



## ASSEMBLY MANUAL

# 1994-2002 Hyper Chassis 250cc & 600cc

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# Assembly Guide

## About This Manual

This manual is based on our experience assembling over 100 chassis. Follow the steps in order for maximum efficiency.

## Preparation

### READ THE ENTIRE PROCEDURE

Familiarize yourself with all hardware kits and parts.

### GATHER THE FOLLOWING TOOLS AND MATERIALS:

- drill
- drill bits: 13/32", 9/32", 3/16", .128
- taps: 7/16"-20, 7/16"-14, 3/8"-24, 5/16"-24
- Permatex Locktite Blue
- teflon plumbers tape
- Mystic JT-6 or other water-proof high temp grease
- grease gun
- sockets
- wrenches: regular and allen
- screwdrivers
- cutting oil
- pop rivet gun
- die grinder
- rubber mallet
- utility knife
- vice
- tape measure

## Procedure

### TIP Smart Assembly

When assembling the chassis at the shop, we put the most of the chassis together "loosely assembled" with the exception of bolts that are hard to reach at a later time, such as the fuel tank mount to frame. Once the entire chassis is assembled, tighten to race ready condition.

### 1► DRILL HOLES IN BUMPERS, NERF BARS AND FRONT WING UPRIGHT

- Mark the ends of the tubes 1" from the end so that you can tell when they are in the entire way. Sometimes you will have to open up the socket with a die grinder to remove paint or powder coating. Use a rubber mallet or a hammer and a block of wood against the rail and push the rails into the sockets up to your mark.
- Drill through the existing holes in the sockets all the way through the rails with a 3/16" drill bit.
- Remove nerf bars and bumpers and set aside until the end.
- Bolt the wing upright and bumpers in place, making sure the manual wing adjuster tab goes on the right.

### TIP Smart Assembly

To avoid scratching the sheet metal, follow this sequence. Drill the bolt holes in the nerf bars, bumpers, and front wing upright before the sheet metal is fitted. Then fit the unpainted sheet metal. Have the sheet metal painted while you start the rest of your assembly.

### 2► FIT THE BODY PANELS TO THE FRAME.

In chassis kits, this step is done for you. To fit a new body panel, use your old one as a guide to mark the holes.

### TIP Left and Right

Hold the rod ends up with the bearing at the top. If the threads point up and to the right, it is a right hand, up and to the left is a left hand. Left jam nuts are gold. The left ends on the radius rods are knurled.

### 3► ASSEMBLE THE RODS AND ROD ENDS

Apply grease to the rod ends before installing. This will make adjustments easier. Screw the jam nuts onto the rod ends until there are only a few threads showing on the rod end. Then screw the rod ends into the rods.

#### RADIUS ROD LENGTHS

'96-'00 Left Front Radius (1)	12" x 7/16"	03-120
'96-'00 Right Front Radius (2)	11" x 7/16"	03-110
'96-'00 Front Panhard (1)	14" x 7/16"	03-140
'96-'00 Front Steering, Rack (2)	see chart	
'95-'00 Left Rear Radius (2)	15.5" x 7/16"	03-155
'95-'00 Right Rear Radius (2)	16.5" x 7/16"	03-165
'95-'00 Rear Panhard Bar (1)	17" x 7/16"	03-170
'95-'00 Rear Panhard Bar, Remote Adjustable (1)	15" x 7/16"	03-150
'95 Left Front Radius (1)	12" x 3/8"	02-120
'95 Right Front Radius (2)	11" x 3/8"	02-110
'95 Front Panhard (1)	14" x 3/8"	02-140
'95 Front Steering, Rack (2)	see chart	
<b>1995-2000 Hyper Chassis 600cc</b>		
'95-'00 Left Front Radius (1)	12.25" x 7/16"	03-1225
'95-'00 Right Front Radius (2)	12.25" x 7/16"	03-1225
'95-'00 Front Panhard (1)	15.5" x 7/16"	03-155
'95-'00 Front Steering, Rack (2)	see chart	
'95-'00 Rear Panhard Bar (1)	17" x 7/16"	03-170
'95-'00 Rear Panhard Bar, Remote Adjustable (1)	15" x 7/16"	03-150

#### RACK BOX RADIUS RODS

Follow the chart on page 18 to measure your axle.

Length	Left	Right
34"	03-130	03-140
34 3/4"	03-1375	03-140
35 1/4"	03-1375	03-145
36 1/4"	03-140	03-150
37 1/4"	03-015	03-016

#### RECOMMENDED AXLE LENGTHS

'94-'00 250cc with Magnesium Star or Magnum Centers	34 3/4"
'94-'00 250cc with Aluminum Centers or 4-Bolt Hubs	34"
'94-'00 600cc Coil Over	37 1/4"
'94-'00 600cc Torsion	37 1/4"

### 4► ASSEMBLE THE FRONT AXLE

- Install the nyliner bushings in the spindles. Grease the four grease fittings in the spindles with a grease gun.



**TIP** Installing Nyliner Bushings

Make a tool to install or remove nylon lined bushings in the spindle. Start with a  $\frac{3}{4}$ " aluminum rod about 6" long. Using a lathe, turn one end down to  $\frac{5}{8}$ " O.D. x  $\frac{3}{4}$ " long. When installing new bushings, be sure to line up the grease hole in the bushing with the grease fitting on the spindle.



- Press the bearings into the hubs. Follow the tip regarding these topics on page 4.
- Assemble the spindle washer, hub, locknut and c-ring onto the spindle. You will need a 1- $\frac{3}{8}$ " or 1- $\frac{1}{2}$ " socket with the O.D. turned down to fit inside the hub. When tightening the locknut, be careful not to overtighten, or you will damage the bearings. It must be tight enough to keep the inner races of the bearings from spinning, but not so tight as to damage the races.
- Loosely assemble the spindles onto the axles, making sure spindle snouts are parallel to the axle.
- Check the fit of the kingpin to make sure that it slides easily through the spindle and the axle. Also, the spindle should rotate freely on the axle. Sand or file the king pin hole in the axle and/or the oilite washer. Now permanently

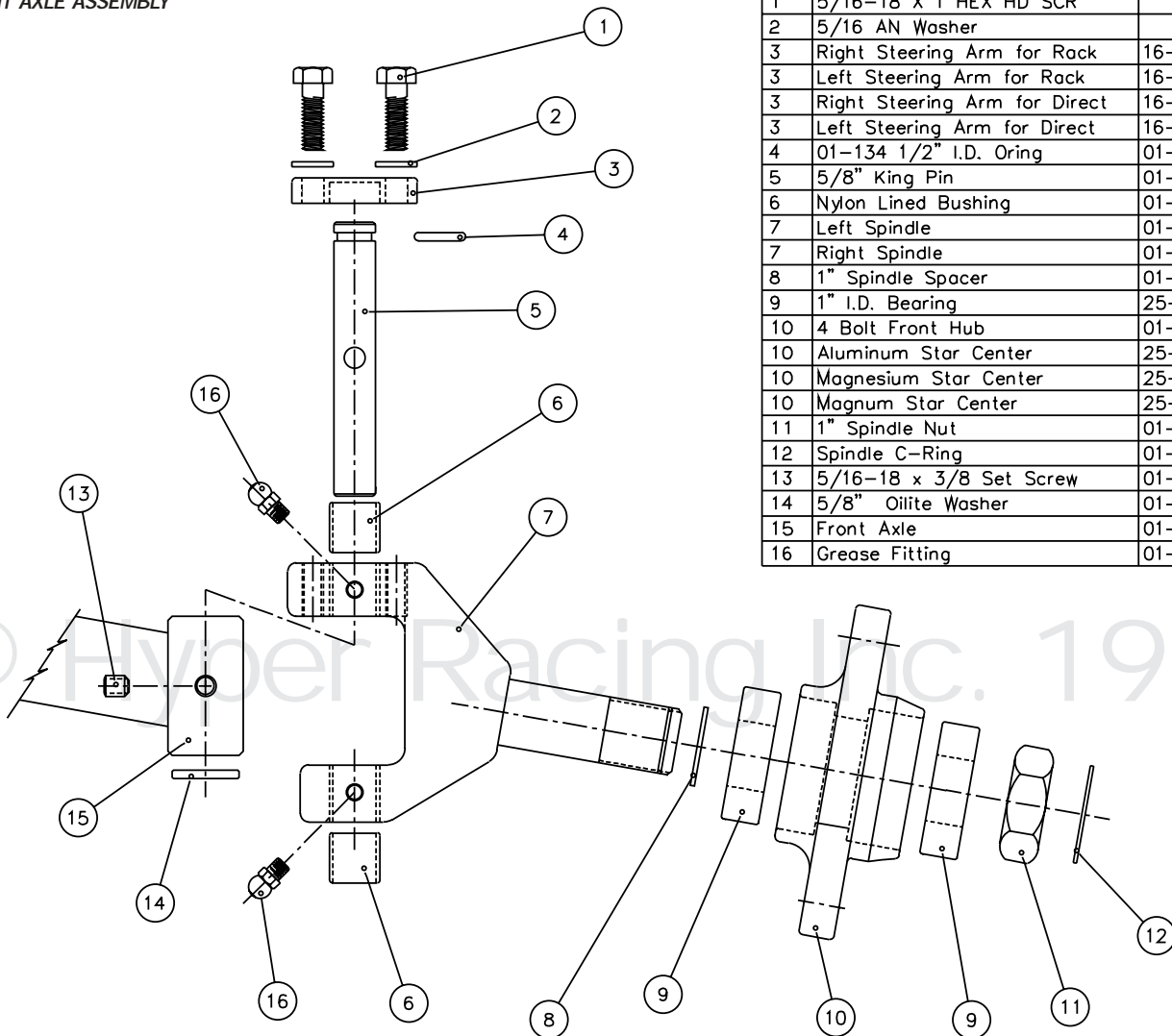
assemble, making sure that the hole in the axle boss lines up with the set screw indentation in the king pin.

- Use a small amount of Locktite Blue on the (2)  $\frac{5}{16}$ "-18 x  $\frac{1}{4}$ " king pin set screws.
- Use a small amount of Locktite Blue on the (8)  $\frac{5}{16}$ "-18 x 1" steering arm bolts.

**TIP** Using Locktite

We instruct you to use Locktite Blue on some of the fasteners. If you don't use it or use it properly, you could incur serious damage from bolts falling out. Follow the instructions on the package.

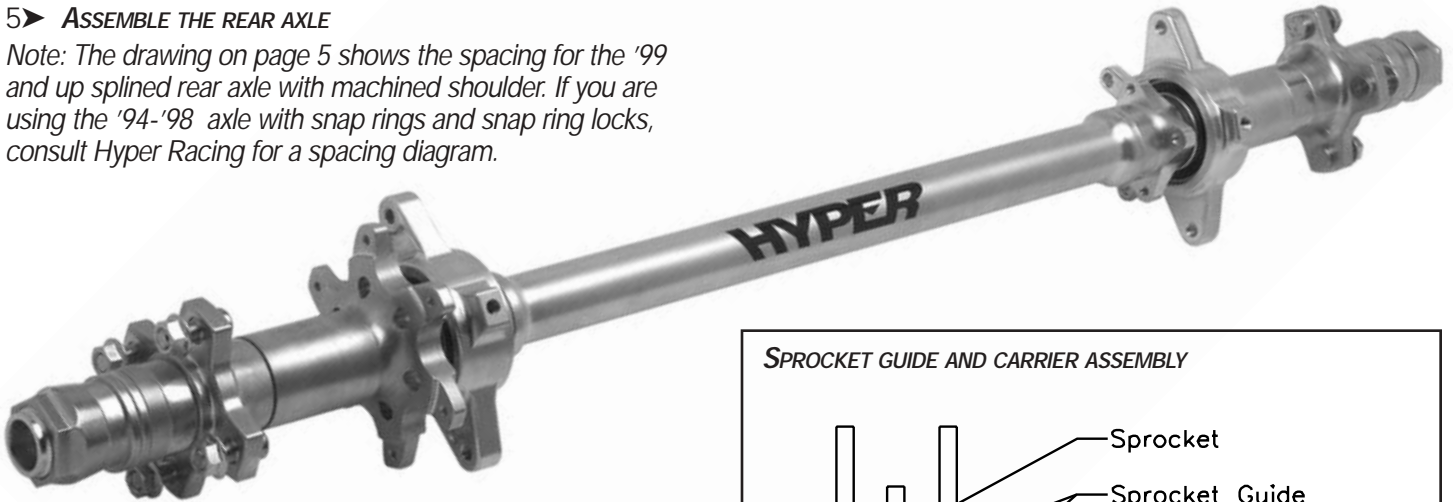
**FRONT AXLE ASSEMBLY**



1	5/16-18 X 1 HEX HD SCR	
2	5/16 AN Washer	
3	Right Steering Arm for Rack	16-200
3	Left Steering Arm for Rack	16-201
3	Right Steering Arm for Direct	16-202
3	Left Steering Arm for Direct	16-203
4	01-134 1/2" I.D. Oring	01-134
5	5/8" King Pin	01-127
6	Nylon Lined Bushing	01-126
7	Left Spindle	01-105
7	Right Spindle	01-108
8	1" Spindle Spacer	01-136
9	1" I.D. Bearing	25-502
10	4 Bolt Front Hub	01-120
10	Aluminum Star Center	25-501
10	Magnesium Star Center	25-502
10	Magnum Star Center	25-475
11	1" Spindle Nut	01-130
12	Spindle C-Ring	01-137
13	5/16-18 x 3/8 Set Screw	01-133
14	5/8" Oilite Washer	01-135
15	Front Axle	01-001
16	Grease Fitting	01-132

5 ➤ **ASSEMBLE THE REAR AXLE**

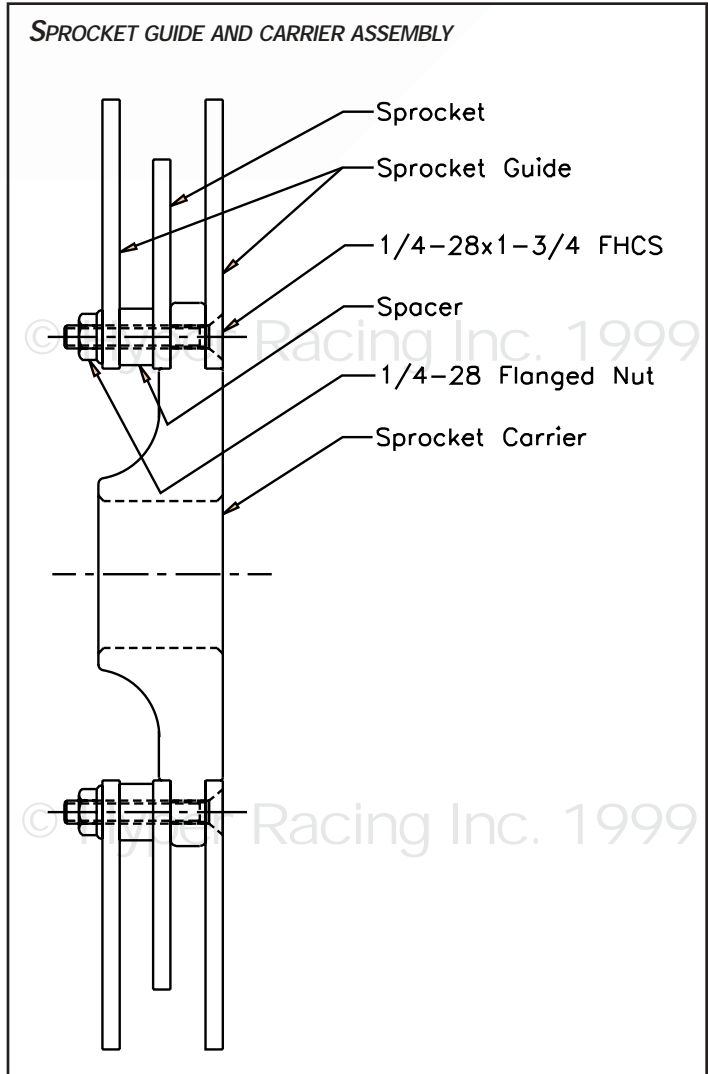
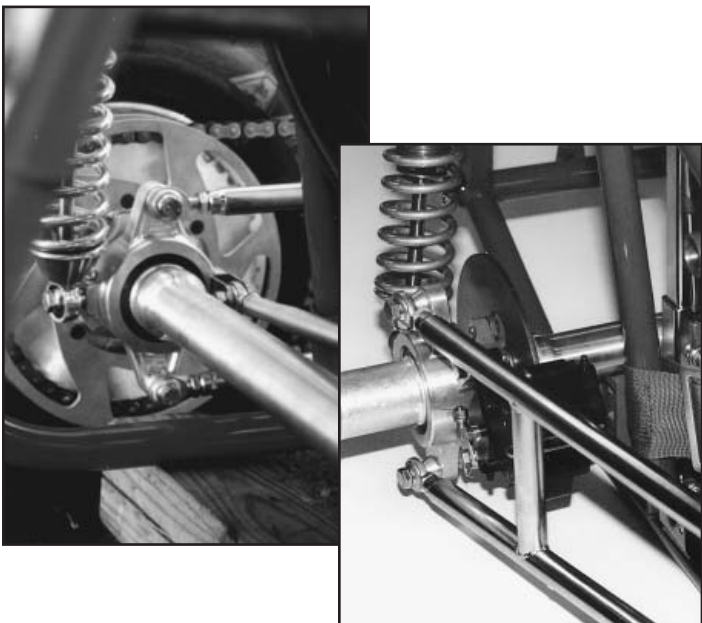
Note: The drawing on page 5 shows the spacing for the '99 and up splined rear axle with machined shoulder. If you are using the '94-'98 axle with snap rings and snap ring locks, consult Hyper Racing for a spacing diagram.



- Install the brake rotor onto the brake hub using a small amount of Loctite Blue on the (4) brake rotor bolts  $5/16''-18 \times 3/4''$ .
- Install the sprocket guide hardware and sprocket guides onto the sprocket carrier. If you know what rear sprocket you want to run, you may put it on now or wait until you install the chain and engine.
- Install the bearings into the bearing carriers following the tip below. Note: In chassis kits, the bearings may be pressed in for you, but you will still need to repack them with grease.

**TIP Increasing Bearing Life**  
 Repack all bearings, whether brand new or used, with a good quality grease before use. Using a small screwdriver, remove the bearing seal. Scoop out the thin grease used by the manufacturer and repack with Mystic JT-6 (77-300) or other waterproof high temp grease. Repack often for best performance.

**TIP Pressing Bearings**  
 Press on the outside race of the bearings only. Pressing on the inner race will damage the balls and races of the bearings.

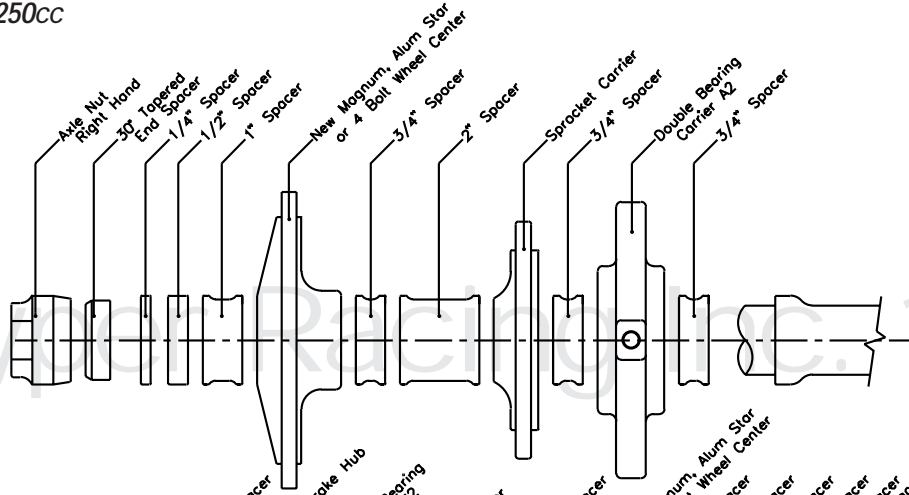


- The shoulder (widest part) of the bearing reducer in each bearing carrier points to the left side of the chassis.
- The  $3/4''$  O.D.  $3/8''$  I.D. X .180" long spacer will be used between the brake caliper and double bearing carrier in step 30. This spacer will align the caliper to the rotor.
- Note: When using the magnesium star or the old style magnum centers, remove the  $3/4''$  spacer behind the wheel center.

**TIP Smart Assembly**  
 Use cutting oil to prolong the life of your drill bits.

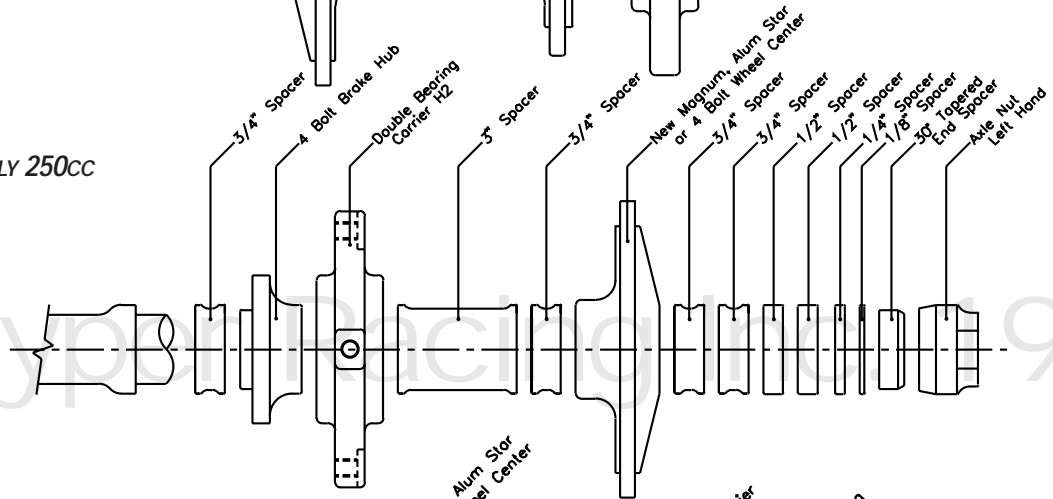
**REAR AXLE ASSEMBLY 250CC**

**LEFT SIDE**



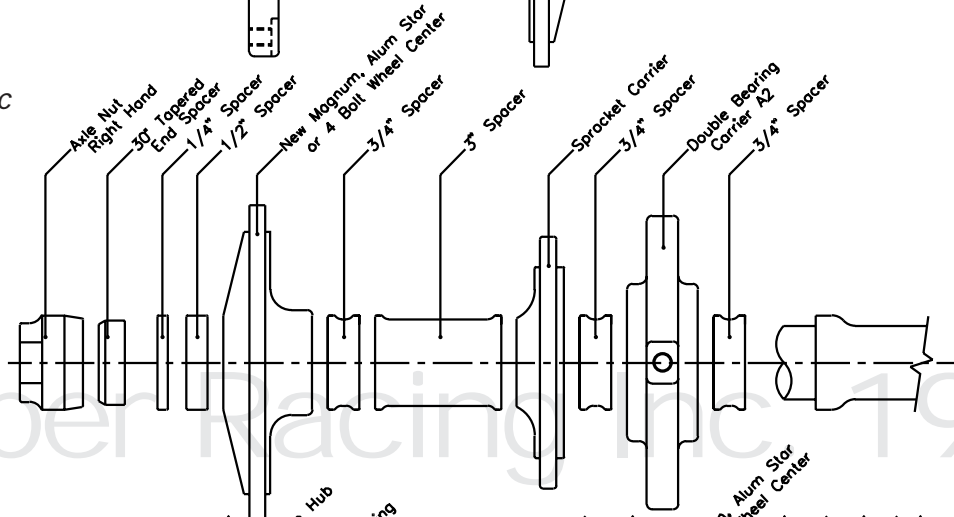
**REAR AXLE ASSEMBLY 250CC**

**RIGHT SIDE**



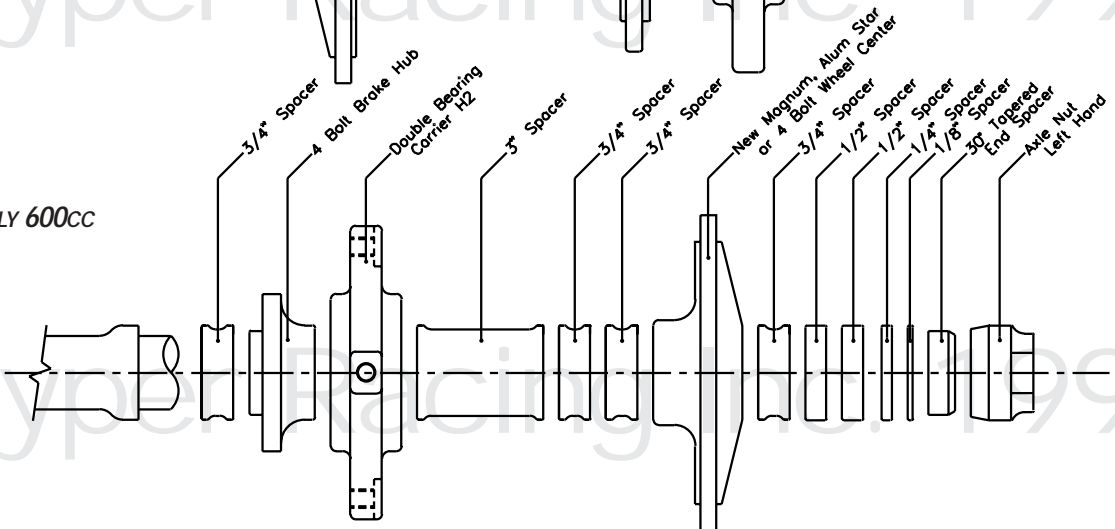
**REAR AXLE ASSEMBLY 600CC**

**LEFT SIDE**



**REAR AXLE ASSEMBLY 600CC**

**RIGHT SIDE**

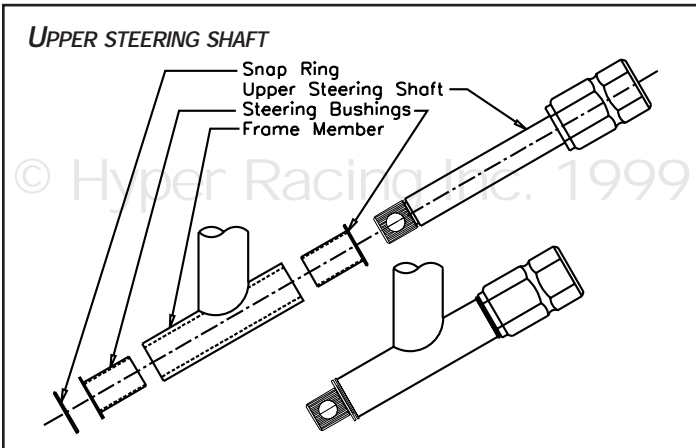


6► **INSTALL THE UPPER STEERING SHAFT**

- Insert the two plastic bushings into the tube ends.
- Apply grease to the upper steering shaft.
- Install the shaft.
- Install the snap ring into the groove in the shaft.

7► **INSTALL THE STEERING WHEEL TO THE QUICK RELEASE**

- Use a small amount of Loctite Blue on the (3)  $\frac{5}{16}$ -18 x  $\frac{3}{4}$ " steering wheel to hub bolts.



8► **FIT THE RACK AND PINION STEERING BOX**

- Slide one of the flanged bearings onto the shaft.
- Push the  $\frac{3}{16}$ " key into the key way of the shaft using a vise.
- Slide one box half over the key
- Tap the pinion gear onto the shaft and part way onto the key using a rubber mallet
- Install this assembly into the car and slide the splined universal onto the upper steering shaft, making sure the universal is slid the entire way on.
- Line up the universal joint bolt with the flat cut in the upper shaft. Tighten until snug.
- Clamp the box half to the mounting tabs on the chassis, aligning the bolt holes.
- Check the position of the gear relative to the box half. You should be able to slide a single piece of paper between the box half and the pinion gear. Remove the shaft from the car and tap the gear to move it on the shaft until proper fit is achieved.
- Tighten the set screw in the pinion gear to the key once you have the position set.
- Use a waterproof grease to grease the entire surface of the wear plate, pinion gear, rack gear and insides of the box halves.
- Assemble the steering box, installing the three  $\frac{1}{4}$ "-20 x 1" bolts first.
- Then loosely install the bolts of the flanged bearings.



9► **INSTALL THE RACK AND PINION STEERING BOX**

- Hold steering box in position, and place universal onto upper steering shaft making sure that the lock bolt lines up with the flat in the upper shaft.
- Bolt the steering box into place
- Tighten the lock bolt in the universal and Loctite it in place.

*Note: If there is a set screw in the universal, remove it and replace it a  $\frac{5}{16}$ -18 x  $\frac{3}{4}$ " HHCS and jam nut. Loctite it in place.*

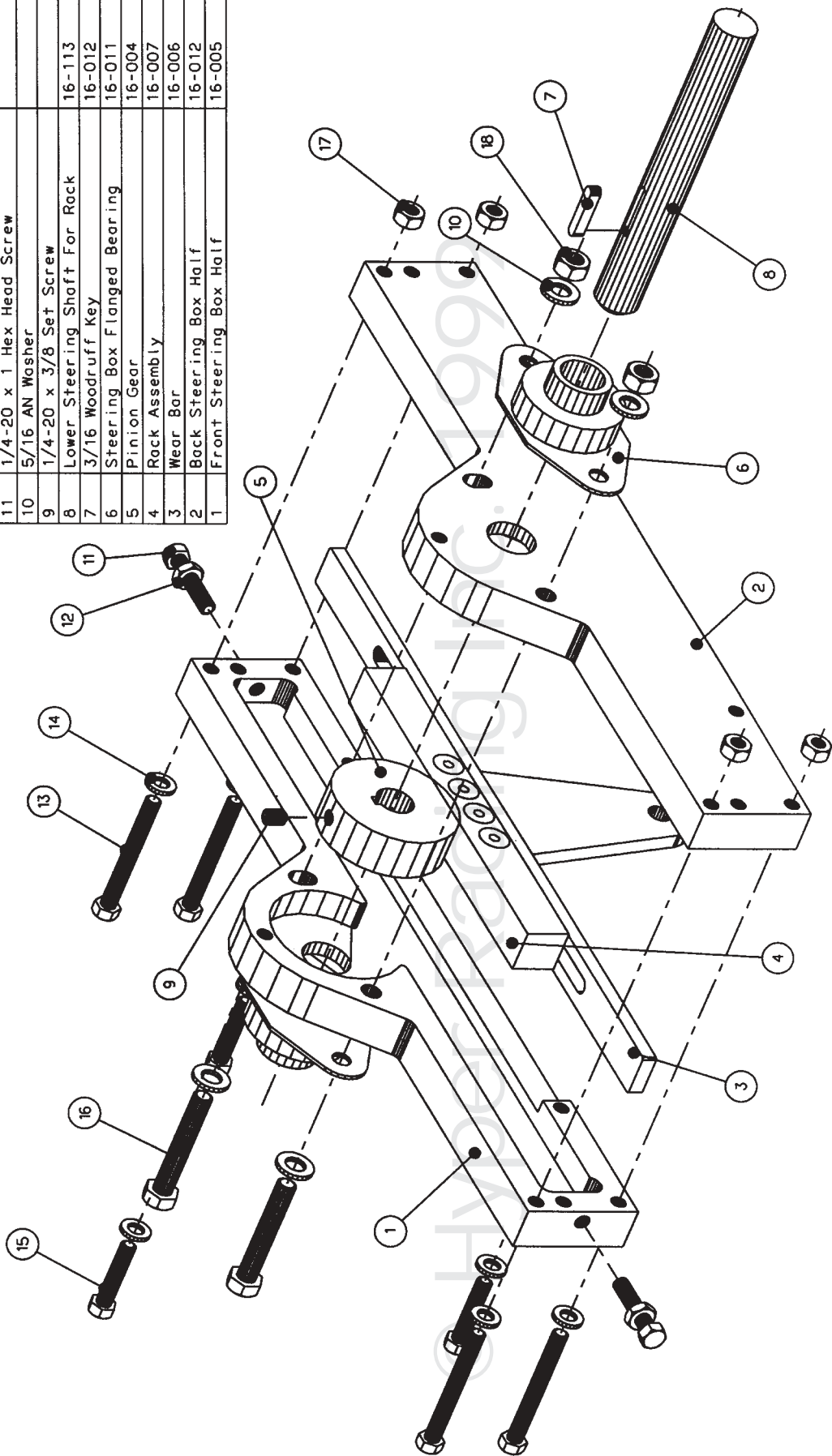
- The pinion gear and flanged bearings will move up and down in the box, allowing you to adjust play.
- Hold the pinion gear down tight against the rack by pushing on the shaft and bearings
- Tap the shaft and gear up  $\frac{1}{16}$ " to prevent any binds.
- Tighten all bolts to a race ready condition. Remember to tighten the set screws on the flanged bearings to the shaft.

10► **INSTALL THE DZUS SPRINGS**

- You may have to run a .128" drill bit through holes in the dzus plates to remove powder coating or paint. This allows the pop rivets to be installed easily.
- Use  $\frac{1}{8}$ " x  $\frac{1}{4}$ " pop rivets with steel mandrel. (Bag 17) Install so that the head of the pop rivet is on the outside of the dzus tab.

RACK AND PINION STEERING BOX

18	5/16-24 Nylock Hex Nut
17	1/4-28 Nylock Hex Nut
16	5/16-24 x 1-3/4 Hex Head Screw
15	1/4-20 x 1 Hex Head Screw
14	1/4 AN Washer
13	1/4-28 x 1-3/4 Hex Head Screw
12	1/4-20 UNC HEX NUT, THIN
11	1/4-20 x 1 Hex Head Screw
10	5/16 AN Washer
9	1/4-20 x 3/8 Set Screw
8	Lower Steering Shaft For Rack
7	3/16 Woodruff Key
6	Steering Box Flanged Bearing
5	Pinion Gear
4	Rack Assembly
3	Wear Bar
2	Back Steering Box Half
1	Front Steering Box Half



### 11► PREPARE THE THREADED BOSSES

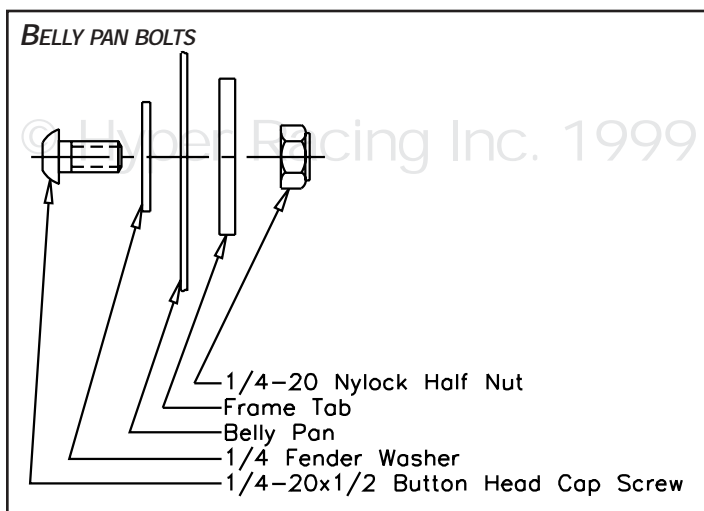
Run a tap through the threaded frame bosses. This allows bolts to be installed easily. Use cutting oil when tapping the bosses to keep the taps sharp and cutting freely. The dimensions are as follows:

- 3/8"-24 (2) throttle and brake pedal bosses
- 3/8"-24 (2) front shock tower
- 3/8"-24 (4) seat bar
- 7/16"-14 (1) engine jacking bolt
- 5/16"-24 (2) panhard adjuster handle bosses
- 7/16"-20 all others

### 12► INSTALL THE BELLY PAN

Place the large fender washer and the button head screw on outside of belly pan. All 250cc Hyper Chassis Frames are made to accommodate a front mount radiator. If you use a rear mount radiator on the 250cc, the belly pan will extend up to the top front frame member. The front part of the belly pan will be connected to the frame with wire ties. Drill six 1/4" holes across the front edge of the belly pan and run the ties through the holes and around the frame member.

*Note: On 600cc, use an AN washer on the top belly pan instead of the fender washer.*



### 13► INSTALL THE MASTER CYLINDER AND RESERVOIR

- Wilwood taps the end of master cylinder with a 3/8" threaded hole. You will retap the hole for 1/8" NPT. This will already be done for you on new chassis kits.
- Screw the 90° brake fitting into the end of the master cylinder using teflon tape. Turn the fitting so the brake line will feed off to the right side of the master cylinder.

#### **TIP** Using Teflon Tape

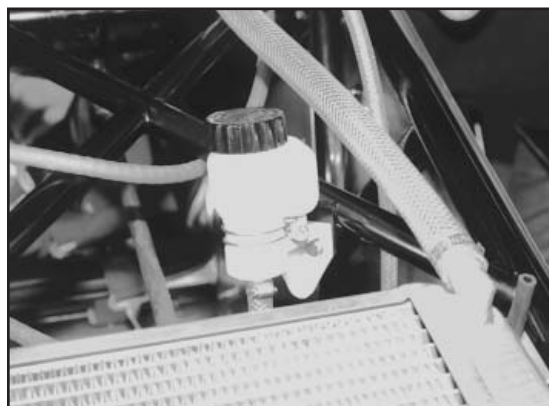
*Wrap a single thickness of tape around the fitting, pull tape taut, so that it forms to the threads of the fitting. The ends of the tape should overlap by about 1/4". The tape should cover the threads, but not exceed them, or pieces can break off and clog lines.*



- Install the remote inlet adapter onto the master cylinder with one of the clamps. Avoid breaking the master cylinder o-ring by applying grease to the master cylinder o-ring and warming the remote adapter in hot water.
- Mount the remote mounting bracket onto the chassis. Install the 4 oz. reservoir onto the remote bracket with the other clamp. Do not over tighten the clamps or the plastic may crack.
- Remove the rubber boot from the cylinder. Fill the area inside the cylinder that is covered by the boot with grease. This will help keep the bore and piston from corroding.
- Bolt the master cylinder to the frame.
- Replace the rubber boot.
- Connect the reservoir to the master cylinder with 3/8" poly-braid. Use two small hose clamps to secure the hose.
- Screw the 5/16" female rod end and jam nut onto threaded rod of the master cylinder. This rod may be cut shorter if you want the pedal further front.
- Slide the brake line through the brake line casing. Use spray lubricant on the brake line if the fit is tight.
- Place the 3/16" tube insert inside the 3/16" brake line, then install the nut and ferrule.
- Run brake line back to the caliper and let it hang for now.

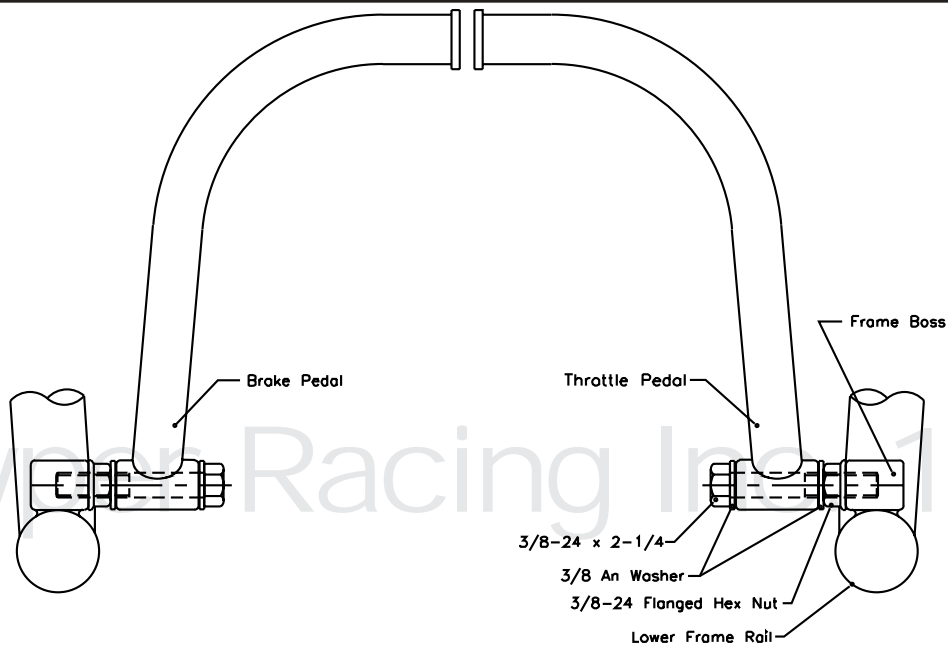
#### **TIP** Using Plastic Brake Line

*Copper tube inserts keep plastic line from crushing as you tighten the nut and ferrule. To use a nut and ferrule, slide the nut and ferrule over the brake line. Push the brake line and tube insert inside the fitting. Tighten the nut and ferrule on the fitting while making sure the brake line is pushed in the fitting as far as possible.*





## PEDALS



### 14► INSTALL PEDALS

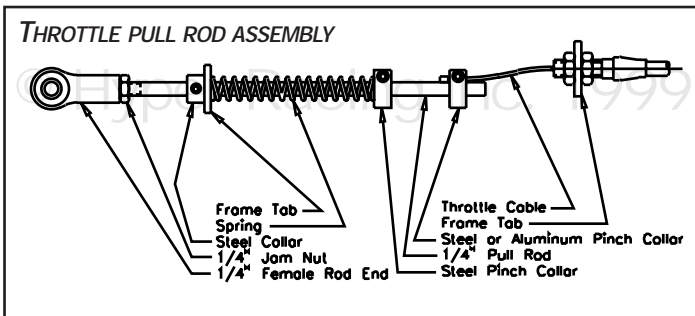
- Put grease on the bolt so that the pedal rotates freely.
- Don't tighten the bolt so much that pedal doesn't move.
- Tighten flanged nut against boss while holding the bolt head with a wrench.

### 15► INSTALL THROTTLE PULL ROD ASSEMBLY

- The end of the pull rod may be bent in a vice in order to achieve perfect match up with the pedal if necessary.

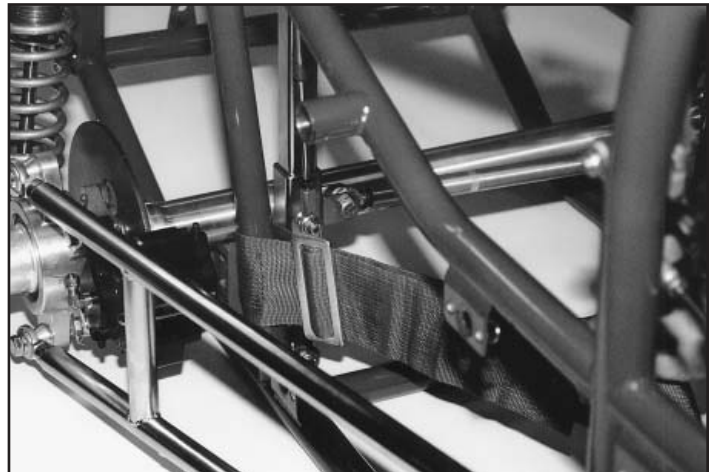
### 16► INSTALL THE THROTTLE CABLE

- Hook the end of the cable through the slot in the pinch clamp, then slide them onto the end of the shaft.
- The throttle stops will be set after the engine is installed.



### 17► INSTALL SEAT BELTS

- Follow the seat belt manufacturer's instructions for fastening seat belt to chassis.
- Lap belts wrap around the vertical 1 1/8" tube behind the seat.
- On 94-98 chassis, the sub belt wraps around the lower seat bar. On 1999 and newer chassis, the sub belt bolts onto the tab on the lower seat bar. This belt must be adjusted before the seat is bolted in place.
- Shoulder belts wrap around the upper horizontal frame member that the seat bolts to.

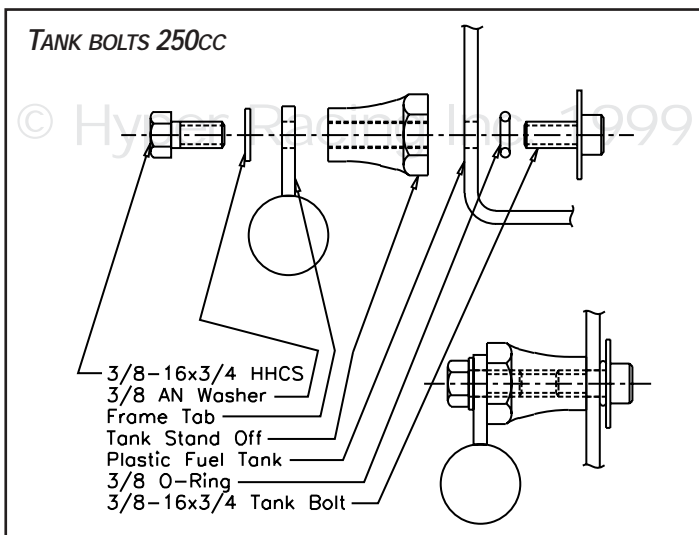
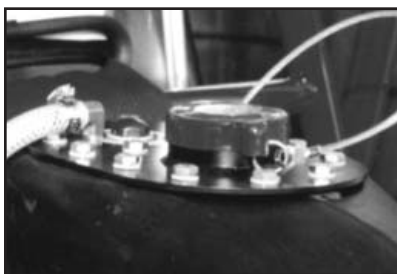


18► **INSTALL RIGHT SIDE BODY PANEL**

19A► **250CC: INSTALL SIDE MOUNT FUEL TANK ONTO FRAME**

- Remove the fuel cap assembly from the tank.
- Drill (4) 3/8" holes in the tank to line up with the frame tabs and a 3/4" hole for the bulkhead fitting in the lower right rear corner of the tank. This is already done for you on new chassis kits.
- Clean and dry the tank, check for plastic shavings.
- Place one of the 3/8" o-rings on a tank bolt. Reach inside the tank and insert the tank bolt through one of the holes. Then screw the tank stand off onto the tank bolt. Be sure to turn the tank stand off and not the tank bolt or you may damage the o-ring. Repeat this with the other three stand offs. Tighten to a race ready condition. Do not over tighten or again, you will risk breaking the o-rings.
- Install (4) 3/8"-16 x 3/4" bolts with washers through the frame tab into the stand off.
- Install bulkhead fitting, in the lower outside back corner of the tank with the o-ring on the outside of tank and the bulkhead nut and star washer on the inside of tank.
- Replace the cap assembly.
- For 6-bolt cap assemblies, create a tank vent. Thread an 1/8" NPT to 3/16" fitting into the hole in the filler neck. (Some cap assemblies require the use of a 1/8" NPT to 1/4" NPT reducer.) Push the end of a 16" length of 3/8" braided fuel line over the threads of the fitting. Wire tie the line inside the car pointing down and to the rear of the car to avoid filling with mud during a race. Trim to 1" above the bottom of the tank to prevent fuel from draining out if the car should land upside down. 12-bolt cap assemblies have a built in vent.

- Clean and dry the tank, check for plastic shavings.
- Place one of the 3/8" o-rings on a tank bolt. The 1" long tank bolts go through the top holes, and the 3/4" long tank bolts go through the bottom holes. Reach inside the tank and insert the tank bolt through the one of the holes. Then screw the nut onto the bolt. Be sure to turn the nut and not the tank bolt or you may damage the o-ring. Repeat with the other three bolts. Tighten to a race ready condition, again taking care not to overtighten.
- Install bulkhead fitting, in the lower outside back corner of the tank with the o-ring on the outside of tank and the bulkhead nut and star washer on the inside of tank.
- Replace the cap assembly.



19B► **600CC: INSTALL TANK TAIL**

- Remove the fuel cap assembly from the tank.
- Drill (4) 3/8" holes in the tank tail to line up with the frame tabs and mounting bar. Drill a 3/4" hole for the bulkhead fitting to the outside of the bottom right 3/8" hole. This is already done for you on new chassis kits.

20► **INSTALL THE SEAT**

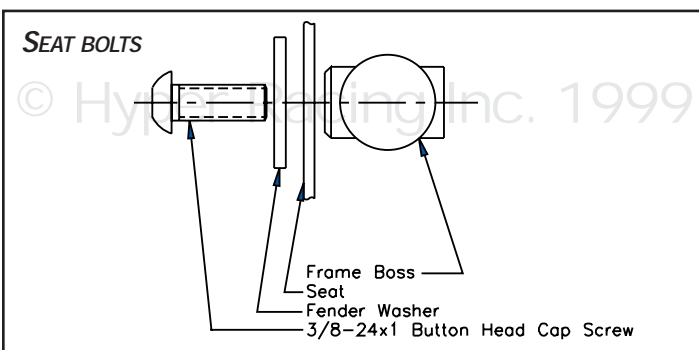
- If you have a 15" seat on a 250cc chassis, it may be necessary to grind the edges of the seat so that it will fit between the frame rails.

**TIP** **Seat Height for 600cc**  
 For 600cc chassis, if the driver weighs under 230 pounds, chassis handling can improve by raising the seat. Seat spacer kits are found in the Hyper Racing Catalog.

- Place the seat into the chassis. For 600cc, if using the spacer kit, spacer between the lower seat bar and the seat. The seat should be installed at an angle so the tabs in back are sitting flat against the seat. Angle seat up or down slightly from this for driver comfort.
- Drill the holes to mount the seat and a drain hole. Do not make all four bolt holes at once. Do them two at a time.
- Make a mark through the top two tabs for drilling the first two holes. Drill the holes using a  $1\frac{3}{32}$ " drill bit. Then put the seat back in the chassis and put bolts through the holes to keep the seat in place while you mark the other two holes. Also mark the lowest point of the seat for a water drain hole.
- Remove the seat and drill the remaining two holes and the  $1\frac{3}{32}$ " drain hole. The drain hole lets the water out when you wash the car.
- Reinstall and bolt in place using the large washers on the inside of the seat. Use grease in the threads of the lower seat bolts to help prevent rusting
- Install the seat cover
- Sit in the seat and make any necessary alterations to the padding. You may bend the seat rib supports in or out, or the head rest back or front. Then adjust the remaining four seat belts, cut off the excess belt material and burn edges to keep them from fraying.

**TIP** Seat Comfort vs. Seat Safety

*It would be nice to feel comfortable in your seat as you race. But you definitely won't be thinking that in an accident. You should feel tight in your seat. Before drilling any holes in your seat, try sitting in it with your racing suit on. The padding in the Kirkey seats is very thick. Keep in mind that the padding in the seat will flatten slightly over time. If you feel your seat is too tight, you can cut away some or all of the foam padding until the seat fits properly. Bend the aluminum wraps to fit your ribs and hips. If your seat is too loose, exchange it for a smaller size.*



21► **250cc: INSTALL LEFT FRONT AND LEFT REAR SIDE PANELS**

22► **INSTALL FIREWALL**

On 250cc, it may be necessary to trim the firewall if it hits the lower frame rail.

23► **ASSEMBLE THE SHOCKS, SPRINGS AND COIL OVER KITS**

Refer to the directions in the coil over kit and consult the Set-Up and Handling section of this book for shock and spring combinations.

24► **FASTEN THE SHOCKS TO THE FRAME**

Use the two  $1\frac{1}{2}$ " to  $\frac{7}{16}$ " reducers on the rear shocks. Shoulders of the reducers point toward the frame.



25► **INSTALL THE FRONT PANHARD BAR PINCH CLAMP**

- Mount the front panhard bar on the front panhard bar pinch clamp
- Clamp the panhard bar pinch clamp to the frame member



26► **INSTALL THE FRONT AXLE ASSEMBLY**

- Use the two  $1\frac{1}{2}$ " to  $\frac{3}{8}$ " reducers on the bottom of the front shocks as you mount them to the axle. Face the reducers towards the axle.
- Use two of the  $\frac{7}{16}$ " aluminum rod end spacers to mount the steering rods to the steering arms, the steering rods get mounted underneath the steering arms.
- Bolt the front panhard bar to the axle.
- Bolt the front radius rods to the axle.

27► **FRONT CONTROL ARMS TO FRAME**

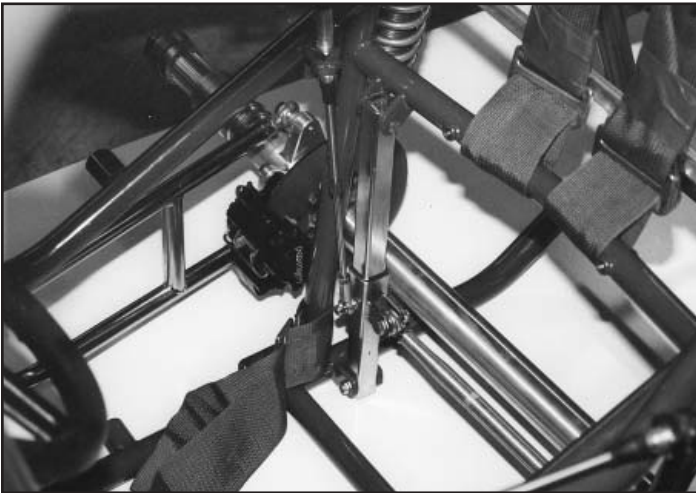
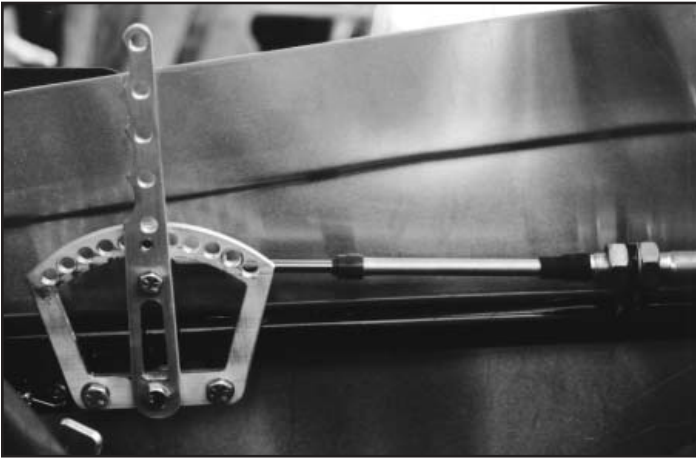
- Use Locktite Blue on the (3)  $\frac{7}{16}$ "-20 x  $1\frac{1}{4}$ " bolts (control arm to frame).

28A► **INSTALL THE REAR PANHARD BAR PINCH CLAMP**

- Mount the rear panhard bar on the rear panhard bar pinch clamp.
- Clamp the panhard bar pinch clamp to the frame member.

28B► **OPTIONAL: INSTALL THE REMOTE PANHARD ADJUSTER**

The powder coating on the mounting tabs may have to be removed with a grinder to allow the adjuster to fit between them. Set the adjustable panhard bar so when the handle is in the middle hole the panhard height is 6." (This is a neutral setting.) Change this by adjusting the large nuts on both ends of the cable.



29► **INSTALL THE REAR AXLE ASSEMBLY**

- Use two 1/2" to 7/16" reducers when mounting the shocks to the bearing carriers. The shoulders of the reducers point to the bearing carriers.
- Use four rod end spacers when mounting the rod ends to the bearing carriers.

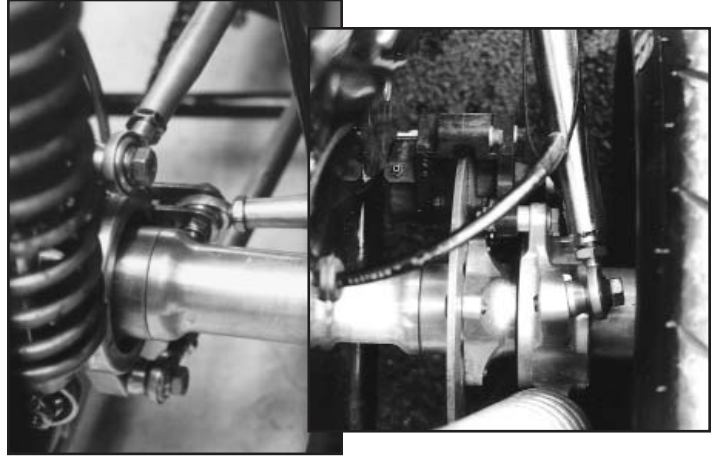
**TIP** Splined Rear Axles

Drill a 3/16" hole in the end of the axle and insert a hitch pin. This keeps the nut and wheels on in case the nuts do come loose.

If the splined rear axle is ever bent it can be straightened. However, do not use heat to straighten this axle or any heat treated aluminum axle because it will destroy the molecular structure and weaken it.

30► **ATTACH REAR CONTROL ARMS TO FRAME**

- Use Locktite Blue on the (4) 7/16"-20 x 1 1/4" bolts.



31► **INSTALL THE BRAKE CALIPER**

- Thread the 90° brake line fitting to the 1/8" NPT hole on the right side of the brake caliper using teflon tape.
- Mount the brake caliper to the right rear birdcage. The 3/4" O.D. 3/8" I.D. x .180" long spacer is needed between the brake caliper and double bearing carrier. This spacer aligns the caliper to the rotor.
- Trim the brake line casing to be 1/2" shorter than the brake line. Attach the brake line to the fitting using the tube insert and the nut and ferrule.

32► **INSTALL THE BRAKE PADS**

- If using a steel rotor, install one brake pad spacer behind each pad. Steel rotors should use green (medium) or black (hard) pads. Aluminum rotors use grey (soft) pads.

**TIP** Brake Pad Spacers

Brake pad spacers are designed to prolong the life of brake pads and prevent damage to the caliper. If using a 3/16" rotor, add a spacer when the pads wear 1/8".

33► **BLEED THE BRAKES**

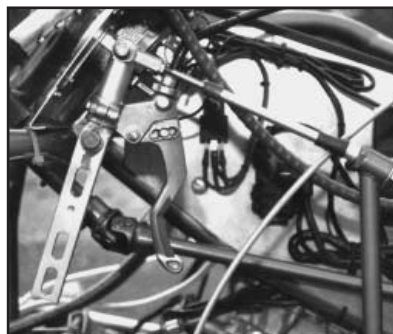
- Fill reservoir to full line with Wilwood HiTemp° Brake Fluid
- Put a drain pan under the brake caliper. Open the bleed screw on the front of the master cylinder until a steady stream of fluid flows out. Gently depress the brake pedal. Tighten the bleed screw. Release the brake pedal.
- Fill the reservoir to the full line again.
- Open the right bleed screw on the brake caliper.
- As long as the level of the fluid in the reservoir is higher than the brake caliper, the fluid will flow on its own to the caliper. Wait 5-15 minutes until the fluid flows continuously out the screw. Close the bleed screw.
- Open the left bleed screw on the brake caliper.
- Wait until the fluid flows continuously out the screw. Close the bleed screw.
- Pump brake pedal four times then hold continuous pressure on pedal as another person opens right bleed screw. The pedal will then depress fully. Keep pedal pressed down and close bleed screw. Listen for air to stop coming

out of the bleed screw. Repeat this procedure until no air is present in the brake lines.

- Repeat above procedure while opening the left bleed screw. Make sure the level of brake fluid in the reservoir stays above the minimum line.
- Fill reservoir to the maximum line.
- Tighten all bleed screws and reservoir cap to a race ready condition.

### 34▶ INSTALL THE SHIFTER

- Mount the shifter handle to the frame.
- Run the shifter cable around the rack box and out the left side.
- Remove one large nut from the cable. If your cable had star lock washers on it, remove and discard them. Run the cable through the tab and replace the nut.
- Screw the jam nut and rod end onto the end of the cable.
- Bolt the rod end to the handle.



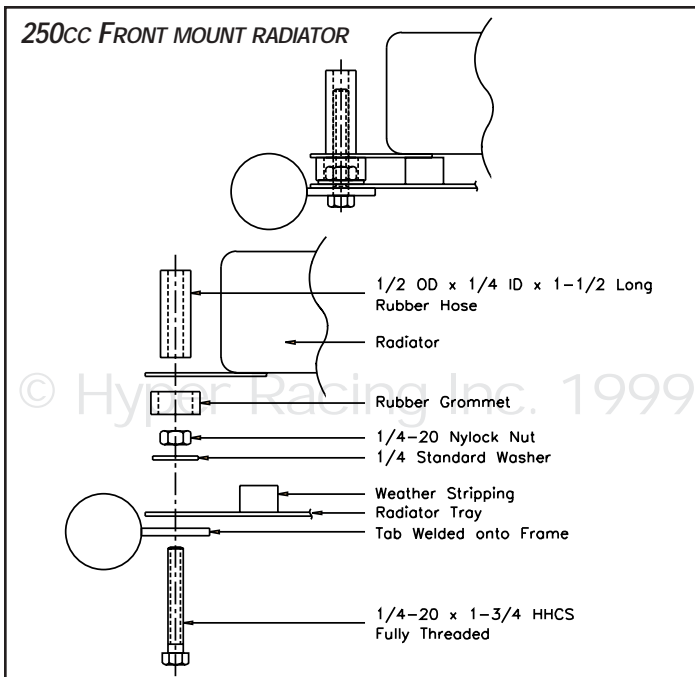
### 35A▶ 250CC: INSTALL THE FRONT MOUNT RADIATOR

- The flex mount system is designed to hold the radiator on four rubber covered posts.
- Lay the tray down on the frame.
- Create the posts by pushing the bolts up through the bottom of the tab and tray and secure them with the washers and nuts.
- If the radiator tabs do not have holes, line the radiator tabs up over the bolts and gently tap each of the four tabs with a hammer to mark the holes. Drill a  $\frac{9}{16}$ " hole in each tab.
- Slide the rubber grommet over the top of the nuts and then push the lengths of hose over the bolts.
- Mount the radiator over all four posts.

*Note: Never mount a radiator solid or without rubber or it will crack and leak.*

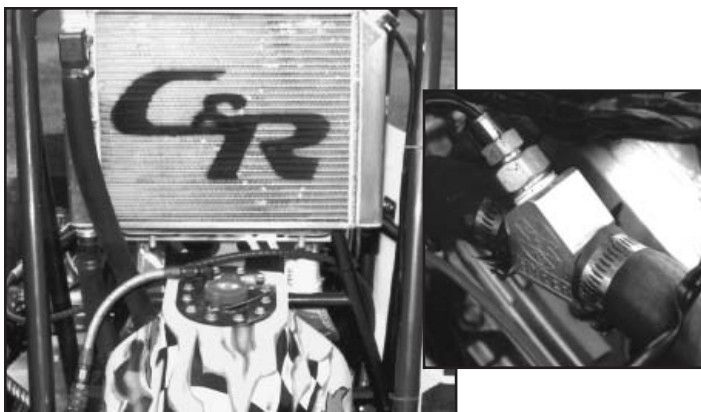
#### **TIP** Easy Does It

Remove air bubbles from the radiator and hoses by lifting it out off the posts and moving it around. 2"-4" of air will appear in the lines at each end of the reservoir after a race. This is caused by the expansion of the hot water and it is normal. If you are losing more water than this, one of the following may be the cause: a leak in the coolant system, blown head gasket, or blown head o-rings. If you can eliminate these causes and still have the problem, try a 16-21 lb. radiator cap.

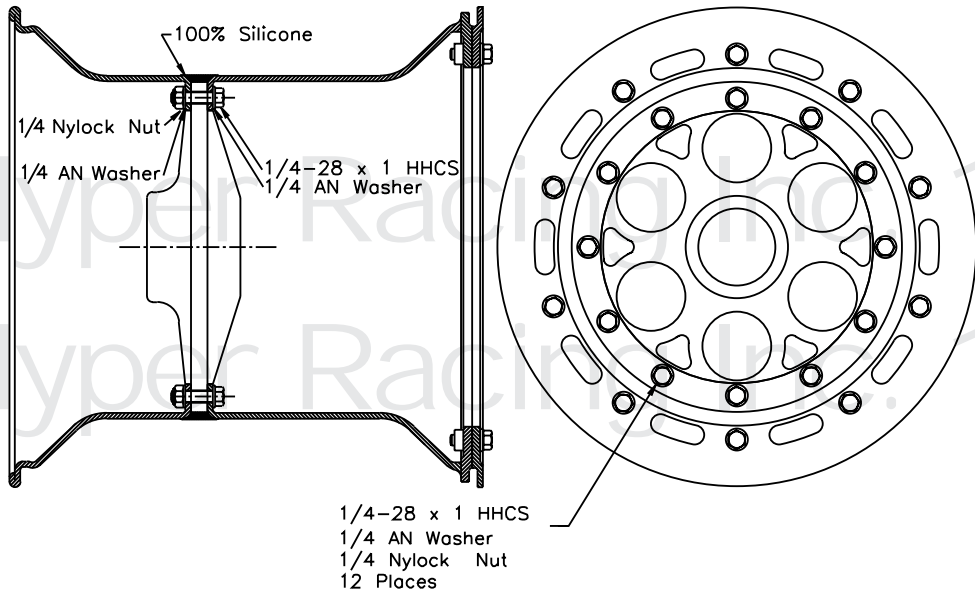


### 35B▶ 600CC: INSTALL THE REAR MOUNT RADIATOR

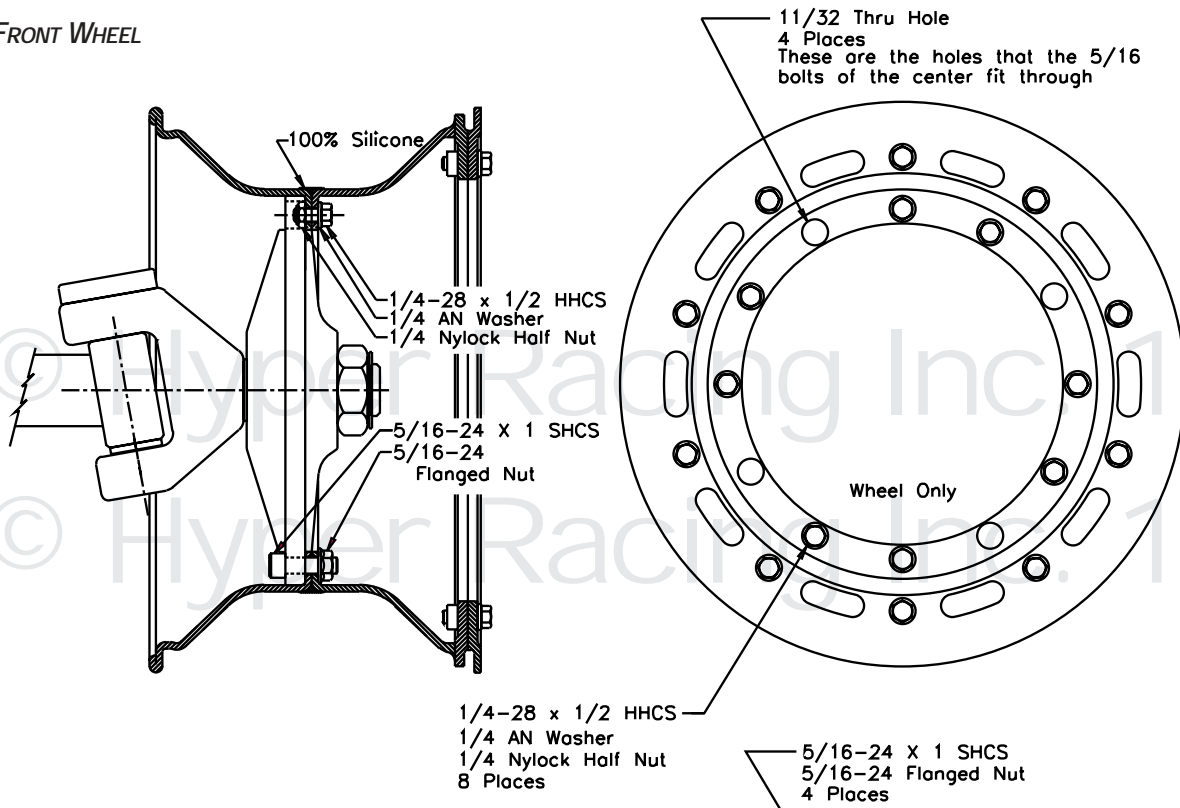
- Install the fittings into the radiator using an elbow fitting on the top and a straight fitting on the bottom.
- Place one rubber grommet in the top tab of the radiator. For '98 and up, place the other two grommets below the radiator in the aluminum angle bracket. On '95-'98, place the two grommets in the frame tab.
- Place the two posts through the grommets in the bracket.
- Use a  $\frac{3}{8}$ "-24 x 1" bolt with two AN washers and a nylock half nut to hold the top of the radiator to the frame.



**REAR WHEEL**



**FRONT WHEEL**



**Note:**  
The 5/16-24 x 1 SHCS is threaded through the back of the wheel center. Use blue or red lock tight when replacing this screw.

**36► ASSEMBLE THE WHEELS**

- Front wheel centers require four of the holes in the wheel halves to be drilled out to 1 1/32".
- File or grind the halves so that they slide on and off the star centers easily.

**TIP Using Silicone**

Use 100% silicone to seal the two halves together. Apply a bead around the entire seam, then use a piece of cardboard as a squeegee to smooth it out.

- If the outside half did not come with a valve stem hole, drill a 7/16" hole through the outside half. On the front wheels, do not line up the valve stem with the lug nut hole.

**TIP Tech Talk**

The size of the inner half is referred to as the wheel's "offset" or "backspacing." For example, the right rear wheel is called 6" on 4" or 10" with 4" backspacing.

**KNOW THE CODE**

**wheel half sizes**

	Outer Half	Inner Half
250cc Left Front	3"	3"
600cc Left Front	4"	3"
250cc Right Front	3"	3"
600cc Right Front	3"	4"
250cc Left Rear	5"	3"
600cc Left Rear	6"	4"
250cc, 600cc Right Rear	6"	4"

**37► MOUNT THE TIRES ONTO THE WHEELS**

- Select the tire sizes, compounds and pressure best for your typical track size and conditions.

**38► MOUNT THE WHEELS ONTO THE AXLES**

- Use a 1" diameter x 4' bar in conjunction with the 1.9" socket to tighten the splined rear axle nuts.

**39► BOLT ON THE BUMPERS AND NERF BARS**

Don't overtighten the bumper and nerf bar bolts or you will deform the socket.

**40► MOUNT THE HOOD AND 250CC TAIL**

**41► MOUNT THE REAR WING UPRIGHT AND WING**

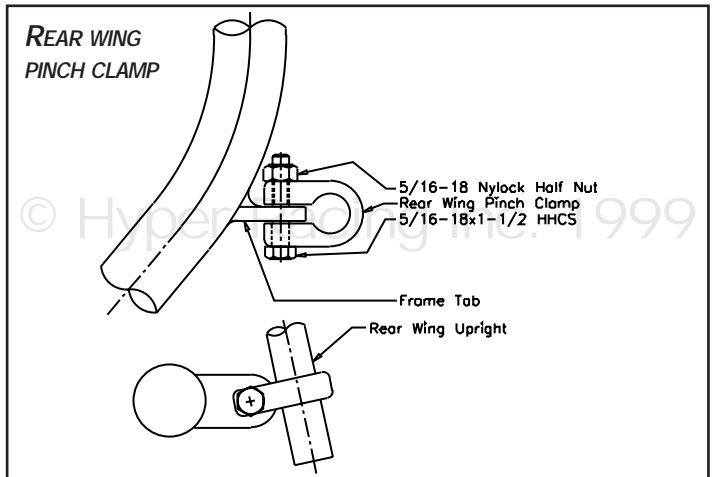
- Drill 7/32" holes in the wing posts. See drawing on page 16.
- Bolt the wing to the runners so the wing is in the hole closest to the front.
- Tighten the bolt just enough to pinch the rear wing upright. Then tighten the nut against the pinch clamp to keep the bolt from loosening.

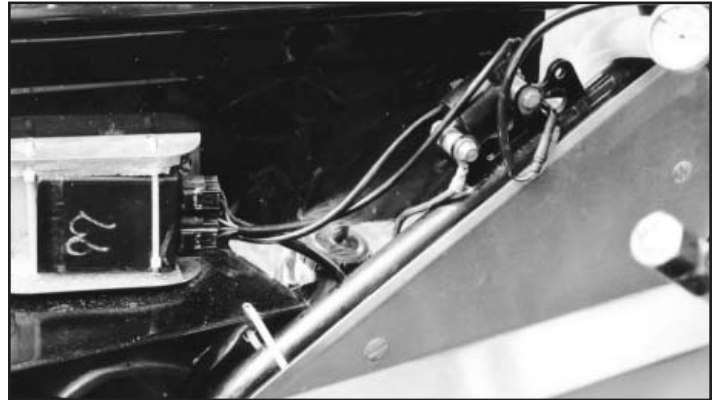
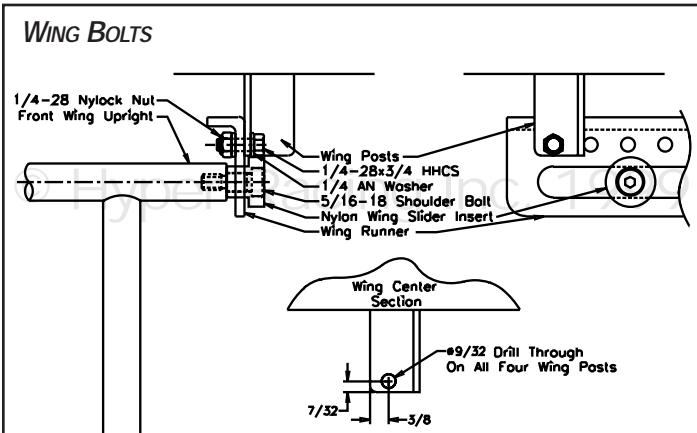
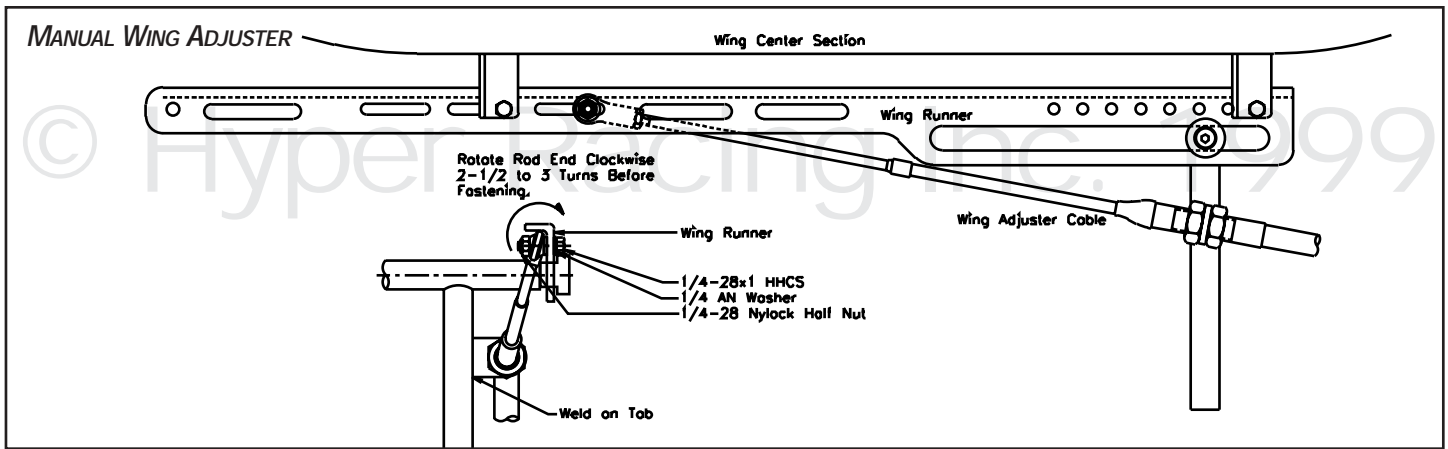
**42► INSTALL THE MANUAL WING ADJUSTER**

- Remove the handle from the cable and the nut with the o-ring.
- Insert the push-pull end of the cable through the frame tab in the cockpit.
- Screw on the nut with the o-ring until it is tight on the housing but not tight against the tab.
- Tighten the back nut up against the tab.

- Replace the handle and use locktite on the small screw or the handle will fall off.
- Insert the other end of the cable through the tab on the right side of the front wing upright.
- Screw the 1/4" jam nut and female rod end all the way on the threaded rod. Tighten the jam nut against the rod end.
- Move the wing fully front.
- Pull the handle in the cockpit until it is entirely out (about 6")
- Hold the rod end up to the wing runner. If there is no hole within 1/2", drill a 9/32" hole in an appropriate position.
- The cable must be preloaded to keep the wing from moving while you race. Rotate the rod end 2 1/2" to 3" turns clockwise. Then bolt the rod end to the wing runner.

Note: Now that the cable is preloaded, the handle in the cockpit can only be turned clockwise to unlock the handle. Once you move the wing into the desired position, only a light counter clockwise twist is required to lock the wing in place.

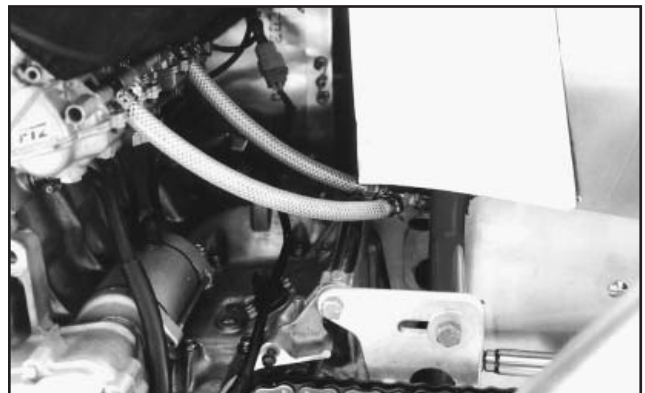
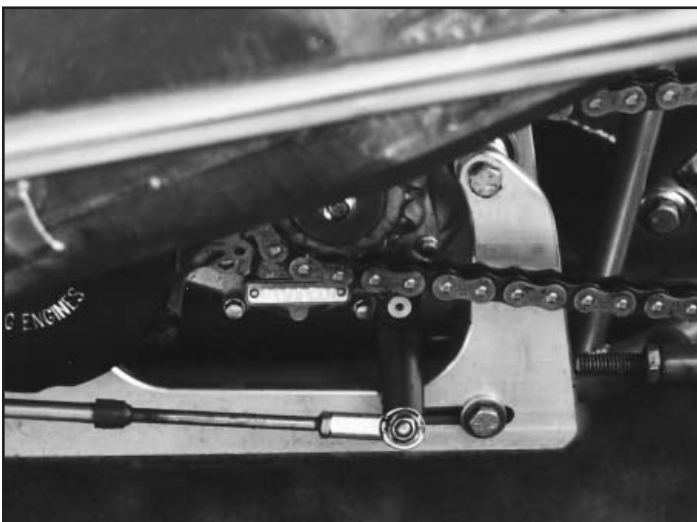




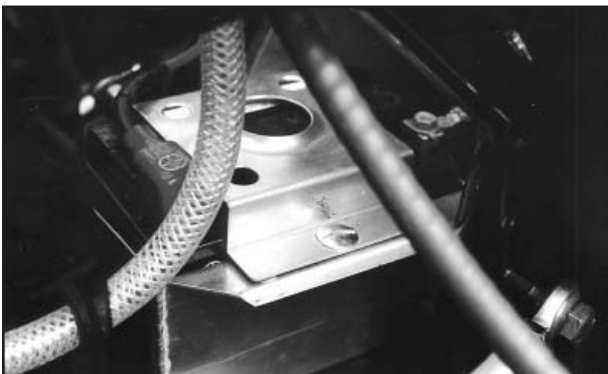
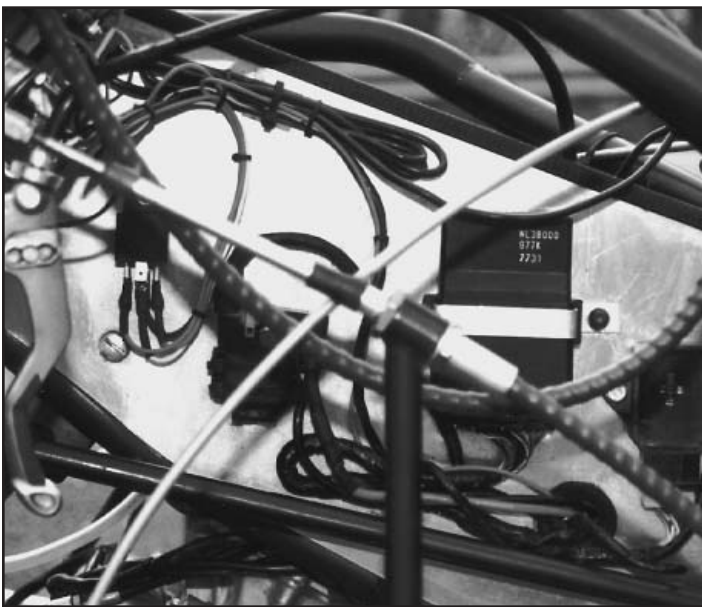
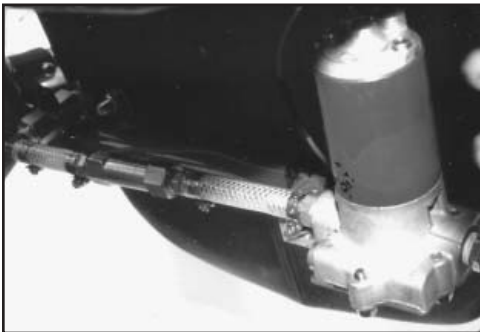
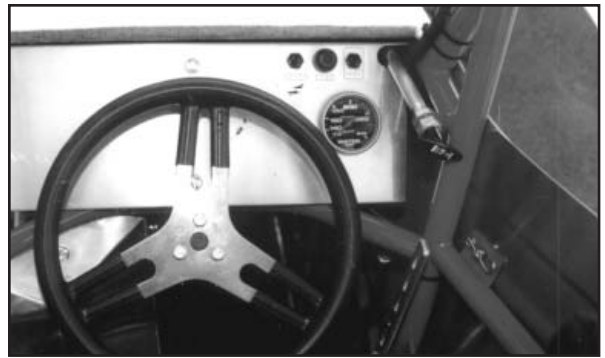
43B▶ 600cc: MOUNT THE ENGINE AND ELECTRONICS

43A▶ 250cc: MOUNT THE ENGINE AND ELECTRONICS

- The CDI box is usually wrapped in foam on the left arm guard and attached with wire ties. Or, a foam-lined aluminum bracket can be used to hold the CDI. Attach it to the arm guard with dzus fasteners and then wire tie the CDI in place.
- The ignition coil will mount to the tab. Depending on the type of coil you are using, spacers may need to be used to space the coil away from the tab.
- Mount the push button kill switch on the steering shaft tube.



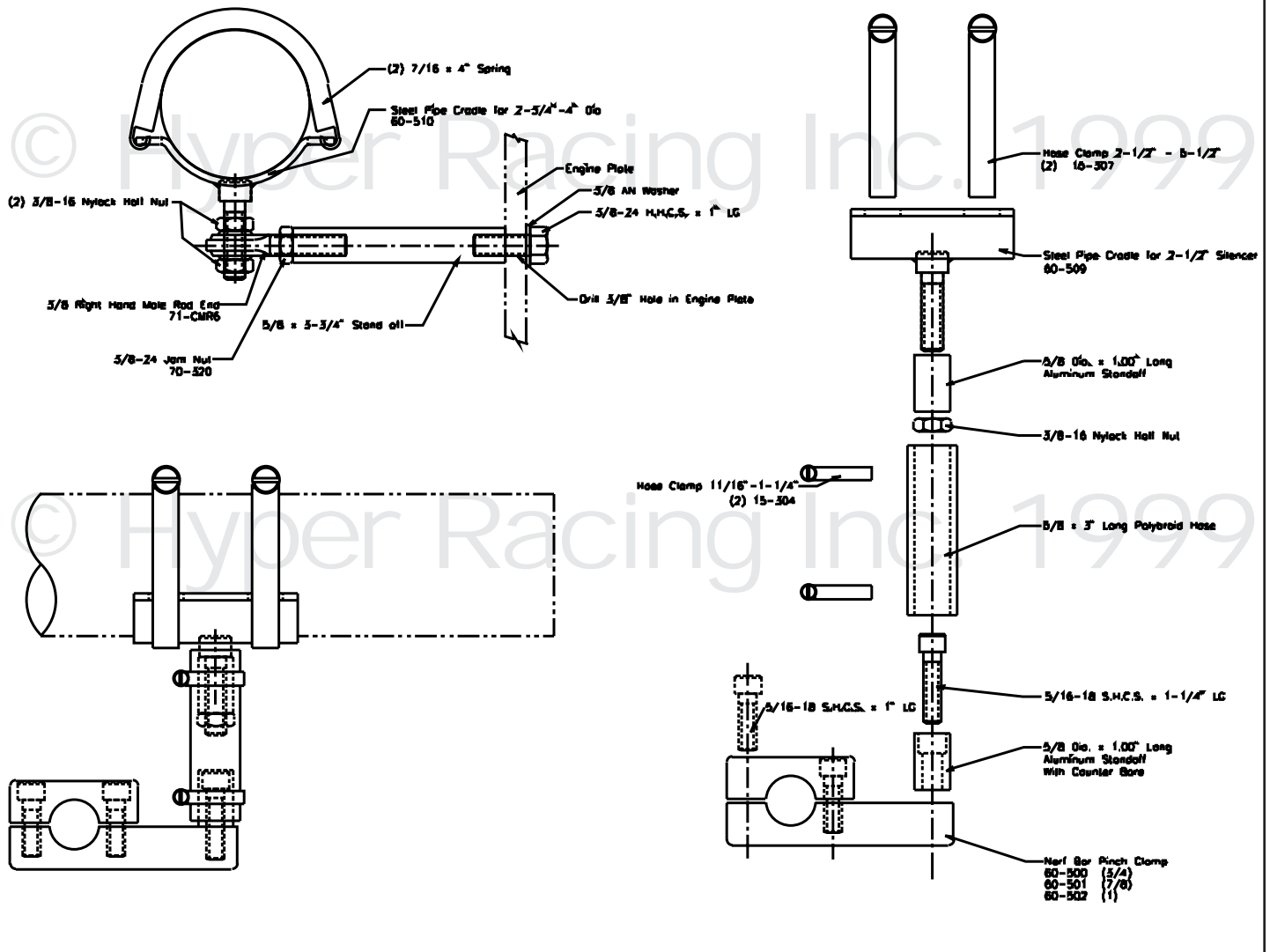




#### 44► *ADJUST THE THROTTLE STOPS*

- The driver must be able to press as hard as he wants on the pedal and not stretch, fray or damage the throttle cable. In order for this to happen, the spring on the pull rod assembly must bottom out before the throttle valve in the carburetor tops out. While this happens, the throttle valve must be fully open.
- Install the throttle cable into the carb and onto the pull rod
- Hold the throttle pedal in the return position. Slide the return stop up against the frame tab and tighten.
- Slide the spring and its pinch clamp up to the tab. Hold the pedal fully returned while continuing to slide the spring's pinch clamp  $\frac{3}{8}$ " and tighten. This will put a pre-load on the spring.
- Adjust the cable adjuster on top of the carburetor until there are  $\frac{3}{16}$ " of threads exposed above the jam nut.
- With the throttle valve in the carburetor in the closed position, slide the throttle cable pinch clamp front on the pull rod just until there is no slack in the throttle cable, tighten pinch clamp.
- Press throttle pedal until either the spring becomes fully compressed or the throttle valve tops out in the carb.
- If the throttle valve tops out, then try one of the following: turn carburetor cable adjuster down, move cable pinch clamp back on pull rod or add more preload on spring by sliding spring pinch clamp forward on pull rod.
- If the spring bottoms out first check to see if throttle valve is fully open (not hanging down in carb at all). If it is not fully open then screw cable adjuster up out of the carburetor, slide spring pinch clamp back on pull rod (but make sure there is still some preload on the spring) or slide cable pinch clamp forward on pull rod (but without opening throttle valve when pedal is in return position). If spring is bottomed out and throttle valve is opened entirely then you have correctly adjusted the throttle stops.
- Check to make sure you are getting full throttle each week during your weekly maintenance. You can apply spray lubricant on the throttle cable each week to help it last longer.
- When finished, make sure that at full throttle the throttle pedal does not hit the steering rods or rack system. If it does it will cause the steering to lock and the throttle to stay on full.

250CC PIPE SUPPORT SYSTEM



45A► 250CC: INSTALL THE PIPE AND PIPE SUPPORT SYSTEM  
 Increase the diameter of the 250cc pipe cradle saddle by squeezing it in a vice to achieve proper fit.



45B► 600CC: INSTALL THE PIPE AND PIPE SUPPORT SYSTEM

