

# SERVICE MANUAL

## Cursor<sup>®</sup> I3 Single Stage Turbocharger Tier 4B (final) and Stage IV Engine

*See the following page for engine model numbers*



## **SERVICE MANUAL**

**F3HFE613A\*B003 , F3HFE613B\*B001 , F3HFE613B\*B002 , F3HFE613D\*B001 ,  
F3HFE613D\*B002 , F3HFE613G\*B001 , F3HFE613G\*B002**

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## INTRODUCTION

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## INTRODUCTION

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## **Foreword - 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 manufacturer reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication but are subject to change without notice.

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



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## Safety rules


### Personal safety





This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual and on machine decals, you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 **DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury. The color associated with DANGER is RED.

 **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury. The color associated with WARNING is ORANGE.

 **CAUTION**, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. The color associated with CAUTION is YELLOW.

### **FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.**

### Machine safety

**NOTICE:** Notice indicates a situation which, if not avoided, could result in machine or property damage. The color associated with Notice is BLUE.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

### Information

**NOTE:** Note indicates additional information which clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

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## Safety rules - Ecology and the environment

Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances.

### Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products 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 you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- The air-conditioning system contains gases that should not be released into the atmosphere. Consult an air-conditioning specialist or use a special extractor to recharge the system properly.
- Repair any leaks or defects in the engine cooling system 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. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

### Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. CNH strongly recommends that you return all used batteries to a CNH dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.



### Mandatory battery recycling

**NOTE:** *The following requirements are mandatory in Brazil.*

Batteries are made of lead plates and a sulfuric acid solution. Because batteries contain heavy metals such as lead, CONAMA Resolution 401/2008 requires you to return all used batteries to the battery dealer when you replace any batteries. Do not dispose of batteries in your household garbage.

Points of sale are obliged to:

- Accept the return of your used batteries
- Store the returned batteries in a suitable location
- Send the returned batteries to the battery manufacturer for recycling

## Torque - Minimum tightening torques for normal assembly

### METRIC NON-FLANGED HARDWARE

| NOM.<br>SIZE | CLASS 8.8 BOLT and<br>CLASS 8 NUT |                     | CLASS 10.9 BOLT and<br>CLASS 10 NUT |                      | LOCKNUT<br>CL.8<br>W/CL8.8<br>BOLT | LOCKNUT<br>CL.10<br>W/CL10.9<br>BOLT |
|--------------|-----------------------------------|---------------------|-------------------------------------|----------------------|------------------------------------|--------------------------------------|
|              | UNPLATED                          | PLATED<br>W/ZnCr    | UNPLATED                            | PLATED<br>W/ZnCr     |                                    |                                      |
| M4           | 2.2 N·m (19 lb in)                | 2.9 N·m (26 lb in)  | 3.2 N·m (28 lb in)                  | 4.2 N·m (37 lb in)   | 2 N·m (18 lb in)                   | 2.9 N·m (26 lb in)                   |
| M5           | 4.5 N·m (40 lb in)                | 5.9 N·m (52 lb in)  | 6.4 N·m (57 lb in)                  | 8.5 N·m (75 lb in)   | 4 N·m (36 lb in)                   | 5.8 N·m (51 lb in)                   |
| M6           | 7.5 N·m (66 lb in)                | 10 N·m (89 lb in)   | 11 N·m (96 lb in)                   | 15 N·m (128 lb in)   | 6.8 N·m (60 lb in)                 | 10 N·m (89 lb in)                    |
| M8           | 18 N·m (163 lb in)                | 25 N·m (217 lb in)  | 26 N·m (234 lb in)                  | 35 N·m (311 lb in)   | 17 N·m (151 lb in)                 | 24 N·m (212 lb in)                   |
| M10          | 37 N·m (27 lb ft)                 | 49 N·m (36 lb ft)   | 52 N·m (38 lb ft)                   | 70 N·m (51 lb ft)    | 33 N·m (25 lb ft)                  | 48 N·m (35 lb ft)                    |
| M12          | 64 N·m (47 lb ft)                 | 85 N·m (63 lb ft)   | 91 N·m (67 lb ft)                   | 121 N·m (90 lb ft)   | 58 N·m (43 lb ft)                  | 83 N·m (61 lb ft)                    |
| M16          | 158 N·m (116 lb ft)               | 210 N·m (155 lb ft) | 225 N·m (166 lb ft)                 | 301 N·m (222 lb ft)  | 143 N·m (106 lb ft)                | 205 N·m (151 lb ft)                  |
| M20          | 319 N·m (235 lb ft)               | 425 N·m (313 lb ft) | 440 N·m (325 lb ft)                 | 587 N·m (433 lb ft)  | 290 N·m (214 lb ft)                | 400 N·m (295 lb ft)                  |
| M24          | 551 N·m (410 lb ft)               | 735 N·m (500 lb ft) | 762 N·m (560 lb ft)                 | 1016 N·m (750 lb ft) | 501 N·m (370 lb ft)                | 693 N·m (510 lb ft)                  |

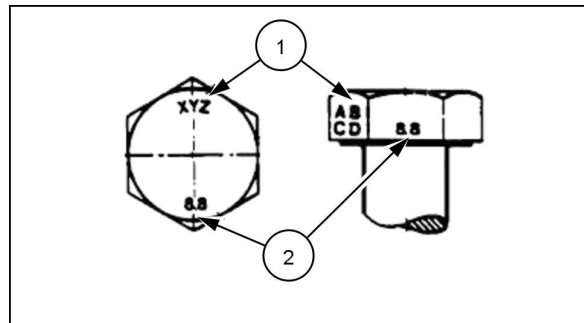
**NOTE:** M4 through M8 hardware torque specifications are shown in pound-inches. M10 through M24 hardware torque specifications are shown in pound-feet.

**METRIC FLANGED HARDWARE**

| NOM. SIZE | CLASS 8.8 BOLT and CLASS 8 NUT |                     | CLASS 10.9 BOLT and CLASS 10 NUT |                      | LOCKNUT CL.8 W/CL.8 BOLT | LOCKNUT CL.10 W/CL.10.9 BOLT |
|-----------|--------------------------------|---------------------|----------------------------------|----------------------|--------------------------|------------------------------|
|           | UNPLATED                       | PLATED W/ZnCr       | UNPLATED                         | PLATED W/ZnCr        |                          |                              |
| M4        | 2.4 N·m (21 lb in)             | 3.2 N·m (28 lb in)  | 3.5 N·m (31 lb in)               | 4.6 N·m (41 lb in)   | 2.2 N·m (19 lb in)       | 3.1 N·m (27 lb in)           |
| M5        | 4.9 N·m (43 lb in)             | 6.5 N·m (58 lb in)  | 7.0 N·m (62 lb in)               | 9.4 N·m (83 lb in)   | 4.4 N·m (39 lb in)       | 6.4 N·m (57 lb in)           |
| M6        | 8.3 N·m (73 lb in)             | 11 N·m (96 lb in)   | 12 N·m (105 lb in)               | 16 N·m (141 lb in)   | 7.5 N·m (66 lb in)       | 11 N·m (96 lb in)            |
| M8        | 20 N·m (179 lb in)             | 27 N·m (240 lb in)  | 29 N·m (257 lb in)               | 39 N·m (343 lb in)   | 18 N·m (163 lb in)       | 27 N·m (240 lb in)           |
| M10       | 40 N·m (30 lb ft)              | 54 N·m (40 lb ft)   | 57 N·m (42 lb ft)                | 77 N·m (56 lb ft)    | 37 N·m (27 lb ft)        | 53 N·m (39 lb ft)            |
| M12       | 70 N·m (52 lb ft)              | 93 N·m (69 lb ft)   | 100 N·m (74 lb ft)               | 134 N·m (98 lb ft)   | 63 N·m (47 lb ft)        | 91 N·m (67 lb ft)            |
| M16       | 174 N·m (128 lb ft)            | 231 N·m (171 lb ft) | 248 N·m (183 lb ft)              | 331 N·m (244 lb ft)  | 158 N·m (116 lb ft)      | 226 N·m (167 lb ft)          |
| M20       | 350 N·m (259 lb ft)            | 467 N·m (345 lb ft) | 484 N·m (357 lb ft)              | 645 N·m (476 lb ft)  | 318 N·m (235 lb ft)      | 440 N·m (325 lb ft)          |
| M24       | 607 N·m (447 lb ft)            | 809 N·m (597 lb ft) | 838 N·m (618 lb ft)              | 1118 N·m (824 lb ft) | 552 N·m (407 lb ft)      |                              |

**IDENTIFICATION**

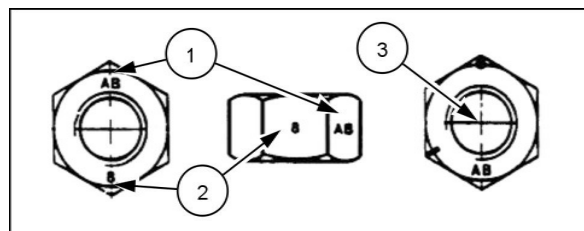
**Metric Hex head and carriage bolts, classes 5.6 and up**



20083680 1

1. Manufacturer's Identification
2. Property Class

**Metric Hex nuts and locknuts, classes 05 and up**



20083681 2

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