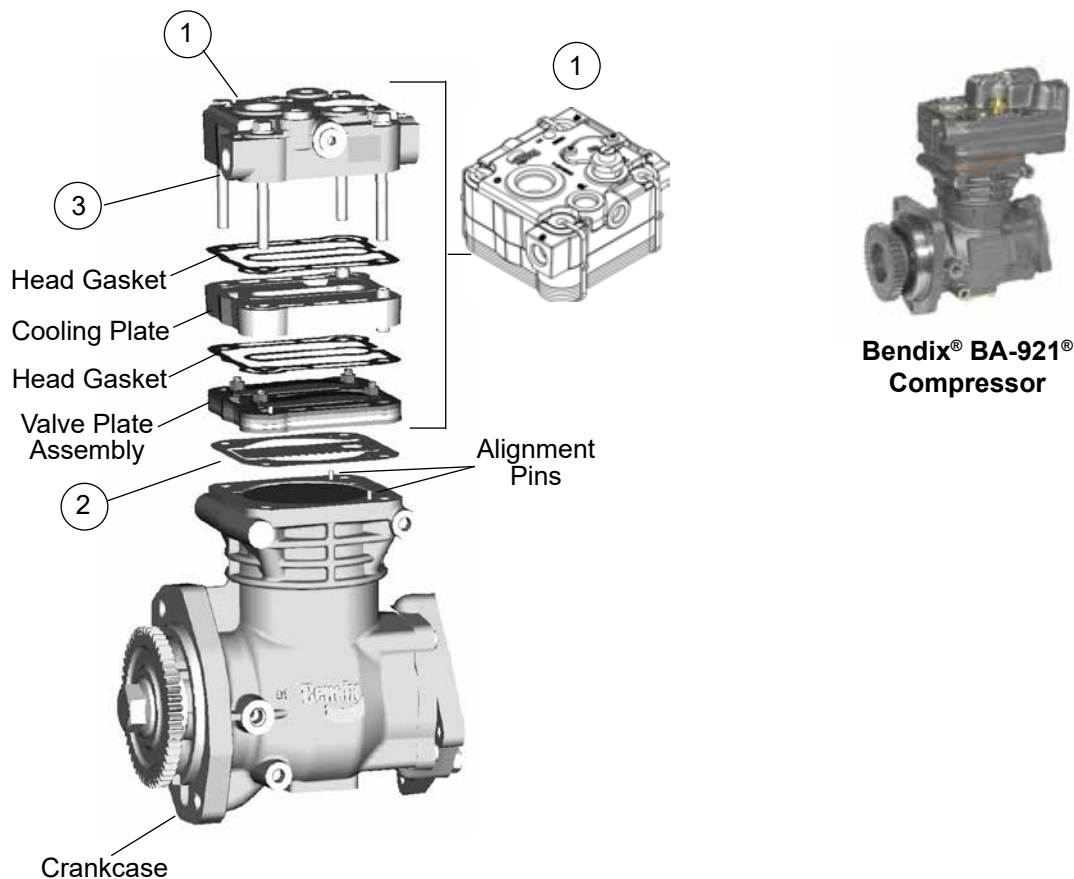


# Installation Instructions



## REPLACEMENT CYLINDER HEAD ASSEMBLY KIT FOR BENDIX® BA-921® COMPRESSORS



Kit Contents		
Key No.	Description	Qty.
1	Cylinder Head Assembly	1
2	Inlet Reed Valve / Gasket	1
3	Cylinder Head Bolts with Washers	4

Figure 1 – Bendix® BA-921® Compressor Cylinder Head Assembly Exploded View



## 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, a Bendix® AD-9si®, AD-HF®, or AD-HF®i 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.

Follow all general safety guidelines including, but not limited to, those found in this document. In many instances it may not be necessary to remove the compressor from the vehicle when installing the various maintenance kits and service parts. The maintenance technician must assess the installation and determine the correct course of action.

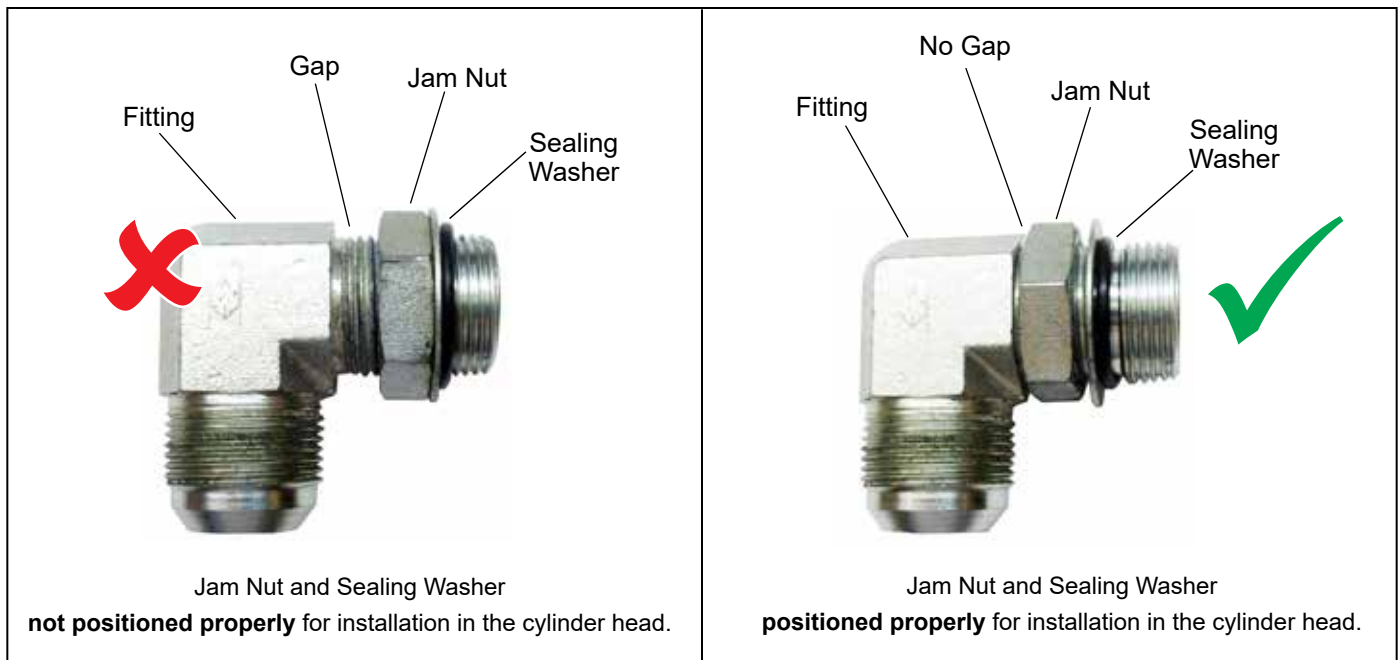
These instructions are general and are intended to be a guide. In some cases additional preparations and precautions are necessary. In all cases follow the instructions contained in the vehicle maintenance manual in lieu of the instructions, precautions, and procedures presented in this document.

## VEHICLE PREPARATION

1. Block the wheels of the vehicle and drain the air pressure from all the reservoirs in the system.
2. Remove road dirt and grease from the exterior of the compressor.
3. Drain the engine coolant system and the cylinder head of the compressor. Identify and disconnect all air hoses, water, and oil lines (if applicable) leading to the compressor.
4. Remove the discharge and inlet fittings, as applicable, and note their position on the compressor to aid in reassembly.
5. Similarly, remove any brackets supporting the compressor and note their positions on the compressor assembly.
6. If present, remove the governor, associated adapter, and bolts from the cylinder head and note their position on the compressor to aid in reassembly.

## REMOVAL OF EXISTING CYLINDER HEAD ASSEMBLY

1. Loosen the four hex head bolts and washers (3) in the cylinder head assembly (1), then gently tap the cylinder head, cooling plate, and valve plate assembly with a soft mallet to break the seal between the valve plate assembly and the crankcase deck.
2. Remove and discard the four cylinder head bolts and washers (3) from the cylinder head.
3. Lift the cylinder head, cooling plate, and valve plate assembly off the crankcase.
4. Inspect the crankcase to confirm that the metal inlet reed valve/gasket (2) has been removed. In cases where the inlet reed valve/gasket is still attached, carefully use a scraper (or similar tool) to separate the metal inlet reed valve/gasket (2) from the crankcase deck. Care must be taken not to damage the crankcase



**Figure 2 – Compressor Inlet Fitting**

surface. Be aware of the protruding alignment pins on the crankcase during removal. These pins will be used during installation to properly position the new metal inlet reed valve/gasket (2) and the new cylinder head assembly (1) on the crankcase of the compressor.

5. Use a cleaning solvent to clean the top of the crankcase deck.

**NOTE:** The piston bore must be kept free of debris. To avoid getting debris in the piston bore, cover the top of the crankcase with a clean shop rag until you are ready to install the new cylinder head assembly.

## INSTALLATION OF THE NEW CYLINDER HEAD ASSEMBLY

Before you begin, remove the tie wraps from the new cylinder head assembly (1) provided in the service kit. Also, inspect the piston bore to ensure it is free of any debris.

1. Install the new inlet reed valve/gasket (2) over the alignment pins on the crankcase.
2. Position the cylinder head assembly (1) onto the crankcase and inlet reed valve/gasket (2) such that protruding alignment pins on the crankcase fit into the corresponding holes on the valve plate assembly.
3. Install the four new cylinder head bolts with washers (3) and snug them down finger tight. Using a torque wrench, torque all four bolts to 265–292 in-lbs using a crossing pattern.
4. Follow steps under the heading “Returning the Vehicle to Service”.

## RETURNING THE VEHICLE TO SERVICE

1. Reinstall any brackets supporting the compressor in the same position as noted during their removal.
2. Inspect the inlet fitting for proper positioning of the jam nut and sealing washer and, if necessary, correct their position. Make certain that the threads are clean and the fittings are free of corrosion. Replace as necessary. Install the fitting in the cylinder head inlet port, positioning it in the proper orientation. Tighten the jam nut per the Torque Specification in this document.



If the jam nut is not properly positioned prior to installation, the thread engagement of the inlet fitting will be minimized. Normal road vibrations can cause this fitting to move back and forth resulting in extensive damage to the cylinder head inlet port.

3. Install the discharge and governor adapter fittings, if applicable, in the same position on the compressor as noted and marked during disassembly. Make certain that the threads are clean and the fittings are free of corrosion. Replace as necessary. *See the Torque Specifications in this document for the applicable torque required for the fitting size and thread.*
4. Inspect all air hoses, oil and coolant lines, and fittings before reconnecting them to the compressor and governor (if applicable). Make certain o-ring seals and hose clamps are in good condition.
5. Refill the engine cooling system.

6. Clean the oil supply line before connecting this line to the compressor. Run the engine briefly to ensure that oil is flowing freely through the supply line.
7. Before returning the vehicle to service, perform the "Operation and Leakage Tests" specified on the next page. Pay particular attention to all the lines reconnected during installation. Check for air, oil, and coolant leaks at the compressor connections, and also check for noisy operation. Repair or replace components as needed.

## OPERATION & LEAKAGE TESTS

1. Start the engine and confirm 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 re-torquing the head bolts after removing all air pressure. Replace the compressor if this does not resolve the leakage problem.
3. Allow air system pressure to build and confirm that the compressor unloads properly at the specified governor cut-out pressure. Repeat this test three times checking 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.
4. More complete compressor performance tests are provided in the Bendix Service Data Sheet.

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## TORQUE SPECIFICATIONS

### Assembly Torques in in-lbs.

M8x1.25-6g Cylinder Head.....	265–292 in-lbs (30–33 Nm)
M8x1.25-6g Governor Adapter .....	195–213 in-lbs (22–24 Nm)

### Inlet Port Fittings

#### 1-3/16"-12 UN-2B

Straight fitting.....	84–925 in-lbs (95–104 Nm)
Adjustable (w/jam nut) .....	597–655 in-lbs (67–74 Nm)

### Discharge Port Fittings

#### 7/8"-14 UNF-2B

Straight fitting .....	509–553 in-lbs (57–62 Nm)
Adjustable (w/jam nut) .....	354–389 in-lbs (40–44 Nm)

### Water Port Fittings

#### 3/4"-16 UNF-2B

Straight fitting.....	265–292 in-lbs (30–33 Nm)
Adjustable (w/jam nut) .....	248–274 in-lbs (28–31 Nm)

### Unloader Port Fittings

1/8"-27 NPT .....	2–3 TFFT <sup>1</sup>
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### Safety Valve Port

7/8"-14 UNF-2B .....	230–257 in-lbs (26–29 Nm)
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### Oil Port

7/16"-16 UNF .....	150–170 in-lbs (17–19 Nm)
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<sup>1</sup>NOTE: TFFT = Turns From Finger Tight



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