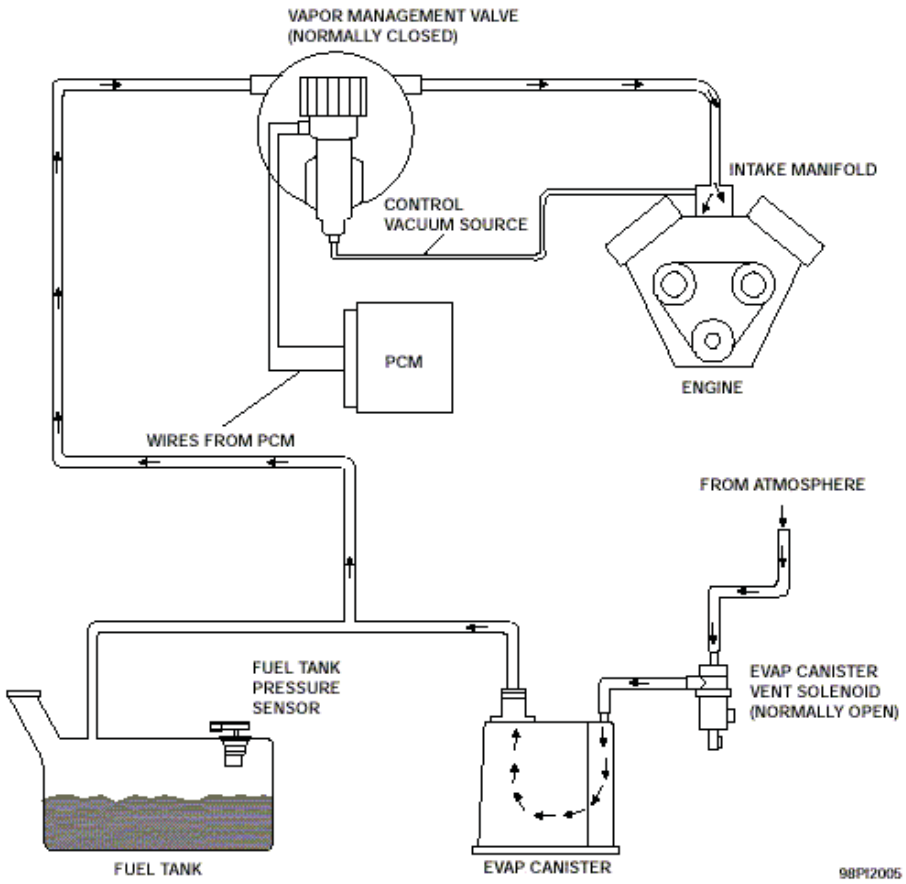
EVAP System Monitor - 0.040” dia. leak check

Vehicles that meet enhanced evaporative requirements utilize a vacuum-based evaporative system integrity check. The evap system integrity check uses a Fuel Tank Pressure Transducer (FTPT), a Canister Vent Solenoid (CVS) and Fuel Level Input (FLI) along with the Vapor Management Valve (VMV) or Electric Vapor Management Valve (EVMV) to find 0.040” diameter or larger evap system leaks.



The evap system integrity test is done under conditions that minimize vapor generation and fuel tank pressure changes due to fuel slosh since these could result in false MIL illumination. The check is run after a 6 hour cold engine soak (engine-off timer), during steady highway speeds at ambient air temperatures (inferred by IAT) between 40 and 100 ^{o}F.

A check for refueling events is done at engine start. A refuel flag is set in KAM if the fuel level at start-up is at least 20% greater than fuel fill at engine-off. It stays set until the evap monitor completes Phase 0 of the test as described below. Note that on some vehicles, a refueling check may also be done continuously, with the engine running to detect refueling events that occur when the driver does not turn off the vehicle while refueling (in-flight refueling).

The evap system integrity test is done in four phases.

(Phase 0 - initial vacuum pulldown):

First, the Canister Vent Solenoid is closed to seal the entire evap system, then the VMV or EVMV is opened to pull a 8" H_2O vacuum. If the initial vacuum could not be achieved, a large system leak is indicated (P0455). This could be caused by a fuel cap that was not installed properly, a large hole, an overfilled fuel tank, disconnected/kinked vapor lines, a Canister Vent Solenoid that is stuck open, a VMV that is stuck closed, or a disconnected/blocked vapor line between the VMV and the FTPT

If the initial vacuum could not be achieved after a refueling event, a gross leak, fuel cap off (P0457) is indicated and the recorded minimum fuel tank pressure during pulldown is stored in KAM. A “Check Fuel Cap” light may also be illuminated.

If the initial vacuum is excessive, a vacuum malfunction is indicated (P1450). This could be caused by kinked vapor lines or a stuck open VMV. If a P0455, P0457, or P1450 code is generated, the evap test does not continue with subsequent phases of the small leak check, phases 1-4.

Note: Not all vehicles will have the P0457 test or the Check Fuel Cap light implemented. These vehicles will continue to generate only a P0455. After the customer properly secures the fuel cap, the P0457, Check Fuel Cap and/or MIL will be cleared as soon as normal purging vacuum exceeds the P0457 vacuum level stored in KAM.

Phase 1 - Vacuum stabilization

If the target vacuum is achieved, the VMV is closed and vacuum is allowed to stabilize for a fixed time. If the pressure in the tank immediately rises, the stabilization time us bypassed and Phase 2 of the test is entered.

Some 2004 MY software has incorporated a "leaking" VMV test, which will also set a P1450 (excessive vacuum) DTC. This test is intended to identify a VMV that does not seal properly, but is not fully stuck open. If more than 1 " H_2O of additional vacuum is developed in Phase 1, the evap monitor will bypass Phase 2 and go directly to Phase 3 and open the canister vent solenoid to release the vacuum. Then, it will proceed to Phase 4, close the canister vent solenoid and measure the vacuum that develops. If the vacuum exceeds approximately 4 " H_2O, a P1450 DTC will be set.

Phase 2 - Vacuum hold and decay

Next, the vacuum is held for a calibrated time and the vacuum level is again recorded at the end of this time period. The starting and ending vacuum levels are checked to determine if the change in vacuum exceeds the vacuum bleed up criteria. Fuel Level Input and ambient air temperature are used to adjust the vacuum bleed-up criteria for the appropriate fuel tank vapor volume. Steady state conditions must be maintained throughout this bleed up portion of the test. The monitor will abort if there is an excessive change in load, fuel tank pressure or fuel level input since these are all indicators of impending or actual fuel slosh. If the monitor aborts, it will attempt to run again (up to 20 or more times). If the vacuum bleed-up criteria is not exceeded, the small leak test is considered a pass. If the vacuum bleed-up criteria is exceeded on three successive monitoring events, a 0.040 “ dia. leak is likely and a final vapor generation check is done to verify the leak, phases 3-4. Excessive vapor generation can cause a false MIL.

Phase 3 - Vacuum release

The vapor generation check is done by releasing any vacuum, then closing the VMV, waiting for a period of time, and determining if tank pressure remains low or if it is rising due to excessive vapor generation

Phase 4 - Vapor generation

If the pressure rise due to vapor generation is below the threshold limit for absolute pressure and change in pressure, a P0442 DTC is stored.

0.040" EVAP Monitor Operation:	
DTCs	P0455 (gross leak), P1450 (excessive vacuum), P0457 (gross leak, cap off), P0442 (0.040" leak)
Monitor execution	once per driving cycle
Monitor Sequence	HO2S monitor completed and OK
Sensors/Components OK	MAF, IAT, VSS, ECT, CKP, TP, FTP, VMV, CVS
Monitoring Duration	360 seconds (see disablement conditions below)

Typical 0.040" EVAP monitor entry conditions, Phases 0 through 4:		
Entry condition	Minimum	Maximum
Engine off (soak) time	6 hours	
Time since engine start-up	330 seconds	1800 to 2700 seconds
Intake Air Temp	40 ^{o}F	90 - 100 ^{o}F
BARO (<8,000 ft altitude)	22.0 " Hg	
Engine Load	20%	70%
Vehicle Speed	40 mph	80 mph
Purge Dutycycle	75%	100%
Purge Flow	0.05 lbm/min	0.10 lbm/min
Fuel Fill Level	15%	85%
Fuel Tank Pressure Range	- 17 H_2O	1.5 H_2O

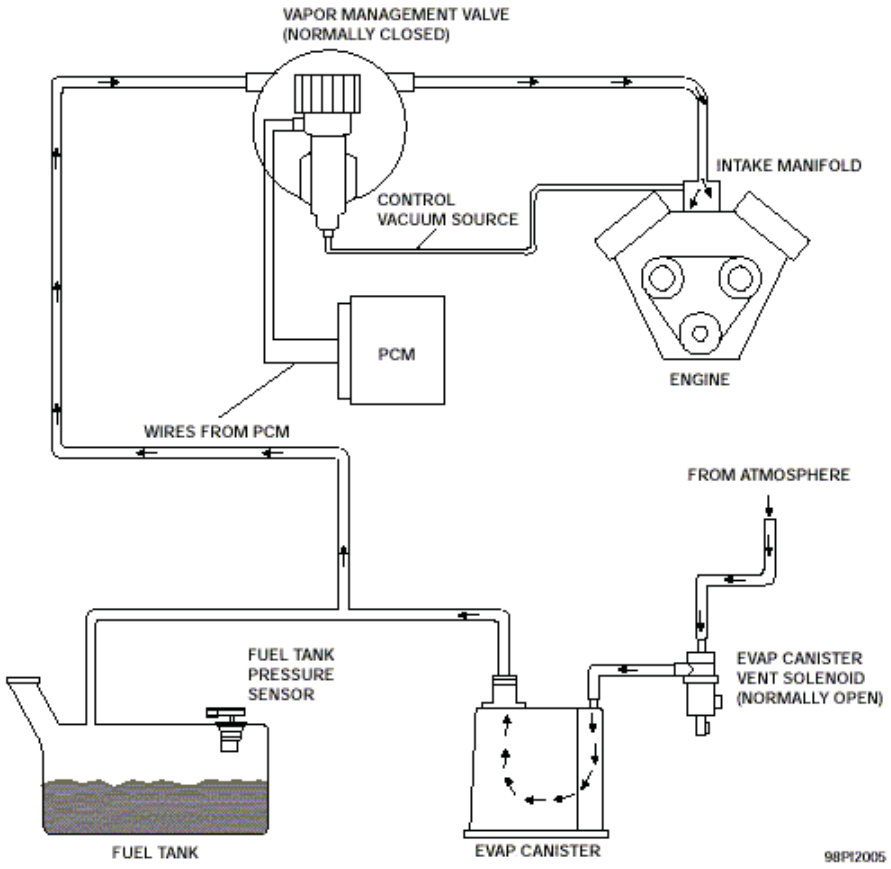
Typical 0.040" EVAP abort (fuel slosh) conditions for Phase 2:
Change in load: > 20%
Change in tank pressure: > 1 " H_2O
Change in fuel fill level: > 15%
Number of aborts: > 20 (may be up to 255)

Typical 0.040 EVAP monitor malfunction thresholds:
P1450 (Excessive vacuum): < -8.0 in H_2O over a 30 second evaluation time or > -4. in H_2O vapor generation
P0455 (Gross leak): > -8.0 in H_2O over a 30 second evaluation time.
P0457 (Gross leak, cap off): > -8.0 in H_2O over a 30 second evaluation time after a refueling event.
P0442 (0.040" leak): > 2.5 in H_2O bleed-up over a 15 second evaluation time at 75% fuel fill. (Note: bleed-up and evaluation times vary as a function of fuel fill level and ambient air temperature)
P0442 vapor generation limit: < 2.5 in H_2O over a 120 second evaluation time

J1979 Evaporative System Mode $06 Data			
Test ID	Comp ID	Description	Units
$26	$00	Phase 0 Initial tank vacuum and minimum limit	in H_20
$26	$00	Phase 0 Initial tank vacuum and maximum limit	in H_20
$27	$00	Phase 2 0.040" cruise leak check vacuum bleed-up and max threshold	in H_20
$2A	$00	Phase 4 Vapor generation maximum change in pressure and max threshold	in H_20
$2B	$00	Phase 4 Vapor generation maximum absolute pressure rise and max threshold	in H_20
Conversion for Test IDs $26 through $2B: Take value, subtract 32,768, and then multiply result by 0.00195 to get inches of H_20. The result can be positive or negative. Note: Default values (-64 in H_20) will be display for all the above TIDs if the evap monitor has never completed. If all or some phases of the monitor have completed on the current or last driving cycle, default values will be displayed for any phases that had not completed.			
Test ID	Comp ID	Description (new 2004 MY strategies)	Units
$61	$00	Phase 0 Initial tank vacuum and minimum vacuum limit (data for P1450 – excessive vacuum)	in H_20
$62	$00	Phase 4 Vapor generation minimum change in pressure and minimum vacuum limit (data for P1450, VMV stuck open)	in H_20
$63	$00	Phase 0 Initial tank vacuum and gross leak maximum vacuum limit (data for P0455/P0457 – gross leak/cap off)	in H_20
$64	$00	Phase 2 0.040" cruise leak check vacuum bleed-up and maximum vacuum limit (data for P0442 – 0.040" leak)	in H_20
Conversion for Test IDs $61 through $64: Take value, subtract 32,768, and then multiply result by 0.00195 to get inches of H_20. The result can be positive or negative. Note: Default values (0.0 in H_20) will be displayed for all the above TIDs if the evap monitor has never completed. Each TID is associated with a particular DTC. The TID for the appropriate DTC will be updated based on the current or last driving cycle, default values will be displayed for any phases that have not completed.			

EVAP System Monitor - 0.020” dia. leak check

Some vehicles that meet enhanced evaporative requirements utilize a vacuum-based evaporative system integrity check that checks for 0.020” dia leaks. The evap system integrity check uses a Fuel Tank Pressure Transducer (FTPT), a Canister Vent Solenoid (CVS) and Fuel Level Input (FLI) along with the Vapor Management Valve (VMV) or Electric Vapor Management Valve (EVMV) to find 0.020” diameter, 0.040” diameter, or larger evap system leaks.



The evap system integrity test is done under two different sets of conditions - first a cruise test is performed to detect 0.040” dia leaks and screen for 0.020” leaks. If a 0.020” dia leak is suspected during the cruise test, an idle test is performed to verify the leak under more restrictive, but reliable, cold-start-idle conditions.

The cruise test is done under conditions that minimize vapor generation and fuel tank pressure changes due to fuel slosh since these could result in false MIL illumination. The check is run after a 6 hour cold engine soak (engine-off timer), during steady highway speeds at ambient air temperatures (inferred by IAT) between 40 and 100 ^{o}F.

A check for refueling events is done at engine start. A refuel flag is set in KAM if the fuel level at start-up is at least 20% greater than fuel fill at engine-off. It stays set until the evap monitor completes Phase 0 of the test as described below. The refueling flag is used to prohibit the 0.020” idle test until the gross leak check is done during cruise conditions. This is done to prevent potential idle concerns resulting from the high fuel vapor concentrations present with a fuel cap off/gross leak condition. Note that on some vehicles, a refueling check may also be done continuously, with the engine running to detect refueling events that occur when the driver does not turn off the vehicle while refueling (in-flight refueling).

The cruise test is done in four phases.

Phase 0 - initial vacuum pulldown

First, the Canister Vent Solenoid is closed to seal the entire evap system, then the VMV or EVMV is opened to pull a 8" H_2O vacuum.

If the initial vacuum could not be achieved, a large system leak is indicated (P0455). This could be caused by a fuel cap that was not installed properly, a large hole, an overfilled fuel tank, disconnected/kinked vapor lines, a Canister Vent Solenoid that is stuck open, a VMV that is stuck closed, or a disconnected/blocked vapor line between the VMV and the FTPT.

If the initial vacuum could not be achieved after a refueling event, a gross leak, fuel cap off (P0457) is indicated and the recorded minimum fuel tank pressure during pulldown is stored in KAM. A "Check Fuel Cap" light may also be illuminated.

If the initial vacuum is excessive, a vacuum malfunction is indicated (P1450). This could be caused by blocked vapor lines between the FTPT and the Canister Vent Solenoid, or a stuck open VMV. If a P0455, P0457, P1443, or P1450 code is generated, the evap test does not continue with subsequent phases of the small leak check, phases 1-4. These codes also prevent the idle portion of the 0.020" dia leak check from executing.

Note: Not all vehicles will have the P0457 test or the Check Fuel Cap light implemented. These vehicles will continue to generate only a P0455. After the customer properly secures the fuel cap, the P0457, Check Fuel Cap and/or MIL will be cleared as soon as normal purging vacuum exceeds the P0457 vacuum level stored in KAM.

Phase 1 - Vacuum stabilization

If the target vacuum is achieved, the VMV is closed and vacuum is allowed to stabilize for a fixed time. If the pressure in the tank immediately rises, the stabilization time is bypassed and Phase2 of the test is entered.

Some 2004 MY software has incorporated a "leaking" VMV test, which will also set a P1450 (excessive vacuum) DTC. This test is intended to identify a VMV that does not seal properly, but is not fully stuck open. If more than 1 " H_2O of additional vacuum is developed in Phase 1, the evap monitor will bypass Phase 2 and go directly to Phase 3 and open the canister vent solenoid to release the vacuum. Then, it will proceed to Phase 4, close the canister vent solenoid and measure the vacuum that develops. If the vacuum exceeds approximately 4 " H_2O, a P1450 DTC will be set.

Phase 2 - Vacuum hold and decay

Next, the vacuum is held for a calibrated time. Two test times are calculated based on the Fuel Level Input and ambient air temperature. The first (shorter) time is used to detect 0.040" dia leaks, the second (longer) time is used to detect 0.020" dia leaks. The initial vacuum is recorded upon entering Phase 2. At the end of the 0.040" dia test time, the vacuum level is recorded. The starting and ending vacuum levels are checked to determine if the change in vacuum exceeds the 0.040" dia vacuum bleed up criteria. If the 0.040" dia vacuum bleed-up criteria is exceeded on three successive monitoring attempts, a 0.040" dia leak is likely and a final vapor generation check is done to verify the leak (phases 3 and 4).

If the 0.040" dia bleed-up criteria is not exceeded, the test is allowed to continue until the 0.020" dia leak test time expires. The starting and ending vacuum levels are checked to determine if the change in vacuum exceed the 0.020" dia vacuum bleed-up criteria. If the 0.020" dia vacuum bleed-up is exceed on a single monitoring attempt, a 0.020" dia leak is likely and a final vapor generation check is done to verify the leak (phases 3 and 4).

If the vacuum bleed-up criteria is not exceeded, the leak test (either 0.040" or 0.020" dia is considered a pass. For both the 0.040" and 0.020" dia leak check, Fuel Level Input and Intake Air Temperature is used to adjust the vacuum bleed-up criteria for the appropriate fuel tank vapor volume and temperature. Steady state conditions must be maintained throughout this bleed up portion of the test. The monitor will abort if there is an excessive change in load, fuel tank pressure or fuel level input since these are all indicators of impending or actual fuel

slosh. If the monitor aborts, it will attempt to run again (up to 20 or more times) until the maximum time-after-start is reached.

Phase 3 - Vacuum release

The vapor generation check is initiated by opening the Canister Vent Solenoid for a fixed period of time and releasing any vacuum. The VMV remains closed.

Phase 4 - Vapor generation

In this phase, the sealed system is monitored to determine if tank pressure remains low or if it is rising due to excessive vapor generation The initial tank pressure is recorded. The pressure is monitored for a change from the initial pressure, and for absolute pressure. If the pressure rise due to vapor generation is below the threshold limit for absolute pressure and for the change in pressure, and a 0.040" dia leak was indicated in phase 2, a P0442 DTC is stored. If the pressure rise due to vapor generation is below the threshold limit for absolute pressure and for the change in pressure, and a 0.020" dia leak was indicated in phase 2, a 0.020" idle check flag is set to run the 0.020" leak check during idle conditions.

Idle Check

The long test times required to detect a 0.020" dia leak in combination with typical road grades can lead to false 0.020" leak indications while the vehicle is in motion. The Idle Check repeats Phases 0, 1, and 2 with the vehicle stationary to screen out leak indications caused by changes in altitude. The 0.020" idle check is done under cold-start conditions to ensure that the fuel is cool and cannot pick up much heat from the engine, fuel rail, or fuel pump. This minimizes vapor generation. The 0.020" idle check is, therefore, conducted only during the first 10 minutes after engine start.

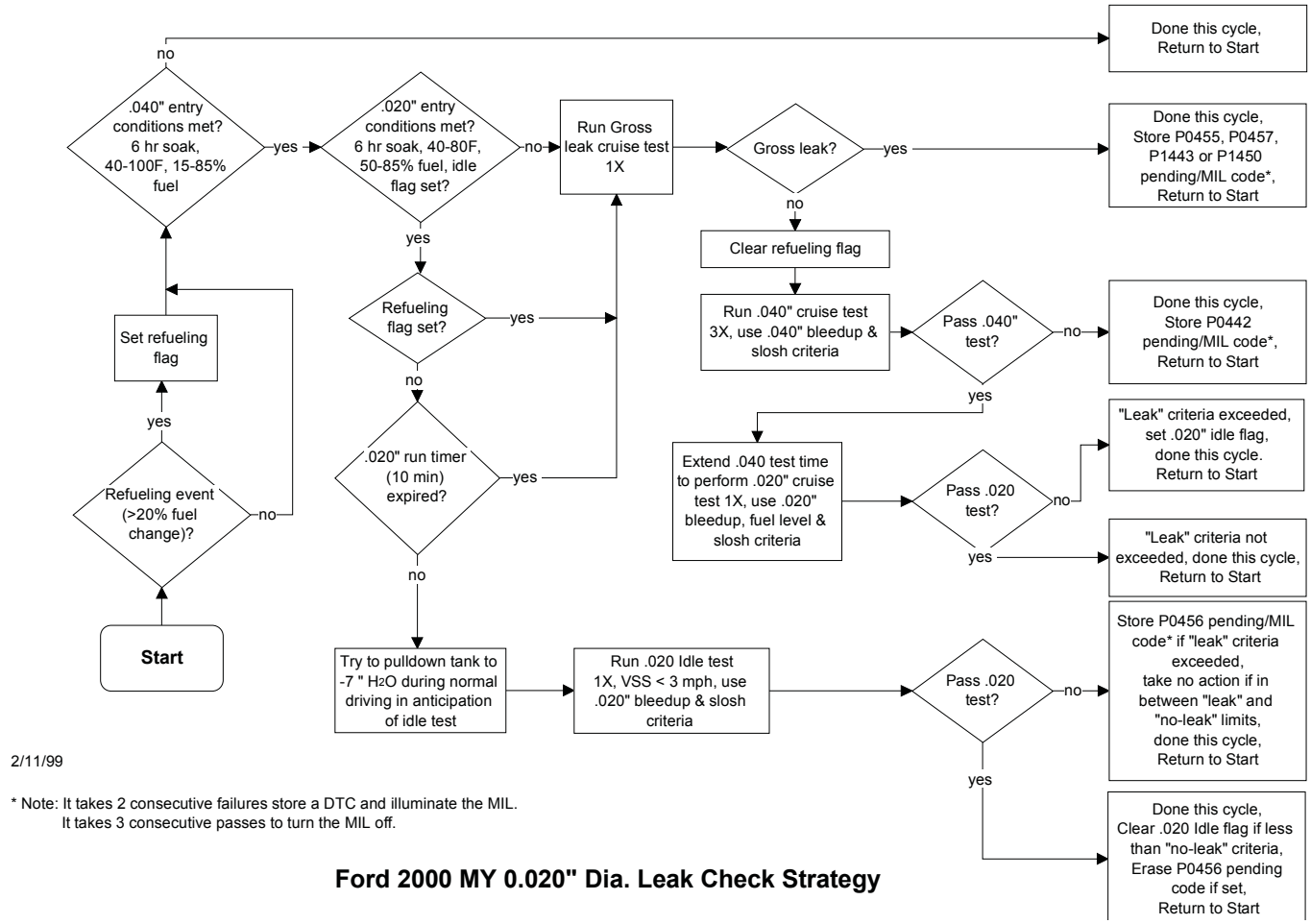
The 0.020" dia leak test entry conditions, test times and thresholds are used. Unique criteria for excessive changes in load, fuel tank pressure and fuel level are used to indicate fuel slosh. The test is aborted if vehicle speed exceeds a calibrated threshold, approx. 10 mph. The initial vacuum pull-down (phase 0) can start with the vehicle in motion in order to minimize the required time at idle to complete the test. If the vacuum bleed-up is greater than the 0.020" dia max. criteria during a single monitoring event, a P0456 DTC is stored. If the vacuum bleed-up is less than the 0.020" dia min. criteria, the pending P0456 DTC may be cleared. If the vacuum bleed-up is in between, no leak assessment is made. A flowchart of the entire 0.020" test sequence is provided below, on a subsequent page.

Ford's 0.020" evaporative system monitor is designed to run during extended, cold-start idle conditions where the fuel is cool and not likely to generate excessive vapors. These conditions will typically occur at traffic lights or immediately after start-up, (e.g. idle in the driveway).

As indicated previously, the 0.020" idle test uses two sets of malfunction thresholds to screen out test results in the area where "leak" and "no-leak" distributions overlap. Loss of vacuum greater than the 0.020" malfunction criteria is designated as a failure. No/low vacuum loss below the pass criteria is designated a pass. Vacuum loss that is greater than the pass criteria but less that the failure criteria is indeterminate and does not count as a pass or a fail.

Test results in this overlap area can stem from high volatility fuel at high ambient temperatures. These situations are not expected to be encountered routinely by customers. Therefore, this strategy will only temporarily hamper monitor performance, while effectively preventing false MIL illumination.

A more detailed description of the functional characteristics of the Evaporative Monitor is provided in the representative calibration submissions to the agency. Additional calibration information is contained on file by Ford Motor Company and may be obtained via agency request.



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* Note: It takes 2 consecutive failures store a DTC and illuminate the MIL.
It takes 3 consecutive passes to turn the MIL off.

Ford 2000 MY 0.020" Dia. Leak Check Strategy

0.020" EVAP Monitor Operation:	
DTCs	P0455 (gross leak), P1450, (excessive vacuum), P0457 (gross leak, cap off), P0442 (0.040" leak), P0456 (0.020" leak)
Monitor execution	once per driving cycle for 0.040" dia leak once per driving cycle, no refueling event for 0.020" dia leak
Monitor Sequence	HO2S monitor for front sensors completed and OK
Sensors/Components OK	MAF, IAT, VSS, ECT, CKP, TP, FTP, VMV, CVS
Monitoring Duration	360 seconds for 0.040" (see disablement conditions below) 60 seconds for 0.020" (see disablement conditions below)

Typical 0.020" EVAP monitor entry conditions, Phases 0 through 4:		
Entry condition	Minimum	Maximum
Engine off (soak) time	6 hours	
Time since engine start-up for 0.040"	330 seconds	1800 to 2700 seconds
Time since engine start-up for 0.020" idle test	30 seconds	600 seconds
Refueling event (for 0.020" idle test only)	none	
Intake Air Temp for 0.040"	40 ^{o}F	90 - 100 ^{o}F
Intake Air Temp for 0.020"	40 ^{o}F	90 ^{o}F
Vehicle Speed for cruise test, 0.040 and 0.020"	40 mph	80 mph
Vehicle Speed for idle test, 0.020"		3 mph
Fuel Fill Level for 0.040"	15%	85%
Fuel Fill Level for 0.020"	40%	85%
BARO (<8,000 ft altitude)	22.0 " Hg	
Engine Load	20%	70%
Purge Dutycycle	75%	100%
Purge Flow	0.05 lbm/min	0.10 lbm/min
Fuel Tank Pressure Range	- 17 H_2O	1.5 H_2O

Typical 0.020" EVAP abort (fuel slosh) conditions for Phase 2:
Change in load: > 20% for 0.040"
Change in load: > 10% for 0.020"
Change in tank pressure: > 1 " H_2O for 0.040"
Change in tank pressure: > 1 " H_2O for 0.020"
Change in fuel fill level: > 15% for 0.040"
Change in fuel fill level: > 8% for 0.020"
Number of aborts: > 20 (may be up to 255)

Typical 0.020 EVAP monitor malfunction thresholds:

P1450 (Excessive vacuum): < -8.0 in H_2O over a 30 second evaluation time or > -4. in H_2O vapor generation.

P0455 (Gross leak): > -8.0 in H_2O over a 30 second evaluation time.

P0457 (Gross leak, cap off): > -8.0 in H_2O over a 30 second evaluation time after a refueling event.

P0442 (0.040" leak): > 2.5 in H_2O bleed-up over a 15 sec. evaluation time at 75% fuel fill.

(Note: bleed-up and evaluation times vary as a function of fuel fill level and ambient temperature).

P0456 (0.020" leak): > 2.5 in H_2O bleed-up over a 30 sec. evaluation time at 75% fuel fill.

(Note: bleed-up and evaluation times vary as a function of fuel fill level and ambient temperature)

P0442 vapor generation limit: < 2.5 in H_2O over a 100 second evaluation time.

J1979 Evaporative System Mode $06 Data

Test ID	Comp ID	Description for J1850	Units
$26	$00	Phase 0 Initial tank vacuum and minimum limit	in H_20
$26	$00	Phase 0 Initial tank vacuum and maximum limit	in H_20
$27	$00	Phase 2 0.040" cruise leak check vacuum bleed-up and maximum 0.040" leak threshold	in H_20
$28	$00	Phase 2 0.020" cruise leak check vacuum bleed-up and max leak threshold	in H_20
$2A	$00	Phase 4 Vapor generation maximum change in pressure and max threshold	in H_20
$2B	$00	Phase 4 Vapor generation maximum absolute pressure rise and max threshold	in H_20
$2C	$00	Phase 2 0.020" idle leak check vacuum bleed-up and maximum "leak" threshold	in H_20
$2D	$00	Phase 2 0.020" idle leak check vacuum bleed-up and max "no-leak" threshold	in H_20

Conversion for Test IDs $26 through $2D: Take value, subtract 32,768, and then multiply result by 0.00195 to get inches of H20. The result can be positive or negative.

Note: Default values (-64 in H_20) will be display for all the above TIDs if the evap monitor has never completed. If all or some phases of the monitor have completed on the current or last driving cycle, default values will be displayed for any phases that had not completed.

Test ID	Comp ID	Description for J1850 (new 2004 MY strategies)	Units
$61	$00	Phase 0 Initial tank vacuum and minimum vacuum limit (data for P1450 – excessive vacuum)	in H_20
$62	$00	Phase 4 Vapor generation minimum change in pressure and minimum vacuum limit (data for P1450, VMV stuck open)	in H_20
$63	$00	Phase 0 Initial tank vacuum and gross leak maximum vacuum limit (data for P0455/P0457 – gross leak/cap off)	in H_20
$64	$00	Phase 2 0.040” cruise leak check vacuum bleed-up and maximum vacuum limit (data for P0442 – 0.040" leak)	in H_20
$65	$00	Phase 2 0.020” idle leak check vacuum bleed-up and maximum vacuum limit (data for P0456 – 0.020" leak)	in H_20
Conversion for Test IDs $61 through $65: Take value, subtract 32,768, and then multiply result by 0.00195 to get inches of H_20. The result can be positive or negative. Note: Default values (0.0 in H_20) will be displayed for all the above TIDs if the evap monitor has never completed. Each TID is associated with a particular DTC. The TID for the appropriate DTC will be updated based on the current or last driving cycle, default values will be displayed for any phases that have not completed.			
Monitor ID	Test ID	Description for CAN (new 2004 MY strategies)	Units
$3A	$80	Phase 0 Initial tank vacuum and minimum vacuum limit (data for P1450 – excessive vacuum)	Pascals
$3A	$81	Phase 4 Vapor generation minimum change in pressure and minimum vacuum limit (data for P1450, VMV stuck open)	Pascals
$3A	$82	Phase 0 Initial tank vacuum and gross leak maximum vacuum limit (data for P0455/P0457 – gross leak/cap off)	Pascals
$3B	$80	Phase 2 0.040” cruise leak check vacuum bleed-up and maximum vacuum limit (data for P0442 – 0.040" leak)	Pascals
$3C	$80	Phase 2 0.020” idle leak check vacuum bleed-up and maximum vacuum limit (data for P0456 – 0.020" leak)	Pascals
Note: Default values (0.0 in H_20) will be displayed for all the above TIDs if the evap monitor has never completed. Each TID is associated with a particular DTC. The TID for the appropriate DTC will be updated based on the current or last driving cycle, default values will be displayed for any phases that have not completed.			

Additional malfunctions that are be identified during the evaporative system integrity check are as follows:

The Vapor Management Valve or Electric Vapor Management Valve (EVMV) (purge solenoid) output circuit is checked for opens and shorts (P0443)

Note that a stuck closed VMV generates a P0455, a leaking or stuck open VMV generates a P1450.

Vapor Management Valve Check Operation:	
DTCs	P0443 – Vapor Management Valve Circuit
Monitor execution	continuous
Monitor Sequence	None
Sensors OK	not applicable
Monitoring Duration	5 seconds to obtain smart driver status

Typical Vapor Management Valve check malfunction thresholds:
P0443 (Vapor Management Valve Circuit): open/shorted at 0 or 100% duty cycle

The Canister Vent Solenoid output circuit is checked for opens and shorts (P1451 or P0446), a stuck closed CVS generates a P1450, a leaking or stuck open CVS generates a P0455.

Canister Vent Solenoid Check Operation:	
DTCs	P1451 or P0446 – Canister Vent Solenoid Circuit
Monitor execution	continuous
Monitor Sequence	None
Sensors OK	not applicable
Monitoring Duration	5 seconds to obtain smart driver status

Typical Canister Vent Solenoid check malfunction thresholds:
P1451 or P0446 (Canister Vent Solenoid Circuit): open/shorted