INFO FLASH

Midlum Dxi5 / Dxi7

Recommendation euro 5
“SCR and components shifting”
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1. Introduction

The aim of this document is to supply all information and recommendations necessary for bodybuilders in order to shift the SCR "Selective Catalytic Reduction" silencer (exhaust line and actives components displacement).

Vehicles involved:
- RENAULT MIDLUM DXi 5/DXi7 Euro 5

Vehicles are launched after the end of confirmed technical design work and validation trials, bearing in mind the different laws, regulations, standards…

The bodybuilder must comply with:
- Different European and/or destination countries' laws and regulations governing the driving and building of vehicles.
- Stipulations of the Highway Code and its various amendments and appendices.
- Different regulations and standards governing road traffic in force in the destination countries.

Any modification not described in the present document or change in position of parts or elements making up the vehicle must be covered by a technical agreement issued by the Technical Commercial Department.

Note: For any further information, consult the Technical Commercial Department.
Note: Parts to be used are available from the Spare Parts Department.
Note: For the description of the warning lights or the fault codes on the dashboard refer to « Vehicle Servicing Handbook »

2. Reminder on the pollution control system

The layout of all these components is defined so as not to disturb bodybuilding and therefore avoid (as much as possible) having to work on these components.
Furthermore, each position is subject to various validations. The correct operation and reliability of the system is no longer guaranteed if the following instructions are not obeyed.
If none of the proposals below do not suit you, contact the Technical Commercial Department.

1 - SCR catalytic converter
2 - Pump (ADS)
3 - Injector
4 - Reservoir
5 - Heater
6 - Solenoid valve
7 - NOx sensor
8 - Exhaust gases temperature sensor
9 - Level and temperature sensor
10 - Engine coolant pipes
11 - AdBlue heating pipes
12 - Engine CAN
13 - Precatalyst
Catalytic converter(s)

Model (1) RENAULT MIDLUM DXi 5 / RENAULT MIDLUM DXi 7
- Weight: 45/50 kg
- Straps securing bolts: 20±4 Nm
- Exhaust clamps securing nuts: 8±1 Nm

WARNING
The heavy weight of catalytic converters requires the use of lifting tackle. Depending on vehicle configuration and workshop tools, use appropriate lifting tackle (handling trolley, strap(s)...).

3. Types of SCR silencer outlets

- **Midlum DXi5**

  ![In the track](image1)
  ![Side](image2)
  ![Vertical](image3)
  ![Sweeper](image4)
  ![FPTL](image5)
Midlum DXi7

4X2

In the track

Side

Vertical

Sweeper

FPT

4X4

In the track

Side
4. Replacement of SCR silencer

If the SCR silencer is replaced, the new SCR silencer must be compatible with the vehicle's engine and meet the same exhaust emissions level requirement and the same weight (or lighter) as the original SCR one. Heat shields and other parts must be fitted to the SCR silencer as on the original installation.

The SCR silencer must always be handled by its original brackets:

(M12x1, 25 class 10, 9)
5. SCR silencer shifting

Reminder:
- **x** – Shifting rearward
- **y** – Shifting inside
- **z** – Shifting upward

Pipe modifications can involve additional pressure losses in the exhaust line and by the way polluting emission or engine’s problems (overconsumption …)

**WARNING**
Any person carrying out work is responsible for his own services in terms of warranty and liability, including damage caused by the work and/or equipment installed on the vehicle or on the basic product.

**WARNING**
Any failure to observe these recommendations shall be considered as breach of the same rules and will relieve the manufacturer from its responsibility in the event of any damage connected directly or indirectly with such non-observation.

The requirements below must be carried out in the order shown to comply with Euro 5 pollution control standards, for meeting the correct operating temperatures and not exceeding the maximum authorized and certified exhaust line head loss.

**Note:**
- The installations recommended in this manual are covered by engine type approvals.
- The maximum engine outlet temperature is 550°C
- Ensure that the exhaust outlet does not damage or adversely affect other on-vehicle components.
- Do not modify existing wiring harnesses – replace if necessary (refer to "Wiring harnesses table").

For any further information on wiring and cabling, please contact the Technical-commercial Department.

- **Maximum upstream exhaust extension pipe length and values for SCR silencer shifting:**

The upstream exhaust line can be extended to the rear of the side members to the maximum of the value indicated in the table below, measured from its initial position.

SCR silencer displacement to the front of the side members is forbidden.

<table>
<thead>
<tr>
<th>désignation</th>
<th>Total Elongation max (m)</th>
<th>Remak</th>
</tr>
</thead>
<tbody>
<tr>
<td>DXi EL left exhaust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi5 EL rear exhaust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi5 EL vertical exhaust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi5 EL vertical exhaust fire truck</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi5 ML/M/L left exhaust</td>
<td>0,8</td>
<td></td>
</tr>
<tr>
<td>DXi5 ML/M/L rear exhaust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi5 ML/M/L vertical exhaust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi5 ML/M/L vertical exhaust sweeper</td>
<td>0,00</td>
<td></td>
</tr>
<tr>
<td>DXi7 M/L/H left exhaust without precatalyst (D7F240)</td>
<td>1</td>
<td>Addition of the 2nd flexible pipe</td>
</tr>
<tr>
<td>DXi7 M/L/H rear exhaust without precatalyst (D7F240)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi7 M/L/H vertical exhaust without precatalyst (D7F240)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi7 M/L vertical exhaust sweeper without precatalyst (D7F240)</td>
<td>0,00</td>
<td></td>
</tr>
<tr>
<td>DXi7 M/L/H left exhaust with precatalyst (D7F290/D7F260)</td>
<td>1,60</td>
<td>Addition of</td>
</tr>
<tr>
<td>Model</td>
<td>Second Flexible Pipe</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>DXi7 M/L/H rear exhaust with precatalyst (D7F290/D7F260)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi7 M/L/H vertical exhaust with precatalyst (D7F290/D7F260)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi7 M/L vertical exhaust sweeper with precatalyst (D7F290/D7F260)</td>
<td>0.3</td>
<td>Addition of the 2nd flexible pipe</td>
</tr>
<tr>
<td>DXi7 M/L vertical exhaust fire truck with precatalyst (D7F290/D7F260)</td>
<td>1</td>
<td>Addition of the 2nd flexible pipe</td>
</tr>
<tr>
<td>DXi7 4x4 left exhaust with precatalyst (D7F290/D7F260)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi7 4x4 rear exhaust with precatalyst (D7F290/D7F260)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi7 4x4 vertical exhaust with precatalyst (D7F290/D7F260)</td>
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<td>Addition of the 2nd flexible pipe</td>
</tr>
<tr>
<td>DXi7 4x4 vertical exhaust fire truck CCR with precatalyst (D7F290/D7F260)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DXi7 4x4 vertical exhaust fire truck CCF with precatalyst (D7F290/D7F260)</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>

**On Midlum**, the silencer can be shifted rearward.

It is not allowed to shift forward the silencer; it will disrupt the post-treatment functioning.

- **Recommendations for the exhaust upstream line modification in case of SCR displacement**

The modified pipe must be correctly held by brackets to avoid damaging the turbocharger outlet, the SCR silencer outlet, and the precatalyst outlet.

These brackets, together with their reliability of assembly, are the equipment manufacturer's responsibility.

In general, the following rules must be observed:

- The free length of the pipe before the SCR entry does not exceed 800mm and should always be equipped by a bracket.
- For an extension pipe between 500mm and 1000mm, an additional bracket should be added every 400mm with the same definition than the standard support (flexibility)
- For an extension pipe upper than 1000mm, a flexible pipe with the same characteristics than the standard one should be added. The flexible pipe must be fitted straight (without bends and without spin) inside its nominal length.

The flexible pipe (1) originally fitted to the turbocharger outlet or to the precatalyst outlet must remain in original position.

- **Displacement with intermediate tube: extension < 1000mm**
To change the position of the SCR silencer, it is necessary to extend the exhaust pipe by meeting the requirements below.

**Tube characteristics**

<table>
<thead>
<tr>
<th>Material</th>
<th>Stainless steel X5CRNi18-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube diameter</td>
<td>88.9 mm</td>
</tr>
<tr>
<td>Tube thickness</td>
<td>2 mm</td>
</tr>
</tbody>
</table>

The following requirements must be met in order to form the bends on the tube between and before the SCR silencer.

**Tube bending characteristics**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum number of bends</td>
<td>3</td>
</tr>
<tr>
<td>Total angle of curvature</td>
<td>200°</td>
</tr>
<tr>
<td>Authorized maximum angle</td>
<td>90°</td>
</tr>
<tr>
<td>Minimum radius (r) measured in centre of tube</td>
<td>130 mm</td>
</tr>
</tbody>
</table>

All the bends added to the pipe must be tangential (gentle bends). The pipes must be assembled so as to ensure a gastight seal (clamps…) whether they be bent or fabricated.

**Note:** Parts to be used should be available from the Spare Parts Department.

**Assembly example**

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
<th>Engine</th>
<th>Part N°</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flexible pipe</td>
<td>DXi5/7</td>
<td>5010626337 / 20752167</td>
</tr>
<tr>
<td>2</td>
<td>Clamps</td>
<td>DXi5</td>
<td>5010610302 / 20712440</td>
</tr>
</tbody>
</table>
WARNING
- If possible, keep the original SCR silencer brackets supplied with the vehicle. In case of modification, ensuring the mechanical strength of the new set
After the silencer shifting, it is necessary to check the ground clearance of the vehicle.
- The modifications made on the SCR silencer bracket and its fastenings, together with the reliability of assembly, are the equipment manufacturer’s responsibility.
- Vertical and inside shifting are not included in this document and will be under bodybuilder responsibility.
- The increase length of the pipes and the addition of elbow can involve “resonance process” and/or increase the noise level of the line. The bodybuilder is responsible to check acoustics of the line after modification.
- The silencer shifting on ADR vehicles is not included in this document. These vehicles have a specific regulation and a silencer displacement will need a new approval. For any modifications on this vehicle ask to the technical support

- Heat shielding:
  Beware: it's necessary to protect some elements from heat. It's under the bodybuilder responsibility to be sure that the modifications do not increase the temperature on other components that can pose problem.

- Precatalyst

The precatalyst is fitted on the engine to avoid constraints on turbo and precatalyst
Precatalyst have an integrated heat insulation that covers most areas of the precatalyst except mainly on brackets areas as shown on this picture.
No intervention on the precatalyst is allowed. The precatalyst can't be moved

6. Modifications of the pipe after the SCR silencer

For any modification length of the pipe after the silencer, seek advice from the. Technical-commercial Department
The orientation of the exhaust outlet is done to avoid water intrusions. Always check this orientation after the silencer displacement to avoid trouble.
Note: The maximum temperature at the exhaust outlet is 450°C.
Ensure that the exhaust outlet does not damage or adversely affect other on-vehicle components.

Note: The exhaust outlet directing must comply with national laws and directives.
Always check regulation conformity before making any modification to the exhaust line.

7. Sensors and wiring harnesses

Note: See also the recommendation "Moving of position of Ad Blue components"

When you modify the position of an SCR silencer, the position of related sensors or, if necessary, it is possible to replace the original wiring harnesses with one of the two wiring harnesses available in spare part.

(1) - 2-way DIN – Temperature sensor after catalytic converter
(2) - 4-way BDK – CAN NOx sensor
Changing position of NOx Sensor

Tightening torques:
- Control unit securing nut(s) (1): 12 Nm
- NOx sensor (2): 50 ± 8 Nm

Position: The position of the NOx sensor compared to the SCR silencer must be preserved. The extension of the cable of the NOx sensor (between 1 and 2) is forbidden.

The shifting of the silencer must be carried out so as to respect the positioning of the sensor.

X = Length of the security loop has to be adapted by the customer to the amplitude of exhaust pipe movements.

Fixing: the position of the sensor should remain identical: existing fixation must be used.
The sensor should be protected from water projection.

Injector, temperature sensor and mixer displacement:

It is necessary that the injector, the temperature sensor and the mixer undergoes same displacement as the SCR silencer. There order installation should be kept. Indeed distances between these various parts must be respected.

Installation to be respected:
Recommendations:
- Minimal straight zone after injector 200mm (no elbows so as to limit crystallization)
- No vertical line between injector and mixer (to limit crystallization)
- No modification possible for the precat (to keep the initial position, closest as possible from the engine)
- Minimal distance between mixer and the SCR silencer = 200mm
- Distance between injector and SCR silencer = 400±100mm
- * Inlet muffler to first catalyst brick around 300 mm (length on the current mufflers)

Injector:

Tightening torque: 10Nm ± 1,5 Nm

The injector can be installed in any angle nevertheless it is recommended to avoid the vertical installation: cf picture below
The location of the injector on the exhaust line is very important. It could affect SCR’s performances.
The injector must be assembled on a base plate as 20787231:

Temperature sensor

Tightening torque: 45 Nm ± 5 Nm

Routing:
The temperature sensor installation must respect information below:

Fastening of the cable: Additional fixing points for the flexible cable should be fitted at:
- Minimum 200 mm behind the fixing nut
- Maximum 150 mm before the connector

Sensor positioning:
Installation angle is preferred to be inclined at minimum 15° towards horizontal (with electrical connection upward). The sensor tip should be positioned preferred close to the centre of the exhaust pipe and perpendicular to the flow. The sensor top may not be in contact with anything

Fastening
The sensor must be fitted on a welded socket such as 25482688
Positioning:
The mixer must be located at more than 200mm from the silencer. It must be installed between the injector and the SCR silencer, in the exhaust pipe, perpendicular to the gas flow.