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Gear Box End Fitting Movement Testing Unit

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ABSTRACT

Some manual transmissions have an extremely low ratio for first gear, called a creeper gear or granny gear. Such gears are usually not synchronized. This feature is common on pick-up trucks tailored to trailer-towing, farming, or construction-site work. During normal on-road use, the truck is usually driven without using the creeper gear at all, and second gear is used from a standing start. Some off-road vehicles, most particularly the Willis Jeep and its descendants, also had transmissions with "granny first's" either as standard or an option, but this function is now more often provided for by a low-range transfer gearbox attached to a normal fully synchronized transmission.

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I. INTRODUCTION

In Manual Gear Transmission , changing of gear is done by shifting the gear shifter and with the help of transmission cables (Linkage Cables). Transmission cables are attached in between select-shift ports and shifting assembly of gear box. Transmission cables consists of eye-ends and aluminium cables cover with synthetic polymers. Eye-ends are attached to either sides of cables which are use to damp the vibrations form the gear box which can create discomfort to the hands of customers. So it is necessary for eye-ends to do the damping, for comfort driving experience.

Driving a vehicle with manual transmission, also known as a gear shift, gear lever, gear stick or shifter is a mechanical lever attached to the shift assembly in a manual transmission equipped automobile and is used change gears. In an automobile transmission-equipped vehicle, a similar device is known as a gear selector. A gear stick will normally be used to change gear wish list depressing the clutch pedal with the left foot to disengage the engine from drive train and wheels. Automatic transmission vehicles, semi automatic transmissions, and those with continuously variable transmission gear boxes do not require clutch pedal.

Gear shift cables are integral part of every vehicle and are used to link the transmission and gear lever. All vehicles, both with automatic as well as manual transmission, have this cable. The failure of the gear shift cable could render the linkage between the gear level and transmission ineffectively.

Manual transmissions come in two basic types:

- A simple but rugged sliding-mesh or unsynchronized/non-synchronous system, where straight-cut spur gear sets spin freely, and must be synchronized by the operator matching engine revs to road speed, to avoid noisy and damaging clashing of the gears.
- The now ubiquitous constant-mesh gearboxes, which can include non-synchronized, or synchronized/synchromesh systems, where typically diagonal cut helical (or sometimes either straight-cut, or double-helical) gear sets are constantly "meshed" together, and a dog clutch is used for changing gears. On synchromesh boxes, friction cones or "synchro-rings" are used in addition to the dog clutch to closely match the rotational speeds of the two sides of the (declutched) transmission before making a full mechanical engagement.

The former type was standard in many vintage cars (alongside e.g. epicyclic and multi-clutch systems) before the development of constant-mesh manuals and hydraulic-epicyclic automatics, older heavy-duty trucks, and can still be found in use in some agricultural equipment. The latter is the modern standard for on- and off-road transport manual and semi-automatic transmission, although it may be found in many forms; e.g., non-synchronized straight-cut in racetrack or super-heavy-duty applications, non-synchro helical in the majority of heavy trucks and motorcycles and in certain classic cars (e.g. the Fiat 500), and partly or fully synchronized helical in almost all modern manual-shift passenger cars and light trucks.

Gearshift cable, which connect the gear shifter and transmission have significant effect on gearshift performance. Normal force on the cable because of Pre-loading of inner cable on outer sleeve, friction coefficients between inner cable and outer conduit and rate at which inner cable slides inside outer conduit are the key parameters that influences cable performance. This work describe methodology, which would exactly match physical routing on the vehicle with help of virtual simulation.

The shift selector cable puts the transmission into the proper gear, which is indicated by shift selector that it has been moved by the driver. Automatic transmission cable that runs on the transmission to shifter assembly, while manual transmission vehicles have too. They both have the same signs when they starts to go bad. Symptoms of showing bad transmission are as follows,

1. Indicator doesn't match the gear.
2. Vehicle will not turn off.
3. Vehicle starts in another gear.
4. Vehicle will not go to gear.

The driver will get the vibrations of gear box on gear shifter.

II. PROBLEM STATEMENT

- Top cap end fitting is stick with ring over moulding.
- Effective gear shifting feel is not observed.
- Hard to gear shift due to vibration.

III. OBJECTIVES

- The main objective of this project is to repair the damper eye-ends so they can be use for the future work.
- There are many techniques to repair the eye-ends, but as concern with industry they want the fast technique so the working time of working can be reduced.
- As per our project is concern our main aim is to reduce the working time and also the cost required to the make as well as maintenance of the machine.
- The handling of machine will also be easy and safe.

IV. WORKING METHODOLOGY

1) Study of the manufacturing process
2)Identification of the problem
3)Need and requirement
4)Design of end fitting mechanism
5)Selection of material
6)Purchasing of material
7)Fabrication of the end fitting mechanism.
8)Flow process on conveyor
9)Final project

V. CONSTRUCTION & PROCEDURE

The main components used in this project are:
Components

1. Frame :

Material selected: Mild Steel
Parameter's considered for selecting mild steel:
1.Availability of material.
2.Strength should be high as possible.
3.Cost should be low.
Hence considering all the factors, mild steel is selected.
Properties of mild steel:
Mild steel contains
Carbon : 0.16 to 0.18 %
Manganese : 0.7 to 0.9 %
Silicon : Max 0.4%
Sulphur: Max 0.04%
Phosphorous: Max 0.04%

2. Cylinder :

Selected Cylinder: Double acting Cylinder.

- We selected DAC because their was availability of DAC in the inventory of industry which was used in previous systems in industry.
- The requirements of dimensions on basis of design were preferable.
- Cost was saved because the old DAC was used in the system which was already available.

3. Dampers:

The device which resist to the motion of vibrating body, which causes a vibrating body to come to rest or equilibrium position. Damper is a device that deadens, restrains or depresses.
Damper may refer to,

- Dashpot, a type of hydraulic or mechanical damper.
- Shock absorber (British or technical use: damper), a mechanical device designed to dissipate kinetic energy
- In electronics, a kind of diode, intended to absorb energy peaks, normally generated by inductive circuitry.

4. PU Tubes :

Polyurethane (PUR and PU) is a polymer composed of organic units joined by carbonate (urethane) links. While most polyurethanes are thermosetting polymers that do not melt when heated, thermoplastic polyurethanes are also available.
Polyurethane polymers are traditionally and most commonly formed by reacting a di- or poly-isocyanate with a polyol. Both the isocyanides and polyols used to make polyurethanes contain, on average, two or more functional groups per molecule.

Procedure-

1. **Start the compressor -**

First of all start the compressor and check until we get required compressed air pressure for breaking the welding.

2. **Place the unit on work place in proper way to break the welding -**

The unit should be properly placed at given premises. With the help of cylinder which is working on compressor; we can break the welding by applying force. The compressed air is pass through PU tubed then the force is applied on the unit. Hence breaking of welding occurs.

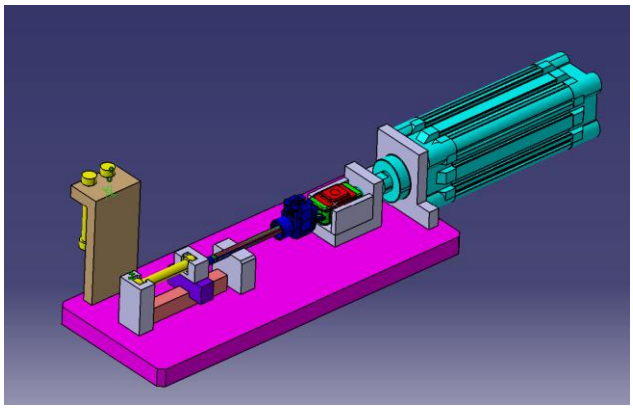
3. **To remove the unit from workplace -**

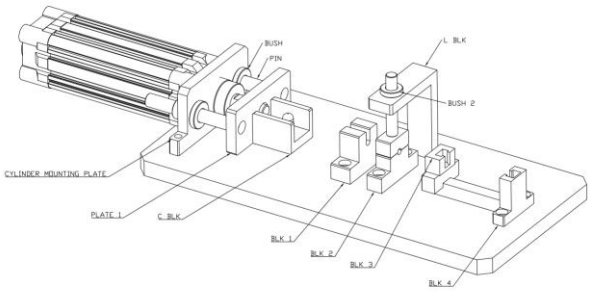
When the breaking of welding of the unit is done then unit is removed from the workplace. The finished unit is then collected in to carate.

VI. FIGURE & EQUATIONS

1. Area of Cylinder : πr^2 ....cm^2

2. Force Required : Area*Pressure ….N





ADVANTAGES

1. It helps to detach the cap end fitting which is stick with ring over moulding
2. It gives soft gear shift
3. Fast operation speed
4. Skilled labours are not required

DISADVANTAGES

1. It takes increased amount of man power.
2. It is time consuming.

APPLICATION
For breaking of weld joints in Industry

VII. CONCLUSION

As per the recent update regarding to project form the industry and our guide the machine use by industry is costly as well as the breaking of load cell used in it can be more burden to the maintenance team, so our project can be effective for the industry.

Experience of industrial activities as well as during the working of the project will be beneficial for future.

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