

❑ **Fig. 127** From Bag #6-11, install the 2 #6474 spring clamps on the rear shocks. The spring should go over the thin flange. Install one with the screw head up, as shown, and the other with the screw head down. There should be a 1/4" (6.35mm) space between the collar and the body hex nut. Tighten the screws just enough to lock the collars. DO NOT overtighten. Slip on the long silver #6478 spring. There is also a long gold spring, which is stiffer than the silver spring. The silver spring will work best on most tracks, but you can experiment with the gold spring also, on your track. Take the #6471 plastic rod end and push it onto the metal ball. The easiest way to do this, is to lay the metal ball end on a table, with the flat end on the table. Set the plastic end on the ball and push it in place with your 1/4" nutdriver. Slip the spring holder on the shaft and into the spring and collapse or squeeze the spring. Then thread the plastic ball end on the shaft. You'll have to keep the shaft from rotating with a needlenose pliers. Grab the shaft close to the threads so that you don't scratch the part that rides in the "O" rings.

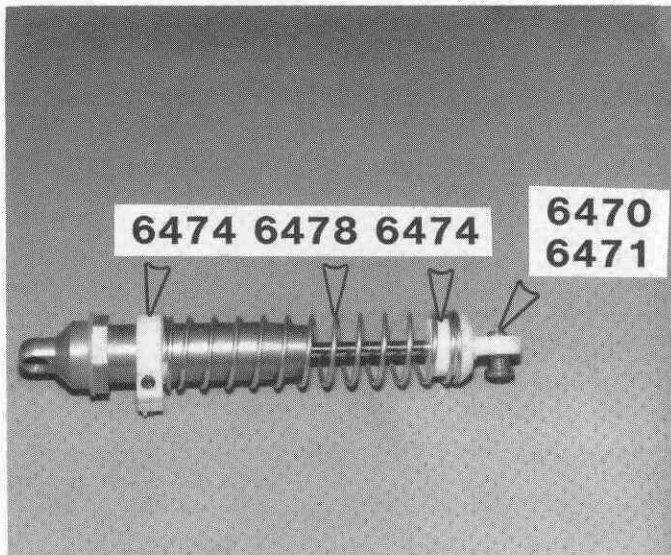


Fig. 127

❑ **Fig. 128** On the front shocks, install the spring collars, as shown. Use the short silver spring, which is softer than the short gold spring. Again, you can experiment with both springs, but start with the silver spring. Install the spring cups that go inside the springs, as shown, and then install the plastic ball end. Your shocks are now complete.

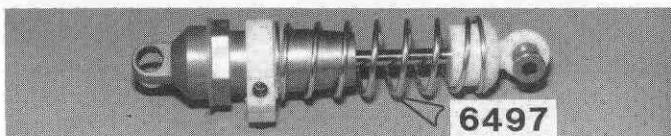


Fig. 128

❑ **Fig. 129** Now we'll install the front shocks on the car. The arrow in the photo is pointing to the upper mount. Now slip on an aluminum washer and then screw down and tighten one of the 4/40 plain nuts. The arrow is pointing to the flanged nylon shock bushing. Slip this bushing on next, with the flanged end on first.

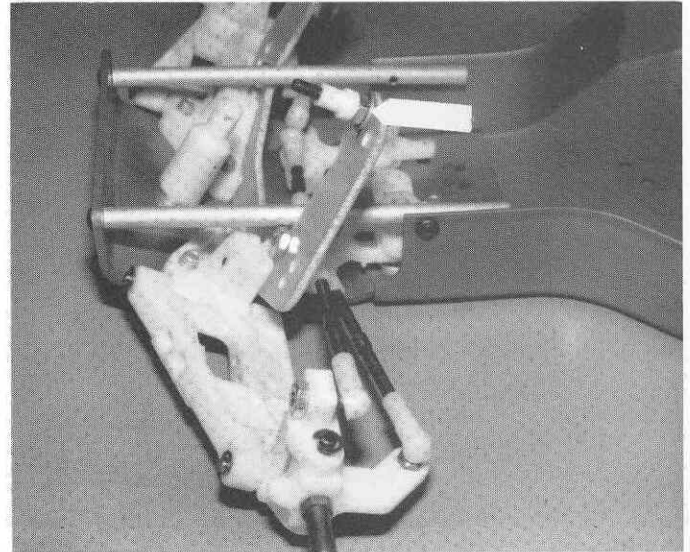


Fig. 129

❑ **Fig. 130** Slip the shock on the upper mount and install a locking nut. DO NOT tighten down too tight on this nut or you'll bind up the shock. Squeeze the bottom end of the shock up and then slip the end down into the lower "A" arm slot, with the flat side of the ball to the rear.

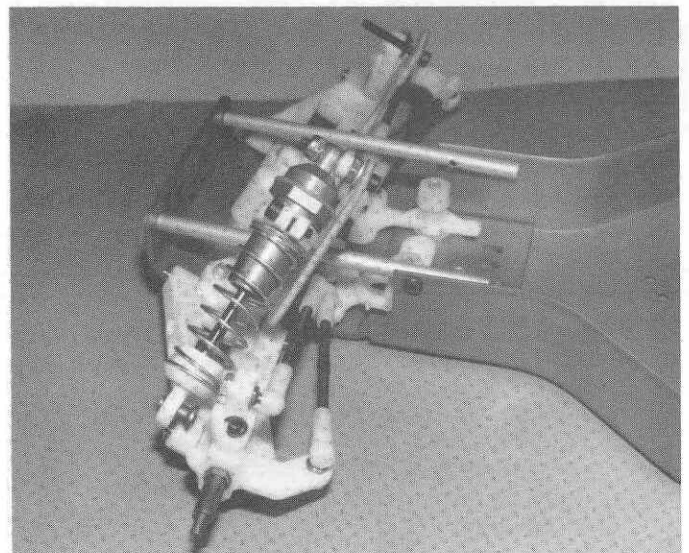


Fig. 130

□ **Fig. 131** The flat side of the ball should be towards the rear as the upper arrow shows. Now, back in Bag #6-1 you have 2 3/4" long screws that only have 1/4" of threads. Use these screws to mount the lower shock balls to the "A" arm, as shown.

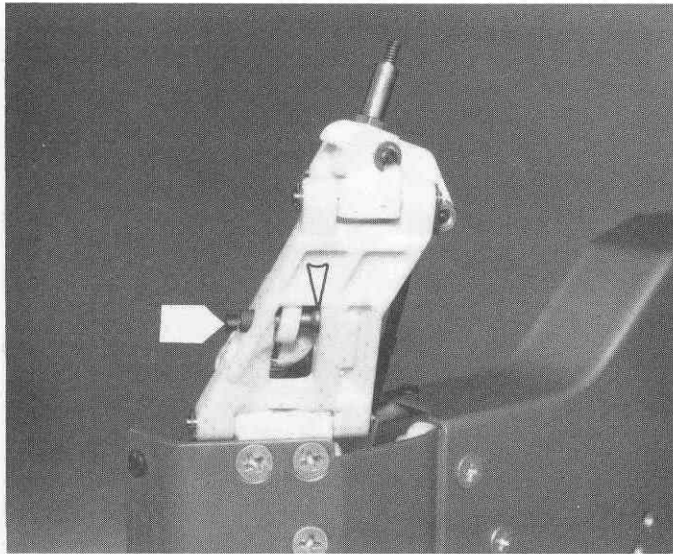


Fig. 131

□ **Fig. 132** Install the R.H. shock.

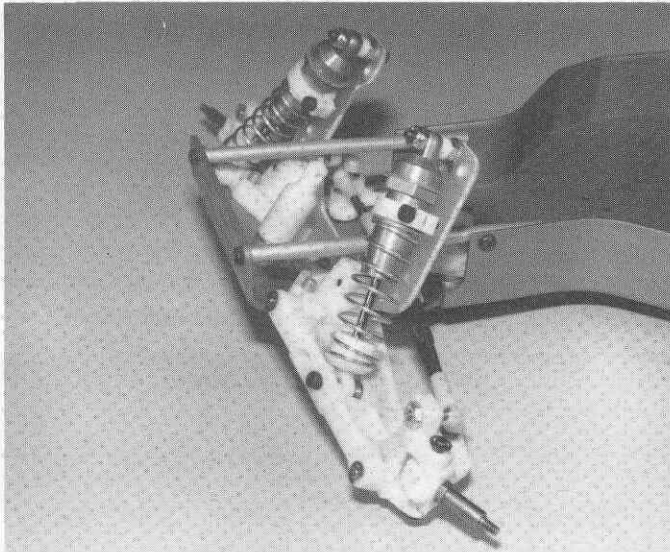


Fig. 132

□ **Fig. 133** In Bag #6-4 are the 2 #6320 nose brace tubes and 4 Allen button head screws, as shown.

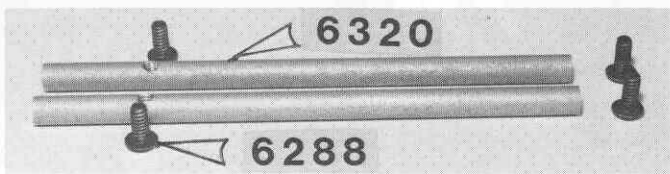


Fig. 133

□ **Fig. 134** These tubes tie in the nose piece very solidly to the chassis. Start by installing the rear screw through the side of the chassis, but do not tighten yet. Install the forward screw through the front of the nose piece into the end of the rod and tighten down. Now tighten the rear screw. Install the 2nd brace.

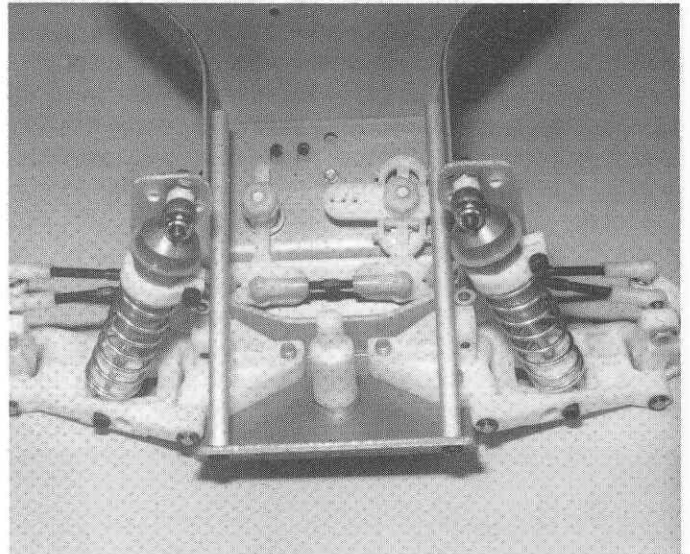


Fig. 134

□ **Fig. 135** Also in Bag #6-4 is the #6378 rear shock strut. Assemble this to the rear bulkhead with the 4 Allen screws, as shown.

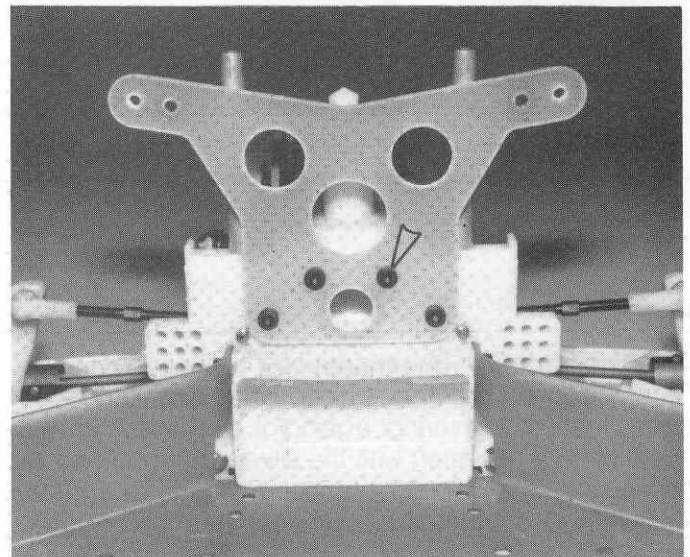


Fig. 135

□ **Fig. 136** It's time to install the rear shocks. From Bag #6-9, install one of the Allen screws through the fiberglass strut from the rear. Then, install a plain nut and an aluminum washer next. Slip a bushing in the shock, with the flange forward, and slip the shock on the screw.

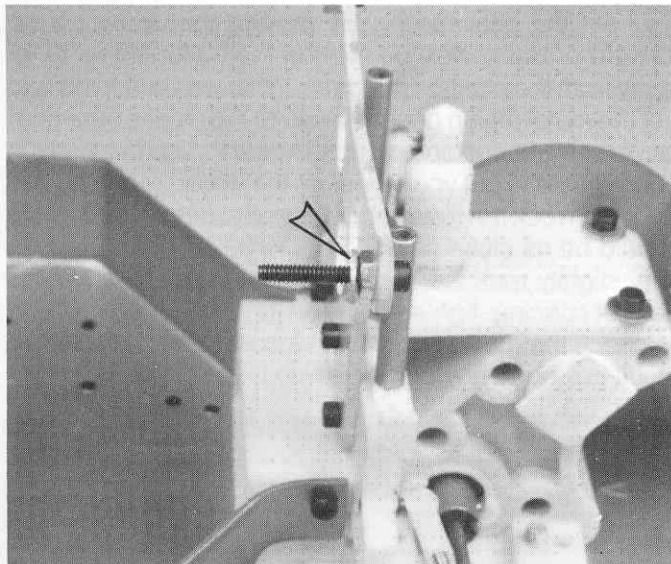


Fig. 136

□ **Fig. 137** Install a locking nut next. Do not overtighten the nut, it is only necessary for the nut to take up the end play.

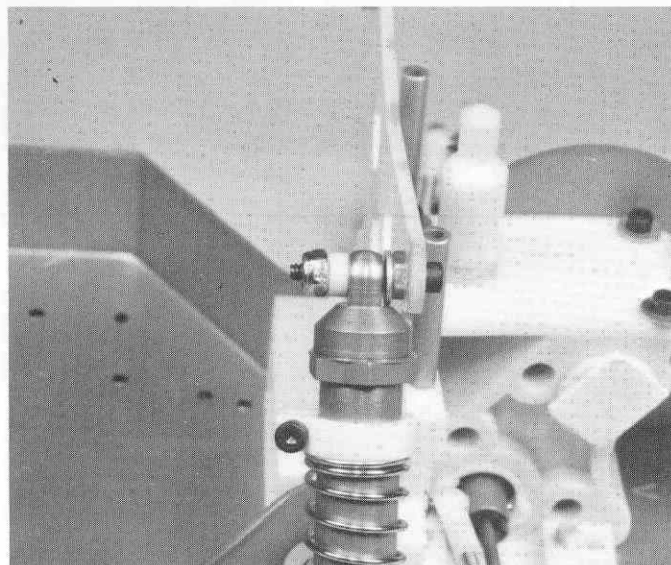


Fig. 137

□ **Fig. 137a** For the shock bottom installation we want the flat part of the metal ball end to be against the "A" arm, as shown. In the "A" arm, there are 4 holes. Install it in the outside hole, as shown. Slip a washer on the screw, and install the screw.

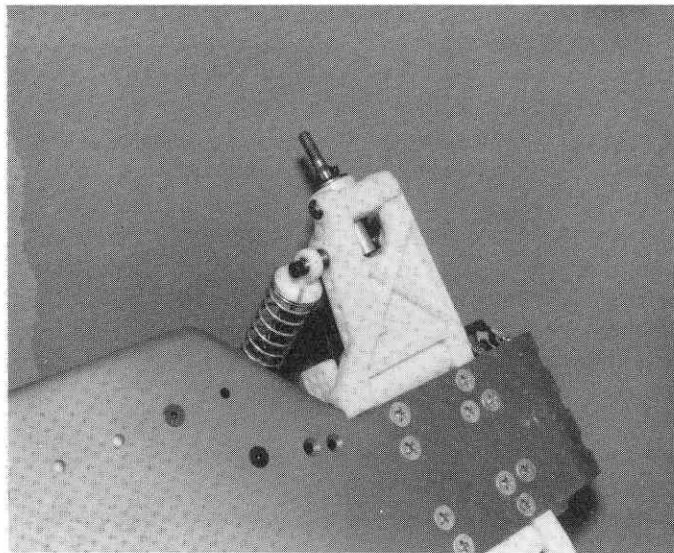


Fig. 137a

□ **Fig. 138 & 138a** Time to put the horsepower in the car. Using ROSIN core solder, solder the motor lead wires and filter capacitors to the #6500 motor, as per the instructions included in the motor bag. From Bag #6-15, take the #6659 motor pinion and install the pinion, as shown. The end of the pinion should be even with the end of the shaft.

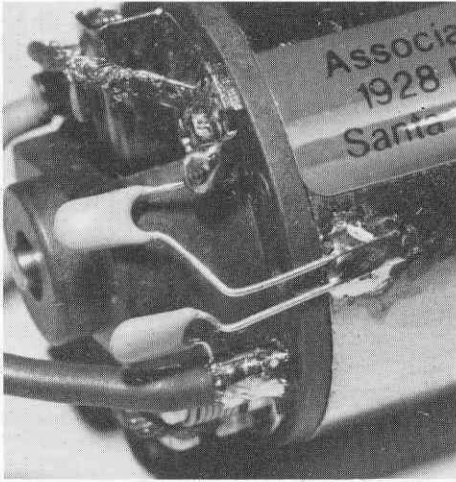


Fig. 138



Fig. 138a

□ **Fig. 139** In the motor bag are 2 metric motor mounting screws. These screws have finer threads and are ONLY used to mount the motor. Slip the motor in the motor mount and start the bottom screw in first. Do not tighten all the way down yet. On the top screw, put a washer on the screw and screw it in, but not tight. Now we'll set the gear mesh. By moving the upper screw, forward or back, we'll be moving the motor closer to, or away from the plastic spur gear. What we want to do is to get the metal pinion gear as close to the plastic spur gear as we can without binding up the gears. The easy way to check this is to put your finger on the plastic gear and see if you can rock it in the teeth of the metal gear. The 2 gears should be as close as possible, while still being able to very slightly rock the plastic gear. When you have this correct spacing, tighten down on the 2 motor screws and re-check the gear spacing. An incorrect gear mesh can result in a huge power loss, so do it correctly.

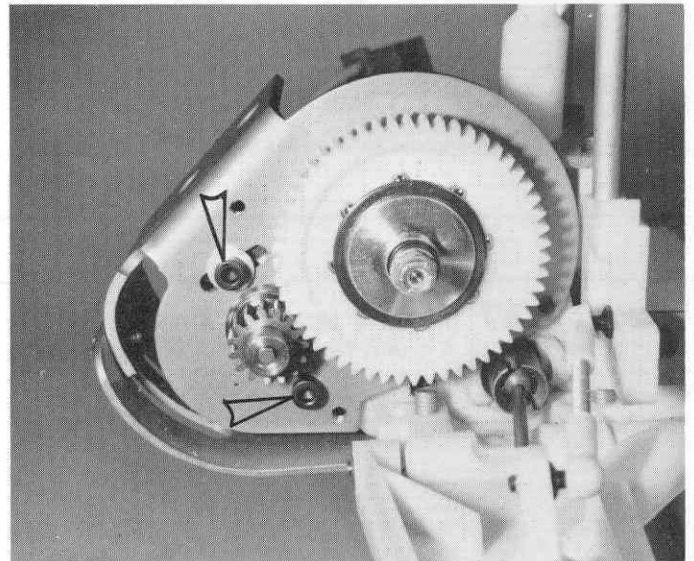


Fig. 139

□ **Fig. 140 & 140a** Now we'll install the #6608 dust cover, in Bag #6-12. You'll have to trim the dust cover to fit, with a scissors. But we want the dust cover to fold over the edges of the motor mount as far as possible. So slip the dust cover on, see where you have to trim and only cut off as much as you have to until you can snap the cover on. When the cover is on, you'll notice 2 indentations in the plastic where the 2 screws go. If you take an Xacto knife and twist it as you push, you can cut the 2 mounting holes in the plastic, or you can use a drill. You'll also have to cut a hole right in the center of the dust cover, by the dif adjusting nut, to fit the black button. You want the hole just big enough that the button will pop in and stay. When you want to adjust the dif, just remove the black button, make your adjustment, and reinstall the black button. Install the 2 mounting screws with washers, as shown.

CAUTION: To remove the motor, you must first remove the dust cover. You will then have 4 screws out that look the same. But if you mix up the dust cover screws with the motor screws, you will strip out the threads. Keep the motor screws with the motor, and the dust cover screws with the dust cover. Also, DO NOT try to use aluminum screws to attach the dust cover because they will break off in this installation.

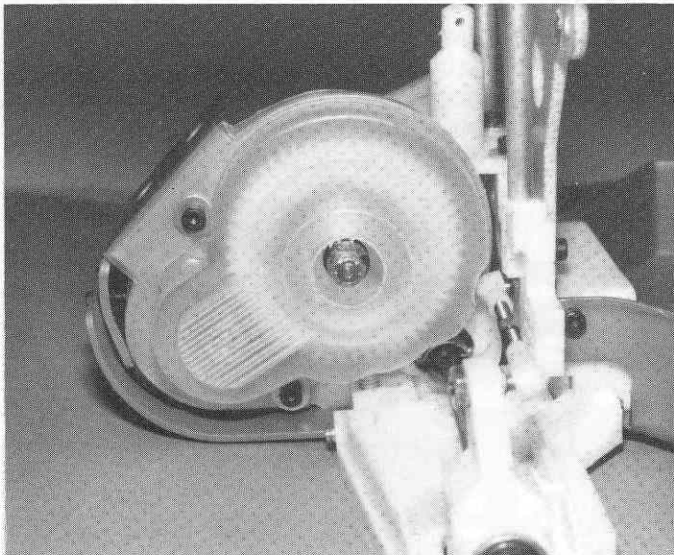


Fig. 140

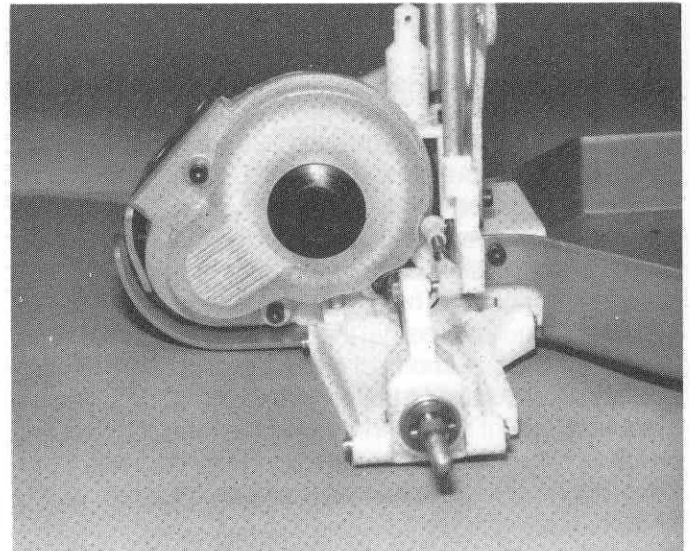


Fig. 140a

RADIO INSTALLATION

We're ready to install the radio. If you haven't purchased a radio yet a good choice would be one of the 2-channel steering-wheel systems made by Futaba or Airtronics. However, many other radios, including stick models, can be used in the car. The higher torque medium sized servos (like the S31, S131, or S28) are preferred for steering, and small servos like the S32 are best for the throttle; but all three sizes, small, medium, and large, can be made to work. The photos that follow show the installation of a Futaba system with FP S32 servos. Special instructions and photos for other types of medium and large servos are also included. In these instructions servo sizes (the width of the case between the mounting ears but not including the ears) are grouped as follows:

SMALL (S32) : 1.5 in. (38mm)
 MEDIUM (S31) : 1.6 in. (41mm)
 LARGE (S29) : 1.8 in. (46mm)

STEERING SERVO

□ **Fig. 141** In Bag #6-6, take out 2 of the #6336 plastic servo mounts. You'll have to drill the mounts for your particular servos. If you have S32 servos, line up your servo with the mounts, so that there will be about 1/16" (1.6mm) clearance between the servo and the chassis plate and mark the hole locations on the mounts. Drill two #43 (2.3mm) holes in each mount on the side away from the chassis mounting hole, which will be on the bottom of the mount. You'll notice that the chassis has 2 sets of servo mounting holes. A short set and a long set. With 2 different sets and by rotating the servo mounts 90 deg, you will be able to mount most servos. Put the rubber grommets on the servo and attach the servo to the mounts with 4 button-head Allen screws and washers, as shown.



Fig. 141

□ **Fig. 142** Install the servo to chassis with the 2 flathead Allen screws shown in photo 141. You'll have to install 2 washers between the rear mount and chassis for proper alignment. Fig. 142a shows the proper holes to use with small servos.

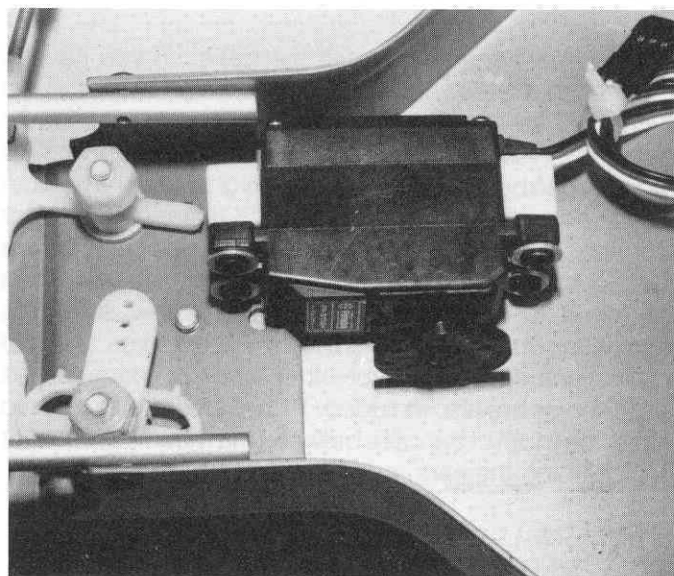


Fig. 142

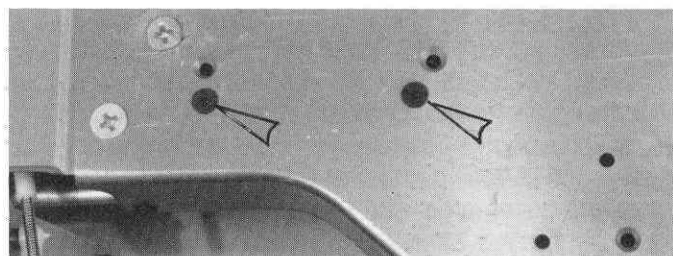


Fig. 142a

□ **Fig. 143** Out of Bag #6-2, take the piano wire linkage and set collars. Turn the servo output arm to the left and right stops and then center the arm between these 2 stops. It will not be exact, but it will be close enough for now. We'll center it exactly with the radio later. Slip one of the "Z" bend arms in the servo arm, as shown. The "Z" bend arm will be easier to install in the servo saver arm if you take your X-acto knife and rotate it in the hole to bevel it slightly. The arrow in the photo is pointing to a slight bend that we want to put in this wire to help clear the collars from the servo. Put a slight bend in the arm and then slip it in the center hole, as shown. Center the servo saver and install and tighten both lock collars.

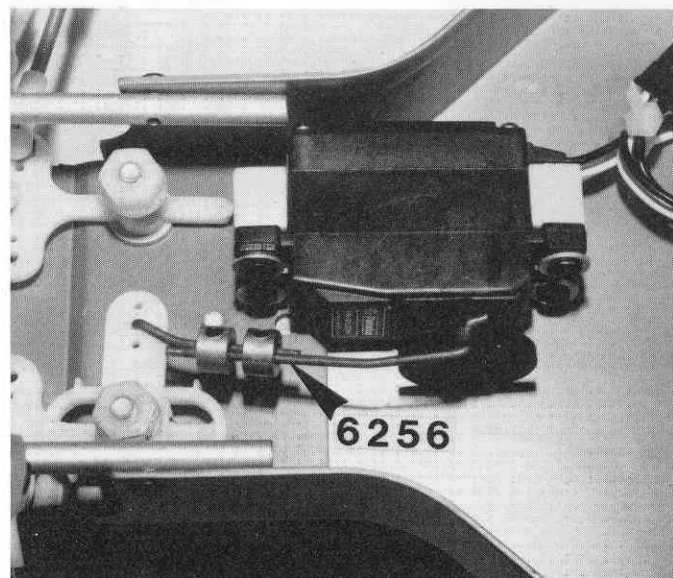


Fig. 143

Special Instructions - Medium steering servo

□ **Fig. 144** Medium sized servos would include Futaba S31, S131, S28; Airtronic 94461; and Novak NES1A. Follow the same procedure as for the small servo but use the wider spaced mounting holes in the chassis.

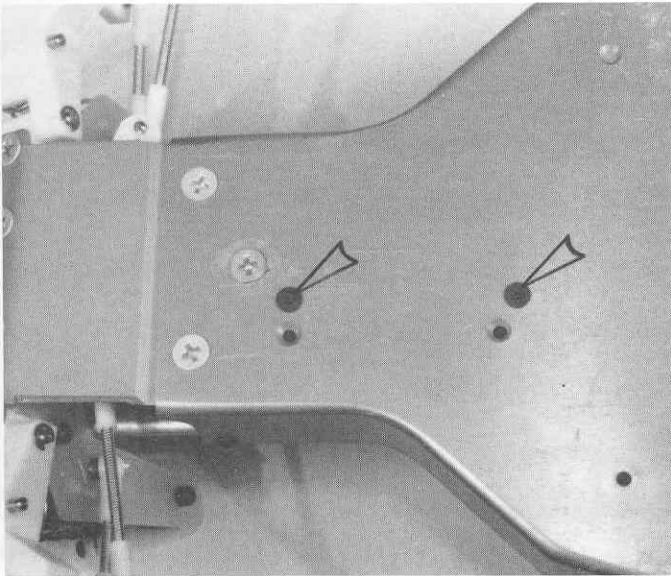


Fig. 144

□ **Fig. 145** Linkage is the same as for small servo but may require slightly more bend.

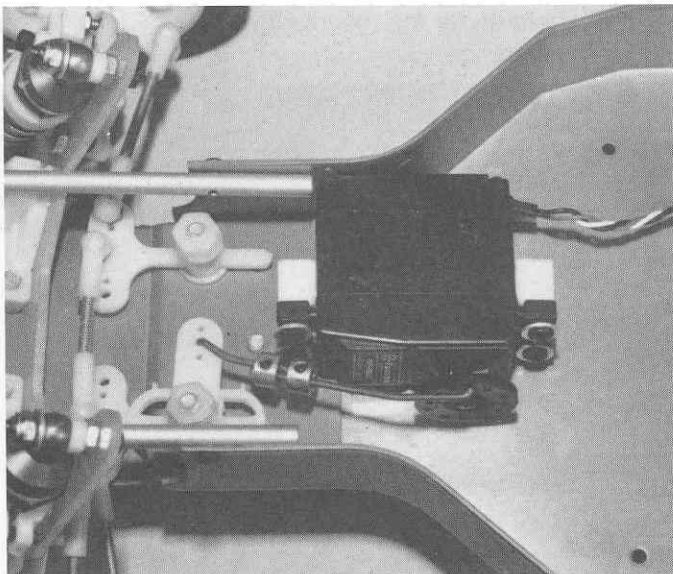


Fig. 145

Special Instructions - Large steering servo

□ **Fig. 146** Large servos would include Futaba S27, S29, as well as several older designs. Follow the instructions in step 141 except that the rear servo mount should be rotated 90 degrees as shown. This will move the mounting point well away from the existing holes in the chassis to make it easier to drill another hole. Temporarily install the front mounting screw, position the servo, and then mark round the rear mount as shown in Photo 146.

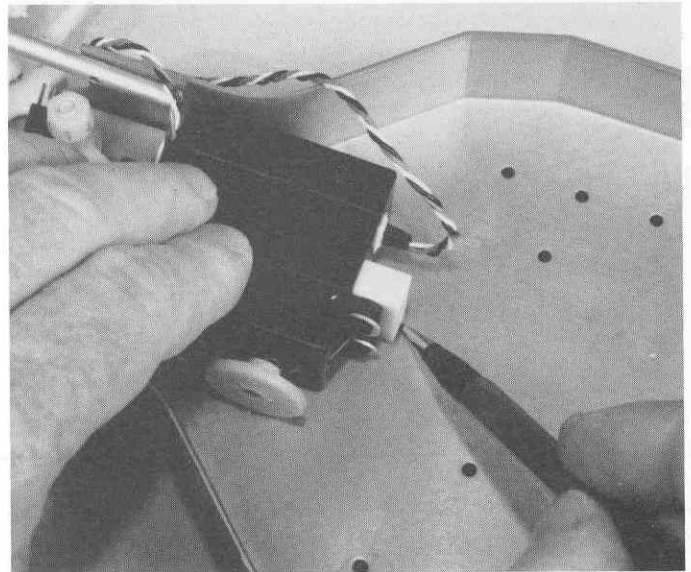


Fig. 146

□ **Fig. 147** Remove the servo and mark a spot to drill within the outline of the mounting block.

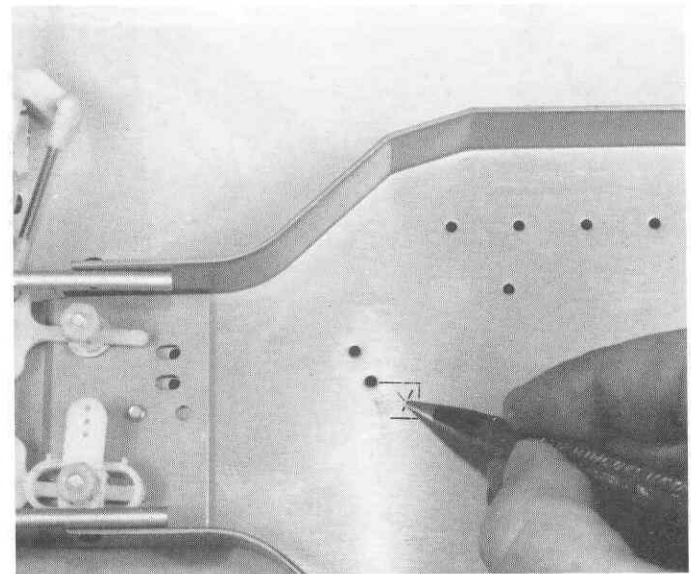


Fig. 147

□ **Fig. 148** Center punch the mark and drill the chassis with a 1/8" (3.1mm) drill. Countersink the hole on the bottom of the chassis if possible. You can use a large (approx. 3/8") drill and turn it by hand to do the countersinking.

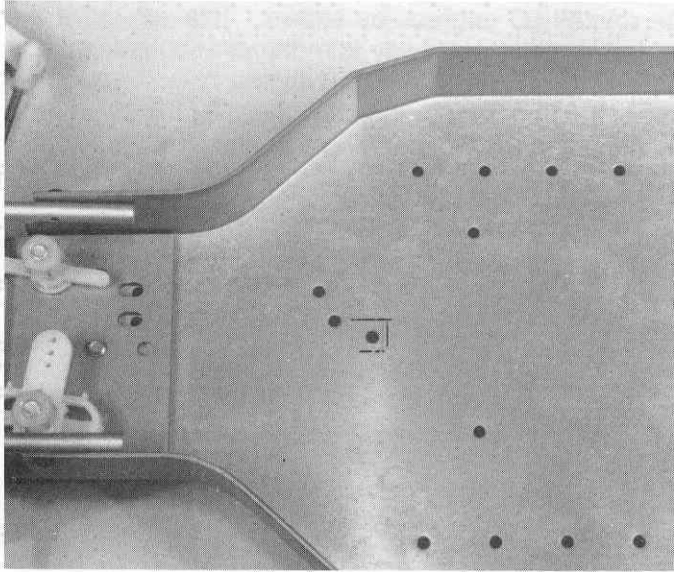


Fig. 148

□ **Fig. 149** Mount the servo and install the linkage following steps 142 and 143. Bend the linkage wire as shown in Photo 149.

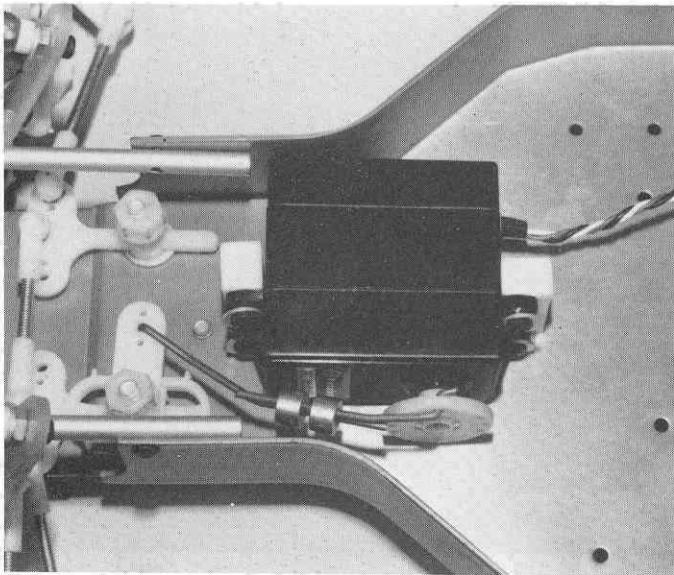


Fig. 149

THROTTLE SERVO

□ **Fig. 150** The throttle resistor servo shown here is an S32. Assemble the servo mounts, as you did in step 141, except this servo is placed in the direction shown.

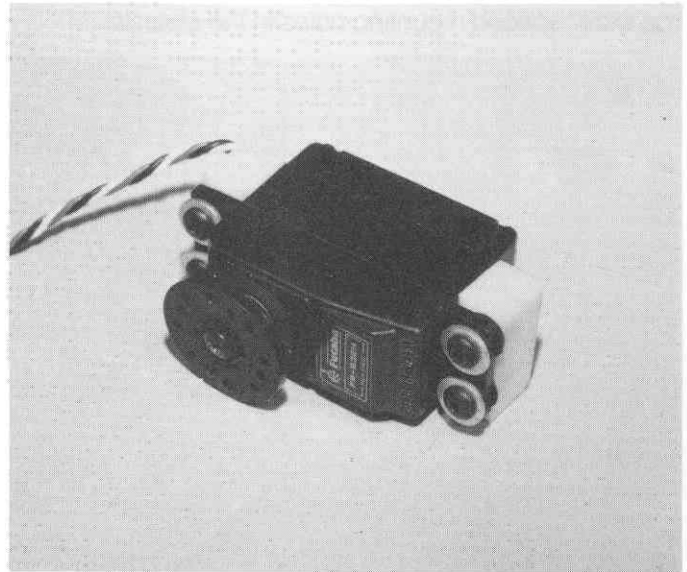


Fig. 150

□ **Fig. 151** Install the servo to chassis, as shown. It is important that the servo mount high enough to allow the servo wheel to clear the chassis by about 1/8" (3.1mm). Add washers under the mounts if necessary to give the required clearance.

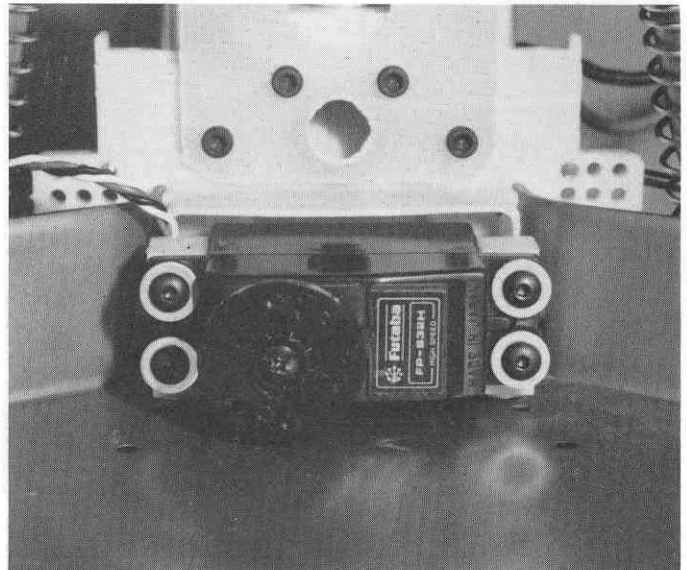


Fig. 151

□ **Fig. 152** From Bag #6-13, install the 2 #6713 resistor brackets with 2 flathead Allen screws and locknuts, as shown. Note that the brackets will be turned differently if you are installing a medium or large servo (see special instructions that follow later).

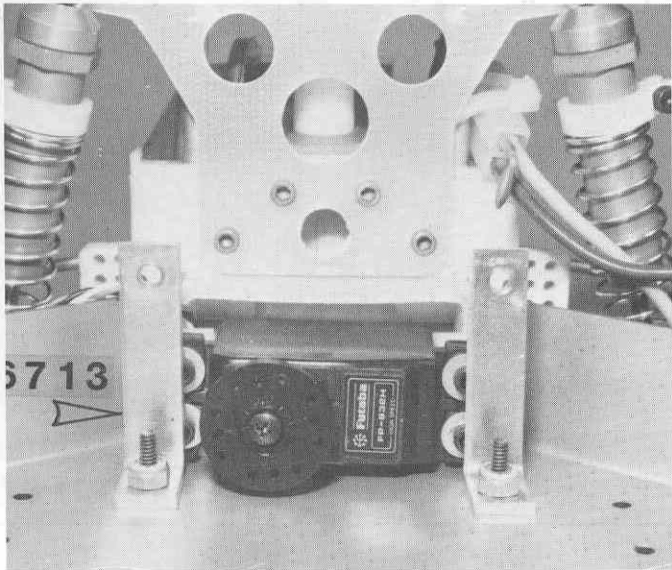


Fig. 152

□ **Fig. 153** Slip the aluminum resistor mount through the #6711 resistor and attach it with a short 4-40 screw and locknut to the R.H. side of photo, as shown. On the other side, where arrow is pointing, install the plastic bypass mount with the longest screw going into the recessed hole, as shown, with a locknut. There are two plastic bypass mounts. Use the thicker mount with the square edges if you are mounting a small (S32) sized servo. For a medium or large servo the resistor brackets must be turned differently and the thinner bypass mount with rounded edges (and possibly dyed a color) should be used.

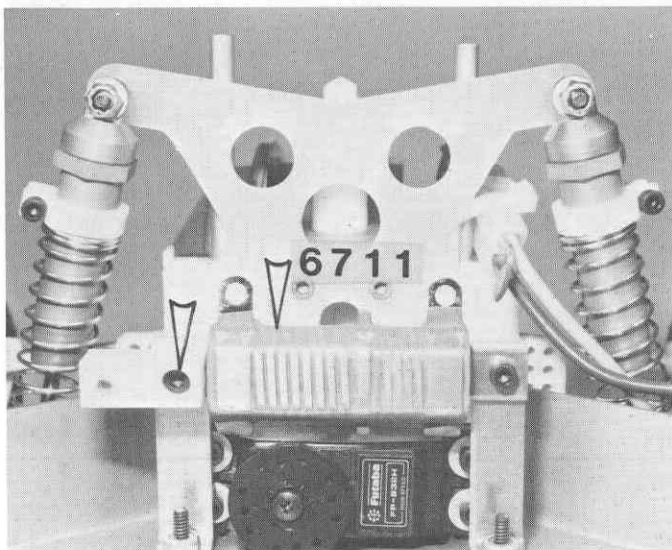


Fig. 153

□ **Fig. 154** In the end of these instructions is a full page detailed drawing of the wiring installation. We'll use that page to help clarify the installation. Attach the correct wires to the resistor per the drawing, and make sure the wire lengths are the same as in Photo 179. If you put the wires through the holes and bend them around they'll stay while soldering. Use only rosin core solder and solder both connections, as shown. All these wire connections **MUST BE** soldered.

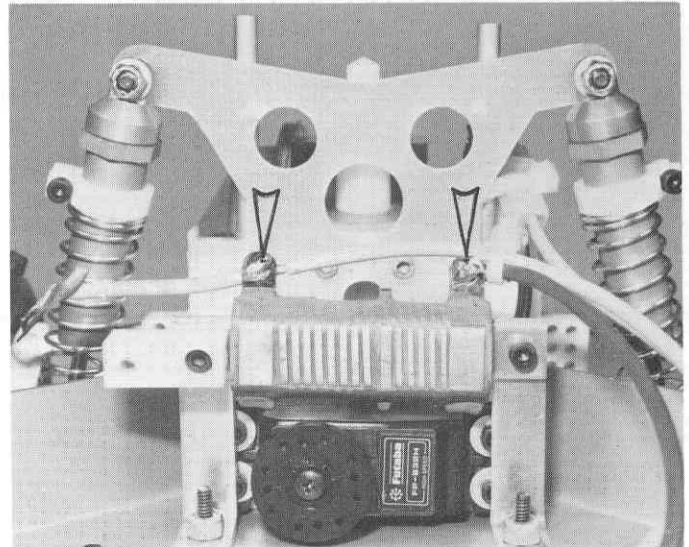


Fig. 154

□ **Fig. 155** (Next page.) Center the servo output arm, as before, then turn it about 30 deg to the right of photo. Locate the wiper arm so that it is in the exact location shown and note the closest holes in the servo wheel to mount the wiper. Solder the wire to the resistor in the exact location shown in the photo. Mount the resistor arm to the servo arm in the exact position shown. If your servo wheel has a raised center then use the small washer to stand the wiper off from the edge of the wheel (see Photo 168).

This next item is **VERY IMPORTANT**. The resistor brass button must push quite hard against the resistor to make a good contact. If it does not have enough pressure the motor will not operate to its fullest horsepower and you will burn out the resistor. An easy way to check this is to take the fingernail from your smallest finger and lift the button a very small amount off the resistor. If it lifts off quite easily, it's too soft. It should pull quite hard on your fingernail, **BEFORE** it lifts off - then it's correct. Bend the arm if necessary to achieve this.

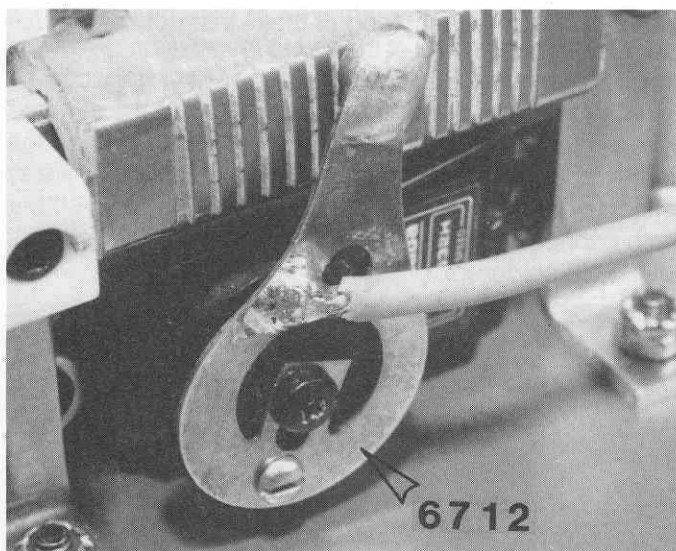


Fig. 155

Special Instructions - Medium throttle servo

□ **Fig. 156** See page 35 for a description of servo sizes. Do the following steps to mount a medium sized throttle servo. Install the servo mounts to the chassis temporarily, using the wider spaced mounting holes.

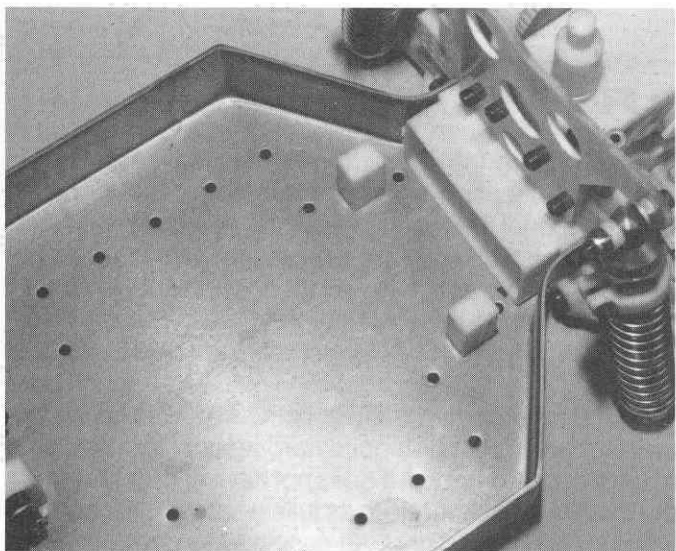


Fig. 156

□ **Fig. 157** These are the mounting holes you should use.

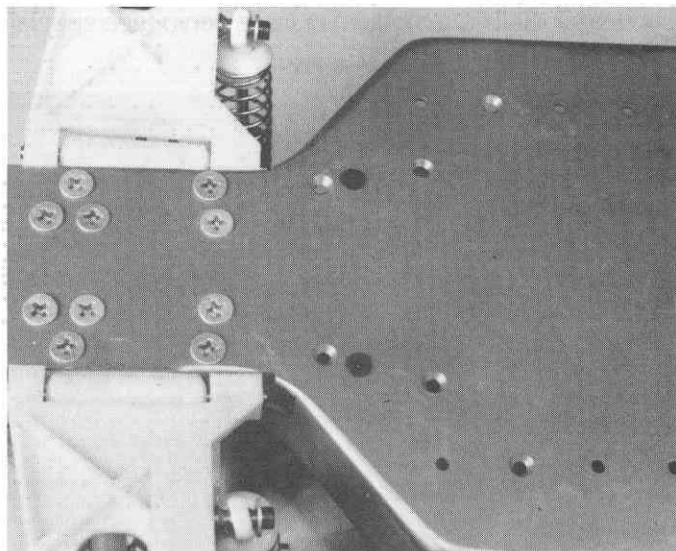


Fig. 157

□ **Fig. 158** Drop in the servo and space it off the chassis with a resistor bracket as shown. Mark the servo mounts with a pencil. Remove the mounts from the chassis and drill the mounts as in step 141. Install the mounts to the servo. Make sure the servo is turned so that the output shaft is on the correct side.

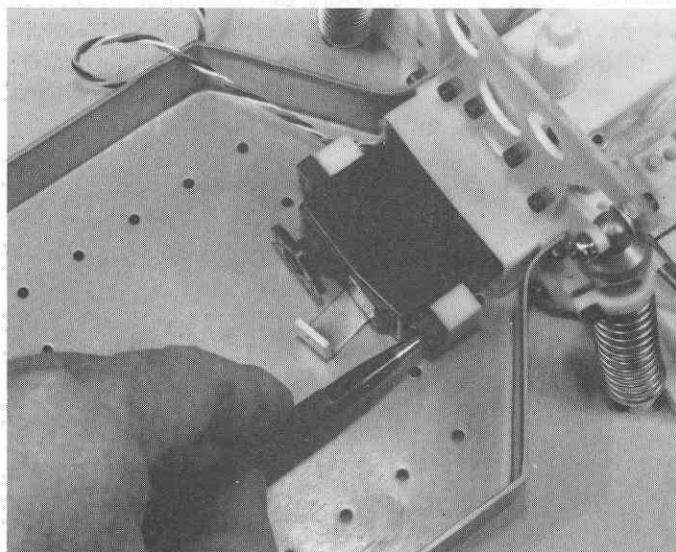


Fig. 158

□ **Fig. 159** Install the servo to the chassis as shown. It is important that the servo wheel clear the chassis by about 1/8" (3.1mm). Use washers under the mounts to achieve the required clearance. Also, some servos (the S28 for instance) are very deep and may bottom out against the bulkhead, making alignment with chassis holes difficult. In this case you should put washers between the mounts and the servo to space the servo away from the bulkhead.

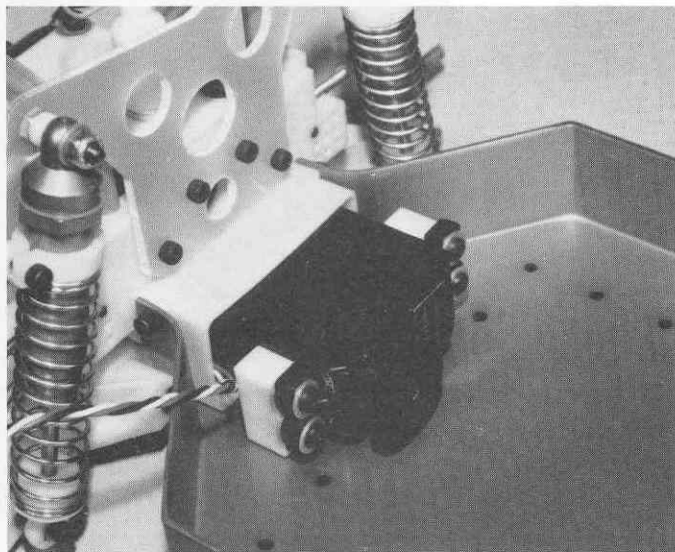


Fig. 159

□ **Fig. 160** Follow the first part of step 155 to determine the mounting position for the wiper. Then remove the servo from the chassis and mount the wiper as shown. Re-install the servo to the chassis.

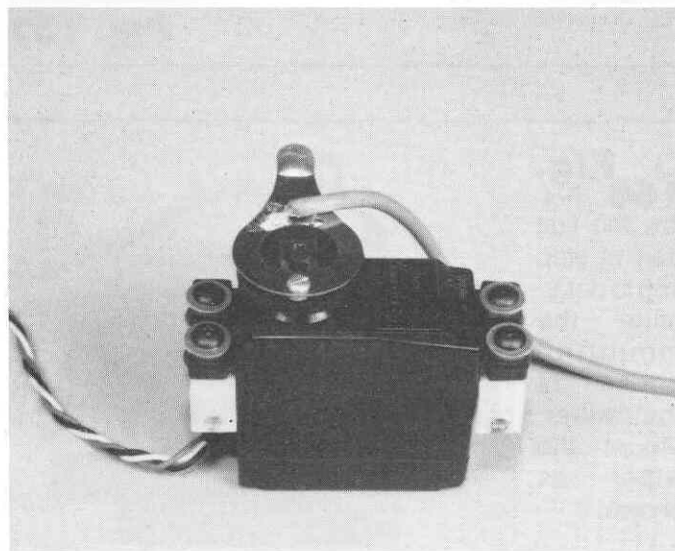


Fig. 160

□ **Fig. 161** Follow steps 152 and 153 to install the throttle resistor, but make the following exceptions: the resistor brackets should be turned 180 degrees, so that they look like Fig. 161. Mount the resistor BEHIND the brackets instead of in front; and use the thin bypass mount (with the rounded edges). When assembled check for proper wiper pressure as in step 155 and complete with wiring in step 154.

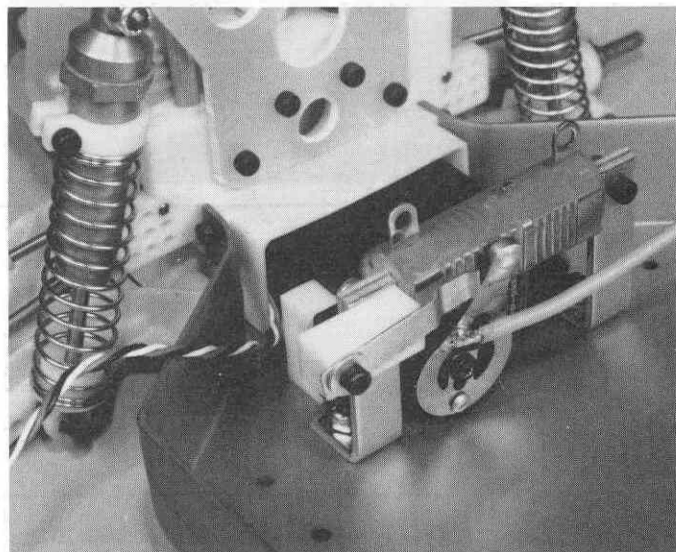


Fig. 161

Special Instructions - Large throttle servo

□ **Fig. 162** It may be necessary to notch the bulkhead to clear the wires for a large servo.

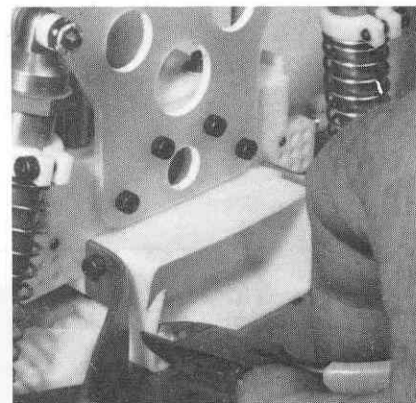


Fig. 162

☐ **Fig. 163** This notch is for a Futaba S27 or S29 servo.

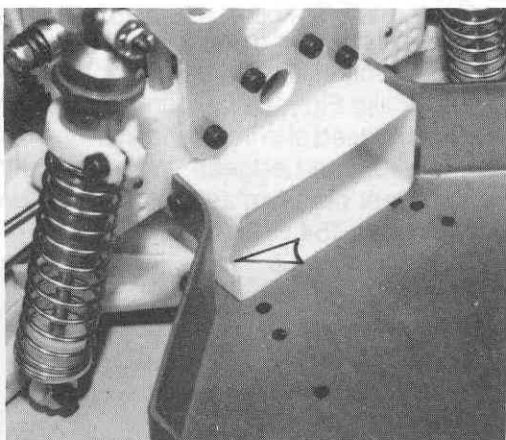


Fig. 163

☐ **Fig. 164** Mark the servo mounts for drilling. Note that the mounts are turned the "wide way" on both sides of the servo (see Fig. 165). Position the servo as high as possible on the mounts before marking.

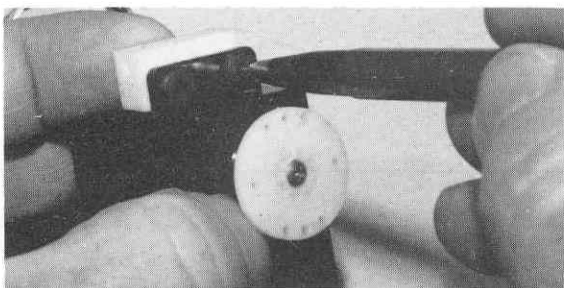


Fig. 164

☐ **Fig. 165** S27 servo with mounts installed.

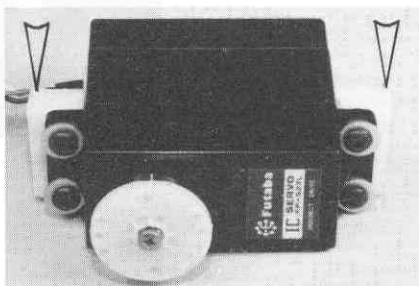


Fig. 165

☐ **Fig. 166** Position the servo as far back as possible in the chassis and mark the center and edge of the mounts on both sides with a pencil.

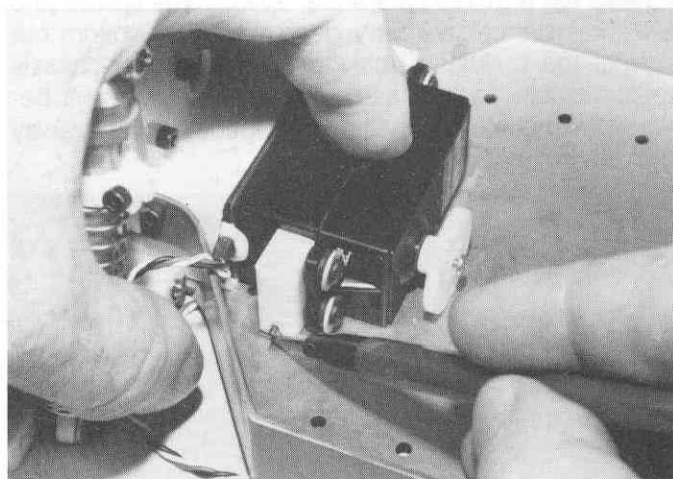


Fig. 166

☐ **Fig. 167** Locate the positions for the mounting holes by extending the center lines inward. Center-punch, drill and countersink the chassis as explained in step 148.

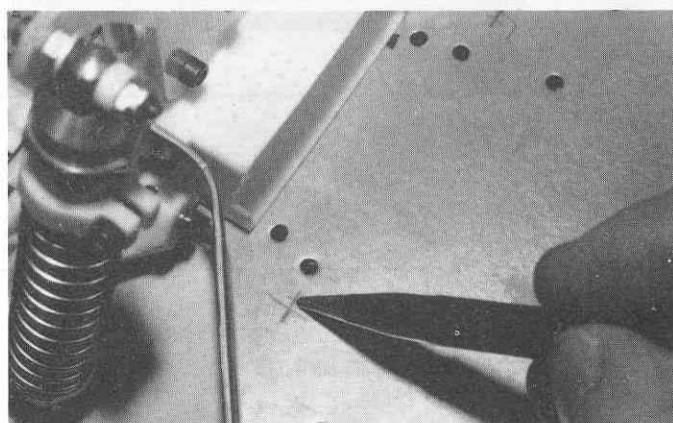


Fig. 167

☐ **Fig. 168** Follow the first part of step 155 to determine the mounting position of the wiper. Mount the wiper as shown.

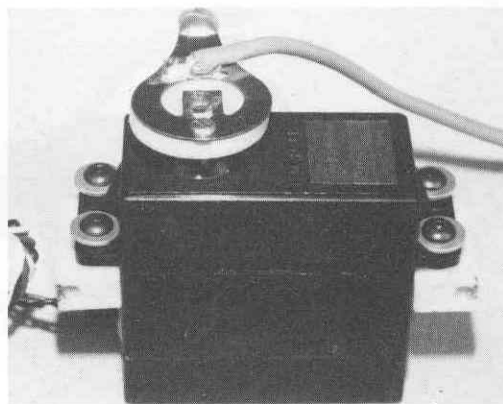


Fig. 168

□ **Fig. 169** Install the servo to the chassis. Mounting holes are typical for S27 servo.

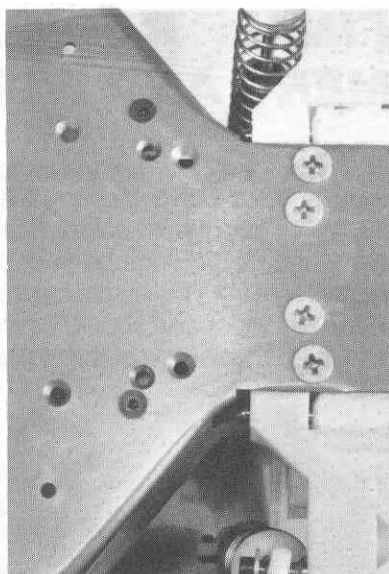


Fig. 169

□ **Fig. 171** Follow steps 152 and 153 to install the throttle resistor, but make the following exceptions: the resistor brackets should be turned 180 degrees, so that they look like fig 171. Mount the resistor BEHIND the brackets instead of in front; and use the thin bypass mount (with the rounded edges). When assembled check for proper wiper pressure as in step 155 and complete with wiring in step 154.

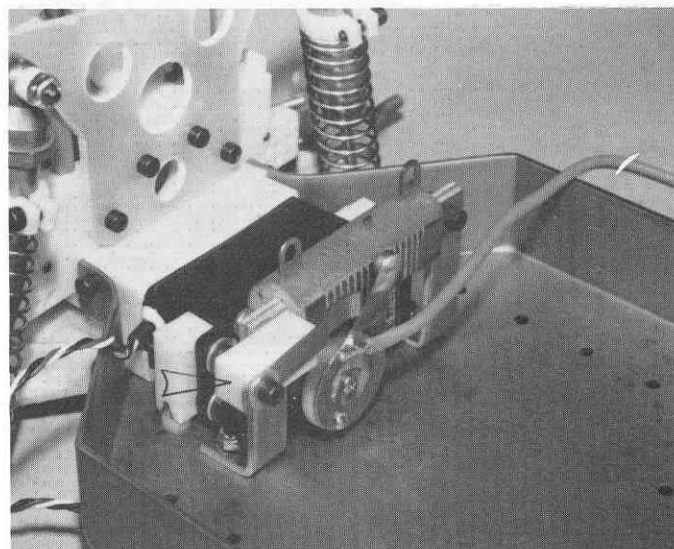


Fig. 171

□ **Fig. 170** S27 servo installed. Use spacers under the mounts to make sure the servo wheel and wiper clear the chassis by about 1/8" (3.1mm).

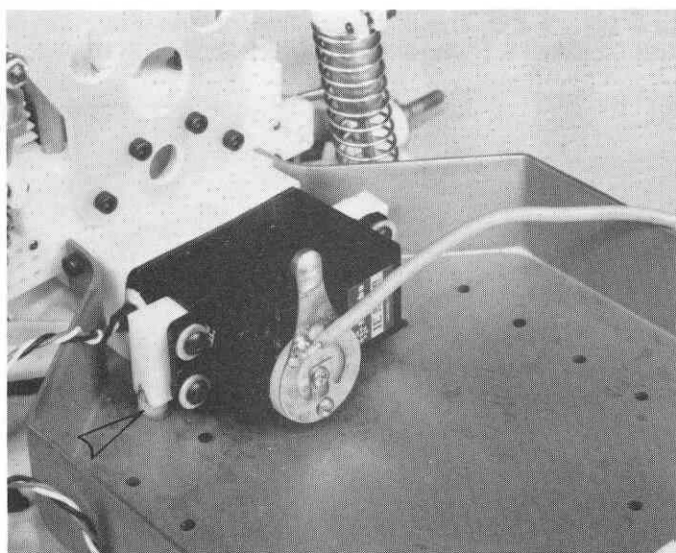


Fig. 170

□ **Fig. 172** Large (S27) servo installed.

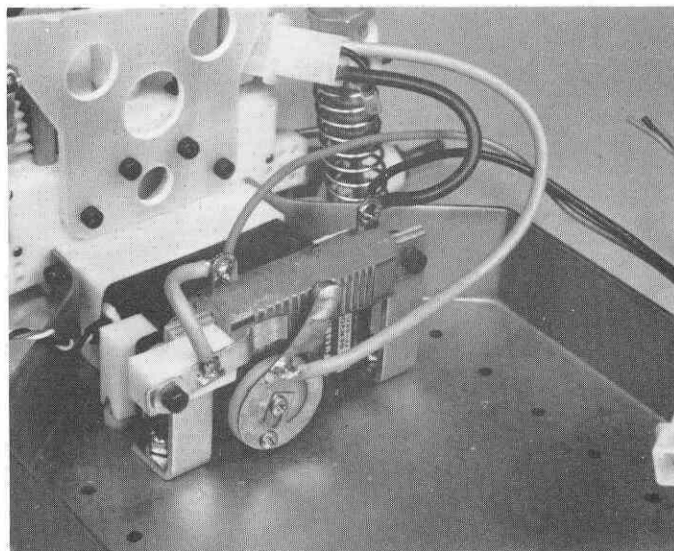


Fig. 172

□ **Fig. 173** Medium (S28) servo installed.

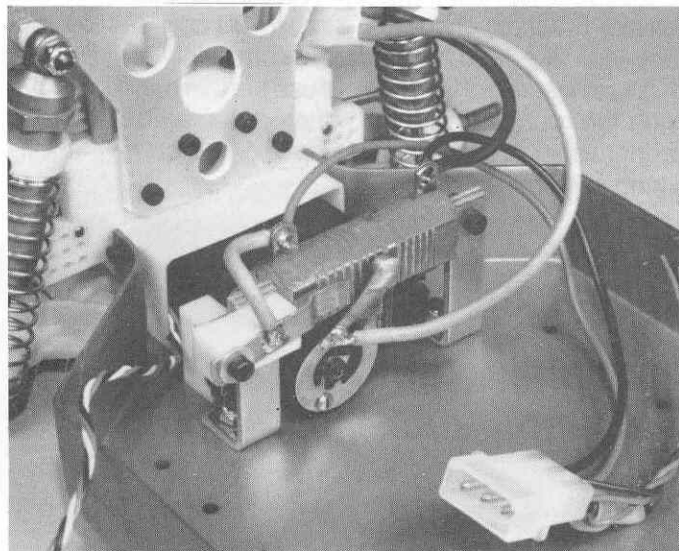


Fig. 173

□ **Fig. 174** Small (S32) servo installed.

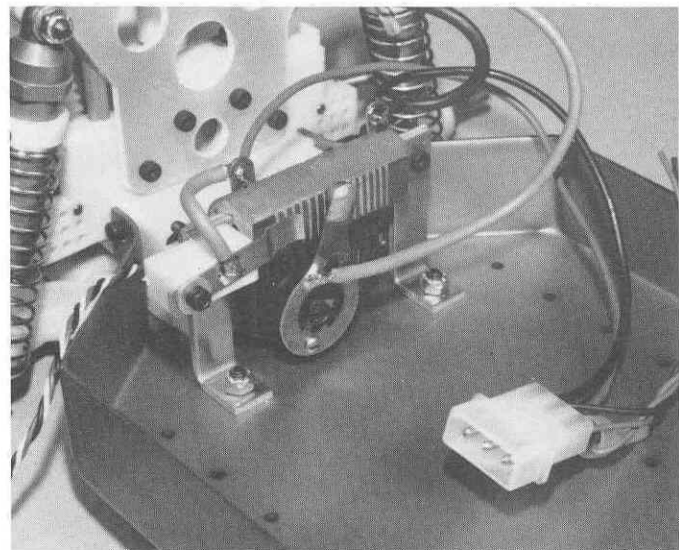


Fig. 174

FINAL RADIO ADJUSTMENT AND WIRING

□ **Fig. 175** Take the bypass and install it to the bypass mount with a 1/2" long Allen screw and washer as shown. Locate the indented portion of the bypass right in the center of the wide bank of the resistor. Solder the bypass wire from the resistor to the arm. This photo shows where the wiper arm should be in the off throttle or brake position. On this side of the resistor are the brake bands.

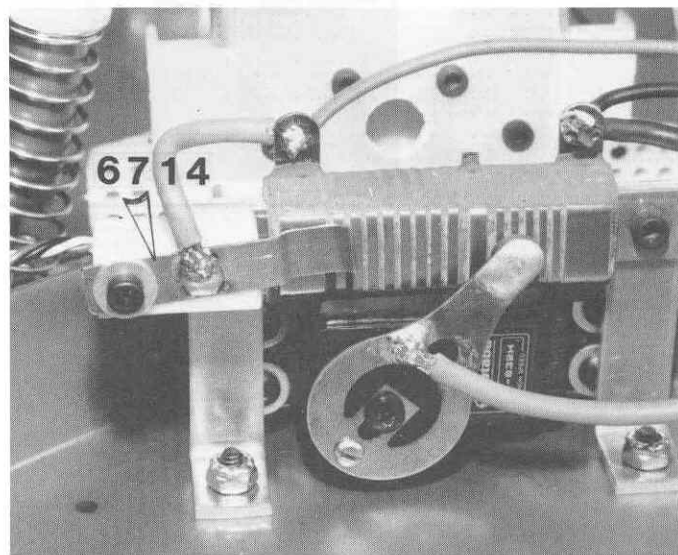


Fig. 175

□ **Fig. 176** This is the position that the wiper arm is in at 1/2 throttle. These are the power bands on the resistor.

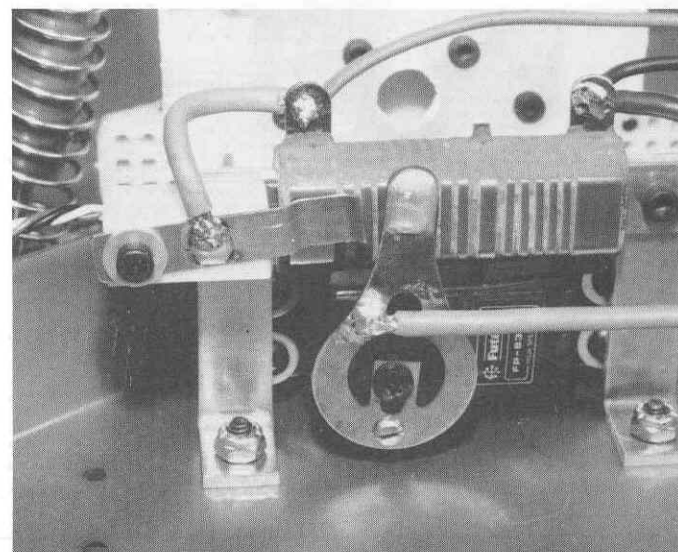


Fig. 176

□ **Fig. 177** This is the full power position of the wiper arm. It should be directly behind the bypass button and in the center of the wide band on the resistor.

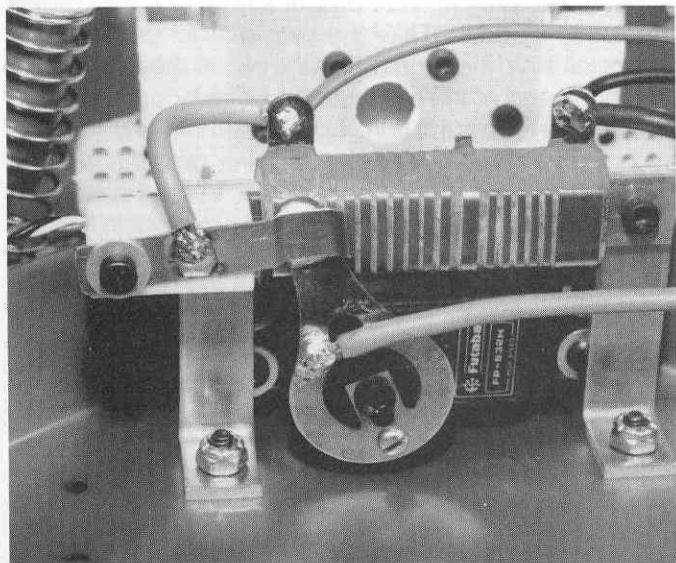


Fig. 177

□ **Fig. 178** The arrow is pointing to the space between the bypass button and the resistor band. This distance should be about .025 (.65mm) less than the thickness of the wiper button section, so that when the wiper arm button moves to full throttle it makes the bypass arm move about .025 (.65mm) forward. This bypass arm then helps to increase the pressure on the throttle wiper arm button, thereby giving it an excellent electrical connection. This, of course, allows the motor to achieve full horsepower and helps the resistor to last longer.

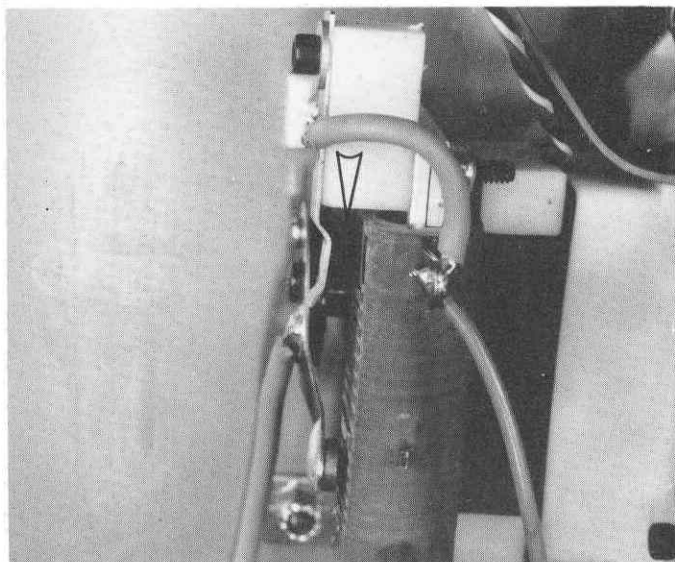


Fig. 178

□ **Fig. 179** We've installed the #6745 portion of the wiring, now we'll finish the #6744 wiring. Now, we'll attach the wires to the switch. On the wiring diagram fig. 208 it shows a black, a green and a red wire going to the radio. You'll only use 2 of these wires, not all 3. On the wiring diagram, you'll notice there are diodes by the battery plug. These diodes cut the voltage down going to your radio so you won't burn out your radio. We'll be attaching 2 of these wires to 2 wires on the radio switch. If there's short wires on the switch, use these for the connections. You'll have to cut the connector off and strip the end of the wires about 1/4" for soldering. We'll tell you the correct wiring for different radio and battery combinations. With a Futaba radio and a 6 cell battery pack - solder the black (-) lead, on the diagram, to the black (-) lead, on the switch. Then solder the green (+) lead on the diagram to the red (+) lead on the switch. Cut the extra red wire off by the 3 pin connector. With a Futaba radio and a 7 cell battery pack, solder the 2 black ends together, and then solder the 2 red ends together. Cut the green wire off by the diode. With an Airtronics radio and a 6 cell battery pack solder the black (-) lead, on the diagram, to the #2 (-) which is marked on the switch plug. Now solder the green (+) lead on the diagram to the #3 (+) lead. Cut the extra red wire off by the 3 pin connector. With an Airtronics radio a 7 cell pack - solder the black (-) lead, on the diagram, to the #2 (-) wire. Now solder the red (+) lead to the #3 (+) wire. Cut the extra green wire off by the diode. For other radios you'll always solder the black (-) wire to the (-) wire on your switch. With a 6 cell battery pack you'll solder the green (+) wire to the (+) wire on your switch and with a 7 cell pack you'll solder the red (+) wire to the (+) wire on your switch. Now, with black electrical tape, put a few wraps of tape around the first solder connection, and then put a few wraps around the 2nd solder connection. Now, attach the #6334 battery trays to the chassis, from Bag #6-7, as shown, with the flathead Allen screws.

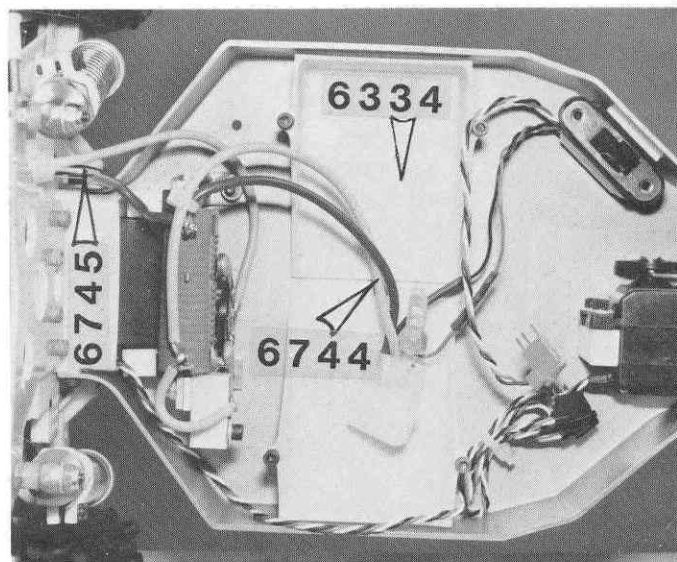


Fig. 179