



Modern Automotive Technology Chapter 57

Automatic Transmission Fundamentals



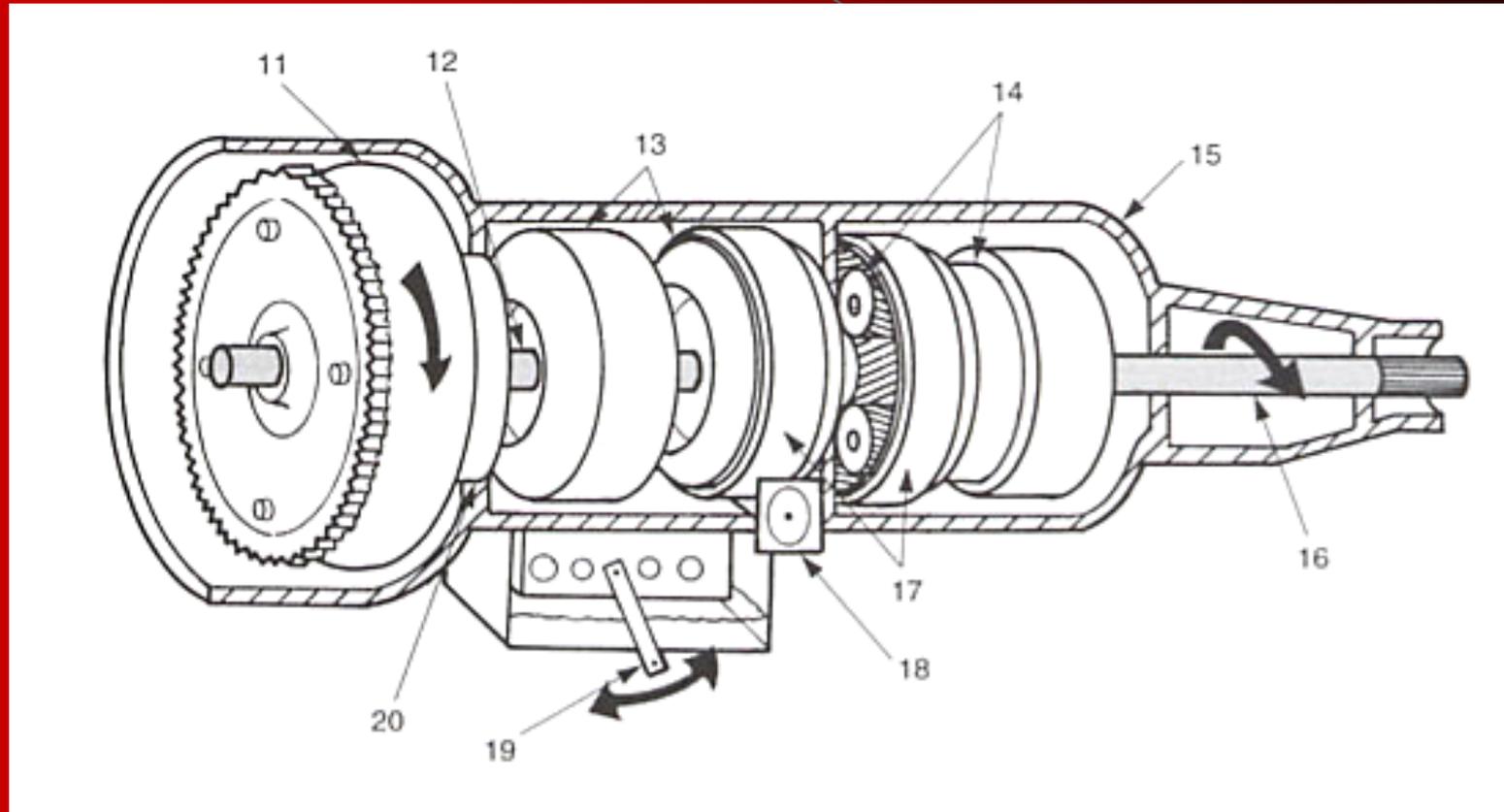
*North Montco
Technical Career Center*

Learning Objectives

- Identify the basic components of an automatic transmission (AT)
- Describe the function and operation of the major parts of of an AT
- Trace the flow of power through an AT
- Explain how an AT shifts gears
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Automatic Transmission



11. Torque Converter 12. Input Shaft 13. Clutch Assemblies
14. Planetary Gear sets 15. Case 16. Output Shaft 17. Bands
18. Servo Piston 19. Shift Lever 20. Oil Pump

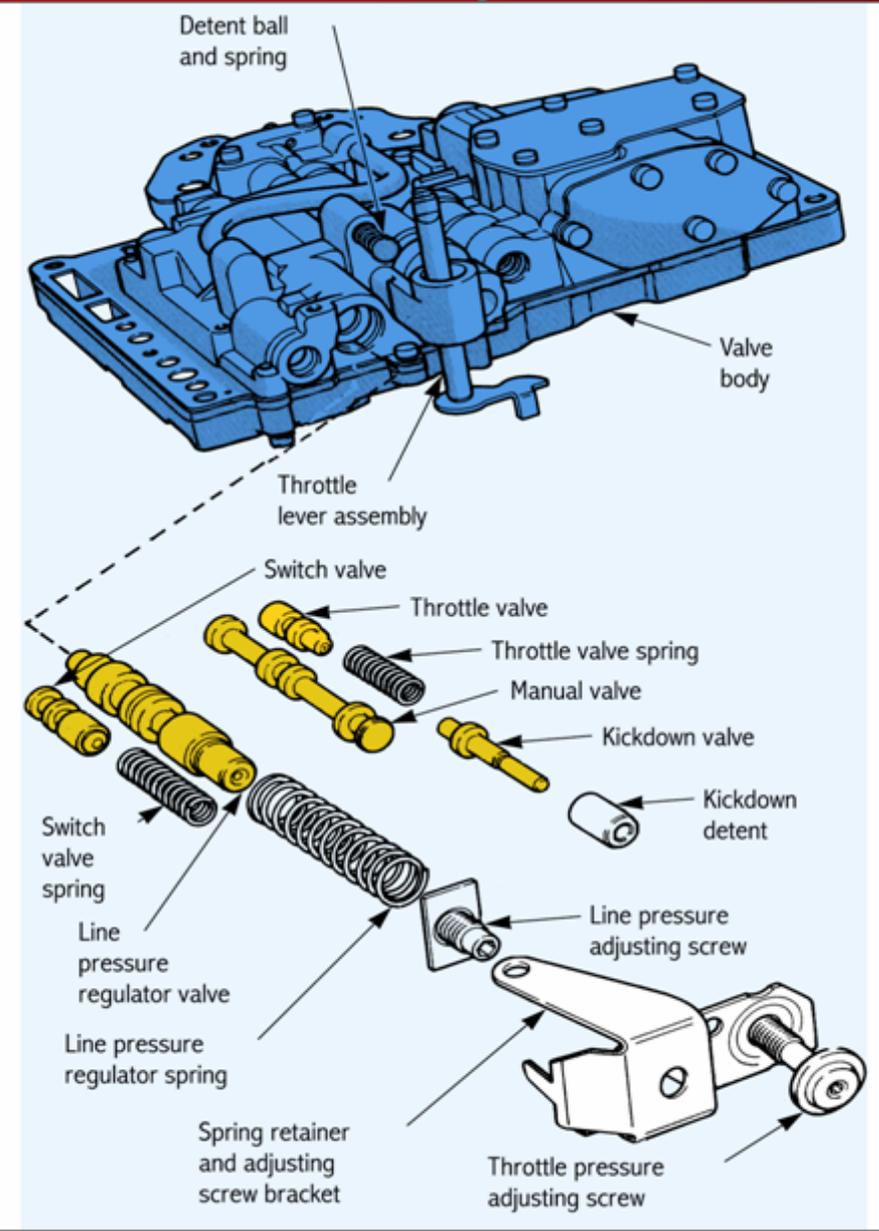


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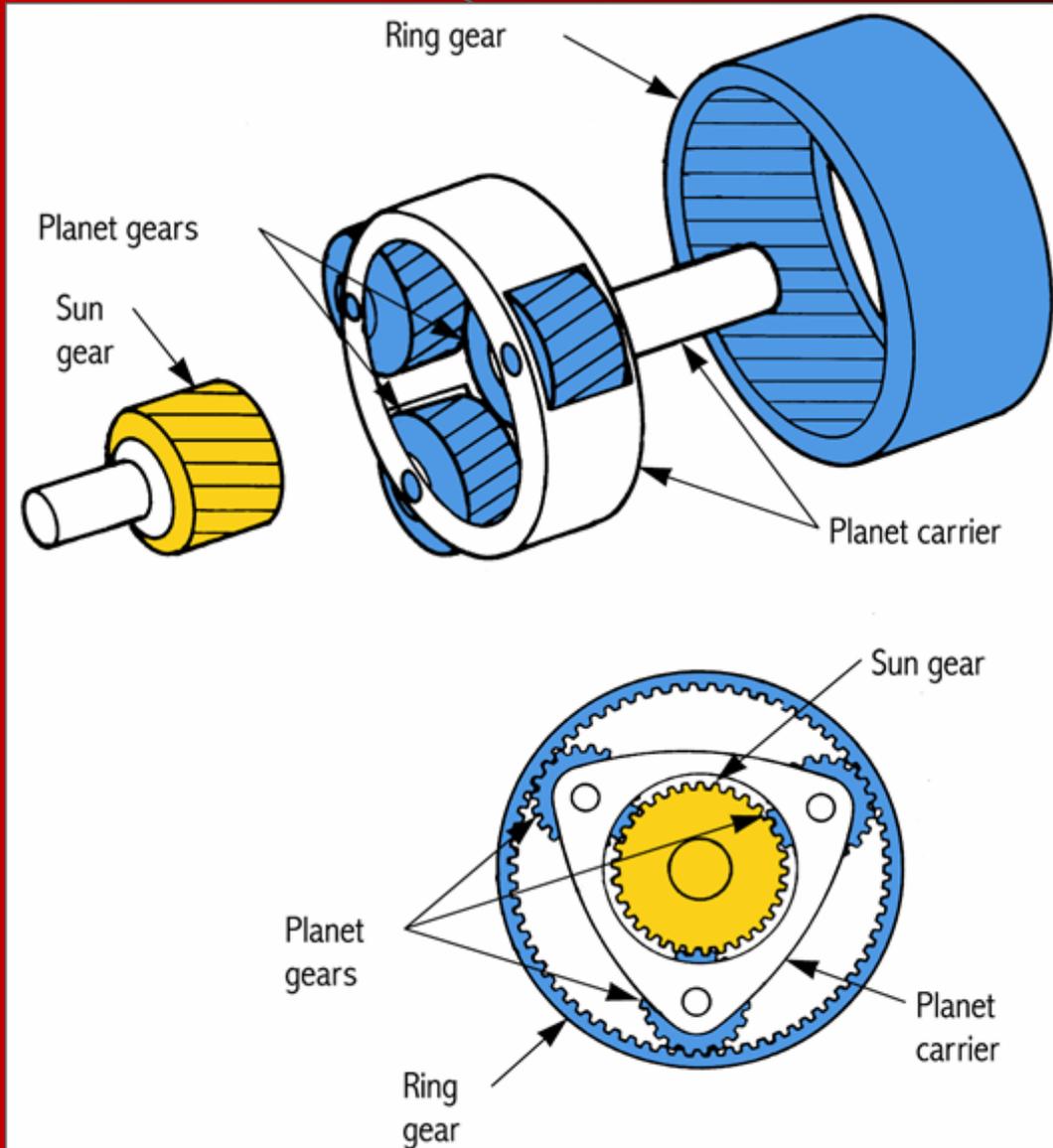
1. The VALVE BODY is operated by the shift lever and sensors, and controls oil flow to pistons and servos
2. The PLANETARY GEARSETS provide different gear ratios and reverse gearing for an automatic transmission/transaxle



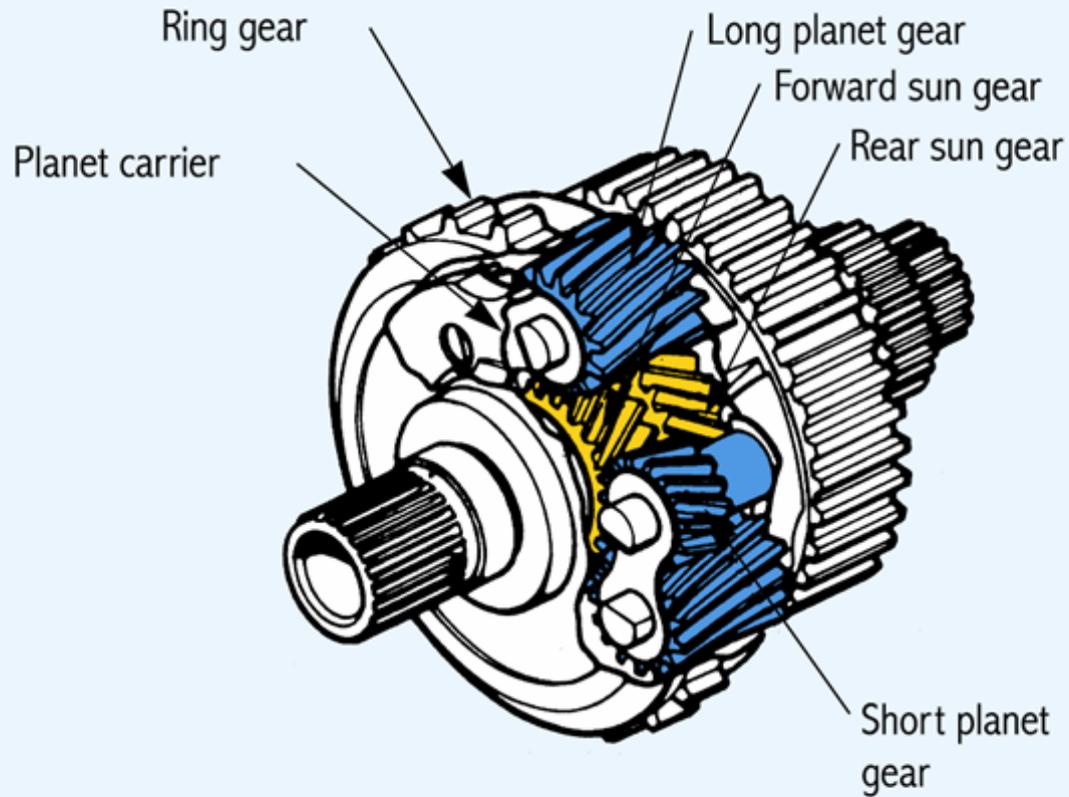
Valve Body



Planetary Gearset



Compound Gearset

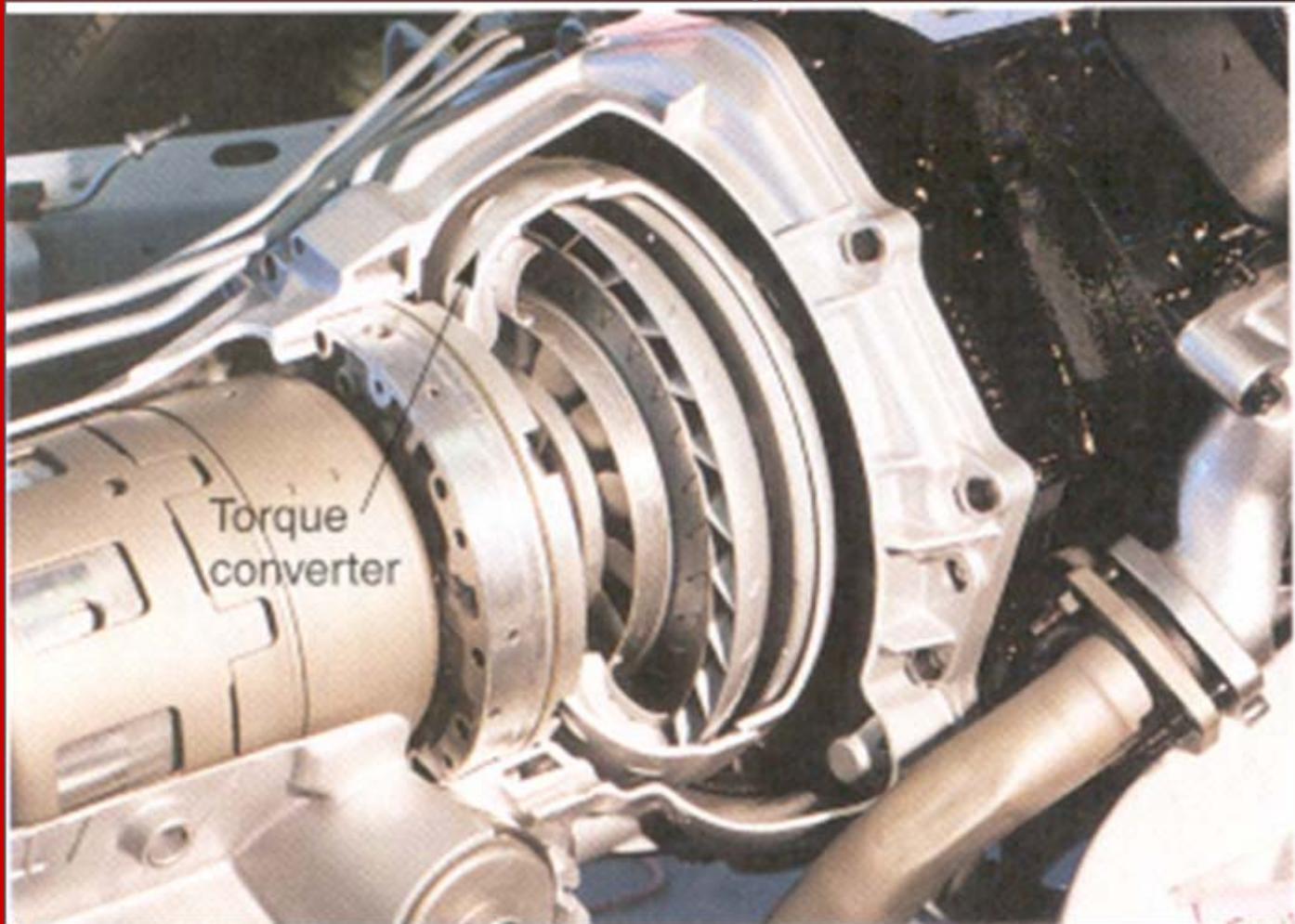


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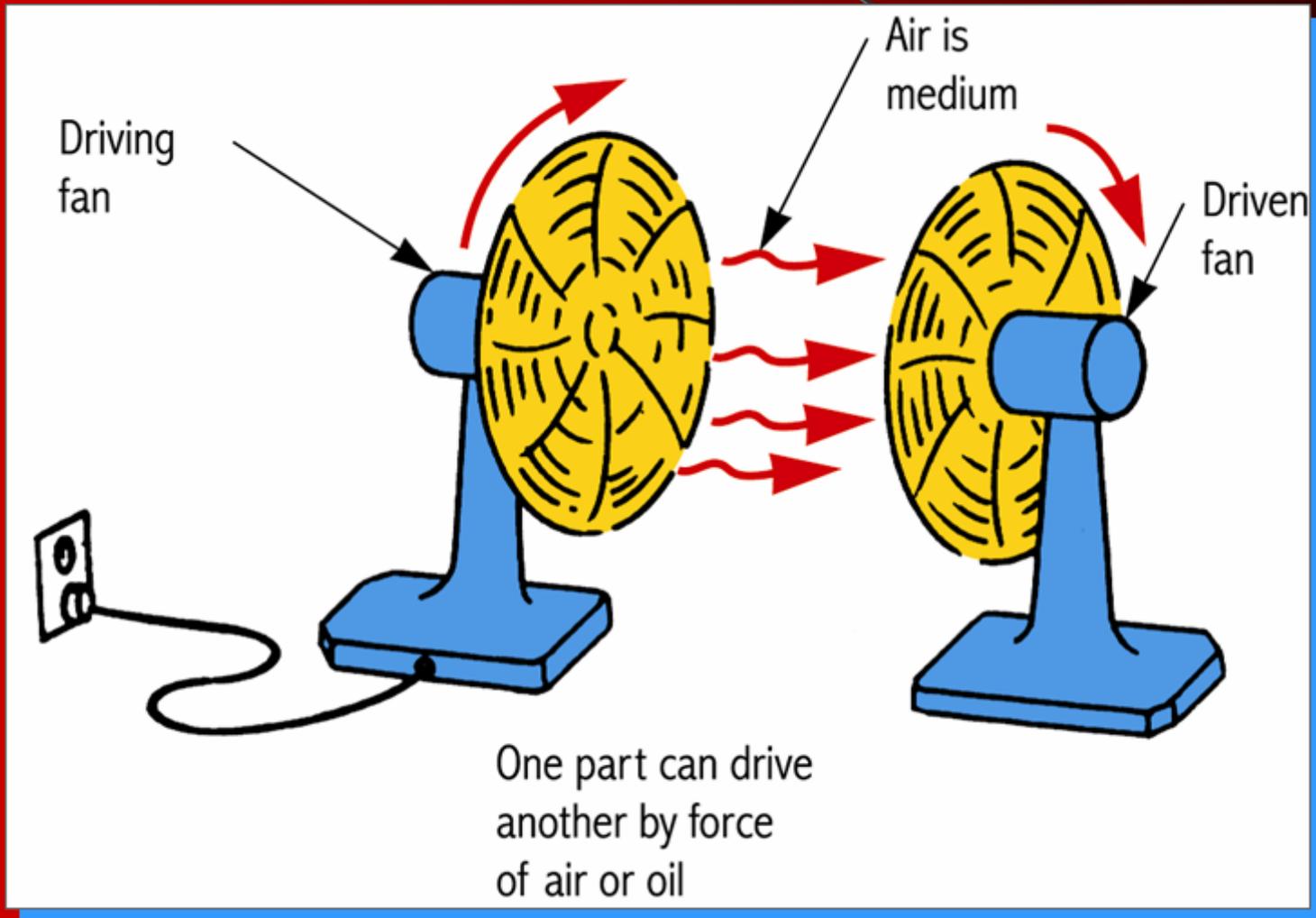
3. The TORQUE CONVERTER is a fluid coupling that connects and disconnects engine and transmission.
4. The OIL PUMP produces the pressure needed to operate the hydraulic components in the transmission



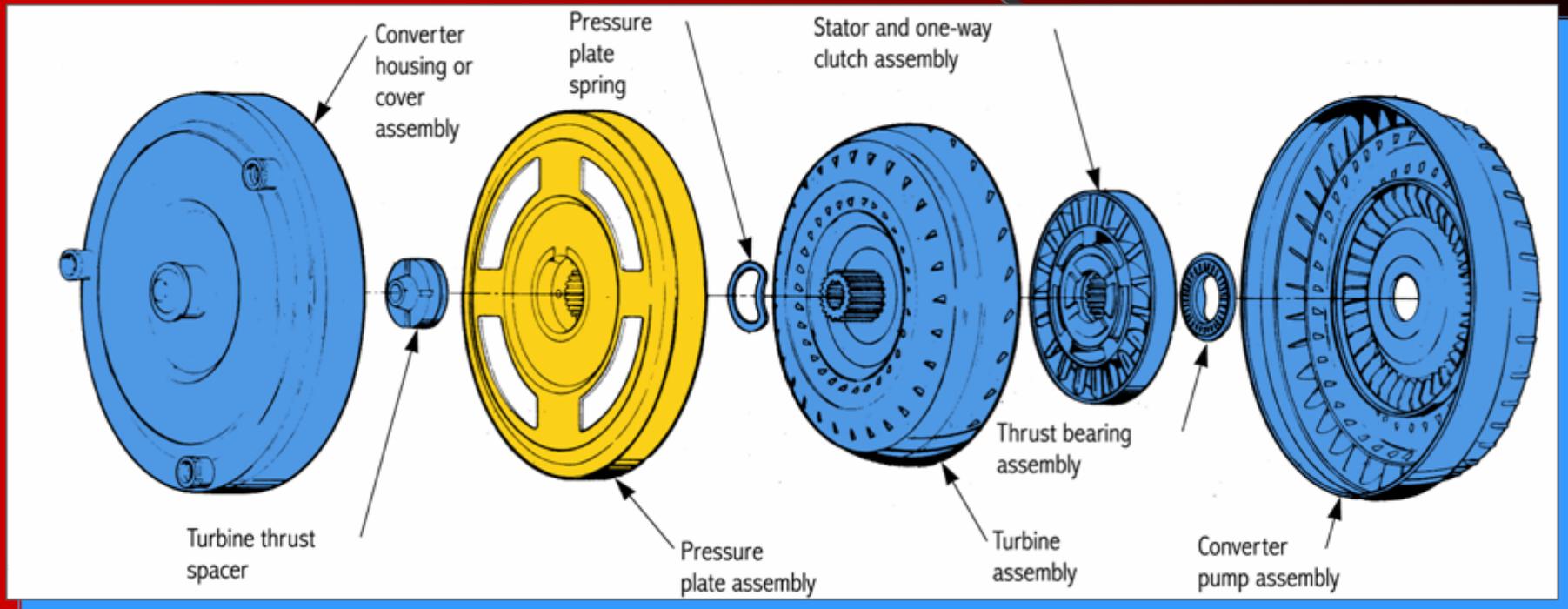
Torque Converter



Principles of Torque Converter Operation



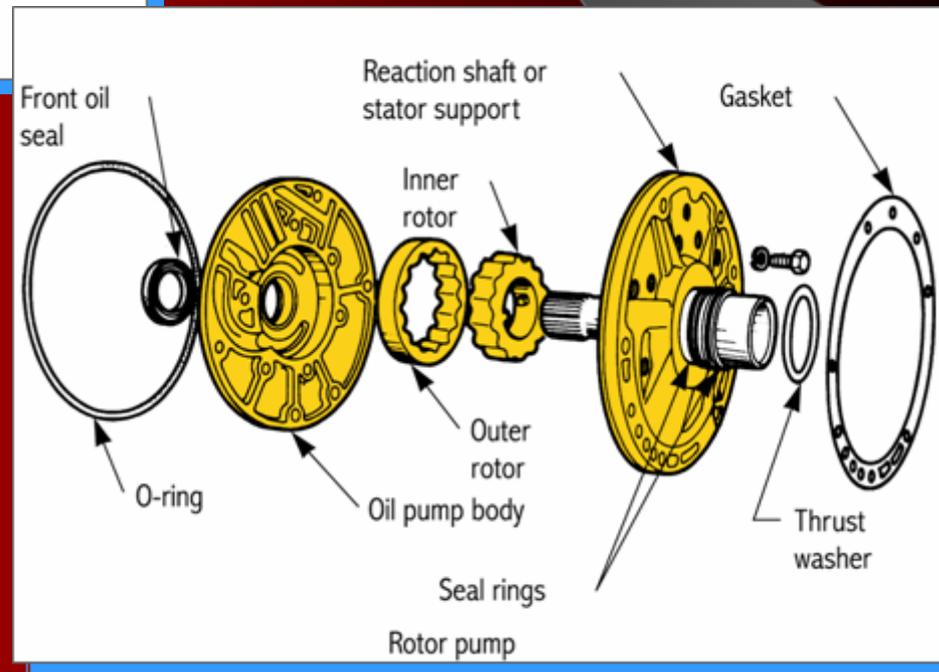
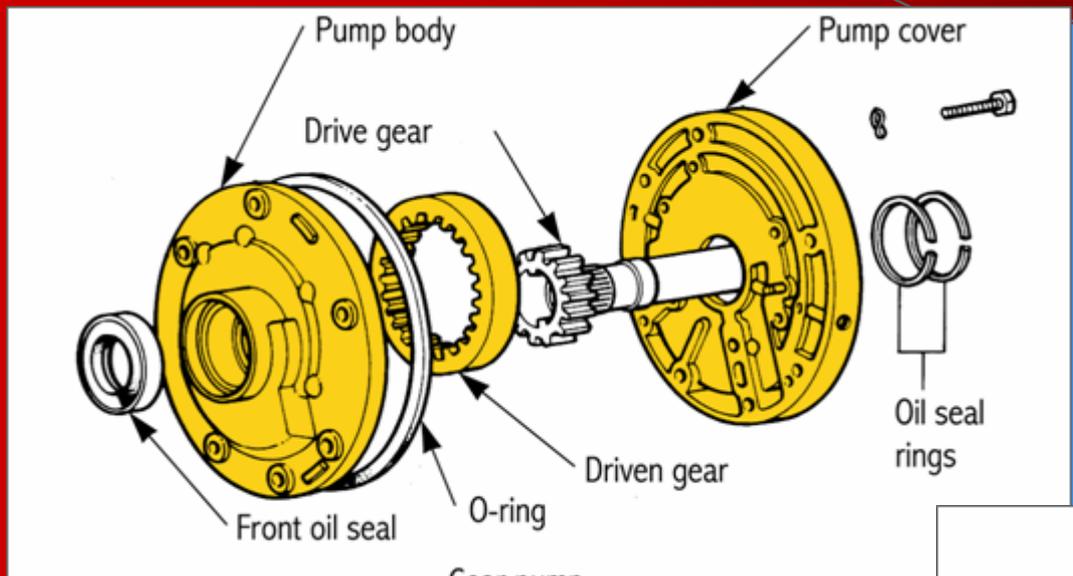
Lockup Torque Converter



In high gear, oil is channeled to the converter piston, locking up converter



Transmission Oil Pumps



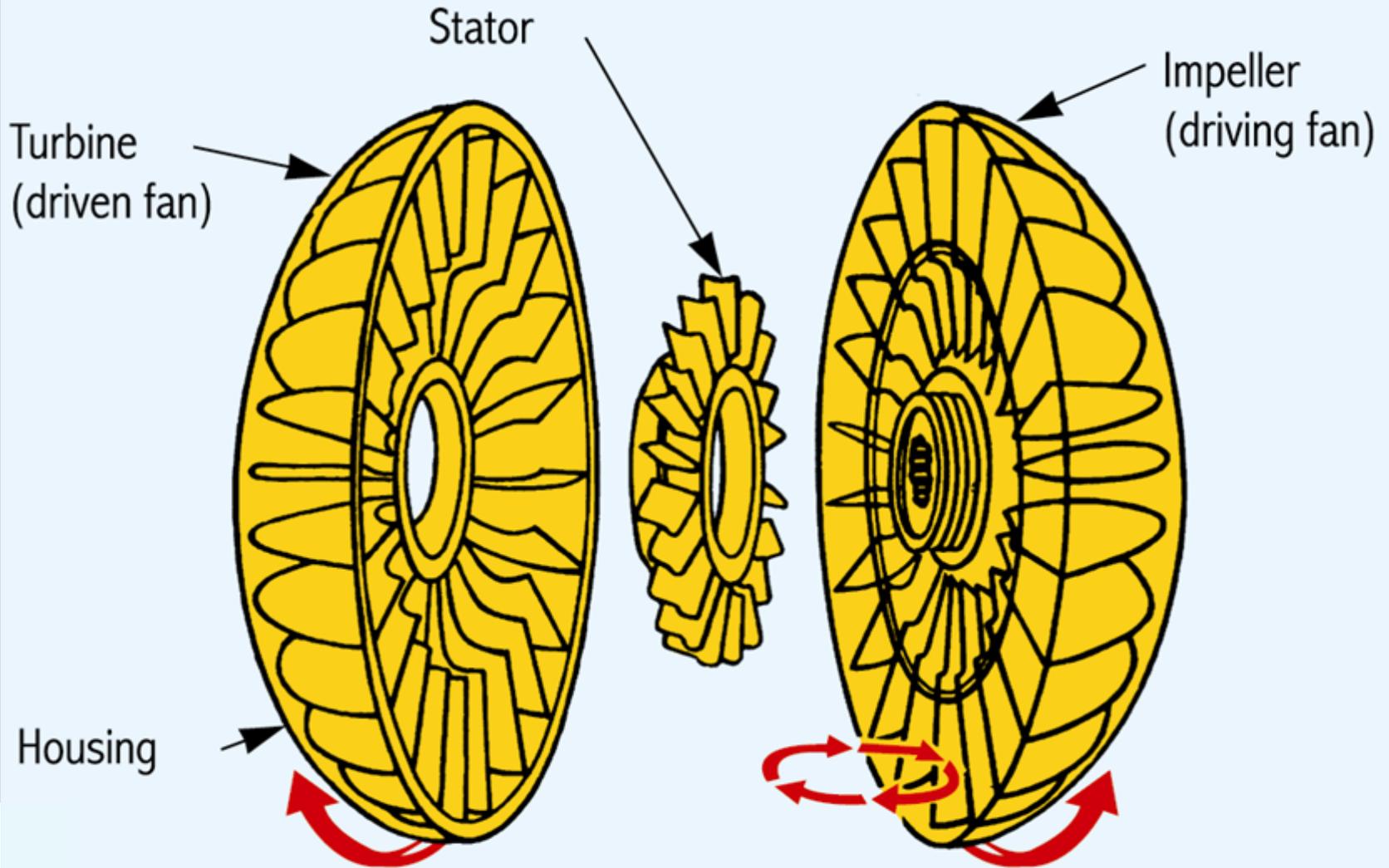
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5. The IMPELLER is a driving fan that produces oil movement inside the converter whenever the engine is running
6. The TURBINE is the driven fan splined to the input shaft of the automatic transmission that is driven by the energy of the oil driven by the impeller





Torque Converter



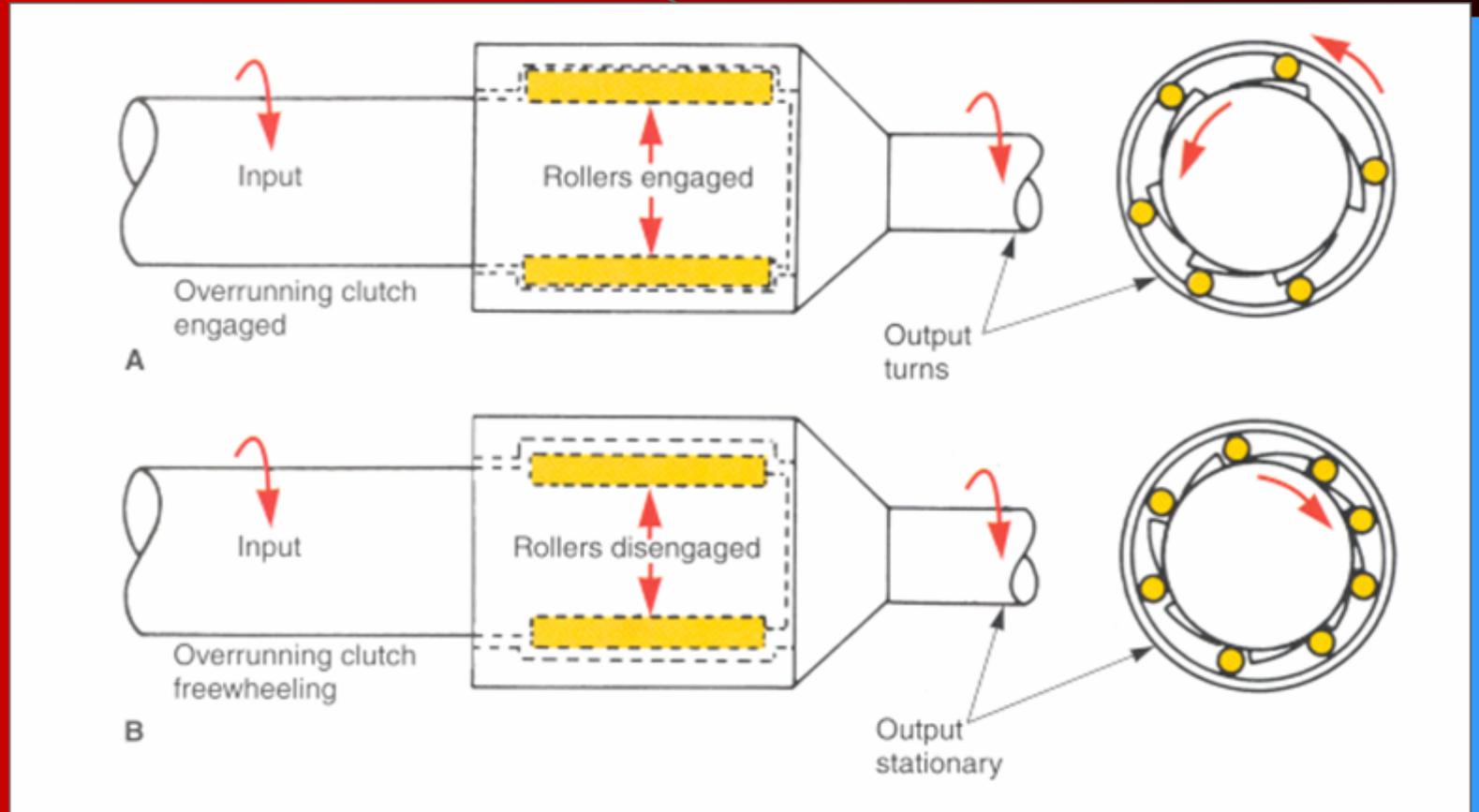
Overrunning Clutches

- Used to hold a planetary gearset member
- One-way roller clutch that locks in one direction and freewheels in the other





Overrunning Clutches



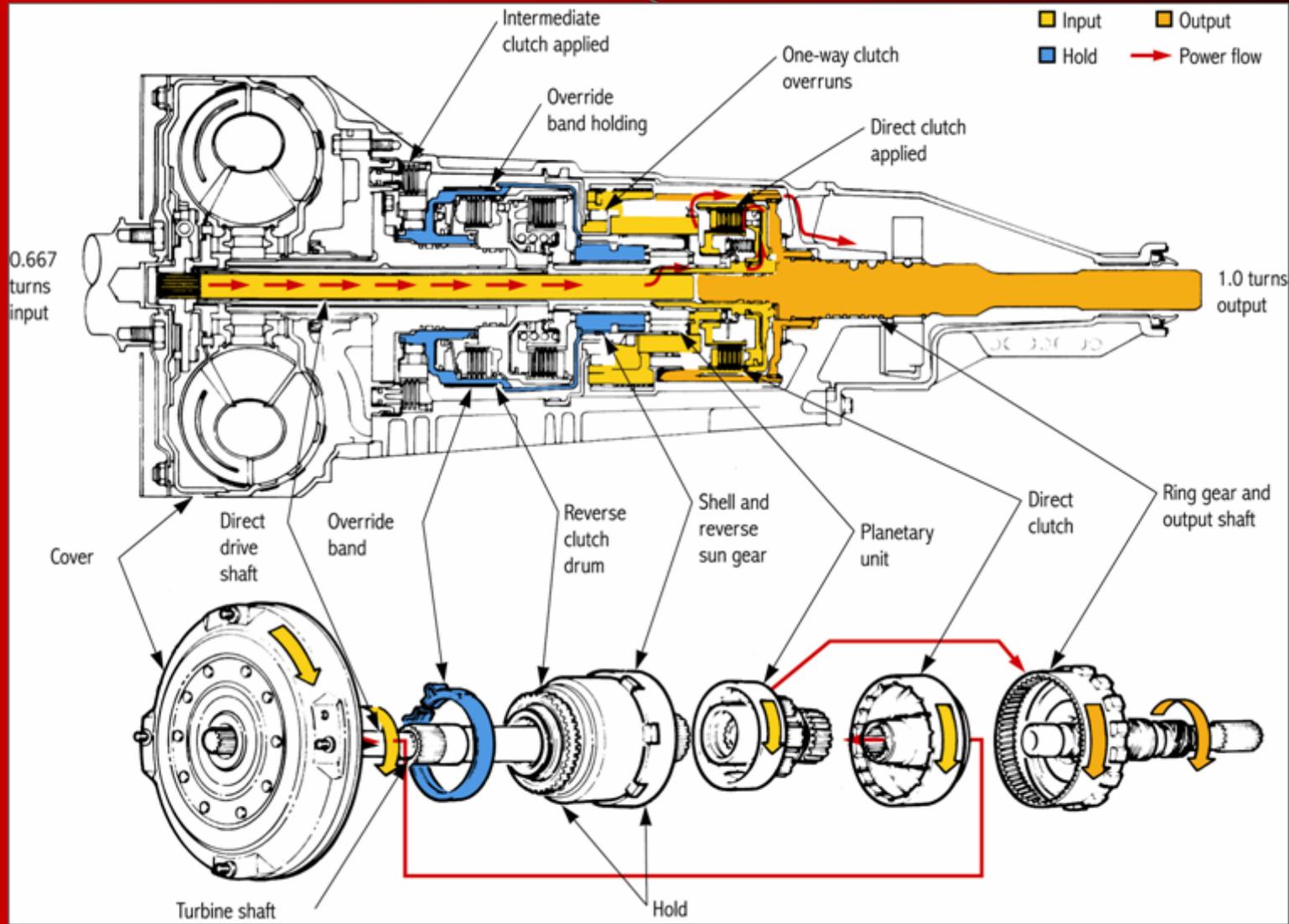
A: This action can stop movement of planetary member
B.:The two races are free to turn independently

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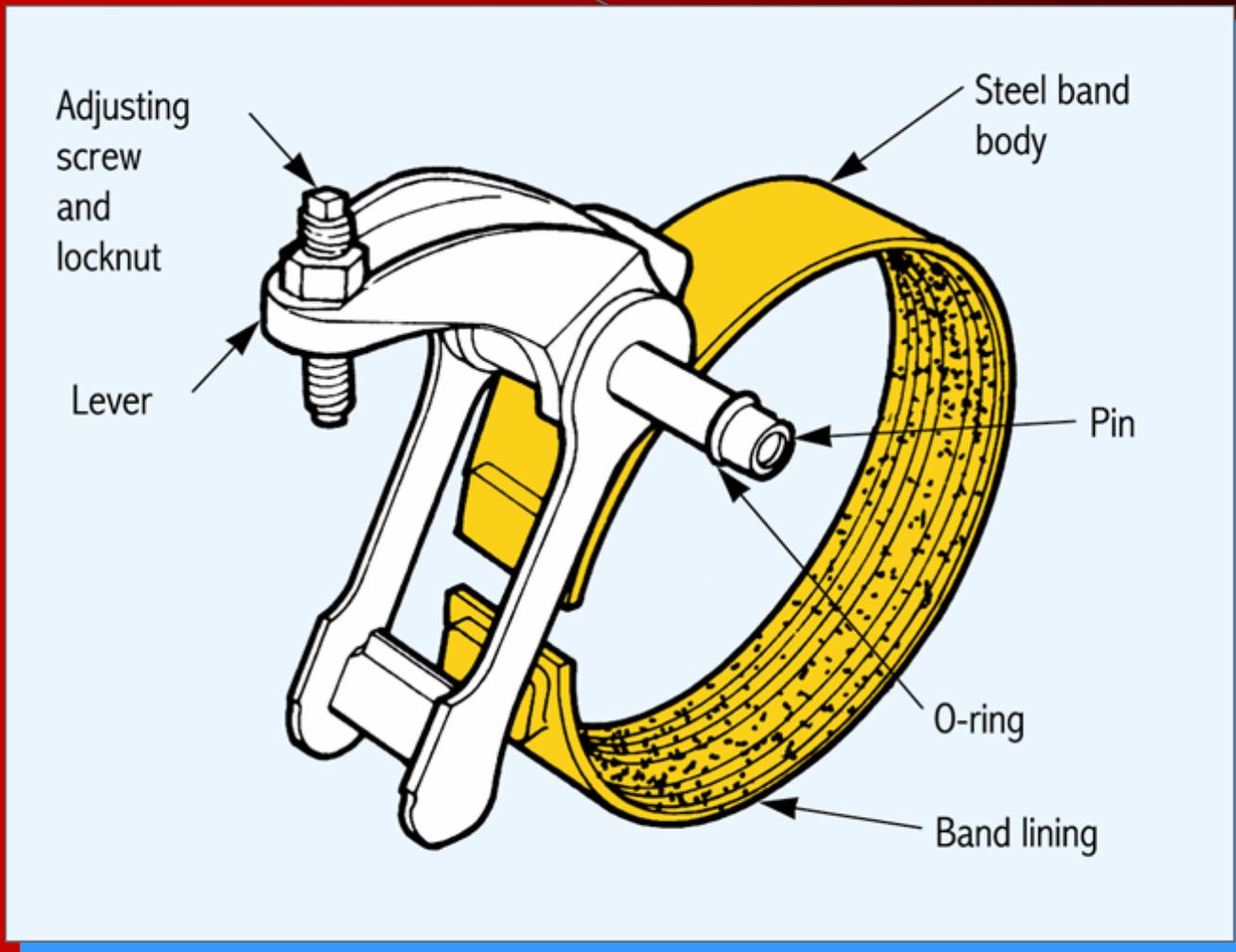
7. The **INPUT SHAFT** transfers power from torque converter to internal drive members and gear sets.
8. The **BANDS** and **CLUTCHES** apply clamping or driving pressure on different parts of gear sets to operate them



Power Flow



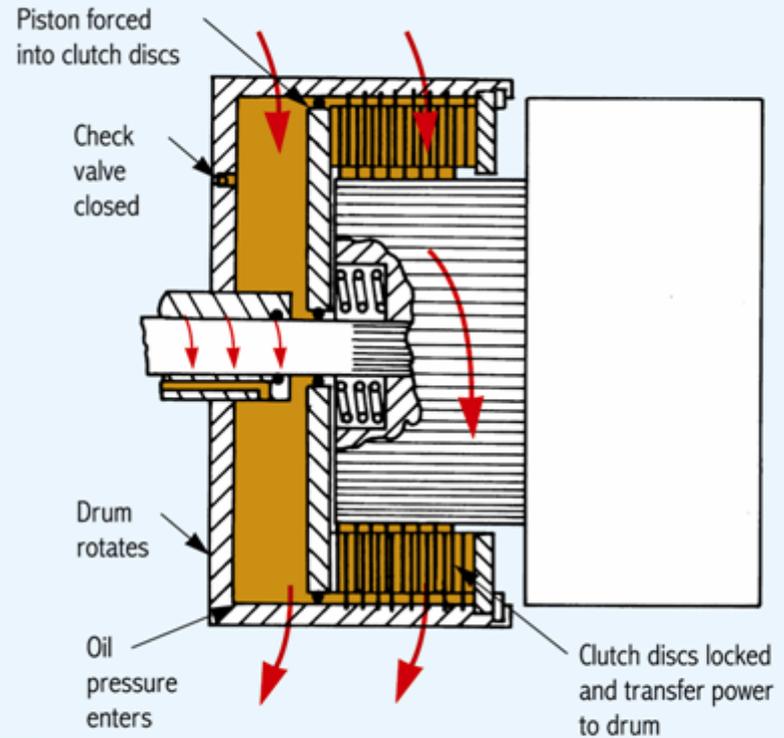
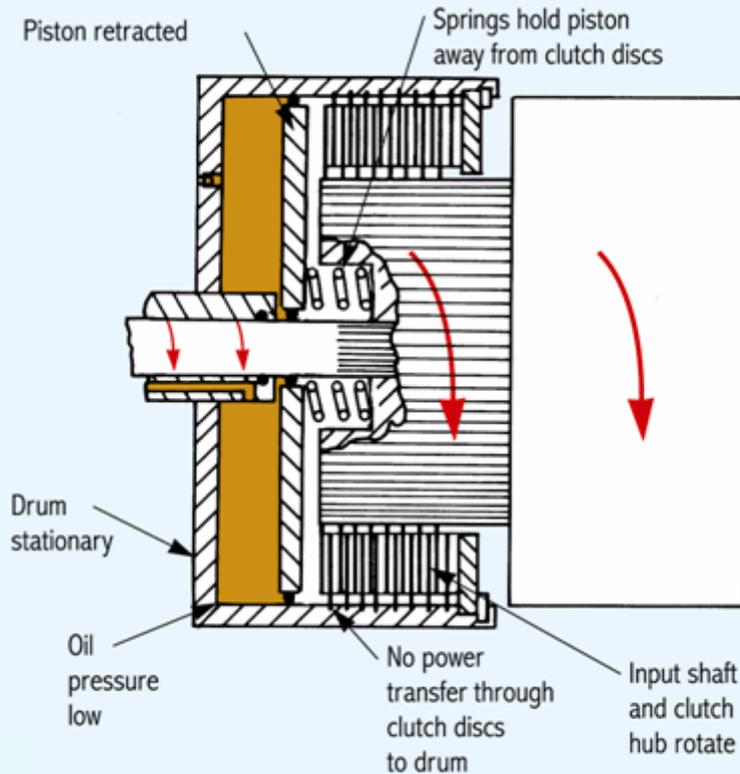
Band



One end is anchored to the case



Clutch Operation



Released

Applied



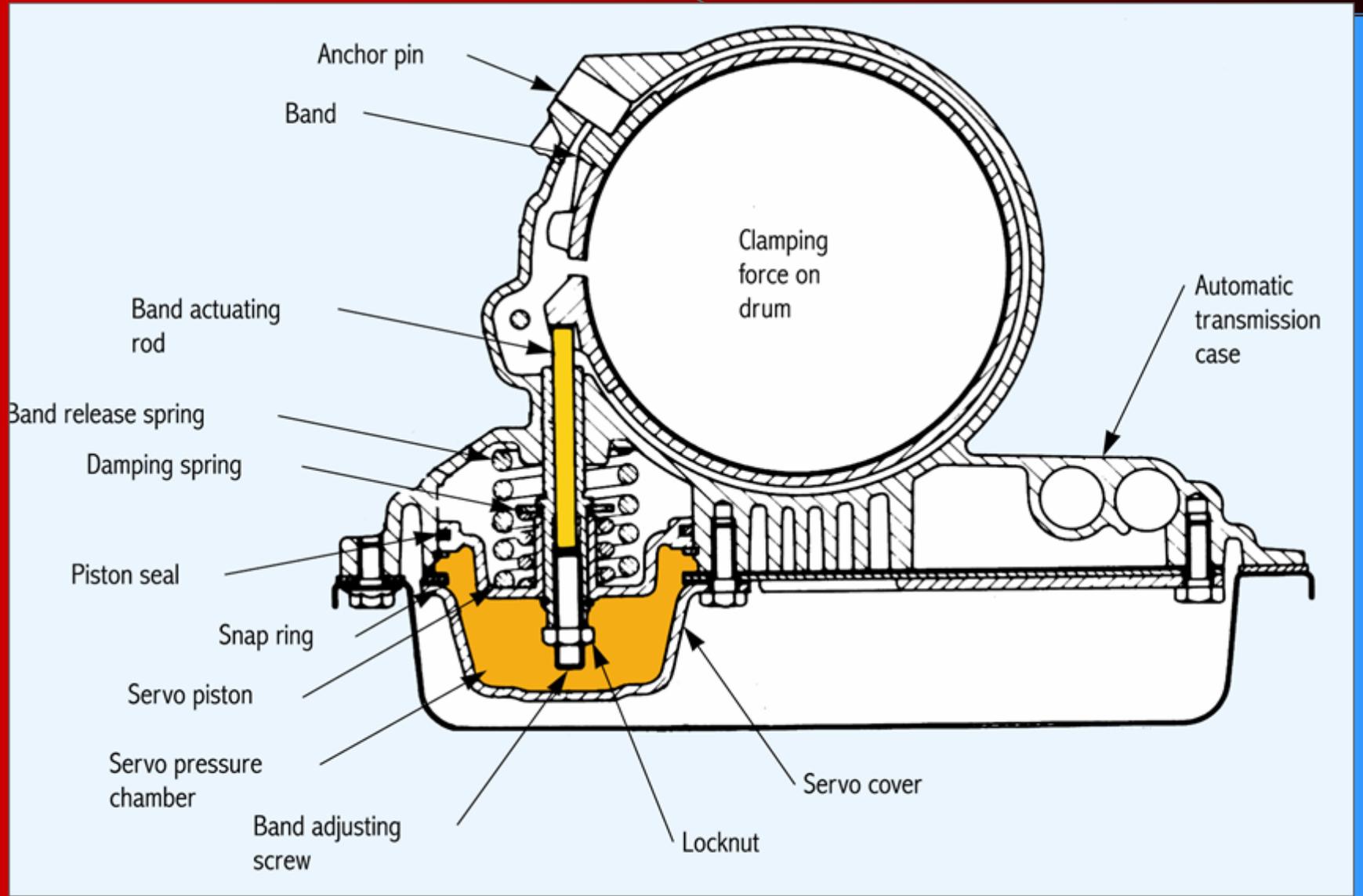
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9. PISTONS and SERVOS actuate (move or hold) the bands and clutches to produce the different gear ratios needed to shift an automatic transmission/transaxle
10. The OUTPUT SHAFT transfers engine torque from the transmissions gear sets to the drive shaft, and ultimately, the rear wheels

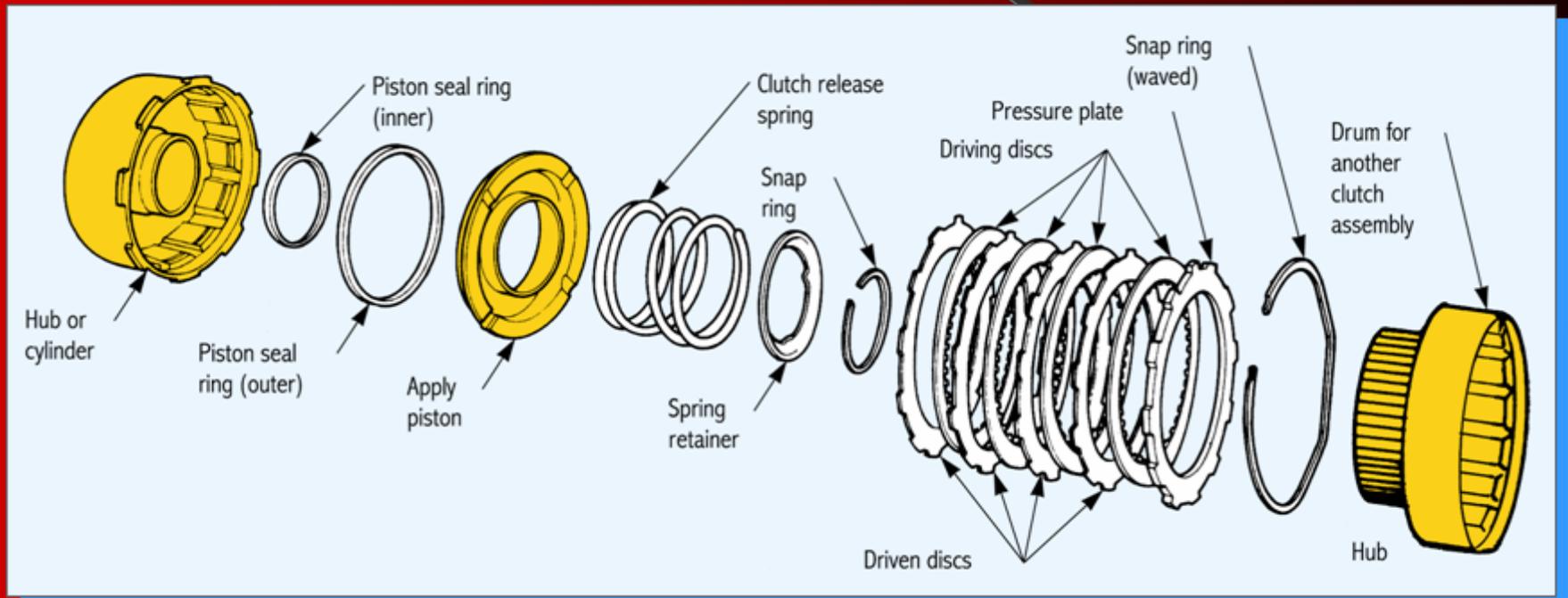




Bands

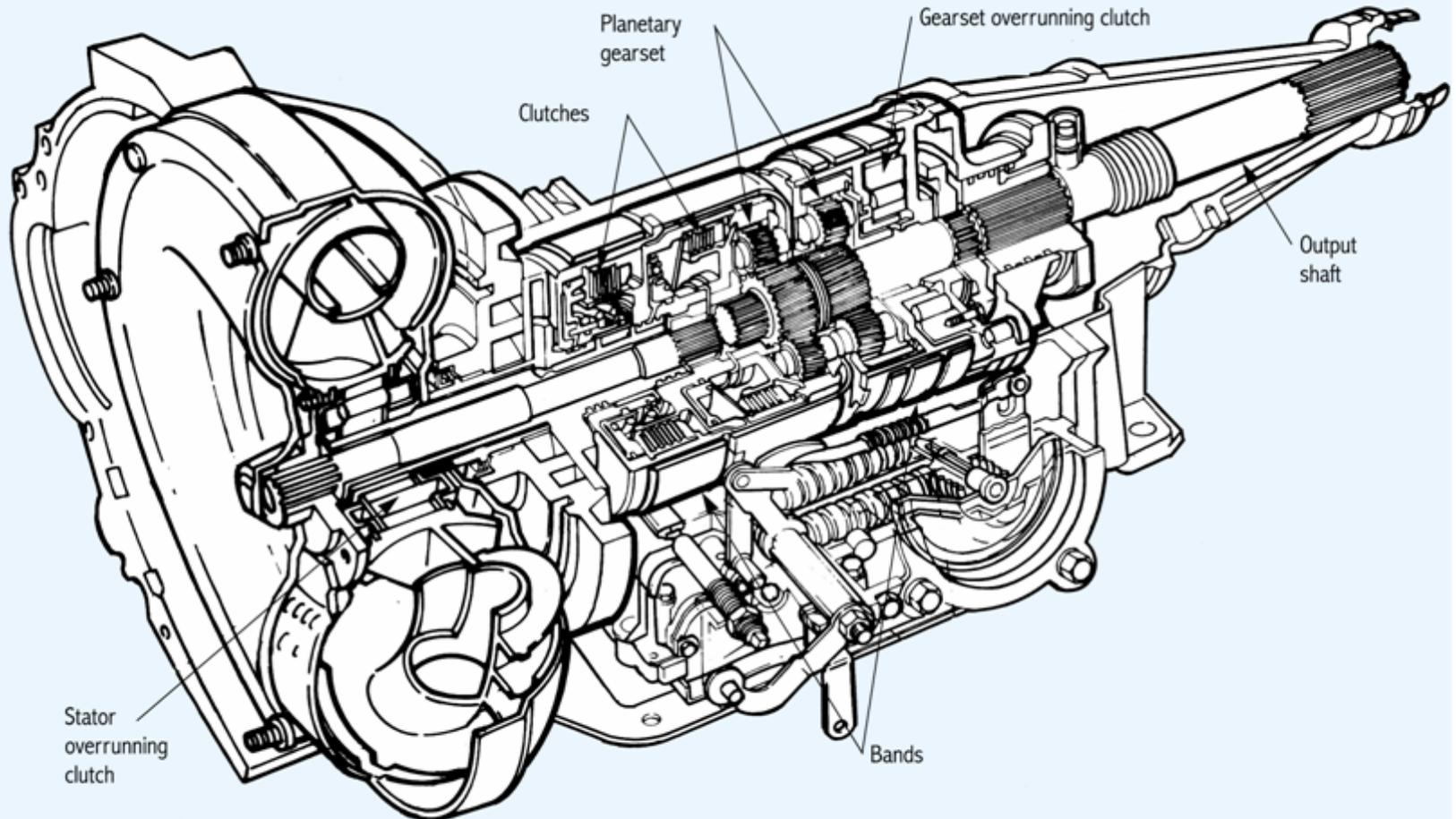


Clutches and Pistons

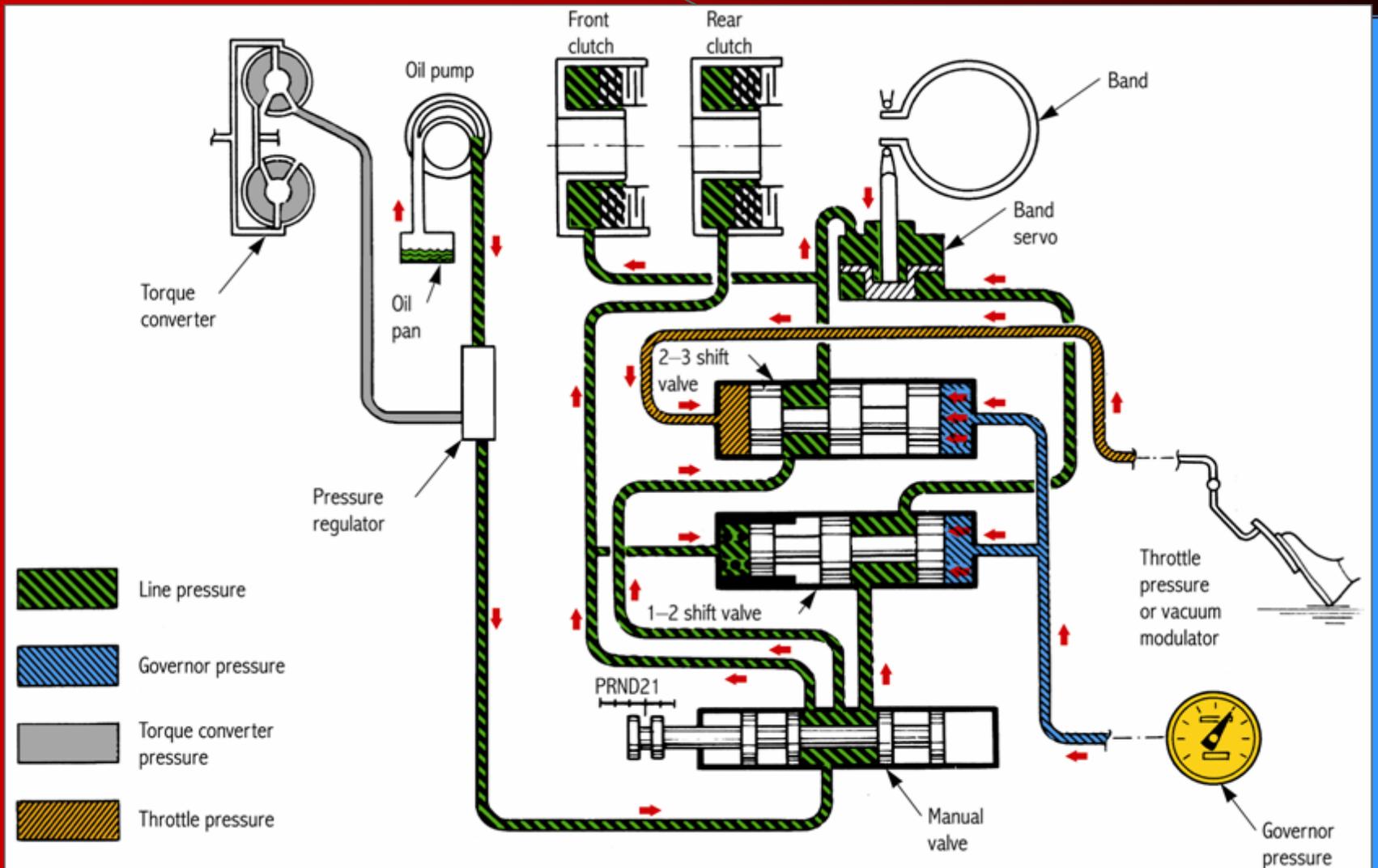




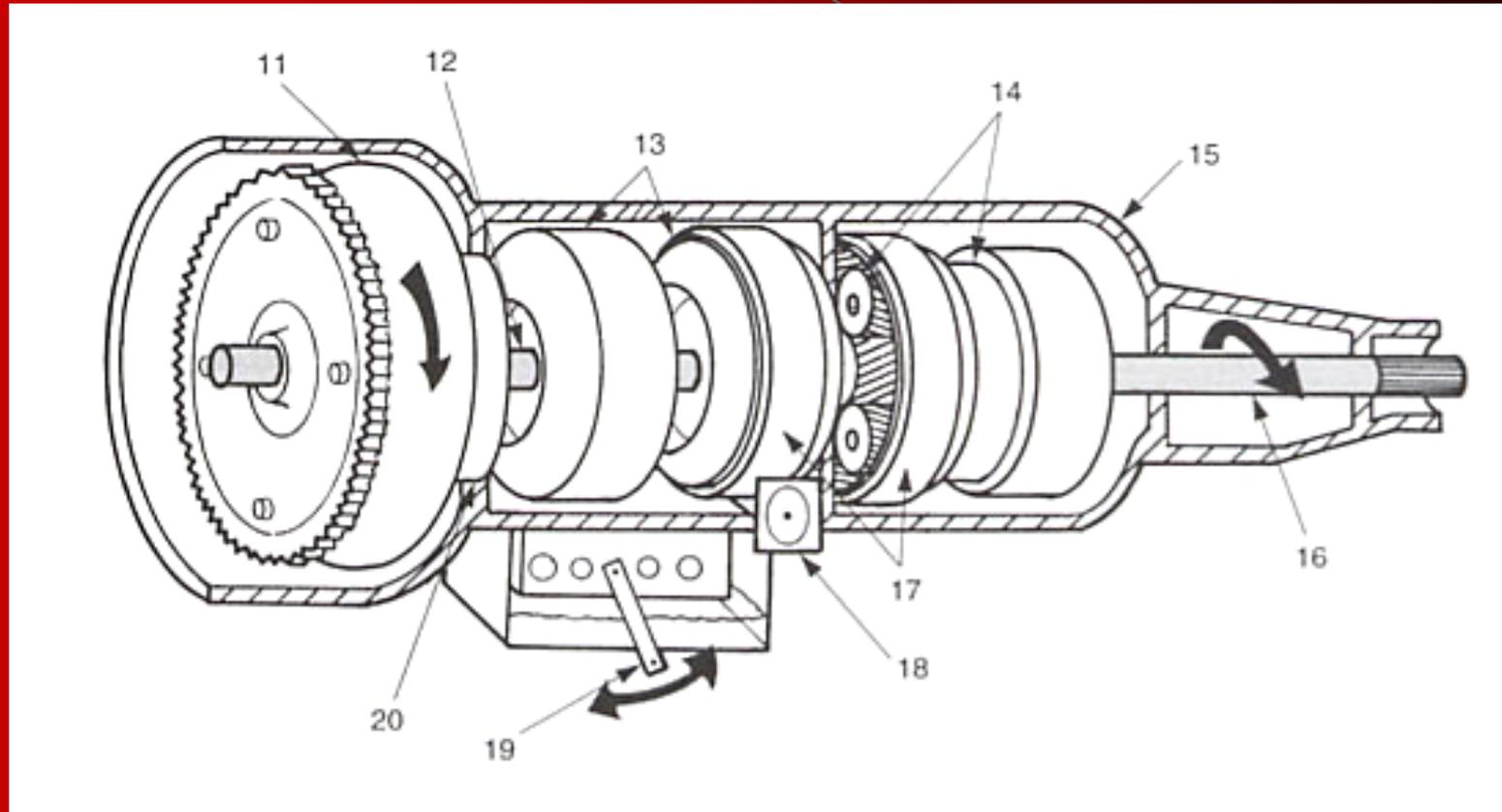
Output Shaft



Hydraulic Circuit



Automatic Transmission



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