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8070

**Front Spring Shackle Inversion Kit
1987-1996 Jeep Wrangler (YJ)**

Read and understand all instructions and warnings prior to installation of system or the operation of the altered vehicle.

SAFETY WARNING: Performance Automotive Group recommends this system be installed by a certified technician! These instructions address installation of the Trail Master system and may not include OE recommended procedures for disassembly / reassembly of OE components. Research the areas requiring certification. In addition to these instructions, professional knowledge of disassembly / reassembly procedures as well as post installation checks must be known. Attempts to install this system without knowledge and expertise may jeopardize the integrity and or operating safety of the vehicle.

PRODUCT SAFETY WARNING: Certain Performance Automotive Group products are intended to improve off-road performance. Modifying your vehicle for off-road use may result in the vehicle handling differently than a factory equipped vehicle. Use of oversize tires, suspension lifts, body lifts, and other suspension modifications may raise your vehicles center of gravity, resulting in an increased tendency for the vehicle to “pitch and roll” during sudden turns or abrupt maneuvers. Extreme care must be used to prevent loss of control or vehicle roll over. Failure to drive your modified vehicle safely may result in serious injury or death. Drive at reduced speeds to ensure your ability to maintain control of the vehicle under all driving conditions. Always wear a safety belt.

PRODUCT SAFETY LABEL: Supplied in this kit is a Safety Warning Label. Install this label inside of the vehicles cab, in a highly visible location to all operators of the vehicle.

Trail Master does not recommend the combined use of suspension lifts, body lifts, or other lifting devices. See Product Safety Warning above. Combining lift devices may require altering your vehicle’s track width to ensure safe handling characteristics. Consult a professional mechanic with off-road experience before combining any lifting device. Larger rim and tire combinations may increase leverage on suspension, steering, and related

components. As you increase the size of the rim and tire combinations over stock, you also increase the possibility of OE and related component failure.

Performance Automotive Group’s goal is to provide you with the best system possible for a reasonable cost. It must be noted that the components in your Trail Master system do not eliminate OE component weakness.

PRE-INSTALLATION NOTES:

1. Back space of wheels and tire pull over must be such that the possibility of the combination will not interfere with any mobile, fixed, or rotating components; failure to do so may result in serious vehicle damage!
2. Special literature or tools required: OE service manual for model / year of vehicle. Refer to OE manual for proper disassembly / reassembly procedures of OE related components. Additional tools required unique to installation are mentioned in the following instructions.
3. Compare parts included in your system with the enclosed parts list. Placing hardware with the components before you start may reduce installation time. Contact your Trail Master dealer if any parts are missing or appear to be different than those indicated on the parts list.
4. **Always wear safety glasses.** Use appropriate safety equipment at all times.

GLOSSARY OF TERMS:

| | |
|-------|----------------------------|
| TM: | Trail Master |
| DRV: | Drivers side of vehicle |
| PASS: | Passengers side of vehicle |
| OE: | Original Equipment |

FASTENERS: Adhere to recommendations when replacement fasteners, retainers, and keepers are called out in the OE manual. When reassembling the vehicle it is recommended by the vehicle manufacturer that certain fasteners are replaced in order to maintain proper retaining characteristics. This system may not include all replacement hardware as recommended by the OE manual. Additional replacement hardware should be obtained prior to installation of this system to meet the requirements of the OE manual.

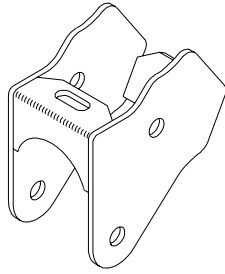
TORQUE SPECIFICATIONS:

See OE manual for torque values and procedures when reusing an OE fastener.
See General Fastener Specifications

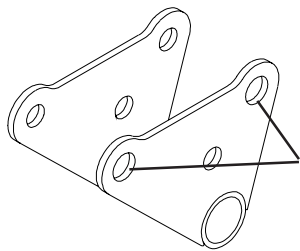
| | |
|------------------------|---------|
| 1/2”-13 Fastener | 75’LBS |
| 9/16” Fastener | 110’LBS |

PARTS LIST:

960602 Forward Mount Bracket..... 2



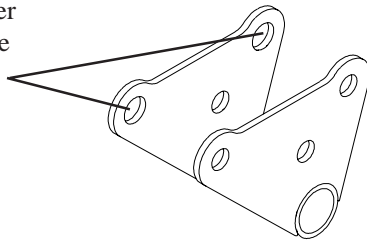
960603 DVR Rear Mount Bracket 1



These holes are larger and go to the outside of the frame

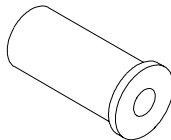
Mount Bracket 1

These holes are larger and go to the outside of the frame



WL001 Product Safety label..... 1

8070BAG1: Hardware For Mounting Front Brackets
960605 Frame Spacer Bushing 2



96412FHHC 9/16 X 4 1/2 Fine Thd Bolt Grade 8 2

12100CHHC 1/2 X 1" Coarse Thd Bolt 2

N96SFL8 9/16 Fine Thd Steel Lock Nut 2

W12S 1/2 SAE Flat Washer 8

W96S 9/16 SAE Flat Washer 4

12412CHHC 1/2 X 4 1/2 Coarse Thd Bolt 2

N12CL 1/2 Coarse Thd Lock Nut 4

8070BAG2: Hardware For Mounting Rear Brackets

12400CHHC 1/2 X 4 Coarse Thd Bolt..... 6

W12S 1/2 SAE Flat Washer 16

12412CHHC 1/2 X 4 1/2 Coarse Thd Bolt 2

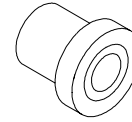
N12CL 1/2 Coarse Thd Lock Nut 8

83 .750 X .109 Wall X 2.430 Long Sleeve 4

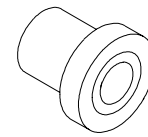
8070BAG3: Shackle Bushings and Sleeves

113 .750 X .109 Wall X 3.355 Long Sleeve 4

960614 Jeep Spring Bushing 4



960613 Jeep Spring Bushing (OE spring only) 4



INSTALLATION INSTRUCTIONS

A. VEHICLE PREPARATION

1. Block and secure vehicle.
 - a. Block the rear wheels
 - b. Raise the front of the vehicle.
 - c. Secure the frame and axles with jack stands.
2. Remove the wheels and tires.

B. REMOVE THE SPRINGS

1. Remove the springs from the axle.
 - a. Disconnect the DRV anti-sway bar from the spring pad
 - b. Remove the four U-bolt nuts retaining the DRV spring pad.
 - c. Remove DRV spring pad.
 - d. Repeat process on opposite side of the vehicle.
2. Remove the springs from the vehicle (be sure to note the front and the rear of the spring).
 - a. Be sure that the axle is supported with jack stands, and that there is no weight resting on the springs.
 - b. Disconnect the DRV spring at its rearward mount point.
 - 1.) Remove the nut from the DRV spring pivot bolt.
 - 2.) Remove the DRV spring pivot bolt, and carefully let the spring hang.
 - c. Disconnect the DRV spring from the lower point of the front shackle.
 - 1.) Remove the spring pivot bolt nut.
 - 2.) Remove the spring pivot bolt.
 - d. Remove the spring from the vehicle.
 - e. Repeat process on the opposite side of vehicle.

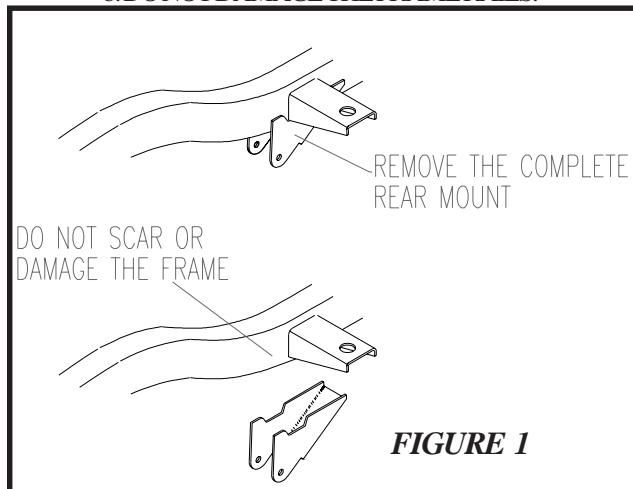
C. REMOVE THE SHACKLES AND BUSHINGS

1. Remove the front shackles.
 - a. Remove the DRV upper shackle pivot bolt nut.
 - b. Remove the DRV shackle.
2. Remove the frame bushings (**save**, these will be reused).
 - a. Remove the DRV front bushings where the shackle used to be.
 - 1.) Pry or push loose the bushings.
3. Repeat process on the opposite side of the vehicle.

D. REMOVE THE TWO LOWER MOUNTING BOLTS FROM THE FRONT BUMPER.

E. REMOVE THE REAR PIVOT BRACKET

1. Using an abrasive cut off wheel remove the pivot brackets as shown in *figure 1*.
 - a. Grind only on the welds.
 - b. **DO NOT DAMAGE THE FRAME RAILS.**

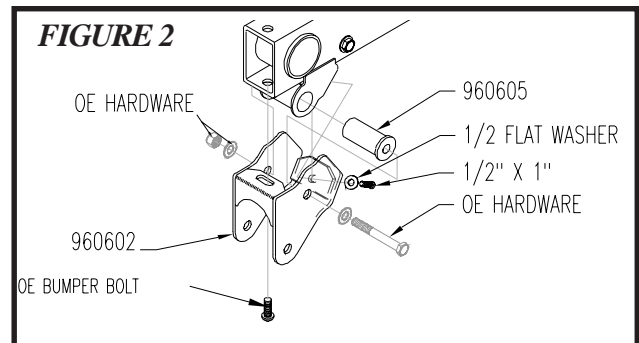


2. Using a grinder dress the frame rail to remove any sharp edges.
3. To prevent rust, cover all exposed metal with either rubberized under coating or black paint.

F. INSTALL THE FRONT MOUNT BRACKETS

1. Install frame spacer bushing (960605) as shown in *figure 2*.
 - a. Place (1) frame spacer bushing into each of the holes left by the OE shackle bushings (Note: the flanged side of the bushing must be to the outside of the vehicle).
2. Slide (1) front mount bracket (960602) into place as shown in *figure 2*.
3. Retain front mount bracket.
 - a. Install the rear OE pivot bolt hardware through the front mount bracket and through the frame spacer as shown in *figure 2*.
 - b. Slide bracket so that the hole in the top of the bracket lines up with the bumper bolt holes.
 - c. Replace the bumper bolts so that they retain

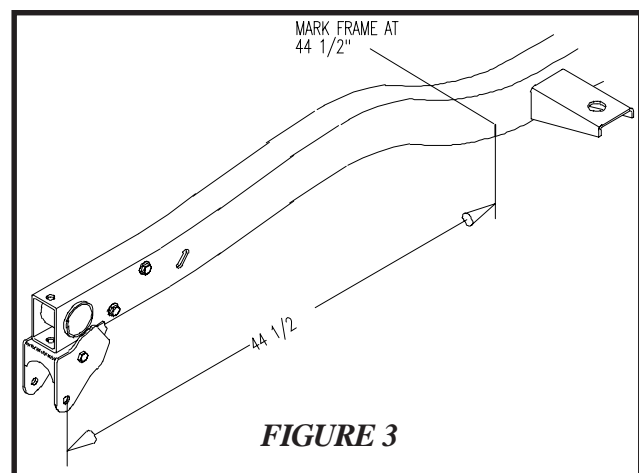
- the front mount bracket as shown in *figure 2*.
- d. Install (1) 1/2 X 1" coarse thd bolt, (2) 1/2 SAE flat washers, and (1) 1/2 coarse lock nut into the hole in the rear of the front mount brackets as shown in *figure 2*.



- e. Torque the fasteners in sequence and to the proper spec.
 - 1.) Torque the OE bumper bolts to OE spec.
 - 2.) Torque the 1/2 bolts in the rear of the bracket to 75'LBS.
 - 3.) Torque the OE pivot bolts to OE spec.

G. INSTALL THE SHACKLE MOUNT BRACKETS

1. Mark for proper placement.
 - a. Measure from the center of the lowest hole in the DRVS front mount bracket to a point on the DRV frame rail 44 1/2" (44.50") back as shown in *figure 3*.
 - b. Mark the frame at 44 1/2" (44.50").



*****CAUTION*****

THIS MEASUREMENT MUST BE DONE AS ACCURATELY AS POSSIBLE IN ORDER TO OBTAIN PROPER AXLE POSITION.

2. Place the DRV rear mount bracket (960603) onto the frame rail.
 - a. Slide the DRV rear mount bracket onto the frame

- rail.
 - b. Adjust the bracket so that the bushing hole is in line with the mark indicating 44 1/2" on the frame as shown in **figure 4** and is tight up against frame.
 - c. Clamp bracket into place using C-clamps.
3. Drill holes for mounting the bracket.
- a. Using the rear mount bracket as a templet mark the center of each of the three mount points with a center punch as shown in **figure 4**.
 - b. Using a 1/2" drill bit, drill through all three mount points as shown, drilling a smaller pilot hole may be helpful. (Note: the holes that are being drilled need to go all the way through the frame rail).

*****CAUTION*****

CARE MUST BE USED TO DRILL STRAIGHT AND LEVEL. ANY AMOUNT OF CROOKEDNESS, MAY RESULT IN A HARDER KIT INSTALLATION AND POSSIBLE AXLE ALIGNMENT PROBLEMS.

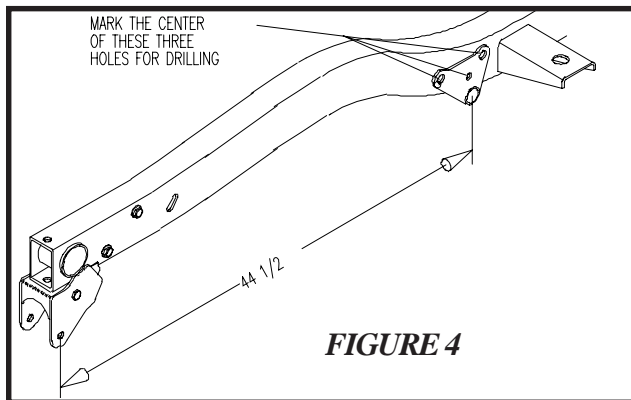


FIGURE 4

- c. Install (1) 1/2 X 4" fine thd bolt, (2) 1/2 SAE flat washers, and (1) 1/2 fine thd lock nut into the center hole as shown in **figure 5**.
 - d. Drill the outside of the two remaining holes again using a 3/4" drill bit (Note: drill only the outside of the frame rails).
4. Retain front mount.
- a. Install spacer sleeves into the outside mount points as shown in **figure 5**, (DO NOT LET SLEEVES DROP INTO THE FRAME RAILS).
 - b. Install (1) 1/2 X 4" fine thd bolt, (2) 1/2 SAE flat washers, and (1) 1/2 fine thd lock nut into each of the two mount points, being sure to have the bolt pass through the sleeves as shown in **figure 5**.

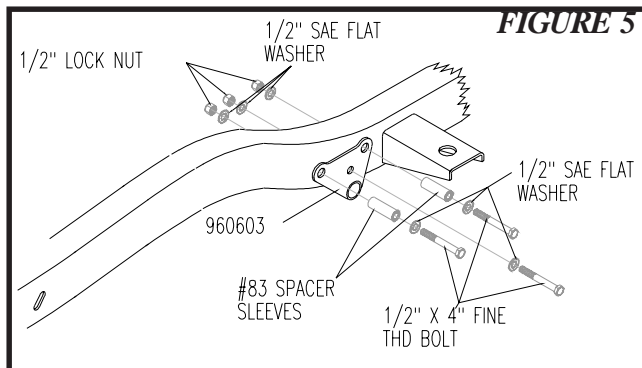


FIGURE 5

- 5. Torque retaining bolts to 85' LBS.
- 6. Repeat on the opposite side of the vehicle using (960604).

H. INSTALL BUSHINGS

- 1. Install the four OE shackle bushings that were removed previously, into the rear mount brackets as shown in **figure 6**.
- 2. Install (1) .75 O.D. X 3.355 long sleeve into each of the rear mount bushings as shown in **figure 6**.

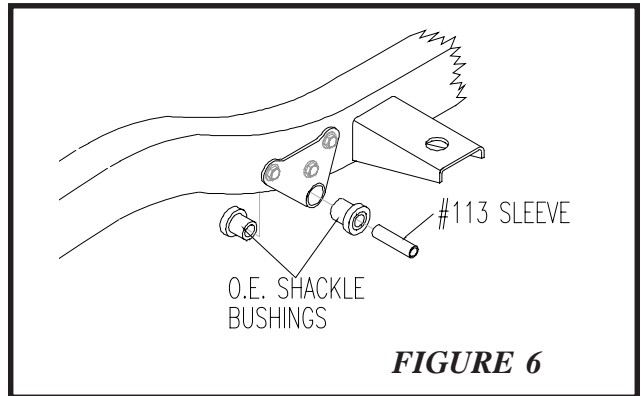


FIGURE 6

- 3. Determine if your Jeep is stock or if it has a Trail Master suspension lift.
 - a. If your Jeep is stock.
 - 1.) Remove the OE sleeves in the rear eye of the springs.
 - 2.) Remove the OE bushings which are in the rear eye of the springs.
 - 3.) Install (2) 960613 bushings into each of the rear spring eyes as shown in **figure 7**.
 - 4.) Install (1) 3/4 O.D. X 3.355 long sleeve (113) into each of the rear spring eyes as shown in **figure 7**.
 - b. If your Jeep has a TM suspension lift kit.
 - 1.) Remove the OE sleeves in the rear eye of the springs.
 - 2.) Remove the OE bushings which are in the rear eye of the springs.
 - 3.) Install (2) 960614 bushings into each of the rear spring eyes as shown in **figure 7**.
 - 4.) Install one .75 O.D. X 3.355 long sleeve (113) into each of the rear spring eyes as shown in **figure 7**.

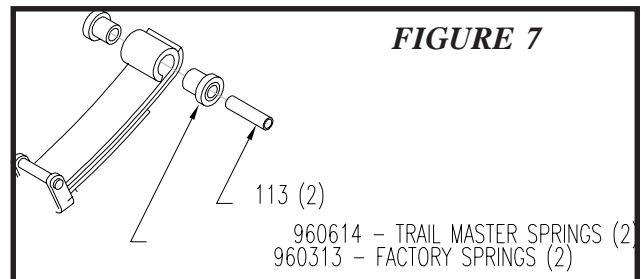
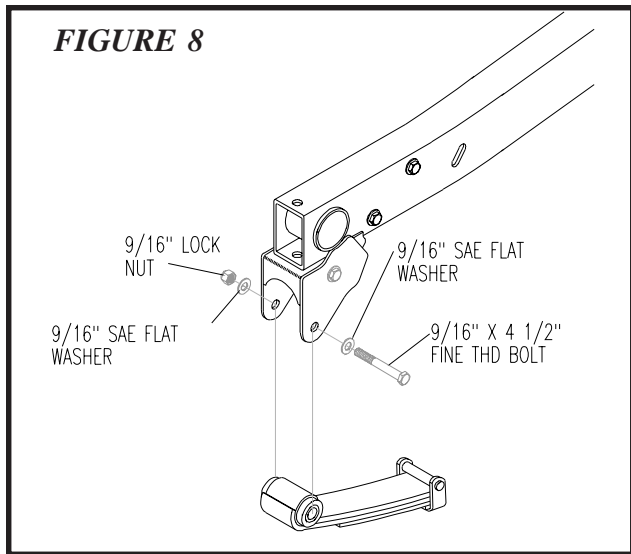


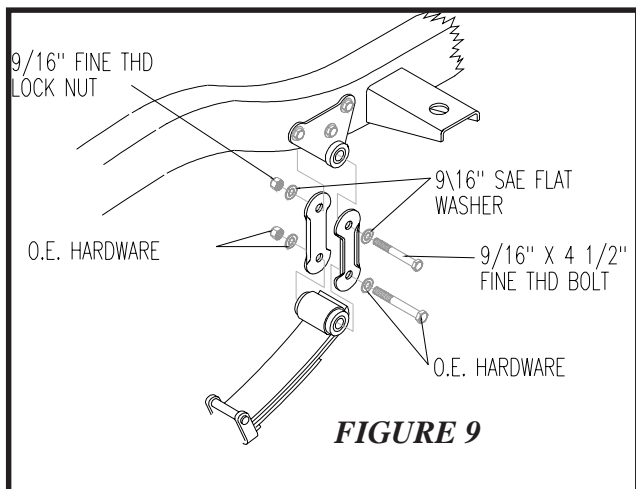
FIGURE 7

I. INSTALL SPRINGS

1. Install the front eye of the spring into the front mount bracket as shown as shown in *figure 8*.



- a. Retain spring using OE rear pivot bolt (do not tighten at this time).
2. Install shackle into the bushing in the rear mount bracket as shown in *figure 9*.
 - a. Retain using (1) 1/2" X 4 1/2" coarse bolt, (2) 1/2" SAE flat washers, (1) 1/2" lock nut (do not tighten at this time).
 3. Install spring into shackle as shown in *figure 9*.
 - a. Line up the holes in the spring eye and the shackle.
 - b. Retain using (1) 9/16 X 4 1/2" coarse thd bolt, (2) 9/16 SAE flat washers, and (1) 9/16 coarse thd lock nut (do not tighten at this time).



4. Repeat process on the opposite side of vehicle.

J. INSTALL AXLE ONTO SPRINGS

1. Lower axle onto springs, being careful to position the axle correctly.
2. Using the U-bolts, spring pads, and U-bolt nuts

which you previously removed, retain the axle to the springs.

3. Torque the U-bolt nuts to OE spec (52'LBS).
4. Connect the anti-sway bar.
 - a. Place the eye of the anti-sway bar over the stem on the spring pad.
 - b. Retain the anti-sway bar using OE hardware which was previously removed.
 - c. Torque to OE specs.

K. REINSTALL RIMS & TIRES

1. Reinstall rims and tires.
2. Lower vehicle.
 - a. Raise vehicle high enough to remove jack stands.
 - b. Remove jack stands.
 - c. Slowly lower the vehicle.
 - d. Remove wheel blocks.
3. Torque wheels to the proper spec.

L. FINAL TORQUING

1. Tighten all bolts left loose.
 - a. Torque rear pivot points.
 - 1.) Torque upper shackle pivot point to 75'LBS
 - 2.) Torque lower shackle to 110'LBS.
 - b. Torque front pivot point to 110'LBS.

POST INSTALLATION WARNINGS

1. Check all fasteners for proper torque. Check to ensure there is adequate clearance between all rotating, mobile, fixed, and heated members. Ensure that there is adequate clearance between exhaust and brake lines, fuel lines, fuel tank, floor board, and wiring harnesses. Check steering gear for interference and proper working order. Inspect brake lines for damage and adequate clearance. Test brake system.

2. Perform a steering sweep. Check to ensure brake hoses have sufficient slack and will not contact rotating, mobile, or fixed members, adjust lines / brackets to eliminate interference and proper working order. Failure to perform inspection may result in component failure.

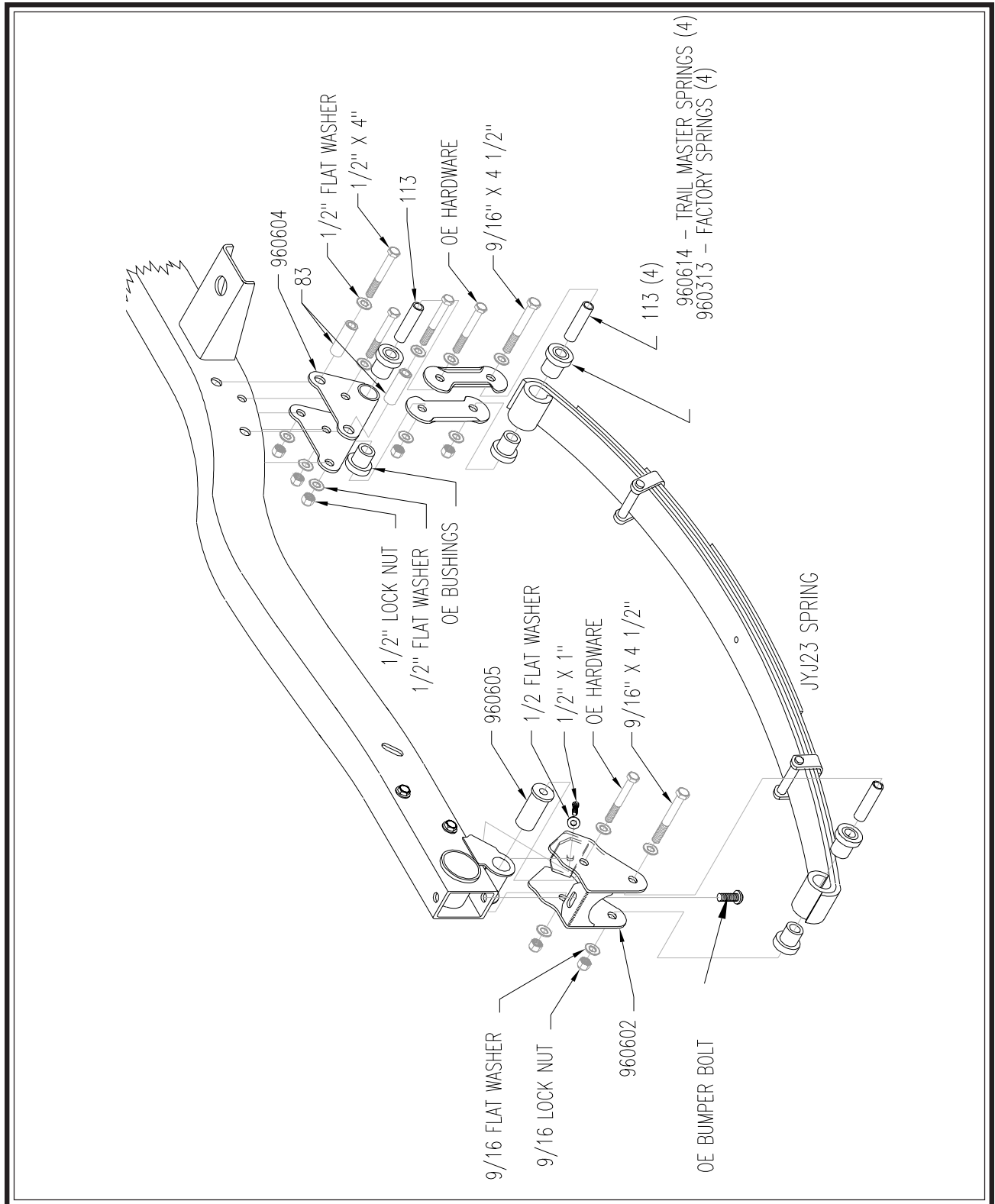
3. Bump stops and extension stops must be in place on all vehicles! Note: allowing suspension to over extend by neglecting to install or maintain stops and extensions may cause serious damage to OE and related components.

4. Re torque all fasteners after 500 miles. Visually inspect components and re torque fasteners during routine vehicle service.

5. Retain this and all information regarding your altered vehicle.

Thank you for choosing Trail Master. For questions or suggestions, contact our Technical Assistance Department.

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