Inspection Procedure **GDF-05**

Gasoline Dispensing Facilities
DISPENSING RATE DETERMINATION

1. PURPOSE

1.1 The purpose of this inspection procedure is to provide a procedure for measuring the dispensing rate of nozzles at a gasoline dispensing facility (GDF). Dispensing rates exceeding the maximum allowable rate of 10.0 gallons per minute (gpm) will cause increased spillage. Dispensing rates less than the lower limit specified by the manufacturer will cause increased spillage due to the improper operation of the nozzle's primary shutoff mechanism.

2. PRINCIPLE AND SUMMARY OF INSPECTION PROCEDURE

2.1 A stopwatch is used to measure the time to dispense a specific quantity of gasoline using the hand-held, wide-open position. The time to dispense a selected volume of gasoline is compared to those values for the minimum and maximum allowed dispensing rates. To minimize the testing-related emissions, it is recommended the dispensing rate determination be conducted during normal vehicle refueling events and not into a portable test tank.

3. BIASES AND INTERFERENCES

3.1 If the dispenser uses a capacitive or "slow-start" feature, dispensing rates will be biased toward lower rates. The bias is minimized by application of a one-gallon (1.0) buffer.

3.2 A bias is inherent due to the accuracy of starting and stopping the stopwatch for a specific volume of gasoline to be timed. To compensate for this potential bias, an allowable measurement error is included in Tables 1 & 2 and as shown in Section 6.2.

4. EQUIPMENT

4.1 **Field Data Sheet.** Use a data sheet to record which nozzles have been tested and their respective dispensing rates. An example of a Field Data Sheet is shown in Form 1.

4.2 **Stopwatch.** Use a stopwatch accurate to within 0.2 seconds.

4.3 **Gasoline Test Tank (Optional)**. If the dispensing rate measurement cannot be conducted during normal vehicle refueling events, use a portable tank. This tank shall meet all applicable fire safety requirements and shall have sufficient volume so that at least five (5.0) gallons may be dispensed prior to activation of the primary shutoff mechanism of the nozzle.

5. INSPECTION PROCEDURE

5.1 Record the dispenser number, gas grade or octane, and the make and model of the nozzle on the Field Data Sheet, as shown in Form 1.

5.2 With no other dispensing occurring from the same submersible turbine pump (STP), begin dispensing into a vehicle tank using the hand-held, wide-open position.

5.3 Start the stopwatch when the dispenser totalizer indicates at least one (1.0) gallon has been dispensed.

5.4 Dispense at least 2.0 gallons of gasoline. Stop the stopwatch at the totalizer reading desired for the volume selected. To facilitate using Tables 1 & 2 of the procedure, it is recommended 2.0, 3.0, 4.0, or 5.0 gallons is used as the gasoline volume to be timed.

5.5 Record the quantity of gasoline dispensed and the associated dispensing time, to the nearest 0.1 seconds, on the Field Data Sheet, as shown in Form 1.

6. CALCULATING RESULTS

6.1 The dispensing rate may be determined using Tables 1 & 2, or as shown below:

$$Q_g = \frac{(G)(60)}{t} \qquad \text{Equation 1}$$

Where:

Q_g = Gasoline dispensing rate, gallons per minute
G = Volume of gasoline dispensed during test, gallons
t = Time required to dispensing the volume G, seconds
60 = Conversion factor from seconds to minutes

6.2 The dispensing rate, as calculated from Equation 1, **shall be corrected as follows:**

a) For compliance with the 10.0 gpm maximum allowable dispensing rate, the measured time (t) shall be multiplied by 1.0167.

b) For compliance with a minimum required dispensing rate, the measured time (t) shall be divided by 1.0167.

Table 1
Maximum Dispensing Rate Determination

Gasoline Dispensed (G), gallons	Time (t) Required to Achieve the Following Dispensing Rates, seconds					
	5.0 gpm	**6.0 gpm**	**7.0 gpm**	**8.0 gpm**	**9.0 gmp**	**10.0 gpm**
2.0	23.6	19.7	16.8	14.8	13.1	11.8
3.0	35.4	29.5	25.3	22.1	19.7	17.7
4.0	47.2	39.3	33.7	29.5	26.3	23.6
5.0	59.0	49.2	42.2	36.9	32.8	29.5

Note: The times (t) have been corrected to allow for the accuracy of the measurement.

Table 2
Minimum Dispensing Rate Determination

Gasoline Dispensed (G), gallons	Time (t) Required to Achieve the Following Dispensing Rates, seconds					
	5.0 gpm	**6.0 gpm**	**7.0 gpm**	**8.0 gpm**	**9.0 gmp**	**10.0 gpm**
2.0	24.2	20.3	17.4	15.3	13.5	12.2
3.0	36.6	30.5	26.1	22.9	20.3	18.3
4.0	48.8	40.7	34.9	30.5	27.1	24.4
5.0	61.0	50.8	43.6	38.1	33.9	30.5

Note: The times (t) have been corrected to allow for the accuracy of the measurement.

7. REPORTING RESULTS

7.1 Record the following information on a Field Data Sheet similar to that shown in Form 1:

a) Gasoline amount dispensed, gal.
b) Time, sec.
c) Dispensing rate, gpm

FORM 1
NOZZLE DISPENSING RATE
INSPECTION PROCEDURE GDF-05

STATION NAME: _____ **ADDRESS:** _____

CITY: _____ **PHONE:** _____

PHASE II SYSTEM TYPE: _____ **NUMBER OF NOZZLES:** _____

DISPENSER #	GAS GRADE [87,89,92]	NOZZLE MAKE	NOZZLE MODEL #	GASOLINE DISPENSED, GALLONS	TIME, SEC.	DISPENSING RATE, GPM	PASS/ FAIL	DATE REPAIRED

INSPECTION CONDUCTED BY: _____ DATE: _____