Vehicle maintenance

Risk Control services
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One of the main goals of a planned or preventative maintenance (PM) program is to keep vehicles in proper operating condition at a cost that meets the organization's financial objectives.

This is accomplished by:

- Establishing regular inspection intervals
- Inspecting each vehicle thoroughly and systematically
- Replacing, adjusting, tightening, testing, and/or repairing needed parts
- Life-cycling critical items

The benefit of an effective PM program is fewer parts failures with fewer emergencies and road calls.

No one specific maintenance program will fit all fleet types. To be effective, the program should be designed for the vehicle type it is supposed to maintain. It must fit the conditions in which the vehicle operates and must change when vehicle conditions change, regardless of vehicle or fleet type.

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The following objectives will help give direction to your PM program.

The program should strive to:

- Prevent crashes caused by mechanical defects (most experts agree that relatively few crashes are caused solely by mechanical defects)
- Reduce on-road breakdowns and delays
- Minimize the number of vehicles down for unplanned repairs
- Prevent excessive parts wear
- Balance the shop workload through planned repairs
- Maintain driver morale

Develop an information bank that can aid in setting PM schedules, parts replacement, and perhaps most importantly, aid in establishing company benchmarks for driver performance. Achieving these objectives requires proper maintenance facilities, trained personnel, periodic vehicle inspections, and recordkeeping.

Maintenance facilities

Whether vehicle maintenance is performed in-house or by an outside company, it must be done in an appropriate facility by trained and qualified personnel. Many companies outsource their maintenance program to companies who specialize in vehicle maintenance. They do this simply to reduce expense and establish a process that places accountability and liability on the maintenance company.

If a fleet chooses to perform its own maintenance, the size of the fleet will determine which kind of facilities are needed. For instance, a company with 100 vehicles may have a difficult time maintaining its fleet in a small shop.

Companies must be cautious when outsourcing maintenance and ensure that the vendor is qualified, has the capacity to handle the work, and maintains records as required by company policies or regulatory requirements.

Vehicle inspections

Any uniform system of measurement can be used to set up a PM inspection schedule. Vehicle mileage, days in operation, engine-running hours, number of trips, or similar measurement system can serve as the basis for the maintenance schedule. The important thing to remember is that the PM inspections must have a regular timetable based on the vehicle type.

Vehicles must be inspected on a periodic basis with consideration given to the vehicle manufacturer, engine manufacturer, etc. Using inspection forms will help establish a consistent plan that can be used by the shop person doing the inspection. Ideally, each type of vehicle should have its own inspection form. From a practical standpoint, similar vehicles in reasonably similar service can share forms.

Ready-made inspection forms are available from many sources, including vehicle and engine manufacturers. Some fleets may need to modify the forms to suit their own needs. This is particularly important if the fleet has made modifications to the vehicle or its components, or if additions were made due to unique service needs, such as being modified to perform a particular task. Note: modifications that may change the vehicle's handling dynamics should only be performed by qualified personnel under the supervision of a professional engineer. This is particularly true if the modifications affect the vehicle's center of gravity.

No matter what inspection form you use, it should provide the inspector with an efficient and logical road map of what to look for.

Mechanics performing the PM inspections must be qualified. One part of the inspection process is to look for changes to the original operation specifications. Unless the inspectors are qualified, there is a possibility they will not recognize a change. This becomes increasingly important as vehicle components become more complex.

Recordkeeping

An effective maintenance record system should include the following:

- Reporting problems
- Simplifying solutions
- Controlling costs
- Organizing maintenance
- Reducing labor
- Deciding on specifications
- Revealing indications of driving behaviors
- Saving money

Three important and basic records must be maintained in any PM program:

1. Inspection form
2. Work and repair order
3. Vehicle history file

Work and repair order

The work and repair order identifies the vehicle and date of repair, mileage at the time of repair, and a complete listing of what was done to the vehicle, including the parts that were repaired or replaced, cost, time, and who performed the work. The work and repair order is the basis of information needed for the vehicle history file.

Each vehicle should have its own history file, which can be either paper or electronic. It should include the entire history of the vehicle from initial purchase through all repairs and modifications. Information on specific vehicle components should also be included. Maintenance records should be easily accessible and kept in a secure place to prevent unintended loss or change. Maintenance forms are frequently subpoenaed as a foundation for determining vehicle condition subsequent to a serious crash.

Vehicle history file

The information in the vehicle history file can serve a number of purposes:

- Help to control maintenance costs
- Set replacement cycles for vehicles and parts
- Help with purchase decisions for vehicles and parts
- Identify how vehicles are driven

Driver-to-shop communications

An essential ingredient in any PM program is open communications between the drivers and the mechanics. The PM inspection helps mechanics identify change, and drivers are most likely to notice a change since they spend far more time with the equipment. Driver input is critical to a maintenance program.

Using maintenance records to identify driver performance

Many companies depend on maintenance records to help them identify those drivers who are achieving optimum operating

efficiencies as well as drivers who are abusing the vehicles and equipment. These companies develop performance benchmarks to compare drivers to one another.

Examples follow:

- **Miles per gallon (MPG):** This simple data point is a very clear indicator of driver behavior. Experts agree that drivers who achieve better than company average MPG are typically better at managing space around their vehicle. They spend more time in cruise control, do not drive at excessively high speeds, do not accelerate quickly from a stop, coast when they recognize they will need to stop or slow down, etc. In short, they anticipate the actions of the traffic situation around them, use the throttle, and brake efficiently.
- **Brakes:** Brake wear and subsequent maintenance costs are indicators of vehicle use. Drivers who get better than company average brake life (depending upon similar driving circumstances) are typically better at moderating speeds for traffic conditions and anticipating actions of other drivers.
- **Tire wear and replacement:** As mentioned above, drivers who operate their vehicle "smoothly" without abrupt maneuvers, hard cornering, and hard stops are generally better drivers. Tire wear is a good indicator.
- **Suspension components:** Compare component life cycles to company averages to identify drivers who are better at managing their vehicle speed, turns, etc.
- **Engine management systems, on-board recorders, electronic control modules, and telematics:** Most, if not all modern vehicles have electronic systems that operate various vehicle components. These include throttle position, airbag and seat belt pre-tensioner sensors, oxygen sensors, brake light position, cruise control status, ABS status, vehicle speed, engine RPM, etc. Each of these systems creates data that can be downloaded using hardware and software available from manufacturers and outside sources. These data are very effective additions to the information managers have regarding vehicle use. Telematics systems can take data from the engine systems and send it without needing to be downloaded directly from the vehicle.

Summary

Fleet managers should use the above informational sources to identify good drivers so they can be recognized, as well as identify

drivers who need help improving their driving skills and tactics. Fleets should establish company benchmarks and expected performance, communicate expectations to all drivers, compare all drivers to those benchmarks, and manage the driving force accordingly.

Drivers who consistently fail to meet expectations are those who will almost certainly be involved in a crash or serious incident. Fleets should not wait for a crash to occur in order to identify at-risk drivers. Vehicle maintenance records are a good early indicator of driver performance.