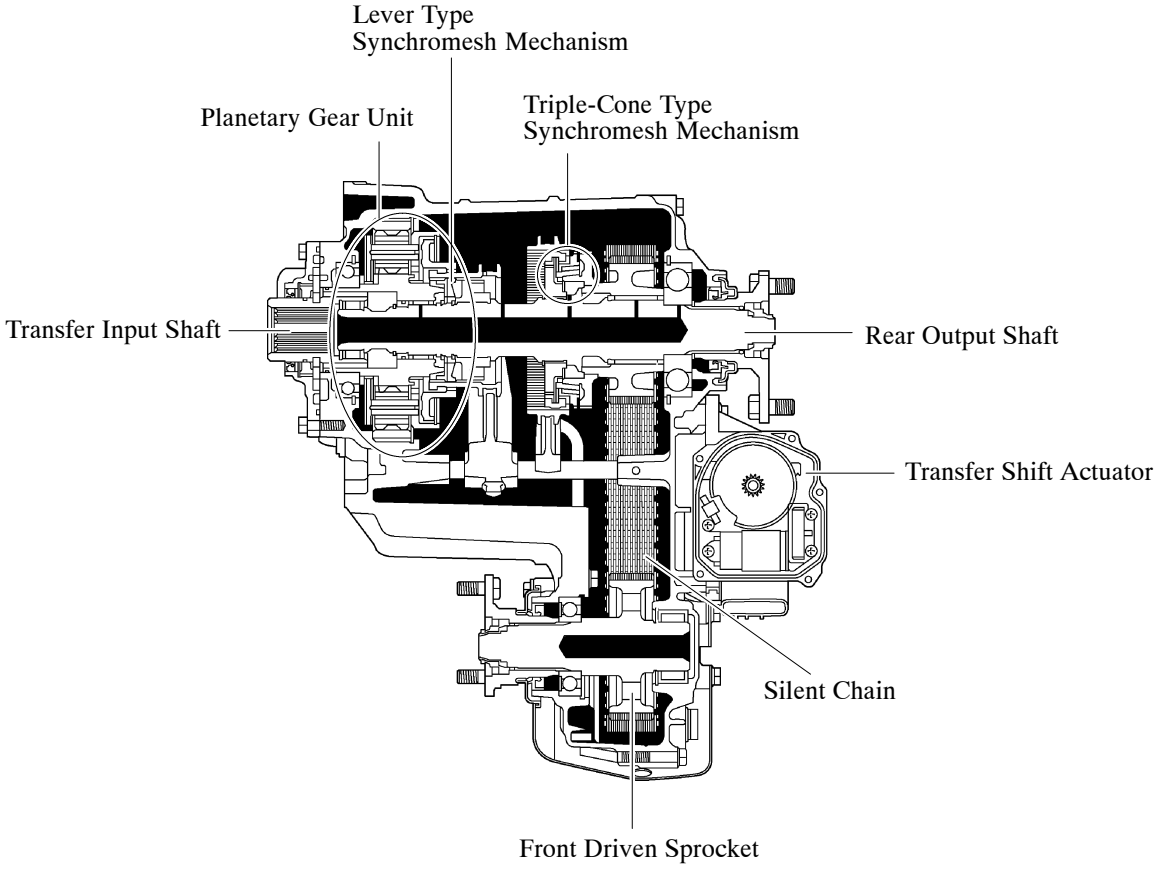
■CONSTRUCTION

1. General

The construction of the JF1A transfer is shown below.

- A planetary gear unit is used in the reduction mechanism and a silent chain is used to reduce front drive noise.
- A lever type synchromesh mechanism is used for the 4H to 4L switching section to eliminate gear clash when switching from 4H to 4L.
- A triple-cone type synchromesh mechanism is used for smooth engagement from 2WD to 4WD.
- For the JF1A transfer, a transfer shift actuator that has 2 built-in shift motors has been adopted. As a result, switching from 2WD to 4WD and from 4H to 4L can be performed independently using the shift motors, achieving a simple shift actuation mechanism. This enhances efficiency of power transfer and durability of the shift mechanism.



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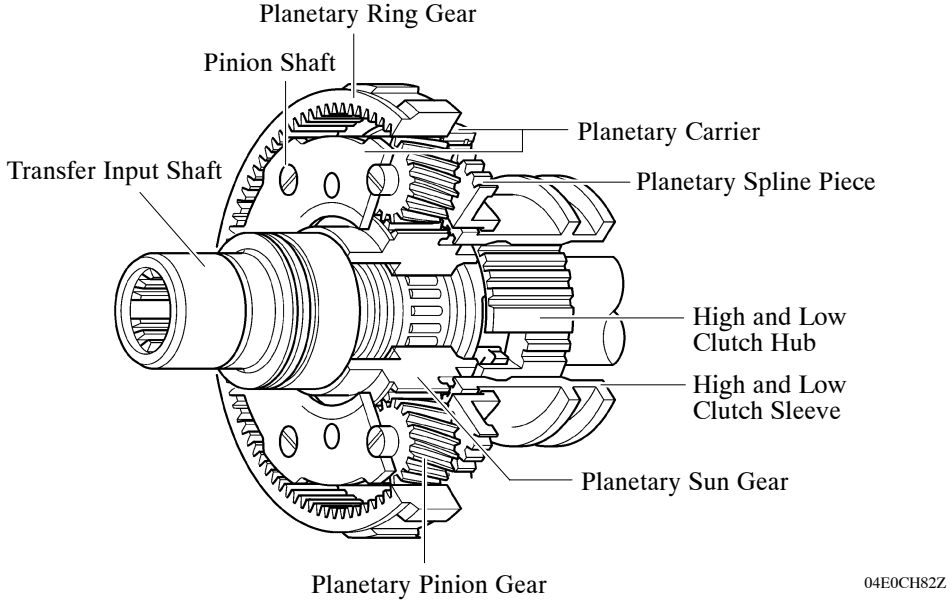
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2. Planetary Gear Unit

General

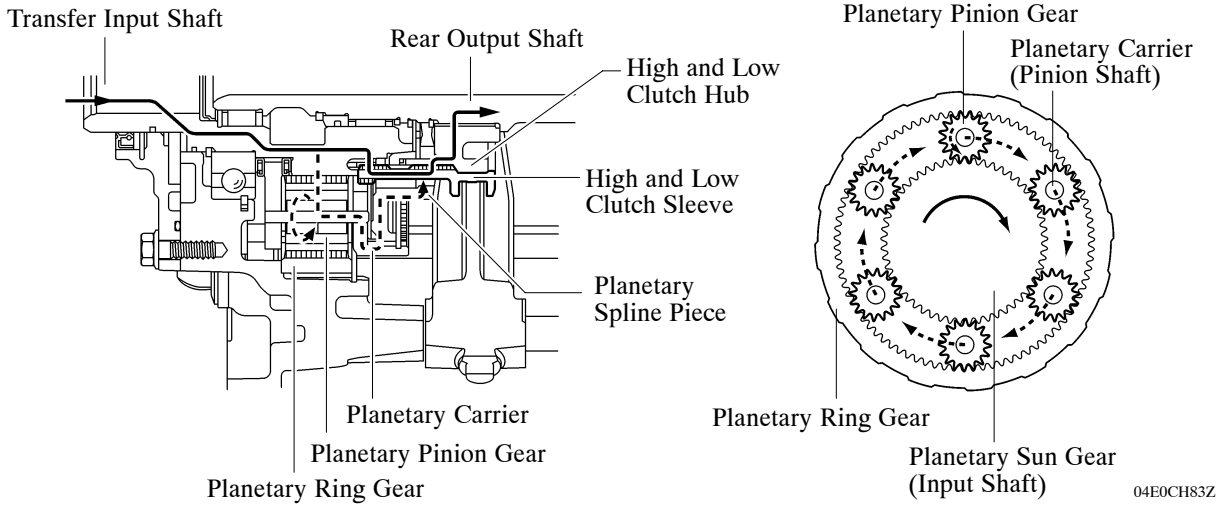
The planetary gear unit consists of the planetary sun gear, 6 planetary pinion gears, and planetary carrier.

- The planetary sun gear is integrated with the transfer input shaft.
- Six planetary pinion gears are fitted to the planetary carrier. Each pinion gear shaft is fixed to the planetary carrier. A planetary spline piece is fitted to the rear of the planetary carrier. When the planetary carrier is to be connected to the output shaft, the power is transferred after engaging the splines on the planetary spline piece with the splines on the high and low clutch sleeve. The high and low clutch sleeve is installed rearward of the transfer input shaft on the high and low clutch hub that is splined to the output shaft.
- The planetary ring gear is fixed to the transfer case and its internal teeth mesh with the planetary pinion gears.



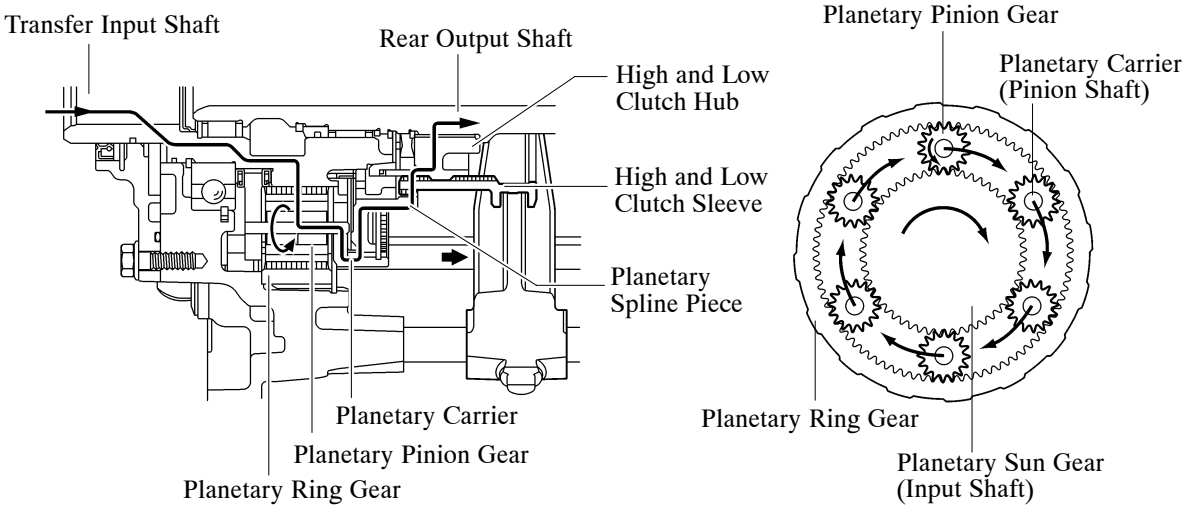
2WD/4H Position

In the 2WD/4H position, the input shaft is directly connected to the output shaft via the splines at the rear of the transfer input shaft which make this connection via the movable high and low clutch sleeve.
The high and low clutch sleeve is constantly meshed with the rear output shaft via the high and low clutch hub. Thus, the rotation of the input shaft is transmitted to the high and low clutch sleeve, to the high and low clutch hub, then to the rear output shaft.



4L Position

In the 4L position, the external teeth of the high and low clutch sleeve are meshed with the planetary carrier via the spline piece.
Thus, the rotation of the input shaft is transmitted from the planetary sun gear, to the planetary pinion gears, to the planetary pinion gear shafts, to the planetary carrier, to the planetary spline piece, to the high and low clutch sleeve, through the high and low clutch hub, to the rear output shaft.

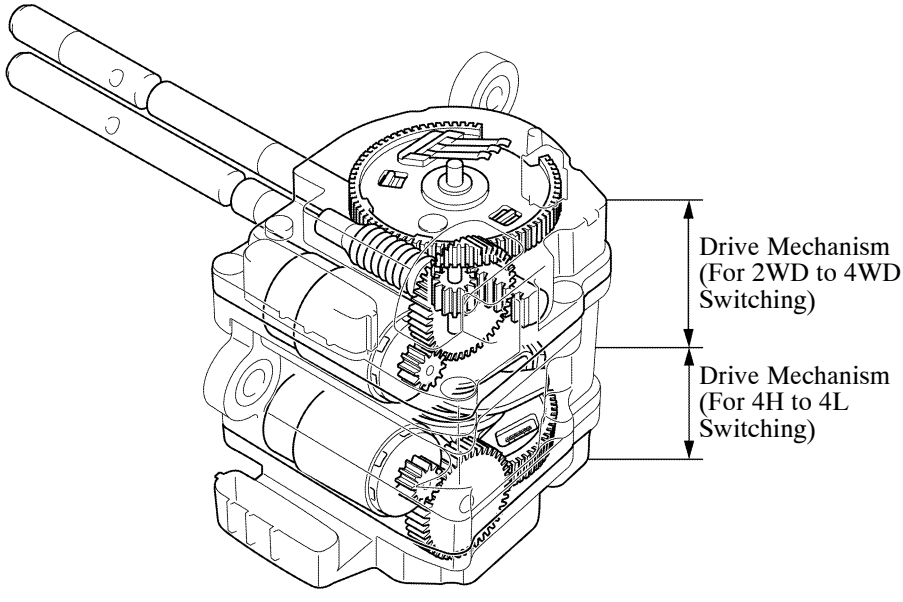


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3. Transfer Shift Actuator

General

The transfer shift actuator is composed of 2 independent drive mechanisms for switching from 2WD to 4WD and from 4H to 4L. Each drive mechanism has a transfer shift motor.

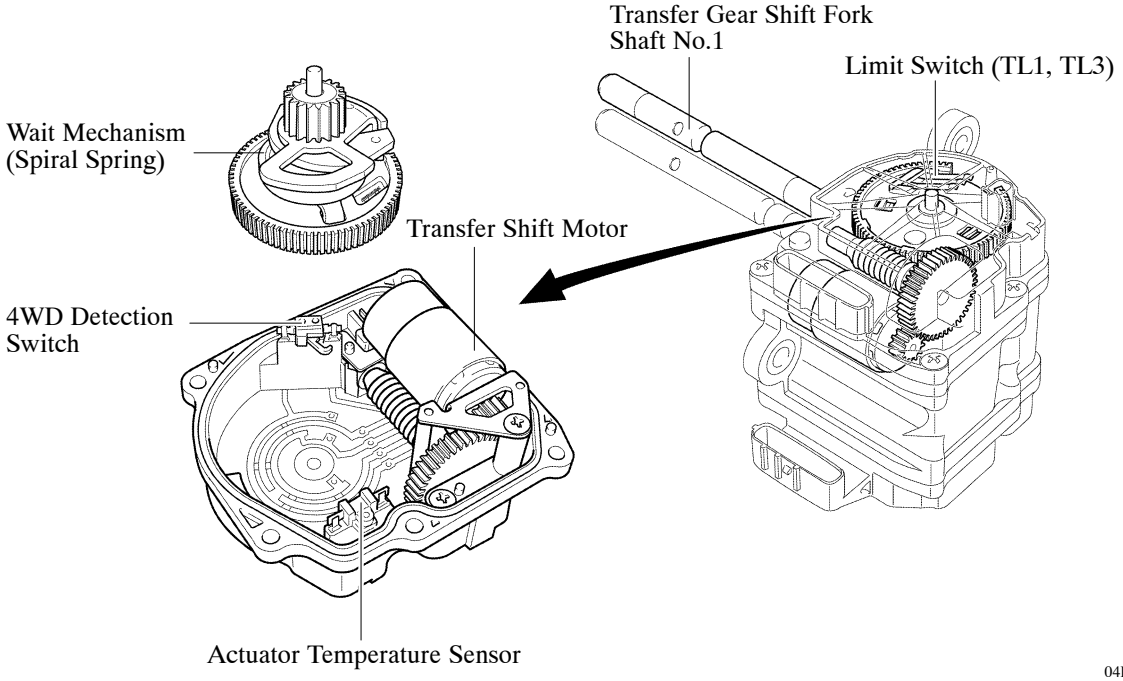


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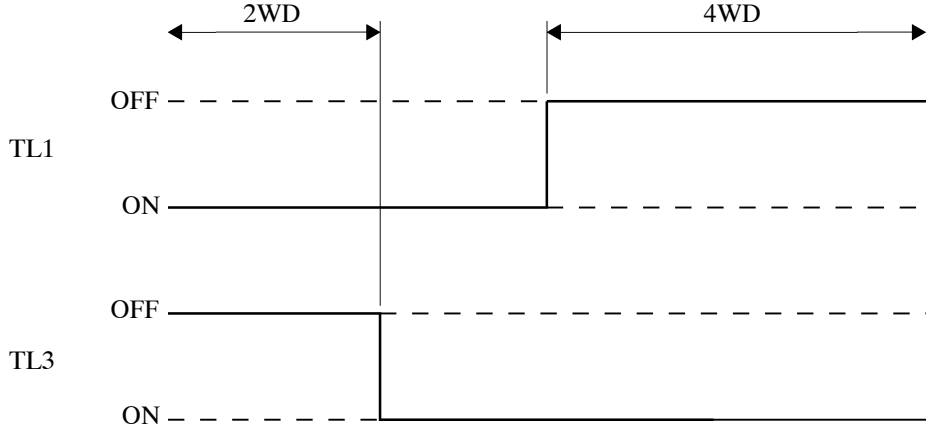
Drive Mechanism for 2WD to 4WD Switching

- The drive mechanism for 2WD to 4WD switching is composed of a transfer shift motor, limit switch, 4WD detection switch, actuator temperature sensor, wait mechanism (spiral spring), and transfer gear shift fork shaft No.1. This drive mechanism cannot be disassembled.
- The limit switch of the drive mechanism for 2WD to 4WD switching has 2 contact point switches (TL1 and TL3). The combination of 2 contact point switches detects the shift motor position (2WD or 4WD mode).
- A wait mechanism (spiral spring) is used for shifting between 2WD and 4WD. If the operating resistance of the transfer gear shift fork shaft No.1 is large, the shift rotation is partially stored in spiral spring. Afterward, when the operating resistance decreases, the spring force causes the transfer gear shift fork No.1 to slide.
- An actuator temperature sensor is provided on the transfer shift actuator (2WD to 4WD switching section) in order to allow an increase of the amount of current applied to the transfer shift motor and improve switching performance at low temperatures.



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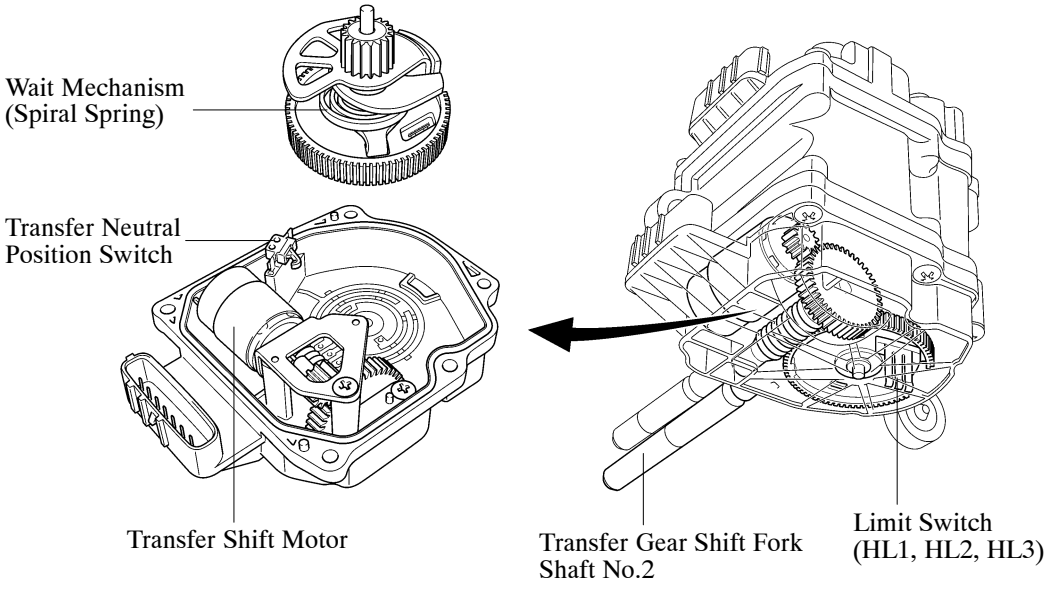
▶ Combination of 2 Contact Point Switches ◀



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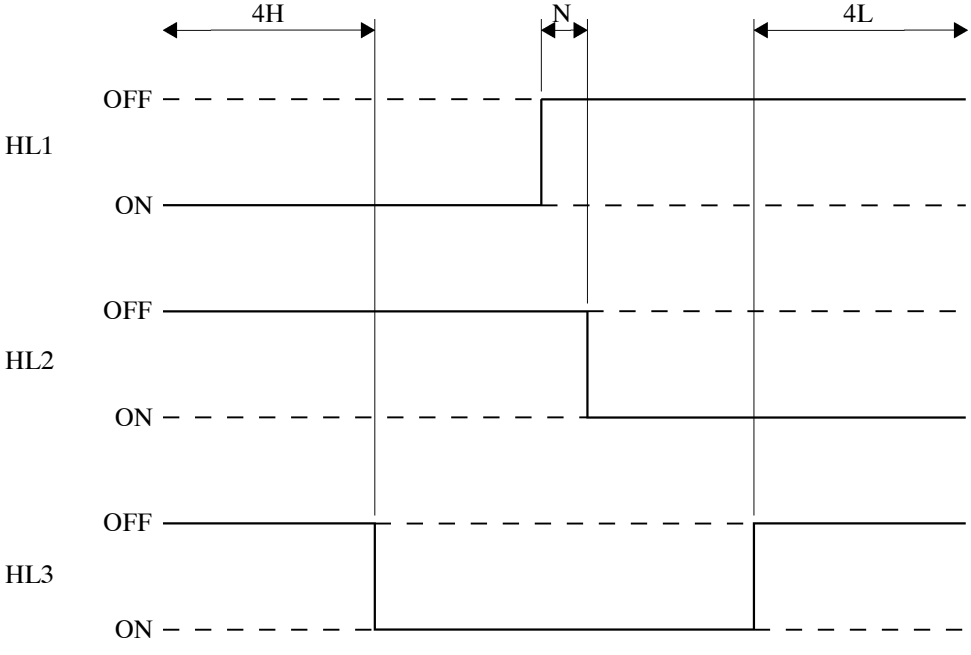
Drive Mechanism for 4H to 4L Switching

- The drive mechanism for 4H to 4L switching is composed of a transfer shift motor, limit switch, transfer neutral position switch, wait mechanism (spiral spring), and transfer gear shift fork shaft No.2. This drive mechanism cannot be disassembled.
- The limit switch of the drive mechanism for 4H to 4L switching has 3 contact point switches (HL1, HL2 and HL3). The combination of 3 contact point switches detects the shift motor position (4H, N or 4L mode).
- A wait mechanism (spiral spring) is used for shifting between 4H and 4L. If the operating resistance of the transfer gear shift fork shaft No.2 is large, the shift rotation is partially stored in spiral spring. Afterward, when the operating resistance is reduced, the spring force causes the transfer gear shift fork No.2 to slide.



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▶ Combination of 3 Contact Point Switches ◀



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