

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

URAL[®]

CLASSIC SIDECAR MOTORCYCLE

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 brainstorm 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 conspicuous--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 assumption.

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:

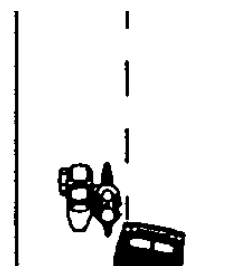


1. Before driving the outfit in traffic, check that your headlight, tail light and stop light are working. Use your turn signals. Flash your brake light to attract the attention of following drivers.
2. Consider lighter-color riding gear such as a tan, silver or bright blue or add brightly colored "vanity 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.

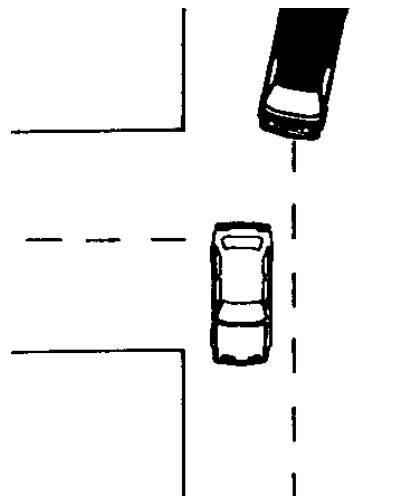
One of the big advantages of sidecar outfits is that many people are curious about them. Other motorists seem to spot sidecar outfits more readily than two-wheeled motorcycles. But where we position the outfit in traffic also has much to do with how easy it is for other drivers to see us and for us to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

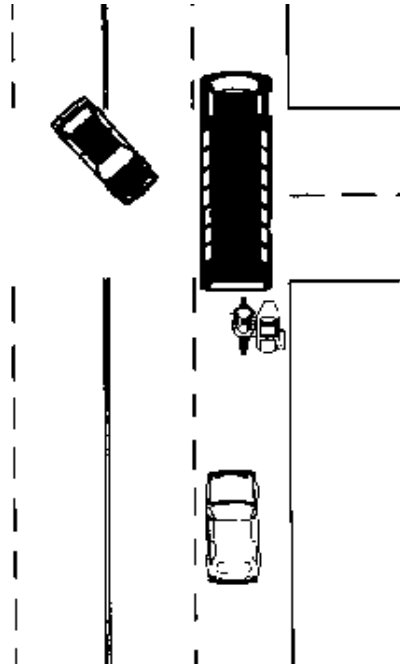


inattention or lazy control habits, but there may be good reasons for moving around in the lane or even changing lanes. The veteran understands the importance of adjusting position to provide the best view of the situation ahead, to increase separation from other vehicles and to make themselves most 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.



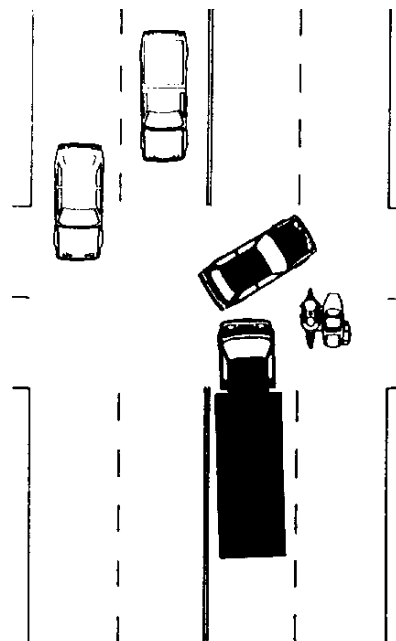
Consider the following positioning tactics:

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.

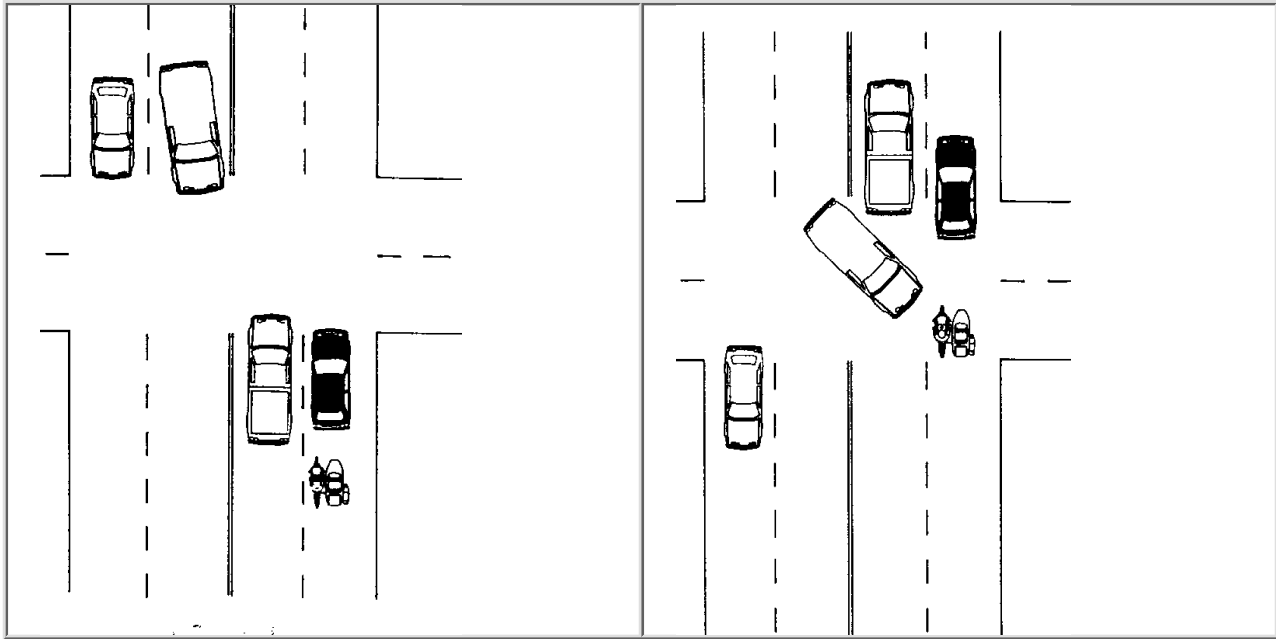
Of course, real life is going to be a lot more complex than our diagrams. You'll have to imagine about ten or twenty other vehicles cluttering up each picture. We'll just show the important ones to keep things easy to understand.

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.

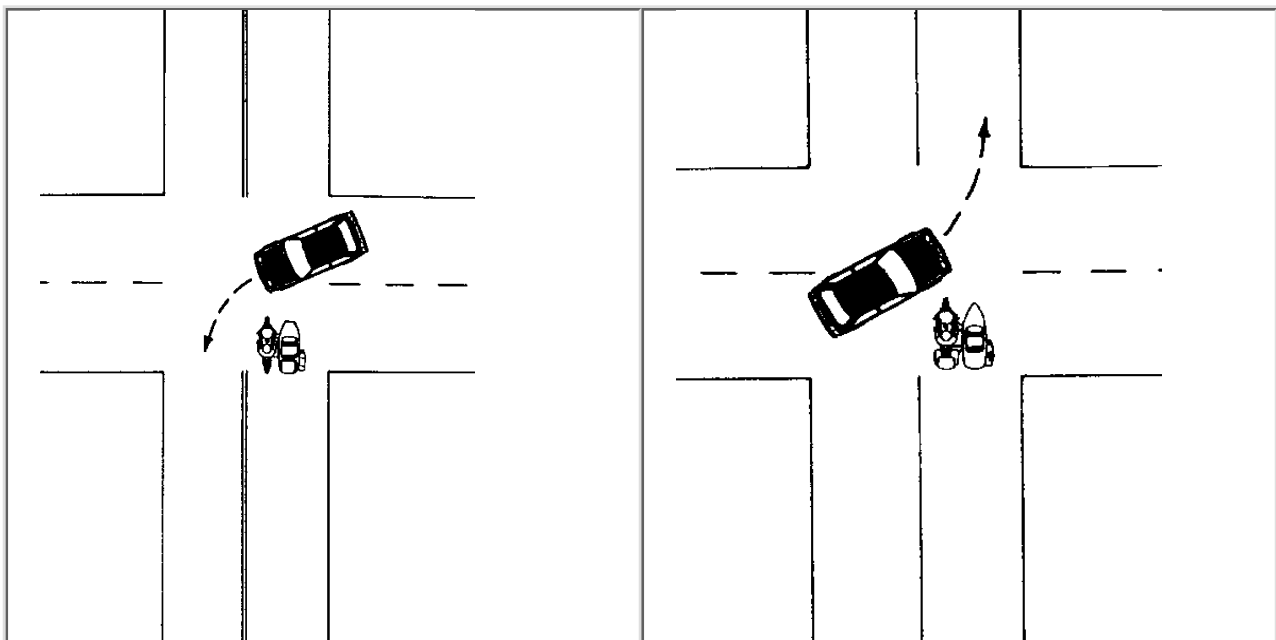


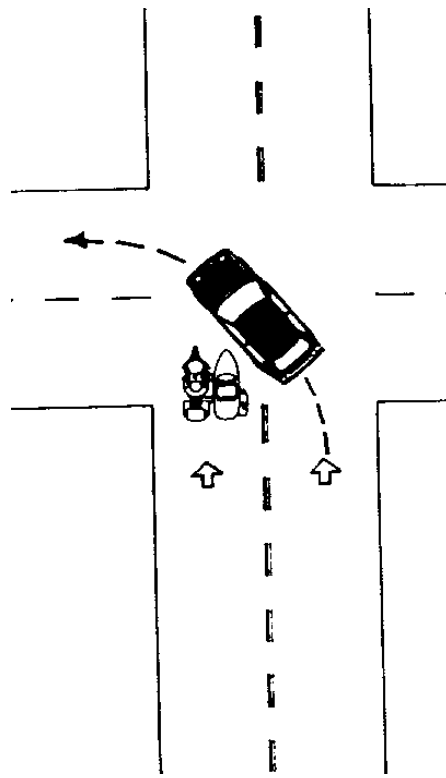
Figure 5 shows one additional left-turner situation that



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 side street 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.

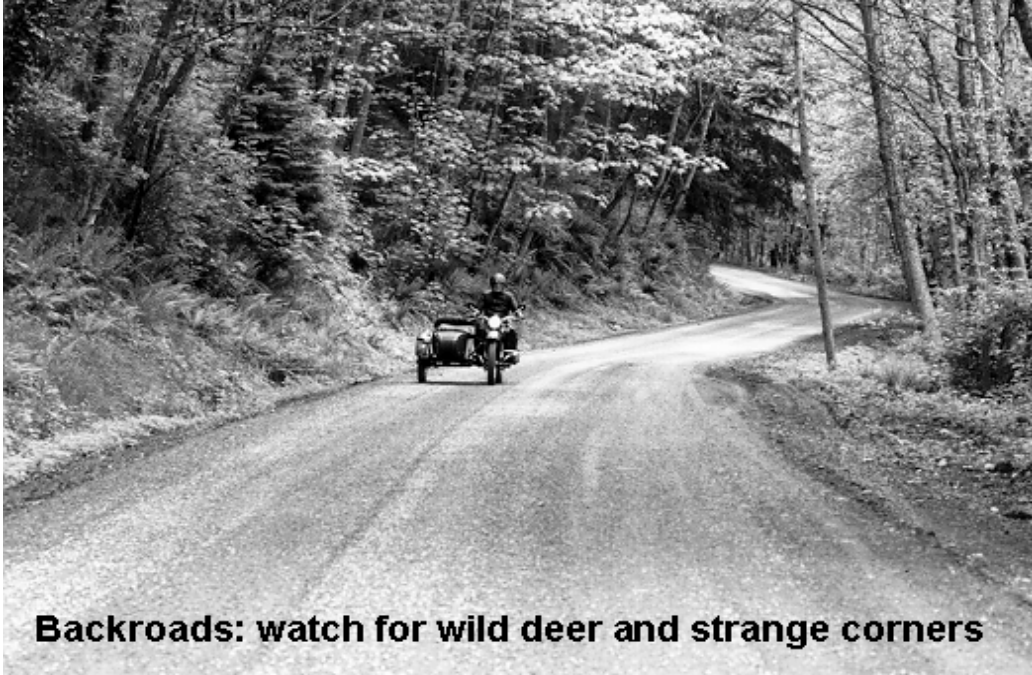
There are more joggers, runners, skateboarders, and bicyclists on the side streets, too. A lot of them are very nervy about dashing out into traffic, zipping on and off sidewalks, and ignoring traffic signals. You need to give these folks lots of space to avoid hitting them, but you must also be aware 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.



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 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

URAL[®]

CLASSIC SIDECAR MOTORCYCLE

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