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| **Model Year:** 2013 | **Model:** RAV4 | **Prod Date Range:** [12/2012 - ] |
| **Title:** GF1A TRANSFER / 4WD / AWD: DYNAMIC TORQUE CONTROL AWD SYSTEM: GENERAL; 2013 MY RAV4 [12/2012 - ] | | |

# GENERAL

## 1. OUTLINE

(a) A GF1A type transfer that is compact and lightweight is used on AWD models.

(b) A dynamic torque control AWD is used on AWD models.

(c) The dynamic torque control AWD is a compact, lightweight and high performance AWD system that optimally controls the torque distribution to the front and rear wheels using an electromagnetic control coupling in the rear differential.

(d) The AWD system performs control in cooperation with the brake control system. The 4WD ECU assembly controls the drive torque distribution to the front and rear wheels in accordance with information received from the skid control ECU. These controls ensure a smooth acceleration and driving stability. For details, see the Brake Control/Dynamic Control Systems section.

## 2. SPECIFICATION

| | | |
|---|---|---|
| Transfer Type | | GF1A |
| Gear Type | | Hypoid Gear |
| Gear Ratio | | 0.439 |
| Transfer Ring Gear | The No. of Teeth | 41 |
| Transfer Driven Pinion Gear | The No. of Teeth | 18 |
| Oil Viscosity | | SAE 75W-85 |
| Oil Grade | | API GL-5 |
| Oil Capacity | | 0.45 Liters (0.48 US qts, 0.41 Imp. qts) |
| Weight (Reference)* | | 11 kg (24.9 lb) |

**HINT:**

*: The weight shown is the weight of the part fully filled without fluid.

## 3. MAIN FEATURES

(a) Based on information provided by various sensors, the 4WD ECU assembly controls the amperage applied to the electromagnetic control coupling in order to transmit an appropriate amount of drive torque to the rear wheels when needed. The following describes the features and benefits of the dynamic torque control AWD:

| FEATURE | OUTLINE |
|---|---|
| Traction Performance | Achieves stable start-off and acceleration performance. |
| Driving Stability Performance | Achieves stable cornering performance. |

| | |
|---|---|
| Fuel Economy | Achieves better fuel economy by transmitting drive torque to the rear wheels when needed, in the amount needed. |

(b) A differential lock switch has been provided. This enables the driver to select between the Auto and Lock modes by operating the switch. The system optimally controls the torque distribution to the front and rear wheels in the respective modes.

| MODE | DIFFERENTIAL LOCK SWITCH | DIFFERENTIAL LOCK INDICATOR LIGHT | OUTLINE |
|---|---|---|---|
| Auto | Off | Off | • Optimally distributes drive torque to the front and rear wheels.<br>• Ensures optimal start-off performance during a start-off based on information provided by various sensors.<br>• Suppresses the tight corner braking phenomenon* during low-speed cornering.<br>• Reduces the amount of torque distribution to the rear wheels and improves fuel economy when the system judges that the vehicle is traveling steadily.<br>• Disengages the AWD during braking deceleration. |
| Lock | On | On | • Distributes the maximum torque limit to the rear wheels.<br>• Distributes the maximum torque limit to the rear wheels during start-off.<br>• Distributes optimal torque during low-speed cornering.<br>• Disengages the AWD during braking deceleration.<br>• Disengages Lock mode and transfers to Auto mode when the vehicle speed exceeds 40 km/h (25 mph). |

**HINT:**

*: Tight corner braking phenomenon: a phenomenon in which a AWD vehicle may lurch and decelerate due to a rotational speed difference between the front and rear wheels, such as during low-speed cornering in AWD mode.

(c) A Sport mode switch has been provided. This enables the driver to select Sport mode by operating the switch. The 4WD ECU assembly performs cooperative control with the skid control ECU, ECM and power steering ECU assembly in addition to AWD control when in Auto mode, thus regulating torque distribution to the front and rear wheels in order to ensure operability and stability during sporty driving.