

**21E**  
**121E**  
**221E**  
**321E**  
**Series 3**  
**Compact Wheel Loaders**

Service Manual

Print No. 87734636C

**CASE**  
CONSTRUCTION

## TO THE READER

This manual has been printed for a skilful engineer to supply necessary technical information to carry out service operations on this machine.

**CNH ITALIA S.p.A.**  
Via Plava, 80  
10135 TORINO - Italy

Read carefully this manual to collect correct information relevant to repair procedures.

For any question or remark, or in case of any error relevant the contents of this manual, please contact:

---



---

## REFERENCES

Beyond this Repair Manual, also refer to documents listed hereunder:

- Operator's Manual
- Parts Catalogue

---



---

## COMPLETE REPAIR MANUAL

The complete Repair Manual consists of two volumes:

- 21E - 121E - 221E - 321E  
Repair Manual for "Wheel loaders"
- 21E - 121E - 221E - 321E  
Repair Manual for "Engine"

The Repair Manuals for "Wheel loaders" and "Engine" contain the necessary technical information to carry out service and repair on machine and on engine, necessary tools to carry out those operations and information on service standard, on procedures for connection, disconnection, disassembly and assembly of parts.

The complete Repair Manual which covers the loader models 21E - 121E - 221E - 321E consists of the following volumes, which can be identified through their print number as stated below:

VOLUME	MACHINE TYPE	PRINT NUMBER
Repair Manual - "Wheel loaders"	21E - 121E - 221E - 321E	87734636C
Repair Manual - "Engine"	21E - 121E - 221E - 321E	87736548A

---

### TO PREVENT ACCIDENTS

The majority of accidents and injuries which occur in industry, on the farm, at home or on the road, are caused by the failure of some individual to follow simple and fundamental safety rules or precautions. For this reason **MOST ACCIDENTS CAN BE PREVENTED** by recognizing the real cause and taking the necessary precautions, before the accident occurs.

Regardless of the care used in design and construction of any type of equipment, there may be conditions that cannot be completely safeguarded against, without interfering with reasonable accessibility and efficient operation.

A careful operator and / or technician is the best insurance against accidents. The complete observance of one simple rule would prevent many thousands of serious injuries each year.

This rule is: never attempt to clean, lubricate or adjust a machine while it is in motion.

---

#### **⚠ WARNING**

Before carrying out any maintenance operation, adjustment and or repair on machines equipped with attachments, controlled hydraulically or mechanically, make sure that the attachment is lowered and safely set on the ground. If it is necessary to have the equipment partially or fully raised to gain access to certain items, be sure the equipment is suitably supported by means other than the hydraulic lift cylinders, cable and /or mechanical device used for controlling the equipment.

---

**NOTE:** in this manual, the abbreviations of the models are the same as in the following table.

---

<b>21E Series 3</b>	<b>21E</b>
<b>121E Series 3</b>	<b>121E</b>
<b>221E Series 3</b>	<b>221E</b>
<b>321E Series 3</b>	<b>321E</b>

**CNH S.p.A.**  
Via Plava, 80  
10135 TORINO - Italy

All rights reserved. Reproduction of text or illustrations, in whole or in part, is strictly prohibited.

---

# INDEX

## SECTION 00 - INTRODUCTION

1. SAFETY INSTRUCTIONS .....	1
1. GENERAL SAFETY INSTRUCTIONS.....	2
1. TECHNICAL SPECIFICATIONS.....	12

## SECTION 10 - ENGINE

1. DIESEL ENGINE .....	1
2. FUEL SYSTEM .....	2
3. COLD START DEVICE (NORTH AMERICA).....	5

## SECTION 25 - FRONT AXLES

1. REMOVAL AND INSTALLATION .....	1
2. DIMENSIONS .....	4
3. TECHNICAL SPECIFICATIONS.....	5
4. OIL CHANGE.....	10
5. DISASSEMBLY AND ASSEMBLY.....	13
5.1 DISC BRAKE ASSY (21E).....	13
5.2 BRAKE CALIPER .....	20
5.3 REDUCTION GEAR (21E).....	25
5.4 REDUCTION GEAR (121E, 221E, 321E).....	28
5.5 WHEEL HUB (21E).....	31
5.6 WHEEL HUB (121E, 221E, 321E).....	40
5.7 WHEEL SHAFT (121E, 221E, 321E).....	46
5.8 BRAKE AND WHEEL SHAFT (121E, 221E, 321E “STANDARD” and “HIGH SPEED”).....	50
5.9 DIFFERENTIAL SUPPORT .....	58
5.10 DIFFERENTIAL ASSY.....	66
5.11 PINION.....	73
6. TROUBLESHOOTING.....	79
7. SPECIAL TOOLS.....	82

## SECTION 27 - REAR AXLES

1. REMOVAL AND INSTALLATION .....	1
2. DIMENSIONS .....	3
3. TECHNICAL SPECIFICATIONS.....	7
4. OIL CHANGE.....	14
5. DISASSEMBLY AND ASSEMBLY.....	18
5.1 MOTOR TB150 .....	18
5.2 MOTOR TB138.5 “HIGH SPEED” .....	21
5.3 TRANSMISSION BOX TB150 .....	25
5.4 TRANSMISSION TB138.5 “HIGH SPEED” .....	34
5.5 REDUCTION GEAR (21E).....	54
5.6 REDUCTION UNIT (121E, 221E, 321E).....	57

---

5.7 WHEEL HUB (21E)..... 61  
5.8 WHEEL HUB (121E, 221E, 321E) ..... 70  
5.9 WHEEL SHAFT (121E, 221E, 321E)..... 76  
5.10 DIFFERENTIAL SUPPORT ..... 80  
5.11 DIFFERENTIAL ASSY ..... 88  
5.12 LIMITED SLIP DIFFERENTIAL ASSY ..... 94  
5.13 PINION..... 101  
6. TROUBLESHOOTING ..... 107  
7. SPECIAL TOOLS ..... 110

**SECTION 33 - BRAKE SYSTEM**

1. BRAKE SYSTEM DIAGRAM ..... 1  
    1.1 STANDARD DIAGRAM (21E)..... 1  
    1.2 "HIGH SPEED" DIAGRAM (121E, 221E, 321E) ..... 2  
2. TECHNICAL SPECIFICATIONS ..... 3  
    2.1 BRAKE PEDAL VALVE..... 3  
    2.2 PRESSURE SWITCHES ..... 3  
3. OPERATION ..... 4  
    3.1 SERVICE BRAKE OPERATION ..... 6  
    3.2 PARKING BRAKE OPERATION..... 8  
4. BRAKE PEDAL VALVE..... 9  
5. PRESSURE SWITCHES ..... 11  
6. BRAKE ACCUMULATOR ..... 12  
    6.1 TECHNICAL SPECIFICATIONS..... 12  
7. CHECKS AND ADJUSTMENTS ..... 13  
    7.1 SERVICE BRAKE SYSTEM PRESSURE CHECK ..... 13  
    7.2 ACCUMULATOR PRESSURE CHECK ..... 14  
    7.3 PEDAL ANGLE ADJUSTMENT ..... 15  
    7.4 "INCHING" VALVE ADJUSTMENT ..... 16  
8. TROUBLESHOOTING ..... 17

**SECTION 35 - HYDRAULIC SYSTEM**

1. HYDRAULIC DIAGRAMS ..... 1  
    1.1 HYDRAULIC DIAGRAM FOR 21E..... 1  
    1.2 HYDRAULIC DIAGRAM FOR 21E WITH OPTIONAL OUTFITS ..... 3  
    1.3 HYDRAULIC DIAGRAM FOR 121E..... 5  
    1.4 HYDRAULIC DIAGRAM FOR 121E WITH OPTIONAL OUTFITS ..... 7  
    1.5 HYDRAULIC DIAGRAM FOR 221E..... 9  
    1.6 HYDRAULIC DIAGRAM FOR 221E WITH OPTIONAL OUTFITS ..... 11  
    1.7 HYDRAULIC DIAGRAM FOR 321E..... 13  
    1.8 HYDRAULIC DIAGRAM FOR 321E WITH OPTIONAL OUTFITS ..... 15  
2. TRANSMISSION ..... 17  
    2.1 HYDRAULIC DIAGRAM..... 17  
    2.2 OPERATION ..... 18  
    2.3 ADJUSTMENTS..... 20  
3. VARIABLE-DISPLACEMENT PISTON PUMP ..... 22  
    3.1 TECHNICAL SPECIFICATIONS..... 23  
    3.2 MAIN VALVES ..... 24

---

It's a preview. You can download the full file by clicking the link below.

<https://shopservicemanual.com/>

Service Manuals from 2\$