

Minimum Corner Speed

Maximum Return on Investment

In Slow... Finish Last

- Most drivers over-slow their cars before the corner entry
- Why?
 - Focused on "in slow, out fast"
 - Focused on "always on brake or throttle"
 - Focused on downshifting (and heel-toe)
 - Focused on left-foot braking
 - They are driving a powerful car and somehow this changes things?
 - Don't know how fast it's possible to go
 - Afraid they can't recover from entering too fast
- Result?
 - Slower, obviously
 - Invites adding power → understeer → lift at exit → slower

How Can I Determine If I'm Too Slow?

- Data logger
- Corner speed and lateral Gs are largely a function of tires
- Compare your data to someone with similar tires
- Compare your corner speeds with a vMin table

vMin Table

- Circle your vMins on a vMin table.
- They should form a horizontal line.
- Outliers are obvious.

T1 160%	T2 87%	T4 75%	6a 145%	6b 149%	Crest 128%	Corral 157%	Hay maker 154%	T10 Bypass 100%	T11 Knuckle 100%	T12 Hairpin 78%	T15 Bypass 100%
56.0	30.5	26.3	50.8	52.2	44.8	55.0	53.9	35.0	35.0	27.3	35.0
57.6	31.3	27.0	52.2	53.6	46.1	56.5	55.4	36.0	36.0	28.1	36.0
59.2	32.2	27.8	53.7	55.1	47.4	58.1	57.0	37.0	37.0	28.9	37.0
60.8	33.1	28.5	55.1	56.6	48.6	59.7	58.5	38.0	38.0	29.6	38.0
62.4	33.9	29.3	56.6	58.1	49.9	61.2	60.1	39.0	39.0	30.4	39.0
64.0	34.8	30.0	58.0	59.6	51.2	62.8	61.6	40.0	40.0	31.2	40.0
65.6	35.7	30.8	59.5	61.1	52.5	64.4	63.1	41.0	41.0	32.0	41.0
67.2	36.5	31.5	60.9	62.6	53.8	65.9	64.7	42.0	42.0	32.8	42.0
68.8	37.4	32.3	62.4	64.1	55.0	67.5	66.2	43.0	43.0	33.5	43.0
70.4	38.3	33.0	63.8	65.6	56.3	69.1	67.8	44.0	44.0	34.3	44.0
72.0	39.2	33.8	65.3	67.1	57.6	70.7	69.3	45.0	45.0	35.1	45.0
73.6	40.0	34.5	66.7	68.5	58.9	72.2	70.8	46.0	46.0	35.9	46.0
75.2	40.9	35.3	68.2	70.0	60.2	73.8	72.4	47.0	47.0	36.7	47.0
76.8	41.8	36.0	69.6	71.5	61.4	75.4	73.9	48.0	48.0	37.4	48.0
78.4	42.6	36.8	71.1	73.0	62.7	76.9	75.5	49.0	49.0	38.2	49.0
80.0	43.5	37.5	72.5	74.5	64.0	78.5	77.0	50.0	50.0	39.0	50.0

Breaking the Over-Slow Habit

- Experiment on how much speed you can carry into a corner
- Gain confidence in entering at a higher speed
- Change mindset away from power and towards momentum
- The Drill: 3rd Gear No Brakes (3GNB)
 - Reference points
 - Softer deceleration
 - Reduce emphasis on acceleration
 - Gain appreciation for turn-based deceleration

Lessons from Sim Racing

- In Professor Korf's "High Performance Driving" class at UC Davis, everyone begins with the same training exercise.
 - Brands Hatch Indy, NA Miata, 26C, half-tank, SV tires, etc.
 - Part 1: drive as fast as you can for 30 minutes (some students have sim racing experience)
 - Part 2: drive the track in 3rd gear with no brakes (3GNB)
 - **100% of drivers are faster in Part 2 than Part 1**
 - About half the students improve on their 3GNB time later (about half cannot)
- Yeah, but it's *just* sim racing...
- If you can't do a 1:04 in the 3GNB drill...
 - You have some basics to work on (reference points, steering, geometry)
 - You will get a lot faster once you master the basics

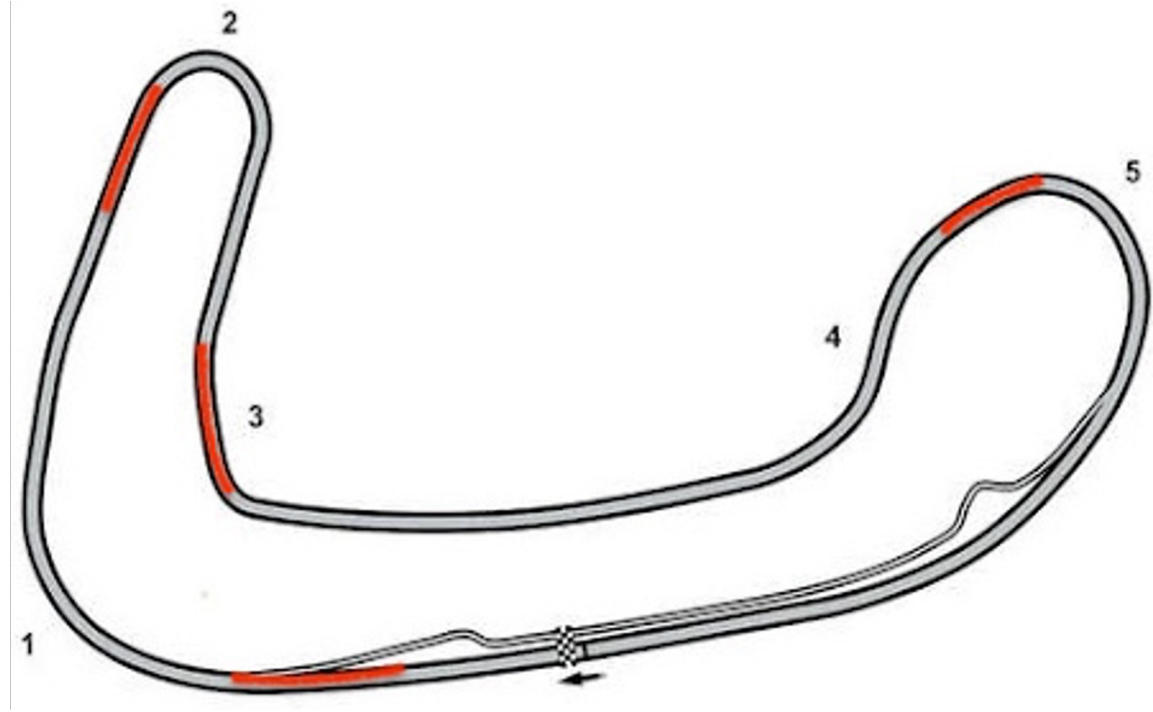
Brands Hatch Indy

When braking and shifting:

- 4 braking zones
- Up to 9 shifts per lap

3rd gear no brakes:

- No brakes, no shifting!
- Faster
- How and why?

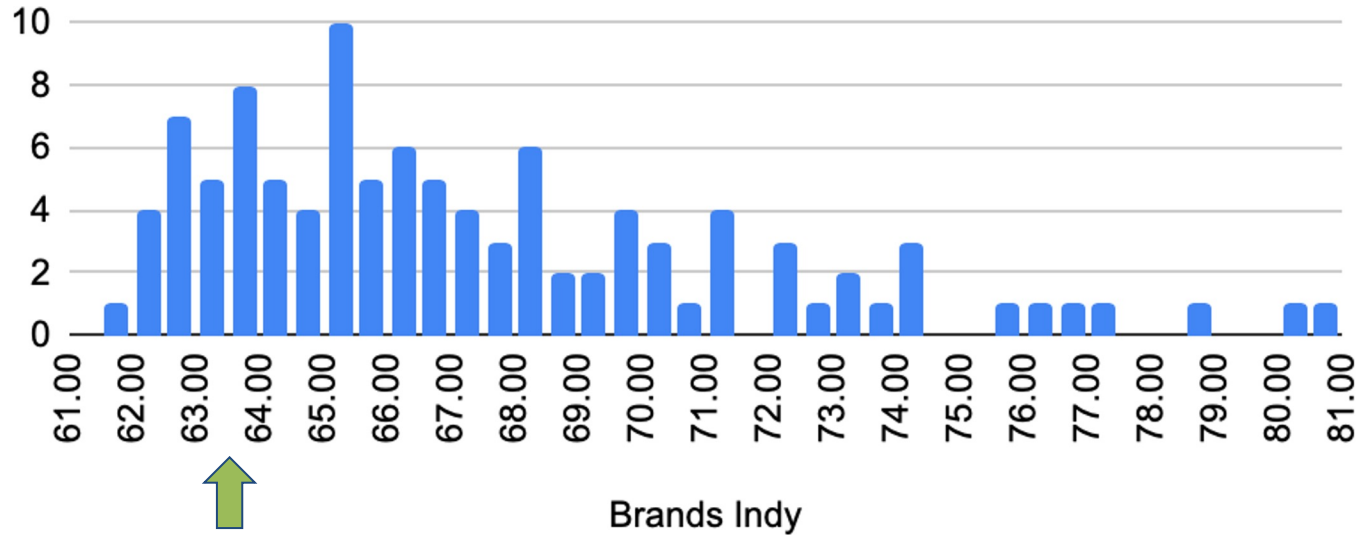


Attention

Everything you do in the cockpit takes some attention. The more things you have to keep track of and coordinate, the worse you perform. In the 3GNB drill, you can focus 100% of your attention on corner entry.

- Hard braking interferes with optimizing entry speed
- Downshifting puts you into an "in slow, out fast" mentality
- Heel-toe shifting puts attention into transmission and engine
- Hard acceleration interferes with finding the optimal geometry

Brands Indy Lap Distribution

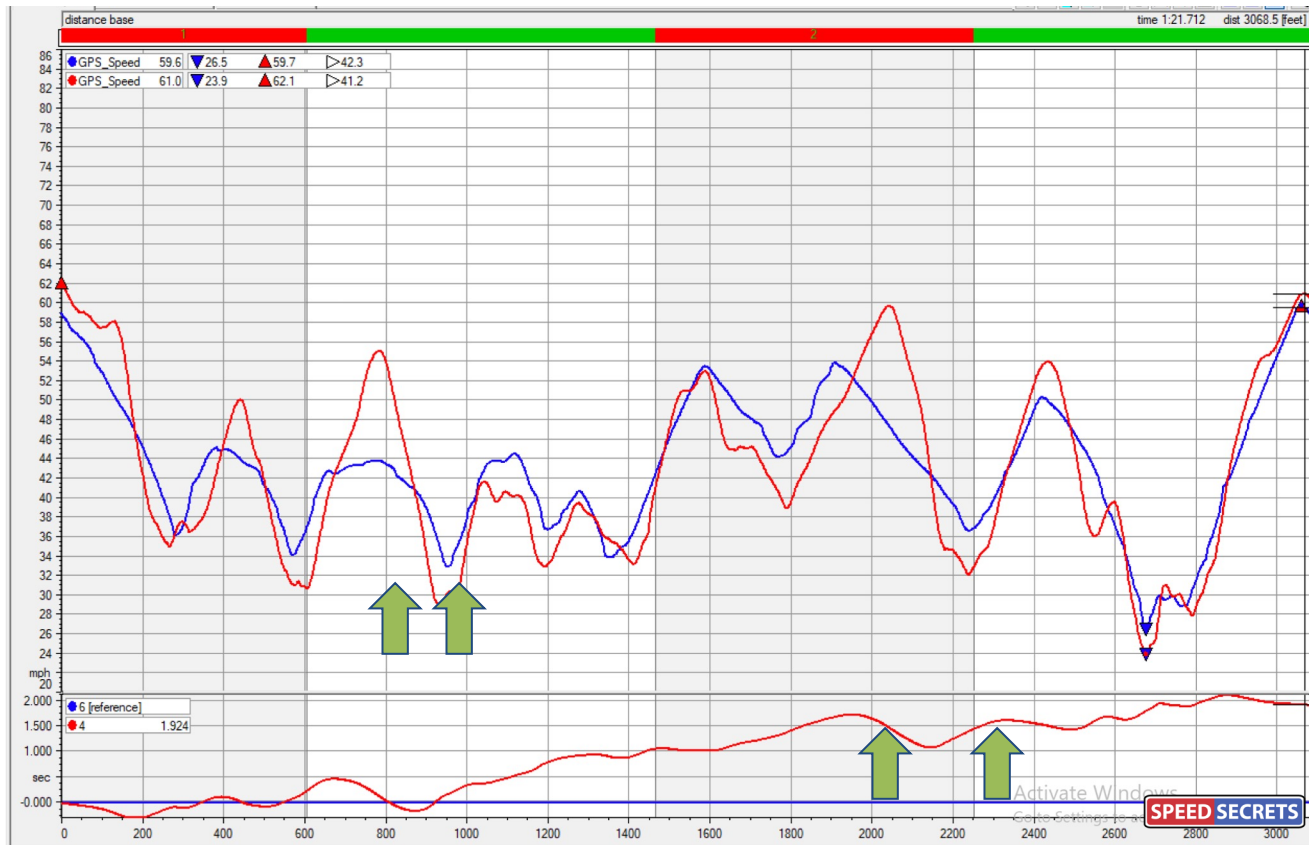


A fast 3GNB is faster than most drivers

3GNB @Pineview Original Track

Two drivers sharing the same car.

- Red is shifting, braking, and trying hard!
- Blue is doing 3rd gear no brakes drill, and is 2 sec faster.
- Is it more important to have a higher top speed or a higher min speed?



3rd* Gear No Brakes Drill

- **Reference Points** - There is no way to do the exercise safely without using reference points. Using reference points is an essential skill!
- **Focus on Momentum** - Without the ability to downshift to gain acceleration, your brain will automatically try to raise minimum corner speed to go faster.
- **Focus on Entry Speed** - If you don't have to shift or brake, you can put 100% of your attention on reference points which determine entry speed. You will go faster because of this.
- **Appreciation of Deceleration** - Cars decelerate a lot even without brakes. Knowing this will help you drive deeper into a corner.

**Some cars may be in a different gear, but no shifting, regardless*

Things to Think About During the Drill

- Accelerate to Point - Mentally mark the point where you get off throttle. Move this deeper and deeper into the corner as the drill progresses
- Turn-in point - Mentally mark the point where you start turning.
- Turn-based deceleration - Turning slows the car a lot. You will see this more clearly in the data.
- Turning - Experiment by turning at different rates.
- Wait - There will be a little time before the next stage, but how much?
- Throttle on - Mentally mark the point where you add throttle. Experiment where you add throttle. Too soon and you will run wide. Too late and you will leave time on the table.