

Appendix A

Operation of LVDT

Linearly Varying Differential Transducers (LVDTs) are a displacement sensing technology based on the principles of a simple transformer. By exciting the coil on one side of a transformer, a voltage and current is induced on the second coil due to a ferromagnetic core and the varying magnetic field caused by the excitation current. In the LVDT, the Primary Winding is excited and generates a varying magnetic field that excites the Secondary Windings through the use of a ferromagnetic core positioned between the two sets of coils. This configuration is shown in Figure A-1 and A-2.

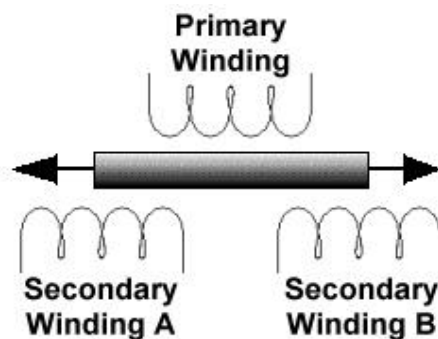


Figure A-1: Structure of LVDT windings

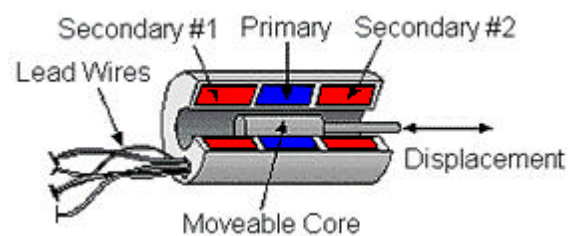


Figure A-2: Cutaway View of LVDT windings

The voltage seen on the secondary windings is proportional to the amount of core surrounded by the particular secondary winding. Based on this characteristic, the two secondaries can be used to determine the position of the core by determining the difference between the two voltages seen on the secondary windings.

Given the appropriate converter, the resulting differential signal can be measured and provides a linear relationship between position and voltage as shown in Figure A-3.

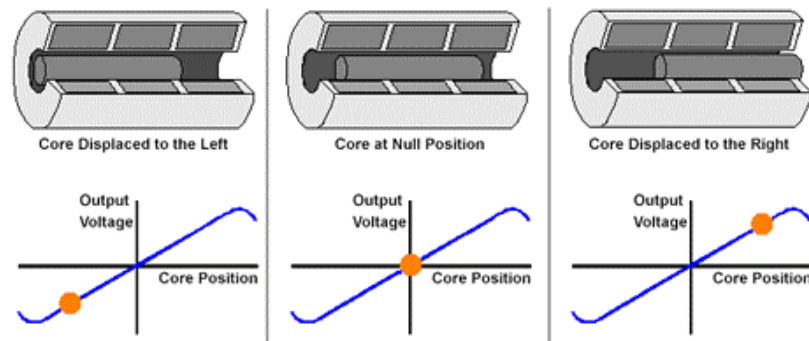


Figure A-3: Output Voltage Difference with respect to Position of Core