

Dorman Training Center Presents:

PITFALLS OF PERFORMING P.M.'S DURING WINTER MONTHS.



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Your Instructor For This Webinar

- **Owner, O&K Truck and Auto Repairs Ltd.**
- **ATTP Master Instructor, New York State**
- **Author, "Medium/Heavy Duty Truck Electricity and Electronics"**
- **Training provider for various Associations, industry and various NY State agencies**
- **Developed trainings that range from four hours to multiple days, specializing in brakes, electrical, regulations and many other subjects relating to our industry.**
- **Member of various organizations such as SAE, CVSA, TANY**



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What Will Be Covered

Instructions For This Webinar

This webinar will be approx. 1 hour long

- All slides that are presented are in your handout and are numbered
- Have a pen or pencil and paper for notes
- Questions can be asked at anytime

- 01 **The effects of extreme weather on trucks and technicians.**
- 02 **Components and systems that require special attention.**
- 03 **Highlighting air systems.**
- 04 **Introduction to Decembers evening webinar.**

The Real World of Preventive Maintenance (PM's)

A company can make great financial decisions affecting profit levels, quite often buying the greatest telematics and software known, to generate more efficiency at all levels of the company. (AI is getting pushed big time).

- “However, failures at even the most basic level can sometimes make or break a company.
- **Software and spreadsheets don't crawl under the vehicle and perform preventive maintenance (PM) tasks and other services.**
- **The same is true for drivers.**

I don't know of any technology that can replace the visual inspection required of drivers and technicians.

The Real World of Preventive Maintenance (PM's)

- Accomplishing these tasks has become harder due to a lack of qualified technicians and drivers.

As a side note: I run across many young generation people that are willing to give our industry a try. With some guidance they might become better than we think we are.

Another side note: I really see great qualities in the people that participate in any trainings I do, whether live or on-line.

Important Fact: Working on trucks is hard. It is not for everyone.

**Thank you all that have endured all the years and
the ones that are new to our industry.
You keep our country going.**

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The Real World of Preventive Maintenance (PM's)

- “Preventive Maintenance” has always been the backbone of our industry, because it ensures that vehicles are in safe operating condition throughout the vehicle’s life cycle.
- “Preventive Maintenance” is one of the methods we use to reduce crash risk.
- **Some of the advantages of a well-planned PM program are:**
 - Reduced on-road failure.
 - Increased longevity of the vehicle, components and/or systems.
 - Lower maintenance costs.
 - Reduced roadside violations (very important because of CSA scores) and;
 - Fewer driver complaints.

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The Real World of Preventive Maintenance (PM's)

- Harsh winters with extreme temperatures and great amount of snow, lead to increased use of salt, calcium chloride and other chemicals that can take a toll on vehicles and the technicians performing “PMs”. As well as an increase in issues with electrical and electronics systems such as lights and ABS.
- Large fleets with wash bays and spare equipment might be able to minimize winter issues. However, there are many smaller carriers and owner-operators without these advantages.

Let's start with the driver

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The Real World of Preventive Maintenance (PM's)

- The vehicle has been sitting outside overnight or driven throughout the day or night through a harsh winter environment.
- **How useful of a pre-trip or post-trip will the vehicle receive when everything is packed with snow and ice covered with layers of salt, not to mention the single digit temperatures?**
- It worsens if these conditions persist for a prolonged period.
- **It's times like these we hope the vehicle has received a thorough PM service to prevent issues, thus alleviating some pressures from the driver.**

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The Real World of Preventive Maintenance (PM's)

Beyond
that drift
are trucks
that need to
come in for
services.



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The Real World of Preventive Maintenance (PM's)



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The Real World of Preventive Maintenance (PM's)

Let's consider the vehicle now.

- Now it is due for a scheduled PM service, and it is packed with snow, ice, salt and brine in places where it is crucial to see and check components (brakes, hoses, chambers, slacks, suspension, steering etc.).
- There might also be a tight deadline to get that vehicle on the road, perhaps due to lack of spare vehicles and commitments to loads.
- Would this vehicle receive a proper PM service from a technician that is also getting wet from due to snow, ice and salty slush dripping on them while performing their tasks underneath?
- How about the basic tasks of lubricating components that are now hard to see or get to?

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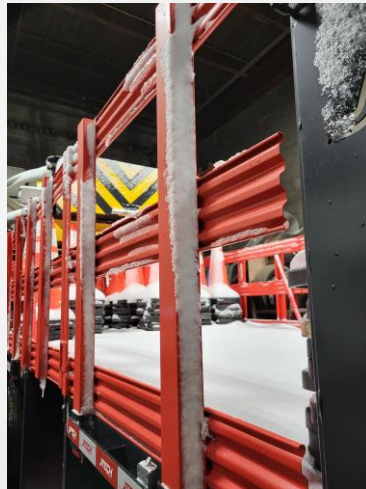
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The Real World of Preventive Maintenance (PM's)

- Can you give it a quick PM?
- We'll pick it up first thing tomorrow morning.
- What time do you open?
- Can you keep it inside so it will be dry and warm for our driver?



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The Real World of Preventive Maintenance (PM's)

YES, harsh winters tax both man and machine.

This takes a certain type of person to work under these conditions and pressures.

However, even with the best personnel, the temptation might be to perform **“pencil inspections”** (checking off a task list without performing the actual task).

Note: That's the real world.

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The Real World of Preventive Maintenance (PM's)

- The cost of passing on a load can far outweigh the cost of unnecessary breakdowns or missing a delivery window because the vehicle and driver are sitting on the side of the road with an “Out-Of-Service” condition, or worse, an accident because something critical was not found because a proper PM service was not performed.
- **Unfortunately, harsh winter months can also interrupt those “ideal” PM schedules.**
- **With that in mind, it might be worthwhile not to adhere to wear limits that could possibly pass under normal conditions.**
- But now with the uncertainty of adhering to schedules could pose an issue if allowed to continue beyond the next scheduled PM

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The Real World of Preventive Maintenance (PM's)

- You would be surprised how often a vehicle has been found with deficiencies or violations and some shop supervisor, safety person or owner has told me that vehicle was due for a service, inspection or repair of the discovered violation in the near future.
 - In winter environments, the near future doesn't always happen.
- Most of the time these situations could have been avoided by a good “Predictive Maintenance Program”

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The Real World of Preventive Maintenance (PM's)

Lights are a perfect example of time and effort wisely spent.

Frequent questions from training classes:

What can be done to reduce constant light violations?

“Lights were working when performing a pre-trip and or PM/Inspection”

Answer:

- **When that vehicle comes in for a PM service, give the technician extra time and resources to concentrate on wiring, connectors and protection.**
- **Physically look at plugs (connectors) and pull them apart (off).**

It's usually the bumps on the road and weight of snow/slush that can affect loose and corroded connectors (the green stuff on terminals and connections). Not to mention the spaghetti looking wiring due to repeated repairs. Cure is Snip and replace with fresh harnesses, plugs and wiring.

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The Real World of Preventive Maintenance (PM's)

- Use shrink type connectors and terminals for every exposed electrical wiring job.
 - Verify that it is sealed and tug on them.
- It's the little extra effort in time and minimal additional expense that will prevent reoccurring problems.
 - It's another area the driver shouldn't have to worry about.
 - Another goal is to reduce driver complaints.

Reminder: We're back to comparing the cost of proper repairs versus the cost of breakdowns, missed loads, appointments and not to mention those "CSA" points.

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The Real World of Preventive Maintenance (PM's)



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The Real World of Preventive Maintenance (PM's)

Mack light issue.
Guess where this plug is located?



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The Real World of Preventive Maintenance (PM's)

This is very common in areas with salt, brine (calcium chloride).



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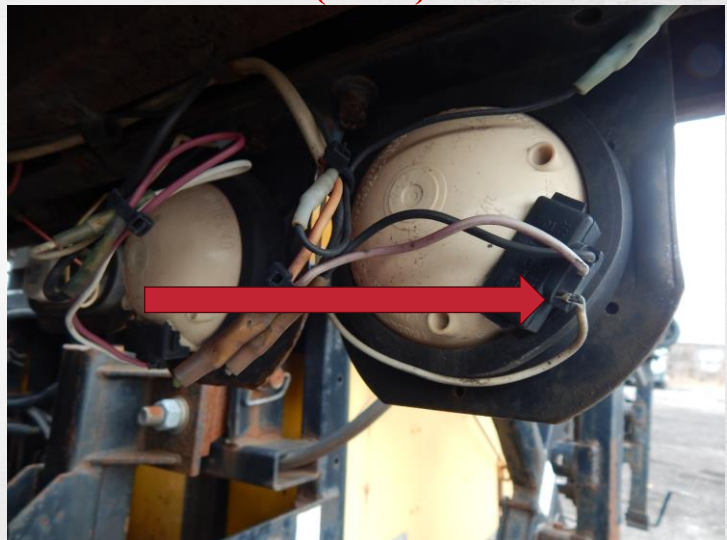
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The Real World of Preventive Maintenance (PM's) WHY???



"But the lights were working when I did a pre-trip".

"But the lights were working when I did a PM".



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The Real World of Preventive Maintenance (PM's)

All of these are a problem, or they will be a future issue.

"Or do you just look to see that the lights works?"

A good inspection needs to be the catalyst to prevent problems.



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The Real World of Preventive Maintenance (PM's)

VOLUME OF AIR

FMVSS 121 System Volume Requirements For Trucks, Tractors and Buses

The combined volume of all service and supply reservoirs must be at least 12 times the combined volume of all service brake chambers at maximum stroke.

Trailers: The total volume of service reservoirs shall be at least 8 times the volume of all service chamber volumes serviced by that reservoir.

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The Real World of Preventive Maintenance (PM's)

VOLUME OF AIR

Volume Of Air Needed To Feed Rear Of A Tandem Truck.

12 x Chamber (sq. in.) x 21/2 Full Stroke x 4

"Type 30"

12 x (30 x 21/2) x 4

12 x 75 = 900 x 4 = 3600 Cu. In.

What happens if reservoirs are loaded up with water and contaminants?

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The Real World of Preventive Maintenance (PM's)

AIR SUPPLY SYSTEM

The primary function of the air supply system is to deliver clean, dry, compressed air at a regulated pressure in sufficient quantity to operate the brake system.

The supply system must also maintain an adequate reserve in case of failure.

The air supply system on many vehicles also has a secondary function of providing air to other operating systems. These systems may include engine starting, vehicle suspension, windshield wipers and even air cushion seats.

The technician should be aware of these additional systems during and repair of the brake system. A malfunction of a parasitic system could affect air supply and cause pressure loss or entire system contamination.

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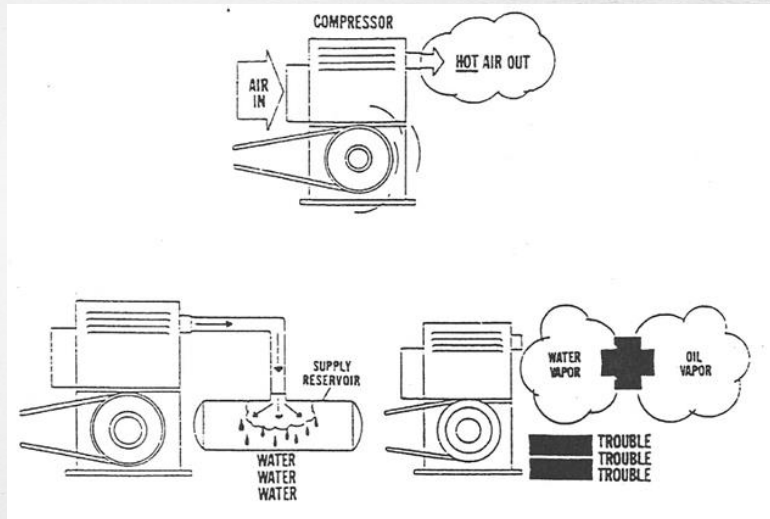
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The Real World of Preventive Maintenance (PM's)

This slide sets the stage for the most important concept pertaining to an air brake system.



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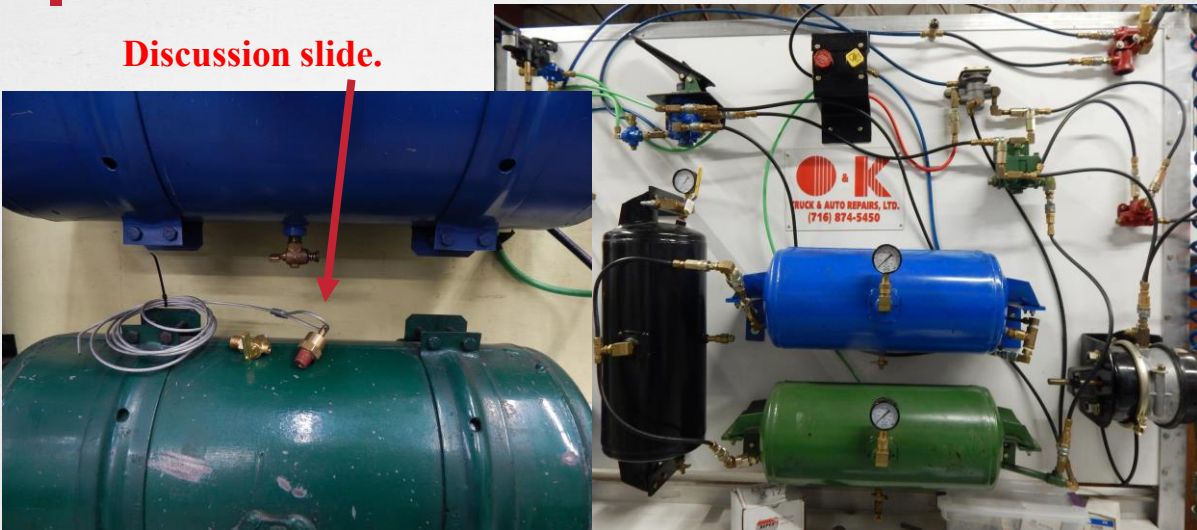
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The Real World of Preventive Maintenance (PM's)

Discussion slide.



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The Real World of Preventive Maintenance (PM's)

Wait to do this till
the temperature is
10° F ?



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The Real World of Preventive Maintenance (PM's)

What are you
seeing here?



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The Real World of Preventive Maintenance (PM's)

Hey driver. Do you drain your air tanks?

Yes, I do!

When was the last time you did?

Yesterday during my pre-trip?

Damn. Someone must have stolen the drain valve when it was parked for your 15-minute break.

Important Note: Be aware of drain valve thieves. There's big money in that.



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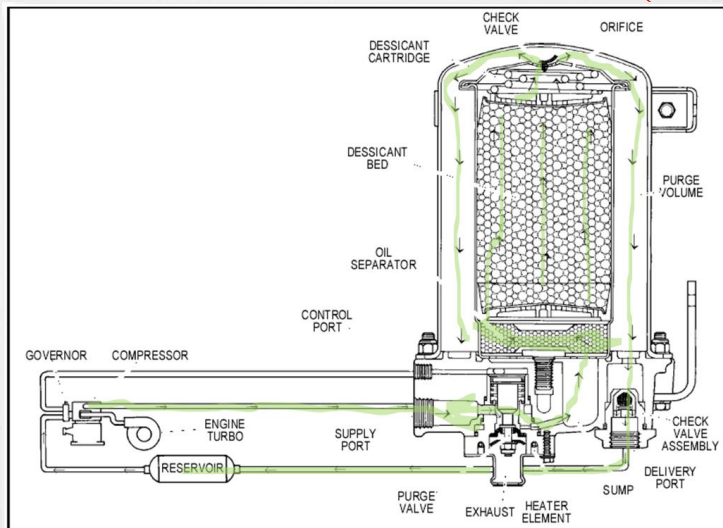
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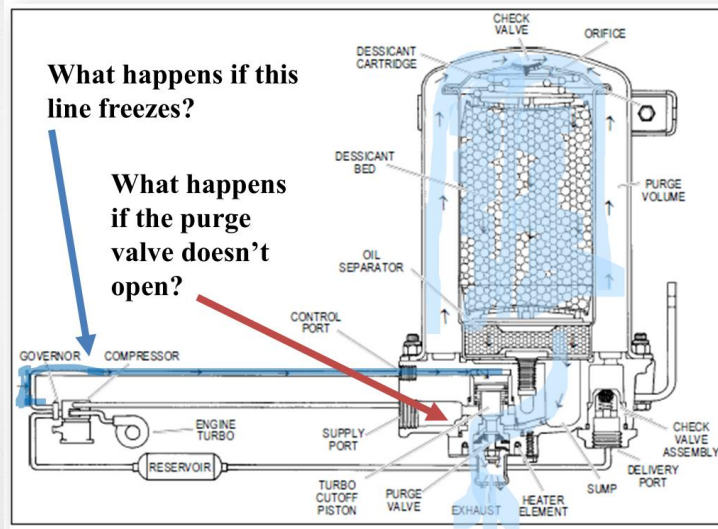
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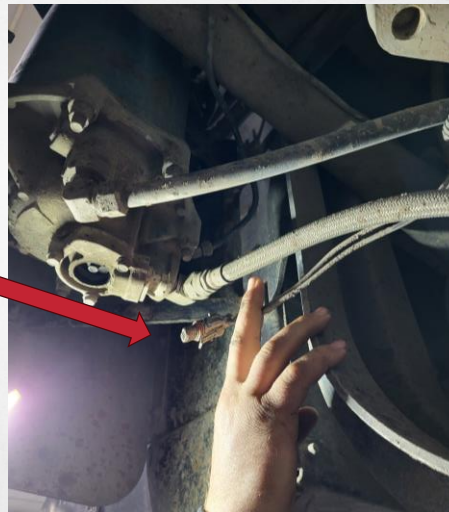
The Real World of Preventive Maintenance (PM's)

Air Dryer →

How does it work?

What is that wire/connector?

Should you know?



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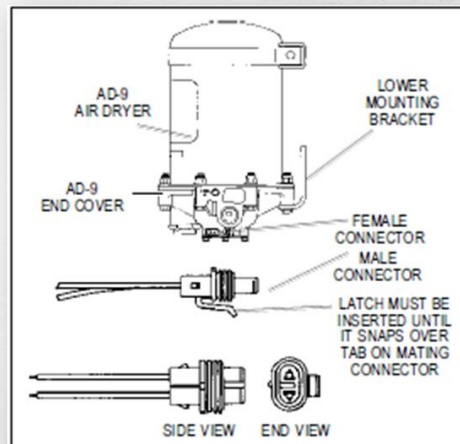
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The Real World of Preventive Maintenance (PM's)

- Two lead wire harness with weather resistant connector.
- One lead goes to ignition switch.
- Remaining lead goes to a good vehicle ground.
- 10-amp fuse for 12-volt heaters.

Make this a pre-winter check.
Volts, Amps.
Whatever works for you.



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The Real World of Preventive Maintenance (PM's)

What do you know about windshield wipers and Washers?

- **Where would you find it?**
 - **Part 393.78** Go there now.
- **Where else would you find it?**
 - **North American Standard Out-Of-Service Criteria**
 - **15. Windshield Wipers**
 - **Any power unit that has an inoperative wiper or missing, or damaged parts that render it ineffective on the driver's side. (Applicable only in inclement weather requiring use of windshield wipers.) (393.78)**
- **Windshield washer is violation, "NOT Out-Of-Service"**

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What do we know about Windshield Wipers/Washers and defrosters?

- **Part 393.78 (a)** Each of these vehicles must have windshield washing system that meets the requirements of FMVSS.104 (S4.2.2) in effect on the date of manufacture.
- **Part 393.** Each bus, truck, and truck-tractor manufactured on or after December 25, 1968, must have a windshield defrosting and defogging system that meets the requirements of FMVSS. 103.
- **OOS 15. Windshield wipers**
 - Any power unit that has an inoperative wiper or missing, or damaged parts that render it ineffective on the driver's side. (Applicable only in inclement weather requiring use of windshield wipers.) (393.78)

Violation section and description:

393.78: Windshield wipers inoperative/defective. Severity 1. Affects driver score? Yes

393.78-WOOS: Wipers- inoperative/missing/damaged on drivers' side, during inclement weather requiring use of the windshield wipers.

393.79: Defroster/defogger inoperative.

- **Appendix A:** Any power unit that has an inoperative wiper or missing or damaged parts that render it ineffective. **NOTE: Nothing about Washer.**



The Real World of Preventive Maintenance (PM's)

What about defrosters? Is it a requirement?

Part 393.79 Windshield defrosting and defogging systems.

(a) Vehicles manufactured on or after December 25, 1968.

Each bus, truck, and truck-tractor manufactured on or after December 25, 1968, must have a windshield defrosting and defogging system that meets the requirements of FMVSS No. 103 in effect on the date of manufacture.

Note: FMVSS 103 sets the testing procedures for manufacturers utilizing SAE Recommended Practice J1903a to assure the defroster systems are adequate in all vehicles.

**It's a requirement, which makes it a possible roadside violation.
HOWEVR, IT FALLS UNDER THE COMMONSENSE REQUIREMENT.**



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The Real World of Preventive Maintenance (PM's)

**This is extreme, but not uncommon.
The effects of a winter environment.**



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The Real World of Preventive Maintenance (PM's)



What are the stickers on the windshield?

I thought enforcement people don't do inspections when it is cold and snowy outside.

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The Real World of Preventive Maintenance (PM's)

**Trailer came "OFF".
Broken timer spring and
other issues.**

**Do you check components
or do you only do a tug
check?**

**What about the abuse
from trying to connect to
trailer with the 5th wheel
packed with snow.
"Hit it HARDER"**



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The Real World of Preventive Maintenance (PM's)

**Does this look
okay?**



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The Real World of Preventive Maintenance (PM's)

I'm not the brightest bulb around. But I think this combination of everything in the hub oil can generate a huge problem.

I wonder if it could freeze in sub-zero weather sitting overnight?

What do you think was the cause of this?



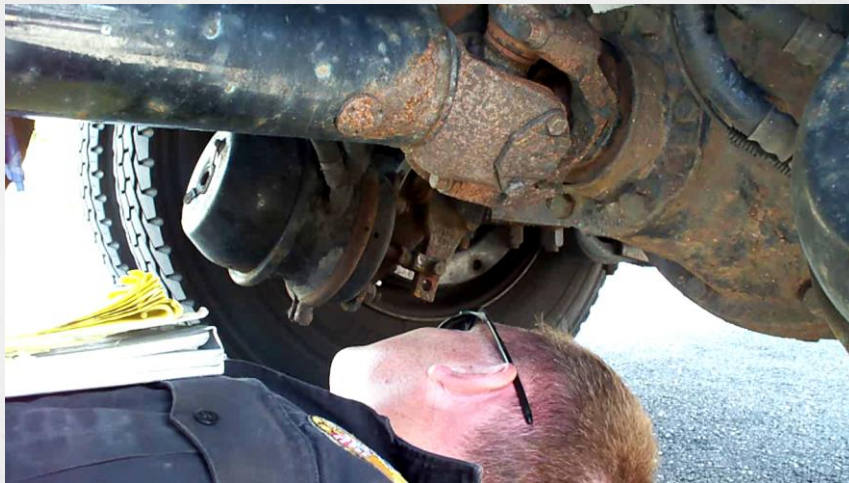
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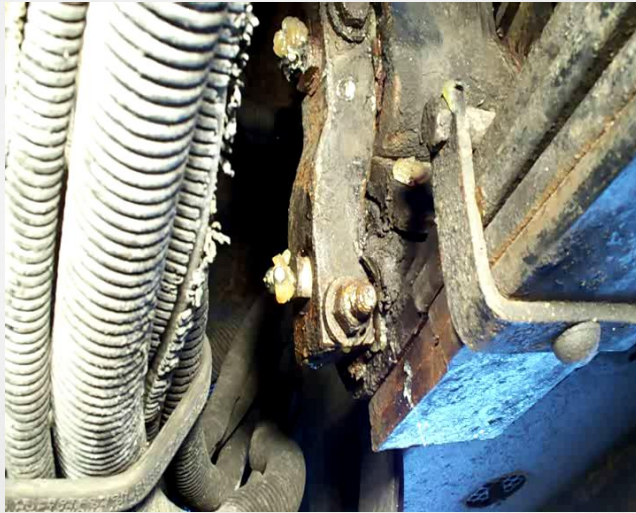
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The Real World of Preventive Maintenance (PM's)

Important concept and reminder:

Preventive Maintenance starts and ends on the floor. You can have all telematics, data and numbers in the world. However, if the tasks aren't performed properly, the numbers and data are meaningless.

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The Real World of Preventive Maintenance (PM's)

“December Evening WEBINAR”

“Winter Proofing Your Truck”

We are putting together a more in-depth **“Winter-time PM”** evening webinar. This webinar is meant for anyone in the country that has anything to do with **“Commercial Motor Vehicles”**

Your vehicles might come from the warm south to winter north.

This webinar will benefit technicians, drivers, managers, owners. Pretty much anyone that must contend with winter conditions.

We will cover: Electrical, batteries, brakes, air systems and anything else that needs to work properly regardless of the weather and most importantly:

**“Reduce Breakdowns” and
“Get driver home safely and timely”**

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Questions?

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