

DESIGN AND FABRICATION OF BUTTON OPERATED ELECTROMAGNETIC GEAR CHANGER FOR FOUR STROKE PETROL ENGINE TWO WHEELER VEHICLE

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ABSTRACT

A rotational output of an internal combustion engine is connected to drive wheels of the automobile and a load device. when a gear shifting up of an automobile transmission is to effected. the load applied by the load device is increased, or the load connected to an output rotation shaft of the engine via selectivity connecting device

Keyword: - Transmissions, Gear, and Load etc....

1. INTRODUCTION

The main objective of our project is to perform an automatic gear change control apparatus for an automobile and a method of controlling such apparatus. A rotational output of an internal combustion engine is connected to drive wheels of the automobile and a load device. When a gear shifting-up of an automatic transmission is to be effected, the load applied by the load device is increased, or the load is connected to an output rotation shaft of the engine via a selectively-connecting device, thereby reducing the rotational speed of the output rotation shaft of the engine to a required level. In this work, two electromagnetic coils are coupled to the gear rod of the two ends.

The two buttons are used to activate the electro-magnetic coil so that the gear will be shifted. An automatic gear change control apparatus for an automobile, comprising an internal combustion engine; an automatic transmission connected to an output rotation shaft of engine so as to transmit the rotational output of drive wheels through any selected one of gear ratios; apparatus comprising a load device for applying a load; means for connecting load device to output rotation shaft of engine and for generating a gear change control signal for selecting one of gear ratios of automatic transmission in accordance with one of operational conditions of automobile and said engine; and load control means for increasing the load of said load device when said gear change signal-generating means generates the control signal for shifting up the gear in automatic transmission. Increasing demands on performance, quality and cost are the main challenge for today's automotive industry, in an environment where every movement, component and every assembly operation must be immediately and automatically recorded, checked and documented for maximum efficiency.

Automotive technology has been developed in many areas, like ABS system, active steering system and other safety systems, which are implemented to increase the passenger safety and comfort. The development has concluded also the gearbox, which became much smoother and produces less noise. Gear shifting mechanism must be easy to use and workable, these demands are very important especially for small cars used by special needs people. For some drivers, the gear shifting can cause some confusing at driving specially at critical situations. A crowded road on a hill or a sudden detour makes a lot of tension on the driver. One of the difficulties in this situation

is to choose the right reduction ratio and engaging it at the right time.

2. DESCRIPTION OF EQUIPMENTS

2.1 Sealed Lead Acid Battery

The lead acid cell type is a secondary cell or storage cell, which can be recharged. The charge and discharge cycle can be repeated many times to restore the output voltage, as long as the cell is in good physical condition. However, heat with excessive charge and discharge currents shortens the useful life to about 3 to 5 years for an automobile battery. Of the different types of secondary cells, the lead-acid type has the highest output voltage, which allows fewer cells for a specified battery voltage. One cell has a nominal output of 2.1V, but lead-acid cells are often used in a series combination of three for a 6-V battery and six for a 12-V battery.

2.2 Spring

Spring steel is a name given to a wide range of steels used widely in the manufacture of springs, prominently in Automotive and Industrial suspension applications. These steels are generally low-alloy, medium-carbon steel or high-carbon steel with a very high yield strength. This allows objects made of spring steel to return to their original shape despite significant deflection or twisting.

A spring is a flexible elastic object used to store mechanical energy. Springs are usually made out of hardened steel. Small springs can be wound from pre-hardened stock, while larger ones. A spring is a mechanical device, which is typically used to store energy and subsequently release it, to absorb shock, or to maintain a force between contacting surfaces. They are made of an elastic material formed into the shape of a helix which returns to its natural length when unloaded this is called return spring. Springs are placed between the road wheels and the vehicle body. When the wheel comes across a bump on the road, it rises and deflects the spring, thereby storing energy therein. On releasing, due to the elasticity of the spring, material, it rebounds thereby expending the stored energy.

2.3 Air Pilot Solenoid Actuator

This solenoid actuator is used to run bigger compressed air valves. The direct acting solenoid actuator has a comparatively slow valve mechanism. In this type of solenoid actuator there are two valves, a smaller direct acting valve which opens into a much larger spool valve. The smaller valve is used for de-energizing which results in the rest phase of the big valve, shifting the spool to the right and the extension of spring takes place which is the internal main valve actuator. The air pilot actuator has its own benefits. A little quantity of compressed air from the main line of the bigger power valve can move massive valve with very little amount of electricity. It however has its problems too. This type of valve cannot control vacuum or low pressure a high pressure supply line is required. Therefore, unless you can bring a supply line with higher pressure to the direct acting solenoid pilot, this type of valve will not be able to control low pressure or vacuum. There usage of Solenoid actuator is extensive in all kinds of machinery and even in vehicles in form of brake actuator.

2.4 Energy Dissipation

The coils have an electrical resistance, and resistive losses are often very significant indeed. The energy in the magnetic field itself does not simply dissipate; much of it returns to the capacitor when the electric current is decreasing. Unfortunately it does this in the reverse direction (via a 'ringing' mechanism due to inductance of the coils), which can seriously damage polarized capacitors (such as electrolytic). In the circuit the magnetic field keeps the current in the coil flowing after the capacitor has discharged, so that it keeps discharging and builds up a negative voltage (see Lenz's law). This is similar to an LC oscillator. The capacitor charging to a negative voltage can be prevented by placing a diode across the capacitor terminals. Some designs bypass this limitation by using couple of diodes. Then, diodes reverse polarity to charge capacitors instead with proper polarity again, effectively re-using remaining coil energy.

A coil gun is a type of synchronous linear electric motor which is used as a projectile accelerator that consists of one or more electromagnetic coils. These are used to accelerate a magnetic projectile to high velocity. The name Gauss gun is sometimes used for such devices in reference to Carl Friedrich Gauss, who formulated mathematical descriptions of the electromagnetic effect used by magnetic accelerators.

Coil guns consist of one or more coils arranged along the barrel that are switched in sequence so as to ensure that the

projectile is accelerated quickly along the barrel via magnetic forces.

3. WORKING

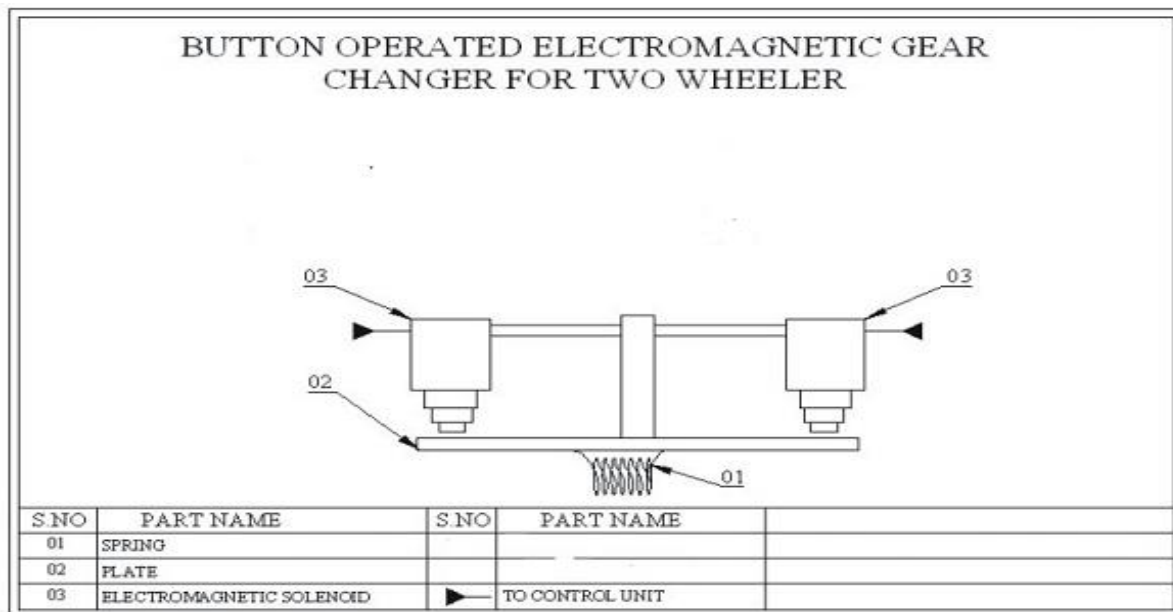


Fig 1. Button operated electromagnetic gear changer

The two electro-magnetic coils are fixed to the gear shaft of the two ends. One is used to shift the gear in upward direction. Another one is used to shift the gear in downward direction. These two coil is operated depends upon the speed of the vehicle this is automatically button operated electromagnetic gear changer for two wheeler.

To perform an automatic gear change control apparatus for an automobile and a method of controlling such apparatus. A rotational output of an internal combustion engine is connected to drive wheels of the automobile and a load device. When a gear shifting-up of an automatic transmission is to be effected, the load applied by the load device is increased, or the load is connected to an output rotation shaft of the engine via a selectively-connecting device, thereby reducing the rotational speed of the output rotation shaft of the engine to a required level. In this work, two electromagnetic coils are coupled to the gear rod of the two ends.

4. CONCLUSIONS

This project is made with pre-planning, that provides a lot of practical knowledge regarding, planning, purchasing, assembling and machining. The application of electro-magnetic coil produces smooth operation. Even though the initial cost of button operated electro-magnetic gear shifting system is very high, but it is very much useful for two wheelers, car owners & auto-garages. By using more techniques, this design can be modified and developed according to the applications. This project also helped us to know the periodic steps in completing a project work. And let to know the strength of team work.

5. REFERENCES

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