

## **Introduction**

### **Purpose**

CURE Leasing & Maintenance is committed to maintenance excellence. This preventive maintenance program establishes a standard to minimize vehicle failures by monitoring the current condition of the equipment and correcting defects before they develop into safety concerns or costly repairs. The program establishes a systematic procedure to inspect, lubricate and maintain all vehicles that CURE is in charge of servicing. These procedures reduce breakdowns and accidents with all fleet customers and provide them with trouble-free, safe and efficient operations. Our company goal is to provide all CURE customers industry leading equipment that is safe and reliable.

### **Scope**

This P.M. Program applies to all customers' equipment. As changes occur, Technical Service Bulletins may be issued to address certain issues and amend processes. CURE's inspection program will encompass the mandatory Department of Transportation (DOT) inspection criteria set forth in section 396 of the Federal Motor Carrier Safety Regulations (FMCSR). This serves as the criteria for which we will service all customers' equipment. Any vehicle found that does not meet these minimum standards shall be placed out of service and reported to the appropriate customer representative. We will perform quality control audits and self-inspections for compliance of our maintenance processes. By this we will be able to identify areas of improvement and correct deficiencies.

### **Tips for Success**

- Only trained qualified technicians are to perform preventive maintenance inspections.
- Retain records of Preventive Maintenance Inspections (PMI) and repair orders that are required by CURE and various governmental agencies.
- Practice effective communication between the customers and CURE Maintenance Providers for problem identification and resolution.
- Keep vehicle/equipment records up-to-date.
- Complete PMI inspections in a timely manner and on schedule.
- Utilize PMI inspection forms and methods.
- Follow a logical flow while conducting the inspection to avoid returning to the same area of the equipment multiple times.
- Always establish a start and stop point for all inspections.
- Schedule and complete all out of service repairs found during a PMI inspection.
- The PMI inspection is your chance to find items needing repair or replacement while the vehicle/equipment is scheduled for time out-of-service.
- The PMI can help identify items that could be claimed for Warranty.

**PREVENTIVE MAINTENANCE INSPECTION  
GUIDELINES FOR HEAVY DUTY**

Below is a list of tools that will be needed to perform the PMI.

1. Miscellaneous hand tools
2. Spray lube
3. Shop rags
4. Flash light
5. Air pressure gauge
6. Tread depth gauge
7. Tire square
8. Air chuck
9. Grease gun
10. Battery load tester
11. Fifth wheel adjustment tools

## **PMI MAINTENANCE GUIDELINES FOR HEAVY DUTY**

### **CAB AREA**

**1. Review vehicle history, service bulletins and Driver Vehicle Inspection Reports (DVIR)**

Prior to each preventive maintenance inspection, review the vehicle history to determine the nature and extent of work to be performed. Examine the vehicle history to determine when such items as brake work and major work were performed. Review the records for any repetitive repairs and pending service bulletins that may be needed to be performed during the PM. Review pending DVIRs for any needed repairs

**2. Record vehicle information on PM inspection form**

Compare the current mileage with the mileage at the last PM. Complete all required information on the form.

**3. Leaks, doors, door locks, handles and steps**

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 steps/step wells for conditions.

**4. Seat, belt, and interior**

Examine seat mounts, seat covering, adjusting mechanism, seat belt, retractor, and anchors. Check the sun visors and other inside cab components for operation and condition.

**5. Key, ignition, and door key assembly**

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

**6. Buzzers and warning devices**

Turn the ignition "on". All appropriate warning lights and alarms-such as oil pressure, water level, water temperature, antilock braking system (if equipped) should light and buzzers should sound. 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 actions, unusual sounds, and neutral switch**

Check to ensure the engine will not crank in any position other than neutral for vehicles equipped with an automatic transmission. Place the transmission in neutral and start the engine. No unusual noises should be heard.

**8. Gauges, horn, heater, oil pressure, and mirrors**

Check the operation of all gauges. Check the horn for operation and loudness. Turn on heater, defroster, and all other cab systems. Observe the oil pressure as soon as 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 and are in good condition. Some models may have heated and remote controlled mirrors. On this type of mirror, check the operation of the heating element and the motorized controls.

**9. Accessories, glass, windshield wipers, fan, and radio**

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 so equipped.

**10. Steering play \_\_\_\_\_ inches**

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 steering wheel in the other direction until the tires start to move. The total movement of the steering wheel before the wheels begin to move should not exceed 4 inches. If the play exceeds this, check for worn or misadjusted parts. Enter the amount of play on the form.

**11. Lights, turn signals, and back up lights**

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

**12. Floor and under dash wiring**

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.

**13. Clutch operation, pedal and pads**

On manual transmission vehicle, test clutch for slippage, pedal free-play and proper clutch brake operation. Listen for abnormal noise from release bearing. Pedal free travel should be 1½" to 2", clutch brake application 1" above the floor board. Adjust if needed. Check the pedal for wear. If vehicle is equipped with an automatic transmission, only inspect the pedals for wear

**14. Windows, regulator, and door hinges**

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

**15. Safety equipment, fire extinguisher, and accident kit**

Remove the fire extinguisher from the holder. Inspect that the fire extinguisher fill gage is in the green area and a seal is in place. An inspection tag must be affixed to the extinguisher. Sign and date the tag showing that the extinguisher was inspected. Replace the fire extinguisher if it fails any part of the inspection. Check mounting of the emergency warning kit to ensure that the kit is secured in vehicle. Inspect the contents of the warning kits and replace all missing parts. Ensure that accident reporting information is in the vehicle. Replace any missing paper work.

**16. Authorized cab decals**

Check for decals and position of authorized decals.

**17. General paint, logos, markings and body condition**

Inspect all painted surfaces for deterioration and condition. Do not defer any wear and tear repairs, painting or accident body work. Check exterior markings and decals to ensure that the exterior markings are not faded, scratched, torn, or missing and that they are positioned properly. Update decals as needed. Repaint vehicles on an as needed basis.

**18. Drain air reservoirs**

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**

Start engine and run at fast idle. The low pressure warning light and buzzer should be on. When the air pressure reaches approximately 60 PSI, the low pressure warning system (dash warning light and buzzer) should go off.

**20. Air pressure build-up time**

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. Note the air pressure gauge. Start timing when the air pressure gauge reads 85 PSI. Stop timing when air pressure reaches 100 PSI. The air pressure should build-up from 85 to 100 PSI within 40 seconds. Note: The average build-up time is approximately 15 seconds.

**21. Governor range**

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

**22. Air system leak check**

System air leak checks

- A. With maximum pressure, engines stopped, and parking brakes applied, allow pressure to stabilize for at least one minute. Observe the dash gauge pressures for one minute and note any pressure drop. Air pressure drop should not exceed 2 PSI in one minute.
- B. With maximum pressure, engine stopped, and parking brakes released, make and hold brake application. A block of wood can be used to hold the foot valve down during these tests. Allow pressure to stabilize for one minute and begin timing for one minute while watching the dash gauge for a pressure drop. Air pressure drop should not exceed 3 PSI in one minute.

- C. With maximum pressure and engine idling at 600-900 RPM, manually operate the park control valve and note that parking brakes apply and release promptly as control valve button is pulled out and pushed in.
- D. Parking brake and foot brake test
- I. Tractor with manual transmission
  - a. Parking brake check

Start the engine, push clutch pedal down (releasing the clutch) and put the transmission in HIGH gear. Increase engine speed to 300 RPM above idle and slowly let up on clutch pedal (engaging clutch). The vehicle should NOT move and the engine should die before 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). Make and hold a full service brake application. Push the clutch pedal down (releasing the clutch) and put the transmission in HIGH gear. Increase engine speed to 300 RPM above idle and slowly let up the clutch pedal (engaging clutch). The vehicle should NOT move and the engine should die before the clutch is fully engaged. If the vehicle moves, the brakes need to be adjusted.
- II. Tractor with automatic transmission
  - a. Parking brake check

Start the engine and put the transmission in drive. 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 park brakes (PP valves in). Make and hold a full brake application. Put the transmission in the drive position 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.

## **CIRCLE INSPECTION**

### **23. Tire inflation**

Examine condition of all tires for damage, wear, and proper inflation. If a tire is found 10 pounds or more low, investigate the cause for the loss of air pressure and make corrections. Use a valve cap. Inspect the tire pressure decals to see if they are the correct decal and are positioned properly on vehicle.

### **24. Lug nuts, wheels, hubs, and alignment**

Inspect wheels, lug nuts, 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. 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.

**25. Tire probe, condition, and tread depths**

Probe tires and remove foreign objects, such as nails or glass. Check all tire tread depths. Replace if tread is less than 4/32 inch. Record tread depth for each tire on the form. With dual tires, check for tires being matched by using a straightedge. Replace any tire that is not matching. The tires are to match within 1/2". The tread design is to match on each axle. Record the tread depth on the form.

**26. Body doors, latches condition and security**

Check the rear door lock for operation and security. Replace any damaged panels. Inspect the door operation and door seals. Check the condition and operation of the door retractors. Lube all components as needed

**27. Bumpers, reflectors, lenses, and mud flaps**

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

**28. Accident damage**

While performing the preventive maintenance, technician must inspect the vehicle for accident damage, report any damage to their supervisors, and indicate damage on the diagram on the reverse of form. Accident damage may not be deferred to a later date.

**29. Glad-hands, hoses, and electrical plug**

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

**30. Fifth wheel, assembly**

Examine 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/welds. Follow the instructions below during every PMI:

A. Periodic Inspections and Adjustments

Perform all of the following during each preventive maintenance inspection. Perform the inspections after steam cleaning to ensure a good inspection.

1. Inspection and Adjustment: 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 on each pivot ear. If the top plate moves more than 1/2" maximum, 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 following procedure for the appropriate type locking

mechanism. If the locks cannot be properly adjusted due to wear, rebuild or replace the fifth wheel.

B. Fifth Wheel Sliding Mechanism Inspections and Adjustments:

1. Adjustment of Locking Plungers:

- (a). Loosen lock 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. When Locking Plungers Won't Release to Permit Sliding of the Fifth Wheel:

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

3. When Locking Plungers 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 item III A.

**31. Fuel cap, vent, and filler neck**

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

**32. Cat walk, steps, and grab handles**

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

## UNDERNEATH INSPECTION/LUBE

### 33. **Frame leaks and engine mounts**

Prior to 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.

### 34. **Change oil, filters, and lubricate chassis**

Change engine oil and filters on each PM (date filters). Perform complete lubrication of chassis and check fluid levels and condition.

### 35. **Steering, tie rods and arms**

Check steering column, shaft assembly, and steering gear for 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. Check kingpins for excessive wear. Lubricate the tie rods and other steering components as you inspect. Inspect the power steering hoses and connections to ensure the hoses is not rubbing, leaking, or deteriorating.

### 36. **Brake linings**

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

### 37. **Brake chamber push-rod travel**

When checking the brake chamber push-rod travel, air pressure system must be approximately 90 to 100 PSI. With engine stopped, and parking brakes released, make and a hold brake application. Measure the distance that the push-rod traveled from the released to brakes 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 vehicle manufacturer for proper specifications. All late model tractors are equipped with automatic slack adjusters. Inspect the brake chamber push-rod for an orange band painted into grooves on the push-rod. If the paint is visible, it indicates the self adjuster is not working or other foundation brake service may be required.

### 38. **Bearing play and condition**

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

### 39. **Suspension, springs, shocks, and hangers**

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

**40. Suspension, springs, shocks, hangers and lines**

Examine all spring hangers, shackles, shackle pins and bushings for wear. Check for sagging or broken spring leaves or broken center bolts. Check the condition and tightness of the spring U-bolts. Check for indications of misaligned or shifted springs. Examine shock absorbers for leaks, worn grommets, and loose brackets. Check for any loose axle positioning parts and signs of axle misalignment. If vehicle is equipped with a power take off (PTO) inspect the components for wear. Lubricate the u joint and examine it for wear.

**41. Transmission, fluids and mounting**

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, and check the fluid level.

b. Automatic Transmissions

Examine transmission mounts for deterioration. Check the transmission cooler lines for leaks and chaffing. Some automatic transmission equipped vehicles have both internal and external filters.

**42. Exhaust system**

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.

**43. Driveline, alignment and condition**

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

**44. Differential and breather**

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

**45. Undercoating condition**

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 rust proofing. Check for corrosion of all chassis components.

**46. Body hold downs, hoses and wires**

Inspect the body hold downs on the unit and make sure they are complete and tight. Ensure that hoses and wires are properly secured to the chassis.

## **ENGINE COMPARTMENT AREA**

### **47. Engine compartment and cab lifting system**

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

### **48. Antifreeze protection level**

Remove the radiator overflow tank cap and inspect the fluid level. Squeeze the hoses before removing it to see if the system is pressurized. Carefully remove the radiator cap and check the seal. Test engine coolant mixture for freeze protection with a refractometer or test strip. Add quantities as necessary to maintain a maximum 50% solution of antifreeze and water. Record the protection level on the form.

### **49. Coolant condition additive protection**

Test condition of coolant. Coolant must be tested for corrosion resistant properties (PH). This can be accomplished by the use of test strips or coolant systems test kits. Replace coolant only when the coolant fails the test or the test recommends coolant replacement. It is recommended that the coolant be replaced with a long life coolant. Refer to the manufacturer's recommendation for type of coolant to be used. Some engines may be equipped with a cooling system filter. Replace coolant filter annually. Date the filter. Supplemental coolant conditioners, such as Nalcool may be used. Add makeup coolant and chemical conditioners required to ensure adequate cooling system protection.

### **50. Radiator, hoses, and leaks**

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

### **51. Belts and pulleys**

Check all belts for condition, alignment and proper tension. When adjusting belts, a belt tension gauge must be used. Inspect all pulleys for alignment and condition. Check for unusual noise, slipping or worn belt and loose or bent drive pulley. Examine damper for deterioration and/or excessive vibration. Examine water pump, idler pulley and fan hub for noise or vibrations.

### **52. Alternator mounting and power steering**

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

### **53. Fuel lines, fuel system and linkage**

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.

### **54. Fuel filter(s)**

Replace all fuel filters annually or more frequently as necessary.

**55. Emission control devices**

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

**56. Air filter restriction**

Test air filter restriction. Record reading on form. 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.

**57. Clean battery post and cables**

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

**58. Battery box and hold-downs**

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

**59. Battery load test**

Load test the battery using a volt amp tester, Sun VAT 40 or equal. Record results on the form.

**60. Starter test**

Test the battery using a battery test using a tester.

**61. Alternator, regulator test \_\_\_\_\_ amps \_\_\_\_\_ volts**

Use a volt amp tester to perform an alternator, regulator test. Record results on the form.

Compare the test readings from the electrical test to the vehicle's specification. If the test results do not meet specifications, a pin point test must be perform to indentify which system component needs to be replaced. A voltage drop test may be required before any electrical component is replaced.

**62. Cable routing**

Inspect all battery cables for proper routing. Ensure that the cables are rubbing any other metal surface. Check battery cable ground. If ground shows any signs of rust or corrosion, cable must be removed and clean to ensure proper electrical ground.

**63. Engine**

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

**64. Emissions**

Observe the exhaust smoke. If excessive smoke is observed, investigate the cause. Some states may require a diesel engine's exhaust be tested with an opacity meter. In this case, refer to local emission ordinances.

After completing the PM, the tech must sign and date the form. The next step is to repair the defects that were generated from performing the PM. After all the repairs have been made, the vehicle passed the elements of the DOT Federal Annual Inspection, the DOT decal can be placed on the vehicle. If the vehicle failed the inspection, do not install the decal until the repairs have been made. The PM form meets or exceeds the requirements of the DOT Federal Annual Inspection part 396.