

Best Practice Report
June 18, 2011

Questions for the May 2011 Best Practice study were submitted by our regular research participants during the last couple of months. Nineteen fleet representatives participated in this study. Results follow: The initial question as it appeared is shown in *italics* followed by the group results and individual comments.

Are you having any regeneration problems with DPF? If yes, on what make, model and duty cycle of truck and what specific problems are you having?

Five of the nineteen participants have had some problems – the table below captures the details from those five:

Make/Model/Duty Cycle	Problem
International with Cummins engine	Severe face plugging
IHC/Cummins/OTR	Won't regen on its own
Peterbilt/Mack, Freightliner, Autocar - all in Refuse Duty Cycles	DPF plugging, not enough heat and airflow to regen automatically
Mack/CXU613/ 2,500 miles a week	Cracked DEF filters, defective sensors and valves
Volvo daycab P&D, anything with CAT	Volvo's ('07 engines) tend to have a lot of regen's and are a problem. Good thing CAT got out of the business, their engines have turned out to be junk.

Are you having issues with overhead cam failures in the 2005-2007 Cummins ISX15 engines – especially between 400,000 and 600,000 miles? If yes, please explain

Only two indicated they were having problems:

- Cam's seem to go bad
- Cummins claims it is from not changing the oil enough. The cam just wears out, it is a hardening issue.

Are you having continuing problems with underhood heat? If yes, on what make/model/duty cycle of truck and how are you mitigating the problem?

Only one and they are a waste hauler – all COE models and “they aren’t having much success mitigating the problem”. No other fleet in our response group indicated they were having any problems.

Please provide information on any experience you have had with 2010 SCR and/or Advanced EGR Engines

The following table includes all the input we received for each engine technology:

Best Practice Report
June 18, 2011

SCR Engines:

Vehicle Info	Duty Cycle	MPG	Maintenance Issues	Reliability	Positive or Negative	Acquisition Cost	Life Cycle Cost Comparison
Peterbilt Model 384 Paccar MX	mountains & high wind drag chip trailers	between 4.8 and 6.5 depending on terrain & percent loaded	none to speak of	some sensor faults and wiring issues, otherwise no major issues at the 100,000 miles mark	great engine so far, lots of positive driver comments, excellent OEM support	substantial cost for 2010 compliance	substantial improvement over the last of our Cat engines
Mack MP7		5.6 to 7.54					
Cummins, Mack	Refuse		Most are DPF related	DPF related down time		8 to 10 K upcharge	worse
Mack/CXU6 13/MP7	2500 miles a week	5.1	DEF level gauge	good	unsure about improved fuel economy	none (test truck)	unknown
Freightliner/Cascadia/D D13	Line haul	7.58	none to speak of	excellent	Great MPG	\$10k	Better so far
Daimler Cascadia DD15	120000 annual	6.85	Recalls, Turbo, Fuel Pump, Wiring, ECM Fuel map	Good	They have been proactive on addressing issues that they have found, still don't like the down time	10,000	Slightly higher
Peterbilt	OTR	6.6 plus DEF	none	good			higher acquisition cost, DEF use and handling

Advanced EGR Engines

Vehicle Info	Duty Cycle	MPG	Maintenance Issues	Reliability	Positive or Negative	Acquisition Cost	Life Cycle Cost Comparison
Int'l ProStar MF13	32,000	6.4	ECU Programming	undetermined	okay service but reliability issues	10,000	projected higher costs
IHC/Prostar	Line haul	7.56	none	excellent	Great MPG	\$8k	Better so far
Int. Maxforce 13 ProStar sleepers and daycabs	OTR and short haul	7.0 for OTR	heavy oil use during breaking	good			higher purchase cost

If you are using SCR technology, are you having any issues finding DEF across the country?

None of the participants indicated they were having any problems at all

What are you doing to prepare your technicians for 2010 and beyond engine technology?

- OE-Engine Training
- Have them signed up for continuous training from the engine makers
- Adding training and new programs
- For both our techs and drivers, teach how it works (in detail for the techs) and what each system does. If you don't know how it works then you can use logic to troubleshoot and repair
- Nothing at this time, we take all problems to the dealer
- Train, train, train
- Will need to send techs to an approved school
- In house training, newsletters
- Education
- Nothing - hiring younger ones that have been factory trained
- Trying to keep up with the training but a problem. In some cases we are ahead of the dealers

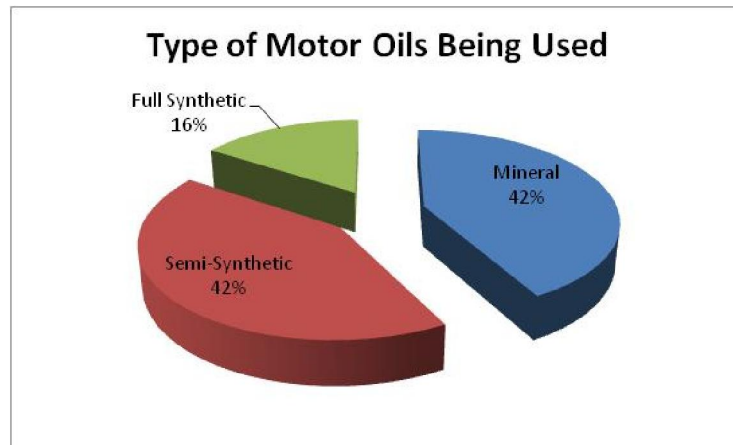
If I were buying a used truck, which engine was the most reliable in 2005 – 2008?

Unfortunately there's not much consistency to the answers – "beauty is in the eye of beholder"; although there are some suggested choices on this list.

- 2006
- 2008-ISX
- Cummins
- Cummins
- There was a reliable engine in this period? We didn't get that memo so we limited 2004-2006 purchases to only a few and basically completely avoided 2007-2009. If we must buy used it will be 2008-2009 (to reap benefits of best product improvements) and it will be Cat (to stay within our previous fleet engine). Actually, we would be best to wait until 2010 become available used (for CARB compliance reasons) and then it will be MX
- M-B 4900
- Mack Aset
- DDC 70
- Detroit
- Certainly not Cat c-9, c-11, c-13
- Pre '07 would be CAT C13, after '07 Maxforce or Detroit
- Volvo
- Detroit Diesel
- MBE 4000

What type of motor oils are you using?

*Mineral
Semi-synthetic
Full synthetic*



Have you tried 10W-30 or W30 for fuel mileage? If yes, what's been the result of that?

There were four respondents who indicated that they have tried these types of oils with the following comments:

- Didn't work as well as the 5W30
- 5w40, improved fuel economy, startability
- No measurable change
- Just started test

What is your current oil change interval for over the road tractors?

There are almost as many interval measures as there were answers; but I've sorted these by the type of motor oil used as given in previous inquiry. That breakdown shows that for the most part our respondents have longer intervals using semi-synthetic than mineral and longer again if using full synthetic. Not true across the board but generally speaking.

Mineral

- 18,000 miles
- 25,000 (This fleet indicated they use both mineral and semi-synthetic)
- 6,000
- Caterpillar 25,000-30,000 Paccar MX 40,000
- 30,000
- 35,000
- 45,000 kms

Semi-Synthetic

- 47,000 miles
- 50,000
- Don't have over the road change by analysis
- 40,000
- Varies based on engine 20,000 30,000 50,000
- 30,000

Best Practice Report
June 18, 2011

Full Synthetic

- By analysis 75,000-100,000
- 1000 hours with synthetic
- 60,000

Are you using or have you tested Tire Pressure Monitoring Systems such as Crossfire, Cateye or something else? If yes, what product and what was/is your experience with it?

Ten of the respondents have had some experience with TPMS with varying degrees of success:

Product	Experience
Crossfire	Best money ever spent
Several	All junk!
Pressure Pro	would be better to be more user friendly
Crossfire	We manually air gauge every tire on Saturday morning (that also forces a visual inspection). That program has almost eliminated air pressure related failures and thus reduced value Of monitoring systems for us (although they may be very successful on other fleets)
Catseye	Fairly good, some seal problems
Hendrickson	Very new to the fleet-so far so good
Meritor PSI	Excellent
IVTM	Positive
Pressure Pro	Still can't get drivers to pay attention
Crossfire	The crossfires started developing seal leaks and become a bigger liability than help with air pressure.

What is your perception of air disc brakes?

- Positive
- They will eventually be mandated!
- If you don't have them you should
- I feel disc brakes are going to be popular in the very near future once they become more popular which in turn should drive the cost down
- It will be interesting to confirm that they got it right this time. If so, we are interested in testing our application.
- We would try if weight neutral and cost neutral
- We are having great success, at least double service interval of 8 5/8 drums
- Too costly upfront
- Not required yet, too heavy
- Purchase them on trailers, still weight disadvantage on tractor spec.
- Junk used to stop foreign trucks
- Trying several in fleet, good so far except one vehicle mated to trailer. Looks like truck disc brakes are doing all the work
- The product has reached a refined enough stage for me to specify on new equipment
- Should work good
- I like them but too expensive
- We're currently spec'ing all of our new purchases with disc brakes
- We have not tried any but I have heard that they are working well

Best Practice Report
June 18, 2011

If you have integrated air disc brakes into your fleet, how long (miles or time) are the rotors and the pads lasting?

- Projected triple (OTR)
- 4,000 hours for Meritor, 3,000 for Bendix (Waste hauler)
- So far have 300,000 and still running on units spec'd 2.5 years ago (OTR, Flats)
- Several applications. Looks like at least twice the life of drums at this point

Do you see an advantage to having stability control on the trailers as well as on tractors? If yes, please explain

(4) respondents answered yes with the following comments:

- Absolutely works
- It works
- For the cost of the product, we cannot afford not to put it on
- May hookup to a power unit without stability control

A few other respondents gave some explanation but did not answer yes to the question:

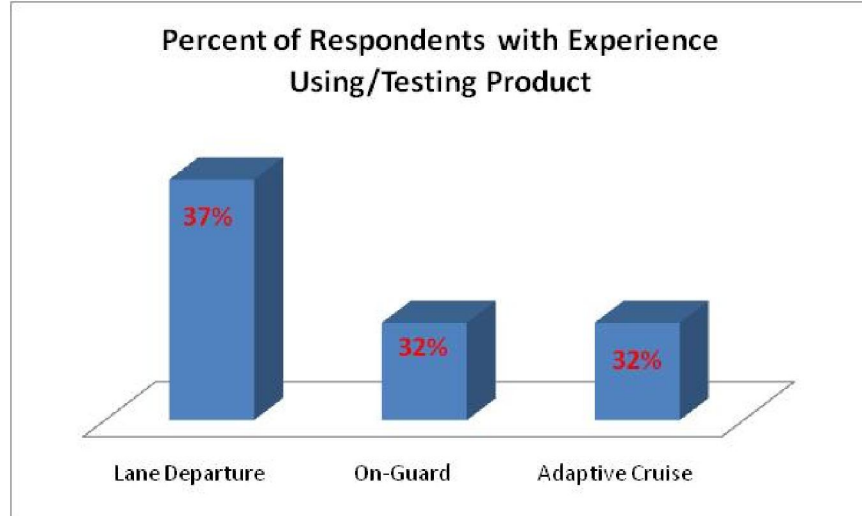
- I believe this pertains more to your fleet application on the products that you haul. Fuels in tanker applications and carrier's that haul goods which can possibility to be top heavy. It will never take the place of a bad driver.
- More idiot proof
- No tractor controls on trailer

In your opinion what are the benefits of onboard safety devices? Is the cost justified?

On-board safety	
Benefits	Cost Justified?
Most are very good but there is not a "one size fits all" system	Yes
The rollover systems have saved us 75% rollovers	
Should be on	Hard to do as fleets never know what "didn't" happen
This to me all comes down to carrier's applications	Possible
On our curvey roads it definitely forces the "fast" drivers to change their habits. The careful drivers never even know the devices are on the trucks (because they are already driving that way). The fast drivers sometimes complain about them (because they have to change their habits)	Yes - prevent one crash and all devices are paid for
Stability control well worth it	Definitely
Very good in certain duty cycles	Usually
The more the better	Very much so.
Lower exposure with rookie drivers	Yes
Accident mitigation	Yes
You only need one to make them seem cheap	
Good for poor drivers, questionable for good drivers	Another \$7,000 per truck, might be better off spending that with driver trainers
We are self-insured within set limits. Most accident costs go straight to the bottom line. Currently employ LDWS, CWS, Stability Control	Yes
They can be very beneficial but finding a way to pay for the initial cost is the biggest hurdle	yes

Do you have, or have you tested any of the following – if yes, please explain your experience with them?

- Lane departure warning
- On-Guard crash avoidance
- Adaptive Cruise Control



Experience:

Lane Departure	On-Guard	ACC
Drivers don't like on curvy 2 lane roads	Too early to tell, looks impressive	Ditto to On-Guard
Attempting to make it feasible	Will be implementing on new purchases	Attempting to make it feasible
		We've used for years
Very good system and drivers are very accepting		
Ok, not real happy	Good so far, still testing	
Reduction in accident percentage	Reduction in accident percentage	Reduction in accident, slight MPG improvement according to drivers
Just on a few tractors seems like money well spent	Same as LDW - problem is lane changers with no warning or lane	
Still had a turnover on a truck with this device when driver was distracted	Hard to say if it has helped because we don't know when it has worked	Same as On-Guard
		Driver acceptance is difficult

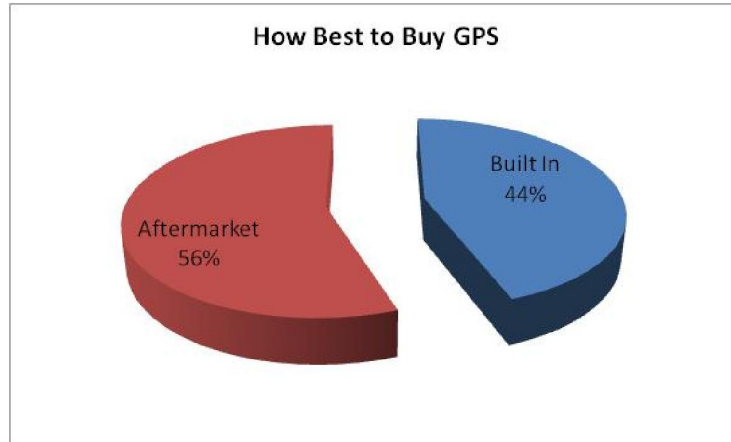
What GPS systems are now available with black box for small fleets to lease or buy at affordable rates?

We received only two recommendations:

- WebTech Wireless offers a great system, very affordable
- PeopleNet

Is it best to buy GPS systems built in to new vehicle or purchased in the aftermarket?

Only half the respondents (9) had an opinion of those it's pretty evenly split (5) Aftermarket and (4) Built-In, so no clear recommendation from this data.



If you have a set "trade cycle" for OTR power units, what is it now?

There is, of course, a range of responses but looks like 5-6 years (about 600,000 miles) is about normal now at least for many of the respondents to this survey. Only one respondent had anything less than that (they are an OTR TL for-hire carrier)

- 5 years
- 3yr 375k miles
- 8 years
- 8 years
- As needed and repairs too high
- No cycle now
- 6 year/600,000
- 550,000 or 5 years
- 5.5 years
- Have nothing now
- 5 years
- 6 years
- Run OTR to 650,000 miles and then put in local/regional service

Best Practice Report
June 18, 2011

What factors go into your decision to buy a specific brand of vehicle – please list in order of importance

The following list is all the factors that were listed in the number one slot – I have combined similar responses: Acquisition cost and overall cost of ownership were the top factors; followed by three closely aligned factors (Customer Service, Product Support and the Dealer) which when combined are almost as important as cost.

- Cost (2), Price; Total cost of ownership (2), Overall cost per mile (purchase, repair, fuel)
- Customer service
- Product Support
- Dealer; Local dealer with service
- Ability to get the job done (available specs and durability of construction for a very long life).
- Value
- MPG
- Weight
- Meets all features required
- Past experience and established relationships
- Longevity

The following table lists all of the responses in the slot (in order importance) where each was put:

#1	#2	#3	#4
Product Support	Warranty	TCO Total Cost of Ownership	Residual value
Cost	Cost	Cost	Cost
Customer service dealer	Durability of product name	Warranty	Drivers feedback and costs
Ability to get the job done (available specs and durability of construction for a very long life).	Availability of parts and service at reasonable cost and close location.	Common components shared with existing fleet.	Engine and emission system
Value	Durability	Light weight, new buzz word	
Cost of Ownership	Dealer Support	OEM Support	Service costs
MPG	Low maintenance	Driver acceptance	Fleet experience
Cost			
Weight	MPG	Life Cycle Cost projection	Operator satisfaction
Meets all features required	Price	Dealer must be in two counties	Factory backup for parts
over all cost per mile (purchae, repair, fuel)	weight	dependability	
Past experience and established relationships	Spec process and flexibility in utilizing emerging technologies	Value for the price	Service after the sale
Price	Meet spec	Overall cost	
Longevity	Warranty	Price	Quality
Total cost of ownership	Network	Resale value	
Local dealer with service	Good availability network to work on vehicle on the road	Engine choices	Ease of service

How many miles are you willing to give up on tread wear for fuel economy?

There isn't much conformity to the answers we received – from zero to 40,000.

- 10%
- It's either or!
- 10%
- I believe with the right rubber compound you shouldn't have to give up anything. Your best mileage on any rubber is usually around 10/32 and down
- None (3)
- If the accurately measured amount of fuel saved exceeds the cost of tread surrendered then talk to me. Truly coming to this decision point is easier said than done.
- ROI dependent
- 30,000
- As little as possible
- 20,000-40,000
- 10,000

If you would like any additional details associated with this Best Practice study, please send an e-mail to chris@ckcvr.com and I'll try to provide from the data we received.

Best regards,

Chris Kemmer