

7256

**INSTRUCTIONS FOR ELIMINATOR II A-ARM FRONT, 4-LINK REAR,
MILD STEEL, INTERMEDIATE, SERIES CHASSIS**

| <u>ITEM</u> | <u>QTY</u> | <u>SIZE/PART NO.</u> | <u>TUBE CODE</u> | <u>DESCRIPTION</u> |
|-------------|------------|----------------------|------------------|------------------------------------|
| 1 | 2 | 4138 | | Cage Side |
| 2 | 2 | 4208 | | Forward strut, A-arm |
| 3 | 1 | 4038 | | Main Hoop |
| 4 | 1 | 4227 | | Cage top |
| 5 | 2 | 4248 | | Rear frame Eliminator II |
| 6 | 1 | 4709 | | Engine support loop |
| 7 | 1 | 1 5/8 x 19 | J | Rack and pinion crossmember |
| 8 | 2 | 4206 | | Front frame 1 5/8 A-arm |
| 9 | 2 | 1 5/8 x 60 | A B | Long side bar |
| 10 | 2 | 1 5/8 x 27 | H | Upper side bar |
| 11 | 2 | 1 5/8 x 28 | I | Lower side bar |
| 12 | 2 | 1 5/8 x 56 | C D | Rocker support |
| 13 | 1 | 1 5/8 x 51 | E | Mid mount |
| 14 | 1 | 1 5/8 X 54 | F | Main hoop crossmember |
| 15 | 1 | 1 5/8 x 54 | G | Upper 4-link crossmember |
| 16 | 2 | 1 5/8 x 20 | J | Rear frame crossmember |
| 17 | 2 | 1 5/8 x 29 | K | Main hoop rear strut |
| 18 | 1 | 5/8 x 22 | L | Transmission crossmember |
| 19 | 2 | 1 5/8 x 12 | A B | Foot brace |
| 20 | 2 | 1 5/8 x 18 | L | Cage side extension |
| 21 | 2 | 1 1/4 x 30 | U | Rear frame support |
| 22 | 3 | 1 1/4 x 24 | V | Main hoop to rear strut back brace |
| 23 | 2 | 1 1/4 x 36 | M | Rear frame Xmember forward support |
| 24 | 2 | 1 1/4 x 54 | N O | Rocker triangulator |
| 25 | 2 | 1 1/4 x 58 | P Q | Double rail top |
| 26 | 2 | 1 1/4 x 9 | N | Rear strut support |
| 27 | 4 | 1 1/4 x 6 | R U | Roll cage gusset |
| 28 | 1 | 1 1/4 x 52 | R | Cage top triangulator |
| 29 | 2 | 1 1/4 x 36 | S | Forward strut frame support |
| 30 | 2 | 1 1/4 x 34 | T | Frame triangulator |
| 31 | 2 | 1 1/4 x 25 | W | Shock crossmember rear supports |
| 32 | 2 | 1 1/4 x 9 | O | Double rail frame support |
| 33 | 2 | 1 1/4 x 36 | X | Lower bracket supports |
| 34 | 2 | 1 1/4 x 12 | P Q | Engine support |
| 35 | 4 | 2015 | | Frame end cap 1 5/8 round |
| 36 | 2 | 3200 | | Locknut 1/2 - 20 |
| 37 | 2 | 3100 | | Bolt 1/2 - 20 x 2 1/4 |
| 38 | 4 | 1000 | | Misalignment bushing 1/2 |
| 39 | 12 | 2101 | | 1/2 hole suspension tabs |
| 40 | 2 | 2300 | | Rack and pinion brackets |
| 41 | 8 | 2103 | | Lower A-arm bracket 1 5/8 frame |
| 42 | 4 | 2301 | | Lower bracket cap |
| 43 | 2 | 2329 | | Control arm cap |
| 44 | 1 | 927256 | | Assembly drawing |

OPTIONAL PIECES FROM FUNNY CAR CAGE #7226

45 1 4230 Funny car cage auxiliary hoop

| | | | |
|----|---|------------|--|
| 46 | 2 | 4231 | Funny car cage support loops |
| 47 | 1 | 1 5/8 X 17 | Funny car cage top (made from spare tube from chassis) |

All straight tubes are cut from two boxes labeled #4404, they contain the following tubes:

| <u>QTY</u> | <u>SIZE</u> | <u>TUBE CODE</u> | <u>ITEM FROM INSTRUCTION</u> |
|------------|-------------------|------------------|------------------------------|
| 12 | 1 5/8 x .134 x 72 | A | 9 and 19 |
| | | B | 9 and 19 |
| | | C | 12 |
| | | D | 12 |
| | | E | 13 |
| | | F | 14 |
| | | G | 15 |
| | | H | 10 and 10 |
| | | I | 11 and 11 |
| | | J | 16, 16 and 17 |
| | | K | 17 and 17 |
| | | L | 18, 20 and 20 |
| 12 | 1 1/4 x .134 x 72 | M | 23 and 23 |
| | | N | 24, 26 and 26 |
| | | O | 24, 32 and 32 |
| | | P | 25 and 34 |
| | | Q | 25 and 34 |
| | | R | 28, 27, 27 and 27 |
| | | S | 29 and 29 |
| | | T | 30 and 30 |
| | | U | 21, 21 and 27 |
| | | V | 22, 22 and 22 |
| | | W | 31 and 31 |
| | | X | 33 and 33 |

When you receive your chassis, the first thing to do is to make sure you have all the parts. Use the above list of components to verify that you have all the parts. The bent cage parts will usually be banded together in two bundles. The straight tubes will come in two identical boxes labeled #4404. The brackets will be in a small box labeled #3000. The assembly drawing will be in the same 8 1/2 x 11" envelope these instructions were in. If anything is missing, contact Chassisworks for assistance.

The straight tubes boxes will provide enough material to build your chassis provided you cut the correct lengths from each tube. The above chart will give you a guideline. The length of each tube from the instruction sheets are approximate. Do not cut the tubes before you need them and try to cut the long tubes first.

Chassisworks makes no guarantee or claims that this chassis will be accepted by any sanctioning body. It is the sole responsibility of the chassis' owner to determine that this chassis can be used for the owners intended use. We suggest that you carefully examine the rules that pertain to chassis construction for the associations that you race under and, make sure that this chassis fits those rules. We also require you to measure the diameter and wall thickness of

every tube (bent and straight) that goes into the chassis to make sure it is the correct size for the rules. With the advent of sonic testing, it is important that you measure the wall thickness of every tube in the roll cage that is subject to the sonic test. See your Association Rule Book to determine which tubes must be a specific minimum wall thickness. Do not install any tube that is not at least the minimum. Chassisworks will replace any tube that is undersized and has not been installed.

Read all the instructions completely and make sure you understand them before you begin. Only tack weld the chassis components whenever possible. This will make it easier to remove components if you make a mistake. All joints that are covered by another tube or bracket must be completely welded before they are covered up. This chassis must be tig (heliarc) welded by an experienced welder - your life depends on it!

Construction of a chassis cannot be accomplished without a jig. To assemble the chassis you will need a level surface as large as the car. This should be a steel table or an "I" beam. You will need to hold the body up off your surface at ride height, the table surface will simulate the ground. Also, weld a little of each joint at a time to help avoid distortion.

Do not assemble your chassis using only the dimensions on the assembly drawing. You must use a body to help in tube placement. The dimensions on the assembly drawing are for a 1982-1990 Camaro/Firebird.

This chassis can easily be modified to fit other intermediate size cars. Most intermediate size cars are very close to the same width inside. They also have very similar windshield angles. This allows this cage to fit many cars. When altering the dimensions on the assembly drawing for different vehicles, do not change any dimensions that affect where any front or rear suspension brackets mount in relation to other brackets or the chassis will not work.

To vary the wheelbase, lengthen or shorten the distance from the firewall to the front axle centerline. If your body has a shorter wheelbase, do not shorten the driver's compartment more than is absolutely necessary, you need the leg room for the driver.

When altering the dimensions on the assembly drawing for different vehicles, do not change any dimensions that are not inside rectangular boxes. Only the dimensions in the boxes should be altered to fit different vehicles. See the chart for dimensions for other vehicles. Dimensions "A" through "G" need to be determined for your car. Write them on the assembly drawing in the boxes provided. If your car is not in the chart, you will have to measure the body.

CHASSIS DIMENSIONS FOR COMMON INTERMEDIATE CARS

| <u>Year & Model</u> | <u>Dim A</u> | <u>Dim B</u> | <u>Dim C</u> | <u>Dim D</u> | <u>Dim E</u> | <u>Dim F</u> | <u>Dim G</u> |
|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Camaro/Firebird 82-90 | 104 | 55 | 26 | 38 | 53 | 21 | 28 |
| Camaro/Firebird 78-81 | 108 | 55 | 30 | 40 | 58 | 21 | 28 |
| Camaro/Firebird 67-69 | 108 | 55 | 30 | 37 | 60 1/2 | 21 | 28 |
| Chevy II 62-67 | 110 | 62 | 25 | 40 | 65 | 21 | 27 |
| Nova 68-76 | 110 | 57 | 30 | 45 | 63 | 21 | 28 |

| | | | | | | | |
|--------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Beretta 88-90 | 105 1/2 | 57 | 25 1/2 | 33 | 54 1/2 | 21 | 28 |
| Thunderbird 83-89 | 104 | 57 | 24 | 42 | 57 | 21 | 28 |
| | | | | | | | |
| <u>Year & Model</u> | <u>Dim A</u> | <u>Dim B</u> | <u>Dim C</u> | <u>Dim D</u> | <u>Dim E</u> | <u>Dim F</u> | <u>Dim G</u> |
| | | | | | | | |
| Mustang 64-69 | 108 | 55 | 30 | 35 | 58 | 21 | 28 |
| Mustang 83-90 | 101 | 54 | 24 | 31 | 54 | 21 | 27 |
| Chrysler A body 68-74 | 108 | 59 | 26 | 43 | 61 | 21 | 28 |
| Scaled down 55-57 Chevy | 106 | 55 | 28 | 41 | 59 | 19 | 28 |

Prepare the body for the frame by first measuring forward from the rear axle centerline and marking the rocker panel at 23 inches. This dimension will be used to position the body correctly on the chassis when viewed from the side. The mark on the body at 23 inches should be in line (when viewed from the side) with the back of the main hoop crossmember where the 4-link mounts. This will position the new chassis rear axle centerline in the same location in reference to the body that the stock rear axle centerline had. In some vehicles, it will be necessary to move the rear axle centerline forward 1 to 3 inches from stock to provide adequate room for the rear wheel tubs against the back window. To do this, just move the body back in reference to the chassis 1 to 3 inches. Measure the stock wheel base and this will be Dimension A. In some front wheel drive body styles, the front tires will have to be moved forward to provide enough room for the engine. If you move the front tires forward, add this amount to the wheelbase. If your body was also set back to provide wheel tub clearance, this amount will usually be added to the front fenders to make the front end long enough. Measure the width of the car at the rocker panels, you will need this dimension later to assure the body is installed at the correct width.

Cut up the body by trimming all inner panels. You just want the single outer skin. You need to attach the body at the rocker panel, A-pillar, B-pillar, rear valance, and top 4 corners of the cage. On steel bodies, weld tabs to the chassis and body that bolt together. This will make it easier to remove and re-install the body as you build the car. Fiberglass bodies should be attached to sheet metal plates and fiber-glassed inside the body. Cleco the body to the plates until the final assembly when the plates should be fiber-glassed in. Do not use pop rivets, they will rattle out and crack the fiberglass.

Locate the body off of the jig at the correct ride height. Block the rocker panels and rear of the body so that the car will be held steady. Your jig will need a centerline from the rear of the car to a point forward of the front axle centerline. A string pulled tight will work. This will ensure that all chassis and body parts are centered.

1. Install the main hoop crossmember in the chassis between the rocker panels. To position the main hoop crossmember in the car, you must place the backside 23 inches forward of the rear axle centerline. The rocker supports need to be cut to length and installed with the main hoop crossmember. The rocker tubes should be installed so they are open at both ends. This provides a convenient place to run the battery cables and fuel lines without putting them under the chassis.

2. Install the main hoop per the drawing. It should be as tall as possible to provide adequate headroom. It should be at least 40 inches above the top of the frame. In some low body styles, the rear of the body will have to be raised off the ground to get enough height for the main hoop.

3. Install the upper 4-link crossmember. Use the 4-link chassis mounts to help position it at the correct location.

4. Install the rear frame rails per the dimensions on the assembly drawing. Measure from the back of the main hoop crossmember to the taillight panel. Subtract 23 inches and this will be Dimension D. The frame rails should be centered in the car and 3 inches narrower than the outside width of the 4-link brackets. This will be Dimension F. Make the 4-link brackets outside width as wide as possible while leaving enough room for the rear tires. Install the two rear frame crossmembers per the assembly drawing. Install the rear upper shock mount so it is centered under the frame. Install the chassis 4-link front mounts on the main hoop crossmember and the upper 4-link crossmember. The upper crossmembers front side is even with the main hoop crossmembers rear side when viewed from the side. Two 1/2 x 2 1/4 inch bolts and two 1/2 inch locknuts are used in the upper shock mounts to mount the shocks. The four misalignment bushings are also used in the shock mounts. One goes on each side of the shock bearings to fill the gap in the shock mount bracket. Use #6247 Adjustable Shock Mount for the lower mount.

5. Before you can install the front frame, you must determine what frame width you need for your tires to clear your fenders, this will be Dimension "G". Due to the many different front wheel and tire combinations, you should do the following calculations for your vehicle, even if it is listed in the chart.

Step 1: Determine the outside front tire width that you need. Measure the width between the front fenders. You will need 4 to 5 inches of clearance from the side of the tire to the inner front fender lip. Subtract 8 to 10 inches from the inner fender width. This will equal the outside tire width.

Step 2: To determine the hub width, you need to know how much wider the outside of the tire is than the front hub. Put a yard stick across the outside of the tire and measure through the center to the side of the wheel that bolts to the hub. When the wheel is bolted on, it is this much wider than the hub. Multiply this by 2 and subtract this amount from the outside tire width you calculated in step one. This will be the required hub width.

Step 3: Subtract 26 1/4 inches from the hub width to find the outside frame width. The frame cannot be narrower than 24 inches. Write your frame width on the Assembly Drawing.

6. Position the new front frame rails in the chassis. The rear end will most likely be too long, it attaches to the crossmember welded between the rocker panels. Try to put the first bend by the new firewall location. This will be determined by Dimensions "B" and "C". If the front frame does not clear the grillwork, shorten it. Be careful not to cut too much. The end of the frame must be at least 13 inches forward of the front spindle centerline. The rails should be parallel at the correct width you determined and centered in the frame. Measure diagonally to make sure the frame is square. Measure from the side of the frame to the body in several places to make sure the frame is centered in the body.

The top of the frame rail (measured at the front spindle line) should be 16 inches off the ground. This will give you 3 inches of ground clearance on the bottom of the frame. The frame does not have to be level in the engine bay or the driver's compartment. Use whatever frame rake is necessary to attach the rear of the frame correctly. The top of the frame in the engine compartment should be within 3 degrees of level.

7. Measure forward from the crossmember welded between the rocker panels to locate the front spindle line, this Dimension is equal to "B" and "C". Use a large square or plumb bob to put a line on both sides of the new front frame rails, which will represent the front spindle centerline. All of your brackets will locate off of this line.

8. Using the A-arm assembly tool #6706, install the lower A-arm brackets to the frame. Bolt the brackets together with the correct spacers. See the Assembly Drawing for the correct dimensions. Hold the assembly under the frame and tack it in place. The rear A-arm bracket goes 3/4 of an inch behind the spindle centerline. Use the control arm cap to gusset the front pair of lower A-arm brackets. Use two lower A-arm bracket caps on each rear set of lower A-arm brackets. One caps the bottom of the brackets and the other provides an additional gusset for the top adjustable shock mount. See the Assembly Drawing for the correct location.

9. Cut the 1 5/8 inch tube to the correct length for the rack and pinion crossmember. Install it between the front A-arm brackets so it is even with the bottom and rear edges of the front A-arm brackets. Install the rack and pinion mounts per the dimensions on the assembly drawing. If the frame outside width is less than 29 inches, you will have to trim the driver's side rack and pinion mount, as it will actually weld to the lower A-arm bracket. Just tack weld the crossmember in place until after you have checked for bump steer on the front end.

10. Install the upper A-arm brackets and adjustable shock mount (purchased separately). Use the #6706 Spacer Set to properly space the brackets. See the Assembly Drawing for the correct dimensions. Position the A-arm brackets so the adjustable shock mount is 1/4 inch forward of the front spindle line. Just tack weld the upper mounts in place until after you have installed the A-arms and been able to properly align the front end. Also install the forward frame struts. Make sure they clear the A-arms and shock mounts.

11. Install the complete front suspension and steering less the springs. Align the front end to 1/32 to 1/8 inch toe in, zero degrees camber, and 6 to 10 degrees of caster. The front end can be aligned by using a machinist level on the spindle flats.

12. Move the spindle through its full travel to make sure nothing binds up. Also, check for bump steer. If assembled correctly, all unnecessary bump steer can be removed by shimming the tie rods up and down at the spindle or by raising or lowering the rack and pinion slightly (1/16 of an inch at a time).

13. Install the cage top and cage sides per the assembly drawing. Install the front of the cage top as high against the roof as possible. Mount the main hoop end of the cage top on the side of the main hoop to provide more head room for the side of the driver's head. Tack the cage sides in place. Keep the lower leg of the cage side and frame as close to 90 degrees as possible because this will make installation of the firewall easier.

14. Install the cage side extension and foot brace per the assembly drawing, the driver's side and passenger's sides are the same. The rocker supports should be installed under the cage side extension and main hoop. The rocker supports should be positioned so the front and rear ends are open. This will give you an effective and protective tube to run your battery cable and fuel lines through to the front of the chassis. Install the mid mount bar at the correct height.

15. The next step is to install the funny car cage, if you purchased this option.

16. Install the engine support tubes at the mid mount per the drawing (each "U" bend makes 2 parts). If the engine is too far back, it can be moved forward for more windshield clearance. The mid plate attaches to the front of the engine support tubes. Install the tubes at 2 degrees

from perpendicular to the frame. Remember, the engine runs uphill to the rear 2 degrees. Install the front engine support tubes with the motor plate to assure the correct location.

17. Install the transmission crossmember, rocker supports, and frame triangulator when you are installing the transmission crossmember.

18. Position the seat and install the top double rail to clear the seat. If you add more triangulation to the top rail, make sure it will clear the seat.

19. Install the remaining straight tubes, forward frame strut, rear main hoop struts and back brace, rear crossmember and frame supports, side bars and roll cage gussets. Make sure these additional tubes clear all parts of the body.

20. Use the frame end caps to cap the ends of the front and rear frame.

21. Recheck all dimensions, remove the body and finish welding the chassis.

22. Chris Alston's Chassisworks, Inc., carries a complete line of accessories to make completion of your car easier.

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