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CHRIS ALSTON'S Chassisworks
THE HOME OF HIGHER TECHNOLOGY

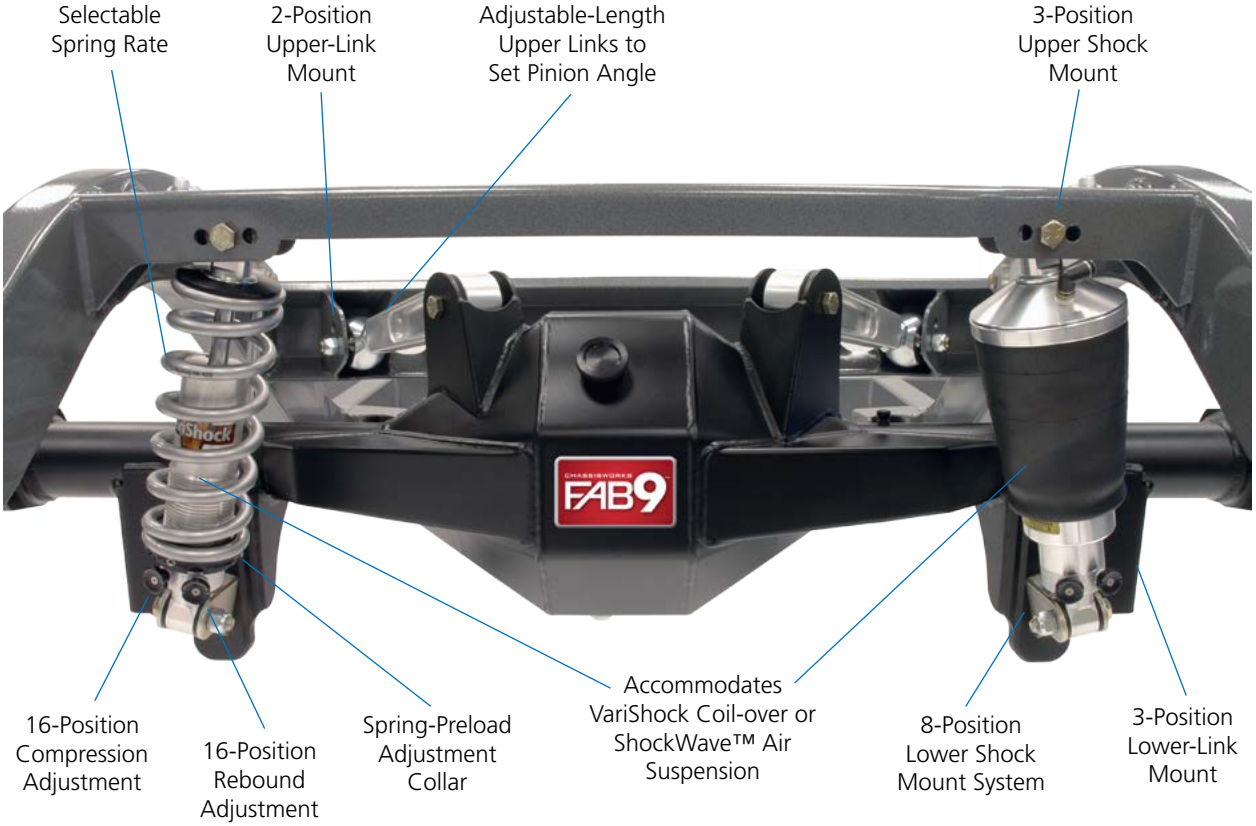
4 x 2" Rear Frame with Billet 4-Bar Rear Suspension System

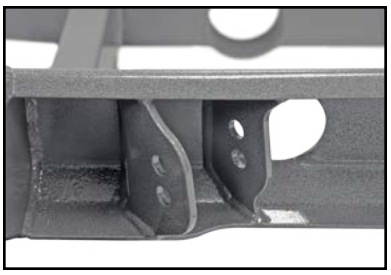
Canted Billet 4-Bar Rear Suspension System

Chassisworks' canted billet 4-bar rear frame system is a truly versatile high-performance suspension solution, suitable for g-Machines, street rods, muscle cars, or any project in need of optimized handling. State-of-the-art computer workstations with Pro/ENGINEER software were instrumental in creating a system that can be easily sized from 34" to 50" frame widths without introducing bind or negatively affecting suspension geometry. Multiple mounting points for each of the suspension components, including shocks, control arms, and anti-roll bar, enable highly adjustable suspension geometry that can be fine-tuned to match the performance requirements and weight distribution of your specific vehicle application. In addition, VariShock coil-over or ShockWave™ air suspension can be installed to meet the demands of both performance and street rod projects. Components include the rear frame, billet aluminum upper and lower suspension links, factory-welded FAB9™ housing, ball-end anti-roll bar, and selected shock system.

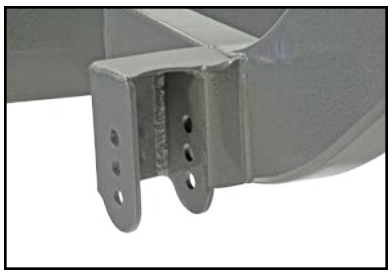
Highly Adjustable Suspension Tuning

Adjustment of rear-suspension geometry, ride height, and shock valving, combined with a broad selection of spring rates, enables precise tuning to meet the specific performance needs of your project. Housing pinion angle and lateral location are controlled by adjusting the upper-link lengths. Multiple positions at the upper-link chassis mount and lower-link chassis and housing mounts allow adjustment of the specific geometry that affects handling and traction. The multi-position upper and lower shock mounts also allow adjustment of the shock-motion ratio as well as ride height. The QuickSet 2 VariShock coil-over and ShockWave™ feature 16-position compression and rebound valve adjustments enabling 256 possible combinations. Spring rates range from 80 to 450 lb/in to accommodate a complete range of performance and ride-quality applications and can be changed with minimal effort.





Two-position upper-link mount enables simple adjustment of suspension instant center.

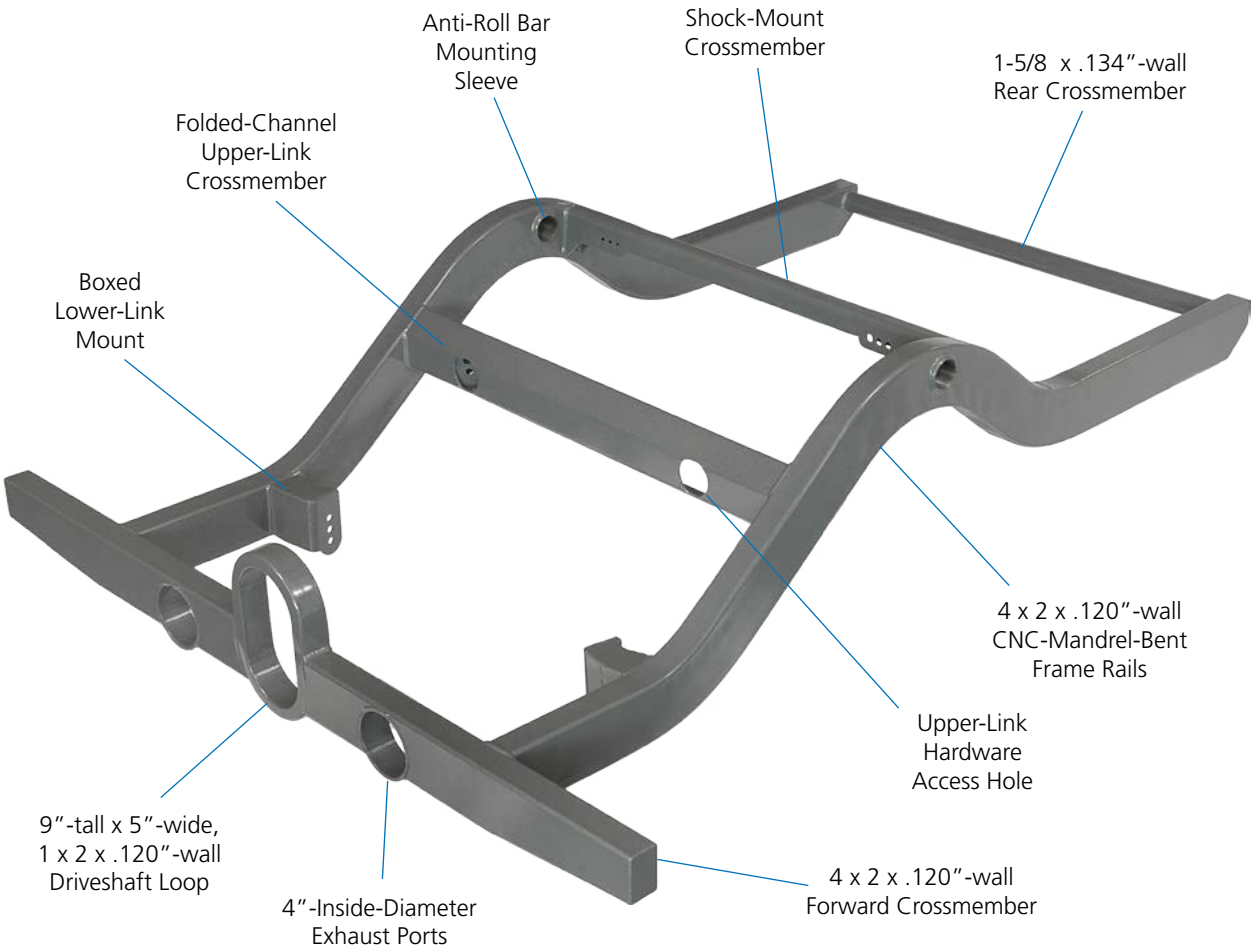


Three-position lower-link mount used with three-position housing mount for nine different settings.

Four-position shock mount plate with reversible clevis (not shown) for eight different settings.

Rear Frame and Options

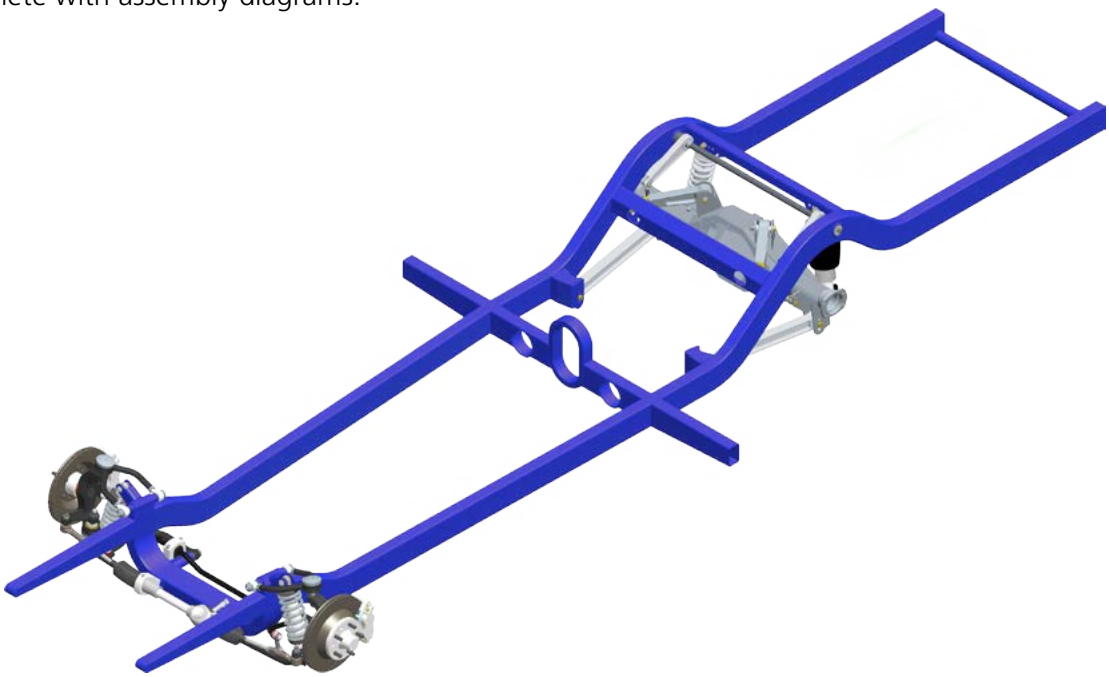
The rear frame is formed from CNC-mandrel-bent, 4 x 2 x .120"-wall steel tubing and designed with minimal rise over the rearend housing to allow more room in the rear seat and trunk areas. Optional 4 x 2" front crossmembers equipped with 1 x 2" tubular oval driveshaft loop are available with or without dual 4"-ID exhaust ports. Driveshaft loops measure 9" tall and 5" wide and are positioned as ordered to accommodate pinion offsets of 0", 1/2", or 1". Four-by-two forward frame connectors, 60" in length, can also be added to aid in tying the rear frame into your existing structure. Preassembled frames can be purchased in outside frame widths ranging from 34" to 50" in 1/2" increments. This ensures perfect geometry and fit with minimal effort while saving considerable installation time. Components are professionally spray-arc-welded by Chassisworks' welding staff in a controlled environment using computer-designed fixtures and production-quality equipment. Alternately, frames can be order in subassembly kit form with lower-arm, shock, and anti-roll-bar mounts factory-welded to each frame rail. Crossmembers are then simply cut to desired length and welded into place by a qualified installer.



Fully optioned frame shown.

4 x 2" g-Machine Full Frame with Canted Rear Suspension

The canted billet 4-bar rear system can also be integrated into our g-Machine 4 x 2" full frame for "ground-up" vehicle builds. Standard wheelbase configurations range from 91" to 125" in 1" increments, but custom lengths outside our standard range can be accommodated. Front-suspension-crossmember hub widths can be sized from 51" to 65" in 1" increments. Complete frames can be ordered factory-welded with 4-1/2" or 6" frame clearance or in unassembled kit form complete with assembly diagrams.



Unassembled Rear- and Full-Frame Kits

Part Number	Description
7154	Unassembled 4 x 2" Canted Rear-Frame Base Kit
OPTIONS	4 x 2 x 64" Front Crossmember with Driveshaft Loop
	4"-ID Exhaust Ports (pair)
	4 x 2 x 60" Forward Frame Connectors (detached)
7530	Unassembled 4 x 2" Full Frame, 4-1/2" Frame Clearance, g-Machine (front), Canted (rear)
7535	Unassembled 4 x 2" Full-Frame, 6" Frame Clearance, g-Machine (front), Canted (rear)
Note:	Rear frame in subassembly kit form includes rear and shock crossmembers with sufficient length for 50" outside frame width. Crossmember material must be cut to desired length prior to assembly.

Factory Welded Rear and Full Frames

Part Number	Description
7154-W	Factory-Welded 4 x 2" Canted Rear Frame, Base
OPTIONS	4 x 2 x 60" Forward Frame Connectors (detached)
	4 x 2" Front Crossmember with Driveshaft Loop
	4 x 2" Front Crossmember with Driveshaft Loop and Exhaust Ports
7530-W	Factory-Welded 4 x 2" Full Frame, 4-1/2" Frame Clearance, g-Machine (front), Canted (rear)
7535-W	Factory-Welded 4 x 2" Full Frame, 6" Frame Clearance, g-Machine (front), Canted (rear)

Billet 4-Bar Canted System

The billet 4-bar links can be purchased for use with our 7154 canted rear frame and 8272 or 8273 FAB9™ housing. They can also be purchased with detached mounts for welded installation with your existing frame and/or rearend housing. Complete kit includes upper and lower links with housing brackets, lower chassis mounts, and trim-to-fit upper mount crossmember. When purchased with 7154 subassembly frame kit, 7154-W pre-assembled frame, and/or pre-assembled 8272 FAB9™ housing, chassis and housing brackets are removed from 4-bar kit and added to welded assembly.

Billet 4-Bar Link System (6241) includes upper and lower suspension links, housing brackets, lower-link chassis mounts, and upper-link crossmember.

Billet Aluminum 4-Bar Links

Chassisworks' billet aluminum 4-bar links combined with our TrueCenter™ pivot-socket technology (see sidebar) provide extremely precise control of rearend-housing movement, resulting in stable and predictable vehicle handling. The 4-bar links' I-beam design with curved surface transitions was developed with the aid of state-of-the-art finite element analysis (FEA) software. Careful computer analysis enabled us to remove unnecessary weight and eliminate stress concentrations, resulting in a lightweight, visually appealing product with excellent strength and durability. Fixed-length lower links measure a stout 2" tall x 1-7/16" wide with taller 2-7/16" ends, providing additional strength at the TrueCenter™ pivot socket. Adjustable-length upper links feature a large 1"-diameter shank, screw-in TrueCenter™ pivot socket, enabling precise pinion-angle and housing-centering adjustment. All components have a satin-anodized or clear-zinc finish providing a high-tech, show-quality appearance.

TrueCenter™ Pivot Technology

The TrueCenter™ pivot socket is a deflection-free, high load capacity, serviceable component that maintains bearing preload throughout the assembly's service life. Non-compressible, low-friction, synthetic-polymer bearing races eliminate deflection, reduce wear, and remain linear in resistance, unlike rubber or polyurethane. Each TrueCenter™ pivot assembly is specially designed for its particular application allowing us to use the largest bearing diameter possible to maximize load-bearing capability.

The assembly can also be lubricated with a standard grease gun but differs from a balljoint or rod end in the ability to tighten the polymer races against the bearing if play should ever develop. TrueCenter™ pivot technology has been applied to our line of billet 4-bar links, improving performance and serviceability.

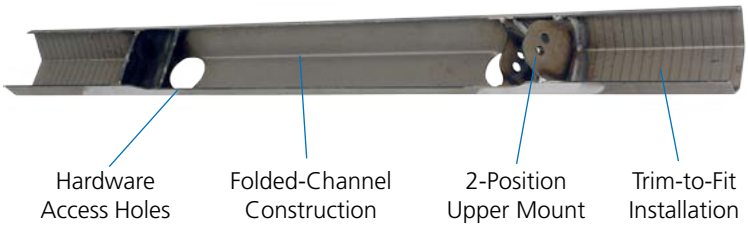
Chassis Mount - Lower Links

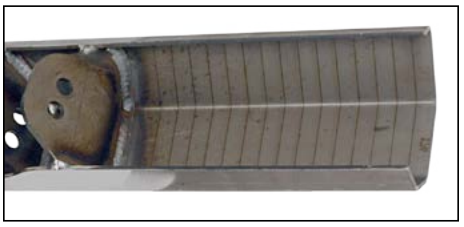
Lower-link mounts are boxed structures welded to the inside of each frame rail and feature three mounting positions. Altering the links' forward mounting position adjusts available traction and cornering characteristics. Mounts are included as part of the 7154 frame kit and 7154-W welded frame, or they can be shipped as a loose subassembly when used with an existing frame.

Lower-Link Mounts can ship as welded subassemblies for weld-in installation with customer's existing frame.

Chassis Mount - Upper-Link Crossmember

Upper-link mounts are positioned along a broad, folded-channel crossmember and offer two mounting positions. The outward mounting position triangulates the upper links to positively locate the rearend housing, preventing any side-to-side movement and eliminating any need for a separate track locater or panhard bar. When purchasing the 6241 4-bar system for use with an existing frame or purchasing the 7154 rear-frame kit the upper-link crossmember ships as a trim-to-fit component. Otherwise, the crossmember will be part of the 7154-W welded rear-frame assembly.





Laser-etched to simplify trimming to size.

Housing Mount - Lower-Links

Lower-link axle-housing mounts are a one-piece folded clevis sized specifically for the billet lower links and do not require additional spacers. Mounts are notched to precisely fit 3"-diameter axle tubes, and they feature two additional mounting holes for the anti-roll-bar end links.

Housing Mount - Upper-Links

The upper-link axle-housing mounts are a boxed mount utilizing a full-length rear gusset to increase the weld area against the housing and improve stability. The clevis opening is sized specifically for the billet upper links and does not require the use of additional spacers. To aid installation with existing or unassembled FAB9™ housings, each sheet metal component is laser-etched with guidelines and a number system to greatly simplify notching the brackets to correctly fit the housing.

Numbered etched-line system for fitting tabs to existing FAB9™ housings.

Housing Mount - Upper-Link Welding Fixture

For customers using rearend housings other than Chassisworks' direct-fit, factory-welded 8272 or 8273 FAB9™, our engineers have developed a simple-to-use welding fixture that precisely locates the upper-link mounts. The fixture plate bolts to any 9" housing face and features multiple, clearly marked mounting holes to accommodate centered, 1/2", or 1" pinion offsets. Once assembled, CNC-machined aluminum blocks positively locate the upper-link-mount components at the correct position and axis in relation to the frame centerline. This fixture greatly simplifies the installation of the upper control arm axle-housing mounts.

Billet 4-Bar Canted System

Part Number	Description
6241	Billet 4-Bar Links and Chassis and Housing Mounts (For use with customer frame and housing)
OPTIONS	Billet 4-Bar Links ONLY (For use with 7154 frame and 8272 FAB9™ housing)
	Billet 4-Bar Links and Chassis Mounts ONLY (For use with customer frame and 8272 FAB9™ housing)
	Billet 4-Bar Links and Housing Mounts ONLY (For use with customer housing and 7154 frame)
	Upper Housing Bracket Welding Fixture (For use with customer housing)

Adjustable Shock Mount and Clevis Kit

Chassisworks' highly adjustable lower shock mount features four holes and a reversible clevis to provide 8 different mounting positions, enabling a ride-height adjustment range of over 4". The 4-position, heavy-duty, threaded mounting base was designed to easily handle off-axis loads from the variable-angle shock configuration. A stout 5/8"-diameter, Grade 8 bolt allows the reversible bolt-on clevis to be positioned at the correct angle and securely supports the clevis with the aid of a backup locknut. The mount system can be included with our factory-welded FAB9™ rearend housing or shipped as a weldable kit for installation on other housings.

Adjustable Shock Mount and Clevis Kit

Part Number	Description
6252	Adjustable Shock Mount and Clevis Kit (for weld-in installation with customer housing)

Shock-System Options

VariShock Coil-overs provide an advanced level of tuning for both performance and street vehicles. Variable shock valving gives you up to 256 different combinations of "instant adjustment" by simply turning the adjustment knobs to one of 16 detents. The threaded lower spring enables fine tuning of ride height, shock-travel balance, and corner weighting without affecting spring rate.

VariSprings are manufactured using a new high-tensile wire, which is stronger than the chrome-silicon wire used by other manufacturers. Since this wire can flex more than conventional chrome-silicon wire, we can wind VariSprings with a coarser pitch that reduces weight and increases the spring's travel.

The ShockWave™ Air Suspension enables rapid changes in ride height when used with one of the various RidePro™ compressor control systems — perfect for street rods. Air suspension provides smooth, comfortable ride quality, but the ShockWave's™ built-in adjustable valving allows the system to be tuned for enhanced performance.

Coil Spring Rate Baseline

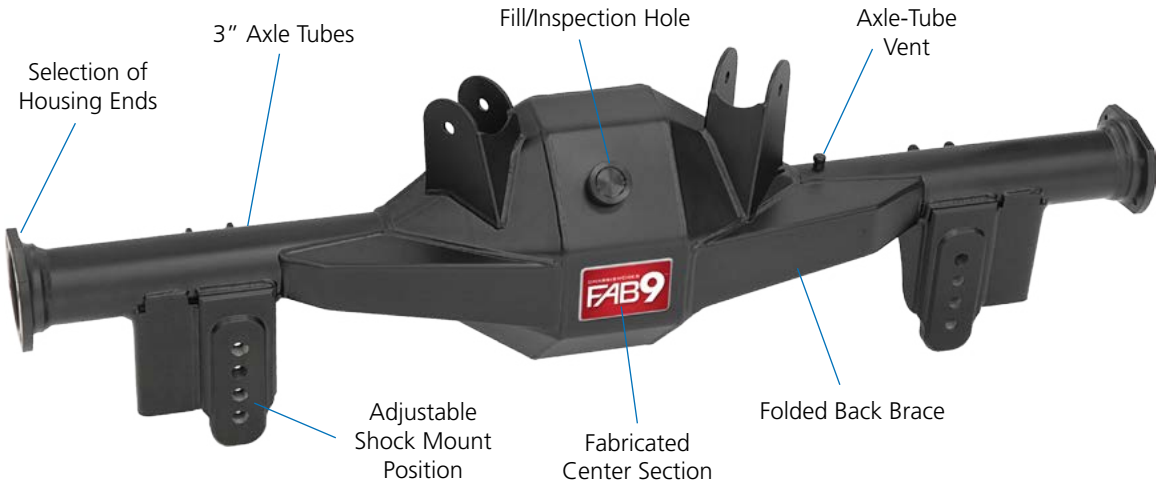
Rear Vehicle Weight (lb)	Rate (lb/in)	Spring Travel (in)	Part Number
820-925	80	8.63	VAS 21-12080
925-1025	95	8.28	VAS 21-12095
1025-1125	110	7.91	VAS 21-12110
1125-1225	130	8.43	VAS 21-12130
1225-1350	150	7.61	VAS 21-12150
1350-1500	175	7.60	VAS 21-12175
1500-1750	200	7.45	VAS 21-12200
1750-2025	250	7.00	VAS 21-12250
2025-2300	300	7.07	VAS 21-12300
2300-2600	350	7.00	VAS 21-12350
2600-2900	400	6.35	VAS 21-12400
2900-3200	450	6.24	VAS 21-12450

Shock-Absorber Options

Part Number	Description
VAS 21-12XXX[1]	VariSpring 12" Length, Powder-Coat Finish (pair)
VAS 11122-515	VariShock QuickSet 1, Single-Adjustable, Poly Eyes, 5.15" Travel, 16.10" Max., 10.95" Min., pr.
VAS 11222-515	VariShock QuickSet 2, Double-Adjustable, Poly Eyes, 5.15" Travel, 16.10" Max., 10.95" Min., pr.
VAS 131J2-515	ShockWave™ QuickSet 1, 5"-OD, Poly Eyes, 5.00 " Travel, 16.56" Max., 11.56" Min., pr.
VAS 132J2-515	ShockWave™ QuickSet 2, 5"-OD, Poly Eyes, 5.00 " Travel, 16.56" Max., 11.56" Min., pr.
Note:	
1	XXX = Spring Rate in lb/in. Range: 80 to 450 lb/in

FAB9™ Direct-Fit 9" Housing for Canted Billet 4-Bar Suspension

Chassisworks' FAB9™ direct-fit, fabricated 9" housing offers exceptional performance, reliability, and adjustability. Housing mounts have been engineered to accept our billet aluminum 4-bar links and feature multiple mounting positions for instant center adjustment. Additional shock mount and clevis kit (6252) also has the benefit of multiple mounting positions that enable a ride-height-adjustment range of 4-1/8" without sacrificing available shock travel. FAB9™ offers superior strength from fabricated center-section panels, internal tube gussets, folded back braces, and consistent robotic spray-arc-welded seams. Selectable options include 4-link bracket width of 34" to 50" in 1/2" increments; housing end-to-end width of 36" to 62-1/4" in 1/4" increments; housing-end type; centered, 1/2", or 1" pinion offset; installed axle vent; installed folded back brace; and adjustable shock mount and clevis kit. (See pricing table for width ranges.) Complete correct-length axle packages and third members are also available. Ask our sales representatives for details.



FAB9™ Construction

Finite element analysis (FEA) software was used to create a fabricated 9" (FAB9™) center section stronger yet lighter than its OEM counterpart. Angular panels, internal gussets, and a heavy-wall front face are assembled by a robotic spray-arc welder to ensure every housing is built to exacting standards. Axle tubes are 3" in diameter and welded along the internal tube gusset as well as the tapered edge of the center section. It is this enclosed internal chamber at each end of the center section that gives the entire assembly superior strength over OEM and competitors' designs. The housing can be further strengthened by adding an optional folded back brace. FAB9™ back braces are exact-fit boxed structures spanning from the outer edge of the back panel to the inside edge of the axle mounts. The tapered design is broad closest to the center section for maximum support and narrows toward the housing ends for lighter weight.

Complete Hardware Kit

Each FAB9™ housing comes equipped with an easily accessible fill hole, drain, and all necessary hardware. The fill hole is purposely oversized and strategically placed to allow visual inspection of the ring gear without draining fluid or disrupting gaskets or seals. A black-anodized, billet aluminum cap with O-ring seal prevents any unwanted fluid seepage. A specially slotted drain insert, welded to the floor of the center section, allows complete drainage of fluid and increases drain-plug thread engagement. The magnetic drain plug with reusable copper gasket captures metal particles suspended in the fluid, reducing the rate of wear on gears and seals. To relieve internal pressure, housings can be fitted with an optional axle vent located along the top of the axle tube. Equalized pressure improves the effectiveness of all seals and gaskets for trouble-free extended use. If an external fluid catch can is required, axle vents can be easily removed using the 7/16" hex and replaced with an appropriate 1/8" NPT fitting. Third-member mounting hardware consists of high-strength 12-point studs, hardened SAE flat washers, and nylon-insert locknuts.

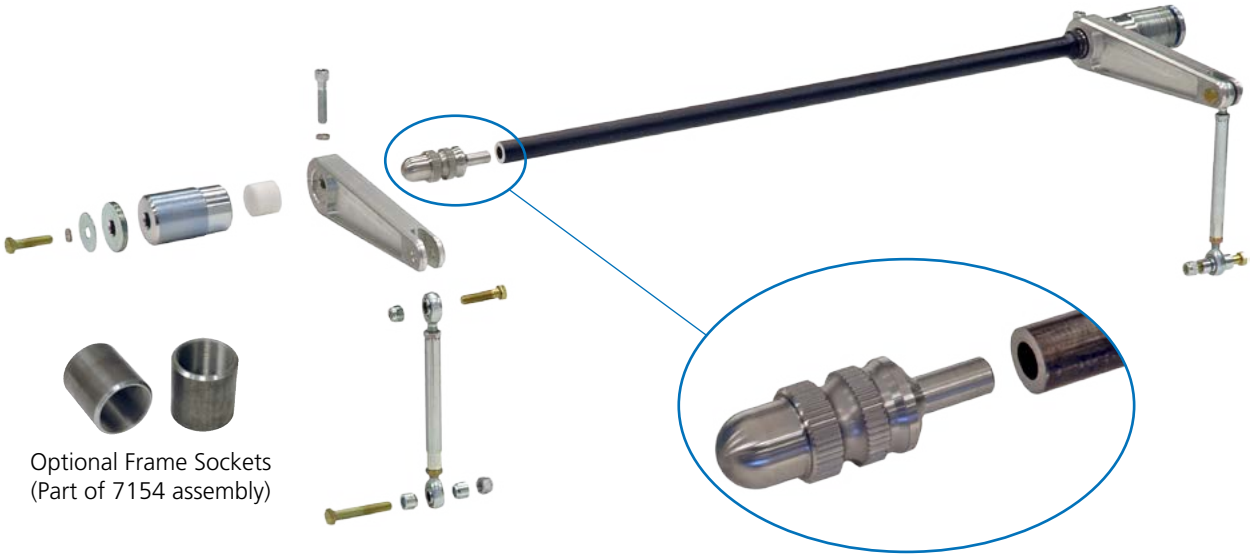
FAB9™ Housing for Canted 4-Bar Rear Suspension (8272)

Part Number	Description
8272	Welded Canted 4-Bar FAB9™ Housing, Mild Steel (36" to 62-1/4" in 1/4" increments)
8273	Welded Canted 4-Bar FAB9™ Housing, 4130 Steel (36" to 62-1/4" in 1/4" increments)
OPTIONS	Over 41-3/4"
	Installed Back Brace
	4-Bar Bracket Width: 34" to 50" in 1/2" increments
	Pinion Offset: Centered, 1/2", or 1" (Offset toward passenger side)
	Housing-End Type: Refer to Custom-Housing Worksheet and Instructions

Ball-End Anti-Roll Bar

The newest innovation in rear-suspension control is Chassisworks' ball-end anti-roll bar with integrated frame-rail mounts. It has been designed specifically to provide maximum exhaust clearance by placing the anti-roll bar closely against the vehicle's under-body, with no bulky mounts placed along the frame rail. The key to our tucked-away installation are the threaded mounting sleeves integrated directly into each frame rail. Billet bushing housings screw in from the outside of each frame rail to capture the ball-ends of the bar with low-friction polymer bearings.

The anti-roll-bar assembly includes a 7/8" road-handling or 1-1/4" drag-race, heat-treated torsion bar with splined ends and billet aluminum arms. Each arm is machined with a single split to ease installation fit and to clamp down upon the spline when tightened. A socket-head fastener applies pressure to the spline, creating a play-free joint while also fitting into a groove machined at the end of the bar. This locking joint prevents the arms from sliding, even under the most extreme force. Billet arms are connected to the chassis mounts by adjustable-length end-link assemblies. Steel end-link tubes feature left- and right-hand threads and a 1/2" hex for quick adjustment during installation. Adjuster links feature a 3/8"-shank 4130-body rod end for the ultimate in strength.



Optional Frame Sockets
(Part of 7154 assembly)

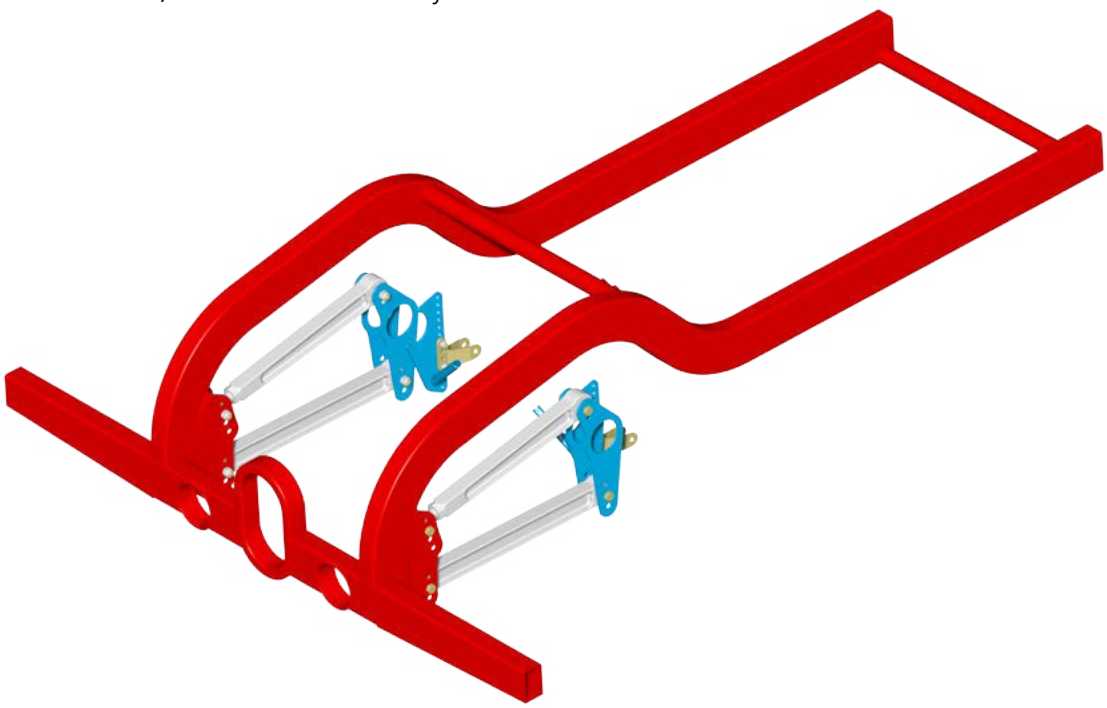
Ball-End Anti-Roll Bar for Canted 4-Bar Rear Frame (6259)

Part Number	Description
6259	Ball-End Anti-Roll Bar for Canted Rear Suspension
OPTIONS	Frame Sockets (for custom application other than 7154 frame)
	7/8"-Diameter Road-Handling Bar
	1-1/4"-Diameter Drag-Race Bar

Related Product

Parallel Billet 4-Bar Rear Suspension System

Chassisworks' parallel billet 4-bar rear-frame system uses a traditional 4-link layout, suitable for Pro Street projects, street rods, and muscle cars with high-horsepower requirements. To accommodate extremely wide wheel and tire combinations, outside frame widths range from 48" down to 20", with factory-welded mild-steel or 4130 FAB9™ housings available from 24" to 62-1/4". Multiple-position, suspension-link mounts at the chassis and housing, with a reversible-clevis, shock mount system, provide an optimum traction setting for any vehicle. Billet aluminum 4-bar links, featuring our TrueCenter™ pivot-socket technology, can be purchased for use with our 7153 parallel rear frame and 8270 or 8271 FAB9™ housing. They can also be purchased with detached mounts for welded installations using components other than Chassisworks'. In addition, VariShock coil-overs or ShockWave™ air suspension can be installed to meet the demands of both performance and street rod projects. Available components include the rear frame, billet aluminum upper and lower suspension links, factory-welded FAB9™ housing, track locaters, panhard bars, ball-end anti-roll bar, shock mounts, and selected shock system.



Part Number	Description
6224	Adjustable Shock Mount with Reversible Clevis
6249	Adjustable Pro Street Track Locater, Urethane Bushings
6231	Panhard Bar, Double-Adjustable 3/4" Urethane Ends
7153	Unassembled 4 x 2 Parallel Rear Frame
7153-W	Factory-Welded 4 x 2 Parallel Rear Frame
6239	Billet 4-Link Suspension with Chassis- and Housing-Mounts
8270	Welded Parallel 4-Bar FAB9™ Housing, Mild Steel (24" to 62-1/4" in 1/4" increments)
8271	Welded Parallel 4-Bar FAB9™ Housing, 4130 Steel (24" to 62-1/4" in 1/4" increments)

All prices subject to change. Current pricing available at www.cachassisworks.com.

CHRIS ALSTON'S Chassisworks THE HOME OF HIGHER TECHNOLOGY

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