



TRS 090/105  
Compressor

**For R-134a**

# Repair Procedures



## GENERAL

- All repair and service operations should be performed on a clean bench and with the use of clean tools.
- Use genuine parts and correct tools for all repair service work.
- Tighten every nut / bolt / screw to specified torque.

NO.	ITEMS	SPEC.
1	Armature Air Gap	0.35 - 0.65mm
2	Minimum Armature Engagement Voltage	8.0V max
3	Pulley Fixing Bolt Torque (Overhang Clutch Only)	$8.8 \pm 1.0$ N-m
4	Armature Fixing Nut Torque (TRS series)	$17.7 \pm 1.0$ N-m
5	Lead Wire Clamp Torque	$2.0 \pm 0.5$ N-m
6	Thermal Protector Switch Fixing Bolt Torque	$6.9 \pm 1.0$ N-m
7	Oil Charge	Suction half / Discharge half

# CLUTCH SERVICE

## A. Clutch Disassembly

### 1. Removal of Armature Fixing Nut (Figure 1.)

Insert three prongs of armature securing tool into the three holes on the armature. Then, serving the tool by hand remove the armature fixing nut with a 14mm socket.



Fig 1. Removal of Armature Fixing Nut

### 2. Removal of Clutch Armature Assembly (Figure 2.)

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If armature cannot be removed by hand, use the puller as follows Align puller center bolt to compressor shaft. Install (hang) the three puller hooks into the holes on front plate. Turn center bolt clockwise until armature disengages from the shaft.



Fig 2. Removing Clutch Armature Assembly

### 3. Removal of Snap Ring (Figure 3.)

Remove the snap ring which secures the clutch rotor to the front housing using snap ring pliers.

**NOTE :** Take care that the snap ring does not fly out at the point of release from its groove.



Fig 3. Removal of Snap Ring

#### 4. Removal of Clutch Rotor (Figure 4)

The clutch rotor is a tight fit to the front boss. With shaft protector (2143a) in place, remove with puller as shown in figure 4. The clutch bearing is not a serviceable item for the TRS090 / 105. The rotor and bearing assembly has to be replaced as one unit.

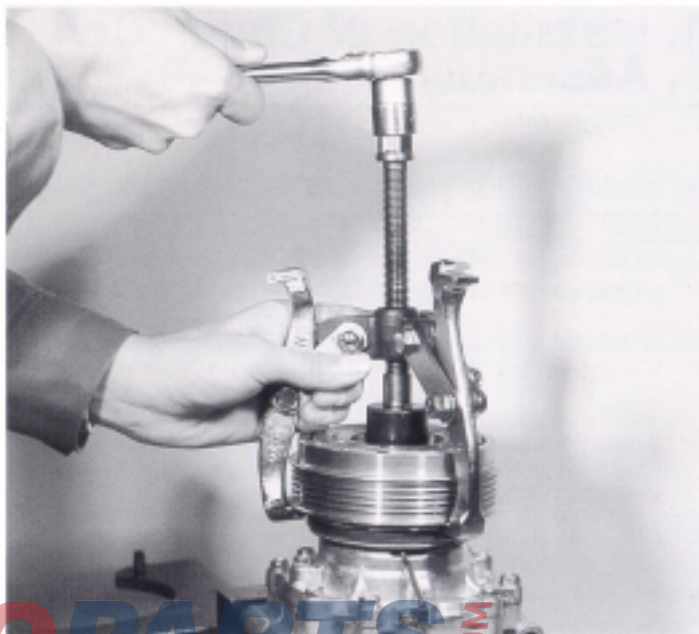


Fig 4. Removal of Clutch Rotor

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#### 5. Removal of Clutch Coil Assembly (Figure 5 )

- a. Loosen the lead wire retaining clamp using a phillips screwdriver, and remove lead wire from the compressor. Disconnect lead wire from thermal protector switch.
- b. Remove the snap ring which secures the clutch coil assembly to the front housing using snap ring pliers.  
**NOTE :** Take care that the snap ring does not fly out from its groove.
- c. Remove air gap adjusting shims from the top of compressor shaft.



Fig 5. Removal of Clutch Coil Assembly

# CLUTCH SERVICE

## B. Clutch Reassembly

### 1. Installation of Clutch Coil Assembly (Figure 6)

- Position the back of the clutch coil over the front housing. This ensures correct angular position of clutch coil and lead wire.
- Secure the clutch coil in position on the Front Housing with a snap ring using snap ring pliers

**NOTE :** Install it so that the chamfered edge of the snap ring faces upwards as shown below.

- Secure the lead wire with a lead wire retaining clamp using a phillips screwdriver  $+02.0 \pm 0.5 \text{N} \cdot \text{m}$  ( $1.4 \pm 0.4 \text{ft} \cdot \text{lb}$ ,  $0.2 \pm 0.05 \text{kg} \cdot \text{m}$ )
- Connect the lead wire with the thermal protector switch.



Fig 6. Installation of Clutch Coil Assembly

### 2. Installation of Clutch Rotor (Figure 7)

- Place rotor assembly over the shaft and onto the front housing.
- Place the rotor installer (3153 for TRS090 / 3154 for TRS105) onto the clutch bearing.
- Press fit rotor assembly using a hand press.

**NOTE :** Press fit force must not exceed 400kg.

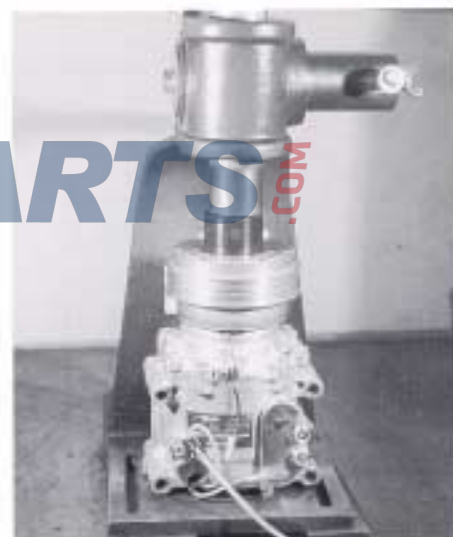


Fig 7. Installation of Clutch Rotor

### 3. Installation of Snap Ring (figure 8)

Install snap ring into the snap ring groove of the front housing using snap ring pliers.

**NOTE :** Install it so that the chamfered edge of the snap ring faces upwards as shown below.

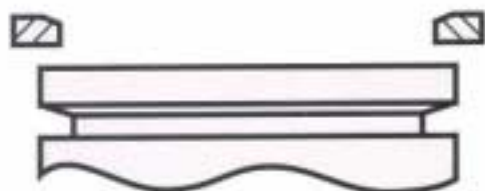


Fig 8. Installation of Snap Ring

#### **4. Installation of Shims**

Replace the shims onto the shaft. In the case where more than one shim is used, there is no special order for installing the shims.

#### **5. Installation of Clutch Armature Assembly**

(Figure 9.)

Install the clutch armature, aligning the flat on the end of compressor shaft with the corresponding flat on armature. Using the armature securing tool and a 14mm socket, install and torque armature fixing bolt to  $17 \pm 1.0$  N.m ( $13.0 \pm 0.7$  ft.lb  $1.8 \pm 0.1$  kgf. m)



Fig 9. Installation of Clutch Armature Assembly

#### **6. Air Gap Adjustment**

(Figure 10)

Measure air gap between clutch armature and clutch rotor using feeler gauges as illustrated in Fig. 10. Recommended air gap is 0.35 ~ 0.65mm. If adjustment of the air gap is indicated, remove fixing nut and armature assembly (refer preceding instructions), then add or remove shims as necessary to achieve the recommended air gap.



Fig 10. Air Gap Adjustment

## THERMAL PROTECTOR SWITCH SERVICE

**NOTE :** Never reinstall thermal protector switch. Always replace it with a new unit when required.

### 1. Removal of Thermal Protector Switch

Loosen the bolt securing the thermal protector switch fixing plate and lead wire clamp. Apply screwdriver between the thermal protector switch and the thermal protector switch socket to remove.

**NOTE :** Due to the use of silicone it may be difficult to ensure thermal contact.

### 2. Replacement of Thermal Protector Switch

Remove silicone filler from the socket and thoroughly clean the socket with thinners or equivalent. Place the new thermal protector switch so that the flat copper surface faces upwards. Apply the specified silicone (KE347 RTV or Dow Corning #839) to the flat copper surface of the new thermal protector switch until the surface is evenly covered. Install the thermal protector switch into the socket and secure it with the thermal protector switch fixing plate and bolt torque  $6.9 \pm 1.0$  N.m (5.1 T 0.7 ft.lb,  $0.7 \pm 0.1$  kgf. m)

**NOTE :** Apply silicone directly from tube only.

## PORT O-RING SERVICE

When port O-ring damage is found, replace it with new O-ring using Oring hook.

**NOTE :** Use H-NBR O-ring for R-134a.

## SERVICE OIL

Sanden provides field service containers of SP-10 PAG oil for Sanden TR-series compressors in convenient 40cc & 250cc can. These cans are designed to resist moisture ingress. Always keep the cap of the can tightly closed when not using the oil. Sanden will not warrant TR compressors unless approved SP-10 is used for field service.

Sanden Number

- 40cc can of SP-10 oil 3000-9040
- 250cc can of SP-10 oil 3000-9050