Advancement of vehicle inspection in Japan

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Japan
Advancement of Vehicle Inspection in Japan

The National Agency of Vehicle Inspection (NAVI)
Kazuro KURIHARA, Chief Executive
Outline of Presentation

- Basic Information on National Agency of Vehicle Inspection (NAVI)
- Basic Information on Vehicle Inspection in Japan
- Inspection Method for Two Wheel Vehicle
- Three-Dimensional Measurement and Image Capture, Digitalization and Compiling Database of Inspections Results
- Inspection Method Improvements
  - Speed limiter device (SLD) function inspection
  - Exhaust emission inspections utilizing on-board diagnostics (OBD)
  - Inspections of used cars converted into electric vehicles (Conversion EV)
# Basic Information on NAVI

**Date of Establishment**

July 1, 2002, derived from MLIT

*MLIT; Ministry of Land, Infrastructure, Transport and Tourism*

<table>
<thead>
<tr>
<th>Capital</th>
<th>Fiscal Budget</th>
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<td>€93 Million</td>
<td>€95 Million (FY2012)</td>
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<table>
<thead>
<tr>
<th>Number of Employees</th>
<th>Number of Vehicles Inspected</th>
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<td>818 (as of April 2013)</td>
<td>7.48 Million (FY2011)</td>
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<table>
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<tr>
<th>Number of Vehicles Inspected per a Inspector</th>
<th>Inspectin Fee</th>
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<td>about 10,000 yearly</td>
<td>about 14€ (PTI)</td>
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* PTI; Periodical Technical Inspection

(1 € = 130 Yen)
Organization of NAVI

- Tokyo Head Office
- Central Training Center
- 93 Branch Office
Basic Information on Vehicle Inspection

- **Initial Inspection**
  - Dealers
  - Users
  - Type-Approved Vehicles
  - Other Vehicles
  - NAVI
  - Transport Ministry (MLIT)

- **Periodical Technical Inspection (PTI)**
  - Users
  - Designated Garages (70%)
  - Certified Garages
  - Navi (30%)
  - MLIT

- **Modification Inspection, Roadside Inspection**
  - Users
  - NAVI
  - MLIT

*Except for light motor vehicles*
Basic Information on Vehicle Inspection

Measurement Lane
- Vehicle height measuring instrument
- Main camera
- Scale
- Swivel side camera
- Fixed side camera
- Target
- Sideslip tester
- Speedometer tester
- Brake tester
- Headlight tester
- Exhaust emission tester
- Total evaluation

Compliance Check Lane
- Total evaluation
- Underbody inspection (Pit type)
- Exhaust emission inspection
- Sideslip inspection
- Speedometer inspection
- Headlight inspection
- Brake inspection
- Confirmation of identity
- External inspection

Other inspection equipment
- Inspection of two-wheeled motor vehicles
- Proximity exhaust noise inspection
- Inspection of stable inclination angle
- Diesel smoke inspection
1. Basic Information on two wheel vehicle inspection in Japan

- Subject of inspection: engine displacement over 250cc
- Annual inspection number: approx. 410,000
- Valid period of inspection certificate: 2 year [3 year (initial inspection)]

2. Inspection equipment for two wheel vehicle

- 72 branch offices

Inspection flow of two wheel vehicle tester

1. Front wheel brake inspection and Speedometer inspection
2. Rear wheel brake inspection (and Speedometer)
3. Headlight inspection

Tester operates when the rider treads on foot switch in every stage
- Unauthorized body-building after inspection to pad maximum load and for other purposes has become a social issue.
- Vehicles mounted with unauthorized secondary equipment exceed the regulated values for gross vehicle weight. This creates safety problems linked to longer braking distance, structural durability and other areas.
Three-Dimensional Image Measurement and Capture, Digitalization and Compiling Database of Inspections Results

- Inspection result data providing
- 3D image Measurement and Capture (initial inspection)
- Spec measurements
- Underbody inspection
- Exhaust emission inspection
- Brake / Speed meter / Headlight inspection
- Sideslip inspection
- Compliance Check Lane
- Measurement Lane
- Confirmation of identity
- External inspection
- Diesel smoke inspection
- Underbody inspection
- Exhaust emission inspection
- Brake / Speed meter / Headlight inspection
- Sideslip inspection
- Use of digitalization to prevent inspection result slip fabrication and alteration.
- Digitalization and compiling database of inspections results
- Inspection data analysis
Three-Dimensional Image Measurement and Capture

National Agency of Vehicle Inspection

Three Dimensional Image Measurement and Capture

1. Three Dimensional Image Measurement and Capture

2. Three Dimensional Image Measurement and Capture

3. Three Dimensional Image Measurement and Capture

4. Three Dimensional Image Measurement and Capture

5. Three Dimensional Image Measurement and Capture

6. Three Dimensional Image Measurement and Capture

7. Three Dimensional Image Measurement and Capture

8. Three Dimensional Image Measurement and Capture

9. Three Dimensional Image Measurement and Capture

10. Three Dimensional Image Measurement and Capture
Application measure examples

- Extraction of problematic data potentially leading to recalls
- Extraction of matters demanding priority inspection
- Extraction of matters demanding priority check and maintenance

Status of Actions

- Database conversion implementing application measures (2013-2014)
- Implement of application measures (2014～)
Inspection Method Improvements

Speed limiter device (SLD) function inspection

(Status Quo)

◆ Large-size trucks (GVW > 8 t) are required to install SLD (MAX speed 90 km/h). But unauthorized modifications occur.

◆ SLD function is checked by malfunction indicator lamps (MIL) and other means, but clever modifications are difficult to expose.

(Status of Actions)

◆ Trial introduction of equipment capable of checking SLD function and measuring braking force and speedometer accuracy on two axles simultaneously.

About 400 illegal SLD modifications

Check SLD function

Large-size multi-tester

Simultaneous measurements of brakes and speedometer on two axles

◆ Eliminate unauthorized modifications of SLD on large-size trucks
◆ Prevent accidents at inspection stations
Large-size Multi-tester

【combination of rollers】

A and B for vehicles with short wheel base
A and C for vehicles with long wheel base

direction of movement
movable range of A roller
speedometer/brake tester
Inspection Method Improvements

Exhaust emission inspections utilizing on-board diagnostics (OBD)

(Status Quo)

◆ Idling exhaust emission (CO, HC) is inspected. OBD function is checked by MIL.

◆ Exhaust emissions reduction technology makes progress very fast (aftertreatment systems, more sophisticated controls, etc.). Inspection method must be improved to keep pace with it.

◆ Installation on passenger cars of advanced emission OBD has been mandatory since 2008.

(Status of Actions)

◆ Trial introduction of inspection utilizing OBD scanning tools.
  • Equipment and methods capable of efficient inspections of many vehicles in short time.
Inspection for ‘Conversion EV’

◆ Number of electric vehicles (EV) and hybrid electric vehicles (HEV): over 2 million in Japan.

◆ Increase of “conversion EV” – conversion of regularly marketed gasoline-engine vehicles into EV by venture companies.

◆ Enforcement of regulation for protection against electrical shock for conversion EV in July 2012
  (In conformity to UN regulation No.100)
Outline of Inspection for 'Conversion EV'

1. **Protection against direct contact**
   - ex) Covers of conductivity or non-conductivity

2. **Ensure isolation resistance**
   - ex) Isolation with covers of conductivity

3. **Protection against indirect contact**
   - ex) Potential equalization between covers of conductivity and other conductive parts

**High voltage**

- Converter
- Speed controller
- Battery
Thank You!

National Agency of Vehicle Inspection
http://www.navi.go.jp