



Stonking power plants like this weapon with 700rwhp need a good stiff rear end to stop bouncing around and unloading the tyres



CHASSIS PREP

HOW TO GET YOUR COMMODORE TO LAUNCH HARD AND STRAIGHT
STORY AND PICS BY MARTIN DONNOR

A perfectly set-up IRS rear end propels this VZ Ute (with a totally stock engine) to a new record of 11.3 seconds – all through a manual gearbox and some slicks

There is nothing worse than spending all your time putting together a car with a pile of power, then getting out to the track and making yourself look like a goose with a lousy timecard. Time after time it happens.

At the track, it is kilowatts and horsepower that count for nothing and the suspension set-up that is king.

Putting the tyre to the ground effectively at the start of the drag strip not only has massive advantages in getting you off the line quickly, but it also determines how the rest of your pass will pan out. This is why you see a lot of experienced racers back off instantly the moment they fluff the launch.

THE LIVE REAR AXLES

In most drag-racing classes, it's the live rear axle that gets the nod as the serious weapon of choice. While Holden no longer manufactures Commodores in live axle form, this apparently 'primitive' suspension technology is always going to be the favourite for drag racers.

The logic is simple too. A live rear axle keeps the rear wheels square to the track surface at all times. With a dirty great solid set of axles connecting each rear wheel to the differential, there is nowhere for each wheel to deflect or turn when the power comes on and the rear end squats.

Instead of skewing off in different directions, the rear wheels get pushed directly onto the track.





Notice the Ute's turbocharged cousin, which makes twice the power (and then some) of the bolt-on car. It has much less of a squat off the line and simply drives away to a 10.5sec pass

WHEEL HOP

The worst thing that can happen with a live rear end is when wheel hop occurs. Energy from a large clutch, dumped launch or a stalled-up step off the plate winds up the rear leaf springs and then starts them oscillating as the car drives down the track.

Not only is this slow, but it is also dangerous to the driveline components. The rear end gets loaded and unloaded with large shock impact to the axles and differential.

Wheel hop, or axle tramp as it is also known, affects every single kind of rear end there is ranging from the venerable old-school leaf spring we are currently discussing through to the most modern of independent systems.

There really isn't a lot you can do about it with the newer stuff, but with old-school rear ends you can always install some Cal-Tracs.

TRACTION RODS

An American invention, the Cal-Trac is designed to stop the front flat part of the leaf spring (in front of the axle) winding up and storing energy for later release (in the form of wheel hop or wheel spin) by locating the axle. It's this twisting moment of the axles that the Cal-Trac resists, which in turn transfers all of the driveline's energy to the back wheels.

You don't need to rush out and buy a Cal-Trac kit and then adapt it to your Holden to stop your own rear end from winding up. You can

quite easily make the whole set-up yourself given some time, patience, and access to the right tools.

Pictured on p116 is a Cal-Trac system prepared locally by THR Developments in South Australia for the one-tonner range of Commodores.

Playing around with the 'tension' or length of the Cal-Trac rods determines whether they are set 'loose' or 'tight'. This in turn has a fairly substantial effect on how the car exits the plate and crosses the first 60 crucial feet.

The turbocharged Holden One Tonner in question needed the tightest of settings to generate a 1.51sec 60ft launch, which still had plenty of room for improvement.

INDEPENDENT REAR SOLUTIONS

Holden is quick to point out that IRS rear ends are the be all and end all for a combination of handling, comfort, and all-round performance. However, it fails to mention that if you happen to use such a thing at the drag strip, the IRS rear end can be your worst enemy.

You need to understand how it all works, and then set up your car around it.

The biggest problem with the Commodore IRS system is that as the car launches and steps hard off the line. This lifts the nose and squats the rear, and the camber and toe direction of the rear wheels change at the same time.

It's quite spooky really, when you think about it. Rather than just go up and down like a live rear end, the

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Improved subframe bushes to hold the rear-end crossmember in position and stop it storing wasted energy are a must

While most circuit or handling-orientated bits aren't normally accepted as drag-racing parts, they are the choice once the power levels start to climb



wheels of an IRS-equipped Holden go through a whole three-dimensional curve of travel, which in turn can severely limit the amount of rubber contact patch on the road.

CAMBER CHANGE

Using not one but two camber kits, it is possible to dial positive camber into the rear wheels of the IRS Holden at normal ride height. As the rear end squats under full weight transfer and the camber tries to go negative from a zero setting, instead it will probably just go closer to a zero setting, which is exactly what you want.

If you are in any doubt, get the camber kits set up to have your rear tyres at 0° of camber when the vehicle is stationary. This will still represent a massive improvement over the stock set-up where there is anywhere up to 1.5° negative camber from the factory.

CONTROLLING THE TRAMP

Without the ability to screw in traction rods (like you can for an old-school rear end), the only way to control wheel hop in an IRS car is to dial up the grip levels with a bigger rear tyre. Alternatively, you can improve the rebound control of the rear dampers with a softer spring/firmer damper combination.

The most common solution is to use urethane mounts in the rear subframe to stop it wobbling around. Then, go softer and softer in the rear tyre (or lower in pressure in the case of a slick or specialist drag radial) until there is complete traction available.

THE GUN SET-UP

For any type of rear end, the gun set-up is to use 90/10-rated shockers in the front end of your Holden. What these do in effect is have 90 percent of their valving or 'firmness' direction towards bump control, and only 10 percent on the rebound.

Think about it for a moment and consider that as the shocks pull apart on launch (that's the easy bit), they allow the weight to transfer onto the rear tyres without the shockers protesting. Then, they keep it there with the aggressive 90-percent bump settings.

The typical nose up stance of a serious street-based drag car can always be put down to light springs in the front combined with 90/10 front shockers. It holds the nose up and keeps the weight pushing in the right direction for the very best possible off-the-line traction.

The good news is that any shock absorber shop or repair centre should be able to modify stock shockers into 90/10s quickly and easily.

REAR SHOCK

A lot of the really fast but only moderately powered IRS guys swear by using the stock rear shocker and spring assembly from an FE2-equipped Holden in the rear end for lightning fast launches. They aren't kidding either, as there are a host of these punters running 1.5sec 60ft times using these parts and 90/10 shockers at the front.

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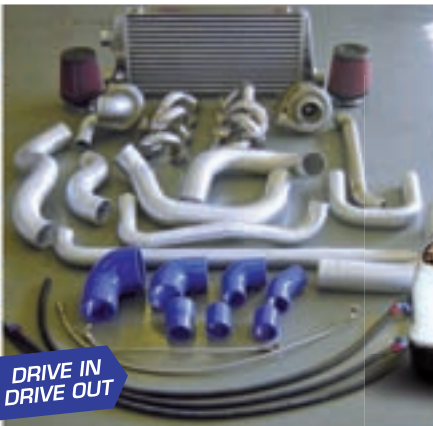
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Cal-Tracs are quite simple devices once you understand how they work



A complete Cal-Trac assembly in place. Locate the rear axle and keep energy storage out of the rear spring



Horse-and-cart suspension in the One Tonner isn't the best thing for ride comfort and certainly not for handling, but it can be made to work well at the drag strip



A nicely composed 1.51sec 60ft time with some Cal-Tracs in place on a live rear axle

The definitive IRS launch is shown here. This super rapid bolt-on Commodore squats on the deck (scraping the rear bumper for awesome drive) and keeps the rear wheels nice and straight



Start to wind in some serious turbo or supercharger power, and the promise of the stock parts delivering excellent times begins to change a little.

Too much shock off the line can cause factory rear shocks to start oscillating out of control and the spring to take charge of the rear end, which is the very last thing you want.

Where circuit-racing dampers with aggressive rates and stiff springs are normally the enemy of good drag-strip performance, the pendulum starts to swing back towards their use (or much higher rate than conventional drag parts) in an attempt to keep the car poised and under control during hard launches.

TEST IT

Regardless, the only way of verifying any suspension change you carry out to your street-driven racer is with a few passes down the local strip. Make sure you keep a record of every change you make, and how this affects your times (gain or loss). Keep the conditions as constant as possible.

As one of my teachers once said, "Apply a little science and you will go far". When it comes to drag-racing suspension set-up, truer words have not been spoken. *SC*

