

The objective of this project to design and construct a two wheel tractor with an improvement of steering without any confusion in spite of a road being flat or steep. For this project available EMIE 7 Chinese tractor was innovated with a new design of independent brake system to the two independent pinion wheels of the gearbox for getting rid of the problem, described below. *Leading and trailing shoe brake assemblies* were used for the brake system.

The power from the engine is transmitted to the driving wheels through two independent clutches of the gearbox. Unlike the friction clutches, this type of dog clutch has two operations either to engage or to disengage. When one clutch is being disengaged of a particular wheel, engaged wheel can move faster than the other.

But when it is going on a downhill, most times the engine acts as a brake. As the engine is driven by the load/ inertia under this condition, the forces acting on the wheel by the ground will be reversed. When the tractor is to be steered to left or right, the clutch of the wheel of opposite side has to be disengaged, as the weight or the inertia of the load applied on the wheel tends to move at a greater speed than the engine driven wheel.

The brake system, which is being operated simultaneously with the independent clutch, was tested in various road conditions and load conditions well. But we observed that this brake system has to be improved to withstand greater load conditions. This problem can be controlled by introducing a reliable brake system to the trailer.

Required brake torque at the driving wheel, say T_A and the required torque at the designed brake system, say, T_Z .

T_Z can be calculated as,

$$T_Z = 0.1546 T_A$$

The type of brake system is ideal for the tow-wheel tractor for preventing the directional change in turning to a particular side while moving on a downhill. This will also prevent the operator from being confused due to the directional change and ensure the safety. As the above said problem arises only when moving on down slopes, this problem has been neglected by most of the design Engineers.