Automotive Transmission Diagrams — SAE J647

SAE RECOMMENDED PRACTICE

REVISION OF FIGURES

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LAND
SEA
AIR
SPACE

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The following schematic diagrams exemplify the SAE recommended method of illustrating automotive transmission arrangements. They were developed to standarize industry practice and facilitate a clear understanding of the functional interrelations of the gearing, clutches, hydrodynamic drive unit and other transmission components.

Two variations of diagrams are used: Transmission in neutral and in gear. For illustrative purposes, a representative five speed countershaft transmission and four speed planetary transmission are shown.

1. TRANSMISSION IN NEUTRAL

Fig. 1 illustrates a five speed countershaft transmission which is constant mesh in all forward gears. Each gear is identified according to the particular transmission speed it provides when engaged, for example: 1st, 2nd, 3rd, and so forth. The number of teeth in each gear is indicated. Synchronized and positive jaw clutches are schematically represented with a drive dog and mating slot in the affected gear. One drive plate and two driven plates are used to designate the plate clutch assembly. The reverse idler gear is shown out of position for clarity.

Fig. 3 illustrates a planetary gear transmission in neutral with clutches and bands shown disengaged. Brake bands and clutches are designated as 1st, 2nd, 3rd, Reverse, and so forth in accordance with their use. Gear sets are designated as G1, G2, G3, and so forth. The number of teeth in each gear is shown.

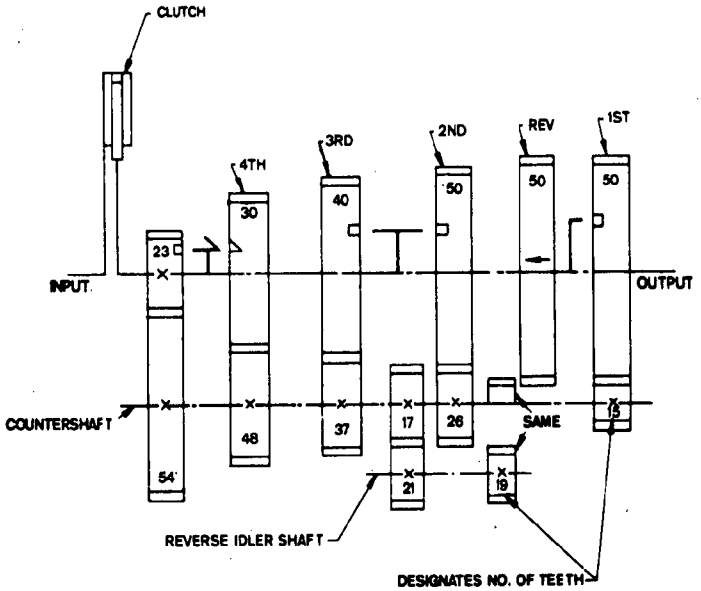
2. TRANSMISSION IN GEAR

Figs. 2 and 4 illustrate the countershaft transmission and the planetary gear transmission in gear with the torque path denoted by straight bold arrows. Curved arrows indicate direction of shaft rotation. Active members are designated in full lines with sections crosshatched. Idling parts are designated in dotted lines and are not crosshatched. When engaged to transmit torque, the clutch plates are shown in contact.

Countershaft transmission (Fig. 2) — In third, for example, the main shaft third gear is clutched to the output shaft. This means of the drive dog engaging the slot in the gear.

Planetary gear transmission (Fig. 4) — Second gear is illustrated. The pertinent brake band is contacting the drum to denote brake application. Additional information added to this diagram is optional: The rpm of the sun gear, ring gear, and carriers are designated for 100 rpm input speed; clutch plate speed differential is designated for 100 rpm input speed; and the torque of the sun gear, ring gear, and carrier is designated for 1.00 "T" input torque.

3. ONE-WAY CLUTCH DIAGRAMS—Fig. 5 shows the SAE recommended one-way diagrams.



GEAR ROTATABLE ON SHAFT IF NOT OTHERWISE INDICATED

× GEAR FIXED TO SHAFT

GEAR SPLINED TO SHAFT & SLIDEABLE

OR GEAR ENGAGEABLE BY JAW CLUTCH

GEAR ENGAGEABLE THRU SYNCHRONIZED CLUTCH

FIG. 1 - FIVE SPEED TRANSMISSION DIAGRAM—NEUTRAL

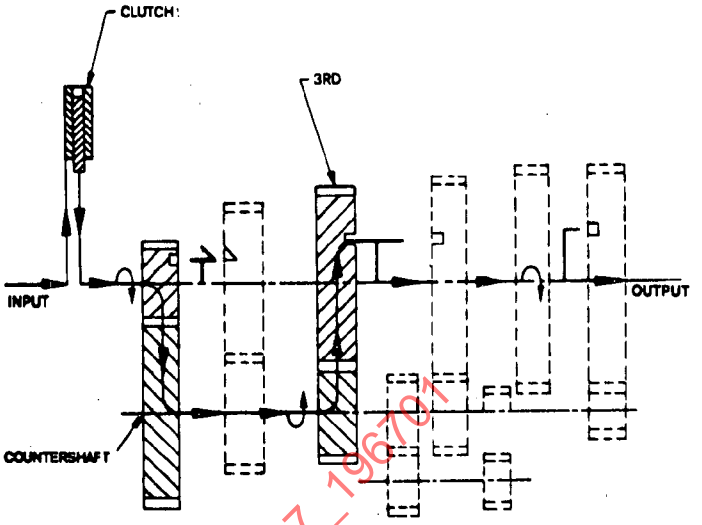


FIG. 2 - FIVE SPEED TRANSMISSION DIAGRAM—3RD SPEED

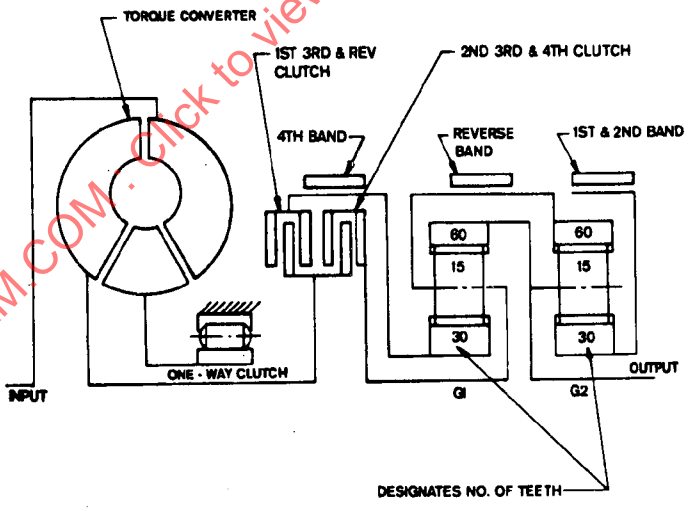


FIG. 3 - FOUR SPEED TRANSMISSION DIAGRAM—NEUTRAL