



2950 Tractor



TECHNICAL MANUAL 2950 Tractor

TM4407 (01AUG86) English

John Deere Werke Mannheim
TM4407 (01AUG86)

LITHO IN U.S.A.
ENGLISH



2950 TRACTOR TECHNICAL MANUAL TM-4407 (Apr-86)

CONTENTS

The engine information has been removed from this manual. For engine information, refer to engine component technical manual, CTM-4, 3179, 4239, and 6359 Engines.

SECTION 10 - GENERAL

- Group 00 - Specifications and Special Tools
- Group 05 - Predelivery, Delivery, and After-Sales Inspections
- Group 10 - Lubrication and Service
- Group 15 - Tune-Up
- Group 20 - Tractor Separation

SECTION 20 - ENGINE

- Group 00 - Specifications
- Group 05 - Radiator

SECTION 30 - FUEL AND AIR INTAKE SYSTEM

- Group 00 - Specifications and Special Tools
- Group 05 - General Information, and Diagnosing Malfunctions
- Group 10 - Fuel Tank and Water Trap
- Group 15 - Cold Weather Starting Aids
- Group 20 - Speed Control Linkage
- Group 25 - Air Cleaner

SECTION 40 - ELECTRICAL SYSTEM

- Group 00 - Specifications and Special Tools
- Group 05 - Description, Diagnosing Malfunctions and Tests
- Group 06 - Connector Repair
- Group 10 - Wiring Harnesses
- Group 15 - Controls and Instruments
- Group 20 - Lighting System
- Group 25 - Wiring Diagrams
- Group 30 - Starting Motor
- Group 35 - Alternator

SECTION 50 - POWER TRAIN

- Group 00 - Specifications and Special Tools
- Group 05 - Description, Operation and Lubrication System
- Group 10 - Clutch Operating Linkages
- Group 15 - Engine Clutch
- Group 20 - Hi-Lo Shift Unit
- Group 25 - Creeper Transmission
- Group 30 - Transmission Shift Linkages
- Group 35 - Synchronized Transmission and Transmission Oil Pump
- Group 40 - Differential
- Group 45 - Final Drives
- Group 50 - Independent PTO
- Group 55 - Mechanical Front Wheel Drive

SECTION 60 - STEERING SYSTEM AND BRAKES

- Group 00 - Specifications and Special Tools
- Group 05 - Steering System
- Group 10 - Brakes

All information, illustrations and specifications contained in this technical manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

COPYRIGHT® 1986
DEERE & COMPANY
Moline, Illinois
All rights reserved
Previous Edition
Copyright® 1982, 1984
Deere & Company

**Thanks very much for your reading,
Want to get more information,
Please click here, Then get the complete
manual**

JustClickHere 

NOTE:

**If there is no response to click on the link above,
please download the PDF document first, and then
click on it.**

**Have any questions please write to me:
admin@servicemanualperfect.com**

CONTENTS—Continued**SECTION 70 - HYDRAULIC SYSTEM**

- Group 00 - Specifications and Special Tools
- Group 05 - Description, Diagnosing Malfunctions and Tests
- Group 10 - Oil Reservoir, Filter, Valves and Oil Cooler
- Group 15 - Hydraulic Pump
- Group 20 - Rockshaft
- Group 25 - Selective Control Valve (Poppet Valve Type) and Breakaway Coupler
- Group 26 - Selective Control Valve (Spool Type) and Quick Coupler
- Group 30 - Remote Cylinder

SECTION 80 - ENGINE

- Group 00 - Specifications
- Group 05 - Front Axle
- Group 10 - Front and Rear Wheels

SECTION 90 - OPERATOR'S STATION

- Group 00 - Specifications and Special Tools
- Group 05 - Air Conditioning System
- Group 10 - Cab Ventilation and Heating
- Group 15 - Seats
- Group 20 - SOUND-GARD Body
- Group 25 - ROLL-GARD Protective Structure

Section 10 GENERAL

CONTENTS OF THIS SECTION

	Page		Page
GROUP 00 - SPECIFICATIONS AND SPECIAL TOOLS		GROUP 05 - PREDELIVERY, DELIVERY AND AFTER-SALES INSPECTIONS	
Specifications	10-00-3	Tractor Storage	10-05-1
Serial Numbers	10-00-3	Predelivery Inspection	10-05-2
Model Numbers	10-00-3	Delivery Inspection	10-05-9
Engine	10-00-3	After-Sales Inspection	10-05-10
Engine Clutch	10-00-4		
Cooling System	10-00-4	GROUP 10 - LUBRICATION AND SERVICE	
Fuel System	10-00-4	Lubrication and Service	10-10-1
Electrical System	10-00-4		
Synchronized Transmission	10-00-4	GROUP 15 - TUNE-UP	
Hi-Lo Shift Unit	10-00-4	Preliminary Engine Testing	10-15-1
Creep Transmission	10-00-5	Dynamometer Test	10-15-1
Differential and Final Drives	10-00-5	Testing Compression Pressure	10-15-2
Differential Lock	10-00-5	Engine Tune-Up	10-15-2
PTO	10-00-5	Checking Tractor Operation	10-15-7
Mechanical Front Wheel Drive	10-00-5	Standard Torques	10-15-8
Hydrostatic Steering	10-00-6		
Foot Brakes	10-00-6	GROUP 20 - TRACTOR SEPARATION	
Handbrake	10-00-6	Separating between Engine and	
Hydraulic System	10-00-6	Tractor Front End	10-20-1
Capacities	10-00-6	Removal and Installation of Engine	10-20-5
Travel Speeds	10-00-6	Removal and Installation of	
Front and Rear Wheels	10-00-6	Clutch Housing	10-20-8
Dimensions and Weights	10-00-6	Removal and Installation of	
Predelivery, Delivery and		Final Drives	10-20-10
After-Sales Inspections	10-00-7	Removal and Installation of	
Lubrications and Service	10-00-8	Rockshaft	10-20-15
Tune-up	10-00-9	Removal and Installation of	
Tractor Separation	10-00-10	SOUND-GARD® Body	10-20-17
Standard Torques	10-00-11		
Special Tools	10-00-13		

Group 00

SPECIFICATIONS AND SPECIAL TOOLS**SPECIFICATIONS****Serial Numbers**

The engine serial number is stamped into the plate located on the lower front right-hand side of the cylinder block.

NOTE: When ordering engine parts, quote all digits of serial number stamped on the plate

The plate showing the tractor serial number is located on the right-hand side of the front axle carrier.

NOTE: When ordering tractor service parts (excluding engine parts), quote all digits and letters of serial number stamped on the plate.

A plate showing the tractor type, transmission serial number, cone point measurement etched into pinion face of differential drive shaft (as well as reduction of differential) is located on the right-hand side of the transmission case.

Model Numbers

The fuel injection pump, fuel injection nozzles, alternator, starting motor, hydrostatic steering valve and hydraulic pump have model numbers to facilitate identification of different makes of a given unit.

Engine

Number of cylinders	6
Cylinder liner bore	106.5 mm (4.19 in.)
Stroke	110 mm (4.33 in.)
Displacement	5883 cm ³ (359 cu. in.)
Compression ratio	
up to engine serial no. 547636CD	16.8:1
from engine serial no. 547637CD	17.4:1
Maximum torque at 1400 rpm	330 N·m (243 lb-ft)
Firing order	1-5-3-6-2-4
Valve clearance (engine hot or cold)	
Intake valve	0.35 mm (0.014 in.)
Exhaust Valve	0.45 mm (0.018 in.)
Fast idle speed	2610 to 2660 rpm
Slow idle speed	700 to 800 rpm
Rated engine speed	2500 rpm
Working speed range	1400 to 2500 rpm

PTO* horsepower at engine rated speed—2500 rpm 63 kW (85 hp)

Lubrication system Full internal force feed system with full flow filter

Engine Clutch Single dry disk clutch with torsion damper, foot-operated

Cooling System

Type Pressurized system with centrifugal pump

Temperature regulation Two thermostats

Fuel System

Type Direct injection

Fuel injection pump timing to engine TDC

Fuel injection pump type (Roto Diesel R 3462 F 690) (ISO) Distributor type

Air cleaner Dry-type air cleaner with secondary
(safety) element

Electrical System

Batteries 2 x 12 volts, 88 Ah

Alternator with internal regulator 14 volts, 33 or 55 amps.

Starting motor 12 volts (3 kW) (4 hp)

Battery terminal grounded Negative

Synchronized Transmission

Type Synchronized transmission

Gear selections 8 forward and 4 reverse

Gear shifting Two forward groups and one reverse group
Synchronized forward and reverse shifting
within groups

Hi-Lo Shift Unit

Type Hydraulic gear reduction unit which can be
shifted under load with "wet" multiple
disk clutch and brake packs

Travel speed decreases in each gear by Approx. 20 percent

Shifting to reduced (Low) speed Preloaded cup springs

Shifting to normal (High) speed Hydraulic

* With the engine run in (above 100 hours of operation) and having reached operating temperature (engine and transmission);
measured by means of a dynamometer. Permissible variation \pm 5 percent.

Creeper Transmission

Type Synchronized reduction unit

Travel speed decreases in low (I) and reverse ranges by Approx. 79%

Shifting both ranges Mechanical and not under load

Differential and Final Drives

Type of differential Spiral bevel gears

Type of final drive Planetary reduction drive

Differential Lock

Operation Hand or foot operated

Disengage Will disengage automatically as soon as traction has equalized

PTO

Type Independent of transmission, can be engaged and disengaged under load

PTO speeds (with engine speed of 2400 rpm) 540/1000 rpm

PTO clutch Hydraulically operated "wet" disk clutch

PTO brake Hydraulically operated "wet" disk brake

ENGINE/PTO SPEED RELATIONSHIPS

Engine speed	540 rpm shaft	1000 rpm shaft
800	180	335
2400	540	1000
2500	565	1040
2660	600	1110

Mechanical Front Wheel Drive

Type Engaged hydraulically, under full load with "wet" disk clutch

• Control Electrical/hydraulic solenoid switch

Engagement Preloaded cup springs

Disengagement Hydraulic

Hydrostatic Steering Without mechanical linkage between steering valve and the front wheels

Foot Brakes Self-adjusting, hydraulically operated “wet” disk brakes

Handbrake Mechanically operated band-type locking brake acting on the differential

Hydraulic System

Type Closed center, constant pressure system

Standby pressure 15800 to 16200 kPa (158 to 162 bar) (2300 to 2350 psi)

Operating pressure 14000 kPa (140 bar) (2050 psi)

Hydraulic pump 8-piston pump with variable displacement

Capacities

Fuel tank 122 liters (32.0 U.S. gals.)

Cooling system

Without SOUND-GARD Body 17.0 L (4.5 U.S. gals.)

With SOUND-GARD Body 19.0 L (5.0 U.S. gals.)

Engine crankcase

Without filter change 11.0 L (2.9 U.S. gals.)

With filter change 11.5 L (3.0 U.S. gals.)

Hydraulic clutch reservoir 500 cm³ 17.5 fl. oz.

Transmission - Hydraulic system

Initial filling 68.0 L (18.0 U.S. gals.)

Oil change 60.0 L (15.9 U.S. gals.)

Mechanical front wheel drive

Front axle housing 7.0 L (7.85 U.S. gals.)

Wheel hub housing, each 0.75 L (0.2 U.S. gals.)

Travel Speeds See Operator's Manual

Front and Rear Wheels

Tires, tread widths, tire pressure and ballast weights See Operator's Manual

Dimensions and Weights See Operator's Manual

PREDELIVERY, DELIVERY AND AFTER-SALES INSPECTIONS

Engine Speeds

Slow idle	700 to 800 rpm
Fast idle	2610 to 2660 rpm
Rated speed	2500 rpm

Fan Belt

The fan belt should have 19 mm (3/4 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

Batteries

Specific gravity at an electrolyte temperature of 20°C (68°F)

Normal and arctic conditions	1.28
Tropical conditions	1.23

Clutch Operating Linkage

Tractors Without SOUND-GARD Body

Clutch pedal free travel	approx. 25 mm (1 in.)
--------------------------------	-----------------------

Tractors With SOUND-GARD Body

Travel of slave cylinder operating rod	8.5 to 12.0 mm	(5/16 to 15/32 in.)
--	----------------	---------------------

Front Wheel Toe-In

Tractors without MFWD	3 to 6 mm	(0.12 to 0.25 in.)
Tractors with MFWD	0 to 3 mm	(0 to 0.12 in.)

Torques for Hardware

Start safety switch in rockshaft housing, max.	50 N·m	(35 ft-lbs)
Front wheel rim to hub		
Tractors without MFWD	180 N·m	(130 ft-lbs)
Tractors with MFWD	300 N·m	(220 ft-lbs)
Axle knees to axle center, cap screws	400 N·m	(300 ft-lbs)
Tie rod clamps		
Cap screw (M10)	55 N·m	(40 ft-lbs)
Cap screw (M12)	90 N·m	(65 ft-lbs)
Tie rod tube, cap screw	55 N·m	(40 ft-lbs)
Rear wheels		
Rear wheels to axle	400 N·m	(300 ft-lbs)
Wheel disk to hub (rack-and-pinion axle)	400 N·m	(300 ft-lbs)
2-post ROLL-GARD protective structure		
Supports to crossbar, cap screws	200 N·m	(145 ft-lbs)
Supports to final drives, cap screws and nuts	400 N·m	(300 ft-lbs)

LUBRICATION AND SERVICE

Capacities

Engine crankcase

Without filter change	11.0 L	(2.9 U.S. gal.)
With filter change	11.5 L	(3.0 U.S. gal.)

Cooling system

Without SOUND-GARD Body	17.0 L	(4.5 U.S. gals.)
With SOUND-GARD Body	19.0 L	(5.0 U.S. gals.)

Transmission - Hydraulic system

Initial filling	68.0 L	(18.0 U.S. gal.)
Oil change	60.0 L	(15.9 U.S. gal.)

Mechanical front wheel drive

Front axle housing	7.0 L	(1.85 U.S. gal.)
Wheel hub housing, each	0.75 L	(0.2 U.S. gal.)

Service Intervals

Checking crankcase oil level	every 10 hours
Changing engine oil	every 100 hours
Changing engine oil filter	every 200 hours
Checking transmission/hydraulic system oil level	every 50 hours
Changing transmission/hydraulic system oil filter	every 500 hours
Changing transmission/hydraulic oil	every 1000 hours
Changing hydrostatic steering filter	every 1000 hours
Cleaning hydraulic pump strainer	every 1000 hours
Checking MFWD oil level	every 100 hours
MFWD oil change	every 1000 hours
Cleaning and packing front wheel bearings	every 1000 hours
Lubricating grease fittings	
Clutch throw-out bearing grease fitting (when equipped)	every 100 hours
Mechanical front wheel drive universal-jointed shaft	every 50 hours
In wet and muddy conditions	every 10 hours
Front axle and front axle bearings	every 50 hours
Rear axle bearings	every 500 hours
In wet and muddy conditions	every 10 hours
Three-point hitch	every 200 hours

TUNE-UP

PTO horsepower* at 2500 rpm rated engine speed	63 kW	85 hp
Slow idle	700 to 800 rpm	
Fast idle	2610 to 2660 rpm	
Rated engine speed	2500 rpm	
Air intake system vacuum	3.5 to 6.0 kPa	35 to 60 mbar (14 to 25 in. water head)
Air cleaner restriction warning switch closes at a vacuum of	5.5 to 6.5 kPa	55 to 65 mbar (22 to 26 in. water head)
Radiator cap high pressure valve opens at	40 to 50 kPa	0.4 to 0.5 bar (6 to 7 psi)
Radiator cap low pressure valve opens at	0 to 4 kPa	0 to 0.04 bar (0 to 0.6 psi)

Fan Belt

Fan belt should have 19 mm (3/4 in.) flex with 90 N (20 lb) pull midway between crankshaft and alternator or water pump (use a spring scale).

Compressor Belt





Compressor belt should have 19 mm (3/4 in.) flex with 60 N (13 lb) pull midway between pulleys.

** With the engine run in (more than 100 hours of operation) and having reached operating temperature (engine and transmission); measured by means of a dynamometer. Permissible variation $\pm 5\%$.*

TRACTOR SEPARATION**Torques for Hardware**

Front axle carrier to engine block, cap screws	230 N·m	(170 ft-lbs)
Front axle carrier to oil pan, cap screws	400 N·m	(300 ft-lbs)
Engine block to front axle carrier, cap screws	230 N·m	(170 ft-lbs)
Hydraulic pump drive shaft, cap screws	50 N·m	(35 ft-lbs)
Jointed shaft flange to front axle drive hub (tractors with MFWD), cap screws	75 N·m	(55 ft-lbs)
Clutch housing to engine block		
Cap screws	230 N·m	(170 ft-lbs)
Hex. nuts	230 N·m	(170 ft-lbs)
Oil pan to clutch housing, cap screws	230 N·m	(170 ft-lbs)
Clutch housing to transmission case, cap screws	160 N·m	(120 ft-lbs)
Oil drain plug of transmission case	135 N·m	(100 ft-lbs)
Hydraulic lines retainer to clutch housing, cap screw	45 N·m	(32 ft-lbs)
Final drive housings to transmission case, cap screws	230 N·m	(170 ft-lbs)
Rockshaft housing to transmission case, cap screws	120 N·m	(85 ft-lbs)
Rear wheels to rear axle	400 N·m	(300 ft-lbs)
Wheel disk to hub (rack and pinion axle)	400 N·m	(300 ft-lbs)
Rear fenders to final drive housings, hex. nuts	200 N·m	(145 ft-lbs)
2-post ROLL-GARD protective structure to final drive housings	400 N·m	(300 ft-lbs)
Both supports to crossbar	200 N·m	(145 ft-lbs)
Basic weight to front axle carrier, cap screws	400 N·m	(300 ft-lbs)
Drawbar to transmission case		
Front cap screws	230 N·m	(170 ft-lbs)
Rear cap screws	120 N·m	(85 ft-lbs)
SOUND - GARD Body to rubber bearing block, cap screws and hex. nuts	200 N·m	(145 ft-lbs)

STANDARD TORQUES

RECOMMENDED TORQUES IN N:m, AND FT-LBS FOR UNC AND UNF CAP SCREWS				
Head Marking (Identifying strength)	  or 10.9*		  or 12.9**	
Thread-O.D. (In.)	N:m	ft-lbs	N:m	ft-lbs
1/4	15	10	20	15
5/16	30	20	40	30
3/8	50	35	70	50
7/16	80	55	110	80
1/2	120	85	170	120
9/16	180	130	240	175
5/8	230	170	320	240
3/4	400	300	580	425
7/8	600	445	930	685
1	910	670	1400	1030
1-1/8	1240	910	1980	1460
1-1/4	1700	1250	2800	2060

RW7097

NOTE: A variation of $\pm 10\%$ is permissible for all torques indicated in this chart.

Torque figures indicated above and in the Specification sections of this manual are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

* Tempered steel high-strength bolts and cap screws

** Tempered steel extra high-strength bolts and cap screws

RECOMMENDED TORQUES IN N:m, AND FT-LBS FOR METRIC CAP SCREWS						
Head Marking (identifying strength)	8.8*		10.9**		12.9***	
Thread-O.D. (mm)	N:m	ft-lbs	N:m	ft-lbs	N:m	ft-lbs
M5	7	5	9	6.5	10	8.5
M6	10	8.5	15	10	20	15
M8	30	20	40	30	40	30
M10	50	35	80	60	90	70
M12	100	75	140	100	160	120
M14	160	120	210	155	260	190
M16	240	175	350	260	400	300
M20	480	355	650	480	780	575
M24	820	605	1150	850	1350	995
M30	1640	1210	2250	1660	2700	1990
M36	2850	2110	4000	2950	4700	3465

RW7095

NOTE: A variation of $\pm 10\%$ is permissible for all torques indicated in this chart.

Torque figures indicated above and in the Specification sections of this manual are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual.

* Regular bolts and cap screws

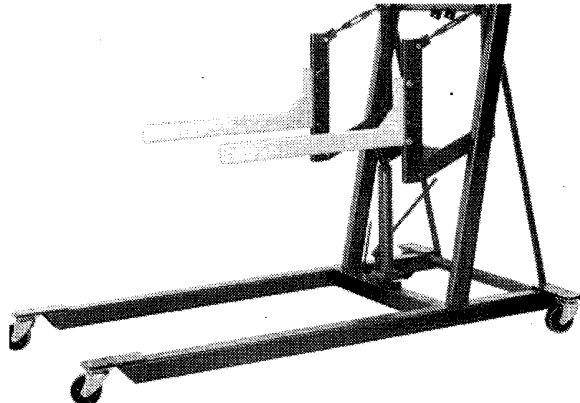
** Tempered steel high-strength bolts and cap screws

*** Tempered steel extra high-strength bolts and cap screws

RECOMMENDED TORQUES IN N:m, AND FT-LBS FOR PIPE AND HOSE CONNECTIONS				
Thread size	with O-rings		with Cone	
	N:m	ft-lbs	N:m	ft-lbs
3/8-24 UNF	7.5	5.5	8	6
7/16-20 UNF	10	7	12	9
1/2-20 UNF	12	9	15	11
9/16-18 UNF	15	11	25	18
3/4-16 UNF	25	20	45	35
7/8-14 UNF	40	30	60	45
1-1/16-12 UNC	60	45	100	75
1-3/16-12 UNC	70	50	120	90
1-5/16-12 UNC	80	60	140	105
1-5/8-12 UNC	110	80	190	140
1-7/8-12 UNC	150	110	220	160

RW7095

SPECIAL TOOLS**Tractor Separation**

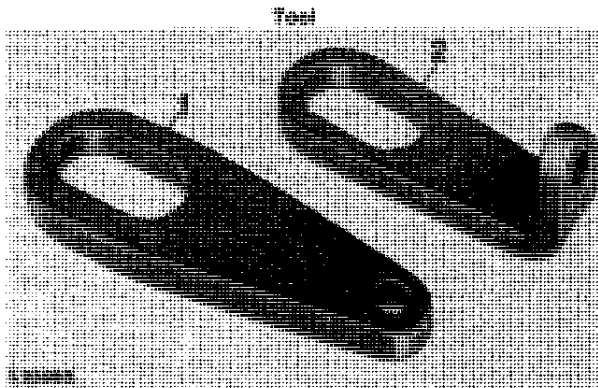
Tool	Number	Use
	Brown Body Lift	To remove SOUND-GARD Body
L 32430		

L32430

Fig. 1—Brown Body Lift

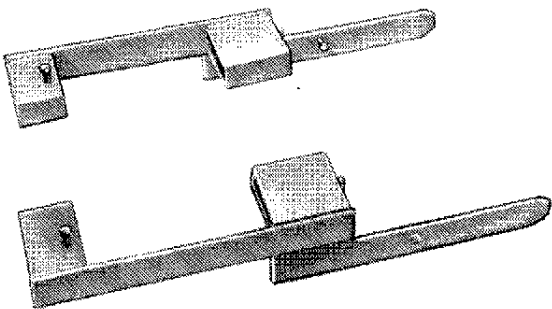
Tractor Separation — Continued

Number	Use
1. JD244-1 (Straight)	Tractor separations
2. JD244-2 (Bent)	



L23995

Fig. 2—Lifting Eyes



JDG-21 Fork Lift Adapters	To remove SOUND- GARD Body
------------------------------	-------------------------------

R28518

Fig. 3—Fork Lift Adapters