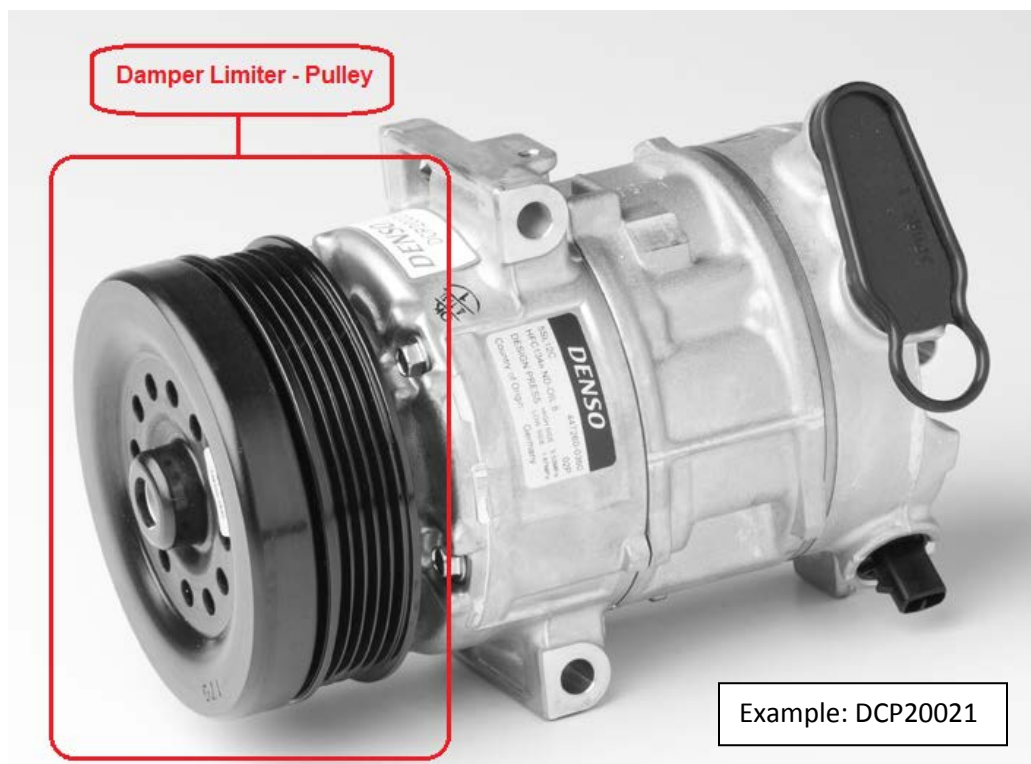


**Subject: Failure of Damper Limiter - Pulleys, for external controlled compressors****1. Outline**

This bulletin is to inform you, how to diagnose DL-Pulley failure, for external controlled compressors.

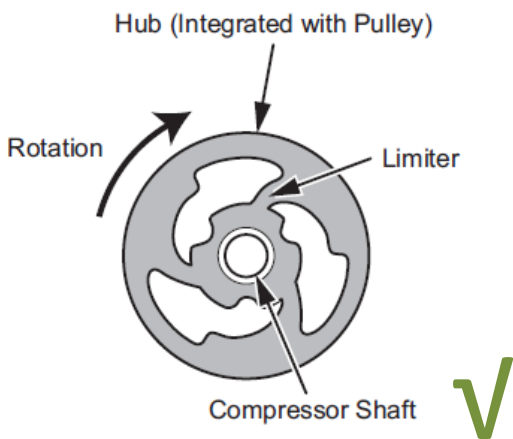
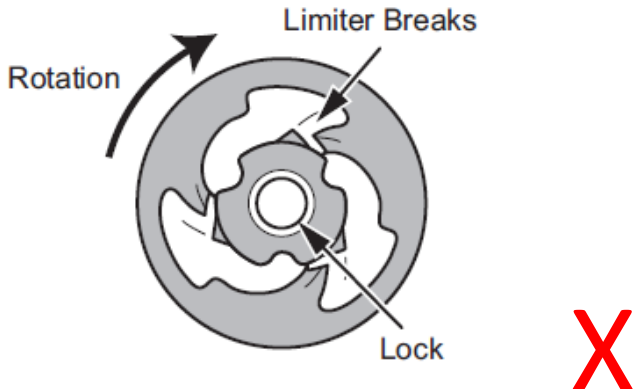


**2. Applicable product**

All external controlled compressors with a DL-Pulley.



**Purpose of the limiter and (optional) mass damper**

The limiter of the DL Pulley is a safety mechanism, which prevents the multi belt from breaking, after, for example, the compressor is locked. When the limiter breaks, the pulley can run freely, so the multi belt will not lose his drive function. The mass damper is (optional) installed too dampen variations in engine speed.

Limiter <b>OK</b>	Limiter <b>NG</b>
	
	

## Why do limiters break or does the (optional) mass damper comes loose?

The main reasons, why the limiter of the DL-pulley breaks or the mass damper comes loose are,

1. Excessive negative force on the DL-pulley, due to too much drive belt movement.
2. Continuously changing force on the DL-pulley, due to severe rotation speed fluctuation.
3. Excessive force on the DL-pulley, due to too much engine torque.
4. Liquid lock of the compressor, due to excessive refrigerant, incorrect charging of refrigerant, expansion valve problems or too much compressor oil.
5. Too much friction of internal compressor parts.
6. Vacuum lock, caused by running the engine, when the refrigerant system is vacuumed.

## Explanation

1. Negative force, caused by the drive belt, is one of the main issues.  
This negative force can be caused by several parts of the accessory belt drive system.

### How to check?

Carry out inspection with the engine idling, engine speed increase and engine speed decrease. Check by visual inspection, if the drive belt has too much movement. In case of too much belt movement, inspection and / or replacement of the following parts is required.

- Various pulley's, like alternator free run pulley, crankshaft pulley and idler pulley
- Automatic belt tensioner (check the damper)
- Dual mass flywheel

2. Severe rotational speed fluctuation of the engine can be caused by the fuel injection system, ignition system, exhaust emission control system or camshaft timing. (rough idling – rough running)
3. Too much engine torque, due to enhanced torque output. (chip tuning)
4. Liquid lock is usually caused by charging a liquid refrigerant to the low pressure side, of the vehicle AC system. Another cause could be the creation of “refrigerant mist” inside the low pressure side of the AC system, which ultimately, also can cause liquid lock of the AC compressor. This creation of mist is usually caused by a faulty expansion valve or excessive amount of refrigerant.

Too much compressor oil is another reason, which can cause liquid lock. All new Denso compressors are pre-filled with compressor oil. Please read the “Compressor Installation Guide” very carefully, before replacing the compressor. The “Compressor Installation Guide” is enclosed with the new compressor or can be downloaded, in different languages, from the Denso After Market website.

[www.denso-am.eu](http://www.denso-am.eu)

5. Too much friction of internal compressor parts, can be caused by the use of the wrong type of compressor oil, too much or wrong UV-dye, insufficient oil and refrigerant amount or insufficient cleaning of the refrigerant cycle, after replacing the compressor. For details, see “Compressor Installation Guide”
6. Vacuum lock can be caused when the AC system is under vacuum and the engine is started. Because of the vacuum in the AC system, the swash plate, inside the compressor is moved over the maximum displacement position. When the engine is running in this condition, the pistons will hit the front end of the drive plate and the compressor locks.

