



TURBO DIESEL

REGISTER



TECHNICAL TOPICS

Service/Parts Updates

HERE WE GO AGAIN — LUBE OIL CK-4 EVALUATION

Does the title for our lube oil article bring up memories of the Ray Charles song “Here We Go Again”?

For me the obvious answer is, “yes.”

Ray’s opening verse:

Here we go again
She’s back in town again
I’ll take her back again
One more time

Here we go again
The phone will ring again
I’ll be her fool again
One more time

Modified lyrics to fit *another* round of lube oil testing to see who has the *best* CK-4 lube oil:

Here we go again
New category to test again
I’ll buy the oil again
One more time

Here we go again
The phone will ring again
John Martin will acquiesce again
One more time.

Putting the whimsical lyrics aside, I received correspondence from TDR Member Bill Holley and he wanted to know if we could get John Martin’s opinion on the CK-4 lube oils. As a “newbie,” Bill had read our previous report on the CJ-4 oils (from Issue 76) that he found in the TDR’s [Perfect Collection](#) book, pages 54-58. In that article we tested 10 different CJ-4 lube oils. He also did the research way back to our evaluation of the old CI-4 oils that was written in Issues 54-57 where we tested 22 different CI-4 specification lube oils.



It’s CK-4 oil evaluation time.

TDR Chapter and Verse Ram EcoDiesel Engine

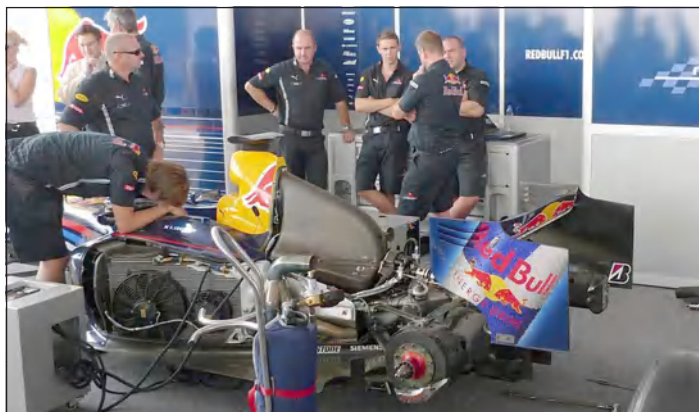
Further, TDR member Bill Holley cited the most recent TDR chapter-and-verse lube oil article that was found in Issue 110, pages 12-18. In that article I had the help of John Martin and Kevin Cameron to explain the lube oil specification change for Ram’s EcoDiesel engine: “Effectively Ram moved from the difficult to find 5W30, European 3, specification to an easy to find 5W40, Shell Rotella T6 synthetic lube oil.” Issue 94 comments by John Martin sum up the actions by Ram: “As you may have concluded by now, the switch from SAE 5W30 to SAE 5W40 produces one key effect—higher oil pressure at engine operating temperatures (200°F). EcoDiesel owners, I would make the change to 5W40 in short order.” Was Bill Holley up to date?

TDR Chapter and Verse Cummins 2019-Newer CGI Engine

TDR Member Holley also understood the update for Cummins: “In contrast to the EcoDiesel engine, the new-for-2019 Cummins 6.7 CGI engine called for a different viscosity than the good ole ‘15W40’ that was recommended all the way back to the first Turbo Diesel in 1989. This Cummins engine calls for a thinner 10W30 oil in climates above 0°. Below 0° the specification is a 5W40 synthetic oil such as Mopar, Shell Rotella and Shell Rimula, that meets FCA Material Standard MS-10902 and the API CK-4 engine oil category is required.”

Also, in that Issue 110 magazine, writer Kevin Cameron gave us a three-page discussion that expanded on my 2019-newer, Cummins 6.7 CGI engine and engine oil observation: “Tighter bearing tolerance and thinner oil are helpful in performance and fuel economy. But, the 6.7 CGI is not as tolerant of ‘misbehavior.’ Again, use the proper temperature lower viscosity oils for better initial start oil flow and don’t ‘hammer’ the engine immediately after start up.”

Kevin went further and told of bygone days and airplanes with canvas hoods and oil-fired furnaces. He tied those engines to today's Formula 1 engines and their unique starting procedure: heated water from a tower is circulated through the engine block to expand the engine's tolerances for start up. "We have temperature," and the starter is engaged.



Ready to start? Formula 1 engine preparations.

Fascinating stuff. Now, back to our story.

CI, CJ and CK-4 Lube Oil Discussion – History

In the opening of this article TDR member Bill Holley correctly noted that we had not evaluated the CK-4 oils. However, I didn't realize that this specification was put into place back in December of 2016. So, effectively, I'm five years late in doing "The Best CK-4 Lube Oil" article. And, as I looked back to the CJ-4 evaluation in 2012, I realized that those oils were adopted in January 2007. Another five years behind the times. The CI-4 oils: They were introduced in 2002 and we did our evaluation in 2007. Another lapse of five years.

"Mr. Editor, not a good track record for timeliness."

That's an observation I can't refute. However, by doing the first CI-4 comparison at the time the marketplace was changing to CJ-4 oils, John Martin was able to evaluate on whether the *new* CJ-4 specification was better for our engines.

Long, long story: lube oil category evolution (CH to CI to CJ to CK, etc.) typically go hand-in-hand with changes to the diesel engine to meet a new set of exhaust emissions regulations. The CI oils introduced in 2002 were reformulated with a stronger detergent package to help new engines that were using exhaust gas recirculation as an emission control strategy. The CJ oils were designed for another lower emissions hurdle and engines that would operate on the ultra-low sulfur diesel fuel that was implemented on January 1, 2007.

Your Reason to Read the TDR

The previous summary was the corporate *raison d'être*. (Fancy French words: reason to be.) For the bottom line on lube oil evolution, let's let our insider, John Martin, give you a peek behind the curtain.

John tells us, "Back in 2002 when diesel engines started using catalytic converters and exhaust gas recirculation to reduce exhaust emissions, the old 'reduce the phosphorus' bugaboo started up, and the EPA started pushing engine builders and lube oil suppliers around much like they had with automotive/car oils. I was at a Technology and Maintenance Council (TMC) meeting in 2004 where four very large fleets reported their field experience with traditional diesel oils and catalytic converters in field tests lasting for at least 200,000 miles per unit. Not one of them reported a lube-related failure of their catalysts using higher levels of ZDP! But the EPA doesn't deal in facts. They enjoy disrupting anything to do with internal combustion engine builders or Big Oil.

"As I reported at length here in the TDR (Issue 76 and Issue 57), in the 2006 timeframe the EPA insisted that a new oil performance category, API CJ, be developed to reduce the sulfated ash content of diesel oils to below 1% wt max. This effectively places a limit on the amount of detergency and ZDP a diesel oil can contain, and translates into reduced performance, no matter what anyone tells you. Since you can no longer obtain CI-4 diesel oils, TDR readers will be forced to purchase API CJ-4 diesel oils."

The bottom line of John's rant: CJ oils were not better than CI oils.

*The bottom-line of John's rant:
The CJ oils were not better than CI oils.*

The Move From CJ-4 to CK-4

How about the move from CJ to CK? Again, in Issue 84, John Martin had a lengthy discussion on the CK category: "Sometimes I think the American Petroleum Industry likes to change the specification so that they can say they did something. Seriously, the CK (and 'energy conserving' FA-4 oils) were formulated for better fuel economy, shear stability and oxidation stability (higher temperatures)."

Ouch! John calls 'em like he sees 'em.

In this evaluation I'll give John Martin the reprint of our CJ-4 oils (found in Issue 76) and let him compare the formulations/additive packages to the new CK-4 data. I'll also look back at some CI-4 oils from way back in Issue 57. (The big chart is found on page 33.)

Previously, Had the Editor Been Duped?

Way back in Issue 56 (our first evaluation of CI-4 oils) I was intrigued by an article I found in Trailer Life magazine in *January 2005*. It was written by Bruce Smith, a writer that has agreed to do some “I’m retired, but that topic sounds interesting enough to do some work for spending money” articles for us. You’ll recognize his name from the CP-4 fuel injection pump article in Issue 115. My observations from Bruce’s research way back in 2005:

“In the blind-sampling-from-the-bottle done by Trailer Life magazine in January 2005, I was greatly *disappointed* to see that Walmart Super Tech 15W40 diesel oil stood toe-to-toe with other very respected brand names.

“Why disappointment? First, consider what John Martin has said in our two previous evaluations: ‘Consequently there is less and less difference between engine oil that barely passes the API certification test and one that is designed to pass by a significant margin. Therefore, oils meeting a given performance spec (example API CI-4+ and subsequent categories) are approaching commodity status. Yep, the Walmart oil met the certification test and it was good stuff.’

“Second, I am not a big fan of Walmart. I could go into a long tirade, but I will refrain.

“Third, for all of my vehicle ownership years (Let’s see, that is about 46 years.) had I been duped? Had I fallen for the marketing hype? Or, as we know, the focus on lube oil base stock versus the importance of the additive package has changed over the years. Is this a good excuse? I do not want to believe that lube oil is just a commodity. Yet the Trailer Life grid did not lie.”

Your thoughts? How about this? “Well, Mister Editor, you’ve established that this issue’s CK-4 test will be unbiased. But, if you are not going to change what a person believes, why bother?”

Good observation and question. The answer: “I’ll spend the money on lube oils and analysis so that John Martin and I can have data to debate and discuss. If by chance should the data enlighten and educate others, then so be it.”

*If by chance should the data
might enlighten and educate others,
then so be it.*

Now, Let’s Look Closely at the CK-4 Lube Oils

Are you tired of the corporate phrase, “supply chain issues?” I am. It seems that there are too many backorder situations. The bottom line for this article, the Shell Rotella T6, 5W40, synthetic oil was very difficult to find. Yep, this is the oil recommended for the EcoDiesel and Cummins 6.7 CGI engines.

To come up with some candidates to test, I had to stop at several auto parts stores. Not only were the Shell oils out of stock, the shelves were seriously low everywhere. And, to think, I thought I could purchase sufficient oil candidates at just one stop, Walmart.

So, as Ray Charles sang back in 1967, “Here we go again.” Page 32 has John’s latest evaluation comments.



Let’s Get Serious



Several of the lube oils to be tested.

FINALLY: CK-4 EVALUATION

by John Martin

And, Now, John Martin Evaluates the CK-4 Oils

Lube Oil Background

What is John Martin looking for in our CK-4 evaluation? Good question.

John Martin tells us, "When new lube oil is analyzed, you can get a good idea of the quality of the additive package, that makes up 20-25% of the lube oil blend. Maintaining viscosity at higher temperatures, and maintaining high alkalinity (total base number, TBN) are key lube oil attributes. Readings for calcium are a way to measure dispersion detergency. Protecting against wear with the right blend of phosphorus, zinc, boron and molybdenum are important lube oil attributes."

I'm going to preface my comments with some lube oil history. Prior to the 1973 oil embargo, most major oil companies maintained their own Research and Development facilities. They were very competitive with each other. They seldom purchased a complete package from an additive manufacturer. Smaller independent oil marketers, due to their economic situation, relied on the additive manufacturers for their R&D.

I remember the technical director of one such company telling me, "We don't care what it costs, we just want the best product out there." Gone are those days. You will never hear that comment again. That company is now owned by a lawyer and a bean counter is in charge of their product development. He told me, "We still want the best product, but we will haggle about the price." So he thinks he can purchase a Ferrari for the cost of a Chevrolet.

To remain profitable during and after the 1973 oil embargo, several major oil companies eliminated their R&D departments entirely. Others gutted their R & D departments to render them nothing more than technical service functions. They all threw the burden of additive research onto the additive manufacturers and began purchasing complete packages, just like the smaller independents had been doing.

Since several oil marketers utilize the same additive package (and often the same base stocks), it makes no sense trying to promote products based on performance. Oil marketers are now merely promoting their products by brand name. When I worked in R&D for Shell (1965 to 1973), we fought hard to have the best products in each and every oil performance category. In today's market, "Not anymore."

Currently, the majors send their base oils to several additive suppliers and request a package to meet their specifications. Then, the additive suppliers come up with a package and conduct the necessary engine lab tests to prove the oil meets the specification. The successful suppliers are then asked to bid for the business. Guess who wins. The former company that I worked for (25 years), Lubrizol, quit dealing with one oil marketer after we totaled up the costs of developing and testing their products only to discover we lost money on every oil we developed for them. Now you see why I insist that every oil which meets a given API performance specification is a commodity.

To prove my point, I examined the CI, CJ, and CK oil data (page 34) Robert had saved and put together. To me it was obvious that all the products shown have changed additive suppliers at least once during the course of the three specification changes, except Shell and possibly Mobil. I know that, in one case, an oil marketer with their own additive company was forced to purchase from Lubrizol when their CI-4 additive package couldn't pass all the required engine tests. I'll bet that was embarrassing because anyone who knows their oil chemistry could have seen what happened.

Typical Diesel Oil Performance Package	
<ul style="list-style-type: none"> • Detergents Neutralize Combustion Acids Minimize Cylinder Bore Wear Inhibit Rust Formation Oxidation Inhibitor (Calcium, Phosphorus, Magnesium) • Dispersants Prevent Agglomeration of Soot Particles Suspend Contaminants in Oil 	<ul style="list-style-type: none"> • Oxidation Inhibitors Retard Oil Decomposition Slow Deposit Formation (Boron) • Anti-Wear Agents Create Sacrificial Film Between Metal Parts Minimize Valve Train Wear (Phosphorus, Zinc) • Foam Inhibitors Prevent Oil Foaming



Time to send out the samples.

Editor's Note: John Martin isn't the only TDR writer that has seen his share of changes in the lube oil industry. John can relate back to the 1970s—yep, he has been around longer than I have. Ditto Moses Ludel and his longevity in the business. See pages 84-90 for Ludel's commentary and realize (at least to me) that their stories are the same.

Today's CK-4 Oil Evaluation

Okay, let's discuss the CK-4 lube oil specification. CK-4 is a performance upgrade in at least three areas:

- Improved oxidative stability
- Better viscosity control (more shear stability)
- Better anti-foaming performance (less air entrainment)

(TDR Issue 99, pages 52-53 had my lengthy discussion of the CK specification.)

Some base oils were also improved to reduce their sulfur content. Bottom line: CK-4 was definitely an improvement over CJ-4, but its diesel engine durability performance wasn't as good as API CI-4 was.

With the advent of CJ and CK, diesel detergency has been reduced significantly. The oil marketers will tell you this is because ULSD (Ultra Low Sulfur Diesel) fuel requires less detergency to combat corrosive chemical wear. I'm going to give you another, and possibly the most truthful, explanation.

Lube oil demand has steadily decreased over the past few years, and extended oil change intervals don't help. Look at a refinery as a huge water faucet continuously processing hundreds of thousands of gallons of crude oil per day. All of the processes are optimized for maximum gasoline production, but a significant amount of lube oil base stock comes off the distillation column every day. Since the quantities are so large, these materials can't be easily stored. If base oil quantities aren't quickly disposed of, a bottleneck is created. Extended oil change intervals worsen the situation (too much supply).

Let's have a quick lube oil chemistry review before discussing the oil properties seen in Robert's tables. Sulfated Ash (SA % wt.) is directly proportional to the amounts of detergent and Zincdithiophosphate (ZDP) in the oil. Detergents are like Tums for your engine. They neutralize acidic byproducts of combustion minimizing chemical wear in your engine's ring belt zone (and chemical wear is much worse than mechanical wear there). Calcium (Ca) detergents are better at preventing wear in field service than Magnesium (Mg) detergents. Mg detergents are better for passing laboratory engine tests. ZDP forms a sacrificial film to protect highly loaded (extreme pressure or EP) components in the engine such as the valve train. (Note to aspiring lube oil engineers/evaluators: John's looking for high Calcium and high Zinc numbers.)

Our friends at CARB (California Are Really Bastards) and the EPA (Evil Preregulation A** holes) seek to minimize sulfur in the oil by minimizing the oil's SA content. They also want to minimize the amount of ZDP in the oil because the phosphorus can create a glaze-like film over catalytic converter and diesel particulate filter substrates rendering them less effective. Neither CARB nor the EPA give a damn about your truck. They would rather you purchase an electric vehicle (which doesn't eliminate emissions; it just moves them).

On to the data. When I first looked at the table Robert had posted, I was surprised at the low TBN values for the synthetic oils as compared to the mineral oils. Traditionally, synthetic oils have had higher TBN levels to sell them on the basis of extended oil change intervals, thereby helping to offset the higher initial cost. Then I noticed that several of the synthetic oils had API "SN" credentials. These oils can meet the needs of gasoline "spark" engines, the latest specification being "N." Likewise, "C" means "compression," with our latest specification being "K," the letter we are discussing.

API SN has even lower SA and phosphorus limits than API CK, so detergency and ZDP are even further limited. Let me say this about that! Don't use SN oils in your diesel if you care about engine durability. The only exception would be if the oil was required to maintain warranty coverage. Evidently, oil suppliers have now decided to market their synthetic products as "universal oils" for use in both your pickup truck and your family car. "Horse Hockey," as Colonel Potter would say. Just remember "Diesels love detergents."

Looking at the data, I preferred oils 5, 6, and 7 for their maximized Calcium detergent content. Oil #1 is a good second. Oil #12 looks to be a competent product. Oils 3, 10, and 14 are okay, but I wouldn't get too excited about them. At one time, Oil #10 was a premium diesel product. In today's market, "Not anymore." Oils 2, 8, 9, and 10 have the poorest extreme pressure (that's zinc) protection of the bunch. I wouldn't use Oil #4 to lubricate my screen door hinges.

*I wouldn't use
Oil #4 to lubricate
my screen door hinges.*

So, if you look at the "Product Identification" table you can use the most economical approach to purchasing diesel oil. That would lead me to Oil #12. However, I tend to purchase Shell Rotella T mineral oil for two reasons. One, I worked there, and two, I always felt Shell cared about the quality of their products more than most. I wouldn't purchase a synthetic oil unless I was operating under low or high temperature extremes.

**John Martin
TDR Writer**

Product Identification Table

	Manufacturer	Product	Viscosity	Type
1	Shell	Rotella T6	5W40	Synthetic
2	Chevron	Delo 400 XSP	5W40	Synthetic
3	Mobil Delvac	ESP	5W40	Synthetic
4	STP	Diesel Motor Oil	5W40	Synthetic
5	Shell	Rotella T6	15W40	Synthetic
6	Royal Purple	Duralec Super	15W40	Synthetic
7	Shell	Rotella T4	15W40	Mineral
8	Chevron	Delo 400 SDE	15W40	Mineral
9	Mobile	Delvac 1300 Super	15W40	Mineral
10	Valvoline/Cummins	Premium Blue	15W40	Mineral
11	Motorcraft	Super Duty Formula	15W40	Mineral
12	Walmart	Super Tech	15W40	Mineral
13	O'Reilly	Heavy Duty	15W40	Mineral
14	Fram	Heavy Duty	15W40	Mineral

How 'bout My Brand of Oil

The comment that I frequently receive after the article is published: "Why didn't you test 'ABC Brand' of lube oil?"

In the past there wasn't a great excuse. Looking back to the first test in 2007, we had 22 different oils. This go-round, with all of the backorder problems, the answer was easier. Likely, I couldn't get the oil.

However, I really, really, really do understand brand preference. After all, we are all partial to the Ram/Cummins combination of pickup trucks. So, if your brand of oil was not evaluated, it is simple to add that data to our chart. Purchase a Fleetguard oil sample kit, part number CC2543, and send the sample in for evaluation. Add another line item to the chart and you're good to go.

Lube Oil Analysis Chart

Sample Number	Viscosity @ 100°	TBN	Calcium	Phosphorus	Zinc	Magnesium	Boron	Molybdenum	Price	Notes
1	14.8	7.43	1877	910	1066	77	180	2	29.99	5W40 Synthetic Group
2	15.2	6.64	1323	697	796	663	101	1	29.99	
3	13.7	10.1	936	1030	1225	805	133	47	32.99	
4	15.0	8.27	727	948	1120	928	64	53	26.99	
5	14.5	7.62	2179	1055	1241	82	213	0	29.99	15W40 Synthetic Group
6	14.4	7.01	2522	996	1132	10	1	0	39.99	
7	15.1	7.83	2111	968	1109	11	190	0	17.99	15W40 Mineral Group
8	15.2	9.11	1555	775	899	666	366	133	15.18	
9	14.5	9.29	1597	749	886	474	67	39	18.99	
10	15.4	8.57	1121	691	829	736	46	44	14.99	
11	15.4	6.45	1270	1021	1164	661	100	2	23.99	
12	15.8	8.36	1695	1032	1218	369	5	46	13.32	
13	15.4	7.36	1527	962	1124	549	426	135	13.99	
14	15.2	8.47	1049	1071	1283	904	1	61	18.99	

Then and Now Lube Oil Evolution

This CK-4 lube oil update was an eye opener. I looked back to Issue 57 and realized that we tested 22 different oils. The “Lube Oil Composition” chart was extensive.

In Issue 76 the test was only 10 oils. It was interesting to note that there were seven name brand oils that were tested in both magazines. How did the CI-4 specification oils compare to the newer CJ-4 formulations?

Looking at those seven name brands, I was fortunate to find those *same* seven brands on the shelf for this 2022 evaluation. So, how do the new CK-4 oils compare to those CI and CJ oils of yesterday?

Ahh, the benefits of longevity, consistency and old magazines stashed in the corner. From Issues 57 and 76, let’s build a new chart: “Then and Now.”

This is going to be really scary...

Then and Now Conclusion: Wait for It

After looking at the changes from CI to CJ to CK, I don’t have a conclusion. All of the data just makes my head spin.

Observations: Looking at the chart, Motorcraft and Cummins offered good TBN/Calcium/Zinc numbers back in the days of the CI specification. Their CK oils, not so much. So much for brand-name shopping?

Likewise, the Shell’s Rotella T6, Synthetic, 15W40 CJ-specification oil was poor in its calcium (detergent) package. (I looked back to Issue 76 to make sure the “770” number was not a misprint.) Hey, the Shell oil is a premium product, right? Hey, products do change from year-to-year and spec-to-spec? Hey, do you really know what you are purchasing?

I would like to continue with the overly-simplistic mantra from John Martin: “If it meets the specification, treat the oil as a commodity and purchase the product based on low price.” However...(See next page.)

Then and Now Chart

		Viscosity @ 100°	TBN	Calcium	Phosphorus	Zinc	Magnesium	Boron	Molybdenum	Price
Motorcraft Super Duty Formula Mineral 15W40	CI	15.0	9.20	3119	1251	1297	9	2	6	9.52
	CJ	15.5	8.17	2183	1053	1152	9	3	1	20.99
	CK	15.4	6.45	1270	1021	1164	661	100	2	23.99
Walmart Super Tech Mineral 15W40	CI	15.1	9.02	3016	1179	1226	9	0	0	7.68
	CJ	15.1	8.69	1135	1020	1172	783	0	40	10.97
	CK	15.8	8.36	1695	1032	1218	369	5	46	12.32
Mobile Delvac Mineral 15W40	CI	15.2	8.99	1379	982	1028	921	62	49	9.68
	CJ	14.7	9.27	1299	941	1069	837	64	48	17.99
	CK	14.5	9.29	1597	749	886	474	67	39	18.99
Chevron Delo Mineral 15W40	CI	15.9	11.4	3396	1284	1350	20	143	253	10.88
	CJ	16.5	8.19	1412	1084	1250	395	503	89	17.99
	CK	15.2	9.11	1555	775	899	666	366	133	15.18
Valvoline Cummins PBlue Mineral 15W40	CI	15.3	11.6	3964	1468	1541	14	148	112	9.98
	CJ	15.5	9.15	1171	1088	1202	970	0	43	17.99
	CK	15.4	8.57	1121	691	829	736	46	44	14.99
Shell Rotella T4 Mineral 15W40	CI	15.7	8.77	2488	1108	1147	8	37	2	10.96
	CJ	15.0	9.03	2209	1039	1156	10	35	0	17.99
	CK	15.1	7.83	2111	968	1109	11	190	0	17.99
Shell Rotella T6 Synthetic 15W40	CI	14.6	11.90	3631	1403	1435	12	0	1	17.36
	CJ	14.3	9.22	770	994	1171	1119	60	58	27.99
	CK	14.8	7.43	1877	910	1066	77	180	2	29.99

The Big “However” Statement

However, John Martin noted that he “wouldn’t use oil #4 to lubricate his screen door hinges.” To me, this doesn’t fit the previous observations from our CI and CJ evaluations.

After 15 Years: The Editor’s Conclusion

So, conclusion: The prices have gone up. The Walmart oil looks like a good value. With John’s comment about “door hinges,” I’m not as confident in the overly simplistic mantra that I had adopted from the Issue 57 and 76 evaluations. Also, reading James Langan’s experience (“Huge Difference After Just One Oil Change,” page 81) where the RedLine oil was changed to Chevron Delo, leaves me bewildered.

Wait, see the story (writer, Heather Parks) on page 7, “Lube Oil Confessions.” At the end of the third paragraph it reads, “Conclusion: Any brand of lube oil is better than no lube oil.”

I like that mantra.

**Robert Patton
TDR Staff**

**SIDEBAR
WHO IS JOHN MARTIN?**

When you’ve put together a staff of writers for almost 30 years, you take for granted that the audience has been with you for the entire time.



John Martin at the nostalgia drag races, Beech Bend, Kentucky, Raceway. John was a member of the race team in the 1960s.

One of the staff at Geno’s Garage reminded me that is not the case. We were talking about the exciting topic of Formula 1 racing. I asked if he had read John Martin and Kevin Cameron’s articles in Issue 110 where they discussed lube oils for our simple diesel engines (EcoDiesel and Cummins) and the high-performance engines in F1.

Nope, he had not read the article.

This was a reminder that I should do a quick John Martin introduction. Here goes:

To examine the changes to engine lube oils I contacted a “hired gun,” John Martin, formerly (25 years of service) of Lubrizol Corporation.

For those not familiar with Lubrizol, Lubrizol is one of a handful of companies that make and sell the additive package that goes into the finished product: the one-gallon lube oil jug.

More on John’s credentials: He holds several patents and has published many industry-related technical articles. He is a past Chairman of the Cleveland Section of the Society of Automotive Engineers (SAE) and both a Recognized Associate and a Silver Spark Plug (their highest honor) of the Technology and Maintenance Council of the American Trucking Association. He is a recognized lubrication consultant to both the racing (NASCAR and NHRA) and trucking industries.

We are fortunate to have John’s articles addressing diesel lube oil specifications.

**Robert Patton
TDR Staff**