



Allis Chalmers

Service Manual

715 Diesel

Tractor, Loader & Backhoe

Service Manual

JENSALES.COM

or Call 800-443-0625



THIS IS A MANUAL PRODUCED BY JENSALES INC. WITHOUT THE AUTHORIZATION OF
ALLIS CHALMERS OR IT'S SUCCESSORS. ALLIS CHALMERS AND IT'S SUCCESSORS
ARE NOT RESPONSIBLE FOR THE QUALITY OR ACCURACY OF THIS MANUAL.

TRADE MARKS AND TRADE NAMES CONTAINED AND USED HEREIN ARE THOSE OF OTHERS,
AND ARE USED HERE IN A DESCRIPTIVE SENSE TO REFER TO THE PRODUCTS OF OTHERS..

AC-S-715

Model 715
BACKHOE / LOADER

CLICK ANYWHERE FOR MORE DETAILS

Diesel Engine



A

Fuel Injection System



B

Forward - Reverse Transmission



C

Four Speed Transmission



D

Rear Axle and Brakes



E

Front Axle and Steering System



F

Loader - Backhoe Structure



G

Hydraulic System



H

Electrical System



I

JENSALES.COM

or Call 800-443-0625

CLICK ANYWHERE FOR MORE DETAILS

7. Remove the fuel lift pump from the right hand side of the block.
8. Carefully remove the camshaft and the thrust washer from the cylinder block, as shown in Figure 45, being careful not to damage the bearing journals, cam lobes or bearings.

Inspection

Carefully clean and inspect the camshaft as follows:

1. Inspect the camshaft bearing journals and cam lobes for wear or damage. If they are damaged or show apparent wear, the camshaft must be replaced.
2. Measure the diameter of the bearing journals with a micrometer. If journal diameters or the camshaft lobes are worn, the camshaft should be replaced.

New Camshaft Specifications are as follows:

Front Bearing Journal	
Diameter	1.9965" - 1.9975"
Center Bearing Journal	
Diameter	1.9865" - 1.9875"
Rear Bearing Journal	
Diameter	1.9665" - 1.9675"
Cam Lobe Lift (intake and exhaust)	
	0.3035"

3. Measure the camshaft bearing bores in the block with a hole gauge and micrometer, then compare each bore diameter to its mating journal diameter. Correct clearance between the camshaft bearing journals and the camshaft bores is 0.0025" - 0.0053".

NOTE: Later engine blocks have a replaceable bushing in the front camshaft hole. Inspect this bushing for wear and also inspect the oil passages in the bushing and engine block for alignment.

4. Visually inspect the camshaft thrust washer and measure its thickness. Replace the thrust washer if it is scored or worn. New thrust washer thickness is 0.216" - 0.218".
5. The tappets are mushroom shaped and can only be removed and reinstalled after the oil pan and camshaft have been removed.

Inspect Tappets using the following Specifications:

Tappet Stem Diameter	0.7475" - 0.7485"
Tappet Bore in Block	0.7500" - 0.75125"
Clearance Limits	0.0015" - 0.00375"

6. If any tappets have uneven wear on the cam follower face, it is an indication that the tappet has not been rotating in its bore. Replace tappets with badly worn faces. New tappets should be installed whenever the camshaft is replaced.

Do not attempt to reclaim tappets by regrinding the faces.



FIGURE 46 - Camshaft Thrust Plate Installation T-61492

1. Camshaft Thrust Washer
2. Camshaft
3. Thrust Washer Dowel Pin

Installation

To install the camshaft, proceed as follows:

1. Lubricate the journals and lobes with oil, and carefully slide the camshaft in place, being careful not to damage the camshaft or bearing.
2. Install the camshaft thrust washer, as shown in Figure 46, making sure it is correctly located on the dowel pin.
3. Check the thrust washer location in relation to the front face of the cylinder block. The thrust washer is non-directional and should extend 0.026" - 0.036" beyond the front face of the block.
4. Use a new gasket and install the fuel lift pump.
5. Turn the engine over to its normal position and install the timing gear housing, timing gears and timing gear cover.

NOTE: Make sure the engine idler gear is installed with all timing gear marks in alignment.

6. Install the push rods, rocker arm shaft assembly and adjust valve clearance to 0.012".
7. Install rocker arm cover and complete reassembly of engine.

Fuel Injection System

Contents

Section:	Page
1. DESCRIPTION AND OPERATION	B-2
2. FUEL TANK ASSEMBLY	B-2
Removal	B-2
Installation	B-2
3. PRIMARY FUEL LIFT PUMP	B-3
DESCRIPTION AND OPERATION	B-3
Sediment Chamber Cleaning Procedure	B-3
TESTING FUEL LIFT PUMP	B-3
Removal	B-3
Disassembly	B-3
Cleaning and Inspection	B-4
Assembly and Installation	B-4
4. INJECTION PUMP	B-5
Removal	B-5
Installation	B-5
TIMING INJECTION PUMP TO ENGINE	B-9
Description	B-9
Operation	B-9
Transfer Pump	B-11
End Plate	B-12
Mechanical Governor	B-12
Regulating Valve	B-13
Control of Injection Timing	B-14
DISASSEMBLY	B-14
Injection Pump	B-14
INSPECTION	B-17
General	B-17
Individual Items	B-17
ASSEMBLY	B-18
BENCH TESTING AND ADJUSTMENTS	B-23
Test Machine Specifications	B-23
General Test Instructions	B-24
CAV Pump Test Data	B-24
Priming Procedures	B-25
Vacuum Test	B-26
Transfer Pressure	B-26
Speed Advance	B-26
Maximum Fuel Setting	B-27
Shut-off Control	B-27
Governor Testing	B-27
Timing Injection Pump	B-27
Special Tools	B-28
TROUBLE SHOOTING WHEN TESTING	B-28
TORQUE VALUES FOR FUEL INJECTION PUMP	B-30
5. FUEL INJECTORS	B-31
TROUBLE SHOOTING	B-31
LOCATING FAULTY INJECTOR	B-31
Removal	B-31
Installation	B-32
Injector Service	B-32
INJECTOR DIFFICULTIES AND REMEDIES	B-33
Disassembly	B-34
Cleaning and Assembly	B-34

Forward - Reverse Transmission

INDEX

Contents

Section:	Page
1. DESCRIPTION & OPERATION.....	C-2
Power Flow.....	C-2
Hydraulic Circuits.....	C-4
2. TESTING PROCEDURES.....	C-6
Pressure Tests.....	C-6
Trouble Analysis.....	C-8
3. TRANSMISSION REMOVAL & INSTALLATION.....	C-10
Removal.....	C-10
Installation.....	C-11
4. OVERHAUL TORQUE CONVERTER ASSEMBLY.....	C-12
Disassembly & Inspection.....	C-12
Assembly.....	C-13
5. OVERHAUL PUMP ASSEMBLY.....	C-14
Disassembly & Inspection.....	C-14
Assembly.....	C-15
6. OVERHAUL BELL HOUSING ASSEMBLY.....	C-15
Disassembly & Inspection.....	C-15
Assembly.....	C-16
7. OVERHAUL CLUTCH ASSEMBLY.....	C-17
Disassembly & Inspection.....	C-17
Assembly.....	C-19
8. OVERHAUL CONTROL VALVE ASSEMBLY.....	C-21
Disassembly.....	C-21
Assembly.....	C-23
9. OVERHAUL GEAR TRAIN ASSEMBLY.....	C-25
Disassembly.....	C-25
Assembly.....	C-27

JENSALES.COM

or Call 800-443-0625

Four Speed Transmission

Contents

Section:	Page
1. TRANSMISSION REMOVAL & INSTALLATION.....	D-2
Removal	D-2
Installation	D-2
2. SHIFTER COVER OVERHAUL.....	D-3
Disassembly.....	D-3
Inspection.....	D-4
Assembly.....	D-4
3. MAINSHAFT OVERHAUL	D-5
Disassembly.....	D-5
Assembly.....	D-11
4. COUNTERSHAFT CLUSTER OVERHAUL.....	D-18
Disassembly.....	D-18
Assembly.....	D-19
5. DRIVE SHAFT OVERHAUL.....	D-20
Removal	D-20
Disassembly.....	D-20
Inspection & Repair	D-21
Assembly.....	D-21

purchase full manual at

JENSALES.COM
or Call 800-443-0625

Rear Axle and Brakes

Contents

Section:	Page
1. DESCRIPTION & OPERATION	E-2
2. ADJUSTMENTS	E-3
3. OVERHAUL REAR AXLE SHAFT ASSEMBLY	E-4
4. OVERHAUL PLANETARY GEAR ASSEMBLY AND AXLE HOUSING	E-8
5. OVERHAUL DISC BRAKE ASSEMBLY	E-9
6. OVERHAUL DIFFERENTIAL & DIFFERENTIAL LOCK ASSEMBLY	E-10
7. OVERHAUL DRIVE PINION ASSEMBLY	E-13
8. SPECIFICATIONS & SPECIAL TOOLS	E-15

MANUAL PREVIEW

JENSALES®

purchase full manual at

JENSALES.COM
or Call 800-443-0625

CLICK ANYWHERE FOR MORE DETAILS

Install the outer brake housing and inner brake housing making sure the mating surfaces are clean. Install and tighten the retaining nuts to the specified torque. Remove the differential bearing cup and shim from the inner brake housing; use a bearing cup pulling attachment and slide hammer.

Clean the axle housing mounting flange. Place the gauge block in the bearing cup bore with the small diameter end down. Place the pre-load gauge on the axle housing, over the gauge block. Measure the gap between the gauge block (Figure 9) and tool and select the correct shim as specified in Table "B". Remove the tool, retaining nuts and the inner brake housing. Place the selected shim in the inner brake housing and press the bearing cup into the inner brake housing against the shim.

T-61452

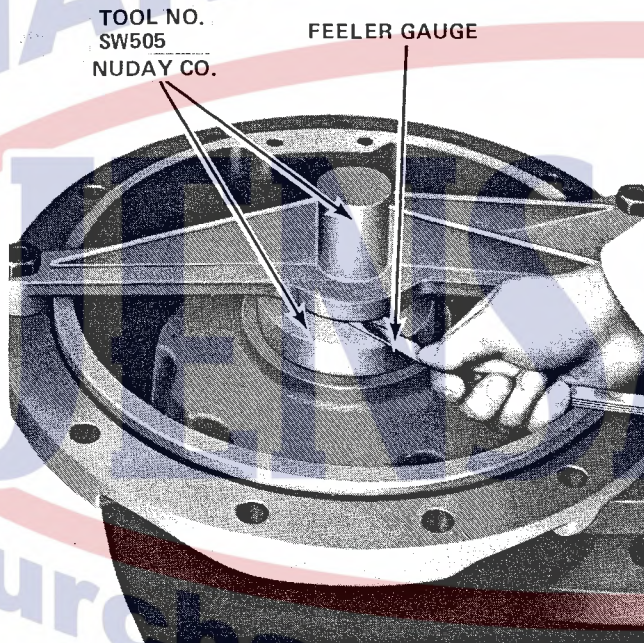


FIGURE 9 - Checking Differential Bearing Pre-Load

GAP READING	PART NUMBER OF SHIM TO BE FITTED	SHIM THICKNESS
0.037 - 0.042" (0.94 - 1.08 mm.)	1008564-5	0.038 - 0.040" (0.965 - 1.016 mm.)
0.043 - 0.048" (1.09 - 1.23 mm.)	1008565-2	0.044 - 0.046" (1.118 - 1.168 mm.)
0.049 - 0.054" (1.24 - 1.38 mm.)	1008566-0	0.050 - 0.052" (1.270 - 1.321 mm.)
0.055 - 0.060" (1.39 - 1.53 mm.)	1008567-8	0.056 - 0.058" (1.422 - 1.473 mm.)
0.061 - 0.066" (1.54 - 1.68 mm.)	1008568-6	0.062 - 0.064" (1.575 - 1.626 mm.)
0.067 - 0.072" (1.69 - 1.83 mm.)	1008569-4	0.068 - 0.070" (1.727 - 1.778 mm.)
0.073 - 0.078" (1.84 - 1.98 mm.)	1008570-2	0.074 - 0.076" (1.880 - 1.930 mm.)
0.079 - 0.084" (1.99 - 2.13 mm.)	1008571-0	0.080 - 0.082" (2.032 - 2.083 mm.)

7. Position the sun gear in the planet gear carrier.
8. Install the brake assembly in the following order, (Figure 3).

- a. Brake disc assembly;
- b. Intermediate disc with notch on the torque pin;
- c. Brake disc assembly.
- d. Brake actuating disc assembly with the control rod passing through the brake control rod seal assembly (Figure 10). Position the notch over the torque pin. If the brake control rod seal assembly has been removed, install a new seal by tapping it into the rear axle housing and locking the seal in the annular groove on the brake control rod. Secure a new control rod gastener.
- e. Brake disc assembly;
- f. Intermediate plate with notch on the torque pin;
- g. Brake disc assembly.

NOTE: Prior to installing the inner disc brake housing, make sure the intermediate discs and actuating disc assembly are properly centered. This will permit easier installation of the housing.

9. Install the inner disc brake housing and secure with eight nuts and tighten the nuts to the torque indicated in the Specifications Section. When reassembling the right hand axle housing it will be necessary at this stage to fit the differential lock fork and differential lock lever. Tighten the screw and lock nut.
10. Position the differential assembly in the rear axle center housing, install the axle housing and wheel assembly and secure to the rear axle center housing. See Specifications Section for bolt torque.

Connect brake linkages. Fill rear axle with lubricant, to the capacity shown in the Specifications Section.

T-61453

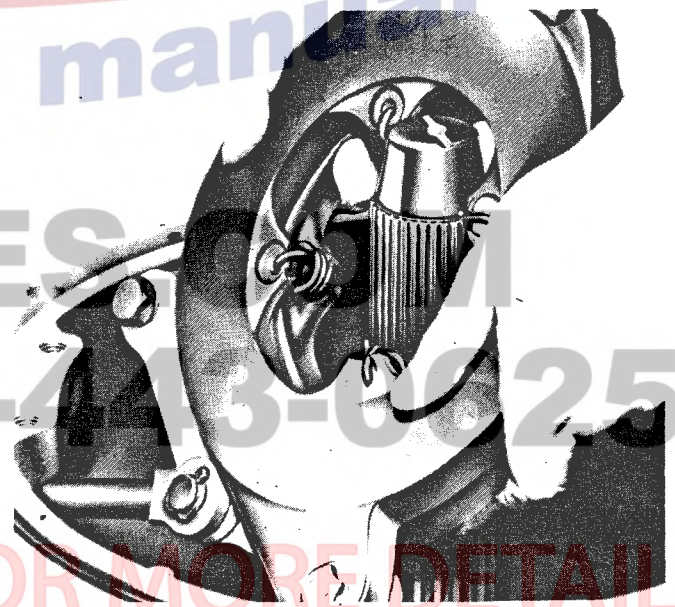


FIGURE 10 - Fitting Brake Actuating Discs

Front Axle and Steering System

Contents

Section:	Page
1. POWER STEERING PRESSURE TEST	F-2
2. POWER STEERING PUMP VOLUME TEST	F-2
3. HYDRAULIC PUMP & FLO-DIVIDER OVERHAUL	F-3
A. Removal	F-3
B. Disassembly	F-3
C. Inspection & Repair	F-3
D. Assembly	F-5
E. Installation	F-5
4. STEERING ORBITROL MOTOR OVERHAUL	F-6
A. Removal	F-6
B. Disassembly	F-6
C. Assembly	F-7
D. Installation	F-9
5. POWER STEERING CYLINDER OVERHAUL	F-9
A. Removal	F-9
B. Disassembly	F-9
C. Assembly	F-10
D. Installation	F-10
6. FRONT WHEEL SPINDLE OVERHAUL	F-11
A. Removal	F-12
B. Inspection & Repair	F-12
C. Installation	F-12
7. FRONT AXLE OVERHAUL	F-12
A. Removal	F-12
B. Inspection & Repair	F-12
C. Installation	F-12
8. TOE-IN ADJUSTMENT	F-13
9. TROUBLE SHOOTING	F-13

JENSALES.COM

or Call 800-443-0625

Loader - Backhoe Structure

Contents

Section:	Page
1. LOADER BOOM.....	G-2
Removal	G-2
Inspection	G-2
Installation	G-2
2. BACKHOE DIPPERSTICK AND BUCKET.....	G-4
Removal	G-4
Inspection	G-4
Installation	G-4
3. BACKHOE BOOM	G-6
Removal	G-6
Disassembly.....	G-6
Inspection.....	G-6
Assembly and Installation	G-6
4. BACKHOE SWING FRAME.....	G-8
Removal	G-8
Inspection	G-8
Installation	G-8
5. BACKHOE STABILIZERS.....	G-10
Removal	G-10
Inspection	G-10
Installation	G-10

JENSALES.COM

or Call 800-443-0625

Hydraulic System

Contents

Section:	Page	Section:	Page
1. System Description & Operation.....	H-2	9. Boom Cylinder Overhaul.....	H-42
A. General.....	H-2	A. Removal.....	H-42
B. System Oil Flow.....	H-2	B. Disassembly.....	H-42
2. Reservoir, Filter & Suction Strainer.....	H-4	C. Inspection & Repair.....	H-42
A. Description & Operation.....	H-4	D. Assembly.....	H-43
B. Removal.....	H-4	E. Installation.....	H-43
C. Installation.....	H-5	10. Dipperstick & Bucket Cylinder	
D. Filter.....	H-5	Overhaul.....	H-44
3. Hydraulic Implement Pump Overhaul.....	H-5	A. Removal.....	H-44
A. Description & Operation.....	H-5	B. Disassembly.....	H-44
B. Removal.....	H-6	C. Inspection & Repair.....	H-44
C. Disassembly.....	H-6	D. Assembly.....	H-46
D. Inspection & Repair.....	H-6	E. Installation.....	H-46
E. Assembly.....	H-8	11. Loader Lift & Tilt Cylinder	
F. Installation.....	H-8	Overhaul.....	H-47
4. Loader Control Valve Overhaul.....	H-9	A. Removal.....	H-47
A. Description & Operation.....	H-9	B. Disassembly.....	H-47
B. Removal.....	H-15	C. Inspection & Repair.....	H-47
C. Disassembly.....	H-16	D. Assembly.....	H-47
D. Inspection & Repair.....	H-17	E. Installation.....	H-48
E. Assembly.....	H-17	12. Hydraulic Cylinder Specification	
F. Installation.....	H-18	Chart.....	H-49
5. Backhoe Control Valve Overhaul.....	H-18	13. Hydraulic Test Procedures.....	H-50
A. Description & Operation.....	H-18	A. Hydraulic Specifications.....	H-51
B. Removal.....	H-26	• Loader System Relief Test.....	H-52
C. Disassembly.....	H-27	• Hydraulic Pump (large section)	
D. Inspection & Repair.....	H-28	Volume Test.....	H-52
E. Assembly.....	H-28	• Swing Valve System Relief Test.....	H-53
F. Installation.....	H-29	• Hydraulic Pump (small section)	
6. Swing Control Valve Overhaul.....	H-29	Volume Test.....	H-53
A. Description & Operation.....	H-29	• Backhoe Boom Circuit Relief Valve	
B. Removal.....	H-32	(1500 PSI) Test.....	H-54
C. Disassembly.....	H-33	• Dipperstick Circuit Relief Valve Test.....	H-54
D. Inspection & Operation.....	H-34	• Backhoe Bucket Circuit Relief	
E. Assembly.....	H-34	Valve Test.....	H-55
F. Installation.....	H-35	• Backhoe Boom Circuit Relief Valve	
7. Backhoe Swing Cylinder Overhaul.....	H-35	(3000 PSI) Test.....	H-55
A. Description & Operation.....	H-35	• Swing Valve Circuit Relief	
B. Removal.....	H-36	Valve Test.....	H-55
C. Disassembly.....	H-37	• Swing Cushion Valve & Relief	
D. Inspection & Repair.....	H-37	Valve Test.....	H-56
E. Assembly.....	H-39	• Hydraulic Cylinder Packing	
F. Installation.....	H-39	Leakage.....	H-56
8. Stabilizer Cylinder Overhaul.....	H-40	• Loader Lift Circuit Relief Valve.....	H-56
A. Removal.....	H-40	14. Trouble Shooting.....	H-57
B. Disassembly.....	H-40	A. Preliminary Checks.....	H-57
C. Inspection & Repair.....	H-40	B. Isolation Checks.....	H-57
D. Assembly.....	H-41	• Loader Trouble Shooting.....	H-58
E. Installation.....	H-41	• Backhoe Trouble Shooting.....	H-58

Electrical System

Contents

Section:	Page
1. Wiring Diagrams and Schematic.....	I-2
2. Functional Check - Instruments and Lights.....	I-3
3. Fuses.....	I-3
4. Key Switch.....	I-4
5. Neutral Start and Push Start Switches.....	I-4
6. Dash Gauge and Sender Circuits.....	I-4
7. Hourmeter Circuit.....	I-4
8. Batteries.....	I-5
9. Alternator-Regulator Charging Circuit.....	I-12
10. Starter.....	I-19

MANUAL PREVIEW

JENSALES®

purchase full manual at



JENSALES.COM
or Call 800-443-0625

CLICK ANYWHERE FOR MORE DETAILS