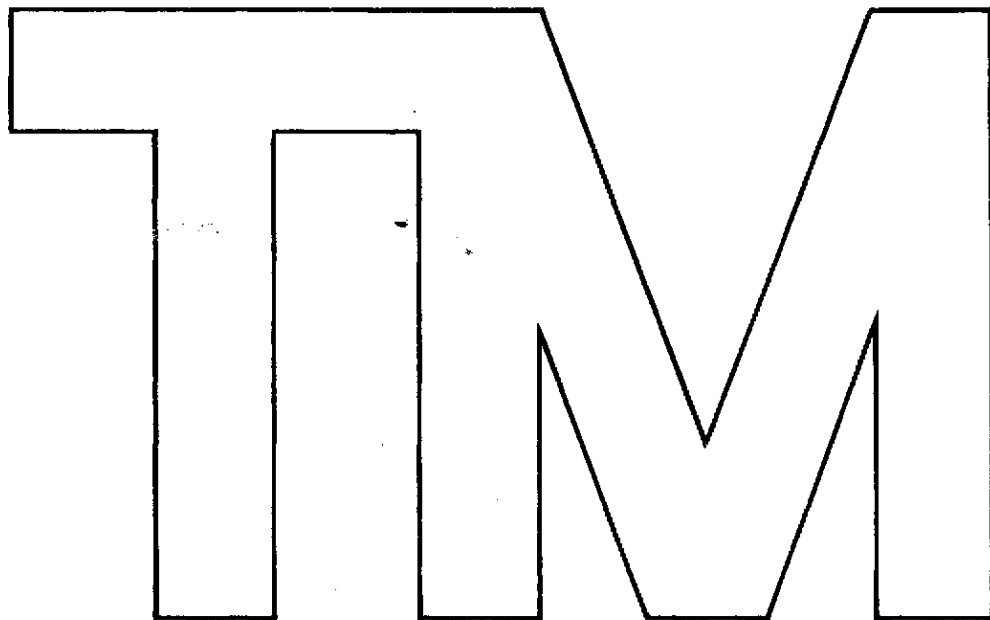




Technical Manual

**John Deere
925, 935, 945,
955, 965 and 975
Combines**

TM-4307



CONTENTS

SECTION 10 — GENERAL

- Group 5 — Specifications
- Group 10 — Pre-delivery, delivery and after-sales inspections
- Group 15 — Lubrication and periodic service
- Group 20 — Engine and combine tune-up
- Group 25 — Combine separation

SECTION 20 — ENGINE

- Group 5 — General information and diagnosing malfunctions
- Group 10 — Cylinder head, camshaft and balancer shafts
- Group 15 — Cylinder block, liners, pistons and connecting rods
- Group 20 — Crankshaft, main bearings and flywheel
- Group 25 — Timing gear train
- Group 30 — Engine lubricating system
- Group 35 — Engine cooling system
- Group 40 — Air intake system
- Group 45 — Speed control linkage

SECTION 30 — FUEL SYSTEM

- Group 5 — Diagnosing malfunctions
- Group 10 — Fuel tank, water trap, transfer pump and fuel filter
- Group 15 — Roto Diesel fuel injection pump
- Group 20 — Roosa Master fuel injection pump, "DM 4" type
- Group 25 — Roosa Master fuel injection nozzles
- Group 30 — Cold weather starting aids

SECTION 40 — ELECTRICAL SYSTEM

- Group 5 — Diagnosing malfunctions
- Group 10 — Components and wiring diagram
- Group 15 — Starting motor
- Group 20 — Alternator

SECTION 50 — POWER TRAIN

- Group 5 — Engine clutch and clutch linkage - combines 925, 935, 945
- Group 10 — Engine clutch and clutch linkage - combine 955
- Group 15 — Engine clutch - combines 965 and 975
- Group 18 — Reverser clutch, control and linkage - combines 965 and 975
- Group 20 — Front axle - combines 925, 935, 945
- Group 25 — Front axle - combines 955, 965 and 975
- Group 30 — Track system - combines 965 and 975
- Group 35 — Separator drive
- Group 40 — Variable drives
- Group 45 — POSI TORQ ground drive - combine 975

SECTION 60 — BRAKES AND REAR AXLE

- Group 5 — Parking brake combines 925, 935, 945
- Group 10 — Parking brake - combines 955, 965, 975
- Group 15 — Footbrakes
- Group 20 — Rear axle
- Group 25 — V-support for wide rear axle - combine 975

SECTION 70 — HYDRAULIC SYSTEM

- Group 5 — General information, and diagnosing malfunctions
- Group 10 — Pressure tests
- Group 15 — Hydraulic oil reservoir, filter, suction and pressure lines
- Group 20 — Hydraulic pump and flow driver
- Group 25 — Tandem (dual-gear) hydraulic pump - combines 965 and 975
- Group 30 — Single and three-spool control valves - combines 925 to 955
- Group 35 — Seven - spool control valves - combines 965 and 975
- Group 40 — Hydraulic cylinders
- Group 45 — Nitrogen accumulators
- Group 50 — Hydrostatic steering
- Group 55 — Hydraulic brakes
- Group 60 — Hydraulic clutch control-combines 965 and 975

CONTENTS (Contd.)

SECTION 100 — CUTTING PLATFORM AND CORN HEAD

- Group 5 — General information and diagnosing malfunctions
- Group 10 — Cutting platform and knife drive
- Group 15 — Corn head
- Group 20 — Corn head gear case

SECTION 110 — FEEDER HOUSE

- Group 5 — General information and diagnosing malfunctions
- Group 10 — Feeder house

SECTION 120 — SEPARATOR AND CLEANING UNIT

- Group 5 — General information and diagnosing malfunctions
- Group 10 — Threshing Cylinder
- Group 15 — Concave
- Group 20 — Beater
- Group 25 — Cross shaker
- Group 30 — Straw walkers, cleaning shoe with sieves and fan

SECTION 130 — ELEVATORS, GRAIN TANK AND GRAIN TANK UNLOADING AUGERS

- Group 5 — General information and diagnosing malfunctions
- Group 10 — Clean grain auger and elevator
- Group 15 — Lower tailings auger, elevator and upper auger
- Group 20 — Grain tank leveling auger and unloading augers
- Group 25 — Outer unloading auger and housing

<https://www.ebooklibonline.com>

Hello dear friend!

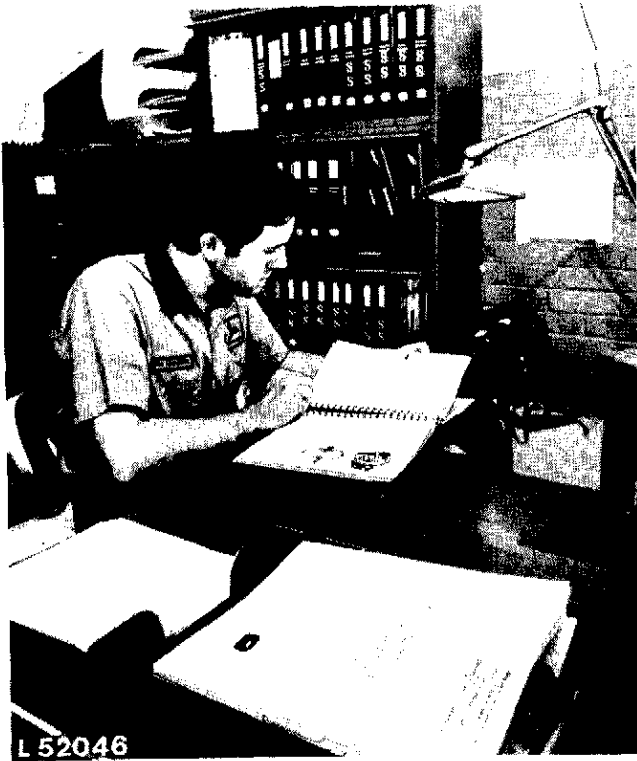
Thank you very much for reading.

Enter the link into your browser.

The full manual is available for immediate download.

<https://www.ebooklibonline.com>

Introduction



Use FOS Manuals for Reference

This technical manual is part of a twin concept of service:

- FOS Manuals — for reference
- Technical Manuals — for actual service

The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

Fundamentals of Service (FOS) Manuals cover basic theory of operation, fundamentals of trouble shooting, general maintenance, and basic types of failures and their causes. FOS Manuals are for training new personnel and for reference by experienced technicians.

Technical Manuals are concise service guides for a specific machine. Technical Manuals are on-the-job guides containing only the vital information needed by an experienced technician.

IMPORTANT: Your technical manual contains the new SI metric measurements which have been standardized internationally.

Example:

New	Old
10 N (Newton)	1 kp
10 Nm (Newton-Meter)	1 mkp
1 bar	1 kp/cm ²
1 kW	= 1.36 PS (1.34 HP)



Use Technical Manuals for Actual Service



When a technician should refer to a FOS Manual for more information, a FOS symbol like the one at the left is used in the TM to identify the reference.

Some features of this technical manual:

- Table of contents on page 3 of Manual
- Contents at front of each Section
- Exploded views showing parts relationship
- Photos showing service techniques
- Specifications at end of each Group
- Special tools at end of each Group

This technical manual was planned and written for you — an experienced technician. Keep it in a permanent binder in the shop where it is handy. Refer to it whenever in doubt about correct service procedures or specifications.

Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.



This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

Section 10

General 10

CONTENTS OF THIS SECTION

	Page		Page
GROUP 5 — GENERAL		Removal and Installation of Front Axle —	
Serial numbers	5-3	Combines 925, 935 and 945	
Model numbers	5-5	Removal	25-10
Specifications	5-5	Installation	25-12
GROUP 10 — PREDELIVERY INSPECTION, DELIVERY SERVICE AND AFTER-SALES INSPECTION		Removal and Installation of Front Axle —	
Predelivery inspection	10-1	Combines 955, 965 and 975	
Delivery service	10-6	Removal	25-13
After-sales inspection	10-7	Installation	25-14
GROUP 15 — LUBRICATION AND PERIODIC SERVICE		Removal and Installation of Transmission —	
General information	15-1	Combines 925, 935 and 945	
GROUP 20 — ENGINE AND COMBINE TUNE-UP AND ADJUSTMENTS		Removal	25-14
General information	20-1	Installation	25-15
Preliminary engine testing	20-1	Removal and Installation of Transmission —	
Engine tune-up	20-3	Combines 955, 965 and 975	
Checking engine performance	20-4	Removal	25-15
Combine adjustments	20-4	Installation	25-16
Standard torques	20-6	Removal and Installation of Final Drives —	
Special tools	20-7	Combines 955, 965 and 975	
GROUP 25 — SEPARATION		Removal	25-17
Removal and Installation of Engine —		Installation	25-17
Combines 925 and 935		Removal and Installation of Rear Axle —	
General information	25-1	Combines 925, 935, 945 and 955	
Removal	25-1	Removal	25-17
Installation	25-3	Installation	25-18
Removal and Installation of Engine —		Removal and Installation of Rear Axle —	
Combines 945 and 955		Combines 965 and 975	
General information	25-3	Removal	25-18
Removal	25-3	Installation	25-19
Installation	25-5	Removal and Installation of Hydraulic	
Removal and Installation of Engine —		Steering Unit	
Combines 965 and 975		Removal	25-19
General information	25-6	Installation	25-20
Removal	25-6		
Installation	25-10		

	Page
Removal and Installation of Three Spool Control Valve — Combines 925, 935, 945 and 955	
Removal	25-21
Installation	25-21
Removal and Installation of Single Spool Control Valve — Combine 955	
Removal	25-22
Installation	25-23
Removal and Installation of Seven Spool Control Valve — Combines 965 and 975	
Removal	25-23
Installation	25-24
Removal and Installation of Bowden Cables for Seven Spool Control Valve — Combines 965 and 975	
Removal	25-24
Installation	25-26
Removal and Installation of Hydraulic Pump — Combine 925	
Removal	25-25
Installation	25-26
Removal and Installation of Hydraulic Pump — Combines 935, 945 and 955	
Removal	25-26
Installation	25-27
Removal and Installation of Hydraulic Pump — Combines 965 and 975	
Removal	25-28
Installation	25-28
Removal and Installation of Brake Master Cylinder	
Removal	25-29
Installation	25-30

	Page
Removal and Installation of Clutch Master Cylinder — Combines 965 and 975	
Removal	25-30
Installation	25-30
Removal and Installation of Steering Cylinder	
Removal	25-31
Installation	25-31
Removal and Installation of Engine Clutch — Combines 925, 935 and 945	
Removal	25-31
Installation	25-32
Removal and Installation of Engine Clutch — Combines 955 and 965	
Removal	25-32
Installation	25-34
Removal and Installation of Posi Torq Ground Drive — Combine 975	
Removal of upper unit	25-34
Removal of lower unit	25-35
Installation of upper and lower unit	25-36
Removal and Installation of Reverser Clutch — Combines 965 and 975	
Removal and installation	25-37
Removal and Installation of Hydraulic Swing Unloading Auger — Combines 965 and 975	
Removal	25-37
Installation	25-38
Torques for hardware	25-39
Special tools	25-39

Group 5 Specifications 10

SERIAL NUMBERS

NOTE: Please quote all the serial numbers stamped in the appropriate serial number plate when ordering replacement parts for your combine, combine engine and special equipment (e.g. operator's cab, cutting platform trailer).

Serial number plates are located as follows:

Combine

The combine serial number is stamped into the name plate on the right-hand side of the operator's platform (see fig. 1).

The serial number is also stamped into the right-hand angle frame of the combine if the name plate gets lost for any reason (see fig. 2).

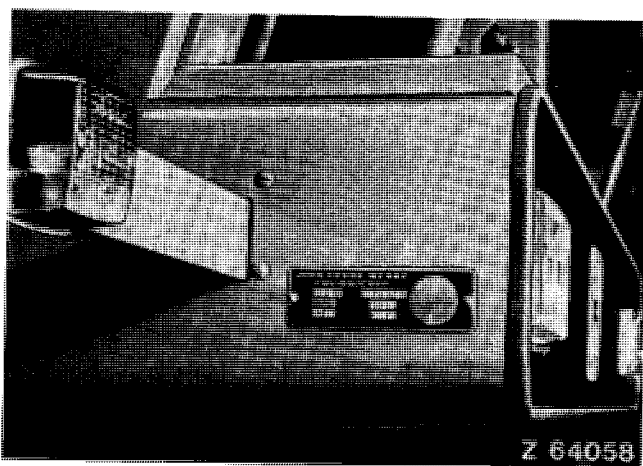


Fig. 1 — Serial Number Plate on Operator's Platform

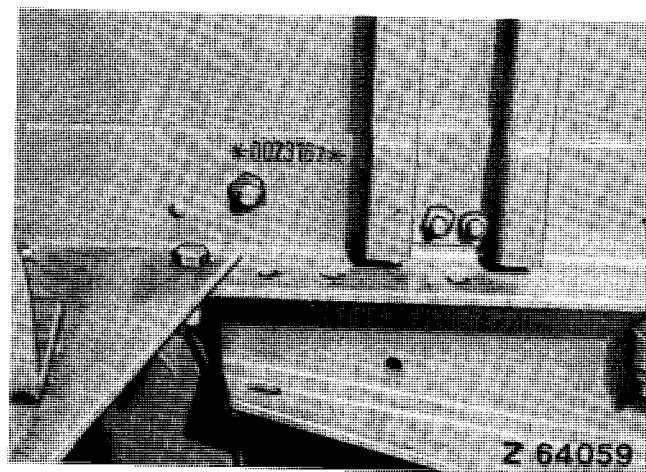


Fig. 2 — Serial Number Stamped into Angle Frame

Engine

The serial number of a John Deere engine is stamped into the name plate on the lower right of the cylinder block near the fuel transfer pump (see fig. 3).

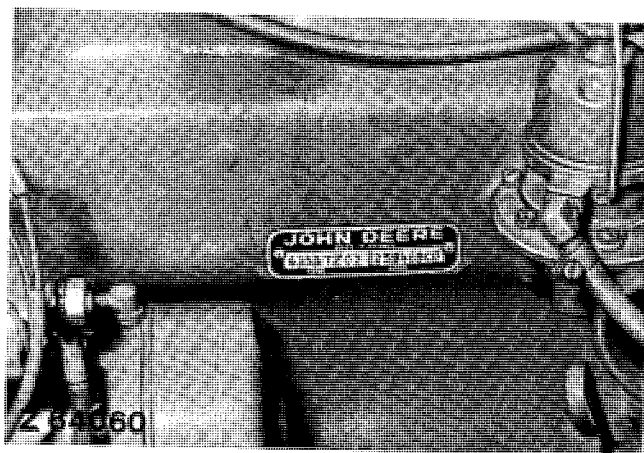


Fig. 3 — Engine Serial Number on a John Deere Engine

Cutting Platform

The serial number of the cutting platform is stamped into a plate on the outer right-hand side panel of the platform (see fig. 4).*

* The various sized cutting platforms are marked as follows:

A = 7 ft. 9 in.	D = 12 ft.	F = 16 ft.
B = 8 ft. 5 in.	E = 14 ft.	G = 18 ft.
C = 10 ft.		

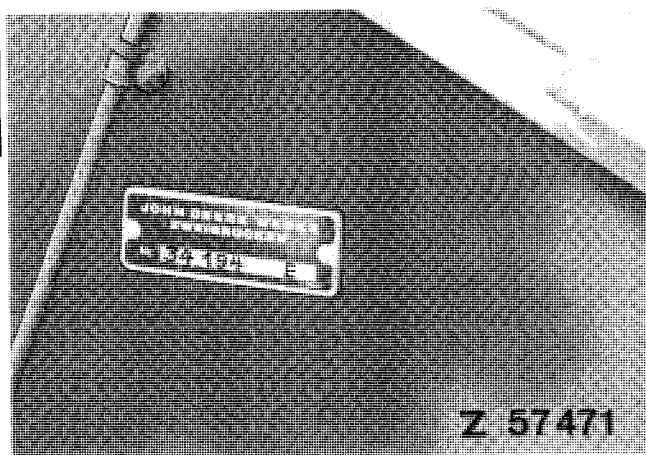


Fig. 4 — Serial Number of Cutting Platform
(14 ft. cutting platform shown)

Corn Head

The corn head serial number is stamped into a plate on the right-hand side below the drive guard (see fig. 5).

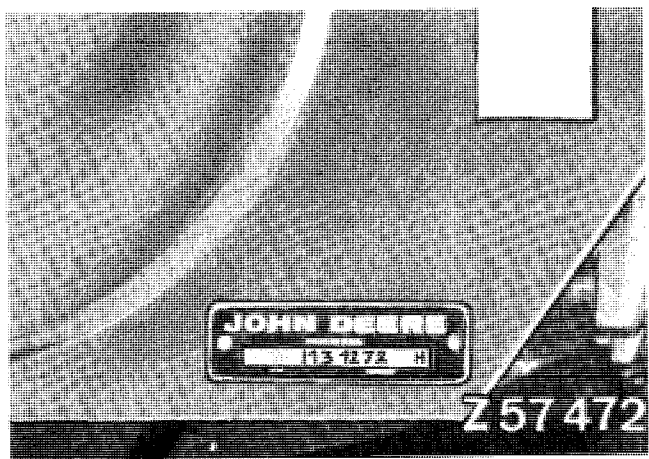


Fig. 5 — Corn Head Serial Number

Cutting Platform Trailer

The cutting platform trailer serial number is stamped into the name plate located on the right-hand side of the trailer drawbar behind the towing eye (see fig. 6).

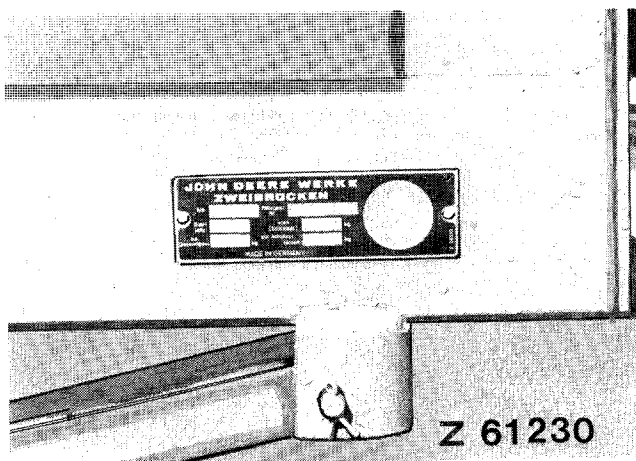


Fig. 6 — Serial Number of Cutting Platform Trailer

Operator's Cab

The operator's cab serial number is stamped into the name plate located on the right-hand inner side panel of cab.

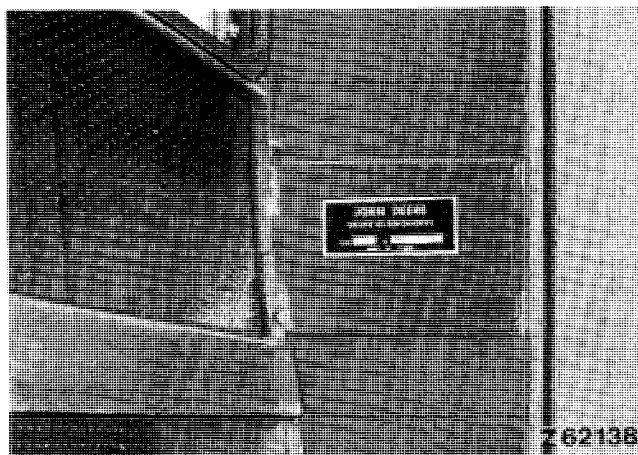


Fig. 7 — Serial Number of Operator's Cab

Fuel Injection Pump

The fuel injection pump type and serial number (Roto-Diesel or Roosa-Master) is stamped into the name plate located on pump housing (see figs. 8 and 9).

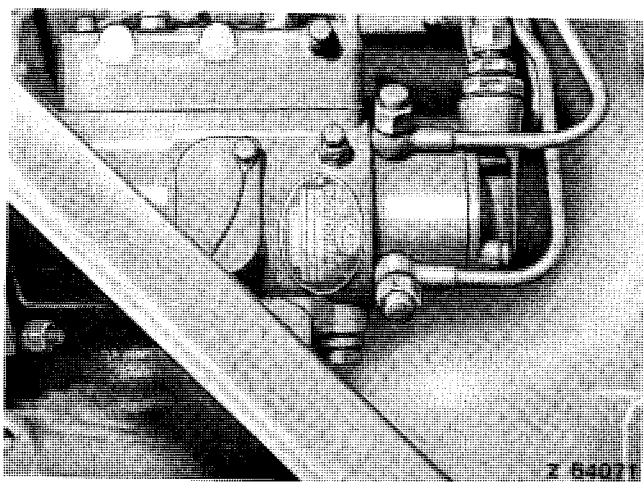


Fig. 8 — Serial Number of Fuel Injection Pump
(Roto-Diesel on Combines 925 to 965)

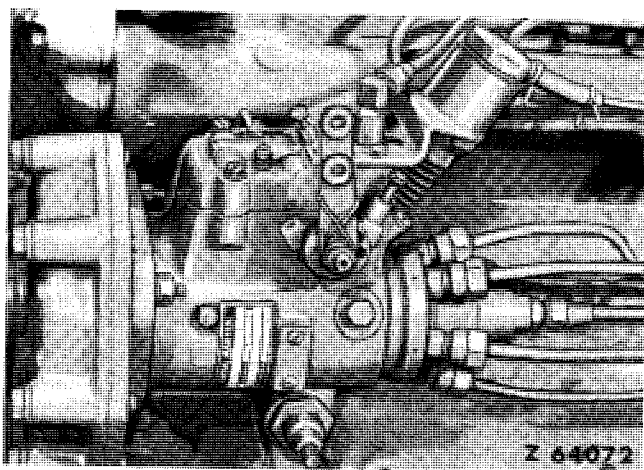


Fig. 9 — Serial Number of Fuel Injection Pump
(Roosa-Master on Combine 975)

Track Assembly

The track assembly serial number is stamped into the outer side of track frame below the front idler bracket.

Left-hand track assemblies are numbered with an odd serial number. Right-hand track assemblies have an even serial number (see fig. 10).

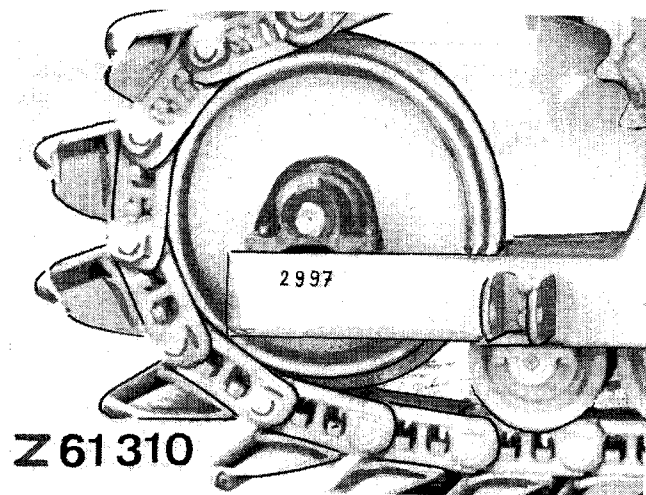


Fig. 10 — Serial Number of Track Assembly, L.H.
Side

MODEL NUMBERS

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

SPECIFICATIONS

The specific operator's manual contains all the necessary specifications.

Group 10

Predelivery Inspection, Delivery Service and After-Sales Inspection

PREDELIVERY SERVICE

Every new JOHN DEERE combine leaves the factory in such a condition that it can be delivered to the customer after a minimum of service.

To promote complete customer satisfaction, proper delivery service and the thorough completion of the following inspections are very important as they contribute to trouble-free operation of the combine.

It was necessary to dismantle various parts of the combine prior to its shipment by rail (railway regulations — maximum width and height). The reassembling of these parts should be carried out by the dealer, complying with the separate installation instructions supplied (e.g. Grain tank installation instructions for 965 and 975 combines — Z 91151). The following inspections etc. must be carried out by the dealer:

TEMPORARY COMBINE STORAGE

Service	Specifications	Reference
COMBINE		
Shelter combine in a dry, level place. If combine is to be stored for a longer period, block up combine, taking load off tires or block up combine, remove wheels and tires and store in a suitable place.	.....	Operator's manual
Coat drive chains with thick oil	.....	Operator's manual
Leave doors open at bottom of elevator	.....	Operator's manual
Lubricate combine completely	.....	Operator's manual
Grease threads on adjustment bolts. Apply a coating of grease to slip clutch jaws. Release spring tension.	.....	Operator's manual
Touch up all parts where paint has been damaged.	.....	.....
Lower cutting platform onto a horizontal dry base. Lower feeder house.	.....	Operator's manual
Coat polished hydraulic piston rods with grease and retract pistons as far as possible.	.....	Operator's manual
ENGINE		
Check coolant level and anti-freeze content in radiator.	Coolant level should be midway between radiator core and bottom edge of filler neck	Operator's manual

Service	Specifications	Reference
IMPORTANT: When the combine is delivered, red cable is not connected to alternator terminal "B+" Further, the alternator three-terminal plug is not connected. Connect cable and plug before operating combine for the first time, NOT before. Connect batteries in the proper polarity. Improper connections ("+" and "-") will result in damage to alternator and regulator. See pages 10-10-3 and 4 for further important instructions regarding the alternator. Remove anti-corrosion bag from fuel tank strainer and discard. Fill fuel tank with diesel having added approx. 10% of good quality rust inhibitor. Unscrew plug from air intake manifold and inject good quality rust-inhibitor through the opening, while turning over the engine slowly. Reinstall plug. IMPORTANT: Make sure the engine does not start during this procedure, otherwise the operation must be repeated. Seal all engine openings with plugs or oil-proof paper. Place strong strips of paper between fan belt and pulleys to prevent sticking.	 Use good quality rust inhibitor; approx. 35 cm³ (2.0 cu.in.) for each cylinder	Operator's manual and Section 40

PREDELIVERY INSPECTION

Service	Specifications	Reference
GENERAL		
Make sure that all loosely packed parts and collis on combine have been removed.	Check with packing note	
TIRES AND WHEELS		
Tighten front wheel nuts to specified torque.	420 Nm (42 mkp/300 ft-lb)	.....
Check tire inflation pressure.	.....	Operator's manual
LUBRICATION		
Check crankcase oil level	Top mark on dip stick	Operator's manual
Check oil level in hydraulic reservoir	Top mark on dip stick	Operator's manual
Check transmission oil level	.....	Operator's manual
Check oil level in final drive assys. (Combines 955, 965 and 975 only)	.....	Operator's manual
Oil all moving parts such as joints, rollers, adjusting levers etc.	.....	.....
ENGINE		
Check dry-type air cleaner	.....	Operator's manual
Top up fuel tank and start engine	.....	Operator's manual
Check if speed control linkage moves easily (Combines 925 to 955)	.....	See section 20, group 40
Check engine idle speeds	.....	See section 20, group 40
Check injection timing	.....	See section 20, group 15
ELECTRICAL SYSTEM		
Check whether lighting system and control lights are working correctly	.....	Operator's manual and section 40
IMPORTANT: The combine is equipped with an alternator		
When the combine is delivered red cable is not corrected to terminal B+. Connect cable before operating combine for the first time.	.....	Operator's manual and section 40

Service	Specifications	Reference
If the combine is to be operated for a short time without battery (using a slave battery for starting), do not, under any circumstances interrupt the circuit by switching off the key switch to position "0" before stopping the engine. Further it is recommended to use additional current (lights-position 2) while engine is running. Only after having stopped the engine, turn key to position "0" and remove. With combine battery removed and starting with a slave battery always insulate battery end of disconnected starter cable properly, to avoid damage to alternator and regulator. With the engine running, do not short circuit or ground (even momentarily) alternator and regulator terminals. If this advice is disregarded, damage to alternator and regulator may result. Fill dry charged battery with electrolyte (gravity 1.28) according to manufacturer's instructions enclosed. Connect batteries in the proper polarity. If they are improperly connected ("+" and "-"), the rectifier diodes will be immediately destroyed First connect positive (+) cable and then ground (-) strap of battery Check function of reverser clutch unit control lights COOLING SYSTEM Check radiator for loss of coolant Check gravity of antifreeze and rust inhibitor mixture	 Green light - forward travel Red light - reverse travel Coolant level should be midway between radiator core and bottom edge of filler neck 	Manufacturer's Instructions Section 40 Section 40 Operator's manual and section 50 Operator's manual Operator's manual

Service	Specifications	Reference
BRAKES		
Check brake fluid level in reservoir		Operator's manual
Check brake lines for leaks		
Check brake operation		Operator's manual
Check parking brake		Operator's manual
COMBINE		
Check pulley sheaves for damaged sidewalls		
Check flat belts and V-belts for proper tension and see that pulleys are correctly aligned		Operator's manual
Check all drive chains for smooth running and proper tension		Operator's manual
Adjust slip clutches		Operator's manual
Set reel parallel to platform		Operator's manual
Adjust reel tines for first crop to be harvested		Operator's manual
Check cutter bar knife for smooth operation and run		Operator's manual
Check cutting platform auger fingers for correct setting according to operating conditions and adjust if necessary		Operator's manual
The cutting platform should be parallel to the front axle. Adjust, if necessary		Operator's manual
Install crop dividers and adjust		Operator's manual
Check basic adjustment of concave	See "Combine Settings Chart"	Operator's manual
Check chaffer and grain sieve adjustment	See "Combine Settings Chart"	Operator's manual
Check cylinder and blower speeds	See "Combine Settings Chart"	Operator's manual

Service	Specifications	Reference
Check variable ground speed drive belt tension (Combines 925 to 965)		Operator's manual
Check Posi-Torq drive belt tension (Combine 975)		Operator's manual
Check steering system for proper function		Section 70
Check controls and instruments for correct function		Operator's manual
Check operation of engine clutch		Operator's manual
Check beater speed with engine running at maximum revs.	Beater speed : $850 \pm 30_5$ rpm	Operator's manual and section 20, group 40
Check operation of variable cylinder drive	Speed range infinitely variable between 470 and 1140 rpm	Operator's manual
Check operation of grain tank unloading auger in extended position		Operator's manual
At medium engine speed, engage the various drives one after another and listen carefully for any unusual noise. Then set engine at full speed and again engage the various drives. Stop engine immediately should any unusual noise occur and investigate.		Operator's manual

DELIVERY SERVICE

A thorough discussion of the operation and service of the combine at the time of its delivery helps to assure complete customer satisfaction.

Proper delivery should be an important phase of the dealer's program.

It is a well-known fact that many complaints have arisen simply because the owner was not shown how to operate and service his new combine properly. Therefore, enough time should be devoted, at the customer's convenience, to introducing him to his new combine and explaining to him how to operate and service it.

Using the combine operator's manual as a guide, be sure that the owner understands the following points properly:

1. Adjusting the seat
2. Adjusting the steering column
3. Operation of control levers and instruments
Satisfy yourself that customer understands fully all operating functions
Starting and shutting off the engine (important instructions for 945, 965 and 975 combines with turbocharger)
5. All functions of the hydraulic system
6. Adjustment of chaffer and sieves
7. Cleaning fan speed adjustment with engine running
8. Importance of the safety rules
9. The importance of lubrication and periodic service. If necessary, advise customer regarding local traffic regulations (extra width, lighting etc.)
10. Advise customer as to special equipment available for his combine and its use

AFTER-SALES INSPECTION (25 TO 30 HOURS)

In the interest of the purchaser and the dealer an after-sales inspection should be carried out by the dealer after the first 25 to 30 hours of using a new John Deere combine.

The purpose of this inspection is to make sure that the customer is receiving satisfactory performance from his combine. At the same time, the inspection should reveal whether or not the combine is being operated, lubricated and serviced properly.

Through this inspection a needless volume of service work can be eliminated by preventing

minor difficulties from developing into serious problems later on. It also will promote stronger dealer-customer relations and give the customer an opportunity to ask questions that may have arisen during the first few days of use.

Thereby the dealer has the further opportunity of promoting the possible sale of other new equipment.

The following inspection program is recommended:

Service	Specifications	Reference
COOLING SYSTEM		
Check coolant level	Coolant level should be midway between radiator core and bottom edge of filler neck	Operator's manual
Clean exterior of radiator	.....	.....
Check hose connections	.....	.....
FUEL SYSTEM		
Check sediment bowl at fuel-shut-off cock and fuel filter. Clean fuel transfer pump strainer.	.....	Operator's manual
Check line connections	.....	.....
ELECTRICAL SYSTEM		
Check gravity of battery electrolyte	Gravity should be 1.28 at an electrolyte temperature of 20°C (68°F)	Operator's manual
Check electrolyte level of batteries	To bottom of filler neck in each cell	Operator's manual
Check tension of fan belt	19 mm (3/4 in.) deflection with a 90 N (9 kp/20 lb) force applied between alternator and crankshaft pulley	Operator's manual
Start engine and check operation of lights, indicator lamps and instruments	.....	Operator's manual

Service	Specifications	Reference
LUBRICATION		
Check crankcase oil level	Top mark on dip stick	Operator's manual
Check transmission oil level	.....	Operator's manual
Check oil level of final drive housings assys. (Combines 955, 965 and 975 only)	.....	Operator's manual
Check hydraulic oil reservoir level	.....	Operator's manual
Lubricate lubricating points	.....	Operator's manual
ENGINE		
Check dry-type air cleaner and pre-cleaner	.....	Operator's manual
Check valve clearance	Intake valve: 0.35 mm (0.014 in.) Exhaust valve: 0.45 mm (0.018 in.)	Section 20, group 10
Check engine revolutions at full speed with separator engaged	Beater speed 850 ± 30 rpm	Section 20
Check engine revolutions at slow idle speed (measured at engine V-belt pulley)	1.250 ± 50 rpm	Section 20
Check engine revolutions at full speed (measured at engine V-belt pulley)	2.675 rpm	Section 20
GENERAL		
Check clutch pedal adjustment (All combines)	.....	Operator's manual
Shift transmission through all gears	.....	Operator's manual
Check operation of hydraulic system	.....	Operator's manual and section 70
Drain hydraulic reservoir and refill with fresh oil. Clean filter strainer (change oil filter on 965 and 975 combines)	.....	Operator's manual
Check hydrostatic steering system	.....	Section 70
Check foot brakes	.....	Operator's manual
Check parking brake	.....	Operator's manual
Tighten all accessible hydraulic lines and connections	.....	.....
Check all drive chains for proper tension and alignment	.....	Operator's manual and section 50
Check tension of feeder conveyor drive chain	.....	Operator's manual
Check slip clutch adjustment	.....	Operator's manual
Check all flat belts and V-belts for proper alignment and tension	.....	Operator's manual and section 50

Service	Specifications	Reference
Check variable ground speed drive belt tension (Combines 925 to 965)	.....	Operator's manual
Check Posi-Torq drive belt tension (Combine 975)	.....	Operator's manual
Check cylinder rasp bars for tightness	.....	Operator's manual
Make sure steering arm attaching cap screws are seated correctly and tighten to specified torque	180 Nm (18 mkp/130 ft-lb)	Operator's manual
Tighten front wheel nuts to specified torque (with grain tank empty and cutting platform lowered)	420 Nm (42 mkp/300 ft-lb)	Operator's manual
Tighten rear wheel bolts to specified torque	180 Nm (18 mkp/ 130 ft-lb)	Operator's manual
On the cutter bar, check knife fingers, clip, guides and sections as well as knife register	.....	Operator's manual
While the combine is running, walk around and make sure all components are operating properly and that there is no unusual noise		
 CAUTION: Comply with safety suggestions.	.....	Operator's manual
Shut-off engine and check for hot bearings	.....	Operator's manual
Carry out visual inspection of combine	Paint damage, loose connections, correct installation of hydraulic lines and hoses, leaks, function of all mechanical parts etc.	.....
Make sure customer has used the proper setting for crops harvested	See combine settings chart	Operator's manual
Explain the operation of special equipment and operating possibilities when harvesting under his particular field conditions	.....	.....

Group 15

Lubrication and Periodic Service 10

For brands of oil and lubricants to be used as well as for lubricating and servicing a combine, see relevant operator's manual.

Group 20

Engine and Combine

Tune-up and Adjustments

GENERAL INFORMATION

Before tuning up the engine, determine whether a tune-up will restore operating efficiency. If there is doubt, the following preliminary tests will help to determine if the engine can be tuned up.

PRELIMINARY ENGINE TESTING

Service	Specifications	Reference
Check air intake system by means of vacuum gauge (on engines with Turbocharger check before turbocharger)	Air restriction indicator registers at 0.0635 bar vacuum or 635 mm (25 in.) waterhead, engine running at fast idle speed	 "Fundamentals of Service — Engine" manual under "Diagnosing and Testing"
Check radiator for air bubbles or oil film	.....	.....
Check compression with cranking speed of 180 rpm which should be at least (using special tool No. 19.58-90.578)	24 bar (348 psi)	 "Fundamentals of Service — Engine" manual under "Diagnosing and Testing"
Measure blow-by at crankcase vent tube	See below	See below

Measuring the volume of escaping exhaust fumes is an important check in preliminary engine testing. For permissible exhaust fume volume at a given engine speed observe the following instructions:

For a preliminary diagnosis on the general condition of an engine, both compression and volume of escaping exhaust fumes should be determined.

Measuring the volume of escaping exhaust fumes will show if leakage from combustion chamber into crankcase is within specified tolerances. The illustration on next page shows how to measure fumes (using a commercial gas meter available from your local specialist dealer).

Permissible blow-by at rated speed (2500 rpm)

	925	935	945	955	965	975
m ³ /h	1.5	2	4	3	6	9
cu.ft./h	53	70.6	141	105.9	212	318

Test as follows:

10 Warm up engine and remove breather pipe from engine. Use a commercial gas meter for measuring volume of escaping exhaust fumes and connect it to engine as shown in fig. 1.

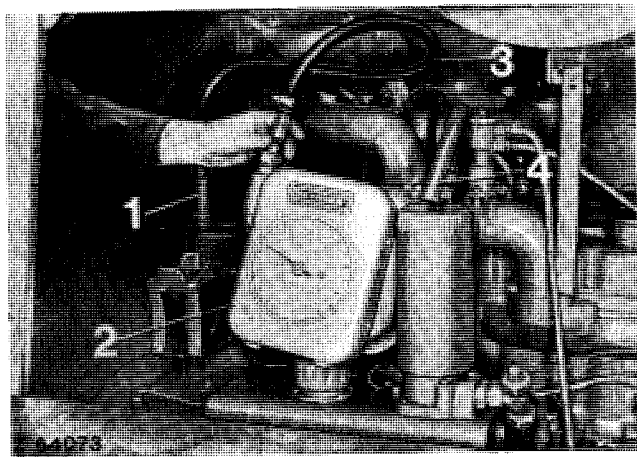


Fig. 1 — Measuring Volume of Engine Exhaust Fumes, Using a Gas Meter

- | | |
|-------------------------------------|----------------------------|
| 1 Breather hole in rocker arm cover | 3 Inlet line of gas meter |
| 2 Commercial gas meter | 4 Outlet line of gas meter |

Set hot engine at rated speed and record volume of exhaust fumes escaping within 5 minutes.

Multiply recorded fume volume times 12 to obtain actual volume per hour. Compare this value with specifications stated in table on previous page. If determined value is less than or identical to specifications, engine is in order. However, if determined value exceeds specified value, impermissible wear of piston rings and liners is indicated. In that case the engine must be overhauled.

ENGINE TUNE-UP

Service	Specifications	Reference
AIR INTAKE SYSTEM		
Dry-type cleaner - clean filter element and dust unloading valve	.....	Operator's manual and "Fundamentals of Service — Engine" manual
Check crankcase vent tube for foreign particles (restriction)	.....	.....
CYLINDER HEAD		
Tighten cylinder head cap screws	150 Nm (15 mkp/110 ft-lb)	Section 20, group 10
Check and adjust valve clearance	Intake valve: 0.35 mm (0.014 in.) Exhaust valve: 0.45 mm (0.018 in.)	Section 20, group 10
TURBOCHARGER		
Check turbocharger for lubrication oil leakage	.....	Section 20, group 10 and  "Fundamentals of Service — Engine" manual
Check turbocharger for excessive vibration at rated speed		
Check turbocharger for unusual noise at rated speed		
BATTERY		
Thoroughly clean cables, connections and battery	.....	.....
Liberalily coat battery terminals and cable connectors with petroleum jelly	.....	.....
Check electrolyte level of battery	.....	Operator's manual
Check specific gravity of electrolyte	.....	Operator's manual
ALTERNATOR		
Check fan belt tension	.....	Operator's manual
FUEL SYSTEM		
Check fuel tank and lines for leaks or restriction	.....	.....
Clean screen of fuel transfer pump	.....	Operator's manual

ENGINE TUNE-UP - Continued

Service	Specifications	Reference
Check filter element and replace, if necessary	.....	Operator's manual
Check injection timing and adjust, if necessary	.....	Section 30, group 15
Bleed fuel system	.....	Operator's manual
Check engine speed and adjust speed control linkage, if necessary	.....	Section 20, group 45
ENGINE LUBRICATION SYSTEM		
Check minimum engine oil pressure	1 bar (14 psi) at 1200 rpm 35 to 4.2 bar (50 to 60 psi) at 2500 rpm	Section 20
COOLING SYSTEM		
Clean and flush cooling system	.....	"Fundamentals of Service — Engine" manual
Check radiator hoses for damage and leaks	.....	.....
Clear radiator core of restrictions	.....	.....

CHECKING ENGINE PERFORMANCE

After the engine has been tuned up as explained above determine horsepower by means of a dynamometer or other suitable measure device. Compare measured horsepower with specified value in Operator's Manual or "Specifications" in section 10, group 5.

If the variation exceeds $\pm 5\%$ there is another defect which should be repaired.

COMBINE ADJUSTMENTS

After carrying out engine tune-up, adjust combine as follows:

Service	Specifications	Reference
ENGINE CLUTCH		
Adjust clutch pedal free travel	.....	Operator's manual
WHEELS		
Clean and lubricate rear wheel bearings	.....	Section 60
Adjust rear wheel bearings	.....	Section 60
Check toe-in	4 to 6 mm (5/32 to 15/64 in.)	Operator's manual
Check torque of rear wheel bolts	180 Nm (18 mkp/130 ft-lb)	Operator's manual
Check torque of front wheel nuts	420 Nm (42 mkp/300 ft-lb)	Operator's manual

COMBINE ADJUSTMENTS – Continued

Service	Specifications	Reference
BRAKES		
Bleed foot brakes	.....	Operator's manual
Adjust parking brake	.....	Operator's manual
SEPARATOR		
Adjust beater speed	.....	Operator's manual
Check basic adjustment of concave and cylinder	.....	Operator's manual
GROUND DRIVE		
Adjust variable ground drive or Posi-Torq	.....	Operator's manual
HYDRAULIC SYSTEM		
Check maximum system pressure in hydrostatic steering (primary) circuit (use hydraulic test unit AZ 90989 and adapter as shown in Special Tools)	93 bar (1350 psi)	Section 70
Check maximum system pressure in lift cylinder (secondary) circuit (use hydraulic test unit 19.58-90.260 or AZ 90989 and adapter as shown in Special Tools)	145 bar (2105 psi)	Section 70
Check hydraulic pump delivery to hydrostatic steering (primary) circuit (use hydraulic test unit AZ 90989 and adapters as shown in Special Tools)	10.4 liters/min. 2.75 U.S.gals./min.	Section 70
Check hydraulic pump delivery to lift cylinder (secondary) circuit (use hydraulic test unit AZ 90989 and adapter as shown in Special Tools)	32 liters/min. 8.5 U.S.gals./min.	Section 70
TIRES		
Check tire inflation pressure	.....	Operator's manual
TORQUES		
Check all accessible cap screws and nuts of combine for proper torque	.....	Torque chart



Suggest:

If the above button click is invalid.

Please download this document first, and then click the above link to download the complete manual.

Thank you so much for reading

STANDARD TORQUES

10

Recommended torques in Nm, mkp and ft-lb for UNC cap screws									
Grade according to DIN SAE JDM head marking	5.6 (5D)			8.8 (8G)			10.9 (10 K)		
	2			5			8		
	A 17 B			A 17 D			A 17 F		
	8.8 or 8 8			8.8 or 8 8			10.9 or 10 9		
Thread O.D. UNC (in.)	Nm	mkp	ft-lb	Nm	mkp	ft-lb	Nm	mkp	ft-lb
1/4	8	0.8	5.8	12	1.2	8.7	17	1.7	12.3
5/16	15	1.5	11	24	2.4	17	34	3.4	24
3/8	26	2.6	19	40	4	29	57	5.7	41
7/16	39	3.9	28	62	6.2	45	88	8.8	64
1/2	57	5.7	41	88	8.8	64	125	12.5	90
9/16	79	7.9	57	128	12.8	93	180	18	131
5/8	105	10.5	76	165	16.5	123	240	24	174
3/4	173	17.3	125	280	28	205	400	40	290
7/8				410	41	302	640	64	465
1				600	60	430	920	92	665
1 - 1/8				830	83	600	1340	134	970
1 - 1/4				1090	109	790	1770	177	1280

Recommended torques in Nm, mkp and ft-lb for UNF cap screws									
Grade according to DIN SAE JDM head marking	5.6 (5D)			8.8 (8G)			10.9 (10K)		
	2			5			8		
	A 17 B			A 17 D			A 17 F		
	8.8 or 8 8			8.8 or 8 8			10.9 or 10 9		
Thread O.D. UNF (in.)	Nm	mkp	ft-lb	Nm	mkp	ft-lb	Nm	mkp	ft-lb
1/4	9	0.9	6.5	14	1.4	10	19	1.9	14
5/16	18	1.8	13	28	2.8	20	38	3.8	28
3/8	29	2.9	21	45	4.5	33	63	6.3	46
7/16	43	4.3	31	66	6.6	48	94	9.4	68
1/2	63	6.3	46	98	9.8	71	140	14	100
9/16	85	8.5	62	140	14	101	200	20	143
5/8	110	11	80	180	18	131	260	26	186
3/4	180	18	131	300	30	215	420	42	304
7/8				420	42	305	650	65	407
1				620	62	450	960	96	695
1 - 1/8				840	84	610	1370	137	990
1 - 1/4				1130	113	820	1840	184	1330

<https://www.ebooklibonline.com>

Hello dear friend!

Thank you very much for reading.

Enter the link into your browser.

The full manual is available for immediate download.

<https://www.ebooklibonline.com>