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# Shop Manual

# DL550-5 Wheel Loader

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Serial Number **10001 and Up**

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# Wheel Loader Safety

Edition 1

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## Wheel Loader Safety

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# SAFETY INSTRUCTIONS

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## WARNING

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### AVOID DEATH OR SERIOUS INJURY

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments repairs or service. Untrained operators and failure to follow instructions can cause death or serious injury.

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## SAFETY MESSAGES

Safety messages and safety decals included in this manual and on the machine provide instructions how to operate, service and maintain the machine. Safety messages and safety decals indicate potential hazards and describe safety precautions required to avoid hazards. Operator and maintenance personnel should read and understand these safety messages and decals before beginning operation or maintenance.

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## SAFETY ALERT SYMBOL



**Be Prepared - Get to Know All Operating and Safety Instructions.**

**This is a Safety Alert Symbol. Wherever it appears in this manual or on safety decals on the machine, you must be alert to the potential for personal injury or accidents. Always observe safety precautions and follow recommended procedures.**

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### Signal Words

The signal words "DANGER", "WARNING", "CAUTION" are used throughout safety messages and safety decals in this manual or on the machine. They indicate an existence of, and the relative seriousness of, a hazard. All three indicate that a safety risk is involved. Observe the precautions indicated whenever a Safety Alert Symbol is present, no matter which signal word appears next to it.



## DANGER

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**DANGER** - This signal word is used on safety messages and safety labels and indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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## WARNING

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**WARNING** - This signal word is used on safety messages and safety labels and indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

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## CAUTION

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**CAUTION** - This signal word is used on safety messages and safety labels and indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

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### Other Signal Words

In addition to safety signal words, the following signal words are used to indicate proper and effective use of machine.

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## IMPORTANT

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**This signal word identifies procedures which must be followed to avoid damage to machine.**

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**NOTE:** *The word "NOTE" identifies information for effective use.*

1. Turn battery disconnect switch to "ON" position.
2. Close battery compartment door.

# Engine



# SAFETY INSTRUCTIONS

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## WARNING

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# OVERVIEW

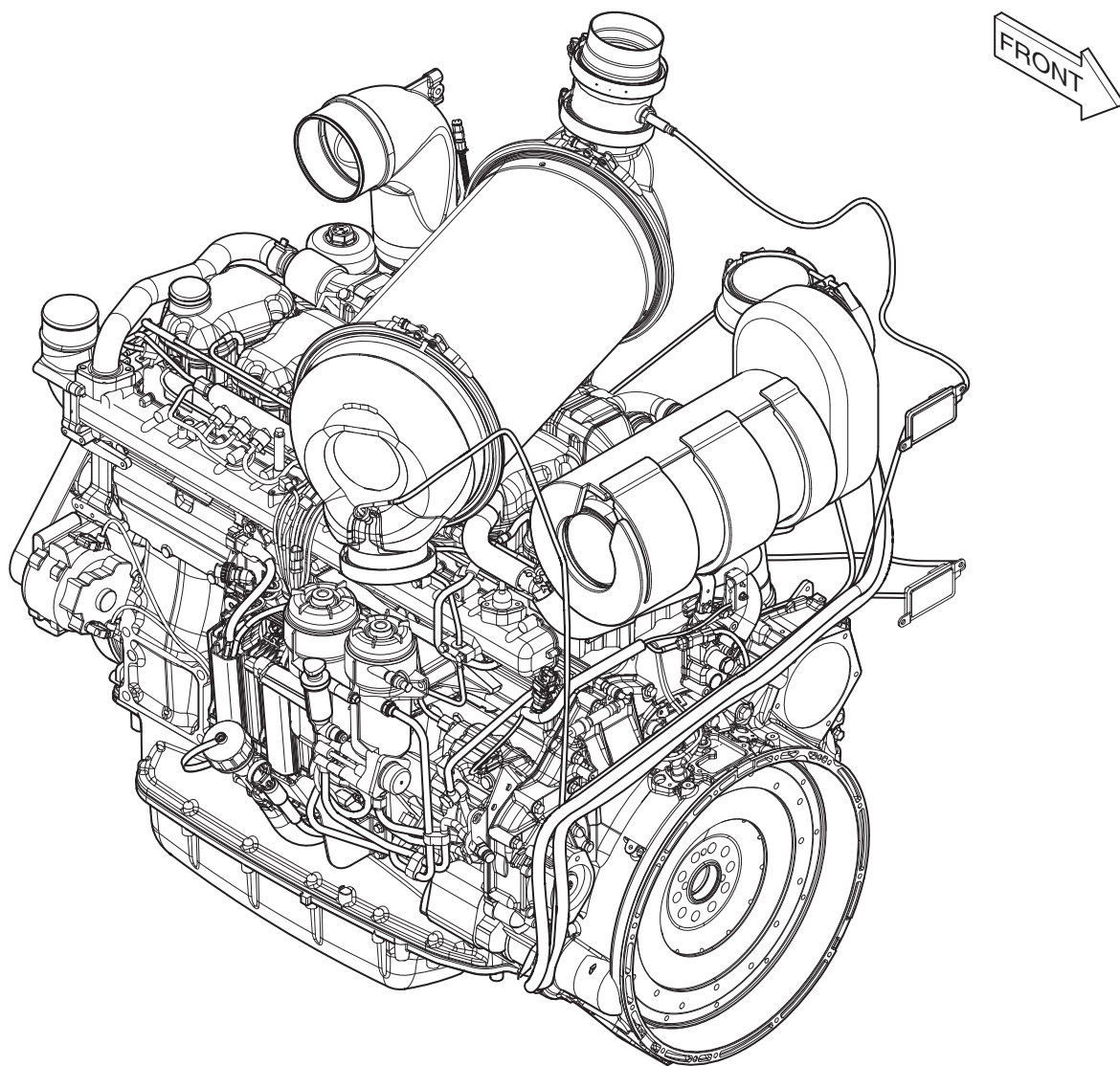


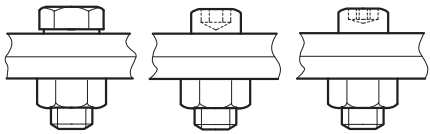
Figure 1

WL140008

## Special Tightening Torque

The specifications recommend values for special tightening torques for certain threaded joints where there are strict requirements on the distribution of prestressing force. The distribution of the tightening torque is  $\pm 15\%$  and the clamping force then spread about  $\pm 30\%$ .

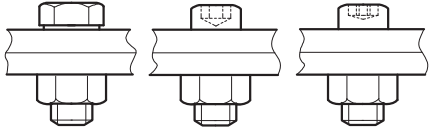
Hexagonal Screws, Hexagon Socket Screws, Six-point Socket Screws, Hexagon Nuts. Applies also with Captive Washer and Hexagon Screws with Thread Cleaning Thread. (Metric Threads, Course Pitch)		
Thread	Strength Class	
	8.8/8	10.9/10
	Tightening Torque (Nm)	
M4	2.9	3.6
M5	6	7.5
M6	9.5	12
M8	24	30
M10	47	59
M12	84	105
M14	135	170
M16	210	270
M18	290	360
M20	420	530
M22	580	730
M24	730	910



FG020238

Hexagonal Screws, Hexagon Socket Screws, Six-point Socket Screws, Hexagon Nuts Applies also with Captive Washer and Hexagon Screws with Thread Cleaning Thread (Metric Thread, Fine Interval)		
Thread	Thread Tightening Torque ( $\pm 15\%$ Nm)	
	8.8/8	10.9/10
	Tightening Torque (Nm)	
M8x1	26	32
M10x1.25k	50	62
M12x1.25k	92	115
M14x1.5k	150	180
M16x1.5k	230	290
M18x1.5k	330	410
M20x1.5k	470	590
M22x1.5k	640	800
M24x1.5k	830	1040



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Flange Screws with Hexagonal Head and Hexagonal Flange Nuts (Metric Threads, Course Pitch)		
Thread	Thread Tightening Torque ( ±15 % Nm)	
	8.8/8	10.9/10
	Tightening Torque (Nm)	
M5	6.7	8.1
M6	10.2	13
M8	26	32
M10	50	63
M12	92	115
M14	149	187

**Tightening Torques for Hose Clamps**

Specifications in the tables show tightening torque when tightening by hand.

Tightening torque for new unfitted hose clamp is max 1 Nm.

A = Width (mm)	Tightening Torque (±15 % Nm)
7.5 - 9	1.5
12	5

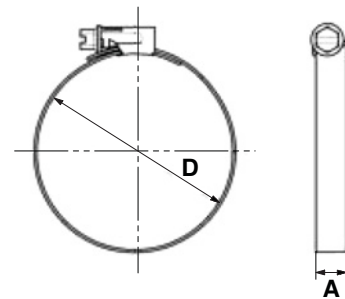


Figure 10

EX1301803

A = Width (mm)	Tightening Torque (±15 % Nm)
25	20

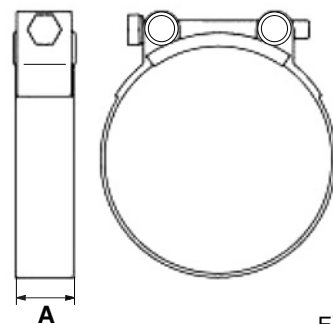


Figure 11

EX1301804

A = Width (mm)	Tightening Torque (±15 % Nm)
20	10
25	20

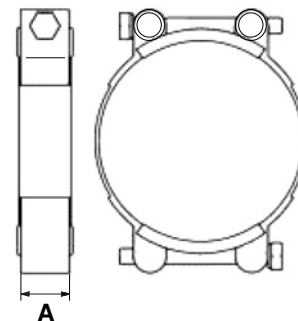


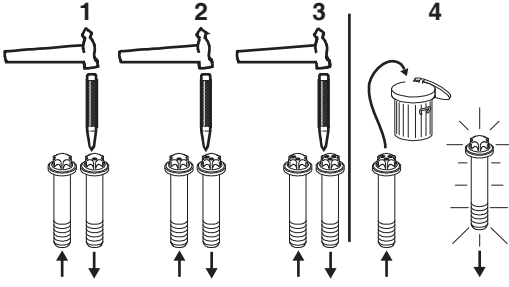
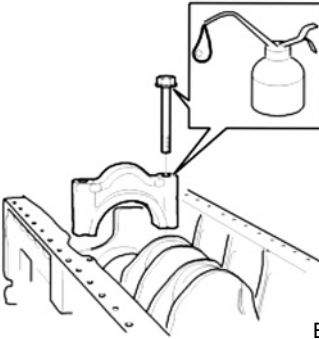
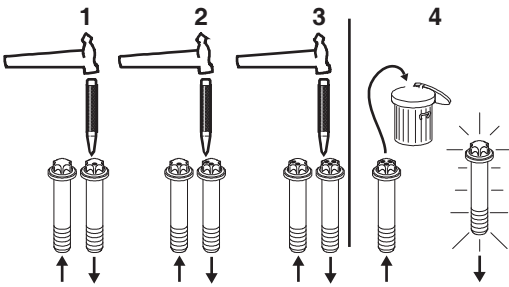
Figure 12

EX1301805

# IMPORTANT

Tightening torques for threaded joints in engines.

If the tightening torque is not available in the table for each engine, refer to the special and normal tightening torques tables.

Engine Assembly	
<b>Cylinder Block</b>	
<ul style="list-style-type: none"> <li>Piston cooling nozzle: 23 Nm</li> </ul>	
<b>Main Bearing Cap</b>	
<p><b>NOTE:</b> <i>The screws can only be reused 3 times. Mark the screws each time before installing.</i></p>          <ul style="list-style-type: none"> <li>Torx screw (M19): 110 Nm + 90°</li> <li>Hexagon screw (M19): 110 Nm + 90°</li> </ul>	 <p style="text-align: right;">EX1301810</p>           <p style="text-align: right;">EX1301811</p>
<b>Connecting Rod Cap</b>	
<p><b>NOTE:</b> <i>The screws can only be reused 3 times. Mark the screws each time before installing.</i></p>	 <p style="text-align: right;">EX1301810</p>

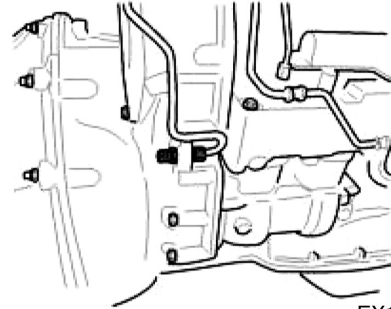
- Torx screw: 50 Nm + 90°
- Check torque: 170 Nm



EX1302070

### Flywheel Housing

- Lead-in union: 40 Nm ±6

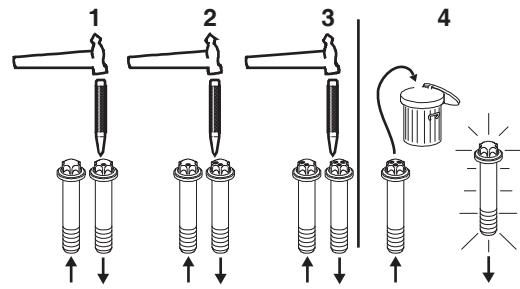


EX1301813

## Cylinder Head and Valve Package

### Cylinder Head

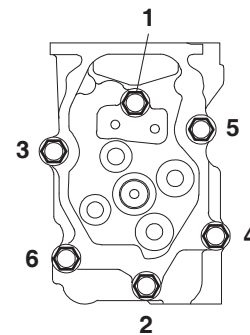
**NOTE:** *The screws can only be reused 3 times. Mark the screws each time before fitting.*



EX1301810

Cylinder head bolt, tightened in four stages

- First stage: 60 Nm
- Second stage: 150 Nm
- Third stage: 250 Nm
- Fourth stage: 90°



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