Module 1: Introduction to Preventive Maintenance and Inspection

Introduction

- PMI ensures that heavy vehicles conform to federal, state, and local safe operation laws.
- Every inspection requires careful attention to detail.
- A general visual inspection includes checking mountings, fasteners, cabling, driveline phasing, tire condition, and wear patterns.
- Always consult the service literature for the vehicle make and model you are working on.

Purposes of Preventive Maintenance Inspections

- The four main reasons to perform PMI are because they:
  1. Are required by FMCSA regulations
  2. Lower overall maintenance costs
  3. Ensure greater vehicle dependability
  4. Reduce road accidents

Setting Up a PMI Schedule

- PMI scheduling is based on time, mileage, and fuel consumption.

Types of PMI

- Federal inspection guidelines are set forth by FMSCA and 49 CFR, part 396.
- Annual inspections include brake systems, lubrication, air systems, and hydraulics.
- Vehicle inspections are assigned the following levels.
  1. Level 1: Comprehensive; with the driver and vehicle both present
  2. Level 2: Comprehensive; all items are inspected without getting underneath the vehicle
  3. Level 3: Only the driver items, seatbelt systems, and hazardous materials are inspected
  4. Level 4: Inspection of a particular item
  5. Level 5: Comprehensive; driver is not present

Federal Regulatory Agencies

- The following agencies administer regulations related to the operation of commercial vehicles in North America: Department of Transportation (DOT), Federal Motor Carrier Safety Administration (FMCSA), National Highway Traffic Safety Administration (NHTSA), Commercial Vehicle Safety Alliance (CVSA), Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA).
- The DOT oversees FMCSA and NHTSA.
- FMCSA develops and enforces regulations on annual vehicle inspections, inspector qualifications, vehicle
inspection record keeping, and pre- and post-trip inspection procedures.
- NHTSA provides public access to government information on technical service bulletins, safety-related recall campaigns, and federal motor vehicle safety standards.
- CVSA provides procedures and standards on out-of-service criteria, commercial vehicle safety operations, and inspection procedures.

Periodic Maintenance Inspections

Commercial motor vehicles in the United States must be inspected annually per 49 CFR, part 396.17.

PMI Record Keeping Requirements

Records of maintenance inspections must be kept in accordance with 49 CFR, part 396.21.
- Only trained and authorized inspectors can carry out maintenance inspections.
- Inspection reports must include: the name of the inspector, the date of the inspection, the motor carrier operating the vehicle, the vehicle components inspected, and the results of the inspection.
- Inspections must be confirmed by an inspection report, decal, or sticker.

Inspector Regulations

Evidence of inspector qualifications must be retained by the motor carrier during the inspection period and for one year thereafter.
- Inspector qualifications include:
  - Understanding inspection criteria in 49 CFR, part 393 and Appendix G
  - Identifying defective components
  - Mastering the methods, procedures, tools, and equipment for inspections
  - Obtaining training or experience via a training program and/or on-the-job training

Brake Inspectors

Brake inspector qualifications are similar to, but separate from, vehicle inspector qualifications.

Lubricants Used in PMI

Motor oil is graded by the SAE based on a viscosity index.
- Modern oils blend low and high viscosity oils with viscosity index improver additives.
- The American Petroleum Institute classifies oil by service: “S” for spark ignition engines, and “C” for diesel or compression ignition engines.
- Single-viscosity lubricants with the highest ambient operating temperature are recommended by most manufacturers.
- One on-board chassis lubricating system is the automatic chassis lubrication system (ACLS) for air- or electric-driven systems.
- The other on-board chassis lubricating system is manual manifold or distribution block.
- Always follow the service manual guidelines for trailer lubrication.

OSHA provides regulations on fire protection, hazardous materials and handling and storage, personal protective equipment, right-to-know laws, and employer/employee obligations.

The EPA develops and enforces regulations on hazardous waste disposal.
Walk-Around Inspection

Perform a walk-around inspection with the vehicle operator prior to inspecting specific components. Do not overlook or miss any components, they may be critical. Look for the following potential leaks: coolant, fuel, grease, engine oil, transmission fluid, power steering fluid, brake fluid, and hydraulic fluid. Ensure that the vehicle is ready for review. Look for and document flat tires, broken springs, objects or parts out of place, a cracked or bent frame or rims, dents in the vehicle body or trailer, missing or damaged parts, improper driveline connections, and broken glass.

Follow up on problems observed during the walk-around inspection during the more thorough inspection.

Shop and Vehicle Rules

Always use the correct tool for the job. Take great care of a customer’s car; drive slowly and cover seats and fenders. Follow standard rules to prevent injury and protect equipment. Keep the shop floor and workbenches clear.

Properly tag and report malfunctioning equipment. Keep shop equipment in good working order. Do not use a tool without proper training in its use. Following shop rules shows customers respect for their vehicles.

Workshop Setup

Workshops should be set up for functionality. All equipment needed for inspection should be available and in the proper position.

General Guidelines for Conducting PMIs

There are several general tasks or guidelines that are required for all inspections. Locate and use the correct service manual for the vehicle or component being inspected. Document all discrepancies for follow-up by a qualified technician. Only perform repairs for which you are qualified.

Check the service manual for proper lube procedures, as these differ from vehicle to vehicle. Use a lubrication chart to find the correct lubricant for the component being serviced. Dispose of hazardous materials in the proper manner. Refer to the service manual to determine if a certain discrepancy is reason for a vehicle to fail inspection.

Specialty Tools

Some vehicle inspections require specific tools, as per the manufacturer’s instructions. Fundamental tools for performing inspections include:
- Brake lining measurement tool
- Belt tension gauge
- Headlight adjustment tool
- Portable light tester
- Tire mating square
- Battery load tester
- Coolant tester (refractometer)
- Coolant system pressure tester
- Scan tools
- Dial indicator gauge

- Tire tread depth gauge
- Light bulb socket scrubber
- Bazooka
- Digital volt-ohm meter (DVOM)
- Test strips and coolant
- Thermometer
- Fifth wheel test pin
- One-foot ruler
- Torque wrench
- Wheel alignment equipment

A standard hydrometer may be used to test antifreeze, but the Technology Maintenance Council recommends a refractometer.
Finding Information on Recalls

**READY FOR REVIEW**

- Manufacturers are required to alert customers and the government to component failures.
- During an inspection, determine whether the vehicle or component has been subject to a recall.
- Finding recall information can be done in one of the following ways:
  - Check the vehicle’s service history.
  - Check manufacturer service bulletins.
- In the United States, check the NHTSA listing of recalls at http://www.recalls.gov/nhtsa.html.
- Check the EPA’s list of emissions-related recalls at http://www.epa.gov/otaq/recall.htm.