



Mastering Below-Zero Maintenance



**Ensuring Truck Performance
in Extreme Cold**



TABLE OF CONTENTS

1. Introduction
2. Section 1: Understanding Cold-Weather Challenges
3. The Impact of Extreme Cold on Your Truck
5. Risks and Consequences of Inadequate Maintenance
7. Section 2: Cold Weather Maintenance Tips for Your Truck
8. Prolong the Life of Your Engine by Keeping it Warm
10. Manage Your Air Tanks to Keep Them from Freezing
12. Prevent Your Air Lines from Freezing: Air Dryer Filter Replacement
14. Prevent Your Fuel Lines from Freezing: Fuel System Maintenance
15. Stay Safe on Icy Roads: Brake System Checks
17. Prevent Your Fuel from Gelling: Fuel Choice and Additives
19. Section 3: The Best Practices in the Cold Months for Your Truck
20. Integrating Maintenance Protocols into Your Schedule
21. Best Practices for Winter Maintenance for Your Truck
22. Take Control Over Your Truck's Health with Diagnostic Tools
23. Conclusion

INTRODUCTION

Operating trucks in below-zero temperatures presents numerous challenges, impacting engine functionality, fuel systems, and safety components.



**HOW DOES THE COLD
IMPACT MY ENGINE?**



**WHY IT'S IMPORTANT TO MANAGE
YOUR AIR TANKS IN THE COLD.**



**HOW YOU CAN PREVENT YOUR
FUEL LINES FROM FREEZING.**

This whitepaper aims to serve as a guide, offering you our best maintenance tips to equip truck drivers with the knowledge needed to navigate sub-zero conditions effectively and safely.

01 **UNDERSTANDING COLD-WEATHER CHALLENGES**



THE IMPACT OF EXTREME COLD ON YOUR TRUCK

Engine Performance:

In extremely cold conditions, engine oils thicken, making it difficult to start the engine. **Block heaters and battery warmers are essential** to maintain the best engine temperature, ensuring smooth start-ups and reducing wear on vital components.

Air Brake Systems:

Low temperatures cause moisture in air tanks to freeze, leading to potential brake system malfunctions. Regularly draining primary and secondary air tanks prevents water buildup and safeguards brake functionality.

Fuel Systems:

Cold weather increases the likelihood of fuel line freezing and filter blockages. **Fuel water separators needs draining to prevent frozen fuel lines and maintain uninterrupted fuel flow.** Utilizing small micron fuel filters provides added protection against contaminants.



MORE →



Enhancing Your Battery Performance:

Cold temperatures affect your battery performance, reducing its ability to supply sufficient power to start your engine.

Battery warmers help maintain your battery at the best temperature, ensuring it can deliver the necessary power to start the vehicle reliably.

Diagnostic Tools:

In the cold, diagnostic tools like **OTR Diagnostics can monitor your engine's performance** by providing real-time insights into your truck's engine diagnostics.

It assists in gauging and providing data on engine start-up conditions along with the health of critical components.

CONSEQUENCES OF POOR MAINTENANCE

Neglecting your trucks maintenance in freezing conditions is very risky and can lead to many problems.

Below are a few of those potential issues:

Truck Safety Hazards:

The risk of malfunctioning brakes due to frozen components is a critical safety concern. Cold weather can cause moisture to freeze within the brake system, leading to reduced braking efficiency or even complete failure. This significantly increases the chances of accidents and can be a severe threat to the road.

Unplanned Downtime:

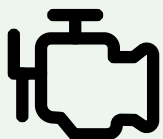
Your time is money, even when you're not moving. Engine-related issues such as stalling or breakdowns are more likely to happen in freezing conditions, especially if your truck hasn't been well maintained. **These breakdowns result in unexpected downtime, disrupting schedules, deliveries, and operational efficiency.** The time taken for repairs can lead to delays, impacting your timelines, and potentially causing you increased costs due to lost productivity.



MORE →

Impact On Your Finances:

The money you may pay for poor maintenance in freezing conditions can be detrimental to your truck and your business. Repairing cold-related damage, whether to your engine, braking system, or other components in your rig, can be costly.



Unexpected repairs strain your budget for maintenance and profitability. Longer downtime means more financial losses.

Maintenance delays can harm your reputation and customer trust, potentially leading to dissatisfied clients and lasting damage to your industry standing.



02 **COLD WEATHER MAINTENANCE TIPS FOR YOUR TRUCK**



PROLONG THE LIFE OF YOUR ENGINE BY KEEPING IT WARM

In extremely wintry weather, block heaters and battery warmers play a crucial role in maintaining the functionality and longevity of your truck's engine. Here is a breakdown of why they are important.

Facilitating Cold Starts with Your Truck:

In frigid temperatures, engine oil thickens, making it harder for your engine to turn over and start.

Block heaters are designed to warm the engine block, ensuring that the oil remains at an optimal viscosity.

This makes starting your engine easier and minimizes the strain on the components during ignition.



Cold engines use more fuel during start-up due to increased combustion resistance. A preheated engine is more fuel-efficient.



Reducing Wear and Tear:

Cold starts put a significant strain on various engine components, such as the pistons, cylinders, and bearings. **By preheating your semi-truck's engine with a block heater, these parts expand slightly,** reducing the stress and wear they would otherwise experience during a cold start.



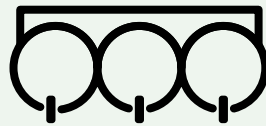
Extending Your Engine Life:

Consistently subjecting your truck's engine to harsh, cold starts can lead to premature wear and tear, potentially shortening your engine's lifespan. **Using block heaters regularly can significantly prolong the life of your engine by minimizing stress during start-up and reducing wear on critical components.**



MANAGE YOUR AIR TANKS TO KEEP THEM FROM FREEZING

Managing air tanks in your truck, especially in cold climates, is crucial to maintaining the functionality and safety of your air brake system. Here's why regular draining of air tanks is essential.



Air tanks in your truck's brake system collect moisture, which can freeze in cold weather, causing blockages and brake issues. Regularly draining the tanks prevents freezing.

Preserving Your Brake System's Strength:

Frozen moisture can cause various issues within your air brake system. Ice formation in the lines can disrupt the airflow and pressure, leading to brake malfunctions or reduced braking efficiency.



By draining the tanks, you prevent the formation of ice that could compromise the strength of your brake system.

Preventing Corrosion from Forming:

Moisture accumulation in the air tanks can also lead to corrosion of the tank's interior surfaces. **Draining the tanks removes this moisture**, reducing the likelihood of corrosion and preserving the structural integrity of the tanks.

Maintaining System Efficiency:

Frozen moisture in air tanks can lead to air leaks or blockages, affecting the overall efficiency of your air brake system. Properly managing the tanks by draining them ensures that your system operates at its best without any issues caused by frozen moisture.





PREVENT YOUR AIR LINES FROM FREEZING: AIR DRYER FILTER REPLACEMENT

Preventing air lines from freezing is crucial for maintaining your semi-trucks functionality, especially in cold climates. One essential aspect of this maintenance is replacing the air dryer filter regularly. Here are some reasons why it's important.

Moisture Elimination:

Air dryer filters play a critical role in removing moisture from the compressed air that powers various systems in your truck. Moisture can condense in the air lines, leading to freezing in extremely cold temperatures. By replacing the air dryer filter, you ensure that it effectively captures moisture, preventing it from accumulating and freezing in your lines.

Preventing Ice Build-Up:

Frozen moisture in air lines can obstruct airflow, leading to reduced efficiency or failure of critical systems. **Regularly replacing your air dryer filter helps maintain its effectiveness in eliminating moisture,** minimizing the risk of ice formation and blockages in your lines.

Keeping Your System Working Great:

A properly functioning air dryer filter ensures that the compressed air distributed through the lines remains dry and free from contaminants. This helps maintain the best performance of various systems, including brakes, suspension, and other pneumatic components, especially in harsh, freezing conditions.

Enhancing Safety:

A well-maintained air dryer filter reduces the risk of frozen air lines, which could compromise essential vehicle functions like braking. Ensuring the airlines remain free from freezing helps uphold the vehicle's safety and reliability, especially in challenging weather conditions.

Prolonging Component Lifespan:

Moisture in airlines can lead to corrosion and damage to pneumatic components. **By regularly replacing the air dryer filter, you prevent moisture-related damage.** By doing that, you are extending the lifespan of your truck.



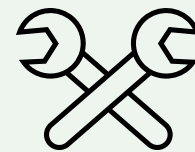
PREVENT YOUR FUEL LINES FROM FREEZING: FUEL SYSTEM MAINTENANCE



Taking care of the fuel system is crucial so they don't freeze in the lines. **Here's how you can maintain it:**

Drain Your Fuel Water Separators:

Make it a habit to drain these separators before starting any trips. This simple step helps prevent water build-up in your fuel lines, stopping them from freezing in cold conditions.



Regularly check the small micron fuel filters, they protect your engine by ensuring a steady flow of clean fuel, this is crucial in cold weather when freezing is a problem.

PREVENT YOUR FUEL FROM GELLING: FUEL CHOICE AND ADDITIVES



In cold weather, using ultra-low sulfur diesel and fuel additives is key to prevent fuel gelling.

Choose truck stops with hydrosorb filters to reduce water in fuel and avoid freezing, crucial for smooth trips in colder regions. Here's how you can safeguard it.



Fuel Choice: Ultra-Low Sulfur Diesel (ULSD):

Opting for ULSD can make a significant difference. This type of diesel fuel is less prone to gelling in cold temperatures compared to other types. Its reduced sulfur content helps prevent the formation of crystals that can clog fuel filters and lines.

MORE →

STAY SAFE ON ICY ROADS: BRAKE SYSTEM CHECKS

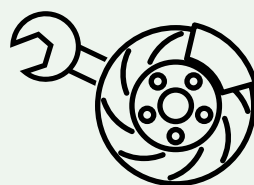
Staying safe on icy roads starts with maintaining your brake system. Here are some reasons why you should always maintain your brakes.

Regular Brake Inspections:

Make it a routine to check your brakes. Inspect them for wear and tear, ensuring they are in top condition. These regular checks help catch any issues early on and allow for timely adjustments or repairs.

Critical Adjustments:

Well-maintained brakes are vital on icy roads. They are less likely to freeze because they are in good working condition.



Adjustments ensure the system operates smoothly, reducing the risk of freezing components and allowing brakes to function optimally even in freezing temperatures.



Optimal Functionality:

Properly maintained brakes are your safety net on icy roads. They provide the responsiveness and reliability needed to navigate slick surfaces.

By preventing freezing, your brakes remain responsive when you need them most, helping you stay in control and avoid potential accidents while in your truck.

**Enhanced Safety:**

Well-functioning brakes for your semi-truck are integral to your safety. They can prevent skidding or loss of control on icy surfaces.

Ensuring they are free from issues that could lead to freezing helps maintain their ability to stop your vehicle effectively, keeping you and others safe on wintry roads.



Consider Fuel Additives:

Additives specifically designed to prevent fuel gelling can be a lifesaver in frigid weather. They modify the fuel's properties, lowering its freezing point and ensuring it flows smoothly even in extremely cold conditions.

Hydrosorb Filters at Gas Stations:

Seek out truck stops that are equipped with hydrosorb filters. These filters are designed to remove water from the fuel before it enters your tank. Water in the fuel can contribute to gelling, so having it removed at the source decreases the risk of fuel freezing in your trucks system.

There is so much more you can do to maintain your semi-truck during cold temperatures.

Monitoring tire pressure for better handling and fuel efficiency, using specialized lubricants for moving parts in low temperatures, checking coolant levels and antifreeze strength to prevent engine damage, and protecting electrical systems with grease against cold-induced issues, are just a few more tips.



03 **THE BEST PRACTICES IN THE COLD MONTHS FOR YOUR TRUCK**



INTEGRATING MAINTENANCE PROTOCOLS INTO YOUR SCHEDULE

Winter maintenance tasks into regular schedules. This is especially important if you own more than one truck. Develop checklists or schedules that prioritize essential tasks for extreme cold conditions.



BEST PRACTICES FOR WINTER MAINTENANCE FOR YOUR TRUCK

Weather Monitoring:

Regularly monitor forecasts and anticipate maintenance needs based on temperature drops.



Operator Training:

Make sure you and your drivers are up to date with the latest laws and regulations on winter-specific protocols. If not provide them with necessary tools and resources for cold-weather maintenance.

Integrating Maintenance Protocols:

Diagnostic tools like OTR Diagnostics can be integrated into your routine maintenance schedules, facilitating proactive and preventive measures based on diagnostic insights. **All from the convenience of your cell phone.**

TAKE CONTROL OVER TRUCK'S HEALTH WITH DIAGNOSTIC TOOLS

Diagnostic tools like OTR Diagnostics are a super tool for truck owners. They help you keep an eye on lots of different parts of your truck's engine and crucial systems. There isn't a better time to have that data at your fingertips than winter.

Here are some key points on why they help.



Use OTR Diagnostics for real-time monitoring of vital truck components in cold weather. It provides **live data on engine temperature, speed, fault codes, helping you identify potential issues early** on for better cold-weather performance

Preventative Maintenance:

By accessing live data from your phone, you can proactively address maintenance needs. You can take immediate action if something isn't working as it should due to freezing temperatures, reducing the risk of breakdowns or safety hazards on icy roads.

Timely Decision-Making:

Having instant access to diagnostic insights on your truck empowers you to make quick, informed decisions. Whether it's adjusting your route or scheduling maintenance at a shop you trust, forcing a regen, or resetting fault codes, this information allows you to navigate winter conditions more safely and efficiently.



Conclusion

Understanding and performing truck maintenance in cold conditions is crucial for keeping you and your truck safe when you hit the road in winter.

Whether you own one truck or more, by following these important tips and making them a regular part of your routine, you'll be armed with the best strategies to confidently handle the extreme cold.

Taking these proactive steps and sticking to a consistent maintenance plan not only improves your trucks' performance and lifespan but also plays a big role in making your winter journeys safer overall.





TAKE THE MYSTERY OUT OF MODERN TRUCKING

Send dealer level commands like forced regen to make sure you're keeping your DPF filter clean of soot and other contaminants.

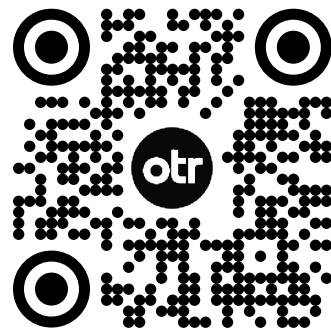


CONTACT US

www.otrperformance.com
sales@otrperformance.com

  **(586) 799 - 4375**

@otrperformance



**SCAN QR CODE
TO LEARN MORE**