SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.

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DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 19MCE402 – AUTOTRONICS

IV YEAR / VII SEMESTER

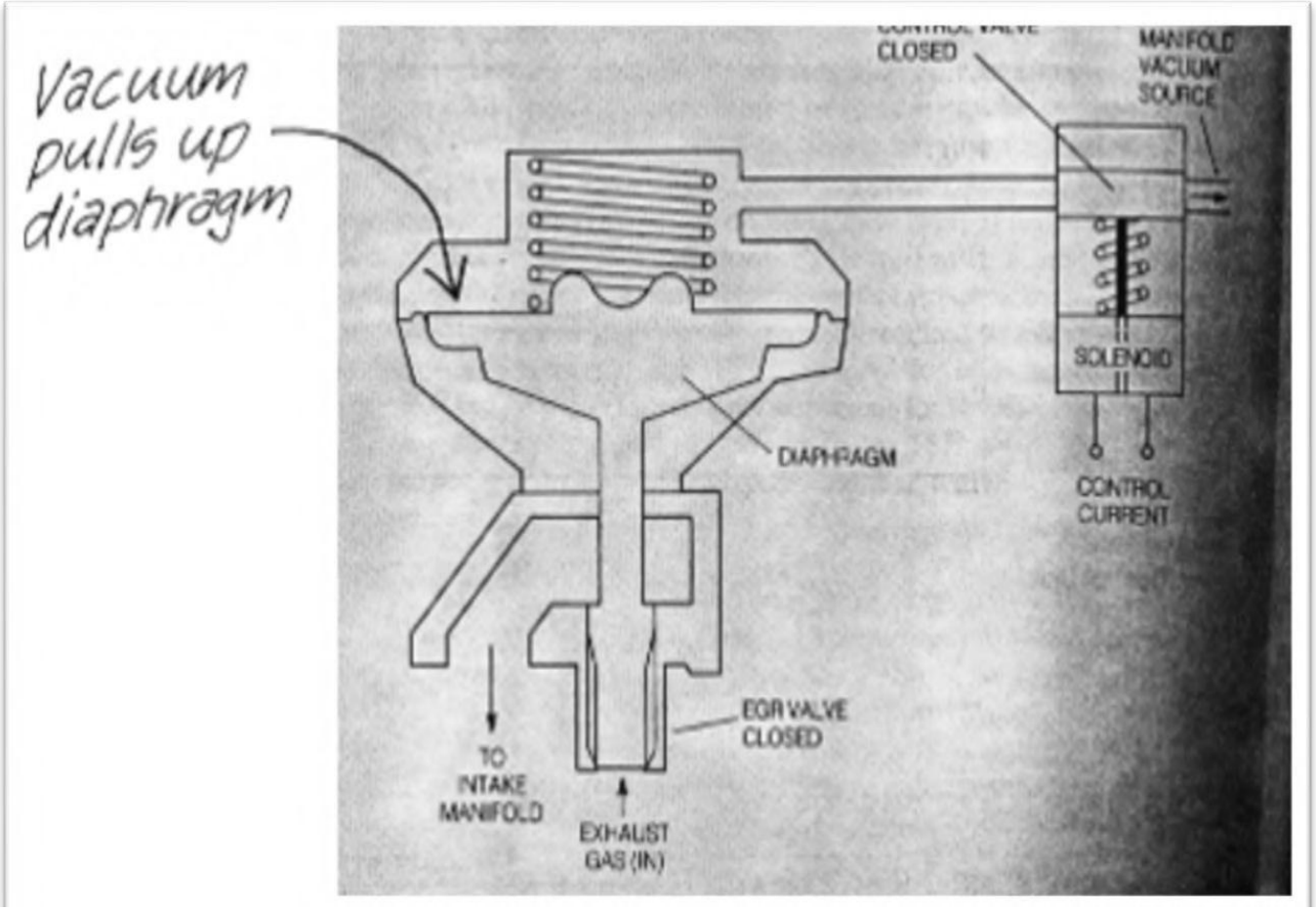
Unit 3 – EGR Actuator

EGR Valve Actuator

- The exhaust gas recirculation (EGR) is utilized to reduce NOx emissions. The amount of EGR is regulated by the engine controller.
- When the correct amount of EGR has been determined by the controller based on measurements from the various engine control sensors, the controller sends an electrical signal to the EGR actuator.
- Typically, this actuator is a variable-position valve that regulates the EGR as a function of intake manifold pressure and exhaust gas pressure. Although there are many EGR configurations, only one representative example will be discussed to explain the basic operation of this type of actuator.

- The example EGR actuator is shown schematically in Figure. This actuator is a vacuum-operated diaphragm valve with a spring that holds the valve closed if no vacuum is applied.
- The vacuum that operates the diaphragm is supplied by the intake manifold and is controlled by a solenoid-operated valve. This solenoid valve is controlled by the output of the control system.
- This solenoid operates essentially the same as that explained in the discussion on fuel injectors. Whenever the solenoid is energized (i.e., by current supplied by the control system flowing through the coil), the EGR valve is opened by the applied vacuum.

- The amount of valve opening is determined by the average pressure on the vacuum side of the diaphragm.
- This pressure is regulated by pulsing the solenoid with a variable-duty-cycle electrical control current.
- The duty cycle of this pulsing current controls the average pressure in the chamber that affects the diaphragm deflection, thereby regulating the amount of EGR.


Vacuum pulls up diaphragm
CLOSED
MANIFOLD VACUUM SOURCE
SOLENOID
DIAPHRAGM
CONTROL CURRENT
EGR VALVE CLOSED
TO INTAKE MANIFOLD
EXHAUST GAS (IN)

Thank You !