4720 Forage Harvester

JOHN DEERE

TECHNICAL MANUAL

4720 Forage
Harvester

TM1312 (01SEP84) English

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LITHO IN U.S.A.
ENGLISH

4720 FORAGE HARVESTER

TECHNICAL MANUAL
TM-1312 (SEP-84)

CONTENTS

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.

Because John Deere sells its products world-wide, U.S. units of measure are shown wih their respective Metric equivalents throughtout this technical manual. These equivalents are the SI (International System) Units of Measure.

0A9; E03;;0000 B 200684

INTRODUCTION

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

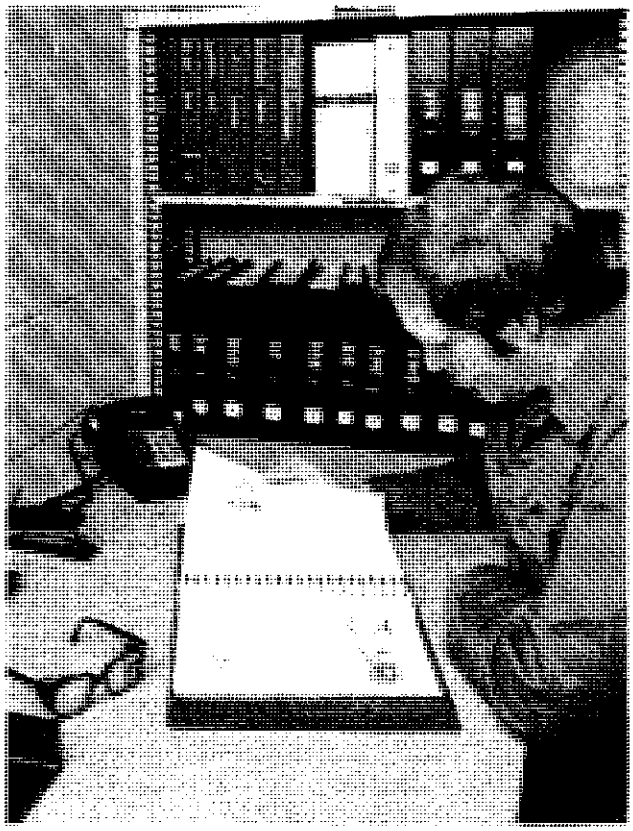
FOS Manuals — for reference

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 people 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.



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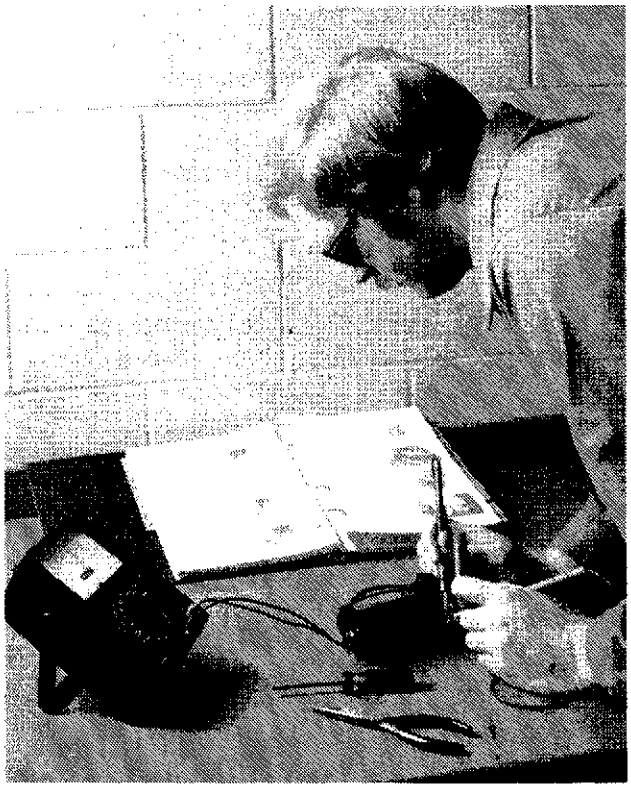
FEATURES OF THIS TECHNICAL MANUAL

- John Deere ILLUSTRATION format emphasizing more detailed pictures and fewer words.
- Instructions and illustrations grouped together in easy-to-use modules.
- Removal and installation groups preceding some repair groups. These groups show how to remove and install components from the machine rather than from major components. They also show how to acquire access to major components of a machine.
- *Exploded views showing parts relationship.*

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.



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Section 10
GENERAL

CONTENTS

OA9; E03;;1000 P 200684

OBSERVE SAFETY RULES

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


T27993N

Avoid loose clothing that can catch in moving parts and put you out of work.

Wear your safety glasses while on the job.

Avoid working on equipment with the engine running. If it is necessary to make checks with the engine running, ALWAYS USE TWO PEOPLE—with the operator, at the controls, able to see the person doing the checking. Also, put the transmission in neutral, set the brake, and apply safety locks provided. KEEP HANDS AWAY FROM MOVING PARTS.

Don't attempt to check belt tension while the engine is running.

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OBSERVE "IMPORTANT" MESSAGES

Messages labeled "Important" will appear in this manual and/or on the machine to provide specific instructions for performing adjustments, services, etc. If these instructions are not followed, it could result in damage to the machine.

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NOTES

The word NOTE is followed by a statement that identifies a qualification or exception to a previous statement. A "NOTE" may also identify nice-to-know information pertinant to, but not directly related to the previous statement.

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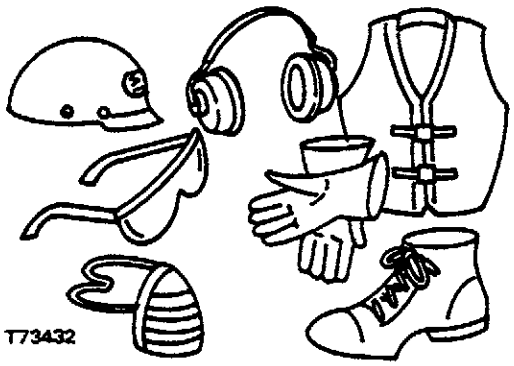
FOLLOW SAFE PRACTICES



Wear safety equipment.

Wear fairly tight clothing.

Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment.

Make sure the service area is adequately vented.

Periodically check the shop exhaust system for leakage. Engine exhaust gas is dangerous.

Be sure all electrical outlets and tools are properly grounded.

Use adequate light for the job at hand.

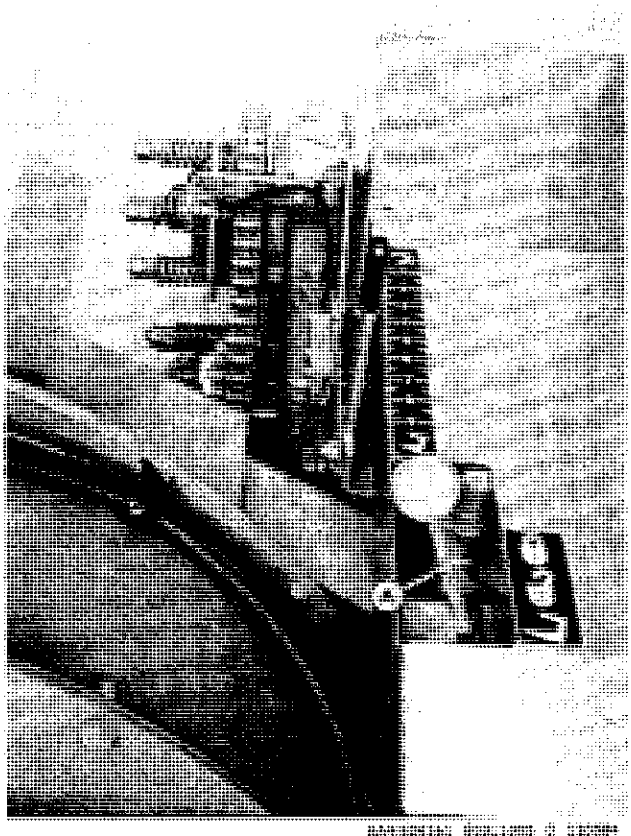
Use lifting equipment and safety stands which have adequate strength for the job being performed.

3FA;T73432 E01;1005 F 221182

Move cutterhead lock valve lever (A) to locked position before working on or around forage harvester with cutterhead in raised position.

Move cutterhead lock valve lever to locked position when transporting forage harvester with harvesting unit attached.

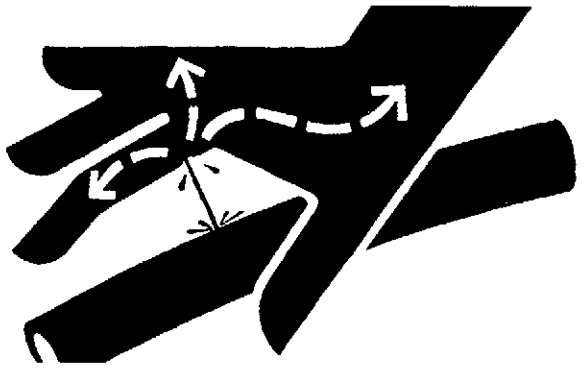
Move cutterhead lock valve lever to unlocked position when operating forage harvester in the field.



AVOID HIGH PRESSURE-FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.



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AVOID FIRE HAZARDS

Be prepared if an accident or fire should occur. Know where the first aid kit and the fire extinguishers are located and how to use them.

Don't smoke while refueling or handling highly flammable material.

Don't use open pans of gasoline or diesel fuel for cleaning parts. Use good commercial, nonflammable solvents.

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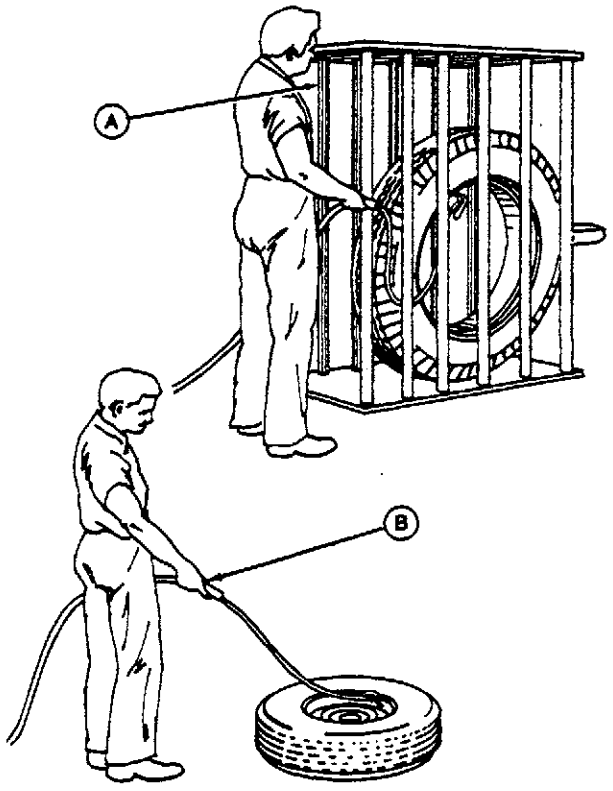
MOUNTING TIRES

Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death. Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job. Have it done by your John Deere dealer or a qualified tire repair service.

When sealing tire beads on rims, never exceed 35 psi or maximum inflation pressures specified by tire manufacturers for mounting tires. Inflation beyond this maximum pressure may break the bead, or even the rim, with dangerous explosive force. If both beads are not seated when the maximum recommended pressure is reached, deflate, reposition tire, relubricate bead, and reinflate.

Detailed agricultural tire mounting instructions, including necessary safety precautions, are contained in John Deere Fundamentals of Service (FOS) Manual 55, Tires and Tracks, available through your John Deere dealer. Such information is also available from the Rubber Manufacturers Association and from tire manufacturers.



A—Use a safety cage if available.
B—Do not stand over tire. Use a clip-on chuck and extension hose.

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DO NOT MODIFY MACHINE

Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

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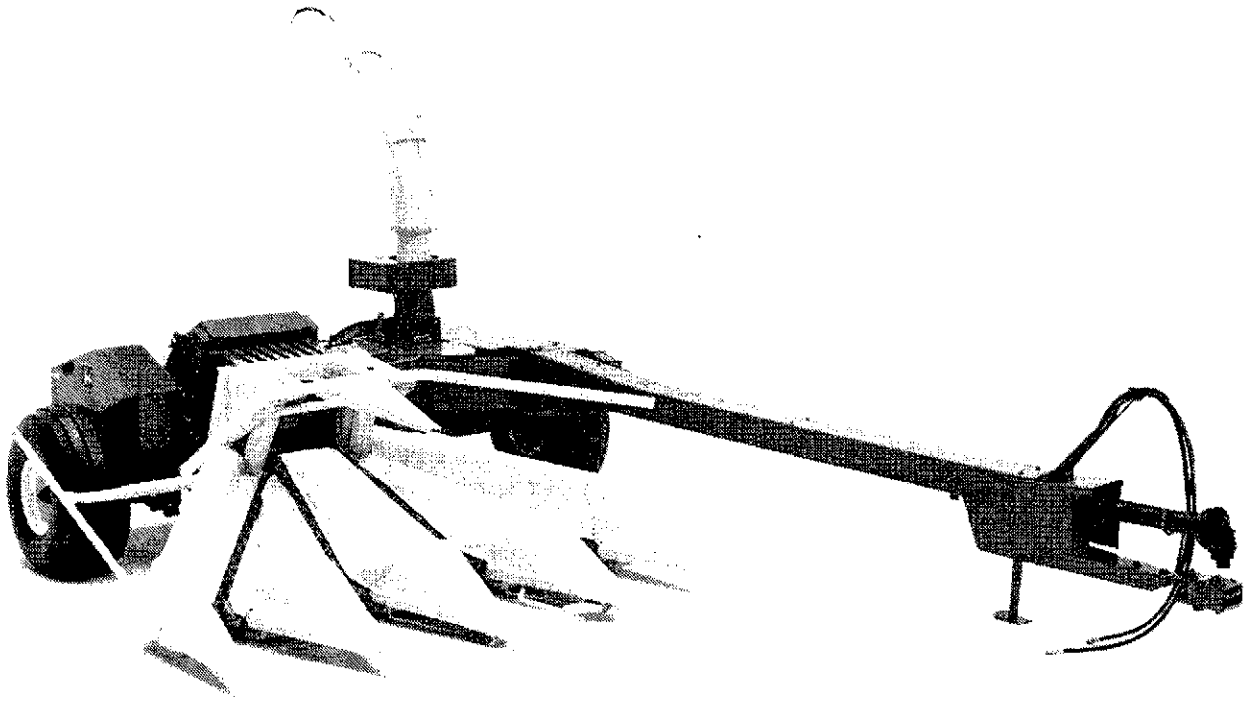
IDENTIFICATION VIEW



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DIMENSIONS

Overall width of basic machine less harvesting units . . . . . 3785 mm (12 ft. 5 in.)

HEIGHT

With basic spout . . . . . 2.7 m (9 ft.)

WEIGHT

(Less Harvesting Unit and Metal Detector) . . . . . 2876 kg (6340 lbs)

TIRE SIZE AND OPERATING PRESSURE

Standard: 16.5 -16.1, 8 Ply Rating

All Harvesting Units except

7 Ft. Hay Pickup. . . . . 28 psi (190 kPa) (1.9 bar)

7 Ft. Hay Pickup . . . . . 24 psi (170 kPa) (I.7 bar)

MINIMUM HYDRAULIC PRESSURE

Required . . . . . 1500 psi (10 340 kPa) (104 bar)

CUTTERHEAD

Diameter . . . . . 609.6 mm (24.00 in.)

Width . . . . . 576.6 mm (22.70 in.)

Number of knives 40

Knife type . . . . . Small, straight knife in helical pattern

Knife size . . . . . 148.4 x 84.9 mm (5.84 x 3.34 in.)

Speed . . . . . 850 rpm

Recutter screen

Sizes . . 12.8, 16, 19, 25.4, 38.1, 50.8, 70 mm (1/2, 5/8, 3/4, 1, 1-1/2, 2, 2-3/4 in.)

FEED ROLL DRIVE

Gear case. . . . . Enclosed

Shift . . . . . Electrohydraulic

FEED ROLLS AND HOUSING

Housing width . . . . . 558.8 mm (22.00 in.)

Feed roll rise . . . . . 177.8 mm (7.00 in.)

Feed roll opening . . . . . 993.00 cm^2 (154.00 $in.^2$)

Upper and lower feed roll protection . . . . . Slip Clutch

Length-of-cut . . . . . (With full set of knives) 5.6 to 13.7 mm (.22 to .54 in.) (With half set of knives) 11.2 to 27.4 mm (.44 to 1.08 in.)

BLOWER FAN

Number of blades 4

Diameter . . . . . 812.8 mm (32.00 in.)

Width . . . . . 177.8 mm (7.00 in.)

Speed . . . . . 1000 rpm (standard) 850 rpm (optional)

CONTROLS

Standard . . . . . Electrohydraulic

AUGER

Diameter . . . . . 279.4 mm (11.00 in.)

Speed . . . . . 833 rpm

Auger drive protection. . . . . Shear bolt

POWER TRAIN

Speed of tractor powershaft . . . . . 1000 rpm

Universal Joint . . . rated up to 224 kW (300 hp).

Horsepower rating . . . 1000 rpm -127 to 224 kW (170 up to 300 hp)

TYPES OF MATERIAL

Pickup Unit . . . . . Windrowed Crops

Row Crop . . . . . Corn, Cane, Sorghum, Maize

(Specifications and design are subject to change without notice.)

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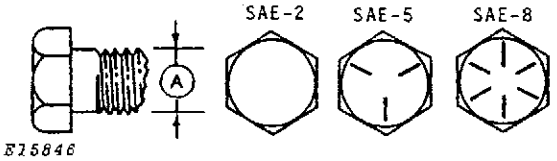
BOLT TORQUE CHARTS

The tables shown below give correct torque values for various bolts and cap screws. Check bolts periodically, using bolt torque chart as a guide.

U.S. MEASUREMENT

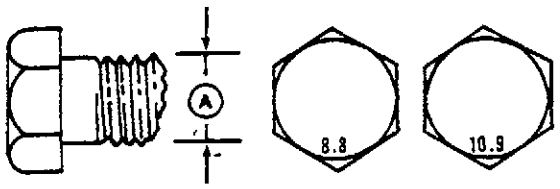
Bolt Diameter "A"	Bolt Torque in Lbs-Ft (N·m)					
	SAE 2		SAE 5		SAE 8	
1/4"	Not	Used	14	(10)	19	(14)
5/16"	Not	Used	27	(20)	41	(30)
3/8"	23	(31)	35	(47)	50	(68)
7/16"	35	(47)	55	(75)	80	(108)
1/2"	55	(75)	85	(115)	120	(163)
9/16"	75	(102)	130	(176)	175	(237)
5/8"	105	(142)	170	(231)	240	(325)
3/4"	185	(251)	300	(407)	425	(576)
7/8"	160	(217)	445	(603)	685	(929)
1"	250	(339)	670	(910)	1030	(1396)
1-1/4"	330	(450)	910	(1235)	1460	(1979)



Replace hardware with the same strength bolt.

METRIC MEASUREMENT

Bolt Diameter "A"	Bolt Torque in Lbs-Ft (N·m)			
	8.8		10.9	
5 mm	5	(6)	7	(9)
6 mm	9	(11)	13	(17)
8 mm	20	(28)	30	(40)
10 mm	40	(55)	59	(80)
12 mm	70	(95)	103	(140)
16 mm	173	(235)	258	(350)
20 mm	350	(475)	498	(675)
24 mm	608	(825)	863	(1170)
30 mm	1201	(1630)	1712	(2320)



NOTE: Bolts having lock nuts should be torqued to approximately 65% of amounts shown in above chart.

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CAUTION: Do not clean, lubricate, or adjust machine while it is in motion.

IMPORTANT: The lubrication period recommended is based on normal conditions. Severe or unusual conditions may require more frequent lubrication or oil changes.

See operator's manual for detailed instructions.

Clean grease fittings before using grease gun. Replace any lost or broken fittings immediately. If a new fitting fails to take grease, remove it and check for failure of adjoining parts.

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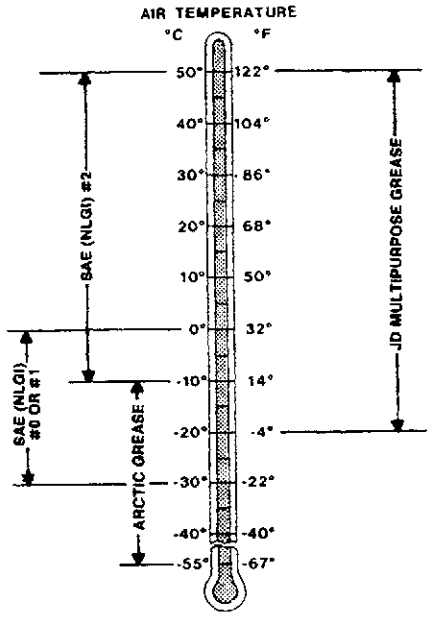
GENERAL PURPOSE GREASE

Depending upon the expected air temperature range during the service interval, use grease as shown on the adjoining temperature chart.

John Deere Multipurpose Grease is recommended. If other greases are used, use:

—SAE Multipurpose Grease
—SAE Multipurpose Grease containing 3 to 5 per cent molybdenum disulfide.

At temperatures below —30°C (—22°F), use arctic greases such as those meeting Military Specification MIL-G-10924C.



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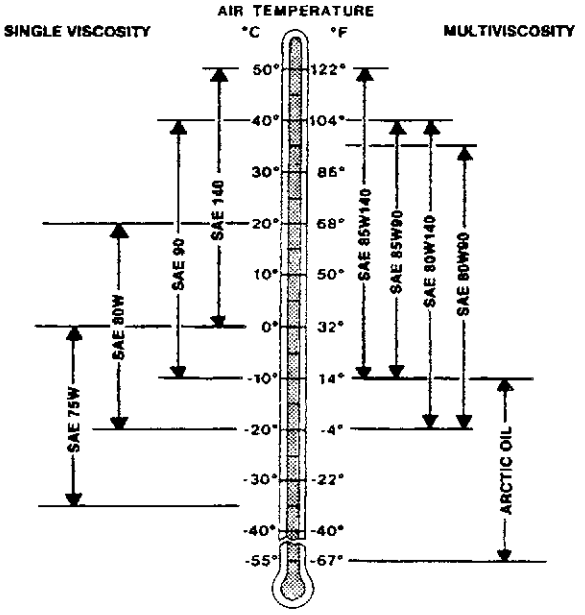
GEAR CASE OIL

Depending upon the expected air temperature range during the drain interval, use oil viscosity shown in the temperature chart.

John Deere API GL-5 Gear oil is recommended. If other oils are used, they must be oils meeting the following requirements:

—API Service Classification GL-5
—Military Specification MIL-L-2105B
—Military Specification MIL-L-2105C

At temperatures below —35°C (—31°F), use arctic oils such as those meeting Military Specification MIL-L-10324A.



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HYDRAULIC OIL

Use John Deere All-Weather Hydrostatic Fluid or Type "F" automatic transmission fluid.

9FA; E01;1020 J 221182

ALTERNATIVE LUBRICANTS

Conditions in certain geographical areas may require special lubricants and lubrication practices which do not appear in this manual. If you have any questions, consult your John Deere dealer to obtain the latest information and recommendations.

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DIAGNOSING MALFUNCTIONS

The majority of operating problems that occur with the pull-type harvester can be traced to improper adjustment or delayed service. The following examples are designed to illustrate a problem, show the possible cause, and the possible solution.

These examples should be applied with caution. Make certain the source of the problem is not located someplace other than where the problem exists. A thorough understanding of the harvester is a must if operating problems are to be corrected satisfactorily.

ORGANIZING THE DIAGNOSIS

1. Know the Machine.

Study this manual to know how the individual components work and their function in the overall system. Keep up with the latest service information. Read it and store it in a handy reference file.

2. Consult the Operator.

Ask the operator how the unit was performing when the problem occurred. Find out if any corrective measures were already taken. Ask if the machine was serviced regularly as prescribed in the operator's manual.

3. Operate the Machine.

If the machine can be safely operated, see for yourself how it malfunctions -don't completely rely on the operator's diagnosis.

4. Inspect the Machine.

Visually check the machine. Look at the components for any cracked welds, loose hardware, damaged linkages, worn or broken lines, or anything that looks out of the ordinary.

5. List the probable causes.

Write down the information you have learned by steps 1 through 4. What are the signs you found while inspecting the machine and what are the most probable causes as outlined under "Diagnosing"?

6. Reach Some Conclusions.

Look over the possible causes and decide which ones are the most likely. Reach your decision on the most probable cause and plan to check it first.

7. Test Your Conclusions.

Before disassembling any components, test your conclusions to see which are correct. Tests narrow the possibilities and soon the actual cause will be pinpointed.

8. Check Troubleshooting Section

Go to the section of the Technical Manual applicable to the problem. There is a troubleshooting group in each section.

OA9; E03;;1020 M 200684

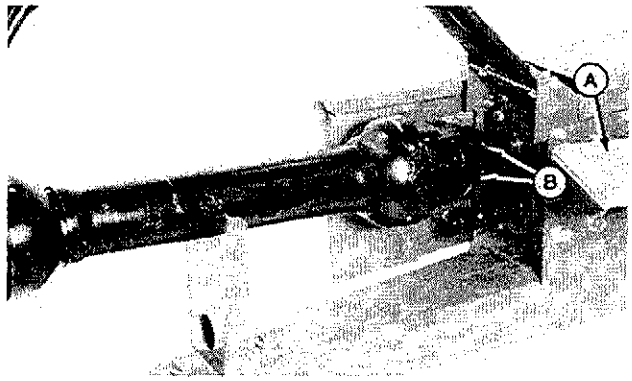
Section 20
DRIVE TRAIN

6FA; E03;;2000 A 200684

REMOVE TRACTOR DRIVELINE

CAUTION: Driveline is heavy. Support driveline well before removing from machine.

1. Open shield (A) as shown.
2. Release quick-lock pins (B) and pull driveline off machine.



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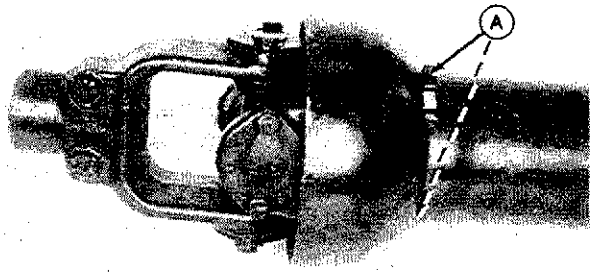
DISASSEMBLE TRACTOR DRIVELINE

1. Separate halves of tractor driveline.
2. Remove shield bearing halves.



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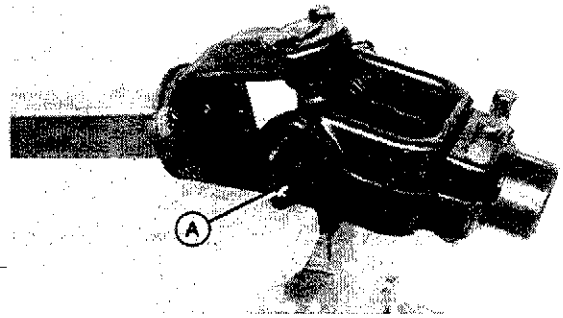
3. Remove grease fittings from bearing journals.
4. Bend tabs on lock strap (A) and remove cap screws holding bearing cup to yoke.



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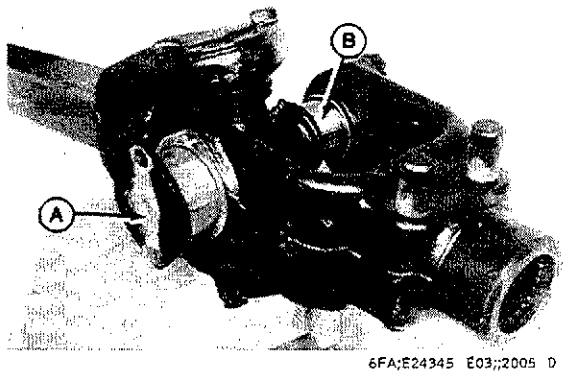
5. With yoke in vise, strike yoke with hammer to remove bearing cups. Repeat striking yoke until bearing cups (A) can be removed. Remove journal (B) from yoke.



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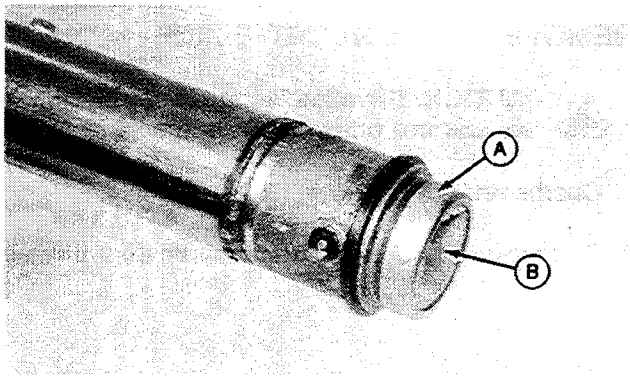
6. Using a drill, remove stake from cap (A). Unscrew cap (A) from tube.

7. Remove sleeve insert (B).



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INSPECT TRACTOR DRIVELINE

Inspect parts for wear and/or breakage.

Inspect tractor driveline for straightness. Remove driveline shields. Install driveline on tractor and forage harvester. Measure total indicator reading (TIR) at three places:

1. Front yoke at shaft shield bearing groove. Maximum allowable TIR is 0.025-in.

2. Rear yoke at tube shield bearing groove. Maximum allowable TIR is 0.025-in.

3. Rear yoke with tube between center shield bearing and weld joints. Maximum allowable TIR is 0.050-in.

Replace or straighten driveline if TIR is higher than the maximum allowable.

CAUTION: Be sure to install shields after checking TIR.

Inspect shields for damage. Insure that shields will telescope together.

Replace sleeve inserts, tube cap, bearing journals and needle bearings.

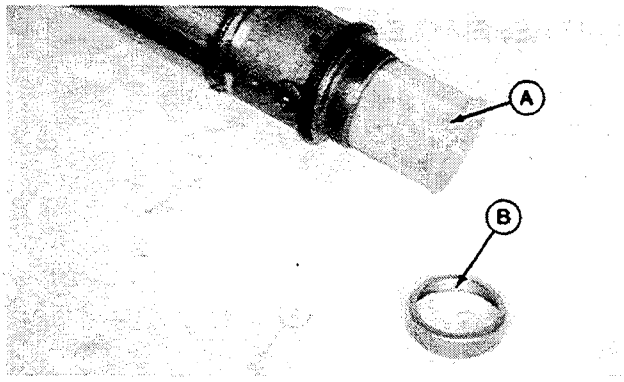
6FA; E03;;2005 F 150584

INSTALL SLEEVE INSERT IN TUBE

1. Install new sleeve insert (A) in tube.

2. Install new cap (B) on tube.

3. Tighten securely by hand. Stake cap to tube in staked area of tube.



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INSTALL JOURNAL AND BEARINGS IN YOKE

1. Place yoke in vise. Install new journal in yoke.

2. Coat needle bearings in bearing cup with grease. Install bearing cups into yoke.

3. Install lock strap and cap screws.

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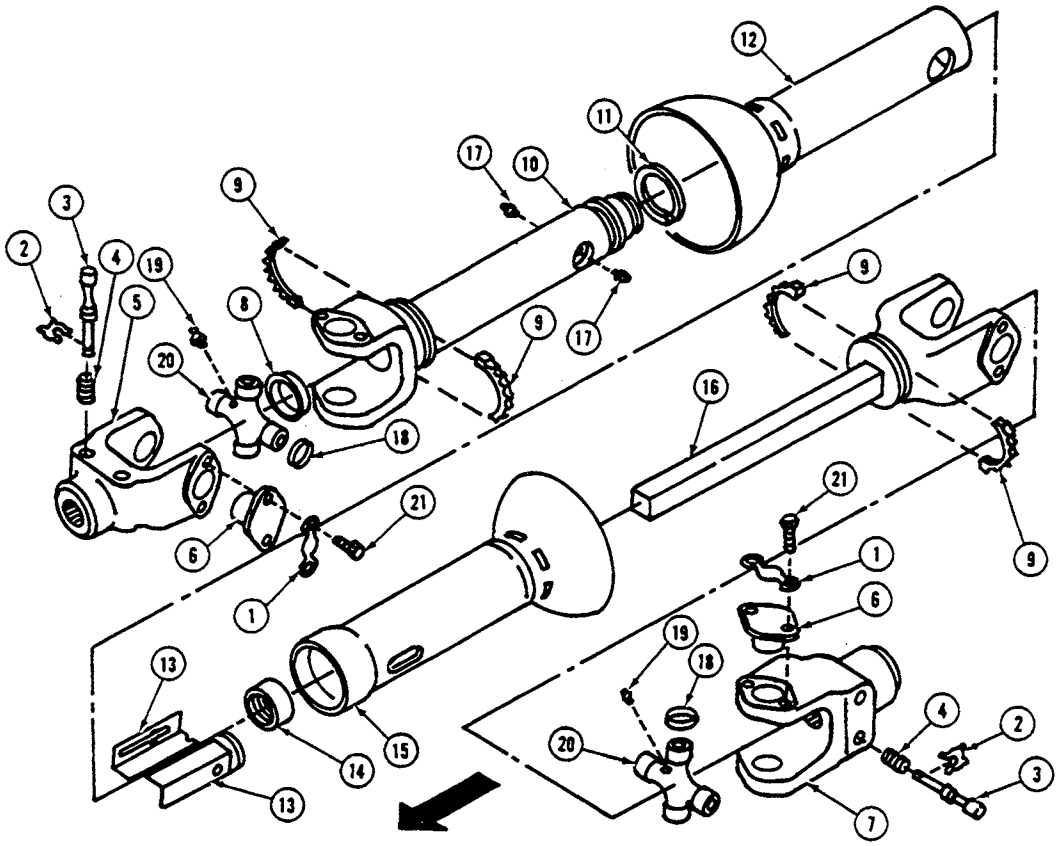
REASSEMBLE TRACTOR DRIVELINE



1—Lock Strap
2—Retainer Clip
3—Lock Pin
4—Spring
5—Yoke
6—Bearing Cup
7—Yoke
8—Plug
9—Shield Bearing Half
10—Yoke With Tube
11—Shield Support Bearing
12—Inner Shield
13—Sleeve Insert
14—Cap
15—Outer Shield
16—Yoke With Shaft
17—Grease Fitting
18—Washer
19—Grease Fitting
20—Journal

1. Assemble sleeve insert and bearing journals.

2. Install shields on yoke with tube and yoke with shaft.

3. Secure shields with shield bearing halves. Install shield bearing halves in direction shown.

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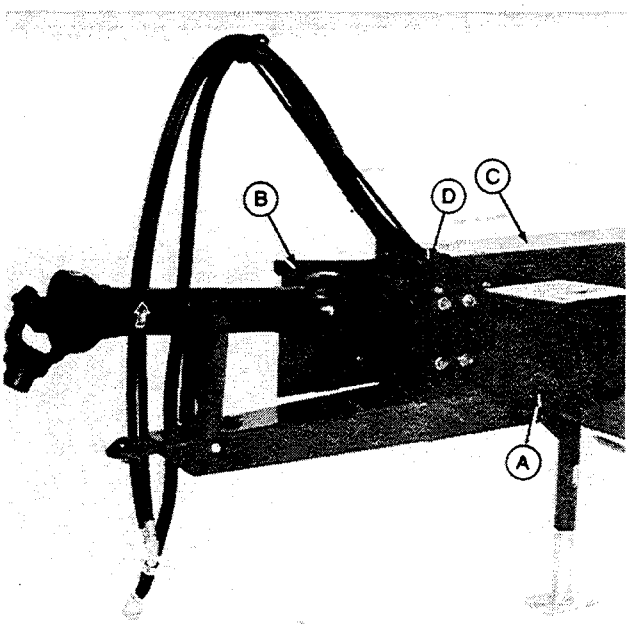
REMOVE REVERSE DRIVE GEAR CASE

1. Open left-hand shield (A). Remove right-hand shield (B).
2. Remove tractor driveline.
3. Remove powerline cap (C).
4. Remove hose holder bracket (D).

A—Left-Hand Shield
B—Right-Hand Shield
C—Powerline Cap
D—Hose Holder Bracket



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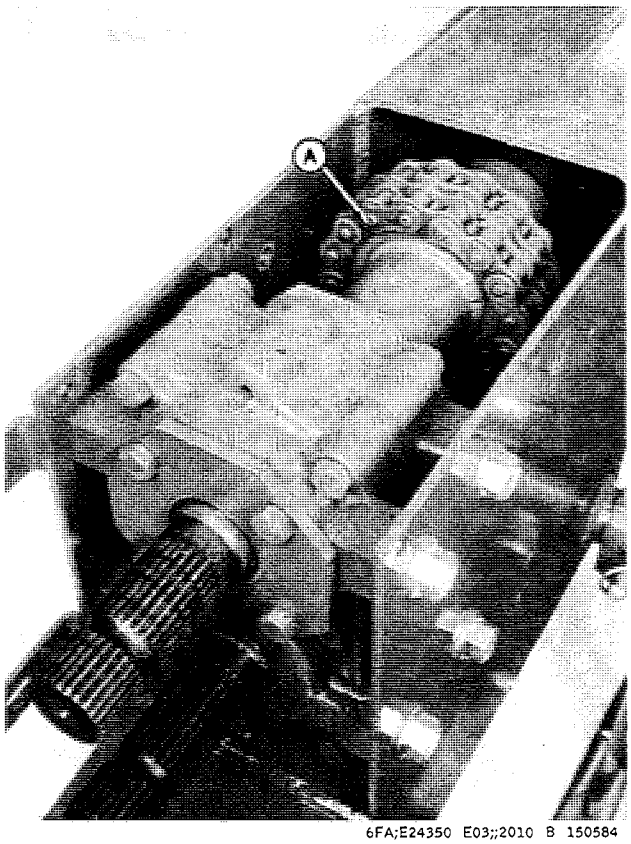
5. Remove double chain (A).
6. Remove gear case and sprocket.
7. Remove sprocket from shaft.



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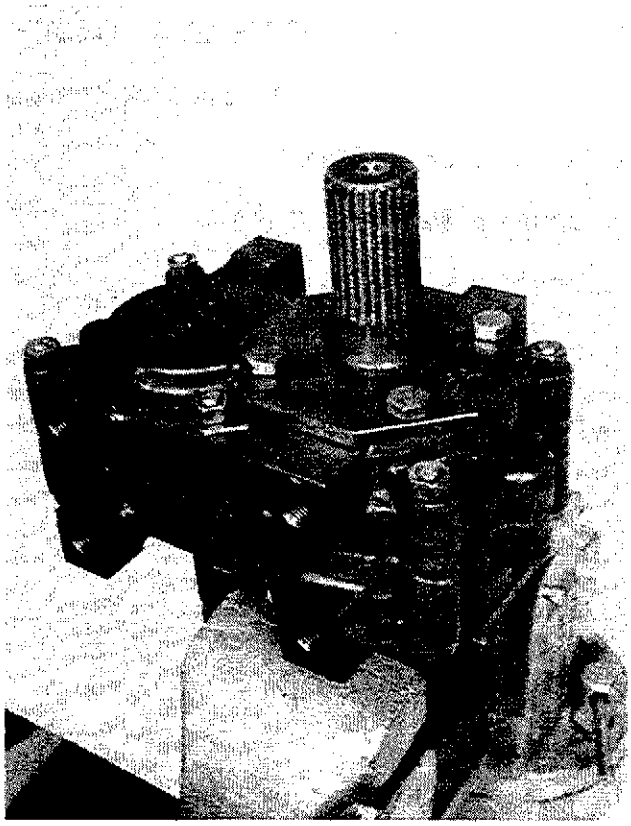
DISASSEMBLE REVERSE DRIVE GEAR CASE

1. Remove cap screws.
2. Separate gear case.



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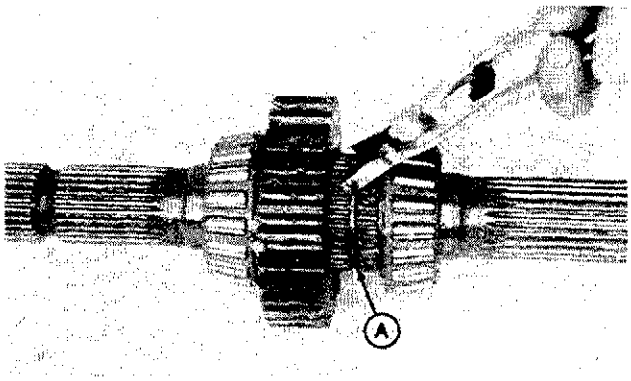
3. Remove shafts with gears from gear case.
4. Remove snap ring (A).



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