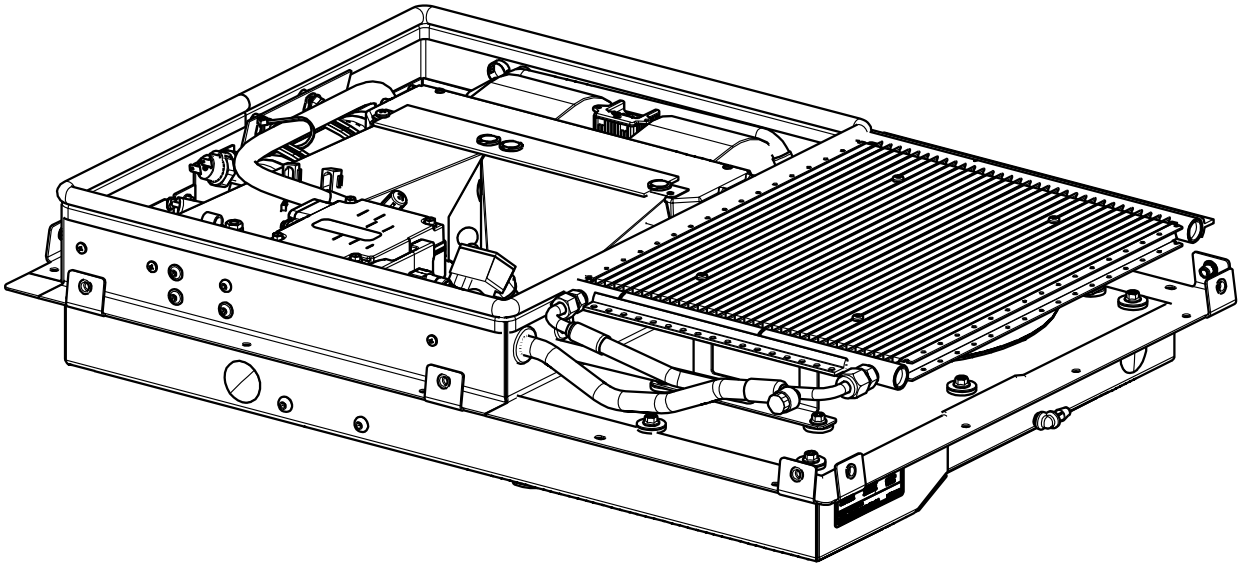
CURTIS

SERVICE & REPAIR MANUAL

Air Conditioner
p/n: 1ACUNIT-G2
Service and Repair Manual



Product Specifications
25” x 36” x 7”
Weight: 53 lbs.
Air Flow: 306 CFM
Cooling Capacity: 12,000 BTU / hr
Voltage: 12 VDC
Amp Draw: 62
Refrigerant: R134a, 2.1 lbs. charge

Approximate Installation Time *
Experienced Dealer Technician – 1 Hour
Average Dealer Technician – 1.5 Hours
Do-It-Yourself – 2 Hours

This service manual is intended for use by only properly certified and trained technicians. Refrigeration systems must only be serviced by individuals meeting all local, state and federal requirements

Rev. A

TABLE OF CONTENTS

1. HOW TO USE THIS MANUAL

Included in the first 11 pages of this manual are the operator instructions and service items. Starting on page 12 are technical service and repair procedures.

All repair work instructions in this manual are to be done with the A/C unit removed from the vehicle. See appropriate vehicle specific installation instructions for removal procedures. Any service or repair procedure done with the A/C unit installed on the vehicle should be done with the vehicle battery disconnected with the exception of specific troubleshooting procedures as noted.

The installation and removal instructions are in an order that builds on themselves, by section. I.E. when removing the condenser fan, first the condenser must be removed from above the fan. That step is described along with assembly instructions. If you need to remove the fan, use the condenser removal instruction, then the fan removal instruction. To install, install the last component removed first (fan) then follow the next removed part (condenser) installation instructions. Complex operations such as compressor removal have removal and installation procedures listed in order by page as noted.

There are tips and cautionary notes included throughout this manual. Read the instructions and review all notes on the pages before beginning work. Notes in RED are critical points called out for safety as well as procedures that must be followed to successfully service and/ or repair the unit.

At the top of each page in the left hand corner are two notations. One is a diagram that depicts the skill level of the technician required to safely and legally complete each task. Please review the key for this depiction on page 7 of this manual. The second is a list of tools required to complete the tasks listed on that page.

There are notes on each page containing an operation that requires the technician to have certification meeting Part 609 EPA standards. Following these guides is imperative for the technician's safety and compliance with EPA laws. Technicians must also follow all Local, State, and Federal guidelines for handling R134a refrigerant.

Pay close attention to notes contained in these sections

2. WARNINGS

Curtis air conditioners feature an assembly of parts designed for your vehicle which require adjustment and alignment of components to accommodate vehicle variations. For accurate installation, proper operation, and years of satisfaction, please read and understand the Service & Owner's Manual fully prior to installing the air conditioner.

From all of us at Curtis, we thank you for choosing our product.

ADDED WEIGHT NOTICE

Curtis Cabs, blades and general accessories add additional weight to the base vehicle. All Curtis accessory weights are listed in product brochures. Deduct the accessory's total weight from the vehicle's rated capacity and never exceed the vehicle's rated capacity including driver and passenger.

WARNING

Exposure to Carbon Monoxide can Cause illness, serious injury or death. *Never operate vehicle if suspicious of Carbon Monoxide. Inspect exhaust system for leaks monthly. Leaks can result from loose connections, corrosion, cracks or other damage to the exhaust manifold. If leaks are found, repair or replace exhaust system. Do not use vehicle until repair or replacement is complete.*

California Health and Safety Proposition 65 Warning: This product may contain chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.

Shock Hazard: Always disconnect the negative lead of the battery before servicing.

Disclaimer: Always discharge air conditioner refrigerant in accordance with all federal, state, and local laws.

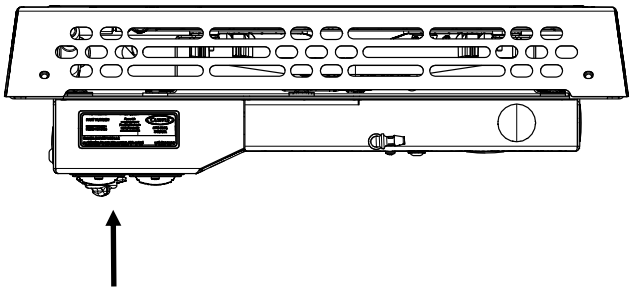
GENERAL INFORMATION BEFORE YOU START

HELPFUL HINTS:

- Read and understand all instructions before beginning.
- Apply a silicone sealant to seal any minor gaps that may occur due to vehicle variations.
- Use caution to avoid damaging installed threaded inserts or weld nuts. Begin the thread engagement by hand to avoid or correct potential cross threading.
- Plastic washers have been supplied to provide a weather seal under the heads of some exterior bolts. The plastic washer should be installed under each bolt head directly against the outside cab surface. Care should be taken not to over tighten the fasteners and damage the plastic washer.
- Silicone, Epoxy, Cork Tape, industrial hot melt glue, high adhesion duct work tape are used in sealing air, water drains, and preventing moisture build-up on internal components. Be sure to replace any of these sealants and/or fasteners when servicing or replacing components. Failure to properly install these components can result in performance degradation and damage to the components.

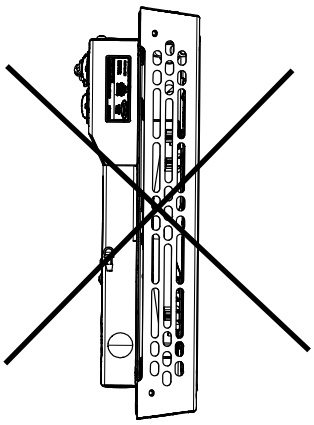
System evacuation and charging must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local and Federal requirements. R134a refrigerant is under high pressure and when released can cause severe bodily harm including from contact risk of localized frost bite. Always wear proper personal safety equipment when working on refrigerant system including safety glasses and gloves. Follow refrigerant recovery equipment manufacturer's safety and operation guidelines for use of their equipment. Only perform service in a well ventilated area away from contamination and sources of ignition. Never pressurize system with compressed air to perform a leak check. R134a refrigerant can become flammable and could explode under certain conditions.

2. WARNINGS



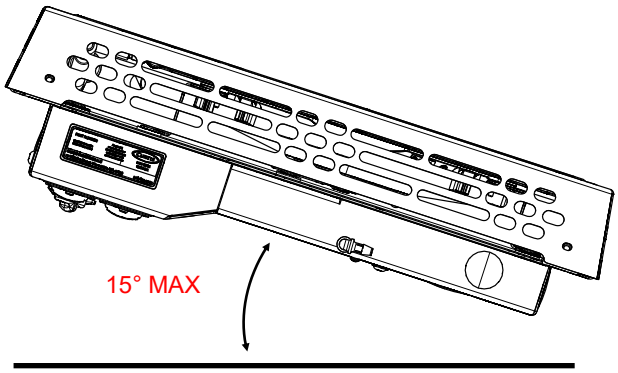
The air conditioner should arrive laying down flat.

Take care to protect the switches and louvers at the bottom of the unit when handling.



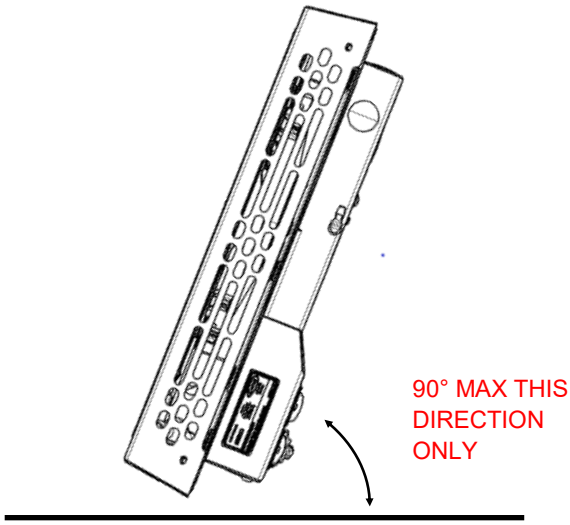
Do not receive the air conditioner from the shipping company if the air conditioner is standing up on end as shown.

Doing so will drain the oil from the compressor.



Do not tip the air conditioner more than 15° in the direction shown above during installation and service.

Doing so will drain the oil from the compressor.

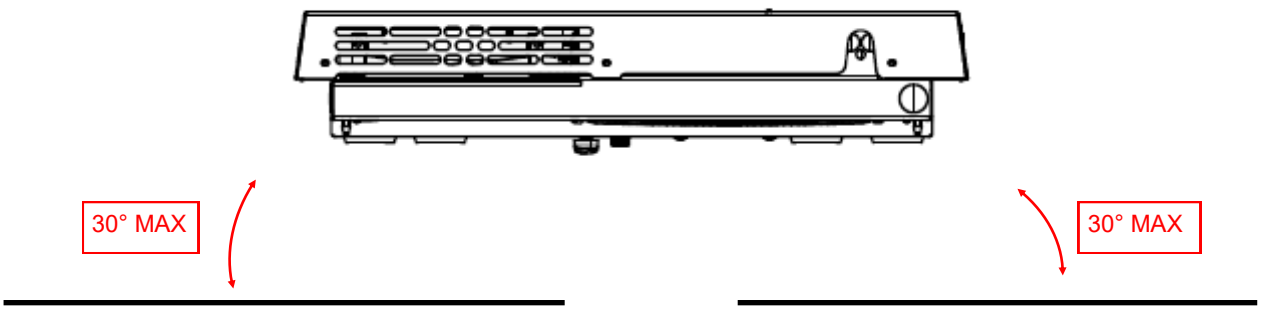


Do not tip the air conditioner more than 90° in the direction shown above during installation and service.

Doing so will drain the oil from the compressor.

** NOTE THIS IS THE ONLY DIRECTION THE AIR CONDITIONER CAN BE TILTED TO 90 DEGREES

2. WARNINGS



Do not tip the air conditioner more than 30° in the direction shown above during installation and service.

Doing so may drain the oil from the compressor.

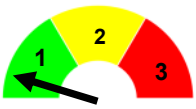
Do not tip the air conditioner more than 30° in the direction shown above during installation and service.

Doing so may drain the oil from the compressor.

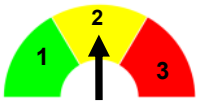
3. TECHNICIAN REQUIREMENTS

PLEASE FAMILIARIZE YOURSELF WITH THE FOLLOWING TECHNICIAN REQUIRED QUALIFICATION DIAGRAMS AND DESCRIPTIONS.

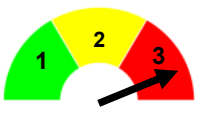
DIAGRAMS ARE LOCATED ON EACH PAGE AT THE TOP LEFT HAND CORNER AS A REFERENCE TO THE SKILL LEVEL AND QUALIFICATION REQUIRED FOR A TECHNICIAN TO SAFELY AND LEGALLY PERFORM THE TASK ON THAT PAGE. FAILURE TO FOLLOW THESE GUIDELINES COULD RESULT IN INJURY AND/OR DEATH, DAMAGE TO PROPERTY, AND VIOLATION OF LOCAL, STATE, AND FEDERAL LAWS



OPERATION TO BE PERFORMED BY QUALIFIED TECHNICIAN



OPERATION TO BE PERFORMED BY AN EPA PART 609 CERTIFIED TECHNICICAN THAT HAS BEEN SPECIFICALLY TRAINED & LICENCED IN R134a REFRIGERANT AIR CONDITIONER EVACUATION, SERVICE, AND REPAIR USING EPA APPROVED EQUIPMENT OR BY A QUALIFIED TECHNICIAN THAT IS UNDER CLOSE SUPERVISION OF AN EPA PART 609 CERTIFIED TECHNICIAN THAT HAS BEEN SPECIFICALLY TRAINED & LICENCED IN R134a REFRIGERANT AIR CONDITIONER EVACUATION, SERVICE, AND REPAIR USING EPA APPROVED EQUIPMENT



OPERATION TO BE PERFORMED BY AN EPA PART 609 CERTIFIED TECHNICICAN THAT HAS BEEN SPECIFICALLY TRAINED & LICENCED IN R134a REFRIGERANT AIR CONDITIONER EVACUATION, SERVICE, AND REPAIR USING EPA CERTIFIED EQUIPMENT

4. TECHNICAL OVERVIEW

The Curtis A/C unit (p/n: 1ACUNITG-2) is an all electric driven system that has a 12 volt electric scroll compressor and utilizes R134a refrigerant.

The system is assembled from standard automotive grade components, with a Tube and Fin Evaporator and a Bar & Plate Condenser.

The refrigerant system is regulated by an Electronic Thermostat as well as an Expansion Control Valve (ECV).

Due to the Electric Compressor being located in the roof top unit, there are no refrigeration lines being subjected to engine vibrations and heat loads. Also, unlike a standard automotive mechanical compressor, the electric compressor has no rotating parts exposed to the atmosphere, thus eliminating a common leak point.

With the refrigerant system being completely contained within the Roof Top Unit, it can be shipped fully charged with refrigerant (within the continental US).

As part of Curtis's Quality Control Process, each unit is leak and performance tested on a Run Bench.

Due to the robust self contained design, the Curtis G2 Roof Top A/C unit requires very little maintenance. The only items requiring scheduled maintenance within the unit are the Evaporator drain tubes and condenser core, which require being cleared of any blockage, debris and/or insects. Curtis recommends the operator inspect all fasteners every 40 hours to assure they remain tight due to the off road use of the vehicle.

⇒ *As with any R134a refrigeration system, it is mandatory that only a trained and properly qualified/ licensed technician perform any service or repair requiring removal and replacement of refrigerant to the system using certified Recovery, Recycle and Charging equipment.

5. SPECIFICATIONS

WEIGHT: 53LBS (A/C UNIT WITH COVER)

HEIGHT ABOVE CAB: 3-5/8”

INTRUSION INTO CAB: 2” (OPERATOR AREA); 3” (LOWEST POINT)

SYSTEM : 12V DC

RUNNING AMPERAGE DRAW: 62 AMP (HIGH BLOWER SPEED)

HOUSING: POWDER COATED, CORROSION RESISTANT ALUMINUM ALLOY

COVER: POWDER COATED, CORROSION RESISTANT ALUMINUM ALLOY

EVAPORATOR CORE: AUTOMOTIVE GRADE, CORROSION RESISTANT ALUMINUM ALLOY, TUBE AND FIN

CONDENSER CORE: POWDER COATED, CORROSION RESISTANT ALUMINUM ALLOY, BAR AND PLATE

EVAPERATOR BLOWER: 306CFM AUTOMOTIVE GRADE 12 VOLT, 10 AMP WITH 3 SPEEDS

CONDENSER FAN: AUTOMOTIVE GRADE, 12 VOLT, 20 AMP, LOW NOISE, “S” BLADED

INTAKE: INTEGRATED INTO CASE, SINGLE POINT ENTRY, RECIRCULATION, NON FILTERED

OUTLET: FOUR 4-WAY ADJUSTABLE LOUVERED VENTS

OPERATOR CONTROLS: COMPRESSOR ON/OFF, SYSTEM ON/OFF WITH 3 BLOWER SPEEDS, ON SELECT VEHICLES ALTERNATOR BY-PASS BUTTON

LOAD CONTROL: PATENTED ELECTRONIC AUTOMATED CONTROL OF ALTERNATOR LOAD ON ENGINE

THERMOSTAT: ELECTRONIC, THERMISTOR SENSOR, NON-ADJUSTABLE

REFRIGERANT: 2.1 LBS R134a

REFRIGERANT OIL: 3 OZ ZEROL ESTER 68SL

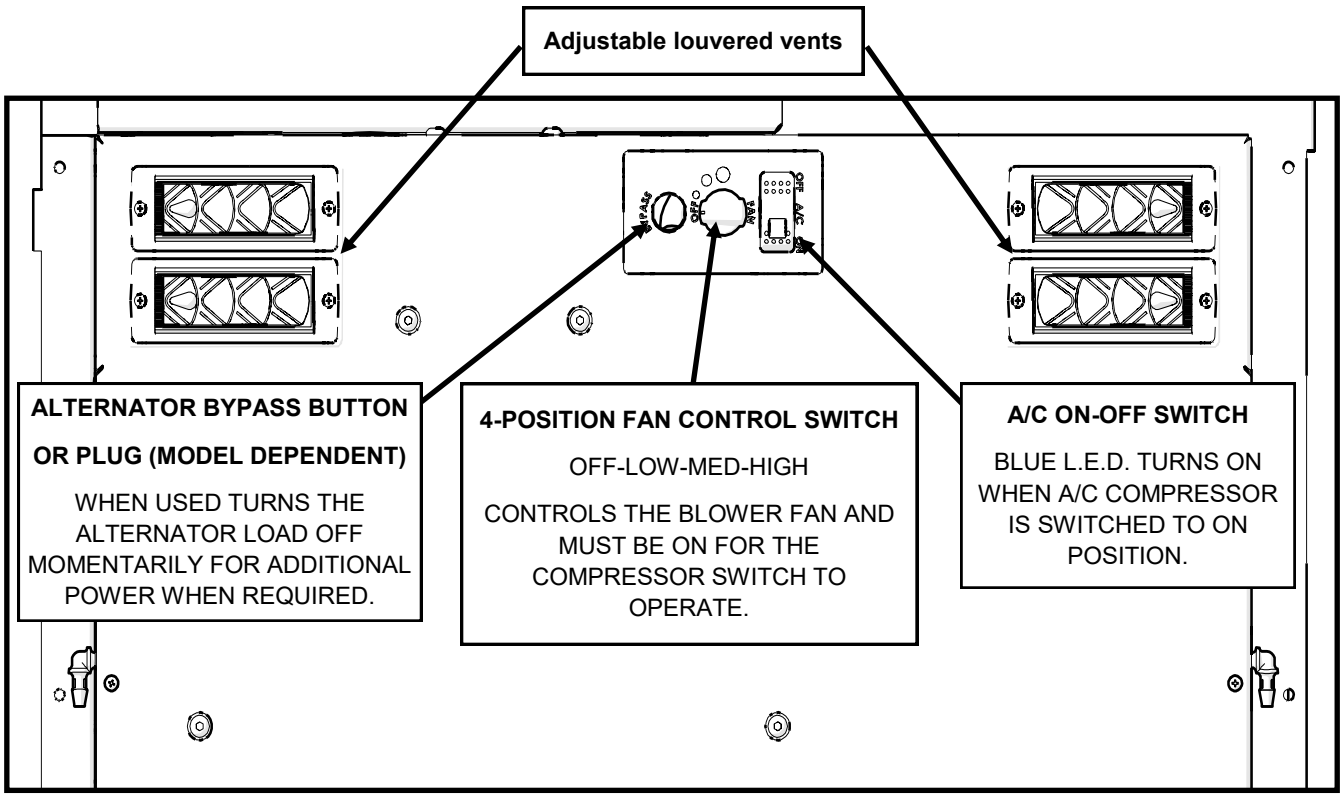
COOLING CAPACITY: 12,000 BTU / HR

6. FEATURES & OPERATION

Turn the 4-POSITION FAN CONTROL SWITCH to activate the blower. The air conditioner may be used as a fan in this manner.

Toggle the A/C ON-OFF SWITCH to activate the compressor for chilled air. The blower must be turned on before the compressor will activate.

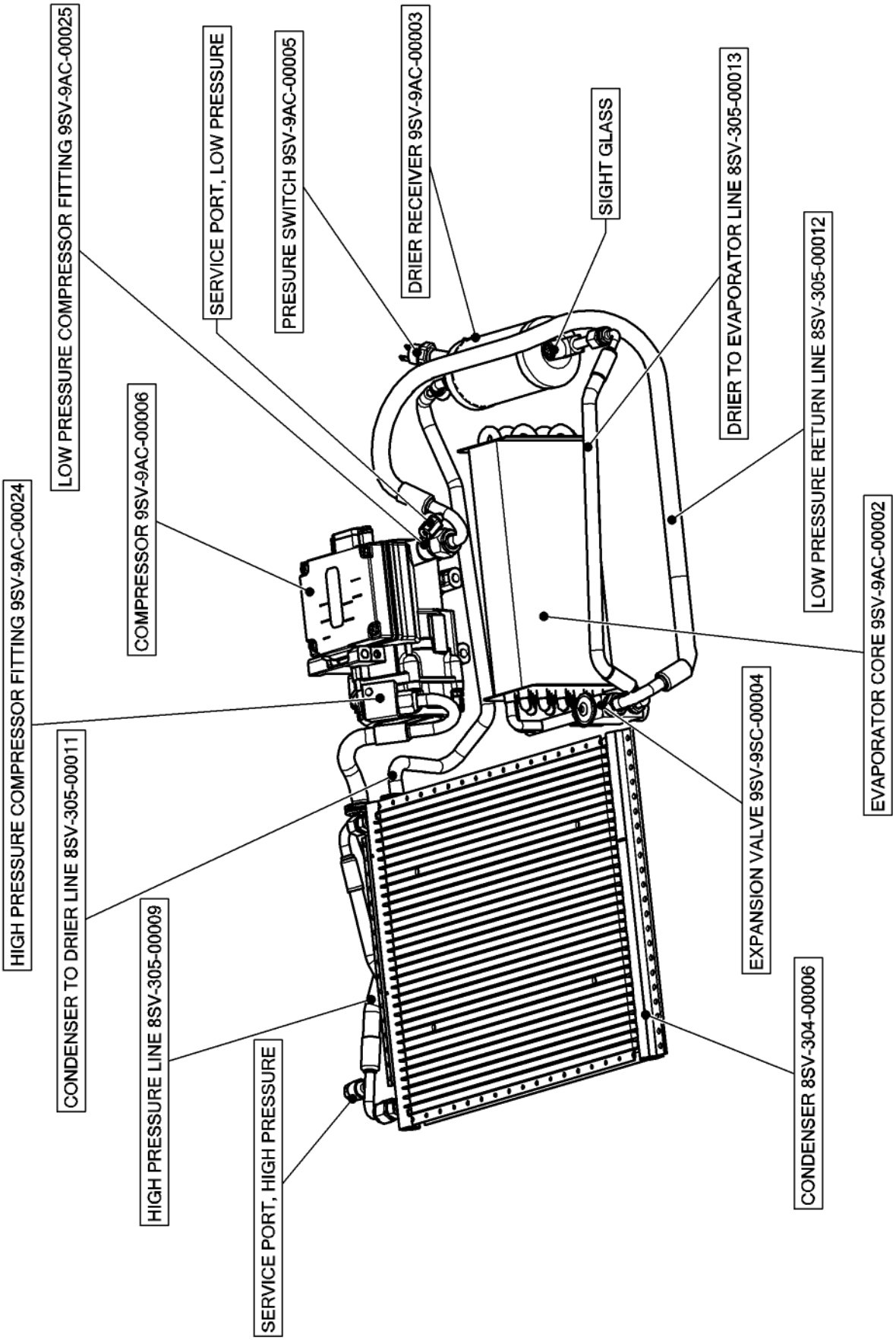
4 louvered vents are adjustable for air direction and volume



7. CARE AND MAINTENANCE

- Clean the exterior of the condenser after every 50 hours of operation, or as needed depending on usage conditions.
- Periodically inspect and tighten hardware after every 40 hours of operation for the entire life of the air conditioner.
- Wash the painted surfaces of the air conditioner with commercial automotive cleaning products.
- Every 3 months of use, or annually, assure the Evaporator Drain Tubes are clear of blockage & draining

8. REFRIGERANT FLOW DIAGRAM



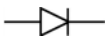
9. BASIC TROUBLESHOOTING

If A/C unit is not functioning as expected, review the following for guidance and important notes before proceeding with diagnostics of system.

- Some units have a delayed start to allow the vehicle's motor to get up to speed before engaging.
- Some applications have a delayed turn-off feature. This can be overridden by turning off the blower switch.
- The air conditioner's compressor has a built in reset time between stopping and restarting in order to allow refrigerant pressure to equalize. This is done to prevent starting against high pressures, in order to extend the life of the compressor.
- If Curtis electric heater will be installed along with an A/C, be aware that when switching quickly between heat and A/C with the rocker switch on the heater mount, it is possible to run both at the same time. It is recommended to shut one accessory off before switching to the other to prevent additional drain on the battery.

- Check all electrical connections to ensure that proper connections are made and terminals are all tight.
- Check Battery Condition:

  Resting/No Load Voltage should be 12.6V or greater.

  Terminals should be clean and tight.
- Check all fuses:
  - ◊ 15 amp ATC blade fuse, located inside the air conditioner.
  - ◊ 25 amp ATC blade fuse, located inside the air conditioner.
  - ◊ 10 amp fuse on the Purple wire connected to the solenoid.
  - ◊ Two 100 amp fuses located along 2AWG red wire between battery and alternator. Refer to the alternator kit for details.
- Diodes 
  - ◊ There are two 1 Amp diodes in what looks like a mini blade fuse holder, located inside the A/C unit as part of the wire harness.
  - ◊ Do not replace diodes with fuses. The unit will not turn off, draining the battery.
  - ◊ If a diode is removed for any reason, it must be re-installed so that the symbol points towards the main power solenoid.
- Check all relays:
  - ◊ Relays, located under the cover of the A/C unit.
  - ◊ Timed relays, located under the cover of the A/C unit (if applicable).
- Check alternator output. The alternator should put out 12.5-14 volts DC.
- Check the tension of the alternator and drive belts.

10. COVER & SEAL

Tools

3/8” Open/ Box end Wrench or Socket
#3 Phillips Head Screwdriver

Removal

Remove 10 outer cover bolts.

Remove center cover screw and sealing washer.

Remove cap by lifting directly up. (note sealing cork tape may stick to underside of cap, this is normal and can be overcome with steady pressure taking care not to bend cover)

Installation

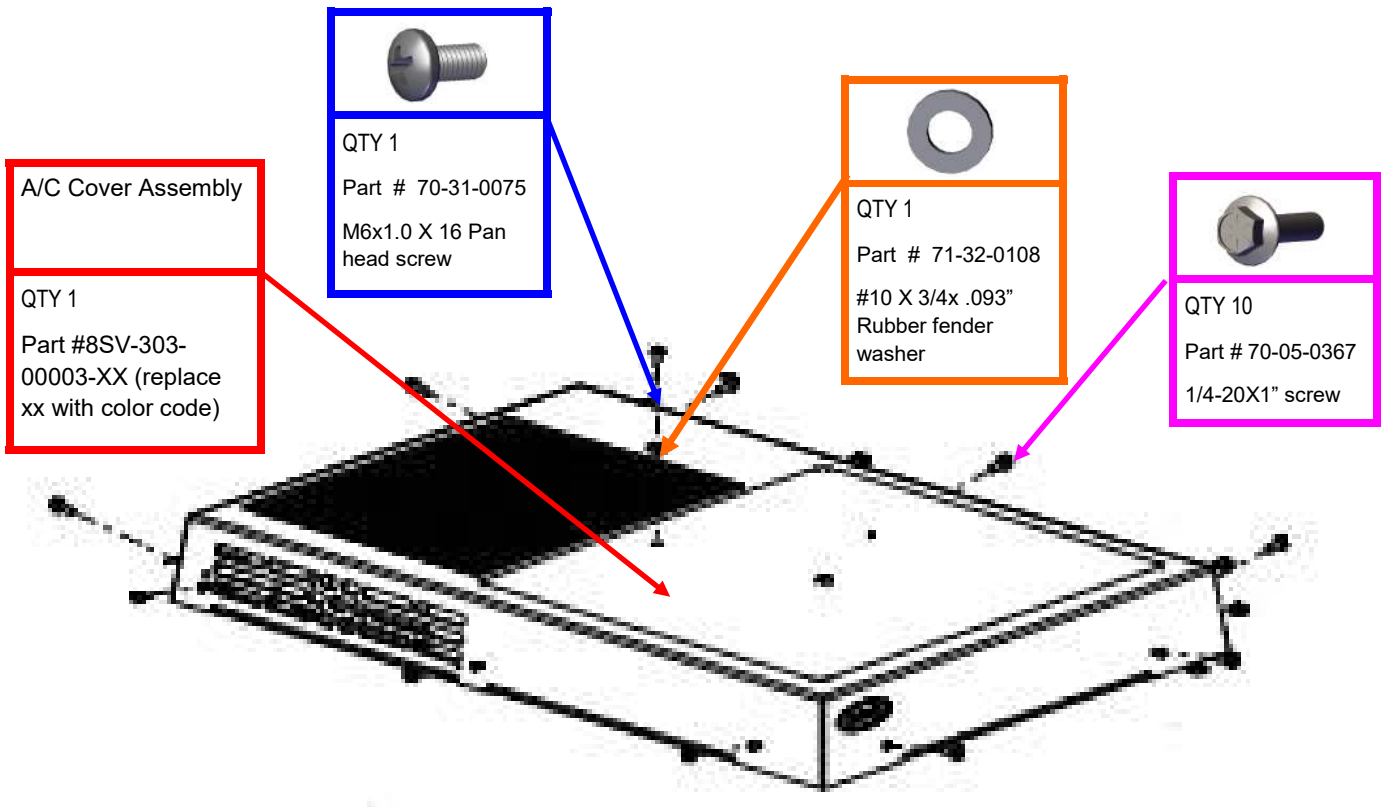
Coat threads of fasteners with anti-seize compound.

Install center cover screw first to align cap, leave loose.

Install 10 outer cover bolts, leave loose until all bolts are in place.

Tighten outer cover bolts.

Tighten center cover screw until rubber washer is slightly compressed.



10. COVER & SEAL

Tools

Metal Shears (Tin Snips)

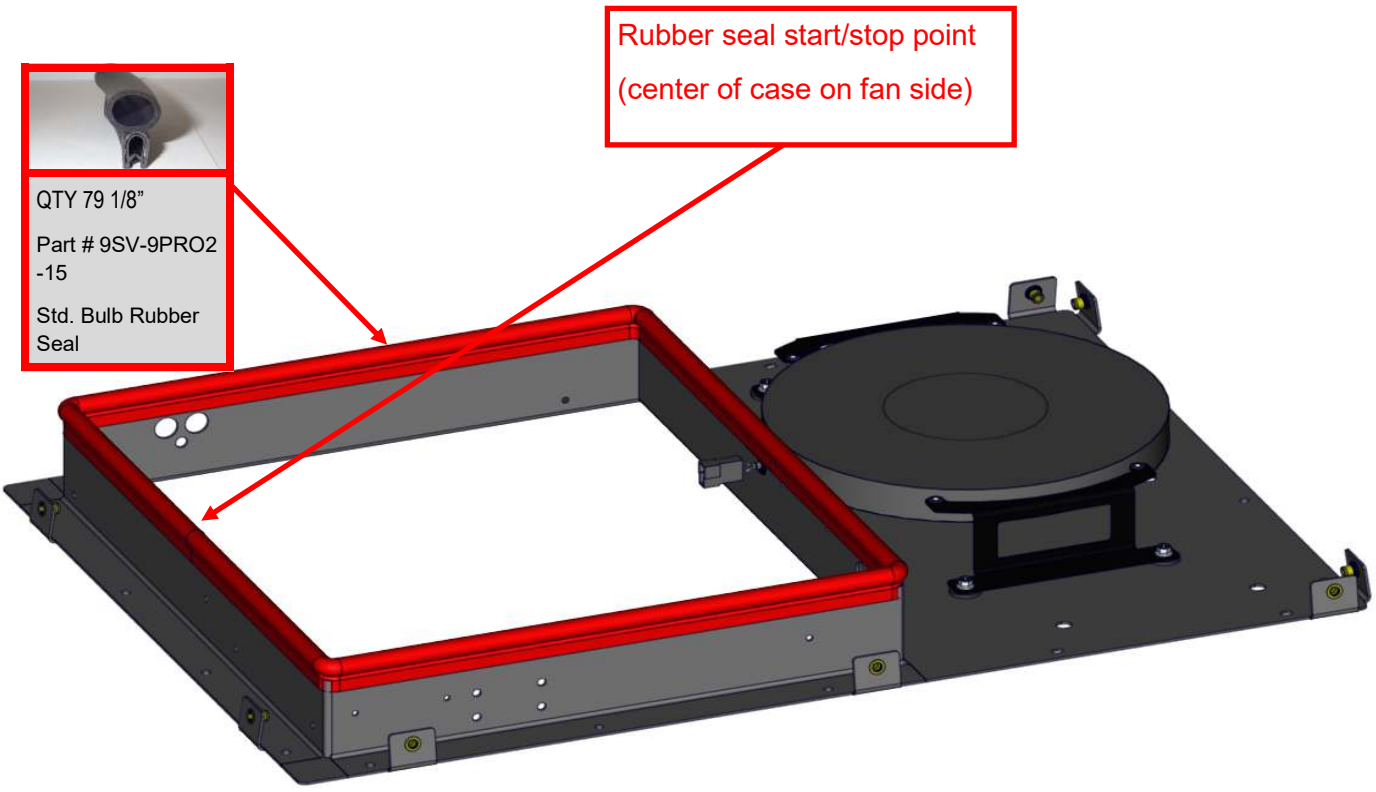
Removal

Start at end of seal (per illustration) and peel away from housing.

Installation

Start new seal installation in location per illustration, pressing seal into place by hand on edge of housing taking care to not damage seal.

Mate ends of seal together tightly trimming excess with metal shears.



11. CONDENSER FAN

Tools

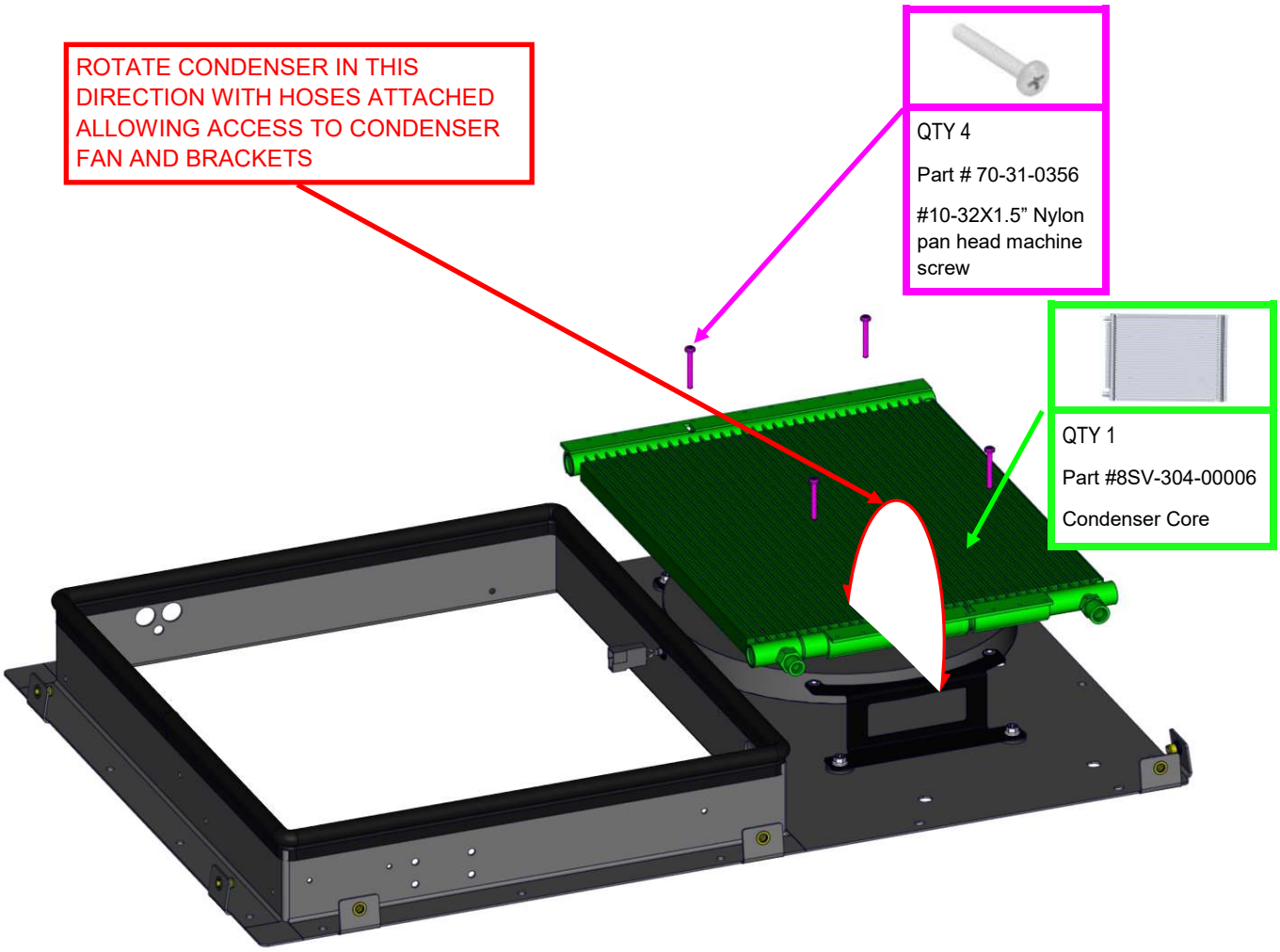
#2 Phillips Screwdriver

CONDENSER HOSES ARE FLEXIBLE AND DO NOT HAVE TO BE REMOVED TO FACILITATE ACCESS TO THE CONDENSER FAN AND BRACKETS. GENTLY ROTATE THE CONDENSER IN THE DIRECTION DEPICTED, ALLOWING ACCESS TO THE CONDENSER FAN AND BRACKETS

Removal

Remove 4 plastic condenser-to-fan mounting screws.

Rotate condenser in direction shown to provide access to condenser fan. Take care not to damage fins on condenser.



11. CONDENSER FAN

Tools

Snips

CONDENSER HOSES ARE FLEXIBLE AND DO NOT HAVE TO BE REMOVED TO FACILITATE ACCESS TO THE CONDENSER FAN AND BRACKETS. GENTLY ROTATE THE CONDENSER IN THE DIRECTION DEPICTED ALLOWING ACCESS TO THE CONDENSER FAN AND BRACKETS

Removal

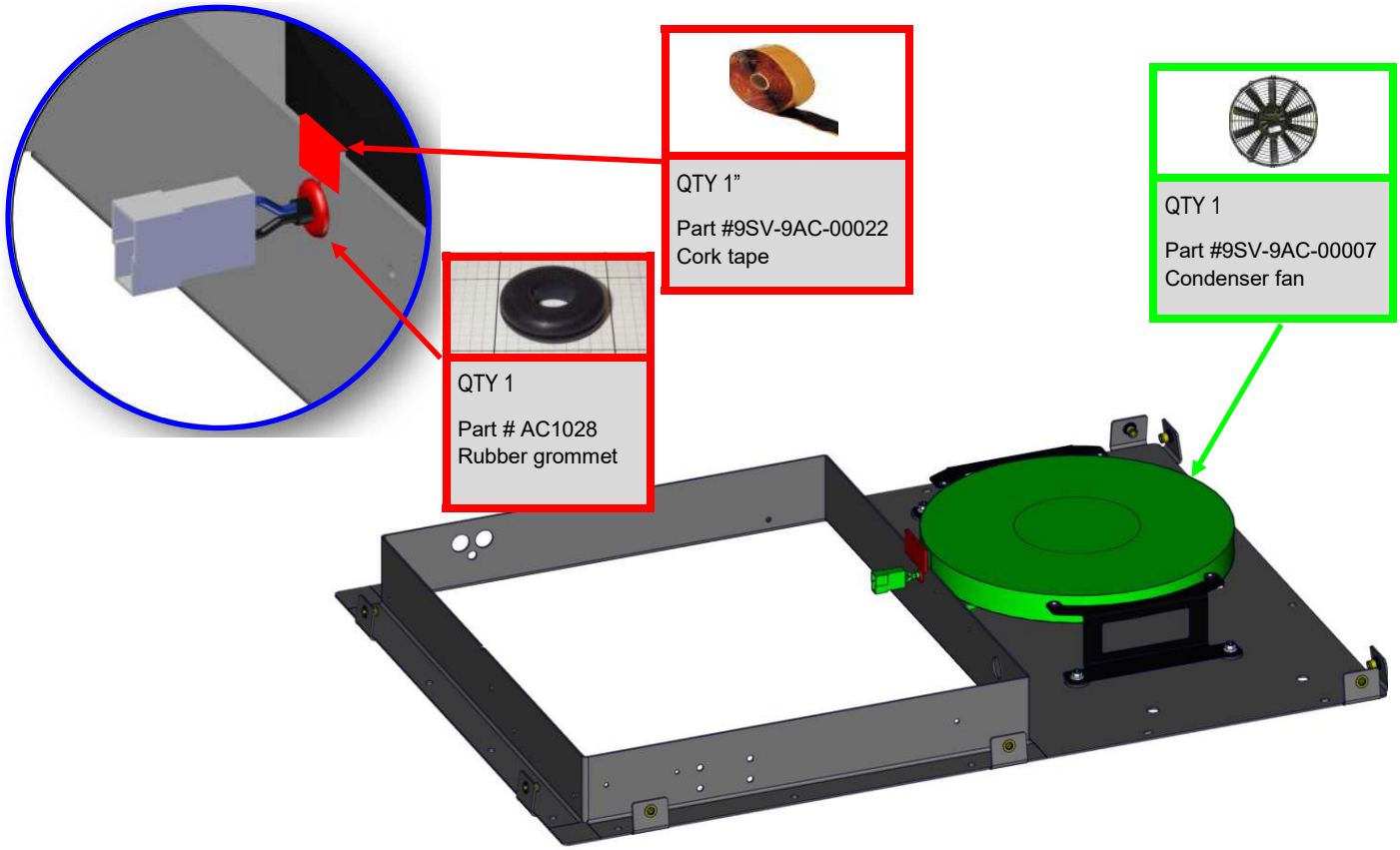
Disconnect blue and black wires at 2-pin connector.

If rubber flange seal is still in place, remove enough to expose edge of case above connector.

Remove cork tape from area shown in red below, exposing slot in case.

With condenser rotated out of the way (per previous step), lift fan assembly from brackets.

With fan held up, remove wire by sliding through slot in rubber grommet and case, being careful not to damage wires.



11. CONDENSER FAN

Tools

Snips

CONDENSER HOSES ARE FLEXIBLE AND DO NOT HAVE TO BE REMOVED TO FACILITATE ACCESS TO THE CONDENSER FAN AND BRACKETS. GENTLY ROTATE THE CONDENSER IN THE DIRECTION DEPICTED ALLOWING ACCESS TO THE CONDENSER FAN AND BRACKETS

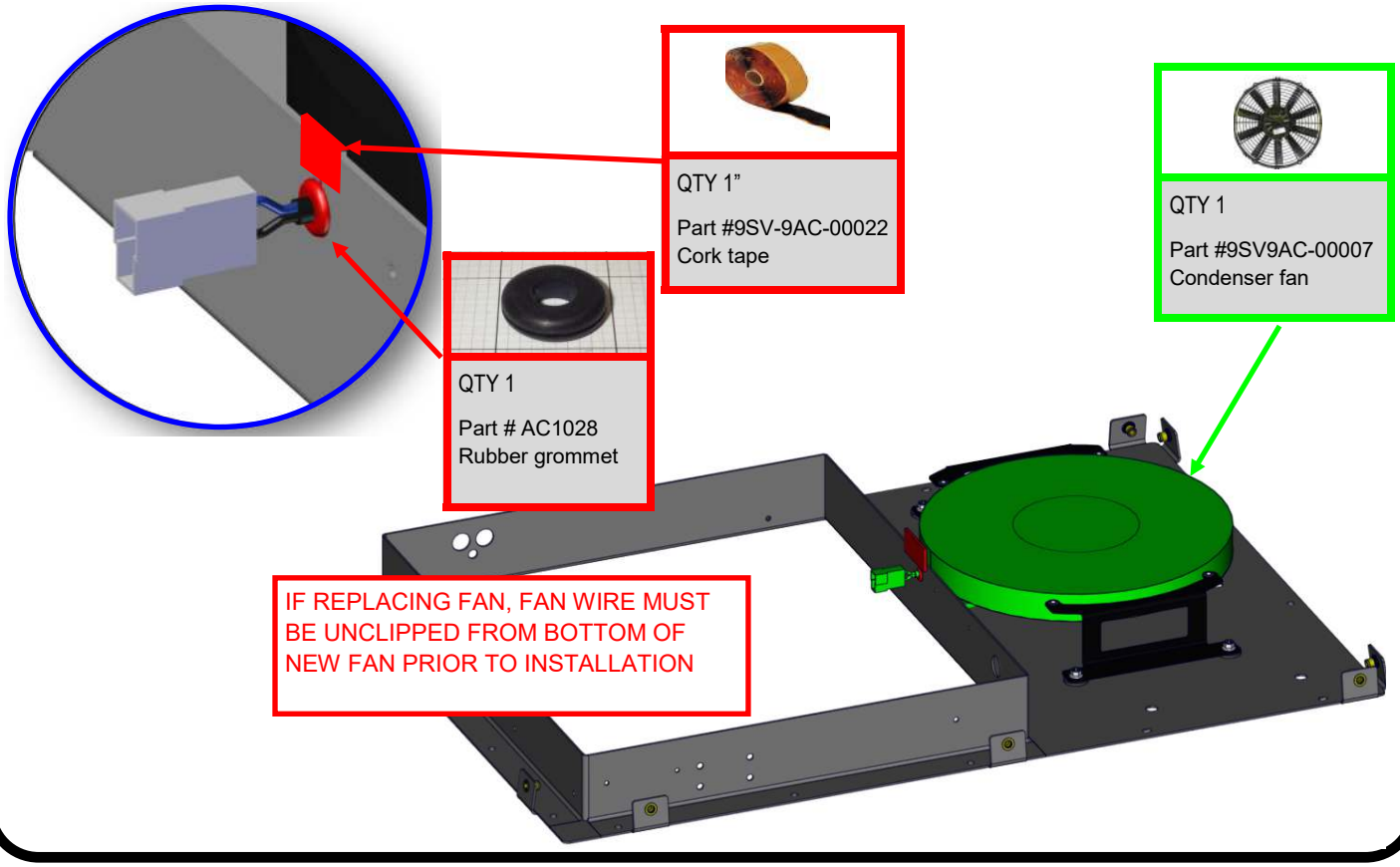
Installation

Install wires through slot in case and rubber grommet being careful not to damage wires.

Place fan into location on fan brackets.

Install cork tape over slot in case and over slit in rubber grommet to prevent water entry, per illustration. Re-install rubber flange seal.

Connect blue and black wires at 2-pin connector.



11. CONDENSER-FAN

Tools

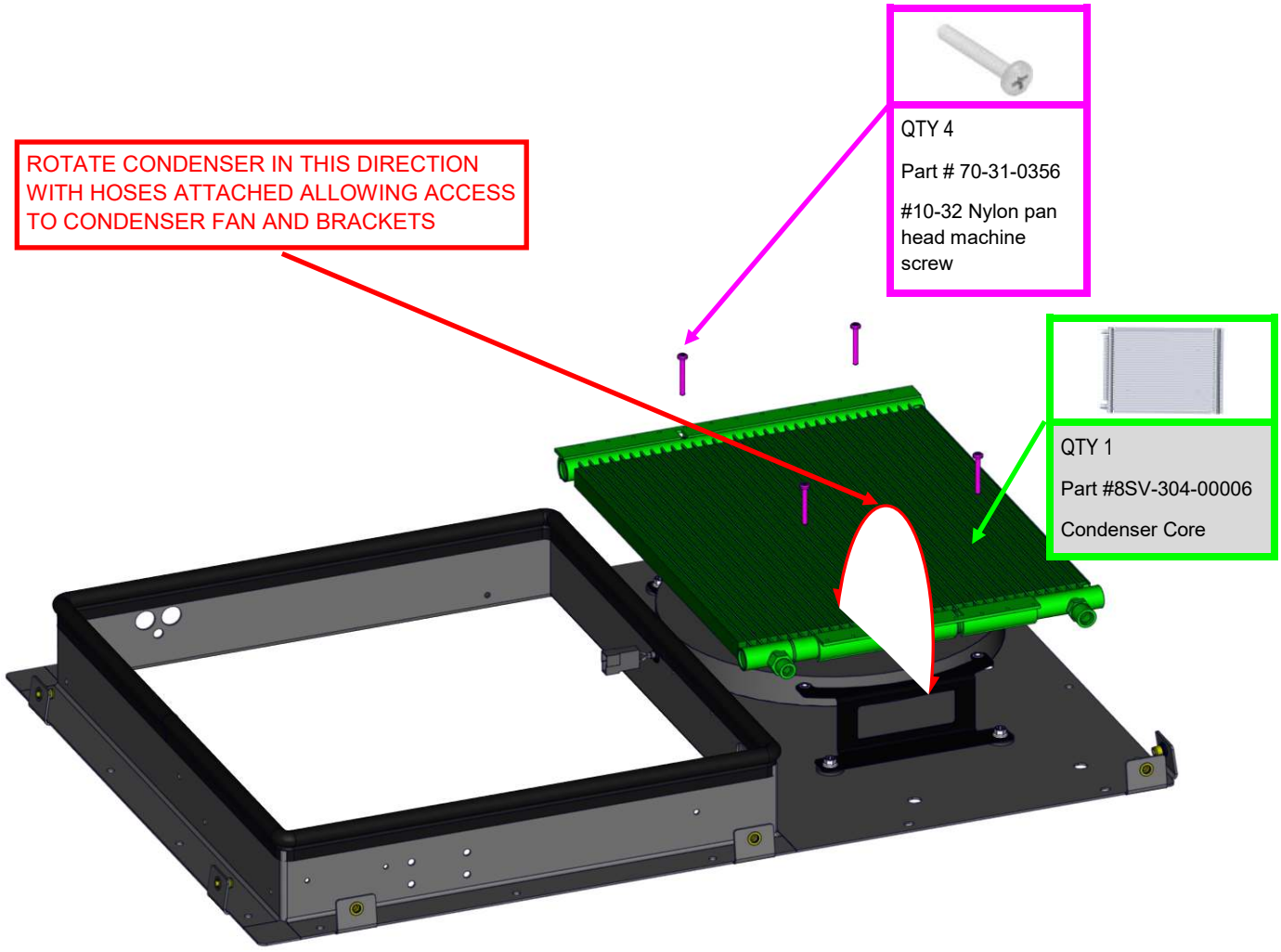
#2 Phillips Screwdriver

CONDENSER HOSES ARE FLEXIBLE AND DO NOT HAVE TO BE REMOVED TO FACILITATE ACCESS TO THE CONDENSER FAN AND BRACKETS. GENTLY ROTATE THE CONDENSER IN THE DIRECTION DEPICTED ALLOWING ACCESS TO THE CONDENSER FAN AND BRACKETS

Installation

Rotate condenser into position being careful not to damage fins.

Install 4 nylon screws through condenser holes, through condenser fan, into mounting bracket. Tighten nylon screws gently until head of screw is flush with condenser core tubes. Do Not over-tighten nylon screws.



12. CONDENSER FAN BRACKET

Tools

3/8” Open/ Box End Wrench

RUBBER WASHERS ARE USED TO REDUCE VIBRATION OF FAN AGAINST CASE. THEY ARE LOCATED BETWEEN BRACKET AND CASE, NOT UNDER FLANGE BOLTS.

Removal

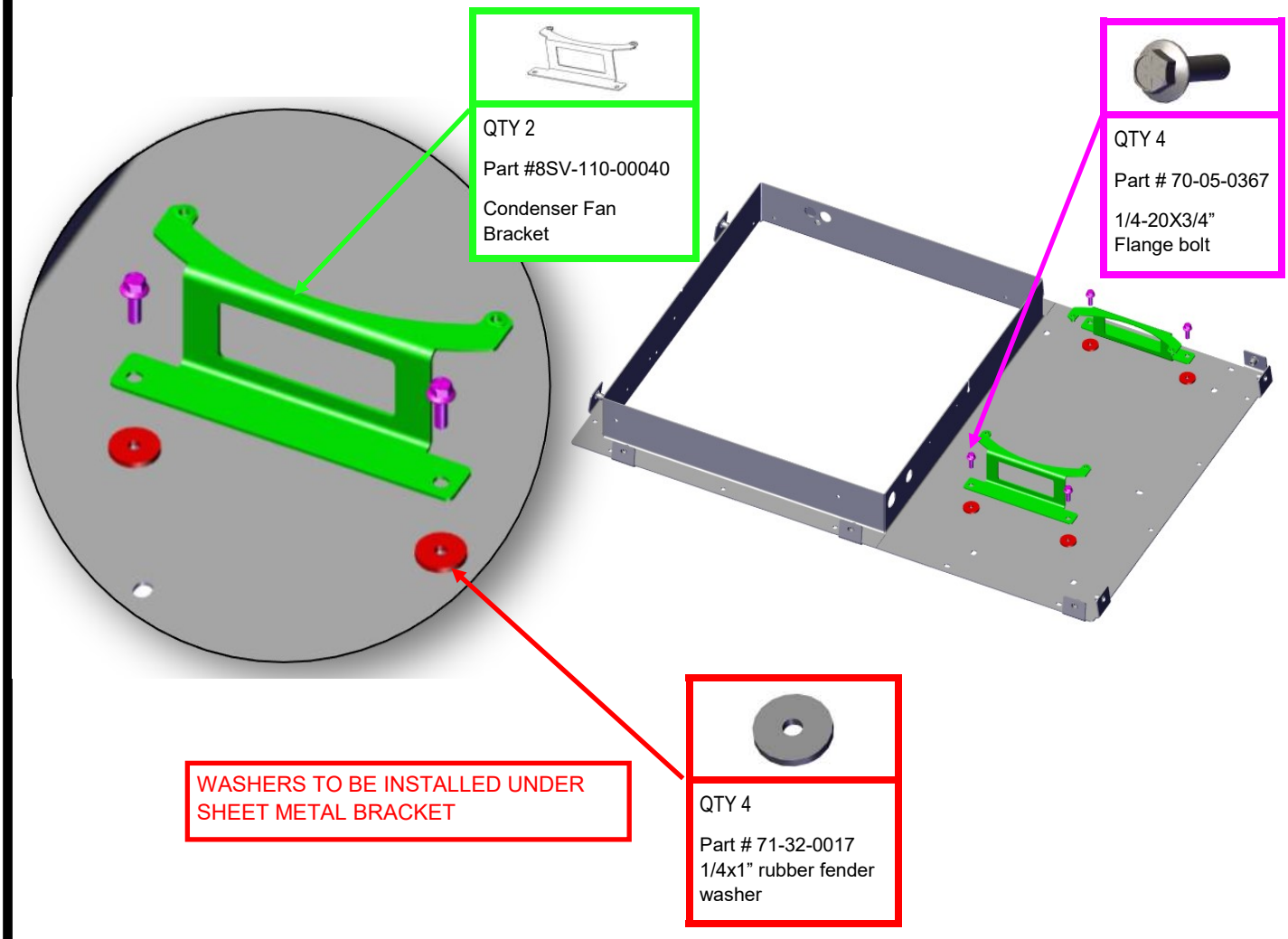
Remove bolts retaining bracket(s) to case.

Remove bracket(s) from case being certain to remove rubber washers beneath bracket.

Installation

Install rubber washers on case aligning holes in washers with mounting holes in case.

Install bolts thru bracket, rubber washers, and into case.

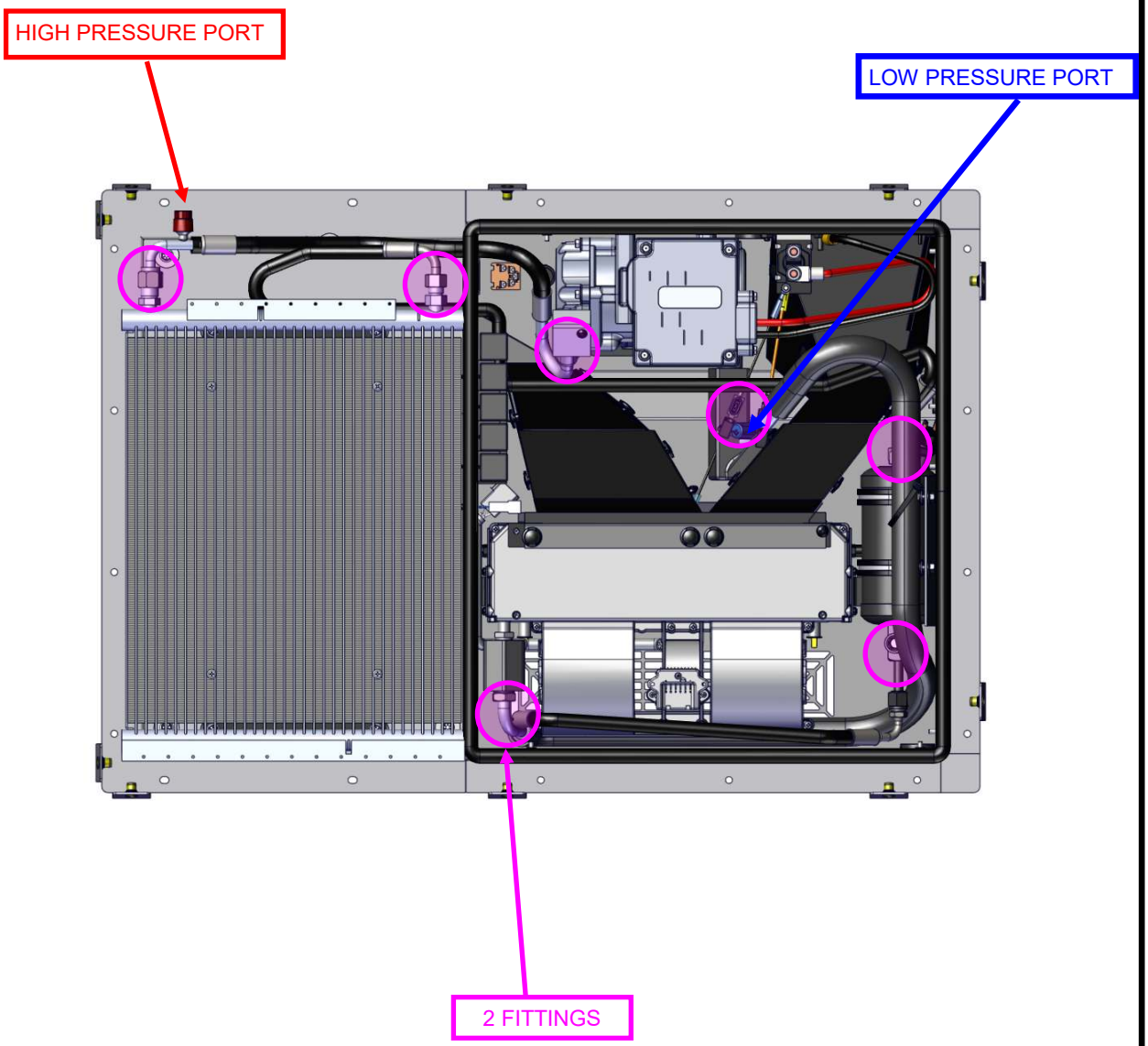


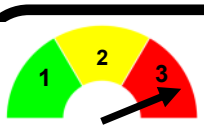
13. REFRIGERANT SYSTEM EVACUATION, VACUUM & CHARGE

Tools

EPA Certified R134a Recovery, Recycle,
Recharge refrigerant handling equipment.

VERIFY HOSE FITTINGS HAVE BEEN TIGHTENED AT ALL CIRCLED LOCATIONS PRIOR TO CHARGING SYSTEM.





13. REFRIGERANT SYSTEM EVACUATION, VACUUM & CHARGE

Tools

EPA Certified R134a Recovery, Recycle,
Recharge refrigerant handling equipment.

System evacuation and charging must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements. Wear appropriate personal safety equipment, per refrigerant handling equipment manufacturer's operating instructions, including safety glasses and gloves.

Recovery

Remove high pressure port cap from #8 high pressure line fitting located at condenser.

Remove low pressure port cap from #10 low pressure line fitting located at compressor inlet fitting.

Following manufacturer's instructions, attach Evacuation machine high and low pressure lines and evacuate refrigerant.

Note amount of refrigerant oil removed from AC unit. This must be replaced when re-charging.

Services requiring recovery of refrigerant can be performed after this step is completed.

Vacuuming

Prior to performing this operation, assure all fittings are tight. Refer to preceding page for diagram.

After servicing or repair of unit, evacuate system for a minimum of 20 minutes to remove moisture that may have entered the system during repairs.

Conduct at least a 10 minute vacuum hold test prior to charging.

Charging

Following manufacturer's instructions, program machine to install the amount of oil removed when recovering refrigerant and 2.1 lbs of refrigerant.

If a new compressor and drier were installed: the compressor contains the appropriate amount of oil. There is no need to add the amount recovered.

Capacities:

The system requires: 3oz of ZEROL ESTER 68SL oil

2.1lbs of R134a

14. CONDENSER

Tools

7/8” Open/ Box End Wrench
3/4” Open/ Box End Wrench

System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Removal

Evacuate System (see Refrigerant System Evacuation, Vacuum & Charge).

Remove condenser to drier #6 line from condenser fitting.

Remove high pressure condenser to compressor #8 line with high pressure port from condenser fitting.

Seal both condenser fittings and hose ends if system is to be left apart for more than 2 minutes.

Installation

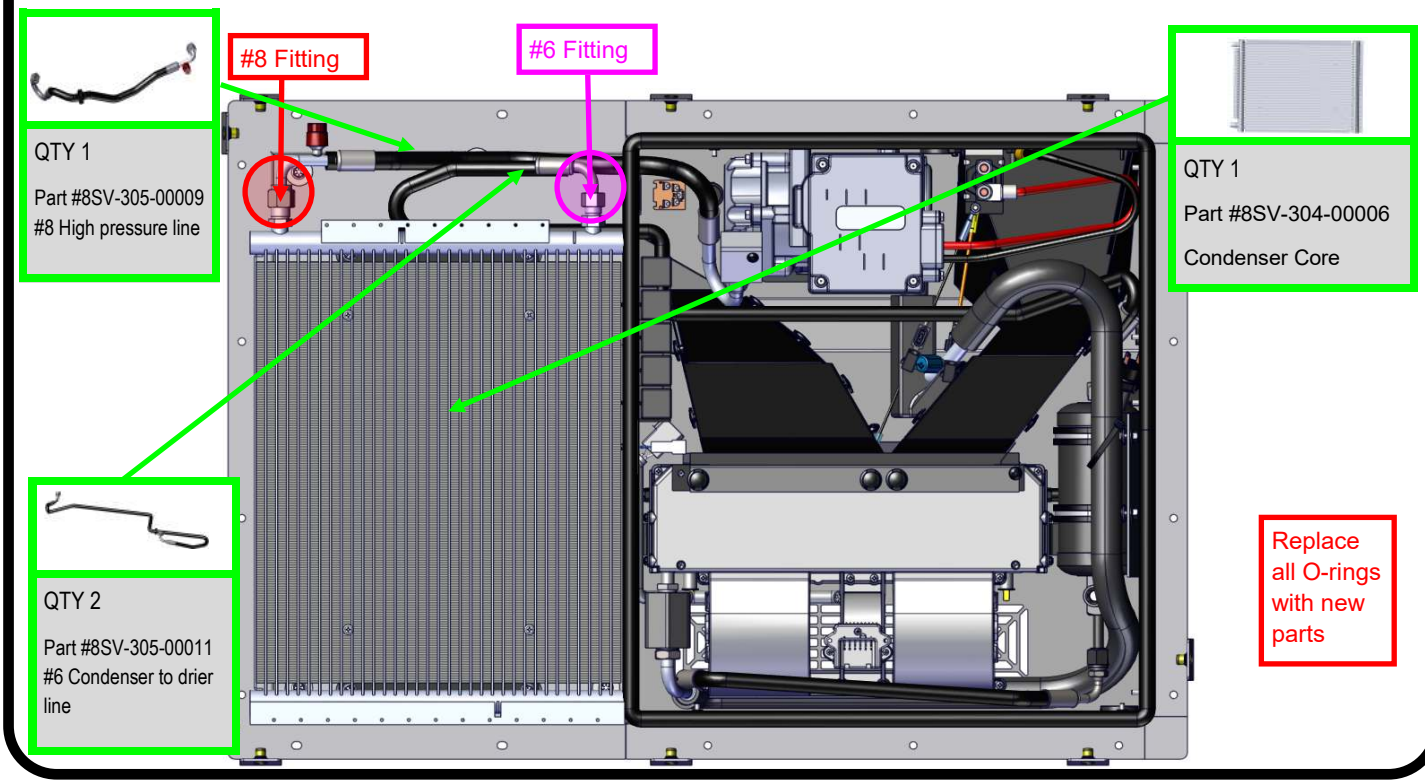
If installing a new condenser, separate fins at mounting screw locations using a pick. Use removed condenser as a template to match hole locations to.

Ensure fittings and ports are clean, install new O-rings on fittings, and coat with ZEROL ESTER 68SL oil.

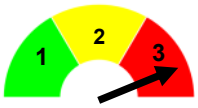
Install condenser to drier #6 line onto condenser #6 fitting.

Install condenser to compressor #8 line onto condenser #8 fitting.

If repair is complete, Vacuum and Charge system, per section 13 in this manual.



15. PRESSURE SWITCH



Tools

1-1/16” Open/ Box End Wrench

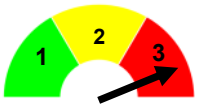
System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Function

The pressure switch prevents the compressor from turning on if the system’s pressure is low (system low on refrigerant) or if it is too high (condenser not functioning properly, system over-charged, condenser fan not functioning, etc…).

The pressure switch is electrically in-line between the thermostat and compressor relay. If the pressure switch is thought to be faulty (system is properly charged, not over pressure), it can be bypassed with a jumper wire between the two brown wires to test and determine if system will operate. Do not leave test jumper in place and operate system for more than 1 minute. ***Never return the unit to operation with customer with a test jumper in place.**

15. PRESSURE SWITCH



Tools

1-1/16” Open/ Box End Wrench

System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Removal

Evacuate system (see system evacuation).

Remove two brown wires with push-on terminals from pressure switch (orientation of these wires is not important).

Remove pressure switch.

Seal port on drier if system is to be left apart for more than 2 minutes.

Installation

Ensure switch and port are clean, install new O-ring on pressure switch, and coat with ZEROL ESTER 68SL oil.

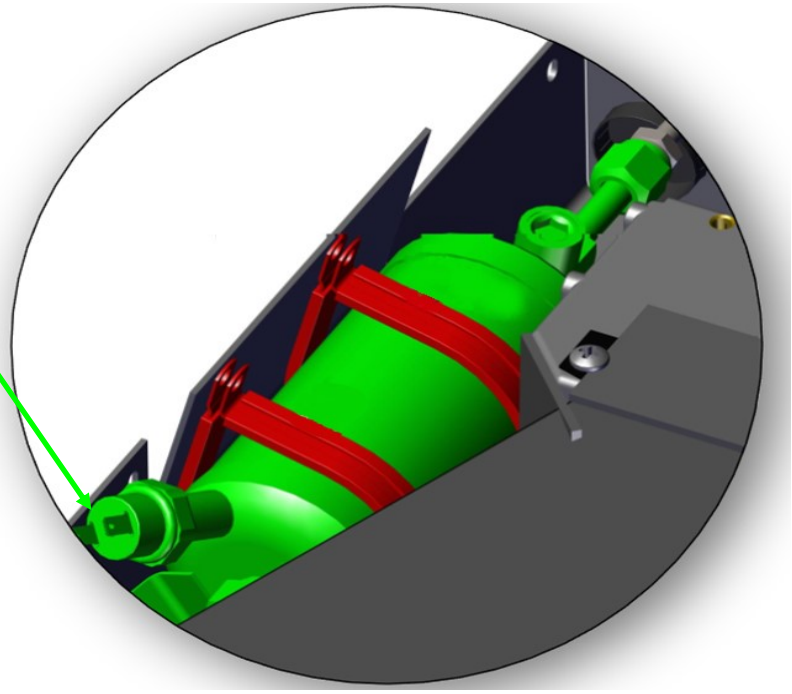
Install pressure switch into drier port and torque to 10 Ft.-LBS.

If repair is complete, Vacuum and Charge system, per section 13 in this manual.

QTY 1

Part #9SV-9AC-00005
Pressure switch

Replace O-rings with new parts



For pressure switch diagnostics, see electrical system operation section of this manual

16. RECEIVER/DRIER

Tools

3/8” Open/ Box End Wrench
5/8” Open/ Box End Wrench
7/16” Open/ Box End Wrench
3/4” Open/ Box End Wrench

System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

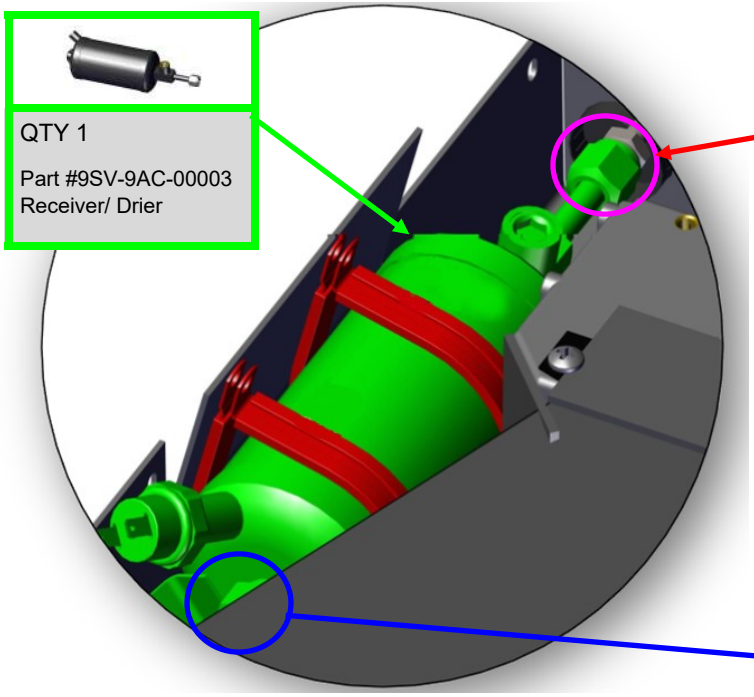
Removal

Evacuate system.

Remove condenser to drier #6 fitting from inlet side of drier (next to pressure switch).

Remove drier to evaporator control valve #6 fitting from outlet side of drier (next to sight glass).

Seal both drier fittings and hose ends if system is to be left apart for more than 2 minutes.

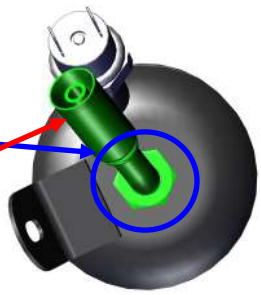


QTY 1

Part #9SV-9AC-00003
Receiver/ Drier

Use caution removing fitting, as aluminum hose fitting is a fixed male O-ring. To remove, loosen Black nut on drier with 3/4” wrench holding aluminum fitting nut in place with 5/8” wrench.

Replace O-rings with new parts



Orientation of #6 inlet hose fitting, remove fitting from drier using 3/4” wrench

16. RECEIVER-DRIER

Tools

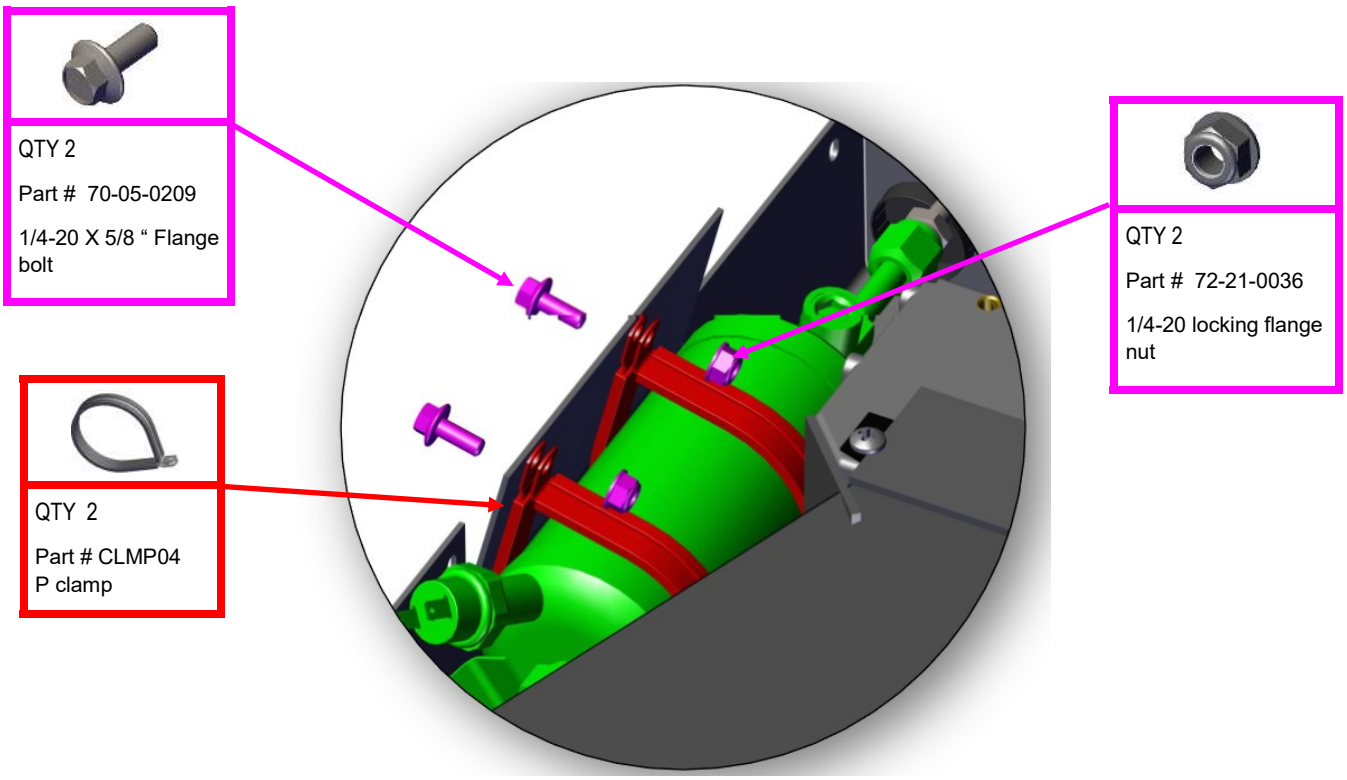
3/8” Open/ Box End Wrench
5/8” Open/ Box End Wrench
7/16” Open/ Box End Wrench
3/4” Open/ Box End Wrench

System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Removal

With lines removed and fittings capped, remove 2 bolts and nuts retaining drier and mounting clamps to case.

Remove drier with clamps from case.



16. RECEIVER/DRIER

Tools

3/8” Open/ Box End Wrench
5/8” Open/ Box End Wrench
7/16” Open/ Box End Wrench
3/4” Open/ Box End Wrench

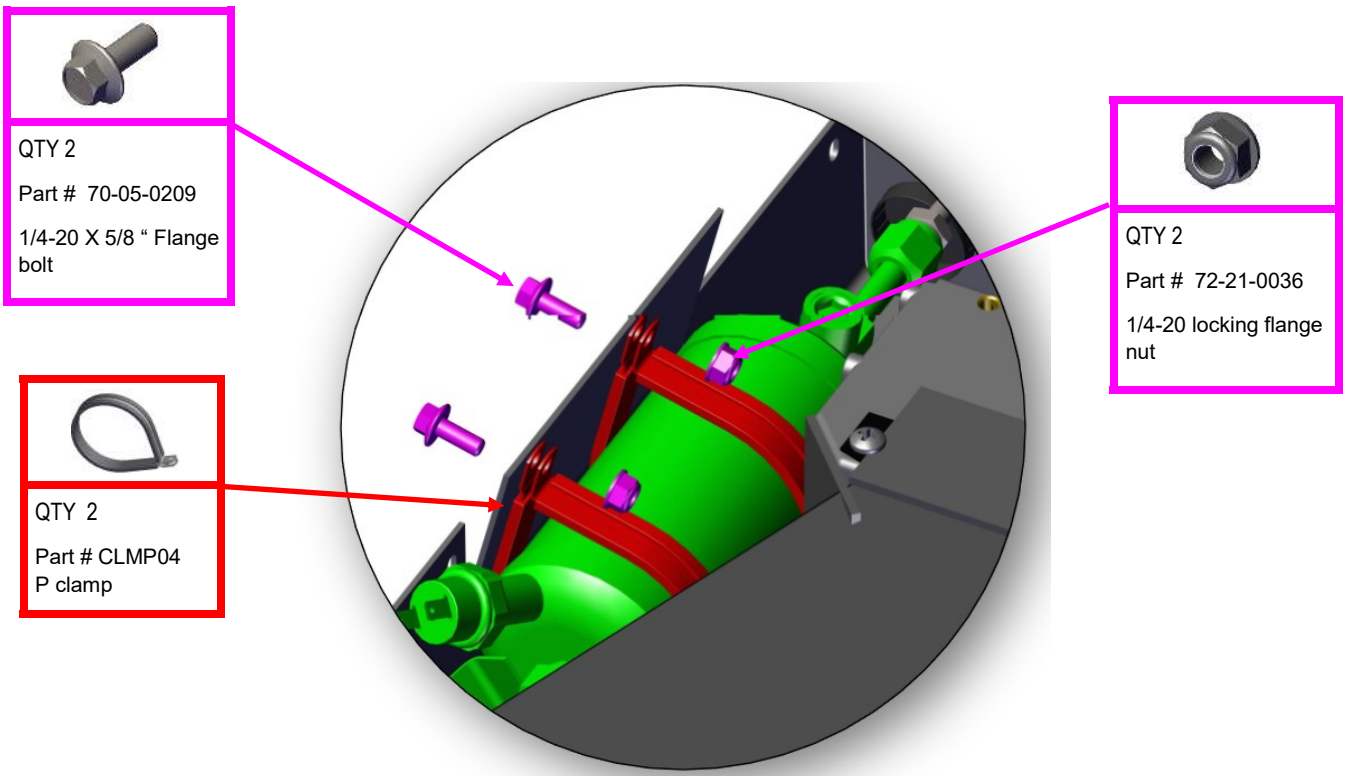
System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Installation

If a new receiver/drier is being installed, remove pressure switch port plug prior to installing into case.

Install drier with clamps into case.

Install two bolts with nuts as shown in illustration to attach clamps and drier to case.



16. RECEIVER/DRIER

Tools

3/8” Open/ Box End Wrench
5/8” Open/ Box End Wrench
7/16” Open/ Box End Wrench
3/4” Open/ Box End Wrench

System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Installation

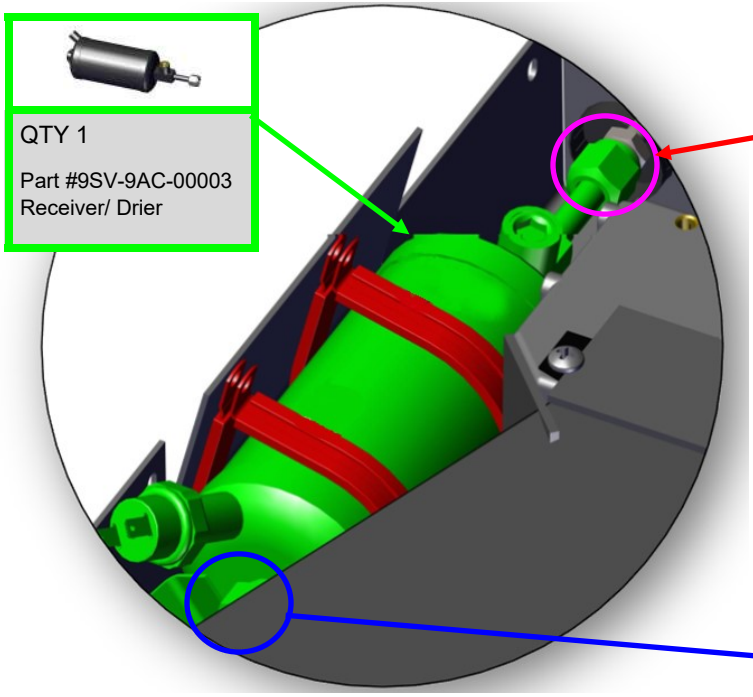
Ensure fittings and ports are clean, install new O-rings on fittings, and coat with ZEROL ESTER 68SL oil.

Install condenser to drier #6 fitting from inlet side of drier (next to pressure switch).

Install drier to evaporator control valve #6 fitting from outlet side of drier (next to sight glass).

If pressure switch was removed, follow instructions for pressure switch installation.

If repair is complete, Vacuum and Charge system, per section 13 in this manual.

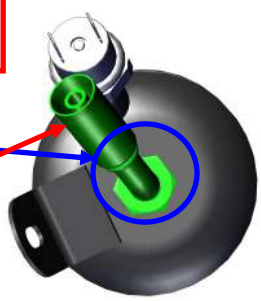


QTY 1

Part #9SV-9AC-00003
Receiver/ Drier

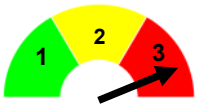
Use caution installing fitting, as aluminum hose fitting is a fixed male O-ring. To install, tighten Black nut on drier with 3/4” wrench holding aluminum fitting nut in place with 5/8” wrench.

Replace O-rings with new parts



Orientation of #6 inlet hose fitting, install fitting from drier using 3/4” wrench

17 COMPRESSOR



Tools

EPA Certified R134a Recovery, Recycle,
Recharge refrigerant handling equipment.

System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Function

The compressor used in this system is an electric scroll type compressor. It has no seals exposed to the atmosphere, and is not serviceable. If the compressor fails, it must be replaced as an assembly. The Receiver/Drier must also be replaced when installing a new compressor. A new compressor is shipped with the appropriate amount of oil for the unit in it. Do not add the amount of recovered oil to the system if replacing the compressor and receiver Drier.

The compressor is controlled by an onboard controller. To test functionality, the red wire of the compressor's 6-pin gray connector can be connected to the black wire of that same connector to activate the compressor. This wire can be jumped to test run the compressor for 10 seconds. In order to do so, the main compressor Power and Ground wires must be connected and have at least 12 Volts on them. The compressor's safety circuit will turn off the compressor at 11.2 volts to protect itself.

Removal

Evacuate system per section 13 of this manual.

Installation and removal procedures in this section are listed separately in a specific order.

Do not tilt A/C unit except as shown on pages 10 and 11 of this manual.

Use caution to prevent contamination of compressor and/ or loss of compressor oil.

Seal compressor fittings and hose ends if system is to be left apart for more than 2 minutes.

Installation

If installing a new compressor, the Receiver/Drier must also be replaced.

Always install new O-Rings, using caution not to cut or damage them when installing on fittings and adapters.

17 COMPRESSOR STEP 1

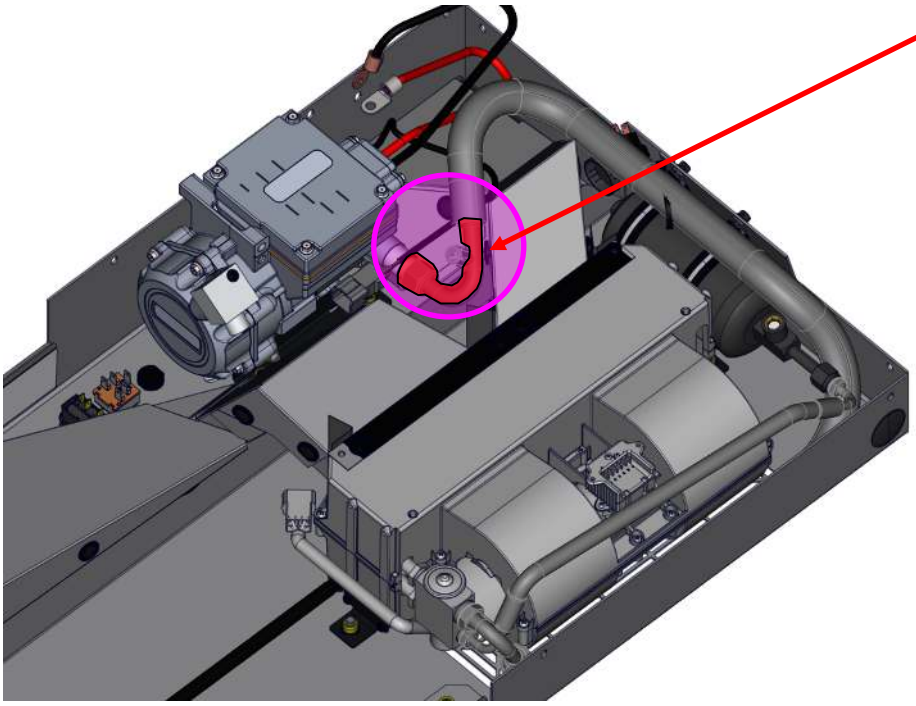
Tools

Snips

Cork tape is extremely tacky, use of gloves when removing is recommended.

Removal

Remove cork tape from area shown in red.



QTY 17 7/8”

Part #9SV-9AC-00022

Cork tape

17 COMPRESSOR STEP 2

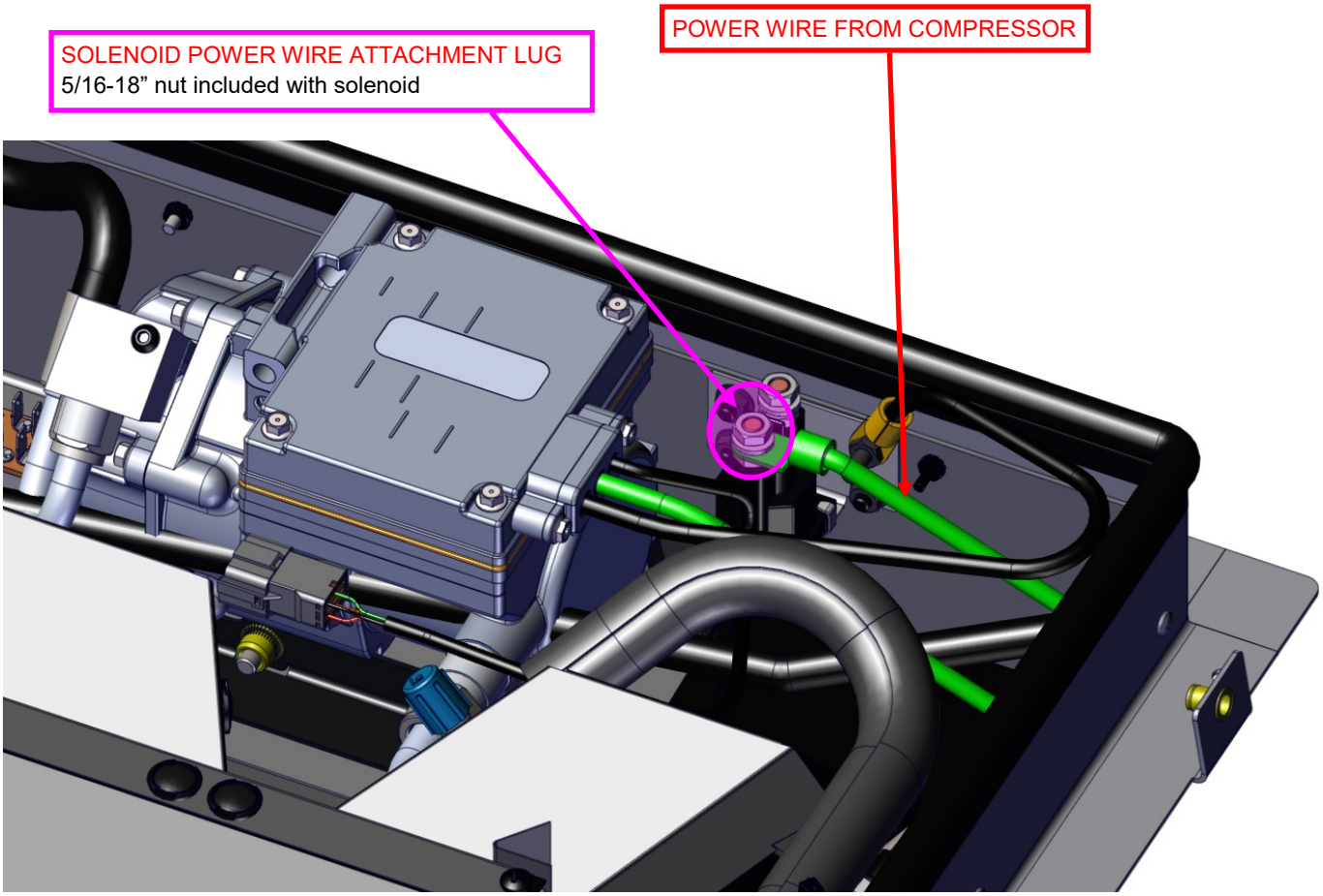
Tools

1/2” Open/Box End Wrench

Ensure battery is disconnected if performing this operation with unit on vehicle.

Removal

Remove compressor power wire from solenoid.



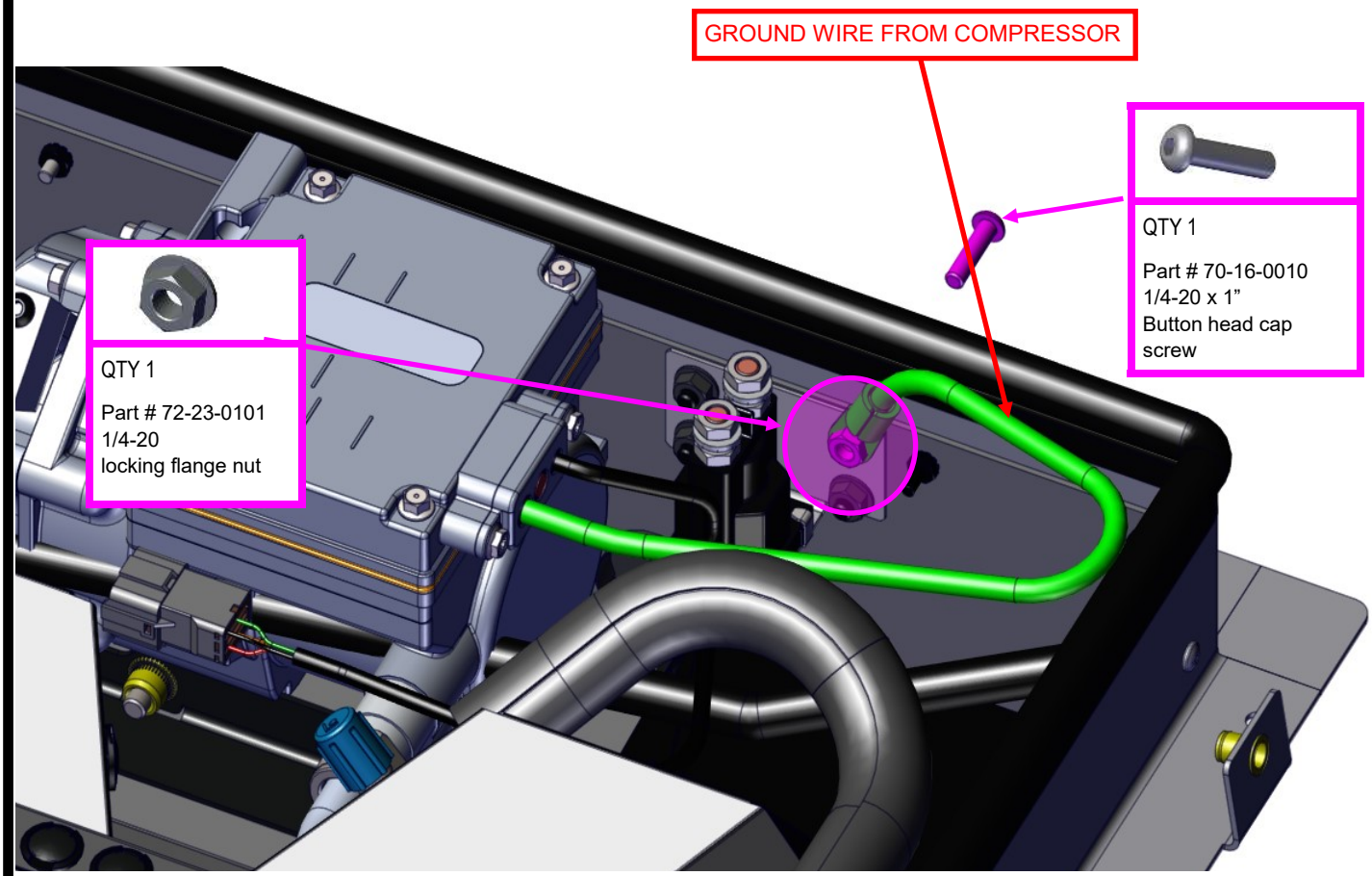
17 COMPRESSOR STEP 3

Tools

5/32” Allen socket/ wrench
7/16” Open/ box end wrench

Removal

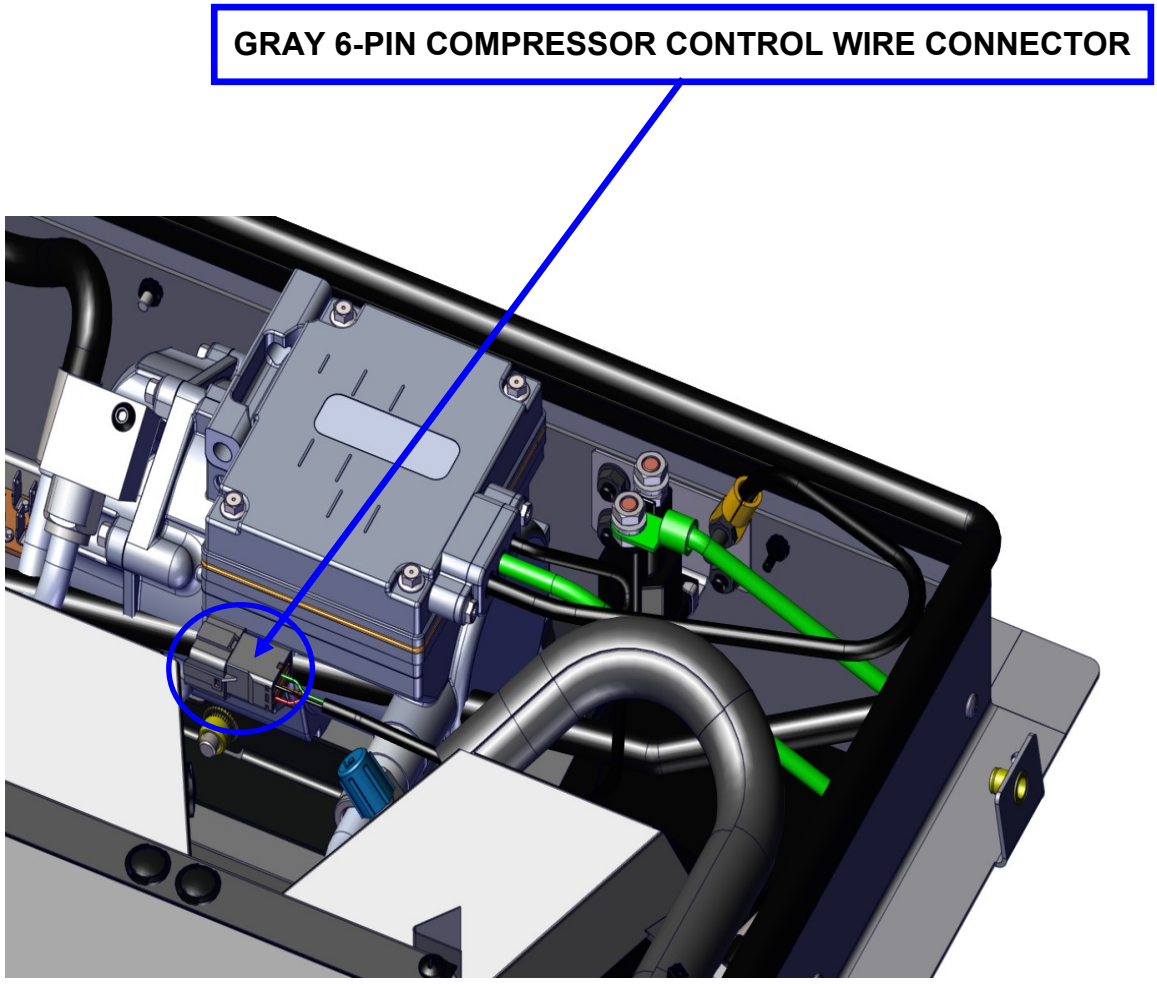
Remove compressor ground wire from ground bolt on case at solenoid mount.



17 COMPRESSOR STEP 4

Removal

Disconnect compressor control wires at gray 6-pin connector.



17 COMPRESSOR STEP 5

Tools

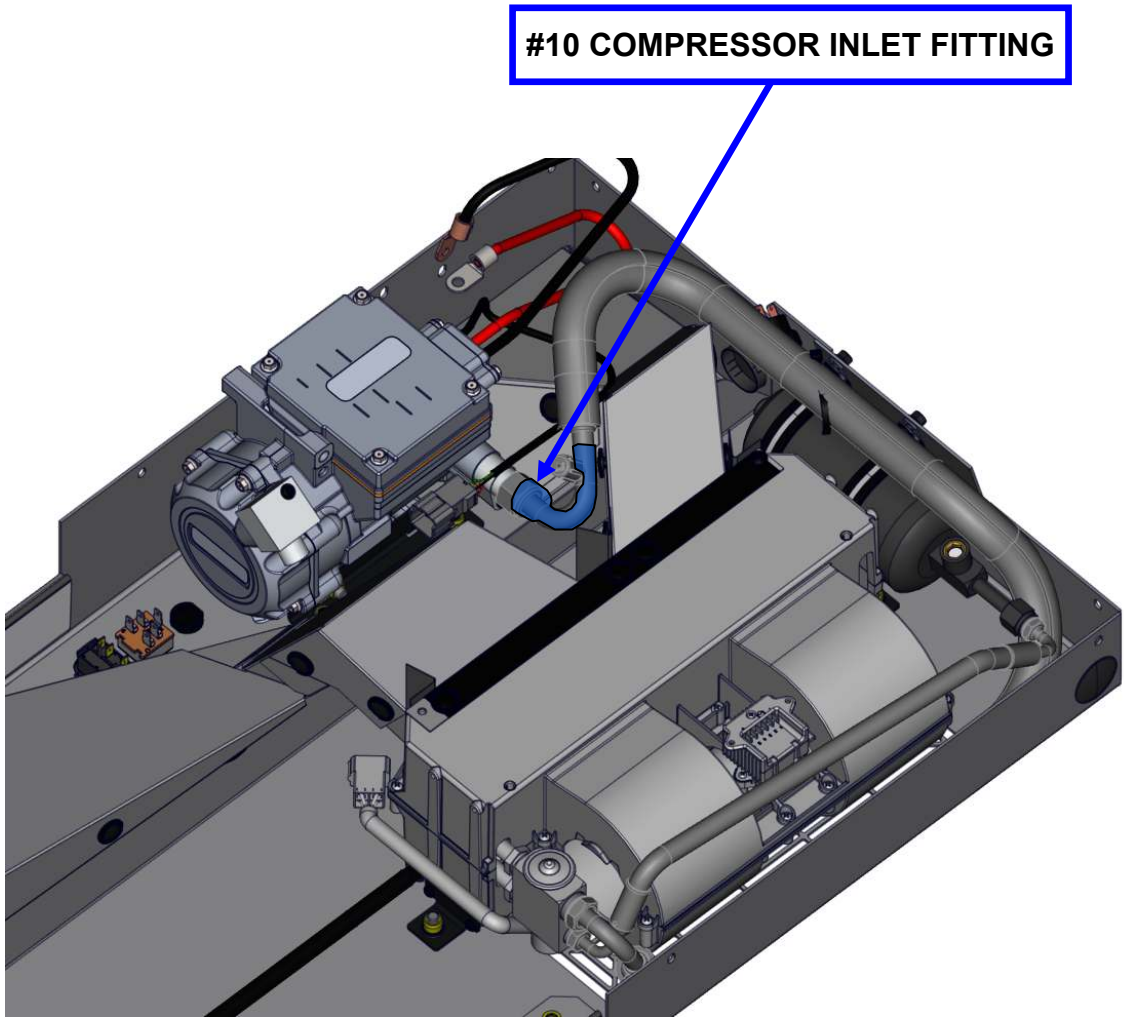
1” Open/box end Wrench

Cork tape is very tacky, use of gloves when removing is recommended.

Removal

Remove cork tape from fitting.

Remove #10 inlet fitting from compressor adapter at inlet port.



17 COMPRESSOR STEP 6

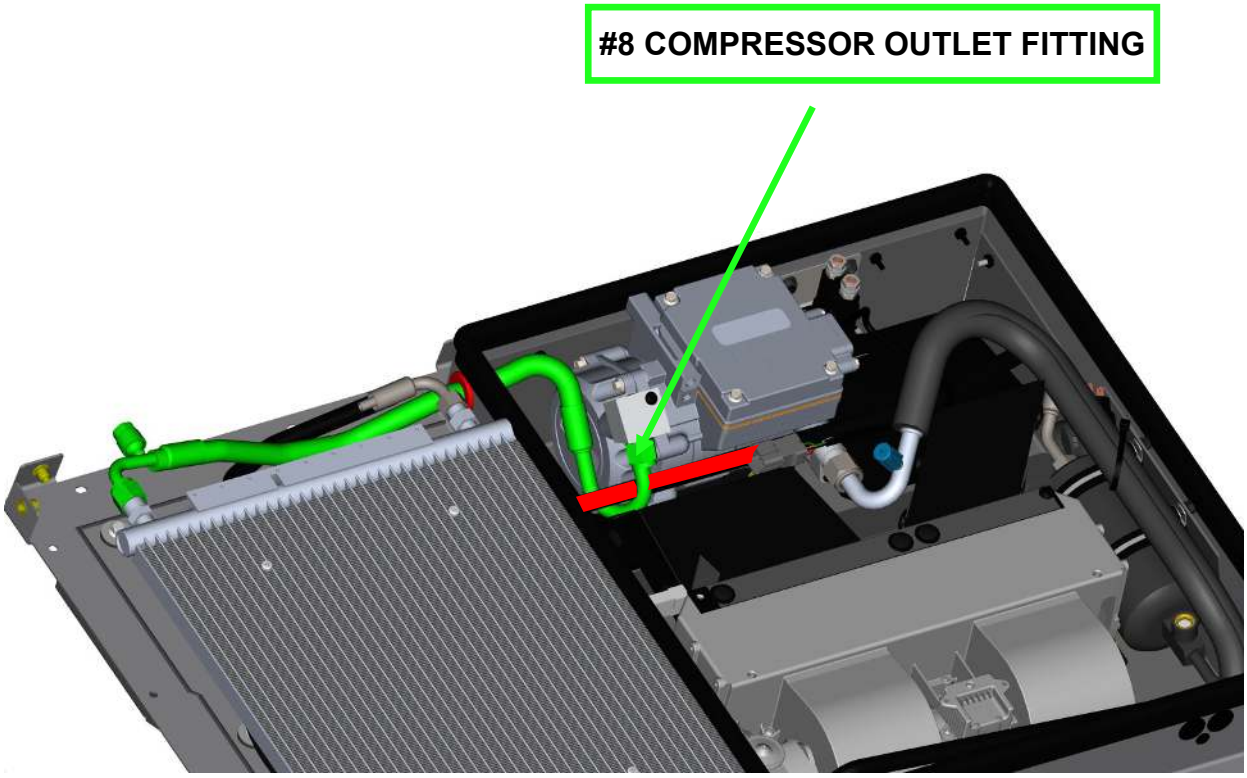
Tools

7/8” Open/ box end wrench

Note routing of hoses before removal, routing may be different than picture below.

Removal

Remove #8 compressor outlet fitting from compressor adapter at outlet port.



17 COMPRESSOR STEP 7

Tools

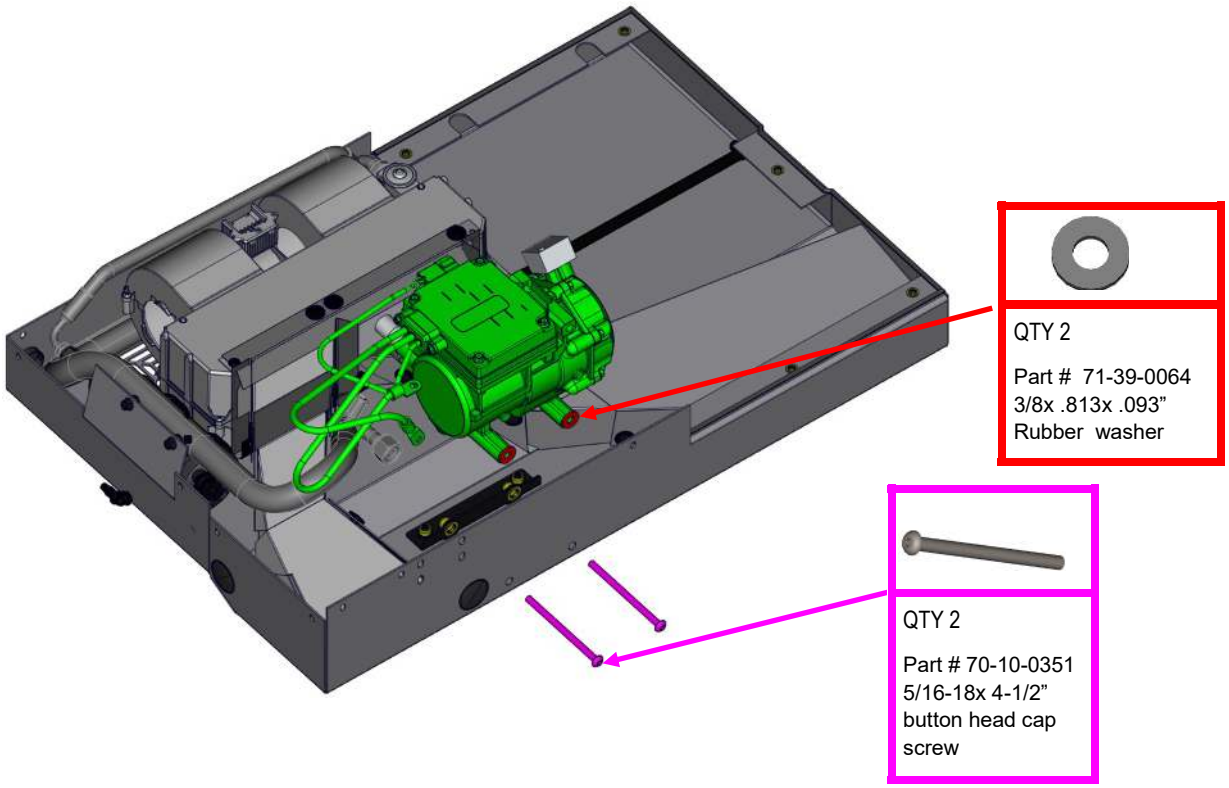
3/16” Allen wrench

Removal

Remove 2 bolts retaining compressor to case and mounting brackets from side of unit.

Remove two rubber washers located between compressor mounting lugs and case.

Remove Compressor from unit.



17 COMPRESSOR STEP 8

Tools

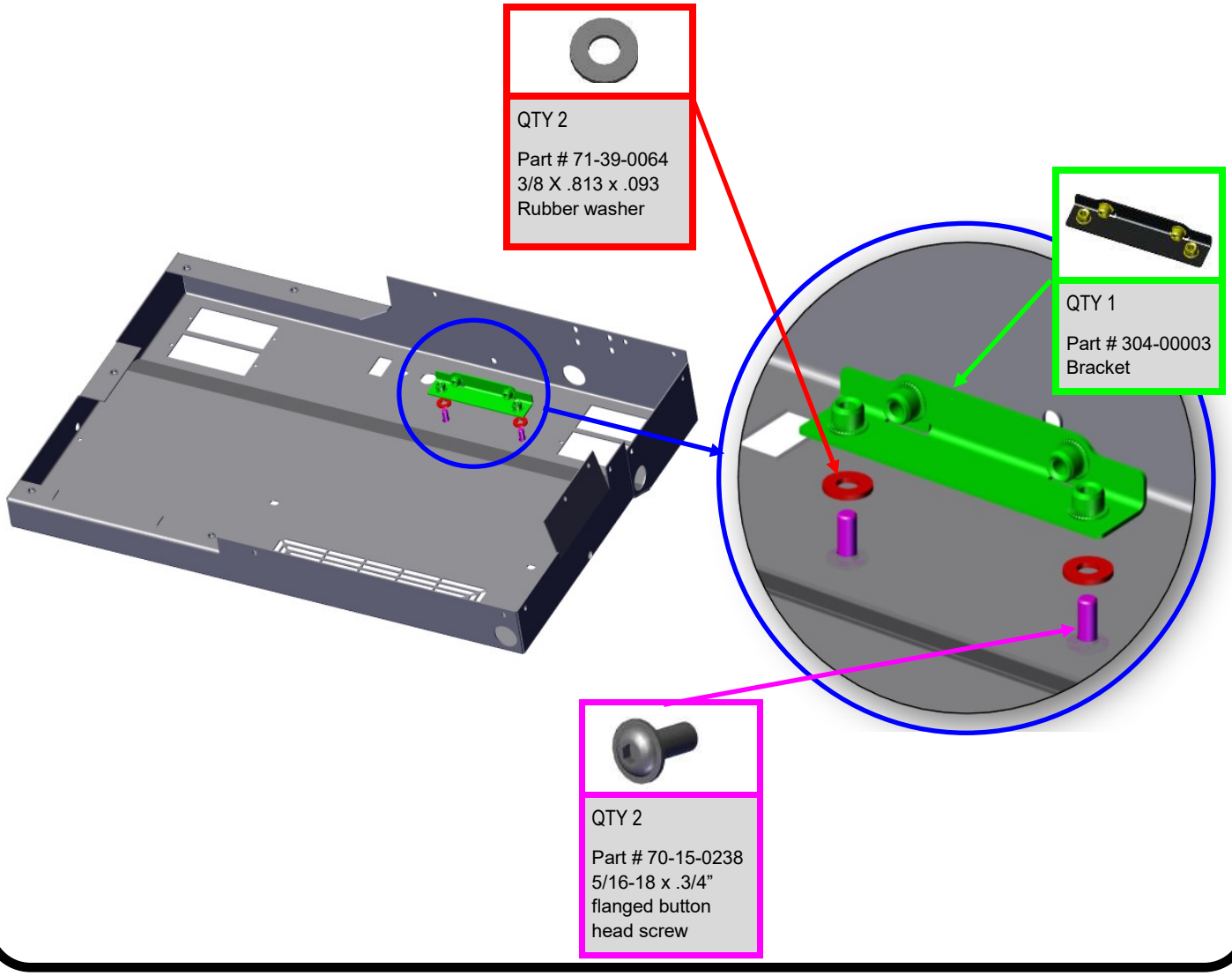
3/16” Allen wrench

Removal

Remove 2 compressor mounting bracket bolts from underside of case.

Remove compressor mounting bracket.

Remove two rubber washers located under compressor mounting bracket.



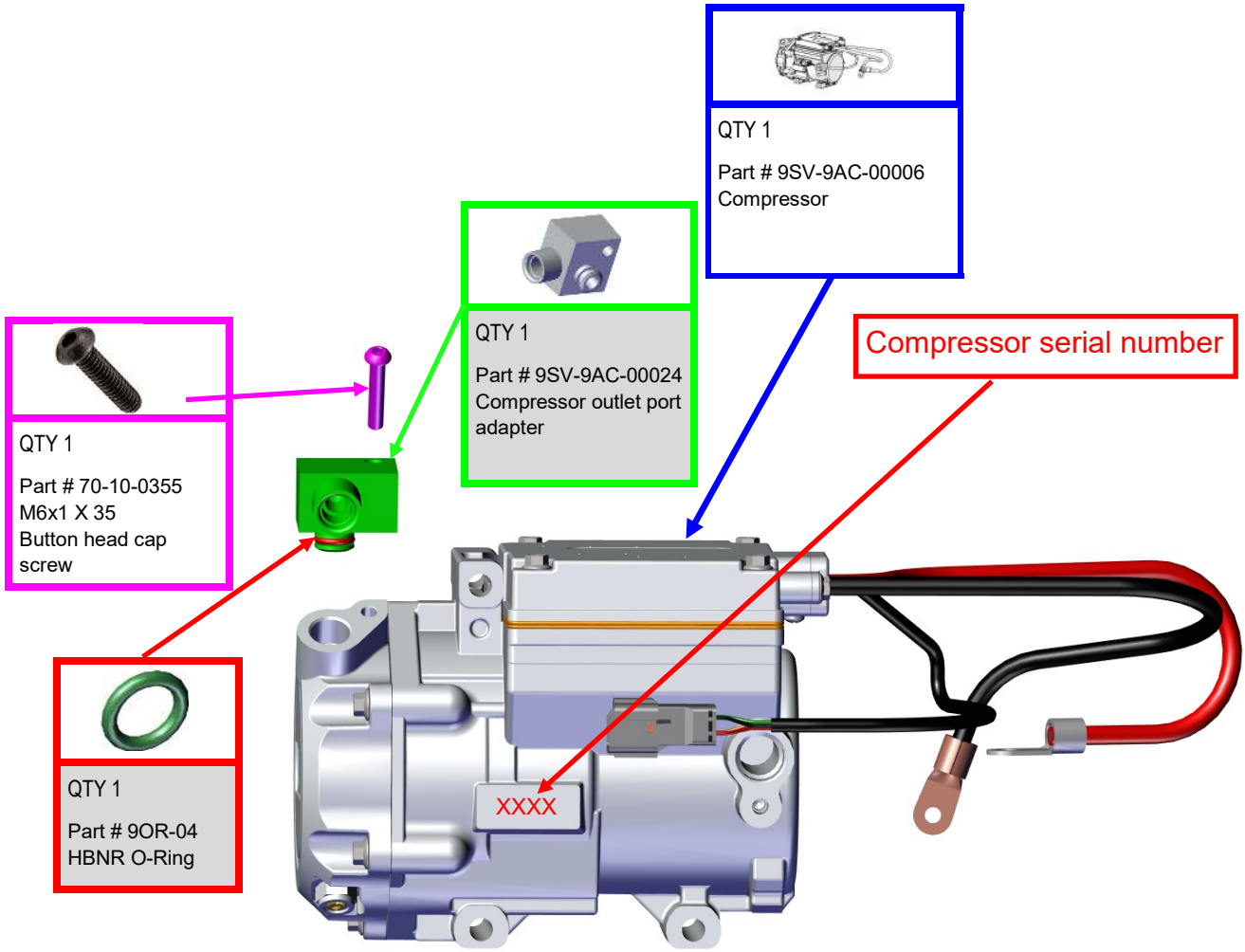
17 COMPRESSOR STEP 9

Tools

4MM Allen wrench

Removal

Remove #8 outlet port adapter from compressor.



17 COMPRESSOR STEP 10

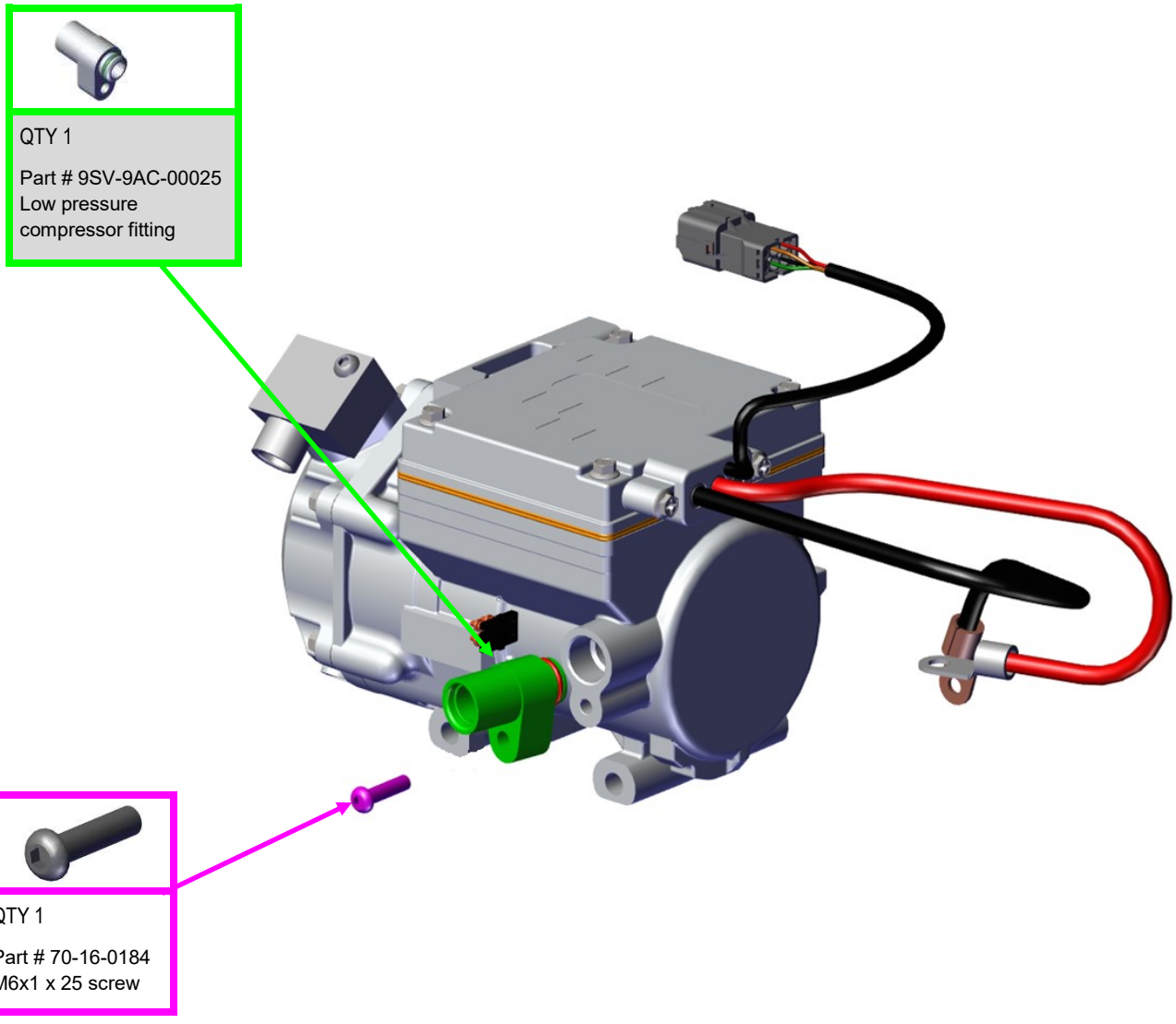
Tools

4MM Allen wrench

Removal

Remove #10 inlet port adapter from compressor.

Seal compressor fitting and hose ends if system is to be left apart for more than 2 minutes.



17 COMPRESSOR STEP 11

Tools

4MM Allen wrench

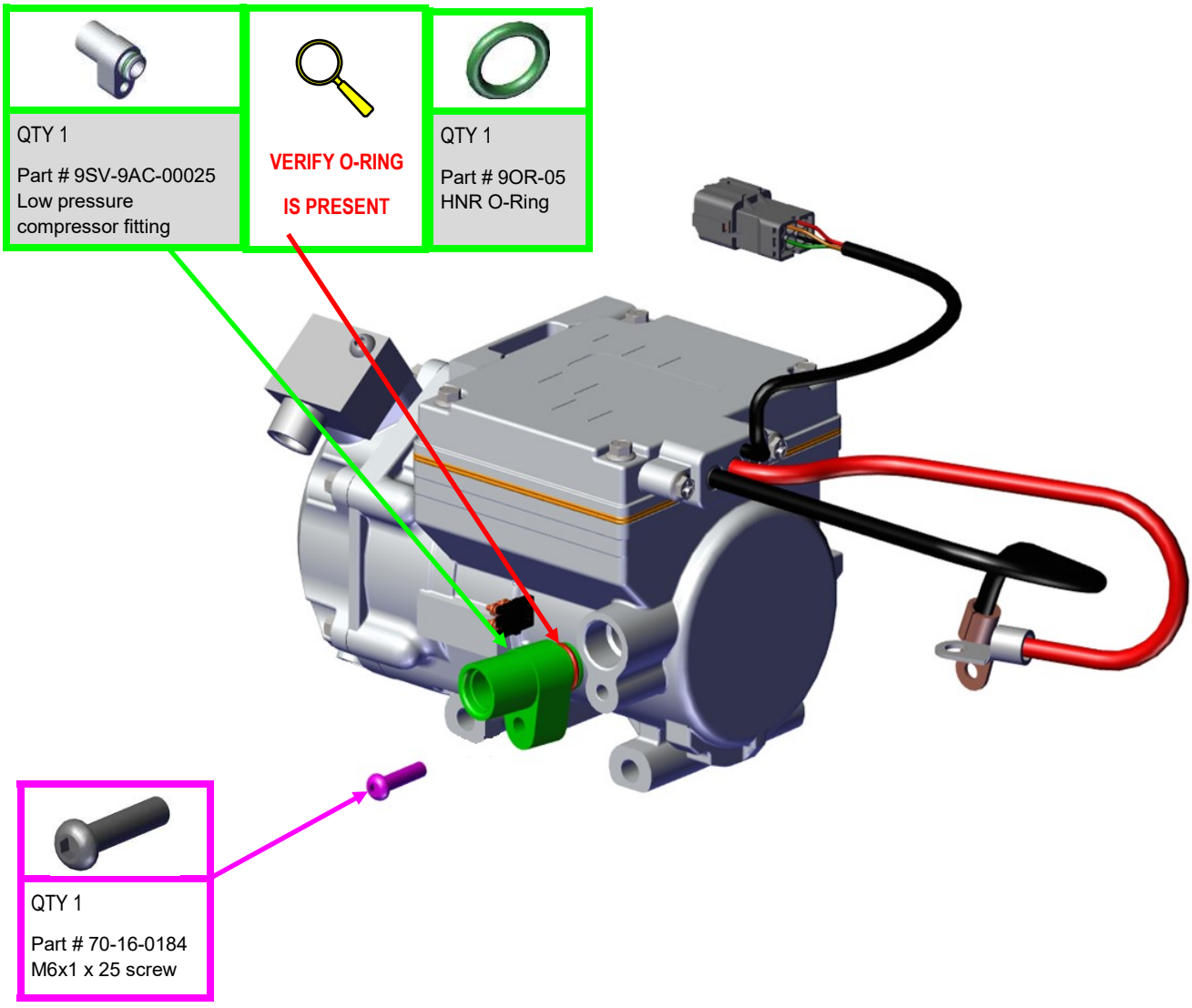
Install new O-ring.

Use caution not to damage O-ring during installation.

Installation

Ensure fitting and port is clean, install new O-ring on fitting and coat with ZEROL ESTER 68SL oil.

Install #10 inlet port adapter on compressor.



17 COMPRESSOR STEP 12

Tools

4MM Allen wrench

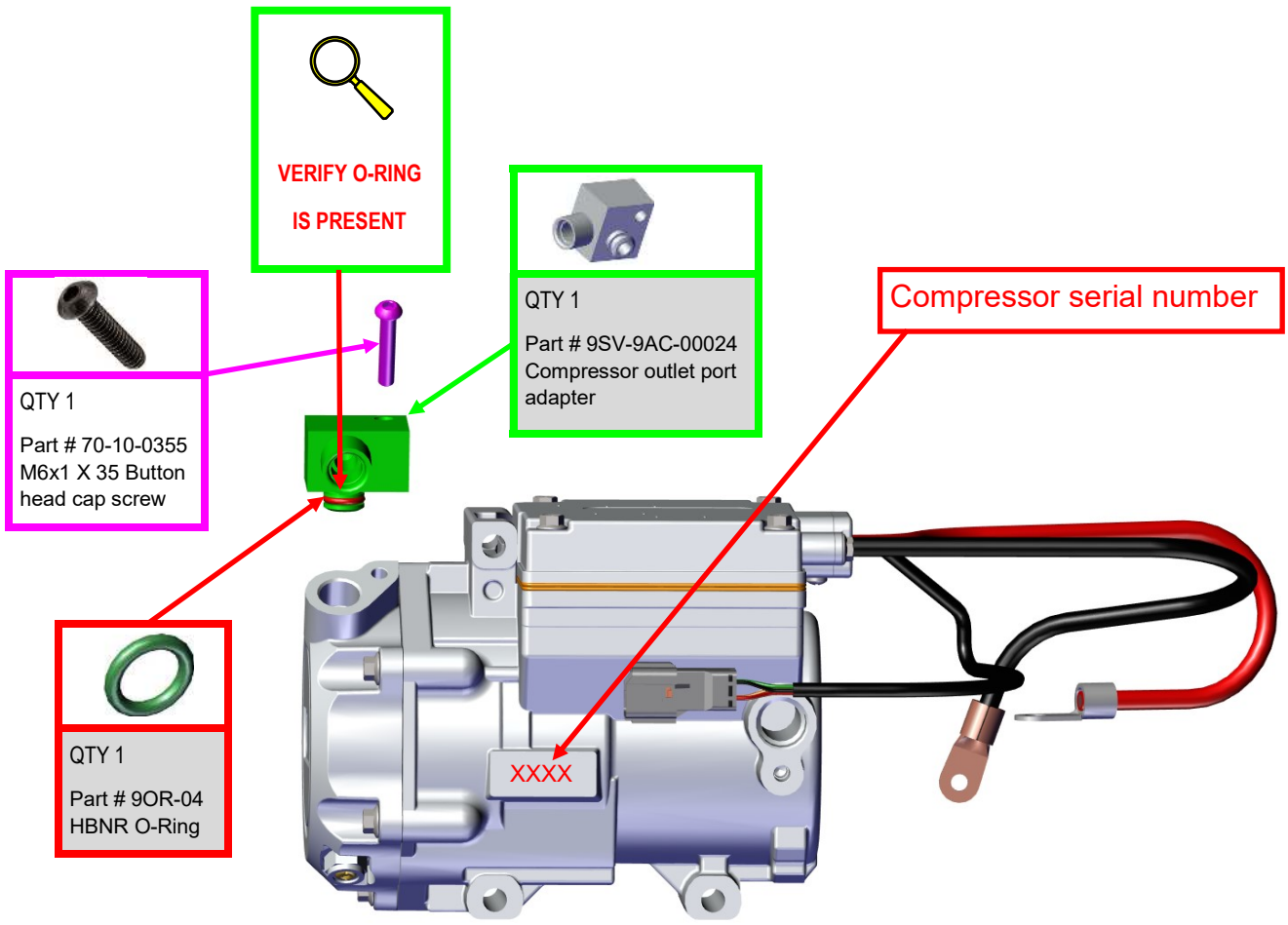
Install new O-ring.

Use caution not to damage O-ring during installation.

Installation

Ensure fitting and port are clean, install new O-ring on fitting, and coat with ZEROL ESTER 68SL oil.

Install #8 outlet port adapter on compressor.



17 COMPRESSOR STEP 13

Tools

3/16” Allen wrench

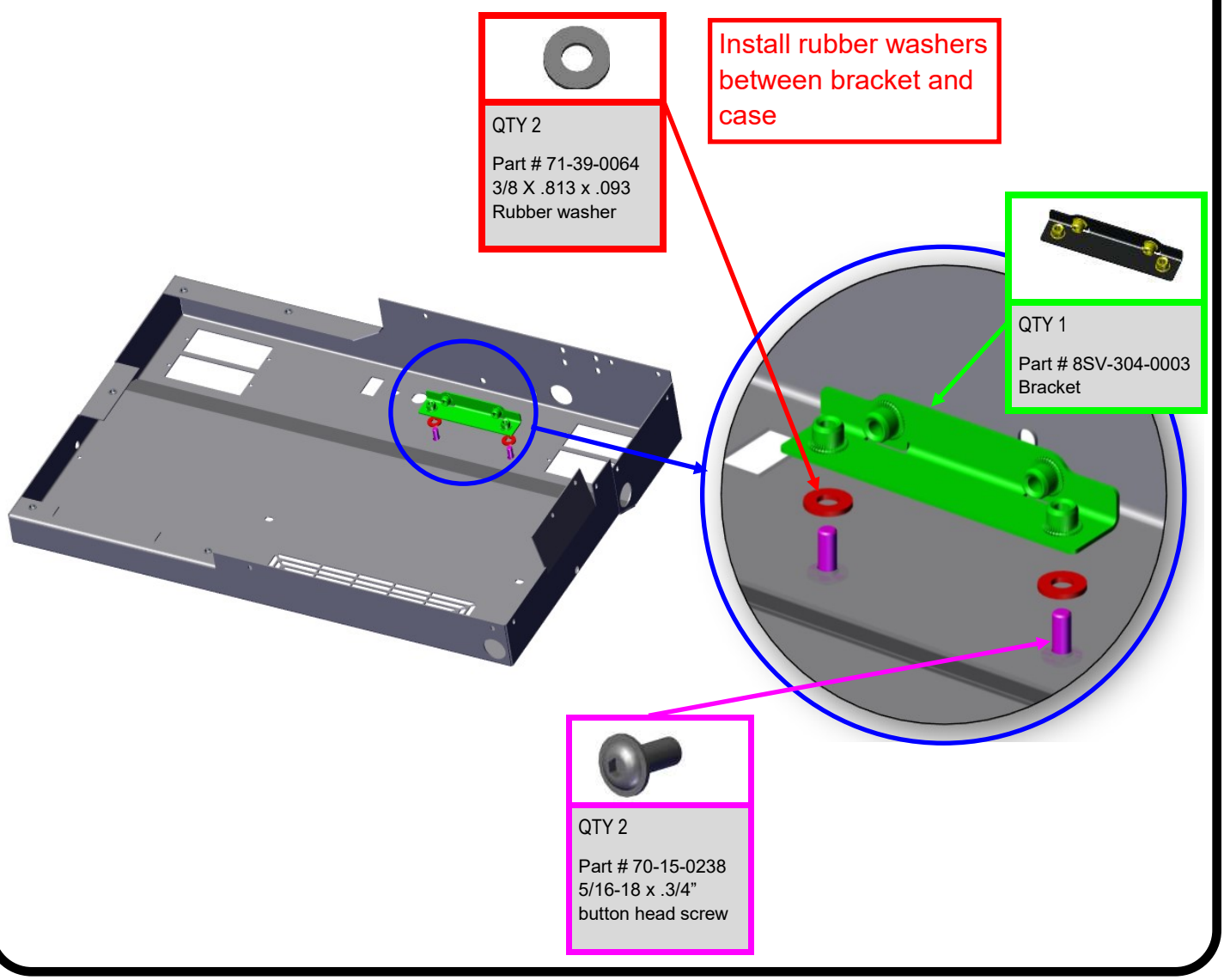
Verify that rubber washers are in place between case and compressor mounting bracket.

Install

Install two rubber washers over bracket mounting holes in case. Ensure alignment using a light amount of grease to hold washers in place.

Install compressor mounting bracket over rubber washers.

Install 2 compressor mounting bracket bolts from underside of case, threading into inserts in compressor bracket. Do not tighten at this time.



17 COMPRESSOR STEP 14

Tools

3/16” Allen wrench

Verify that rubber washers are in place between case and compressor mounting lugs.

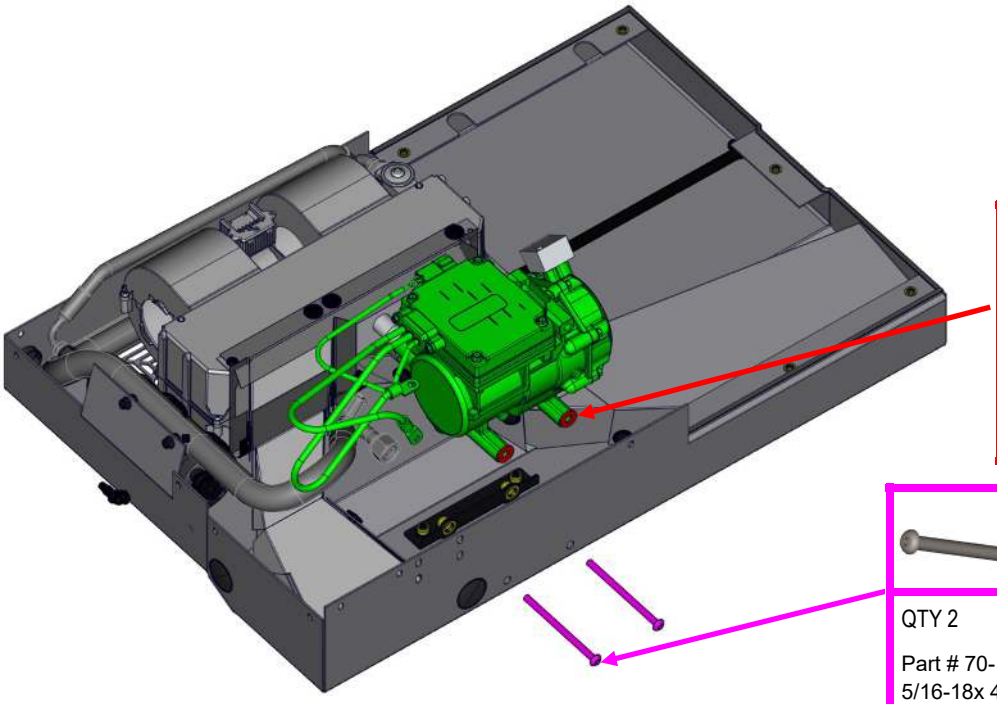
Installation

Install compressor into case between compressor mounting bracket and wall of case.

Install 2 rubber washers between compressor mounting lugs and case wall.

Install 2 bolts thru side of case, compressor mounting lugs, and into threads in compressor mounting brackets from side of unit. Be certain rubber washers are in place between case and compressor mounting lugs.

Install rubber washers between compressor and case



QTY 2

Part # 71-39-0064
3/8x .813x .093”
Rubber washer

QTY 2

Part # 70-10-0351
5/16-18x 4-1/2”
button head cap
screw

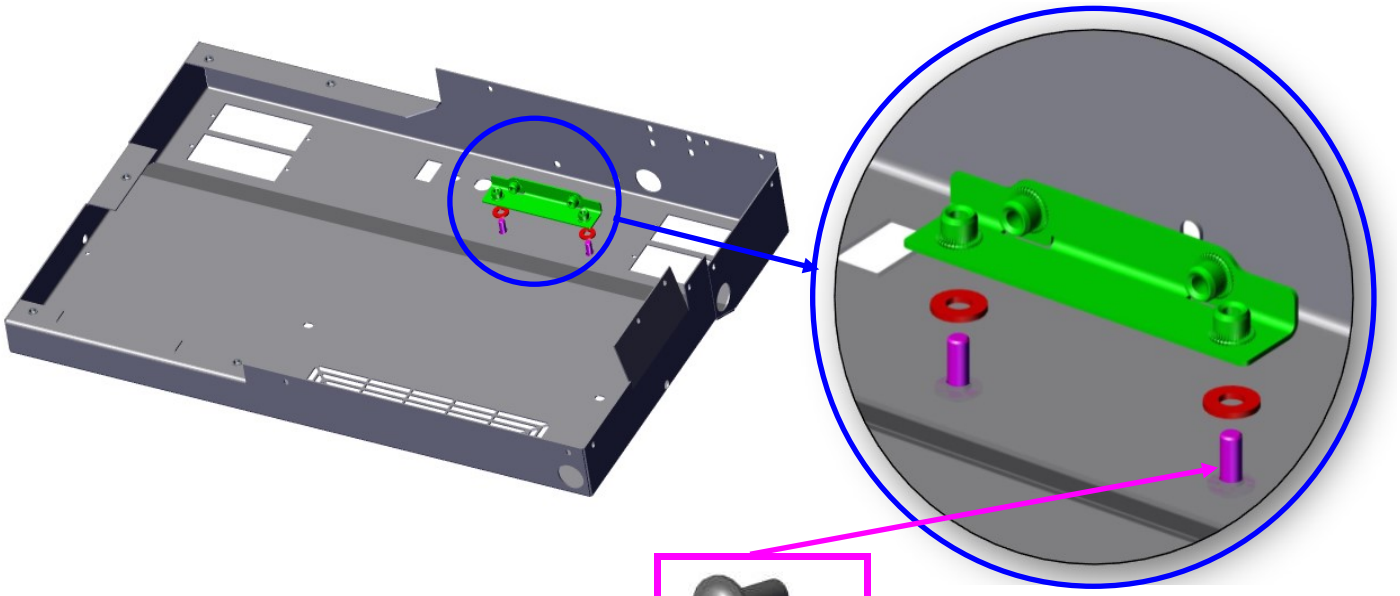
17 COMPRESSOR Step 15

Tools

3/16” Allen wrench

Installation

Tighten 2 compressor mounting bracket screws.



QTY 2

Part # 70-15-0238
5/16-18 x .3/4”
flanged button
head screw

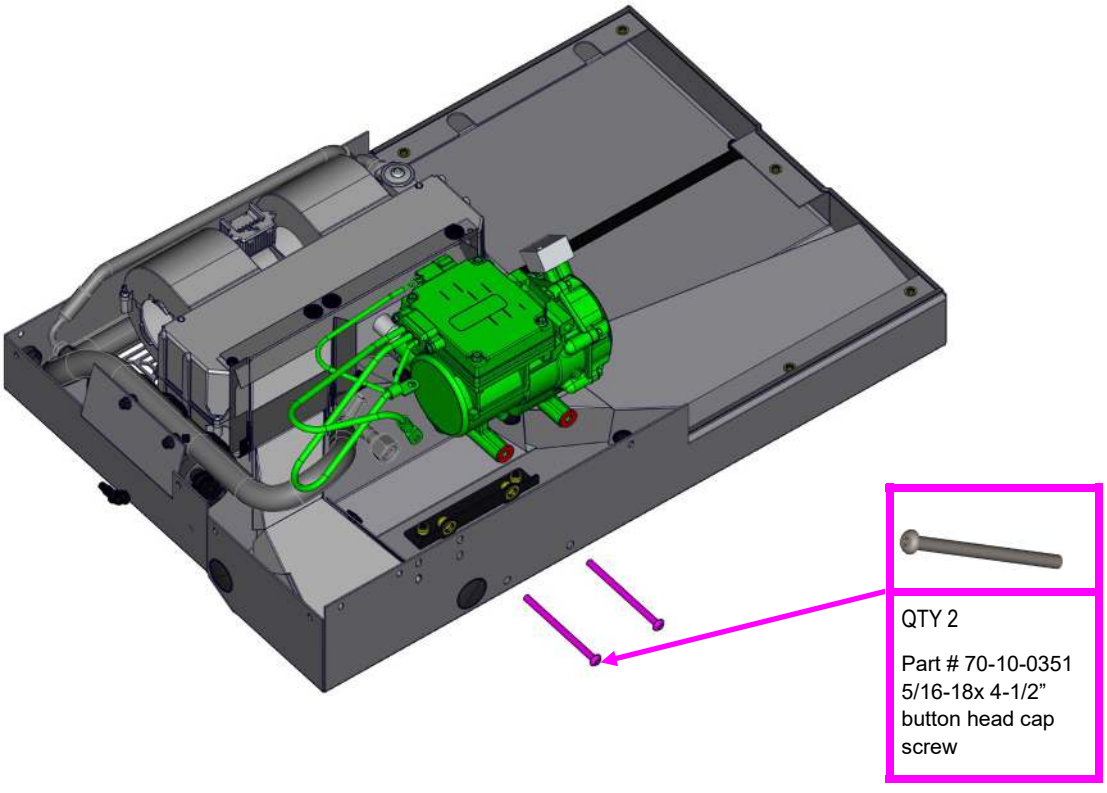
17 COMPRESSOR Step 16

Tools

3/16” Allen wrench

Installation

Tighten 2 compressor mounting screws.



17 COMPRESSOR Step 17

Tools

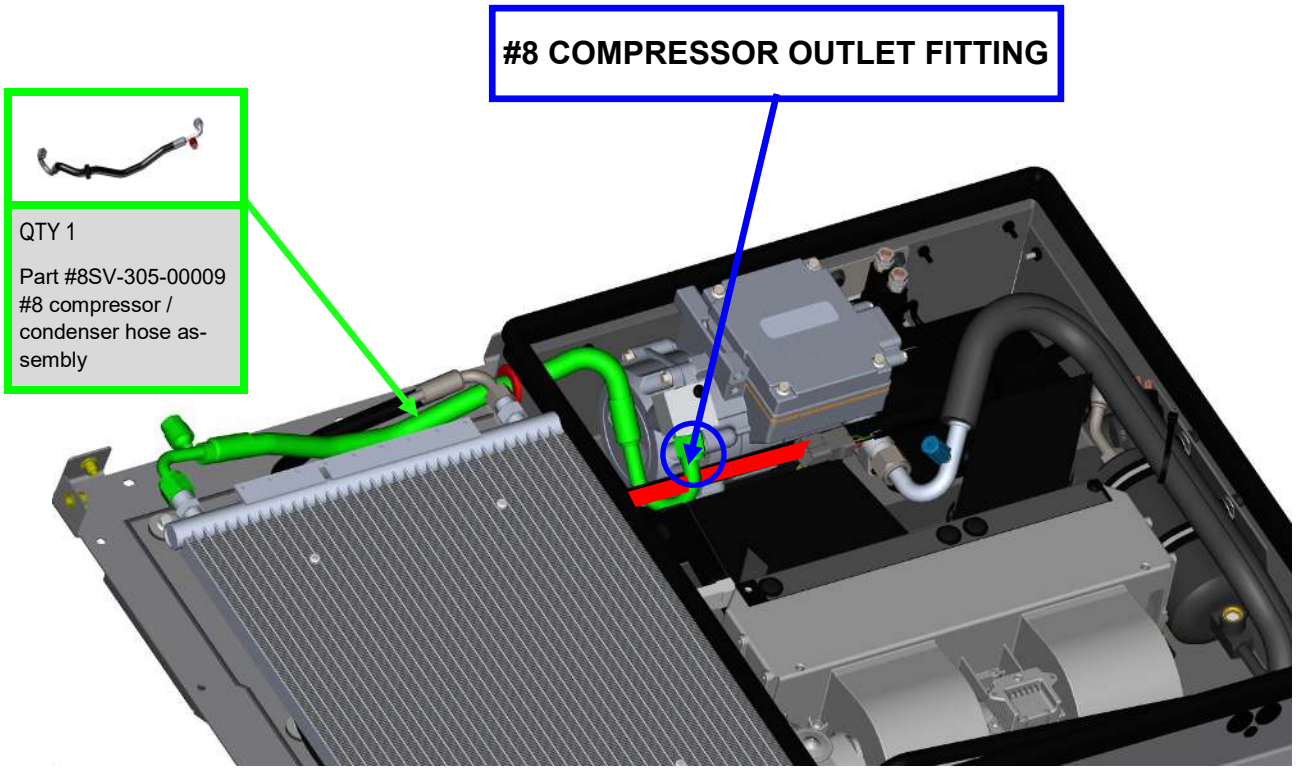
7/8” Open/ box end wrench

Route hose per position noted in step 6.

Installation

Ensure fitting and port are clean, install new O-ring on fitting, and coat with ZEROL ESTER 68SL oil.

Install #8 compressor outlet fitting onto compressor adapter at outlet port, and tighten.



17 COMPRESSOR Step 18

Tools

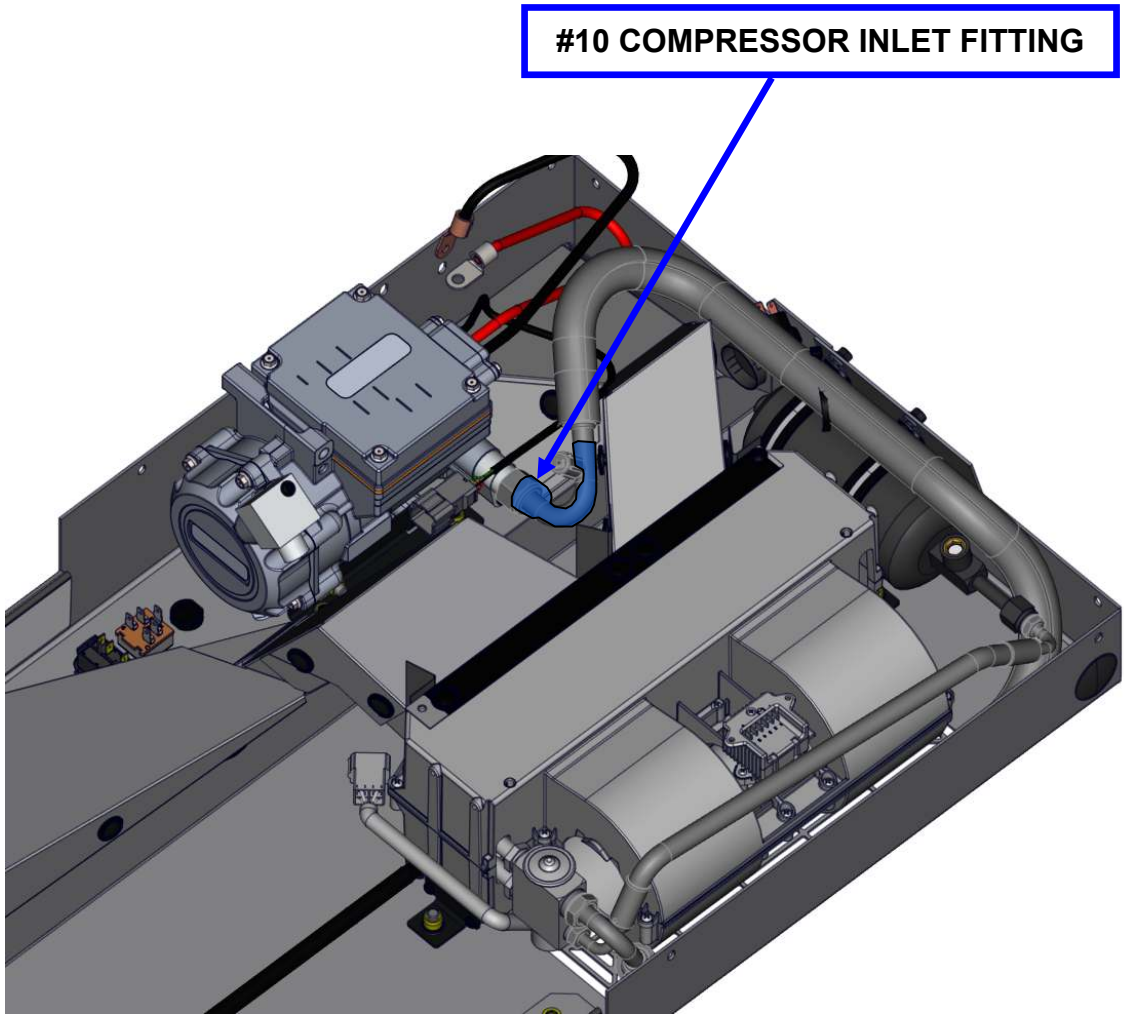
1” Open/box end Wrench

Install new O-ring.

Installation

Ensure fitting and port are clean, install new O-ring on fitting, and coat with ZEROL ESTER 68SL oil.

Install #10 inlet fitting onto compressor adapter at inlet port.

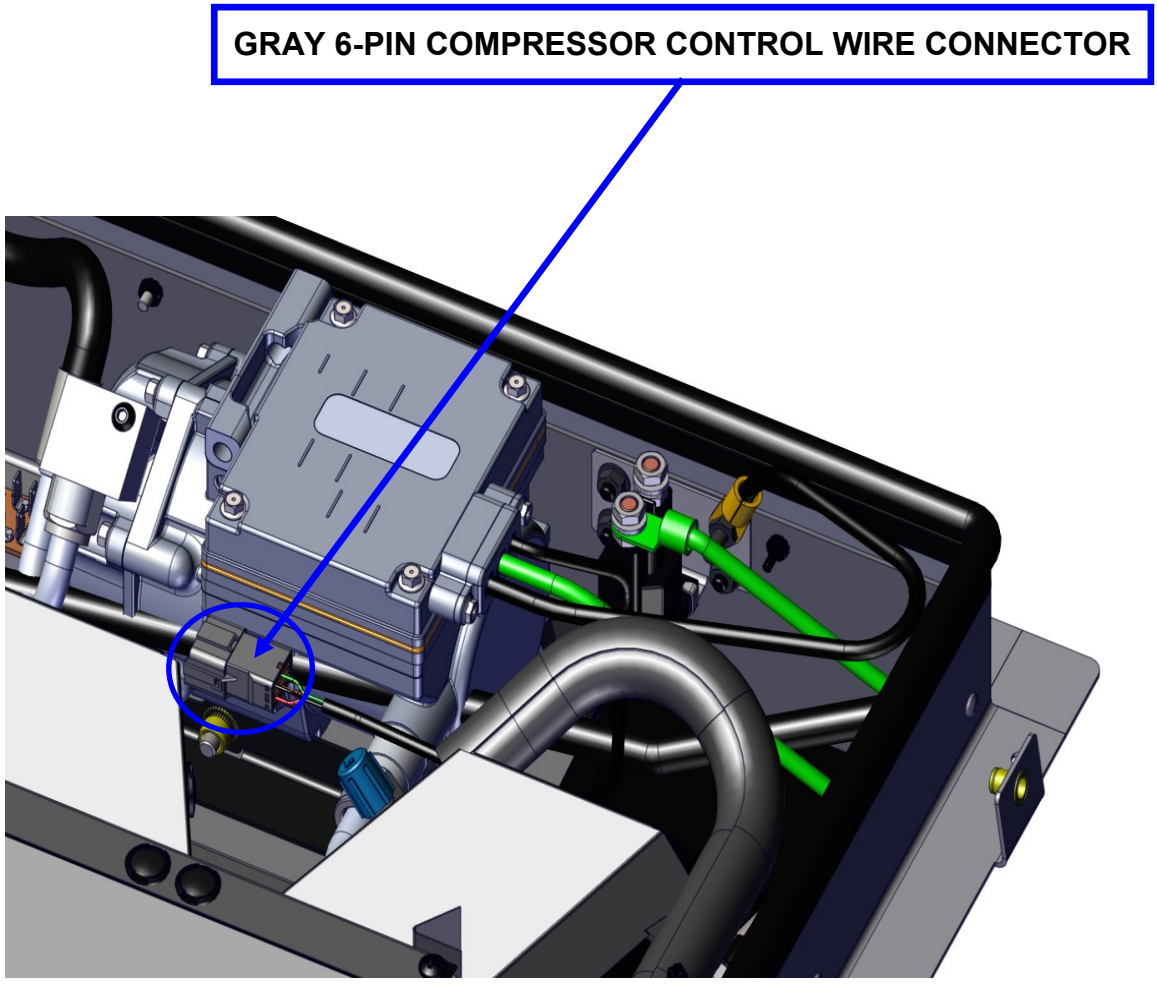


17 COMPRESSOR Step 19

Note location of connector, route wires away from sharp edges.

Installation

Connect compressor control wires at gray 6-pin connector.



17 COMPRESSOR Step 20

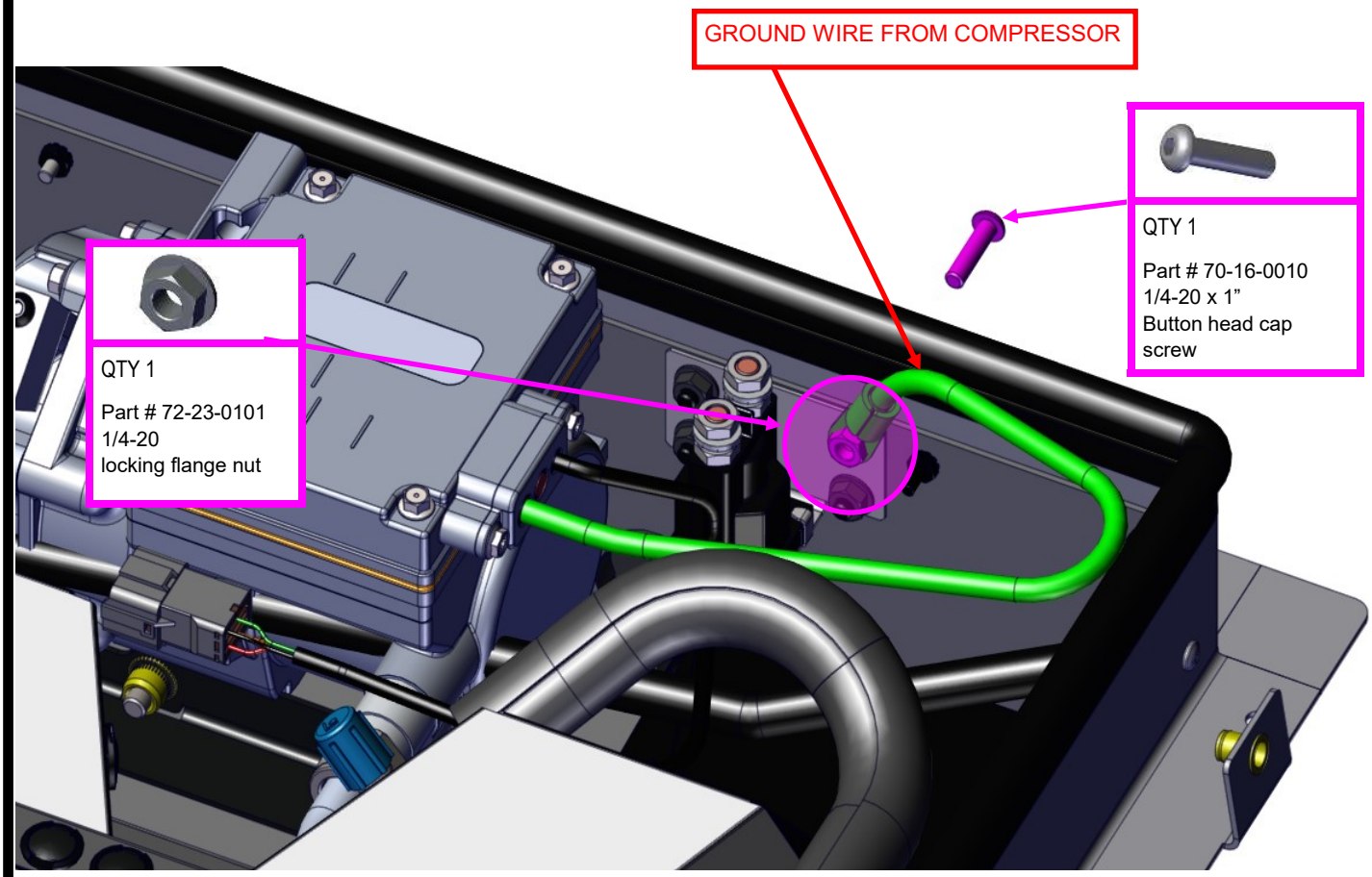
Tools

5/32” Allen wrench
7/16” Open/ box end wrench

Route wires away from sharp edges, ensure wire terminals are routed properly, and only make contact with termination point fastener. Ensure all ground wires are in place with compressor ground wire on ground bolt.

Installation

Connect compressor ground wire to ground bolt on case at solenoid mount.



17 COMPRESSOR Step 21

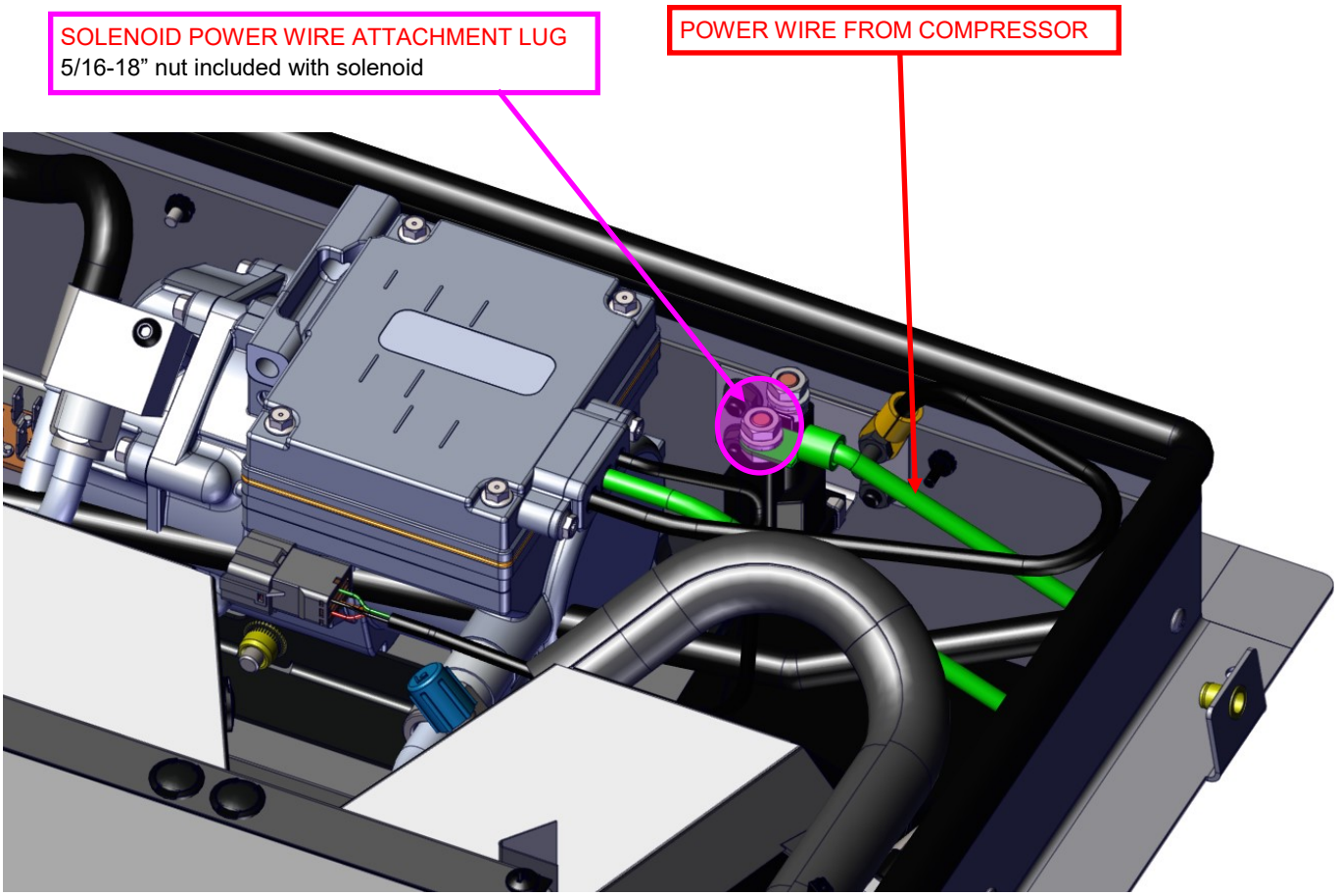
Tools

1/2” Open/Box End Wrench

Route wires away from sharp edges, ensure wire terminals are routed properly, and only make contact with termination point fastener.

Installation

Install compressor power wire onto solenoid.



17 COMPRESSOR Step 22

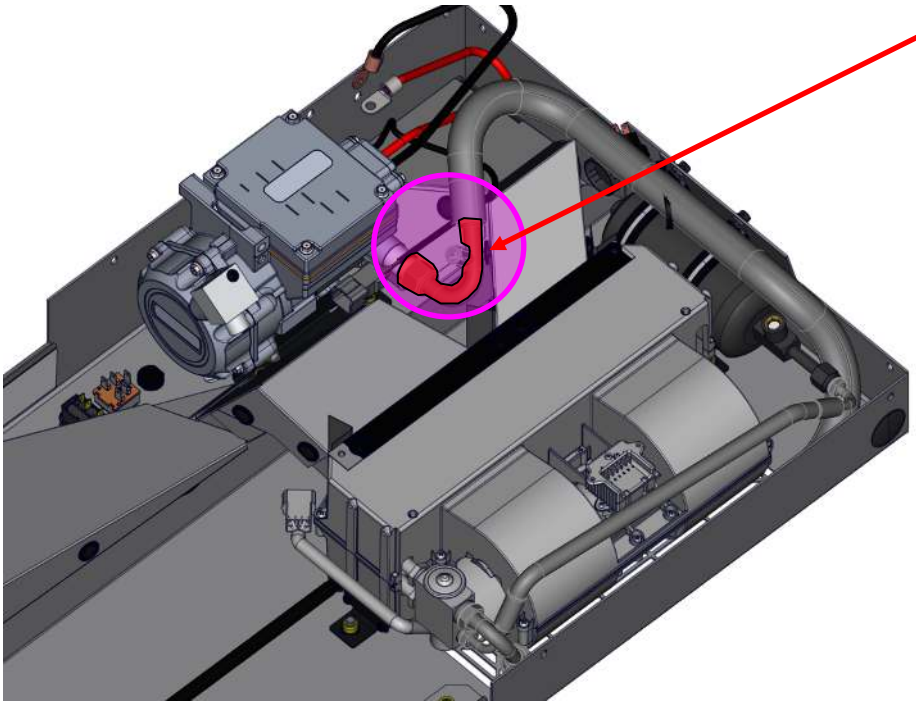
Tools

Snips

Cork tape is very tacky, use of gloves when removing is recommended.

Installation

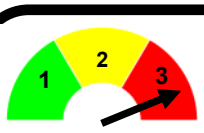
Install cork tape over area shown in red, being certain to cover all exposed metal of fitting.



QTY 17 7/8”

Part #9SV-9AC-00022

Cork tape



17 COMPRESSOR Step 23

Tools

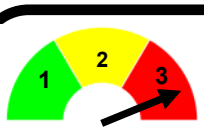
R134a Recovery machine

System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Installation

If repair is complete, reinstall Receiver/Drier (must be new if compressor was replaced). Reinstall Pressure Switch and Condenser per appropriate sections in this manual.

Vacuum and Charge system, per section 13 in this manual.



18 EVAPORATOR BOX

Tools

R134a Recovery machine

System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Removal

System must be evacuated and have condenser removed. See sections 12 & 13 in this manual.

*Condenser, fan, and brackets can remain in place on upper case.

Evaporator core is contained in the evaporator box assembly with blower.

Use caution to prevent contamination of compressor and/ or loss of compressor oil.

Seal fittings and hose ends if system is to be left apart for more than 2 minutes.

Installation

This assembly is water tight below the core. The lines and fittings must be sealed and attached properly to prevent condensed water from leaking into passenger compartment.

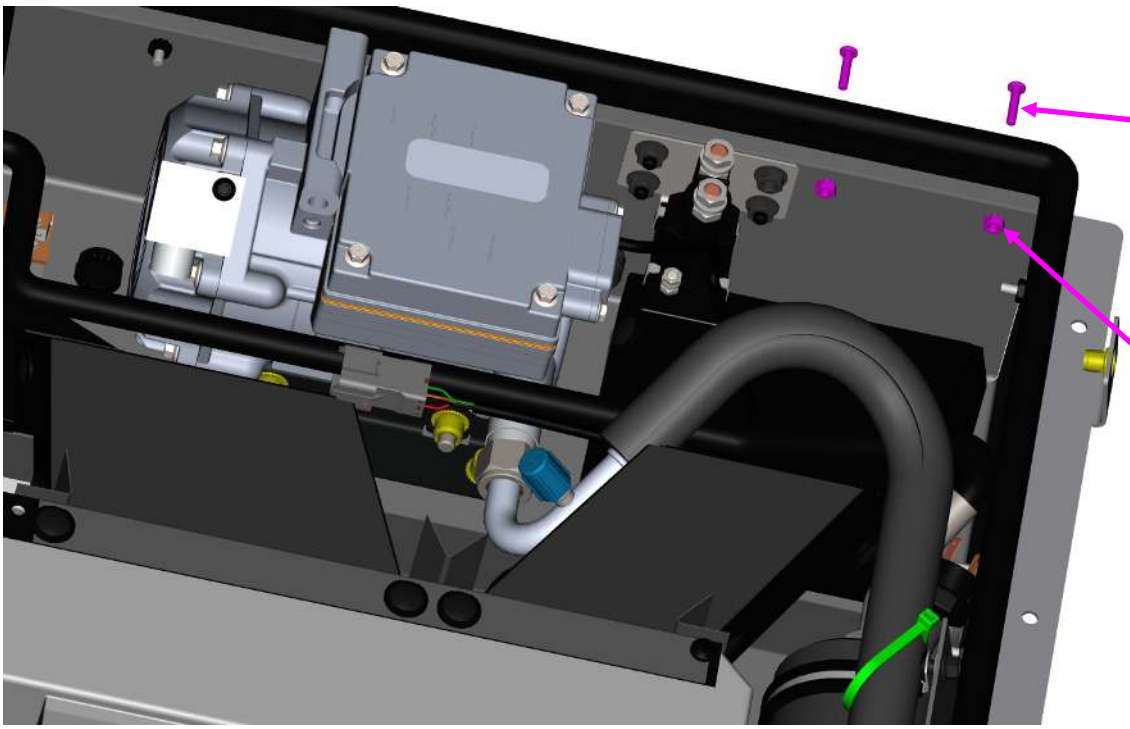
18 EVAPORATOR BOX Step 1

Tools

3/8” Open/ box end wrench
Phillips screw driver

Removal

Remove 2 controller mounting bolts, nuts, and controller (if installed).



QTY 2

Part # 70-31-0101
#8-32 Pan head machine screw

QTY 2

Part # 72-04-0100
#8-32 K-locking hex nut

18 EVAPORATOR BOX Step 2

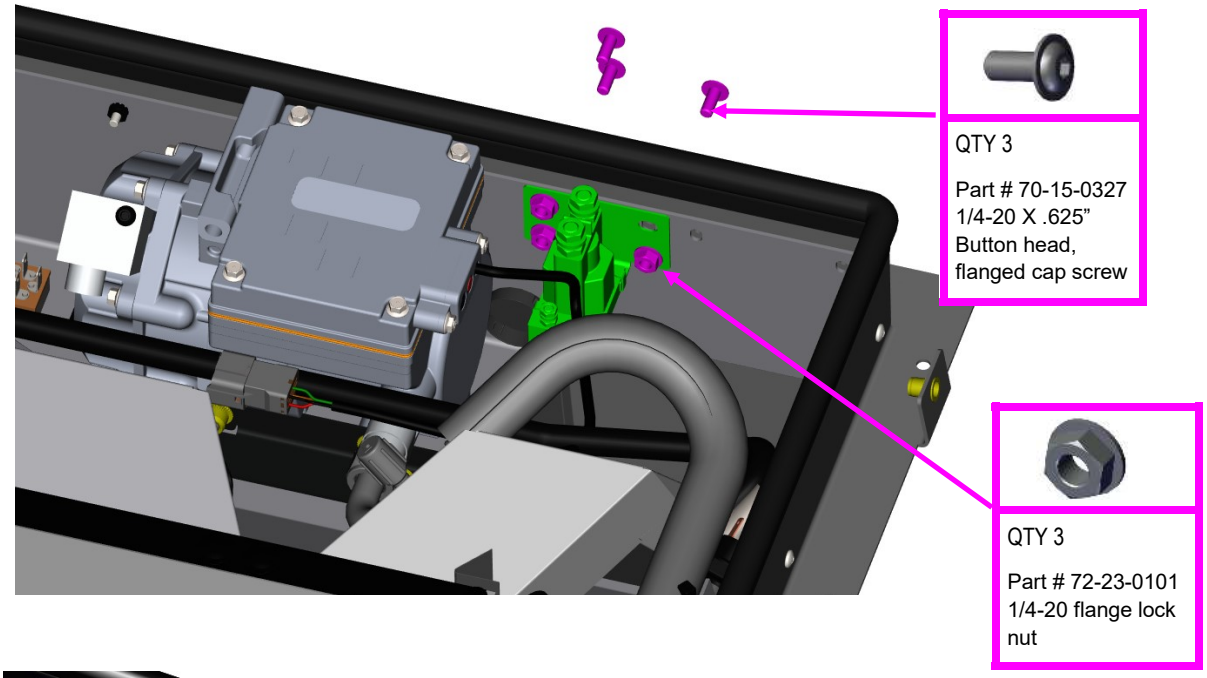
Tools

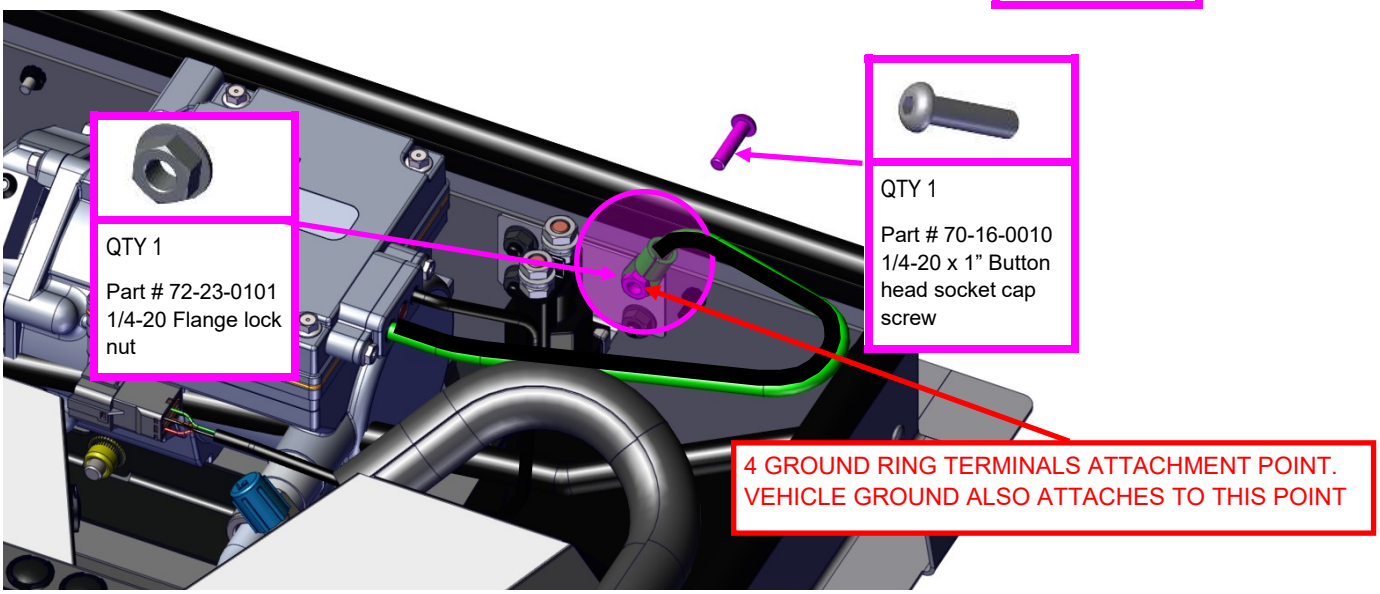
5/16” Allen wrench
7/16” open/ box end wrench

Removal

Remove 4 button head solenoid mounting bolts. Leave solenoid in place with wires attached.

Note location of ground wires being removed with upper longer solenoid mounting bolt.





18 EVAPORATOR BOX Step 3

Tools

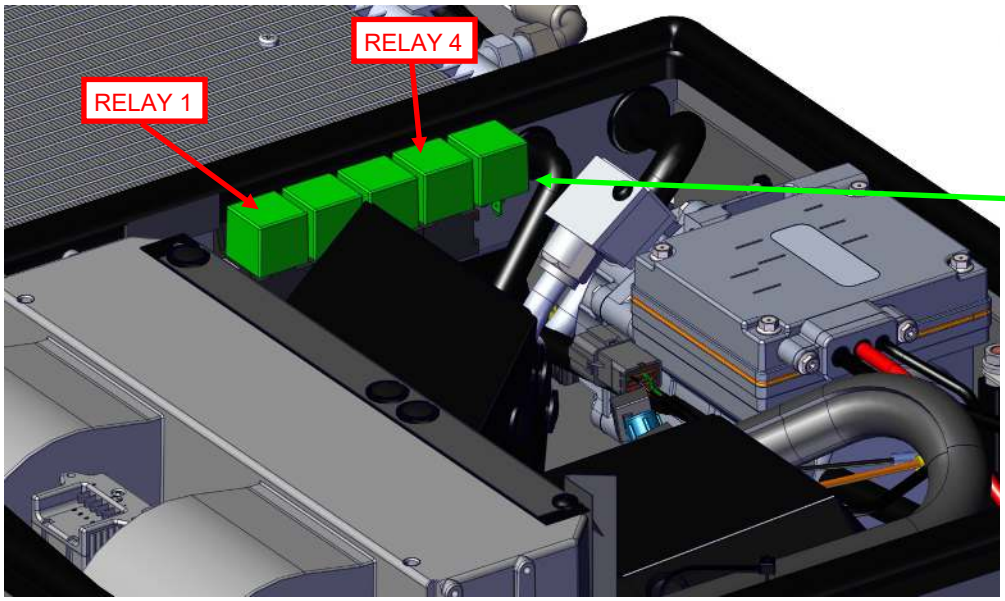
Phillips screw driver

Only relays 1 and 4 are required to be removed, other relays shown removed for clarity.

Removal

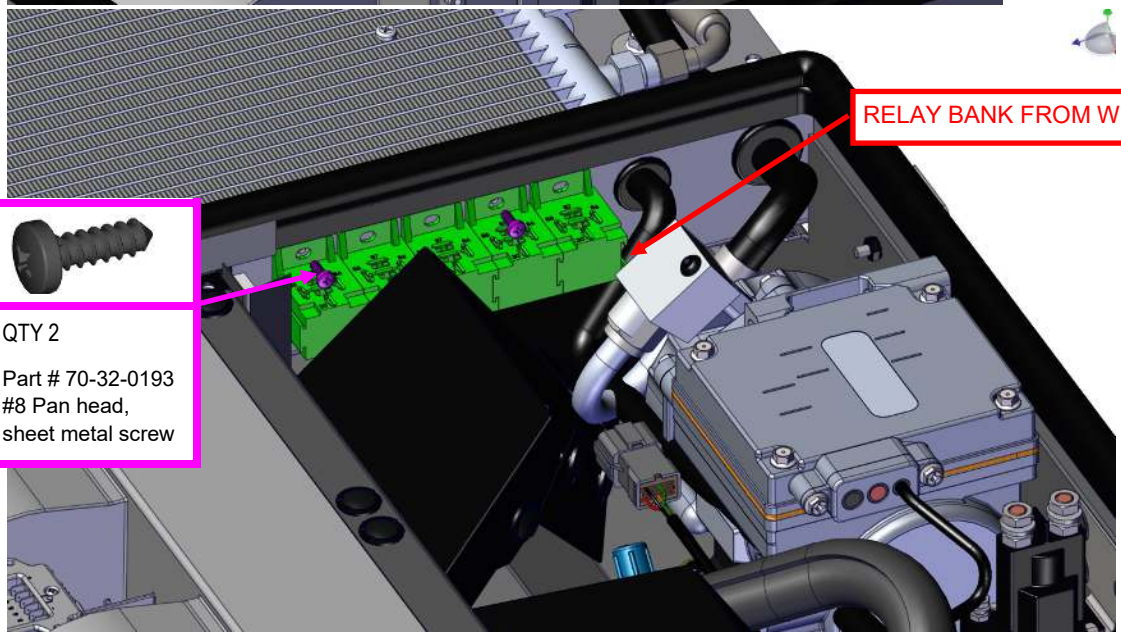
Remove relays 1 and 4 from relay bank (see illustration for relay positions).

Remove 2 relay mounting screws, allowing relay bank to fall away from case.



Relays QTY 5

Part 9SV-85-01-0022 12V 20/40A SPDT relay



QTY 2

Part # 70-32-0193 #8 Pan head, sheet metal screw

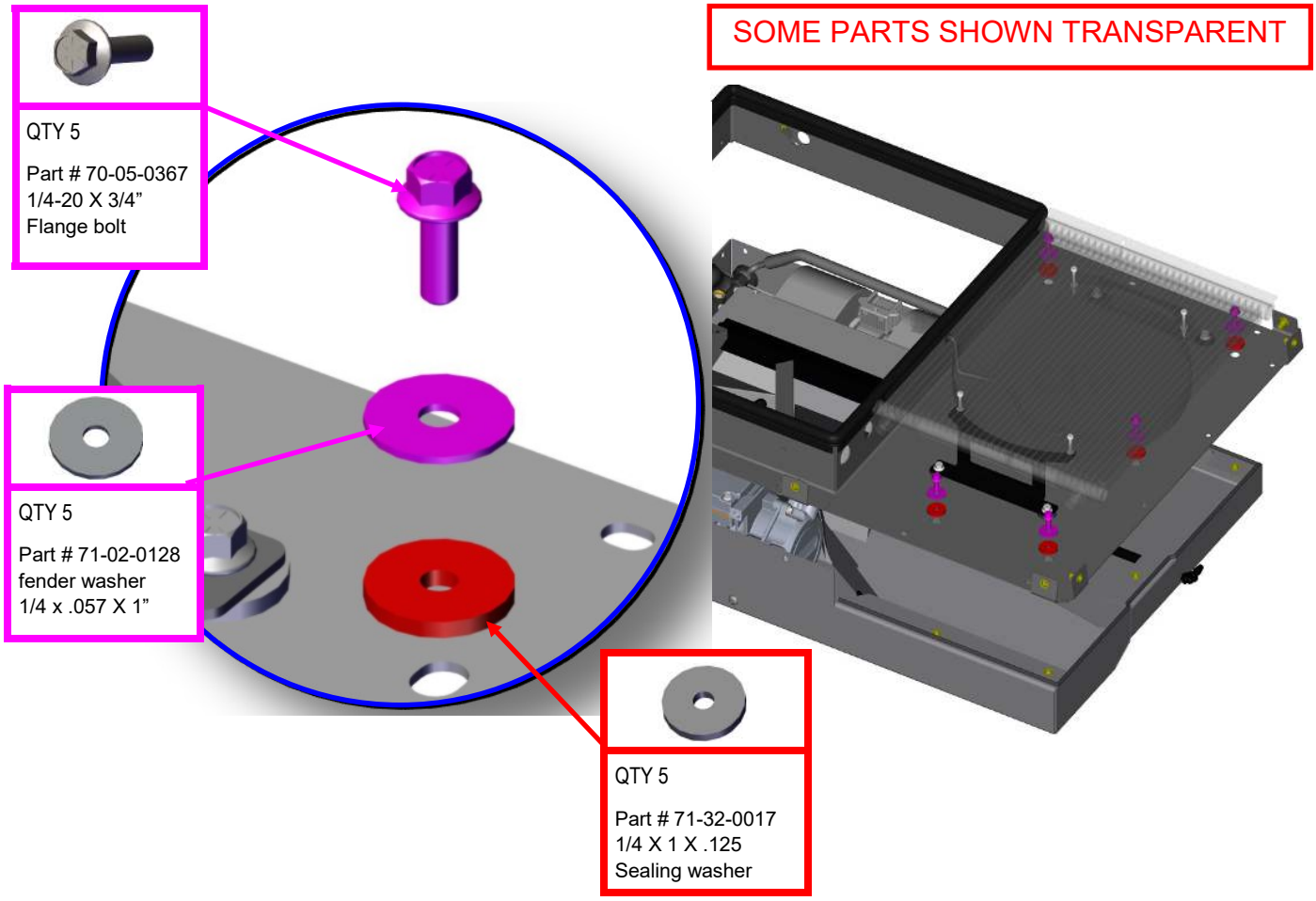
18 EVAPORATOR BOX Step 4

Tools

3/8” Open/ box end wrench

Removal

Remove 5 hex head bolts, fender washers, and rubber sealing washers from condenser fan tray.



18 EVAPORATOR BOX Step 5

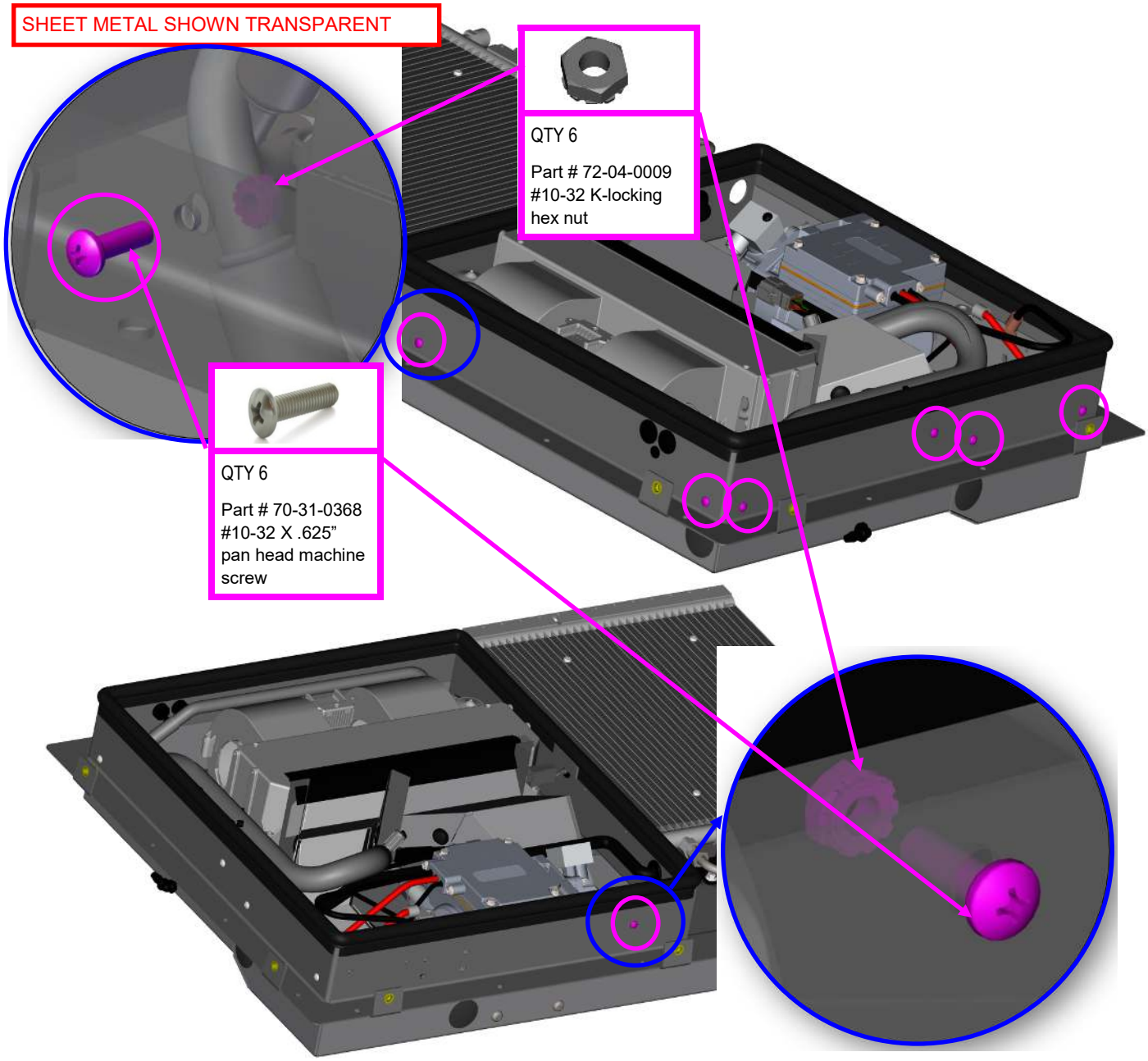
Tools

Phillips screw driver
3/8” Open/ box end wrench

Removal

Remove 7 upper case half retaining screws and nuts from perimeter of sealed case area.

Remove upper case.



18 EVAPORATOR BOX Step 6

Tools

Phillips screwdriver
3/8 Open/ box end wrench

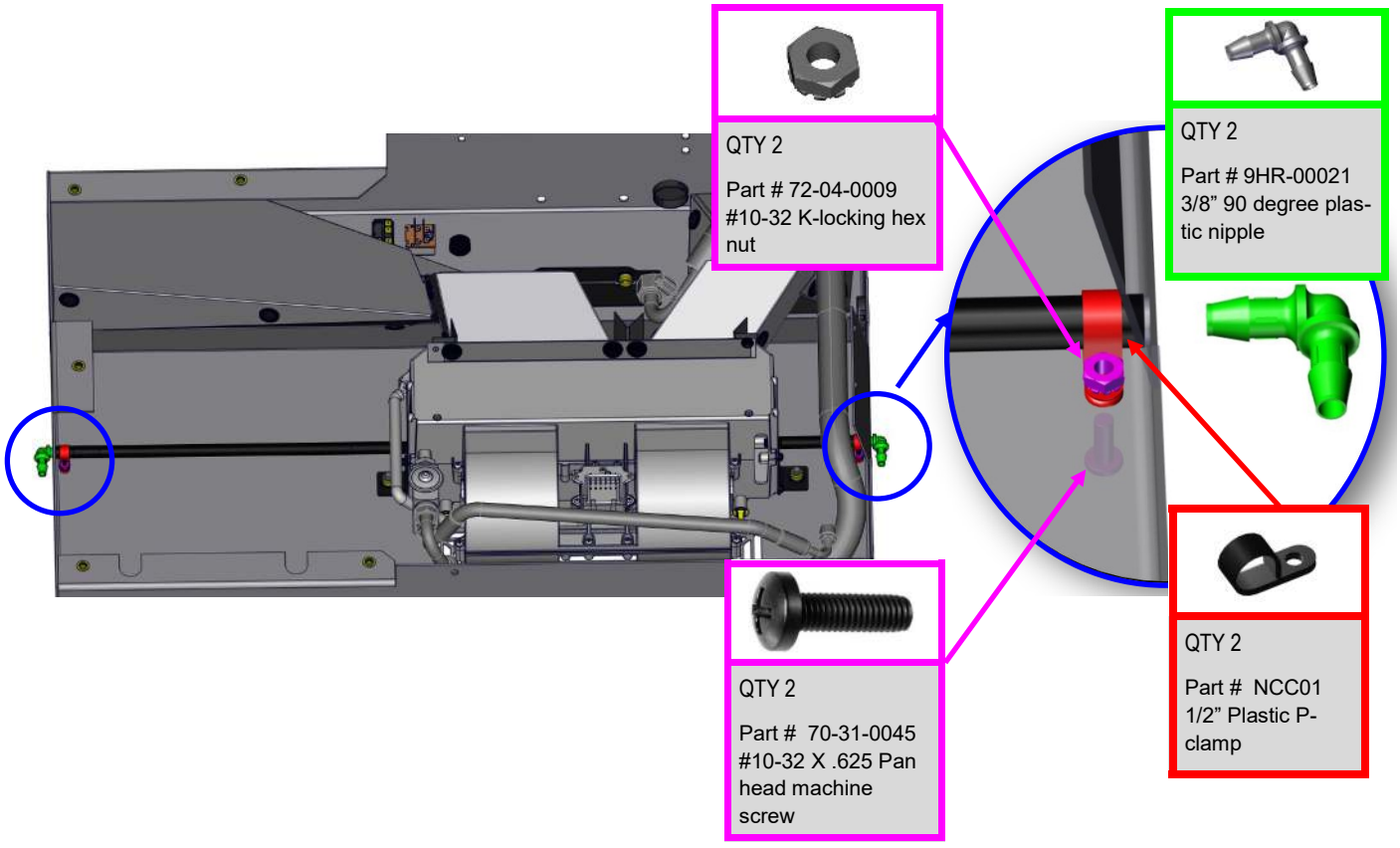
When removing elbows from drain tubes, care must be taken not to disturb fittings in evaporator case. Do not rotate or pull against these fittings, as damage may very likely occur to plastic threads and/or sealant, resulting in a leak when re-assembled.

Removal

Remove 2 screws and nuts fastening P-clamps to case on 1/2” drain hose.

Remove drain hoses from 90 degree elbows and remove, pulling out of the tube and through case. ** See caution noted above.

Be certain to note position of elbows in drain tubes for proper orientation when re-assembling.



18 EVAPORATOR BOX Step 7

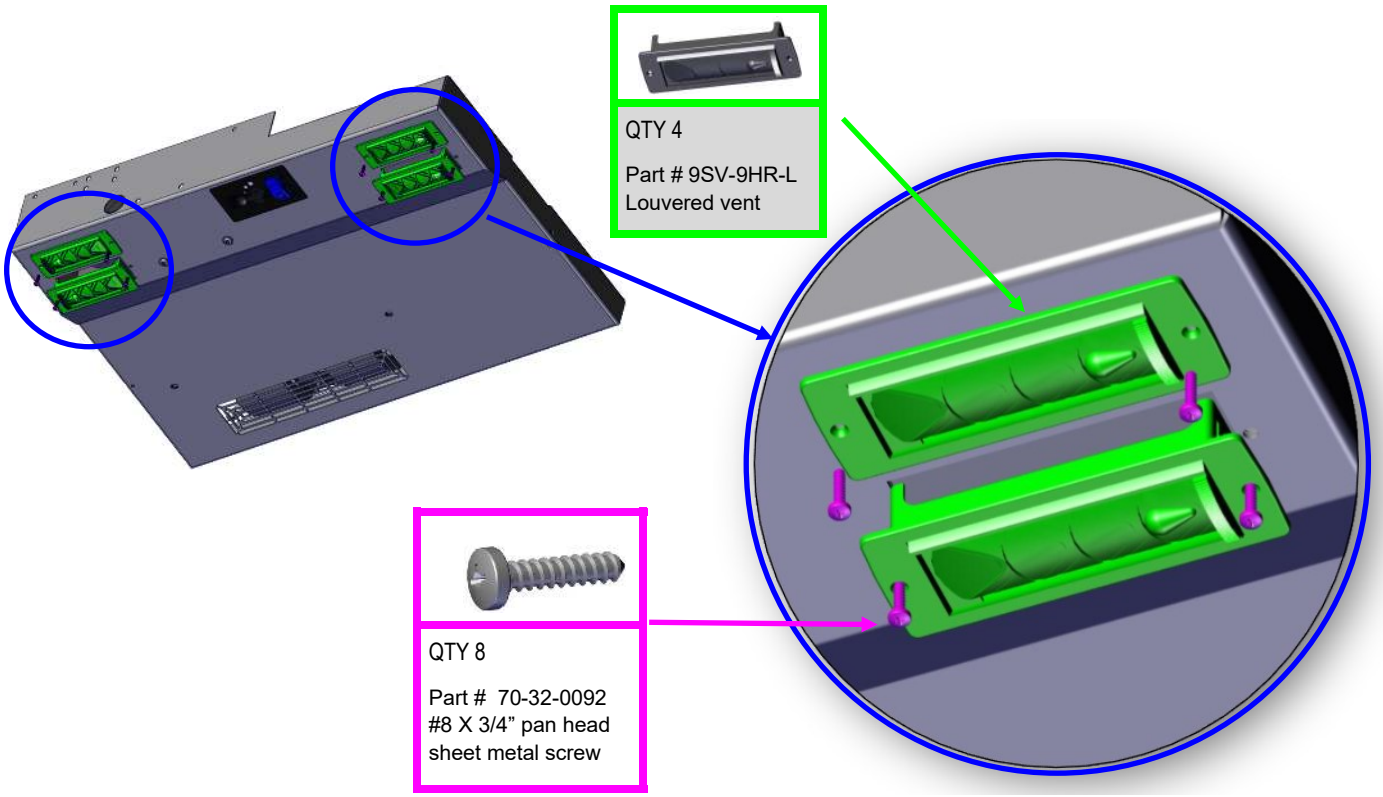
Tools

Phillips screw driver

Removal

Remove 8 Phillips pan head screws attaching vents to case and air ducts.

Remove 4 vents from case/ air ducts. Use caution to ensure clip nuts remain in place and are prevented from falling into air ducts.



18 EVAPORATOR BOX Step 8

Tools

3/16” Allen wrench

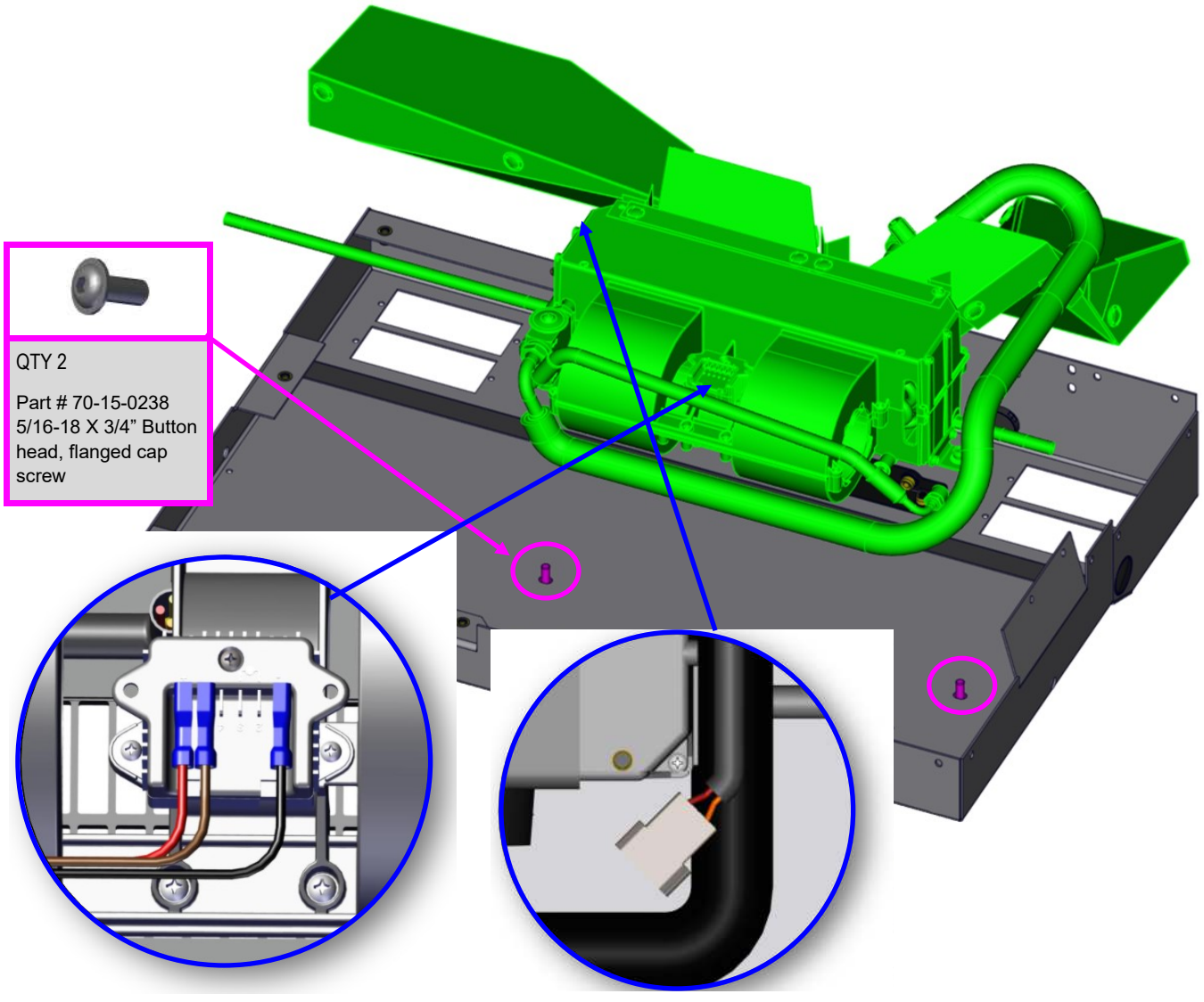
System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Removal

Remove 2 flange screws retaining evaporator assembly to case.

Disconnect thermostat wires from thermostat, note positions of connectors.

Disconnect blower motor 4-pin connector from main harness.



18 EVAPORATOR BOX Step 9

Tools

3/4” Open/ box end wrench
7/8” Open/ box end wrench

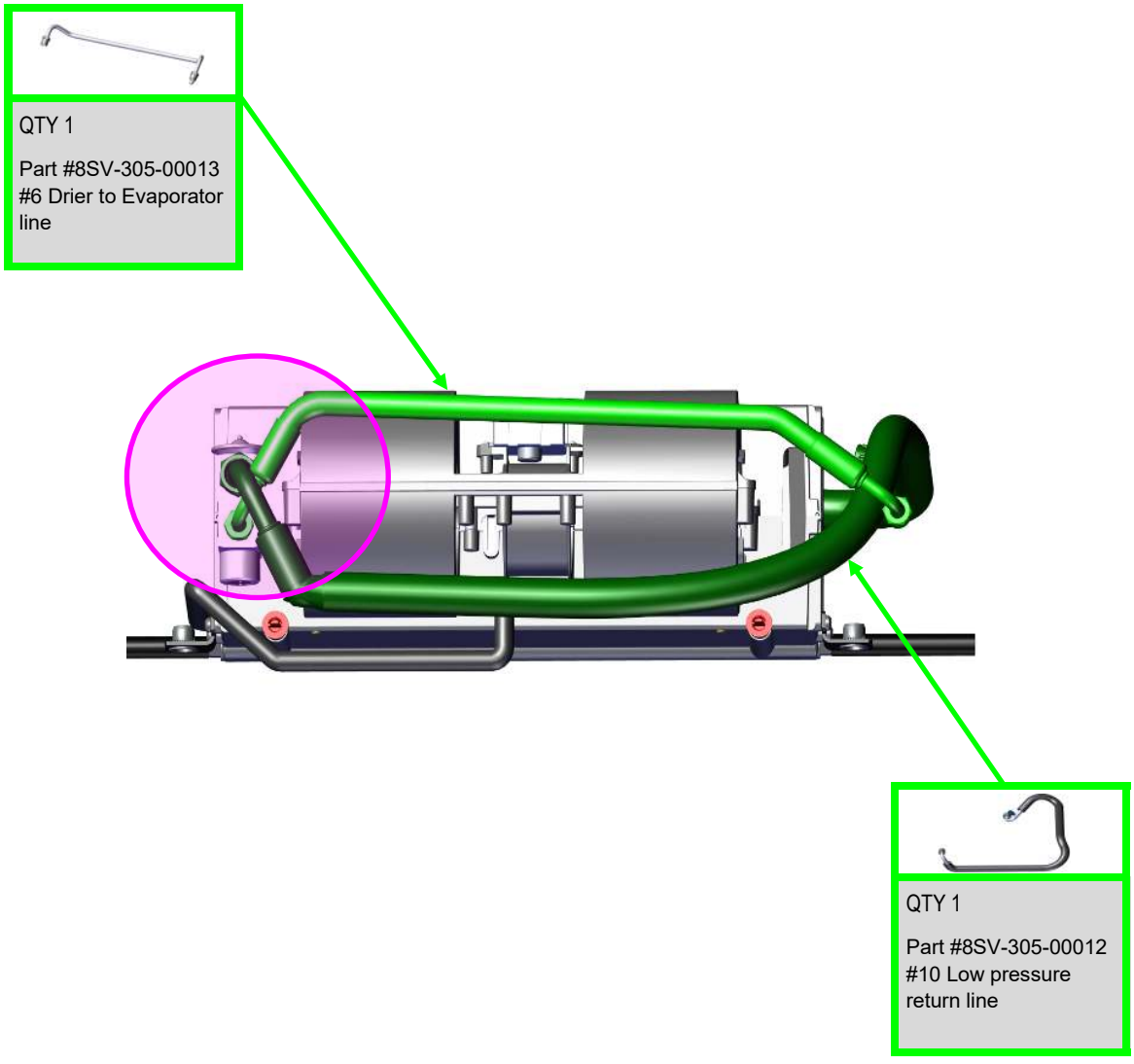
Be careful to remove O-rings when removing lines. Oil may be present in lines, prevent oil from draining. Cover all openings if system is to be left disassembled for more that 2 minutes to prevent moisture and contaminants from entering system.

Removal

Remove cork tape from lines and valve.

Remove upper Evaporator Control Valve to compressor #10 line.

Remove lower #6 Evaporator Control Valve to drier line.

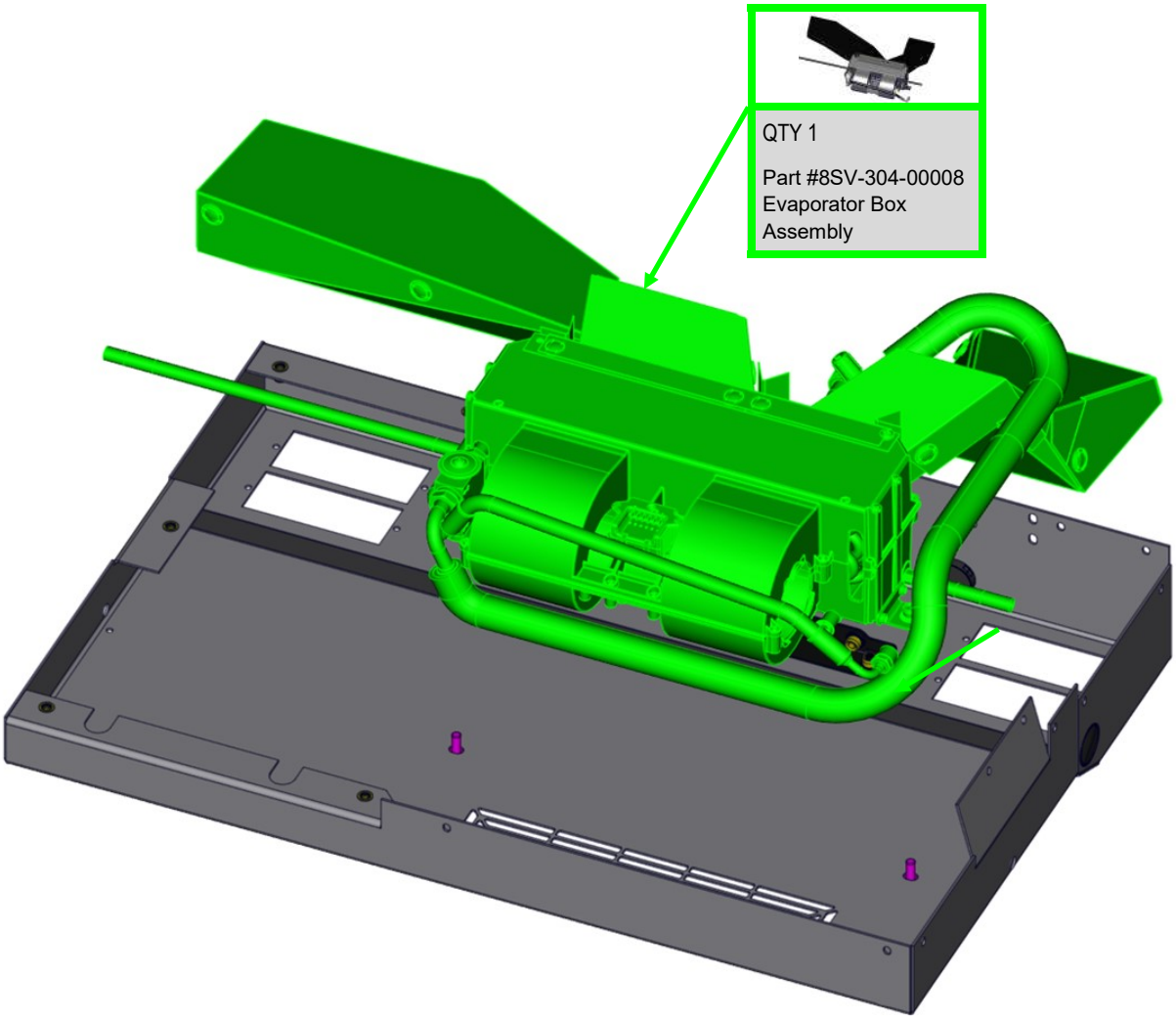


18 EVAPORATOR BOX Step 10

System evacuation must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Removal

Remove evaporator and duct assembly from case, being careful not to damage duct at sealing points or drain hose fittings.



18 EVAPORATOR BOX Step 11

Tools

R134a Recovery machine

SEE ALL NOTES BELOW

Removal

If replacing the Evaporator Box Assembly (p/n: 8SV-304-00008), no further disassembly of the box is required.

If replacing the Evaporator Core (p/n: 9SV-9AC-00002), it is contained in the Evaporator Box Assembly with the Blower. If replacing the evaporator core, go to that section at this point and return to this point when ready to assemble Evaporator Box into unit.

Installation

This assembly is water tight below the Evaporator Core. The lines and fittings must be sealed and attached properly to prevent condensed water from leaking into passenger compartment. The case halves are also sealed together with gaskets and rubber sealing washers to prevent rain water intrusion into passenger area. Confirm all seals and gaskets are in proper condition before assembling evaporator box into unit.

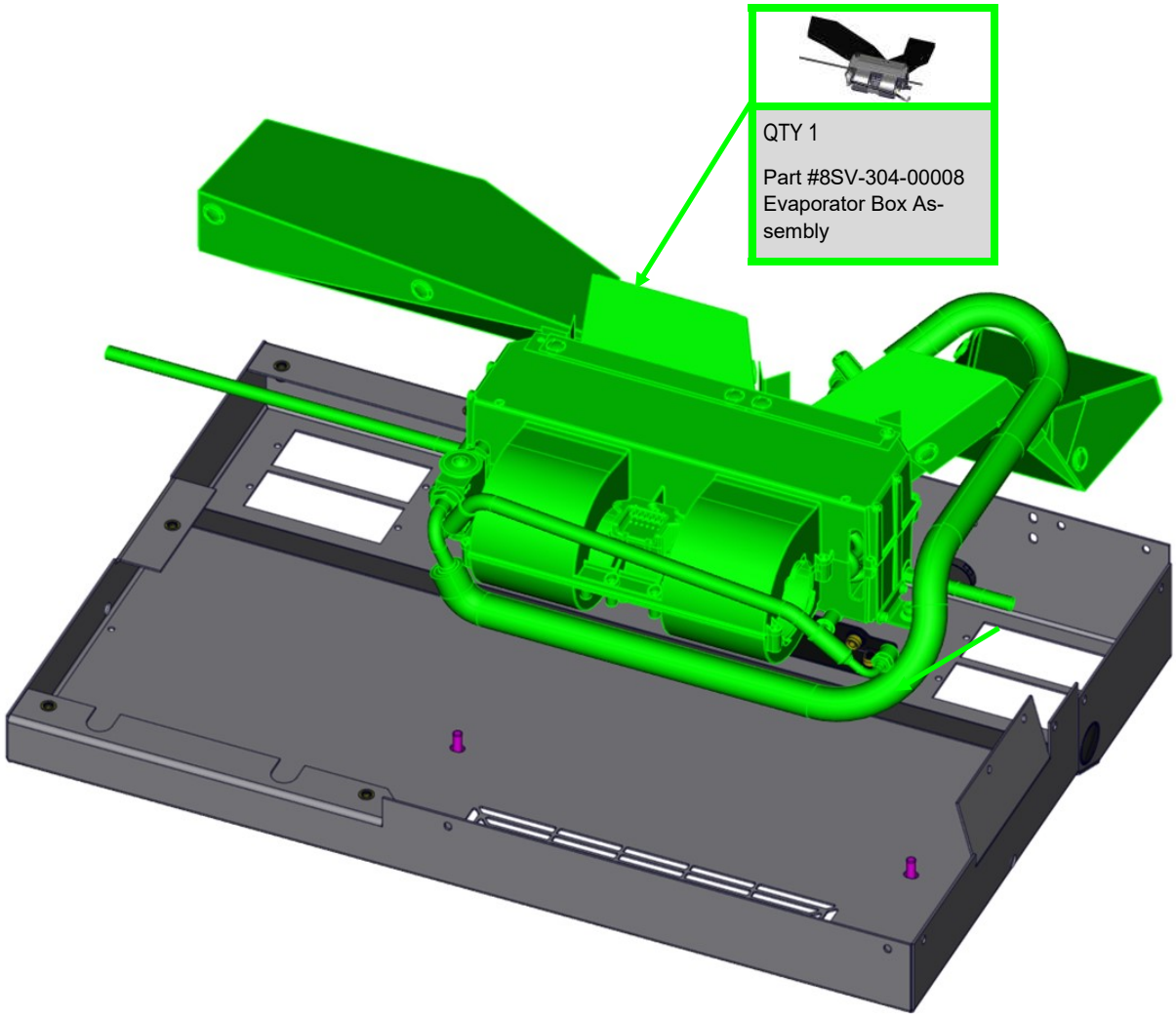
Replace O-rings on refrigerant line fittings and lubricate them with refrigerant oil prior to assembly.

18 EVAPORATOR BOX Step 12

Inspect all joints and fittings to ensure sealant is in place, fittings are not damaged, and are water tight. Be aware that if the drain tube fitting on the long hose side leaks (located beneath the condenser pan when assembled), disassembly of the upper case is required to access.

Installation

Install evaporator and duct assembly into case, being careful not to damage duct at sealing points or drain hose fittings.



18 EVAPORATOR BOX Step 13

Tools

3/4"" Open/ box end wrench
7/8" Open/ box end wrench

Confirm Cap/plugs are in place. These prevent water from draining into cabin area of vehicle.

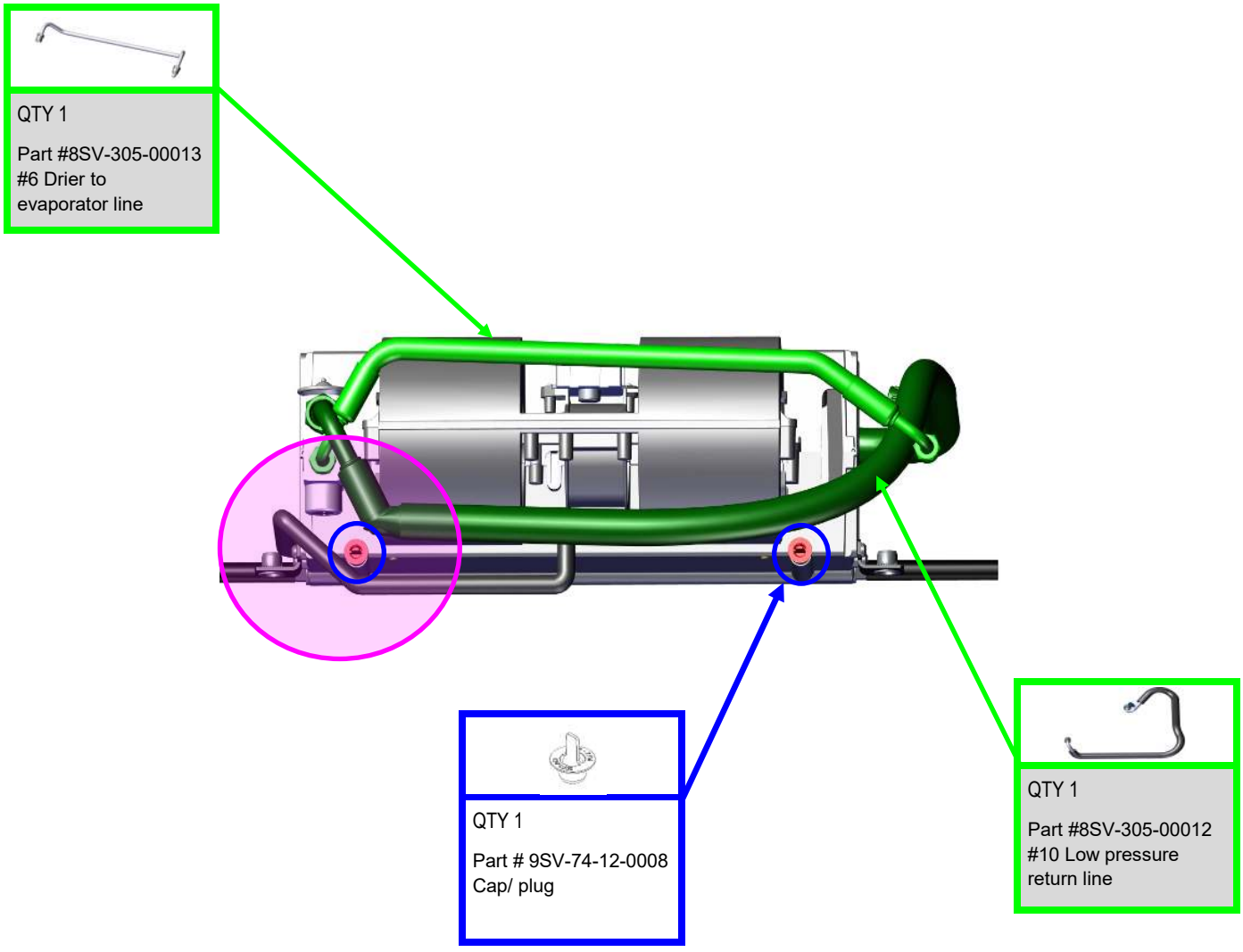
Installation

Place new O-ring onto lower #6 Evaporator Control Valve to drier line, lubricate and install line.

Place new O-ring onto upper Evaporator Control Valve to compressor #10 line, lubricate and install line.

Install cork tape over both fittings and valve, being certain to cover all exposed metal.

Confirm cap/ plugs are in place in unused evaporator box drain nipples.



18 EVAPORATOR BOX Step 14

Tools

3/16” Allen wrench

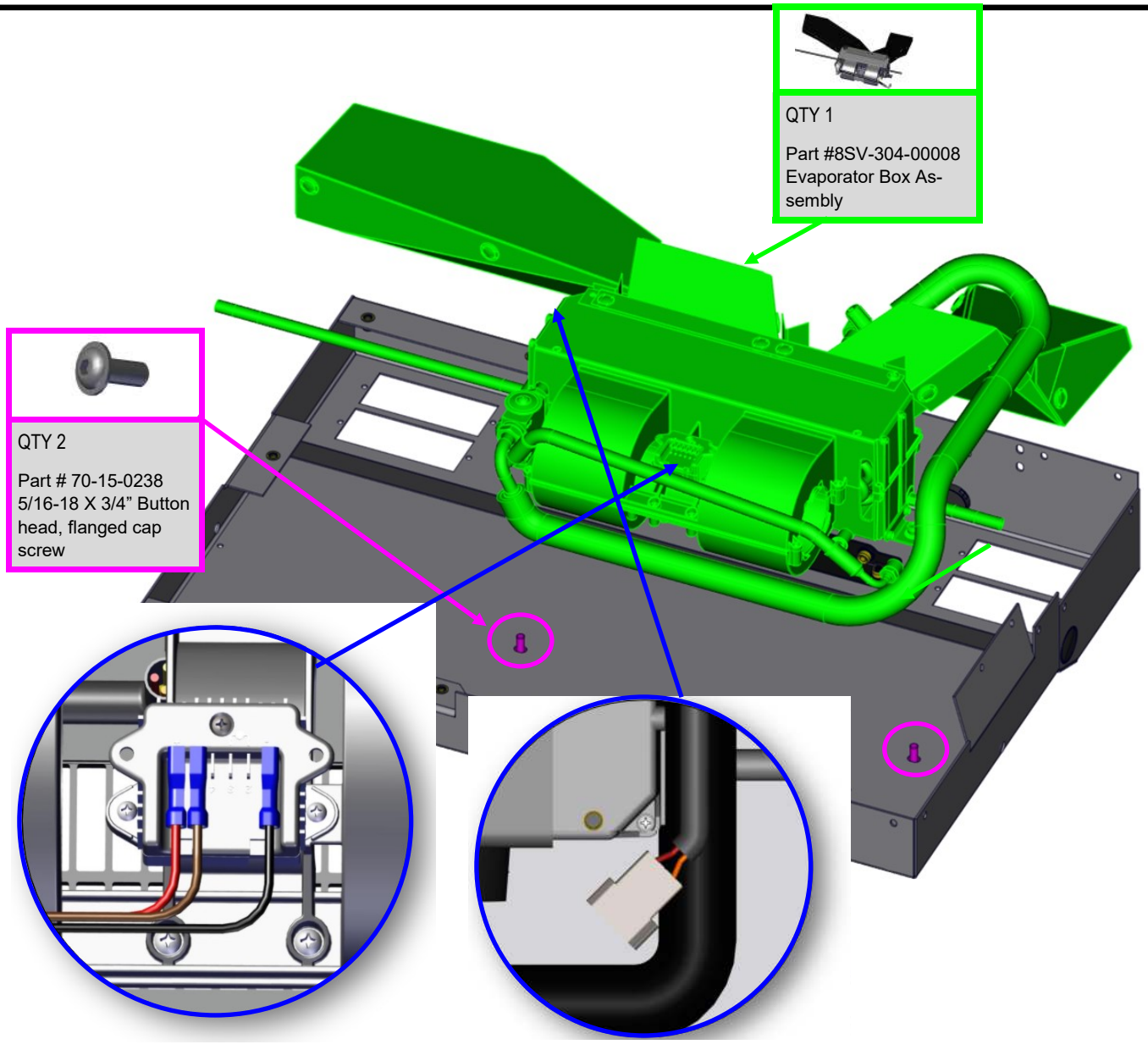
Inspect all joints and fittings to ensure sealant is in place, fittings are not damaged and are water tight. Be aware that If the drain tube fitting on the long hose side leaks (located beneath the condenser pan when assembled), disassembly of the upper case is required to access.

Installation

Install (2) 5/16” flange screws, retaining evaporator assembly to case.

Connect thermostat wires to thermostat, note position of connectors, install per pin numbers on wires and on thermostat.

Connect blower motor 4-pin connector from main harness.



18 EVAPORATOR BOX Step 15

Tools

Phillips screw driver

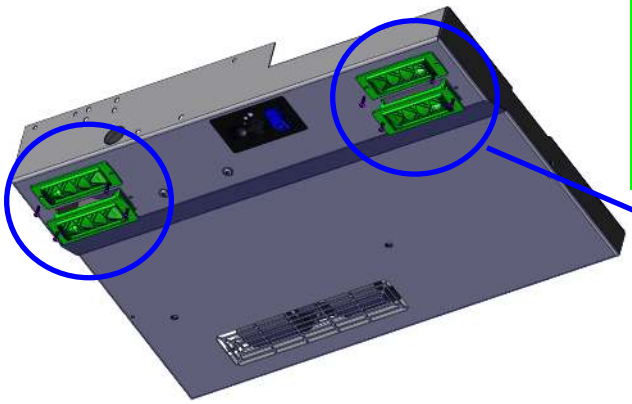
To ease assembly, it is recommended to start all (8) screws prior to tightening them.

Caution should be used not to over-tighten screws and damage plastic vents.

Installation

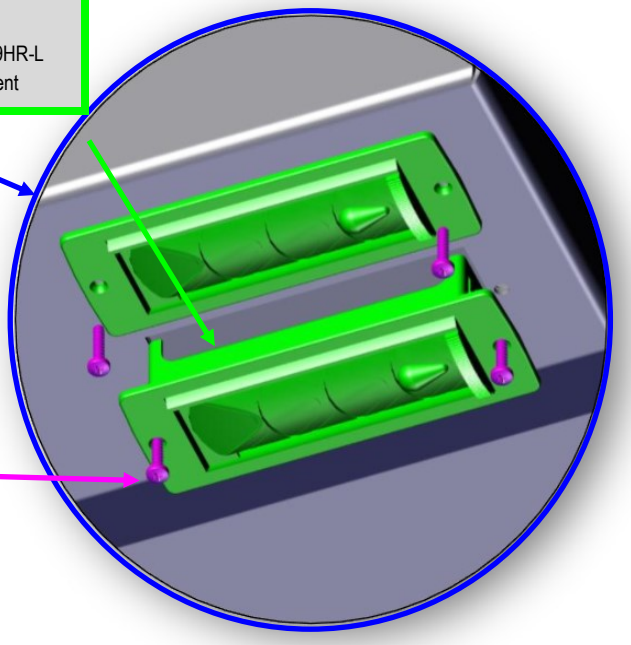
Place 4 vents into case/ air ducts, confirming clip nuts are in place on air ducts.

Install 8 pan head screws thru vents, case and air ducts, into clip nuts attaching vents to case and air ducts.



QTY 4

Part #9SV-9HR-L
Louvered vent

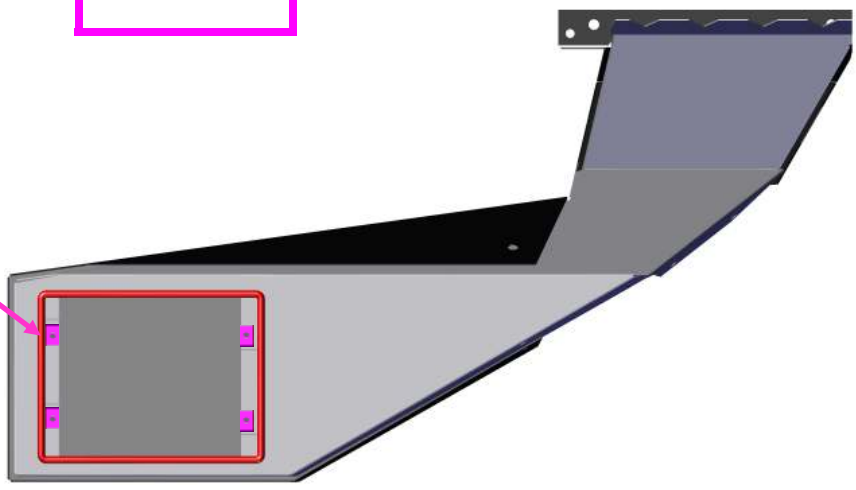


QTY 8

Part # 70-32-0092
#8 X 3/4" pan head
sheet metal screw

QTY 4

Part # 72-50-0108
#8 Nut clip



18 EVAPORATOR BOX Step 16

Tools

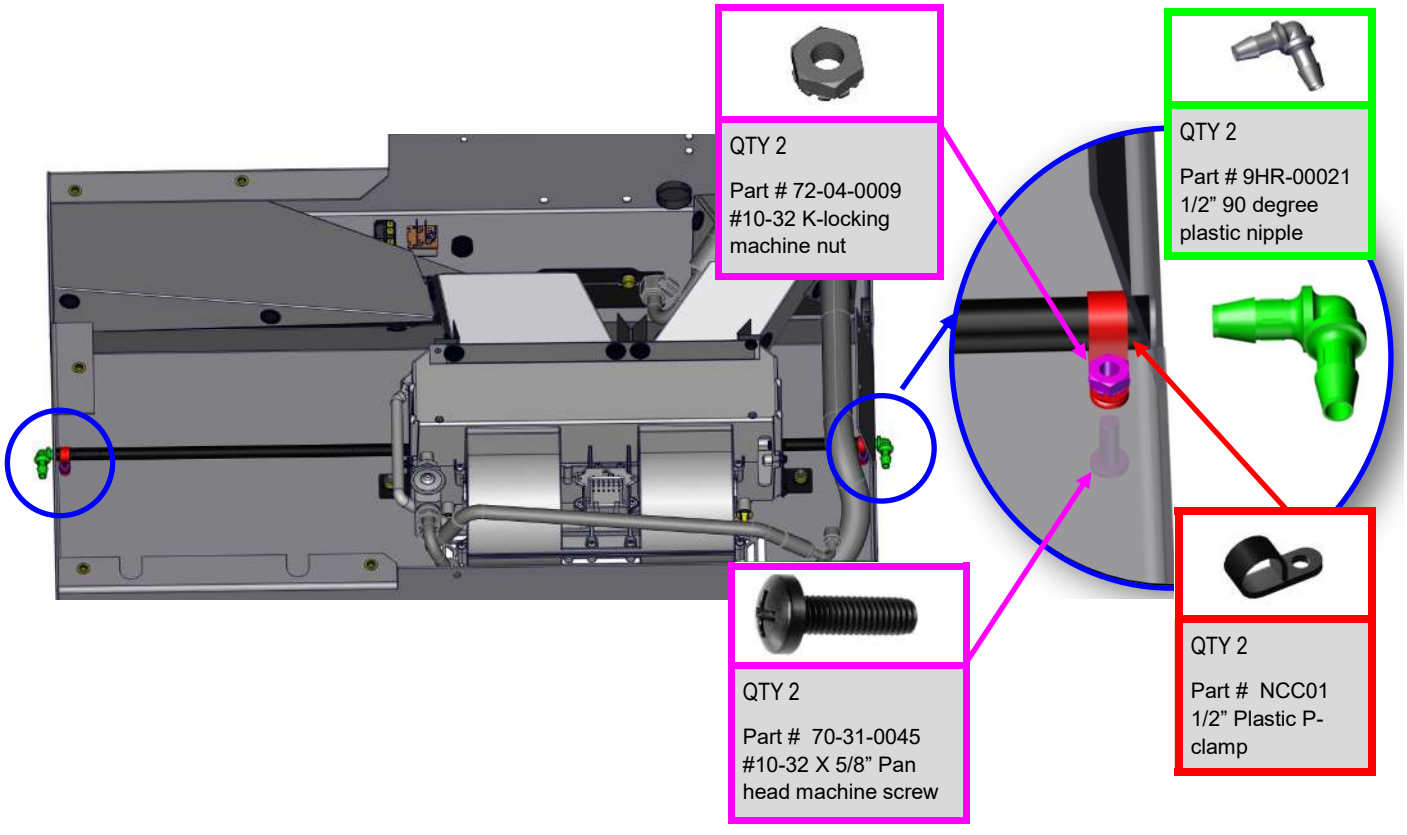
3/8 Open/ box end wrench
Phillips screwdriver

When installing elbows into drain tubes care must be taken not to disturb fittings in evaporator case. Do not rotate or pull against these fittings, as damage may very likely occur to plastic threads and/or sealant resulting in a leak when re-assembled.

installation

Install drain hoses into 90 degree elbows, passing through case and into drain hose. Orient as previously noted when disassembling. ** See caution noted above.

Install 2 screws and nuts, fastening P-clamps over tubing at fittings and to case on 1/2” drain hose.



18 EVAPEORATOR BOX Step 17

Tools

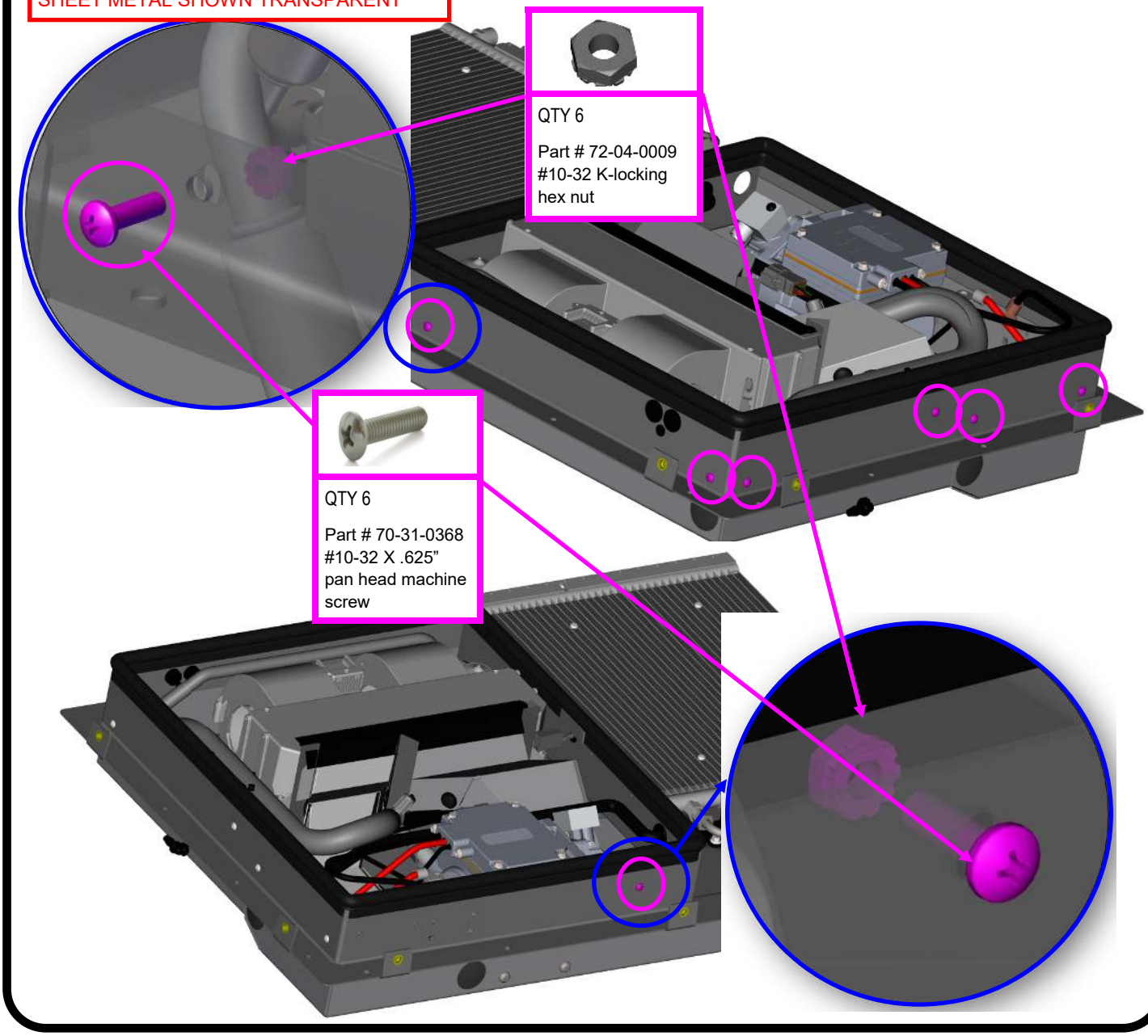
#2 Phillips screw driver
3/8” Open/ box end wrench

Installation

Position upper case over lower case.

Install 7 upper case retaining screws from the outside and nuts on the inside around perimeter of sealed case area. Do not tighten at this time.

SHEET METAL SHOWN TRANSPARENT



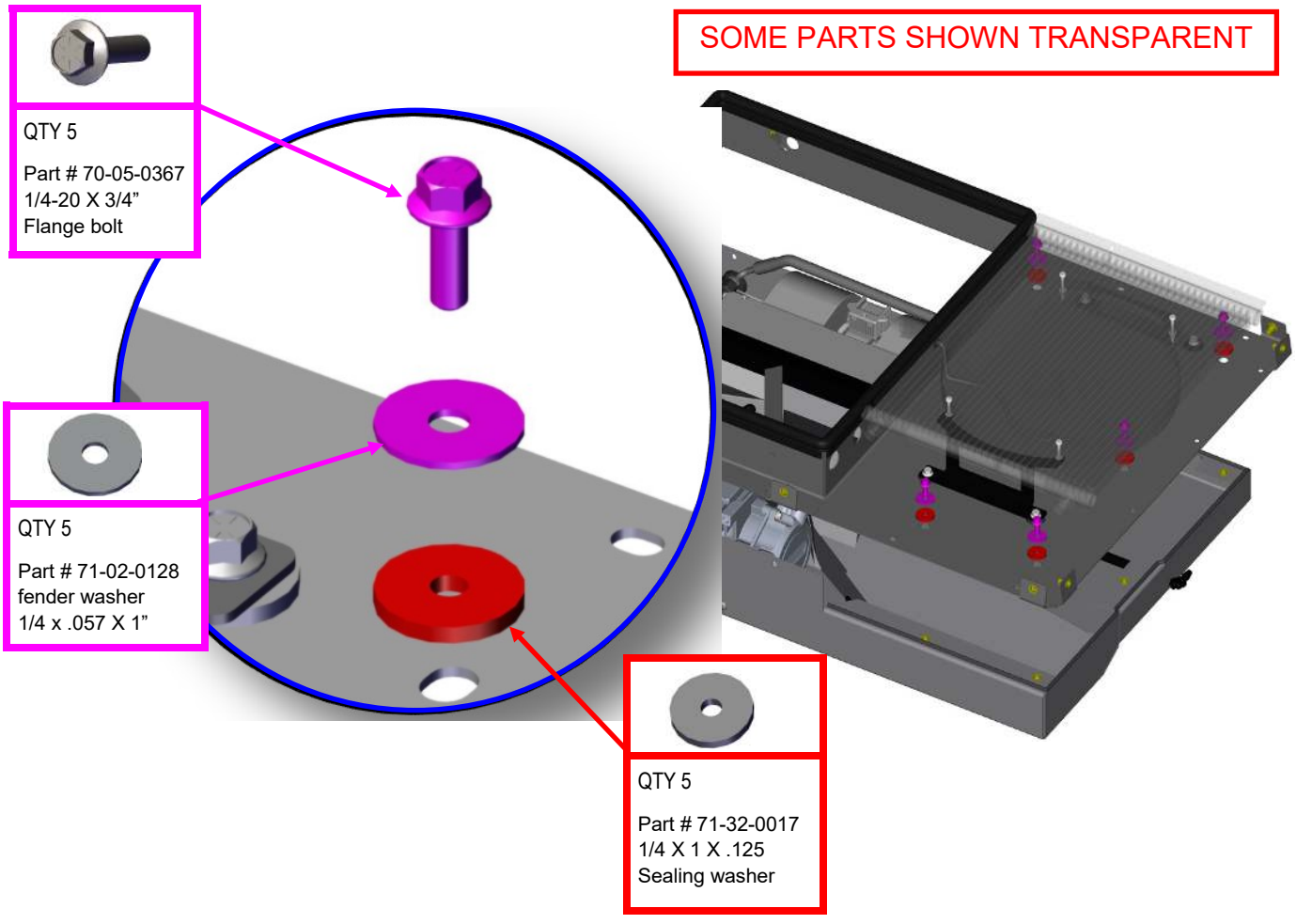
18 EVAPORATOR BOX Step 18

Tools

3/8” Open/ box end wrench

Install

Install 5 hex head bolts, fender washers, and rubber sealing washers onto condenser fan tray thru to lower case and tighten. Tighten 7 upper case screws left loose in previous step.



18 EVAPORATOR BOX Step 19

Tools

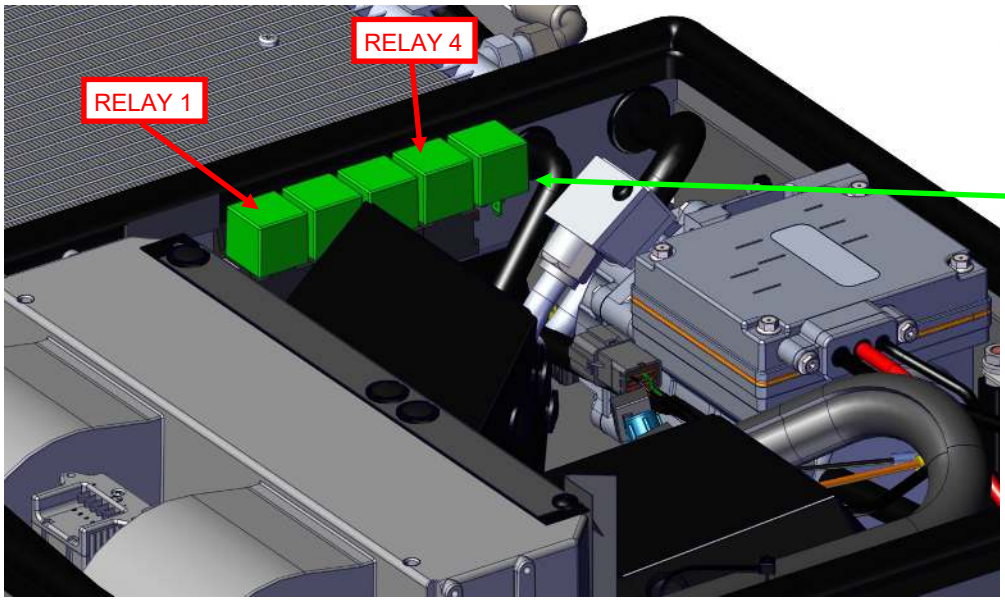
#2 Phillips screw driver

Only relays 1 and 4 are required to be removed, other relays shown removed for clarity

Installation

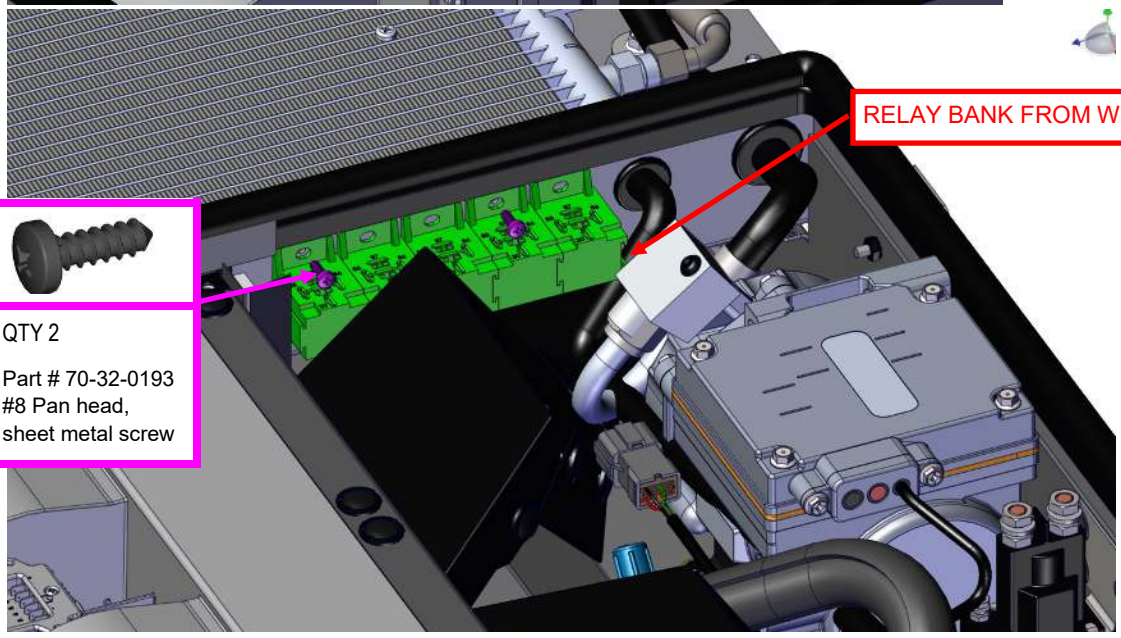
Install 2 relay mounting screws into relay bank, being careful not to pinch wires.

Re-install relays 1 and 4 into relay bank (see illustration for relay positions).



Relays QTY 5

Part # 9SV-85-01-0022
12V 20/40A SPDT Relay



QTY 2

Part # 70-32-0193
#8 Pan head,
sheet metal screw

18 EVAPORATOR BOX Step 20

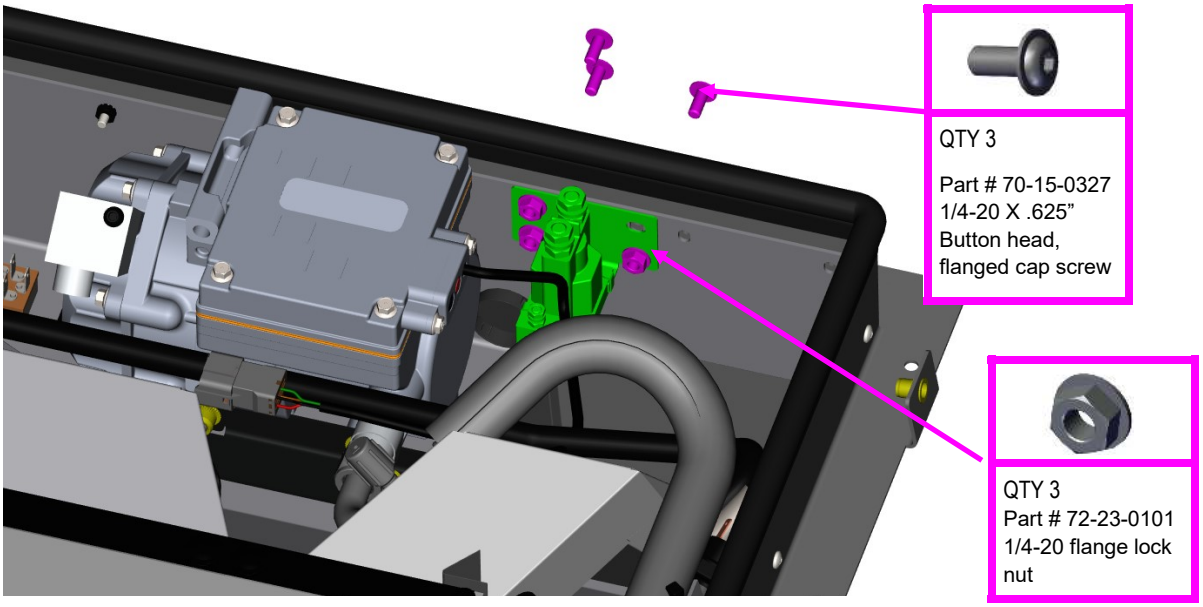
Tools

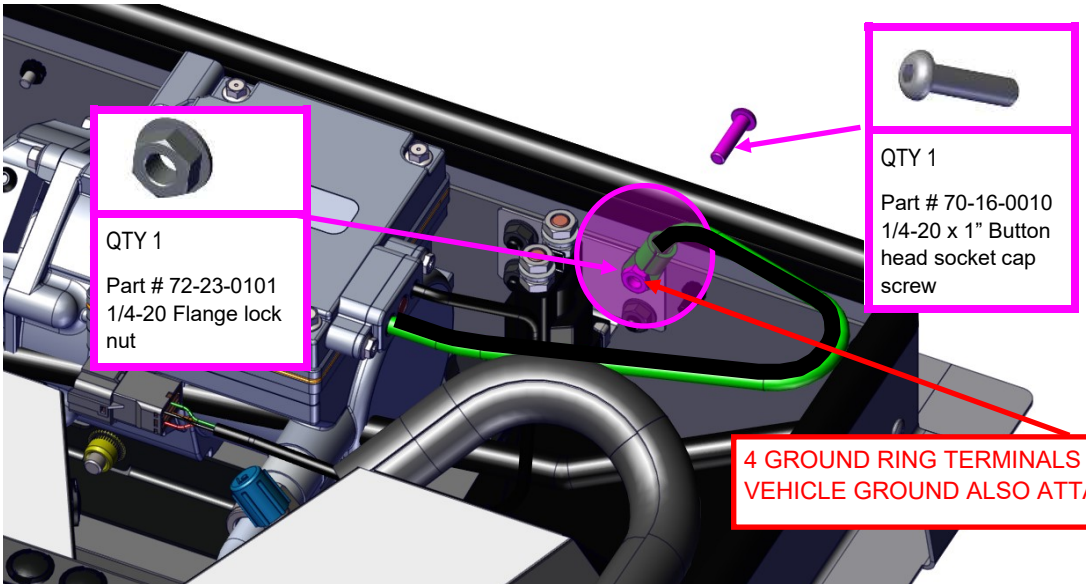
3/16” Allen wrench
7/16” open/ box end wrench

Be certain all ground terminals are in place against bare metal solenoid mounting base to assure proper grounding

installation

Position solenoid over mounting holes and install 3 short Allen head solenoid mounting bolts from outside of case with nuts on inside of case. Install longer bolt and nut with ground wires in the same orientation as removed on inside of case against bare metal of solenoid mounting bracket.





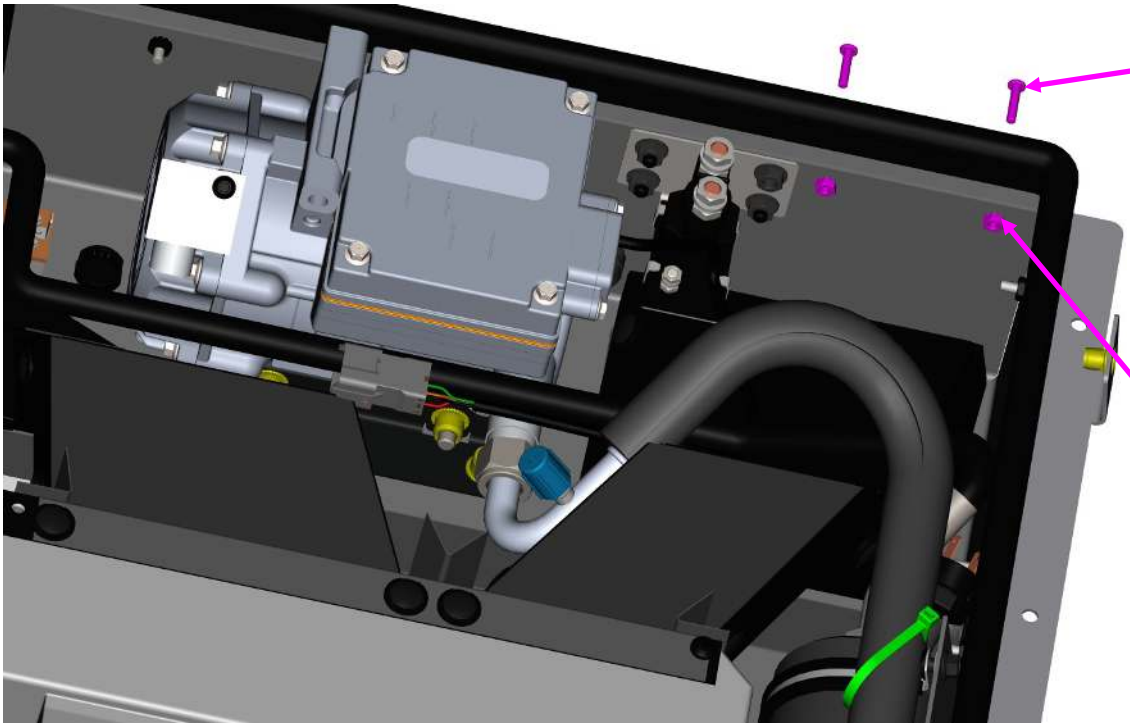
18 EVAPORATOR BOX Step 21

Tools

#2 Phillips screw driver
5/16” Open/ box end wrench

Installation

Install 2 controller mounting bolts and nuts (with controller, if applicable).

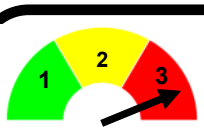


QTY 2

Part # 70-31-0101
#8-32 Pan head machine screw

QTY 2

Part # 72-04-0100
#8-32 K-locking hex nut



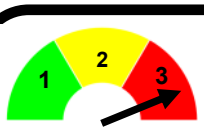
18 EVAPORATOR BOX Step 22

System evacuation and charging must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Installation

If repair is complete, install Condenser and charge system per sections 12 & 13 in this manual.

This assembly is water tight below the Evaporator Core. The lines and fittings must be sealed and attached properly to prevent condensed water from leaking into passenger compartment. The case halves are also sealed together with gaskets and rubber sealing washers to prevent rain water intrusion into passenger area. Confirm all seals and gaskets are in proper condition before assembling evaporator box into unit.



19 EVAPORATOR CORE

System evacuation and charging must only be performed by an EPA Part 609 certified technician, using EPA certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Removal

The evaporator core is contained in the Evaporator Box which, must be removed from the A/C case prior to disassembly. Follow instructions in section 18 “Evaporator Box removal” before proceeding with this section.

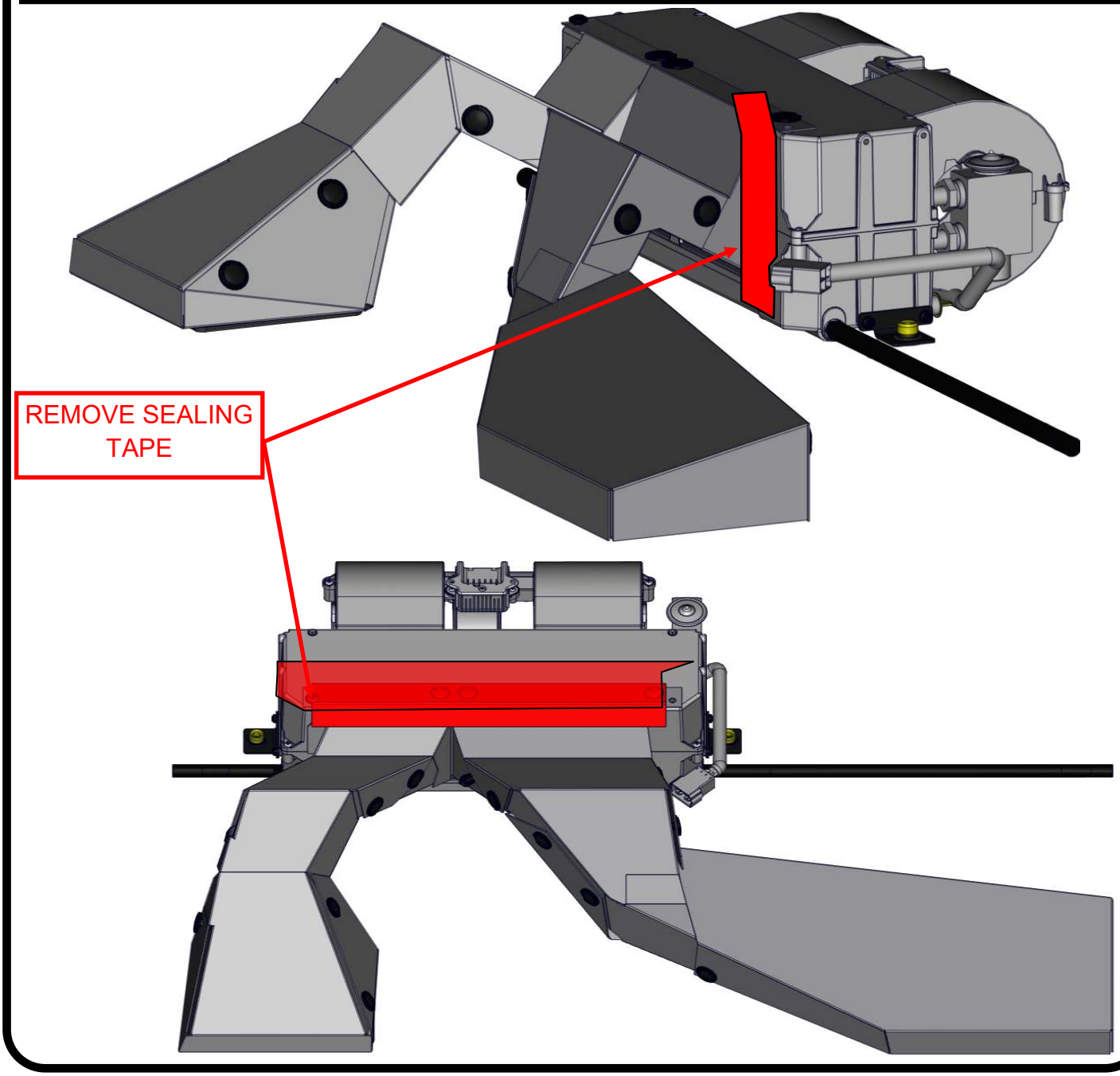
19 EVAPORATOR CORE Step 1

Cork tape is very tacky, use of gloves when removing is recommended

Removal

With Evaporator Box removed:

Remove sealing tape from top and driver's side of assembly.

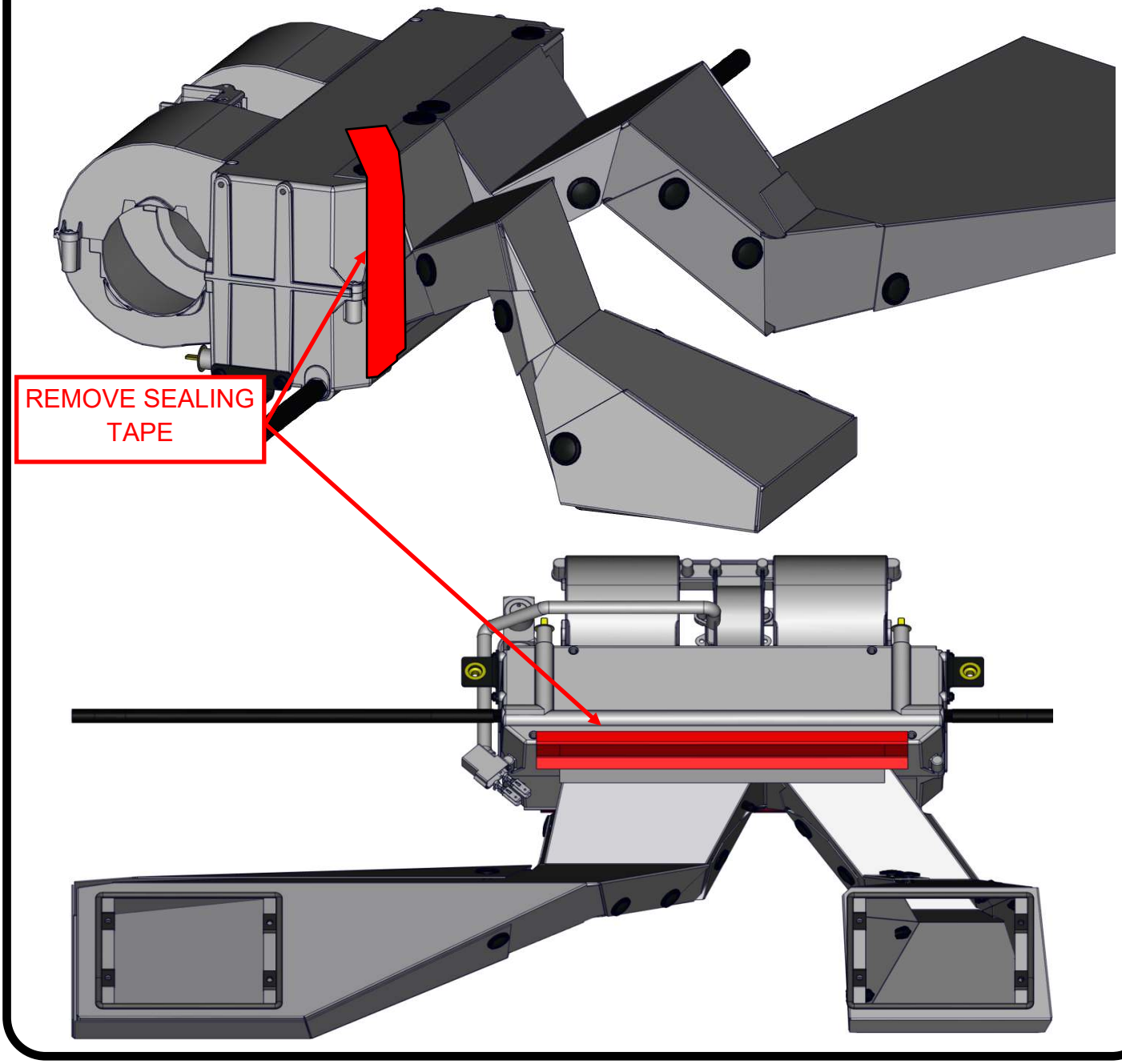


19 EVAPORATOR CORE Step 2

Cork tape is very tacky, use of gloves when removing is recommended.

Removal

Remove sealing tape from passenger side and bottom of assembly.

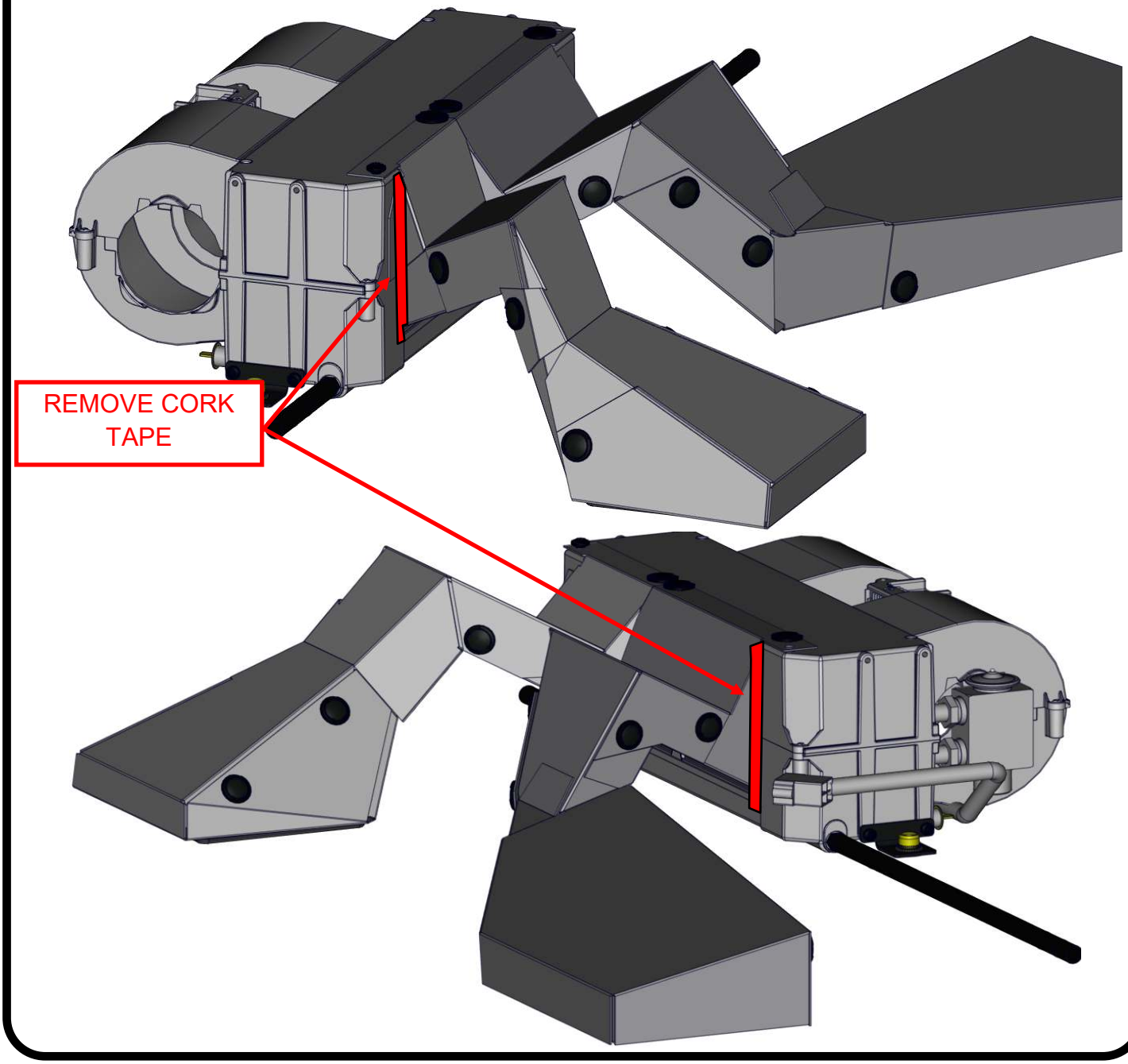


19 EVAPORATOR CORE Step 3

Cork tape is very tacky, use of gloves when removing is recommended.

Removal

Remove sealing cork tape from passenger and driver's side of assembly.



19 EVAPORATOR CORE Step 4

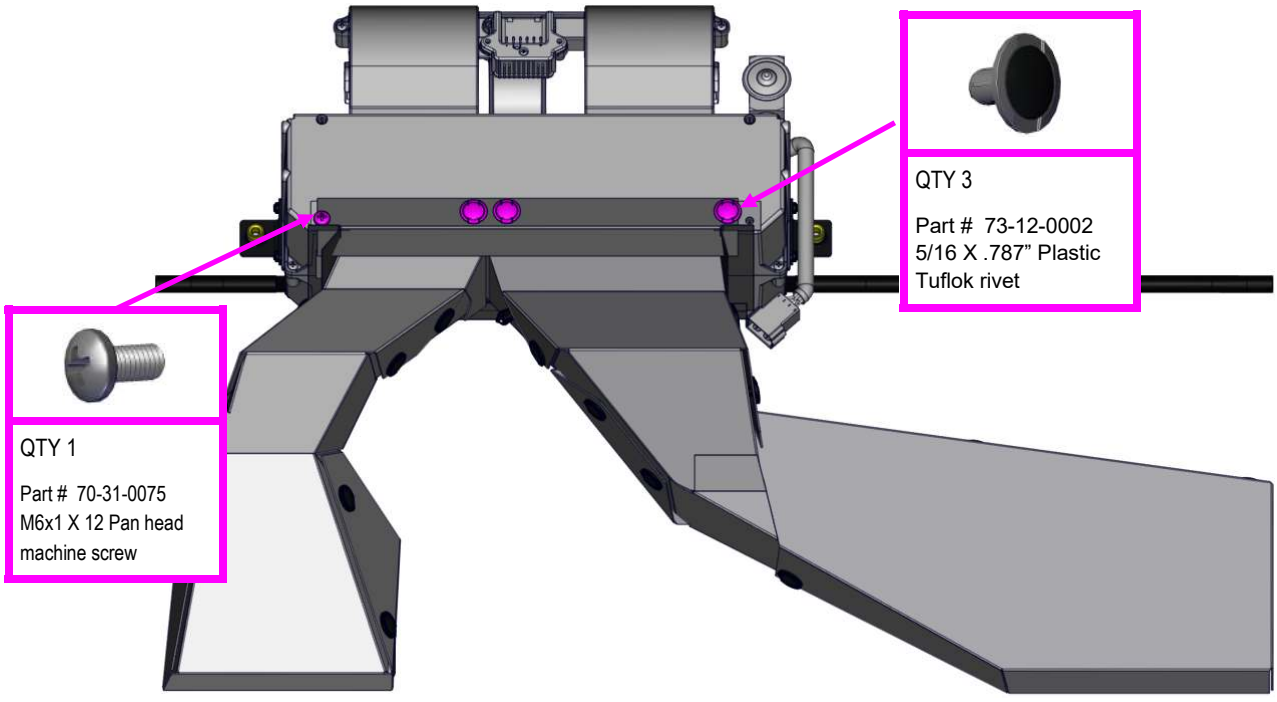
Tools

#1 Flat blade screw driver
#3 Phillips screw driver

Cork tape is very tacky, use of gloves when removing is recommended.

Removal

Remove 1 screw and 3 plastic rivets retaining duct to evaporator box.



19 EVAPORATOR CORE Step 5

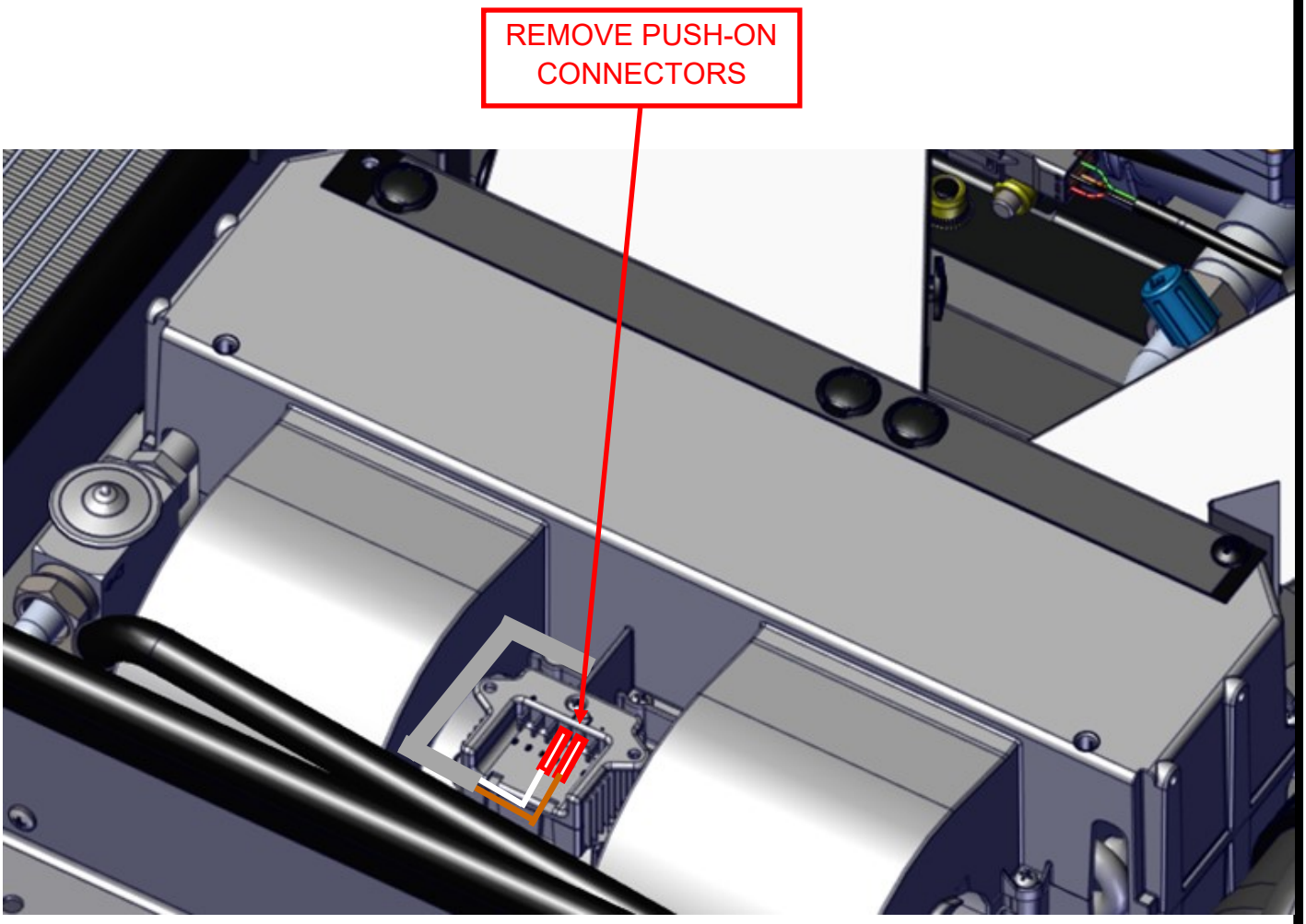
Tools

#1 flat blade screwdriver
needle nose pliers

Use screwdriver to gently pry terminal back from pin. Use needle nose pliers to remove, do not pull on wire.

Removal

Remove 2 thermistor wires from thermostat by pulling push-on connectors from their pins.



19 EVAPORATOR CORE Step 6

Tools

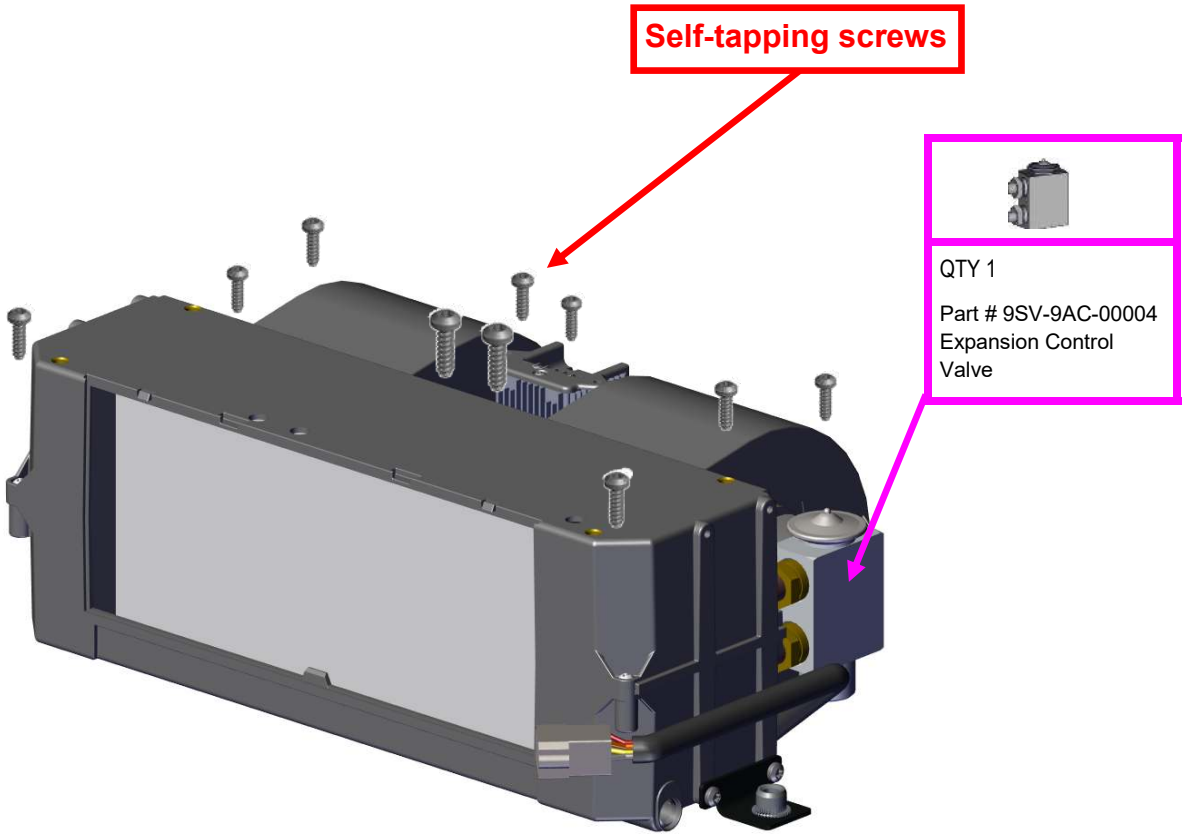
#2 Phillips screw driver

Care should be taken not to damage fins on core. Bending fins will result in airflow reduction which can cause a reduction in performance of the A/C system.

Removal

Remove 10 self-tapping screws, separate evaporator box halves, and remove evaporator core from box.

Remove Thermistor and wire assembly gently from between core fins. Note location in fins.



19 EVAPORATOR CORE Step 7

Tools

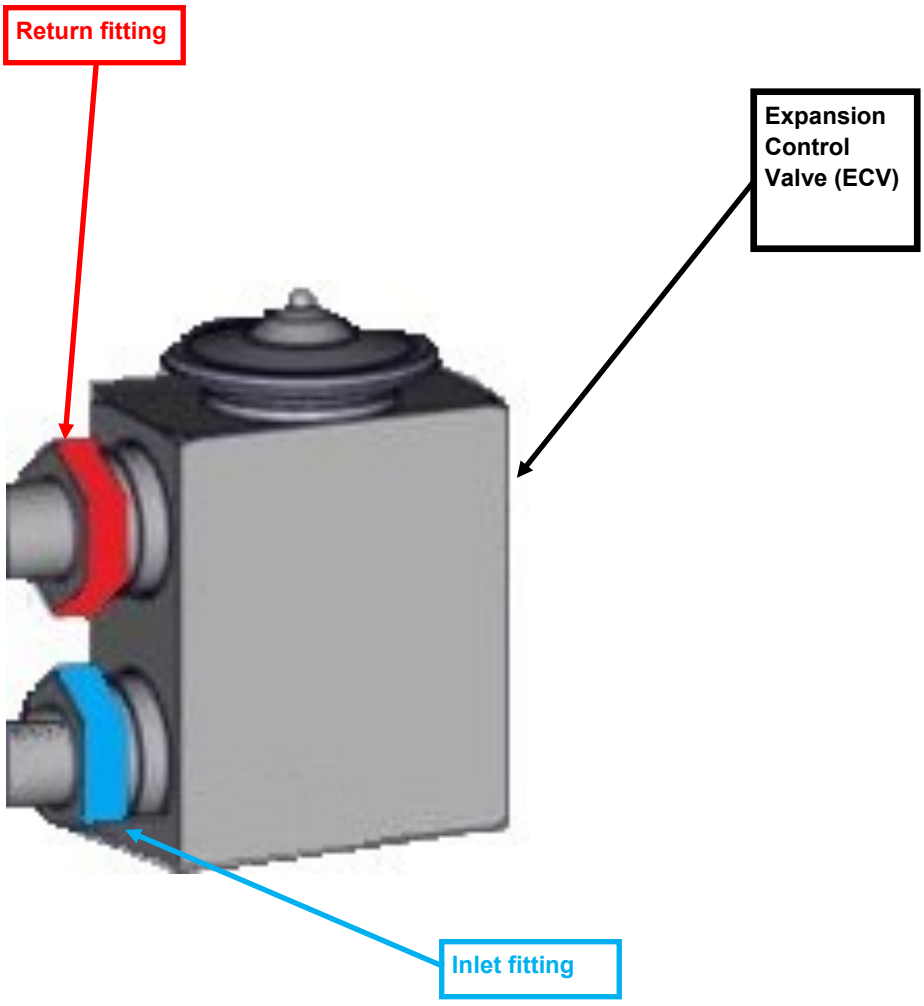
Two 3/4” Open End Wrenches

Care should be taken not to damage fins on core. Bending fins will result in airflow reduction, which can cause a reduction in performance of the AC system.

Removal

Slide foam sealing ring back to expose fittings (remove cork tape as needed)

Remove Evaporator Control Valve being careful not to bend pipes or damage core. Hold valve steady with adjustable wrench. Turn fitting nuts to remove.



19 EVAPORATOR CORE Step 8

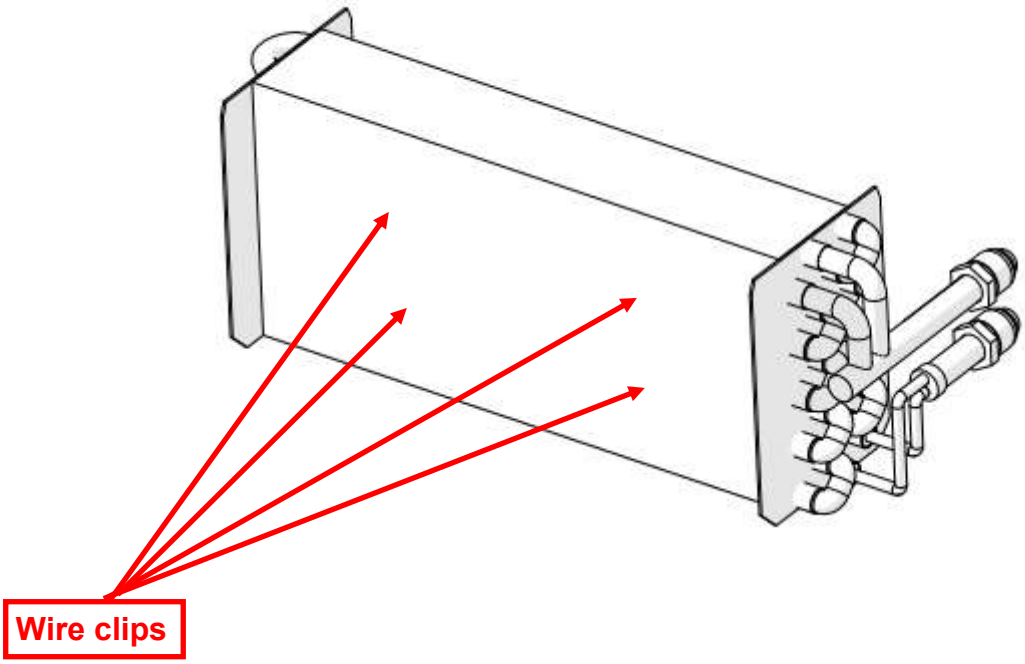
Tools

Hook pick
Needle nose pliers

Care should be taken not to damage fins on core. Bending fins will result in airflow reduction which can cause a reduction in performance of the AC system. Clips are pushed thru foam, located between core fins and fit over the tubes to retain condensation collection foam to core.

Removal

Remove condenser collection foam from core by pulling retaining clips gently away from core tubes.



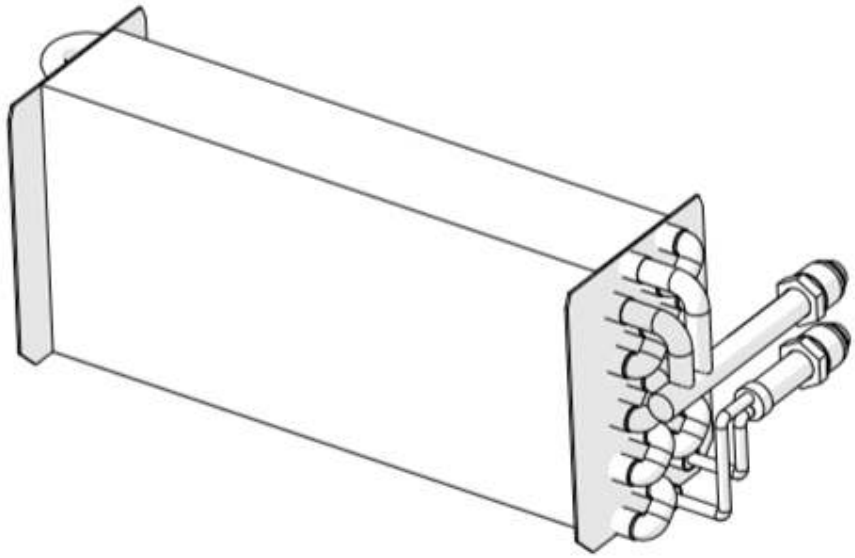
19 EVAPORATOR CORE Step 9

DO NOT ATTEMPT TO REPAIR EVAPORATOR CORE. ONLY REPLACE WITH THE SAME PART NUMBER CORE AS ORIGIONALY INSTALLED TO ENSURE SAFE AND PROPER SYSTEM PERFOMRANCE.

Installation

If core is damaged or leaking, replace with a new core part number 9SV-9AC-00002. Remove protective caps & seals from inlet and outlet ports prior to assembly.

EVAPORATOR CORE
P/N: 9SV-9AC-00002



19 EVAPORATOR CORE Step 10

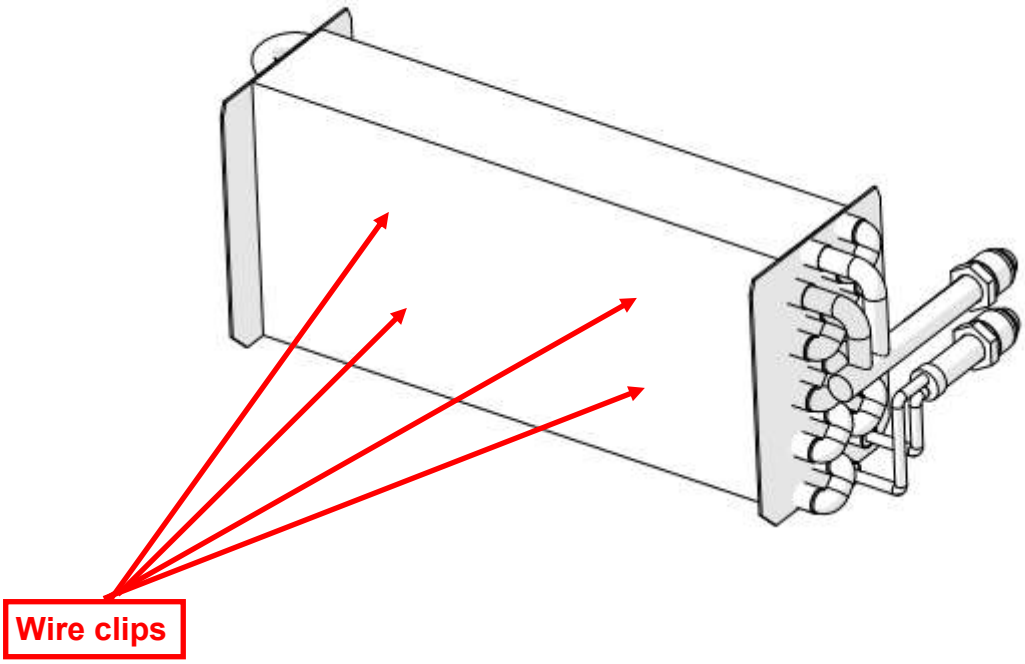
Tools

Hook pick
Needle nose pliers

Care should be taken not to damage fins on core. Bending fins will result in airflow reduction which can cause a reduction in performance of the AC system. Clips are pushed thru foam, located between core fins and fit over the tubes to retain condensation collection foam to core.

Installation

Install condenser collection foam onto core by gently inserting retaining clips through foam and onto tubes. Take care not to damage fins, which will reduce airflow over the core.



19 EVAPORATOR CORE Step 11

Tools

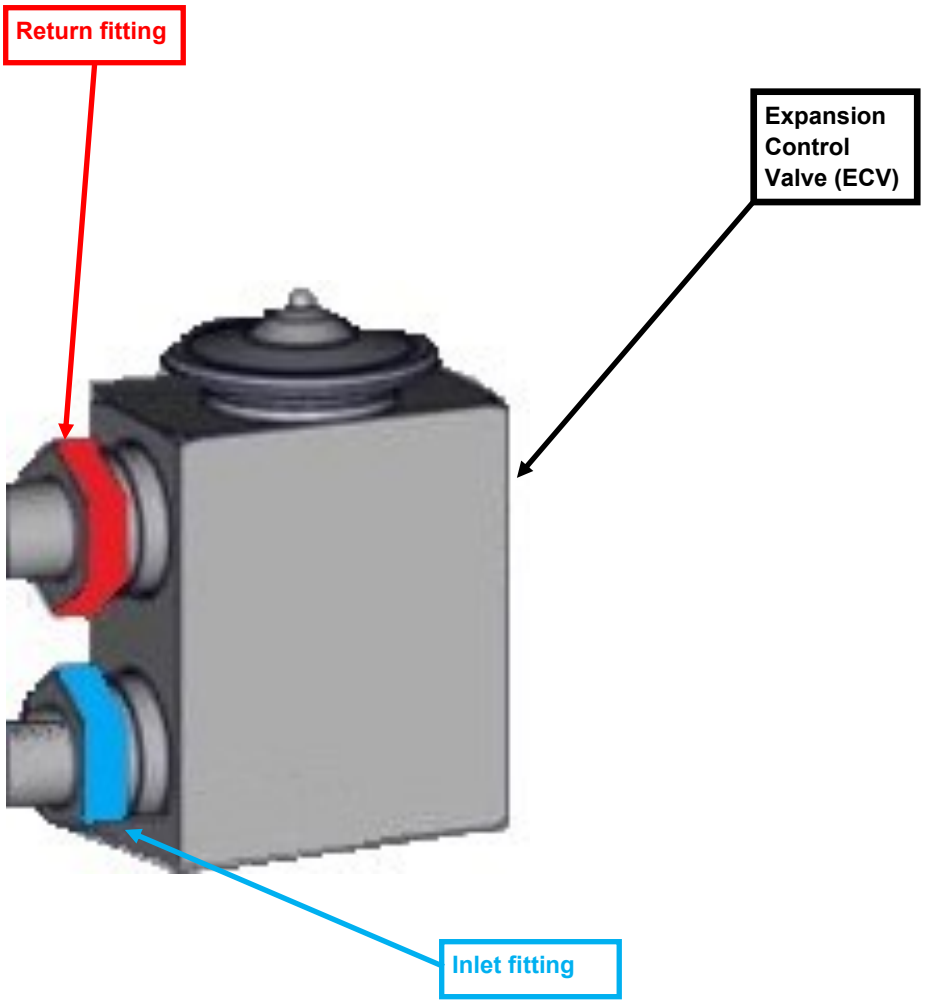
Two 3/4” Open End Wrenches

Install new O-rings onto fittings and lubricate with ZEROL ESTER 68SL refrigerant oil prior to assembling. Care should be taken not to damage fins on core. Bending fins will result in airflow reduction which can cause a reduction in performance of the AC system

Installation

Install new O-rings onto fittings of evaporator core and lubricate with ZEROL ESTER 68SL refrigerant oil.

Install Expansion Control Valve onto fittings. Tighten with valve oriented as shown.



19 EVAPORATOR CORE Step 12

Tools

#2 Phillips screw driver

Care should be taken not to damage fins on core. Bending fins will result in airflow reduction which can cause a reduction in performance of the AC system.

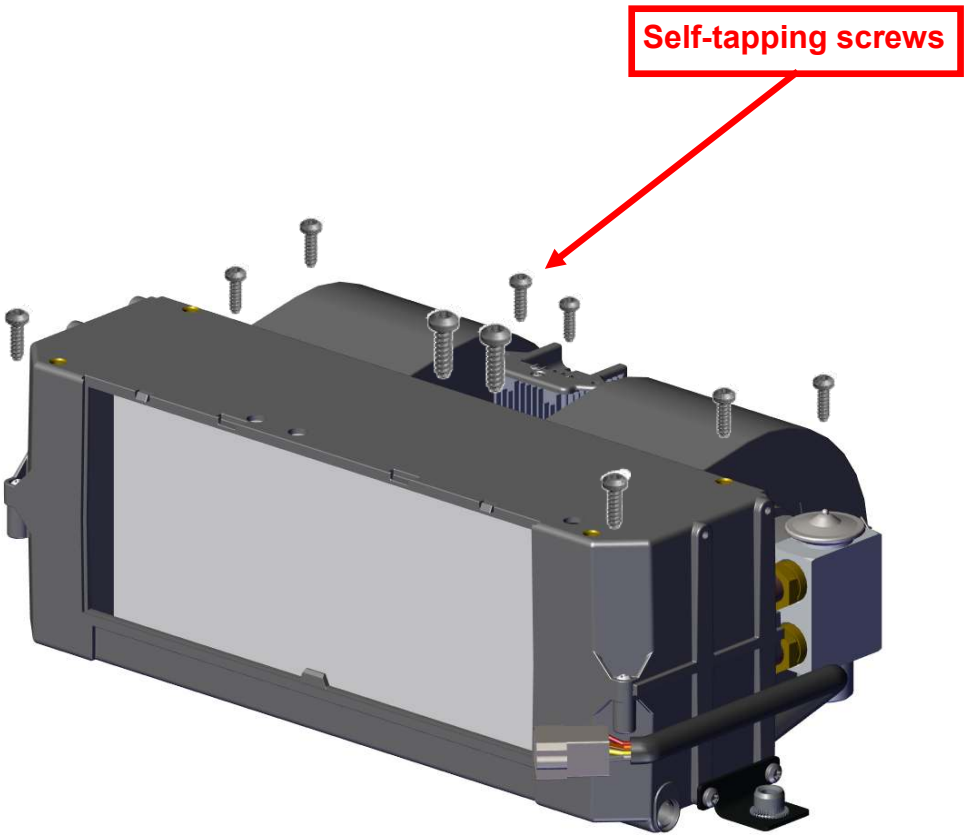
Installation

Install Thermistor and wire assembly into core in same position as noted during disassembly.

Install core with Evaporator Control Valve and Thermistor into lower half of box.

Place top half of box onto lower half, being careful to position core into slats, and thermistor wire into place. Be careful to prevent fins from being damaged.

Install 10 self-tapping screws holding upper case to lower case.



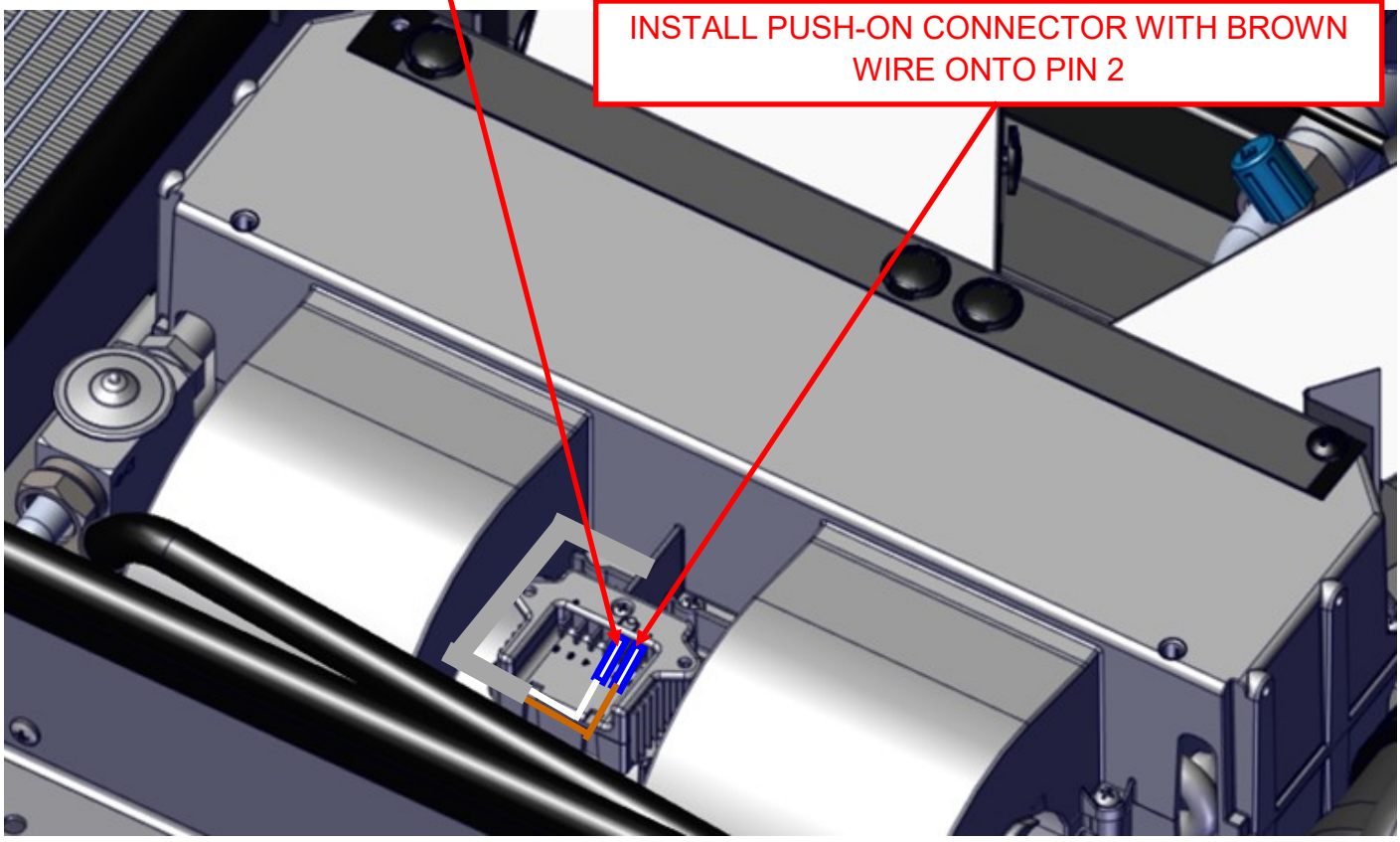
19 EVAPORATOR CORE Step 13

Tools

Needle nose pliers

Installation

Install 2 thermistor wires onto thermostat by pushing connectors onto their respective pins

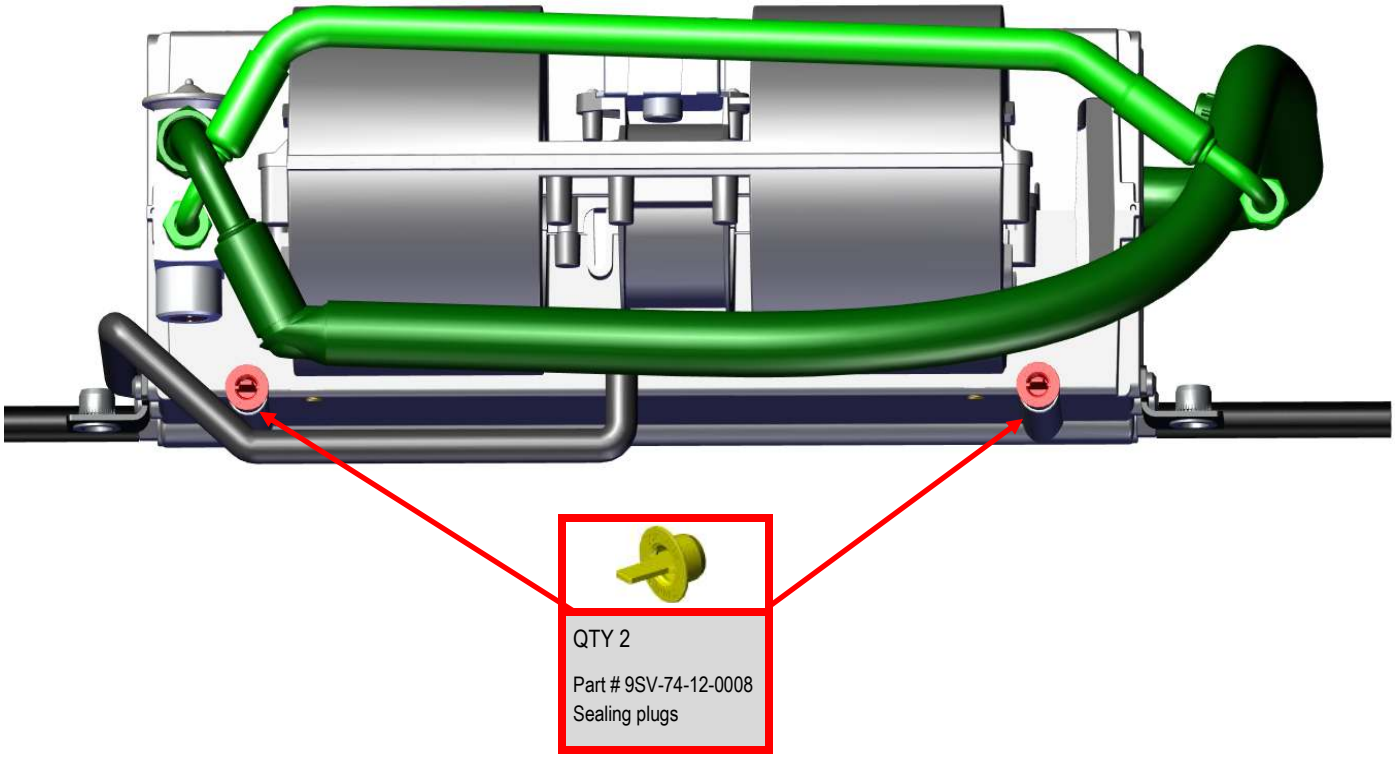


19 EVAPORATOR CORE Step 14

Ensure plugs are tight in tubes, use sealant if needed to ensure plugs are water tight.

Installation

Ensure 2 drain tube plugs are in place on unused fittings of evaporator box



QTY 2

Part # 9SV-74-12-0008
Sealing plugs

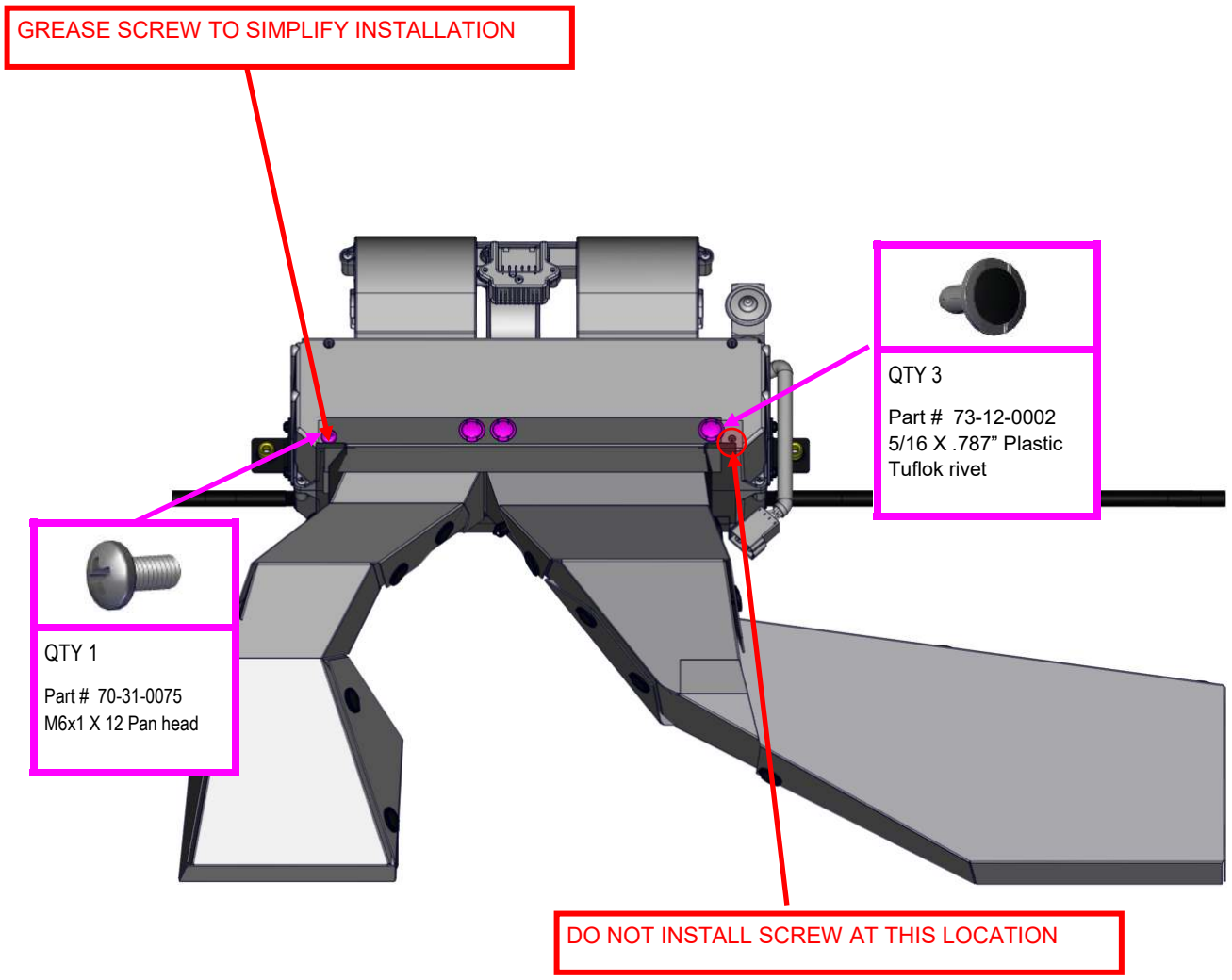
19 EVAPORATOR CORE Step 15

Tools

#3 Phillips screwdriver

Installation

Install 1 screw and 3 plastic rivets retaining duct to evaporator box.



19 EVAPORATOR CORE Step 16

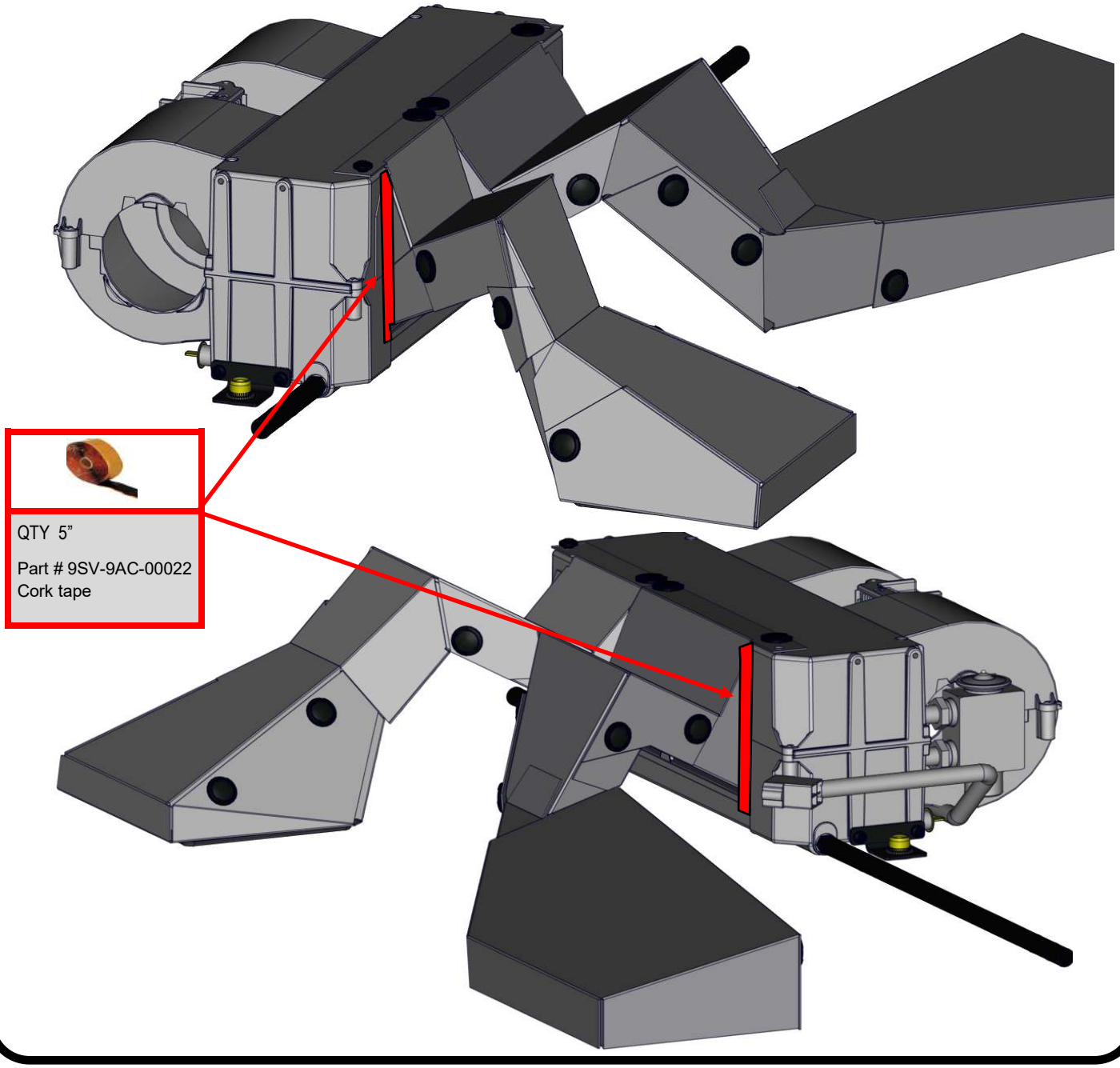
Tools

Scissors

Cork tape is very tacky, use of gloves when removing is recommended.

Installation

Install sealing cork tape over gaps at seams between duct and case.



QTY 5”

Part # 9SV-9AC-00022
Cork tape

19 EVAPORATOR CORE Step 17

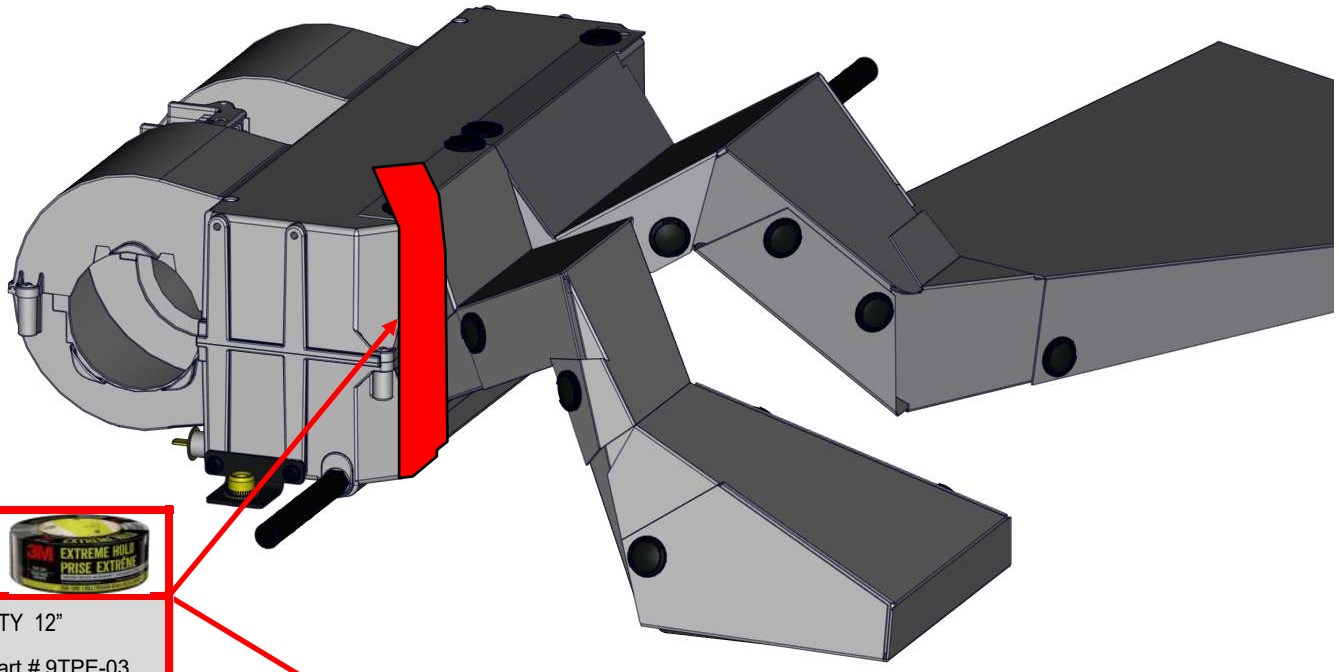
Tools

Scissors

Cork tape is very tacky, use of gloves when removing is recommended.

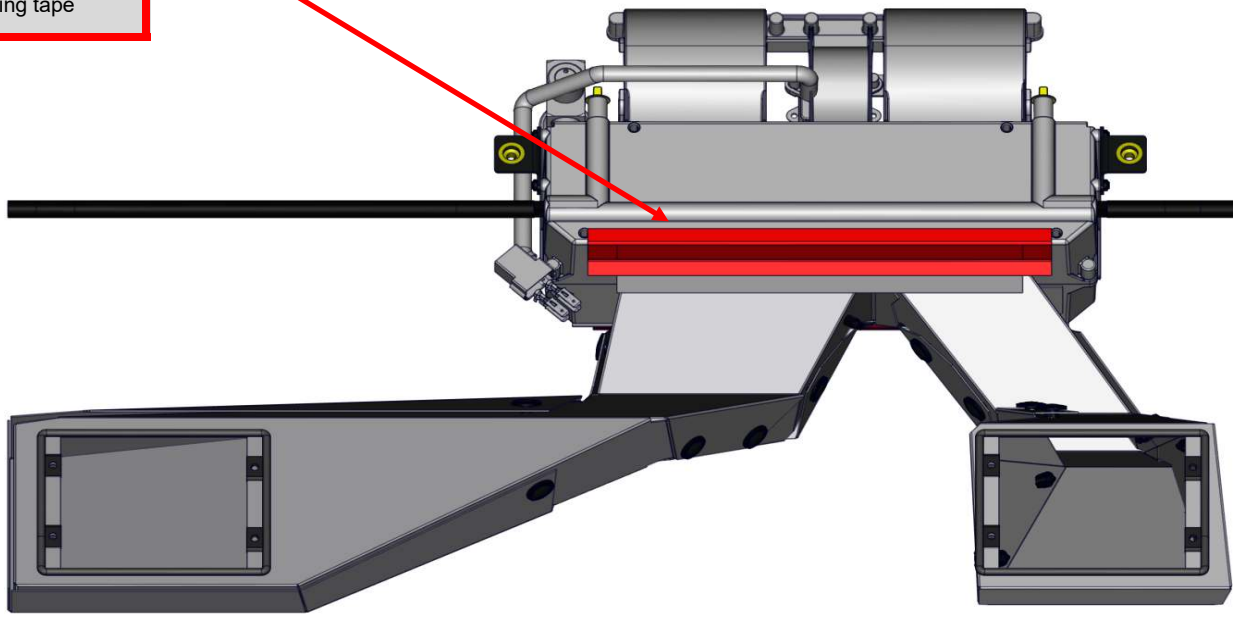
installation

Install sealing tape over seams.



QTY 12”

Part # 9TPE-03
sealing tape



19 EVAPORATOR CORE Step 18

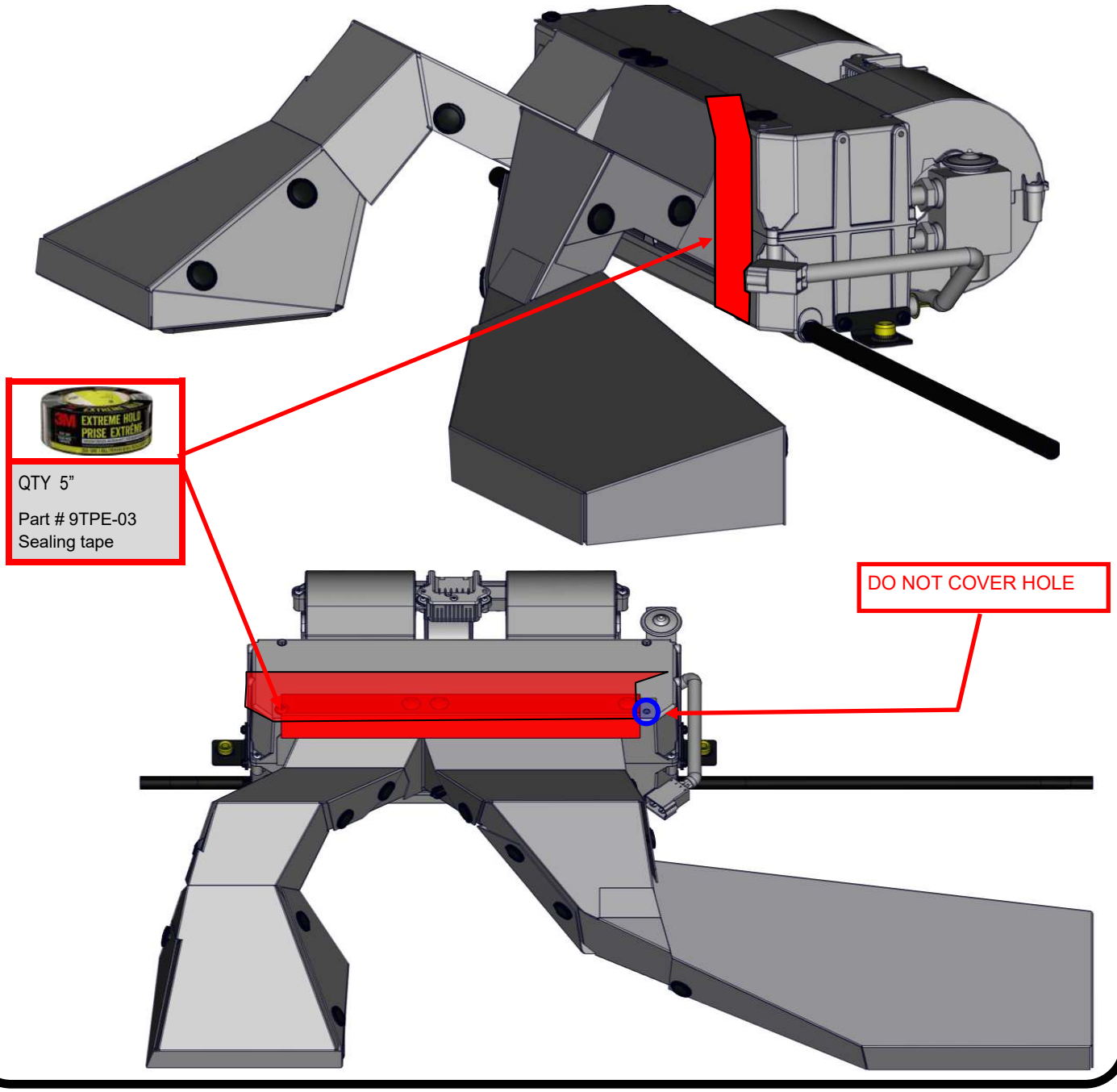
Tools

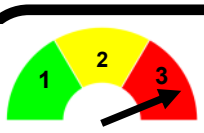
Scissors

Cork tape is very tacky, use of gloves when removing is recommended.

Installation

Install sealing tape over seams.





19 EVAPORATOR CORE Step 19

System evacuation and charging must only be performed by an EPA Part 609 certified technician, using EPA Certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Installation

Re-assemble Evaporator box into unit, per Evaporator Box instructions.

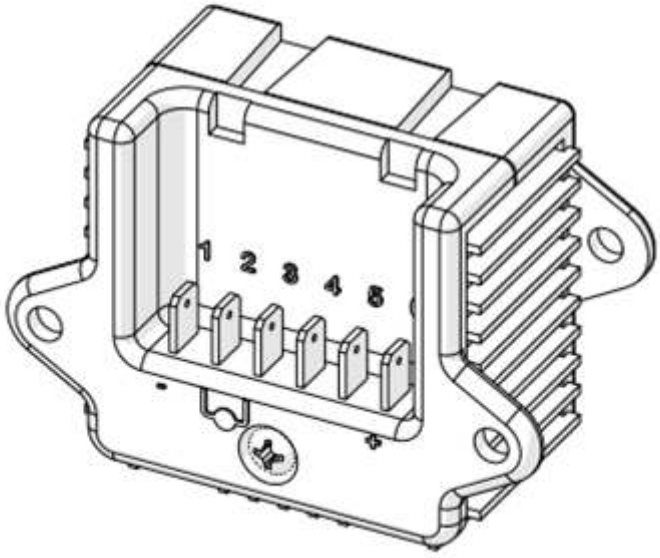
Charge system per section 13 in this manual.

20 THERMOSTAT

Operation

The thermostat is an electronic switching unit that turns off the compressor should the core temperature reach 40 degrees F to prevent freezing of condensation and thus preventing air flow. The thermostat is preset at the factory and requires no adjustments. Should the thermostat fail, only replace with an exact fit component to ensure proper system performance.

THERMOSTAT
P/N: 9SV-9AC-00008



20 THERMOSTAT

Tools

Needle nose pliers

Flat blade screwdriver

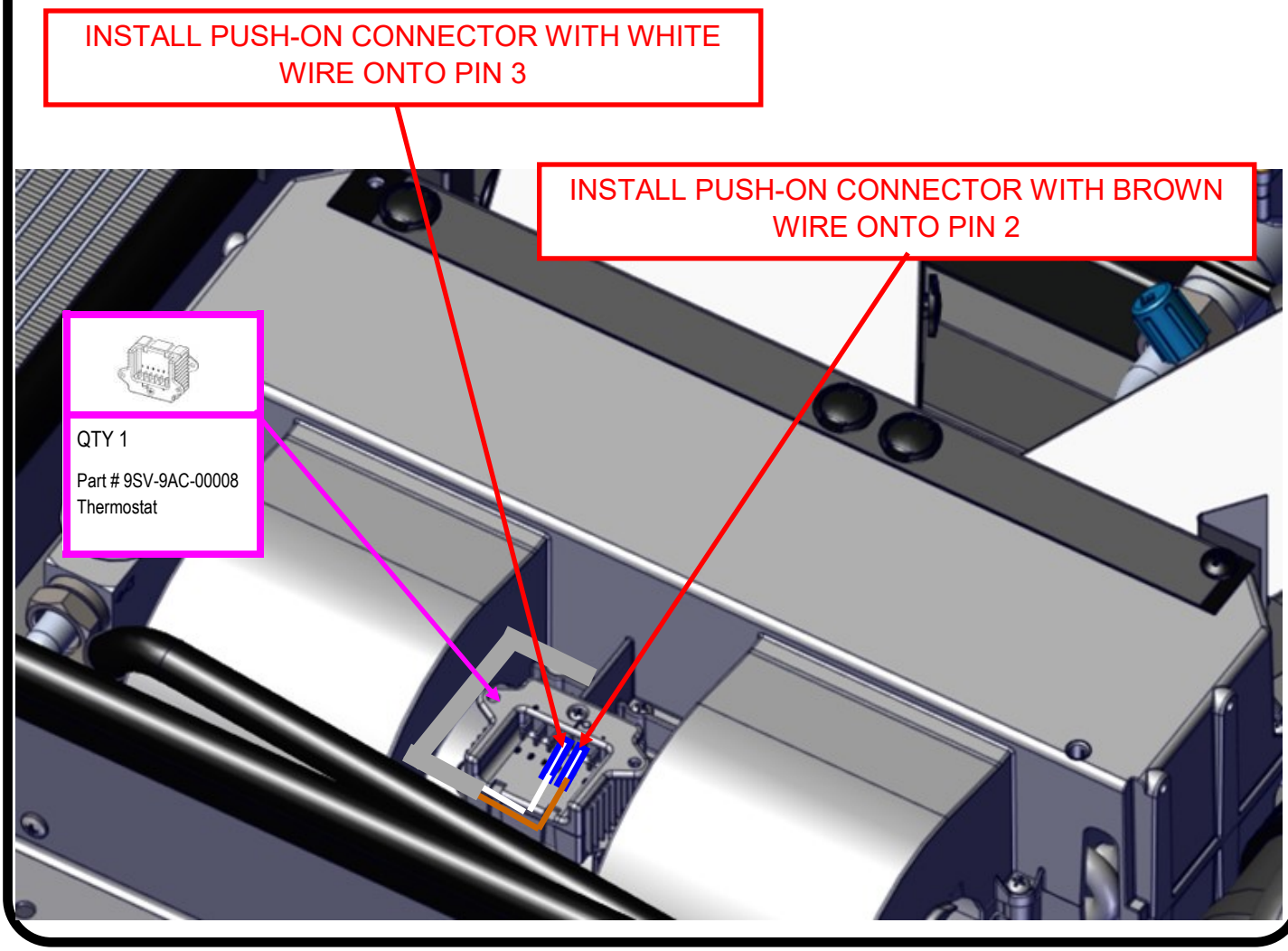
Use screw driver to gently pry terminal back from pin. Use needle nose pliers to remove, do not pull on wire.

Removal

Remove 2 thermistor wires from thermostat by pulling connectors from their respective pins. Use screwdriver to pry connectors back, then needle nose pliers to remove. Use care not to damage connectors or wires.

Installation

Install 2 thermistor wires onto thermostat by pushing connectors onto their respective pins.



21 EXPANSION CONTROL VALVE (ECV)

Operation

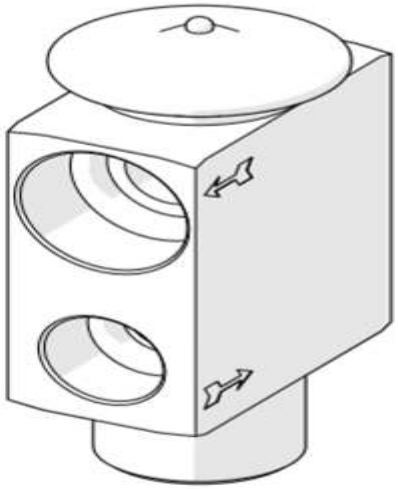
The Expansion Control Valve, or ECV, or Expansion Valve, regulates refrigerant flowing into the evaporator core via an orifice and thermostatically controlled needle valve.

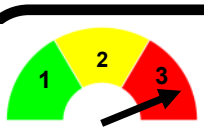
The ECV is sized to the system's requirements, and is a very integral part of system refrigerant charge amount and performance. If the valve is contaminated, refrigerant flow can be restricted, causing low or no flow thru the core.

The valve is preset at the factory, and confirmed to be operating properly during the final assembly/ QC process.

Only replace ECV with the an exact replacement part to ensure proper system performance.

EXPANSION VALVE
P/N: 9SV-9AC-00004





21 EXPANSION CONTROL VALVE (ECV) Step 1

Cork tape is very tacky, use of gloves when removing is recommended.

Removal

Evacuate System per section 13 in this manual.

Remove sealing tape from Inlet line (from drier) and outlet line (to compressor) fittings.

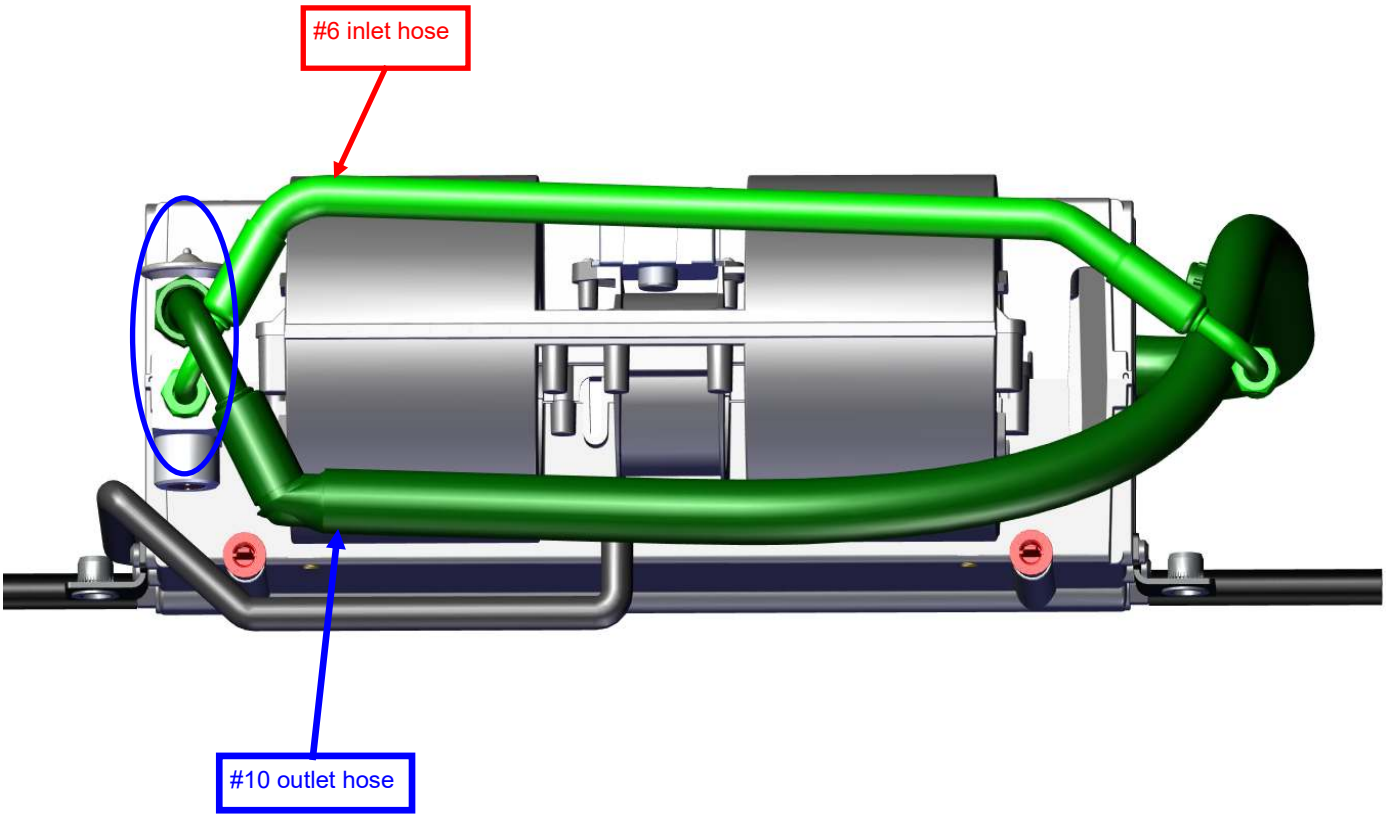
Remove sealing tape and gasket (if equipped) from fittings attaching ECV valve to core.

21 EXPANSION CONTROL VALVE (ECV) Step 2

Tools

3/4” Open/ box end wrench
7/8” Open/ box end wrench

Remove both the outlet and inlet hose fittings from valve.



21 EXPANSION CONTROL VALVE (ECV) Step 3

Tools

3/4” Open End Wrench
8” Adjustable wrench

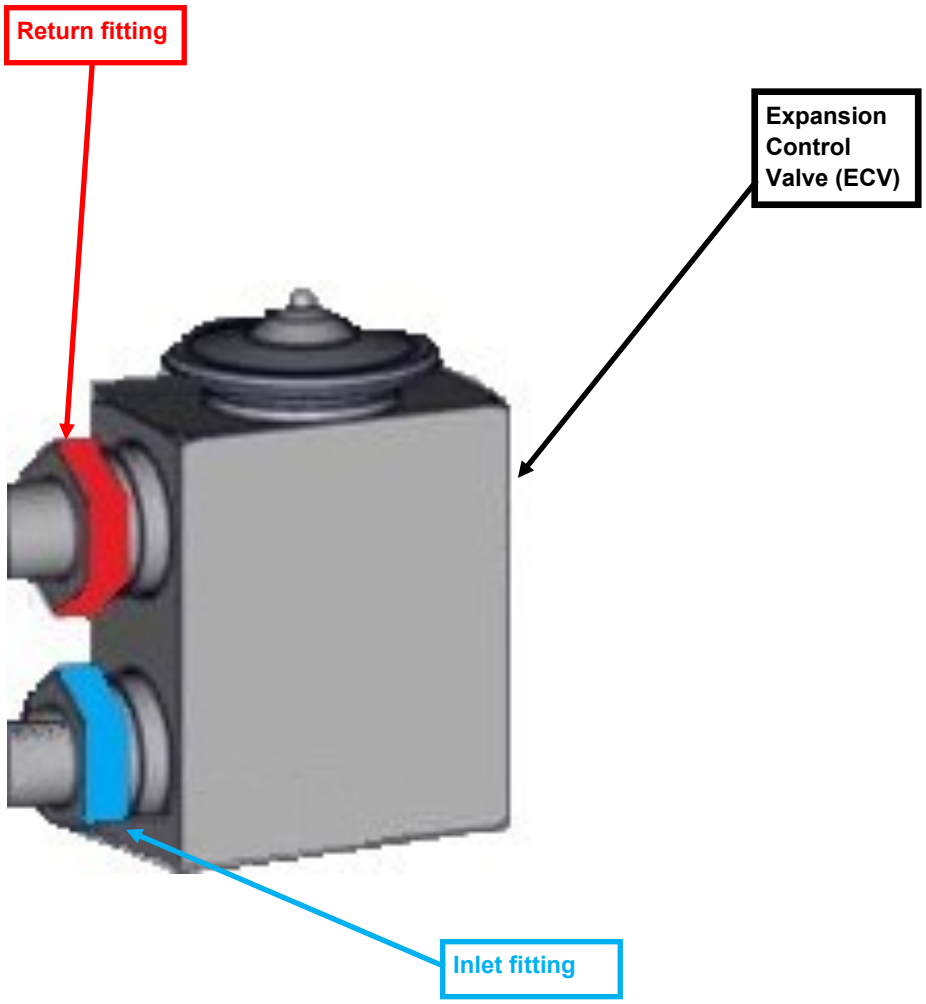
Install new O-rings onto fittings and lubricate with ZEROL ESTER 68SL refrigerant oil prior to assembling. Care should be taken not to damage fins on core. Bending fins will result in airflow reduction, which can cause a reduction in performance of the AC system.

Removal

Remove inlet and outlet fittings attaching valve to core, being certain not to bend or damage core by holding valve with adjustable wrench while loosening fittings.

Remove cork tape, (note placement on valve for use during assembly)

Seal fitting and hose ends if system is to be left apart for more than 2 minutes.



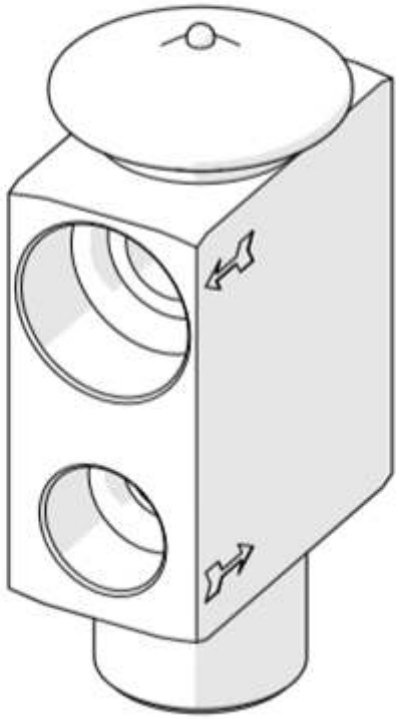
21 EXPANSION CONTROL VALVE (ECV) Step 4

Install new O-rings onto fittings and lubricate with ZEROL ESTER 68SL refrigerant oil prior to assembling. Care should be taken not to damage fins on core. Bending fins will result in airflow reduction which can cause a reduction in performance of the AC system.

Installation

If valve is damaged, leaking, and/or not performing properly, replace with a new part number 9SV -9AC-00004.

EXPANSION VALVE
P/N: 9SV-9AC-00004



21 EXPANSION CONTROL VALVE (ECV) Step 5

Tools

3/4” Open End Wrench
8” Adjustable wrench

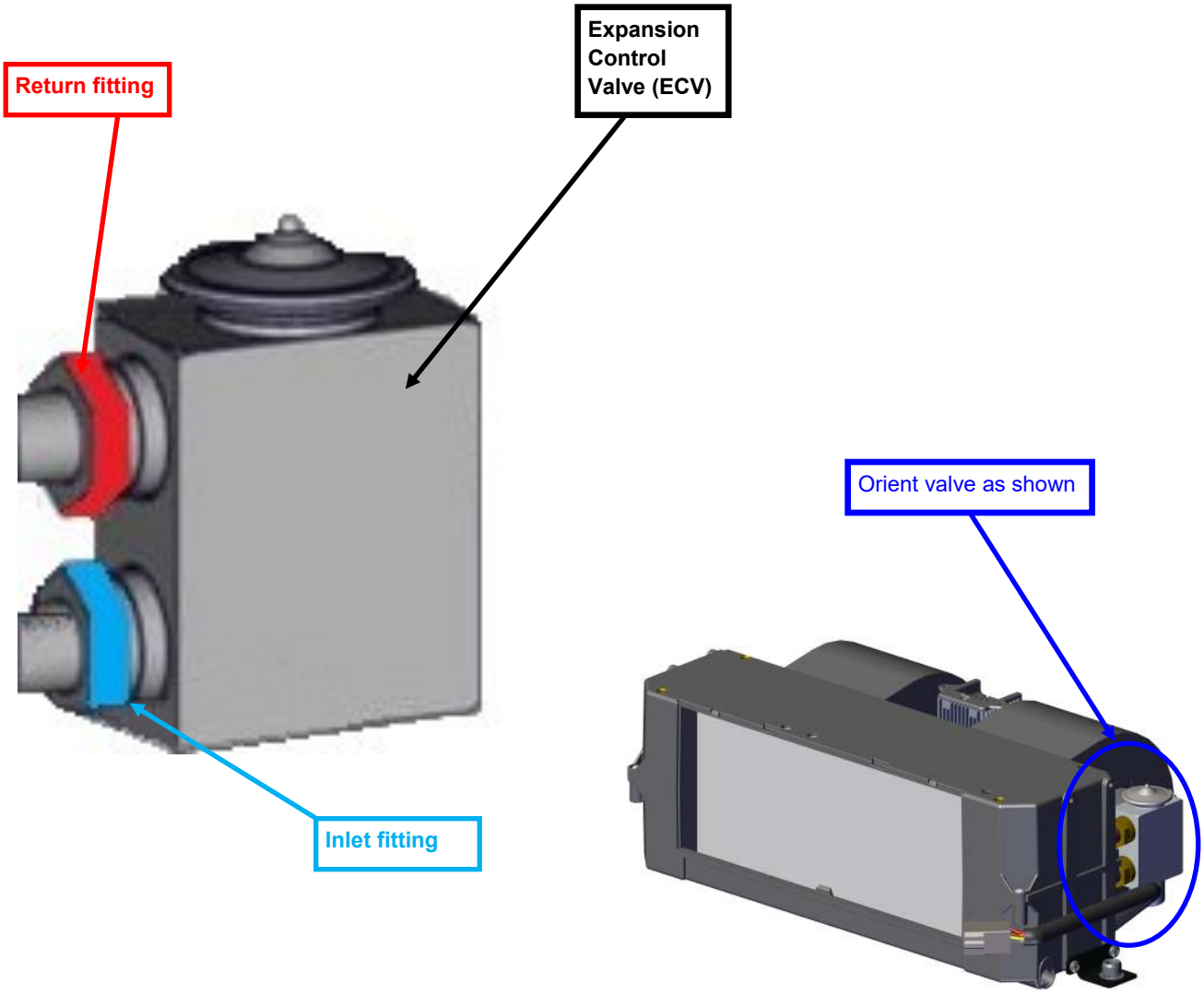
Install new O-rings onto fittings and lubricate with ZEROL ESTER 68SL refrigerant oil prior to assembling. Care should be taken not to damage fins on core. Bending fins will result in airflow reduction, which can cause a reduction in performance of the A/C system.

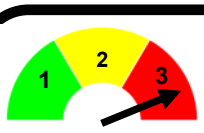
Installation

Install new O-rings onto fittings of evaporator core and lubricate ZEROL ESTER 68SL refrigerant oil

Install Evaporator Control Valve onto fittings. Tighten with valve oriented as shown.

Install cork tape covering valve as noted during removal in step 3.





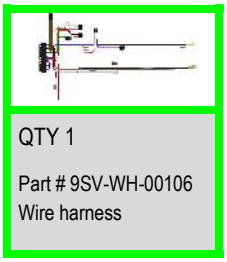
21 EXPANSION CONTROL VALVE (ECV) Step 6

System evacuation and charging must only be performed by an EPA Part 609 certified technician, using EPA Certified refrigerant handling equipment suitable for R134a refrigerant. Both the technician and equipment must meet all State, Local, and Federal requirements.

Installation

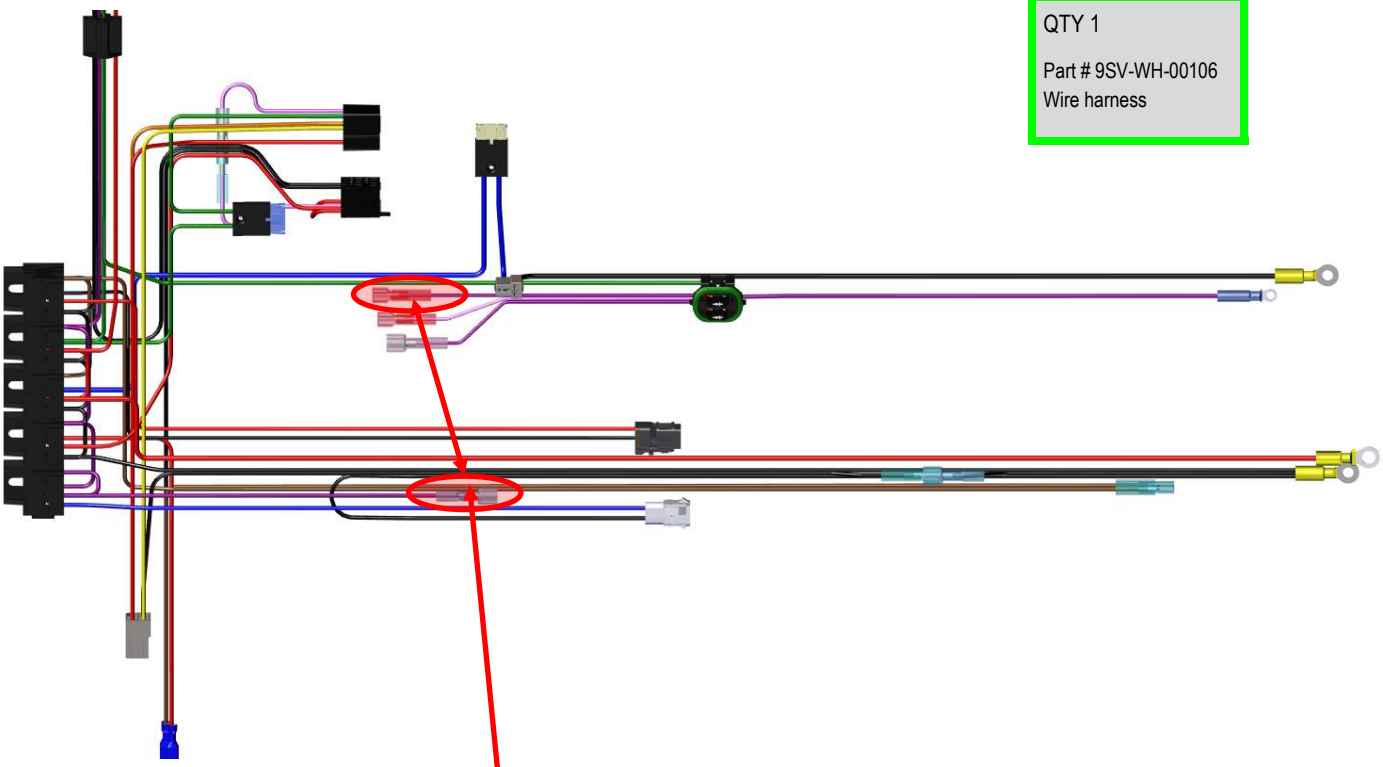
If repair is complete, charge system per section 13 in this manual.

22 WIRING HARNESS



QTY 1

Part # 9SV-WH-00106
Wire harness



CONFIRM 2 PURPLE HARNESS WIRES ARE CONNECTED TO EACH OTHER

23 COMPRESSOR ON/OFF SWITCH

Tools

#2 Flat blade screwdriver
5/8” Open/ box end wrench

Removal

Remove connector from back of switch. There is a locking pin in one corner of connector that must be pushed back to release from switch.

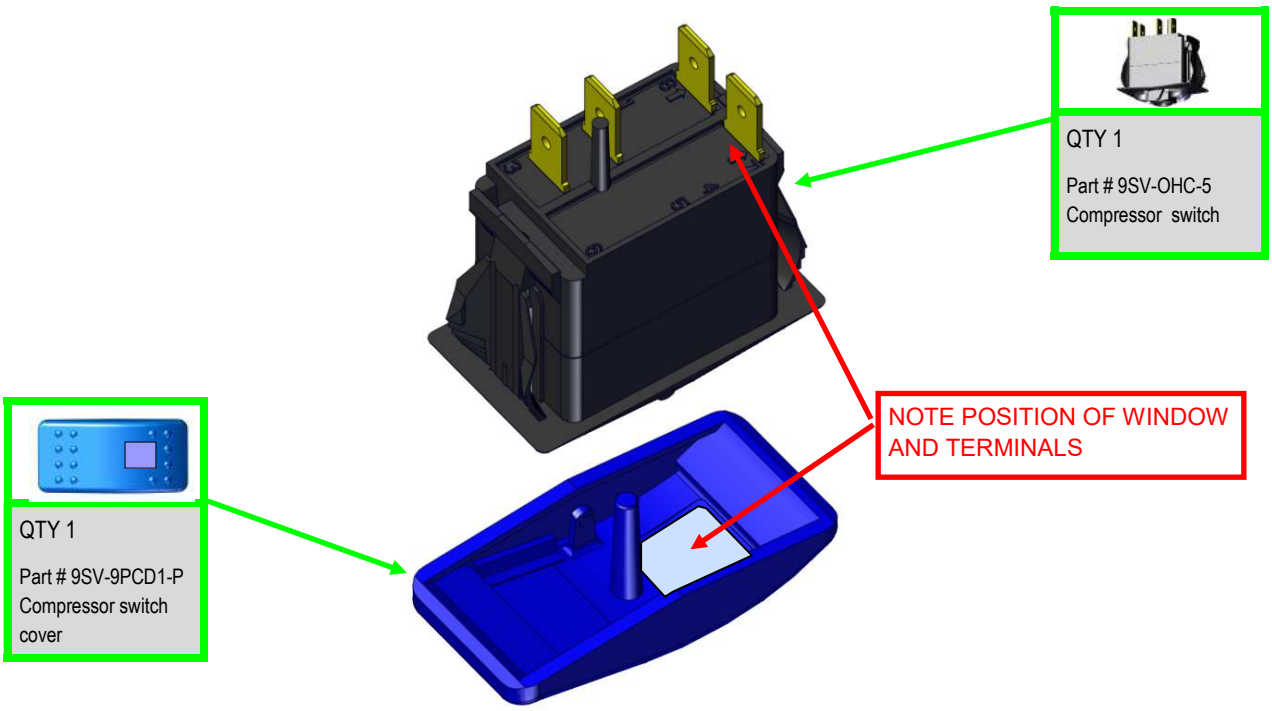
Depress tangs on side of switch to release from case. Push switch out of case. Remove cover as shown.

Installation

Install cover being certain of direction for lighted window.

Install switch into case with lighted window facing ON position of decal.

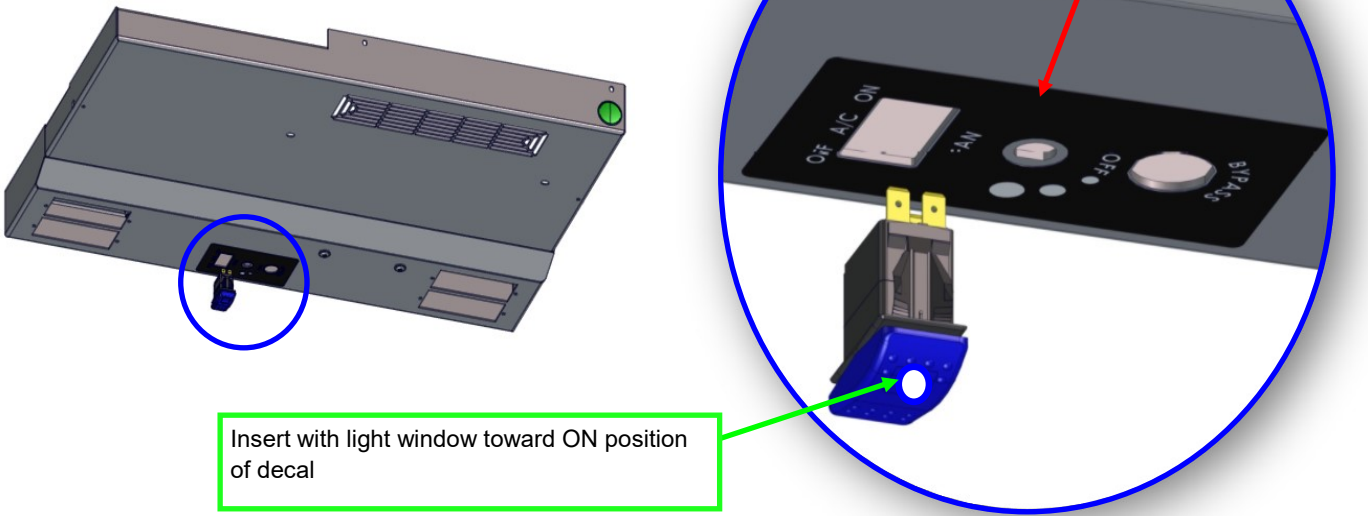
Install connector onto back of switch using lock pin as guide. Ensure lock is in place with connector fully seated on switch.



23 COMPRESSOR ON/OFF SWITCH

Installation

Install switch into case, being certain of direction for lighted window in relation to decal labeling.



24 BLOWER SWITCH

Tools

#2 Flat blade screwdriver
5/8” Open/ box end wrench

Note flats on switch and knob when installing.

Removal

Remove connector from back of switch. There is no locking tab on connector.

Remove switch from case by pulling knob from stem, then removing retaining nut and washer.

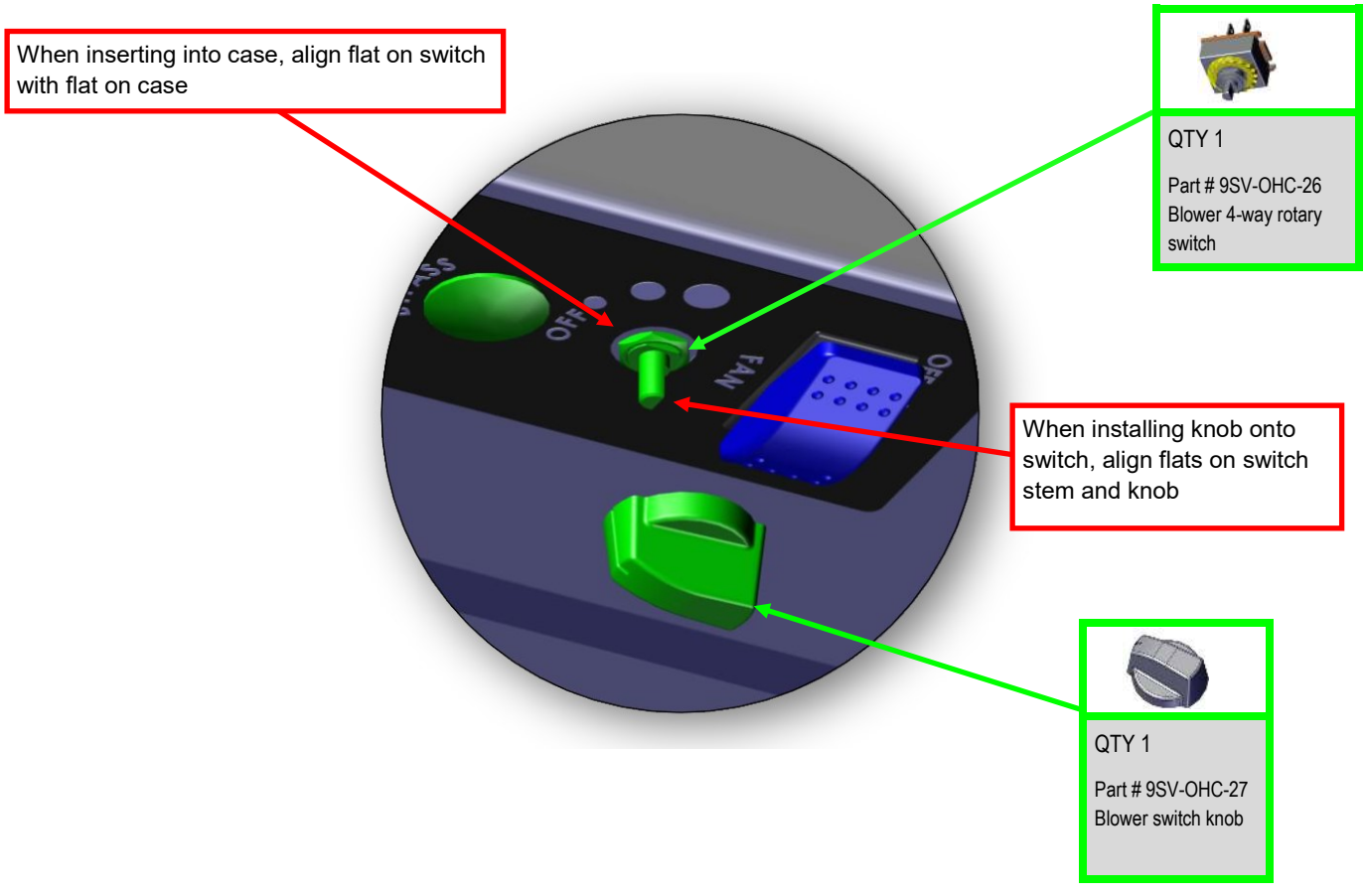
Installation

Install switch into case, aligning flat side of switch with flat in case cutout.

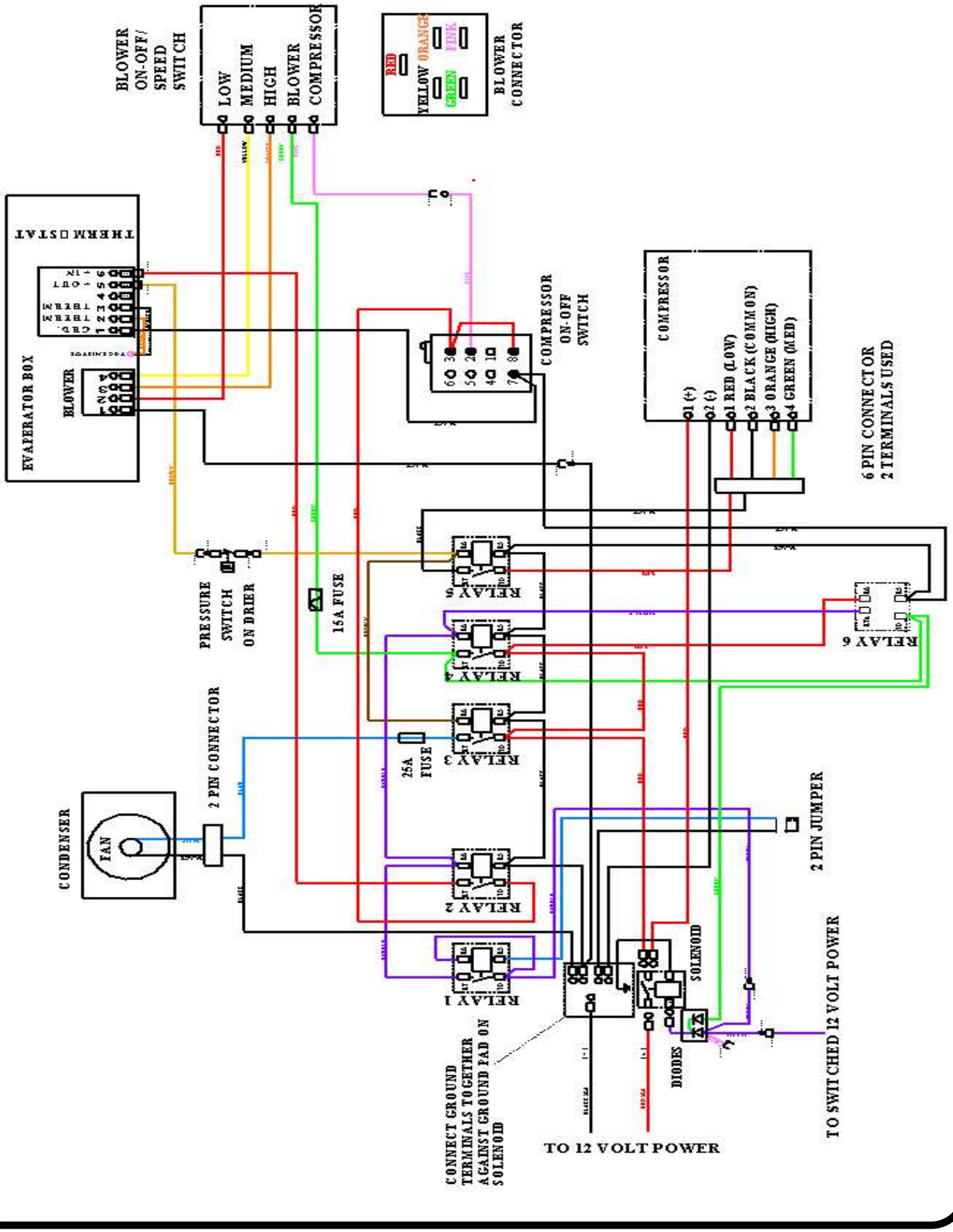
Install washer and nut onto switch stem.

Install knob onto stem aligning flat with stem flat.

Install connector onto back of switch depressing fully onto terminals.



25 ELECTRICAL SCHEMATIC



26 ELECTRICAL CIRCUIT OPERATION

The main Power Solenoid located in the Roof Top Unit supplies power to the A/C electrical system. There is a main power cable that goes from the vehicle battery to this solenoid that supplies power at all times the battery is connected. There are two 100 amp fuses in this circuit, one at the battery and the other at the alternator.

When 12 volts is applied to the Purple “switched” wire from the vehicle, the solenoid is activated and turns power on to the system.

The electronic controller, or control relay, (depending on the vehicle) then switches on the A/C system, based on one or all of the following; engine RPM, throttle position, alternator output, power demand by the A/C system, system voltage.

In some applications, the compressor and blower are allowed to remain on for separate predetermined lengths of time dependent on the vehicle. These functions can be overridden if the main blower switch is turned off. If the A/C unit is configured for a pedal start vehicle using this delayed off function, there will be an InPower time delay off relay in the loose #6 relay block and no relay in the #4 position. It is important to note that there should only be a relay in block 6 (time delay) **or** block #4 (standard relay) **never should there be a relay in both positions.**

When the unit is in operation (key switch on & control parameters met), the blower can be run in any of its three speeds without the compressor being turned on. There are 4 positions of the blower switch. Off, On with Low blower speed, On with Medium blower speed, On with High blower speed. In some configurations, the blower is allowed to run after the vehicle engine has stopped.

With the Blower switch on in one of the three speed settings, the compressor can be turned on/off using the two position lighted compressor switch. Once turned on, the Blue light will illuminate showing the compressor is on the On or Run position.

When the compressor is turned on, the Condenser fan is activated and will run as long as the system is on.

Compressor function is then controlled by the Low/High refrigerant Pressure Switch located on the Receiver/Drier, and the Electronic Thermostat located on the evaporator assembly. Per the wiring diagram, power passes thru the thermostat, thru the pressure switch, and to the compressor relay, allowing it to close and activate the compressor control circuit. In some configurations, there is an additional time delay relay control that will allow the compressor to run after the unit has either come to a stop or been turned off for a predetermined amount of time. If this function is being used, there will be a Bueller time delay relay in the #2 position of the relay block. This function can be overridden by turning the blower switch to the Off position.

When the compressor is running, if the evaporator core temperature is too low, the compressor will be switched off by the thermostat to prevent core icing. The compressor will automatically be turned on and off to prevent this condition.

26 ELECTRICAL CIRCUIT OPERATION

There are two 1 amp diodes contained in the A/C system wiring harness. These prevent power from being back fed to the vehicle when the A/C unit is configured to operate after the vehicle has been turned off for Pedal Start Vehicles. Orientation of these diodes is critical. If replaced, they must be installed in the same orientation as removed for proper unit/vehicle operation.

There are 5 relays used in the A/C system harness. There are 6 relay positions. Dependent on the vehicle configuration, **either** relay position 4 or 6 are used. **Never are both relay positions utilized**. Relay positions are as follows.

Relay 1: Main Relay- N/O Hella 40/20 12V

Relay 2: System Control- Either N/O Hella 40/20 12V relay or Bueller Time Delay

Relay 3: Condenser Fan- N/O Hella 40/20 12V

Relay 4: Blower Primary- N/O Hella 40/20 12V (when utilized, “standard” configuration)

Relay 5: Compressor- N/O Hella 40/20 12V

Relay 6: Blower Secondary- In Power Time Delay (when utilized, in “vehicle specific” configuration)

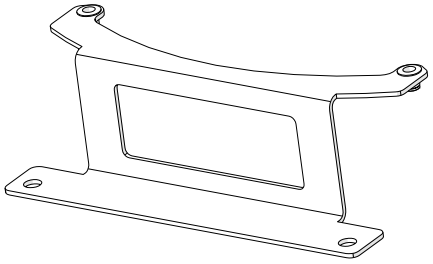
There are 2 Fuses located in the A/C Roof Top Unit.

Condenser fan Fuse- 25 Amp

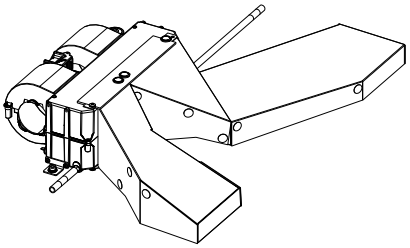
Blower Fuse– 15 Amp

27 1ACUNIT-G2
SERVICE PARTS

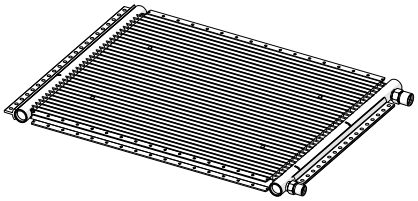
CONDENSER FAN BRACKET
P/N: 8SV-110-00040



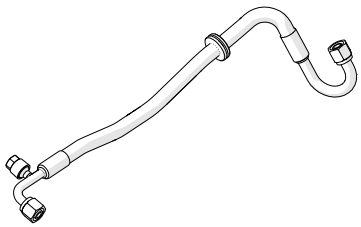
EVAPORATOR ASSEMBLY
P/N: 8SV-304-00008



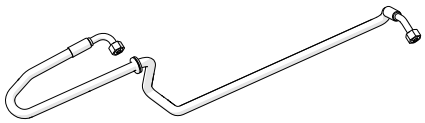
CONDENSER
P/N: 8SV-304-00006



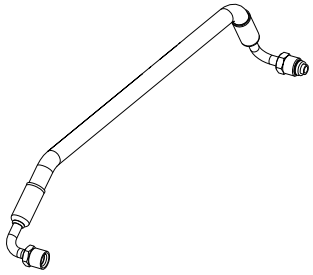
HIGH PRESSURE LINE
P/N: 8SV-305-00009



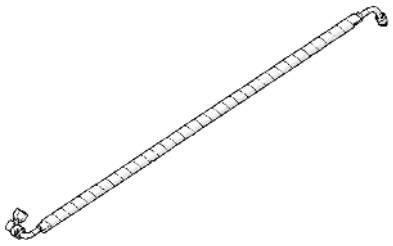
CONDENSER TO DRIER LINE
P/N: 8SV-305-00011



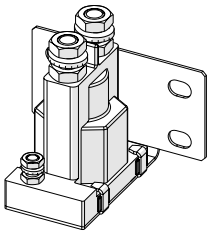
DRIER TO EVAPORATOR LINE
P/N: 8SV-305-00013



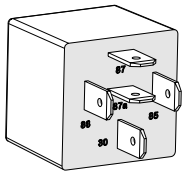
LOW PRESSURE RETURN LINE
P/N: 8SV-305-00014



12V SOLENOID
P/N: 9SV-1TBP61A

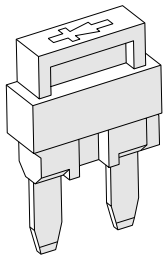


RELAY, 12V, 20/40A, SPDT, MINI ISO
P/N: 9SV-85-01-0022

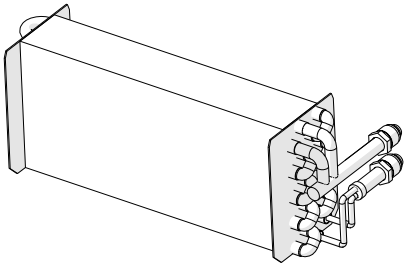


NOTE: SOME VEHICLES MAY REQUIRE DIFFERENT OR ADDITIONAL RELAYS. REFER TO THE ALTERNATOR KIT MANUAL SPECIFIC TO YOUR VEHICLE.

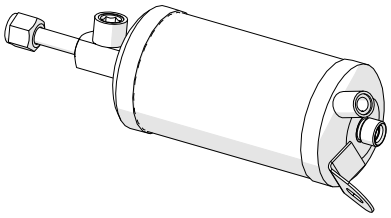
DIODE, 1 AMP, MINI
P/N: 9SV-85-10-0027



EVAPORATOR CORE
P/N: 9SV-9AC-00002

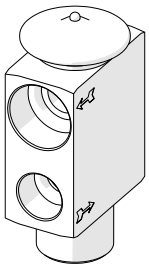


DRIER RECEIVER
P/N: 9SV-9AC-00003

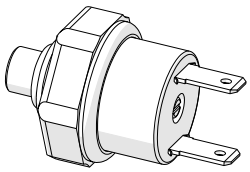


27 1ACUNIT-G2
SERVICE PARTS

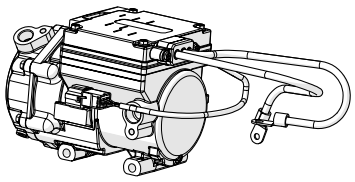
EXPANSION VALVE
P/N: 9SV-9AC-00004



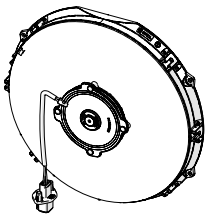
PRESSURE SWITCH, 2-28KG/CM2
P/N: 9SV-9AC-00005



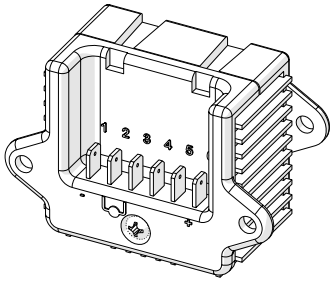
COMPRESSOR, 12 VDC
P/N: 9SV-9AC-00006



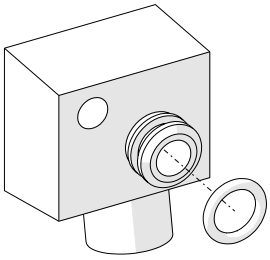
AXIAL FAN
P/N: 9SV-9AC-00007



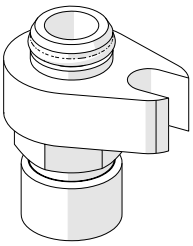
THERMOSTAT
P/N: 9SV-9AC-00008



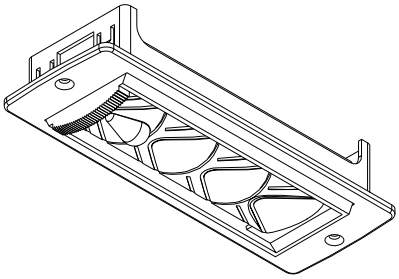
HIGH PRESSURE COMPRESSOR
FITTING W/ O-RING
P/N: 9SV-9AC-00024



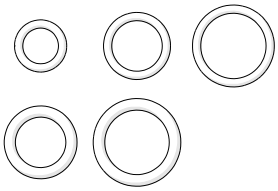
LOW PRESSURE COMPRESSOR
FITTING W/ O-RING
P/N: 9SV-9AC-00025



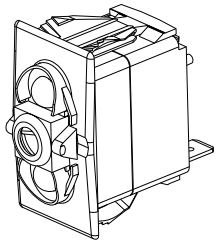
REPLACEMENT LOUVER
P/N: 9SV-9HR-L



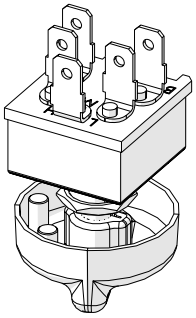
A/C UNIT O-RING KIT
P/N: 9SV-9OR-01



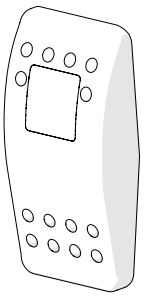
SWITCH, SPST
P/N: 9SV-OHC5



4-WAY ROTARY SWITCH W/ KNOB
P/N: 9SV-OHC-26

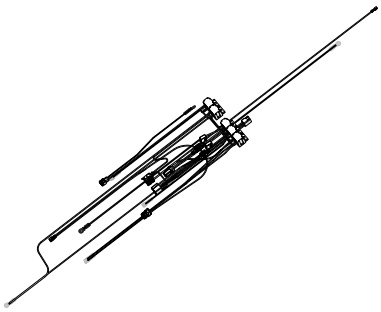


CONSOLE ROCKER SWITCH
COVER, BLUE LENS
P/N: 9SV-9PCD1-P

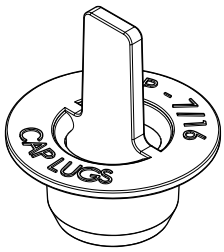


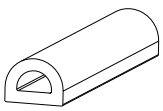
27 1ACUNIT-G2
SERVICE PARTS

WIRE HARNESS, A/C ROOF UNIT
P/N: 9SV-WH-00106



CAP/PLUG (QTY.: 2)
P/N: 9SV-74-12-0008



3/8" PVC HOSE, BLACK, 1/2" OD	5/8" STD BULB, 1/16" GRIP	ARCH PSA RUBBER .20WDX.15TALL	CORK TAPE
			(NOT PICTURED)
9SV-AC-00019-15	9SV-PRO2-15	9SV-PR53-15	9SV-9AC-00022-5