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PuMA measure

## N74 Cylinder Leakage Test

UR-V-2 65503553-01 - 11/3/20

### Complaint:

Information and instructions on carrying out a Cylinder Leakage Test on an N74 engine

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### Cause

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A cylinder leakage test can be used to assess the mechanical health of an engine by measuring pressure loss within a combustion chamber.

If an engine has a mechanical issue (low cylinder pressure) it is possible to pinpoint where this loss is coming from by carrying out a cylinder leakage test.

It can be used as supplementary test to a compression test, it does not replace a compression test.

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### Measure

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For any engine running complaint that cannot be attributed to a basic misfire complaint (Plug, coil, injector), a cylinder leakage test should be carried out.

The purpose of this measure is to provide you with an overview of the benefits of a Cylinder Leakage Test, as well as the information required to carry out a test and interpret your results.

A cylinder leakage test takes the pressure from the tester and compares it to the air pressure that the cylinder is able to hold.

For example if the tester outputs 8Bar of pressure, but the cylinder is only capable of holding 6Bar of pressure then there will be a loss/leakage of 25%.

During a Cylinder Leakage Test the tester will apply air pressure to the cylinder and will measure the amount that is lost/leaks out past the valves, piston rings or head gasket/cracks.

When the cylinder that you're testing is at TDC, both the exhaust and the inlet valves will be closed, this should seal the cylinder and allow virtually no air to escape. Very small amounts may pass past the piston rings but the cylinder leak test can precisely identify the areas of leakage within the engine by listening/feeling where the air is escaping.

If you can feel/hear air escaping through the inlet manifold/throttle body then you will be looking at the sealing of the inlet valves.

If the air can be felt or heard through the exhaust (\*This may be minimal on our engines due to Turbo/Catalyst setup, you may need to remove exhaust centre section from downpipe and listen that way) then the exhaust valves are at fault.

If the air can be felt/heard through the oil dipstick or the oil cap then it is leaking past the piston rings.

If the air is felt/heard in the expansion bottle then the leakage would be in the head gasket or a crack in the block/cylinder head through to the water jacket.

If the Air is heard/felt in the neighboring cylinder this may be blowing past the headgasket.

Please see the attachment for how to use the BMW pressure loss tester.

Carry out the cylinder leakage test on a warm engine, remove the spark plug of the cylinder being tested, dipstick, oil cap, expansion bottle cap and air intake (this will allow you to easily identify if any air is escaping and from where).

Turn the engine over manually to get desired cylinder onto TDC (the BMW Cylinder Leakage Tester comes with a TDC tool)

Connect the Cylinder Leakage Tester to the spark plug hole on the desired cylinder, connect the air line to the tester (Check manufacturers instructions for pressure) and check the reading on the gauge. (See attached instructions)

This reading will show the amount of air that is leaking out of the cylinder.

If excessively high readings are detected disconnect the air supply and attempt to find TDC again and retest.

Repeat for all cylinders.

Gauge readings that are below 22% are deemed to be OK.

Any readings that are above 22% will need to be investigated to ascertain the cause of the leakage.

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NOTE - Ensure the area is free of debris, all screws/nuts/bolts/foreign objects are secured and away from any openings that they may fall into before carrying out this test.

NOTE - Before Spark plug removal remove dirt contamination from the spark plug shaft. The plug shaft must be cleaned with compressed air after the ignition coils have been removed but before the spark plugs have been dismantled. After removing the spark plugs, check the sealing surface again for dirt contamination and if necessary, clean with a damp cloth or again with compressed air.

NOTE: Deposits that are not removed according to instructions may enter the combustion chamber and lead to uncontrolled combustion. Remaining deposits in the area of the spark plug seal can lead to leaks and to the spark plugs coming loose during engine operation.

NOTE - Ensure the engine is locked when applying pressure to the cylinder, as excessive pressure may cause the engine to turn back, and affect the timing, ultimately damaging the engine.

Please follow:

Spark Handling and Installation Guide 65357190

Engine Repair and Replacement Carepoint 65380533

Spark Plug repair instructions on ISTA/AIR for relevant models

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### Validity information

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Model series:	[RR5, RR4, RR22, RR11, RR12, RR6, RR31, RR21]
Engine range:	[N74, N74R, N74L]
Body style:	[ALL]
Fault codes:	[]
Production period:	-

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### Repair overviews

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11/00/001, Engine, Engine compartment area (front), , Cannot be encoded with VFC, , No action

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### Attachments

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Number of attachments: 4