

C Modified Quarterly

cm-q

V1-I2 / Spring 1999

Activities & Events

When I first started in CM, I ran my Solo Vee every available weekend. The thrill from driving the Vee at the limit was intoxicating! It took nearly four years of running week in and week out before I started looking for a way to boost this excitement.

I was considering building up a newer Solo Vee when Nick Scott approached me with an offer to trade the Vee for his Reynard. I took him up on the offer and my CM thrill trip was back.

After a few years of nearly weekly CM competition, I found my thrills beginning to diminish. I realized that it was time to ease up a little on my hectic Solo II schedule and try some other automotive/racing related activities.

Lately, I have been skipping events at the small/bumpy lots to stay home and watch racing on TV. Just watching an F1 or CART race on television puts me in a mood to jump back into competition with the Reynard. This recharge effect is second only to actually watching an open wheel race at the track.

Over the last several years, I have missed several larger events to instead spend a day at the track. I am fortunate that I live relatively close to a number of tracks that host a fair number of professional and amateur open wheel events.

I have watched professional open wheel racers at Detroit (F1/CART), Indianapolis (CART/ IRL), Cleveland (CART), and Michigan (CART). I really want to catch the CART cars at Road America.

Equally enjoyable are the amateur open wheel events that I have attended in last several years at Mid-Ohio (SCCA Runoffs), Grattan (Test Day), and Waterford Hills (SCCA Regional). This year I plan on a trip to Gingerman for the 30th anniversary vintage FF races.

Another facet of going to the track that I have found fulfilling is the opportunity to get up close and look over the various open wheel cars. At the professional races, I tend to spend more time reviewing the cars from the various support series (Lights/Barber/FA/FF2000) since in most cases it's free and the crowds are substantially smaller.

At the amateur events, I try to locate the FF1600/FF2000 folks. In most cases, if you make the right introduction, these people are more than willing to spend a few minutes talking to you about road racing the FF1600/FF2000. These conversations sometimes lead to beneficial information regarding the various aspects of car set up and preparation. I also like to check out the suppliers who frequent these events. It's amazing the number of unadvertised deals that exist at the track.

Each time I go to a track for an open wheel event, I think about taking the Reynard road racing. This thought lasts until I witness a car suffer a high dollar shunt or component failure. Until I am at a point in my life when I can live with the fact that my race car is a disposable item, I will stick to karting and Solo II track events.

Karting provides an adequate fix for my wheel to wheel thoughts. On an annual basis, a group of Solo II regulars gathers at Stefan Johansson's indoor karting center in Indianapolis. The set up of the event is such that you get an hour of wheel to wheel time against fellow Solo II enthusiasts!

Solo II track events in this area run annually at Grattan and Waterford Hills. Cones in key locations keep the speeds somewhat sane, but you still end up going way faster than any Solo II course you normally run. These types of events have me contemplating a Solo I or hillclimb before I replace the Reynard.

As I stated above, the overriding excitement of running the Reynard has diminished a tad over the last year or so. Don't misunderstand me, I still cherish my car like none other, yet I have been entertaining the thought of switching cars. I guess I am looking for a new challenge.

I keep finding myself drooling over late model FF2000 cars. Current Solo II rules place the FF2000 in BM, so I know there is no chance of these cars being competitive. On the flip side, I think it would be a total gas to run one of these cars and that's really what I am seeking. To be honest, I have no plans for my current car beyond the Solo II Nationals.

-pru-
50 cm



Day dreaming: 1994 Vector TF-94 FF2000

Details

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Subscriptions

To become a cm-q subscriber, please forward the editor your U.S. Mail address along with a donation (suggested amount \$5 / year) to cover the cost of publishing (many thanks to those subscribers who have already forwarded donations).

Although I really enjoy publishing **cm-q**, there is a finite amount of debt I am willing to incur. I will continue to publish cm-q until such time that the yearly deficit goes beyond the \$100 mark.

cm-q Year to Date Statistics	
Issues Printed	100
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99 Surplus / (Deficit) *	\$48

* rounded to the nearest dollar

Commercial Ads	
Business Card	\$10 / year
Half Page	\$15 / year
Full Page	\$25 / year

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Letters / Books

cm-q V1-I1

Great job on the first issue. Of course right now I'm reading the copy w/ the white cover looking for the errors, but the orange will be here in the next few days.

I'm going to pass a copy on to Tom Andresen and hopefully he'll help out a little. Maybe can even get him to contribute something, like Craig Taylor is going to.

I'll also be passing on to you some websites to update your list. A few of yours w/ just phone numbers have sites now too.

Pete

'CALHOUN65@aol.com'

Pete,

Thanks for your input! I will incorporate your data into the next issue of cm-q.

I'm currently looking for an FF / S2 engine expert and Tom would be perfect! I am planning a technical article on engine maintenance for the "Nationals" issue of cm-q. When you approach Tom Andresen, please ask if he would be interested in being a "subject matter expert" for FF / S2 engines. I'm all over the book "How to Build and Maintain Competitive (yet legal) Formula Ford 1600 Engines" that Jake Lamont and Tom Andresen recently published!

-pru-

Recommended Reading

A few years ago, I picked up a copy of RACERCAR ENGINEERING at a newsstand. Initially, I was drawn in by the cover that advertised an article on "50 Years at the Front / the Engineering Innovations of Scuderia Ferrari." After a few minutes of paging through the issue, I decided the \$8 purchase price was not out of line for this magazine. The depth and breadth of the articles contained within this issue were remarkable. In my opinion, RACERCAR ENGINEERING is the technical journal of the racing industry.



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Technical

Gearboxes - Part 2

In this edition of **cm-q**, we conclude our discussion of the gearbox started in V1-I1. Noted driveline specialist Craig Taylor of Taylor Race Engineering willingly agreed to answer the following series of FF / S2 Solo II gearbox maintenance questions:

cm-q: How often should I change my gearbox oil?

CT: You should change your gearbox oil after every third Solo II event. Add one quart of oil split between the differential and gearbox sections. It is also critical to run magnetic drain plugs to filter out the steel particles from the dog rings. The dog rings shed metal as they wear, and this shedding metal will cause rapid bearing wear. For additional information regarding oils, check out the Taylor Race Engineering Technical Bulletin included below.

cm-q: What type of oil should I use?

CT: We normally recommend a good, branded, 75-90 GL4 or 5 oil, natural or synthetic. Synthetic does not have any advantage in wear over natural, but has the advantage of being slipperier and therefore shifts better. In a Solo II, where the temps never come up, there is also a viscose drag advantage with synthetic. We recommend Red Line, Valvoline, or AmsOil.

cm-q: How long should I go between gearbox rebuilds?

CT: Gearbox wear is higher in a Solo II application, because of the standing starts, and heavy use of first and second gears. Normally 3-4 years is par.

cm-q: When will I know it's time for a gearbox rebuild?

CT: Included below is a listing of wear limits for your reference. The wear limits will tell you when things are worn out. Also below you will find a Taylor Race Engineering Technical Bulletin on Breaking in a Gearbox.

cm-q: How do I know when a dog ring / gear set needs to be replaced?

CT: Dog rings are worn out when the dog lug is rounded 25% of its height.

cm-q: How well does the Mk 9 (majority of Solo II boxes) handle Solo II standing starts?

CT: The standing start, particularly with the gumballs that Hoosier is providing for Solo II, is devastating to any gearbox, and the MK9 is no exception. If at all possible, let the clutch do a bit of slipping to prevent total shock load. We have found that the carbon-carbon clutch softens the blow dramatically, and results in far fewer driveline failures. Though initially expensive, these clutches prove to be cheaper in the long run. A carbon-carbon clutch drives like a street clutch, but locks up harder when it gets hot. Perfect for standing starts.

cm-q: How can I get additional gearbox information?

CT: For a free catalog or drivetrain advice, please contact Taylor Race Engineer at 800 922 4327 or 972 422 0567. Our fax number is 972 422 8677. You can check out our latest online catalog at www.taylor-race.com. I can also be reached via e-mail at tayrace1@airmail.net

cm-q: Thank you very much for your time!

CT: My pleasure.

Technical Bulletin Number 101a

All About Oils

Taylor Race Engineering, Inc.

Oil is the lifeblood of the racing transmission, and it must be taken seriously. First, never use "Lightweight", "Trick", "Zero Weight", Motor Oil, or Automatic Transmission fluid. These oils will not properly lubricate the spiral-bevel ring and pinion gears, causing rapid wear. Only use oils with GL-4, GL-5, or "Extreme Pressure" ratings.

Second, the correct viscosity rating should be used. For low powered cars such as the Formula Ford, a 75W80 rating is sufficient. For Formula 2000 and Formula Atlantic, a 75W90 is the minimum. For more powerful cars, a 80W140 rated oil is required.

Third, the correct quantity of oil is imperative. Too little will result in rapid wear of both the transmission gears and the ring and pinion. Too much oil will result in overheating, due to oil being squeezed out the end of the gear teeth.

We have seen little difference in gearbox wear when either properly rated conventional synthetic or "dinosaur squeezing" oil is used. However, synthetic oil has the advantage of both lower cold viscosity and greater slipperiness, resulting in better shifting. The new *Redline "Shockproof"* oil is the only new development we have seen that works, and we highly recommend it. If a natural oil is desired, we have had excellent results with the Sweeney products.

The following recommendations for oil quantity should be adhered to (Quantities in US Quarts):

Gearbox Type	Road Race		Oval Track	
	Fill	Gear Change	Fill	Gear Change
MK and Webster	1.5	1.0	2.0	1.5
Staffs w/o Pump	2.0	1.5	3.0	2.0
Staffs w Pump	1.5	0.5	2.0	1.5
LD200 4-Speed	1.25	1.0	1.75	1.5
FT200	2.0	1.5	2.5	2.0

Note that Hewland Manuals often show "Pints" or Quarts." Remember that these are Imperial units, which are larger than US equivalent. Oil moves away from the ring and pinion on oval, requiring more oil to ensure lubrication.

Technical - Continued

Technical Bulletin Number 101b Breaking in a Gearbox Taylor Race Engineering, Inc.

Before Installation

Be sure to grease the pilot bearing/bushing prior to installing the gearbox.

A light spray of molybdenum-type aircraft grease on the clutch splines will reduce the spline wear.

A *very* light coat of grease on the clutch diaphragm spring fingers will reduce noise and increase spring life.

If the transmission uses a clutch bobbin, the bobbin bushings must be lubricated. It is best to soak the bobbin in hot transmission lube to fill the Oilete™ bushings with oil. Avoid if possible the Hewland-type solid bronze bushings in the bobbin, as they have no oil retention capability.

Breaking in the Gearbox

Treat the new or rebuilt gearbox as you would a fresh engine. The ring and pinion is the critical component, and should be run very carefully. For the first session, run the car gently to allow the pattern to begin to develop. During the second session, use full power briefly - five seconds - then off for five seconds to allow the pattern to spread to the full tooth without localized overheating which will damage the heat treatment at the small end of the pinion gear. The *off* time allows the lubricant to cool the gear teeth prior to the next full power applications, preventing damage. It also allows the pattern to develop on the *coast* side of the gear teeth.

The change gears in the gearbox section require little break-in, and can be run at full power immediately.

After the first session, retighten all nuts and bolts giving special attention to the sideplate nuts. Do not over-tighten - 12 ft-lb max.

Need More Technical Help?

You can reach one of our technicians any weekday from 8:30 AM to 6:00 PM on our tech Hotline: 972 522 0567.



Mk 9, Webster, and Formula Mazda Torque and Wear Specifications Taylor Race Engineering, Inc.

The following torque values should be adhered to when assembling the Mk 9, Webster Model 400 (Mk 9), and Webster Model 300 (Formula Mazda):

1.	Rear Cover Nuts (1/4-28)	4 ft-lb
2.	Bearing Carrier and Sideplate Nuts (8mmx1.25)	10-12 ft-lb
3.	Main Pinion Shaft Nut (7/8-20)	115 ft-lb
4.	Main Pinion Shaft Nut Formula Mazda	135 ft-lb
5.	Layshaft Nut (both 7/8-20 and 7/8-14)	115 ft-lb
6.	Drawbolt	½ turn loose
7.	Shift Finger Nuts (self locking <u>w</u> red Loctite)	35 ft-lb
8.	Detent Spring Caps (Model 300 <u>w</u> pipe sealant)	4 ft-lb
9.	Main Pinion Bearing Retainer Bolts (<u>w</u> red Loctite)	38 ft-lb
10.	Main Pinion Bearing Ring Nut	180 ft-lb
11.	Ring Gear Bolts, Steel Diff (<u>w</u> red Loctite)	75 ft-lb
12.	Ring Gear Bolts, Aluminum Diff (<u>w</u> red Loctite)	70 ft-lb
13.	Fill Plugs (tapered pipe <u>w</u> pipe sealant)	20 ft-lb

The following wear limits are provided as a guide. Normally the component is replaced when the part reaches this limit.

1.	Shift Fork Dog Ring Groove	.208"
2.	Dog Lug (Gear and Dog Ring) Max Rounding	.075"
3.	Rear Layshaft Bearing Max Axial Play	.035"
4.	Inner Track Wear	no pitting
5.	Front Layshaft Bearing Journal	no pitting
6.	Maximum Pinion Gear Tooth Pitting	1/3 of tooth
7.	Differential Gears	no pitting
8.	Coupling Sleeve Splines	no step
9.	Main Pinion Bearing (note: Main Pinion Bearing must be compressed by the Hub Stack and tightened Pinion Nut for this check)	no play



For a free drivetrain catalog, contact Taylor Race Engineer at 972 422 0567 or toll free at 800 922 4327. Our fax number is 972 422 8677. Check out our online catalog at www.taylor-race.com. We can also be reached via e-mail at tayrace1@airmail.net.

cm-q Subscribers

With this issue of **cm-q**, I will begin alternating between issues the listing of contacts and subscribers. Contact me if there is any discrepancy regarding the subscriber information list below.

Note that if the names of your favorite CM competitors are not on this list, they are not currently receiving **cm-q**. Please forward the appropriate information and I will send them the latest issue.

-pru-

CM Numbers

Here is an updated listing of CM numbers. Thanks to Mark Sorita and Jim Gary who originally put this listing together which they willingly turned over to me.

Please forward your updates. The CM numbers listing will be a regular feature of **cm-q**.

-pru-

Driver / Car

For the spring issue of **cm-q**, Bill Lane has agreed to be the focus of this column. As a precursor to the interview, I mailed Bill a series of questions after he agreed by phone to participate. A couple of weeks later, I received the following candid letter:

Hello Chris,

I received your interview questions and will do my best to answer them. However, not being a serious competitor I am convinced that nobody is interested in anything I have to say. In fact, ask anybody, and they will tell you I am a klutz, or something or other. But I do enjoy the sport of Solo II as much as anybody and intend to continue to participate, no matter how poorly I do. And believe me, I will have lots of fun while doing it.

Since the interview questions are usually intended for competitive people, they don't really apply to me and therefore I haven't the faintest idea how to answer them. I am mailing these so called answers to you because I am not a good talker, and besides I don't have anything of interest to say anyway. So here goes:

cm-q: What's your full name?

BL: I am Bill Lane. Don't confuse people with my full name of Arthur William Lane Jr which I don't answer to anyway.

cm-q: What is your age?

BL: I am an enthusiast of 813 months.

cm-q: Where do you live?

BL: Western New York (Buffalo).

cm-q: What is your occupation?

BL: You mean *work* ??? I quit that foolishness long ago.

cm-q: What is your SCCA Region / Division?

BL: Western New York Region of NeDiv.

cm-q: How long have you been a SCCA member?

BL: I have been a member since 1964 - You figure it out. Been hooked on autocrossing ever since.

cm-q: What cars have you autocrossed?

BL: Anything that happens to be running at the time. My true love is my Lotus Elan.

cm-q: How many Solo II Nationals have you attended?

BL: I have been to all 26 Solo II Nationals and I know nobody will ever break my record number of last places.

cm-q: Have you ever Solo I or Club Raced your CM car?

BL: I have run a few Hillclimbs. Boy, am I slow. Wow, are they fun.

cm-q: How many years have you run in CM?

BL: Who knows? I sure don't.

cm-q: Why did you pick CM?

BL: This is the class the car is in.

cm-q: What CM number do you normally run?

BL: Any number available. I have 14 on the car since I can't run 41 at the Nationals with a co-driver.

cm-q: Why did you pick those numbers?

BL: Why 41? I don't know. Why not?

cm-q: How did you acquire your current CM car?

BL: My kid told me about it being for sale in Houston. It is a Lotus so I had to buy it.

cm-q: What year and model is the Lotus?

BL: It was built in 1969 and is a *Lotus 61* Formula Ford.

cm-q: Who currently prepares your car?

BL: Prepare??? Why? It runs.

cm-q: What tires and wheels do you normally run?

BL: Four of each. One *bolted* on each corner of the car.

cm-q: Who builds / maintains your engine / gearbox?

BL: Everything was in the car when I bought it.

cm-q: What type of battery / jump do you use?

BL: I only jump the car when necessary. Now that I think about it, quite often.

cm-q: What type of oil do you run?

BL: Quaker State.

cm-q: What type of coolant do you run?

BL: Water with anti-freeze. In Buffalo, lots of anti-freeze.

cm-q: What type of gas do you run?

BL: Gas works pretty good. Friend of mine tried jet fuel (kerosene) in his Formula Ford (didn't work with a damn).

cm-q: Have you made any special modifications?

BL: What???



Driver / Car Continued

cm-q: Do you normally have a co-driver?

BL: I am always happy to have someone drive any of my cars. For some strange reason, competitors seldom want to. My son, Artie, from Houston, drives with me at the Nationals in Kansas. He's not got any sense either.

cm-q: What the name of your team / sponsor?

BL: No team. No sponsor. No name. Just me having fun.

cm-q: What's the "ideal" CM car?

BL: The fastest.

cm-q: What's the "coolest" CM car?

BL: What kind of questions is that? And the answer is: *Green and Yellow Lotus 61 FF*. Number 14 of course.

cm-q: What do you like the most about CM?

BL: This one is easy. The competitors and other members of the SCCA. Sports car people are the greatest in the world and I most certainly enjoy their friendship and associating with them.

cm-q: What do you like the least about CM?

BL: This one is also easy. The competitors. They're too damn fast.

cm-q: What would you do to improve CM?

BL: Less Rules. More fun.

cm-q: Do you have anything you would like to add?

BL: As you can see, a serious competitor I am not. But I challenge anybody to have more fun than I do. And SCCA and CM is where it's all at.

Bill Lane's 1969 Lotus 61 / Photo provided by Bill Lane

For Sale

1979 Dulon MP-21 FF CM #57

Set-up for Solo II and Pro Solo. Rebuilt suspension and shocks '98. Fresh engine and trans. '97. Current CENDIV champion. Second at Nationals '98 CML. Many Pro Solo wins. Panasports (2 sets), fresh rains, gears, single axle trailer, misc. \$6000 obo.

Contact Gary Godula for more information at 248 374 9305 (h) or 734 523 3351 (w).

1979 Tiga FFA Serial #85

New Parts. Complete frameup winter 1998. Williams Engine 1998. Shocks(Carrera). Springs(4 or 5 Sets). Rod ends throughout. All new hardware. All new wiring, floor pan, bulkheads, hoses, starter, radiator and fans (electric), new dash (polished aluminum). Replated all suspension parts

Other stuff. Spare nose. Spare lower body (Old Style, ground effects look). 1 set Revolutions. 1 set Ultralight Panasports (New last year). 1 set Rains on steels. Spare front A-Arms. This car has been spared no expense. \$6500.00.

Contact Mike Bultemeier via e-mail at hottvr@tfs.net or by phone at 816-461-1600 (h) or 816-224-5852 (w).

V1-I3 Preview

The plan for **cm-q** V1-I3 is to focus on the various logistical aspects of the Solo II Nationals. The fastest / most scenic way to get to Topeka from the four corners of the country. The best places to stay / eat in the Topeka area. Please forward your recommendations!

For the V1-I3 Technical article, Tom Andresen of Andresen Engine Development agreed to provide engine maintenance recommendations for the Solo II FF / S2.

I really would like the subject of V1-I3 Car/Driver column be a former Solo II National Champion. Any suggestions / volunteers.?

As always, I welcome submissions of any type. The deadline for the next issue of **cm-q** is August 1st. V1-I3 will be mailed to your home on August 15th.

Formula Ford Festival! Gingerman Raceway July 9-11, 1999
Click [HERE](#) for more info from the VSCDA. **Races for Vintage, Historic, and Club Fords**
Celebrating 30 Years of Formula Ford in America Be There!