
GROUP 27

REAR AXLE

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GENERAL INFORMATION

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For the rear axle, the unit bearing (double row angular contact ball bearing) in which the hub and ball bearing are incorporated has been adopted for the rear wheel bearing, and the EBJ-ETJ type constant velocity joint for the rear driveshaft.

There are the following features.

- The lightweight rear driveshaft and compact EBJ-ETJ type constant velocity joint have been equipped.
- The rear driveshaft spline diameter on the wheel-side and differential-side (LH) has been increased, improving torsional strength.
- The ABS magnetic encoder for wheel speed detection has been integrated into the rear wheel bearing, and the protector cover of magnetic encoder for wheel speed detection has been equipped to the driveshaft.

- The lead-free grease has been adopted for the constant velocity joint.
- Hexavalent chromium has been eliminated from the dust cover material and protector cover of magnetic encoder for wheel speed detection.
- The AYC differential has been equipped.

NOTE:

EBJ (High Efficiency Compact Birfield Joint): Joint which is lighter and more compact than BJ (Birfield Joint) by increasing the number of balls from six to eight

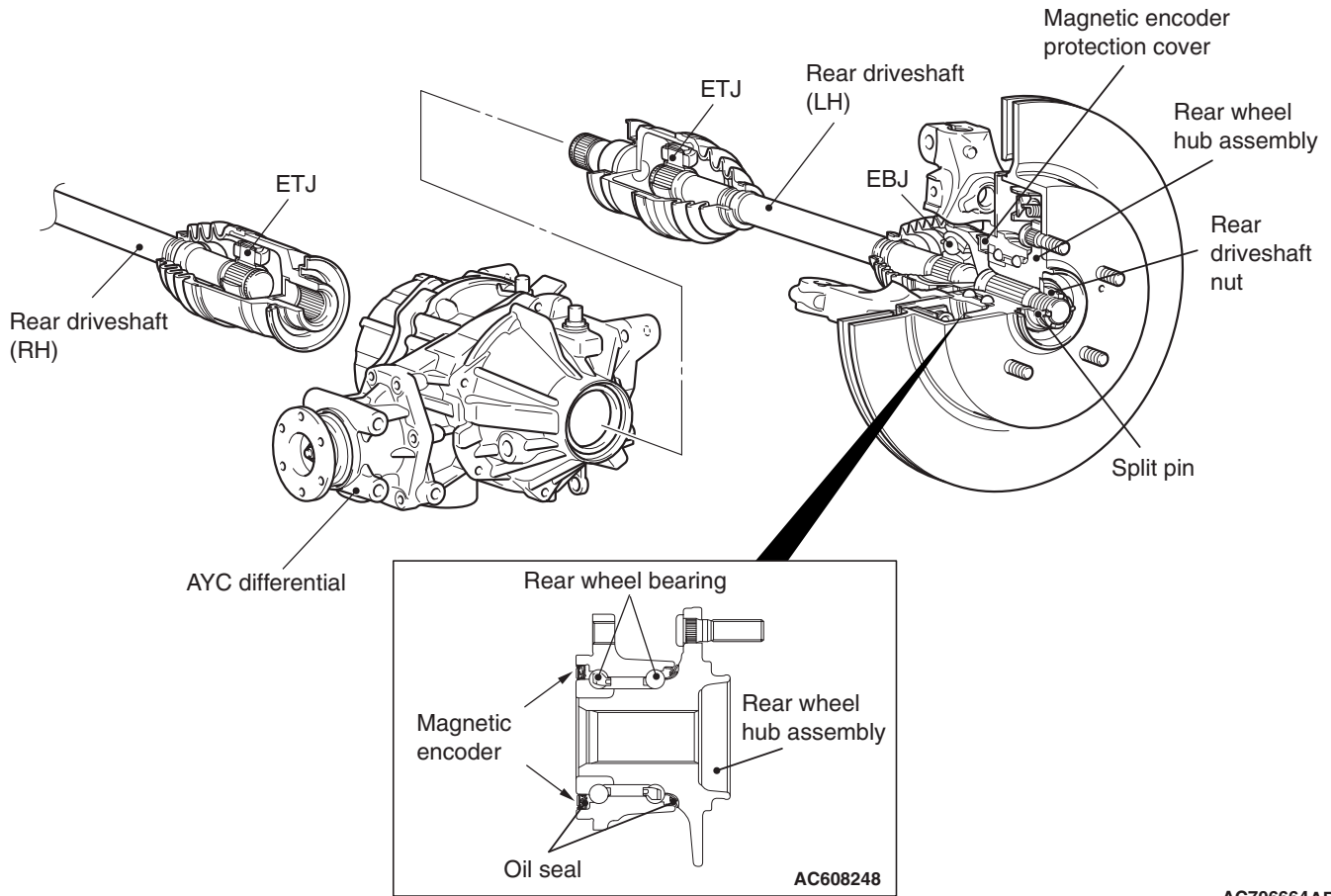
ETJ (High Efficiency Compact Tripod Joint): Joint which is lighter and more compact than TJ (Tripod Joint)

SPECIFICATIONS

Item		Specification	
Rear wheel bearing	Bearing type		Unit bearing (double-row angular contact ball bearing)
Rear driveshaft	Joint type	Outer	EBJ
		Inner	ETJ
	Shaft length* x Shaft diameter mm (in)	LH	434 × 25 (17.1 × 0.98)
		RH	456 × 25 (18.0 × 0.98)

NOTE: *: Indicates the distance between the center of each joint.

CONSTRUCTION DIAGRAM



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DIFFERENTIAL

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The AYD differential is adopted, and has the following features:

- The AYD differential consists of differential mechanism, acceleration/deceleration gear and two pairs of wet multi-plate clutch.
- In order to increase torque transfer amount, shaft-to-shaft coupling, which directly transmits torque between LH and RH wheels, has been adopted for the AYD differential.
- In order to achieve shaft-to-shaft coupling, a planetary gear has been adopted for the differential mechanism.

- Cornering ability: When the torque transfer amount is increased between LH and RH wheels, the yaw moment is also increased to raise the cornering limit, as well as to reduce understeer characteristics.
- Traction ability: Traction ability (LSD effect) is increased when the rear inner wheel loses contact with the ground during high-gravity cornering, or when the road conditions for LH and RH wheels largely differ.

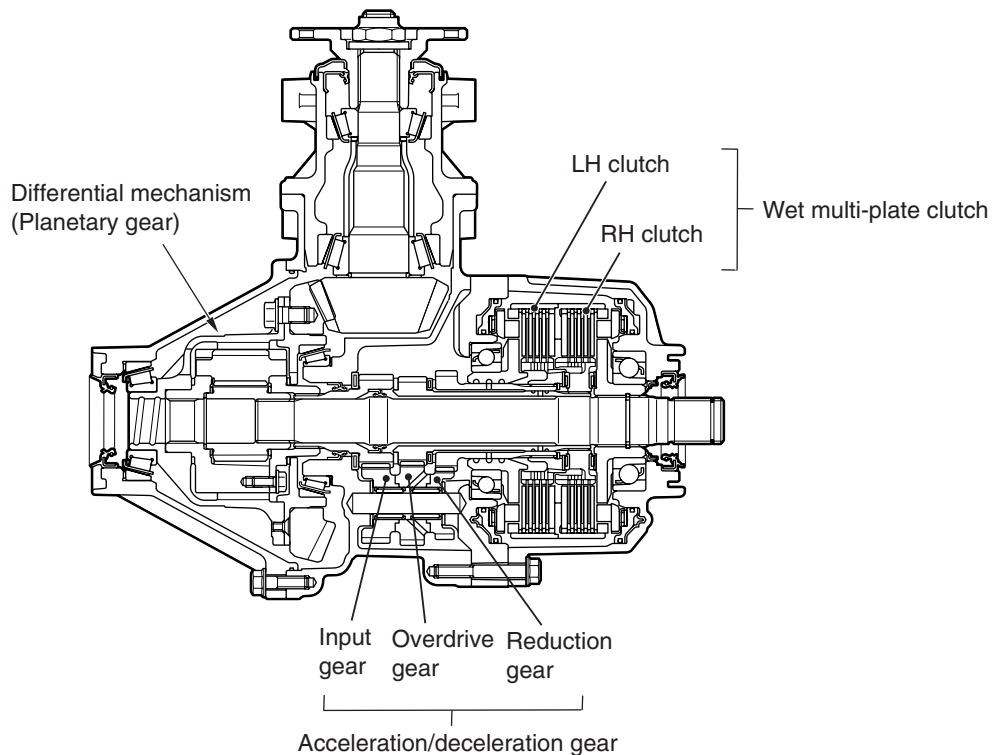
NOTE:

- For the AYD (Active Yaw Control), refer to GROUP 22A – Super All Wheel Control (S-AWC) – Information of construction and operation P.22A-6.

SPECIFICATIONS

Item		Specification
Differential type		AYC differential
Reduction gear type		Hypoid gear
Reduction ratio		3.307
Number of teeth	Drive gear	43
	Drive pinion	13
Bearing (Outside diameter × inside diameter) mm (in)	Side	72 × 37 (2.8 × 1.5) <LH>, 92 × 67 (3.6 × 2.6) <RH>
	Front	62 × 25 (2.4 × 1.0)
	Rear	72 × 35 (2.8 × 1.4)

DIFFERENTIAL



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DIFFERENTIAL MECHANISM

When the vehicles turns, admits the revolution difference between inner wheel and outer wheel.

ACCELERATION/DECELERATION GEAR

Have the revolution speed of right and left wet multi-plate clutch to accelerate or decelerate as opposed to the revolution speed of right wheel.

WET MULTI-PLATE CLUTCH

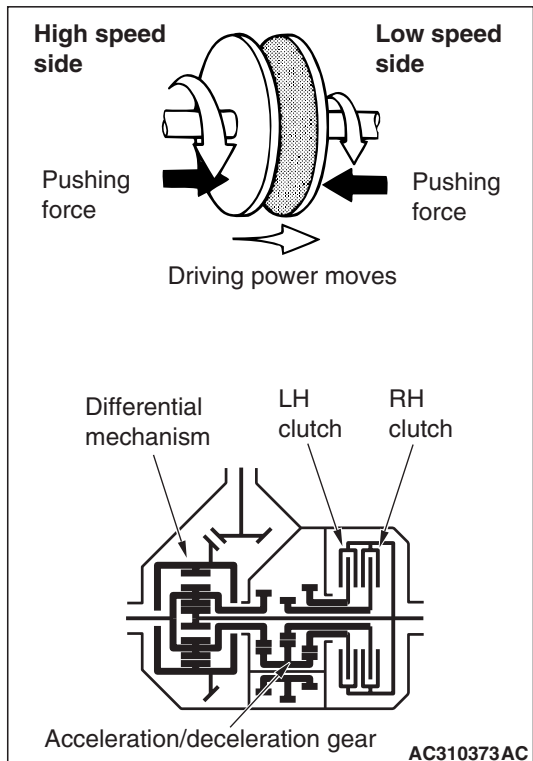
Have the torque to move from high speed wheel to low speed wheel.

LH clutch operate: deceleration gear have the torque to move RH wheel to LH wheel.

RH clutch operate: acceleration gear have the torque to move LH wheel to RH wheel.

The movement of torque is dependent on pushing force of the clutch.

AYC DIFFERENTIAL MECHANISM



When high speed clutch is pushed, the driving power always moves from high speed side to low speed side, and controls the driving power with the aid of the property which the movement of driving power is proportional to the pushing force of clutch.

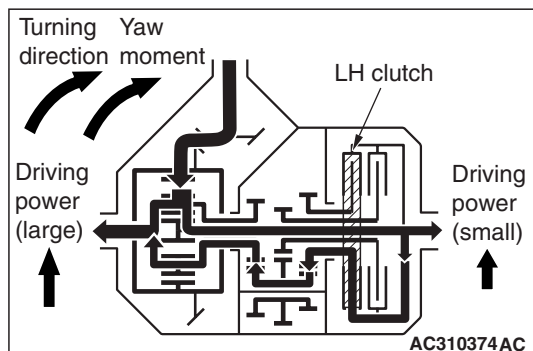
In AYC differential, acceleration/deceleration gear always engages, and toward to input speed from the differential mechanism, LH clutch engaging deceleration gear rotates in low speed, and RH clutch engaging acceleration gear rotates in high speed.

In other hand, the housing side of RH/LH clutch is integrated to rear RH axle and if RH or LH clutch is operated, the driving power can be moved to right or left.

THE FLOW OF DRIVING POWER

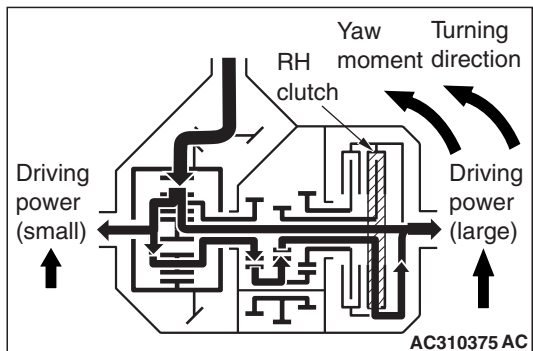
1. LH CLUTCH OPERATE

In order to boost the driving power of LH wheel, when LH clutch is operated, a part of the driving power of RH wheel flows to the differential mechanism, the driving power of LH wheel is boosted. The result of this, the yaw moment occurs in a right to the vehicle.

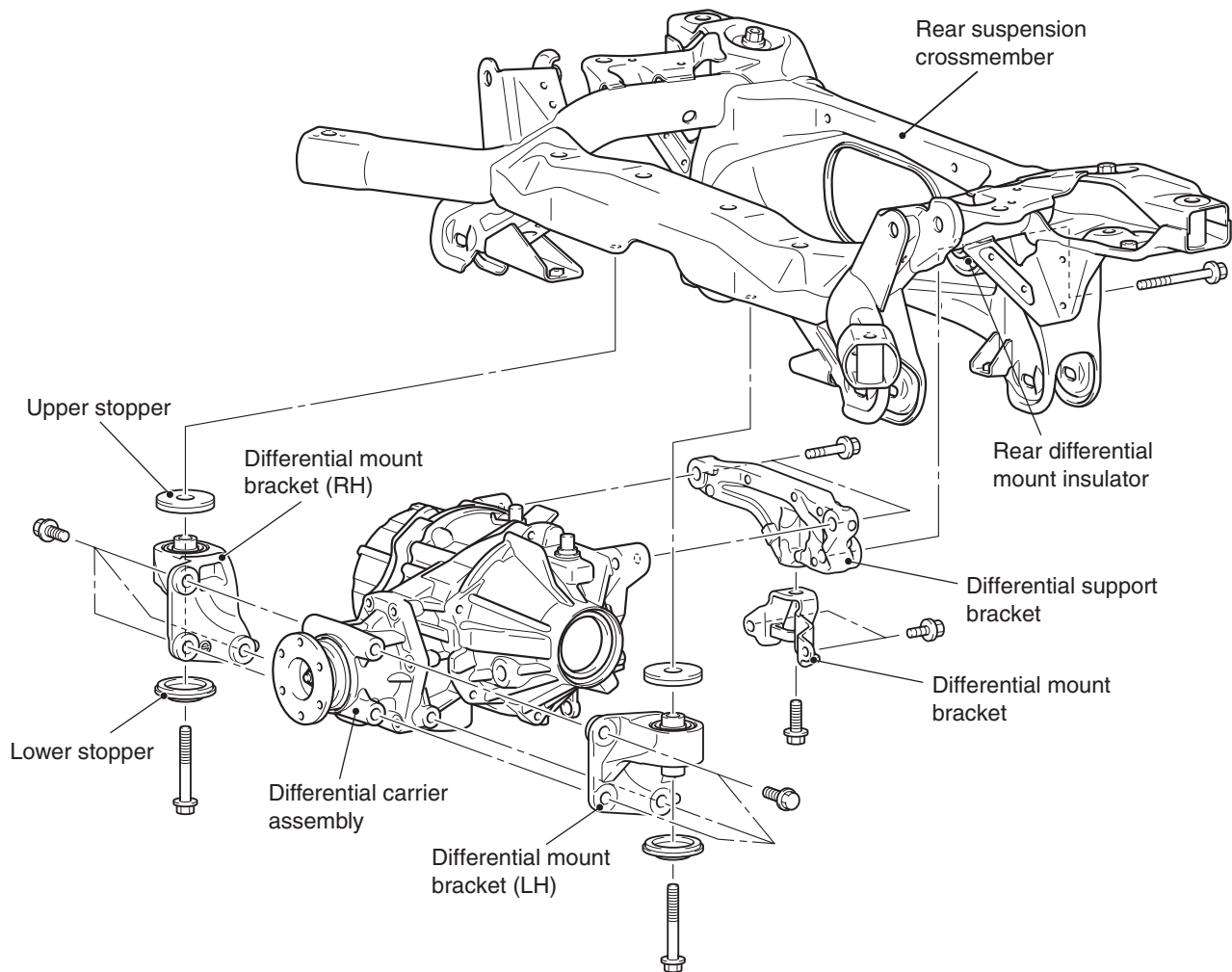


2. RH CLUTCH OPERATE

In order to boost the driving power of RH wheel, when RH clutch is operated, a part of the driving power of LH wheel flows to the differential mechanism, the driving power of RH wheel is boosted. The result of this, the yaw moment occurs in a left to the vehicle.



DIFFERENTIAL MOUNT



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The front side of the differential carrier assembly is installed to the rear suspension crossmember via the differential mount bracket (LH/RH), and the rear side of the assembly is installed via the differential mount bracket (AYC differential), differential support bracket, and rear differential mount insulator. As described above, 3-point support and optimization of bushing position for the differential mount are established, reducing vibration and noise.