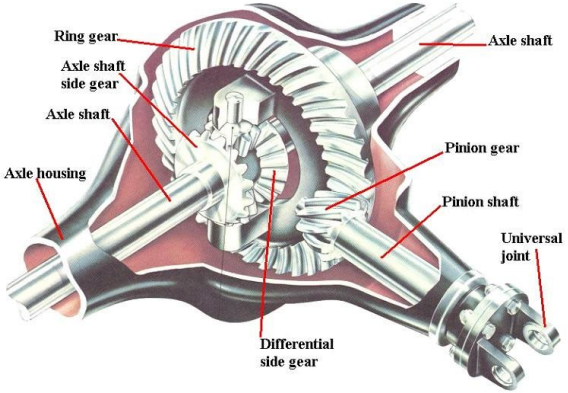
Baja Car Differential Preferences

Design Review

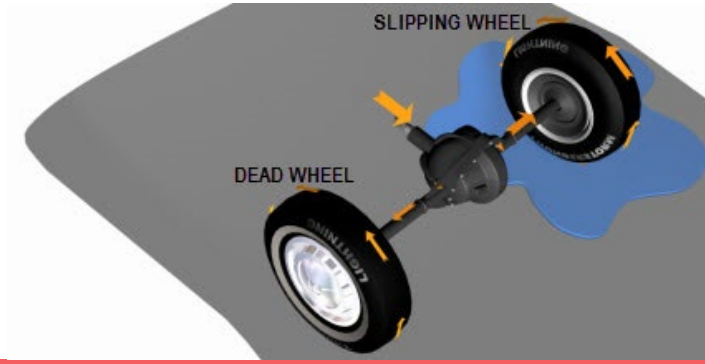
Types of Differentials

Open Differential



+ Easy to obtain (cheap and more common)
+ Less complex (weighs less than LSD, takes less spac

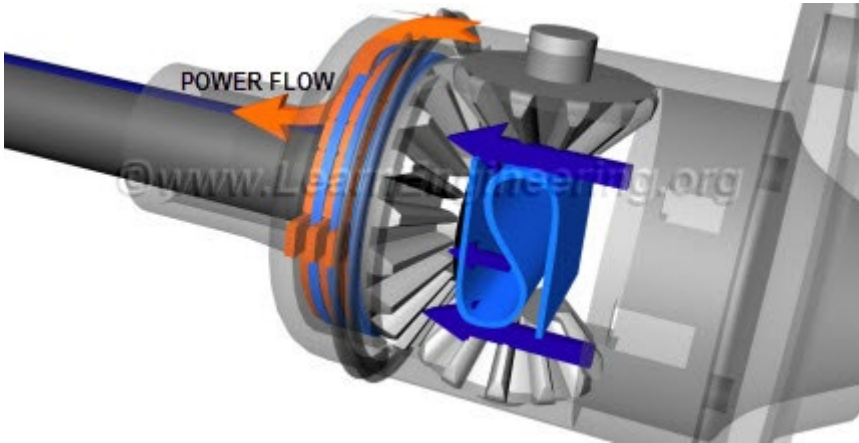
- Traction loss (easy to get stuck)
- No set distribution of torque on wheels



Limited Slip Differential (LSD)

LSD Types:

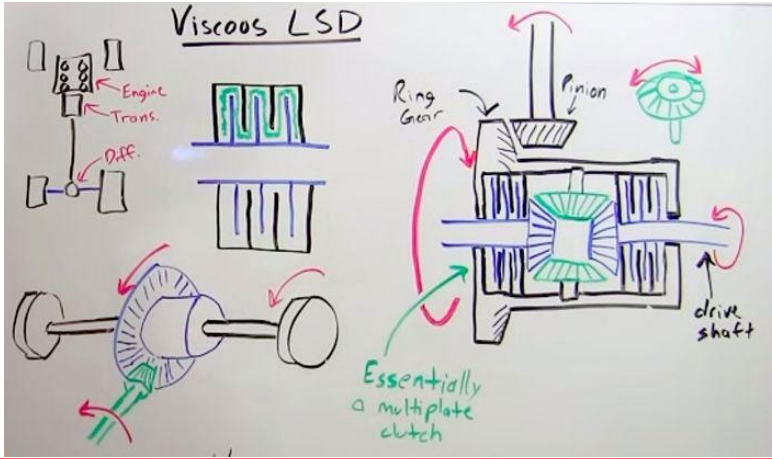
- Viscous - uses fluid
- Torsen - uses helical gears
- Clutch pack - uses clutch packs
  - 1-way
  - 1.5-way
  - 2-way



Viscous LSD

Properties:

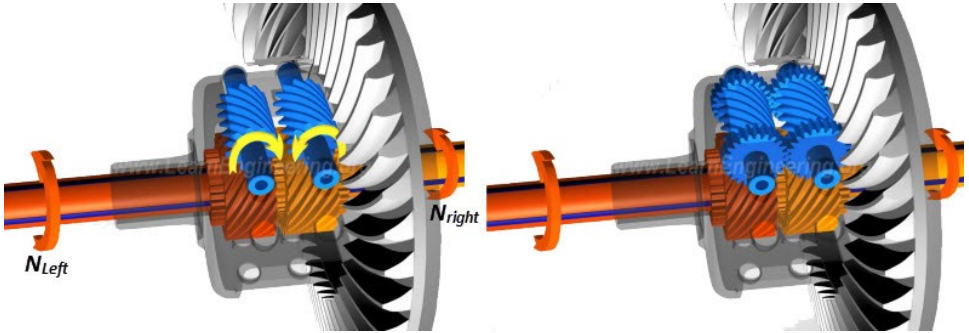
- Diff locked when throttle is applied
- Unequal torque split
- Consideration of thermodynamic properties of the fluid
- Wheels never turn at the same rate
- Hard to find for baja vehicle specs



Torsen LSD

Properties:

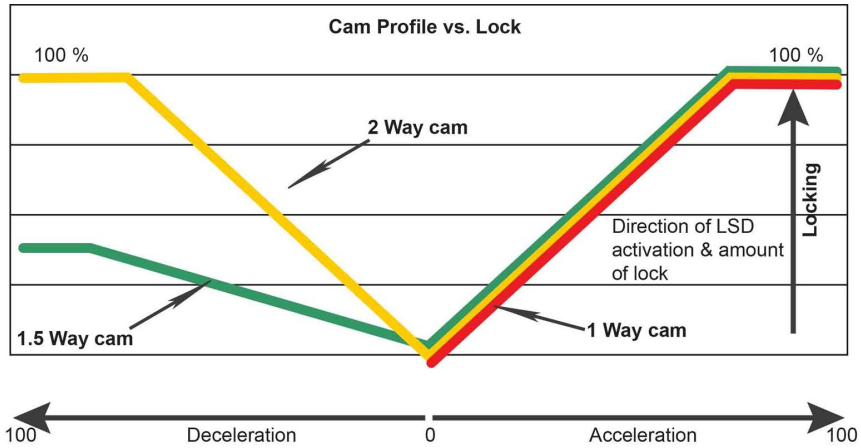
- Quick diff reaction
- Low maintenance, similar to open diff
- Limited choices for baja vehicles
- Needs both wheels on ground for locking on throttle

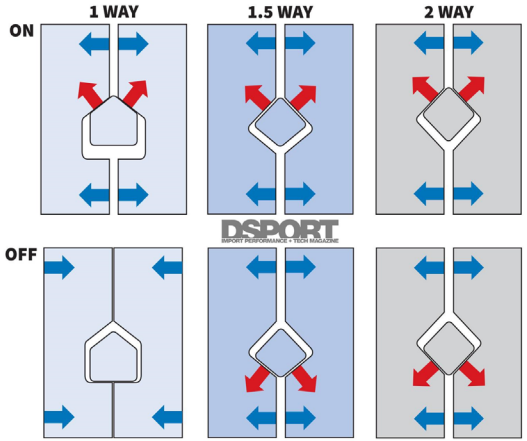


Clutch Pack LSD

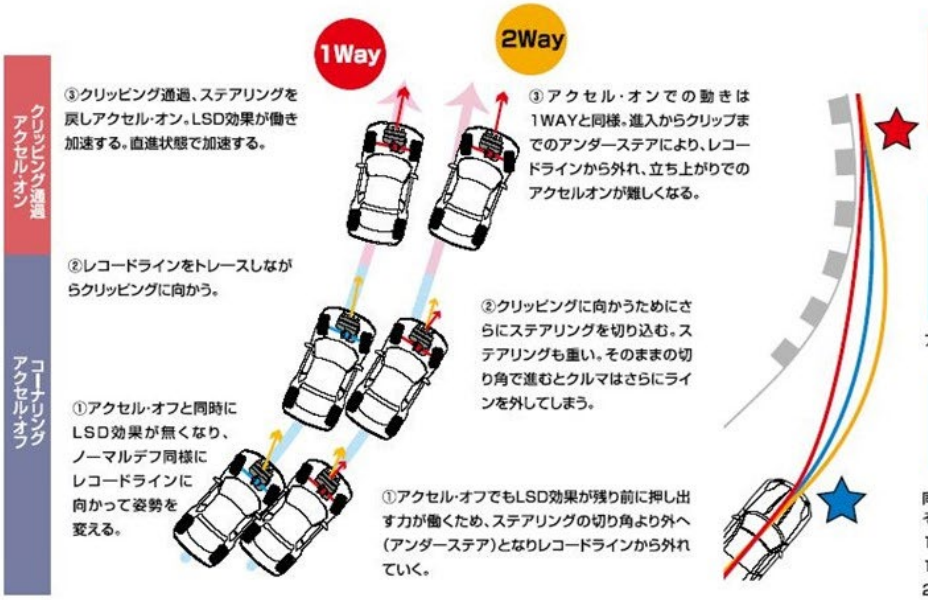
Types:

- 1-way - lock only on throttle
- 1.5-way - lock on throttle and partially on deceleration
- 2-way - lock on throttle and deceleration





FF車、4WD車　フロントにLSDを入れると‥

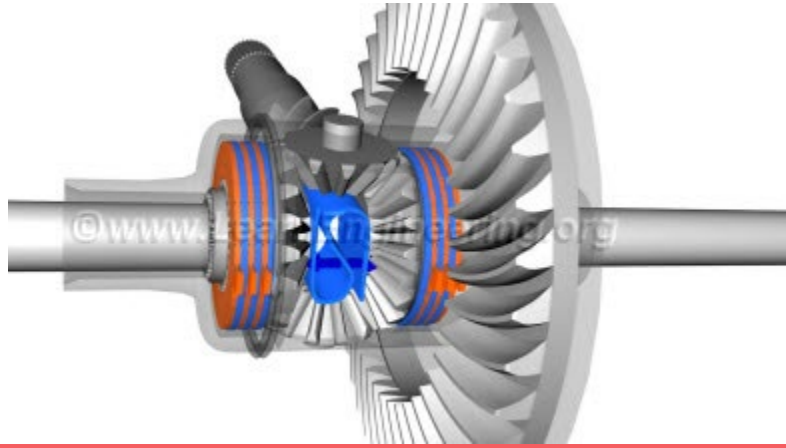


FR車、4WD車　リヤにLSDを入れると‥

Clutch Pack LSD

Properties:

- Equal force on both wheels when on throttle
- Rotate both wheels at the same rate regardless if one is off the ground
- Clutch pack can wear out and needs regular maintenance



Comparison

Differentials		No Diff.
Open	LSD	
easy to obtain(cheap and more common) less complex(weighs less than LSD, takes less space)	controlled launches Reduced chance of car flicking out No single spinning wheel, equal torque distribution, same rotational speed Predicted power output during cornering	easier to calculate brake power simplifies the gearbox design makes the overall design lighter
loss of traction(as wheels are independent in rotation)	increased tyre wear more frequent maintenance(for nonviscous) expensive to repair decreased cornering ability while the diff is locked during decelaration(1.5 and 2 way)	cornering ability is decreased

The improvement on this year's steering is expected to counteract this effect of running no differential

Current Decision:

No Differential

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Running a single continuous rear axle

References:

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