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 end of the mainshaft, just behind the left side cover. The 1 st clutch is supplied clutch pressure by its oil feed pipe within the mainshaft.

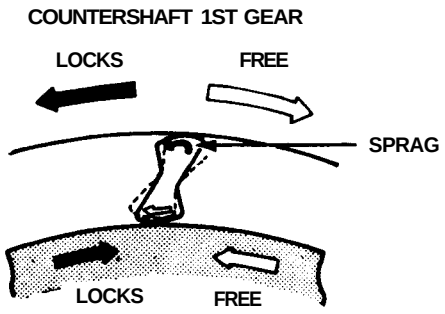
1st-hold Clutch
The 1 st-hold clutch engages/disengages 1 st-hold or [1] position, and is located at the end of the countershaft, just behind the left side cover. The 1 st-hold clutch is supplied clutch pressure by its oil feed pipe within the countershaft.

2nd Clutch
The 2nd clutch engages/disengages 2nd gear, and is located on the secondary shaft. The 2nd clutch is supplied clutch pressure through the secondary shaft by a circuit connected to the 2nd accumulator body.

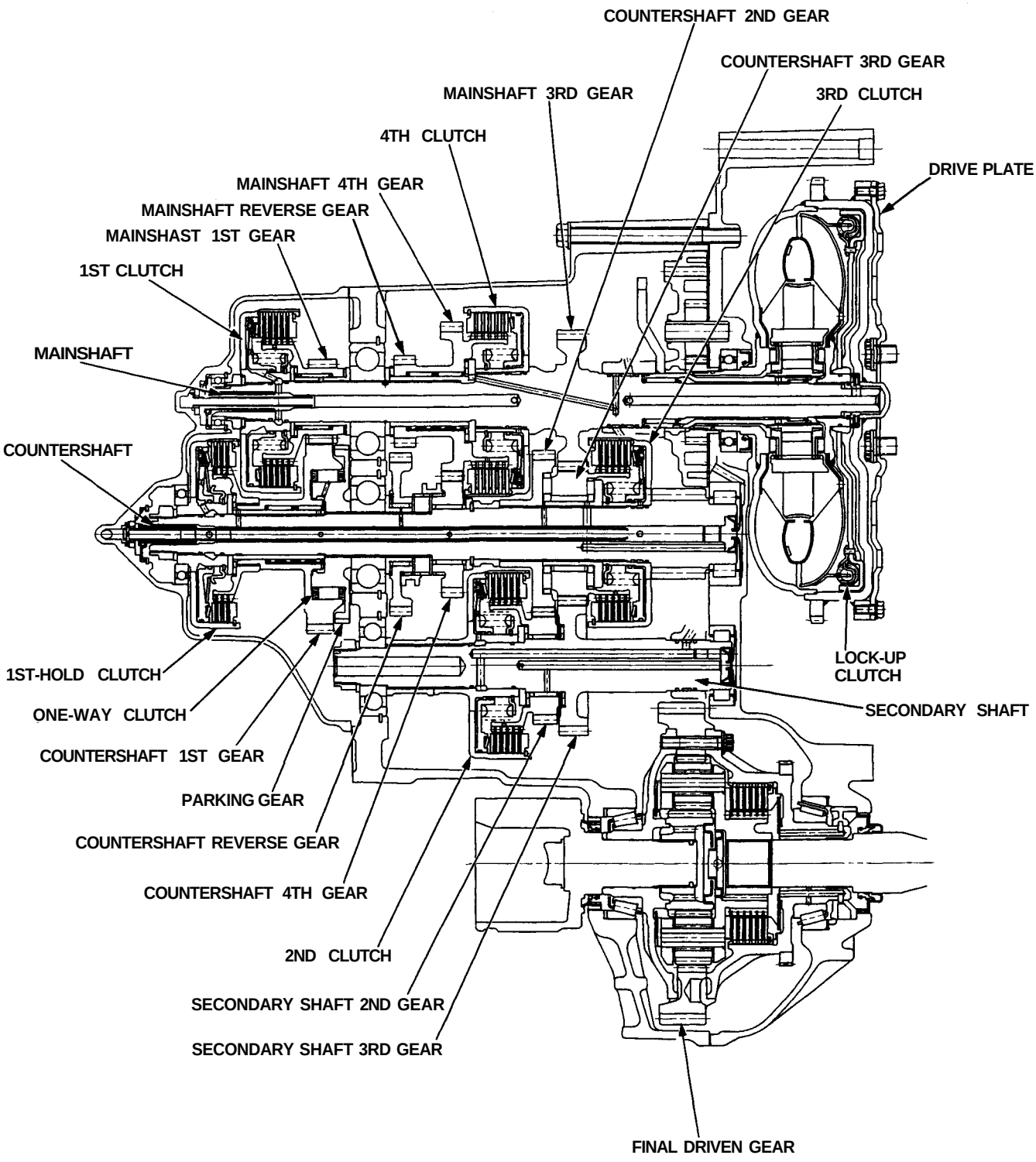
3rd Clutch
The 3rd clutch engages/disengages 3rd gear, and is located at the end of the countershaft, opposite the left side cover. The 3rd clutch is supplied clutch pressure by its oil feed pipe within the countershaft.

4th Clutch
The 4th clutch engages/disengages 4th gear, as well as reverse gear, and is located at the center of the mainshaft. The 4th clutch is supplied clutch pressure by its oil feed pipe within the mainshaft.

One-way Clutch
The one-way clutch is positioned between the parking gear and 1 st gear, with the parking gear splined to the countershaft. The 1st gear provides the outer race surface, and the parking gear provides the inner race surface. The one-way clutch locks up when power is transmitted from the mainshaft 1 st gear to the countershaft 1 st gear.
The 1st clutch and gears remain engaged in the 1st, 2nd, 3rd, and 4th gear ranges in the [2], [3], and [D] position. However, the one-way clutch disengages when the 2nd, 3rd, or 4th clutches/gears are applied in the [2], [3], and [D] 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.



View from Left side cover side.


COUNTERSHAFT 2ND GEAR
COUNTERSHAFT 3RD GEAR
MAINSHAFT 3RD GEAR
3RD CLUTCH
4TH CLUTCH
DRIVE PLATE
MAINSHAFT 4TH GEAR
MAINSHAFT REVERSE GEAR
MAINSHAST 1ST GEAR
1ST CLUTCH
MAINSHAFT
COUNTERSHAFT
1ST-HOLD CLUTCH
LOCK-UP CLUTCH
ONE-WAY CLUTCH
SECONDARY SHAFT
COUNTERSHAFT 1ST GEAR
PARKING GEAR
COUNTERSHAFT REVERSE GEAR
COUNTERSHAFT 4TH GEAR
2ND CLUTCH
SECONDARY SHAFT 2ND GEAR
SECONDARY SHAFT 3RD GEAR
FINAL DRIVEN GEAR

(cont'd)

Description

Clutches (cont'd)

Lock-up Clutch

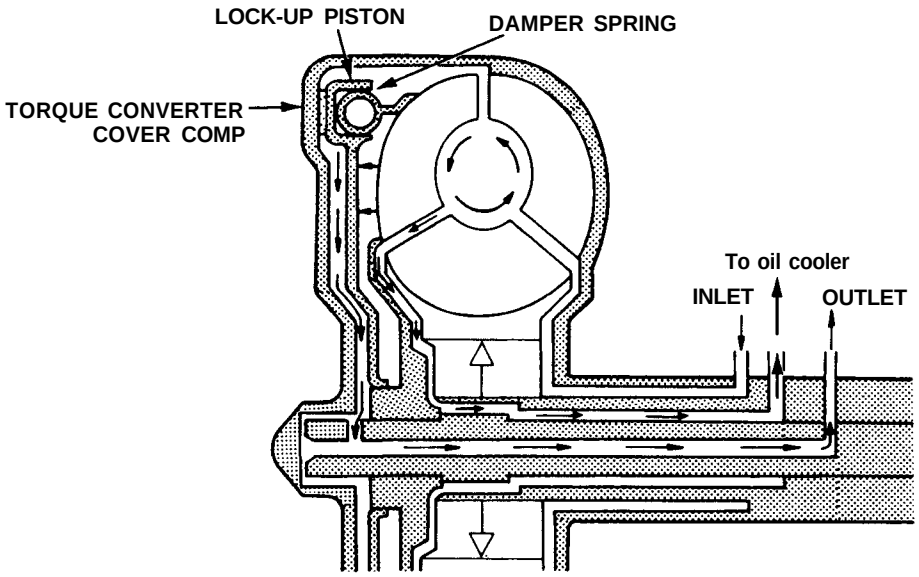
1. Operation (clutch on)

With the lock-up clutch on, the oil in the chamber between the 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 firmly. 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