


Climate Control System - General Information - Air Conditioning (A/C) System Recovery, Evacuation and Charging

General Procedures

Recover / Reclaim

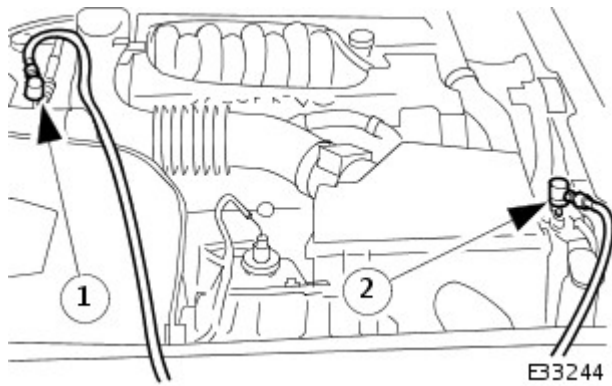
1.  **CAUTION:** Read the procedures and instructions supplied by the manufacturer of the air conditioning service center before commencing any process requiring the handling of refrigerant. In addition to the manufacturer's information, observe all safety precautions and advice detailed in this section.

Disconnect battery ground lead; refer to 86.15.19.

2. Remove passenger side firewall cover.
3. Remove driver side firewall cover.
4. Remove engine compartment rear cover.
5. Remove vehicle charge port protective caps and connect equipment pressure hoses to vehicle.

1. BLUE hose = low pressure.

2. RED hose = high pressure.



6. Complete procedure in accordance with equipment manufacturer's instructions.

Evacuation

1. Complete procedure in accordance with equipment manufacturer's instructions.


- This process will typically take 30 minutes, but will depend upon the equipment and the extent of repairs carried out to the system.

Charging

1. Set the appropriate charge weight, see Specifications in this section.
2. Complete procedure in accordance with equipment manufacturer's instructions.
3. Disconnect hoses from vehicle and replace charge port protective caps.
4. Reconnect battery ground lead; refer to 86.15.15.
5. Check system for correct operation.

Climate Control System - General Information - Contaminated Refrigerant Handling

General Procedures

1.  CAUTION: If contaminated refrigerant is detected DO NOT recover the refrigerant into your R-134a OR R-12 recovery/recycling equipment. Take the follow actions:

Repeat the test to verify contaminated refrigerant is present.

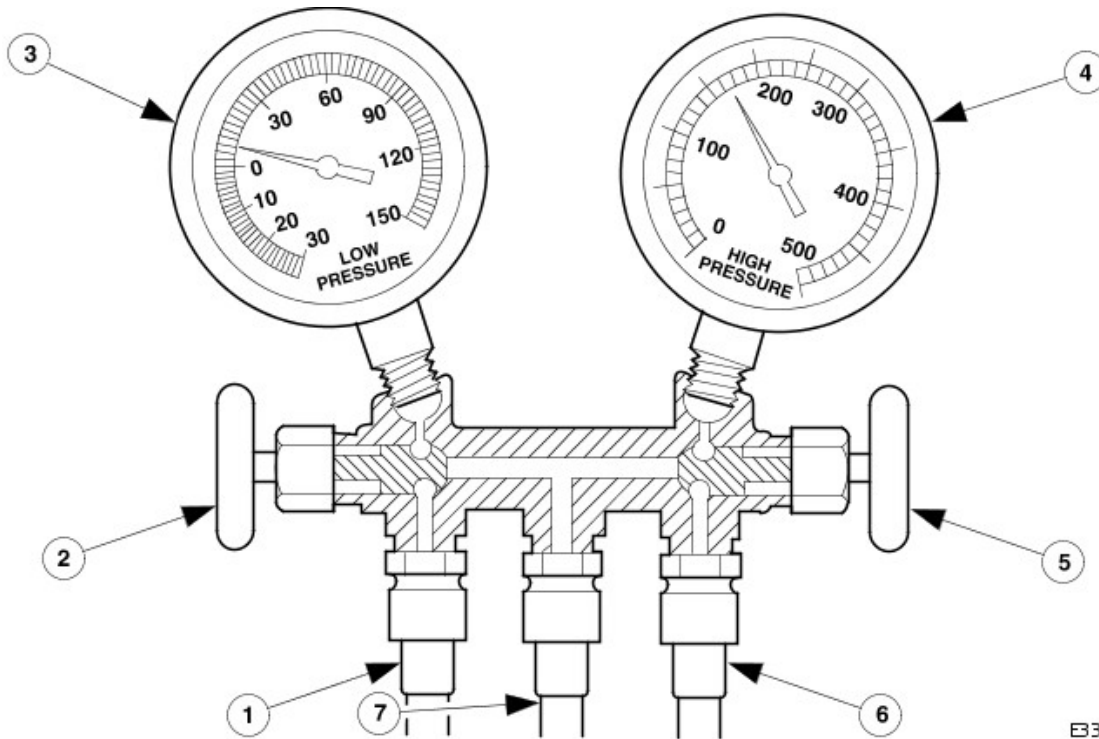
2. Advise the customer of the contaminated A/C system and any additional cost to repair the system. The customer may wish to return to the repair facility performing the last A/C repair.
3. Recover the contaminated refrigerant using suitable recovery only equipment designed for capturing and storing contaminated refrigerant. This equipment must only be used to recover contaminated refrigerant to prevent the spread to other vehicles. As an alternative, contact an A/C repair facility in your area with the proper equipment to perform the repair.

Climate Control System - General Information - Manifold Gauge Set Connection

General Procedures

1. The 'manifold gauge set' is a most important tool for tracing faults and system efficiency assessment. The relationship between HIGH and LOW pressures and their correlation to AMBIENT and EVAPORATOR temperatures must be compared to determine system status (see Pressure / Temperature graphs).

Because of the heavy reliance upon this piece of equipment for service diagnosis, ensure that the gauges are calibrated regularly and the equipment is treated with care.



2.

Parts List

Item	Description
1	LOW side service hose - BLUE
2	LOW side hand valve - BLUE
3	LOW pressure compound gauge - BLUE
4	HIGH pressure gauge - RED
5	HIGH side hand valve - RED
6	HIGH side service hose - RED
7	System service hose - Neutral color, commonly YELLOW

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Manifold.

1. The manifold is designed to control refrigerant flow. When connected into the system, pressure is registered on both gauges at all times. During system tests both the high and low side hand valves should be closed (rotate clockwise to seat the valves). The hand valves isolate the low and the high sides from the center (service) hose.

Low Side Pressure Gauge.

1. This compound gauge, is designed to register positive and negative pressure and may be typically calibrated - Full Scale Deflection, 0 to 10 bar (0 to 150 lbf / in²) pressure in a clockwise direction; 0 to 1000 mbar (0 to 30 in Hg) FSD negative pressure in a counter clockwise direction.

High Side Pressure Gauge.

1. This pressure gauge may be typically calibrated from 0 to 30 bar (0 to 500 lbf / in²) FSD in a clockwise direction. Depending on the manufacturer, this gauge may also be of the compound type.

Climate Control System - General Information - Refrigerant Adding

General Procedures



CAUTION: If oil was drawn out during the recovery process, the correct amount may be added directly from the recovery, recycle and recharge station (if so equipped) prior to the charging process. It must be stressed that the need to protect compressor oil from moisture is vital, observe the procedures in HANDLING LUBRICATING OIL and those concerning excessive engine speed.

1. In order that the air conditioning system may operate efficiently it must contain a full refrigerant charge. The indications of some system defects, and the results of certain tests, will show that a low charge is the most probable cause of the fault. In such cases the charge should be recovered from the system, the weight noted, and the correct amount added.

Should refrigerant be added in liquid form, the engine speed must not exceed 2000 rpm for a period of two minutes after first running the compressor. If the engine speed is excessive, compressor damage may occur due to the lubricating oil and the liquid refrigerant being initially forced around the system as a 'slug', thus taking oil away from the compressor. These marginal lubrication conditions in the compressor will cease as the refrigerant becomes gaseous.

Never attempt to estimate the amount of refrigerant in a system. Always recover and recharge with the correct charge weight; this is the only accurate method.

Climate Control System - General Information - Refrigerant Oil Adding

General Procedures



CAUTION: Always decant fresh oil from a sealed container and do not leave oil exposed to the atmosphere. PAG oil is very hygroscopic (absorbs water) and will rapidly attract atmospheric moisture. PAG oil must NEVER be mixed with mineral based oils. Do not re-use oil following a recovery cycle, dispose of it safely.

1. The amount of oil drawn out during a recovery procedure will be dependent on the state of the system and the rate of recovery. The quantity will be approximately 30 to 40 ml.; this may vary, and the figure is given only for guidance.

The oil separator vessel in the recovery equipment must be clean and empty at the start of the process, so that the quantity of oil which is drawn out may be accurately measured.

- **NOTE:** The equipment manufacturer's instructions must be followed when adding oil directly into an original, or new unit, owing to rectification work to the existing compressor, or the need to fit a new compressor.

Oil may be added to the system either via the recovery, recycle and recharge station or by using a proprietary oil injector. Alternatively, if the compressor has been removed from the vehicle, the oil may be added directly to the compressor.

Original Compressor

1. From an existing compressor, drain the oil into a measuring cylinder and record the amount. Flush the unit out with fresh oil and drain thoroughly. Replenish the compressor with the same amount of oil that was originally drained out and immediately plug all orifices ready for refitting to the vehicle.

New Compressor

1. Drain and discard the transit lubricating oil from the new compressor before it is fitted.

To avoid over-filling the system, an allowance must be made for the quantity of oil found in the original compressor and the quantity deposited in the recovery equipment oil separator from the charge recovery operation.

Typical example:

- Drained from original compressor - 50 ml.
 - Recovered from oil separator - 40 ml.
 - Quantity to be put in new compressor - $50 + 40 = 90$ ml.
2. The difference between the combined total quantity of recovered and drained oil and the nominal capacity of the system (180 ml.), is due to the quantity of oil remaining in components such as the condenser, receiver drier or evaporator. This oil is not normally recoverable.

The same procedure may be followed if a problem has occurred due to oil leakage, as the amount of oil lost is generally small. If the recovery process has not been necessary, because refrigerant has also been lost, then only the quantity drained from the original compressor needs to be replaced.

System Components

1. Should a major component such as condenser, receiver drier or evaporator be renewed, then an adjustment to the system oil content must be made. This may be carried out in the same way as the examples for the compressor, except for the fact that trapped oil within any of these components cannot normally be recovered. An extra quantity of oil should be added, in addition to that recovered from the recovery station separator, as follows:

- Condenser - Add 40 ml.
- Evaporator - Add 40 ml.
- Receiver drier - No addition.