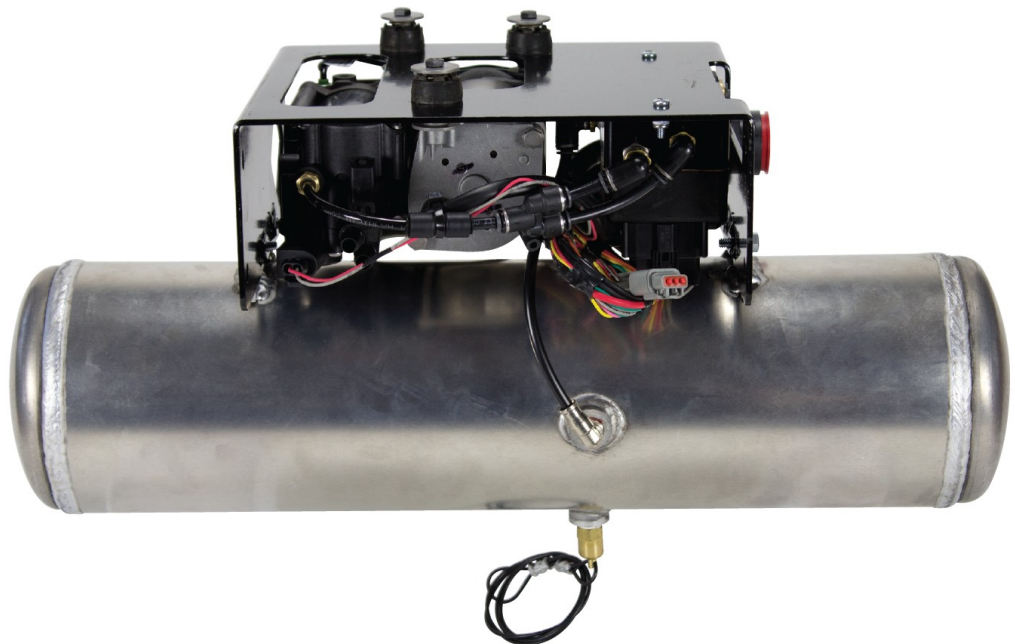


INSTALLATION GUIDE

Link® **UltraRide**®
Chassis Air Suspension

Electronic Air Control Kit
Link Part No. 800M1300



Questions ? Contact this Professional Installer :

Company : _____

Phone : _____

Installer : _____ Date : _____

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1. INTRODUCTION

IMPORTANT! It is important that the entire installation instructions be read thoroughly before proceeding with the installation.

The **UltraRide**[®] Electronic Air Control Kit is intended ONLY to provide a pressurized air supply for Link **UltraRide**[®] Chassis Suspensions and control the dump action of the suspension.

Any other use of these Air Control Products is not authorized. Link accepts no warranty responsibility for damage resulting from misuse.

Items included with this Air Control Kit

- ❑ **Power Pack.** Contains the compressor, valves, ECU, relays, pressure switches, and all other components necessary for the operation of the air kit.
- ❑ **Air Tank.** Provides a reserve source of pressurized air to manage compressor run time and dump recovery time.
- ❑ **Chassis Integration Wiring Harness.** The wiring harness that connects the Power Pack to the battery, to power the compressor, the cab controls to control the function of the air kit, the height sensors, and the brake system.
- ❑ **Airline, Air Filter, & Cable Ties.** Extra airline is included with this kit to connect it to the **UltraRide**[®] suspension system. Cable ties are also included to connect the intake hoses to the compressor and air filter.
- ❑ **Height sensors, magnets, their mounting hardware.** Height sensors and magnets are mounted to the suspension with the included stainless steel hardware.
- ❑ **This Installation Manual & a separate Owner's Manual.**







Items NOT included with the Air Control Kit

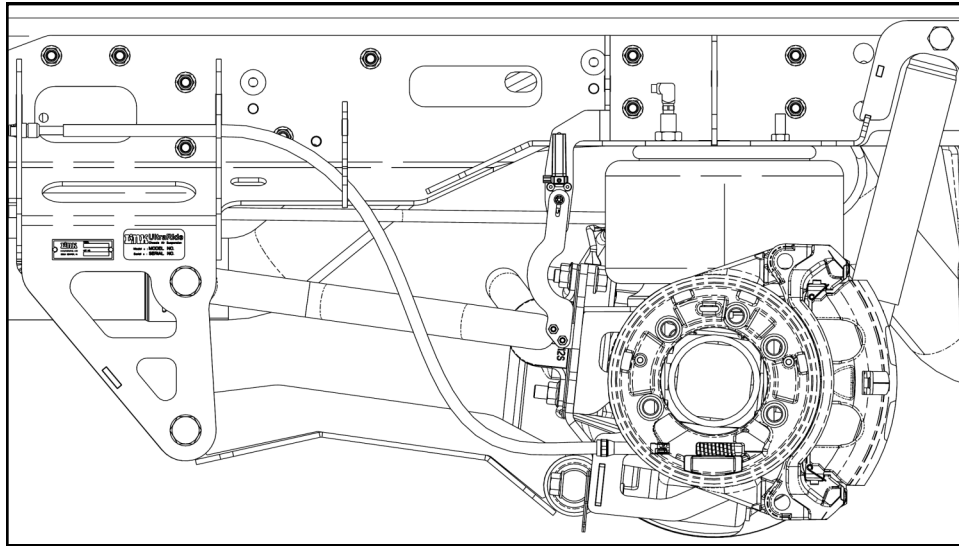
- ❑ **Mounting brackets.** Mounting brackets to mount the Air Control Kit to the vehicle ARE NOT included in this kit. The installer can either supply their own brackets to mount the kit OR Link Mfg. offers a mounting bracket kit (such as part # 800M1301). Contact your Link Mfg. representative for availability.
- ❑ **Cab Control Panel.** Many custom installers wish to use their own custom cab switches and lights. For this reason, the **UltraRide**[®] air kit does not contain the Link Control Panel. It can be ordered separately as Link PN: 800M1074. Contact your Link Mfg. representative for availability.
- ❑ **Diagnostic computer interface & software.** Used to set the suspension Dump Height and to diagnose air kit errors.
 - Diagnostic computer interface part number: 13010578
 - Computer software can be downloaded from: <http://www.linkmfg.com/LinkAirTools.exe>

PRODUCT INSTALLER RESPONSIBILITIES

- ❑ Installer is responsible for installing the product in accordance with Link Mfg. specifications and installation instructions.
- ❑ Installer is responsible for providing proper vehicle components and attachments as well as required or necessary clearance for suspension components, axles, wheels, tires, and other vehicle components to ensure a safe and sound installation and operation.
- ❑ Installer is responsible for advising the owner of proper use, service and maintenance required by the product and for supplying maintenance and other instruction as readily available from Link Mfg..

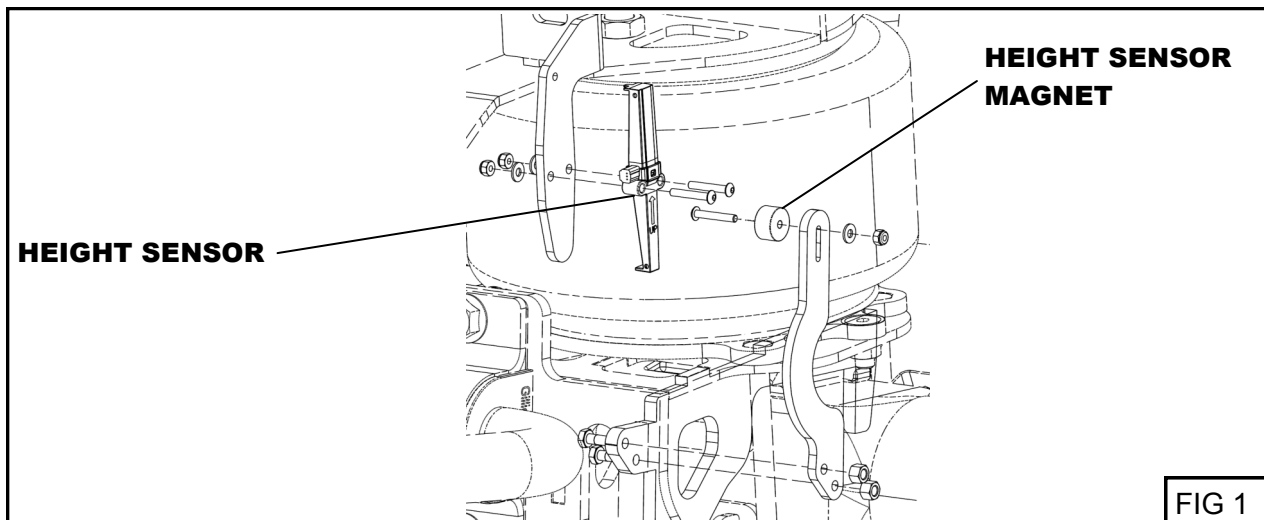
SAFETY SYMBOLS, TORQUE SYMBOL, and NOTES

	<p>This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.</p>		<p>The torque symbol alerts you to tighten fasteners to a specified torque value.</p>
 WARNING	<p>WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</p>	<p>NOTE:</p>	<p>A Note provides information or suggestions that help you correctly perform a task.</p>
 CAUTION	<p>CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.</p>		<p>The electrical symbol indicates the presence of electric shock hazards which, if not avoided, may result in injury to personnel or damage to equipment.</p>
<p>CAUTION</p>	<p>CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.</p>	<p>Proper tightening of U-Bolt nuts and mounting nuts are required for proper operation. Need for proper Torque value is indicated by wrench symbol and values will be found in Table 12-1 in Maintenance section of the instructions. Failure to maintain proper torque can cause component failure resulting in accident with consequent injury.</p> 	



2. INSTALLING THE HEIGHT SENSORS AND MAGNETS

1. The height sensor, with the arrow on it pointing up, is to be secured to the frame bracket as shown in Figure 1. Use (2) #10-24 UNC x 1 1/4 stainless steel button head cap screws, (2) #10 stainless steel flat washers, and (2) #10-24 UNC nylon locking nuts from the hardware bag. Repeat this step on the other side of the vehicle
2. The height sensor magnet is to be secured to the magnet mount plate (provided with the suspension) also shown in Figure 1. Be sure that the countersink in the magnet is facing the height sensor. Use (1) #10-24 UNC x 1 1/4 stainless steel countersunk cap screws, (1) #10 stainless steel flat washers, and (1) #10-24 UNC nylon locking nuts from the hardware bag. Repeat this step on the other side of the vehicle.
3. Center the height sensor magnet in the adjustable slot now. The sensor magnet and position will be adjusted later to fine tune the ride height of the suspension.

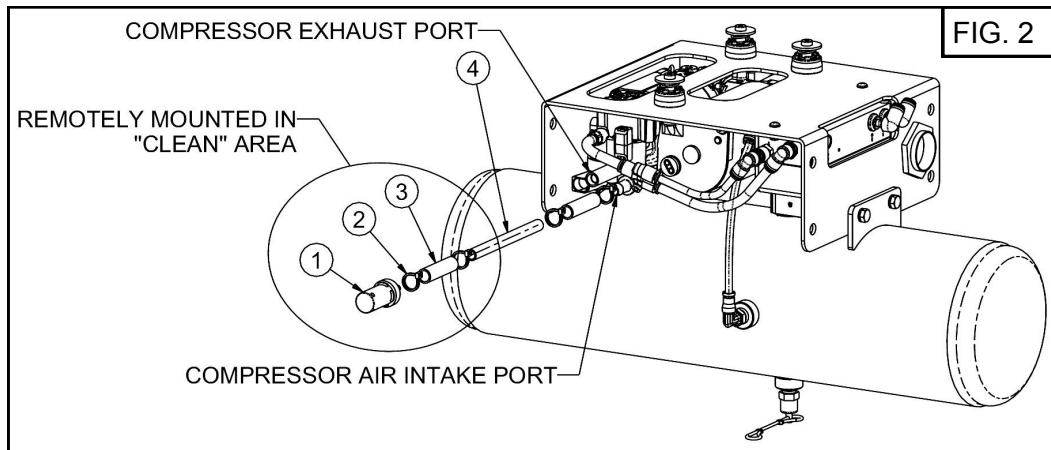


3. MOUNTING THE AIR KIT

The **UltraRide**® Electronic Air Control Unit is shipped with the air tank attached to the Power Pack. If desired, the air tank can be split from the Power Pack and each can be mounted separately, connecting them with a 1/4 inch DOT air line hose.

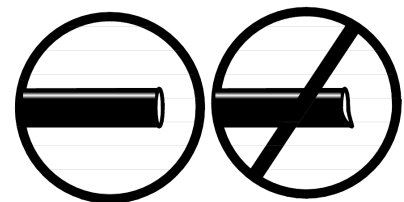
If a mounting kit (such as the Link Mfg 800M1301 Frame Mounting Kit) was purchased with your air kit, follow the instructions included in the mounting kit to mount your **UltraRide**® Electronic Air Control Unit to the vehicle.

If NOT using a Link Mfg mounting kit, mount the Air Control Unit in a suitable location with open air flow to cool the compressor. For proper vibration isolation, the rubber compressor mounts **MUST** be oriented up as shown in Figure 2. The air tank must always be mounted with a drain on the bottom side for proper drain operation.

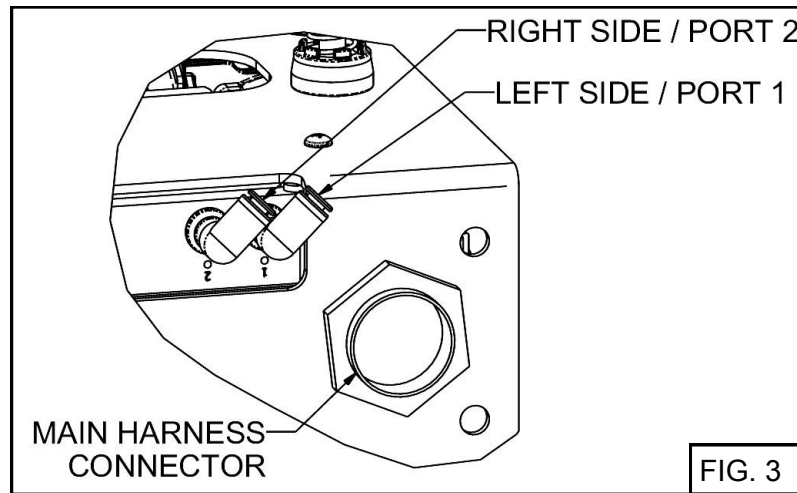


4. AIR LINE CONNECTIONS

1. **Locate compressor intake filter in a clean, dry, protected location** (such as the vehicle's cabin or within a body compartment) where it is accessible for maintenance. Never place the air filter under the chassis where it will be directly exposed to moisture, dust, and debris!!
2. Using a 2 inch rubber hose (item 3) and two cable ties (item 2) from the air kit components bag, secure the inlet filter to the 3/8 inch DOT air line hose.
3. Connect the other end of the 3/8 inch DOT air line hose to the compressor intake port using another 2 inch rubber hose and two cable ties as shown in Figure 2. NOTE: the air kit ships with a plug in the compressor intake port. Remove this plug before attaching intake.
4. Verify that the intake hose is not kinked and has a minimum bend radius of 5 inches at any bend.
5. Only use 1/4" OD DOT airline (a length of airline is included in the kit). The airline ends must be cut squarely & cleanly using an airline cutting tool. **DO NOT USE scissors or wire cutters.** Link Mfg. recommends the SMC air line cutting tool. Inspect the airline ends to ensure they are free of dirt, debris, and scratches. Dirt and debris can clog or damage valves and/or limit airflow. Scratches near the end of the airline can prevent the fitting from sealing properly and cause it to leak.
6. Insert the 1/4 inch DOT air line hose into the Push To Connect (PTC) connection of Port 1 (Left Side) until fully seated as noted in Figure 3 and route the other end of the air line hose to the left air spring. Insert the air line hose into the PTC fitting on top of the air spring. Use the included elbow to improve connection routing.



7. Insert another 1/4 inch DOT air line hose into the PTC connection of Port 2 (Right Side) until fully seated also noted in Figure 3. Route the other end of the air line hose to the right spring and insert into the PTC fitting on top of the air spring.



5. ELECTRICAL CONNECTIONS

The included chassis integration wiring harness for the **UltraRide**[®] Electronic Air Control Unit uses heavy gauge wiring and industrial standard sealed connectors, allowing greater flexibility in routing and placement options.

CAUTION! All wiring and air lines should be routed and secured neatly to avoid any functional or visual issues. Under hood and under-body wire and airline routings should be clear of sharp edges (3/4 inches minimum) and direct sources of heat (4 inches minimum). They should not be routed through wheel well areas where it may be damaged by tire or road debris, and it should not be routed over the exhaust system. They should not contact the brake lines or fuel lines. Always disconnect the battery cables before installing or servicing any electrical components.

Connecting the Height Sensors

1. Connect the chassis integration harness to the **UltraRide**[®] Electronic Air Control Unit.
2. Locate the left height sensor connector plug (deutsch plug with three colored wires: Yellow/Black/Red).
3. Route the wiring harness appropriately from the control unit to the left height sensor and insert the electrical plug until the plug lock engages. Secure the wiring harness to the chassis with cable ties every 12 inches.
4. Locate the right height sensor connector plug (deutsch plug with three colored wires: Green/Black/Red).
5. Route the wiring harness appropriately from the control unit to the right height sensor and insert the electrical plug until the plug lock engages. Secure the wiring harness to the chassis with cable ties every 12 inches.

Connecting to the Control Panel

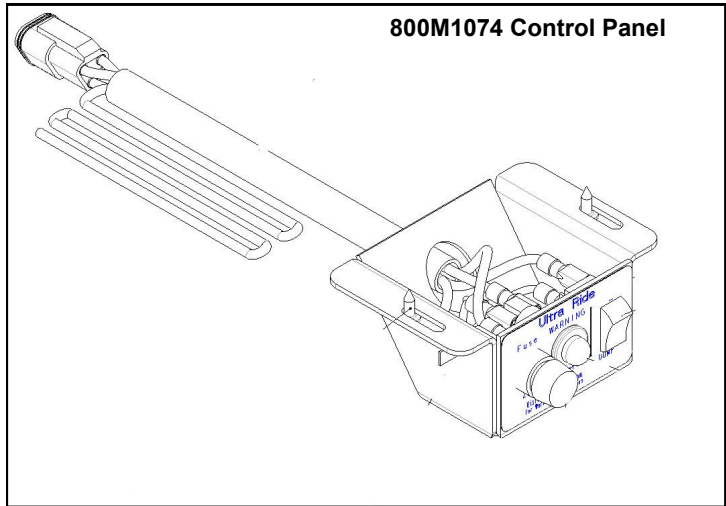
- Route the control panel plug and the diagnostic interface plug on the Chassis Integration Wiring Harness into the cab, where it can be connected to the air kit controls for easy, in-cab operator

use. Route it to the driver's side of the bulkhead, either passing through an existing grommet hole behind the dash, or drilling an appropriate hole in the bulkhead to pass the harness through.

NOTE: use a grommet around the harness and in the bulkhead to reduce noise transmission. Keep the harness away from the sharp edges and seal the cab area against dirt and moisture. For more detailed control harness routing options, see Appendix B for Ford vehicles.

Using the optional 800M1074 Control Panel (sold separately):

- ❑ The Control Panel should be mounted somewhere between the driver and passenger seating areas to keep it out of the Passenger Protection Zone (Figure 4).
- ❑ Connect the Control Panel wiring pigtail to the Control Panel connector plug on the Chassis Integration Wiring Harness.
- ❑ The **white wire** on the Control Panel wiring harness must be connected to a "key hot" signal wire so that it only receives +12V power when the ignition key is in the "RUN" position to ensure that the Air Control Kit only runs when the key is on, preventing the batteries from draining. For more details on locating a suitable "key hot" wire for your application, see Appendix B for Ford vehicles.



Using your own, custom control panel switches and lights:

- ❑ A 2A fuse, warning indicator light, and a dump switch must be installed to complete the control harness circuit. See Figure 5 for custom control panel wiring. **Note: the use of a warning indicator device (such as a warning light), is REQUIRED** and should be included in any custom control interface design. Failure to do so may result in damages not covered by warranty.

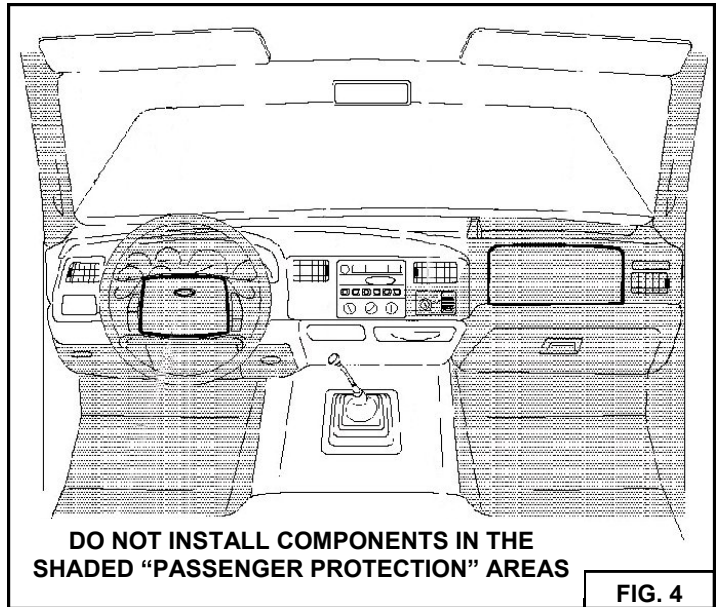
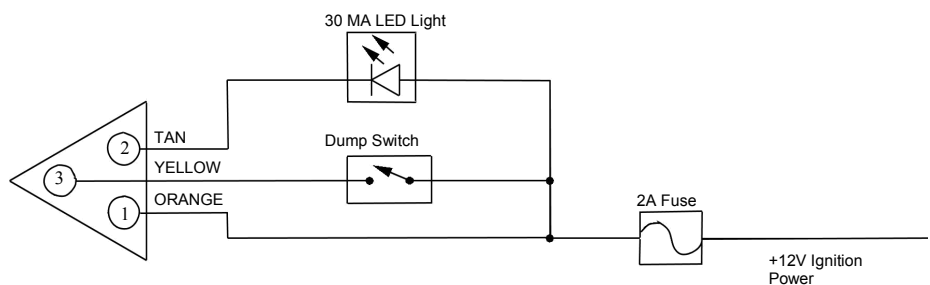


FIG. 4

UltraRide® Air Kit Control Panel Schematic

FIG. 5

Connector:
 Duetcsch Series DT Connector
 Housing: DT06-3S (QTY 1)
 Socket: 1062-16-0122 (QTY 3)
 Wedgelock: W3S
 Pin 1(A) - +12V Ignition Power
 Pin 2(B) - Warning Light
 Pin 3(C) - Dump Switch

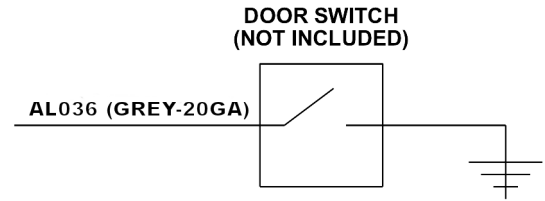


- ❑ **NOTE:** The warning indicator light MUST be a LED type light with a maximum current draw of **30 milliamps**. An incandescent light or any light exceeding a current draw of 30 milliamps will not function properly.

Connecting a Door Switch (if applicable)

If the application calls for the use of a door switch, the installer can utilize the Auxiliary Dump wire lead provided in the Chassis Integration Wiring Harness. The installer is responsible for providing the ground connection and the door switch.

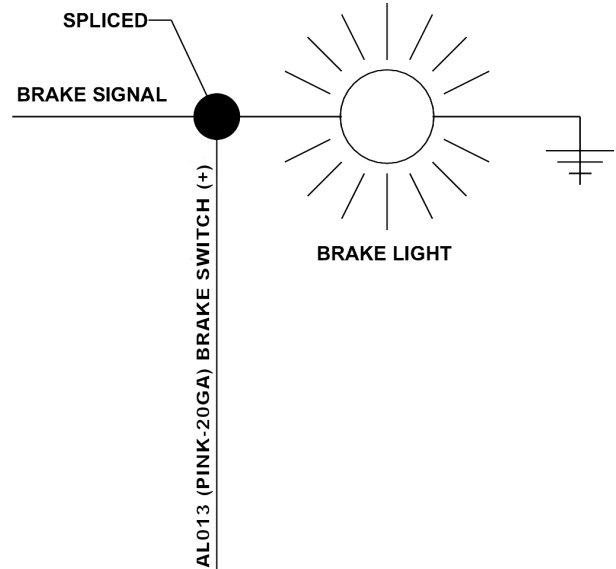
- ❑ Connect the signal wire to the grey wire lead (AL036) on the provided Chassis Integration Wiring Harness.



Connecting the Brake Input

The UltraRide® Electronic Air Control Unit is designed to return the suspension to ride from a dump state the moment the brake circuit signals and the dump switch has been de-activated.

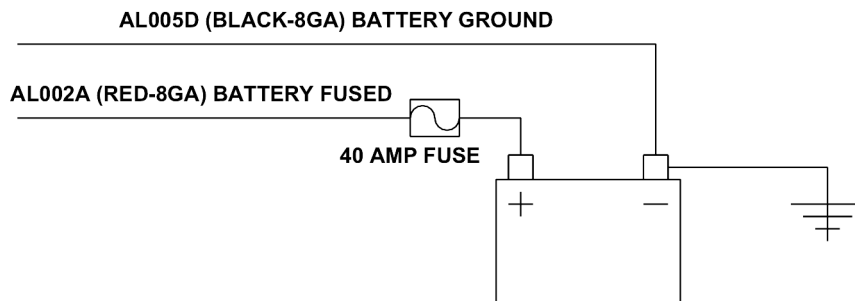
- ❑ Locate a suitable brake signal wire. Consult the body builder's guide and electrical manuals of your vehicle to best locate a brake signal wire. Possible wires to use include trailer brake wires.
- ❑ Connect the brake signal wire to the pink wire lead (AL013) on the provided Chassis Integration Wire Harness.



Connecting the Battery

To complete the electrical wiring, validate that all added connections have been properly connected and are sealed.

- ❑ Connect the black ground wire lead (AL005D) of the Chassis Integration Wiring Harness to the negative battery post.
- ❑ Connect the fused red power wire lead (AL002A) of the Chassis Integration Wiring Harness to the positive battery post.



6. AIR SYSTEM OPERATION

NOTE: Before operating the **UltraRide®** Air Control Kit, be sure it has been properly connected to the **UltraRide®** Chassis Suspension.

Powering the system up for the first time.

- ❑ Make sure the dump switch on the control panel is in the OFF position.
- ❑ If auxiliary door switches were installed, be sure that all doors are closed.
- ❑ Turn on the vehicle's ignition switch.

The Air Control Kit will power on and begin to fill the air tank. Once pressure in the tank has reached 150 psig, the air spring control valves will open and begin to fill the air springs. The vehicle will rise until Ride Height has been achieved at which point, the air spring control valves will close.

Setting the Suspension Ride Height

Adjust the suspension ride height on each side by moving the sensor magnet up or down. (See your suspension manual for correct Design Height).

- ❑ Move the magnet up to increase Ride Height.
- ❑ Move the magnet down to decrease Ride Height.
- ❑ Wait while the suspension adjusts.
- ❑ Re-tighten Height Sensor Magnet when finished!

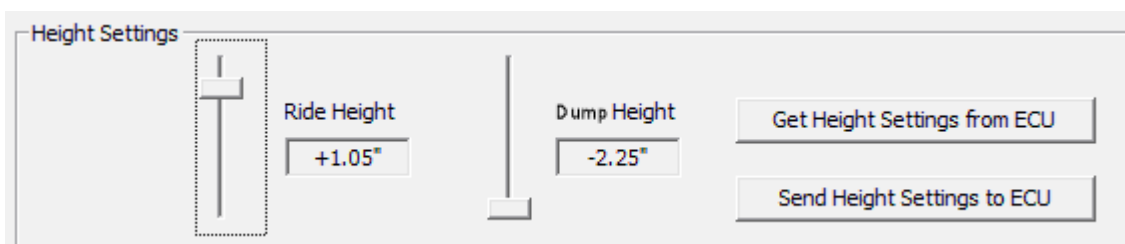
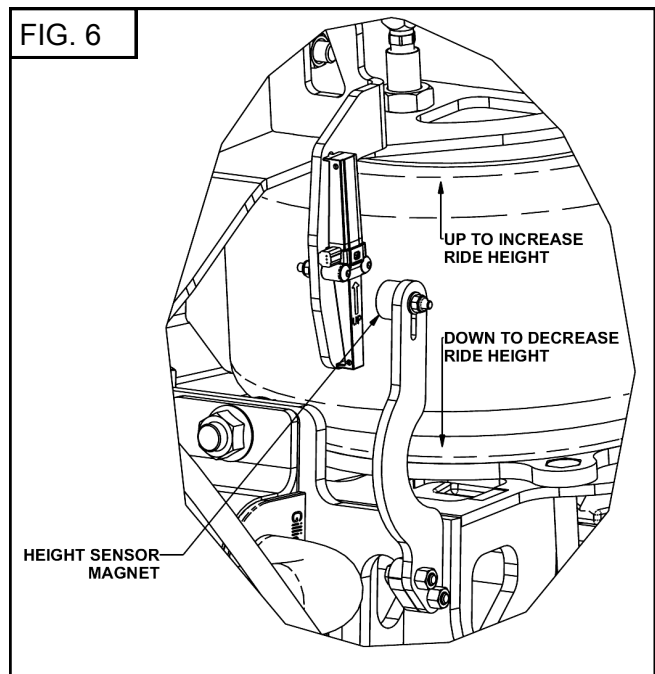
Setting the Suspension Dump Height

From the factory, the Dump Height is set to -2.25 inches from Ride Height.

The suspension Dump Height can be changed via the diagnostic interface software. (See Appendix A on how to install the software on your laptop or computer)

To adjust the Dump Height

- ❑ Connect the diagnostic interface to the connector on the wire harness
- ❑ Access the Virtual Display Screen in the Link Air Kit Tools software.
- ❑ Click "Get Height Settings from ECU" to retrieve the current height settings.
- ❑ Edit the Dump Height Value.
- ❑ Click "Send Height Settings to ECU" to save the new Dump Height settings.



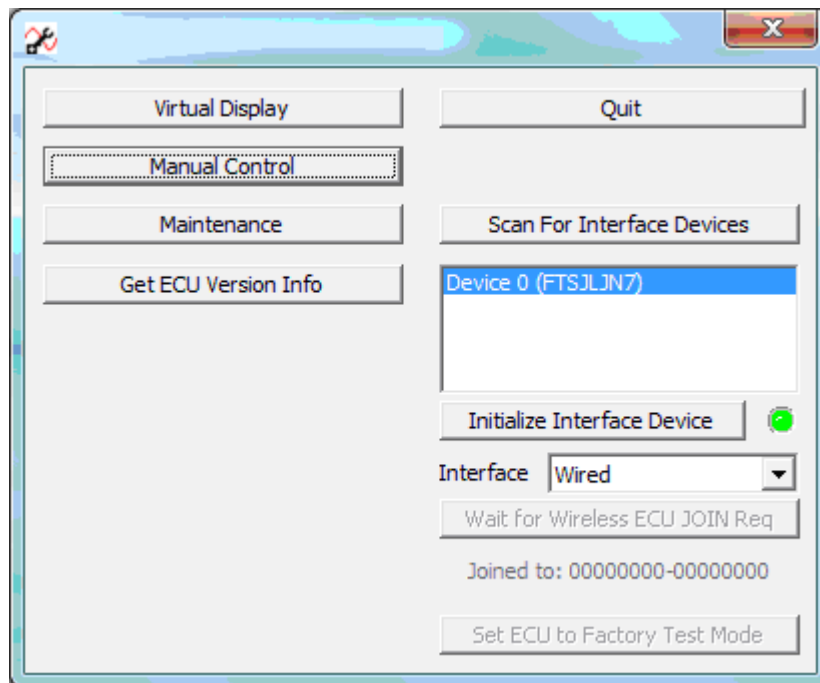
7. USING THE DIAGNOSTIC INTERFACE SOFTWARE

- ❑ Connect the **UltraRide®** Air Kit Interface Module to the diagnostic plug on the Chassis Integration Wiring Harness.
- ❑ Connect the USB cable to the computer and to the **UltraRide®** Air Kit Interface Module.
- ❑ Launch the Link Air Kit Tools program by clicking on the desktop icon created during the software installation.



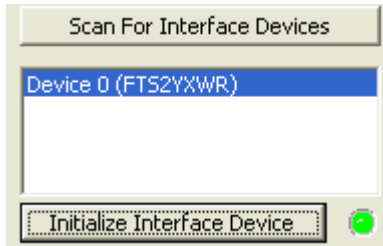
The main menu will appear and allow the user the ability to choose from different sub-menus and tasks. Each different sub menu will allow the user the ability to view or modify suspension information.

Scan For Interface Devices



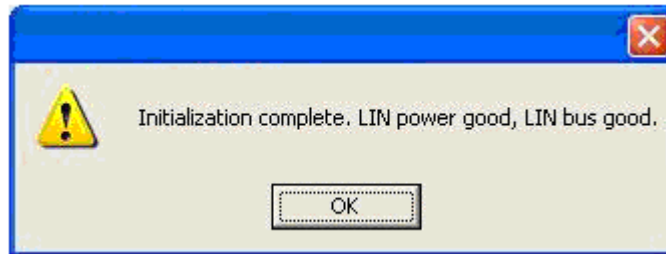
This allows the user to see if the transceiver is connected to the computer. A successful scan will return a similar image as seen below with the serial number of the transceiver.

If the transceiver is not detected, it will show "NONE" in the dialog box.

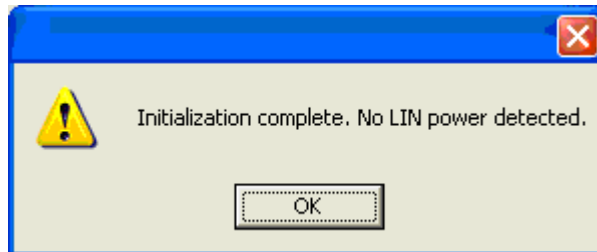


Initialize Interface Device

This allows the user to connect the transceiver to the manifold in the Electronic Air Control Unit. If a pop up window states that "Initialization complete. LIN power good. LIN bus good." then the connection to the manifold is good.



If a pop up window states that "Initialization complete. No LIN power detected." then connection issues between the transceiver and the manifold are present.



Virtual Display Menu

The virtual display allows the user to view the manifold information interactively.



When the suspension is in a dump mode, the warning indicator light will be lit solid. The warning indicator will flash when the compressor is overheated, the spring is overloaded, a sensor is invalid, or an air leak is present.

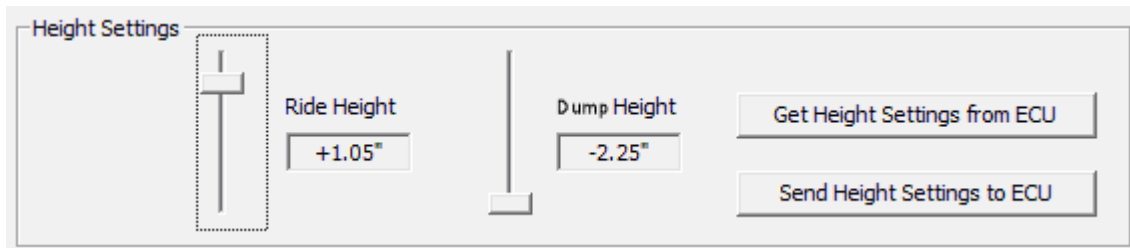
Failure modes include:

- Compressor Overheat >220F
- System Fault
- Valve Fault
- Sensor Fault
- Calibration Error

Communication Status

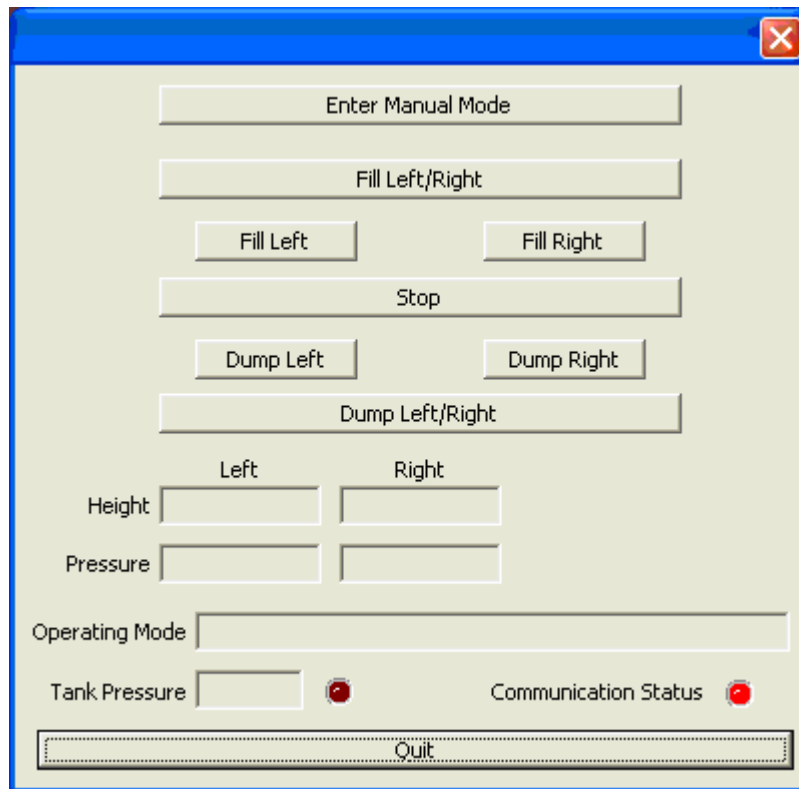
- Blinking Green = connection established
- Solid Red = connection not present

To change the height settings, click and hold the slide bar to change the target height for Ride Height and Dump Height. Once the desired heights are set, click the “Send Height Settings to ECU” button. The example shown below shows a technician in the process of changing the right height setting to 1.05 inches.



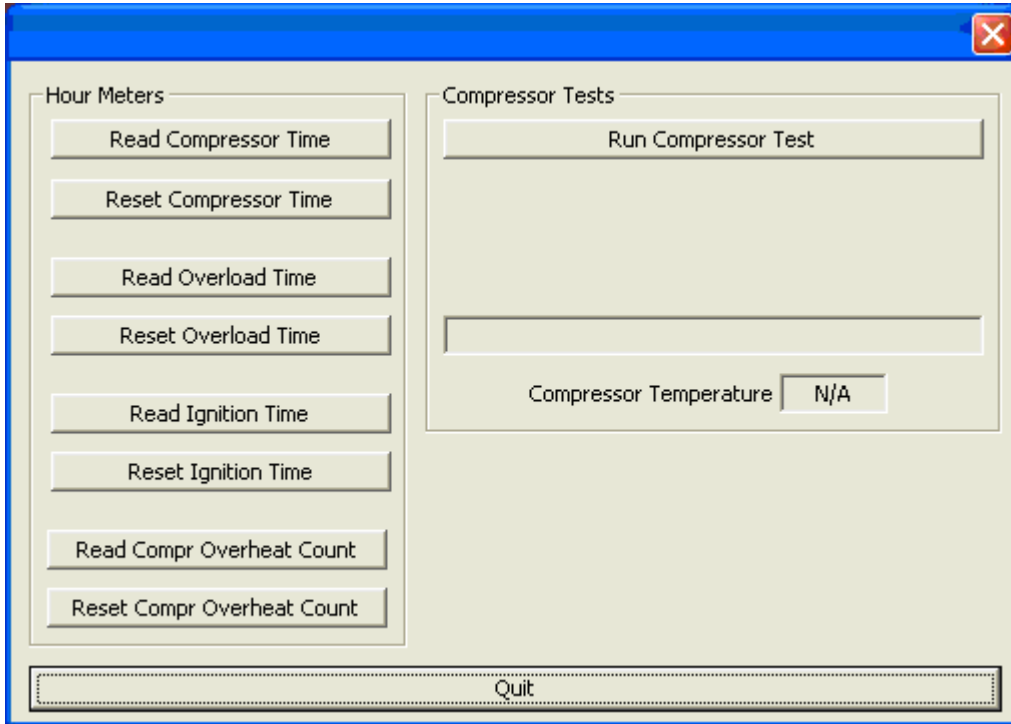
Manual Control Menu

The Manual Control menu allows the technician to fill or deflate the air springs. When using this menu, the manifold will execute a command until the “STOP” button is pressed. Reference heights and pressures will be displayed. The system will not react when in the “Exception—Mandatory Tank Fill” operating mode.



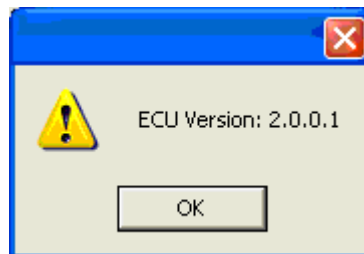
Maintenance Menu

The Maintenance allows the technician to read and reset the compressor time, to read and reset overload time, to read and reset Ignition time, and to read and reset compressor overheat counter. There is also a button to allow the technician to test the compressor. When executed, the tank will deflate to 100 PSI. The compressor will then be signaled to inflate the tank to 150 PSI. The time to bring the pressure up will be displayed on the screen.



ECU Version Menu

The ECU Version menu displays the software version that has been programmed into the ECU



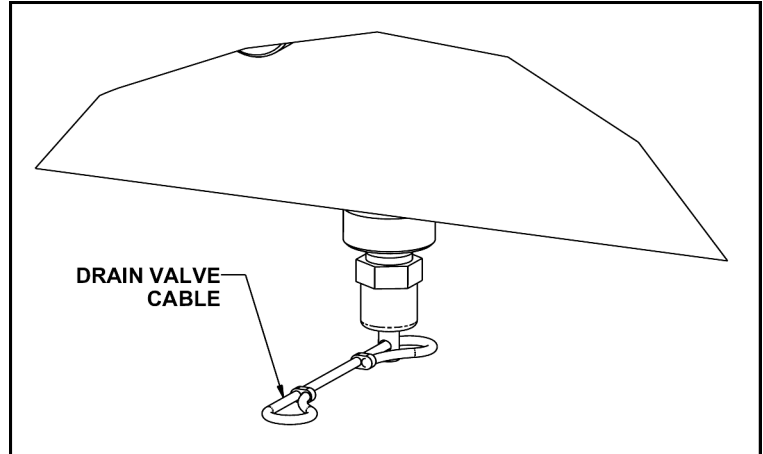
8. SERVICE & MAINTENANCE

The **UltraRide**[®] Air Control Kit needs no lubrication and little maintenance. The following components should be checked at the time the truck is being serviced. However, immediate corrective action should be taken if a serious malfunction occurs.

It is important to release any moisture contained within the air reservoir weekly!

Even with the advanced features of the electronic air kit system along with accessories like air dryers, moisture can build up in the air tank and should be checked.

This can be done by pulling on the cable attached to the drain valve. Not releasing the moisture on a regular basis will cause the drain valve to not operate properly, and may cause the air kit to malfunction. Excess moisture in the system can also cause premature failure of other components including the tank itself.



Operational Notes:

- ❑ The Warning light:
 - ❑ Solid on: Suspension is Dumped and vehicle should not be driven
 - ❑ Blinking: There is an error and the vehicle should not be driven.
- ❑ A minimum tank pressure of 120 psig is required for the system to recover from a suspension Dump. The Air Control Kit will not Dump if there is not sufficient pressure to recover

EVERY Week

- ❑ Manually drain excess moisture form tank.

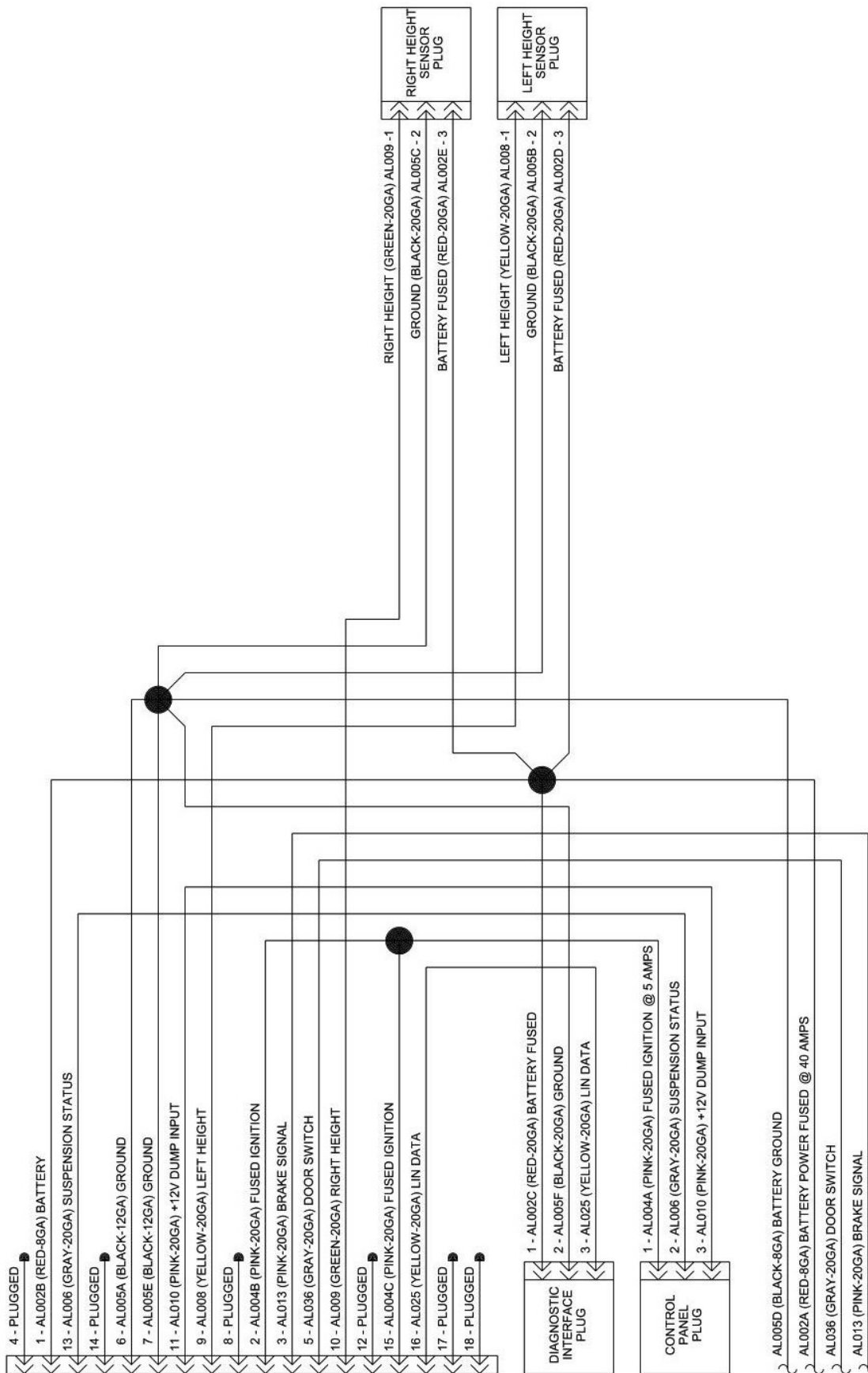
EVERY 3,000 miles or every oil change:

- ❑ Check for air leaks around fittings
- ❑ Check air filter; replace if necessary
- ❑ Check for debris on magnet and clean if necessary

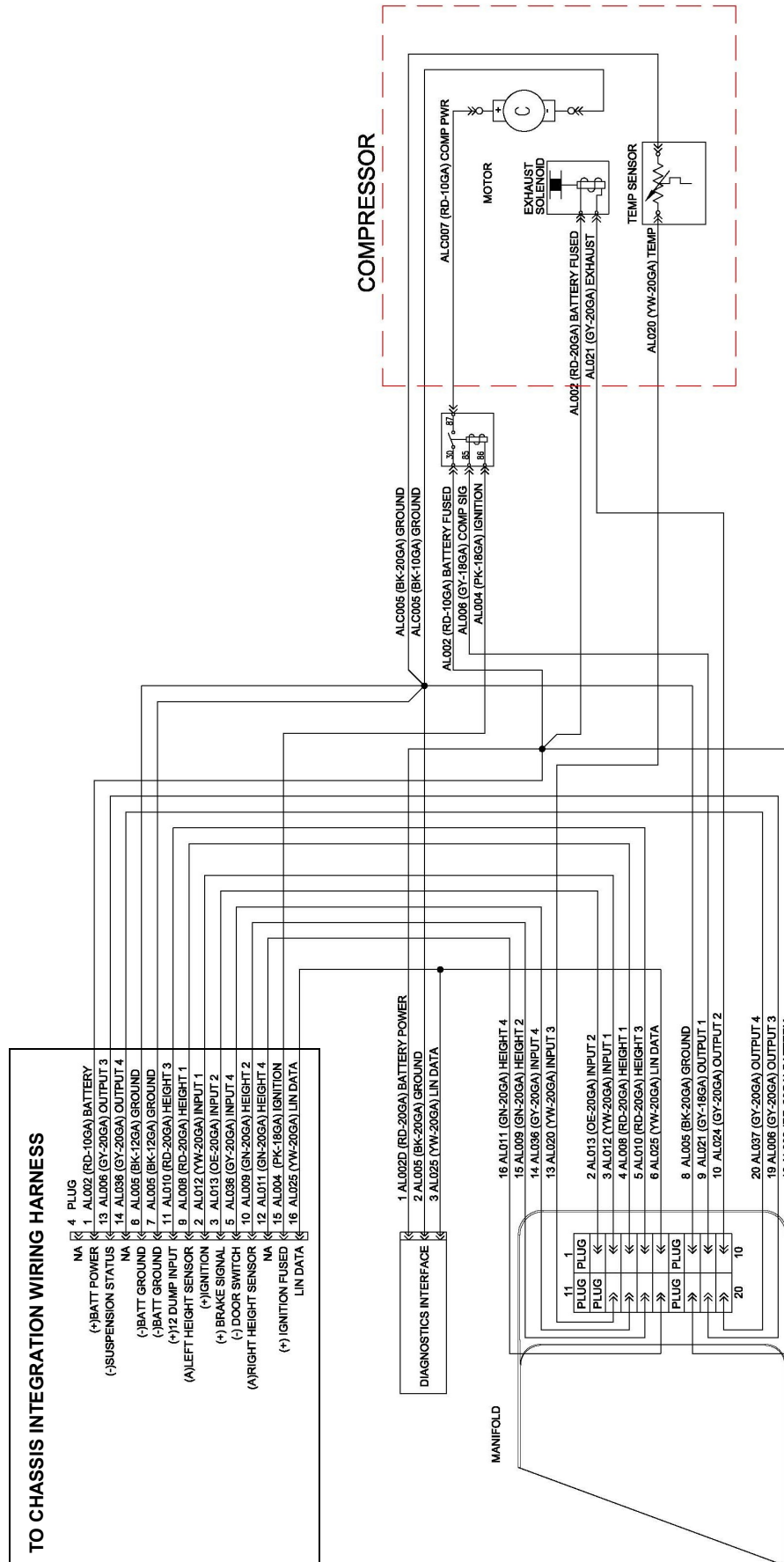
EVERY 30,000 miles or 6 months, whichever comes first:

- ❑ Replace the air filter

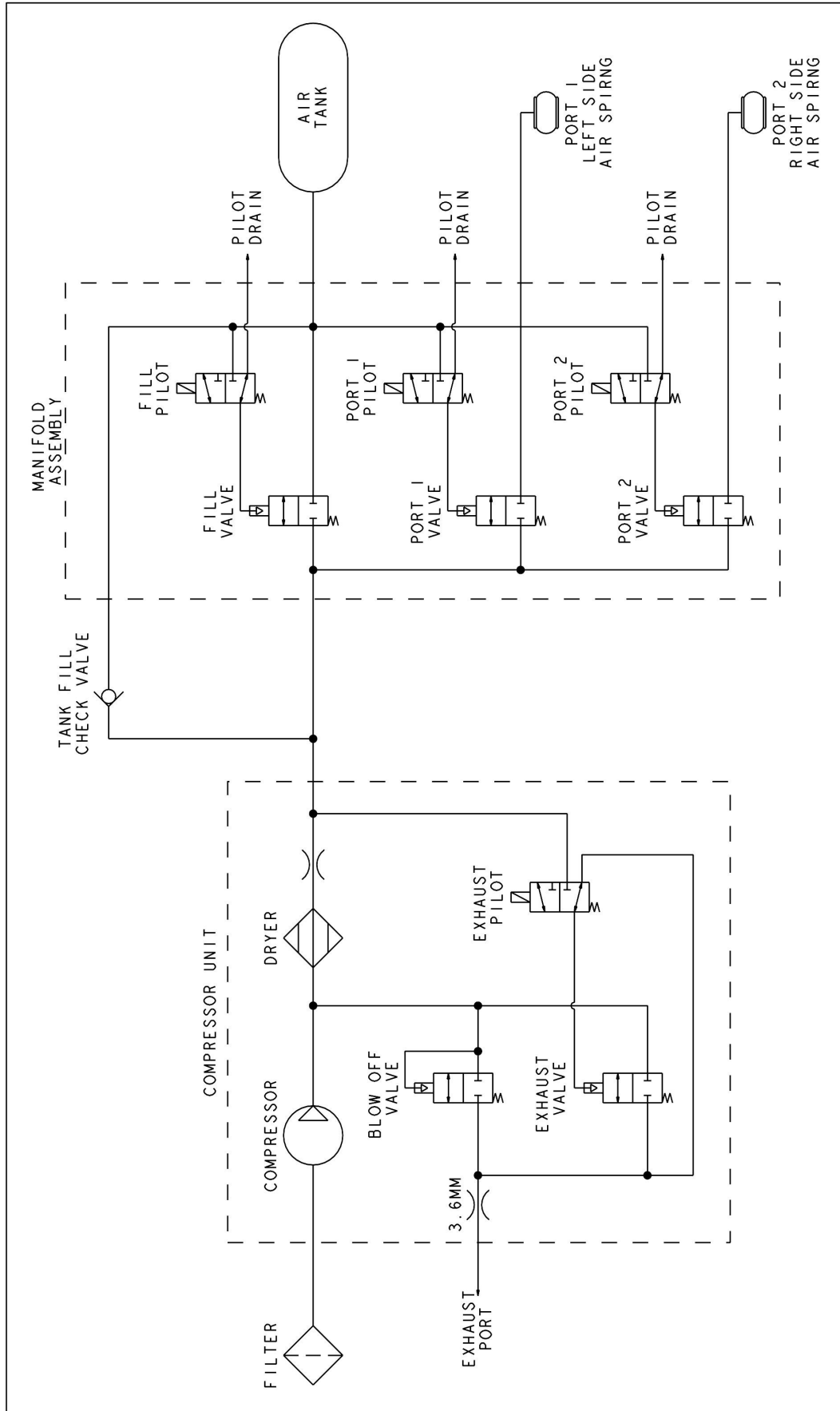
CHASSIS INTEGRATION WIRING HARNESS ELECTRICAL SCHEMATIC



INTERNAL WIRING HARNESS ELECTRICAL SCHEMATIC



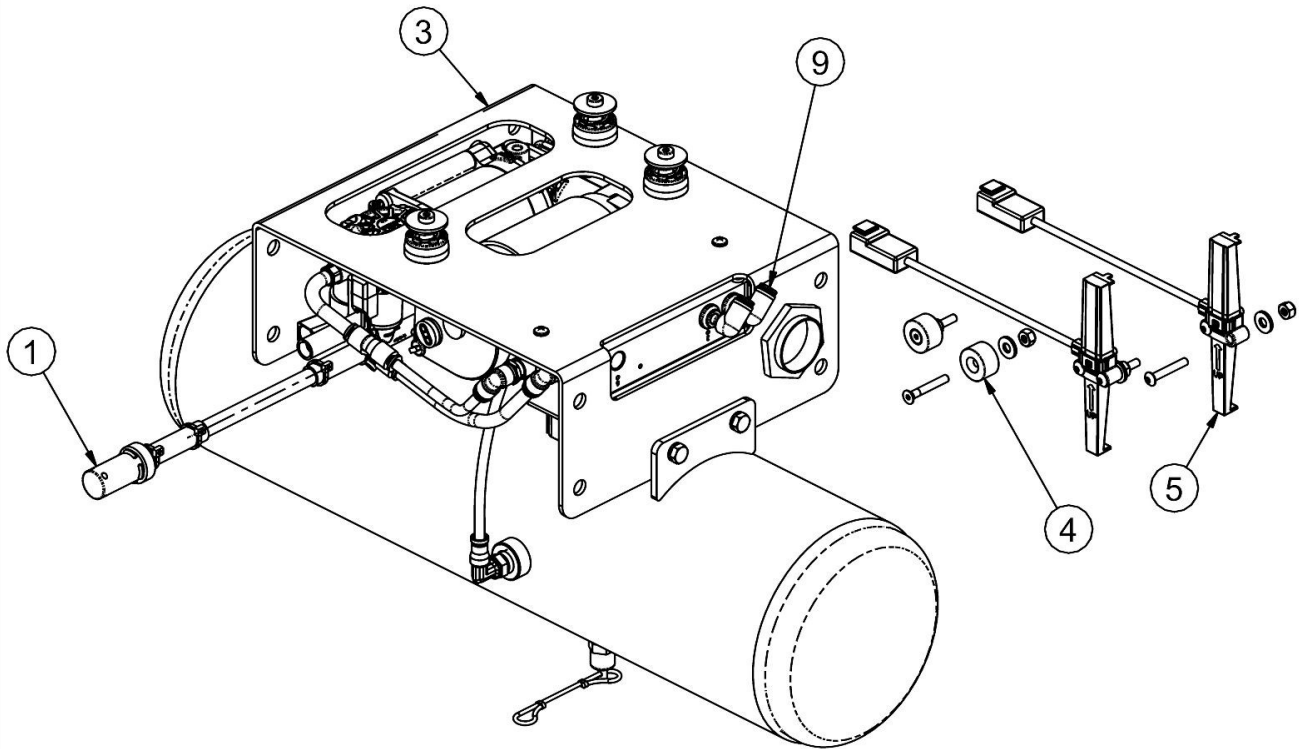
PNEUMATIC SCHEMATIC



ULTRARIDE[®] - 800M1300

ELECTRONIC AIR CONTROL KIT

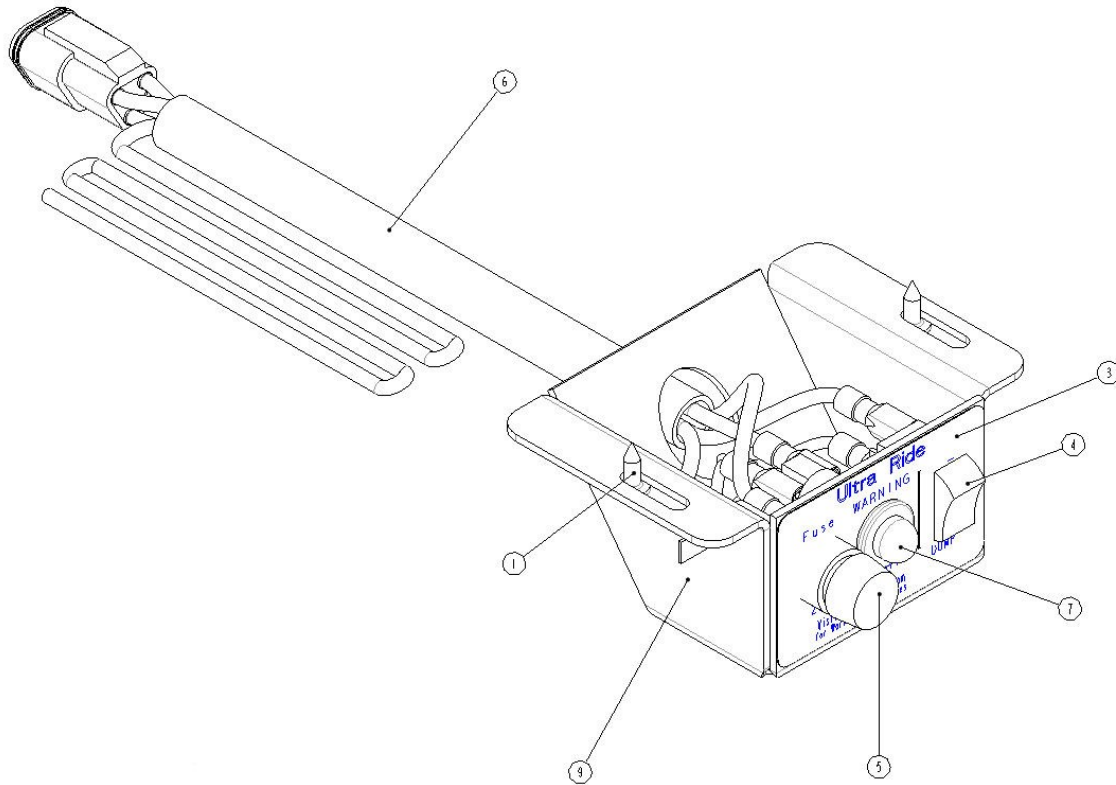
PARTS LIST



ITEM	PART NUMBER	DESCRIPTION	QTY
1	13010585	INTAKE AIR FILTER KIT	1
2	13010581	CHASSIS INTEGRATION HARNESS	1
3	13010582	AIR CONTROL UNIT AND HARNESS	1
4	13010583	MAGNET KIT	2
5	13010584	SENSOR KIT	2
6	13020090	AIRLINE-NYLON, 1/4" BULK (FEET)	30
7	13034000	AIRLINE-NYLON, 3/8" BULK (FEET)	15
8	15000435	CORRUGATED LOOM, 1/4" BULK (FEET)	30
9	13025499	ELBOW -PLUG-IN, 1/4"	2

ULTRARIDE® - 800M1074

OPTIONAL CONTROL PANEL PARTS LIST



ITEM	PART NUMBER	DESCRIPTION	QTY
1	1459-0C07	NO. 8 X .438 PHIL-PAN SHEET	2
2	1500-1255	BOX(4.25 X 2.5 X 8.00)	1
3	15001828	LABEL-AIR CONTROL, ULTRARIDE	1
4	1505-0207	SWITCH-ROCKER	1
5	1505-1883	FUSE HOLDER,PANEL STYLE	1
6	15050040	HARNESS-CONTROL, ULTRARIDE	1
7	15050053	LIGHT-LED, 12V	1
8	15051872	2 AMP FUSE	1
9	80002161	PANEL-MOUNT, SWITCH	1

APPENDIX A.

INSTALLING THE DIAGNOSTIC INTERFACE SOFTWARE

The interface tool is designed for the service technician to use while diagnosing **UltraRide**[®] Electronic Air Control suspension system related situations. The interface tool requires working knowledge of Microsoft Windows and the ability to install the software.

Items required:

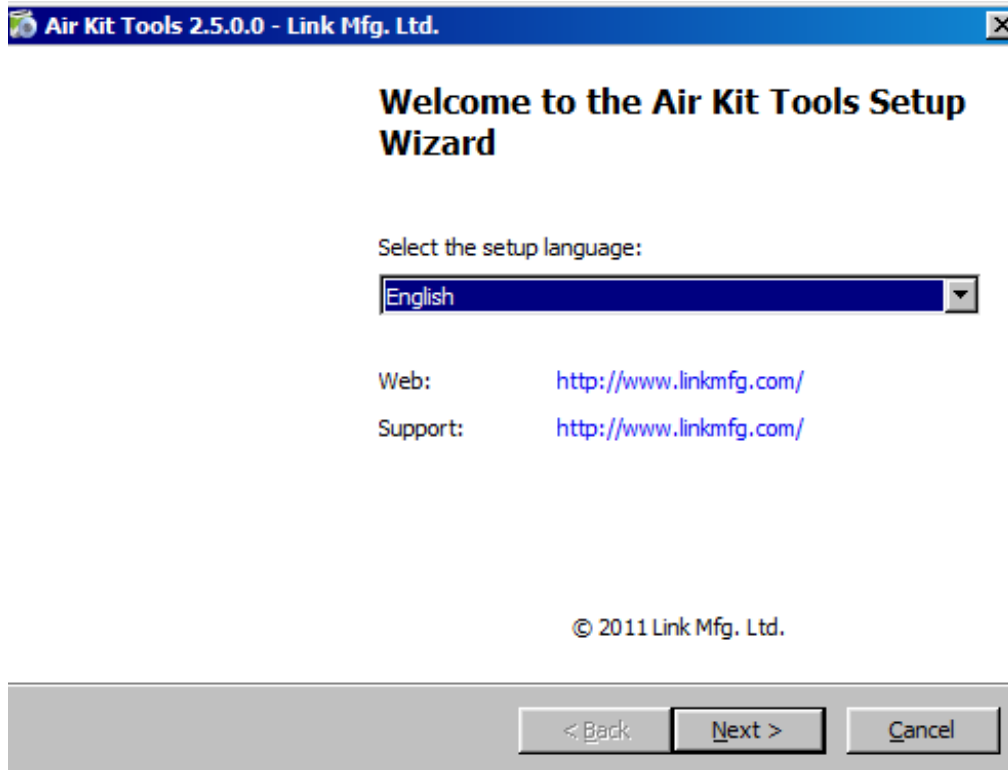
- PC or laptop running a Microsoft Windows Operating System that supports USB.
- USB cable A-B M/M
- Downloaded copy of the Link Mfg. Air Kit Tools software

<http://www.linkmfg.com/LinkAirTools.exe>

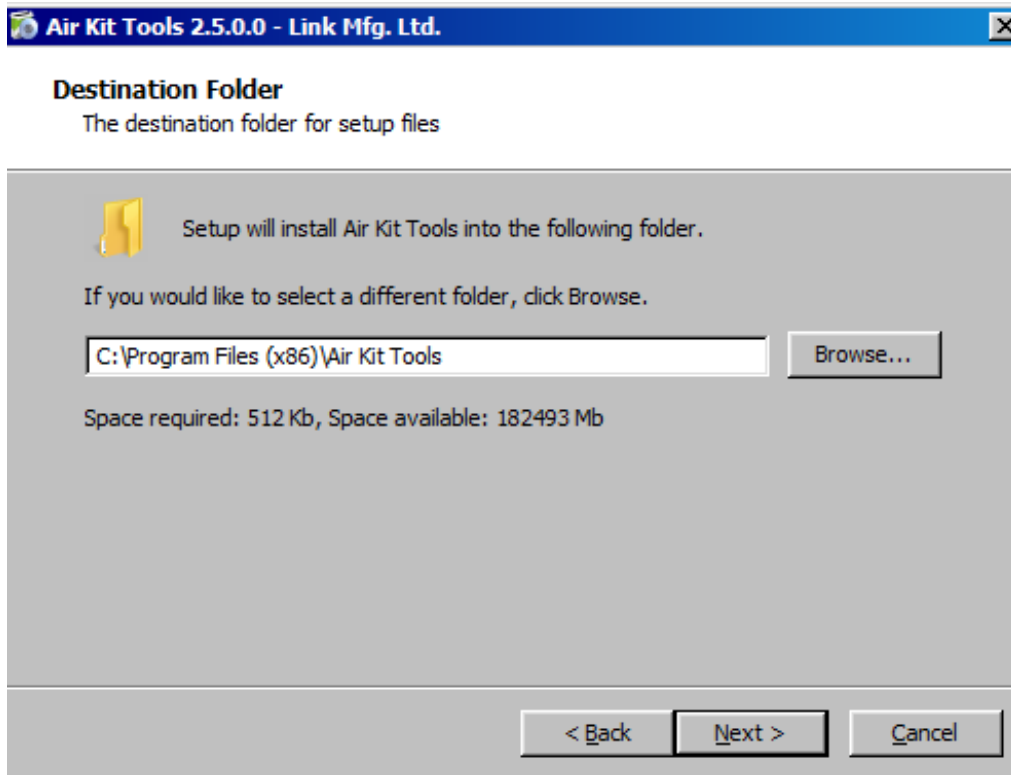
- **UltraRide**[®] Air Kit Interface Module (Link Mfg. part number 13010578)
- Double click on the “LinkAirTools.exe” file to install the device drivers and application software.



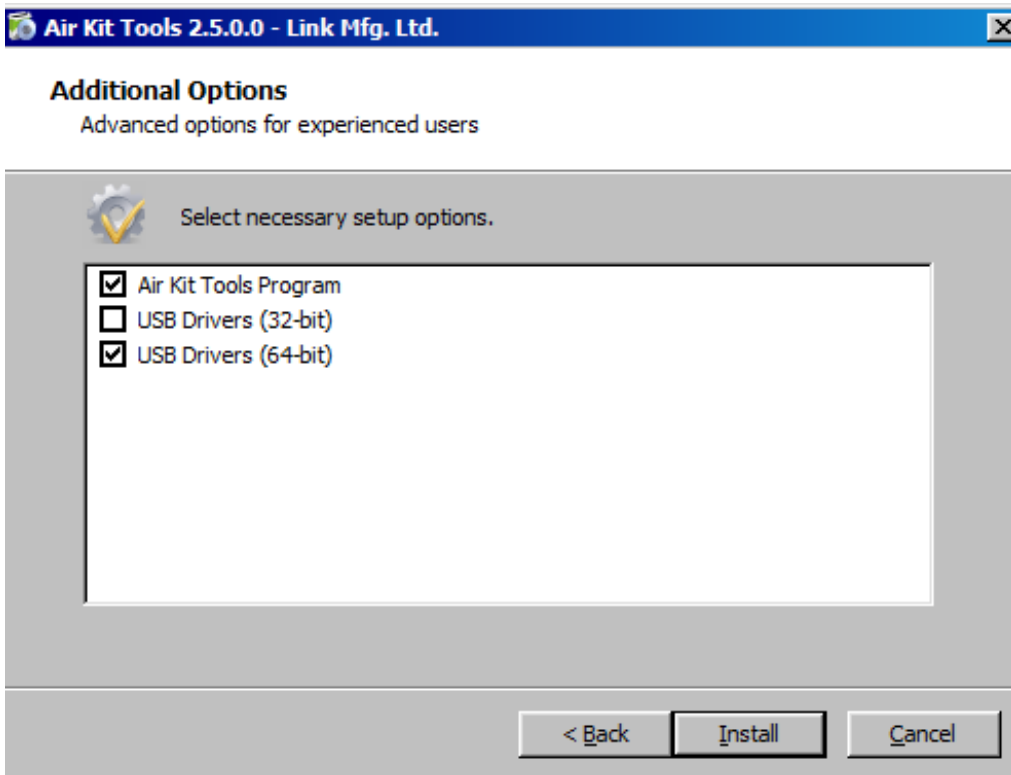
- Select the choice of language and click the “Next” button.



- Select the path to where files are to be installed and select “Next”.



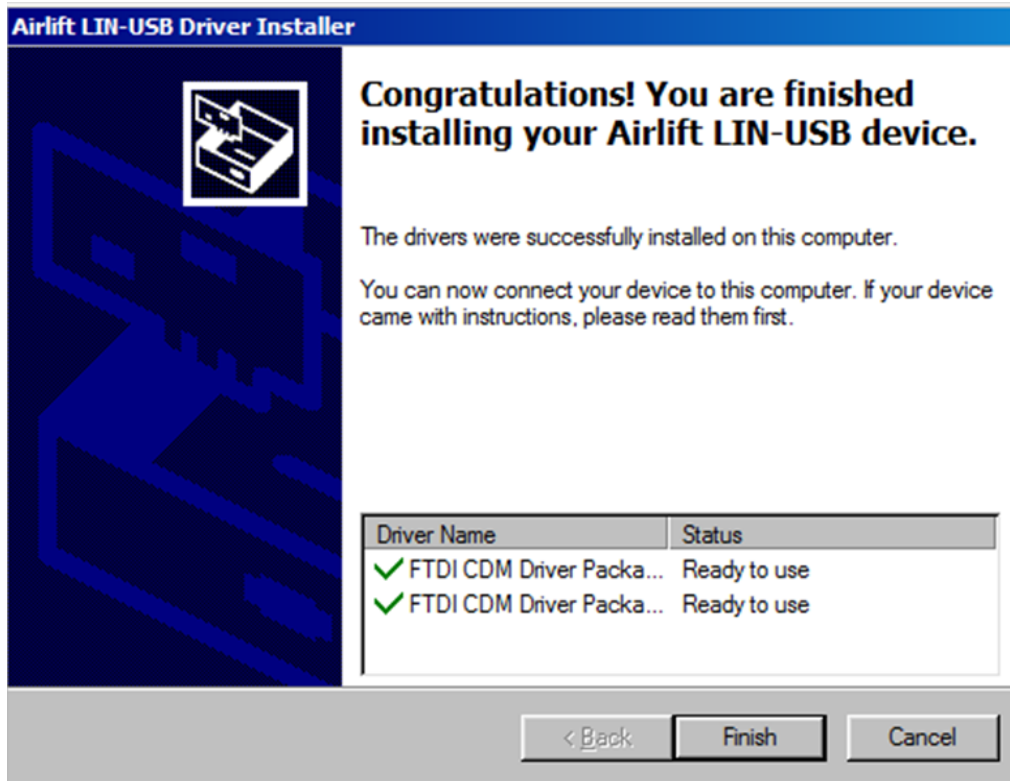
- Be sure that the check boxes are checked for the "Air Kit Tools Program" and the correct "USB Drivers" then select "Install".



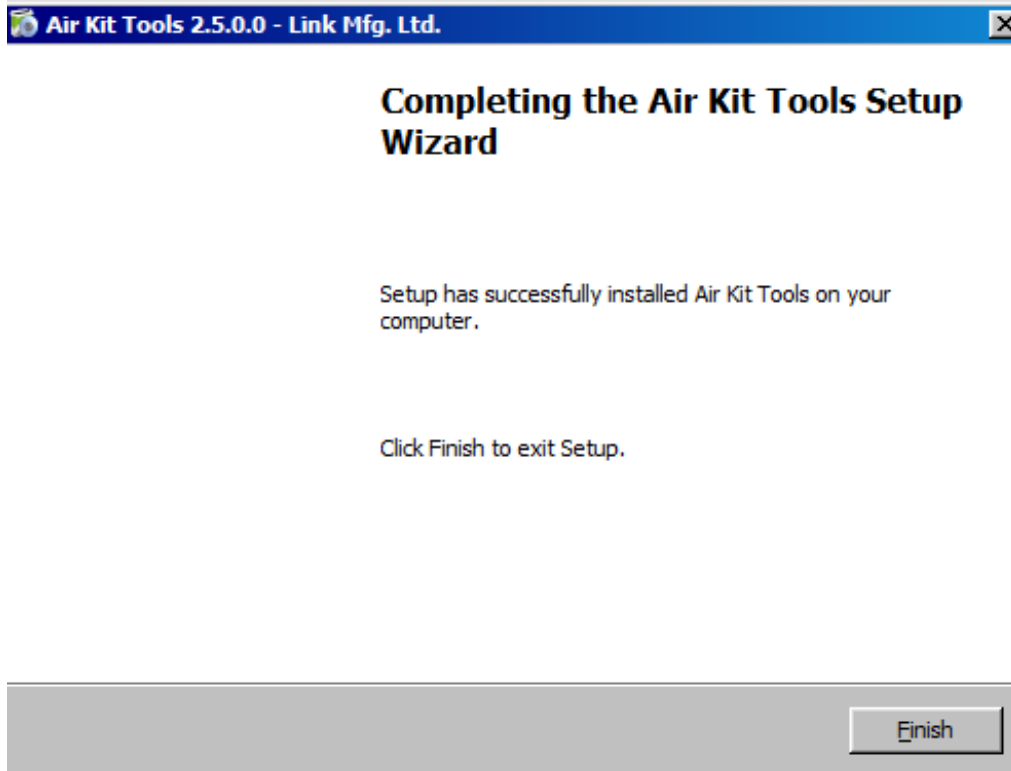
- Click "Next".



- Click "Finish".



- Click "Finish"



APPENDIX B

WIRING DETAIL FOR F-SERIES FORD VEHICLES

Harness Routing:

One option in routing the harness is to run the harness under the floor pan of the passenger's side, and through the grommet in the passenger side floor, if available. The harness can then run under the floor covering and behind the dash. See Figure A-1.

Key Hot Wire Selection:

For '99 and newer **Ford** vehicles, the PTO 12-volt power source wire provides an adequate "key hot" wire for the **UltraRide®** Air Kit. This wire does not have any terminals attached to it, and is part of the OE supplied Power Take-Off Circuits. To verify the correct wire, use a test light or multimeter. The selected wire should only be "hot" when the ignition switch is on.



FIG. A-1

For **pre-2002** model year vehicles, the wire is Circuit Number **295** and has a wire color of **light blue and pink**.

For **2002—2007** model year vehicles, the wire is Circuit Number **294** and has a wire color of **white and light blue**. This wire can be found blunt-cut & taped, on the harness behind the Diagnostic Link Connector (below and to the RIGHT of the steering wheel). See Figures A-2 and A-3.

For **2008 and newer** model year vehicles, the wire is Circuit Number **CBP44** and has a wire color of **purple**. This wire can be found blunt-cut & taped, on the harness behind the Diagnostic Link Connector (below and to the LEFT of the steering wheel).

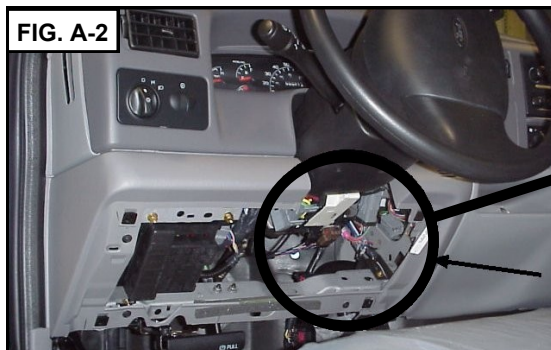


FIG. A-2

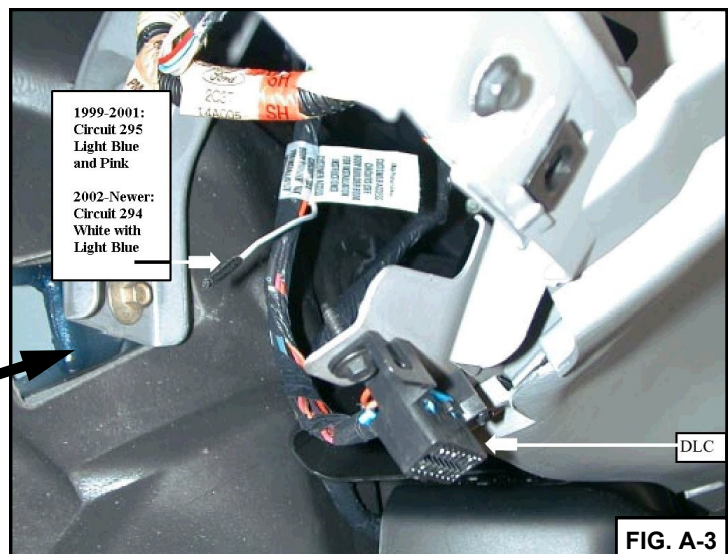


FIG. A-3

APPENDIX C

DIAGNOSING AND FINDING AIR SYSTEM LEAKS

Leaks in the Air Spring Paths:

An air spring circuit leak can be determined by a leaning vehicle. The easiest way to determine if it is leaking or not is to inspect it after sitting over night on level ground. If the vehicle is consistently leaning it needs to be inspected for a leak. Use a mixture of water and dish soap in a spray bottle to find the leak. Link Mfg. recommends 4 cups of water to 1/8 cup of dish soap.

1. Start by spraying the fitting at the air kit. If the line is cut improperly or is not pressed in all the way the fitting can leak in two places. It can be where the air line enters the fitting around the plastic ring or where the brass ring of the fitting meets the aluminum manifold. If either one of the two or both are showing bubble formation, remove and inspect the line for scratches or poor cuts. If the line is cut poorly or is scratched re-cut the line in a clean spot and re-install. If the same leak is present please call Link Mfg. Customer Service.
2. Check the entire length of airline for rubs or pinches or kinks. The soap solution can be used to check the line for leaks.
3. Check the fitting on the air spring. If bubbles are found please remove and follow procedure 1 above.
4. Check the air spring for rubs or holes, use the soapy solution to determine if a leak is present. Call Link Mfg. Customer Service for any questions.
5. If no leak is found Call Link Customer Service.

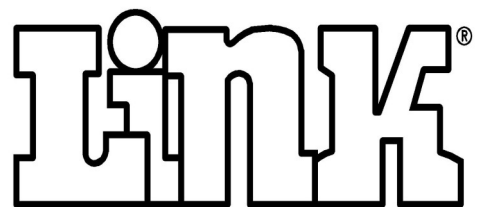
Leaks in the Air Tank Paths:

A tank leak can be determined by a few different things. A major leak will cause the system to not operate upon vehicle start up. The system must have a minimum pressure to function. Another way help determine if you have a leak is if the compressor comes on every time the key is cycled to the on position after a short period of time. The best way to determine a leak is to connect the Link Mfg. PC Diagnostics to the air kit. Open up the virtual display and watch the tank pressure while the vehicle is sitting on level ground. **Note: A tank leak will not affect air spring pressures. The vehicle should not sag or lean over night even with a major tank leak.**

1. To find the leak use the same soapy solution and spray the fittings on the tank and the air line going to the control manifold.
2. If bubbles are found please call Link Mfg. Customer Service.

Leaks in the Compressor Fill & Exhaust Paths:

A leak between the compressor and the valve manifold can best be detected when the compressor is running. A leak in this area will not cause the tank or air springs to loose pressure, but it will increase compressor run time and reduce system performance.



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