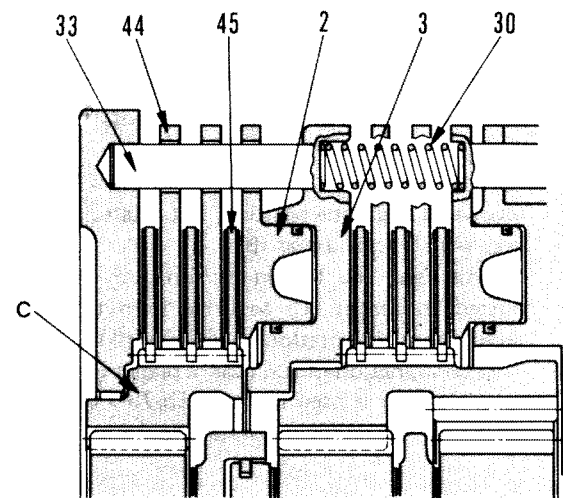


ACTING OF PISTON

For locking ring gear (C), the discs (44) and plates (45) are incorporated. The clutch consists of a clutch piston (2), clutch plates (44), clutch discs (45), pins (33) and piston return springs (30).

The disc's internal teeth engage with the ring gear's external teeth.

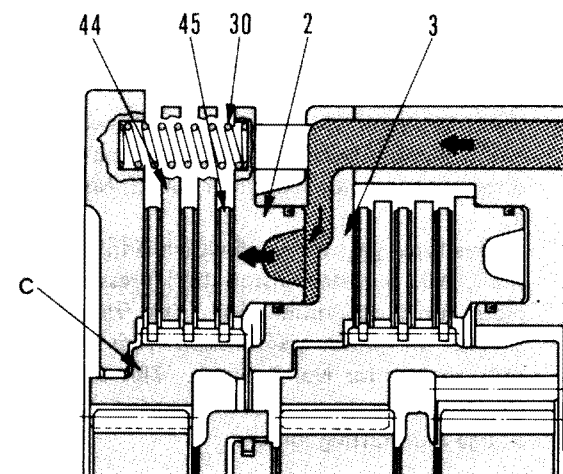
The plates, whose notch on the outside diameter engage with pins (33) on housing (3), are locked against the rotating direction. Piston (2) also is locked against the rotating direction.



FI 44C036

- **Clutch Engaged (Oil pressure is acting)**

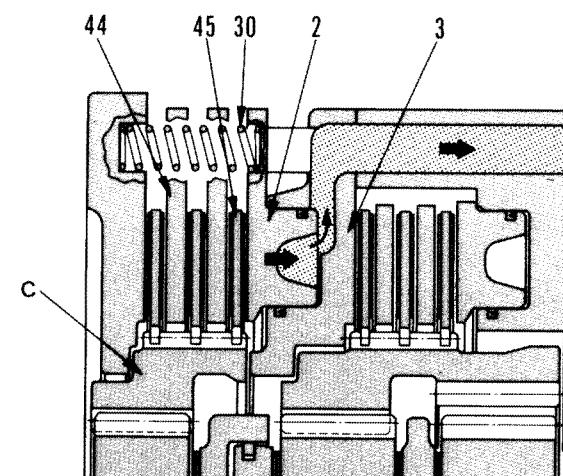
Oil from the control valve flows under pressure through the port in housing (3) to the piston (2). The piston presses clutch plates (44) and clutch discs (45) together, and the frictional force developed stops clutch discs (44) revolution, thus ring gear (C) meshing with the disc's internal teeth is locked.



FI 44C037

- **Clutch Disengaged (Oil pressure is not acting)**

When the supply of pressure oil from the control valve is shut off, piston (2) returns to the initial position by the force of piston return spring (30), thus relieving the frictional force between plates (44) and discs (45), bringing the ring gear (C) in free.



FI 44C038

FUNCTION OF THE BALL CHECK VALVE IN NO. 5 CLUTCH

- A rotation clutch is employed for No. 5 clutch in model D57S-1.

When the gear shift lever is put into "1st speed", oil from the control valve enters the left side of No. 5 clutch piston (10), and pushes piston (10) to the right. The rotation of No. 5 piston housing (9) is transferred to the gear for No. 5 clutch (11).

If the gear shift lever is now put into 2nd or 3rd speed, the force of spring (29) tries to push piston (10) back to the left. However, the rotation applies centrifugal force to the oil on the left side of piston (10), so piston (10) cannot move back to the left immediately.

As a result, the clutch remains partially engaged, and it is impossible to change gear.

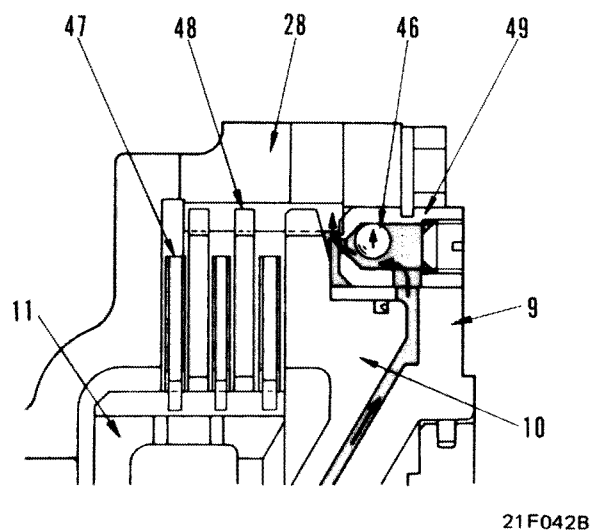
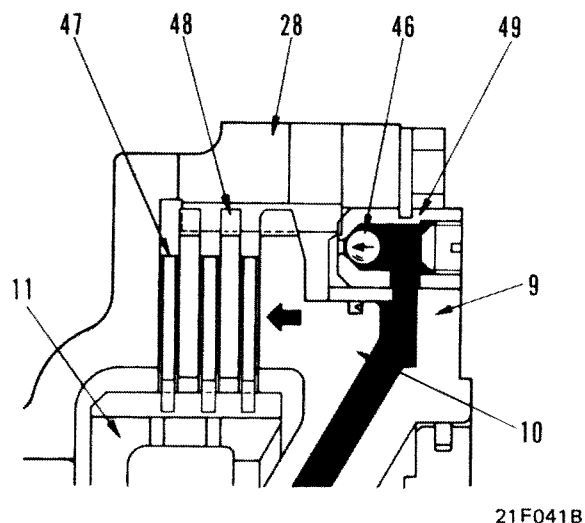
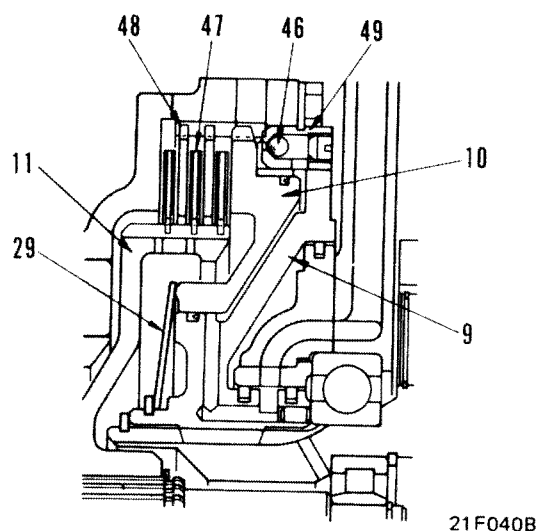
To prevent this from happening, ball check valve (46) is installed to allow the piston to return to the left immediately.

1. Clutch engaged

The pressure oil from the control valve is supplied through the port of housing (9) to the left of piston (10). Then, ball check valve (46) closes the valve seat (49) port, and piston (10) presses clutch discs (47) to clutch plates (48), engaging the disc's internal teeth and gear's (11) external teeth, the plate's external teeth and the carrier's (28) internal teeth, thus effecting clutch engagement.

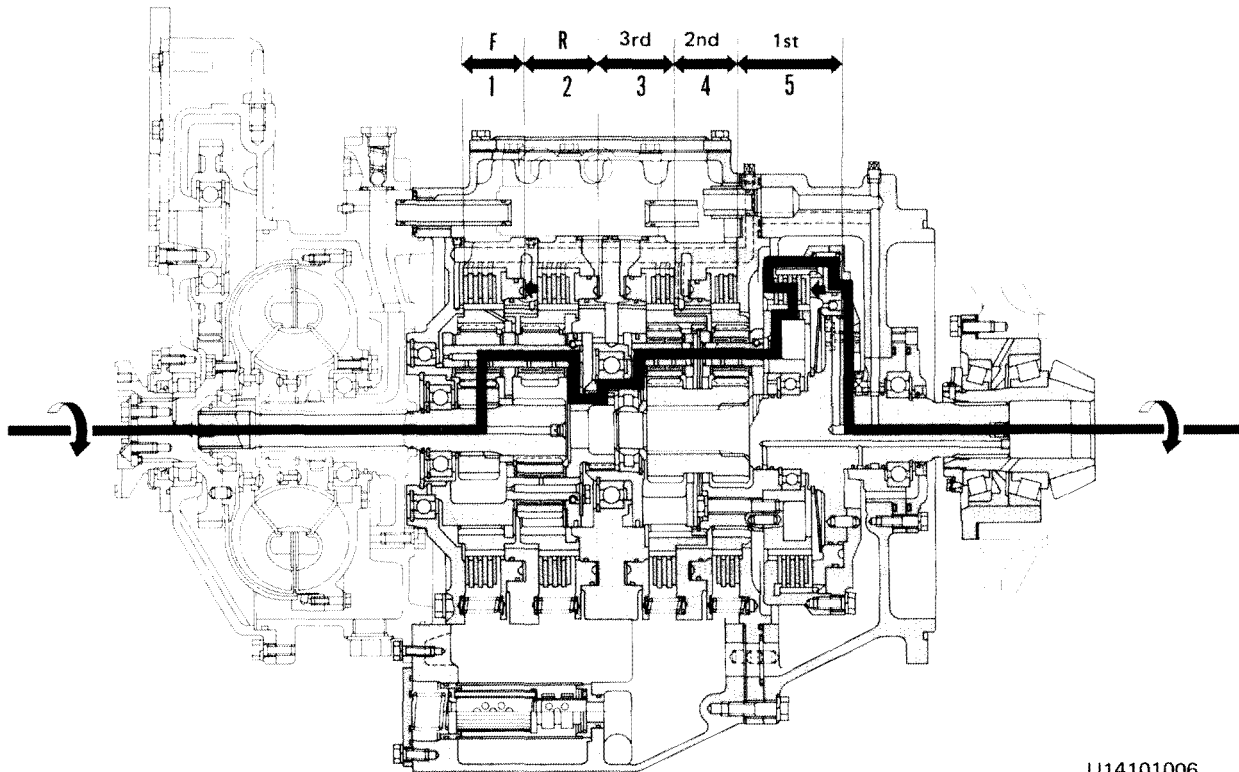
2. Check disengaged

When the flow of oil from the control valve is shut off, the force pushing ball check valve (46) on to valve seat (49) is lost. Ball check valve (46) then moves to the outside under the centrifugal force caused by the rotation. (See the figure on the right) As a result, the oil on the left side of piston (10) and in the ball check valve (46) of housing (9) passes through the gap in valve seat (49). From here it drains to the transmission case. Because of this, the centrifugal force of the oil loses its effect and the force of return spring (29) can push piston (10) back to the left immediately.



POWER TRAIN

1st speed-Forward



U14101006

No. 1 and No. 5 clutches are engaged, No. 1 ring gear is hold and No. 5 gear is connected directly to output shaft.

The No. 1 clutch is engaged to hold the No. 1 ring gear stationaly and the No. 5 clutch is engaged to connect to the output shaft. Rotation of the input shaft is transmitted from the No. 1 sun gear to the No. 1 planetary gears and the resulting rotation of the No. 1 carrier is transmitted to the No. 3 carrier. Here, driving power

is delivered into two passages: one passage transmits rotation of the No. 3 carrier to the No. 3 ring gear, the No. 4 carrier and the No. 5 shaft; while the other passage transmits the rotation to the No. 3 planetary gears and the No. 3 sun gear which is fixed to the No. 5 shaft. Then finally to output shaft.