

Suzuki Samurai Air Compressor Conversion Project
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You can convert your Samurai Air Conditioning compressor for use as an air compressor. It does not cost much to do and it's a fairly simple project. These instructions can also be used to build a similar compressor system on other vehicles.

You should consider doing this project if you have a need for air for inflating tires after off-roading, you are installing air lockers or you want to inflate camping mattresses and other items. If you add a pressure switch and a tank, you can also operate small air-powered tools to a limited degree.

You should **NOT** consider doing this project if you plan to add power steering or you like air conditioning in your Samurai.

There are a number of ways to do this conversion. The most common ways are with a pressure switch and tank and without a pressure switch and tank. If you only want to inflate tires or power your locker(s) you can do without the pressure switch and tank. However, a pressure switch and tank adds a great deal of usefulness and safety to the system. You should seriously consider the inclusion of these two items if you want to get the most usefulness out of this conversion. See the Operations section at the end of this document for details.

Basic parts list.

Some specific items, such as the Campbell-Hausfield air tool set and parts assortment, may not be available in your area. If you have to buy most items separately, refer to figure 1 for part name and count. Note that all the copper fittings, couplers and other components are labeled **1/4" NPT**. This represents the inside diameter hole size (in English measurement units) and NPT the type of threads on the part. NPT is a standard English plumbing thread type if you have metric components where you live, use the metric counterparts.

Part Description	Source	Rough Cost
Samurai Compressor	junkyard	\$0.00 to ?
Outlet connector from A/C Assembly	junkyard	\$0.00 to ?
2 - 3/8" – 7/8" clamps	hardware store	\$1.38
1 - 25' air hose with 1/4" NPT nipples	hardware store	\$9.90
2 - barb hose, 1.4" NPT	hardware store	\$1.86
1 - 90-degree brass 1/4" NPT elbow	hardware store	\$2.25
1 - 1/4" NPT brass tee	hardware store	\$2.89
1 - Campbell-Hausfeld air tool set (tire gage, air chuck, tire inflation chuck, snap connector assortment, etc.)	hardware store	\$14.89
2 - female snap air fitting/coupler	hardware store	\$2.19
1 - male snap air fitting/coupler	hardware store	\$1.06
1 - 1/4" NTP hex nipple	hardware store	\$1.33
1 - 125 PSI ASME coded pop-off safety valve 1/4" male NPT	hardware store	\$9.98
1 - automatic line oiler 1/4" male NPT	hardware store	\$18.99
1 - roll Teflon plumber's tape	hardware store	\$0.59
1- 12V illuminated toggle switch (Radio Shack 25-50706)	Radio Shack	\$2.79

	total:	\$70.10
Tank items:		
1 - compressor gage	Hardware Store	\$14.89
2 - 1/4" NPT brass tee	hardware store	\$2.89
1 - 25' length of air hose with 1/4" NPT nipples on each end (or build one with air hose and 2 barb hose to 1/4" nipples)	hardware store	\$9.90
1 - Pressure switch	hardware store	\$48.00 (ballpark)

	total:	\$75.68

Tank adapter for Basic conversion:

Part Description	Source	Rough Cost
1 - male snap air fitting/coupler with 1/4" NPT tread end	hardware store	\$1.06
1 - male snap air fitting coupler with 1/4" NPT nipple end	hardware store	\$1.89

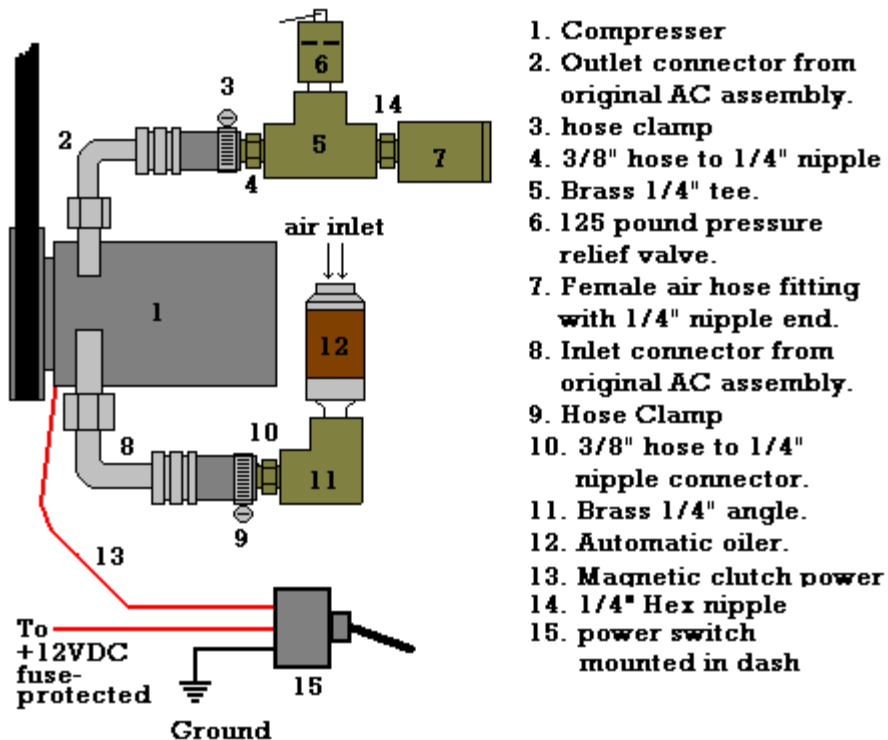
	Total	\$2.95

Construction:

Refer to **Figure 1** for parts placement. Be sure to wrap all threads with Teflon plumbers tape (or similar sealing product) as you assemble the plumbing. Note that the **outlet connector** on the compressor is the one **CLOSEST TO** the engine block and the inlet connector is the one that is the farthest away from the engine block.

I used hose clamps and the original compressor hoses and hose clamps to simplify adapting the air plumbing from Metric to English. Since the United States has not completely adapted ourselves to the metric standard, finding metric fittings for the compressor outlet and inlet is difficult and expensive. Recycling the original hose lines and using hose clamps solves this problem. It also makes for an easier to repair system.

There is another description of this conversion on the Internet that involves the use of a 1/2" iron plumbing tee and an epoxy-like substance called J-B weld. The idea is to liberally apply J-B weld to the right-angle port of the tee, then screw it onto the metric threaded outlet port of the compressor. I guess this is okay in a pinch, but it is prone to pinhole leaks if not done properly and is very permanent! The hose clamp method allows you to easily adjust the positioning of the components and does not permanently change the compressor's outlet connector.

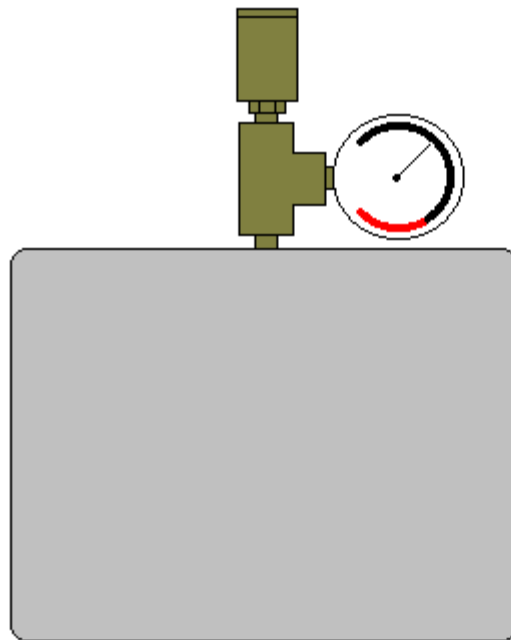


Basic Samurai Compressor Schematic

Figure 1

If you want to use the basic design to fill an air tank, try the tank design in **Figure 2**. You will also need to make the adapter pictured in **Figure 3**. The double-ended male connector adapter allows you to connect the air tank in figure 2 for filling through an air hose. If you already have a tank, examine the way the tank is filled and create a suitable adapter for it. Be sure to check for a one-way check valve on your tank if you want to use the adapter in **Figure 3**. If there is one installed in line with the tank's outlet connector, you will not be able to fill the tank with the adapter.

Although the 125 pound pressure relief (item 6 in the schematic) valve will provide protection from over-pressurizing a tank, **YOU MUST STILL CAREFULLY MONITOR THE PRESSURE ON THE TANK'S GAGE DURING THE FILLING PROCESS TO KEEP IT FROM ACCIDENTALLY OVERFILLING THE TANK CAUSING THE TANK IT TO EXPLODE!**



Simple Air Tank Setup

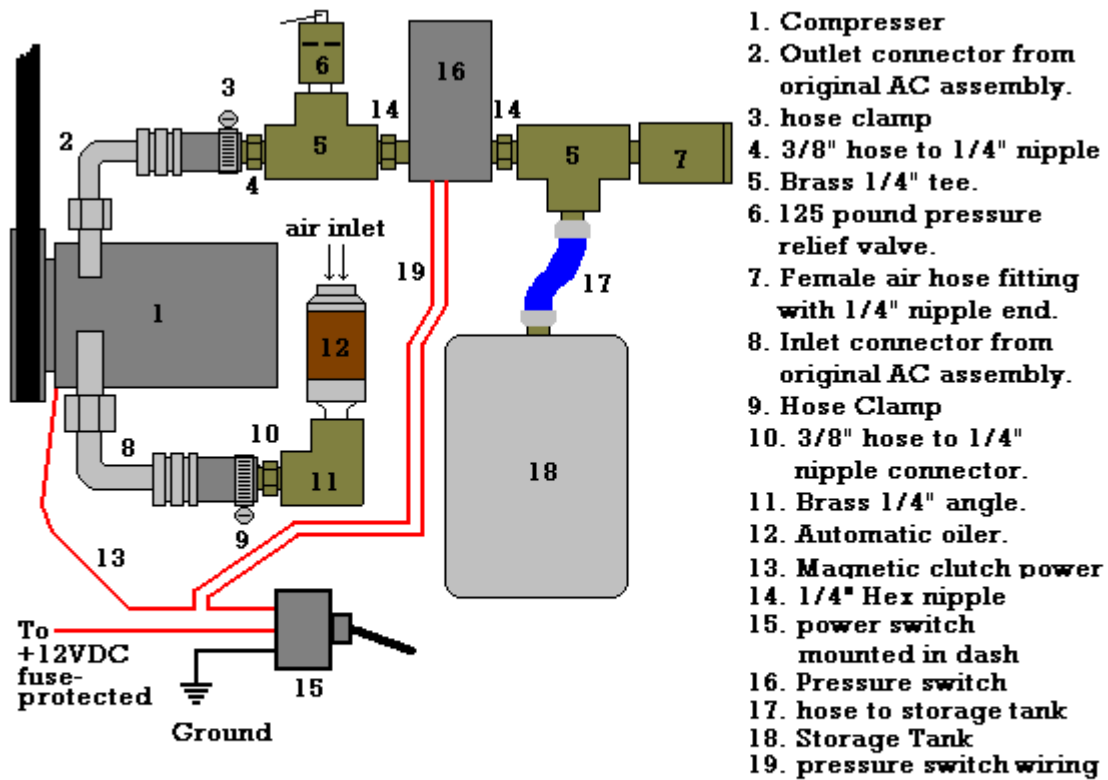
Figure 2



Male to Male Adapter

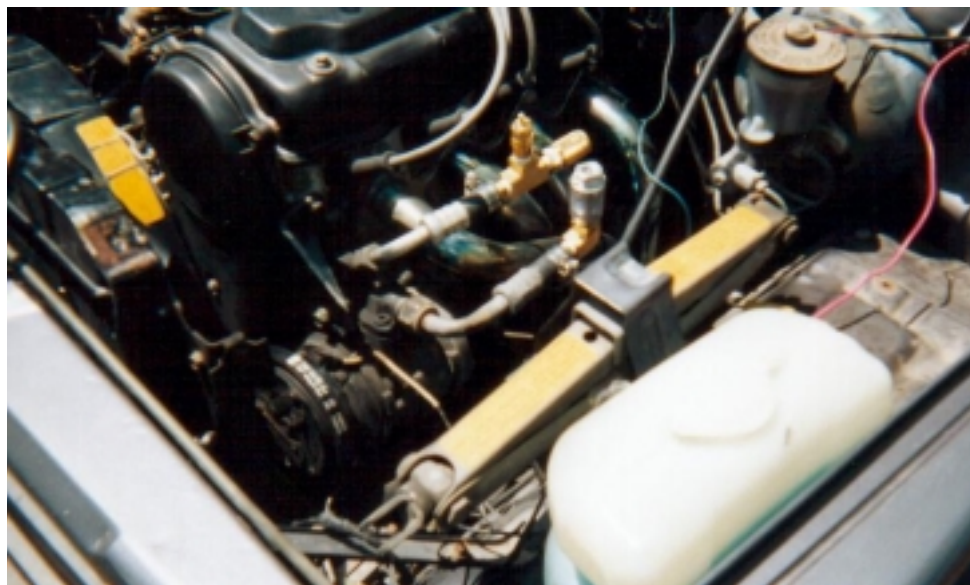
Figure 3

If you would like to permanently add a tank to your basic compressor, use the schematic in **Figure 4**. It uses a pressure switch that is designed to automatically shut off the compressor when a maximum pressure is reached – usually no more than 125 pounds and turn the compressor back on when the pressure drops to a minimum level – usually around 60 to 80 pounds. This system **MUST** use a pressure switch in order to work safely and properly. In addition, the pressure switch makes the system work a lot easier! See the **Operation** section at the end of the article for details.



**Samurai Compressor Schematic
 with Pressure Switch and Storage Tank**

Figure 4



Picture 1

Picture 1 is an example of how the compressor and plumbing is installed on my vehicle. You can place your air hose connector and tank wherever you want on the vehicle body. Just be sure that you keep the lines away from heat and the potential for damage from objects while on the trail. **Picture 2** shows how I mounted the power switch (the red switch next to the dimmer knob) on my dash



Picture 2

Although some people use their hollow steel bumper as an air tank, there is a REAL danger of flying shrapnel should a pressurized bumper be torn open in an accident. Something to think about...

Operation

I have installed the basic system in my Samurai without a pressure switch and a permanent tank.. Operating it **REQUIRES two people** – one to operate the compressor switch and the throttle and one to inflate the tire or other item. Here is what I do when I inflate something (tires, air mattresses, etc.) with the Basic Compressor setup:

1. Make sure that the compressor switch is turned off.
2. Pull up on the pressure relief valve to depressureize the output side of the compressor.
3. Connect the air hose and appropriate tool (usually an tire inflating chuck) to the output of the compressor.
4. Start the engine and idle up to around 2000 RPM.
5. Connect the air hose to the item to be inflated. If you are using a tool with a trigger, press the trigger.
6. Start the compressor to inflate.
7. Turn off the compressor and release the throttle to disconnect and check the air pressure.
8. **Repeat steps 4 through 7 until the item is properly inflated.**

If you have installed the pressure switch and a permanent tank, **you only need one person** to operate the system. Here is what you need to do:

1. Start the engine.
2. Connect the air hose and tool to be used.
3. Turn on the compressor.
4. If the system is discharged, let the pressure build up until the pressure switch shuts off the compressor.
5. Use the air tool stopping as necessary for the compressor to “catch up” with air usage.
6. Turn off the compressor when done.

There you have it. Have fun and be careful on the trails!