

Miatas



at MotorSport Ranch II

Saturday and Sunday, March 17 and 18, 2001

We have secured a weekend date in the Spring of 2001. The two day driver education event will be open to the first eighty Miatas entered, Saturday and Sunday, March 17 and 18, hosted by the Lone Star Miata Outlaws.

Motorsport Ranch is a new facility designed as a 'Country Club for Sports Cars'. It is primarily for use by it's members, but has been made available for lease a few days each month. The facility includes a 1.7 mile, eleven turn road course, a skid pad, club house (under construction), paved paddock, control tower, covered grid, and acres and acres of unobstructed runoff area. The road course includes something for everyone, with elevation changes, hidden and off-camber corners, long sweepers, and short, tight esses. The track is forty feet wide with approximately thirteen hundred feet of FIA-type curbing on all inside corners and some of the smoothest asphalt I have ever driven on.

For those in the Dallas/Fort Worth area, it is an easy drive to the Motorsport Ranch, southwest to Benbrook, then fifteen minutes south on 377. For others, the small town of Granbury is another ten minutes down 377 which has several nice hotels and many Bed & Breakfast homes near the historic square.

Each entry will include a minimum of four, twenty-five minute sessions and lunch each day. Classroom sessions and in-car instruction will be available. Track sessions will be limited to twenty Miatas and will be grouped by driver experience. Roll bars will be required only for advanced students, but are strongly recommended for all participants. Helmets will be required with a Snell rating of M90, M95, SA90, or SA95. Cost for the two day event will be \$180.00, due by January 15, 2000. After that date, entry fees increase to \$240.00.

Ony Anglade
Event Coordinator



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Rules and Information

General

1. Everyone entering Motorsport Ranch is required to sign the insurance waiver at the gate, both days.
2. Only paid entrants are allowed on the track and skid pad, with the exception of touring laps during the lunch breaks.
3. The only passengers allowed on the track will be students with instructors, or instructors with students.
4. The speed limit in the paddock is 15MPH for all vehicles.
5. Draining fluids in the paddock area must be with the use of approved catch pans. All spills must be cleaned up immediately.
6. No stakes will be driven into the asphalt in the paddock area.
7. Please use the trash barrels provided.
8. No alcoholic beverages may be consumed until after the final session of the day.

Communications

1. We will do our best to adhere to the published schedule. Activity reminders, and changes, will be announced on the public address system. Please listen.
2. Groups will be called to the grid, via the PA system, ten and five minutes prior to the session start time.
3. On-track communication will be via your Miata's FM radio. Please tune your radio to 88.9 prior to reporting to the grid. A radio check will be conducted for each group, immediately prior to the start of the session. Ensure that the volume is high enough to be heard, and understood, while at speed on the track.
4. While on the track, follow all instructions from the control tower, IMMEDIATELY. Possible instructions you might hear are:
 - a. Car XX, you are blocking traffic. Please signal to allow the faster drivers to pass.
 - b. Caution on the track exiting Ricochet. Red Miata XX has spun and is off on drivers left.
 - c. Track is clear.
 - d. Car XX, please bring your car to the hot pit for a safety check.
 - e. Attention all cars. We are in a red flag condition. Come to a safe stop on the edge of the track and await further instructions.
 - f. This is your checked flag lap. Please take a cool down lap and return to the paddock.
5. In the event of radio failure, one of the following flags will be shown in Rattlesnake (esses) from the pit wall:
 - Yellow - Caution on the track. NO PASSING.
 - Red - Come to a safe stop on the edge of the track and await further instructions.
 - Black - Complete the lap and enter the hot pit. The Grid marshall wants to talk to you!
 - Checkered - The session is over. Take a cool down lap and return to the paddock.



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Grid Procedures

1. Please wait until your group is called before going to the grid.
2. Enter the grid on either side, taking the next available slot, parking at a diagonal toward the front, center of the grid, as directed by the grid workers.
3. There will be a three minute and one minute warning by the grid marshall. Prepare for your session and signal acknowledgment to the warnings and subsequent radio check.
4. Follow the grid marshall instructions for entering the track.

On-track rules

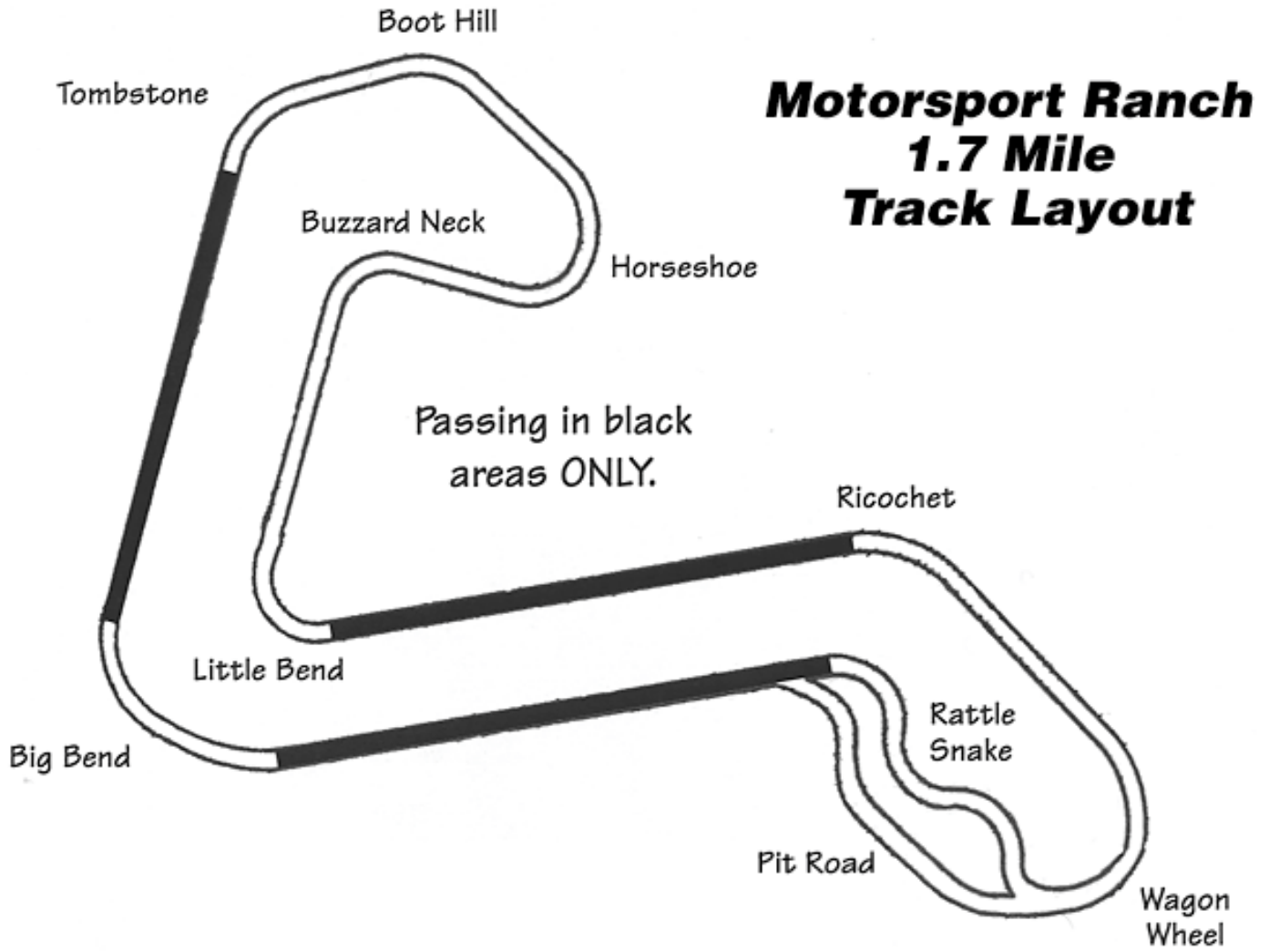
1. Drive within your ability.
2. The control tower is in control of the track at all times. Follow instructions as quickly and safely as possible.
3. Corner names will be used to indicate problem areas on the track. Please become familiar with the names and locations prior to your first track session (see track map).
4. Track direction will be counter-clockwise.
5. If you have to exit the track surface, do it in a straight line under control, with clutch in and heavy braking to get the car stopped as safely as possible. Wait for instruction from the tower before re-entering the track.
6. Uncontrolled spins and four wheels off are cause for a visit to the hot pits and a talk with the session chief. Excessive visits may result in track privileges being suspended.
7. Passing is only allowed on the three longest straights (see track map), after a signal from the overtaken driver. Signals will be out the drivers window, arm straight out to pass on left, arm over the top to pass on right. When possible, signal in the preceding turn to allow the overtaking driver to maintain their momentum. Red group does not require signals.
8. If a driver continues to block faster traffic, ignoring warnings from the tower, he/she will be black flagged and have a discussion with the session chief.
9. Passes must not be started before the apex cone of the preceding corner and must be completed prior to the turn-in cone for the next corner.
10. Safe entry and exit to/from the hot pit is the responsibility of the driver leaving/entering the track. Yield to drivers on the track and signal your intentions.

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Preparing your Miata

This information includes suggestions for preparing your Miata for an enjoyable and reliable weekend at the track. We will start with normal maintenance items that should be looked at prior to the event, followed by suggestions to improve the factory settings, then concluding with final preparation at the track. Although a Miata will perform VERY well just as it came from the dealership, there are certain adjustments that can make it even better. None of these are necessary for the track event at Motorsport Ranch, especially if this is your first event, but they will make the Miata handle and stop better as your skills improve.

Maintenance items (in order of importance)

1. Check brake pad wear. Replace if necessary. Replace brake fluid completely and bleed brakes.
2. Check tires for even wear and depth of remaining tread. If the tread wear bars are visible, replace the tires. Use a quality replacement all-season or performance tire of the same type on all four corners. Typically, tires with 10-20K miles will grip better (in the dry) on the track than brand new tires. Tire pressures will be discussed later.
3. If your Miata is near the 60K or 120K mileage, make sure the timing belt is replace. If you have a 90 or early 91 Miata, make sure this is done CORRECTLY, as there is a design flaw in early crankshafts that can appear if the woodruff key is not inserted correctly.
4. Make sure the oil and filter has been changed recently.
5. The OEM spark plug wires have a tendency to fail under heavy load, especially in hot weather. This should not be a problem in March, but if your plug wires have never been changed, buy a replacement set.
6. In multiples of 30K miles, the following should have been changed: Fuel filter, Air filter, Transmission fluid, Differential gear oil, and Spark plugs. If they haven't been done or it is getting close, help your Miata out be having them done prior to the event.

Improvements

1. As was indicated earlier, a Miata with factory settings will do just nicely on the track, BUT, if you are looking for more, here are some alignment suggestions that will make your Miata turn in quicker and stick better in the corners.

	Front		Rear	
	Camber	Caster	Toe	Toe
Stock	+0.3	4.5	3/16 toe in	-0.7
Mild	-0.5	3.5	0	1/8 toe in
Agressive	-1.0	2.5	1/8 toe out	1/16 toe in

Here is a quote from Merv:

First of all, let's talk about toe

Toe IN is POSITIVE. Toe OUT is NEGATIVE. Most cars have toe IN (in the front) and are not adjustable in the rear (unlike the Miata). Front toe in is safe, as it forces understeer. It also makes the car more stable at speed, but it's not optimum for serious, aggressive driving. Zero toe will make the car very neutral in a straight line. If you want all the speed you can get, this is it...minimum scrub. Toe out, on the other hand, generally loosens up the front end, allowing more crisp turn-in but the car skitish in long, high-speed sweepers. It requires more driver input and will generally give you the fastest cornering. In the rear, toe in keeps the rear tucked-in, while toe-out will make the car tail happy...fun, but definitely not what you want to go fast. Again, for straight line speed, zero is the way to go, BUT, the bushings flex. Under acceleration, this flex causes the rear to go slightly negative, so you need a little positive toe to end up at zero.Caster needs to be different for



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autocrossing and track events.

The numbers above are for track events. For autocrossing, just go for maximum caster. Autocrossers crank in as much caster as they can, because, in a turn, caster effectively adds camber. With slow, tight transitions, you need all the camber you can get. For track events, less caster gives you more control as you have to steer into and out of the corners. It also maintains a more linear camber than the autocross settings, which is more important in high speed corners where steering inputs should be smaller, smoother and slower. That said, let's compare alignment settings. I'm pulling the stock settings from memory, so I may be off a little. The mild settings will be better for performance driving with only slight degradation in tire wear. The aggressive settings are probably the most you will want on a street car and will wear out the tires more quickly. All of these numbers can be shuffled a little, for your driving style. Some people like more understeer, while others prefer oversteer. Hopefully the explanations will allow you to find a combination that works right for you. One other thing, the M2 has a slightly wider track and more caster from the factory. This allows the M2 to handle as well with less aggressive settings than a M1 with more aggressive settings.

2. Now that we have helped the suspension work better, let's help the tires by changing air pressure. Recommended factory tire pressures are fine for normal driving for ride and tire wear. For track events, it is necessary to increase pressures to give the sidewalls more support under high-G side loads that are experienced in the corners. Generally, the lower the profile of the tire and the wider the width, the less pressure that is needed. Suggested pressures will be with cold tires. You can expect an increase of 4-8PSI during aggressive track driving. Starting with a stock size tire of 185/60-14, we recommend 34PSI. The next common size (standard on 99 leather and sport packages) is 195/50-15, which is both shorter and wider, works well at 30PSI. A 16" wheel will need just slightly less pressure. As you go to really big wheels, the side walls get so short that the danger of rim damage overrides logic, and pressures tend to increase (no recommendations here!), the tires wear quickly in the center, and adhesion suffers.
3. Increase ignition timing to fourteen degrees. This cannot be done on a 99 and later Miata. It may be necessary to increase the octane rating of gasoline if the engine 'pings' with this change.
4. Switch to performance brake pads and high temperature brake fluid. This will cause more brake dust, and more rotor wear, but will give more consistent braking in shorter distances.
5. Change all fluid to synthetic. This includes engine oil, transmission fluid, and differential gear lube.
6. Change air filter to a free-flowing performance type.
7. Add a roll bar. This is a personal safety item, and we would recommend that anyone who is serious about driving their Miata at the limits should install one.
8. Along with a roll bar, never without one, add a 5 or 6 point harness. This prevents undesirable slipping and sliding in the seat and ultimately increasing control, not to mention the safety issues.

At the track

By this time, there isn't much else to do to get ready for your track sessions, so we'll just finish up with some general stuff. Hopefully, you remembered to stop and fill up the gas tank on the way.

1. Empty the trunk, glove box, console, and cockpit of everything that isn't bolted down, including floor mats. The spare tire and jack are extra weight, so take them out also.
2. Remove the center caps on the wheels.
3. Torque the lug nuts to 80lb-ft.
4. Increase tire pressures as noted above. Air is available in each of the garages.
5. If you're driving a 99 or newer, it's a good idea to put some protective tape over the headlights. They are expensive to replace and someone could throw a rock your direction.
6. Put your color group sticker on your windshield in the upper left corner and add your numbers on each side.
7. Now relax and wait for the drivers meeting. The next two days are going to be an experience you won't soon forget!



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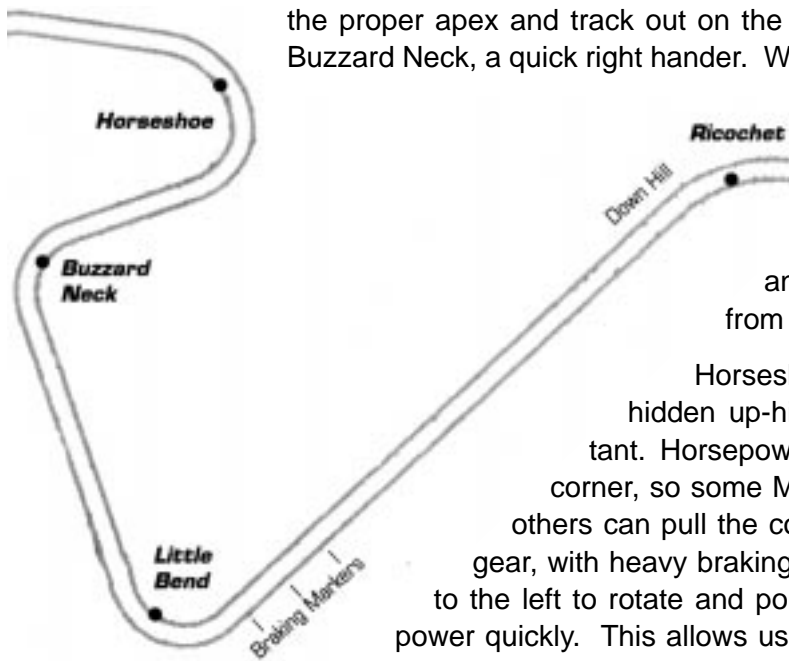
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A Miata Hot Lap at Motorsport Ranch

As we exit the hot pit in a counter-clockwise direction, we check back over our left shoulder for traffic coming through Rattlesnake (the esses). The track is clear, so we enter the course on the far right edge of the track and roll on the power in second gear. Halfway through this one hundred and eighty degree turn that we call Wagon Wheel, we aim for an apex on the left side of the track just about the point where the elevation begins to increase. We are also nearing redline, so we shift to third gear while still in the turn. Now we let the car drift completely out to the right edge of the track just before the top of the hill. We crest the hill, continuing to accelerate, staying on the right edge to set up for Ricochet.



Ricochet is a fast downhill left sweeper leading on to the back straight. The entry is blind until the secondary elevation change down the hill, where we up-shift to fourth gear to get the car settled before turn-in. It appears that Ricochet is off camber, but with a slightly late apex, we track out far down the hill just as the track flattens out. Depending on tire grip, a slight lift of the throttle may be necessary to help the car turn in, but with 'R' tires, the right foot stays planted and the drop in elevation allows us to accelerate quickly down the back straight. Hard on the power, we begin a smooth transition to the left side of the track, looking for the braking markers before Little Bend. Our braking begins just past the second marker and ends with a downshift to third just before turn-in which is deep into the corner. We trail brake a couple of car lengths into the corner, then begin rolling into the power as we aim for a very late apex, about three-quarters down the curbing. Being the long corner that Little Bend is, it is easy to early apex this corner and find ourselves dirt-tracking off drivers left. Having been there a few times, we now clip the proper apex and track out on the left edge where we will stay for the entry into Buzzard Neck, a quick right hander. We can't see Buzzard Neck until we crest a small rise in the track, about one hundred yards before turn-in, so it is very important to be on the left edge of the track. We brake slightly on the entry, wanting to carry as much speed as possible. Track out all you need to the left and then smoothly move right about a car length from the left edge for entry into Horseshoe.



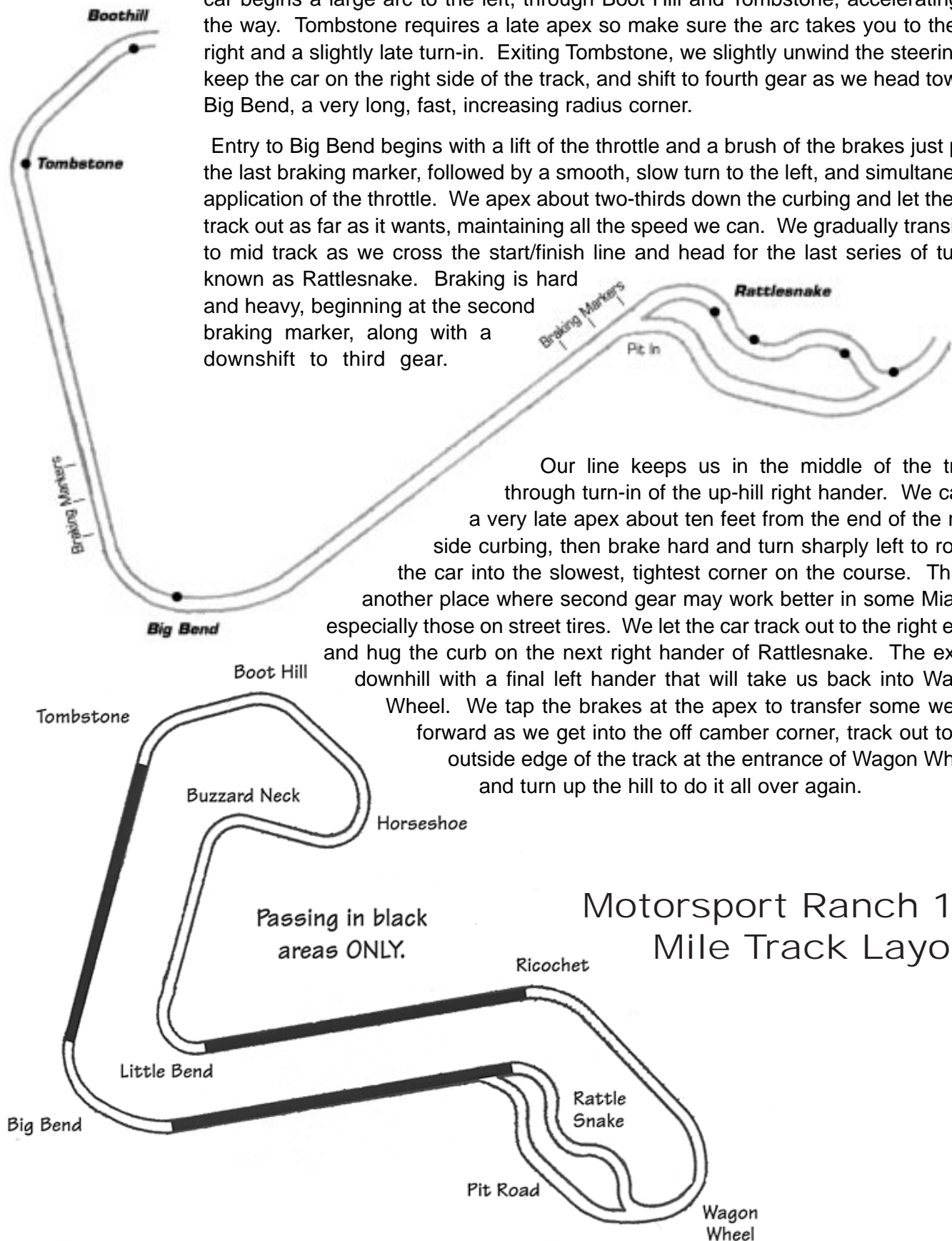
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Horseshoe is a significantly off-camber corner with a hidden up-hill track out, where speed is extremely important. Horsepower, torque, and grip determine the entry into this corner, so some Miatas will do well to drop to second gear while others can pull the corner in third. We will enter the corner in third gear, with heavy braking early into the corner, followed by a sharp turn to the left to rotate and point the car toward the inside curbing, applying power quickly. This allows us to clip an apex just about the point the elevation begins to increase. We hold the inside line almost to the crest of the hill, at

which time we allow the car to begin to track out slightly. Had we allowed the car to track out immediately after the apex, we would have found ourselves on the right edge of the track at the crest of the hill, heading for the dirt! We are still in the turn and can now see the track ahead. With minimal steering input, the car begins a large arc to the left, through Boot Hill and Tombstone, accelerating all the way. Tombstone requires a late apex so make sure the arc takes you to the far right and a slightly late turn-in. Exiting Tombstone, we slightly unwind the steering to keep the car on the right side of the track, and shift to fourth gear as we head toward Big Bend, a very long, fast, increasing radius corner.

Entry to Big Bend begins with a lift of the throttle and a brush of the brakes just past the last braking marker, followed by a smooth, slow turn to the left, and simultaneous application of the throttle. We apex about two-thirds down the curbing and let the car track out as far as it wants, maintaining all the speed we can. We gradually transition to mid track as we cross the start/finish line and head for the last series of turns, known as Rattlesnake. Braking is hard and heavy, beginning at the second braking marker, along with a downshift to third gear.

Our line keeps us in the middle of the track through turn-in of the up-hill right hander. We catch a very late apex about ten feet from the end of the right side curbing, then brake hard and turn sharply left to rotate the car into the slowest, tightest corner on the course. This is another place where second gear may work better in some Miatas, especially those on street tires. We let the car track out to the right edge and hug the curb on the next right hander of Rattlesnake. The exit is downhill with a final left hander that will take us back into Wagon Wheel. We tap the brakes at the apex to transfer some weight forward as we get into the off camber corner, track out to the outside edge of the track at the entrance of Wagon Wheel, and turn up the hill to do it all over again.



Motorsport Ranch 1.7 Mile Track Layout



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Driver Education Technical Inspection

Driver's Name _____ Car Color _____

Year _____ Car number _____

In consideration of my participation in this event for myself and any additional drivers, I have checked the following items and certify that they meet or exceed the requirements. I agree to indemnify and hold harmless the organizers of this event, or their agents, with respect to responsibility for the condition and preparation of my car, or any subsequent mechanical failures or resulting damage to my car and for injuries to its occupants as a result, direct or indirect, of any such failures. I acknowledge that at all times I remain solely responsible for the safety and road-worthiness of my car, and that I am not relying on this inspection as the sole or primary basis for deciding to enter this car in this event.

INITIALS		Item(s) Inspected
DRIVR	INSPECT	
_____	_____	Helmet – Snell rated M or SA current or last date certificate, no cracks; chin strap in good condition.
_____	_____	Roll Bar – Mandatory for White or Red run groups.
_____	_____	Seat Belts -- minimum, factory shoulder harness in both seats for instructed groups; belts not frayed
_____	_____	Structural Integrity – no loose body or interior parts; no structural rust at or near suspension points
_____	_____	Windshield – no cracks, condition does not impair vision; functional wipers and blades in good condition
_____	_____	Mirrors – minimum of single mirror in good condition
_____	_____	Gas Cap – proper seal and venting; tightly closed; no leakage
_____	_____	Fluids – NO DRIPPING LEAKS of any fluid of any type; appropriate levels and proper fluid types
_____	_____	Fluid Lines – proper fittings and line condition; no external clamps used on pressurized oil lines
_____	_____	Battery – properly secured; no battery box corrosion; positive post cover, or contained within complete box
_____	_____	Throttle Return – freely operating and proper spring(s); proper adjustment for full throttle range
_____	_____	Engine – proper exhaust in good condition; general condition of engine and accessories
_____	_____	Belts – in good condition with proper tension
_____	_____	Electrical – good overall wiring condition
_____	_____	Brakes – rotor and pad condition; recommend that pads be new or near new to start event, 40% minimum
_____	_____	Brake Fluid – system flushed WITHIN LAST 6 MONTHS; proper fluid level; premium fluid recommended ** Date of last flush: ___/___/___
_____	_____	Brake Lights – functional and visible brake lights
_____	_____	Pedals – good condition, with proper pedal pads for grip
_____	_____	Tires – general good condition; no cracks, cuts, cords or blisters; speed rated; sufficient tread thickness for tire type and use; proper inflation
_____	_____	Wheels – no cracks or flaws; all lug nuts properly torqued; hubcaps removed. Check non-OE wheels often!
_____	_____	Wheel Bearings – proper free rotation; no looseness in hub
_____	_____	Front Suspension – no excessive play; ball joints and tie rods secure; boots and all seals in good condition
_____	_____	Rear Suspension – Boots in good condition; mounting hardware in good condition
_____	_____	Steering – proper movement and response; no excessive free play
_____	_____	I hereby declare and certify that I have no physical conditions that could jeopardize others or myself if I participate in this event.

ALL OF THE ITEMS ON THIS TECHNICAL INSPECTION SHEET HAVE BEEN INSPECTED OR SERVICED AS NECESSARY TO MEET THE MINIMUM STANDARDS SET FORTH HEREIN. THE TECH INSPECTOR'S SIGNATURE BELOW DOES NOT IMPLY COMPLIANCE WITH THE ABOVE. IT SERVES ONLY AS WITNESS TO THE DRIVER'S SIGNATURE THAT WARRANTS COMPLIANCE.

Tech/Dealer

Driver's Signature _____ Date _____

Inspector's Signature _____ Date _____

1/00

Stamp Here

(Thanks to the Maverick Region of the Porsche Club of America for their help in providing this tech form.)



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Directions and Accomadations

Directions to Motorsport Ranch

From Dallas/Fort Worth

South to I-20
West to Benbrook
South on Highway 377 to Cresson
One mile past Hwy 171 intersection (stop light),
turn left into MSR

From Houston:

North on I-45 to I-20
West to Benbrook
South on Highway 377 to Cresson
One mile past Hwy 171 intersection (stop light),
turn left into MSR

From Austin:

North on I-35 to Hillsboro
North on Hwy 171 through Cleburne, to Cresson
One mile past Hwy 171 intersection (stop light),
turn left into MSR

From San Antonio:

North on HWy 281 to Stephenville
Northeast on Hwy 377, through Granbury to Cresson
Just as you enter Cresson (end of divided Hwy),
turn right into MSR

From Points North:

South on I-35,
taking the west brach in Denon (I-35W)
Follow Dallas Fort/Worth directions

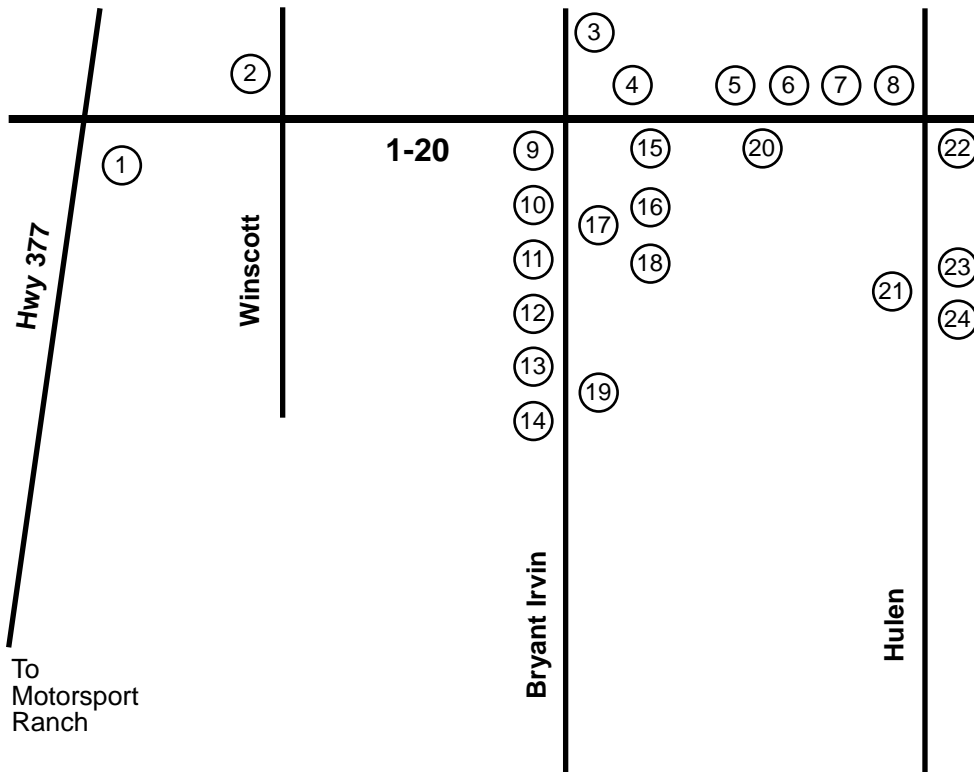
From Points West:

East on I-20
South on Hwy 377 to Cresson
South on Highway 377 to Cresson
One mile past Hwy 171 intersection (stop light),
turn left into MSR

From Points East:

West on I-20 or I-30
Follow Dallas/Fort Worth directions

Benbrook Area Accomadations



1. Motel 6
2. Cracker Barrel
3. On the Border
4. Mimi's Cafe
5. Chef Chen
6. Tai's
7. Olive Garden
8. TGI Fridays
9. Black Eye Pea
10. Outback
11. Razooks
12. Lone Star Oyster Bar
13. La Quinta
14. Hillard MAZDA
15. Saltgrass Steal House
16. Holiday Inn Express
17. AmeriSuites
18. StudioPlus
19. Cousins BBQ
20. Hampton Inn
21. Colter's BBQ
22. JoJo's Resturant
23. Red Lobster
24. Bennigans