



Preventive Maintenance Inspection (PMI) Program

Vehicle Maintenance Bulletin V-07-98

June 1, 1998
Transmittal Letter

- A. **Purpose.** This Vehicle Maintenance Bulletin describes the Preventive Maintenance Inspection (PMI) Program and the forms used in completing vehicle inspections.
- B. **Distribution.** This bulletin is distributed to:
Manager, Operations Programs Support
Manager, Vehicle Maintenance
Manager, Vehicle Maintenance Facility
- C. **Additional Copies.** Additional copies of this bulletin or of the forms used for vehicle inspections can be ordered from the Material Distribution Centers by submitting Form 7380, *MDC Supply Requisition*, or by calling 800-332-0317, option 3.
- D. **Comments.** Written comments about this bulletin can be sent to:
VEHICLE MAINTENANCE
US POSTAL SERVICE
475 L'ENFANT PLZ SW RM 7142
WASHINGTON DC 20260-2802
- E. **Cancellations.** This bulletin replaces Fleet Management Bulletin V-11-93, dated 2/25/93.
- F. **Effective Date.** This bulletin is effective June 1, 1998.

A handwritten signature in black ink that reads "Michael F. Spates".

Michael F. Spates
Manager, Delivery

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Introduction

I. Background

The changes contained in this Bulletin are part of ongoing efforts to update and revise the Postal Service fleet's Preventive Maintenance Inspection (PMI) Program. Our goal is to continually improve the reliability, safety, and appearance of Postal Service vehicles while controlling maintenance costs.

II. Effective Date

This Bulletin is effective immediately upon receipt. Vehicle Maintenance Facilities (VMFs) are required to use these new guidelines for all PMIs, including those performed by contractors.

III. New Inspection Checklists

The following forms have been revised and are included in this Bulletin:

- PS Form 4546-A, *Preventive Maintenance Inspection Guidelines — Administrative Vehicles*
- PS Form 4546-B, *Preventive Maintenance Inspection Guidelines — Light Delivery Vehicles*
- PS Form 4546-C, *Preventive Maintenance Inspection Guidelines — Intermediate Delivery Vehicles*
- PS Form 4546-D, *Preventive Maintenance Inspection Guidelines — Cargo Vans*
- PS Form 4546-E, *Preventive Maintenance Inspection Guidelines — Tractors*
- PS Form 4546-F, *Preventive Maintenance Inspection Guidelines — Trailers*

Instructions for completing these forms are included in this bulletin. See the transmittal letter at the beginning of this bulletin for information on ordering these forms. Copies of these forms are included in the Appendix of this bulletin. These forms can be reproduced locally until they are received from the material distribution centers (MDCs).

IV. Levels of Inspection

These guidelines have been changed to allow for two levels of inspection: A and B. In all cases, the B level inspection is more in-depth and takes more time than the A level inspection. This two-tiered approach allows VMFs to perform the necessary level of PMI based on each vehicle's mileage and operating history. **The two levels of inspection do not impact the PMI schedule.** Vehicles still must be inspected according to the current 6-, 13-, 17-, and 26-week cycles.

V. Scheduling

VMF managers must schedule their fleet's PMIs to reflect a constant and balanced workload over a 52-week period. A and B inspections must be scheduled to balance the workload. As always, needed repairs must be made at the time of inspection. Repairs should not be postponed.

VI. Parts Replacement

Parts should be replaced on an as-needed basis and only if warranted by the results of a PMI. **Repairs must be performed immediately; they must not be put off until the next scheduled A or B service.**

VII. Emission and Brake Tests

VMFs must perform emission tests on all vehicles in accordance with all state and local regulations. At a minimum, brakes must be inspected annually. Vehicle history will indicate if more frequent inspections are required.

VIII. PMI Frequency

Each VMF manager must ensure that every vehicle's scheduled PMI frequency is set according to the following requirements:

- 500 or fewer miles per accounting period (6,500 or fewer miles per year): 26 weeks.
- 501–1,000 miles per accounting period (6,501–13,000 miles per year): 17 weeks.
- 1,001–1,500 miles per accounting period (13,001–19,500 miles per year): 13 weeks.

In addition, please note:

- All spotter tractors must be serviced every 200 hours of operation regardless of miles traveled.
- All vehicles (except for the 1992 and 1997 Mack tractors — see below) must have an oil and filter change at least every 5,000 miles. They may not be driven more than 5,000 miles between oil and filter changes.
- The 1992 and 1997 Mack tractors must have an oil and filter change every 25,000 miles or 600 hours, whichever comes first.

PMI Guidelines for Administrative Vehicles

These tools are needed to perform the PMI:

- Miscellaneous hand tools
- Spray lubricant
- Shop rags
- Flashlight
- Air pressure gauge
- Tread depth gauge
- Air chuck
- Grease gun
- Battery load tester
- Scan tool
- Engine analyzer with emission tester
- Anti-freeze test strips
- Coolant pressure tester
- Coil adapter
- Torque wrench
- Filter wrench

Explanation of Form 4546-A, *Preventive Maintenance Inspection Guidelines — Administrative Vehicles*

Fill in the vehicle number, assigned location, due date (for PMI), and the type of PMI (level A or B).

Cab Area

1. Review vehicle jackets, modification orders, and repair tags (A & B)

Prior to each preventive maintenance inspection, review the vehicle jacket to determine the nature and extent of work to be performed. Reviewing the vehicle jacket provides maintenance personnel with the vehicle's history. Compare the current mileage with the mileage at the last PMI. Examine the file to determine when items such as brake work and tune-ups were performed last. Review the vehicle records for any pending Vehicle Modification Orders and for any history of repetitive repairs. Review Forms 4565, *Vehicle Repair Tag*.

2. Road test (A & B)

Drive the vehicle and check the engine for smooth acceleration and power. Check transmission slippage and shift points. Check steering for ease of operation, wander, pulling, etc. Listen for any unusual noises. If the vehicle also is powered by compressed natural gas (CNG), perform part of the road test with the engine running on CNG.

3. Leaks, doors, and handles (A & B)

Check the operation of the doors, latches, locks, hinges, strikers, and weather seals. Inspect the handles for proper operation and security. Check the door and window seals for wear and damage.

4. Seat, belt, and interior (A & B)

Examine seat mounts, seat coverings, adjusting mechanisms, seat belts, retractors, and anchors. Check the sun visors and other inside cab components for operation and condition.

5. Key, ignition, and door key assembly (A & B)

Check the keys for cracks and signs of wear. Inspect the lock assemblies for signs of wear. Lubricate all lock assemblies with spray lubricant.

6. Buzzer and warning devices (A & B)

Ensure that all warning lights located on the dash temporarily light when the ignition key is in the "on" position. After the engine starts, ensure lights go

out. If the lights and warning devices are not working correctly, refer to the manufacturer's service manual.

7. Starter action, unusual sounds, and neutral switch (A & B)

Ensure that the engine will not crank in other than neutral or park. Note the sound of the starter operation.

8. Gauges, horn, heater, oil pressure, and mirrors (A & B)

With the car on, check the operation of all gauges. Check the horn for operation and loudness. Turn on the heater, defroster, and all other cab systems. Check the oil pressure gauge when the engine starts. If the engine is warm, note this pressure. Refer to the manufacturer's recommendations on the oil pressures for both idling and operating RPM. Examine all mirrors and mounting attachments for loose or damaged parts. Make sure the mirrors are the proper mirrors for the vehicle and that they are in good condition.

9. Accessories, glass, windshield wipers, and fan (A & B)

Operate and examine all switches and controls. Check windshield washer operation. Examine all glass for cracks, chips, or lamination separation. Check wiper arms and blades for operation and condition. Examine ventilation fan, if equipped, for operation and safety guards.

10. Steering play (A & B)

With the engine running and the wheels in a straight-ahead position, turn the steering wheel in one direction until the tires begin to turn. Note the position of the steering wheel. Turn the wheel in the other direction until the tires start to move. Total movement of the steering wheel before the wheels begin to move should not exceed 1-1/2 inches. If the play exceeds this, check for parts that are worn or out of adjustment. Enter the amount of play in inches on Form 4546-A.

11. Parking brake and foot brake test (A & B)

Check brake stopping ability and parking brake holding ability. Apply the foot brake. With the foot brake applied, apply the parking brake. Put the transmission into drive. Slowly accelerate engine to approximately 500 RPM above idle. Allow the engine to return to idle, then place the gear selector to reverse and again slowly accelerate to 500 RPM above idle. If the vehicle does not move in either direction, the parking brake is properly adjusted. If the vehicle moves, the parking brake must be adjusted. Adjust the parking brake after inspecting/servicing the rear brakes. To adjust, remove the set screw and adjust the brake. Reinstall the set screw after the adjustment.

12. Clean inside and out (A & B)

During each PMI, pressure clean the engine and chassis. Wash the vehicle before performing repairs.

Note: The estimated repair time (ERT) shown on the back of Form 4546-A was calculated assuming the use of an automatic truck washer. Add 0.3 hours if the vehicle is hand-washed and 0.2 hours for cleaning windows and inside of vehicle.

13. Lights, turn signals, and back-up lights (A & B)

Examine all lenses for cracks, deterioration, and brightness. Check all lights for proper operation.

14. Floor and underdash wiring (A & B)

Inspect the floor mats for wear and tear. Examine wiring and harnesses for chafing and for proper connection and support. Ensure that the wiring is neatly taped and secured.

15. Window, window guides, and regulator (A & B)

Test the windows and regulators to ensure they are working properly. Inspect the window guides for cracking, fraying, excessive dryness, and ease of movement.

16. Authorized cab decals and Label 70 (A & B)

Ensure that only authorized decals are present and that they are positioned properly on the dashboard for visibility. Remove any unauthorized decals. The following decals must be displayed in each vehicle:

- a. "Look Before Backing" decal.
- b. Label 70, *Safety Check and Vehicle Dimensions*.

17. General paint and body condition (A & B)

Inspect all painted surfaces for deterioration and condition. Repaint vehicles on an as-needed basis, as determined by the Manager, Vehicle Maintenance. Do not delay any wear and tear repairs, painting, or accident-caused body work.

18. Wax vehicle (B only)

Wax the vehicle at least once a year. The estimated time to wax the vehicle is 1 hour. Add this as a line item on the work order.

19. Reserved

20. Reserved

Circle Inspection

21. Tire inflation (A & B)

Examine condition of all tires for damage, wear, and proper inflation. If a tire is 10 PSI or more low, investigate the cause for the loss of air pressure and

make corrections. Use a valve cap. Ensure that tire pressure decals are the correct ones for the vehicle and are positioned properly. Refer to Poster 49, *Tire Pressure Chart*, for a list of proper tire pressures.

22. Lug nuts, wheels, hubs, and alignment (A & B)

Inspect lug nuts, wheels, and hubs for tightness and elongation around holes. Check wheels and rims for cracks, straightness, missing lug nuts, and broken studs. Use a torque wrench to retorque the lug nuts. Visually inspect the front tires. Where there are signs of unusual tire wear, investigate the cause of the wear problems. Balance front tires and align front end when indicated by uneven wear or abnormal steering conditions.

23. Tire probe, condition, and tread depths (A & B)

Probe tires and remove foreign objects such as nails or glass. Check all tire tread depths. Replace a tire if the tread is less than 2/32 inch or if winter conditions are a factor. Record tread depth for each tire in the spaces provided on Form 4546-A.

24. Bumpers, reflectors, and lenses (A & B)

Examine bumpers, reflectors, and lenses for damage or environmental deterioration.

25. Logos, markings, posters, and beltline (A & B)

Check exterior markings and decals to ensure they are not faded, scratched, torn, or missing and that they are positioned properly. Update decals as needed. Check the beltline and vehicle numbers in the same manner. Review Publication 500-G, *Vehicle Guidelines*, for more information on vehicle markings.

26. Interior condition, floors, and roof (A & B)

Check the condition of the interior, including floors, seats, and headliner. Inspect the roof and side panels for holes, signs of leaks, or other damage.

27. Fuel cap, door, and filler neck (A & B)

Remove the filler cap and inspect the cap, seal, and retaining chain, if equipped. Check the integrity of the "no leaded fuel" nozzle restrictor in the fuel filler pipe. Ensure that the restrictor has not been removed or enlarged. The hole must be small enough to prevent the entry of a leaded fuel nozzle. In some states a special tool must be used for this test. Inspect and lubricate the door hinge and spring.

28. Accident kit (A & B)

Ensure that the forms compartment contains Item 087-H, Accident Report Kit, and the vehicle's operator's manual. Remove all other debris from the forms compartment.

29. Accident damage (list on diagram) (A & B)

During each PMI, maintenance employees must inspect the vehicle for accident damage, report any damage to their supervisor, and indicate damage on the diagram on the reverse of Form 4546-A. Do not defer repairs of accident damage to a later date. Prepare a separate work order and code it as an accident.

30. Reserved**31. Reserved****32. Reserved****33. Reserved****Underneath Inspection/Lube****34. Fluid leaks and engine mounts (A & B)**

Before changing the engine oil, inspect the engine and transmission for fluid leaks. Check the radiator for leaks. Inspect lower radiator hose for condition and leaks. Examine motor mounts for deterioration and fatigue.

35. Change oil, filter, and lubricate (A & B)

Change engine oil and filter during each PMI. Clean all fittings, perform complete lubrication, and check **fluid levels and condition in accordance with all items as shown on the lubrication chart**. Write the lube, oil, and filter as a line item on Form 4543, *Vehicle Maintenance Work Order*.

Note: If the lubrication is performed by someone other than the person doing the PMI, subtract 0.3 hours from PMI ERT.

36. Steering, tie rods, and arms (A & B)

Check steering column, shaft assembly, and steering gear for any deficiency or looseness. Examine all steering linkages and arms for wear, looseness, or damage. Check steering damper for proper mounting and operation. Rotate components and check for end play. Examine ball joints/kingpins for excessive wear or for excessive resistance to turning front wheels. Check the condition of the ball joints and other steering components. Lubricate the tie rods and other steering components. Inspect the power steering hoses and connections to ensure the hoses are not rubbing, leaking, or deteriorating.

37. Brake linings (B only)

Remove all wheels to inspect brake assemblies, linings, and drums. Record the findings in the spaces provided on Form 4546-A. Check all applicable brake components for leaks. Check the wear rate of the shoes and compare the shoes to new shoes. For example, brake linings that have 4/32 inch remaining are not worn out if the vehicle has gone three or four inspections since the brakes were new. The original amount of shoe may have only been

8/32 inch. The inspector must balance brake safety against the risk of throwing away good lining material. Brake linings with less than 2/32 inch must be replaced. Inspect the parking brake cables to make sure they are operating properly, secure, and not frayed.

The B PMI ERT includes the time for the brake inspection. If the brakes need to be inspected during an A PMI, the inspection time must be written as a line item on Form 4543, *Vehicle Maintenance Work Order*. The estimated time to perform this brake inspection on an administrative vehicle is 0.5 hours, which includes the time to clean, inspect, and adjust all brakes.

38. Bearing play and condition (A & B)

Check the wheel bearing for excessive play. Adjust if necessary. If the vehicle has been driven 25,000 miles since the last front wheel bearing service or if operating conditions warrant (operation in hub-deep water, etc.), clean and pack the front wheel bearings and replace seals. Always service bearings when performing brake service.

39. Suspension, springs, shocks, and hangers (A & B)

Examine all spring hangers, shackles, and bushings for wear. Check for sagging or broken spring leaves or broken center bolts. Inspect the condition of the stabilizer bar. Check tightness of spring U-bolts. Examine shock absorbers for leaks, damage, or worn grommets. On front wheel drive vehicles, inspect the McPherson suspension system.

40. Transmission and mountings (A & B)

Check transmission fluid level and condition. Service transmissions only to correct a deficiency or if transmission fluid smells burned or contains metal or friction material particles. If fluid level is adequate and is not burned or contaminated, do not service. If doubtful about fluid condition, drain out a sample for closer examination. Examine transmission mounts for deterioration. Check the transmission cooler lines to make sure they are not rubbing against any other components. Inspect the speedometer cable and attachment. Ensure there are no kinks or leaks and that the cable bends smoothly and is protected from possible damage.

41. Exhaust systems, converter, and muffler (A & B)

Examine complete exhaust system for leaks, damage, or loose hangers. Examine catalytic converter for evidence of overheating.

42. Driveline, alignment, and condition (A & B)

Examine propeller shaft, universal joints, carrier bearing, and slip joint for wear or damage. If vehicle has front wheel drive, inspect the condition of the drive axles, CV joints, and CV boots.

43. Differential and breather (A & B)

Check the differential fluid level and check for leaks. Fill as necessary. Check the breather hose for restrictions and for proper operation.

44. Undercoating condition (A & B)

Inspect the condition of the undercoating. Touch up the undercoating annually to ensure a long life cycle for postal vehicles. After accident repairs are made, reapply rustproofing.

45. Reserved**46. Reserved****47. Reserved****48. Reserved****Engine Compartment Area****49. Engine compartment (A & B)**

Raise hood and examine and lubricate hood latches, hinges, and hood support. Fill windshield washer reservoir and check the level of the brake master cylinder.

50. Antifreeze protection level (A & B)

Before removing the radiator overflow tank cap, squeeze the hoses to see if the system is pressurized or hot. Carefully remove the radiator cap and check the seal. Inspect the fluid level. Test coolant mixture for freeze protection with a refractometer or test strip. Add quantities as necessary to maintain a solution of 50% antifreeze and 50% water. Record the protection level in the space provided on Form 4546-A.

51. Alkalinity protection (A & B)

Test corrosion resistant properties of the coolant with a coolant test strip. If test results are unsatisfactory, drain, flush, and refill cooling system with a solution of 50% antifreeze and 50% water.

52. Replace or recycle coolant as required (A & B)

Replace or recycle coolant as required by the type of coolant used. The service requirement might differ between coolant manufacturers. Refer to the coolant manufacturer's recommendations concerning the change or recycle interval.

53. Radiator, hoses, and leaks (A & B)

Pressure test complete cooling system. Examine all hoses and connections for leaks or wear. Inspect water pump. Replace hoses as needed.

54. Belts and pulleys (A & B)

Check all belts for condition, alignment, and proper tension. When adjusting belts, use a belt tension gauge. Inspect all pulleys for alignment and condition.

55. Alternator and power steering (A & B)

Check alternator terminal connections and mounting. Check the fluid level of the power steering pump. Ensure there are no leaks.

56. Fuel lines, fuel system, and linkage (A & B)

Inspect fuel lines for routing and leaks. Inspect carburetor or fuel injection system linkage and lubricate as needed.

57. Fuel filter, air filter, and PCV filter (A & B)

Replace fuel filter, air filter, charcoal canister filter (if applicable), and PCV filters as necessary or when indicated by mileage, age, or condition.

58. Clean battery post and cables (A & B)

Clean battery posts and cables. Clean the terminals with a wire brush. If very corroded, clean the area with a solution of baking soda and water. Apply protective spray to the cleaned terminals. Make sure the battery posts bolts are properly tightened.

59. Battery box and hold-downs (A & B)

Examine battery box for signs of corrosion. Clean and paint box if needed. Check hold-downs for looseness and tighten if needed.

60. Wiring and hoses (A & B)

Check for proper routing of all wiring and hoses, including electrical wiring and fuel hoses. Make sure that these components are not rubbing against each other or any other metal surface.

61. Battery load test (A & B)

Perform a battery load test using a volt amp tester (Sun VAT 60 or similar equipment). Record the results in the space provided on Form 4546-A.

62. Starter cranking test (A & B)

Perform a starter cranking test using a volt amp tester (Sun VAT 60 or similar equipment). Record the results in the space provided on Form 4546-A.

63. Alternator output test (A & B)

Perform an alternator output test using a volt amp tester (Sun VAT 60 or similar equipment). Record the results in the space provided on Form 4546-A.

64. Regulator voltage (A & B)

Perform a regulator test using a volt amp tester (Sun VAT 60 or similar equipment). Record the results in the space provided on Form 4546-A.

65. Emission control systems (B only)

The vehicle emissions inspection/maintenance (I/M) program tests the emission system. Follow the step-by-step procedure as outlined.

Note: It is unlawful to modify or render inoperative any emission control devices or to allow a vehicle to operate if the vehicle fails this test.

The I/M program is divided into three sections — the visual inspection, the emissions inspection, and the functional inspection. The first portion involves a thorough check of the vehicle to ensure that critical emission control components are present and operational. The second procedure tests the exhaust emissions from the tailpipe. The functional testing verifies that certain equipment is operating to Original Equipment Manufacturers (OEM) standards.

During the I/M inspection, use the vehicle's service maintenance manual. Some states also require that specific emissions manuals must be available during the testing procedure for referencing the various specifications applicable to different vehicles.

Many electronic analyzers will prompt you automatically for answers to questions as well as the next steps to be taken in testing. During the testing, all the information is recorded into the analyzer. When all the procedures have been completed, print the results from the analyzer and staple the printout to the work order as part of the permanent record.

A. Visual Inspection

1. Positive crankcase ventilation (PCV) system

Examine all the PCV hoses, connections, and grommets for deterioration. Replace valve if necessary.

2. The thermostatic air cleaner

Inspect system to ensure all hoses and the heat stove tube are connected. Check for kinked, plugged, or deteriorated hoses. Check for the presence and condition of the gasket seal between the air cleaner and the throttle. With air cleaner assembly installed, the damper door should be open to outside air. Start the engine, and watch the damper door in air cleaner snorkel. When the engine is first started, the damper door should move and close off outside air. As the air cleaner warms up, the damper door should open slowly to outside air. If the air cleaner fails to operate as described above, perform a vacuum motor check. If it operates, the door may not be moving at the right temperature. If a driveability problem occurs during warm-up, perform a temperature sensor check.

3. Evaporative emission control system

Check operation of the total system. Replace vapor canister if it is damaged or if fuel is leaking from the bottom. Replace filter at the bottom of the

canister. If a fuel tank filler cap requires replacement, use only a cap with the same Original Equipment Manufacturers (OEM) features. Failure to use the correct cap can result in a malfunctioning system. Check the condition of fuel lines, hoses, and connections.

4. Catalytic converter

Examine all connections for signs of leaking exhaust.

5. Exhaust gas recirculation (EGR) system

Ensure the solenoid is in good condition and not stuck open. Check that the vacuum hose is connected to the valve.

6. Fuel injection, sensors, and connectors

Inspect the wiring and connections to all fuel injectors, sensors, switches, and to the electronic control module. Check that all connectors are properly fastened and the system has not been modified.

After all items have been located and passed the visual inspection, proceed to the tail pipe emission section of the test. If any of the visual items did not pass, repair all items before performing the tail pipe emission test.

B. Tail Pipe Emission Section

Below are guidelines for performing and recording engine analysis and emission test results for the vehicles. Use these instructions to complete items for each type of vehicle. All emission readings must be taken at 2500 RPM and then retested at idle. Record the results in the spaces provided on Form 4546-A.

The engine must be at *normal operating temperature* while performing the tail pipe test. Turn off all accessories. Put the vehicle in park or neutral. Secure the emergency brake and insert wheel chocks or raise the drive axle(s) off the ground. Pre-condition the vehicle by running the vehicle for 4 minutes at 2,000 RPM. Turn the engine off.

Connect the vehicle to an engine analyzer and an infrared four gas exhaust analyzer and computer scanner for a careful examination of basic engine, ignition, fuel, and exhaust emission systems. Restart the engine and verify that it is being operated in closed loop.

The tester will measure the emissions of four gases: carbon monoxide (CO), carbon dioxide (CO₂), hydrocarbon (HC), and oxygen (O₂). Run the engine at 2250 to 2750 RPM for 30 consecutive seconds. Record the readings in the space provided on Form 4546-A. Run the engine at idle (between 400 and 1010 RPM) for 30 consecutive seconds. Record the readings in the space provided on Form 4546-A. If the basic engine and ignition conditions are within specifications and the CO, CO₂, HC, O₂, and scan data meet OEM specifications, do not perform any further tune-up repairs.

However, if a problem is indicated in the basic engine, ignition, or fuel emission system, or if serial data are not within specifications, perform a complete engine analysis and make repairs as necessary. List the results and repairs on Form 4546-A.

C. Functional Test

1. Fuel fill pipe leaded gas nozzle restrictor

Insert the dowel into the gas tank filler neck. The dowel must not fit into the fill pipe.

2. EGR System

This check has many variables. Refer to the vehicle's emissions or service manual for the proper procedure.

Begin by determining which EGR system is being used. There are three types of EGR valves: standard, positive back pressure, and negative back pressure. Knowing the type of valve is very important, since the testing procedures are different for each valve. To find out which valve is on the vehicle being tested, use the shop manual identification code, then visually check the number on the valve itself.

3. Park/Neutral Switch

On vehicles equipped with automatic transmissions, test the park/neutral switch using a hand-held "Scan" tool.

D. Ignition Timing

Because of the many types of vehicles in the administration fleet, follow the procedure on the underhood emissions label to check timing. Before checking timing, start the engine and verify that the "check engine" light is not on. If the light is on, a code is stored in the Electronic Control Module (ECM) memory, and the emission system needs to be serviced.

E. Check Engine Light Test

The final function test is on the emission control "check engine" or system malfunction light/indicator.

Turn the ignition key to the "on" position; the "check engine" light should come on. Turn the ignition key to the "off" position; the light should go off. Start the engine. The "check engine" light should be off when the engine is started and running.

The I/M testing procedure is now complete. If the vehicle fails any part of the testing, it must be repaired and then retested. After the test is complete, print one copy of the vehicle inspection report (VIR). Sign it and staple it to the work order and Form 4546-A.

The I/M test procedures must be followed for all administrative vehicles, *including those powered by compressed natural gas (CNG)*. Procedures may vary depending on the type of vehicle being tested. Persons performing emissions tests should refer to that vehicle's service manual. In some states, vehicles may be subjected to further testing at a centralized state test facility. Local management must ensure that all state-required tests are performed.

If vehicle is CNG powered, go to step 68.

66. List all repair actions on Form 4541 or 4543 (A & B)

List all repair actions on Form 4541, *Order Invoice for Vehicle Repair*, or Form 4543, *Vehicle Maintenance Work Order*. Schedule work generated by the PMI.

67. Quality assurance road test (A & B)

After the required repairs have been completed, drive the vehicle and check engine for acceleration, smoothness, and power. Check transmission shift pattern. Check steering for ease of operation, wander, pulling, etc. Listen for any unusual noises. Check brake stopping ability and parking brake holding ability. Before the vehicle is released for service, ensure that seat, seatbelt, steering wheel, and shift lever are clean.

When the quality assurance road test is satisfactorily completed, enter the work order number and odometer reading in the spaces provided at the bottom of Form 4546-A. Sign and date the form. Return the vehicle to service.

Compressed Natural Gas (CNG) Vehicles

Cab Area

68. Fill valve and starter interrupt switch (A & B)

Check the condition of the fill valve and dust cover. On some CNG systems, the dust cap must be in place to engage the starter. Ensure that the interrupt switch is operating properly. Some models of CNG systems have a filter located in the fill line. If the vehicle is equipped with this filter, service the filter during each PMI. See the vehicle's service manual for proper servicing procedures. Check all components and connections for leaks using a non-ammonia soap solution and an electronic leak detector. It is important that all connections be checked for leaks during the PMI. Repair all leaks.

69. Warning lights and engine operation (A & B)

Start the engine. With the engine running on CNG, check the operation of the engine. All CNG vehicles have a light on the dash to inform the driver what fuel the engine is operating on. Check the operation of this light. Check the operation of the engine hour meters for both CNG and gasoline.

70. Wiring (A & B)

Examine all wiring for chafing and for proper connection to the CNG computer and vehicle computer.

71. CNG labels (A & B)

Inspect the vehicle to ensure that the CNG labels (blue diamond) are properly positioned on the vehicle. Refer to Publication 500-G, *Vehicle Guidelines*, for proper location of decals. Inspect the manual shut off label, which is located near the shut off valve.

Engine Compartment**72. CNG labels (A & B)**

Check the condition of the CNG label, which must be located in the engine compartment area. Verify that the label identifies the system manufacturer, operating pressure, installation date, and tank expiration date or recertification date. Vehicles operated in California must also have a Bureau of Automotive Repair (BAR) emission label.

73. CNG components (A & B)

Check all CNG components. Check for proper operation of the system. Refer to the vehicle's service manual.

74. Emission control systems (B only)

With the vehicle running on CNG, recheck the tail pipe gases according to the procedures outlined in item 65. Record the emission control systems results in the spaces provided on Form 4546-A. Compare the gasoline and CNG emissions readings. If the two sets of readings differ a great deal, recheck the engine operation.

Underneath Inspection**75. Leak checks (A & B)**

Check all components and connections for leaks using a non-ammonia soap solution or a methane detector. It is important that all connections be checked for leaks during the PMI. Repair all leaks.

76. Fuel tank (A&B)

Check the fuel tank mountings. Check all bolts for tightness and torque if necessary. Inspect the tank for corrosion, cuts, dents, or bulges. Damage to tanks must not exceed the tank manufacturer's criteria. Inspect the condition of the CNG tank's fiber covering. The tank must not have any exposed metal surfaces. Make sure that the tank is not rubbing against any components. Ensure that the DOT label is on the tank and is readable, and review the expiration date to see when the tank was last certified. Fuel tanks must be removed every 3 years to be hydrostatically pressure tested by a certified testing facility. Acoustic tank testing may be substituted for the hydrostatic pressure test. This test is done with the tank mounted on the vehicle. NGV-2 tanks have a 15-year life from the date of manufacture and do not require recertification.

77. Lines, valves, and regulators (A & B)

Check the condition of all lines. Make sure they are not rubbing against any other components. Ensure that the brake cable is not rubbing against the fuel tank or brackets. Inspect the lines and valves for proper attachment. Ensure that there are no kinks and that the lines are protected from damage. Inspect the valve condition and the operation of the manual shut-off valve. Ensure that the shut-off valve is properly labeled. Inspect the regulators for damage. On some systems the regulators have a filter inside; service that filter during B PMIs. Refer to the vehicle's service manual for proper procedures.

78. Reserved**79. Reserved**

When the CNG inspection is complete, return to Line 66.

Note:

Estimated inspection times for administrative vehicles:

	Estimated Inspection Time (hours)
Level A	1.5
Level A with CNG	2.0
Level B	2.0
Level B with CNG	2.5

PMI Guidelines for Light Delivery Vehicles

These tools are needed to perform the PMI:

- Miscellaneous hand tools
- Spray lubricant
- Shop rags
- Flashlight
- Air pressure gauge
- Tread depth gauge
- Air chuck
- Grease gun
- Battery load tester
- Scan tool
- Engine analyzer with emission tester
- Anti-freeze test strips
- Coolant pressure tester
- Coil adapter
- Torque wrench
- Oil filter wrench

Explanation of Form 4546-B, *Preventive Maintenance Inspection Guidelines* — *Light Delivery Vehicles*

Fill in the vehicle number, assigned location, due date (for PMI), and the type of PMI (level A or B).

Cab Area

1. Review vehicle jacket, modification orders, and repair tags (A & B)

Prior to each preventive maintenance inspection, review the vehicle jacket to determine the nature and extent of work to be performed. Reviewing the vehicle jacket provides maintenance personnel with the vehicle's history. Compare the current mileage with the mileage at the last PMI. Examine the file to determine when items such as brake work and tune-ups were performed last. Review the vehicle records for any pending Vehicle Modification Orders and for any history of repetitive repairs. Review Forms 4565, *Vehicle Repair Tag*.

2. Road test (A & B)

Drive the vehicle and check the engine for smooth acceleration and power. Check transmission slippage and shift points. Check steering for ease of operation, wander, pulling, etc. Listen for any unusual noises. If the vehicle also is powered by compressed natural gas (CNG), perform part of the road test with the engine running on CNG.

3. Leaks, doors, handles, and steps (A & B)

Check the operation of the doors, tracks, latches, locks, hinges, and strikers. Check door rails, rollers, and weather seals. Inspect the handles for proper operation and security. Check the door and window seals for wear and damage. Check the condition of steps and step wells.

4. Seat, belt, and interior (A & B)

Examine seat mounts, seat coverings, adjusting mechanisms, seat belts, retractors, and anchors. Check the sun visors and other inside cab components for operation and condition.

5. Key, ignition, and door key assembly (A & B)

Check the keys for cracks and signs of wear. Inspect the lock assemblies for signs of wear. Lubricate all lock assemblies with spray lubricant.

6. Buzzer and warning devices (A & B)

Ensure that all warning lights located on the dash temporarily light when the ignition key is in the "on" position. After the engine starts, ensure the lights go

out. If the lights and warning devices are not working correctly, refer to the manufacturer's service manual.

7. Starter action, unusual sounds, and neutral switch (A & B)

Ensure that the engine will not crank except in neutral or park. Note the sound of the starter operation. Remove the shift lever and inspect the condition of the lever. Replace lever if worn.

8. Gauges, horn, heater, oil pressure, and mirrors (A & B)

With the car on, check the operation of all gauges. Check the horn for operation and loudness. Turn on the heater, defroster, and all other cab systems. Check the oil pressure gauge when the engine starts. If the engine is warm, note this pressure. Refer to the manufacturer's recommendations on the oil pressures for both idling and operating RPM. Examine all mirrors and mounting attachments for loose or damaged parts. Make sure that the mirrors are the proper mirrors for the vehicle and that they are in good condition.

9. Accessories, glass, windshield wipers, and fan (A & B)

Operate and examine all switches and controls. Check windshield washer operation. Examine all glass for cracks, chips, or lamination separation. Check wiper arms and blades for operation and condition. Examine ventilation fan (if applicable) for operation and safety guards.

10. Steering play (A & B)

With the engine running and the wheels in a straight-ahead position, turn the steering wheel in one direction until the tires begin to pivot. Note the position of the steering wheel. Turn the wheel in the other direction until the tires start to move. Total movement of the steering wheel before the wheels begin to move should not exceed 1-1/2 inches. If the play exceeds this, check for parts that are worn or out of adjustment. Enter the amount of play in inches on Form 4546-B.

11. Parking brake and foot brake test (A & B)

Check brake stopping ability and parking brake holding ability. Apply the foot brake. With the foot brake applied, apply the parking brake. Put the transmission into drive. Slowly accelerate engine to approximately 500 RPM above idle. Allow the engine to return to idle, then place the gear selector to reverse and again slowly accelerate to 500 RPM above idle. If the vehicle does not move in either direction, the parking brake is properly adjusted. If the vehicle moves, the parking brake must be adjusted. Adjust the parking brake after inspecting/servicing the rear brakes. To adjust, remove the set screw and adjust the brake. Reinstall the set screw after the adjustment.

12. Clean inside and out (A & B)

During each PMI, pressure clean the engine and chassis. Wash the vehicle before performing repairs. Take extreme precautions when washing inside of vehicles.

Note: The estimated repair time (ERT) shown on the back of Form 4546-B was calculated assuming the use of an automatic truck washer. Add 0.3 hours if the vehicle is hand-washed and 0.2 hours for cleaning windows and inside of vehicle.

13. Lights, turn signals, and back-up lights (A & B)

Examine all lenses for cracks, deterioration, and brightness. Check all lights for proper operation.

14. Floor and underdash wiring (A & B)

Inspect the floor mats for wear and tear. Examine wiring and harnesses for chafing and for proper connection and support. Ensure that the wiring is neatly taped and secured.

15. Mail tray and brackets (A & B)

Check the mail tray slide mechanism for proper operation. Ensure that the brackets and bolts are secure. Inspect supports for cracks.

16. Window, window locks, regulator, and door slides (A & B)

Test the windows and regulators to ensure they are working properly. Inspect the window guides and locks for proper operation.

17. Authorized cab decals and Label 70 (A & B)

Ensure that only authorized decals are present and that they are positioned properly on the dashboard for visibility. Remove any unauthorized decals. The following decals must be displayed in each vehicle:

- a. "Look Before Backing" decal.
- b. Label 70, *Safety Check and Vehicle Dimensions*.
- c. In a 1/4 ton AMG, Label 126, *Owner-Driver Caution*, must be riveted to the dash.

18. General paint and body condition (A & B)

Inspect all painted surfaces for deterioration and condition. Repaint vehicles on an as-needed basis, as determined by the Manager, Vehicle Maintenance. Do not delay any wear and tear repairs, painting, or accident-caused body work.

19. Wax vehicle (B only)

Wax the vehicle at least once a year. The estimated time to wax the vehicle is 1 hour. Add this as a line item on the work order.

20. Reserved**Circle Inspection****21. Tire inflation (A & B)**

Examine condition of all tires for damage, wear, and proper inflation. If a tire is 10 PSI or more low, investigate the cause for the loss of air pressure and make corrections. Use a valve cap. Ensure that tire pressure decals are the correct ones for the vehicle and are positioned properly. Refer to Poster 49, *Tire Pressure Chart*, for a list of proper tire pressures.

22. Lug nuts, wheels, hubs, and alignment (A & B)

Inspect lug nuts, wheels, and hubs for tightness and elongation around holes. Check wheels and rims for cracks, straightness, missing lug nuts, and broken studs. Use a torque wrench to retorque the lug nuts. Visually inspect the front tires. Where there are signs of unusual tire wear, investigate the cause of the wear problems. Balance front tires and align front end when indicated by uneven wear or abnormal steering conditions.

23. Tire probe, condition, and tread depths (A & B)

Probe tires and remove foreign objects such as nails or glass. Check all tire tread depths. Replace a tire if the tread is less than 2/32 inch or if winter conditions are a factor. Record tread depth for each tire in the spaces provided on Form 4546-B.

24. Bumpers, reflectors, lenses, and mud flaps (A & B)

Examine bumpers, reflectors, and lenses for damage or environmental deterioration. Examine condition of mud flaps and mounting for damage.

25. Logos, markings, posters, and beltline (A & B)

Check exterior markings and decals to ensure they are not faded, scratched, torn, or missing and that they are positioned properly. Update decals as needed. Check the beltline and vehicle numbers in the same manner. Review Fleet Management Bulletin V-18-94 for more information on vehicle markings.

26. Rear door security and condition (A & B)

Check the rear door lock for proper operation and security. Inspect the overhead door pull-down strap and door seals.

27. Interior condition, cargo door, floors, and roof (A & B)

Inspect the cargo light. With the rear door pulled down, inspect the roof and side panels for holes, signs of leaks, or other damage. Inspect and lube rear door spring assembly, cable, rollers, door hinges, and other moving parts. Operate and lube the cargo vent hardware. Check the partition door for proper operation.

28. Cargo restraining devices (A & B)

Check the "E" tracks. Ensure no bolts are loose or missing from the tracks. Inspect the track slots for cracks and wear.

29. Fuel cap, door, and filler neck (A & B)

Remove the filler cap and inspect the cap, seal, and retaining chain, if equipped. Check the integrity of the "no leaded fuel" nozzle restrictor in the fuel filler pipe. Ensure that the restrictor has not been removed or enlarged. The hole must be small enough to prevent the entry of a leaded-fuel nozzle. In some states a special tool must be used for this test. Inspect and lubricate the door hinge and spring.

30. Accident kit (A & B)

Ensure that the forms compartment contains Item 087-H, Accident Report Kit, and the vehicle's operator's manual. Remove all other debris from the forms compartment.

31. Accident damage (list on diagram) (A & B)

During each PMI, maintenance employees must inspect the vehicle for accident damage, report any damage to their supervisor, and indicate damage on the diagram on the reverse of Form 4546-B. Do not defer repairs of accident damage to a later date. Prepare a separate work order and code it as an accident.

32. Reserved**33. Reserved****Underneath Inspection/Lube****34. Fluid leaks and engine mounts (A & B)**

Before changing the engine oil, inspect the engine and transmission for fluid leaks. Check the radiator for leaks. Inspect lower radiator hose for condition and leaks. Examine motor mounts for deterioration and fatigue.

35. Change oil, filter, and lubricate (A & B)

Change engine oil and filter during each PMI. Clean all fittings, perform complete lubrication, and check **fluid levels and condition in accordance with all items as shown on the manufacturer's lubrication chart**. Write

the lube, oil, and filter as a line item on Form 4543, *Vehicle Maintenance Work Order*.

Note: If the lubrication is performed by someone other than the person doing the PMI, subtract 0.3 hours from PMI ERT.

36. Steering, tie rods, and arms (A & B)

Check steering column, shaft assembly, and steering gear for any deficiency or looseness. Examine all steering linkage and arms for wear, looseness, or damage. Check steering damper for proper mounting and operation. Rotate components and check for end play. Examine ball joints/kingpins for excessive wear or for excessive resistance to turning front wheels. Check the condition of the ball joints and other steering components. Lubricate the tie rods and other steering components. Inspect the power steering hoses and connections to ensure the hoses are not rubbing, leaking, or deteriorating.

37. Brake linings (B only)

Remove all wheels to inspect brake assemblies, linings, and drums. Record the findings in the spaces provided on Form 4546-B. Check all applicable brake components for leaks. Check the wear rate of the shoes and compare the shoes to new shoes. For example, brake linings that have 4/32 inch remaining are not worn out if the vehicle has gone three or four inspections since the brakes were new. The original amount of shoe may have been only 8/32 inch. The inspector must balance brake safety against the risk of throwing away good lining material. Brake linings with less than 2/32 inch must be replaced. Inspect the parking brake cables to make sure they are operating properly, secure, and not frayed.

The B PMI ERT includes the time for the brake inspection. If the brakes need to be inspected during an A PMI, the inspection time must be written as a line item on Form 4543, *Vehicle Maintenance Work Order*. The estimated time to perform this brake inspection on a light delivery vehicle is 0.5 hours, which includes time to clean, inspect, and adjust all brakes.

38. Bearing play and condition (A & B)

Check the wheel bearing for excessive play. Adjust if necessary. If the vehicle has been driven 25,000 miles since the last front wheel bearing service or if operating conditions warrant (operation in hub-deep water, etc.), clean and pack the front wheel bearings and replace seals. Always service bearings when performing brake service.

39. Suspension, springs, shocks, and hangers (A & B)

Examine all spring hangers, shackles, and bushings for wear. Check for sagging or broken spring leaves or broken center bolts. Inspect the condition of the stabilizer bar. Check tightness of spring U-bolts. Examine shock absorbers for leaks, damage, or worn grommets.

40. Transmission and mountings (A & B)

Check transmission fluid level and condition. Service transmissions only to correct a deficiency or if transmission fluid smells burned or contains metal or friction material particles. If fluid level is adequate and is not burned or contaminated, do not service. If doubtful about fluid condition, drain out a sample for closer examination. Examine transmission mounts for deterioration. Check the transmission cooler lines to make sure they are not rubbing against any other components. Inspect the speedometer cable and attachment. Ensure there are no kinks or leaks and that the cable bends smoothly and is protected from damage.

41. Exhaust systems, converter, and muffler (A & B)

Examine complete exhaust system for leaks, damage, or loose hangers. Examine catalytic converter for evidence of overheating.

42. Driveline, alignment, and condition (A & B)

Examine propeller shaft, universal joints, carrier bearing, and slip joint for wear or damage.

43. Body hold downs, hoses, and wires (A & B)

Inspect the vehicle body hold downs to make sure they are intact and tight. Ensure that all hoses and wires are properly secured to the chassis.

44. Differential and breather (A & B)

Check the differential fluid level and check for leaks. Fill as necessary. Check the breather hose for restrictions and for proper operation.

45. Undercoating condition (A & B)

Inspect the condition of the undercoating. Touch up the undercoating annually to ensure the long life cycle for postal vehicles. After accident repairs are made, reapply rustproofing.

46. Reserved**47. Reserved****48. Reserved****Engine Compartment Area****49. Engine compartment (A & B)**

Raise hood and examine and lubricate hood latches, hinges, and hood support. Fill windshield washer reservoir and check the level of the brake master cylinder.

50. Antifreeze protection level (A & B)

Before removing the radiator overflow tank cap, squeeze the hoses to see if the system is pressurized or hot. Carefully remove the radiator cap and check the seal. Inspect the fluid level. Test coolant mixture for freeze protection with a refractometer or test strip. Add quantities as necessary to maintain a solution of 50% antifreeze and 50% water. Record the protection level in the space provided on Form 4546-B.

51. Alkalinity protection (A & B)

Test corrosion resistant properties of the coolant with a coolant test strip. If test results are unsatisfactory, drain, flush, and refill cooling system with a solution of 50% antifreeze and 50% water.

52. Replace or recycle coolant as required (A & B)

Replace or recycle coolant as required by the type of coolant used. The service requirement might differ between coolant manufacturers. Refer to the coolant manufacturer's recommendations concerning the change or recycle interval.

53. Radiator, hoses, and leaks (A & B)

Pressure test complete cooling system. Examine all hoses and connections for leaks or wear. Inspect water pump. Replace hoses as needed.

54. Belts and pulleys (A & B)

Check all belts for condition, alignment, and proper tension. When adjusting belts, use a belt tension gauge. Inspect all pulleys for alignment and condition.

55. Alternator and power steering (A & B)

Check alternator terminal connections and mounting. Check the fluid level of the power steering pump. Ensure there are no leaks.

56. Fuel lines, fuel system, and linkage (A & B)

Inspect fuel lines for routing and leaks. Inspect carburetor or fuel injection system linkage and lubricate as needed.

57. Fuel filter, air filter, and PCV filter (A & B)

Replace fuel filter, air filter, charcoal canister filter (if applicable), and PCV filters as necessary or when indicated by mileage, age, or condition.

58. Clean battery post and cables (A & B)

Clean battery posts and cables. Clean the terminals with a wire brush. If very corroded, clean the area with a solution of baking soda and water. Apply protective spray to the cleaned terminals. Make sure the battery posts bolts are properly tightened.

59. Battery box and hold-downs (A & B)

Examine battery box for signs of corrosion. Clean and paint box if needed. Check hold-downs for looseness and tighten if needed.

60. Wiring and hoses (A & B)

Check for proper routing of all wiring and hoses, including electrical wiring and fuel hoses. Ensure that these components are not rubbing against each other or any other metal surface.

61. Battery load test (A & B)

Perform a battery load test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-B.

62. Starter cranking test (A & B)

Perform a starter cranking test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-B.

63. Alternator output test (A & B)

Perform an alternator output test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-B.

64. Regulator voltage (A & B)

Perform a regulator test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-B.

65. Emission control systems (B only)

The vehicle emissions inspection/maintenance (I/M) program tests the emission system. Follow the step-by-step procedure as outlined.

Note: It is unlawful to modify or render inoperative any emission control device or to allow a vehicle to operate if the vehicle fails this test.

The I/M program is divided into three sections—the visual inspection, the emissions inspection, and the functional inspection. The first portion involves a thorough check of the vehicle to ensure that critical emission control components are present and operational. The second procedure tests the exhaust emissions from the tailpipe. The functional testing verifies that certain equipment is operating to Original Equipment Manufacturers (OEM) standards.

During the I/M inspection, use the vehicle's service maintenance manual. Some states also require that specific emissions manuals must be available during the testing procedure for referencing the various specifications applicable to different vehicles.

Many electronic analyzers will prompt you automatically for answers to questions as well as the next steps to be taken in testing. During the testing, all the information is recorded into the analyzer. When all the procedures

have been completed, print the results from the analyzer and staple the printout to the work order as part of the permanent record.

A. Visual Inspection

1. Positive crankcase ventilation (PCV) system

Examine all the PCV hoses, connections, and grommets for deterioration. Replace valve if necessary.

2. The thermostatic air cleaner

Inspect system to ensure all hoses and the heat stove tube are connected. Check for kinked, plugged, or deteriorated hoses. Check for the presence and condition of the gasket seal between the air cleaner and the throttle. With air cleaner assembly installed, the damper door should be open to outside air. Start the engine, and watch the damper door in air cleaner snorkel. When the engine is first started, the damper door should move and close off outside air. As the air cleaner warms up, the damper door should open slowly to outside air. If the air cleaner fails to operate as described above, perform a vacuum motor check. If it operates, the door may not be moving at the right temperature. If a driveability problem occurs during warm-up, perform a temperature sensor check.

3. Evaporative emission control system

Check operation of the total system. Replace vapor canister if it is damaged or if fuel is leaking from the bottom. Replace filter at the bottom of the canister. If a fuel tank filler cap requires replacement, use only a cap with the same Original Equipment Manufacturers (OEM) features. Failure to use the correct cap can result in a malfunctioning system. Check the condition of fuel lines, hoses, and connections.

4. Catalytic converter

Examine all connections for signs of leaking exhaust. The condition of converter may be checked following the procedures listed in the LLV technical manual.

5. Exhaust gas recirculation (EGR) system

Ensure the solenoid is in good condition and not stuck open. Check that the vacuum hose is connected to the valve.

6. Fuel injection, sensors, and connectors

Inspect the wiring and connections to all fuel injectors, sensors, switches, and to the electronic control module. Check that all connectors are properly fastened and the system has not been modified.

After all items have been located and passed the visual inspection, proceed to the tail pipe emission section of the test. If any of the visual items did not pass, repair all items before performing the tail pipe emission test.

B. Tail Pipe Emission Section

Below are guidelines for performing and recording engine analysis and emission test results for the vehicles. Use these instructions to complete items for each type of vehicle. All emission readings must be taken at 2500

RPM and then retested at idle. Record the results in the spaces provided on Form 4546-B.

The engine must be at *normal operating temperature* while performing the tail pipe test. Turn off all accessories. Put the vehicle in park or neutral. Secure the emergency brake and insert wheel chocks or raise the drive axle(s) off the ground. Pre-condition the vehicle by running the vehicle for 4 minutes at 2,000 RPM. Turn the engine off.

Connect the vehicle to an engine analyzer and an infrared four gas exhaust analyzer and computer scanner for a careful examination of basic engine, ignition, fuel, and exhaust emission systems. Restart the engine and verify that it is being operated in closed loop.

The tester will measure the emissions of four gases: carbon monoxide (CO), carbon dioxide (CO₂), hydrocarbon (HC), and oxygen (O₂). Run the engine at 2250 to 2750 RPM for 30 consecutive seconds. Record the readings in the space provided on Form 4546-B. Run the engine at idle (between 400 and 1010 RPM) for 30 consecutive seconds. Record the readings in the space provided on Form 4546-B. If the basic engine and ignition conditions are within specifications and the CO, CO₂, HC, O₂, and scan data meet OEM specifications, do not perform any further tune-up repairs.

However, if a problem is indicated in the basic engine, ignition, or fuel emission system, or if serial data are not within specifications, perform a complete engine analysis and make repairs as necessary. List the results and repairs on Form 4546-B.

C. Functional Test

1. Fuel fill pipe leaded gas nozzle restrictor:

Insert the dowel into the gas tank filler neck. The dowel must not fit into the fill pipe.

2. EGR System

This check has many variables. Refer to the vehicle's emissions or service manual for the proper procedure.

a. Begin by determining which EGR system is being used. There are three types of EGR valves: standard, positive back pressure, and negative back pressure. Knowing the type of valve is very important, since the testing procedures are different for each valve. To find out which valve is on the vehicle being tested, use the shop manual identification code. Then visually check the number on the valve itself. The LLV uses a negative EGR valve.

b. Check the vacuum source to the EGR system. Find the vacuum line leading to the Throttle Body Injection assembly and disconnect it from the EGR solenoid. Install a vacuum gauge to the end of the hose. Start the engine and run at approximately 2000 RPM. Vacuum should be present at the gauge. If there is no vacuum present, repair the system.

c. Turn the engine off. Remove the gauge from the hose and connect to the manifold side of the EGR solenoid. Apply at least 10 inches of vacuum to the solenoid. The solenoid must hold the vacuum. If the solenoid loses vacuum, replace the solenoid. Next turn the ignition switch to "on." The vacuum should

still hold. If not, check for the proper operation of circuits. Refer to the EGR Systems Check in the service manual.

d. Ground the diagnostic test terminals. Once the test terminal has been grounded, the vacuum should fall to zero. If the vacuum does not drop, check for faulty circuits, EGR solenoid, or Electronic Control Module (ECM). Again refer to the manual. Remove the ground from the diagnostic test terminal and turn the ignition to "off."

e. Check the EGR valve and hose. While performing this portion of the test, the shop exhaust system must be disconnected. Disconnect the vacuum harness that leads to the EGR valve from the EGR solenoid. Remove the vacuum pump from the manifold side of the EGR solenoid and connect to the vacuum harness. Apply approximately 20 inches of vacuum. Using a mirror, observe the EGR diaphragm. The diaphragm should move freely and hold a vacuum for at least 20 seconds. Crank the engine, but don't start it. Observe the vacuum and valve position. The valve is good if the valve moved to the seated position and the vacuum dropped. If the vacuum does not hold or the diaphragm does not move, check to see if the vacuum harness hose or valve is defective.

f. After completing the EGR systems test, make sure the system is reconnected. Remember the LLV uses a negative backpressure EGR valve. If the vehicle being tested uses a positive or standard EGR valve, follow the instructions in the service manual.

3. Park/Neutral Switch

Check the LLV's automatic transmission by testing the park/neutral switch. This can be performed by using a hand held "Scan" tool.

D. Ignition Timing

The next function test is the ignition timing. Follow the procedure on the underhood emissions label.

1. Start the engine. Verify that the "check engine" light is not on. If the light is on, a code is stored in the Electronic Control Module (ECM) memory, and the emission system needs to be serviced.
2. With the engine at operating temperature, ground the diagnostic connector located under the dash. The "check engine" light will begin to flash. With timing equipment connected, check and adjust the average timing of cylinders one and four to specifications. Remove the ground from the diagnostic connector.

E. Check Engine Light Test

The final function test is on the emission control "check engine" or system malfunction light /indicator.

Turn the ignition key to the "on" position; the "check engine" light should come on. Turn the ignition key to the "off" position; the light should go off. Start the engine. The "check engine" light should be off when the engine is started and running.

The I/M testing procedure is now complete. If the vehicle fails any part of the testing, it must be repaired and then retested. After the test is complete, print one copy of the vehicle inspection report (VIR). Sign it and staple it to the work order and Form 4546-B.

The I/M test procedures must be performed on all light delivery vehicles, *including those powered by compressed natural gas (CNG)*. Procedures may vary depending on the type of vehicle being tested. Persons performing emissions tests should refer to that vehicle's service manual. In some states vehicles may be subjected to further testing at a state centralized test facility. Local management must ensure that all state-required tests are performed.

If vehicle is CNG powered, go to step 68.

66. List all repair actions on Form 4541 or 4543 (A & B)

List all repair actions on Form 4541, *Order Invoice for Vehicle Repair*, or Form 4543, *Vehicle Maintenance Work Order*. Schedule work generated by the PMI.

67. Quality assurance road test (A & B)

After the required repairs have been completed, drive the vehicle and check engine for acceleration, smoothness, and power. Check transmission shift pattern. Check steering for ease of operation, wander, pulling, etc. Listen for any unusual noise. Check brake stopping ability and parking brake holding ability. Before vehicle is released for service, ensure that seat, seatbelt, steering wheel, and shift lever are clean.

When the quality assurance road test is satisfactorily completed, enter the work order number and odometer reading in the spaces provided at the bottom of Form 4546-B. Sign and date the form. Return the vehicle to service.

Compressed Natural Gas (CNG) Vehicles

Cab Area

68. Fill valve and starter interrupt switch (A & B)

Check the condition of the fill valve and dust cover. On some CNG systems, the dust cap must be in place to engage the starter. Ensure that the interrupt switch is operating properly. Some models of CNG systems have a filter located in the fill line. If the vehicle is equipped with this filter, service the filter during each PMI. See the vehicle's service manual for proper servicing procedures. Check all components and connections for leaks using a non-ammonia soap solution and an electronic leak detector. It is important that all connections be checked for leaks during the PMI. Repair all leaks.

69. Warning lights and engine operation (A & B)

Start the engine. With the engine running on CNG, check the operation of the engine. All CNG vehicles have a light on the dash to inform the driver what fuel the engine is operating on. Check the operation of this light. Check the operation of the engine hour meters for both CNG and gasoline.

70. Wiring (A & B)

Examine all wiring for chafing and for proper connection to the CNG computer and vehicle computer.

71. CNG labels (A & B)

Inspect the vehicle to ensure that the CNG labels (blue diamond) are properly positioned on the vehicle. Refer to Publication 500-G, *Vehicle Guidelines*, for proper location of decals. Inspect the manual shut off label, which is located near the shut off valve.

Engine Compartment**72. CNG labels (A & B)**

Check the condition of the CNG label, which must be located in the engine compartment area. Verify that the label identifies the system manufacturer, operating pressure, installation date, and tank expiration date or recertification date. Vehicles operated in California must also have a Bureau of Automotive Repair (BAR) emission label.

73. CNG components (A & B)

Check all CNG components. Check for proper operation of the system. Refer to the vehicle's service manual.

74. Emission control systems (B only)

With the vehicle running on CNG, recheck the tail pipe gases according to the procedures outlined in item 65. Record the emission control systems results in the spaces provided on Form 4546-B. Compare the gasoline and CNG emissions readings. If the two sets of readings differ a great deal, recheck the engine operation.

Underneath Inspection**75. Leak checks (A & B)**

Check all components and connections for leaks using a non-ammonia soap solution or a methane detector. It is important that all connections be checked for leaks during the PMI. Repair all leaks.

76. Fuel tank (A&B)

Check the fuel tank mountings. Check all bolts for tightness and torque if necessary. Inspect the tank for corrosion, cuts, dents, or bulges. Damage to tanks must not exceed the tank manufacturer's criteria. Inspect the condition of the CNG tank's fiber covering. The tank must not have any exposed metal surfaces. Make sure that the tank is not rubbing against any components. Ensure that the DOT label is on the tank and is readable, and review the expiration date to see when the tank was last certified. Fuel tanks must be removed every 3 years to be hydrostatically pressure tested by a certified testing facility. Acoustic tank testing may be substituted for the hydrostatic pressure test. This test is done with the tank mounted on the vehicle. NGV-2 tanks have a 15-year life from the date of manufacture and do not require recertification.

77. Lines, valves, and regulators (A & B)

Check the condition of all lines. Make sure they are not rubbing against any other components. Ensure that the brake cable is not rubbing against the fuel tank or brackets. Inspect the lines and valves for proper attachment. Ensure that there are no kinks and that the lines are protected from damage. Inspect the valve condition and the operation of the manual shut-off valve. Ensure that the shut-off valve is properly labeled. Inspect the regulators for damage. On some systems the regulators have a filter inside; service that filter during B PMIs. Refer to the vehicle's service manual for proper procedures.

78. Reserved**79. Reserved**

When the CNG inspection is completed, return to Line 66.

Note:

Estimated inspection times for light delivery vehicles:

	Estimated Inspection Time (hours)
Level A	1.5
Level A with CNG	2.0
Level B	3.0
Level B with CNG	3.5

PMI Guidelines for Intermediate Delivery Vehicles

These tools are needed to perform the PMI:

- Miscellaneous hand tools
- Spray lubricant
- Shop rags
- Flashlight
- Air pressure gauge
- Tread depth gauge
- Tire square
- Air chuck
- Grease gun
- Battery load tester
- Scan tool (if gas powered)
- Engine analyzer with emission tester (if gas powered)
- Diesel opacity meter (if state required)

Explanation of Form 4546-C, *Preventive Maintenance Inspection Guidelines — Intermediate Delivery Vehicles*

Fill in the vehicle number, assigned location, due date (for PMI), and the type of PMI (level A or B).

Cab Area

1. Review vehicle jacket, modification orders, and repair tags (A & B)

Prior to each preventive maintenance inspection, review the vehicle jacket to determine the nature and extent of work to be performed. Reviewing the vehicle jacket provides maintenance personnel with the vehicle's history. Compare the current mileage with the mileage at the last PMI. Examine the file to determine when items such as brake work and tune-ups were performed last. Review the vehicle records for any pending Vehicle Modification Orders and for any history of repetitive repairs. Review Forms 4565, *Vehicle Repair Tag*.

2. Road test (A & B)

Drive the vehicle and check the engine for smooth acceleration and power. Check transmission slippage and shift points. Check steering for ease of operation, wander, pulling, etc. Listen for any unusual noises. If the vehicle also is powered by compressed natural gas (CNG), perform part of the road test with the engine running on CNG.

3. Leaks, doors, handles, and steps (A & B)

Check the operation of the doors, tracks, latches, locks, and strikers. Check door rails, rollers, and weather seals. Inspect the handles for proper operation and security. Check the door and window seals for wear and damage. Check the condition of steps and step wells.

4. Seat, belt, and interior (A & B)

Examine seat mounts, seat coverings, adjusting mechanisms, seat belts, retractors, and anchors. Check the sun visors and other inside cab components for operation and condition.

5. Key, ignition, and door key assembly (A & B)

Check the keys for cracks and signs of wear. Inspect the lock assemblies for signs of wear. Lubricate all lock assemblies with spray lubricant.

6. Buzzer and warning devices (A & B)

Ensure that all warning lights located on the dash temporarily light when the ignition key is in the "on" position. After the engine starts, ensure the lights go

out. If the lights and warning devices are not working correctly, refer to the manufacturer's service manual.

7. Starter action, unusual sounds, and neutral switch (A & B)

Ensure that the engine will not crank except in neutral or park. Note the sound of the starter operation.

8. Cold weather starting aids (A & B)

Check operation of the glow plug system (if equipped). See manufacturer's service manual for proper operation. Some engines may have another type of starting aid other than a glow plug system. See manufacturer's service manual for information on these systems. If the vehicle is equipped with a block heater, inspect the electrical cord and plug for damage.

9. Gauges, horn, heater, oil pressure, and mirrors (A & B)

With the car on, check the operation of all gauges. Check the horn for operation and loudness. Turn on the heater, defroster, and all other cab systems. Check the oil pressure gauge when the engine starts. If the engine is warm, note this pressure. Refer to the manufacturer's recommendations on the oil pressures for both idling and operating RPM. Examine all mirrors and mounting attachments for loose or damaged parts. Make sure that the mirrors are the proper mirrors for the vehicle and that they are in good condition.

10. Accessories, glass, windshield wipers, and fan (A & B)

Operate and examine all switches and controls. Check windshield washer operation. Examine all glass for cracks, chips, or lamination separation. Check wiper arms and blades for operation and condition. Examine ventilation fan, if equipped, for operation and safety guards.

11. Steering play (A & B)

With the engine running and the wheels in a straight-ahead position, turn the steering wheel in one direction until the tires begin to pivot. Note the position of the steering wheel. Turn the wheel in the other direction until the tires start to move. Total movement of the steering wheel before the wheels begin to move should not exceed 4 inches. If the play exceeds this, check for parts that are worn or out of adjustment. Enter the amount of play in inches on Form 4546-C.

12. Parking brake and foot brake test (A & B)

Check brake stopping ability and parking brake holding ability. Apply the foot brake. With the foot brake applied, apply the parking brake. Now put the transmission into drive. Slowly accelerate engine to approximately 500 RPM above idle. Allow the engine to return to idle, then place the gear selector to reverse and again slowly accelerate to 500 RPM above idle. If the vehicle does not move in either direction, the parking brake is properly adjusted. If

the vehicle moves, the parking brake must be adjusted. Adjust the parking brake after inspecting/servicing the rear brakes. To adjust, remove the set screw and adjust the brake. Reinstall the set screw after the adjustment.

13. Clean inside and out (A & B)

During each PMI, pressure clean the engine and chassis. Wash the vehicle before performing repairs. Take extreme precautions when washing inside of vehicles.

Note: The estimated repair time (ERT) shown on the back of Form 4546-C was calculated assuming the use of an automatic truck washer. Add 0.5 hours if the vehicle is hand-washed and 0.3 hours for cleaning windows and inside of vehicle.

14. Lights, turn signals, and back-up lights (A & B)

Examine all lenses for cracks, deterioration, and brightness. Check all lights for proper operation.

15. Floor and underdash wiring (A & B)

Inspect the floor mats for wear and tear. Examine wiring and harnesses for chafing and for proper connection and support. Ensure that the wiring is neatly taped and secured.

16. Safety equipment and fire extinguisher (A & B)

Check the vehicle's fire extinguisher and emergency warning kits (if required) per Section 243 of Handbook PO-701. Check the seal on the fire extinguisher. Inspect the contents of the warning kits (if required). Replace the fire extinguisher and contents of the warning kits (if required) as necessary.

17. Window, window locks, regulator, and door slides (A & B)

Test the windows and regulators to ensure they are working properly. Inspect the window guides and locks for proper operation. Check that the door slides are in satisfactory condition and operate properly.

18. Authorized cab decals and Label 70 (A & B)

Ensure that only authorized decals are present and that they are positioned properly on the dashboard for visibility. Remove any unauthorized decals. The following decals must be displayed in each vehicle:

- a. "Look Before Backing" decal.
- b. Label 70, *Safety Check and Vehicle Dimensions*.

19. General paint and body condition (A & B)

Inspect all painted surfaces for deterioration and condition. Repaint vehicles on an as-needed basis, as determined by the Manager, Vehicle Maintenance.

Inspect the bulkhead and corners for damage. Do not delay any wear and tear repairs, painting, or accident-caused body work.

20. Wax vehicle (B only)

Wax the vehicle at least once a year. The estimated time to wax the vehicle is 1 hour. Add this as a line item on the work order.

Circle Inspection

21. Tire inflation (A & B)

Examine condition of all tires for damage, wear, and proper inflation. If a tire is 10 psi or more low, investigate the cause for the loss of air pressure and make corrections. Use a valve cap. Ensure that tire pressure decals are the correct ones for the vehicle and are positioned properly. Refer to Poster 49, *Tire Pressure Chart*, for a list of proper tire pressures.

22. Lug nuts, wheels, hubs, and alignment (A & B)

Inspect lug nuts, wheels, and hubs for tightness and elongation around holes. Check wheels and rims for cracks, straightness, missing lug nuts, and broken studs. Use a torque wrench to retorque the lug nuts. Visually inspect the front tires. Where there are signs of unusual tire wear, investigate the cause of the wear problems. Balance front tires and align front end when indicated by uneven wear or abnormal steering conditions.

23. Tire probe, condition, and tread depths (A & B)

Probe tires and remove foreign objects such as nails or glass. Check all tire tread depths. Replace a tire if its tread is less than 4/32 inch. Use a straightedge to check that dual tires are matched to within 1/4 inch. Replace any tire that is not matching. Record the tread depth for each tire on Form 4546-C. The tread design is to match on each axle.

24. Bumpers, reflectors, lenses, and mud flaps (A & B)

Examine bumpers, reflectors, and lenses for damage or environmental deterioration. Examine condition of mud flaps and mounting for damage.

25. Logos, markings, posters, and beltline (A & B)

Check exterior markings and decals to ensure that exterior markings are not faded, scratched, torn, or missing and that they are positioned properly. Update decals as needed. Check the beltline and vehicle numbers in the same manner. Review Fleet Management Bulletin V-18-94 for more information on vehicle markings.

26. Rear door security and condition (A & B)

Check the rear door lock for proper operation and security. Inspect the overhead door pull-down strap and door seals.

27. Interior condition, cargo door, floors, and roof (A & B)

Inspect the cargo light(s). With the rear door pulled down, inspect the roof and side panels for holes, signs of leaks, or other damage. Inspect and lube rear door spring assembly, cable, rollers, door hinges, and other moving parts. Operate and lube the cargo vent hardware. Check the partition door for proper operation.

28. Cargo restraining devices (A & B)

Check the "E" tracks. Ensure no bolts are loose or missing from the tracks. Inspect the track slots for cracks and wear.

29. Fuel cap, door, and filler neck (A & B)

Remove the filler cap and inspect the cap, seal, and retaining chain, if equipped. Check the integrity of the gas tank.

30. Accident kit (A & B)

Ensure that the forms compartment contains Item 087-H, Accident Report Kit, and the vehicle's operator's manual. Remove all other debris from the forms compartment.

31. Accident damage (list on diagram) (A & B)

During each PMI, maintenance employees must inspect the vehicle for accident damage, report any damage to their supervisor, and indicate damage on the diagram on the reverse of Form 4546-C. Do not defer repairs of accident damage to a later date. Prepare a separate work order and code it as an accident.

32. Lift gate (A & B)

Inspect lift gate (if equipped) for proper operation. Lubricate all moving parts. Check the latching mechanisms and safety locks for proper operation. Paint lift gates as follows: Use postal white to paint the parts that park above the vehicle frame. Use black to paint the parts of the lift gates that park below the frame. Paint all walking surfaces with non-skid paint.

33. Reserved**Underneath Inspection/Lube****34. Fluid leaks and engine mounts (A & B)**

Before changing engine oil, inspect the engine and transmission for fluid leaks. Check the radiator for leaks. Inspect lower radiator hose for condition and leaks. Examine motor mounts for deterioration and fatigue.

35. Change oil, filter, and lubricate (A & B)

Change engine oil and filter during each PMI. Clean all fittings, perform complete lubrication, and check **fluid levels and condition in accordance**

with all items as shown on the manufacturer's lubrication chart. Write the lube, oil, and filter as a line item on Form 4543, *Vehicle Maintenance Work Order*.

Note: If the lubrication is performed by someone other than the person doing the PMI, subtract 0.3 hours from PMI ERT.

36. Steering, tie rods, and arms (A & B)

Check steering column, shaft assembly, and steering gear for any deficiency or looseness. Examine all steering linkage and arms for wear, looseness, or damage. Check steering damper for proper mounting and operation. Rotate components and check for end play. Examine ball joints/kingspins for excessive wear or for excessive resistance to turning front wheels. Check the condition of the ball joints and other steering components. Lubricate the tie rods and other steering components. Inspect the power steering hoses and connections to ensure the hoses are not rubbing, leaking, or deteriorating.

37. Brake linings (B only)

Remove all wheels to inspect brake assemblies, linings, and drums. Record the findings in the spaces provided on Form 4546-C. Check all applicable brake components for leaks. Check the wear rate of the shoes and compare the shoes to new shoes. For example, brake linings that have 4/32 inch remaining are not worn out if the vehicle has gone three or four inspections since the brakes were new. The original amount of shoe may have been only 8/32 inch. The inspector must balance brake safety against the risk of throwing away good lining material. Brake linings with less than 2/32 inch must be replaced. Inspect the parking brake cables to make sure they are operating properly, secure, and not frayed.

The B PMI ERT includes the time for the brake inspection. If the brakes need to be inspected during an A PMI, the inspection time must be written as a line item Form 4543, *Vehicle Maintenance Work Order*. The estimated time to perform this brake inspection on an intermediate vehicle is 1.5 hours, which includes the time to clean, inspect, and adjust all brakes.

38. Bearing play and condition (A & B)

Check the wheel bearing for excessive play. Adjust if necessary. If the vehicle has been driven 25,000 miles since the last front wheel bearing service or if operating conditions warrant (operation in hub-deep water, etc.), clean and pack the front wheel bearings and replace seals. Always service bearings when performing brake service.

39. Suspension, springs, shocks, and hangers (A & B)

Examine all spring hangers, shackles, and bushings for wear. Check for sagging or broken spring leaves or broken center bolts. Inspect the condition of the stabilizer bar. Check tightness of spring U-bolts. Examine shock absorbers for leaks, damage, or worn grommets.

40. Transmission and mountings (A & B)

Check transmission fluid level and condition. Inspect the speedometer cable and attachment. Ensure there are no kinks or leaks and that the cable bends smoothly and is protected from damage. Examine transmission mounts for deterioration. Check the transmission cooler lines for leaks and chaffing. Drain and refill automatic transmission fluid every 50,000 miles or every 2 years, whichever comes first. Some vehicles with automatic transmission have both internal and external filters. Change both of these filters when changing transmission fluid.

41. Exhaust systems, converter, and muffler (A & B)

Examine complete exhaust system for leaks, damage, or loose hangers.

42. Driveline, alignment, and condition (A & B)

Examine propeller shaft, universal joints, carrier bearing, and slip joint for wear and damage and for proper alignment.

43. Body hold-downs, hoses, and wires (A & B)

Inspect the vehicle body hold-downs to make sure they are intact and tight. Ensure that all hoses and wires are properly secured to the chassis.

44. Differential and breather (A & B)

Check the differential fluid level and check for leaks. Fill as necessary. Check the breather hose for proper operation.

45. Undercoating condition (A & B)

Inspect the condition of the undercoating. Touch up the undercoating annually to ensure the long life cycle for postal vehicles. After accident repairs are made, reapply rustproofing.

46. Reserved**47. Reserved****48. Reserved****Engine Compartment Area****49. Engine compartment and engine (A & B)**

Raise hood and examine and lubricate hood latches, hinges, and hood support. Fill windshield washer reservoir and check the level of the brake master cylinder. If the vehicle is diesel powered, perform scheduled engine maintenance and adjustments in accordance with the manufacturer's recommendations.

50. Antifreeze protection level (A & B)

Before removing the radiator overflow tank cap, squeeze the hoses to see if the system is pressurized or hot. Carefully remove the radiator cap and check the seal. Inspect the fluid level. Test coolant mixture for freeze protection with a refractometer or test strip. Add quantities as necessary to maintain a solution of 50% antifreeze and 50% water. Record the protection level in the space provided on Form 4546-C.

51. Alkalinity protection (A & B)

Test corrosion resistant properties of the coolant with a coolant test strip. If test results are unsatisfactory, drain, flush, and refill cooling system with a solution of 50% antifreeze and 50% water.

52. Replace or recycle coolant as required (A & B)

Replace or recycle coolant as required by the type of coolant used. The service requirement might differ between coolant manufacturers. Refer to the coolant manufacturer's recommendations concerning the change or recycle interval.

53. Radiator, hoses, and leaks (A & B)

Pressure test complete cooling system. Examine all hoses and connections for leaks or wear. Inspect water pump. Replace hoses as needed.

54. Belts and pulleys (A & B)

Check all belts for condition, alignment, and proper tension. When adjusting belts, use a belt tension gauge. Inspect all pulleys for alignment and condition.

55. Alternator and power steering (A & B)

Check alternator terminal connections and mounting. Check the fluid level of the power steering pump. Ensure there are no leaks.

56. Fuel lines, fuel system, and linkage (A & B)

Inspect fuel lines for routing and leaks. Inspect carburetor or fuel injection system linkage and lubricate as needed.

57. Air filter restriction and service fuel filter(s) (B only)

Test air filter restriction. Record reading on Form 4546-C. Replace air filter when restriction exceeds 25 inches water. Service fuel filter(s) annually or more frequently as necessary.

58. Clean battery post and cables (A & B)

Clean battery posts and cables. Clean the terminals with a wire brush. If very corroded, clean the area with a solution of baking soda and water. Apply protective spray to the cleaned terminals. Make sure the battery posts bolts are properly tightened.

59. Battery box and hold-downs (A & B)

Examine battery box for signs of corrosion. Clean and paint box if needed. Check hold-downs for looseness and tighten if needed.

60. Wiring and hoses (A & B)

Check for proper routing of all wiring and hoses, including electrical wiring and fuel hoses. Ensure that these components are not rubbing against each other or any other metal surface.

61. Battery load test (A & B)

Perform a battery load test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-C. On vehicles equipped with dual batteries, test each battery separately.

62. Starter cranking test (A & B)

Perform a starter cranking test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-C.

63. Alternator output test (A & B)

Perform an alternator output test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-C.

64. Regulator voltage (A & B)

Perform a regulator test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-C.

65. Emission control systems (B only)

Inspect the engine for all related emission control components and test for their correct operation. Examine crankcase depression regulator. Examine all hoses, connections, and grommets for deterioration. For non-diesel powered vehicles, connect the vehicle to an engine analyzer and an infrared exhaust analyzer to examine the ignition, induction, and combustion systems. Tune up engine only if emissions levels cannot be brought into specifications by adjustment or if the examination indicates other problems. See Light Delivery Guidelines for more information on emission testing for gasoline powered vehicles.

If vehicles are diesel powered, observe the exhaust smoke. If there is excessive smoke, investigate the cause. Some states may require an opacity meter to test diesel engine exhaust. Refer to local emission ordinances.

If vehicle is CNG powered, go to step 68.

66. List all repair actions on Form 4541 or 4543 (A & B)

List all repair actions on Form 4541, *Order Invoice for Vehicle Repair*, or Form 4543, *Vehicle Maintenance Work Order*. Schedule work generated by the PMI.

67. Quality assurance road test (A & B)

After the required repairs have been completed, drive the vehicle and check engine for acceleration, smoothness, and power. Check transmission shift pattern. Check steering for ease of operation, wander, pulling, etc. Listen for any unusual noise. Check brake stopping ability and parking brake holding ability. Before vehicle is released for service, ensure that seat, seatbelt, steering wheel, and shift lever are clean.

When the quality assurance road test is satisfactorily completed, enter the work order number and odometer reading in the spaces provided at the bottom of Form 4546-C. Sign and date the form. Return the vehicle to service.

Compressed Natural Gas (CNG) Vehicles**Cab Area****68. Fill valve and starter interrupt switch (A & B)**

Check the condition of the fill valve and dust cover. On some CNG systems, the dust cap must be in place to engage the starter. Ensure that the interrupt switch is operating properly. Some models of CNG systems have a filter located in the fill line. If the vehicle is equipped with this filter, service the filter during each PMI. See the vehicle's service manual for proper servicing procedures. Check all components and connections for leaks using a non-ammonia soap solution and an electronic leak detector. It is important that all connections be checked for leaks during the PMI. Repair all leaks.

69. Warning lights and engine operation (A & B)

Start the engine. With the engine running on CNG, check the operation of the engine. All CNG vehicles have a light on the dash to inform the driver what fuel the engine is operating on. Check the operation of this light. Check the operation of the engine hour meters for both CNG and gasoline.

70. Wiring (A & B)

Examine all wiring for chafing and for proper connection to the CNG computer and vehicle computer.

71. CNG labels (A & B)

Inspect the vehicle to ensure that the CNG labels (blue diamond) are properly positioned on the vehicle. Refer to Publication 500-G, *Vehicle Guidelines*, for proper location of decals. Inspect the manual shut off label, which is located near the shut off valve.

Engine Compartment

72. CNG labels (A & B)

Check the condition of the CNG label, which must be located in the engine compartment area. Verify that the label identifies the system manufacturer, operating pressure, installation date, and tank expiration date or recertification date. Vehicles operated in California must also have a Bureau of Automotive Repair (BAR) emission label.

73. CNG components (A & B)

Check all CNG components. Check for proper operation of the system. Refer to the vehicle's service manual.

74. Emission control systems (B only)

With the vehicle running on CNG, recheck the tail pipe gases according to the procedures outlined in item 65. Record the emission control systems results in the spaces provided on Form 4546-C. Compare the gasoline and CNG emissions readings. If the two sets of readings differ a great deal, recheck the engine operation.

Underneath Inspection

75. Leak checks (A & B)

Check all components and connections for leaks using a non-ammonia soap solution or a methane detector. It is important that all connections be checked for leaks during the PMI. Repair all leaks.

76. Fuel tank (A&B)

Check the fuel tank mountings. Check all bolts for tightness and torque if necessary. Inspect the tank for corrosion, cuts, dents, or bulges. Damage to tanks must not exceed the tank manufacturer's criteria. Inspect the condition of the CNG tank's fiber covering. The tank must not have any exposed metal surfaces. Make sure that the tank is not rubbing against any components. Ensure that the DOT label is on the tank and is readable, and review the expiration date to see when the tank was last certified. Fuel tanks must be removed every 3 years to be hydrostatically pressure tested by a certified testing facility. Acoustic tank testing may be substituted for the hydrostatic pressure test. This test is done with the tank mounted on the vehicle. NGV-2 tanks have a 15-year life from the date of manufacture and do not require recertification.

77. Lines, valves, and regulators (A & B)

Check the condition of all lines. Make sure they are not rubbing against any other components. Ensure that the brake cable is not rubbing against the fuel tank or brackets. Inspect the lines and valves for proper attachment. Ensure that there are no kinks and that the lines are protected from damage. Inspect

the valve condition and the operation of the manual shut-off valve. Ensure that the shut-off valve is properly labeled. Inspect the regulators for damage. On some systems the regulators have a filter inside; service that filter during B PMIs. Refer to the vehicle's service manual for proper procedures.

78. Reserved

79. Reserved

When the CNG inspection is completed, return to Line 66.

Note:

Estimated inspection times for intermediate vehicles:

	Estimated Inspection Time (hours)
Level A	1.5
Level A with CNG	2.0
Level B	3.0
Level B with CNG	3.5

PMI Guidelines for Cargo Vans

These tools are needed to perform the PMI:

- Miscellaneous hand tools
- Spray lubricant
- Shop rags
- Flashlight
- Air pressure gauge
- Tread depth gauge
- Tire square
- Air chuck
- Grease gun
- Battery load tester
- Diesel opacity meter (if state required)

Explanation of Form 4546-D, *Preventive Maintenance Inspection Guidelines* — *Cargo Vans*

Fill in the vehicle number, assigned location, due date (for PMI), and the type of PMI (level A or B).

Cab Area

1. Review vehicle jacket, modification orders, and repair tags (A & B)

Prior to each preventive maintenance inspection, review the vehicle jacket to determine the nature and extent of work to be performed. Reviewing the vehicle jacket provides maintenance personnel with the vehicle's history. Compare the current mileage with the mileage at the last PMI. Examine the file to determine when items such as brake work and tune-ups were performed last. Review the vehicle records for any pending Vehicle Modification Orders and for any history of repetitive repairs. Review Forms 4565, *Vehicle Repair Tag*.

2. Road test (A & B)

Drive the vehicle and check the engine for smooth acceleration and power. Check transmission slippage and shift points. Check steering for ease of operation, wander, pulling, etc. Listen for any unusual noises.

3. Leaks, doors, door locks, handles, and steps (A & B)

Check the operation of the doors, latches, locks, and strikers. Check door hinges and weather seals. Inspect the handles for proper operation and security. Check the alignment and the door for adjustment. Check the door and window seals for wear and damage. Check the condition of steps and step wells.

4. Seat, belt, and interior (A & B)

Examine seat mounts, seat coverings, adjusting mechanisms, seat belts, retractors, and anchors. Check the sun visors and other inside cab components for operation and condition.

5. Key, ignition, and door key assembly (A & B)

Check the keys for cracks and signs of wear. Inspect the lock assemblies for signs of wear. Lubricate all lock assemblies with spray lubricant.

6. Buzzer and warning devices (A & B)

Ensure that all warning lights located on the dash temporarily light when the ignition key is in the "on" position. After the engine starts, ensure the lights go

out. If the lights and warning devices are not working correctly, refer to the manufacturer's service manual.

7. Cold weather starting aids (A & B)

Check operation of the cold weather starting system (usually a glow plug or ether system). See manufacturer's shop manual for proper operation. This vehicle is also equipped with a block heater. Inspect the electrical cord and plug for damage.

8. Starter action, unusual sounds, and neutral switch (A & B)

For vehicles equipped with automatic transmission, ensure that the engine will not crank except in neutral or park. Note the sound of the starter operation — there should be no unusual noises.

9. Gauges, horn, heater, oil pressure, and mirrors (A & B)

With the car on, check the operation of all gauges. Check the horn for operation and loudness. Turn on the heater, defroster, and all other cab systems. Check the oil pressure gauge when the engine starts. If the engine is warm, note this pressure. Refer to the manufacturer's recommendations on the oil pressures for both idling and operating RPM. Examine all mirrors and mounting attachments for loose or damaged parts. Make sure that the mirrors are the proper mirrors for the vehicle and that they are in good condition. Some models may have heated and remote controlled mirrors. For these mirrors, check the operation of the heating element and the motorized controls.

10. Accessories, glass, windshield wipers, fan, and radio (A & B)

Operate and examine all switches and controls. Check windshield washer operation. Examine all glass for cracks, chips, or lamination separation. Check wiper arms and blades for operation and condition. Examine ventilation fan for operation and safety guards. Inspect the radio mounting and connections (if applicable).

11. Steering play (A & B)

With the engine running and the wheels in a straight-ahead position, turn the steering wheel in one direction until the tires begin to pivot. Note the position of the steering wheel. Turn the wheel in the other direction until the tires start to move. Total movement of the steering wheel before the wheels begin to move should not exceed 4 inches. If the play exceeds this, check for parts that are worn or out of adjustment. Enter the amount of play in inches on Form 4546-D.

12. Lights, turn signals, and back-up lights (A & B)

Examine all lenses for cracks, deterioration, and brightness. Check all lights for proper operation.

13. Floor and underdash wiring (A & B)

Inspect the floor mats for wear and tear. Examine wiring and harnesses for chafing and for proper connection and support. Ensure that the wiring is neatly taped and secured.

14. Pedal and pads (A & B)

Inspect all pedals for wear. Make sure that the air brake pedal is clear from other components.

15. Window, regulator, and door hinges (A & B)

Test the windows, regulators, and door hinges to ensure they are working properly. Inspect the window guides for proper condition.

16. Safety equipment, fire extinguisher, and accident kit (A & B)

Check the vehicle's fire extinguisher and emergency warning kits per Section 243 of Handbook PO-701. Check the seal on the fire extinguisher. Inspect the contents of the warning kits. Replace the fire extinguisher and contents of the warning kits as necessary. Ensure that the forms compartment contains Item 087-H, Accident Report Kit, and the vehicle's operator's manual. Remove all other debris from the forms compartment.

17. Authorized cab decals and Label 70 (A & B)

Ensure that only authorized decals are present and that they are positioned properly on the dashboard for visibility. Remove any unauthorized decals. The following decals must be displayed in each vehicle:

- a. "Look Before Backing" decal.
- b. Label 70, *Safety Check and Vehicle Dimensions*.

18. Drain air reservoirs (A & B)

Drain all air brake reservoirs to 0 PSI. Do not drain the air starter tank at this time. Close all drain valves after draining air system.

19. Low air warning system (A & B)

Start the engine and run at high idle. The warning light and buzzer for low air pressure should be on. When the air pressure reaches approximately 60 PSI, the warning light and buzzer should go off.

20. Air pressure build-up time (A & B)

Before performing the air pressure build-up time test, make sure that the air starter air reservoir contains at least 100 PSI. Continue running the engine at high idle. Start timing when the air pressure gauge reaches 85 PSI, and stop timing when the air pressure gauge reaches 100 PSI. The air pressure should build up from 85 PSI to 100 PSI within 40 seconds.

Note: The average build-up time is approximately 15 seconds.

21. Governor range (A & B)

Reduce service air pressure to governor cut-in pressure by fanning the brake pedal. Continue running the engine at high idle. The air pressure gauge will start to increase at approximately 100 PSI. Note the cut-in pressure. The governor will allow the air pressure to increase to approximately 120 PSI. Note the cut-out pressure. When the governor reaches cut-out pressure, the air dryer will cycle. If the air dryer does not cycle, perform service on the air dryer. Refer to the vehicle's service manual for proper serving procedures. Enter the cut-in and cut-out pressures on Form 4546-D. The difference between cut-in and cut-out pressure must not exceed 25 PSI.

22. Perform air system leak checks and service air dryer (A & B)

A. With maximum pressure, engine stopped, and parking brake applied, allow pressure to stabilize for at least 1 minute. Observe the dash gauge pressures for 1 minute and note any pressure drop. Air pressure drop should not exceed 2 PSI in 1 minute.

B. Get a block of wood to hold down the foot valve. With maximum pressure, engine stopped, and parking brake released, apply and hold the brakes. Allow pressure to stabilize for 1 minute. Observe the dash gauge pressures for 1 minute and note any pressure drop. Air pressure drop should not exceed 3 PSI in 1 minute.

C. With maximum pressure and engine idling at 600–900 RPM, manually operate the park control valve. As the control valve button is pulled out and pushed in, check that the parking brake is applied and released promptly.

D. Parking brake and foot brake test (A & B)

1. Parking brake check

Start the engine, apply the foot brake, and apply the parking brake. With the foot brake still applied, put the transmission in drive and increase the engine speed to 300 RPM above idle. The vehicle should not move. If the vehicle moves, the brakes need to be adjusted.

2. Service brake check

Start the engine and run at rated speed until the air pressure reaches governor cut-out pressure. Return engine speed to idle. Release the parking brake (PP valves in). Apply and hold the brakes. Put the transmission in drive and increase the engine speed to 300 RPM above idle. The vehicle should not move. If the vehicle moves, the brakes need to be adjusted.

3. Air dryer

Some models of air dryers may require annual service. Refer to the vehicle's service manual for service procedures.

23. Clean inside and out (A & B)

During each PMI, pressure clean the engine and chassis. Wash the vehicle before performing repairs. Take extreme precautions when washing inside of vehicles.

Note: The estimated repair time (ERT) shown on the back of Form 4546-D was calculated assuming the use of an automatic truck washer. Add 0.5 hours if the vehicle is hand-washed and 0.3 hours for cleaning windows and inside of vehicle.

24. General paint and body condition (A & B)

Inspect all painted surfaces for deterioration and condition. Repaint vehicles on an as-needed basis, as determined by the Manager, Vehicle Maintenance. Do not delay any wear and tear repairs, painting, or accident-caused body work.

25. Wax vehicle (B only)

Wax the vehicle at least once a year. The estimated time to wax the vehicle is 1 hour. Add this as a line item on the work order.

Circle Inspection

26. Tire inflation (A & B)

Examine condition of all tires for damage, wear, and proper inflation. If a tire is 10 psi or more low, investigate the cause for the loss of air pressure and make corrections. Use a valve cap. Ensure that tire pressure decals are the correct ones for the vehicle and are positioned properly. Refer to Poster 49, *Tire Pressure Chart*, for a list of proper tire pressures.

27. Lug nuts, wheels, hubs, and alignment (A & B)

Inspect lug nuts, wheels, and hubs for tightness. Check wheels and rims for cracks, straightness, unseated locking rings, and broken or missing lugs, studs, or clamps. Inspect for "bleeding" rust stains. Check for loose or damaged lug nuts and elongated mounting stud holes. Use a torque wrench to retorque the lug nuts. Check the oil level in the hubs. Visually inspect the front tires. Where there are signs of unusual tire wear, investigate the cause of the wear problems. Balance front tires and align front end when indicated by uneven wear or abnormal steering conditions.

28. Tire probe, condition, and tread depths (A & B)

Probe tires and remove foreign objects such as nails or glass. Check all tire tread depths. Replace a tire if its tread is less than 4/32 inch. Use a straightedge to check that dual tires are matched to within 1/2 inch. Replace any tire that is not matching. Record the tread depth for each tire on Form 4546-D. The tread design is to match on each axle.

29. Bumpers, reflectors, lenses, and mud flaps (A & B)

Examine bumpers, reflectors, and lenses for damage or environmental deterioration. Examine condition of mud flaps and mounting for damage.

30. Logos, markings, posters, and beltline (A & B)

Check exterior markings and decals to ensure that exterior markings are not faded, scratched, torn, or missing and that they are positioned properly. Update decals as needed. Check the beltline and vehicle numbers in the same manner. Review Publication 500-G, *Vehicle Guidelines*, for more information on vehicle markings.

31. Rear door security and condition (A & B)

Check the rear door lock for proper operation and security. Replace any damaged panels. Inspect the overhead door pull-down strap and door seals. Check the condition and operation of the rear door protection bar.

32. Interior condition, cargo door, floors, and roof (A & B)

Inspect the cargo light(s) for proper operation. With the rear door pulled down, inspect the roof, floor, and side panels for holes, signs of leaks, or other damage. Inspect and lube rear door spring assembly, cable, rollers, door hinges, and other moving parts. Operate and lube the cargo vent hardware. Inspect the roof bows to ensure that the roof is attached properly.

33. Cargo restraining devices (A & B)

Check the "E" tracks. Ensure no bolts are loose or missing from the tracks. Inspect the track slots for cracks and wear.

34. Fuel cap, vent, and filler neck (A & B)

Check the fuel filler pipe. Remove the filler cap and inspect the cap, seal, and retaining chain. Inspect the vent. Check for loose mounting, leaks, or other tank damage.

35. Air tanks, valves, hoses, pipes, and air gauge (A & B)

Examine tank mounting brackets for damage. Examine tanks, hoses, valves, and plumbing for damage or chafing.

36. Accident damage (list on diagram) (A & B)

During each PMI, maintenance employees must inspect the vehicle for accident damage, report any damage to their supervisor, and indicate damage on the diagram on the reverse of Form 4546-D. Do not defer repairs of accident damage to a later date. Prepare a separate work order and code it as an accident.

37. Lift gate (A & B)

Inspect lift gate (if applicable) for proper operation. Lubricate all moving parts. Check the latching mechanisms and safety locks for proper operation.

Paint lift gates as follows: Use postal white to paint the parts that park above the vehicle frame. Use black to paint the parts of the lift gates that park below the frame. Paint all walking surfaces with non-skid paint.

38. Reserved

Underneath Inspection/Lube

39. Fluid leaks and engine mounts (A & B)

Before changing engine oil, inspect the engine and transmission for fluid leaks. Check the radiator for leaks. Inspect lower radiator hose for condition and leaks. Examine motor mounts for deterioration and torque.

40. Change oil, filter, and lubricate (A & B)

Change engine oil and filter during each B PMI or every 10,000 miles, whichever comes first. Service the oil centrifuge when changing the oil. Perform complete lubrication, and check **fluid levels and condition in accordance with all items as shown on the manufacturer's lubrication chart**. Write the lube, oil, and filter as a line item on Form 4543, *Vehicle Maintenance Work Order*.

Note: If the lubrication is performed by someone other than the person doing the PMI, subtract 0.7 hours from PMI ERT.

41. Steering, tie rods, and arms and slack adjusters (A & B)

Check steering column, shaft assembly, and steering gear for any deficiency or looseness. Examine all steering linkage and arms for wear, looseness, or damage. Check for proper mounting and operation of steering damper. Rotate components and check for end play. Examine kingpins for excessive wear. Lubricate the tie rods and other steering components. Inspect the power steering hoses and connections to ensure the hoses are not rubbing, leaking, or deteriorating.

42. Brake linings (B only)

It is not necessary to remove the wheels on every inspection to examine the condition of the brake linings. However, on every service make a visual inspection of the brake drum and lining. This may be done by viewing the lining through the inspection hole in the dust shields or by removing the dust shields. After brake inspection, reinstall the dust shields.

Local management must ensure that all brakes are properly maintained. Once a year, remove all wheels to inspect brake assemblies, linings, and drums. Check for missing, non functioning, loose, contaminated, or cracked parts, such as brake drum, shoes, rotors, pads, linings, brake chamber, chamber mounting, push rods, or slack adjusters. Check for "S" cam roll over. Check for audible air leaks around brake components and lines. Check hoses, brake lines, and chambers for leaks. Ensure that these items do not rub against any components. Examine slack adjusters and links. Ensure the

operation of automatic slack adjusters (if applicable). Adjust all brakes. Replace brake linings that have 8/32 inch or less of lining material remaining. Record the findings on Form 4546-D. On the yearly brake inspection, write line item "Pull all wheels and drums for brake inspection" on Form 4543, *Vehicle Maintenance Work Order*. The estimated time to perform this brake inspection on a cargo van is 2 hours. This time includes adjustment of the wheel bearings and replacement of the seals.

43. Brake chamber push-rod travel and slack adjusters (A & B)

When checking the brake chamber push-rod travel, air pressure system must be approximately 90 PSI to 100 PSI. Stop the engine, release the parking brake, and apply and hold the brakes. Measure the distance that the push-rod traveled from the point the parking brake was released to the point the brakes were applied. This is push-rod travel, and it should be as short as possible without brake drag and equal on the same axle. Check the angle formed between the brake chamber push rod and slack adjuster arm. It should be at least 90 degrees when the brakes are fully applied. Refer to the vehicle's service manual for proper specifications. All late-model cargo vans are equipped with automatic slack adjusters. If the orange band painted into grooves on the push-rod is visible, that indicates that the self-adjuster is not working or that other foundation brake service may be required.

44. Bearing play and condition (A & B)

Check the wheel bearing for excessive play. Adjust if necessary. Do not service wheel bearings except on brake service unless operating conditions warrant (operation in hub deep water, etc.).

45. Suspension, springs, shocks, and hangers (A & B)

Examine all spring hangers, shackles, shackle pins, and bushings for wear. Check for sagging or broken spring leaves or broken center bolts. Check the tightness of spring U-bolts, and check for indications of misaligned or shifted springs. Examine shock absorbers for leaks, loose brackets, or worn grommets. Check for loose axle positioning parts and signs of axle misalignment.

46. Transmission and mountings (A & B)

Examine transmission mounts for deterioration. Check the transmission cooler lines for leaks and chaffing. Drain and refill automatic transmission fluid annually or every 50,000 miles, whichever comes first. Some vehicles with automatic transmission have both internal and external filters. Change the internal filter only when the transmission pan is removed for adjustments or overhaul. Change the external filter only when prompted by the warning light on the dash panel or every 3 years, whichever comes first. Inspect the speedometer cable and attachment. Ensure there are no kinks or leaks and that the cable bends smoothly and is protected from damage.

47. Exhaust systems (A & B)

Examine complete exhaust system for leaks, damage, or loose hangers. Examine exhaust pipes and stack for evidence of leaking joints. Ensure the exhaust does not make contact with any fuel, water, air, or electrical lines.

48. Driveline, alignment, and condition (A & B)

Inspect the drive shaft for correct phasing. Examine drive shaft, universal joints, and slip joints for wear or damage.

49. Differential and breather (A & B)

Check fluid level and fill as necessary. Clean vent assembly and examine housing for indication of leaks.

50. Undercoating condition (A & B)

Inspect the condition of the undercoating. Touch up the undercoating annually to ensure the long life cycle for postal vehicles. After accident repairs are made, reapply rustproofing. Check for corrosion of all chassis components.

51. Body hold-downs, hoses, and wires (A & B)

Inspect the vehicle body hold-downs to make sure they are intact and tight. Ensure that all hoses and wires are properly secured to the chassis.

52. Reserved**Engine Compartment Area****53. Engine compartment and cab lifting system (A & B)**

Examine cab lock lever and safety catches for broken springs. Check cab tilt latches for proper adjustment. Check springs in tilt assist torsion unit. Examine tilt trunnions. Inspect the cab lifting system for proper operation. Fill windshield washer reservoir.

54. Antifreeze protection level (A & B)

Before removing the radiator overflow tank cap, squeeze the hoses to see if the system is pressurized or hot. Carefully remove the radiator cap and check the seal. Inspect the fluid level. Test coolant mixture for freeze protection with a refractometer or test strip. Add quantities as necessary to maintain a solution of 50% antifreeze and 50% water. Record the protection level in the space provided on Form 4546-D.

55. Alkalinity protection and water filter (A & B)

Test corrosion resistant properties of the coolant with a coolant test strip. This engine is equipped with a cooling system filter and treatment system that must be serviced at each PMI. Supplemental coolant conditioners, such as Nalcool, may be used, and their condition may be tested by coolant test

kits. If test results are unsatisfactory, drain, flush, and refill cooling system with a solution of 50% antifreeze and 50% water. Replace coolant filter annually. Add make-up coolant and chemical conditioners required to ensure adequate cooling system protection.

56. Replace or recycle coolant as required (A & B)

Replace or recycle coolant as required by the type of coolant used. The service requirement might differ between coolant manufacturers. Refer to the coolant manufacturer's recommendations concerning the change or recycle interval.

57. Radiator, hoses, and leaks (A & B)

Pressure test complete cooling system. Examine all hoses and connections for leaks or wear. Inspect water pump. Replace hoses as needed.

58. Belts and pulleys (A & B)

Check all belts for condition, alignment, and proper tension. When adjusting belts, use a belt tension gauge. Inspect all pulleys for alignment and condition. Check for unusual noise. Examine damper for deterioration or excessive vibration. Examine water pump, idler pulley, and fan hub for noise or vibrations.

59. Alternator and power steering (A & B)

Check alternator terminal connections and mounting. Check the fluid level of the power steering pump. Ensure there are no leaks. Examine pump and mounting bracket for condition and check for loose or broken bolts.

60. Fuel lines, fuel system, and linkage (A & B)

Inspect fuel lines for routing and leaks. Inspect fuel injection system linkage and lubricate as needed. Examine linkage, levers, connectors, and return springs for wear or interference.

61. Fuel filter(s) (B only)

Replace all fuel filters annually or more frequently as necessary.

62. Emission control devices (A & B)

Inspect the engine for all related emission control components. Ensure their correct operation. Examine crankcase emission system regulator. Examine all hoses, connections, and grommets for deterioration.

63. Air filter restriction (B only)

Test air filter restriction. Record reading on Form 4546-D. Replace air filter when restriction exceeds 25 inches water. Examine mounting brackets on air cleaner and compressor aftercooler. Check hoses, clamps, and piping for leaks or loose connections.

64. Clean battery post and cables (A & B)

Clean battery posts and cables. Clean the terminals with a wire brush. If very corroded, clean the area with a solution of baking soda and water. Apply protective spray to the cleaned terminals. Make sure the battery posts bolts are properly tightened.

65. Battery box and hold-downs (A & B)

Examine battery box for signs of corrosion. Clean and paint box if needed. Check hold-downs for looseness and tighten if needed.

66. Wiring and hoses (A & B)

Check for proper routing of all wiring and hoses, including electrical wiring and fuel hoses. Ensure that these components are not rubbing against each other or any other metal surface.

67. Battery load test (A & B)

Perform a battery load test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-D.

68. Starter cranking test (A & B)

On cargo vans equipped with electric starters, perform a starter cranking test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-D. On cargo vans equipped with air starters, check for proper lubrication of the system by cranking the engine several times. A light mist of diesel fuel should come from the exhaust of the starter. On later model cargo vans, the starters are self-lubricated. Inspect the air starter air system for leaks. Drain the moisture from the air starter air tank.

69. Alternator output test (A & B)

Perform an alternator output test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-D.

70. Regulator voltage (A & B)

Perform a regulator test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-D.

71. Engine (A & B)

Perform scheduled engine maintenance and adjustments in accordance with the manufacturer's recommendations.

72. Emissions (B only)

Observe the exhaust smoke. If there is excessive smoke, investigate the cause. Some states may require an opacity meter to test diesel engine exhaust. Refer to local emission ordinances.

73. List all repair actions on Form 4541 or 4543 (A & B)

List all repair actions on Form 4541, *Order Invoice for Vehicle Repair*, or Form 4543, *Vehicle Maintenance Work Order*. Schedule work generated by the PMI.

74. Quality assurance road test (A & B)

After the required repairs have been completed, drive the vehicle and check engine for acceleration, smoothness, and power. Check transmission shift pattern. Check steering for ease of operation, wander, pulling, etc. Listen for any unusual noise. Check brake stopping ability and parking brake holding ability. Before vehicle is released for service, ensure that seat, seatbelt, steering wheel, and shift lever are clean.

When the quality assurance road test is satisfactorily completed, enter the work order number and odometer reading in the spaces provided at the bottom of Form 4546-D. Sign and date the form. Return the vehicle to service.

75. Reserved

76. Reserved

77. Reserved

78. Reserved

Note:

Estimated inspection times for cargo vans:

	Estimated Inspection Time (hours)
Level A	2.0
Level B	3.5

The B PMI and the follow-up repairs satisfy the Federal Annual Vehicle Inspection, as prescribed in the Federal Motor Carrier Safety Regulations.

PMI Guidelines for Tractors

These tools are needed to perform the PMI:

- Miscellaneous hand tools
- Spray lubricant
- Shop rags
- Flashlight
- Air pressure gauge
- Tread depth gauge
- Tire square
- Air chuck
- Grease gun
- Battery load tester
- Diesel opacity meter (if state required)
- Axle spacing tool
- Fifth wheel adjustment tools

Explanation of Form 4546-E, *Preventive Maintenance Inspection Guidelines — Tractors*

Fill in the vehicle number, assigned location, due date (for PMI), and the type of PMI (level A or B).

Cab Area

1. Review vehicle jacket, modification orders, and repair tags (A & B)

Prior to each preventive maintenance inspection, review the vehicle jacket to determine the nature and extent of work to be performed. Reviewing the vehicle jacket provides maintenance personnel with the vehicle's history. Compare the current mileage with the mileage at the last PMI. Examine the file to determine when items such as brake work and tune-ups were performed last. Review the vehicle records for any pending Vehicle Modification Orders and for any history of repetitive repairs. Review Forms 4565, *Vehicle Repair Tag*.

2. Road test (A & B)

Drive the vehicle and check the engine for smooth acceleration and power. Check transmission slippage and shift points. Check steering for ease of operation, wander, pulling, etc. Listen for any unusual noises.

3. Leaks, doors, door locks, handles, and steps (A & B)

Check the operation of the doors, latches, locks, and strikers. Check door hinges and weather seals. Inspect the handles for proper operation and security. Check the alignment and the door for adjustment. Check the door and window seals for wear and damage. Check the condition of steps and step wells.

4. Seat, belt, and interior (A & B)

Examine seat mounts, seat coverings, adjusting mechanisms, seat belts, retractors, and anchors. Check the sun visors and other inside cab components for operation and condition.

5. Key, ignition, and door key assembly (A & B)

Check the keys for cracks and signs of wear. Inspect the lock assemblies for signs of wear. Lubricate all lock assemblies with spray lubricant.

6. Buzzer and warning devices (A & B)

Ensure that all warning lights located on the dash temporarily light when the ignition key is in the "on" position. After the engine starts, ensure the lights go

out. If the lights and warning devices are not working correctly, refer to the manufacturer's service manual.

7. Cold weather starting aids (A & B)

Check operation of the cold weather starting system (usually a glow plug or ether system). See manufacturer's shop manual for proper operation. This vehicle is also equipped with a block heater. Inspect the electrical cord and plug for damage.

8. Starter action, unusual sounds, and neutral switch (A & B)

For vehicles equipped with automatic transmission, ensure that the engine will not crank except in neutral or park. Note the sound of the starter operation — there should be no unusual noises.

9. Gauges, horn, heater, oil pressure, and mirrors (A & B)

With the car on, check the operation of all gauges. Check the horn for operation and loudness. Turn on the heater, defroster, and all other cab systems. Check the oil pressure gauge when the engine starts. If the engine is warm, note this pressure. Refer to the manufacturer's recommendations on the oil pressures for both idling and operating RPM. Examine all mirrors and mounting attachments for loose or damaged parts. Make sure that the mirrors are the proper mirrors for the vehicle and that they are in good condition. Some models may have heated and remote controlled mirrors. For these mirrors, check the operation of the heating element and the motorized controls.

10. Accessories, glass, windshield wipers, fan, and radio (A & B)

Operate and examine all switches and controls. Check windshield washer operation. Examine all glass for cracks, chips, or lamination separation. Check wiper arms and blades for operation and condition. Examine ventilation fan for operation and safety guards. Inspect the radio mounting and connections (if applicable).

11. Steering play (A & B)

With the engine running and the wheels in a straight-ahead position, turn the steering wheel in one direction until the tires begin to pivot. Note the position of the steering wheel. Turn the wheel in the other direction until the tires start to move. Total movement of the steering wheel before the wheels begin to move should not exceed 4 inches. If the play exceeds this, check for parts that are worn or out of adjustment. Enter the amount of play in inches on Form 4546-E.

12. Lights, turn signals, and back-up lights (A & B)

Examine all lenses for cracks, deterioration, and brightness. Check all lights for proper operation.

13. Floor and underdash wiring (A & B)

Inspect the floor mats for wear and tear. Examine wiring and harnesses for chafing and for proper connection and support. Ensure that the wiring is neatly taped and secured.

14. Clutch operation, pedal, and pads (A & B)

On vehicles with manual transmission, test the clutch for slippage, pedal-free-play, and proper clutch brake operation. Pedal-free travel should be 1-1/2 inches to 2 inches, and clutch brake application should be 1 inch above the floor board. Listen for abnormal noise from release bearing. Adjust if needed. Inspect all pedals for wear. On vehicles with automatic transmission, inspect all pedals for wear.

15. Window, regulator, and door hinges (A & B)

Test the windows, regulators, and door hinges to ensure they are working properly. Inspect the window guides for proper condition.

16. Safety equipment, fire extinguisher, and accident kit (A & B)

Check the vehicle's fire extinguisher and emergency warning kits per Section 243 of Handbook PO-701. Check the seal on the fire extinguisher. Inspect the contents of the warning kits. Replace the fire extinguisher and contents of the warning kits as necessary. Ensure that the forms compartment contains Item 087-H, Accident Report Kit, and the vehicle's operator's manual. Remove all other debris from the forms compartment.

17. Authorized cab decals and Label 70 (A & B)

Ensure that only authorized decals are present and that they are positioned properly on the dashboard for visibility. Remove any unauthorized decals. The following decals must be displayed in each vehicle:

- a. "Look Before Backing" decal.
- b. Label 70, *Safety Check and Vehicle Dimensions*.

18. Drain air reservoirs (A & B)

Drain all air brake reservoirs to 0 PSI. Do not drain the air starter tank at this time. Close all drain valves after draining air system.

19. Low air warning system (A & B)

Start the engine and run at high idle. The warning light and buzzer for low air pressure should be on. When the air pressure reaches approximately 60 PSI, the warning light and buzzer should go off.

20. Air pressure build-up time (A & B)

Before performing the air pressure build-up time test, make sure that the air starter air reservoir contains at least 100 PSI. Continue running the engine at

high idle. Start timing when the air pressure gauge reaches 85 PSI, and stop timing when the air pressure gauge reaches 100 PSI. The air pressure should build up from 85 PSI to 100 PSI within 40 seconds.

Note: The average build-up time is approximately 15 seconds.

21. Governor range (A & B)

Reduce service air pressure to governor cut-in pressure by fanning the brake pedal. Continue running the engine at high idle. The air pressure gauge will start to increase at approximately 100 PSI. Note the cut-in pressure. The governor will allow the air pressure to increase to approximately 120 PSI. Note the cut-out pressure. When the governor reaches cut-out pressure, the air dryer will cycle. If the air dryer does not cycle, perform service on the air dryer. Refer to the vehicle's service manual for proper serving procedures. Enter the cut-in and cut-out pressures on Form 4546-E. The difference between cut-in and cut-out pressure must not exceed 25 PSI.

22. Perform air system leak checks and service air dryer (A & B)

A. With maximum pressure, engine stopped, and parking brake applied, allow pressure to stabilize for at least 1 minute. Observe the dash gauge pressures for 1 minute and note any pressure drop. Air pressure drop should not exceed 2 PSI in 1 minute.

B. Get a block of wood to hold down the foot valve. With maximum pressure, engine stopped, and parking brake released, apply and hold the brakes. Allow pressure to stabilize for 1 minute. Observe the dash gauge pressures for 1 minute and note any pressure drop. Air pressure drop should not exceed 3 PSI in 1 minute.

C. With maximum pressure and engine idling at 600-900 RPM, manually operate the park control valve. As the control valve button is pulled out and pushed in, check that the parking brake is applied and released promptly.

D. Parking brake and foot brake test (A & B)

1. Tractor with manual transmission

a. Parking brake check

Start the engine, push the clutch pedal down (releasing the clutch), and put the transmission in high gear. Increase engine speed to 300 RPM above idle. Slowly let up the clutch pedal (engaging the clutch). The vehicle should not move, and the engine should stall before the clutch is fully engaged. If the vehicle moves, the brakes need to be adjusted.

b. Service brake check

Start the engine and run at rated speed until the air pressure reaches governor cut-out pressure. Release the spring brakes (PP valves in). Apply and hold the brakes. Push the clutch pedal down (releasing the clutch), and put the transmission in high gear. Increase engine speed to 300 RPM above idle. Slowly let up the clutch pedal (engaging the clutch). The vehicle should

not move, and the engine should stall before the clutch is fully engaged. If the vehicle moves, the brakes need to be adjusted.

2. Tractor with automatic transmission

a. Parking brake check

Start the engine, apply the foot brake, and apply the parking brake. With the foot brake still applied, put the transmission in drive and increase the engine speed to 300 RPM above idle. The vehicle should not move. If the vehicle moves, the brakes need to be adjusted.

b. Service brake check

Start the engine and run at rated speed until the air pressure reaches governor cut-out pressure. Return engine speed to idle. Release the parking brake (PP valves in). Apply and hold the brakes. Put the transmission in drive and increase the engine speed to 300 RPM above idle. The vehicle should not move. If the vehicle moves, the brakes need to be adjusted.

c. Air dryer

Some models of air dryers may require annual service. Refer to the vehicle's service manual for service procedures.

23. Clean inside and out (A & B)

During each PMI, pressure clean the engine and chassis. Wash the vehicle before performing repairs. Take extreme precautions when washing inside of vehicles.

Note: The estimated repair time (ERT) shown on the back of Form 4546-E was calculated assuming the use of an automatic truck washer. Add 0.5 hours if the vehicle is hand-washed and 0.3 hours for cleaning windows and inside of vehicle.

24. General paint and body condition (A & B)

Inspect all painted surfaces for deterioration and condition. Repaint vehicles on an as-needed basis, as determined by the Manager, Vehicle Maintenance. Do not delay any wear and tear repairs, painting, or accident-caused body work.

25. Wax vehicle (B only)

Wax the vehicle at least once a year. The estimated time to wax the vehicle is 1 hour. Add this as a line item on the work order.

Circle Inspection

26. Tire inflation (A & B)

Examine condition of all tires for damage, wear, and proper inflation. If a tire is 10 psi or more low, investigate the cause for the loss of air pressure and make corrections. Use a valve cap. Ensure that tire pressure decals are the

correct ones for the vehicle and are positioned properly. Refer to Poster 49, *Tire Pressure Chart*, for a list of proper tire pressures.

27. Lug nuts, wheels, hubs, and alignment (A & B)

Inspect lug nuts, wheels, and hubs for tightness. Check wheels and rims for cracks, straightness, unseated locking rings, and broken or missing lugs, studs, or clamps. Inspect for "bleeding" rust stains. Check for loose or damaged lug nuts and elongated mounting stud holes. Use a torque wrench to retorque the lug nuts. Check the oil level in the hubs. Visually inspect the front tires. Where there are signs of unusual tire wear, investigate the cause of the wear problems. Balance front tires and align front end when indicated by uneven wear or abnormal steering conditions.

28. Tire probe, condition, and tread depths (A & B)

Probe tires and remove foreign objects such as nails or glass. Check all tire tread depths. Replace a tire if its tread is less than 4/32 inch. Use a straightedge to check that dual tires are matched to within 1/2 inch. Replace any tire that is not matching. Record the tread depth for each tire on Form 4546-E. The tread design is to match on each axle.

29. Bumpers, reflectors, lenses, and mud flaps (A & B)

Examine bumpers, reflectors, and lenses for damage or environmental deterioration. Examine condition of mud flaps and mounting for damage.

30. Logos, markings, posters, and beltline (A & B)

Check exterior markings and decals to ensure that exterior markings are not faded, scratched, torn, or missing and that they are positioned properly. Update decals as needed. Check the beltline and vehicle numbers in the same manner. Review Publication 500-G, *Vehicle Guidelines*, for more information on vehicle markings.

31. Glad-hands, hoses, and electrical plug (A & B)

Inspect the condition of the glad-hands. Replace glad-hand seals annually. Examine the condition of the intervehicular electrical cord and connector, air hoses, and storage connectors.

32. Fifth wheel assembly (B only)

Examine the fifth wheel locking and release mechanism, surface condition, tilting trunnions, and mounting brackets. Examine condition of ground strap and connections. Examine guide ramps for loose or broken mounting bolts and welds. During every PMI, follow the instructions below:

A. Periodic Inspections and Adjustments

Perform all of the following during each PMI. Perform steam cleaning first to ensure a good inspection.

1. Inspection and Adjustment of Fifth Wheel Mounting and Assembly

a) Inspect the fifth wheel mounting for bent, worn, or broken parts. Use a small pry bar to pry up each pivot ear. If the top plate moves more than 1/2 inch, replace or rebuild the mounting subassembly. Check torque and replace any missing or damaged bolts. Check for broken or distorted components and repair or replace as needed.

b) Check the operation and adjustment of the fifth wheel locking mechanism. Use the appropriate procedure for the type of locking mechanism. If the locks cannot be properly adjusted due to wear, rebuild or replace the fifth wheel.

WARNING: Improper adjustment can cause improper locking of the mechanism.

2. Type "A" Lock Adjustment (highway tractors):

The lock adjustment screw is found in the crotch on the right side.

a) Close the locks with the Holland lock tester P/N TF TLN 1000.

b) Tighten the adjustment screw using a 1/2-inch Allen wrench or Allen socket extension. Turn clockwise until tight.

c) Loosen the adjustment screw by turning it counterclockwise 1 1/2 turns. The locks are now properly adjusted.

d) Using the Holland lock tester, verify this adjustment by locking and unlocking the mechanism several times.

3. Type "B" Lock Inspection (spotter tractor):

Note: Spotter tractor fifth wheels have no adjustment. Check for excessive wear and proper operation.

a) Close the locks and insert a Holland Plug, P/N TF 0237 in the locks.

b) Check for excessive wear. The plug should fit freely. However, if the plug can be moved forwards and backwards more than 1/2 inch, rebuild the top plate. This top plate has no adjustment.

c) Verify proper operation of the locking mechanism by locking and unlocking the mechanism several times with the Holland lock tester, P/N TF TLN 1000. If the locking mechanism fails to lock or has too much slack, rebuild or replace the top plate. This top plate has no adjustment.

d) Lubricate by applying a light rust resistant oil to all moving parts.

B. Fifth Wheel Sliding Mechanism Inspections and Adjustments**1. Adjustment of Locking Plungers**

a) Loosen the locking nut and turn adjusting bolt out (counterclockwise).

b) Disengage and engage the locking plungers. Check that the plungers are securely seated without binding.

c) Turn adjusting bolt in (clockwise) until it contacts the rack. Turn adjusting bolt an additional 1/2 turn and then tighten the locking nut securely.

CAUTION: Proper adjustment of the sliding bracket locking plungers must be performed at installation and maintained at regular intervals

by use of the adjusting bolts provided on both sides. proper adjustment is required for proper operation and for proper load transfer and distribution.

2. Adjustment of Locking Plungers When They Won't Release to Permit Sliding of the Fifth Wheel

- a) Check the air cylinder for proper operation. Replace if necessary.
- b) Check plunger adjustment.
- c) If adjusted plunger binds on pocket, grind the top plunger edges 1/16 inch, reinstall, and adjust as in step B-1. Use a Holland TF TIN 2500 spring compressor to install the plunger.

3. Adjustment of Locking Plungers When They Are Too Loose

- a) Check plunger adjustment.
- b) Check the plunger springs for proper compression. Replace if necessary.
- c) Check for plunger wear and replace if necessary. Use a Holland TF TIN 2500 spring compressor to remove and reinstall the plungers. Adjust the plungers as described in step B-1

33. Fuel cap, vent, and filler neck (A & B)

Check the fuel filler pipe. Remove the filler cap and inspect the cap, seal, and retaining chain. Inspect the vent. Check for loose mounting, leaks, or other tank damage.

34. Cat walk, steps, and grab handles (A & B)

Examine step plates and cat walk for bent or broken brackets. Check grab handle mountings.

35. Air tanks, valves, hoses, pipes, and air gauge (A & B)

Examine tank mounting brackets for damage. Examine tanks, hoses, valves, and plumbing for damage or chafing.

36. Accident damage (list on diagram) (A & B)

During each PMI, maintenance employees must inspect the vehicle for accident damage, report any damage to their supervisor, and indicate damage on the diagram on the reverse of Form 4546-E. Do not defer repairs of accident damage to a later date. Prepare a separate work order and code it as an accident.

37. Reserved

38. Reserved

Underneath Inspection/Lube

39. Fluid leaks and engine mounts (A & B)

Before changing engine oil, inspect the engine and transmission for fluid leaks. Check the radiator for leaks. Inspect lower radiator hose for condition and leaks. Examine motor mounts for deterioration and torque.

40. Change oil, filter, and lubricate (A & B)

Change engine oil and filter during each B PMI or every 10,000 miles, whichever comes first. Service the oil centrifuge when changing the oil. Perform complete lubrication, and check **fluid levels and condition in accordance with all items as shown on the manufacturer's lubrication chart**. Write the lube, oil, and filter as a line item on Form 4543, *Vehicle Maintenance Work Order*.

Note: If the lubrication is performed by someone other than the person doing the PMI, subtract 0.7 hours from PMI ERT.

41. Steering, tie rods, and arms (A & B)

Check steering column, shaft assembly, and steering gear for any deficiency or looseness. Examine all steering linkage and arms for wear, looseness, or damage. Check steering damper for proper mounting and operation. Rotate components and check for end play. Examine kingpins for excessive wear. Lubricate the tie rods and other steering components. Inspect the power steering hoses and connections to ensure the hoses are not rubbing, leaking, or deteriorating.

42. Brake linings (B only)

It is not necessary to remove the wheels on every inspection to examine the condition of the brake linings. However, on every service make a visual inspection of the brake drum and lining. This may be done by viewing the lining through the inspection hole in the dust shields or by removing the dust shields. After brake inspection, reinstall the dust shields.

Local management must ensure that all brakes are properly maintained. Once a year, remove all wheels to inspect brake assemblies, linings, and drums. Check for missing, non functioning, loose, contaminated, or cracked parts, such as brake drum, shoes, rotors, pads, linings, brake chamber, chamber mounting, push rods, or slack adjusters. Check for "S" cam roll over. Check for audible air leaks around brake components and lines. Check hoses, brake lines, and chambers for leaks. Ensure that these items do not rub against any components. Examine slack adjusters and links. Ensure the operation of automatic slack adjusters (if applicable). Adjust all brakes. Replace brake linings that have 8/32 inch or less of lining material remaining. Record the findings on Form 4546-E. On the yearly brake inspection, write line item "Pull all wheels and drums for brake inspection" on Form 4543, *Vehicle Maintenance Work Order*. The estimated time to perform this brake inspection on a single axle tractor is 2 hours. This time includes adjustment of the wheel bearings and replacement of the seals.

43. Brake chamber push-rod travel (A & B)

When checking the brake chamber push-rod travel, air pressure system must be approximately 90 PSI to 100 PSI. Stop the engine, release the parking brake, and apply and hold the brakes. Measure the distance that the push-rod traveled from the point the parking brake was released to the point the brakes were applied. This is push-rod travel, and it should be as short as possible without brake drag and equal on the same axle. Check the angle formed between the brake chamber push rod and slack adjuster arm. It should be at least 90 degrees when the brakes are fully applied. Refer to the vehicle's service manual for proper specifications. All late-model tractors are equipped with automatic slack adjusters. If the orange band painted into grooves on the push-rod is visible, that indicates that the self-adjuster is not working or that other foundation brake service may be required.

44. Bearing play and condition (A & B)

Check the wheel bearing for excessive play. Adjust if necessary. Do not service wheel bearings except on brake service unless operating conditions warrant (operation in hub deep water, etc.).

45. Suspension, springs, shocks, and hangers (A & B)

Examine all spring hangers, shackles, shackle pins, and bushings for wear. Check for sagging or broken spring leaves or broken center bolts. Check the tightness of spring U-bolts, and check for indications of misaligned or shifted springs. Examine shock absorbers for leaks, loose brackets, or worn grommets. Check for loose axle positioning parts and signs of axle misalignment.

46. Transmission and mountings (A & B)

A. Manual Transmissions

Inspect the shifter boot for deterioration and broken seal springs. Check the transmission mounts, shift linkage, and U joints for wear or deterioration. Inspect the transmission for leaks. Check the fluid level.

B. Automatic Transmissions

Examine transmission mounts for deterioration. Check the transmission cooler lines for leaks and chaffing. Drain and refill automatic transmission fluid annually or every 50,000 miles, whichever comes first. Some vehicles with automatic transmission have both internal and external filters. Change the internal filter only when the transmission pan is removed for adjustments or overhaul. Change the external filter only when prompted by the warning light on the dash panel or every 3 years, whichever comes first. Inspect the speedometer cable and attachment. Ensure there are no kinks or leaks and that the cable bends smoothly and is protected from damage.

47. Exhaust systems (A & B)

Examine complete exhaust system for leaks, damage, or loose hangers. Examine exhaust pipes and stack for evidence of leaking joints. Ensure the exhaust does not make contact with any fuel, water, air, or electrical lines.

48. Driveline, alignment, and condition (A & B)

Inspect the drive shaft for correct phasing. Examine drive shaft, universal joints, and slip joints for wear or damage.

49. Differential and breather (A & B)

Check fluid level and fill as necessary. Clean vent assembly and examine housing for indication of leaks.

50. Undercoating condition (A & B)

Inspect the condition of the undercoating. Touch up the undercoating annually to ensure the long life cycle for postal vehicles. After accident repairs are made, reapply rustproofing. Check for corrosion of all chassis components.

51. Automatic lubrication system (A & B)

If the vehicle is equipped with an automatic lubrication system, check for proper lubrication of the chassis by setting the timer to the test cycle. Grease should appear at each lube point. If no grease is found, make necessary repairs. Refill system as needed.

52. Air suspension system (B only)

For vehicles equipped with an air suspension system, operation of the air suspension ride height is controlled by an air leveling valve that increases or decreases the amount of air pressure in the air spring for a given load. The air leveling valve senses the weight of the load and inflates or deflates the air springs to maintain the required ride height. The vehicle ride height remains the same whether the vehicle has a loaded or unloaded trailer hookup.

The driver controls the air suspension system with a control valve located in the cab of the vehicle. **For operation, the valve must be in the "Ride" position. For hooking or unhooking to trailers, the valve must be in the "Lower" position. Failure to follow these directions may cause damage to the tractor.**

On each PMI, check nuts for proper torque. Inspect the condition of springs, radius rod, and torque rod bushing. Drain air tanks. Inspect the air springs for proper clearance. Do not mount any optional or auxiliary equipment too close to the air springs. After system stabilizes, check ride height. It takes 2 seconds to 8 seconds after movement of the control before air starts to flow into or out of the air springs. If all air springs are inflated equally, the vehicle should be at the required ride height. If it is not, refer to the vehicle's service manual for proper repair procedure.

Engine Compartment Area

53. Engine compartment and cab lifting system (A & B)

Examine cab lock lever and safety catches for broken springs. Check cab tilt latches for proper adjustment. Check springs in tilt assist torsion unit. Examine tilt trunnions. Inspect the cab lifting system for proper operation. Fill windshield washer reservoir.

54. Antifreeze protection level (A & B)

Before removing the radiator overflow tank cap, squeeze the hoses to see if the system is pressurized or hot. Carefully remove the radiator cap and check the seal. Inspect the fluid level. Test coolant mixture for freeze protection with a refractometer or test strip. Add quantities as necessary to maintain a solution of 50% antifreeze and 50% water. Record the protection level in the space provided on Form 4546-E.

55. Alkalinity protection and water filter (A & B)

Test corrosion resistant properties of the coolant with a coolant test strip. This engine is equipped with a cooling system filter and treatment system that must be serviced at each PMI. Supplemental coolant conditioners, such as Nalcool, may be used, and their condition may be tested by coolant test kits. If test results are unsatisfactory, drain, flush, and refill cooling system with a solution of 50% antifreeze and 50% water. Replace coolant filter annually. Add make-up coolant and chemical conditioners required to ensure adequate cooling system protection.

56. Replace or recycle coolant as required (A & B)

Replace or recycle coolant as required by the type of coolant used. The service requirement might differ between coolant manufacturers. Refer to the coolant manufacturer's recommendations concerning the change or recycle interval.

57. Radiator, hoses, and leaks (A & B)

Pressure test complete cooling system. Examine all hoses and connections for leaks or wear. Inspect water pump. Replace hoses as needed.

58. Belts and pulleys (A & B)

Check all belts for condition, alignment, and proper tension. When adjusting belts, use a belt tension gauge. Inspect all pulleys for alignment and condition. Check for unusual noise. Examine damper for deterioration or excessive vibration. Examine water pump, idler pulley, and fan hub for noise or vibrations.

59. Alternator and power steering (A & B)

Check alternator terminal connections and mounting. Check the fluid level of the power steering pump. Ensure there are no leaks. Examine pump and mounting bracket for condition and check for loose or broken bolts.

60. Fuel lines, fuel system, and linkage (A & B)

Inspect fuel lines for routing and leaks. Inspect fuel injection system linkage and lubricate as needed. Examine linkage, levers, connectors, and return springs for wear or interference.

61. Fuel filter(s) (B only)

Replace all fuel filters annually or more frequently as necessary.

62. Emission control devices (A & B)

Inspect the engine for all related emission control components. Ensure their correct operation. Examine crankcase emission system regulator. Examine all hoses, connections, and grommets for deterioration.

63. Air filter restriction (B only)

Test air filter restriction. Record reading on Form 4546-E. Replace air filter when restriction exceeds 25 inches water. Examine mounting brackets on air cleaner and compressor aftercooler. Check hoses, clamps, and piping for leaks or loose connections.

64. Clean battery post and cables (A & B)

Clean battery posts and cables. Clean the terminals with a wire brush. If very corroded, clean the area with a solution of baking soda and water. Apply protective spray to the cleaned terminals. Make sure the battery posts bolts are properly tightened.

65. Battery box and hold-downs (A & B)

Examine battery box for signs of corrosion. Clean and paint box if needed. Check hold-downs for looseness and tighten if needed.

66. Wiring and hoses (A & B)

Check for proper routing of all wiring and hoses, including electrical wiring and fuel hoses. Ensure that these components are not rubbing against each other or any other metal surface.

67. Battery load test (A & B)

Perform a battery load test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-E.

68. Starter cranking test (A & B)

On vehicles equipped with electric starters, perform a starter cranking test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-E. On tractors equipped with air starters, check for proper lubrication of the system by cranking the engine several times. A light mist of diesel fuel should come from the exhaust of the starter. On later model tractors, the starters are self-lubricated. Inspect the air starter air system for leaks. Drain the moisture from the air starter air tank.

69. Alternator output test (A & B)

Perform an alternator output test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-E.

70. Regulator voltage (A & B)

Perform a regulator test using a volt amp tester (Sun VAT 60 or equal equipment). Record the results in the space provided on Form 4546-E.

71. Engine (A & B)

Perform scheduled engine maintenance and adjustments in accordance with the manufacturer's recommendations.

72. Emissions (B only)

Observe the exhaust smoke. If there is excessive smoke, investigate the cause. Some states may require an opacity meter to test diesel engine exhaust. Refer to local emission ordinances.

73. List all repair actions on Form 4541 or 4543 (A & B)

List all repair actions on Form 4541, *Order Invoice for Vehicle Repair*, or Form 4543, *Vehicle Maintenance Work Order*. Schedule work generated by the PMI.

74. Quality assurance road test (A & B)

After the required repairs have been completed, drive the vehicle and check engine for acceleration, smoothness, and power. Check transmission shift pattern. Check steering for ease of operation, wander, pulling, etc. Listen for any unusual noise. Check brake stopping ability and parking brake holding ability. Before vehicle is released for service, ensure that seat, seatbelt, steering wheel, and shift lever are clean.

When the quality assurance road test is satisfactorily completed, enter the work order number and odometer reading in the spaces provided at the bottom of Form 4546-E. Sign and date the form. Return the vehicle to service.

75. Reserved

76. Reserved

77. Reserved

78. Reserved

Note:

Estimated inspection times for tractors:

	Estimated Inspection Time (hours)
Level A	2.0
Level B	3.5

The B PMI and the follow-up repairs satisfy the Federal Annual Vehicle Inspection, as prescribed in the Federal Motor Carrier Safety Regulations.

PMI Guidelines for Trailers

These tools are needed to perform the PMI:

- Miscellaneous hand tools
- Spray lubricant
- Shop rags
- Flashlight
- Air pressure gauge
- Tread depth gauge
- Tire square
- Air chuck
- Air system/light checking tool
- Axle alignment tools
- King pin tools
- 50-foot tape measure

Explanation of Form 4546-F, *Preventive Maintenance Inspection Guidelines* — *Trailers*

Fill in the vehicle number, assigned location, due date (for PMI), and the type of PMI (level A or B).

Walk Around

1. Review vehicle jacket, modification orders, and repair tags (A & B)

Prior to each preventive maintenance inspection, review the vehicle jacket to determine the nature and extent of work to be performed. Reviewing the vehicle jacket provides maintenance personnel with the vehicle's history. Compare the current mileage with the mileage at the last PMI. Examine the file to determine when items such as brake work and tune-ups were performed last. Review the vehicle records for any pending Vehicle Modification Orders and for any history of repetitive repairs. Review Forms 4565, *Vehicle Repair Tag*.

2. Landing gear assembly (A & B)

Raise and lower the landing gear. Check operation of gear in low and high range. Inspect the landing gear mounting and brackets. Inspect pad mounting for damage, alignment, and condition.

3. Glad-hands and connectors (A & B)

Inspect the condition of the glad-hands. Replace glad-hand seals annually. Inspect and clean the seven-pin connector.

4. Road test (A & B)

Pull the trailer a short distance. Check brake stopping ability and parking brake holding ability. Check the trailer for handling and tracking.

5. Test brakes for proper operation (A & B)

Ensure that brakes are operational when foot brake is applied. Ensure that trailer brakes are operational when trolley valve is applied.

6. Emergency brake valve operation (A & B)

With the trailer hooked to a tractor, ensure that trailer brakes are operational when tractor protection valve is pulled. If brakes are not operational, investigate the cause and repair as needed.

7. Perform air system leak checks and drain air tanks (A & B)

Drain all air tanks to 0 PSI. If the trailer is hooked to a tractor, make sure the engine is turned off and the parking brake is released. Allow the pressure to stabilize for 1 minute. Apply and hold the brakes. Allow the pressure to stabilize for 1 minute. Observe the dash gauge pressures for 1 minute and note any pressure drop. Air pressure drop should not exceed 4 PSI in 1 minute. If it does, investigate the cause and repair as needed.

If the trailer is not hooked to a tractor, perform the air system test with an air system tester and shop air using the following procedure: Install the two test glad-hands to the corresponding trailer glad-hands. Apply approximately 120 PSI to the emergency side of the trailer's air system and approximately 80 PSI to the service side of the system. Allow the air pressure to stabilize for 1 minute. Observe the dash gauge pressures for 1 minute and note any pressure drop. Air pressure should not drop more than 1 PSI in 1 minute, and the air in the emergency side should not bleed into the service side.

8. Lights and turn signals (A & B)

Examine all lenses for cracks, deterioration, and brightness. Check all lights for proper operation.

9. Electrical junction box (A & B)

Inspect the condition of the junction box and electrical receptacle. Ensure that the mounting is secure. Examine wiring and harnesses for chafing and for proper connection and support. To prevent corrosion, coat the terminals with a liberal application of dielectric grease.

10. Rear door and seals (A & B)

Inspect the overhead door, pull down strap, and door seals. Replace any damaged panels. Inspect and lube rear door spring assembly, cable, rollers, door hinges, and other moving parts. Operate and lube the cargo vent hardware.

11. Logos, markings, and beltline (A & B)

Check exterior markings and decals to ensure that exterior markings are not faded, scratched, torn, or missing and that they are positioned properly. Update decals as needed. Check the beltline and vehicle numbers in the same manner. Review Publication 500-G, *Vehicle Guidelines*, for more information on vehicle markings.

12. Bumpers, reflectors, lenses, and mud flaps (A & B)

Examine bumpers, reflectors, and lenses for damage or environmental deterioration. Examine condition of mud flaps and mounting for damage. Inspect the Interstate Commerce Commission (I.C.C.) bumper for cracks and damage. Repair as needed.

13. General paint and body condition (A & B)

Inspect all painted surfaces for deterioration and condition. Repaint vehicles on an as-needed basis, as determined by the Manager, Vehicle Maintenance. Inspect the bulkhead, corners, and fiberglass reinforced panels (FRPs) for damage. Check the body caulking to prevent panel damage and electrolysis of the body rail. Do not delay any wear and tear repairs, painting, or accident-caused body work.

14. Cleaning inside and out (A & B)

During each PMI, steam or pressure clean the trailer chassis.

Note: The estimated repair time (ERT) shown on the back of Form 4546-F was calculated assuming the use of an automatic truck washer. Add 0.5 hours if the trailer is hand-washed and 0.2 hours for sweeping the inside of the trailer. Do not wash the inside of trailers.

15. Accident damage (list on diagram) (A & B)

During each PMI, maintenance employees must inspect the trailer for accident damage, report any damage to their supervisor, and indicate damage on the diagram on Form 4546-F. Do not defer repairs of accident damage to a later date. Prepare a separate work order and code it as an accident.

16. Interior condition, floors, and roof (A & B)

Inspect the cargo lights for proper operation. With the rear door pulled down, inspect the roof, floors, and side panels for holes, signs of leaks, or other damage. Inspect the roof bows to ensure that the roof is attached properly.

17. Cargo restraining devices (A & B)

Check the "E" tracks. Ensure no bolts are loose or missing from the tracks. Inspect the track slots for cracks and wear.

Wheels, Tires, and Underneath

18. Lug nuts, wheels, rims, hubs, and spacers (A & B)

Inspect lug nuts, wheels, rims, and hubs for tightness. Check wheels and rims for cracks, straightness, unseated locking rings, and broken or missing lugs, studs, or clamps. Inspect for "bleeding" rust stains. Check for loose or damaged lug nuts and elongated mounting stud holes. Use a torque wrench to retorque the lug nuts. Check the oil level in the hubs. On wheel designs using spacers, check condition of spacers.

19. Tire inflation (A & B)

Examine condition of all tires for damage, wear, and proper inflation. If a tire is 10 psi or more low, investigate the cause for the loss of air pressure and make corrections. Use a valve cap. Ensure that tire pressure decals are the

correct ones for the vehicle and are positioned properly. Refer to Poster 49, *Tire Pressure Chart*, for a list of proper tire pressures.

20. Tire probe, condition, and tread depths (A & B)

Probe tires and remove foreign objects such as nails or glass.

Visually inspect tires for signs of unusual wear and investigate the cause of wear problems. Check all tire tread depths. Replace a tire if its tread is less than 4/32 inch. Use a straightedge to check that dual tires are matched to within 1/2 inch. Replace any tire that is not matching. Record the tread depth for each tire on Form 4546-F. The tread design is to match on each axle.

21. Lube trailer or check automatic lube system (A & B)

Perform complete lubrication, and check **fluid levels and condition in accordance with all items as shown on the manufacturer's lubrication chart**. If the trailer has an automatic lube system, check the lines for leaks and fill the reservoir as needed. Write the lube as a line item on Form 4543, *Vehicle Maintenance Work Order*.

Note: If the lubrication is performed by someone other than the person doing the PMI, subtract 0.2 hours from PMI ERT.

22. Springs, spring pins, U bolts, and shackles (A & B)

Examine all spring hangers, shackles, and bushings for wear. Check for sagging or broken spring leaves or broken center bolts. Check the tightness of spring U bolts, and check for indications of misaligned or shifted springs.

23. Radius rods and bushings (A & B)

Check all radius rods, bolts, and bushings for tightness and condition.

24. Coupler plate and king pin condition (A & B)

Use a flatness gauge to check the flatness of the coupler plate. If flatness exceeds 1/4 inch or if the pin fails to meet the specification, replace king pin coupler plate. Using a king pin gauge and square, inspect the mounting, height, squareness, and diameter of the king pin. Inspect the pin's mounting for cracks.

25. Brake linings (B only)

Remove all wheels to inspect brake assemblies, linings, and drums. Check for missing, non functioning, loose, contaminated, or cracked parts, such as brake drums, shoes, rotors, pads, linings, brake chamber, chamber mounting, push rods, or slack adjusters. Check for "S" cam roll over. Check for audible air leaks around brake components and lines. Check hoses, brake lines, and chambers for leaks. Ensure that these items do not rub against any components. Replace brake linings that have 8/32 inch or less of lining material remaining. Record the findings on Form 4546-F. The estimated time to perform this brake inspection on a trailer is 1 hour per axle. This time includes adjustment of the wheel bearings and replacement of the seals.

26. Brake chamber push-rod travel and slack adjusters

When checking the brake chamber push-rod travel, air pressure system must be approximately 90 PSI to 100 PSI. Stop the engine, release the parking brake, and apply and hold the brakes. Measure the distance that the push-rod traveled from the point the parking brake was released to the point the brakes were applied. This is push-rod travel, and it should be as short as possible without brake drag and equal on the same axle. Check the angle formed between the brake chamber push rod and slack adjuster arm. It should be at least 90 degrees when the brakes are fully applied. Refer to the vehicle's service manual for proper specifications. All late-model trailers are equipped with automatic slack adjusters. If the orange band painted into grooves on the push-rod is visible, that indicates that the self-adjuster is not working or that other foundation brake service may be required.

27. Air tank, mounting, and valves (A & B)

Inspect air tank and drain valve for mounting and damage. Open and drain tanks completely.

28. Air lines, hoses, wiring, and connections (A & B)

Inspect brake lines for leaks. Check the condition of all air hoses and ensure that they are not rubbing against any metal components. Check the condition of all wiring and ensure that no wiring is exposed.

29. Axle alignment (B only)

To check axle alignment on a single-axle trailer, install axle extension on left front axle, install king pin adapter, attach metal tape, and measure the distance from the axle to the axle extension. Repeat this procedure for the right front axle. Compare the two measurements. If the measurements vary more than 1/8 inch, align the axle.

To check axle alignment on a tandem-axle trailer, first check the left side by measuring from the left front axle to the left rear axle. Repeat this procedure for the right side. Compare the two measurement. If the measurements vary more than 1/8 inch, align the rear axle.

30. Body cross members (A & B)

Check the condition of all body cross members for cracks and broken welds.

31. Undercoating condition (A & B)

Inspect the condition of the undercoating. Touch up the undercoating annually to ensure the long life cycle for postal vehicles. After accident repairs are made, reapply rustproofing.

32. List all repair actions on Form 4541 or 4543 (A & B)

List all repair actions on Form 4541, *Order Invoice for Vehicle Repair*, or Form 4543, *Vehicle Maintenance Work Order*. Schedule work generated by the PMI.

33. Quality assurance road test (A & B)

After the required repairs have been completed, pull the trailer. Check the trailer for wander and pulling. Listen for any unusual noise. Check brake stopping ability and parking brake holding ability.

When the quality assurance road test is satisfactorily completed, enter the work order number in the space provided at the bottom of Form 4546-F. Sign and date the form. Return the vehicle to service.

34. Reserved**35. Reserved****Note:**

Estimated inspection times for trailers:

	Estimated Inspection Time (hours)
Level A, single-axle	1.5
Level A, tandem-axle	1.5
Level B, single-axle	2.5
Level B, tandem-axle	3.0

The B PMI and the follow-up repairs satisfy the Federal Annual Vehicle Inspection, as prescribed in the Federal Motor Carrier Safety Regulations.

Appendix: Forms Used in the PMI Program

The following forms are used in the PMI program. Instructions for completing these forms are included in this bulletin. See the transmittal letter at the beginning of this bulletin for information on ordering these forms. These forms can be reproduced locally until they are received from the material distribution centers (MDCs).

PS Form 4546-A, *Preventive Maintenance Inspection Guidelines —
Administrative Vehicles*

PS Form 4546-B, *Preventive Maintenance Inspection Guidelines —
Light Delivery Vehicles*

PS Form 4546-C, *Preventive Maintenance Inspection Guidelines —
Intermediate Delivery Vehicles*

PS Form 4546-D, *Preventive Maintenance Inspection Guidelines —
Cargo Vans*

PS Form 4546-E, *Preventive Maintenance Inspection Guidelines —
Tractors*

PS Form 4546-F, *Preventive Maintenance Inspection Guidelines —
Trailers*



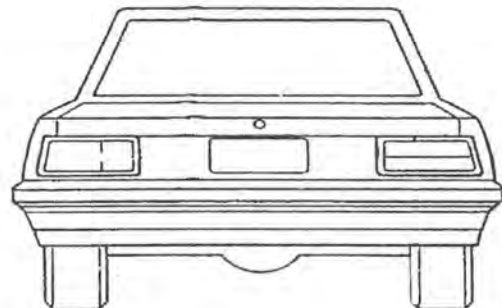
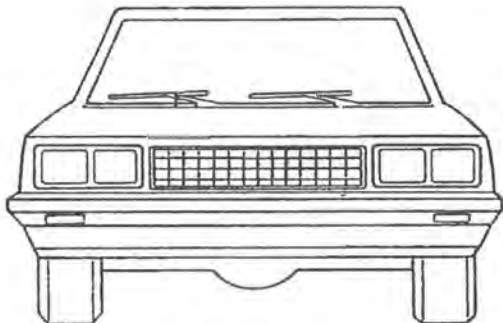
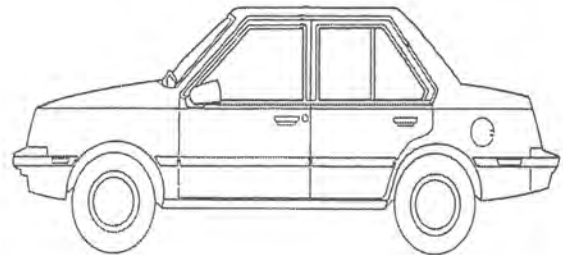
UNITED STATES POSTAL SERVICE PREVENTIVE MAINTENANCE INSPECTION GUIDELINES ADMINISTRATIVE VEHICLES



Vehicle No.		Assigned Location	Due Date	Type PMI
In box before each item indicate condition as follows: (✓) Item is OK (0) Adjustment Made (X) Repairs Needed (-) Not Applicable				
A	B	Cab Area	A	B
		1. Review vehicle jacket, mod orders, and repair tags		31.
		2. Road test		32.
		3. Leaks, doors, and handles		33.
		4. Seat, belt, and interior	Underneath Inspect/Lube	
		5. Key, ignition, and door key assembly		34. Fluid leaks and engine mounts
		6. Buzzer and warning devices		35. Change oil, filter, and lubricate
		7. Starter action, unusual sounds, and neutral switch		36. Steering, tie rods, and arms
		8. Gauges, horn, heater, oil pressure, and mirrors		37. Brake linings LF ___/32 RF ___/32
		9. Accessories, glass, windshield wipers, and fan		LR ___/32 RR ___/32
		10. Steering play ___ inches		38. Bearing play and condition
		11. Parking brake and foot brake test		39. Suspension, springs, shocks, and hangers
		12. Clean inside and out		40. Transmission and mountings
		13. Lights, turn signals, and back-up lights		41. Exhaust systems, converter, and muffler
		14. Floor and underdash wiring		42. Driveline, alignment, and condition
		15. Window, window guides, and regulator		43. Differential and breather
		16. Authorized cab decals and Label 70		44. Undercoating condition
		17. General paint and body condition		45.
		18. Wax vehicle		46.
		19.		47.
		20.		48.
Circle Inspection			Engine Compartment Area	
		21. Tire inflation		49. Engine compartment
		22. Lug nuts, wheels, hubs, and alignment		50. Antifreeze protection level ___°F
		23. Tire probe, condition and tread depths LF ___/32 RF ___/32 LR ___/32 RR ___/32		51. Alkalinity protection
		24. Bumpers, reflectors, and lenses		52. Replace or recycle coolant as required
		25. Logos, markings, posters, and beltline		53. Radiator, hoses, and leaks
		26. Interior condition, floors, and roof		54. Belts and pulleys
		27. Fuel cap, door, and filler neck		55. Alternator and power steering
		28. Accident kit		56. Fuel lines, fuel system, and linkage
		29. Accident damage (list on diagram)		57. Fuel filter, air filter, and PCV filter
		30.		58. Clean battery post and cables
				59. Battery box and hold-downs

PREVENTIVE MAINTENANCE INSPECTION GUIDELINES (continued)

A	B	Engine Compartment Area (con't)	A	B	CNG Vehicles (con't)
		60. Wiring and hoses			70. Wiring
		61. Battery load test ____ volts			71. CNG labels
		62. Starter cranking test ____ amps	Engine Compartment		
		63. Alternator output test ____ volts ____ amps			72. CNG labels
		64. Regulator voltage ____ volts			73. CNG components
		65. Emission control systems HC ____ ppm CO ____ % at idle HC ____ ppm CO ____ % at 2500 RPM O ₂ ____ % CO ₂ ____ % at idle O ₂ ____ % CO ₂ ____ % at 2500 RPM			74. Emission control systems HC ____ ppm CO ____ % at idle HC ____ ppm CO ____ % at 2500 RPM O ₂ ____ % CO ₂ ____ % at idle O ₂ ____ % CO ₂ ____ % at 2500 RPM
		66. List all repair actions on Form 4541 or 4543	Underneath Inspection		
		67. Quality assurance road test			75. Leak checks
CNG Vehicles					76. Fuel tank
Cab Area					77. Lines, valves, and regulators
		68. Fill valve and starter interrupt switch			78.
		69. Warning lights and engine operation			79.



Note: If damage is more than normal wear and tear, a separate work order must be written and coded as an accident.

ERT to perform an "A" PMI on an administrative vehicle is 1.5 hours. ERT to perform an "A" PMI on an administrative vehicle equipped with CNG is 2.0 hours. ERT to perform a "B" PMI on an administrative vehicle is 2.0 hours. ERT to perform a "B" PMI on an administrative vehicle equipped with CNG is 2.5 hours.

Completed by	Date	Work Order No.	Odometer
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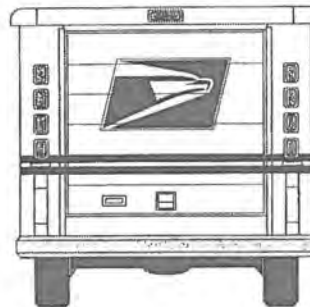
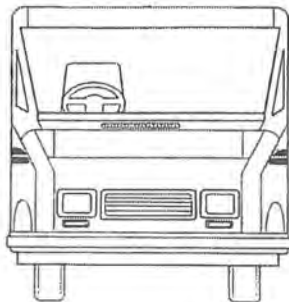
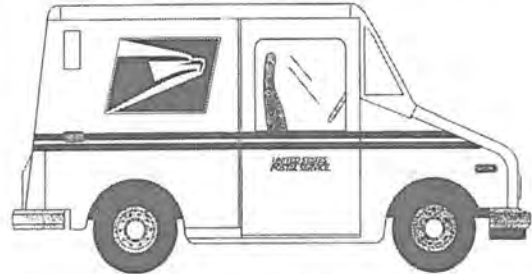
**UNITED STATES POSTAL SERVICE
PREVENTIVE MAINTENANCE INSPECTION GUIDELINES
LIGHT DELIVERY VEHICLES**



Vehicle No.		Assigned Location	Due Date	Type of PMI	
In box before each item indicate condition as follows: (√) Item is OK (0) Adjustment Made (X) Repairs Needed (-) Not Applicable					
A	B	Cab Area		A	
		1. Review vehicle jacket, mod orders, and repair tags		31. Accident damage (list on diagram)	
		2. Road test		32.	
		3. Leaks, doors, handles, and steps		33.	
		4. Seat, belt, and interior		Underneath Inspect/Lube	
		5. Key, ignition, and door key assembly			34. Fluid leaks and engine mounts
		6. Buzzer and warning devices			35. Change oil, filter, and lubricate
		7. Starter action, unusual sounds, and neutral switch			36. Steering, tie rods, and arms
		8. Gauges, horn, heater, oil pressure, and mirrors			37. Brake linings LF ___/32 RF ___/32
		9. Accessories, glass, windshield wipers, and fan			LR ___/32 RR ___/32
		10. Steering play ___ inches			38. Bearing play and condition
		11. Parking brake and foot brake test			39. Suspension, springs, shocks, and hangers
		12. Clean inside and out			40. Transmission and mountings
		13. Lights, turn signals, and back-up lights			41. Exhaust systems, converter, and muffler
		14. Floor and underdash wiring			42. Driveline, alignment, and condition
		15. Mail tray and brackets			43. Body hold downs, hoses, and wires
		16. Window, window locks, regulator, and door slides			44. Differential and breather
		17. Authorized cab decals and Label 70			45. Undercoating condition
		18. General paint and body condition			46.
		19. Wax vehicle			47.
		20.			48.
Circle Inspection			Engine Compartment Area		
		21. Tire inflation		49. Engine compartment	
		22. Lug nuts, wheels, hubs, and alignment		50. Antifreeze protection level ___°F	
		23. Tire probe, condition and tread depths LF ___/32 RF ___/32 LR ___/32 RR ___/32		51. Alkalinity protection	
		24. Bumpers, reflectors, lenses, and mud flaps		52. Replace or recycle coolant as required	
		25. Logos, markings, posters, and beltline		53. Radiator, hoses, and leaks	
		26. Rear door security and condition		54. Belts and pulleys	
		27. Interior condition, cargo door, floors, and roof		55. Alternator and power steering	
		28. Cargo restraining devices		56. Fuel lines, fuel system, and linkage	
		29. Fuel cap, door, and filler neck		57. Fuel filter, air filter, and PCV filter	
		30. Accident kit		58. Clean battery post and cables	
				59. Battery box and hold-downs	

PREVENTIVE MAINTENANCE INSPECTION GUIDELINES (continued)

A	B	Engine Compartment Area (con't)	A	B	CNG Vehicles (con't)
		60. Wiring and hoses			70. Wiring
		61. Battery load test ____ volts			71. CNG labels
		62. Starter cranking test ____ amps	Engine Compartment		
		63. Alternator output test ____ volts ____ amps			72. CNG labels
		64. Regulator voltage ____ volts			73. CNG components
		65. Emission control systems HC ____ ppm CO ____ % at idle HC ____ ppm CO ____ % at 2500 RPM O ₂ ____ % CO ₂ ____ % at idle O ₂ ____ % CO ₂ ____ % at 2500 RPM			74. Emission control systems HC ____ ppm CO ____ % at idle HC ____ ppm CO ____ % at 2500 RPM O ₂ ____ % CO ₂ ____ % at idle O ₂ ____ % CO ₂ ____ % at 2500 RPM
		66. List all repair actions on Form 4541 or 4543	Underneath Inspection		
		67. Quality assurance road test			75. Leak checks
CNG Vehicles					76. Fuel tank
Cab Area					77. Lines, valves, and regulators
		68. Fill valve and starter Interrupt switch			78.
		69. Warning lights and engine operation			79.



Note: If damage is more than normal wear and tear, a separate work order must be written and coded as an accident.

ERT to perform an "A" PMI on a light delivery vehicle is 1.5 hours. ERT to perform an "A" PMI on a light delivery vehicle equipped with CNG is 2.0 hours. ERT to perform a "B" PMI on a light delivery vehicle is 3.0 hours. ERT to perform a "B" PMI on a light delivery vehicle equipped with CNG is 3.5 hours.

Completed by	Date	Work Order No.	Odometer
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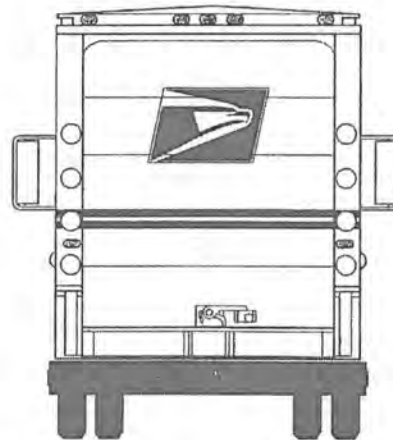
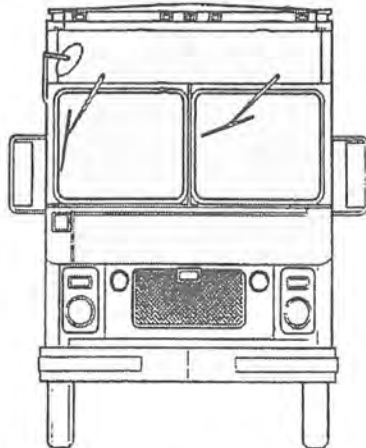
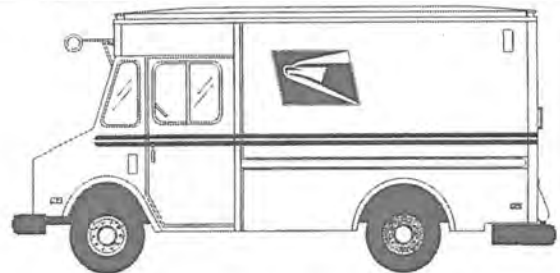
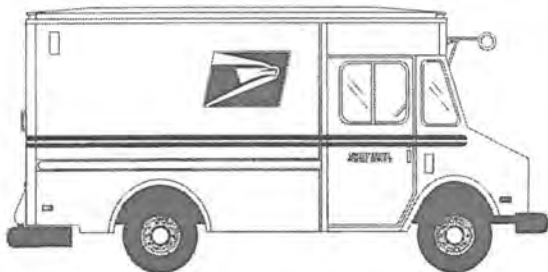
**UNITED STATES POSTAL SERVICE
PREVENTIVE MAINTENANCE INSPECTION GUIDELINES
INTERMEDIATE DELIVERY VEHICLES**



Vehicle No.		Assigned Location		Due Date		Type of PMI	
(-) Not Applicable							
		ab A ea	A	B			
		1. Review vehicle jacket, mod orders, and repair tags			31. Accident damage (list on diagram)		
		2. Road test			32. Lift gate		
		3. Leaks, doors, handles, and steps			33.		
		4. Seat, belt, and interior	Underneath Inspect/Lube				
		5. Key, ignition, and door key assembly			34. Fluid leaks and engine mounts		
		6. Buzzer and warning devices			35. Change oil, filter, and lubricate		
		7. Starter action, unusual sounds, and neutral switch			36. Steering, tie rods, and arms		
		8. Cold weather starting aids			37. Brake linings LF ____/32 RF ____/32		
		9. Gauges, horn, heater, oil pressure, and mirrors			LR ____/32 RR ____/32		
		10. Accessories, glass, windshield wipers, and fan			38. Bearing play and condition		
		11. Steering play ____ inches			39. Suspension, springs, shocks, and hangers		
					40. Transmission and mountings		
					41. Exhaust systems, converter, and muffler		
		14. Lights, turn signals, and back-up lights			Driveline, alignment, and condition		
		15. Floor and underdash wiring			Body hold-downs, hoses, and wires		
					Differential and breather		
		17. Window, window locks, regulator, and door slides			Undercoating condition		
		18. Authorized cab decals and Label 70					
		19. General paint and body condition					
		20. Wax vehicle					
Circle Inspection				Engine Compartment Area			
					49. Engine compartment and engine		
					50. Antifreeze protection level ____°F		
					51. Alkalinity protection		
					52. Replace or recycle coolant as required		
					53. Radiator, hoses, and leaks		
					54. Belts and pulleys		
					55. Alternator and power steering		
					56. Fuel lines, fuel system, and linkage		
					57. Air filter restriction ____ in inches and service fuel filters		
					58. Clean battery post and cables		
					59. Battery box and hold-downs		

PREVENTIVE MAINTENANCE INSPECTION GUIDELINES (continued)

A	B	Engine Compartment Area (con't)	A	B	CNG Vehicles (con't)
		60. Wiring and hoses			70. Wiring
		61. Battery load test 1. ___ volts 2. ___ volts			71. CNG labels
		62. Starter cranking test ___ amps			Engine Compartment
		63. Alternator output test ___ volts ___ amps			72. CNG labels
		64. Regulator voltage ___ volts			73. CNG components
		65. Emission control systems HC ___ ppm CO ___ % at idle HC ___ ppm CO ___ % at 2500 RPM O ₂ ___ % CO ₂ ___ % at idle O ₂ ___ % CO ₂ ___ % at 2500 RPM			74. Emission control systems HC ___ ppm CO ___ % at idle HC ___ ppm CO ___ % at 2500 RPM O ₂ ___ % CO ₂ ___ % at idle O ₂ ___ % CO ₂ ___ % at 2500 RPM
		66. List all repair actions on Form 4541 or 4543			Underneath Inspection
		67. Quality assurance road test			75. Leak checks
		CNG Vehicles			76. Fuel tank
		Cab Area			77. Lines, valves, and regulators
		68. Fill valve and starter interrupt switch			78.
		69. Warning lights and engine operation			79.



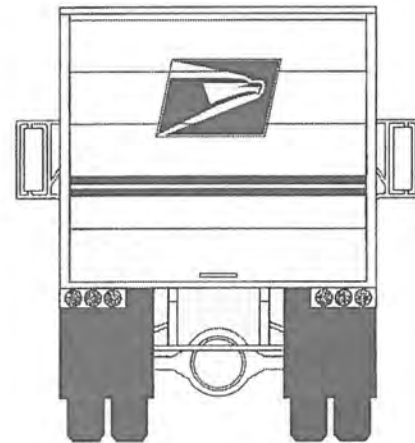
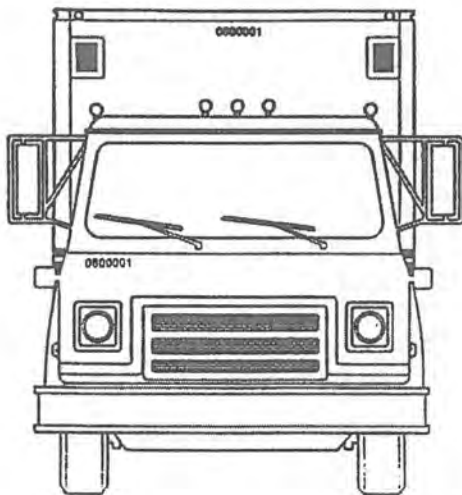
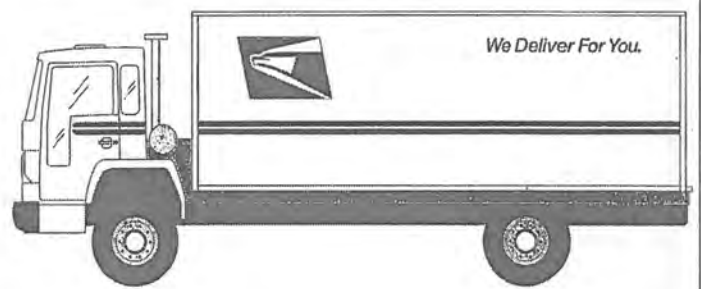
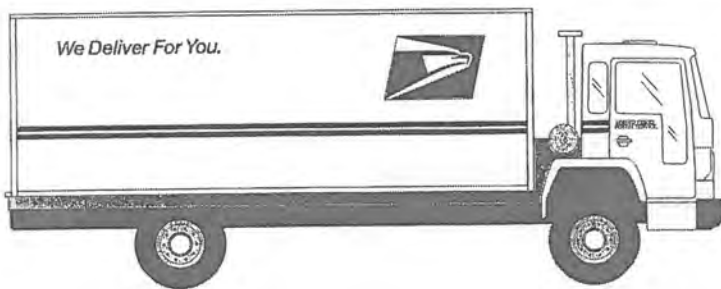
Note: If damage is more than normal wear and tear, a separate work order must be written and coded as an accident.

ERT to perform an "A" PMI on an intermediate delivery vehicle is 1.5 hours. ERT to perform an "A" PMI on an intermediate delivery vehicle equipped with CNG is 2.0 hours. ERT to perform a "B" PMI on an intermediate delivery vehicle is 3.0 hours. ERT to perform a "B" PMI on an intermediate delivery vehicle equipped with CNG is 3.5 hours.

Completed by	Date	Work Order No.	Odometer
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PREVENTIVE MAINTENANCE INSPECTION GUIDELINES (continued)

A	B		A	B	
		61. Fuel filter(s)			70. Regulator voltage ____ volts
		62. Emission control devices			71. Engine
		63. Air filter restriction ____ inches			72. Emissions
		64. Clean battery post and cables			73. List all repair actions on Form 4541 or 4543
		65. Battery box and hold-downs			74. Quality assurance road test
		66. Wiring and hoses			75.
		67. Battery load test ____ volts			76.
		68. Starter cranking test			77.
		69. Alternator output test ____ volts ____ amps			78.



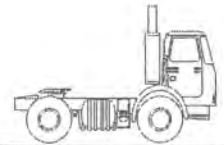
Note: If damage is more than normal wear and tear, a separate work order must be written and coded as an accident.

ERT to perform an "A" PMI on a cargo van is 2.0 hours. ERT to perform a "B" PMI on a cargo van is 3.5 hours.

Completed by	Date	Work Order No.	Odometer
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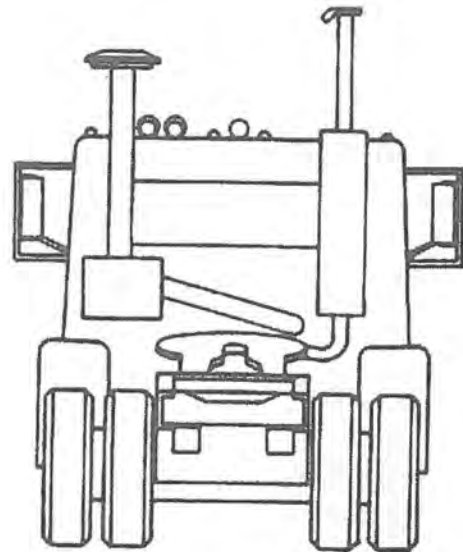
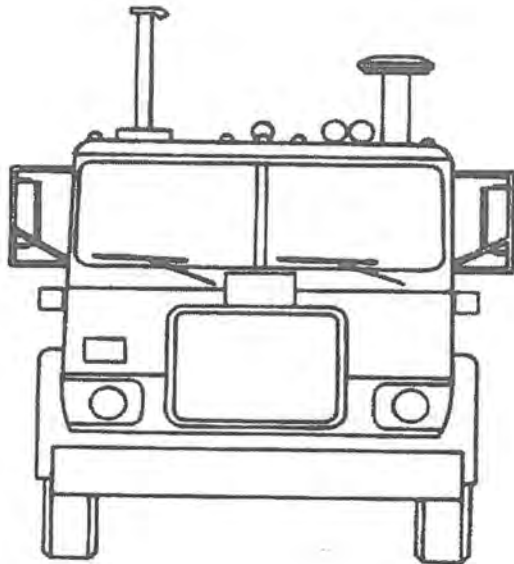
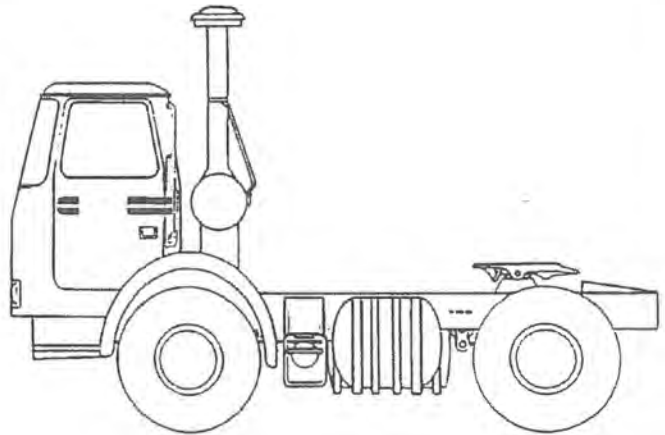
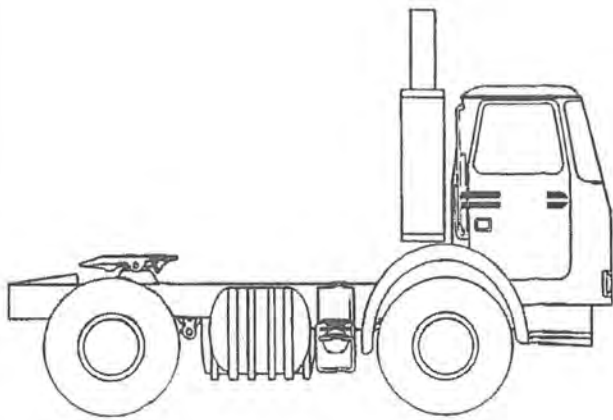
UNITED STATES POSTAL SERVICE PREVENTIVE MAINTENANCE INSPECTION GUIDELINES TRACTORS



Vehicle No.		Assigned Location	Due Date	Type PM	
In box before each item indicate condition as follows: (√) Item is OK (0) Adjustment Made (X) Repairs Needed (-) Not Applicable					
A	B	Cab Area		A	B
		1. Review vehicle jacket, mod orders, and repair tags			31. Glad-hands, hoses, and electrical plug
		2. Road test			32. Fifth wheel assembly
		3. Leaks, doors, door locks, handles, and steps			33. Fuel cap, vent, and filler neck
		4. Seat, belt, and interior			34. Cat walk, steps, and grab handles
		5. Key, ignition, and door key assembly			35. Air tanks, valves, hoses, pipes, and air gauge
		6. Buzzer and warning devices			36. Accident damage (list on diagram)
		7. Cold weather starting aids			37.
		8. Starter action, unusual sounds, and neutral switch			38.
		9. Gauges, horn, heater, oil pressure, and mirrors	Underneath Inspect/Lube		
		10. Accessories, glass, windshield wipers, fan, and radio			39. Fluid leaks and engine mounts
		11. Steering play ____ inches			40. Change oil, filter, and lubricate
		12. Lights, turn signals, and back-up lights			41. Steering, tie rods, and arms
		13. Floor and underdash wiring			42. Brake linings LF ____/32 RF ____/32
		14. Clutch operation, pedal, and pads			Non-Driven L ____/32 R ____/32
		15. Window, regulator, and door hinges			Driven L ____/32 R ____/32
		16. Safety equipment, fire extinguisher, and accident kit			43. Brake chamber push-rod travel and slack adjusters
		17. Authorized cab decals and Label 70			44. Bearing play and condition
		18. Drain air reservoirs			45. Suspension, springs, shocks, and hangers
		19. Low air warning system			46. Transmission and mountings
		20. Air pressure build-up time ____ sec.			47. Exhaust systems
		21. Governor range cut out ____ cut in ____			48. Driveline, alignment, and condition
		22. Perform air system leak checks and service air dryer			49. Differential and breather
		23. Clean inside and out			50. Undercoating condition
		24. General paint and body condition			51. Automatic lubrication system
		25. Wax vehicle			52. Air suspension system
Circle Inspection			Engine Compartment Area		
		26. Tire inflation			53. Engine compartment and cab lifting system
		27. Lug nuts, wheels, hubs, and alignment			54. Antifreeze protection level ____ °F
		28. Tire probe, condition, and tread depths			55. Alkalinity protection and water filter
		LF ____/32 RF ____/32			56. Replace or recycle coolant as required
		Non-driven-LRO ____/32 LRI ____/32 RRI ____/32 RRO ____/32			57. Radiator, hoses, and leaks
		Driven-LRO ____/32 LRI ____/32 RRI ____/32 RRO ____/32			58. Belts and pulleys
		29. Bumpers, reflectors, lenses, and mud flaps			59. Alternator and power steering
		30. Logos, markings, posters, and beltline			60. Fuel lines, fuel system, and linkage

PREVENTIVE MAINTENANCE INSPECTION GUIDELINES (continued)

A	B		A	B	
		61. Fuel filter(s)			70. Regulator voltage ____ volts
		62. Emission control devices			71. Engine
		63. Air filter restriction ____ inches			72. Emissions
		64. Clean battery post and cables			73. List all repair actions on Form 4541 or 4543
		65. Battery box and hold-downs			74. Quality assurance road test
		66. Wiring and hoses			75.
		67. Battery load test ____ volts			76.
		68. Starter cranking test			77.
		69. Alternator output test ____ volts ____ amps			78.



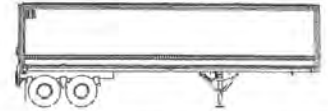
Note: If damage is more than normal wear and tear, a separate work order must be written and coded as an accident.

ERT to perform an "A" PMI on a tractor is 2.0 hours. ERT to perform a "B" PMI on a tractor is 3.5 hours.

Completed by	Date	Work Order No.	Odometer
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**UNITED STATES POSTAL SERVICE
PREVENTIVE MAINTENANCE INSPECTION GUIDELINES
TRAILERS**

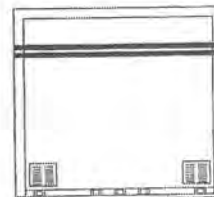
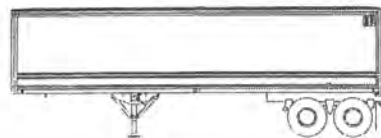
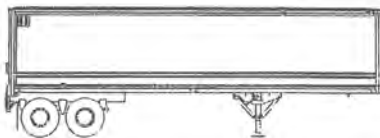


Vehicle No.	Assigned Location	Due Date	Type PM
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In box before each item indicate condition as follows:

(√) Item is OK (0) Adjustment Made (X) Repairs Needed (-) Not Applicable

A	B	Walk Around			
		1. Review vehicle jacket, mod orders, and repair tags			20. Tire probe, condition, and tread depths LF ___/32 RF ___/32 Non-driven-LRO ___/32 LRI ___/32 RRI ___/32 RRO ___/32 Driven-LRO ___/32 LRI ___/32 RRI ___/32 RRO ___/32
		2. Landing gear assembly			
		3. Glad-hands and connectors			
		4. Road test			21. Lube trailer or check automatic lube system
		5. Test brakes for proper operation			22. Springs, spring pins, U bolts, and shackles
		6. Emergency brake valve operation			23. Radius rods and bushings
		7. Perform air system leak checks and drain air tanks			24. Coupler plate and king pin condition
		8. Lights and turn signals			25. Brake linings front L ___/32 R ___/32 rear L ___/32 R ___/32
		9. Electrical junction box			
		10. Rear door and seals			
		11. Logos, markings, and beltline			26. Brake chambers push-rod travel and slack adjusters
		12. Bumpers, reflectors, lenses, and mudflaps			27. Air tank, mounting, and valves
		13. General paint and body condition			28. Air lines, hoses, wiring, and connections
		14. Cleaning inside and out			29. Axle alignment
		15. Accident damage (list on diagram)			30. Body cross members
		16. Interior condition, floors, and roof			31. Undercoating condition
		17. Cargo restraining devices			32. List all repair actions on Form 4541 or 4543
A	B	Wheels, Tires, and Underneath			33. Quality assurance road test
		18. Lug nuts, wheels, rims, hubs, and spacers			34.
		19. Tire inflation			35.



Note: If damage is more than normal wear and tear, a separate work order must be written and coded as an accident. ERT to perform an "A" PMI on either a single-axle or tandem-axle trailer is 1.5 hours. ERT to perform a "B" PMI on a single-axle trailer is 2.5 hours. ERT to perform a "B" PMI on a tandem-axle trailer is 3.0 hours.

Completed by	Date	Work Order No.	Odometer
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