Modern Fuel Pump System with Integrated Sender Module GEN 4

PART # X211111085



Congratulations on purchasing a DeLorean Industries Modern Fuel Pump with an Integrated Sender Tank Module System (Gen 4). This stand-alone system is designed to replace the high-failure-rate rubber components inside the fuel tank up to the frame hardline connection points while also servicing critical components throughout the system. The system implements a state-of-the-art sender solution that is fully programmable. The premium Delphi pump supplied and related components in direct contact with fuel are compatible with blended fuels, also known as “ethanol.”

Read the instructions in their entirety before attempting this process. If anything is left to question, contact us directly via email. We do not offer phone tech support as we find that it is crucial to have a written reference for you to use.

The tank must be completely emptied at the start of the installation process. If the current pump no longer operates, all fuel must be removed regardless. Utilizing a siphon pump to discard the current contents in the tank is the correct method. Do not attempt to use shop vacuums or other components not rated for contact with flammable substances. In most cases, the motors are not sealed assemblies due to cost savings measures in manufacturing and will ignite fumes. The tank can hold on average 13.5 gallons of fuel. If the tank is heavily contaminated after draining the old fuel, you must completely clean the tank. Failure to do so will void the pump’s warranty. The best solvent available for cleaning hard deposits is acetone. Referring to the chemical manufacturer’s MSDS before using this for all applicable safety regulations.

Gasoline is dangerous. Always have a Class B fire extinguisher available when servicing fuel system components. Remove any flammables from around the work area. Do not smoke or use an open flame. If the workspace is heated, remember that gasoline fumes hug the floor. A well-ventilated work area is

not optional. Failure to adhere to the above will result in serious life-changing injuries and death.

PROCESS OVERVIEW

__Kit Component Contents
__Installation Preparation/Factory Component Removal
__ Fuel Hardline Flushing
__ Binnacle Removal
__Wiring Component Integrity Inspection
__ Wiring Integration at Gauge Cluster
__ Wiring Integration at Pump Frame Harness
__ Fuel Sender System Test Procedure
__ Pump and Line Assembly Integration

KIT COMPONENT CONTENTS

The Gen 4 System now includes components previously optional as standard. This includes weather pack crimping pliers and a fuel filter kit.

Core Components:

__ X1 211111089 1.4 Modern Fuel Pump Assembly with Internal Tank Level Sender

__ X1 211106685 1.5 Modern Pump Sealing Ring

__ X1 Feed/Return Lines with Quick Disconnect Fittings and Clamps

__ X1 Brass One-Way Check Valve

__ X1 211SP10388 52. Modern Pump Assembly V-Band Clamp Stainless

__ X1 211105161 53. Sender Block Off Cap Modern Pump Configuration

__ X1 53.1 Sender Block Off Cap O Ring

__ X1 211100523 27.1 Fuel Filter

__ X2 210106977 25. Fuel Filter Outlet Sealing Washer

__ X1 210106685 31. Fuel Filter Mounting Pad

Electrical Components:

__ X1 211107002 1.7 Fuel Pump Module Sender Controller Gen 4

__ X1 T0020 Weather Pack Connector Crimp Tool

__ X1 2-Pin Weatherpack Termination Kit

__ X1 3-Pin Weatherpack Termination Kit

__X1 RPM Relay Test Jumper Wire W/ Fused Link

X1 Low Fuel Harness Flying Lead with LED Bulb

INSTALLATION PREPARATION/FACTORY COMPONENT REMOVAL

__Disconnect the battery (wrap the positive terminal to prevent contact)

__Remove the trunk contents, spare tire board cover, and the spare tire. Remove the tank access plate assembly. Due to condition or prior service, the rivet nuts in the Fiberglass Body may fail or require drilling for removal. A complete kit of stainless inserts and hardware is available from DeLorean Industries.

__Remove the factory pump assembly by loosening the large hose clamp. Pull the assembly up and outwards to cut the lower pick-up hose. In some cases, a spring may have been installed within the lower pick-up hose to prevent a collapse condition.

__ Disconnect the factory two-pin Lucas connector for the pump power and ground distribution. If the connector is brittle or in poor condition, cut the harness directly behind the frame harness side of the connector for removal.

__ Disconnect the factory three-pin Lucas connector for the divorced tank sending unit. If the connector is brittle or in poor condition, cut the harness directly behind the frame harness side of the connector for removal.

__Remove the 10 mm nut and washer securing the factory pick-up assembly to the molded stud point at the base of the tank. Remove the factory baffle/pickup. The lower plate must be removed and slid off of the pick-up handle for removal. This allows the baffle to be squeezed through the tank opening.

__Cut factory feed/return line flexible sections from barb connections on passenger side frame rail. NOTE: The factory lines are wrapped in an Asbestos-based protective weave over the internal plastic lines. Discard fuel pump assembly, feed/return lines, stock sending unit, and all tank pick-up components.

__Remove factory feed lines from barb fittings on stock hardlines. Note damaging fittings will result in fuel line sealing issues.

__Clean the inside of the tank completely. NOTE: Keep cell phone within reach. If you insert your arm past the elbow joint, a high risk of becoming stuck exists. During the intense cleaning of the fuel tank finding yourself planking over the right front fender without recourse is less than desirable. Vaseline on your cleaning arm around the elbow joint to facilitate removal works to prevent this condition. If any doubt on tank condition exists, take pictures with a phone inserted into the large tank opening and send to DeLorean Industries for review.

FUEL HARDLINE FLUSHING

__ Remove the Fuel Accumulator Feed Hose part # 210106999. The hose, if original, will require being cut from the barb ends. Using a razor blade, cut along the length of the hose to remove from the barb. Excessive pressure will result in damage to the fitting/line sealing concerns. Discard the hose section and replace it during assembly regardless of the condition. This is a generic high-pressure fuel line rated for 225 psi and available at any parts store.

__ Remove the Fuel Filter including the mounting bracket and hardline connection. The top connection if original, is a 12mm banjo bolt that feeds the fuel distributor. If original, or any original lines are present in the engine compartment, replacement is mandated for safety concerns. A complete kit is available prorated with the purchase of the product. If the pump system is purchased without, contact DeLorean Industries for prorated pricing available with pump purchases. The Gen 4 system includes an updated high micron filter, mounting pad for factory clamp, and updated ultra seal elbow. The updated elbow facilitates quick filter changes on future service procedure intervals without the sealing issues with the factory connection.

__ Flush both feed and return lines to the fuel accumulator assembly. It is critical to remove any debris present without contaminating the new tank system or components throughout the fuel flow cycle. Using clean filtered shop air, post chemical flush dry lines completely. Automotive Brake parts cleaner is an excellent option for this process. Only flush away from the tank towards the rear of the car, and install a length of hose into a bucket from the exit side of the fittings to prevent spraying cleaner and contamination.

NOTE: Any deviation from the order of operations listed below will result in damage to the pump assembly. The module is bench-tested and calibrated at an idle system voltage of 13.8 volts. Post installation, testing voltage at the pump connector is required to verify redundancy between test/calibration and installed system voltage. A deviation of +/- 1 volt will result in the gauge having an offset. For detailed instructions on performing a voltage test contact us directly. If the pump voltage is less than 12.1 volts, the underlying concern requires correction before a high level of accuracy calibration. The pump will not provide the required system pressure for proper operation at all engine loads below 12 volts.

BINNACLE REMOVAL

The Gen 4 System comprehensively updates the instrument cluster harness and low fuel output function for optimal performance, avoiding reliance on the aged factory components prone to causing inconsistent gauge operation.

__ Remove the left and right driver-side knee pad assemblies for additional access. This is secured with 10mm nuts at four locations per pad. The column gator cover will also utilize this as a mounting point.
__ Remove the Instrument Housing Reinforcement Bracket Kit. If this is not present, the kit is available here:

https://deloreanindustries.com/online-store/electrical/3-6-6-instrument-cluster/instrument-housing-

reinforcement-brkt-kit-stainless/

__ Remove the four nuts and oversized washers securing the binnacle housing to the GRP body structural dash mounting points.

__ Raise the binnacle vertically to pull mounting studs through GRP body mount points. NOTE: the trip reset shaft is prone to breaking when a lateral load is applied to the reset shaft.

__ Disconnect the mechanical GM-style speedometer cable input drive.

__ Disconnect the center white electrical connector.

__Disconnect the driver-side offset black electrical connector.

__ Place the binnacle assembly face down on a clean towel propping the housing face to prevent the shaft reset from being damaged.

WIRING COMPONENT INTEGRITY INSPECTION

The Gen 4 system now takes the pump/sending units critically relied upon power and ground distribution management to the next level through a series of inspections and tests. This involves updating, checking, cleaning, and replacing all connection points within the pump/sending system that are known points of electrical degradation in the car. Failure to perform any of these inspections may result in operational issues with the Gen 4 System. This also acts as a definitive test guide for faults in the pump/sender system.

Inertia Switch Inspection

__ Located on the fiberglass firewall to the left of the driver-side footwell or mounted to the bracket securing the lambda counter. Check for melted wires at the connector assembly and damage to the harness. This component was also subject to a factory recall. In an accident or rollover condition, the internal magnetic mechanism acts as a switch to terminate power to the fuel pump circuit and cycle the door lock system. The component has a known documented outright failure rate. Many intermittent concerns range from starting/ stalling after a short run time to no-start conditions, etc. Poor mounting location often leads to this being inadvertently activated by kicking the unit. If the switch in the vehicle does not have a white paint stripe, the unit should be replaced by default.

Printed Circuit Board Inspection

__ With the binnacle removed and the rear of the instrument cluster exposed, inspect the printed circuit board. The most common failure is delamination of the printed circuit board around areas where it contours the cluster, nut securing contact points that have been over-tightened, and connector pin interface locations on the vertical (white) and horizontal (black) cluster connectors.

Frame Ground Junction (Front)

__ The front frame ground junction is located within the main frame harness assembly and secures to the drivers' side upper radiator mount bracket. Remove the M6 fastener and clean the junction point. If the eyelet is damaged or heavily corroded replacement is required.

Main Frame Harness

__ Accessible by removing the washer bottle assembly, the main frame harness includes a nine-pin junction connection. Age is a major factor along with poor connector pin condition. In almost all cases, this requires at a minimum removal and replacement of the connector and pins or outright harness replacement. Additionally, the harness has been through extensive heat cycling from the cooling system directly moving hot air across the chassis. If the harness exhibits any signs of insulation cracking or is brittle, replacement is required. For more information on this process contact us directly.

WIRING INTEGRATION AT GAUGE CLUSTER

The factory gauge cluster configuration relies on precise voltage and resistance values to calculate the required offset for accurate gauge representations at various operating conditions. With heavy system degradation due to age, poor storage conditions, and poor manufacturing practices, successfully implementing a precise modern sender configuration is difficult. A visual representation of this issue can be easily obtained by thinking of the recycling symbol adopted globally. Gary Anderson’s symbol accurately portrays the synergy required in virtually every cycling system. Now, replace a singular section of the flowing arrow in the system with the capacity to outperform the other sections. This section will never reach its full potential due to the lack of reliance on dependable counterparts operating to complete the cycle. This is the purpose behind a comprehensive inspection and update of the system.

__Viewing from the rear of the housing, remove the second bulb housing on the left side of the printed circuit board. This is the low fuel light circuit output indicator light. The housing rotates counterclockwise to remove.

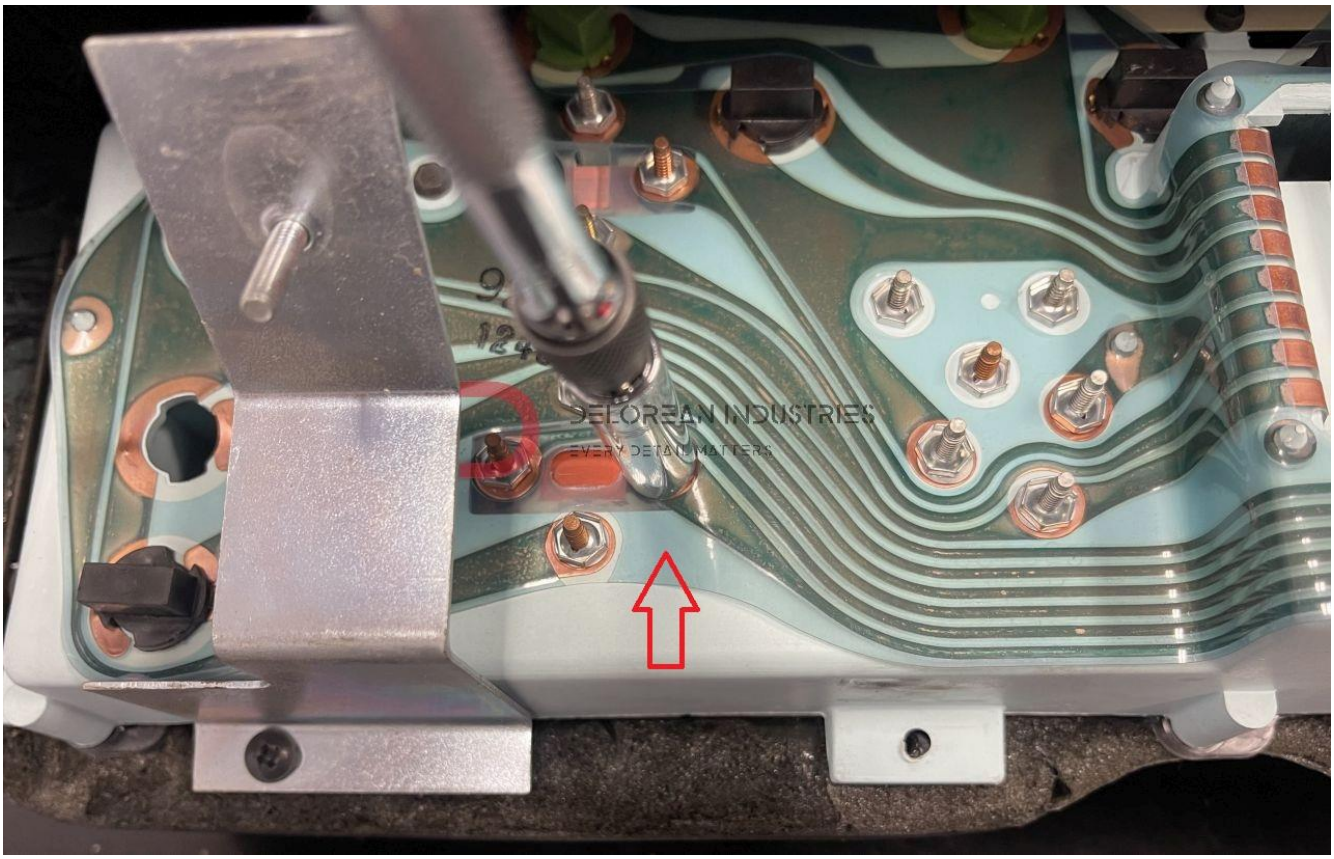


___The supplied flying lead with LED bulb socket directly integrates into the factory instrument cluster assembly.

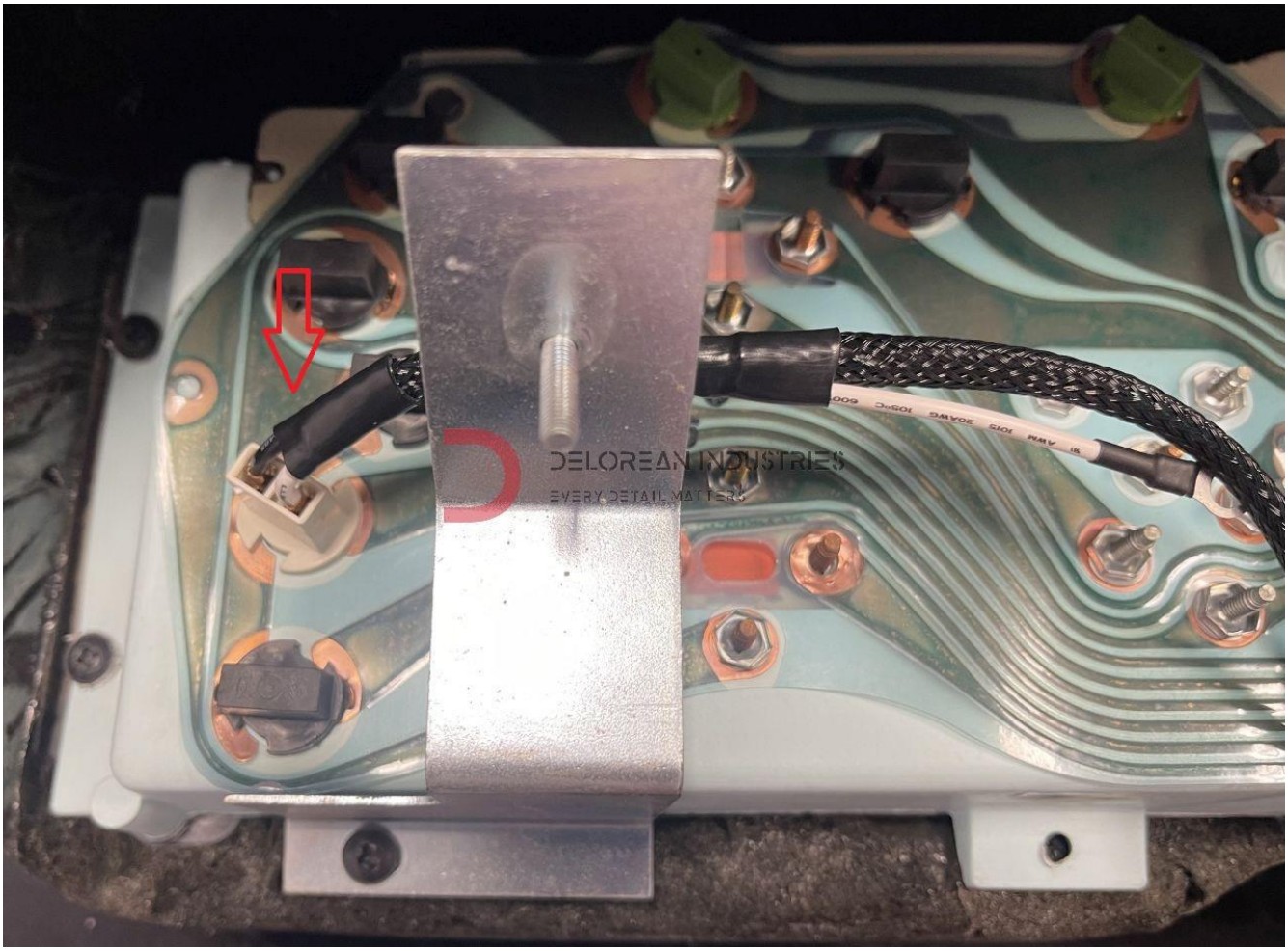


The flying lead is electrically tested for proper bulb orientation as required with an LED application. NOTE: It is possible to replace most of the instrument cluster light bulbs with the LED equivalent. The only circuit that is not compatible with this is the battery light. Changing this bulb will result in a no-charge condition from the alternator circuit.

__Remove the printed circuit board power lead nut on the fuel gauge mounting stud.

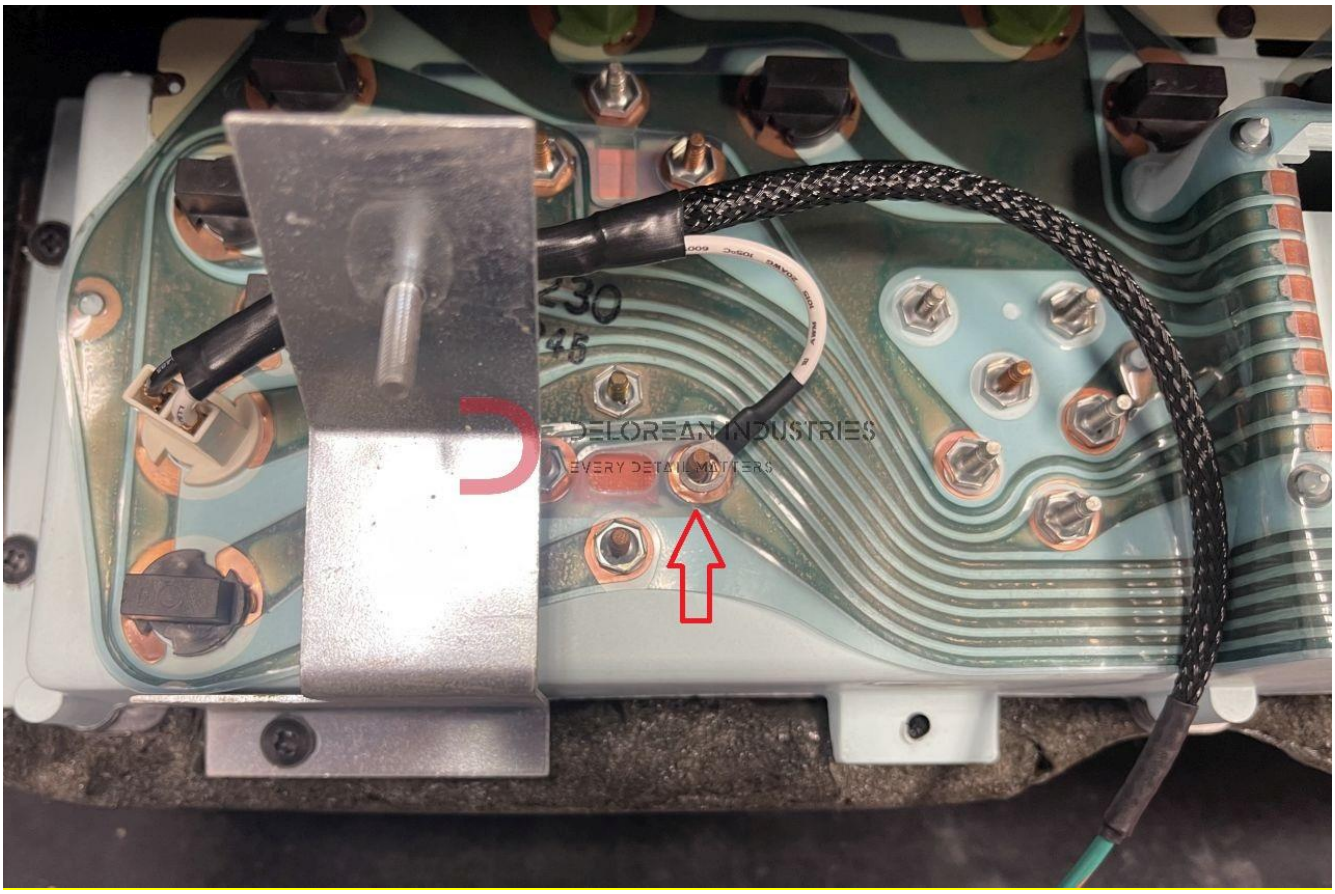


__ Install the updated harness flying lead with LED bulb socket. This seats with a clockwise motion into the housing.

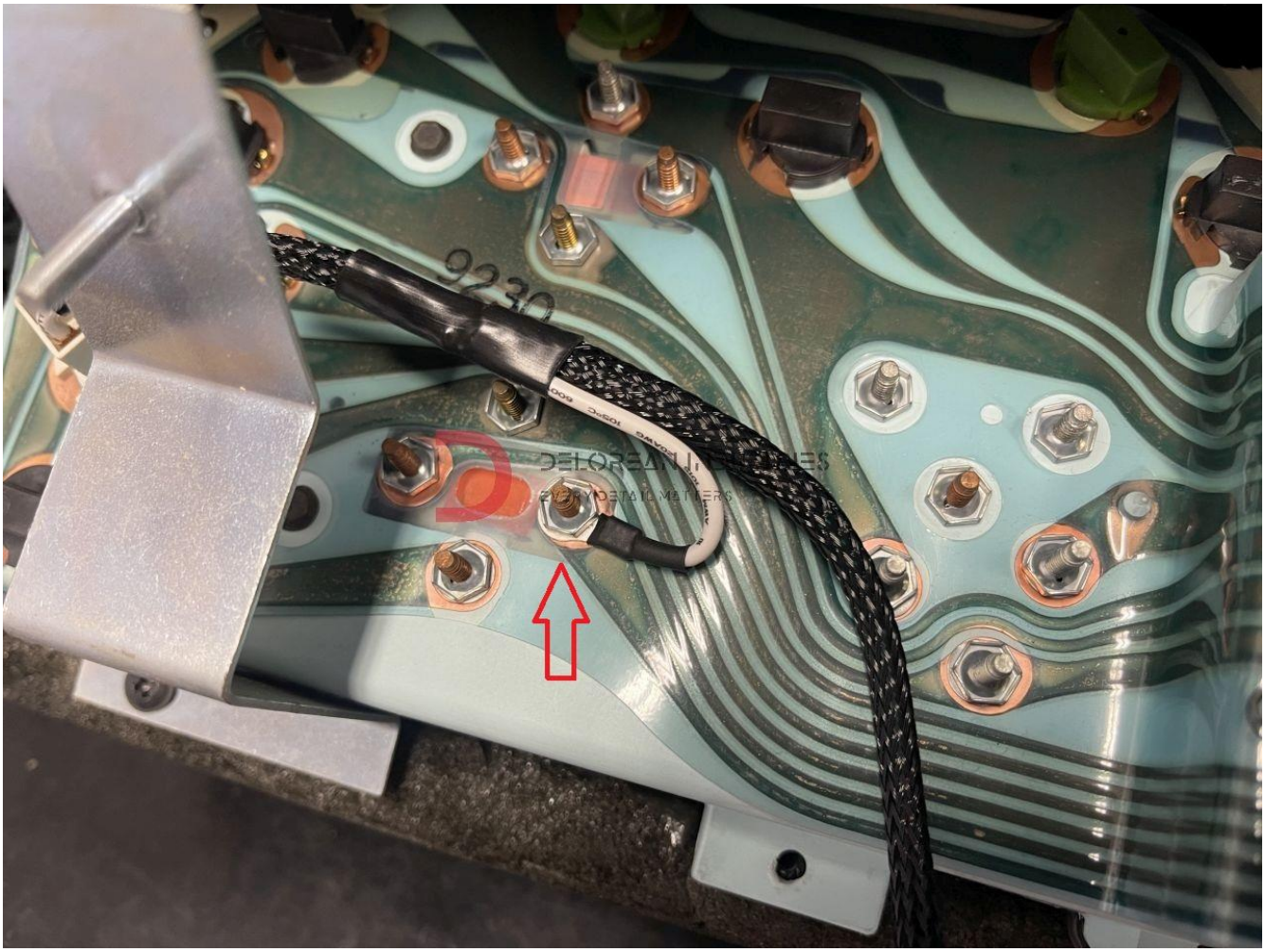


NOTE: When installed, the white terminal lead from the bulb socket should be at the 4 o'clock position. This is critical four the following harness routing.

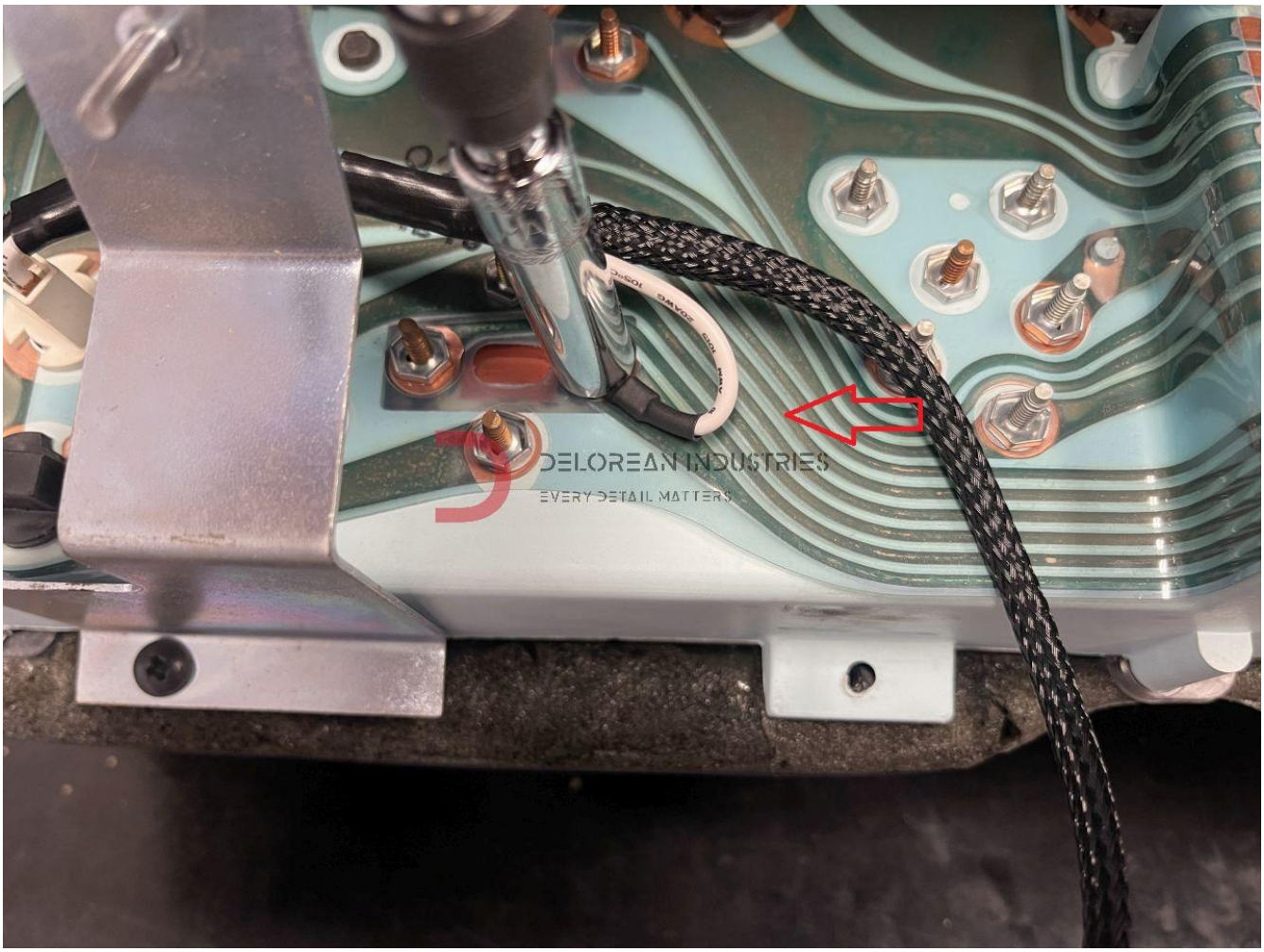
__ Install the ring terminal onto the gauge mount stud. This provides power to the LED low fuel function.



__ Install the printed circuit board power lead nut to secure the ring terminal. This should be installed finger tight allowing for orientation in further steps.



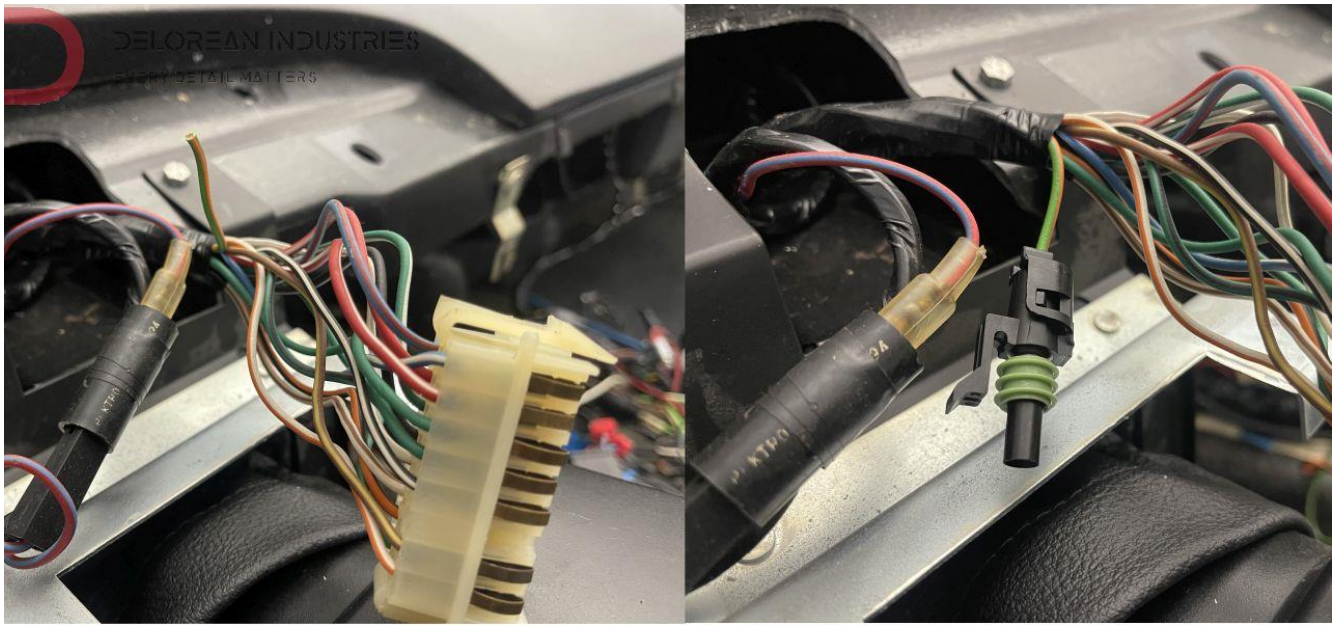
__ Tighten the printed circuit board power lead nut to secure the ring terminal. Note the orientation of the lead should follow the path of the underlying printed circuit board feature. This is critical for proper harness lead management when installing the binnacle.



__Final installation of binnacle update before installation in the vehicle.



__ Remove the green with orange tracer wire from the white instrument cluster connector. Cut the wire three inches back from the terminal end. Install the supplied One-Pin Weatherpack terminal and connector. This plugs into the harness flying lead to provide the low fuel gauge module output function. The harness routes along the white vertical connector wiring routing path.



WIRING INTEGRATION AT PUMP FRAME HARNESS

The supplied updated connector and wiring ends are intended to create a water-tight seal. Cutting the factory harness on the car side of the failure-prone two-pin Lucas connector is required. Leaving the unsealed Lucas connector in the system will result in performance issues. This is a high failure point for voltage issues to the pump assembly. Using the supplied water-tight crimp connectors make the following connections.

Two-pin Connector:

__Install the gray/red harness connector wire to the factory purple/white wire. (Pump power)
__Install the black wire to the factory purple and black wire. (Ground)

Three-pin Connector:

__Install the Black wire to the factory Black wire on the sender 3 wire harness.
__Install the Green/Black to the Green/Black wire on the sender harness.
__Install the Green/Orange wire for the low fuel light to the factory green/orange wire on the sender harness.

NOTE: If the factory harness is damaged, brittle, external insulation cracking or modified, replacement is required. (The same protocol as discussed in the initial harness inspection phase) DeLorean Industries produces a new harness to correct this issue. This is prorated with pump purchase, including if a system is purchased and the factory harness issue is found after the fact.
https://deloreanindustries.com/online-store/electrical/3-7-2-front-harness/7-harness-frame/

PUMP AND LINE ASSEMBLY INTEGRATION

__Before installing the pump assembly in the tank, make sure that the free-floating static wire located towards the driver's side internally on the tank is bent as far as possible towards the driver's side. This will prevent interference with the integrated unit pump sending wire and float. Install the pump assembly in the tank. The black supplied seal seats on the upper tank ring edge. This must be slid over the pump assembly first. The pump's lower housing features a purpose-built flat spot around the lower diameter. This is for clearance around the stud for the factory baffle assembly. Proper pump orientation is crucial for fitment.

__The pump assembly is supplied with the float wire detached to prevent damage during shipping. This is installed on the pump housing by inserting the metal wire into the center hole of the pump sender sensor. DO NOT apply pressure to the electrical contact area of the level sensor wiper arm during installation. Applying pressure to this will damage the electrical contacts for the sending unit. The float arm assembly must be fully seated to prevent coming loose in the tank. After installation, check that the float arm does not bind and freely travels to its maximum and minimum settings.

__Tighten the supplied clamp assembly while pushing down on the unit. When installed, the stainless clamp should capture the top of the pump assembly and contact below the bead ridge on the fuel tank.

__Blanking cap and O ring installation on the factory sending unit port is accomplished by screwing the 6 TPI cap and o ring onto the factory tank. In some instances on very early cars, this may not want to seat/tighten or seal properly. If this occurs, contact us directly for O ring options and proper installation. The sealing O-Ring is shipped and installed in the cap assembly.

__Install M14- AN fitting line adapters using 17mm tube nuts and factory hardline crush sleeves. Take care not to break the fuel hard lines from the plastic clips securing the lines to the top of the frame. This will result in NVH concerns in various driving conditions.

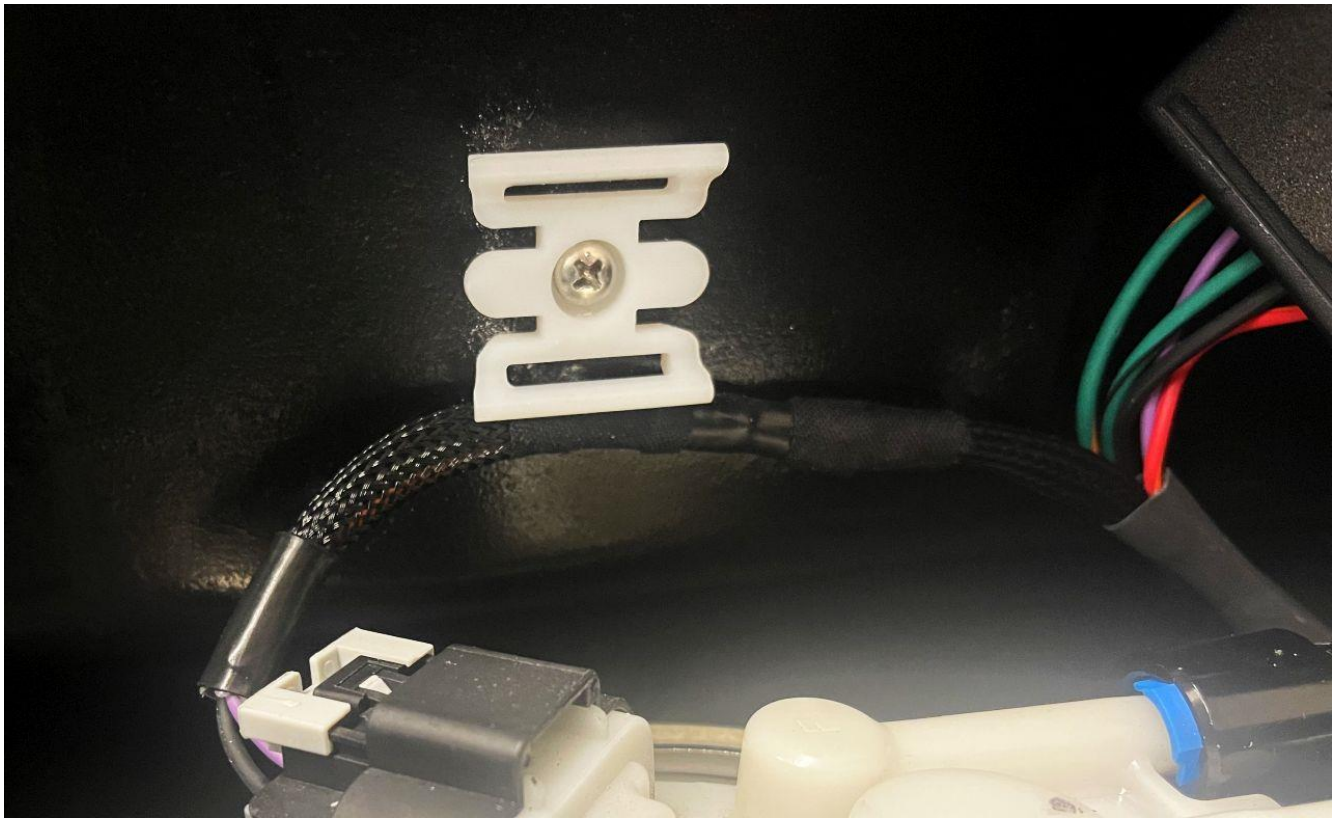
__ With the hardline adapter installation completed, install the AN-to-barb fitting adapters to allow proper installation of the high-pressure fuel lines. Note: the factory barb fittings are not designed for direct hose connection; the barbed fitting end must be replaced. Failure to replace the connection point with the supplied fitting will result in fuel leaks and unsafe conditions.

__ The lines are shipped assembled “loose”. All connections must be tightened. The return line is identified as being one piece without the check valve. The lines cannot be interchanged at the pump connection point as they feature different quick-disconnect line end sizes. The return side is to the front of the car, with the feed at the rear.

__Connect the AN line fitting to the installed adapters at the frame hard line connection point. The connection point closest to the inside of the car is the feed line. The connection closer to the outside is the return. Mixing these connections will produce a no-start condition

__Test system for leaks prior to running car. This is accomplished by jumping the RPM relay in the fuse compartment. With the supplied jumper, connect the brown wire to the purple and white wire. (same jumper procedure used for sending gauge test)

The fuel pump sending unit module mounts directly above the pump assembly. The rivnut mounting insert requires an installation tool and drill bit. With the bracket installed, use the supplied Velcro industrial strap to mount the module.



Completed Installation

__Once the above steps have been completed install tank closing cover. Note: due to the variations in the GRP fiberglass body and ballooned aged fuel cell plastics the tank sits at different heights. If your tank plate does not fit due to pump interference an extra step is required. Remove all 14 of the fuel tank closing plate bolts beneath the car. Push down on the tank assembly and install the closing plate. Then proceed to tighten up the 14 tank closing plate bolts. This method relaxes a ballooned tank allowing for the plate to be installed without putting excess tension on the rivet nuts securing the fiberglass closing plate.