

# A/C COMPRESSOR SERVICING

## 1998 GENERAL SERVICING General Motors Corp. - Compressor Servicing

### BODY DESIGNATIONS

#### BODY DESIGNATIONS (CARS)

Model	(1) Body Designation
Achieva, Cutlass, Grand Am, Malibu & Skylark	"N" Body
Aurora & Riviera	"G" Body
Bonneville, Eighty Eight LeSabre, LSS & Regency	"H" Body
Camaro & Firebird	"F" Body
Catera	"V" Body
Cavalier & Sunfire	"J" Body
Century, Grand Prix, Intrigue, Lumina, Monte Carlo & Regal	"W" Body
Concours, DeVille & Seville	"K" Body
Corvette	"Y" Body
Eldorado	"E" Body
Metro	"M" Body
Park Avenue	"C" Body
Prizm	"S" Body
Saturn	"Z" Body
(1) Body codes are determined by fourth character of VIN code.	

#### BODY DESIGNATIONS (LIGHT TRUCKS & VANS)

Model	(1) Body Designation
Astro & Safari	
2WD	"M" Series
4WD	"L" Series
Blazer, Bravada, Jimmy, Pickup & Sonoma	
2WD	"S" Series
4WD	"T" Series
Commercial Van & Chassis	"P" Series
Express, G-Van & Savanna (Van)	"G" Series
Pickup, Sierra, Suburban Tahoe & Yukon	
2WD	"C" Series
4WD	"K" Series
Tracker	"J" Series
Silhouette, Trans Sport & Venture	"U" Series
(1) Series codes are determined by fifth character of VIN code.	

# COMPRESSOR APPLICATIONS

## COMPRESSOR APPLICATIONS

Application	Compressor
Cars <sup>(1)</sup>	
"C" Body	Harrison V5 5-Cyl.
"E" Body	Harrison HD6/HT6 6-Cyl.
"K" Body	Harrison HD6/HT6 6-Cyl.
"F" Body	
3.8L Engine	Harrison V5 5-Cyl.
5.7L Engine	Harrison V7 7-Cyl.
"G" Body	
Aurora	Harrison HD6/HT6 6-Cyl.
Riviera	Harrison V5 5-Cyl.
"H" Body	Harrison V5 5-Cyl.
"J" Body	Harrison V5 5-Cyl.
"M" Body	Nippondenso 10-Cyl.
"N" Body	Harrison V5 5-Cyl.
"S" Body	Harrison V5 5-Cyl.
"V" Body	Harrison V5 5-Cyl.
"W" Body	Harrison V5 5-Cyl.
"Y" Body	Harrison V7 7-Cyl.
"Z" Body	Zexel Rotary Vane
Light Trucks & Vans <sup>(2)</sup>	
"C" & "K" Series	Harrison HD6/HT6 6-Cyl.
"G" Series	Harrison V5 5-Cyl.
"J" Series	Nippondenso 10-Cyl.
"L" & "M" Series	Harrison HD6/HT6 6-Cyl.
"P" Series	Harrison HD6/HT6 6-Cyl.
"S" & "T" Series	
2.2L	Harrison V7 7-Cyl.
4.3L	Harrison HD6/HT6 6-Cyl.
"U" Series	Harrison V5 5-Cyl.
(1) Body codes are determined by fourth character of VIN code.	
(2) Series codes are determined by fifth character of VIN code.	

## HARRISON HD6/HT6, HARRISON V5 5-CYL. & V7 7-CYL.

## CLUTCH ASSEMBLY

**CAUTION: DO NOT hammer on compressor shaft to remove clutch plate, as compressor damage will result.**

## **Removal**

1. Remove compressor from vehicle. Place compressor in Holding Fixture (HD6/HT6 compressor use J-33026; on V5 or V7 compressor use J-34992 or J-41790). On V5 or V7 compressor, remove dust cover (if equipped). Use Clutch Plate Spanner (J-33027-A) to hold clutch plate and remove compressor shaft nut using Shaft Nut Socket (J-33022). See **Fig. 1** or **Fig. 2**.
2. On all compressors, using Clutch Plate Remover/Installer (J-33013-B), remove compressor clutch plate and hub. See **Fig. 1** or **Fig. 2**. Hold remover body and turn center screw into remover body to remove clutch plate and hub. Ensure forcing tip on remover/installer center screw is flat or end of shaft/axial plate will be damaged. Remove shaft key.
3. Remove snap ring. Install Puller Guide (J-33023-A) on front head. Position Pulley and Bearing Puller (J-41552 for HD6/HT6 or J-33020 for V5 or V7 compressor) into inner circle of slots on pulley assembly. Turn puller clockwise in slots. Tighten puller and remove pulley assembly.
4. If bearing is to be removed, remove forcing screw from puller. With puller still engaged in pulley slots, invert assembly onto a solid flat surface. Use a hammer and Bearing Remover (J-9398-A) to drive bearing from pulley. See **Fig. 1** or **Fig. 2**.

**NOTE: It is not necessary to remove staking in front of bearing before removing bearing.**

5. Disconnect clutch coil lead. Scribe marks on compressor and clutch coil for installation reference. Remove clutch coil using Puller Adapter (J-33023-A) and 2-jaw puller.

## **Installation**

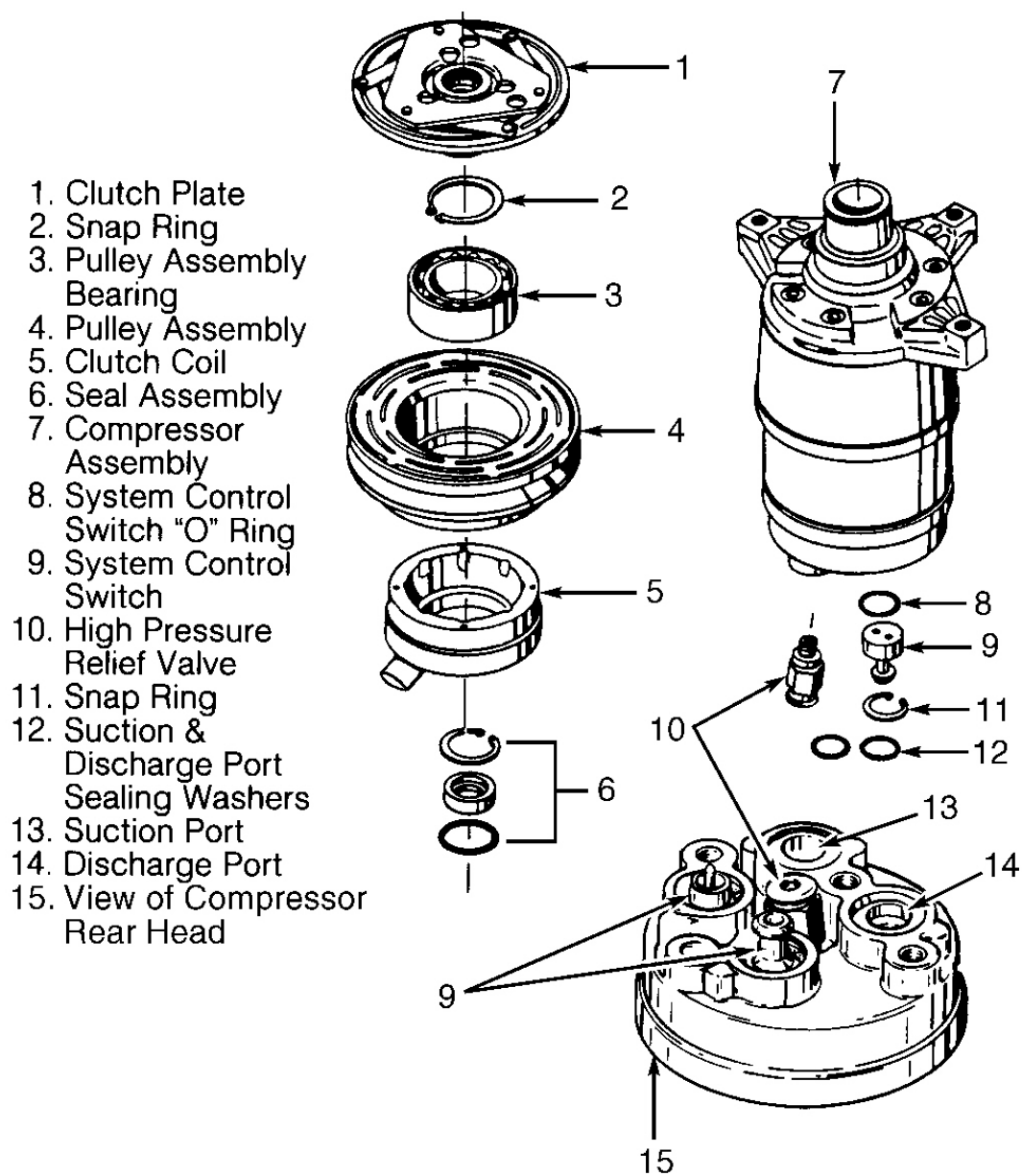
1. Align reference marks made during removal. Using Puller Adapter (J-33024) and Puller Bar (J-8433-1), press clutch coil onto compressor. Ensure clutch coil and installer stay lined up during installation. Using a 1/8" punch, stake clutch coil inner ring in 3 places, 120 degrees apart. Stake size should be 1/2 the area of punch tip and 0.010-0.015" (0.28-0.38 mm) deep.

**NOTE: To ensure proper bearing clearance, it is necessary to remove old stake metal before installing a NEW bearing.**

2. To install pulley bearing, place pulley on Support (J-21352-A). DO NOT support pulley rim on flat surface, or pulley will be damaged. Install bearing in pulley using hammer, Bearing Installer (J-9481-A) and Handle (J-29886).
3. With pulley on support, use Bearing Staking Guide (J-33019-1) and Bearing Staking Pin (J-33019-2) to stake pulley in 3 places, 120 degrees apart. Reposition pulley on support to ensure full support under staking pin. Metal stake should be similar to original stake (down to, but not touching bearing). Position pulley on compressor.
4. Place Bearing Installer (J-33017) and Puller Guide (J-33023-A) over inner race of bearing. Using puller, press pulley onto compressor. Install snap ring. Install shaft key in clutch plate, allowing key to protrude

about 1/8" from rear of clutch plate.

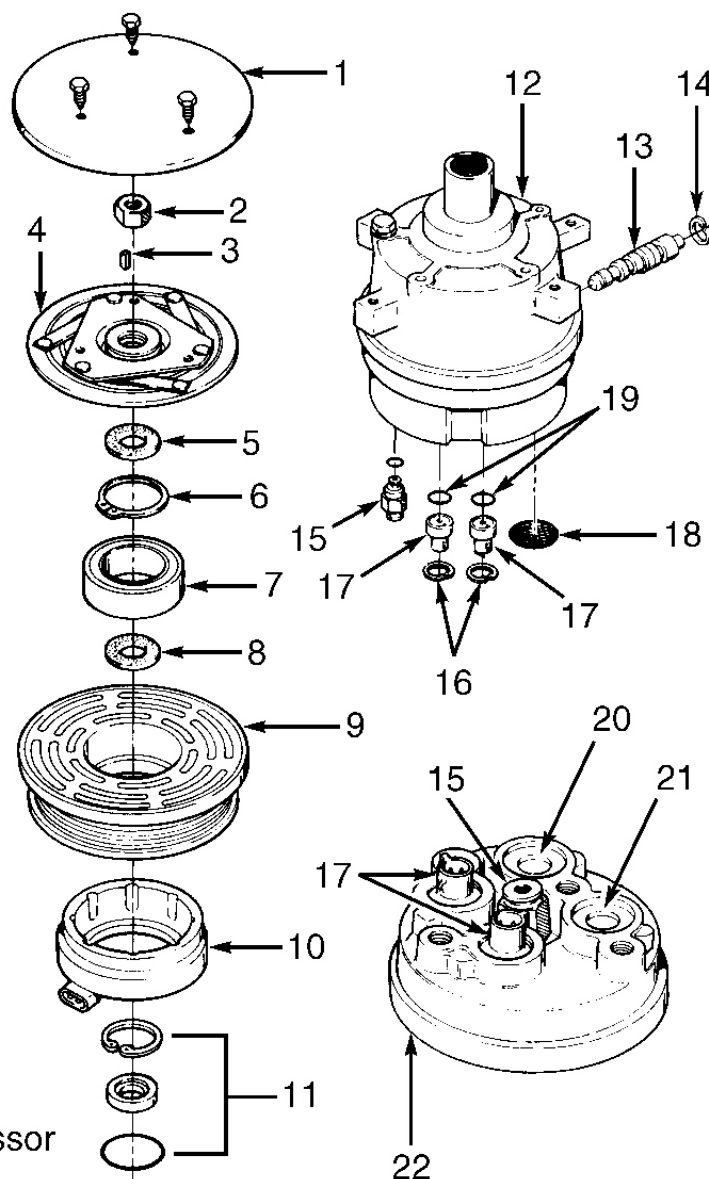
5. Install clutch plate on compressor shaft. Using clutch plate remover/installer, press clutch plate onto compressor. Ensure shaft key is still in keyway before installing clutch assembly.
6. Air gap between friction surfaces for HD6/HT6 compressor is 0.020-0.030" (0.51-0.76 mm); for V5 and V7 compressor air gap is 0.015-0.020" (0.38-0.51 mm). On V5 and V7 compressor, using clutch plate spanner, install compressor shaft nut. Tighten shaft nut to 12.5 ft. lbs. (17 N.m). Check components for proper rotation.



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**Fig. 1: Compressor Components (Harrison HD6/HT6 6-Cylinder)**  
 Courtesy of GENERAL MOTORS CORP.

1. Dust Cover  
(If Equipped)
2. Nut
3. Key
4. Clutch Plate
5. Dust Seal  
(If Equipped)
6. Snap Ring
7. Pulley Assembly  
Bearing
8. Felt Washer  
(If Equipped)
9. Pulley Assembly
10. Clutch Coil
11. Seal Assembly
12. Compressor  
Assembly
13. Compressor  
Control Valve  
Assembly
14. Snap Ring
15. High Pressure  
Relief Valve
16. Snap Ring
17. System Control  
Switches
18. Suction Port  
Filter Screen
19. "O" Rings
20. Suction Port
21. Discharge Port
22. View Of Compressor  
Rear Head



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**Fig. 2: Compressor Components (Harrison V5 5-Cylinder Shown; V7 7-Cylinder Is Similar)**  
**Courtesy of GENERAL MOTORS CORP.**

## SHAFT SEAL

**NOTE:** It is not necessary to replace shaft seal because of a small amount of oil found on adjacent surfaces. A small amount of oil is normal for lubrication purposes. Shaft seal should only be replaced after a confirmed refrigerant leak is found.

## Removal

1. Discharge A/C system, using approved refrigerant recovery/recycling equipment. Loosen and reposition compressor in mounting bracket. Remove clutch plate and hub assembly. See CLUTCH ASSEMBLY. See **Fig. 1** or **Fig. 2**.
2. Remove shaft seal snap ring. Ensure all surfaces around seal are clean. Insert Shaft Seal Remover/Installer (J-23128-A) into shaft seal. Rotate handle clockwise to seat seal remover/installer in seal. Remove shaft seal. Using "O" Ring Remover (J-9553-01), remove "O" ring. Ensure shaft and inside of compressor neck are clean and free of foreign material. Thoroughly clean "O" ring groove in front head.

## Installation

1. Install Shaft Seal Protector (J-34614) over compressor shaft. With shaft seal protector in place, lubricate NEW "O" ring with refrigerant oil and install it on "O" Ring Installer (J-33011).
2. Insert "O" ring installer in compressor until it bottoms. Move slide on "O" ring installer downward until "O" ring is released into groove. Rotate installer to seat "O" ring. Remove "O" ring installer.
3. Lubricate shaft seal with NEW refrigerant oil. Install shaft seal onto Seal Installer (J-23128-A). Install shaft seal so flared side of lip seal is installed toward compressor. Expand seal using shaft seal remover/installer. Install shaft seal on Seal Protector (J-34614). Place seal protector over shaft.
4. Push shaft seal into compressor using a rotary motion until seal bottoms. Install NEW snap ring with flat side against seal. Install clutch plate and hub assembly onto compressor shaft. See CLUTCH ASSEMBLY.

# NIPPONDENSO 10-CYLINDER

## CLUTCH ASSEMBLY

### Removal & Installation (Metro & Tracker)

1. Discharge A/C system, using approved refrigerant recovery/recycling equipment. Remove compressor. Drain, measure and discard refrigerant oil from compressor.
2. Using Clutch Plate Holder/Remover (J-41384) remove clutch plate nut, washer and clutch plate from compressor drive shaft. Remove clutch pulley snap ring and shim. Using a plastic mallet, gently tap and remove clutch pulley. Remove clutch coil wire retainer from compressor. Remove clutch coil snap ring and clutch coil. See **Fig. 3**.
3. Install clutch coil and snap ring. Attach clutch coil wire retainer to compressor. Install clutch pulley, snap ring and shim. Install clutch plate to compressor shaft. Measure air gap between clutch pulley and clutch plate.
4. Air gap should be 0.014-0.026" (0.35-0.65 mm). Add or remove shims as necessary. Install compressor shaft nut and washer. Tighten compressor shaft nut to 11-15 ft. lbs. (15-20 N.m). After repairs, add NEW refrigerant oil to compressor equal to amount drained. To complete installation, reverse removal procedure.

## SHAFT SEAL

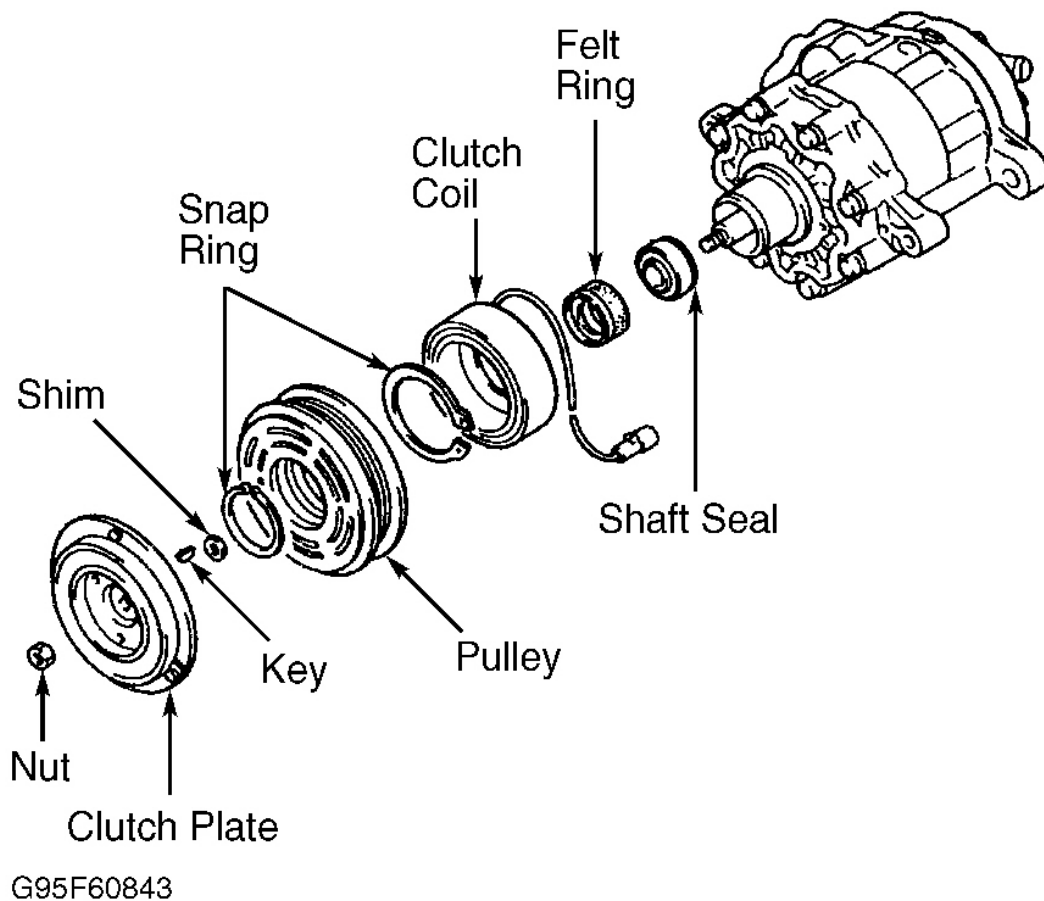
## Removal

1. Discharge A/C system, using approved refrigerant recovery/recycling equipment. Remove compressor. Drain, measure and discard refrigerant oil from compressor. Remove clutch plate, clutch pulley, shims, and clutch coil. See CLUTCH ASSEMBLY. See **Fig. 3**.
2. Using a flat-blade screwdriver, remove felt ring and felt washer from front housing. Remove shaft key and shaft seal snap ring. Insert Compressor Shaft Seal Remover/Installer (J-33942-B) into seal. Turn seal remover/installer until contact with notches in seal is made. Remove shaft seal.

## Installation

1. Install Compressor Shaft Seal Protector (J-34614) onto compressor shaft. Lubricate NEW shaft seal with refrigerant oil. DO NOT touch sealing surfaces. Engage seal remover/installer into seal notches and install seal onto compressor shaft. Remove seal protector and remover/installer.
2. Install seal snap ring. Install felt washer and felt ring. Install clutch plate, clutch pulley, shims, and clutch coil. See CLUTCH ASSEMBLY. See **Fig. 3**. After repairs, add NEW refrigerant oil to compressor equal to amount drained. To complete installation, reverse removal procedure. Perform leak test.





**Fig. 3: Compressor Components (Nippondenso 10-Cylinder)**  
 Courtesy of GENERAL MOTORS CORP.

## ZEXEL ROTARY VANE

### CLUTCH ASSEMBLY

**NOTE:** Discharging A/C system and removing refrigerant lines from compressor is not necessary to service clutch assembly.

#### Removal

1. Loosen tensioner and remove drive belt from pulley. Disconnect clutch electrical connector. Remove compressor mounting bolts. With refrigerant lines connected lift compressor upward and forward. Install one front mounting bolt through bottom rear compressor mounting ear. Tighten bolt so compressor is supported by mounting bracket.

2. Using Clutch Drive Plate Holder (SA9510AC), remove clutch drive plate center bolt. Insert Clutch Drive Plate Remover Sleeve (SA9506AC) into center of drive plate. Install remover bolt. While holding clutch remover sleeve, tighten remover bolt and remove drive plate and shims.
3. Remove pulley external snap ring. Position Puller Center Adapter (SA9149AC-2) over end of compressor shaft. Attach 3-jaw puller to back of pulley. Tighten puller bolt against pulley center adapter and remove pulley. Remove clutch coil screws. Disconnect clutch coil wire. Remove clutch coil.

## **Installation**

1. Install coil in original position. Ensure electrical connector is aligned with indent in front of compressor head. Tighten screws to 44 INCH lbs. (5 N.m). Place Drive Plate Installer (SA9149AC-3) and thrust bearing on installation bolt and insert through center of pulley. Finger-tighten pulley installation bolt into compressor shaft.
2. Finger-tighten nut on installation bolt to align pulley to compressor. Hold end of bolt and tighten nut until pulley bottoms on compressor. Loosen nut and remove installation bolt, thrust bearing and drive plate installer. Install snap ring with tapered side out.
3. Install thrust bearing on installation bolt and insert through clutch drive plate. Place original shims on installation bolt. Thread bolt into compressor shaft. Hold end of bolt and tighten nut until clutch drive plate bottoms out. Loosen nut and remove installation bolt and thrust bearing. Install center bolt and tighten to 115 INCH lbs. (13 N.m) using clutch drive plate holder.
4. Using a feeler gauge, measure air gap between drive plate and pulley. Air gap should be 0.018-0.030" (0.46-0.76 mm). If air gap is not as specified, add or remove shims as necessary. Install compressor onto mounting bracket. Tighten front bolts to 36 ft. lbs. (49 N.m) and rear bolts to 19 ft. lbs. (26 N.m). Connect clutch electrical connector and install accessory drive belt.
5. Start engine and allow it to idle. Turn A/C on and cycle compressor on and off 10-15 times to break-in NEW clutch drive plate and pulley assembly.