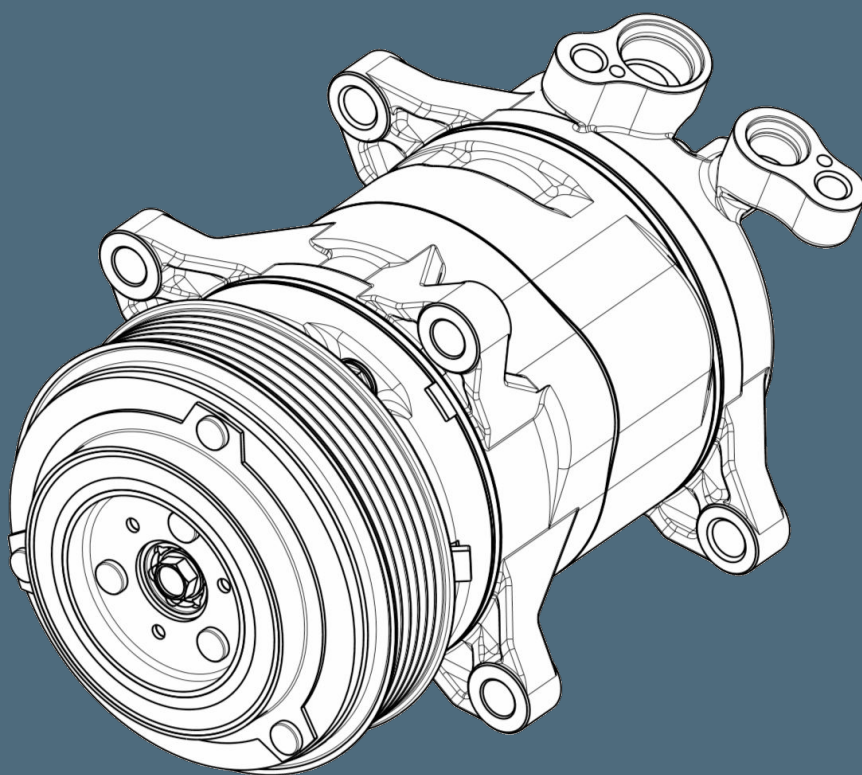


# SERVICE MANUAL

## Valeo TMX



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# Foreword

This service manual has been elaborated to help service personnel to provide efficient and correct service and maintenance on the **TMX** model compressor (for HFC-134a and HFO-1234yf) for commercial vehicles air conditioning. This manual includes the operation specifications, procedures for disassembly, reassembly and inspection of the compressor.

The contents of this manual, including illustrations, drawings and specifications were the latest available at the time of printing. Valeo reserves the right to make changes in specifications and procedures at any time without notice.

VALEO INC.

## WARNINGS

The following warning signs are used in this service manual. These are extremely important to ensure safe operation and to prevent body injuries and property damage. They must be fully understood before starting the air conditioner maintenance.

**WARNING!** Maintenance must be properly done to avoid serious injury risks.

**CAUTION!** Improper maintenance can result in injury or property damage.

## MEANING OF MARK

The following marks are used in this service manual to facilitate correct air conditioner maintenance.

**Advice** Procedures necessary to ensure the best air conditioner maintenance.

**Note** Information to optimize the air conditioner maintenance.

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# 1 - PRODUCT DESCRIPTION - COMPRESSOR

TECHNOLOGY	Heavy Duty Fixed Piston Swash Plate Type Compressor
DISPLACEMENT	156.7cc
NUMBER OF CYLINDERS	10 (5 double-headed pistons)
DIRECTION OF ROTATION	Clockwise
BORE	30.5 mm (1.2 in)
STROKE	21.4 mm (0.84 in)
SHAFT SEAL	Lip seal type
LUBRICATION SYSTEM	Splash lubrication
REFRIGERANT	R134a or R1234yf
OIL TYPE / AMOUNT *	VC100YF PAG OIL / 130 cm <sup>3</sup>
RATED VOLTAGE	12V DC

\* Customer can order Valeo service oil package → Part number: T428727  
(1 CASE = 6 x 250 cc can)

# 1 - PRODUCT DESCRIPTION - COMPRESSOR

## Compressor

- 1. The compressor must be operated within the green area shown on **Table 1**.
- 2. Inclination limit at installation The compressor must be installed on the vehicle within the range shown on **Table 2**.

Table 1

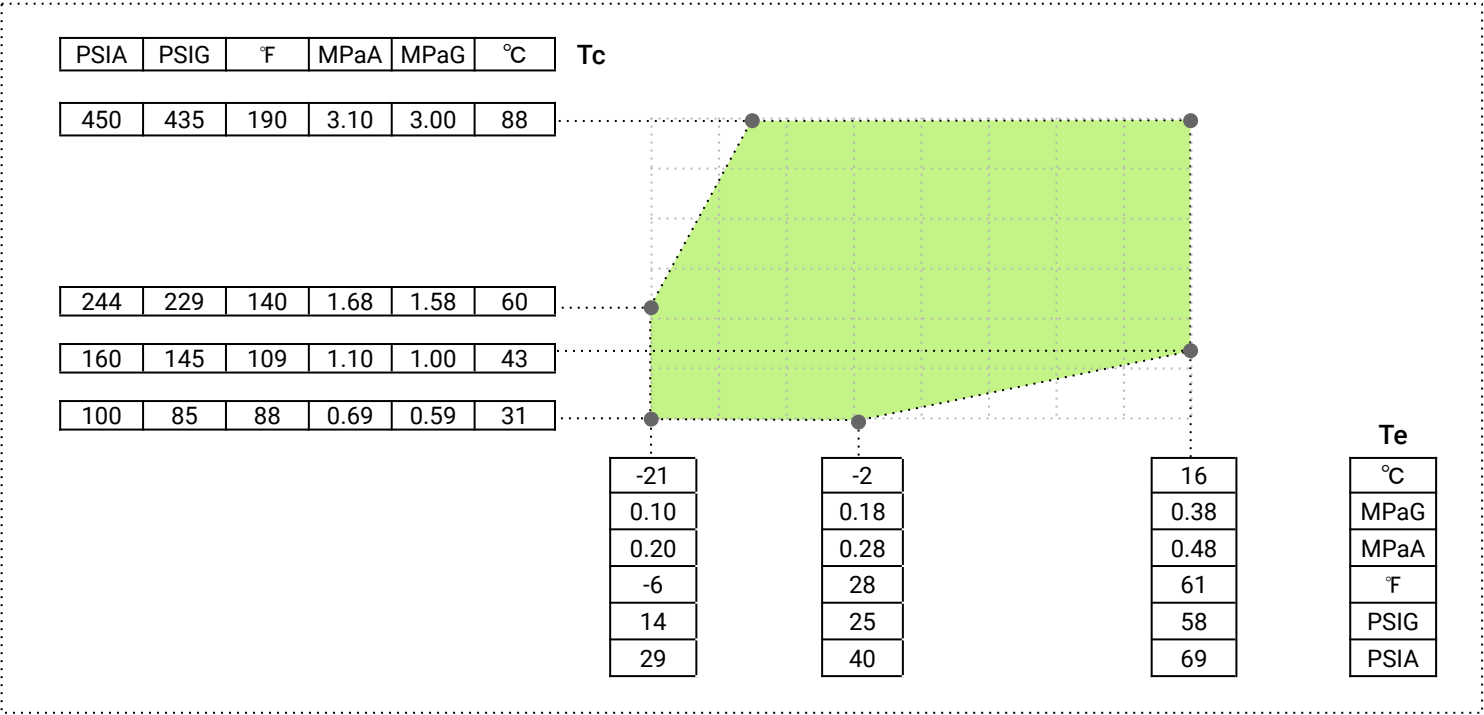
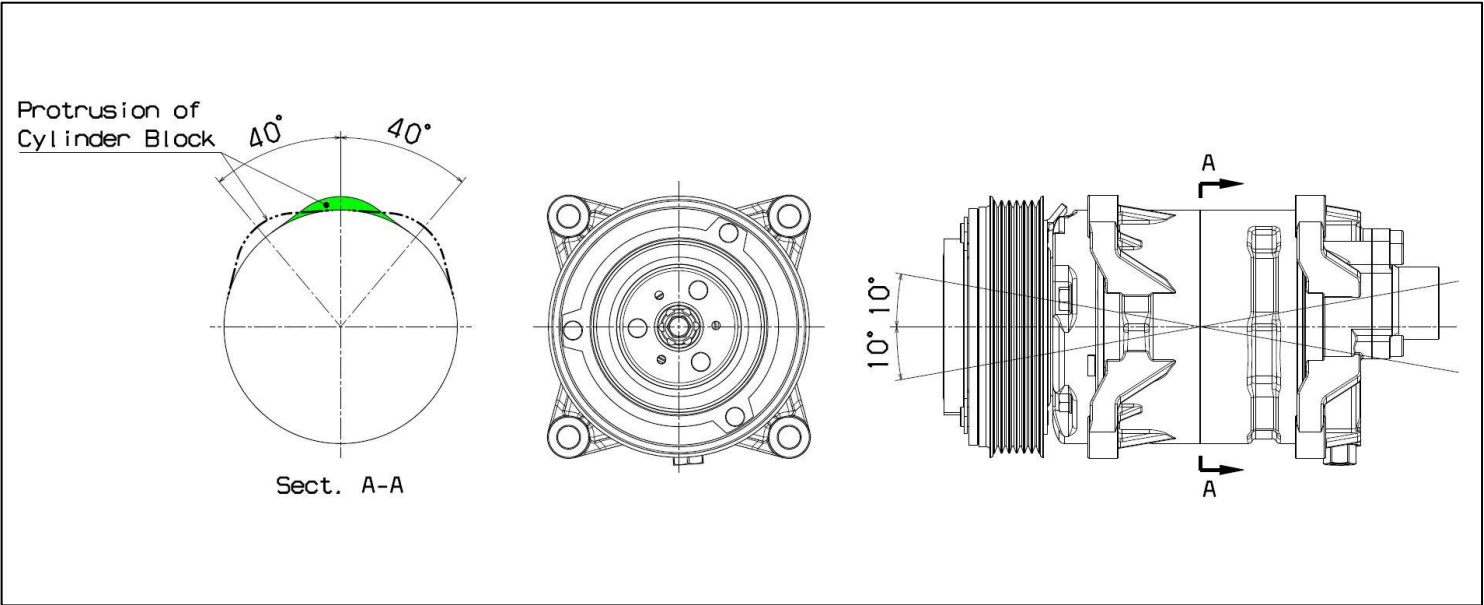


Table 2



# 1 - PRODUCT DESCRIPTION - PERFORMANCE

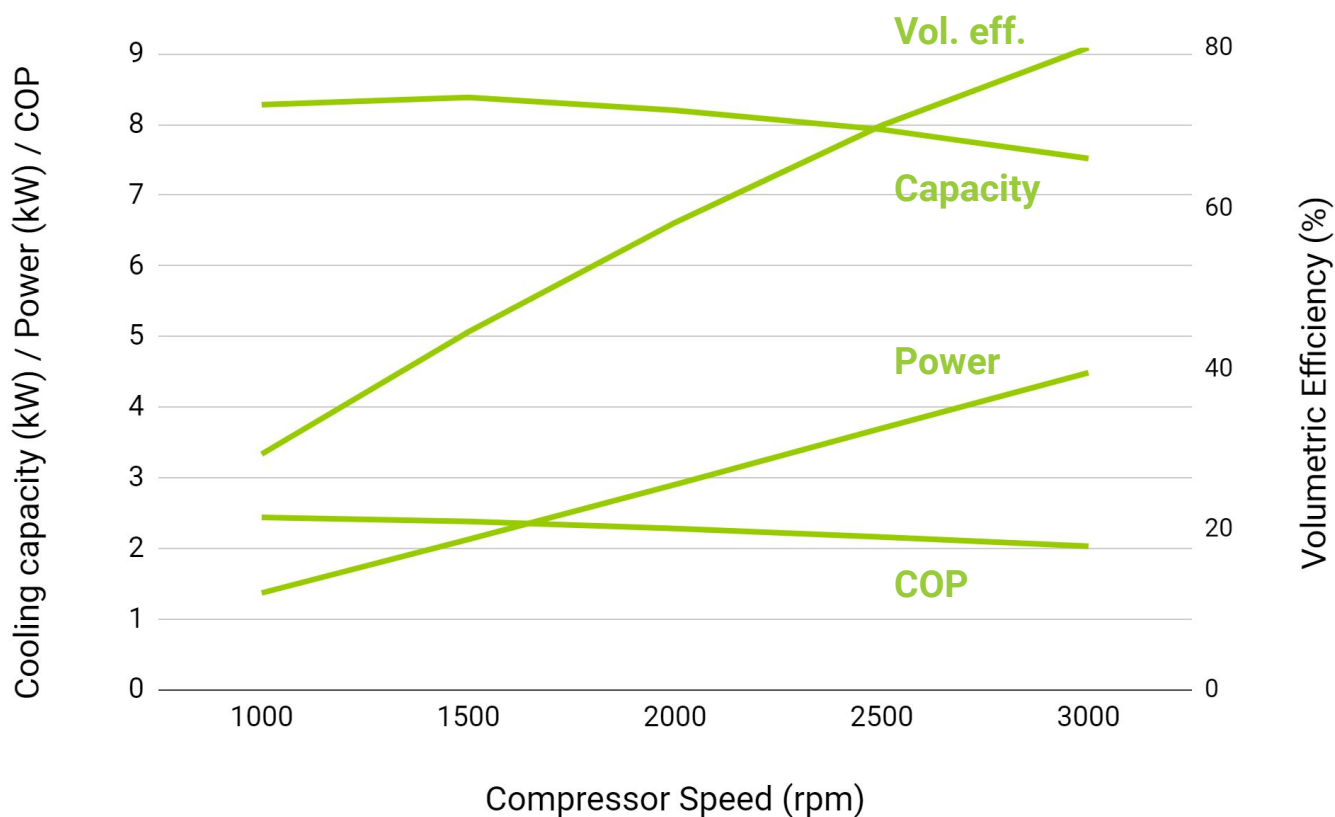
The performance data below were measured under the following conditions:

- Discharge Pressure:  $P_d = 1.52$  MPaG
- Suction Pressure:  $P_s = 0.18$  MPaG
- Subcooling temperature:  $SC = 5^\circ\text{C}$
- Super heat temperature:  $SH = 10^\circ\text{C}$

Valeo **TMX** performance data table (R134a) :

Nc (r/min)	1000	1500	2000	2500	3000
Vol. Eff. (%)	72.9	73.8	72.2	69.8	66.2
Capacity (kW)	3.3	5.1	6.6	8.0	9.1
Power (kW)	1.4	2.1	2.9	3.7	4.5
COP	2.4	2.4	2.3	2.2	2.0

Valeo **TMX** performance data graph (R134a) :

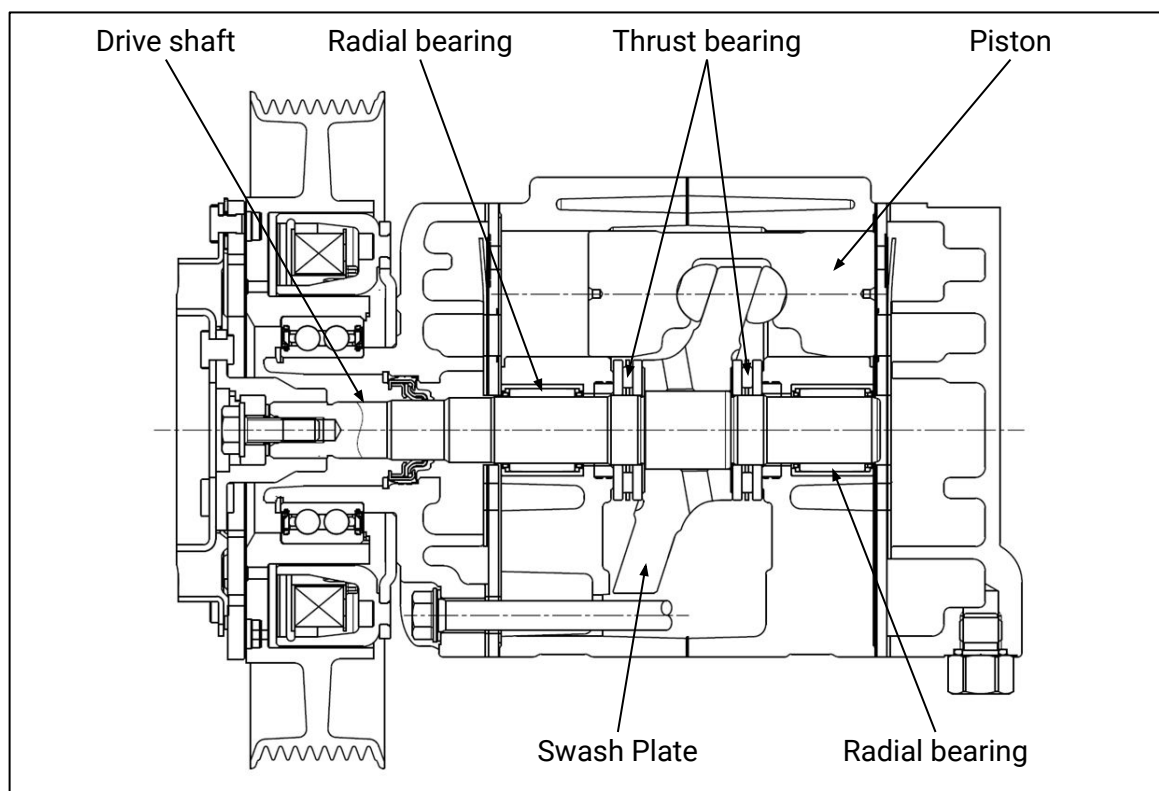


# 1 - PRODUCT DESCRIPTION - SWASH PLATE SYSTEM

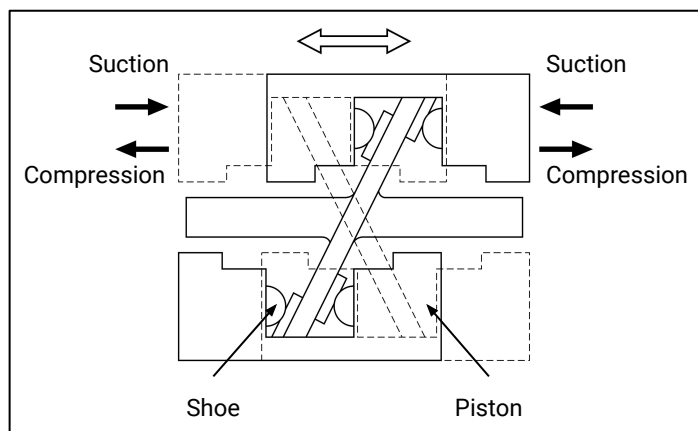
Valeo **TMX** is a 10 cylinders swash plate type compressors. The cylinders and pistons are arranged axially along the drive shaft. The pistons operate within the cylinders and are driven by a swash plate to perform suction, compression and discharge.

## Swash plate system

The drive shaft, which is driven by the engine through the magnetic clutch, is equipped with a swash plate. The drive shaft is supported by two radial bearings and two thrust bearings. The swash plate is rotated by the drive shaft, and moves the pistons back and forth.



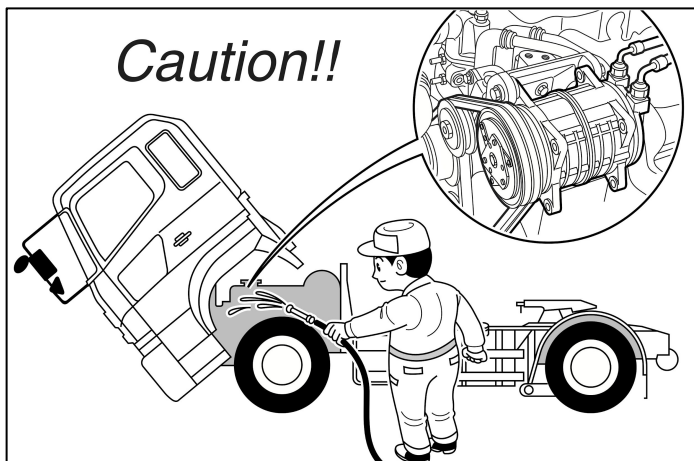
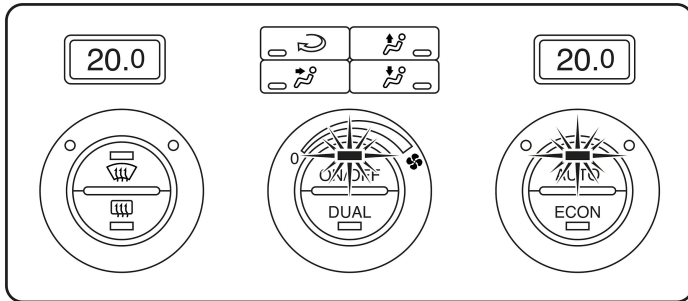
## Piston Drive System



The pistons in the cylinders are mounted on the swash plate through hemispherical shoes. Each piston has a compression head at each end. The rotation of the swash plate results in a reciprocating piston movement parallel to the drive shaft. The cylinders, which are arranged at 72° intervals around the drive shaft, are each divided into 2 chambers providing 5 front and 5 rear bores. As each piston performs suction and compression at either end, the compressor operates as a 10 cylinder compressor.

## 2 - OPERATION PRECAUTIONS

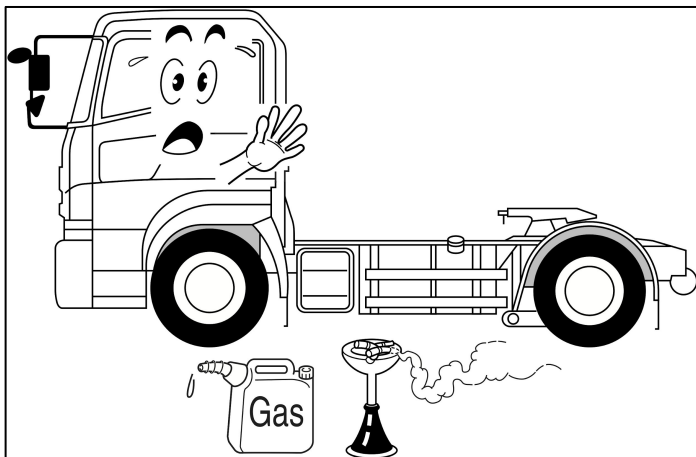
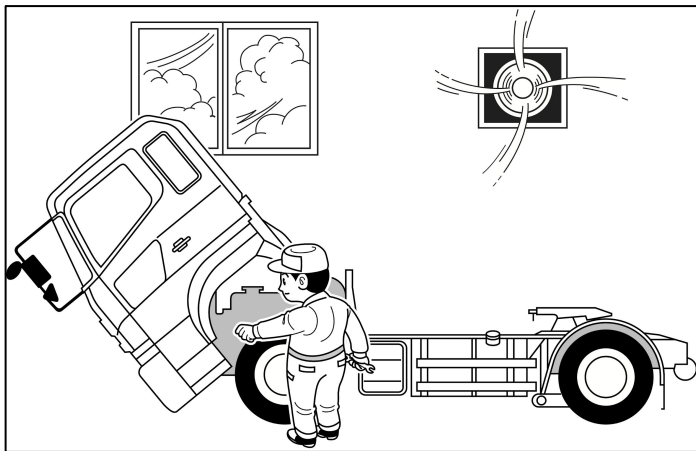
### Preventive Maintenance



1. During the off season of the air conditioner, operate the compressor for a few minutes once a week.
2. Do not drive through water. Water may damage the magnetic clutch, thus preventing normal operation
3. Do not allow a compressor that has not been used for a long period to become wet.
4. Always charge the A/C system with the specified quantity of refrigerant.
5. Keep the compressor clear of water projection while cleaning the vehicle



# 3 - HANDLING INSTRUCTIONS



## Maintenance precautions

### Working Area

As the components of air conditioners are particularly sensitive to moisture, dirt and rust, always observe the following:

- Work indoors whenever possible.
- Select a flat ground work area.
- Keep the work area clean.
- Select a work area with adequate ventilation.

### CAUTION!

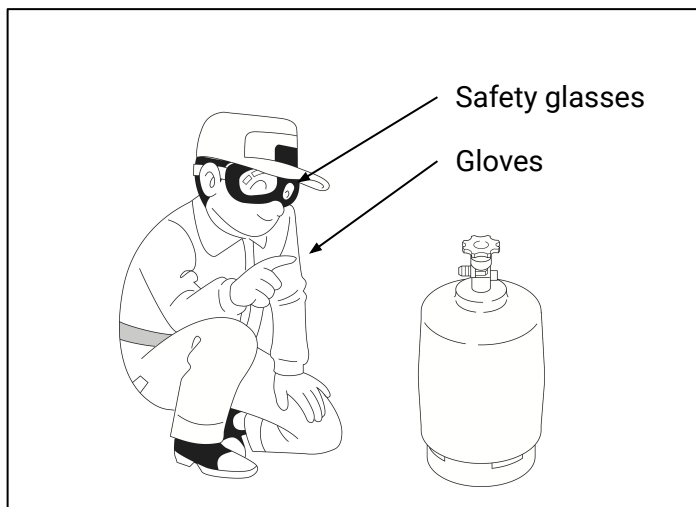
**Refrigerant itself is not harmful but excessive accumulation in a closed area can cause oxygen deficiency.**

- Keep open flame and inflammables away from the vehicle in which the air conditioner is being installed. (Fire is particularly dangerous during the gas leak inspection following installation).

### WARNING!

**Contact with flame and high temperatures can generate toxic gases.**

# 3 - HANDLING INSTRUCTIONS



## Refrigerant handling

### **WARNING!**

**Direct contact with refrigerant can cause frostbite or blindness.**

**Always wear safety glasses and protective gloves.**

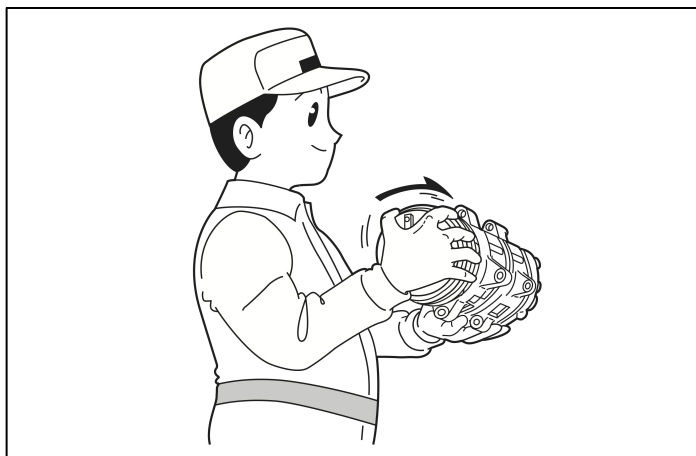
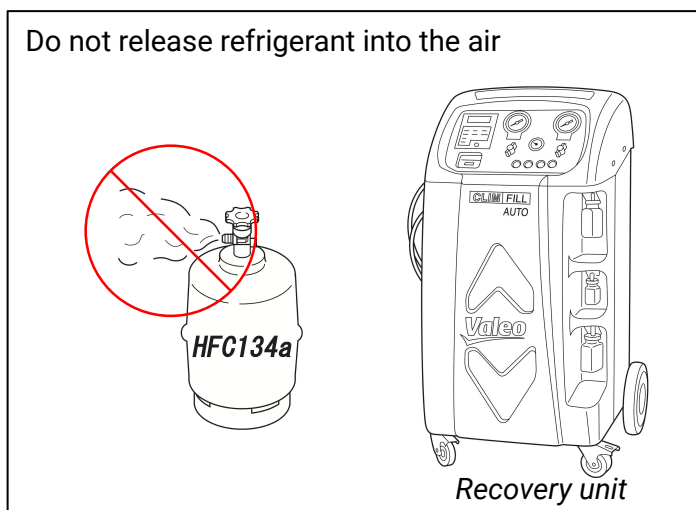
**Do not work with refrigerant close to your face.**

#### 1. Do not misidentify refrigerants

If an HFC-134a (or HFO-1234yf) air conditioning system is mistakenly charged with another refrigerant, serious problems such as compressor seizure may occur. Therefore, confirm before charging with refrigerant that the type of air conditioning system is an HFC-134a (or HFO-1234yf) system.

#### 2. Do not release refrigerant into the air

Although HFC-134a (or HFO-1234yf) is not subject to CFC regulations, it can have effect on global warming and so should not be released into the air. When removing refrigerant from the air conditioner system, always use a refrigerant recovery unit made especially for HFC-134a (or HFO-1234yf).



## Compressor handling

Do not strike or unnecessarily turn the compressor upside down. If the compressor is knocked over or turned upside down during handling or installation, rotate the armature plate 5 or 6 times by hand to circulate the oil. Otherwise, oil in the cylinder during compressor start-up will cause valve damage and reduce durability.

# 3 - HANDLING INSTRUCTIONS

## Compressor removal

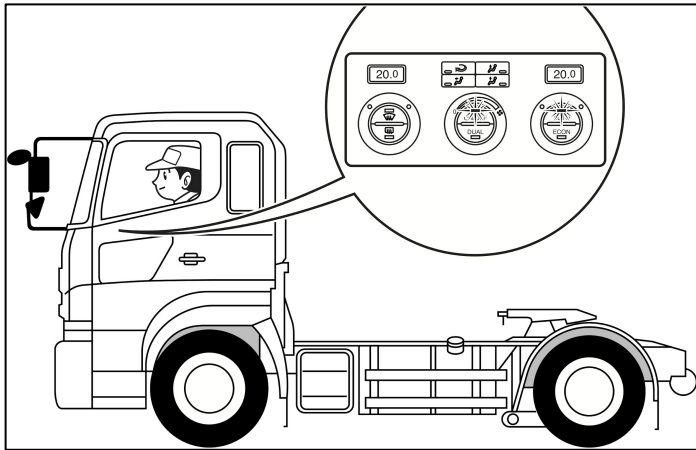
### When the compressor is operational

1. Perform the oil return operation (p.11).
2. Recover the refrigerant from the system using a refrigerant recovery unit.
3. Remove the compressor.
4. Drain the oil from the compressor and close all open connections immediately.
5. Check the oil quantity and the degree of contamination (p.12).

### When the compressor is not operational

1. Recover the refrigerant from the system using a refrigerant recovery unit if the shut-off valves are removed with the compressor.
2. Remove the compressor.
3. Drain the oil from the compressor and close all open connections immediately.
4. Check the oil quantity and the degree of contamination (p.12).

## Oil return operation



Compressor oil mixed with refrigerant is circulating in the air conditioning system. Perform the oil return operation to return this oil to the compressor before removing components from the system.

1. Open the doors and windows and operate the blower motor at maximum speed.
2. Operate the vehicle engine at idling at least 20 minutes.

**Note:** The maximum amount of oil cannot be recovered at higher speeds. This operation also requires a warm ambient temperature.

# 3 - HANDLING INSTRUCTIONS

## Oil quantity inspection

There is no particular need for frequent inspection or replacement of compressor, although it is recommended to check operating refrigerant pressure and oil level at the start of the season. Please replace the refrigerant and restore the system oil, refrigerant charge to factory specifications if:

- The AC system is opened for repair or replacement of any component (e.g. evaporator, condenser or receiver drier)
- Any loss of charge - refrigerant or oil - is detected.

## Handling precautions

1. The oil must be free from dust, metal filings, etc.
2. Do not mix oils.
3. The moisture content must not exceed 1,000 ppm.
4. The oil easily absorbs moisture when the container is open. Therefore always seal the container immediately after use.

## Oil contamination

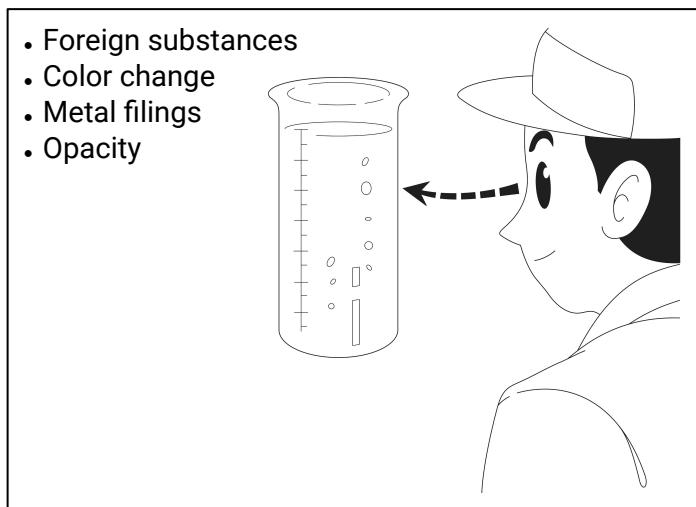
Unlike engine oil, no cleaning agent is added to the compressor oil. Even if the compressor is run for a long period (approximately 1 season), the oil never becomes turbid as long as there is nothing wrong with the compressor or its method of use. Inspect the extracted oil for any of the following.

- Increased opacity of the oil.
- Color change to red.
- Presence of foreign matter, metal filings, etc.

## Oil specification

Use only VC100YF PAG OIL

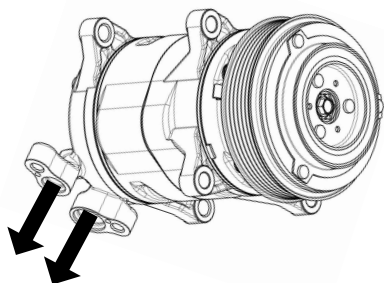
Customer can order Valeo service oil package  
→ Part number: T428727 (1 CASE = 6 x 250 cc can)



## WARNING!

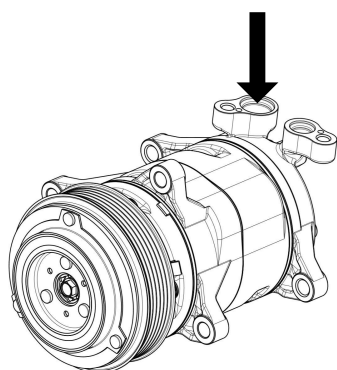
When system (oil) contamination is found during compressor replacement, flush the A/C system with a fluid that meets SAE J2670 and replace the dryer (or accumulator).

### 3 - HANDLING INSTRUCTIONS



Remove used oil from the discharge and suction ports

Fill the oil through the suction port



#### Oil check

The compressor oil must be checked and adjusted as follows when replace compressor or performance system service:

1. Perform the oil return operation (p.11).
2. Remove the old compressor from the vehicle.
3. Drain the oil through both suction and discharge ports. To drain maximum amount of oil, with both ports facing down, slowly position the compressor at different orientations, then rotate the compressor **armature plate** 3 ~ 5 turns. Repeat 2 ~ 3 times.
4. Check the oil for contamination.
5. Adjust the oil amount of the new replacement compressor per chart below. In case additional oil need to be added, fill oil through the suction port (see table below).

#### CAUTION!

The total amount of oil your air conditioning system requires is provided by the system designer or supplier.

Unit: cm<sup>3</sup> & cc

		Current compressor is kept		Compressor is replaced
	Factory oil charge	Amount recovered	Charging amount	Amount to remove from the new compressor
TMX	130	78 or more	Same as recovered	52
		Under 78	78	39

Unit: ounce

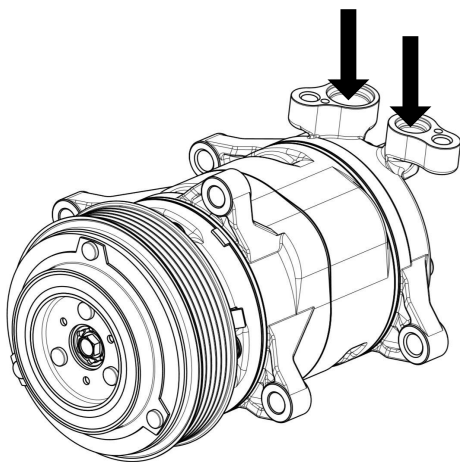
		Current compressor is kept		Compressor is replaced
	Factory oil charge	Amount recovered	Charging amount	Amount to remove from the new compressor
TMX	4.6	2.8 or more	Same as recovered	1.8
		Under 2.8	2.8	1.4

#### CAUTION!

All of the oil cannot be removed when draining the compressor as some remains as an oil film on the inside of the compressor and the system components. Therefore, refer to the table at left when recharging the compressor with oil. Excess oil adversely affects the cooling capacity and the compressor

## 3 - HANDLING INSTRUCTIONS

Connect the flexible hoses to suction and discharge port



### CAUTION!

**While the compressor is being run-in in step 3 above, check the outside temperature of the front head. If the temperature exceeds 80°C (176°F), stop the running-in operation. Resume the operation when the head has cooled.**

### Running-in operation

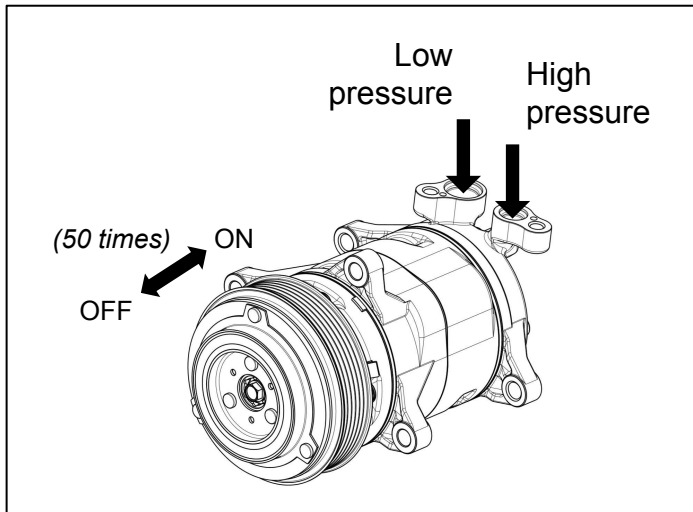
Whenever moving parts have been replaced, it is necessary to run-in both the compressor and the magnetic clutch.

#### Compressor running-in

Reassembled compressors must be run-in after the leak test (p.15).

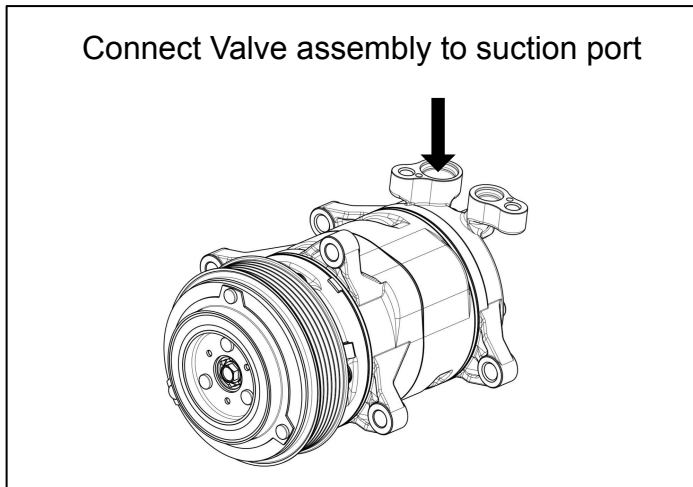
1. Check that the compressor contains the specified amount of oil (p.13).
2. Interconnect the suction fitting and the discharge fitting with the flexible hose.
3. Connect the two connector ports using a flexible hose
4. Run the compressor at 500r/min for 30 minutes to 60 minutes. This operation may be performed by an electric motor or the engine of an automobile.
5. Replace the oil.
6. Repeat the leak test.

# 3 - HANDLING INSTRUCTIONS



## Magnetic clutch running-in

1. Install the clutch on the compressor.
2. Install the compressor on the test bench, and operate the compressor by running the system.
3. Maintain the compressor speed at 500 rpm. Operate the A/C switch through the ON/OFF cycle at least 50 times ("ON" for 10 seconds and "OFF" for 10 seconds)

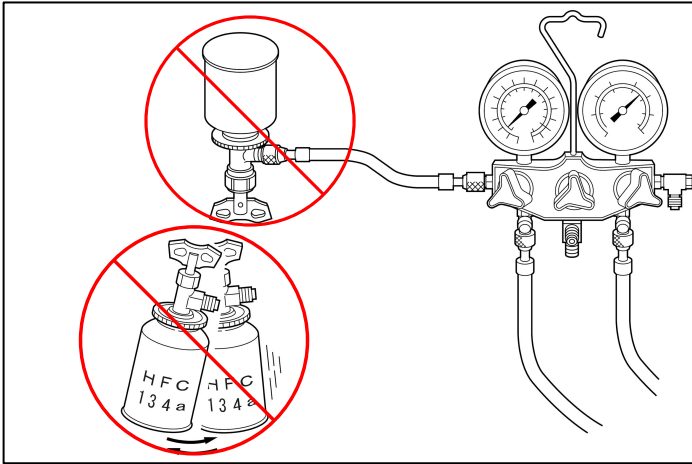


## Leak test

The compressor must be checked for refrigerant leaks after it is repaired. The procedure is as follows.

1. Fill the compressor with refrigerant through the suction side, raising the refrigerant pressure to at least 0.39 MPaG {5 kgf/cm<sup>2</sup> , 56.3 psig}.
2. Check the compressor for leaks using a Helium leak detector.

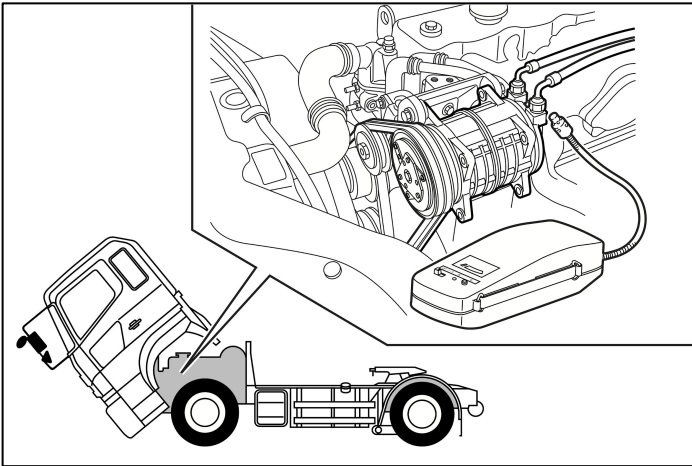
# 3 - HANDLING INSTRUCTIONS



## Refrigerant charging

Countermeasures to avoid charging with the wrong refrigerant have been taken. These include different shaped service valves, different service tool thread sizes, caution stickers and labels.

In order to prevent a liquid charge and greatly increase risks of compressor damage, do not shake or turn the refrigerant bottle upside-down.



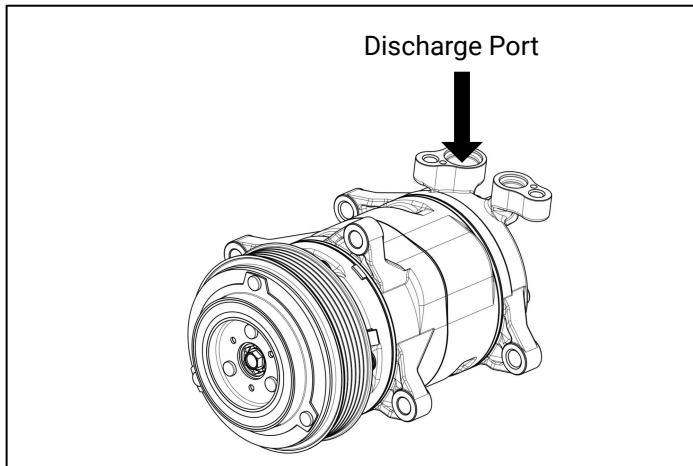
## Initial Leak Check

Using the leak detector, check the system connections for leaks.

As the system pressure is not yet high, only large leaks can be detected at this time.



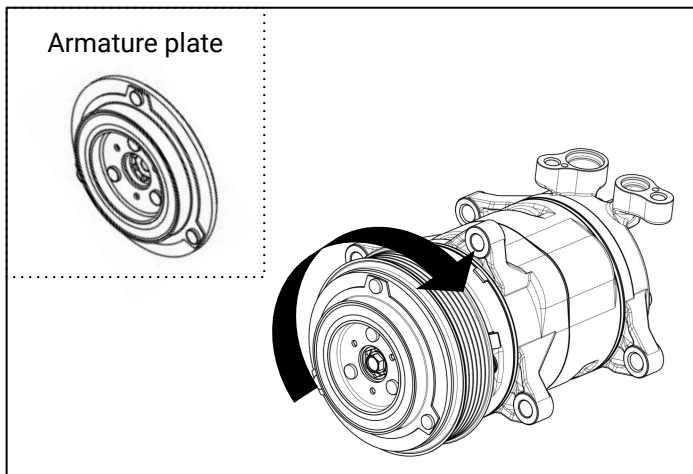
# 3 - HANDLING INSTRUCTIONS



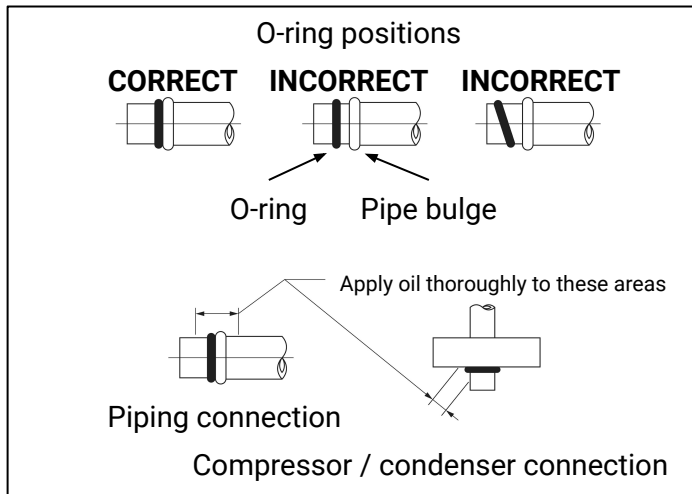
## Installation precautions

The new compressor is filled with the specified quantity of compressor oil and nitrogen gas (N<sub>2</sub>). When mounting the compressor on the vehicle, please follow as below :

1. Loosen the discharge side connector's cap and gently release nitrogen gas (N<sub>2</sub>) from the compressor.
2. Turn the magnetic clutch **armature plate** several times by hand to distribute the oil which has settled in the cylinders.
3. When installing the compressor in service system, the compressor should be installed after adjusting the amount of oil, referring to "oil check" (p.13)



# 3 - HANDLING INSTRUCTIONS



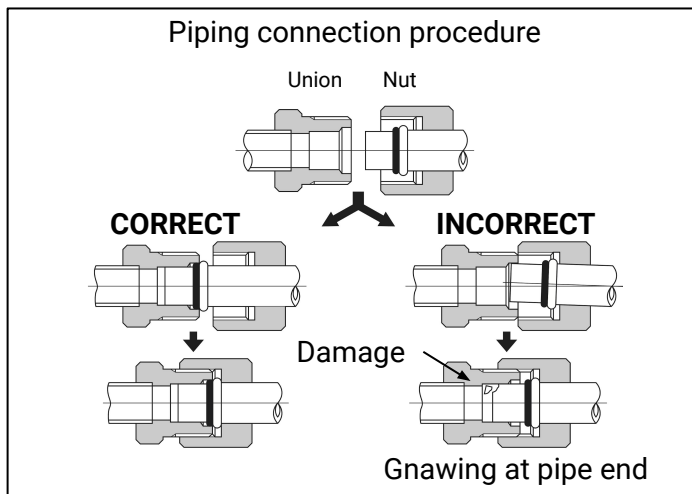
## Piping precautions

1. Position the O-Ring against the bulge in the pipe when connecting hoses and pipes.
2. Coat the piping connections and the O-rings with PAG oil.

### CAUTION!

**Always use the specified oil for HFC-134a and HFO-1234yf systems to coat the O-rings.**

3. Fit the nuts and unions tightly against the base of the companion pieces, then hand tighten the nut as much as possible. Then tighten to the specified torque.



# 4 - TROUBLESHOOTING

## Compressor troubleshooting

As long as the compressor maintenance is done correctly, there should not be any problem throughout the whole vehicle life, but should it happen, this troubleshooting can help solving the issue.

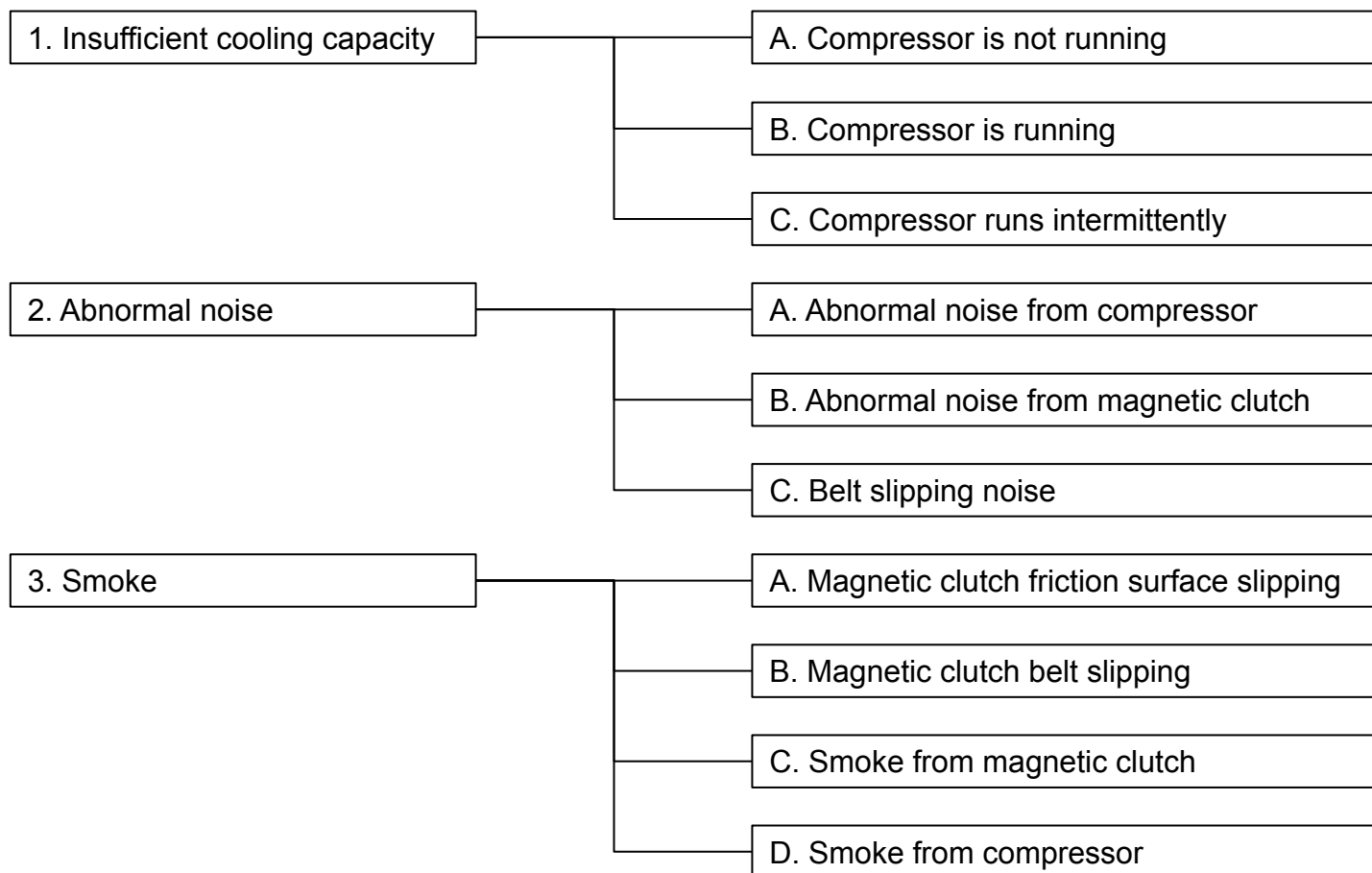
Below are listed most of the issues you may encounter while the A/C is ON. Please refer to the compressor troubleshooting tree to localize the malfunction symptom, then look at the table (p.24-25) for the appropriate counter measure.

Most of the malfunction symptoms can be classified in the following categories:

1. Insufficient cooling capacity
2. Abnormal noise
3. Smoke

In case of insufficient cooling capacity, we recommend that you prepare a gauge manifold to measure the pressure of both discharge and suction sides (for a detailed diagnosis by gauge pressure, p.24-25).

## Compressor troubleshooting tree



# 4 - TROUBLESHOOTING

## 1. Insufficient cooling capacity

Issue	Symptom	Potential cause	Counter measure
A. Compressor is not running (no cool blow coming out)	Magnetic clutch slips when turning on the A/C switch	Compressor internal damage	Replace the compressor
	Low pressure cut switch operates	Refrigerant shortage	Fix the refrigerant leakage then fill with refrigerant until reaching the right amount
	The magnetic clutch slips or does not engage when the compressor runs	Lead wire short circuit or wiring connector not seated properly	Replace the lead wire if it is defective
		Magnetic clutch damage	Replace the magnetic clutch
		Magnetic clutch air gap too wide	Replace magnetic clutch
		Low magnetic clutch voltage	Check the voltage of battery
		Thermal fuse activated by high heat	Service system and replace the compressor
	The magnetic clutch engages but the armature does not rotate	Belt slipping	Replace compressor if it is locked
	Belt run off the pulley	Compressor internal part damage or magnetic clutch damage	Replace compressor or magnetic clutch
	Center bolt is loose / Center bolt is missing	Bolt drop off / Armature drop off	Replace magnetic clutch

# 4 - TROUBLESHOOTING

## 1. Insufficient cooling capacity

Issue	Symptom	Potential cause	Counter measure
<b>B.</b> Compressor is running (no cool blow coming out)	Compressor is running abnormally	Defective compressor	Replace compressor
	No difference of temperature between discharge side and suction side (see p.24-25)	Refrigerant shortage	Fix the refrigerant leakage then fill with refrigerant until reaching the right amount
	The magnetic clutch slips or does not engage when the compressor is running	Magnetic clutch friction surface slipping	Check the voltage of the battery or replace the magnetic clutch
		Loose connection of the magnetic clutch with electrical circuit	Replace the magnetic clutch if it is clutch defect
	Belt slipping	Magnetic clutch belt slipping	Belt tension adjustment
	The magnetic clutch does not engage	Defective thermostatic switch	Replace the thermostatic switch after making sure it is defective
<b>C.</b> Compressor runs intermittently (cool blow comes out irregularly)	Both discharge and suction pressures are high	Excess of refrigerant	Reduce the refrigerant charge until reaching the right amount
		Condenser fan failure	Replace the condenser after making sure it is defective
	The magnetic clutch slips or does not engage when the compressor is running	Loose connection of the magnetic clutch electrical circuit	Replace the magnetic clutch after making sure it is defective
	The magnetic clutch does not engage	Defective thermostatic switch	Replace the thermostatic switch after making sure it is defective

# 4 - TROUBLESHOOTING

## 2. Abnormal noise

Issue	Symptom	Potential cause	Counter measure
A. Abnormal noise from the compressor	Abnormal vibration after turning on the A/C switch	Compressor installation bolt is loose	Increase tightening torque of the loose bolts
		Wide gap at the attaching portion between the compressor and the engine mounting points	Mount compressor correctly
	Abnormal noise from the compressor body	Compressor body internal component damage	Replace the compressor
B. Abnormal noise from the magnetic clutch	The magnetic clutch has a backlash and slips	Magnetic clutch damage	Replace the magnetic clutch
	Strange noise when the magnetic clutch engages	Air gap too wide	Replace magnetic clutch
	Armature slips does not engage when the compressor is running	Magnetic clutch friction, slippery surface	Check the voltage of battery or replace magnetic clutch
C. Belt slipping noise	Armature does not rotate when magnetic clutch engages	Belt slipping	Replace the compressor if locked. Adjust the belt tension if the belt is loose

# 4 - TROUBLESHOOTING

## 3. Smoke

Issue	Symptom	Potential cause	Counter measure
A. Magnetic clutch friction surface slipping	The magnetic clutch slips / does not engage when the compressor is running	Magnetic clutch air gap wider than 1.2mm	Adjust air gap or replace magnetic clutch
		Low magnetic clutch voltage	Check the voltage of battery
		Magnetic clutch friction, greasy surface	Clean friction surface or replace magnetic clutch
B. Magnetic clutch belt slipping	The magnetic clutch slips / does not engage when the compressor is running	Belt alignment is not correct	Adjust the compressor installation position
		Magnetic clutch belt is greasy	Clean or replace the belt
		Magnetic clutch belt tension is loose	Adjust belt tension
C. Smoke from the magnetic clutch	The magnetic clutch does not engage	Coil open or shorted	Replace the magnetic clutch
D. Smoke from the compressor	Refrigerant / oil is blowing out	Refrigerant leaking, uncoupled piping or piping burst	Fix the refrigerant leakage then fill with refrigerant until having the right amount
		Refrigerant blowing from the high pressure relief valve due to excess of refrigerant	Reduce the refrigerant charge until reaching the right amount

# 4 - TROUBLESHOOTING

## A/C cycle diagnosis by gauge pressure

Following is a diagnosis procedure to connect gauge manifold to A/C cycle, measure suction and discharge pressures and analyze the defects of the cycle.

Operation conditions of the A/C cycle for pressure measuring:

1. Ambient temperature: 30 - 35 °C
2. Engine speed: 1,500 rpm
3. A/C switch: ON
4. Blower speed: high
5. Temperature control: full cold

Gauge pressure indication	Cause	Confirmation method	Action to take
Pressure is normal	A/C cycle operates normally. If there is any defect (poor cooling performance), there shall be another cause. <ul style="list-style-type: none"> <li>• <b>Discharge pressure:</b> around 0.9 - 1.6 MPaG (10 - 17 kgf/cm<sup>2</sup>)</li> <li>• <b>Suction pressure:</b> around 0.03 - 0.10 MPaG (1.3 - 2.0 kgf/cm<sup>2</sup>)</li> </ul>		
Both discharge and suction pressures are low	Refrigerant shortage	Connect gauge manifold to cycle	Recover refrigerant, then refill with the right amount of refrigerant
	Receiver dryer is clogged	Temperature difference between inlet and outlet pipes happens. Dryer is covered with frost	Replace parts
	Expansion valve is clogged	Expansion valve was covered with frost or dust	Clean or replace part (Tightening torque = 7.8~9.8N.m)
	Enclosure leakage from the expansion valve temperature sensing tube. (Expansion valve operates to close the valve opening)	Outlet side of the expansion valve is not cooling. (Low side of gauge indicates vacuum)	Replace part
	Temperature sensing device at outlet air is defective	Evaporator becomes frozen up	Adjust or replace the part
	Refrigerant piping is clogged or crashed	If any part between the dryer and the compressor is clogged or crashed, the low side pressure becomes vacuum	Adjust or replace the part

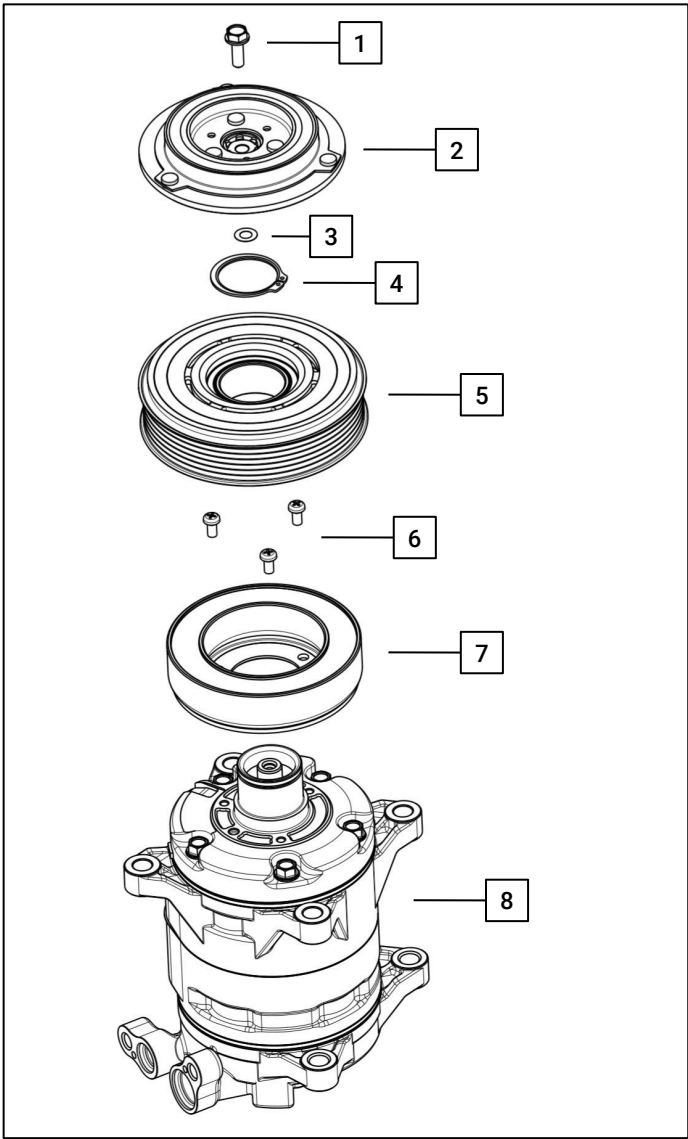


## 4 - TROUBLESHOOTING

Gauge pressure indication	Cause	Confirmation method	Action to take
Both discharge and suction pressures are high	Excess of refrigerant	Connect gauge manifold to cycle	Recover refrigerant, then refill with the right amount of refrigerant
	Condenser cooling malfunction	Condenser becomes muddy and fins are clogged and collapsed. Defect of cooling fan rotation. Malfunction of fan motor for condenser	Clean up, hand repair of fin and replacement
	Misaligned Expansion valve or thermal sensing tube of the Expansion valve is not fit on regularly. (Excess opening of the Expansion valve)	Defective refrigerant flow control, the thermal sensing tube is not closely in contact with the evaporator pipe	Adjustment or replacement
	Air mixed in refrigeration cycle	Just after compressor stops, discharge pressure will come down immediately to 0.19 - 0.29 MPaG (3 - 4 kgf/cm <sup>2</sup> )	Evacuate air from cycle, the charge with the adequate amount of refrigerant
Discharge pressure is high and suction pressure is low	Refrigerant cycle is clogged between compressor and condenser	Appreciable temperature difference at the clogged location	Clean up inside the cycle or replace the part
Discharge pressure is low and suction pressure is high	Defect of the compressor valve or gasket	Discharge and suction pressures balance immediately after the compressor stops. (Defective compression of compressor)	Replace the compressor

# 6 - SERVICE PROCEDURE - MAGNETIC CLUTCH

Exploded view of Magnetic Clutch

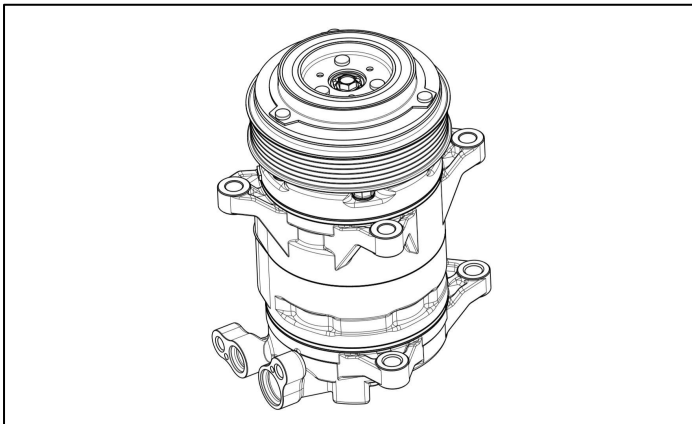


- 1. Center bolt
- 2. Armature plate
- 3. Adjusting shim
- 4. Snap ring
- 5. Pulley assembly
- 6. Coil Screw
- 7. Field coil
- 8. Compressor body

Clutch Assembly Specifications

Tightening torques		Air Gap (between Armature plate and Pulley)
Center Bolt	Coil Screw	
14.5~15.5 N-m (10.7~11.4 ft lbs)	3.9~5.9 N-m (2.9~4.4 ft lbs)	0.3~0.6 mm (0.012~0.024 in)

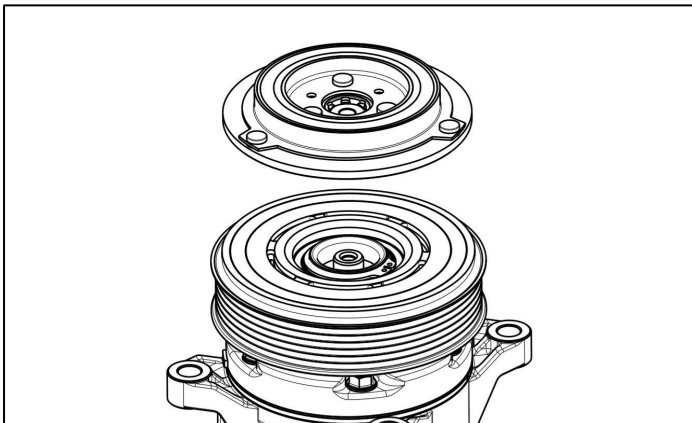
## 6 - SERVICE PROCEDURE - MAGNETIC CLUTCH



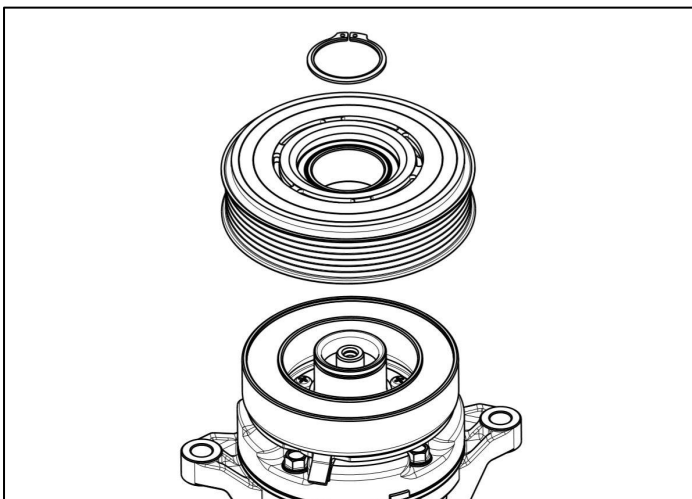
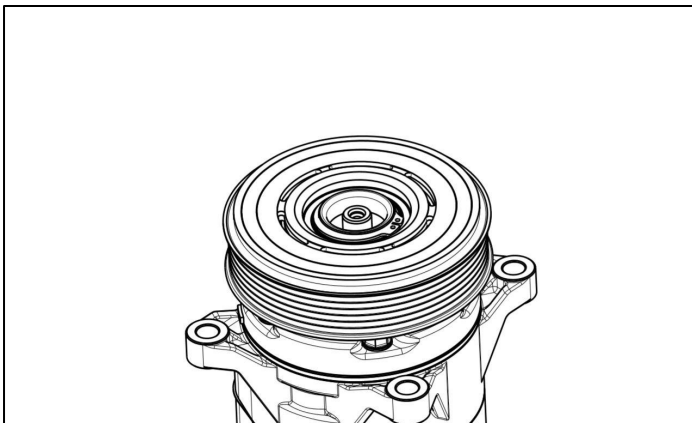
### Magnetic Clutch

#### Removal

- Step 1: Remove the center bolt using a drive plate holder (p.31) to prevent armature plate from rotation.

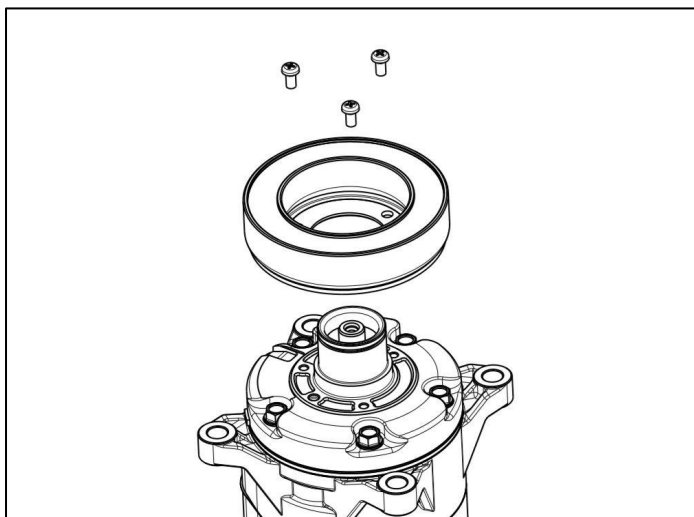


- Step 2: Remove the armature plate by hand or using a M8 screw if necessary.



- Step 3: Remove the snap ring using external snap ring pliers.
- Step 4: Position the center pulley puller at the end of the driveshaft.
- Step 5: Attach a suitable pulley puller to the pulley. Hook the puller claws to the edge of the pulley.
- Step 6: Tighten the pulley puller bolt to remove the pulley.

## 6 - SERVICE PROCEDURE - MAGNETIC CLUTCH



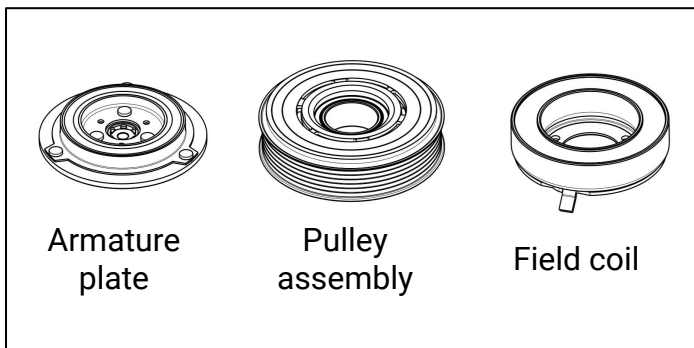
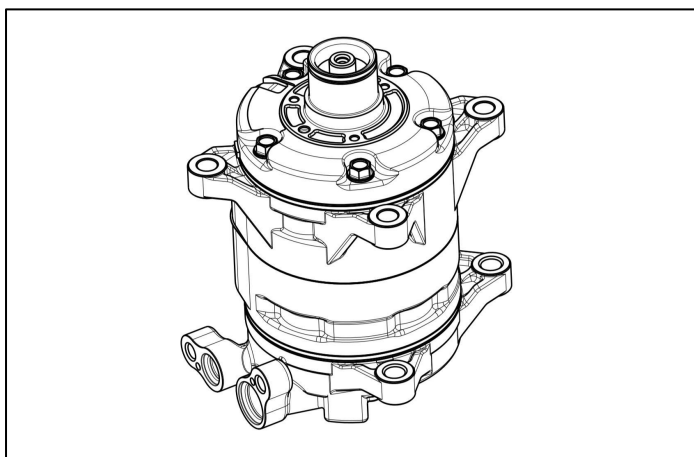
### Magnetic Clutch

#### Removal

- Step 7: Remove the field coil lead wire bushing using a flat screwdriver (p.31).
- Step 8: Remove the three field coil/compressor screws. Then remove the field coil.

#### **CAUTION!**

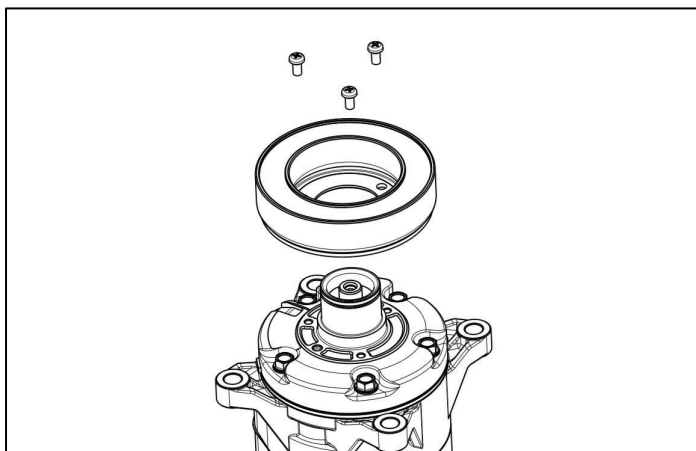
**Do not hold the field coil by the harness**



#### Inspection

1. If the contact surface has been damaged by excessive heat, the armature plate and pulley must be replaced.
2. Check the appearance of the pulley assembly. If the pulley grooves show excessive wear due to slippage, both the pulley and armature plate must be replaced. The contact surfaces of the pulley assembly must be cleaned with a suitable solvent before reinstallation.
3. Check the field coil for a loose connector or cracked insulation.

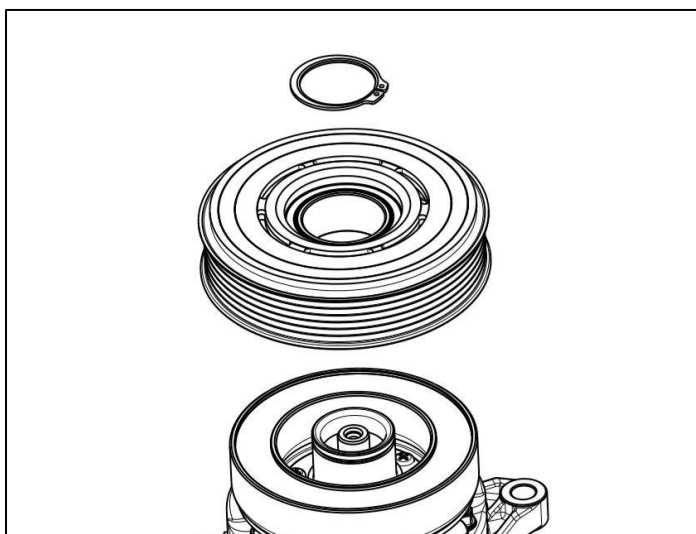
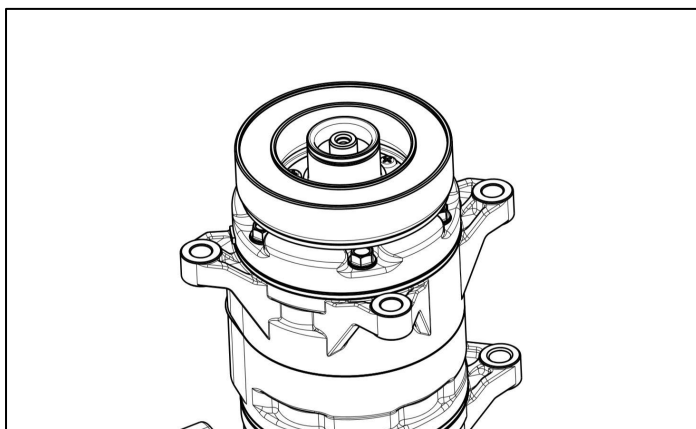
## 6 - SERVICE PROCEDURE - MAGNETIC CLUTCH



### Magnetic Clutch

#### Installation

- Step 1: Install the field coil on the compressor (with the harness on top) and tighten the mounting screws to the specified torque (p.26).
- Step 2: Carefully place the the wire harness bushing.



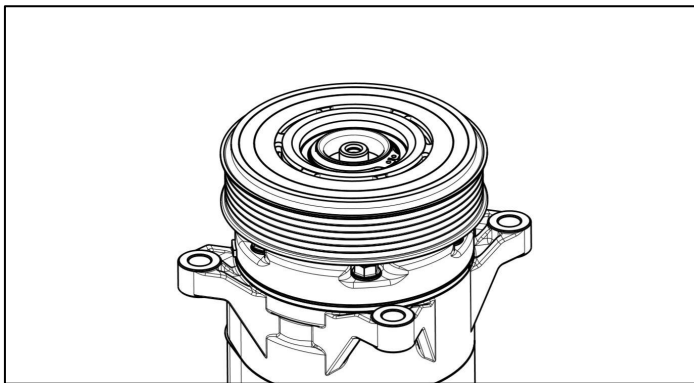
- Step 3: Install the pulley assembly using a pulley installer (p.31) and an hand press.

#### **CAUTION!**

**Use only a press to install the pulley assembly. Do not use a hammer. An hammer will damage or deform the pulley**

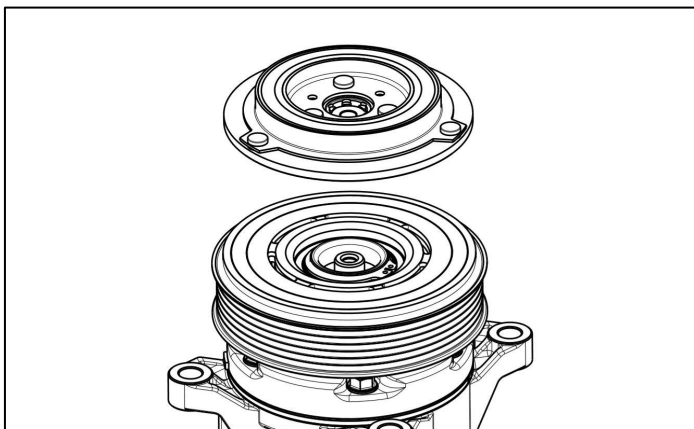
- Step 4: Install the snap ring (beveled edge up) using external snap ring pliers.

## 6 - SERVICE PROCEDURE - MAGNETIC CLUTCH



### Magnetic Clutch

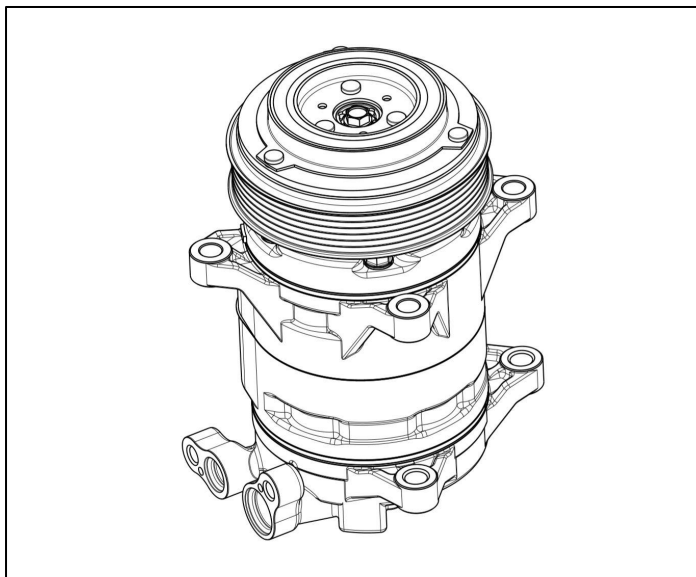
#### Installation



- Step 5: Install the armature plate on the driveshaft together with the original shims. Press the armature assembly down by hand.
- Step 6: Install the center bolt and tighten the bolt to the specified torque (p.26) using a drive plate holder (p.31).

#### **CAUTION!**

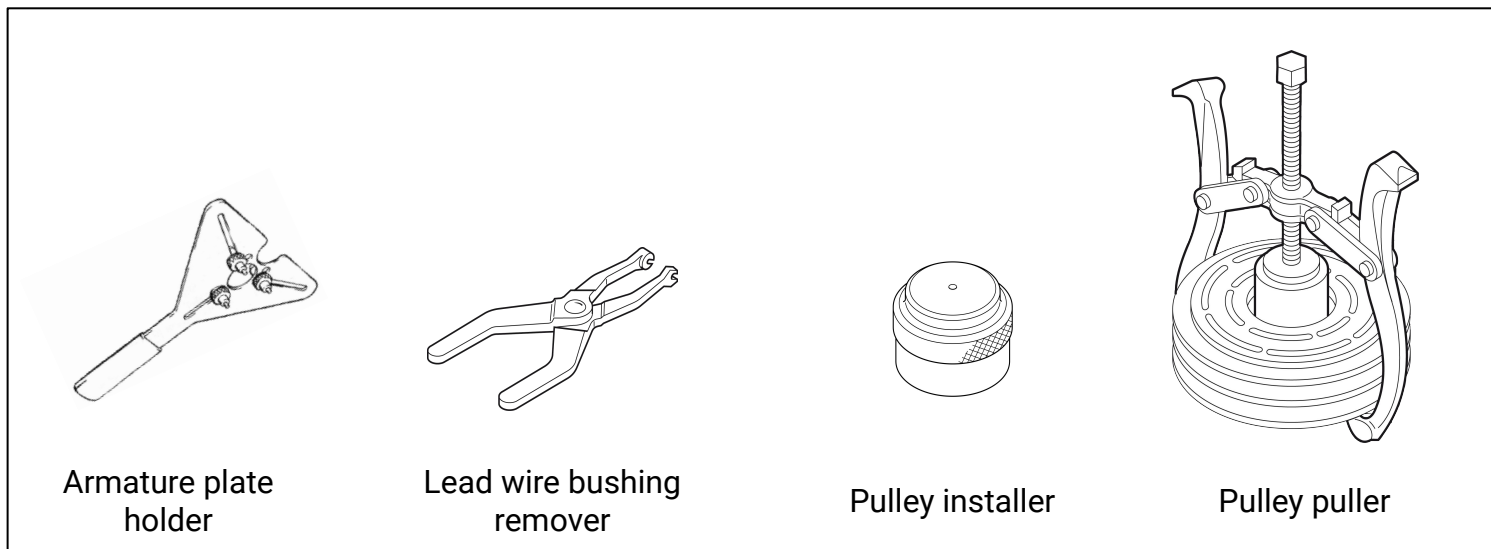
**After tightening the center bolt, check that the pulley rotates smoothly.**



- Step 7: Use a feeler gage to check clutch air gap (p.31). If necessary adjust the air gap using shims (p.26).
- Step 8: Run-in the clutch (p.15)

# 7 - SERVICE TOOLS

## Special service tools required for clutch assembly / disassembly



- |  |                          |
|--|--------------------------|
| • Armature plate holder                | → To fix the drive plate |
| • Lead wire bushing remover            | → To remove lead wire    |
| • Pulley installer                     | → To install pulley      |
| • Pulley puller + Center pulley puller | → To remove pulley       |

### Other regular service tools needed:

- |                    |                          |
|--------------------|--------------------------|
| • M8 screw         | → To remove armature     |
| • Filler gauge     | → To check air gap       |
| • Flat screwdriver | → To remove wire harness |



# Valeo TMX compressor

## TMX compressor benefits

- Staggering value through innovation
- Reduced noise and vibration
- Improved field serviceability
- Compact & robust design
- Lower fuel consumption
- Enhanced performance
- Higher cooling capacity
- Integration flexibility
- High reliability

Customer satisfaction

**Valeo**



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