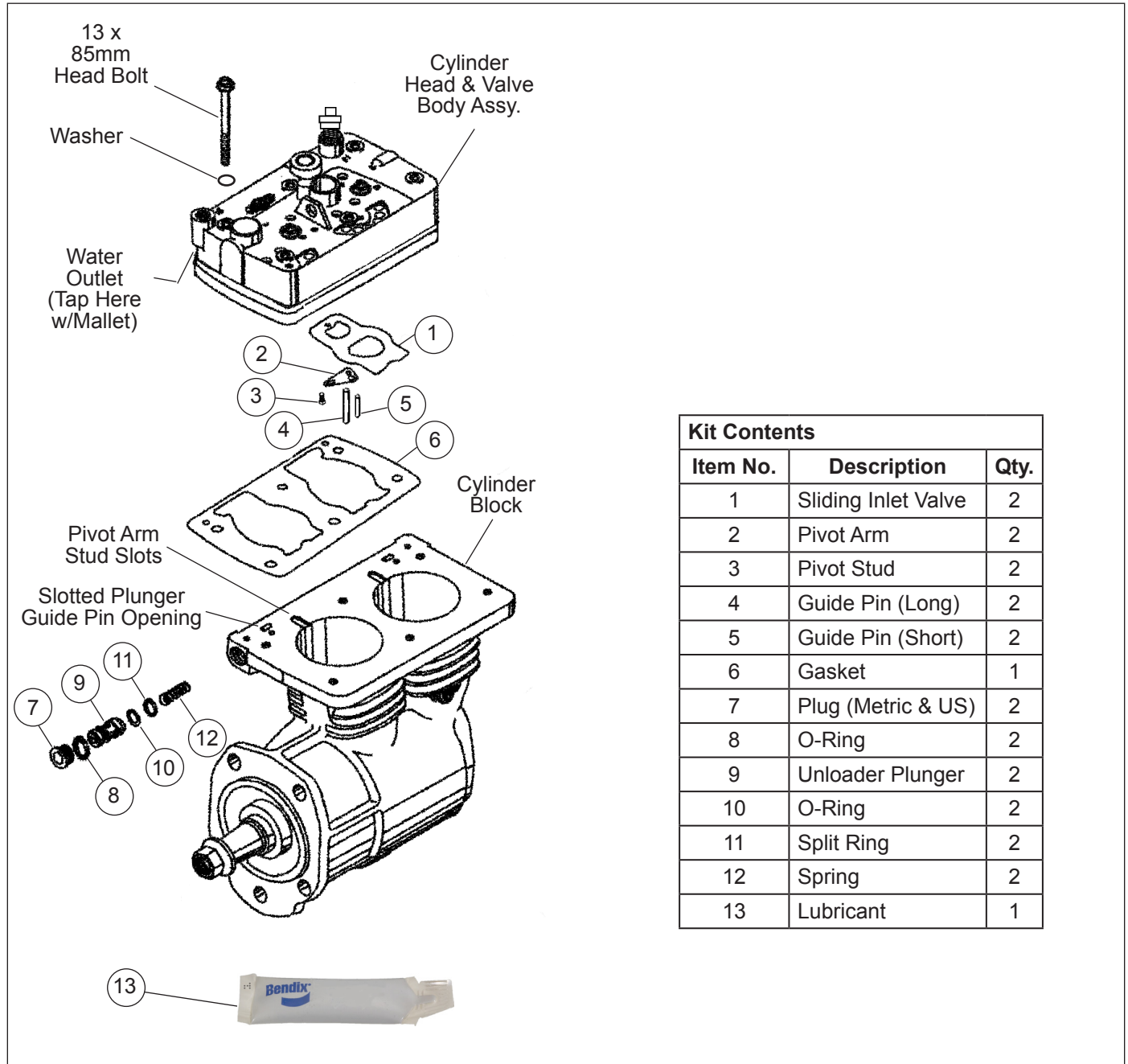


Installation Instructions



BENDIX® DURAFLO 596™ COMPRESSOR UNLOADER MAINTENANCE KIT



Kit Contents		
Item No.	Description	Qty.
1	Sliding Inlet Valve	2
2	Pivot Arm	2
3	Pivot Stud	2
4	Guide Pin (Long)	2
5	Guide Pin (Short)	2
6	Gasket	1
7	Plug (Metric & US)	2
8	O-Ring	2
9	Unloader Plunger	2
10	O-Ring	2
11	Split Ring	2
12	Spring	2
13	Lubricant	1

Figure 1 – Bendix® DuraFlo 596™ Unloader Maintenance Kit Contents

GENERAL

Depending upon the location of the compressor on the vehicle and ease of access, this kit may be installed without complete removal of the compressor. All kit components and their location in the head are shown in Figure 1 above.



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.

COMPRESSOR REMOVAL

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 here.

1. Block the wheels of the vehicle and drain the air pressure from all the reservoirs in the system.
2. Drain the engine cooling system and the cylinder head of the compressor. Identify and disconnect all air, water, and oil lines leading to the compressor.
3. Remove as much road dirt and grease from the exterior of the compressor as possible.

Note: If the compressor is not being removed, stop here and proceed to PREPARATION FOR DISASSEMBLY, if not, continue.

4. Remove any supporting bracketing attached to the compressor and note their positions on the compressor to aid in reassembly.
5. Remove the flange mounting bolts and remove the compressor from the vehicle.

PREPARATION FOR DISASSEMBLY

Remove the balance of road dirt and grease from the exterior of the compressor with a cleaning solvent. Before the compressor is disassembled, mark the items that are to be removed or disconnected to show their relationship when the compressor is assembled. Mark the relationship of the cylinder head to the valve body assembly.

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.

HEAD REMOVAL

1. Loosen, but do not remove, the six 13mm x 85mm head bolts around the circumference of the head.
2. **DO NOT REMOVE** the two 13mm x 60mm bolts at the center of the cylinder head.
3. Using a soft mallet, tap the head—under the water outlet port (See *Figure 1*) or the discharge fitting—to break the metal gasket seal between the cylinder head and valve body assembly and the cylinder block (metal gasket item 6).
4. Remove the six 13mm x 85mm bolts and washers and lift the cylinder head and valve body assembly off the cylinder block.
5. Remove and discard the metal gasket (6).

UNLOADER & INLET VALVE

1. Remove and discard the unloader port plug and sealing ring (7 & 8).

Note the thread type (DDC® compressors-Metric or CAT® compressors-US) to facilitate reassembly.

2. Remove and discard both sliding inlet valves (1).

Note: The sliding inlet valves may have “stuck” to the cylinder head.

3. Remove and discard both the pivot arms (2) and pivot arm studs (3).

4. To remove spring tension from the unloader plunger guide pin (4), insert a 1/4” brass dowel into one of the unloader plunger bore and depress the plunger (9) slightly. While holding the plunger (9) depressed, remove and discard the plunger guide pin (4). Slowly extract the dowel rod from the unloader bore until spring tension is relieved.

Note: As an alternative to this procedure an appropriately sized nut or dowel rod can be placed in the unloader bore and the plug (7) installed then removed after the guide pin is removed.

5. Remove and discard the unloader plunger (9), with its o-ring (10) and back-up ring (11) from the bore. Remove the unloader spring (12).
6. Repeat steps 4 and 5 for the other unloader plunger.

CLEANING AND INSPECTION OF PARTS

GENERAL

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

CYLINDER HEAD

1. Carefully remove all gasket material adhering to the cylinder head and valve body assembly. Make certain not to deeply scratch or mar the gasket surfaces.
2. Remove carbon deposits from the cylinder head and valve body assembly. Make certain the inlet and discharge ports of the valve body assembly are open and clear.
3. Remove rust and scale from the cooling cavities and passages in the head and valve body assembly and use shop air to clear debris from the passages.
4. Check the threads in all cylinder head ports for galling. Minor chasing is permitted.
5. Carefully inspect the cylinder head gasket (6) surfaces on the cylinder block and valve body assembly for deep gouges and nicks. If detected, the compressor must be replaced.

ASSEMBLY

General Note: All torques specified 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. Using the lubricant (13) provided in this kit, coat items (7) through (11) prior to installation.

UNLOADER PLUNGERS

1. Choose the appropriate unloader plug (7) either Metric (for DDC compressors) or US (for CAT compressors). Both are provided in the kit. Discard the unused plug. Install the sealing ring (8) on the plug (7) and set it aside.
2. Install one o-ring (10) and back-up ring (11) in the groove of the unloader plunger (9). The back-up ring (11) should be installed in the groove so that it is closest to the center of the plunger.
3. Install the unloader plunger return spring (12) in the bore in the end of the unloader plunger (9).
4. Insert the assembled plunger (9) and spring (12) into one of the unloader bores in the cylinder block. When inserting the plunger, orient it so that its guide pin hole will be visible through the slotted opening in the cylinder block.
5. Insert a 1/4” brass dowel into the unloader plunger bore and depress the plunger (9) slightly. While holding the plunger (9) depressed, insert the plunger guide pin (4) into the slotted opening in the cylinder block and into the unloader plunger until it is fully seated and extends above the top surface of the cylinder block approximately 1/8”. Slowly extract the dowel rod from the unloader bore until spring tension is relieved and the guide pin retains the plunger.

Note: The unloader plunger guide pin (4) is larger in diameter and longer than the pivot arm guide pin (5).

6. Repeat steps one through five for the other unloader plunger assembly.

INLET VALVES & PIVOT ARMS

1. Install both pivot arm guide pins (5) in the cylinder block.
2. Place the pivot arm studs (3) in their slots in the cylinder block. The head (large diameter) of the stud should be in the slot with the small diameter facing away from the cylinder block.
3. Install both pivot arms (2) over the pivot arm guide pin (5) and unloader plunger guide pin (4) as well as the stud (3). When installed correctly, the pivot stud (3) and unloader plunger guide pin (4) will be in the slotted openings of the pivot arm (2).

Note: It may be necessary to slightly depress each unloader plunger to allow easy installation of the pivot arms over the guide pins.

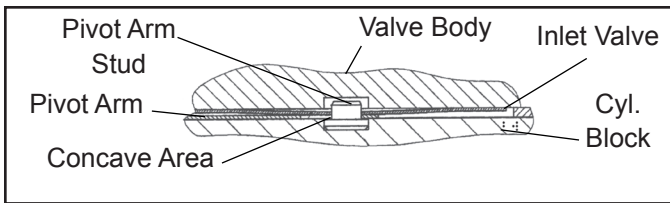


Figure 2 – Sliding Inlet Valve Installation

4. Locate one of the sliding inlet valves (1) and place it on a flat surface. Note that there is a concave and convex side in the surface where the small pivot arm stud hole is located. (See Figure 2).
5. Place the metal gasket (6) on the cylinder block, red side toward the cylinder block, while aligning the cylinder head bolt holes.
6. Install the sliding inlet valve (1) on the pivot arm stud, concave side toward the cylinder block. Make certain to center the inlet valves within their openings in the metal gasket (6).

Note: The inlet valves must not be pinched between the metal gasket and the cylinder block. They must be free to slide within their openings in the metal gasket.

VALVE BODY & CYLINDER HEAD

1. Orient, and carefully install, the cylinder head and valve body assembly on the cylinder block. The pivot arm guide pin (5) will locate and guide the installation.

Note: Try not to disturb the location of the metal gasket (6) during the installation of the valve body because the sliding inlet valves may be pinched.

2. Insert the six 13mm x 85mm head bolts into the head and tighten each finger tight.
3. Insert a 1/4" brass dowel into one of the unloader plunger bore and depress the unloader plunger (9) several times. The unloader plunger (9) should move freely with only spring tension resistance noted. If greater resistance is noted, the sliding inlet valve (1) is pinched and the cylinder head and valve body must be removed and the sliding inlet valve (1) must be repositioned within the opening of the metal gasket (6). Repeat this procedure for the other unloader plunger and sliding inlet valve.
4. Beginning with one of the center bolts, torque the six 13mm x 85mm head bolts to 265-292 in-lbs. using a figure eight pattern.
5. Apply a thread sealant to the assembled plug and sealing ring (7 & 8) and install it in the cylinder block unloader bore that was marked during disassembly. Tighten sufficiently to seal air pressure.

INSTALLING THE COMPRESSOR

1. Install any supporting bracketing on the compressor in the same position noted and marked during removal.
2. Install a gasket on the drive flange of the compressor. Make certain oil supply or return holes in the gasket are properly aligned with the compressor and engine. Gasket sealants are not recommended. Secure the compressor on the engine and tighten the mounting bolts.
3. Install the discharge and inlet fittings, if applicable, in the same position on the compressor noted and marked during disassembly. Make certain the threads are clean and the fittings are free of corrosion. Replace as necessary.
4. Inspect all air, oil, and coolant lines and fittings before reconnecting them to the compressor. Make certain o-ring seals are in good or new condition. Tighten all hose clamps.
5. Clean the oil supply line. Before connecting this line to the compressor, run the engine briefly to be sure oil is flowing freely through the supply line.
6. Before returning the vehicle to service, test all lines reconnected during installation and check for air, oil, and coolant leaks at compressor connections. Also check for noisy operation. Check the compressor for proper build-up and unloader operation.

TESTING REBUILT COMPRESSOR

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 20 seconds (with minimum required reservoir volume as specified in FMVSS 121). During this test, the compressor should be checked for gasket leakage and noisy operation, as well as unloader operation and leakage. If the compressor functions as indicated, reinstall on the vehicle connecting all lines as marked in the disassembly procedure.



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