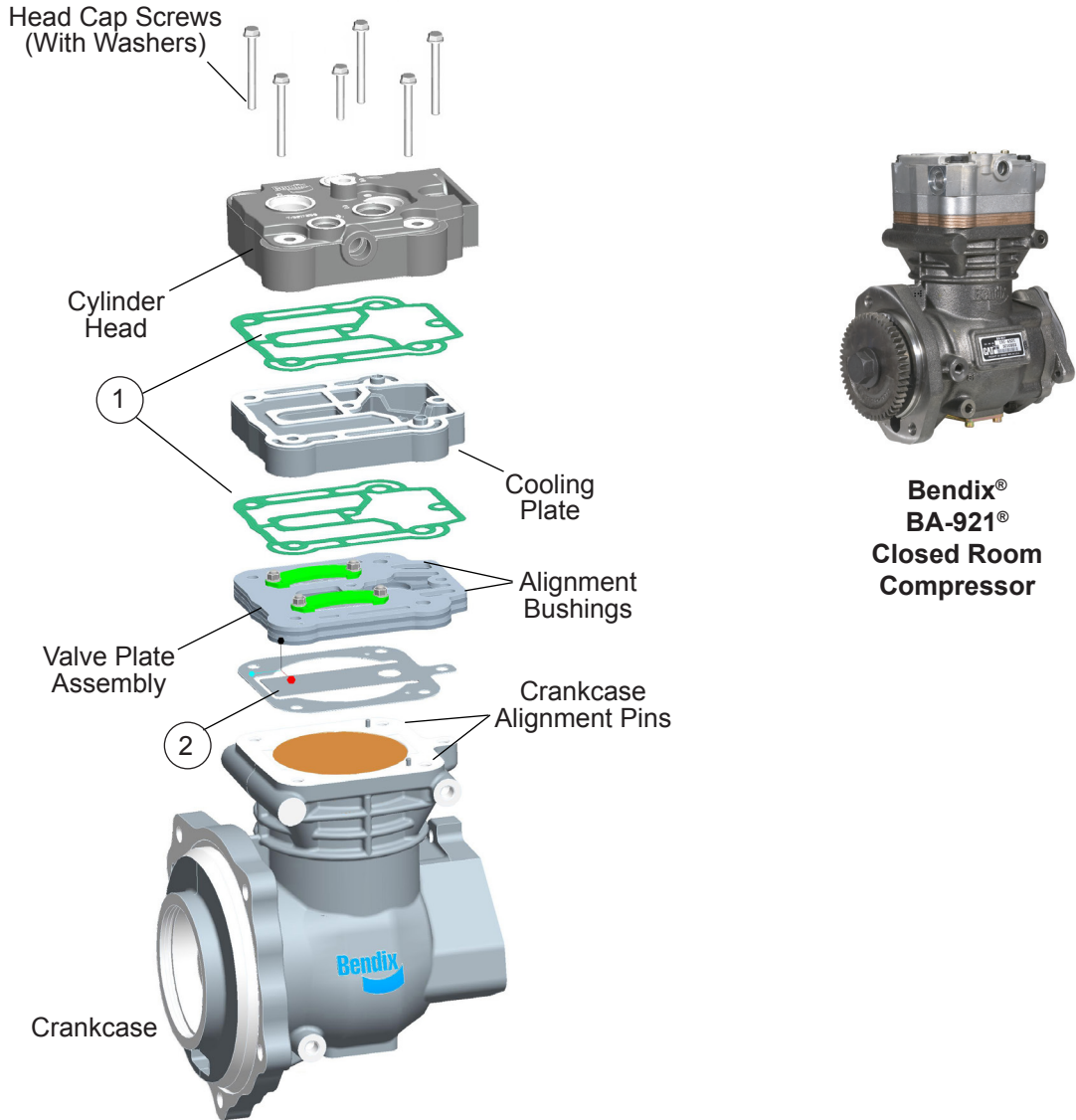


Installation Instructions



BENDIX® BA-921® HEAD GASKET REPLACEMENT KIT



Kit Contents		
Item No.	Description	Qty.
1	Head Gasket	2
2	Inlet Reed Valve/Gasket	1

Figure 1 – Bendix® BA-921® Closed Room Compressor 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, 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.
- ▲ You should consult the vehicle manufacturer's operating and service manuals, and any related literature, in conjunction with the Guidelines above.
- ▲ 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.

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 instruction sheet.

PREPARATION FOR DISASSEMBLY

Remove the balance of road dirt and grease from the exterior of the compressor with a cleaning solvent. If a rear end cover or end cover adapter is used on the compressor being worked on, mark it in relation to the crankcase. It is recommended, but not specifically necessary, to mark the relationships of the cylinder head, cooling plate, valve plate assembly, and crankcase.

A convenient method to indicate the above relationships is to use a metal scribe to mark the parts with numbers or lines. Do not use marking methods such as chalk that can be wiped off or obliterated during rebuilding.

Prior to disassembly make certain that the appropriate kits and/or replacement parts are available. Refer to *Figure 1* during the entire disassembly and assembly procedure.

CYLINDER HEAD

1. Remove the six hex head bolts from the cylinder head.
NOTE: The five hex bolts located towards the perimeter of the cylinder head retain the cylinder head directly to the crankcase. The single hex bolt in the center of the cylinder head holds the cylinder head, cooling plate, and valve plate assembly together; independent of the crankcase.
2. Gently tap the cylinder head, cooling plate, and valve plate assembly with a soft mallet to break the gasket seal between the valve plate assembly and the crankcase. Lift the cylinder head with cooling plate and valve plate assembly off the crankcase.
3. Remove and discard the metal inlet reed valve/gasket (2).
4. Gently tap the cylinder head, cooling plate, and valve plate assembly with a soft mallet to break the gasket seals. Then separate the cylinder head from the cooling plate and valve plate assembly and remove and discard the two gaskets (1) between them.

CLEANING OF PARTS

GENERAL

All parts should be cleaned in a good commercial grade of solvent and dried prior to inspection.

CYLINDER HEAD ASSEMBLY

1. Carefully remove all gasket material adhering to the cylinder head, cooling plate, valve plate assembly, and cast iron crankcase. Make certain not to scratch or mar the gasket surfaces. Pay particular attention to the gasket surfaces of the head.
2. Remove carbon deposits from the discharge and inlet cavities of the cylinder head, cooling plate, and valve plate assembly. They must be open and clear in both assemblies. Make certain not to damage the head.
3. Remove rust and scale from the cooling cavities and passages in the cylinder head, cooling plate, and valve plate assembly and use shop air to clear debris from the passages.
4. Check the threads in all cylinder head ports for galling (e.g. abrasion, chafing). Minor thread chasing (damage) is permitted.

INSPECTION OF PARTS

1. Carefully inspect the head gasket surfaces on the cylinder head for deep gouges and nicks. Also, inspect the cylinder head for any cracks or port thread damage. If detected, the compressor must be replaced. If large amounts of carbon build-up are present in the discharge cavity such that it restricts the air flow through the cylinder head, the compressor should be replaced.

2. Carefully inspect both sides of the head gasket surfaces on the cooling plate for deep gouges and nicks. Also, inspect the cooling plate for any cracks or other damage. If found, the compressor must be replaced.
3. Carefully inspect the valve plate assembly gasket surfaces (both sides) for deep gouges and nicks. Pay particular attention to the gasket surface. An inlet reed valve/gasket (2) is used between the valve plate assembly and crankcase. This gasket surface must be smooth and free of all but the most minor scratches. If excessive marring or gouging is detected, the compressor must be replaced. If large amounts of carbon build-up are present on the two main surfaces, in the two discharge valve holes or between the discharge valve and the discharge seat, the compressor should be replaced.

CRANKCASE

Check the cylinder head gasket surface on the deck (top) of the crankcase for nicks, gouges, and marring. A metal gasket is used to seal the cylinder head to the crankcase. This surface must be smooth and free of all but the most minor scratching. If excessive marring or gouging is detected, the compressor must be replaced.

ASSEMBLY

NOTE: All torques specified in this instruction sheet are assembly torques and typically can be expected to fall off after assembly is accomplished. Do not re-torque after initial assembly torques fall unless instructed otherwise. A compiled listing of torque specifications is presented on page 5.

IN-LBS TO FT-LBS

To convert in-lbs to ft-lbs of torque, divide in-lbs by 12.

Example: $\frac{12 \text{ in-lbs}}{12} = 1 \text{ ft-lb}$

FT-LBS TO IN-LBS

To convert ft-lbs to in-lbs of torque, multiply ft-lbs by 12.

Example: $1 \text{ ft-lb} \times 12 = 12 \text{ in-lbs}$

CYLINDER HEAD ASSEMBLY

PART ONE: HEAD INSTALLATION

1. Note the position of the protruding alignment pins on the deck (top) of the crankcase. Install the metal inlet reed valve/gasket (2) over the alignment pins on the crankcase.

2. Position the valve plate assembly on the crankcase so that the alignment pins in the crankcase fit into the corresponding holes in the valve plate assembly.
3. Position and install one of the embossed metal gaskets (1) over the alignment bushings protruding from the cooling plate. Position and install the second embossed metal gasket (1) over the alignment bushings on the opposite side of the cooling plate. When properly installed, the outline of the two embossed gaskets match the outline of the cooling plate.
4. Install the cooling plate onto the valve plate assembly by lining up the alignment bushings on the cooling plate over the oversized countersunk holes of the valve plate assembly. Again, when properly installed, the outline of the cooling plate matches the outline of the valve plate.
5. Position and install the cylinder head over the alignment bushings protruding from the cooling plate. When properly installed, the outline of the cylinder head assembly will match the outline of the cooling plate and valve plate assembly. *NOTE: The alignment bushings will only fit into two of the cylinder head bolt holes.*
6. Install the 6 hex head cylinder head bolts and washers and snug them (finger tight), then torque the bolts in the sequence specified in Figure 3.

LEAKAGE TESTS

NOTE: Leakage in the air supply system (components before the supply reservoir - such as the governor, air dryer, reservoir drain cocks, safety valve, and check valves) will not be registered on the vehicle dash gauges and must be tested separately. Refer to the various maintenance manuals for individual component leakage tests and the Bendix "Test and Checklist" published in the Air Brake System Handbook (BW5057) and on the back of the Dual Circuit Brake System Troubleshooting Card (BW1396).

TESTING THE REBUILT COMPRESSOR

In order to properly test a compressor under operating conditions, a test rack for correct mounting, cooling, lubricating, and driving the compressor is necessary. Such tests are not compulsory if the unit has been carefully rebuilt by an experienced person. A compressor efficiency or build-up test can be run which is not too difficult. An engine lubricated compressor must be connected to an oil supply line of at least 15 psi pressure during the test and an oil return line must be installed to keep the crankcase drained. Connect to the compressor discharge port, a reservoir with a volume of 1500 cubic inches, including the volume of the connecting line. With the compressor operating at 2100 RPM, the time required to raise the reservoir(s) pressure from 85 psi to 100 psi should not exceed 5 seconds. During this test, the compressor should be checked for gasket leakage and noisy operation, as well as unloader operation

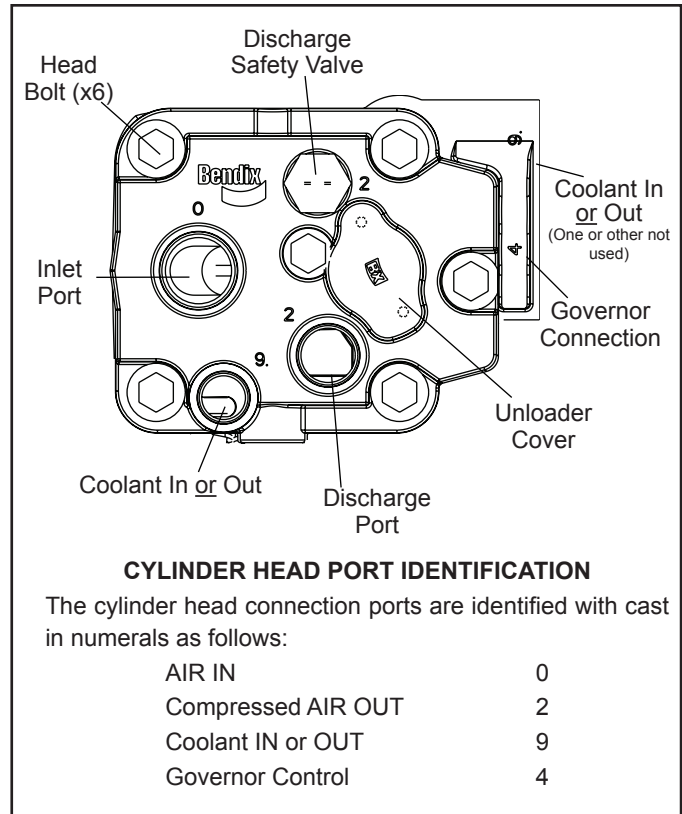


Figure 2 – Closed Room Bendix® BA-921® Compressor Cylinder Head

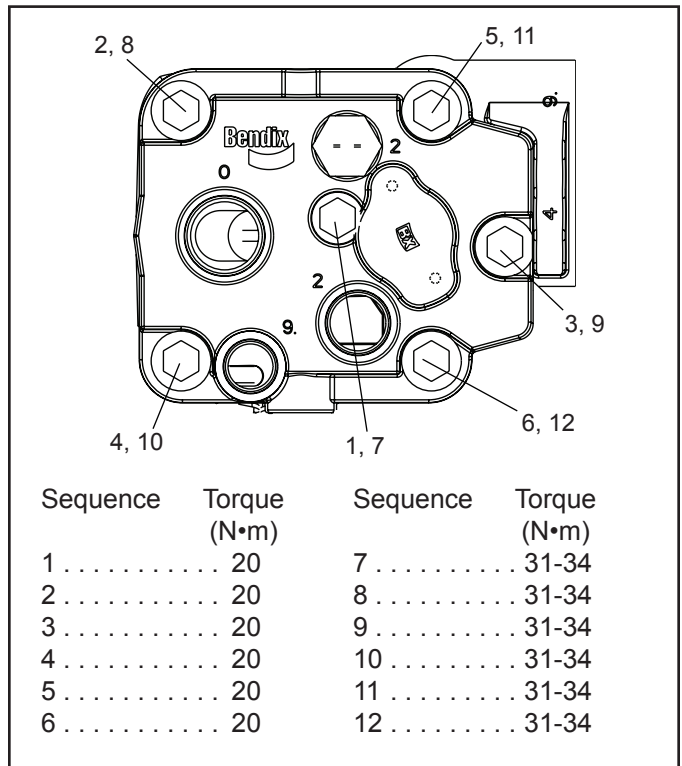


Figure 3 – Closed Room Compressor Head Bolt Torque Sequence

and leakage. If the compressor functions as indicated, reinstall on the vehicle connecting all lines as marked in the disassembly procedure.

CYLINDER HEAD

Check for cylinder head gasket air leakage.

1. With the engine running, lower air system pressure to 60 psi and apply a soap solution around the cylinder head. Check the gasket between the cylinder head and valve plate assembly and the inlet reed valve/gasket between the valve plate assembly and crankcase for air leakage.
2. No leakage is permitted. If leakage is detected, replace the compressor or repair the cylinder head using a genuine Bendix® maintenance kit available from an authorized Bendix parts outlet.

While it is possible to test for inlet, discharge, and unloader piston leakage, it may not be practical to do so. Inlet and discharge valve leakage can generally be detected by longer compressor build-up and recovery times. Compare current compressor build-up times with the last several recorded times. Make certain to test for air system leakage, as described under In Service Operating Tests, before making a determination that performance has been lost.

Unloader leakage is generally exhibited by excessive compressor cycling between the loaded and unloaded condition.

1. With service and supply system leakage below the maximum allowable limits and the vehicle parked, bring system pressure to governor cut-out and allow the engine to idle.
2. The compressor should remain unloaded for a minimum of 5-10 minutes. If compressor cycling occurs more frequently and service and supply system leakage is within tolerance, replace the compressor or repair the compressor unloader system using a genuine Bendix® maintenance kit available from an authorized Bendix parts outlet.

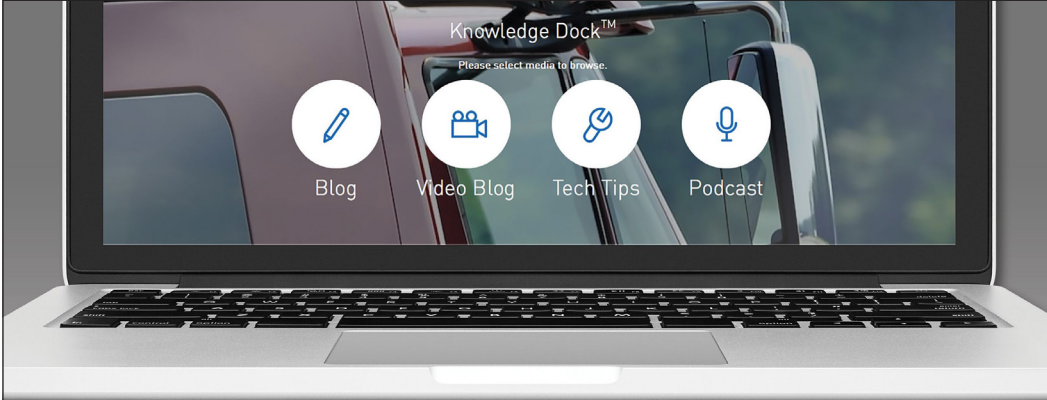
Bendix® BA-921® Closed Room Compressor

TORQUE SPECIFICATIONS


Assembly Torques in in-lbs

M8x1.25-6g Cylinder Head.....	270-305 (30.5-34.5 Nm)
M5x0.75-6g Unloader Cap	62-71 (7-8 Nm)
M8x1.25-6g Governor Adapter	195-213 (22-24 Nm)
M8x1.25-6g Rear End Cover.....	195-213 (22-24 Nm)
M6x1.00-6g Crankcase Cover	62-71 (7-8 Nm)
Inlet Port Fittings	
M27x2-6g. Inlet Port Fittings...	991-1089 (112-123 Nm)
Discharge Port Fittings	
M22x1.5-6H.....	814-912 (92-103 Nm)
Water Port Fittings	
M18x1.5-6H.....	593-637 (67-72 Nm)
Unloader Port Fittings	
1/8"-27 NPT.....	2 - 3 TFFT ¹
Safety Valve Port	
M16x1.5-6H.....	230-257 (26-29 Nm)

¹ Note: TFFT = Turns From Finger Tight



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