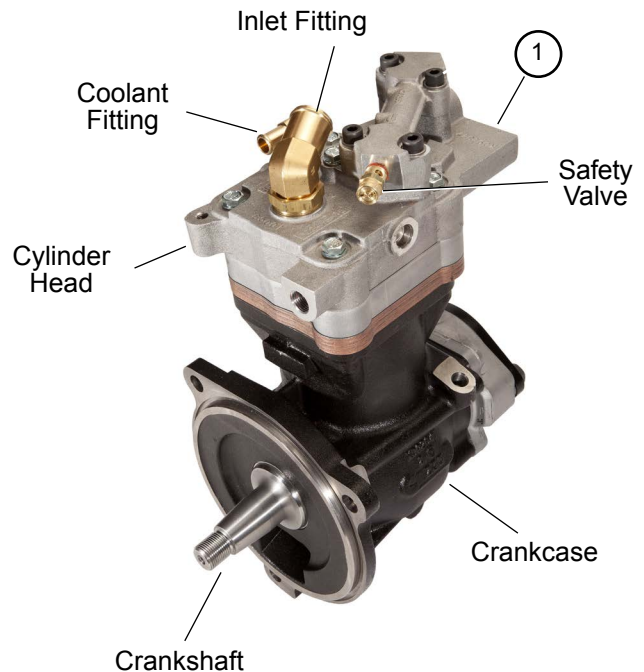


Installation Instructions



BENDIX® SNA-01™ COMPRESSOR FIELD CONVERSION KIT

Kit Contents		
Item No.	Description	Qty.
1	Bendix® SNA-01™ Compressor	1
2	Coolant Union Fitting	1
3	Coolant Hose	1
4	Coolant Hose Clamp	3
5	Synflex Tubing (Governor Line)	1
6	Tubing Union	1
7	Inlet Hose	1
8	Inlet Hose Clamp	3



Notes:

1. When changing over to the Bendix® SNA-01™ compressor, several items must be transferred from the old compressor to the new. The items include unloader port fitting, discharge port fitting, oil port fitting, straight coolant fitting, the oil supply line (Volvo® installations only), compressor drive gear, and drive gear nut.
2. Additional items such as the front flange o-ring (Volvo P/N 992065) and oil supply line (Volvo P/N 977650 on Mack® installations only) will be needed to facilitate this installation. See your authorized Volvo/Mack dealer for these parts.

Figure 1 – Bendix® SNA-01™ Compressor Discharge Jumper Assembly Kit

IMPORTANT

The Bendix® SNA-01™ compressor (1) is a service new single cylinder compressor developed exclusively for the Volvo D11, D13, and D16 engines; and the Mack MP7 and MP8 engines produced in the 2006 through 2010 time-frame. The retrofit kit is only suited for these engine models in this time frame. Bendix does not approve the usage of the SNA-01 compressor on engines outside of these parameters.

GENERAL

This field conversion kit is used to convert the vehicle from the WABCO® 318 compressor (Mack vehicle) and WABCO 636 compressors (Volvo vehicle) to the Bendix SNA-01 compressor. This kit, along with the Volvo parts specified in Figure 1, Note 2 – facilitates the installation. Refer to *Compressor Application Matrix (BW3006)* available online at bendix.com. This compressor application matrix offers directional information when sizing the compressor for vehicle vocations.

These instructions are general and are intended to be a guide. In some cases, additional preparations and precautions are necessary. In all cases, follow the instructions contained in the vehicle maintenance manual in lieu of the instructions, precautions, and procedures presented in this document.



GENERAL SAFETY GUIDELINES

WARNING! PLEASE READ AND FOLLOW THESE INSTRUCTIONS

TO AVOID PERSONAL INJURY OR DEATH:

When working on or around a vehicle, the following guidelines should be observed **AT ALL TIMES**:

- ▲ Park the vehicle on a level surface, apply the parking brakes and always block the wheels. Always wear personal protection equipment.
- ▲ Stop the engine and remove the ignition key when working under or around the vehicle. When working in the engine compartment, the engine should be shut off and the ignition key should be removed. Where circumstances require that the engine be in operation, **EXTREME CAUTION** should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated or electrically-charged components.
- ▲ Do not attempt to install, remove, disassemble or assemble a component until you have read, and thoroughly understand, the recommended procedures. Use only the proper tools and observe all precautions pertaining to use of those tools.
- ▲ If the work is being performed on the vehicle's air brake system, or any auxiliary pressurized air systems, make certain to drain the air pressure from all reservoirs before beginning ANY work on the vehicle. If the vehicle is equipped with a Bendix® AD-IS® air dryer system, a Bendix® DRM™ dryer reservoir module, or a Bendix® AD-9si® air dryer, be sure to drain the purge reservoir.
- ▲ Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.
- ▲ Never exceed manufacturer's recommended pressures.
- ▲ Never connect or disconnect a hose or line containing pressure; it may whip and/or cause hazardous airborne dust and dirt particles. Wear eye protection. Slowly open connections with care, and verify that no pressure is present. Never remove a component or plug unless you are certain all system pressure has been depleted.
- ▲ Use only genuine Bendix® brand replacement parts, components and kits. Replacement hardware, tubing, hose, fittings, wiring, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems.
- ▲ Components with stripped threads or damaged parts should be replaced rather than repaired. Do not attempt repairs requiring machining or welding unless specifically stated and approved by the vehicle and component manufacturer.
- ▲ Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.
- ▲ For vehicles with Automatic Traction Control (ATC), the ATC function must be disabled (ATC indicator lamp should be ON) prior to performing any vehicle maintenance where one or more wheels on a drive axle are lifted off the ground and moving.
- ▲ The power **MUST** be temporarily disconnected from the radar sensor whenever any tests **USING A DYNAMOMETER** are conducted on a vehicle equipped with a Bendix® Wingman® system.
- ▲ You should consult the vehicle manufacturer's operating and service manuals, and any related literature, in conjunction with the Guidelines above.

VEHICLE PREPARATION

1. Park the vehicle on a level surface and prevent movement by means other than the brakes.
2. Drain all reservoirs to 0 psi. **CAUTION:** Always depressurize the air dryer purge reservoir, and all other reservoirs on the vehicle to 0 psi before performing the compressor retrofit.

INSTALLATION ASSUMPTIONS AND UNDERSTANDINGS

1. This installation instruction procedure assumes that the OE installed compressor (e.g. WABCO® 318 or 636 compressor) is being removed from the engine and a Bendix® SNA-01™ compressor is being retrofit onto the engine.
2. A new compressor front flange o-ring must be purchased from Volvo®/Mack® to facilitate the installation. This o-ring is not supplied with this kit. *See Figure 1, Note 2.*
3. The compressor inlet fitting and top coolant fitting is pre-installed (tightened to specification) at the proper positions to line up to the mating hardware. It is possible that readjustment of the air inlet fitting may be required due to engine air inlet tube variability from engine to engine.
4. Unless specifically stated in this instruction sheet, the instructions apply to both the Mack and Volvo compressor retrofits.
5. Unless otherwise stated in this instruction sheet, the assembly torques recommended in the Volvo/Mack compressor replacement service manual should be used.

COMPRESSOR REMOVAL FROM VEHICLE

1. Use the vehicle manufacturer's service manual to remove the existing compressor from the engine.
2. The following hardware must be removed from the compressor being replaced for use on the replacement Bendix SNA-01 compressor. (*See Figure 2, images A through D for the location of these hardware items.*)
 - A. Compressor drive gear and attachment nut (**NOTE:** *Use the vehicle manufacturer's recommended procedure for removing the compressor drive gear from the existing compressor.*
Three compressor flange mounting nuts that secure the compressor to the engine mounting flange.
 - B. Oil supply fitting and discharge fitting.
 - C. Straight coolant fitting (located on side/front of the cylinder head).
 - D. Unloader fitting and attachment screws/brackets fastened on the cylinder head.

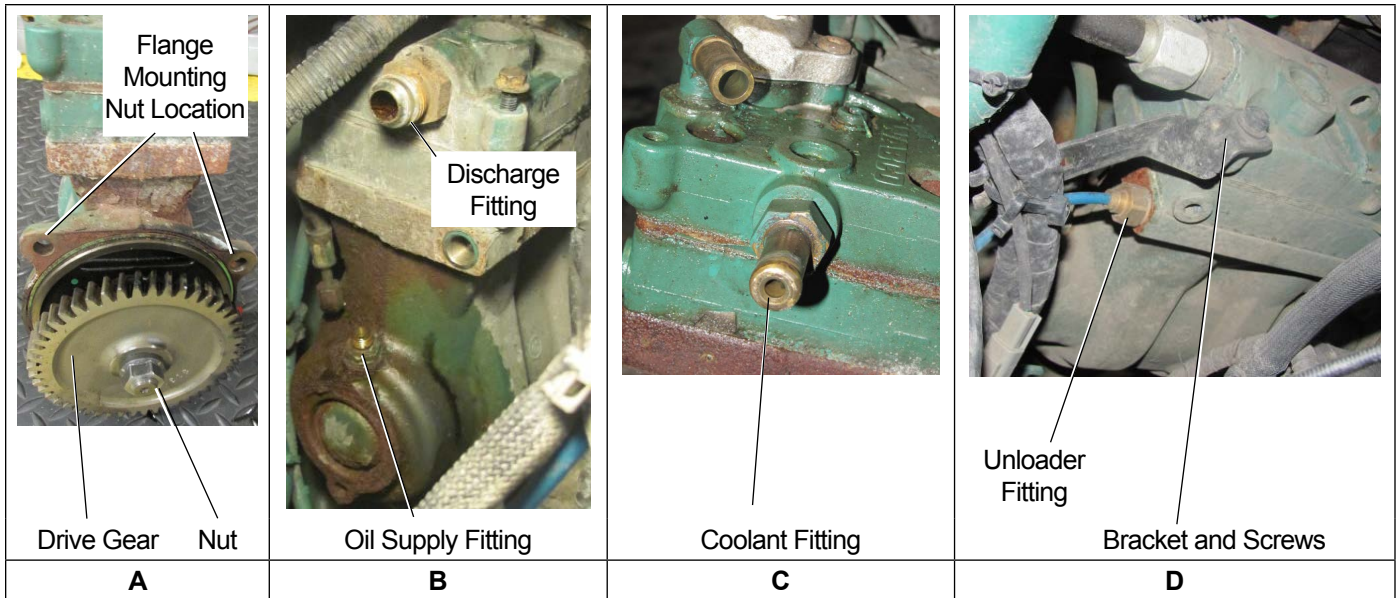


Figure 2 – Hardware That Must Be Removed From The Compressor Being Replaced

- Once the existing WABCO® compressor has been removed, the P-clamp and line that the P-clamp holds must be repositioned to ensure proper clearance when the new Bendix® SNA-01™ compressor is installed. Refer to Figure 3 to determine the P-clamp that must be adjusted. Loosen and remove the bolt that holds the P-clamp. Invert the P-clamp and position it such that the P-clamp is located above the bolt hole. Install and retighten the bolt that holds the P-clamp.

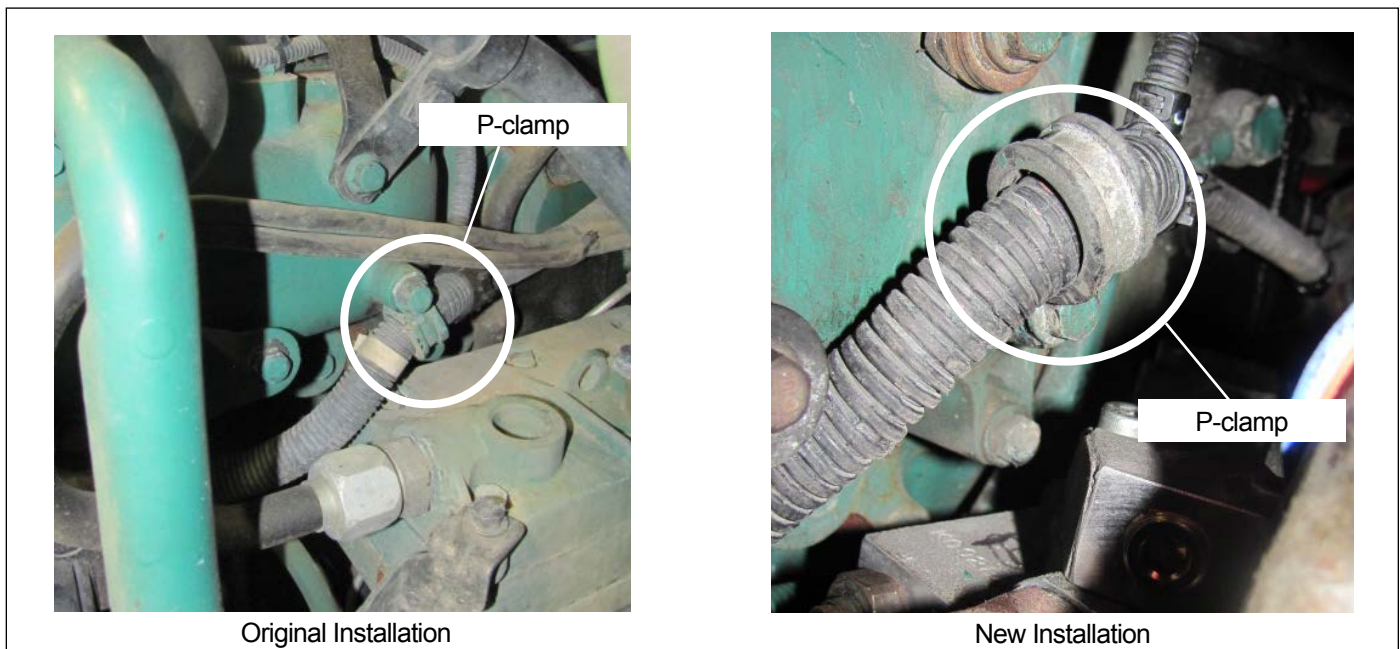


Figure 3 – P-Clamp Positioning

INSPECTION OF PARTS

This section applies to the hardware that was removed from the compressor being replaced in section “COMPRESSOR REMOVAL FROM VEHICLE”, Step 2.

1. **Compressor drive gear and attachment nut:** Inspect the gear teeth to ensure there is no damage. Inspect the surface that mates to the compressor crankshaft. There should be no defects or raised material on the surface. If damage/defects are found, the drive gear should be discarded and a new drive gear purchased through a qualified Volvo®/Mack® dealer.
2. **Fittings:** All internal and external threads should be intact. If any threads are stripped, or if material transfer from the compressor ports has occurred, the part must be discarded. If sealing surfaces are damaged, the parts must be discarded. Replacement parts should be purchased through a qualified Volvo/Mack dealer.

PREPARE THE BENDIX® SNA-01™ COMPRESSOR FOR INSTALLATION

Install the compressor drive gear on the new compressor.

1. Follow the recommended procedure in the Volvo/Mack service instruction manual to install the drive gear from the existing compressor to the Bendix® SNA-01™ compressor.
2. Clean the shaft end of the new compressor as well as the drive gear. Secure the drive gear in a vice with soft jaws. Position the new compressor shaft into the drive gear. Install the gear nut and torque to 200 +/- 15 ft-lbs (270 +/- 20 N•m).

Install the fittings onto the new compressor.

1. Install the straight coolant fitting into the side coolant port at the front of the cylinder head. Torque the fitting to a value less than 310 in-lbs (35 N•m). *Note: Teflon tape can be used to aid in the sealing of the threads. (Refer to Figure 4.)*
2. Install the unloader fitting into the unloader port on the back side of the compressor cylinder head. Torque the fitting to 230–257 in-lbs (26–29 N•m). (Refer to Figure 5.)



Figure 4 – Front (Side) Coolant Fitting Installation

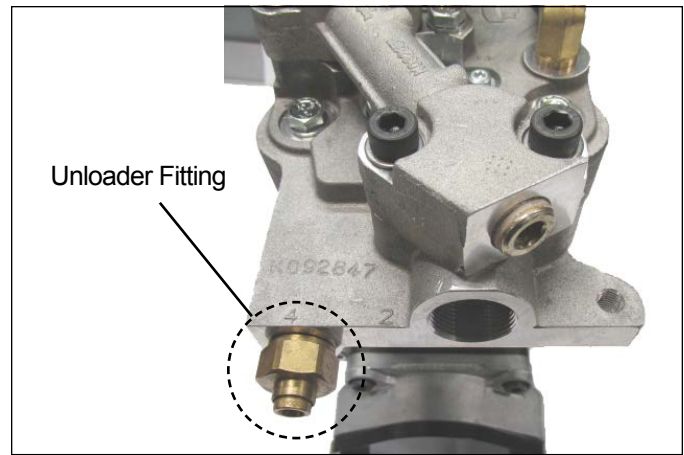


Figure 5 – Unloader Fitting Installation

3. Install the oil supply fitting from the compressor that was removed in the oil supply port of the SNA-01 compressor as shown in Figure 6. Torque the fitting to 142–159 in-lbs (16–18 N•m).



Figure 6 – Oil Fitting Installation

4. Install the discharge fitting into the discharge port in the back of the cylinder head. Orientation and specific fittings may be different based on vehicle model. The torque applied to the fitting should be 81–96 ft-lbs (110–130 N•m). (Refer to Figure 7.)



Figure 7 – Discharge Fitting Installation

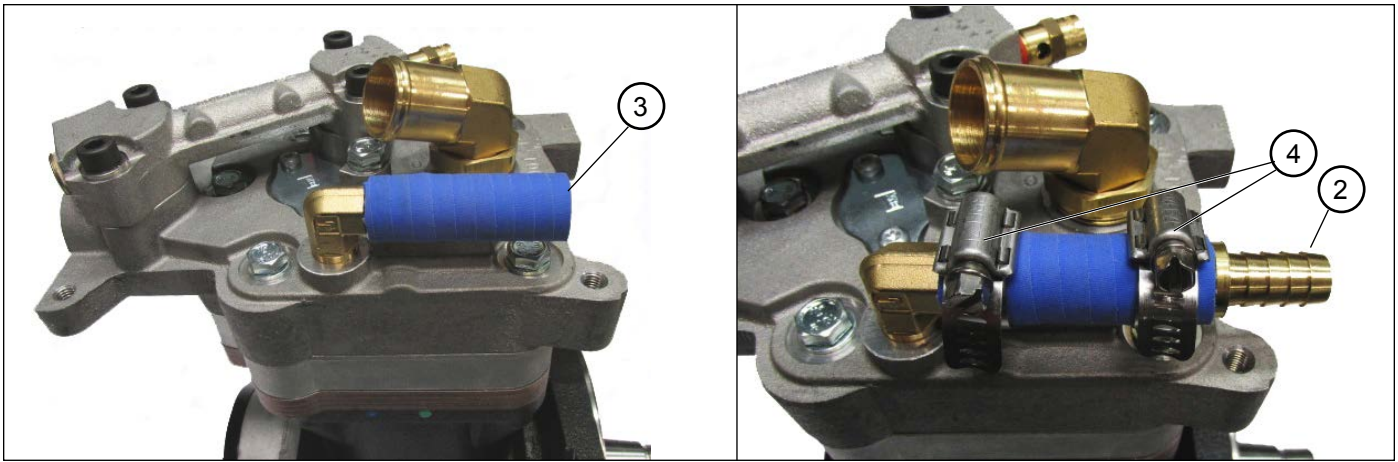


Figure 8 – Coolant Hose and Union Installation

Install the coolant conversion hardware at the top cylinder head coolant fitting. Use contents of this kit to facilitate the installation. (Refer to Figure 8.)

1. Slide the 1/2 inch ID coolant hose (3) onto the pre-installed coolant (elbow) fitting.
2. Slide the coolant hose union fitting (2) onto the opposite end of the coolant hose.
3. Attach and tighten two coolant hose clamps (4); one at each end of the coolant hose to secure the hose to the coolant (elbow) fitting and coolant hose union. *Note: There are two different size hose clamps in the kit. The smaller version should be used.*

Install the Bendix® SNA-01™ compressor onto the engine. (Refer to Figure 9.)

1. Remove any protective covering from the compressor mounting surface placed on the engine during the compressor removal process. Clean the compressor mounting surface.
2. Install a new o-ring in the o-ring groove on the front flange of the compressor. *Note: The o-ring (Volvo® P/N 992065) is not included in the retrofit kit and must be purchased through an authorized Volvo/Mack® parts outlet.*
3. Install the compressor onto the engine; making sure that the three mounting bolts on the engine fit into the three holes on the compressor mounting flange. *Note: Verify that the compressor mounting flange is flush to the engine mounting face and that the drive gear on the compressor engages the engine gear.*
4. Install the mounting fasteners onto the mounting studs and torque the fasteners to 63 +/- 11 ft-lb (85 +/- 15 N•m).

Install the oil supply line to the Compressor (Refer to Figure 10.)

Important: Because the Bendix SNA-01 compressor oil supply port is not in the exact same position as on the original equipment compressor, care must be taken to select and install the oil supply line.

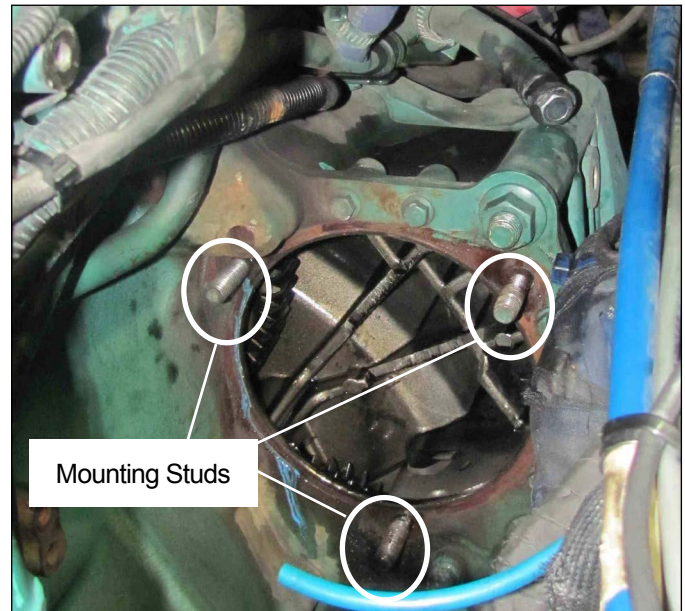


Figure 9 – Compressor Mounting Flange

On Volvo vehicle retrofits – The compressor oil supply line can be re-used for the compressor retrofit, however the orientation of the oil supply line must be reversed. Therefore, the oil supply line must be removed. What was the end that was installed onto the engine oil fitting must now be installed on the compressor oil supply port fitting. The other end must be installed onto the engine oil fitting.

On Mack® vehicle retrofits – The existing oil supply line must be removed and replaced with a longer supply line; Volvo P/N 977650. *Note: This is not included in the retrofit kit and must be purchased through an authorized Volvo/Mack parts outlet.*

1. After identifying the correct orientation for the oil supply as shown in Figure 10, install the oil supply line to the fittings in the engine block and compressor oil supply ports as described for the appropriate chassis.
2. Tighten the oil supply line fitting and torque to 12 +/- 2 ft-lb (16 +/- 2.5 N•m).

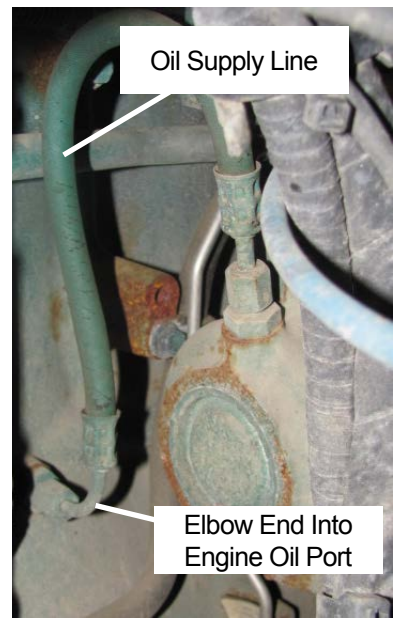

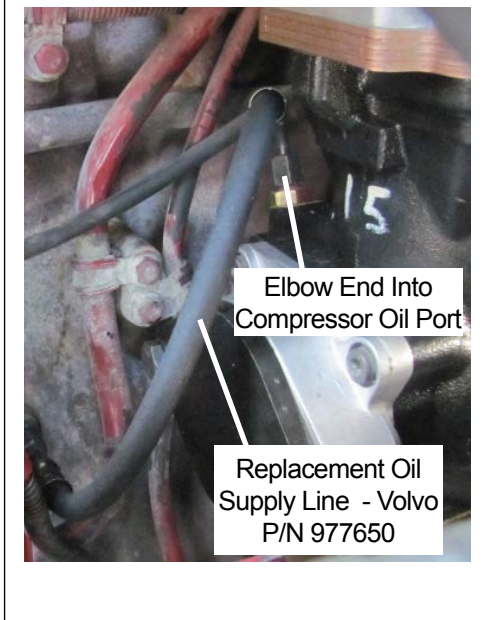
 <p>Oil Supply Line</p> <p>Elbow End Into Engine Oil Port</p>	 <p>Elbow End Into Compressor Oil Port</p>	 <p>Elbow End Into Compressor Oil Port</p> <p>Replacement Oil Supply Line - Volvo P/N 977650</p>
Existing Installation	Bendix® SNA-01™ Compressor Installation	Bendix SNA-01 Compressor Installation
Volvo® Chassis		Mack® Chassis

Figure 10 – Oil Supply Line Installation

Connect the coolant lines to the compressor. (Refer to Figure 11.)

1. Remove any plugs installed in the coolant lines from the engine during the compressor removal process.
2. Slide the existing coolant hose clamp over each of the two coolant lines (A & B). Connect coolant line (A) to the coolant union fitting in the top coolant port of the cylinder head and coolant line (B) into the appropriate coolant fitting.

NOTE: Because the coolant fittings are in slightly different positions from the original compressor, the coolant lines will need to be re-routed such that coolant line (B) will run over the top of coolant line (A) to ensure proper installation. If the two lines are in contact with each other, plastic conduit should cover both lines at the contact location to avoid abrasion.

3. Position the hose clamps over the fittings and secure.

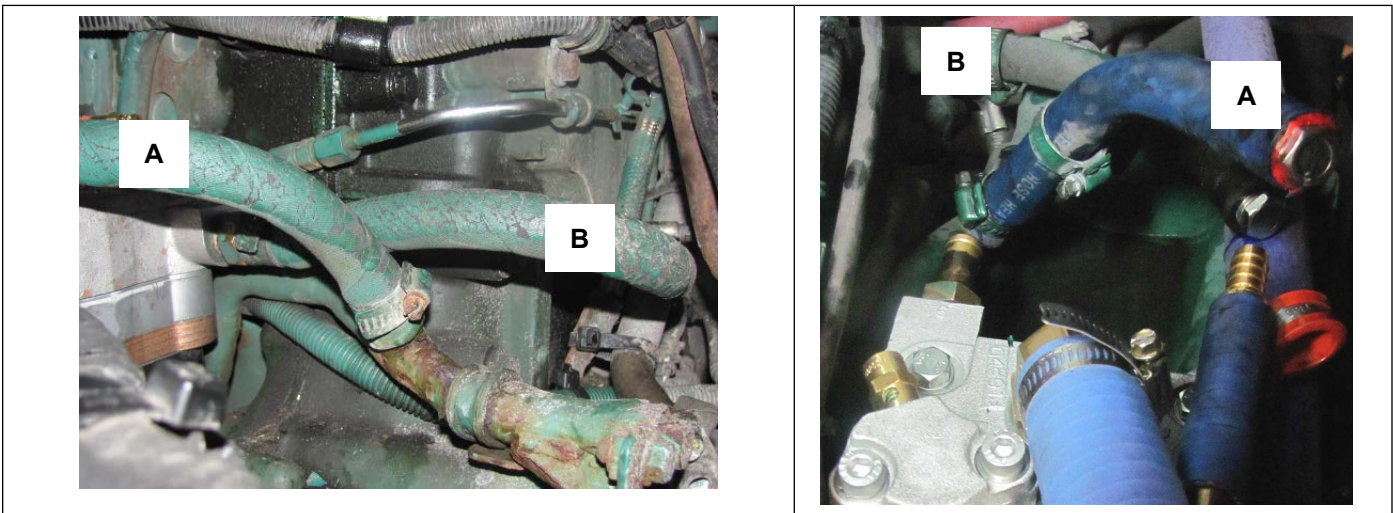


Figure 11 – Coolant Line Installation



Figure 12 – Bracket Attachment

Install the miscellaneous hardware. (Refer to Figure 12.)

1. If previously removed, install the frame bracket and secure the wire harness with the straps in the original position.
2. If present, remove the P-clamp fastener from the original compressor. Transfer that hardware to the same location on the new Bendix® SNA-01™ compressor.

Connect the compressor discharge line to the compressor. (Refer to Figure 13.)

1. Connect the air compressor discharge line to the compressor discharge fitting. Install the discharge line support brackets and torque the mounting bracket hardware per the vehicle manufacturer's guidelines.

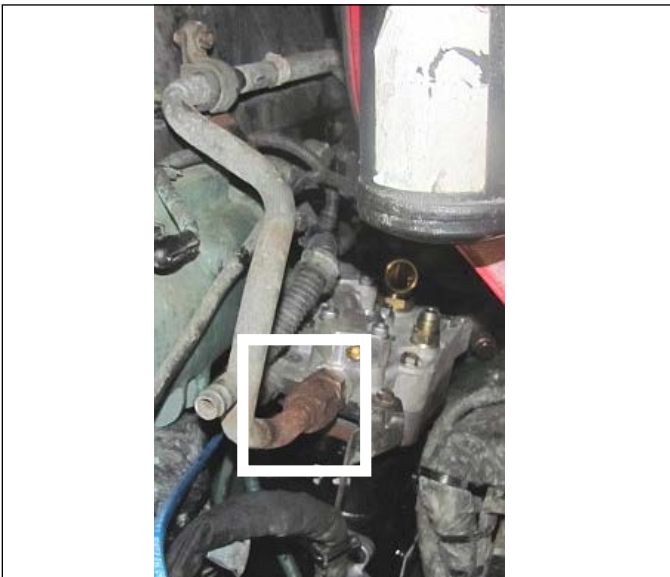


Figure 13 – Discharge Line Installation

Connect the unloader signal line to the compressor (Refer to Figure 14.)

Note: The unloader port on the SNA-01 compressor is slightly farther from the governor than the original WABCO® compressor. Therefore, you will need the additional Synflex® tubing (5) to reach the unloader port on the compressor. Perform the following steps.

1. Install the push-to-connect union (6) from the retrofit kit onto the end of the existing Synflex line from the governor.
2. The retrofit kit contains a piece of Synflex tubing (5) approximately eight inches in length. Install one end of the tubing (5) into the push-to-connect union (6) and the other end into the unloader fitting in the compressor cylinder head. Using tie wraps, secure the Synflex tubing as necessary to properly support it and to prevent chaffing with other parts on the chassis.

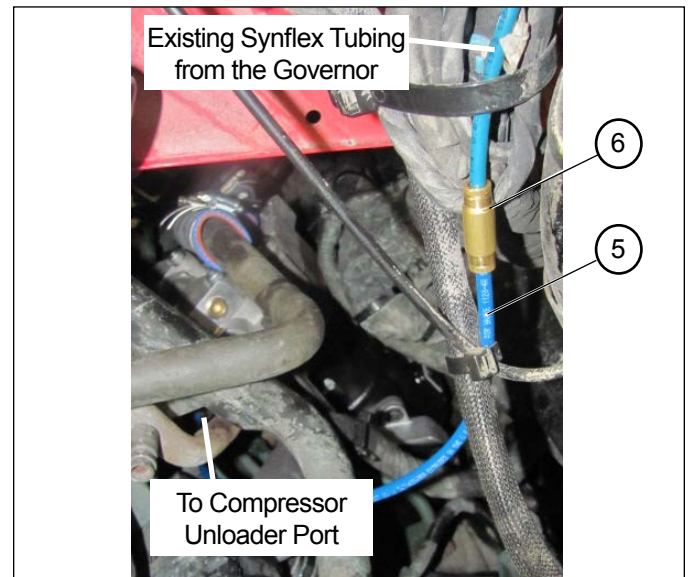


Figure 14 – Discharge Line Installation

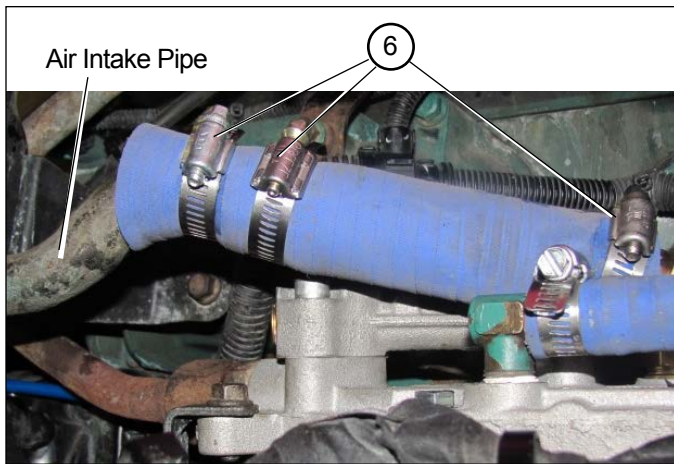


Figure 15 – Compressor Air Inlet Hose Installation

Install the new air intake hose onto the compressor (Refer to Figure 15.)

Note: This step will require the inlet hose (7) and the three inlet hose clamps (8) from the retrofit kit provided. The inlet hose clamps will be the larger of the clamps provided in the kit.

1. Position the air intake pipe such that it lines up with the hose end of the compressor inlet fitting. Slide the new inlet hose (7) onto the end of the air intake pipe. The hose should be pushed approximately three inches onto the pipe.
2. Place all three inlet hose clamps (8) onto the inlet hose and slide up to the end of the hose on the air intake pipe end. Slide the inlet hose onto the compressor inlet fitting such that it covers the entire hose barb end.
3. Slide one of the hose clamps to the inlet fitting end and position and secure the hose to the fitting.
4. The two remaining hose clamps should be used to secure the opposite hose end to the air intake pipe. The pipe has a raised bead approximately one inch from the end of the pipe. The two hose clamps must be used to secure the hose onto the air intake pipe; one on each side of the raised bead. *NOTE: If there is a kink in the inlet hose and the air intake pipe cannot be adjusted to remove the kink, the compressor inlet fitting jam nut should be loosened, the fitting readjusted to remove the kink and the jam nut retightened. Re-torque the jam nut to 48–53 ft-lbs (65–72 N•m).*
5. If the air intake pipe fasteners were previously loosened to adjust the position of the pipe end at the compressor, the fasteners should be re-tightened as shown in Figure 16.
6. Re-install and torque to specification all remaining hardware previous removed to access/remove the old compressor.



Figure 16 – Air Intake Pipe Adjustments

7. Follow the Volvo®/Mack® service instruction manual to re-attach all the engine hardware previously removed to initiate the retrofit; fill the coolant system; reconnect the battery terminals; and perform leakage checks to ensure the compressor connection are properly attached and the compressor is functioning properly.

OPERATION & LEAKAGE TESTS

1. Start the engine and note that the air system steadily builds pressure.
2. With system air pressure increasing, check for cylinder head gasket air leakage. Apply a soap solution around the cylinder head. Check the gaskets between the cylinder head, cooling plate, and valve plate assembly for air leakage. No leakage is permitted. If leakage is detected, try torquing the head bolts again after draining all air pressure. Replace the compressor if replacing the head gasket has not resolved the leakage problem.
3. Allow air system pressure to build and note that the compressor unloads properly at the specified governor cut-out pressure. Repeat this test three times noting that the compressor unloads at approximately the same pressure each time. If the compressor fails to unload by at least 150 psi system pressure, check all air lines to and from the governor. Make certain each line is clear (unobstructed) and not kinked, or leaking. Repair or replace the governor as needed. If an unloader kit was also installed, recheck installation.
4. More complete compressor performance tests are provided in the *Bendix Service Data sheet SD-01-10142*. This publication is available online at bendix.com or by calling 1-800-247-2725, option 5.

