

# TALKING PORSCHE 996

PCGB Modified and 996 Register Zoom Meet

05.08.2020



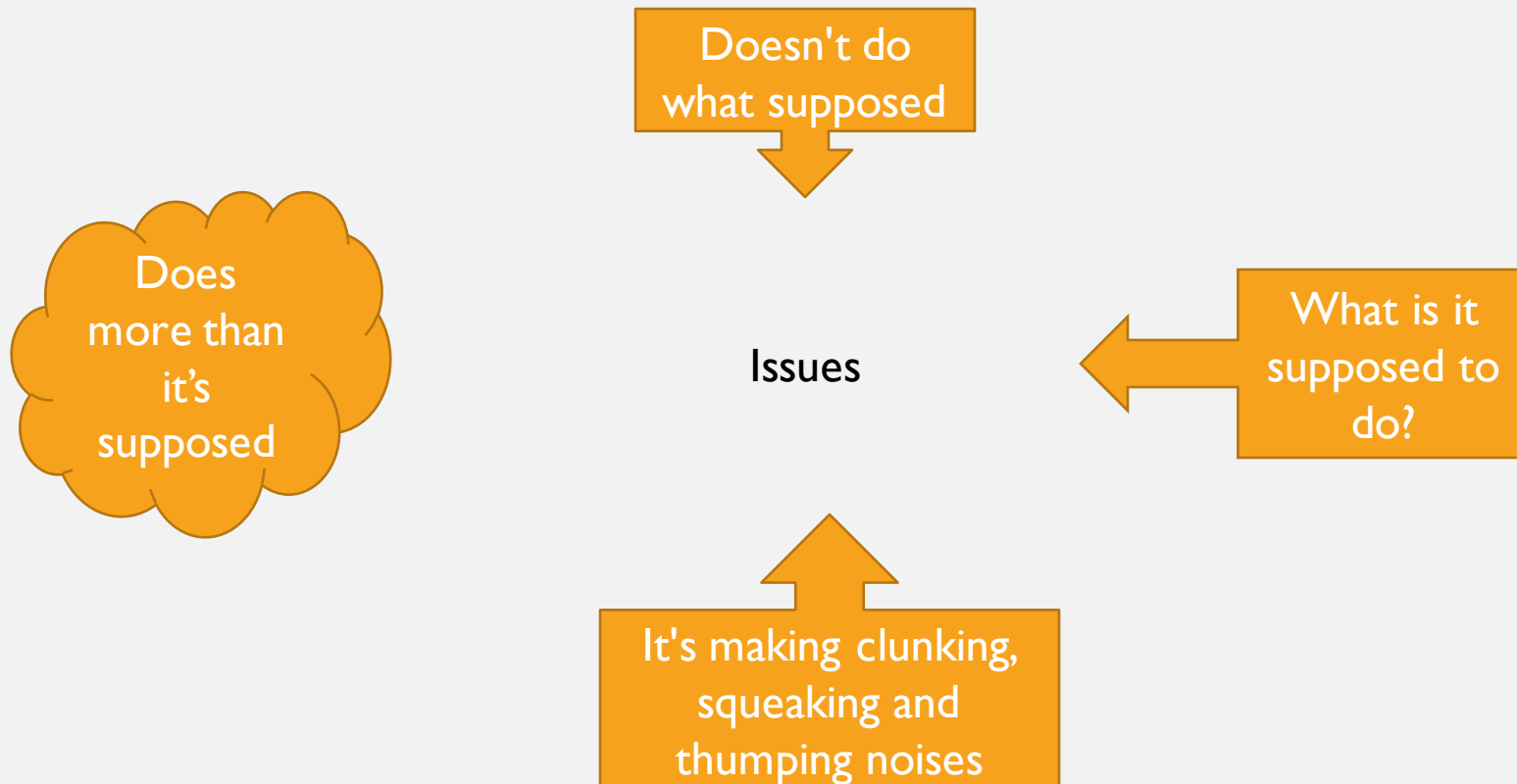
# 996 SUSPENSION

- Suspension Issues
- Degradation of the performance of components
- Typical issues arising
- Options to improve or restore original performance



\* when driving

# SUSPENSION ISSUES





# WHAT IS SUPPOSED TO HAPPEN <sup>\* and not</sup>

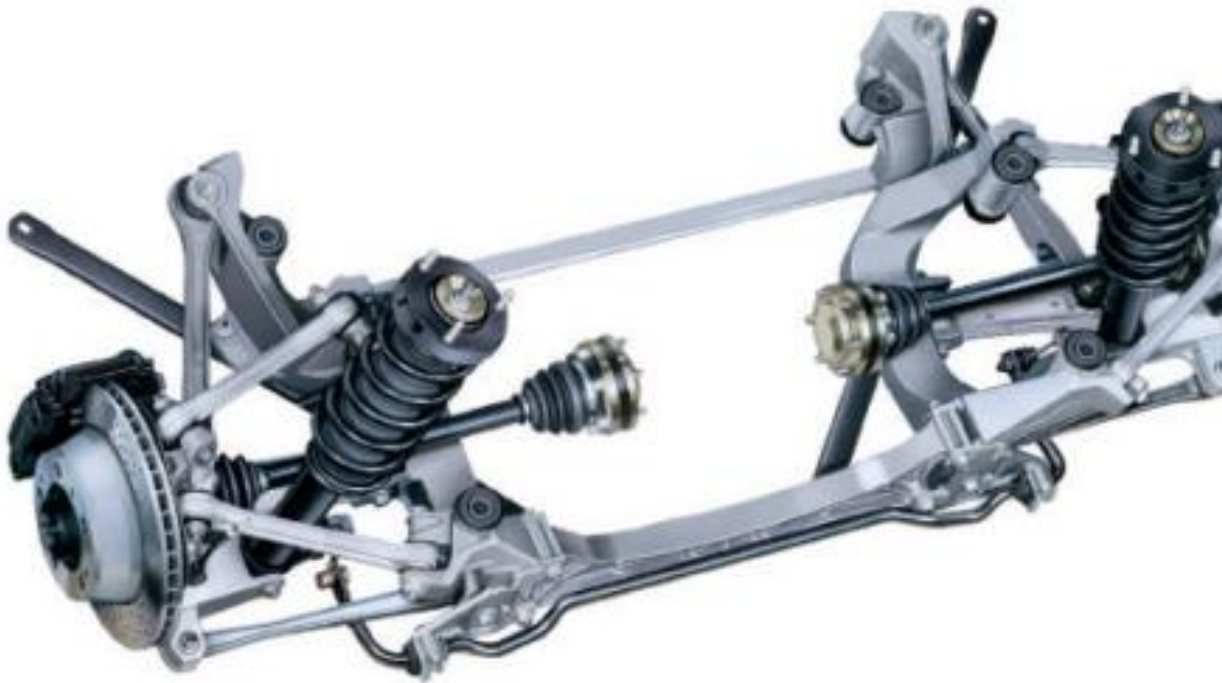
## 996 driving themes

- Optimise grip to accelerate, brake & turn
- Safe, fun, sportier with confidence
- Give precise control
- Wheels conform to the road surface
- Comfort for driver and passengers

## 996 driving gripes

- Lack of grip in powering turn
- Lightness at the wheel at higher speed
- Skittish behavior off smooth roads
- Steering feels light and vague at high speed
- Wheels react to road (mouse and the elephant!)
- My wife will not get in it (too harsh)

IZ03 Rear axle



## LIGHT STABLE AGILE (LSA) REAR AXLE

- MULTI LINK
- 5 LINKS/WHEEL
- 2 PIVOTS/LINK
- 80% ALUMINIUM
- FORGED & CAST
- COILOVER  
DAMPER

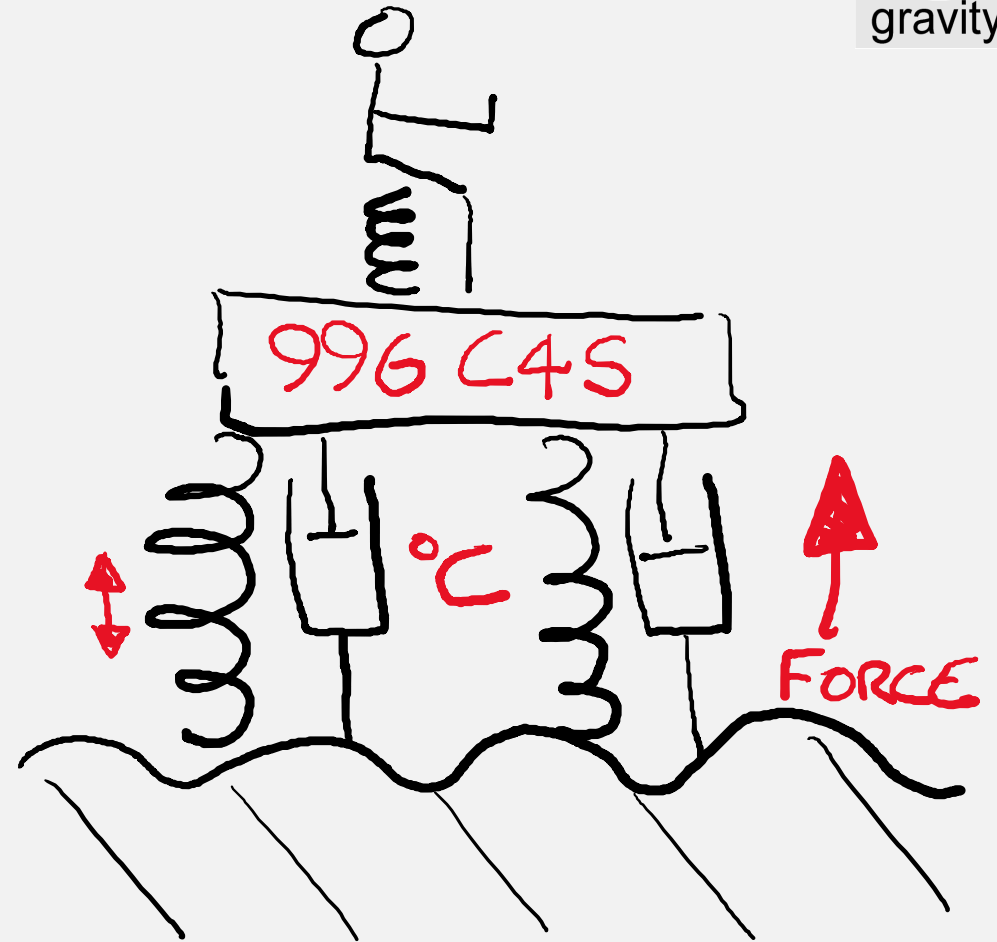
996 FRONT  
AXLE  
MCPHERSON  
STRUT  
SIMPLE CHEAP  
80%  
ALUMINIUM  
COILOVER





# THE THEORY

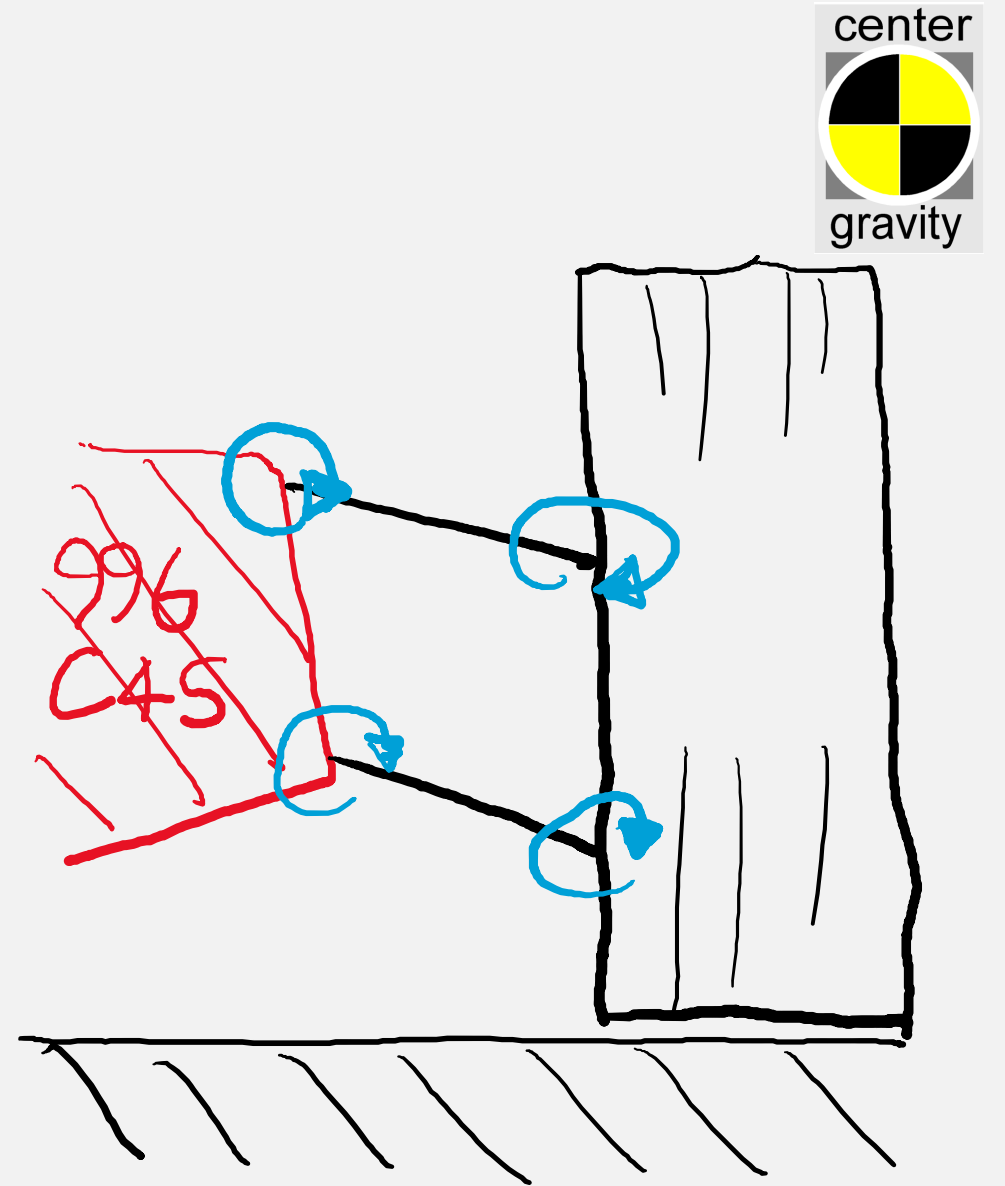
Springs and dampers  
Energy of the bump is absorbed by the spring and dissipated by the damper



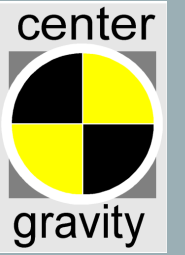
## THE THEORY

Links (control arms) and pivots

The links precisely locate the wheel through its travel







# CONTROL ARM BALLJOINT

# METALASTIC BUSH





# 996 HANDLING ACHILLES HEELS

- Miles
- Abuse
- Fun = WEAR
- Duty      Reduction in control of the wheels path and direction of travel
- Broken bushing  
    Or      = allows link and wheel  
    Worn balljoint      more freedom
- Stiff balljoint = restricts link and wheel freedom



# INVENTORY OF SUSPENSION COMPONENTS

## FRONT

- 2x dampers
- 2x springs
- 2x front top mounts
- 2x front bump stops
- 2x track control arms
- 2x diagonal control arms
- 2x inner rod end
- 2x outer rod end
- 2x front ARB bush
- 2x front ARB droplinks
- 1x steering rack (PAS)
- 2x wheel bearings

## REAR

- 2x dampers
- 2x springs
- 2x rear top mounts
- 2x rear bump stops
- 2x track control arms
- 2x diagonal control arms
- 4x upper link arms
- 2x toe arms
- 2x rear ARB bush
- 2x rear ARB droplinks
- 2x engine mount
- 1x gearbox mount
- 2x wheel bearings

# ON THE CG SCRAP HEAP



TRACK CONTROL ARM  
COFFIN ARM  
LOWER CONTROL ARM

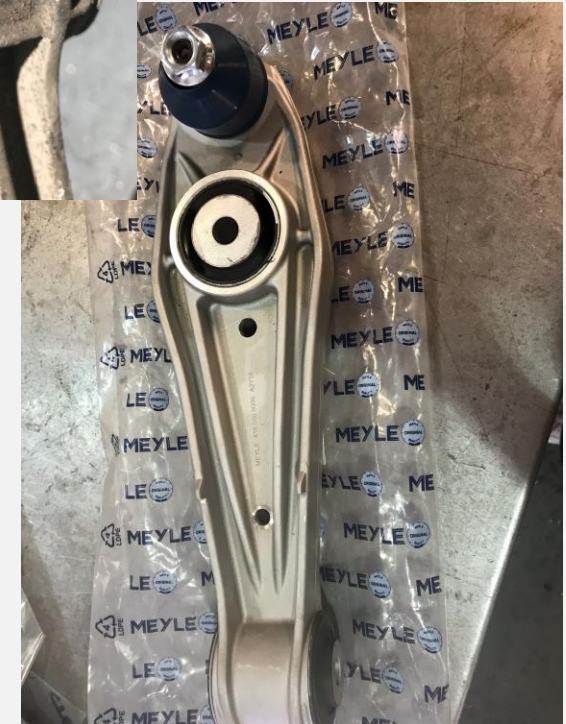
Broken TCA bushings/balljoints

Symptoms include:

Strange on/off throttle and braking behaviour

Unpredictable/darty handling of bumps

Creaky noise 'frogs'



## STEERING CONTROL ARM ROD ENDS (INNER/OUTER)

Worn balljoints

Symptoms include:

Vagueness in steering – exacerbated at speed

Rattles and snockerballs



DIAGONAL ARM  
LINK ARM  
RADIUS ARM  
TUNING FORK

Worn balljoints

Asymptomatic

Snooker ball rattle - metallic





## FRONT TOP MOUNT

Broken or delaminated top mount bushing

Symptoms:

Squeaks, clunks and rattles

(especially over broken surface and at slow maneuvering)



## FRONT BUMP STOP SECONDARY SPRING

Perish and break

Symptoms:

- Quietly perish/break under top mount
- Rarely evaporate evenly across axle giving directional change on braking
- Harsh ride quality over bump



# TOE ARM

Balljoint fails (first!)

Symptoms:

Loose rear axle

Steering from the rear

Occasional knock



REAR UPPER LINK ARM  
DOGBONE  
REAR LOWER WISHBONE

Worn bush

Symptoms:

Unpredictable, darty handling on bump

Strange on/off behaviour on throttle/braking



## DAMPERS AND SPRINGS SHOCK ABSORBERS STRUT

wear due to mileage/age/over exertion

Leaking possible (dampers)

Quiet – even when worn

Get old gracefully

Springs can snap – longstanding in cold weather or overexertion



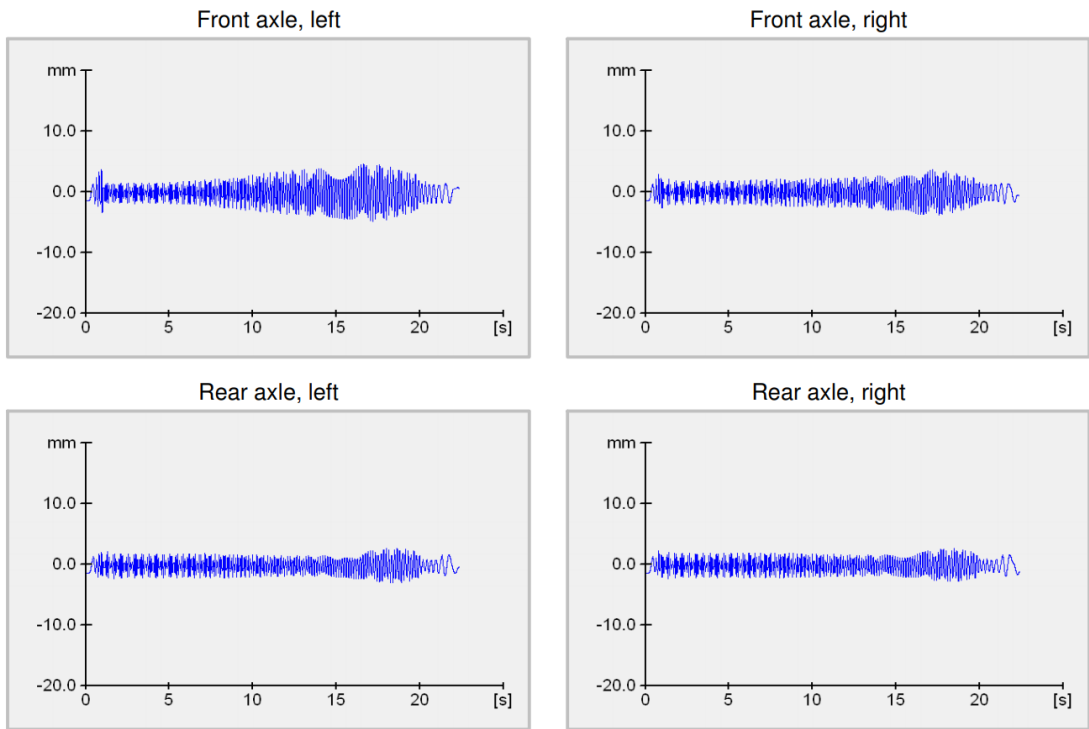
Results Suspension Test

	Front axle			Rear axle		
	left	diff	right	left	diff	right
Absorption Theta	0.30	0 %	0.30	0.30	0 %	0.30
Wheel weight	269 kg		261 kg	450 kg		418 kg
Axle weight	530 kg			868 kg		
Start time	13/08/2018 11:19:03			End time 13/08/2018 11:21:59		

DODGY DAMPERS...?

996 C2 M030

Slightly loose FL damper in low speed bump and rebound



# SHOPPING LIST – PARTS FOR RESTORE

- Michelin tyres
- Pirelli tyres
- Bridgestone tyres
- Hartech refurbished arms
- OEM Porsche
- OETRW
- OE Lemforder
- Bilstein B4 (M029 and M030)

## Near restore

- Meyle
- CTE

## Aftermarket restore

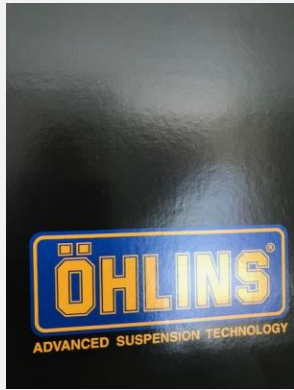
- Hamburg Technik





# UPGRADE

- Koni – Special Active damper
- Powerflex bushes
- Bilstein (B6, B8, B12, B16, PSS)
- Elephant Racing
- RSS
- Eibach spring and ARB
- H&R spring and ARB
- Rennline
- Ohlins coilover
- KW coilover







## FAVOURITE MODS?

### CHRIS

- Optimal geo
- Increase rear ARB (Eibach ARB here, lightweight, adjustable front and rear and stiffer)
- Lightweight fly wheel and clutch

### PETE

- Optimised geometry
- RSS semi solid engine mounts
- Michelin PS4