Congratulations on your purchase of a California Side Car. You are about to experience the wonderful world of sidecaring, the most fun and functional accessory you can buy for a motorcycle.

CALIFORNIA SIDE CAR INSTALLATION INSTRUCTIONS

Steps

1) Pre-read instructions.

2) Open crate and check parts against packing slip.

3) Collect tools and clean work space.

4) Install frame.

5) Install body.

6) Wire electrical.

7) Install seat.

8) Install windshield.

9) Take a test ride with your new sidecar!

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A Division of U.S. Sidecars, Inc.

Although installing your California Side Car is not difficult, it does require care and attention to detail. You are, after all, working with a frame and suspension comparable to that of a high performance sports car. Before starting the installation, you should have the following: (or reasonable substitutes)

1) About 200 square feet of clean work space on a smooth, level surface.

2) The following hand tools:
Phillips screwdriver
3/8" socket or box-end wrench
1 each 1/2" socket or box-end wrench
2 each 9/16" socket or box-end wrench
2 each 3/4" socket or box-end wrench
1 each 7/8" open-end wrench
1 each 1 1/8" and 1 5/16" open-end wrench
24 inch carpenters framing square
rubber mallet
channel locks or vice grips for squeezing clamps
sharp knife
wire cutter and crimper

3) If you did not order the optional dolly & re-alignment stand*, you will need about 10' of 2 x 4. Cut four pieces 24" long, two pieces 7" long and two pieces 6" long. Nail together as shown. These stands will be used for installation and also for storage when you remove your California Side Car.

Before attempting to install and handle a sidecar rig, some basic principles of sidecars should be understood. The following information is general and will vary with different car and motorcycle combinations. All measurements given are to be used as starting points from which finer adjustments can be made, depending on bike, rider and passenger.

1) SIDECAR WHEEL LEAD

The distance the sidecar axle leads the rear axle of the motorcycle. For the best performance under most conditions, the axle of the sidecar should be positioned eight to twelve inches forward of the rear axle of the motorcycle. As you fine tune your rig, you will find the farther to the rear the easier it turns.

2) TOE-IN ADJUSTMENT

The purpose of a slight inward set of the sidecar wheel in relation to the wheels of the motorcycle is to counteract the drag of the sidecar and offset the scrubbing tendancy of the rear wheel. Too much toe-in will cause rapid tire wear. Too little will cause the rig to pull to the side. A correct balance is achieved if the rig will not noticeably pull to the right or left while maintaining a speed of approximately 30-40 m.p.h. on a level highway. Toe-in should be the minimum that will allow straight-ahead steering. In most instances, it will be between 3/4 and 1 1/4 inches. We suggest you start at 1-1/4 inches and adjust outward as refinements are made.

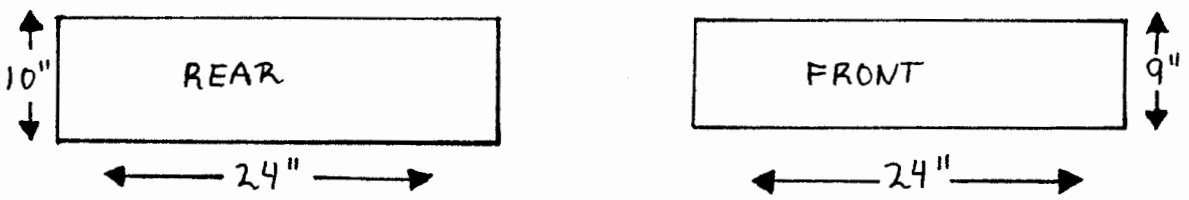
3) LEAN-OUT

The amount that the motorcycle leans away from the sidecar will vary depending on several factors--- weight of the motorcycle, suspension of the sidecar and the general load that will be carried in the sidecar. Each motorcycle and car combination is an individual and in most cases only experimentation will produce the best possible lean out combination. Generally speaking, the more the motorcycle leans out, the easier your left turns; however, the easier the wheel will lift on right turns. Conversely, the more the motorcycle leans in, the harder it will be to pick up the wheel on right turns; however, it will take more effort to make left turns. The added weight of a driver will lessen the degree of lean in. Ballast added to an empty sidecar or passenger, will counteract the tendancy of the wheel to lift.

4) What you want to acheive is sometimes referred to as the vertical ideal. When the motorcycle is rigged properly, with the normal load, the wheels of the motorcycle and the sidecar should be near vertical. The unit should track straight when moving at a steady speed. The sidecar should set level when viewed from the rear when under anticipated loading conditions. Achieving the vertical ideal is usually a trial and error process and the odds are very strong against this happening the first time around. The trouble-shooting graph is a good reference point for refining the alignment.

Experience has shown that generally you should not have any trouble in attaching your sidecar. However, if you do experience a seemingly insurmountable problem, please feel free to call our Service Department at: (714) 892-2483. Our service manager, Barry Bates, will be happy to assist you. If possible, try to call between the hours of 1:00p.m. and 3:00p.m., Pacific Time. Since the Service Department is separate from the front office, we request that any calls relating to installation and service be make on the (714) 892-2483 line.

* Alignment stand:



WITH THESE PRINCIPLES IN MIND:

1) Start by supporting bike so that it leans very slightly left of vertical. If necessary, use the side stand and blocks of wood. Bike should remain at riding height. **DO NOT USE THE RIDE OFF STAND.**

2) Place the sidecar frame on 2 x 4 frame. Assemble swing arm and pre-load as follows:

   a) Friendship: Put tire on swing arm; put swing arm on frame; let tire set on ground.

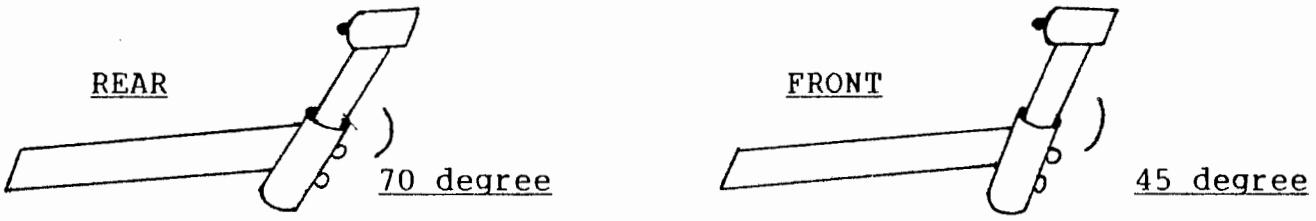
   b) Companion: Same as A.

   c) Commuter: The 2 x 4 frame should be level at the lowest point of the bike.

   Torque bolts to 75 - 80 foot lbs.

3) Adjust wheel on axle so that wheel has a drag, then back off one slot. Insert cotter pin.

4) Pre-assemble clamps and bell or boss struts to frame. Use 70 degree clamp and bell strut in rear position.



5) Place frame alongside bike on 2 x 4 stands, front 1 inch lower than rear.

6) Before placing mounting hardware on the motorcycle, study the relationship between bike's frame and the mounting brackets on the sidecar frame. Choose four points; two as low as possible, and two as high as possible, and all as far apart as possible for attaching the clamps and/or ball adaptors. [Refer to figure 5 (on some models) or illustration attached to hardware check off list for more specific reference points.] The four attachment points should be chosen so that the clamps will not interfer with operation of anything, pinch or chafe any cables, wires or lines, or interfere

with servicing the bike. You may have to remove some optional items like case savers or oil cooler, but you will be able to put them back after the frame is mounted. When installing the U-clamps, you may want to spread them with two screwdrivers as they can be squeezed to the proper dimensions with channel locks. Insert block with pad against frame and tighten until snug. Ball clamps should be at 90 degree to vertical, pointing out at the sidecar. In some instances, a deflection of up to 15 degrees is allowed.

TORQUE TO 55 FOOT LBS.

7) Adjust frame struts to allow sidecar axle 8" to 12" forward of the rear tire axle of motorcycle.

8) Now slide the sidecar frame into place with the sockets over the ball joints and tighten them using your 1/2" box-end wrench or socket. Then check that the following conditions are met:

   a) Sidecar frame is level on stands.

   b) Sidecar frame is level front to back. (Friendship models 1" down)

   c) Sidecar has approximately 1 1/4" toe-in as shown in Figure 3.

<u>Toe-in is achieved as follows</u>:

Lay one 2" x 4" parallel to the outfit on the outside of the motorcycle (opposite the sidecar). Make sure the rear wheel is exactly parallel to the motorcycle frame and that the frame is not distorted or bent. Gently nudge the 2" x 4" so it rests against the rear wheel, then, with the front wheel pointed straight ahead, bring the 2" x 4" parallel to the front wheel. Do not forget to make an allowance if the rear tire is wider than the front. If it is, make two shims equal to one-half the difference in width between the maximum cross section of the front tire and the rear. Nail shims on 2" x 4" where it will contact the front tire. Measurements will be more accurate if the 2" x 4" rests upon a brick at front and rear.

Take another 2" x 4" and gently lay against the sidecar wheel at the same height as the first 2" x 4". Ensure that this 2" x 4" is parallel to the sidecar wheel. You are now ready to determine toe-in.

Just slightly ahead of the front wheel measure the distance between the outer edges of the two 2" x 4" 's. Repeat the measurement just behind the rear wheel. The second measurement should be between 3/4" to 1 1/4" larger than the first for normal adjustment.

e) Slightly tighten frame bolts with 3/4" wrenches.

9) Install two-way struts to establish final lean angle. Recheck toe-in adjustment. Tighten frame bolts to 75 to 80 foot lbs.

NOTE:
a) Use frame 45 degree angle holes for Friendship.
b) Adjust and rotate struts so you do not have to bend welded clevis U's.

10) Double check for interference with cables, levers, etc. Install covers, boards, lights etc., and tighten.

11) Begin mounting the sidecar body to the frame. Align the body so there is 1" clearance at the rear of the tire to allow for the forward arc of the suspension. Drillinng from the bottom through the holes in the frame, make the first two holes and install the bolts with a fender washer inside. Check clearance around the wheel. Drill the remaining holes, install bolts and double check clearance. Snug-up the bolts and check that all attaching points are tight.

Note: On some bikes, side covers or lower fairings may have to be notched.

12) HOW TO WIRE ELECTRICAL:

Because of the different and varied electrical accessories, i.e. tail lights, turn signals, driving lights, marker lights, radio, map light, etc., we suggest that you throughly study and lay out wire before cutting and splicing.

Two wire disconnects are provided with standard units and deluxe model units use four wire disconnects.

NOTE: A good source of power from the bike is located at the brake light switch with on side always being hot and the other hot when either brake is applied.

13) Install the seat. Fender washers are used underneath the body.

14) Install the windshield, with 1/4" screws, washers and nuts. Place washers on outside of windshield.
DO NOT OVERTIGHTEN: WINDSHIELD WILL CRACK!!

15) Now you are ready for a test ride after you remember:

a) Driving a sidecar rig is not harder than riding a two-wheeler, just different.
b) The sidecar will have a tendency to lift on right turns. 100 lbs. of ballast is recommended to minimize this tendency.
c) There should be no pulling to either side at constant speed and a minimum of pulling while starting or stopping.
d) A little low speed shimmy is normal. It can be minimized or eliminated with a California Sidecar steering damper.
e) IMPORTANT...Do your test riding and experimenting in an area as free of traffic as possible. A vacant parking lot is suggested.
f) Remember, the rig is now over twice as wide as your basic two-wheeler, with a track of about 4 1/2 feet.

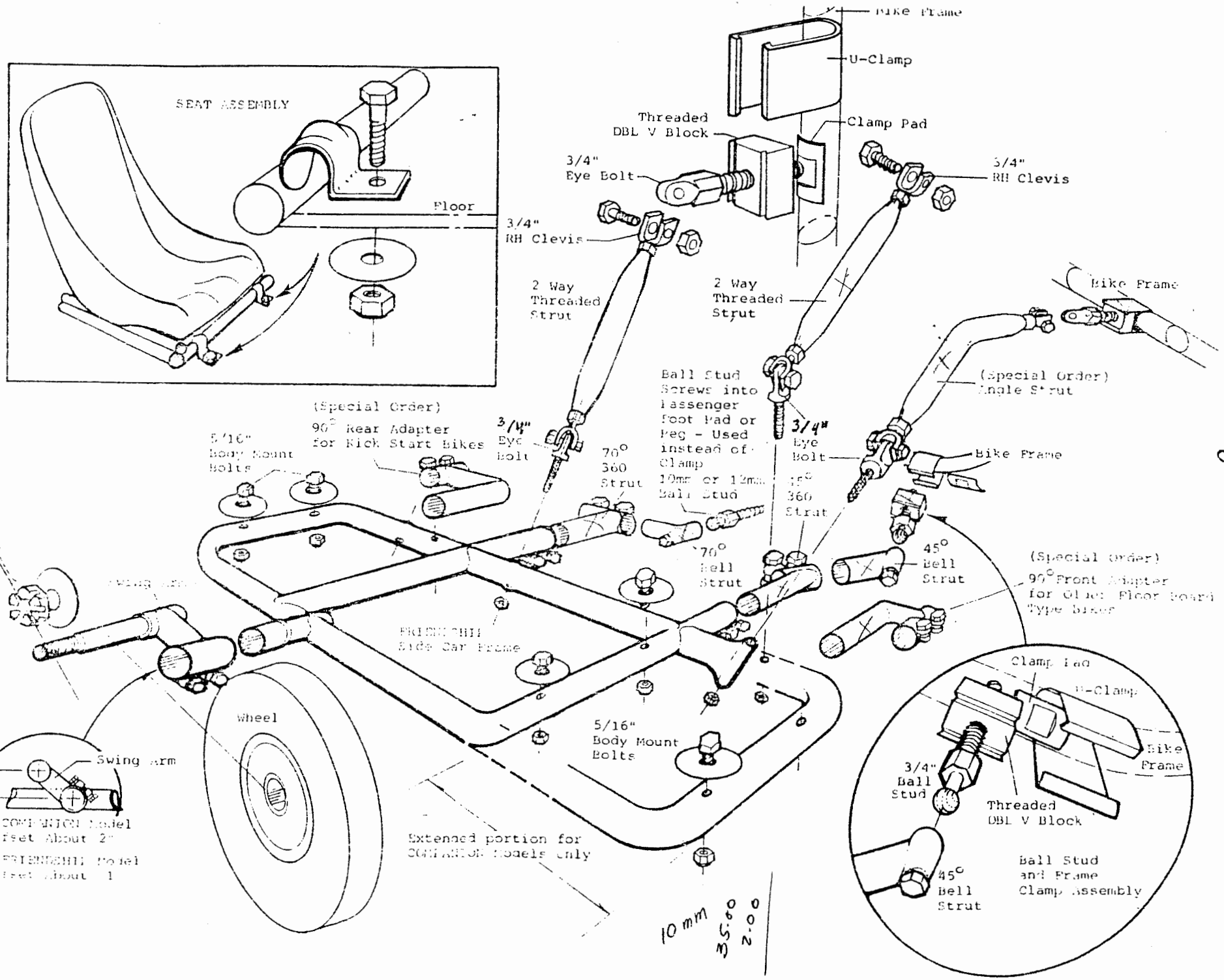

SEAT ASSEMBLY
Floor
Bike Frame
U-Clamp
Threaded DBL V Block
Clamp Pad
3/4" Eye Bolt
5/4" RH Clevis
3/4" RH Clevis
2 Way Threaded Strut
2 Way Threaded Strut
Bike Frame
(Special Order) Angle Strut
Ball Stud Screws into Passenger Foot Pad or Peg - Used instead of Clamp 10mm or 12mm Ball Stud
3/4" Eye Bolt
3/4" Eye Bolt
Bike Frame
(Special Order) 90° Rear Adapter for Kick Start Bikes
5/16" Body Mount Bolts
70° 360 Strut
70° Bell Strut
45° 360 Strut
45° Bell Strut
(Special Order) 90° Front Adapter for Offset Floor Board Type Brace
Swing Arm
FRIENDSHIP Side Car Frame
Wheel
5/16" Body Mount Bolts
Swing Arm
Offset About 2"
Offset About 1
Extended portion for COMPANION Models only
10mm
Clamp Pad
U-Clamp
Bike Frame
3/4" Ball Stud
Threaded DBL V Block
45° Bell Strut
Ball Stud and Frame Clamp Assembly

FIGURE #2

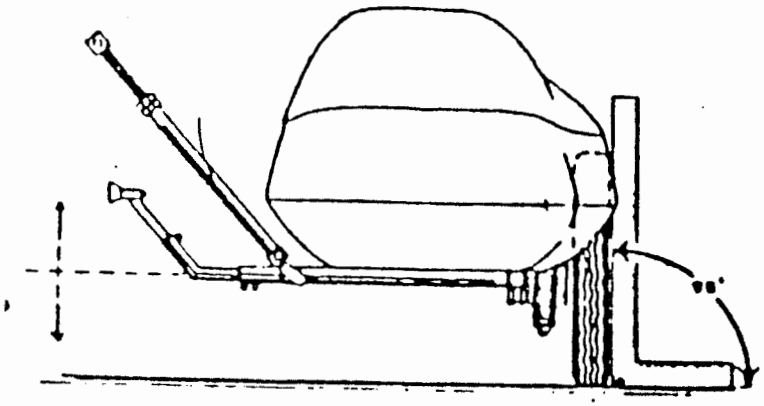
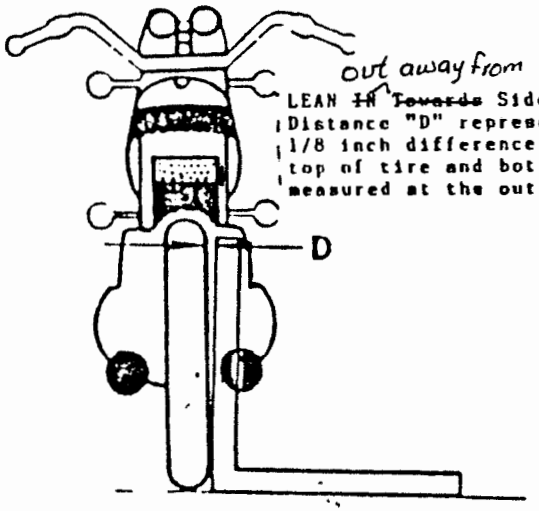
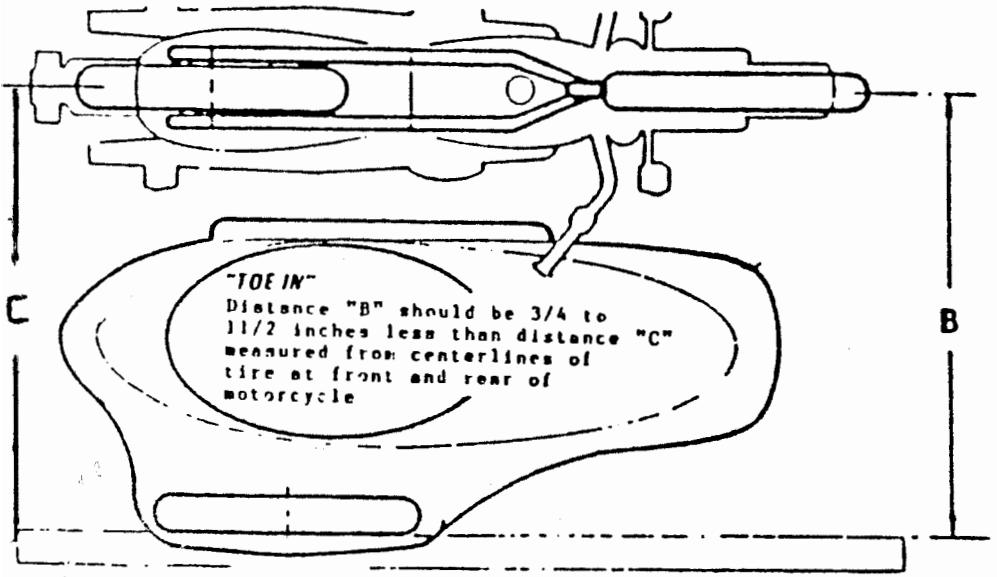


Figure #4



REAR VIEW

FIGURE #3

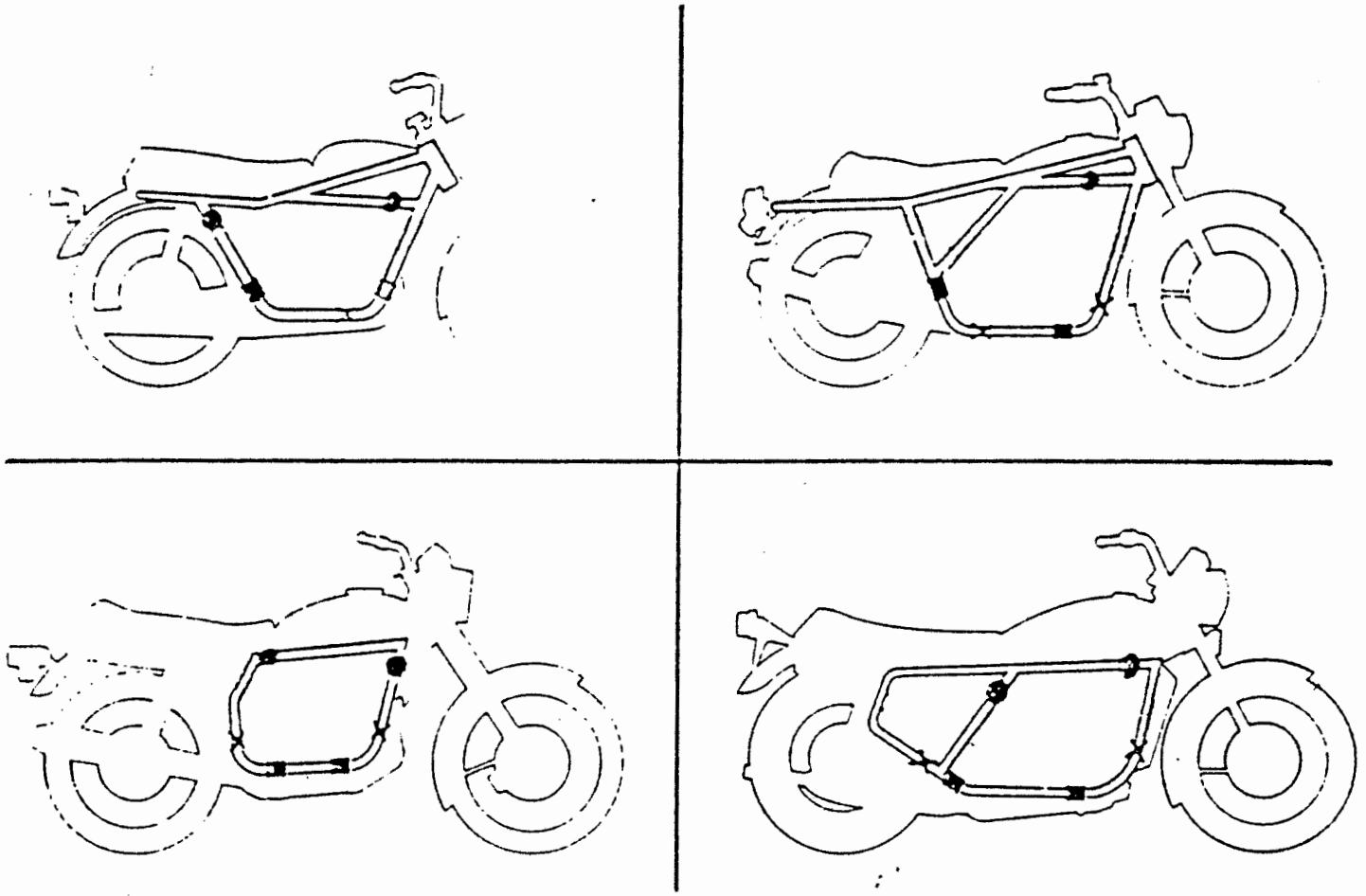


Sidecar Problems and Solutions

	Pulls Right	Pulls Left	Hard To Turn Right	Hard To Turn Left	Sidecar Wheel Lifts Easily	Wobble	Excessive Tire Wear
Increase toe in	X			X			
Decrease toe in		X	X				X
Increase lean out	X			X			
Increase lean in		X	X		X		
Stiffer shocks						X	
Steering head tension*						X	
Tire pressure			X	X		X	X
Swing arm bushings						X	
Add weight in sidecar					X		
Move sidecar further forward	X			X			
Move sidecar further back		X	X				X

Figure 5

THE FOUR BASIC FRAMES



The small squares indicate preferred placement of clamps for best efficiency.

The "X"s denote alternate clamp positions when equipment or accessories interfere.

DRIVING A SIDE CAR UNIT

Perhaps the thing to keep uppermost in mind when you start to drive the rig is that the side car must be steered when cornering. The solo motorcycle is leaned into corners and steering is accomplished largely by shifting body weight. this is not true with a side car. It does not lean and negotiating corners is strictly a matter of pushing and pulling handle bars combined with throttle to allow the momentum of the side car to help turn the rig.

A novice should approach his initial side car drive with a passenger or weight in the side car. Straight line driving is the easiest but you will notice an odd but perfectly normal tendency for the motorcycle to wag its head back and forth at low speeds. Motorcycles with steering dampers help control this condition.

Cornering is where most first-timers have difficulty. The left hand turns are great. The right hand corner is a whole new ballgame. Centrifugal force, your friend on the left turns, becomes your foe turning right. It tries to lift up the side car and you have to counter with some body english and a lower speed. At anything but a crawling pace, the right-hand turn can most easily be negotiated by leaning slightly into the corner.

A word of caution: "Do not ride hands off when decelerating at speeds less than approximately 30 m.p.h." Near this point the drag from the side car begins to overcome the gyroscopic force tendency. The occurrence is minimized by the four point mount, insuring you have good front bearings, and adding a front fork brace. If you want to eliminate it 99%, you can install a steering damper.

A second word of caution: "Do not make accelerated tight radius right-hand turns when the side car is empty". Since you cannot lean into the turn, compensation for the centrifugal force is achieved by putting weight into the side car, slowing down your speed, widening the radius of the turn or leaning your shoulder over the side car. These phenomena are the big things to get used to with a side car. You will find it happens at stop signs. So go slow to the right, do not punch it.

Practice is the key to developing into an accomplished side car pilot. Temper that practice with a liberal dose of caution and common sense and soon you will be handling your side car like a veteran. Remember, all these hints should be considered even more if the side car is empty. With no passenger, the side car is lighter and right-hand turns should be made with extra caution.

IMPORTANT: UNTIL YOU BECOME PROFICIENT IN HANDLING YOUR RIG WE STRONGLY RECOMMEND CARRYING 100 LBS. BALLAST IN AN EMPTY SIDE CAR.

CALIFORNIA SIDECAR "QUICK CONNECT"

Occasionally, removing and replacing your sidecar is necessary and your Friendship has been designed to make that procedure extremely easy.

TO REMOVE

Step 1. Place stand side down. Position dolly or frame stand under frame of sidecar.

Step 2. Using two (2) 9/16" wrenches, loosen 3/8" bolts on upper rear and upper front struts.

Step 3. Using 1/2" wrench, loosen by 1 turn only the 5/16" ball connector bolts. This allows ball connectors to swivel following operations.

Step 4. Stand on left-hand side of your motorcycle, gently rock sideways and remove 3/8" bolt from upper rear strut connecting point. Follow by next removing upper front strut 3/8" through bolt.

CAUTION: Be carefull not to lean bike away from sidecar at this point, as in some cases the lower 360 degree strut clamp may be close to muffler and could dent such.

Step 5. Remove 5/16" ball strut bolts on lower ball mounts and slide sidecar away from bike approximately four inches. (It is now safe to have bike rest on sidestand.) Remove wiring per quick dis-connect.

Step 6. Finish removing procedure by removing front strut upper 3/8" through bolt and store strut with sidecar.

RE-INSTALLATION

Step 1. Having frame blocked level, install flower with ring on to lower ball mounts.

Step 2. Slide frame in place and using 5/16" x 1 1/4" bolt, with washer and lock washer, install lower front ball mount, making sure that wire retaining clip is within bell strut, tighten lightly.

Step 3. Proceed with lower rear ball mount per step number 2.

Step 4. Attach struts and torque through bolts to 35-40 ft. lbs.

Step 5. Torque lower 5/16" ball retaining bolts to 25-30 ft. lbs.

Step 6. Connect wiring and check lights.

HAPPY RIDING!!