## GENERAL MOTORS EXHAUST GAS RECIRCULATION (Cont.)

NOTE – *A constant vacuum supply must be used.*

**2)** Valve should not open. If it does, control valve is stuck closed and EGR valve must be replaced.

**3)** With vacuum still applied, apply a stream of air from a low pressure source into the EGR valve exhaust gas intake passage. Valve should open completely. If it does not open at all, control valve is stuck open or exhaust passages are plugged. Replace EGR valve.

**4)** If EGR valve and control valve are both functioning properly, clean the mounting surfaces, then using a new gasket, install valve on engine. Reconnect vacuum hose.

**EGR-TVS Test (Hot) – 1)** Remove EGR valve vacuum hose at EGR valve and connect hose to a vacuum gauge. Start engine. With transmission in Park or Neutral, open throttle partially. As throttle is opened, the vacuum gauge should respond with an increase in vacuum reading. If operation is satisfactory, remove gauge and reconnect hose to EGR valve. If gauge does not respond to throttle opening, proceed to step **2)**.

**2)** Remove carb-to-switch hose from switch and connect hose to vacuum gauge. Start engine. With transmission in Park or Neutral open throttle partially. If vacuum gauge responds to throttle opening, then switch is defective. Remove switch and replace with new part. If gauge does not respond to throttle opening, then check for plugged hose or defective carburetor.

**EGR-TVS Test (Cold) – 1)** Engine coolant must be below 85°F. Drain coolant to below level of switch. Disconnect vacuum lines and remove switch. Inspect switch to make sure it is in good condition.

**2)** Connect a vacuum hose to lower nipple of switch, marked "C" or "CARB". Connect a vacuum gauge to upper nipple, marked "E" or "EGR". Place switch in water at 75°F and submerge completely for 2 minutes while agitating water thoroughly. Apply 12 in. Hg vacuum to hose on lower nipple of switch. Under this condition, the switch should be closed.

NOTE – *Leakage of up to 2 in. Hg of vacuum in 2 minutes is allowable and does not mean a defective switch.*

**3)** If operation is satisfactory, reinstall switch. If switch is defective, replace with a new part. Replace coolant and check level.

### MAINTENANCE

#### EGR PASSAGE CLEANING

If inspection of EGR passages in intake manifold indicates excessive build up of exhaust deposits, the passages should be cleaned. Care should be taken to ensure that all loose particles are completely removed to prevent them from clogging the EGR valve or from being ingested into the engine.

## GENERAL MOTORS VACUUM ADVANCE SPARK CONTROL

### DESCRIPTION

#### TRAPPED VACUUM SPARK

Trapped vacuum spark is used on all models. A thermal vacuum switch (TVS) is mounted in cylinder head and used to sense engine coolant temperature. A vacuum check valve is mounted between manifold vacuum, distributor and thermal vacuum switch. The system maintains high vacuum levels to the distributor during cold engine operation and cold engine acceleration.

#### SPARK VACUUM DELAY

The spark vacuum delay is used on 350" and 400" V8 engines with Heavy Duty Emissions. It is installed between the TVS check valve and the distributor.

### OPERATION

#### TRAPPED VACUUM SPARK

When engine temperature is below a pre-set specified value, the manifold vacuum signal is routed through the check valve to the distributor. Ports on TVS are blocked. The check valve will keep distributor vacuums at levels higher than manifold depression during vehicle acceleration. A small sintered iron bleed orifice is provided in the check valve to allow for a leakdown to enable engine to be restarted if it stalls. (This applies to all models except: Light Duty California and Altitude Emissions; 350" and 400" V8 with Heavy Duty Emissions; all 454" V8 engines.)

When engine temperature is above pre-set value, TVS ports will be open to allow manifold vacuum to the distributor. During this mode of operation, the check valve will act as a connector.

#### SPARK VACUUM DELAY

As manifold vacuum increases, the check valve opens and allows distributor vacuum to increase to same level. When vacuum decreases during vehicle acceleration, the check valve closes and distributor vacuum will decrease at a rate controlled by the internal bleed.