URAL®

HOW TO RIDE

FIND OUT HOW TO RIDE THE CLASSIC URAL MOTORCYCLE

USE THE NAVIGATION ON THE LEFT TO LEARN CHAPTER BY CHAPTER ON HOW TO RIDE THE URAL



RIDE A TRUE CLASSIC

RIDE THE URAL!

URAL®
CLASSIC SIDECAR MOTORCYCLE

Introduction

Motorcycle enthusiasts have been attaching sidecars to their machines since about 1895. Motorcycle/sidecar combinations are alternatively referred to as "rigs," "hacks," "chairs" or "outfits." While combinations continue to be only a small minority of motorcycles worldwide, sidecars are still being built and attached to today's motorcycles. There are probably more outfits on the road than ever before. There are all sorts of sidecar rigs in operation, including some that lean into corners and some with steerable sidecar wheels. But the majority of sidecar rigs are straightforward three-wheelers built by attaching a sidecar rigidly to a motorcycle.

The URAL motorcycle/sidecar combinations have been built with the same basic frame arrangement for 55 years, although the operating systems have gradually been refined. There are two basic URAL sidecar combinations, one with a single driven rear wheel and a similar model with both the rear and sidecar wheels shaft-driven. Throughout this manual we will point out differences in handling and operating techniques for the different models.

The most important lesson about motorcycle/sidecar combinations is that the resulting three-wheeler is neither a motorcycle nor an automobile, but an entirely different vehicle with very different operating characteristics. Even the veteran motorcyclist with hundreds of thousands of miles of three-wheeled experience becomes a novice when learning to pilot a hack for the first time.

Scope

The purpose of this manual is to assist the novice sidecar operator to learn how to drive a combination on the street. The manual includes both explanations of basic sidecar riding techniques and driving exercises the novice can practice to gradually build skill.

For the benefit of those with no prior motorcycle experience, the first lesson starts with a description of motorcycle controls, followed by novice practice exercises on the machine. Subsequent lessons describe strategies for driving in traffic, followed by exercises to help build more advanced sidecar handling skills.

The focus of this manual is on operating skills. It does not cover topics such as how to attach a sidecar to a motorcycle or sidecar alignment specifications. For purposes of this manual, it is assumed that the novice has a sidecar combination available to use for practice.

This manual applies only to URAL motorcycle/sidecar combinations with the sidecar mounted on the right-hand side. The operation of both single-wheel-drive and dual-wheel-drive URAL sidecar combinations is explained.

Training Considerations

While lots of new owners have taught themselves to drive a sidecar outfit, the techniques for handling a rig are complex enough that you are encouraged to take a sidecar operator course if one is available. It is much better to learn under the guidance of an experienced instructor who can coach you through the exercises and help you learn good habits.

This manual may be used by sidecar instructors as a curriculum guide. The general layout of the manual is similar to other "learn-to-ride" training courses.

Teaching yourself

If you choose to teach yourself, using this manual as a "do-it-yourself" course of instruction, be aware that we cannot guarantee your safety. This information is presented as a public service to assist you in learning, based on the best information available. It's up to you to put it into practice. Study the lessons carefully, paying special attention to notes, cautions and warnings.

Notes remind you of details of particular importance.

Cautions indicate a possibility of damage to the vehicle.

Warnings mean there is the possibility of personal injury to yourself or others.

If you have difficulty mastering the riding exercises, you are encouraged to take a formal sidecar operator course or seek the assistance of an experienced sidecar driver.

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Chapter 1

INTRODUCTION TO DRIVING THE URAL

A motorcycle/sidecar combination is neither a motorcycle nor an automobile, but an entirely different vehicle with very different operating characteristics. Even if you are a veteran motorcyclist with many of miles of experience, you should consider yourself a novice sidecar driver when learning to operate a combination. Most importantly, three wheelers steer "backwards" from two-wheelers. And, since motorcycle/sidecar outfits are not symmetrical, they accelerate and brake differently in left turns than in right turns. Cornering tactics include learning to balance the outfit on both three wheels and two wheels.

We cannot stress too much the importance of gaining knowledge and basic operating skills off-street before taking a sidecar rig onto the public roads. Even experienced motorcyclists are wise to master the basic skills away from traffic, to ensure that surprises don't turn into accidents.

HOW TO USE THIS MANUAL

This manual describes the physical dynamics of URAL sidecar outfits, the proper operating techniques, the mental skills needed to minimize the risks of operating motorcycle/sidecar combinations on the public roads and evasive maneuvers that may be needed to avoid collisions when riding in traffic.

If at all possible, you are encouraged to participate in a sidecar operator course, where a trained instructor can use this manual to coach you through the exercises. If you absolutely can't locate a sidecar course, at least try to find an experienced sidecarist who is willing to help. Your URAL dealer should be able to help you through this training or refer you to a local training course or help find a veteran sidecarist willing to assist you.

This manual is divided into lessons and riding exercises. Each lesson explains specific dynamics and operating techniques, followed by a series of riding exercises to practice the skills. The exercises build skill in steps, so each exercise must be mastered before progressing to the next exercise. The entire course of study and riding practice takes approximately 20 hours. The experienced motorcyclist should be able to master the skills in somewhat less time.

The layouts of the riding exercises are diagrammed in the back of this manual. Layouts are intentionally kept simple. Most of the exercises in this manual can be accomplished on a large "figure-8" layout. The actual dimensions are not critical, but learning will be more progressive if the paths of travel are well marked by either painted lines or temporary markers.

Brightly-colored tennis balls cut in half make excellent exercise markers.

REASONS FOR SIDECARS

Motorcycle/sidecar combinations are historic vehicles that suggest a more romantic time.

Sidecars have an inherent mystique that makes them interesting, even to people who might otherwise avoid motorcycles. And certainly owning a sidecar is a unique activity that not many people have experienced. But there are also some very practical reasons for driving a sidecar outfit.

ADVANTAGES OF SIDECARS

The unique advantage of a rigid three-wheeler over a two-wheeler is the inherent stability. A two-wheeler requires constant balance and the rider must support it when stopped. On treacherous surfaces such as oily pavement or gravel, a two-wheeled motorcycle can lose traction and fall down. In Russia, the URAL is a utilitarian commuting vehicle, even when roads are covered with snow and ice. The tricycle gear supports a sidecar outfit, so it doesn't fall over when stopped. The rig can slide sideways without falling down on poor surfaces, similar to an automobile. Unpaved roads or off-road situations that would be difficult to ride on a two-wheeler are quite manageable on a sidecar outfit. Yet, unlike the enclosed automobile driver, the sidecar operator can enjoy being out in the fresh air, just like any other motorcycle enthusiast.

Since a sidecar outfit doesn't need to be supported by the driver when it stops, people with physical limitations such as short legs don't have to be concerned with dropping the motorcycle at a stop sign. Those with physical disabilities are often able to operate a sidecar outfit even when it would be impossible or painful to handle a two-wheeled motorcycle. Some URAL outfits have had the controls custom altered to meet the physical needs of the operator.

Rigid sidecar "rigs" have more carrying capacity than the typical two-wheeled motorcycle. Carrying children in a sidecar is much less risky than carrying them on the back of an open motorcycle. The big advantage of a sidecar is that the occupants can't slip off should they momentarily forget to hang on, become fatigued or fall asleep while riding. Some family pets enjoy going for a ride in the hack.

Unlike most owner-assembled sidecar combinations, the URAL is engineered as a three-wheeled sidecar vehicle, with features such as a leading link front fork, a strong frame and permanently attached sidecar connections.

DISADVANTAGES OF SIDECARS

Of course, attaching a sidecar to a two-wheeled motorcycle has certain drawbacks. A sidecar rig is larger than a two-wheeled motorcycle, so it takes up more space when parked. The extra weight and wind resistance of the sidecar requires the engine to work harder than for a comparable "solo" motorcycle. Tire wear is greater. The steering geometry is different from a two-wheeled motorcycle, so it isn't practical to disconnect the sidecar and ride the motorcycle "solo". Experienced motorcyclists may not enjoy a rigid sidecar combination that doesn't lean into corners like a conventional motorcycle. And since sidecarists are such a minority of motorists, they must be rugged individualists capable of solving their own problems independently.

DIFFERENT TYPES OF SIDECARS

While the typical sidecar combination is simply a metal or fiberglass body supported on a frame attached to the side of the motorcycle, there are a surprising number of different

types of sidecars. The sidecar can have a flat utility platform or package box instead of a passenger body. Others may have just a rail for transporting another motorcycle, a bicycle, a wheelchair or a canoe. The URAL Tourist and Sportsman models have a large passenger body suitable for carrying passengers or pets. The Utility model has a large metal box for carrying cargo.

A sidecar can be mounted on either side of a motorcycle. In countries such as the US, where traffic drives on the right side of the road, sidecars are mounted on the right side of the motorcycle. In countries such as England, Japan and South Africa, where traffic drives on the left, sidecars are mounted on the left side. All URAL combinations imported to North America have the sidecar mounted on the right-hand side. The instructions in this manual only apply to the operation of a URAL with a right-hand mounted sidecar.

RISK AWARENESS

While sidecar outfits are more stable than two-wheelers, all motorcycles require a higher degree of concentration and application of driving skill than a typical automobile. The rider is exposed to both the elements and to potential physical injury. Unlike contemporary automobiles which can provide crash restraints such as seat belts or air bags, motorcycles offer little protection to the rider in the event of an accident. More importantly, sidecar outfits are narrower and less stable than automobiles and therefore require more skill to control.

IMPORTANCE OF EDUCATION, TRAINING

The only reliable tactic for avoiding injury while motorcycling is to avoid accidents. It is possible to gradually learn accident avoidance techniques by spending many years in the saddle, but there are many operating skills and accident scenarios which are not self-obvious. The novice sidecarist may not understand what is happening during a maneuver or may not possess the necessary control skills needed to avoid an accident. The best technique for quickly learning the fundamentals of sidecar operation is to follow a course of study, preferably a rider training course taught by a certified instructor who can provide individual coaching through the exercises.

RISK ACCEPTANCE

The novice sidecarist should understand that it is impossible to make any form of transportation totally "safe". We cannot take all the risk out of motorcycling, even sidecar operation. Each of us must accept responsibility for our choice of transportation, learn what the risks are and then take steps to manage those risks. If you intend to teach yourself to ride a sidecar combination without benefit of a trained instructor, be aware that we cannot guarantee success. Each lesson in this manual contains the best available information, but it is always possible to misunderstand important details. Study each lesson carefully before you try the subsequent riding exercise on the motorcycle. Most importantly, practice the exercises in the exact order presented. Do not skip any intermediate exercise. Spend sufficient time on each exercise to become really familiar with it. Advance to the next exercise only when you have mastered the current one.

PROTECTIVE GEAR

We highly recommend that the operator of a sidecar outfit wear the same protective gear as if on a two-wheeler. A speeding outfit can overturn, slide off the road or collide with another vehicle. As with a "solo" motorcycle, the sidecar operator is likely to be thrown off in an accident. To help protect yourself against possible injury, we recommend an approved helmet, tall leather boots with stepped heels, leather gloves and abrasion resistant jacket and pants.

We'll describe riding gear in more detail a little later on.

LEGAL RESTRICTIONS

State laws dictate licensing, mandatory riding gear and minimum motorcycle equipment for operation on the public roadways of that state. Each state has different laws. In general, all laws relating to two-wheeled motorcyclists apply to operators and passengers of motorcycle/sidecar combinations. Almost all states recognize a motorcycle/sidecar combination as a "motorcycle". The sidecar itself is not usually licensed or registered as a separate vehicle.

In most states, a motorcyclist is required to have a motorcycle license to operate any type of motorcycle on the public roads, whether a two-wheeler or a three-wheeler. The motorcycle license is usually an endorsement to the person's automobile driver's license. Some states require motorcyclists to take the riding test on a two-wheeled motorcycle, even if the license is for a sidecarist. Other states allow a driving exam on the sidecar, similar to an automobile test. A sidecarist intending to take the riding test on their sidecar outfit should make a specific request of the license examining office to determine local regulations.

Some states have mandatory helmet, eye protection and footwear laws which apply to both driver and the passenger in the sidecar. Even where helmets or eye protection are not required by law, we recommend wearing an approved helmet and shatterproof eye protection such as a plastic faceshield or riding goggles. Many states require both the headlight and taillight of the motorcycle to be turned on whenever the outfit is in operation, day or night.

You are advised to contact your state driver licensing office or motor vehicle department to obtain information about current motorcycle laws.

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Chapter 2 (Part 1)

THE URAL

The operating controls for the URAL are described in detail in the Owner's Manual. If you are **not** an experienced motorcyclist, it is important for you to understand the functions of each control and its location on the motorcycle.

If you **are** an experienced motorcyclist, but not familiar with the URAL, take the time to review the URAL controls and familiarize yourself with any that are different from your current machine.

THROTTLE

The engine **throttle** control is the right twist grip on the handlebar. To increase engine power, roll the top of the twistgrip towards you. To reduce power, roll the top of the twistgrip away from you.

CLUTCH LEVER

The **clutch lever** is on the left side of the handlebar. Squeezing the clutch lever disengages the engine from the drive train, as when stopping the motorcycle. Easing out the clutch lever connects the engine gradually to the drive train, as when moving away from a stop.

GEAR SHIFT LEVER

The **gear shift lever** is on the left side of the engine, next to the left footpeg. It has a toe pad at the front and a heel pad at the rear.

Gears are shifted with the left foot.

To shift, press and release the shift lever, which then springs back to a center position. You will have to rotate your heel in towards the motorcycle to do this. An alternative method which you may prefer is to move your foot back and use our toe to step on the rear pedal to shift to higher gears. Try both ways and use the one that with which you're the most comfortable.

To shift to a higher gear, step on the heel pad of the shift lever and then release it.

To shift into lower gears, step on the toe lever and release it.

Each time you press the lever down, the transmission is shifted to the next lower gear.

URAL transmissions have a **reverse** gear. The reverse lever is behind the right footpeg. The transmission must be in neutral before reverse can be engaged.

A green **neutral light** on the instrument cluster shows when the transmission is in neutral or reverse. Neutral is halfway between first and second gears. To help find neutral, watch

the neutral light as you shift.

BRAKES

The URAL has separate front and rear **brakes**. The sidecar wheel brake is linked to the rear motorcycle brake. The front brake lever is on the right handlebar grip, just in front of the throttle. Squeezing the lever applies the front brake, as when bringing the motorcycle to a stop. The rear brake pedal extends forward of the right footpeg. You apply the rear brake with your right foot. Normally, both front and rear brakes are applied together.

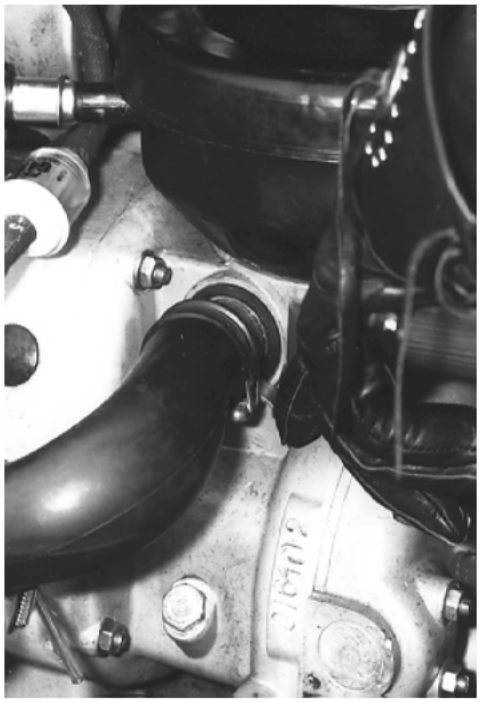
Chapter 2 (Part 2)

CHAPTER TWO (Part 2)

ENGINE STARTING







Fuel valve, ignition switch, air shutter, choke, cutoff switch, starter



The >URAL has a starter pedal that is kicked with your foot to turn the engine over. To prepare for starting the engine, first turn on the **fuel valve** under the tank, then turn on the **main ignition switch** which is at the left of the headlight. The switch is on in the first position. Shift the transmission into neutral, check the reverse lever for (forward) position, then release the clutch lever. If the engine has not been run within the last hour or the temperature is cold, the mixture must be enrichened for starting. An **air shutter** on the carburetor inlets adjusts air flow. The Mikuni carburetors also have **choke** levers to aid starting in cold weather. See

the Owner's Manual for the detailed starting procedure.

The engine **cutoff switch** is on the right handlebar grip housing. To start the engine, turn

the cutoff switch to the run position and crank the engine by kicking downward on the **starter pedal**.





To stop the engine, turn the **cutoff switch** to the stop position. It isn't necessary to shift to neutral when stopping the engine. Just squeeze the clutch lever, turn off the cutoff switch and after the engine stops, release the clutch lever. Sidecar outfits are normally parked in first gear to prevent rolling away. Unless lights or horn are needed, turn off the main ignition switch. If the motorcycle will not be run immediately, turn off the fuel valve.

LIGHTING & SIGNALS, HEADLIGHT, STOPLIGHT, TURN INDICATORS, HORN

The >URAL **headlight** and **taillight** are connected to the main ignition switch so that the lights are on whenever the switch is turned on. The headlight has two beams; a **low beam** for normal riding and a **high beam** for night-time riding when there is no traffic approaching. The high/low switch is on the left handlebar grip. A blue **high beam indicator** light in the instrument cluster shows when the headlight is on high beam.

The tail-light also contains a **stoplight** which comes on when the brakes are applied, to warn following traffic. The stoplight is activated automatically when either brake is applied.

Turn signals are activated by a switch on the left handlebar grip.

The **horn** is honked by pressing a button on the left handlebar grip.



PRE-RIDE CHECKS, TIRES, OIL, FUEL

The motorcycle and sidecar should be checked for operable condition before riding it, especially if it has not been ridden for several days. **Tires** should be checked for proper inflation before the motorcycle is driven, while the tires are at ambient temperature. Both motorcycle tires should have minimum tread depth and no obvious damage.



Engine lubricating **oil** should be checked with the dipstick for correct level to ensure there is sufficient oil to maintain lubrication. Engine oil should also be observed for contamination. A very dark color usually indicates the oil is dirty and should be changed. Oils come in different viscosities and service grades for different uses. Refer to your Owner's Manual for the correct oil.

The >URAL has gravity **fuel** feed from the tank down to the engine fuel system. There is no fuel gauge, so fuel must either be checked by opening the tank cap and observing the level or by monitoring mileage. With the **fuel valve** lever in either horizontal position, fuel is shut off. For riding, fuel is on when the valve handle is straight down. As fuel is used, flow will eventually stop with some "reserve" fuel remaining in the bottom of the tank. The **reserve fuel** is only an emergency supply to get you to a nearby fuel station. Turning the fuel valves to the reserve (straight up) position allows the remainder of the fuel to be used. After refueling, most motorcyclists reset the **trip meter** on the odometer. Before the trip meter reaches a mileage at which the tank would reach the reserve level based on previous fuel consumption, the tank is refilled. This technique avoids the need to open the tank to visually determine fuel level.

There is a **steering damper** to control unwanted oscillations of the front end. If steering feels too loose, screw down the large knurled knob just behind the center of the handlebars. If steering is too sluggish, unscrew the knob slightly.

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Chapter 3

BASIC DRIVING SKILLS

THE OPERATOR, MENTAL ATTITUDE

It is important to understand that motorcycles can be dangerous. Any operator of a motorcycle, whether a two-wheeler or a sidecar combination, is exposed to potential risk. While it is not possible to remove all the risks from operating a sidecar outfit, it is possible to reduce the risks by adopting a conservative mental attitude, developing proficient sidecar handling skills and wearing protective riding gear.

One key to accident avoidance is being constantly alert to what's happening on the roadway ahead. Risk reduction starts by thinking of sidecar combinations as serious vehicles requiring knowledge and skill, even if the outfit is only ridden occasionally around the neighborhood. Experienced riders make a habit of constantly searching the road for potential hazards and taking steps to avoid problems before they get too close to take evasive action.

Staying alert to road conditions requires clear thought, so the wise rider avoids drugs that would effect vision, hearing or judgment. Alcohol is commonly implicated in fatal motorcycle accidents. It is very important to avoid drinking before or during a ride. It is also important to avoid riding after taking any drugs that cause disorientation or drowsiness.

Even when a sidecarist does everything right, there is still the potential for an accident. A motorist may not expect a motorcycle or may refuse to yield right-of-way. A sidecarist may be riding at a sensible speed for traffic and yet overturn the outfit in a corner that is banked the wrong way. A deer could leap onto the roadway or rocks might tumble off a gravel truck.

RIDING GEAR

Since there isn't time to put on crash-resistant riding gear just as an accident is happening, the wise sidecarist wears durable riding gear all the time.

The end purpose of riding gear is to protect skin against abrasion and cushion the brain against sudden impacts. But riding gear also provides protection against heat, cold, precipitation, wind, noise and debris. Riding gear must be comfortable if it is to be worn consistently, so style must be secondary to functionality. The primary pieces of riding gear are: jacket, pants, boots, gloves, helmet, eye protection and rain gear.

Leather is an excellent choice for motorcycling gear. Leather is flexible, comfortable, breathable, non-melting and one of the most abrasion-resistant materials available. Jackets, pants and gloves are made in a variety of leathers other than cowhide, with the most durable being goatskin and deerskin being the most flexible. Elk skin makes a comfortable riding glove that retains it's shape and insulative qualities even when wet.

However, leather riding suits are expensive, heavy, difficult to clean and cannot be made

waterproof. Certain man-made fabrics have excellent comfort and abrasion resistance, with much less weight than leather. Fabric suits are washable and available with water-resistant linings and removable abrasion pads at knees, elbows and shoulders. Outdoor garments of cotton, nylon, vinyl, PVC or polyester are generally unsatisfactory as motorcycling gear, due to poor abrasion and heat resistance and lack of important details. A floppy collar that might be fine for hiking can flap viciously against a motorcyclist's neck at highway speed. Cotton jeans are comfortable, but have almost no abrasion resistance. Nylon fabric melts from the heat of friction and burns into the skin.

BOOTS

Special motorcycling boots are available, but usually only in D width. Shin-height "Wellington" style leather boots with a stepped heel are adequate for motorcycling and are available in a wide variety of sizes and widths. Slip-on or zippered boots without buckles or laces are preferable, to avoid the hazards of catching a foot on a motorcycle part while riding. A stepped heel is important to resist slipping off the footpeg. Tall (11 inch or higher) boots help protect the ankles against flying stones, stinging insects and hot exhaust pipes. Composition soles are preferable to smooth leather soles.

GLOVES

Leather gloves are comfortable and abrasion-resistant. There are many different styles of motorcycle gloves available, with features such as gauntlets, zippers, curved fingers, abrasion pads, insulation and waterproof covers. Leather work gloves are adequate for summer sidecaring, but gauntlets are important to keep insects from flying up an open jacket sleeve and to help protect the wrists against sun and wind burn.

HELMETS

A helmet protects the head against wind, rain, heat and cold, but the ultimate purpose is to cushion the brain against sudden shocks during an accident. If a rider is thrown off a motorcycle during an accident, it is possible to slide into a curb or roadside object with a hard edge. It is important to protect the brain, because the brain is a soft tissue that is easily injured by sudden impacts and brain tissue does not heal like other body organs.

A helmet helps reduce the severity of shock to the brain in the event of a sudden impact. The hard external helmet shell serves to hold a crushable liner inside and secures the helmet on the head via a chin strap. The internal foam liner absorbs shock by crushing. Once a helmet has been through an accident, it should be rebuilt with a new crushable liner or replaced with a new helmet.

There are three testing standards for helmets in the United States, the Federal Department Of Transportation (DOT), the American National Standards Institute (ANSI) and the Snell Memorial Foundation (SNELL). Most states have standardized on a DOT approval. The SNELL rating is primarily for racing gear, where higher impact speeds and multiple strikes may occur. A helmet may meet both DOT and SNELL ratings. Helmet specialists generally advise that a DOT rating is sufficient for street motorcycling.

Whatever the standard, it is most important for a helmet to fit the rider's head snugly and for the helmet to not come off in a crash. Different brands of helmets have different internal shapes and different riders have different head shapes. The best method for selecting a helmet is to try on different brands at your >URAL dealer. Be aware that helmets tend to loosen with use. A new helmet should fit snugly enough that a rider can shake his or her head without having the helmet wiggle around. Within a few days of use the helmet will loosen up and be more comfortable.

Helmets with a single chin strap design may not stay on the rider's head during a violent impact. A Y-shaped strap attachment to the helmet shell is superior to a single point attachment, regardless of other helmet features.

Different styles of helmets have more or less head coverage, even though each may meet the minimum DOT standard. The full coverage ("full face") helmet covers all of the head plus the chin. A standard ("3/4" or "open face") helmet covers all of the head but has an open face area. The half ("shorty") helmet covers the head above the ears only. The preferred style of helmet should take into consideration the type of eye protection to be used.

Be aware that there are fake motorcycle helmets available that some riders wear as a protest against mandatory helmet laws. Fake DOT stickers are sometimes applied in an attempt to avoid arrest. Fake helmets do not comply with helmet laws. More importantly, flimsy plastic hats with no internal crushable liner cannot provide even minimal brain protection. Sidecar operators and passengers are encouraged to wear genuine approved helmets.

EYE PROTECTION

Eye protection is important not only because the eyes are easily injured, but because even non-injury debris in the eye may be so distracting that the driver loses control of the outfit. Most states require eye protection, either directly over the eyes or as a windshield mounted to the motorcycle. Eye protection for a motorcyclist should be both shatterproof and windproof. Shatterproof generally means plastic rather than glass. Windproof eye protection helps prevent debris or insects from reaching the eye. Sunglasses with glass lenses are not advised for motorcycling because they are not sufficiently shatterproof. The simplest and cheapest type of eye protection is a flat plastic "competition" shield that snaps around the front of a standard helmet. Full coverage helmets usually include a flip-up shield. A half helmet may not provide adequate mounting for the shield of your choice.

With or without a windshield, many riders prefer a helmet faceshield or goggles that fasten around the helmet with an elastic strap. Sidecarists who must wear prescription eyeglasses should try on faceshields, helmets and goggles to ensure that the gear fits over their glasses without discomfort.

RAINGEAR

Waterproof riding gear is essential for staying dry and therefore retaining body warmth through cold showers. Raingear also protects expensive leather gear from damage. As with other gear, motorcycling is hard on rainwear. The wind blast at highway speed can shred a lightweight rainsuit within a few miles. A hot exhaust pipe can instantly melt thin vinyl or nylon material. And raingear carried unused must survive abrasion and still be waterproof when needed.

There are two styles of raingear to add as a final layer of waterproof protection: one-piece suits and separate jacket/pants. When considering raingear for motorcycle use, try on the rainsuit over your normal riding gear while sitting on the motorcycle. Be certain the rainsuit is large enough to wear comfortably over your normal gear and be long enough in the arms and legs to cover the extremities while you are in a riding position. One-piece rainsuits are more stylish and waterproof, but very hard to wiggle into by the side of the road. Two-piece suits are more bulky, but easier to put on.

As an alternative to carrying separate raingear, some riders prefer fabric riding suits with water-resistant as well as abrasion-resistant qualities. Good riding gear will last for a number of seasons of continuous use. The expense of durable gear should be weighed against the value of comfort as well as the expense of potential injury.

Now that we have covered some of the basics of getting prepared to ride, let's consider how we operate a motorcycle. If you aren't familiar with motorcycle controls, you may find it helpful to refer to the >URAL Owner's Manual as we go through the details. We'll go through this again later, on the motorcycle.

GETTING ON THE MOTORCYCLE

The normal way to climb on a sidecar motorcycle is to grasp both handlebar grips, stand up on the left footpeg and swing the right leg over the saddle. It is also a good habit to squeeze the front brake lever while getting on or off, to prevent the machine from rolling if the transmission is not in gear. After sitting down in the saddle, the smart rider immediately checks the mirrors and adjusts them as needed to be able to see the left rear as well as the right rear behind the sidecar.

STARTING THE ENGINE

To prepare for starting, the key is inserted and the main switch turned on from the first (off)position to the center position. The third position is inactive on North American >URALs. The switch is on when the red generator light comes on. The transmission must be in neutral for starting. Observe the green neutral light on and check that the reverse lever is also in neutral (forward position).

If necessary, shift the transmission into neutral by shifting up to second gear and then nudging the lever halfway down. It may help to roll the outfit forward and back a few inches to allow the transmission to shift. If your >URAL is reluctant to shift into neutral, try shifting down into first gear, then simultaneously stepping on the heel pad while shifting the reverse lever into reverse. Shifting the reverse lever forward again places the transmission in neutral and ready for starting.

Turn on the fuel valve. If the engine hasn't been run for more than an hour or if the weather is cool, close the air shutter to enrich the fuel mixture for starting. If the engine is warm, close the air shutter about halfway. If the temperature is very cold, close the air shutter and also depress both carburetor chokes.

With the transmission in neutral, the main switch on and the fuel valve on, the engine is almost set to start. Turn the handlebar cutoff switch to the run position and spin the engine by pushing the kick-start lever briskly. It is necessary to leave the clutch released, to allow the kick-start gears to spin the engine. The normal position for starting the >URAL engine is standing on the rear footpeg on your right foot and pushing the start lever down with your left foot.

When the engine fires and starts to run, roll on just enough throttle to keep it running but don't rev it over about 2,000 rpm. Immediately open the air shutter more and open the carburetor choke levers if they were used. Let the engine run at a fast idle for a few moments, opening the air shutter all the way as the engine warms up. With familiarity you will learn how much shutter, choke and throttle works best when starting in various temperatures. Swing into the saddle and you are ready to ride away.

RIDING POSTURE

Sit straight in the saddle, with your head and eyes up. Pull your knees in snug against the fuel tank and pull your elbows in close to your jacket. Left fingers cover the clutch lever. ("Cover" means in a position to use the control, but not yet squeezing or pushing.) Your left foot should be on the footpeg, covering the shift lever. Your right foot should be on the footpeg, covering the rear brake pedal. With a sidecar outfit, you don't need to support the machine with your feet while stopped, so you keep your feet on the pegs.

CLUTCH SLIPPING

To get the outfit rolling from a stop, it is necessary to let the clutch slip for a few feet as the engine starts to pull. Hold the front brake on, squeeze the clutch lever all the way in and shift down into first gear. Release the brake, roll on the throttle slightly and slowly ease out the clutch lever to the point where the engine begins to pull the outfit forward. Keep the clutch squeezed slightly, gradually roll on a little more throttle and then ease out the clutch all the way as the rig begins to move. If the engine stalls, you need to ease out the clutch more gently and roll on a little more throttle.

TURNING TECHNIQUE

When you need to turn, reduce speed by rolling off the throttle. Turn your head, look in the direction you want to go and point the front wheel towards the turn. If you have no prior motorcycle experience, making turns will be intuitively obvious.

Special note for experienced motorcyclists:

If you are an experienced two-wheeled motorcyclist, steering a three-wheeler may be difficult at first. Remember that two-wheelers are balanced and steered by "countersteering". That is, to initiate a left turn, the rider of a two-wheeler first leans the bike over by pushing on the left grip. But rigid three wheelers don't lean into turns, so the habit of countersteering or "push steering" turns a sidecar outfit the wrong way. So long as all three wheels remain in contact with the ground, the front wheel of a sidecar outfit is immediately pointed towards the direction you want to go. To put this another way, two-wheelers steer backwards from sidecar rigs. You may need to unlearn some two-wheeler habits.

Since sidecar outfits are not symmetrical, the technique for left turns is somewhat different from right turns. The outfit won't lean into the turn like a "solo" bike, but instead rolls slightly towards the outside of the turn like an automobile. The sidecar driver compensates by leaning body weight towards the turn and by applying extra force to the handlebars.

Sidecar outfits with single-wheel-drive tend to veer towards the right when speeding up and veer left when slowing down, because the driving and braking forces are not centered on the rig. The driver must compensate for this veering or "yawing" tendency by adjusting pressure on the handlebars to keep the machine pointed in the right direction. Outfits with dual wheel drive, such as the >URAL Sportsman, have less tendency to veer, because the driving force is divided between the rear wheel and sidecar wheel.

Chapter 3 (Part 2)

SHIFTING

As you increase speed, the engine turns faster. It is necessary to shift to higher gears to keep the engine from over-revving. To shift gears, roll off the throttle, simultaneously squeeze the clutch lever and step down firmly on the heel pad. Ease out the clutch lever, adjust the throttle and release pressure on the heel pad. The transmission shifts up or down one gear at a time.

When you are slowing down, it is necessary to shift to lower gears to keep the engine from lugging and stalling. Roll off the throttle, squeeze the clutch lever and step down firmly on the toe of the shift lever. Roll on the throttle slightly as you ease out the clutch lever, then release pressure on the shift lever. If you are planning to come to a complete stop, just keep the clutch squeezed and downshift through all the gears one after the other as the machine slows down. It is better to shift all the way down to first gear or neutral before the machine comes to a stop, so that the transmission gears are still turning while being shifted.

With experience, you will soon learn to match engine speed to transmission gear so that the engine is always in the right RPM range; never over-revving or lugging. Experienced riders "blip" the throttle when downshifting to match engine revs to bike speed to smooth the shift. It is normal to hear a "clunk" as the transmission shifts from one gear to the next.

To back up, stop, in either low gear or neutral and continue to squeeze the clutch. Reach down and push the reverse lever back with your right hand or right heel. As you ease out the clutch the outfit will go backwards. **WARNING: Back up very slowly as the outfit can become unstable at excessive speeds.** Pull the lever forward again to put the transmission in neutral.

STOPPING

Roll off the throttle, squeeze the clutch lever and apply both brakes. Continue to keep your head up and look forward to where you want to stop. Remember to downshift through all the gears before the machine comes to a stop. Keep both of your feet on the pegs when stopped.

PARKING THE OUTFIT

Stop the engine with the cutoff switch and wait for it to stop. Release the clutch lever and then turn off the main switch. If the outfit won't be run for more than a few minutes, also shut off the fuel valve.

When parking a sidecar outfit, it is important to keep it from rolling away. As a general rule, always park with the transmission in either first gear or reverse. The easiest way to be sure the transmission is in gear is to try rolling the outfit forward and back with the clutch released. If it is in gear, it will only roll an inch or two. The >URAL also has a parking brake. It is the triangular knob located above the right foot peg behind the reverse

lever. Push down on the rear brake pedal, then push down the knob and turn it counterclockwise 90 degrees to lock the brake. It is important to engage the parking brake whenever parking on hills.

SUGGESTIONS FOR RIDING PRACTICE

Now that we have gained some familiarity with motorcycle controls, it's time to practice some exercises on the outfit. The following riding exercises are designed to build sidecar operating skills progressively, assuming no prior motorcycle or sidecar experience. Even if you already know how to ride a motorcycle, you are encouraged to go through each sidecar exercise, however briefly. If you are a novice motorcyclist, take the time to master each exercise before moving on to the next. If you have difficulty with any subsequent exercise, go back and practice the previous exercise some more.

If at all possible, you are advised to practice riding under supervision of an instructor or at least an experienced sidecarist. For the driving practice exercises you will need a flat area of approximately 100 x 200 feet, clear of obstructions. The range layout is diagrammed in the back of this manual. A smooth paved parking lot free of curbs, poles or other vehicles is ideal. Any level surface is acceptable, including a grassy field. It helps to have some small traffic cones or other markers to lay out the exercises. Brightly-colored tennis balls cut in half make excellent markers. Whatever you use to mark the exercises, we will refer to all course markers as "cones".

Be aware that the exercises quickly progress in skill and speed. It is possible for you to make a mistake during the process of learning and have an accident. You are encouraged to wear the recommended riding gear whenever driving the outfit, even during slow speed exercises.

Chapter 3 Excerises

URAL®
CLASSIC SIDECAR MOTORCYCLE

Chapter 3 - Exercises

Exercise 1

FAMILIARIZING YOURSELF WITH THE OUTFIT

In this exercise, you will sit on the stationary outfit, locate and operate all the controls, and familiarize yourself with the weight and balance of the rig. You won't be riding the outfit yet, so no riding area is needed for this exercise. You may wish to keep your Owner's Manual handy if you don't quite remember where all the controls are located.

Mount the motorcycle

With the engine off, climb aboard, standing on the left footpeg and swinging your right leg over the saddle. Stand up straight to avoid scuffing your right boot across the saddle.

With the handlebars centered, adjust the mirrors. Turn the handlebars full left, then full right, and back to center. Observe the friction of the front tire and the arc of the handlebars. Assure that the handlebars or mirrors do not strike the sidecar windshield or the fuel tank. Adjust the steering damper for modest friction, neither too tight nor too loose.

Identify the following controls:

Parking brake: Press down on the rear brake pedal and set the parking brake. Release the parking brake and reset it.

Throttle: Roll open 1/4 turn, then roll open 1/2 turn, then roll closed. Throttle spring should close throttle when you roll it open and then release it.

Engine cutoff switch: Turn the cutoff switch to the RUN position, and then to the STOP position.

Clutch lever: Squeeze the clutch lever all the way in, then ease out halfway and hold, then

release all the way.

Air shutter: Close the air shutter, open halfway, then open all the way.

Carburetor chokes: Close both carburetor chokes by pushing them down, then open both by pulling levers up.

Fuel valve: Turn the fuel valve to ON, then select RESERVE, then turn off the valve OFF.

Main ignition switch: Turn ON the main switch to the first position, but leave the cutoff switch OFF. Observe the red generator light on and the headlight on.

Horn: Beep the horn three times.

Turn signals: Signal for a left turn, observe the left turn lights blinking, cancel.

Signal a right turn, check turn lights on sidecar, then cancel. Note: It is possible that the

turn signals won't blink when the engine is not running. If this is the case, check turn signal operation later when the engine is running.

Rear brake: Press the rear brake pedal. Look back to check the red brake light

illuminates bright. Release brake pedal and observe brake light extinguishes.

Front brake: Squeeze and hold the front brake lever, observe brake light illuminates, then release lever.

Shift lever: Squeeze the clutch and shift the transmission to neutral. Observe

the green neutral light. If you have difficulty finding neutral, release the parking brake, dismount, stand alongside the outfit and roll it forward and back a few inches while moving the shift lever with your foot. It may be helpful to shift up to second gear and push down slightly to find neutral. Leave the transmission in neutral and the clutch released, but hold the outfit to prevent it from rolling away. You can now turn off the main ignition switch to conserve your battery.



Reverse lever: With the transmission in low or in neutral, push the reverse lever back firmly until it engages in reverse. Roll the outfit forward and back to check that reverse is engaged. Then pull the reverse lever forward to neutral. The motorcycle should roll freely back and forth. With the transmission in neutral, set the parking brake.

Kick start lever: Check the cutoff switch OFF. Hold both handgrips, stand up on the passenger peg on your right foot, and plant the ball of your left foot on the kick start lever. Push down on the lever gently until you feel resistance, then kick the engine through briskly two or three times, taking care not to strike the driver's footpeg with your toe. Note that the transmission must be in neutral and the clutch lever released to allow the kick starter to crank the engine.



Park the outfit.

Transmission: Squeeze clutch, shift down to first gear, release the clutch lever.

Cutoff switch: Check in STOP position.

Ignition switch: Check switch off, remove key.

Fuel valve: Turn off fuel. (lever horizontal)

With the sidecar empty, grasp both handlebar grips firmly, turn the handlebars full right. Stand on the left footpeg and see if you can lift the sidecar wheel off the ground by swinging yourself briskly away from the motorcycle and pulling on the handlebars.

Observe the weight of the sidecar and the effort required to raise it. If you can, pull the sidecar up in the air until the outfit is almost balanced, then let it drop back on the sidecar wheel. Notice that the sidecar becomes much easier to lift as the motorcycle leans over farther.

Caution: During all of the novice riding exercises, either carry an adult passenger in the sidecar, or carry approximately 100 pounds of ballast in the car. Bags of sand are excellent for ballast because they won't easily slide around.

Chapter 3 Exercise 2

Chapter 3 - Exercises

Exercise 2

MOVING THE OUTFIT (engine off)



The purpose of this exercise is to be certain you can stop the outfit using the brakes, before you practice starting the engine. You don't need a passenger in the sidecar for this exercise. If you have someone to assist, have them push the outfit forward while you are sitting in the saddle. If you don't have anyone to assist, walk alongside the outfit and push it holding the handlebar grips.

Check the engine cutoff switch STOP, and turn ON the main ignition switch to the first (center) position. Unlock the parking brake. Check the reverse lever in neutral. Squeeze the clutch lever, shift the transmission into neutral, and release the clutch lever. Check the Neutral light ON. Then turn OFF the main ignition switch.

Start the outfit rolling forward for a few feet, then stop it using the brakes. If you have someone pushing you, use both brakes together. Do this several times in a straight line, then turn it around and push it back, stopping several times. If you are pushing the outfit by yourself, use just the front brake to stop it. Take care to avoid hitting your legs with the footpeg or engine cylinder.

Exercise 3

STARTING AND STOPPING THE ENGINE

The purpose of this exercise is to practice starting and stopping the engine. The rig remains stationary, so you don't need any practice area. Starting the engine takes a combination of preparation and kicking technique.

Prepare for starting:

1. Main ignition switch ON.

2. Fuel valve ON.

3. Transmission in NEUTRAL.

4. Reverse lever in NEUTRAL. (forward position)

5. Carburetor chokes down (depending on temperature)

6. Air shutter CLOSED (as required depending upon temperature).

7. Cutoff switch to RUN position.

8. Release parking brake if set.

9. Roll the outfit forward and back to ensure transmission is in neutral.

Start the engine

1. Stand up on the passenger peg and push down briskly on the kick starter to spin the

engine. The engine should start within three or four kicks.

2. Roll on enough throttle to keep the engine running at a fast idle.

Open air shutter lever halfway as soon as the engine starts and lift up chokes if they are on. Then gradually open air shutter fully as engine warms up.

Note: Starting the engine becomes easier as you gain experience. If the temperature is cool or the engine hasn't been run for a while, keep the air shutter closed for three or four kicks. If it doesn't start, it may have become flooded with excess fuel. To clear the fuel, open the air shutter, roll the throttle full open, and kick it through several times. Before attempting to start it again, check that the ignition switch is ON (look for the red generator light), and the cutoff switch is in the RUN position.

Caution: If the outfit begins to pull forward as you push down on the start lever, that means the transmission is still in gear. Be certain the transmission is in neutral for starting.

Stop the engine, park the outfit.

1. Turn the cutoff switch to the stop position to stop the engine.

2. Turn off the main switch and remove key.

3. Close the fuel valve.

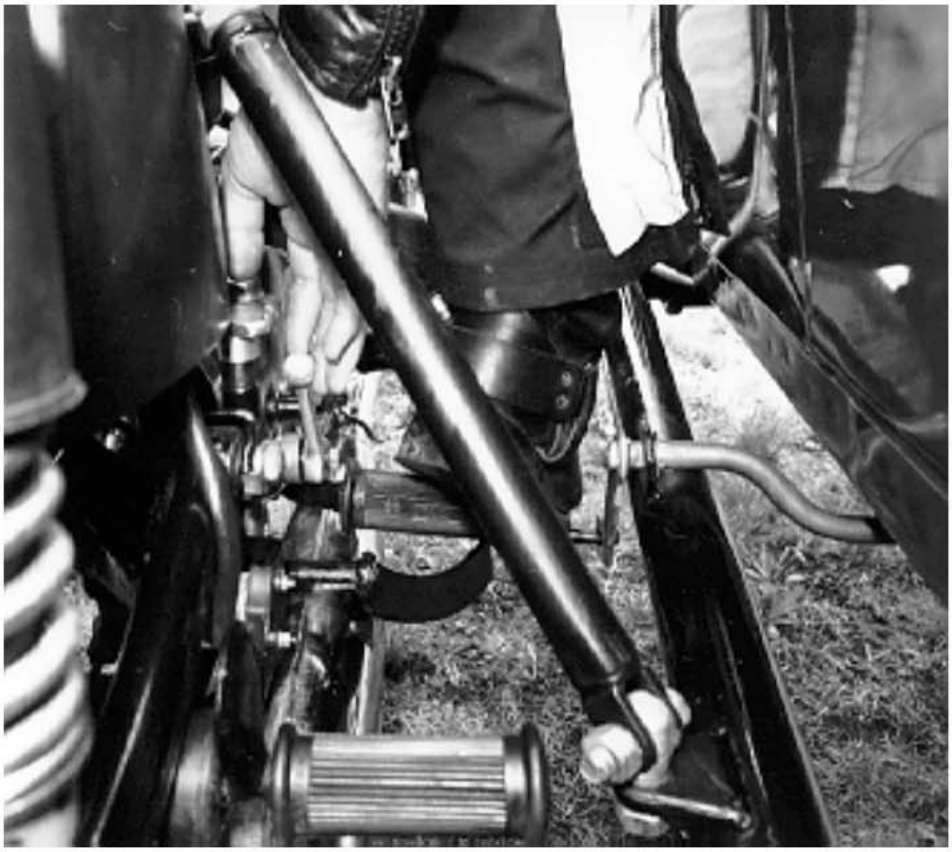
4. Shift to first gear.

5. Check transmission in gear by rolling outfit forward and back.

6. Set parking brake.

Exercise 4

LEARNING TO USE THE CLUTCH IN FORWARD AND REVERSE



The purpose of this exercise is to practice using the clutch to help the engine start the outfit rolling, and to practice using reverse. Until further notice, either keep ballast in the sidecar or carry a passenger whenever driving the rig.

Prepare for starting the engine. If the parking brake is set, leave it set until you get the engine started. Open the fuel valve and turn on the main ignition switch. Shift the transmission to neutral and release the clutch. If the engine is already warm from just being run, you won't need to use the air shutter. Start the engine and let it warm up.

Climb aboard, press the rear brake pedal, and release the parking brake. Squeeze the clutch lever, shift down into 1st gear. You're ready to roll.

Gradually ease out the clutch and roll on a little throttle until the outfit begins to move forward, then squeeze the clutch and let the outfit slow down. Continue to ease out the clutch lever and then squeeze it again until you are familiar with the friction point where the engine begins to pull the outfit forward. If the engine stalls, you must shift the transmission to neutral and kick start it again.

When you are familiar with using the clutch in forward, practice using the clutch in reverse. Stop, shift to neutral, push the reverse lever firmly back to reverse, then ease out the clutch to back up. If your >URAL is reluctant to shift into reverse, shift into first, then push down on the heel pad while shifting the reverse lever back. Shifting the reverse lever forward again puts the transmission in neutral.

Drive the outfit back to the perimeter, and use reverse to back it into the parking place. Stop the engine and park the outfit as in the previous exercise. If you leave the transmission in reverse, remember to shift it back to neutral before attempting to start it again.

Exercise 5

DIRECT STEERING

(oval, left turn)

The purpose of this exercise is to practice smooth throttle and steering control while making left turns. Continue to either keep ballast in the sidecar or have a passenger ride in the sidecar until further notice.

Prepare for starting , start engine, and prepare to drive the outfit. (as in previous exercises)



Shift into first gear, gradually roll on a little throttle and ease out the clutch to make the outfit move forward. As the outfit begins to move away, ease out the clutch all the way, and roll on just enough throttle to keep the engine pulling.

Ride around the two large circles in a counterclockwise direction (continuous left-hand turns). Roll off the throttle to slow down as you approach each turn. Steer the front wheel towards the turn, then roll on a little throttle to pull the sidecar around the motorcycle. Turn your head and look through each turn to where you want the outfit to go.

Continue around the oval, concentrating on smooth throttle control. As you gain familiarity with the throttle and steering, practice using the brakes to slow down for the corners. Then take the outfit to the perimeter, back into the parking space using reverse, and park it.

Notes:

1. With the single-wheel-drive models, remember to compensate for yaw by adjusting steering pressure as you accelerate or decelerate, to keep the rig on course.

2. If you are an experienced motorcyclist, remember that >URAL outfits don't lean into turns. Concentrate on pointing the front wheel in the direction you want to go.

3. Remember that you must shift the transmission into neutral or low gear before engaging the reverse gear.

Exercise 6

WEAVING BETWEEN CONES L & R

(cones in straight line)

The purpose of this exercise is to practice steering both left and right, weaving between cones. (set in a straight line 25 ft. apart)



Prepare for starting, start engine, prepare to drive.

Note: for this and subsequent exercises, we assume you have mastered the starting "drill" and know what's needed to get the outfit started and rolling.

Examine diagram on page 107 before beginning this exercise. Weave slowly between the cones. Point the front wheel in the direction you want to go. Turn around at the end and weave back. Remember to turn your head and look where you want to go. Allow enough space when turning right to avoid running over the cones with the sidecar wheel.

When you can weave between all the cones smoothly without running over any cones or stalling the engine, return to the perimeter and park the outfit.

Notes:

1. Cover the clutch (keep your fingers over the lever) but don't squeeze it unless you need to stop.

2. Observe that the sidecar easily slows down when you are turning right, but must be accelerated when you are turning left. Drivers of single-wheel-drive models must compensate by adding sufficient pressure on the grips to point the front wheel in the desired direction of travel.

Exercise 7

STEERING AND SHIFTING BODY WEIGHT

(figure 8)

The purpose of this exercise is to practice shifting body weight while making both left and right turns. You'll be riding a long figure 8. If you have a physical disability which prevents you from shifting your weight in the saddle, see note at end of this exercise.



Begin riding slowly around the figure 8 pattern. You will be making both left and right turns. Continue to roll off the throttle approaching either turn, then point the front wheel around the circle and roll on a little throttle as you go around.

After two laps, start leaning your body weight towards the inside of each turn. That is, in the left turn, lean your body over towards the left. In the right turn, lean your weight towards the sidecar. When riding straight ahead, sit upright in the center of the saddle. Continue to practice smooth throttle control while also leaning your body weight.

Notes:

1. Shifting body weight towards the inside of turns is an important skill, and is essential when driving the outfit later without weight in the sidecar. Sidecar drivers with physical disabilities which prevent sliding sideways in the saddle are advised to compensate by carrying additional ballast in the sidecar, and by approaching right-hand turns more cautiously.

Caution: Engine thrust for the two-wheel-drive Sportsman will temporarily dissipate if either wheel loses traction. Shifting body weight into the turn helps maintain forward power by keeping the "inside" drive wheel firmly on the ground.

Exercise 8

STOPPING WITH BOTH BRAKES

(straight line)

The purpose of this exercise is to practice smooth, straight-line braking using both brakes. You will be riding down a straight line with cones at the end where you will apply the brakes. Allow adequate run out room beyond the braking cones. Examine the diagram on page 108 before beginning this exercise.

Drive down the "braking chute" in first gear, at about 18 mph.



As the front wheel passes the braking cones, squeeze the clutch, roll off the throttle, and apply both brakes smoothly to bring outfit to a complete stop. Come to a complete stop, check your mirrors as you would in traffic, then drive back to the start of the brake chute and practice again several times.

Notes:

1. The clutch should always be squeezed when braking to a stop.

2. On >URAL outfits, the sidecar brake is connected to the rear brake pedal. Depending upon brake adjustment and weight in the sidecar, the outfit may tend to yaw left or right while braking. Be prepared to adjust steering pressure on the handlebars to keep the outfit stopping in a straight line. If the outfit consistently yaws to one side during braking, or if you can't apply full braking force, the brakes should be adjusted per the instructions in the Owner's Manual.

Exercise 9

STOPPING ON A CURVE

(fig 8 with braking cones at ends)

The purpose of this exercise is to practice braking while in a curve, both in left turns and in right turns. You will be riding the same figure 8 (page 108) as in previous exercises, except with braking cones added at the outside ends of the circles.



Begin driving around the figure 8. Continue to practice the recommended cornering techniques from previous exercises.

As the front wheel passes the braking cones, squeeze the clutch, roll off the throttle, and apply both brakes smoothly to bring the outfit to complete stop while still turning. After the outfit has come to a complete stop, continue around the figure-8 to the next turn.

Notes:

1. Because a motorcycle/sidecar combination is not symmetrical, it responds differently to braking in left vs. right turns. When braking, apply pressure on the grips as needed to keep the outfit pointed around the circle. In a left turn, the front tire may begin to slide if the brake is applied too suddenly. If the tire slides out while braking, use a little less front brake pressure to avoid skids during this exercise.

2. In a right turn, the sidecar may lift briefly if the brakes are applied too suddenly. Continue to lean your weight to the inside of the turns, even when practicing smooth braking.

Exercise 10

SHIFTING IN STRAIGHT LINE

(left oval with shift cones)

The purpose of this exercise is to practice shifting the transmission as you speed up and slow down. You'll be riding an oval pattern, shifting up to second gear for the straights, and down to first gear for the turns.



Begin driving around the oval. Continue to practice the cornering techniques from previous exercises.

As soon as you straighten out from a turn, shift up to 2nd gear.

Just before entering the next turn, shift down into 1st gear.

Continue shifting up and down for several laps, until you are familiar with shifting the transmission, then return to the perimeter and park.

Notes:

1. When shifting up to second gear, move your heel over the heel pad, squeeze the clutch, roll off the throttle, and push down firmly on the lever. To shift back to first gear, get your toe over the front of the lever, squeeze the clutch, roll off the throttle a little, and push the toe down firmly.

2. Rolling off the throttle as you shift allows the engine to slow down. If the engine is revving too fast, the transmission may refuse to shift, or there will be a crunching noise. Smoother, quieter shifts will result as you learn to match engine revs to outfit speed.

Exercise 11

TURNING, BRAKING AND SHIFTING

(fig 8)

The purpose of this exercise is to practice the previous turning, braking, and shifting techniques together. You will be riding a figure 8 (page 108) pattern. Continue to practice the recommended cornering techniques such as leaning your weight towards the inside of turns, but now add shifting the transmission.

Begin driving around the figure 8.

Approaching each turn, brake as you shift into first gear. Lean your body weight towards the inside, release the brakes, and roll on just enough throttle to match RPMs and pull the

outfit around the curve. As you straighten out, shift up into 2nd gear.

When you have mastered all of the techniques together, return to the perimeter and park the outfit.

Note:



1. This is a complex exercise, and it all happens very quickly, but these are the basic skills for controlling a sidecar combination. Spend at least 30 minutes on this exercise. Take a rest break and repeat if necessary. If you have difficulty putting it all together, go back to the previous exercises and practice them again. It is essential that you master these techniques before progressing to more advanced exercises.

Warning: Cornering too briskly can lead to tipovers in both left and right turns. Keep speed under control.

Chapter 4

Chapter 4

DRIVING IN TRAFFIC

HOW ACCIDENTS HAPPEN

Biker Bob is on his way to the big sidecar rally. He's been on the road most of the day and he's just an hour away. Since Bob began riding his own outfit last year, he has heard a lot about sidecars, mostly from riding buddies. He has learned about direct steering, shifting his weight in the saddle and keeping the outfit straight while braking hard. He knows about staying out from behind busses in traffic and watching for left-turning cars at intersections.

Intellectually, Bob understands that sidecar outfits are motorcycles and that motorcycling carries with it increased risk of having an accident. So he wears a helmet, leather riding jacket, tall boots and durable gloves. But Bob has yet to discover what it really means to have a motorcycle crash. Bob doesn't know it, but he won't make it to the rally. In about 60 seconds he will get his turn to crash.

As he rides along today in a cold drizzle, circumstances are conspiring to ambush him. The rain that started a hundred miles back hasn't let up. His riding gear has become soaked and miserable. A rattling pickup truck ahead is throwing dirty spray that clouds his vision. And now his faceshield is starting to fog up on the inside. But the worst effect of the weather has snuck up on him without announcing itself. He is chilled to the bone and hypothermia has quietly fogged his judgment and slowed his reactions.

Without warning, the decrepit pickup truck ahead suddenly slows and begins a left turn into a hidden driveway. Bob's chilled brain doesn't immediately comprehend what's happening, because the truck's brake lights are not working and the driver didn't bother to signal. For a moment Bob just freezes on the grips. Finally, he makes the decision to brake, but the message is sluggish getting to his right hand. While Bob is still squeezing the brake lever in slow motion, the outfit slams into the back of the truck, spins around and flings Bob down on the pavement. Fortunately, he survives the crash. The worst injury is only a broken arm, but the ride is over for today and for the rest of the year.

In the months it takes for Bob's fractured bones to knit, he will quietly weigh the pleasures of motorcycling against the risks which have been given new meaning by the ultimate lesson. "What went wrong?" Bob ponders. Is there something I could have done to avoid the crash? Should I have stayed closer to home? Or is crashing one of those inevitable pay backs for the pleasures of motorcycling? Will I have to go through this again every few years? If I know I'm going to crash sooner or later, do I really want to continue riding?" A lot of other motorcyclists have weighed similar thoughts after being involved in accidents.

What do you think? Was Bob allowing enough following distance for the wet pavement? Would he have gotten on the brakes in time if he hadn't allowed himself to get chilled? Should he have swerved around the truck instead of trying to brake? Would he have been safer closer to home? Perhaps the most important question we could ask is this: Was Bob just a victim waiting for an accident to find him or was he really in control of the situation?

Investigations of motorcycle accidents hint that riders have very little time between the point where they realize an accident is happening and the point of impact. The median time between realization and impact is less than two seconds. Such statistics might lead

us to believe that accidents happen very suddenly and we just don't have time to react.

But there are also many veteran motorcyclists who rarely have close calls, let alone accidents. Are these veterans just lucky, are they really good at sudden evasive maneuvers or do they know something we don't?

"Sudden" Collisions

The first thing to realize about collisions is that they seldom occur as suddenly as most crashees think. Now, if you "suddenly" realize you are on a collision course with a rattling pickup truck, just a second or two away from impact, the rest of the crash may seem awfully sudden. But the "suddenness" is often a matter of not observing what is happening until too late in the process, typically the last second or two. If you know where to look, how to look and what to look for, you can almost always spot a potential collision several seconds before the point of impact. And, once you understand what is happening, you can make a small correction to avoid riding into the problem.

Bob wouldn't have been any safer staying close to home. More than half of all motorcycle accidents occur within five miles of home. 90% of motorcycle accidents occur in urban or suburban situations. One of the reasons why cities are so hazardous is just the amount of stuff going on all at once. We've got multiple lanes of traffic, vehicles weaving around in all directions, cross-traffic squirting out at intersections, double-parked cars, jaywalking pedestrians, aggressive bicyclists, roaring trucks, oil-dripping busses, slick plastic arrows, sunken railroad tracks, grated bridge decks, man-eating chuckholes and millions of traffic signs and signals.

All that stuff going on demands our attention at once and any one problem is capable of causing us grief. The paradox is that we've somehow got to be aware of all the hazards at once, but there are usually too many hazards to keep track of at any one moment. Shortly, we'll share a few brainstorms on how to deal with this paradox.

Crashes are sometimes precipitated by poor riding skills. For example, a sidecarist enters a right-hand curve and suddenly realizes halfway through that the curve is tighter than expected. The sidecar starts to fly and the driver panics. The survival reaction is to roll off the throttle, jam on the brakes and steer left to keep from overturning. But those reactions may do more to cause a crash than help avoid one.

The correct tactic for sharp right-hand turns is to shift body weight towards the sidecar, stay on the gas and squeeze on enough front brake to control speed. Engine power keeps the motorcycle up on the suspension and forces the rear tire to drift sideways, helping the outfit to settle down. Such cornering skills aren't obvious to the novice sidecarist. That's why it is so important to learn and practice the correct riding techniques in the parking lot exercises before you take the outfit out onto the public roads.

To help us keep track of all that stuff around us in city traffic, let's think through the various riding situations and consider some accident avoidance strategies. Then we will work through some advanced riding skills, including evasive maneuvers to avoid collisions.

STRATEGIES FOR AVOIDING ACCIDENTS

A motorcyclist has a lot of things to think about while motoring down the road. The situation continuously changes, demanding changes in speed, lane position, or following distance. While it is important to know the correct control skills, we might suggest that a large part of motorcycling happens inside the brain, rather than just at the grips and pegs.

Veteran motorcyclists seem to develop riding skills of a higher order, including an apparently magical "sixth sense" to predict what is going to happen before there are any obvious clues. Veterans also seem to have "automatic" responses to the changing conditions.

There is no magic in this, but rather a well-honed set of riding habits and skills. For example, consider the situation of a motorcyclist who gets stuck in the wrong lane approaching the planned exit. The novice rider may panic and chance an impulsive dive through traffic. The veteran is more likely to avoid any impulsive moves, and concentrate instead on a change of plan, plotting an alternate route to the same destination. The habit of avoiding impulsive moves in traffic reduces the risk of collisions with vehicles that suddenly "come out of nowhere." Let's consider how we can better keep track of what's happening around us in traffic.

Separate The Hazards

The first important habit is to "separate" the hazards. Although it often seems as if everything is demanding our attention at once, it is often possible to separate our awareness of the hazards, if only by a few feet or a few milliseconds. We can't make the other drivers move farther apart or go more slowly, but we can observe them over more distance or more time by looking farther ahead.

The farther ahead you spot trouble, the more time you will have to observe it, make a decision about it, and deal with it. You won't have to do any sudden emergency maneuvers, because you can make a few simple adjustments early on, and just stay out of harm's way. The safety folks often use the measurement "12 seconds" when describing how far ahead to look. That's the distance you will be covering during the next 12 seconds, which translates into about as far ahead as you can see any details.

Looking 12 seconds ahead is a good habit, but the purpose is to observe what is happening down the road so that you can make intelligent decisions. "Observe" means really keeping your eyes moving to take in as much as possible, not just staring ahead with glazed eyeballs. As an example, try this exercise: go back and read the last paragraph again, but this time read one line at a time, and spend two seconds scrutinizing the world around you before reading the next line. See if you can remember what you're reading while also observing details of what's around: the current time, who else is in the room, the color of the car driving by, what pictures are on the wall behind you, the color of your socks.

It's not easy, is it? There is a temptation to either look around and forget about reading, or continue reading and forget the observing. But don't we do something very similar as we simultaneously ride the outfit and observe traffic around us? And consider this: once you record in your memory what time it is or who else is in the room, you don't have to study those items again for a while. The only items you need to study on subsequent glances are things which have changed. It's the same way in traffic. We need to glance at everything, but we can pay primary attention to those things which are in the process of changing into potential hazards. For example, the big rattling car transporter rolling along in the next lane may scream for attention, but the higher priority is the car waiting to turn left at the next intersection, because left-turners are the most common motorcycle hazard.



Intersections are danger zones where we especially need to focus our attention. Folks with poor judgment are very likely to make mistakes at intersections, pulling out in front of other drivers or making quick turns or jamming on the brakes or motoring through red lights. Recognize that "intersections" include anywhere vehicles can cross paths, whether on divided eight-lane arterials or where two lanes cross in the shopping mall parking lot. Statistically, about three-fourths of all "motorcycle" crashes are collisions with cars and about one-fourth of all "motorcycle" crashes are with the car driver making a quick left turn across the path of the motorcyclist. Never mind who is at fault, the motorcyclist is the one who more often gets hurt. So it is in our best interests to take charge of the situation.

Just as we can mentally separate our observation of what is happening around us, we can physically separate ourselves from hazards. We can move the outfit farther away from hazards and we can separate one hazard from another. For example, if the rattling car transporter is too much of a distraction being so close, you can speed up, slow down or change lanes to get farther away.

Since intersections are trouble enough, try to separate yourself from other hazards before you get to an intersection. If at all possible, move far away from trucks or busses that block your view. If you are being tailgated by an aggressive driver, take action to move farther away. Don't allow yourself to be a victim of whatever happens and don't permit hazards to multiply around you. Take control of the situation to continuously improve the odds in your favor.

CONSPICUITY

I Didn't SEE You.

If you allow another motorist to run into you. you'll hear the same thing every time: "I didn't see you." The errant driver may look down at you lying miserably crunched under your bent rug and say "Gosh, I didn't see you. Besides, you didn't have your headlight turned on." Certainly there are occasion when the other driver really couldn't see the motorcyclist, but we have a strong suspicion that the explanation is really an excuse. we can't expect errant drivers to say "I saw you but figured you would get out of my way."

The "I didn't see you" excuse has led some safety experts to believe that the problem is simply that motorcyclists are hard to see in traffic. The solution, therefore, is to make us more conspicious--we could wear flamingo-pink leather, for example or add flashing beacons to our helmets. Most high-mileage mtorocyclists consider conspicuity gadgets more of a magic talisman that a safety device. (Magic talismans are supposed to ward off

evil with no effort on the part of the wearer.) Conspicuity devices are based on the assumption that the other guy will get out of the way of the motorcyclist and that's not a smart assupmtion.

On the other hand, we can't control every situation and we often depend upon other motorists to not run us over, like it or not. Other motorists don't always comprehend how rapidly a motorcycle is approaching. And less experienced riders don't know all the tricks of urban traffic. If you are just starting to learn the tactics of traffic survival, you really are more dependent upon other drivers to stay out of your way and you should help them out by being more conspicuous.

Here are some suggestions:



1. Before driving the outfit in traffic, check that your headlight, tail light and stop light are working. Use your turn signals. Flash your brake light to attract the attention of following drivers.

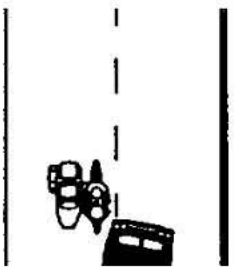
2. Consider lighter-color riding gear such as a tan, silver or bright blue or add brightly colored "vanity stripes" to your darker colored leathers. Wear a bright reflective vest over your jacket. Choose a brightly-colored helmet.

3. For night operation, add reflectors or reflective tape to the rear end of your sidecar and helmet. Choose riding gear with reflective patches.

4. When buying raingear, consider bright colors such as yellow, red or light blue.

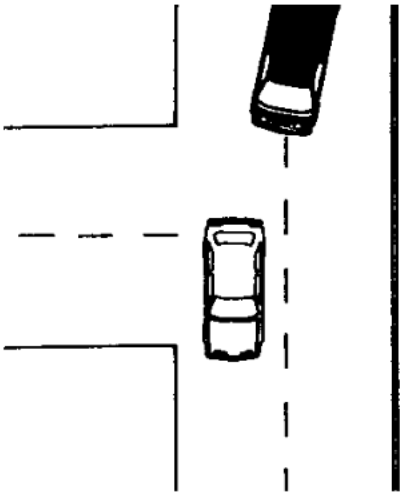
One of the big advantages of sidecar outfits is that many people are curious about them. Other motorists seem to spot sidecar outfits more readily than two-wheeled motorcycles. But where we position the outfit in traffic also has much to do with how easy it is for other drivers to see us and for us to see them.

POSITIONING



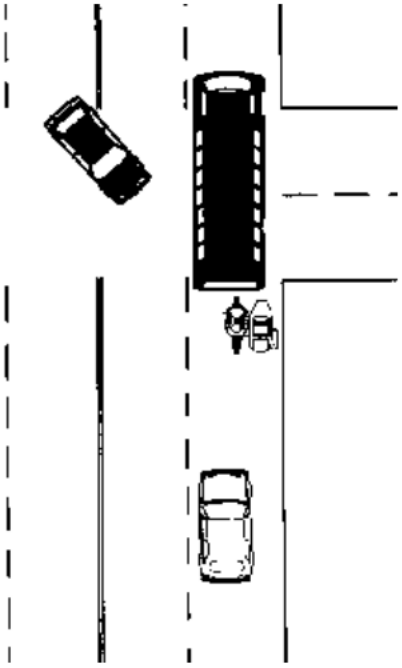
Veteran sidecarists sometimes seem to wander all over the road. One minute they are over towards the right side of the lane, then they wander over to the left and the next thing you know they have meandered halfway across the fog line. To the novice, this may appear to be

inattention or lazy control habits, but there may be good reasons for moving around in the lane or even changing lanes. The veteran understands the importance of adjusting position to provide the best view of the situation ahead, to increase separation from other vehicles and to make themselves most visible to other drivers. Where you position your motorcycle in the flow of traffic is perhaps more important than what color you paint it or whether you have your headlight turned on.



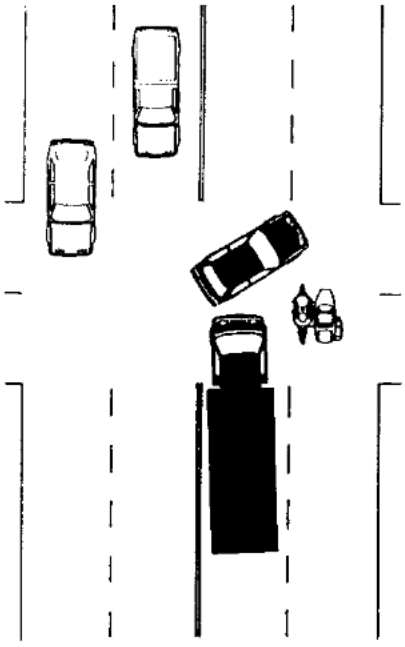
Consider the following positioning tactics:

1. Avoid the "blind spots" of other vehicles. Blind spots are those sectors where the driver can't see you easily, typically the left and right rear quarters. The smart rider either changes lane position to increase separation, moves ahead where the motorcycle can be seen by the other driver or drops back a couple of seconds.



2. Stay out from behind big boxy vehicles such as trucks, busses or motorhomes. You can't see what's happening ahead. More importantly, other drivers can't see that you're there. A motorist intent on turning behind one of those big boxes may not suspect that a sidecar rig is hiding there. Worse yet, you don't have a good view of the left turner. For similar reasons, be very wary about passing a big box that is waiting to make a turn.

3. Maintain at least two seconds distance between your machine and the vehicle ahead, even if it is just a small car. That's the minimum separation you need to avoid a rear-ender if the driver suddenly jams on the brakes. It is helpful to actually count out the two seconds rather than just guess. When the car ahead passes some stationary point such as a pavement break, start counting: "one-thousand-one, one-thousand-two". If your front tire crosses the same point after the "two", you are at least two seconds behind, which is the minimum separation for any speed. Counting out following distance is especially important at night, because the human eye has trouble judging distances in dim light, especially lights in the red spectrum--which happens to include tail lights.



Two seconds is the minimum safe following distance to allow reaction time plus room to stop. If you don't have a good view ahead or the roadway is slick from rain or if another driver is tailgating you, increase following distance to at least four seconds.

Cornering Lines

On a curving road, consider that tighter turns require more traction and cause the outfit to sway more. While a sidecar rig needs more road space than a two-wheeler, the sidecar driver can often follow cornering lines that maximize traction and minimize sway and roll.

A large part of smart cornering is choosing a path of travel or "line" with the most gradual curves. Successful cornering also depends on how we control the throttle and brakes and how we balance the rig, but for now let's consider smarter cornering lines.

Where possible, enter curves farther towards the outside edge of the lane. That position allows you to follow the straightest line and also provides the best view of the road around the corner.

We tend to steer the vehicle towards where we are looking and we are tempted to stare at the inside edge of the pavement as it rolls into view. But that's not where we want to point the outfit. One technique for choosing a smart cornering line is to imagine a "window" through which the outfit must pass. The critical window is towards the outside of the curve entry. By looking at the imaginary window rather than the inside edge, it is easier to steer the rig where it ought to go. In multiple curves, keep your head up and look towards the next curves, not down at the road in front of you. Remember, the machine will go where you are looking.

Choosing smart cornering lines takes a lot more mental effort than simply cruising down the center of your lane, but the payoff is having much better control of the outfit when the road suddenly makes a tighter turn than expected or the surface slants off in the wrong direction.

Positioning is important, both to improve the view and to reduce the risks we encounter while cornering.

INTERSECTIONS

We have discussed how accidents occur, introduced some accident avoidance strategies and described how lane position relates to visibility and safer cornering. Now let's consider some tactics for riding in urban traffic.

Predictability

One of the important lessons about traffic is that those cars, trolleys, skateboards, busses and other wheeled whatnots have more-or-less predictable trajectories. When you are surrounded by intense traffic, it may seem that everyone else is whizzing around you willy-nilly with no apparent sense of direction, but it is possible to make some sense of it. Even the aggressive drivers have some predictable driving habits. If you're really looking, you can see that many of the same dynamic patterns of vehicle movement repeat over and over again. By learning and

recognizing the patterns, we can predict what is going to happen farther in advance and have more time to do something about it.



As an example, study this typical urban intersection. At the moment, everyone on our street is waiting for the green light. Of all the vehicles you can see in the picture, which one would you predict is the most hazardous to a motorcyclist? We'll give you the answer a little later.

In the meanwhile, let's delve into the statistics for a moment. Some years ago, the National Highway Traffic Safety Administration funded a survey of motorcycle accidents. The accident investigators studied every motorcycle crash they could get to in the city of Los Angeles, over a two-year period. The report on this study is often called the "Hurt Report" after the chief investigator, Harry Hurt. Since the Hurt Report was based on urban accidents, it's a pretty useful tool for helping us understand what the hazards are and therefore helping us predict what's likely to happen in traffic.

For instance, an overwhelming 65 percent of motorcycle collisions involved collisions with passenger cars, with the prime target being the side of the car. Angle collisions with cars add up to just under 30 percent. And collisions with left turners account for roughly 25 percent of all accidents, city or country. Although accident studies do not differentiate between two-wheeled and three-wheeled motorcycles, it is very likely that sidecarists face the same types of collisions as other motorcyclists.

DIAGRAMS

To help think about what happens at intersections, it might be helpful to think of traffic patterns like we think about football plays. Riding through traffic, the view is more like being on the line of scrimmage. To understand better what happens in traffic, we'll sketch out some typical sneak plays and suburban end runs as if we were looking down on them from a blimp. You'll need to convert the diagrams into the earthbound view to put it in perspective. Or, to think of it the other way around, as you are riding through traffic, try to visualize the blimp view of what the vehicles around you are doing. Later on, we'll throw in some critical advice on what you can do about these situations.

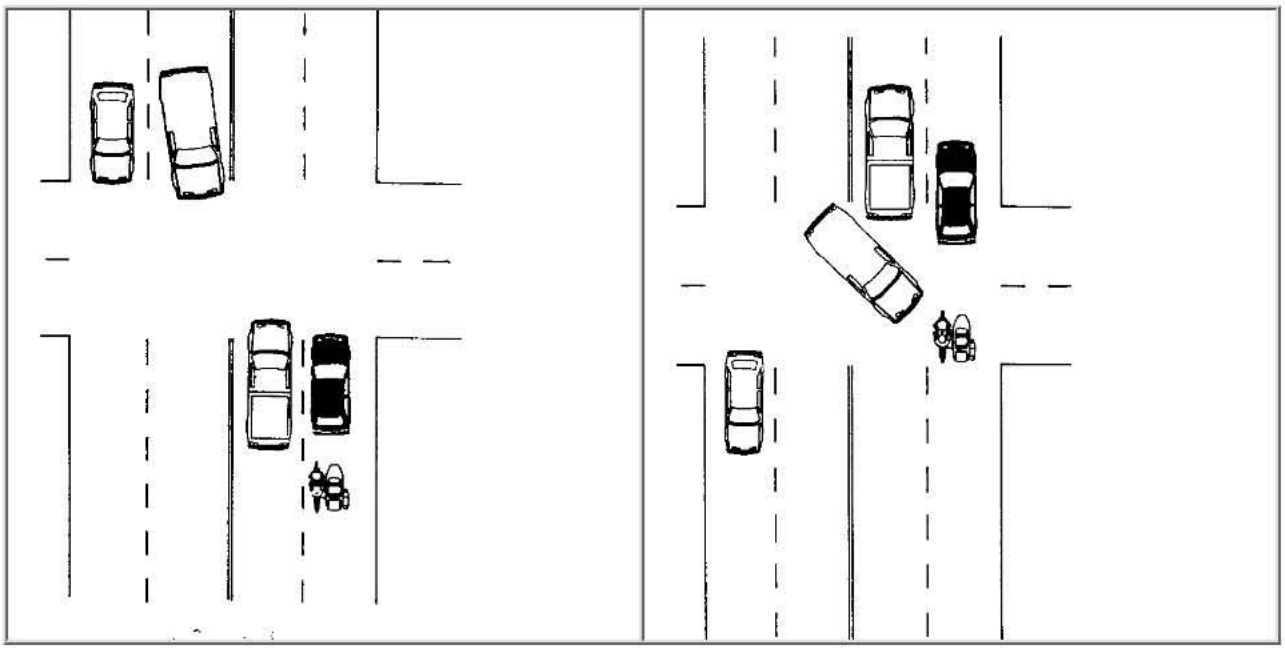
Of course, real life is going to be a lot more coplex than our diagrams. You'll have to imagine about ten or twenty other vehicles cluttering up each picture. We'll just show the important ones to keep things easy to understand.

Chapter 4 (Part 2)

Chapter 4 (Part 2)

THE LOATHSOME LEFT-TURNER

Study that photo again and see if you can spot the light-colored van coming towards you in the opposing lane. Figure 1 is the blimp-view diagram of this same scenario and Figure 2 is how a typical left-turn accident occurs after the light turns green. The unwary rider can very quickly turn into a target for a left turner like that van.



There are other versions of the same play. Figure 3 shows a second version of the left-turner with the car pulling out of a side street from your right. Figure 4 is a third version is with the driver pulling out of a side street from your left.

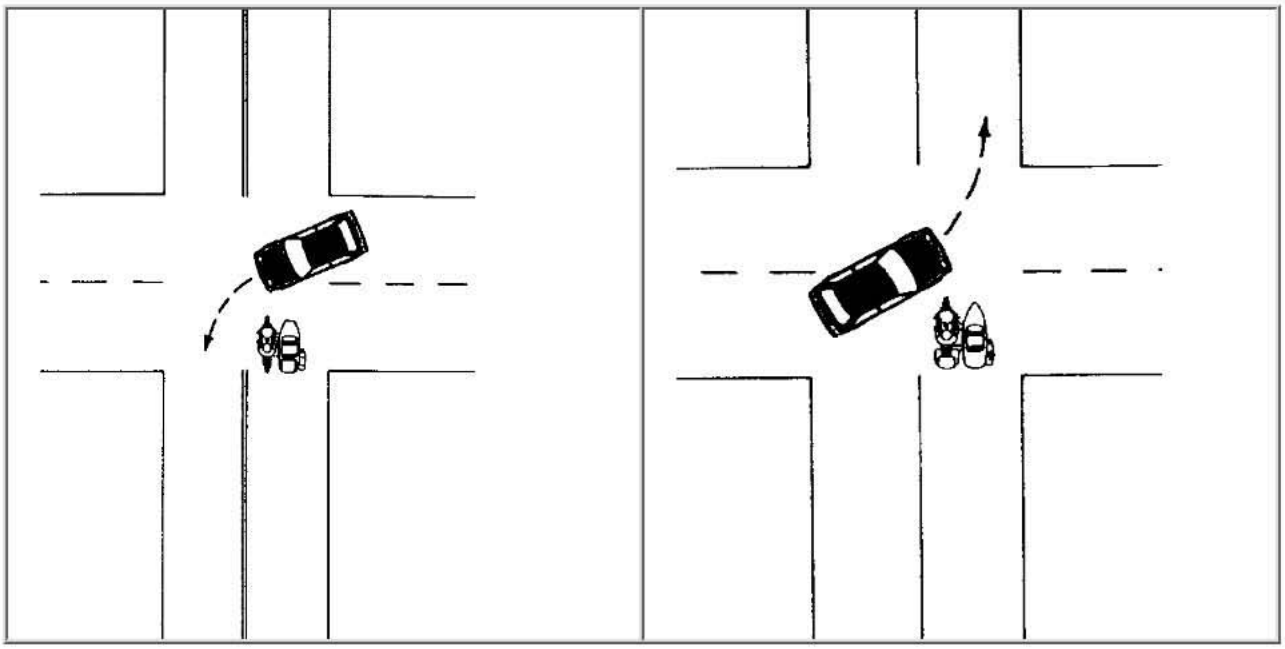
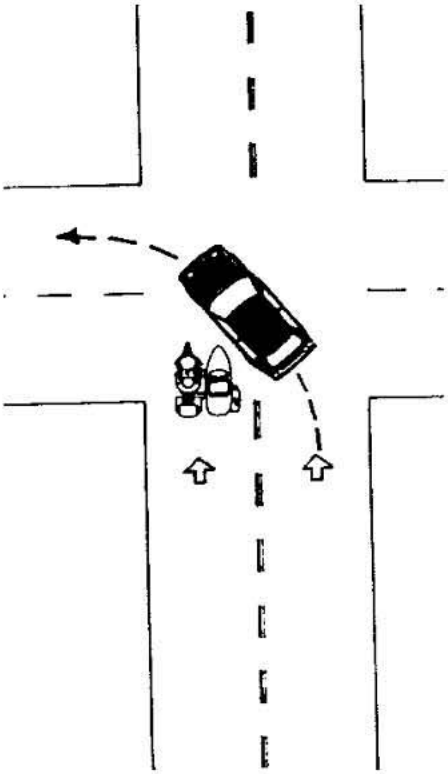


Figure 5 shows one additional left-turner situation that

can suddenly surprise you: a driver in the right lane of a one-way street may suddenly swoop left onto a side street. This "play" is more likely when traffic is light; the driver may forget that he is on a one-way street, momentarily thinking the left lane is vacant because no one is coming the other way. The Sidestreet Swooper is a rare bird, but one more good reason for keeping your distance from other vehicles while approaching an intersection.



If you are waiting to pass a slow-moving vehicle, avoid the temptation to pass at an intersection. In most states, passing at intersections is illegal and it is certainly risky. The driver may suddenly decide to turn left or another vehicle may pull out of a sidestreet into your path.

Remember that "intersections" include anywhere there is an opening to turn into or a driveway to pull out of, including gas stations, minimarket parking lots, alleys and entrances to shopping malls. Matter of fact, those big mall parking lots are just as complex and just as hazardous as small town intersections. And cars emerging from alleyways or driveways account for 17 percent of motorcyclist fatalities.

WHAT'S HAPPENING

You may have heard somewhere that establishing "eye contact" is a good way to keep drivers from pulling out in front of you. You might meet some interesting people in life by establishing eye contact, but eye contact doesn't keep cars from moving. What you really want to know is whether the vehicle is moving or not, and in which direction. Here's where to look:

1. If the car is approaching an intersection from the other direction and still moving, watch the front end. If the hood dips slightly approaching the intersection, it's a good clue that the driver is slowing down to make a turn.

2. If a car is stopped in a left turn lane, or is waiting to pull out of a side street or parking space, watch the top of the front tire to get the earliest warning that the vehicle is starting to move. The top of the tire moves twice as fast as the front bumper, and it also shows if the driver is steering in your direction.

3. "Nervous" head turns are a clue that a driver is about to make a sudden mystery move such as a lane change, a tire-squealing turn into a driveway, or a merge into traffic. Smart riders give extra space to nervous drivers, who may not know any better than you what they are going to do next. A nervous driver with an out-of-state license or a rental car sticker should activate your mental alarm system.

WINKERS AND BLINKERS

Turn signals and stop lights on other vehicles are worth watching, but not always worth believing. For example, that truck ahead is apparently signaling for a left turn, if you can believe the winking red turn signal on its left side. So, is it safe to pass the truck on the

right at the next intersection? Would you be surprised if the truck turned right instead of left? Consider what it looks like when the right side stop light burns out. As the driver pumps the brakes, only the left stop light blinks, so it appears as if he is signaling for a left turn. Did you catch the clue back in the second sentence? Tail lights and stop lights are red. Turn signal lights are amber.

TRAFFIC SIGNALS



Novice sidecar pilots sometimes get very nervous about traffic signals, especially green lights that have been green a long time. Of course you should be just as prepared to make a stop for a traffic signal as for a left-turner. The key is to gauge your stopping distance, and mentally measure back from the intersection to a point where you must either apply the brakes or continue through the intersection. If the light hasn't turned yellow when you get to that point, keep going. But is there some way to know when the traffic light is suddenly going to turn yellow, to help you avoid getting caught in the intersection under a red light?

If there is a pedestrian signal at the intersection, watch for the "DON'T WALK" light. The pedestrian signal always changes a few seconds before the vehicle signal to give the walkers time to sprint to the curb.

As you motor through city traffic, try to get into the habit of simply being aware of the dynamic patterns of vehicles around you. And if you can spare a few moments, park your outfit near a busy intersection sometime, watch what goes on there, and see if you can predict what's going to happen before it happens.

SIDE STREETS

Common sense might lead us to believe that accidents happen to motorcyclists far from home, but that's not true. More than half of motorcycle crashes happen during a trip of less than five miles. 68 percent occur within the first 12 minutes of the trip. 90 percent occur in city or suburban areas. About half occur on arterial streets, with a lot of collisions near shopping centers. These statistics hint that we need to stay alert while riding the familiar side streets near home.



Side streets: more dangerous than they seem

When we are driving down quiet residential streets it is easy to get lulled into a false sense of security. Traffic is light, and drivers are often more courteous closer to home. We tend to get complacent. We motor right by alleys without expecting a car to emerge, or continue through intersections where the view is limited by fences and hedges. We may fail to observe the parked car about to pull out.

One measure of our residential complacency is the significant number of motorcycle fatalities at driveways or alleys. Only 13 percent of motorcycle accidents occur at these locations, but the resulting collisions account for a whopping 17 percent of all fatal accidents.

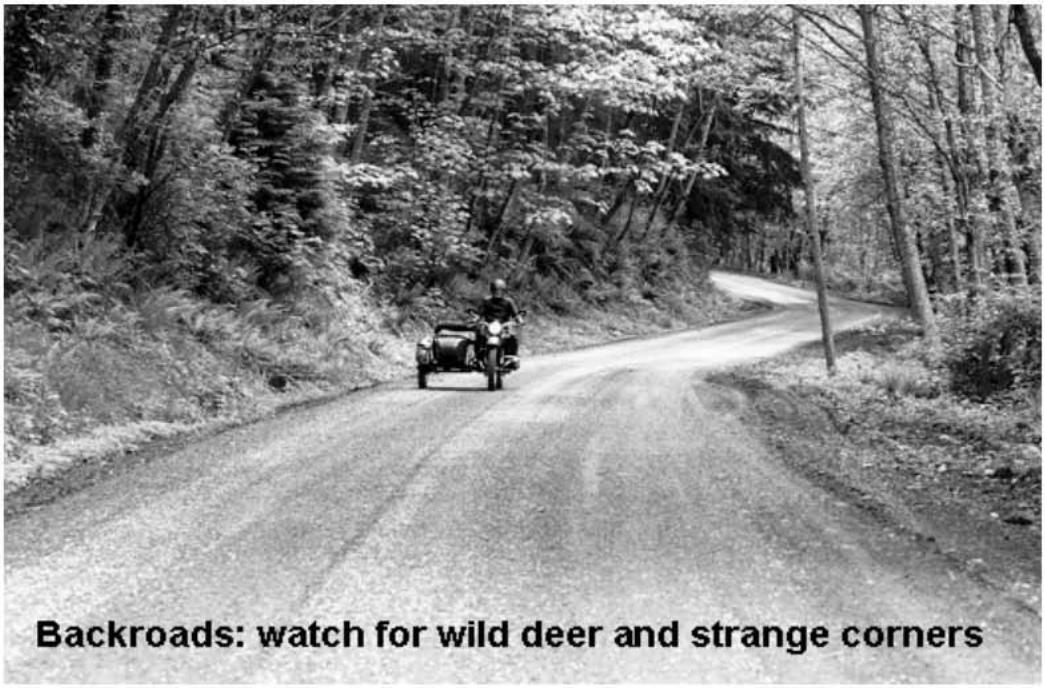
There are more joggers, runners, skateboarders, and bicyclists on the side streets, too. A lot of them are very nervy about dashing out into traffic, zipping on and off sidewalks, and ignoring traffic signals. You need to give these folks lots of space to avoid hitting them, but you must also be aware of secondary hazards they create. For example, an oncoming car may swerve across the centerline to get around a bicyclist on the other side of the road.

Children playing near the street often dash out from between parked cars without looking. Family pets may wander out, or even run out to chase you. Local residents will cross the street in mid-block, sometimes engrossed in conversation, or carrying bulky loads. Even though you may have the right-of-way, be prepared to slow or stop to avoid hitting anyone.

The family dog can upset two-wheelers, but the stability of the sidecar combination provides a unique advantage. Dogs seem to retain the hunting instinct of diving under the front "legs" of prey, so they may concentrate on your front wheel, and be struck by the sidecar. While no sensible person wishes to injure someone's pet, the sidecarist has the advantage of three-wheeled stability during a dog encounter.

To help avoid collisions with cars, watch for people in them. Empty cars seldom move unexpectedly. Brake lights or exhaust vapor from a tailpipe are good clues that a car is being started and is likely to back out soon. For occupied cars in parking spaces, observe the top of the front wheel. If the front wheel is turned out towards you, that's a good clue that the vehicle is ready to pull out. And remember, the top of the front wheel moves twice as fast as the vehicle, so that's your first indication of movement.

Above all, be very wary of intersections and alleyways where your view is severely limited by foliage, fences, or buildings. The primary defense against other vehicles which may suddenly shoot out in front of you, is careful scrutiny of the situation before you get there. You should always be prepared to stop within your sight distance. If your view is limited, slow down to give yourself more time to react.



Backroads: watch for wild deer and strange corners

CURVY BACK ROADS

The back roads are less hazardous than city streets, but can present special challenges for sidecarists.

All motorists must be aware of the common hazards of slow-moving farm vehicles, animals being herded across the roadway and surface hazards such as spilled gravel or manure. We should also be aware of wild animals and strange twists of the road.

In forested areas we should be wary of deer. Wild deer account for the majority of animal collisions on country roads. Deer often feed alongside the road during the morning and evening hours. They are especially hazardous just after sundown. A deer alongside the road ahead may appear to be harmless, but deer typically leap into action only as we get within a few yards. Expect a deer to suddenly leap onto the roadway and zigzag ahead of you unpredictably.

The first defense against deer is using caution in marked deer crossings, especially during the spring and fall migration seasons. In summer, watch for them especially after dark. Deer eyes reflect light, much like a white reflector on a roadside post. The difference is that the deer blink. A winking reflector is very likely a deer eye looking up at you in the darkness.

The only reliable technique for avoiding a deer strike is to brake to a stop before you reach the deer. Since the deer zigzag unpredictably, attempting to swerve around them may not be successful. To provide braking space, it is wise to encourage a tailgater to pass you on the back roads when in deer country.

Where the two-wheeled motorcyclist is concerned mostly about surface hazards that might cause a spill on the back roads, the sidecarist must be more concerned about the

shape of the road. Right-hand curves with a decreasing radius or turns with a reverse camber can quickly cause the sidecar to get out of balance and threaten to flip the outfit.

To help avoid a tipover, wise sidecar operators never carry a passenger on the back of the motorcycle seat with an unladen sidecar. When carrying both an adult and a small child as passengers, it seems logical to have the adult ride on the rear of the motorcycle seat, with the child strapped in the sidecar. But that load distribution can quickly overbalance the sidecar during a sharp right-hander, especially if the road slants the wrong way. If there is sufficient room, the best tactic is to carry both adult and child passengers in the sidecar together. If an adult passenger must be carried on the rear of the motorcycle seat, the passenger must be instructed to shift weight into turns to help keep the sidecar from flying.

In addition to how passenger weight is carried on the outfit, the driver must also master more advanced cornering skills. A little later, we will explain the tipover characteristics of sidecars and the advanced skills needed to keep them under control in both right-hand and left-hand turns.

SUPER SLABS

You will probably enjoy your >URAL most on quiet back roads where you can ride along at a sensible pace. But there may be times when you must drive on multiple-lane highways. Such highways may actually be tollways, expressways or freeways, but we'll refer to them all by the generic term "super slabs".

The biggest problem with driving a sidecar outfit on the super slab is that traffic is moving faster these days, with almost total disregard for legal speed limits. Commercial trucks are now so powerful that they can tailgate other vehicles on upgrades at illegal speeds. Careless drivers zoom around without signaling and they are just as likely to pass on the right as to the left. The super slab has become a sort of vehicular anarchy where anything goes.

This combination of traffic density, speed, vehicle mix and aggressiveness makes high-speed highways an uncomfortable and potentially dangerous place to ride a sidecar rig. Statistically, multi-lane highways aren't as hazardous as city streets, but if we intend to survive this generation's super slab, we'd better figure out some smart moves. Let's consider some characteristics of the freeway environment.

Speed

Common sense hints that the faster you go the more likely you are to crash. But it isn't that simple. Speed alone isn't as important as the relative speed between different vehicles. Traffic is least hazardous when everyone is moving at the same speed, whether that speed is fast or slow. In other words, if everyone is moving at 80, there is less risk than if a few drivers are moving at 70 and some at 60 and others at 50. Your least hazardous speed is whatever the vehicles around you are doing at the moment.

A whole convoy of cars can zoom along safely even when packed closely together, so long as no one changes position or speed. A slow-moving vehicle can create a hazard. A faster driver coming up on a slower vehicle may not comprehend the difference in speed. If the faster driver suddenly jams on the brakes to avoid a rear-ender, the next driver also must jam on the brakes, and a chain reaction occurs three or four cars back. Even if there is no collision, all the faster drivers must change lanes to get around.

Since the >URAL has limited power, you may find yourself the slow-moving vehicle in

super slab traffic. Because of this, you should drive in the slow (right-hand) lane, monitor traffic coming up behind you and be very aware of traffic around on ramps and exits.

Balky Backers and On-Ramp Oafs

On-ramps and off-ramps are prime locations for collisions because vehicles entering or leaving the highway must change both speed and direction. There are some repeating patterns in the confusion, though. Let's give them names we can remember them by. Consider the "Offensive Off-ramper" who waits until he is almost past the exit and suddenly darts across one or two lanes to barely make the off ramp. A variation of the Offensive Off-ramper is the Balky Backer who realizes he has just passed the exit, brakes to a screeching halt, shifts into reverse and backs crazily into the maw of traffic to regain the missed exit.

On-ramps call for merging vehicles to accelerate up to the speed of traffic so they can be eased into the outside lane without causing a problem for other drivers. There are a few "Milquetoast Mergers" around who think "merge" means to motor down to the end of the on-ramp and then suddenly jam on the brakes to study the situation whizzing by. We will also encounter "On-ramp Oafs" who shoot directly from the on-ramp to the fast lane without wasting any time on courtesies such as looking or signaling. Your best defense against these careless characters is to stay away from merging lanes. When you must drive in a merging lane, watch carefully for Offensive Off-rampers, Balky Backers, Milquetoast Mergers and On-ramp Oafs and adjust speed to give yourself maximum separation.

Super slab accidents

Accidents on the super slab happen very quickly and very violently. One second, everyone is motoring along without a care--the next second, brake lights are starting to come on and cars are slamming into each other. Sometimes there are chain-reactions where fifty cars pile up before following drivers see enough red lights to get on the brakes and slow down the pack.

If you wait until you see brake lights ahead to react to what's happening, there is very little time to keep from slamming into the mess. To avoid collisions, we need to look far enough ahead is to give us time to spot problems and take evasive action early. One of our advantages is that the higher seating position gives us a better view ahead.

If you think an accident might be starting to occur ahead, look for an escape route, preferably towards the shoulder. At least, head for an outside lane. Better yet, take an off-ramp and wait to see what happens next. It certainly isn't smart to come to a complete stop in the middle of the freeway with traffic behind you just awakening to the brake lights.

While less than 10 percent of motorcycle accidents occur on multi-lane highways, we don't want to be a cause of accidents on a fast-moving super slab. When faced with heavy traffic moving at higher speeds, the wise >URAL driver will choose alternate roads or more relaxed times of travel.

Chapter 4 Part 3

HILLS

Up to now, we've been describing various riding techniques assuming a level road. In real life we will encounter hills, both in the city and in the country. Let's consider the implications of cornering and braking while negotiating steep grades, both up and down. There are several important considerations, including traction, gravity, inertia and spatial orientation. Let's first review some of the physics and then see if we can offer some tips for maintaining directional control while also staying out from under the wheels of other vehicles.

Inertia and Gravity

When we corner on a three-wheeler, we depend upon gravity to load the tires and maintain traction needed to force the outfit into the turn. And we also must manage the effects of inertia, which "transfers weight" to the rear wheel during acceleration, to the front wheel during heavy braking and pulls away from the sidecar in right-hand turns.

Uphill



With the front end pointed uphill, gravity is pulling more towards the rear wheel. Note that maximum traction is limited to how much force is pushing the tire into the road surface. For acceleration, going uphill is good news from the standpoint of traction. Both gravity and inertia load the rear tire and it will have more traction to thrust the motorcycle forward.

But, when driving uphill, all that "weight transfer" to the rear end unloads the front tire, so there is less traction available for steering or braking. The reduced front wheel traction means it can't provide as much force to make the motorcycle turn. The front tire may drift sideways in corners, especially on slick or loose surfaces.

Stopping while going uphill is easy, because gravity is already pulling backwards on the bike and this backwards pull of gravity helps counteract the forward inertia of the machine. Rolling off the throttle has an immediate effect and we don't need much braking to make a quick stop. The problem with braking while heading uphill isn't getting the bike stopped, it's holding the rig from sliding backwards downhill. The reduced traction on the front tire provides little stopping force. Since the >URAL sidecar brake is activated by the rear brake pedal, it is important to keep the rear brake adjusted and apply it firmly when stopping on hills. With an empty sidecar, the sidecar tire may slide on a steep hill, but that doesn't have much effect on directional control.

Downhill



The reason why accelerating downhill is so effortless is that gravity is already pulling the machine downhill. Of course, there is less traction available at the rear tire, but we don't need much traction to accelerate because gravity is added to the engine's thrust. The forward weight shift increases front wheel traction, which helps maintain steering control in downhill turns and also allows more front wheel braking.

Stopping while traveling downhill is more difficult, because the brakes have to overcome the downhill gravitational pull in addition to the inertia of the machine and load. Given the same angle of slope, the downhill gravitational pull is constant at any speed, but the inertial force increases dramatically as a function of speed. Inertial forces almost triple with an increase in speed from 30 to 50 mph. If speed is allowed to increase on a steep downhill section, inertia can quickly increase to the point where the brakes can't slow the outfit quickly enough to prevent a tipover in turns. Drum brakes also heat up from friction and begin to fade if used continuously on a steep downhill grade. With the physical dynamics in mind, let's review some of the tactics veterans use to maintain control on steep hills.

Starting and Stopping

Veterans have learned some fancy footwork to hold their roadburners in position on steep hills. When pointed uphill, hold the motorcycle with the rear brake, keeping the bike in gear but the clutch squeezed. Set the parking brake to start the engine. When starting up a steep uphill grade with a loaded sidecar, the engine must be revved up to develop enough power and the clutch must be slipped more to get the outfit moving uphill. If you really have trouble getting started on a very steep hill, remember the old bicycle trick of

starting by angling across the lane rather than straight uphill. Keep the sidecar on the downhill side.

Uphill corners

When negotiating steep uphill turns, remember that the weight shift to the rear has unloaded the front tire and reduced traction needed for steering. Use the inertia of the machine to carry it uphill, just to the tightest part of the corner. Get the machine turned while inertia is still pushing it uphill, then accelerate in the straightest possible line.

Downhill

When braking hard on steep downhill grades, veterans keep speed in check by using both brakes. The front brake is used in both left and right turns. Shifting to a lower gear and rolling off the throttle allows the engine to provide compression braking, but experienced sidecarists avoid sudden downshifts and quick release of the clutch, which can slide the rear tire loose. With the 2-wheel-drive >URAL Sportsman, engine braking force will dissipate if the sidecar wheel loses traction.

Descending steep switch backs, it is often necessary to stay on the brakes even while turning, so we have less traction available for steering. Smart downhill hackers brake harder on the front during the straight line approach to a curve, then ease up on the front brake to allow most of the traction for cornering.

Stopping on steep downhill grades requires more force on the front brake, but the rear brake will continue to be effective. With a loaded sidecar, the sidecar brake will help decelerate the weight in the car and make it easier to hold a straight line.



Downhill Right-Handers

It is important to slow more when approaching downhill turns, especially right-hand curves with an empty sidecar. Both inertia and gravity are pulling the combination towards the outside of the curve and the outfit could easily tip towards the left. Veteran sidecar pilots slow to a crawl and slide their weight off the saddle towards turns to help prevent tipovers. In subsequent lessons and exercises we will help you increase the cornering skills needed for such hazardous situations.

EVASIVE MANEUVERS

Whether we are driving the outfit in the city or the country, we must be able to maneuver away from trouble to avoid accidents. Ideally, we will spot hazards far enough ahead to simply make a small speed or position adjustment and avoid the problem. But we will sometimes encounter hazards that can't be predicted or occur so quickly we must take immediate evasive action.

We have laws that say a trucker can't ignore a red light and pull out in front of a motorcyclist. But, in fact, the trucker can pull out. You may have the legal right-of-way, but that won't protect you from getting smashed. There's a little rhyme which sums this up nicely:

"He was right, dead right, as he sped along;

but he's just as dead as if he'd been wrong."

The bottom line is that the motorcyclist wishing to survive urban traffic must adopt a "move it or lose it" attitude. Sidecarists with limited motorcycle experience need to understand that a sidecar outfit is perceived as a motorcycle by other motorists and that motorcycles are often given less respect than they deserve.

Evasive Action

Since the name of the urban traffic game is "move-it-or-lose-it", we must constantly be in the process of spotting potential hazards and moving away from them. We'll call this process "evasive action". Ideally, evasive action shouldn't have to be heart-thumping, eye-bulging panic stops, tire-chirping swerves or white-knuckle acceleration. By understanding the typical accident scenarios and predicting what the other vehicles around us are about to do, we should be able to make easy corrections to just stay away from trouble. Most of the time, we can do just that. For example, if you are being tailgated in deer country, you can encourage the tailgater to pass before you need to make a quick stop to avoid a deer strike.

But sometimes we just can't keep from getting boxed into a corner. We either make some drastic move within the last two or three seconds or get clobbered. Let's say you are riding down a quiet side street when a car suddenly shoots out of an alley. You must take immediate evasive action to avoid a collision.

Frozen on the throttle.

Perhaps one of the most significant eye-openers of the Hurt report concerns the evasive actions taken by riders faced with impending collisions. 99% reported 4 seconds or less between the time they realized a crash was about to happen and the actual impact. 61 % reported 2 seconds or less. So, what evasive maneuvers would you think these riders attempted in those last few seconds prior to impact? Guess what? About a third of the crashees did absolutely nothing prior to impact!

Maneuverability

Maneuverability is one of our best assets. A sidecar outfit can be turned very quickly. A proficient Ural driver can stop the outfit from typical 35 mph suburban speeds in perhaps 30 feet in ideal conditions. Of course, your actual stopping distance depends upon the skill you have developed.

When faced with an obstruction, we need to decide whether to accelerate, brake or

swerve, because we can't do more than one effectively at the same time. For example, when you spot a potential left turner, you could try to gas it and beat him through the intersection. Or, you could maintain speed and swerve around him. Or, you could prepare for a quick stop in a straight line. Let's consider the implications of these evasive tactics.

Accelerating

Accelerating to avoid a problem is a tempting choice and there are times when acceleration is the best tactic. But heavy sidecar rigs don't accelerate very quickly. And accelerating through a busy intersection is seldom a clever choice, for several good reasons: Accelerating increases momentum. And, car drivers have been known to beat the motorcyclist to the intersection and then slam on the brakes halfway across. The biggest drawback with accelerating is that it cancels out the other options. If you attempt to accelerate, you can't change your mind and do a rapid swerve or a quick stop.

Swerving

Swerving is a often a better choice than acceleration, because you haven't increased inertia and you can use the available traction for changing direction. Of course, swerving successfully requires that you know how to swerve and which way the obstruction is going to move. Cars don't always go where you think they are going. The good news is that swerving doesn't cancel out the other options; you could swerve, then straighten out and either brake or accelerate.

Quick stops

Hard braking gives you additional options. You can brake hard and come to a quick stop in a straight line or you can release the brakes at a slower speed and then make a more dramatic swerve without flipping the rig. So, hard braking is often the best choice of evasive action at intersections.

Smart sidecar drivers are already prepared for a quick stop as they enter a busy intersection. We've let the tailgating "shark" past, back in the middle of the block and now he's tailgating the bus ahead. We passed that "creeper" to avoid becoming a creeper sandwich; but now we've backed off to stay out from behind the bus. We're looking for left turners and watching their hoods and front tires, right? So, what more can we do to be prepared? Well, let's repeat five veteran techniques for making successful evasive maneuvers with a minimum of panic.

1. Get in the front brake habit. Stay in the habit of using the front brake every time you brake. The front brake is the most effective on the outfit. It is tempting to fall into the lazy habit of using just the rear brake and believing that you can reach for the front brake on those rare occasions when a quicker stop is needed. The trouble is, very few of us can out-think our habits. In an emergency we will do whatever we have been in the habit of doing. If you use the front brake all the time, you will use it during a quick stop without even thinking about it.

2. Practice. At least once each year, practice quick stops and swerves to maintain proficiency. Skill can only be improved through practice. Reading is OK to improve your mind, but you've got to practice if you want to hone your braking skill. Quick stops require that you be able to apply maximum braking on both wheels just short of a skid, whether on dry pavement or wet, uphill or down, on the straight or in a curve. You must be able to quickly separate braking from swerving and handle the techniques of hard braking starting in a curve. We will deal with braking and swerving practice in subsequent lessons.

3. Slow down 10. As you approach an intersection, decelerate just 10 mph, shifting down a gear as needed to keep engine revs up. Typical intersection speeds are 30 to 40 mph. Slowing just 10 mph, from 40 mph to 30 mph, reduces inertial energy by half, which

means the same brakes and tires can stop the same load in about half the distance. If you don't have to make a quick stop, you can easily get back up to speed after you've cleared the intersection.

4. Cover the front brake. Keep two or three fingers curled around the front brake lever in traffic and apply just a hint of brake if you suspect you might have to do a quick stop. Just reaching for the lever could take a half-second, plus maybe another half-second to start squeezing the lever. One second's worth of reaction time at 30 mph eats up about 44 feet of critical road space or just about the distance it takes to stop from 30 mph. If you are already on the front brake, you won't need more than a fraction of a second to squeeze harder.

5. Look where you want to go. As you ride along, make a habit of looking where you want to go, not at things you'd rather miss. If you want to hit a chuckhole, stare at it. It's a phenomenon called "target fixation". While you're cruising through intersections, keep your eyes moving to spot potential collisions, but spend some of your attention spotting escape routes or paths of travel you could follow if you need to make a sudden exit from a situation that's closing in. If a car suddenly gets in your way, don't stare at the car, focus instead on a path of travel that carries you around the car or a spot on the pavement where you will be stopped short of a collision.

Which brings us back to some observations we made earlier. Remember, the farther ahead you spot a problem, the more time you will have to deal with it. If you're sharp enough, you'll never need to do any "panic" evasive maneuvers. But when you do need to "move it or lose it" in the final 3 or 4 seconds before an upcoming smasho, having a plan of action and having practiced it will make the difference between a smasho and a close call.

PASSING

The >URAL prefers to motor along at a relaxed pace and you may find other drivers passing you more often than not. You should understand some common-sense rules for helping faster drivers to get around you. And there are times when you must pass other vehicles to separate yourself from hazards.

Our main concern when being passed by another vehicle is to not get in the way. When another vehicle is passing us, we need to be aware of that and be prepared to take evasive action to keep from getting clobbered. On the super slab we need to look behind both left and right to spot aggressive drivers moving up through the pack.

On secondary highways, getting passed can be an irritating business as the other vehicle pulls back in front, stirring up turbulent air and road grit and sometimes spreading a nauseous cloud of diesel soot. But increasing speed just encourages the other driver to cut in closer in front of us. Instead of getting incensed when we are passed, we ought to evaluate what's going on.

Traffic Speed

If we get passed by one or two hurried drivers in a hundred miles, that's just folks in a hurry to get to the radar trap first. But if we're being passed by everyone else on the road, it's a clue that we are moving too slowly. We ought to get up to traffic speed to avoid causing a problem, pull over more frequently to let faster traffic go by or choose a less traveled road.

Passing

Sometimes even we sidecarists need to pass other vehicles. For example, you may come up behind a slow-moving motorhome on a secondary road. After a mile or two several

vehicles pile up behind you and it is obvious the motorhome driver isn't going to speed up or pull off. By staying behind the motorhome you limit your view of the road ahead and also make it difficult for following drivers to pass. You may decide to pass or you may decide to drop back and allow following drivers more room to pass both you and the motorhome.

When passing another vehicle on a two-lane highway, what's important is to plan the pass to avoid collisions with either the vehicle we're passing or other traffic that enters the scene. It's not smart to depend on other drivers to brake or swerve to miss us. Since we'll be borrowing the opposing lane for a few moments, we need to choose a section of road no one else is likely to use at the same time.

Quick decisions and faster speeds can suddenly degrade into panic situations. We don't pass on bridges because there's no escape path except into concrete or steel. We don't pass at intersections because traffic can quickly pull out of a side street into our path. We don't pass on hills or in blind corners because we can't see enough of the opposite lane to know it is clear. In most states it is illegal to pass in such locations and good riders agree with the law.

Passing accidents occur when someone does something unexpected in the critical moments when the passer is hanging out in the wrong lane. For instance, a sidecarist with a clear road ahead starts to pass a groaning gravel truck. Then, just as the sidecar pilot gets up to speed, the truck starts a left turn into an unmarked driveway.

One way to avoid such scenarios is to scrutinize the road ahead well enough to spot any place where the other vehicle could make a sudden turn and avoid passing at that point. When you do decide to pass, make a habit of taking one last look in the mirrors before pulling out, to avoid collisions with other vehicles that suddenly attempt to pass you both. One way to avoid tangling with a vehicle being passed is to sound the horn as you come up abreast. Sounding the horn when passing is required by law in many states, but beeping seems rude, so most of us ignore the law. One polite beep when passing might be a smart tactic.

Politeness

Passing someone has the psychological implications of a put-down. We're "beating" the creeper down the road. It is perceived as especially rude to pull back in line too closely in front of the other vehicle. The slower driver may react to our pass by blasting the horn, waving nasty digits, speeding up, tailgating or even pulling out a handgun. We can help disarm the situation by signaling our intentions well in advance and allowing a minimum space of two seconds in front of another vehicle.

RIDING AT NIGHT

Remember old Paul Revere, pounding through the streets in the middle of the night? Wouldn't you think that Paul would have been smarter to do his fast riding in the daylight? Well, he had a schedule problem. He had to ride at night. Sometimes we motorcyclists face the same problem. We need to cover some miles and there isn't enough daylight. Or maybe we want to cross the Arizona desert under moonlight rather than beneath the scorching sun. Whatever the reasons for riding at night, we should understand the correct tactics.

The very first problem with night riding is that most of us have our bodies programmed for sleep at night. Unless we change the programming, it is extremely difficult to keep our eyelids propped open while staring into the darkness and listening to the hypnotic drone of

the engine.

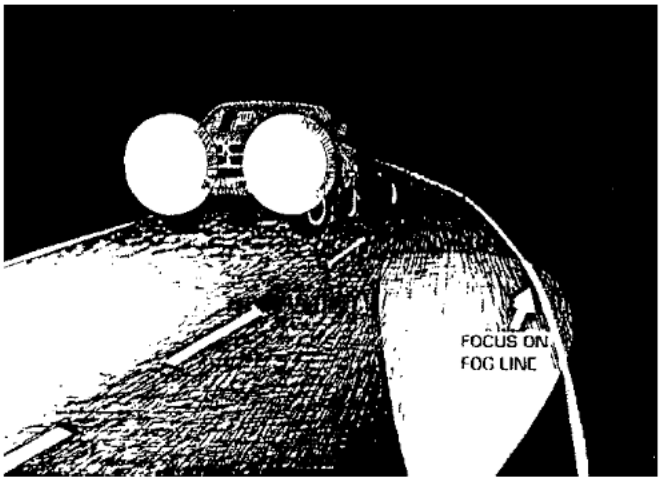
Perhaps the most important night-riding tactic is to take frequent rest breaks. As a practical technique, stopping for a coffee break at a restaurant provides a good cue for a subsequent stop at a rest area. If you don't drink coffee, drink a couple glasses of water.

The Eyes

Our vision also tends to fade as we get older and most of us age another year about every 12 months. One common problem is "floaters" that drift around on the surface of the cornea and interfere with clear vision. As the years go by we may become near-sighted or far-sighted and need corrective lenses. Then our "reading" bifocals may have the wrong focus distance for reading our motorcycle instruments. Some people gradually lose peripheral vision or start to form cataracts or lose the ability to distinguish colors. Because vision is so important to a motorcyclist, it is smart to have vision checked every couple of years, preferably by an eye physician ("ophthalmologist") who is trained to spot problems as well as dispense lens prescriptions. Deteriorating vision is a good reason to avoid night riding altogether.

Even if your vision is 20-20, the human eye has some odd night-time characteristics. Consider what happens when someone takes a flash photo of you while you're staring at the camera. The instantaneous flash of bright light overwhelms vision for a second or two. The same thing happens during a night ride when we walk out of a brightly lit building and stumble blindly over the curb while our vision receptors gradually adjust to the dim night-time level. That's one reason why many veteran truckers wear sunglasses in the restaurant at night and why experienced night riders wait a few moments in the dark before riding away.

Blinding Lights



But what do you do when you're cruising down a narrow road and an oncoming vehicle approaches with its lights blazing at you? You can't just shut your eyes until the vehicle passes. If you stare directly at the lights, your eyes begin to adjust to the high light level, but after the car passes it takes several seconds to adjust back to low light again. The trick is to avoid focusing on bright lights. Instead, as the other vehicle gets close, temporarily shift your focus to the white "fog" line along the right edge of your lane. Let your peripheral vision soak up the bright lights and save your important central vision for the dark road you need to see after the vehicle passes.

Before you head out into the darkness on your >URAL, check the lights, especially those on the rear end. You don't want to be hit at a stop sign because your tail light or brake light has burned out. If you intend to ride regularly at night, consider adding additional reflectors to your outfit and riding gear. Does your jacket and helmet have reflective

patches on the back? Would it help to wear a reflective vest over your leather jacket at night? Could you add some reflectors on the back of the sidecar?

Body Care

Even during the summer, night time temperatures can be surprisingly chilly. Don't forget to wear insulation under your crash padding and slip on your neckwarmer or balaclava. There are enough problems to deal with while riding at night, that you don't need to get hypothermic too.

Drunks

Remember that the most dangerous hours to be on the road are between 11pm and 2 am, especially on weekends. Those are the hours when the drinkers are heading home from the taverns. Your risks double during these hours. Drunk drivers tend to be erratic, wandering out of the lane, making sudden steering corrections or jamming on the brakes for no apparent reason. Give the drunks lots of room.

It's always smart to avoid alcohol during the ride, but it is critical at night. Not only does alcohol degrade your judgment, hearing and muscle control, it also upsets vision, including the ability of your eyes to focus and adapt to changing light levels.

Obviously, the risks increase after the sun goes down. If you have any reservations about midnight rides, just say "no". Take a day off work and make that rally transit in the daylight or have an early snooze tonight and get up at dawn to start that desert crossing. If you have a choice, choose daylight. If Paul Revere were around, he'd probably agree.

Chapter 5

Chapter 5

INCREASING DRIVING SKILLS

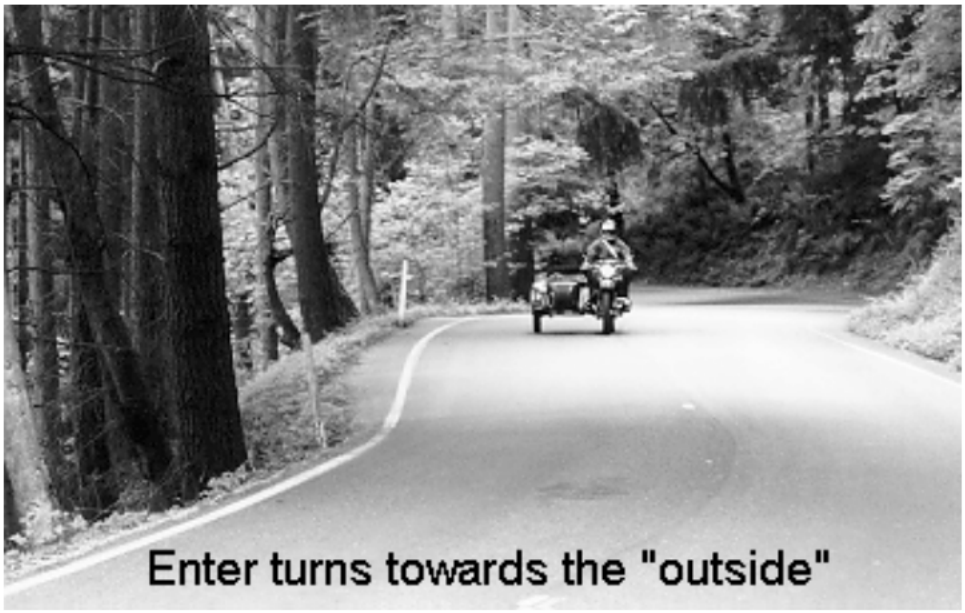
Now that you have practiced the basic control skills and studied some accident-avoidance strategies for riding in traffic, let's move on to more advanced techniques. First, we'll think about the dynamics of how sidecar outfits are controlled, then we will add some advanced exercises to practice on your machine.



Traction Control

One of the unique advantages of motorcycle/sidecar combinations is that a three-wheeler doesn't fall down just because one of the tires begins to slide. We can approach the limits of traction without losing control. For example, on a gravel road, we can accelerate or brake to the limits where the tires begin to spin or slide, yet not fall down or lose directional control. However, there are situations where losing traction can precipitate a rollover. Even if you ride conservatively, there are situations in which you must know what your tires are doing.

We call the rolling friction between the tires and the road surface "traction". The tire rubber actually presses into the tiny bumps and dimples in the pavement as it rolls across. Traction resists any forces pulling laterally on the vehicle, whether engine power, braking or side loads forcing the outfit into a turn. One important point to remember is that maximum traction depends upon how much weight is pressing down on the tire. For example, there is less traction on the front tire going uphill than going downhill, even on the same pavement.



Traction is a limited commodity. Even on rough dry concrete with excellent traction we can use it all up. For example, if we brake hard on the front wheel in an uphill left turn, the front tire could slide off on a tangent. There simply isn't enough traction for both turning and braking at the same time. Let's consider some tactics for controlling or "managing" traction.

On a twisty road, we can make the most of the available traction by following a path of travel or "line" that conserves traction. Since the tires use the least traction when rolling in a straight line, we can plan cornering lines with straighter curves than the centerline of the pavement. At the same speed, a cornering line with a larger radius of turn uses less traction than a smaller radius.



The advantage of following straighter lines through curves is more than just keeping the tires from sliding. Remember, that sidecar outfits have less stability than wider four-wheeled vehicles. By reducing the side loads on the tires, we also reduce tipover forces. The key to following smarter cornering lines is to enter turns closer towards the outside of the lane.

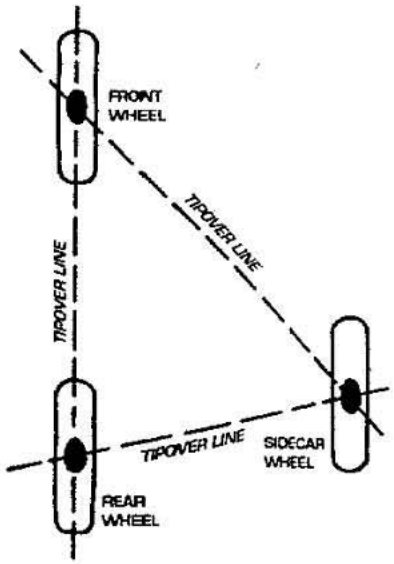
We can also help manage traction and side loads by correct throttle and braking

technique. In a level or uphill turn, we should roll on some throttle through the curve to help transfer more weight onto the rear wheel. With single-wheel-drive outfits, rolling on the throttle not only shifts weight rearwards, but also causes the rig to yaw towards the right until the sidecar weight is accelerated. That helps turn the rig in right-hand curves, but not in left-handers.

With the two-wheel-drive Sportsman, there is much less tendency to yaw while turning, but power delivery still depends upon keeping the tires firmly on the ground. If either driving tire loses traction, engine power transfers to that wheel and forward thrust is lost. So, it is just as important to manage cornering traction on the Sportsman as on any other outfit.

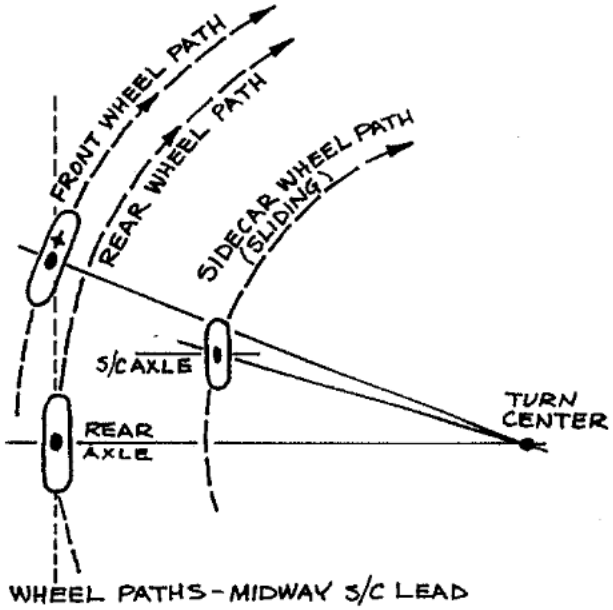
We should also note that rolling off the throttle uses traction. With the throttle closed, the engine acts as a compression brake. Braking on the rear wheel transfers weight forward, which reduces rear wheel traction even more. That's why suddenly rolling off the throttle or jamming on the rear brakes can cause the rear end to slide. If the outfit is in a tight turn at that moment, the rear end will slide sideways. Some veteran sidehackers do this on purpose to make a quick U-turn, but we don't recommend skidding the URAL sideways. If the "inside" tire suddenly catches traction, the outfit can be flipped over.

To better control traction and avoid groundloops, we need to consider tipover lines and study the correct techniques for "drifting" the outfit.



TIPOVER LINES

If you were to lift the sidecar wheel off the ground, the outfit would continue to be supported by the other two wheels. In fact, it is quite acceptable to tip the URAL sidecar up in the air to do sidecar maintenance. But consider that when the outfit tips up, the contact patches of the motorcycle tires are the hinge points. If we could draw a line on the ground between the two motorcycle tires, we could describe that as a "tipover line". Since we could tip the outfit over any two wheels, there are actually three tipover lines forming a triangle between the three contact patches of the tires.



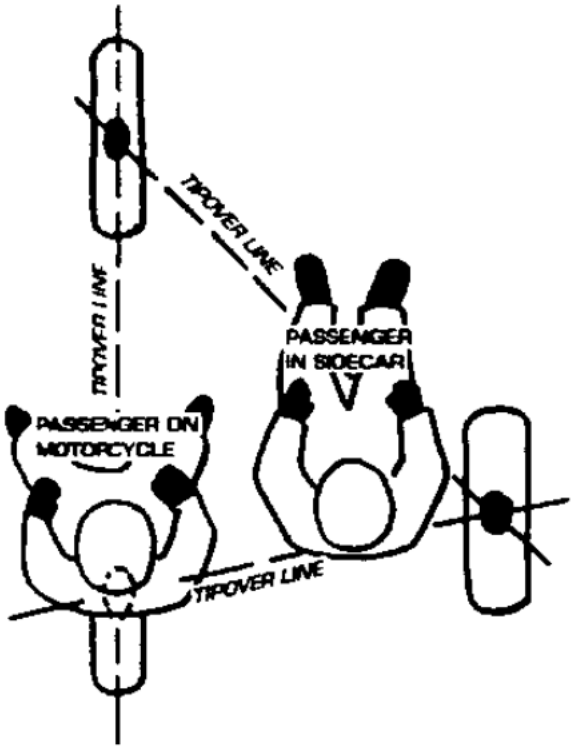
The farther apart the tipover lines and the lower the center of gravity, the more stable the vehicle.

Since URAL sidecar rigs have a relatively high center of gravity compared to the width of the wheel track, it is important to learn and practice correct cornering tactics.

You may have noticed that the sidecar axle on the URAL isn't in line with the rear axle of the motorcycle. The sidecar wheel is positioned a few inches ahead of the rear wheel. Sidecar wheel position has a lot to do with how a sidecar rig corners and balances.

A sidecar outfit would be most stable if the sidecar wheel were positioned about halfway between the motorcycle's wheels. But that position would make it very difficult to steer the rig, because the sidecar tire would have to slide sideways during turns.

Some sidecars are mounted with the sidecar axle exactly in line with the rear motorcycle axle. This provides easiest steering, but such outfits are much easier to tip over in left turns, because the tipover line is even closer to the motorcycle.



The URAL sidecar axle leads the motorcycle rear axle by several inches as a compromise between easy steering and tipover resistance. Sidecar wheel position in relation to the motorcycle (lead) is critical and should not be modified.

It is also very important how we load the rig, especially in terms of where passengers are carried. A heavy passenger carried on the rear of the motorcycle is already halfway outside one of the tipover lines. If the sidecar is lifted up only a few inches, the passenger's weight is quickly shifted entirely over the tipover line. If the passenger is carried in the sidecar seat, the passenger's weight is well within the left side tipover line. We'll consider the best ways to carry passengers and loads later on.



In right turns, the sidecar driver's weight also helps control tipover forces. Not only does the driver's weight generate centrifugal force, but the driver's gravity can shift outside the tipover line if the car flies or if the road slants the wrong way. That's why it is important for

the driver to slide towards the inside of turns.



Left turns can provide some quick surprises, too.

In a quick left turn, the outfit tends to roll and slide towards the right and the important tipover line is the one between the front wheel and the sidecar wheel. A heavy passenger in the sidecar generates a tipover force sufficient to lift the rear wheel of the motorcycle in a quick left turn. It is possible to "groundloop" the motorcycle over the sidecar. Knowing this, veteran sidecar pilots shift body weight towards the turn even in left-handers.

The two-wheel-drive Sportsman has a higher center of gravity that other models and also has different traction characteristics. Remember, that a rolling tire has more traction than a sliding tire. If the Sportsman is slid sideways and the sidecar tire suddenly regains traction, the outfit can quickly groundloop over the sidecar. We recommend you avoid sliding any URAL outfits sideways, especially on tractable pavement.

SLIDING AND DRIFTING



To understand how to keep from sliding, we need to understand more about it. A sliding tire actually has less traction than a tire that is still rolling on the road surface. A tire that is sliding sideways allows the tipover line to move sideways and allows inertial energy to dissipate. For example, on a loose gravel surface it would be more difficult to groundloop the rig during a tight turn because the reduced traction would allow the entire rig to slide sideways and settle down.

. The first important lesson about sliding is that a sliding tire doesn't care which way it slides. A sliding front tire tends to slide straight ahead whether it is steered left or right. With all three tires sliding, a sidecar driver wouldn't be able to steer and the rig would simply slide off on a tangent until it stopped.

The second important lesson about sliding tires is that if a tire regains traction it immediately wants to start rolling in whatever direction it happens to be headed. A sliding sidecar tire that suddenly grabs the pavement could yank the outfit into a new direction or flip the rig. But it is possible to control how much the tires slide even as they are still rolling. We call this "drifting".

Drifting is the fine art of using throttle and brakes to balance tire sliding while still maintaining directional control. We primarily use drifting in turns to help dissipate side loads and keep the rig on all three wheels.

In fast left-handers, we can use just enough throttle to drift all three tires without sliding out. In fast right-handers, we can drift the outfit by using throttle and front brake together. And we can help control tipover by shifting our body weight towards the inside of turns. Let's see how we do that.

USING THROTTLE AND BRAKES IN RH TURNS

The technique for drifting through right-hand turns is to use the front brake and throttle together. Rolling on some throttle helps push the rig around the corner, jacks the bike up on the suspension and transfers weight to the rear tire. The rear tire drifts slightly towards the left, helping dissipate some of the centrifugal force and keeping the sidecar on the ground.

Of course, if we simply rolled on more throttle in a right-hander, the rig would quickly

speed up, centrifugal force would increase and the sidecar would soon begin to fly again. So, the trick is to squeeze on just enough front brake to keep speed from increasing, even while we are rolling on the throttle. And don't forget that we're doing this while planning a smart cornering line and also sliding our weight off the inside of the saddle. It's complex, but it's the technique that is needed, especially when that turn ahead happens to be a decreasing-radius, off-camber "killer corner".

Later, in the exercises, you'll be practicing the technique, to the degree that you are physically able. First, you'll practice sliding off the inside of the saddle, as if in a sharp right turn. You want to shift your posterior now, not just your shoulders. Plant your right foot firmly on the footpeg and slide your "buns" as far as you can towards the sidecar while still keeping a grip on the bars. Hook your left knee over the saddle. The idea is to hang off, not fall off. Grip the throttle with two fingers and wrap the other two fingers around the front brake lever so you can operate the throttle and front brake simultaneously.

We'll help you through all of the steps in the exercises to follow.

QUICK STOPS

Back in our discussion of evasive maneuvers, we suggested that making a quick stop was a primary technique for avoiding collisions in traffic. A quick stop is also the best way to avoid a deer that leaps onto the road in front of you. A quick stop is simply bringing the outfit to a standstill in the shortest distance. Let's review the dynamics of braking and then consider how to practice quick stops on your outfit.

At speed, the outfit has stored energy we call inertia. In plain English, the outfit wants to keep rolling. To stop the rig, we try to grab the wheels with the brakes. And the wheels try to grab the road via tire traction. Remember, that traction is a function not only of the road surface and the stickiness of the tires, but also the force pushing the tire onto the road. Under hard braking, the effect of inertia is that the weight of the outfit seems to transfer forward. With more force pushing down on the front wheel, the front tire has more available traction and therefore much more potential braking force. That's why the front brake is so essential to quick stops.

Even though inertia "transfers weight" to the front wheel as the brakes are applied, the rear wheel and sidecar wheel continue to provide enough traction for braking. Quickest stops are made in a straight line, with brakes applied to all wheels just short of a skid. If the tires skid on a sidecar rig it isn't disastrous, but it won't stop as quickly as possible. During our quick stop practice, we will explore the limits of traction by intentionally skidding the tires and then learn to avoid skids

Since the URAL sidecar brake is connected to the motorcycle rear brake pedal, we can't modulate braking independently on the third wheel. If the sidecar is empty, the sidecar tire may skid. If the sidecar is loaded, more weight means more traction, but also more inertia to stop. The bottom line is to ignore the sidecar brake unless it consistently drags the rig into a yaw, which means it needs a simple adjustment.

But we shouldn't ignore the throttle. Remember, that rolling the throttle closed also adds engine braking on the rear wheel. With a single-wheel drive, rolling off the gas tends to pull the outfit into a swerve or "yaw". On the two-wheel-drive Sportsman, rolling off the gas applies engine braking to both the rear wheel and sidecar wheel, which limits yaw. But if either of the rear tires skids, engine braking will transfer to the other wheel, resulting in a yaw.

Since quickest stops are made in a straight line, hard braking is a lot easier when we use just the brakes and not the engine. We can disconnect the engine from the wheels by squeezing the clutch lever as we brake.

So, the quick stop technique is to squeeze the front brake and press on the rear brake simultaneously, adjusting pressure on the levers to apply maximum braking just short of skidding either tire. As the weight shifts forward, we can squeeze the front brake even harder, but we'll have to let up slightly on the rear brake. If the sidecar tire skids, we can safely ignore it.

Quick stops in curves

Making quick stops in a curve is a bit more difficult, especially if the road curves to the right. Hard braking in a right turn tends to lift the sidecar and drag the outfit towards the left. But if we're already practicing the correct right turn techniques, we are already prepared to squeeze harder on the front brake and make a controlled stop.

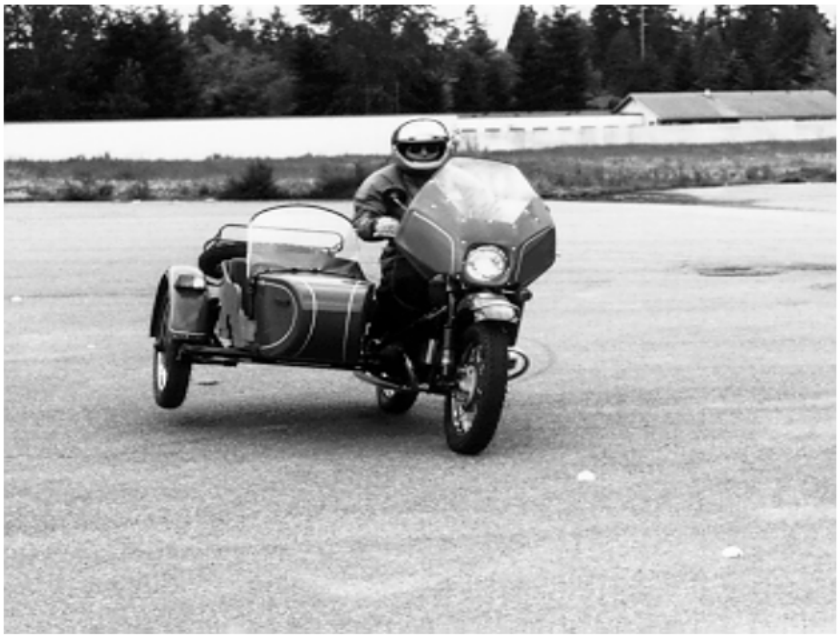
Making a quick stop in a left curve is less difficult, because the heaviest part of the rig--the motorcycle--is already on the left side. We will still make the quickest stop without skidding the tires, but if we do happen to skid, there is less risk of capsizing the outfit. And if we squeeze the brakes so hard that we skid the tires, the outfit will slide off towards the road shoulder--not into the opposing lane.

What's really important about quick stops is this: when we are suddenly faced with a hazard in our path we will do whatever we've been practicing. If we intend to do a quick stop for the occasional emergency, we need use the front brake every time we stop to develop the right habits.

SWERVING

There may be times when we need to make a quick swerve around something that suddenly appears in our path. For example, we may suddenly realize that the dark patch of pavement ahead is really a missing manhole cover.

A swerve is simply two quick turns one after the other. To avoid slamming into the open manhole, we could make a quick right turn, then a quick left turn to straighten out again. Or we could make a quick swerve into the other lane.



Of course, when a sidecar outfit is suddenly yanked into a turn, we should expect some strange behavior. In a swerve to the right, the sidecar will immediately fly, even with a substantial passenger aboard. But as we straighten out, the car will come back to the road again. In a swerve to the left, the rear wheel may momentarily slide sideways. And straightening the rig out requires a quick right turn, which will likely lift the car, too.

We don't really do anything different to make a swerve, we just do it a bit quicker than usual and there isn't time to prepare by sliding body weight around in the saddle or covering the front brake lever.



Remember, that traction is a limited commodity. If we need all the available traction for swerving, we shouldn't squander any of it on braking. So, if we're going to swerve, we need to hold a steady hand on the throttle and stay off the brakes, at least until we get straightened out again. When faced with a sudden hazard, our survival instinct is to roll off the throttle and slam on the brakes. If we're going to swerve, we need to fight that

unhelpful instinct. Obviously it's a lot easier to do an emergency swerve if we've practiced the right techniques beforehand.

STEERING REVISION AND FLYING THE CAR

Up to now, we've assumed that all three wheels of the sidecar outfit should stay in contact with the road all of the time. We have mentioned that the sidecar may lift up during a right turn and offered suggestions for keeping it down. There is a good reason for learning the basic sidecar skills without "flying the car". But now it is time to consider what happens when the third wheel begins to fly. We might even suggest that learning to control the outfit with the car flying is an important skill every sidecarist should master.

A three wheeler steers by direct steering. That is, to turn right, we point the front wheel towards the right. To turn left, we point the front wheel left. That's the way it works so long as all three wheels are rolling on the ground.



But a two-wheeled motorcycle doesn't steer that way, because it must be leaned into corners. To steer a two-wheeler to the right, the rider presses on the right grip to initiate a lean to the right. To turn left, the rider presses on the left grip. In other words, a two-wheeled motorcycle steers backwards from a three-wheeled motorcycle. Two-wheeled steering is called "countersteering" because the rider turns the handlebars counter to the intended direction of travel to initiate the lean.

Now, consider that a sidecar outfit with the third wheel flying instantly turns into a very out-of-balance two-wheeled motorcycle. How would you steer a sidecar outfit that happens to be balanced on the two motorcycle wheels? With the sidecar in the air, direct steering reverts to countersteering. Usually, the sidecar wheel quickly thumps back to pavement and the driver may not realize there was steering reversion. There is just the strange feeling that something was temporarily wrong with the steering. But in a continuous sweeping right-hander the sidecar wheel can fly off the pavement for hundreds of feet. In such situations it is important for the sidecarist to understand what is happening and maintain control of the rig.

Our suggestion for keeping the outfit under control is to get more familiar with steering

reversion. And the best way to get familiar is to learn how to fly the car on purpose.

Flying the car is not a matter of speed, but a matter of balance. Veteran sidecarists can fly the car at a slow walk. The trick is, once the car is flying, it is balanced by countersteering. That is, you lean the outfit more left by pushing harder on the left grip (and pulling on the right grip). Releasing the pressure on the grips slightly allows the car to drop a bit and the rig will curve off towards the right. If you relax pressure on the handlebars, the car will thump back to pavement and steering instantly reverts back to three-wheeled again.

The advanced exercise include flying the car on purpose and to make it easier, practice is with an empty sidecar.

FRAME STRESS DURING DRAMATIC MANEUVERS

As we progress from easy turns to more advanced maneuvers such as drifting, sliding the tires, emergency swerves and flying the car, we are increasing the stresses on the motorcycle/sidecar combination. Increased stresses can fracture bolts that haven't been kept tight, snap a loose wheel spoke or allow an under-inflated tire to slip on the rim. While the URAL frame is designed to handle sidecar loads, it is necessary to do some maintenance from time to time.

Chassis connectors

Connector bolts and collets may gradually loosen. Veteran sidecar pilots check all frame fasteners often, especially important connectors such as axle nuts and sidecar attachments.

Brakes

It is necessary to have the brakes adjusted correctly to be able to do quick stops. You should be able to squeeze the front brake lever as hard as you can without the lever contacting the grip. And, with the lever released, the front wheel should be free to rotate. If you have noticed a tendency for the outfit to yaw to one side during braking, you are advised to adjust the sidecar brake now.

Tires

Advanced maneuvers all depend upon having good tires and keeping them inflated to correct pressures. Tires are best checked by jacking up that corner of the outfit so that the wheel can be rotated as you inspect it. Look for tread condition and check for cuts, nails and glass shards. Tire pressures should always be checked "cold" (that is, before the outfit is driven and the tires have warmed up). If you discover that a tire consistently loses pressure, the inner tube and valve should be inspected and replaced if necessary.

Wheels

While you are inspecting the tires, spin the wheel, check that it is reasonably true and that the bearings rotate freely without any noises or side play. It is important with spoked wheels to have all spokes carrying a share of the load. Even one or two loose spokes can trigger wheel problems and even wheel collapse. When correctly tensioned, spokes will emit a "ping" sound when tapped. If loose spokes are found, the wheel should be removed and trued by a qualified mechanic.

These maintenance items are critical, but there are a number of other maintenance tasks to consider. You may wish to review the maintenance section in the URAL owner's manual before practicing the advanced exercises.

When you are satisfied that the machine is ready, it's time to practice the advanced skills on your outfit. If possible, have an experienced sidecarist coach you through the exercises.

Since it is always possible to make a mistake while learning something new, you are encouraged to wear abrasion-resistant riding gear and a quality helmet.

The advanced exercises are practiced with an empty sidecar. If you have physical disabilities which prevent you from sliding your body around in the saddle, you should carry at least 50 pounds of ballast in the sidecar.

The following exercises should be mastered in sequence. If you have difficulty with any exercise, go back and practice the previous exercise again. If you begin to get tired or frustrated, take a break. Advanced sidecar skills aren't easy, but the payoff is being in control of your outfit later as you explore the backroads.

Chapter 6

OTHER RIDING SITUATIONS

If you have learned the important lessons about driving an outfit in traffic and mastered all of the advanced sidecar exercises, you are well prepared to handle your rig on the road. But there are a few other riding situations we should study, including unpaved roads, carrying loads and passengers and equipment failures.

CROWNED ROADS

Most roads are higher in the center than at the sides, to allow rainwater to run off into the ditches. This "crown" can be a help or a hazard to sidecarists. Sidecar rigs are normally set up (rigged) with the motorcycle leaning out towards the left. With normal road crown slanting off towards the right in our lane, the leanout brings the motorcycle near vertical and provides almost neutral steering.

Although the >URAL motorcycle and sidecar are attached rigidly to each other, the motorcycle leanout can be adjusted. If you discover that your rig consistently drags to the right on the roads you typically travel, you can increase leanout. If the rig consistently drags left, reduce leanout. Leanout is adjusted by screwing the upper sidecar struts in or out. We recommend that you talk to your authorized >URAL dealer if you have any questions about this.

In a right turn, the typical road crown slanting towards the right helps lean the outfit into the turn, which reduces side loads on the tires and helps keep the sidecar from flying. But not all roads have proper crown. The pavement may slant off towards the left in a right turn. Such "off camber" corners are particularly hazardous for sidecar drivers, especially if the car is empty or if the driver hasn't mastered advanced cornering tactics. The keys to avoiding a tipover on poorly crowned roads are: following smarter cornering lines, shifting body weight and controlling speed.

Slowing down for corners helps, because inertial forces dissipate quickly with reduction in speed. Entering corners at slower speeds also allows you to roll on some throttle during the turn, in order stabilize and drift the outfit. Downhill, off-camber turns are most hazardous because gravity and inertia shift weight forward onto the front wheel. That places more weight closer to the tipover line in left-handers. It is very important to keep speed in check all the way around downhill turns. In downhill left-handers, with the driver hanging off the left, it may be difficult to reach the rear brake pedal, so the front brake should be used to control speed.

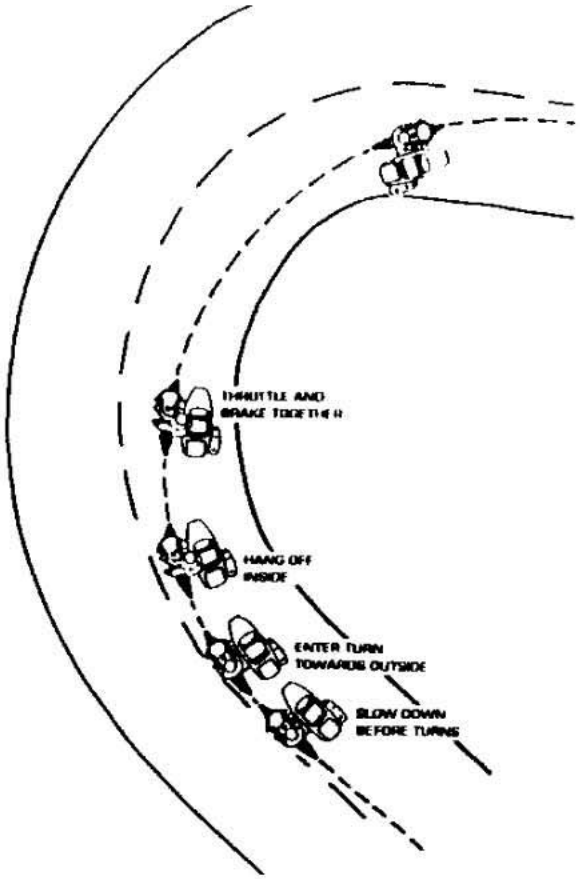
Note that in left turns, road crown often slants off towards the right. Expect the outfit to lean over even farther towards the sidecar during left turns. The hazard is that the rear motorcycle wheel can start to lift and it is possible to groundloop the motorcycle over the sidecar. That's why veteran sidehackers hang off the left side of the rig going around left-handers and follow the smart cornering line that takes the outfit closer to the centerline at the middle of the turn. The road is usually flatter towards the center.

Practicing the skills we have introduced in the advanced exercises helps you keep the outfit under control even when you encounter strange road crown shapes, off-camber

corners and turns on steep hills.

CHANGING RADIUS OF TURN

Just as roads occasionally have corners with strange slanting crowns, we must also expect the odd curve with a changing radius of turn. When the turn changes radius unexpectedly, our skillful cornering plans get upset. Obviously, we would prefer to have some idea of where the road goes before we put our tires over it. Veteran sidecar pilots look as far ahead as possible to scrutinize turns. Sometimes we can see all the way around the turn before we enter it, but more often, we can't see the turn exit until we're right in the middle of the corner.



Consider a turn that starts tight and then eases into a larger radius as it goes around. Such an "increasing-radius" turn is not a problem, because we can safely increase speed as we go around. And allowing the rig to turn a little wider also helps dissipate tipover forces.

Decreasing-radius turns are the ones we call "Killer Corners", as in Figure 7. As we realize that the turn is tightening up, we must turn the rig sharper. But steering towards the inside increases tipover forces. If we turn tighter, the outfit may tip over. If we don't turn tighter, we will run off the road. We need to slow down to turn tighter, but if we roll off the gas to slow down, tipover forces are increased. The situation is even scarier if the decreasing-radius Killer Corner occurs on a steep downhill section or the road crown slants off the wrong way.

How do we survive the Killer Corners? One important tactic is to make a practice of slowing down for all turns and especially, those "blind" turns where you can't see all the way around. It's a lot easier to speed up than slow down. It also helps to practice the smart cornering line that enters every turn towards the outside of your lane.

But what is most important is simply to practice advanced cornering techniques even when you don't have to. Practice using the front brake and throttle together, even in a gradual right turn. Remember, that you can reduce speed by braking on the front, even without rolling off the gas.

In a surprise situation, you'll do whatever you've been practicing. So, when the sharp right-hand curve you are rounding suddenly turns into a Killer Corner, you are already prepared. You are already hanging off towards the inside and using throttle and front brake together. You're all set to squeeze on a little more front brake to tighten the turn and drift the rear end a little wider. For you, Killer Corner can be just another turn in the road.

LOOSE AND SLICK SURFACES

One of the unique advantages of >URAL outfits is that you can explore unpaved roads and even back country where there are no roads. But before you head out to those unpaved areas, let's consider the special tactics needed to keep the outfit under control on loose surfaces such as gravel or slick surfaces such as mud or snow.

In general, loose and slick surfaces are handled the same way. Such surfaces have reduced traction, which affects engine thrust, braking and steering. Let's consider how we might ride a road covered by loose gravel.

As we start the outfit rolling, the rear wheel may spin and throw gravel instead of pushing the rig forward. We can help control wheelspin by easing the clutch out more gradually and using just enough throttle to turn the rear wheel. We can also help by sliding our weight back towards the rear wheel to increase rear wheel traction.

With the two-wheel-drive Sportsman, the sidecar wheel may spin if there is no load in the sidecar. You can help control traction by shifting your weight more towards the sidecar.

Once the rig is moving, expect steering to be easier but less responsive. The front tire tends to drift in low-traction turns, so the outfit may be sluggish to turn. On loose or slick surfaces, you can help steer the outfit with the throttle. In a right turn, rolling on some throttle will drift the rear end wide and point the outfit more towards the right. In a left turn, rolling off the throttle will help point the outfit more left.

With the Sportsman, front wheel steering will be more responsive in level turns, because engine thrust is equalized between the two drive wheels. The throttle can still be used to help slide the rear end and point the rig in the desired direction.

Warning: It is much easier to slide the outfit sideways on low-traction surfaces such as gravel, grass or ice. But avoid sliding the rig sideways over bumps or grooves that might suddenly catch a tire and cause a tipover.

Driving up steep hills, there may not be sufficient traction for the tires to keep the outfit moving. You can help conserve traction by shifting weight back in the saddle and using just enough throttle to keep the wheel turning but not spinning. You can also use inertia to assist engine thrust. Increase speed before starting up the hill to build inertia. Then allow speed to decrease towards the top.

Driving down steep hills, there may not be enough traction to stop. And, remember that inertia increases rapidly with increasing speed. It is important to slow down at the top of hills and use both engine compression and wheel braking to keep speed from increasing. Since rolling tires have more traction than sliding tires, apply only as much braking as possible, short of skidding the tires.

When driving the outfit on rough dirt roads, veteran sidecarists often stand up on the

footpegs and allow their legs to soak up the bumps.

As with paved roads, unpaved roads have odd crowns, hills and radius of turns. The same smart cornering lines that work on paved roads also work on gravel or dirt roads. Hanging body weight off towards the inside of curves also helps on loose or slick surfaces, but front brake techniques must be modified. With reduced traction, there often is barely enough traction to get the front end turned. There isn't enough traction for braking while turning. However, short bursts of throttle or rear wheel braking can be used to drift the rear end sideways and keep the outfit level. Dirt bike riders offer the advice: "When in doubt, gas it."

We don't have any "parking lot" exercises to help you practice riding on slick or loose surfaces. Instead, we recommend spending some time driving a gravel or dirt road. Fill the tank and go exploring. Just take it easy while driving on unpaved surfaces becomes more familiar.

CARRYING PASSENGERS AND LOADS

Another of the advantages of a sidecar rig is the ability to carry passengers in greater comfort and safety and more space to carry loads. While the >URAL is engineered to carry extra weight, we must use some precautions about how we load that weight on the outfit.

People who might otherwise avoid motorcycles can often be talked into a ride in the sidecar. Children especially enjoy the novelty of the three-wheeled motorcycle. When carrying inexperienced sidecar passengers, there is the temptation to show off a bit for them, but the wise sidecarist knows how scary advanced riding skills may be for the new passenger. They will enjoy the experience best if you drive conservatively during their first sidecar ride.

It is important that passengers or loads be carried in the sidecar, not on the back of the motorcycle saddle. The rule of thumb is that there should always be as much weight in the sidecar as on the back of the motorcycle. A passenger sitting upright on the back of the saddle is already balanced over the left tipover line. A modest right turn or road crown slanting left is sufficient to overbalance the sidecar so quickly that the driver is likely to lose control. A passenger sitting in the sidecar is well inside the tipover lines.

If two adult passengers are to be carried, the heaviest passenger should be in the sidecar seat. When carrying an adult passenger plus a child, both should be in the sidecar. The utility sidecar is designed to carry cargo, not passengers. With the utility outfit, the only logical seat for an extra passenger is on the back of the motorcycle saddle, but with an empty box, that creates a tipover hazard. Unless the cargo box is carrying a load heavier than the passenger, it is best to avoid carrying a passenger on the Utility rig.

Even with a loaded sidecar, a passenger seated on the back of the motorcycle should be instructed to lean into turns like the driver.

Heavy loads carried on a sidecar rig should be balanced over the sidecar axle and secured to prevent shifting. Lengthy objects such as boards or ladders must be secured to prevent sideways movement during turns. When carrying such loads on a sidecar, be prepared for other drivers to wander into your lane as they gawk in amazement at your unique rig.

Remember that extra weight affects performance. It takes more power to move a heavier load down the road andmore distance to brake to a stop. Two adult passengers on a >URAL outfit add considerable extra weight. On hills, use lower gears both to ascend and

descend andbe more cautious about keeping downhill speed in check.

TIRE FAILURES

Back at the beginning, we mentioned that sidecarists must be rugged individualists capable of solving their own problems independently. That statement is especially true of motorcycle tires. Tires take considerable abuse and tire failures are the most common motorcycle breakdown. Automobile tire shops and service stations are not usually equipped to handle motorcycle tires and motorcycle shops may not have tires suitable for sidecars. When faced with a flat tire, the sidecarist may have to solve the problem with little assistance.

Since the >URAL has spoked wheels, the tires require inner tubes. The inner tube holds the air pressure inside the tire. A slowly deflating tire is usually a result of an innertube puncture from some sharp object such as a nail. Innertubes can also be punctured by a spoke being tightened with the tire still mounted. Tubes can also disintegrate and allow the tire to deflate suddenly. We call such sudden deflations "blow outs", although the tire itself may survive intact.

When a tube loses pressure while riding, the deflated tire loses its grip on the wheel rim andthat wheel begins to wiggle around on the rim. The "rubbery" feeling on that wheel is usually our first indication of a tire problem. If a blowout occurs at highway speeds, the tire has enough centrifugal force to stay more-or-less in place on the rim. But as the outfit slows down below about 25 mph, the wiggling gets worse. For this reason, the driver with a flat tire should get the outfit stabilized and avoid any sudden changes of speed or direction. Gently roll off the throttle, avoid braking on the affected wheel and ease the rig off onto the road shoulder.

One of the unique features of >URAL sidecars is that most models have a spare tire carried on the rack. All of the wheels on the >URAL are identical, so the spare can be used on any corner of the rig and wheels can be rotated to equalize tire wear. However, changing a >URAL wheel is not like changing the typical automobile wheel. We highly recommend you take the time to practice changing a wheel at home, to familiarize yourself with the tools and techniques in a more relaxed atmosphere than alongside a busy highway. The wheel changing procedure is described in the Owner's Manual.

Since most contemporary vehicle tires are tubeless, repairing a tube-type tire requires skills that most North American tire shops have long forgotten. You will either have to fix it yourself or find a repair shop which can. When replacing an innertube, mark the tire to ensure it returns to the original location on the rim. It is best to replace rather than patch innertubes. You may wish to carry a spare innertube on your travels, carefully wrapped in a protective covering. If you aren't familiar with mounting tube-type tires, contact your >URAL dealer for assistance.

The tires used on >URAL outfits are special sidecar tires with flatter tread and stiff sidewalls. Tire specifications are listed in the Owner's Manual. Your >URAL dealer should be able to provide correct replacement tires. Whenever you replace a tire, a new innertube should be installed and the wheel rebalanced. If the wheel also needs truing or spoke tightening, that work should be done while the tire is off the wheel.

Tire failures are more likely to be avoided when the tires are kept inflated to correct pressures and worn tires are replaced promptly.

STEERING WOBBLE

Since sidecar rigs aren't symmetrical, the sidecar wheel is angled slightly towards the front of the motorcycle. This angle, or "toe-in" of the sidecar wheel adds a modest force pushing towards the left to help counteract wind drag and prevent sideways oscillations sometimes called "steering wobble."

Wobble is the action of the front end darting left-right-left as the rig tries to center itself. Wobble typically occurs at speeds of 20 to 40 mph and is more of a nuisance than a danger on sidecar outfits. A properly adjusted >URAL combination will not exhibit any wobble under normal conditions. But, sudden speed changes or variations in road crown can sometimes precipitate momentary wobble.

Wobble can usually be controlled just by the driver holding the handlebars more firmly at speeds where the particular machine has shown a tendency to "wiggle it's nose". Tightening the steering damper may also help control wobble. But constant wobble is an indication that the sidecar toe-in is not correct or that the motorcycle steering head bearings need adjustment. If your >URAL wiggles its nose too much, perhaps the steering head bearings have become too loose or the sidecar is out of alignment.

If the outfit seems hard to steer in a straight line, it may be that the steering head bearings are too tight or the steering damper is screwed down too far. With too much steering resistance, the driver continuously over-corrects, with the result that the outfit wants to dart ("weave") from one side to the other as speed increases over about 40 mph. If your outfit seems to weave more as speed increases, try unscrewing the steering damper knob to release friction and then check that the front end easily pivots without resistance.

You should expect a bit of steering wobble once in a while as a normal slow-speed characteristic of sidecars, but continuous wobbles or weaves are an indication that it is time to get out the wrenches and do a little maintenance. The Owner's Manual provides specifications for sidecar toe-in and leanout andexplains how to adjust the steering head bearings. If in doubt, take the motorcycle to an authorized >URAL dealer.

ANIMALS

Animals running into the road can be a problem, whether pets in residential areas or wild game in the country. While a sidecar outfit isn't likely to tip over as a result of running into a dog, a sidecarist could certainly get bit. Worse yet, a highway-speed collision with a deer or antelope could demolish the outfit and cause serious injury.

In residential areas, loose-running dogs are the primary animal hazard to watch for. Some communities do not adequately control animals and you may encounter several aggressive dogs within a few blocks. Most loose dogs seem to enjoy the game of chasing vehicles and have fun predicting the intercept point. But dogs are also territorial anda few aggressive dogs will attack if they assume the street is part of their "turf".

The tactic for avoiding tangles with friendly chasers is to slow down when you see a dog eyeing you from the yard, then accelerate as the dog sprints out for the chase. A well-tuned >URAL can easily outrun the average dog. But if an aggressive dog is waiting for you in "his" street, different tactics are needed. A dog shows aggression by lowering the nose, baring teeth, growling, pulling the ears back and lowering the tail. When you spot an aggressive dog, either consider an alternate route or be prepared to defend yourself. Don't bother to kick at an aggressive dog; he's probably quicker than you are. If the sidecar is empty, put the sidecar between the dog's teeth and your leg. Passengers, should keep their hands and arms inside the sidecar. Be prepared for an aggressive dog to attack your front tire. Even smart dogs don't seem to understand what happens when they run in front of a steel sidecar frame.

Out in the country, there are many different wild animals that you may encounter in your path, but the most common animal hazard is deer. Wild deer occur in a wide variety of habitat all over North America. In the spring and fall, deer migrate in scattered herds and migration routes may cross the highway. Deer Crossing signs indicate that a large number of deer strikes have already occurred in that area. The wise sidecar pilot slows down in marked deer zones and stays alert to deer approaching from the side.

In the summer months, deer graze on the tender mowed grass on the shoulder of the road, especially in the morning and evening hours. Deer grazing on the road shoulder may appear to pay the approaching sidecar no attention, but they will suddenly leap into action when you get closer. Expect deer to leap out onto the roadway in front of you at the last second andthen zigzag unpredictably in front of you.

The only reliable technique for avoiding deer strikes is to make a quick stop when you see a deer, whether migrating or munching. In deer country, that's reason to encourage tailgaters to pass you.

At night, animal eyes reflect light much like a glass reflector. The difference is that the glass reflector doesn't blink. If you see one of the reflector posts ahead winking at you, it is very likely a deer eye. Whether the animal connected to the winking eye is a deer, a porcupine or a skunk, you don't want to hit it. Hit the brakes instead.

PARKING

We've explained how to get the >URAL started, how to ride it andhow to manage the risks of riding in traffic and in the country. But you can't ride your >URAL all of the time--sooner or later you'll need to park it. Let's consider some common-sense parking techniques.

Whenever you are parking the outfit where you can't keep it in view, turn off the ignition and remove the key. If the outfit will be parked for a while, shut off the fuel to prevent the carburetors from overflowing. Park the outfit in either first or reverse to prevent it rolling away. When parking alongside a road, get the outfit completely out of the traffic lane, preferably several feet away from passing vehicles.

With the handy reverse gear, you don't have to worry about getting the outfit out of downhill sloping parking spaces when it's time to go. But set the parking brake whenever parked on slopes, whether downhill or uphill.

When you park the rig at restaurants, parks and other public places where people gather, be aware that many people have never seen a sidecar outfit up close. They may be tempted to wiggle it or even crawl onto it as if it were a toy. Neither children nor their parents are likely to be cautious about leaning up against a dirty tire or grasping a hot exhaust pipe. You will have to get used to the stares and questions and come up with your own clever answers. If nearby children are curious about the outfit, you can help prevent burns by explaining to them that they can "look but not touch" and mentioning to their parents that the motor is still hot.

Because a motorcycle can be attractive to both the curious and to thieves, motorcyclists often park their machines where they can be seen. If you are concerned about security while you are away from the rig, consider carrying a hardened chain or cable which can be used to padlock either motorcycle wheel to the sidecar frame. The fork lock is not a complete theft deterrent because it doesn't prevent the wheels from rolling. If you do use the >URAL fork lock, remember that it has a different key from the ignition.

Chapter 7

Chapter 7

ALCOHOL AWARENESS

It should be obvious by now that driving a sidecar outfit requires knowledge, judgment, planning, advanced skills and quick reactions. We might even suggest that driving a sidecar rig is more demanding than driving an automobile and certainly has greater inherent risk. One very important part of keeping the risks under control is avoiding driving while under the influence of alcohol.

We know that a large percentage of motor vehicle accidents involve alcohol. Automobile drivers have gradually come to understand that alcohol often precipitates accidents and alcohol-related accidents are occurring less frequently with each passing year. But, for whatever reason, some motorcyclists continue to ride after drinking. Alcohol-involved motorcycle accidents are not decreasing at the same rate as other motor vehicle accidents. Experts have calculated that approximately half of motorcycle accidents involve alcohol.

More to the point, when alcohol is involved in an accident, the accident is very likely to produce a fatality. Approximately 1 out of 3 motorcycle fatalities involves a rider who was under the influence of alcohol.

From your sidecar driving exercises, you should now understand that there is often a fine line between being in control and crashing. For example, in a tight, off-camber downhill decreasing-radius turn, we may maintain control right at the limits of speed and balance. That demands our full attention and that's also part of what makes driving a sidecar rig so much fun.

What makes alcohol so dangerous is that alcohol degrades the mental and physical skills that we need to keep the rig under control. Alcohol degrades inhibitions, judgment, memory, vision, hearing, muscle control and reaction time. Just a couple drinks may be enough to reduce inhibitions to where a normally reserved sidecar driver will increase speed or attempt show-off maneuvers. Sober, you know that sliding an outfit sideways on a tractable surface can lead to an instant ground loop. After two or three beers, sliding sideways may seem like a do-able stunt. But the driver not only has reduced inhibitions, but also degraded judgment, riding skill and reaction time. At the critical moments, a sidecar pilot under the influence can easily slip over the line between staying in control and flipping the rig.

Because judgment is one of the first mental processes degraded by alcohol, a persons who have been drinking are not in a position to judge their own impairment. Even people who know they are legally intoxicated may still feel they are capable of driving a motor vehicle. It doesn't make any difference whether the alcohol is consumed as a can of beer, a glass of wine or a shot of whiskey or vodka. A 150-pound human body requires about 1 hour to burn off the alcohol from one drink. Coffee or fresh air won't speed up the process.

The only practical method for preventing alcohol-related accidents and fatalities is to separate drinking and driving. If you don't drink at all, that's great. Hopefully, you will have the skills to avoid the drunks on the road. If you do drink, it is important to avoid driving the outfit after drinking or to drink while out on a sidecar ride. And that's a decision that needs to be made while sober. If you know from experience that you are likely to hop on the hack and go for a spin after a few drinks, consider having a responsible person hold your

ignition keys for you.

If you intend to "keep on hacking", don't allow alcohol to cut your sidecar experiences short.

Chapter 8

Chapter 8

STATE AND LOCAL REGULATIONS

Each state and local municipal area has laws that relate to motorcyclists and remember that sidecar outfits are normally regulated as motorcycles. We don't have the space to list all the separate laws, state-by-state. We suggest you take the time to determine the laws in your local area. Some state police offices provide small pamphlets outlining the laws relating to different vehicles.

Your state drivers licensing office should be able to explain the laws relating to motorcycles as well as motorcyclists. You may also wish to contact your country sheriff's office or police department to inquire about local laws that may be more restrictive than state laws.

LICENSING

You will need the appropriate state driver's license or license endorsement to drive the outfit on public roads. In most states, a motorcycle driver's license is an endorsement to an automobile license. Generally, you apply for a permit, take a written test and schedule a driving test on the outfit. If you already have a motorcycle endorsement, you are probably licensed to drive a sidecar rig too. You may be able to get a sidecar-specific endorsement or you may need to obtain a full motorcycle license even though you will be operating only the sidecar rig.

Many states subsidize rider education programs. The usual method of financing such programs is to collect a surcharge on motorcycle rider license fees.

Helmet laws also vary from state to state. You are required to abide by the laws of the state in which you are driving. Many states have mandatory helmet laws that apply to passengers in the sidecar as well as the driver. The helmet must be worn whenever the outfit is in motion on public roads.

Most helmet-law states require that the helmet be an approved motorcycle helmet. Generally, a DOT (Federal Department Of Transportation) certification is acceptable in all states. Helmet standards are usually indicated by a sticker or imprint on the outside of the helmet. Police do sometimes hassle a motorcyclist for helmet-law violations when the rider is uncooperative, but sidecarists are rarely bothered if the helmet appears to be in compliance.

Most states require both headlight and taillight to be turned on whenever the motorcycle is in motion, even during daylight hours. It is up to the operator to be sure the lights are on. Although the headlight and taillight on URALs automatically come on when the main switch is turned on, either light can burn out in the daytime without being obvious. You should make a habit of checking the required lights whenever starting the machine.

Most headlight-on states do not differentiate between low beam and high beam during daylight hours. In the event the low beam burns out, it may be possible to switch to high beam to comply with the law. If only one taillight is required, the light on the sidecar fender will fulfill the legal requirement even if the taillight on the motorcycle happens to burn out.

Other motorcycle equipment may be required. Most states require at least one rearview

mirror. Some states require a mirror on both sides of the handlebars. Fenders may be required over wheels and some states have minimum wheel coverage specified. Tires may require DOT or other certification to be street-legal. Knobby "dirt" tires may be suspect for use on paved streets. In general, your URAL dealer will set up the rig as needed to comply with local laws. You probably won't be hassled for equipment failures if you keep the rig equipped the same way it was delivered to you.

If you do travel to other states or foreign countries, be aware that equipment laws are probably different from your "home" area. However, your state driving license is accepted for operating elsewhere.

INSURANCE

Liability (third party) insurance is mandatory in many states. Even where liability insurance is not required, it is wise to carry it to protect yourself against liability should you run into someone. Insurance costs and coverage varies from company to company. Insurance companies may not offer motorcycle coverage or may discourage motorcycles by quoting high premiums. Some insurance companies will add a surcharge for the sidecar, even for liability coverage. Others will offer the same premiums as if the sidecar outfit were a two-wheeled motorcycle. Specialty motorcycle insurance companies usually offer 9-month premium costs if the rig is not operated during the winter months.

Some insurance companies that currently offer competitive rates for URAL sidecar motorcycles include Dairyland Motorcycle Insurance at 1-800-345-0335.

You may wish to obtain collision and comprehensive coverage for your outfit, to protect you against hit-and-run accidents, theft or fire. The American Motorcyclist Association offers discounted insurance for members. Telephone 1-800-398-7158. You do not have to be an AMA member to obtain insurance, but membership may provide a discount.

Chapter 9

Chapter 9

SIDECAR RIGGING BASICS

"Rigging" refers to the connection and alignment of the sidecar to the motorcycle, plus whatever modifications to the motorcycle are needed for sidecar use. Most sidecars are purchased separately and must then be attached to a standard motorcycle. Attaching sidecars to standard motorcycles other than the URAL is a relatively complex process. Since the URAL comes with the sidecar already connected and aligned, URAL owners needn't be over concerned about rigging. But you should know enough about rigging to know when your URAL needs running gear adjustments. Your URAL dealer should be able to make the necessary readjustments. But you may wish to know more about alignment yourself.

The URAL sidecar is attached to the motorcycle at four points, two lower "ball and collet" connectors and two slanting upper legs ("struts"). A diagram in the Running Gear section of the Owners Manual shows the related parts. The lower collets clamp around ball fittings that are welded to the motorcycle frame. These collets should be kept snug enough to prevent play, but not so tight that the fittings are stressed.

Alignment should be checked if the outfit drags continuously to one side, if there is steering wobble at normal speeds or if tires begin to wear prematurely. Alignment includes toe-in, lean-out and sidecar elevation.

Toe-in is the slight angling of the sidecar wheel towards the front of the motorcycle. Toe-in is measured from a straight edge along the outside of the sidecar tire, to a straight edge along the outside of the motorcycle tires. The distance between the straight-edges at front and rear axle positions is measured. The difference between the rear measurement and the front measurement is the amount of toe-in. The measurement in line with the front axle should be 10mm shorter than the rear measurement (approximately 3/8 to 1/2 inch).

Taut string can be used as a "shade tree" method to check toe-in. It is important to position the front wheel exactly in line with the rear wheel if no straight edge is available. The string is held taut along the outside of the sidecar tire, about 4 inches off the ground. Toe-in measurements can then be made between the string and the inside edge of front and rear wheel rims. Toe-in measurements on the URAL assume tires of equal size and shape. If a knobby tire is mounted on the rear, measurements should be made to the wheel rims rather than to the edge of the tires.

Toe-in of the sidecar wheel is adjusted by loosening all attachments and then sliding the rear collet assembly in or out of the sidecar frame.

Leanout of the motorcycle away from the sidecar helps the outfit to steer straight at highway speeds. The motorcycle leaning out helps balance the air drag and rolling friction of the sidecar. Leanout is also affected by the crown of the road, wind direction, speed, load in the sidecar, tire diameters and toe-in. Leanout adjustments are made after toe-in is set.

Leanout is initially adjusted at approximately 1 degree from vertical with suspension compressed with normal load, but leanout must then be fine-tuned from steering feedback. If the outfit consistently drags towards the right at highway speed, leanout

should be increased. If the outfit steers too much towards the left, leanout should be decreased.

Leanout is adjusted by slightly loosening the lower collets, then loosening and adjusting the forked connectors on the legs.

The sidecar should also sit level in relation to the road surface. The adjustable lower rear collet bracket also controls height of the rear end of the sidecar frame. If the collet bracket slips, the rear of the sidecar could sag. When making toe-in adjustments, it is important to maintain the proper elevation of the sidecar frame. The rear frame member should be horizontal.

When making adjustments, small changes can have big results. Make minor changes one at a time and then check the results. After making alignment adjustments, it is important to snug up all connectors and locking nuts and then check measurements again after riding the outfit.

Should you ever undertake the mounting of a URAL sidecar to a motorcycle other than a URAL or decide to put together an entirely different motorcycle/sidecar combination, be aware that rigging a "new" outfit is usually a complex structural problem. In most states it is legal to attach sidecars to motorcycles without having the resulting three-wheeler inspected or relicensed, but the rig might also be ill-handling or unsafe. Most contemporary two-wheeled motorcycles are not designed to have sidecars attached to them. Before you begin any such projects, you are advised to seek the advice of knowledgeable sidecar rigging mechanics.

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UNITED SIDECAR ASSOCIATION

The United Sidecar Association (USCA) was formed in 1976 to serve as a coordinating body for local sidecar clubs and associations, which also acting in a national interest to support positive legislation for motorcyclist's right.

Through The Sidecarist, news journal of the USCA, information is made available by the USCA to its members, including local rallies and event and technical information. The Sidecarist is published 6 times yearly.

The USCA also supports and promotes safe sidecar driving skills throughout the Sidecar Safety Program. USCA - approved instructors pass on sidecar driving skills to motorcyclists, whether they are sidecarists or not, in a hands-on fashion.

A sidecar rig does handle differently than a solo motorcycle. The USCA recommends attending a SSP course to learn what those differences are.

The USCA also publishes manuals on sidecar operation and a sidecar catalog, which depicts current and non-current sidecars. Also available are paraphernalia such a coffee mugs, T-shirt and patches.

URAL size="4">America, Inc. recommends that all >URAL owners join the USCA. You can use the folling membership application.

USCA

Membership Application / Renewal / Emergency Contact Update

Date of Application:_Membership #_AMA #

Name_Phone #

Address

City, State_Zip

Occupation Spouse's name

Children's names

	Motorcycle #1	Sidecar #1	Motorcycle #2	Sidecar #2
Manufacturer				
Model				
Engine size (cc) or # of seats in sidecar				
Year of Manufacture				
Year Purchased				

Include additional information on a separate sheet

Other motorcycle club affiliations

Motorcycle interests: Touring o Rallies o Racing o Legislative o Other

Emergency and Friendship

Complete if you wish to be included in the Annual Directory

First name_Emergency Only_Friendship Only_Both

Please include any update information when you renew.

Annual dues based on 12 month membership:

US and Canadian Membership: New $25.00_Renewal $22.00

Overseas Membership: New $35.00_Renewal $32.00

Optional Donation to Sidecar Safety Training Program: $

Please make your check or money order in US currency only, please, payable to the USCA, Inc.

Please send to the USCA Membership Secretary, Al Roach, 130 South Michigan, Villa Park, IL 60181 USA or phone (708) 833-6732 for additional information.

First years dues include decal, patch and your subscription to The Sidecarist, the news journal of the USCA.

Please include Emergency Contact Information on this application and renewal form if there have been changes.

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KNOWLEDGE TEST

1. Motorcycle/sidecar outfits are driven just like a comparable two wheeled motorcycle.

a. true b. false

2. Because sidecar outfits are supported on three wheels, they can't tip over.

a. true b. false

3. The ultimate purpose of a motorcycle helmet is to:

a. protect the skull from fractures

b. protect the brain tissue from injury

c. prevent accidents

4. Which is the best eye protection?

a. regular glass sunglasses

b. a windshield on the motorcycle

c. a plastic faceshield on the helmet

5. When moving the motorcycle away from a stop sign you should:

a. release the clutch lever

b. ease out the clutch lever

c. keep the clutch lever squeezed

6. To start the URAL engine:

a. squeeze the clutch lever and kickstart

b. shift to neutral, release the clutch, kickstart

c. squeeze the clutch, shift to first gear, kickstart

7. Squeezing the lever on the left side of the handlebars:

a. temporarily interrupts engine thrust

b. applies the front wheel brake

c. stops the engine

8. The red light illuminated at the top left of the dash means:

a. no oil pressure

b. the brakes are on

c. at this engine speed the generator is not charging the battery

9. Stepping down on the right side foot pedal:

a. applies the rear brake

b. applies the rear brake and the sidecar brake

c. shifts the transmission into reverse

10. Brain tissue heals itself from injury just like any other part of the body.

a. true b. false

11. Before starting the engine, the red generator light illuminated means:

a. the main switch is on

b. the engine is low on oil

c. the transmission is in neutral

12. If you kick the engine over and it doesn't start, what should you do first?

a. check the main switch on and the kill switch to the run position

b. check that the reverse lever is in neutral

c. turn the fuel valve lever straight up

13. With all three wheels on the ground, a sidecar rig steers the same as a two-wheeled motorcycle.

a. true b. false

14. You shift from second gear to third gear by:

a. pressing down on the shift lever toe pad

b. pressing down on the shift lever heel pad

c. lifting up on the left footpeg with your toe

15. To bring the outfit to a complete stop:

a. squeeze the clutch, roll off the throttle, apply both brakes

b. shift down, roll off the throttle, turn off the kill switch

c. squeeze the clutch, turn off the kill switch

16. If you push down on the kick start lever and the outfit begins to move, it means:

a. you didn't squeeze the clutch

b. the transmission is in gear

c. the parking brake is set

17. To turn the outfit towards the left, you:

a. point the front wheel left

b. push on the left grip

c. pull on the right grip

18. A motorcycle tire has more traction when rolling than when sliding.

a. true b. false

19. If the rig yaws to the right when braking, it means:

a. the front brake is adjusted too tight

b. the sidecar brake is adjusted too tight

c. the rear brake is adjusted too tight

20. When braking in a right turn, the sidecar wheel tends to:

a. lift off the ground

b. press down harder on the ground

c. slide towards the left

21. When shifting up from first gear to second gear you should:

a. squeeze the clutch and roll off the throttle

b. squeeze the clutch and roll on the throttle

c. squeeze the clutch and "blip" the throttle

22. You lean your body to the right and simultaneously squeeze the front brake as you roll on some throttle. You would do this in:

a. a level left turn

b. a downhill left turn

c. a level right turn

23. Motorcyclists often have more than two seconds to react to hazards.

a. true b. false

24. What percentage of motorcycle accidents occur within five miles of home?

a. 10 percent

b. 50 percent

c. 90 percent

25. Which technique allows us to separate traffic hazards?

a. looking farther ahead

b. slowing down

c. both of the above

26. The most common motorcycle accident is:

a. car turns left into motorcycle

b. car pulls out of alley into motorcycle

c. car rear-ends motorcycle

27. You can prevent other drivers from running into you by:

a. wearing brightly colored riding gear

b. making sure your headlight is on

c. getting out of their way

28. You should stay out from behind trucks in traffic because:

a. the truck might stop quickly

b. other drivers can't see you

c. you don't have room to accelerate

29. When driving in traffic, the minimum acceptable following distance is:

a. 2 seconds

b. 2 bike lengths

c. 20 feet

30. Where should you look to learn whether on oncoming car is about to turn left in front of you?

a. maintain eye contact with the driver

b. look at the top of the left front tire

c. look at the turn signals

31. Alleys and driveways produce what percentage of fatal accidents?

a. 7 percent

b. 17 percent

c. 1 percent

32. The recommended tactic for avoiding deer strikes on country roads is:

a. swerve around the deer if it jumps

b. slow down quickly when you see a deer

c. flash your high beam and beep the horn

33. On a curving road, which line produces the greatest side forces for the same speed?

a. the largest radius of turn

b. the straightest line through the turn

c. following the center of your lane

34. On the freeway, you can reduce your risks by:

a. maintaining the speed of traffic

b. looking far ahead

c. scrutinizing traffic behind you

d. all of the above

35. On the "superslab", the left lane is:

a. no different than any other lane

b. a passing lane only

c. a lane for fast cruising

36. What percentage of motorcycle accidents occur on superslabs?

a. less than 10 percent

b. 25 percent

c. 50 percent

37. When driving an outfit uphill, front tire traction:

a. increases

b. decreases

c. stays constant

38. The front tire is most likely to slide sideways:

a. during a sharp uphill left turn

b. during a sharp downhill left turn

c. during hard straight-line braking

39. It is most important to stay on the front brake:

a. during a steep uphill right turn

b. during a steep uphill left turn

c. during a steep downhill right turn

40. With a speed increase from 30 mph to 40 mph, how much does the force of inertia increase?

a. inertia increases by 25 percent

b. inertia increases by 33 percent

c. inertia doubles

41. Which evasive maneuver is less likely to result in a flipover?

a. hard, straight-line braking

b. quick swerving

c. sliding sideways

42. Which brake is the most powerful?

a. sidecar brake

b. rear brake

c. front brake

43. Shifting body weight towards the inside (hanging off) in turns is mostly to:

a. keep the outfit from flipping over

b. keep the outfit from sliding sideways

c. help improve traction

44. The advanced technique for "drifting" through right-hand turns is to:

a. roll off the throttle, squeeze the front brake

b. roll on the throttle while squeezing the front brake

c. roll on the throttle while also pressing on rear brake.

45. When the sidecar wheel is "flying", you turn the rig more towards the left by:

a. pressing more on the left grip

b. pressing more on the right grip

c. pointing the front wheel more towards the left

46. With an empty sidecar, why should you hang off the inside in turns?

a. helps avoid a tipover

b. shifts center of gravity towards the outside

c. helps avoid a slideout

47. On a gravel road, the correct technique for a downhill right-hand turn is:

a. hang off right, roll on throttle, squeeze front brake

b. hang off right, roll off throttle

c. hang off right, roll on throttle

48. Approaching a steep hill on gravel, you should:

a. slow almost to a stop, then accelerate uphill

b. accelerate at the bottom, then slow as you go uphill

c. slow almost to a stop, then ride slowly uphill

49. When making a quick stop to avoid a deer in the road, you should:

a. apply both front and rear brakes to the maximum just short of a skid

b. apply the front brake only, as hard as possible

c. apply the rear brake only, as hard as possible

50. With a two-wheel-drive outfit, what happens when either rear wheel loses traction?

a. the other wheel loses power and rig slows down

b. the other wheel starts to slide

c. the other wheel starts to spin faster

Answers:

1. b 26. a

2. b 27. c

3. b 28. b

4. c 29. a

5. b 30. b

6. b 31. b

7. a 32. b

8. c 33. c

9. b 34. d

10. b 35. b

11. a 36. a

12. a 37. b

13. b 38. a

14. b 39. c

15. a 40. c

16. b 41. a

17. a 42. c

18. a 43. a

19. b 44. b

20. a 45. a

21. a 46. a

22. c 47. b

23. a 48. b

24. c 49. a

25. c 50. a

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ADDITIONAL INFORMATION

As you gain experience with your URAL outfit, you may meet other sidecarists and be introduced to a whole world of sidecar enthusiasts. You may be invited to special sidecar events such as rallies or campouts. Perhaps you are curious about different sidecar rigs others have put together or the history of sidecars. Where do you go for sidecar information?

SIDECAR PUBLICATIONS AND ASSOCIATIONS

There are two reliable sources of sidecar information in the United States, The United Side Car Association and Hack'd Magazine. Hack'd is an independent commercial publication with quarterly "newsletter" style issues stuffed full of technical and travel articles, advertisements, new products and announcements of sidecar events. The Editor/Publisher is Jim Dodson.

Hack'd Magazine, PO Box 813, Buckhannon, WV 26201; telephone (304) 472-6146

Motorcycle Consumer News is a newsletter-style commercial publication for motorcyclists, available by subscription only. For subscription information:

Motorcycle Consumer News Subscription Division, P. O. Box 420243, Palm Coast, FL 32142-9477; telephone (904) 445-4608

There are a number of local sidecar clubs in the US and Canada, but the United Side Car Association is the only comprehensive North American sidecar organization. The USCA is a volunteer association of sidecar enthusiasts, with a bi-monthly publication, The Sidecarist. The USCA holds a national rally and offers sidecar operator training at a limited number of sites. A membership application is located on page 92 of this manual.

For USCA sidecar operator training information, contact:

USCA Sidecar Safety Program, Ed Johnson, 703 First Street, Manhattan, IL, 60442-9115; telephone (815) 478-5609.

Because BMW motorcycles have historically been attached to sidecars, many BMW enthusiasts are also sidecar enthusiasts. The major BMW club in North America is BMW Motorcycle Owners of America. BMWMOA publishes a slick monthly color magazine and holds a national rally. For membership information contact:

BMW Motorcycle Owners of America, PO Box 489, Chesterfield, MO 63006-0489

The American Motorcyclist Association sanctions road and racing events, lobbies against anti-motorcycle legislation and offers member services such as uncrated motorcycle shipping, insurance and travel planning. For membership information contact:

American Motorcyclist Association, 13515 Yarmouth Dr, Pickerington, OH 43147; telephone (800) 262-5646 (AMA-JOIN); www.AMADirectlink.com

Motorcycle Rider Training for two-wheeled motorcyclists is available at independent training sites all across North America. Most states certify courses developed by the Motorcycle Safety Foundation. In the future, MSF training may also be available for sidecarists. To locate the nearest rider training site, telephone (800) 447-4700.

The MSF has also produced an excellent text, Motorcycling Excellence, that helps novice motorcyclists improve knowledge and traffic riding strategies. Although some of the information applies only to two-wheeled motorcyclists, much of the book also applies to sidecar operators. Motorcycling Excellence is available from Whitehorse Press, P. O. Box 60, North Conway, NH 03860-0060; telephone (800) 531-1133.

State Driving Handbook

Most states provide handbooks for anyone applying for a learner's permit. However, there are separate handbooks for motorcyclists and automobile drivers. The typical motorcycle handbook assumes two-wheeled operation. However, both books describe road signs and legal requirements for that state. You should study the appropriate handbook, recognizing that specific "motorcycle" questions on the written test may not be true for sidecarists.

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INSTRUCTION GUIDE

This manual can be used as a do-it-yourself course of instruction, but it is best used as a curriculum by certified instructors who can coach students through the exercises. This guide briefly explains how the instruction should be presented.

EXERCISE PRACTICE RANGE LAYOUT

The driving practice area or "range" for practicing the exercises should be a level area separated from traffic and free of obstructions. The surface should be level and reasonably smooth, but need not be paved. An even grass or gravel surface is adequate for all of the exercises.

The basic range layout is two 25-foot diameter circles set 125 feet apart, center-to-center. The two circles form either an oval or a "figure-8". The majority of exercises can successfully be practiced on this same layout. Having one main exercise layout saves time by precluding having to explain different layouts for successive exercises and saves instructor effort. Additional exercises such as straight-line braking or swerving are relatively easy to set up when needed.

The basic layout can be marked with cones, painted permanently on a hard surface or marked temporarily with chalk or lime on unpaved surfaces. Brightly-colored tennis balls cut in half make excellent "cones" to mark the path of travel.

BASIC INSTRUCTIONAL PLAN

The course of instruction includes both study and driving practice. Chapters 1, 2 and 3 are studied first, followed by driving exercises 1 through 11 to learn the basic sidecar driving skills. These novice exercises are conducted with weight in the sidecar. Chapter 4 exposes the novice to strategies and techniques for driving in traffic.

Chapter 5 introduces the novice to advanced driving skills, followed by exercises 12 through 21, which are conducted with an empty sidecar. The concluding Chapters 6 through 9 provide additional information about sidecar operation, alcohol awareness, regulations and a brief introduction to rigging.

A multiple-choice knowledge test is included. The test addresses only subjects covered in the lessons. The test can be used at the beginning of the course as a stimulus to learn or given at the end of the course after Chapter 6 to test knowledge gained.

As with instruction of two-wheeled motorcyclists, skills such as cornering are too complex to master in a single lesson or exercise. The lessons provide needed information to help practice the skills and some critical information is repeated in subsequent lessons and skill practice. Since the practice exercises build skills cumulatively, it is important that each exercise be mastered before proceeding to the next, even if the "student" is an experienced two-wheeled motorcyclist.

COURSE SCHEDULE

The total time needed to teach this course depends on entry level of students as well as number of participants. Due to the minority nature of sidecarists, it may seldom be possible to have more than two or three students in the same class. Assuming a small number of students, the entire course should take no longer than 16 hours. Although the lessons are intentionally made brief, class time can be reduced by students reading Chapters such as 4, 6, 7, 8 and 9 outside of class. Chapter 5 should be included in class time, to ensure that novices understand the advanced techniques before attempting to practice them on the range.

Given over a weekend, the introductary Chapters 1 through 3 can be presented on Saturday morning, followed by the Basic (novice level) skill practice. Chapters 4 and 5 can be studied outside of class on Saturday night, with Chapter 5 reviewed as the introduction to advanced skill practice. The course can be concluded by giving the knowledge test and handing out any additional information that is available.

It is recommended that the course be conducted as a continuous unit rather than being divided up over a period of days or weeks. The lessons should be followed immediately by practice exercises while the information is still fresh in the students' minds.

INSTRUCTOR QUALIFICATION

Currently, there are no standards or restrictions on sidecar instructors. The United SideCar Association does train and certify sidecar instructors to teach the USCA sidecar course, which is roughly the sidecar equivalent of the MSF Experienced RiderCourse. Ideally, the instructor intending to teach novice sidecarists will already be a certified motorcycle safety instructor as well as an experienced sidecarist. At some point in the future, the Motorcycle Safety Foundation may include sidecar instruction and therefore sidecar instructor certification.

Experienced sidecarists who are not certified instructors should understand that teaching novices requires instructional skills in addition to sidecar driving experience. You must have the patience to coach novices gradually through each exercise without becoming frustrated at slow progress and you must constantly evaluate each skill step to ensure that aggressive novices have mastered each skill progressively. If you have never coached motorcyclists through exercises, you might consider monitoring an existing rider training class.

EVALUATION AND EXERCISE COACHING

Even when you have only one or two students, it is important to maintain control of the exercises. Use as consistent staging area where the outfits are parked before and after each exercise. Explain each exercise and if necessary, demonstrate the exercise to show what you expect. Start the drivers and signal them what to do with hand signals and gestures. When a driver needs coaching, signal him or her aside and explain as concisely as possible how to practice the particular skill needed to master that exercise.

When introducing each exercise, describe the purpose of the skill, explain the path of travel and briefly review the technique. If needed, demonstrate the exercise yourself, taking care to do it exactly as you want them to do. Then review any coaching signals and start the exercise. It is important to spend time on driving the outfits, not on explanations that should have been covered in the preeceding lessons.

Demonstrations

For demonstrating exercises, you should encourage the drivers to walk closer to the action. Students will be watching your every move, even before and after the demonstration. Be sure to put on all of your recommended riding gear whenever driving

and follow the exact drills already practiced. For example, always use the cutoff switch in the recommended sequence and always squeeze the front brake lever when climbing aboard, even though the exercise is primarily about shifting.

Remember that you are demonstrating an exact skill, not showing off your cumulative sidecar proficiency. Drive exactly as you would expect the novice to drive, following the exact line of travel, turning your head to look through turns, covering the appropriate controls when required and driving at the (slow) speed suitable for the novice at that stage of learning.

Coaching

The words you use to coach students are important. Use the same words or phrases that were used in the preceeding leesons. For example, say "squeeze" the clutch, rather than pull, disengage, grab or other terms the novice has not yet learned. The recommended terms are those in the exercise descriptions.

Get involved with the student in mastering the exercise. Watch carefully what they are doing. Offer positive reinforcement when the student does it right. Clap your hands, smile, shout "Yes!" give a thumb up or similar obvious reinforcement as they pass you. Avoid negative comments such as "NO-NO-NO" or profanity. Your actions and demeanor must always demonstrate that the student is OK, even when the student has not yet mastered the skill.

The advanced exercises (12 and on) approach the limits of balance and traction. It is much more important that each advanced exercise be mastered in sequence. Should a student approach a limit where you are concerned a tipover might occur, stop the exercise and explain both the dynamics and the correct technique. It is particularly important to avoid sliding the Urals sideways on tractable pavement, particularly the two-wheel-drive Sportsman.

Failures

Some individuals simply do not possess the judgement or motor skills to master certain driving exercises, particularly the advanced techniques. Since the exercises build skill progressively, allowing a student to proceed to a subsequent exercise without mastering an earlier one is setting the stage for a subsequent accident. The novice probably does not appreciate that failure to complete a driving exercise means subsequent exercises are compromised. If you have only one or two students, you can decide to patiently coach the slow learner through each exercise for as long as it takes to get it right. But if you have a class of several new sidecarists, it is unfair to keep the others waiting while you deal with the slow student.

When a student is failing to complete any novice-level driving exercise, you may already have formed an opinion that the individual is not ready or worse yet, not capable of operating a sidecar rig on the public roads. It is better that you weather a momentary storm of anger over your decision, than weather the guilt of a subsequent sidecarist fatality. You could simply flunk them on the spot and send them home. Or you might suggest that they monitor the rest of the course without driving or suggest that they spend time studying the lessons and then reschedule at another class. You cannot prevent them from continuing to learn on their own by trial-and-error, but you can avoid being a conspirator to an accident.

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