

Description

Clutches

The four speed automatic transmission uses hydraulically actuated clutches to engage or disengage the transmission gears. When clutch pressure is introduced into the clutch drum, the clutch piston is applied. This presses the friction discs and steel plates together, locking them so they don't slip. Power is then transmitted through the engaged clutch pack to its hub-mounted gear.

Likewise, when clutch pressure is bled from the clutch pack, the piston releases the friction discs and steel plates, and they are free to slide past each other while disengaged. This allows the gear to spin independently of its shaft, transmitting no power.

1st Clutch

The 1st clutch engages/disengages 1st gear, and is located at the right of center on the mainshaft. The 1st clutch is joined back-to-back to the 4th clutch. The 1st clutch is supplied clutch pressure by its oil feed pipe within the mainshaft.

1st-hold Clutch

The 1st-hold clutch engages/disengages 1st-hold, **1** position or **2** position, and is located at the center of the countershaft. The 1st-hold clutch is supplied clutch pressure by its oil feed pipe within the countershaft.

2nd Clutch

The 2nd clutch engages/disengages 2nd gear, and is located at the right of the mainshaft. The 2nd clutch is supplied clutch pressure by its oil feed pipe within the mainshaft.

3rd Clutch

The 3rd clutch engages/disengages 3rd gear, and is located at the end of the countershaft, opposite the rear cover. The 3rd clutch is supplied clutch pressure by a circuit connected to the accumulator body.

4th Clutch

The 4th clutch engages/disengages 4th gear, and is located at the left of center on the mainshaft. The 4th clutch is joined back-to-back to the 1st clutch. The 4th clutch is supplied clutch pressure by a circuit connected to the regulator valve body.

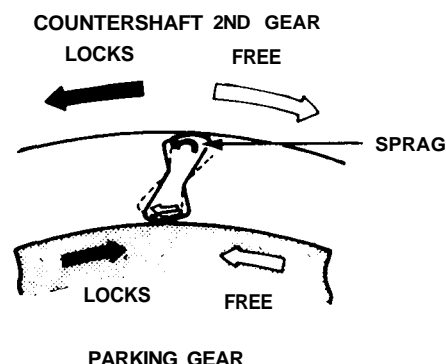
Reverse Clutch

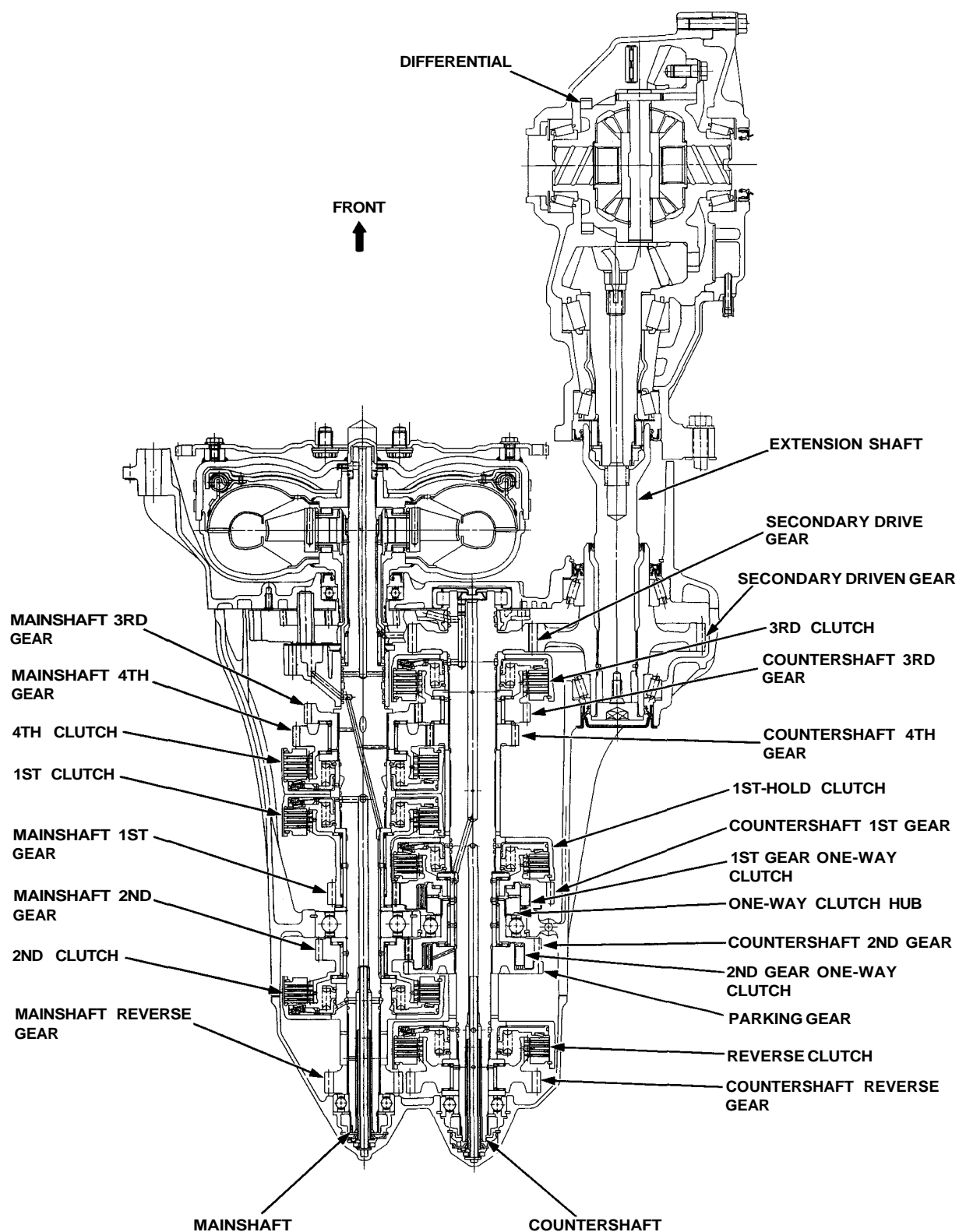
The reverse clutch engages/disengages reverse gear, and is located at the right of the countershaft. The reverse clutch is supplied clutch pressure by its oil feed pipe within the countershaft.

One-way Clutch

This transmission has two one-way clutches, the 1st gear one-way clutch and the 2nd gear one-way clutch. The 1st gear one-way clutch is positioned between the 1st gear and the one-way clutch hub, with the one-way clutch hub splined to 2nd gear. The 1st gear provides the outer race surface. The 2nd gear one-way clutch is positioned between the 2nd gear and the parking gear, with the parking gear splined to the countershaft. The 2nd gear provides the outer race surface, and the parking gear provides the inner race surface. The one-way clutches lock up when power is transmitted from the mainshaft 1st gear to the countershaft 1st gear. The 2nd gear one-way clutch locks up when power is transmitted from the mainshaft 2nd gear to the countershaft 2nd gear.

The 1st clutch and gears remain engaged in the 1st, 2nd, 3rd, and 4th gear position in the **D₃** or **D₄** position. However, the 1st gear one-way clutch disengages when the 2nd, 3rd or 4th clutches/gears are applied in the **D₃** or **D₄** position. This is because the increased rotational speed of the gears on the countershaft over-ride the locking "speed range" of the one-way clutch. Thereafter, the one-way clutch freewheels with the 1st clutch still engaged.





(cont'd)

Description

Clutches (cont'd)

Lock-up Clutch

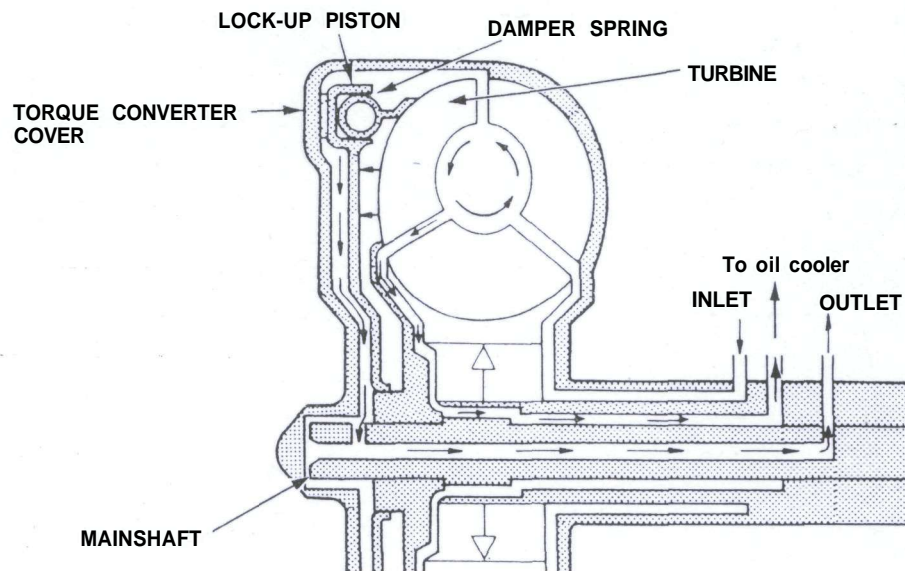
1. Operation (clutch on)

With the lock-up clutch on, the oil in the chamber between the torque converter cover and lock-up piston is discharged, and the converter oil exerts pressure through the piston against the converter cover. As a result, the converter turbine is locked on the converter cover. The effect is to bypass the converter, thereby placing the car in direct drive.

Power flow

The power flows by way of:

Engine
↓
Drive plate
↓
Torque converter cover
↓
Lock-up piston
↓
Damper spring
↓
Turbine
↓
Mainshaft



2. Operation (clutch off)

With the lock-up clutch off, the oil flows in the reverse of CLUTCH ON. As a result, the lock-up piston is moved away from the converter cover; that is, the torque converter lock-up is released.

Power flow

Engine
↓
Drive plate
↓
Torque converter cover
↓
Pump
↓
Turbine
↓
Mainshaft

