1982 Exhaust Emission Systems

FORD SYSTEMS

DESCRIPTION

Several systems are used to control emission of pollutants. System usage depends on model and engine-transmission combinations. Each system is designed to control a particular vehicle emission. In addition, specially calibrated carburetors, distributors, and modified combustion chambers are used with these systems.

NOTE: There are 2 light duty truck emission control standards classifications: Light Duty and Heavy Duty Emissions. Light Duty refers to vehicles up through 8,500 lbs. GVW; Heavy Duty refers to vehicles over 8,500 lbs. GVW.

THERMOSTATIC AIR CLEANER

Regardless of type of thermostatic air cleaner used, air valve or thermostat, the function is the same, providing hot air from exhaust manifold shroud to carburetor during warm-up conditions.

AIR INJECTION

Air injection system consists of an air pump, diverter valve, check valve, and various air distribution lines for injecting fresh air adjacent to exhaust valves. Such injection creates an afterburn, which further consumes unburned material in engine's exhaust. *For additional information, see "Air Injection Systems — Air Pump Type" in this section.*

EXHAUST GAS RECIRCULATION (EGR)

Exhaust Gas Recirculation (EGR) system uses a vacuum-operated EGR valve to introduce metered amounts of exhaust gas into engine's combustion chambers. This lowers peak combustion temperatures and also lowers NOx formations.

ELECTRONIC ENGINE CONTROL SYSTEM (EEC III)

This system is used on California Light Duty Emission models with 5.0L (302") and 5.8L (351") W engines. Sensors monitor crankshaft position, EGR valve position, throttle position, manifold and barometric pressure, engine coolant temperature and exhaust gas oxygen. Information is sent to the Electronic Control Assembly (ECA) where it is analyzed.

ECA then computes correct engine operating modes and signals other components to adjust timing, air/fuel ratio, EGR flow rate, thermactor air flow, canister vapor flow and idle speed.

MICROPROCESSOR CONTROL UNIT (MCU) SYSTEM

Used on California models with 4.9L (300") engine, this system is named for and commanded by a micro-computer. Computer is located in the engine compartment, and is capable of controlling engine air/fuel ratios, air injection, and on some models, canister purge, spark retard and idle speed.

ELECTRIC ASSIST CHOKE

This unit is supplied power from stator terminal on alternator. An electric heating element is located in choke cap. At underhood temperatures above 54°F(12°C), choke mechanism heats up, causing a more rapid choke opening time. This helps to lean mixtures much sooner. Below 54°F (12°C), normal choking action occurs.

DECEL THROTTLE MODULATOR

This unit holds the throttle partly open during deceleration, reducing emissions of hydrocarbons (HC).

VACUUM EXHAUST HEAT CONTROL VALVE

This vacuum-operated valve directs exhaust gases through a passage in intake manifold. This rapidly heats the incoming air/fuel mixture to promote better cold engine emissions.

CATALYTIC CONVERTER

This unit is used on all Light Duty Emission models. It is connected into exhaust system so exhaust gas passes through converter. Inside converter, a chemical reaction takes place which reduces exhaust emissions. *For additional information, see Catalytic Converter article in this section.*

POSITIVE CRANKCASE VENTILATION

Positive Crankcase Ventilation (PCV) system controls crankcase blow-by gases. This systems takes blow-by gases from crankcase and recirculates them back into combustion chamber for reburning. Key device in PCV system is vacuum-controlled PCV valve. *For additional information, see Crankcase Ventilation article in this section.*

EVAPORATIVE EMISSION CONTROL

Fuel evaporative control system consists of a special fuel tank, a liquid vapor separator, a non-vented filler cap, a charcoal-filled storage canister located in engine compartment, and hoses necessary to direct fuel vapors to charcoal canister for storage.

With this system, fuel vapors are not allowed to evaporate from carburetor or fuel tank. Instead, they are routed to charcoal canister for storage. Carburetor vacuum later purges canister of stored fuel vapors. *For additional information, see appropriate Fuel Evaporation System article in this section.*

FORD VACUUM DIAGRAMS NOT AVAILABLE

As Ford Motor Co. does not release its vacuum diagrams until the end of the model year, 1982 diagrams will be included in the 1983 Domestic Light Truck Service and Repair Manual.