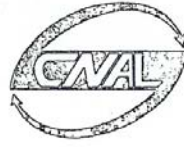




(2002)量认(国)字(P0643)号



No.L1062

编号: WT-05-009-01-ZD01

# TEST REPORT

Project Name: Vehicle Road Test of "TADGER Exhaust Emission Reduction Device"

Customer Name: Shanghai Suntek Environmental Technologies Co., Ltd.

Test Classification: Customer Requested

Date: March 30, 2005

(Authorized Stamp)



Energy Utilization Monitoring Centre of Vehicle Transportation  
Industry  
The Ministry of Communications

## Terms and Conditions

1. This test report relates only to the provided samples;
2. This test report is invalid without the authorized stamp;
3. This test report is invalid without the signatures of the inspector and auditor;
4. This test report is invalid if the changes made without approval;
5. Photocopy of this test report without authorized stamp is invalid;
6. The appeal of the test results is only acceptable within three months commenced on the date of the report received;
7. The appeal of the test results will not be accepted under the following conditions: samples are difficult to preserve (high volatilization, moisture absorption etc.); no samples are retained in the test centre after tests; tests are non-repeatable.

### Test Centre:

Address: 8 Xitucheng Road, Haidian District, Beijing  
Phone: 010-62079180 Fax: 010-62079180  
Post Code: 100088


### Customer:

Address: Room 6109, No. 29 Jianguo Zhong Road, Shanghai  
Phone: 021-64720769 Fax: 021-64729540  
Post Code: 200025

# Table of Contents

Summary	(1)
1. Objective	(2)
2. Test Specifications	(2)
3. Test Sample	(2)
4. Test Items	(2)
5. Test Date, Location, and Facility and Equipment	(3)
6. Test Results	(3)
7. Appendix	(4)

**Summary**

<b>Sample Name</b>	TADGER Exhaust Emission Reduction Device	<b>Type/Spec.</b>	N/A
		<b>Trade Mark</b>	TADGER
<b>Customer Name</b>	Shanghai Suntek Environmental Technologies Co., Ltd.	<b>Test Classification</b>	Customer Requested
<b>Manufacturer</b>	TADGER Group International	<b>Product Level</b>	Q.C. Passed
<b>Sender</b>	Xu, JianYe	<b>Date Submitted</b>	Dec. 28, 2004
<b>Quantity</b>	1 set	<b>Product ID (Serial No.) or Manufactured Date</b>	000575
<b>Test Standard</b>	GB/T 14951-1994 《Evaluation Method for Vehicle Fuel-Saving Technique》		
<b>Test Items</b>	<ol style="list-style-type: none"> <li>1. Evaluation of fuel consumptions at constant speed with the transmission in the fifth gear</li> <li>2. Evaluation of acceleration performance at full throttle with the transmission in the fifth gear</li> <li>3. Evaluation of exhaust emissions at rolling acceleration</li> </ol>		
<b>Test Results or Conclusion</b>	<p>All tests were conducted on a testing vehicle (IEVCO, A40.10) supplied by Shanghai Suntek Environmental Technologies Co., Ltd. After installing the TADGER, test data were taken when the testing vehicle had been driven for 200km and 1200km, respectively. The data were analyzed according to GB/T 14951-1994 《Evaluation Method for Vehicle Fuel-Saving Technique》. The comparisons with the data recorded without the TADGER show that</p> <ol style="list-style-type: none"> <li>1. Reductions of fuel consumptions under urban driving condition are 3.3% and 3.4%, respectively,</li> <li>2. Reductions of fuel consumptions under intra-city driving condition are 2.7% and 3.3%, respectively,</li> <li>3. Reductions of fuel consumptions under high-way driving condition are 0.8% and 1.9%, respectively,</li> <li>4. Coefficients of acceleration time with the transmission in the fifth gear are 1.045 and 1.015, respectively. The acceleration time decreased by 0.45% and 0.15%, respectively,</li> </ol> <p>Smoke density did not change for rolling-acceleration tests when the testing vehicle had been driven for 200km after installing the TADGER. The smoke density reduced by 7.1% when the testing vehicle had been driven for 1200 km after installing the TADGER.</p> <div style="text-align: right;">               (Authorized Stamp)              March 28th, 2005         </div>		
<b>Remark</b>	<ol style="list-style-type: none"> <li>1. Shanghai Suntek Environmental Technologies Co., Ltd supplied the testing vehicle (IEVCO A40.10) manufactured by Nanjing Automobile Manufactory.</li> <li>2. After installing the TADGER, test data were taken when the testing vehicle had been driven for 200km and 1200km, respectively.</li> </ol>		


Authorizer:

Auditor:

Test Engineer:

批准: 

审核: 

主检: 

## 1. Objective

The objective of the project submitted by Shanghai Suntek Environmental Technologies Co., Ltd is to evaluate the road performance of the testing vehicle with and without the “TADGER Exhaust Emission Reduction Device”, which is manufactured by TADGER Group International. The tests were conducted by Energy Utilization Monitoring Centre of Vehicle Transportation Industry.

The effects of “TADGER Exhaust Emission Reduction Device” on fuel economy, acceleration, and smoke density at rolling-acceleration are evaluated by comparing road test performance of the testing vehicle with and without the TADGER installed. The testing vehicle is supplied by Shanghai Suntek Environmental Technologies Co., Ltd.

## 2. Test Specification

GB/T 14951-1994 《Evaluation Method for Vehicle Fuel-Saving Technique》

## 3. Test Sample

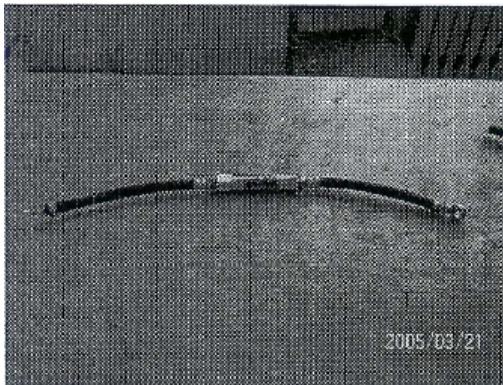
3.1 Sample Name: TADGER Exhaust Emission Reduction Device

3.2 Manufacturer: TADGER Group International, Canada

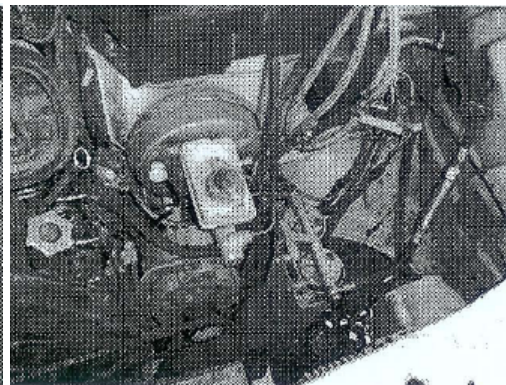
3.3 Sample Quantity: 1 (set)

3.4 Sample Status: Q.C. Passed

3.5 Sample Description and Installation: The submitted sample is a cylindrical metal device with connectors on both ends. The length of the sample is 94mm and the diameter is 25mm, as shown in Figure 3.5.1. According to the arrow which indicates the flow direction on the device, one end of the device is connected to the rear end of fuel filter through the connector and the other end is connected to the input fuel line, as shown in Figure 3.5.2.



**Figure 3.5.1 Test Sample**



**Figure 3.5.2 Installation Illustration**

## 4. Test Items

- 4.1 Fuel consumptions at constant speed with the transmission in the fifth gear
- 4.2 Fuel consumptions at full throttle acceleration with the transmission in the fifth gear
- 4.3 Smoke emission at rolling acceleration

## 5. Test Date, Location, and Facility and Equipment

### 5.1 Test Date

March 15, 2005, Sunny, Temperature: 10°C-15°C, Winds: 1.5m/s, Atmospheric Pressure: 101.4kPa;

March 18, 2005, Sunny, Temperature: 9°C, Winds: 1.5m/s, Atmospheric Pressure: 101.9kPa;

### 5.2 Test Location

The road course utilized to test the long straight-line performance of ground vehicles at the Research Institute of Highways, the Ministry of Communications.

### 5.3 Facility and Equipment

5.3.1 Testing Vehicle: IEVCO A4.0. Initial odometer reading is 215,674 km. The vehicle was loaded with two testing engineers, testing equipment, and additional battery

5.3.2 LC-5100S Non-Contact Speedometer

5.3.3 FP-224 Fuel Flow Rate Sensor

5.3.4 DiSmoke 4000 Emission Analyzer

5.4 Fuel: #0 diesel, original fuel density is 0.827g/cm<sup>3</sup>. The fuel density after driving 200km with the TADGER installed is 0.829g/cm<sup>3</sup>. The fuel density after driving 1200km with the TADGER installed is 0.834g/cm<sup>3</sup>.

## 6. Test Results

6.1 After driving 200km with the TADGER installed, the fuel consumptions were recorded at different speed with the transmission in the fifth gear. The comparisons of fuel consumptions are shown in Table 1. The overall evaluation is shown in Table 2. Figure 1 is the plot of fuel consumptions at different speed. Same tests were repeated after driving 1200km. The comparisons of fuel consumptions are shown in Table 3. The overall evaluation is shown in Table 4. Figure 2 is the plot of fuel consumptions at different speed.

6.2 The acceleration performance of the testing vehicle installed with the TADGER after driving 200km is shown in Table 5. The performance curves are shown in Figure 3 and Figure 4.

The acceleration performance of the testing vehicle installed with the TADGER after driving 1200km is shown in Table 6. The performance curves are shown in Figure 5 and Figure 6.

6.3 The comparisons of smoke density are shown in Table 7.

6.4 The data were analyzed according to the test specifications described in GB/T 14951-1994 ((Evaluation Method for Vehicle Fuel Saving Technique)).

6.4.1 As shown in Tables 1, 2, 3, and 4, when the testing vehicle was running at constant speed of 30, 50, 70, 90, and 110 km/hr with the transmission in the fifth gear,

- The reduction rates of fuel consumptions after driving 200km are 3.1%, 3.5%, 3.0%, 0.9%, and 0.8%, respectively,
- The reduction rates of fuel consumptions after driving 1200km are 3.5%, 3.4%, 3.4%, 3.1%, and 1.9%, respectively.



After driving 200km,

- The reduction rate of fuel consumptions under urban driving condition is 3.3%,
- The reduction rate of fuel consumptions under intra-city driving condition is 2.7%,
- The reduction rate of fuel consumptions under highway driving condition is 0.8%.

After driving 1200km,

- The reduction rate of fuel consumptions under urban driving condition is 3.4%,
- The reduction rate of fuel consumptions under intra-city driving condition is 3.3%,
- The reduction rate of fuel consumptions under highway driving condition is 1.9%.

6.4.2 It is shown in Tables 5 and 6 that when the testing vehicle installed with the TADGER was accelerated from 30 km/hr to 110 km/hr with the transmission in the fifth gear:

- (i) After driving 200km, the coefficient of acceleration time  $K_t$  is 1.045. The acceleration time was reduced by 0.45% comparing with the test without the TADGER.
- (ii) After driving 1200km, the coefficient of acceleration time  $K_t$  is 1.015. The acceleration time was reduced by 0.15% comparing with the test without the TADGER.

6.4.3 It is shown in Table 7 that smoke density did not change for rolling acceleration test after driving 200km. Smoke density reduced by 7.1% for rolling acceleration test after driving 1200km.

## 7. Appendix

**Table 1. Fuel Consumptions at Constant Speed (Vehicle Model: IEVCO A40)**

Speed (km/hr)	30	50	70	90	110
Data 0: Fuel Consumption/Speed	4.24/30.3	5.02/50.4	6.71/70.3	8.87/90.2	12.1/110.0
Data 1: Fuel Consumption/Speed	4.11/30.5	4.84/50.3	6.50/70.2	8.80/90.2	12.0/110.1
Reduction of Fuel Consumption	0.13	0.17	0.20	0.08	0.1
Reduction Rate (%)	3.1	3.5	3.0	0.9	0.8

**Note:**

“0” represents the test data without the TADGER

“1” represents the test data with the TADGER #1

Unit of fuel consumption: kg/100km

Test date without the TADGER: March 15, 2005

Test date with the TADGER #1: March 15, 2005

Software: ROAD2.0 Data Process Software

Tested by: Energy Utilization Monitoring Centre of Vehicle Transportation Industry, the Ministry of Communications

**Table 2. Overall Evaluation Results**

Test Condition	Reduction of Fuel Consumption (kg/100km)	Reduction Rate (%)
Urban driving condition	0.16	3.3
Intra-City driving condition	0.16	2.7
Highway driving condition	0.10	0.8

Software: ROAD2.0 Data Process Software

Tested by: Energy Utilization Monitoring Centre of Vehicle Transportation Industry, the Ministry of Communications

**Table 3. Fuel Consumptions at Constant Speed**

Speed (km/hr)	30	50	70	90	110
Data 0: Fuel Consumption/Speed	4.24/30.3	5.02/50.4	6.71/70.3	8.87/90.2	12.1/110.0
Data 1: Fuel Consumption/Speed	4.09/30.5	4.84/50.2	6.48/70.3	8.60/90.2	11.9/110.0
Reduction of Fuel Consumption	0.15	0.17	0.23	0.27	0.2
Reduction Rate (%)	3.5	3.4	3.4	3.1	1.9

**Note:**

“0” represents the test data without the TADGER

“1” represents the test data with the TADGER #2

Unit of fuel consumption: kg/100km

Test date without the TADGER: March 15, 2005

Test date with the TADGER #2: March 18, 2005

Software: ROAD2.0 Data Process Software

Tested by: Energy Utilization Monitoring Centre of Vehicle Transportation Industry, the Ministry of Communications

**Table 4. Overall Evaluation Results**

Test Condition	Reduction of Fuel Consumption (kg/100km)	Reduction Rate (%)
Urban driving condition	0.17	3.4
Intra-City driving condition	0.21	3.3
Highway driving condition	0.23	1.9

Software: ROAD2.0 Data Process Software

Tested by: Energy Utilization Monitoring Centre of Vehicle Transportation Industry, the Ministry of Communications

**Table 5. Test Data of Acceleration Performance**

Speed (km/hr)	30	50	70	90	110
Data 0: Distance/Time	0/0.0	97/8.9	226/16.6	433/25.9	824/39.9
Data 1: Distance/Time	0/0.0	102/9.4	237/17.5	450/27.0	860/41.7

**Note:**

“0” represents the test data without the TADGER

“1” represents the test data with the TADGER #1

Time: second                      Distance: meter

Test date without the TADGER: March 15, 2005

Test date with the TADGER #1: March 15, 2005

Software: ROAD2.0 Data Process Software

Tested by: Energy Utilization Monitoring Centre of Vehicle Transportation Industry, the Ministry of Communications

**Table 6. Acceleration Performance**

Speed (km/hr)	30	50	70	90	110
Test Data 0: Distance/Time	0/0.0	97/8.9	226/16.6	433/25.9	824/39.9
Test Data 1: Distance/Time	0/0.0	95/8.7	225/16.5	437/26.0	841/40.5

**Note:**

“0” represents the test data without the TADGER

“1” represents the test data with the TADGER #2

Time: second                      Distance: meter

Test date without the TADGER: March 15, 2005

Test date with the TADGER #2: March 18, 2005

Software: ROAD2.0 Data Process Software

Tested by: Energy Utilization Monitoring Centre of Vehicle Transportation Industry, the Ministry of Communications

**Table 7. Smoke Density at Rolling Acceleration**

Items	Smoke Density	
	After driving 200km	After driving 1200km
Results		
without the TADGER(Rb)	1.4	1.4
with the TADGER(Rb)	1.4	1.3
Purification Rate (%)	0	7.1

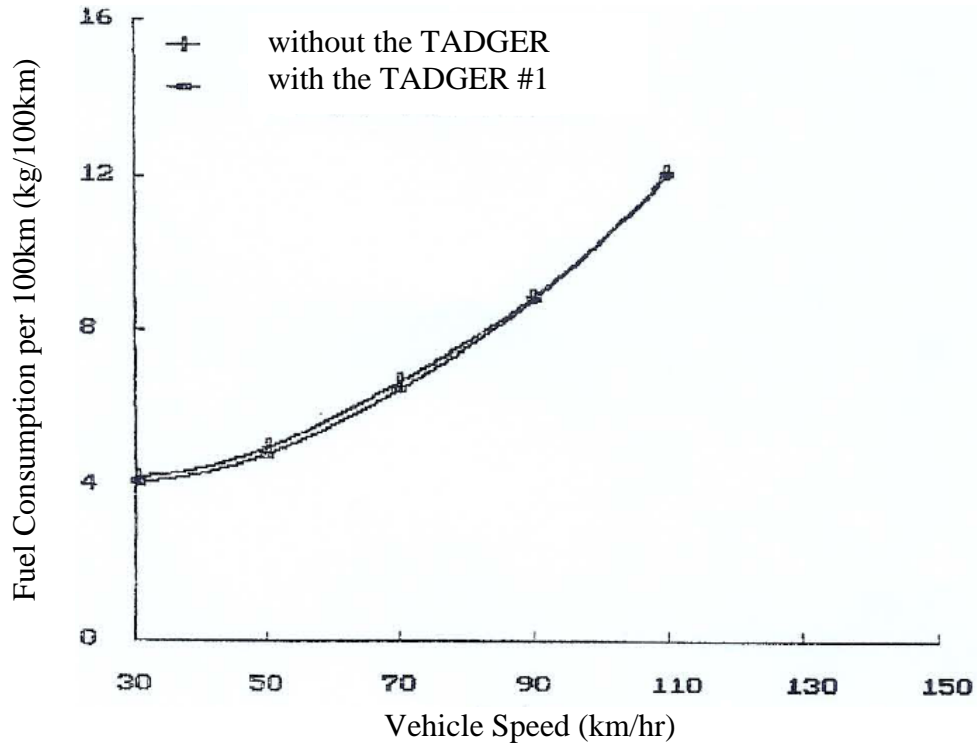


Figure 1. Fuel Consumptions at Constant Speed

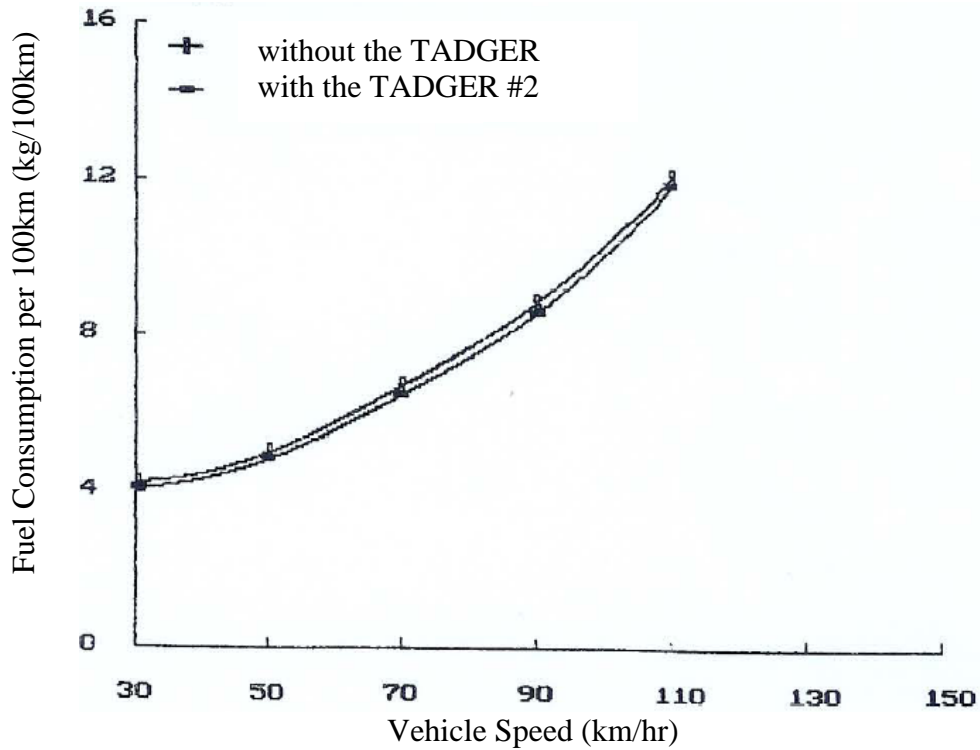


Figure 2. Fuel Consumptions at Constant Speed

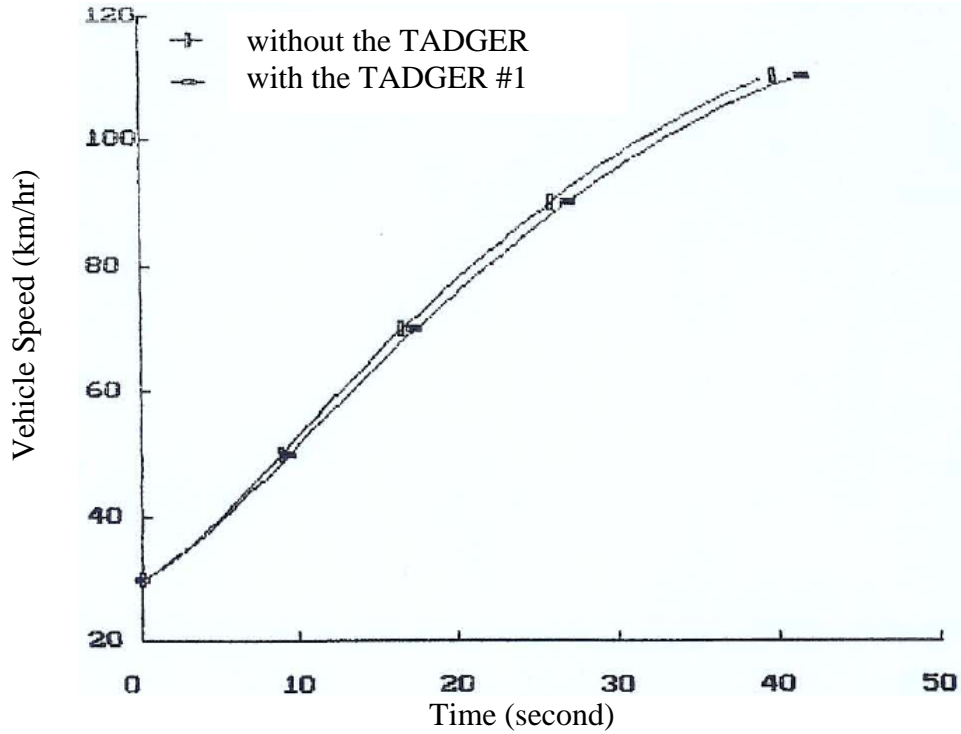


Figure 3. Acceleration Curves (Speed vs. Time)

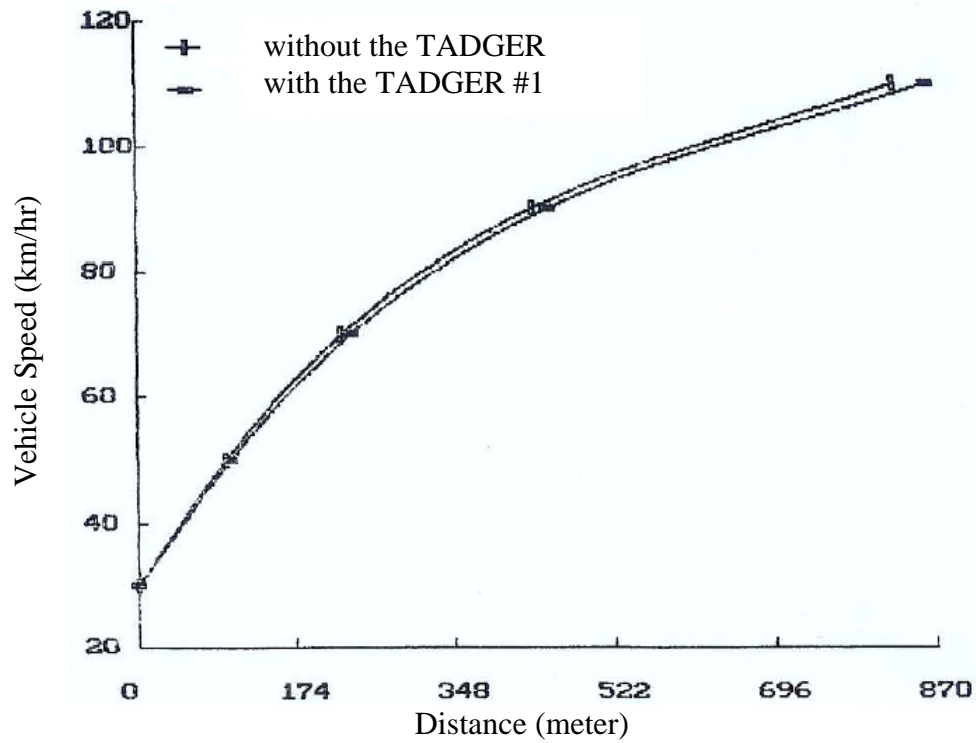


Figure 4. Acceleration Curves (Speed vs. Distance)

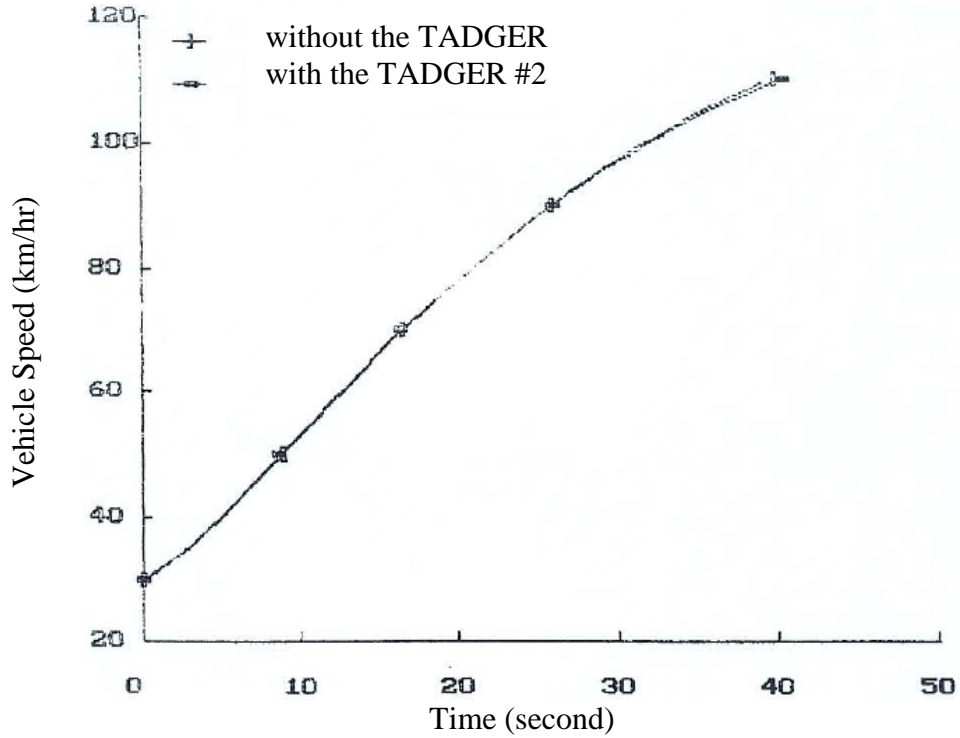


Figure 5. Acceleration Curves (Speed vs. Time)

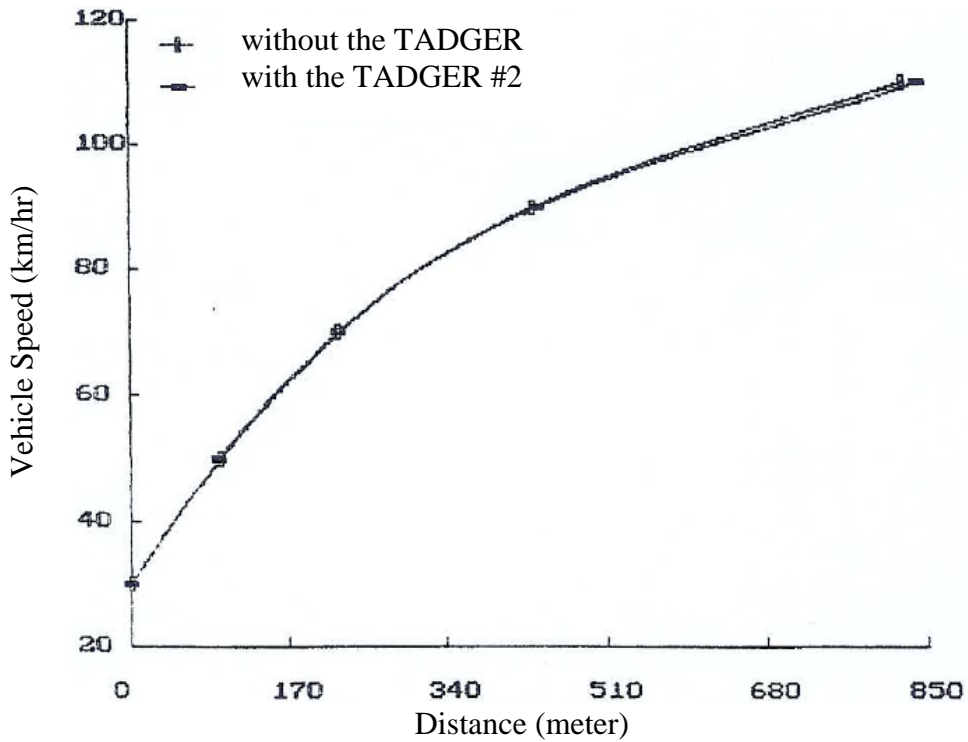


Figure 6. Acceleration Curves (Speed vs. Distance)