

DIAGNOSIS

COMPRESSOR

GENERAL SYMPTOMS

CHECK FOR COMPRESSOR STROKE
V5 VARIABLE DISPLACEMENT

- Run engine at 3000rpm
- Set A/C Controls to: Normal Mode, High Blower and Temperature to Full Cold
- Open vehicle windows and doors, move mode lever from vent to A/C every 20 seconds for 3 minutes
- Bonnet Should be lowered for this position

Are the compressors **HIGHSIDE** and **LOWSIDE** pressures within 270kpa (300psi) of each other?

YES Determine if compressor is damaged internally

NO **CHECK SYSTEM PERFORMANCE TO CONFIRM**

CONTROL VALVE CHECK
V5 VARIABLE DISPLACEMENT

- Disconnect blower motor
- Set A/C mode to max
- Open bonnet and Close windows & doors
- Start engine and run at fast idle

Is the pressure between 161 and 238 kPa? (23 and 35psi)

YES **CONFIRM NORMAL SYSTEM OPERATION, IF HIGH-SIDE PRESSURE IS STILL LOW AND LOW-SIDE STILL HIGH THEN REPLACE COMPRESSOR**

NO **RECOVER REFRIGERANT PER MANUFACTURERS INSTRUCTIONS | REPLACE CONTROL VALVE | EVACUATE & CHARGE SYSTEM PER MANUFACTURERS INSTRUCTIONS**

CLUTCH OFF ALL THE TIME

Check compressor feed with test light or place jumper lead from the compressor to the positive terminal of the battery

ENGAGED **NOT ENGAGED**

1 Check for blown main fuse
2 Check for open circuit at the following:

APPLY EXTERNAL GROUND TO COMPRESSOR, IF CLUTCH IS STILL NOT ENGAGED REMOVE COMPRESSOR FOR CLUTCH OVERHAUL

a Thermostat Switch Replace Switch

b High & Low Pressure Switch
- Confirm gas pressure
- Replace switch

ALL SWITCHES CHECK OKAY

CHECK FOR BROKEN WIRE OR LOOSE CONNECTION IN COMPRESSOR CIRCUIT. REPAIR OR REPLACE

CLUTCH DISENGAGED OR NOISY

- Check compressor mounting components
- Check engine components eg. alternator, water pump, crankshaft pullet etc.
- Check for intermittent operation of clutch or slipping clutch

- Check clutch bearing
- Check for overcharge
- Check oil level
- Check belt tension

- Check fuse and electrical supply
- Check compressor air gap
- Check idler pulley
- Check compressor clutch rotor pulley

CHECK ALL BELTS & IDLER PULLEY ASSEMBLIES BEFORE COMMENCING ANY COMPRESSOR FAULT FINDING

COMPRESSOR NOISE

OR

BELT SLIPPAGE

Correct belt tension

Is noise corrected?

YES POSSIBLE TXV JAMMED

NO **POSSIBLE COMPRESSOR NOISE**

Possible compressor noise?

Is the noise repeatable?

Longer than 30 seconds?

NO **POSSIBLE LOW CHARGE OR JAMMED CLOSED TXV**

Check system performance to confirm

If pressure confirms as normal, check for loose compressor bolts and/or fouling of A/C plumbing

Everything OK?

RECOVER THE REFRIGERANT AND REPLACE COMPRESSOR

HIGH SIDE GAUGE
POSITIVE DISPLACEMENT

AND

LOW SIDE GAUGE
POSITIVE DISPLACEMENT

Check if compressor clutch is engaged

YES Check for compressor noise

NO Check if discharge hose is hot

NO **CARRY OUT CLUTCH CHECK**

YES Engine off. Clutch disengaged. Rotate compressor & check for tight or rough operation

YES Cycle compressor on and off to verify source of noise

NO Check for blockage in suction hose after service port

NO **REPLACE COMPRESSOR**

COMPRESSOR TYPES

THE COMPRESSOR IS A PUMP THAT CAN BE EITHER VARIABLE OR POSITIVE DISPLACEMENT. IT CARRIES BOTH REFRIGERANT AND OIL THROUGH THE A/C SYSTEM AND HAS TWO PURPOSES

ONE FUNCTION
TO CREATE A LOW PRESSURE CONDITION AT THE PRESSURE INLET

SECOND FUNCTION
TO COMPRESS THE LOW PRESSURE REFRIGERANT VAPOUR INTO HIGH PRESSURE REFRIGERANT VAPOUR

ROTARY VANE

The rotating vane compressor employs a series of rotating vanes or blades, which are installed equidistant around the periphery of a slotted rotor. No sealing rings or pistons are used in the vane type compressor and it has only one valve, which is a discharge valve. The vanes are sealed against the compressor housing by centrifugal force and lubricating oil. Oil is supplied from an oil pump located on the discharge side of the compressor.

eg. Matsushita, Seiko Seiki

VARIABLE DISPLACEMENT

As the name implies, this compressor varies its displacement by changing the stroke of the pistons. The angle of a wobble plate is changed by means of a mechanical valve train or by electronic control valves. Temperature is maintained by varying the capacity of the compressor, NOT BY CYCLING THE CLUTCH ON & OFF. The displacement of the compressor can be varied with the load from 5% to 100%.

eg. V5 Delphi, Sanden TRV

SCROLL

This compressor is based on the scroll-compression concept. The compression unit is made up of two matching scrolls one fixed and the other orbiting, which when placed together form a series of gas pockets. The suction gas enters the scroll unit at the periphery and is compressed progressively into the centre discharge port of the stationary scroll.

eg. Sanden TR

RECIPROCATING PISTON
SINGLE ACTING

In the single-acting compressor, compression of the vapour occurs only on the one side of the piston and once every revolution of the crankshaft.

eg. York, Tecumesh

RECIPROCATING PISTON
DOUBLE ACTING (SWASH PLATE)

In the double acting compressor, the pistons are controlled by means of a wobble plate, compression of the vapour occurs alternately on both sides of the piston so that compression occurs twice during each revolution.

eg. Sanden SD, Unicla