TM

Technical Manual

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

TM-4307

John Deere Werke Zweibrücken

Printed in Germany (New)
(Engl.)

Combines 925, 935, 945, 955, 965, and 975

Technical Manual
TM-4307 (March-76)

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.

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CONTENTS

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CONTENTS (Contd.)

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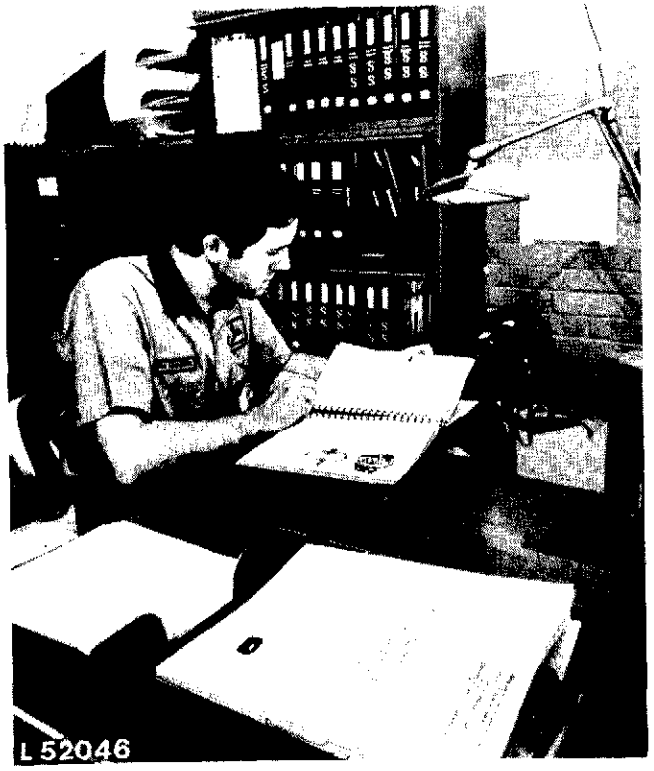
Introduction



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.

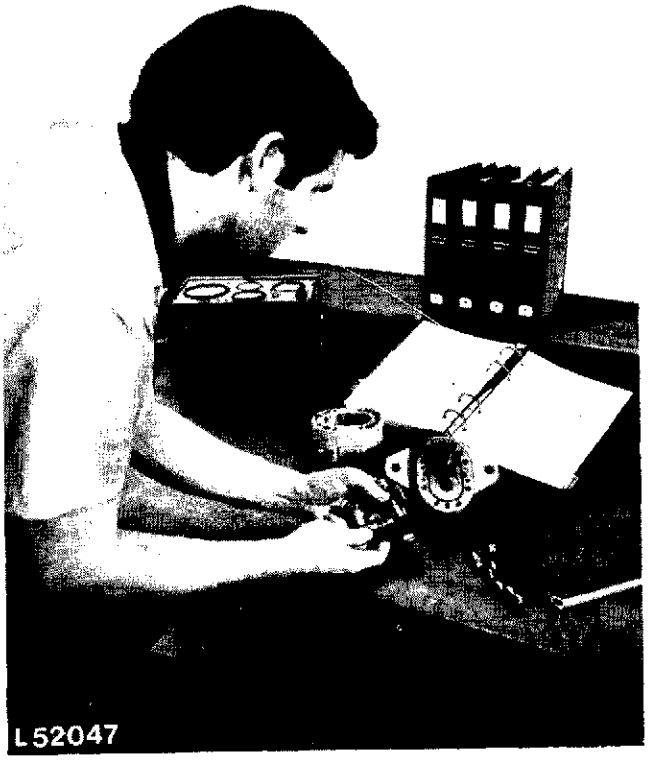
Fundamentals of Service (FOS) Manuals cover *basic* theory of operation, *fundamentals* of trouble shooting, *general* maintenance, and *basic* types of failures and their causes. FOS Manuals are for training new personnel and for reference by experienced technicians.

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/cm2
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.

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Section 10
General

10

CONTENTS OF THIS SECTION

Printed in Germany

10

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Group 5
Specifications

10

SERIAL NUMBERS

NOTE: Please quote all the serial numbers stamped in the appropiate serial number plate when ordering replacament 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).

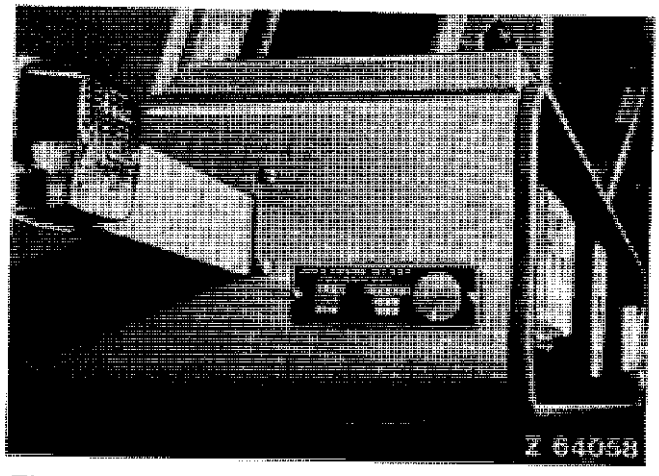

Fig. 1 — Serial Number Plate on Operator's Platform

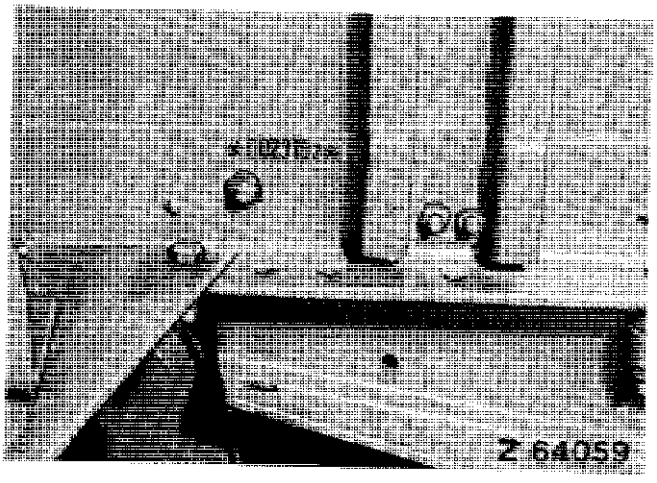

Fig. 2 — Serial Number Stamped into Angle Frame

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).

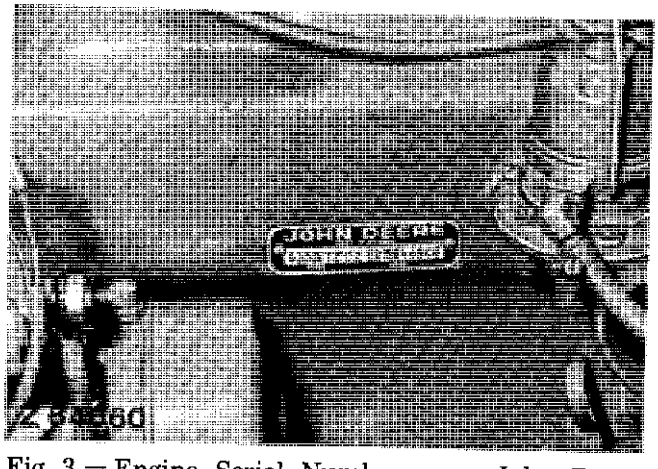

Fig. 3 — Engine Serial Number on a John Deere Engine

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.		

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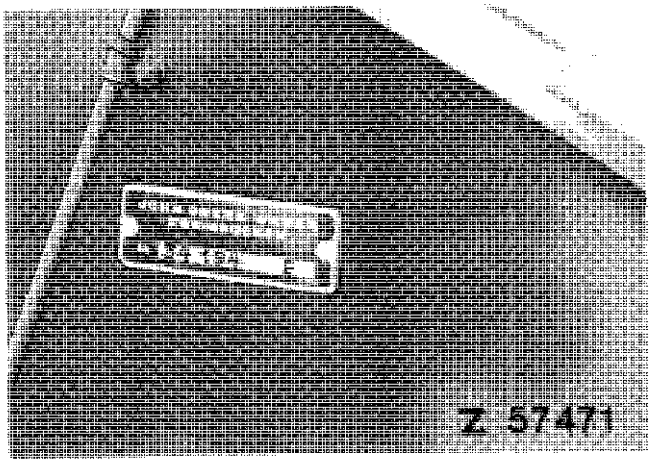

Fig. 4 — Serial Number of Cutting Platform (14 ft. cutting platform shown)

Corn Head

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

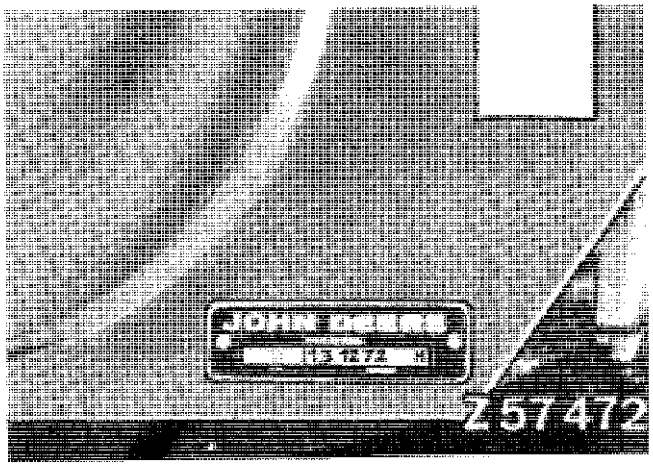

Fig. 5 — Corn Head Serial Number

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).

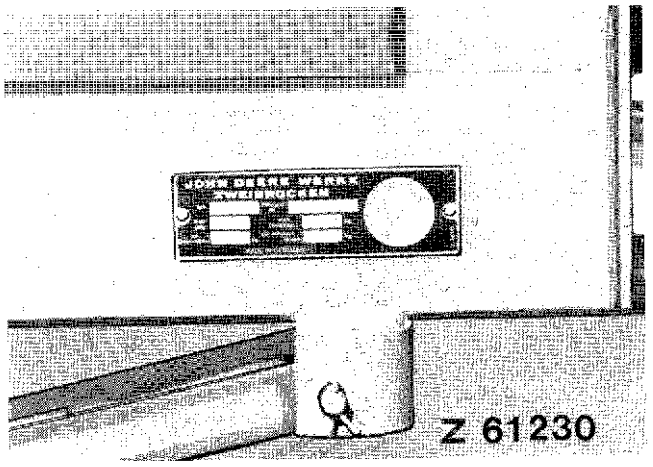

Fig. 6 — Serial Number of Cutting Platform Trailer

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.

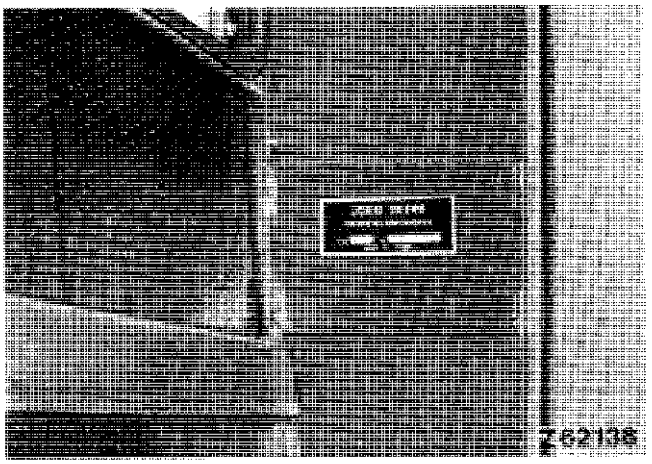

Fig. 7 — Serial Number of Operator's Cab

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).

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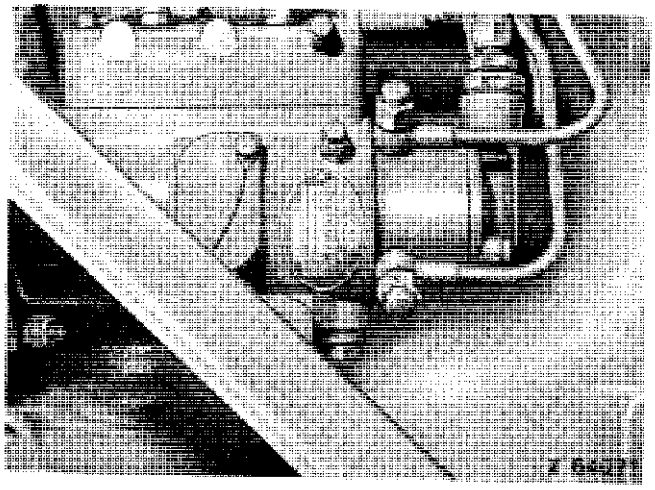

Fig. 8 — Serial Number of Fuel Injection Pump (Roto-Diesel on Combines 925 to 965)

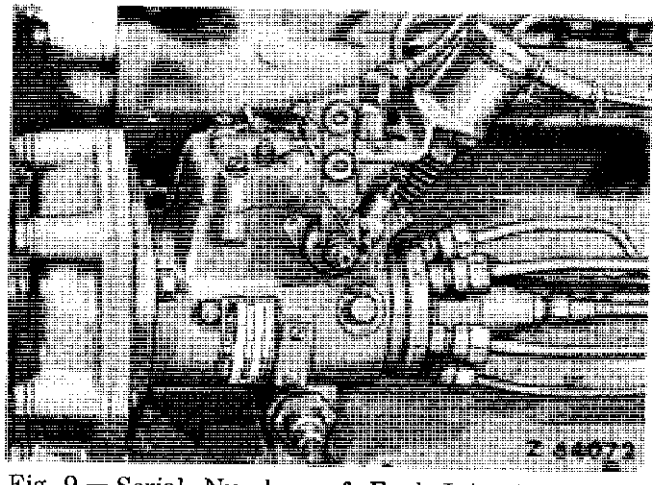

Fig. 9 — Serial Number of Fuel Injection Pump (Roosa-Master on Combine 975)

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).

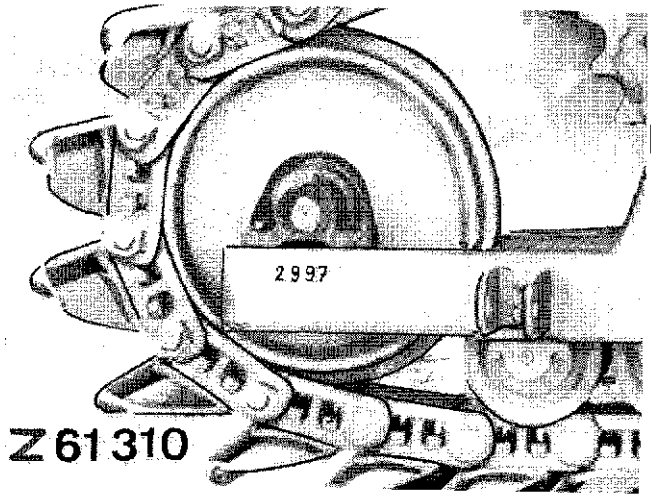

Fig. 10 — Serial Number of Track Assembly, L.H. Side

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

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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.	. . . . .	Operator's manual and Section 40
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.**	Use good quality rust inhibitor, approx. 35 cm^3 (2.0 cu.in.) for each cylinder	
Seal all engine openings with plugs or oil-proof paper.		
Place strong strips of paper between fan belt and pulleys to prevent sticking.		

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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

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10

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 is its 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.	. . . . .	Manufacturer's Instructions
Connect batteries in the proper polarity. If they are improperly connected ("+" and "-"), the rectifier diodes will be immediately destroyed	. . . . .	Section 40
First connect positive (+) cable and then ground (-) strap of battery	. . . . .	Section 40
Check function of reverser clutch unit control lights	Green light - forward travel Red light - reverse travel	Operator's manual and section 50
COOLING SYSTEM		
Check radiator for loss of coolant	Coolant level should be midway between radiator core and bottom edge of filler neck	Operator's manual
Check gravity of antifreeze and rust inhibitor mixture	. . . . .	Operator's manual

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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

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10

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 $\pm \frac{30}{5}$ 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

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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

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10

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 $\pm \frac{30}{5}$ rpm	Section 20
Check engine revolutions at slow idle speed (measured at engine V-belt pulley)	1.250 $\pm$ 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

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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

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

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Group 20

Engine and Combine Tune-up and Adjustments

10

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

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10

Test as follows:

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.

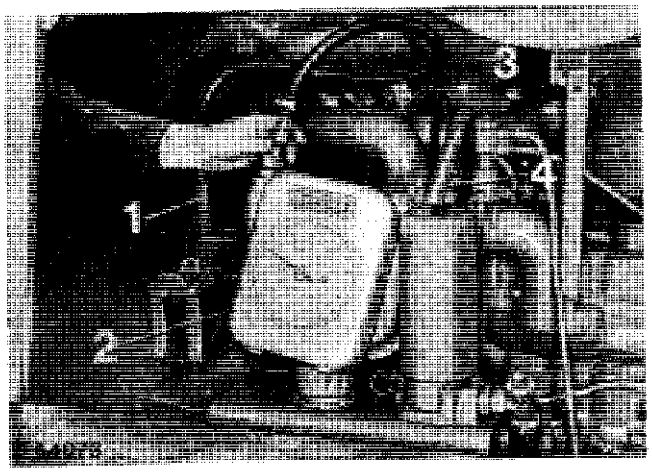

Fig. 1 — Measuring Volume of Engine Exhaust Fumes, Using a Gas Meter

1 Breather hole in rocker arm cover
2 Commercial gas meter
3 Inlet line of 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.

10

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	. . . . .	. . . . .
Liberally 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

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10

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 ± 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

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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

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10

STANDARD TORQUES

Recommended torques in Nm, mkp and ft-lb for UNC cap screws									
Grade according to DIN SAE JDM head marking	5.6 (5D) 2 A 17 B			8.8 (8G) 5 A 17 D 8.8 or 8 8			10.9 (10 K) 8 A 17 F 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) 2 A 17 B			8.8 (8G) 5 A 17 D 8.8 or 8 8			10.9 (10K) 8 A 17 F 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

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Recommended torques in Nm, mkp and ft-lb for metric cap screws									
Grade according to DIN SAE JDM head marking	8.8 (8 G) 5 A 17 D 1 8.8 or 8 8			10.9 (10 K) 8 A 17 F 1 10.9 or 10 9			12.9 (12 K) A 17 G 1 12.9 or 12 9		
Metric standard thread (mm)	Nm	mkp	ft-lb	Nm	mkp	ft-lb	Nm	mkp	ft-lb
M 5	6	0.6	4.3	9	0.9	6.5	11	1.1	7.9
M 6	11	1.1	7.9	15	1.5	10.8	18	1.8	13
M 8	25	2.5	18.1	34	3.4	24.6	43	4.3	31
M 10	47	4.7	34	65	6.5	47	83	8.3	60
M 12	78	7.8	56.4	113	11.3	81.7	140	14	101
M 14	120	12	86.8	175	17.5	126.6	215	21.5	155
M 16	180	18	130	260	26	188	310	31	224
M 18	250	25	181	360	36	260	430	43	311
M 20	335	33.5	242	470	47	340	560	56	405
M 22	430	43	311	600	60	434	700	70	506
M 24	560	56	405	790	79	571	950	95	687

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

Torque figures indicated above and in the Specifications sections of this manual are valid for non-greased or non-oiled threads and screw heads unless otherwise specified.

SPECIAL TOOLS

Part No. when ordering from JD Parts Depot	Manufacturer	Description	Use
19.58-90-578		Special adapter	Checking compression
19.58-90.260		Special tool	Checking oil pressure
		Gas meter	Measuring volume of escaping exhaust fumes

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Group 25
Separation

10

Removal and Installation of Engine – Combines 925 and 935

GENERAL INFORMATION

A hoist is required for removing engine from combine. The hoist should be high enough to lift the engine approx. 150 mm (6 in.) and to remove it sideways from combine (see fig. 1).

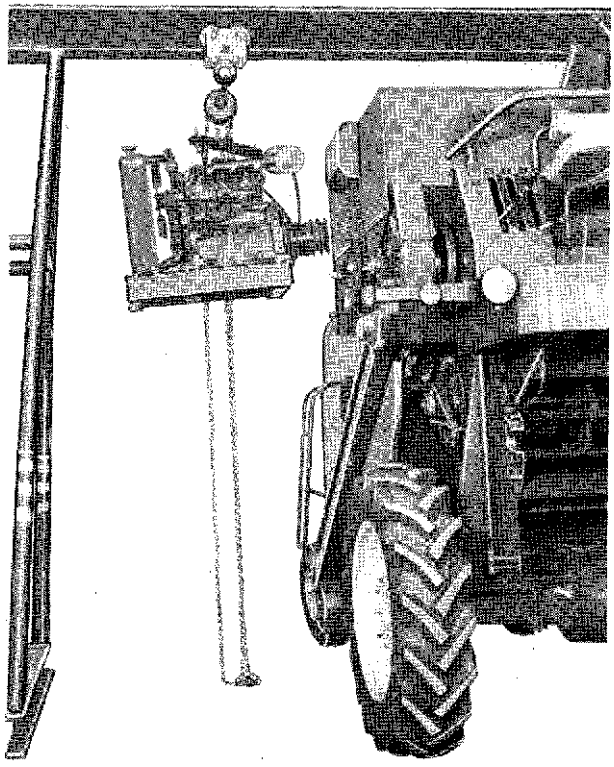

Fig. 1 — Hoist (Engine Being Removed Sideways from Combine)

IMPORTANT: Before removal mark position of engine on combine. Mark position on combine and engine mountings both laterally and longitudinally. These marks are essential for correct alignment when reinstalling the engine.

For most service operations the engine need not be removed. Remove the engine in case of major engine overhaul or for repairs to the crankshaft.

REMOVAL

Before removing engine carry out the following:

First disconnect ground cable of battery.

Remove right-hand engine cover.

Disconnect wiring harness at connector 1 (fig. 2).

Loosen fuel line clamps of fuel lines on combine.

Remove three or four attaching cap screws 2 (depending on combine model) from right-hand engine carrier.

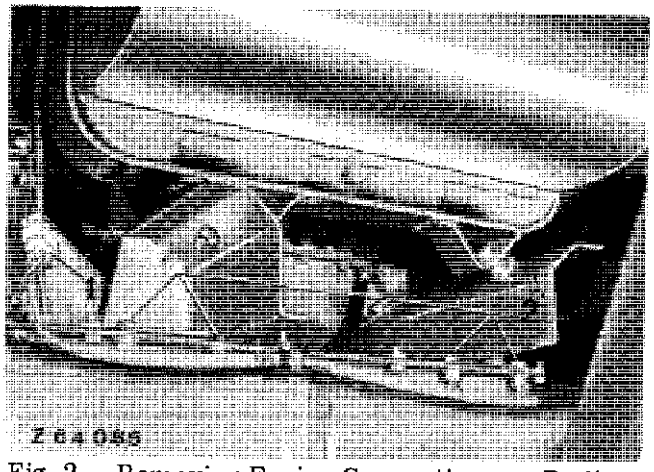

Fig. 2 — Removing Engine Connections on Radiator Side (Combine 935)

1 Wiring harness
2 Attaching cap screws of engine carrier

Remove fuel suction and return hose 1 (fig. 3) from fuel transfer pump and return line.

Remove engine oil drain hose 7 from left-hand combine side panel (fig. 5).

Disconnect positive cable 3 (fig. 3) from battery. Loosen attaching cap screws 2 of hydraulic pump bracket. Take off hydraulic pump drive belt and remove hydraulic pump with bracket from engine.

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Remove breather tube clamp 4 from engine block and pull breather tube out of rocker cover (necessary for later installation of lifting eyes).

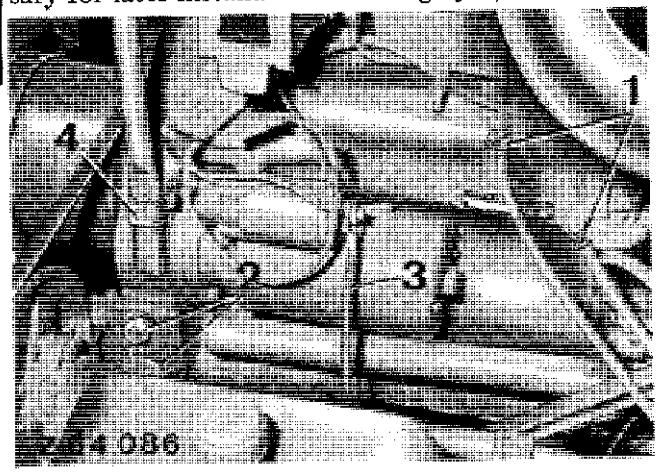

Fig. 3 — Removing Various Engine Connections Near Hydraulic Pump and Starting Motor (935 Shown)

1 Disconnect fuel hoses here
2 Attaching cap screws of hydraulic pump bracket
3 Positive cable
4 Breather tube clamp

Disconnect throttle and stop control linkage 1 at ball joint 2 of fuel injection pump (remove wire clip or hex. nut).

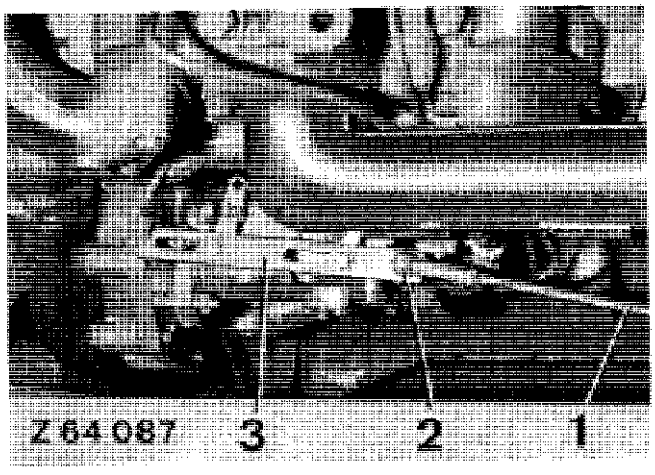

Fig. 4 — Removing Various Engine Connections Near Fuel Injection Pump (935 Shown)

1 Throttle and stop control linkage
2 Ball joint
3 Throttle and stop adjusting plate

Remove unloading auger drive belt 1 (fig. 5) from engine drive pulley and shift control lever of unloading auger into operating position.

Slacken ground drive belt 2 (variable ground speed drive) and remove from engine drive pulley.

Remove flat belt (power band) 3 and hydraulic pump drive belt 6.

Remove grain tank braces 5 and the three (or four) attaching cap screws 4 from engine carrier angle frame.

Remove flat belt tension roller from tensioner bracket.

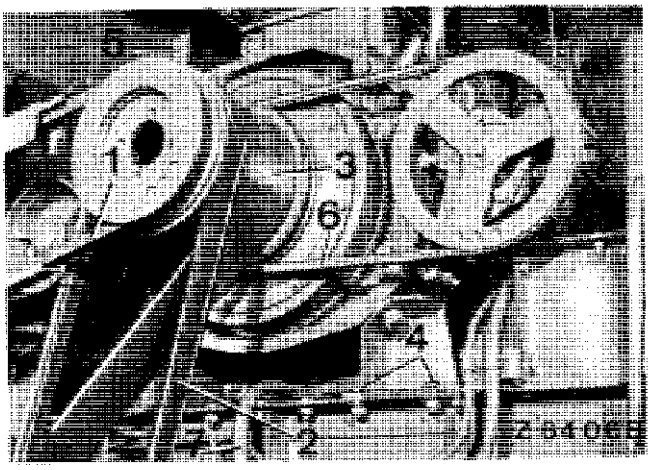

Fig. 5 — Removing Various Engine Connections Near Drive Pulley (935 Shown)

1 Unloading auger drive belt
2 Ground drive belt
3 Flat belt
4 Attaching cap screws of engine carrier angle frame
5 Grain tank braces
6 Hydraulic pump drive belt
7 Engine oil drain hose

Attach lifting eyes to engine (see fig. 6 and Special Tools) and by means of a suitable hoist lift up complete engine approx. 150 mm (6 in.). Then slide engine to the right out of combine.

IMPORTANT: On the combine 935 there are shims located under the engine carrier. Attach shims to specific carrier when engine is raised. This to ensure that original shim packs are placed under engine carriers when engine is reinstalled. This is important for engine alignment.

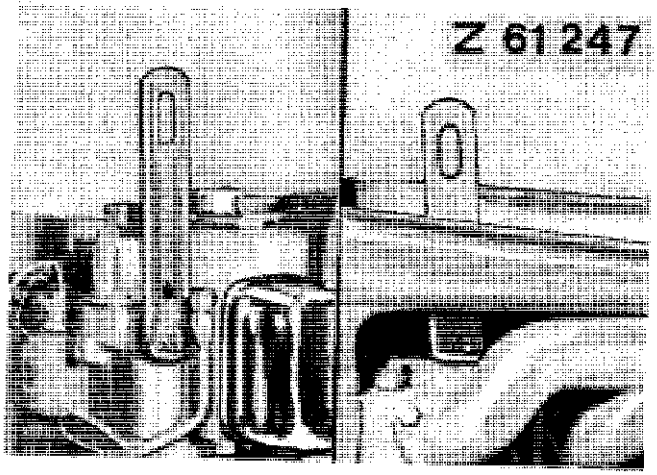

Fig. 6 — Attaching Lifting Eyes

INSTALLATION

When installing the engine, reverse removal procedure.

IMPORTANT: Make sure when aligning engine that marks made on engine carrier and combine are aligned on both sides of engine.

It is absolutely essential to make sure that engine is correctly aligned for correct flat belt travel. Note and comply with instructions given under "Flat Belt Travel Path" in Section 50, Group 35.

Check crankcase oil and coolant level.

Bleed fuel system. See operator's manual for details.

Make a test run of the engine.

After the test run check all attaching cap screws for tightness. Then check all drive belts for correct adjustment, true running and tension.

Check engine speeds to make sure that beater is running at specified speed of 850 $\pm^{30}_{5}$ rpm. If necessary adjust throttle and stop control linkage.

Removal and Installation of Engine — Combines 945 and 955

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GENERAL INFORMATION

A hoist is required for removing engine from combine. The hoist should be high enough to lift the engine approx. 150 mm (6 in.) and to remove it sideways from combine (see fig. 7).

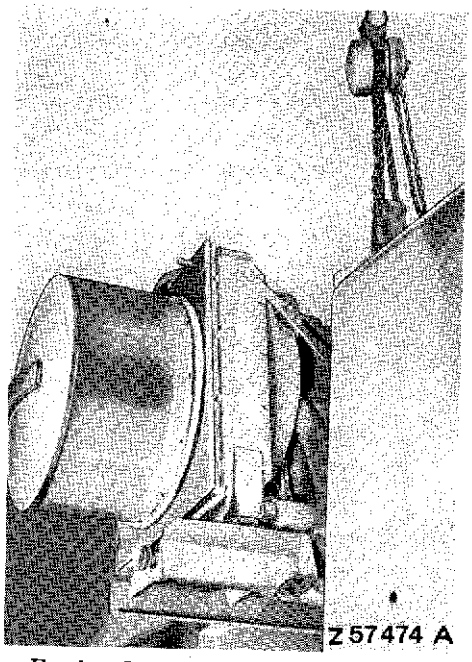

Fig. 7 — Engine Being Removed Sideways from Combine

REMOVAL

IMPORTANT: Before removal mark position of engine on combine. Mark position on combine and engine mountings both laterally and longitudinally. These marks are essential for correct alignment when reinstalling the engine.

For most service operations the engine need not be removed. Remove the engine in case of major engine overhaul or for repairs to the crankshaft.

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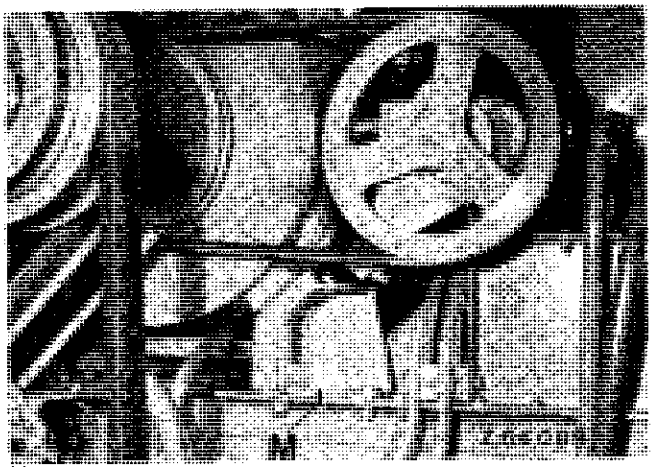

Fig. 8 — Marking Position of Engine to Combine

M Mark between engine carrier and combine frame

Before removing engine carry out the following:

First disconnect ground cable and then positive cable of battery. Disconnect engine wiring harness at disconnecting point A 29 (see wiring diagram in section 40 and fig. 9).

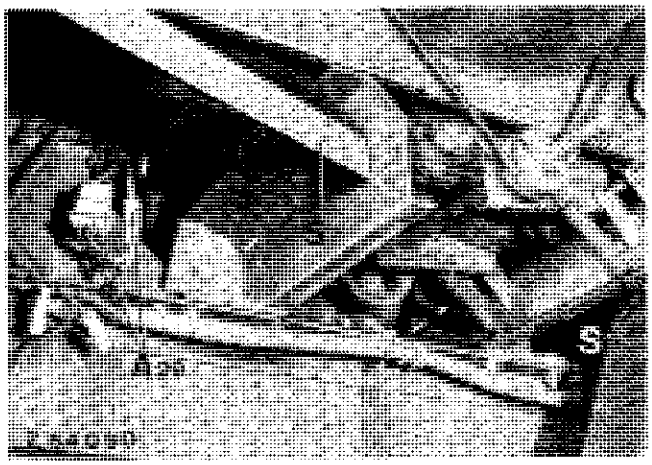

Fig. 9 — Engine Wiring Harness Disconnecting Point

A 29 Engine wiring harness disconnecting point
S Engine carrier supports

On engines with a Thermostart cold weather starting aid, disconnect cable from burner at intake manifold. Remove both engine carrier supports S (fig. 9) and right-hand engine guards. Also remove the right-hand rear engine covers. Disconnect fuel suction and return lines from fuel transfer pump and return line.

Loosen square-headed hydraulic pump drive belt adjusting screw S. Remove V-belt K from pulley and finally remove hydraulic pump complete with adjusting lever H from bracket after having removed clamping screw S1.

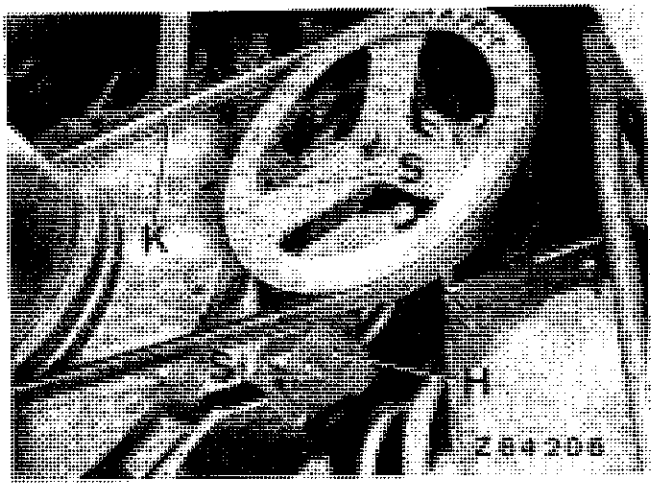

Fig. 10 — Removal of Hydraulic Pump (955 Shown)

Remove engine breather hose 1 (fig. 12) from left-hand side of engine.

Remove engine oil drain hose 2 (fig. 12) from left-hand side of combine.

Disconnect throttle and stop control linkage 1 (fig. 11) at ball joint 2 from fuel injection pump (disconnect wire clip).

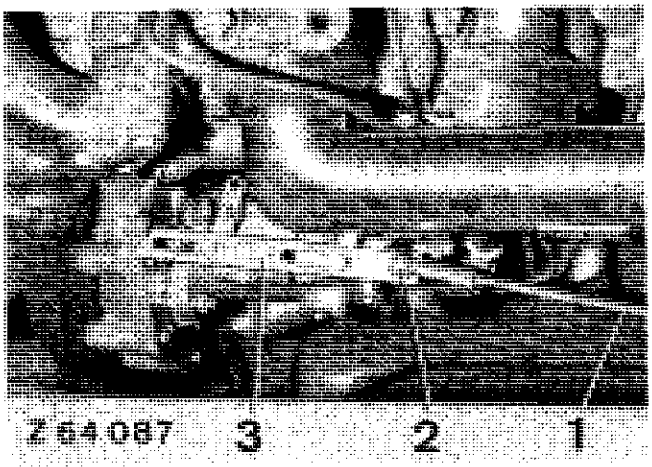

Fig. 11 — Removing Various Engine Connections Near Fuel Injection Pump

1 Throttle and stop control linkage
2 Ball joint
3 Throttle and stop adjusting plate

Remove unloading auger drive belt 4 (fig. 12) from engine drive pulley.

Shift control lever of unloading auger into operating position.

Slacken ground drive belt 5 and remove from engine drive pulley.

Remove flat belt 6 from engine drive pulley after having removed belt guide.

Remove hydraulic pump drive belt 7 from engine drive pulley.

Remove flat belt tension roller from tensioner bracket.

Disconnect grain tank braces 8 from engine carrier.

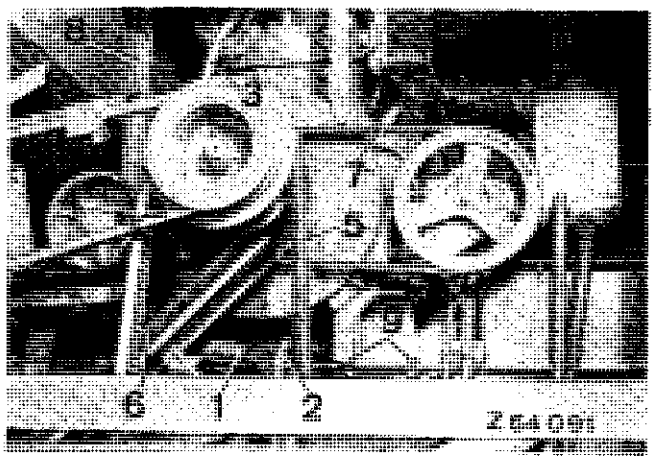

Fig. 12 — Removing Various Engine Connections Near Drive Pulley

1 Engine breather hose
2 Engine oil drain hose
3 Breather tube
4 Unloading auger drive belt
5 Ground drive belt
6 Flat belt
7 Hydraulic pump drive belt
8 Grain tank braces
9 Attaching cap screws of engine carrier supports

Remove attaching cap screws 9 of engine carrier supports.

Attach lifting eyes to engine (see fig. 13 and Special Tools). By means of a suitable hoist lift up complete engine approx. 150 mm (6 in.) and slide engine to the right out of combine.

IMPORTANT: There are shims located under the engine carrier. Attach shims to specific carrier when engine is raised. This to ensure that original shim packs are placed under engine carriers when engine is reinstalled. This is important for engine alignment.

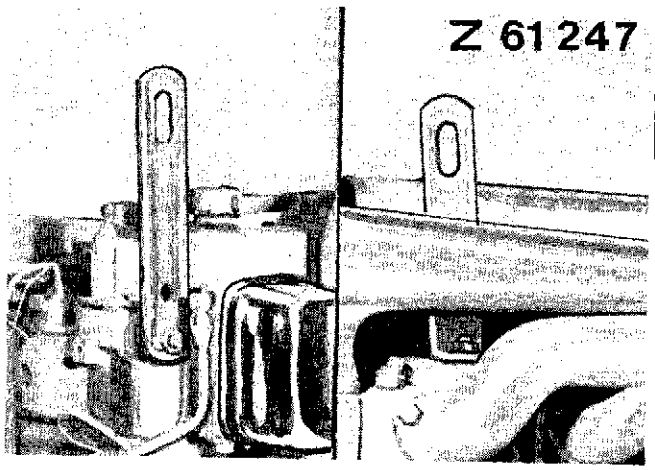

Fig. 13 — Attaching Lifting Eyes

INSTALLATION

When installing the engine, reverse removal procedure.

IMPORTANT: Make sure when aligning engine that marks made on engine carrier and combine are aligned on both sides of engine.

Check crankcase oil and coolant level.

Bleed fuel system. See operator's manual for details.

Make a test run of the engine.

After the test run check all attaching cap screws for tightness. Then check all drive belts for correct adjustment, true running and tension.

Check engine speeds to make sure that beater is running at specified speed of 850 $\pm^{30}_{5}$ rpm.If necessary, adjust throttle and stop control linkage.

At full load speed adjusting plate 3 should lightly contact stop. If not, adjust control linkage 1 (fig. 11).

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Removal and Installation of Engine – Combines 965 and 975

GENERAL INFORMATION

A hoist is required for removing engine from combine. The hoist should be high enough to lift the engine approx. 200 mm (8 in.) and to remove it sideways from the combine (see fig. 14).

NOTE: For most service operations the engine need not be removed. Remove the engine in case of major engine overhaul or for repairs to the crankshaft.

Always remove engine from right-hand side of combine.

REMOVAL

When removing engine on combines 965 and 975 it is not necessary to mark position of engine carrier to combine.

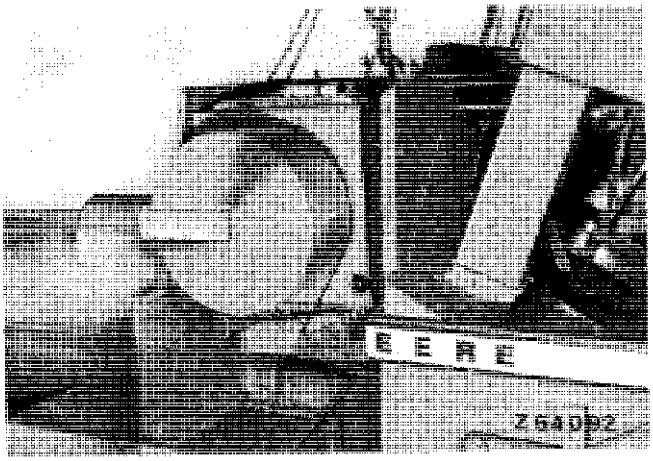

Fig. 14 — Engine Being Removed Sideways from Side of Combine

Carry out the following preparatory work to remove engine:

IMPORTANT: Lower feeder conveyor to the ground (hydraulic system now pressure-free).

Disconnect ground (-) and positive (+) cable at battery.

Work on left-hand side of combine:

Remove lower side panel.

Remove beater drive belt guard.

Slacken transmission drive belt 1 (figs. 16 and 17) at tensioner 2.

Remove power band guide 3.

Remove clamp of engine breather tube 4 and pull out tube from O-ring guide from left-hand engine mounting frame.

Remove cotter pin and pin 5 (fig. 17) from connecting plates L between both arms of cutting platform throw-out device.

Using a chisel remove cotter pin S (fig. 15) so that later connecting link T can be removed from arm 6.

Remove cotter pin L (fig. 15) and remove arm 6 to the left and at the same time disconnecting link T from arm.

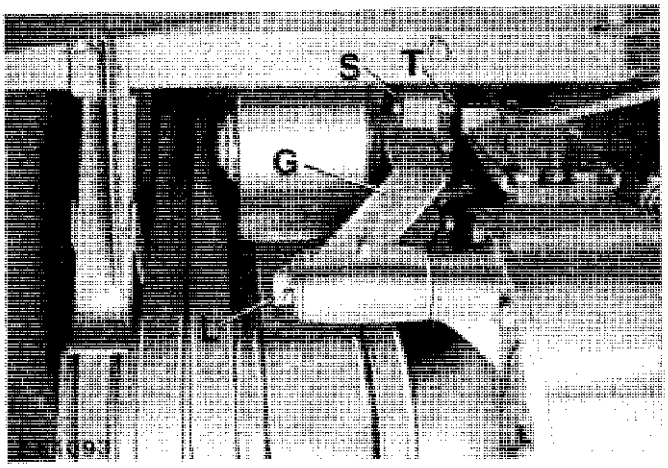

Fig. 15 — Removing Cutting Platform Throw-Out Device

NOTE: Do not disconnect connecting link T at lifting plate.

Remove power band guide bracket 6 (fig. 16) from left-hand engine mounting bracket 7.

Disconnect hydraulic line and battery cable clamps from left-hand engine mounting bracket.

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Disconnect all belts from engine drive pulley.

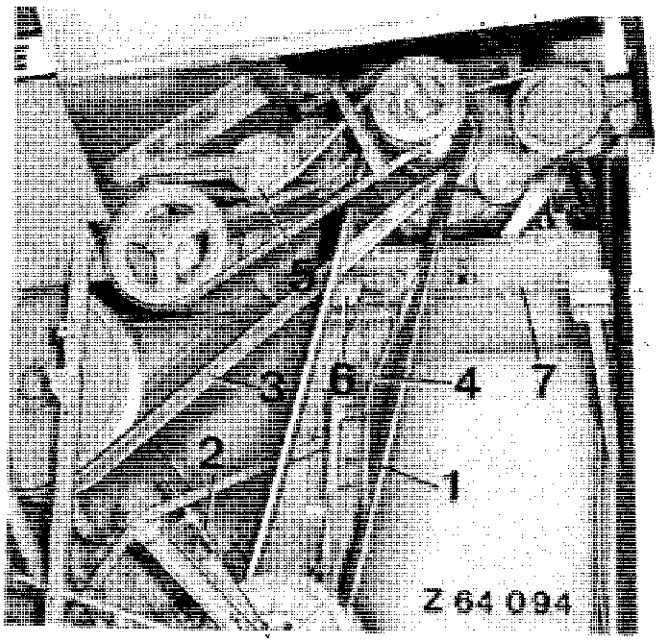

Fig. 16 — Preparing to Remove Engine (Combine 965 - Left-Hand Side)

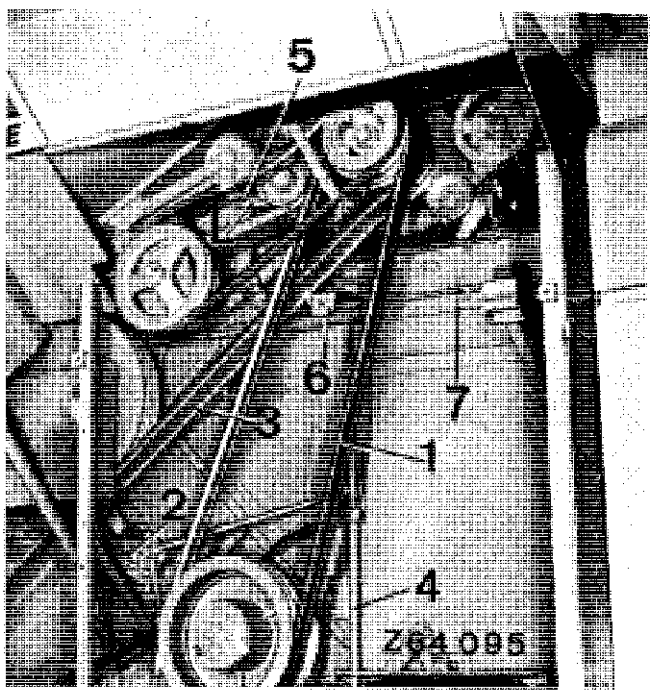

Fig. 17 — Preparing to Remove Engine, Combine 975 - Left-Hand Side

Remove guard plate from above muffler.

Remove muffler S from turbocharger and support 1.

Remove air cleaner L complete with support bracket from combine partition.

Remove support W above radiator between grain tank and rear engine panel.

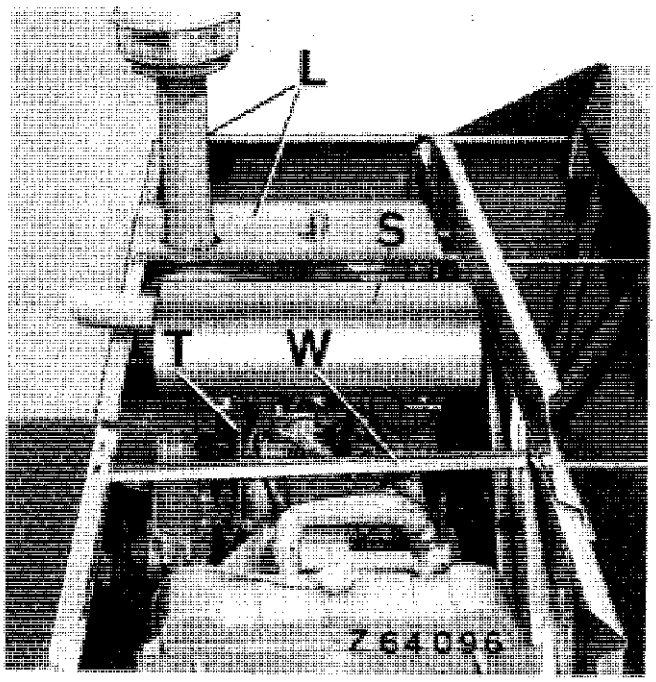

Fig. 18 — Preparing to Remove Engine

Disconnect the two fuel lines to fuel transfer pump and return line from Thermostart.

Remove bracket between hydraulic tank and rear panel of engine.

Work at grain tank rear panel area:

At control valve remove both inspection plates from rear panel of grain tank.

IMPORTANT: Thoroughly clean control valve area.

Remove ball joints from rocker arms K (fig. 20) on control valve.

NOTE: Some 965 and 975 combines were equipped with plastic ball joints as shown in fig. 20. These have now been replaced with steel ball joints.

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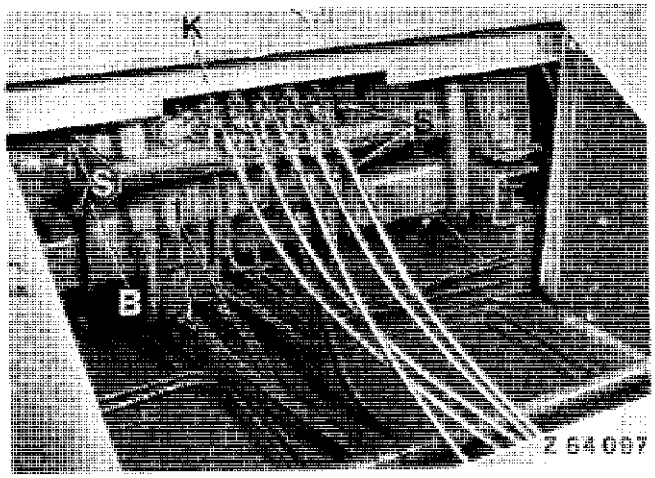

Fig. 19 — Preparing to Remove Engine at Control Valves

B Bowden cable bracket S Cap screws
K Rocker arm ball joints 1 Hose connections

Disconnect bowden cable bracket B from control valve by removing the four cap screws.

Disconnect both hose connections 1 (fig. 19) leading to the steering pump. Seal opening immediatly with plastic plugs.

NOTE: Mark position of hydraulic lines to control valve before removal.

Disconnect all hydraulic lines to control valve and seal openings immediately with plastic plugs or caps.

Disconnect speed control and shut-off rod G from bracket H (fig. 20).

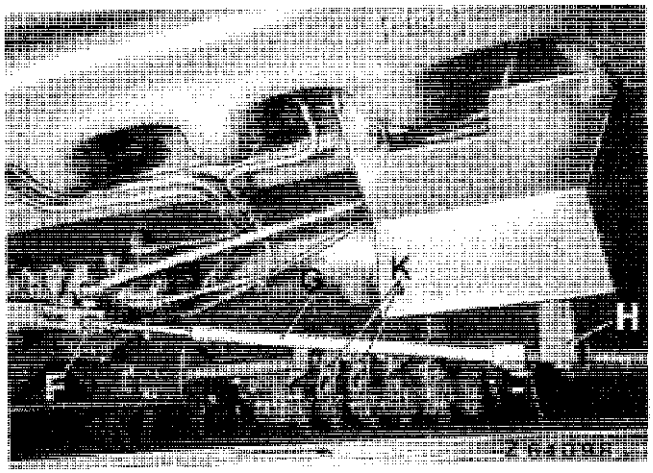

Fig. 20 — Preparing to Remove Engine at Fuel Injection Pump on 965 Combine

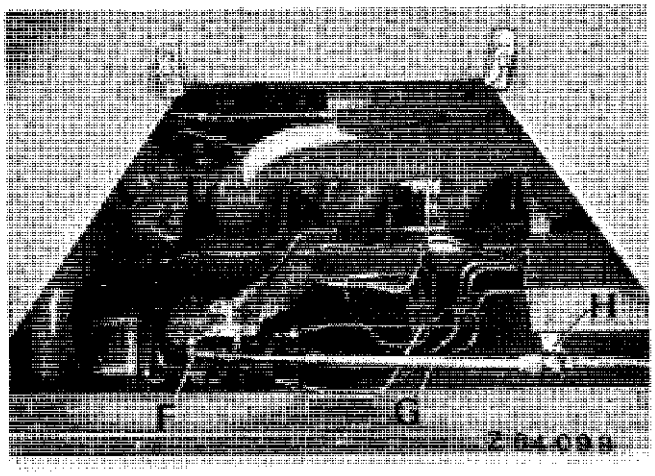

Fig. 21 — Preparing to Remove Engine at Fuel Injection Pump on 975 Combine

After having removed wire seal disconnect ball joint F of speed control rod at fuel injection pump.

Work on right-hand side of combine:

Remove engine and grain tank cover (on 975 combines this is in two parts).

Disconnect the long hinged cover below the John Deere sign at the three hinges and remove.

Remove the four cap screws and lift off cover with John Deere sign.

Loosen upper handrail of rear service platform at triangular supports of rear engine panel and remove wooden blocks. Then loosely reinstall handrail with triangular supports (without wooden blocks).

NOTE: This is necessary for more space when lifting out engine.

Disconnect plug R (fig. 22) of the electrical system next to the operator's seat.

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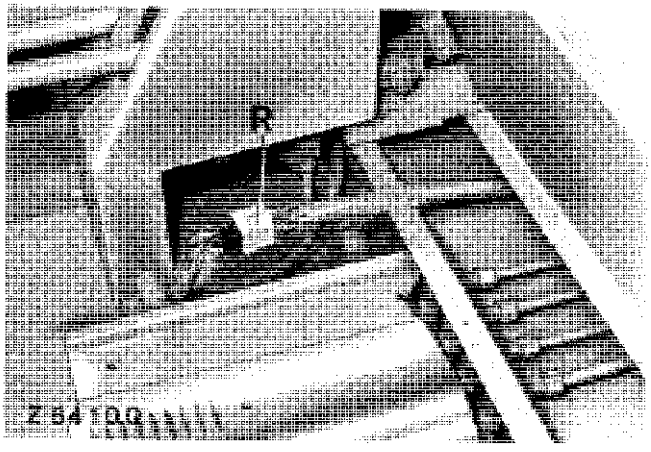

Fig. 22 — Disconnecting Wiring Harness Plug next to Operator's Seat (Shown with Operator's Seat Removed)

Disconnect wiring harness plug S (fig. 23) at right-hand engine support.

Disconnect cable V at straw walker warning device.

Disconnect engine floor plate at the three cap screws X.

Remove fuel tank brace T from engine support.

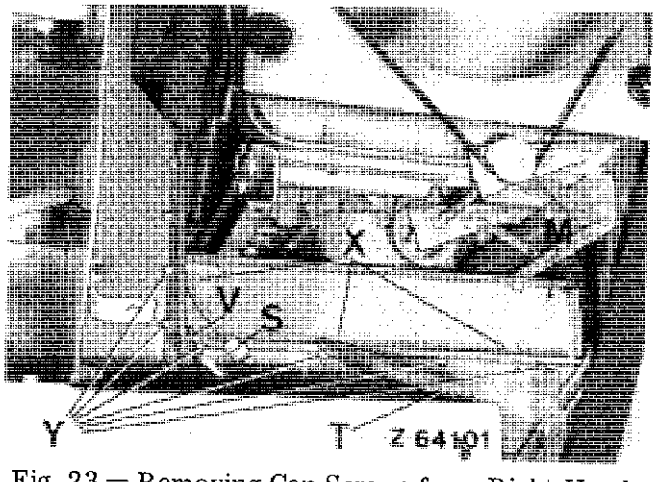

Fig. 23 — Removing Cap Screws from Right-Hand Engine Support

Remove the six cap screws Y from right-hand engine support M.

Attach lifting eyes to engine (see fig. 24 and Special Tools). By means of a suitable hoist lift up complete engine approx. 200 mm (8 in.).

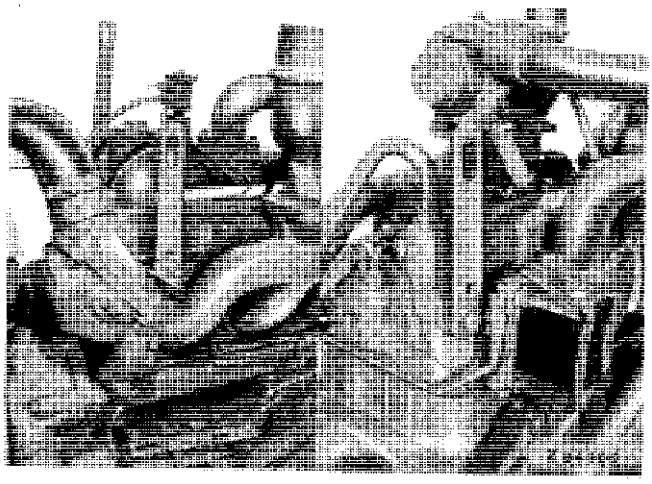

Fig. 24 — Front Lifting Eye Attached

Slide engine to the right out of combine.

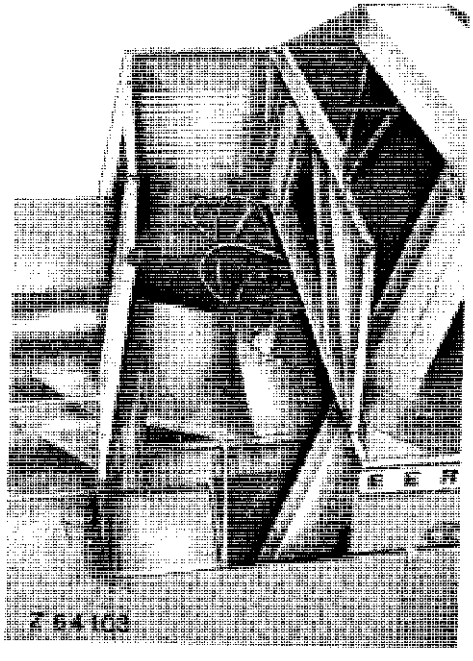

Fig. 25 — Engine Removed

10

INSTALLATION

When installing engine, reverse removal procedure.

With engine installed and attaching cap screws Y (fig. 23) tightened, check all drive belts for proper adjustment, true running and tension (especially power band, see section 50, group 35 for details).

Check the following:

— Engine oil level
— Hydraulic oil level
— Coolant level

Bleed the fuel system (see operator's manual) and make a test run of the engine.

While engine is running bleed the hydraulic system by operating all hydraulic control levers (operate until free of air). Then with hydraulic cylinders retracted again check level of hydraulic oil. If necessary, top up system to correct level with oil of specified quality and viscosity (see operator's manual).

Check selective control valve connections for leakage.

Heaving completed the engine check run check all attaching cap screws for tightness.

Check all drive belts for correct adjustment, true-running and tension.

Check engine speeds to make sure that beater runs at specified speed of $850 \pm {}^{30}_{5}$ rpm.

Removal and Installation of Front Axle — Combines 925, 935 and 945

REMOVAL

Remove cutting platform and feeder house.

Disconnect ground cable from negative (-) pole of battery.

Thoroughly clean front axle.

Loosen wheel nuts.

Slacken ground drive belt and remove from clutch drive pulley.

Remove engine clutch (see Removal of Engine Clutch in Group 5 of this Section).

NOTE: It is *necessary to remove the engine clutch on combines 925 and 935 (for later safe support of combine). The combine 945 clutch can remain installed.*

The left-hand support stand is later attached to combine support using the holes provided (see fig. 30).

Disconnect clutch cable from lever on clutch housing as well as (on combines 925 and 935) cable guide from support on angle guide.

Remove hydraulic lines and clamps 7 from support (see figs. 26 and 27).

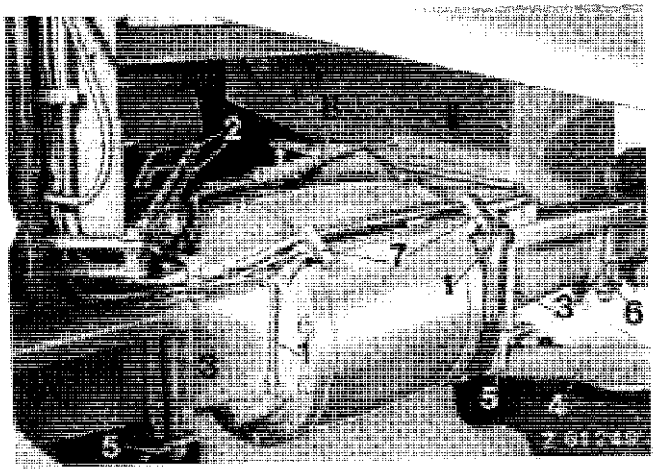

Fig. 26 — Front Axle before Removal (Combines 925 and 935)

1 Brake lines
2 Shift linkage
3 Attaching cap screws
4 Cutting platform lift cylinder
5 Lift cylinder support plates
6 Front axle support plates
7 Hydraulic line clamps
8 Clutch bowden cable

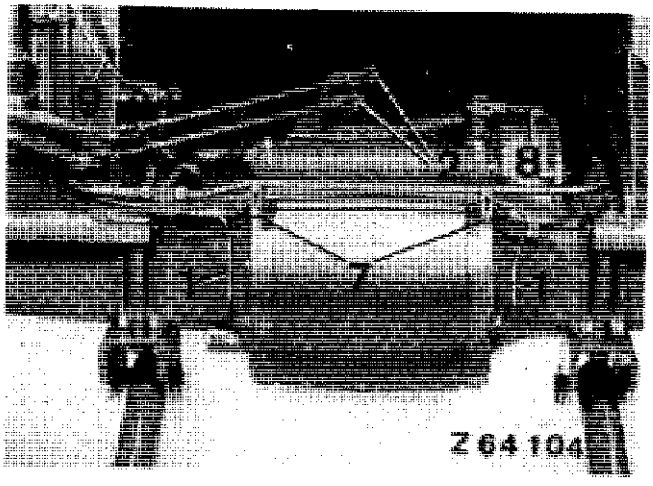

Fig. 27 — Front Axle before Removal (Combine 945)

1 Brake lines
2 Shift linkage
7 Hydraulic line clamps
8 Clutch bowden cable
9 Parking brake bowden cable

Disconnect hydraulic brake lines 1 (figs. 26 and 27) at adapters on both axle tubes. Plug openings of elbow fittings and lines with suitable plastic plugs.

Remove shift linkage 2 from transmission shift levers.

On Combines 925 and 935 disconnect parking brake bowden cable 1 (fig. 28) from brake shaft. Remove cotter pin 2 from shaft and slide parking brake shaft 3 with brake band off brake disk (to the right).

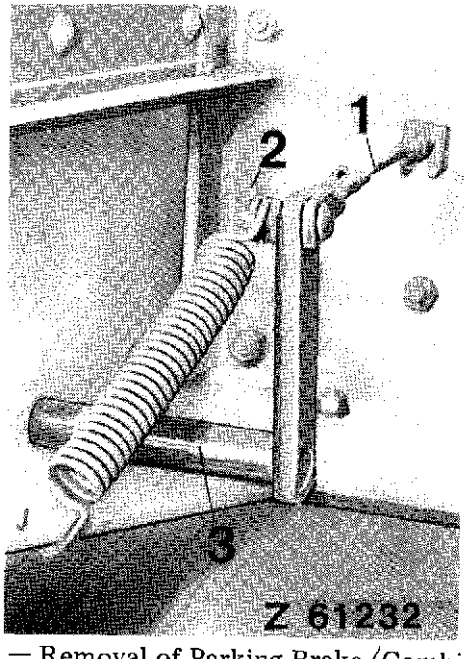

Fig. 28 — Removal of Parking Brake (Combines 925 and 935)

1 Parking brake bowden cable
2 Cotter pin
3 Parking brake shaft

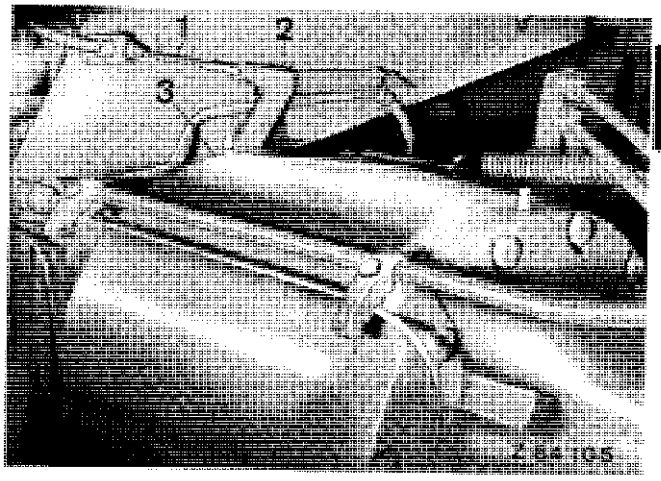

Fig. 29 — Removal of Parking Brake (Combine 945)

1 Parking brake bowden cable
2 Cotter pin
3 Parking brake shaft

Removal of parking brake on combine 945 is similar except the bowden cable 1 is installed inside the axle support bracket.

Remove cutting platform lift cylinder 4 (figs. 26 and 33) from support plates 5.

IMPORTANT: Plug hydraulic hose ends and cylinder fittings with plastic caps.

Raise combine by means of a trolley jack and support safely using stands 1 (fig. 30).

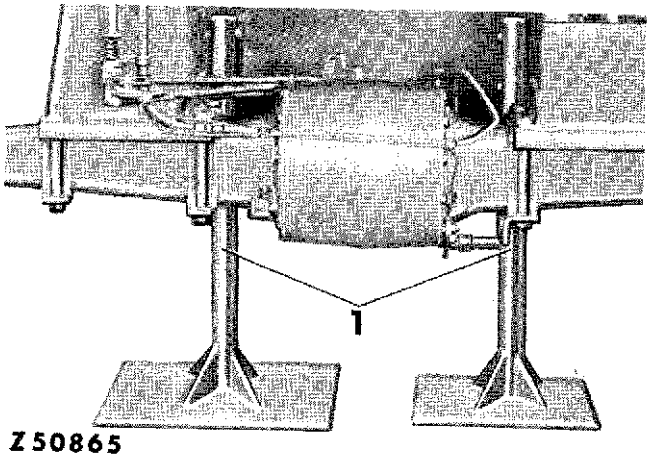

Fig. 30 — Combine Supported Safely (Combine 925 and 935)

1 Support stands

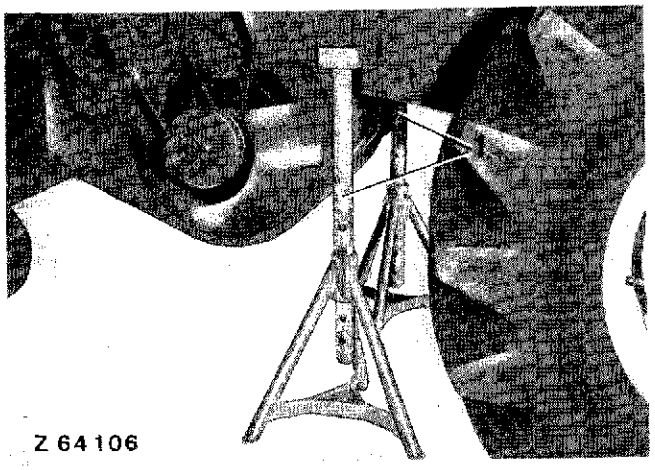

Fig. 31 — Combine Supported Safely (Combine 945)

1 Support stands

The support stands shown in figs. 30 and 31 can be made in your workshop (see Special Tools).

Remove the wheel nuts previously loosened and lift off front wheels.

Support transmission case using a trolley jack and mounting plate (see fig. 32). Manufacture mounting plate in your workshop (see Special Tools).

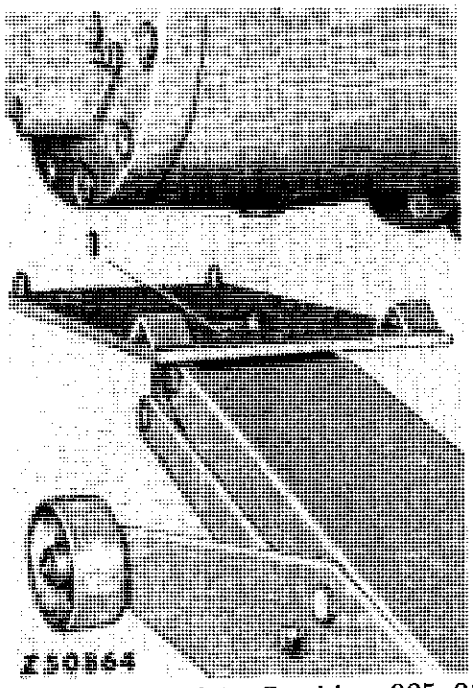

Fig. 32 — Mounting Plate, Combines 925, 935 and 945

1 Mounting plate on trolley jack

Remove hex. nuts from attaching cap screws 3 (fig. 26 and 33) between front axle and combine frame.

Remove lift cylinder support plates 5 and front axle support plates 6 (925 and 935 only).

The front axle, supported by the mounting plate and trolley jack, can be removed.

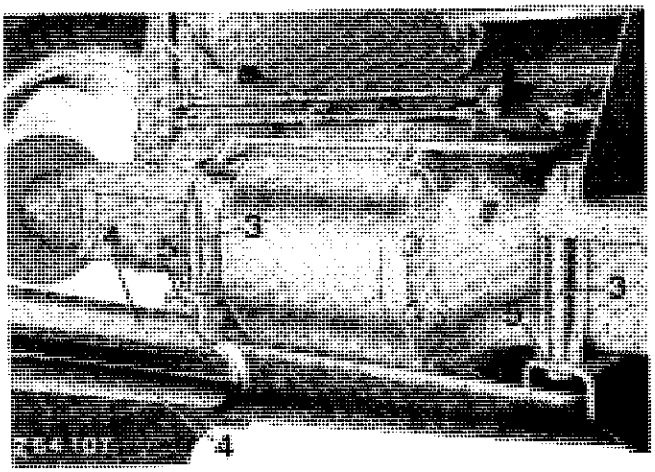

Fig. 33 — Front Axle before Removal (Combine 945)

3 Attaching cap screws
4 Cutting platform lift cylinder
5 Lift cylinder support plates

INSTALLATION

When installing the front axle, reverse removal procedure.

When front axle is installed, tighten cap screws attaching front axle to combine frame and front wheel nuts to the specified torque (see Torques for Hardware).

Bleed brakes (see section 70).

Check and adjust clutch pedal free travel if necessary (see operator's manual and section 50 of this technical manual).

Attach feeder house and cutting platform to combine.

Connect ground cable to negative (-) pole of battery.