



# KIT Inlet Guide Vane (IGV) MOTOR SERVICE

100035-1.



**Installation and servicing of Danfoss Turbocor® compressors by qualified and product trained personnel only. Follow these instructions and sound refrigeration/electrical/servicing practices relating to installation, commissioning, maintenance and service.**

<p>Consult the appropriate Danfoss Turbocor (DTC) Service Manual on <a href="http://turbocor.danfoss.com">turbocor.danfoss.com</a> for detailed service instructions.</p>	<p><b>Never power compressor without covers in place and secured.</b></p> <p><b>Removing the mains input cover will expose you to a voltage hazard of up to 575V. Ensure the mains input power is off and locked out before removing cover.</b></p> <p><b>Before removing top cover, wait at least 20 minutes after isolating AC power to allow the high voltage capacitors to discharge.</b></p>	<p>Always wear appropriately rated safety equipment when working around equipment and/or components energized with high voltage.</p> <p><b>This equipment contains hazardous voltages that can cause serious injury or death.</b></p>	<p><b>Recover all refrigerant from compressor in accordance with local codes and ensure pressure is fully vented before the removal of refrigerant containing components.</b></p>
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## 1 - Introduction:

IGV MOTOR SERVICE removal and installation instructions.

## 2 - Removing Refrigerant from Compressor:

- Recover refrigerant from compressor in accordance with local codes and practices

## 3 - Tools Needed:

The following tools/items are necessary to disassemble and reassemble IGV assemblies:

- 2.5 & 8 mm Allen keys
- Stepper Motor Driver
- Loctite 243 (Blue in color)
- Hammer
- Needle-nose pliers
- Torque wrench – Must be able to measure torques between 5 Nm (3.7 ft.lb) to 22Nm (18 ft.lb)
- Turbocor Service Monitoring Tool

## 4 - Disassembly Instructions:

1. Isolate compressor power as described in compressor Service Manual.
2. Disconnect IGV Motor Cable and Suction Sensor connector.
3. Remove IGV assembly from compressor.

4. Using a stepper motor driver, turn the worm shaft and Vane Drive assembly to position the motor shaft so that locking set screw is aligned with the hole shown in Figure 1. Use needle-nose pliers or similar tool to turn the worm gear if a stepper motor driver is not available or if the motor is not functioning properly.

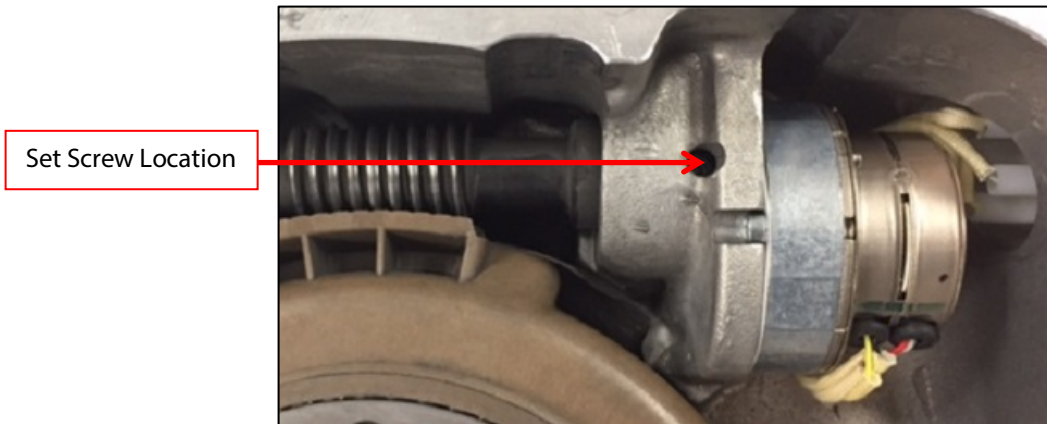


Figure 1. Set Screw Removal Location

5. Unbolt and separate the four-pin Feed Through from IGV Housing.
6. Disconnect the four wires from the four-pin Feed Through. Note and record position of wire colors to their corresponding pins. Expected: 1 = Red, 2 = Grey, 3 = Yellow, and 4 = Black (See Table 1).

Color	Pin#
Red	1
Grey	2
Yellow	3
Black	4

7. Remove the set screw completely using a 2.5 mm Allen key to release the motor from the worm gear.
  - **NOTE:** Set screw may be difficult to release as it will have Loctite applied. Do not use ball end Allen key.
8. Remove IGV Motor assembly by pulling away from worm shaft. Support bottom of IGV Motor to prevent damage to the motor shaft. A tap on the motor locating screw with a hammer may help release the motor shaft from the worm gear.
9. Turn the worm shaft by hand to check if the IGV drive system is functioning smoothly.
10. The entire IGV may need to be completely overhauled if the worm shaft does not rotate easily. Refer to IGV Overhaul Bulletin.
11. Inspect the IGV Housing assembly for residue/contaminations or foreign objects.

5 - Assembly Instructions:

1. Ensure that all components and threads are clear, clean, and oil free.
2. Insert the IGV Motor wires through the Feed Through hole.
3. Check the position of the flat surface of the shaft relative to the locating pin. The flat surface should be oriented facing up, (refer to the Figure 2) ready to be inserted in the worm gear.

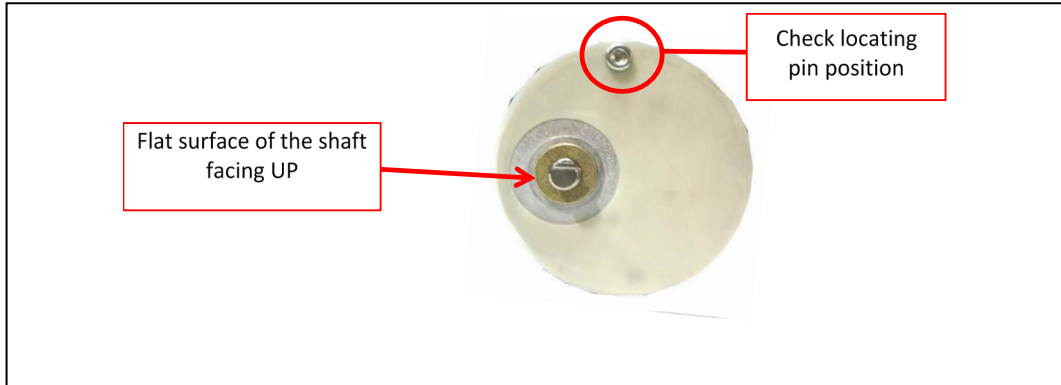


Figure 2. Shaft Position

4. Install the motor into the housing and align the motor shaft flat surface with worm gear adapter.

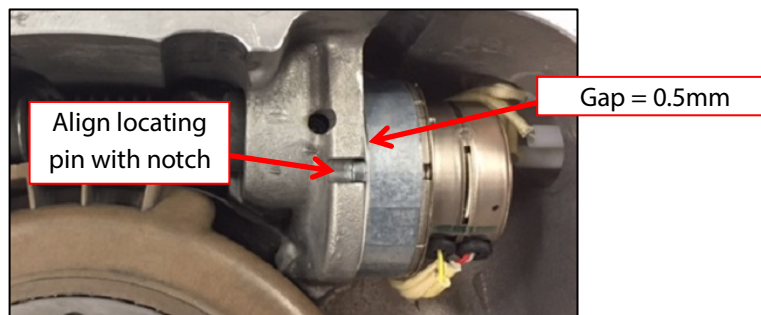


Figure 3. IGV Motor

5. Ensure that the motor locating pin is aligned with the notch in the housing flange.
6. Put one drop of Loctite 243 on threads of small set screw. While pushing in on the backside of the motor, secure the worm gear to the flat surface of the motor shaft using a 2.5 mm Allen key. Rock the motor backwards and forwards while tightening screw to ensure full and correct tightening of screw.
7. Clean, lubricate, and install the O-ring on the Feed Through before connecting the wires. If removed motor had ¼ spade terminals and new motor has round connectors, cut spade from Feed Through pins with side cutters.

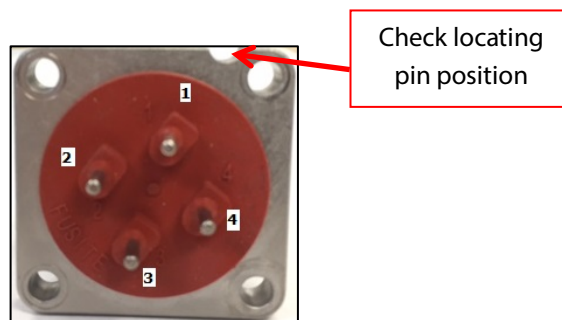


Figure 4. Locating Pin Position

Table 2 – Pin to Wire Reference		
	All except TT300N	TT300N
Color	Pin Number	Pin Number
RED	1	2
GREY	2	1
YELLOW	3	3
BLACK	4	4

- **NOTE:** Winding connections are 1-2 & 3-4.
8. Insert the motor wires onto the Feed Through pins in accordance to the above chart. Also reference your notes from removal.
  9. Loop wires as shown in Figure 5.

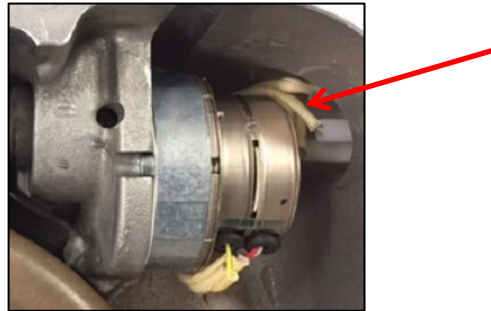


Figure 5. Wire Wrap

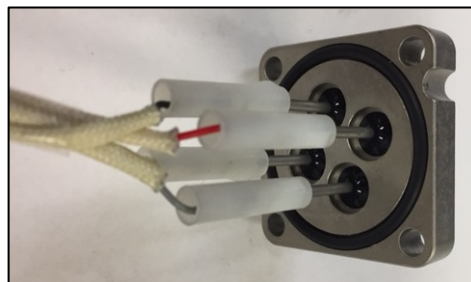


Figure 6. IGV Motor Wires Connected

10. Install the Feed Through using the four socket cap screws and install the IGV Motor Cable Retainer Clip under one of the screws. Tighten only three of the screws to 5Nm (3.7 ft.lb) while leaving the fourth screw with the retainer clip slightly loose.

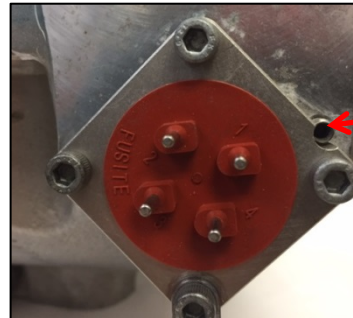






Figure 7. Feed Through Orientation

- ⚠ Check that wiring is clear of housing and edges of motor.
11. Clean the mating surfaces of both the compressor and IGV.
  12. Clean, lubricate, and install the O-ring.
  13. If available, test the motor operation with a stepper motor driver. Operation of the IGV can also be tested using the SMT driving the IGV manually (once the IGV has been mounted on the compressor).
  14. Re-install the IGV on the compressor and finger-tighten the socket cap screws.
  15. Tighten the bolts to 22Nm (18 ft.lb) in a criss-cross pattern.
  16. Leak test and evacuate in accordance with good industry practices.
  17. Plug in the four-pin Feed Through and Suction Pressure Temperature Sensor Harness.
  18. Tighten the remaining Feed Through socket cap screw (the one securing the Motor Harness Retainer Clip).
  19. Test run compressor to verify proper operation and movement of the IGV assembly.
  20. Charge system with the proper refrigerant as required.
    - **NOTE:** All IGV assemblies except TT300N are fully open when ball is in top position. TT300N is fully open when ball is at the bottom of the indicator window.

6 - Kit Contents:

Kit numbers	Compressor models
100035-1	All TT and TG Models

QTY	Part(s) Description	Picture(s)
1	MOTOR ASSEMBLY - IGV 12VDC STEPPER	
1	SCREW M5X8 S/SET FLT POINT	
1	O-RING (IGV)	
1	O-RING (Suction)	
1	O-RING (Discharge)	
1	O-RING (Economizer) *For TT300/TG230 compressors only*	
1	O-RING (Economizer) *For all TT-TG compressors excluding TT300/TG230*	
1	O-RING (Feed Through)	
2	LUBRICATION-SUPER-O-LUBE-2G	

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