

Southern California Timing Association / Bonneville Nationals Inc.

SOUTHERN CALIFORNIA



TIMING ASSOCIATION



Rookie Orientation Booklet Bonneville

INTRODUCTION

Welcome to Land Speed Racing!

Racing at Bonneville takes place in August and October at the Bonneville Raceway – an expanse of flat salt located on Highway 80, near Wendover, Utah. There are up to four courses available, depending on weather conditions; two 3 and 5 mile combination courses, a 3 mile short course and a one mile course for Rookie and licencing runs. To run there, membership in either SCTA (Southern California Timing Association) or BNI (Bonneville Nationals Inc.) is required. Pre-Entry forms are available for Speed Week, which is held in August around March, with the pre-entry cut off early May. Exact dates are available from the SCTA / BNI web site.

Our racing boundaries are clearly defined by cones and signs and are patrolled by SCTA volunteers to ensure members of the public remain outside the dangerous areas (where the racing is taking place). Race vehicles are restricted to the race course and must be towed everywhere else.

The SCTA and BNI organizations are made up of volunteer members who have a love of racing and are prepared to put in large amounts of time to make it happen for everyone. It is a close-knit community that is dedicated to making racing safe and enjoyable for everyone who wants to try their hand at it.

*Please remember that everyone needs to own and read the current Southern California Timing Association Rule Book. **This publication serves only as a training guide.***

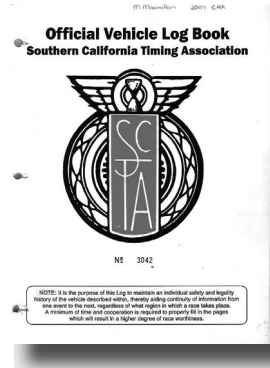


YOUR FIRST RACE

After much blood, sweat and tears (not to mention money) you will be prepared for your first race as a rookie. Many rookie drivers are indoctrinated by more established race teams, while others come to the salt with a new car and new drivers. Below is a list of items you need to have or be prepared to get:

Logbook

New logbooks are available for purchase at the Registration trailer for \$10. You must have a logbook to go through tech inspection. The serial number of this book is also stamped on a sticker which is placed on the roll cage of the car, or frame of the motorcycle, ensuring that important information can be recalled. An example of a few important pages in the logbook can be found in Appendix A of this booklet.



Tech Inspection

Tech inspection is carried out by experienced volunteers who use a checklist to help you ensure your car / bike meets minimum SCTA standards. For a new vehicle or one that can exceed 200 mph, two inspectors are required to check the car out. Bailouts are also done at this time.



Photos Compliments of Larry Ledwick Blackhorse photo

Driver's/Rider's Gear

Drivers/Riders must have all their safety gear available for inspection during tech. During this time SFI tags, expiration dates and specifications are examined to ensure all equipment is safe and appropriate for the speeds you plan to do. Fire bottles and other safety equipment is also checked at this time.

You should make sure you have the following items for inspection:

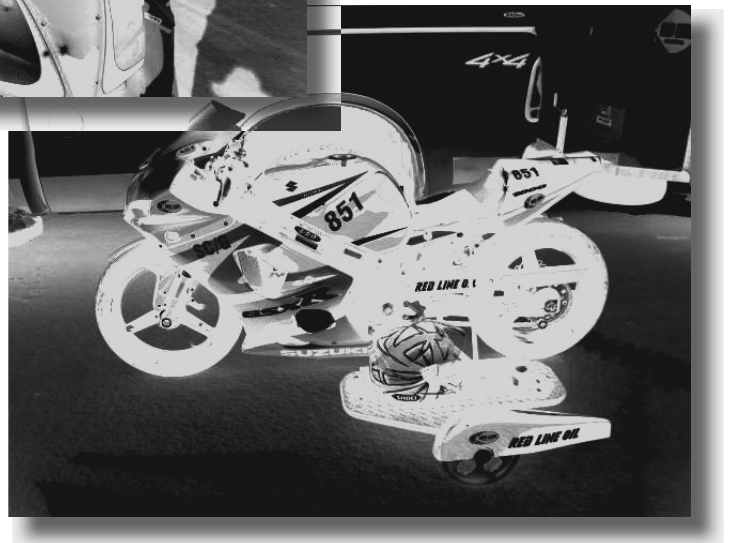
- Fire bottles in push truck
- CB Radio in push truck

Car Driving Apparel

- Racing suit
- Helmet
- Gloves
- Racing boots
- Head sock
- Head and neck restraint

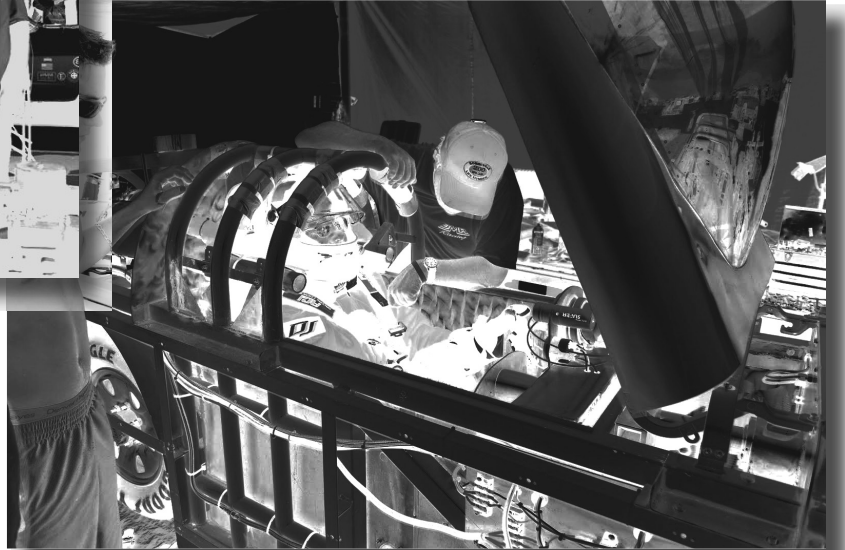
Motorcycle Riding Apparel

- Rider's Helmet
- Leathers
- Boots
- Gloves



Bailouts

Every new driver must complete a bailout to prove that they can safely exit the vehicle in a timely manner. This is done fully suited up (with race suit, gloves, boots, helmet and neck restraint device on) and fully belted in. The driver must demonstrate their knowledge of the fire system, parachute release and other safety related equipment appropriate to the vehicle. They also must show that they can reach every important system, with all the belts done up. It is a good idea to practice this process a few times before going to inspection.



Registration Trailer

After having successfully completed tech inspection you take all your paperwork to the registration trailer. There you will receive your inspected sticker that will go on the window of your vehicle or on some visible surface of your motorcycle. You will not be permitted to race without one – so don't lose it! At this point you also hand over your completed Medical Form and sign a waiver that allows you to get your driver's wristband. Other team members will also have to sign the waiver and get wristbands also. Team members are issued a red band, drivers, a yellow.



Photo Compliments of Larry Ledwick Blackhorse photo

ROOKIE ORIENTATION

Rookie Orientation takes place on the first day of competition (and at 11am each day of racing after), directly following the Drivers Meeting, which is held at the start line in-between Course One and Two. An experienced driver gives the orientation and will hand out course maps. All rookie drivers and crews **MUST** attend this meeting and bring with them a tow vehicle with a working CB radio. After the initial meeting, crews will drive down the course with the Rookie Director, who will conduct some of the meeting via the CB radio and point out important course features. Crews will be able to familiarize themselves with the mile markers, turn out areas and the return road. Under direction of the Rookie Director, Rookie crews may watch more experienced drivers/riders make some initial passes from a safe area and learn where to pull parachutes and where to stop after a pass. At the end of the meeting, drivers are given a rookie sticker, which is affixed to their helmet. This is so the starter is aware that you are a rookie driver and coaches you as needed. Regardless of SCTA license held, Rookie drivers/riders at the salt, are required make a first run under 150 mph. Any exceptions will be at the discretion of the Race Director, Rookie Director and/or the appropriate Tech Chair or Chief Inspector and will be considered on a case-by-case basis. Rookie drivers/riders may qualify for a record on their rookie run if the existing record is less than 150 mph and ALL rookie run requirements are met.



Photo Compliments of Larry Ledwick Blackhorse photo

TOPICS THAT WILL BE COVERED ARE:

Course description

There are up to four courses (salt conditions permitting); two 3 and 5 mile combination courses, one dedicated 3 mile course and one 2 mile course for rookie, licensing and test/tune runs. The track is 100 feet wide with a 2 to 3 mile shut down area depending on the length of course you are on. All rookies runs will be made on the 2 mile course. The long 5 mile courses have timed miles from the 1 to the 2 mile, the 2 to the 3 mile, the 3 to the 4 and the 4 to the 5 mile plus a final timing light for exits speeds, which don't count for records. The short 3 mile course is timed from the 1 to the 2 mile and the 2 to the 3 mile. Slower vehicles running on the short course do not have to run all the way to the 3 mile and may exit the course after the 2 mile if they've reached their maximum speed at this point. The 2 mile course has one timed mile from the 1 to the 2 mile with a 1 mile long shut down area. All full length courses have a timing light at the 2 ¼ mile. In order to qualify to run on the long course, you must go at least 175 mph at the 2 ¼ mile on the short course.

Large orange marker signs with the mile marker painted on them mark miles on the course. Blank smaller orange signs are at every 1/4 mile. The return roads are marked with the smaller sized black signs. On the short course, all drivers turn off after passing through the 3-mile mark.

Drivers Meeting

Driver's meeting takes place at 9am on the first day of racing at the start line in-between Course One and Two. All drivers and crew members have to attend. Information about course conditions and event organization is given at this time.

Crew Preparation

Role – The crew's job is to prepare the driver/rider and the race vehicle for a safe pass. It helps to go over everyone's roll, before getting up to the line.

Jobs may include:

- Crew Chief (organizes everyone else),
- Dressing the driver / rider
- * Strapping the driver in (includes wrist restraints)
- Warming up the car or motorcycle
- * Pulling the fire bottle and parachute pins (always show the driver the pulled pins)
- * Putting up the window net
- Providing shade for the driver / rider
- * Cleaning the windshield



Driver / Rider Safety

Very Important! Some teams have a checklist of things that must be completed prior to a pass.

These could include:

- Driver / Rider gear - do you have it all?
- Leathers have button to prove they have been checked at tech inspection (motorcycles only)
- Kill switch lanyard is present (motorcycles only)
- * Checking restraints - are they the correct length? Can they be tightened sufficiently
- * Checking arm restraints - do you have both (2) of them - one for each arm?
- * Ensuring driver can reach everything in cockpit with all restraints tightened.
- * Fire pins, parachute pins - who is in charge of pulling the pins?
- Going over instructions / procedures - is the driver/rider sure which way to turn out?

*Specific car items

Driver/Rider Comfort

Sitting in a hot car in a fire suit, or in the sun in black leathers isn't comfortable. Provide an umbrella or some sort of shade.

Driver/Rider Instructions

Driving/riding a race vehicle at high speeds for the first time is stressful and there is a lot to remember. Go over the instructions and procedures with your driver/rider multiple times. Make sure they know which way to turn out in an emergency and which way to turn out for a normal run. Be aware, that due to the layout of the courses, this can change from course to course. If in doubt, ask the starter or line steward.

Equipment

- Fire bottles – ensure all safety pins are pulled (check bottles for secondary pins) *
- Parachute – ensure parachute safety pin is pulled – the driver will activate the chute when they cross the finish line.*
- Working CB radio in tow vehicle – make sure it is tuned to the correct channel (1 or 10)
- Fire Extinguisher in tow vehicle
- Tool box in tow vehicle – be sure to include Dzeus tools if appropriate.
- Other essential items may include: Windshield cleaner, cloths, duct tape, zip ties
- Cold Water - for your driver and crew!



Line procedure

As a rookie, you will line up on Course Four or a specifically designated course. You will be told which course to use at Rookie Orientation. When your vehicle is 3 back from the starting line, be ready to get into your car – fully strapped in and ready to go. If you are a motorcycle rider, be in your leathers with your helmet on. It is beneficial to spend LOTS of time sitting in/on your race vehicle getting familiar with the systems. Try finding everything with your eyes closed!



Rookie Pass – Driver and Crew

As a rookie, you need to make a clean pass below 150 mph. A clean pass means that you followed the Starter's orders, went through the timing lights, pulled the chute (if your race vehicle requires a parachute), kept the race vehicle straight and stopped on the course side of the return road. Your crew is also under scrutiny; that they left the starting line, turned to the non-emergency side of the course and drove down the return road, keeping to the speed limit. They then met you, and towed you back along the return road, at the speed limit. Rookie drivers/riders may qualify for a record on their rookie run if the existing record is less than 150 mph and ALL rookie run requirements are met. To qualify as a first pass of a record run, the above requirements **MUST** be met and signed off **FIRST**.

DRIVING THE COURSE

Where to go?

The Starter will initially call your race vehicle's number into the tower. When the clear course message is received, the starter will indicate to the driver / rider that they are to close their helmet visor. The starter will then



indicate to the driver/rider that they may proceed down the course from the starting line. The race vehicle then goes down the course, keeping within the orange markers.

How to stop

As a rookie driver, you **MUST** pull your parachute (if you have one) when you cross through the indicated mile marker. The parachute safely slows the car, without relying on the brakes. It also prevents the course from



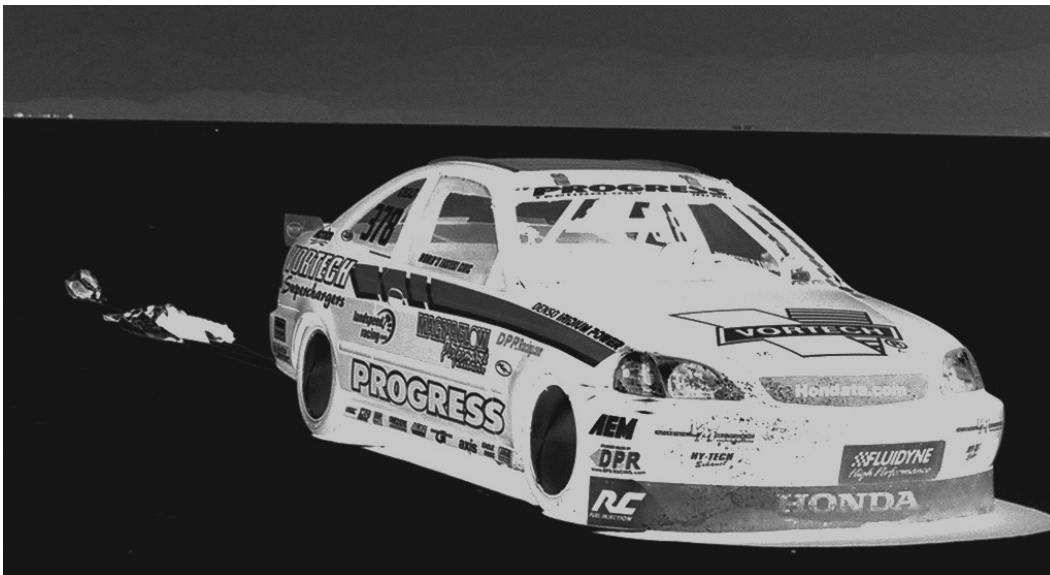
getting cut up. As a motorcycle rider, you must come slowly off the throttle after crossing the indicated mile marker before turning to the non-emergency side of the course.

Where to stop

When the race vehicle is slowed down sufficiently, it then turns off the course to the non-emergency side. The race vehicle comes to a stop inside the line marked by the black signs that indicate the return road. Be careful to stop away from other race vehicles as you don't want to run over their parachutes, have them run over yours or in the case of motorcycles, run over you!

What next

After stopping, exit /dismount the race vehicle and have a look around to make sure everything is ok. You are looking for fluids that shouldn't be there, parts that may have come off, tires that are flat and holes that weren't there when you started. If you do notice something, call it in on the CB Radio, or tell a patrol ASAP! The course will have to be stopped and swept for parts. If nothing is amiss, gather up your parachute (if in a car) and your



helmet etc. and wait for your tow vehicle.

EMERGENCIES

What could go wrong?

Many things can go wrong with a run and not all of them are emergencies. If in doubt, turn to emergency side of the course. Safety crews are watching and will come out to help.

Fire

In the event of a fire it is important to stop safely, shut off your engine and activate your fire system. Turn out to the emergency side of the course. Safety crews will come out and help put out the fire.

Engine blows up

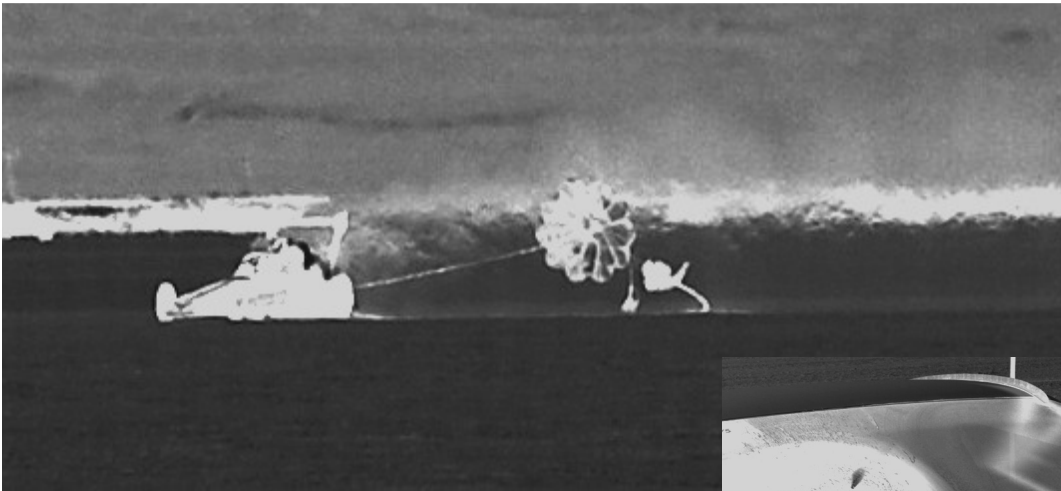


Photo Compliments of Larry Ledwick Blackhorse photo



Losing an engine may also cause a fire, in addition to leaving parts on the course. Turn out to the emergency side of the course. The course will also have to be swept for parts.

Lose control

Spin – Pull the parachute (if in a car) and stop safely as soon as possible. Your vehicle will be yellow tagged and you must prove that corrective action has been taken before being allowed to race again.

Can't control car/bike – stop in the safest manner possible. Don't worry about not getting off the course – stop safely.

Can't see the course

If at any time you can't see the course it is your responsibility to come to a stop safely. This may include stopping in a straight line on the course.

Obstruction

Problems have included drivers who can't see over the steering wheel, salt storms that effect vision and things covering the windshield. If you can't see pull the parachute (if in a car) and stop!

Race vehicle isn't running right

Unfortunately if the race vehicle isn't running right, going faster won't fix it. Pull the parachute (if in a car) and turn out to the non-emergency side of the course before the finish line. You will have an opportunity to get in line and try again. This leaves the course clear for the next people in line behind you.

Race vehicle feels strange

This may be a case of inexperience or something may indeed be wrong. If in doubt, pull the parachute (car only) and turn out to the non-emergency side of the course before the finish line and get some help. There are many experienced drivers who would be happy to help if you are unsure.

Motorcycle Specific Issues

- Tire spin at high speed can and will cause tire failure
- Stopping should be done cautiously and smoothly. Using the brakes too harshly can cause a loss of traction and control.
- Sitting up in the wind to slow down, can cause a loss of control.

WHAT DO I DO NEXT?

Licensing Runs

While competing as a rookie driver / rider, you are able to work through your licensing levels, under the close supervision of the Rookie Director, Tech Inspectors and Chairs, Race Director and Starters. The licensing levels are in your rule book. Any deviations will be at the discretion of the Race Director, Rookie Director and/or the appropriate Tech Chair or Chief Inspector and will be considered on a case-by-case basis. After running at the prescribed speed and making a clean run, you then take your timing slip to the Starter who saw you off and ask



nically if they would sign your timing slip. This slip is then taken to Licensing Official located near the Tech Inspection area, who will issue your license for that speed level. Motorcycle riders take their signed timing slip to Motorcycle Tech Inspection first and then they will direct you where to go from there.

Records

After your rookie runs and licensing passes you are allowed to run against a record. A record pass is recognized if you run over the same measured mile, at a speed exceeding the official record, twice - a qualifying pass and a back up run. You may get a license level signed off at the same time as setting a record if you are really organized.

If you are lucky enough to qualify for a record, then your race vehicle will need to be towed to impound with your timing slip. On entry to impound, your details are recorded, as is your entry time, and the up to 4 hour time period begins. This time period allows you to make any modifications, repairs and maintenance needed before



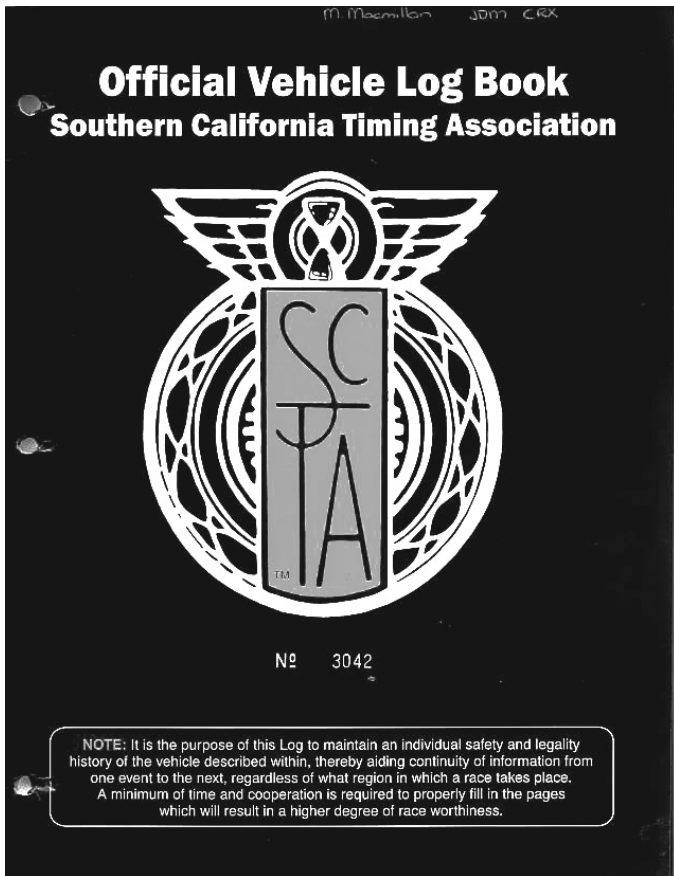
you certify the record on the second pass the next morning. The Record Certification Inspectors may look at fuel (if the race vehicle is in a gas only class), the timing slip and class compliance. Your race vehicle will remain in impound, on a tarp overnight. It is not allowed to come out of impound!

Back up runs

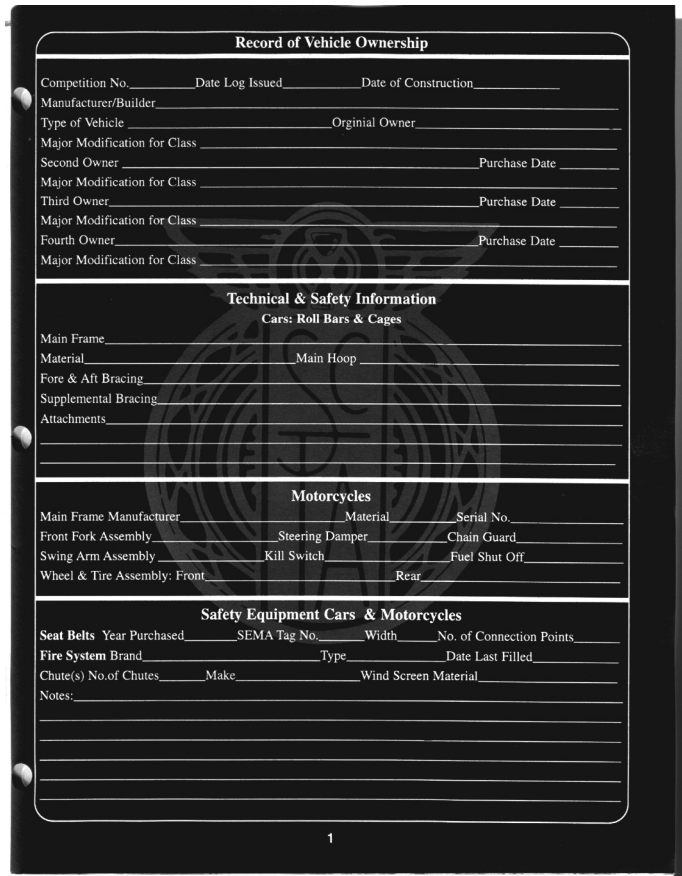
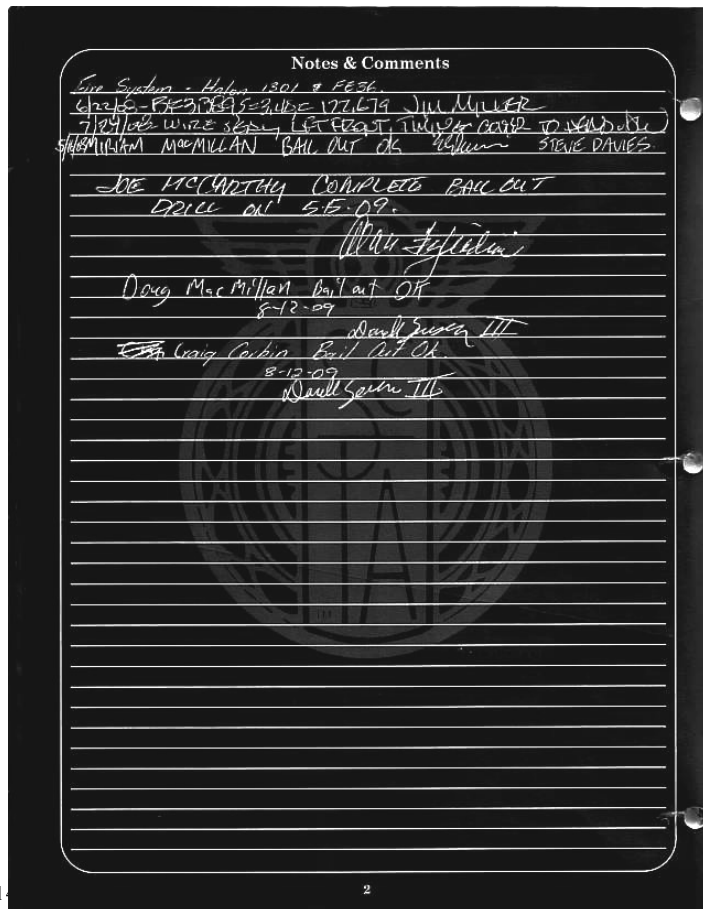
The salt opens at 6am. Crews with race vehicles in impound have about 30 - 45 min to prepare their race vehicles, for the supervised tow to the startline at 7am. Once there, they will split up to head to the various courses. If everything goes right, then your race vehicle will have once again broken the standing record, over the same measured mile as it ran the previous day. The crew will then tow the race vehicle back to Car Tech Inspection or Motorcycle Tech Inspection, where the Race Vehicle Certification Officers will check the seal on the fuel tanks and measure the fuel (in the gas classes), measure the engine's capacity and check the race vehicle for class



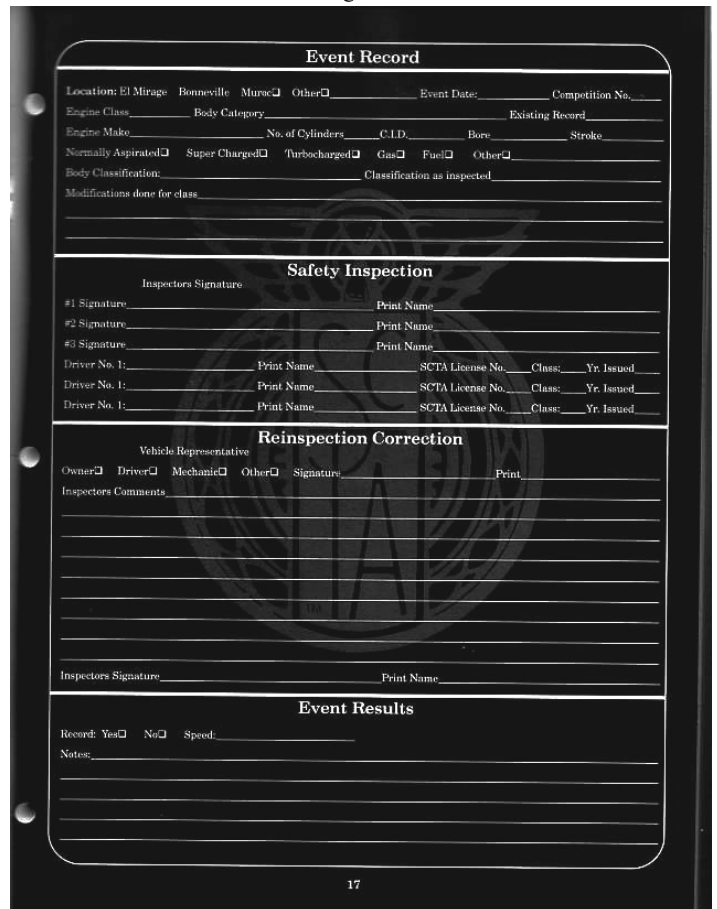
APPENDIX A



The below log book pages show the record of drivers who have done bailouts in this car.



The above page shows where the record of ownership and commonly used vehicle codes go. The below page is a blank event record which must be filled in for each event or class change.



APPENDIX C - SPEED CALCULATIONS

RPM/Speed Calculations

For Motorcycles

$$RPM = \frac{SPEED \times 336 \times PRI \times GEAR \times \frac{BIG}{SMALL}}{DIA}$$

RPM = engine speed

SPEED = vehicle speed in MPH

PRI = primary drive ratio (between crankshaft and clutch)

GEAR = transmission gear ratio (1.33, 1.00, etc.)

BIG = tooth count of big (rear) sprocket

SMALL = tooth count of small (front) sprocket

DIA = drive tire diameter in inches

Example: What engine speed is required to go 140 mph on a 2006 Kawasaki ZX-14 with a 25" tall rear tire in 5th gear?

Primary Drive Ratio = 1.54:1

5th Gear Ratio = 1.15:1

Big Sprocket = 41 teeth

Small Sprocket = 17 teeth

$$RPM = \frac{SPEED \times 336 \times PRI \times GEAR \times \frac{BIG}{SMALL}}{DIA} \longrightarrow RPM = \frac{140 \times 336 \times 1.54 \times 1.15 \times \frac{41}{17}}{25}$$
$$RPM = \frac{200919}{25} \longrightarrow RPM = 8037$$

RPM/Speed Calculations

For Cars/Trucks

$$RPM = \frac{SPEED \times 336 \times GEAR}{DIA}$$

RPM = engine speed

SPEED = vehicle speed in MPH

GEAR = final drive gear ratio (2.50, 3.30, etc.)

DIA = drive tire diameter in inches

Example: What engine speed is required to go 140 mph with a 3.00:1 final drive ratio and 27" tall rear tires?

$$RPM = \frac{SPEED \times 336 \times GEAR}{DIA} \quad \longrightarrow \quad RPM = \frac{140 \times 336 \times 3.00}{27}$$
$$RPM = \frac{141120}{27} \quad \longleftarrow \quad RPM = 5227$$
$$\quad \quad \quad \longrightarrow$$

****NOTE**** The above example assumes a 1:1 final transmission gear. If using overdrive transmission, multiply final drive ratio by transmission overdrive ratio to get effective final gear.

Example: What engine speed is required to go 140 mph with a .75:1 overdrive, 3.50:1 final drive ratio and 27" tall rear tires?

$$RPM = \frac{SPEED \times 336 \times GEAR}{DIA} \quad \longrightarrow \quad RPM = \frac{140 \times 336 \times (3.50 \times .75)}{27}$$
$$RPM = \frac{123480}{27} \quad \longleftarrow \quad RPM = 4573$$
$$\quad \quad \quad \longrightarrow$$