



RoadForce® Premium Diesel Fuel



Year-round performance benefits

Sprague's proprietary RoadForce® premium diesel fuel offers field-proven enhanced engine performance. It is designed to maintain the integrity and quality of ultra-low sulfur diesel fuel through **every** season. RoadForce® is rigorously tested to ensure it meets our strict standards and maintains the quality that you trust.

RoadForce® premium diesel fuel can help lower total operating costs by:

- Cleaning Up and Keeping Clean injector deposits formed in today's high pressure common rail systems with a detergent treat rate powerful enough to treat **all** diesel engine classes including Class 8 Heavy Duty Engines
- Reducing diesel particulate filter (DPF) manual regeneration by **promoting** complete fuel combustion and preventing excess soot formation, **decreasing** vehicle downtime
- Improving fuel's lubricity rating to **protect** injectors and pumps against premature wear
- Dispersing moisture to **prevent** fuel tank water bottoms that could lead to harmful fuel system corrosion
- Containing superior Cold Flow Improver (CFI) technology **reducing** the need for winter kerosene, which is higher in cost and lower in BTU content

**RoadForce**®
Premium Diesel Fuel

**Sprague**®
Our Energy Makes the Difference®

Save Money with RoadForce®

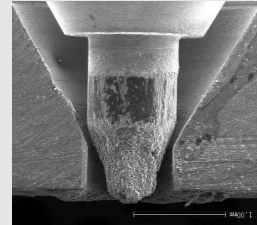
The high temperatures and pressures inside a diesel engine can cause sticking diesel metering valves and nozzle needles, and this can keep injectors from opening and closing properly. This results in poor starts and either over- or under-fueling, depending on whether the needle gets stuck open or closed. Either can lead to poor performance and possible failure of the entire injection system.

How much is **NOT** using RoadForce® costing you?

Failed Parts/Expenses	Cost
Fuel Injectors	\$6,000 (\$1,000 per unit)
Fuel Pump	\$500 - \$1,500
EGR Valve	\$2,500
DPF	\$1,000 - \$4,000
Towing	\$100 - \$400
Labor	\$50 - \$100/hr
Downtime	\$?



Deposit Covered Injector Needle



Maintenance Costs vs. Fuel Costs

Information below is for a typical long-haul tractor trailer:

- Saving 2 cents per gallon on fuel will save \$3,000 over the course of an engine's intended life ($\$.02 \times 150,000 \text{ gal}$)*
- Spending 2 additional cents will cost you \$500 per year (150,000 miles per year at 6 mpg = 25,000 gallons of fuel, $\$.02 \times 25,000 \text{ gal} = \500)**
- Paying \$500/yr to eliminate one injector failure will save you \$5,500+ per truck per year.

* A typical Class 8 engine will burn over 150,000 gallons of diesel per life

** Based on 150,000 miles per year at 6mpg

Sprague's RoadForce® exceeds Top Tier standards

Regular diesel fuel must meet ASTM D975, "Standard Specification for Diesel Fuel Oils."

<https://www.astm.org/Standards/D975.htm>

Sample of ASTM D975 specifications:

- Sulfur Content ≤ 15 ppm
- Flash Point $> 130^\circ\text{F}$
- Lubricity Rating < 520 micron
- Cetane Index > 40
- Copper Strip Corrosion $< \text{No. 3}$
- API Gravity @ $60^\circ\text{F} > 30^\circ\text{F}$
- Conductivity > 25 pS/m

Current ASTM D975 specifications are not keeping up with engine technology. RoadForce exceeds these specifications, preventing potential issues from occurring.

Top Tier diesel fuel must meet all ASTM D975 Standards PLUS require an additive package that:

- Provides protection against water and particulates introduced into the fuel before being dispensed into the vehicle or equipment
- Improves lubricity
- Improves fuel stability
- Reduces deposits on fuel injectors (both internal and external)

https://www.toptiergas.com/toptier_diesel_fuel/

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Our Energy Makes the Difference®

Reducing Vehicle Downtime

While increasing fuel economy

RoadForce® promotes complete fuel combustion in diesel engines, which leads to less particulate matter and soot formation. This reduces the need for DPF manual regeneration and decreases driver and vehicle downtime.

RoadForce® protects vehicle exhaust aftertreatment

Before using RoadForce® Premium Diesel Fuel	After Using RoadForce® Premium Diesel Fuel
Multiple manual DPF regens	0 forced regens
Excessive soot loading and turbocharger failures	Improved vehicle uptime
Frequent injector fouling and failures	Improved vehicle uptime
Exhaust aftertreatment equipment failures	Improved vehicle uptime
Poor fuel economy	Significant fuel economy improvement

RoadForce® improves lubricity

Q: What happened to diesel fuel's natural lubricity?

A: Diesel fuel's natural lubricity qualities were reduced indirectly due to sulfur legislation (Clean Air Act Amendments of 1990*)

- 2,000-4,000 ppm sulfur content up until October 1993
- 500 ppm through May 2006
- 15 ppm currently

Q: Why is lubricity important in diesel fuel?

A: Without lubricity, fuel injection systems, fuel pumps, and other engine components are subject to premature wear, which leads to:

- Inefficient performance
- Shortened service life
- High replacement and/or repair costs and possible engine failure

Q: How does RoadForce® improve lubricity?

A: By helping meet ASTM and EMA industry lubricity standards (<520, <460 micron rating), improving a fuel's lubricity rating by up to 100 micron

*<https://www.epa.gov/history/epa-history-clean-air-act-amendments-1990>

Housekeeping & best practices

Diesel fuel storage tank maintenance

- Check for and remove free water
- Inspect fill & vapor caps for damage and missing gaskets (replace if necessary)
- Have tank periodically cleaned

Diesel fuel fleet tank maintenance

- Change fuel filters
- Monitor water separators daily (drain if necessary)
- Drain saddle tanks

Improper storage tank maintenance can lead to vehicle issues

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Our Energy Makes the Difference®

Keep Your Engine Running

#1 Fuel Problem Year-Round is Water

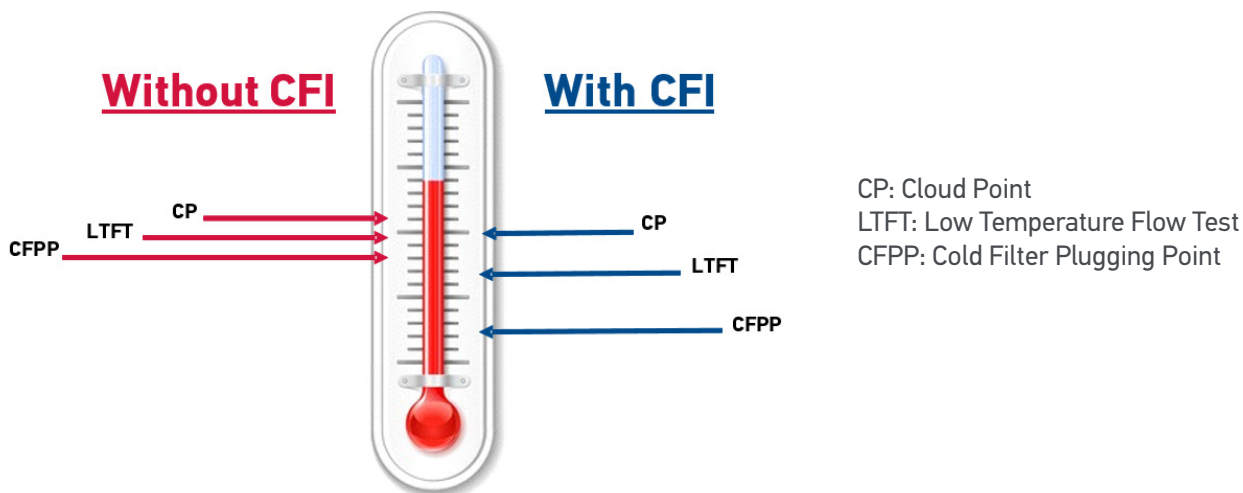
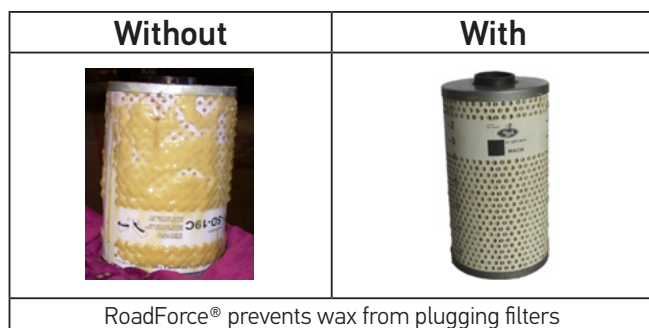
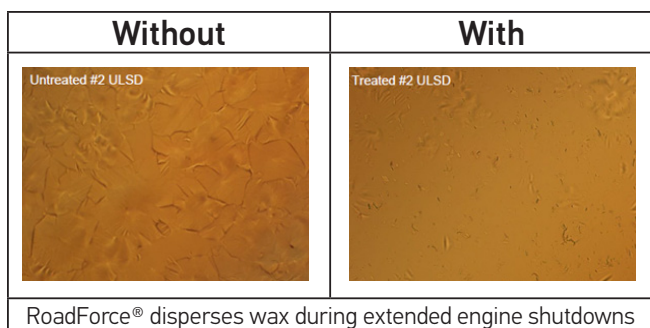
Diesel fuel is naturally hygroscopic, which means it attracts & holds water

Water Related Problem	Leading to...	RoadForce® Solution
Ice	Plugged Filters	Anti-icing Agent (Preventing the Formation of Ice Crystals in Fuel)*
Metals (Water Carries the Metals Into the Fuel)	Injector Deposits	Prevents Carried Metals From Wear and Tear
Rust	Corrosion of Storage Tanks, Dispensing Equipment, and Engine Parts	Moisture Dispersant

*Aviation Approved

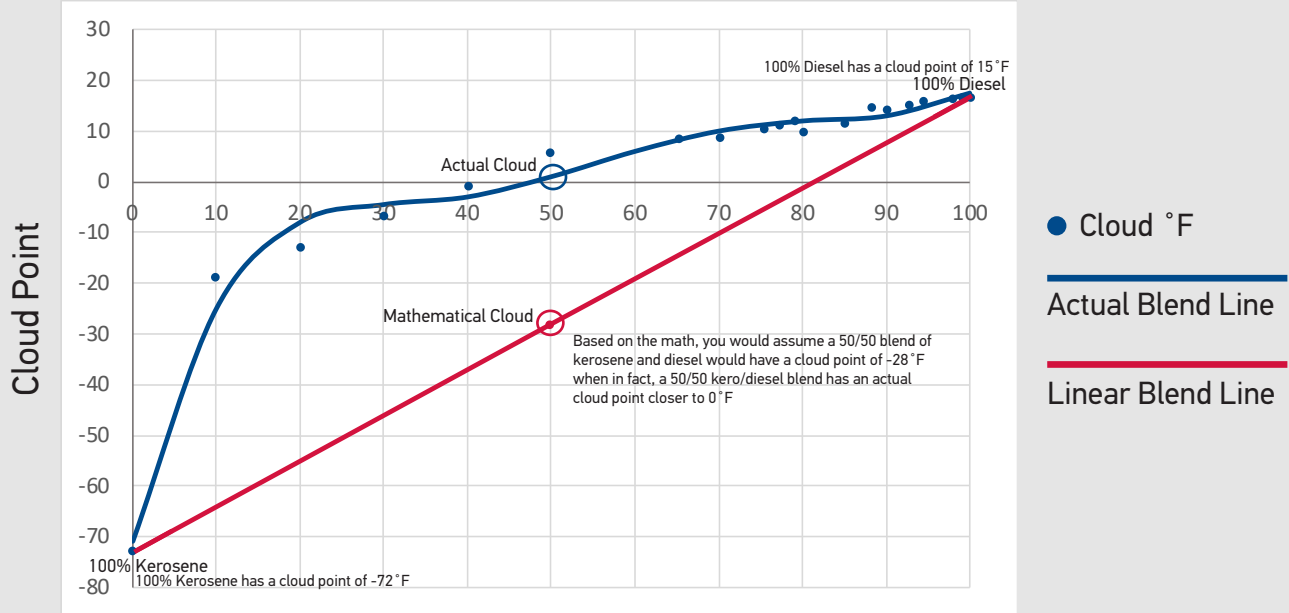
RoadForce® improves low temperature operability

Wax is important to diesel fuel, and reducing wax during the refining process can be problematic to your equipment. RoadForce® contains superior Cold Flow Improver (CFI) technology that prevents fuel gelling and reduces the need for high percentage kerosene blending (>50%) to maintain winter vehicle operability. This technology prevents winter related filter plugging by modifying the size and shape of wax crystals and keeping them dispersed throughout the fuel during extended cold soaks.



Cloud Point & CFPP

Diesel Kero Blend Chart



More kero alone is not the answer

If you look at this chart from left to right, you can see that a minimal amount of ULSD content can have a BIG impact on the Cloud Point. 10% diesel (90% kero) content returns a -18°F Cloud Point when you would expect something closer to -65°F. That is a difference of 54° (72-18) from 0% diesel (100% kero)! Why? Because there is still wax in the fuel when only blending in 10% diesel, making the overall fuel appear cloudy at -18°F! Without a CFI additive in the fuel to manage the inherent wax, this diesel blend 10/90 will still gel and plug filters.

RoadForce® is available at the following Sprague terminal locations:


Sprague RoadForce®
 Premium Diesel Testing Results



Testing Results Effective: 12/14/23

Terminal	Current RoadForce® Kerosene Content %	Max RoadForce® CFPP F°	RoadForce® Cloud Point F°	Last Updated
S. Portland, ME	20%	-14°	5°	12/14/2023
Newington, NH	20%	-14°	5°	12/14/2023
Rensselaer, NY	20%	-15°	11°	12/14/2023
Rensselaer, NY B5 (5% Biofuel)	20%	-15°	11°	12/14/2023
Springfield, MA	0%	-5°	15°	10/31/2023
Quincy, MA	10%	-14°	1°	12/14/2023
East Providence, RI	10%	-10°	6°	12/14/2023
Providence, RI (Dyed Diesel Only)	0%	-7°	10°	12/14/2023
Portland, CT (B&B Terminal) ⁽²⁾	0%	-5°	15°	10/31/2023
New Haven, CT (New Haven Terminal) ⁽²⁾	0%	-10°	10°	12/14/2023
Bridgeport, CT ⁽²⁾	0%	-4°	16°	12/14/2023

This sheet lets our customers know what our latest winter operability results are for our RoadForce® premium diesel fuel. Sprague tracks this data until the end of the winter season.



CFPP: Cold Filter Plugging Point (ASTM D-6371/45µm filter) The temperature at which a fuel will cause a fuel filter to plug due to wax which has begun to crystallize or gel. The CFPP is considered by Sprague to be the true indicator of the diesel fuel's low temperature operability. All temperatures reported in Fahrenheit.

Cloud Point: (ASTM D-5773) The temperature at which wax in diesel fuel becomes cloudy when it is cooled. Wax is inherent in diesel fuel. As the fuel is cooled, the wax will crystallize forming platelets that clog fuel filters. Typical diesel fuels will fail at temperatures near the cloud point. RoadForce is specially formulated to operate well below the cloud point. This is accomplished with wax crystal modifier additives that break down the wax into microscopic fragments allowing them to pass through the fuel filter. All temperatures reported in Fahrenheit.

⁽¹⁾ With or without kero blending year-round ⁽²⁾ Without kero blending year-round
⁽³⁾ Dyed only without kero blending year-round ⁽⁴⁾ Without kero blending seasonal

The image above is a sample of the chart from Sprague's website. You can find the current RoadForce® specs at <https://www.spragueenergy.com/roadforce>

Protection for your engine

RoadForce® benefits include:

- Keeps fuel system components free from harmful deposits that can lead to downtime and reduced fuel economy
- Promotes clean spray patterns, efficient burn, and reduced emissions with diesel detergents
- Prevents fuel soot and sludge formation caused by thermal stressing within the engine, extending fuel filter, injector, lube oil, and fuel pump life
- Provides thermal and oxidative stability
- Prevents fuel gelling in low temperatures, lowers pour point by as much as 40°F, and lowers cold filter plugging point by as much as 30°F
- Disperses and suspends wax during extended cold periods and improves low temperature operability of diesel fuel
- Provides fuel system corrosion protection
- Helps prevent filter icing with an anti-icing additive component

Sprague's RoadForce® vs. the Competition

	Sprague	Wholesale Comp. A	Wholesale Comp. B	After Market Comp. C
Exceeds Top Tier Detergency Requirements	✓			
Rack Availability	✓	✓	✓	
High Energy Content (BTU's) Even in Winter	✓			✓
Safe to use in biodiesel up to B20	✓	✓	✓	✓
Kero Blended as Needed in Winter	✓			
Prevents Corrosion	✓			
Enhances Lubricity	✓		✓	✓
Disperses Water	✓			✓
High Temperature Fuel Stabilizer	✓			
Superior Cold Flow Improver Technology	✓			
Contains WASA (Wax Anti-Settling Additive) Component	✓			
Reduces Exhaust Emissions	✓			

Testimonial from Michael MacPhail at North Atlantic Excavation (NAX) and Atlantic Fuels

As an end-user for our fleet of over 50 trucks and 40 pieces of heavy equipment, switching to exclusively RoadForce® in the middle of the cold spell last winter put a quick end to what had been a growing number of fuel quality problems. Fuel filter gelling was minimized to almost zero in a matter of days, and we were able to see a dramatic savings in fuel filters for both trucks and equipment. In addition to the increase in fuel quality noticed by our mechanics, drivers of our heavy trucks reported winter fuel mileage increases of 1 mpg and greatly improved cold starting ability. RoadForce® without a doubt decreased our downtime and ultimately led to improved customer relations and higher profits.

As a wholesaler, switching to RoadForce® made increasing our sales extremely easy. With first hand experience of the benefits of RoadForce® in our own fleet, the confidence of our sales team in bringing the product to customers sky rocketed. Our commercial diesel customer base has grown significantly and become very loyal to the product.

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