

**Detroit Speed**  
**Mini-Tub Kit**  
 1968-74 Chevy Nova, Oldsmobile Omega, Pontiac Ventura  
 P/N: 041207DS & 041208DS



PN: 041207DS Shown

Item	Component	Quantity
1	DSE Mini Tubs - 1968-74 X-Body	2
2	Rear Upper Shock Crossmember	1
3	Upper & Lower Shock Mount Bolt (1/2"-13 x 3"L)	2
4	Upper & Lower Shock Mount Nylock Nut (1/2"-13)	2
5	Upper Shock Mount Bushing (3/4" OD x 1/2"ID x 5/8" L)	2
6	Lower Shock Mount Bushing (3/4" OD x 1/2"ID x 1/4" L)	2
7	Lower Shock Mount Washer (1/2" SAE)	2
8	Offset Shackle Set	1
9	Urethane Bushing Kit	1
10	Adjustable Leaf Spring Pad	2
11	1/2" U-Bolt Kit	1
12	Lower Shock Plate- Right Hand	2
13	DSE Rear Leaf Spring (2" or 3" Drop)	2
14	Mini-Tub Shock	2
15	Instructions	1

Congratulations on your purchase of the DSE Rear Mini-Tubs Kit for your 1968-74 X-Body. The DSE Mini-Tubs are inner wheel housings designed to accommodate wider tire and wheel packages, including tires as wide as 315 mm. They are engineered for a perfect fit and retain a stock appearance. The DSE Mini-Tubs are wider than stock, stamped from 18 gauge steel, made in the USA. Please read the entire set of instructions and fully understand all of the steps involved before beginning the project.

**NOTE:** All work should be performed by a qualified welder and technician.

**NOTE:** The DSE Mini-Tubs were designed to OEM sheet metal, therefore any aftermarket restoration sheet metal may require additional body work to fit to the DSE Mini-Tubs.

**NOTE:** There is an installation video available through the DSE website shown here: [detroitsspeed.com/blog/post/detroit\\_speed\\_1968-74cx\\_nova\\_hydroformed\\_subframe\\_front\\_suspension\\_system\\_quadralink\\_rear\\_suspension\\_system\\_mini-tub\\_subframe\\_connector\\_install](https://detroitsspeed.com/blog/post/detroit_speed_1968-74cx_nova_hydroformed_subframe_front_suspension_system_quadralink_rear_suspension_system_mini-tub_subframe_connector_install).

**NOTE:** We recommend welding one mini-tub in at a time because it is easier to fit and install the upper shock crossmember without one of the mini tubs in place. Cut and fit both sides however only weld one side in place until the upper shock crossmember has been fitted.

1. Properly support the vehicle on jack stands with the vehicle square and level.
2. Remove the rear axle, drive shaft, shocks, leaf springs, and fuel tank.
3. Strip/remove all undercoating, paint and seam sealer from the inner and outer wheel houses. This will help identify seams and spot welds.
4. Remove the decklid and decklid torsion springs from the vehicle as shown in Figure 1. Use caution when removing the leaf springs as they are under tension.



Figure 1 – Removing the Torsion Springs

5. **Mark or scribe a line between the original upper shock point centerlines on the trunk floor.** This will be used as a reference line when installing the Detroit Speed Upper Shock Crossmember in the Leaf Spring Mini-Tub Kit. **NOTE: You must draw this reference line before you make any cuts, otherwise you will NOT be able to locate your upper shock crossmember.** The upper shock mounts are not visible from the trunk pan on an X-Body (Nova, Ventura, Omega) so it's necessary to drill a reference hole through the center of the shock mount and into the trunk pan. Draw a straight line between the two holes marking the original upper rear shock mounts.

- The Detroit Speed Mini Tubs will be 2" wider than stock. Take your measurements and mark along the outside edge of the stock tub. Set your dividers to 2" as this is the difference in distance from the new DSE mini tub as compared to the stock inner tub. Scribe a line around the stock inner wheel tub as shown in Figure 2.



Figure 2 – Scribe Cut Line

- Once you have scribed along the stock inner tub, use a marker to mark the cut lines on the trunk floor and back seat brace as shown in Figure 3.

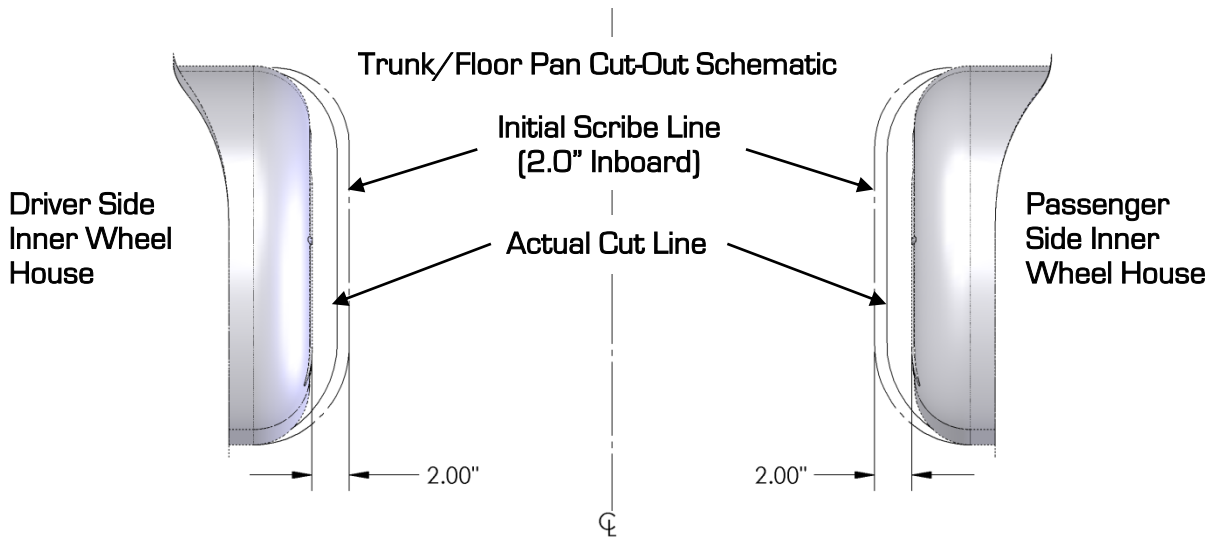


Figure 3 – Mark the Cut Lines

- Mark the floor pan next to the tub at 2" for your flange bend line. An additional line should be marked with your dividers set at 1-1/4" as shown in Figure 4. This additional line will be used on the interior floor pan; this will be the actual cut line. The 2" marked line will be used as a folding line for the new flange. See the cut-out schematic in Figure 5 on the next page for further details.



Figure 4 – Mark the Flange Bend Line



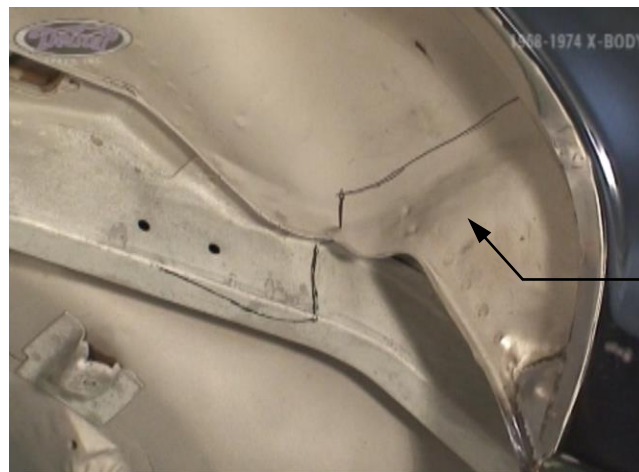
**Figure 5 - Actual Cut Line is 3/4" Outboard from Initial Scribe Line  
(The Initial Scribe Line will be used as a folding line for the new flange)**

9. Use your dividers to scribe and mark a 2" line underneath your vehicle as shown in Figure 6. You will be removing a small section of the framerail towards the rear of the wheel tub. This will be replaced with 1/8" thick steel which will be created using the provided templates later during the install.



**Figure 6 - Mark the Framerail**

10. The DSE Mini-Tubs do not have provisions for the back lower portion of the inner wheel tub so you must leave that section attached to your vehicle. Mark a line about an inch above the framerail and draw a line to the outside edge of the stock tub above where the floor of the trunk would be as shown in Figure 7.



Leave this section of the stock inner tub

**Figure 7 - Stock Tub Cut Line**

11. Finish marking your cut lines on the outside section of the framerrail and stock tubs as shown in Figure 8.



Figure 8 – Mark Cut Lines

12. Continue marking your 2” cut line down the outside edge of the framerrail with your dividers. After making your 2” mark, scribe another line at 1-1/4” as we did on the inside of the vehicle for the flange cut line as shown in Figure 9.



Figure 9 – Mark Flange Line

13. With all of your lines marked and using the cut lines as a guide, start to cut out the stock tub with a cut off wheel, die grinder or plasma cutter. This line will be inboard of the frame rail as the frame rail runs outward, rear of the axle centerline. See Figure 10, start at the rear section of the stock tub that you will be leaving in place shown in Figure 7.



Figure 10 – Start Cutting the Stock Tub

14. Mark around the visible weld area of the trunk mounts from underneath the stock tub. Cut and remove them along with the rear section of the stock tub as shown in Figure 11.



Figure 11 – Mark the Trunk Mounts

15. After cutting around the bottom side of the trunk mount, next cut the decklid hinge mount to remove it from the vehicle as shown in Figure 12. Continue to cut out the stock tub on all of your pre-marked lines in the trunk as well as inside the vehicle as shown in Figure 13.



Figure 12 – Cut and Remove the Hinge Mount



Figure 13 – Cut Pre-Marked Lines

16. Leave the 2" cut lines that you have marked for the flanges and just cut the lines you marked off at 1-1/4" as shown in Figure 14. You will also need to mark around the visible welds of the seat back brace underneath the vehicle and remove that section as shown in Figure 15.



Figure 14 – Cut 1-1/4" Marked Lines



Figure 15 – Remove the Seat Brace

17. Remove the stock inner wheel tub as it will not be re-used as shown in Figure 16. Do not damage the outer wheel house. If the outer wheel house is rust free it will not need to be modified.



Figure 16 – Stock Inner Tub Removed

18. With the stock tub removed from the vehicle, finish your cuts along the framerail to make room for the new 2" wider DSE mini tubs. Due to space constraints around the stock upper shock mounts, use the appropriate tool for the space provided as shown in Figure 17 on the next page.



Figure 17 - Cutting along the Framerail

19. The outer frame rail wall can now be removed with a plasma cutter or die grinder. The section to be removed will start approximately at the wheel/axle centerline and continue rearward to the inner tub radius as shown in Figure 18.



Figure 18 - Notch the Framerail

20. With the stock inner tub removed, grind the edge however make sure to leave the seam from the stock outer tub. That way you have a thicker edge with more material to weld the new DSE mini-tub as shown in Figure 19.



Figure 19 - Grind Seam



21. Carefully trim and clean up the rest of your floor cut lines to prepare the mini-tub for test fit. Finish by grinding down the edges to the pre-marked cut lines as shown in Figure 20.



Figure 20 – Finish Cut and Grind Pre-Marked Lines

22. The 3/4" sheet metal flange can now be folded down using the initial scribe line as a reference. A flange tool or Vise Grips™ can be used to start working the metal. A body hammer and dolly can be used to finalize the shape of the flange only on the floor area inside the car and under the back seat as shown in Figure 21.

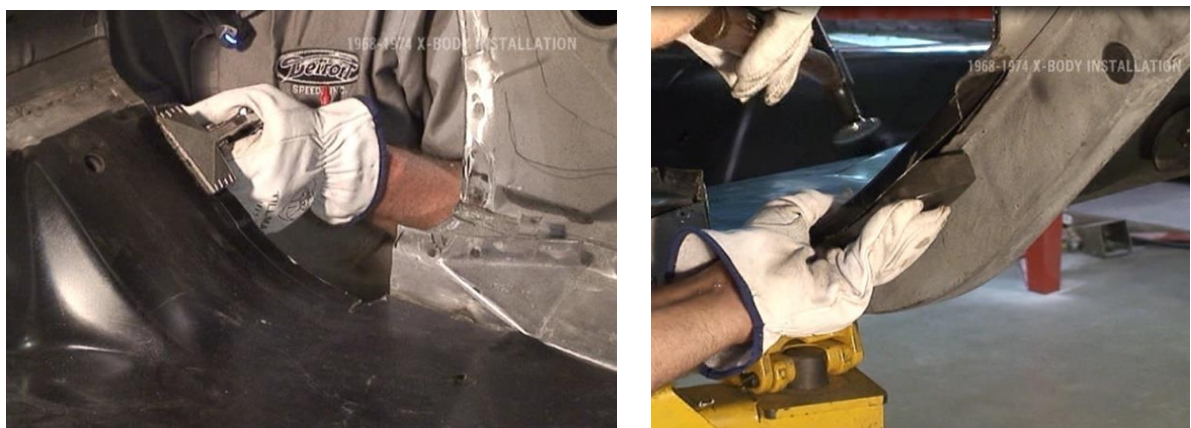


Figure 21 – Folding & Shaping of the Flange

23. With the new flange created, and the stock inner tub removed and the framerail cut and clearance, it is now time to test fit the mini-tub as shown in Figure 22.



Figure 22 – Test Fit

24. A new outer frame rail section can now be fabricated from 1/8" steel. This will close and strengthen the frame rail. The section should follow the rear inner tub radius. Close out panels should be made from 1/8" steel to close the upper trunk/stock shock area. All pre-made closeout and flange templates for your project are included in the kit. The provided templates are to be used as a general guide. Due to vehicle variation, you can also create new templates to properly fit your vehicle as shown in Figure 23.



Figure 23 - Framerrail Templates

25. Once you have transferred your template to 1/8" steel, as you can see in Figure 24, we attached a tab to the outside surface to make it easier to hold onto. Once it's welded in place you can remove that tab. We also added a small step to the closeout so it fits it doubles over into the framerrail.



Figure 24 - Framerrail Closeouts

26. Tack weld both closeouts in place and check for fitment before final welding. Once they are completely welded in place, you can grind your welds smooth so it is ready for the DSE mini-tub as shown in Figure 25.



Figure 25 - Grind Closeouts

27. With everything prepped and ready, position and line up your mini-tub along the seams and clamp into place. Once it is clamped, come in from the trunk side and mark your lines at the backside of the tub and also on the inside at the back seat area. Also make a reference line around the seam of the mini-tub at the outside framerail so you have a good return point after you punch your spot weld holes in the mini-tub as shown in Figure 26.



Figure 26 - Mark the Mini-Tub

28. Drill or punch 9/32" holes in the mini-tub flange and along the lower edge of the mini-tub as shown in Figure 27. With all of the holes punched in the mini-tub, fit and secure it to the vehicle and prepare to weld it in place.

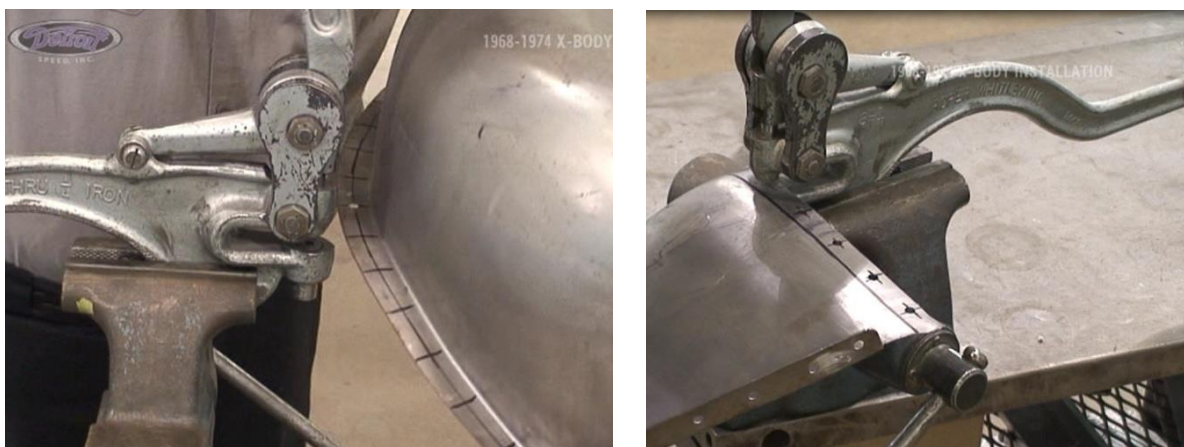


Figure 27 - Punch Spot Weld Holes

29. Pre-drill a few location holes in the mini-tub and the frame rail on your last fitment so you can hold it in place with Cleco fasteners. Then you can clamp the mini-tub tightly in place for welding as shown in Figure 28.



Figure 28 - Secure the Mini-Tub for Welding

30. With the mini-tub lined up and clamped in place, start welding it to the vehicle in different locations as shown in Figure 29.



Figure 29 – Welding the Mini-Tub

31. Grind off the welds at the bottom side of the mini-tub at the front of the wheel well. Mark around the welded area and use a template to create a doubler plate using 1/8" steel. Before welding in place, grind the welds and any high spots in that area so the doubler plate will sit flat as shown in Figure 30.

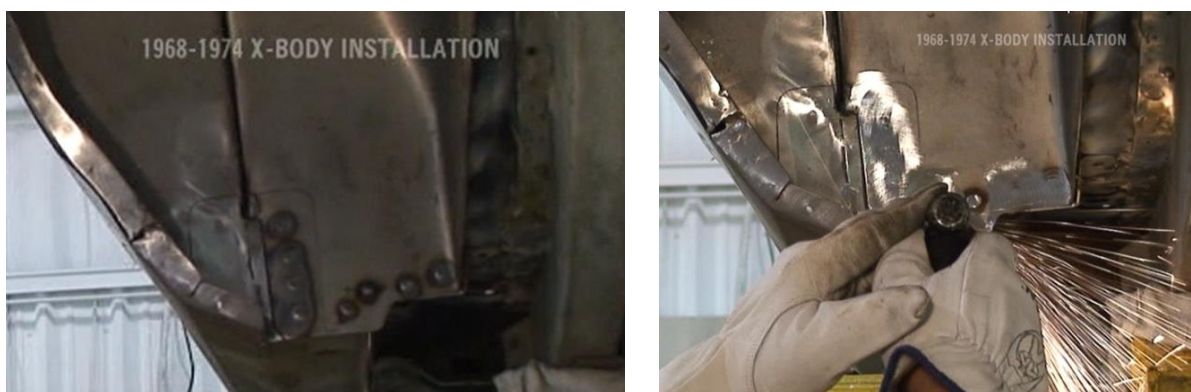


Figure 30 – Prepare for Doubler Plate

32. Once you have the plate fit and ground, plug weld in place. Once it is plug welded, grind the doubler plate smooth. When finished it will be the same as what you had from the factory as shown in Figure 31.

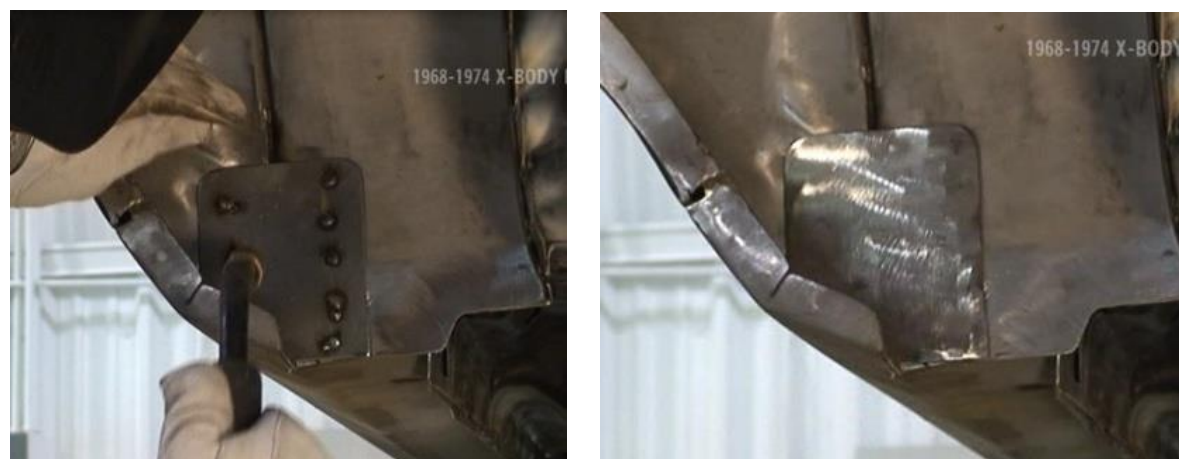


Figure 31 – Welding Doubler Plate

33. Fabricate a new decklid support mount to replace the factory one that was removed earlier to fit the new mini-tub. After fabricating a new decklid mount, clamp it to the vehicle and weld it in place as shown in Figure 32.



Figure 32 – Fabricate and Weld the Decklid Support

34. After welding the deck lid support into place, grind the decklid support mount and the mini-tub welds to a smooth finish as shown in Figure 33.



Figure 33 – Finish Grind Mini-Tub

35. Start the passenger side mini-tub install by cutting the decklid support mount. Follow the same steps you used in removing the driver's side tub to remove the passenger side stock inner tub as shown in Figure 34.

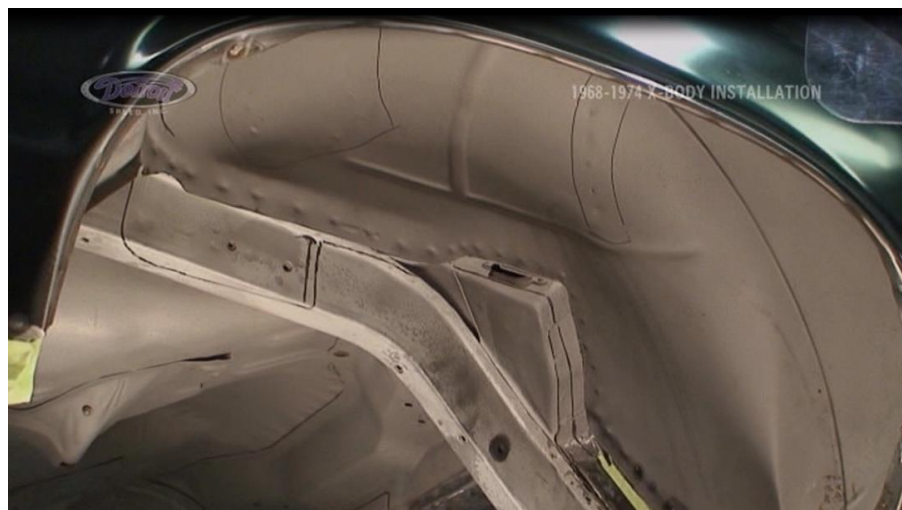


Figure 34 – Passenger Side Stock Tub

36. With most of the stock inner tub removed, finish cutting out the marked area of the vehicle's framerails as shown in Figure 35.



Figure 35 - Passenger Side Framerrail

37. Cut and fit the passenger side mini-tub however do not weld it in place until the upper shock crossmember has been fitted. **NOTE:** We recommend welding one mini-tub in at a time because it is easier to fit and install the upper shock crossmember without one of the mini tubs in place. Cut and fit both sides however only weld one side in place until the upper shock crossmember has been fitted.

#### Install the Upper Shock Crossmember

38. To begin the installation of the upper shock crossmember, use the original upper shock mount reference centerline made earlier in step 5. Mark and/or scribe the trunk pan for the cut lines that will be approximately 6" wide. Use the shock centerline as a guide and measure 3" on either side of the shock centerline. The two cut lines should be the same width or narrower than the new shock crossmember as it is always a good idea to cut inside your lines; the section can always be made wider during final fitting. The shock crossmember should be installed according to the original upper shock mounts. Using the two lines as reference, cut along each line and continue to trim the trunk pan for the upper shock crossmember clearance.
39. Once the crossmember can be placed in position, determine your mounting height. The top of the crossmember should be approximately 1-1/2" above the trunk floor measured from the frame rail area. This will provide additional shock travel if ride height is lowered.
40. With the crossmember in position, scribe the underside of the crossmember with the trunk pan and floor pan. The crossmember can be removed and the length will need to be trimmed to the trunk pan contours, as well as to insure proper clearance to each inner wheel tub.
41. The crossmember is used to add structure to the upper shock mount when relocating inboard of the frame. Once fitted, the crossmember should be welded on both sides of the trunk/floor pan and to each wheel tub and frame rail once the passenger side mini-tub is installed.

## Finish Installing the Passenger Side Mini-Tub

42. Once the upper shock crossmember is installed, you will need a flat surface to have the passenger mini-tub seal up against. Due to framerail and the inner sheet metal variations on this application you may need to create a template and then a steel part to weld in place as shown in Figure 36.



Figure 36 - Passenger Side Closeout

43. You will also need to make a steel closeout for the rear section of the framerail. When both frame rail pieces are tacked in place, finish welding them to the framerail. Then grind your welds to a clean smooth finish as shown in Figure 37. **NOTE:** The DSE QUADRAlink track bar bracket has been installed on the bottom side of the framerail in Figure 37. This bracket does not exist for the DSE Leaf Spring Mini-Tub Kit.



Figure 37 - Finished Closeouts

44. Now it's time to test fit the passenger side mini-tub. With it in place, mark the top and bottom and around the points on the vehicle so when you remove it, you can mark for your plug weld holes. With your lines marked and your holes punched, fit the mini-tub into place. Secure it with clamps and begin welding the mini-tub to the vehicle as shown in Figure 38 on the next page.



Figure 38 – Clamp and Weld to the Vehicle

45. When finished welding, grind your plug welds to a smooth clean surface. With both mini-tubs welded to the vehicle, mark lines at every 1-1/2" and stitch weld both mini-tubs to the floor pan as shown in Figure 39 on the next page.



Figure 39 – Stitch Weld

46. To finish your passenger side mini-tub, create a trunk mount template and fit to your application. Then create your mount out of steel and weld it to the vehicle as shown in Figure 40. With both Mini-Tubs in place and welded, the deck lid brace can now be attached to the original hinge support and the new Mini-Tub. Then grind your welds to a smooth flat finish.



Figure 40 – Trunk Mount



47. The seat back brace can be reinstalled to the Mini-Tub and original seat back structure. At the start of this installation we had to cut the rear seat brace loose from the factory tub so now it is time to put that connection back in place. Start by creating a template to fit the vehicle and then fabricate a steel part as shown in Figure 41.



Figure 41 – Seat Back Brace

48. Secure the new seat back brace and weld it to the vehicle. Do this for both sides of the vehicle and grind your welds to a flat smooth finish as shown in Figure 42.



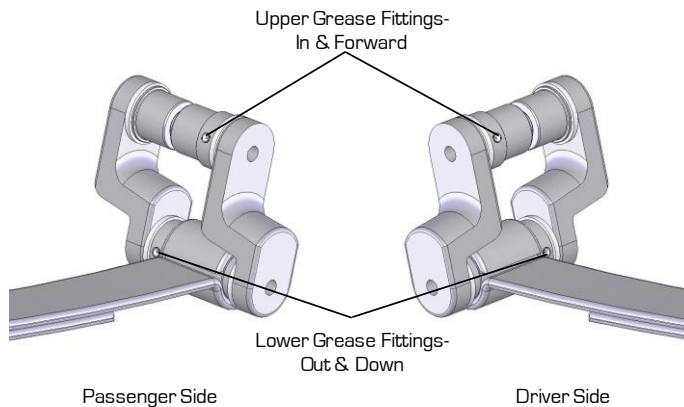
Figure 42 – Weld and Grind Seat Back Brace

49. Remove the rear seat cover and padding. Modify the seat frame to clear the DSE Mini-Tubs. Install the bare seat frame and mark points of interference between the seat frame and tubs. These points will have to be modified to clear the new tubs.
50. Modify rear interior trim panels as necessary to fit the DSE Mini-Tubs.
51. The installation of the Mini-Tubs is complete. We recommend that all seams receive seam sealer to prevent the possibility of water intrusion and all bare metal be primed and painted.

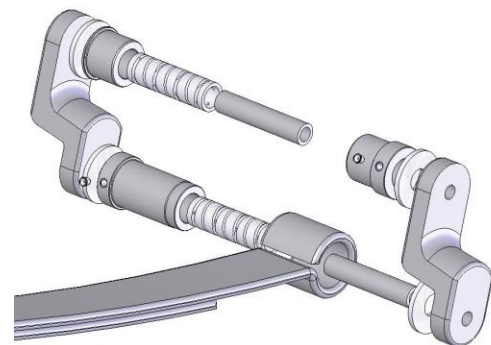
### Installing the Rear Urethane Bushings

**NOTE:** If the Delrin Bushing Kit has been purchased, skip to step 3.

52. Remove your stock shackles and press out your stock bushings. Before installing the new bushings and crush sleeves, lightly coat the following areas and parts with the grease supplied:
- I.D. of the rear spring eye
  - I.D. of the shackle bushing brackets
  - I.D., O.D. and flange of the polyurethane bushing
  - O.D. of the crush sleeves
53. Install the urethane bushings by first gently tapping in the bushings and then tapping in the crush sleeves. Skip steps 3-5 and go to the next section.
54. After removing your stock shackles and pressing out your stock bushings (if applicable), insure that the bushings are oriented in the shackles as follows;
- a. The upper, two-piece bushings should be installed with the grease fittings facing toward the inside and front of the vehicle.
  - b. The lower, one-piece bushings should be installed with the grease fittings facing down and toward the outside of the vehicle.
55. Correct bushing configuration can be seen in Figure 43 below. This configuration is correct for standard and offset shackles. The included Delrin™ washers should be installed between the bushing and the shackle at each contact point as seen in Figure 44 below.
56. Installing the bushings can be made easier by pre-lubricating the bushings before pressing them into the springs and shackle mounts. After installation, the bushings should be lubricated thoroughly and checked for adequate lubrication from time to time.



**Figure 43 - Delrin Bushing Positioning**



**Figure 44 - Exploded View of Offset Shackle with Delrin Bushings**

### **Installing the Offset Shackles**

57. Install the offset shackles so that the offset portion of the shackle is inboard of the frame rail. See Figure 45, Detail B at the bottom of the page. Do not torque at this time. Once the rear suspension is loaded with the weight of the vehicle, then torque the rear shackle bolts to 90 ft-lbs.

### **Installing the Leaf Springs**

58. Next, prepare the leaf springs to be installed in the vehicle. The front leaf spring bushings have a “thick” and “thin” side. Make sure to bias the bushing so that the “thin” half is on the inboard of each spring. The front spring pocket mounting is left unchanged, but may need to be loosened to allow it to “float” when moving the springs inboard.
59. Install the leaf springs into the vehicle using the factory front leaf spring perch and the rear DSE offset shackles. Re-tighten the front leaf spring pockets after installation of the leaf springs. Do not torque the shackle bolts at this time.

## Installing the Adjustable Leaf Spring Pads

60. It will be necessary to remove the factory leaf spring pads from your axle housing tubes by cutting and grinding the axle tubes smooth. Set the rear axle on top of the leaf springs. Install the DSE adjustable spring pads on the axle housing and lightly clamp.
61. Center the housing at the new spring location and adjust pinion angle at ride height. It is recommended that the adjustable leaf spring pads be clamped securely in position once the pinion angle and spring widths are set. **NOTE:** Failure to draw the bolts down evenly will cause permanent damage to the spring pads. DSE recommends a pinion angle of  $-3^{\circ}$  to  $-4^{\circ}$  down towards the ground.
62. Remove the leaf springs and permanently attach the pads by **welding** the lower spring pad bases to the axle tubes. Use care when welding as excessive heat can distort the axle tubes. See Figure 45, Detail A below. **NOTE:** The spring pads **must be welded** to the axle tube before driving the vehicle.

## Installing the Lower Shock Plates

63. Install the lower shock plates to the vehicle using the provided  $1/2$ "-20 U-bolts and torque to 75 ft-lbs. Position the lower shock mounting for correct shock orientation. For staggered shocks, the driver's side shock should be rear of the axle tube and the passenger side will be forward of the axle tube, both inboard of the leaf spring. See Figure 45, Detail C.

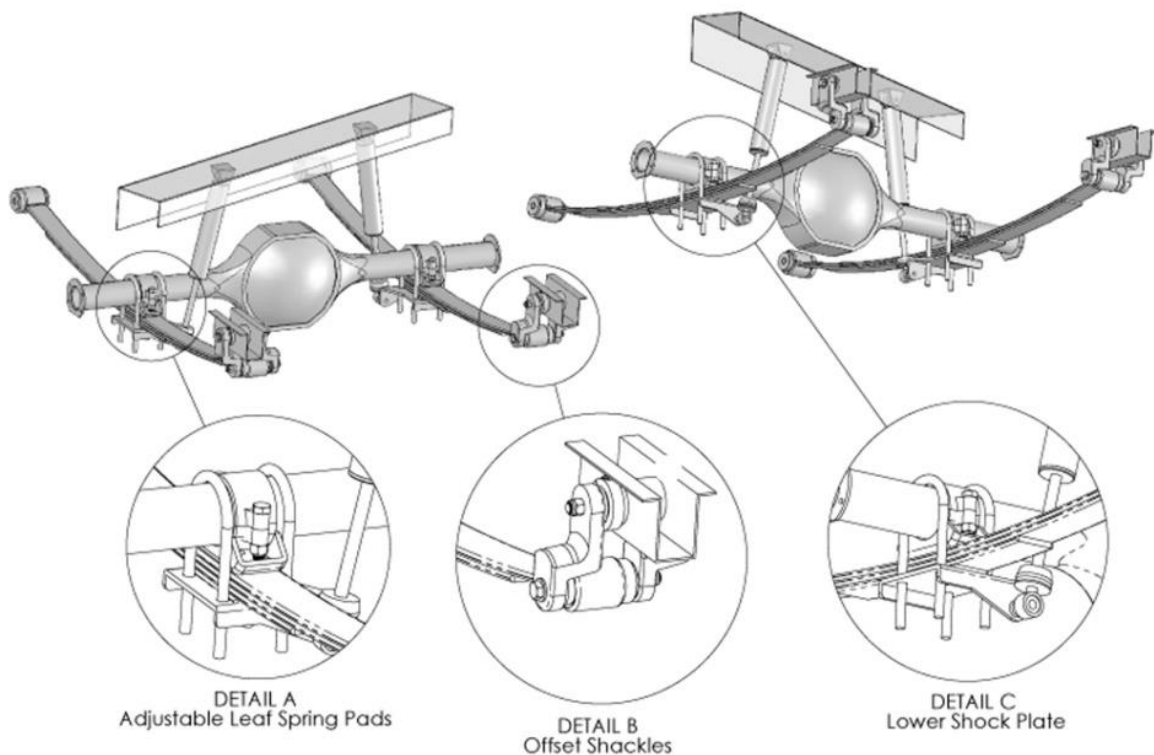


Figure 45

## Installing the Upper Shock Mounts and the Mini-Tub Shocks

64. The Mini-Tub shocks can now be attached with the shaft side down, to the lower shock plates using the provided  $1/2$ "-13 hardware and lower shock bushing. **NOTE:** There is an upper and lower shock mount bushing so make sure you have the correct one. The longer bushing is for the upper shock mount and the shorter bushing is for the lower shock mount.

65. Attach the Mini-Tub shocks to the lower shock plates using the provided 1/2"-13 x 3"L hex head bolts. Place the lower shock mount bushing over the bolt and install them through the lower shock eyelet.
66. Install the bolt and shock through the lower shock plate and tighten with the provided 1/2"-13 Nylock nut and washer.
67. The upper shock mounts must now be located to the upper shock crossmember. Place the upper shock mount bushing on the provided 1/2"-13 x 3"L hex head bolt. **NOTE:** There is an upper and lower shock mount bushing so make sure you have the correct one. The longer bushing is for the upper shock mount and the shorter bushing is for the lower shock mount.
68. Place the shock eyelet into the upper shock mounts and install the bolt and upper shock bushing through the upper shock mount. Tighten the bolt with the provided 1/2"-13 Nylock nut and washer.
69. With the weight of the vehicle on the rear axle, position the shocks so they are straight up and down when looking at the side of the vehicle and then tilt the top of the shock in towards the center of the vehicle by 5 to 10° off vertical while looking from the rear of the vehicle forward. Maintain shock tube to axle tube clearance during suspension travel. See Figure 45 on the previous page. **NOTE:** DSE references a ride height shock length of 15" to 15-1/2" from eyelet to eyelet with the Mini-Tub shocks.
70. Mark the bottom side of the upper shock crossmember where the upper shock mounts meet, and tack weld the upper shock mounts to the crossmember. Position the upper shock mounts so that the 1/2" bolts are parallel with the frame rails and tack weld in place.
71. Disconnect the shocks so you have room to final weld the upper shock mounts to the bottom side of the upper shock crossmember. Allow clearance for shock fasteners inside the crossmember.
72. Install the DSE Mini-Tub shocks to the upper shock mounts and lower shock plates using the provided 1/2"-13 hardware.

### **Final Assembly**

73. With the wheels/tires installed and resting the vehicle on all four tires, check that the rear axle is positioned correctly in the vehicle. It should be centered from side to side, and the wheelbase should be correct on both sides of the vehicle at 111.0"
74. Once the rear suspension is loaded with the weight of the vehicle, then torque the front leaf spring eye bolt and rear shackle bolts to 90 ft-lbs.
75. If the kit was purchased without the leaf springs the rubber front bushing must be pressed out. The leaf spring front spacer must be installed and the bushing pressed back in place with the spacer on the outboard side of the leaf spring. This will provide the maximum tire to leaf spring clearance.
76. A stainless steel narrowed gas tank is available from Detroit Speed to fit between the new offset spring locations.
77. Re-cover the seat bottom and then reinstall the package tray, rear interior quarter trim panels, carpet padding, carpet, seats, gas tank, and any additional interior panels that were removed for the installation process.
78. Check all rear clearances before driving the vehicle and make sure all hardware is tightened and has been installed with the correct torque settings.
79. Enjoy your new DSE Mini Tub rear suspension kit!



If you have any questions before or during the installation of this product, please contact Detroit Speed at [tech@detroitsspeed.com](mailto:tech@detroitsspeed.com) or 704.662.3272

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