Installation Manual

1969-1976 Chevy Nova

DOCUMENT #1-2061
Congratulations...

You have just purchased the highest quality, best performing A/C system ever designed for your Chevy Nova.

To obtain the high level of performance and dependability our systems are known for, please pay close attention to the following instructions. Our installation steps and procedures are derived from a long history of research and development and the combined experience achieved thru thousands of successful installations (and feedback from customers like you). Please remember that our #1 goal is that you’ll have a successful installation and a system that performs at a very high level for many years to come.

Before starting, read the instructions carefully, from beginning to end, and follow the proper sequence. On the next page you’ll find a safety and general checklist that you should read before starting your installation.

Again, thank you from our entire staff.
Check List, Pre-Installation:

- Before beginning the installation check the shipping box for the correct components. YOUR BOXED UNIT INCLUDES A LIST OF MAJOR COMPONENTS AND A LIST OF BAGGED PARTS. We have a 5 stage check process to make sure you have everything you’ll need.

- If your vehicle has been or is being modified, some procedures will need to be adjusted to fit your particular application.

- A basic cleaning of the engine compartment and interior before beginning will make things go more smoothly.

- Check condition of engine mounts. Excessive engine movement can damage hoses to A/C and/or heater.

- Before starting, check vehicle interior electrical functions (interior lights, radio, horn, etc). Make a note of anything that does not work as it’s supposed to. During the installation you might find the opportunity to repair or upgrade non-working or out of date components. When you’re ready to start the installation, **DISCONNECT THE BATTERY FIRST.**

- Drain the radiator. Retain the coolant and reuse, or dispose of properly.

- SAFETY FIRST: Wear eye protection while drilling/cutting, deburr sharp edges, and never get in a hurry or force a part.

- Tools: Your installation only requires the basic tools everyone has in their garage, nothing exotic or specific to A/C or Heat equipment.

Procedures, During Installation:

- Fittings: Use one or two drops of mineral oil (supplied with your kit) on ALL rubber o-rings, threads and rear of bump for o-ring where female nut rides. Do not use thread tape or sealants.

- Measure twice (or more), cut once

- **Should you have any technical questions, or feel you have defective components (or missing items), call us immediately, we will be glad to assist you. Our toll-free number is listed on every page, we’re here to help!**

**YOU CAN NOW BEGIN THE INSTALLATION...**
A Basic Overview of Automotive A/C....

1. **Evaporator with Blower Fan** In order to remove the heat from the air in the vehicle, the A/C evaporator allows the refrigerant to absorb the heat from the air passing over it. The blower fan moves cool air out into the car interior.

2. **Compressor** The compressor pumps and circulates the refrigerant through the system.

3. **Condenser** The condenser is a heat exchanger mounted at the front of the vehicle. Heat drawn out of the interior of the car is expelled here.

4. **Receiver/Drier** The drier not only dries refrigerant, it also filters the refrigerant and stores it under certain operating conditions.

5. **High Pressure Switch** A pressure switch is used to shut down the system if high or low pressure is detected, basically it acts as a safety switch.

The air conditioning system in your car is comprised of a compressor, condenser, expansion valve, receiver/drier, and evaporator. Refrigerant (also known as Freon) is compressed in the compressor. In the condenser, gas is cooled to a liquid state and travels to the expansion valve. As the liquid refrigerant goes through the expansion valve it rapidly cools in the evaporator. A fan blows over the evaporator and cools the air that blows out your vents.
Control & Operating Instructions

Your new Perfect Fit-Elite system offers complete comfort capabilities in virtually every driving condition. This includes temperature control in all of the modes. This system also provides the ability to blend the air between Face, Heat, and Defrost modes simultaneously. To illustrate the various ways you can adjust the airflow direction and temperature - we’ve provided these handy illustrations and chart to show exactly how you can adjust your Perfect Fit-Elite for maximum comfort...

**Left Lever Position Distribution**

<table>
<thead>
<tr>
<th>Left Lever Position</th>
<th>Distribution</th>
<th>Compressor State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Face A/C 100%</td>
<td>ON</td>
</tr>
<tr>
<td>2</td>
<td>Face A/C 80%</td>
<td>Defrost 20%</td>
</tr>
<tr>
<td>3</td>
<td>Face A/C 60%</td>
<td>Defrost 40%</td>
</tr>
<tr>
<td>4</td>
<td>Face A/C 40%</td>
<td>Defrost 60%</td>
</tr>
<tr>
<td>5</td>
<td>Face A/C 20%</td>
<td>Defrost 80%</td>
</tr>
<tr>
<td>6</td>
<td>Defrost 100%</td>
<td>ON</td>
</tr>
<tr>
<td>7</td>
<td>Floor 20%</td>
<td>Defrost 80%</td>
</tr>
<tr>
<td>8</td>
<td>Floor 40%</td>
<td>Defrost 60%</td>
</tr>
<tr>
<td>9</td>
<td>Floor 60%</td>
<td>Defrost 40%</td>
</tr>
<tr>
<td>10</td>
<td>Floor 80%</td>
<td>Defrost 20%</td>
</tr>
<tr>
<td>11</td>
<td>Floor 100%</td>
<td></td>
</tr>
</tbody>
</table>

**MODE LEVER**
There are 11 levels of adjustment within the range of the DASH/FLOOR lever.

**TEMP LEVER**
The COLD/HOT positions works like any traditional adjustment lever.
Remove Glovebox, Console (optional) Radio and Bezel, and set them aside for reinstall later (see figure 1).

The removal of the Original Heater Assembly can be accomplished by disconnecting three control cables. One is attached to the Heat/Defrost door (see figure 2). One is attached to the Temperature door, and one is attached to the Vent / Heat door (see figure 3). Disconnect the electrical harness from the assembly. Also remove attachment screw located in front of the air inlet (see figure 4).

When retaining parts it’s a good idea to store parts in a zip lock bag, labeled with info where the parts came from and what size/type of tool is needed to reinstall.
Disconnect the electrical harness at the resistor block (see Figure 5).

Remove the OEM control head, which is held in with two screws. Retain the OEM screws.

Set the control head aside (you’ll need the bezel later).
Moving to the engine compartment:

In order to remove your heater assembly it is necessary to remove the heater case housing first.

Located on the engine side of the firewall, remove seven (7) bolts around the perimeter of the heater case housing (see Figure 7). Remove the housing (Discard).

NOTE: To remove the two bolts at locations 1A and 7B, it may be necessary to lower the inner fender. Retain these screws.

Drain coolant from radiator. Remove the heater hoses from heater coil and firewall (see Figure 8).

You will also cut a power lead to the blower motor. This will not be re-used.
You should now be able to remove the heater assembly located behind the dash area. Rotate upward being careful not to drain any coolant left in the heater coil.

The OEM defrost duct is secured with two screws. Remove both screws from defrost duct and set aside.
THESE ARE THE PARTS YOU WILL FIND IN CONTROL BOX

You will use all of these parts and hardware during the next series of installation steps.

D.E.R. Control
PN#16-3056
Fittings: Use one or two drops of mineral oil (supplied with your kit) on ALL rubber o-rings, threads and rear of bump for o-ring where female nut rides. Do not use thread tape or sealants.

Measure twice (or more), cut once

Should you have any technical questions, or feel you have defective components (or missing items), call us immediately, we will be glad to assist you. Our toll-free number is listed on every page, we're here to help!

You can now begin the installation...

YOU CAN NOW BEGIN THE INSTALLATION...

**Face/Floor Assembly**
**PN#2-2025-1**
**PRE-INSTALLED**

**Evaporator Support Brackets**
PN#0023-7

**Illustrations NOT shown actual size**

**Two Air Inlet Block Offs**
PN#0047-1

**Fresh Air Inlet Block Off**
PN#10-1048-2

**One Male Spade Connector**

**One Bulb Clamp**

**Two #10 - 16 x 3/4” Tek Screws**

**Six #10 - 10 x 5/8” Phillips Screws**

**One Flange Nut**

**Liquid Tube**
PN#0034-9

**Suction Tube**
PN#0034-10

**#6 and #10 O-ring**

**Defrost/Heat Duct Assembly**
PN#2-2025-2
**PRE-INSTALLED**

**One Male Spade Connector**

**Two #10 - 16 x 3/4” Tek Screws**

**Defrost/Heat Duct Assembly**
PN#2-2025-2
**PRE-INSTALLED**

**One Male Spade Connector**

**One Flange Nut**

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Within the engine compartment area, Install Fresh Air inlet block-off Pn# 10-1048-2 (from Bag Kit B) over the OEM fan opening using the OEM screws (A1 and B7).

If necessary, reinstall inner fender.

Remove evaporator unit from box and place on a work surface.
Familiarize yourself with the Evaporator

Take a minute to familiarize yourself with the evaporator unit:

- Dash Servo Motor
- Capillary Tube
- Blower Motor
- Blower Motor Plug
- Expansion Valve
- Liquid Tube
- Suction Tube
- Condensation Drain Outlet
- Defrost Adapters
- Firewall Mounting Stud
- Heater Tubes
- Defrost/Heat Duct Assembly
- Floor Air Outlet
- Dash Duct Assembly
- (4) Dash Air Outlets
- Dash Servo Motor
- Defrost/Floor Servo Motor
- Evaporator Case
- Thermostat
- Defrost/Floor Servo Motor
- Capillary Tube
- Blower Motor
- Blower Motor Plug
- Expansion Valve
- Liquid Tube
- Suction Tube
- Condensation Drain Outlet
- Defrost Adapters
- Firewall Mounting Stud
- Heater Tubes
- Defrost/Heat Duct Assembly
- Floor Air Outlet
- Dash Duct Assembly
- (4) Dash Air Outlets
- Dash Servo Motor
- Defrost/Floor Servo Motor
- Evaporator Case
- Thermostat
WIRING PREP

- Locate Evaporator Unit from Main Box
- Pre-installed Face Duct Assembly
- Pre-installed Defrost/Heat Duct Assembly
- Locate electronic water valve from Bag Kit D
- Locate Blue, Yellow, Orange wiring harness from Bag Kit C
- Locate main wiring harness from Bag Kit C
- Locate the D.E.R. control in BAG KIT A
- Locate ECU and Calibration Key from Bag Kit C
- Acquire a 12V Battery (NOT a battery charger)

DO NOT USE CALIBRATION KEY WITHOUT TECH SUPPORT
Push S-Clips over flange securing with two #10x5/8” screws, from back

Attach to front outlet securing with pre-installed S-Clips
Wiring Preparation Steps 1 through 3

1. Connect Blue Harness into Defrost/Heat Servo Motor
2. Connect Yellow Harness into Face/Floor Servo Motor
3. Connect Orange Harness into water valve
**WIRING PREP**

- Wiring Preparation Steps 4 through 7

1. **Click!**
   - Connect Yellow Harness into Face/Floor Port on ECU

2. **Click!**
   - Connect Blue Harness into Defrost/Heat Port on ECU

3. **Click!**
   - Connect Orange Harness into Water Valve Port on ECU

4. From your D.E.R.,
   - Connect Green Harness into Control Port on ECU
WIRING PREP

Wiring Preparation Steps 8 through 12

8. Connect corresponding Fan Switch harness to the Bower Switch on Controls. Connect Power lead to 12V.

9. Connect red tagged power harness to POWER port on ECU. Connect ground.


11. Connect both BLUE leads into thermostat (either lead into either terminal).

12. Connect ground.

(White lead is to be connected to compressor)
FUNCTION TESTING

1. Move FAN knob to HIGH
   Move MODE knob to DASH
   Move TEMP knob to COLD
   AIR OUT OF DASH VENTS

2. Move MODE knob to DEF
   AIR OUT OF DEFROST VENTS

3. Move MODE knob to FLOOR
   AIR OUT OF FLOOR VENTS

• Function Test, Steps 1 thru 3
Function Testing

- Function Test, Steps 4 and 5

Return all wiring harnesses, water valve, and ECU to their originally bags/boxes (this keeps them organized for future installation steps).

Your controls are now fully calibrated to your unit. Please refer to the next steps in your installation manual for installing the system in your vehicle.

NOTE: IF DURING ANY OF THESE STEPS YOU DO NOT GET THE CORRECT OUTCOME, PLEASE CALL TECH SUPPORT BEFORE INSTALLING INTO VEHICLE. 1(866)435-7801

Move TEMP knob to HOT

Move TEMP knob to COLD

You will be able to see through water valve passage

You will NOT be able to see through water valve passage

OPEN

CLOSED
NOTE: Two people are needed for this step!

Place evaporator on floor panel. Roll unit up behind the glove box opening, inserting tubes through the large hole in firewall.
Installing the complete evaporator unit under the dash will go much easier with the help of a friend. Once the unit has been rolled up under the dash, one person can hold the unit in place while the other person can be ready at the firewall area with the included flange nut to secure the unit (see figure 17). Leave Flange nut loose to allow leveling of unit in next steps.
Locate in the UPPER MOUNTING BRACKETS and attach to evaporator unit using four #10 - 10 x 5/8" Phillips screws. Attach other end to the cowling with a #10 - 16 x 3/4" Tek Screws (see figure 9). IMPORTANT NOTE: On the side of the main unit you will see several holes for mounting holes... ONLY USE THE ONES ON THE FAR LEFT AND RIGHT FOR THESE BRACKETS! Do not tap into the other holes for any reason (see figure 10). Also, use a screwdriver and hand-power and do not over-tighten so you don’t strip the holes.
Install liquid line onto the Expansion valve (TXV) as shown. Use #6 o-ring and (2) drops of mineral oil on the o-ring and tighten securely.

Install Suction Tube to the outlet on the unit as shown. Use #10 o-ring and (2) drops of mineral oil on the o-ring and tighten securely.

Locate Sensing Coil attached to Expansion valve (TXV) and utilizing Bulb Clamp, attach to the Suction Tube.

**CAUTION: THE SYSTEM WILL NOT FUNCTION PROPERLY IF THE SENSING COIL IS NOT CLAMPED IN THE CORRECT POSITION. SEE PICTURE.**

Wrap Suction Tube and Sensing Coil with the refrigerant tape provided. Be sure that all of the exposed metal is covered.

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**Reminder...**
*Use two wrenches to tighten o-ring fittings*
Installing the Drain tube

Mount Evaporator level to firewall.

Locate Drain nipple on Evaporator and drill a 3/4” hole below the nipple on the firewall. This will allow condensation to drain properly.

THIS IS FROM INSIDE THE VEHICLE!

Attach 1/2” clear drain tube to Evaporator nipple and run through 3/4” hole you just drilled.

All condensation will now drain out into the engine bay.
THESE ARE THE PARTS YOU WILL FIND IN BAG KIT C

You will use all of these parts and hardware during the next series of installation steps.

ECU and Calibration Key
DO NOT USE CALIBRATION KEY WITHOUT TECH SUPPORT

Illustrations NOT shown actual size

Wire Harness System

Pressure Switch
(engine compartment)

Ground

ECU

Thermostat

OEM Power Supply

Wire Harness - Power Supply PN#0105-36

Blower Switch Connection

Ground

Fan Plug

Relay

Four #10 - 16 x 3/4" Tek Screws

Yellow

Blue

Orange

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1. Connect Blue Harness into Defrost/Heat Servo Motor
2. Connect Yellow Harness into Face/Floor Servo Motor
3. Connect Orange Harness into water valve
Connect Yellow Harness into Face/Floor Port on ECU

Connect Blue Harness into Defrost/Heat Port on ECU
Connect Orange Harness into Water Valve Port on ECU

From your D.E.R.,
Connect Green Harness into Control Port on ECU
Connect corresponding Fan Switch harness to the Bower Switch on Controls.
Connect Power lead to 12V.

Connect red tagged power harness to POWER port on ECU.
Connect ground.

Connect corresponding fan motor harness.
Connect ground.

Connect both BLUE leads into thermostat (either lead into either terminal)

Connect ground.

(White lead is to be connected to compressor)
THESE ARE THE PARTS YOU WILL FIND IN BAG KIT D

You will use all of these parts and hardware during the next series of installation steps.

- Electronic Water Control Valve
  PN#16-1081-2
- Firewall Block Off
  PN#10-1061-1
- Six Worm Gear Clamps
- Refrigerant Tape
- Clear Plastic Drain Tube
- Six #10 - 16 x 3/4" Tek Screws

Illustrations NOT shown actual size
In Bag Kit D you’ll find the firewall block off. Install this over the hose connections coming through the firewall within the engine compartment. Attach with six #10 - 16 x 3/4" Tek screws.

TIP: Route ORANGE cable through the block off plate (it will be plugged into the electronic water valve).

The loose white wire from main power harness can be fed through the same hole (as shown below).
IMPORTANT NOTICE: PROPER INSTALLATION OF WATER VALVE

Your water valve **MUST** be installed per these instructions!... *(If not, your system will not work properly.*

The **lower** heater tube connection on firewall will be routed to the water connection on intake manifold using 5/8" dia. heater hose with the supplied worm gear clamp.

The **upper** heater tube connection on the firewall will be routed to the water valve connection labeled **heater core**, using a 6" piece of 5/8" heater hose attached with supplied worm gear clamp.

Connect the remaining outlet on water valve labeled **water pump** to the water pump using 5/8" dia. heater hose with the supplied worm gear clamp.

**FOLLOW THESE TAGS... CHECK IT TWICE BEFORE PROCEEDING!**
THESE ARE THE PARTS YOU WILL FIND IN BAG KITS E, F, and G
You will use all of these parts and hardware during the next series of installation steps.

Bag E
- Two Defrost Diffuser
  PN#2-1054-2
- Two Duct Hoses, 2" I.D.
- Four Zip-Ties

Bag F
- Driver and Passenger Vents
  PN#2-1060-3
- Two Duct Hoses, 2" I.D.
- Face/Floor Assembly
  PN#2-2025-1
- Four Zip-Ties

Bag G
- Center Dash Vent
  PN#2-1061-1
- Two Duct Hoses, 2" I.D.
- Four Zip-Ties
- Two #10 - 16 x 3/4"
- Tek Screws
- 1969-1974 Bracket
  PN#0071-2
- 1976 Nova Only Bracket
  PN#0071-5
- Two #10 x 5/8" Screws
FIGURE 24

TOP OF DASH

Push defrost adapters onto lip of dash tab (below defrost vents, inside of dash), S-clips (already installed) will hold the adapters securely

One end of the duct hose is installed over the defrost/heat duct assembly outlets on the main unit.

Next route the duct hoses from the defrost/heat duct assembly upward toward defrost vents. Attach the flex hose to the defrost diffuser using zip-ties on both ends.
**Bag Kit F:** Before you can use the included drivers and passenger side louvers you will need to cut holes in the lower dash for them. We’ve included templates on the last pages of this manual. Cut out the templates, tape to dash (where indicated on templates) and cut out the corresponding holes. We recommend you cut just inside of the cut-out areas and open gradually with a flat file, using a louver as a guide (the goal is to have a tight fit for your new louvers).

Route supplied flex hoses as shown below. Take your time and route them so they don’t become kinked or torn. Secure the hose to the new louvers with the supplied ty-wraps.

During installation of the hoses be aware of the eventual movement of the wiper arm components.

The smoother the route of the flex hoses the better the airflow.
1976 NOVA DASH PAD ONLY

Rolled Edge

Bottom edge of dash pad
Remove Dash Pad (this will make the process easier, in our experience) and place on bench. Locate the template we’ve included, cut out the template and tape to the dash pad. Carefully cut dash pad along the opening in the template.

Insert center louver assembly through opening and attach to bracket using (2) #10 x 5/8” pan head screws from the hardware sack kit.
Bag Kit G / Center Louver: 1976 Novas - Remove Dash Pad (this will make the process easier, in our experience) and place on bench. Locate the template we’ve included, cut out the template and tape to the dash pad. Carefully cut dash pad along the opening in the template. Locate in the center louver and (2) #10 x ¾‘tek screws. Place louver thru the opening in the dash pad and secure louver using (2) #10 screws thru the bracket and into the louver (this will clamp the louver to the backside of the dash pad).
THESE ARE THE PARTS YOU WILL NEED FOR THE ENGINE COMPARTMENT INSTALLATION

You’ll find all of these parts within the main box:

- Drier
- Top Condenser Bracket PN#0049-50
- Bottom Condenser Brackets PN#0049-51
- Condenser PN#11-1089
- Drier Bracket
- Splice and Bullet Connector
- Eleven #10 - 20x1/4" Screws
- Core Support Bracket PN#0049-62
- Core Support Bracket PN#19-151
- Six #10 - 16 x 3/4" Tek Screws
- Pressure Switch and harness, Bag of O-rings and Mineral Oil Tube
- Liquid Tube (condenser to drier)
- Liquid Tube (drier to rad support)
- Discharge Tube (condenser to rad support)

Three Refrigerant Hoses

#6 5/16" Liquid Hose

#8 3/2" Discharge Hose

#10 1/2" Section Hose
DRIER AND CONDENSER PREPARATION. You can perform most of the following steps on a clean flat surface like a workbench. Lay the condenser down so that both hose connections are on the left side (the larger connection will be on top). The drier is conveniently mounted on the left hand side of the condenser. First insert the drier into the drier mounting bracket (it’s basically a sleeve for the drier). Attach the drier liquid tube to the drier and also to the connection on the condenser (tighten connections at either end using supplied o-rings on both ends and a few drops of mineral oil to each o-ring). With these two components combined it will easy to find the correct place to attach the drier bracket to the condenser with the included #10-20 x 1/4” screws (attach drier and bracket from the front of the condenser).

PRESSURE SWITCH: Screw the high-pressure switch into the port on the top of the drier. Go ahead and plug the pressure switch harness into the switch at this time (black electrical boot with two long white wires).

BRACKETS: Install the upper condenser bracket using four #10 - 20 x 1/4” screws in the top two holes on each side. Next, attach the lower brackets using the bottom two holes, with the same size screws. These brackets have a bend that will face away from you.

You can easily find the correct position for mounting the drier to the condenser by using the drier liquid tube as a gauge.

Reminder... Use two wrenches to tighten o-ring fittings.
Remove the hood latch assembly. Retain original hardware. Slide condenser assembly down in front of the radiator.

Locate condenser in the center of the radiator. Attach top condenser brackets to the bulkhead using (2) #10 Tek screws.

Located behind the air damn and at the lower radiator bulkhead, attach the lower condenser brackets using (2) #10 Tek screws.

Reinstall hood latch assembly using original hardware.

Locate the Liquid tube, Discharge tube, (1) #6 o-ring, and (1) #8 o-ring. Attach Liquid tube to the drier using the #6 o-ring and a few drops of mineral oil. Attach Discharge tube to the condenser using #8 o-ring and a few drops of mineral oil.

Locate the tube support bracket, the tube clamp, and (2) #10 x ¾" tek screws, and (1) #10 x ½" hex head screw.

Attach the support bracket to the radiator bulkhead using (2) #10 x ¾" tek screws.

Attach liquid and discharge tubes using the tube clamp, using (1) #10 x ½" screw.
Install the compressor kit. Included was a premium compressor kit with all the parts you’ll need to install the compressor. This kit includes instructions specifically written for your engine. Once you’ve installed the complete compressor kit, continue on to connecting the hoses.

CONNECTING THE HOSES: Based on PASSENGER or DRIVERS SIDE compressor mounting see illustrations for routing.

The #10 (LARGEST) refrigerant hose. Attach end with service fitting to the compressor using (1) #10 o-ring and a few drops of mineral oil. Attach other end to #10 fitting at the firewall. Attach using one #10 o-ring and a few drops of mineral oil. Tighten securely.

The #6 (SMALLEST) refrigerant hose. Route behind fender and to the connection on firewall. Attach using two #6 o-ring and a few drops of mineral oil.

The #8 (MEDIUM) refrigerant Hose. Route behind fender and to the connection on compressor. Attach using two #6 o-ring and a few drops of mineral oil.

TWO WRENCH METHOD

Reminder... Use two wrenches to tighten o-ring fittings
New A/C System Preparation... A MUST READ!

Please read through these procedures before completing this new A/C system charging operation. **A licensed A/C technician should be utilized for these procedures to ensure that your new system will perform at its peak, and that your compressor will not be damaged.**

1. Your radiator/cooling system is an integral part of your new system. Please insure that you have a 50/50 mix of distilled water and antifreeze. The heater coil **MUST** be purged (cycle heater control valve) to make sure no water, without antifreeze, is in the heater coil before you charge the A/C system.
2. Evacuate the system for a minimum of 45 minutes.
3. Your new compressor **MUST** be hand turned 15-20 revolutions before and after charging with liquid. Failure to do this may cause the reed valves to become damaged. This damage is **NOT** covered by your warranty.
4. Your new system requires 1.5lbs (24oz) of R134a refrigerant.
5. Your new compressor comes charged with oil - **NO** additional oil is necessary.
6. Ensure that the new belt is tight.
7. **DO NOT** charge system with liquid refrigerant!

**Recommended Test Conditions:**
(After system has been fully charged and tested for basic operation)
- Determine the temperature outside of the car
- Connect gauges or service equipment to high/low charging ports
- Place blower fan switch on medium
- Close all doors and windows on vehicle
- Place shop fan directly in front of condenser
- Run engine idle up to approximately 1500 rpm

**ACCEPTABLE OPERATING PRESSURE RANGES:**
1. High-side pressures: 150-275 PSI
2. Low-side pressures: 10-25 PSI (in a steady state)

Readings above are based on an ambient temperature of 90°F with an adequate airflow on condenser.

**CAUTION!** When mounting your compressor and/or adjusting the belt use caution. Mount by using the centerline of the oil fill plug as your guide. The compressor can **ONLY** be mounted inbetween the 9 to 3 positions. **DO NOT** mount inbetween the 4 to 8 positions.

This can cause compressor failure.

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Do **NOT** tilt, shake or turn refrigerant can upside-down OR use a charging station to install refrigerant while the engine is running. Doing so will direct liquid refrigerant into the compressor piston chamber, causing damage to reed valves and/or pistons and/or other components, as well as potentially seizing the compressor. Allow a minimum of 30 minutes for liquid to “boil off.” You must hand turn the compressor hub (not the pulley) a minimum of 15 complete revolutions prior to starting the engine with the clutch engaged.
Test conditions used to determine system operation:
These test conditions will simulate the effect of driving the vehicle and give the technician the three critical readings that they will need to diagnose any potential problems.
   A. Connect gauges or service equipment to high/low charging ports
   B. Place blower fan switch on medium
   C. Close all doors and windows on vehicle
   D. Place shop fan in front of condenser
   E. Run engine idle up to 1500 RPM

Acceptable operating pressure ranges (R134A type):
1. High-side pressures: 150-275 PSI
   *note: general rule is two times the ambient/daytime temperature plus 15-20%
2. Low-side pressures: 10-25 PSI in steady state

Charge as follows: R134a = 1.5lbs (24oz)
No additional oil is necessary in our new compressors.

Typical problems encountered in charging systems - noisy compressor:
A noisy compressor is generally caused by charging a compressor with liquid or overcharging.

   A. If the system is overcharged both gauges will read abnormally high readings. This is causing a feedback pressure on the compressor causing it to rattle or shake from the increased cylinder head pressures. System must be evacuated and re-charged to exact weight specifications.

   B. Installing the heater control valve in the incorrect hose will cause the system to cool at idle and gradually warm up when the RPM's of the engine rise. The heater control is a directional valve; make sure the water flow is with the direction of the arrow. As the engine heats up, the water transfers the heat to the coil thus overpowering the a/c coil. A leaking or faulty valve will have a more pronounced affect on the unit's cooling ability. Installing the valve improperly - such as having the flow reversed - will also allow water to flow through which inhibits the cooling. Check for heat transfer by disconnecting hoses from the system completely. By running down the road with the hoses looped backed through the motor you eliminate the possibility of heat transfer to the unit.

   C. Evaporator freezing can occur both externally and internally on an evaporator core. External freeze up occurs when the coil can’t effectively displace the condensation on the outside fins so the water forms ice. The evaporator core resembles a block of solid ice, it restricts the flow of air that can pass through it, which gives the illusion of the air not functioning. The most common cause of external freezing is the thermostat setting and humidity in the passenger compartment. All door and window seals should be checked in the event of constant freeze-up. A thermostat is provided with all units to control the cycling of the compressor.

   D. Internal freeze-up occurs when the system has too much moisture inside. The symptoms of internal freeze-up often surface after extended highway driving. The volume of air stays constant but the temperature of the air gradually rises. When this freezing occurs the low-side pressure will drop and eventually go into a vacuum. At this point, the system should be checked by a professional who will evacuate the system and change the drier.

   E. The condenser works best in front of the radiator with a large supply of fresh air. Abnormally high pressures will result from improper airflow. Check the airflow requirements by placing a large capacity fan in front of the condenser and running cool water over the surface. Pressures dropping significantly will indicate the need for better airflow.

   F. Incorrect condenser capacity will cause abnormally high head pressures. A quick test that can be performed is to run cool water over the condenser while the system is operating, if the pressures decrease significantly, it is likely a airflow or capacity problem.

   G. An expansion valve failure is generally caused by dirt or debris entering the system during assembly. If an expansion valve fails it will be indicated by abnormal gauge readings. A valve that is blocked will be indicated by high-side that is unusually high and the low-side unusually low (may even go into a vacuum.) A valve that is stuck open will be indicated by both the pressures rising to unusually high readings and tend to move toward equal readings on the gauges.

   H. A restriction in the cooling system will cause abnormal readings on the gauges. A high-side restriction, between the compressor and the drier inlet, will be indicated by the excessively high discharge reading. These simple tests can be performed by a local shop and can help determine the extent of the system’s problem.
Troubleshooting Your Classic Auto Air A/C System

Problem: system is not cooling properly
Issue: cold at idle. warmer when raising engine RPMs

Make sure the water valve is positioned correctly.
The water valve is a directional valve and should be installed with the arrow pointing towards the water pump. It should be connected to the heater hose that runs from the heater core to the water pump. If the water valve is incorrectly connected to the hose it allows water to circulate through the system via the heater core over-powering the cooling effect of the a/c coil.

Step 1: Check placement of the water valve and correct if needed.
Step 2: If changing the location of the water valve does not rectify the issue, the water valve may be permanently damaged and may need to be replaced. To check the integrity of the water valve you will need to completely remove the heater core’s water hoses and “loop” together. By doing so, the heater system will be completely removed from the possibilities. If the system now cools then the water valve will need to be replaced.

Verify adequate air flow to the condenser.
The condenser’s function is to dissipate heat. Your air conditioning system will not cool your vehicle’s cabin properly if you do not have an adequate airflow across the condenser.

Step 1: Connect gauges to a/c hoses. When ambient temp is 90°, pressures should be:
   Low-side pressures: 10-25 PSI
   High-side pressures: 150-275 PSI
If the low-side pressures are normal but the high-side pressures are high then there might be an airflow issue and you will need to test the airflow to the condenser.

Test airflow to the condenser.
Step 1: Place a piece of paper on the condenser with the car idling to see if the paper is held in place.
Step 2: With the car still idling, attach gauges and place a large capacity fan in front of the condenser. Check the pressures to see what happens.
Step 3: With the car still idling and the gauges still attached, pour water down the front of the condenser. Check the pressures again to see what happens.
If the paper was held in place then you are getting some air flow. If the high-side decreases during step 2 and step 3 then your condenser is not getting enough air which is stopping your system from cooling properly. To correct this issue, you will need a more powerful mechanical fan.

Confirm the correct refrigerant charge is in the system.
All of our systems should be charged with 1.5lbs (24oz) of R134a refrigerant only. If overcharged, you will need to evacuate the system and recharge with the correct amount.*

Measurement meanings:
1. Low temp and high pressure seems to be equal = malfunctioning expansion valve that is stuck open.
2. High side is extremely high and low side is extremely low (possibly into vacuum) = blockage in the system. Remove hoses and blow cold compressed air through it in both directions. Re-check your pressures. If pressures do not change then it is possible that your expansion valve is stuck closed and would have to be replaced.

*Compressor Concerns:
If you have a noisy compressor, it is due to the improper charging with liquid or overcharging. An overcharged compressor will cause rattling. A compressor charged with pure liquid produces a high probability of bent reed valves. When the reed valves get bent they will created a tapping sound. Ensure your system is charged with 1.5lbs (24oz) of R134a refrigerant to avoid compressor related cooling issues.
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TEMPLATE
PASSENGERS SIDE LOUVER
1969-1976 NOVA

BOTTOM EDGE OF PADDED DASH

GLOVE BOX OPENING

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CUT OUT THIS AREA
CUT OUT THIS AREA
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1976 NOVA DASH PAD ONLY

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