28/31/35 Mini-excavator
7-83260 SERVICE MANUAL

Table of Contents

Chapter 0 - GENERAL INFORMATION

0.1 SAFETY PRECAUTIONS 0-2

0.2 USING THE SERVICE MANUAL 0-3

0.2.1 Manual introduction 0-3

0.2.2 The structure of the manual 0-3

0.2.3 Page numbers 0-3

0.2.4 Highlight symbols 0-3

0.2.5 Special tools 0-3

0.2.6 Repairs and replacements 0-4

0.2.7 Repair time schedule 0-4

0.2.8 Service information releases 0-4

0.3 MACHINE SPECIFICATIONS 0-5

0.3.1 Machine dimensions 0-5

General dimensions 0-5

Machine bucket attachment dimensions 0-6

Dozer blade dimensions 0-7

0.3.2 Weights and capacities 0-7

Weights 0-7

Capacitites 0-7

0.3.3 General specifications 0-8

Engine 0-8

Fuel system and air cleaner 0-9

Cooling system 0-9

Transmission 0-9

Hydraulic system 0-10

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Chapter 0
GENERAL INFORMATION

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

3.3 FUEL, AIR, AND EXHAUST TROUBLESHOOTING 3-10

3.3.1 Starter motor turns but engine does not start 3-10

3.3.2 Fuel level lamp comes on 3-10

3.3.3 Air filter lamp comes on 3-10

3.3.4 Engine stalls when speed is low 3-10

3.3.5 Insufficient power 3-10

3.3.6 Fuel consumption high 3-11

3.3.7 Black exhaust smoke 3-11

3.3.8 Blue or white exhaust smoke 3-11

Chapter 4 - TRACK GEARBOX

4.1 TRACK GEARBOX DATA 4-2

4.1.1 Track gearbox specifications 4-2

4.1.2 Track gearbox torque data 4-2

4.2 TRACK GEARBOX MAINTENANCE 4-3

4.2.1 Principle of operation of the track gearbox (Typical) 4-3

Axial piston type hydraulic motor 4-3

Control valve 4-4

4.2.2 Checking the track gearbox oil level 4-6

4.2.3 Changing the track gearbox oil 4-6

4.2.4 Removing and installing the track gearbox 4-7

Removing the track gearbox 4-7

Installing the track gearbox 4-7

4.2.5 Disassembling, inspecting, and assembling the track gearbox 4-8

Disassembling the track gearbox 4-8

Inspecting the track gearbox 4-18

Assembling the track gearbox 4-19

4.3 TRACK GEARBOX TROUBLESHOOTING 4-33

4.3.1 The track gearbox does not turn 4-33

4.3.2 Turning is not stable 4-33

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

6.2.2 Cleaning the tracks

WARNINGS

- **If two people are cleaning the tracks, make sure the person operating the controls is a competent operator. Operation of the wrong lever (or if the controls are moved violently) is dangerous, the other person could be killed or injured.**
- **To clean the tracks you must turn them. When the tracks are turning, keep clear of rotating parts. Make sure you have no loose clothing such as cuffs or ties.**
- **You must support the machine with stands when you lift it using the attachments.**

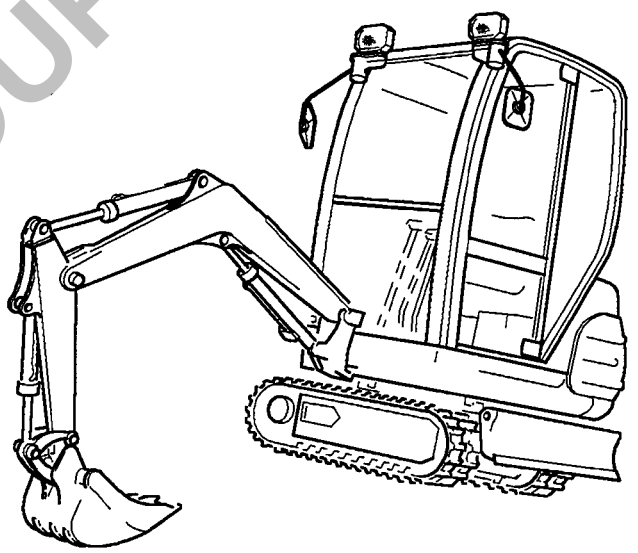
Clean the tracks as follows:

1. Park the machine on level ground. Slew the cab around as shown and lower the attachment to the ground.
2. Raise the track to be cleaned clear of the ground.

WARNING

Rotating the tracks off the ground may cause stones and other debris to be thrown with considerable force. Keep other people away from the equipment.

3. Rotate the raised track in both directions until all mud is shaken off. If necessary, hose down the track during rotation to aid cleaning.



CC163

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

0.2 USING THE SERVICE MANUAL

0.2.1 Manual introduction

The purpose of this manual is to assist Dealers and Distributors with the efficient repair and maintenance of the 28, 31 and 35 mini-excavators.

Following the procedures as detailed together with using the special tools where appropriate, will enable the operations to be completed within the time stated in the Repair Time Schedule (RTS).

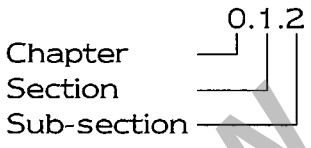
0.2.2 The structure of the manual

This manual has been divided into 15 Chapters using the same numbering system as the Operator's Book and the Parts Catalogue.

Each Chapter is divided into three Sections. The three Sections are Data, Maintenance and Troubleshooting.

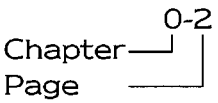
Some Sections are further divided into Sub-sections.

The Contents at the front of this manual lists all Chapters, Sections and Sub-sections with corresponding page numbers using the following numbering system for identification.



0.2.3 Page numbers

The page numbers are shown at the bottom of each page in sequential order. Each Chapter starts at page 1. The Chapter number is also included on each page.



0.2.4 Highlight symbols

Throughout this manual the following symbols are used to draw your attention to areas where special care is required, to prevent accident, injury, damage to equipment or to give you additional information.

WARNING

A warning gives the reader information (or a command) which, if disregarded, could cause injury or death. Because of its importance, any warning preceeds the Instruction(s) which, in the act of being performed, could be dangerous.

CAUTION

A caution provides the reader with advice, which, if disregarded, could cause damage to the equipment.

Note

A note furnishes additional information to assist the reader when reading a particular paragraph.

0.2.5 Special tools

The use of the special tools mentioned in the text contributes to safe, efficient and profitable repair. Some operations are impracticable without their use.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

9.3 ELECTRICAL SYSTEM TROUBLESHOOTING 9-12

9.3.1 Starter motor will not turn engine 9-12

9.3.2 Battery specific gravity reading low 9-12

9.3.3 Alternator not charging 9-12

9.3.4 Wash and wipe inoperative 9-12

9.3.5 Heater will not operate 9-13

9.3.6 Worklamp inoperative 9-13

9.3.7 Beacon inoperative 9-13

9.3.8 Circuits inoperative 9-13

Chapter 10 - HYDRAULIC SYSTEM (EXCEPT CYLINDERS)

10.1 HYDRAULIC SYSTEM DATA 10-2

10.1.1 Hydraulic system specifications 10-2

10.1.2 Hydraulic system torque data 10-3

Control valve 10-3

Main hydraulic pump 10-3

10.1.3 Hydraulic system special tools 10-4

10.2 HYDRAULIC SYSTEM MAINTENANCE 10-5

28 Hydraulic Circuit Diagram (up to Ser No. DBK0005010) 10-5

28 Hydraulic Circuit Diagram (from Ser No. DBK0005010) 10-6

31/35 Hydraulic Circuit Diagram (31, up to Ser No. DBK0006026/ 35, up to Ser No. DBK0007002) 10-7

31/35 Hydraulic Circuit Diagram (31, from Ser No. DBK0006026/ 35, from Ser No. DBK0007002) 10-8

10.2.1 Principle of operation of the hydraulic system and components 10-9

Main hydraulic pump 10-10

Control valve (28) 10-14

Control valve (31 and 35) 10-15

Control valve operation 10-17

Straight line travel function 10-18

Dipper-in function 10-19

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Bucket cylinder 13-2

Off-set cylinder 13-2

Dozer blade cylinder 13-2

13.2 HYDRAULIC CYLINDERS MAINTENANCE 13-3

13.2.1 Principle of operation of hydraulic cylinders (Typical) 13-3

13.2.2 Removing and installing cylinders 13-4

Removing and installing cylinders 13-4

13.2.3 Disassembling, inspecting, and assembling cylinders (Typical) 13-4

Disassembling cylinders 13-4

Inspecting cylinders after disassembly 13-5

Assembling cylinders 13-5

Inspecting cylinders after assembly 13-5

13.2.4 Cylinder leak test 13-6

External leak test 13-6

Internal leak test 13-6

13.2.5 Venting air from a hydraulic cylinder 13-6

13.3 HYDRAULIC CYLINDER TROUBLESHOOTING 13-7

13.3.1 Oil leaks from piston rod sliding surface 13-7

13.3.2 Oil leaks from the outer circumference of the rod cover 13-7

13.3.3 Cylinder natural fall is 0,5 mm or greater 13-7

13.3.4 Boom or dipper cylinder will not operate or operation is slow or there is no power 13-8

13.3.5 Off-set cylinder will not operate 13-8

13.3.6 Bucket cylinder does not move or there is no power 13-8

13.3.7 Dozer blade cylinder does not move or there is no power 13-9

13.3.8 Boom drops temporarily when operating lever is pulled gently 13-9

13.3.9 Boom cylinder natural fall is excessive 13-9

13.3.10 Dipper or bucket cylinder natural fall is excessive 13-9

13.3.11 Dozer blade cylinder natural fall is excessive or dozer blade will not hold up the machine 13-9

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Chapter 5
BRAKES

This information is incorporated in the relative track drive and slew drive sections as the brakes are part of these assemblies.

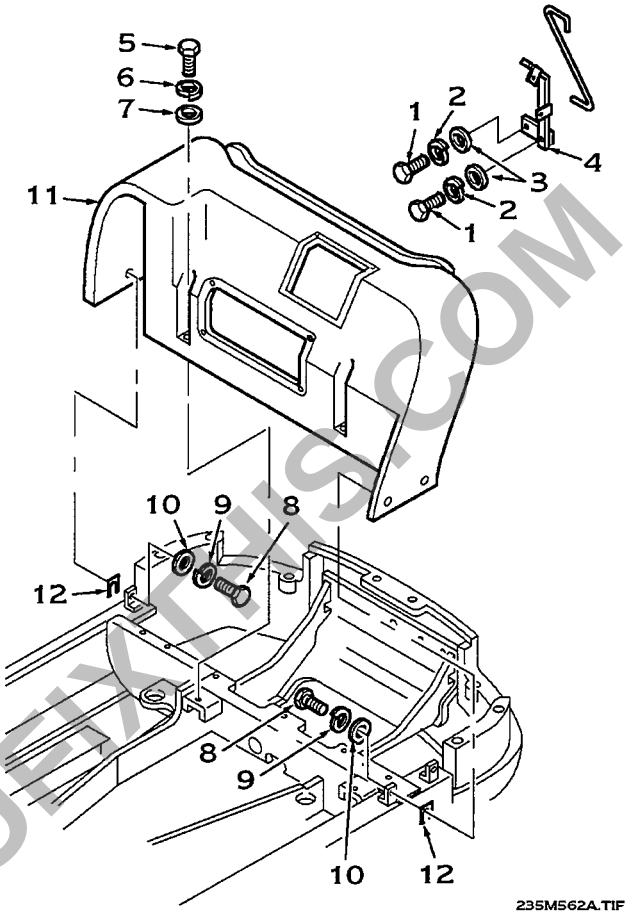
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Removing the bulkhead

Remove the bulkhead as follows:

1. Remove the two bolts (1), and the washers (2) and (3), and remove the supprt (4).
2. Remove the two bolts (5) and the washers (6) and (7).
3. Remove the three bolts (8) and the washers (9) and (10).
4. Remove the bulkead (11) and collect the spacers (12).

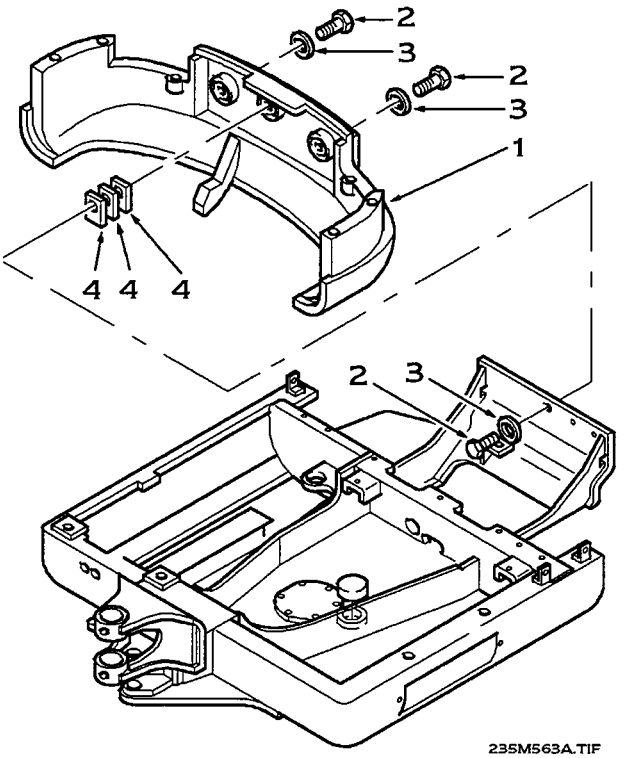


235M562A.TIF

Removing the counterweight

Proceed as follows to remove the counterweight:

1. Connect suitable lifting tackle to the counterweight (1).
2. Remove the three bolts (2) and the washers (3).
3. Remove the counterweight (1) and collect the shims (4).

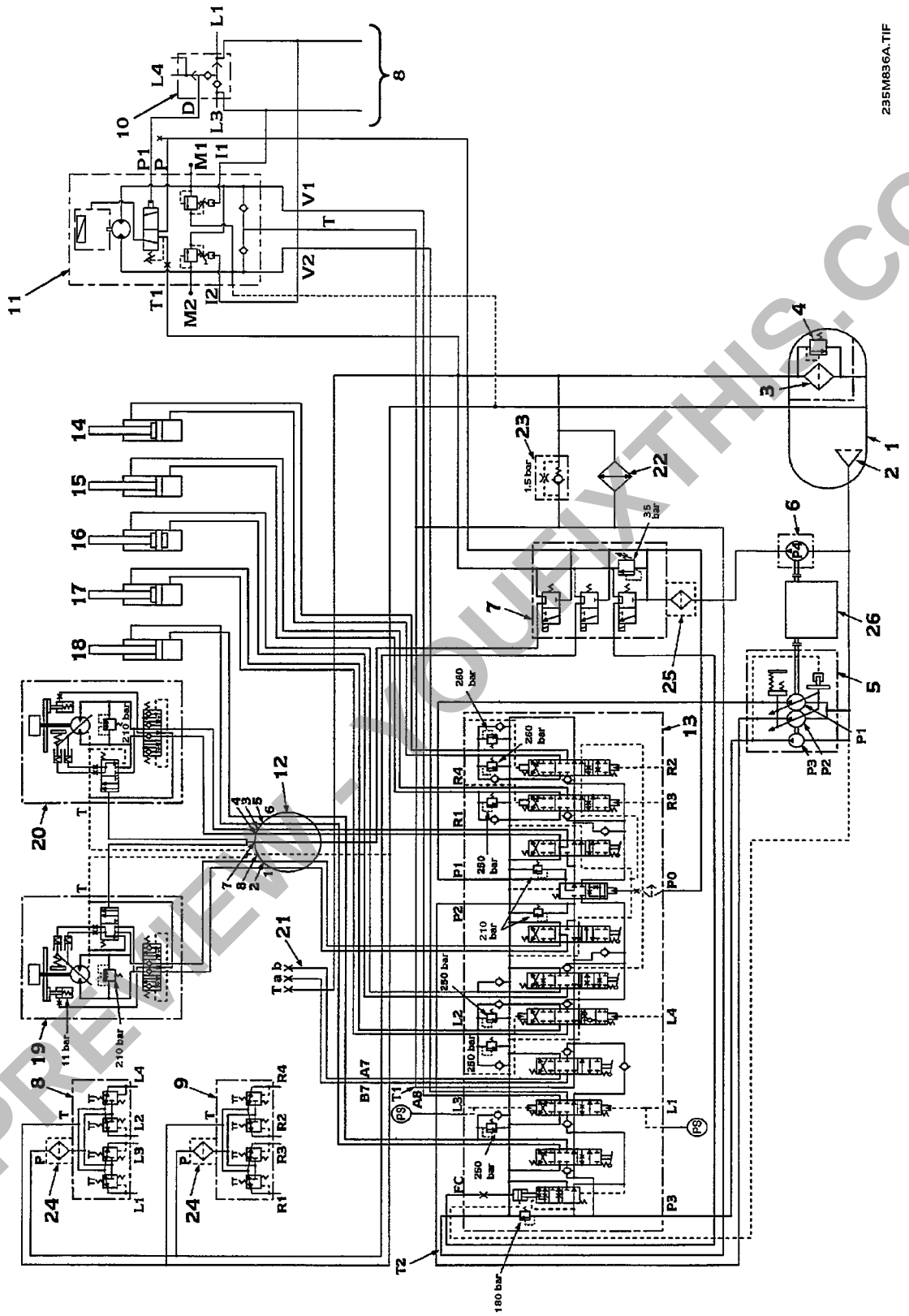


235M563A.TIF

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

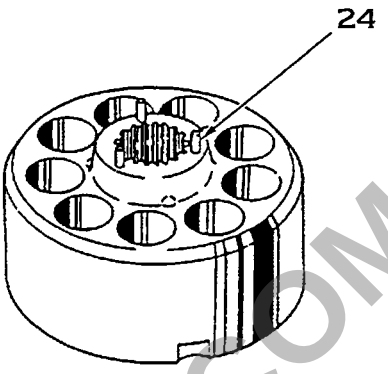
28 Hydraulic Circuit Diagram (From Ser. No. DBK0005010)



PREVIEW - YOUFIXTHIS.COM

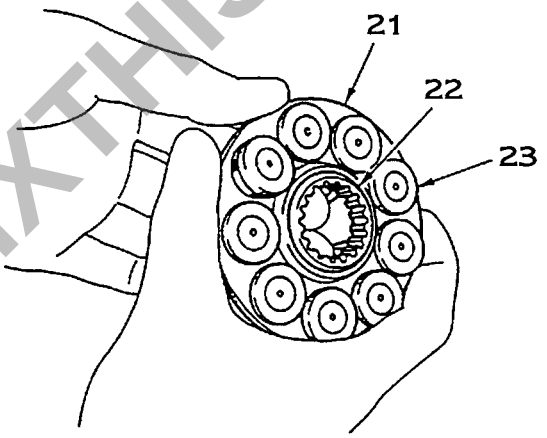
Download full manual at youfixthis.com

26. Install the pins (24) in the cylinder block.



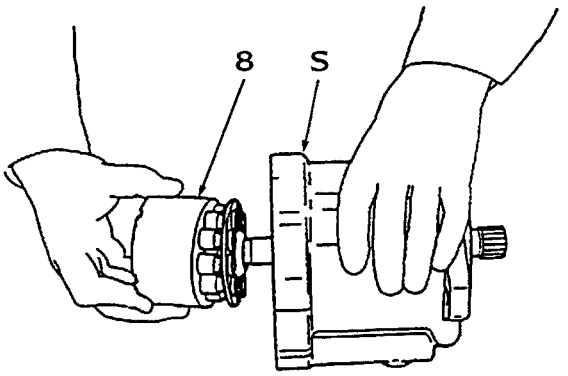
235M765A.TIF

27. Install the guide (22) in the cylinder block. Attach the pistons (23) to the holder (21) and install the holder (21) in the cylinder block.



235M764A.TIF

28. Install the cylinder block assembly (8) in the body S.

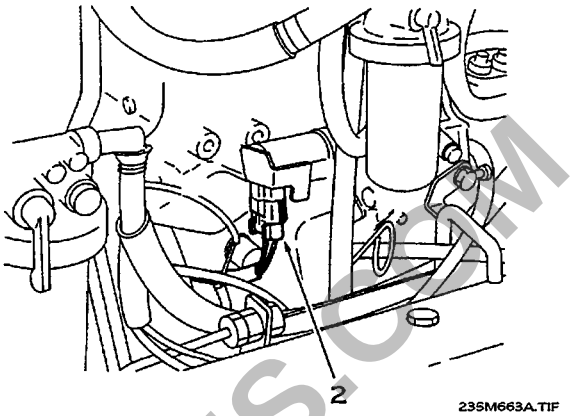


235M758A.TIF

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

2. Disconnect the electrical wiring (2) to the engine stop solenoid.
3. Use the starter motor to turn the engine and check if hydraulic oil is discharging from the pump. If no hydraulic oil is discharging, the pump or the coupling is faulty.

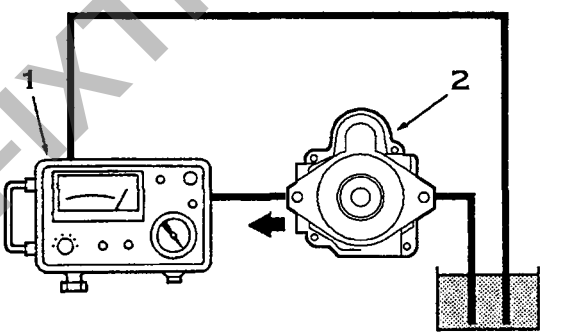


235M663A.TIF

10.2.33 Checking the main hydraulic pump discharge volume

Check the main hydraulic pump discharge volume, (with the hydraulic system at operating temperature), as follows:

1. Connect a tester (1) to the discharge side of the pump (2).
2. Open the tester loading valve and start the engine. Run the engine at the rated speed for the pump under test (refer to sub-section 10.1.1).
3. Gradually close the loading valve and apply the rated pressure to the pump.
4. Measure the discharge volume and the pump speed (engine speed).



235M664A.TIF

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

13.3.7 Dozer blade cylinder does not move or there is no power

CAUSE	REMEDY
Spool not operating	Repair or replace control valve slice.
Incorrectly adjusted linkage	Adjust, repair, or replace parts.
Incorrect control valve supply pressure	Check and reset relief valve.
Faulty swivel joint	Repair or replace swivel joint.
Faulty cylinder	Repair or replace cylinder.

13.3.8 Boom drops temporarily when operating lever is pulled gently

CAUSE	REMEDY
Faulty load check valve in the control valve	Replace load check valve or control valve slice.
Internal leakage in the boom cylinder	Repair or replace boom cylinder.

13.3.9 Boom cylinder natural fall is excessive

CAUSE	REMEDY
Internal leakage in the cylinder	Repair or replace cylinder.
Faulty port relief valve	Repair or replace port relief valve.
Internal leakage in the control valve	Repair or replace the control valve slice.

13.3.10 Dipper or bucket cylinder natural fall is excessive

CAUSE	REMEDY
Faulty cylinder	Repair or replace cylinder.
Internal leakage in the control valve	Repair or replace the control valve slice.

13.3.11 Dozer blade cylinder natural fall is excessive or dozer blade will not hold up the machine

CAUSE	REMEDY
Internal leakage in the cylinder	Repair or replace the cylinder.
Internal leakage in the control valve	Repair or replace the control valve slice.
Faulty swivel joint	Repair or replace the swivel joint.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 17 of 324 pages

The full manual includes:

- All 324 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Case 28, 31, 35 Service Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual