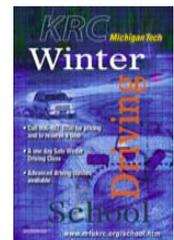


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SAFE Winter Driving

Tips & Techniques

Mark Osborne
MTU KRC Winter Driving School



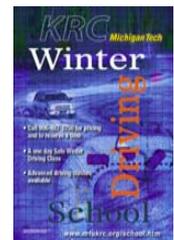
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Today We Will Cover The Following:

- ***What is KRC***
- ***KRC Winter Driving School***
- ***Basic Items***
- ***Grip - Friction***
- ***Braking Techniques***
- ***Weight Transfer and Control Techniques***

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KRC – Research, Development & Testing

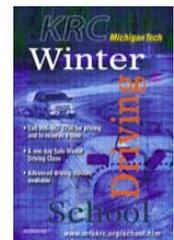


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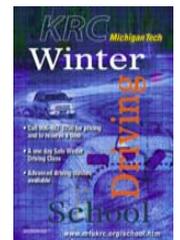
KRC – Winter Test Facility

- **Lot's of SNOW – 200 inches Annually**
- **Long Winter's – December to April**
- **Operate Winter Test Facility**
 - **Automakers**
 - **Heavy Truck Components**
 - **Tier 1's – Tires, AWD Systems, Etc.**

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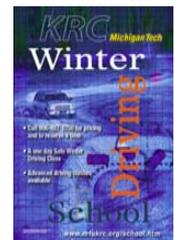
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KRC Winter Driving School

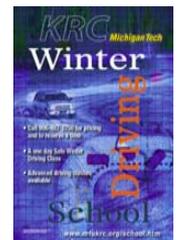
- **Started About 12 Years Ago**
- **Winter Test Facility – Saturdays Slower**
- **Bridgestone Winter Driving School**
- **GM Human Factors Research Project**
- **OHSP Grant – Developed Driving Manuals**
- **AAA Donation - Video**



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KRC Winter Driving School

- ***Taught Every Saturday January to No Snow***
- ***Runs 8 am to About 4 pm***
- ***Costs Only \$150***
- ***Lots of Seat Time Mixed With Classroom***
- ***Small Classes – Personalized Attention***
- ***Builds Confidence and It's FUN!***

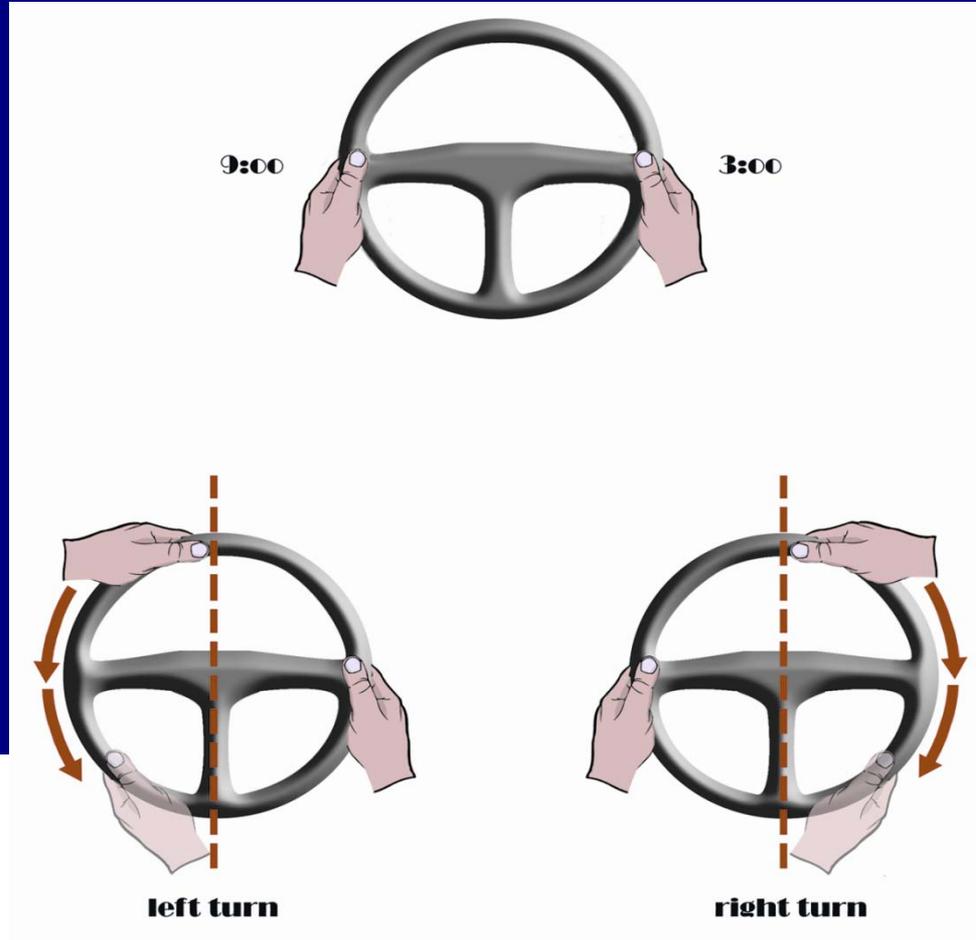


The Basics - The Best Sitting Position

- **Not Too Close – Or Too Far Back**
- Difficult To Control The Pedals
And The Wheel For Large
Steering Inputs Also Concern
For Airbags/Injuries
- **With Arms Outstretched – Wrists**
Should Hit Top Of Steering Wheel
Adjust For Pedal Control Too!



The Basics - Steering Wheel Hand Position



The Basics

- ***Wear Seat Belts***
 - *Make passengers wear them*
 - *They do save lives*
- ***Buy/Use Other Safety Devices***
 - *Child car seats*
 - *ABS brakes (but understand them)*
 - *Airbags*

The Basics

- **Create Space**
 - **4 Seconds + - more for bad conditions**
 - **In heavy traffic – create space – Slow Down!**
- **Avoid Distractions While Driving**
 - **Cell phone**
 - **Eating**
 - **Adjusting the radio**
- **Use Your Headlights All The Time!**

The Basics - Tires!

- **Most Important Factor**
- **If You Live In Snow Country We Recommend Using Winter Radials On All Four Wheels!**
- **Or Good (Not Worn) All Season Radials On All Four Wheels**
- **Don't Over Or Under-Inflate Tires**



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All Season Radial



Winter Radial

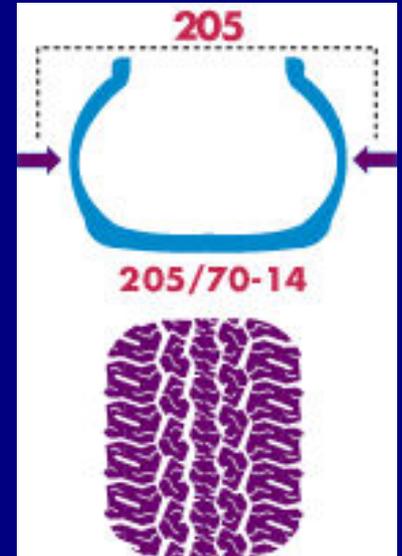
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Grip

- ***Adhesive Quality Between the Tire and the Road***
- ***Very Important To Understand For Traction, Handling And Braking!***
- ***You Can Not Steer Without Grip!***

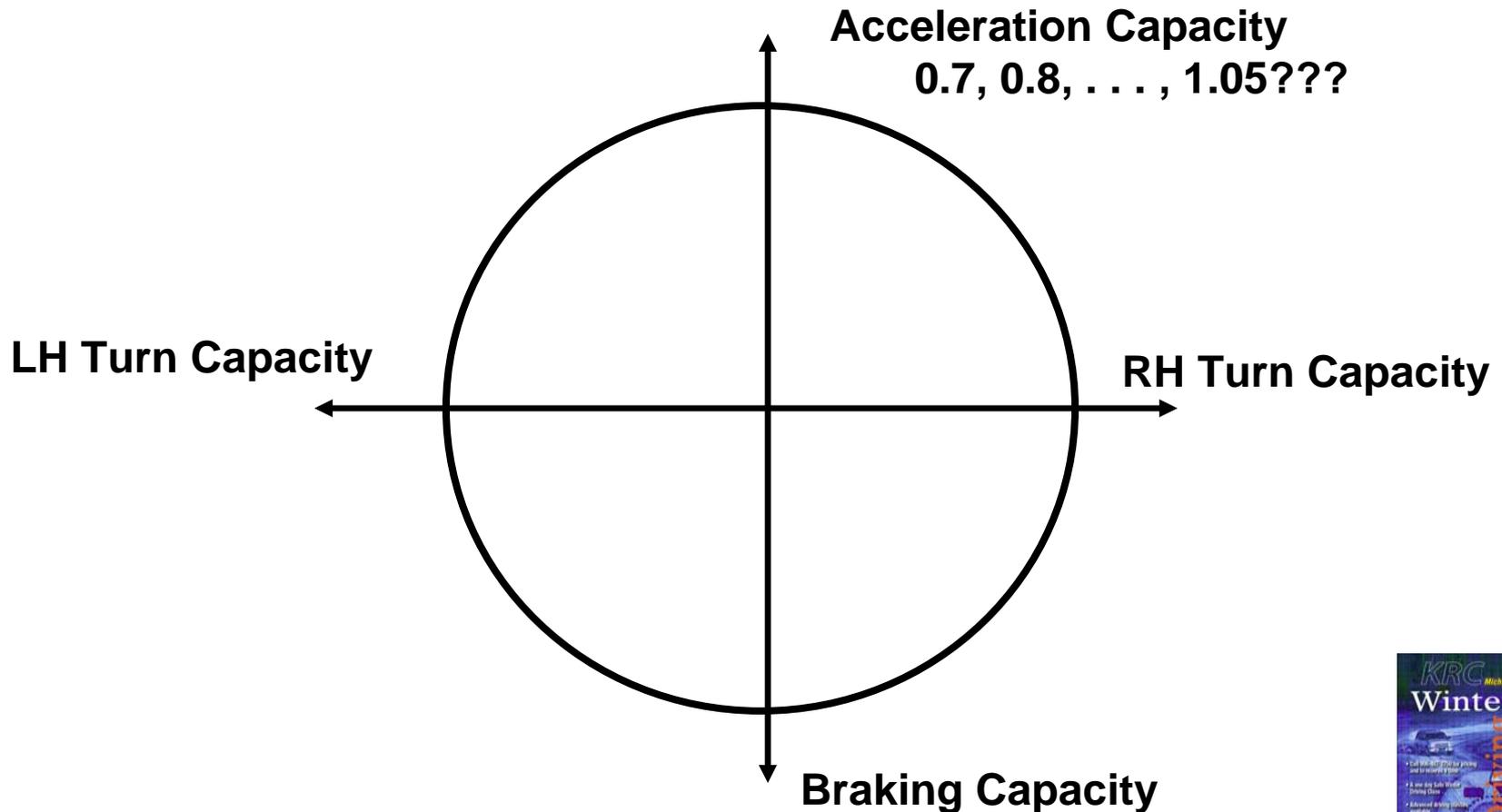
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Where's The Grip?

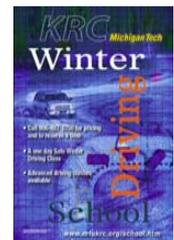
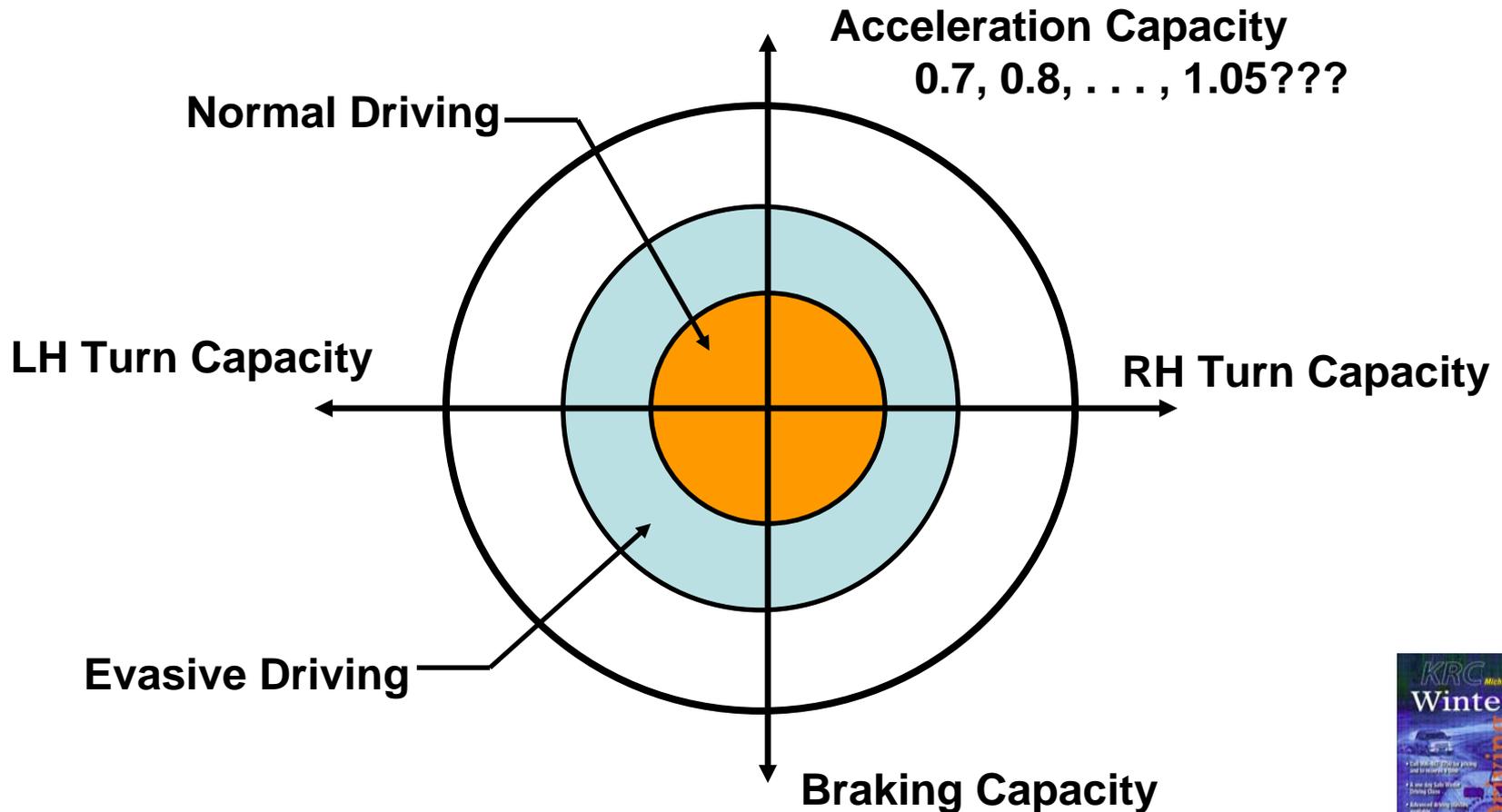


At The Contact Patch! 4 of 'em!

Friction Circle Concepts

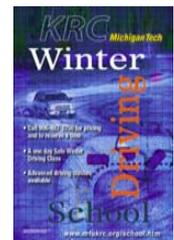
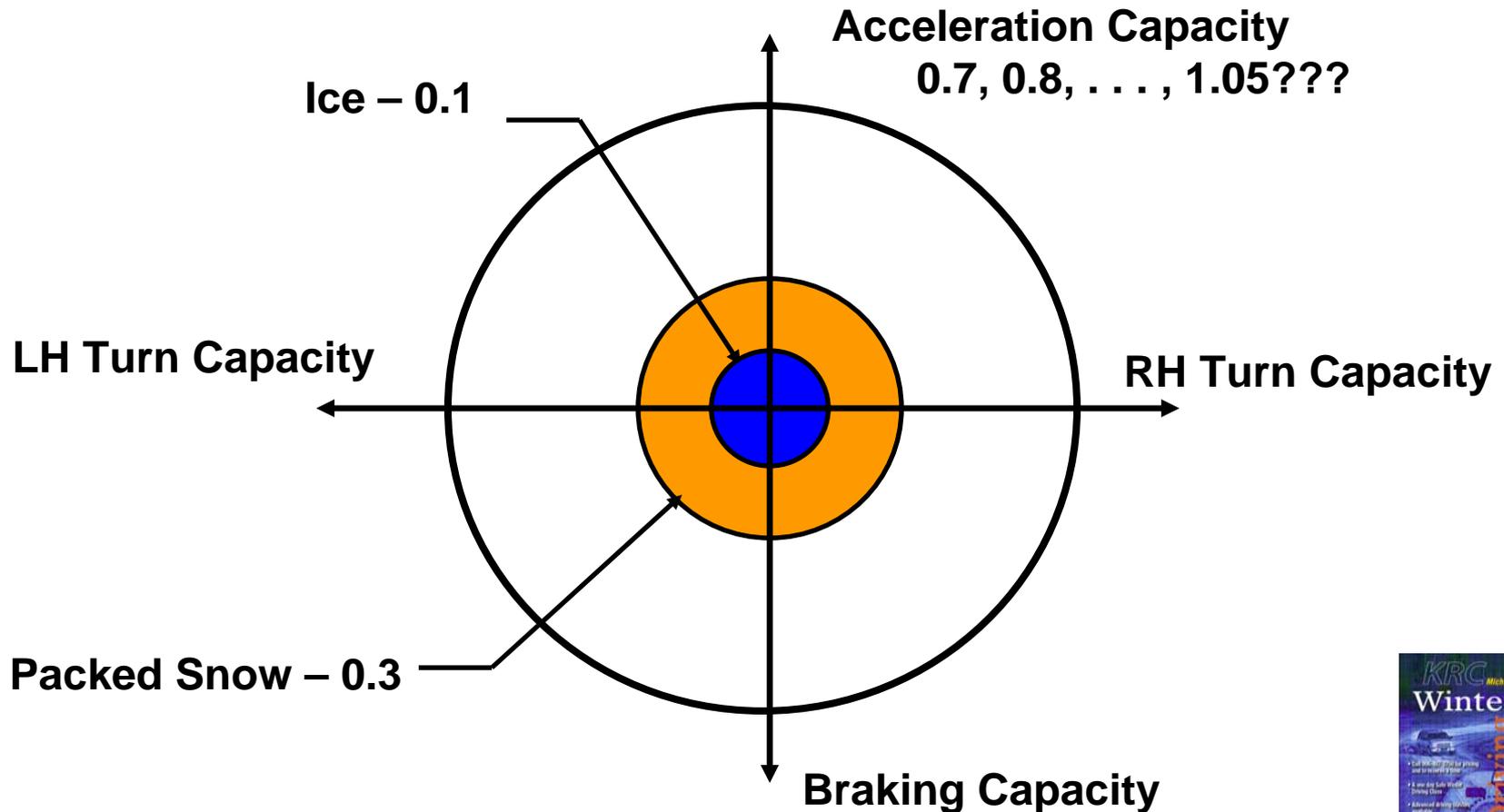


Friction Circle Concepts

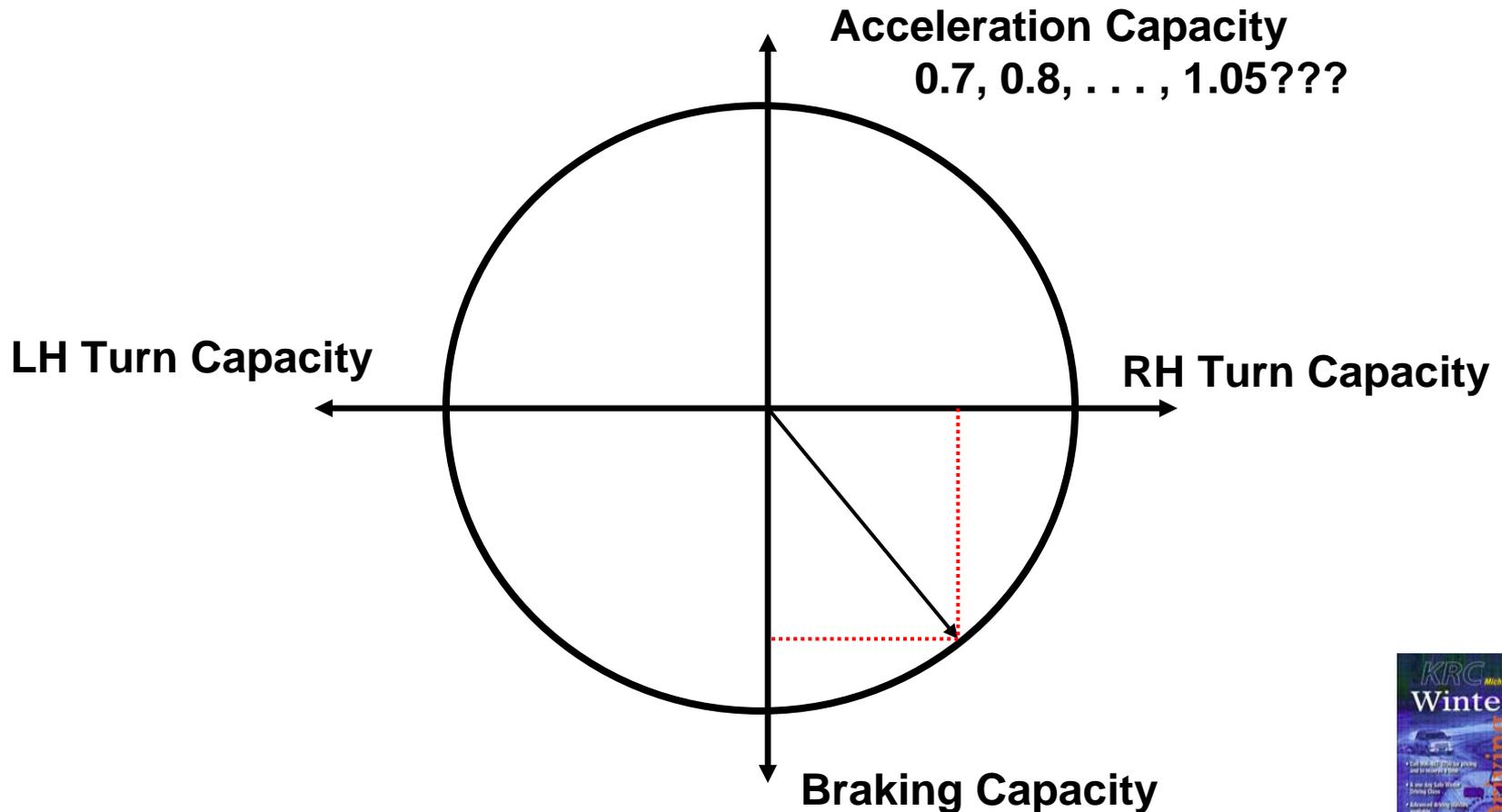


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Friction Circle Concepts



Friction Circle Concepts



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Braking Techniques

- ***Cadence Braking Is Pumping The Brakes – No Prolonged Lockup!***
- ***Crisp Lock, Then Release (Let Roll), Then Lock, Then Release, Etc.***

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Braking Techniques

- **Threshold Braking is Holding The Brakes At The Point Where Brakes Start To Lock**
- **May Have To Lock Brakes For Short Period And Back Off Slightly To Find Threshold**
- **Difficult To Do On Slippery Roads**

Braking Techniques

- *Anti-lock Brakes (ABS) Pump The Brakes For You, Very Fast*
- *Does Not Lock The Wheels*
- *Doesn't Always Stop You Faster!*
- *Allows SOME Steering Control*

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Panic Avoidance

- *You Can't Brake & Steer On Slippery Surfaces*
- *Brake Then Steer*

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Weight Transfer

- **Helps To Provide Control**
- **Transfer Weight To Tires That Need Grip**

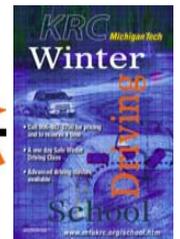
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Weight Transfer

Acceleration

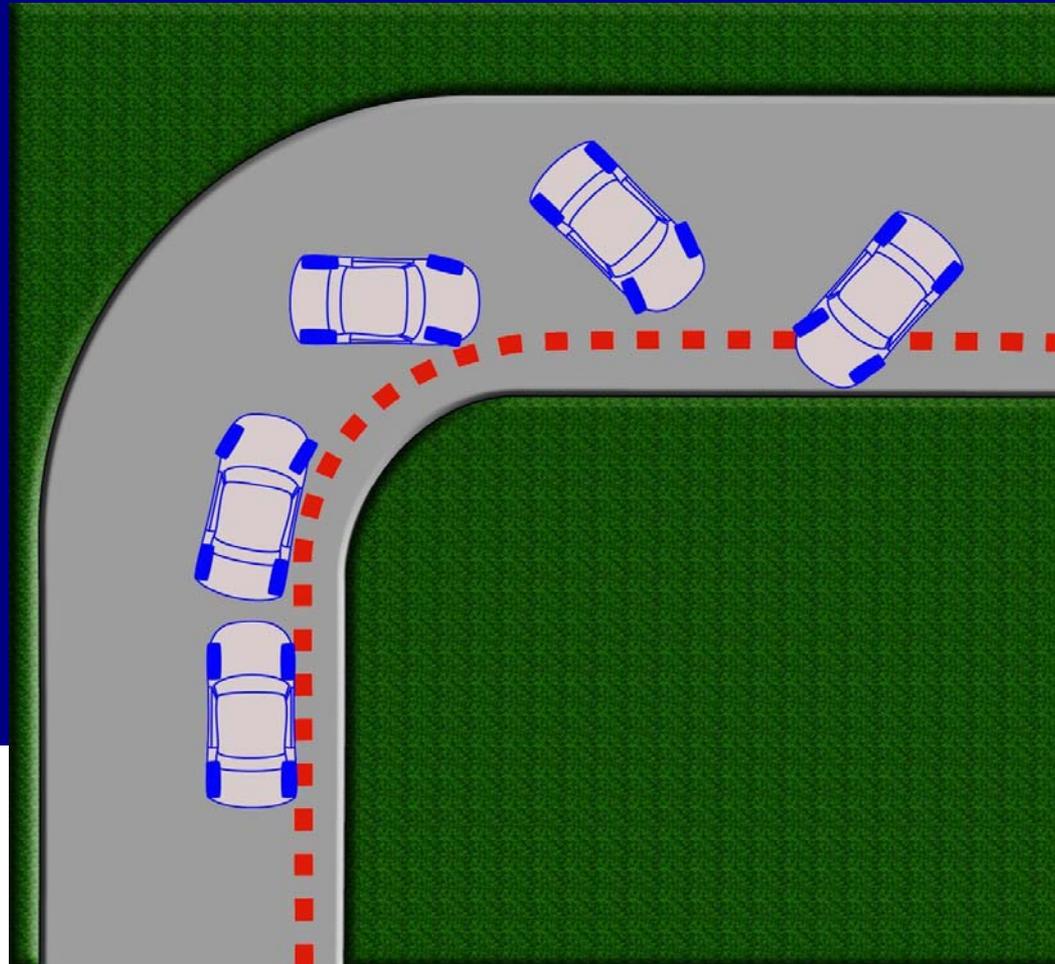


Braking



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Oversteer

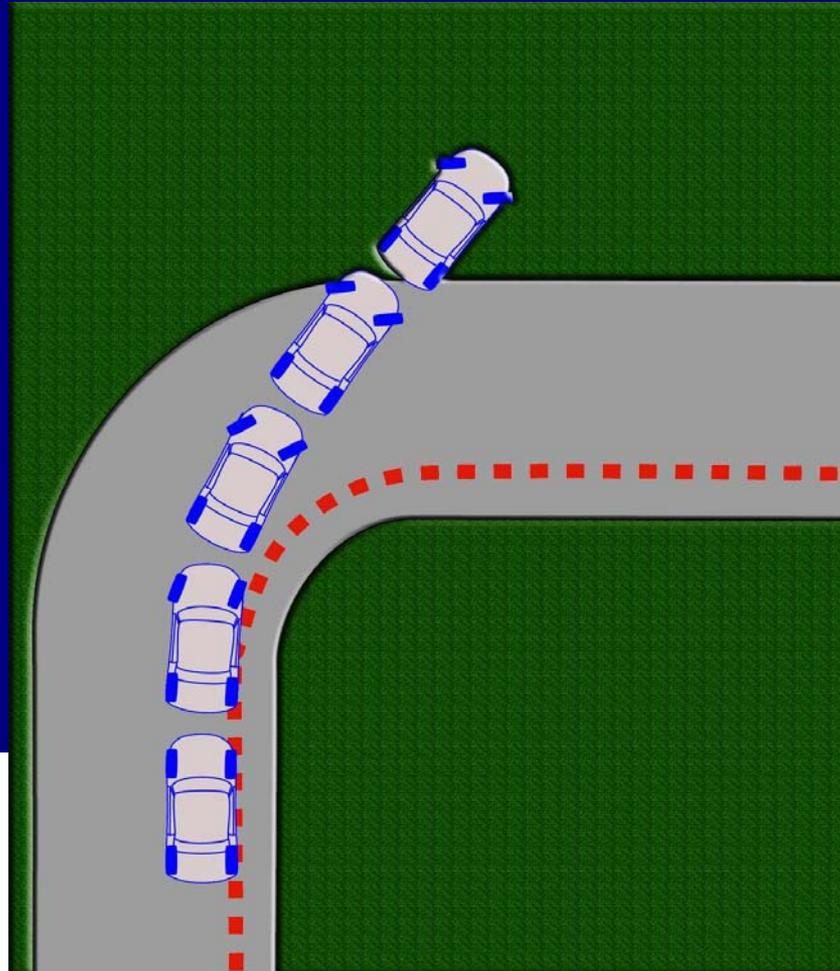


Oversteer Causes & Solutions

- **Loss Of Grip On The Rear Wheels**
- **Low Speeds & Take – Off**
Steer In The Direction Of The Slide
Let Off Gas
- **High Speeds**
Steer In The Direction Of The Slide
Stay On The Gas – Steady!

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Understeer



Understeer Causes & Solutions

- ***Loss Of Grip To Steering Wheels
Either Spinning Or Not Rolling***
- ***Don't Accelerate During A Turn!***
- ***Use Lift Throttle To Transfer Weight
To Front Wheels***
- ***Use Lift Throttle & A Brake Tap To
Transfer More Weight To Front Wheels***

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Be Smooth!

- **Most People:**
 - **Brake Too Hard, Too Often**
 - **Accelerate Too Hard**
 - **Use Too Much Steering Input**
- **It's Best To Be Smooth!**
- **Remember To Look Where You Want To Go And You Will Go There!**

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Practice!

- ***We Can Teach You The Methods***
- ***You Have To Practice To Be Smooth***
- ***Practice Builds Confidence!***

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***To Learn More About Winter Driving
Attend
The KRC Winter Driving School***

(906) 487-2750

