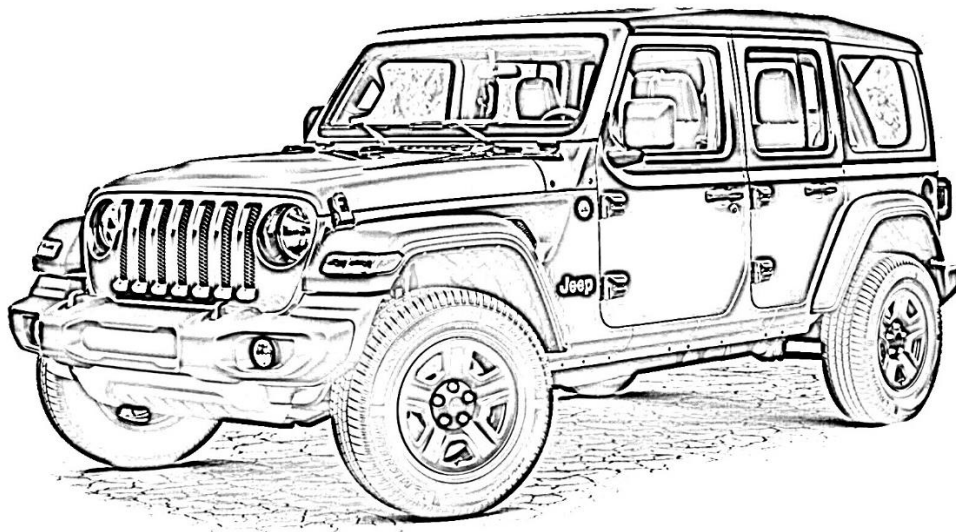




JL220

INSTALLATION MANUAL

REV: A (1/21/2019)



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JL220 Installation and Operation Manual

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2. How to Use this Manual

2.1. Interactive Manual using Adobe Reader

It is recommended to open this digital PDF using Adobe Reader[®] to take advantage of following key features:

- **Hyperlinks** ([blue underlined text](#)) allow access to additional content via internet; click/tap to activate
 - Includes [Installation Figures](#) and “[Figure xx](#)”
- **Table of Contents** page allows easily navigating this manual; click/tap any section line to go to it
- **Bookmarks** allow quickly navigating to any section; click/tap
- **Zoom IN** on pictures by pressing “CTRL and +” at same time on PC, or pinch in on smart devices
- **Zoom OUT** on pictures by pressing “CTRL and -” at same time on PC, or pinch out on smart devices

To install Adobe Reader[®]

On PC, or Mac

- visit <https://get.adobe.com/reader/otherversions/>

On Android, iPhone/iPad, and Windows devices,

- visit <https://acrobat.adobe.com/us/en/acrobat/mobile-app.html>
-

2.2. Your Kit SKU Number and this Manual

This manual covers installation, testing, and operation of following SKU part numbers

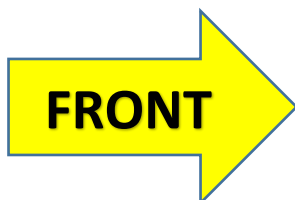
2.2.1. **JL220** (i.e., 220 Train Horn with On-Board Air System)

NOTE: Illustrations and pictures contained herein may represent only one kit part number. Where critical differences exist between kits (i.e., different parts, orientation, mounting points, etc.), additional text, or necessary graphics are provided to minimize confusion.

Parts list explicitly state kit differences with **(BOLD TEXT)** inside parenthesis, shown below part number.

2.3. Illustration/Photo Details and Orientation

This manual may use digitally created illustrations, and/or actual photos of example vehicle. These graphics may not include exact items found on your vehicle (i.e., electrical wiring, fuel lines, body panels, etc.). Illustrations typically will be missing details and are for clarity to show critical mounting locations and orientation on vehicle.



Throughout this manual yellow arrows with text reading “FRONT”, may be present over illustrations and pictures. These arrows specify direction toward front of vehicle and provide clarity to how illustration is viewed.



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3. Safety First

Read manual thoroughly before starting installation of this kit. Verify you have all parts listed and that you clearly understand this installation procedure. Contact Kleinn technical support for any questions.

Installation of this kit requires **moderate mechanical aptitude**; seek professional help if you're not competent using hand tools in tight uncomfortable spaces, and around possibly rusted and sharp vehicle parts.

Before starting, obtain proper tools required to perform installation correctly, adequate lighting, eye protection, hearing protection for operating train horns, and hand protection to guard against sharp edges and metal burrs, which may be present on kit parts and vehicle parts.

Throughout this manual the following words may be used; be aware of their meaning and application.

CAUTION: means damage could occur to vehicle, or kit parts during, or after installation

WARNING: means injury could occur to you or others, including damage to vehicle, or kit parts

DANGER: means serious injury or death could occur to you or others during installation



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4. Application Chart

4.1. 100% Direct Bolt-On Vehicle List

JL220 is a 100% direct bolt-on aftermarket product for Jeep vehicles listed in below chart; every effort has been made to verify correct fitment on these vehicles in their factory, non-modified conditions.

| MODEL YR | MODEL | DRIVE | ENGINE | BODY | TRIM |
|-----------|-------|-------|--------|--------|-------|
| 2018-2019 | JLU | ALL | 3.6L | 4 DOOR | ALL** |

NOTE: All vehicles listed may require drilling holes for ground wires and installing switches, based on preference of installed switch locations and wire grounding points.

4.2. **Excluded Vehicles

JL220 is NOT compatible with following JEEP vehicles:

- 4.2.1. ALL 2-Door Jeep JL
- 4.2.2. Jeep JLU with 3.0L Diesel/Hybrid.

4.3. Aftermarket Product Compatibility

This kit has been designed and tested to be compatible with leading manufacturers of aftermarket truck steps, such as Amp Research Power Steps[®] and all OEM standard and optional steps.

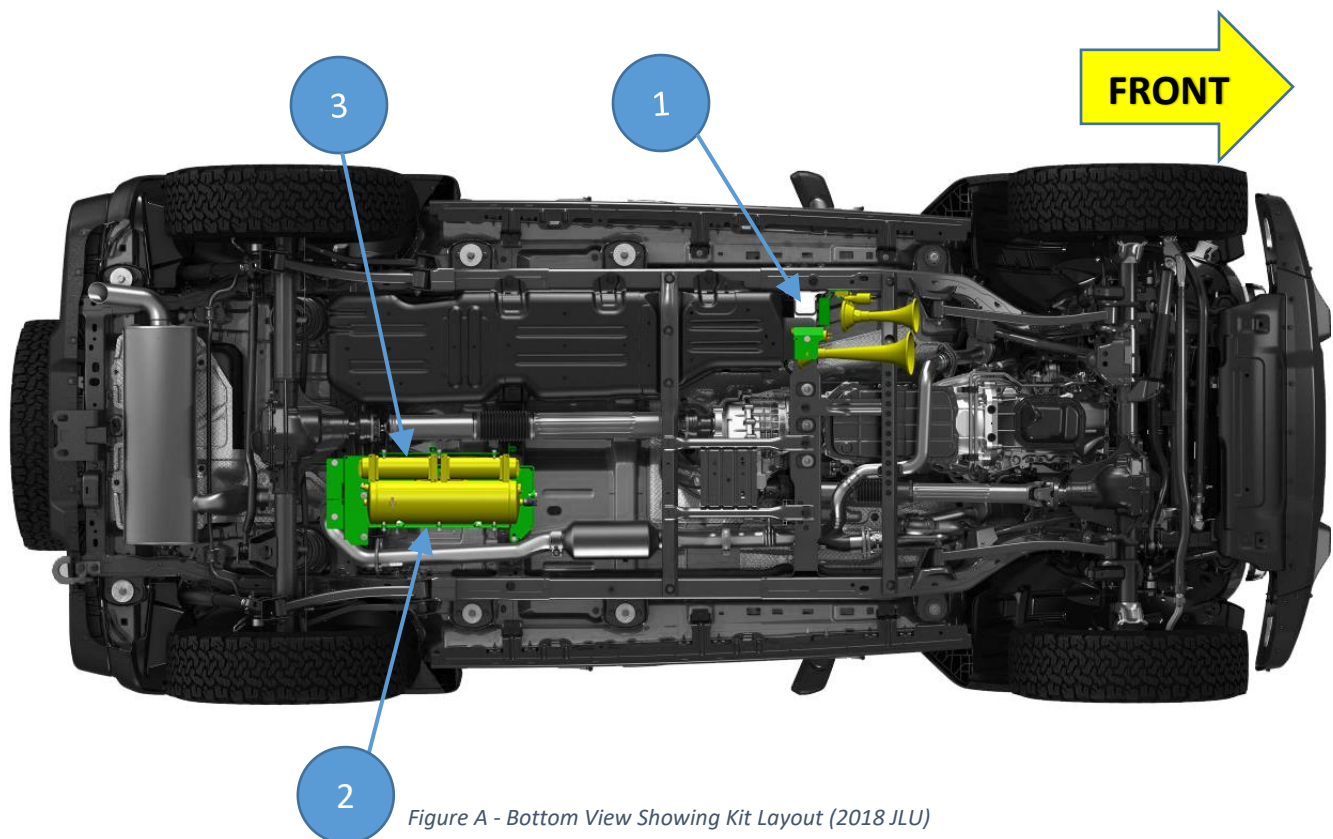
This kit has NOT been designed, or tested for use with leading manufacturers of aftermarket exhaust systems.

5. Installation Overview

5.1. Kit Layout and System Location(s)

JL220 consists of following sub-systems, located on vehicle, as follows:

| ITEM | DESCRIPTION | MOUNTING LOCATION | APPROX. INSTALL TIME |
|------|---|--|----------------------|
| 1 | 220 Series Dual Horn with Air Solenoids | Passenger side frame rail, next to transmission. | 2+ Hours |
| 2 | JL-JK-OBA KIT (Previously installed) | | N/A |
| 3 | JL-JK-OBA KIT (Previously installed) | | N/A |





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5.2. Approximate Installation Time

JL220 is a multi-faceted product consisting of multiple mechanical, electrical, and pneumatic components.

For a typical home mechanic, auto enthusiast, or technician installing a Kleinn Bolt-On kit for first time, a professional installation job with setup and testing of final product, is estimated to take:

- **2-4 Hours**
-

5.3. ***Quick Install Outline

For person(s) with experience installing Kleinn bolt-on kits, JL220 can be installed in an order similar to below:

1. Route Wiring, install Relay, and install Horn Switch
2. Remove Factory splash shield in front of Gas tank
3. Bolt in horn bracket with horn drivers bolted to bracket.
4. Connect wiring and air lines.
5. Install Trumpets into Horn Drivers.
6. Test System and adjust, as needed



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6. List of Tools and Supplies

6.1. Standard Tool List (Required)

- 6.1.1. Basic mechanic's 3/8" drive socket sets with extensions
 - Inch Size Sockets (1/4" – 1" Hex)
 - Metric Size Sockets (6mm – 20mm Hex)
- 6.1.2. Basic mechanic's combination wrenches (box/open-end)
 - Inch Size Wrenches (1/4" – 1" Hex)
 - Metric Size Wrenches (6mm – 20mm Hex)
- 6.1.3. Basic mechanic's screwdriver set (Philips, Flat Head)
- 6.1.4. Diagonal Cutter/Wire Cutter Pliers
- 6.1.5. Wire Strippers
- 6.1.6. Wire Terminal Crimpers
- 6.1.7. Slip-Joint Pliers
- 6.1.8. Utility Knife, or Utility Razor blade
- 6.1.9. Magnetic retrieval tool

6.2. Special Tool List (Recommended)

- 6.2.1. 10-100 ft.-lb. torque wrench
- 6.2.2. 20-150 in.-lb. torque wrench
- 6.2.3. Multi-Meter for 12V DC electrical systems, or equivalent
- 6.2.4. 12V DC Test Light, or equivalent
- 6.2.5. Trim Panel Tool, for removing wiring push pins

6.3. Shop Consumables List (Recommended)

- 6.3.1. Quality Electrical tape
- 6.3.2. Di-electric grease for electrical connections
- 6.3.3. Heat Shrink tubing for electrical connections
- 6.3.4. Blue Loctite (i.e., Loctite PN 242), or equivalent
- 6.3.5. Sand Paper, or Wire Brushes for installing ground wires
- 6.3.6. Extra plastic zip ties > 6" long
- 6.3.7. Extra NPT sealant (i.e., Kleinn Air Horn Juice, Teflon tape, etc.)
- 6.3.8. Touch-up paint for frame/chassis
- 6.3.9. Typical cleanup supplies



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7. Parts List

7.1. Parts List covers following SKU Numbers

7.1.1. **JL220** (i.e., 220 Train Horns)

Unpackage and organize Kit across a large work area and verify all parts are included, as listed below. Contact Kleinn support if any questions arise.

7.1.2. Review pre-packaged items (i.e., train horn box, air compressor, air tank, etc.)

7.1.3. Review Air Fittings and Tubing


7.1.4. Review Wiring and Accessories

7.1.5. Review Bolt-On Mounting Brackets



7.1.6. Review Hardware/Fasteners


7.2. Pre-Packaged Electro-Mechanical Items

NOTE: Items in this section come in their own packages and may include additional items inside package




| ITEM | QTY | PART NUMBER | DESCRIPTION | PICTURE |
|------|-----|-------------|---|--|
| 1 | 1 | 220 | 220 Series Horn Kit, with included solenoid/valve, and 1/4" Air Tubing, 20 ft. long |  |

7.3. Air Fittings and Related Items

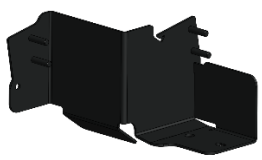
| ITEM | QTY | PART NUMBER | DESCRIPTION | PICTURE |
|------|-----|---|---|---|
| 2 | 1 | 51414L (view location on Air Tank) | 1/4" NPT X 1/4" Compression Fitting, 90 Deg Elbow |  |
| 3 | 1 | 25014 | 1/4" Air Tubing, 10 ft. long |  |

| | | | | |
|---|---|-----------------------|---------------------------------|---|
| 4 | 1 | KLEINN AIR HORN JUICE | Thread Sealant for NPT Fittings |  |
|---|---|-----------------------|---------------------------------|---|

7.4. Electrical Small Components and Related Items

| ITEM | QTY | PART NUMBER | DESCRIPTION | PICTURE |
|------|-----|-----------------------------|--|---|
| 5 | 1 | 320 | Terminator – Nickel Plated Remote Horn Button |  |
| 6 | 1 | WIRE KIT | Full Wire Kit, with electrical connectors and zip ties |  |
| 7 | 1 | 1/8" WIRE LOOM, 10 ft. Long | 1/8" wire loom for electrical routing |  |

7.5. Bolt-On Mounting Brackets & Special Hardware

| ITEM | QTY | PART NUMBER | DESCRIPTION | PICTURE |
|------|-----|-------------|-----------------------|---|
| 8 | 1 | JL-301 | HORN MOUNTING BRACKET |  |



7.6. Hardware/Fasteners

| ITEM NO. | PART TYPE | PART SIZE | QTY. | WHERE USED |
|----------|--|---------------------|------|----------------------------------|
| 1 | HEX NUT, GRADE 2, ZINC-PLATED | 5/16"-18 | 4 | HORN (4) |
| 2 | LOCK WASHER, SPLIT LOCK, ZINC-PLATED | 5/16" | 4 | HORN (4) |
| 3 | FLAT WASHER, SAE, ZINC-PLATED | 5/16" ID X 0.69 OD | 4 | HORN (4) |
| 4 | FLAT WASHER, METRIC DIN 125, ZINC-PLATED | M12 X 24 OD | 2 | HORN BRACKET (2) |
| 5 | FLAT WASHER, SAE, ZINC-PLATED | 1/4" ID X 0.63 OD | 1 | HORN BRACKET (1) |
| 6 | HEX BOLT, GRADE 8.8, ZINC-PLATED | M12 X 1.5 X 70 LONG | 1 | HORN BRACKET (1) |
| 7 | LOCK WASHER, SPLIT LOCK, ZINC-PLATED | M12 | 1 | HORN BRACKET (1) |
| 8 | RUBBER EDGE TRIM (U) | 8" LONG | 1 | HORN BRACKET (1) |
| 9 | LOCK WASHER, SPLIT LOCK, ZINC-PLATED | 1/4" | 1 | HORN BRACKET (1) |
| 10 | HEX NUT, GRADE 8.8, ZINC-PLATED | M12 X 1.5 | 1 | HORN BRACKET (1) |
| 11 | HEX NUT, GRADE 8.8, ZINC-PLATED | M6 X 1.0 | 1 | HORN BRACKET (1) |

End of Section

8. On-Vehicle Electrical Installation

CAUTION: Follow all recommended safety precautions for working on vehicle's electrical system; consult vehicle owner's manual for further instruction.

8.1. Relay and Fuse Diagram for Air Horn, Air Compressor, and Air Tank Pressure Switch

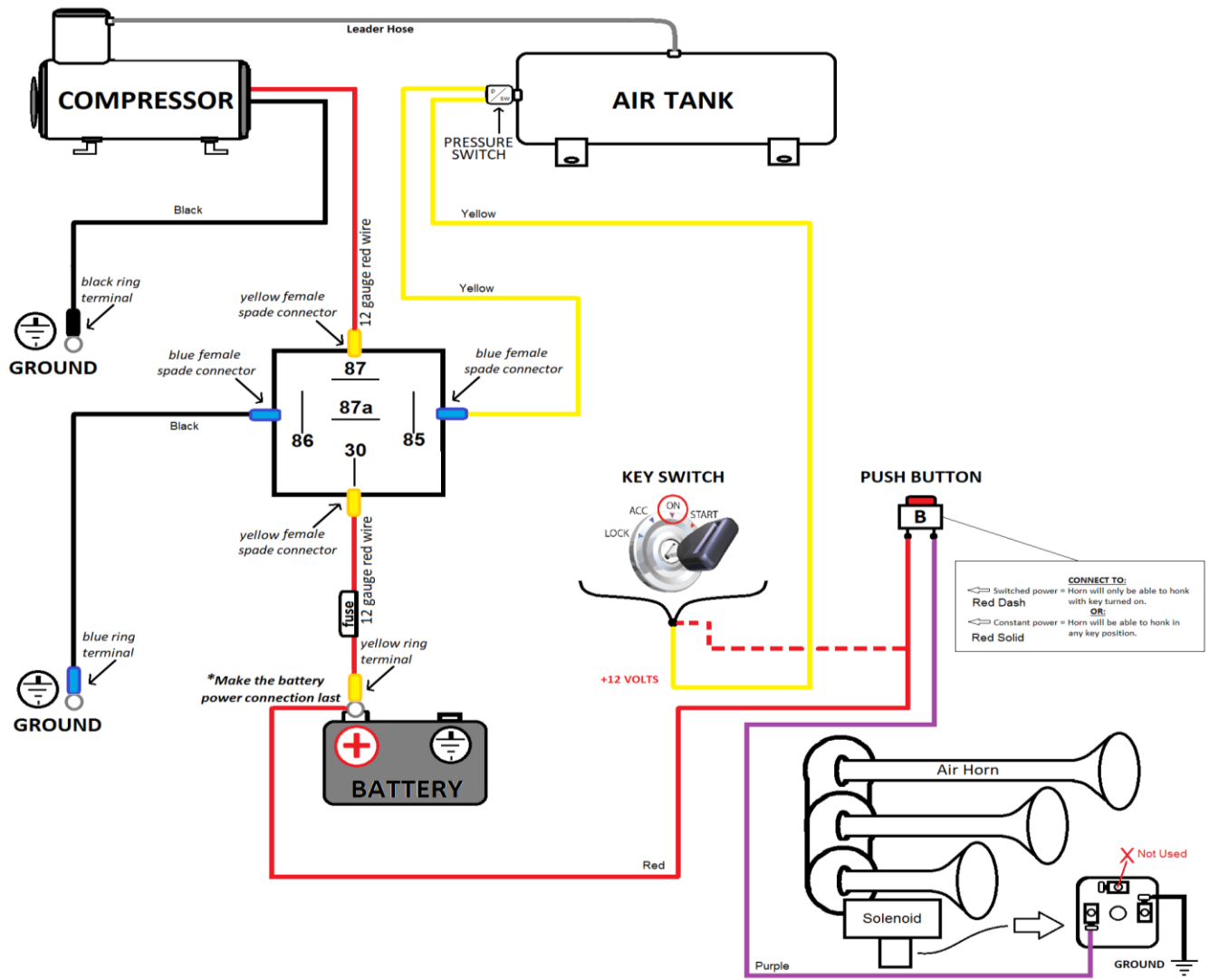


Figure 1 - Suggested Ignition Relay Diagram for Air Horn System

8.2. Suggested Wire Routing for Air Horn, Air Compressor, and Pressure Switch

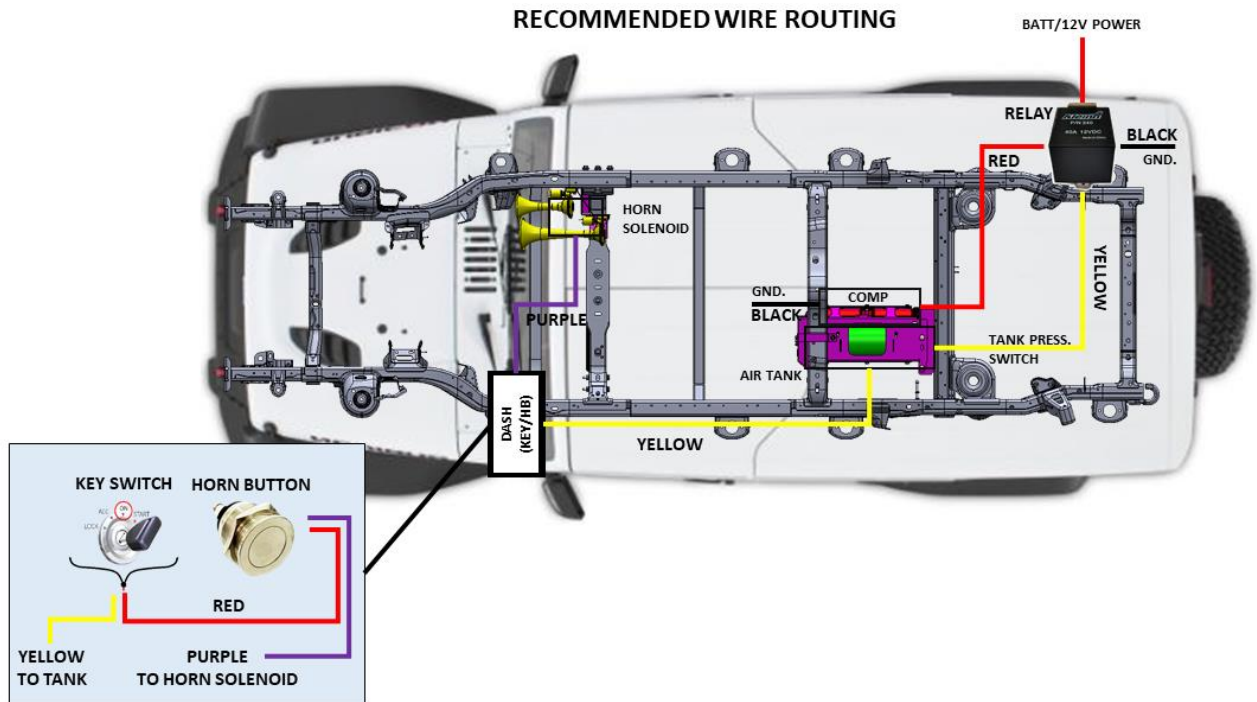


Figure 2 - Suggested Wire Routing for Horn, Air Compressor, and Pressure Switch

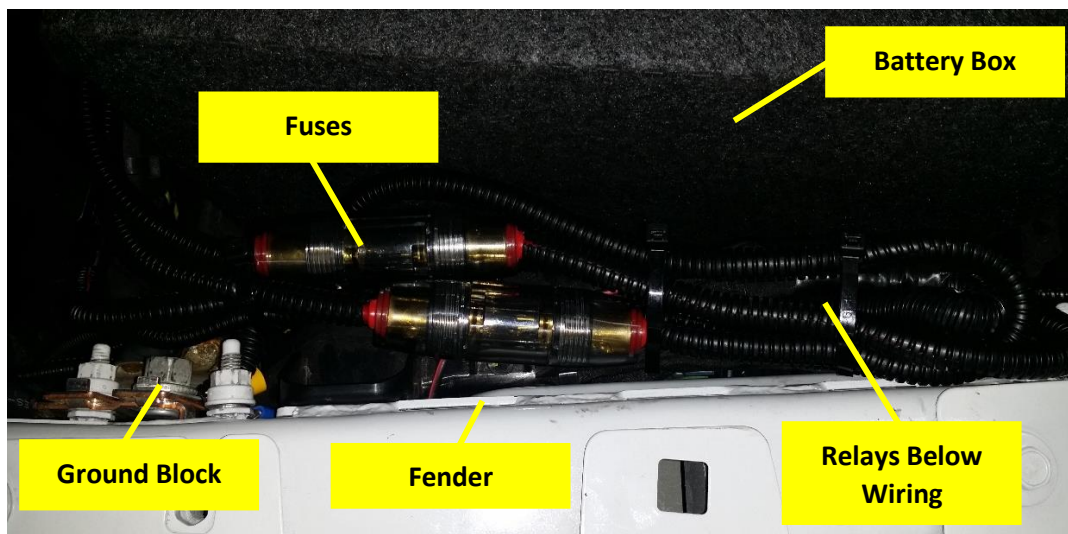
8.3. Disconnect Vehicle Battery(s)

8.3.1. Use special care if vehicle is equipped with Auxiliary Auto Stop Battery. Consult Owner's Manual.

8.4. Connect Wiring to Relay(s) and Fuse(s), then Attach to Vehicle

8.4.1. Find a suitable location for supplied relay(s) and fuse(s). Shown below is an example location under hood next to battery and near grounding block. Use supplied self-tapping screws, as necessary.

8.4.2. Connect routed wiring to relay(s) and fuse(s), per wiring diagram in Figure 1 shown above



8.5. Route Wiring and Install Horn Button

- 8.5.1. Route wiring throughout vehicle, per diagrams; however, installer may route as desired.
- 8.5.2. Insert all wiring into included wire loom and ensure loom is away from all sharp edges, hot vehicle parts (i.e., exhaust, engine, radiator), and fasten securely to vehicle using zip ties, or equivalent.

NOTE: Do not cut wires to length until 100% sure of length required for final connections.

- 8.5.3. Install supplied fuse holder on end of power wire by cutting the loop in fuse holder and connecting supplied Ring terminal to one end and Butt connector on other end.

CAUTION: Do not install 30-amp fuse until all electrical connections are final.

- 8.5.4. Find a suitable location for horn push-button (i.e., in dash, center console, etc.); verify location has 1"+ of clearance behind for terminals. Mark location for drilling.



NOTE: FOR VEHICLES WITH FACTORY UPFITTER SWITCHES:

If your vehicle is equipped with factory upfitter (i.e., auxiliary) switches, you may elect to use them for your Kleinn Air Horn kit; consult Owners Manual, or dealership for further instructions on what wire terminals to use and programming required.

- 8.5.5. Drill a 3/4" hole at location. Route horn button wires to hole then slide push-button retaining nut over wires and connect per wiring diagram. Install push-button into hole and tighten retaining nut securely on backside.

8.6. Connect Air Horn Solenoid

- 8.6.1. Vehicle space constraints make it difficult to connect Air Horn Solenoid in-vehicle; therefore, it is recommended to cut and connect a section of wiring to Solenoid during bench assembly, then perform final connection once Air Horn assembly is installed.

End of Section

9. Bench Assembly Steps

Complete following steps off vehicle to facilitate final installation.

NOTE: ALL HARDWARE WILL BE SPECIFIED IN INSTRUCTIONS USING ITEM NO.'S FOUND IN PARTS LIST. [See Parts List](#). Assemble ALL fasteners clean and dry using proper socket and box-end wrench. (Not including Air fittings)

9.1. Horn Bracket Assembly

9.1.1. Using JL-301, install horn drivers onto studs, following Figure 3, using [Hardware](#) #3, #4, & #5. Tighten to 75-88 in-lbs.

NOTE: Make sure edges of horn drivers are parallel to edges of brackets shown in Figure 3 below in red.

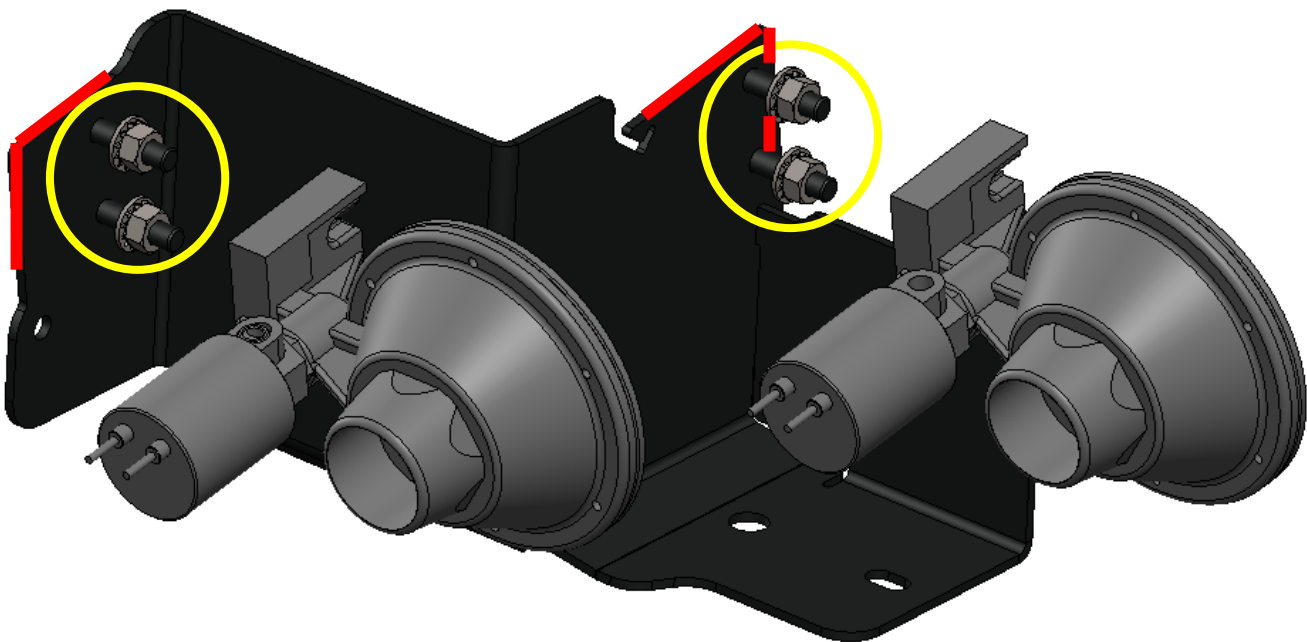


Figure 3 - Horn Driver Installation onto JL-301

9.1.2. Attach air tubing and wiring now, but **do not** trim to length until horn bracket is installed.

NOTE: Make sure solenoid orientation matches Figure 3.



- 9.1.3. To protect fuel line against potential abrasion during severe off-road use, install rubber trim [Hardware #8](#) to JL-301 along outer edge shown in red in Figure 4 below; zip tie ends of trim to reliefs circled.

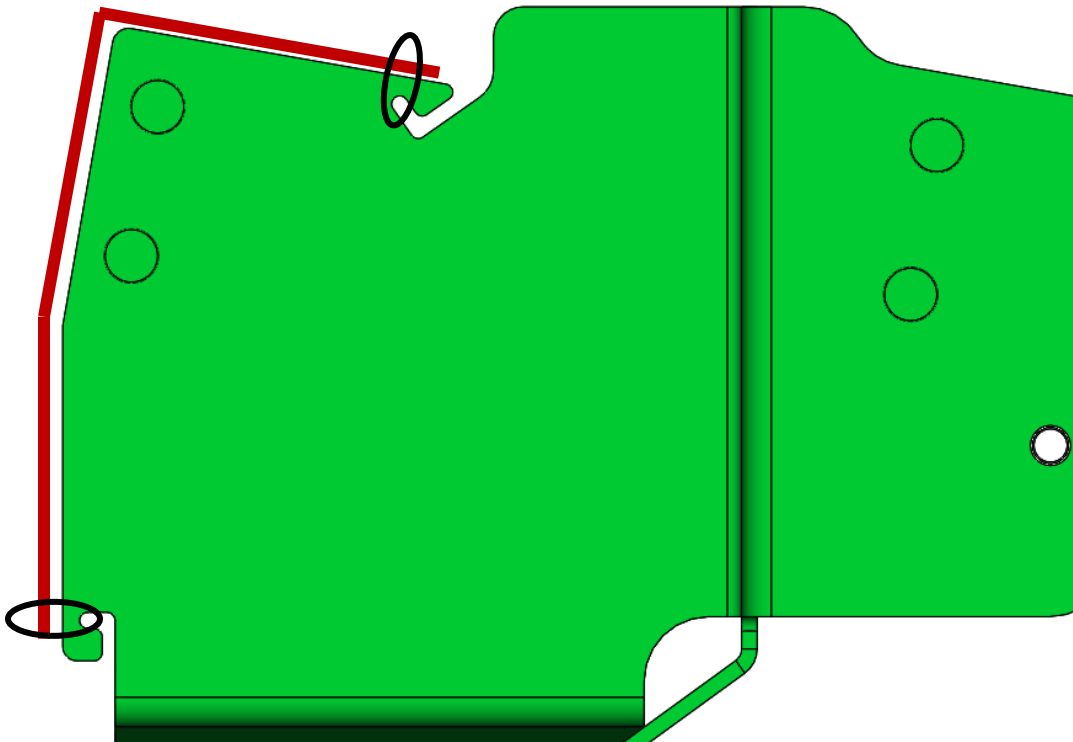


Figure 4 – Rubber Trim shown ziptied to JL-301

9.2. Air Tank Fittings

- 9.2.1. Apply two small drops of [Kleinn Air Horn Juice](#) to each male pipe thread.
- 9.2.2. Attach air fittings to tank, per below illustration, [Click Here to View Fittings List](#)

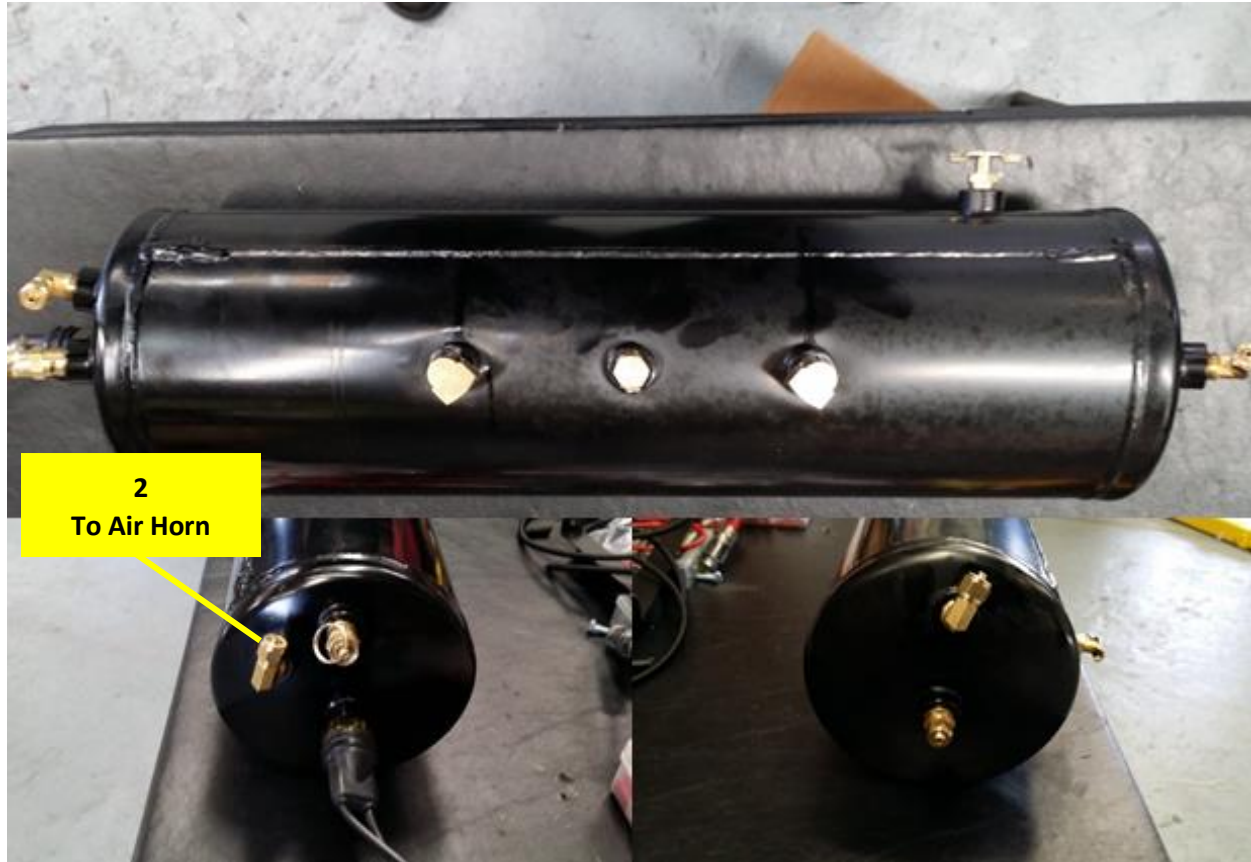


Figure 5 - Air Tank with Fittings Installed (JL-JK-OBA Shown)

- 9.2.3. Hand-tighten each fitting, then further tighten each 1/4-1/2 turn using proper sized box-end wrench; adjust as necessary to match fitting orientation shown in above figure.

10. On-Vehicle Mechanical Assembly Steps

Complete following steps *on vehicle*.

Raise vehicle off ground using appropriate vehicle lift, ramps, or jack stands.

DANGER: Installation requires being underneath vehicle and applying forces to vehicle chassis. Follow all recommended safety precautions for raising vehicle; consult vehicle owner's manual.

10.1. Horn Bracket Installation

10.1.1. Remove M6 nut and bolt from OEM gas tank splash shield, near Transmission crossmember, as shown circled in Figure 6 below.

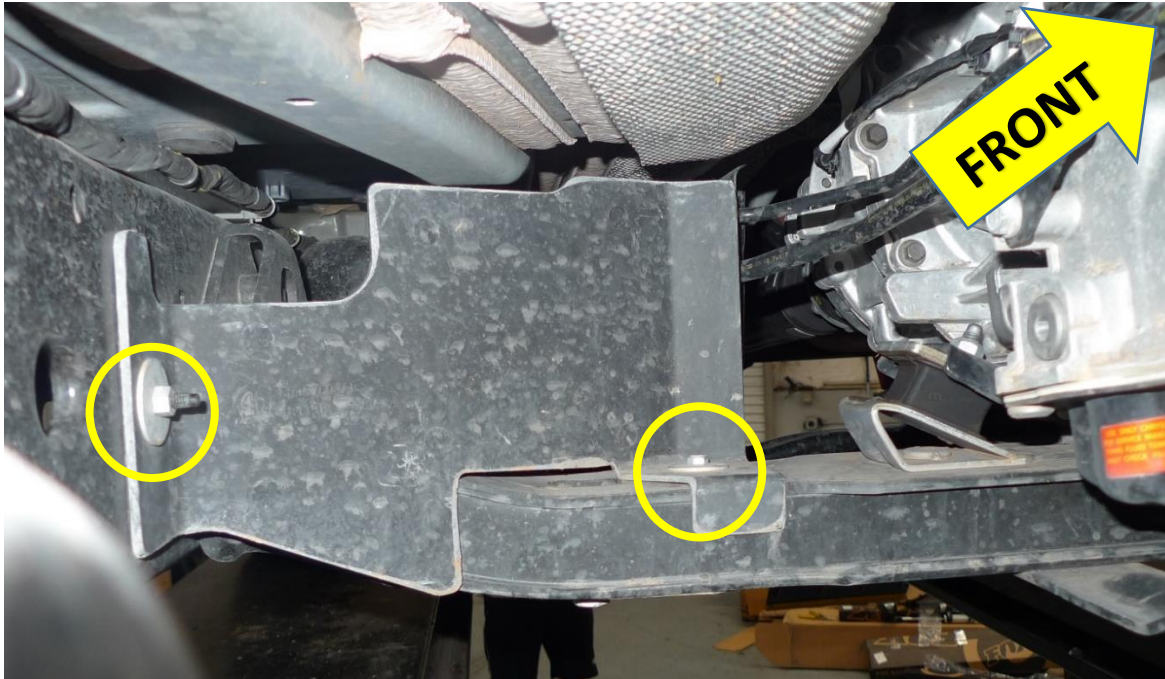


Figure 6 – OEM Splash Shield Mounting Points

10.1.2. Bolt will be re-used. Save large washer nut and shield if desired to remove kit at future date.

10.1.3. Install JL-301 with horn drivers attached in place of Splash Shield, as removed in previous step.



Figure 7 - JL-301 Attached to Vehicle

10.1.4. Install [Hardware](#) #5, #9, & #11 on frame stud, as shown circled in Figure 8 below.

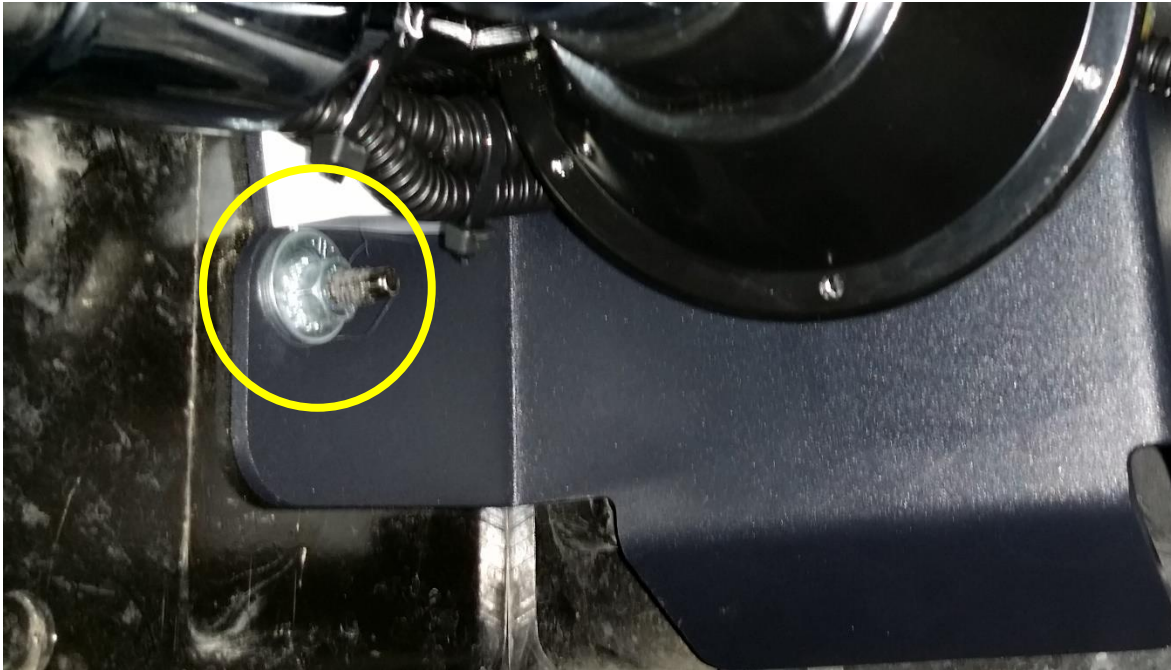


Figure 8 - JL-301 Attached to Frame Stud

10.1.5. Remove factory gas tank skid plate bolt that attaches to same crossmember, as shown circled in Figure 9 below. This bolt will not be re-used, but save in case kit is transferred to other vehicle in future.



Figure 9 - Factory Gas Tank Skid Plate Bolt

- 10.1.6. In same hole, insert [Hardware](#) #6, and #4 through threaded hole and tighten to 55-65 ft-lbs; verify that bolt is properly protruding from top of crossmember through JL-301, as shown in Figure 10 below.
- 10.1.7. Using #4, #7, and #10, secure JL-301 to the other end of bolt #6 and tighten to 55-65 ft-lbs; verify that #4 bolt does not rotate while tightening nut.
- 10.1.8. Reinstall OEM large washer M6 bolt back into hole shown in Figure 10 below, and torque to 110-130 in-lbs.

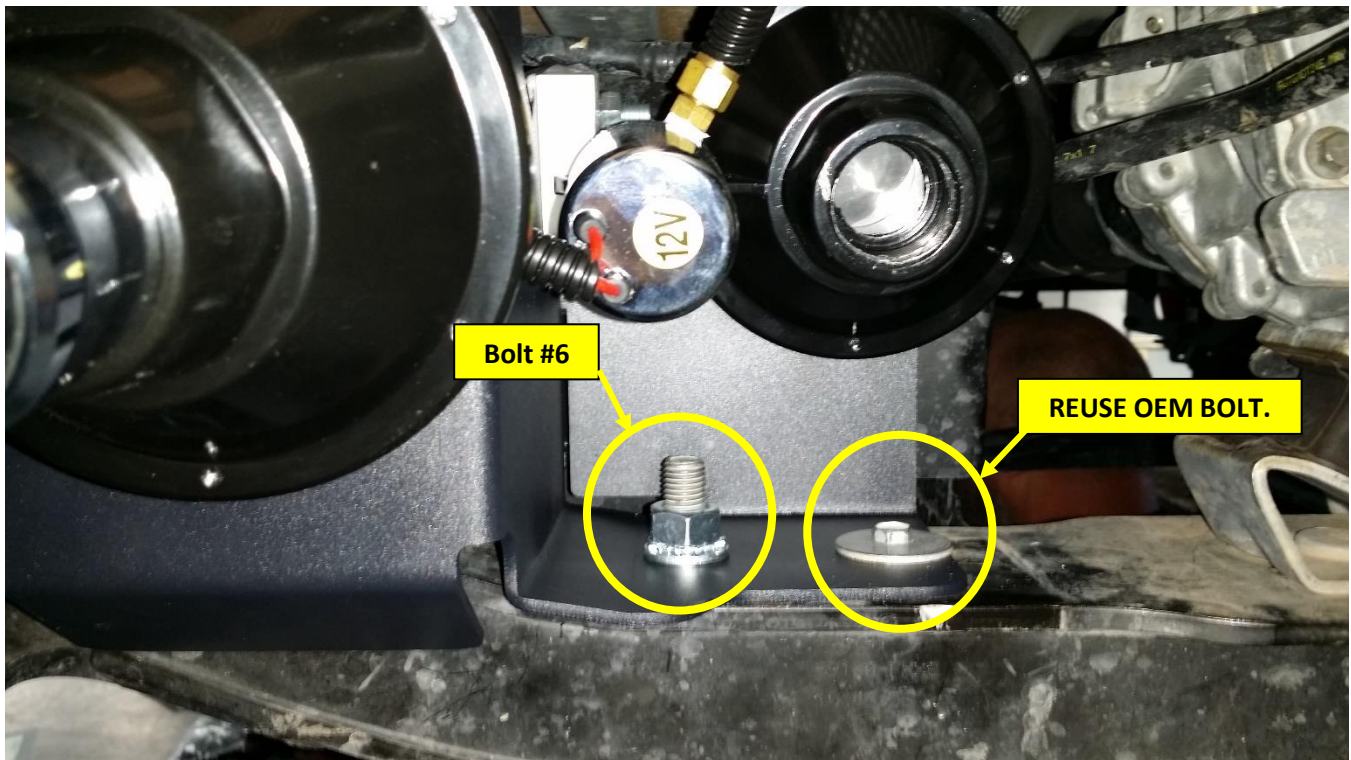


Figure 10 - Horn Bracket Crossmember Mounts



Figure 11 - Horn Assembly Installed w/ Wiring and Air Lines

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- 10.1.9. Thread Trumpets into correct Horn Drivers, as shown in Figure 12 below; tighten Trumpets snugly with both hands.
- 10.1.10. If necessary, slightly loosen 5/16"-18 Horn Driver mounting bolts and move/angle position of Trumpets to ensure a minimum 1/4" clearance all between Trumpets and vehicle. Re-tighten any loosened fasteners.

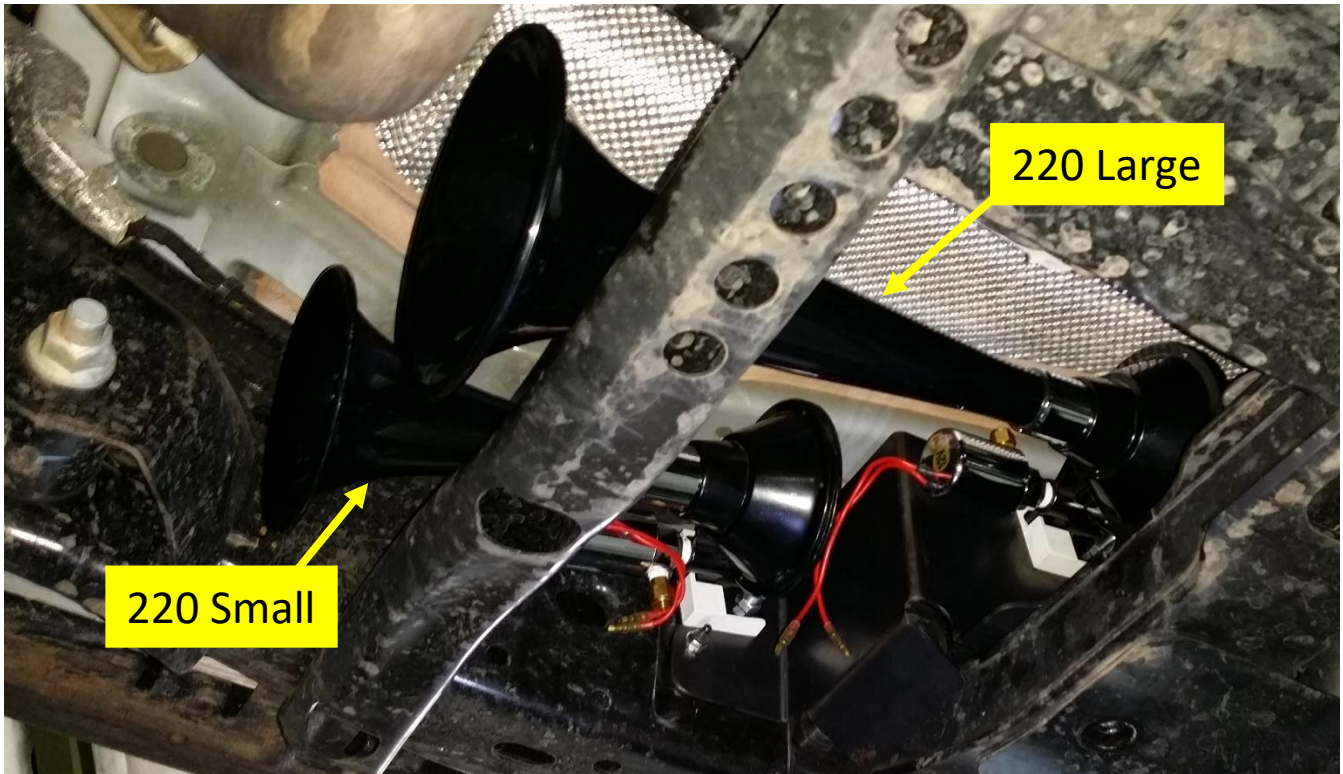


Figure 12 - Horn Trumpets Installed

End of Section



11. Initial Testing of Kit

11.1. Reconnect Vehicle Battery(s)

CAUTION: Before connecting vehicle battery(s), verify all wiring is properly connected and no shorts exists. Use of Multi-Meter, or Test Light is recommended to check continuity of all connections.

11.2. Test Train Horns

- 11.2.1. Allow Air Compressor to run and shut-off automatically (i.e., Air Tank is full)
- 11.2.2. Verify all tubing and electrical wire is securely fastened to vehicle, brackets, or kit parts; if necessary, use extra zip ties to hold tubing and wire in place
- 11.2.3. Ensure all nearby persons have adequate hearing protection and provide courtesy warning to neighbors or others in vicinity

WARNING: NEVER operate train horns with ears close to trumpets or in an enclosed space without [substantial hearing protection](#) (i.e., > Ear Plugs and Ear Muffs) for all persons closer than 100 feet from vehicle. Never operate train horns outdoors when persons are near vehicle without adequate hearing protection.

- 11.2.4. Briefly activate Horns by pressing Horn Button for one (1) second; repeat three (3) times with a short rest period between (i.e., 1-3 seconds)
- 11.2.5. Horns should sound as expected and be loud; [click to listen to example 230 Kit](#)
- 11.2.6. Horn sound/loudness will taper quickly as Air Tank loses pressure
- 11.2.7. Allow Air Compressor to refill tank, if needed and activate Horns for longer three (3) second period to ensure Horns are functioning properly.

12. General Operation of Kit

12.1. Compressor Operation

WARNING: Never operate Air Compressor above its MAXIMUM PRESSURE RATING (see label on body). Operation exceeding maximum pressure will damage Air Compressor and may result in Dangerous Air System failure.

- 12.1.1. Air compressor is equipped with an automatic thermal overload protection circuit, designed to protect air compressor from overheating and causing permanent damage.
- 12.1.2. Automatic thermal overload protector will automatically reset after 30 minutes.
- 12.1.3. To prevent discharge of vehicle's battery and for best performance, keep vehicle's engine running while using air compressor for any prolonged use (i.e., filling tires, using air tools, etc.).

12.2. Horn Operation

- 12.2.1. Allow Air Compressor to run until it shuts off automatically (i.e., Air Tank is full), or for at least one minute in between horn activations.
- 12.2.2. Press Horn Button to activate Horns
- 12.2.3. Horn sound/loudness will taper quickly as Air Tank loses pressure.
- 12.2.4. Horns should sound for 3-7 seconds depending on kit and tank size

WARNING: NEVER operate train horns with ears close to trumpets or in an enclosed space without [substantial hearing protection](#) (i.e., > Ear Plugs and Ear Muffs) for all persons closer than 100 feet from vehicle. Never operate train horns outdoors when persons are near vehicle without adequate hearing protection.

13. Routine Maintenance

Perform following steps at least once during recommended intervals.



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- 13.1. Yearly, or every 12000 miles verify all mounting fasteners are properly torqued; applying witness marks across fasteners and mounting parts is good practice to quickly ensure fasteners have not moved.
- 13.2. Yearly, or every 12000 miles inspect fuel lines behind JL-301 Horn bracket, to **verify no abrasion or rubbing.**
- 13.3. Yearly, or every 12000 miles remove all road grime and mud from mounting brackets and kit parts using clean water from a garden hose; pay special attention to corners where dirt may collect. Touch up all paint chips using automotive grade enamel in either spray, or brush form.

NOTE: High-pressure washers may damage part finishes and *must* be used with care. Do this more frequently if traveling regularly off-road, or in winter climates where road salts are used.

- 13.4. Yearly, or every 12000 miles check electrical and air fitting connections and wires for

abrasion, corrosion, or other damage. Replace damaged components.

NOTE: if system runs continuously or turns on unexpectedly, leaks or intermittent electrical connection may be present.

- 13.5. Monthly, or every 10 hours of compressor run time, drain moisture from air tank using drain valve installed at bottom of tank.

WARNING: *Failure to regularly drain air tank may result in corrosion inside tank and possible failure in tank or air lines, which can suddenly release air pressure causing injury to nearby people.*

- 13.6. Yearly, or every 12000 miles clean, or replace air compressor air filter element. Replacement frequency depends on operating frequency and conditions of operating environment (i.e., daily use of air compressor in dusty, or wet environment requires more frequent filter change). Order replacement filters at Kleinn.com.

NOTE: Never lubricate or add any liquids to the included oil-less air compressor

14. Warranty Information

Thank you for purchasing this JL220. Shall you experience any unexpected problems during installation, or have problems with any part at any time please contact Kleinn support.

KLEINN MANUFACTURER LIMITED DEFECT WARRANTY:

Kleinn Automotive Air Horns warrants this product to the end-user, when properly installed and under normal conditions of use, to be free from defects in workmanship and materials for a period of one year from the provided date of purchase, to the original purchaser of the product. This warranty does not cover abuse, operation in a manner inconsistent with the product's design, or damage resulting from exposure to the elements. If the defect is considered "under warranty", Kleinn will, at its option, repair or replace the product free of charge to the original purchaser. Kleinn is not liable for any installation charges, loss or damage of any kind incurred in the replacement or repair of any warranted product

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