**Formula SAE - Vehicle Dynamics Terminology List**

**BALANCE**
- Oversteer
- Understeer
- Understeer gradient in deg/g.

**CHASSIS**
- Ultimate tensile strength of materials used in chassis and suspension construction
- Modulus of elasticity for the same materials
- The difference between strength and stiffness
- Torsional rigidity by FEA and by physical measurement
- Torsional rigidity profile or slope
- Installed stiffness
- Bump, droop, roll, heave, warp

**SUSPENSION RATES**
- Ride rate, wheel rate, spring rate, motion ratio (installed ratio)
- Body un-damped natural frequency
- Suspension un-damped natural frequency (hop and tramp)
- The effect of “stiction” or friction in suspension pivots
- Damping ratio
- Single tube and twin tube shock absorbers (dampers)
- Shock absorber bump and droop
  - Shock absorber piston speed
  - Shock absorber nose pressure
  - Shock absorber hysteresis
- Critical damping
- Roll stiffness
- Percentage of roll stiffness from springs/anti roll bars
- Roll stiffness per transverse g., front and rear
- Static load distribution
- Lateral load transfer per transverse g.
- Longitudinal load transfer per g.
- Load transfer due to steering geometry
- Load transfer due to steering geometry
- Anti squat and anti dive coefficients and in percentages
- Advantages and disadvantages of anti squat and anti dive geometry

**SUSPENSION GEOMETRY**
- Roll center (definition)
- Roll center height and lateral location
- Roll center migration (vertical and lateral)
- Roll axis
- Camber
  - Camber change in ride (ride camber coefficient in degrees/inch)
  - Camber change in roll (roll camber coefficient in degrees/degree)
Caster
Camber change with steer angle due to caster
King pin inclination (steering axis)
Camber change with steer angle due to king pin inclination
Scrub radius (steering offset)
Mechanical trail (caster trail)
Spindle offset (wheel center to steering axis at spindle height)
Toe in and toe out
Ackerman, modified Ackerman and anti-Ackerman steering geometry
Bump Steer
  Ride steer
  Roll steer

MOMENTS
  Polar moment of inertia
  Moments of rotational inertia
  Yaw Moment
  Roll moment
  Pitch moment

BRAKE SYSTEM
  Pedal mechanical ratio
  Hydraulic ratio, front and rear
  Clamping load front and rear per 100 psi line pressure
  Coefficient of friction between disc and pad friction material at operating temperature
  Hysteresis

DRIVE LINE
  Differential bias ratio
  Angular capacities of joints used in drive shafts
  Drive line angles
    Open differential operation
    Salisbury or “plate” differential operation
    Cam and pawl differential operation
    Zexel/Gleason differential operation
    Spool operation

TIRES
  Coefficient of friction
  Slip angle
  Percent slip (slip ratio)
  Cornering stiffness
  Camber stiffness
  Self aligning torque
  Normal load sensitivity
  Load transfer sensibility
  Pneumatic trail