



# Performance Durability Longevity Economy

## Gas Versus Diesel Everything You Always Wanted To Know

Well... maybe not *everything*, but a pretty good overview of the key purchasing decision issues relative to gas and diesel engines in Medium Duty Trucks.

Let's start with a disclaimer – We're biased. We build great trucks that are diesel powered so we tend to think in those terms – but that doesn't mean we can't be objective about this. So in our best "objective analysis mode" we offer the following thoughts on why you would want to buy a diesel engine instead of a gas engine for your Medium Duty Truck applications.

### Executive Summary

For those of you who are not about to read this whole paper, we can cut to the chase. There are four key points to analyze when deciding on the power you need in your truck. We offer our conclusion on each one below:

**Performance** – How efficiently does the engine burn fuel and what kind of mileage can you expect? What kind of performance does each engine provide?  
**Advantage - Split Decision** – Depends on your application.

**Durability** – How does the engine handle both day to day cycling (stop and go type traffic) and highway applications – what can you expect in terms of dependability?  
**Advantage - Diesel**

**Longevity** – How long will the engine last and what does that mean for resale value of your truck?  
**Advantage - Diesel**

**Economy** – What is the net cost of ownership of the engine – not just the fuel economy but the purchase price, fuel usage and resale value combined?  
**Advantage - Diesel**

Let's review more specific information on each of these topics.

### Performance

#### Advantage - Split Decision

Are you looking for acceleration or pulling power? Do you have light loads or heavy loads? As you can see in the automotive market, gasoline engines rev higher and can make big horsepower which provides faster acceleration. Diesel engines are typically rated lower on horsepower and RPM but provide more torque at lower rev levels than gas engines. They're great for hauling heavier loads or pulling trailers. So we call this one a split decision. If you travel unloaded a good portion of the time and need acceleration in tight traffic, the gas engine is a good choice. If you want the flexibility to load your truck to its rated limits or are pulling a trailer, the diesel will be a better choice.

Today's common rail fuel injection systems have leveled the playing field for diesel engines in the areas of cold weather operation and noise/vibration. Electronic control of the air/fuel mixture allows today's diesels to start without aid in very cold weather and multi-firing pilot injection has reduced diesel combustion noise to levels very near gasoline engines.

In the area of emissions the 2004, 2007 and 2010 emission regulations will virtually eliminate the diesel particulate problems of the past and nitrous oxides will be reduced 90%. These controls will add to the initial purchase price of diesels in the short term but the return on that investment will be higher for diesels once mileage and resale value are considered.

People who opt for diesel engines are typically those who have determined that it is time to move from an automotive van or pickup derivative to a full Medium Duty Truck. With that decision they upgrade every feature of their drive train. The result is real truck performance for real truck applications.



## Durability

### Advantage - Diesel

Since diesel engines rely solely on compression instead of spark plugs to burn the fuel they use for power, their compression ratios are typically 2 to 3 times those of gasoline engines. The higher compression and resulting higher cylinder pressures require blocks, heads and other components that are built heavier to withstand the diesel operating environment. The disadvantage for diesel designs is weight – they tend to weigh more than gas engines. The advantage for diesels is durability. **The heavier designs result in B50 life estimates (the average time to overhaul of an engine) in the 300,000 or 500,000 mile range for Medium Duty applications.** A gas engine B50 life is about half that of the diesel.

## Longevity

### Advantage - Diesel

Gasoline engines are built lighter and rev higher than diesel engines. The result is that they tend to wear themselves out faster than diesel engines. **A good indicator to the longevity of a diesel engine is its resale value on the used market.** Second market buyers scan the industry papers and the Internet looking for well documented diesel powered trucks which demand \$2000 to \$4000 more per truck in the used market. It is not unusual to see “\$3500 Deduct for Gas” in the fine print of used truck value tables. The reason is simple – the diesel engine offers substantially more longevity than any gas alternative.

## Economy

### Advantage - Diesel

In considering the economic comparison of gas versus diesel engines, you need to consider both mileage and maintenance.

### Fuel Economy

**Diesel fuel has a higher energy density than gasoline** (about 147,000 BTUs of energy in a gallon of diesel fuel versus 125,000 BTUs for gasoline). That higher density, and the higher compression of diesels results in higher efficiency. In other words, a diesel engine generates more power from every rotation of the engine than a gasoline engine. The overall result is less fuel used in both idle conditions and at speed on the highway. It is not unusual to see diesel engines show 60% to 100% higher fuel economy than gasoline engines in similar applications.

### Fuel Cost

Another consideration in an engine's economy is the cost of the fuel used. Currently (January 2006), diesel fuel costs marginally more than gasoline because of constraints in the refinery process post hurricane Katrina and the fact that diesel fuel competes with home heating and jet fuel in the distillation process. Typically, diesel fuel costs less than gasoline and it is probable that things will return to that state once the current constraints are eased.

### Short Term Maintenance

Regular maintenance on a diesel engine costs more than gasoline power maintenance. Diesels tend to hold more oil and require both fuel filters and water separators. The newer Exhaust Gas Recirculation systems (EGR) on diesels also require larger cooling systems which hold more antifreeze than gasoline models. **So the short term maintenance advantage goes to gasoline.** Diesel manufacturers are countering this disadvantage with special oil formulations that extend oil change intervals.

### Long Term Maintenance

The higher costs of short term maintenance for **diesel engines** is offset by the **lower cost of long term maintenance.** Where major components in gasoline engines are often replaced in the 100,000 to 125,000 mile range, diesel engines can easily provide 300,000 miles or more of major-maintenance free operation. You should also note the difference in the warranty coverage of your engine. Diesel engines typically offer much **longer warranty periods** which can reduce your risk.



## Conclusion

**This won't surprise you – we think diesel power is the clear choice for people who have real Medium Duty Truck applications. We know from independent testing that Hino's J-Series engines have shown better fuel economy than other brands of diesel engines. (See our Fuel Test White Papers.)**

**The initial purchase price of a truck is not the end of the story. It is the total net cost of operation and the residual value that makes diesel powered Hino Trucks the smart move in the Medium Duty market.**

**Find your Hino Dealer at [www.hino.com](http://www.hino.com)**

Every report of this type needs some fine print – so here it is. Our idea in publishing these papers is to keep you informed on our issues pertaining to Hino Trucks. The contents are as accurate as possible at the time of publishing. But everything may change if we get a better idea.

