AUTOMATED ELECTROMAGNETIC CLUTCH CONTROL GEARBOX

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Abstract: An improved control method activates an electric motor to drive a torque-to- thrust converter for controlling the torque capacity of an electromagnetic clutch mechanism. The control utilizes a model-based feed-forward control in combination with a closed-loop position feed-back control. The desired electromagnetic clutch torque capacity is characterized in terms of a desired motor speed position(rpm), and the feed-forward control models the motor speed and position response to changes in the desired electromagnetic clutch as per motor position. The modeled speed and position, in turn, are used to create a feed-forward command, and the feed-forward command is combined with a feedback command based on actual position error.

I. ABOUT

We have designed this project as a major innovation in the field of Automobile industry. Our project "Automated Electromagnetic clutch control gearbox" is a prefect combination of electronic and mechanical sciences or we can call it mechatronics. We designed our project by using heavy mechanical equipments and electronic micro chip atmel 89s52 micro controller & desecrate components. Heart of the project is this strong powerful Electromagnetic clutch; it has a high torque holding capacity at the time of 24v. Power supply. In our project we are using one pair of three different gears and we use these gear as gearbox, we fix one set of three gears in wheel shaft and other three gears with dc gear motor (engine) power transmission shaft, now we fix three Electromagnetic clutch in three transmission side gears and these clutch control by microchip. We fix one rpm counter with wheel shaft when wheel shaft rotate rpm counter give pulse to microchip and microchip decide gear clutching according to the speed by default our circuit attach clutch-1 at time of wheel initial start speed. We control dc motor speed (power transmission shaft) with simple fan regulator.

II. BASIC OPERATION

The clutch has four main parts: field [disambiguation needed] , rotor [disambiguation needed] , armature, and hub [disambiguation needed] (output) (B1). When voltage is applied the stationary magnetic field generates the lines of flux that pass into the rotor. (The rotor is normally connected to the part that is always moving in the machine.) The flux (magnetic attraction) pulls the armature in contact with the rotor (the armature is connected to the component that requires the acceleration), as the armature and the output start to accelerate. Slipping between the rotor face and the armature face continues until the input and output speed is the same (100% lockup). The actual time for this is quite short, between 1/200th of a second and 1 second.
Disengagement is very simple. Once the field starts to degrade, flux falls rapidly and the armature separates. One or more springs hold the armature away from the rotor at a predetermined air gap.

III. CONCLUSION

The presented system is designed for practical use as well as will to be adapted by automobiles worldwide.

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