Southern Oregon Corvette Association

April 2024

Newsletter

SOUTHERN OREGON CORVETTE ASSOCIATION, LLC
WWW.SOVETTE.COM
106 NW F St. # 222, Grants Pass, Oregon 97526
501(c) (7) Non-Profit Organization • Federal Tax I.D. #91-1819589

April 2024 NEWSLETTER

Next Club Social

Club Social is Friday, April 19, 2024, at Wonder Bur Lounge at 116 SW H St in Grants Pass OR at 6pm. For more information, see the “Events” section (page 5) for details.

Upcoming Meetings

General Membership Meeting, Wednesday, May 1, 2024, **6:30 p.m.** at the Rogue River Community Center, 132 Broadway Street, Rogue River.

Visitors are always welcome!

Why Join SOCA?

•Promote *esprit de corps* among Corvette enthusiasts.
•Create interest in the Corvette as a true dual-purpose sports car.
•Provide a means of technical information and service to members.
•Encourage dealer and manufacturer cooperation.
•Organize and promote events of a social nature and provide social gatherings for enthusiasts with common interests.
•Sponsor or participate in activities to benefit the community through recognized charities as selected by the members of the Association.

SOCA Logo Apparel
Competitive Athletics, 105 NE 7th St., Grants Pass
(541) 479-1001

OFFICERS:

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Elected Officers

President:	Ron Howard
Vice-President:	Wayne Shelford
Secretary:	James Johnson
Treasurer:	Carol Misner
Sgt-at-Arms:	Larry Weiner
Membership:	Paul Mitchell

Appointed Positions

Sunshine:	Sandee Anderson
Activities:	Kim Moore
Communications:	Gar Stevens
Internet Site:	Sharon Hook-Martino, Elaine Ellis
Parade Coord:	Kerry Razza
Natl Corvette Museum:	Len Atlas
Facebook::	Tammi Moore
Newsletter:	Rob Hill

BIRTHDAYS AND ANNIVERSARIES:

April Birthdays

Larry Bayless
Scott Bayless
Brandon Bretl
Brian Farber
Robin Fliegel
Rob Hill
Ron Howard
Bill Martino
Leslie McCullough
Dora Moore
Lynette Rothwell
Alberto Salas

April Anniversaries

Len & Marga Atlas
Joe & Mariann Chavez
James & Keri Johnson
Frank & Robin Miranda

EVENTS:

2024 Southern Oregon Corvette Association (SOCA) Events

	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
Club meeting (Wed.)	*3*	*7*	*6*	*3*	*1*	*5*	*3*	*7*	*4*	*2*	*6*	*4*

All dates below are Saturdays, except as noted … The dates shown are tentative and subject to change or cancellation.

April:

13th: Pear Blossom Parade in Medford, Lunch at Original Road House (noon)

19th: Social: Wonder Bur Lounge, 116 SW H St, Grants Pass OR, 6 pm

27th: Rod & Custom Show, Medford OR

For additional events, information, and links … see the SOCA website "Events Page:" https://www.sovette.com/events

Remember to take photos at SOCA events, send them to Sharon Hook, and selected photos will appear here on the sovette.com website!

PHOTO GALLERY

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March Social at Jackson Creek Pizza in Medford OR

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Cars & Coffee in Medford OR on April 6

4-Wheel Drive (4WD) vs. All-Wheel Drive (AWD)

Vehicle acceleration on a flat road is possible thanks to two systems: powertrain and driveline (drivetrain).

The **powertrain** is the system which **generates power (torque and speed)**. In most of the cases it's an internal combustion engine, but it can also be an electric motor or a combination of both (in case of a hybrid electric vehicle).

The **driveline** is the sum of mechanical components placed between the wheels and the powertrain. All the components after the engine, which transmit the power to the wheels, are part of the driveline. These components are: clutch/torque converter, gearbox, propeller shaft, differential and drive shafts. The driveline has multiple roles:

- allows the engine to run even if the vehicle is stationary
- allows a smooth vehicle launch from standstill
- converts engine torque and speed to match the road conditions
- allows the vehicle to move backwards, for the same direction of rotation of the internal combustion engine

allows the drive wheels to rotate with different speeds during vehicle cornering

Legend:

1. **internal combustion engine**
2. **clutch / torque converter**
3. **gearbox**
4. **differential**
5. **propeller (longitudinal) shaft**

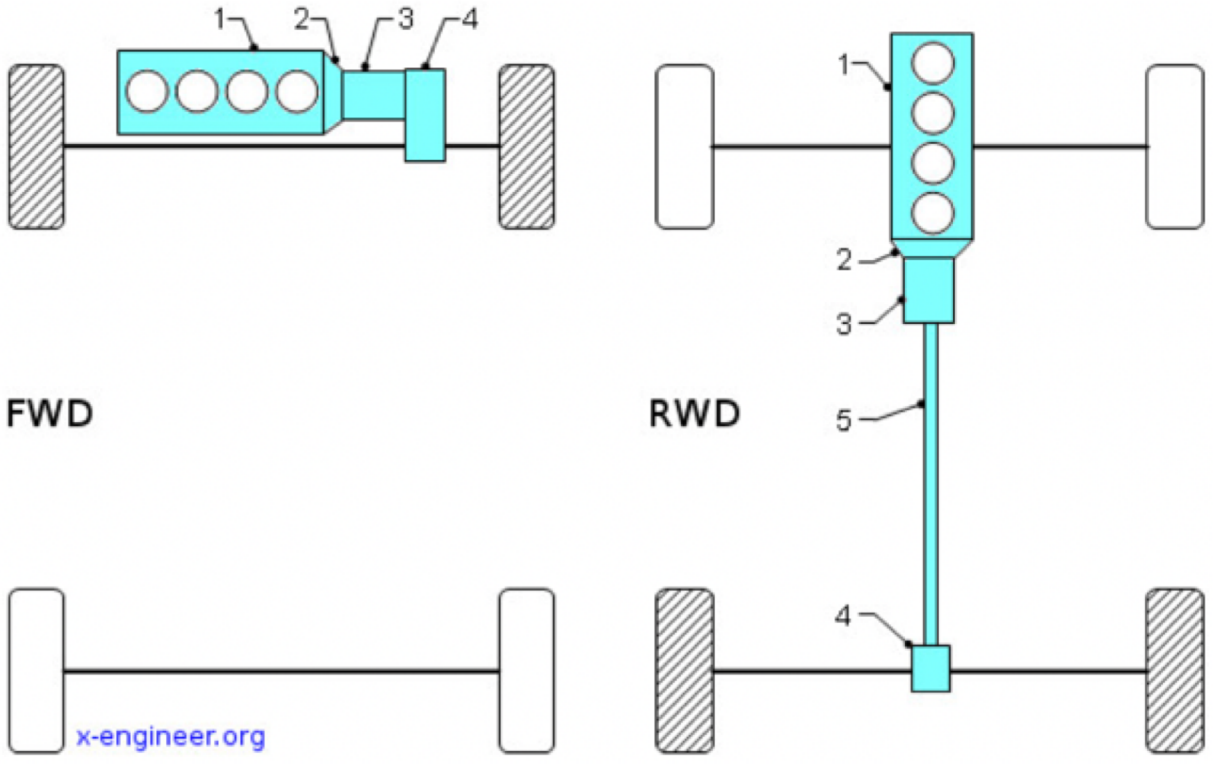


Image: Front-wheel drive (FWD) and rear-wheel drive (RWD) driveline architectures

The **drive wheels** are the wheels of a vehicle's axle which are receiving the engine power, thus performing the traction. Depending on which axle contains the drive wheels, we can have:

- front-wheel drive (FWD)
- rear-wheel drive (RWD)
- four-wheel drive (4WD) / all-wheel drive (AWD)

Front-wheel drive (FWD) vehicles contain both the engine and the drive wheels on the front axle. This is the most common powertrain and driveline arrangement for small and compact vehicles, because of the advantages in terms of space and efficiency.

Rear-wheel drive (RWD) vehicle usually have the powertrain on the front axle and the drive wheels on the rear axle. This is also called the "classical" driveline arrangement, because this is how the first road vehicles were configured. Most of the luxury sedans and sport cars have rear-wheel drive configuration.

Both FWD and RWD vehicles are **two-wheel drive (2WD)** vehicles because the power is transmitted only through two wheels.

There are some vehicle architectures which have both the engine and the drive wheels on the rear axle (e.g. Porsche 911 classic, Renault Twingo 3).

Legend:

1. **internal combustion engine**
2. **clutch / torque converter**
3. **gearbox**
4. **rear differential**
5. **rear propeller (longitudinal) shaft**
6. **transfer case (with central differential and gear reductor (optional))**
7. **front propeller (longitudinal) shaft**
8. **front differential**
9. **coupling device (viscous, electromagnetic)**

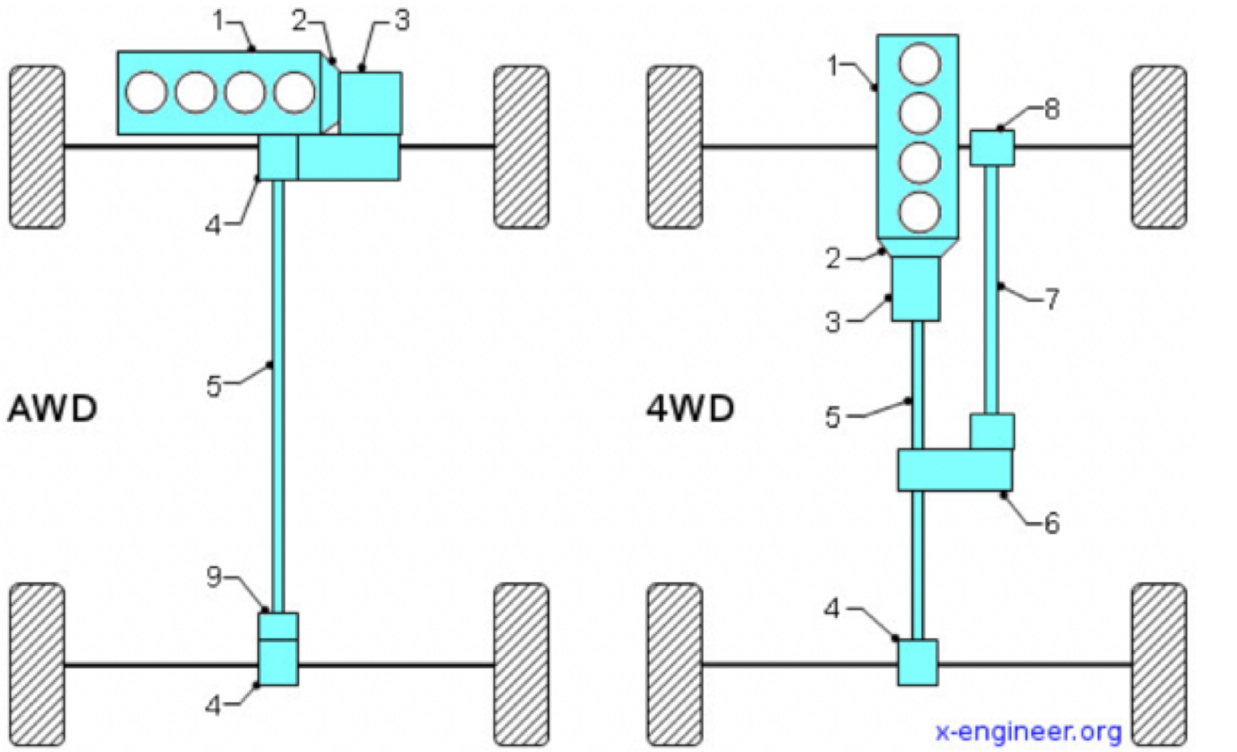


Image: All-wheel drive (AWD) and four-wheel drive (4WD) driveline architectures

When the engine power is distributed to all wheels the vehicle is **all-wheel drive (AWD)** or **four-wheel drive (4WD)**. There is no clear distinction between AWD and 4WD, but usually 4WD vehicles contain a transfer case, which has a central differential and an optional two-gear reductor (LO-low and HI-high).

In case of a AWD or 4WD vehicle, both front and rear axles need to be equipped with a differential, due to the fact that all wheels transmit power and they need to rotate with different speeds during vehicle cornering.

AWD/4WD vehicles are also called **“four-by-four” (4×4) vehicles**. The numbers come from the vehicle **driveline formula**:

2·TotalNumberOfAxles x 2·TotalNumberOfDriveAxles

For a vehicle with two axles, if only one axle has the drive wheels, the formula becomes “**4×2**“. If both axles have the drive wheels, the formula is “**4×4**“.

A **permanent/full-time all-wheel drive** vehicle has a permanent torque split between the front and rear axle, it can not be disabled by the driver or by an electronic control module (ECM).

An AWD/4WD vehicle can have a 2WD mode because the ECM (or the driver) can disconnect one of the axles from being driven. In modern vehicles, the switch between 2WD and 4WD mode is usually done without the driver noticing.

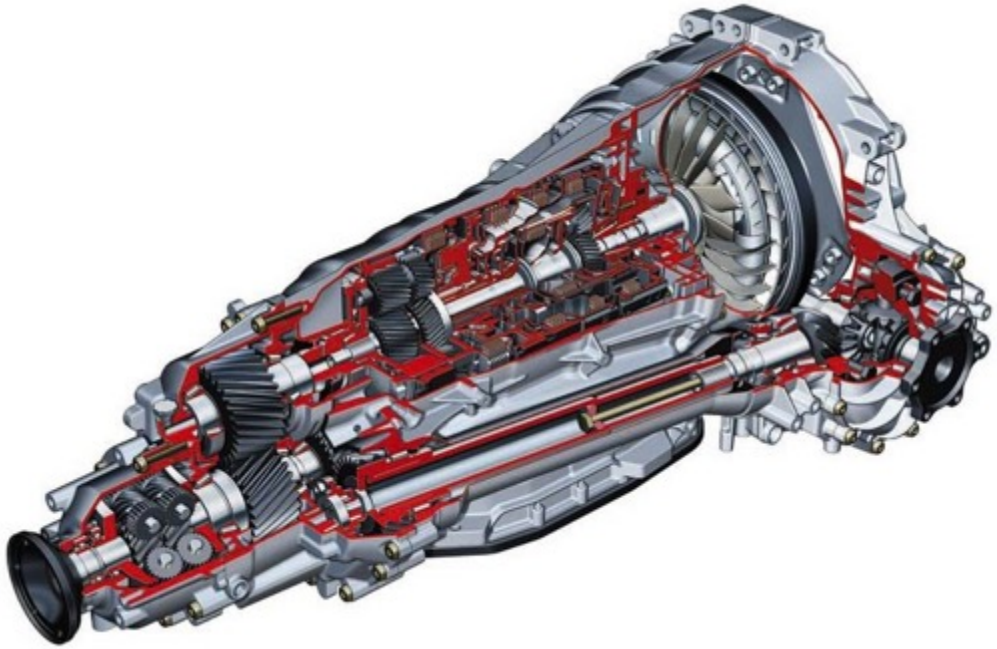
Vehicle manufacturers use different AWD/4WD technologies. Some of them are proprietary driveline systems, some use dedicated components, from Tier 1 suppliers.

Torsen

Torsen comes from **Torque Sensing** and it's a limited-slip mechanical differential. This type of differential was manufactured by the Gleason Corporation. They can be used as front / rear differential or as central (inter-axial) differential.

Torsen differentials are fully mechanical, with satellites and helicoid gears. Their self-locking characteristic depends on torque difference sensing between front and rear axles or between left and right wheels.

Examples of vehicles equipped with Torsen AWD systems: Audi Quattro, Alfa Romeo Q4.



Haldex®

Haldex AWD systems are based on a central coupling device with a wet multi-disc clutch. They are manufactured by Haldex Traction AB group, currently owned by BorgWarner. Haldex systems are usually used as rear axle limited-slip differential.

The Haldex limited-slip differential is controlled by an electronic control module (ECM). Through the multi-disc clutch position (open, closed, slipping), the vehicle can be operated as a FWD vehicle or AWD vehicle. The torque split between the front and rear axles is variable, depending on the clutch position. The system is controlled through an electro-hydraulic actuation system.

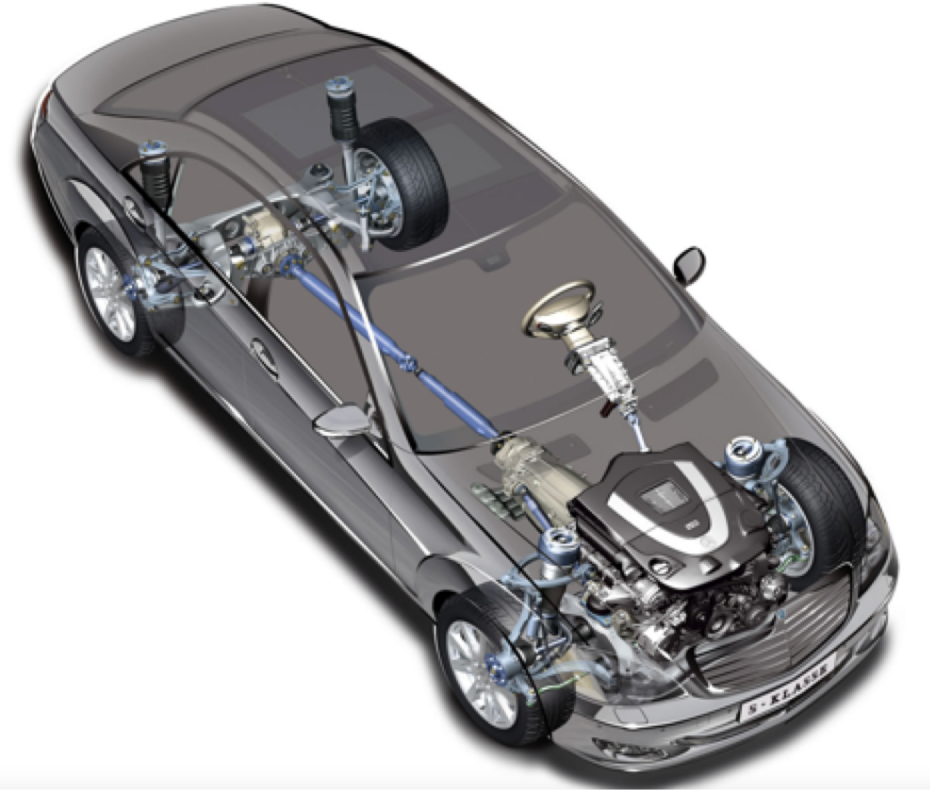
Haldex AWD systems are widely used in automotive industry, for example in the vehicles: Audi Q3, Skoda Octavia 4×4, VW Tiguan, SEAT Alhambra 4, Lamborghini Aventador LP 700-4, Bugatti Chiron, Volvo V60 AWD, Volvo XC90 AWD, Ford Kuga, Land Rover Range Rover Evoque, Opel Insignia, Buick Lacrosse, Cadillac SRX, etc.

BMW xDrive

xDrive is the BMW proprietary 4WD technology. First BMW equipped with xDrive was X5 in 2004. The main component of the xDrive system is the **transfer case**. The purpose of the transfer case is to split the power coming from the gearbox between front and rear axles.

The torque control between front and rear axle is performed through a wet multi-disc clutch inside the transfer case. The clutch position is actuated with an electric motor by an electronic control module. When the clutch is fully closed, the torque split is 50:50 between front and rear axle.

4MATIC is the AWD/4WD technology developed by Mercedes-Benz. In consists in a central planetary differential which splits the torque between front and rear axles. The first generation of 4MATIC was using an electronically controlled central differential, a rear limited-slip differential and a front open differential. The latest generation of 4MATIC system is using three open differentials (front, rear and central).



EMCD comes from Electro-Magnetic Control Device. It consists wet multi-disc clutch controlled by an electro-magnetic actuator. The EMCD system is manufactured by GKN Driveline. It is acting as a limited-slip central differential, controlled by an electronic control module (ECM). The vehicles equipped with an EMCD are working in nominal mode as a FWD vehicles. The AWD capability is on-demand" depending on the vehicle and road conditions. The driver has the option to completely lock the clutch, for permanent AWD capability, but in AUTO mode the ECM takes the decision.

Examples of vehicles with EMCD-AWD system: Nissan Quashgai, Nissan X-Trail, Dacia Duster, Fiat Sedid.

Visco-coupling system

These are the simplest 4WD technologies. The front and rear axles are linked together through a viscous self-locking coupling device. The visco-couple contains several circular plates with tabs and perforations. These are immersed in a viscous, silicone-based fluid.

The visco-coupling technology was usually used on small vehicles. The front axle is the nominal drive axle, the rear axle was pulled, without torque being transferred through the visco-couple. If the front axle was spinning, due to loss of adhesion, the visco-couple started to lock, transferring torque to the rear axle.

The advantage of the visco-coupling technology is simple construction at low cost. The disadvantages are low efficiency and slow reaction time.

Examples of vehicles with visco-coupling: Fiat Panda, Renault Scenic RX4.