Well-oiled machines

Reap the rewards of switching to FA-4 oil

Produced for Chevron Lubricants by Randall-Reilly.

Many fleets have switched to the latest, most advanced category API FA-4 oil, and many more are considering doing so.

At a certain point, it makes solid financial sense to benefit from the savings on fuel and maintenance costs offered by these oils. You don't want to leave money on the table by failing to make the switch if appropriate.

Having a clear plan for switching will ensure a smooth transition to FA-4 oil, and choosing the right lubricant partner will help your operation achieve maximum return on investment.

PART 1

Bottom-line benefits

API FA-4 oils can provide higher fuel efficiency relative to API CK-4 oils for engines and decrease the amount of service required. Both those things can benefit a fleet's bottom line as more miles per gallon means less fuel burned; plus, maintenance intervals are stretched out to keep trucks out of the shop longer. As a fleet gets larger, the cost savings it can reap by using FA-4 oil can multiply fast. Check with your truck OEM or OEMs to see if the most technologically advanced oil, designated FA-4, will work for your fleet. Navistar and Cummins have approved FA-4 for their 2017 and onwards heavy-duty models, while Daimler Trucks North America has approved FA-4 oil for Detroit Diesel heavy- and medium-duty engines going back to 2010. Check with your lubricant partner whether other older engines can also use FA-4 oil.

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— **James Booth**,
commercial sector manager
for North America at Chevron

Here are 3 critical ways FA-4 oils can pay when it comes to your fleet:

1. Better engine protection

FA-4 oils are one of two new designations introduced by the American Petroleum Institute (API) in December 2016. The other oil is CK-4, which is backwards compatible with the CJ-4 oil type. While CK-4 oils offer some advanced characteristics compared to the older CJ-4 oils, it's the FA-4 oils that offer fleets the most advantages.

For starters, FA-4 oils have lower viscosity and are designed to produce less friction in an engine, allowing the moving parts to glide more easily and with less energy expended. That increases fuel economy and was a part of Greenhouse Gas 2017 requirements for more fuel efficient, lower-emission diesel engines. The latest engines also tend to run hotter, so FA-4 oils are formulated to provide greater resistance to oxidation, which occurs when oil breaks down and its ability to lubricate an engine deteriorates. In addition to heat protection, these most advanced oils are designed to protect engines better at low temperature extremes.

2. Increased fuel efficiency

"If we compare 10W-30 CK-4 oil to the old industry standard 15W-40, we see between 0.9% and 1.2% improved fuel efficiency," says James Booth, commercial sector manager for North America at Chevron. "If you compare 10W-30 FA-4 oil to 15W-40, you're more in the range of 1.4% to 2.% improved fuel efficiency. For a fleet, I would say that if your trucks are doing anything in the range of 40,000 miles a year and upwards, it starts to make sense to be using an FA-4 oil."

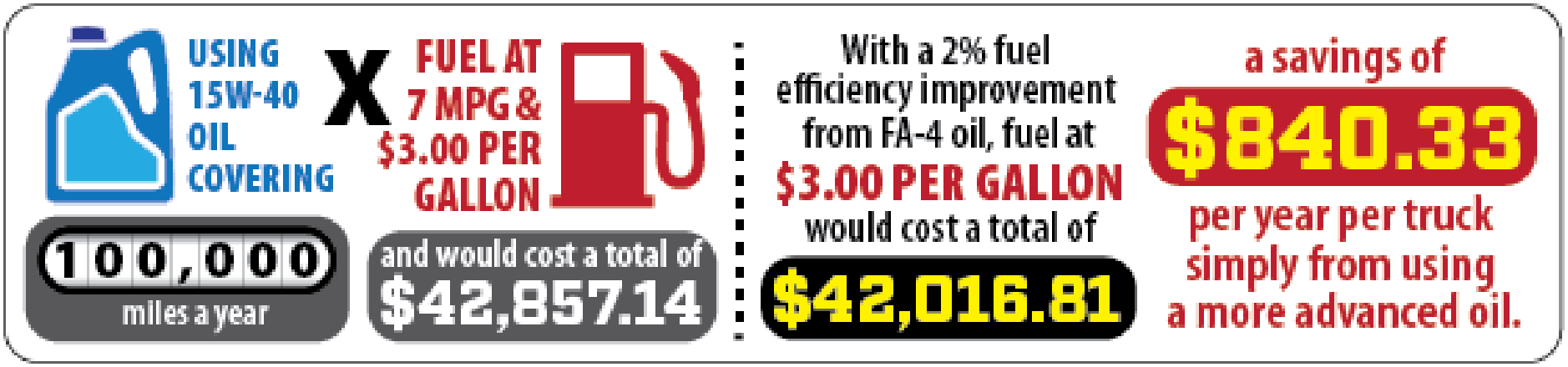
Taking that basic example, let's say a truck using a 15W-40 oil covers 40,000 miles per year and gets 7 mpg. It would need 5,714.29 gallons of diesel to go that distance over the year. At $3.00 per gallon, the fuel would cost $17,142.86.

Add in a conservative 1% fuel efficiency improvement from FA-4 oil and it reduces the fuel needed to 5,657.71 gallons, which works out at $3.00 per gallon to a total of $16,973.13, a savings of $169.73 per year per truck. A 2% fuel efficiency improvement would bring the fuel needed to 5,602.24 gallons at a cost of $16,806.72, which would mean a savings of $336.14 per year per truck. And that's using a relatively small 40,000 miles per year for trucks, which many fleets exceed.

If you do the same calculations with trucks using 15W-40 oil but covering 100,000 miles a year — again with fuel at 7 mpg and $3.00 per gallon — the total fuel cost is $42,857.14. With a 2% fuel efficiency improvement from FA-4 oil, fuel at $3.00 per gallon would cost $42,016.81, a savings of $840.33 per year per truck, solely from using a more advanced oil.

3. Extended oil drain intervals

The other big advantage with FA-4 oils is that they allow for longer drain intervals such as 75,000 miles or even more. Memphis, Tennessee-based trucking company Ozark Motor Lines, which has transitioned to Delo 400 ZFA 10W-30 (an API FA-4 engine oil), is testing longer drain intervals of up to 100,000 miles. Longer drain intervals means a fleet can keep a truck on the road rather than having to bring it in for an oil change as frequently. It can also reduce the amount of oil overall that a fleet needs to use. The right lubricants partner can provide the expertise to adopt an oil analysis program to help your fleet



confirm that oil and engines are healthy and to determine the proper drain intervals.

It's recommended that your fleet sample and test oil from its trucks to be sure of oil and engine health. You can work with your lubricant partner to be sure you're running the correct weight and type of oil and adjust as necessary. Oil analysis also lets you know if you can extend oil drain intervals, which can save your fleet time and money.

To be sure your trucks are getting the right oil, Michael D. Holloway, owner of 5th Order Industry LLC, an industrial consulting firm that helps fleets transition to new oils, says fleets should regularly perform oil inventory checks and sample oil analysis.

Glen McDonald, vice president of maintenance for Ozark Motor Lines, agrees that oil analysis can benefit fleets. He notes that the Ozark fleet uses a third party to analyze oil samples as it monitors oil life and tests for proper oil drain intervals. The oil manufacturers themselves may also offer sample analysis programs.

"We did oil sampling, and I would recommend oil sampling anyway," McDonald says of his fleet's use of FA-4 oil. "We pulled a sample every oil change, and we charted and tracked those samples. We validated that the engine was still in good shape at that interval."

Booth notes that it's no more or less important to sample FA-4 oil than any other oil. He emphasizes that analysis needs to be done correctly, however. "As with many things, what's important is how you execute it," he says. "You need to follow some best practices on sampling, and there's the analysis itself. Where this falls down is when sampling is done of the wrong oil, the mileage information is incorrect, or if it's been topped off with a different brand of engine oil."

"Whoever is responsible for receiving sample data," Booth adds, "needs to have some sort of mechanism by which they're using it to inform decisions or being able to plot trends." Oil analysis can be a good way to ease any concerns a fleet may have about switching to FA-4 oil, he says.

PART 2

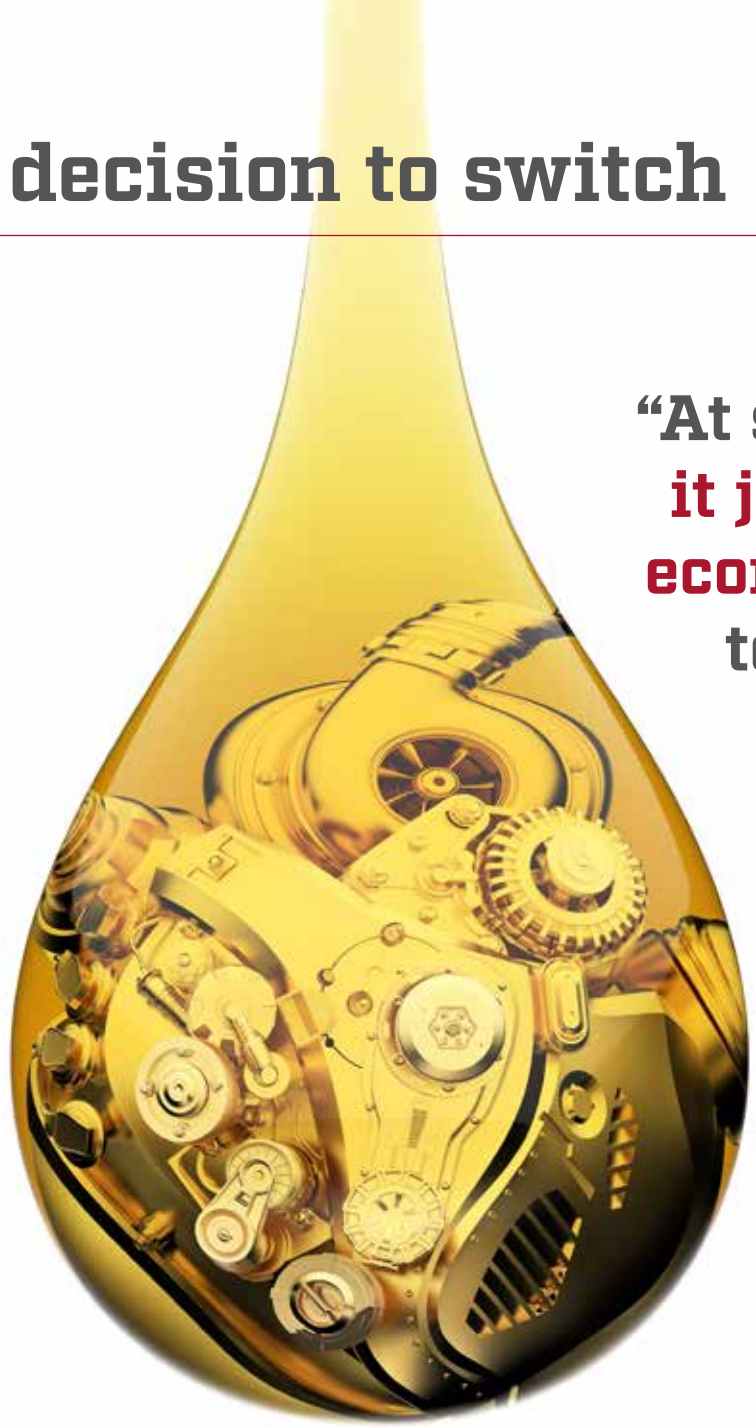
Making the decision to switch

Many fleets have been reluctant to switch to FA-4 oils, in part because fleet managers often feel that the lower viscosity will sacrifice engine protection. Booth notes that Chevron's approach with its FA-4 Delo oils was to exceed industry and OEM specifications for wear and durability. "I think everyone should have confidence there," he says. "The Delo brand as a whole is designed to deliver greater performance in a number of areas than what the industry demands from us."

The first thing to know is whether or not your trucks can use FA-4 oils. Again, these oils were designed to help the newest engines meet GHG 2017 requirements and are part of what helps those engines deliver higher fuel efficiency and lower emissions. However, some OEMs have been approving older engines going back well before 2017 for use with the new FA-4 oils.

Booth notes that Daimler Trucks North America has approved FA-4 oil for Detroit Diesel engines going back to 2010. Cummins and Navistar have approved FA-4 oil for certain 2017 and newer engines, and Booth says he expects more OEMs will follow suit and approve FA-4 oil for their engines.

Fleets should check with their trucks' OEMs to



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see if their engines have been approved to use FA-4 oil. The field of approved engines has been expanding, and some oil manufacturers will even provide warranties against engine damage if an older truck is switched over to FA-4 oil. Chevron offers such a warranty program, Booth says.

Fleets can (and should) also check with their lubricant partner as to whether an FA-4 oil is appropriate for their trucks and whether any warranties are available. Booth points out that if you have a fleet which contains multiple OEM brands, checking with your lubricant partner can help save time as opposed to checking with each individually.

Meanwhile, fleets have also been replacing older equipment and bringing in more new trucks that can use FA-4 oil. "We knew that at some point in buying new trucks and replacing them that the number of them using the new type of product would outnumber the old type," McDonald says. "At some point, it just makes economic sense to go on and change."

McDonald says that the Ozark fleet uses Delo 400 ZFA 10W-30 semi-synthetic oil for most of its 700-plus trucks, but a small number of its trucks still require an older 15W-40 oil. "We have had to put a 15W-40 oil back in the shop for anything other than our new Freightliners, but it's only like 40 trucks or so," McDonald explains. The factory fill for the fleet's Freightliner trucks is Delo 400 ZFA 10W-30, making it an easy choice for the bulk of the fleet.

With fleets replacing older trucks for several years since the introduction of FA-4 oil, it's time to check with your OEMs to see if an FA-4 oil is appropriate for your trucks. There may be a need to keep another oil on hand if you are running some older trucks, but verify with your truck OEMs and oil partner if even those older engines can now use FA-4 oil.

PART 3

Maximizing ROI:

Some typical operations and practices won't work well for the switch to an FA-4 oil. Booth points out that a standard fleet practice is to refill bulk oil tanks when they get down to about 10% capacity, but that's not ideal in this case. Draining tanks down lower than that when switching to FA-4 oil will mix oils less and will allow the fleet to get maximum benefit out of these latest oils.

"Because you want to maximise the fuel efficiency benefit of the lower viscosity oil, if they can, drawing down to less than 10% would be preferred" before refilling, Booth says. Fleets should try to avoid mixing FA-4 oils with CK-4 oils as much as possible.

Train your technicians

When you do switch, reaping the benefits of FA-4 will depend on you having the right basic framework in place. Training technicians and drivers as well about the new oils is critical, and if your fleet will need multiple oils, differentiating between oils and dispensing equipment is just as important. You can also label trucks as to which oil they take to help prevent misapplication. To get the most out of your switch to FA-4 oil, technicians need to be trained on the differences of FA-4 oils and on keeping them separate from other oil products. After all, your techs are the ones who will ultimately be changing oil and refilling diesel engine blocks and

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crankcases, and they need to keep FA-4 oil apart from any legacy engine oil your fleet may be using.

“The way I look at it is this: An FA-4 oil vs. a CK-4 oil, that’s like the difference between hydraulic fluid and transmission oil,” Holloway says. “They have to be dealt with completely separately, and it requires training.” FA-4 oils “are a different breed, and the base oil is different, too,” he adds. Compared to CK-4 oils, FA-4 oils have a thinner base oil and different additives packages to achieve their higher performance and longevity, Holloway says.

He recommends that fleets foster an environment where technicians aren’t penalized for speaking up if they mistakenly use the wrong oil to refill a truck. “If it’s an honest mistake or it’s just you were careless for that one minute, you know what? We’re all human,” he says. “Own up to it. You’re not going to get in trouble, but we’ve got to make it right,” he adds, describing how fleet maintenance shops should approach the issue.

Be sure that drivers are educated on FA-4 oil, and keep top-off oil in the trucks. "We are seeing FA-4 being carried in more and more Truck Stops, however you can't guarantee it will be available every place you stop, so we would recommend that trucks carry a few gallons of FA-4 oil," Booth says.

Set up your shop

FA-4 oils are significantly different from other oils, and your oil tanks and spouts should be clearly labeled. That can help ensure the right oil gets into the right trucks, maximizing the benefits of FA-4 oil for the fleet.

Fleets should check with their lubricant partners to see if a labeling program or system is available. Booth notes that Chevron offers such a program, which includes frame rail labels so that when a truck comes into the shop, the type of oil the truck takes is clearly visible.

"It's fairly straightforward if you're only going to have one engine oil," Booth says. "It becomes more complex if the fleet is going to carry two or more engine oils, because then the labeling and education become that much more critical since there's more risk of misapplication."

McDonald echoes those calls for keeping oils separated and clearly differentiated. "In the shop setting, I would definitely come up with a way to differentiate the different weights" of oil, he says. "I would keep them as separate as I could so technicians know they have to go 'here' for that product. I would paint the containers a different color — one black and one red or yellow, green, or whatever you can do to make them appear different," he says. "I would use my imagination."

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The right FA-4 oil, when appropriate for use, can boost your fleet's bottom line.

Advantages of FA-4 include higher fuel efficiency, longer oil drain intervals, reduced maintenance and better protection at temperature extremes. As with many things, just making the switch isn't enough for your fleet to see maximum return on investment. It's important to set up your shop correctly and differentiate between oils, particularly if the fleet will use more than one oil, and to train your technicians and drivers on the different oils. Properly executed, a switch to FA-4 oil can make solid financial sense for your fleet.•