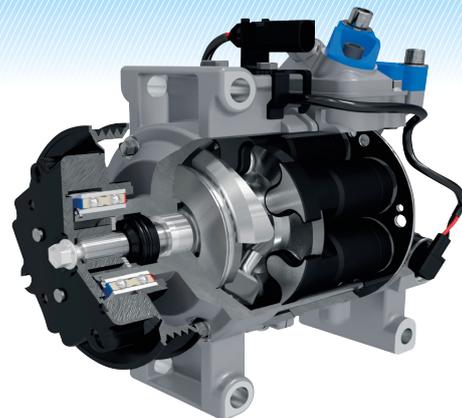


# Compressor Control Valve Identification



Some DENSO compressors for Mercedes-Benz applications are equipped with a diode inside the external control valve

> This bulletin explains their purpose and how to identify if there is a diode inside the external control valve.

## Compressor Control Valve Identification

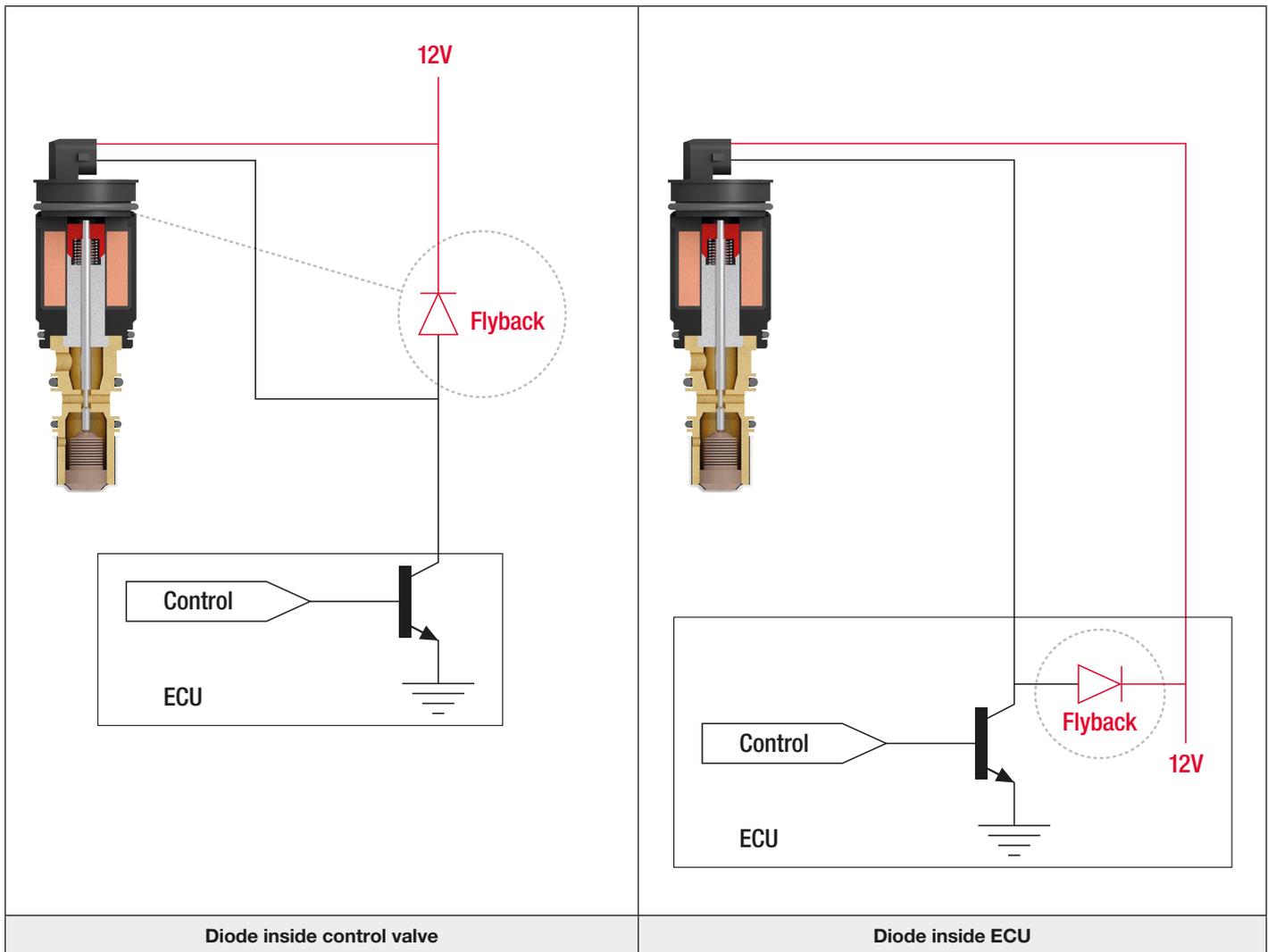
 <p>External Control Valve</p>	
<p>Variable Displacement Compressor</p>	<p>External Control Valve</p>



### Purpose of diode

The purpose of the diode inside the control valve is to eliminate fly back. Fly back is a sudden voltage spike sent across an inductive load when its supply current is suddenly reduced or interrupted. Depending on vehicle application, the diode is installed inside the electronic control unit (ECU) or external control valve. For this reason it is important to select and install the right type of compressor.

If a compressor with a diode inside the external control valve is replaced with a compressor without a diode in the external control valve, the compressor will not operate and the ECU will store a DTC.





**How to identify?**

Ps* Control Valve	Ps* Control Valve with CS** function	Ps* Control Valve with CS** function
<p>The control valve with the diode implemented can be recognised by the five dots on the connector.</p>	<p>No indication on the control valve means the diode is inside the ECU</p>	<p>Triangle on top of the connector is the identification for diode-implementation</p>
↓	↓	↓
<p><b>Ps* valve with Diode</b></p>	<p><b>Ps* valve without Diode</b></p>	<p><b>Ps* + CS** valve with Diode</b></p>

**Ps\* Control Valve**

The Ps\* control valve is a type of external control valve that electromagnetically controls suction pressure directly related to the evaporator temperature.

**Ps\* Control Valve with CS\*\* function**

When a vehicle is parked for a long time, there are rare cases in which liquid refrigerant accumulates inside the compressor. When liquid refrigerant accumulates, it is churned by a swash plate under high-speed rotation when the compressor is driven, and the crank chamber pressure rises. A rise in pressure means the refrigerant discharge capacity cannot be increased, and as a result the cooling performance cannot be increased.

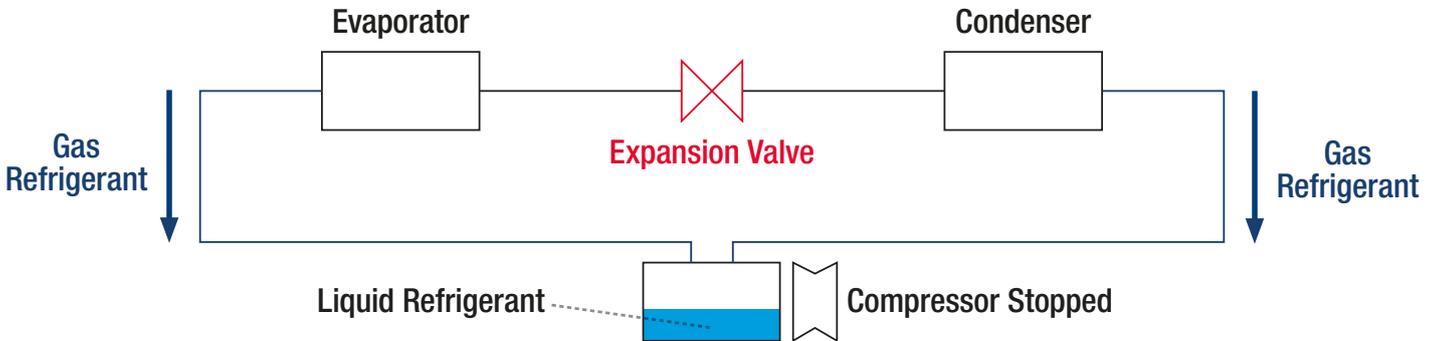
When liquid refrigerant accumulates in the compressor, the CS\*\* valve quickly discharges liquid refrigerant to the suction chamber, to improve the response of the variable displacement compressor.

\*Ps = suction

\*\*CS = Crank to Suction



### What causes refrigerant to accumulate inside the compressor?



The compressor has a large heat capacity. Therefore, when the vehicle is left parked for a long time, gas refrigerant within the refrigeration cycle is cooled by a compressor where it becomes liquid refrigerant and accumulates. When the ambient temperature rises, the compressor is harder to warm than other cycle components. As a result, there are cases where liquid refrigerant does not become gas refrigerant and accumulates in the compressor. This is why a CS valve is used.

**Further details of DENSO's Thermal range are available online at [www.denso-am.eu](http://www.denso-am.eu), on TecDoc or from your local DENSO Aftermarket contact.**

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