

A/C COMPRESSOR SERVICING

Article Text

1989 Volkswagen Golf
For Volkswagen Technical Site
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Monday, August 23, 1999 11:35PM

ARTICLE BEGINNING

1989 GENERAL SERVICING
Compressor Service

*** PLEASE READ THIS FIRST ***

CAUTION: When discharging air conditioning system, use only approved refrigerant recovery/recycling equipment. Make every attempt to avoid discharging refrigerant into the atmosphere.

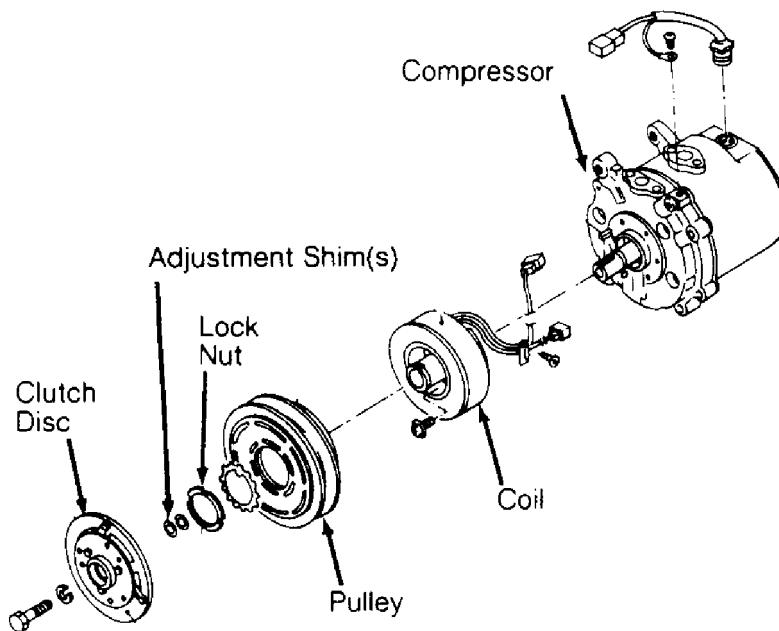
ATSUGI ROTARY VANE CLUTCH R & I

Removal

When replacing compressor clutch, be careful not to scratch shaft or bend pulley. When removing center bolt, hold clutch disc with Clutch Holder (KV99231010). Using Hub Puller (KV998VR001 & KV99231010), remove clutch disc. When removing pulley, remove lock nut with Hub Socket (KV99235160).

Installation

Wipe oil off clutch surface. Adjust disc pulley clearance to .012-.024" (.3-.6 mm). Tighten center bolt to 80-104 INCH lbs. (9.1-11.8 N.m). Tighten clutch lock nut to 22-29 ft. lbs. (29-39 N.m). See Fig. 1.



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Fig. 1: Atsugi Rotary Vane Compressor
Courtesy of Nissan Motor Co., U. S. A.

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BOSCH 6-CYL CLUTCH R & I

Removal

1) Hold clutch plate and remove shaft nut. Using Clutch Plate Remover (64 5 00), remove clutch plate. Using snap ring pliers, remove circlip and remove pulley assembly.

2) If pulley bearing is being replaced, remove circlip at rear of pulley. Press bearing and spacer from pulley. Press in new bearing with spacer and replace circlip.

Installation

1) Clean all surfaces. Install pulley assembly on compressor and install circlip. Ensure clutch plate shim is in place on shaft. Install clutch plate and nut. Tighten nut to 13-14 ft. lbs. (18-20 N. m).

2) Using a feeler gauge, check clutch plate-to-pulley clearance. Clearance should be .028-.051" (.7-1.3 mm). If clearance is not correct, remove clutch plate and replace clutch plate shim. See Fig. 2.

BOSCH 6-CYL SHAFT SEAL R & I

Removal & Installation

1) Remove clutch plate. Remove shaft key and circlip. Using Seal Seat Remover/Installer (64 5 030), remove seal seat.

2) Using Seal Remover/Installer (64 5 040), remove shaft seal by turning seal slightly clockwise to disengage tangs and pull out shaft seal. Remove "O" ring seal.

3) Coat new "O" ring seal with refrigerant oil and install. Coat new shaft seal with refrigerant oil and install shaft seal on Seal Remover/Installer (64 5 040). Ensure alignment of shaft seal and shaft machine surfaces. Insert shaft seal and turn slightly counterclockwise to secure on shaft.

4) Using sleeve from Seal Seat Remover/Installer (64 5 030), push seal seat into compressor and install circlip. Install shaft key and clutch plate. Check compressor oil level before charging system.

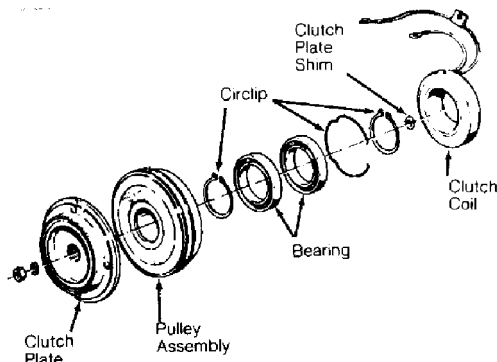


Fig. 2: Bosch 6-Cylinder Compressor Clutch
Courtesy of BMW of North America, Inc.

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DIESEL KIKI ROTARY VANE CLUTCH R & I

Removal

1) Using Clutch Holder (KV99231010), hold clutch disc. Remove center bolt retaining clutch assembly to shaft. Thread Hub Remover (KV99232232) into bore of clutch hub. Hold hub remover with wrench and thread center bolt inward until clutch disc is removed.

2) Remove clutch disc, collar and adjusting shims. Remove snap ring and plate. Remove pulley and bearing assembly. If assembly cannot be removed by hand, use a puller and adapter.

3) Be careful not to scratch shaft or bend pulley. Using an impact driver, loosen 6 coil mounting screws. Remove key and clutch coil. See Fig. 3.

Installation

1) Install key. Position coil assembly on compressor body. Be sure that electrical terminals are installed in original position. Install and tighten coil mounting screws to 35-52 INCH lbs. (4-6 N.m).

2) Press pulley assembly onto neck of coil assembly using Pulley Installer (KV99234160). Wipe oil thoroughly off clutch surface. Select adjusting shims which give correct clearance between pulley and clutch disc.

3) Using a plastic mallet, tap clutch disc in place on drive shaft. Do not use excessive force with plastic mallet or press. Place spring washer and center bolt onto drive shaft. Tighten center bolt to drive clutch wheel onto drive shaft. Tighten center bolt to 11-13 ft. lbs. (15-18 N.m).

4) Hold clutch with Clutch Holder (KV99231010). Check clearance around entire outer edge of clutch disc. Clearance should be .012-.024" (.3-.6 mm). If specified clearance is not obtained, replace adjusting shims as required.

5) When replacing compressor clutch assembly, break-in procedure must be performed. This is accomplished by engaging and disengaging clutch 30 times.

DIESEL KIKI 6-CYL CLUTCH COIL R & I

Removal & Installation

Using clutch holder to prevent clutch disc rotation, remove bolt. Using clutch holder and puller, remove clutch disc. Remove shims from compressor drive shaft or clutch disc. Remove snap ring with external snap ring pliers and then remove pulley. Using a gear puller, remove pulley. Remove coil lead wire and 6 screws. Remove coil. To install, reverse removal procedure. Adjust clutch disc-to-pulley clearance to .010-.020" (.3-.6 mm). See Fig. 4.

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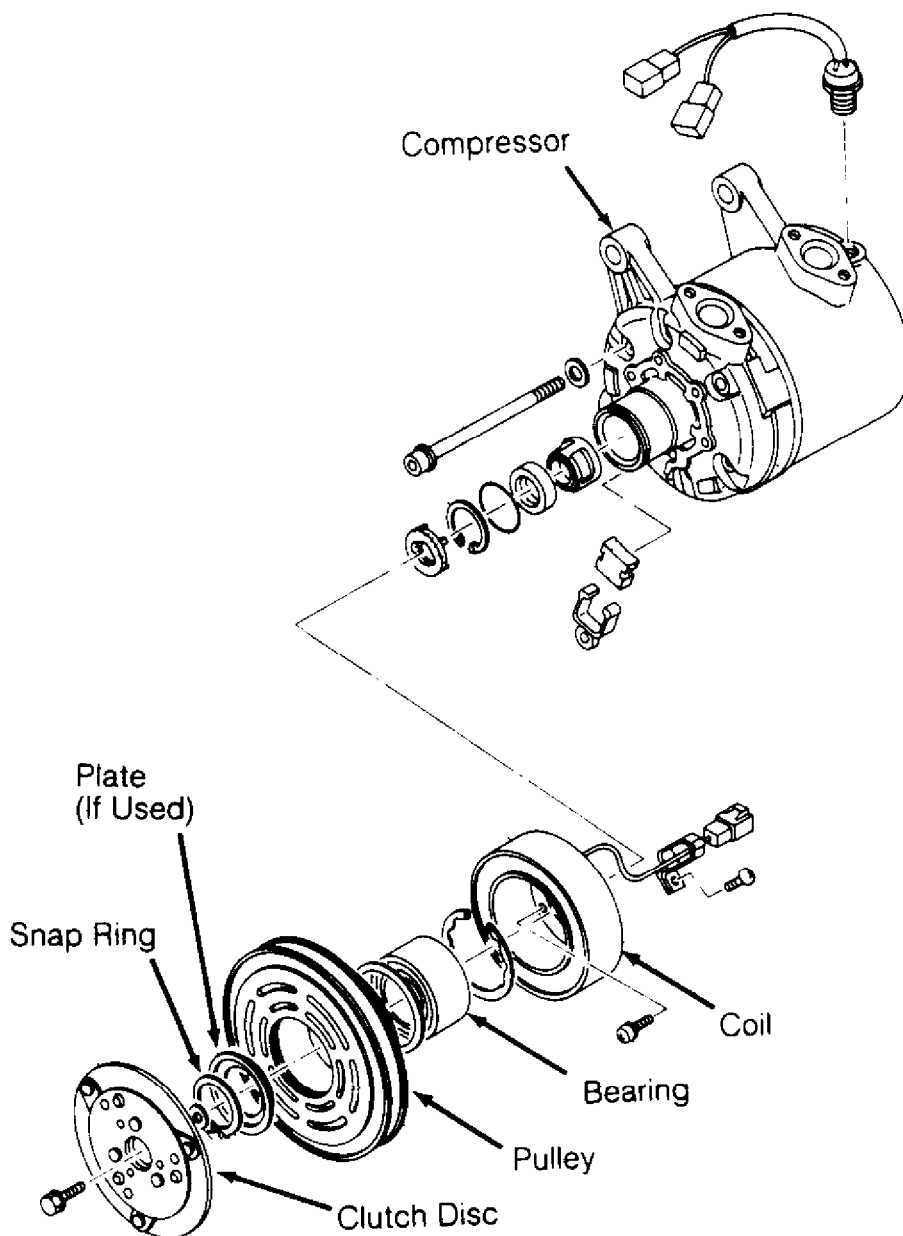
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Fig. 3: Diesel Kiki Rotary Vane Compressor
Courtesy of Nissan Motor Co., U.S.A.

DIESEL KIKI 6-CYL SHAFT SEAL R & I

Removal & Installation

1) Remove clutch coil assembly. Remove retainer and felt. Discard retainer and felt. Using internal snap ring pliers, remove seal seat snap ring. Remove seal seat and discard. Using a seal pick, remove "O" ring from inside groove of shaft seal housing. Discard "O" ring.

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2) To remove shaft seal, push down and turn clockwise on seal remover to engage tangs. Slowly draw seal from bore. Discard seal. Check shaft and inside of compressor neck for dirt or foreign material and ensure these areas are perfectly clean before installing new seal.

3) To install, reverse removal procedure. Coat "O" ring, shaft seal, and seal seat with new refrigerant oil. See REFRIGERANT OIL & R-12 SPECIFICATIONS chart in this section for system capacities.

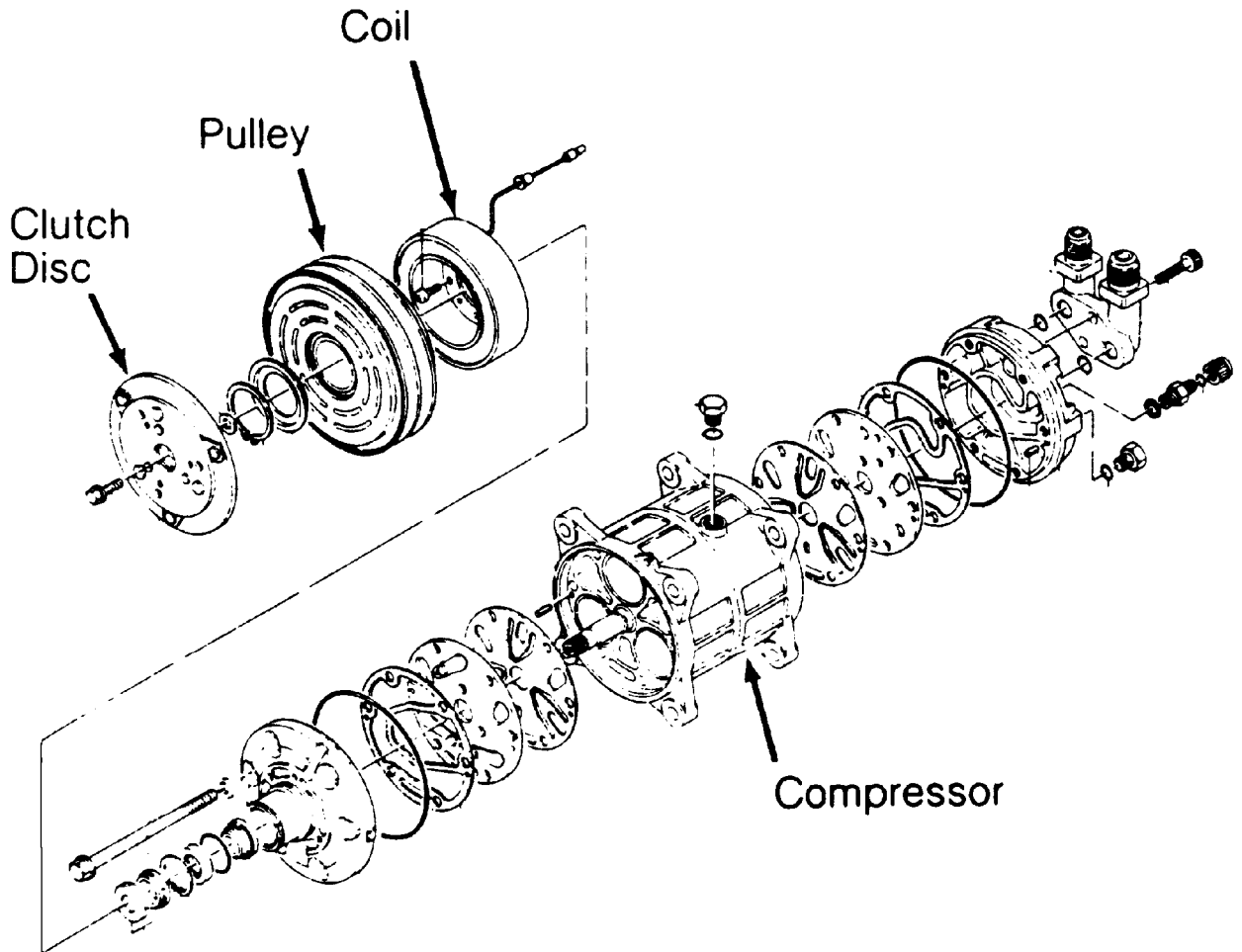


Fig. 4: Diesel Kiki 6-Cylinder Compressor
Courtesy of Mitsubishi Motor Sales of America.

HARRISON R4 4-CYL CLUTCH R & I

Removal

1) Clamp Holding Fixture (J-25008-A) in a vise and attach compressor to holding fixture with thumb screws. Use Clutch Hub Holder (J-33027) to hold clutch. Remove shaft nut using Shaft Nut Socket (J-9399).

2) Thread Clutch Plate and Hub Assembly Remover (J-33013-B) into hub. Hold body of remover with a wrench and turn center screw into remover body to remove clutch plate and hub assembly. Remove

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shaft key and retain for assembly. See Fig. 5.

NOTE: DO NOT drive or pound on clutch hub or shaft.

Installation

1) Install shaft key into hub key groove. Allow key to project approximately 1/8" out of keyway. Shaft key is curved slightly to provide an interference fit in hub key groove.

2) Be sure frictional surface of clutch plate and clutch rotor are clean before installing clutch plate and hub assembly. Align shaft key with shaft keyway and place clutch plate and hub assembly onto compressor shaft.

3) Hold hex portion of Installer (J-9480-B) with a wrench. Tighten center screw to press hub into shaft until there is .020-.040" (.5-1.0 mm) air gap between frictional plate and clutch rotor.

4) Install new shaft nut with small diameter boss of nut against crankshaft shoulder. Use Thin Wall Socket (J-9399) and Clutch Hub Holder (J-25030). Tighten shaft nut to 10 ft. lbs. (14 N.m). Spin pulley rotor by hand to ensure rotor is not rubbing on clutch drive plate.

HARRISON R4 4-CYL SHAFT SEAL R & I

Removal

1) Clamp Holding Fixture (J-25008-A) in a vise and attach compressor to holding fixture with thumb screws. Use Clutch Hub Holder (J-33027) to hold clutch. Remove shaft nut using Shaft Nut Socket (J-9399).

2) Thread Clutch Plate and Hub Assembly Remover (J-33013-B) into hub. Hold body of remover with a wrench and turn center screw into remover body to remove clutch plate and hub assembly. Remove clutch plate and shaft key. Pry out dust seal (if equipped). Remove seal seat snap ring. Thoroughly clean compressor neck area and "O" ring groove surrounding shaft. Any dirt or foreign material may cause compressor damage.

3) Use Seal Remover/Installer (J23128-A), remove seal with a twisting motion. Use "O" Ring Remover (J-9553-01) to remove "O" ring.

Installation

1) Coat new shaft seal with refrigerant oil and install shaft seal on remover/installer. Align compressor shaft machined surface with shaft seal and install. Turn remover/installer slightly counterclockwise to secure shaft seal tangs.

2) Using Seal Installer (J-33011), install "O" ring and coat with refrigerant oil. Coat seal seat with refrigerant oil and install using seal seat remover/installer. Install snap ring. Install dust seal (if supplied in seal kit). See Fig. 5.

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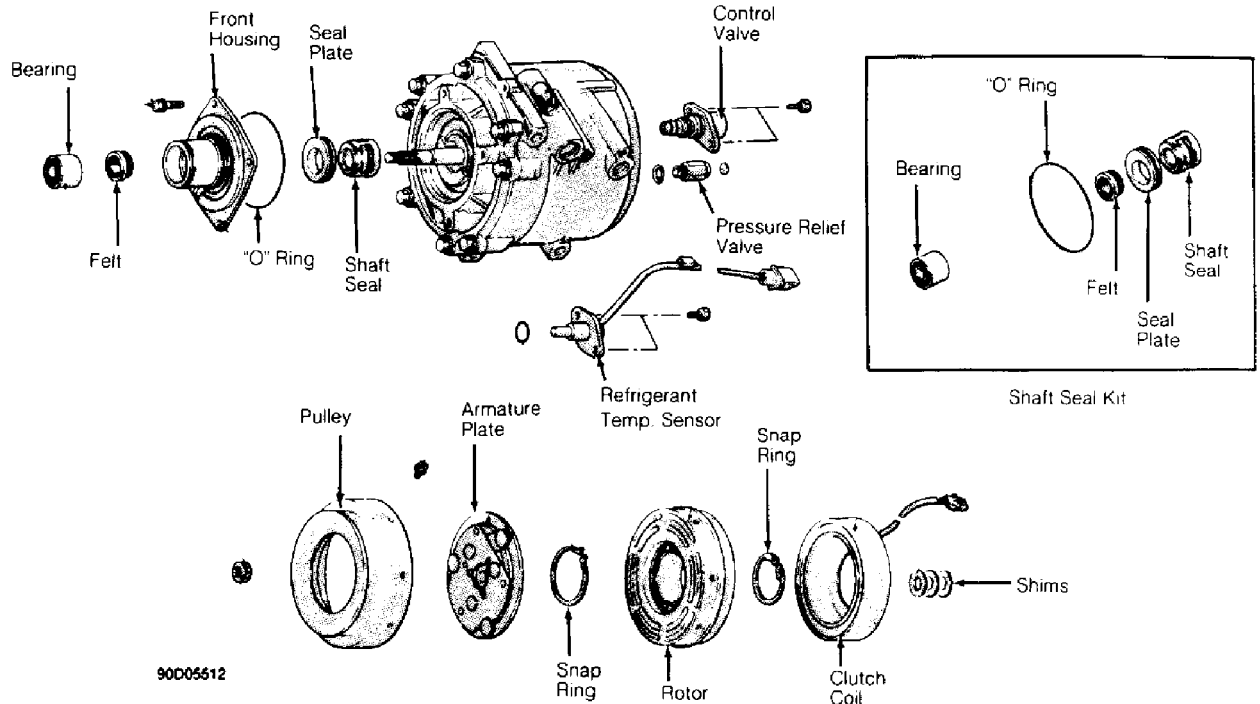


Fig. 5: Harrison R-4 Radial Compressor
Courtesy of Isuzu Motor Co.

HARRISON A6 6-CYL CLUTCH R & I

NOTE: Kent-Moore tool numbers are supplied.

Removal

1) Clamp Holding Fixture (J-33026) in a vise and attach compressor to holding fixture with Thumb Screws (J-33026 1). Using Clutch Hub Holder (J-33027) to hold clutch, remove shaft nut using Shaft Nut Socket (J-33022).

2) Thread Clutch Plate Remover/Installer (J-33013) into hub. Hold body of remover with a wrench and turn center screw into remover body to remove clutch plate and hub assembly. Remove shaft key and retain for assembly.

NOTE: DO NOT drive or pound on clutch hub or shaft.

Installation

1) Install shaft key into hub key groove. Allow key to project approximately 1/8" out of keyway. Shaft key is curved slightly to provide an interference fit in hub key groove.

2) Be sure frictional surface of clutch plate and clutch rotor are clean before installing clutch plate and hub assembly. Align shaft key with shaft keyway and place clutch plate and hub assembly onto compressor shaft.

3) Remove forcing tip from remover/installer and reverse body

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direction on center screw. Install remover/installer with bearing. Body of remover/installer should be backed off sufficiently to allow center screw to be threaded fully onto end of compressor shaft.

4) Hold center screw with a wrench. Tighten hex portion of remover/installer body to press hub onto shaft. Tighten body several turns, remove installer tool and check to see that shaft key is still in place in keyway before installing clutch plate and hub assembly to its final position. The air gap between frictional surfaces of clutch plate and clutch rotor should be .015-.025" (.38-.64 mm).

5) Remove Installer (J-33013) and check for correct positioning of shaft key (even or slightly above clutch hub). Install shaft nut. Hold clutch plate and hub assembly with Clutch Hub Holder (J-33027). Using Shaft Nut Socket (J-33022), tighten nut against crankshaft shoulder to 8-16 ft. lbs. (11-22 N.m). Spin pulley rotor by hand to see that rotor is not rubbing on clutch drive plate. See Fig. 6.

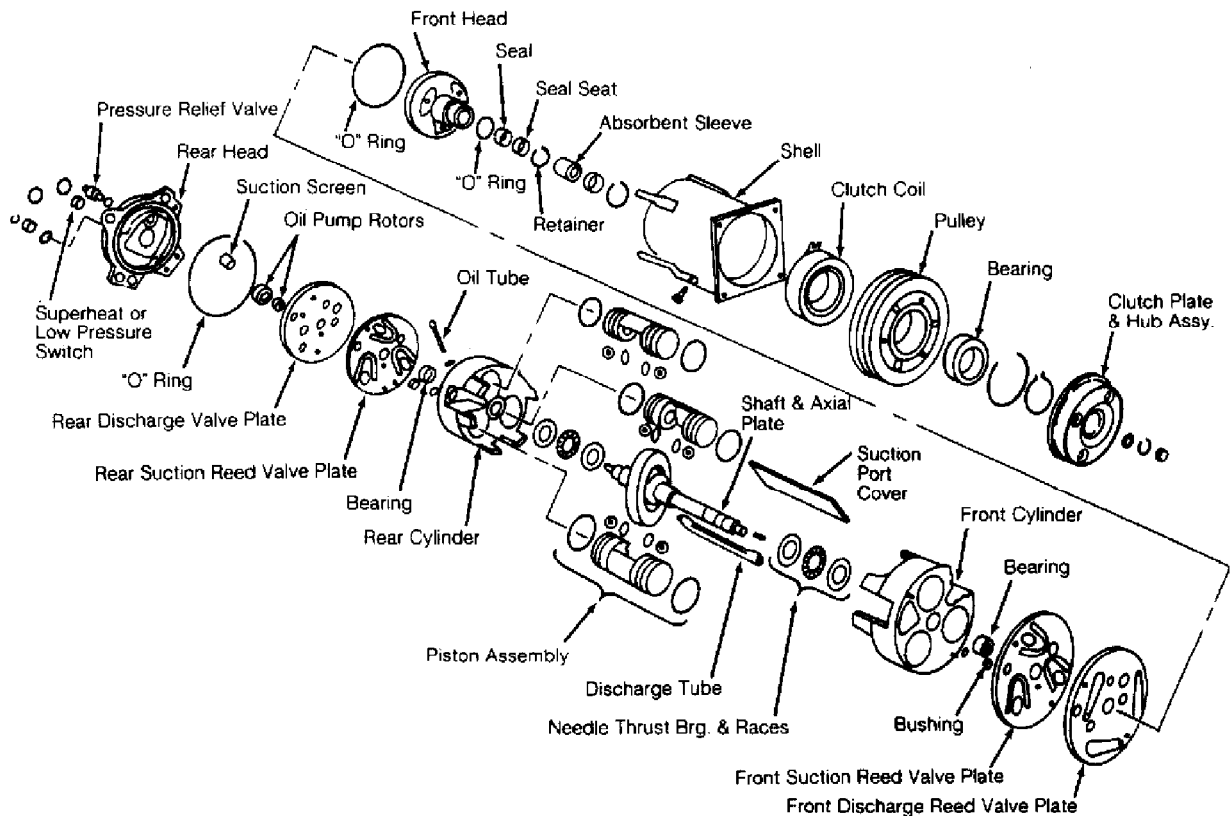


Fig. 6: Harrison A-6 6-Cylinder Compressor
Courtesy of General Motors Corp.

HARRISON A6 6-CYL SHAFT SEAL R & I

Removal

1) Clamp Holding Fixture (J-33026) in a vise and attach compressor to holding fixture with Thumb Screws (J-33026 1). Using

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Clutch Hub Holder (J-33027) to hold clutch, remove shaft nut using Shaft Nut Socket (J-33022).

2) Thread Clutch Plate Remover/Installer (J-33013), into hub. Hold body of remover with a wrench and turn center screw into remover body to remove clutch plate and hub assembly. Remove shaft key and retain for assembly. Pry out dust seal (if equipped). Remove seal seat snap ring.

3) Using Seal Seat Remover (J-23128-A) for Ceramic type or (J-9393-A) for Steel type, remove seal seat. Using Seal Remover (J-9553-01), remove "O" ring seal.

4) Using Shaft Seal Remover/Installer (J-9392-01), remove shaft seal by turning seal slightly clockwise to disengage tangs and pull out shaft seal. Clean all surface areas.

Installation

1) Coat new shaft seal with refrigerant oil and install shaft seal on remover/installer. Align compressor shaft machined surface with shaft seal and install. Turn remover/installer slightly counterclockwise to secure shaft seal tangs.

2) Using Seal Installer (J-33011), install "O" ring and coat with refrigerant oil. Coat seal seat with refrigerant oil and install using seal seat remover/installer. Install snap ring. Install dust seal (if supplied in seal kit).

HITACHI 6-CYL CLUTCH & COIL R & I

Removal

1) Using Clutch Holder (KV99412302), hold clutch hub. Remove shaft nut from shaft. Using Clutch Hub Remover (KV994C5780), remove clutch hub.

2) Pry inner snap ring off. Remove pulley and bearing assembly. If assembly cannot be removed by hand, use Pulley and Bearing Removers (KV994C5781 and KV994C5782).

3) Remove clamping screws that secure coil assembly leads. Remove inner snap ring from coil assembly. Remove coil assembly from front cover. See Fig. 7.

Inspection

Check friction surfaces of clutch for damage due to excessive heat, or excessive grooving due to slippage. Replace compressor components as necessary. Oil or dirt on friction surfaces should be cleaned with a solvent and a dry rag. Check coil for binding, shorted or open leads.

Installation

1) Install coil assembly on compressor. Properly position terminals. Using snap ring pliers, install snap ring. Using a plastic mallet, drive pulley and bearing assembly onto neck of front cover. Turn pulley, making sure that there is no noise and that rotation is free. Ensure there is no pulley play.

2) Using snap ring pliers, install inner snap ring. Remove all oil from clutch pulley. Fit key and clutch hub to shaft. Select

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adjusting spacer which gives the correct clearance between pulley and clutch hub.

3) Coat shaft nut with Loctite and install. Using a feeler gauge, measure clutch hub-to-pulley clearance. Clearance should be .020-.031" (.5-.8 mm). If specified clearance is not obtained, replace adjusting spacer and readjust.

4) When replacing compressor clutch assembly, DO NOT forget break-in operation. This is accomplished by engaging and disengaging clutch 30 times.

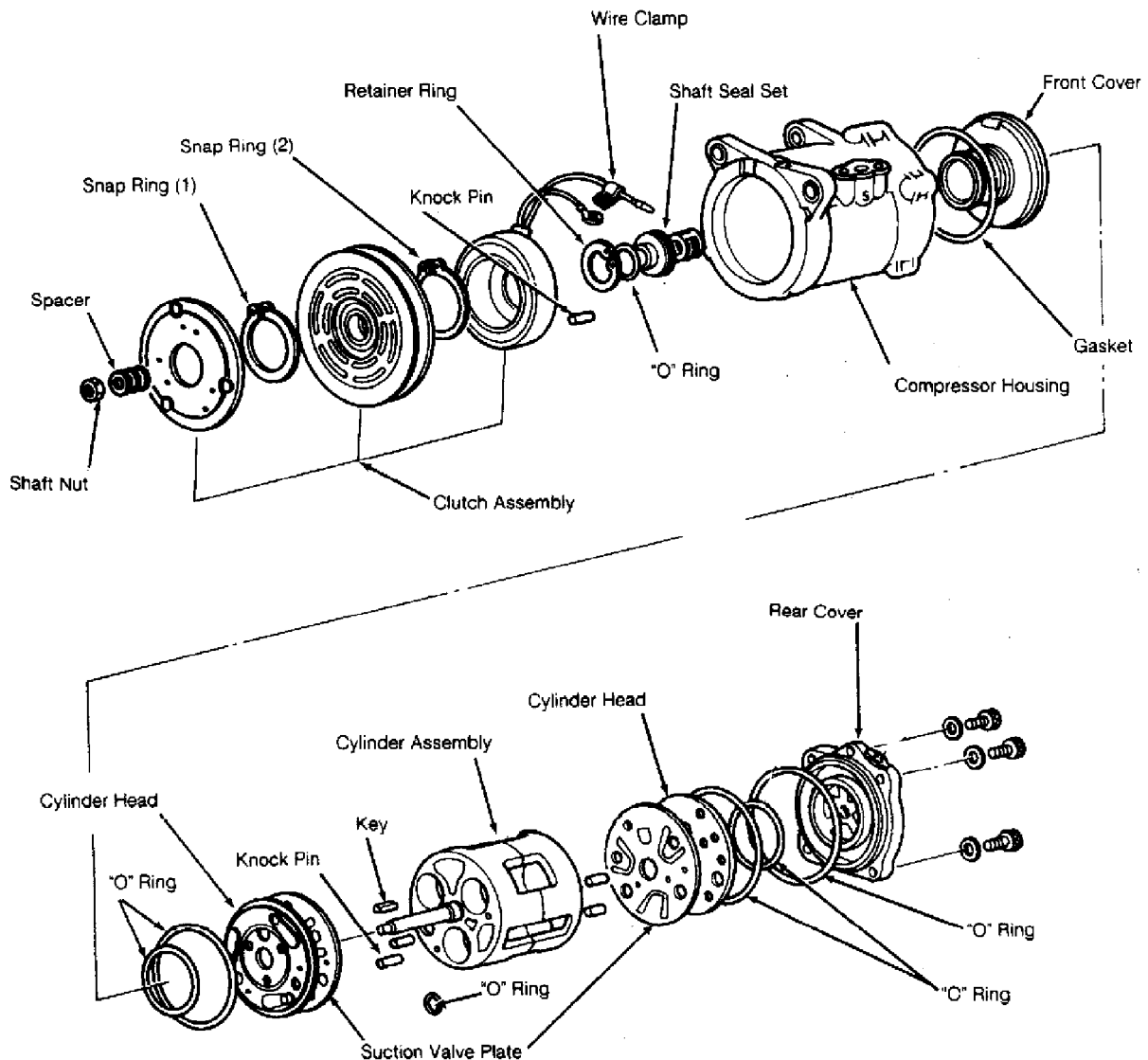


Fig. 7: Hitachi 6-Cylinder Compressor
Courtesy of Nissan Motor Co., U.S.A.

HITACHI 6-CYL SHAFT SEAL R & I

NOTE: Check compressor refrigerant oil level when replacing seals.
See COMPRESSOR REFRIGERANT OIL CHECKING article in this

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section.

Removal

1) Drain oil from suction port, measure oil drained and discard oil. Remove clutch hub, pulley, bearing assembly and coil assembly. See CLUTCH COIL removal in this article.

2) Using snap ring pliers, remove retainer ring. Remove key and plug low and high pressure openings of compressor with Plugs (KV994C4531, KV994C4532 and KV994C4559).

3) Insert Adapter (KV994C1552) into hole in middle of blind cover at low pressure side of compressor. Connect Pressurizer (KV994C1552) to can of R-12 refrigerant. Wrap a rag around compressor shaft. Apply pressure of 28-71 psi (2-5 kg/cm²) at low pressure (suction) service valve of compressor. Catch shaft seal seat in rag. See Fig. 8.

NOTE: If shaft seal cannot be pulled out, reset to its original position, and pressurize again.

4) Insert shaft seal Remover/Installer (KV994C1143) through the open end of front cover. Depress carbon seal and hook tool at case projection of shaft seal. Slowly pull out to remove shaft seal. See Fig. 9.

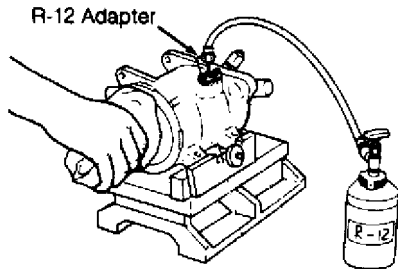


Fig. 8: Hitachi 6-Cylinder Compressor Shaft Seal Seat Removal
Courtesy of Nissan Motor Co., U.S.A.

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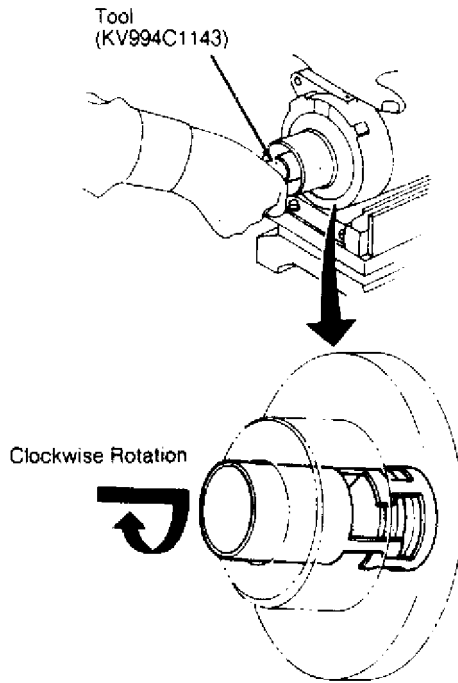


Fig. 9: Hitachi 6-Cylinder Compressor Shaft Seal Removal
Courtesy of Nissan Motor Co., U. S. A.

Inspection

Check carbon seal surface of shaft seal for damage. Check "O" ring and carbon seal contact surface of shaft seal seat for damage. Make sure that "O" ring contact surface on front cover is not damaged. Make sure refrigerant oil is applied to oil seal in shaft seal seat.

Installation

1) To install, reverse removal procedure. Ensure shaft seal contact surface is free of dirt. Lubricate with refrigerant oil. Cap end of compressor shaft.

2) Using Guard (KV994C1143), insert shaft seal. Be sure shaft seal case is aligned with shaft. Apply force to turn seal to left and right. Ensure shaft seal seats properly in shaft cut-out.

3) Fit "O" ring to outside groove of shaft seal seat. Ensure "O" ring seats properly. Apply refrigerant oil on contact surfaces and around shaft seal seat. Lightly coat surface of shaft with refrigerant oil.

4) Install key on compressor shaft. Using snap ring pliers, compress retainer ring and fit retainer ring into front cover. Seat retainer ring firmly in groove. Thoroughly wipe grease or oil from shaft surface.

5) Connect Installer (KV99412329) to shaft of compressor, and turn shaft 5 or 6 times in a clockwise direction to seat seal. See REFRIGERANT OIL & R-12 SPECIFICATIONS chart in this section for system capacities.

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Removal

1) Turn compressor upside-down. Drain oil from suction port, measure oil drained and discard oil. Using Remover (KV99412330), remove rear cover mounting bolts. Starting at top, loosen all bolts one turn (in an alternating pattern) and remove bolts.

2) Grasp rear cover and carefully separate it from compressor. Tap flange lightly with a plastic mallet. Remove flange and discard 3 "O" rings. Remove rear cylinder head, suction valve plate, 2 pins and "O" ring. Carefully remove suction valve plate.

Inspection

Ensure cylinder surface which comes into contact with suction valve plate is not scratched. Check suction valve plate and cylinder head valve for signs of damage.

Installation

1) Using clean refrigerant oil, remove dirt and other matter from rear cover, cylinder head and suction valve plate.

2) Using blocks, position compressor with front face downward and rear upward. Install 2 pins and gas pipe "O" ring in rear of cylinder. Coat "O" ring with refrigerant oil.

3) Apply a coat of refrigerant oil to cylinder surface. Install suction valve plate, making sure that 3 valves properly align with cylinders. Assemble cylinder head and install 3 "O" rings in their respective positions. Coat "O" rings with refrigerant oil before installation.

4) Carefully fit rear cover to rear of compressor. Using hex socket, tighten 5 bolts in an alternating pattern, starting at the top. DO NOT forget lock washers. See REFRIGERANT OIL & R-12 SPECIFICATIONS chart in this section for system capacities.

HITACHI 6-CYL FRONT COVER & CYL HEAD R & I

Removal

1) Turn compressor upside-down. Drain oil from suction valve, measure oil drained and discard oil. Remove compressor clutch assembly. See CLUTCH COIL removal in this article.

2) Using snap ring pliers, remove shaft seal retainer ring. Remove shaft seal seat. Shaft seal may be removed when cylinder assembly is removed from front cover.

3) Remove rear cover "O" rings, cylinder head, suction valve plate, 2 pins and "O" ring in order. With front facing downward, support compressor shell. Using a plastic mallet, tap at rear end of shell flange, driving shell straight downward. Discard front cover gasket. Detach front cover from cylinder assembly. Discard old "O" rings. DO NOT deform suction valve plate when removing. See Fig. 10.

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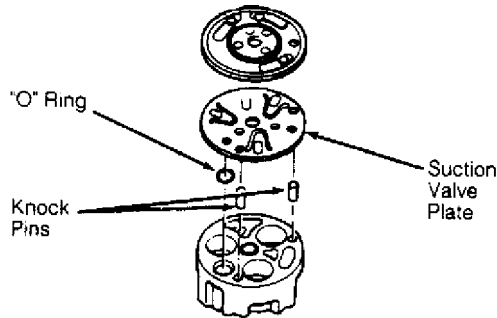


Fig. 10: Hitachi 6-Cylinder Compressor Front Cover Removal
Courtesy of Nissan Motor Co., U. S. A.

Installation

1) Using blocks, face cylinder assembly upward. Install 2 "O" rings before assembly. Position suction valve plate, making sure that 3 valves of suction valve plate are aligned with cylinder.

2) Apply refrigerant oil on both suction plate surfaces before assembling. Align shaft seal with shaft cut-out. Firmly seat shaft seal at shaft land.

3) Attempt to turn shaft seal back and forth, confirming that shaft seal is seated properly. Install "O" rings on cylinder head. Coat "O" rings with refrigerant oil.

4) Front cover must be installed in such a manner that clutch terminal can be positioned in cut portion of shell. Install front cover on cylinder head so angle is about 60 degrees between threaded hole in front cover and low pressure side of refrigerant passage.

5) Install gasket on front cover. Adjust position of compressor case so suction inlet of case opens in same direction as suction slot of cylinder assembly. Make sure swashplate is visible in suction inlet by removing suction valve.

6) Turn over assembled compressor case and cylinder (with front downward). Install shaft seal seat. Install and adjust compressor clutch.

NOTE: Hold compressor case and cylinder assembly firmly to prevent possible mismatching of "O" rings.

7) Ensure clutch terminal is in cut portion provided on top of case. Perform leak test. Fill compressor with specified amount of refrigerant oil. See REFRIGERANT OIL & R-12 SPECIFICATIONS chart in this section for system capacities.

MATSUSHITA ROTARY VANE CLUTCH & COIL R & I

Removal & Installation

1) Insert two 5 mm bolts into threaded holes in armature. Using a screwdriver as a lever in between bolts, remove center bolt. Remove armature and shim from shaft.

2) Remove snap ring. Using a puller, remove pulley. Disconnect electrical leads from field coil. Remove 3 field coil mounting bolts. Remove field coil. Reverse removal procedure for

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installation. See Fig. 11.

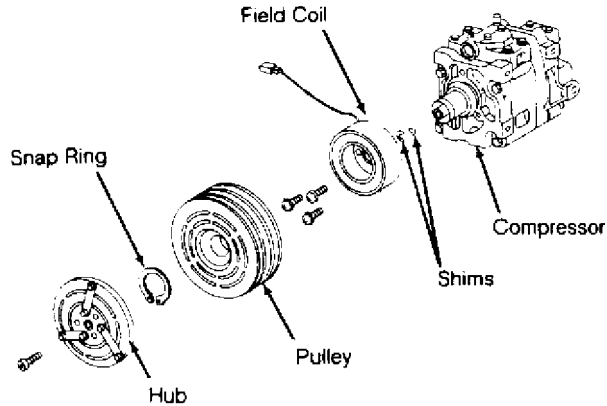


Fig. 11: Matsushita Rotary Vane Compressor
Courtesy of Subaru of America, Inc.

NIPPONDENSO 6 & 10-CYL SHAFT SEAL R & I

NOTE: Check compressor refrigerant oil level when replacing seals. See COMPRESSOR REFRIGERANT OIL CHECKING article in this section.

Removal

- 1) Hold clutch hub stationary and remove center nut. Screw remover into center of hub. Turn center bolt to remove pressure plate.
- 2) Remove shims from shaft. Remove snap ring from inside of pulley. Tap pulley off of shaft with plastic mallet. Be careful not to distort pulley while removing.
- 3) Disconnect clutch coil wires from compressor housing. Remove snap ring inside coil and lift coil off compressor. Pry dust seal out from around compressor shaft (if equipped).
- 4) Place shaft key remover on shaft and turn to remove key. Remove drain plug (if equipped). Remove bolts holding service valves to body of compressor and remove valves. Discard "O" rings. Drain oil out of compressor.
- 5) Remove 6 through bolts from front head of compressor and discard washers. Tap head loose from compressor, being careful not to scratch sealing surfaces. Remove snap ring (if equipped) from front housing. Press seal plate out. Remove seal from shaft. See Fig. 12.

Installation

- 1) Lubricate shaft seal with clean refrigerant oil. Place on compressor shaft. Lubricate seal plate (and "O" ring, if equipped) and install in front housing. Install snap ring (if equipped).
- 2) Place front housing on compressor body. Using new washers, install through bolts. Tighten bolts evenly and alternately to 18 ft. lbs. (24 N.m). Install shaft key with installer and plastic mallet. Insert dust seal into front of compressor.
- 3) Install drain plug using new gasket. Add correct amount of refrigerant oil to compressor. If service valves were removed, coat

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new "O" rings with refrigerant oil and install service valves.

4) Place clutch coil on compressor and install snap ring. Install shims on shaft to adjust clearance between pressure plate and rotor to .016-.028" (.41-.71 mm). Tighten shaft nut to 12 ft. lbs. (16 N.m). See REFRIGERANT OIL & R-12 SPECIFICATIONS chart in this section for system capacities.

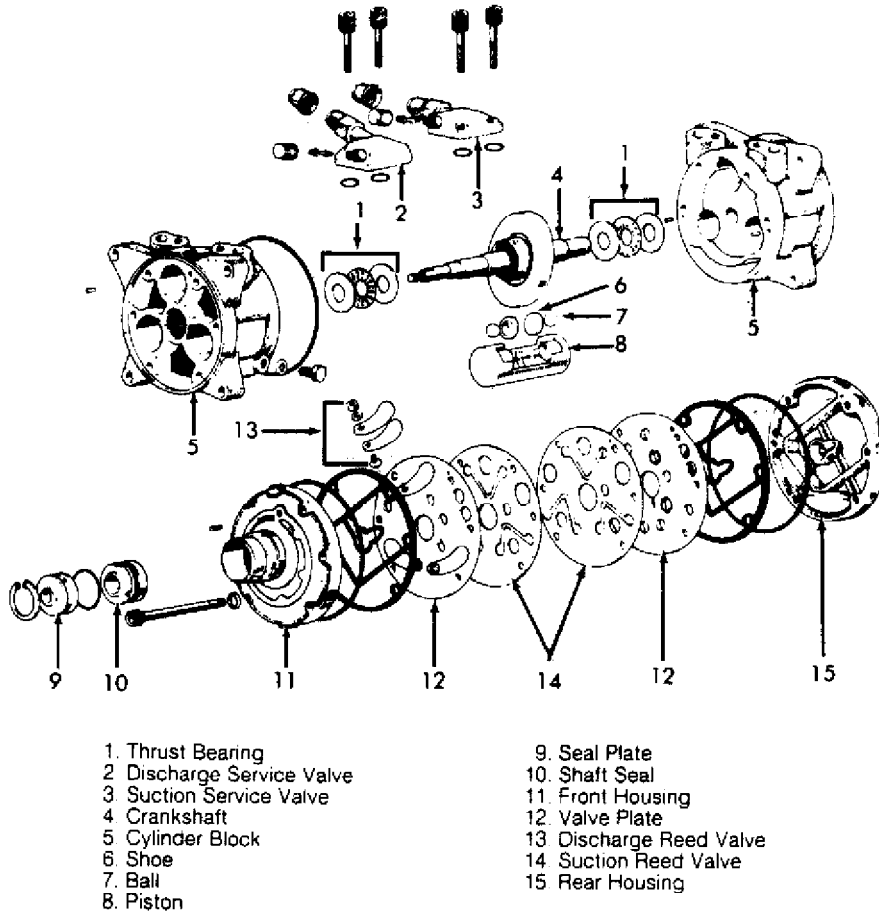


Fig. 12: Nippondenso 6-Cylinder Compressor
Courtesy of Chrysler Motors.

SANDEN SCROLL CLUTCH & SHAFT SEAL R & I

NOTE: Check compressor refrigerant oil level when replacing seals. See COMPRESSOR REFRIGERANT OIL CHECKING article in this section.

Removal

- 1) Secure 2 box-end wrenches, to hold armature plate, using two 6 mm bolts 1 in. (25 mm) or longer. Holding box-end wrenches, use a socket and ratchet to remove clutch hub nut.
- 2) Remove armature plate. Remove snap ring with internal snap ring pliers. Remove clutch hub. Remove snap ring and clutch coil.
- 3) Remove bolts retaining front housing. Remove front housing

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and "O" ring from compressor. Remove shaft seal from shaft. Remove snap ring from back side of front housing. Remove seal plate.

4) Use brass drift and hammer to lightly tap shaft bearing from front housing. Remove felt seal.

NOTE: Do not touch the sealing surfaces of the shaft seal carbon ring and shaft seal plate.

Installation

1) Lubricate shaft seal with compressor oil. Align notches on shaft seal with notches on crank shaft. Install shaft seal plate on the front housing. Install front seal housing to compressor.

2) Use Press Tool (MB991301) to install felt into front housing. Make sure felt metal section faces up. Use Press Tool (MB991301) to press bearing into front housing.

3) Align and install clutch coil. Install snap ring so that the tapered surface is facing outward. Install clutch hub. Install snap ring. Install armature plate, aligning raised area to notch.

4) Secure 2 box-end wrenches, to hold armature plate, using two 6 mm bolts 1 in. (25 mm) or longer. Holding box-end wrenches, use a socket and ratchet to tighten clutch hub nut to 12 ft. lbs. (16 N.m).

5) Use feeler gauge to measure distance between armature and clutch hub. If gap is not .01-.02" (.25-.51 mm), remove clutch assembly and add or remove shims accordingly. See Fig. 13.

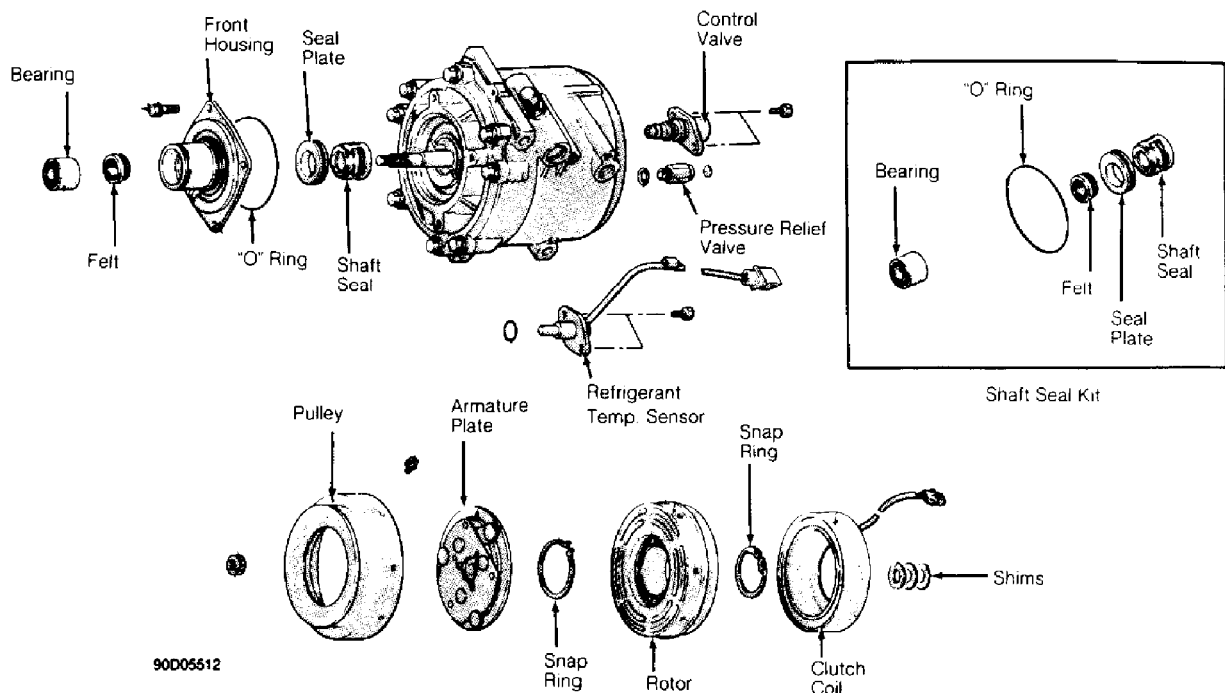


Fig. 13: Sanden Scroll Compressor
Courtesy of Chrysler Motors.

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SANDEN 5-CYL SHAFT SEAL R & I

NOTE: Check compressor refrigerant oil level when replacing seals. See **COMPRESSOR REFRIGERANT OIL CHECKING** article in this section.

Removal

1) Hold clutch hub stationary and remove shaft nut with thin wall socket. Use clutch plate puller to remove clutch plate. Tap key out of slot in crankshaft.

2) Remove seal retainer with seal remover and 3/4" socket wrench. Use seal seat remover tongs to pull seal seat off compressor shaft. Insert seal remover into front housing and turn to engage tangs on seal. Lift seal out. Remove seal "O" ring from front housing, being careful not to scratch shaft.

Installation

1) Coat "O" ring with refrigerant oil and install into groove. Load a new seal onto installer, being careful not to touch carbon sealing surface with fingers. Install shaft protector. Dip seal in refrigerant oil and install on shaft. Rotate seal clockwise until seal fits into flats on shaft. Remove seal installer by turning counterclockwise.

2) Coat seal seat with refrigerant oil and install with tongs. Reinstall seal seat retainer (with flat side down). Install shims and shaft key. Rotate shaft several times to help break in seal.

3) Use a press to install clutch plate. Make sure that air gap is .016-.031" (.41-.79 mm). Hold plate stationary and install shaft nut. See **REFRIGERANT OIL & R-12 SPECIFICATIONS** chart in this section for system capacities.

SANDEN 5-CYL PULLEY BEARING & CLUTCH COIL R & I

Removal

1) Hold clutch hub stationary and remove shaft nut. Remove clutch plate using puller. Remove external front housing snap ring and internal bearing snap ring. See Fig. 14.

2) Install puller and pull off rotor assembly. Remove 3 screws and clutch coil. Use driver and hammer to drive out bearing from hub.

Installation

1) Install new bearing, ensuring that installer contacts outer race of bearing. Install snap ring and check that bearing turns freely. Install clutch coil on compressor.

2) Support compressor on rear mounting ears. Align rotor on front housing hub. Use adapter and press to install rotor (or drive into place with soft mallet). After rotor is seated, install front snap ring.

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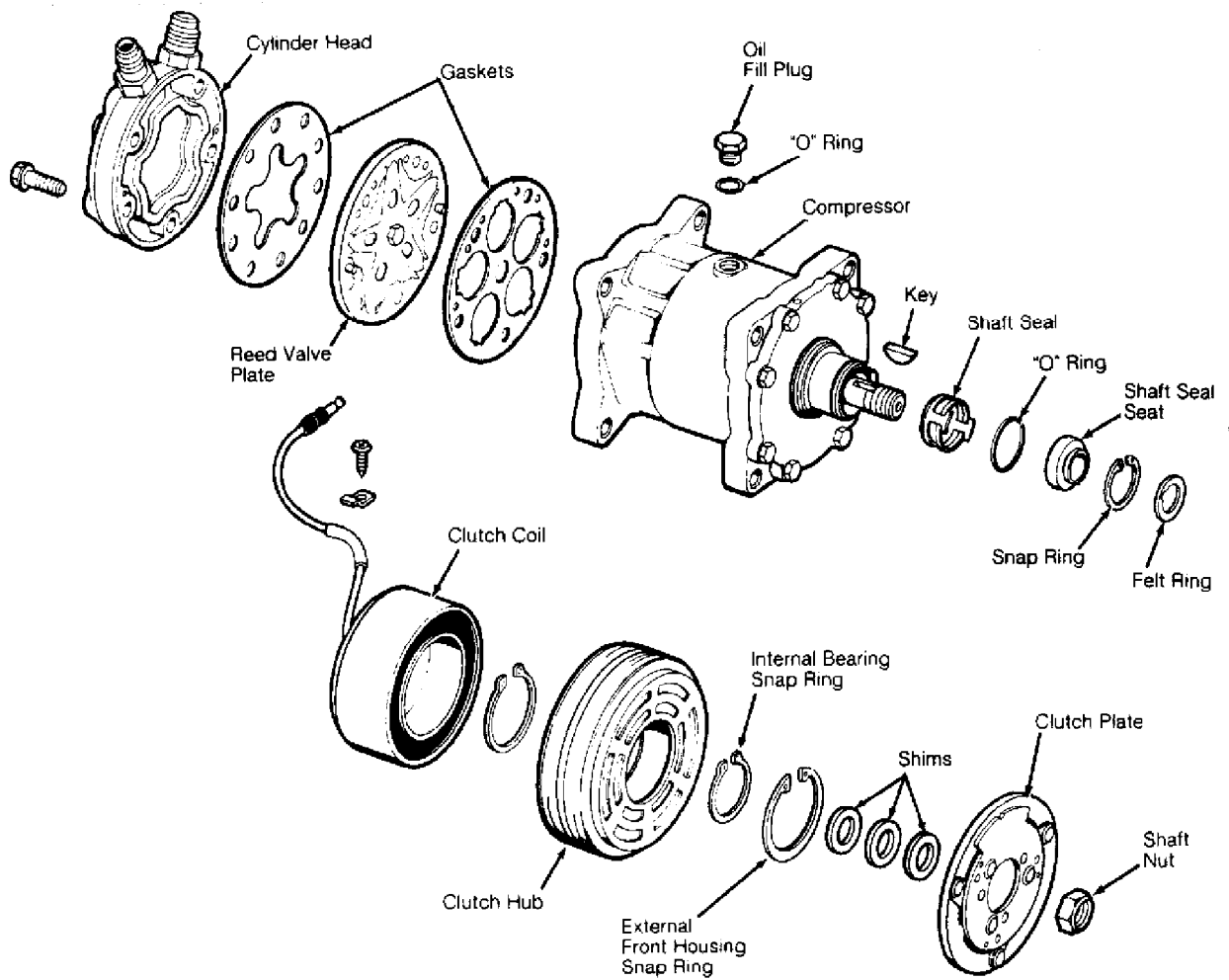


Fig. 14: Sanden 5-Cylinder Compressor
Courtesy of Chrysler Motors.

END OF ARTICLE