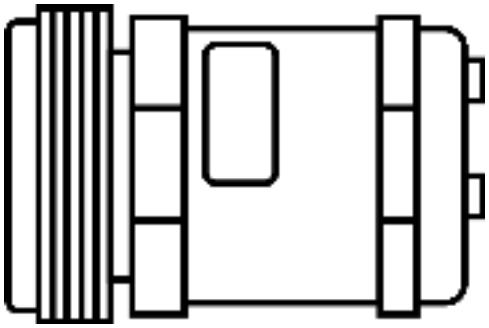
# BMW E24 Sanden Conversion Kit



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## Forward

Welcome to the official A/C Solutions E24 Sanden Conversion Kit user guide. This document contains product specifications, installation instructions, and troubleshooting for the E24 chassis. This user guide is intended for the BMW owner with basic mechanical skills; however, the evacuation and charging of freon should be handed by a licensed A/C professional. Assembly instructions assume the vehicle is stock and still retains all its original equipment. Always conform to basic safety standards and procedures when working with automotive chemicals, tools, and electrical equipment. If you are uncertain about your mechanical abilities during the removal or installation, please consult a certified professional mechanic. If you or your mechanic has any questions regarding this kit, or would like to provide feedback, please do not hesitate to contact us at info@acsolutions.co.

## Disclaimers

R134a is a potent greenhouse gas with a global warming potential that is 1,430 times that of CO2. Use of HFC-134a in MVAC systems accounts for an estimated 24% of total global HFC consumption. It is the most abundant HFC in the atmosphere. HFC-134a will no longer be approved for use in new light-duty vehicles manufactured or sold in the United States as of model year 2021 as a result of EPA's July 2015 final rule under SNAP (July 20, 2015, 80 FR 42870); however, servicing of existing vehicles using HFC-134a with HFC-134a will not be impacted and will continue to be allowed. This information is current as of April, 2022.

Prop 65 WARNING: This product can expose you to tetrafluoroethylene, which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov.

By opening this product, the user assumes all risk. Improper use or handling of automotive equipment and tools can lead to injury or death.

## Components Included:

- Sanden compressor (SD5H14 6630) w/ 1-year warranty
- Low-pressure suction line (LINE A)
- High-pressure discharge line (LINE B)
- Sanden compressor bracket
- Compressor mounting hardware
- R134a compliant engine bay O-ring kit
- Filter drier
- V-belt
- Heat shrink tubing
- 22ga crimp
- Body edge trim
- Instructions

## Tools Needed for Assembly:

*Tools and equipment needed for removal will vary by model/year.*

- Metric combo wrench set
- Metric socket set
- Combo crimp tool
- Pencil torch/lighter (for heat shrink)
- PAG oil (for O-ring installation)
- PTFE threat sealant or freon compatible sealer

## Diagrams

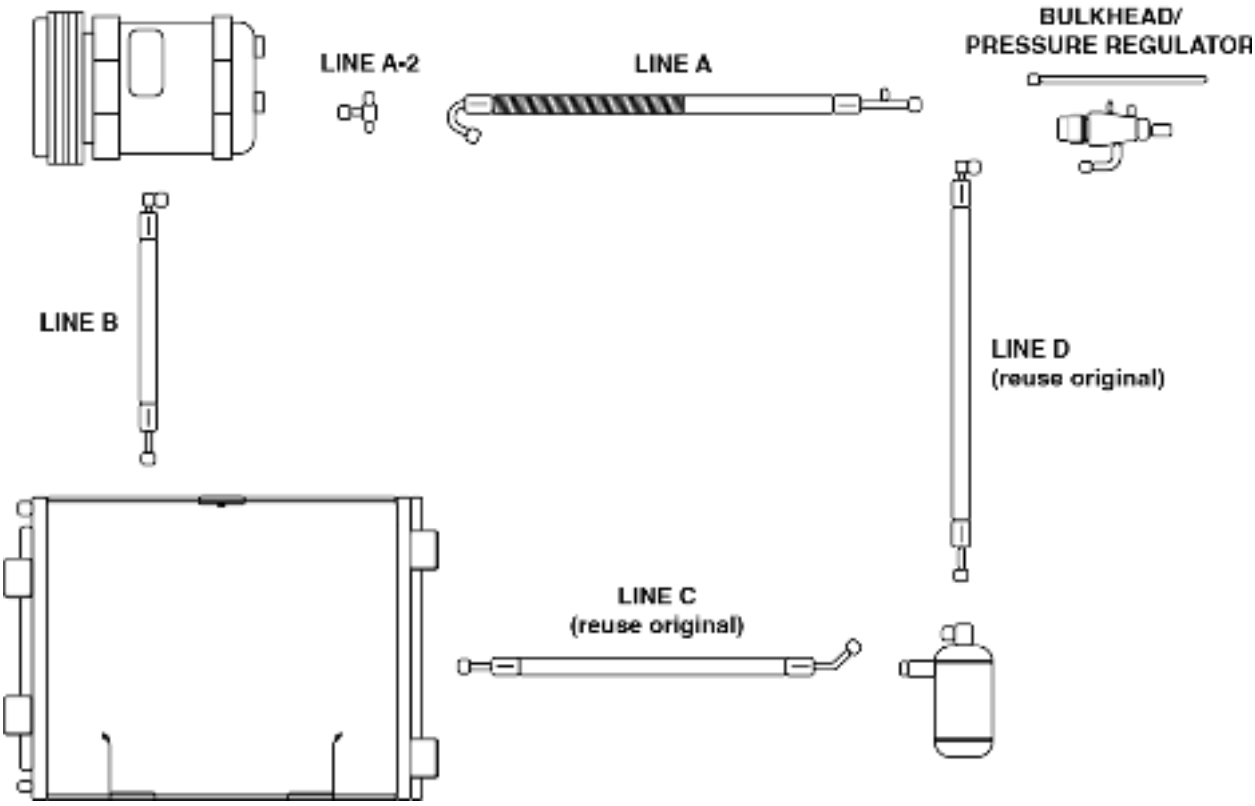



*Figure 1*

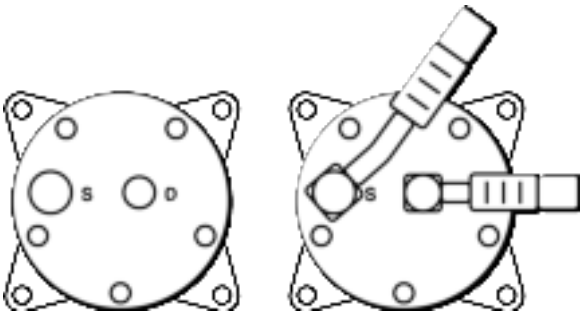



*Figure 2*

## System Check & Optional Items Needed:

*Depending on the condition of the vehicle, the following components should be inspected for proper functionality/leaks/damage/etc. prior to the assembly of the new system as they will all affect A/C cooling performance. Ohm values and other system specifications can be found in your workshop manual. Freon operates in a closed system and will not function properly with leaks. It is imperative that the system be flushed and decontaminated prior to installing the new components.*

- A/C high-pressure cut off switch (ensure ohm values are within range; inspect for leaks)
- High-pressure drier return line (inspect rubber hose for leaks)
- High-pressure condenser return line (inspect rubber hose for leaks)
- Auxiliary fan and auxiliary fan relays, switches, etc. (check for functionality)
- Expansion valve(s) (R12 type is acceptable, but R134a type is preferred)
- Evaporator (inspect for leaks and/or damage)
- Interior A/C selector switch (check for functionality)
- Interior A/C line O-rings (inspect for leaks)
- Interior A/C blower motor (check for functionality)
- Interior temperature sensor (ensure ohm values are within range)
- Evaporator temperature sensor (check for functionality)
- Evaporator regulator/control module (check for functionality)
- Fresh air flap control unit, actuator, and potentiometer (check for functionality)

## Installation Instructions

*Do not discard of any of the original components as some may be used during the installation process.*



## PART 1 OF 2: DISASSEMBLY

### A. Remove A/C compressor and lines

1. Discharge and evacuate the existing freon. Once evacuated, flush the system to remove old oil and contaminants.

   ***NOTE –***
   *The evacuation of freon (R12 or R134a), must be done by a certified A/C shop as its chemicals are toxic and harmful to the environment. Always perform an evacuation/discharge in a well-ventilated area.*

2. Disconnect the negative ( - ) cable from the battery.

3. Disconnect the low-pressure suction line (LINE A) and remove.

   ***NOTE –***
   *For model with rear A/C, you may need to remove the heat shield to access all connections of the pressure regulator to remove the suction line. Removal of the pressure regulator fittings will be required to install new O-rings.*

   ***NOTE –***
   *For model with fuel coolers, you will be required to remove and cap the fuel lines as the fuel cooler will not be reused during install.*

4. Disconnect the high-pressure discharge line (LINE B) and remove.

   ***NOTE –***
   *Removal of the RH side grill and turn signal is recommended for additional line access.*

   ***NOTE –***
   *For models with an automatic, you may need to disconnect the transmission cooler lines to remove the discharge line.*

5. Disconnect the wiring from the wiring harness to the compressor.

   ***NOTE –***
   *Depending on the year, the vehicle may have 2 wires exiting the compressor for the external temp sensor cut off switch. Disconnect one/both from the wiring harness loom.*

6. Remove the compressor V-belt and compressor.

7. Remove the compressor adjustment bracket – leaving the aluminum accessory bracket on the engine block.

**B. Remove filter drier**

1. Remove the washer tank and all associated wiring to gain access to the filter drier.
2. Disconnect/loosen the high-pressure condenser return line (LINE C) and high-pressure drier return line (LINE D) from the filter drier.

   ***NOTE –***
   *Do NOT open or install the new drier at this time.*

3. Disconnect the high-pressure cut off switch connector from the wiring harness and unbolt and remove the filter drier.
4. Remove the high-pressure cut off switch from the existing drier, but do NOT yet install on the new drier.

This concludes disassembly. At this time, it is suggested to clean and degrease any areas of the chassis that are now accessible with the A/C system partially removed. Keep all your original components as some will be used during the installation process.

## PART 2 OF 2: ASSEMBLY

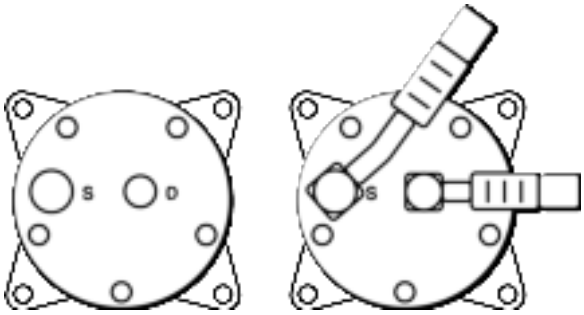
### A. Install compressor and mounting bracket

1. Using the supplied wiring kit, splice and crimp the original male bullet connector from the end of the old compressor to the single wire coming off the new compressor.

   ***NOTE –***
   *Depending on the year, the vehicle may have 2 wires exiting the compressor for the external temp sensor cut off switch. This can be bypassed as it will not be needed on the new compressor.*

2. Apply heat shrink and check electrical connection.

3. With the old compressor adjustment bracket and accessory bracket removed, fit and install the new compressor bracket with the supplied hardware and tighten. Refer to the orientation below:




4. Install new V-belt and tighten.

   ***NOTE –***
   *For initial installation, it is recommended to tighten the V-belt before installing the AC lines to ensure they are positioned in the proper orientation. This will ensure easy removal of the V-belt in the future without damaging the lines.*

5. Connect compressor wiring to the wiring harness.

6. Compressor and mounting bracket installation are now complete and ready for lines.

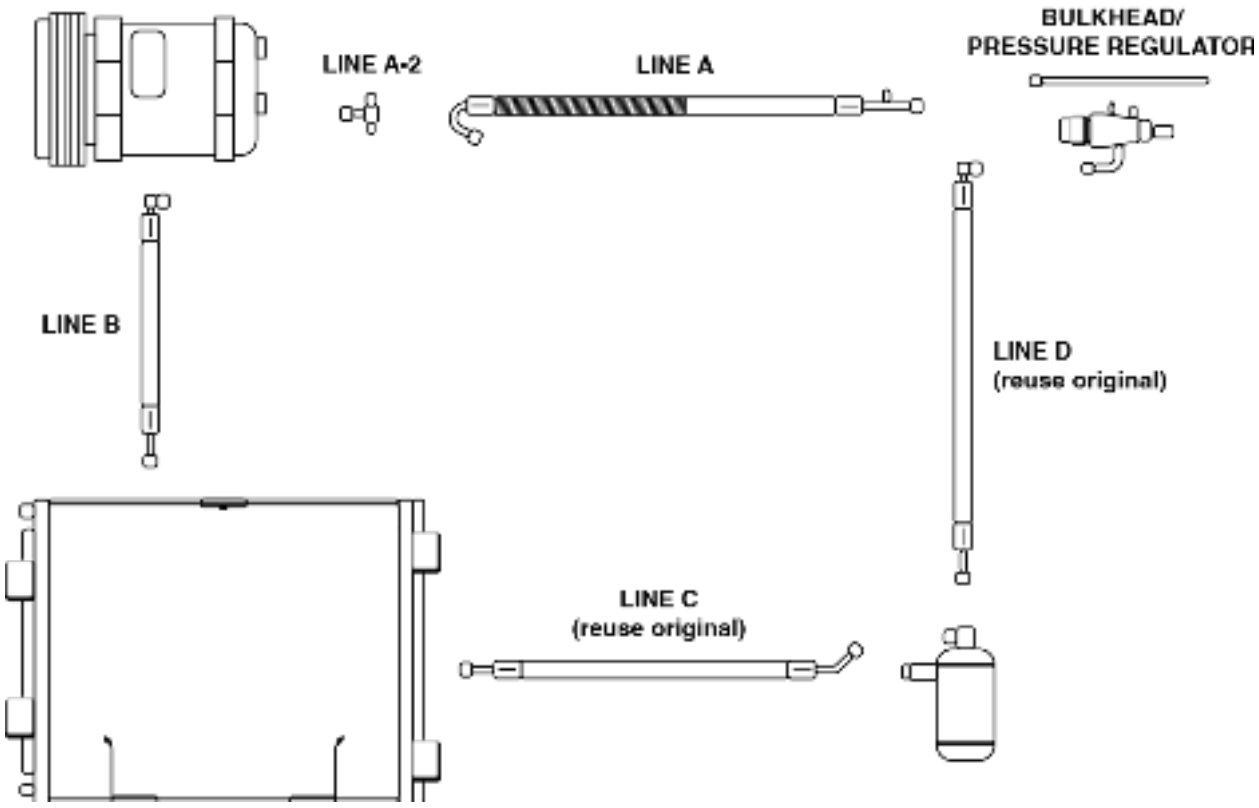
### B. Install filter drier

1. Carefully open the filter drier (it will be charged with Nitrogen), and transfer over the high-pressure cut off switch (or install new). Coat with a freon compatible thread sealant or PTFE tape and tighten until snug.
2. Place filter drier into location and connect the high-pressure cut off switch to the wiring harness.
3. Refit the original high-pressure condenser return line (LINE C) from the drier to the condenser using the supplied O-rings (2x medium) and tighten.

   ***NOTE –***
   *O-rings must be lubricated with PAG oil when installed.*

4. Refit the original high-pressure drier return line (LINE D) to the drier using the supplied O-rings (1x small, 1x medium).
5. Tighten the filter drier mounting nut to chassis.
6. Filter drier installation is now complete.

### C. Install new A/C lines



1. Install the high-pressure discharge line (LINE B) from the condenser to the compressor using the supplied O-rings (2x medium).

   ***NOTE –***
   *It is recommended to install the compressor side first, then snake the hose underneath the frame rail and around the tow hook before connecting it to the condenser.*

2. Using the supplied edge trim, cut and install to any areas where the new rubber hose (LINE B) may contact sharp edges of the chassis.

3. Install the low-pressure suction line (LINE A) from the pressure regulator (or bulkhead for standard A/C models) to the compressor using the supplied O-rings (2x large).

   ***NOTE –***
   *For the 635CSi and M635CSi, install the low-pressure adapter (LINE A-2) to the compressor using the supplied O-ring (1x large).*

   ***NOTE –***
   *For the 635CSi and M635CSi, use the original hose clamp to secure the new line against the frame rail mimicking the original line routing.*

4. Install the factory heat shield.

   ***NOTE –***
   *If necessary, install the supplied spacer between the chassis and the aluminum heat shield to allow for more clearance around the new rubber hose (LINE A).*

5. A/C line installation is now complete.

## D. Install new O-rings

1. Refer to the following table when installing the supplied O-rings:

   ***NOTE –***
   *O-rings must be lubricated with PAG oil when installed.*

**M635CSi and 635CSi (with standard A/C)**

| O-ring | Location |
|---|---|
| 3x large | Low-pressure suction line (LINE A) (all connections) |
| 2x medium | High-pressure discharge line (LINE B) (all connections) |
| 2x medium | High-pressure condenser return line (LINE C) (all connections) |
| 1x small, 1x medium | High-pressure drier return line (LINE D) (all connections) |

**M6 and 635CSi (with rear A/C)**

| O-ring | Location |
|---|---|
| 2x large | Pressure regulator (all connections except LINE A) |
| 3x large | Low-pressure suction line (LINE A) (all connections) |
| 2x medium | High-pressure discharge line (LINE B) (all connections) |
| 2x medium | High-pressure condenser return line (LINE C) (all connections) |
| 1x small | Drier to rear A/C (located in RH side fender well) |
| 1x large | Pressure regulator to rear A/C (located in RH side fender well) |
| 1x small, 1x medium | High-pressure drier return line (LINE D) (all connections) |

## E. Vacuum test and charge

1. Do NOT add oil as the compressor already contains the proper amount of oil for the system.

   ***NOTE –***
   *If you are driving the vehicle to an A/C shop for charging and/or vacuum/pressure testing, it is recommended to disconnect the A/C compressor wire to protect the system from running without freon.*

2. Pull a vacuum on the system for a minimum of 1 hour.
3. Using a gauge set or A/C machine, let the system sit for a minimum of 1 hour and ensure no pressure is lost. If pressure is lost, inspect all components for leaks, then diagnose, repair, and retest.

4. Fill to system capacity (adjusted for R134a freon conversion factor and relative ambient temperatures).

   ***NOTE –***
   *Charging and filling of the system should be completed by a licensed A/C professional. Do NOT overcharge the system as it will result in catastrophic failure.*

This concludes assembly. If you or your mechanic has any questions regarding this kit, or would like to provide feedback, please do not hesitate to contact us at info@acsolutions.co.

## TROUBLESHOOTING

| Problem | Solution |
|---|---|
| System leaks/does not hold vacuum or freon. | Inspect all line and hose connections, fittings, and components for leaks. |
| Interior vent temps are >50 deg Fahrenheit. | Ensure the system is charged to the correct pressure/capacity, check to see if compressor clutch is engaging/disengaging properly, check system for leaks, **confirm functionality of expansion valve**. |
| Interior vent temps are <32 deg Fahrenheit. | Ensure the system is charged to the correct pressure/capacity, check to see if compressor clutch is engaging/disengaging properly, check functionality of evaporator temp sensor, evaporator control module, and high-pressure cutoff switch. |
| Compressor is not engaging. | Check electrical connection to the compressor, check all interior sensors and switches to ensure continuity/functionality, ensure system is not over or undercharged. |
| Auxiliary fan is not running. | Check fan relay, fuses, and electrical connection at the front of the vehicle. |