

## **Compressor Installation Procedures**

FAILURE TO FOLLOW THESE STEPS WHEN INSTALLING THE COMPRESSOR WILL VOID YOUR WARRANTY

## **Procedimientos de Instalación de Compresores**

LA FALTA DE CUMPLIMIENTO DE ESTOS PASOS AL INSTALAR EL COMPRESOR ANULARÁ LA GARANTÍA  
DE FÁBRICA

## **Procédures d'installation du compresseur**

VOTRE GARANTIE SERA JUGÉE NULLE SI VOUS OMETTEZ DE SUIVRE CES ÉTAPES LORS DE  
L'INSTALLATION DU COMPRESSEUR

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# COMPRESSOR INSTALLATION INSTRUCTIONS

## Always Practice Safety First!

- Air Bags (Caution)
- No Smoking
- Wear Eye Protection
- Work in a well ventilated area
- Wear Skin Protection (gloves)
- Recover refrigerant before making repairs

## **Follow all Federal, State and Local Regulations.**

Proper A/C performance is dependent on all systems performing properly. Make certain that the engine cooling system is at peak operation, and that the cooling fan / fan clutch is operating properly. Worn belts, idlers and tensioners can cause poor cooling system performance due to belt slippage. Low voltage at the A/C clutch assembly can cause premature compressor failure.

Contaminated refrigerant continues to be one of the most significant problems facing the A/C service industry today. Use a refrigerant identifier to verify that the refrigerant in the system is not contaminated with a blend refrigerant or has a high concentration of air.

### Tip!!!

*When mounting the replacement compressor to the vehicle, the compressor must fit or rest with even contact at each mounting point. Warped brackets must be completely straightened or replaced. Leave mounting bolts loose until all bolts are in place. Tighten bolts equally according to torque specs for that specific compressor. **Do Not Over-Tighten.** (Over-Tightening Causes Leaks)*

## **Replace the Filter Drier or Accumulator**

All **Filter Driers** and **Accumulators** contain a desiccant material. This material is designed to absorb the moisture that has seeped into the A/C system. Moisture in an A/C system can form corrosive contaminants that will cause rapid system failure. It is very important to remove all moisture from the A/C system before charging.

## **REPLACE OR INSPECT THE CONTROL DEVICES**

The **orifice tube** is a control and filter device for accumulator systems, and should always be replaced to ensure proper refrigerant and oil flow through the system. The **thermal expansion valve** is the control device for systems using a receiver/drier. It should be examined and replaced, if found to be contaminated.

## **A Clean A/C System is Imperative**

When a compressor fails, tiny internal particles mix with oil and spread throughout the entire system. This contaminated oil, as well as moisture and other corrosives must be removed to avoid premature failure of the replacement compressor. Clean the entire system thoroughly with an effective cleaning agent and/or replace contaminated parts. Air alone does not remove contaminants. Two methods used today are effective in removing oil and contaminants:

### (1) liquid cleaning with an effective **cleaning agent**

Flushing with Dura Flush II or similar non-oil based flush designed specifically for automotive A/C use, is a proven method to clean A/C system components when used with a flush cylinder and pressurized air.

Closed loop flushing with a power flush machine and the machine manufacturer's approved solvent is an effective method to clean A/C system components. This cleaning method is utilized by several major OE service providers.

### (2) **closed loop power cleaning** using a refrigerant.

#### **Note**

Newer **condenser** designs are difficult, if not impossible to thoroughly clean, and in many cases must be replaced.

#### **Proper Evacuation**

The A/C system must be free of moisture and air to work properly. Removing the air and moisture with an A/C system **vacuum pump** for a minimum of forty-five minutes to an hour, is necessary to deliver proper long lasting A/C performance.

## **Lubrication**

The only moving component in the A/C system is the compressor, and adequate lubrication is critical. If oil or refrigerant charges are incorrect, internal damage to the compressor will occur! If uncertain about the proper lubricant type or amount, refer to the Capacities Guide, the under hood decal, or an O.E. service manual.

To ensure proper compressor lubrication, install half the required system oil in the suction side. This may require turning the compressor shaft as the oil is installed. The remaining amount of required system oil should be installed in the accumulator or low side of the system.

To ensure that the front seal is lubricated and does not leak, after the oil is installed, the compressor must be placed or held with the front seal down for 1 to 3 minutes, to allow oil to coat the seal. If this seal is not lubricated before installation, refrigerant may leak.

**REMEMBER!!!**

Compressors are shipped with assembly lube or ICE 32. **DO NOT DRAIN. Add the correct type and amount of lubricant per specific system specifications.**

Use only the recommended Refrigerant Type and Amount

Only **R12** or **R134a** can be used to maintain proper system performance. The correct amount of charge is critical for system efficiency and durability, because the refrigerant carries the lubricant through the system. Specifications can be found in the Capacities Guide, the under hood decal or an O.E. service manual.

Tip!!!

*Dual A/C systems require additional refrigerant and oil, check vehicle specifications.*

Compressor Rotation

Always rotate the compressor shaft at least 10 revolutions after the hoses are connected and prior to starting the engine. This will pump the excess liquid lubricant out of the compressor cylinders and into the system.

Clutch

Clutch coil voltage should be within one volt of system operating voltage. Anything less weakens the magnetic force of the clutch allowing slippage, increased heat, and failure. Clutch air gap (between hub and pulley) is important and should be checked before installation to ensure no changes have occurred during shipping and handling. Ask your suppliers for air gap specifications.

TIP!!!

After installation, with the engine idling, switch the compressor off and on 10 to 12 times. This will burnish the hub and pulley face removing any machining glaze or rust inhibitors and enhance complete surface contact.

Verify the Repair

Use an **electronic leak detector** or **fluorescent dye** to check for leaks. A leak will cause system failure. When repairs are finished, ensure that the job is done right the first time by doing temperature drop testing.

*Suggested A/C tools & equipment:*

- A/C O-Ring Lube*
- Charging Cylinder*
- Gauge Set*
- Leak Detector*
- Refrigerant Identifier*
- Spanner Wrench*
- Vacuum Pump*

*This compressor is warranted to be free from defects in materials and workmanship at the time of its manufacture. See your supplier for details of the terms and conditions of this warranty.*

*Temperature Control Division  
1801 Waters Ridge Dr.  
Lewisville, TX 75057*

*\*Tech Tips can be found at [www.4s.com](http://www.4s.com)*

# COMPRESSOR MOUNTING TORQUE AND CLUTCH AIR GAP

\*NOTE: This is a reference guide only. Always refer to OEM for specific application when available.

|                  | Torque<br>Compressor to Engine                                | Torque<br>Compressor to Bracket                               | Torque<br>Manifold/Fitting   | Air Gap     | Torque<br>Shaft Nut | Method of<br>Adjustment |
|------------------|---|---|--|-------------|---------------------|-------------------------|
| 2 CY 2C90        | Refer to OEM Specification                                    |   |  |             | 20 ft. lbs.         | Non Adjustable          |
| 6C17             | 30 ft. lbs. 2.2/2.5<br>40 ft. lbs. 3.0<br>30 ft. lbs. 3.3/3.5 | 21 ft. lbs. 2.2/2.5<br>40 ft. lbs. 3.0<br>30 ft. lbs. 3.3/3.5 | 15-20 ft. lbs. 2.2/2.5<br>15-20 ft. lbs. 3.0<br>15-20 ft. lbs. 3.3/3.5 | .020-.035   | 12 ft. lbs.         | Shim                    |
| A590             | 30 ft. lbs. 2.2/2.5<br>40 ft. lbs. 3.0<br>30 ft. lbs. 3.3/3.5 | 21 ft. lbs. 2.2/2.5<br>40 ft. lbs. 3.0<br>30 ft. lbs. 3.3/3.5 | 15-20 ft. lbs. 2.2/2.5<br>15-20 ft. lbs. 3.0<br>15-20 ft. lbs.         | .020-.035   | 12 ft. lbs.         | Shim                    |
| A6               | Refer to OEM Specification                                    |   |  | .022-.057   | N/A                 | Press Fit               |
| BOSCH            | Refer to OEM Specification                                    |   |  | .015-.030   | *                   | Shim                    |
| C171             | 30 ft. lbs. 2.2/2.5<br>40 ft. lbs. 3.0<br>30 ft. lbs. 3.3/3.5 | 21 ft. lbs. 2.2/2.5<br>40 ft. lbs. 3.0<br>30 ft. lbs. 3.3/3.5 | 15-20 ft. lbs. 2.2/2.5<br>15-20 ft. lbs. 3.0<br>15-20 ft. lbs. 3.3/3.5 | .020-.035   | 12 ft. lbs.         | Shim                    |
| CVC              | 50 ft. lbs.   | 50 ft. lbs.   | 20 ft. lbs.  | .012-.024   | 106 In. lbs.        | Shim                    |
| DCV, DKV, KC-50  |   | 30 ft. lbs.   | 17 ft. lbs.  | .016-.030   | 10 ft. lbs.         | Shim                    |
| DCW, DKS         |   | 30 ft. lbs.   | 17 ft. lbs.  | .016-.030   | 10 ft. lbs.         | Shim                    |
| FORD FS6         | 17 ft. lbs. to 25 ft. lbs.                                    | 17 ft. lbs. to 25 ft. lbs.                                    | 15-20 ft. lbs.   | .020-.035   | 12 ft. lbs.         | Shim                    |
| FORD FX15 FS10   | 15-21 ft. lbs.  | N/A   | 13-17 ft. lbs.   | .013-.033   | 12 ft. lbs.         | Shim                    |
| Ford Scrolls     | Refer to OEM Specification                                    |   |  | .014-.030   | 13 ft. lbs.         | Shim                    |
| FS-18            | Bolts = 35 ft. lbs.<br>Nuts = 2-18 ft. lbs.                   | N/A   | 11 ft. lbs.  | .014-.026   | 10 ft. lbs.         | Shim                    |
| FS-20            | Bolts = 35 ft. lbs.<br>Nuts = 2-18 ft. lbs.                   | N/A   | 11 ft. lbs.  | .014-.026   | 10 ft. lbs.         | Shim                    |
| HG 500, HG850    | Refer to OEM Specification                                    |   |  | *           | 20 ft. lbs.         | Non Adjustable          |
| HG 1000          | Refer to OEM Specification                                    |   |  | *           | 20 ft. lbs.         | Non Adjustable          |
| HITACHI AXIAL    | Refer to OEM Specification                                    |   |  | .015-.033   | *                   | Shim                    |
| HITACHI RADIAL   | 36 ft. lbs.   | 16 ft. lbs.   | *  | .015-.033   | *                   | Shim                    |
| HR6, DA6, HR6HT  | 40 ft. lbs.   | 37 ft. lbs.   | 25 ft. lbs.  | .015-.025   | N/A                 | Press Fit               |
| HS-15            | 15.0-22.6 ft. lbs.  | 12.5 ft. lbs.   | 12.0-19.2 ft. lbs.   | .0157-.0236 | 7.5-11.3 ft. lbs.   | Shim                    |
| HS-17            | 15.0-22.6 ft. lbs.  | N/A   | 12.0-19.2 ft. lbs.   | .014-.026   | 7.5-11.3 ft. lbs.   | Shim                    |
| HS-18            | 14.8-18.4 ft. lbs.  | N/A   | 13.1-17.3 ft. lbs.   | .014-.026   | 7.5-11.3 ft. lbs.   | Shim                    |
| HS-20            | 14-21 ft. lbs.  | N/A   | 7.5-11.3 ft. lbs.  | .014-.026   | 7.5-11.3 ft. lbs.   | Shim                    |
| KEIHIN           | Refer to OEM Specification                                    |   |  | .012-.024   | 33 ft. lbs.         | Shim                    |
| MATSUSHITA       | 36 ft. lbs.   | 16 ft. lbs.   | *  | .015-.030   | *                   | Shim                    |
| MITSUBISHI       | 36 ft. lbs.   | 16 ft. lbs.   | *  | .015-.030   | *                   | Shim                    |
| NIHON CALSONIC   | 36 ft. lbs.   | 16 ft. lbs.   | *  | .015-.030   | *                   | Shim                    |
| NIPPONDENSO 10P  | 36 ft. lbs.   | 16 ft. lbs.   | *  | .016-.030   | 10 ft. lbs.         | Shim                    |
| NIPPONDENSO 6E   | 36 ft. lbs.   | 16 ft. lbs.   | *  | .016-.030   | 12 ft. lbs.         | Shim                    |
| NIPPONDENSO 6P   | 36 ft. lbs.   | 16 ft. lbs.   | *  | .020-.035   | 12 ft. lbs.         | Shim                    |
| PANASONIC NA1301 |   | 19 ft. lbs.   | 10-14 ft. lbs.   | .016-.030   | *                   | Shim                    |
| R4               | 40 ft. lbs.   | 24 ft. lbs.<br>30 ft. lbs. Diesel                             | 25 ft. lbs.  | .020-.040   | N/A                 | Press Fit               |
| SA1150           | Refer to OEM Specification                                    |   |  | .014-.026   | 10 ft. lbs.         | Shim                    |
| SD 508, 510, 709 |   | 30 ft. lbs.   | 17 ft. lbs.  | .016-.031   | 10 ft. lbs.         | Shim                    |
| SEIKO-SEIKI      | 16-20 ft. lbs.  |   |  | .015-.030   | 10 ft. lbs.         | Shim                    |
| SELTEC           | Refer to OEM Specification                                    |   |  | .015-.030   | 10 ft. lbs.         | Shim                    |
| TR 70, TR105     |   | 30 ft. lbs.   | 17 ft. lbs.  | .013-.025   | 10 ft. lbs.         | Shim                    |
| TRF090, TRS090   | Refer to OEM Specification                                    |   |  | .014-.026   | 13 ft. lbs.         | Shim                    |
| TV12, TV14       | Refer to OEM Specification                                    |   |  | .016-.024   | 10 ft. lbs.         | Shim                    |
| V5               | 40 ft. lbs.   | 37 ft. lbs.   | 25 ft. lbs.  | .015-.025   | N/A                 | Press Fit               |
| YORK 206         | Refer to OEM Specification                                    |   |  | *           | 20 ft. lbs.         | Non Adjustable          |
| YORK 209, 210    | Refer to OEM Specification                                    |   |  | *           | 20 ft. lbs.         | Non Adjustable          |

\* Check with the OEM for each vehicle for these specifications. Not available from TCD.

### COMPRESSOR OIL CHART

Refer to the O.E. Manufacturer's Specifications when installing a compressor.

The following chart is a guideline to be used only if you do not have access to the OE specs.

It is recommended that all of the original oil be flushed out of the system when performing major repairs.

This chart is for vehicles using R134a, both OE and retrofitted.

| VEHICLE MANUFACTURER | COMPRESSOR MANUFACTURER | COMPRESSOR MODEL           | Part Number  |
|----------------------|-------------------------|----------------------------|--------------|
| All                  | Hybrid Vehicle          | -                          | 59889/409610 |
| Acura                | Nippondenso             | 10P                        | 59007/409503 |
| Alfa Romeo           | Sanden                  | SDV                        | 59007/409503 |
| Alfa Romeo           | Nippondenso             | SC8                        | 59007/409503 |
| Audi                 | Diesel Kiki/Zexel       | DCW                        | 59007/409503 |
| Audi                 | Nippondenso             | 10P                        | 59007/409503 |
| Audi                 | Sanden                  | SDV                        | 59007/409503 |
| BMW                  | Seiko Seiki             | SS                         | 59007/409503 |
| BMW                  | Nippondenso             | 10P                        | 59007/409503 |
| BMW                  | Bosch / Behr            | Wing                       | 59007/409503 |
| BMW                  | Bosch / Behr            | Axial                      | 59003/409501 |
| Chrysler             | Nippondenso             | 10PA                       | 59007/409503 |
| Chrysler             | Nippondenso             | 6C / 6CA                   | 59007/409503 |
| Chrysler             | Sanden                  | TR / TRS                   | 59007/409503 |
| Chrysler             | Sanden                  | SD                         | 59002/409502 |
| Chrysler             | Mitsubishi              | FX                         | 59007/409503 |
| Jeep / Eagle         | Sanden                  | SD                         | 59002/409502 |
| Jeep / Eagle         | Sanden                  | TR                         | 59007/409503 |
| Jeep / Eagle         | Nippondenso             | 10P / 10PA                 | 59007/409503 |
| Citroen              | Sanden                  | SD7                        | 59002/409502 |
| Citroen              | Sanden                  | SDV                        | 59007/409503 |
| Citroen              | Harrison                | V5                         | 59003/409501 |
| Ferrari              | Sanden                  | SDV                        | 59007/409503 |
| Fiat                 | Sanden                  | SD7                        | 59002/409502 |
| Fiat                 | Nippondenso             | SC8                        | 59007/409503 |
| Ford                 | Ford                    | FS10 / FX15                | 59007/409503 |
| Ford                 | Nippondenso             | 10P / 10PA                 | 59007/409503 |
| Ford                 | Sanden                  | SD                         | 59002/409502 |
| Ford                 | Panasonic               | Rotary                     | 59007/409503 |
| Ford                 | Ford                    | FS6                        | 59007/409503 |
| Ford                 | Harrison                | A6                         | 59003/409501 |
| Ford                 | Sanden                  | TR, TRS                    | 59007/409503 |
| Ford                 | Ford                    | FS-18, FS-20               | 59007/409503 |
| Ford                 | Ford Scroll             |                            | 59007/409503 |
| G.M.                 | Delphi / Harrison       | V5 Retro                   | 59003/409501 |
| G.M.                 | Delphi / Harrison       | V5 R134a                   | 59003/409501 |
| G. M.                | Four Seasons            | 88 series HR6 / HD6 / HT6  | 59007/409503 |
| G.M.                 | Delphi / Harrison       | HR6 / HD6 / HT6            | 59003/409501 |
| G.M.                 | Delphi / Harrison       | R4                         | 59003/409501 |
| G.M.                 | Nippondenso             | 10PA                       | 59007/409503 |
| G.M.                 | Sanden                  | SD7                        | 59002/409502 |
| G.M.                 | Sanden                  | SD5                        | 59002/409502 |
| Geo                  | Nippondenso             | 10PO                       | 59007/409503 |
| G.M. Saturn          | Diesel Kiki/Zexel       | DKV                        | 59003/409501 |
| G.M. Saturn          | Diesel Kiki/Zexel       | DCV                        | 59003/409501 |
| G.M.                 | Harrison                | CVC                        | 59003/409501 |
| Honda                | Sanden                  | TR                         | 59007/409503 |
| Honda                | Sanden                  | SD                         | 59002/409502 |
| Honda                | Nippondenso             | 10P                        | 59007/409503 |
| Honda                | Nippondenso             | HADSYS. 7 Cyl.             | 59007/409503 |
| Hyundai              | Ford                    | FX15 / FS10                | 59007/409503 |
| Hyundai              | Halla                   | FX15 / FS10/HS-15,17,18,20 | 59007/409503 |
| Infinity             | Zexel                   | -                          | 59003/409501 |
| Infinity             | Calsonic                | CVW                        | 59007/409503 |
| Infinity             | Zexel                   | -                          | 59007/409503 |
| Isuzu                | Zexel                   | -                          | 59007/409503 |
| Isuzu                | G.M.                    | V5                         | 59007/409503 |
| Isuzu                | Diesel Kiki/Zexel       | KC50                       | 59003/409501 |
| Isuzu                | Diesel Kiki/Zexel       | Rotary                     | 59007/409503 |
| J. I. Case           | Sanden                  | SD                         | 59002/409502 |
| Jaguar               | Sanden                  | SD7H                       | 59002/409502 |

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This chart is for vehicles using R134a, both OE and retrofitted.

| VEHICLE MANUFACTURER | COMPRESSOR MANUFACTURER | COMPRESSOR MODEL | Part Number  |
|----------------------|-------------------------|------------------|--------------|
| Jaguar               | Sanden                  | SD               | 59002/409502 |
| John Deere           | Nippondenso             | 10P              | 59007/409503 |
| Lamborghini          | Sanden                  | SD7              | 59002/409502 |
| Lancia               | Sanden                  | SD7              | 59002/409502 |
| Mack                 | Sanden                  | SD               | 59002/409502 |
| Land Rover           | Sanden                  | TRS              | 59007/409503 |
| Land Rover           | Sanden                  | SD7              | 59002/409502 |
| Lexus                | Nippondenso             | 10PA             | 59007/409503 |
| Lotus                | Sanden                  | SD               | 59007/409503 |
| Mazda                | Panasonic               | Rotary           | 59007/409503 |
| Mazda                | Nippondenso             | TV               | 59002/409502 |
| Mazda                | Ford                    | FS10             | 59007/409503 |
| Mazda                | Sanden                  | SD               | 59002/409502 |
| Mazda                | Zexel                   |                  | 59007/409503 |
| Mercedes             | Harrison                | A6, R4           | 59003/409501 |
| Mercedes             | Nippondenso             | 6CA              | 59007/409503 |
| Mercedes             | Nippondenso             | 10P / 10PA       | 59007/409503 |
| Mercedes             | Sanden                  | SD6V             | 59007/409503 |
| Mercedes             | York                    |                  | 59009/409500 |
| Mitsubishi           | Mitsubishi              | FX / MSC         | 59007/409503 |
| Mitsubishi           | Nippondenso             | 10P / 10PA       | 59007/409503 |
| New Holland          | Sanden                  | SD               | 59007/409503 |
| Nissan               | Diesel Kiki/Zexel       | DKV / DCV        | 59003/409501 |
| Nissan               | Calsonic                | Rotary           | 59007/409503 |
| Nissan               | Diesel Kiki/Nihon       | DKS / Rotary     | 59007/409503 |
| Nissan               | Diesel Kiki/Zexel       | DKV / Rotary     | 59003/409501 |
| Opel                 | Delphi / Harrison       | V5               | 59003/409501 |
| Opel                 | Nippondenso             | 6CA              | 59007/409503 |
| Opel                 | Sanden                  | 7SB              | 59007/409503 |
| Peterbilt            | Sanden                  | SD               | 59002/409502 |
| Peugeot              | Sanden                  | SD               | 59002/409502 |
| Peugeot              | Sanden                  | SDV              | 59007/409503 |
| Porsche              | Nippondenso             | 10P              | 59007/409503 |
| Peugeot              | Sanden                  | SD7              | 59002/409502 |
| Renault              | Sanden                  | SDV              | 59007/409503 |
| Renault              | Sanden                  | SD7              | 59002/409502 |
| Renault              | Sanden                  | TRS              | 59007/409503 |
| Renault              | Zexel                   | DKS-15CH         | 59007/409503 |
| Rolls Royce          | Sanden                  | SDV              | 59007/409503 |
| Rover                | Sanden                  | SD7              | 59002/409502 |
| Rover                | Sanden                  | SDV              | 59007/409503 |
| Rover                | Nippondenso             | 10P              | 59007/409503 |
| Saab                 | Seiko Seiki             | SS               | 59007/409503 |
| Saab                 | Sanden                  |                  | 59009/409500 |
| Saab                 | Nippondenso             | 7SB              | 59007/409503 |
| Seat                 | Sanden                  | SDV              | 59007/409503 |
| Skoda                | Sanden                  | SD7              | 59002/409502 |
| Subaru               | Zexel                   | Rotary           | 59003/409501 |
| Subaru               | Diesel Kiki             | 15CH             | 59007/409503 |
| Suzuki               | Sanden                  | SD               | 59002/409502 |
| Suzuki               | Nippondenso             | 10P              | 59007/409503 |
| Toyota               | Nippondenso             | 10P / 10PA       | 59007/409503 |
| Toyota               | Nippondenso             | TV               | 59002/409502 |
| Vauxhaul (GM)        | Delphi / Harrison       | V5               | 59003/409501 |
| Volkswagen           | Sanden                  | SD / SD7         | 59002/409502 |
| Volkswagen           | Sanden                  | SDV              | 59007/409503 |
| Volkswagen           | Sanden                  | 7SB              | 59007/409503 |
| Volkswagen           | Zexel                   | DCW              | 59007/409503 |
| Volvo                | Seiko Seiki             | SS               | 59007/409503 |
| Volvo                | Sanden                  | SD / SD7         | 59002/409502 |