

# DIESEL TRUCK SMOKE TEST - OPACITY

J.L. John Services, Inc Meter Mfg: Red Mountain Engineering, Inc.  
Year and Make: 1992 S/N:8500240 Year of Engine: 1992 Model #  
Smoke Check 1667 Engine Mfg: COUMMM Software Version:  
3.69C Engine HP: 350 Vehicle Inspection OK

This test is currently being used for measurement of particulate in diesel trucks' stack exhaust in California. The equipment consists of a telescopic pole (9-12 ft) with one end consisting of a triangular shaped apparatus that houses a laser/optical measurement device. The measuring device is attached to a hand-held computer and a recording printing mechanism. A bung protruding from the measurement device is placed directly into the exhaust stack allowing the triangular housing to rest above/across the exhaust pipe opening. The measurement device measures smoke/exhaust across two points using laser light refraction. The truck is in idle and the first measurements are calculated. The tester, in the cab of the truck, steps on the accelerator and holds it down at set RPM's for a set period (approx. 5 seconds). This test is repeated and measured several times as the hand held computer instructs the tester along the way. These measurements are recorded and calculated in a report. This calculates the particulate/opacity of the diesel exhaust under load.

## Base Tested After STM-3

	Baseline	Add STM-3 3 Minutes	% Decrease
Date:	07/08/04		
Ambient Time:	79.5F		
Baro. Press:	29.39 inHg		
Rel Humidity	35.90%	27.20%	
Mileage	512,854	513,239	
Test 1	7.02	6.48	-8.33%
Test 2	6.96	6.04	-15.23%
Test 3	6.86	5.78	-18.69%
Avg. of all tests	6.95	6.1	-13.88%

### Tested After Driving 15 Miles With STM-3

	15 Miles With STM-3	% Decrease
Date:	07/08/04	
Ambient Time:	86.4F	
Baro. Press:	29.31 inHg	
Rel Humidity	25.40%	
Mileage	513,254	
Test 1	4.12	-70.39%
Test 2	4.34	-60.37%
Test 3	4.67	-46.90%
Avg. of all tests	4.38	-58.72%

### Tested After Driving 100 Miles With STM-3

	100 Miles With STM-3	% Decrease
Date:	07/20/04	
Ambient Time:	75.9F	
Baro. Press:	29.5 inHg	
Rel Humidity	51.60%	
Mileage	513,354	
Test 1	0.00	-100.00%
Test 2	0.00	-100.00%
Test 3	0.00	-100.00%
Avg. of all tests	0.00	-100.00%

#### Test Description:

The third test --driving the truck for 100 miles -- yielded even better results. Between tests, the measuring device was used on two other trucks and calibrated to insure the accuracy of the device. The readings indicated that after 100 miles, 100% removal of the diesel exhaust particulate had been achieved.