Service Manual

Wheeled Loading Shovel - 426, 435, 436, 446

Section 1 - General Information

Section 2 - Care and Safety

Section 3 - Routine Maintenance

Section A - Attachments

Section B - Body and Framework

Section C - Electrics

Section E - Hydraulics

Section F - Transmission

Section G - Brakes

Section H - Hydraulic Steering

Section K - Engine



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Contents Page No.

Introduction
About this Manual ..... 1 - 1
Machine Model and Serial Number ..... 1 - 1
Using the Service Manual ..... 1 - 1
Section Numbering ..... 1 - 1
Left Side, Right Side ..... 1 - 2
Cross References ..... 1 - 2
Identifying Your Machine ..... 1 - 3
Machine Identification Plate ..... 1 - 3
Component Identification Plates ..... 1 - 5

Standard Torque Settings
Zinc Plated Fasteners and Dacromet Fasteners ..... 1 - 7
Introduction ..... 1 - 7
Bolts and Screws ..... 1 - 7
Hydraulic Connections ..... 1 - 11
'O' Ring Face Seal System ..... 1 - 11
'Torque Stop' Hose System ..... 1 - 14

Service Tools
Numerical List ..... 1 - 15
Tool Detail Reference ..... 1 - 16
Section B - Body and Framework ..... 1 - 16
Section C - Electrics ..... 1 - 20
Section E- Hydraulics ..... 1 - 22
Section F - Transmission ..... 1 - 30
Section H - Steering ..... 1 - 33
Section K - Engine ..... 1 - 33

Service Consumables
Sealing and Retaining Compounds ..... 1 - 35

Terms and Definitions
Colour Coding ..... 1 - 37
Hydraulic Schematic Colour Codes ..... 1 - 37

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Contents Page No.

Safety Notices
Important Information ..... 2 - 1
The Operator Manual ..... 2 - 1
Safety Warnings ..... 2 - 1
Safety Check List ..... 2 - 2
Safety - Yours and Others ..... 2 - 2
General Safety ..... 2 - 2
Operating Safety ..... 2 - 4
Maintenance Safety ..... 2 - 7
Safety Labels ..... 2 - 12
Introduction ..... 2 - 12
Safety Label Identification ..... 2 - 13
Part Numbers and Descriptions ..... 2 - 14

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Contents **Page No.**

Routine Maintenance
Service Requirements 3-1
Introduction 3-1
Owner/Operator Support 3-1
Service/Maintenance Agreements 3-1
Initial Service and Inspection 3-1
Fit for Purpose Tests for Lifting Equipment 3-2
Obtaining Replacement Parts 3-2
Health and Safety 3-3
Lubricants 3-3
Battery 3-5
Service Schedules 3-7
Introduction 3-7
How to Use the Service Schedules 3-7
Calendar Equivalents 3-7
426 to 1295000, 436 to 1410000 3-8
426 from 1295000, 436 from 1410000 3-13
Fluids, Lubricants and Capacities 3-19
Specifications 3-19
Coolant Mixtures 3-24
Anti-Corrosion Additives 3-24
Fuel 3-25
Tools 3-28
Toolbox 3-28
Carrying Tools onto the Machine 3-28
Prepare the Machine for Maintenance 3-29
Introduction 3-29
How to Make the Machine Safe (Loader Arm Lowered) 3-30
How to Make the Machine Safe (Loader Arms Lifted) 3-30
Safety Mechanism 3-31
Articulation Lock 3-33
Cleaning the Machine 3-34
Introduction 3-34
Preparing the Machine for Cleaning 3-34
Cleaning the Machine 3-35
Checking for Damage 3-36
Check the Machine Body and Structure 3-36
Check the Seat and Seat Belt 3-36
Check the Tyres 3-36
Check the Electrical Circuits 3-36
Check the Hydraulic Hoses and Fittings 3-37
Checking the ROPS/FOPS Structure 3-37
Greasing 3-38
Introduction 3-38
Preparing the Machine for Greasing 3-38
Loader Arms and Shovel 3-39
Centre Pivot, Rear Axle Pivots and Steer Rams 3-41
Quickhitch Locking-Pins 3-41
Cab Door Hinges 3-42
Driveshafts 3-43
Automatic Greasing System (if fitted) 3-44
Access Panels 3-48
Rear Grille 3-48
Heater Door 3-48
Engine Covers 3-49

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Insufficient Cooling of Condenser or Refrigerant Overcharge

Gauge Readings:

Low Side Gauge - High.

High Side Gauge - High.

Other symptoms:

Sight Glass - No bubbles visible even at lower engine RPM.

Diagnosis:

Refrigerant overcharge, condenser cooling fins clogged with dirt or cooling fans malfunctioning.

Correction:

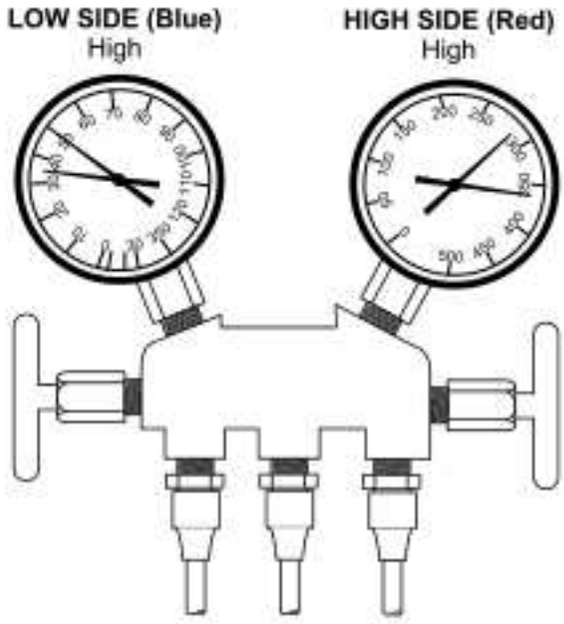
1 Clean condenser cooling fins.

2 Check cooling fan operation.

3 Evacuate AC system.

4 Charge system with R-134a.

5 Operate system and check performance.



LOW SIDE - 3.0 bar (3.0 kgf/cm^2)(43 lbf/in^2)
HIGH SIDE - 22.1 bar (22.5 kgf/cm^2)(320 ibf/in^2)

A258060-V1

Fig 9.

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Harnesses 426 from 1295000, 436 from 1410000

The harness number refers to and corresponds with the annotations in the schematic drawing.

Table 1. Cab Roof Harness

Harness No.	Issue	Remarks	Drawing
721/11818	4		⇨ C-305)
Main components connected to this harness:		Cab harness	
		Front work light switch	
		Rear work light switch	
		Beacon switch	
		Front work lights	
		Front auxiliary work lights	
		Rear work lights	
		Rear auxiliary work lights	
		Beacon socket	
		Interior light	
		Number plate lights	
		Radio power and speakers	
		Heated mirror switch	
		Heated mirrors	
		Earth point	

Table 2. Transmission Harness

Harness No.	Issue	Remarks	Drawing
721/11826	3		⇨ C-308)
Main components connected to this harness:		Output speed sensor	
		Turbine speed senor	
		Gear chain speed sensor	
		Engine speed	
		Control unit	
		Cab connector	

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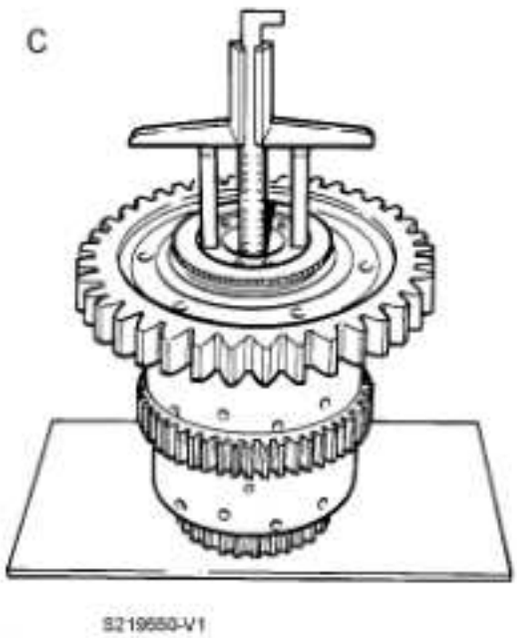


Fig 24.

d Add the median end play (0.20mm) to dimension (iii) to obtain the installation dimension.

e.g 227.20 + 0.20 = 227.40mm

e Subtract dimension (ii) from dimension (i) to obtain the housing dimension.

e.g 251.15 - 21.00 = 230.15mm

f Subtract the installation dimension from the housing dimension to calculate shim required.

e.g 230.15 - 227.40 = 2.75mm

10 Install clutch K4/K3 into gear housing. Fit thrust washer **35**, forked washer **36** and calculated shim **37**.

11 Fit rectangular section rings **38** to axle **39**. Ensure they are aligned concentrically. Lubricate and fit new O-ring **40**.

12 Heat housing bores using a hot air blower. Insert axle into clutch K4/K3 until axle flange is in contact with gear housing. Fit hex. nuts **41** and torque to 23Nm (17 lbf ft).

13 Recheck clutch end play and correct if necessary.

14 Check the operation of clutches K4 and K3 using compressed air. The opening and closing of the clutches should be clearly audible.

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Earthing - Cab and Cab Roof

Table 21.

Connections: See ⇨ *Fig 42. (C-185)*	
A	⇨ *Fig 40. (C-181)*
B	⇨ *Fig 34. (C-169)*
C	⇨ *Fig 34. (C-169)*
D	⇨ *Fig 34. (C-169)*
E	⇨ *Fig 41. (C-183)*
F	⇨ *Fig 35. (C-171)*
G	⇨ *Fig 33. (C-167)*
H	⇨ *Fig 33. (C-167)*
I	⇨ *Fig 39. (C-179)*
J	⇨ *Fig 35. (C-171)*
K	⇨ *Fig 41. (C-183)*
L	⇨ *Fig 41. (C-183)*
M	⇨ *Fig 37. (C-175)*
N	⇨ *Fig 37. (C-175)*
O	⇨ *Fig 38. (C-177)*
P	⇨ *Fig 39. (C-179)*
Q	⇨ *Fig 37. (C-175)*
R	⇨ *Fig 39. (C-179)*
S	⇨ *Fig 40. (C-181)*
T	⇨ *Fig 40. (C-181)*
U	⇨ *Fig 40. (C-181)*
V	⇨ *Fig 40. (C-181)*
W	⇨ *Fig 40. (C-181)*
X	⇨ *Fig 35. (C-171)*
Y	⇨ *Fig 43. (C-187)*
Z	⇨ *Fig 34. (C-169)*
AA	⇨ *Fig 36. (C-173)*
AB	⇨ *Fig 36. (C-173)*
AC	⇨ *Fig 36. (C-173)*
AD	⇨ *Fig 36. (C-173)*
AE	⇨ *Fig 36. (C-173)*
AF	⇨ *Fig 39. (C-179)*
AG	⇨ *Fig 36. (C-173)*
AH	⇨ *Fig 39. (C-179)*
AI	⇨ *Fig 37. (C-175)*
AJ	⇨ *Fig 37. (C-175)*
AK	⇨ *Fig 36. (C-173)*
AL	⇨ *Fig 36. (C-173)*
AM	⇨ *Fig 36. (C-173)*
AN	⇨ *Fig 39. (C-179)*
AO	⇨ *Fig 36. (C-173)*
AP	⇨ *Fig 36. (C-173)*
AQ	⇨ *Fig 36. (C-173)*
AR	⇨ *Fig 39. (C-179)*
AS	⇨ *Fig 36. (C-173)*
AT	⇨ *Fig 36. (C-173)*
AU	⇨ *Fig 38. (C-177)*
AV	⇨ *Fig 35. (C-171)*
AW	⇨ *Fig 35. (C-171)*
AX	⇨ *Fig 33. (C-167)*
AY	⇨ *Fig 33. (C-167)*
AZ	⇨ *Fig 33. (C-167)*
BA	⇨ *Fig 35. (C-171)*
BB	⇨ *Fig 32. (C-165)*
BC	⇨ *Fig 32. (C-165)*
BD	⇨ *Fig 32. (C-165)*
BE	⇨ *Fig 32. (C-165)*
BF	⇨ *Fig 32. (C-165)*
BG	⇨ *Fig 32. (C-165)*
BH	⇨ *Fig 35. (C-171)*
BI	⇨ *Fig 35. (C-171)*
BJ	⇨ *Fig 35. (C-171)*
BK	⇨ *Fig 35. (C-171)*
BL	⇨ *Fig 35. (C-171)*
BM	⇨ *Fig 37. (C-175)*
BN	⇨ *Fig 38. (C-177)*
BO	⇨ *Fig 38. (C-177)*
BP	⇨ *Fig 38. (C-177)*
BQ	⇨ *Fig 39. (C-179)*
BR	⇨ *Fig 39. (C-179)*
BS	⇨ *Fig 37. (C-175)*
BT	⇨ *Fig 33. (C-167)*
BU	⇨ *Fig 33. (C-167)*
BV	⇨ *Fig 39. (C-179)*
BW	⇨ *Fig 42. (C-185)*
BX	⇨ *Fig 42. (C-185)*
BY	⇨ *Fig 42. (C-185)*
BZ	⇨ *Fig 42. (C-185)*
CA	⇨ *Fig 42. (C-185)*

For **next** schematic	⇨ *Fig 34. (C-169)*
For component key	N/A
For connecting schematics key	⇨ *Table 22. (C-186)*

For **previous** schematic	⇨ *Fig 41. (C-183)*
For component key	⇨ *Table 19. (C-182)*
For connecting schematics key	⇨ *Table 20. (C-182)*

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Addendum Tooth Position

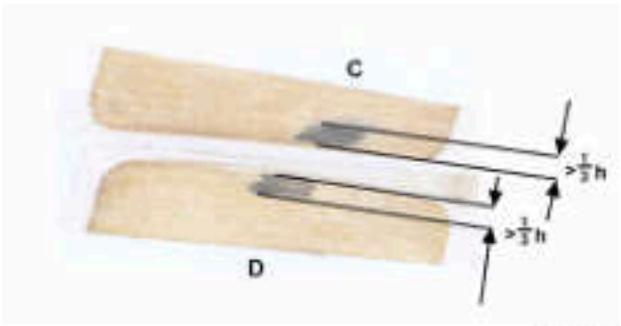


Fig 5. Poor Contact Pattern

C Convex
D Concave

The contact pattern on the convex and concave flanks is too far in the top section.

The contact pattern is too small and is not at a tangent to the flank middle line.

Adjustment: Add a thicker shim to the pinion.

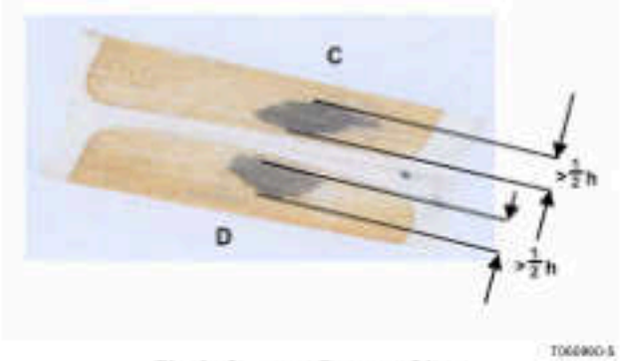


Fig 6. Contact Pattern Okay

The convex contact pattern must be visible in the direction of the tooth centre depth.

A minimum 50% of the flank in the direction of the tooth depth is covered.

Line Contact Pattern

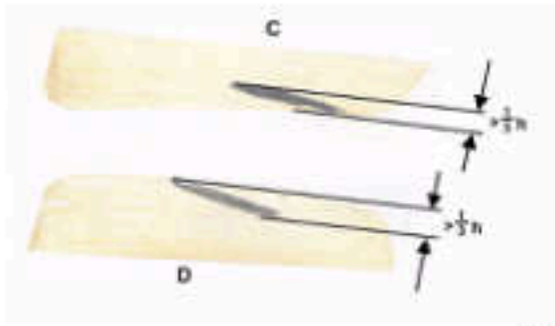


Fig 7. Poor Contact Pattern

C Convex
D Concave

The contact pattern on the convex and concave flanks is too far up on the crown-wheel. The contact pattern is also too small and is not at a tangent to the middle line of the flank.

Adjustment: Add a thicker shim to the pinion.

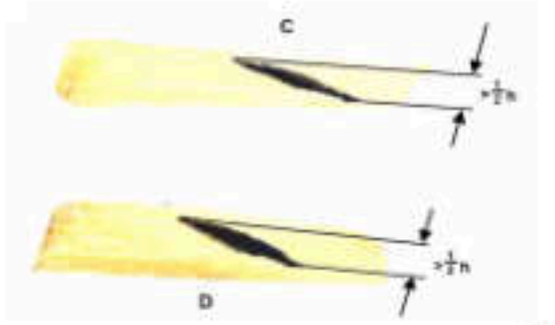


Fig 8. Contact Pattern Okay

The convex contact pattern must have an impression at the tooth middle line. A minimum of 50% of the tooth depth (flank) is covered.

Note: *An edge **X** on the root of the tooth is allowed, this is caused by the shot-peening process.*

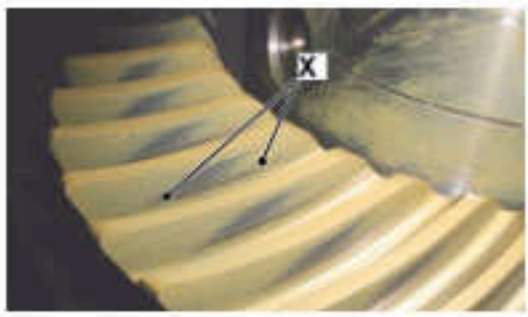


Fig 9.

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