March 15, 2026

WINTER DRIVERS SEMINAR

How to Go Faster…Safely

How to Go Faster…Safely

- Today: Ideas and tools for solo drivers
- “Hands on” and discussion-oriented
  - Lots of video!
  - Questions encouraged
- Each of us can improve

- Handout for routine items

AGENDA

- Introduction (Bill)
- What can we learn from Video? (Dyke)
- Small Steps, Small Mistakes (Bill)
- How to compare laps? (Bill)
- When to coast? (Doug)
- Where's the Grip? (Lester)
- Let's Have Some Fun! (Lester)
- Patience! (Bill)
- The line matters! (Bill)
- Wrap-Up (Bill)

Video Advantages

A video is worth 10,000 words

- Vehicle Placement
- Steering - real time inputs
- Track Reference points
- “Eyes-up” Visual targets
- Turn in rate - Hand Speed
- Driver’s Car control

- Vehicle yaw “Rotation”
- Elevation Changes
- Track camber
- Crests & compression
- Traffic

Lime Rock Video

Optimize each Section in a Corner

- Fast entry - control car with brake pedal
- Minimum time @ vMin
- Manage “rotation” with throttle and steering inputs
- Early and progressive throttle application after vMin
- Give yourself track out room to “unwind” steering angle as you go to full throttle, allowing the car to achieve maximum forward acceleration.

Why do we “Turn-In” Early?

- **Fear-Panic Response**
  - Corner “arrives” faster than expected, triggers instinctive early turn.
- **Illusion of Safety**
  - Turning early feels more controlled but actually reduces margin for error.
- **Lack of Spatial Calibration**
  - We don’t yet understand how the car’s arc and rotation relate to speed and the turn’s geometry.
- **“Chasing” a car**
  - Focusing on catching a car tends to lead to early turn in.

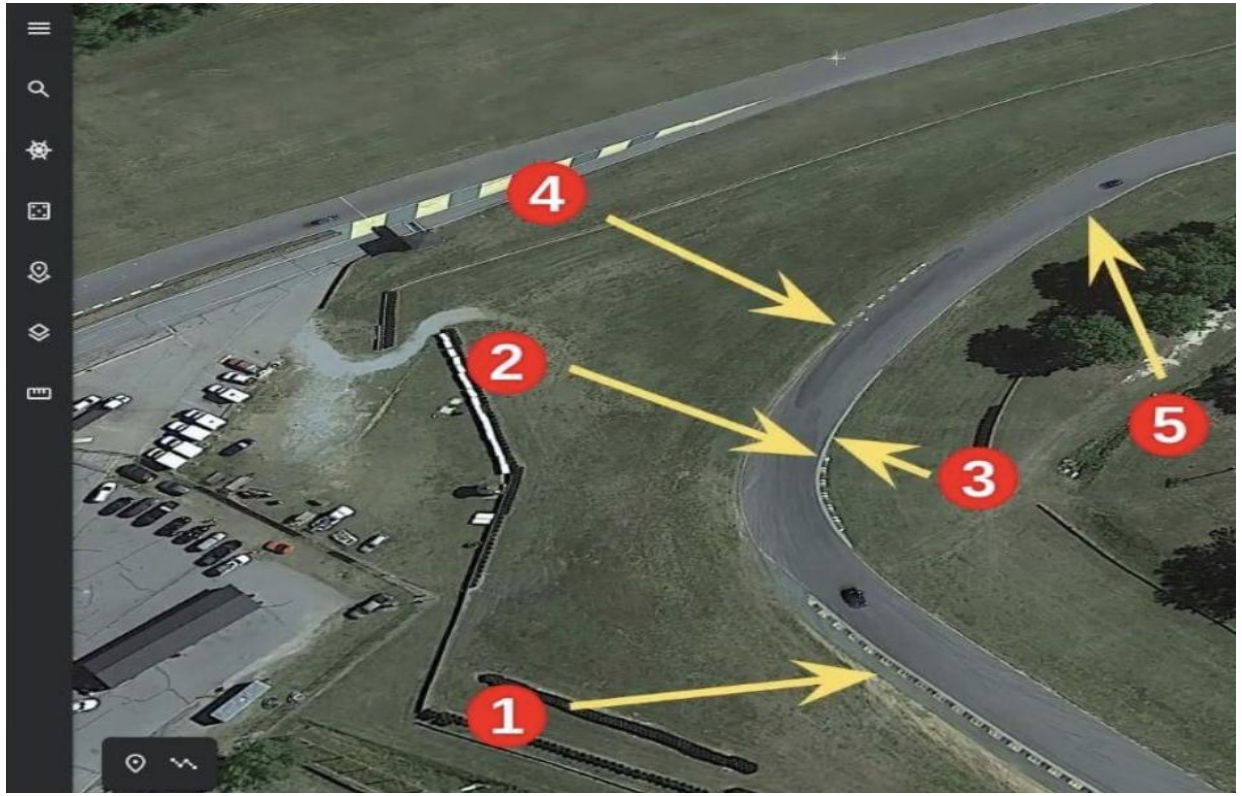
Key Takeaways

- Vision drives everything. You can’t turn later if you don’t see later.
- “Late feels wrong at first, before it feels right.”
- The correct line may feel slower at first
  Patience at entry = power at exit.

Learning with Video

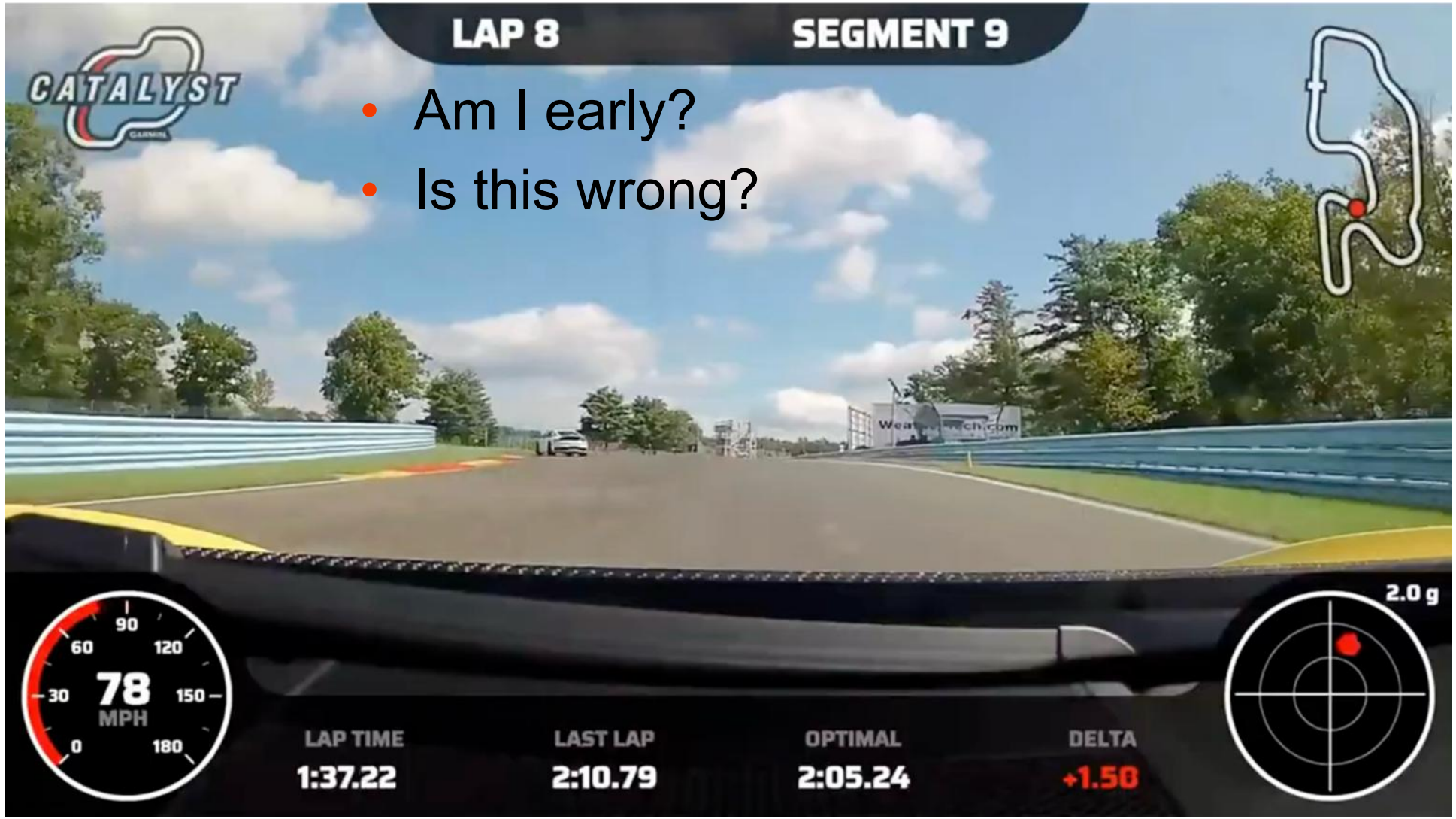
Corner element areas*

1. Turn in
2. Minimum speed (vMin)
3. Apex
4. Track out
5. Wide Open Throttle (WOT)

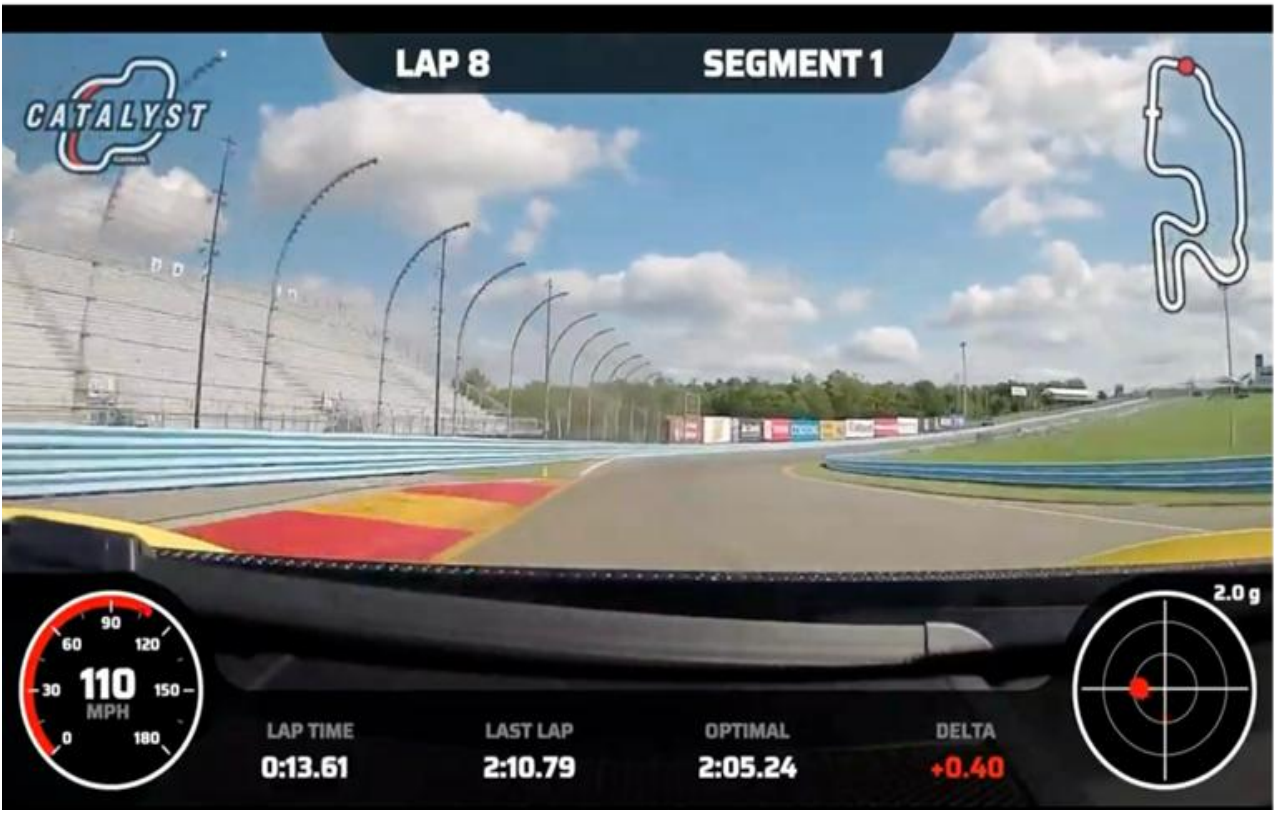


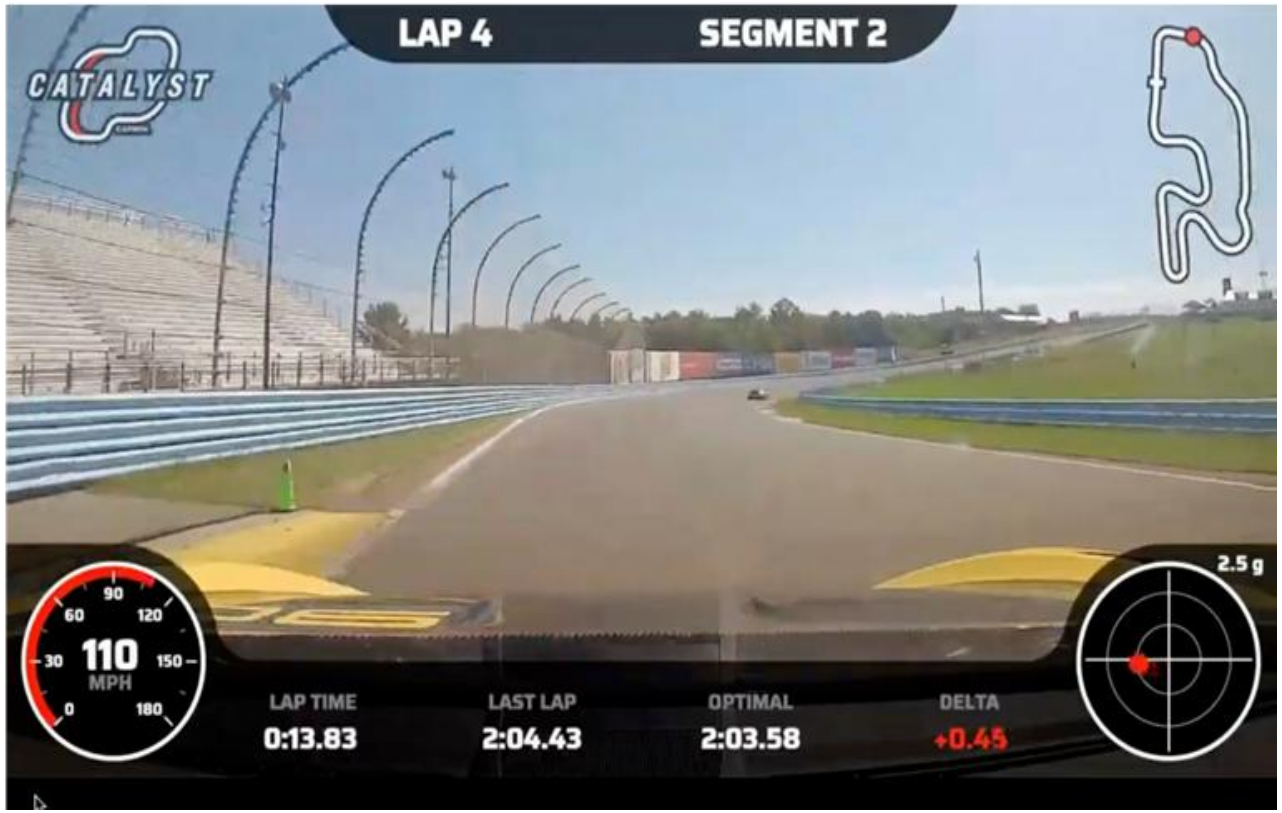
**Dion von Moltke of Blayze Consulting*

Turn-in Turn 9, 2023

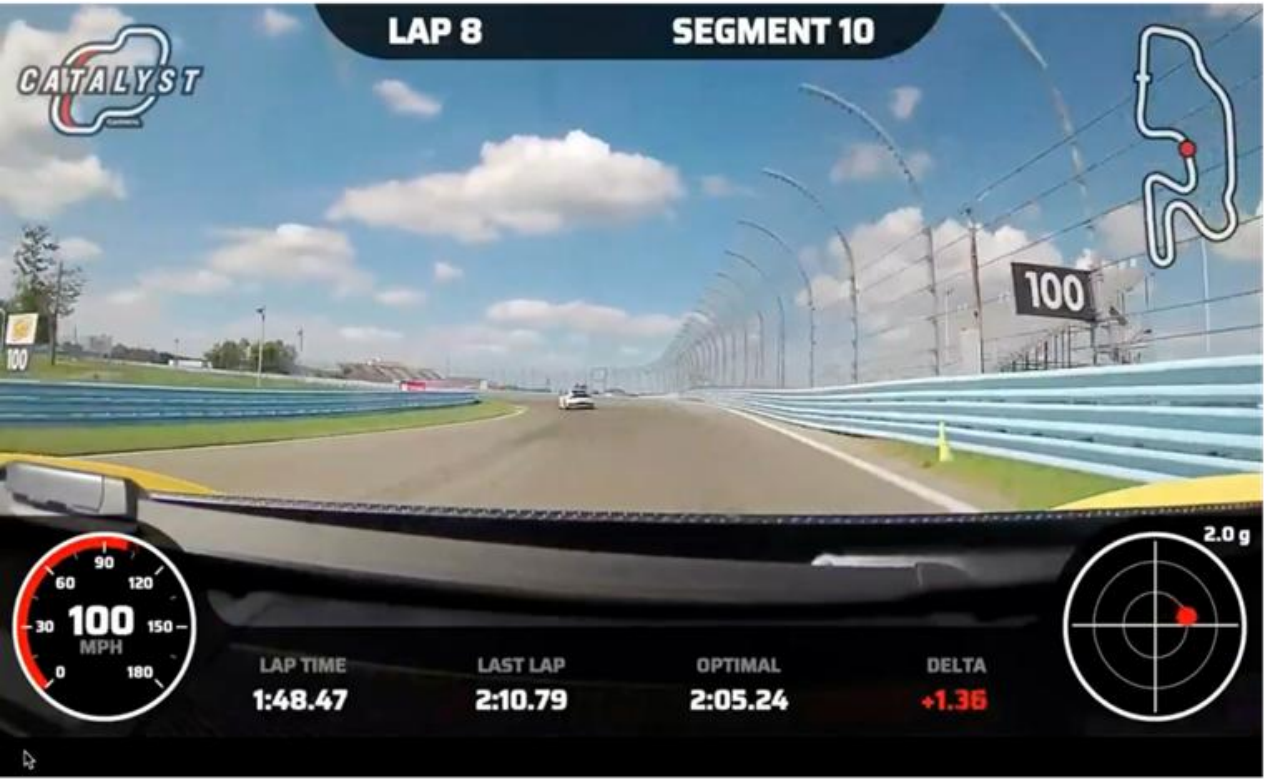


Turn 2, Turn-in: 2023 vs 2025

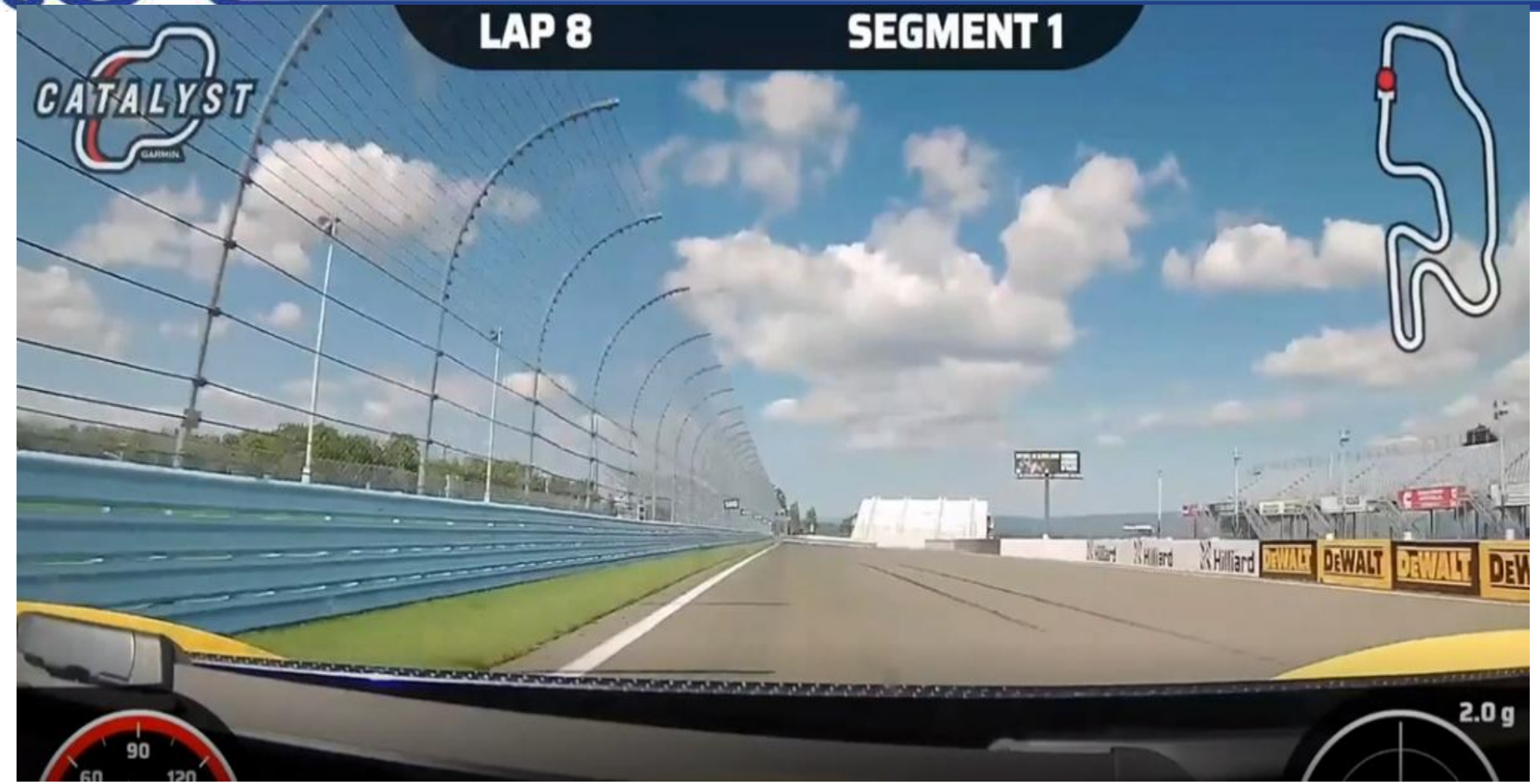




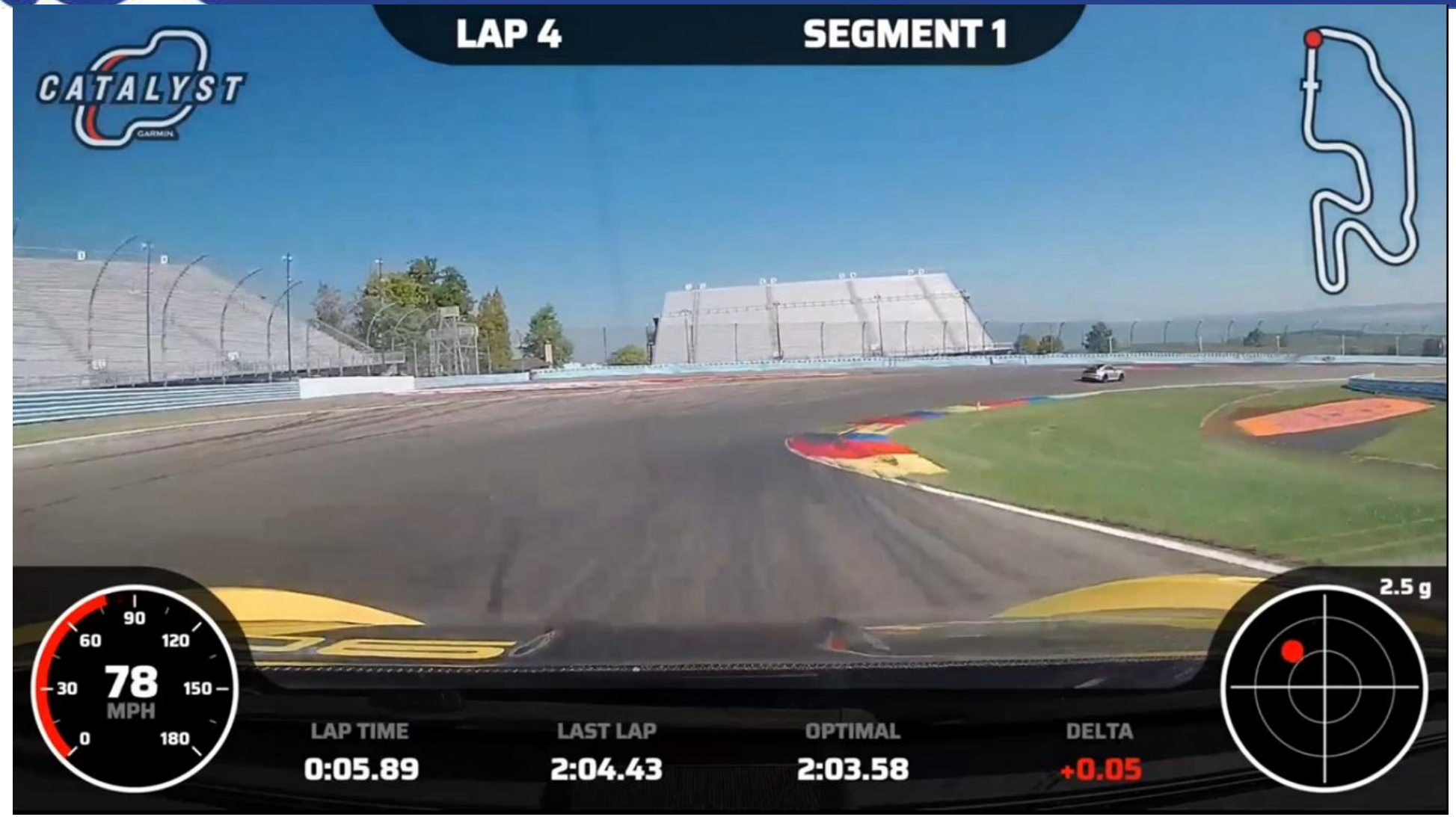
Turn 10, Turn-in: 2023 vs 2025



Watkins Glen Turns 2 and 10 Video



Watkins Glen 2025: One Lap Video



"Data" from the Videos

The goal for a fast lap is **highest % at Wide Open Throttle,** with the **least time spent in the slowest** (vMin) sections.

	V-Minimum								
	Turn 1	Turn 2	Bus Stop	Turn 6	Turn 7	Turn 8	Turn 9	Turn 10	Turn 11
WGI 2023	59	106	72	82	57	59	56	91	73
WGI 2025	61	112	77	86	57	59	57	92	76
	2	6	5	4	0	0	1	1	3
				Top Speed before turn					
WGI 2023	139	110	154	120	118	129	98	106	100
WG1 2025	141	112	149	118	123	128	101	109	109
	2	2	-5	-2	5	-1	3	3	9

Going Faster Requires…

SMALL STEPS, SMALL MISTAKES

Small Steps, Small Mistakes

- Watkins Glen Bus Stop
  - 2025: first time ever…no entrance curb
  - Ideal conditions no dirt, no high curbing…super smooth.

- Lots of issues, our event and others
  - Some drivers carried more speed in and ultimately had issues…

- Ken's goal: incrementally carry more speed and adjust
  1. …
  2. …
  3. …

Watkins Glen Bus Stop Video

VIR – What did Ken do Wrong? What did Ken do Right?

- Turn 3
- Oak Tree

VIR – What did Ken do Wrong? What did Ken do Right?

How to Compare Laps?

Let’s Dive Deeper into Lime Rock

One Lap of Lime Rock

- What's different from the lap Dyke showed?

Lime Rock Lap Comparison

- Two “good” laps
  - 101.082
  - 101.116

Δ = .038 << a tenth!

- How to compare?

- Options
  - Side by side videos
  - Video log
  - Garmin phone app
  - AiM RaceStudio 3 / VBox

Comparison Tools: Side by Side Video

- Side by Side Video
  - Requires RaceRender or other Video editing softwar
    - Synch is often hard
  - Can be hard to see differences unless large
    - E.g. example below
- An option in RaceStudio3

Comparison Tools: Video Log

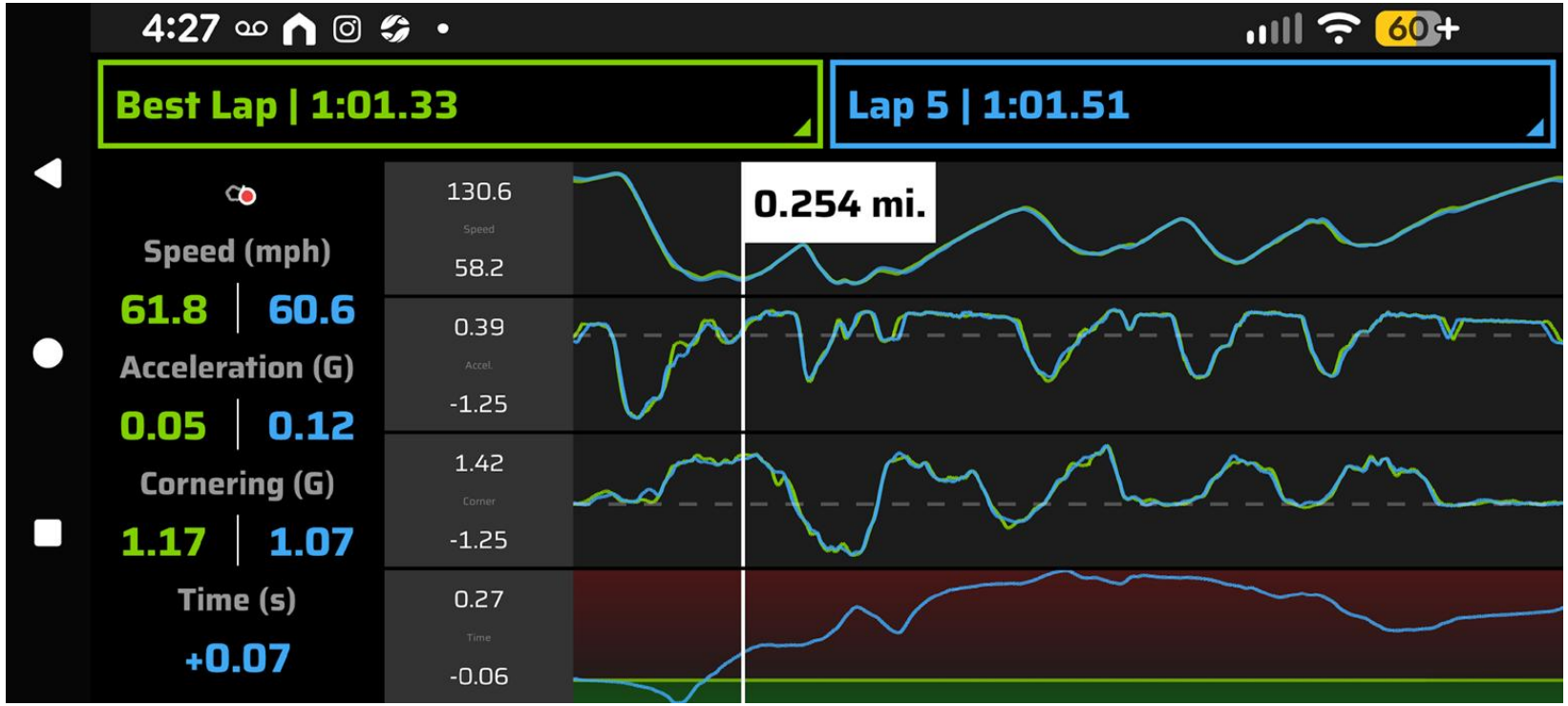
- Video log
  - Write down key measures for 2 or more laps

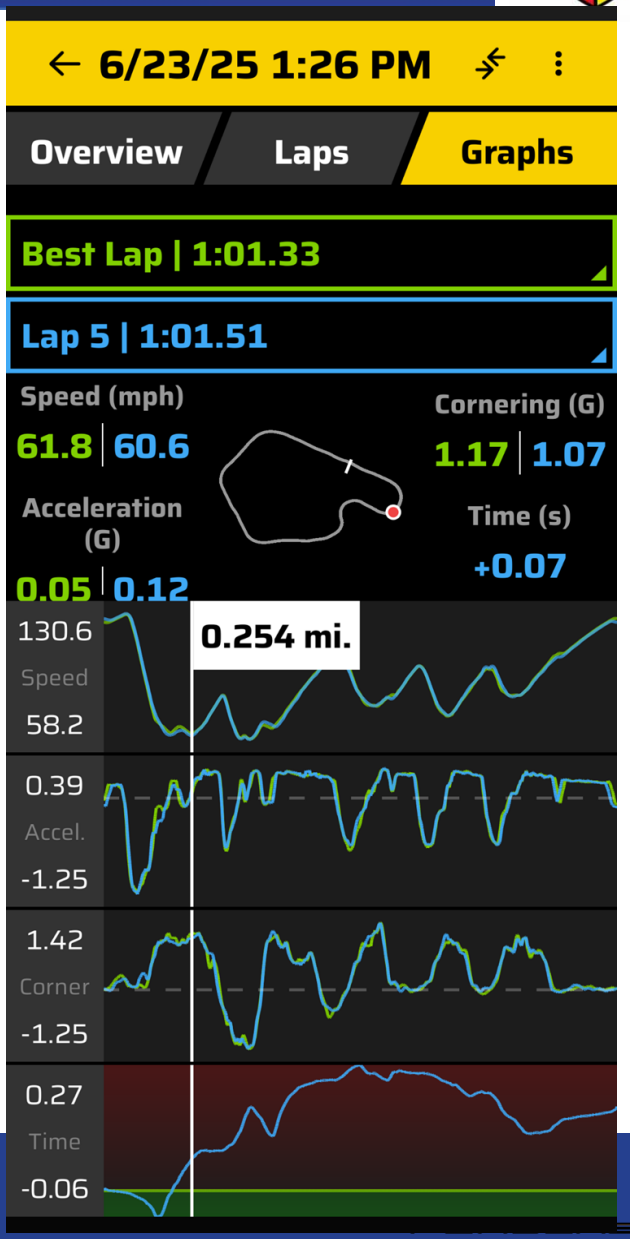
	BoB	Turn-in	EoB	V-Min	WOT	Turn Exit
Lap 1						
Lap 2						

Downhill	BoB	Turn-in	EoB	V-Min	WOT	Turn Exit
Lap 1	**Hill top /102**	**< Cone**	**1/3 to Apex**	**87**	**> Apex**	**106**
Lap 2	**Same**	**Same**	**Immed > TI**	**89**	**End of Curb**	**108**

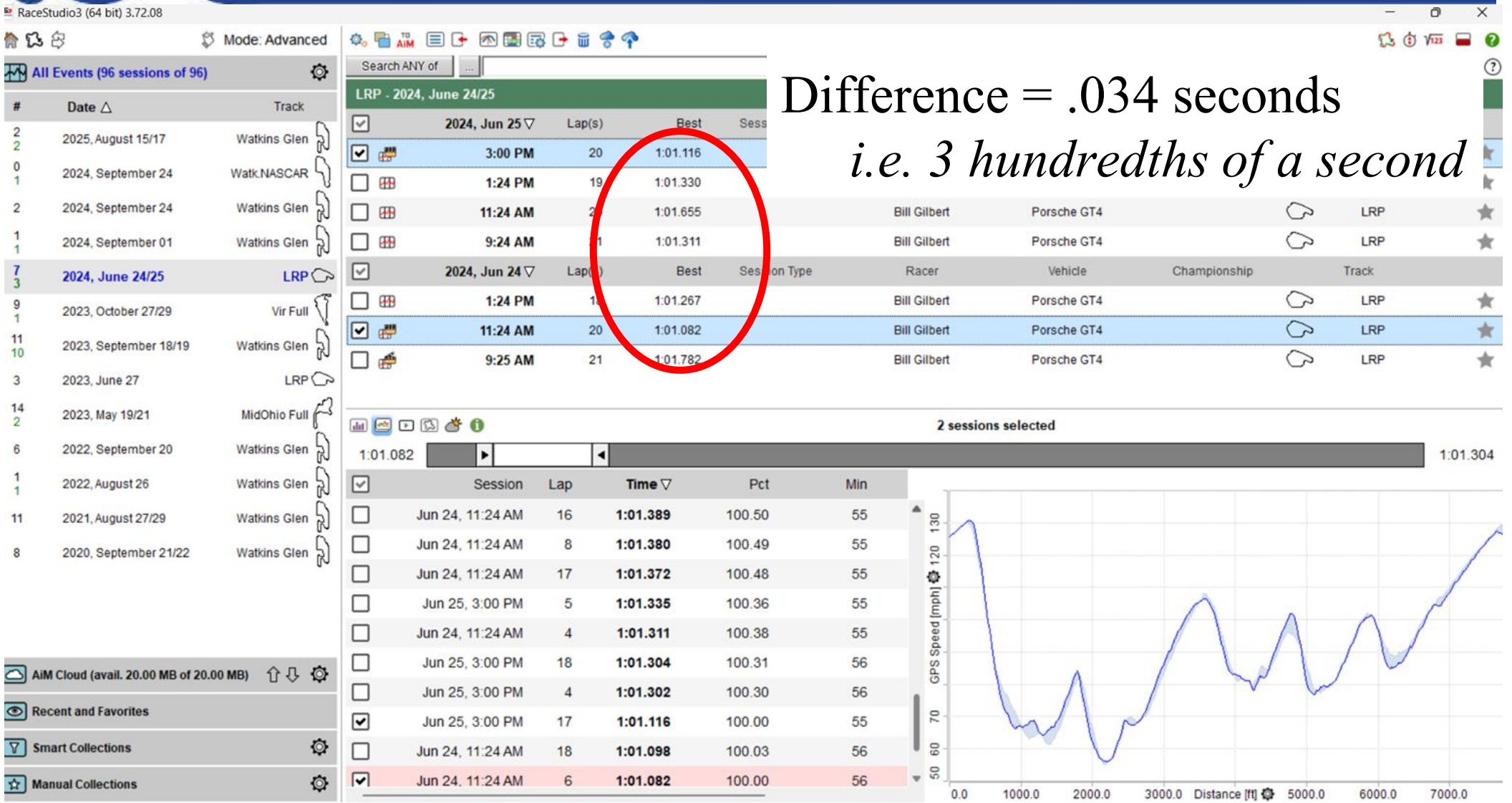
Comparison Tools: Catalyst App

- Catalyst Phone App
  - Compare your laps or import others
  - Limited to small screen





Comparison Tools: RaceStudio 3



Difference = .034 seconds

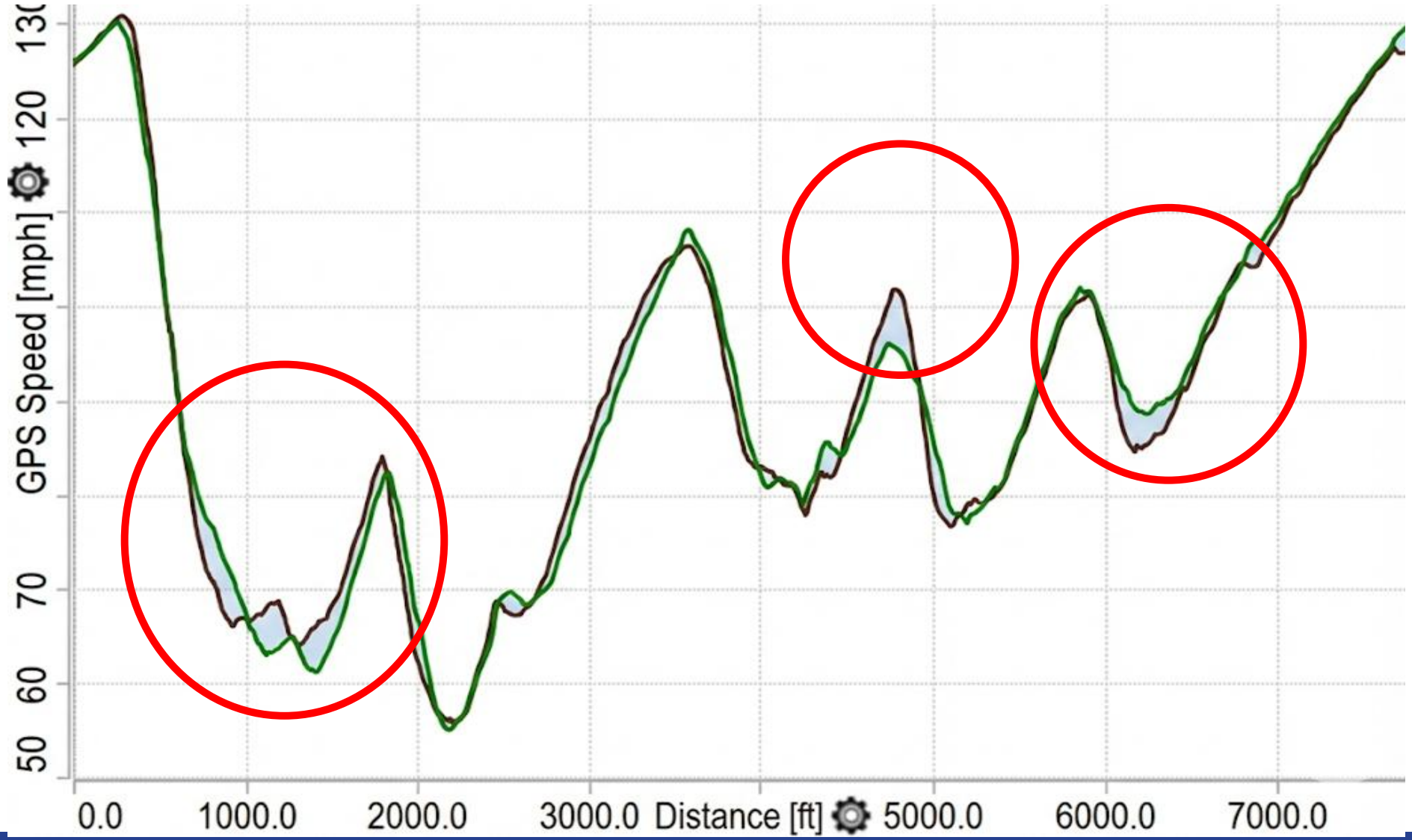
i.e. 3 hundredths of a second

Other Laps Almost as Fast

- Other sessions / laps reasonably consistent
  - i.e. no flyers
  - Next 12 laps all within half a second, half within .2

Session	Lap	Time ▽	Pct	Min	Avg	Max
Jun 25, 3:00 PM	3	**1:01.573**	100.75	56	85	129
Jun 25, 3:00 PM	10	**1:01.531**	100.68	56	86	129
Jun 25, 3:00 PM	9	**1:01.526**	100.67	53	86	131
Jun 25, 3:00 PM	7	**1:01.523**	100.67	55	86	129
Jun 24, 11:24 AM	16	**1:01.389**	100.50	55	86	131
Jun 24, 11:24 AM	8	**1:01.380**	100.49	55	86	130
Jun 24, 11:24 AM	17	**1:01.372**	100.48	55	86	132
Jun 25, 3:00 PM	5	**1:01.335**	100.36	55	86	131
Jun 24, 11:24 AM	4	**1:01.311**	100.38	55	86	131
Jun 25, 3:00 PM	18	**1:01.304**	100.31	56	86	133
Jun 25, 3:00 PM	4	**1:01.302**	100.30	56	86	130
Jun 25, 3:00 PM	17	**1:01.116**	100.00	55	86	130
Jun 24, 11:24 AM	18	**1:01.098**	100.03	56	86	130
Jun 24, 11:24 AM	6	**1:01.082**	100.00	56	86	131

Two Fast Laps Not the Same



How Big are the Differences?

RaceStudio3 (64 bit) 3.72.08 [Lime Rock 3 - LRP]

Time-Distance | Track | Split Times Report

	Big Bend	LH	RH	Uphill	West Bend	Downhill
1:01.082 - 6 (best)	0:15.135	0:06.580	0:08.378	0:09.191	0:08.222	0:13.576
1:01.904 - 7	0:15.175	0:06.685	0:08.829	0:09.489	0:08.136	0:13.590
1:01.380 - 8	0:15.117	0:06.733	0:08.492	0:09.274	0:08.168	0:13.596
1:03.458 - 15	0:15.574	0:06.670	0:09.174	0:10.016	0:08.434	0:13.590
1:01.737 - 16	0:15.386	0:06.760	0:08.513	0:09.240	0:08.315	0:13.523
1:01.116 - 17 (best)	0:15.359	0:06.536	0:08.478	0:09.203	0:08.236	0:13.304
1:01.304 - 18	0:15.271	0:06.750	0:08.586	0:09.132	0:08.202	

Δ	Δ	Δ	Δ	Δ	Δ
.+224	-.044	+.100	+.012	+.014	-.272

Root Cause?

	BoB	Turn-in	EoB	V-Min	WOT	Turn Exit
Turn 2	69			66	¾ to TO	76
	64			61	~ same	74
Downhill	Hill top / 102	< Cone	1/3 to Apex	87	> Apex	106
	Same	Same	Immed > TI	89	End of Curb	108

Easy to See Speed Δ in RaceStudio 3

- T2 entry speed: Brown 69 vs Green 64

- T2 Vmin: Brown 66 vs Green 61

- Downhill Vmin: Green 89 vs Brown 87

How to Find Lap Time?

- Overall Lap Time is only a starting point
- Look at many laps for consistency
- Compare 2 or more laps for differences
  - Video, no data? Use Video Log
    - Side by side video: maybe?
  - Catalyst? Phone App may help
  - AiM? Vbox? Use Segments and highlight biggest Δ

This is the (safe) way to find lap time!

WHEN TO COAST?

Dion von Moltke, 2 Years Ago

- Von Moltke talked about “coasting” - not undesirable coasting before a brake zone, but “off-throttle” mid-corner – I will use “off-throttle”

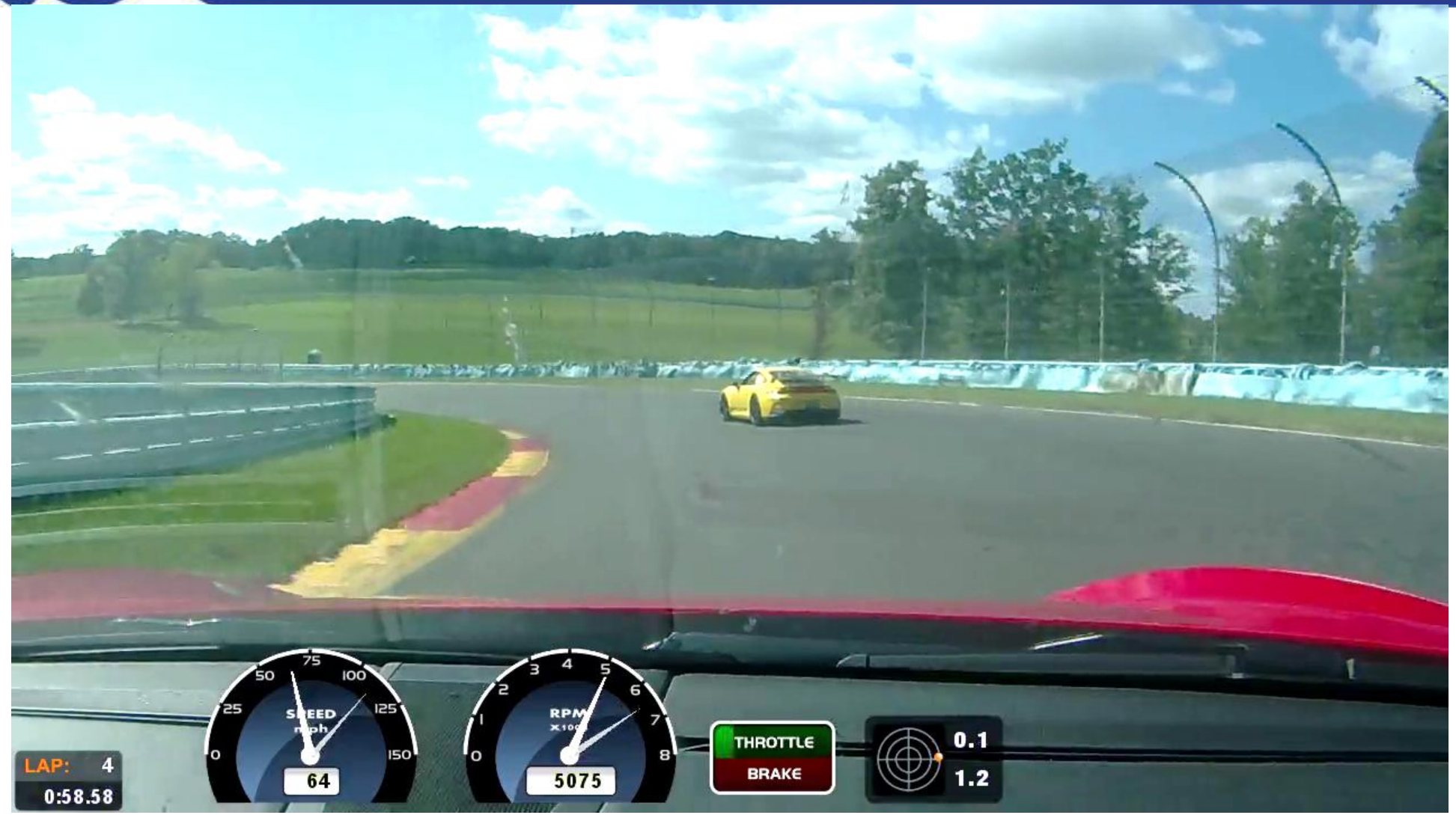
- At 2024 Midwinter Seminar, my notes include
  - Don’t fix overslowing by going to the throttle early
  - Coasting in a corner is good, at all driving levels
    - “Coasting is your friend, especially for beginning students.”
    - “In every corner, there is some coasting, if driving at the limit.”
  - Minimum speed (V-min) typically within ~1 car length of apex: before for exit-speed (Type 1) corners, after for entry-speed (Type 2)

Why is Off-Throttle Good?

- Friction circle: sum of all G-forces has a maximum
  - Lateral (turning) plus longitudinal (accel, braking)
- What do you want in a corner?
  - Maximize turning, so minimize accel/braking (balance front/rear)
- Off-Throttle is nearly, but not quite, balanced front/rear
  - Car continues to slow (engine braking and tire scrubbing)
  - Slight forward weight transfer assists rotation
    - More weight on front, less on rear
    - Think as very light trail-braking
  - As slowing occurs, can add a little more steering

Video – WGI Laces Before Video

WGI Laces Before – at Vmin



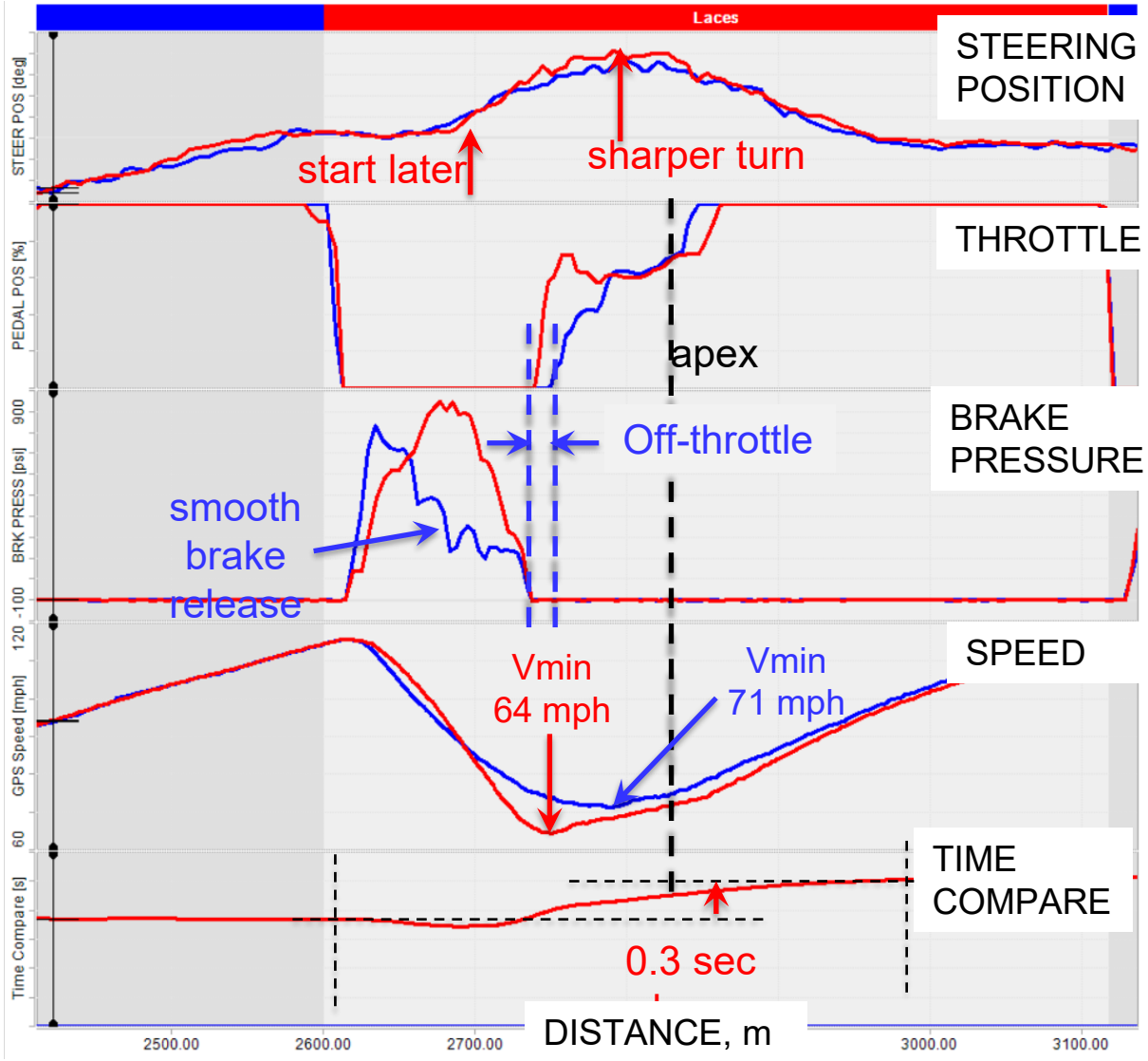
Changes I've Tried to Make

- Don't touch the gas until I could smoothly commit to WOT (as start to unwind wheel)
  - Force myself to have off-throttle period
  - If feel need to go to gas earlier, I have overslowed
- Work on rolling more speed into corner safely
  - Increase speed: a little at a time, via brake release
  - Don't change BoB – ask me how I know
- For specific corners, enter wider (guidance from coach)

Video – WGI Laces After Video

WGI Laces After - at Vmin

WGI "Laces" Before/After



Improvement: 0.3 sec faster from

- More continuous steering
- Earlier, smooth brake release
- Off-throttle period
- Less premature throttle
- 7 mph Vmin improvement

More opportunity?

- Still early Vmin and throttle?, so could be rolling even more speed?

Video – Lightning Turn 5 Before Video

Lightning T5 Before – At Vmin

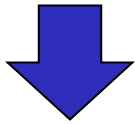
Video – Lightning Turn 5 After Video

Lightning T5 After – at Vmin

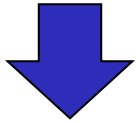
WHERE IS THE GRIP?

What do these Turns have in Common?

- VIR Hog Pen, WGI T6, LRP Uphill, Lightning T1



- They all offer gobs of free grip! (Way cheaper than a set of Hoosiers or Aero)



- How to use track geometry to manipulate contact patch…drive the terrain as well as the line

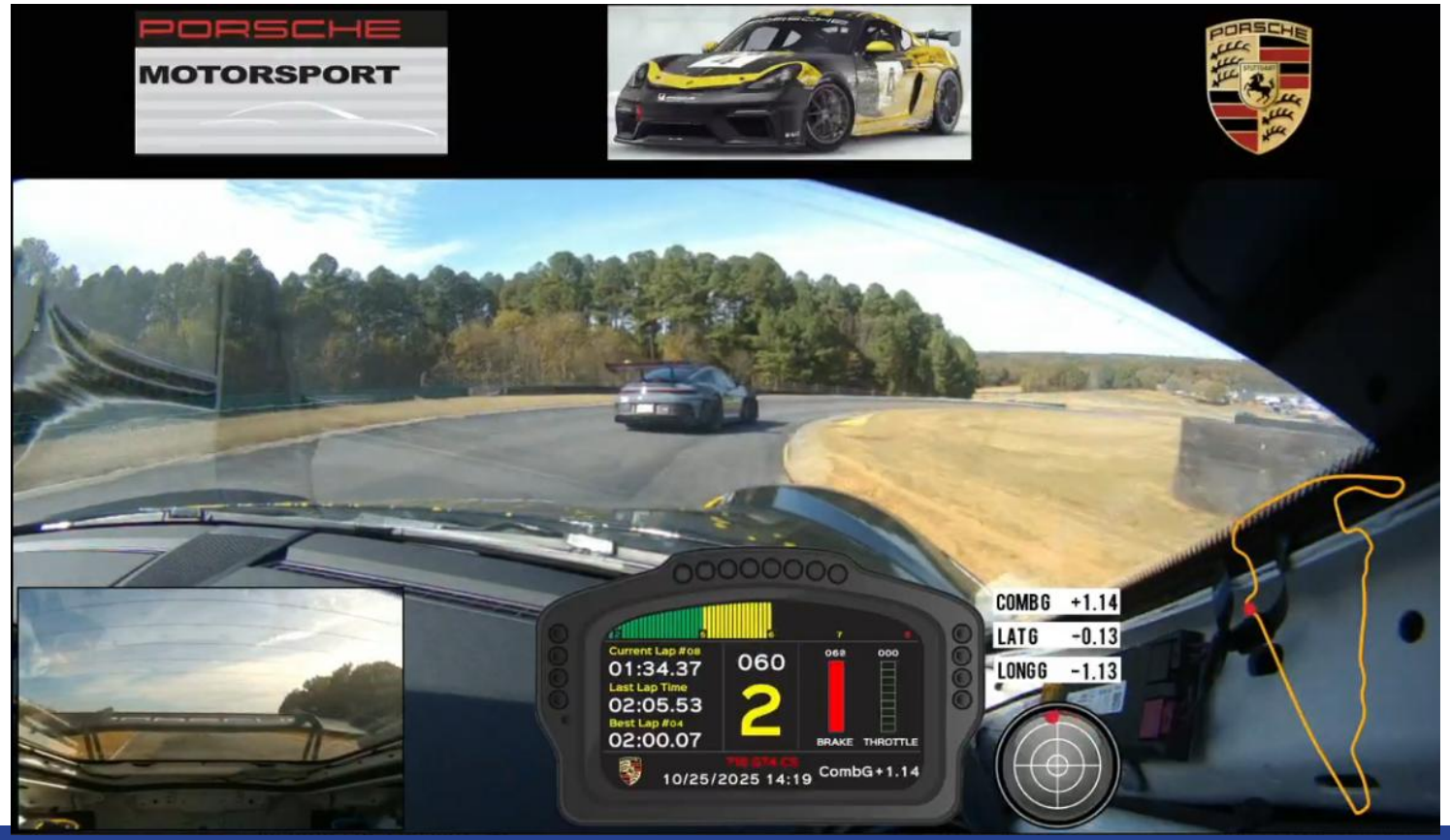
Positive Camber & Compression

- Leverage banking and uphill slope to maximize load / grip of tires (vertical g-load spike)
- Use this grip window to be more aggressive… faster/bigger turn-in, earlier to full throttle, later/lighter braking

- Important reminder…what the track Gods giveth, they also take away (e.g. negative camber, downhill brake zone)

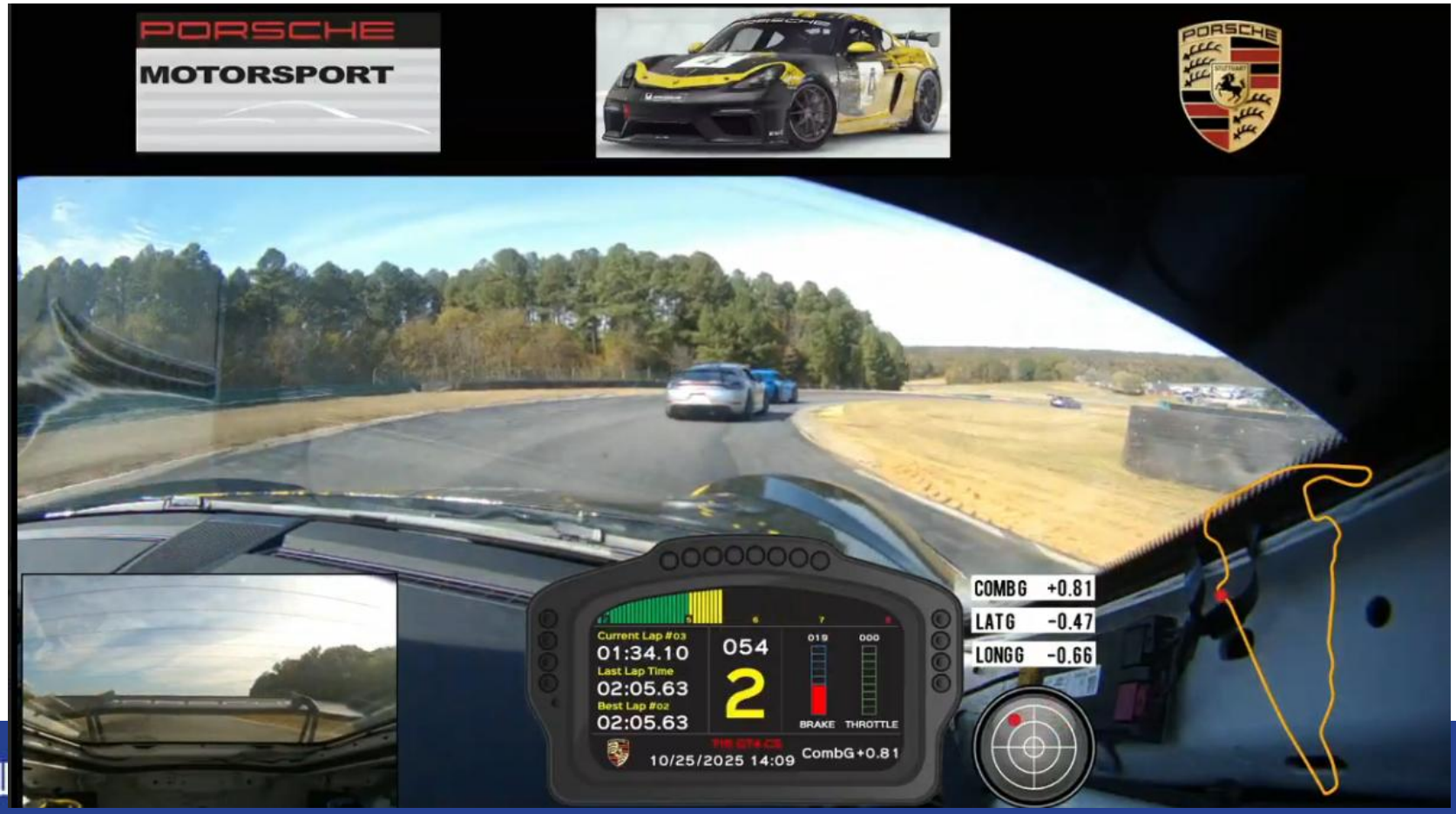
VIR Hog Pen Video …

- 992 GT3RS
  - Example of lighter braking, carrying more speed…not allowing faster car to pull away as quickly on exit



VIR Hog Pen Video …

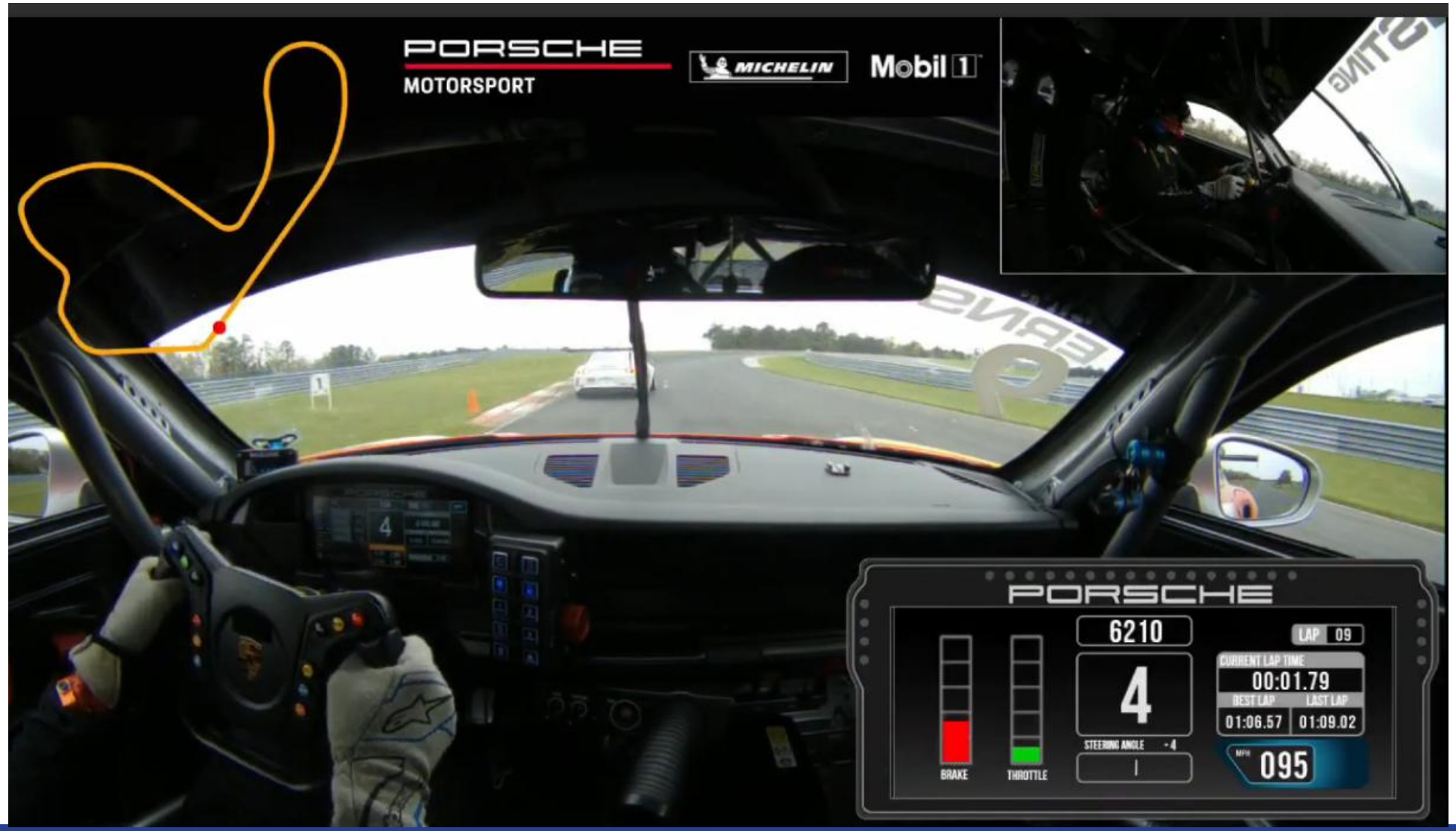
- GT4RS
  - Example of lighter braking, carrying more speed, better rotation, quicker to throttle



Lightning Cup Cars, Shows…

- Fun on track.
  - Both give quick point-bys and work hard to catch up when slowed by traffic.
- Ken in 992 Cup chasing Alex in 991.2 Cup.
  - Notice virtually identical lines.
- Watch line, brake, gas
- Super important on Turn 5 to have car up on right curbing.

Lightning Cup Cars Video



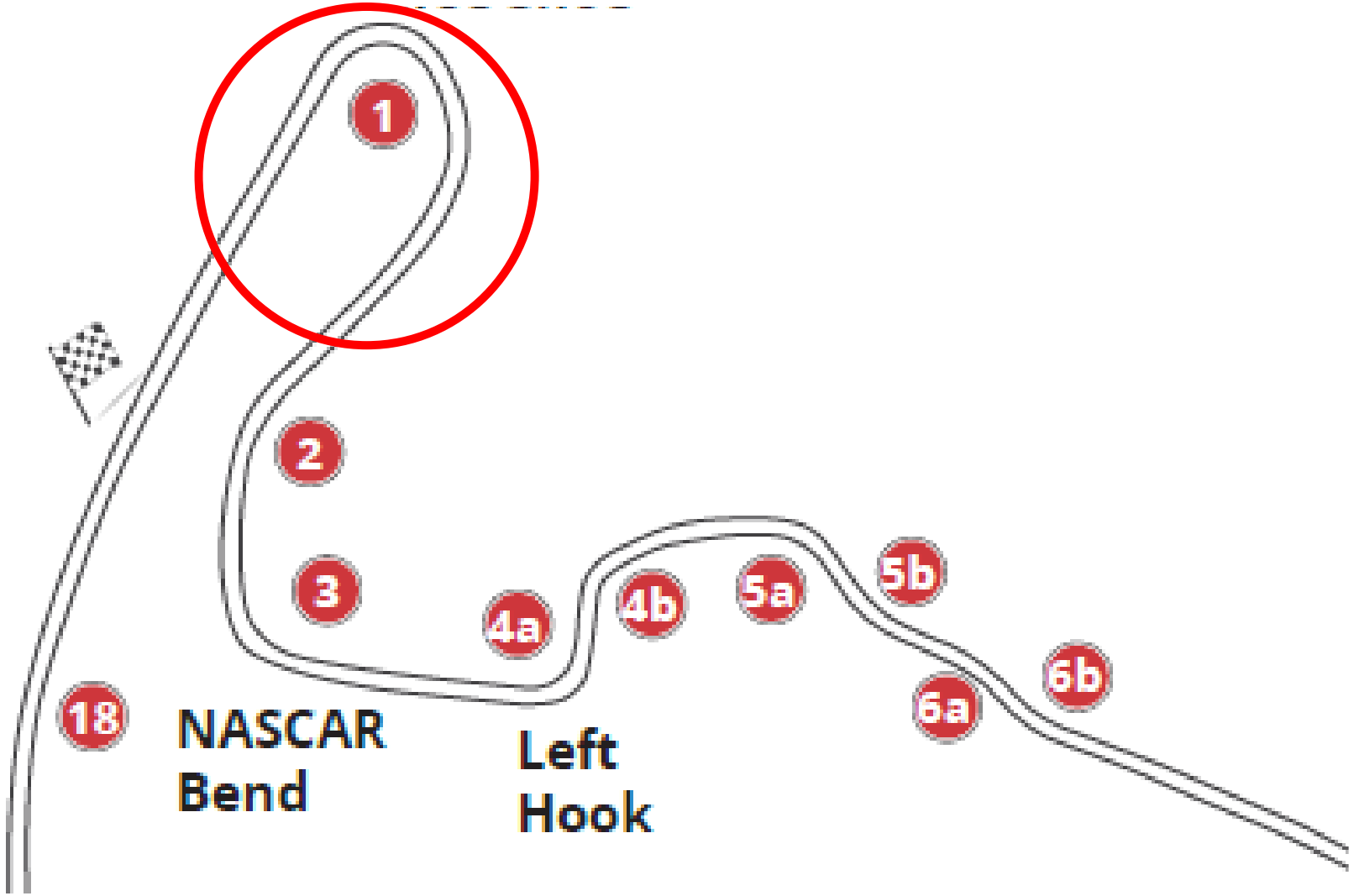
Lightning GT4 Clubsport Video

Lightning Comparisons

- Lines similar for the most part
  - except perhaps T7… shallower line in, not hitting curb but min speed same (no aero advantage)
- T1…min speed same (compression negates aero under braking) vs T2/T3 where Cup speed higher
- Same with T5…min speed same (no aero advantage)
- T9 apex speed same thru end of exit curb (compression, easier rotation -> earlier full throttle)

VIR Turn 1

- Patience!



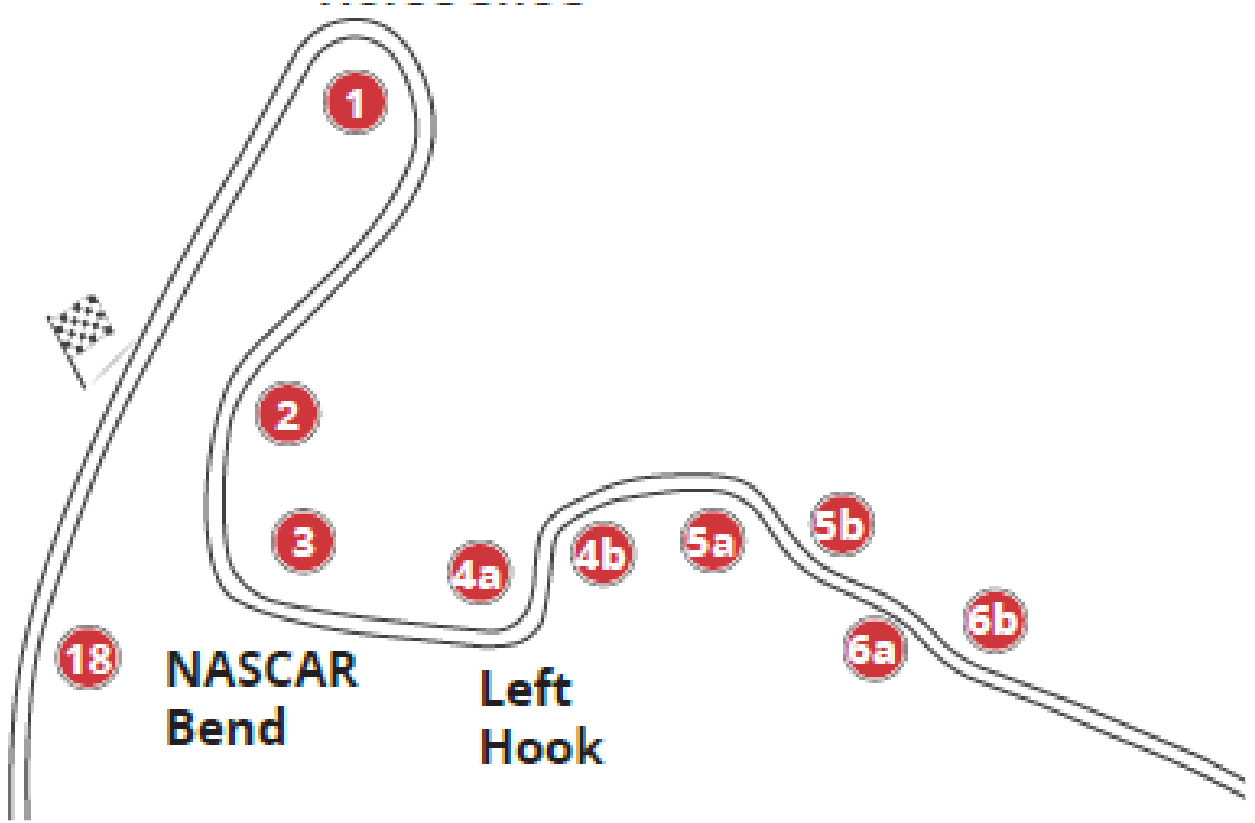
Patience!

- We see many different T1 lines at VIR.
  - Most wrong!
  - Lots of offs for a variety of reasons…
    - Late braking
    - Swinging too wide exiting T1
      - Less grip and marbles and off you go!
  - Proper line eliminates going wide as video demonstrates.
    - First Dave Scott, then Grant Minneman, two former pro drivers and current pro coaches
- In Cup car, note Grant's steering wheel and how it is cranked 90 degrees…
  - Much more input than most drivers, but it sets up the car to be ready for power coming out of T1

Dave Scott (GT4RS), Grant Minneman (Cup) Video

Patience!

- How different was that line vs. yours in Turn 1??



The Line Matters!

Driving the VIR Esses Fast and Safely Requires Deliberate, well-timed turns.

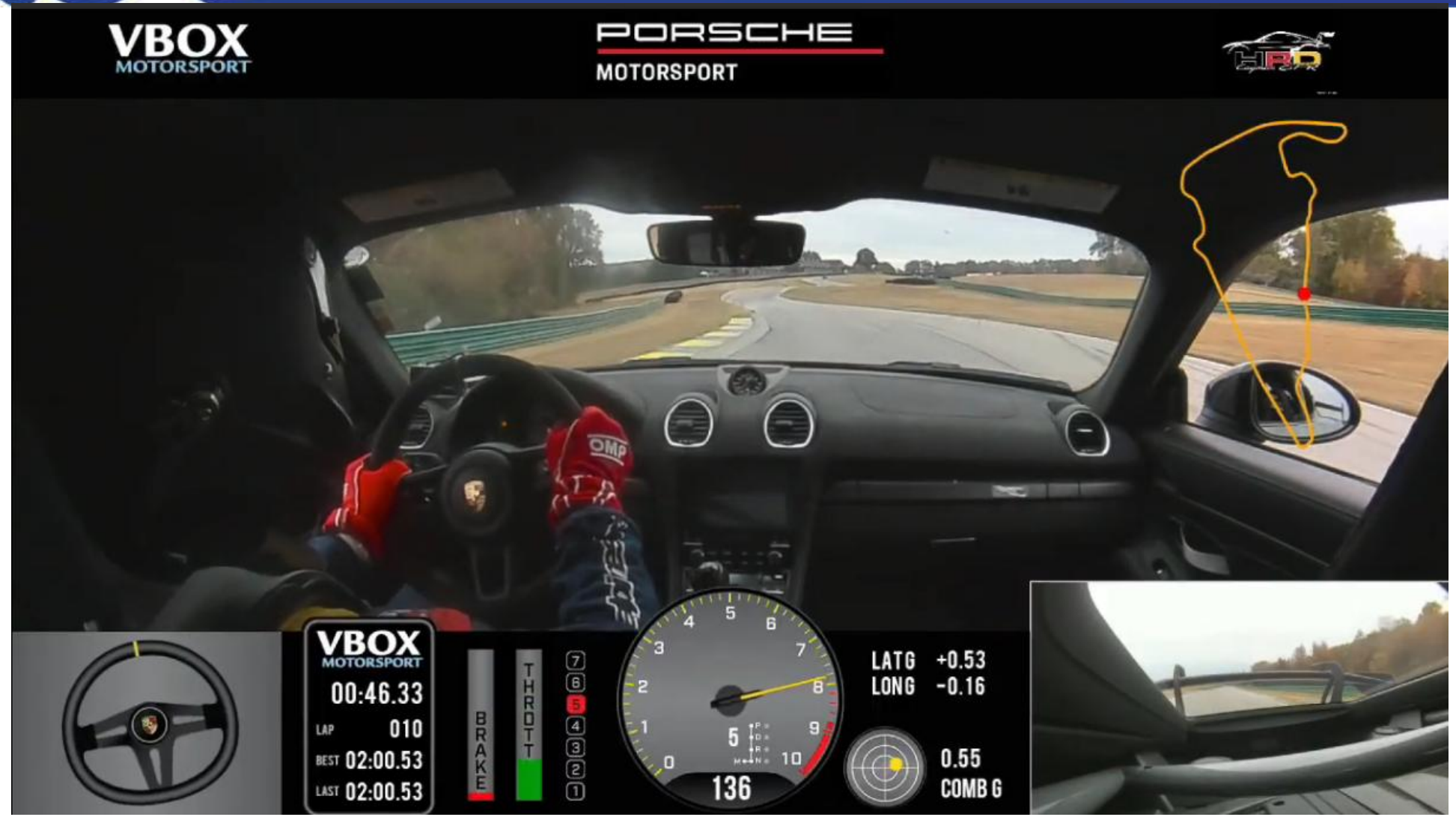
- Most challenging part of VIR is the esses.
- Lots of misconceptions
  - Some want to make esses as straight as possible
  - That won't work: here's why
  - No way to turn this into a straight, unless you go off track

The Line Matters!

Driving the VIR Esses Fast and Safely Requires Deliberate, well-timed turns.

- You must make specific steering inputs to be safe
  - Turn in is critical: many drivers early
  - Timing and car positioning are critical: “back side” of curbs (late)
- The faster you go, the less room for error
  - Last place you should look to pick up speed!
- But proper technique can result in safe, faster times
- Easy technique from Dave Scott…
  - When entering esses, go up a gear
  - Cayman, 911 or race car: platform feels more balanced and able to input throttle more easily.
  - We tried it and felt more confident applying throttle while going up without causing any chassis instability.

Video of Jeff and Grant up the Esses



Summary: How to Go Faster, Safely

- Video is worth 10,000 words…
- Don’t turn in early…
- Make mistakes small enough to recover safely
- Many tools for comparing laps
- ~~Coasting~~ Off-throttle in mid-corner is good!
- Use the grip
- Have fun!
- Patience is required…
- The Line matters!

Summary: Ways to Improve…Safely

- Before event, review video/data from last event and identify where you can do better…write it down and use for event focus.
- Review video of friend or faster driver in similar car to find improvements
- Each session, simple written plan to improve 1 or 2 areas, e.g., brake ~~later~~ lighter here, turn in later here, go to WOT here.
  - Write down what you learn on your track map, right after each session
- Each event: ride with an instructor or ask them to ride with you
- Lead/follow: faster driver in similar car to improve line/braking
- Pro coaching
  - At the track: can be shared with multiple drivers
  - Via remote analysis of your laps, before or during event
- Your car
  - Don't live with car issues; get car set up right and you'll be able to focus on driving and have more fun.
  - Don't try to get "just a few more heat cycles out of your tires".

Your Feedback?

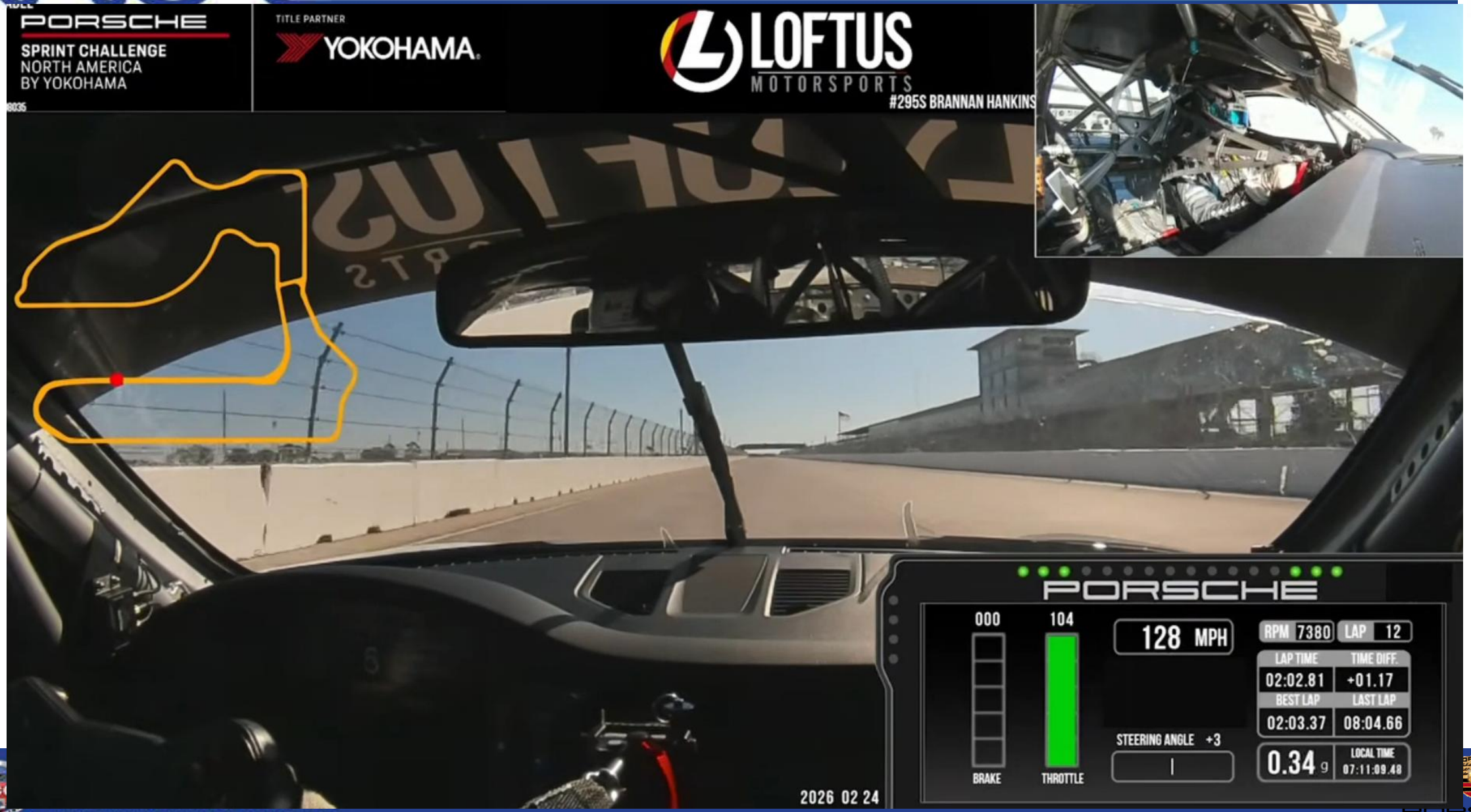
- Was this helpful?
- What would you like to see more of?
- Less of?
- Other topics?
- Fill in email survey!

Watch These Skills in Next Video

Very fast Sebring lap: 2:02!

- Where WOT occurs
  - Throttle ramp up
- Patience between brake and gas
- Length of V-Min
  - Very short!
- Steering input near V-Min on several corners
- Car position at apex
- Brake pressure (lack of)
  - = entry speed
  - Long trail at hairpin
- Turn 17 entry

Mike Skeen 2:02 Sebring Lap in 992.1 Cup



Q&A