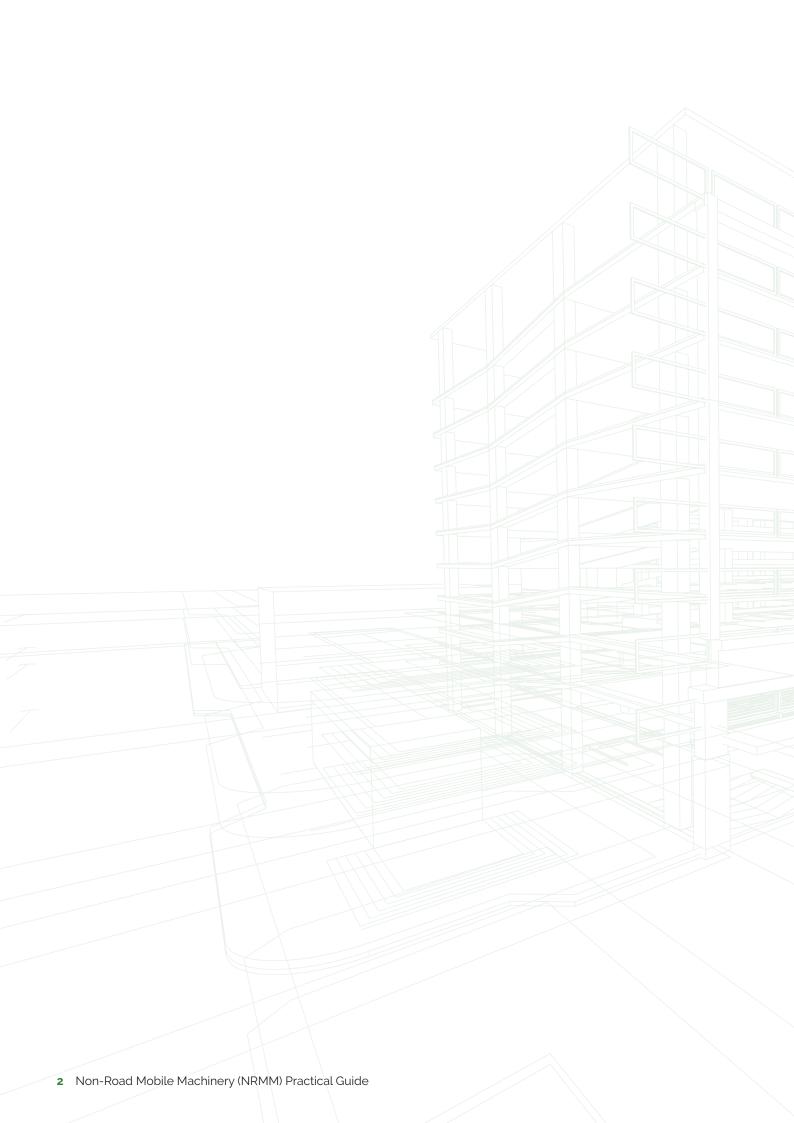


GREATER LONDON

LONDON LOW EMISSION

Non-Road Mobile Machinery (NRMM) Practical Guide

September 2017



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### **Section 1: Introduction**

#### 1.1 Purpose

This document contains guidance on the processes and procedures that should be in place on all relevant development sites, including the recommended practices, documentation, considerations and planning conditions.

It can be used by both regulators and developers to better understand what is expected of sites.

#### 1.2 Background

For a number of years, many diesel road vehicles have had to meet emissions standards to avoid being charged for travelling within the London Low Emission Zone (LEZ). It is also important to take action to reduce emissions from non-road mobile machinery (NRMM) in order to protect and improve the health of Londoners. The London Atmospheric Emissions Inventory estimates that in 2013, NRMM used on construction sites was responsible for 7% of NOx emissions, 8% of PM10 emissions, and 14.5% of PM2.5 emissions in London.

PMs and NOx also contribute to poor respiratory health. Ensuring that NRMM used on site meets cleaner emissions standards also helps to protect the health of site workers who use and work in close proximity to these machines.

To address the contribution made by nonroad mobile machinery on London's air quality, the GLA have established emissions standards for London.

## **Section 2: The Requirements**

#### 2.1 Definition of NRMM

Non-road mobile machinery (NRMM) is defined as any mobile machine or vehicle that is not solely intended for carrying passengers or goods on the road.

The Emissions requirements are only applicable to NRMM that is powered by diesel, including diesel hybrids.

# Examples of NRMM include, but are not limited to:

- Access platforms
- Dumpers
- Piling rigs
- Excavators
- Bulldozers
- Forklifts
- Compressors
- Generators
- Mobile cranes
- Concrete pumps
- Mobile crushers
- Telehandlers
- Rollers
- Other construction machinery

#### 2.2 Where do the NRMM emissions standards apply?

Currently the NRMM emissions standards apply to all Major Development Sites in Greater London, and all sites within the Central Activity Zone or Canary wharf (CAZ/CW).

From 1st September 2020 the NRMM emissions standards will apply to all sites in Greater London.

#### 2.3 Definition of a major development

Major development sites are defined in the London Plan as a residential development of 10 or more dwellings, or having an area of 0.5 hectares or more where number of dwellings is not known; or any development carried out on a site having an area of 1 hectare or more, or floor space of 1000 square metres or more.

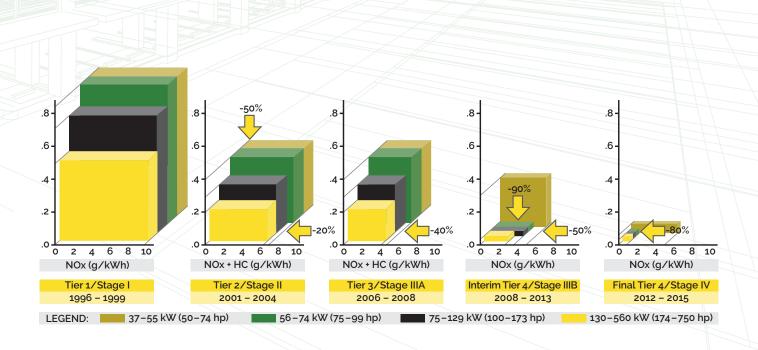
#### 2.4 What are the requirements?

Currently NRMM on major construction sites within Greater London are required to meet Stage IIIA of EU Directive 97/68/EC as a minimum; and NRMM on all sites within either the Central Activity Zone or Canary Wharf (CAZ/CW) are required to meet Stage IIIB of EU Directive 97/68/EC as a minimum.

From 1st September 2020 NRMM on all sites within Greater London will be required to meet Stage IIIB of EU Directive 97/68/EC as a minimum; and NRMM on all sites within either the Central Activity Zone or Canary Wharf (CAZ/CW) will be required to meet Stage IV of EU Directive 97/68/EC as a minimum.

Currently the requirements only apply to NRMM of net power between 37kW and 560kW. The net power range will be annually reviewed by the GLA.

Although the requirements do not apply to all sites, and only to NRMM of net power between 37kW and 560kW, it is good practice to apply the same standard to all sites and all categories of NRMM.



#### 2.5 Model Planning Condition

The NRMM regulations affect all development sites within the Central Activity Zone (CAZ) or Canary Wharf and all major development sites within Greater London. Planning conditions should be placed on those sites in order to help mitigate the impact of developments on air quality and safeguard the health of site workers.

Model Condition:

'NRMM used on any site within the CAZ or Canary Wharf is required to meet Stage IIIB of EU directive 97/68/EC as a minimum, and NRMM used on the site of any major development within Greater London is required to meet Stage IIIA of EU directive 97/68/EC as a minimum.'

# Section 3: Recommended management procedures

Here is a recommended site procedure that works in most situations, however sites are free to adapt this procedure for their site. The procedures should still ensure that the site is compliant, and that centralised records of the relevant emissions information are being kept and can be made available on site.

Sites must additionally ensure that the online register is kept up to date.

#### 3.1 Roles and Responsibilities

On each site the Primary Contractor should nominate a person to manage the NRMM requirements. It is their responsibility to ensure that the site is compliant, which includes:

- a) Ensuring that all relevant site workers are aware of the requirements, carrying out their roles and adequately equipped to do so.
- b) Keeping all relevant machinery emissions information and documentation centralised on site
- c) Ensuring that the NRMM online register is kept up to date (http://nrmm.london/)

Each sub-contractor should nominate 1 person to be responsible for ensuring that the NRMM they are bringing to site is compliant and provide the Primary Contractor with the relevant details for each machine.

#### 3.2 Sub-contractors checks

The maximum amount of time an item of non-compliant NRMM can stay on site without an exemption is 5 days, therefore NRMM should be checked by the sub-contractor, and the primary contractor notified within the first 5 days of its arrival.

An example of the type of form that can be used to record NRMM details when it arrives is shown in Appendix 1. For guidance on how to find the relevant emissions information on the engine, and how to confirm engine emissions stage, see Sections 4.3 – 4.6.

#### 3.3 Site NRMM inventory spreadsheet

After being checked by the sub-contractor, the NRMM emissions information should be passed to the Primary Contractor, who will keep the relevant information for all NRMM on site centralised on their own spreadsheets. An example spreadsheet that could be used is shown in Appendix 3. It is optional for subcontractors to keep similar spreadsheets of their own.

#### 3.4 Primary contractor checks

The information provided by the sub-contractors should be checked by the Primary Contractor at least once per month, this could be included in the site monthly/weekly environmental audits. These checks should be documented on the site NRMM inventory spreadsheet.

For guidance on how to find the relevant emissions information on the engine, and how to confirm an engines emissions stage, see Section 4: Inspections and Assessing compliance.

#### 3.5 Managing non-compliant NRMM

If during any of these checks an item of NRMM is found to be non-compliant, the contractor should remove it from site within 5 days of its arrival. If this is not possible then the primary contractor should apply for a 30 day exemption, explaining why the item of NRMM cannot be removed within the 5 day deadline. The application should include your intentions for the machine, for example when you plan to remove it from site or install a retrofit (see Section 4.6 for more information regarding retrofits).

While the exemption request is awaiting approval the exemption is active, but be aware that these applications may be refused and sites should be prepared to remove the machine as soon as possible in those cases.

It is also recommended that sites keep a record of actions taken to address any instances when non-compliant NRMM arrives on site. An example incident report sheet is shown in Appendix 4.

## Section 4: Inspections & Assessing compliance

#### 4.1 Health and Safety

Site health and safety procedure must be followed at all times during NRMM inspections. If for health and safety reasons a particular item of NRMM on site cannot be inspected. the person carrying out the inspection should ask to see the appropriate documentation for that machine. If there is reason to believe that the item of NRMM is non-compliant, or the appropriate documentation is not available, an inspection should be carried out as soon as possible at a time when it is safe to do so.

#### 4.2 Local Authority Inspection

It is recommended that these inspections are arranged in advance. The inspecting officer should view all areas of site where NRMM could be found, checking whether the NRMM on site is compliant and that the relevant emissions information matches up with site records.

An example inspection form is available in Appendix 2. This is primarily for local authority use, but sites can also use this if they wish to do so. Most sites prefer to record their own checks on their NRMM inventory spreadsheets (Appendix 3).

#### 4.3 Reading engine Type Approval plates

Approved engines must have an EC Type Approval Number. The type approval number should be permanently fixed and durable for the lifetime of the engine. The exact location of the Type Approval Plate varies from one machine to another.

The number takes the following format:

#### e11\*97/68AB\*2004/26\*XXXX\*YY

(Note that this is an example and not a real Type Approval Number)

the member state authority that tested the engine
the original EC base legislation the approval is for
the encoding letter of the EU Emissions Stage
variable speed (A) or constant speed (B) engine

2004/26\* the latest level of the legislation that the approval relates toXXXX\* the identification number of the manufacturer or importer

**YY** indicates if the approval has any revisions

Using the tables below, an engines EU Emissions Stage and Power Band (kW) can be identified from the encoding letter in the Type Approval Number. Note that Encoding letters D and K indicate Power Band 19kW – 37kW which is currently outside of the kW threshold of the requirements.

Encoding Letter	EU Emissions Stage
A-C	EU Stage I
D-G	EU Stage II
H-K	EU Stage IIIA
L-P	EU Stage IIIB
Q-R	EU Stage IV

		Power Band (kW)								
		19≤ kW <37	37≤ kW <56	56≤ kW <75	75≤ kW <130	130≤ kW <560				
Зе	I	*	С	С	В	А				
stage	Ш	D	G	G	F	E				
ons	IIIA	K	J	J	I	Н				
Emissions	IIIB	*	Р	Ν	М	L				
п	IV	*	*	R	R	Q				

\* no encoding letter assigned

Example Type Approval plates with explanations of what information can be gathered from them are available in Appendix 5.

#### 4.4 Difficulty locating Type Approval plates

If you are having trouble finding a Type Approval plate you should get in touch with the machine supplier who may be able to tell you where it is located on the machine.

If no Type Approval Number is evident on the machine, or it cannot be read for any reason, then appropriate documentation should be kept as evidence of the engines compliance. This can be either:

- A Type Approval Certificate issued by an approval authority; or
- A Declaration of Conformity from the manufacturer; showing the Type Approval Number for that engine.

Example Type Approval Certificates and acceptable Declarations of Conformity from the manufacturer are shown in Appendix 6.

If no Type Approval Number is evident on the machine, or it cannot be read for any reason, and suitable documentation is not available, the machine is non-compliant in both Greater London and the Central Activity Zone / Canary Wharf.

#### 4.5 Exemptions

There are cases where items of NRMM may be exempt from certain requirements. Note that all NRMM between 37kW and 560kW should be registered online regardless of any exemptions that may apply.

Block Exemptions currently apply to truckmounted cranes and constant speed engines. This excuses them from Stage IIIB emission requirements only. This exemption is automatic and does not need to be applied for online. For more information on how to identify constant speed engines see Section 4.3.

Viability Exemptions: If no viable retrofit is available and the supply of compliant equipment is limited, you can apply for a viability exemption online. The machine will still have to meet the next best possible emissions stage. This exemption lasts for 1 year, after which time you will need to re-apply for the exemption.

**Short-term Exemptions**: Short term exemptions are available in cases of emergencies, allowing non-compliant NRMM to be on site for 30 days.

#### 4.6 Retrofits

There are a variety of retrofit abatement technologies available to reduce emissions to the required level. The most common method of retrofitting involves the installation of a diesel particulate filter (DPF) or catalytic convertor to the exhaust system of the NRMM. All diesel engines are potentially suitable for retrofit to mitigate particulate emissions but space within the engine compartment and cost may both be limiting factors.

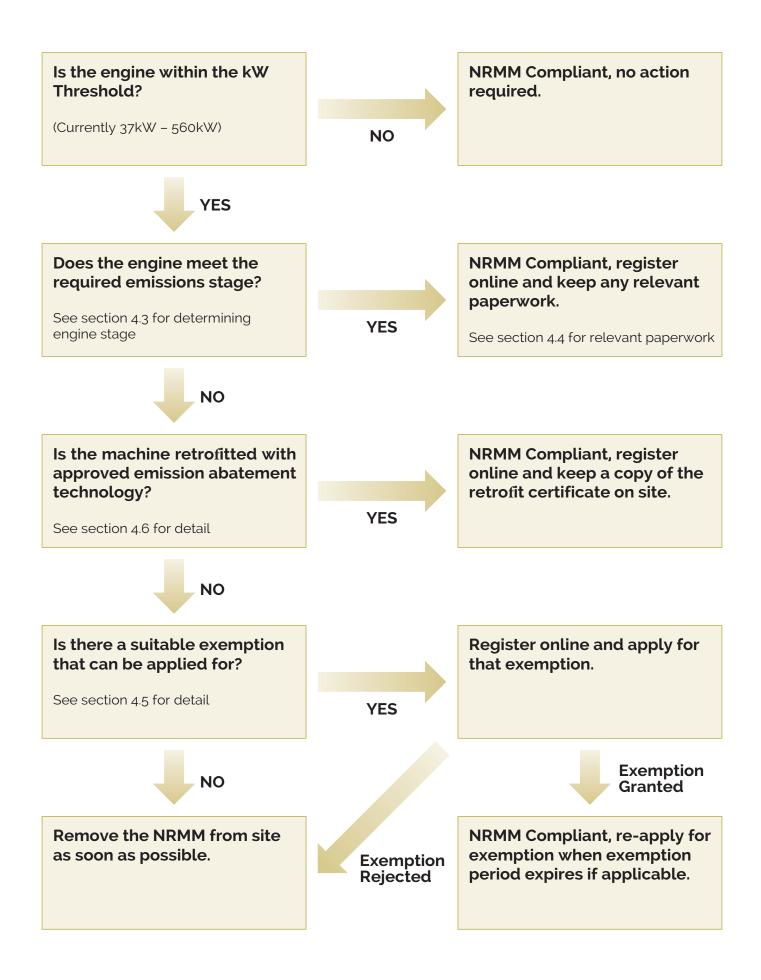
Only retrofit technology that has been registered and endorsed by the Energy Saving Trust NRMM certification scheme should be fitted to machinery to ensure the retrofit is correctly specified and fitted in order to prevent engine damage or any risk to the operator. A list of suppliers and endorsed products can be found at:

http://www.energysavingtrust.org.uk/ business/products/emissions-reductionsystems

Retrofit suppliers should issue a certificate for each individual retrofit with appropriate identifying information. It is strongly recommended that sites keep copies of all the certificates for retrofits on their site as a record of compliance and to aid inspections. It is recommended that you take these certificates with you when you carry out inspections on site to help identify which certificate is for which retrofit.

Examples of acceptable retrofit documentation are shown in Appendix 7.

#### 4.7 Compliance Flowchart



## **Appendix 1: Example Arrival Form**

**NRMM Arrival Form** 

# (Complete and pass to primary contractor within 5 days of NRMM arriving on site) **Contractor:** Machine type Supplier Date of Arrival Plant ID Engine Power (kW) **Engine Manufacturer** EU Type Approval Number **EU Emissions Stage** Retrofit Details\* Date Checked Checked by Signed

\*If the machine has been retrofitted with emission abatement technology, the certificates for those retrofits

should be provided to the Primary Contractor with this form.

# Appendix 2: Example Inspection Form (Local Authority)

#### Front page

Inspector:			Time	me: Date:			
Site address:	CAZ/CW						
Contact Office addre	Greater Lond	on					
Name:		Telephone:			Registered Si	te:	
Company:		email:			Registered al	l NRMM:	
Manufacturer	Machine type	Serial number / Plant ID	kW	Type Approv	al Number	F	Retrofit
Management system			tla a va si a	tou kont up to data?			
What systems are in plac	ce to ensure the equipr	nent is compliant and	rne regis	ster kept up to date?			
How are retrofits maintai	ned? (filter changes, re	etrofit expiry etc.)					
Is an inventory of all NRN Have sub-contractors pla							
Recommendations	ant been included?						
		Encoding Let	ter	EU Emissions	Stage		
		A-C		EU Stage	÷		
		D-G		EU Stage			
[Your logo	here]	H-K		EU Stage I			
		L-P		EU Stage I			
		Q-R		EU Stage			
		Q-IX		LO Stage	1 V		

### **Continuation page**

Manufacturer	Machine type	Serial number / Plant ID	kW	Type Approval Number	Retrofit
Manufacturer	Machine type	Serial number / Plant ID	kW	Type Approval Number	Retrofi

# **Appendix 3: Example Site NRMM Inventory**

		 	1									 
	Date left site											
(Your logo here)	Date of arrival											
(Your	Exemption received											
	Exemption applied for											
	Date E											
	Retrofit info											
>	EU stage											
Site address NRMM Inventory	Type Approval Number											
Site add	Engine manufacturer											
	κw											
	Plant ID											
	Machine type											
	Contractor											

# **Appendix 4: Example Incident Report Sheet**

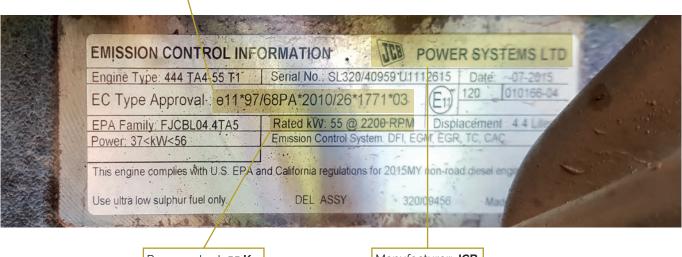
	Action taken							
	Action required							
	Ac							
Site address NRMM Inventory	Issue							
Site addre	Plant ID							
	Machine type							
	Checked by							
	Date checked							

### **Appendix 5: Example Type Approval Plates**



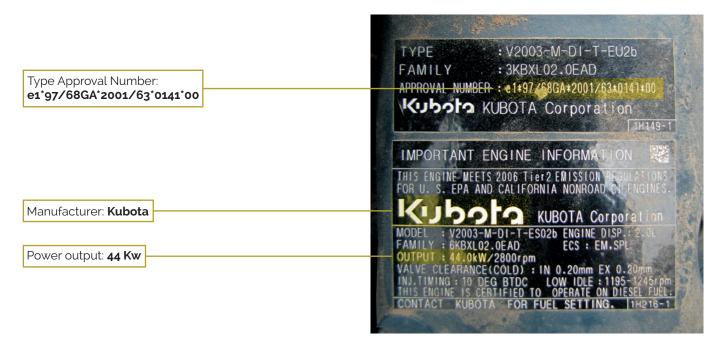
Manufacturer	Deutz
Power Output (kW)	55.4
Type Approval Number	e1*97/68PA*2012/46*0699*04
Comments	Stage IIIB variable speed engine

Type Approval Number: **e11\*97/68PA\*2010/26\*1771\*03** 



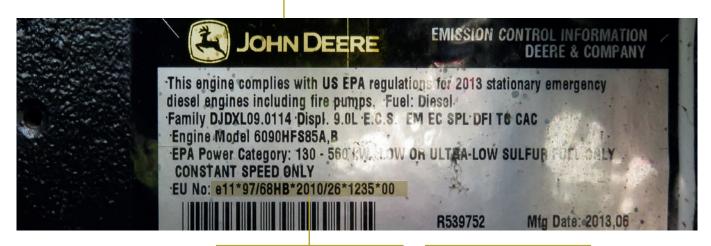
Power output: 55 Kw Manufacturer: JCB

Manufacturer	JCB
Power Output (kW)	55
Type Approval Number	e11*97/68PA*2010/26*1771*03
Comments	Stage IIIB variable speed engine



Manufacturer	Kubota
Power Output (kW)	44
Type Approval Number	e1*97/68GA*2001/63*0141*00
Comments	Stage II variable speed engine

Manufacturer: John Deere



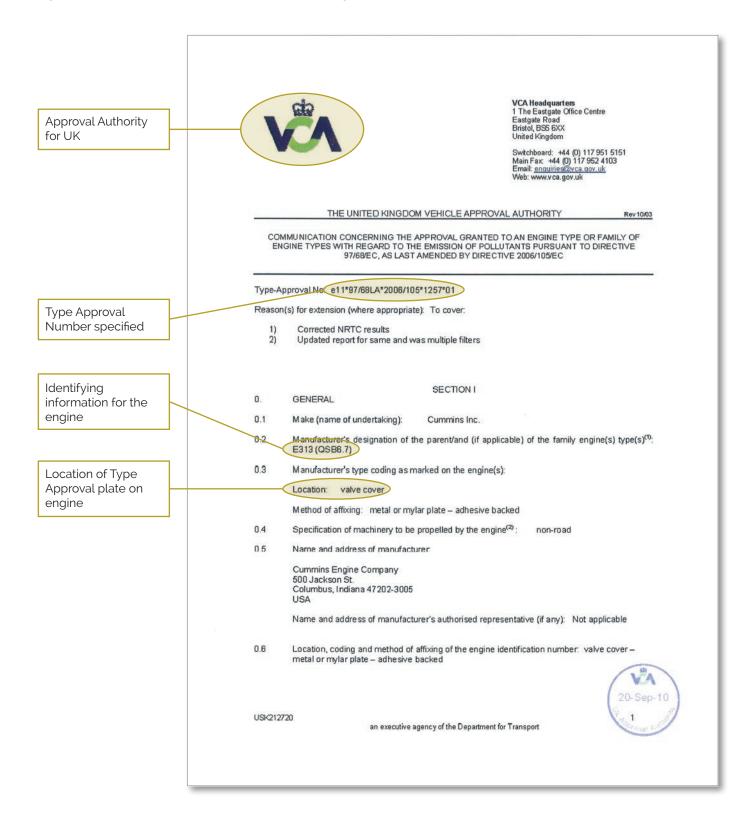
Type Approval Number: **e11\*97/68HB\*2010/26\*1235\*00** 

Power output: **Not shown, check VIN plate** 

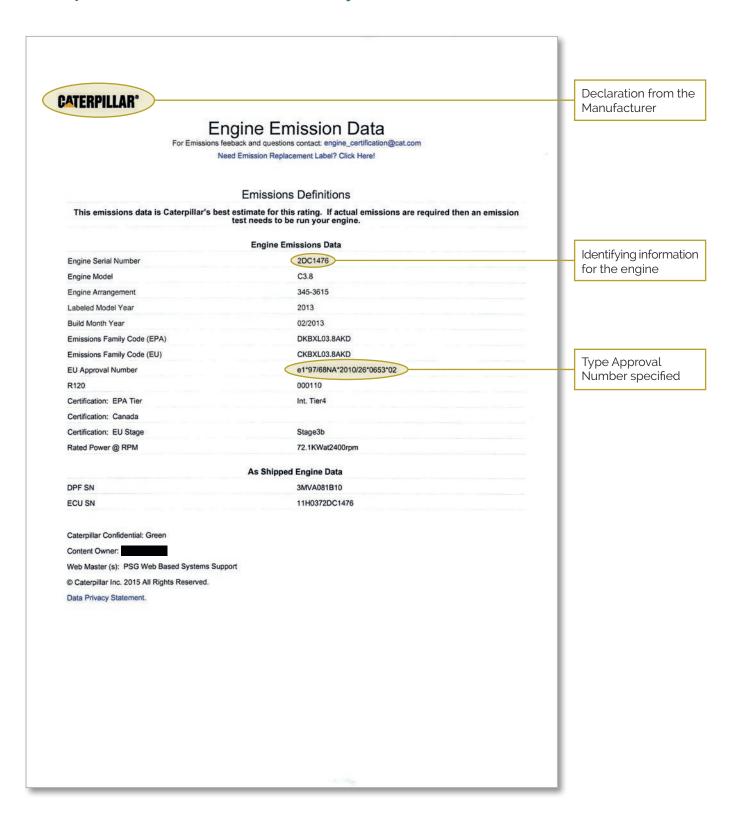
Manufacturer	John Deere
Power Output (kW)	Not shown, check VIN plate
Type Approval Number	e11*97/68HB*2010/26*1235*00
Comments	Stage IIIA constant speed engine

# Appendix 6: Suitable Documentation for Type Approval Number

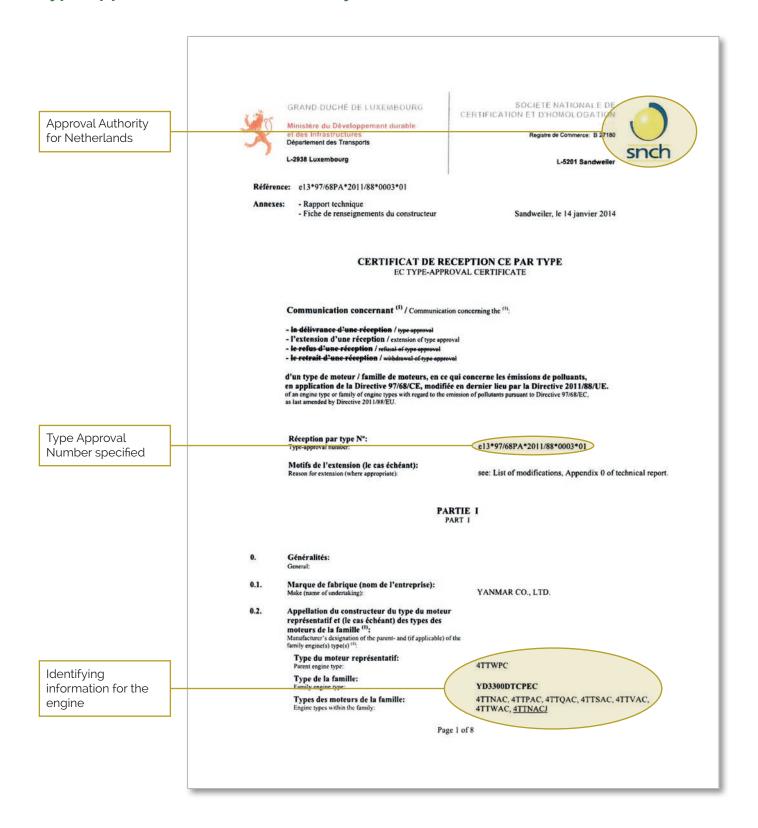
#### Type Approval Certificate issued by the VCA



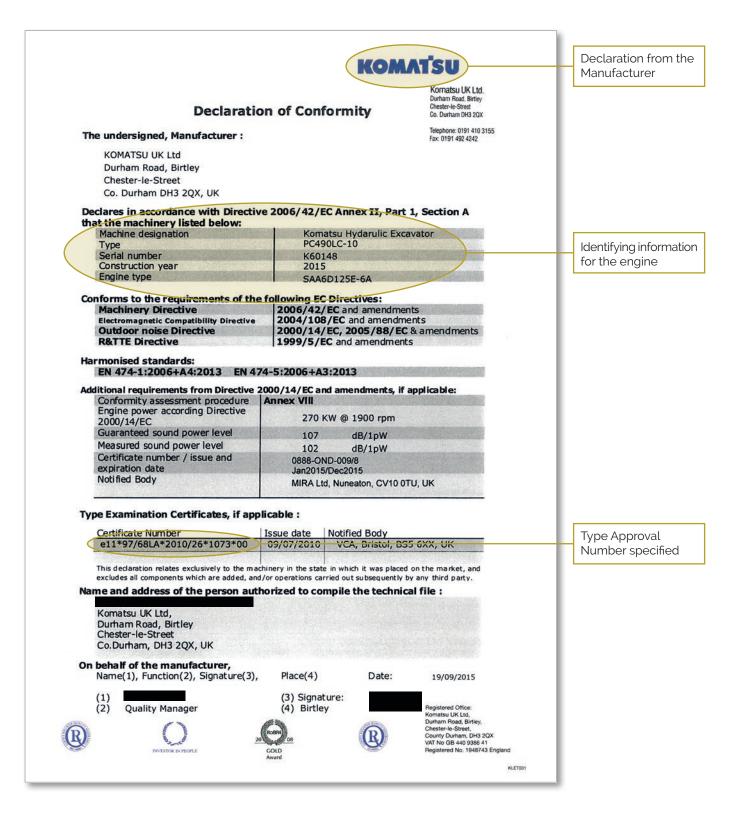
#### **Caterpillar Declaration of Conformity**



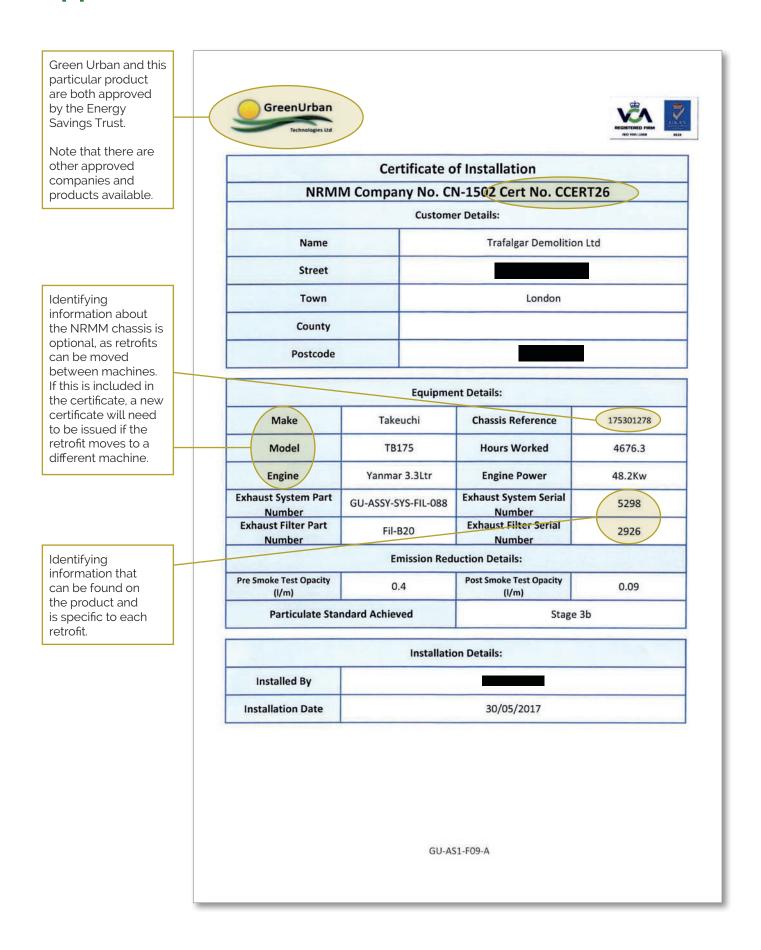
#### Type Approval Certificate issued by SNCH



#### **Komatsu Declaration of Conformity**



## **Appendix 7: Suitable Retrofit Certificates**



## Machinery Certificate of Compliance for Non-Road Mobile Machinery (NRMM) Retrofit Programme

**energy saving** trust

Pollution abatement system manufacturer's declaration of installation

PCERT45 Date of issue 06.04.2016 Certificate no. Vehicle/Machine Details Machine type 4 Tool Compressor Model/series 7/71 Machine serial Manufacturer 521663 Doosan no. Éngine manufacturer John Deere Engine model 4045DF270E Engine EU Stage (e.g. IIIA) CD4045G075125 Engine serial no. Stage 2 Engine 60 kw 4.5 ltr Engine power (kW) displacement (cc) Vehicle registration Machine hours at 2617 BB806026 mark (if applicable) fitment Machine owner details Byrne Bros (formwork) Ltd

Pollution abatement system details

Manufacturer or supplier	Baumot AG	Energy Saving Trust company approval no.	CN-0901
Part No	BAB 7512/25/70	Energy Saving Trust product approval no.	P CERT 45
Serial number	7512200123		

Manufacturer/installer details



Installation Sign-off

Machine Owner/Operator		Manufacturer (or installer on their behalf)	
Signed		Signed	
Name		Name	
Position	Plant Manager	Position	Engineer
Company	Byrne Bros	Company	BAUMOT UK LTD
Date	06/04/2016	Date	06/04/2016

Energy Saving Trust Version 3 04 February 2013

page **1** of 1

Identifying information about the NRMM engine is optional, as retrofits can be moved between machines. If this is included in the certificate, a new certificate will need to be issued if the retrofit moves to a different machine.

Beaumot AG and this particular product are both approved by the Energy Savings Trust.

Note that there are other approved companies and products available.

Identifying information that can be found on the product and is specific to each retrofit.

