FOREWORD

The Datsun 1200 development program was initiated by the Datsun Competition Department to improve the overall performance potential of the 1200 chassis for SCCA C sedan competition. The project had three primary goals:

1. To obtain maximum chassis performance at minimum cost.
2. To produce a handling package requiring a minimum number of chassis modifications, i.e. a bolt-on competition suspension kit.
3. Winning the National C sedan championship.

At the end of the first season all three goals were attained, and you can benefit from the results of this extensive development program.

The project was guided by Dick Roberts, head of the Datsun Competition Department, using the George Eickhoff 1200 sedan as the development car. The 1200 suspension was prepared by Trevor Harris and the car was driven by Don Devendorf. During the first season of development, Devendorf captured every pole position and won every race he entered. He ended the year with a pole position and class win at the Nationals at Road Atlanta. This book is a step-by-step guide to duplicating that winning set-up.

Before fabricating any parts, it is essential that you read all the instructions and study the blueprints carefully. Beside some of the figure numbers throughout the book you will find a "zone" number which will indicate the position of that particular part on the enclosed blueprints. Note that many suspension components are left stock with no modifications whatsoever. The front crossmember, lower control arms (with stock rubber bushings), the steering links, and tie rod ends all remain stock and have held up well in competition.

Notice that the rear axle depends on the springs for lateral location, and uses no panhard rod, watts linkage, or any other lateral locator, Relatively simple traction bars prevent axle wind-up and provide the fore-aft location.

This chassis set-up has repeatedly proved itself in competition, yet remains relatively simple and inexpensive to fabricate. All the information necessary to duplicate Eickhoff's 1200 is provided. The rest is up to you.

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FRONT SUSPENSION MODIFICATIONS

For road racing, the front suspension of the race car must be modified to improve handling and maneuverability. This is done by: lowering the car (thereby lowering the center of gravity); reducing body roll by increasing roll stiffness; and, by improving high speed stability.

Along with the above improvements, the Datsun 1200 is further modified to allow the use of superior brake components and is also converted to a fully adjustable suspension system.

The Datsun 1200 suspension, modified following the procedures in this manual, will provide the following features:

1. **Camber Adjustment** – The front strut tower is modified to allow the camber to be adjusted as needed.

2. **Increased Caster** – The tension rods are altered to provide an optimum increase in caster of 4° over stock.

3. **Adjustable Ride Height** – A threaded collar is added to the strut assembly to allow the height of the car to be varied depending on track conditions.

4. **Lower Center of Gravity** – The stock front springs are replaced with stiffer, lower competition units that reduce front car height by 2-inches.

5. **Improved Brakes** – The stock 1200 brakes are discarded and the competition strut assembly is modified to accept the more efficient 240-Z disc brake components.

6. **Roll Stiffness** – Replacing the stock springs with stiffer units and adding a heavier sway bar increases suspension stiffness and reduces body roll.

Front Camber Adjustment

To allow for camber adjustments, the holes in the top strut mounting point must be elongated to 9/16-inch in length, as shown in Fig. 1. Note that the outboard mounting hole extends into the large hole provided for the upper portion of the strut assembly. Tin snips can be used to increase the size of the large opening and the outboard mounting hole. The two remaining mounting holes can be elongated with the proper size drill and a round file.

To gain the maximum amount of adjustment, it may be necessary to file down the top strut mounting insulator to obtain the necessary clearance between it and the shock tower. (Fig. 2)

Check the clearance by placing the assembled strut into position and moving the top of it as far inboard as possible within the limits of the mounting holes. If part of the strut mounting insulator hits radius "X" (Fig. 1) of the strut tower, then that portion of the insulator should be filed off.

During final installation of the modified strut assembly, place large (1-inch diameter) washers under the stock strut mounting nuts and lockwashers.

Aside from the possibility of a slight amount of filing (for clearance), the top strut mounting assembly remains stock and is entirely adequate for competition road racing purposes. No modifications are made to the top spring seat or the top pivot bearing.

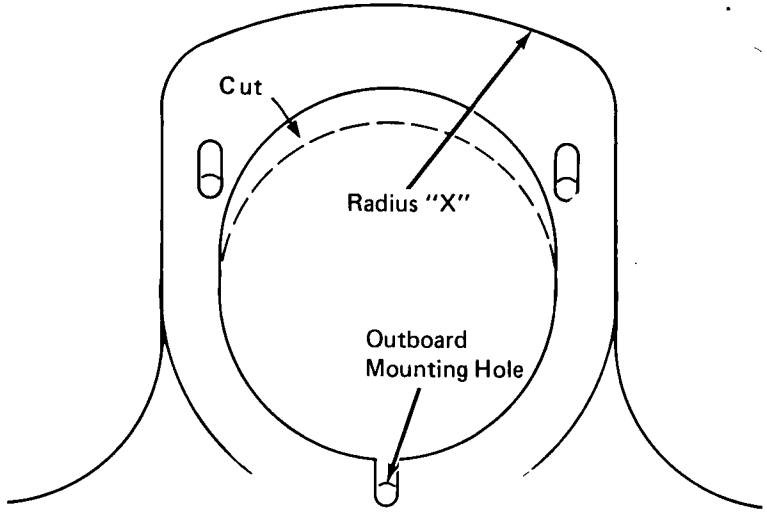


Fig. 1 *(Zone 1B)*

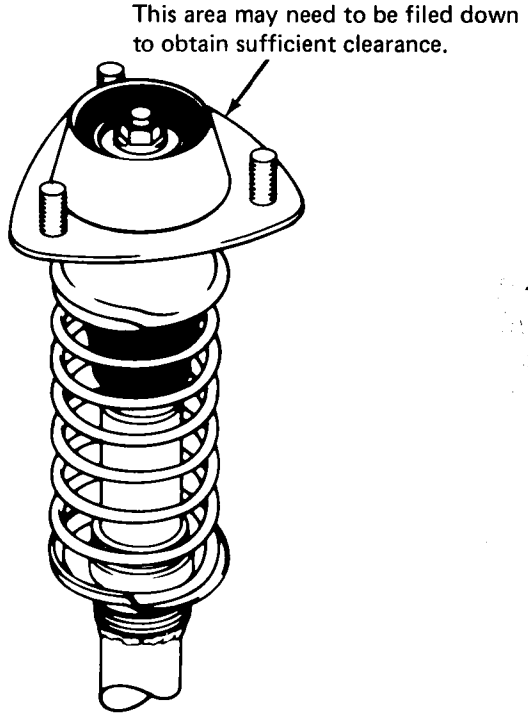


Fig. 2

Adjustable Ride Height

In road racing, it is important to have an easily adjustable ride height. Due to the simplicity of design of the Datsun front suspension, this can easily be accomplished with a small amount of machine work and welding. Basically, this modification consists of adding a threaded collar to the competition front strut assembly which allows a specially fabricated spring seat to move up and down. Thus the ride height can be adjusted to suit various track conditions.

The first step is to cut the stock spring seat from the competition strut tube using a lathe. (The seal at the top of the strut can be removed in order to fit the strut tube into the lathe chuck and it can be later replaced without fear of damaging the shock in any way.) Be careful not to cut into the strut assembly. **Confine all cutting to the spring seat and the weldment.** Leave a small portion of the stock spring seat weldment on the strut tube. This will serve as a seat for the threaded adjustment collar that will be slipped over the tube. (Fig. 3)

Fabricate the threaded collar following the blueprints provided. The collar is made from 2-inch diameter, 109-inch wall, mild steel tubing.

Attach the threaded collar to the strut by tack welding it with **Heliarc** (or epoxy). **Do not gas weld or use regular arc welding!** The strut is a sealed unit and contains oil. Do not overheat and do not disassemble. (Fig. 4)

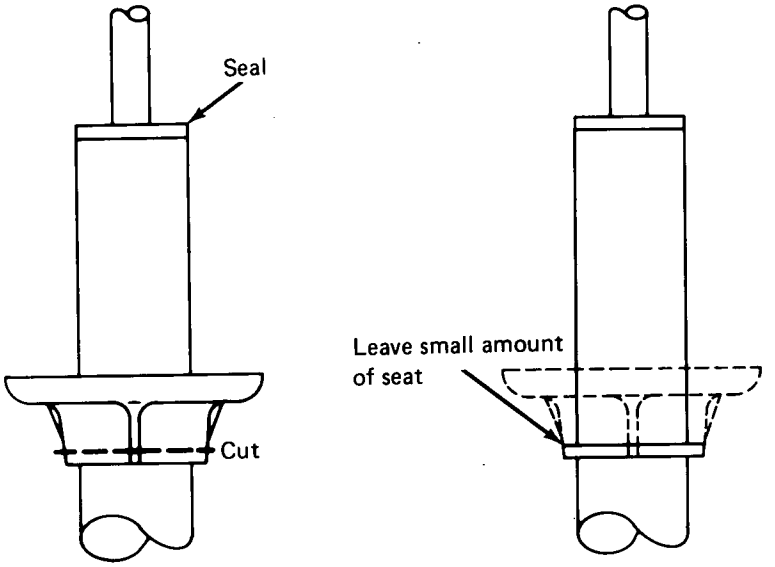


Fig. 3

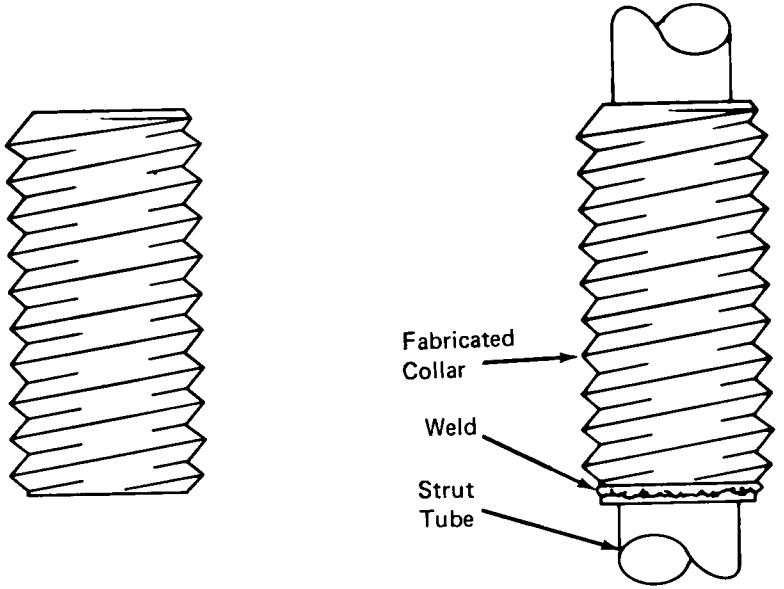


Fig. 4 *(Zone 8D)*

To fabricate the adjustable lower spring seats, start with two upper spring seats (part number 54040-H1000). Follow the instructions on the blueprints and, using a lathe, cut a 2¼-inch hole in the center of each spring seat. Fabricate two threaded collars according to the dimensions given on the blueprints and weld the collars to the spring seats as shown. Mild steel tubing can be used for the collars. (Fig. 5)

Note: Struts already modified for adjustable ride height are available from the Datsun Competition Department. Part numbers are 54302-H1072 and 54303-H1072.

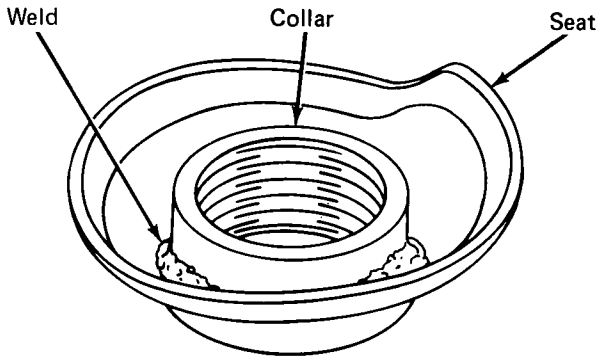


Fig. 5 *(Zone 7H, 7C)*

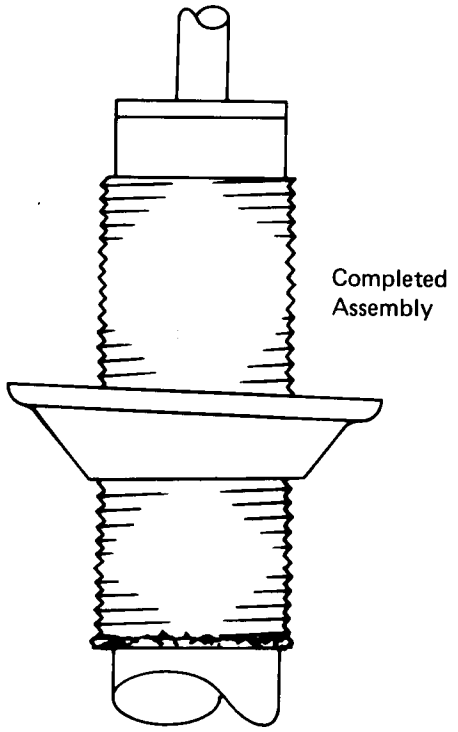


Fig. 6 *(Zone 8H)*

Modified Strut Caliper Mount

For competition purposes, the stock 1200 front brakes are replaced with 240-Z disc brakes. In order to adapt the more efficient disc brake components, the competition strut must be modified.

The first step is to cut off a portion of the caliper flange. Scribe a line on the caliper flange as shown in Fig. 7 and cut (hacksaw or bandsaw) the caliper mounting "ear" off. (Strut part numbers 54302-H1024 and 54303-H1024).

Fabricate a new ear (caliper mount) from 5/8-inch C1018 mild steel following the specifications given in the blueprints.

Clamp the new ear to the strut so that the plane of S1 coincides with the plane of S2. It is extremely important that the ear be located very precisely (Fig. 9).

Using a heliarc, tack weld the ear to the strut using No. 316 rod and then check the alignment. When the two parts are lined up properly, weld completely around the part line.

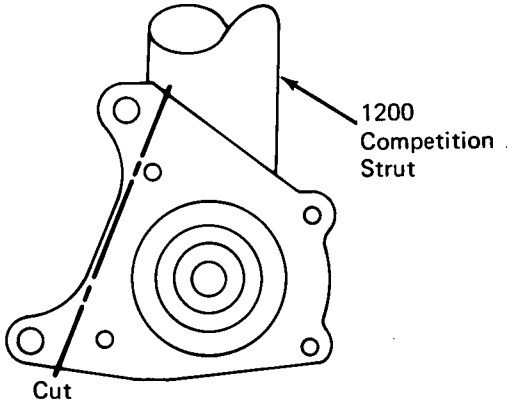


Fig. 7 *(Zone 2B)*

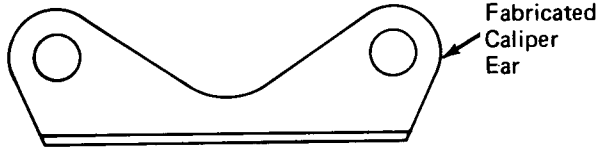


Fig. 8 *(Zone 1D)*

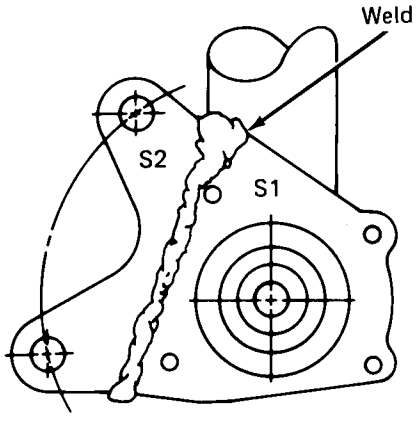


Fig. 9 *(Zone 3B)*

Front Hub

In order to increase the tread width and to allow the use of the 240-Z disc brake set-up, a new hub must be fabricated from 2024T3 or 7075T6 aluminum stock. With the new hub, modified 240-Z discs are used. Also, using a 7/8-inch offset wheel, the track will be increased to 52 inches. (This is the maximum legal width under SCCA rules).

1. Fabricate the front hub according to the specifications provided on the blueprint.

   Important Note: Two bearing removal reliefs must be provided on each bearing seating surface. These reliefs can be made with a hand-held grinder or a high speed electric drill. (See Fig. 11)

2. The finished hub should be heated to approximately 212° F and the bearing races installed. The hub is set up to accept stock 1200 inner and outer bearings and stock bearing seals.

3. The wheel stud holes should be reamed to .5±.001 inch to accept Tilton Engineering studs. The studs (4) locate on a 4½-inch diameter bolt circle (Fig. 12).

4. The four holes to mount the brake disc have a bolt circle diameter of 4.058-inch and are 7/16 x 14, .800 inch deep. Index the disc bolt holes between the wheel stud holes.

   The bolts which hold the rotor to the hub are 7/16 x 14 x 1.0 fully threaded grade 8.

   Note: A good black anodized coating will help to protect the surface from scratches.

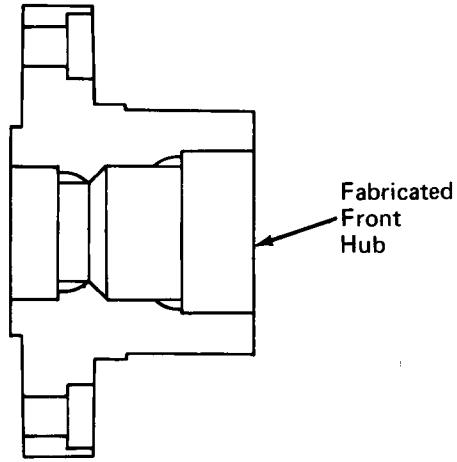


Fig. 10 *(Zone 6B)*

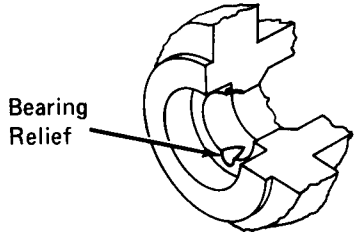


Fig. 11 *(Zone 6B)*

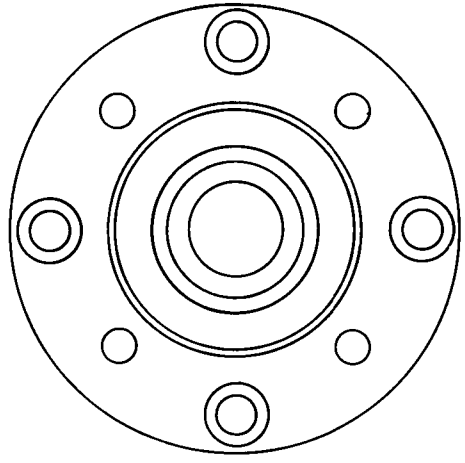


Fig. 12 *(Zone 6B)*

Disc Brake Rotor

The disc brake rotor is a modified, stock 240-Z unit (part number 40206-E4101).

The first step in adapting the 240-Z rotor to the 1200 is to machine the outside diameter of the rotor to 10.312±.025.

Machine radius "X" (see Fig. 13) to clear the hub flange radius. (Radius –.250).

Machine surface S, Fig. 13, to remove casting marks, (optional)

Note: The rotor inside diameter must clear the hub by .002 to .004-inch to allow for heat expansion.

Rotor mounting bolts should be fully threaded, 1.0-inch shank length, grade 8. Torque the bolts to 40 lbs. and secure with Lock-Tite and safety wire (Fig. 14).

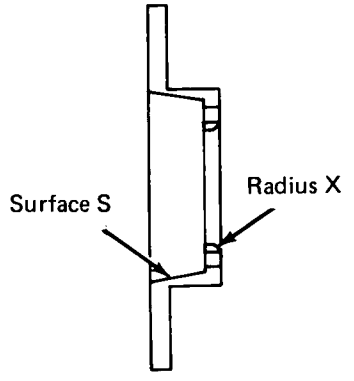


Fig. 13 *(Zone 4C)*

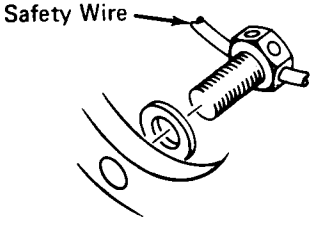


Fig. 14

240-Z Caliper Modification

The 240-Z disc brake calipers have to be modified for proper clearance. The outside of each caliper should be ground down slightly to provide adequate wheel clearance. Also approximately 1/8-inch of material must be removed from the bottom of the caliper to clear the brake disc. The shaded areas in Fig. 15 illustrate the areas to be ground down.

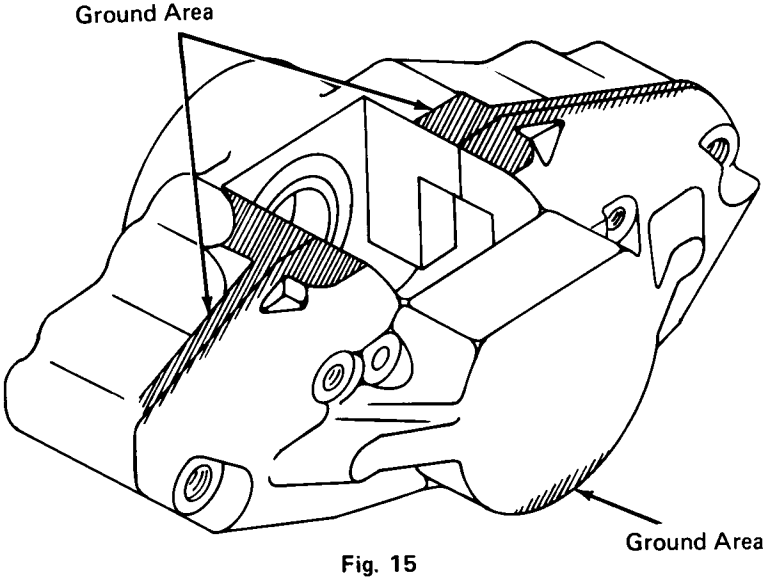
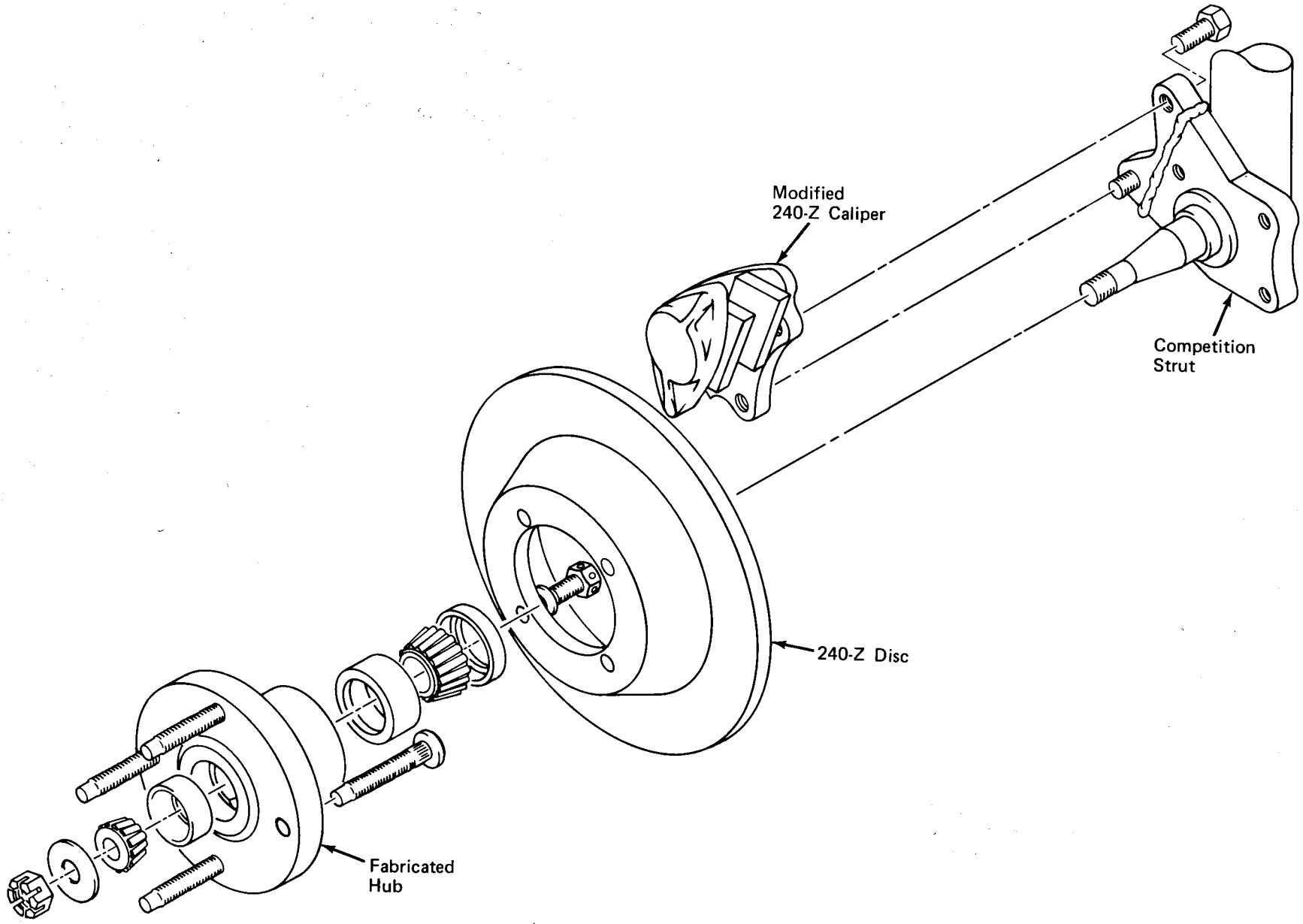


Fig. 15



Complete Competition Front Brake Assembly

Fig. 16

Front Springs

The Nissan front racing springs, part number 54010-H1070 should be used. These competition units have a spring rate of 110 lbs/per inch and lower the car approximately two inches. If desired, the car can be further lowered by cutting one coil from each of the springs. If this modification is used, the coil ends should be reshaped to fit the spring seats. The spring ends can be reshaped simply by heating with a torch, shaping and being allowed to air cool. This can be done without affecting the spring temper. (It is not necessary to heat treat or re-temper.)

A ½-inch thick bump rubber must be installed on the shock rod. These can be made by cutting down the stock rubber bumpers.

Although not normally recommended, if stiffer springs than the cut down 1200 competition units are needed, 240-Z competition springs may be modified to fit. Both the outside and inside diameters are the same as 1200 springs. However, when using springs which are stiffer than the cut down 1200 units, steps must be taken to keep the spring from falling out of the lower seat at full suspension droop. The end coils of the spring must be securely wired or strapped to both the top and bottom seats.

This tendency for the springs to fall out of the lower seat is the major problem in using a stiffer unit and extreme care should be taken to securely anchor the spring if this modification is used.

Note: When the front end is lowered and a wider racing tire is used, the inner wheel well must be modified for proper tire clearance and a fender flare must be added.

Lower Link and Steering Gear

The complete lower suspension link can be left stock, The inner chassis mount rubber bushing may also be left stock since it is very rigid and deflects a minimal amount while cornering.

The complete steering linkage assembly is adequate for competition purposes. This includes the steering gear box, tie rods, tie rod ends, all steering arms, idler arm assembly and the lower ball joint.

Tension Rod and Bushing Modification

High speed stability can be enhanced by increasing the caster. On a Datsun 1200, this is accomplished by remachining the tension rods .600 of an inch as shown in Fig. 17. This shortens the rod and pulls the bottom of the strut foreward to obtain approximately 4° of additional caster.

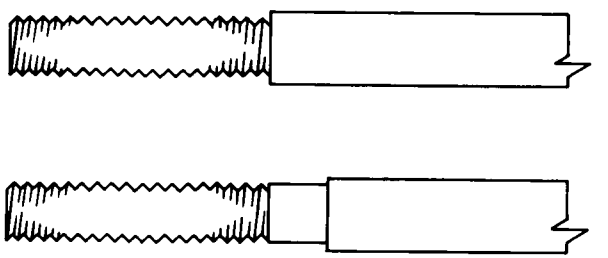


Fig. 17 *(Zone 1H)*

The stock tension rod rubber bushings are too soft for competitive use. Replace them with two Balkamp (NAPA) motor mount rubbers, part number 3-5121. The Balkamp rubber bushings have an outside diameter of 1.5-inches and a thickness of .850-inch. The only modification needed is to enlarge the center hole from 3/8-inch to 5/8-inch (Fig. 18). When installing the rubber bushings on the modified tension rods, use all the stock washers and spacer sleeve.

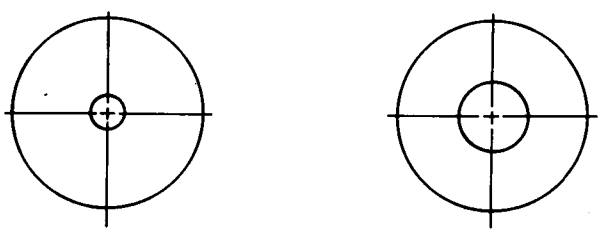


Fig. 18 *(Zone 3A)*

Sway Bar Assembly

In a competition car, it is imperative that body roll and subsequent weight transfer be held to a minimum. To help accomplish this, the stock sway bar on the 1200, which is not suitable for competition, must be replaced with a stronger one.

To fabricate a suitable competition sway bar, obtain a 4-foot length of 1.0-inch diameter Stressproof bar or equivalent. Stressproof can be torch heated to a dull red color, bent, and allowed to slowly air cool. Do not quench. The material does not have to be re-heat treated. (Stressproof is avialable from outlets of the La Salle Steel Company.)

Use the stock sway bar as a template and bend the Stressproof to the proper shape. (A full scale, detailed drawing of the competition sway bar is included on the enclosed blueprint.) Once the Stressproof is bent, check to see that there is sufficient clearance between the forward sway bar loop and the oil pan and filter. Also check the clearance around the tension rod carefully (Fig. 19).

Carefully locate and drill three, 3/8-inch link attachment holes in each of the sway bar ends. Grind or file the outside surface of the ends flat in order to allow proper seating of the sway bar rod end links (Fig. 20).

Be certain the link attachment holes are laid out the same distance from the sway bar pivot (mount bushings) centerline on each sway bar end. Dimensions should be held to a tolerance of 1/16-inch.

To attach the sway bar to the car, two sway bar mounting brackets must be fabricated. These brackets should be made from .065–.083 inch, mild steel. The easiest way to put the proper bend into the brackets is to clamp the bracket material to a short length of 1.5-inch water pipe. Then heat the bracket with a torch and pull it half way around the pipe until the proper bend is achieved (Fig. 21).

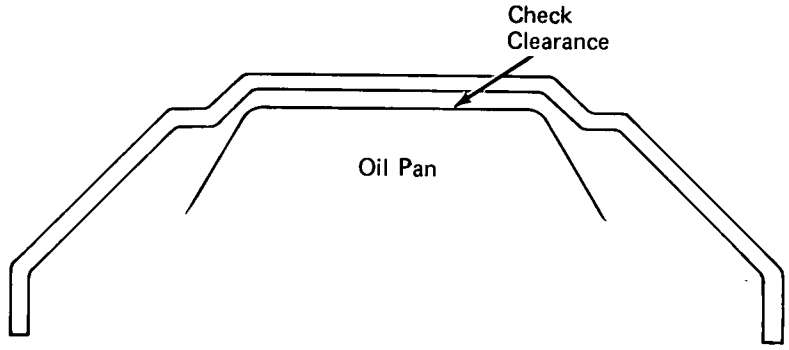


Fig. 19 *(Zone 4H)*

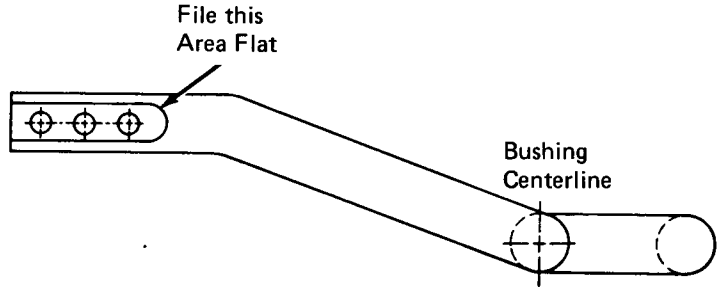


Fig. 20 *(Zone 7G)*

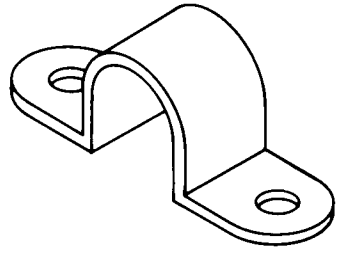


Fig. 21 *(Zone 6G)*

An additional aluminum spacer may be required to keep the sway bar from hitting the frame at full bump (Fig. 22). If possible, use 1.5-inch socket head (allen) bolts to hold these brackets to the frame.

The rubber bushings required for the sway bar mounting brackets can be made from 59-60 Ford items. (Ford part number B9A-5493B.) The only modification necessary is to bore the hole out from 15/16-inch to 1.0-inch (Fig. 23).

The final parts necessary to attach the sway bar to the chassis are two link assemblies (Fig. 24).

Note: When the link mounting bolt is firmly torqued into the 3/8-inch rod end, the link rubbers should be compressed to about 3/8-inch thickness (each). If the bolt bottoms into the rod end before this amount of compression is reached, adjust the spacer length by adding 3/8-inch washers.

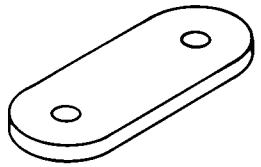


Fig. 22 *(Zone 2F)*

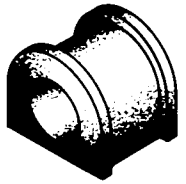


Fig. 23 *(Zone 5F)*

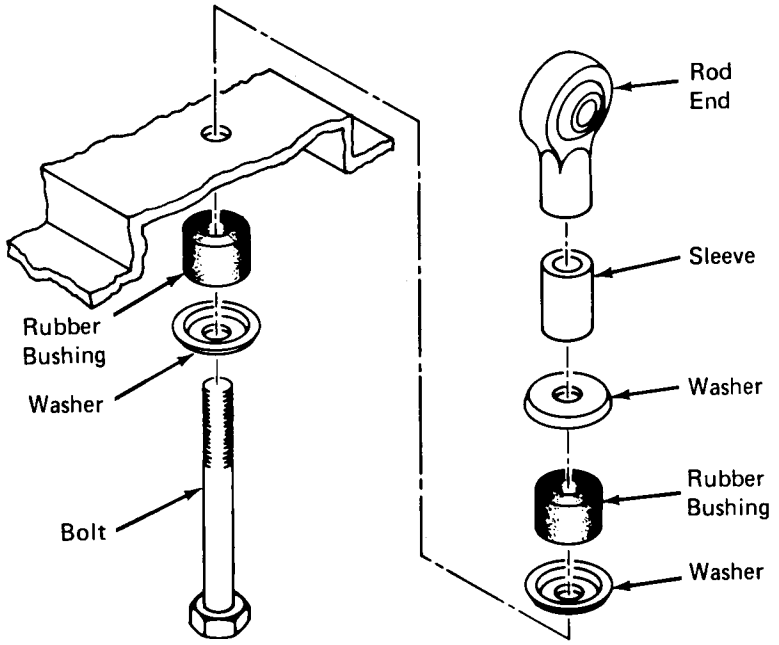


Fig. 24 *(Zone 3F)*

Front Competition Suspension Assembly

The following are the steps in assembling the Datsun 1200 competition front suspension. If any general information is required, refer to the Datsun 1200 factory service manual.

1. Bolt the 240-Z brake rotor to the newly fabricated hub. (Safety wire mounting bolts.)

2. Install all bearings and seals. (Stock 1200 bearings and seals are used.)

3. Attach the hub/rotor assembly to the competition strut using the stock mounting hardware.

4. Bolt the 240-Z caliper to the specially fabricated mounting "ear" on the strut. (Use competition brake pads, part number 99996-E7010.)

   Note: The lower caliper bolt head may have to be thinned to approximately .20-inch for adequate steering clearance.

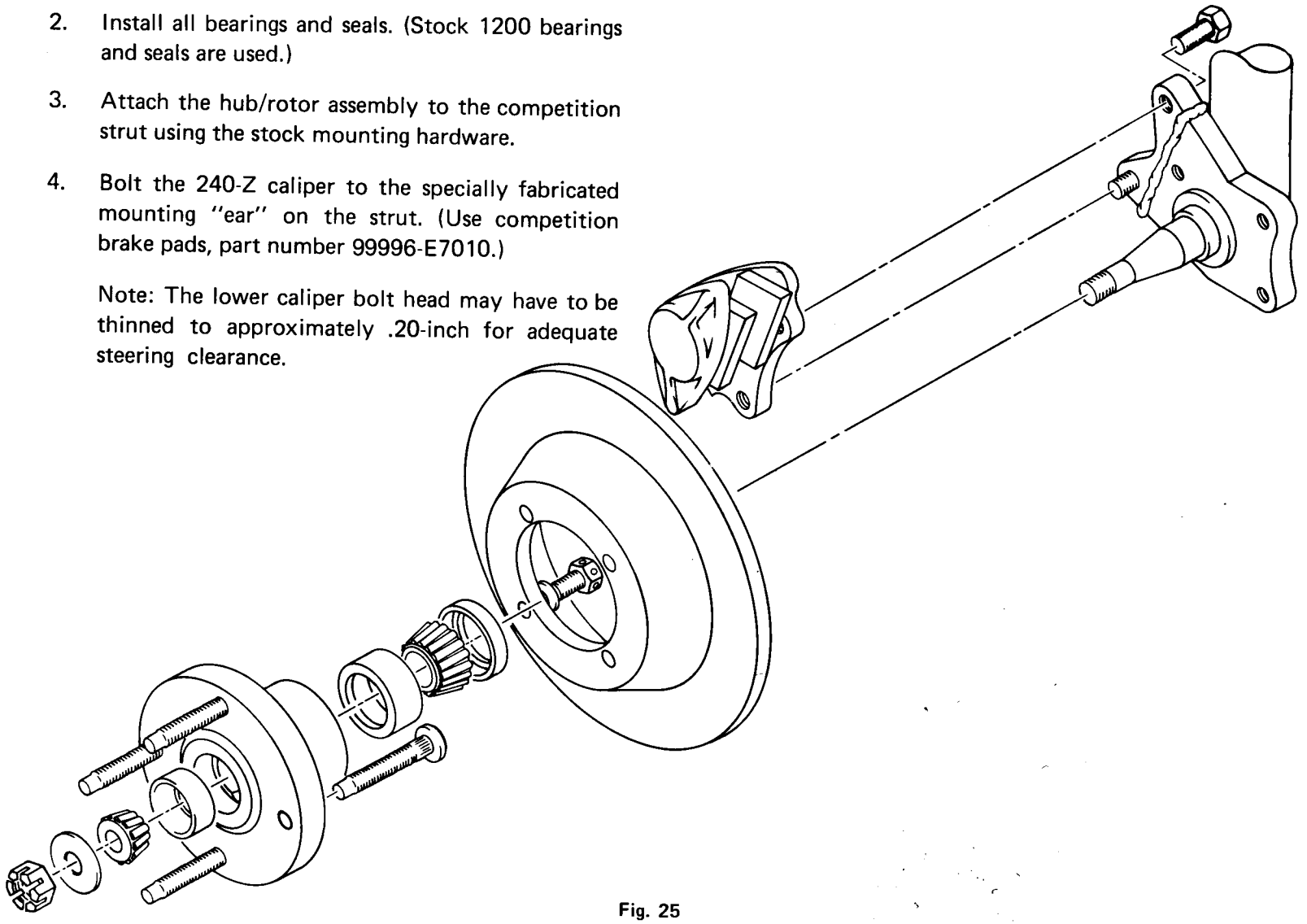


Fig. 25

5. Screw the adjustable lower spring seat onto the threaded strut collar and install the competition springs.

   Note: If the springs are cut down, they must be wired or securely strapped to the spring seats to prevent them from becoming unseated during full suspension droop.

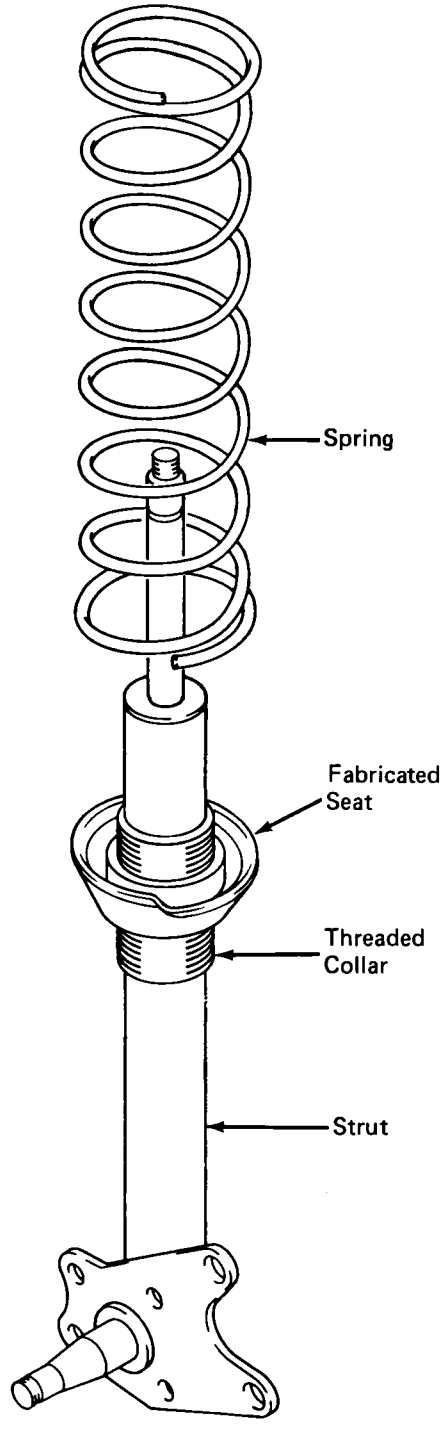


Fig. 26

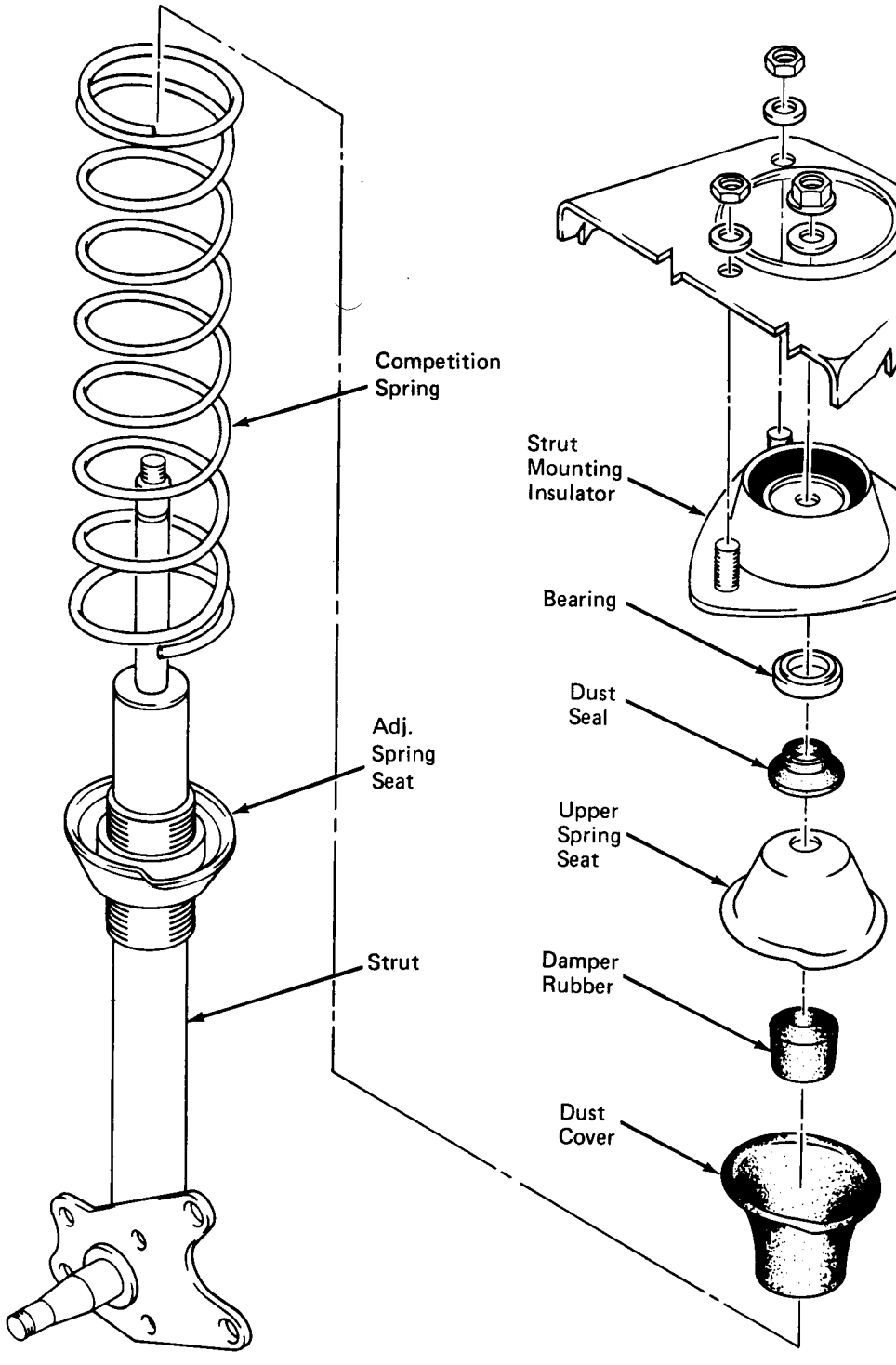
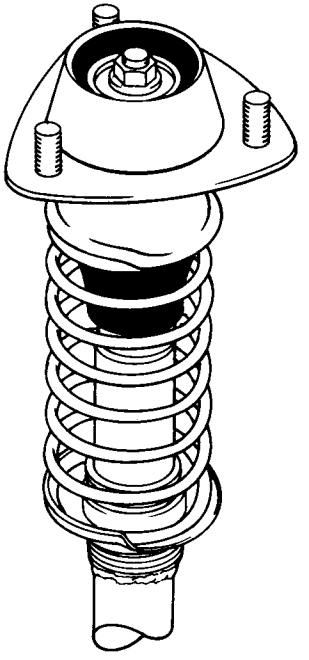


Fig. 27



Complete Assembly

6. Add the dust cover, upper spring seat, strut mounting bearing, strut insulator and lock them into place with the piston rod self locking nut.

   Place large (1-inch diameter) washers under the stock strut mounting nuts and lockwashers.

7. Install both completed strut assemblies on the stock front suspension crossmember and bolt the crossmember to the frame.

   Guide the strut assemblies up into the strut towers and secure them with three self locking nuts (per side).

8. Press the Balkamp bushings on the modified tension rods (use stock washers and spacer sleeve) and install the tension rods onto the chassis.

9. Re-attach all of the steering linkage.

10. Install the front sway bar following the directions on page 18.

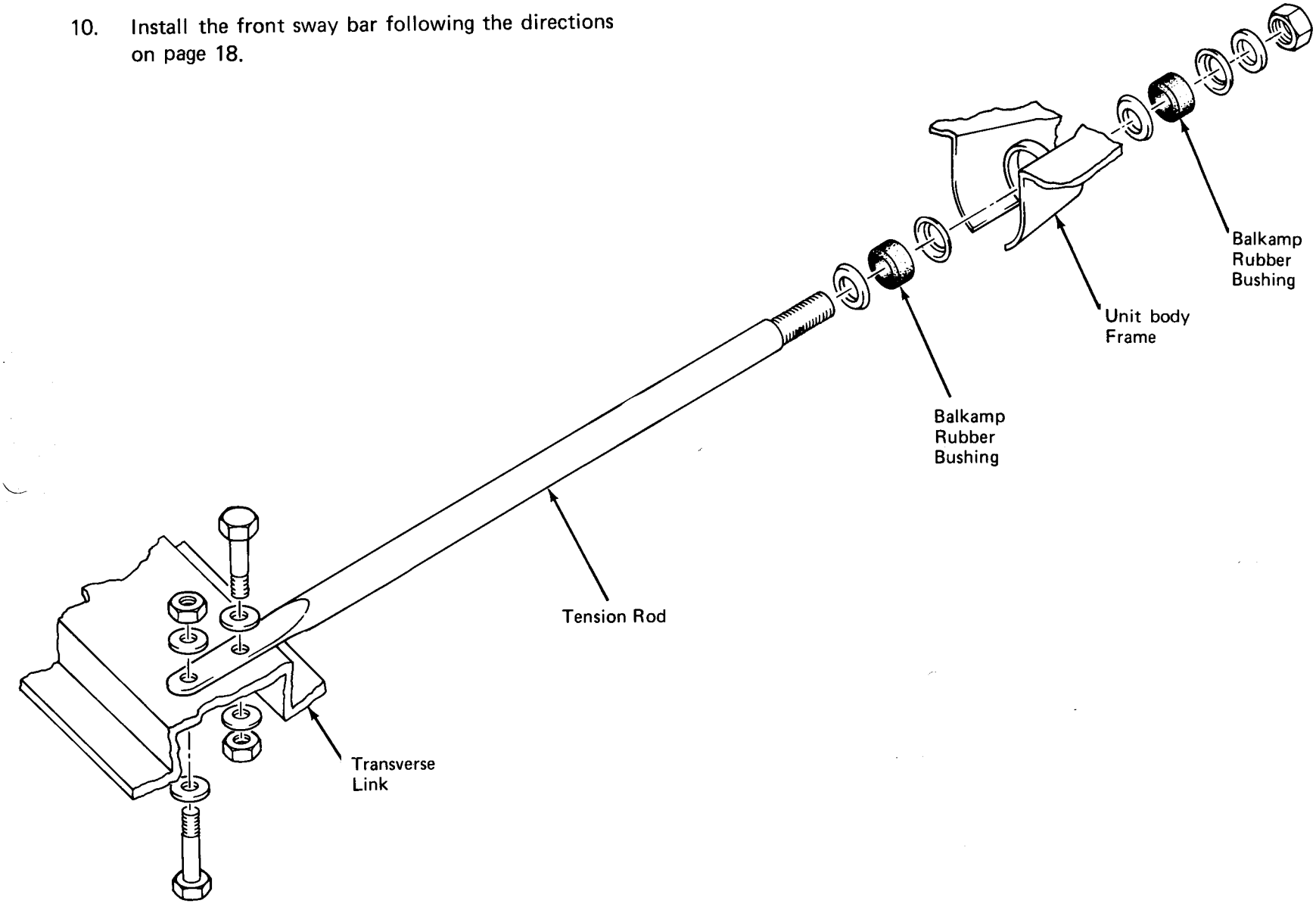


Fig. 28

Sway Bar Installation

The easiest way to install the front sway bar assembly is to loosely attach the bolts and links to all points before tightening any of the points. Once all of the attachment points are tight, it is imperative to check the clearance of the bar throughout the full travel of the suspension. (This check should be made with the springs removed.)

Clearance in the following areas should be checked:

1. Sway bar to frame clearance.
2. Sway bar to tension rod clearance at full bump.
3. Clearance between the ends of the sway bar and the brake caliper at full lock.
4. Sway bar rod end link at full bump and droop.

The sway bar link mounting bolts may have to be modified as shown in Fig. 29, and the rod end may have to be spread outward to allow proper link angling without binding. Also, due to variances in sway bar bending or improper centering when mounting, a different number of link spacers may have to be used on each side of the sway bar. This is acceptable.

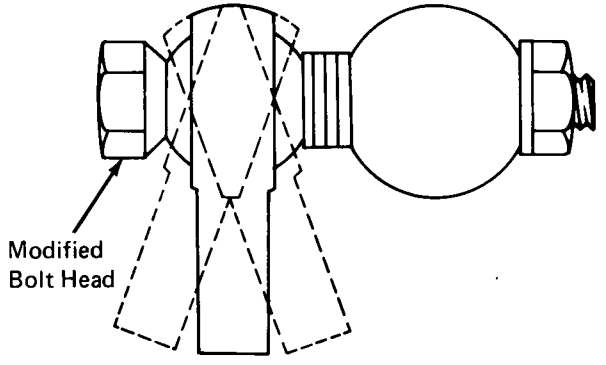


Fig. 29 *(Zone 3F)*

Sway Bar Adjustment

If the sway bar is mounted using the rearmost link attachment hole, the bar will be at its "loosest" setting. Moving the bar back and attaching it at a more forward set of mounting holes will effectively "stiffen" the setting. (See Fig. 30)

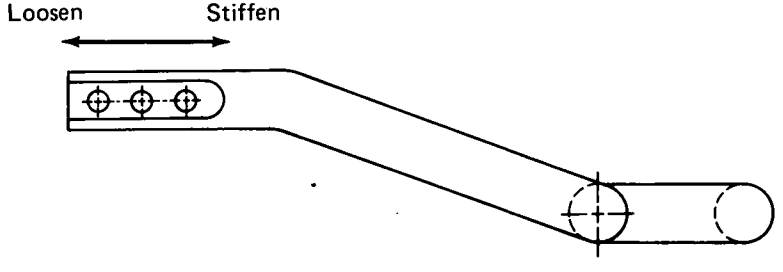
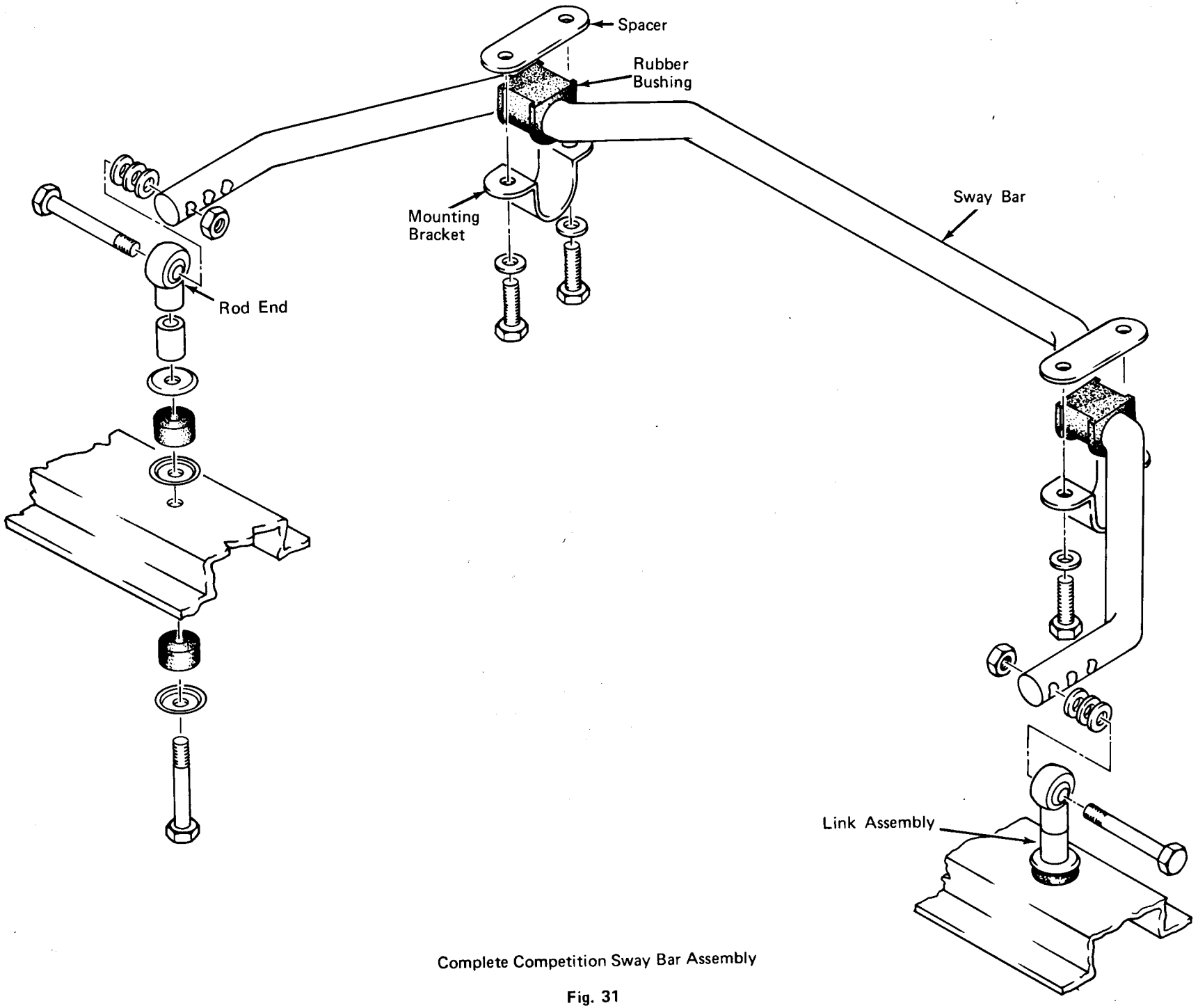


Fig. 30



Complete Competition Sway Bar Assembly

Fig. 31

REAR SUSPENSION MODIFICATIONS

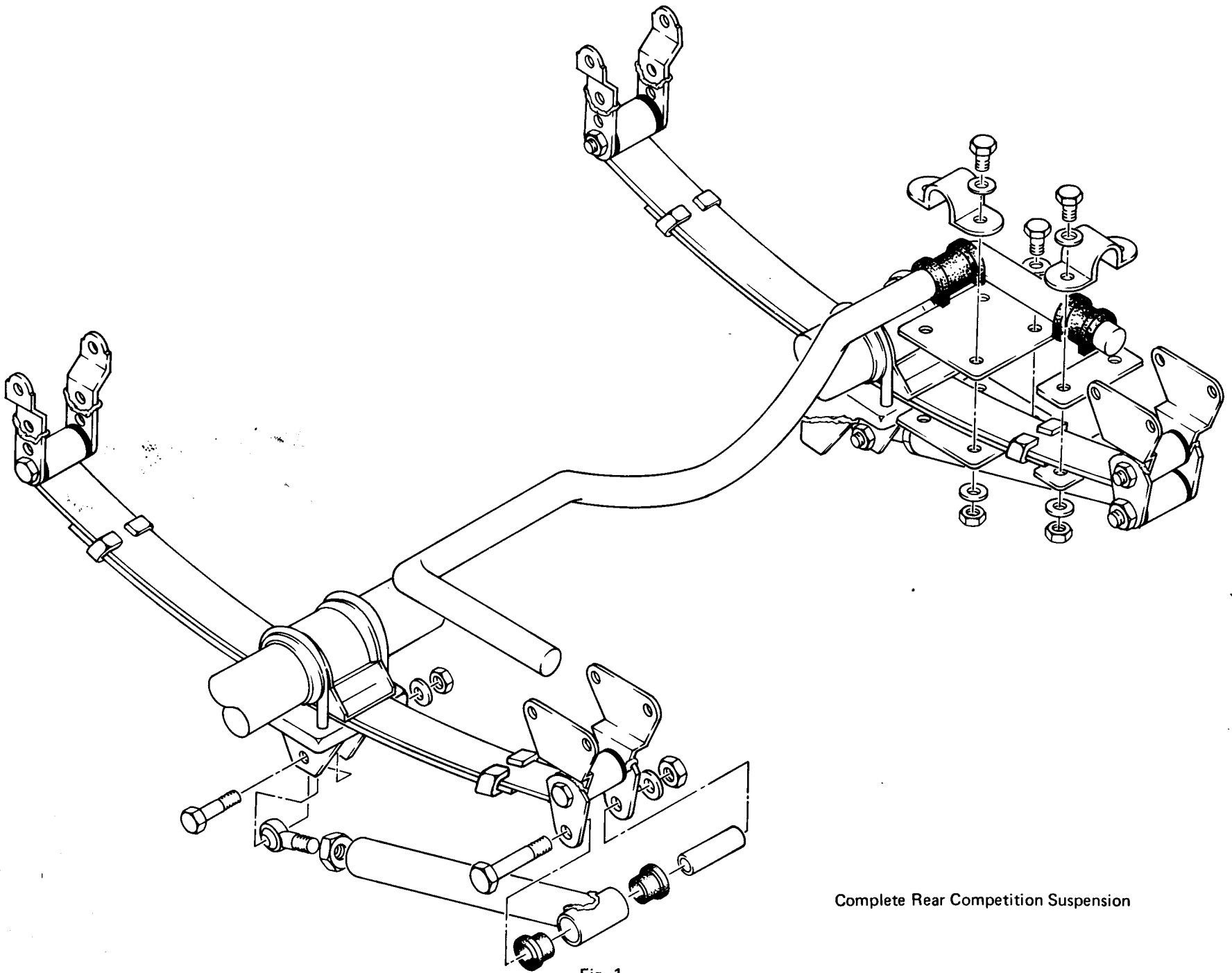
Like the front, the rear suspension must be modified to improve handling and maneuverability. Steps must also be taken to see that traction is improved to insure that all the available power "gets to the ground."

In order to improve handling and traction, the modifications illustrated in this manual are designed to achieve the following results:

1. Control of lateral and fore-and-aft rear axle movement.
2. Prevent spring wrap-up and improve traction.
3. Increase spring rate.
4. Provide a fully adjustable suspension (shocks, ride height, roll stiffness).
5. Lower car height.

Since the front and rear suspensions are quite dissimilar, different steps are needed to achieve the desired results in the rear. These modifications include:

1. Shocks and reworked lower shock mount.
2. Spring modification.
3. Front spring eye bushings.
4. Front spring hanger chassis mount bushings.
5. Traction arm assembly.
6. Reworked rear spring shackle assembly.
7. Sway bar assembly.



Complete Rear Competition Suspension

Fig. 1

Rear Spring Modification

The original rear springs are replaced with modified Datsun 1200 Competition units, Part Number 55020-H1024. The competition spring assembly contains three leaves held together by a single bolt.

Before installation, both of the competition springs are modified by removing the bolt and discarding the bottom (short) leaf. Then simply bolt the two remaining spring leaves back together, This modification will result in a spring rate reduction of approximately 25% from the unaltered competition spring assembly, but an increase of approximately 10% over the stock 1200 assembly.

Note: When the rear of the car is lowered and a wide racing tire is used the inner wheel well must be modified for proper tire clearance and a fender flare must be added.

Front Spring Eye Bushing

In the stock 1200 spring assembly, two rubber bushings are inserted into the front eye of each spring. In racing, where the competition rear springs are used, these stock rubber bushings would be inadequate and cannot be used.

New bushings of plastic must be fabricated (two per side) from either Delrin or Delrin AF. Do not use nylon. Follow the dimensions given on the blueprints carefully and machine the new bushings on a lathe (Fig. 2).

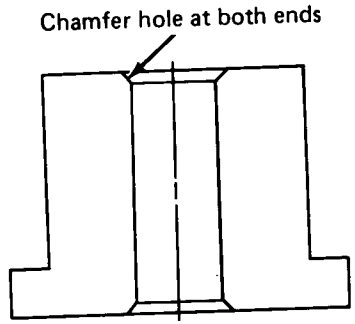


Fig. 2 *(Zone 6H)*

Shocks and Reworked Lower Mount

When the recommended rear spring modification is performed, only KONI shock absorbers (part number 80-1977-0051) should be used on the rear suspension. Konis are an adjustable shock with approximately 6½ inches of available travel. This is very close to the amount of travel provided by the stock shock. However, at maximum bump, the Konis will run completely out of travel before the axle does. If this occurs and the Konis are forced to collapse completely, the adjustment mechanism can be destroyed.

To prevent this, the shock absorber mounting stud on the bottom of the spring seat must be moved downwards one inch. This will provide enough shock absorber and wheel travel so that the shock does not bottom out before the axle hits the chassis.

The first step in lowering the shock mounting stud is to remove the stock stud with a hacksaw. **Note: Use the lower coupe spring plate, not the sedan, regardless of the model being modified.**

Next fabricate a shock bracket extension from a piece of .150 to .180-inch thick mild steel. Bend it to the proper shape as illustrated on the blueprint, and heliarc or arc weld it to the lower edge of the stock coupe spring seat (Fig. 3). A cutting template and detailed bending instructions are given on the blueprints.

A new shock mount stud should be fabricated from a ½-inch by 2.0-inch, grade 8 bolt. Leave the full head thickness of the bolt unaltered as this will properly space the shock away from the bracket surface for proper clearance. Machine and rethread the nose of the bolt as shown in Fig. 4.

Finally, arc weld the bolt to the newly fabricated bracket extension (Fig. 5). Make certain that the bolt is perpendicular to the bracket extension and that the centerline of the new stud (bolt) is 1.0-inch lower and directly in line with, the location of the stock shock mounting stud.

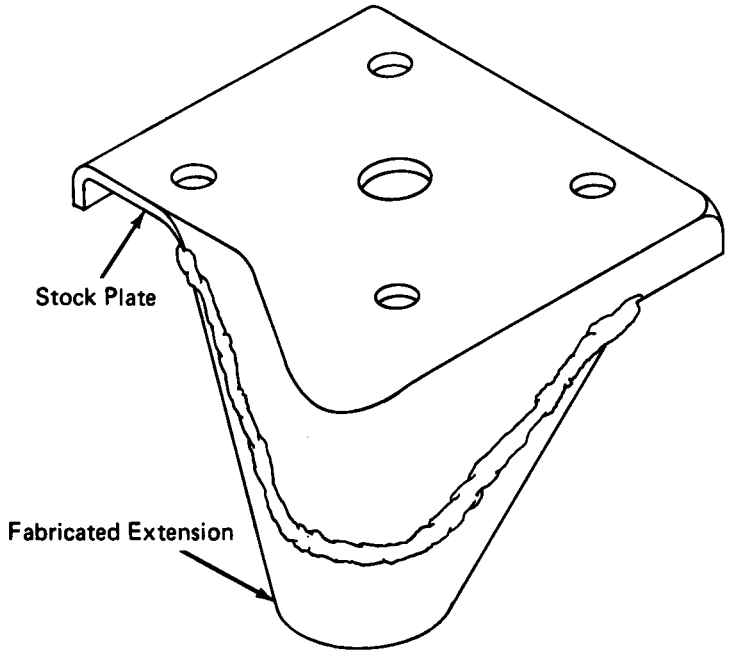


Fig. 3 *(Zone 6B)*

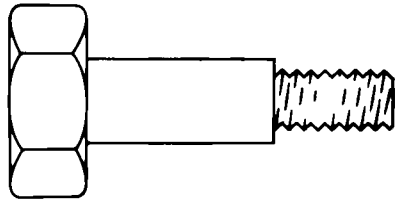


Fig. 4 *(Zone 7H)*

Rear Traction Bar Mount

While the lower spring seat assembly is off the car, it should also be modified to accommodate the rearward mounting of the traction arm assembly. Fabricate four plates (two per spring seat) from 1/8-inch, cold rolled mild steel following the dimensions given on the blueprints. (Fig. 6).

Align the newly fabricated plates on the bottom of the spring seat as shown in Fig. 7. To hold the mounting plates in correct alignment, insert a 5/8-inch bolt through the mounting plate holes. Use a 3/4-inch spacer or a stack of washers equaling 3/4-inch to insure that the plates remain equidistant from the center hole in the spring plate.

Heliarc or arc weld 2 plates to each spring plate as shown in Fig. 7.

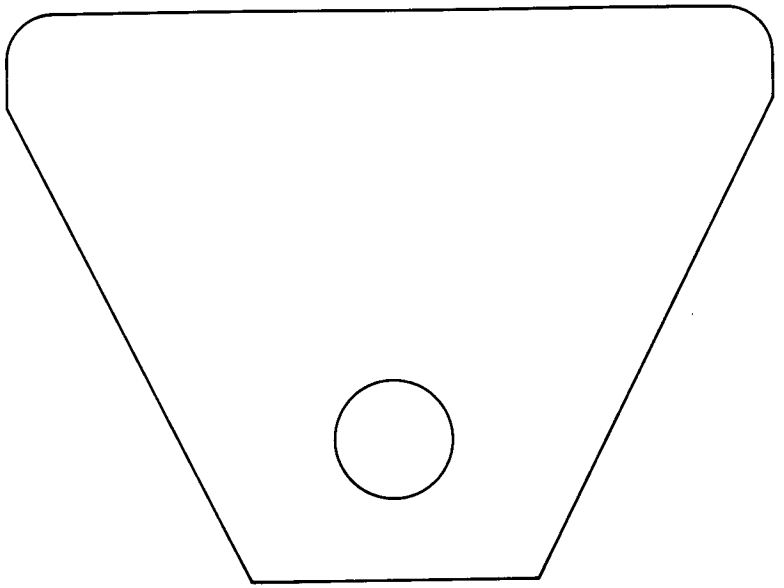


Fig. 6

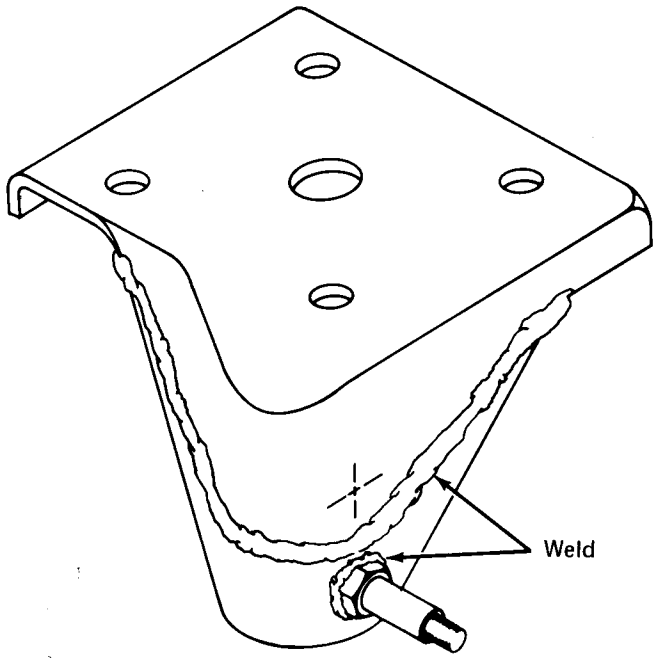


Fig. 5 *(Zone 6B)*

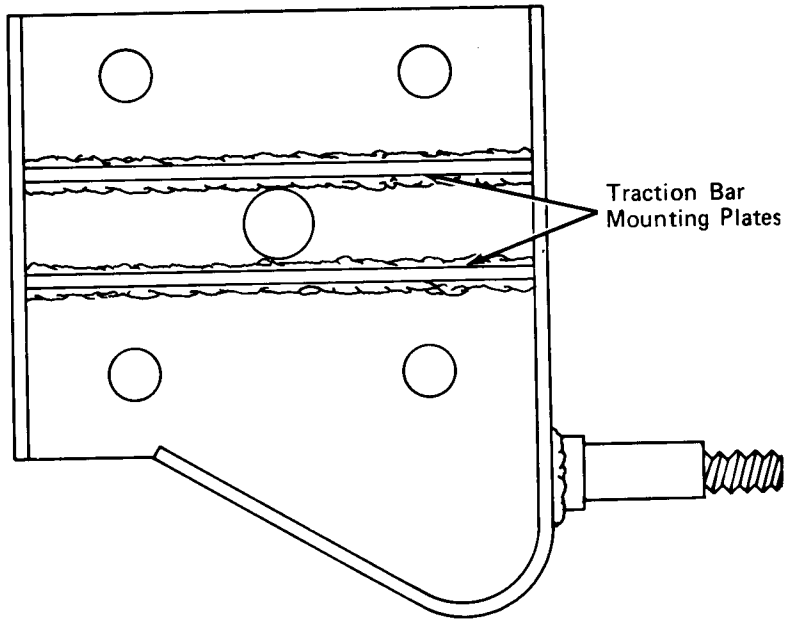
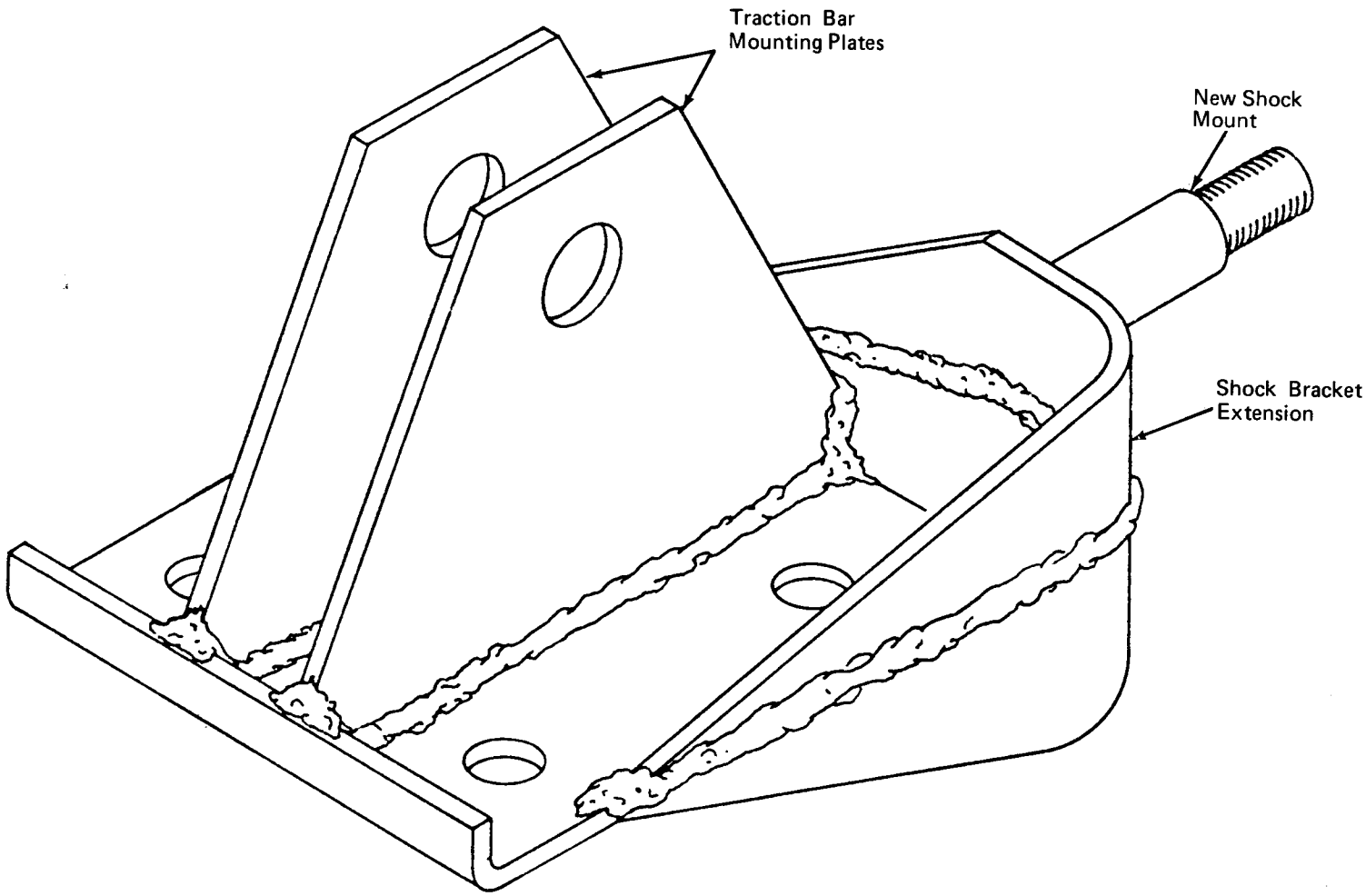


Fig. 7 *(Zone 7B)*



Spring Seat

Fig. 8

Front Spring Hanger Mount Chassis Bushing

The rubber bushings which are situated in the frame where the front spring hangers attach are not firm enough for racing and must be replaced.

Machine eight bushings (four per side) from either hard aluminum or steel, following the dimensions given on the blueprints (Fig. 9).

Front Spring Hanger Assembly

The forward rear spring hanger assembly must be extended downward in order to provide a forward attachment point for the traction arm assembly.

Fabricate four extension pieces from 1/8-inch steel plate following the dimensions given on the blueprints.

In Fig. 10 note that two of the plates have a top mounting hole dimension of 5/16-inch (A) and on the remaining two, the dimension of this hole is 11/16-inch (B). Other than that one specific difference, all four of the extension plates are identical.

Fig. 11 illustrates where the fabricated plates attach to the stock assembly. Plate 'A' fits over bracket 'D' (stock) and plate 'B' fits over bracket 'C' (stock). Notice how a line drawn through H1 and H2 (Fig. 12) is perpendicular to a line drawn through the two upper mounting holes of the spring hanger assembly.

Weld the two fabricated plates (A & B) to the stock brackets (C & D) as shown in Fig. 11. Notice that the plates are welded to the brackets on both sides. If at all possible, the welding should be done with a Heliarc. If Heliarc is not available, an arc welder may be used.

Fig. 9 *(Zone 8G)*

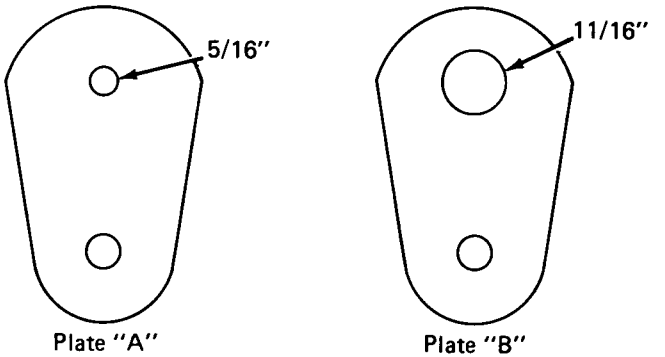


Fig. 10 *(Zone 1A, 6H)*

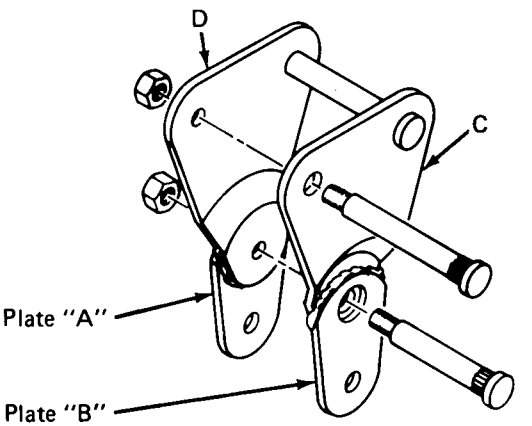


Fig. 11

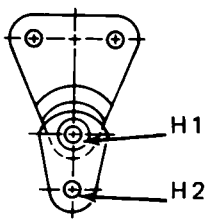


Fig. 12

Traction Arm Assembly

In order to prevent wheel hop during hard acceleration and to improve traction, it is necessary to install traction bars on the rear suspension. The traction bar assembly is simply a set of solid levers that controls the movement of the rear axle and keeps it from "winding up" the rear springs.

The main arm of each traction bar is made from a 17.5-inch length of 1.0-inch O.D. 4130 tubing with a .049-inch wall thickness. 1.0 x .083-inch mild steel can also be used.

The cross piece is fabricated from 1.0-inch O.D., 822 I.D. seemless mild steel tubing with .090 wall thickness.

The first step in fabricating the traction bars is to notch the main arm as shown in Fig. 13. Next, center the cross piece in the newly formed notch to form a "T". Weld the two pieces together.

Machine a 5/8-18 nut to fit the inside diameter of the main tube and weld it into place as shown in Fig. 14. This provides a means of mounting a rod end to that side of the bar. Add a 5/8-inch jam nut to the rod end and install the rod end into the main tube.

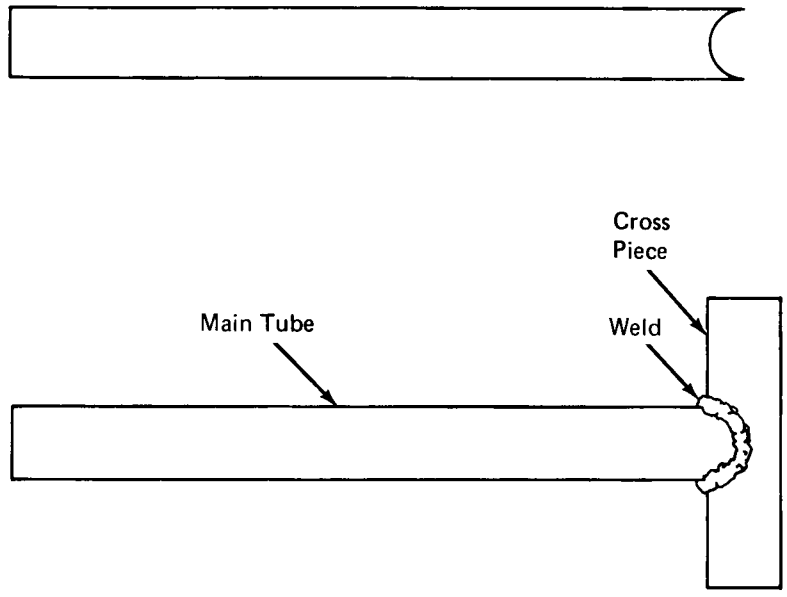


Fig. 13 *(Zone 5D)*

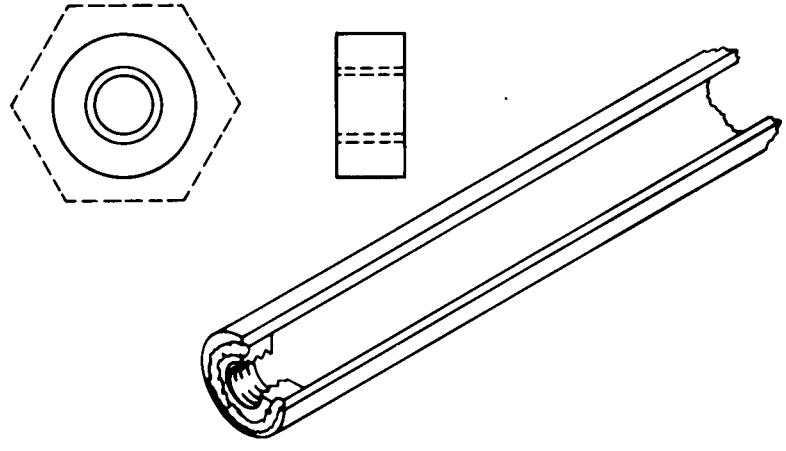


Fig. 14 *(Zone 7E)*

The final pieces needed to finish the traction arm assembly are two bushings and a spacer (per bar).

Machine the bushings from Delrin plastic according to the dimensions given in the blueprints. The bushings should have a tight, press fit in the cross piece.

The spacer sleeve is simply a length of 4130 steel tubing, 2.830-inches long (±.005) with an O.D. of ½-inch and an I.D. of 3/8-inch.

Insert the sleeve into the cross piece and install one bushing at each end. The unit is now ready to install on the car. When installed, the sleeve should be slightly longer than the distance between the outside surfaces of the plastic bushings (to eliminate any possibility of a bind).

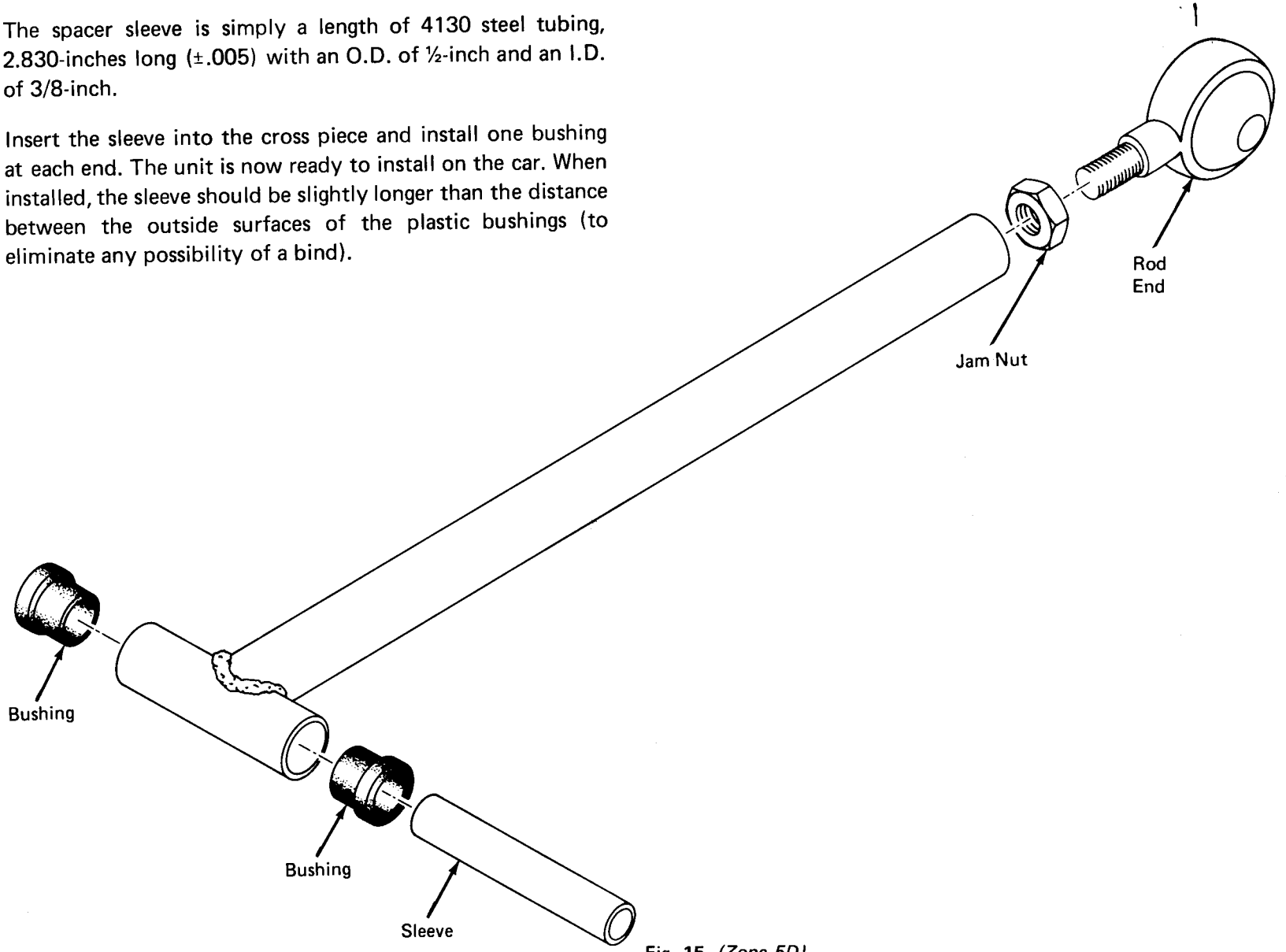


Fig. 15 *(Zone 5D)*

Rear Shackle

When the 1200 is equipped with the modified competition springs, the rear of the car is lowered an excessive amount. To raise the car enough to compensate for the softened competition springs and to provide for adjustable ride height, the rear spring shackle must be extended.

Fabricate four shackle extensions from 1/8-inch (.125–.156-inch) mild steel (C1018) following the dimensions given on the blueprints. Note that two of the shackle extensions (a) have 7/16-inch mounting holes and the remaining two extensions (b) have 5/16-inch holes (see Fig. 16). Other than this one specific difference, all four of the brackets are identical.

Weld one extension to each of the stock shackle plates. Fig. 17 illustrates the correct placement.

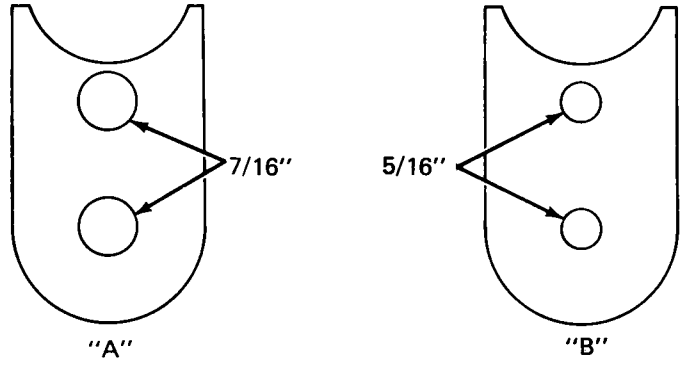


Fig. 16 *(Zone 8F, 8D)*

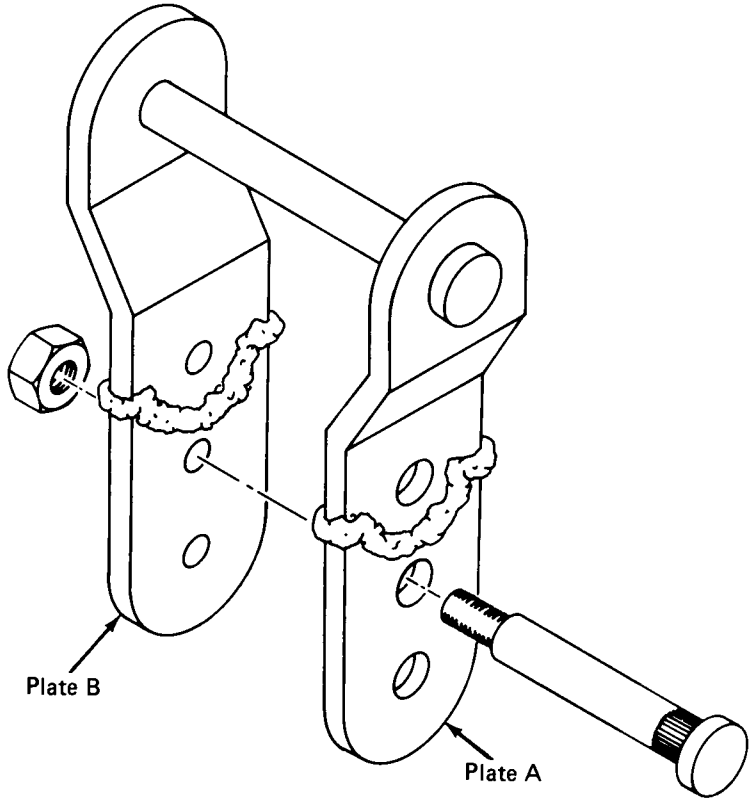


Fig. 17 *(Zone 3B)*

Rear Sway Bar Assembly

In order to increase rear roll stiffness and minimize chassis roll, a rear sway bar must be added.

Following the dimensions on the blueprints, fabricate the rear sway bar from a 7-foot length of 7/8-inch Stressproof bar. Heat the bar using a large torch tip or a "rosebud", bend to shape and allow to air cool. **Do not quench!** It is not necessary to heat treat or re-temper the bar.

Installing the rear sway bar on the car requires no welding. It is held in place by a number of specially fabricated plates and stock Datsun 510 sway bar brackets.

Fabricate four plates as shown in Fig. 19-A and four more as shown in Fig. 19-B. All of these plates are made from 1/8-inch cold rolled mild steel C1018 or 4130. Complete dimensions for these two sets of plates are given on the blueprints.

Figures 20 and 21 show how the bar is mounted to the chassis. Other than the eight special plates, the following items will be needed to complete the installation:

- 4 — Datsun 510 front sway bar U-brackets
- 4 — Datsun 510 23mm mount rubbers
- 12 — 5/16 x 2.0 shank length, 24 threads per inch, grade 5 or 8 bolts
- 24 — 5/16 washers
- 12 — 5/16–24 lock nuts

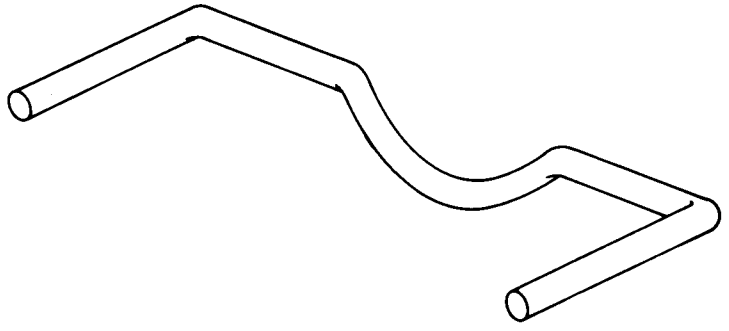


Fig. 18 *(Zone 4H)*

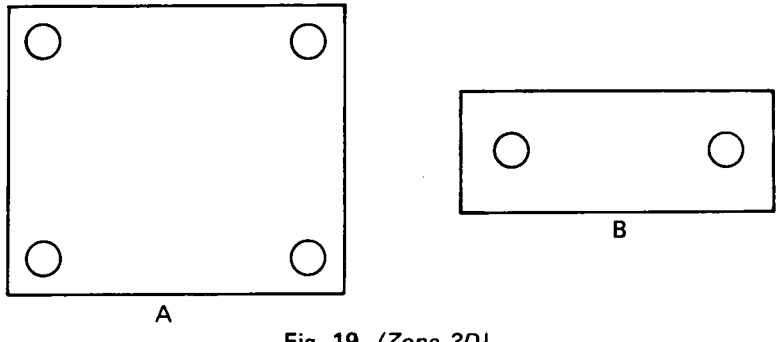


Fig. 19 *(Zone 3D)*

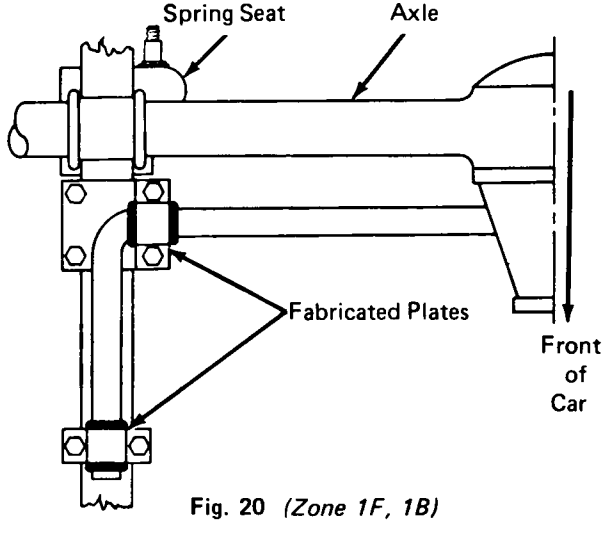
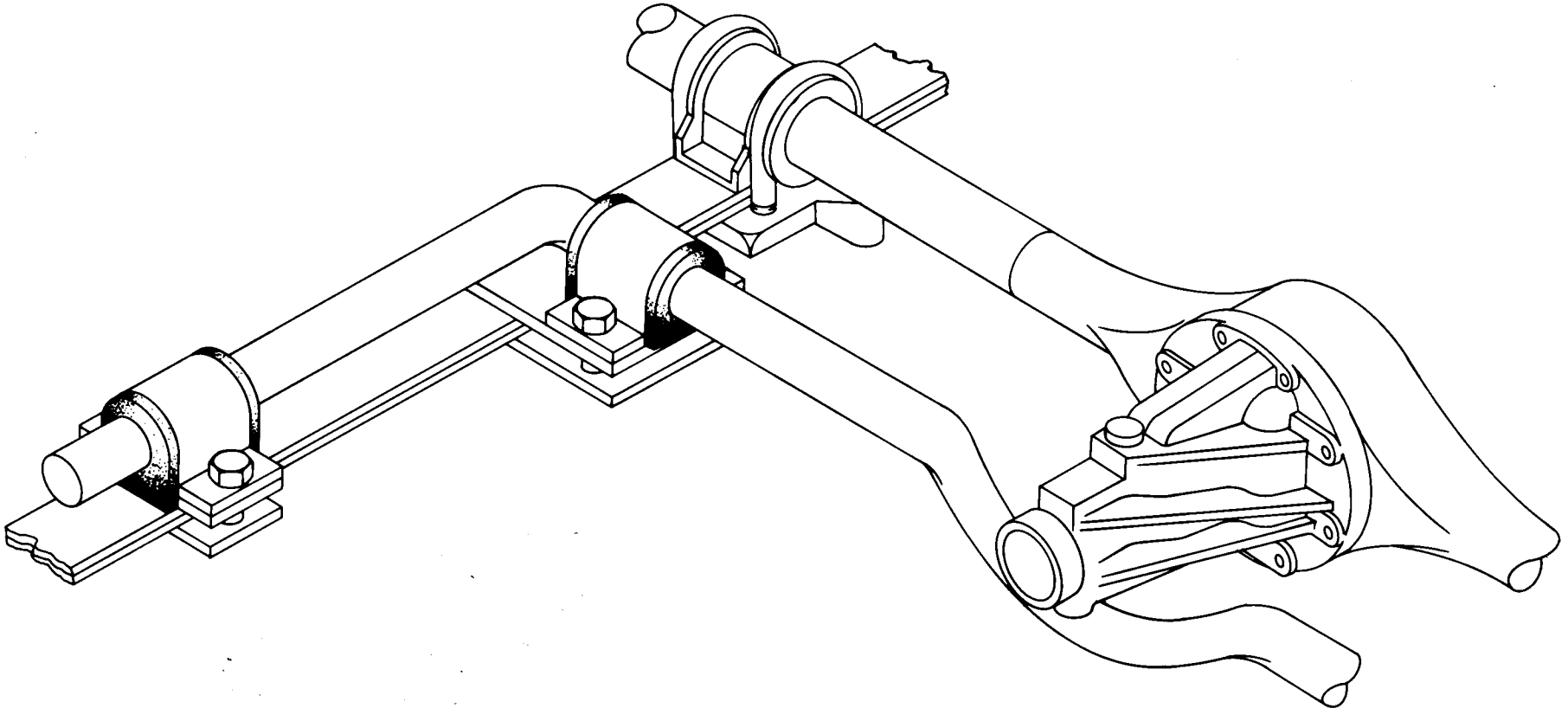


Fig. 20 *(Zone 1F, 1B)*



Sway Bar Installation

Fig. 21

Rear Competition Suspension Assembly

The following are the steps in assembling the 1200 competition rear suspension. If any general information is required, refer to the Datsun 1200 factory service manual.

1. Press the eight, newly fabricated front spring hanger mount bushings into the frame. This can be done by placing two bushings at a time on a ½-inch bolt, 5 or 6 inches long (Fig. 22). Simply tighten the nut and bolt assembly and draw the bushings into the frame. Remove the bolt and insert the remaining bushings in the same manner.

2. Once all the bushings are in place, attach the modified front spring hanger to the frame.

3. The rear spring shackle assembly is installed next. The stock top mounting stud is used to secure the shackle to the frame.

4. Insert the specially fabricated plastic bushings into the front eye of each spring as shown in Fig. 23. A large C-clamp can be used to press the bushings into the spring eye, or a long, 3/8-inch bolt, nut and washer can be used to draw the two bushings into the spring eye. Sometimes the bushings can be tapped (not hammered) into place with a plastic or wooden mallet.

5. Install new stock rubber bushings into the rear eye of each spring (two per spring) (Fig. 23), and insert new stock rear spring chassis bushings into the frame.

6. The spring assembly can now be mounted to the front spring hanger and the rear shackle. Note: When bolting the back of the spring to the rear shackle, the stock mounting stud can be moved up and down in the holes of the fabricated shackle extension to adjust the ride height.

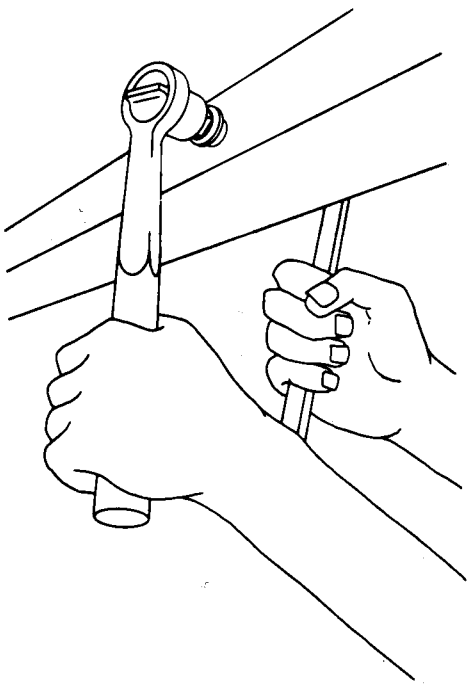


Fig. 22

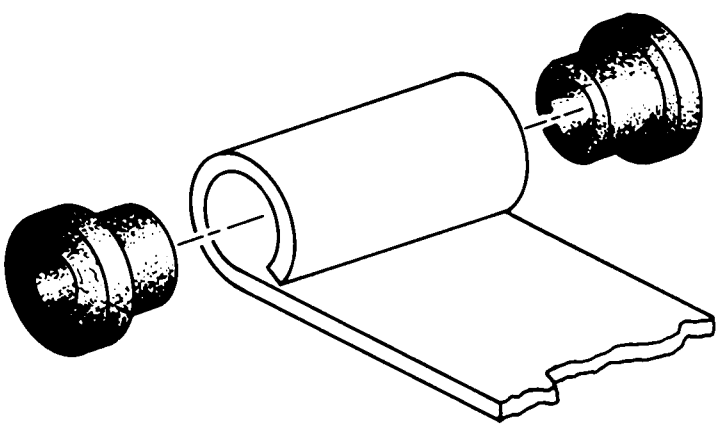


Fig. 23

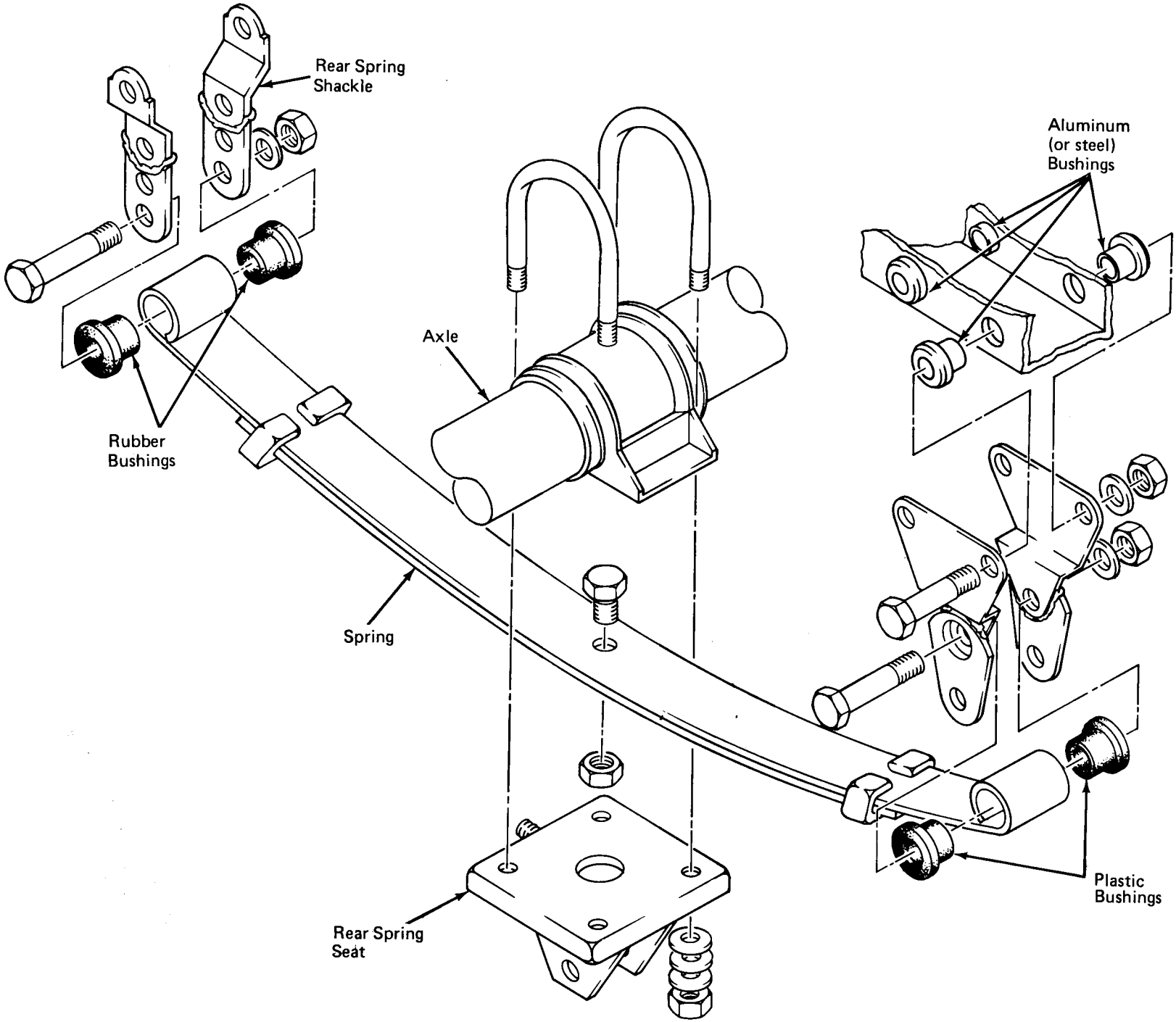

Rear Spring
Shackle
Aluminum
(or steel)
Bushings
Axle
Rubber
Bushings
Spring
Rear Spring
Seat
Plastic
Bushings

Fig. 24

7. The rear axle is mounted by sliding it in from the side through the space above the spring (Fig. 25). Set the lower spring seat in the proper position and attach the axle to the springs with the stock U-bolts. The rear axle should be "aimed" straight ahead to insure that the wheels will be equally displaced off the car centerline. Note: A limited slip (clutch type OK) 3rd member should be used.

Note: When installing the springs onto the axle, make sure there are sufficient threads on the U-bolts. If there are not, a few washers beneath the U-bolts can be used to make up for the lack of spring thickness.

8. Attach the Koni shocks to the stock top mount and the extended lower mount on the spring seat.

9. Install the traction bar assembly. The "T" end of the bar mounts on the extended front spring hanger assembly, and the side with the rod end fits into the specially fabricated brackets added to the lower spring seat.

10. Place the specially fabricated sway bar mounting plates to the springs as shown in Fig. 26.

11. Attach the sway bar to the mounting plates using the Datsun 510 front sway bar mounting brackets. (Fig. 26).

Note: The effective stiffness of the sway bar can be varied by moving the "b" plates as shown in Fig. 26

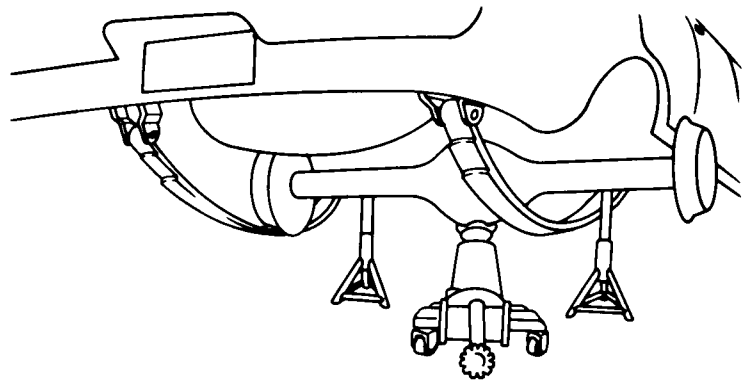


Fig. 25

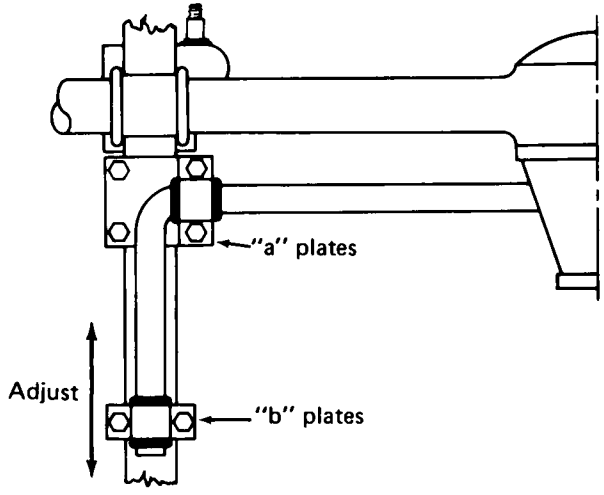


Fig. 26

Final Adjustments

Once the car is completed, there are several areas which should be checked and adjusted before the car is actually taken out for testing. The first step is to be certain that there is no interference or binding anywhere in the suspension system. Any binding or bottoming out of a suspension component while the car is negotiating a corner can cause an instantaneous and sometimes violent change in handling characteristics.

For instance, if the rear axle hits the frame or the bump stop in the middle of a corner, the rear end of the car will tend to lose traction and the car will oversteer. A similar problem in the front suspension, such as a strut bottoming or a sway bar link binding, can cause the front end to lose traction and the car will understeer. Check all clearances with the wheels turned to full lock in both directions. Problems of this type can be eliminated by checking the car throughly before running it.

Set the front ride height of the car to allow for 2 to2½-inches of vertical wheel travel before the top of the strut collides with the bump rubber. (The bump rubber should be approximately ½-inch thick.) The rear static ride height should be set to allow for 2 to 2½-inches of axle travel before it bottoms against the bump stop. These two settings should provide a good general starting point, but keep in mind that each track will have its own bump and droop requirements that may call for different ride height settings. Remember also that a recurring handling problem in a specific type of corner can often be traced to insufficient suspension component travel.

Front caster should be adjusted to 5°–6°. This can be accomplished by modifying the effective tension rod length as outlined on page 11. Once the tension rod is modified and the suspension components reassembled, check for possible interference between the lower suspension control arm and the crossmember at large caster angles.

CAMBER should be 1.0° to 1.5° negative.

TOE-IN should be set at 3/16" total difference between the front and back distance between the front tires (assuming an approximately 21" tire diameter).

Some provisions should also be made to adjust the brake balance (bias). The front to rear brake bias can be made adjustable by using either a dual master cylinder or a single master cylinder equipped with an adjustable proportioning valve (Kelsey Hayes).

Once the car is at the track, general handling characteristics can be altered by adjusting the front and rear sway bars. If the car understeers excessively, the rear sway bar should be stiffened by moving the adjustable spring clamps **foreward** on each spring. Each clamp should be adjusted equally. Reducing the front sway bar stiffness by moving the link attachment towards the back of the car will also reduce understeer. Reducing oversteer can be accomplished by adjusting the front bar link towards the front of the car or by moving the rear sway car clamps towards the rear of the springs.

The rear Koni shocks should be set as soft as possible without introducing wheel hop. If wheel hop occurs **under any condition,** stiffen the shocks.

Tire pressure should be set **cold** in the range of 22 or 24 lbs. Extremely low tire pressure will increase lateral tire flex — tires may deflect laterally as much as 1½" from their static position on the rims — and can cause interference as well as a stability problem.

A tire temperature gauge can be used to extend the life of the front tires since the camber can be adjusted to obtain a relatively even temperature reading across the tire surface. A change in basic handling characteristics will often cause a noticeable change in the tire temperature readings on both the front and rear tires.

Finally, tire adhesion has a great effect on the overall handling characteristics of the car. Tire adhesion is reduced with age and wear, and mounting a new set of tires on just one end of the car can have a dramatic and unwanted effect in the adhesion of the car. Tire adhesion (as well as engine cooling) can be improved with the addition of a front spoiler.

General Handling

A Datsun 1200 set up with the competition suspension system illustrated here will work very well on a wide variety of courses with only a minimum number of adjustments. In fact, as long as there is no physical interference between the suspension parts, most race tracks can be accommodated by just varying the ride height (to eliminate bottoming problems) and adjusting the front and rear sway bars.

In setting up a race car, it is necessary to understand certain general handling conditions.

Oversteer: This is the tendency of the rear end of the car to break loose before the front end. The driver tries to compensate for this characteristic by steering the front of the car in a direction opposite to that required to negotiate the corner.

Understeer: The front end of the car starts to slide before the rear. The driver tries to correct this situation by steering farther into the corner than would seem normal.

Neutral: Both ends of the car lose adhesion at the same time.

A race car that is handling properly will exhibit all three characteristics while negotiating any course. Slow speed understeer, medium speed neutral, and high speed oversteer is a common set of general characteristics that a race car may display although any combination is possible.

The majority of drivers prefer a car to be set up with a broad neutral range (the car remains neutral at various G-loads and cornering speeds) with a certain amount of understeer and oversteer for specific types of turns. Transitions from one characteristic to another must be controllable and predictable. Keep in mind that if the car isn't set up quite right, the driver still has many tools at his disposal to make it do exactly what he wants. Various combinations of throttle, steering, and braking, along with the direction in which the car enters and exits a turn, will alter handling characteristics. However, the fastest car is generally the one which is set up properly and which demands the least amount of radical correction from the driver.

Maximum performance from a chassis can only be extracted by a driver who is capable of exploring the maximum limits of adhesion without losing control. This is because basic handling characteristics are related to the level of lateral loading exerted on the chassis. The true characteristics of a given set-up appear only when a car is driven at the absolute limit of adhesion.

For example, assume that a car understeers at .7G lateral acceleration and becomes neutral when 1.0G is reached. Also imagine that the gap between .7G and 1.0G can be bridged by some suitable driving techniques. A driver who is capable of pushing the car at no greater level than .7G might want to eliminate the .7G understeer, and in the process eliminates the car's capability of generating the very desirable 1.0G neutral characteristic.

So when setting up a car it becomes obvious that the degree of driver skill is a factor which must be considered. The closer to the absolute limit of adhesion a driver can come, the more meaningful his observations and subsequent adjustments become.

The art of setting up a chassis is really a never-ending process of trying to make the chassis perform totally as the driver would like it to, while maintaining the maximum lateral adhesion combined with maximum controllability at all times. From his standpoint, the worst thing a driver can do is to stop seeking areas of possible improvement and compensate for shortcomings in the car by radical driving techniques.

COMPETITION PARTS LIST

The following is a complete list of competition parts that must be purchased or specially fabricated. Other than the items listed, stock 1200 pieces are used to complete the competition suspension.

Please note that whenever the manual calls for stock items to be used, such as bearings, bearing seats, etc., only NEW stock parts should be used.

This list does not include ALL necessary hardware, such as nuts, bolts, lock washers, safety wire, etc.

Front Suspension

QTY.	PART NAME	PART NUMBER	MATERIAL	SOURCE
2	Competition Strut Assembly	54302-H1024 (1 ea) 54303-H1024 (1 ea)	–	Datsun Dealer
2	Threaded Strut Collars*	–	2-inch diameter .109 mild steel tubing	Locally Available
2	Additional Stock Upper Spring Seats	54040-H1000	–	Datsun Dealer
2	Caliper Mount "Ears"*	–	5/8-inch C1018 Mild Steel	Locally Available
2	Spring Seat Threaded Collars*	–	2.25 O.D. Mild Steel Tubing .1925 Wall	Locally Available
2	Front Hubs*	–	2024T3 or 7075T6 Alum.	Locally Available
16	Tilton Engineering Wheel Studs	–	–	Tilton Engineering 114 Center St., El Segundo Ca.
8	7/16 x 14 x 1.0 Grade 8 Bolts (Hub to Rotor Mount)	–	–	Locally Available
2	240-Z Disc Brake Rotors	40206-E4101	–	Datsun Dealer
4	1.0-in. Shank Length Grade 8 (Rotor Mount)	–	–	Locally Available
2	240-Z Caliper Assembly	41000-E4100 (R) 41010-E4100 (L)	–	Datsun Dealer
2 sets	Competition Brake Pads	99996-E7010	–	Datsun Dealer
2	Front Competition Springs	54010-H1070	–	Datsun Dealer
4	Balkamp (NAPA) Motor Mount Rubber Bushings	3-5121	–	NAPA Dealers
1	Sway Bar*	–	Stressproof Bar or Equivalent	Outlets of La Salle Steel Co. or major steel distributor
2	Sway Bar Mounting Brackets*	–	.065–.083-in. mild steel	Locally Available
2	Aluminum Spacers* (Optional)	–	0.65–.083-in. mild steel	Locally Available
2	Sway Bar Mounting Bracket Rubber Bushings	Ford Part No. B9A-5493B	–	Ford Dealer
2	3/8-inch Rod Ends (Wafe Alina female)	–	–	Surplus Supply Outlet Race Car Supply Shop
6	Link Assembly Washers	56113-09400	–	Datsun Dealer
4	Link Assembly Rubber Bushings	56112-09400	–	Datsun Dealer

*Fabricated from blank stock.

Rear Suspension

QTY.	PART NAME	PART NUMBER	MATERIAL	SOURCE
2	Competition Rear Spring Assembly	55020-H1024	–	Datsun Dealer
4	Front Spring Eye Bushings*	–	Delrin Plastic or Delrin AF	Any major plastics supplier
2	Koni Rear Shock Absorbers	80-1977-0051	–	Sports Car Accessory Shops
2	Shock Mount Extension*	–	.150–.180-in. thick mild steel	Locally Available
2	Shock Mount Studs*	–	½-in. x 2.0-in. Grade 8	Locally Available
4	Traction Mount Plates*	–	1/8-in. cold rolled mild steel	Locally Available
8	Front Spring Hanger Mount* Chassis Bushings	–	Hard Aluminum or Steel	Locally Available
4	Rear Spring Hanger Extension*	–	1/8-inch steel plate	Locally Available
2	Traction Arm Assy. Main Arm*	–	17.5-in. long,1.0-in. O.D. Tubing .049-inch wall	Locally Available
2	Traction Arm Assy. Cross Piece*	–	1.0-in. O.D., .822 I.D. seamless mild steel tubing .090 wall	Locally Available
4	Traction Arm Assy. Bushings*	–	Delrin Plastic	Any major plastics supplier
2	Traction Arm Assy. Spacer*	–	4130 steel tubing 2.830-in. long (±.005)O.D. of ½ in. 3/8 I.D.	Locally Available
4	Rear Shackle Extension*	–	1/8-in. (.125–.156-in.) mild steel C1018	Locally Available
1	Rear Sway Bar*	–	7 ft.–3/8-in. Stressproof bar or equivalent	Outlets of La Salle Steel Co. or major steel distributor
8	Rear Sway Bar Mounting Plates*	–	1/8-in. cold rolled mild steel C1018 or 4130	Locally Available
4	Datsun 510 Sway Bar U-Bracket	54616-21001	–	Datsun Dealer
4	Datsun 510 23mm Mount Rubber	54617-22030	–	Datsun Dealer
12	5/16 x 2.0 Shank length, 24 threads per in. Grade 5 or 8 Bolts	–	–	Locally Available
24	5/16 Washers	–	–	Locally Available
12	5/16 – 24 Lock Nuts	–	–	Locally Available
2	Lower Coupe Spring Plate	55262-H1801 RH 55266-H1801 LH	–	Datsun Dealer
2	Traction Bar Rod Ends (Sperco TRE10 or equivalent	–	–	Surplus Supply Outlet Race Car Supply Shop

*Fabricated from blank stock.