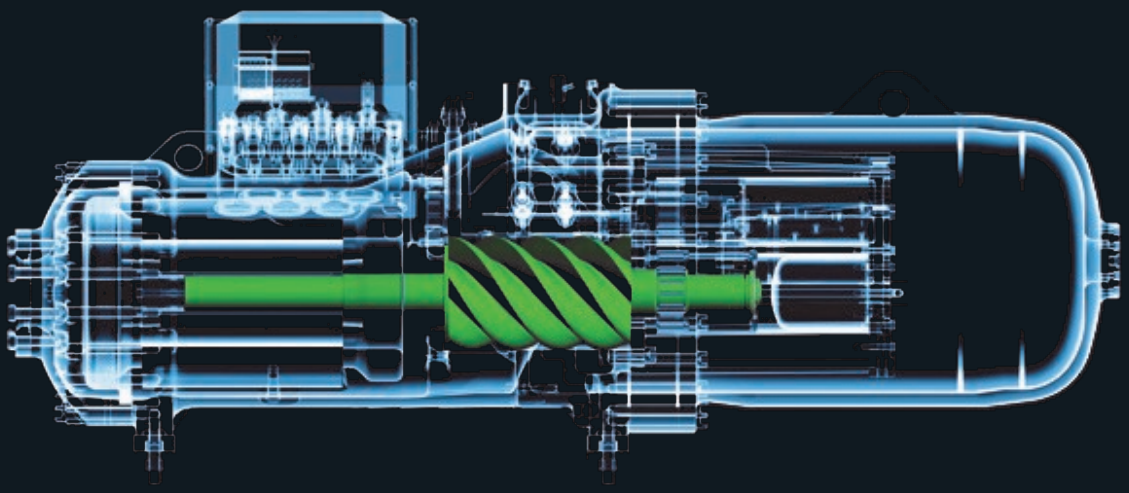
REPLACING DISCHARGE CHECK VALVES
FOR BITZER

SCREW COMPRESSORS



TB-0035

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Introduction

These guidelines are supplied as a recommended procedure for replacing the discharge check valve in the screw compressors.

NOTE	**IMPORTANT:** Each installation may be different and these guidelines are only a minimum recommendation specific to the compressor only.

1.1 Safety instructions

These guidelines are only supplied as accepted field guidelines. BITZER implies no liability to these and this is only a general field guideline and accepts no responsibilities for any current and/or future warranty considerations.
These guidelines are supplied as a recommended procedure for replacing the discharge check valve in the screw compressors.
These guidelines are not intended to replace the system expertise available from system manufacturers.

NOTE	**IMPORTANT:** Each installation may be different and these guidelines are only a minimum recommendation specific to the compressor only.

All standard basic refrigerant handling and practices must be followed.
All standard safety practices must be followed.
All standard electrical practices must be followed.
The system/compressor shall be tagged out electrically with second personnel responsibility checks required.
You are strongly advised to follow these safety instructions.

1.2 Icon Explanation

	**WARNING** This icon indicates instructions to avoid personal injury and material damage.		**CAUTION** This icon indicates instructions to avoid property damage and possible personal injury.
	**High Voltage** This icon indicates operations with a danger of electric shock.		**IMPORTANT** This icon indicates instructions to avoid malfunction of the compressor.
	**Danger of burning or frostbite** This icon indicates operations with a danger of burning or frostbite.	***NOTE***	This word indicates a recommendation for easier operation.
	**Explosion Hazard** This icon indicates operations with a danger of explosion.		

Introduction:

BITZER Screw compressors are supplied as standard with an internal discharge check valve located either under the service valve or behind the braze stub adapter (weld bushing).
The internal check valve operates when gravity and/or system pressure pushes down due to the pressure difference.
To protect against reverse running when the compressor is switched off, a check valve is incorporated in the discharge chamber. Screw compressors normally spin backwards for approximately 2 to 3 seconds. If the compressor spins backwards more than 5 seconds, it is highly recommended that the discharge check valve be inspected and/or replaced.

1. Although the compressor does not need to be removed, depending on the installation of the compressor, screw compressors can weigh in excess of 800 pounds depending on model. Use the correct rated lifting equipment when removing a compressor.
2. Safety glasses should be worn at all times.
3. Use caution when handling a compressor.

Please note: Each installation may be different and these guidelines are only a minimum recommendation specific to the compressor only.

	IMPORTANT
	• Successive compressor damage possible. • Refrigerating compressor oils can absorb large amounts of moisture. • Chemical reactions are possible with humidity and oxygen in the air. • Oil wetted metal surfaces can corrode quickly. • Do not leave compressors open for several hours (e.g. overnight). • Assembled compressors are to be evacuated immediately and charged with protective gas (dried nitrogen) or refrigerant (gaseous). • Do not reuse drained oil.

Instructions:

Your personal safety is the highest priority. This section provides the guidelines to correctly access the internal discharge check valve for inspection and/or replacement on the HS, OS and CS screw compressors.

HSN/HSK Low and Medium Temperature Compressors
Frame 1: HS/OS53
Frame 2: HS64
Frame 3: HS/OS74
Frame 4: HS/OS85

CS High Temperature Compressors
Frame 1: CS65.1 and CS65.3
Frame 2: CS75.1 and CS75.3
Frame 3: CS85
Frame 4: CS95

Recommended Tools:

- Gasket for re-assembly
- Dead blow hammer (rubber mallet)
- Breaker bar
- M10 to M18 socket
- Oil catch pan
- Rags
- Torque wrench
- Snap ring pliers

Never leave an open compressor unattended

Publications:

- SE-110 HS53-64-74 Spare Parts Guide
- SE-161 CSH65.3-CSW65
- SE-171 CSH75.3-CSW75
- SE-181 CSH85.3-CSW85
- SE-190 CSH95.1
- SE-191 CSH95.3
- SE-250 HS-OS85
- SE-500 OS 53-74
- SW-170 Tightening Torques for Screw Compressors
- TB-0020 Screw Compressor Bolt Torques

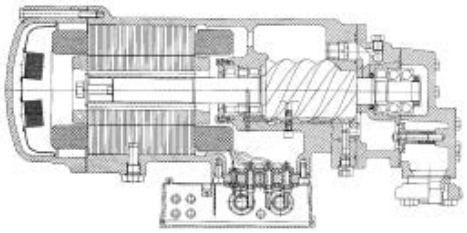
Use personal safety equipment. Safety goggles, gloves, protective clothing, safety boots and hard hats should be worn where necessary.

Preparing the Compressor for Dismantling

- All standard basic refrigerant handling and practices must be followed.
- All standard safety practices must be followed.
- All standard electrical practices must be followed.
- You are strongly advised to follow all safety instructions.
- Isolate all compressor connections and release pressure prior to opening the compressor.

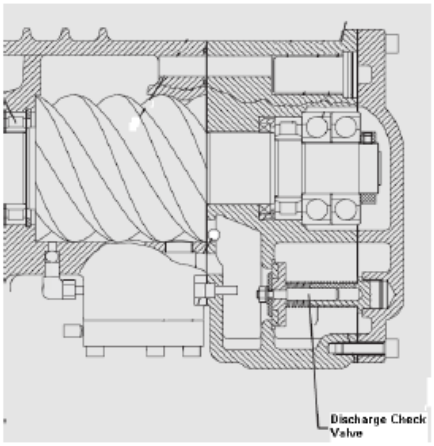
Removing the Discharge Flange Cover

Loosen evenly and remove the screws. Remove the cover. If the cover will not remove and/or is stuck, lightly tap the cover with a dead blow hammer.

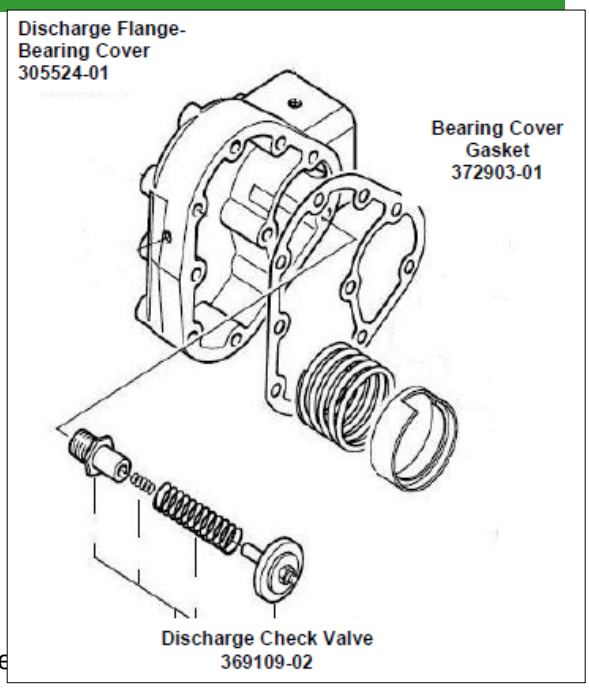


At this point, the bearings should be visible.
The discharge check valve is located in the flange / bearing cover.

Frame 1 (HS53) and Frame 3 (HS74) of the HSN/HSK screw compressor's discharge check valve is located in the discharge flange/bearing cover. The discharge check valve in Frame 2 (HS64) and Frame 4 (HS85) of the compressor can be accessed Without removing the discharge flange/bearing cover.



HSN/HSK/OS Frame 1:



Frame 1:
53 Series

Once the cover is off, the discharge check valve can be removed very easily.

Replace the old check valve with the new one.

If a new discharge flange/bearing cover is being used, The check valve will need to be screwed into place (sleeve).

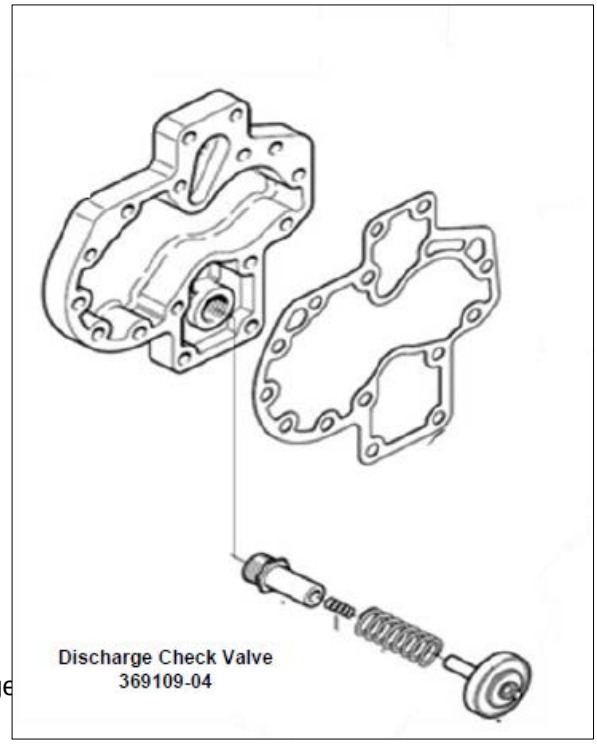
Clean all parts. Re-assemble in reverse order using a new gasket.

Torque Bolts as follows:

- M10 – 59ft/lbs M12 – 92 ft/lbs.
- M16 – 162 ft/lbs. M18 – 162 ft/lbs.

Refrigerant oils are highly hygroscopic and therefore absorb a large drained oil. Dispose of waste oil in an ecologically safe manner.

HSN/HSK/OS Frame 3:



Frame 3:
74 Series

Once the cover is off, the discharge check valve can be removed very easily.

Replace the old check valve with the new one.

If a new discharge flange/bearing cover is being used, The check valve will need to be screwed into place (sleeve).

Clean all parts. Re-assemble in reverse order using a new gasket.

Torque Bolts as follows:

- M10 – 59ft/lbs M12 – 92 ft/lbs.
- M16 – 162 ft/lbs. M18 – 162 ft/lbs.

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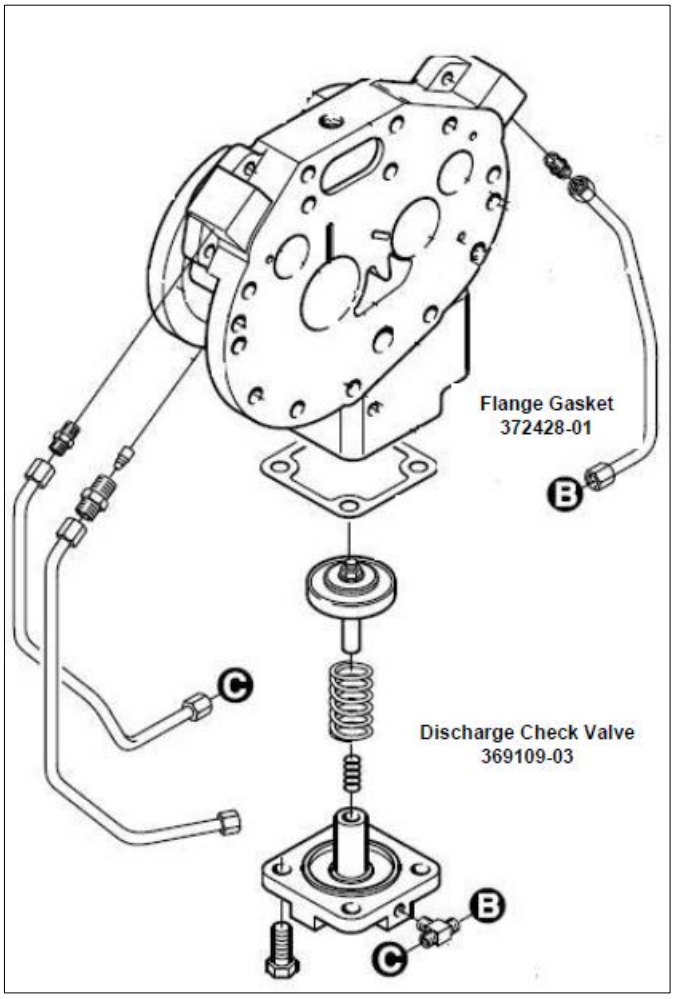
HSN/HSK Frame 2:

Frame 2:
64 Series



Frame 2 compressors do not require the Removal of the discharge flange/bearing cover to access the internal check valve.

Oil line “C” and “B” will need to be removed from the “T” fittings. Remove the cover and the check valve.

Replace the old check valve with the new one.

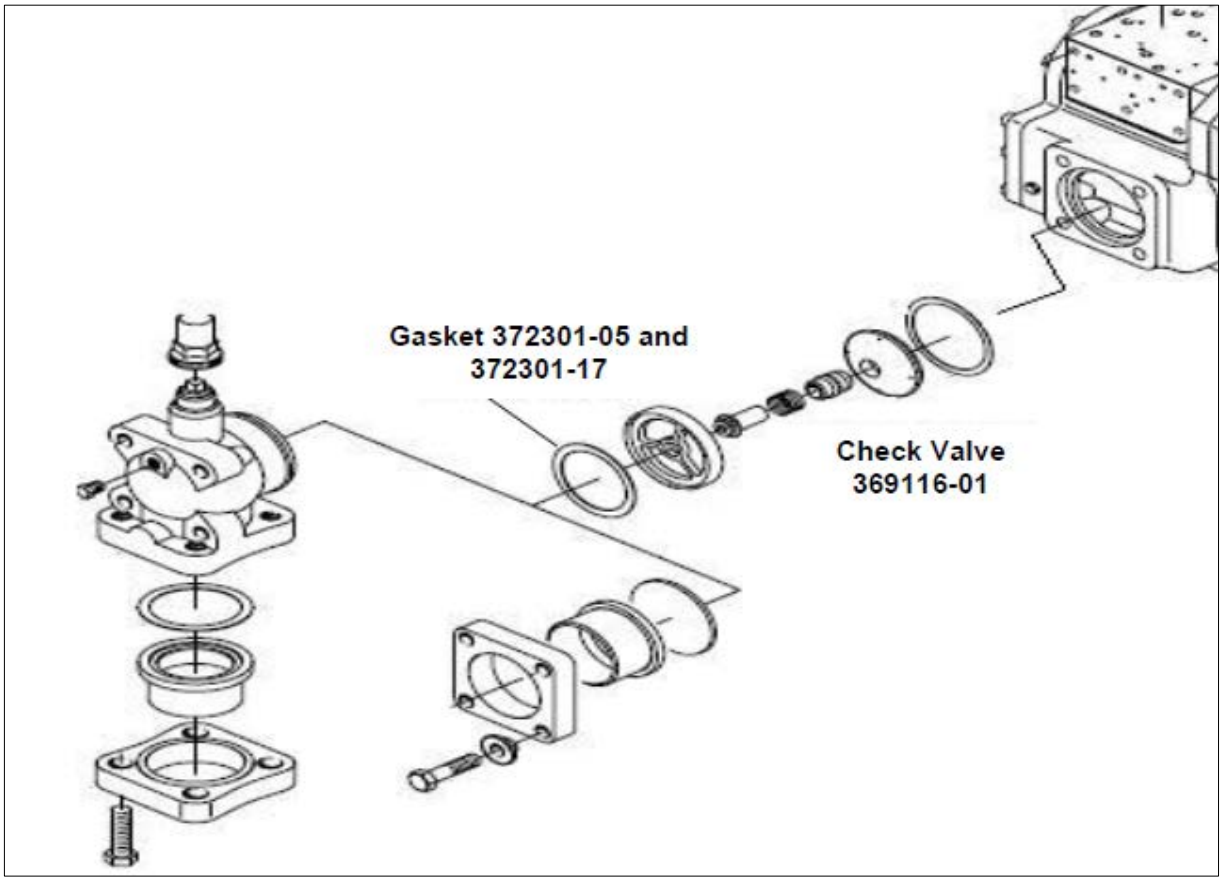
Torque Bolts as follows:

- M10 – 59ft/lbs M12 – 92 ft/lbs.
- M16 – 162 ft/lbs. M18 – 162 ft/lbs.

Refrigerant oils are highly hygroscopic and therefore absorb a large amount of moisture.
Do not reuse any drained oil.
Dispose of waste oil in an ecologically safe manner.

HSN/HSK/OS Frame 4:

Frame 4:
85 Series



Frame 4 compressors do not require the Removal of the discharge flange/bearing cover to access the internal check valve.

The discharge check valve can be accessed after removing the discharge service valve.

Replace the old check valve with the new one.

Clean all parts. Re-assemble in reverse order using a new circular gasket.

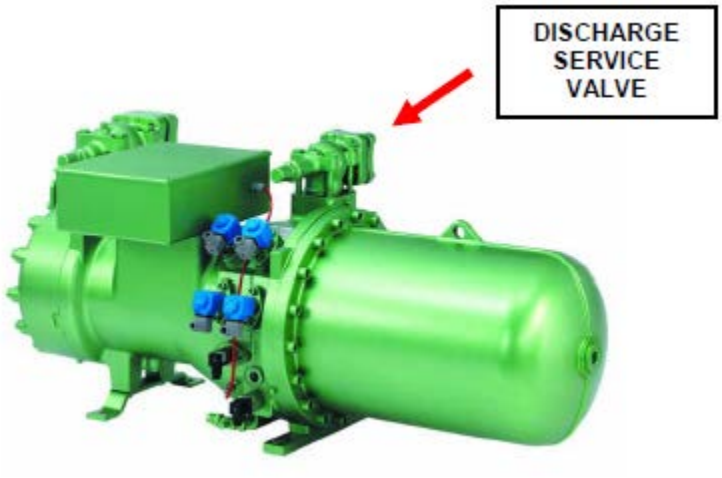
Torque the service valve bolts as follows:

- M18 – 162 ft/lbs.

Refrigerant oils are highly hygroscopic and therefore absorb a large amount of moisture. Do not reuse any drained oil. Dispose of waste oil in an ecologically safe manner.

CSH and CSW High Tem Screw Compressors:

The discharge check valves on the high temp series compressors are located under the discharge service valve.



CSH Frame 1:

Frame 1:
CSH65.1 Series
Part Number 369108-03

Frame 1 does not require the removal of the discharge flange/bearing cover in order to access the check valve.

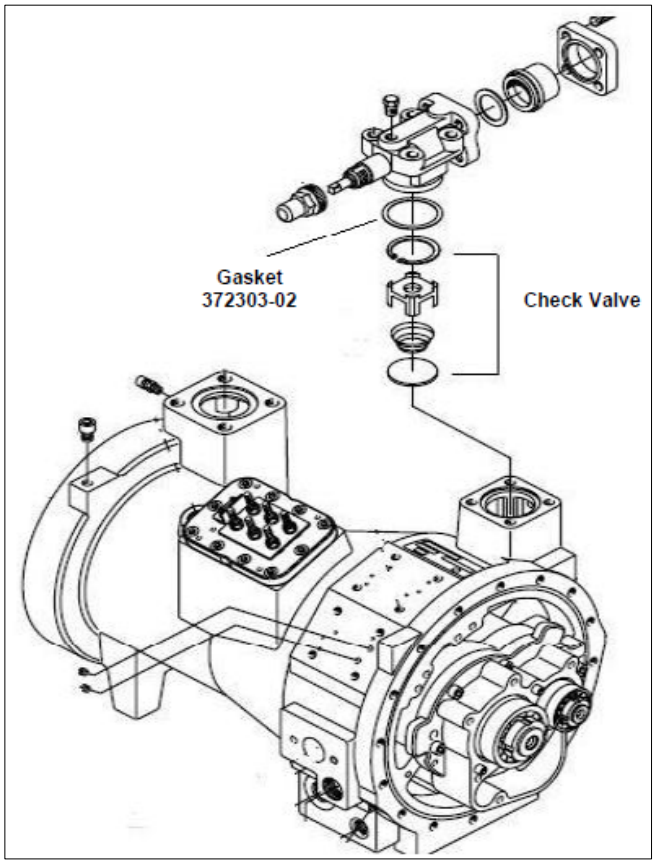
The discharge check valve can be accessed after the discharge service valve is removed.

Replace the old check valve with the new check valve.

Clean all parts. Reassemble in reverse order using a new gasket.

Torque bolts as follows:

- M10 – 59 ft/lbs.
- M12 – 92 ft/lbs.
- M16 – 162 ft/lbs.
- M18 – 162 ft/lbs



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Refrigerant compressor oils are highly hygroscopic and therefore absorb a large amount of moisture. Do not reuse drained oil. Dispose of waste and excess oil in an ecologically safe manner.

CSH/CSW Frame 1:

Frame 1:
CS65.3 Series
Part Number 369108-01

Frame 1 does not require the removal of the discharge flange/bearing cover in order to access the check valve.

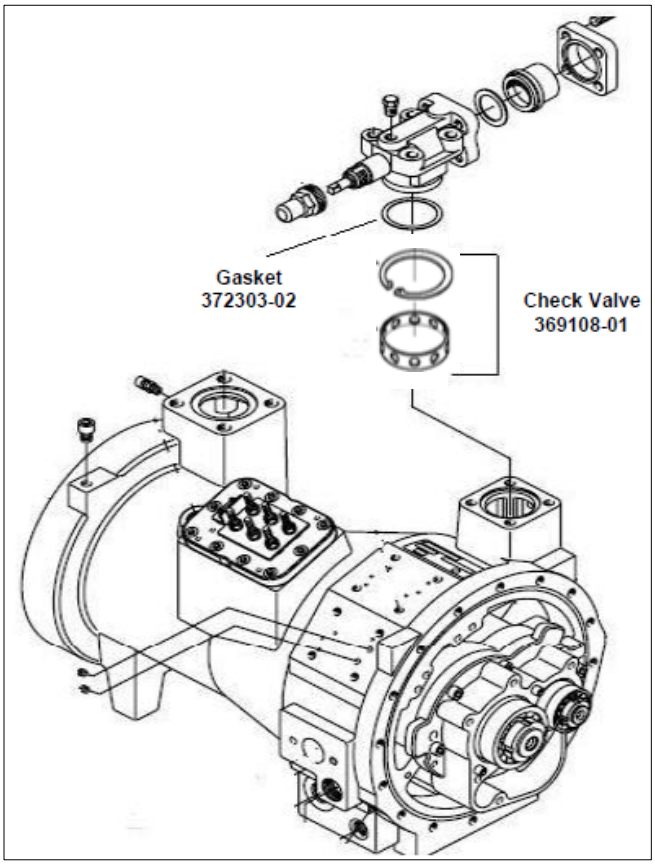
The discharge check valve can be accessed after the discharge service valve is removed.

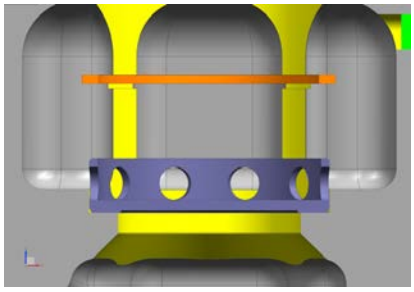
Replace the old check valve with the new check valve.

Clean all parts. Reassemble in reverse order using a new gasket.

Torque bolts as follows:

- M10 – 59 ft/lbs.
- M12 – 92 ft/lbs.
- M16 – 162 ft/lbs.
- M18 – 162 ft/lbs.





CSH Frame 2:

Frame 2:
CS75.1 Series
Part Number 369108-03

Frame 1 does not require the removal of the discharge flange/bearing cover in order to access the check valve.

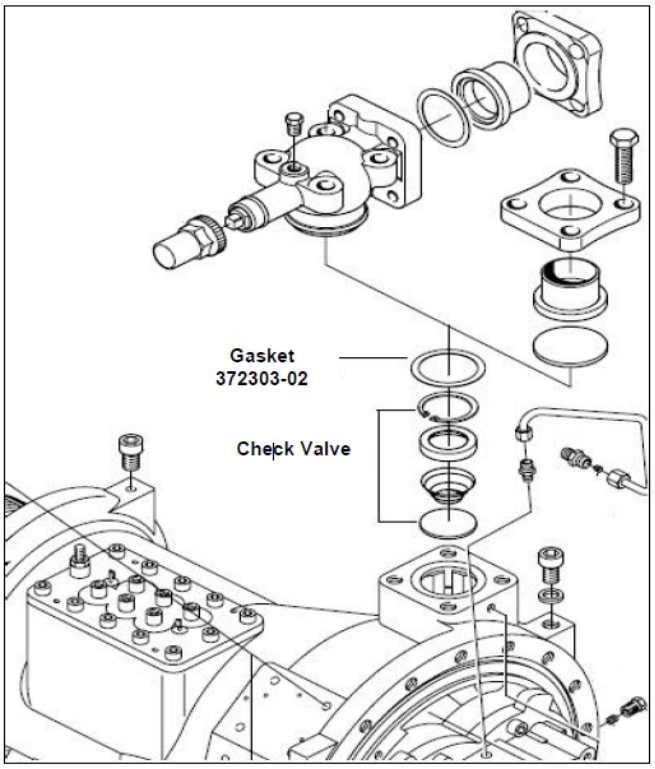
The discharge check valve can be accessed after the discharge service valve is removed.

Replace the old check valve with the new check valve.

Clean all parts. Reassemble in reverse order using a new gasket.

Torque bolts as follows:

- M10 – 59 ft/lbs.
- M12 – 92 ft/lbs.
- M16 – 162 ft/lbs.
- M18 – 162 ft/lbs.



CSH/CSW Frame 2:

Frame 2:
CS75.3 Series
Part Number 369108-01

Frame 1 does not require the removal of the discharge flange/bearing cover in order to access the check valve.

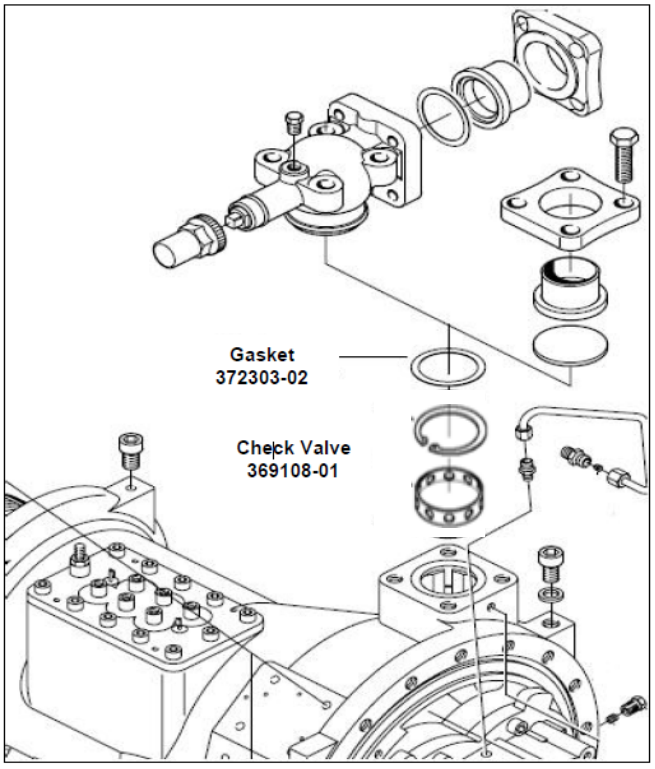
The discharge check valve can be accessed after the discharge service valve is removed.

Replace the old check valve with the new check valve.

Clean all parts. Reassemble in reverse order using a new gasket.

Torque bolts as follows:

- M10 – 59 ft/lbs.
- M12 – 92 ft/lbs.
- M16 – 162 ft/lbs.
- M18 – 162 ft/lbs.



Refrigerant compressor oils are highly hygroscopic and therefore absorb a large amount of moisture. Do not reuse drained oil. Dispose of waste and excess oil in an ecologically safe manner.

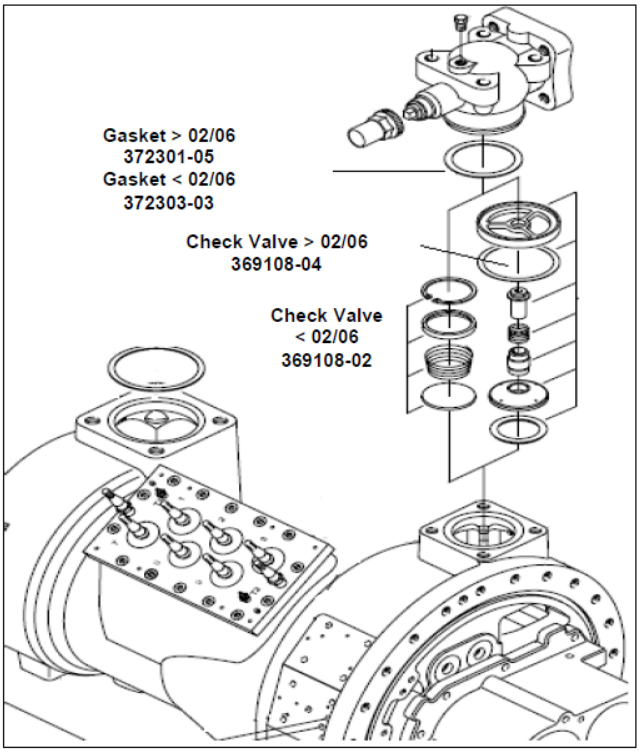
CSH/CSW Frame 3:

Frame 3:
CS85.1 and CS85.3 Series

Frame 3 does not require the removal of the discharge flange/bearing cover in order to access the check valve. The discharge check valve can be accessed after the discharge service valve is removed.
Replace the old check valve with the new check valve. Clean all parts. Reassemble in reverse order using a new gasket.

Torque bolts as follows:

- M10 – 59 ft/lbs.
- M12 – 92 ft/lbs.
- M16 – 162 ft/lbs.
- M18 – 162 ft/lbs.



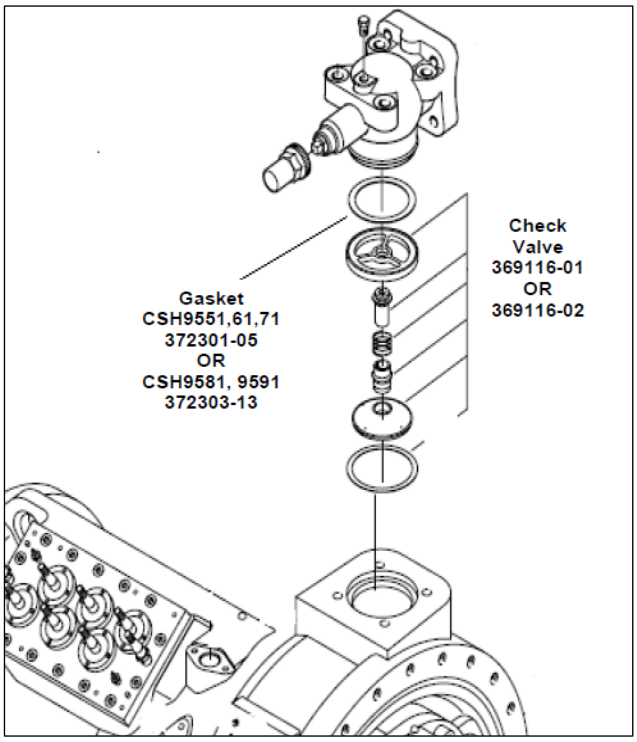
CSH/CSW Frame 4:

Frame 4:
CS95.1 and CS95.3 Series

Frame 3 does not require the removal of the discharge flange/bearing cover in order to access the check valve. The discharge check valve can be accessed after the discharge service valve is removed.
Replace the old check valve with the new check valve. Clean all parts. Reassemble in reverse order using a new gasket.

Torque bolts as follows:

- M10 – 59 ft/lbs.
- M12 – 92 ft/lbs.
- M16 – 162 ft/lbs.
- M18 – 162 ft/lbs.



Refrigerant compressor oils are highly hygroscopic and therefore absorb a large amount of moisture. Do not reuse drained oil. Dispose of waste and excess oil in an ecologically safe manner.

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