



Neutral position of gears in constant-mesh transmission. For low, gear F slides forward to mesh with D and back to H for reverse. Positive clutch locks with E for second gear, with main and clutch shafts for high gear

## Transmission

Anything that causes the transmission gears to clash when shifting them or causes the clutch to grab, throws undue strain on any gears, shafts and bearings throughout the drive system. This causes excessive wear and even breakage of the parts.

Protection of the transmission with a high-quality lubricant is vital in two ways: It reduces wear and prevents excessive clutch spin. Also, "riding" the clutch—keeping your foot on the pedal while driving—causes unnecessary wear. Light contact of the foot brings the throw-out bearing into play and exerts end thrust on the crankshaft, creating end play prematurely. Slightly increased pressure on the pedal contributes to slipping, which wears out the clutch-plate lining and may damage the pressure plate. There is no wear of any kind on the clutch when no pressure is applied on the pedal.

In order to shift gears noiselessly, the engaging gears should be running at approximately the same speed. Even when shifting "synchronesh" transmission, it is desirable to have the parts to be united operating at similar speeds. Therefore, the center disk that turns with the transmission is made as light as possible. This, in conjunction with the predetermined drag of the lubricant, brings the clutch to rest quickly when the foot pedal is depressed. Insufficient lubricant, or lubricant with too

light a body, allows free spinning of the clutch, which contributes to wear in several parts and to difficulty in shifting. If lubricant of the proper kind, as recommended by the manufacturer, is kept up to the bottom of the inspection-hole plug located just below the transmission opening, little trouble will be experienced.

When gears have a tendency to slip out of mesh, the cause may be wear or a sprung shifter fork. When the fork is sprung, the gears of the old-type transmission or the synchronizing unit of the modern transmission are not moved far enough to mesh correctly.

Wear in the throwout mechanism of a clutch should be adjusted promptly. If it is not done, the clutch may drag or slip, with the result that gears or synchronizing parts cannot come to rest or will not function properly. Few clutches have any adjustment within the clutch housing. Most adjustments are made by some combination of screw-and-bolt linkage between the pedal and the clutch shaft. A typical example is the adjustment of free travel on a clutch pedal. Here the pin at the lower end of the screw adjustment is removed, and the adjusting clevis screwed in or out as necessary to give the clutch pedal a free travel of about 1 in. before it acts on the clutch mechanism. Lacking this free travel, the throwout bearings will be in continu-