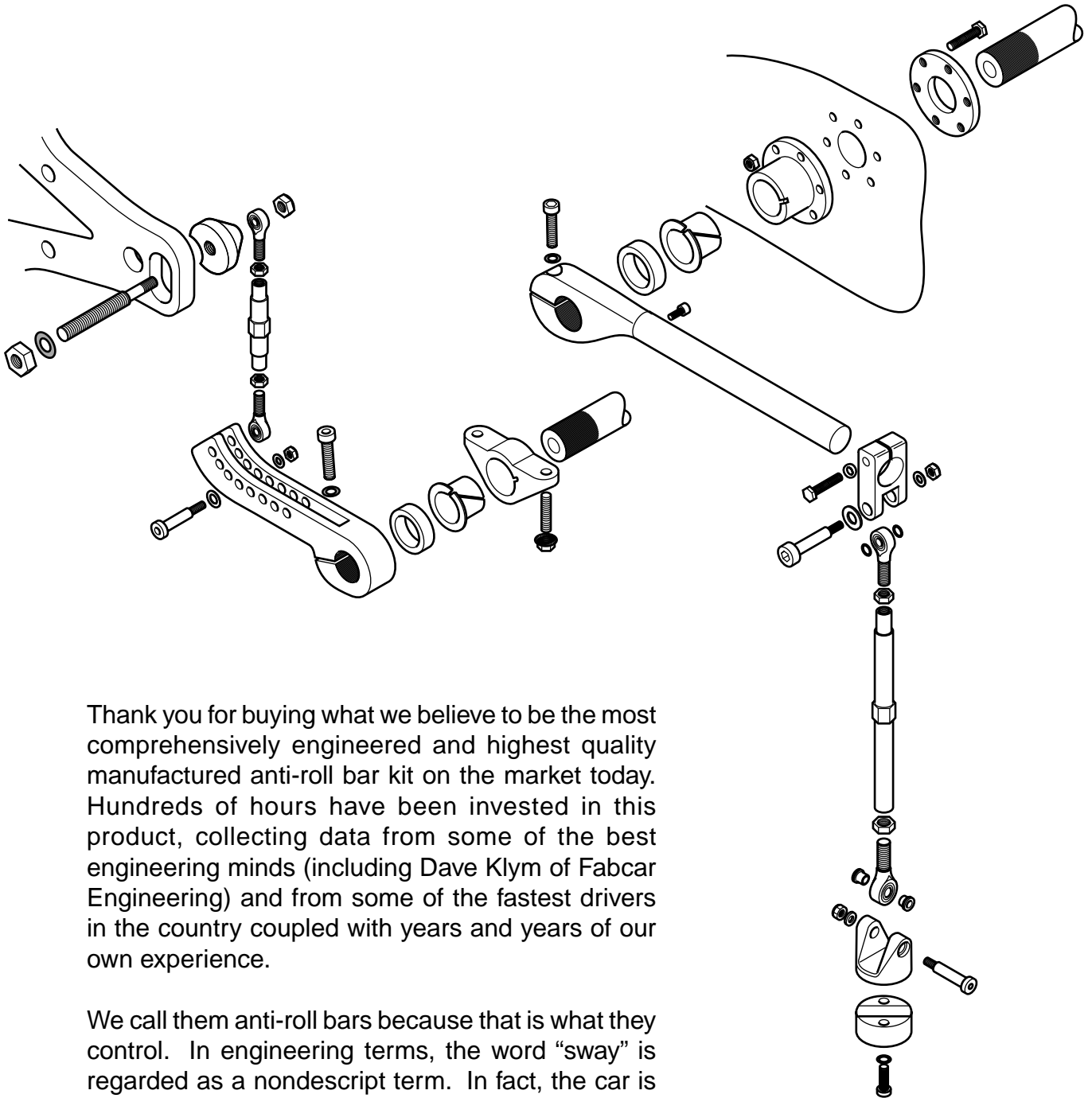


SMARTRACING™

PRODUCTS

*A Company Developing Smart Racing
Products Through Engineering*

Installation Instructions Front and Rear Anti-Roll Bars 1969 - 1989 911's



Thank you for buying what we believe to be the most comprehensively engineered and highest quality manufactured anti-roll bar kit on the market today. Hundreds of hours have been invested in this product, collecting data from some of the best engineering minds (including Dave Klym of Fabcar Engineering) and from some of the fastest drivers in the country coupled with years and years of our own experience.

We call them anti-roll bars because that is what they control. In engineering terms, the word "sway" is regarded as a nondescript term. In fact, the car is "rolling" around its roll centers, hence, anti-roll bars.

Questions or comments please call 408.369.9997 or FAX 408.369.9741
www.smartracingproducts.com

4311XX.ILL Rev. 7

Major Design Premise:

To design a range of ARB's that would have four important features: overlapping rates, standardized mounting, correct kinematics in all positions and ride heights, and **all metric hardware**.

The reasons for these design parameters are as follows:

Overlapping rates: They are required for one simple but important reason: tuneability. If the car is misbehaving because it is determined that one ARB is not stiff enough – or too stiff, you can simply replace that bar with the next one up or down, knowing that there is an approximately 20 percent overlap in rate; the next bar won't be too stiff or too soft.

Standardized mounts: Over time, most cars and drivers continue to develop and get faster and as they do so, often the ARB's are part of the change. In the past, people were reluctant to change the rates of the ARB's because it was very expensive. With our kits all you change is the ARB itself. All of the attaching hardware, bearings and housings, lever arms etc, stay the same! The only cost associated with the change is the price of the bar itself.

Correct Kinematics: One of the biggest gripes I've had over the years is knowing that in certain suspension positions, the kinematics (or motion relationships) were incorrect. With our kits, the kinematics have been computer studied and designed to be as perfect as possible given the basic constraints of the car. No other bar kit on the market even comes close. Our bars can be in the full soft or full stiff position with the suspension in either full bump or full droop and the linkage will operate correctly and never bind. Within the wide range of ride heights, the relationships of connecting links to lever arms to suspension pieces always remain within acceptable geometric limits.

Metric Hardware: Here is the scenario. You are installing your ARB kit and all you have are metric wrenches and assorted tools (by the way, the country is slowly going metric inch by inch!). But now you need a selection of American wrenches to fit your German car! Not with our kit. All fasteners, wrench sizes etc are standard metric sizes and pitches; even our rod ends are genuine Hirschmann - the highest quality German rod ends money can buy.

Car set-up and adjusting guidelines

The following is a general guideline to help you make the most of your SRP ARB kits. Chassis set-up is not as black an art as you might think, it's really just a case of paying close attention to what the car is doing (or telling you while your driving it) and then making the appropriate adjustments.

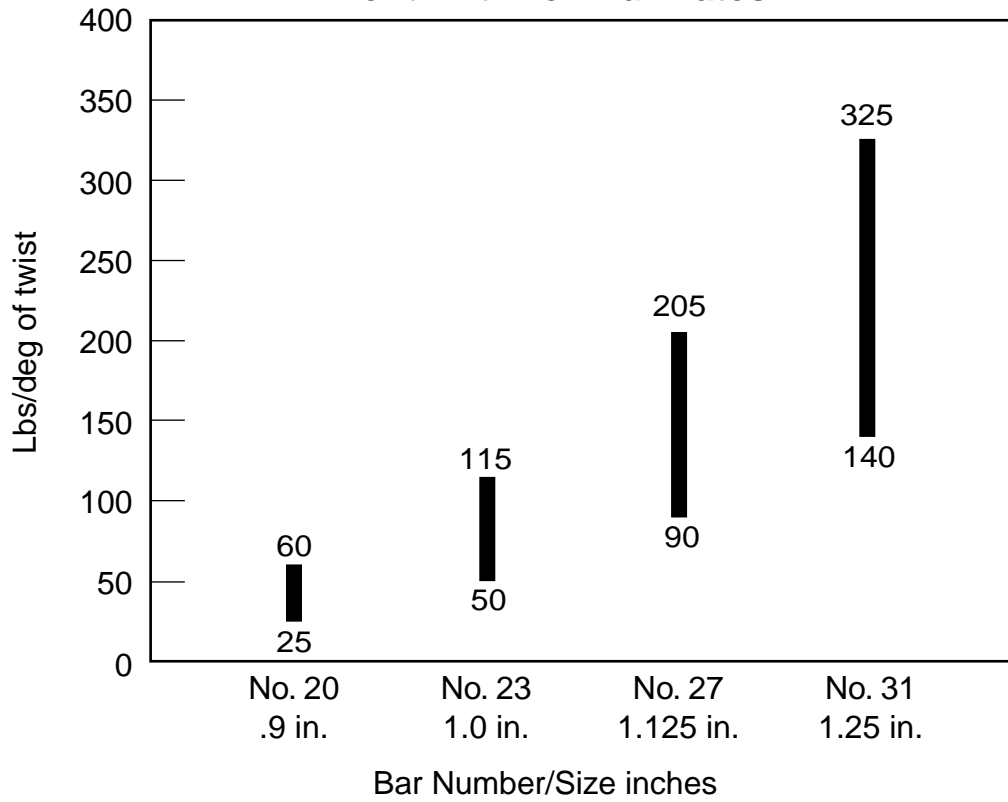
As a general rule, ARB's are used to fine tune the car, that is, if the spring rates are fundamentally wrong, the ARB's will only be able to do so much, and in fact, may be masking another problem. What's the solution? Drive the car at moderate speeds with one connecting link of the front and rear bars disconnected and see how the car feels. Is it loose? Does it push? If it pushes, the front is too stiff. If it is loose, the rear is too stiff. If it feels generally pretty good, then the springs are in the ball park. Now, the ARB's can be a fantastic tuning tool to help you adjust the car to your liking.

Info note: Loose and push definitions. "Loose" refers to the back wheels having too high a slip angle or oversteering. "Push" means the front wheels have too high a slip angle and the car will not turn. Or as Junior Johnson used to say, "if it pushes, it means you go straight into the wall; if it's loose, it means you back into the wall!"

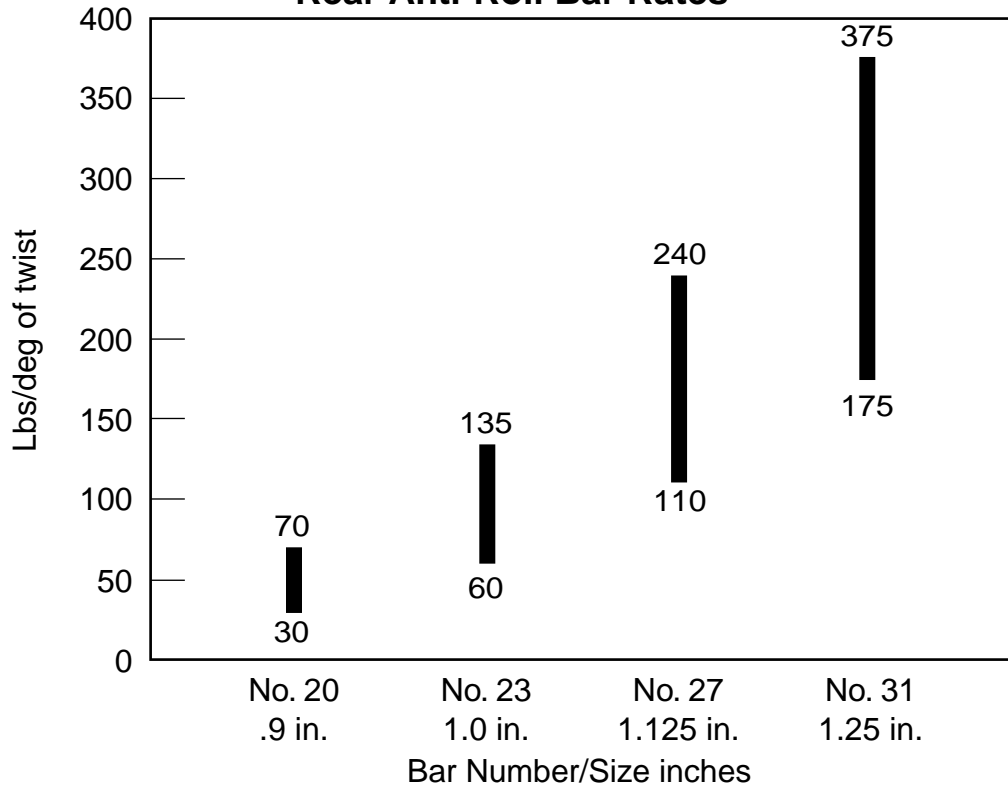
Anti-Roll Bar Rate Chart

Bars can be used front or rear
(Rates vary front to rear because of lever arm lengths)

Front Anti-Roll Bar Rates



Rear Anti-Roll Bar Rates



Installation instructions

Front Anti-Roll Bars (see page 7 for 914 exceptions to instructions)

A. Installing the bearing mounts (do each step to both sides of the car).

Late 911 74-89

1. *Gas tank removal.* Drain the fuel, remove fuel lines, unfasten tank, and remove. When installing a stock fuel tank, replace the foam seal under the tank.
2. *Locating the hole.* The location of the bearing mount is behind the strut on the inner fender well. The fender well has a flat surface with three raised crescent shaped dimples, which helps locate the bearing mount (4) location. The backside of the bearing mount has a groove that sits on the three raised dimples. Position the bearing mount on the grooves.
3. *Drill the pilot hole.* Insert the install tool (34) into the bearing mount. Position the bearing mount over the raised dimples. Then drill a 1/4" pilot hole. This hole will be used for the drilling of the bearing mount holes and the pilot for the hole saw.
4. *Locate the holes for bearing mount.* The bearing mount has six holes that need to be drilled. With the bearing mount and install tool positioned on the fender well, bolt the assembly to the fender well with the nut (36) and bolt (35) provided. The install tool has a lip that clamps down on the bearing mount when bolted to the fender well. The bearing mount is now in position and the six holes can be drilled with a 5/16" or letter O drill using the mount as a guide. After you drill the six holes, remove the bearing mount.
5. *Drill the 1 3/8" hole.* With a 1 3/8" hole saw, drill the hole using the 1/4" pilot hole. Clean and debur the drilled holes.
6. *Install bolts in backing plate.* Install the six 8x25 socket head bolts (2) with a drop of red Loctite into the backing plate (3). Make sure you screw them in all the way. The head of the bolt should be against the backing plate.
7. *Install backing plate and bearing mount.* From inside the trunk, push the backing plate bolts through the holes on the fender well. Now position the bearing mount over the backing plate bolts and fasten with the six 8mm copper nuts (5).

Next see Section B. Bearing mount alignment.

Early 911 69-73

1. *Gas tank removal.* Drain the fuel, remove fuel lines, unfasten tank, and remove. When installing a stock fuel tank, replace the foam seal under the tank.
2. *Locating the holes.* The early cars already have a hole, and three weld-nuts on the chassis behind the front strut. Remove all existing parts, either anti-roll bar or cover plate, for the cars that did not come with roll bars.
3. *Sizing the holes.* Enlarge the center bar holes to match the hole size of the front bearing mount backing plate. Use the backing plate (3) as a template by bolting it to the chassis with three 8mm x 25mm socket head bolts (2). File or grind the hole to match the backing plate hole size.
4. *Drill other mounting holes.* Using the backing plate as a template, bolted to the body, drill three 5/16" holes between the existing factory holes. Then set aside the backing plate as it is not used on early applications.
5. *Install the bearing mounts.* Install the bearing mounts with six 8mm x 25mm socket head bolts (2), six 8mm schnor washers (9), three 8mm flat washers (16), and three 8mm copper hex nuts (5).

Next see Section B. Bearing mount alignment.

B. Bearing mount alignment.

The bearing mounts need to be aligned with each other so the bar moves freely in the chassis.

1. *Install bearings.* Install the two Nyliner Plus bearings (6) into the bearing mounts. There is a tab that prevents the bearing from rotating.
2. *Bearing alignment.* The goal here is to have the bearing mounts parallel and in-line to each other. With both of the bearing mounts loose, slide the anti-roll bar (1) through both bearing mounts. The bar should slide into the other bearing mount with little resistance. Start by tightening the bearing mount slowly while checking rotating resistance of the bar. If the bar starts to bind then check the bearing mount alignment by visually looking at the gap between the back of the bearing mount and the fender well. If the bearing mount is not to flush to the fender well then the alignment is off. Align the mounts by using the bar to bend the fender well until the bearing mounts are flush with the fender well. To do this, slide the bar back towards you and position the bearing surface of the bar

in the mount closest to you. The bar will stick out of the fender well and become an excellent lever to bend the sheet metal. You may have to bend both sides of the car until the mounts are parallel and in-line.

Torque bearing mount to 15 ft. lbs checking to see that the bar stays free.

Make further adjustments if needed.

3. *Lube bearings.* Remove the bar from the car. Apply a small amount of moly lube to the Nyliner bearings. Install the anti-roll bar back in the chassis and check for free movement.

C. Install thrust rings and arms.

1. Install the slider stop screws (10) in both of the arms with a drop of red Loctite.
2. Install the thrust rings (7) and arms (11) on both sides. Make sure the arms are in the same position (index) left to right.
3. Fasten the arms with the 8x25mm socket head bolts (8) and schnor washers (9); **torque to 15 ft. lbs.** Allow a minimal play side to side when you torque the arms.

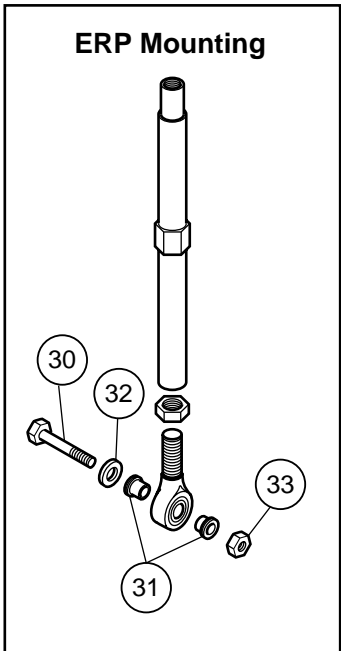
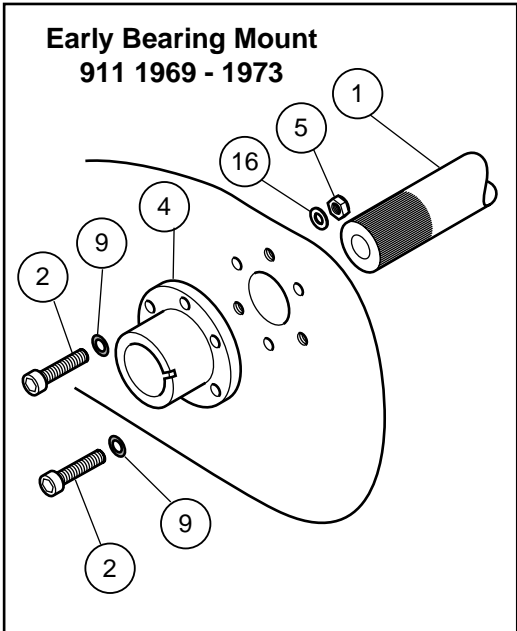
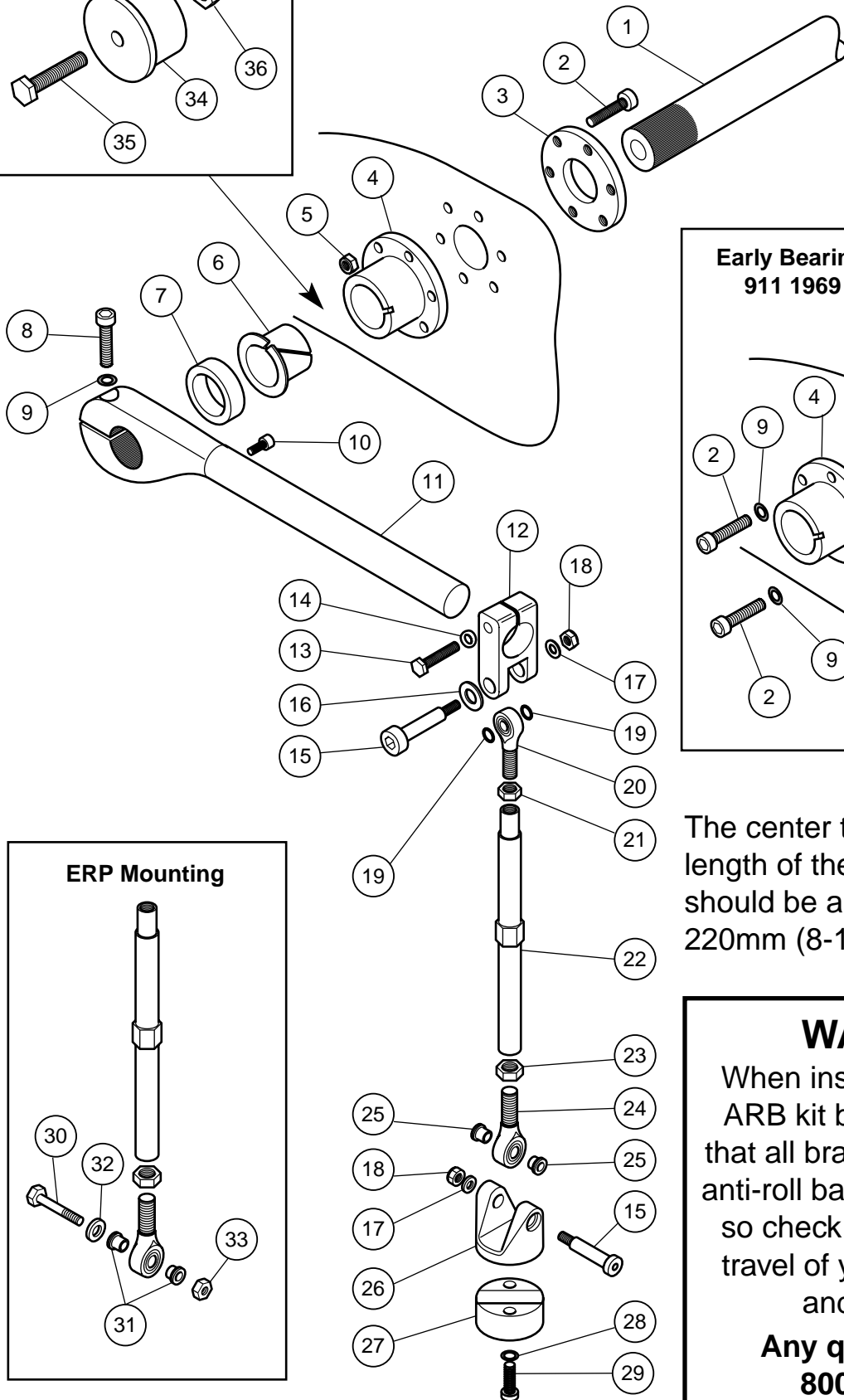
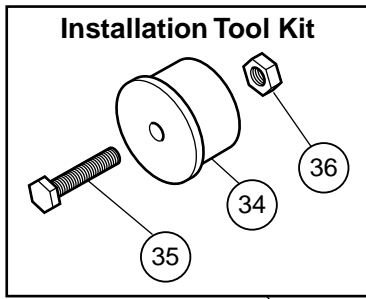
D. Drop link assembly. Assemble the complete drop link before installing on car.

1. *Assemble drop link.* Install the jam nuts (21 & 23) on the rod ends (20 & 24) and screw the rod ends into the drop link (22) with some anti-sieze on the threads. The center to center length of the drop link should be about 220mm (8-11/16 in.). Be sure to screw in the rod ends equal amount on both ends.
2. *Assemble drop link to slider.* Insert the 8mm rod end (20) and two of the 8mm hinge rings (19) into the slider (12). The hinge rings are on either side of the rod end. Slide the 6mm x 8mm x 30mm socket head shoulder bolt (15) through the 8mm flat washer (16), the slider, hinge ring, and rod end. Fasten the shoulder bolt with a 6mm flat washer (17), and a 6mm nylock nut (18); **torque to 6 ft. lbs.** Now install the 6mm x 30mm hex head bolt (13) and 6mm wavy washer (14) into the top of the slider with some anti-sieze on the threads. Do not tighten at this time. Now assemble the other side the same way.
3. *Assemble drop link assembly to lower attachment* (not done if ERP control arms are used). Insert the two rod end bushes (25) into the 10mm rod end (24) and slide into the lower attachment (26). Now slide the 6mm x 8mm x 30mm socket head shoulder bolt (15) through the lower attachment, bushing, and rod end. Fasten with the 6mm flat washer (17), 6mm nylock nut (18), and **torque to 6 ft. lbs.** Do the same for the other side.

E. Final assembly

1. *Install slider and lower attachment.* First, there is a difference between the left and right with the lower attachment (26). The lower attachment is mounted to the control arm on the diagonal tube that runs from the torsion tube to the ball joint. The shoulder bolts (15) that go through the lower rod end and lower attachment will run parallel to the torsion bar tube. If the bolt is not parallel to the torsion bar tube then the drop link assembly is on the wrong side. Now slide the slider over the arm. Make sure the clamp bolt (13) of the slider is facing you. Next fasten the lower attachment to the diagonal tube of the control arm (clean the diagonal tube before clamping lower attachment). Align the attachment bottom (27) and fasten with two 6mm x 20mm socket head bolts (29) with some anti-sieze, two 6mm schnor washers (28), and **torque to 8 ft. lbs.** The lower attachment should be positioned as close to the ball joint as possible. The ERP control arm lower attachment is different. Install the lower rod end to the control arm with a 3/8" hex bolt (30), two lower bushings (31) for ERP arms on both sides of the rod end, 3/8" flat washer (32), and 3/8" jet nut (33); **torque to 15 ft. lbs.**
2. *Adjustment.* The anti-roll bars now need to be adjusted for zero pre-load. First, check to make sure the sliders (12) are in the same position left to right and **torque the clamp bolt (13) to 6 ft. lbs.** With the car sitting level and the wheels straight, adjust the drop link (22) on both sides until the rod ends move freely in the slider and lower attachment. Once set, tighten the four lock nuts (21 & 23) on the rod ends. Now you are ready to adjust the anti-roll bars to your suspension needs.
3. ***After final assembly.* Be sure to check that all brake lines are clear of the anti-roll bar. Be sure to check the full range of travel of your suspension and steering. Steering rack turning limiters are available, Part No. 476110. Any questions please call 1-800-383-0808.**

FRONT ANTI-ROLL BAR



The center to center length of the drop link should be about 220mm (8-11/16 in.)

WARNING
When installing your new ARB kit be sure to check that all brake lines clear the anti-roll bar kit. When doing so check the full range of travel of your suspension and steering.
Any questions call 800-383-0808.

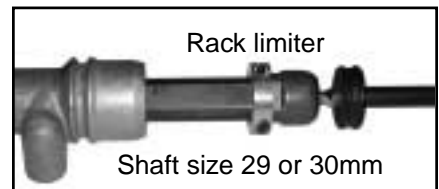
Front Anti-Roll Bar Parts List

Item	Qty	Part #	Description & Order Quantity
1	1	431110	Anti-Roll Bar No. 20
-	1	431120	Anti-Roll Bar No. 23
-	1	431130	Anti-Roll Bar No. 27
-	1	431140	Anti-Roll Bar No. 31
2	12	431680	M8 x 25 socket head bolt
3	2	431260	Front bearing mount backing plate
4	2	431250	Front bearing mount
5	12	431700	M8 copper M12 hex nuts
6	2	431270	Nyliner Plus bearing
7	2	431280	Front/Rear thrust ring
8	2	431680	M8 x 25 socket head bolt
9	14	431640	M8 schnor washers
10	2	431710	M4 x 8 socket head cap screws
11	2	431200	Front lever arm
12	2	431240	ARB slider
13	2	431730	M6 x 30 Hex head bolts
14	2	431670	M6 wavy washers
15	4	431600	M6 x 8 x 30 socket head shoulder bolt
16	8	431660	M8 flat washers
17	4	431610	M6 flat washers
18	4	431620	M6 nylock nuts
19	4	431220	M8 Hinge Rings
20	2	431310	M8 LH Rod End
21	2	431320	M8 LH jam nut
22	2	431210	Front drop link
23	2	431300	M10 RH jam nut
24	2	431290	M10 RH rod ends
25	4	431230	Front lower bushing
26	1	431330	Front left attachment
-	1	431340	Front right attachment
27	2	431350	Front attachment bottom
28	4	431630	M6 schnor washers
29	4	431650	M6 x 20 socket head bolts
30	2	431750	3/8" AN hex bolt
31	4	431235	Front lower bushing for ERP arm
32	2	431760	3/8" Flat washer
33	2	431770	3/8" Jet nut
34	1	431810	Install tool
35	1	431820	Install tool bolt 6mm x 40
36	1	431830	Install tool nut 6mm

Turning Radius Limiter (29mm 476100 or 30mm 476120)

Cars with larger tires may have a problem with wheel well and caliper clearance. Using our steering rack limiters will limit the turning radius so there is tire and caliper clearance.

1. To install the limiters you must slide the rack boots back and clamp the limiters on the shaft. The limiters do not clamp tight on the shaft.



914 installation notes:

Cut out in this area as needed

1. To install the bearing mount backing plate, an opening must be cut in the bulkhead inside the trunk (under gas tank) to allow access to the back side of the fender well.
2. Use two (431280) thrust rings per side between the lever arm and the bearing mount.



Rear Anti-roll Bars

A. Install bearing mounts and bar.

1. Remove old anti-roll bars if applicable.
2. Install the four 8mm x 31mm studs (3) into the anti-roll bar mount bracket on the chassis. Use red Loctite and leave the stud sticking out 16mm.
3. Install the bearing mounts over the four mounting studs (be sure notch for aligning bearing is to the outside of car) installed in step 2. Secure the mounts with four 8mm x 12mm hex flange nuts (4).

B. Bearing mount alignment.

The bearing mounts need to be aligned with each other so the bar moves freely in the chassis.

1. *Install bearings.* Install the two Nyliner Plus bearings (5) into the bearing mounts. There is a tab that prevents the bearing from rotating.
2. *Bearing alignment.* Slide the anti-roll bar (1) through one side and check the alignment with the other. The bar should slide into the other bearing with little resistance. If the alignment is off, pull the bar back towards you. Position the bar in the bearing mount so the bearing surface of the bar is in the Nyliner bearing. Use the bar as a lever to bend the mount. Keep tweaking the mounts, 1st tweak one side, and then the other until the bar is in both mounts and movement is free; **Torque bearing mount to 15 ft. lbs checking to see that the bar stays free. Make further adjustments if needed.**
3. *Lube bearings.* Remove the bar from the car. Apply a small amount of moly lube to the Nyliner bearings. Install the anti-roll bar back in the chassis and check for free movement.
4. *Note.* The chassis bearing mounts should be reinforced with more threads and a gusset plate. The larger bars will require a stronger mount than the stock one. We have a kit you can weld to your existing mounts or you can purchase mounts already modified.

C. Install arms.

1. Screw the two 8mm x 35mm socket head bolts (8) and two 8mm schnor washers (9) into both of the rear lever arms (7). Do not tighten at this point.
2. Put the two rear thrust rings (6) on to either end of the rear bar.
3. Slide the rear lever arm over either end of the rear bar. Make sure the arms are in the same position (index) left to right.
4. Rotate the arms so they both point to the ground and **torque** the 8mm x 35mm socket head clamp bolt (8) **to 15 ft. lbs.** There should be minimal side to side movement.

D. Install trailing arm mounts.

1. Screw the trailing arm mount stud (21) into the trailing arm mount (20) with a couple of drops of red Loctite. Screw the stud in until the transition from 12mm to 8mm is flush with the tapered end of the mount. Later, when you install the 8mm rod end (18) on the end of the stud, the rod end should be flush with the trailing arm mount.
2. Remove the toe adjusters from the trailing arms. The trailing arm has four bolts that fasten it to the spring plate. The forward most bolt is the toe adjusting bolt. Loosen and remove only the toe adjusting bolts so you don't lose your alignment settings. Be sure to keep the toe bolts handy for future alignments.
3. Install the trailing arm mounts (20) and studs (21) where the toe bolts were with a 12mm schnor washer (22) and 12mm nut (23); **torque to 50 ft. lbs.** Not all of the aluminum trailing arms are flat where the mount rests against the arm. Use a hand file to smooth the area before mounting the trailing arm mounts.

E. Install drop links.

1. Screw the jam nuts (15 & 17) on the four 8mm rod ends (14 & 18), both left and right hand threads.
2. Thread the four rod ends, with anti-sieze into the two rear drop links (16).
The center to center length of the drop link assembly should be about 135mm (5.3in.).

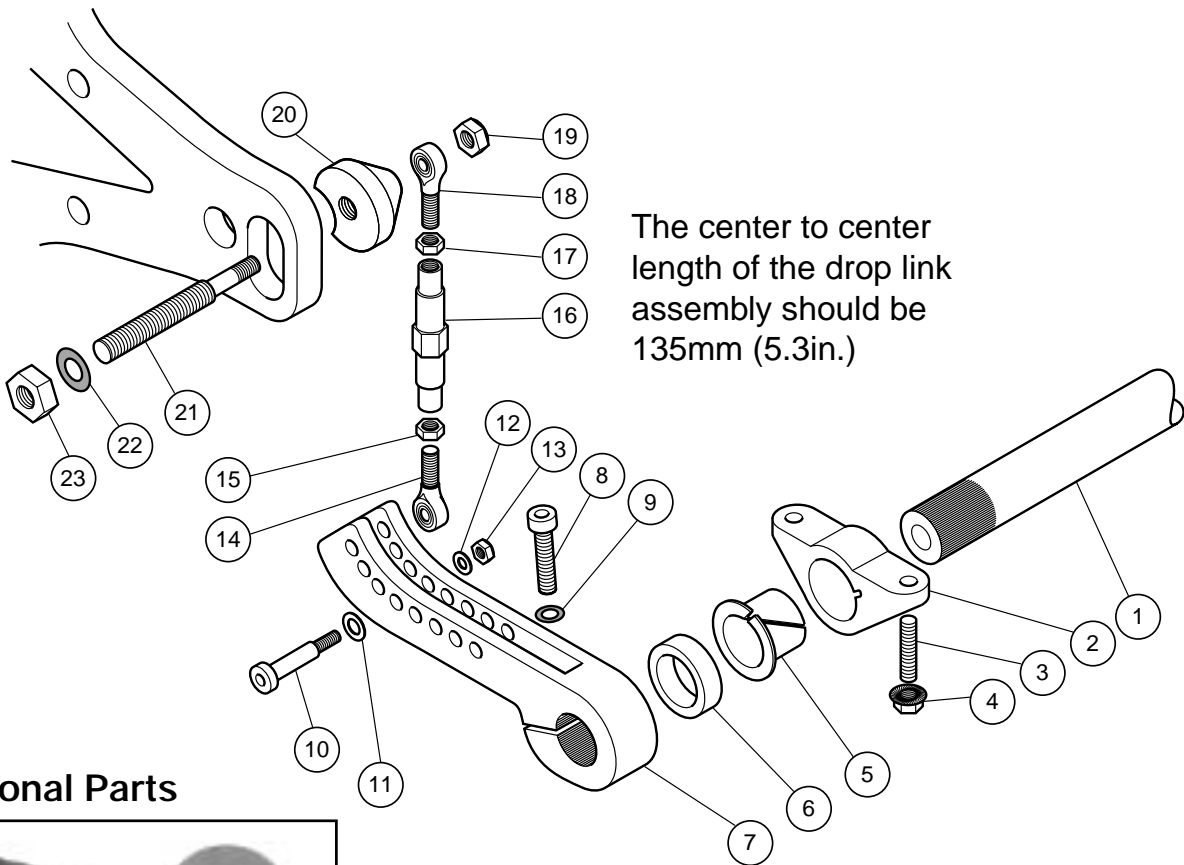
3. Install both of the drop link assemblies on to the trailing arm mount studs (21) with a 8mm copper 12mm hex nut (19); **torque to 13 ft. lbs.**
4. Attach one of the drop link assemblies to the rear lever arm (7). Pick a hole and use the 6mm x 8mm x 25mm socket head shoulder bolt (10), 8mm flat washer (11), through the arm, through the rod end, then a 6mm flat washer (12), and fastened with 6mm nylock nut (13); **torque to 6 ft. lbs.**
5. Now, lower the car on a level surface. With the car at ride height, adjust the drop link assemblies so that the second link bolts in easily. The 6mm x 8mm x 25mm socket head shoulder bolt (10) should slide in easily. Once adjusted, fasten as the other side.
6. Finish by tightening the jam nuts (17 & 15) on the rod ends. The rear anti-roll bar is ready to tune to your chassis needs.

Note:

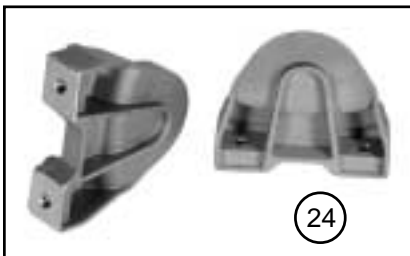
Turbo chassis can be a problem with the swaybar position and the rear transmission mount. We've solved the problem the following ways:

1. If it is close to fitting, we machine the steel transmission mount to clear the bar.
2. If it is not even close to fitting, we cut and weld stronger rear swaybar mounts in a more favorable position to clear the transmission mount.
3. Make spacers for mounts to lower bar.

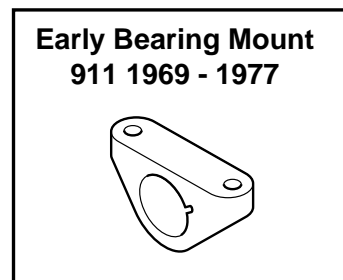
REAR ANTI-ROLL BAR



Optional Parts



WEVO rear ARB mounting console fits '72-89 911's earlier cars take some modification to install. Part Number 533015



Rear Anti-Roll Bar Parts List

Item	Qty	Part #	Description & Order Quantity
1	1	431110	Anti-Roll Bar No. 20
-	1	431120	Anti-Roll Bar No. 23
-	1	431130	Anti-Roll Bar No. 27
-	1	431140	Anti-Roll Bar No. 31
2	2	531210	Rear bearing mount late
-	2	531250	Rear bearing mount early
3	4	531620	M8 x 31 studs
4	4	531630	M8/12 hex flange nuts
5	2	431270	Nyliner Plus bearing
6	2	431280	Front/Rear thrust ring
7	2	531201	Rear lever arm
8	2	531640	M8 x 35 socket head bolt
9	2	431640	8mm schnor washers
10	2	531650	M6 x 8 x 25 Socket head shoulder bolt
11	2	431660	M8 flat washers
12	2	431610	M6 flat washers
13	2	431620	M6 nylock nuts
14	2	431310	M8 LH Rod End
15	2	431320	M8 LH jam nut
16	2	531220	Rear drop link
17	2	531610	M8 RH jam nut
18	2	531600	M8 RH Rod ends
19	2	431700	M8 copper 12mm hex nuts
20	2	531230	Trailing arm mount
21	2	531240	Trailing arm mount stud
22	2	531660	M12 schnor washers
23	2	531670	M12 x 1.5 nuts
Optional Parts			
24	2	533015	WEVO rear ARB mounting console