# Baseline

RHS\_Upr\_OB\_pickup = [538.53,351]; #RHS Upper OB pickup point

RHS\_Lwr\_OB\_pickup = [564.85,171.5]; #RHS Lower OB pickup point

RHS\_Upr\_IB\_pickup = [304.29,348.38]; #RHS Upper IB pickup point

RHS\_Lwr\_IB\_pickup = [227.28,149.35]; #RHS Lower IB pickup point

static\_camber = -1.5; #In degrees

UWB\_length = 234.254625; #Upper wishbone length in front view

LWB\_length = 418.9412262; #Lower wishbone length in front view

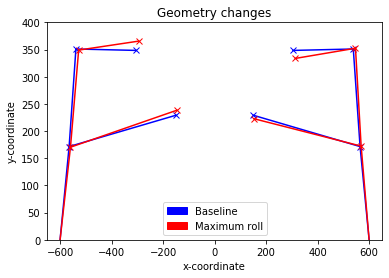
UWB\_angle = 0.6408328324; #Upper wishbone angle to horizontal. Anti-clockwise positive

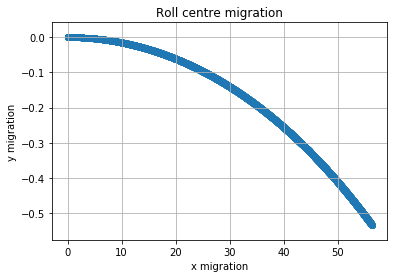
LWB\_angle = -7.910191806; #Lower wishbone angle to horizontal. Anti-clockwise positive

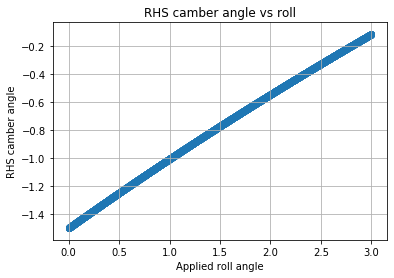
Baseline kingpin angle is: -8.34˚.

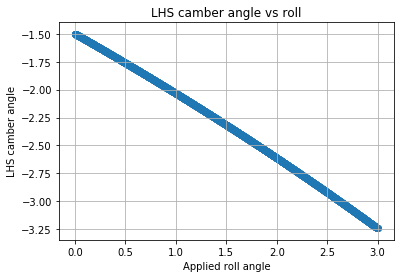
Baseline scrub radius is: 10.0 mm.

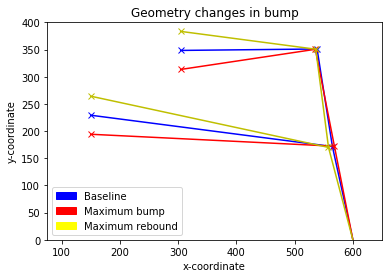
Baseline roll centre height is: 164.46 mm.

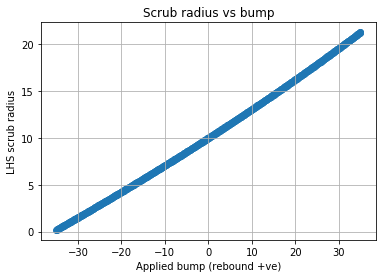


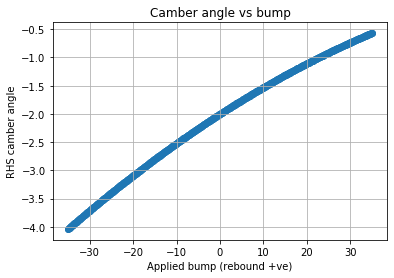












# RDW\_Geom001

RHS\_Upr\_OB\_pickup = [538.53,315]; #RHS Upper OB pickup point

RHS\_Lwr\_OB\_pickup = [564.85,130]; #RHS Lower OB pickup point

RHS\_Upr\_IB\_pickup = [299.98,200]; #RHS Upper IB pickup point

RHS\_Lwr\_IB\_pickup = [215,70]; #RHS Lower IB pickup point

static\_camber = -1.5; #In degrees

UWB\_length = 264.8; #Upper wishbone length in front view

LWB\_length = 354.94; #Lower wishbone length in front view

UWB\_angle = 25.739629449782196; #Upper wishbone angle to horizontal. Anti-clockwise positive

LWB\_angle = 9.732215290781069; #Lower wishbone angle to horizontal. Anti-clockwise positive

**The motivation behind this geometry was to lower the ride height to around 50-70 mm and return the baseline roll centre to a sensible position above the ground plane.**

|  |  |  |
| --- | --- | --- |
|  | **Baseline** | **New** |
| Suspension Data | Baseline kingpin angle is: -8.34˚.  Baseline scrub radius is: 10.0 mm.  Baseline roll centre height is: 164.46 mm. | Baseline kingpin angle is: -8.1˚.  Baseline scrub radius is: 16.65 mm.  Baseline roll centre height is: 18.62 mm. |
| Geometry Changes in Roll |  |  |
| Roll Centre Migration |  |  |
| RHS Camber Angle vs Roll |  |  |
| LHS Camber Angle vs Roll |  |  |
| Geometry Changes in Bump |  |  |
| Scrub Radius vs Bump |  |  |
| Camber Angle vs Bump |  |  |

## Conclusions:

* Roll centre position and migration is sensible. Lateral migration could be improved but would be acceptable.
* RHS camber changes in bump show a strange characteristic and this needs further investigation with other geometries.
* LHS camber recovery in roll is improved – but potentially “too much” as it loses out in bump.
* Camber changes in bump are much more pronounced but this is an expected result of the more aggressive geometry. It is beyond an acceptable limit and needs to be reduced.
* Scrub radius in bump is less linear but reaches a smaller peak value.

## Next steps:

* Try lengthening the upper wishbone to see the effect on camber.
* Investigate moving the OB points. Can we have a similar scrub radius and reduce the inclination of the wishbones to something more conventional?

# JDRS\_Geom001

The baseline geometry is FDW\_Geom001. The change in this geometry is a less aggressive angle downwards.

RHS\_Upr\_OB\_pickup = [528.53,355]; #RHS Upper OB pickup point

RHS\_Lwr\_OB\_pickup = [564.85,140]; #RHS Lower OB pickup point

RHS\_Upr\_IB\_pickup = [304.29,290]; #RHS Upper IB pickup point

RHS\_Lwr\_IB\_pickup = [215.02,110]; #RHS Lower IB pickup point

static\_camber = -1.5; #In degrees

UWB\_length = 234.254625; #Upper wishbone length in front view

LWB\_length = 418.9412262; #Lower wishbone length in front view

UWB\_angle = 0.6408328324; #Upper wishbone angle to horizontal. Anti-clockwise positive

LWB\_angle = -7.910191806; #Lower wishbone angle to horizontal. Anti-clockwise positive

|  |  |  |
| --- | --- | --- |
|  | **Baseline** | **New** |
| Suspension Data | Baseline kingpin angle is: -8.1˚.  Baseline scrub radius is: 16.65 mm.  Baseline roll centre height is: 18.62 mm. | Baseline kingpin angle is: -9.59 ˚.  Baseline scrub radius is: 11.5mm  Baseline roll centre height is: 23.81mm |
| Geometry Changes in Roll |  |  |
| Roll Centre Migration |  |  |
| RHS Camber Angle vs Roll |  |  |
| LHS Camber Angle vs Roll |  |  |
| Geometry Changes in Bump |  |  |
| Scrub Radius vs Bump |  |  |
| Camber Angle vs Bump |  |  |

## Conclusion

* Camber characteristic is a bit more reasonable, with good camber recovery still
* Lower OB BJ is higher to prevent clashes
* Better characteristic in bump
* Roll centre is stable
* The downside is that ride height is not as low as we would want

## Next Steps

* Try to lower the ride height further with a more aggressive setup

# JDRS\_Geom002

The baseline geometry is FDW\_Geom001. The change in this geometry is a less aggressive angle downwards, but slightly more aggressive than JDRS\_Geom001

RHS\_Upr\_OB\_pickup = [528,355]; #RHS Upper OB pickup point

RHS\_Lwr\_OB\_pickup = [565,140]; #RHS Lower OB pickup point

RHS\_Upr\_IB\_pickup = [305,260]; #RHS Upper IB pickup point

RHS\_Lwr\_IB\_pickup = [215,90]; #RHS Lower IB pickup point

static\_camber = -1.5; #In degrees

UWB\_length = X; #Upper wishbone length in front view

LWB\_length = X; #Lower wishbone length in front view

UWB\_angle = X; #Upper wishbone angle to horizontal. Anti-clockwise positive

LWB\_angle = -X; #Lower wishbone angle to horizontal. Anti-clockwise positive

|  |  |  |
| --- | --- | --- |
|  | **Baseline** | **New** |
| Suspension Data | Baseline kingpin angle is: -8.1˚.  Baseline scrub radius is: 16.65 mm.  Baseline roll centre height is: 18.62 mm. | Baseline kingpin angle is: -9.76 ˚.  Baseline scrub radius is: 10.91mm  Baseline roll centre height is: 16.64mm |
| Geometry Changes in Roll |  |  |
| Roll Centre Migration |  |  |
| RHS Camber Angle vs Roll |  |  |
| LHS Camber Angle vs Roll |  |  |
| Geometry Changes in Bump |  |  |
| Scrub Radius vs Bump |  |  |
| Camber Angle vs Bump |  |  |

## Conclusions

* Lower ride height
* Camber recovery is great, with a normal characteristic
* Roll centre stable
* Bump characteristic is marginally better

# JDRS\_Geom003

The baseline geometry is FDW\_Geom001. The change in this geometry is a slight extension of the upper wishbone

RHS\_Upr\_OB\_pickup = [528.53,355]; #RHS Upper OB pickup point

RHS\_Lwr\_OB\_pickup = [564.85,140]; #RHS Lower OB pickup point

RHS\_Upr\_IB\_pickup = [300,285]; #RHS Upper IB pickup point

RHS\_Lwr\_IB\_pickup = [215,110]; #RHS Lower IB pickup point

static\_camber = -1.5; #In degrees

UWB\_length = X; #Upper wishbone length in front view

LWB\_length = 418.9412262; #Lower wishbone length in front view

UWB\_angle = X; #Upper wishbone angle to horizontal. Anti-clockwise positive

LWB\_angle = -7.910191806; #Lower wishbone angle to horizontal. Anti-clockwise positive

|  |  |  |
| --- | --- | --- |
|  | **Baseline** | **New** |
| Suspension Data | Baseline kingpin angle is: -9.59 ˚.  Baseline scrub radius is: 11.5mm  Baseline roll centre height is: 23.81mm | Baseline kingpin angle is: -9.59˚.  Baseline scrub radius is: 11.5 mm.  Baseline roll centre height is: 29.47 mm. |
| Geometry Changes in Roll |  |  |
| Roll Centre Migration |  |  |
| RHS Camber Angle vs Roll |  |  |
| LHS Camber Angle vs Roll |  |  |
| Geometry Changes in Bump |  |  |
| Scrub Radius vs Bump |  |  |
| Camber Angle vs Bump |  |  |

## Conclusion

* Camber recovery is even better
* Better characteristic in bump (around about 0 camber at maximum rebound)