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# **Workshop Manual**

# **2011**

**0312 1936 en**

Illustrations and data in this workshop manual are subject to technical change in the course of improvements to the engines. Reprinting and reproductions of any kind, even in part, require our written permission.





**The engine company.**

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# 1 Foreword

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## Notes

- Read and observe the information in this documentation. You will avoid accidents, retain the manufacturer's warranty and have a fully functional, ready to use engine at your disposal.
- This engine is built exclusively for the purpose according to the scope of delivery - defined by the equipment manufacturer (use for the intended purpose). Any use above and beyond this is considered improper use. The manufacturer will not be liable for damages resulting from this. The user will bear the sole risk in this case.
- Use for the intended purpose also includes observance of the operating, maintenance and repair instructions specified by the manufacturer. The engine may only be used, maintained and repaired by persons who are familiar with it and instructed in the dangers.
- Make sure that this documentation is available to everyone involved in the operation, maintenance and repair and that they have understood the contents.
- Failure to observe this documentation can lead to malfunctions and engine damage as well as injury to persons for which the manufacturer will accept no liability.
- Prerequisite for the proper maintenance and repair is the availability of all necessary equipment, commercial tools and special tools as well as their perfect working order.
- Engine parts such as springs, clamps, elastic retaining rings etc. constitute an increased risk of injury when not used properly.
- The pertinent rules for the prevention of accidents and other generally recognized safety and industrial medicine rules must be observed.
- Maximum cost effectiveness, reliability and long life is only guaranteed when DEUTZ original parts are used.
- Repair of the engine must comply with use for the intended purpose. Only parts released by the manufacturer for the respective purpose may be used for conversion work. Unauthorized modification to the engine exclude manufacturer liability for resulting damages. Failure to observe this will lead to voiding of the warranty!
- The engines made by DEUTZ are developed for a wide range of applications. A wide range of variants ensures that the respective special requirements are met.
- The engine is equipped according to the installation, i.e. not all the parts and components described in this documentation are installed in your engine.
- We have done our best to clearly identify the differences so that you can easily find the operating, maintenance and repair instructions relevant to your engine.

**We are at your service for any questions you may have in this matter.**

**Your DEUTZ AG**







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## 2 General

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Notes

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### DEUTZ engines

are the product of years of research and development. The profound know-how gained in connection with high quality requirements is the guarantee for manufacturing of engines with a long life, high reliability and low fuel consumption. Naturally the high requirements for protection of the environment are also met.

### Maintenance and care

are decisive for whether the engine satisfactorily meets the set demands. Compliance with the prescribed maintenance times and the careful execution of maintenance and care are therefore essential. Difficult operating conditions deviation from normal operation must be observed especially.

### DEUTZ AG

Please consult one of our service representatives responsible for operating faults and spare parts questions. Our trained specialist personnel ensures fast, professional repairs using original parts in the event of damage. Original parts of the DEUTZ AG are always produced according to the latest state of the art. Information about our service can be found at the end of this documentation.

### Take care when the engine is running

Only perform maintenance work or repairs when the engine is at a standstill. Replace any removed protective devices upon completion of the work. When working on the running engine, work clothing must be close fitting.



#### Safety

This symbol accompanies all safety notes. Observe these carefully. Also pass on the safety instructions to your operating personnel. The "General safety regulations and rules for the prevention of accidents" of the legislator must be observed additionally.



#### Note

This symbol accompanies information of a general kind. Observe these carefully.



#### Asbestos

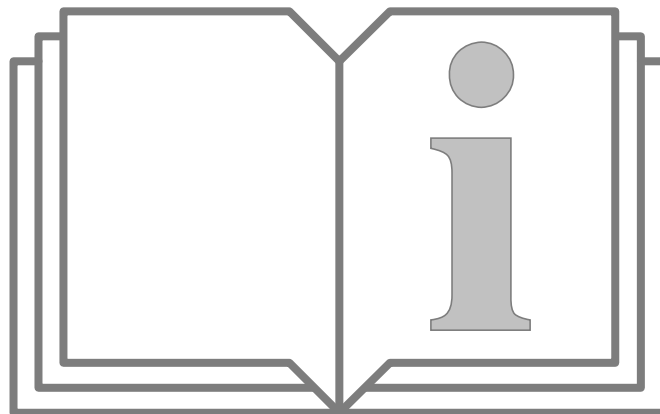
Gaskets used in this engine are asbestos-free. Please use the appropriate spare parts for maintenance and repair work.



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Notes

### 3 User notes





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**Notes**

### 3.1 General

The maintenance work prescribed in the operating manual and in the workshop manual must be performed on schedule and completely.

The maintenance personnel must possess the necessary technical knowledge to perform the work. Safety and protection devices which are removed during maintenance work must be replaced again afterwards.



#### **Caution!**

The rules for the prevention of accidents and the safety regulations must be observed during maintenance work.

Also observe the special safety regulations for the different maintenance groups which are listed in detail as job cards in the Job cards chapter (cf. also section 1.2).

See the maintenance schedules for the maintenance intervals. These also inform you of the work to be performed.

The job cards provide technical instructions for performing the work.

### 3.2 Specifications

#### 3.2.1 Safety regulations and rules for the prevention of accidents

For various maintenance groups, detailed safety notes in the form of job cards have been compiled, these precede the job cards of the respective maintenance groups.

The legally prescribed rules for the prevention of accidents (available from professional associations or from dealers) must be observed. These are dependent on the installation site, operating mode and the operating and auxiliary materials being used.

Special protection measures depending on the respective work are specified and identified in the job description.

It generally applies among other things:

- for the personnel
  - Only instructed personnel may operate or maintain the engine. Unauthorized persons may not enter the engine room.
  - Wear close fitting clothing and ear protectors in the engine room when the engine is running.
  - Only appoint qualified personnel to do repairs and maintenance.
- for the engine room:
  - Ensure adequate ventilation (do not cover air shafts)
  - Install first aid kit and suitable fire extinguishers. Check the filling and readiness for operation regularly.
  - Only store inflammable materials in the engine room if these are necessary for operating the system.
  - Smoking and naked lights are prohibited in the engine room.
- For operation and maintenance of the engine:
  - Only start the engine when all protection devices are installed. Make sure that no-one is standing in the danger area.
  - Only perform cleaning, maintenance and repair work when the engine has been shut down and secured against starting.



### 3.2.2 Disposal regulations

The work described in the operating manual and workshop manual necessitates renewal of parts and operating materials. The renewed parts / operating materials must be stored, transported and disposed of properly. The owner himself is responsible for this.

Disposal includes recycling and the scrapping of parts / operating materials whereby recycling has priority.

Details of disposal and their monitoring are governed by regional, national and international laws and directives which the system operator must observe on his own responsibility.

### 3.3 Operating manual and workshop manual

To structure the information to suit the user, the service documentation is divided into operating manual and workshop manual.

The **operating manual** contains a general description and instructions for all other maintenance work.

It contains the following chapters:

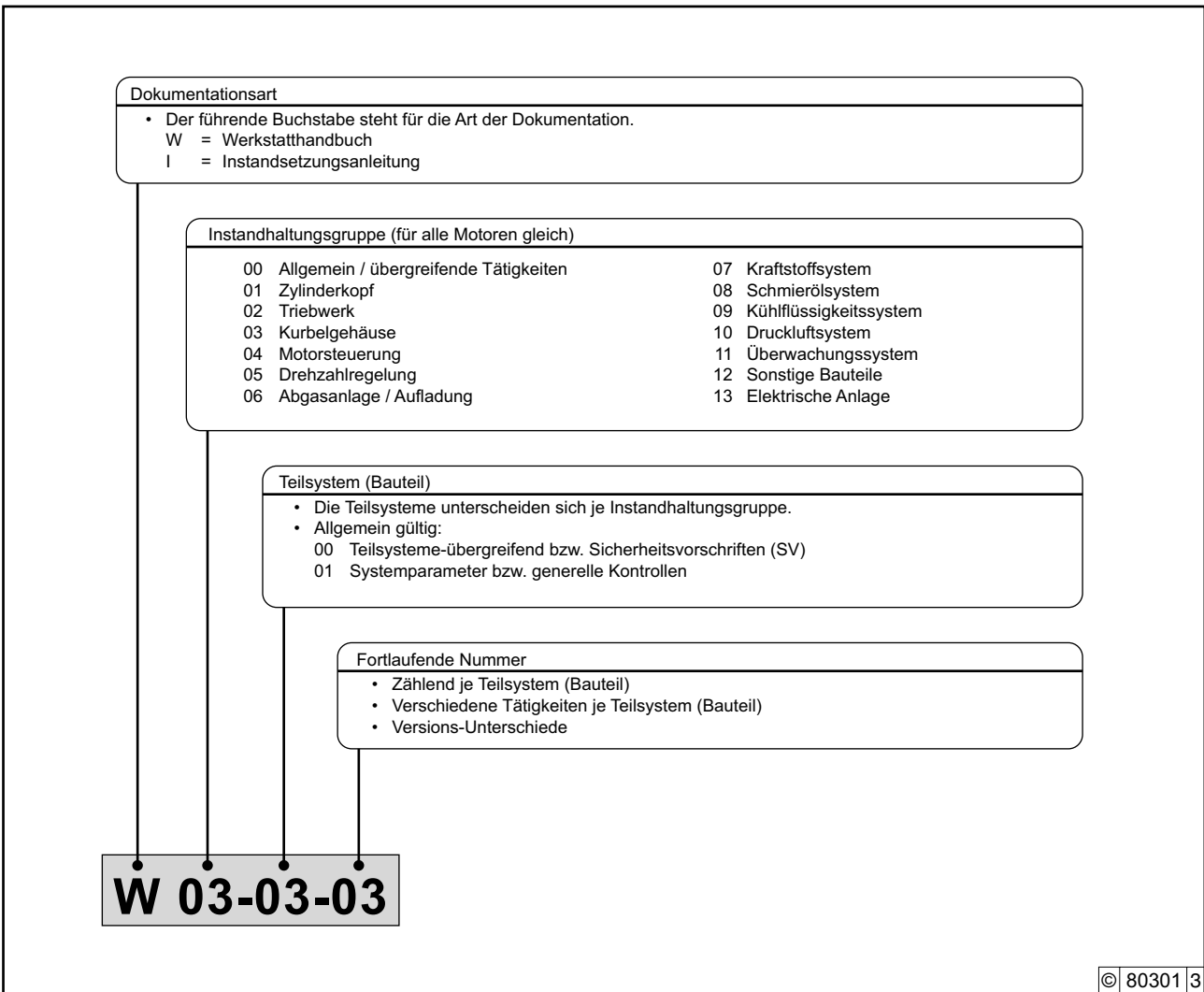
1. General, Contents
2. Engine description
3. Operation
4. Operating materials
5. Maintenance
6. Care and maintenance work
7. Faults, causes and remedies
8. Engine corrosion protection
9. Technical data
10. Service

The **workshop manual** assumes knowledge of the contents of the operating manual, this applies especially for the safety regulations. Minor repairs and emergency measures on components are described the execution of which requires more effort and appropriately qualified personnel.

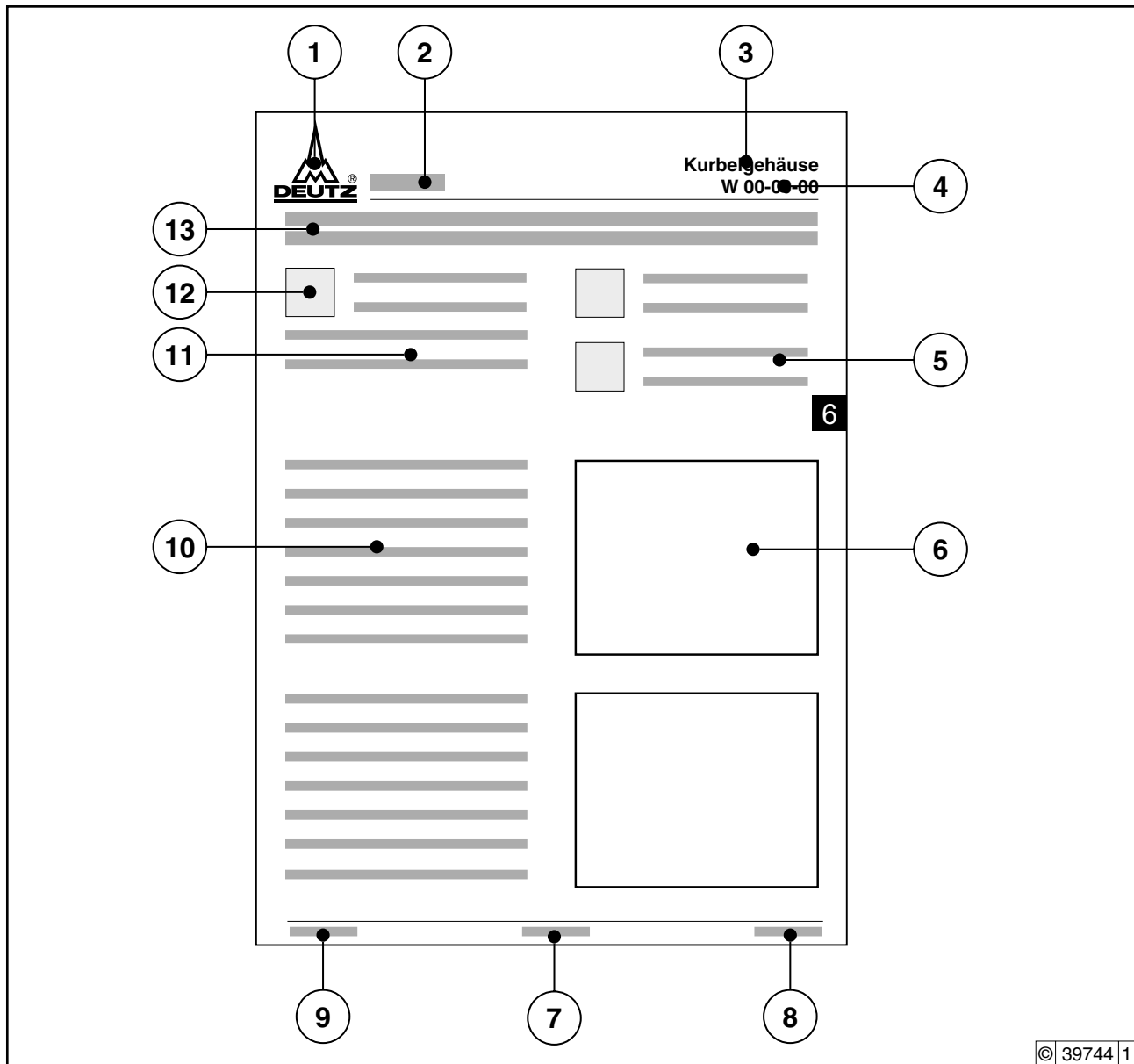
### 3.4 Job cards

The **job cards** are divided into job cards of the **workshop manual** e. g. **W 04-05-01** and the **maintenance manual I 04-05-01**.

#### Numbering of job cards



## Structure of a job card



- |   |  |
|---|--|
| 1. DEUTZ, publisher of the service documentation            | 8. DEUTZ-internal part number of job card and technical order number |
| 2. Engine type (e. g. 914)                                  | 9. Date of issue of the job card                                     |
| 3. Maintenance group  | 10. Work sequence  |
| 4. Job card number  | 11. Safety and general notes   |
| 5. Reference to other job cards, Specifications and similar | 12. Necessary tools, auxiliary materials and spare parts             |
| 6. Explanatory graphics                                     | 13. Title of the job card  |
| 7. Page number  |  |



### Note

For inquiries about the job card please always state the engine type (2), the job card number (4), the page number (7), the date of issue (9) or alternatively the DEUTZ-internal part number (8).

### 3.5 Explanation of symbols



**Caution!**



**Auxiliary material**

For example: Lifting gear, adhesive



**Tools**

for example: 100 400 - meter



**Note**

For example: Cylinder head is dismantled.



**Always renew when assembling**

For example: Gaskets



**References**

For example: Job card no. W xx-yy-zz



**See technical data (test and setting data)**

Line note, for example: "01 61 – Valve clearance (inlet)"



**See technical data (tightening specifications)**

Line note, for example: "01001 – Cylinder head on crankcase"