

The Camber Gauge of each stand should face outward so it is easy to read.

The Camber Gauge of the front stand should face forward with the Camber Gauge of the rear stand facing rearward.

You can see how it all looks from the photograph on the previous page.

Use the provided Wheel Nuts for quick and easy attachment of the Setup Stands to the wheel axles.

NEXT ISSUE

WE'LL START with the Setup theory next issue, meantime you can always go to Hudy's website and download the Hudy Setup Guide as a PDF.

www.hudy.net

SETTING UP THE HUDY WAY

This month in our serialisation of the **HUDY OFF ROAD SETUP GUIDE** we discuss Downstops but first Juraj Hudy gives an overview of car setup using the Hudy Setup System components.

WHEN SETTING up your off road vehicle, Hudy recommends setting it up in the order indicated in the adjacent table.

The order of the settings has been determined as the most logical to set up your vehicle properly and easily.

Also, certain settings must be made before others, as changing one setting will impact on another setting.

The table also lists the setup components to be used to measure or adjust a particular setting.

All of these components

Downstops	• Flat Setup Board • Droop Gauge Support Blocks • Droop Gauge
Ride Height	• Flat Setup Board • Droop Gauge
Camber	• Flat Setup Board • Droop Gauge Support Blocks • Assembled Setup Stands
Track Width	• Flat Setup Board • Board Decal
Caster	• Flat Setup Board • Assembled Setup Stands
Toe	• Flat Setup Board • Droop Gauge Support Blocks • Assembled Setup Stands • Toe Gauge

are part of the Hudy Off Road Setup System.

There are several types of suspensions used on RC cars, including pivot ball and C-hub suspensions.

Each suspension type has its own way of making adjustments for downstops, camber, caster, toe etc.

For detailed information on adjusting the settings on your car, refer to the appropriate setup manuals for your car.

When setting up your off road vehicle, you should always prepare it so it is ready to run, though without the body.

This means you should install all electronics, batteries and fill the fuel tank.

Remember, this guide refers primarily to the XRAY XB808 and X8T, however the principals are suitable for all vehicles.

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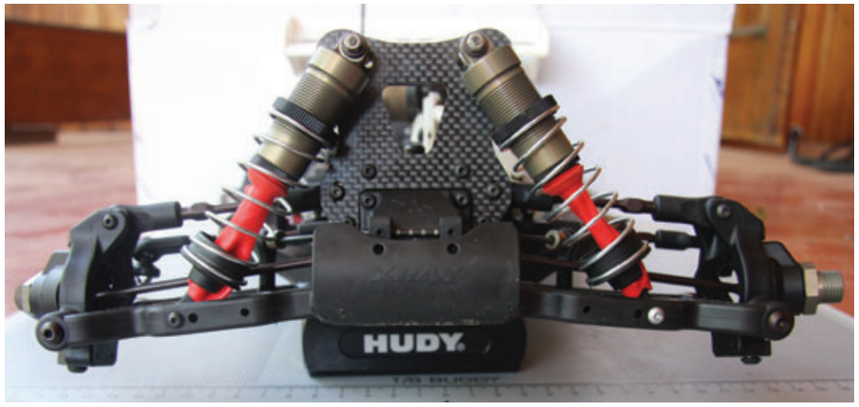


DOWNSTOPS

DOWNSTOPS limit how far the suspension arms travel downward, which determines how far upward the chassis rises.

This affects the car's handling (due to effects on camber and roll centre) and the ability of the tires to "follow" the track.

The effects may change with the type of track and/or amount of grip available.

Downstops are a very sensitive adjustment, since they alter weight transfer and all aspects of chassis performance are affected: braking, acceleration, jumping, traction and rough track handling.

More suspension travel (lower downstop value) makes the car more responsive but less stable.

It is also typically better on a bumpy track or on a track with slow corners.

This allows the chassis to "pitch" rearward or forward more under acceleration or braking (respectively), which results in more weight transfer.

Less suspension travel (higher downstop value) makes the car more stable and is typically better on a smooth track.

This prevents the chassis from "pitching" rearward or forward too much under acceleration or braking (respectively), which results in less weight transfer.

It is very important to have the same downstop settings to the left and right sides of the car.

FRONT DOWNSTOPS	
Higher Downstop Value (arm is higher, less travel)	• Decreases front chassis upward travel on-throttle • Less rearward weight transfer • Better on smooth tracks • More on-power steering • More responsive in direction change
Lower Downstop Value (arm is lower, more travel)	• Increases upward chassis travel on-throttle • More rearward weight transfer • Increases rear traction on corner exit • Better on bumpy tracks
REAR DOWNSTOPS	
Higher Downstop Value (arm is higher, less travel)	• Decreases rear chassis upward travel off-throttle or under braking • Less forward weight transfer • Better on smooth tracks
Lower Downstop Value (arm is lower, more travel)	• Increases rear chassis upward travel off-throttle or under braking • Less stable under braking • Increases steering on corner entry • Better on bumpy tracks • More turn-in

MEASURING DOWNSTOPS	
Prepare the car as follows	**Use the following Setup components**
• Shocks: attach the shocks • Anti-roll Bars: attach the anti-roll bars • Wheels: remove the wheels	• Droop Gauge Support Blocks (#107703) • Droop Gauge (#107717) • Setup Board (#108202)

TO MEASURE the Downstop, place the Droop Blocks on the flat Setup Board and then place the flat part of the chassis (not the angled part) on the blocks.

Make sure the chassis is solidly mounted on the support blocks so it does not move.

Next, lift and drop the suspension arms so that they settle in their lowest positions.

Using the Droop Gauge, measure the downstop values at the front and rear of the car.

Front Downstop

Measure the front downstop values under the round part of the front wheel axles.

DO NOT measure under the hex part.

The values shown on the Droop Gauge indicate how many millimeters the suspension drops below the level of the chassis.

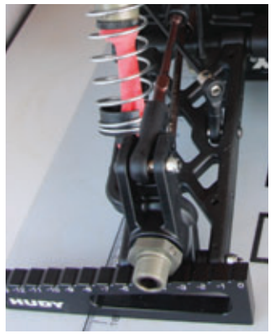
Rear Downstops

Measure the rear downstop values under the round part of the rear wheel axles.

DO NOT measure under the hex part.

The values shown on the Droop Gauge indicate how many millimeters the suspension drops below the level of the chassis.

ADJUSTING DOWNSTOPS



Front Downstop

TO INCREASE turn In (or OUT) the front downstop screw (depending on the car design) so the front lower arm raises up slightly.

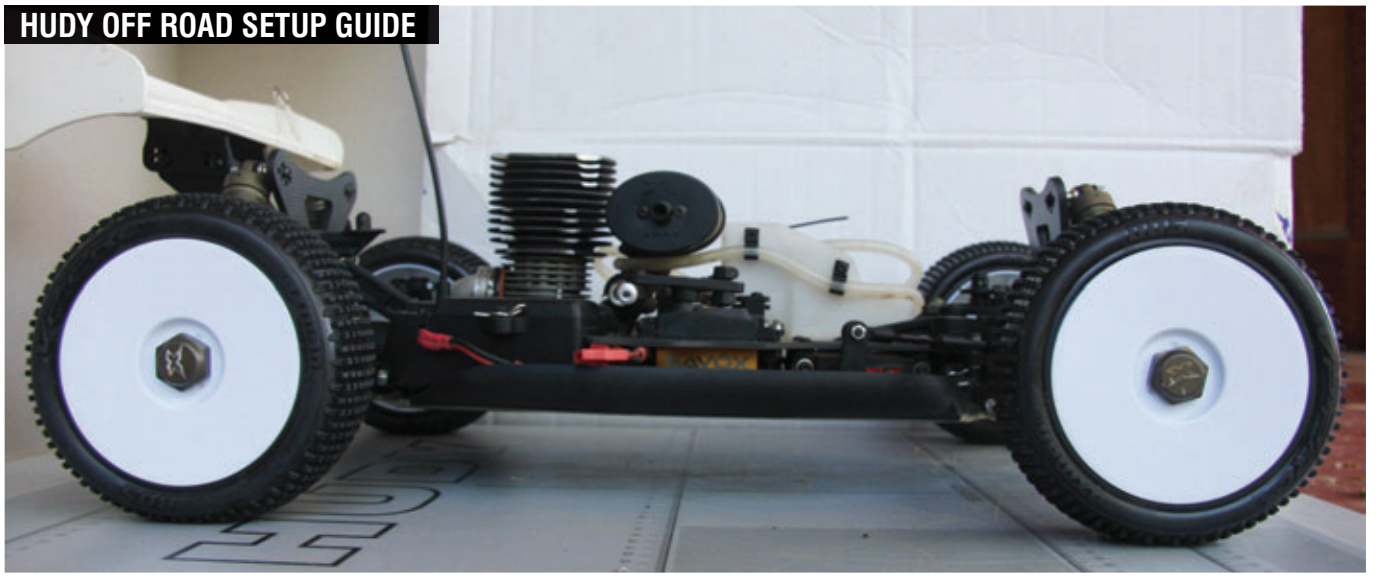
To decrease, turn OUT (or IN) the front downstop screw (depending on the car design) so the front lower arm drops slightly.

Rear Downstop

TO INCREASE turn IN (or OUT) the rear downstop screw (depending on the car design) so the rear lower arm raises up slightly.

To decrease, turn OUT (or IN) the rear downstop screw (depending on the car design) so the rear lower arm drops slightly.

Make equal adjustments on both left and right sides of the car.



PART THREE: RIDE HEIGHT

This month in our serialisation of the **HUDY OFF ROAD SETUP GUIDE** we discuss Ride Heights, how to change the settings and the effects of those changes.

RIDE HEIGHT is the height of the chassis in relation to the surface it is sitting on, with the car ready to run.

Ride height affects the car's traction since it alters the car's centre of gravity and roll centre.

Differences in ride height alter the car's attitude (angle of the chassis) which in an off road vehicle can effect how it jumps and lands.

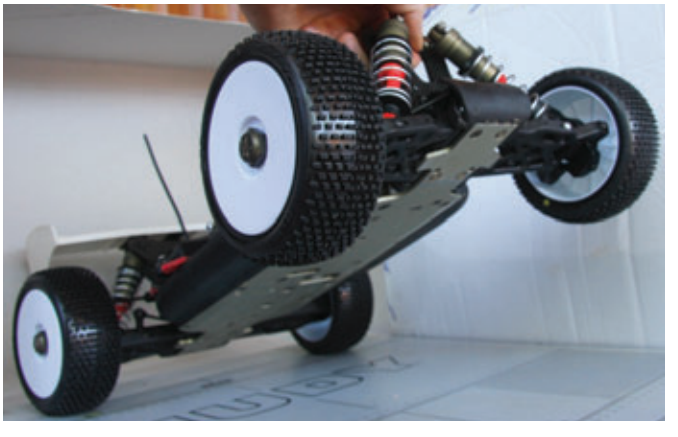
Because of changes in suspension geometry and ground clearnace, there are negative consequences to altering the height too much.

Ride height is measured with the wheels on the car and the car ready to run.

Use the shock preload collars or clips to raise and lower the ride height.

MEASURING RIDE HEIGHT

YOU CAN easily measure the ride height of your car in a few seconds.



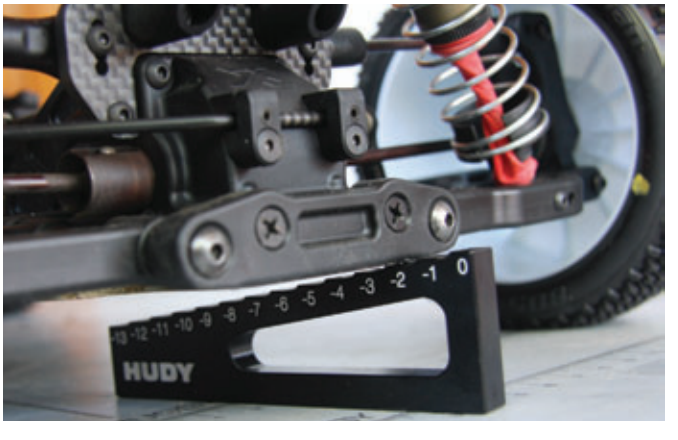
Step 1
Place the car on the set-up board.

Step 2
Lift the front of the car and let it fall back to the set-up board by itself

Step 3
Using the Droop Gauge, measure the ride height value at the front of the car.

Step 4
Lift the rear of the car and let it fall back to the set-up board by itself

Step 5
Using the Droop Gauge, measure the ride height value at the rear of the car.



EFFECTS OF RIDE HEIGHT ADJUSTMENT	
Decreasing ride height	• Increases overall stability • Better on smooth tracks
Increasing ride height	• Decreases over all stability • Better on bumpy tracks (prevents bottoming)
Front higher than rear	• Increases weight transfer to the rear on power • Increases stability • Decreases steering
Front lower than rear	• Increases weight transfer to front off power • Increases steering • Decreases rear traction • May cause car to nose dive off jumps

INITIAL STEPS	SET-UP COMPONENTS
Prepare the car as follows	**Use the following set-up components**
• Shocks: attach all shocks • Anti-roll bars: attach all and roll bars • Wheels: attach all wheels. Both left and right wheels at the front or rear should be the same diameter	• Flat Set-up Board (#108202) • Droop Gauge (#107717)

ADJUSTING RIDE HEIGHT

ADJUST ride height by using spring preload only.

DO NOT adjust ride height using downstop screws.

Your car may use threaded spring preload collars or preload spacers.

PRE-LOAD SETTING	THREADED PRE-LOAD COLLAR	PRE-LOAD SPACERS
Increase	TIGHTEN collar so it moves DOWN the shock body	Use THICKER spacers above the spring
Decrease	LOOSEN collar so it moves UP the shock body	Use THINNER spacers above the spring

FRONT RIDE HEIGHT

PLACE the droop gauge under the front of the chassis (under the FLAT part of the chassis, not the angled part) and measure the difference between the set-up board and the bottom of the chassis.

The **0** mark on the Droop Gauge is equal to 30mm ride height.

A negative value on the Droop Gauge is lower than the 30mm reference height.

For example, if the chassis is at -3mm on the Droop Gauge, your ride height is 30-3mm which equals 27mm.

• Increase preload on both FRONT springs EQUALLY.

• Decrease preload on both FRONT springs EQUALLY.

REAR RIDE HEIGHT

PLACE the Droop Gauge under the rear of the chassis (under the FLAT part of the chassis) and measure the difference between the set-up board and the bottom of the chassis.

The **0** mark on the Droop Gauge is equal to 30mm ride height.

A negative value on the Droop Gauge is lower than the 30mm reference height.

For example, if the chassis is at -3mm on the Droop Gauge, your ride height is 30-3mm which equals 27mm.

• Increase preload on both REAR springs EQUALLY.

• Decrease preload on both REAR springs EQUALLY.

NEXT MONTH we look at camber.

PART FOUR:

CAMBER AND TRACK WIDTH

This month in our serialisation of the **HUDY OFF ROAD SETUP GUIDE** Juraj Hudy discusses Camber and Track Width and their effect on the handling of your car.

CAMBER is the angle of a wheel to the surface on which the car is resting (with wheels and shock absorbers mounted).

- Zero degrees (0°) of camber means that the wheel is perpendicular to the reference surface.
- Negative camber means that the top of the wheel is leaning inwards towards the centreline of the car.
- Positive camber means that the top of the wheel is leaning outwards from the centreline of the car.

Camber affects the car's side traction.

Generally more negative (inward) camber means increased grip since the side traction of the wheel increases.

Adjust front camber so that the front tires wear flat.

Adjust rear camber so that the rear tires wear slightly conical to the inside.

The amount of front camber required to maintain the maximum contact patch also depends on the amount of caster.

Higher caster angles (more inclined) require less negative camber, while lower caster angles (more upright) require more negative camber.

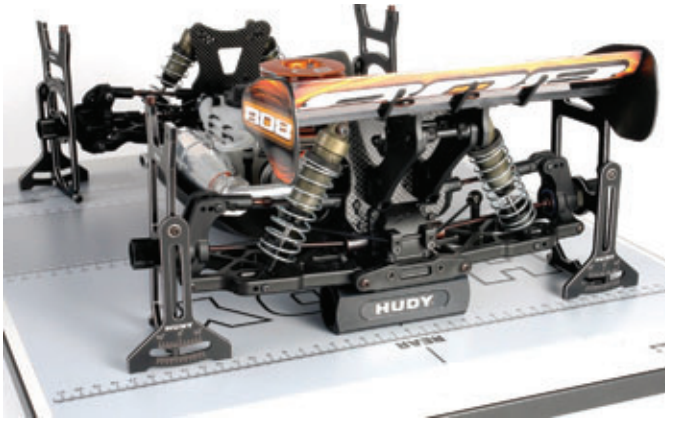
EFFECTS OF CAMBER ADJUSTMENT

FRONT CAMBER	
More negative (more inclined)	• More steering
Less negative (less inclined)	• Less steering
REAR CAMBER	
More negative (more inclined)	• Decreases rear traction entering and in corners
Less negative (less inclined)	• Increases rear traction entering and in corners up to a point • If the shock is too vertical and traction is lost, the traction will be lost very abruptly and the car will be hard to control

MEASURING CAMBER

INITIAL STEPS	
Prepare the car as follows	Use the following set up components
• Shocks: Attach all shocks • Anti-roll bars: Detach all a/r bars • Wheels: remove all wheels	• Flat Set up Board #108202 • Assembled Set up Stands #108805 • Droop Gauge Support Blocks #107703

1. Assemble the Set Up Stands.
2. Mount the Set Up Stands on the axles.
3. Place the Droop Blocks on the flat Set Up Board and then place the flat part of the car chassis (not the angled part) on the blocks.



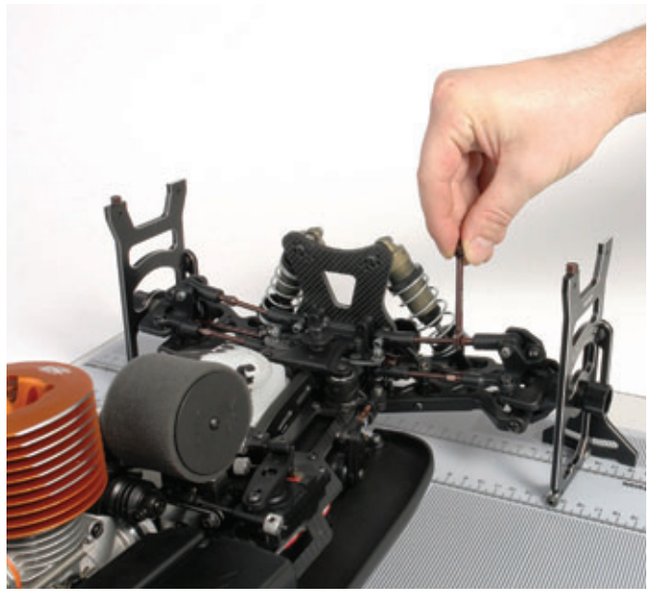
4. Push on the car so the chassis rests flat atop both the Droop Blocks at the front and rear.

5. Read the camber setting from the Camber Gauge of each of the four Set Up Stands.

Each graduated mark indicates a 1° camber value.

You should be able to set camber with a resolution of 0.5°.

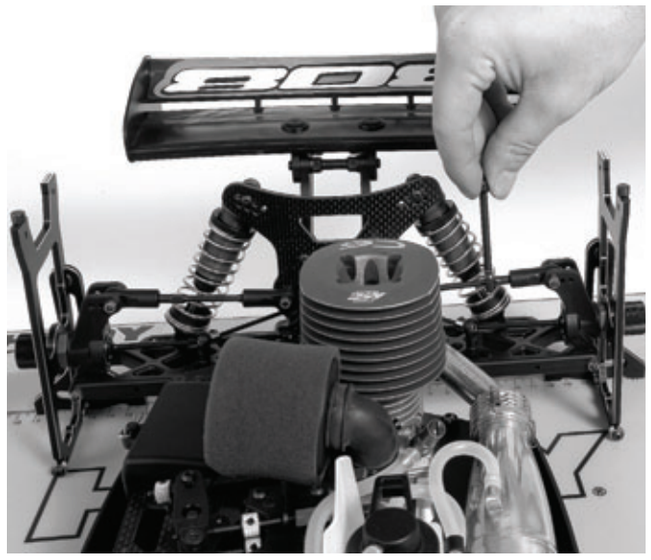
ADJUSTING CAMBER



FRONT CAMBER

Increase (more –ve)
SHORTEN the front upper camber link.

Decrease (less –ve)
LENGTHEN the front upper camber link.



REAR CAMBER

Increase (more –ve)
SHORTEN the rear upper camber link.

Decrease (less –ve)
LENGTHEN the rear upper camber link.

NOTE: Changing the front camber will affect front toe. After setting the camber you must re-adjust the toe and then re-check the camber settings again. It may take a few repetitions of these steps to ensure that both camber and toe are set to the desired values.

TRACK WIDTH

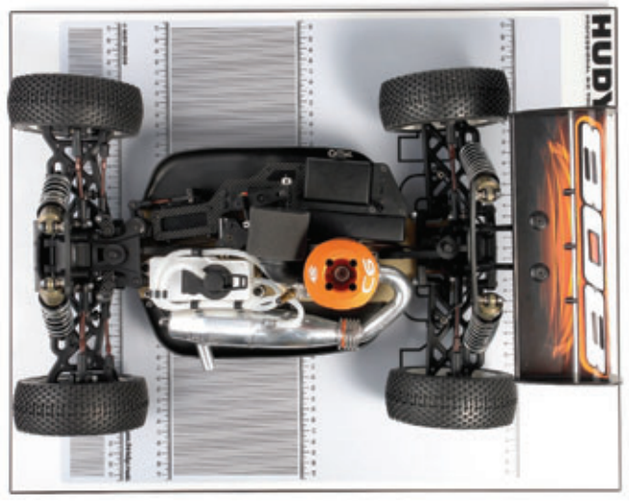
FRONT TRACK WIDTH	
Wider	• Decreases front grip • Increases understeer • Slower steering response • Use to avoid traction rolling
Narrower	• Increases front grip • Decreases understeer • Faster steering response
REAR TRACK WIDTH	
Wider	• Increases rear grip at corner entry • Increases high speed on throttle steering • Use to avoid traction rolling
Narrower	• Increases grip at corner exit • Increases high speed understeer

TRACK WIDTH is the distance between the outside edges of the wheels, front or rear and it affects the car's handling and steering response.

It is important that front or rear track width is adjusted symmetrically, meaning that the left and right wheels (at one end of the car) must be the same distance from the centreline of the chassis.

HUDY'S Off Road Set Up Guide booklet is available for download from the Hudy website as a PDF.

You can also obtain the Guide from your local hobby shop or ask them to contact Hudy's Australian agent, HEI International, for more information.



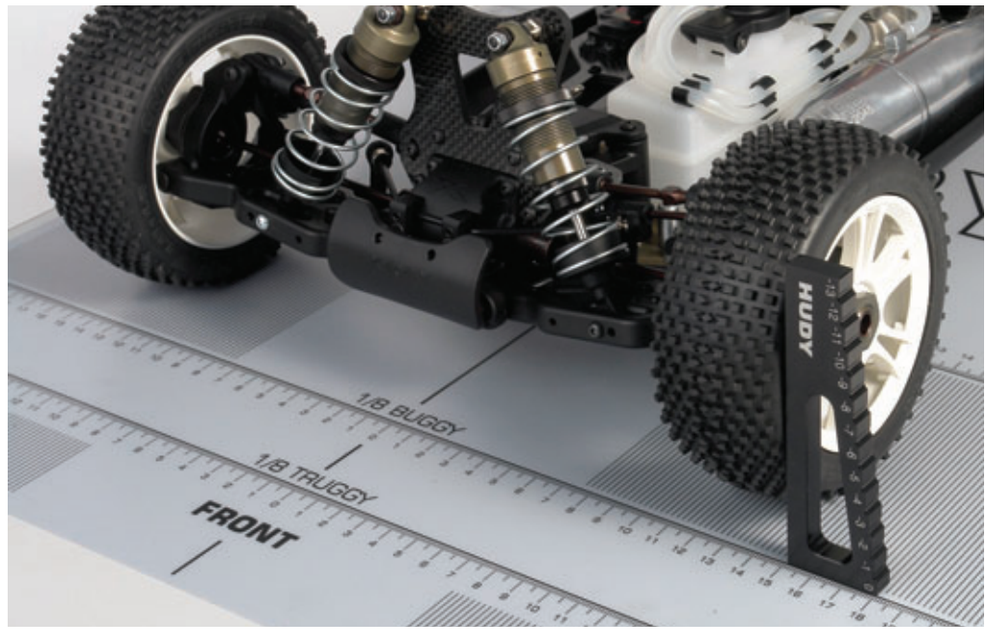
MEASURING TRACK WIDTH

INITIAL STEPS	
Prepare the car as follows	Use the following set up components
• Shocks: Attach all shocks • Wheels: Attach all wheels. Both left and right wheels at the front or rear should have the same offset.	• Flat Set up Board #108202 • Board Decal #108212

1. Place the car on the Set Up Board.

2. Align the centre of the car with the centreline on the Set Up Board Decal.

Make sure both the front and rear are centred on the decal.



3. Make sure the front wheels rest on the front track width graduation marks.

The amount of toe-in/toe-out has direct influence on the track width so make sure to measure at the part where the car is widest.

FRONT TRACK WIDTH

Look where the outer edge of each front wheel lays on the front track width graduation marks.

Use a straight edge against the wheel if necessary to see what the measurement is.

The measurement represents the distance from the car's centreline to the outer edge of each wheel.

For example, on a 308mm wide buggy, the measurement should be close to 154mm (half the track width) for each wheel.

REAR TRACK WIDTH

Look where the outer edge of each rear wheel lays on the rear track width graduation marks.

Use a straight edge against the wheel if necessary to see what the measurement is.

The measurement represents the distance from the car's centreline to the outer edge of each wheel.

For example, on a 306mm wide buggy, the measurement should be close to 153mm (half the track width) for each wheel.

6. Make sure the rear wheels rest on the rear track width graduation marks.

ADJUSTING TRACK WIDTH

Different cars may use different methods for track width adjustment.

C-HUB SUSPENSION

Normally you cannot adjust the track width of a car with C-hub suspension due to the design of the suspension system.

The suspension arms and other parts are designed to give you the correct track width automatically.

Optional offset wheel axles may be offered to adjust track width.

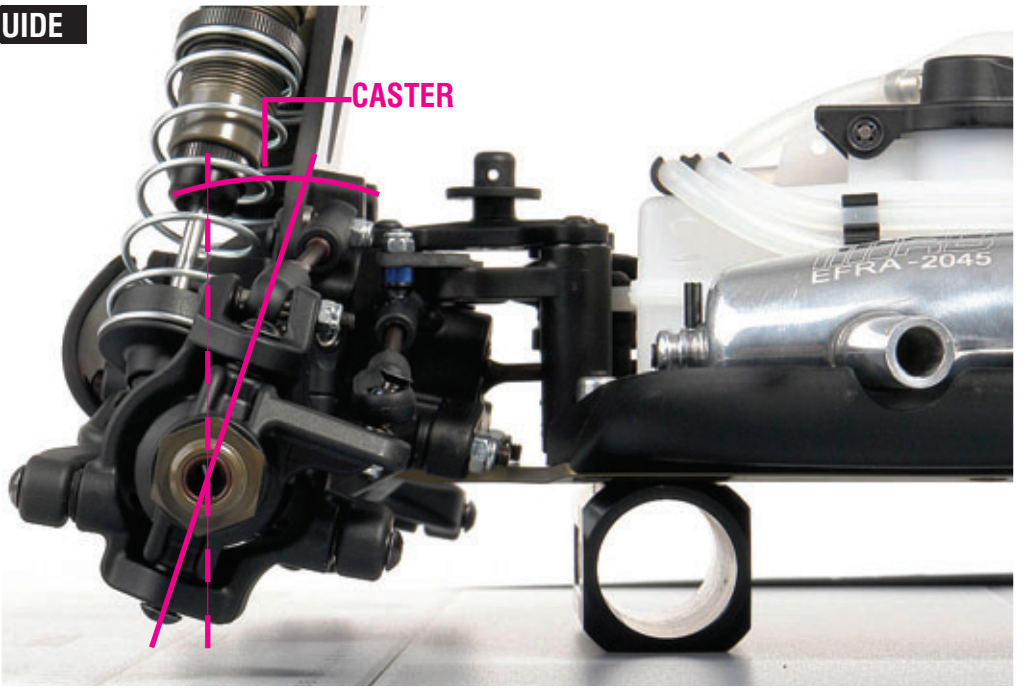
PIVOTBALL SUSPENSION

Cars with adjustable pivot ball style suspension can change track width by adjusting the pivot balls into or out of the suspension arms.

IMPORTANT: Make equal adjustments on both the left and the right sides of the car.

PART FIVE:

CASTER AND TOE



This month in our serialisation of the **HUDY OFF ROAD SETUP GUIDE** Juraj Hudy discusses Caster and Toe and their effect on the handling of your car.

CASTER DESCRIBES the angle of the front steering block with respect to a line perpendicular to the ground.
The primary purpose of having caster is to have a self centering steering system.

Caster angle affects on and off power steering as it tilts the chassis more or less depending on how much caster is applied.

For the purpose of RC cars, it is generally recommended that you use a steeper caster angle (more vertical) on slippery, inconsistent and rough surfaces and use a shallower caster angle (more inclined) on smooth, high grip surfaces.

CAMBER v CASTER

Camber is all about contact patch–keeping as much tire on the ground as possible.

Camber and caster are related in that caster can afford an amount of EFFECTIVE CAMBER change when the front wheels are turned in a corner.

Caster has the effect of progressively leaning the front tires into the direction of the corner.

The more the caster angle is laid back, the greater the effective camber change when the wheels are turned.

This happens because the tops of the wheels BOTH TILT towards the inside of the corner; the wheels "dig in" more, counteracting the centrifugal forces pushing the car to the outside.

Compare that to the static camber of the wheels which is adjusted with the car sitting on a level surface and the wheels pointed straight ahead.

Static camber adjustments primarily affect the outside wheels since those are the wheels that bear the majority of the load during cornering.

Hence, the amount of front camber required to maintain maximum tire contact largely depends on the amount of caster.

A steeper caster angle requires more camber, while a shallower caster angle requires less camber.

TOTAL CASTER ANGLE

Total caster angle also depends on the front kick up angle.

To determine the total caster angle, combine the kick up angle and the C-hub caster angle.

For example, 10° front kick up plus 10° caster in the C-hub will give 20° total caster.

MEASURING FRONT CASTER

INITIAL STEPS	SET UP COMPONENTS
Prepare the car as follows	Use the following set up components
• Shocks: Attach all shocks • Wheels: Remove all wheels	Flat Set Up Board #108202 Assembled Set Up Stands #108805

EFFECTS OF CASTER ADJUSTMENT

Less caster angle (more vertical)	• Decreases straight line stability • Increases off power steering at corner entry • Increases suspension efficiency
More caster angle (more inclined)	• Increases straight line stability • Decreases off power steering at corner entry • Makes the car more stable through bumpy track conditions

SEVERAL years ago, following the launch of the original XRAY 808 1:8 GP Off Road Buggy, Chief Designer, Juraj Hudy, travelled with his team to USA to race major events in the lead up to the 2008 IFMAR GP Off Road World Championships in USA.

He reported his trip in a column soon after, commenting he was surprised just how little setup knowledge many drivers, including top factory drivers, had.

In typical fashion, he set about righting what he saw as appalling ignorance by producing the Hudy Off Road Setup Guide booklet in which he outlined the principals of setup.

He saw it as a way of assisting all off road drivers, not just those with an XRAY and as a way of increasing the enjoyment of driving and racing a car properly set up.

As any racer will tell you, driving an ill handling car is no pleasure!

The booklet in its full form is available to anyone, either via the Hudy website as a PDF or through the Australian agent for Hudy, HEI International.

It is something which should be part of every Buggy and Truggy owner's pit bench, whether at home or at the races.

- Assemble the set up stands
- Mount the set up stands on the axles
- Place the car on the set up board

- Read the caster angle from the side of the front set up stands.

Read the caster angle on the side plates between the imaginary line that goes from the top pivot point to the bottom pivot point.

Each graduated mark indicates a 2° camber value.

You should be able to set camber with a resolution of 1°

.

ADJUSTING FRONT CASTER

There are several different ways to adjust caster on a car with C-hub suspension, depending on the design of the car:

- Non-adjustable C-hubs (for example, XB808): change to C-hubs of different caster values.
- Adjustable C-hubs (for example, XB8EC): change the

C-hub eccentric pin holder.

Important

Make equal adjustments on both left and right sides of the car.

TOE

TOE IS the angle of the wheels when looked at from above the car.

Toe is used to stabilise the car at the expense of traction, as it introduces friction and therefore some slip in the tires.

- When the wheels are parallel with the centerline of the car, toe is ° (neutral).
- When the wheels are closed towards the front, this is called toe-in (positive value).
- When the wheels are open towards the front, this is called toe-out (negative value).

Front wheels can have either toe-in or tow-out.

Rear wheels should always have toe-in–they should never have toe-out.

Toe may be adjustable at either end of a suspension arm.

- Inboard toe (if available) is typically adjusted by altering the angle of the suspension arm's innter pivot pin.

Inboard toe adjustment is not available on all vehicles.

- Outboard toe (if available) may be adjusted in two ways: at the front by adjusting the lengths of the steering rods; at the rear by altering the angle of the suspension arms inner mounting pin (or other method).

EFFECTS OF TOE ADJUSTMENT

FRONT TOE	
Increasing (more toe-in)	• Makes car easier to drive
Decreasing (less toe-in, or more toe-out)	• Decreases understeer • Increases steering at corner entry • Faster steering response • Less stable under acceleration • Makes car more difficult to drive
REAR TOE	
Increasing (more toe-in)	• Increases understeer • More stable exiting on power at corner exit and braking • Less chance of losing rear traction • Decreases top speed
Decreasing (less toe-in)	• Less stable at on power corner exit and braking • More chance of losing rear traction • Increases top speed

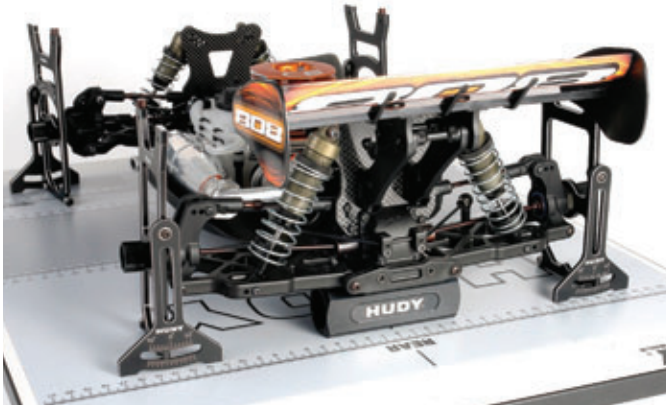
MEASURING TOE

INITIAL STEPS	
Prepare the car as follows:	Use the following set up components
• **Shocks: attach all shocks** • **Wheels: remove all wheels**	• Flat Set Up Board #108202 • Assembled Set Up Stands #108805 • Toe Gauge (for Truggy #108841) • Droop Gauge Support Blocks #107703

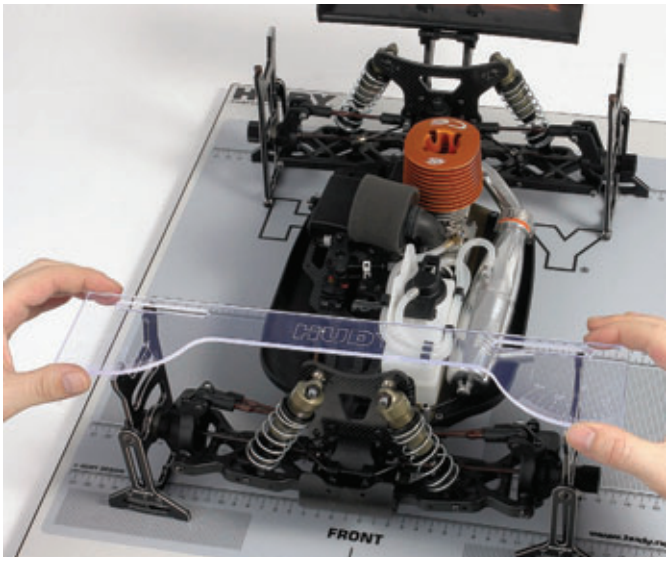
When using the acrylic toe gauge, the toe gauge does not fit over the pins on the set up stands so that the toe gauge is in one position.

The toe gauge is designed to slide over the pins from one side to the other, depending on which wheel you are measuring (left or right).

Follow the instructions carefully.



- Assemble the set up stands.
- Mount the set up stands on the axles.
- Place the droop blocks on the flat set up board and then place the flat part of the car chassis (not the angled part) on the blocks.
- Place the toe plate atop the stands and measure the toe value.



FRONT TOE

Set the toe gauge atop the front set up stands.

The pins at the top of the stands fit in the machined slots in the toe gauge.

Set the steering trim on your servo and transmitter so that the front wheels point directly forward.

Set the steering in the neutral position using the transmitter.

Turn on the car and transmitter when setting front toe so the front wheels point straight ahead.

Push on the car so the chassis sits flat atop both droop gauges at front and rear.

To read the toe value of the left front wheel, push the toe gauge to the right until the pin on the top edge of the left set up stand hits the edge of the slot in the toe gauge.

Now read the toe value on the toe gauge.

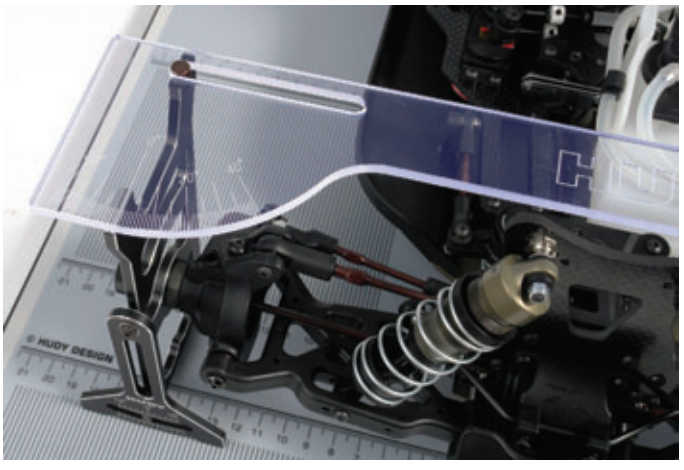
The black line on the top edge of the stand points to a toe value engraved in the toe gauge.

Each graduated mark indicates a 1° toe value.

You should be able to set toe with a resolution of 0.5°.

To read the toe value of the right front wheel, push the toe gauge to the left until the pin on the top edge of the right set up stand hits the edge of the slot in the toe gauge.

Read the measurement.



The pin at the top of the stands fit in the machined slots in the toe gauge.

Push on the car so the chassis sits flat atop both droop gauges at front and rear.

To read the toe value of the left rear wheel, push the toe gauge to the right until the pin on the top edge of the left set up stand hits the edge of the slot in the toe gauge.

Now read the toe value on the toe gauge.

The black line on the top edge of the stand points to a toe value engraved in the toe gauge.

Each graduated mark indicates a 1° toe value.

You should be able to set toe with a resolution of 0.5°.

To read the toe value of the right rear wheel, push the toe gauge to the left until the pin on the top edge of the right set up stand hits the edge of the slot in the toe gauge.

Read the measurement.

REAR TOE

Set the toe gauge atop the rear set up stands.

ADJUSTING TOE

Front toe

Increase (more front toe-in): LENGTHEN both front steering rods EQUALLY.

Decrease (less front toe-in): SHORTEN both front steering rods EQUALLY.

Rear toe

Refer to your car's instruction manual for more information about changing rear toe in.

Different cars use different methods to adjust rear toe-in, usually changing toe-in blocks.

Refer to your car's instruction manual for more information.

NOTE: Changing the front camber will affect front toe.

After setting the camber you must re-adjust the toe and then recheck the camber settings again.

It may take a few repetitions of these steps to ensure both camber and toe are set to the desired values.