

Commodore VT – VX Rear toe link conversion
12th June 2002
Version 1.0



Discussion Paper

Commodore VT – VX Rear toe link conversion.

Copy of email posts discussing options with converting earlier model Commodore IRS systems to use the later model systems incorporating the adjustable toe control link.

Prepared by

Jim Gurieff

Copy of email posted to VT-VX owners on Whiteline's Mail List

To: Commodore VT-VX owners

Date: 12th June 2002

Subject: VT – VX Rear toe link conversion

VT – VX Rear link conversion

I would very much love to report some good news but unfortunately not... our development program for this item is now officially dead!

Why? Mainly cost but first we'd like to at least share some of the information we have learnt during the design stage that may help you understand the positives and negatives. Using this data, you may decide to still proceed with this modification however somewhat better informed as to the costs.

This information pertains to the VT series I/II IRS and VX series I with this range referred to as the earlier model. Only exception is the VT GTS that was supplied by HSV with the toe control link modification as standard. The latter models we refer to are VX series II onward. Main issues with VX II or VT II GTS (HSV) using toe control link as compared with earlier models;

- Latter models use unique cross-member and lower control arms with relocated pickup points and different inner bushings. This is done to achieve a better base line camber setting as well as providing mounts for the toe control link. New inner bushings are specially directionally voided for controlled compliance.
- Using our data, base camber at standard ride height has been pulled back from a range of – 1.75 to –2.25 degrees on the earlier platform to –0.75 to –1.25 degrees on the latter. Factory lowered models like SS and S will have higher base readings due to suspension movement arc. (Holden's claims that up to the VX I chassis, rear static camber averaged –1.5 degrees. However, VX II average should be around –0.5 degrees *Source was Polk Autospec vehicle data.)
- Contrary to Holden's claims of better camber control for towing, we did not find any significant improvement to dynamic camber using the new link other than a reduced base line.

- Base toe setting at standard height used range from –1.0 (toe out) mm to +3.0 (toe in) mm per side! VX II models are adjustable via the toe control link with a very broad range to cover toe in and out.

- The toe control links main advantage is in holding the toe setting through the suspension movement arc (wheel travel). For example, earlier vehicles with a base setting of 0.0 mm or neutral toe would swing between +2.1 mm (toe in) at 40 mm bump to –3.8 mm (toe out) at 40 mm wheel droop. Later models with a base setting of 0.0 mm have next to no change on bump and will toe out by –1.8 mm at 30 mm of wheel droop.

The overall technical results are good and make a significant difference as we have mentioned before. Anyone serious about maximising their Commodore IRS' performance would find these changes very worthwhile as they allow for much more predictable and stable rear dynamics while delivering a great deal more traction potential.

Assuming you wish to proceed, here are the issues (costs are lowest prices found at time of writing);

- VX II uses a new cross member with separate part numbers for V6 and V8. Holden spare parts retail price quoted as \$280
- VX II uses revised control arm assemblies with new style bushing fitted. Common to both V6 and V8 and retail for \$395 each from Holden. Note that VX series I control arm assemblies do NOT have machined section on hub to mount toe link. VT series I and II do however have these mount points machined.
- Toe control links seem to be common to VT GTS and VX II and retail for \$305 each. Allow an additional \$5 to \$10 for some high tensile mounting hardware for the cross-member end of the link.

The cross member is relatively cheap from Holden and hold the key in delivering the static camber improvement while featuring the very elaborate welded mounts for the control link. Whiteline could not offer these mounts as DIY weld options for that much less than the cost of a new cross-member and that still doesn't address the changed pickup point issue.

There is some opportunity in Whiteline developing alternative toe links and we could probably supply them for half the price but this is a relatively small part of the cost equation as the overall labour component would be huge. The cross member would need to be removed completely so that the new mounts could be welded to it. This in itself would necessitate an engineer's inspection, as it would qualify as a "major change" to the

Commodore VT – VX Rear toe link conversion
12th June 2002
Version 1.0



suspension. That would still leave a problem with the VX I cars as the hubs would need to be removed and machined with a taper to accept the ball joint style toe link end.

We therefore concluded that it was simply uneconomical and unviable considering all the variables. We calculate that our parts plus those you would need from Holden would still total in excess of \$700 with around \$350 in fitting labour IF the hubs do not require machining. Even then you will not end up with the improved static camber.

In all honesty, our suggestion would be to wait for a wrecked complete VX II rear-end and have that fitted to your earlier series car. It would probably be the cheapest and easiest solution.

We'd like to thank everyone for their patience on this issue. We hope that you might find this information useful and apologies for any inconvenience.

Best regards

Whiteline Automotive

Copy of customers email discussing their experience with this modification containing additional useful tips.

From: Roger [mailto:XXXXXX@XXXXX.com]
Sent: Wednesday, 12 January 2005 05:25 PM
To: Support

Subject: VT - VX Rear toe link conversion

Just thought I'd comment on the following:

I was looking for a solution to scrubbing out the inside of the rear tyres every 14,000k on a VX 2000 model (Series I ??) SS Commodore. The problem was first noticed after there was a 300mm split in the right rear and the steel belts were poking out. A couple of tyres later I did some research. After reading your article and doing a few measurement of my own I decided to approach Holden with a few questions as to how they could design something like that. Naturally I got no joy, even from the upper echelons. So I did what you suggested...

I also have a VX Series II Executive (V6) and made the swap between these two vehicles as my Brother-in-law has a VX series I Berlina which doesn't exhibit any abnormal tyre wear, even without the toe rods. I attributed this to being fitted with normal profile tyres and only being a V6 (??) whereas the SS has low profile tyres and the Gen III (heavier foot).

To cut a long story short. As you noted, the rear end suspension bits are interchangeable (naturally we left the diff and axles, brakes etc), with the following to note:

The V6 has only one exhaust mount. The SS had to have one mount removed and welded onto the V6 suspension.

The Exhaust on the Series II SS from the cat back must also be different as it interfered with the left toe rod mount. This was fixed by removing about 8mm of the bottom of the mount and slightly recessing the pipe.

Other than that, no problem. One wheel alignment later and the results were that the SS no longer "dipps" under acceleration and the camber is pretty well static. The big surprise was that the V6 handles better (??). The SS did have a factory camber kit fitted but other than that I'm at a bit of a loss.

Still, never look a gift horse in the mouth..

Commodore VT – VX Rear toe link conversion
12th June 2002
Version 1.0



Thanks for the information and for maintaining such a useful web site.

Regards,

Roger.