

2.5 CFM Vacuum Pump

Item 98076

⚠ DANGER

To prevent explosion, serious injury, and death:

- Service of air conditioning systems must be done only by trained and experienced technician to avoid overfilling.
- Technicians opening refrigeration circuit in automotive air conditioning systems **MUST** be certified in refrigerant recovery and recycling procedures in compliance with section 609 of Clean Air Act Amendments of 1990. For additional information regarding ozone depletion and air conditioning service regulations, visit EPA's website: www.epa.gov/ozone.
- Read this material before using this product. Failure to do so can result in serious injury. **SAVE THIS MANUAL.**



When unpacking, make sure that the product is intact and undamaged.
If any parts are missing or broken, please call 1-800-444-3353 as soon as possible.

Visit our website at: <http://www.harborfreight.com>

Email our technical support at: tech@harborfreight.com

Save This Manual

Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

IMPORTANT SAFETY INFORMATION

In this manual, on the labeling, and all other information provided with this product:



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

CAUTION

CAUTION, without the safety alert symbol, is used to address practices not related to personal injury.

General Safety Warnings



WARNING Read all safety warnings and instructions. *Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.*

Save all warnings and instructions for future reference.

The warnings and precautions discussed in this manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

Work Area


1. **Keep the work area clean and well lit.** Cluttered benches and dark areas increase the risks of electric shock, fire, and injury to persons.
2. **Do not operate the pump in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.**
3. **Keep bystanders, children, and visitors away while operating the pump.** Distractions are able to result in the loss of control of the pump.

Electrical Safety

1. **Pump plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with grounded pumps. Unmodified plugs and matching outlets will reduce risk of electric shock.**
2. **Do not expose Pump to rain or wet conditions. Use in dry locations only.**
3. **Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the pump. Keep cord away from heat, oil, sharp edges or moving parts. Damaged or entangled cords increase the risk of electric shock.**
4. **When operating a pump outdoors, use an extension cord suitable for outdoor use. Use of a cord suitable for outdoor use reduces the risk of electric shock.**

Personal Safety

1. **Stay alert. Watch what you are doing and use common sense when operating the pump. Do not use the pump while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating the pump increases the risk of injury to persons.
2. **Do not overreach. Keep proper footing and balance at all times.**
3. **Use safety equipment.** Non-skid safety shoes and a hard hat must be used for the applicable conditions. Wear heavy-duty work gloves during use.

4.  **Always wear eye protection.**
Wear ANSI-approved safety goggles.

5. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to heart pacemaker could cause pacemaker interference or pacemaker failure. Caution is necessary when near coil, spark plug cables, or distributor of running engine. In addition, people with pacemakers should:
- Avoid operating alone.
 - Properly maintain and inspect to avoid electrical shock.
 - Any power cord must be properly grounded.
- Ground Fault Circuit Interrupter (GFCI) should also be implemented – it prevents sustained electrical shock.
6. **WARNING:** The brass components of this product contain lead, a chemical known to the State of California to cause birth defects (or other reproductive harm). (California Health & Safety Code § 25249.5, *et seq.*) Handling the cord on this product will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. Wash hands after handling. (California Health & Safety Code § 25249.5, *et seq.*)

Pump Use and Care

1. **Do not force the pump.** Use the correct pump for the application. The correct pump will do the job better and safer at the rate for which the pump is designed.
2. **Disconnect the pump from the outlet before making any adjustments, changing accessories, or storing the pump.** Such preventive safety measures reduce the risk of starting the pump unintentionally. Unplug the pump before leaving the work area.
3. **Store the pump when it is idle out of reach of children and other untrained persons.** A pump is dangerous in the hands of untrained users.
4. **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that affects the pump's operation.** If damaged, have the pump serviced before using. Many accidents are caused by poorly maintained pumps. There is a risk of bursting if the pump is damaged.

5. Service of air conditioning systems must be done only by trained and experienced technician to avoid overfilling.
6. Technicians opening refrigeration circuit in automotive air conditioning systems **MUST** be certified in refrigerant recovery and recycling procedures in compliance with section 609 of Clean Air Act Amendments of 1990. For additional information regarding ozone depletion and air conditioning service regulations, visit EPA's website: www.epa.gov/ozone.
7. Follow vehicle service manual instructions.
8. Do not leave this Vacuum Pump unattended when it is plugged into an electrical outlet. Turn off the Pump and unplug it from its electrical outlet before leaving.
9. Do not cover this unit. This Vacuum Pump gets very hot when in use. Do not use near combustibles and allow the unit to cool down completely after using, and/or before moving or storage.

Service

1. **Have your Pump serviced by a qualified repair person using only identical replacement parts.** *This will ensure that the safety of the Pump is maintained.*



SAVE THESE INSTRUCTIONS.

Grounding

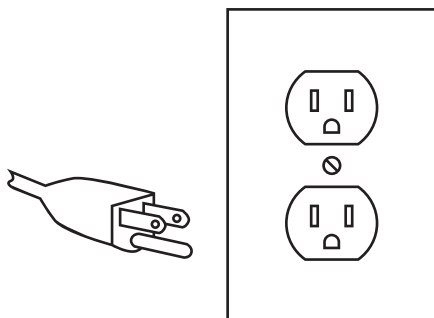
WARNING



TO PREVENT ELECTRIC SHOCK AND DEATH FROM INCORRECT GROUNDING WIRE CONNECTION:

Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded. Do not modify the power cord plug provided with the tool. Never remove the grounding prong from the plug. Do not use the tool if the power cord or plug is damaged. If damaged, have it repaired by a service facility before use. If the plug will not fit the outlet, have a proper outlet installed by a qualified electrician.

Grounded Tools: Tools with Three Prong Plugs



3-Prong Plug and Outlet

1. Tools marked with "Grounding Required" have a three wire cord and three prong grounding plug. The plug must be connected to a properly grounded outlet. If the tool should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user, reducing the risk of electric shock. **(See 3-Prong Plug and Outlet.)**
2. The grounding prong in the plug is connected through the green wire inside the cord to the grounding system in the tool. The green wire in the cord must be the only wire connected to the tool's grounding system and must never be attached to an electrically "live" terminal. **(See 3-Prong Plug and Outlet.)**
3. The tool must be plugged into an appropriate outlet, properly installed and grounded in accordance with all codes and ordinances. The plug and outlet should look like those in the preceding illustration. **(See 3-Prong Plug and Outlet.)**

Extension Cords

1. **Grounded** tools require a three wire extension cord. **Double Insulated** tools can use either a two or three wire extension cord.
2. As the distance from the supply outlet increases, you must use a heavier gauge extension cord. Using extension cords with inadequately sized wire causes a serious drop in voltage, resulting in loss of power and possible tool damage. **(See Table A on page 4.)**
3. The smaller the gauge number of the wire, the greater the capacity of the cord. For example, a 14 gauge cord can carry a higher current than a 16 gauge cord. **(See Table A.)**
4. When using more than one extension cord to make up the total length, make sure each cord contains at least the minimum wire size required. **(See Table A.)**
5. If you are using one extension cord for more than one tool, add the nameplate amperes and use the sum to determine the required minimum cord size. **(See Table A.)**

6. If you are using an extension cord outdoors, make sure it is marked with the suffix "W-A" ("W" in Canada) to indicate it is acceptable for outdoor use.
7. Make sure the extension cord is properly wired and in good electrical condition. Always replace a damaged extension cord or have it repaired by a qualified electrician before using it.
8. Protect the extension cords from sharp objects, excessive heat, and damp or wet areas.

TABLE A: RECOMMENDED MINIMUM WIRE GAUGE FOR EXTENSION CORDS* (120/240 VOLT)

NAMEPLATE AMPERES (at full load)	EXTENSION CORD LENGTH				
	25'	50'	75'	100'	150'
0 – 2.0	18	18	18	18	16
2.1 – 3.4	18	18	18	16	14
3.5 – 5.0	18	18	16	14	12
5.1 – 7.0	18	16	14	12	12
7.1 – 12.0	18	14	12	10	-
12.1 – 16.0	14	12	10	-	-
16.1 – 20.0	12	10	-	-	-

* Based on limiting the line voltage drop to five volts at 150% of the rated amperes.

Symbology

	Double Insulated
	Canadian Standards Association
	Underwriters Laboratories, Inc.
	Volts Alternating Current
	Amperes
	WARNING marking concerning Risk of Eye Injury. Wear ANSI-approved safety goggles with side shields.
	Read the manual before set-up and/or use.
	WARNING marking concerning Risk of Fire. Do not cover ventilation ducts. Keep flammable objects away.
	WARNING marking concerning Risk of Electric Shock. Properly connect power cord to appropriate outlet.

Specifications

Motor	120V~ / 60 Hz / 1720 RPM
Oil Capacity	200 ml
Fittings	R12/R22 and R134A
Air Flow	2.5 CFM

Functions

This Vacuum Pump is useful for pumping gas from sealed containers, for example:

- a. Refrigerators
- b. Medical appliances
- c. Printing machinery
- d. Vacuum packing
- e. Other types of high-vacuum equipment

Operation

IMPORTANT: It is unlawful and hazardous to discharge refrigerants into the atmosphere. Before beginning work with this Vacuum Pump, safely capture refrigerants using an approved refrigerant recovery system (not included) and dispose of them properly. Contact the EPA (Environmental Protection Agency) for important certification regulations and other regulations that apply. **(See front cover of this manual.)**

1. Check the oil level before each use:
 - a. Place the Vacuum Pump on a flat level surface and looking at the Oil Level Glass located on the end of the Pump. The oil should be at the fill line on the pump cover.
 - b. If oil is needed, unscrew the RED Oil Fill Plug (21) and fill with HFV-46 oil only. **CAUTION! Do not overfill.**
 - c. Replace the Red Oil Fill Plug and tighten securely to prevent oil from escaping under pressure during use. Inspect the Sealing "O" Rings (22) each time the Oil Fill Plug is removed. Look for possible tears, cracks, or damage. Replace if needed.
2. Use only one of the L-Shaped Brass Inlet Fittings (23) at a time. Keep the other part of the Fitting capped while not in use.
3. Turn the vehicle/appliance and AC system OFF.
4. Attach the shop AC refrigerant recovery system. Then drain the refrigerant.
5. After reaching 26 to 28 in/hg vacuum, stop and disconnect the recovery system.
6. As appropriate, attach the R-12, R-22, or R-134A manifold to the AC drain port of the vehicle/appliance. This is a "quick release" fitting. The drain port is generally the lower of the two manifold ports and will be located downstream from the compressor in the vehicle. Refer to the vehicle/appliance service manual for vehicle-specific information. Make sure to tightly cap the unused port.
7. Turn on the Vacuum Pump, using the Power Switch (13).

8. The vacuum will build for approximately 2 minutes before reaching full power. Allow the Pump to draw vacuum on the system for approximately 10 minutes to thoroughly remove all moisture and any gas from the system.
9. The Gauge (not included) should show negative pressure and maintain that reading for 10 minutes. If, during that time the pressure reading rises back toward "0", there may be a leak in the system.
10. Turn the Power Switch (13) off before disconnecting the hose from the vacuum fitting.
11. To prevent accidents, disconnect the Power Cord from the electrical outlet after use.
12. Allow the Vacuum Pump to completely cool before wiping down and storing indoors out of children's reach.

NOTE: The operational process is the same for both vehicle and/or other refrigeration systems.

Maintenance

⚠WARNING

TO PREVENT SERIOUS INJURY FROM ACCIDENTAL OPERATION:

Turn the Power Switch (13) of the Vacuum Pump to its "OFF" position and unplug the tool from its electrical outlet before performing any inspection, maintenance, or cleaning procedures.

TO PREVENT SERIOUS INJURY FROM TOOL FAILURE:

Do not use damaged equipment. If abnormal noise or vibration occurs, have the problem corrected before further use.

1. BEFORE EACH USE, inspect the general condition of the tool. Check for loose screws, misalignment or binding of moving parts, cracked or broken parts, damaged electrical wiring, and any other condition that may affect its safe operation.
2. AFTER USE, clean external surfaces of the tool with clean cloth.
3. **WARNING! If the supply cord of this Pump is damaged, it must be replaced only by a qualified service technician.**

Parts List

Part	Description	Qty
1	Fan Cover	1
2	Long Screw	4
3	Screw	1
4	Fan	1
5	Motor Cover	1
6	Centrifugal Switch	1
7	Screw	1
8	Rotor	1
9	Power Cable	1
10	Bearing	1
11	Waveform Gasket	1
12	Insulating Bushing	1
13	Switch	1
15	Handle cover	1
16	Screw	2
17	Capacitor	1
18	Motor Cover	1
19	Handle	1

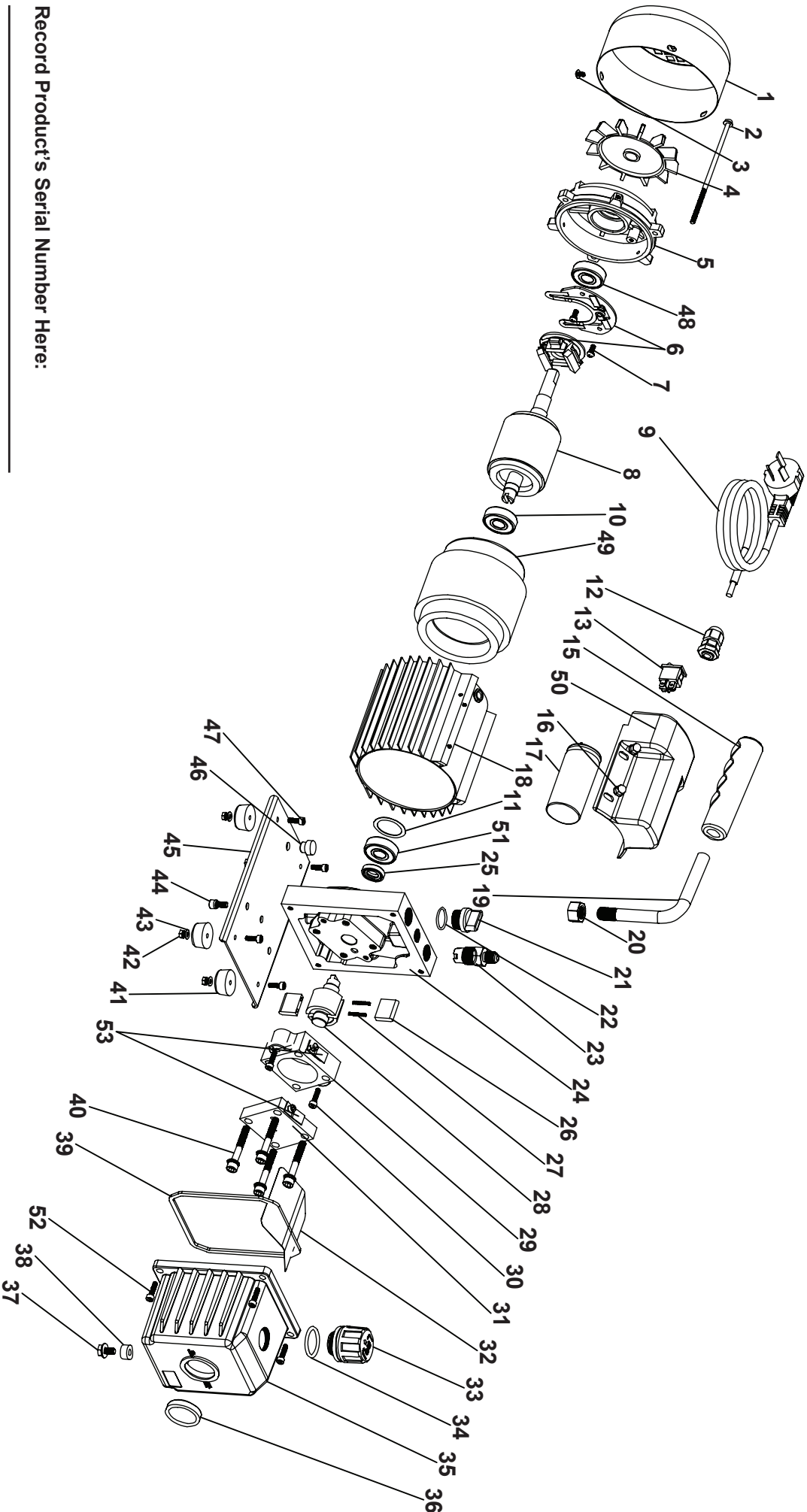
Part	Description	Qty
20	Handle Nut	1
21	Oil Filling Plug	1
22	O-Ring	1
23	L-Shaped Inlet Fitting	1
24	Bracket	1
25	Oil Seal	1
26	Rotary Vane	1
27	Spring	1
28	Pump Rotor	1
29	Pump Body	1
30	Screw	4
31	Back Pump Cover	1
32	Cap Board	1
33	Oil Gas Separator	1
34	O-Ring	1
35	Oil Tank	1
36	Oil Level Glass	1
37	Oil Seal Cap	1

Part	Description	Qty
38	Seal Gasket	1
39	O-Ring	1
40	Bolt	4
41	Rubber Foot	4
42	Nut	4
43	Flat Washer	4
44	Screw	4
45	Baseboard	1
46	Bearing Pad	1
47	Screw	4
48	Bearing	1
49	Stator	1
50	Capacitor Cover	1
51	Bearing	1
52	Bolt	4
53	Displacing Valve	2

PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS LIST AND ASSEMBLY DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

REV 11i



Record Product's Serial Number Here:

Note: If product has no serial number, record month and year of purchase instead.

Note: Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts.

90 Day Warranty

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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