

SR/SRA Series

維修手冊

MAINTENANCE HANDBOOK

SCREW REFRIGERANT COMPRESSOR

螺旋式冷媒壓縮機



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第一章 工具索引

Chapter 1: Tools Directory

爲使壓縮機維修順利. 請事先備妥所需工具.

In order to overhaul the compressor efficiently, it is necessary to get the tool set ready for use.

A. 板手

A. Wrench

Item/ 項次	Tool Name/名稱	Specification/規格	SR-1(H)~SR-3(H)	SR4(H)~SR-8(H)
A1	Hexagon Wrench(六角板手)	M3	○	○
A2	Hexagon Wrench(六角板手)	M5	○	○
A3	Hexagon Wrench(六角板手)	M6	○	○
A4	Hexagon Wrench(六角板手)	M8	○	
A5	Hexagon Wrench(六角板手)	M10	○	○
A6	Hexagon Wrench(六角板手)	M14	○	○
A7	Hexagon Wrench(六角板手)	M17	○	○
A8	Wrench(板手)	M17	○	
A9	Wrench(板手)	M22	○	
A10	Wrench(板手)	M30	○	
A11	Wrench(板手)	11/16"	○	
A12	Wrench(板手)	9/16"	○	
A13	Wrench(板手)	M24×M30		○
A14	Wrench(板手)	M17×M19		○
A15	Wrench(板手)	1/2" ×9/16"		○
A16	Adjustable Wrench(活動板手)	12"		○
A17	Adjustable Wrench(活動板手)	8"	○	
A18	Torque Wrench(扭力板手)	590P"		○
A19	Torque Wrench(扭力板手)	800 N-m"		○
A20	Torque Wrench(扭力板手)	900kgf-cm"	○	○
A21	Torque Wrench(扭力板手)	500N-m	○	○
A22	Pipe Wrench(管板鉗)	14"	○	○
A23	Pipe Wrench(管板鉗)	500mm		○
A24	Pneumatic Wrench(氣動板手)	NW-800		○
A25	Pneumatic Wrench(氣動板手)	NW-2000H		○
A26	Pneumatic Wrench(氣動板手)	NWH-320P		○

B. 套筒		B. Socket		
Item/項次	Tool Name/名稱	Specification/規格	SR-1(H)~SR-3(H)	SR4(H)~SR-8(H)
B1	Socket(套筒)	M30	○	○
B2	Socket(套筒)	M35	○	○
B3	Socket(套筒)	M19×3/8 “ (square hole/方孔)	○	○
B4	Socket(套筒)	M19×1/2” (square hole/)	○	○
B5	Socket(套筒)	M3	○	○
B6	Socket(套筒)	M8	○	○
B7	Socket(套筒)	M10	○	○
B8	Socket(套筒)	M14	○	○
B9	Socket(套筒)	M17	○	○
B10	Socket(套筒)	M19		○
B11	Extension socket(延伸套筒)	3/8” square hole	○	○

C. 量具		C. Measurement tool		
Item/項次	Tool Name/名稱	Specification/ 規格	SR-1(H)~SR-3(H)	SR4(H)~SR-8(H)
C1	Ohm meter(高阻計)	1000V/100MΩ	○	○
C2	Feeler gauge(測隙片)	0.02~0.1mm	○	○
C3	Micrometer(分厘卡)	0~25mm	○	○
C4	Micrometer(分厘卡)	25~50mm	○	○
C5	Micrometer(分厘卡)	50~75mm	○	○
C6	Micrometer(分厘卡)	100~125mm	○	○
C7	Caliper(卡鉗)	150mm	○	○
C8	Bore gauge(測缸規)	50~150mm	○	○
C9	Dial indicator (with holder & magnetic base)		○	○
C10	Ring gauge(環規)	f110		○
C11	Ring gauge(環規)	f70	○	

D. 治夾具		D. Fixture	
名稱 Description	圖像 Photo	名稱 Description	圖像 Photo
D1 扭力板手套筒 Socket for torque wrench		D2 公轉子抗迴轉治具 Male rotor anti-rotation Jig	
D3 公轉子吊具 Hanger with inner-thread for male rotor		D4 插稍移除器 Ping-remover	
D5 油壓缸支撐桿 Rods for Hydraulic cylinder		D6 油壓缸治具 Jig for Hydraulic cylinder	
D7 延伸導套 Extend sleeve		D8 U型螺帽套筒 Socket for removing U-type nut.	
D9 活塞導套 Guider for slide piston		D10 軸承安裝工具 Bearing installation tool	
D11 轉子護環 Rotor protection ring		D12 轉子固定套筒 Fixing socket for rotor	
D13 馬達殼導桿 Guide pin for motor housing		D14 油分離器導桿 Guide pin for oil separator	
D13 軸承座導桿 Positioning guide rod for bearing seat		D14 軸承拆卸器 Bearing remover	

第二章 分解程序

◆ SR-1 (H) ~SR-3 (H) 分解說明

A. 油分離器及接線盒

B. 馬達側

C. 軸承座

D. 本體

Chapter 2: Disassembly Procedure

◆ SR-1 (H) ~SR-3 (H) Disassembly illustration

A. Oil separator and terminal plate

B. Motor casing

C. Bearing seat

D. Casing

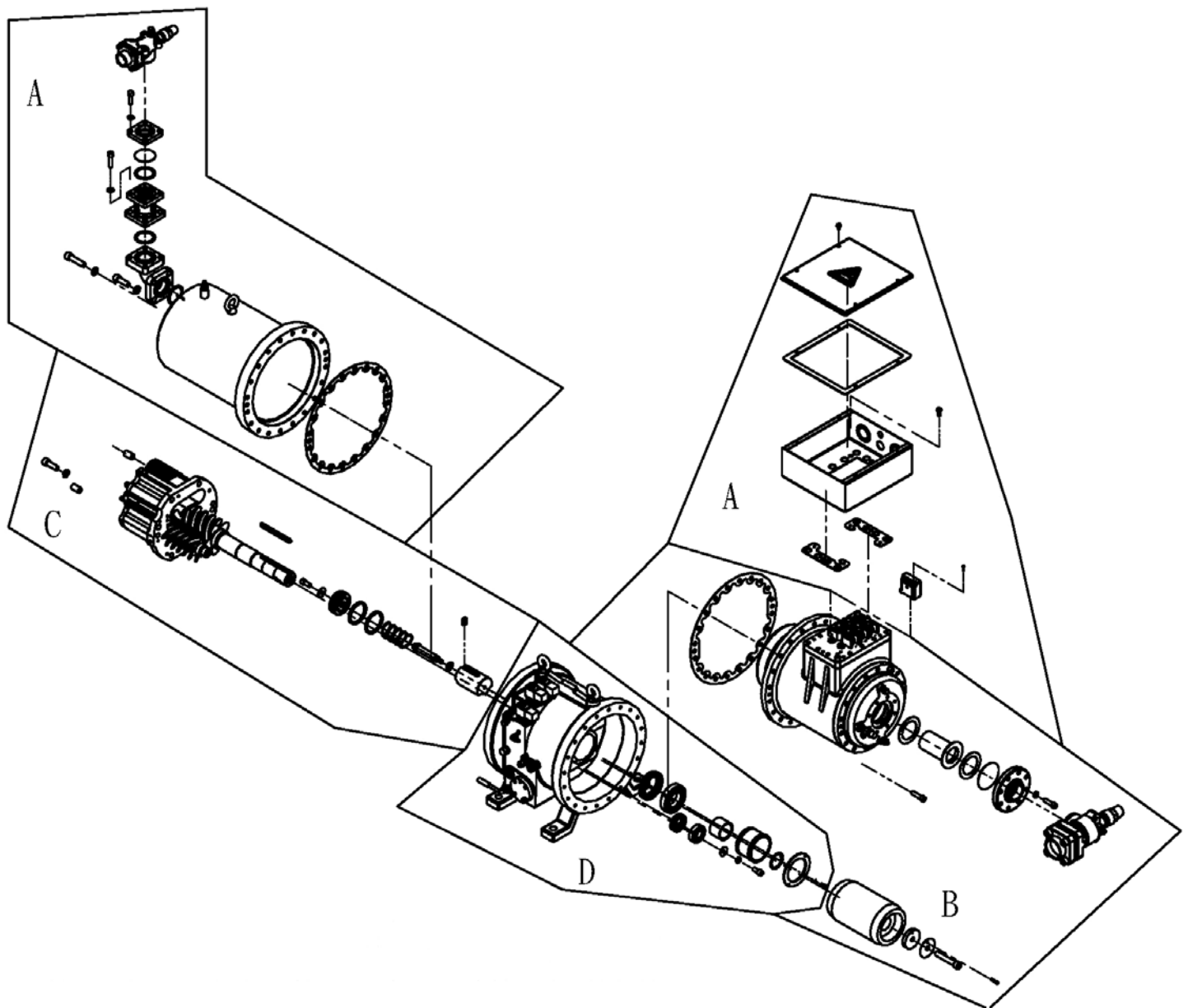


圖 Figure 2-1-1 SR-1 (H) ~SR-3 (H) 分解說明/ Disassembly illustration

◆ SR-4 (H) ~SR-7 (H) 分解說明

- A. 油分離器及接線盒
- B. 馬達側
- C. 軸承座
- D. 本體

◆ SR-4 (H) ~SR-7 (H) Disassembly illustration

- A. Oil separator and terminal plate
- B. Motor casing
- C. Bearing seat
- D. Casing

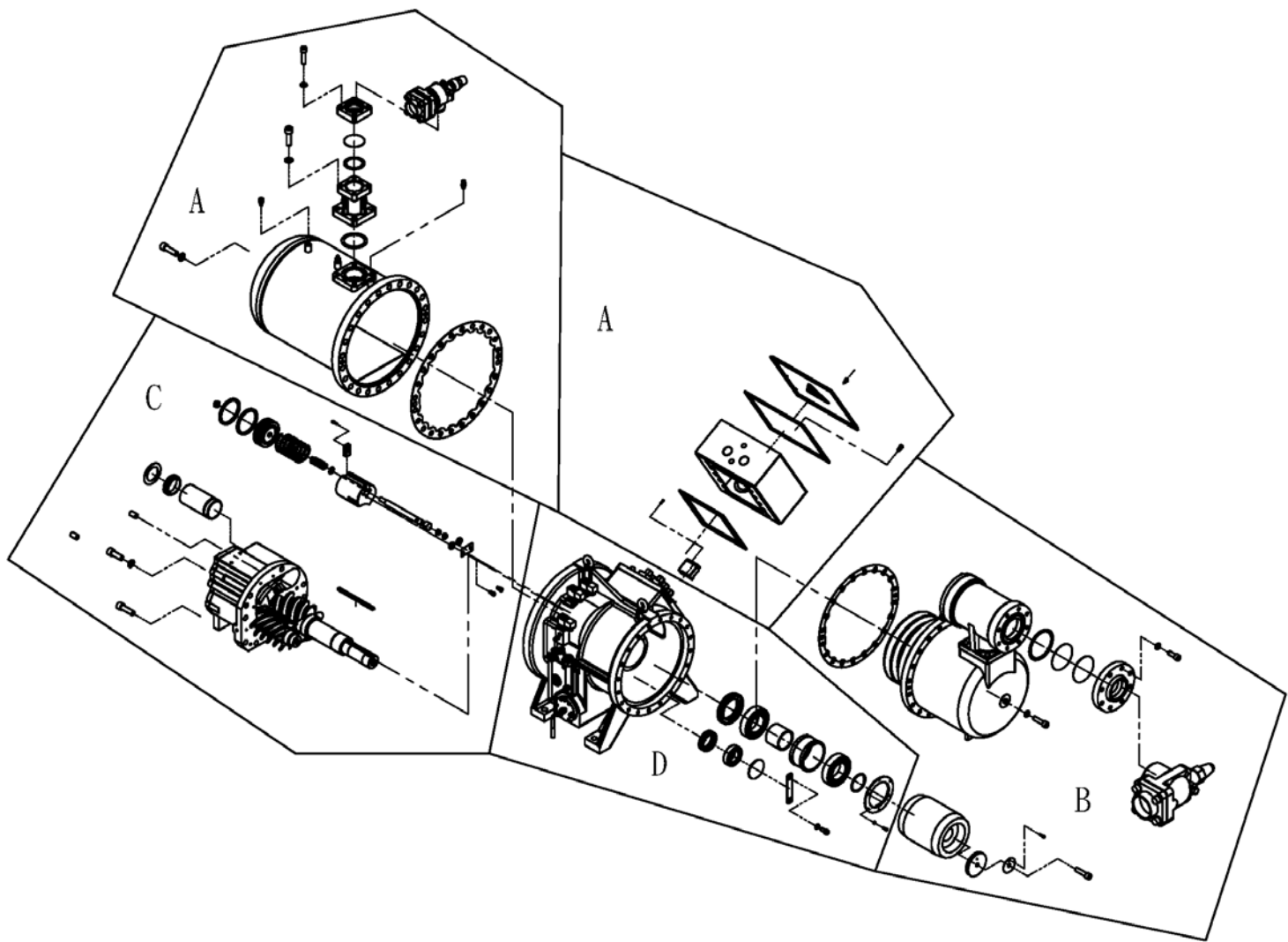


圖 Figure 2-1-2 SR-4 (H) ~SR-7 (H) 分解說明/ Disassembly illustration

◆ SR-8 (H) 分解說明

- A. 油分離器及接線盒
- B. 馬達側
- C. 軸承座
- D. 本體

◆ SR-8 (H) Disassembly illustration

- A. Oil separator and terminal plate
- B. Motor casing
- C. Bearing seat
- D. Casing

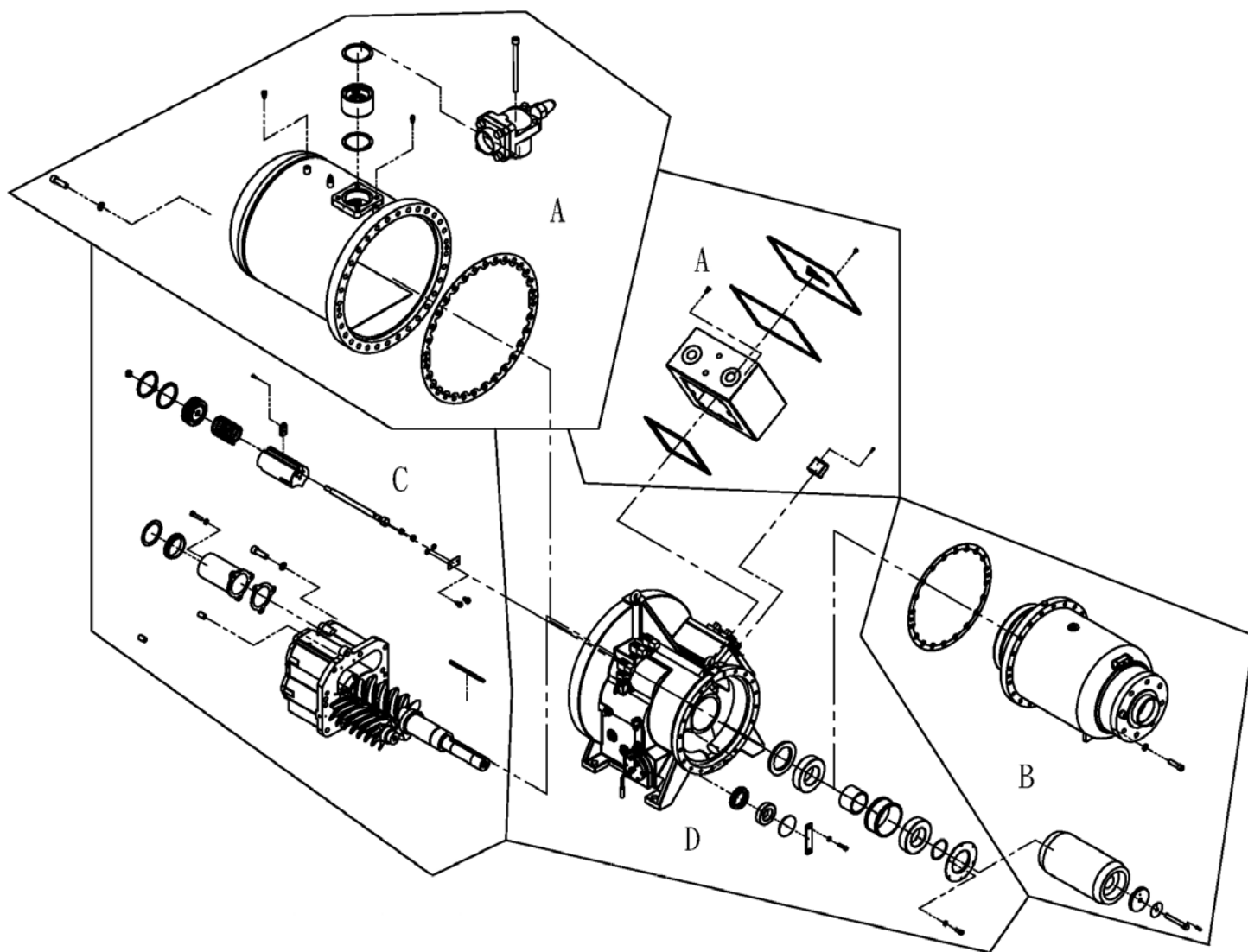


圖 Figure 2-1-3 SR-8 (H) ~SR-8 (H) 分解說明/ Disassembly illustration

◆ SR-434(H) II 分解說明

- A. 油分離器及接線盒
- B. 馬達側
- C. 軸承座
- D. 本體

◆ SR-434(H) II Disassembly illustration

- A. Oil separator and terminal plate
- B. Motor casing
- C. Bearing seat
- D. Casing

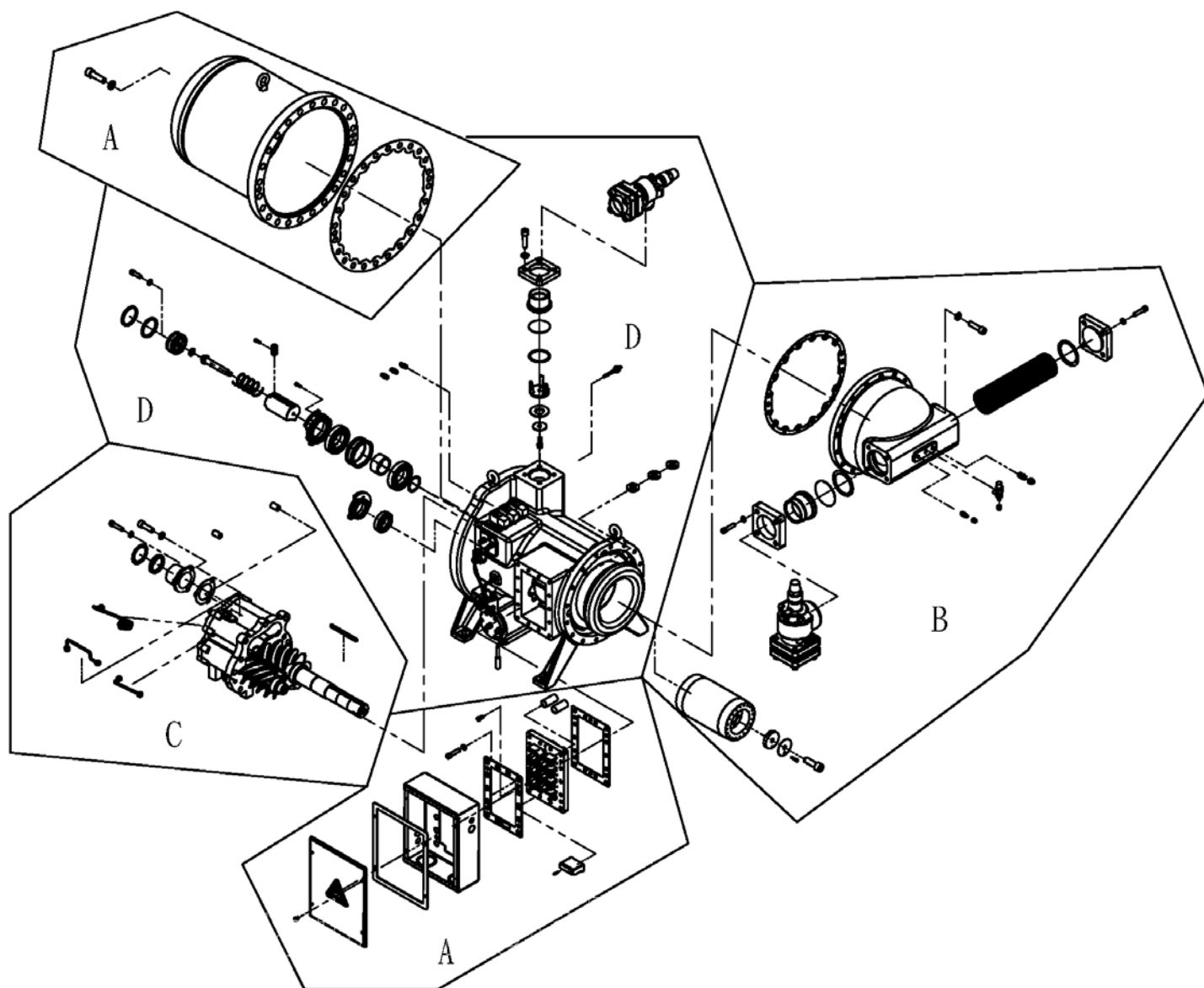


圖 Figure 2-1-4 SR-434 (H)II 分解說明/ Disassembly illustration

2.1 油分離器和接線盒

2.1.1 排放潤滑油

使用 M30 套筒將清潔孔蓋上的油塞頭拆下,排放潤滑油在預先準備的容器中.



圖 Figure 2-2-1 排放潤滑油/ Drain Oil.

2.1 Oil Separator & Terminal Plate

2.1.1 Drain Oil

Use M30 socket releases the plugged bolt on the draining hole and let the oil out.



圖 Figure 2-2-2 排放潤滑油/ Drain Oil.

注意!

回收的潤滑油建議不要重複使用

Attention!

It is not advisable to reuse drained oil.

2.1.2 拆解接線盒和數子蓋板

2.1.2 Take Apart Terminal Plate



圖 Figure 2-3 拆解接線盒和數子蓋板
Take apart terminal plate.

步驟

- ◆ 使用 M10 六角板手拆開盒蓋.
- ◆ 使用 M19 套筒鬆開馬達接線.
- ◆ 使用 M5 六角板手鬆開馬達保護器接線. 工具如表 2-1.

Procedure:

- ◆ Use the M10 Hex key wrench to remove the terminal plate.
- ◆ Use M19 socket to unlock motor cables.
- ◆ Use M5 Hex key wrench to unlock motor thermistor connecting wire. Tool is listed as table 2-1.

型號 Model	套筒 Socket	螺栓 Bolt
SR-1(H)~SR-3(H)	M10	M10X16L, 6pcs
SR-4(H)~SR-8(H)	M10	M12X20L, 8pcs
SR-434(H) II	M10	M12X16L, 4pcs

表 Table 2-1 拆解接線盒工具/ Tool list of taking apart terminal plate.

注意!

在開始細部分解之前,壓縮機型號 SR-4(H) ~ SR-8(H), SR-434(H)II 必須先將馬達接線從馬達接線蓋板分離。

Attention!

It is necessary to disassemble the motor electric from terminal plate of model SR-4(H)~SR-8(H), SR-434(H) II compressor before starting the overhaul.

2.1.3 壓縮機吊在工作台並鎖固

用天車將壓縮機吊起來,小心移到工作台上,對準四個後鎖上螺栓。所需螺栓及工具如表 2-2。

2.1.3 Lift and Fix the Compressor on Workbench

Hoist & move the compressor to the workbench by overhead crane and fix it with 4 fixing bolts on the workbench. Bolts and tool are listed as table 2-2.

型號 Model	螺絲 Bolt	數量 No.
SR-1(H)~SR-3(H)	M22	4
SR-4(H)~SR-8(H)	M24	4
SR-434(H) II	M16	4

表 Table 2-2 工作台壓縮機固定螺栓/ Bolt to fix the compressor.

2.1.4 油分離器拆解

2.1.4 Take Apart Oil Separator



圖 Figure 2-4 油分離器拆解
Take Apart Oil Separator

- ◆ 使用天車先勾住油分離器上的吊環
- ◆ 再使用 M17 六角板手鬆開油分離器法蘭上的螺絲, 預留兩根水平對角的螺絲掛在法蘭上, 防止油分離器掉落。工具如表 2-3。
- ◆ 利用法蘭上的螺絲孔, 將油分離器逼離本體一個適當間隙。
- ◆ Hook the oil separator on 2 eye bolts by overhead crane.
- ◆ Use M17 Hex key wrench to release bolts on the oil separator, reserve 2 horizontal bolts on the flange to prevent oil separator from falling to the ground. Tool is listed as table 2-3.
- ◆ Separate a proper gap by using the thread on the flange.

◆ 使用天車將油分離器分開。(圖 2-1)

◆ Spilt the oil separator housing from the casing.
(Figure 2-1)

型號 Model	SR-1	SR-2, 3		SR-4, 5, 6, 7	SR-8
套筒 Socket	M14	M17		M17	M17
螺絲 Bolt	M16X60L	M20X70L	M20X70L	M20X65L	M20X90L
數量 No.	20	20	20	24	32

表 Table 2-3 油分離器拆解工具/ Tool list of take apart oil separator.

2.2 馬達側

2.2 Motor Casing

2.2.1 進氣濾清器拆解

2.2.1 Take Apart Suction Filter

移開進氣濾清器接頭,目視檢查濾清器有無髒污阻塞而失去功能,若有則需用正廠零件更換。

Take out suction filter and examine if it had been clogged or malfunctioned due to excessive filth. If yes, replace it with authorized part.



圖 Figure 2-5-1 進氣濾清器拆解 SR-4~7/
Take Apart Suction Filter SR-4~7



圖 Figure 2-5-2 進氣濾清器拆解(SRA4~7)/
Take Apart Suction Filter (SRA4~7)

2.2.2 拆解馬達外殼

2.2.2 Take Apart Motor Cover & Motor Casing



圖 Figure 2-6-1 SR-1(H)~3(H) 拆解馬達外殼/
Take Apart Motor Cover & Motor Casing

SR-1(H)~3(H):

- ◆ 工作台旋轉 90 度,使馬達外殼朝上.
- ◆ 鎖附 2 個 M12 環首螺栓. 用天車的吊鉤勾住.
- ◆ 使用 M10 六角板手鬆開 20 根法蘭上的螺絲.然後慢慢的將馬達外殼吊離壓縮室.
- ◆ 使用馬達繞線保護罩,保護線圈,避免線圈直接接觸地面.

注意!

任何對線圈重擊或撕裂傷都可能造成馬達絕緣破壞.

SR-1(H)~3(H):

- ◆ Rotate workbench by 90° , make the motor end upward.
- ◆ Lock the M12 eye-bolt on the motor casing and hook it with an overhead crane.
- ◆ Use M10 Hex key wrench remove 20 fixed bolts on the motor casing flange and hoist it up slowly when separating motor casing from compression chamber
- ◆ Remove and put motor casing on the motor shelf to protect stator from damage.

Attention!

Damage of winding insulation may occurred when heavily hit or scratch the surface of the winding.



圖 Figure 2-6-2 SR-434 拆解馬達外殼/
Take Apart Motor Cover & Motor Casing

SR-434(H) II:

- ◆ 工作台旋轉 90 度.使吸氣端朝上.
- ◆ 吊起馬達前蓋.
- ◆ 鬆開馬達接線蓋板接線.
- ◆ 使用天車及適當吊具勾住馬達定部後,慢慢將馬達定部拉上來.

SR-434(H) II:

- ◆ Rotate the workbench by 90° , making suction end upward.
- ◆ Hoist motor casing cover.
- ◆ Unlock the wiring connection in the terminal plate.
- ◆ Slowly pull the stator of motor out by using the overhead crane.



圖 Figure 2-6-3 SR-4(H)~8(H) 拆解馬達外殼/
Take Apart Motor Cover & Motor Casing

SR-4(H)~8(H):

- ◆ 保持壓縮機在水平位置,鎖附 M16 及 M20 環首螺栓在馬達殼上.
- ◆ 用天車吊鉤勾住兩個環首螺栓後,鬆開法蘭上的 M16 螺絲慢慢的水平移動馬達殼從壓縮室分離.

SR-4(H)~8(H):

- ◆ Keep the compressor in horizontal position and lock the M16 & M20 eye bolts on the motor casing.
- ◆ Hook the eye bolts by the overhead crane, use the M14 hex key wrench to unlock the M16 fixed bolts and then separate the motor casing from the compression chamber of the compressor slowly by moving the crane.

2.2.3 拆解馬達轉部

2.2.3 Take Apart the Motor Rotor



圖 Figure 2-7 取下華司/
Take out the washer.



圖 Figure 2-8 拉出馬達轉部/
Pull the motor rotor out.

步驟:

- ◆ 取下華司.
- ◆ 取下馬達轉部鎖付螺絲.
- ◆ 取下馬達轉部固定螺絲墊片及固定擋片.
- ◆ 小心地拉出馬達轉部.

Procedure:

- ◆ Take out the washer.
- ◆ Take out the bolts on the motor rotor.
- ◆ Take out the fixed plate and washer.
- ◆ Carefully pull the motor rotor out.

2.3 軸承座

2.3.1 拆解排氣消音器

使用管板鉗固定消音器底部,鬆開. 避免扭曲消音器.

2.3 Bearing Seat

2.3.1 Take out Silencer

Use pipe wrench to clip the muffler in the bottom, unlock it . Avoid from distorting the muffler.



圖 Figure 2-9 拆解排氣消音器/
Take out silencer.

2.3.2 拆解軸承座蓋板

2.3.2 Take Apart Bearing Seat Cover



圖 Figure 2-10 拆解軸承座蓋板/
Take apart bearing seat cover.

使用 M10 六角板手鬆開固定螺絲.拆下蓋板. 工具如表 2-4.

Use M10 Hex key wrench to release fixed bolts on the cover first and then remove the cover. Tool is listed as table 2-4.

型號 Model	六角板手 Hex key wrench	螺栓 Bolts	數量 No.
SR-1(H)	M8	M10X40L	11
SR-2(H)~SR-5(H)	M10	M12X40L	15
SR-6(H)~SR-7(H)	M10	M12X40L	15
	M10	M12X50L	2
SR-434(H) II	M8	M10X40L	15
SR-8(H)	M10	M12X40L	17
		M12X50L	3

表 Table 2-4 拆解軸承座蓋板工具/ Tool list of taking apart bearing seat cover.

2.3.3 拆解公母轉子軸承壓環

2.3.3 Take Apart Bearing Spacer on Male & Female Rotor



圖 Figure 2-11 拆解軸承壓環/
Take apart bearing spacer.

2.3.4 拆解容調機構

2.3.4 Take Apart Capacity Modulation



圖 Figure 2-12 拆解容調機構
Take apart capacity modulation.

使用 M30 套筒及延長桿套住容調活塞桿，逆時針方向旋轉，取下活塞環，銅墊片及容調彈簧。

Use M30 socket & extension rod to hold the piston rod and rotate counterclockwise to take out the piston ring, copper wash and spring accordingly.

注意！

容調機構裡面有強力彈簧,請務必小心活塞鐵弗龍環, 避免發生意外.

Attention !

Since there is a strong spring located in the capacity modulation compartment, it is necessary to hold the cover while taking out the fixed bolts in order to avoid the accident from happening.

2.3.5 拆解軸承座

2.3.5 Take Apart Bearing Seat.



圖 Figure 2-13 拆解軸承座
Take apart bearing seat.

- ◆ SR-1(H)~SR-3(H): 使用 M14 六角板手;
SR-4(H)~SR-7(H), SR-434(H) II :
使用 M17 六角板手.

- ◆ SR-1(H)~SR-3(H): Use M14 Hex key wrench to take out bolts; SR-4(H)~SR-7(H), SR-434(H) II : Use M17 Hex key wrench to take out bolts

機型 Model	SR-1 SR-1H	SR-2 SR-2H	SR-3 SR-3H	SR-434 (H) II	SR-4 SR-4H	SR-5 SR-(H)	SR-6 SR-6H	SR-7 SR-7H	SR-8 SR-8H
六角板手 Hex key Wrench	M14	M14	M14	M14	M17	M17	M17	M17	M17
固定螺絲 bolt	M16X45L	M16X45L	M16X45L	M16X50L	M20X55L	M20X55L	M20X50L	M20X50L	M20X60L
數量 No.	3	7	7	8	4	4	8	8	10
固定螺絲 bolt	M16X50L	M16X60L	M16X60L		M20X65L	M20X65L			
數量 No.	3	1	1		4	4			

表 Table 2-5 拆解軸承座工具表/ Tool list of take apart bearing seat.

注意！

請個別註記各個螺絲位置,因為螺絲有不同長度. 工具如表 2-5:

Attention!

Mark the position of each bolt accordingly, keep the bolts of different length separately. Tool is listed as table 2-5.

2.3.6 拆解公母轉子

使用 U 型套筒拆解公母轉子上的 U 型螺帽. 工具如表 2-6.

2.3.6 Take apart male & female rotors

Use U type nut socket to take out U type nuts on the male & female rotors. Tool is listed as table 2-6.

步驟:

- ◆ 安裝公轉子抗迴轉治具(Mounting of anti-rotation fixture)

Procedure:



圖 Figure 2-14-1

- ◆ 套上 U 型套筒(U type nut socket)



圖 Figure 2-14-2

- ◆ 使用扳手鬆開螺帽.(Loose the nuts by wrench)



圖 Figure 2-14-3

- ◆ 取出螺帽(Take out the nut)

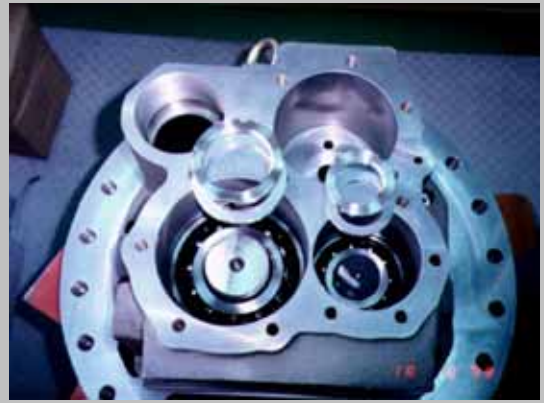


圖 Figure 2-14-4

- ◆ 取出公母轉子(Take out the female and male rotors)
 - ✓ 按裝油壓缸治具及 4 支銅製油壓缸支撐桿在轉子上。(Install hydraulic cylinder jig, using 4 copper rod on the female rotor)
 - ✓ 油壓缸桿對準母轉子中心。(Allow the rod of the hydraulic cylinder aim at the center of the female shaft.)
 - ✓ 讓油壓缸動作, 驅使母轉子脫離。(Drive the cylinder, pushing the female rotor out.)
 - ✓ 重複步驟取出公轉子。(Take out the male rotor as the same procedure.)

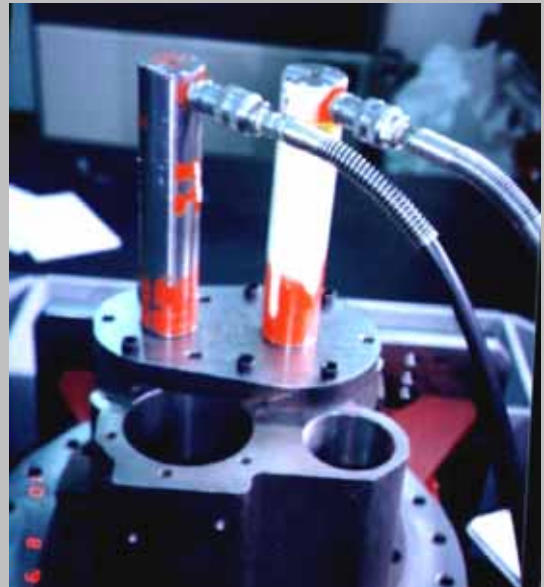


圖 Figure 2-14-5

型號 Model	SR-1 SR-1H	SR-2 SR-2H	SR-3 SR-3H	SR-434 (H) II	SR-4 SR-4H	SR-5 SR-5H	SR-6 SR-6H	SR-7 SR-7H	SR-8 SR-8H
公轉子 U 型螺帽 U type nuts on the male	M45	M50	M50	M55	M65	M65	M75	M75	M75
母轉子 U 型螺帽 U type nuts on the female	M35	M35	M35	M40	M45	M45	M50	M50	M50

表 Table 2-6 拆解公母轉子工具/ Tool list of taking apart male & female rotor.

2.3.7 拆解軸承座上的軸承

2.3.7 Take Apart Bearings on the Bearing Seat



圖 Figure 2-15 拆解軸承座上的軸承/
Take apart bearings on the bearing seat.

- ◆ 將軸承座放在工作台上,使軸承端蓋端面朝上, 軸承出口端面朝下.
- ◆ 將軸承拆卸器的軸頸部插入軸承內環.
- ◆ 用鐵鎚敲擊軸承拆卸器使軸承慢慢滑出.
- ◆ Put bearing seat on the workbench, allowing cover side of the bearing seat upward while bearing exit downward.
- ◆ Insert the neck of into the bearing inner ring the bearing remover.
- ◆ Hit the bearing remover by a hammer, slowly take out the bearing.

2.4 本體

2.4.1 拆解機油過濾器

2.4 Casing

2.4.1 Take Apart the Oil Filter



圖 Figure 2-16 拆解機油過濾器/
Take apart the oil filter.

- ◆ 使用六角扳手鬆開螺絲，緩慢取出機油濾清器，工具如表 2-7.
- ◆ Use Hex key wrench to unlock the bolt, take out the oil filter slowly, tool is listed as table 2-7.

型號 Model	SR-1 SR-1H	SR-2 SR-2H	SR-3 SR-3H	SR-434 (H) II	SR-4 SR-4H	SR-5 SR-5H	SR-6 SR-6H	SR-7 SR-7H	SR-8 SR-8H
六角扳手 Hex key Wrench	M8	M10	M10	M8	M10	M10	M10	M10	M10
螺絲 Bolt	M10X35 L	M12X35L	M12X35L	M12X40L	M12X40L	M12X40L	M12X40L	M12X40L	M12X40L
數量 No.	4	6	6	6	6	6	6	6	6

表 Table 2-7 拆解機油過濾器工具/ Tool list of taking apart the oil filter.

第三章 組裝程序

3.1 軸承組裝

3.1.1 轉子組裝

Chapter 3 Assembly Procedure

3.1 Bearing Assembly

3.1.1 Bearing on Rotors



圖 Figure 3-1 公轉子組裝
Male rotor assembly.



圖 Figure 3-2 母轉子組裝
Female rotor assembly.

- ◆ 將壓縮機本體固鎖在工作台上，並使排氣端朝上。
 - ◆ 將公轉子垂直放入壓縮室並注意避免齒型碰傷。
 - ◆ 將母轉子用旋轉的方式，滑入公轉子。
 - ◆ 確定本體、公母轉子排氣端面在同一平面。
- ◆ Fix compressor casing on the workbench, allowing discharging end upward.
 - ◆ Vertically install male rotor to the compression chamber and pay attention to avoid bumping the rotor lobes while installing.
 - ◆ Rotate and fit female rotor flutes into male rotor lobes.
 - ◆ Verify the ends of casing, male and female rotor are lying on the same ground level.

3.1.2 量測排氣間隙尺寸



圖 Figure 3-3 量測軸承穴之深度/
Measure the depth of bearing cavity

- ◆ 用分離卡量測壓縮室軸承穴之深度得尺寸 A
- ◆ 量測轉子軸頸長度得尺寸 B
- ◆ 計算排氣間隙環尺寸如下所示公式:

排氣間隙環尺寸=A - B +C
其中 C 為排氣間隙,依不同機型,控制在
0.03~0.08mm 之間.(參考表 3-3)

3.1.2 Measure the Thickness of Discharging Spacer Ring



圖 Figure 3-4 量測轉子軸頸長度/
Measure the length of the rotor journal

- ◆ Measure the depth of bearing cavity on compression chamber by micrometer, getting dimension A.
- ◆ Measure the length of the rotor journal, getting dimension B.
- ◆ Calculate the thickness of the spacer ring as follows:

Discharge spacer ring thickness=A - B +C
While C stand for discharging clearance, controlling it
at 0.03~0.08mm, depending on different
model.(Reference table 3-3)

3.1.3 軸承座之軸承安裝

各機型所需軸承座軸承型號如下表所示:

型號 Model	公轉子 Male rotor	母轉子 Female rotor	
SR1(H)	SKF, 7309 BEGAP 3pcs FAG, 7309 BUO 3pcs	SKF, NU2207 ECP 1pc FAG, NU2207 ETVP2 1pc	SKF, 7207 BEGAP 2pcs FAG, 7207 BUO 2pcs
SR2,3(H)	SKF, 7310 BEGAP 3pcs FAG, 7310 BUO 3pcs	SKF, NU2307 ECP 1pc FAG, NU2307 ETVP2 1pc	SKF, 7307 BEGAP 2pcs FAG, 7307 BUO 2pcs
SR4,5(H)	SKF, 7313 BEGAP 3pcs FAG, 7313 BUO 3pcs	SKF, NU2309 ECP 1pc FAG, NU2309 ETVP2 1pc	SKF, 7309 BEGAP 2pcs FAG, 7309 BUO 2pcs
SR6,7(H)	SKF, 7315 BEGAP 3pcs FAG, 7315 BUO 3pcs	SKF, NU2310 ECP 1pc FAG, NU2310 ETVP2 1pc	SKF, 7310 BEGAP 2pcs FAG, 7310 BUO 2pcs
SR8(H)	SKF, 7315 BEGAP 3pcs FAG, 7315 BUO 3pcs SKF, NU315 ECP 1pc FAG, NU315 ETVP2 1pc	SKF, NU2310 ECP 1pc FAG, NU2310 ETVP2 1pc	SKF, 7310 BEGAP 2pcs FAG, 7310 BUO 2pcs
SR-434(H) II	SKF, 7311 BEGAP 3pcs FAG, 7311 BUO 3pcs SKF, NU311 ECP 1pc FAG, NU311 ETVP2 1pc	SKF, NU2308 ECP 1pc FAG, NU2308 ETVP2 1pc	SKF, 7308 BEGAP 2pcs FAG, 7308 BUO 2pcs

表 Table 3-1 軸承座軸承表/ Bearing on the bearing seat.

3.1.3 Bearings on Bearing Seat

Each model of bearing on the bearing seat required are showed as follows:

程序:

- 鎖付 2 個環首螺栓用天車吊起軸承座至壓縮機正上方緩慢下降將一對轉子導入壓縮室, 必要時用兩根 pin 及轉子護環做補助.(圖 3-5)/ Lock 2 eye-bolts on bearing seat and lift it by head crane. Slide down to compression chamber, and position it with 2 pins on the compression chamber. Use 2 guide pins and rotor protection ring as auxiliary.(Figure 3-5)

Procedure:



圖 Figure 3-5

- ◆ 用適當扭力對角鎖 2 根螺絲。(圖 3-6)/ Lock 2 bolts diagonally with proper torque.(Figure 3-6)



圖 Figure 3-6

- ◆ 放入間隔環軸承,鎖上四根螺栓及油壓缸治具(圖 3-7)/ Put spacer and bearing into the bearing cavity of the bearing seat. Then lock 4 rods (both sides with thread) and hydraulic cylinder jig.(Figure 3-7)

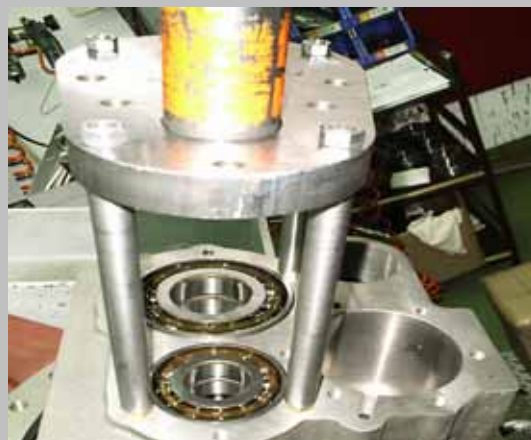


圖 Figure 3-7

- ◆ 作動油壓缸, 壓軸承進入軸頸及壓縮室. 使用延伸導套做輔助工具(圖 3-8). / Activate the hydraulic cylinder, pressing the bearing into the rotor journal, Using extension sleeve as auxiliary.(Figure 3-8)



圖 Figure 3-8

- ◆ 使用公轉子抗轉治具固定公轉子.(圖 3-9)/ Fix male rotor by anti-rotation jig.(Figure 3-9)

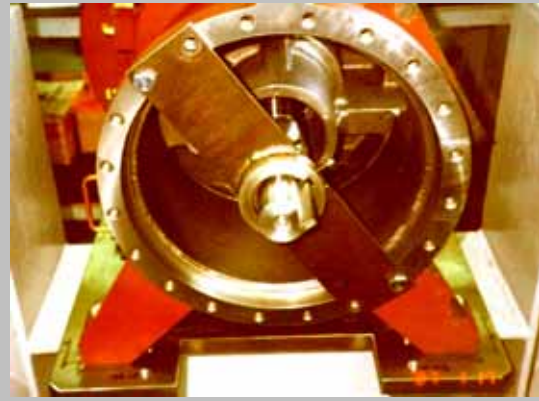


圖 Figure 3-9

- ◆ 鎖付 U 型螺帽,檢查轉子是否運轉順利,加上些許潤滑油.(圖 3-10). 軸承 U 型螺帽鎖緊扭力,參參考表 3-2 / Lock the U nut on both rotors. Rotate the rotor, examining if they were working smoothly. If yes, lubricate with some oil.(Figure 3-10). The tightness torque of U nut on the bearing are showed on table 3-2.



圖 Figure 3-10

軸承鎖緊扭力 Bearing tightness torque	第一次(單位:牛頓·米) first time (unit N·m)		第二次(單位:牛頓·米) second time (unit N·m)	
	公轉子 Male rotor	母轉子 Female rotor	公轉子 Male rotor	母轉子 Female rotor
Model 型號				
SR-1(H)	300	250	150	100
SR-2(H)~SR-3(H)	300	250	150	100
SR-434(H) II	600	300	350	200
SR-4(H)~SR-5(H)	450	350	250	200
SR-6(H)~SR-8(H)	500	400	300	250

表 Table 3-2 軸承 U 型螺帽鎖緊扭力/ Tightness torque of U nut on the bearing.

3.1.4 量測排氣間隙

3.1.4 Measure Clearance on Male and Female Rotor Discharge ends



圖 Figure 3-11 量測公轉子排氣間隙/
Measure male rotor clearance



圖 Figure 3-12 量測母轉子排氣間隙/
Measure female rotor clearance.

- ◆ 鬆開兩根螺絲，用天車舉起軸承座，用測隙片量測間隙值，建議值如表 3-3.
- ◆ 將軸承座組立準備好放在一旁進程序 3.2
- ◆ Unlock 2 bolts Lift bearing seat by the overhead crane and measure discharging end clearance by feeler gauge. Recommended clearances are listed on table 3-3.
- ◆ Allowing the bearing seat sub-assembly stand-by, go procedure 3.2

型號 Model	建議值 Recommended clearance
SR-1,2,3(H)	0.03~0.06mm
SR-434(H) II	0.05~0.08mm
SR-4,5,6,7,8(H)	0.05~0.08mm

表 Table 3-3 量測排氣間隙/ Measure discharging end clearance.

3.2 壓縮室

3.2.1 壓縮室軸承組裝

3.2 Compression Chamber

3.2.1 Bearing Installation on Compression Chamber

型號 Model	公轉子軸承 Male rotor bearing	母轉子軸承 Female rotor bearing
SR-1(H)	SKF NU211, ECP 2pcs FAG NU211, ETVP 2pcs	NJ2206, ECP 1pc NJ2206, ETVP2 1pc
SR-2,3(H)	SKF NU211, ECP 2pcs FAG NU211, ETVP 2pcs	NJ2208, ECP 1pc NJ2208, ETVP2 1pc
SR-434(H) II	SKF NU212, ECP 2pcs FAG NU212, ETVP 2pcs	NJ2208, ECP 1pc NJ2208, ETVP2 1pc
SR-4,5(H)	SKF NU2116, ECP 2pcs FAG NU2116, ETVP 2pcs	NJ2210, ECP 1pc NJ2210, ETVP2 1pc
SR-6,7,8(H)	SKF NU2118, ECP 2pcs FAG NU2118, ETVP 2pcs	NJ2211, ECP 1pc NJ2211, ETVP2 1pc

表 Table 3-4 壓縮室軸承需求表 / Bearing required in compression chamber.

程序

- ◆ 將公母轉子軸承內環在超音波裝置中預熱至 125°C~130°C，再趁熱分別放入軸承座次組立中的公母轉子內。
- ◆ 用加熱裝置預熱壓縮室之軸承穴約 15 分鐘，使軸承穴孔徑膨脹後，置入軸承外環及間格環，再用輔助套筒壓緊。

Procedure:

- ◆ Pre-heat both of male and female bearing collars by supersonic device until temperature reach to 125°C~130°C, inserting the heated collars into the male and female rotor when they are at desired temperature.
- ◆ Pre-heat the compressor chamber by a heater around 15 minutes until the diameter of bearing cavity expands, put female rotor bearing race and spacer ring into the bearing cavity and press it by an auxiliary sleeve.

3.2.2 軸承座和壓縮室的組裝程序

3.2.2 Assembly Procedure of Bearing Seat and Compression Chamber

程序:

- ◆ 旋轉工作台使壓縮室排氣端朝上。(圖 3-13)/ Rotate workbench, allowing discharging end of the compression chamber upward.(Figure 3-13)

Procedure:



圖 Figure 3-13

- ◆ 檢查容調閥滑塊是否可以上下來回滑動平順,裝固定鍵梢確認是否有干涉情況. 如果有請調整固定鍵位置. (圖 3-14)/ Examine if the capacity control slider could smoothly moving back and forth. Also apply positioning key, verify if there is any interference occurred. If it is, adjust the position of the key, check it again until this function works well. (Figure 3-14)



圖 Figure 3-14

- ◆ 在本體排氣頂端油通道的四周圍塗上少許的密封膠, 插入兩根定位梢,吊起軸承座緩慢放入本體.(圖 3-15) / Apply a little sealing compound around oil passage on contact surface of the discharging end. Insert 2 lock pins, lift bearing seat and slide it into the casing carefully. (Figure 3-15)



圖 Figure 3-15

- ◆ 對角鎖付螺絲施予適當扭力. (圖 3-16) / Lock the bolts diagonally with proper torque. (Figure 3-16)



圖 Figure 3-16

- ◆ 裝C型扣環在公轉子的溝槽內, 以防上軸承滑出. (圖 3-17) / Install C-ring into the clip groove of male rotor on bearing so as to prevent bearing from sliding out. (Figure 3-17)



圖 Figure 3-17

3.3 馬達側

3.3 Motor Casing

3.3.1 量測公母轉子軸向間隙

3.3.1 Measuring Axial Clearance Male and Female Rotors



圖 Figure 3-18 量測軸向間隙值
Measure axial clearance.



圖 Figure 3-19 固定轉子軸承/
Fix the rotor bearing.

轉動公轉子檢查是否有干涉發生.; 若有干涉, 則用測隙片量測間隙值, 直到間隙符合表 3-5 的值; 若沒有干涉, 則用軸承壓環固定公母轉子. (圖 3-18,19)

Rotate the male rotor, check if there is any interference occurred.; If interference occurred, measure clearance by feeler gauge, adjust the clearance until it match the valve showed it table 3-5; If there is no interference, fix the male and female rotor with bearing spacer ring. (Figure 3-18,19)

型號 Model	建議值 clearance (unit : mm)
SR-1(H)	0.04~0.07
SR-2,3(H)	0.05~0.08
SR-434(H) II	0.07~0.11
SR-4,5,6,7(H)	0.07~0.11
SR-8(H)	0.06~0.16

表 Table 3-5 轉子軸向間隙/ Axial clearance of rotor.

3.3.2 馬達轉部組立

3.3.2 Motor Rotor Assembly

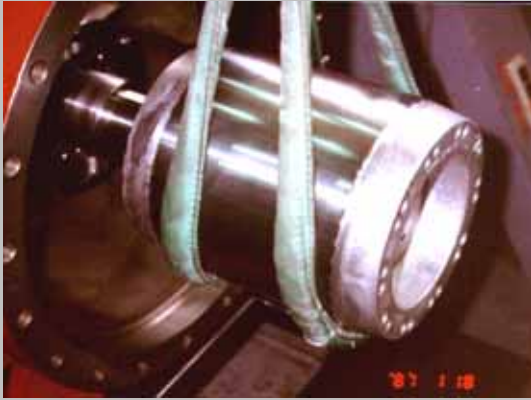


圖 Figure 3-20 馬達轉部組立/
Motor rotor assembly.



圖 Figure 3-21 固定馬達轉部
Fix the motor rotor.

- ◆ 在公轉子軸驅動端鍵槽內放入馬達轉部固定擋片。
- ◆ 將轉部裝入軸心，將固定擋片對準放入軸心並鎖附螺絲。
- ◆ Install motor rotor key on key groove of the male rotor shaft driver end.
- ◆ Install the motor rotor on the shaft, put the washer on the shaft, follow align mark and lock the bolt.

3.3.3 量測轉部同心度

3.3.3 Measure Eccentricity of the Motor Rotor



圖 Figure 3-22 量測馬達轉部同心度/
Measure eccentricity of the motor rotor.

- ◆ 轉部鎖固後，固定針盤指示表在機殼上，探針接觸轉部最外端約 10mm~15mm 之光滑處。
- ◆ 轉動轉部讀出指針變動的數據，可接受範圍在 0.2mm 以內。(圖 3-22)
- ◆ After motor rotor is fixed, take the dial indicator, fix it on the edge of the suction end and use its probe to touch the motor rotor at smooth surface away from the end of the motor rotor by about 10~15mm.
- ◆ Rotate the rotor and read the variable range of the indicator pointer. The acceptable range is recommended within 0.2mm. (Figure 3-22)

3.3.4 馬達和本體組裝

3.3.4 Motor and Casing Assembly



- ◆ SR-1~3 機型, 由本體上方裝入馬達殼. (圖 3-23);
SR-4~8 機型, 由本體水平方向裝入馬達殼. (圖 3-24)

- ◆ For model SR-1~3, assembly the motor from the top of casing (Figure 3-23), while model SR-4~8 at the horizontal direction. (Figure 3-24)

注意:

任何碰撞, 都可能降低馬達絕緣, 減短壓縮機使用壽命。

Attention:

Any collisions at the motor winding may lower the insulation and reduce the lifespan of compressor.



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