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## Installation Instructions for Defender NAS 90 Fuel Tank



### **Model # RNK660A**

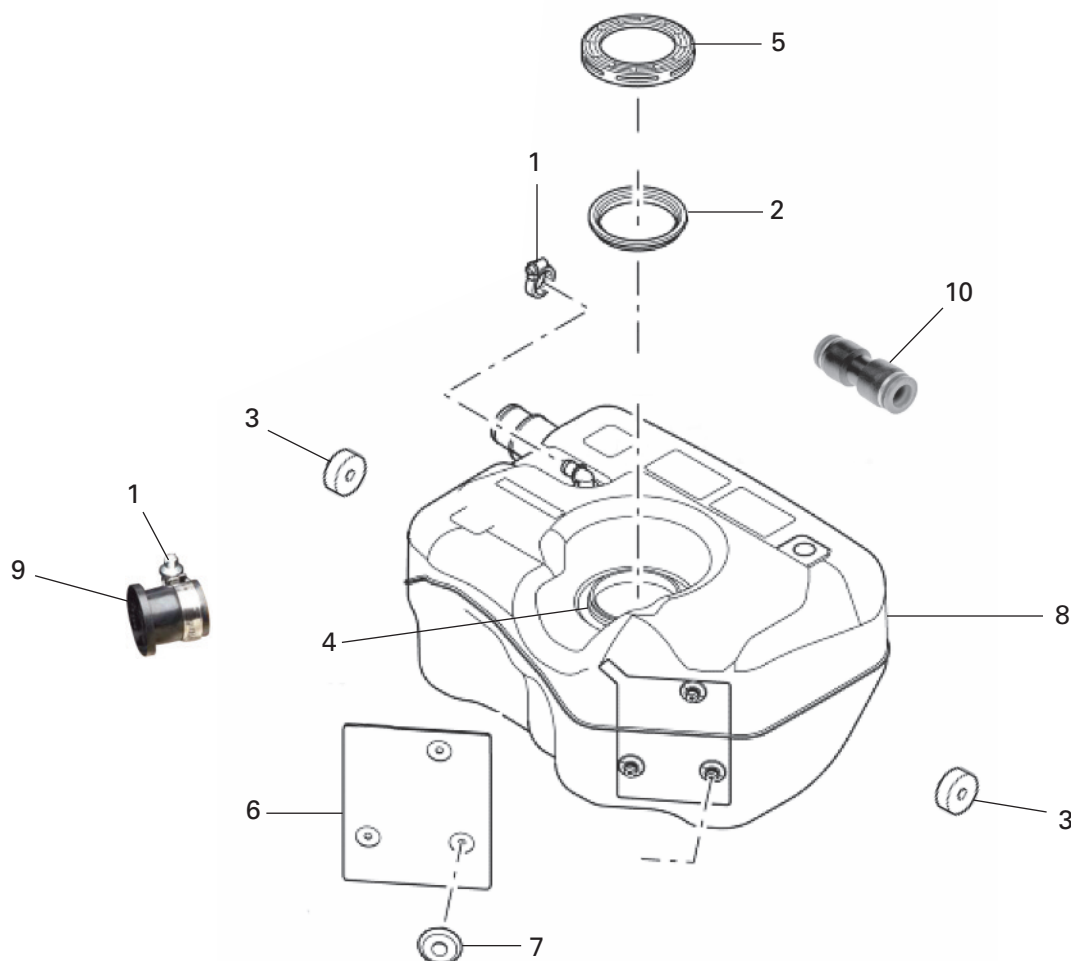
New updated NAS 90 plastic rear fuel tank kit includes: 60 liter fuel tank with integral roll over valves and piping, lock ring and seal for fuel pump, heat shield with installation hardware, 2 rubber side isolators and vent hose for filler tube.

FITS: Defender NAS 90 1994 - 1997



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### RNK660A Parts Listing



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| Nr. | QTY | Part    | Description                                 |
|-----|-----|---------|---|
| 1.  | 1   | RNS449  | Hose Clamp, 25mm                            |
| 2.  | 1   | RNF142  | Seal Fuel Pump-Tank Advanced Evaporative    |
| 3.  | 2   | RNQ802  | Pad-Insulation Fuel Tank Mount, Defender    |
| 4.  | 1   | RNN908  | Adapter Tank Unit, Defender                 |
| 5.  | 1   | RND038  | Locking Ring Fuel Sender, Defender          |
| 6.  | 1   | RNQ801  | Heat Shield Fuel Tank, Defender 90          |
| 7.  | 3   | RNN923  | Rivet Plastic Snap in Fuel Tank Heat Shield |
| 8.  | 1   | RNQ660  | Fuel Tank, NAS 90 w/Vent System             |
| 9.  | 1   | H3-66M  | Cap for Fuel Pump Breather                  |
| 10. | 1   | 800-192 | Press Fit Union                             |



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### FUEL HANDLING PRECAUTIONS

The following information provides basic precautions which must be observed if fuel is to be handled safely. It also outlines the other areas of risk which must not be ignored.

This information is issued for basic guidance only, and in any case of doubt, appropriate enquiries should be made of your local Fire Officer or Fire Department.

Fuel vapour is highly flammable and in confined spaces is also very explosive and toxic.

When fuel evaporates it produces 150 times its own volume in vapour, which when diluted with air becomes a readily ignitable mixture. The vapour is heavier than air and will always fall to the lowest level. It can readily be distributed throughout a workshop by air current, consequently, even a small spillage of fuel is very dangerous.

Always have a fire extinguisher containing **FOAM CO<sup>2</sup> GAS**, or **POWDER** close at hand when handling fuel, or when dismantling fuel systems and in areas where fuel containers are stored.



**WARNING: It is imperative that the battery is not disconnected during fuel system repairs as arcing at the battery terminal could ignite fuel vapour in the atmosphere. Always disconnect the vehicle battery BEFORE carrying out work on the fuel system.**

Whenever fuel is being handled, transferred or stored, or when fuel systems are being dismantled all forms of ignition must be extinguished or removed, any leadlamps used must be flame proof and kept clear of spillage.

No one should be permitted to repair components associated with fuel without first having had fuel system training.

### Hot fuel handling precautions



**WARNING: Before commencing any operation requiring fuel to be drained from the fuel tank, the following procedure must be adhered to:**

1. Allow sufficient time for the fuel to cool, thus avoiding contact with hot fuels.
2. Vent the system by removing the fuel filler cap in a well ventilated area. Refit the filler cap until the commencement of fuel drainage.

### Fuel transfer



**WARNING: Fuel must not be extracted or drained from any vehicle while it is standing over a pit.**

The transfer of fuel from the vehicle fuel tank must be carried out in a well ventilated area. An approved transfer tank must be used according to the transfer tank manufacturer's instructions and local regulations, including attention to grounding of tanks.

### Fuel tank removal

A **FUEL VAPOUR** warning label must be attached to the fuel tank upon removal from the vehicle.

### Fuel tank repair

Under no circumstances should a repair to any tank be attempted.





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#### JACKING

The following instructions must be carried out before raising the vehicle off the ground.

1. Use a solid level ground surface.
2. Apply parking brake.
3. Select 'P' (Park) in main gearbox.
4. Select Low range in transfer gearbox.



**CAUTION:** To avoid damage occurring to the under body components of the vehicle the following jacking procedures must be adhered to.

**DO NOT POSITION JACKS OR AXLE STANDS UNDER THE FOLLOWING COMPONENTS.**

Body structure  
Bumpers  
Fuel lines  
Brake lines  
Front radius arms  
Panhard rod  
Steering linkage  
Rear Trailing links  
Fuel tank  
Engine sump  
Gearbox bell housing

**Jack or support vehicle by axles only.**

#### Vehicle jack

The jack provided with the vehicle is only intended to be used in an emergency, for changing a tyre. Do **NOT** use the jack for any other purpose. Refer to Owner's Manual for vehicle jack location points and procedure. Never work under a vehicle supported by the vehicle jack.

#### Hydraulic jack

A hydraulic jack with a minimum 1500 kg, 3,300 lbs load capacity must be used, see J6083.



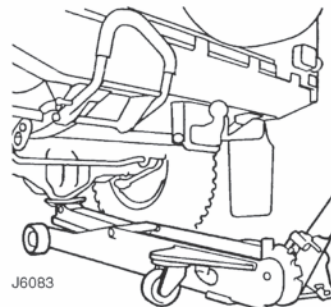
**CAUTION:** Do not commence work on the underside of the vehicle until suitable stands have been positioned under the axle.

#### Raise front of the vehicle

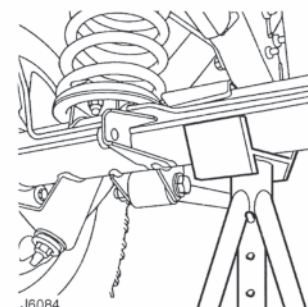
1. Position cup of hydraulic arm under differential casing.



**NOTE:** The differential casing is not central to the axle. Care should be taken when raising the front road wheels off the ground as the rear axle has less sway stiffness.



J6083



J6084

2. Raise front road wheels to enable an axle stand to be installed under left hand axle tube.
3. Position an axle stand under right hand axle tube, carefully lower jack until axle sits securely on both axle stands, remove trolley jack.
4. Before commencing work on underside of vehicle re-check security of vehicle on stands.
5. Reverse procedure when removing vehicle from stands.

#### Raise rear of vehicle

1. Position cup of hydraulic arm under differential casing.
2. Raise vehicle to enable axle stands to be installed under left and right hand axle tubes.
3. Lower jack until axle sits securely on axle stands, remove trolley jack.
4. Before commencing work on underside of vehicle re-check security of vehicle on stands.
5. Reverse procedure when removing vehicle from stands.



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#### FUEL TANK

Service repair no - 19.55.26



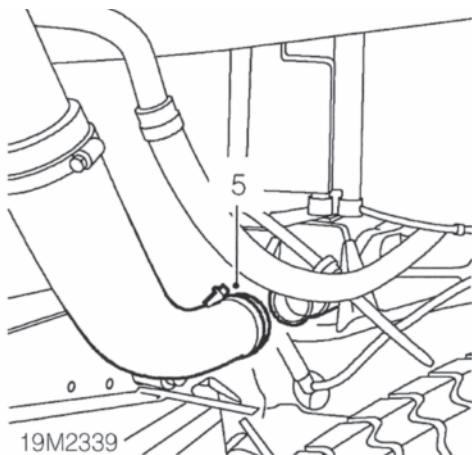
**WARNING:** Ensure that fuel handling precautions given in Section 01 - Introduction are strictly adhered to when carrying out following instructions.



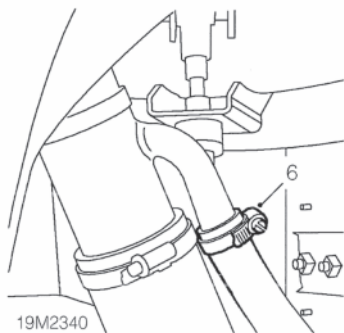
**CAUTION:** Before disconnecting any part of the fuel system, it is imperative that all dust, dirt and debris is removed from around components to prevent ingress of foreign matter into fuel system.

##### Remove

1. Position vehicle on ramp [hoist].
2. Disconnect battery negative lead.
3. Depressurise fuel system.
4. Drain fuel tank.



5. Loosen clip securing filler hose to fuel tank and disconnect hose.



6. Loosen clip securing breather hose to filler neck and disconnect hose.

#### FUEL SYSTEM DEPRESSURISE

Service repair no - 19.50.02



**WARNING:** Fuel pressure of up to 2.5 bar will be present in the system, even if the engine has not been run for some time.

Always depressurise the system before disconnecting any components in the fuel feed line (between fuel pump and pressure regulator). The spilling of fuel is unavoidable during this operation. Ensure that all precautions are taken to prevent fire and explosion.



**NOTE:** Fuel pressure can be relieved at fuel rail feed union or fuel filter unions.

1. Position cloth around relevant union to protect against fuel spray.
2. Carefully loosen union.
3. Tighten union to correct torque once pressure is relieved.

#### FUEL TANK DRAIN

Service repair no - 19.55.02



**WARNING:** Ensure that Fuel Handling Precautions given in Section 01 - Introduction are strictly adhered to when carrying out following instructions.



**CAUTION:** Before disconnecting any part of the fuel system, it is imperative that all dust, dirt and debris is removed from around components to prevent ingress of foreign matter into fuel system.

1. Disconnect battery negative lead.
2. Remove fuel filler cap.
3. Using a fuel bowser with an 18 mm, 0.75 in outside diameter hose, pass hose into tank through filler neck.



**NOTE:** Because the fuel tank filler stub houses a restrictor, repeated attempts may be necessary to enter the hose into the fuel tank. Follow the fuel bowser manufacturers instructions for safe use of bowser.

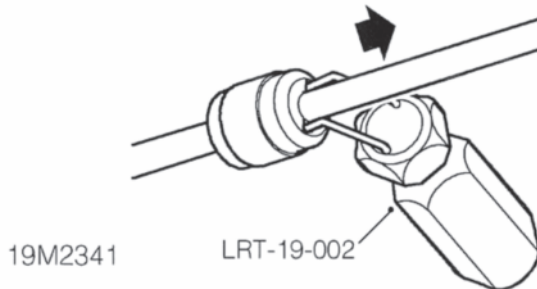
4. Siphon fuel from fuel tank.
5. Fit filler cap.



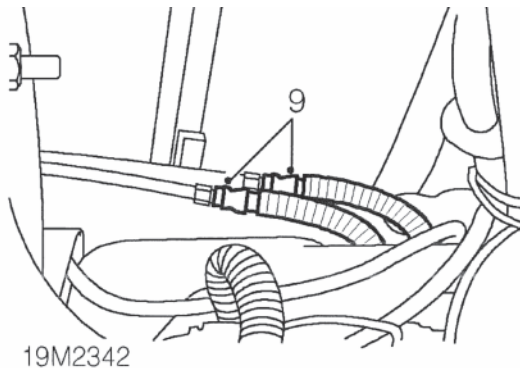
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## FUEL TANK

Service repair no - 19.55.26



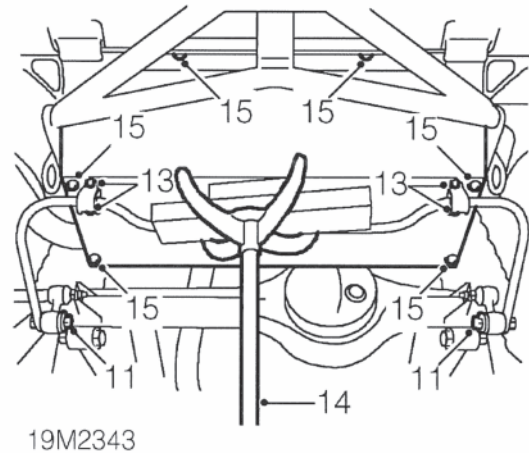
7. Using tool **LRT-19-002** disconnect vapour separator pipe at green end of 'speedfit' connector.
8. Position cloth to absorb fuel spillage.



9. Disconnect fuel feed hose union.
10. Disconnect fuel return hose union.



**CAUTION: Plug the connections.**

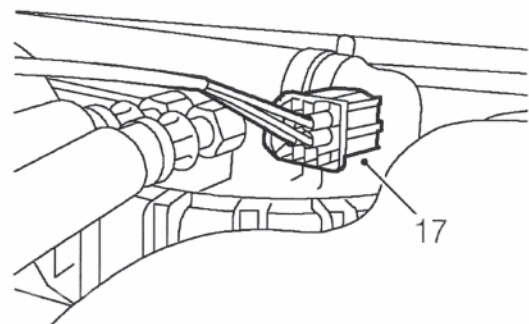


11. Loosen 2 anti-roll [sway] bar link bolts.
12. Mark location of anti-roll [sway] bar straps.
13. Remove 4 bolts securing anti-roll [sway] bar straps and swing bar down clear of fuel tank.
14. Position transmission jack under fuel tank cradle to support fuel tank.



**CAUTION: Use a block of wood or hard rubber pad to protect fuel tank.**

15. Remove 6 bolts securing fuel tank cradle.
16. Lower fuel tank sufficiently to gain access to fuel pump multiplug.



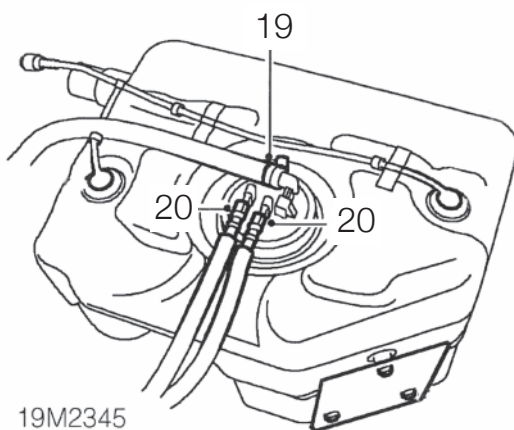
17. Disconnect multiplug and remove clip securing harness to fuel hoses.
18. With assistance, lower jack, remove fuel tank cradle and fuel tank.

***Do not carry out further dismantling if component is removed for access only.***

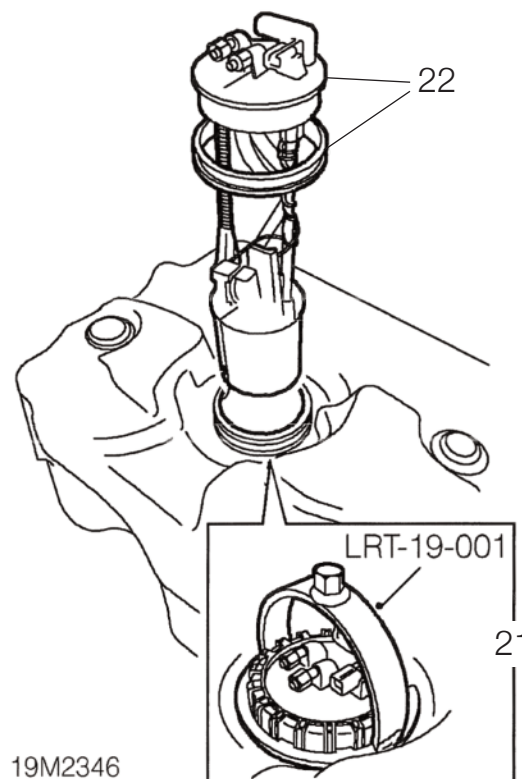




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19. Loosen clip and remove breather hose from fuel pump.
20. Remove fuel feed and return hoses from fuel pump.



21. Using tool **LRT-19-001** remove locking ring securing pump. Withdraw fuel pump from tank.



**WARNING:** A quantity of fuel will be retained in body of pump. Care must be taken to prevent fuel spillage during above operation.

22. Remove and discard sealing ring.



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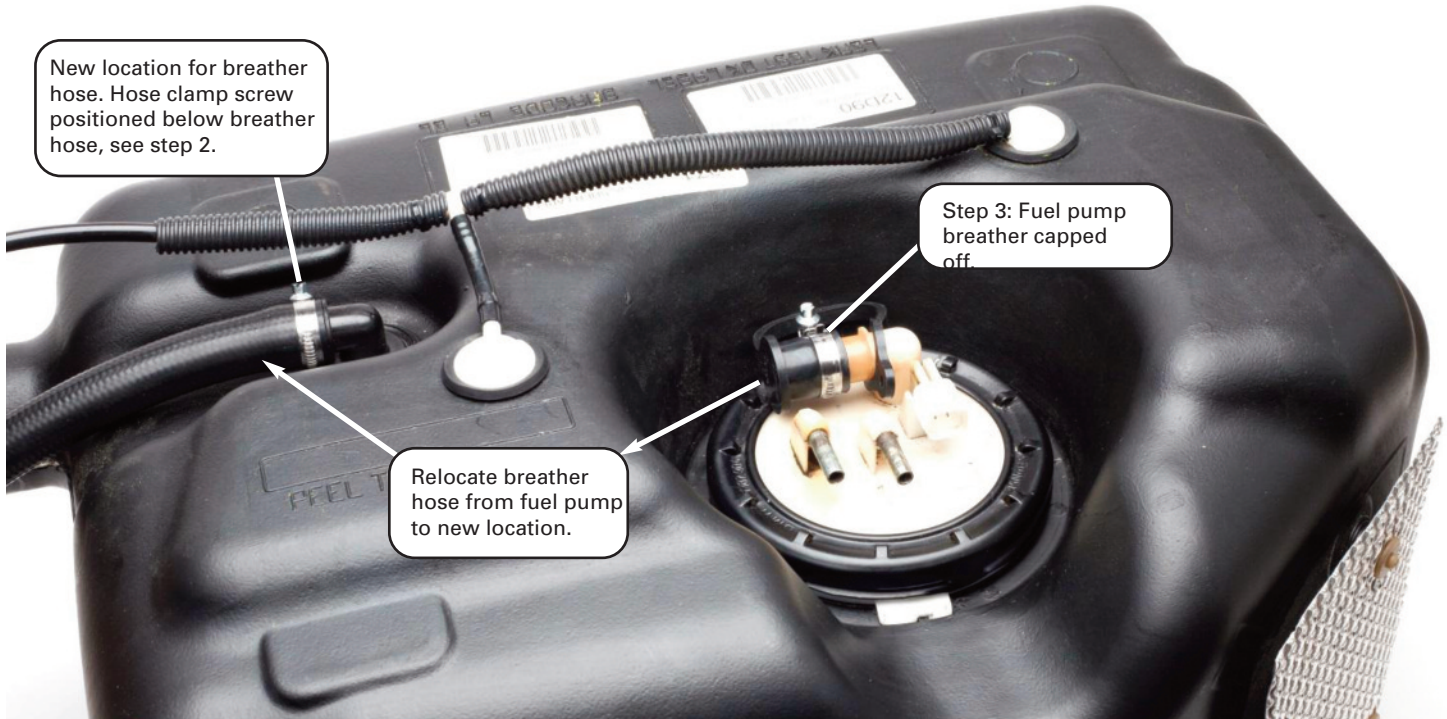


Figure 1

## RNK660A - FUEL TANK INSTALLATION

### Prepare new fuel tank for installation and reassembly

**1.** Once tank is removed, withdraw the fuel pump from the old tank and install the fuel pump in to the new tank using supplied Locking Ring, part number RND038, and seal, part number RNF142. Using Land Rover tool #310-118 torque the new locking ring to 35 Nm (26 ft-lb).

**2.** Relocate the breather hose from the fuel pump barb to the barb on the top of the fuel tank using supplied hose clamp, part number RNS449, Figure 1.

Note: Keep the hose clamp screw below the top of the breather hose. This will help avoid contact with the bottom of the body, Figure 1.

**3.** Using the supplied rubber cap, part number H3-66M, and hose clamp, part number RNS449, cap off the breather on top of the fuel pump, Figure 1A.

**Caution:** Make sure fuel lines, wires and vent pipes do not get pinched between the tank and any other part of the vehicle upon installation.

**Important:** Included in this kit are new insulation pads with an adhesive backing, part number RNQ802. Stick one pad on each side of the tank between the tank and chassis to keep the tank from moving side-to-side. DO NOT AFFIX TO THE BOTTOM OF TANK, see Figure 2.

**4.** Fit fuel feed and return hoses to pump.

**5.** Fit heat shield using supplied plastic rivet part number RNN923.

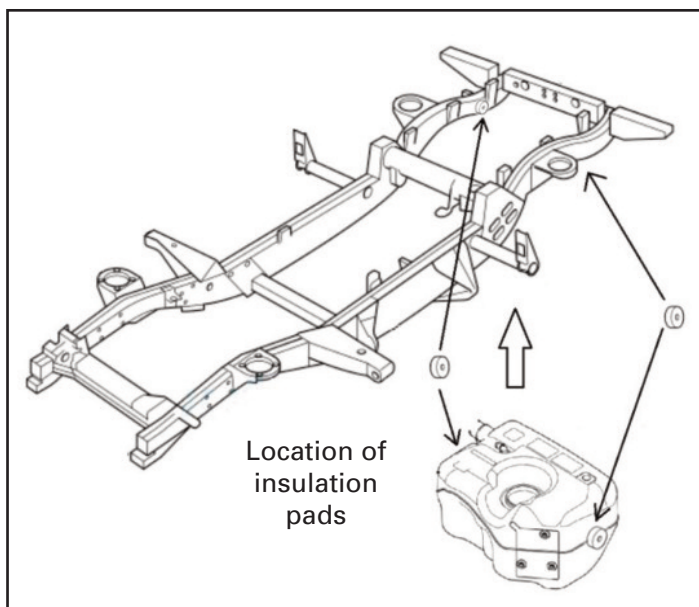


Figure 1A

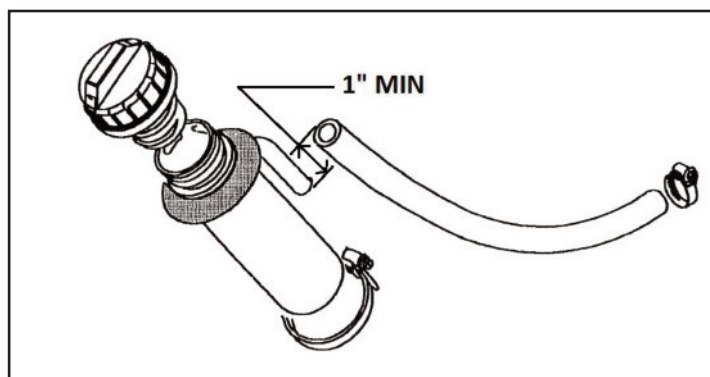




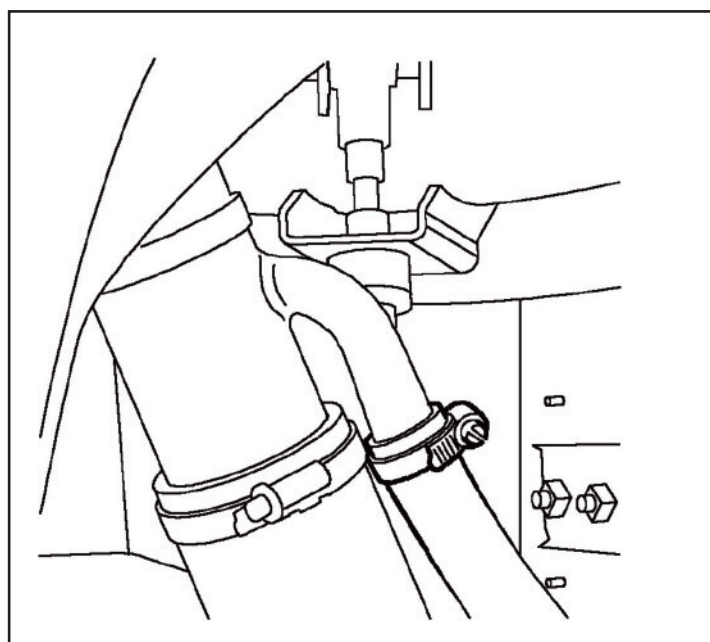
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**Figure 2**



**Figure 3**



**Figure 4**

6. Raise fuel tank sufficiently to access fuel pump multiplug.
7. Connect fuel pump multiplug.
8. With assistance, locate fuel tank and position cradle.
9. Position jack to support tank.
10. Raise anti-roll [sway] bar, align straps and fit and tighten bolts.
11. Tighten anti-roll [sway] bar link bolts.
12. Clean fuel pipe union, connect pipes and tighten.
13. Secure harness to fuel pipes with clip.
14. Connect vapour separator pipe.
15. Once the tank is installed, the breather hose will need to be modified. Trim the breather hose so it is long enough to fit over the fuel filler barb at least 1" (25mm) without rubbing on any part of the body or chassis, Figure 3. Clamp the breather hose to the fuel filler using supplied hose clamp, part number RNS449, Figure 4.
16. Connect filler hose to fuel tank and tighten hose clip.
17. Reconnect filler hose to fuel tank and tighten hose clip.
18. Reconnect battery negative lead.
19. Use the supplied 8mm press fit union to connect the vent pipe exiting the fuel cutoff valves to the vent pipe leading to the Vapor separator. It may be necessary to cut one or both of the vent pipes to achieve proper length and fitment, see Figure 5.
20. Run engine and check for leaks.



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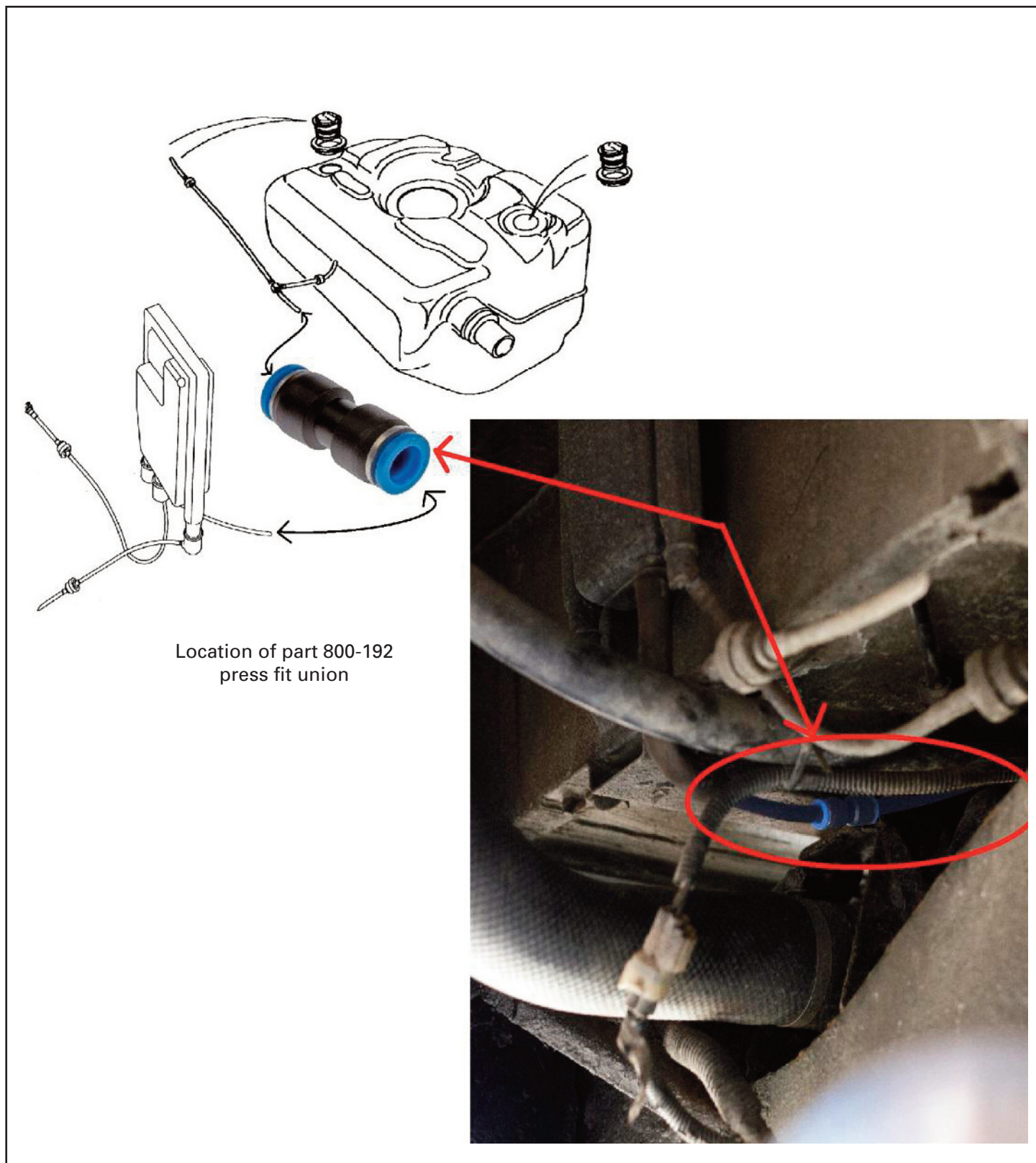


Figure 5