

## V. THE TRANSMISSION SYSTEM

### (1) General

Internal-combustion engines can only be operated within certain speed ranges. In order to put them into operation, a starter is required which imparts the necessary rotary motion to the crankshaft.

The speed of the engine is regulated by means of the accelerator pedal, that is to say, the speed can be increased or decreased within a certain range. To run the tractor, the torque produced by the running engine must be transmitted to the road wheels or running gear.

The connection between running engines and road wheels or running gear can only be established gradually and smoothly, while steadily increasing the engine speed. If this connection is brought about suddenly, the load on the engine is too high. The engine would stall, as this uncalled-for stopping of the engine is called.

The units required to connect the engine with the road wheels or running gear are termed as power transmission system which includes, as the major units, *the clutch, the change-speed gearbox and the differential gear.*

In addition, modern tractors are equipped with several shafts which are driven by the engine and which can be used to drive agricultural implements. These shafts are called power take-off which can be arranged at the front, rear or on either side of the tractor.

### (2) Clutches

#### (a) General

The engine is disconnected from or connected with the other units of the transmission system by means of a clutch. A clutch must therefore be so designed that it can be disengaged and engaged and that the power from the engine is transmitted without any jerks.

When moving off, the clutch should slip somewhat to impart the rotary motion of the crankshaft gradually to the change-speed gear which is still at rest.

The engine must be disconnected from the change-speed gear when shifting gears. When the clutch pedal is actuated (floored) by the driver, the connection between engine and change-speed gear is interrupted. This process is called disengagement of the clutch.