NEW HOLLAND
CONSTRUCTION

SERVICE MANUAL

E215C Standard model
E245C Mass excavator model

Link Product / Engine

Product	Market Product	Engine
E215C Modelo padrão	Latin America	F4GE9684E*J615
E245C Modelo Mass excavator	Latin America	F4GE9684E*J615

Contents

INTRODUCTION

Advice - Important notice regarding equipment servicing

All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The information in this manual is up-to-date at the date of the publication. It is the policy of the manufacturer for continuous improvement. Some information could not be updated due to modifications of a technical or commercial type, or changes to the laws and regulations of different countries.

In case of questions, refer to your Sales and Service Networks.

Foreword - Ecology and the environment

Soil, air, and water are vital factors of agriculture and life in general. When legislation does not yet rule the treatment of some of the substances required by advanced technology, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

NOTE: *The following are recommendations that may be of assistance:*

- Become acquainted with and ensure that you understand the relative legislation applicable to your country.
- Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, antifreeze, cleaning agents, etc., with regard to their effect on man and nature and how to safely store, use, and dispose of these substances.
- Agricultural consultants will, in many cases, be able to help you as well.

Helpful hints

- Avoid filling tanks using cans or inappropriate pressurized fuel delivery systems that may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of them contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when draining off used engine coolant mixtures, engine, gearbox and hydraulic oils, brake fluids, etc. Do not mix drained brake fluids or fuels with lubricants. Store them safely until they can be disposed of in a proper way to comply with local legislation and available resources.
- Modern coolant mixtures, i.e. antifreeze and other additives, should be replaced every two years. They should not be allowed to get into the soil, but should be collected and disposed of properly.
- Do not open the air-conditioning system yourself. It contains gases that should not be released into the atmosphere. Your NEW HOLLAND CONSTRUCTION dealer or air conditioning specialist has a special extractor for this purpose and will have to recharge the system properly.
- Repair any leaks or defects in the engine cooling or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding as penetrating weld splatter may burn a hole or weaken them, allowing the loss of oils, coolant, etc.

Safety rules

⚠ DANGER

Improper operation or service of this machine can result in an accident.
Do not operate this machine or perform any lubrication, maintenance, or repair on it until you have read and understood the operation, lubrication, maintenance, and repair information.
Failure to comply will result in death or serious injury.

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⚠ WARNING

Maintenance hazard!
Always perform all service procedures punctually at the intervals stated in this manual. This ensures optimum performance levels and maximum safety during machine operation.
Failure to comply could result in death or serious injury.

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⚠ WARNING

Pressurized system!
Before attempting any service procedure, it is your responsibility to know the number of accumulators on the machine, and the correct procedure for releasing the pressure of each accumulator.
Failure to comply could result in death or serious injury.

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NOTICE: *Extreme working and environmental conditions require shortened service intervals.*

Use Case fluids, lubricants, and filters for the best protection and performance of your machine. All fluids, lubricants, and filters must be disposed of in compliance with environmental standards and regulations. Contact your dealer with any questions regarding the service and maintenance of this machine.

Read the safety decals and information decals on the machine. Read the Operator's Manual and safety manual. Understand the operation of the machine before you start any service.

Before you service the machine, put a 'Do Not Operate' tag on the steering wheel or over the key switch. Ensure the tag is at a location where everyone who might operate or service the machine may see clearly. One tag is included with your new machine. Additional tags are available from your dealer.

Plastic and resin parts

- Avoid using gasoline, paint thinner, etc. when cleaning plastic parts, console, instrument cluster, etc.
- Use only water, mild soap, and a soft cloth when you clean these parts.
- Using gasoline, thinners, etc. can cause discoloration, cracking, or deformation of the part being cleaned.

Safety rules

Standard safety precautions

Be informed and notify personnel of the laws in force regulating safety, and provide documentation available for consultation.

- Keep working areas as clean as possible.
- Ensure that working areas are provided with emergency boxes. They must be clearly visible and always contain adequate sanitary equipment.
- Fire extinguishers must be properly identified and always be clear of obstructions. Their efficiency must be checked on a regular basis and personnel must be trained on proper interventions and priorities.
- Keep all emergency exits free of obstructions and clearly marked.
- Smoking in working areas subject to fire danger must be strictly prohibited.

Prevention of injury

- Wear suitable work attire and safety glasses with no jewelry such as rings and chains when working close to engines and equipment in motion.
- Wear safety gloves and goggles when performing the following operations:
  - Topping off or changing lubrication oils.
  - Using compressed air or liquids at a pressure greater than **2 bar** (**29 psi**).
- Wear a safety helmet when working close to hanging loads or equipment working at head level.
- Always wear safety shoes and fitting clothes.
- Use protection cream for hands.
- Change wet clothes as soon as possible.
- In the presence of voltages exceeding **48 - 60 V**, verify the efficiency of the ground and mass electrical connections. Ensure that hands and feet are dry and use isolating foot boards. Workers should be properly trained to work with electricity.
- Do not smoke or start an open flame close to batteries and any fuel material.
- Place soiled rags with oil, diesel fuel or solvents in specially provided anti-fire containers.
- Do not use any tool or equipment for any use other than what it was originally intended for. Serious injury may occur.
- If running an engine indoors, make sure there is a sufficient exhaust fan in use to eliminate exhaust fumes.

During maintenance

- Never open the filler cap of the cooling system when the engine is hot. High temperature liquid at operating pressure could result in serious danger and risk of burn. Wait until the temperature decreases under **50 °C** (**122 °F**).
- Never add coolant to an overheated engine and use only appropriate liquids.
- Always work when the engine is turned off. Certain circumstances require maintenance on a running engine. Be aware of all the risks involved with such an operation.
- Always use adequate and safe containers for engine fluids and used oil.
- Keep engine clean of any spilled fluids such as oil, diesel fuel, and or chemical solvents.
- Use of solvents or detergents during maintenance may emit toxic vapors. Always keep working areas aerated. Wear a safety mask if necessary.
- Do not leave soiled rags that may contain any flammable substances close to the engine.
- Always use caution when starting an engine after any work has been performed. Be prepared to cut off intake air in case of engine runaway.
- Never disconnect the batteries while the engine is running.
- Disconnect the batteries prior to performing any work on the equipment.

- Disconnect the batteries to place a load on them with a load tester.
- After any work is performed, verify that the battery clamp polarity is correct and that the clamps are tight and safe from accidental short circuit and oxidation.
- Before disconnecting any pipelines (pneumatic, hydraulic, fuel pipes, etc.), verify that all pressure has been released. Take all necessary precautions bleeding and draining residual pressure. Always wear the proper safety equipment.
- Do not alter the lengths of any wires.
- Do not connect any electronic service tool to the engine electrical equipment unless specifically approved by NEW HOLLAND CONSTRUCTION.
- Do not modify the fuel system or hydraulic system unless approved by NEW HOLLAND CONSTRUCTION. Any unauthorized modification will compromise warranty assistance and may affect engine operation and life span.

For engine equipped with an electronic control unit

- Do not weld on any part of the equipment without removing the control unit.
- Remove the in case of work requiring heating over **80 °C** (**176 °F**).
- Do not paint the components and the electronic connections.
- Do not alter any data filed in the electronic control unit driving the engine. Any manipulation or alteration of electronic components will void engine warranty assistance and may affect the correct working order and life span of the engine.

Respect of the Environment

- Respect of the environment should be of primary importance. Take all necessary precautions to ensure personnel's safety and health.
- Inform the personnel of the laws regarding the dispensing of used engine fluids.
- Handle batteries with care, storing them in a well ventilated environment and within anti-acid container.

SERVICE MANUAL

Engine

E215C Standard model
E245C Mass excavator model

Engine - General specification

Performance

Road speed

Slow	**3.7 km/h** (**2 mph**)
Fast	**5.7 km/h** (**4 mph**)

Motor Specifications

Main specifications

Manufacturer	FPT Tier 3
Model	F4GE9684E*J615
Type	Water-cooled, 4 cycle direct injection type diesel engine with intercooler turbo-charger
Number of cylinders	6 in-line
Bore	**104 mm** (**4.09 in**)
Stroke	**132 mm** (**5.20 in**)
Total displacement	**6728 cm³** (**411 in³**)
Compression ratio	17 : 1
Rated output power (at **2000 RPM**) (**ISO 14396**: Without fan)	**118 kW** (**160 Hp**)
Maximum torque (at **1400 RPM**) (**ISO 14396**)	**670 N·m** (**494 lb ft**)
High idling	**2200 RPM**
Low idling	**800 RPM**
Fuel consumption rate	**212 g/kWh**
Total engine oil volume	**17.8 L** (**4.7 US gal**)
Volume of oil in the filter	**0.90 L** (**0.24 US gal**)
Volume of oil in the line	**0.85 L** (**0.22 US gal**)
Volume of oil in the engine chambers	**1.50 L** (**0.40 US gal**)
Weight without oil	**510.0 kg** (**1124.4 lb**)

Feed

Injection Sequence	1-5-3-6-2-4

Battery

Voltage	2 x **12 V**
Capacity	2 x **100 A·h**

Starter Motor

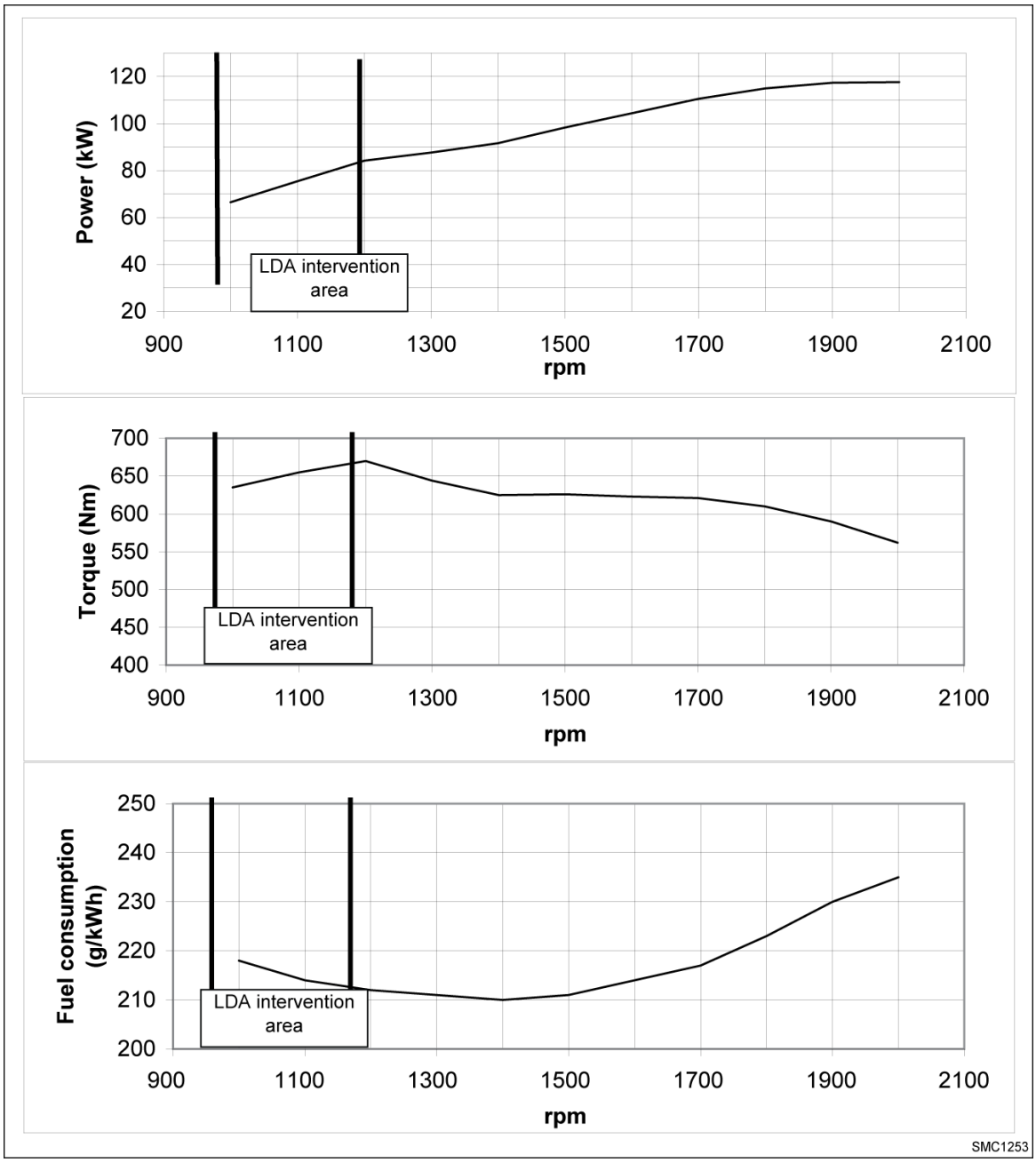
Manufacturer	BOSCH
Voltage	**24 V**
Output	**4 kW** (**5 Hp**)

Alternator

Manufacturer	BOSCH
Voltage	**24 V**
Output	**90 A**

Engine characteristic curve

Condition to be measured: The net value is indicated, measuring without cooling fan.



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Fuel consumption volume
= (Fuel consumption rate / 0.835 x 1000) x kW x Load factor (α)
= (**212 g/kWh** / 0.835 x 1000) x **118 kW** x α
= 29.95 α L/h
α: Standard load factor (0.70 ~ 0.80)
Fuel consumption in regular operation (load factor 0.70 ~ 0.80) **21.8 - 24.9 l/hour** (**5.8 - 6.6 US gal/hour**)

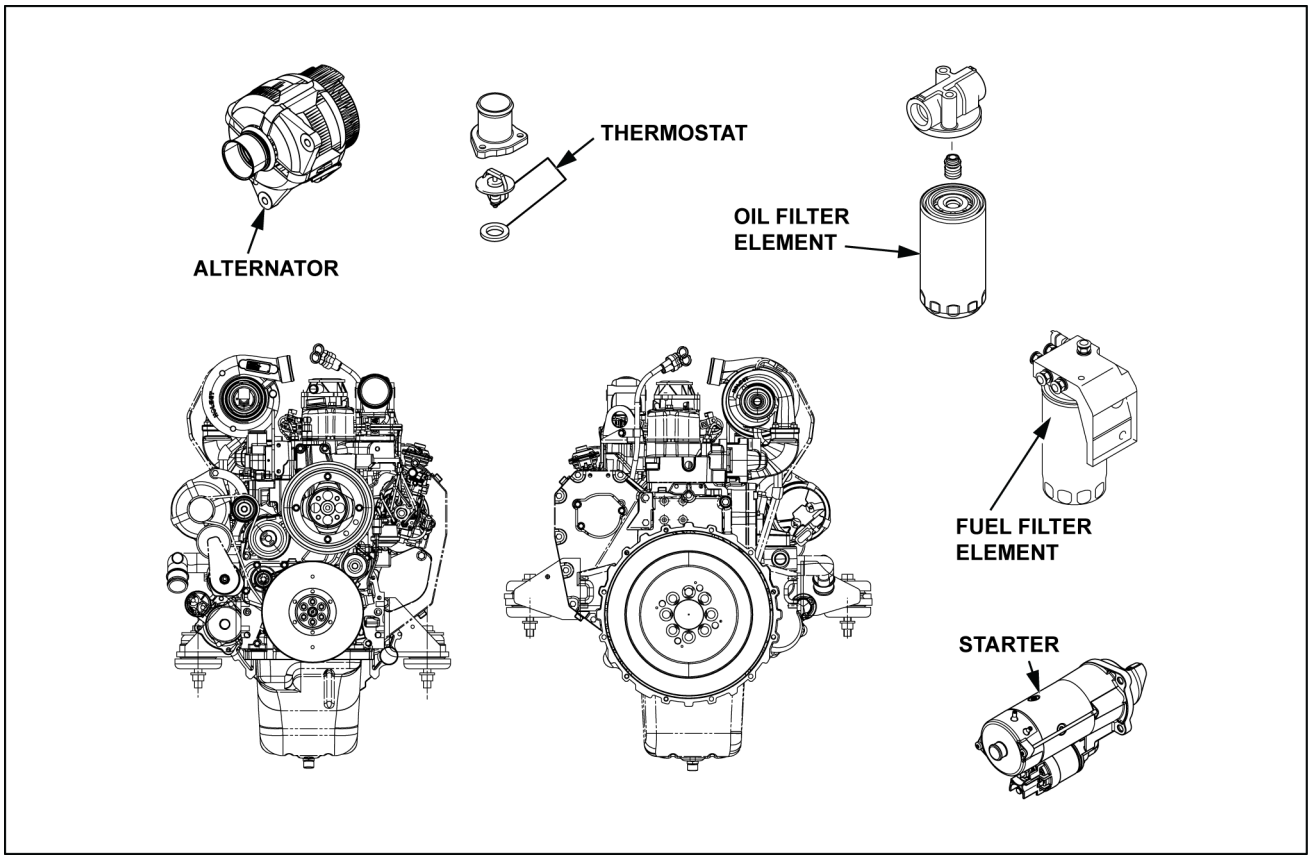
NOTE: *Fuel consumption curve is derived from engine prototype values.*

Engine - Prepare

Preparation for removing

1. Remove battery ground.
2. Remove bonnet and guard. Remove under cover.
3. Remove air cleaner hose.
4. Remove counterweight.
5. Remove radiator hose and inter-cooler hose.
6. Remove fuel hose and heater hose, and if necessary disconnect air-con hose.
7. If necessary, remove pump, muffler and radiator.
8. Remove harness connector.
    1. Remove E/G ground cable.
    2. Starter cable-starter B terminal.
    3. Remove the connector that connects the upper harness with the engine and ECU harness.
    4. Upper harness
       P1 Alternator B terminal
       CN-160 E/G speed sensor
       CN-141, CN142 P1, P2 pump proportional valve
       CN-139, CN-140 P1, P2 pump pressure sensor
       M-1 starter motor C terminal

NOTE: *Prepare a stand, which withstands the weight of the engine assy. and can place the removed engine firmly.*



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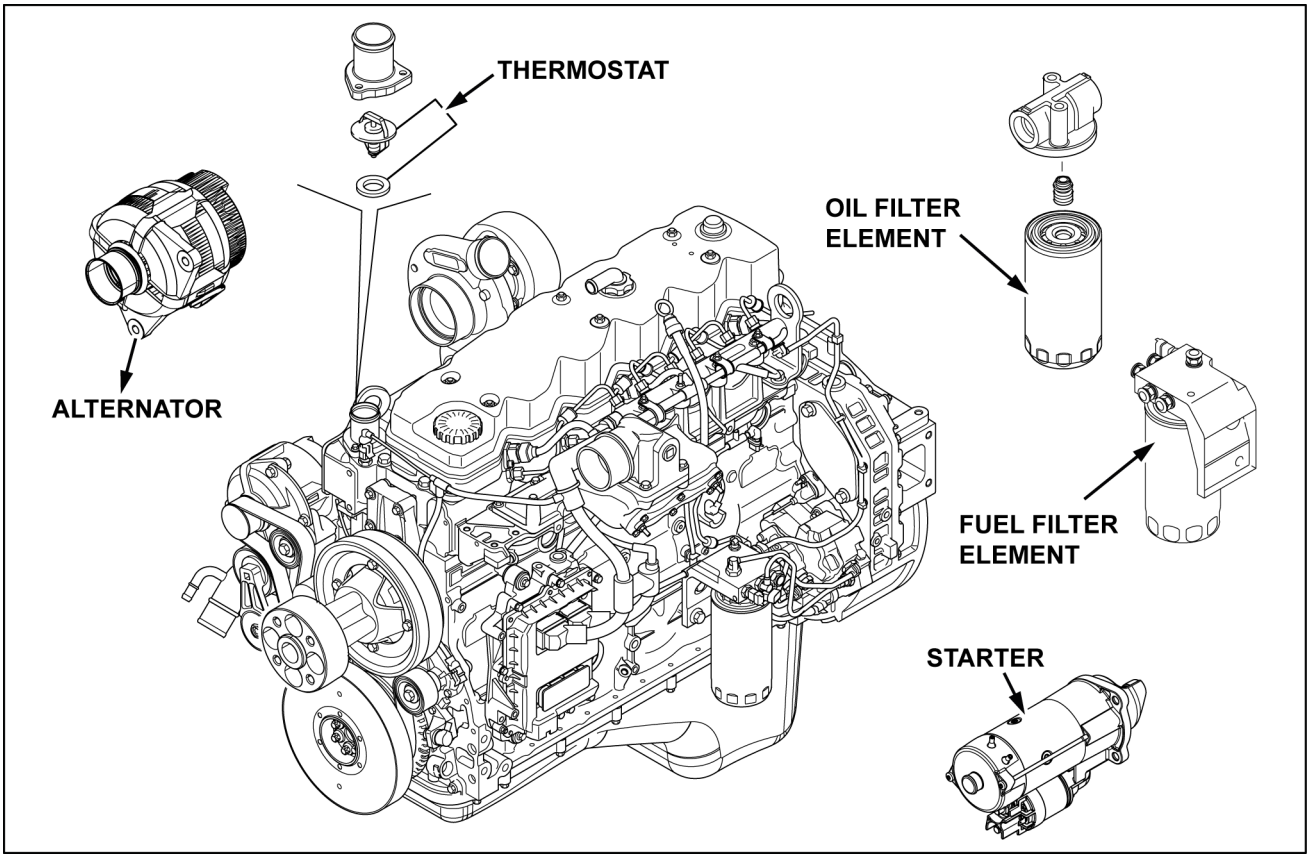

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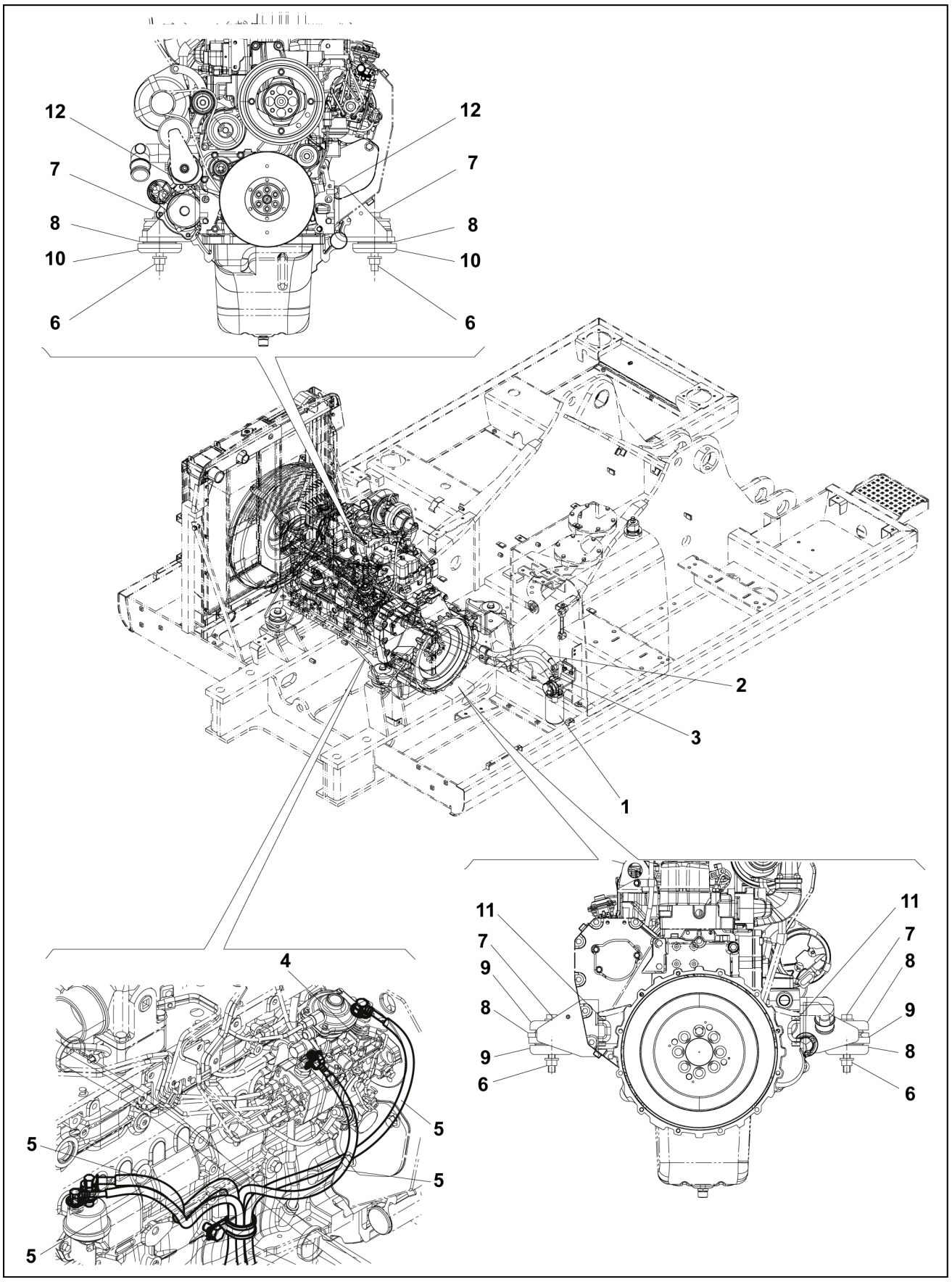
Engine - Remove



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1. Remove hose of engine oil filter.

Suggest:

If the above button click is invalid.

Please download this document

first, and then click the above link

to download the complete manual.

Thank you so much for reading

Place oil pan under the connection of filter **(1)**, and disconnect hoses **(2)**, **(3)**.

: **41 mm** (**1.6 in**)

2. Put a protection cap on the opened hoses.
3. Remove hoses of fuel injection pump **(4)** and water separator.
   Place fuel pan under the connections **(4)** and disconnect hoses **(5)**.
4. Loosen engine mounting bolt of frame.
   1. Loosen 4 nuts **(6) M18**

      : **27 mm** (**1.1 in**)

   2. Loosen 4 capscrews **(7) M18 x 150**.

      : **27 mm** (**1.1 in**)

   3. Remove 4 plates **(8)**.
   4. Remove upper rubber mounts **(9)** and **(10)** 2 each.
5. Slinging engine body
   1. Sling engine hooking wire to lifting lugs on the front and rear sides.

      Weight: Approx. **544 kg** (**1199 lb**)

      Wire: dia. **6 mm** (**0.2 in**)x **1 m** (**3.3 ft**) - 2 pcs.

ATTENTION: *Prepare a stand, which withstands the weight of the engine assy. and can place the removed engine firmly.*

6. Position engine on the stand stably.
7. Remove 4 rubber mounts **(9)**, **(10)**.