



42-01-1151-1

**VOLKSWAGEN AIR CONDITIONER
TYPE 113 SUPER 1972
INSTALLATION INSTRUCTIONS**

VOLKSWAGEN PRODUCTS CORP. FORT WORTH, TEXAS

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TYPE 113 SUPER 1972
INSTALLATION INSTRUCTIONS**

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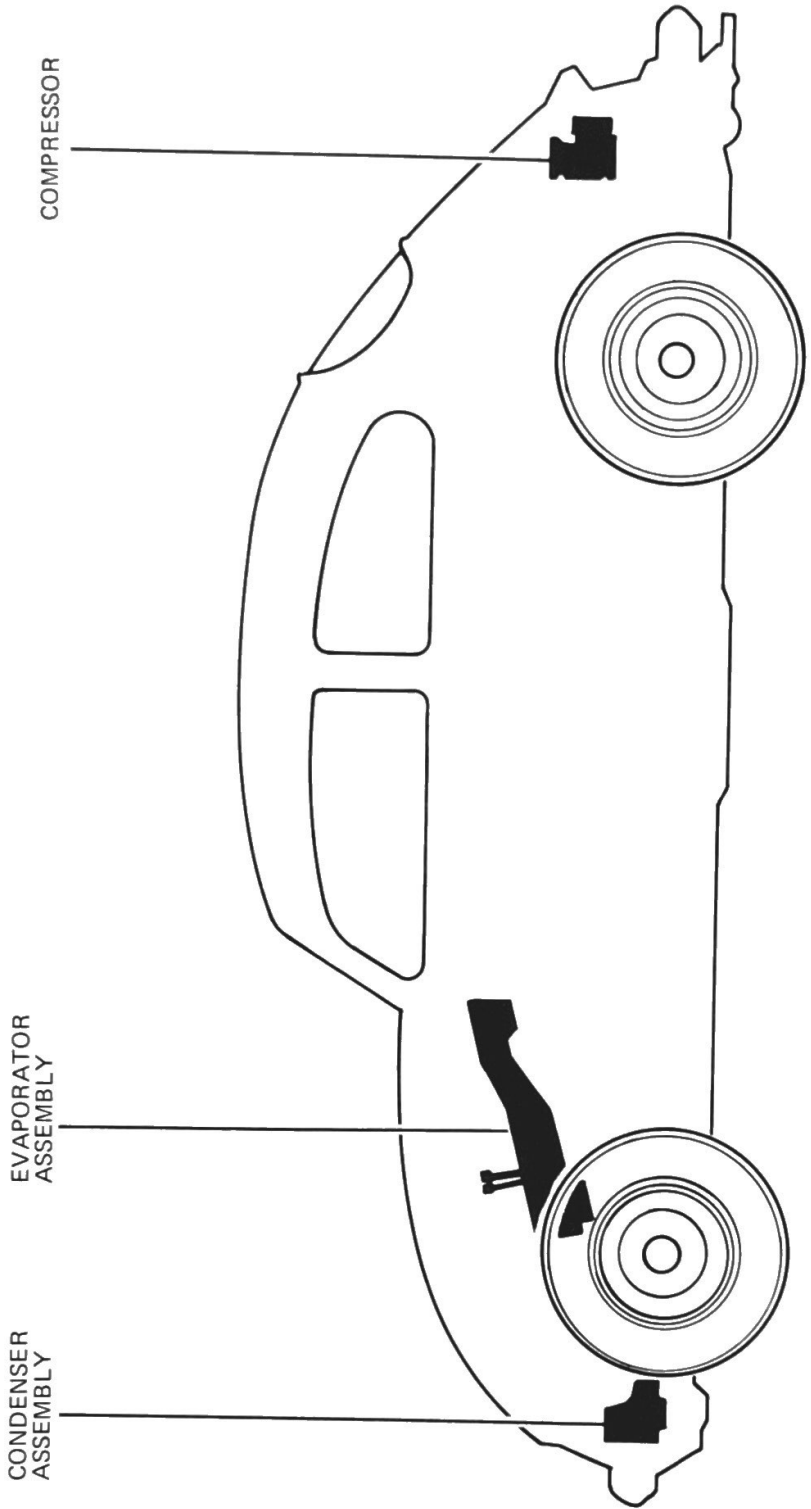
ZCo.1 REQUIRED TOOL LIST

The following tools are required for proper installation of a 1972 113 air-conditioning unit:

- 1) Vacuum pump
- 2) Manifold gauge set (with charging hoses)
- 3) 25 ounces of Refrigerant 12
- 4) Refrigeration oil
- 5) Eye goggles
- 6) Electronic leak detector
- 7) Paper Template ZVW 218 711
- 8) Paper Template ZVW 231 741
- 9) Fiberglass Template US 4442
- 10) Fiberglass Template US 4443
- 11) Holes saws with mandrel and pilot bit
 - a) 1-1/4"
 - b) 1"
 - c) 5/8"
 - d) 3/4"
 - e) 2-1/2"
- 12) Drill bits
 - a) No. 42
 - b) 1/8" (No. 30 or 3 mm)
 - c) 1/4" (6 mm)
 - d) 1/2" (13 mm)
 - e) 5/32" (4 mm)
- 13) Left hand sheetmetal shears
- 14) Right hand sheetmetal shears
- 15) 3/8" drive ratchet
- 16) 3/8" drive 6" extension
- 17) Sockets
 - a) 10 mm (3/8" drive)
 - b) 13 mm (3/8" drive)
 - c) 15 mm (3/8" drive)
 - d) 17 mm (3/8" drive)
 - e) 3/8" (3/8" drive)
 - f) 7/16" (3/8" drive)
 - g) 9/16" (3/8" drive)
 - h) 1-3/16" (1/2" drive)
- 18) 1/2" drive torque wrench (0-125 ft. lbs.)
- 19) Open end wrenches
 - a) 13 mm
 - b) 7/16"
 - c) 9/16"
 - d) 5/8" (offset 90°)
 - e) 3/4"
 - f) 13/16"
 - g) 7/8"
 - h) 15/16"
 - i) 1"
 - j) 1-1/16"
 - k) 1-1/8"
- 20) Electric drill motor
- 21) Slot and phillips screwdrivers
- 22) Wire terminal pliers
- 23) Belt tension gauge

COMPONENT LOCATIONS

ZCo.1



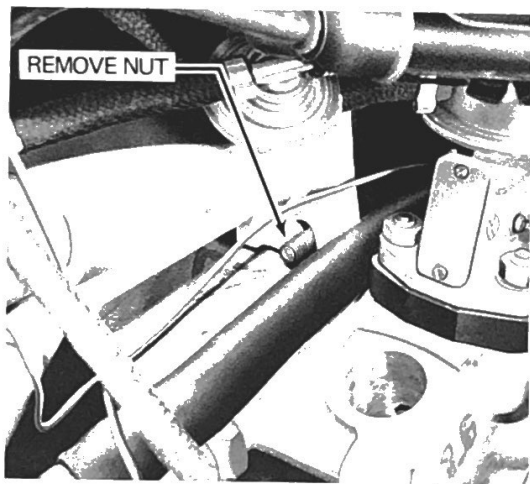
1972 MODEL 113

ZCo.1 ENGINE COMPARTMENT

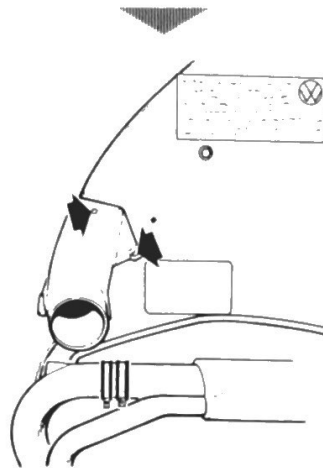
Note:

All instructions for right, left, forward, or rear directions are from the driver's position facing forward unless otherwise noted.

- 1 – Place vehicle on a suitable hoist and raise until engine compartment is at a working level.
- 2 – Remove left rear and left front wheels.
- 3 – Disconnect battery.
- 4 – Loosen right fresh air and preheater hoses at bottom connection and move out of the way. Remove left fresh air hose and discard. Retain the original clamps, hose insert, and rubber sleeve.
- 5 – **California Automatic Stick Shift only:**
Remove and discard exhaust recirculator connecting pipe. A replacement pipe will be installed later.
- 6 – Remove rear engine cover plate. Discard the cover plate for the crankshaft pulley (center section), but retain the two washers.
- 7 – Disconnect the distributor cap and remove the vacuum lines and distributor.
Caution:
Place a protective cover over the distributor hole and both lower fresh air ducts to prevent foreign matter from entering these areas.
- 8 – Remove engine case nut directly behind fuel pump and discard nut and washer.



- 9 – Remove left fresh air duct from fan housing by drilling spot welds with a 1/4" drill.

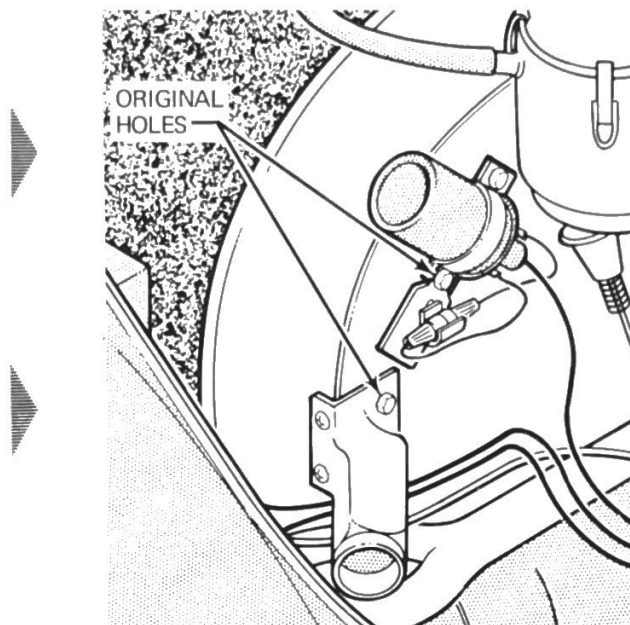


- 10 – Work duct up and down to break away from fan housing and discard.

- 11 – Using sheet metal shears, trim the left fresh air duct projection flange on fan housing as flush as possible to the fan housing surfaces.

ENGINE COMPARTMENT ZCo.1

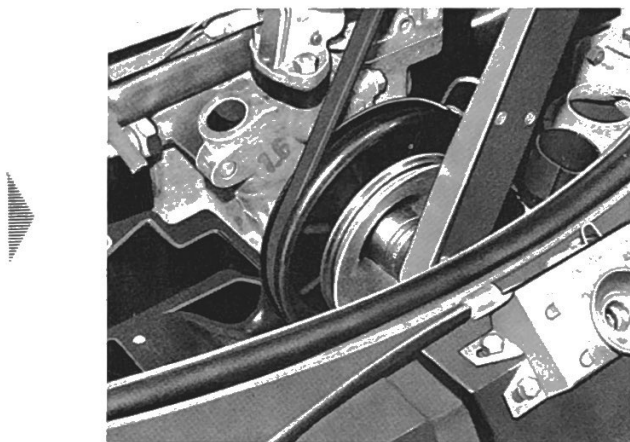
- 12 – Remove ignition coil from original position. Relocate lower hole in clamp to top original hole in fan housing. Using clamp as a template, drill a 5/32" hole. Reinstall with one original screw and one No. 14 sheet metal screw relocating the fuse holder bracket at the same time.



- 13 – Install fresh air duct by first installing bolt from ignition coil mount through large hole in duct and into the hole in the fan housing remaining from the coil removal. Using duct as a template, drill the fan housing in three places using a No. 30 drill. Secure with three No. 8 x 3/8" sheet metal screws.

- 14 – Remove crankshaft bolt and discard. Retain wave washer for reuse.

- 15 – Install compressor drive pulley against the crankshaft pulley using the bolt from the kit and the original wavewasher. Torque the bolt to 80-85 foot pounds.



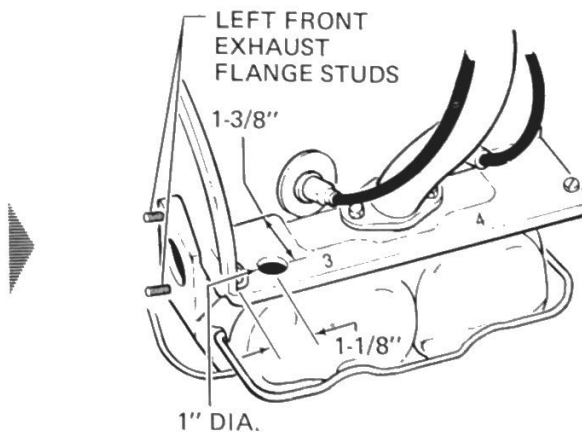
- 16 – Remove two 8 mm nuts from the left rear exhaust flange studs and two 8 mm nuts from the left front exhaust flange studs. Retain one nut for reuse and discard others.

California Automatic Stick Shift only:

Remove upper 8 mm nut from left rear exhaust flange stud and two 8 mm nuts from left front exhaust flange studs.

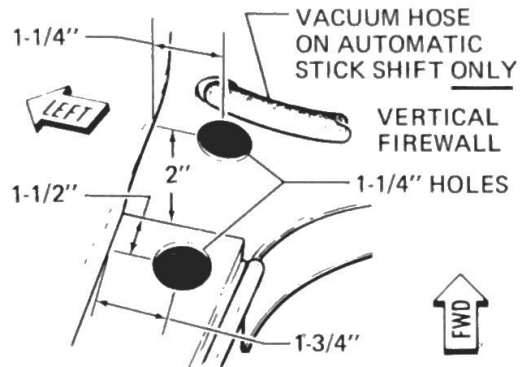
- 17 – Trim rear engine cover plate and protection plate for preheater pipe in accordance with template ZVW 218 711.

- 18 – From the engine compartment, drill a 1" hole through the left engine cover plate for the left compressor brace using template ZVW 231 741.



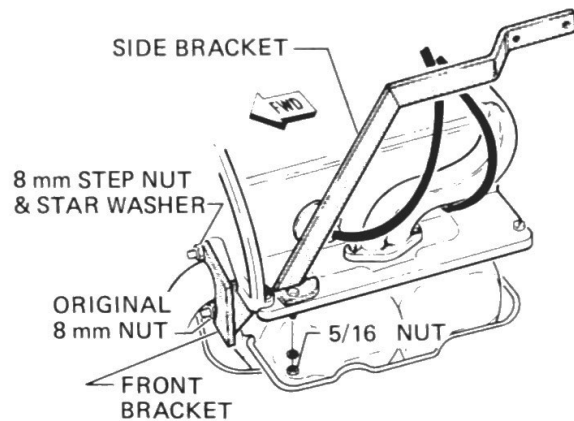
ZCo.1 ENGINE COMPARTMENT

- 19 – Drill one 1-1/4" hole in the lower left side of the engine compartment vertical firewall for the suction hose and one 1-1/4" hole in the horizontal surface for the discharge hose.



- 20 – Install front compressor bracket to left front exhaust flange studs. Thread an 8 mm step nut and star washer to the top stud and the original 8 mm nut to the bottom stud. Tighten the bracket.

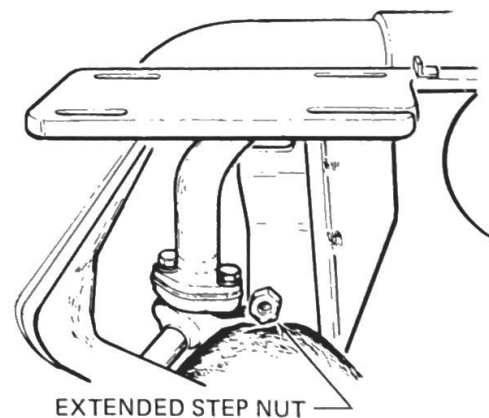
- 21 – Place the forward foot of the side bracket over the 1" hole previously cut in the left engine cover plate and attach loosely to the front compressor bracket with the 5/16 nut, lockwasher, and flatwasher. Do not tighten at this time.



- 22 – Install main compressor mount to the crankcase stud and the two rear exhaust flange studs using three 8 mm step nuts and star washers. Use the extended step nut on the top rear stud. Tighten at this time.

California Automatic Stick Shift only:

Install main compressor mount to the crankcase stud and rear exhaust flange stud using an 8 mm step nut on the crankcase stud and an extended 8 mm nut on the exhaust flange stud. Tighten at this time.

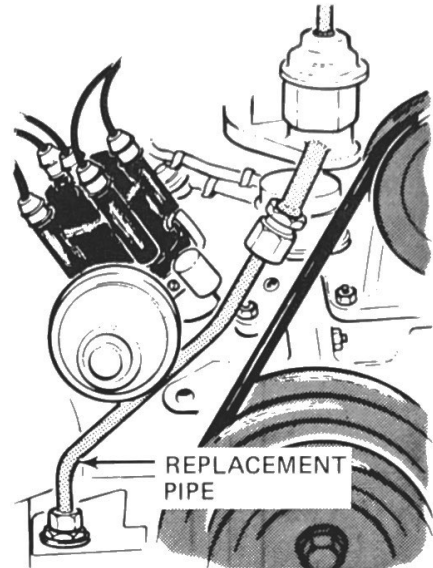


ENGINE COMPARTMENT ZCo.1

23 – Reinstall modified rear engine cover plate and protection plate for preheater pipe.

24 – Reinstall distributor and cap.

25 – **California Automatic Stick Shift only:**
Reconnect exhaust recirculator using replacement connecting pipe from kit.



26 – Thread the 5/8" suction and 1/2" discharge service valves loosely on the compressor service ports.

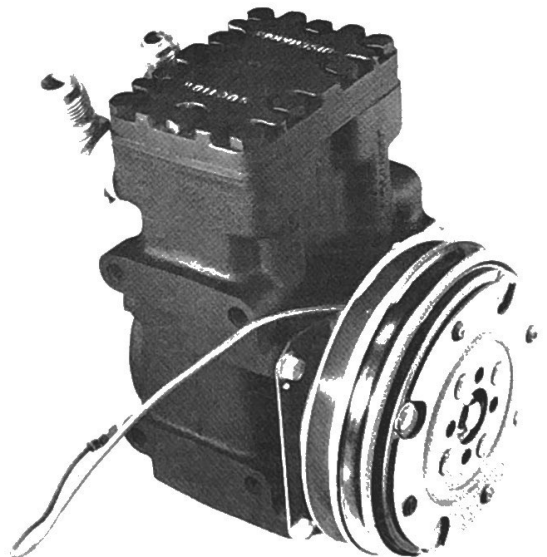
27 – Remove all grease from the compressor shaft.

28 – Position clutch holding coil on the coil mounting bosses on the compressor with the wire in the direction of the compressor cylinder head. Torque the four bolts provided for holding coil attachment to 6 foot pounds.

29 – Align the clutch pulley keyway with the compressor shaft key and insert the clutch pulley over compressor shaft. Secure temporarily with the washer and bolt provided with the clutch pulley.

Warning:

The current must be ON and the belt tightened before the clutch pulley can be secured properly.



30 – Loosely attach the compressor on the main mount using four 3/8 x 3/4" NC bolts with lockwashers and flatwashers. Slide the compressor to the right end of the slots. Do not tighten at this time.

ZCo.1 ENGINE COMPARTMENT

31 – Place the compressor drive belt over the drive pulley and the groove on the clutch pulley rearmost in the vehicle. Adjust the belt tension to a belt gauge reading of 95 pounds tension by inserting a pry bar between the right-angled pry stop welded on the main mount and the compressor base, moving the compressor over to the left. Tighten the four bolts securing the compressor to 22-25 foot pounds.

32 – Tighten bolt between front compressor bracket and side bracket to 22-25 foot pounds.

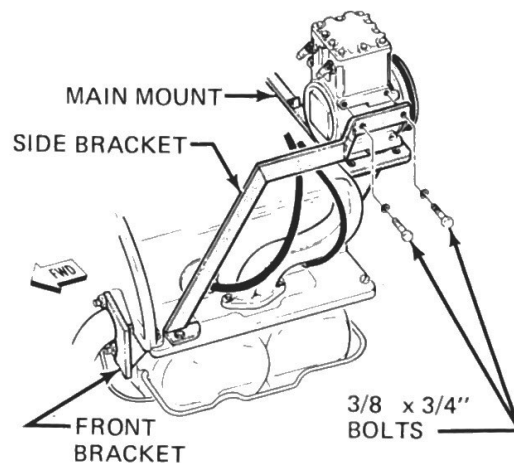
33 – Attach side bracket to upper left compressor with $3/8 \times 3/4$ " NC bolts, lockwashers, and flatwashers. Torque to 22-25 foot pounds.

34 – Extend the green wire to terminal No. 1 of the ignition coil and connect the covered end to the existing green wire.

35 – The original fresh air hose on the left is replaced by the accordion hose from the kit. Clamp the hose to the tube insert and the adapter on the fan housing with the original clamps.

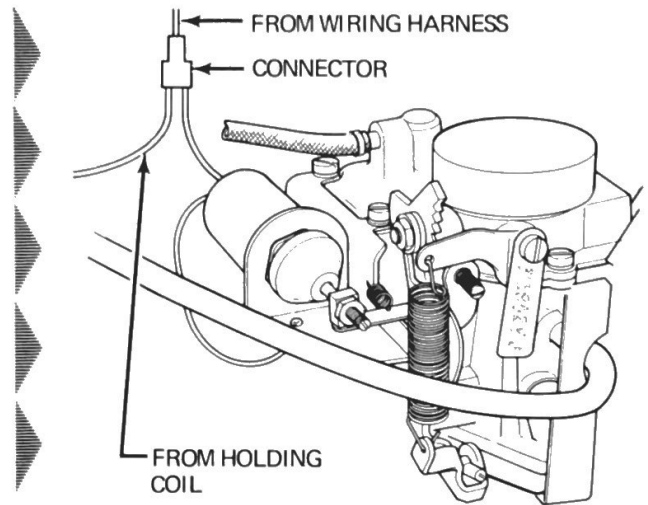
36 – Reinstall right fresh air and preheater hoses.

37 – Reinstall vacuum lines.



38 – Automatic Stick Shift only:

- a – remove air cleaner.
- b – remove hose between fuel pump and carburetor and discard.
- c – remove and discard both left screws and lockwashers from carburetor bowl cover.
- d – install automatic idle advance assembly on left side of carburetor with wired end of solenoid pointing toward front of car. In this position, the bracket flange with mounting holes is on the right of the solenoid. The flanged end of the spring loaded lever on the idle advance rests in front of the throttle lever. Align bracket with carburetor bowl cover, insert screws and tighten.
- e – install the longer fuel hose and clamps.
- f – disconnect clutch holding coil wire from white wire of air conditioner harness.
- g – remove terminals and install connectors provided.
- h – reinstall air cleaner.



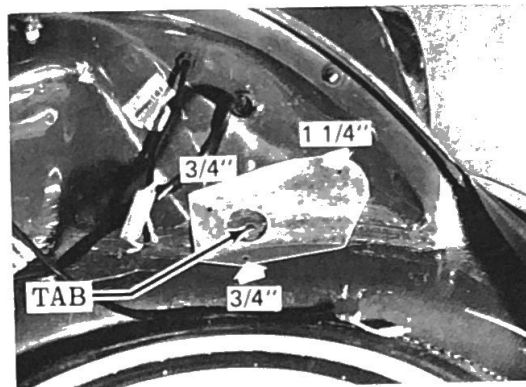
ZCo.1 LUGGAGE COMPARTMENT

Note:

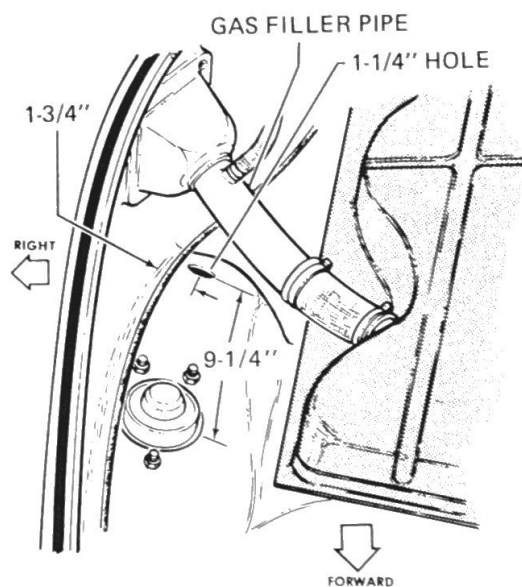
Paper templates are provided in the kit, however fiberglass templates US 4442 and US 4443 are available from VPC.

1 – Remove both fiber luggage compartment liners.

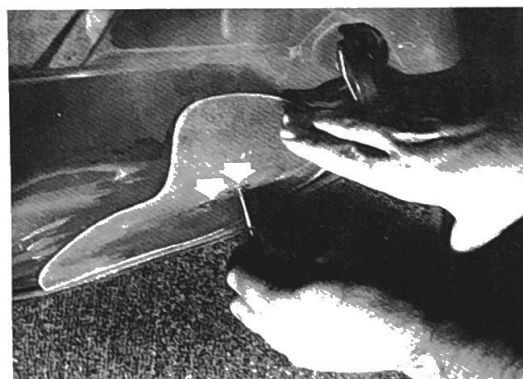
2 – Using US 4442 template for the left side of the luggage compartment, locate and drill one 1-1/4" and two 3/4" holes into the left wheel well for the evaporator liquid hose, the condenser motor wiring, and the pressure switch wiring.



3 – From the luggage compartment, drill one 1-1/4" hole into the right wheel well forward of the gasoline filler pipe for the suction hose.



4 – From the passenger compartment, use template US 4443 provided and drill two 2-1/2" holes into the luggage compartment on the right side. Trim the hole area into one elongated hole.



5 – Drill a 5/8" hole for the evaporator drain hose through the forward vertical wall in the passenger compartment.

6 – Drill a 3/4" hole into the passenger compartment for main wiring harness. Locate the hole centered between the fuse panel and the gas tank flange.

Warning:

Be sure to drill from luggage compartment side to avoid hitting gas tank.

7 – From the passenger compartment, remove the two screws which secure the fuse panel and move the panel out of the way.

8 – From the luggage compartment, depress the tangs on the defogger switch and push into the passenger compartment. Disconnect both wires.

9 – Resecure fuse panel.

10 – Snap defogger light out of speedometer housing and disconnect both wires.

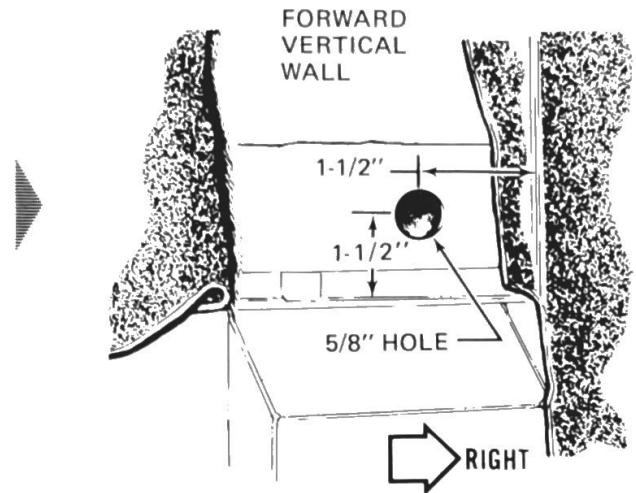
11 – Cut off blue and white wire without removing terminal on double connector with black wire.

12 – Install multiple connector blue wire provided to defogger light. Reconnect black wire from defogger light to multiple connector.

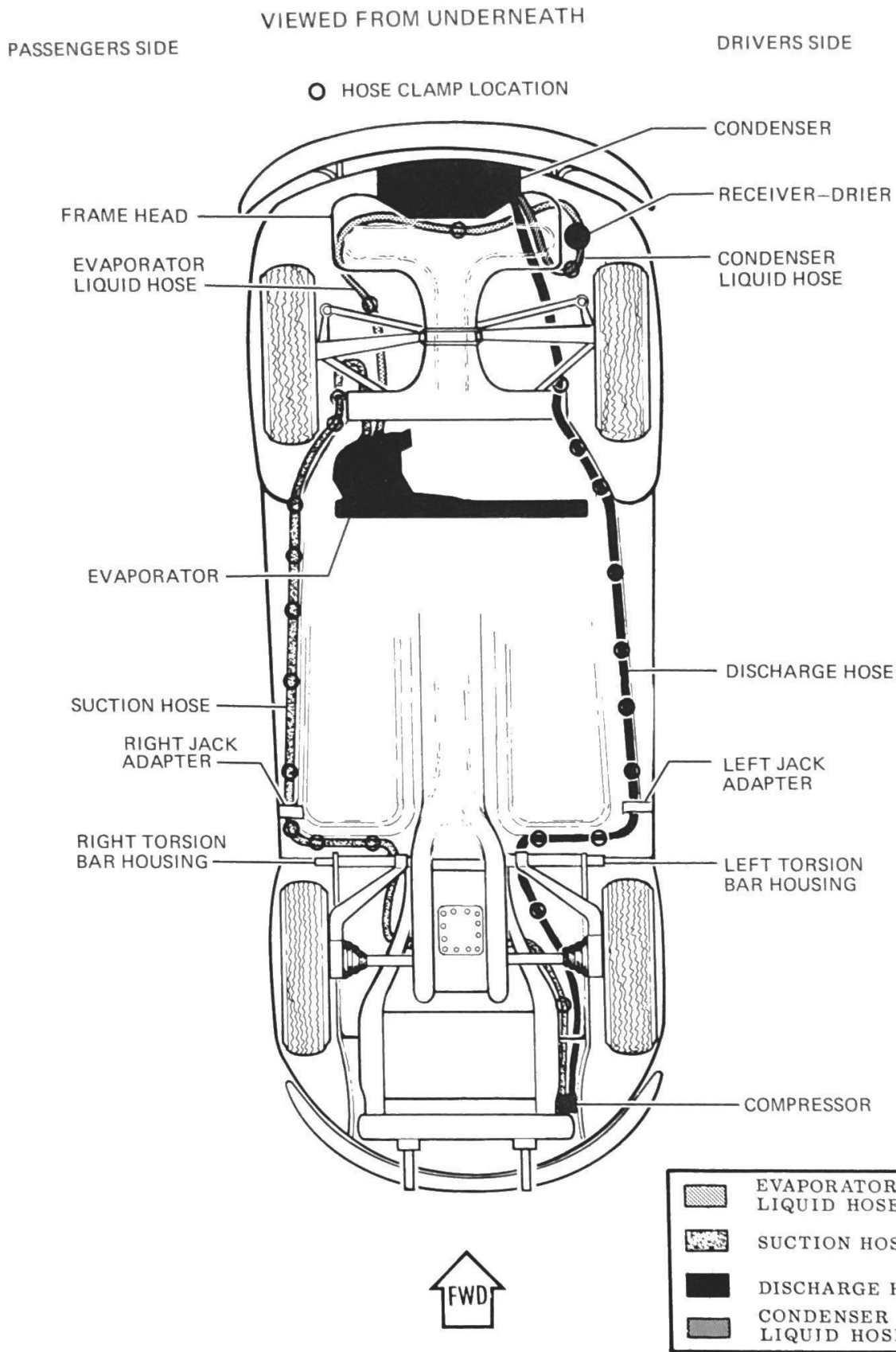
13 – Route new blue and original black wire (to defogger switch) through the 3/4" hole for the a/c wiring into passenger compartment.

14 – Snap defogger light back into speedometer housing.

15 – Tape original hole.



ZCo.1 RECEIVER-DRIER AND HOSES



RECEIVER-DRIER AND HOSES ZCo.1

Note:

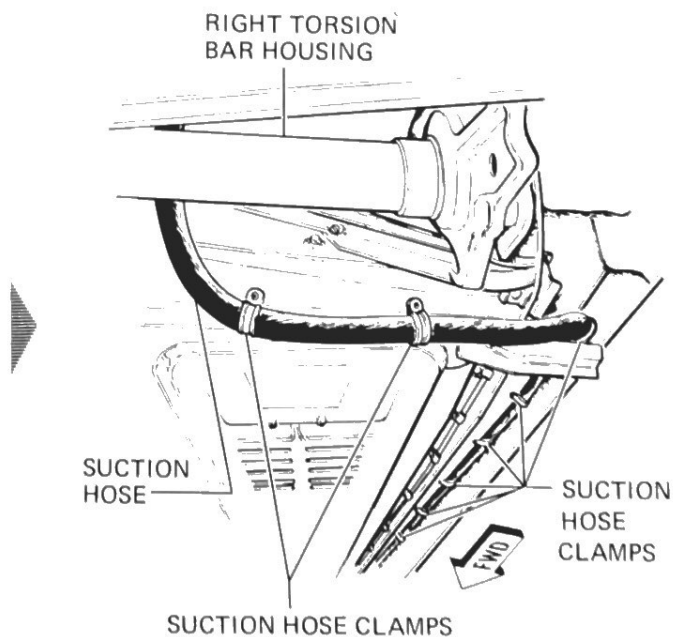
Unless otherwise indicated, do not install hose clamps until after evaporator and condenser assemblies have been installed.

- 1 - Push the 7/8" I.D. hose grommet over the long, 90° end of the No. 8 x 162" discharge hose, and standing beneath the vehicle, insert the hose through the 1-1/4" hole previously cut in the left engine pan. Secure the hose to the discharge service valve on the compressor and press the grommet firmly into place.

Note:

Lubricate all hose connections with clean refrigeration oil for proper sealing.

- 2 - Push the 1" I.D. grommet over the 90° end of the No. 10 x 172" suction hose, and standing beneath the vehicle, insert the hose through the 1-1/4" hole previously cut in the vertical firewall. Secure the hose to the suction service valve and press the grommet firmly into place.
- 3 - Tighten both service valves to compressor 65-70 foot pounds.
- 4 - Break off all projecting body nails in hose routing paths.
- 5 - Route suction hose over transmission to the right, over and in front of right torsion bar housing, and over the outside of the right jack adapter. Continue to route the suction hose along the right side of the vehicle and pass it through the 1-1/4" hole in the right wheel well into the luggage compartment. Push the 1" I.D. grommet over the hose and press firmly into place.

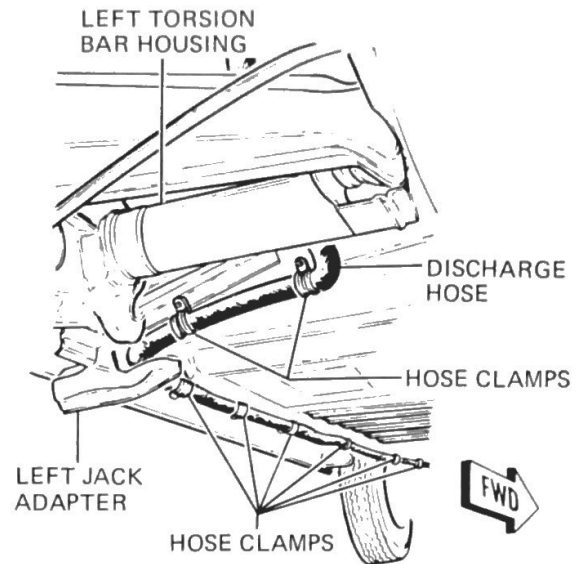


ZCo.1 RECEIVER-DRIER AND HOSES

- 6 – Route the discharge hose over the extreme right of the left torsion bar housing and over the inside of the left jack adapter. Continue to route the discharge hose forward, over the steering gear frame member to the right of the steering box, between the spare wheel well and inner panel of right wheel well, and atop the left side of the frame head. See page 5-1.

Note:

In some cases, left jack adapter may have to be pried downwards to allow hose passage.



- 7 – In the left front wheel well, drill two No. 30 holes for the receiver-drier clamps.

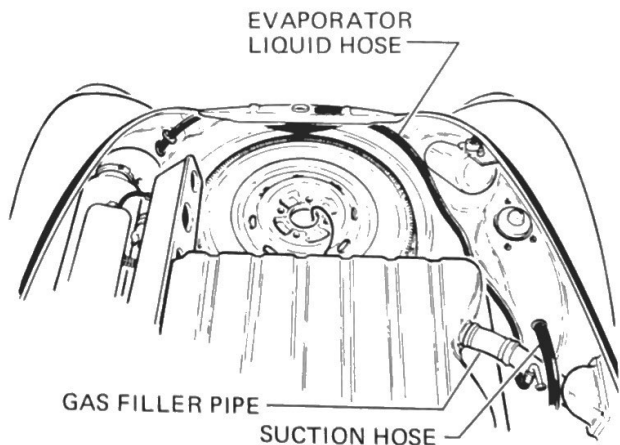
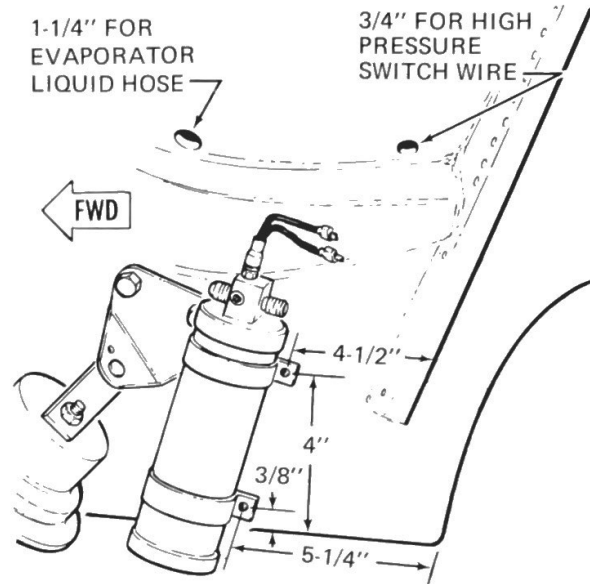
- 8 – Mount the receiver-drier in the clamps with the sight glass facing away from the vehicle, and secure the clamps to the vehicle with two No. 8 x 1/2" sheet metal screws.

- 9 – Insert the two pressure switch leads through the 3/4" hole previously cut into the luggage compartment and push the 5/16" I.D. grommet over the leads. Press the grommet firmly into place.

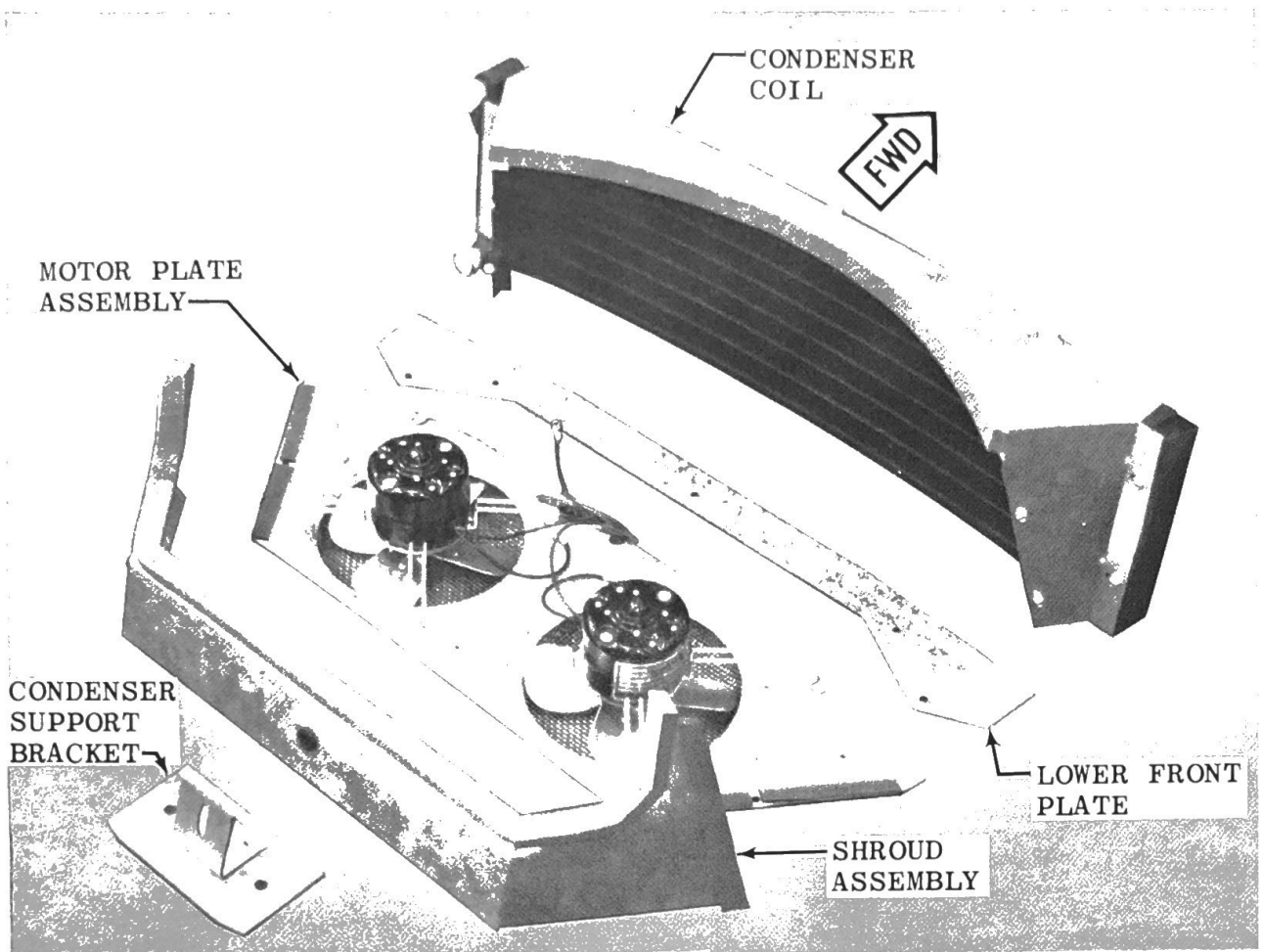
- 10 – Connect the 90° end of No. 6 x 23" condenser liquid hose to the right fitting of the receiver-drier (marked "IN").

- 11 – From the luggage compartment, push the 3/4" I.D. grommet over the 90° end of the No. 6 x 78" evaporator liquid hose, and insert the 90° end through the 1-1/4" hole into the left wheel well and connect to the receiver-drier. Press the grommet firmly into place.

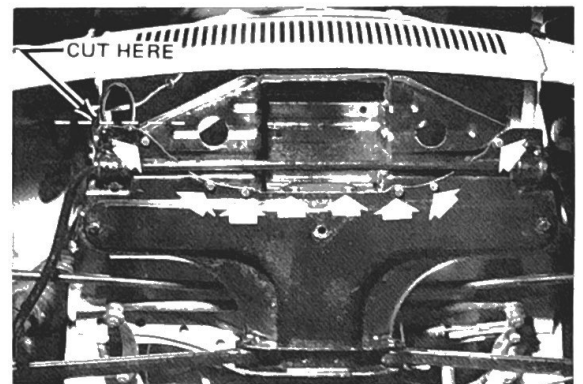
- 12 – Route the remainder of the evaporator liquid hose around the front shelf of the spare tire well beneath the luggage compartment lid latch and under the gasoline tank filler pipe.



CONDENSER ZCo.1

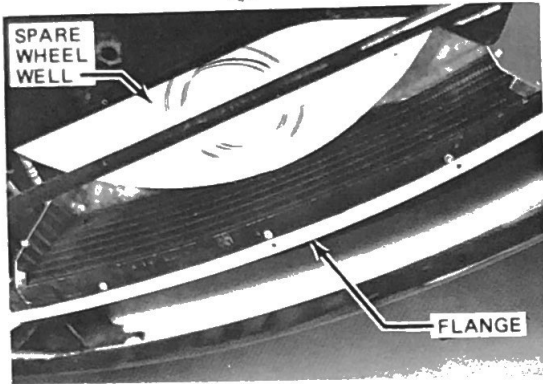


- 1 - Saw the towing eye as flush as possible to the frame head and remove.
- 2 - Remove eight bolts which secure the frame head cover and gearshift access cover. Retain two bolts for later use and discard others. Discard the original gasket.
- 3 - Locate the center louver opening in the apron (20th from either side), and on the lower flange of the apron, drill one 1/4" hole.
- 4 - Punch mark 8-1/4" on both sides of the hole drilled in the previous step, and drill two more 1/4" holes in the lower flange.
- 5 - Before installing the condenser coil, connect the straight end of the No. 8 x 162" discharge hose to the inlet fitting (upper) on the condenser coil.



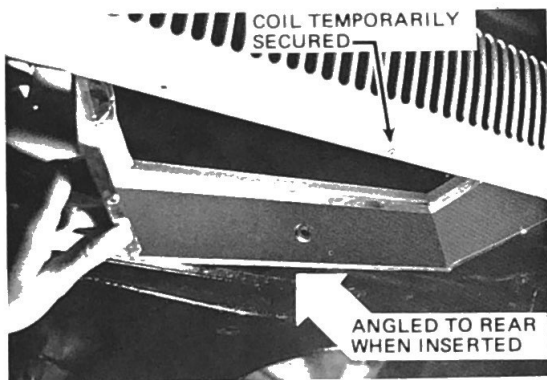
ZCo.1 CONDENSER

- 4 – Standing beneath the vehicle and with the coil fittings to the left of the vehicle, insert the condenser coil (with factory-attached side plates) into the cavity behind the front apron grille. Rest the assembly on the lower flange of the front apron. Temporarily secure with one No. 10-32 machine screw in the center hole of the flange. See illustration on step 6.



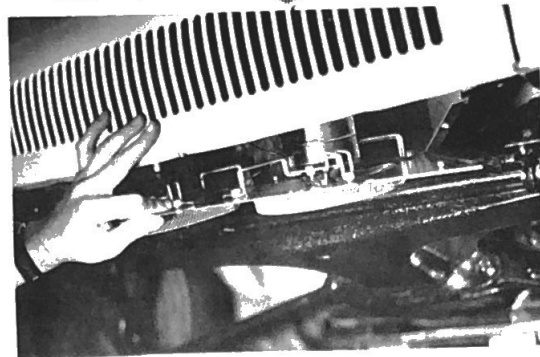
- 5 – Secure straight end of the No. 6 x 23" condenser liquid hose to the outlet (lower) fitting of the condenser coil.

- 6 – Insert the shroud assembly into the cavity with the top angled towards the rear of the car to clear obstructions, and then straight up.

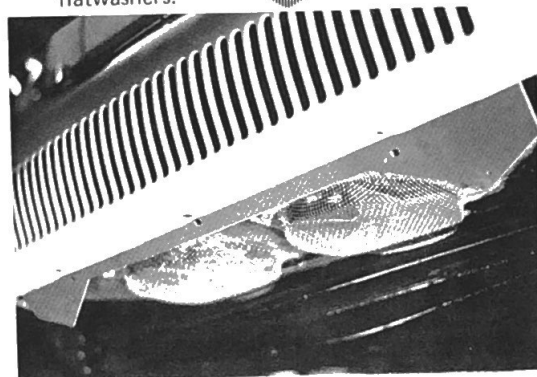


- 7 – Secure the shroud assembly to the condenser coil assembly with four No. 10-32 machine screws and flatwashers.

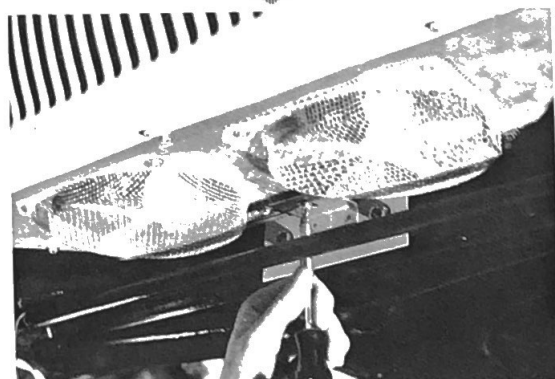
- 8 – Insert the motor plate assembly over sway bar and place rear edge atop the lower rear flange of the shroud assembly. Push the condenser motor lead wires through the grommet in the rear of the shroud assembly.



- 9 – Remove temporary screw. Insert the front edge of the lower front plate between the lower edge of the condenser coil and the lower flange of the front apron and secure with three No. 10-32 machine screws and flatwashers.

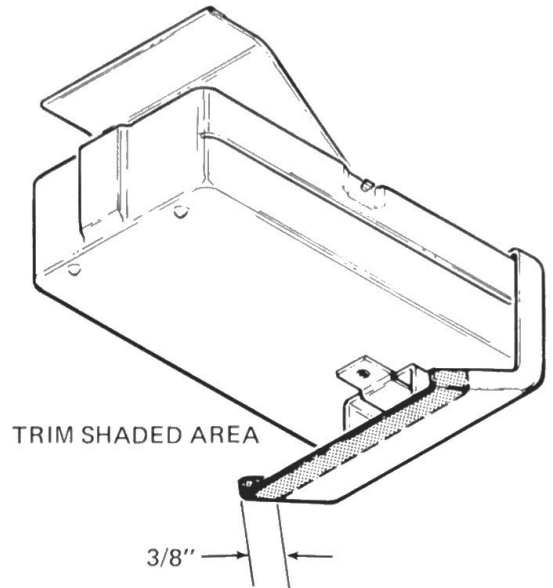


- 10 – Use the original bolts to secure the condenser support bracket to the access cover. Secure the support bracket to the motor plate assembly with one No. 10-32 machine screw and flatwasher.

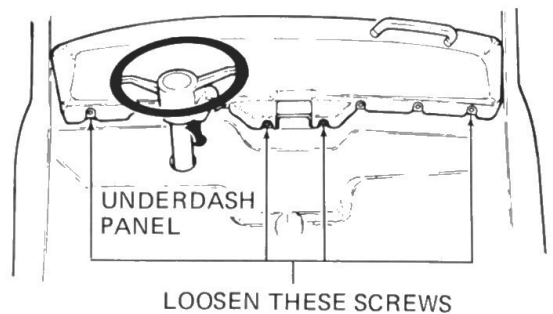


EVAPORATOR ZCo.1

- 1 - Remove the ash tray and trim 3/8" off the pull handle as shown. Reinstall the ash tray.



- 2 - Loosen the extreme right and left and two center phillips head screws which secure the lower edge of the padded dash.



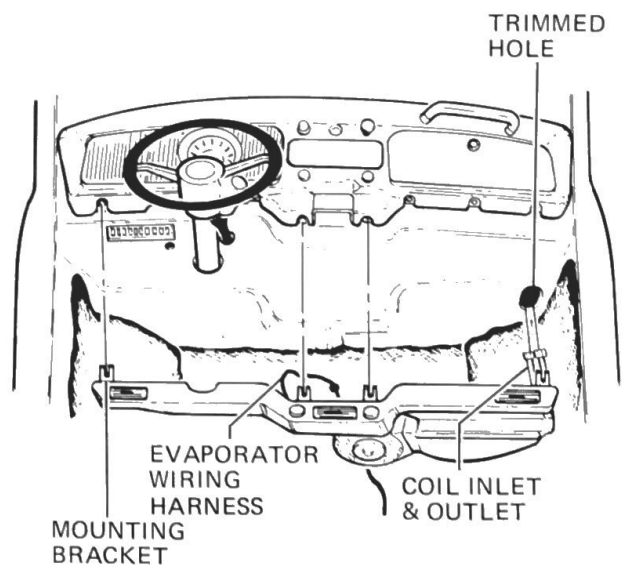
- 3 - With evaporator assembly lying on the floor of passenger compartment, plug the main wiring harness into the evaporator wiring harness above the evaporator and lay it to the right of the blower housing.

- 4 - With the louvers facing towards the passenger compartment, lift the evaporator assembly so that the inlet and outlet pipes of the evaporator coil are inserted through the large hole cut previously in the right side of the underdash panel.

- 5 - Insert the four mounting tabs fastened to the evaporator assembly between the padded dash and the dashboard and center over the original holes. Prop the evaporator assembly in place and resecure the original four screws.

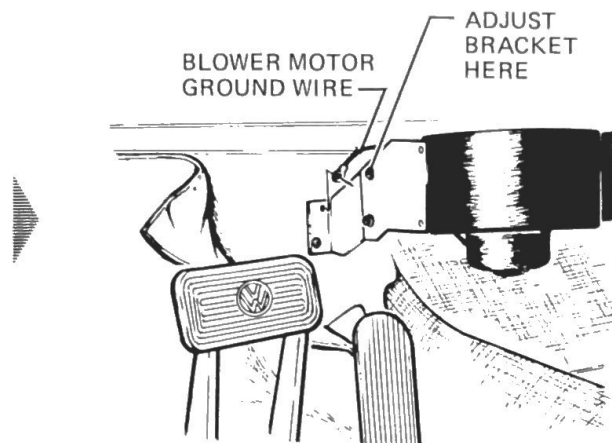
Caution:

To prevent stripping, do not over-tighten these screws.



ZCo.1 EVAPORATOR

- 6 – Adjust the bracket on the evaporator blower housing to fit flush against the forward vertical wall of the passenger compartment, and using the bracket as a template, drill two No. 30 holes. Secure the bracket with two No. 8 x 3/8" sheet metal screws while also attaching the ground wire of the evaporator blower motor to the top screw. Slit the carpet to fit around the bracket.



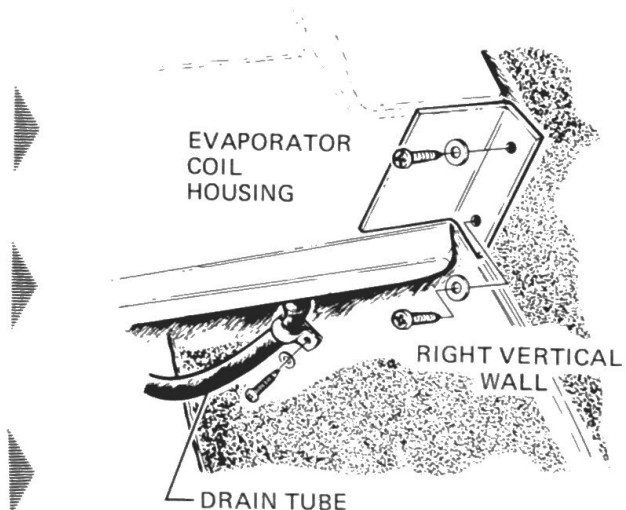
- 7 – Locate the 1/2" flange of the right evaporator support bracket flush against the right vertical wall so that the 1-1/2" flange of the bracket protrudes beneath and supports the evaporator coil housing. Using the bracket as a template drill two No. 30 holes into the right vertical wall and secure with two No. 8 x 1/2 sheet metal screws.

Caution:

Do not drill into evaporator case. Secure the bracket only at the right vertical wall.

- 8 – Cut an opening in the carpet to correspond with the 5/8" hole for the drain hose in the forward vertical wall. Insert the drain hose into the hole.

- 9 – Drill a No. 42 hole in the right vertical wall directly beneath the evaporator assembly and to the rear of the drain hose hole previously cut. Using the clamp provided, secure the drain hose at the junction of the evaporator assembly and the right vertical wall with a No. 6 x 1/2" sheet metal screw.

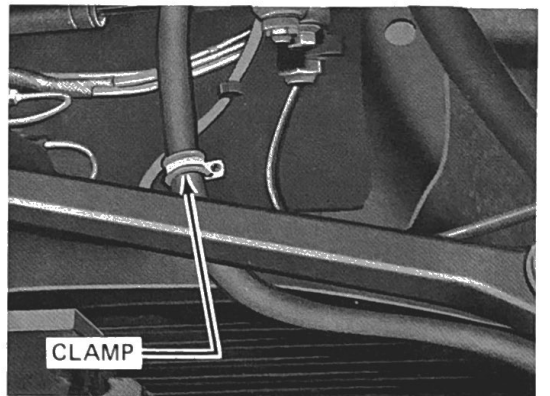
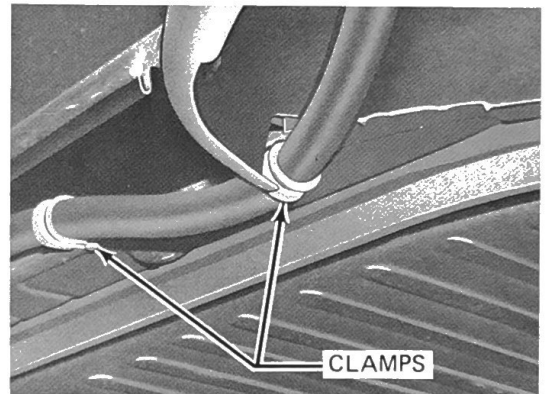
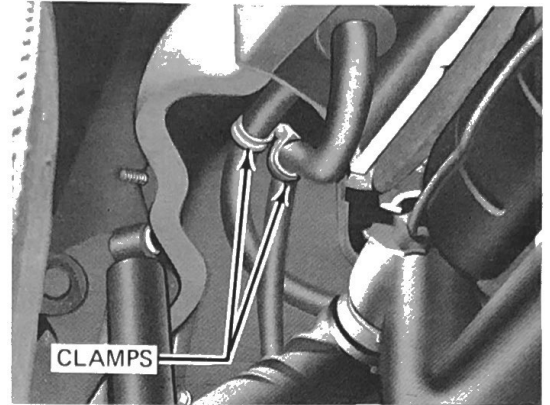


- 10 – Connect the No. 6 x 78" evaporator liquid hose to the expansion valve.

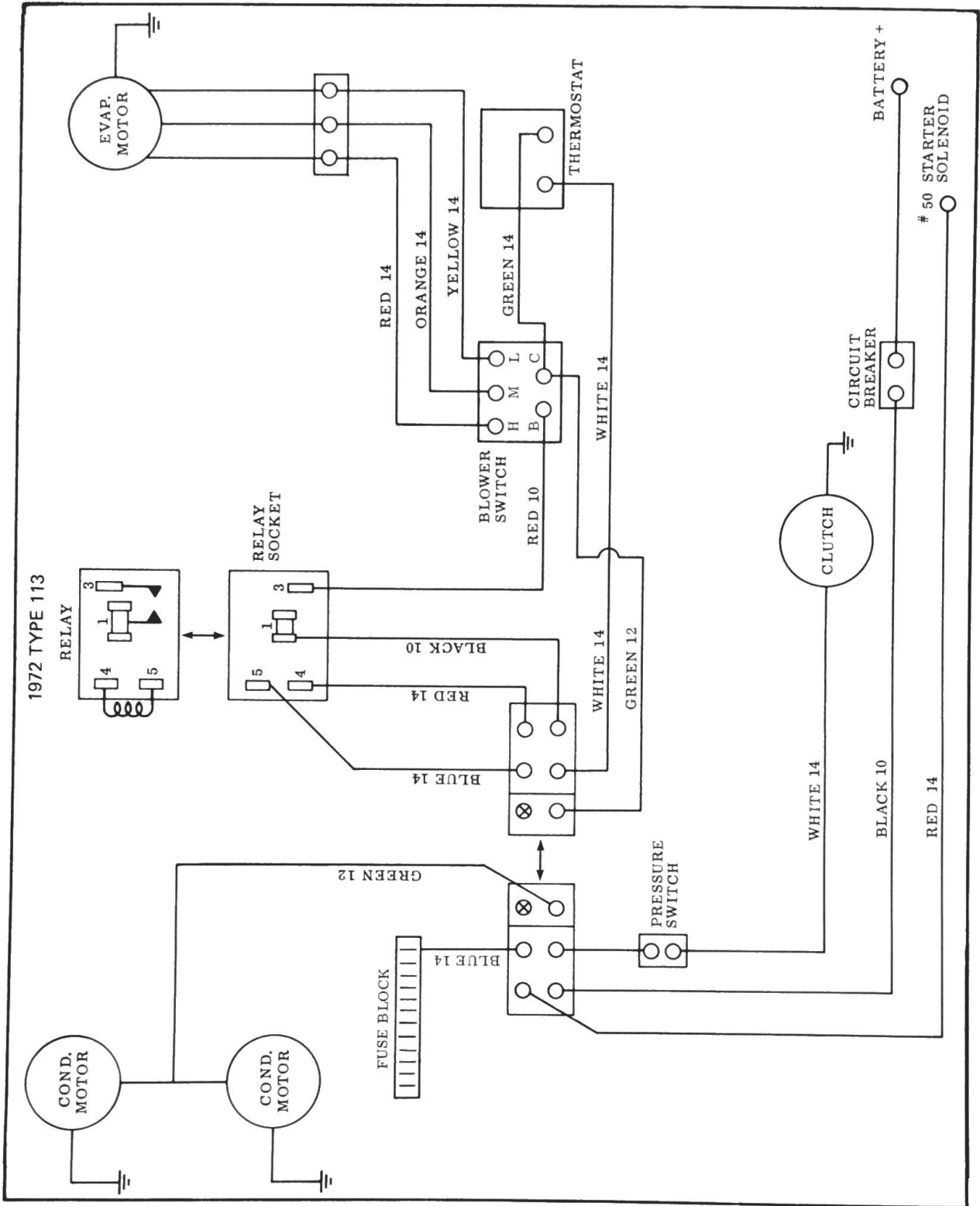
- 11 – Connect the No. 10 x 172" suction hose to the outlet of the evaporator coil and insulate the adjoining metal surfaces of the connection with the sealing tape provided.

- 12 – At this time, connect the vacuum pump and begin to evacuate the system.

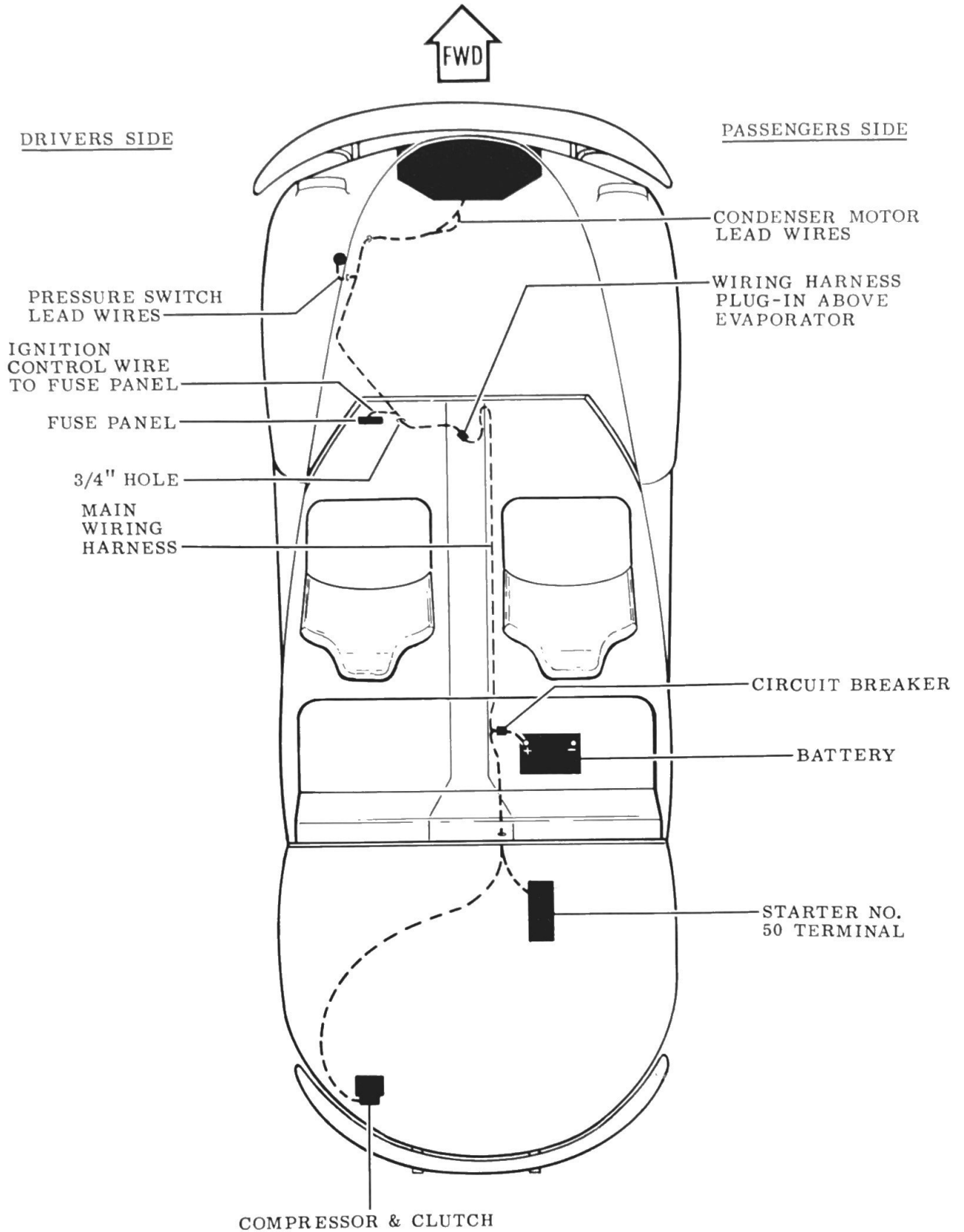
13 — All hose clamps may now be installed as per the illustration on page 5-1 and detailed illustrations.



ZCo.1 WIRING



VIEWED FROM ABOVE

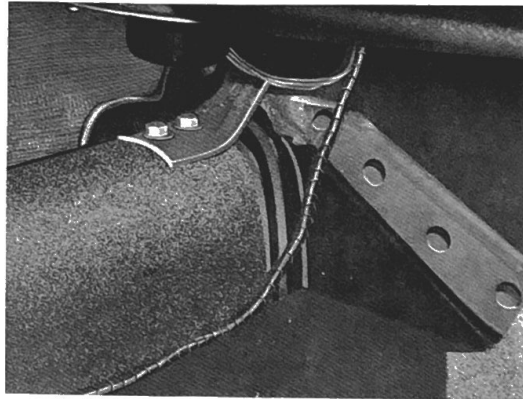


ZCo.1 WIRING

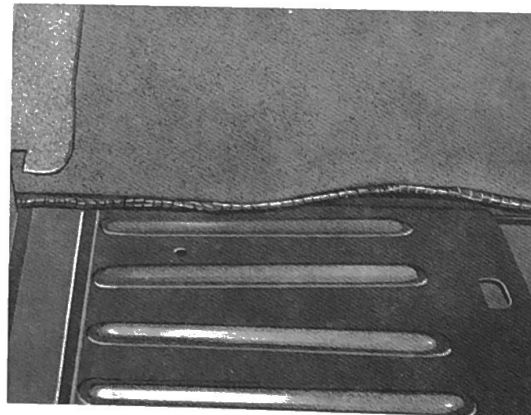
Note:

See illustration on page 8-2

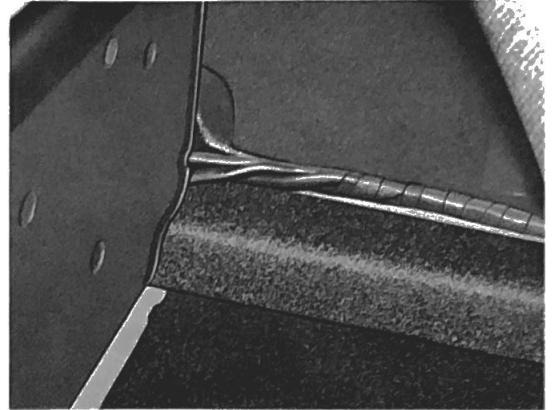
- 1 – Insert the two white pressure switch wires, green condenser motor wire, and blue ignition control wire on the main wiring harness into the luggage compartment from the passenger compartment through the 3/4" hole previously cut in the underdash panel.
- 2 – Route pressure switch wires forward along left side of luggage compartment and connect to pressure switch leads. Push the grommet over the condenser wire, and pass wire through 3/4" hole into left wheel well, over frame head, and connect the two-wire loop connection to the condenser motor lead wires. Press grommet firmly into place.
- 3 – Connect ignition control wire to the ignition control fuse terminal on the fuse panel (third terminal from the right).
- 4 – Route the remainder of the wiring harness in the passenger compartment as follows:
 - a – forward across the top of the evaporator (hidden from view) to the vertical wall;
 - b – under the carpet and down the vertical wall to the junction with the tunnel;



- c – rearwards along the right side of the tunnel;



d – through the gap between the rear seat front panel and the tunnel; and



e – under the seat support lip to the battery.

Note:

If wiring harness is not routed correctly, the wiring may appear to be too short in length.

- 5 – Remove starter cable grommet under right side of rear seat and discard. Push the 3/8" I.D. grommet over the starter cable, white clutch wire, and red starter solenoid wire and pass the wires and cable through the starter cable hole. Press the grommet firmly into place.
- 6 – Connect the starter solenoid wire at No. 50 terminal on the starter.
- 7 – Route clutch wire through suction hose grommet and connect to clutch lead wire.
- 8 – Install black wire with 5/16" terminal eyelet between circuit breaker and positive terminal clamp on battery cable.

ZCo.1 AFTER INSTALLATION

- 1 – Reconnect battery.
- 2 – Reinstall left front and left rear wheels.
- 3 – Turn ignition switch "ON".
Note:
Do not start engine.
- 4 – Turn air conditioner "ON". Tighten clutch center bolt to 15-20 foot pounds. Turn ignition switch and air conditioner "OFF".
- 5 – Charge with 25 ounces of R-12.
- 6 – Check engine timing.
- 7 – Reinstall the receiver-drier sight glass dust cap.
- 8 – Remove all drill chips, shavings, and tools from the vehicle.
- 9 – Reinstall liners in luggage compartment.
- 10 – Adhere the air conditioning decal to the rear window where state law permits.
- 11 – Test drive the vehicle with air conditioner in operation.
- 12 – After driving the vehicle, check the belt tension and readjust to 95 pounds if necessary.

