

1600 Mower-Conditioner

**John Deere Ottumwa Works
TM1474 (15JAN02)**

LITHO IN U.S.A.
ENGLISH

Introduction

FOREWORD

This manual is written for an experienced technician. Essential tools required in performing certain service work are identified in this manual and are recommended for use.

Live with safety: Read the safety messages in the introduction of this manual and the cautions presented throughout the text of the manual.

CAUTION: This is the safety-alert symbol. When you see this symbol on the machine or in this manual, be alert to the potential for personal injury.

Technical manuals are divided in two parts: repair and diagnostics. Repair sections tell how to repair the components. Diagnostic sections help you identify the majority of routine failures quickly.

Information is organized in groups for the various components requiring service instruction. At the beginning of each group are summary listings of all applicable essential tools, service equipment and tools, other materials needed to do the job, service parts kits, specifications, wear tolerances, and torque values.

Binders, binder labels, and tab sets can be ordered by John Deere dealers direct from the John Deere Distribution Service Center.

This manual is part of a total product support program.

FOS MANUALS—REFERENCE

TECHNICAL MANUALS—MACHINE SERVICE

COMPONENT MANUALS—COMPONENT SERVICE

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

Technical Manuals are concise guides for specific machines. Technical manuals are on-the-job guides containing only the vital information needed for diagnosis, analysis, testing, and repair.

Component Technical Manuals are concise service guides for specific components. Component technical manuals are written as stand-alone manuals covering multiple machine applications.



-JUN-24-JUL89
E33399

EX, TM1474, IFC -19-26APR93

Dealer Presentation Sheet

JOHN DEERE DEALERS

IMPORTANT: Please remove this page and route through your service department.

This is a complete revision for TM1474, 1600 Mower-Conditioner.

Listed below is a brief explanation of what was changed.

1. The information on the double overlap cutterbar.
2. The information on the diagnostic procedure for the platform hydraulic drive system.
3. The procedure for installing bushings in the wheel drops.
4. The repair and adjustment of the conditioner roll drive.
5. The repair and adjustment of the platform auger drive.
6. The repair of the knife drive case.

EX,TM1474,DLR -19-26APR93

Dealer Presentation Sheet

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All information, illustrations and specifications in this 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.

TM1474-19-15JAN02

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Previous Editions
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HANDLE FLUIDS SAFELY—AVOID FIRES

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.



DX,FLAME -19-04JUN90

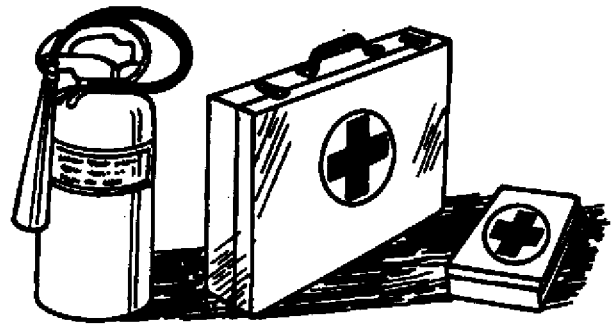
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TS227

PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



DX,FIRE2 -19-03MAR93

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TS291

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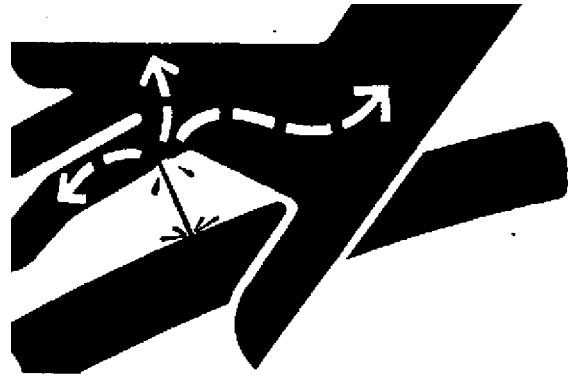
AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



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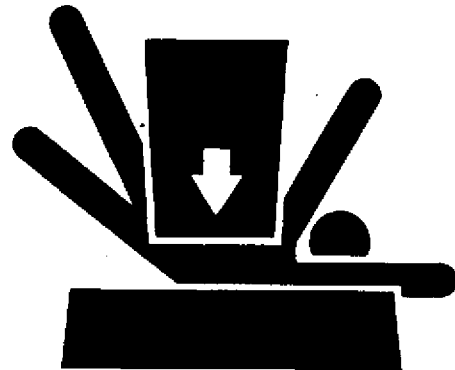
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DX,FLUID -19-03MAR93

SUPPORT MACHINE PROPERLY

Always lower the attachment or implement to the ground before you work on the machine. If you must work on a lifted machine or attachment, securely support the machine or attachment.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.



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DX,LOWER -19-04JUN90

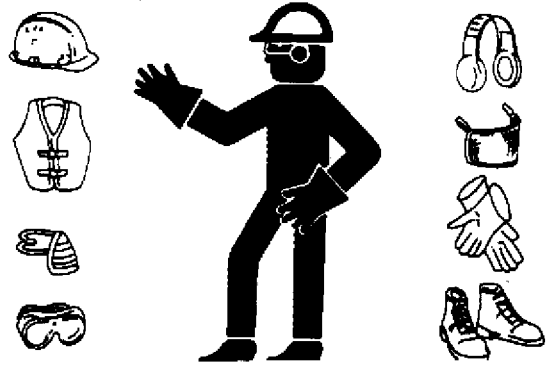
WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



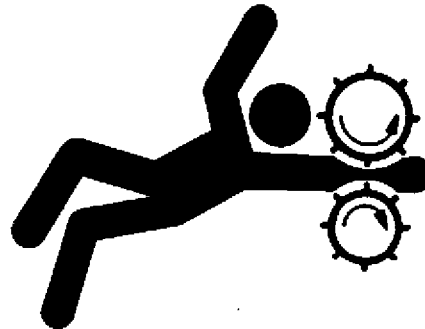
DX,WEAR -19-10SEP90

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-UN-23AUG88
TS206

SERVICE MACHINES SAFELY

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



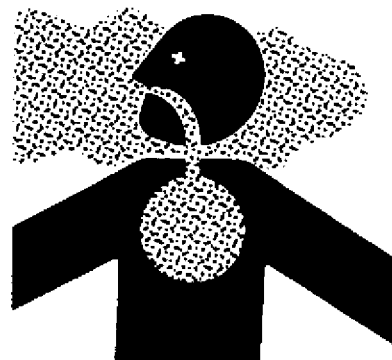
DX,LOOSE -19-04JUN90

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TS228

WORK IN VENTILATED AREA

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

If you do not have an exhaust pipe extension, open the doors and get outside air into the area.



DX,AIR -19-04JUN90

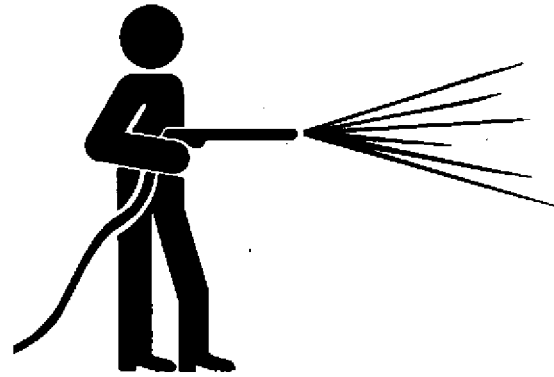
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WORK IN CLEAN AREA

Before starting a job:

- Clean work area and machine.
- Make sure you have all necessary tools to do your job.
- Have the right parts on hand.
- Read all instructions thoroughly; do not attempt shortcuts.



DX,CLEAN -19-04JUN90

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REMOVE PAINT BEFORE WELDING OR HEATING

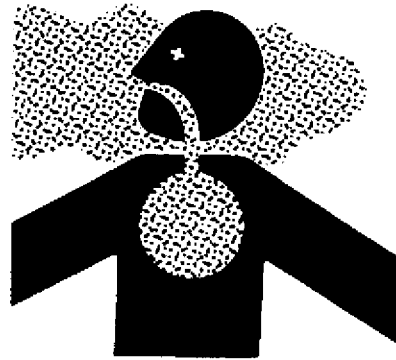
Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



DX,PAINT -19-03MAR93

TS220 -UN-23AUG88

AVOID HEATING NEAR PRESSURIZED FLUID LINES

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.



DX,TORCH -19-03MAR93

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ILLUMINATE WORK AREA SAFELY

Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

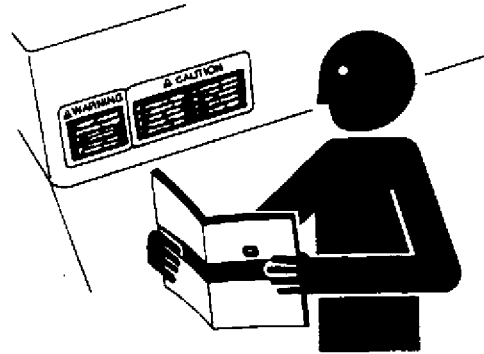


DX,LIGHT -19-04JUN90

TS223 -UN-23AUG88

REPLACE SAFETY SIGNS

Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.



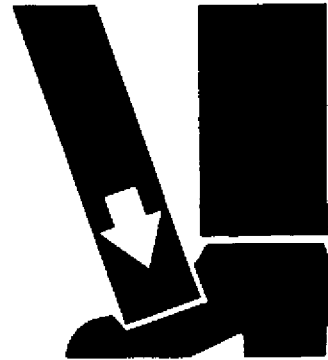
DX,SIGNS1 -19-04JUN90

TS201 -UN-23AUG88

USE PROPER LIFTING EQUIPMENT

Lifting heavy components incorrectly can cause severe injury or machine damage.

Follow recommended procedure for removal and installation of components in the manual.



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SERVICE TIRES SAFELY

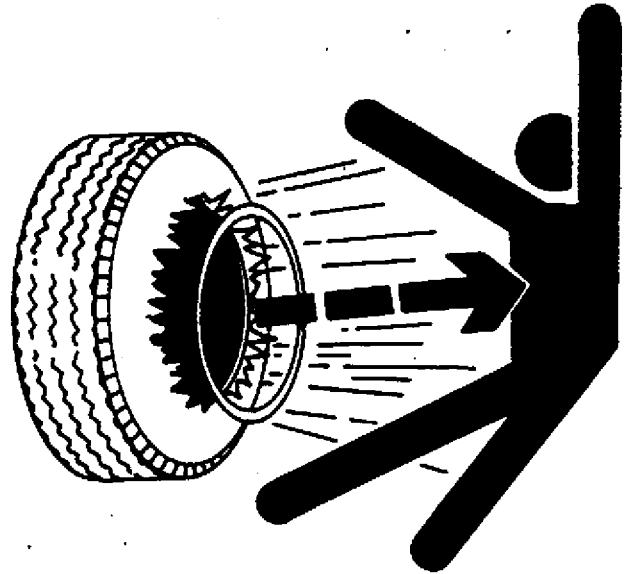
Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.



-UN-23AUG88

TS211

DX,RIM -19-24AUG90

SERVICE TIRES SAFELY

Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.



-UN-12APR90

TS952

DX,TIRECP -19-24AUG90

PRACTICE SAFE MAINTENANCE

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.



-UN-23AUG88

TS218

DX,SERV -19-03MAR93

USE PROPER TOOLS

Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards.

Use power tools only to loosen threaded parts and fasteners.

For loosening and tightening hardware, use the correct size tools. DO NOT use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches.

Use only service parts meeting John Deere specifications.



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TS779

DX,REPAIR -19-04JUN90

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DISPOSE OF WASTE PROPERLY

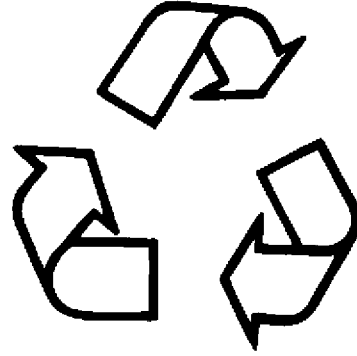
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.



TS1133 -UN-26NOV90

DX,DRAIN -19-03MAR93

LIVE WITH SAFETY

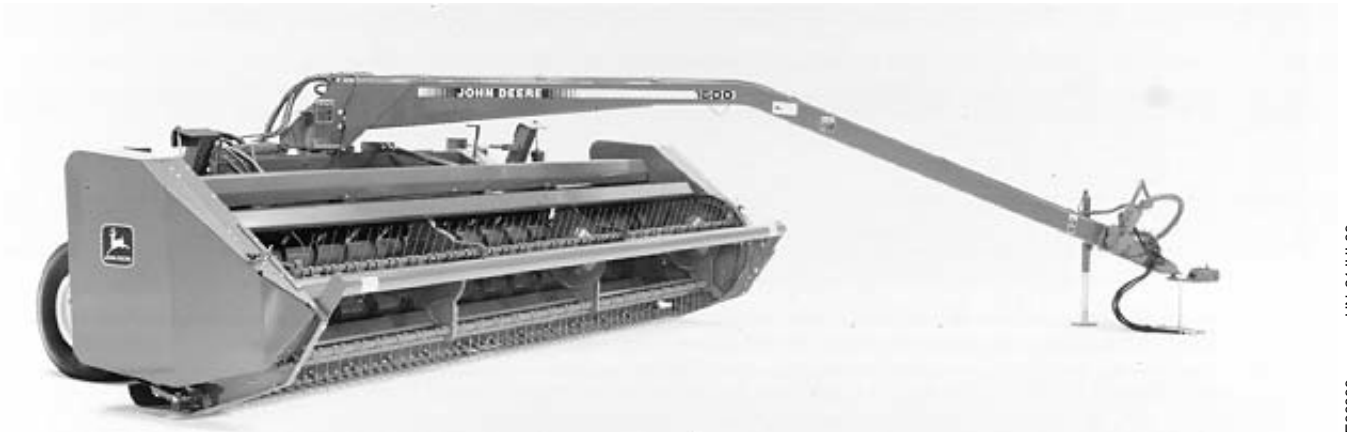
Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.



TS231 -19-07OCT88

DX,LIVE -19-25SEP92

MACHINE DESCRIPTION



The John Deere 1600 Mower-Conditioner is a mid-pivot design which allows cutting back-and-forth or around the field. Machine raise and swing are controlled by tractor hydraulics, and a PTO hydrostatic pump drives the power train. The platform

consists of a reel, a cutterbar with a timed dual knife, and two augers to deliver crop to the conditioner rolls. The size of the windrow is controlled by forming shields with an adjustable swath flap.

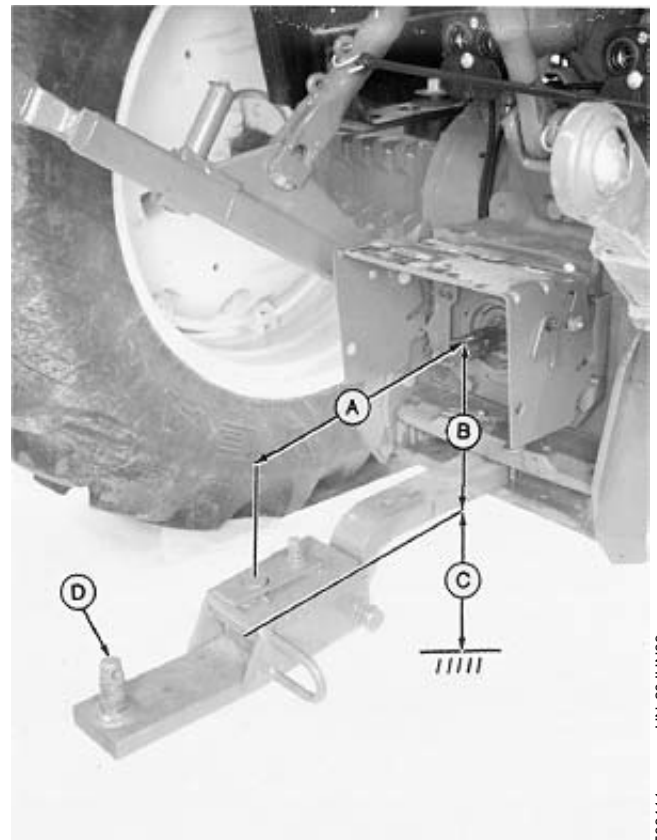
EX,1474,1010,A -19-26APR93

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TRACTOR REQUIREMENT

The tractor must have a minimum of 70 PTO horsepower and can be equipped with a 540 or 1000 rpm shaft. Dual selective control valves with 13790 kPa (138 bar) (2000 psi) are required to operate the hydraulics. The drawbar attachment hitch must be set to the following dimensions:

- A—356 mm (14-in.)
540 rpm
406 mm (16-in.)
1000 rpm
- B—152 to 305 mm
(6 to 12 in.)
- C—330 to 508 mm
(13 to 20 in.)
To Ground
- D—Equal Angle Hitch

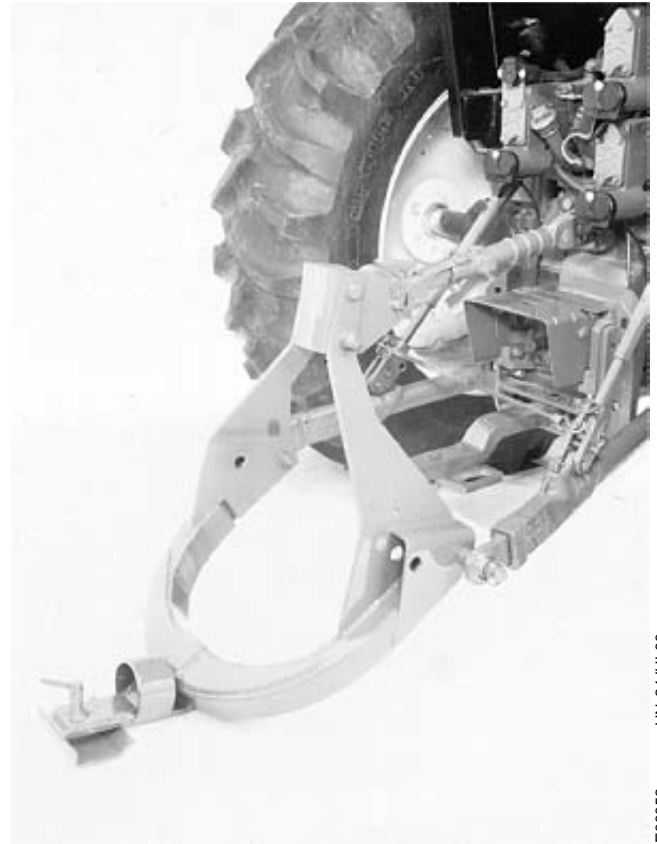


EX,1474,1010,B -19-26APR93

E33411 -UN-20-JUN89

THREE-POINT HITCH

The three-point hitch allows shorter turns and makes the machine more maneuverable. The hitch can be used with Category 2 and 3N three-point hitches and quick couplers. When the hitch is installed, parts are included to extend the hydrostatic pump and hydraulic hoses to the tractor.



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-UN-24JUL89

EX,1474,1010,C -19-26APR93

MACHINE SPECIFICATIONS

OPERATING SPEED	9.7 km/h (Up to 6 mph)
CUTTING HEIGHT	—51 to 483 mm (—2 to 19 in.)
WIDTH OF CUT:	
12-Ft (3.66 m) Platform	3.73 m (12 ft 3 in.)
14-Ft (4.27 m) Platform	4.34 m (14 ft 3 in.)
16-Ft (4.88 m) Platform	4.95 m (16 ft 3 in.)
WINDROW WIDTH:	
(Depending on crop conditions)	1.02 to 2.74 m (40 in. to 9 ft)
TRANSPORTING WIDTH:	
12 Ft (3.66 m) Platform	4.22 m (13 ft 10-1/4 in.)
14 Ft (4.27 m) Platform	4.83 m (15 ft 10-1/4 in.)
16 Ft (4.88 m) Platform	5.44 m (17 ft 10-1/4 in.)
HEIGHT (Transport)	1.98 m (6 ft 6 in.)
LENGTH:	
12-Ft and 14-Ft (3.66 m and 4.27 m) Platforms	6.50 m (21 ft 3-1/2 in.)
16 Ft (4.88 m) Platforms	7.25 m (23 ft 9-1/2 in.)
WEIGHT:	
With 12-Ft (3.66 m) Platform	2270 kg (5000 lb)
With 14-Ft (4.27 m) Platform	2450 kg (5400 lb)
With 16-Ft (4.88 m) Platform	2630 kg (5800 lb)
CUTTERBAR	
Guards	Timed dual knife Heavy-duty, double-forged steel Non-clogs (optional)
Guard Angle	6° to 12°
Knives (Chrome)	Overserrated
Speed	1764 strokes per minute
Type Drive	Enclosed, running in oil
REEL:	
Adjustable	Up and down, fore and aft
Diameter	1067 mm (42 in.)
Drive	V-belt with spring-loaded idler
Speed: Variable	66 to 80 rpm
Tooth Bars	4 Standard and 5 (optional)

EX,1474,1015,A -19-26APR93

AUGERS:

Upper Auger Diameter	229 mm (9 in.)
Lower Auger Diameter	292 mm (11.5 in.)
Drive	V-Belt and 50 Chain
Speed	392 rpm lower; 430 rpm upper

CONDITIONER ROLLS Urethane, intermittent cleat, intermeshing

Diameter	254 mm (10 in.)
Speed	643 rpm
Length	2794 mm (110 in.)
Drive	No. 60 O-ring roller chain

WHEELS:

Tire Size and Tire Inflation Pressure:

3.66 m (12-Ft) Platform	11L x 14-6 Ply 193 kPa (28 psi) (1.9 bar)
-------------------------------	--

4.27 and 4.88 m (14-Ft and 16-Ft) Platforms	31L x 13.5 x 15-6 PR 207 kPa (30 psi) (2.1 bar)
---	--

RESERVOIR CAPACITY:

3.66 m and 4.27 m (12-Ft and 14-Ft) Platforms	94.6 L (25 gal)
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4.88 m (16-Ft) Platform	102.2 L (27 gal)
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POWER TAKE-OFF SPEED 540 rpm or 1000 rpm (1-3/8 in. only)

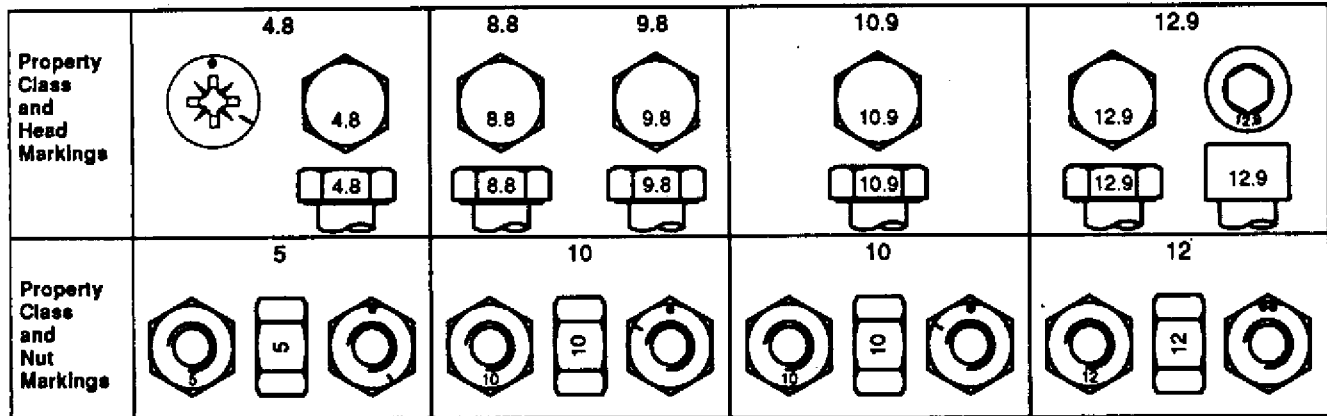
RECOMMENDED TRACTOR 52.5 kW (70 hp) or larger

TRACTOR HYDRAULIC PRESSURE TO LIFT PLATFORM 13 790 kPa (138 bar) (2000 psi)

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

EX,1474,1015,B -19-29JAN92

METRIC BOLT AND CAP SCREW TORQUE VALUES



Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	225	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original.

^a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.












Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

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TS1163 -19-04MAR91

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES

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15
4

SAE Grade and Head Markings	NO MARK	1 or 2 ^b 	5 	5.1 	5.2 	8 	8.2 
	NO MARK	2 	5 	5 	8 	8 	

TS1162 -19-04MAR91

Size	Grade 1				Grade 2 ^b				Grade 5, 5.1, or 5.2				Grade 8 or 8.2			
	Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a		Lubricated ^a		Dry ^a	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	215	160	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	470	300	510	375	470	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

^a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

^b Grade 2 applies for hex cap screws (not hex bolts) up to 152 mm (6-in.) long. Grade 1 applies for hex cap screws over 152 mm (6-in.) long, and for all other types of bolts and screws of any length.

TIGHTEN O-RING FITTINGS*

1. Inspect O-ring and seat for dirt or obvious defects.
2. On angle fittings, back the lock nut off until washer bottoms out at top of groove.
3. Hand tighten fitting until backup washer or washer face (if straight fitting) bottoms on face and O-ring is seated.
4. Position angle fittings by unscrewing no more than one turn.
5. Tighten straight fittings to torque shown.
6. Tighten angle fittings to torque shown while holding the body of fitting with a wrench.

Thread Size (in.)	Nut Size Across Flats (in.)	Torque Value*		Recommended Turns To Tighten (After Finger Tightening)	
		(N·m)	(lb-ft)	(Flats)	(Turns)
3/8	1/2	8	6	2	1/3
7/16	9/16	12	9	2	1/3
1/2	5/8	16	12	2	1/3
9/16	11/16	24	18	2	1/3
3/4	7/8	46	34	2	1/3
7/8	1	62	46	1-1/2	1/4
1-1/16	1-1/4	102	75	1	1/6
1-3/16	1-3/8	122	90	1	1/6
1-5/16	1-1/2	142	105	3/4	1/8
1-5/8	1-7/8	190	140	3/4	1/8
1-7/8	2-1/8	217	160	1/2	1/12

* The torque values shown are based on lubricated connections as in reassembly.

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E33508 -19-21AUG89

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TIGHTEN FLARE TYPE TUBE FITTINGS

1. Check flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tightening.
3. Lubricate connection and hand tighten swivel nut until snug.
4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second, tighten the swivel nut to the torque shown in this chart.

Tube Size OD (in.)	Nut Size Across Flats (in.)	Torque Value*		Recommended Turns To Tighten (After Finger Tightening)	
		(N·m)	(lb·ft)	(Flats)	(Turns)
3/16	7/16	8	6	1	1/6
1/4	9/16	12	9	1	1/6
5/16	5/8	16	12	1	1/6
3/8	11/16	24	18	1	1/6
1/2	7/8	46	34	1	1/6
5/8	1	62	46	1	1/6
3/4	1-1/4	102	75	3/4	1/8
7/8	1-3/8	122	90	3/4	1/8

* The torque values shown are based on lubricated connections as in reassembly.

EX,1474,1015,D -19-25MAR92

E33509 -19-21AUG89

HYDROSTATIC DRIVE OIL

Use oil viscosity based on the expected air temperature range during the period between oil changes.

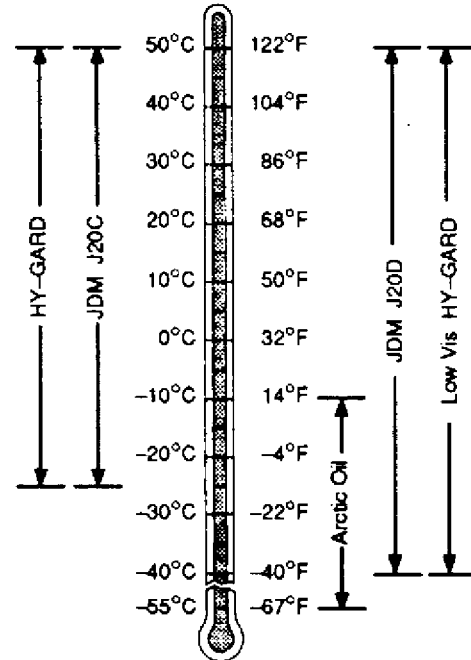
The following oils are preferred:

- John Deere HY-GARD®
- John Deere Low Viscosity HY-GARD®

Other oils may be used if they meet one of the following:

- John Deere Standard JDM J20C
- John Deere Standard JDM J20D

Oils meeting Military Specification MIL-L-46167B may be used as arctic oils.



DX.HYOIL -19-11JUN92

TS1414 -UN-29MAY92

GREASE

Use grease based on the expected air temperature range during the service interval.

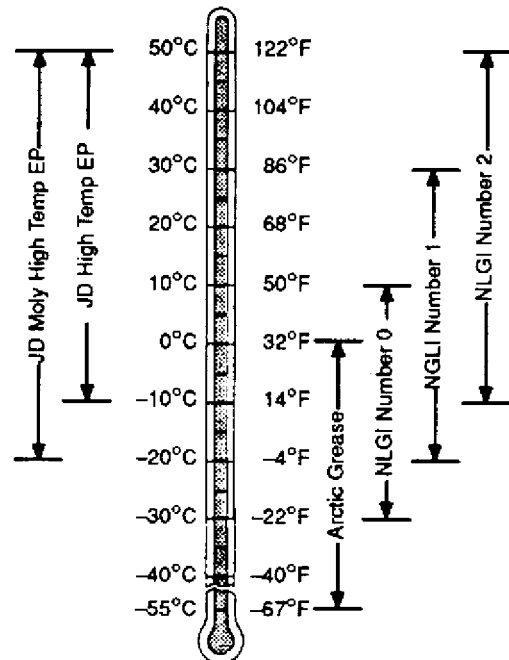
The following greases are preferred:

- John Deere MOLY HIGH TEMPERATURE EP GREASE
- John Deere HIGH TEMPERATURE EP GREASE
- John Deere GREASE-GARD™

Other greases may be used if they meet one of the following:

- SAE Multipurpose EP Grease with a maximum of 5% molybdenum disulfide
- SAE Multipurpose EP Grease

Greases meeting Military Specification MIL-G-10924F may be used as arctic grease.



DX.GREA1 -19-03MAR93

TS1417 -UN-29MAY92

KNIFE DRIVE CASE GREASE

John Deere GL-5 Gear Lubricant is recommended.

EX,1474,1025,A -19-25MAR92

Use oil viscosity based on the expected air temperature range during the period between oil changes.

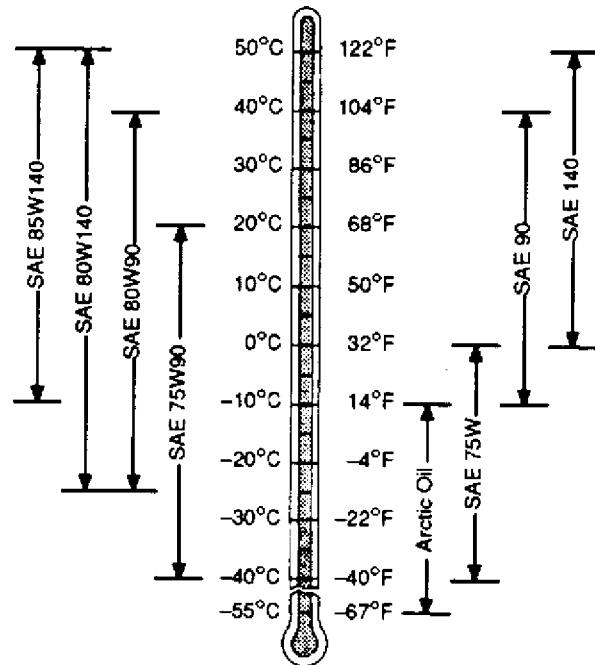
The following oils are preferred:

- John Deere EXTREME-GARD™
- John Deere GL-5 GEAR LUBRICANT

Other oils may be used if they meet the following:

- API Service Classification GL-5

Oils meeting Military Specification MIL-L-10324A may be used as arctic oils.



DX,GEOil -19-11JUN92

TS 1416 -JUN-29MAY92

Section 20

Cutting Components

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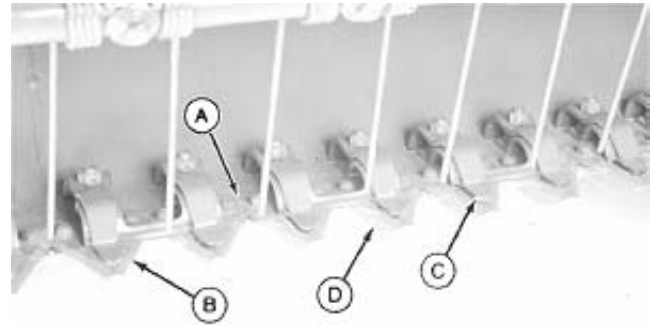
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CUTTERBAR

The cutterbar is a multiple series of shears. To cut properly, the knife (A) must run smoothly in the cutterbar, and the knife section (B) must rest on the knife guard (C). If the knife guards and knife hold-downs (D) are loose or worn, the knife will chew and tear the crop.

The cutterbar can be equipped with regular or non-clog guards, and with smooth, underserrated, or overserrated knife sections.

- A—Knife
- B—Knife Section
- C—Knife Guard
- D—Knife Hold-Down



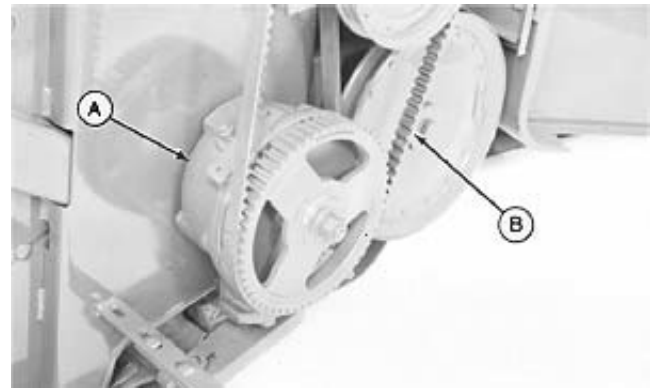
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EX,1474,2005,A -19-04MAY93

KNIFE DRIVE

The knife drive cases (A) are driven by timing belts (B) to synchronize the dual knives and reduce vibration.



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EX,1474,2005,B -19-04MAY93

SPECIFICATIONS

ITEM	MEASUREMENT	SPECIFICATION
Knife Section (Regular)	Clearance	0.13 mm (0.005 in.)
Knife Section (Non-Clog)	Clearance	0.13 mm (0.005 in.)
Knife Section	Bevel	20 - 35 Degrees
Yoke Bushings	Position	Within 0.5 mm (0.02 in.) of Flush
Knife Drive Shaft Bearings	Rolling Torque	0.33 - 0.56 N·m (3 - 5 lb-in)
Upper Support Bearing	Position	Flush with Inside Surface
Lower Support Bearing	Position	8.2 - 9.2 mm (0.32 - 0.36 in.) into Bore
Support Seal	Position	Flush to 0.8 mm (0.30 in.) Below
Knife Head Bearing	Position	6.6 mm (0.26 in.) into Bore
Knife Head Seal	Position	Flush with top of bore
Knife Drive Belt	Deflection	11.5 mm (0.45 in.) with 45 - 58 N (10 - 13 lb) Pressure
Guards	Vertical Alignment	Plus or Minus 3 mm (0.1 in.)

EX,1474,2005,C -19-04MAY93

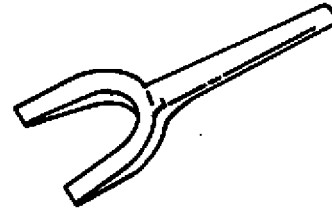
TORQUE VALUES

LOCATION	N-m	(lb-ft)
Cutterbar Single Guards	54 - 75	39 - 55
Regular and Non-Clog Guards	61 - 68	45 - 50
Knife Clamp Bolt	190 - 217	140 - 160
Support to Knife Drive Case	244 - 271	180 - 200
Knife Drive Case Cover	30 - 40	22 - 29
Knife Drive Case Gear	136 - 162	100 - 119
Knife Arm to Yoke	244	180
Knife Drive Case Support to Platform Frame	136 ± 27	100 ± 20

EX,1474,2005,D -19-04MAY93

SPECIAL TOOLS

1. JDO-1 — Use to remove knife drive arm from knife drive case yoke.



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EX,1474,2005,E -19-04MAY93

2. TY5011 — Use to remove and install riveted knife sections.



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EX,1474,2005,F -19-04MAY93

3. DO1O45AA — Driver set used to install bearings and seals in knife head and gear case support.

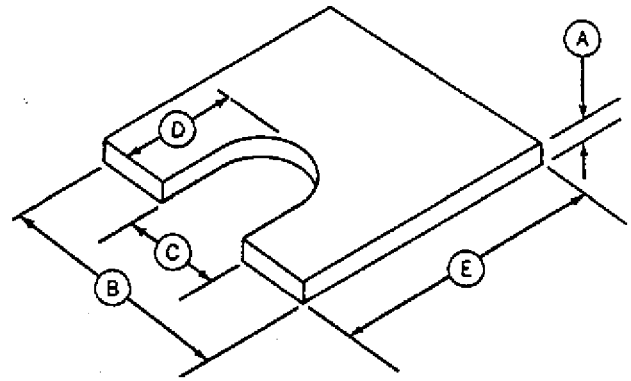
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FABRICATED TOOLS

DFE1 - Shim used when pressing spindles into yoke on knife drive shaft.

- A—3.8 mm (0.150 in.)
- B—51 mm (2 in.)
- C—25 mm (1 in.)
- D—38 mm (1-1/2 in.)
- E—102 mm (4 in.)

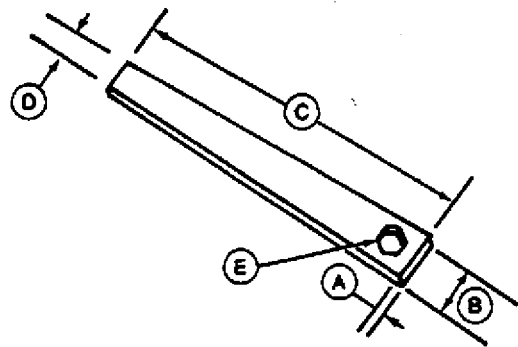


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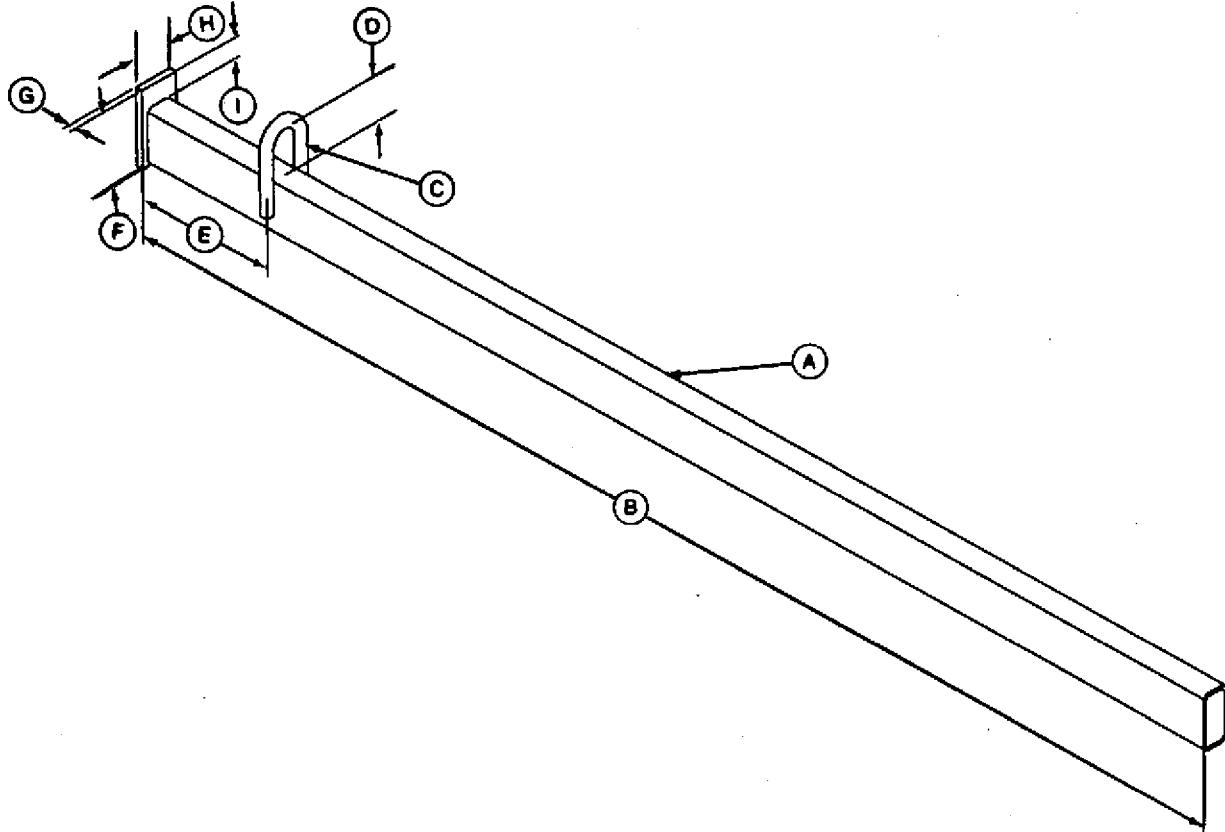
DFE2 - Wrench used to remove and install stake nut on knife drive shaft.

- A—4.8 mm (3/16 in.)
- B—102 mm (4 in.)
- C—610 mm (24 in.)
- D—64 mm (2-1/2 in.)
- E—67 mm (2-5/8 in.)



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EX,1474,2005,I -19-04MAY93



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A—25 x 50 mm (1 x 2-in.)
tubing with 3 mm (1/8-in.)
wall

B—1067 mm (42 in.)
C—10 mm (3/8-in.) Round
Rod

D—38 mm (1-1/2 in.)
E—38 mm (1-1/2 in.)
F—76 mm (3-in.)

G—6 mm (1/4 in.)
H—35 mm (1-3/8 in.)
I—18 mm (0.70 in.)

DFE4 - Cutterbar straightening tool used to straighten
sill and runner.

Put 38 mm (1-1/2 in.) welds along each side
of round tube. (Total of four welds.)

Weld end plate to tubing on all four sides.

EX,1474,2005,J -19-04MAY93

DIAGNOSING MALFUNCTIONS

Symptom	Problem	Solution
Breakage of Knife Head	Guards with wear bar used on end	Use two prong guard WITHOUT WEAR BAR when making single prong guard.
	Incorrect knife pin depth	Position knife pin at correct depth. (See INSTALL KNIVES in this Section.)
Breakage of knife sections or guards	Cutterbar operating too low in rocky field conditions.	Raise cutterbar using gauge shoes and reduce guard angle. (See Adjust Gauge Shoes and Adjust Platform Guard Angle in Section 30.)
	Improper platform float spring adjustment.	Adjust float springs. (See Adjust Platform Float in Section 30.)
	Bent or broken guard.	Replace. (See Install Regular or Non-Clog Guards in this section.)
	Reel teeth too low (teeth into knife).	Raise reel and replace damaged parts. (See Adjust Reel and Replace Reel Teeth in Section 30.)
	Ground speed too fast.	Reduce speed.
Knife back breakage	Worn knife head pin.	Replace. (See Remove Knives and Install Knives in this section.)
	Bent, broken, or worn guard.	Replace. (See Install Regular or Non-Clog Guards in this section.)
	Dull knife.	Sharpen or replace. (See Sharpen Knife Sections in this section.)
	Wear bars not in line against knife back.	Adjust guards. (See Install Regular or Non-Clog Guards in this section.)
Excessive knife head and knife drive wear	Bearings dry.	Lubricate bearings.
	Dull knife, or sections missing.	Replace missing, damaged or worn knife sections. (See Replace Knife Sections in this section.)
	Guards out of alignment or show excessive wear of ledger area.	Align guards and replace any that have excessive ledger wear. (See Install Regular or Non-Clog Guards in this section.)
	Knife is digging into dirt.	Adjust platform float. (See Adjust Platform Float in Section 30.)

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Symptom	Problem	Solution	
		Raise cutterbar using gauge shoes. (See Adjust Gauge Shoes in Section 30.)	
		Adjust guard angle. (See Adjust Guard Angle in Section 30.)	
	Knife is binding on guards.	Align knife and guards so they do not bind. (See Install Regular or Non-Clog Guards in this section. See Adjust Regular or Non-Clog Hold-Downs in this section.)	
	Bent or twisted knife bar.	Straighten or replace knife. (See Remove Knives and Install Knives in this section.)	
Excessive knife guard failure	Machine running too fast.	Reduce PTO speed to rated PTO speed.	
	Guards striking rocks and obstructions.	Adjust gauge shoes to raise guard tips. (See Adjust Gauge Shoes in Section 30.) Adjust guard angle. (See Adjust Guard Angle in Section 30.) Adjust platform flotation. (See Adjust Platform Float in Section 30.)	
	Guards bent or out of alignment.	Straighten cutterbar, or replace guards. (See Install Regular or Non-Clog Guards in this section.)	
Knife section breakage	Cutterbar striking rocks.	Adjust gauge shoes to raise cutterbar above rocks or mounds. (See Adjust Gauge Shoes in Section 30.) Adjust guard angle. (See Adjust Guard Angle in Section 30.) Adjust platform flotation. (See Adjust Platform Float in Section 30.)	
	Cutterbar noise	Knife sections worn or damaged.	Replace knife sections. (See Replace Knife Sections in this section.)
		Needle bearing is loose.	Replace bearing. (See Recondition Knife Head in this section.)
Guards damaged or out of alignment.		Align or replace damaged guards. (See Install Regular or Non-Clog Guards in this section.)	

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Symptom	Problem	Solution
Excessive knife drive noise	Knife is bent.	Remove or straighten knife. (See Remove Knives and Install Knives in this section.)
	Knife drive case mounting loose.	Tighten mounting bolts.
	Knife or guards bent.	Straighten knife and align guards. (See Install Regular or Non-Clog Guards in this section.)
	Knife drive case loose.	Tighten mounting bolts.
	Loose or worn knife head pin.	Tighten or replace pin. Check knife head bearing. (See Recondition Knife Head and Install Knives in this section.)
Knife Plugging	Knife drive arm loose.	Tighten nut securing arm to knife drive case. (See Install Knife Drive Case in this section.)
	Platform drive belt slips.	Adjust belt tension. Replace if burned. (See Adjust Platform Drive Belt in Section 30.)
	Dull or broken knife sections.	Sharpen or replace. (See Sharpen Knife Sections in this section.)
	Bent, broken or worn guard.	Replace. (See Install Regular or Non-Clog Guards in this section.)
	Improper platform float spring adjustment.	Adjust float springs. (See Adjust Platform Float in Section 30.)
	Improper hold-down adjustment.	Adjust hold-downs. (See Adjust Regular or Non-Clog Knife Hold-Downs in this section.)
	Improper reel adjustment.	Adjust reel and cam. (See Adjust Reel and Adjust Reel Cam in Section 30.)
Knife gumming	Juice buildup due to cutting operation.	Periodically clean knife with water.
Ragged and uneven cutting of crop	Worn, damaged, or broken knife sections or guards.	Check and replace all worn and broken parts on cutterbar. (See Install Regular or Non-Clog Guards in this section.)
	Bent knife, causing binding of cutting parts.	Straighten bent knife. Check guard alignment and align if necessary. (See Install Regular or Non-Clog Guards in this section.)

Continued on next page

Symptom	Problem	Solution
	Hold-downs worn or not adjusted to permit knife to work freely.	Adjust or align hold-downs so knife will work freely but still keep knife sections from lifting off guards. (See Adjust Regular or Non-Clog Knife Hold-Downs in this section.)
	Looseness between knife back and guard.	Adjust hold-downs so knife back is snug to guard. (See Adjust Regular or Non-Clog Knife Hold-Downs in this section.)
	Ground speed too fast.	Slow down.
	Slow PTO speed.	Maintain rated PTO speed.
	Platform drive belt is loose.	Adjust belt tension. (See Adjust Platform Drive Belt in Section 30.)
	Improper platform float spring adjustment.	Adjust float springs. (See Adjust Platform Float in Section 30.)
	Crop is being missed and going under platform uncut.	Replace dull or broken knife sections. (See Replace Knife Sections in this section.) Reduce ground speed. Adjust gauge shoes for shorter stubble. (See Adjust Gauge Shoes in Section 30.) Increase guard angle setting. (See Adjust Guard Angle in Section 30.) Install tall crop divider.
	Guards out of alignment.	Align guards. (See Install Regular or Non-Clog Guards in this section.)
	Knife not cutting grasses properly.	Use smooth knife sections in fine grasses and flax.
	Crop gathering on guards.	Adjust reel closer to guards and deck sheet. (See Adjust Reel in Section 30.)
Strips of uncut material	Dull knife.	Sharpen or replace. (See Sharpen Knife Sections in this section.)
	Crowding uncut crop.	Allow enough room for crop to be fed to cutterbar.

Continued on next page

Symptom	Problem	Solution
	Foreign objects on cutterbar.	Disengage tractor PTO and stop engine. After moving parts are completely stopped, remove foreign objects.
	Broken knife sections.	Replace. (See Replace Knife Sections in this section.)
	Worn knife back causes knife to ride up.	Check wear. Replace knife back if necessary. (See Remove Knives and Install Knives in this section.)
	Worn guards cause knife to ride up.	Check wear bar on guard. Replace if necessary. (See Install Regular or Non-Clog Guards in this section.)
	Worn hold-downs allow knife to ride up.	Check hold-downs at front and rear. Adjust or replace as necessary. (See Adjust Regular or Non-Clog Hold-Downs in this section.)
Ragged cut in center	Worn end sections.	Sharpen or replace end sections. (See Sharpen Knife Sections and Replace Knife Sections in this section of manual.)
Down crop left uncut	Reel speed too slow.	Speed up reel. (See Adjust Reel Speed in Section 30.) Add 5th or 6th reel bats.
	Ground speed too fast.	Slow down.
	Very heavy crop.	Cut less than full width of platform.
	Reel teeth not reaching down crop.	Adjust top link for steeper guard angle. (See Adjust Platform Guard Angle in Section 30.)
Long stubble	Gauge shoes set too high.	Lower gauge shoes. (See Adjust Gauge Shoes in Section 30.)
	Guard angle too flat.	Increase guard angle. (See Adjust Platform Guard Angle in Section 30.)
Excessive gap between guard and section	Gap is in one localized area of the cutterbar.	Sight down the guards at the tips and trash bar area to check for bent guards or a bent sill and runner. If guards are bent, replace them. If sill and runner is bent, use cutterbar straightening tool to straighten the sill and runner with the guards in place. In area where sill and runner are bent, model guards so trash bars align with each other. (See Use

Continued on next page

Symptom	Problem	Solution
		Cutterbar Straightening Tool in this section, Group 15.)
	Gap is significantly greater at the tip of the section than at the rear on several sections.	Check perpendicularity of the knife head bearing by removing knife head pin. Reset hold-down clearance with knife head pin removed. If this eliminates the problem, replace the knife or bend the head.
	Gap is localized to only one guard.	Look for a difference in height of the trash bar between adjacent guards. If there is a difference, this indicates a problem in the individual guard or its mounting surface. Check for a burr in the mounting surface. On right-hand cutterbar, check for a gap between the shim and sill. If there is no problem with the mounting surfaces, replace the guard.
	Gap is localized to only one guard, and there is no difference in height of trash bar between adjacent guards.	Check the knife to see if the section is bent up.
	Gap is in the 2nd, 3rd, 4th, and 5th points from the right or left-hand end.	Check to see if the half guard is holding the knife up. Look for a difference in height of the trash bar area or loosen the bolt on the half guard. Replace the guard if it is bad. If the guard is not bad, check the divider to see if it forces the half guard up when the two bolts into the knife drive gear case are tightened. If the divider forces the guard up, try loosening all bolts in the divider and tightening the two in the knife drive case mounting first. If this does not correct the problem, install washer between the divider and runner. Check to see if there is a gap between the knife head and the knife drive arm. If there is less than 2 mm (0.079 in.), use a 1.22 m (4 ft) or longer straight edge to check the bottom of the runner for straightness. The runner can cause knife gap problems if it is high at the outside end. If the runner measures 3 mm (0.12 in.) high or more on the outside end, correct the problem in the platform frame. The sill and runner can be bent with the guards in place using a cutterbar straightening tool.

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Diagnosing Malfunctions

Symptom	Problem	Solution
		Remove guards with excess gap. Check the mounting surfaces for any burrs or weld spatter. On the right-hand side, check for gap between shim and runner. If no problems are found in the mounting surfaces, replace these guards.

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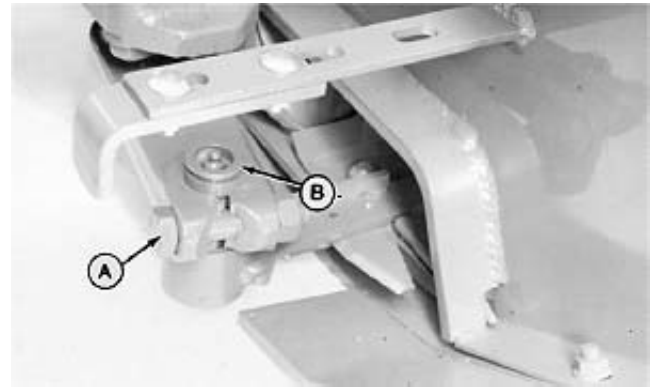
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REMOVE KNIVES

CAUTION: To reduce risk of personal injury, always wear gloves when handling knives, and stand to the rear when removing or installing the knife.

NOTE: On non-clog cutterbar, it may be necessary to loosen adjusting clips.

1. Move knife to outer end of stroke.
2. Remove clamp bolt (A).
3. Fit a screwdriver into small groove in connecting pin (B) and pry up on connecting pin (B) until knife is free.
4. Pull knife to remove from cutterbar.



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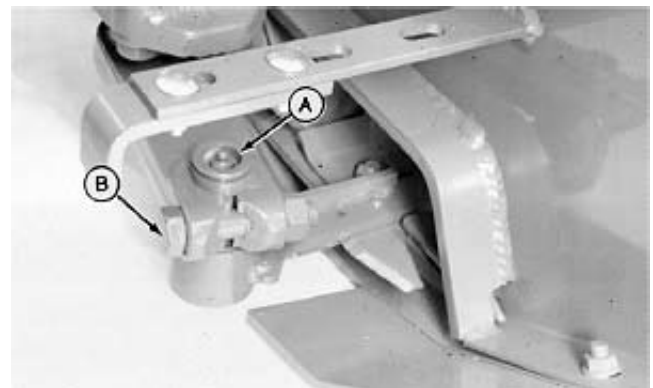
INSTALL KNIVES

CAUTION: To reduce risk of personal injury, always wear gloves when handling knives, and stand to the rear when removing or installing the knife.

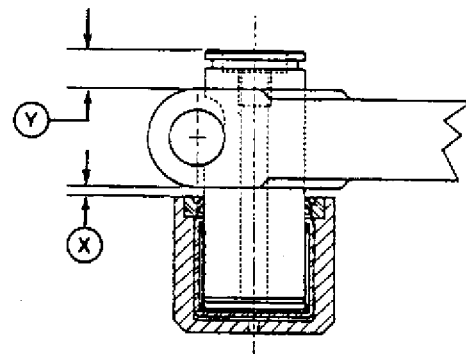
1. Slide knife into place.

IMPORTANT: For proper assembly of the pin in the knife head bearing, locate the pin in the drive arm as indicated.

2. Insert drive pin (A) through drive arm into knife head.
3. With pin installed and clamp bolt loose, measure distance X when knife arm is in its inward stroke, then set distance Y to corresponding value on chart.
4. Secure with clamp bolt (B) and nut. Tighten to 160 lb-ft (217 N-m)
5. For more efficient cutting as parts wear, the hold-downs may need adjusting. (See adjusting Non-Clog Knife Hold-Downs and Regular Knife Hold-Downs.)



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E33391



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E33490

DIMENSIONS

X	Y
0 to 1/8 in. (3 mm)	1/2 in. (12.5 mm)
1/4 in. (6 mm)	3/8 in. (9.5 mm)
3/8 in. (9.5 mm)	1/4 in. (6 mm)

EX,1474,2015,P -19-04MAY93

TIME KNIVES

1. Rotate sheave (A) to the left until knife drive arm (B) moves to the inward position of the stroke.
2. On opposite side of platform, remove knife drive belt (C). (See Replacing Knife Drive Belt in this section.)
3. Rotate sheave (D) to the right until knife drive arm (B) moves to the inward position of the stroke.

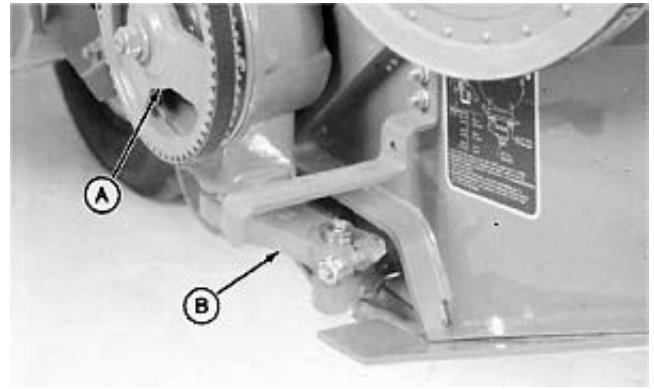
NOTE: In Section 30, see the following:

- *Replace Left Drive Belt*
- *Replace Right Drive Belt*
- *Align Knife Drive Belt*
- *Adjust Knife Drive Belt*

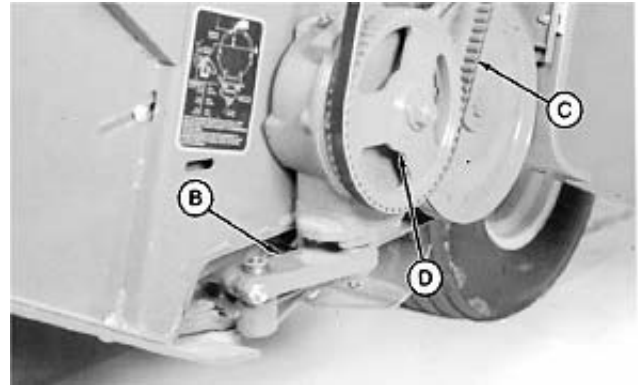
4. Install knife drive belt.

NOTE: The knife strokes will be opposite each other when knives are correctly timed.

A—Sheave
B—Arm
C—Belt
D—Sheave



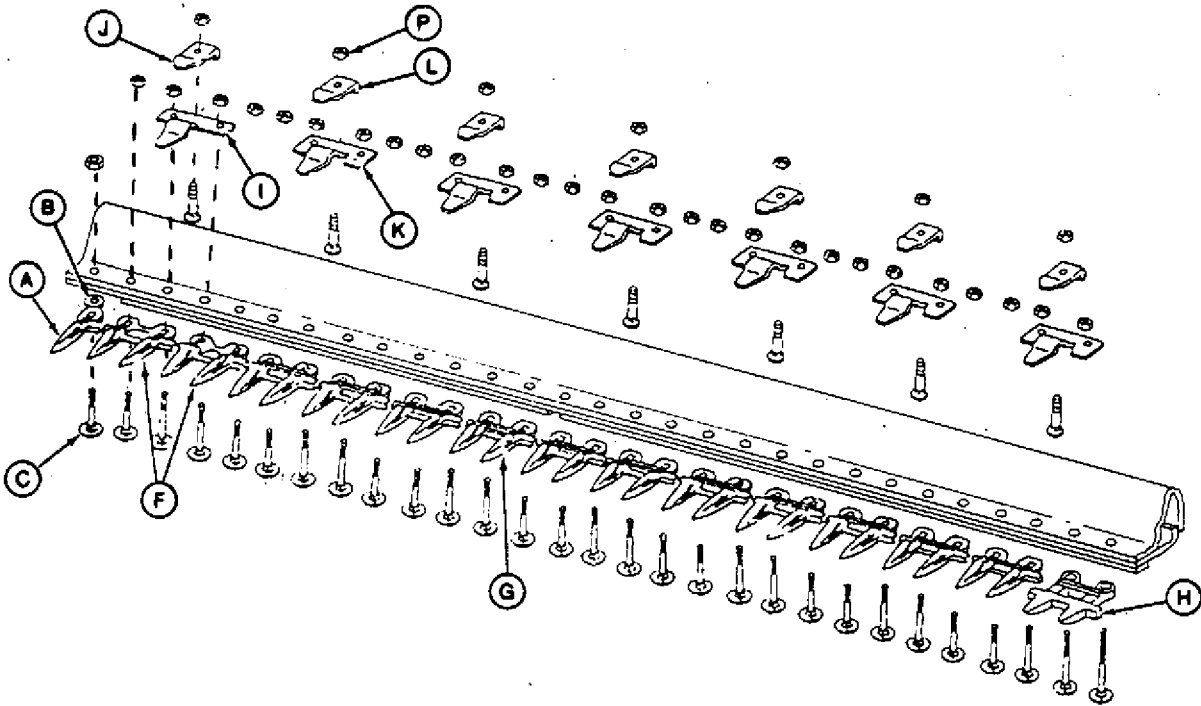
Right Side



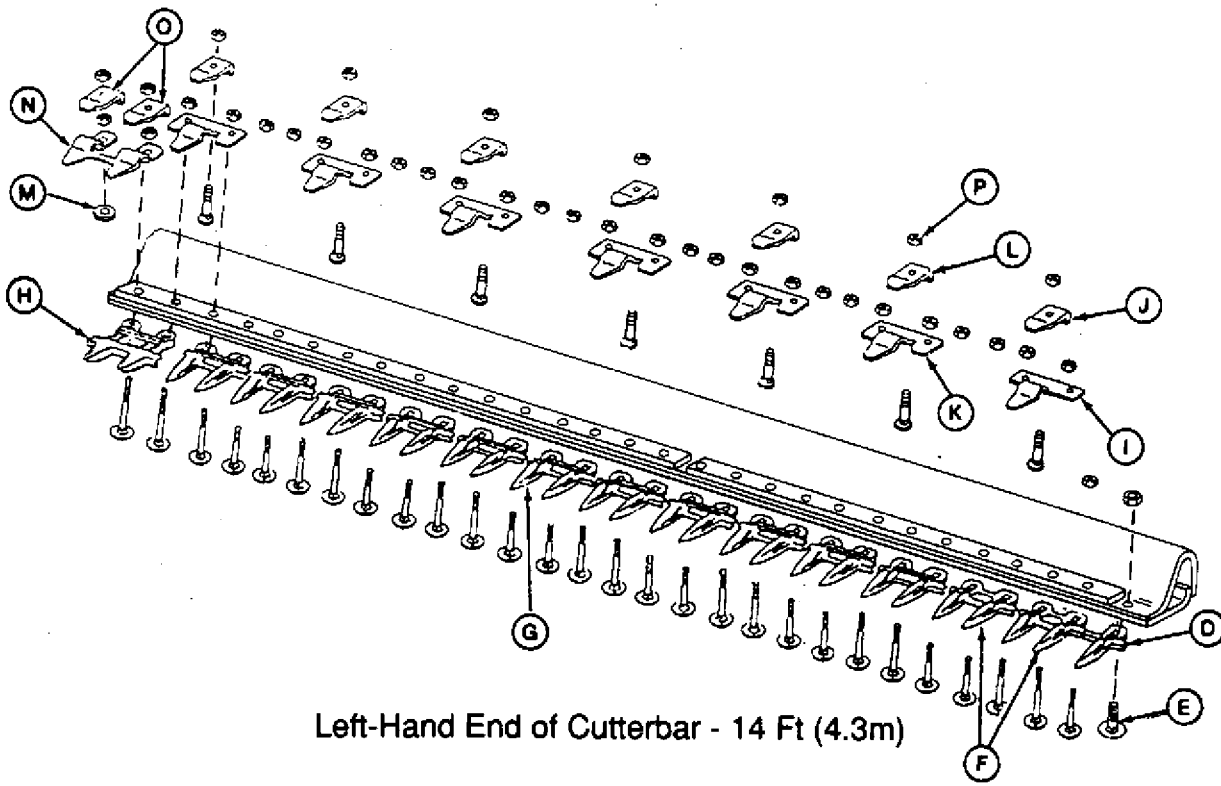
Left Side

EX,1474,2015,Q -19-04MAY93

INSTALL REGULAR GUARDS ON CUTTERBAR SN —915000



Right-Hand End of Cutterbar - 14 Ft (4.3m)



Left-Hand End of Cutterbar - 14 Ft (4.3m)

20
15
3

E33484 -19-08SEP89

EX,1474,2015,B -19-04MAY93

IMPORTANT: Assemble cutterbar as illustrated. Failure to do so may cause machine damage.

1. Remove all guards and hold-downs.
2. In first hole on right-hand end of cutterbar, install a single guard (A), washer (B), 7/16 x 1-1/2 in. round-head bolt (C), and lock nut. Tighten to 54—75 N·m (39—55 lb-ft).

NOTE: A single guard is made by splitting a two prong guard (without wear bar) and removing the center crossbars.

3. In the first hole on the left-hand end of cutterbar, install a single guard (D), 7/16 x 1-1/2 in. round-head bolt (E), and lock nut. Tighten to 54—75 N·m (39 to 55 lb-ft).
4. Install two guards (WITHOUT WEAR BARS) (F) in the next four holes on each end of cutterbar. Do not tighten.
5. Install regular guard (with wear bar) (G) in remaining cutterbar holes, except for the middle four holes. In these four holes, install two non-clog guards (H). Do not tighten.
6. Install hold-down clamp (I) and clip (J) in third and fourth holes from right-hand end and left-hand end. Skip two holes and install hold-down clamp (K) and clip (L). Fasten with 7/16 x 2-3/4 in. round head bolts and nuts.
7. Skip two holes between all remaining hold-down clamps and clips on right-hand side and left-hand side of cutterbar.
8. At the two holes in the center of cutterbar, install washer (M) between cutterbar and hold-down on the right-hand side. Install hold-down (N) and clips (O).

IMPORTANT: To insure good guard alignment, guards must be pushed against cutterbar and held while tightening bolts. Tighten to 61—68 N·m (45—50 lb-ft). If guards are not aligned, cutterbar will not wear evenly.

9. Check vertical guard alignment by placing a line from the far left guard to a point 3 mm (0.1 in.) above the far right guard. Guards on left-hand end of cutterbar are to be within 3 mm (0.1 in.) above or below line. Guards on right-hand end are to be from flush to 6 mm (0.2 in.) below line. Straighten cutterbar if out of alignment.

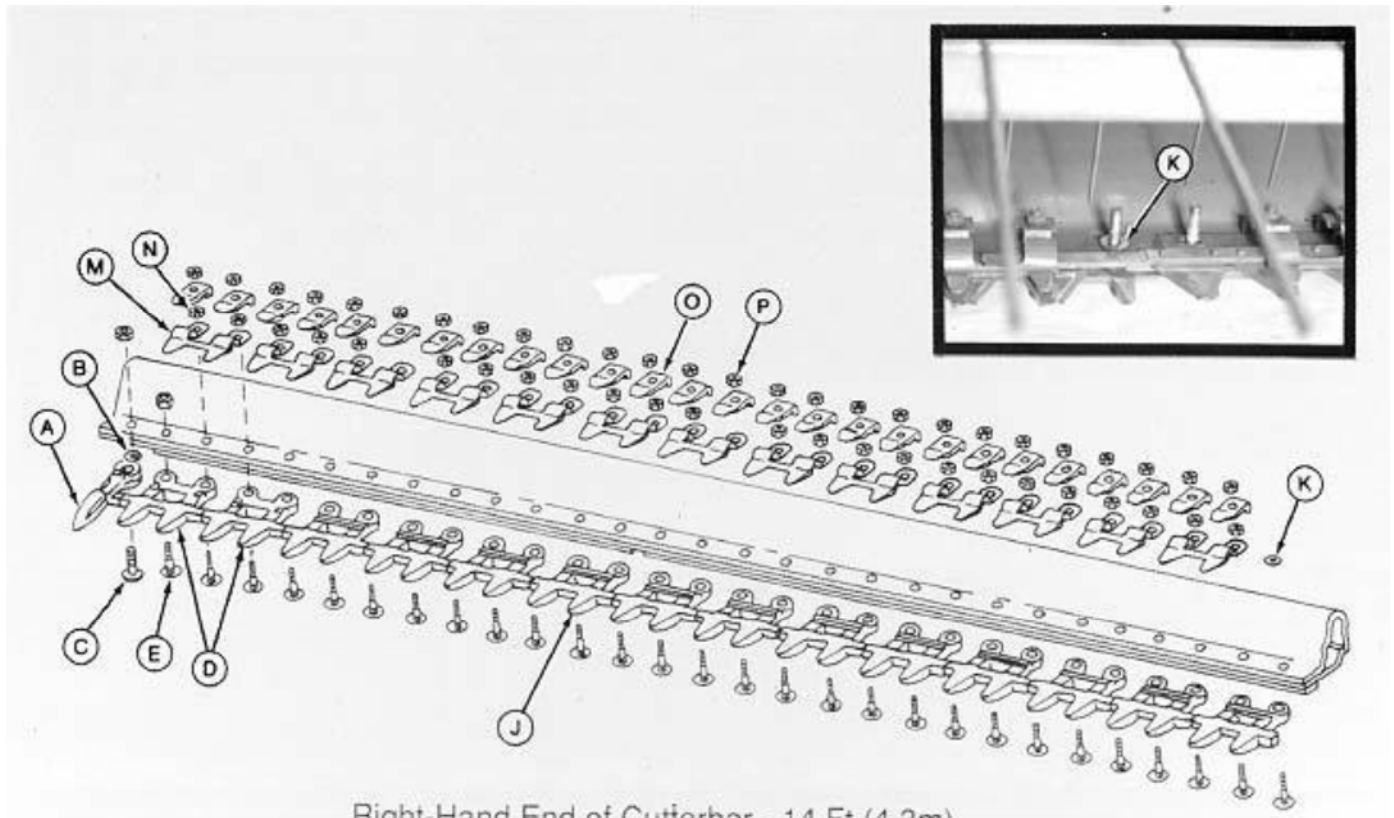
IMPORTANT: Cutterbar must be straight or it will cause an excessive wear of guards and a poor cutting performance.

10. Install knives. (See Install Knives in this section.)
11. Install clips (L). Center left and right-hand knives on hold-downs.
12. Insert 0.13 mm (0.005 in.) feeler gauge between hold-downs (K and I) and knife section. Adjust hold-down clips so that a 44.5 N (10 lb) pull will remove the feeler gauge.
13. Move left and right-hand knives all the way in (with center sections overlapping) and set center hold-down so that a 44.5 N (10 lb) pull will remove the 0.13 mm (0.005 in.) feeler gauge.

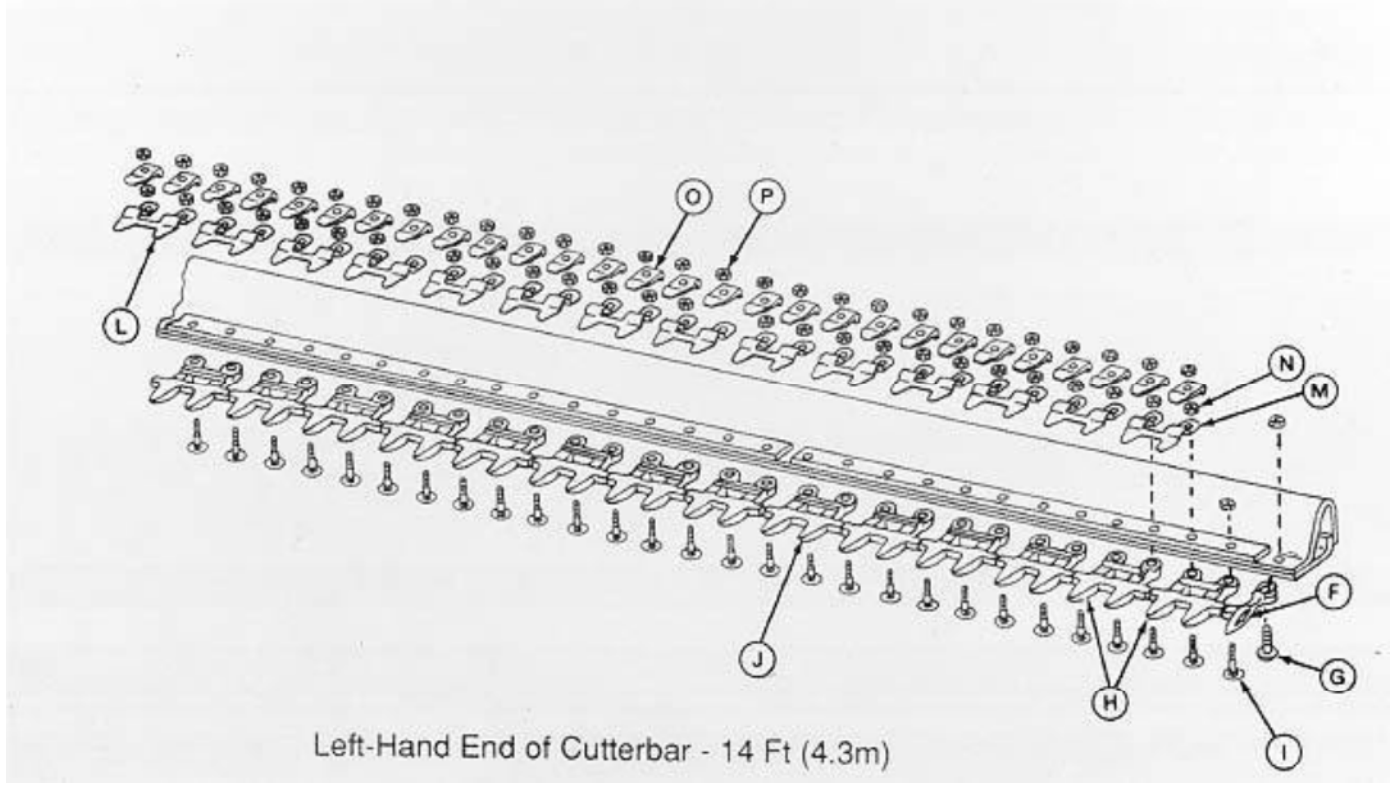
IMPORTANT: When adjusting center hold-down, make sure the end of the right and left-hand knife sections are overlapping in the center of cutterbar. If sections are not overlapping, damage to cutting components may occur.

14. Move knife in until inside tip of section is just above outside edge of ledger area of guard. Maximum allowable gap between knife sections and guards is 0.76 mm (0.030 in.) when measured between the ledger area of the guard and the bottom of the section. If gap is excessive, see the troubleshooting section for help to identify and correct the problem.
15. Oscillate knife by hand to be sure parts are free to move. Run machine for 2 or 3 minutes to be sure knife sections are not heating or binding. Correct any problems.

INSTALL NON-CLOG GUARDS ON CUTTERBAR SN —915000



Right-Hand End of Cutterbar - 14 Ft (4.3m)



Left-Hand End of Cutterbar - 14 Ft (4.3m)

20
15
5

E33485 -19-02OCT89

EX,1474,2015,D -19-04MAY93

IMPORTANT: Assemble cutterbar as illustrated. Failure to do so may cause machine damage.

1. Remove all guards and hold-downs.
2. In first hole on right-hand end of cutterbar, install a single guard (A), washer (B), 7/16 x 1-1/2 in. round-head bolt (C), and lock nut. Tighten to 54—75 N·m (39—55 lb-ft).

NOTE: A single guard is made by splitting a two prong guard (without wear bar) and removing the center crossbars.

3. Install two non-clog guards (WITHOUT WEAR BARS) (D) in the next four holes on each end of cutterbar. Fasten with one 7/16 x 1-3/4 in. round-head bolt (E), and lock nut, and three 7/16 x 2-3/4 in. round head bolts. Do not tighten.
4. In first hole on the left-hand end of cutterbar, install a single guard (F). Fasten with 7/16 x 1-1/2 in. round-head bolt (G), and lock nut. Tighten to 54—75 N·m (39 to 55 lb-ft).
5. Install two non-clog guards (without wear bar) (H) in the next four holes. Fasten with one 7/16 x 1-3/4 in. round-head bolt (I) and lock nut, and three 7/16 x 2-3/4 in. round-head bolts. Do not tighten.
6. Install non-clog guards (with wear bar) (J) in remainder of cutterbar holes. Do not tighten.
7. At the two holes in the center of cutterbar, install a washer (K) between the hold-down and cutterbar on the right side to level the hold-down. Install hold-down (L).
8. Install hold-downs (M) starting in the third hole from the right-hand end and ending in the third hole from the left-hand end.
9. Install regular nuts (N) on all 7/16 x 2-3/4 in. round-head bolts after high arch hold-downs are installed.

10. Check vertical guard alignment by placing a line from the far left guard to a point 3 mm (0.1 in.) above the far right guard. Guards on left-hand end of cutterbar are to be within 3 mm (0.1 in.) above or below line. Guards on right-hand end are to be from flush to 6 mm (0.2 in.) below line. Straighten cutterbar if out of alignment.

IMPORTANT: Cutterbar must be straight or it will cause an excessive wear of guards and a poor cutting performance.

IMPORTANT: To insure good guard alignment, guards must be pushed against cutterbar and held while tightening bolts. Tighten to 61—68 N·m (45—50 lb-ft). If guards are not aligned, cutterbar will not wear evenly.

11. Install knives. (See Install Knives in this section.)
12. Install clips (O). Tighten lock nuts (P). Insert 0.13 mm (0.005 in.) feeler gauge between the hold-downs (K and I) and the knife section.
13. Adjust hold-down clips so that a 44.5 N (10 lb) pull will remove the feeler gauge.

IMPORTANT: When adjusting center hold-down, make sure the end of the right-hand and left-hand knife sections are overlapping in center of cutterbar. If sections are not overlapping, damage to cutting components may occur.

14. Oscillate knife by hand to be sure parts are free to move. Run machine for 2 or 3 minutes to be sure knife sections are not heating or binding. Correct any problems.

INSTALL REGULAR GUARDS ON CUTTERBAR SN 915001—

IMPORTANT: Assemble cutterbar as illustrated. Failure to do so may cause machine damage.

1. Remove both cutterbar knives. (See Remove Knives in this section.)

IMPORTANT: To insure good guard alignment, guards must be pushed against cutterbar and held while tightening bolts. Tighten to 61—68 N·m (45—50 lb-ft). If guards are not aligned, cutterbar will not wear evenly.

NOTE: A single guard is made by splitting a regular guard, without wear bar, (K) and removing the center crossbars.

2. **LOCATIONS 1** - In first hole on RIGHT-HAND end and LEFT-HAND end of cutterbar, install a single guard (S) or (T), 7/16 x 1-1/2 in. round-head bolt (N), and lock nut (A). Tighten to 54—75 N·m (39—55 lb-ft).

3. **LOCATIONS 2** - Install two regular guards (WITHOUT WEAR BARS) in the next four holes on each end of cutterbar. Fasten guards with 7/16 x 1-1/2 round-head bolts (N) and lock nuts (A) through holes 1 and 4.

4. Install strap (H) with plow bolt (I), and hold-down without tabs (E) in holes 3 and 4 from each end. Fasten with 7/16 x 1-3/4 in. round head bolts (O) and lock nuts (A).

5. **LOCATIONS 4** - Install two regular guards (WITH WEAR BARS) in the next four holes on each end of cutterbar. Fasten guards with 7/16 x 1-1/2 round-head bolts (N) and lock nuts (A) through holes 1 and 4.

6. Install strap (H) with plow bolt (I), and hold-down with tabs (G) in holes 2 and 3. Fasten with 7/16 x 1-3/4 in. round head bolts (O) and lock nuts (A).

NOTE: Hold-down (R), right of LOCATION 3, is installed directly over the guard.

7. Repeat procedure in steps 5 and 6 for the remaining holes in LOCATIONS 4.

8. **LOCATION 3** - Position one 15/32 x 1-1/8 x 0.120 washer over the right hole. Install Non-Clog guard (WITH WEAR BAR) (L), 7/16 x 2-3/4 round-head bolts (P), high arch hold-down (F), and nuts (D). Install high arch hold-down clips (C) and lock nut (A). Do not tighten lock nuts at this time.

9. Install regular hold-down clips (B) and lock nuts (A) in LOCATIONS 2 and 4. Do not tighten lock nuts at this time.

10. Check vertical guard alignment by placing a line from the far left guard to a point 3 mm (0.1 in.) above the far right guard. Guards on left-hand end of cutterbar are to be within 3 mm (0.1 in.) above or below line. Guards on right-hand end are to be from flush to 6 mm (0.2 in.) below line. Straighten cutterbar if out of alignment.

11. Install knives. (See Install Knives in this section.)

IMPORTANT: When adjusting center hold-down, make sure the end of the right-hand and left-hand knife sections are overlapping in center of cutterbar. If sections are not overlapping, damage to cutting components will occur.

NOTE: See Time Knives in this section

12. **LOCATIONS 2-4** - Move left and right-hand knives all the way in (with center sections overlapping). Insert 0.13 mm (0.005 in.) feeler gauge between hold-down (E-G) and knife section. Adjust hold-down clips so a 44.5 N (10 lb) pull will remove the feeler gauge.

13. Move knife in until inside tip of section is just above outside edge of ledger area of guard. Maximum allowable gap between knife sections and guards is 0.76 mm (0.030 in.) when measured between the ledger area of the guard and the bottom of the section. If gap is excessive, refer to Troubleshooting section to identify and correct the problem.

14. Oscillate knife by hand to be sure parts are free to move. Run machine for 2 or 3 minutes to be sure knife sections are not heating or binding. Correct any problems.

INSTALL REGULAR GUARDS ON CUTTERBAR SN 915001—

- | | | | |
|----------------------------|------------------------------------|------------------------------------|--|
| A—Lock Nut | I—7/16 x 1-1/4 in. Plow Bolt | M—Regular Guard With Wear Bar | P—7/16 x 2-3/4 in. Round Head Bolt |
| B—Hold-Down Clip | J—15/32 x 1-1/8 x 0.120 in. Washer | • 12 ft - 19 used | Q—Knife Section |
| C—High Arch Hold-Down Clip | K—Regular Guard Without Wear Bar | • 14 ft - 23 used | R—Hold-Down (Location Reference) |
| D—Nut | • 12-14-16 ft. - 4 used | N—7/16 x 1-1/2 in. Round Head Bolt | S—Left Half of Regular Guard Without Wear Bar |
| E—Hold-Down Without Tabs | L—Non-Clog Guard With Wear Guard | O—7/16 x 1-3/4 in. Round Head Bolt | T—Right Half of Regular Guard Without Wear Bar |
| F—High Arch Hold-Down | • 12-14-16 ft. - 1 used | | |
| G—Hold-Down With Tabs | | | |
| H—Strap | | | |

INSTALL NON-CLOG GUARDS ON CUTTERBAR SN 915001—

A—Lock Nut

B—High Arch Hold-Down
Clip

C—Nut

D—Left-Hand Notched High
Arch Hold-Down

E—Right-Hand Notched High
Arch Hold-Down

F—High Arch Hold-Down

G—15/32 x 1-1/8 x 0.120 in.
Washer

H—Non-Clog Guard Without
Wear Bar

• 12-14-16 ft. - 4 used

I—Non-Clog Guard With
Wear Bar

• 12 ft. - 20 used

• 14 ft. - 24 used

• 16 ft. - 28 used

J—7/16 x 1-1/2 Round Head
Bolt

K—7/16 x 2-3/4 Round Head
Bolt

L—Knife Section

M—Regular Guard Without
Wear Bar

N—Left Half of Regular
Guard Without Wear Bar

O—Right Half of Regular
Guard Without Wear Bar

INSTALL NON-CLOG GUARDS ON CUTTERBAR SN 915001—

IMPORTANT: Assemble cutterbar as illustrated. Failure to do so may cause machine damage.

1. Remove both cutterbar knives. (See Remove Knives in this section.)

IMPORTANT: To insure good guard alignment, guards must be pushed against cutterbar and held while tightening bolts. Tighten to 61—68 N·m (45—50 lb-ft). If guards are not aligned, cutterbar will not wear evenly.

NOTE: A single guard is made by splitting a regular guard (M), without wear bar, and removing the center crossbars.

2. **LOCATIONS 1** - In first hole on RIGHT-HAND and LEFT-HAND end of cutterbar, install a single guard (N) or (O), 7/16 x 1-1/2 in. round-head bolt (J), and lock nut (A). Tighten to 54—75 N·m (39—55 lb-ft).

NOTE: High arch hold-downs (D-F) are installed directly over the guards.

3. **LOCATIONS 2** - Install two non-clog guards (WITHOUT WEAR BARS) (H) in the next four holes on each end of cutterbar. Install high arch hold-down (F), 7/16 x 2-3/4 round-head bolts (K), and nuts (C) in holes 4 and 5 from each end.

- **RIGHT-HAND END** - Install **RIGHT-HAND NOTCHED** high arch hold-down (E), 7/16 x 2-3/4 round-head bolts (K), and nuts (C) in holes 2 and 3 from the right end.

- **LEFT-HAND END** - Install **LEFT-HAND NOTCHED** high arch hold-down (D), 7/16 x 2-3/4 round-head bolts (K), and nuts (C) in holes 2 and 3 from the right end.

IMPORTANT: Damage to cutting components will occur if correct notched high arch hold-down is not used.

4. **LOCATIONS 4** - Install non-clog guards (WITH WEAR BARS) (I), high arch hold-downs (F), 7/16 x 2-3/4 round-head bolts (K), and nuts (C) in the next two holes from each end. Repeat this procedure for the remaining holes in **LOCATIONS 4**.

5. **LOCATION 3** - Position one **15/32 x 1-1/8 x 0.120** washer over the right hole. Install non-clog guard (WITH WEAR BAR) (I), 7/16 x 2-3/4 round-head bolts (K), high arch hold-down (F), and nuts (C).

6. Install high arch hold-down clips (B) and lock nuts (A). Do not tighten lock nuts at this time.

7. Check vertical guard alignment by placing a line from the far left guard to a point 3 mm (0.1 in.) above the far right guard. Guards on left-hand end of cutterbar are to be within 3 mm (0.1 in.) above or below line. Guards on right-hand end are to be from flush to 6 mm (0.2 in.) below line. Straighten cutterbar if out of alignment.

8. Install knives. (See Install Knives in this section.)

IMPORTANT: When adjusting center hold-down, make sure the end of the right-hand and left-hand knife sections are overlapping in center of cutterbar. If sections are not overlapping, damage to cutting components will occur.

NOTE: See Time Knives in this section

9. **LOCATIONS 2-4** - Move left and right-hand knives all the way in (with center sections overlapping). Insert 0.13 mm (0.005 in.) feeler gauge between hold-down (D-F) and knife section. Adjust hold-down clips so a 44.5 N (10 lb) pull will remove the feeler gauge.

10. Move knife in until inside tip of section is just above outside edge of ledger area of guard. Maximum allowable gap between knife sections and guards is 0.5 mm (0.020 in.) when measured between the ledger area of the guard and the bottom of the section. If gap is excessive, refer to Troubleshooting section to identify and correct the problem.

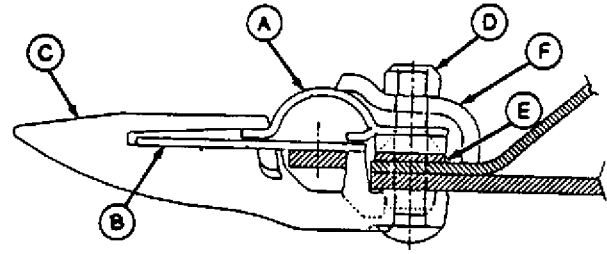
11. Oscillate knife by hand to be sure parts are free to move. Run machine for 2 or 3 minutes to be sure knife sections are not heating or binding. Correct any problems.

ADJUST REGULAR KNIFE HOLD-DOWNS

Knife hold-downs (A) keep knife sections (B) from lifting off guards (C), allowing the knife to slide without binding.

IMPORTANT: Overtightening the hold-downs will cause rapid wear on hold-downs and knife sections. Wear is increased if operating in sandy or muddy conditions.

1. Center left and right-hand knives on hold-downs.
2. Insert 0.13 mm (0.005 in.) feeler gauge between the hold-down (A) and the knife section (B). Adjust hold-down clips so a 44.5 N (10 lb) pull removes the feeler gauge.
3. Move left and right-hand knives all the way in (with center sections overlapping) and set center hold-down so that a 44.5 N (10 lb) pull will remove the 0.13 mm (0.005 in.) feeler gauge.
4. Move knife in until inside tip of section is just above outside edge of ledger area of guard. Maximum allowable gap between knife sections and guards is 0.76 mm (0.030 in.) when measured between the ledger area of the guard and the bottom of the section. If gap is excessive, see the Troubleshooting section for help to identify and correct the problem.



A—Regular Hold-Down
 B—Knife Section
 C—Regular Guard
 D—Lock Nut
 E—Thick Shim
 F—Adjustment Clip

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E33452

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EX,1474,2015,F -19-04MAY93

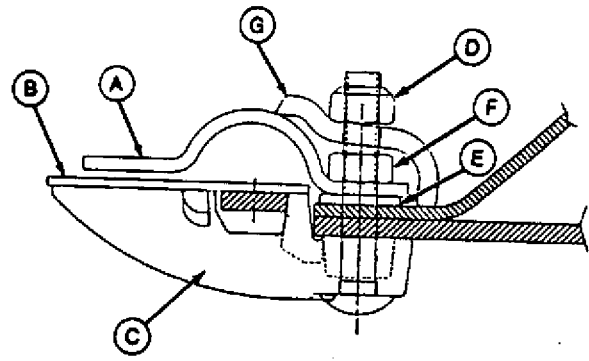
ADJUST NON-CLOG KNIFE HOLD-DOWNS

Knife hold-downs (A) keep knife sections (B) from lifting off guards (C), allowing the knife to slide without binding.

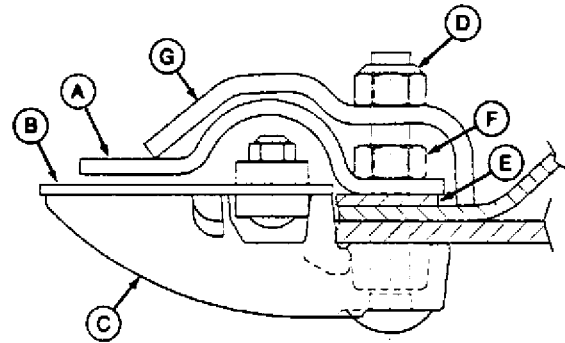
IMPORTANT: Overtightening the hold-downs will cause rapid wear on hold-downs and knife sections. Wear is increased if operating in sandy or muddy conditions.

1. Move left and right-hand knives all the way in to center on hold-downs.
2. Insert 0.13 mm (0.005 in.) feeler gauge between hold-down (A) and knife section (B). Adjust hold-down clip (G) so that a 44.5 N (10 lb) pull will remove the feeler gauge.
3. Maximum allowable gap between knife sections and guards is 0.51 mm (0.020 in.) when measured between the ledger area of the guard and the bottom of the section. If gap is excessive, see the troubleshooting section for help to identify and correct the problem.

- A—High Arch Hold-Down
- B—Knife Section
- C—Non Clog Guard
- D—Lock Nut
- E—Thin Shim
- F—Regular Nut
- G—Adjustment Clip



SN — 915000



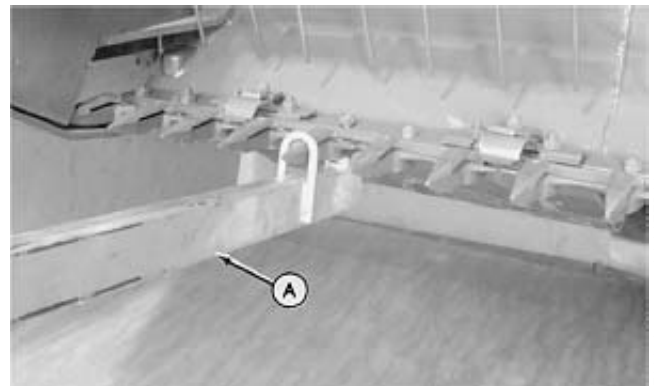
SN 915001 —

EX,1474,2015,G -19-04MAY93

USE CUTTERBAR STRAIGHTENING TOOL

Model guards where sill and runner are bent so trash bars will align with each other.

To make cutterbar straightening tool (A), see Fabricated Tools in this section, Group 5.



EX,1474,2015,H -19-04MAY93

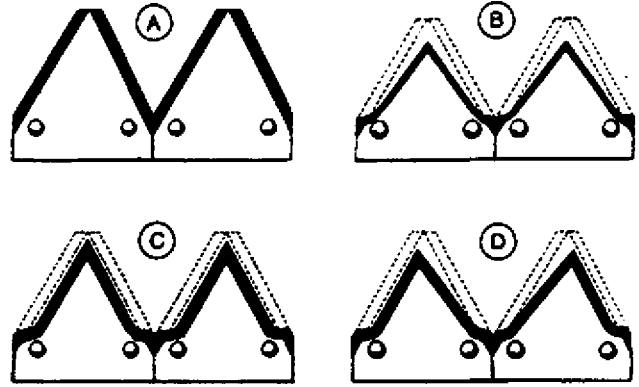
SHARPEN KNIFE SECTIONS

IMPORTANT: Do not sharpen the knife too rapidly. It will cause the steel in the cutting edge to burn. This is indicated by a blue discoloration.

Keep the knife straight and sharp, with sections firmly riveted to knife back.

When sharpening the knife, restore the original shear angle and bevel of 20 to 35 degrees.

- A—New sections—proper bevel and angle for good work.
- B—Improperly ground section; narrow bevel and wrong angle which changes the angle of shear.
- C—Sections properly ground. Even after repeated grinding proper bevel and angle are retained.
- D—Sections ground off center, destroying the register of blade in guard.



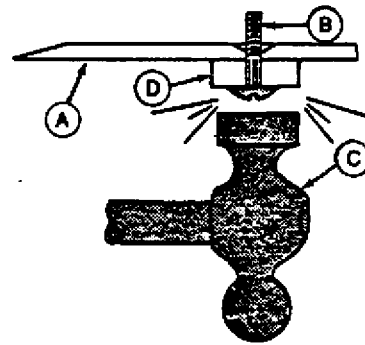
EX,1474,2015,I -19-04MAY93

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REPLACE BOLT-ON KNIFE SECTIONS

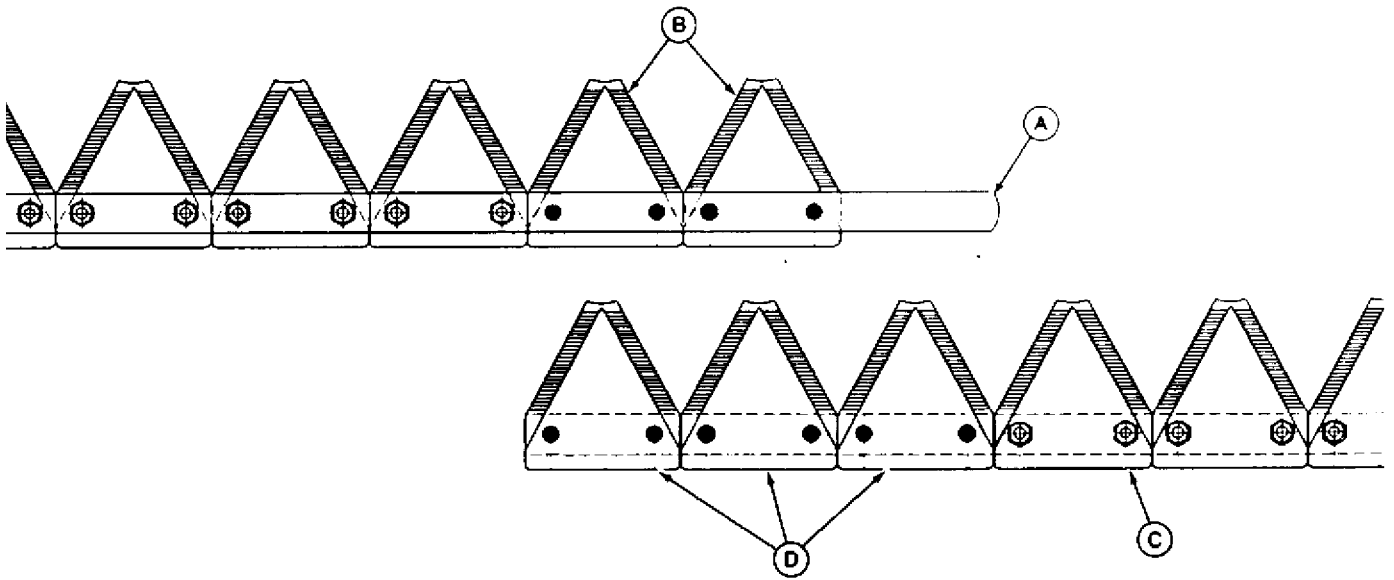
1. Install each new section (A) with two rib neck bolts and lock nuts (B). Install flat side of nut against knife section.
2. Drive bolts in from underneath with a hammer (C). Each bolt must be driven tight against knife back (D).
3. Tighten nuts to 8 lb-ft (11 N·m).



EX,1474,2015,IA-19-04MAY93

E34347 -JUN-16JUL90

REPLACE CENTER KNIFE SECTIONS



A—Left-Hand Knife

B—Bottom Countersunk
Section

C—Right-Hand Knife

D—Top Countersunk Section

Knives on Inward Stroke

IMPORTANT: Make sure knife sections are installed correctly. If sections are not correctly installed, damage to cutting components will occur.

NOTE: If the head of the rivet is not flush with the surface of the section, it may be necessary to lightly file the head of the rivet.

1. On the left-hand knife (A), install the two bottom countersunk sections (B) with flat head rivets.
2. On the right-hand knife (C), install the three top countersunk sections (D) with flat head rivets.

EX,1474,2015,IB-19-04MAY93

REPLACE RIVETED KNIFE SECTIONS

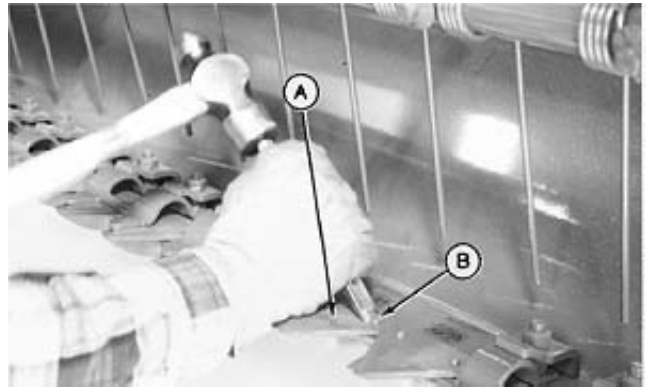
CAUTION: Wear gloves when working with knife to prevent injury.

NOTE: Remove knife from cutterbar to replace knife head.

1. Replace worn or broken knife sections (A) with knife in cutterbar.

IMPORTANT: Striking rivet from front can cause knife section misalignment.

2. Strike rivet (B) from side with chisel and heavy hammer.

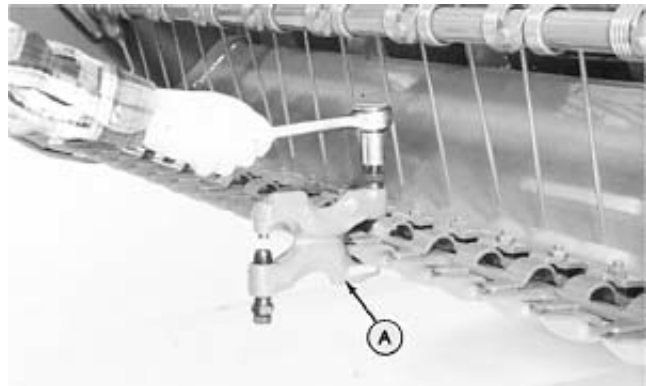


E33856 -UN-18DEC89

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EX,1474,2015,J -19-04MAY93

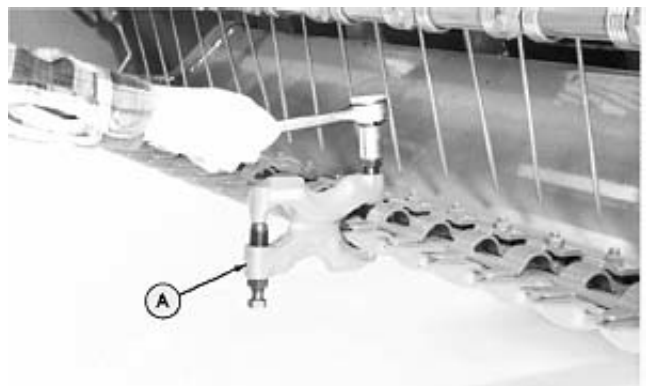
3. Remove rivet with TY5011 rivet tool (A).



E33853 -UN-18DEC89

EX,1474,2015,K -19-04MAY93

4. Position new knife section.
5. Insert rivet from bottom of knife.
6. Secure section with TY5011 rivet tool (A).

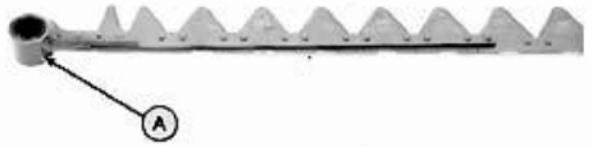


E33854 -UN-18DEC89

EX,1474,2015,L -19-04MAY93

REPLACE KNIFE HEAD

1. Remove knife from cutterbar. (See Remove Knife in this section.)
2. Remove knife head (A) using hammer, chisel and TY5011 rivet tool.
3. Reinstall head using rivet tool.



EX,1474,2015,M -19-04MAY93

E33855 -JUN-18DEC89

RECONDITION KNIFE HEAD

1. Remove knife from cutterbar. (See Remove Knife in this section.)
 2. Pry seal (A) from knife head.
- NOTE: Do not replace bearing unless necessary because it is difficult to remove.*
3. Check if knife head bearing (B) is rough or loose.
 4. Pry needles from caged bearing.



5. Cut several notches in upper lip of caged bearing race.

NOTE: Do not damage bore.

6. Pry outer race away from front or rear surface of bore in knife head (C) to loosen race.
7. Punch race out from bottom of knife head.

EX,1474,2015,N -19-04MAY93

E33858 -JUN-18DEC89

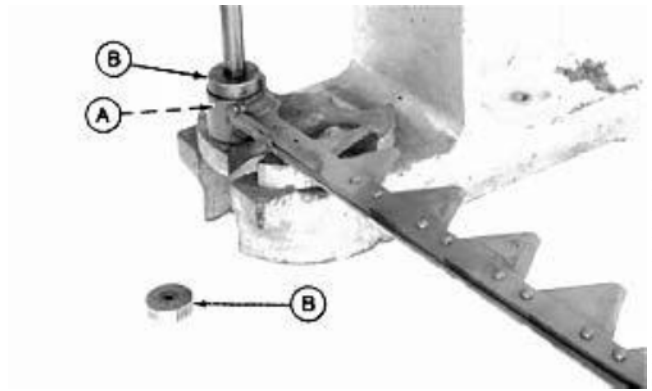
Cutterbar/Recondition Knife Head

8. Press needle bearing into knife head with 1-1/4 in. (A) and 1-3/4 in. (B) driver disks. Position top edge of bearing flush to 6.6 mm (0.26 in.) below step in knife head.

NOTE: Do not bottom bearing in knife head.

9. Position seal in knife head bore with lips facing up. Press seal flush to top of knife head using 1-1/4 in. and 1-1/2 in. (C) driver disks.

10. Coat bearing and seal with grease.



EX,1474,2015,O -19-04MAY93

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E33670

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REMOVE KNIFE DRIVE CASE

CAUTION: Lower both cylinder stops when working on machine. Failure to do so can result in personal injury.

1. Raise platform, lower cylinder stops (A), and place shop stand under platform.



EX,1474,2020,A -19-04MAY93

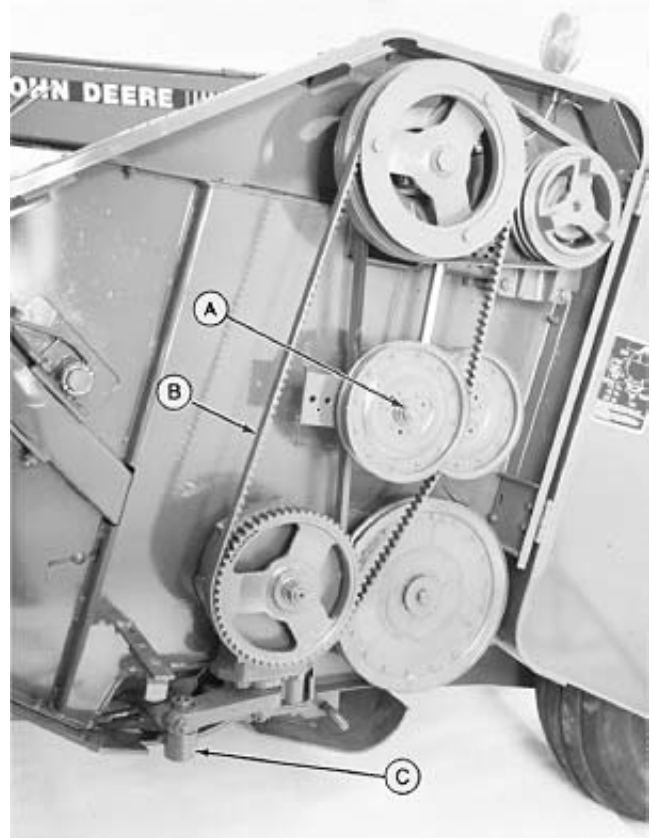
E36211 -UN-16JUL91

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2. Loosen nut (A) and move idler to release belt tension.

NOTE: Left-hand side illustrated.

3. Remove belt (B).
4. Move knife (C) to outer end of stroke.



EX,1474,2020,B -19-04MAY93

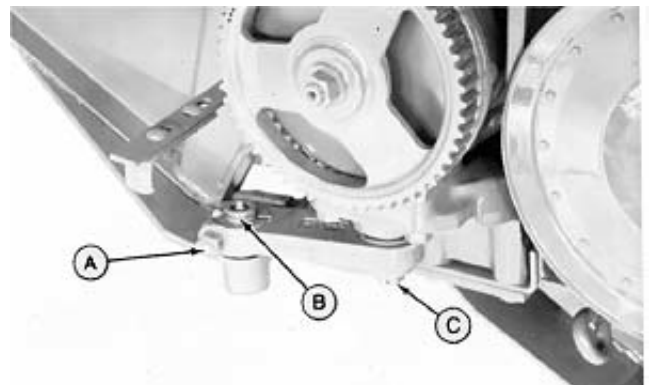
E33802 -UN-18DEC89

5. Remove clamp bolt (A).

6. Use groove (B) to pry connecting pin out of knife.

NOTE: Clamp may need to be opened slightly with wedge.

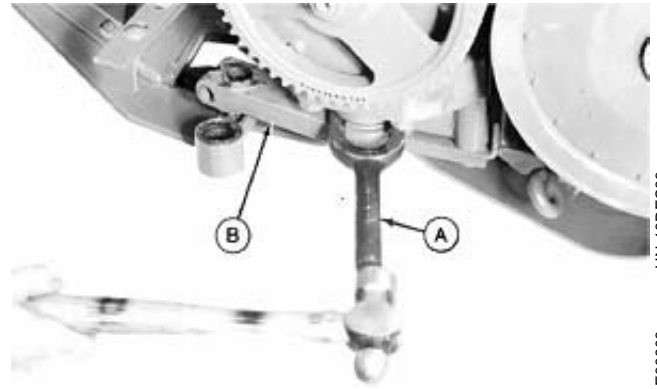
7. Remove cotter pin, nut (C), and washer from yoke.



EX,1474,2020,C -19-04MAY93

E33804 -UN-18DEC89

8. Use special tool JDO-1 (A) to remove drive arm (B).
Strike tool firmly until arm comes loose.



EX,1474,2020,D -19-04MAY93

E33806 -UN-18DEC89

9. Loosen four knife drive case cap screws (A) to ease bench disassembly of knife drive case.

NOTE: Knife drive case can be removed leaving support (B) in position if bearing or seal repair is not needed. Oil will leak out when case is removed.

10. Remove divider shoe (C).
11. Remove three remaining cap screws attaching knife drive support to platform frame.
12. Remove knife drive case (D) and support.



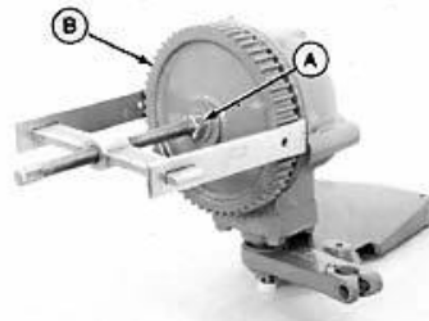
EX,1474,2020,E -19-04MAY93

E33807 -UN-18DEC89

- A—Cap Screws
- B—Support
- C—Divider Shoe
- D—Knife Drive Case

DISASSEMBLE KNIFE DRIVE CASE

1. Drain oil.
2. Loosen nut (A) and use puller to loosen gear (B).
3. Remove gear from shaft.



EX,1474,2020,F -19-04MAY93

E33805 -UN-18DEC89

NOTE: Insure that seal is not damaged by shaft splines.

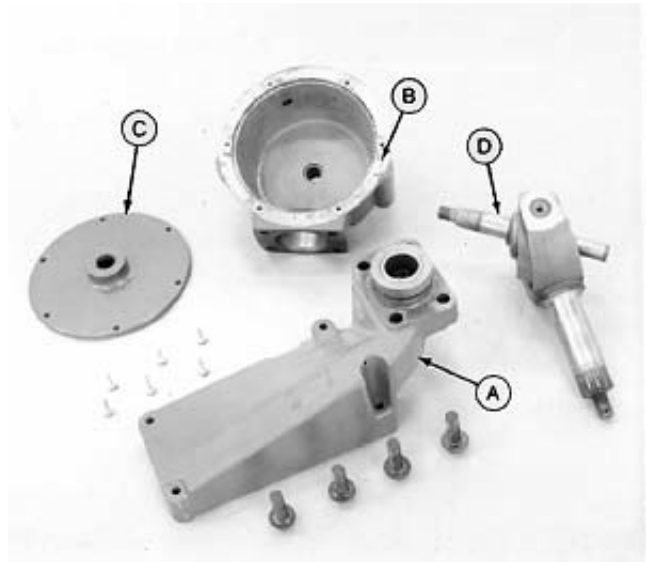
4. Remove support (A) from knife drive case (B).

NOTE: Do not damage sealing surface on aluminum cover or seal.

5. Remove knife drive case cover (C).

6. Remove yoke and knife drive shaft assembly (D) by tilting yoke and sliding from knife drive case.

- A—Support
- B—Knife Drive Case
- C—Cover
- D—Knife Drive Shaft Assembly



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E33808 -UN-18DEC89

EX,1474,2020,G -19-04MAY93

IMPORTANT: When holding the knife drive shaft (A) in the vise, grip the knife drive shaft on the raw casting at points (B) on the opposite side of the housing (C) from the stake nut (D).

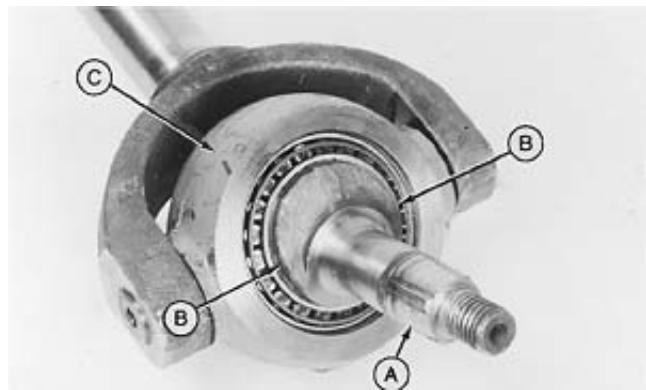
7. Position the knife drive assembly in the vise as shown.

IMPORTANT: When loosening the stake on the stake nut, use care not to damage the threads on the knife drive shaft (A).

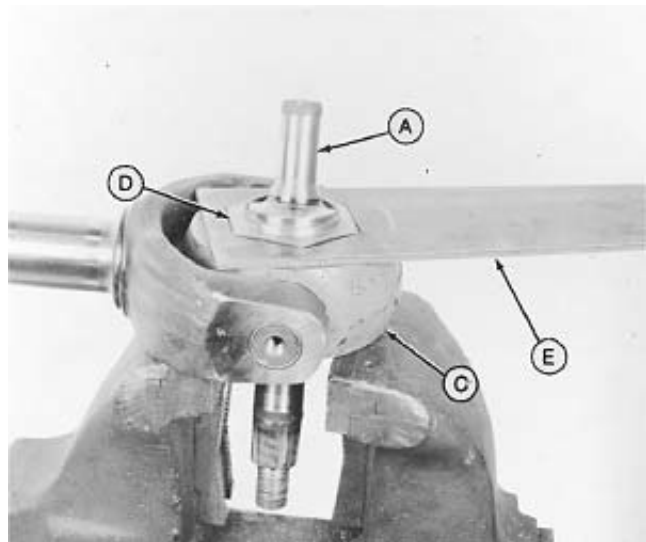
NOTE: Use large adjustable wrench or fabricated tool (E) to remove stake nut.

8. Loosen stake, remove and discard stake nut (D).

- A—Knife Drive Shaft
- B—Gripping Points
- C—Housing
- D—Stake Nut
- E—Fabricated Tool



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E37260 -UN-27APR93

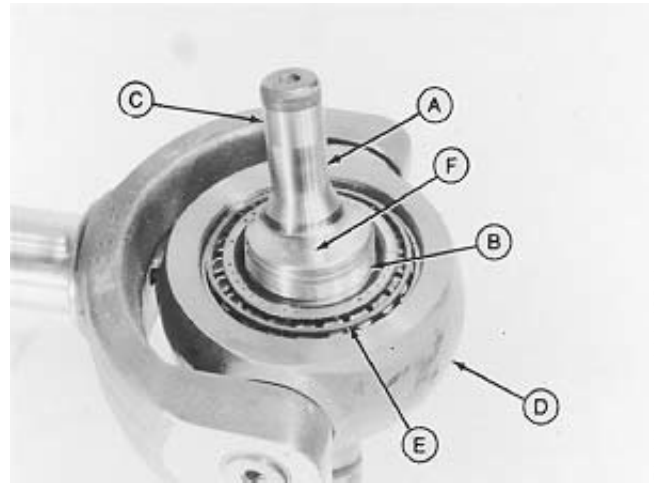
EX,1474,2020,H -19-04MAY93

IMPORTANT: When removing knife drive shaft (C), use care not to damage the machined area (A) or threads (B).

NOTE: When knife drive shaft (C) is pressed out of the housing assembly (D), bearing (E) will remain in the housing assembly.

9. Press knife drive shaft (C), at point (F), out of housing assembly (D). Discard bearing (E).

10. Remove and discard remaining bearing on knife drive shaft (C)



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EX,1474,2020,I -19-04MAY93

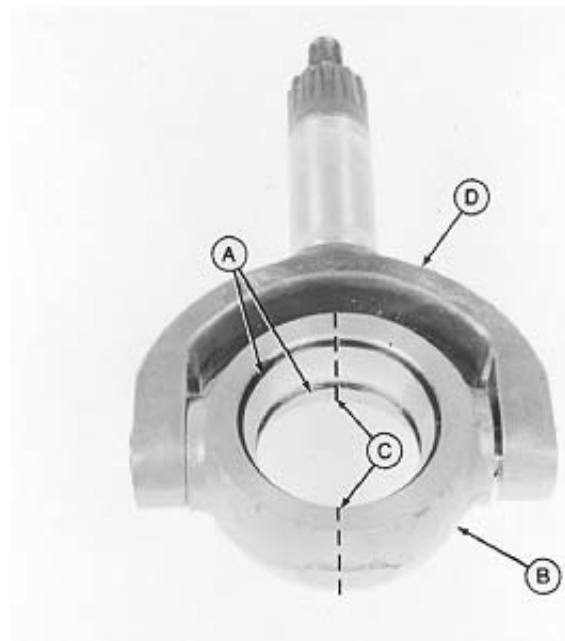
Note: If the yoke (D) is damaged, discard complete assembly at this point. Proceed to INSPECT KNIFE DRIVE CASE in this Section and Group.

11. Using a hammer and punch, drive out and discard both bearing cups (A).

12. Use an acetylene torch or bandsaw and cut the housing (B) in half at locations (C).

13. Remove and discard both halves of the housing.

- A—Bearing Cups
- B—Housing
- C—Location
- D—Yoke



E37276 -UN-30APR93

EX,1474,2020,J -19-04MAY93

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INSPECT KNIFE DRIVE CASE

1. Wash all parts thoroughly in clean solvent and dry.
2. Inspect all parts for wear or damage.
3. Check for irregular wear patterns, nicks, etc.
4. Check gear case bearing for roughness. Be certain bearing rotates freely and all rollers are in place.
5. Inspect spline, bearing surfaces, and threads on knife drive shaft.
6. If knife drive shaft assembly has not been removed from the yoke, rotate knife drive shaft and check bearings for roughness and check that all rollers are in place.
7. Inspect spline and bushings of yoke shaft.
8. Replace damaged parts.

EX,1474,2020,K -19-04MAY93

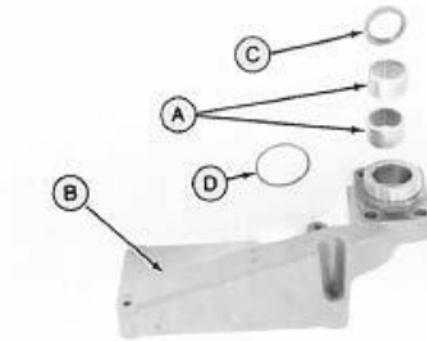
9. Check bearings (A) in knife drive case support (B) for damage or roughness.

10. Check seal (C) and O-Ring (D) for nicks or wear.

NOTE: Press against flat (stamped) side of bearings for ease of removal.

11. Replace damaged parts.

A—Bearings
B—Support
C—Seal
D—O-Ring



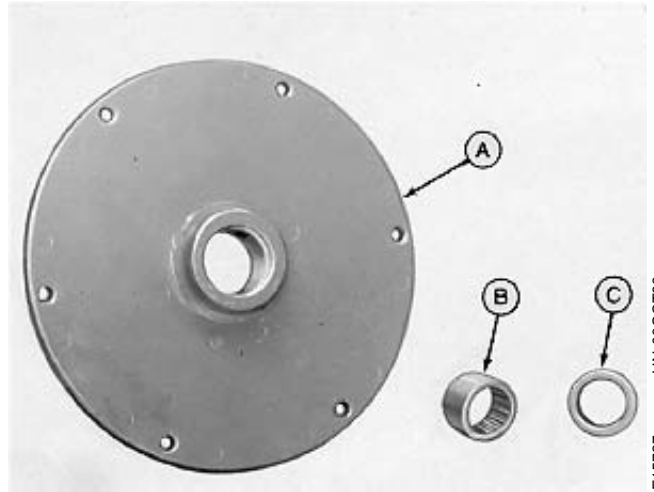
EX,1474,2020,L -19-04MAY93

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Knife Drive Case/Inspect Knife Drive Case

12. Check sealing surface of cover (A) for nicks.
13. Check bearing (B) for roughness.
14. Check seal (C) for nicks or damage.

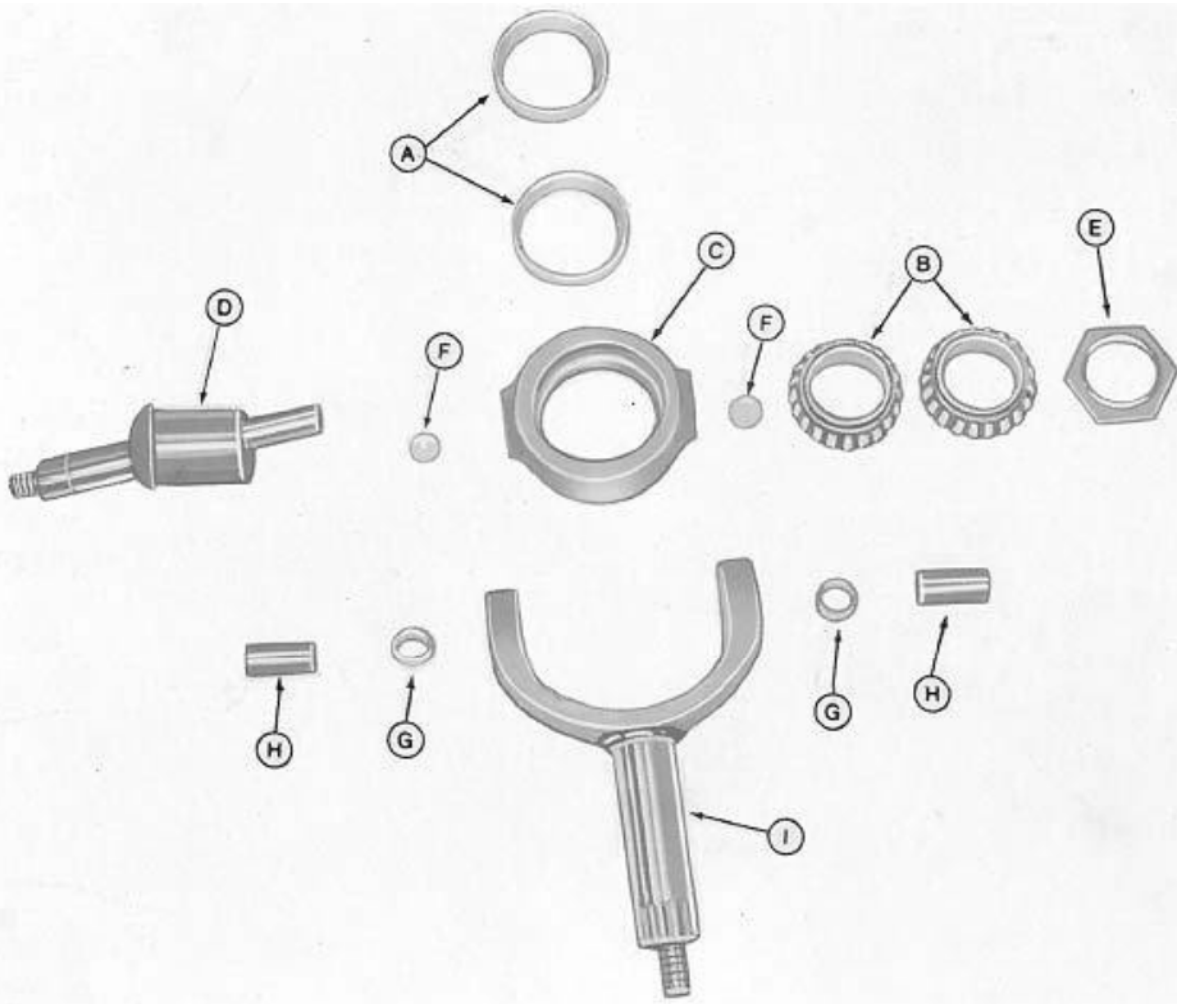


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EX,1474,2020,M -19-04MAY93

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ASSEMBLE KNIFE DRIVE CASE



A—Bearing Cups
B—Bearing Cones
C—Housing

D—Knife Drive Shaft
E—Stake Nut

F—Plugs
G—Bushings

H—Spindles
I—Yoke

IMPORTANT: Do not reuse housing (C), spindles (H), and plugs (F) if housing is removed from yoke (I)

If replacing housing (C), order new bearing cones (B) and stake nut (E).

If replacing knife drive shaft (D), order new stake nut (E).

If replacing bearing cones (B) and cups, order new stake nut (E).

If replacing yoke (I), order new bearing cones (B), housing (C), and stake nut (E).

1. Assemble in reverse order of disassembly using following special instructions.

2. Press bushings (G) into yoke (I) to flush plus or minus 0.5 mm (0.02 in.) with inside finish of yoke.

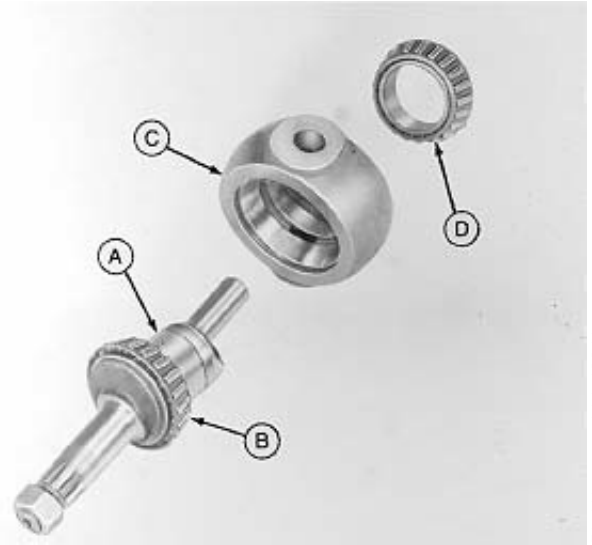
E15728 -JUN-03OCT88

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IMPORTANT: Housing (C) is received from repairs with bearing cups in place. Do not reuse bearing cones (B) and (D) with new housing.

3. Press bearing cone (B) on knife drive shaft (A) as shown.
4. Position knife drive shaft with bearing in housing (C).
5. Press bearing cone (D) on knife drive shaft.

A—Knife Drive Shaft
B—Bearing Cone
C—Housing
D—Bearing Cone



E37263 -UN-27APR93

EX,1474,2020,NA-19-04MAY93

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NOTE: Do not strike end of knife drive shaft with metal hammer when adjusting bearing.

6. Tighten stake nut (A) on knife drive shaft (B) to obtain 0.33—0.56 N·m (3—5 lb-in) rolling torque.

IMPORTANT: Do not clamp finished surface (C) when positioning the housing (D) in the vise.

7. Reposition knife drive assembly in the vise, clamping the housing (D).

8. Install a 3/4-in. nut (E) on threaded end of knife drive shaft.

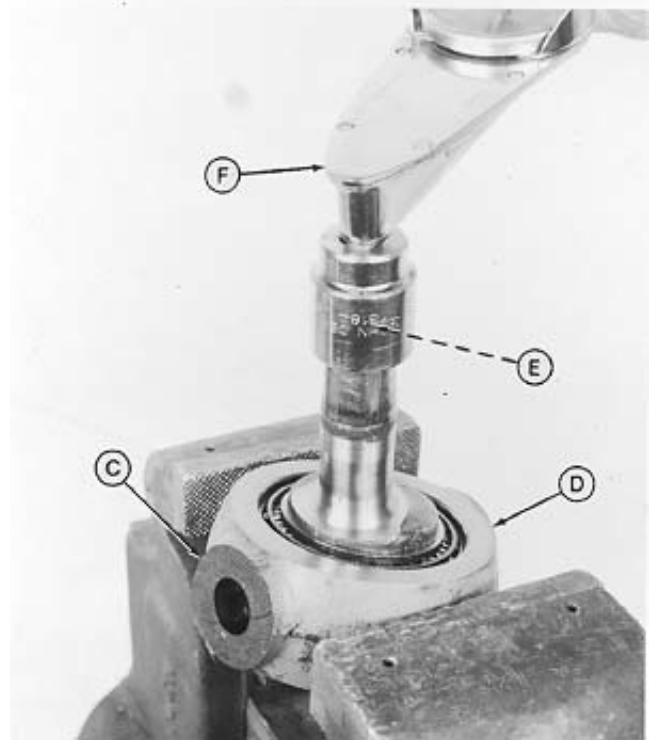
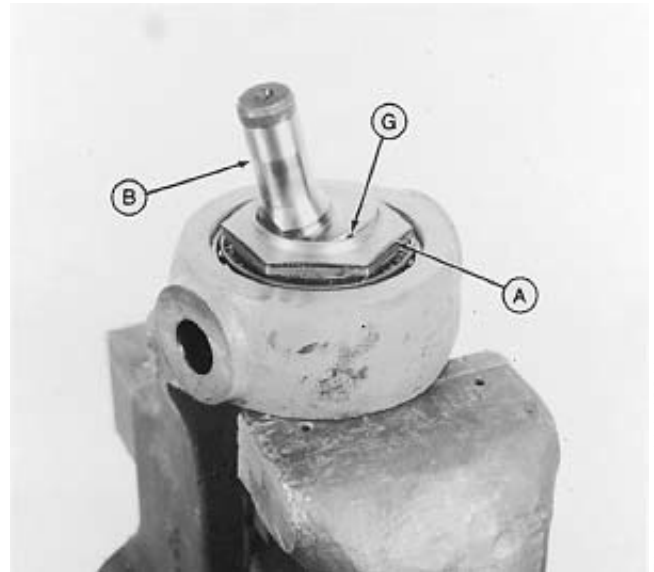
9. Check rolling torque with torque wrench (F).

10. Adjust stake nut until desired rolling torque is obtained.

NOTE: There is a recess (G) in the threads on the knife drive shaft (B). Stake the stake nut (A) at the recess.

11. Stake the stake nut (A) to the knife drive shaft (B).

- A—Stake Nut
- B—Knife Drive Shaft
- C—Finished Surface
- D—Housing
- E—Nut 3/4-in.
- F—Torque Wrench
- G—Recess



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E37265

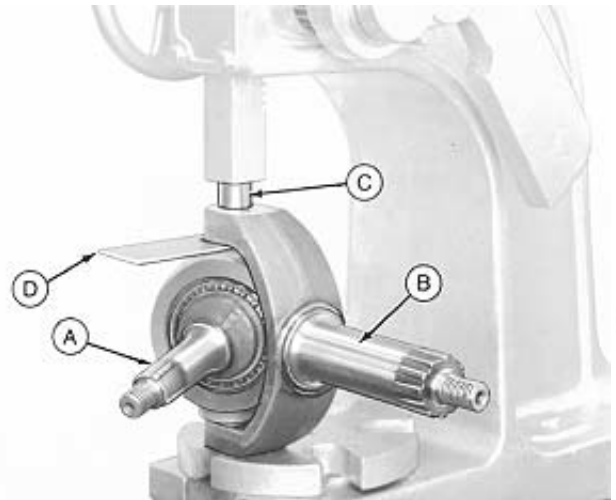
EX.1474.2020.O -19-04MAY93

IMPORTANT: Place plastic plugs in housing bore before pressing spindles into bore to prevent chips from falling into bearing.

NOTE: Use fabricated shim (D) to prevent over-pressing spindle (C) into housing, contacting bearing cups.

12. Assemble knife drive shaft assembly (A) in yoke (B) with spindles (C).

- A—Knife Drive Shaft Assembly
- B—Yoke
- C—Spindle
- D—Shim



EX,1474,2020,P -19-04MAY93

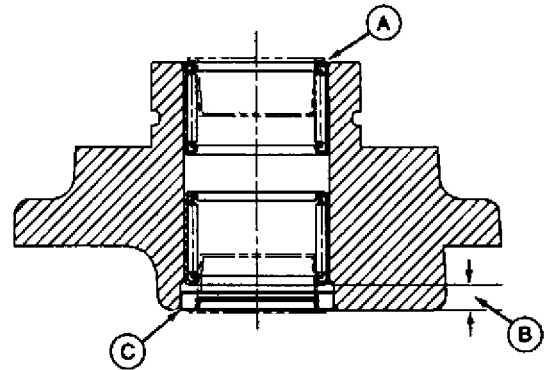
NOTE: Press on flat (stamped) side of bearing.

13. Press upper bearing into gear case support flush (A) with inside surface. Use 1-5/8 in. and 2-in. driver disks.

14. Press lower bearing into bore to 8.2—9.2 mm (0.32—0.36-in.) (B) from outside surface.

NOTE: Position seal lip toward inside.

15. Press seal into bore flush to 0.8 mm (0.03-in.) (C) from outside surface. Use 1-5/8 in. and 2-1/8 in. driver disks.



Gear Case Support

EX,1474,2020,Q -19-04MAY93

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E33869 -UN-05JAN90

Knife Drive Case/Assemble Knife Drive Case

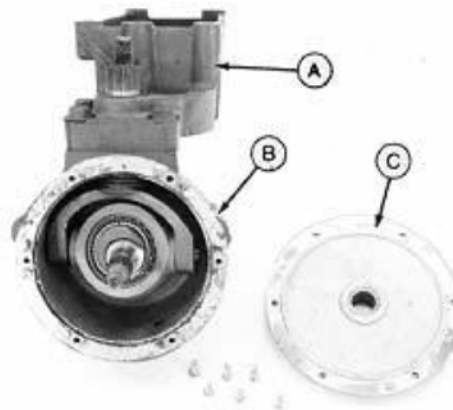
16. Apply 2.5 mm (0.10-in.) bead of TY15130 sealant around cover (C) inside of bolt circle.

NOTE: Use seal protector over splines.

17. Install cover on knife drive case (B) and tighten bolts to 30—40 N·m (22—29 lb-ft)

18. Fill knife drive case with 0.946 L (1 qt) of John Deere GL-5 Gear Lubricant.

19. Install support (A) on knife drive case and tighten cap screws to 244—271 N·m (180—200 lb-ft).



EX,1474,2020,R -19-04MAY93

20. Install gear (A), washer, and nut on shaft.

21. Tighten nut (B) to 136—162 N·m (100—119 lb-ft).



EX,1474,2020,S -19-04MAY93

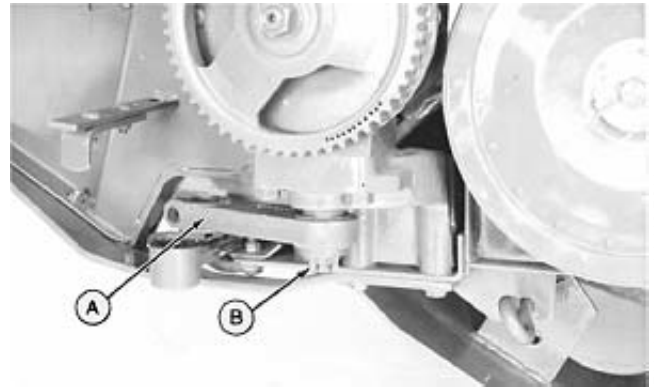
INSTALL KNIFE DRIVE CASE

1. Install in reverse order of removal using following special instructions.
2. Tighten five support mounting bolts to 136 N·m (100 lb-ft).
3. Install knife arm (A) and tighten nut (B) to 244 N·m (180 lb-ft).

NOTE: Be sure chamfer on inside diameter of washer is next to knife arm.

4. Strike rear of arm with hammer to seat arm on tapered shaft.

5. Tighten nut to 244 N·m (180 lb-ft).

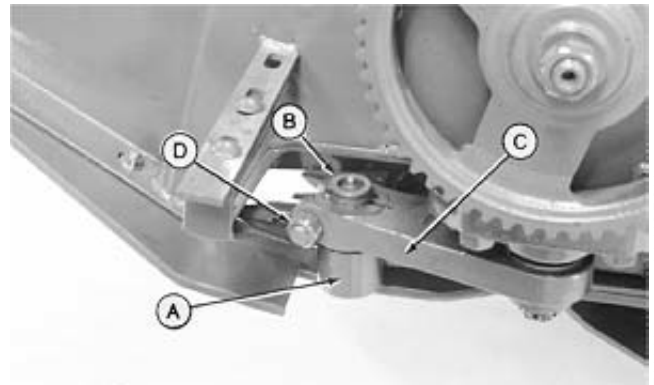


E33811 -UN-18DEC89

EX,1474,2020,T -19-04MAY93

6. Slide knife (A) to midstroke position.
7. Insert drive pin (B) through drive arm (C) into knife head.
8. Install clamp bolt (D), and adjust pin position. (See Install Knives in this section.)
9. Tighten clamp bolt (D) to 190—217 N·m (140—160 lb-ft).

A—Knife
B—Drive Pin
C—Drive Arm
D—Clamp Bolt



E33812 -UN-18DEC89

EX,1474,2020,U -19-04MAY93

IMPORTANT: Overfilling gear case can cause leakage, overheating, and contribute to internal damage.

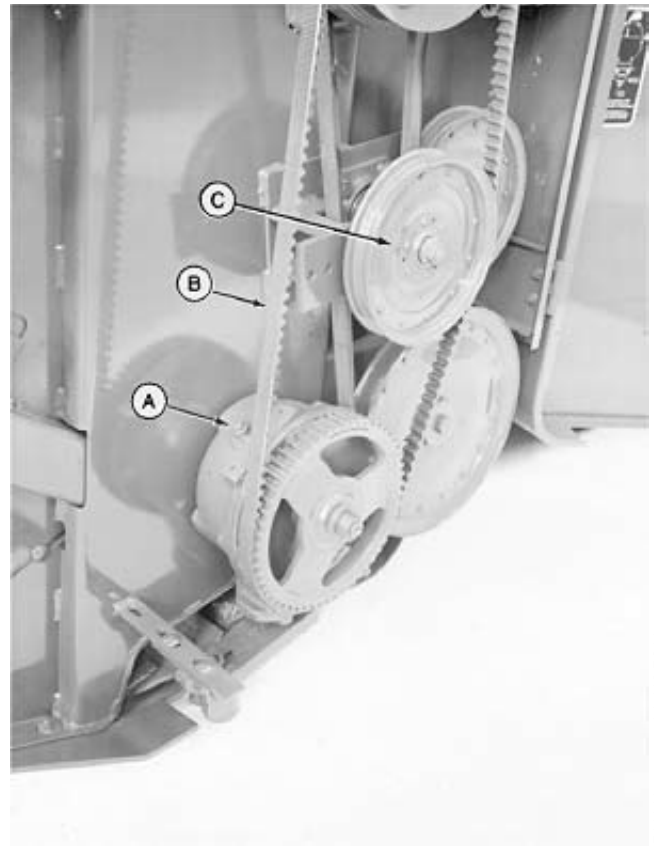
10. Fill gear case (A) to 64—89 mm (2.5—3.5 in.) below fill plug. Capacity is 0.946 L (1 qt). Fill with John Deere GL-5 Gear Lubricant.

11. Insure both knives are fully inward on their strokes for timing. (See Time Knives in this section.)

12. Install timing belt (B).

13. Adjust idler (C) until belt deflects 11.5 mm (0.45 in.) with 45—50 N (10—13 lb) applied at center of belt span.

14. Tighten idler bolt.



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E33810 -JN-18DEC89

EX,1474,2020,V -19-04MAY93

Section 30 Platform

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PLATFORM DESCRIPTION

A turnbuckle (A) or electric actuator changes the platform position to adjust guard angle.

The multi-bat reel (B) delivers the crop to the augers. Reel position, speed, finger angle, and the number of bats can be changed to match conditions.

Two augers (C) with adjustable strippers provide unrestricted crop flow to the entire width of the conditioner rolls.

Two float spring assemblies (D) provide platform flotation.

- A—Guard Angle Turnbuckle
- B—Reel
- C—Augers
- D—Float Spring



EX,1474,3005,A -19-26APR93

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E33928 -UN-04JAN90

PLATFORM DRIVE

The platform is driven from the left side by a power band belt (A). A V-belt (B) drives the augers, and a timing belt (C) drives the left knife drive case.

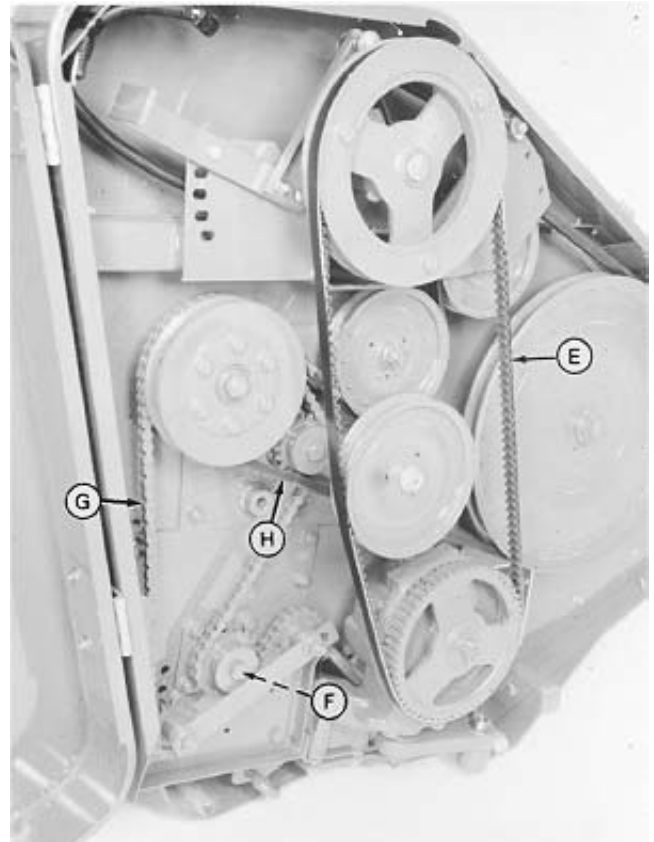
A platform cross shaft (D) transmits power to the right timing belt (E) and knife drive case.

The lower auger shaft (F) transmits power to the right side and drives the upper auger with a roller chain (G). The lower auger also drives the reel with a V-belt (H).

- A—Platform Drive Belt
- B—Auger Drive Belt
- C—Left Knife Drive Belt
- D—Cross Shaft
- E—Right Knife Drive Belt
- F—Lower Auger Shaft
- G—Auger Drive Chain
- H—Reel Drive Belt



E33885 -UN-03JAN90



E37128 -UN-08APR93

EX,1474,3005,B -19-26APR93

SPECIFICATIONS

ITEM	MEASUREMENT	SPECIFICATION
Guards	Angle	6 Degrees to 12 Degrees
Cam Follower	Clearance	3 mm (0.1 in.)
Tooth Pipe	Endplay	0.3—2 mm (0.01—0.08-in.)
Auger Stripper	Clearance	2—4 mm (0.1—0.2-in.)
Carrier Cross Shaft	Endplay	Maximum 1.5 mm (0.06-in.)
Platform Drive Belt	Deflection	3.5 mm (0.14-in.) with 98—124 N (22—28 lb)
Knife Drive Belt	Deflection	6.5—16.5 mm (0.25—0.65 in.) with 44—58 N (10—13 lb)
Auger Drive Belt	Deflection	11.5 mm (0.45 in.) with 67—84 N (15—19 lb)
Auger Drive Chain	Deflection	13 mm (0.5 in.)
Reel Drive Variable Sheave Bearings	Position	Flush to 0.38 mm (0.015 in.) into Bore

EX,1474,3005,D -19

TORQUE VALUES

LOCATION	N·m	(lb-ft)
Reel Teeth	11—24	8—18
Reel Bats	34—60	25—44
Knife Drive Hubs	271—379	200—280
Reel Drive Variable Sheave Mounting Bolt	106—174	78—128
Reel Drive Variable Sheave Carriage Bolts	48—60	35—44

EX,1474,3005,E -19

SPECIAL TOOLS

D01045AA — Driver set used to install bearings in platform drive sheave housing.

EX,1474,3005,C -19-26APR93

TORQUE VALUES

LOCATION	N·m	(lb-ft)
Reel Teeth	11—24	8—18
Reel Bats	34—60	25—44
Knife Drive Hubs	271—379	200—280
Reel Drive Variable Sheave Mounting Bolt	106—174	78—128
Reel Drive Variable Sheave Carriage Bolts	48—60	35—44

EX,1474,3005,D -19-26APR93

SPECIAL TOOLS

D01045AA — Driver set used to install bearings in platform drive sheave housing.

EX,1474,3005,E -19-26APR93

DIAGNOSING MALFUNCTIONS

Symptom	Problem	Solution
Unusual platform vibration	Knife drives out of time.	Time the knives. (See Time Knives in Section 20.)
Mud and dirt buildup on platform	Cutterbar too low.	Raise cutterbar using gauge shoes and reduce guard angle. (See Adjust Gauge Shoes and Adjust Platform Guard Angle in this section.)
Crop wraps around end of auger	Incorrect stripper adjustment.	Adjust strippers at end of augers. (See Adjust Upper and Lower Auger Stripper in this section.)
Crop wraps around middle of lower auger	Heavy, long stem crop.	Adjust center auger stripper. (See Adjust Center Auger Stripper in this section.)
Crop wraps on upper auger	Incorrect reel release.	Adjust reel cam. (See Adjust Cam in this section.)
	Nicks on auger flighting.	Grind smooth any nicks or irregular areas on auger so crop does not wrap.
Crop plugs in front of auger	Reel teeth have too much clearance with deck and guards.	Adjust reel position. (See Adjust Reel in this section.)
	Auger drive belt slipping.	Check belt and adjust. (See Adjust Auger Drive Belt in this section.)
	Reel drive belt slipping.	Check belt and adjust. (See Adjust Reel Drive Belt in this section.)
	Cutterbar plugging.	See Ragged and Uneven Cutting of Crop in Diagnosing Malfunctions in Section 10.
Reel not feeding properly	Reel cannot handle amount of crop coming into platform.	Increase reel speed. (See Adjust Reel Speed in this section.)
		Add additional reel bats.
		Reduce ground speed to 75—80% of reel speed.
	Reel is throwing crop over platform.	Decrease reel speed to prevent carryover. (See Adjust Reel Speed in this section.)
		Adjust cam. (See Adjust Reel Cam in this section.)

Continued on next page

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Symptom	Problem	Solution
		Move reel down and back for light crops. (See Adjust Reel in this section.)
	Reel drive belt slipping.	Check belt tension. (See Adjust Reel Drive Belt in this section.) Adjust reel and cam. (See Adjust Reel and Adjust Reel Cam in this section.)
Leaf loss or crop damage	Reel speed not coordinated with ground speed.	Change reel drive to coordinate reel speed with ground speed so reel will move material smoothly and evenly. (See Adjust Reel Speed in this section.)
	Ground speed too fast for condition of crop.	Slow down.
Crop carrying over top of reel.	Reel speed too fast.	Reduce reel speed. (See Adjust Reel Speed in this section.)
	Wrong cam angle.	Adjust cam (See Adjust Cam in this section.)
Reel hesitation.	Low hydraulic fluid.	Check and add fluid.
	Auger drive belt slipping.	Check belt and adjust. (See Adjust Auger Drive Belt in this section.)
	Platform drive belt slipping.	Check belt and adjust. (See Adjust Platform Drive Belt in this section.)
	Reel drive belt slipping.	Check belt and adjust. (See Adjust Reel Drive Belt in this section.)
	Heavy, lodged material.	Slow down ground speed.
	Cutterbar plugged.	See Ragged and Uneven Cutting of Crop in Diagnosing Malfunctions in Section 10.
Cam rollers leave cam track	Bat clamp bolts are loose.	Adjust for 3 mm (0.1-in.) clearance between cam follower arm and bracket, and between cam follower arm and cam. Tighten bolts. (See Adjust Cam Followers in this section.)
	Roller not in cam far enough.	Reshim for 3 mm (0.1-in.) clearance between cam follower and cam. (See Adjust Cam Followers in this section.) Remove washers from left—hand reel shaft

Continued on next page

Symptom	Problem	Solution
Cam track and follower bearing failure	Reel speed too fast.	Slow down reel speed. (See Adjust Reel Speed in this section.)
Auger drive chain noise.	Chain worn out and climbing on sprocket teeth.	Replace chain. (See Replace and Adjust Auger Drive Chain in this section.)
	Chains are dry.	Clean and lubricate.
Excessive roller chain noise	Chain too loose.	Adjust to correct deflection. (See Replace and Adjust Auger Drive Chain in this section.)
	Chain too tight.	Adjust to correct deflection. (See Replace and Adjust Auger Drive Chain in this section.)
	Chains are dry.	Clean and lubricate chains.
	Sprockets are worn or out of alignment.	Replace worn sprockets or align sprockets. (See Replace and Adjust Auger Drive Chain in this section.)
	Excessive load on chains.	Avoid overload on drives.
Platform side drafts at angle	Incorrect float spring adjustment.	Adjust float springs. (See Adjust Platform Float in this section.)
	Low tire pressure.	Check tire pressure. (See Checking Tire Inflation in Preparing the Mower Conditioner section of operator's manual.)
	Guard angle too steep.	Adjust guard angle. (See Adjust Platform Guard Angle in this section.)
	Platform is dragging on one end and pulling to that side.	Adjust platform flotation. (See Adjust Platform Float in this section.) Adjust gauge shoes. (See Adjust Gauge Shoes in this section.)
Knife drive belt not tracking properly on lower sprocket	Alignment incorrect.	Align sprockets and idler sheave. (See Install Platform Cross Shaft and Align Knife Drive Belt in this section.)
Excessive reel drive belt wear	Incorrect belt tension or out of alignment.	Adjust tension and alignment. (See Adjust Reel Drive Belt in this section.)
	Sheaves are worn.	Replace sheaves.
	Sheave grooves are partially filled.	Remove dirt or rust from grooves.

Continued on next page

Diagnosing Malfunctions

Symptom

Problem

Solution

Knives are producing excessive load on belt.

Replace dull or broken sections. (See Replace Knife Sections in Section 20.)

Adjust knife hold-downs. (See Adjust Regular or Non-Clog Hold-Downs in Section 20.)

Adjust gauge shoes. (See Adjust Gauge Shoes in this section.)

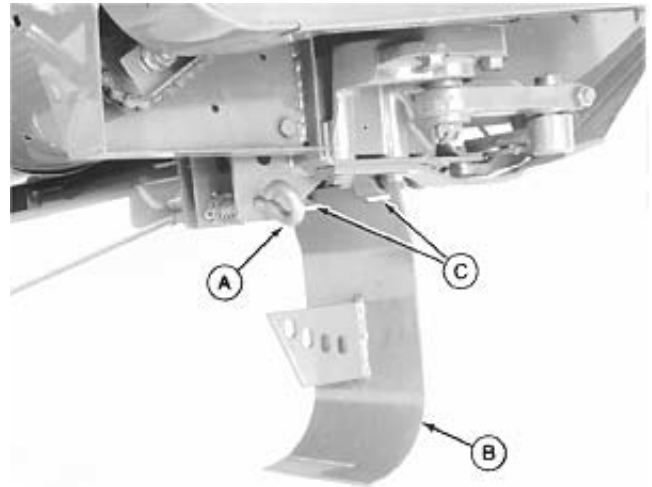
EX,1474,3010,A -19-26APR93

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REPLACE GAUGE SHOES

CAUTION: Lower both cylinder stops when working on machine. Failure to do so can result in personal injury or machine damage.

1. Raise platform and lower cylinder stop at each end of carrier frame.
2. Pull pin (A) and allow gauge shoe (B) to drop down.
3. Remove two cap screws and supports (C).
4. Install gauge shoes in reverse order of removal.
5. Adjust gauge shoe, (see 'Adjust Gauge Shoe in this section).



EX,1474,3015,A -19-26APR93

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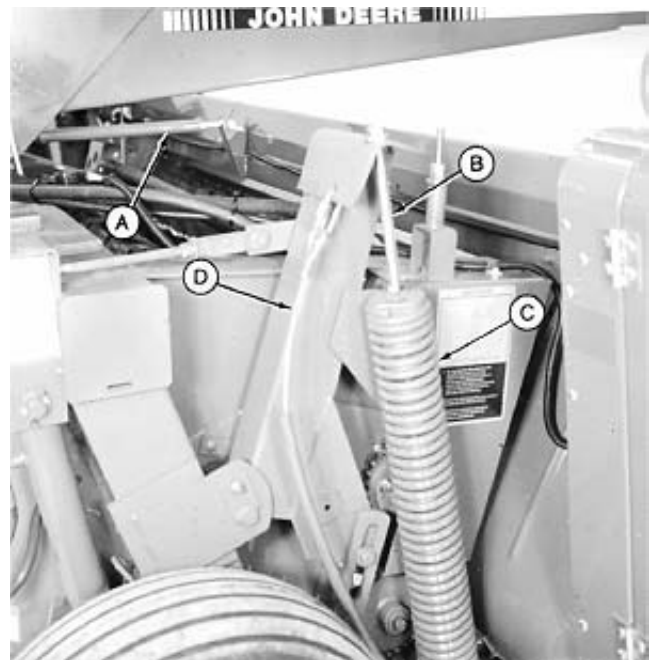
REMOVE PLATFORM

1. Move machine to level area.
2. Lower platform to ground.
3. Disconnect wiring harnesses from tongue and carrier frame.
4. Disconnect powershaft U-joint from carrier. (See Remove Powershaft in this section.)

CAUTION: Platform pivots forward when upper link is disconnected. Support platform to prevent injury or machine damage.

IMPORTANT: Supporting platform at center of knockdown bar can bend bar.

5. Support front of platform at ends of knockdown bar.
6. Loosen jam nut on float spring bolt (B), remove float spring (C), and down stop cable (D) on each side of machine.
7. Disconnect upper link (A) and pivot front of platform to ground.



Right Side

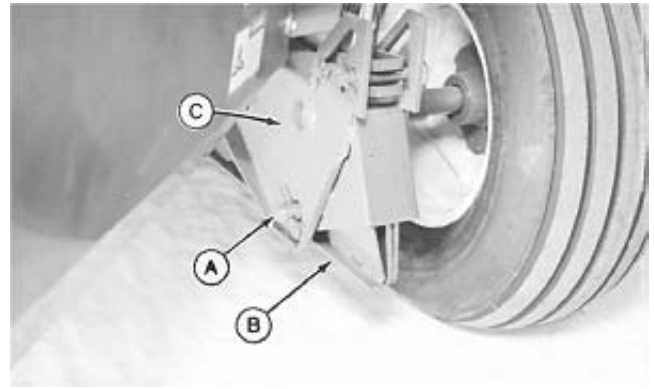
A—Upper Link
B—Bolt
C—Float Spring
D—Down Stop Cable

EX,1474,3015,B -19-26APR93

-JUN-17MAR93
E37099

8. Remove pin (A) and disconnect lower link (B) from wheel support (C).

NOTE: The platform can also be removed from the carrier frame by disconnecting the front of the lower links. Float springs would not have to be completely removed, but make sure all spring tension is released.

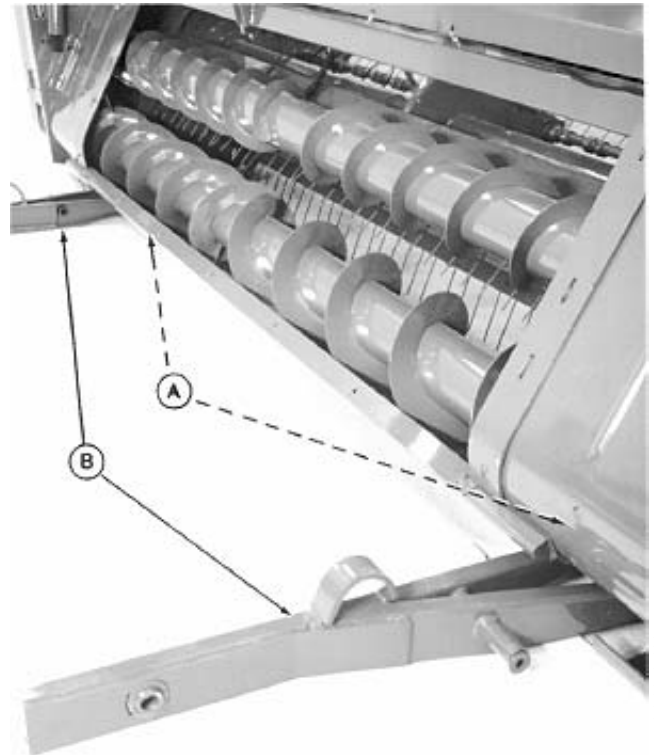


EX,1474,3015,C -19-26APR93

E36686 -UN-04FEB92

9. Move carrier frame to the rear and away from the platform.

10. Remove pins (A) on each side and disconnect lower links (B) from platform if necessary.



EX,1474,3015,D -19-26APR93

E33871 -UN-03JAN90

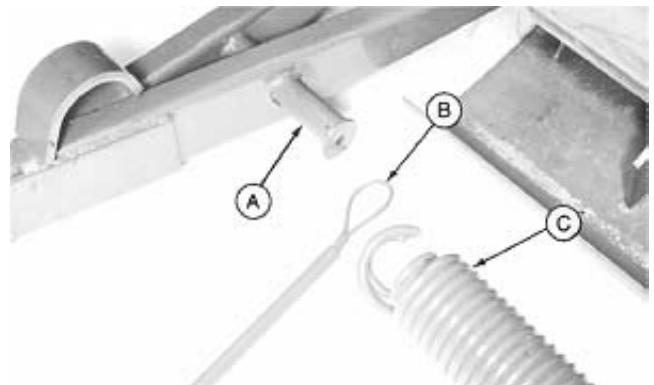
ATTACH PLATFORM

1. Reverse steps 1—9, REMOVE PLATFORM in this Section and Group using the following special instructions.

2. Install down stop cable (B) on lower link (A) then the float spring (C) with hook opening to the rear.

3. Coat float spring bolt head and washer with NEVER-SEEZ®

NEVER-SEEZ is a registered trademark of the Emhart Chemical Group.



EX,1474,3015,E -19-26APR93

E37100 -UN-17MAR93

ADJUST PLATFORM GUARD ANGLE

Adjust to minimum 6° below horizontal for rocky conditions, or to maximum 12° for flat conditions and short stubble.

NOTE: When setting guard angle (D), top of tongue (C) is level, gauge shoes and platform lift cylinders are set for cutting short stubble. (See ADJUST CARRIER FRAME HEIGHT in this Section.)

1. Adjust guard angle (D) by changing length of upper link (A). Three revolutions equal one degree of angle.

NOTE: Dimension (B) is measured from center of ball joint to center of ball joint.

2. Adjust length (B) of upper link (A) to specified length to obtain desired guard angle (D).

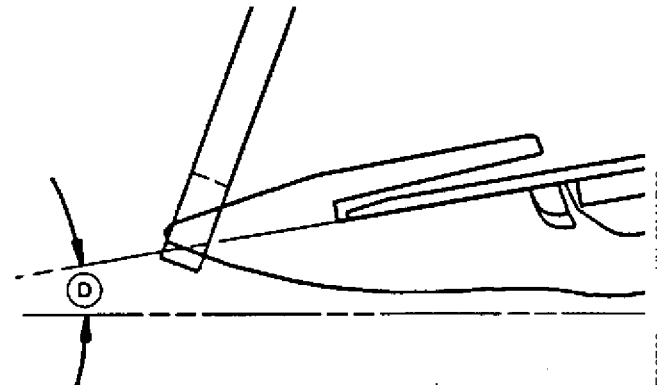
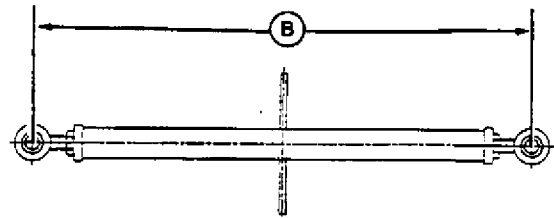
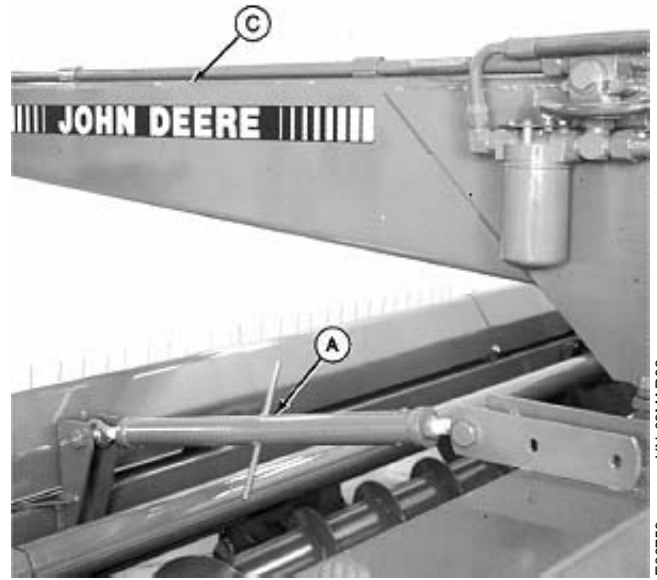
NOTE: Initial guard angle setting, when shipped from the factory, is 737 mm (29 in.).

Guard angle-(D)	Dimension-(B)
11.5°	756 mm (29-3/4 in.)
9°	718 mm (28-1/4 in.)
6°	668 mm (26-1/4 in.)

3. For a guard angle of 8°, adjust upper link (A) to a dimension (B) of 718 mm (28-1/4 in.), then shorten upper link (A) three complete turns.

4. Adjust gauge shoes and platform float. (See Adjust Gauge Shoes and Adjust Platform Float in this section.)

- A—Upper link
- B—Dimension
- C—Tongue
- D—Guard angle



EX,1474,3015,F -19-26APR93

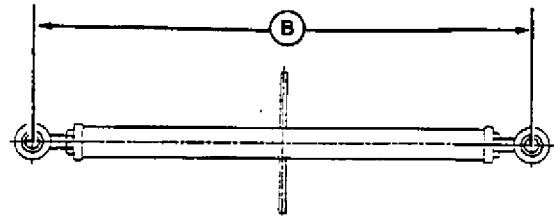
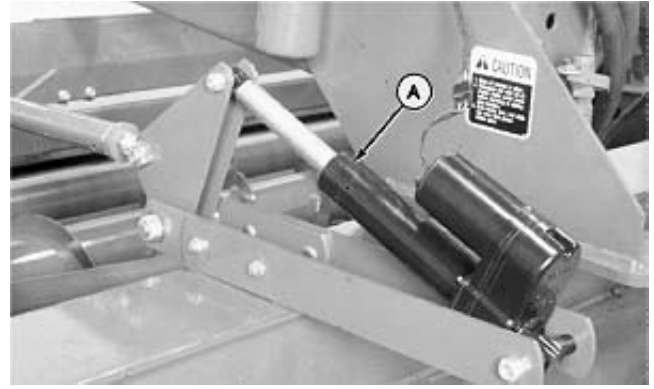
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E36759
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E33489
-UN-09/MAR92
E36760

ADJUST PLATFORM GUARD ANGLE WITH ELECTRIC GUARD ANGLE CONTROLLER

The electric guard angle actuator (A) can change the guard angle from 6° below horizontal to 12° below horizontal.

IMPORTANT: Do not change upper link setting and operate electric actuator as the conditioner rolls may contact rear of platform.

1. Set upper link to 685 mm (27 in.) (B) from center of ball joint to center of ball joint.
2. Retract actuator (A) to set guard angle at 6° below horizontal.
3. Extend actuator halfway (approximately 76 mm [3-in.]) to set guard angle at 8-1/2° below horizontal.
4. Completely extend actuator to set guard angle at 12° below horizontal.



EX,1474,3015,G -19-26APR93

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-UN-06SEP89
E33591

-UN-24JUL89

E33489

ADJUST PLATFORM FLOAT

IMPORTANT: Do not raise platform unless float springs are installed and adjusted. Failure to adjust float springs before raising platform can cause the upper link to damage the power tube.

Adjust float springs (B) for ground pressure of 23—45 kg (50—100 lb) measured at each end of knockdown bar.

Use the lightest float setting that allows the platform to remain firmly on the ground without bouncing. The platform should follow uneven ground without gouging or scraping.

NOTE: Dimension (A) is ± 10 mm (3/8 in)

Following are the factory settings:

Machine Width	Left-Hand Side (A)	Right-Hand Side (A)
12 Foot	220 mm (8-5/8 in)	255 mm (10 in)
14 Foot	160 mm (6-1/4 in)	210 mm (8-1/4 in)
16 Foot	150 mm (5-7/8 in)	175 mm (6-7/8 in)

1. Loosen jam nut (C).
2. Turn adjusting bolt (D) clockwise to decrease ground pressure and counterclockwise to increase ground pressure.
3. Tighten jam nut (C).



A—Dimension
 B—Float Spring
 C—Jam Nut
 D—Adjusting Bolt

E37101 -JUN-17MAR93

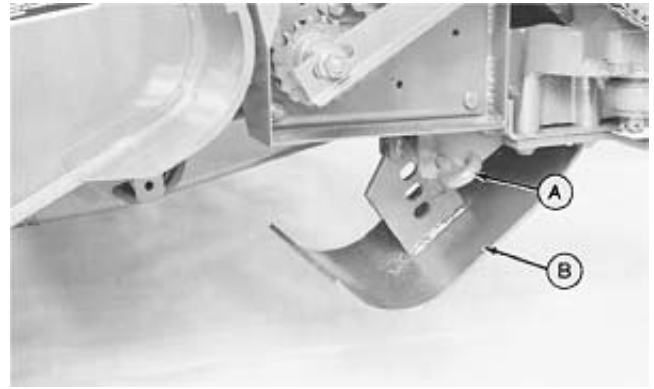
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EX,1474,3015.I -19-26APR93

ADJUST GAUGE SHOES

CAUTION: Lower BOTH cylinder stops when working on machine. Failure to do so can result in personal injury or machine damage.

1. Lower cylinder stop at each end of carrier frame.
2. Pull rod (A) to retract pin. Lift or lower gauge shoe (B) until pin engages hole for desired gauge shoe position.
3. Repeat step on opposite side.



E33324 -UN-24JUL89

IMPORTANT: Cylinder position must correspond to gauge shoe position. If not, machine damage may occur.

4. Adjust carrier frame height to correspond with gauge shoe adjustment (See Adjust Carrier Frame Height in this section).
5. Check platform float and guard angle adjustment.
6. Raise cylinder stops before operating the mower-conditioner.

EX,1474,3015,H -19-26APR93

ADJUST CARRIER FRAME HEIGHT

1. Raise machine completely.

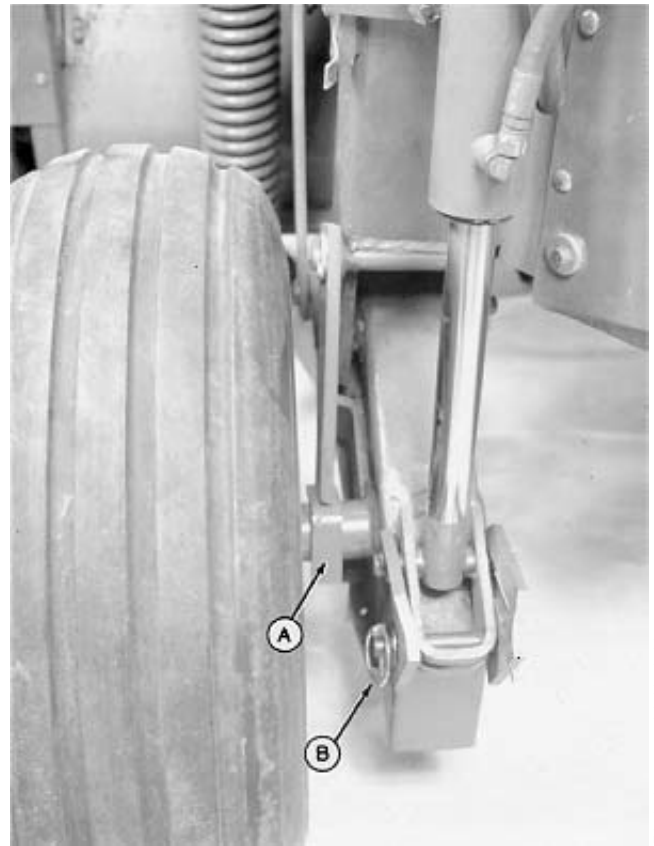
⚠ CAUTION: Lower BOTH cylinder stops when working on machine. Failure to do so can result in personal injury or machine damage.

2. Lower cylinder stop (A) at each end of carrier frame.

3. Lower machine onto stops.

4. Remove quick-lock pin (B). Remove washers and retaining pin.

- See **5A. NORMAL CUTTING HEIGHT** and **5B. LOWEST CUTTING HEIGHT** on the following pages.



EX.1474,3015,J -19-26APR93

E34341 -UN-13JUL90

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5A. NORMAL CUTTING HEIGHT:

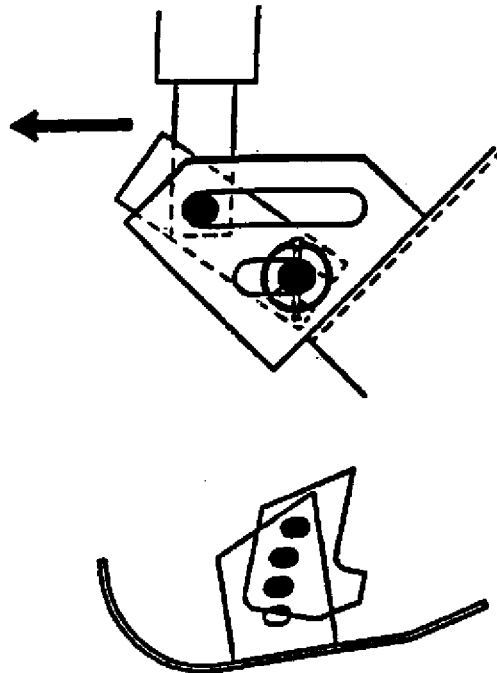
- Push bottom of cylinder to the end of retaining slot (A).
- Rotate retaining arm (B). Align retaining slot with the short slot on wheel support bracket.
- Install the retaining pin (C), washers, and quick-lock pin.
- Repeat on opposite side.

IMPORTANT: Cylinder position must correspond to gauge shoe position. If not, machine damage may occur.

- Adjust gauge shoes to one of the three highest cutting heights. (See Adjust Gauge Shoes in this section.)



E34342 -UN-13JUL90



E37040 -UN-02DEC92

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EX,1474,3015,K -19-26APR93

5B. FOR LOWEST CUTTING HEIGHT:

- Move cylinder forward to the end of retaining slot
- Align retaining arm (A) with the short slot on wheel support bracket.
- Install retaining pin (B), washers and quick-lock pin.
- Repeat on opposite side.

IMPORTANT: Cylinder position must correspond to gauge shoe position. If not, machine damage may occur.

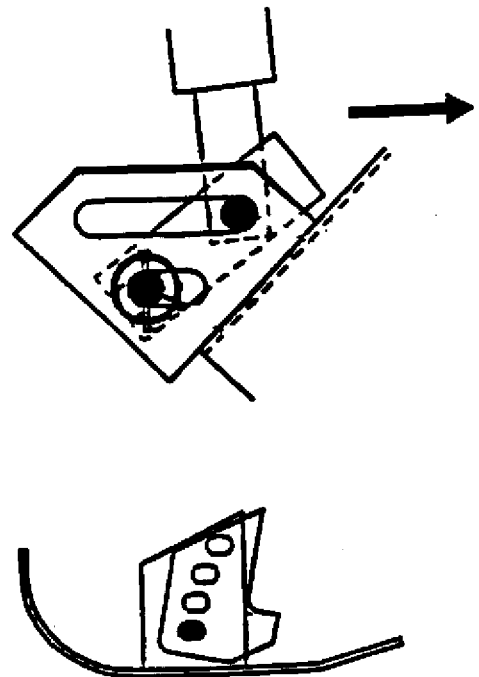
- Adjust gauge shoes to the lowest cutting height. (See Adjust Gauge Shoes in this section.)

6. Raise machine.

7. Raise cylinder stops before operating the machine.



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-UN-13JUL90
E34344



E37041
-UN-02DEC92

EX,1474,3015,L -19-26APR93

REMOVE REEL

1. Swing platform to right and lower to ground.

IMPORTANT: Lifting reel with hoist attached to bat can damage bat or tooth pipe.

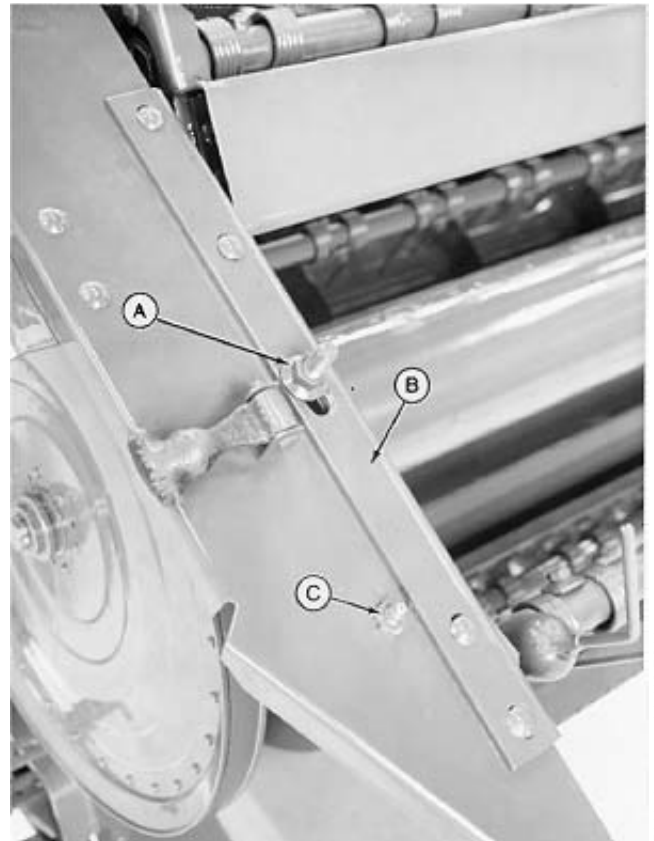
2. Support reel with hoist attached to center tube (A).



EX,1474,3020,A -19-26APR93

E33960 -UN-06FEB90

3. Remove nut (A) from reel position adjusting eyebolt.
4. Remove side sheet reinforcement (B).
5. Disconnect lube line (C) from side sheet band.



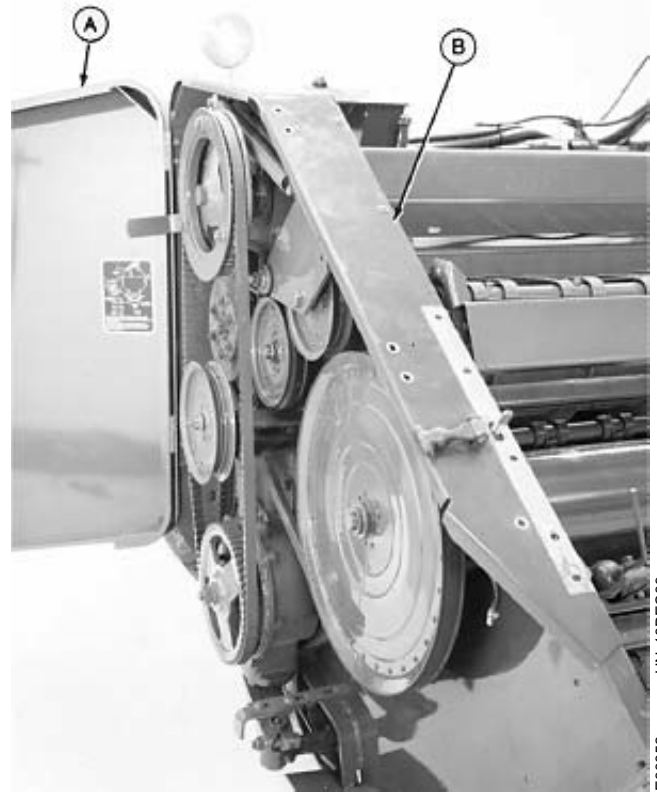
EX,1474,3020,B -19-26APR93

E33851 -UN-18DEC89

6. Remove right access door (A).

NOTE: Remove hinge cap screws from side sheet band to remove door.

7. Remove side sheet band (B).



EX,1474,3020,C -19-26APR93

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E33852

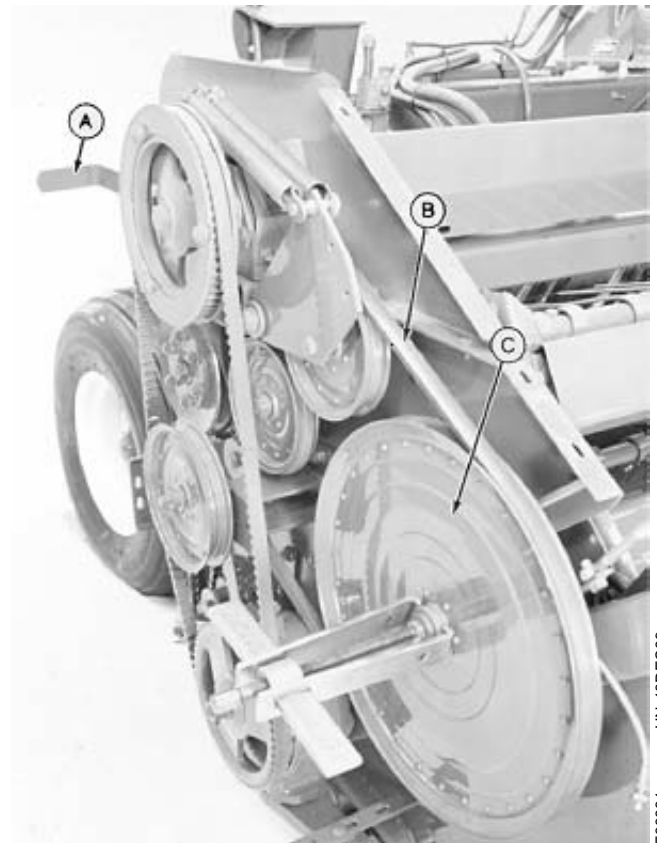
⚠ CAUTION: Lever (A) is spring loaded. Hold firmly until spring tension is released.

8. Raise lever (A) to release reel drive belt tension.

9. Remove reel drive belt (B) from driven sheave (C). It is not necessary to remove belt from platform.

10. Loosen cap screw and pull sheave loose from tapered shaft.

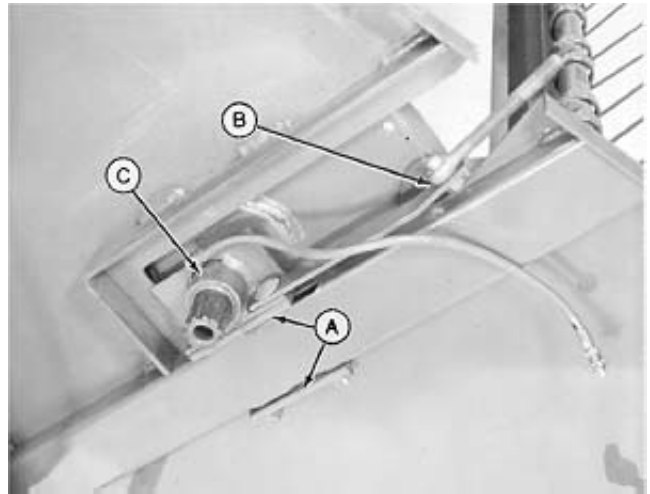
11. Remove sheave.



EX,1474,3020,D -19-26APR93

-UN-18DEC89
E33831

12. Remove two carriage bolts, two adjustment spacers (A), and adjustment strap (B).
13. Pull pillow block housing (C) from shaft.



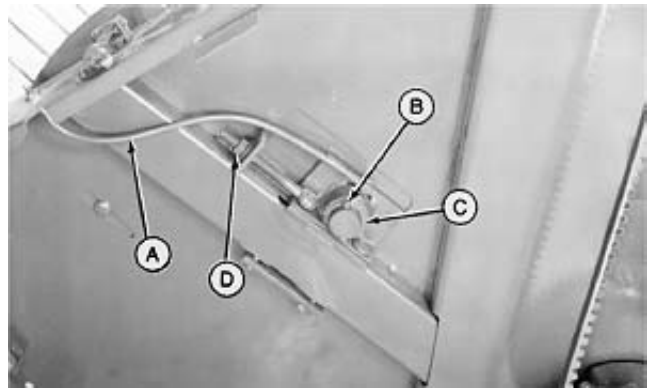
E33830 -JUN-18DEC89

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EX,1474,3020,E -19-26APR93

14. Disconnect lube line (A) from left side sheet band.
15. Drive spring pin (B) from end of reel shaft.
16. Remove hardened washer (C) and spacer washers from reel shaft.
17. Remove nut (D) from reel position adjusting eyebolt.

- A—Lube Line
- B—Spring Pin
- C—Washers
- D—Adjusting Nut



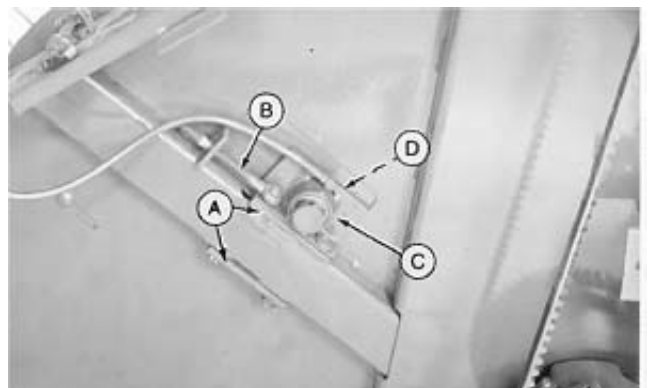
E33832 -JUN-18DEC89

EX,1474,3020,F -19-26APR93

18. Remove two cap screws, two adjustment spacers (A), and adjustment eyebolt (B).
19. Pull pillow block housing (C) from reel shaft.
20. Remove spacer washers (D) from reel shaft.

NOTE: Washers can be easily dropped when removing reel. Count washers because they will be used for alignment during assembly.

- A—Spacers
- B—Eyebolt
- C—Reel Mounting
- D—Washers



E33833 -JUN-18DEC89

EX,1474,3020,G -19-26APR93

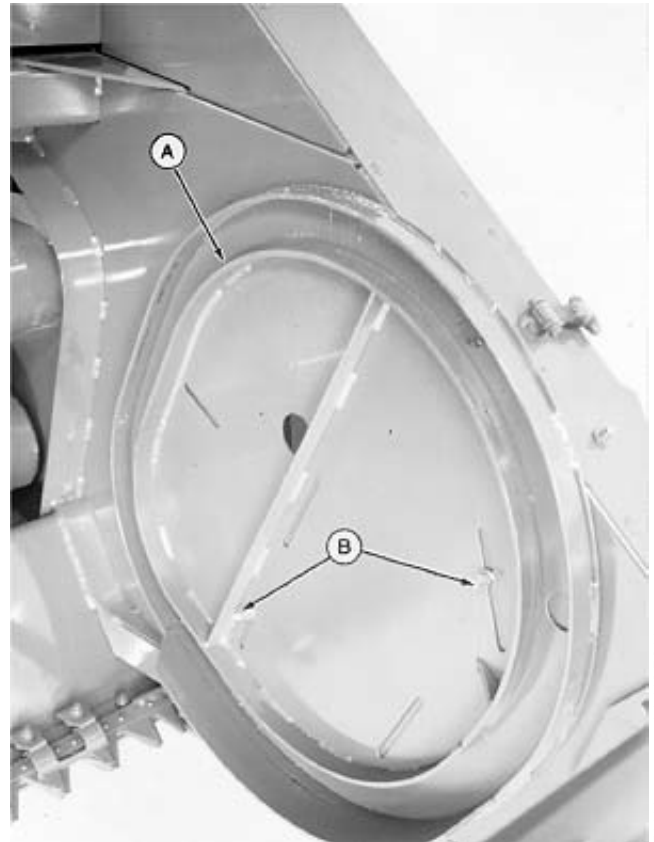
21. Remove carriage bolts from right end of knock-down bar to allow movement of the side sheet.

22. Remove reel by swinging right end up and to front. Leave reel cam in place.

EX,1474,3020,H -19-26APR93

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23. Remove reel cam (A), if necessary, by removing two carriage bolts (B).



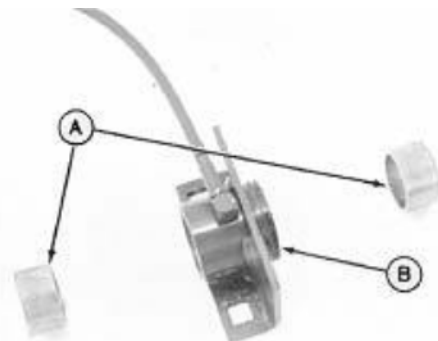
-UN-18DEC89
E33835

EX,1474,3020,I -19-26APR93

INSPECT REEL PARTS

1. Check bushings (A) for excessive wear or scoring. Remove damaged bushings.

2. Install bushings by pressing flush with each side of pillow block (B).



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E33866

EX,1474,3020,J -19-26APR93

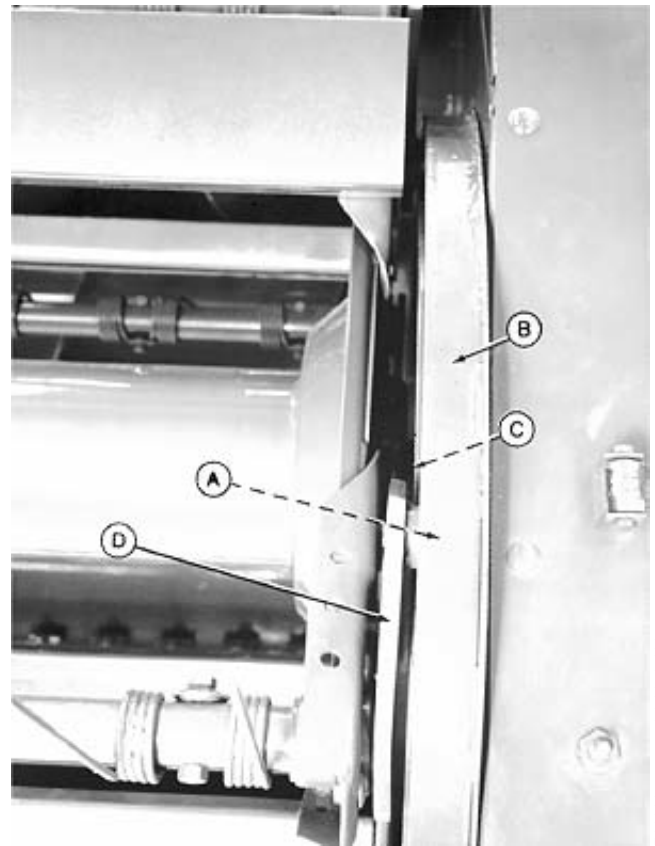
3. Check cam follower bearings for roughness or damage.
4. Check drive belt for excessive wear or fraying.
5. Inspect remaining parts for damage or excessive wear.

EX,1474,3020,K -19-26APR93

INSTALL REEL

1. Install reel in reverse order of removal using following special instructions.
2. Install cam follower bearings (A) into cam (B) in trailing position.
3. Install same number of washers (C) which were removed from reel shaft.
4. Rotate reel to make sure follower bearings are inside cam through 360° of rotation and that cam arms (D) clear track. Add or remove washers on shaft if needed.
5. Grease reel fittings.

A—Cam Follower Bearings
B—Reel Cam
C—Adjusting Washers
D—Reel Cam Arms



EX,1474,3020,L -19-26APR93

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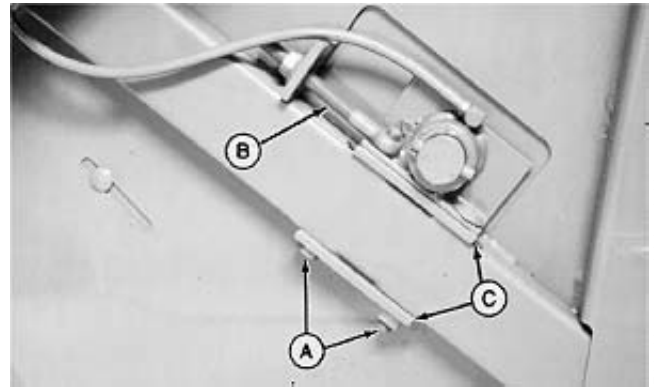
-JUN-03JAN90
E33869

ADJUST REEL

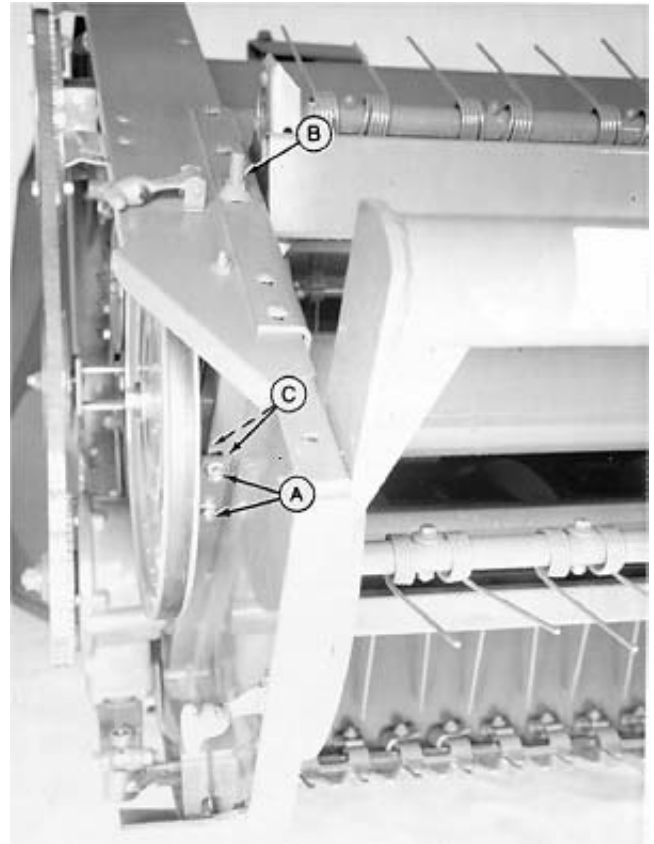
IMPORTANT: The reel teeth should run as close as possible to the cutterbar and deck sheet.

1. Loosen cap screws (A) to change reel position.
2. Adjust eyebolts (B) to move reel.
3. Tighten cap screws.

NOTE: Move spacers (C) for additional adjustment. Place spacers under support channel to move reel down and forward. Place spacers between support channel and pillow block to move reel up and rearward.



Left-Hand Side



Right-Hand Side

EX,1474,3020,M -19-26APR93

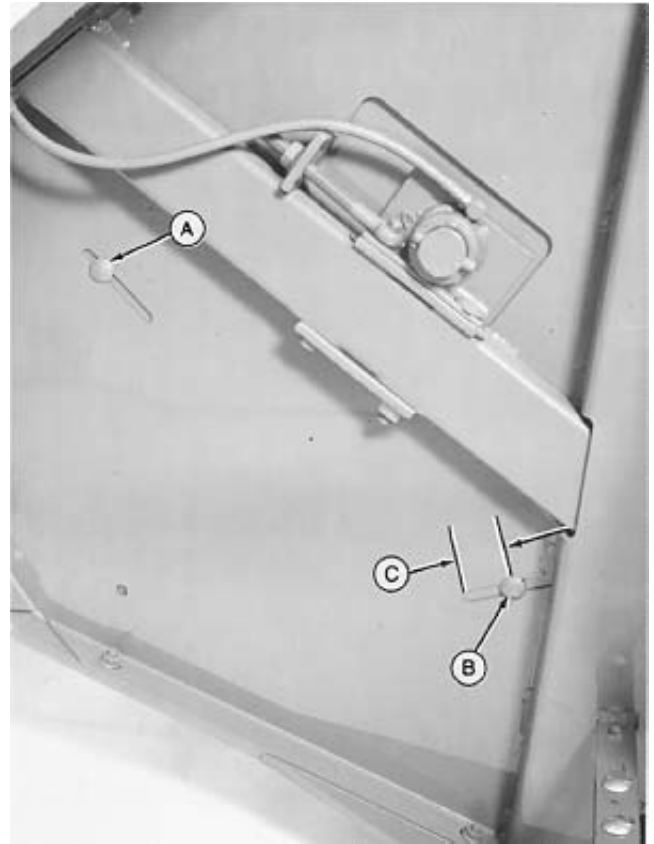
E33436 -UN-24JUL89

E33437 -UN-24JUL89

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6

ADJUST CAM

1. Loosen adjusting bolts (A) and (B) on left side sheet.
2. Rotate cam so that bolt (A) is 45—50 mm (1.8—2.0 in.) (C) from end of slot.
3. Tighten bolts and turn reel over by hand to check tooth clearance with guards, deck, and auger. Readjust if necessary.



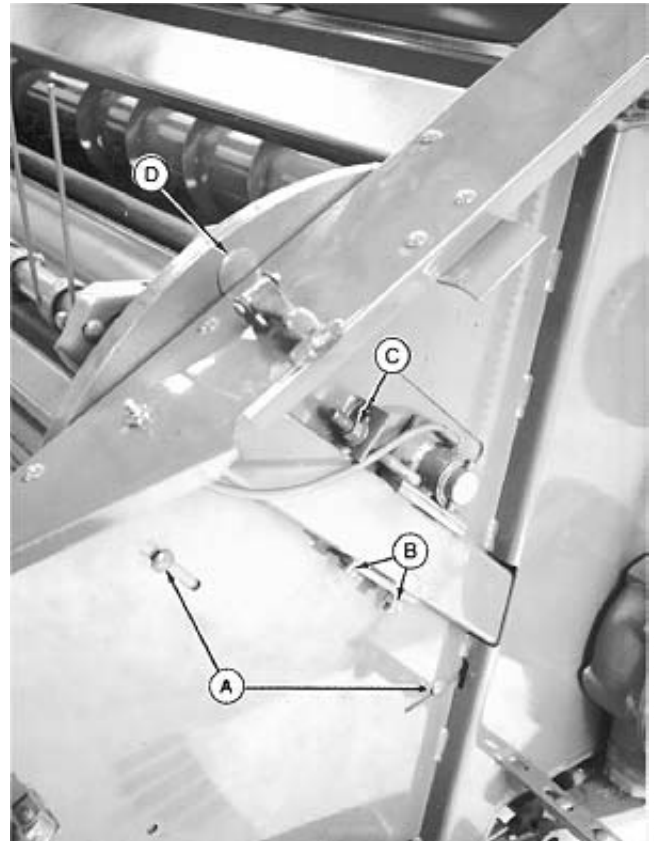
EX,1474,3020,N -19-26APR93

E33442
-UN-24JUL89

REPLACE CAM FOLLOWER BEARINGS

1. Loosen two carriage bolts (A) on reel cam.
2. Loosen two cap screws (B) on reel mounting.
3. Move reel forward with adjusting bolt (C).
4. Remove cam bearing access plug (D).

A—Carriage Bolts
B—Cap Screws
C—Adjusting Bolt
D—Bearing Access Plug

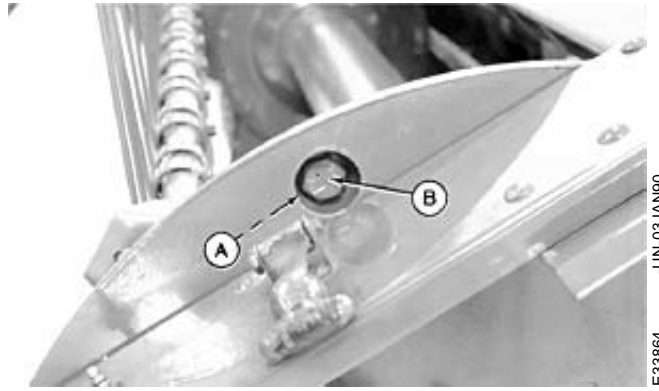


EX,1474,3020,O -19-26APR93

E33863
-UN-03JAN90

Reel/Replace Reel Teeth in Right and Center Sections

- Remove cap screw and cam follower bearing (A).
- Replace bearing and tighten cap screw (B) to 230 N·m (170 lb-ft).

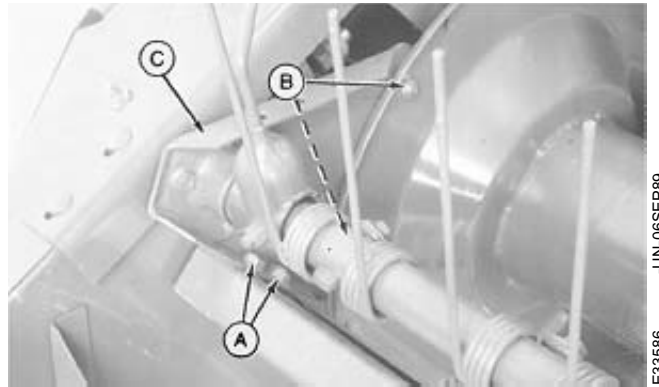


EX,1474,3020,P -19-26APR93

E33864
-UN-03JAN90

REPLACE REEL TEETH IN RIGHT AND CENTER SECTIONS

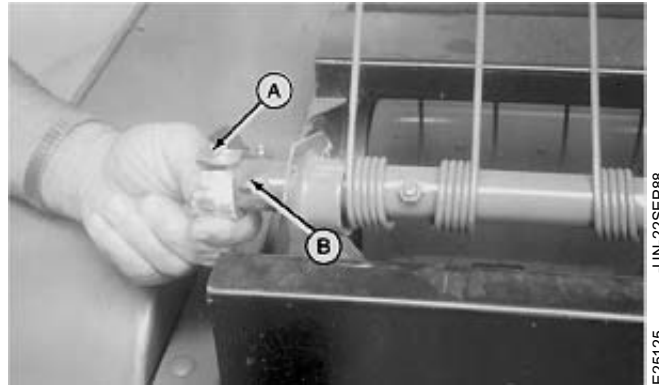
- Rotate reel to position shown for ease in replacing reel teeth.
- Loosen two nuts on reel bat (A) and remove two cap screws (B), nuts, and bracket (C).



EX,1474,3020,Q -19-26APR93

E33586
-UN-06SEP89

- Remove pipe bushing (A) and bushing retaining pin (B).
- Remove 3/8 x 2-in. cap screws, lock nuts, special washers and teeth necessary to replace damaged teeth in right-hand section.



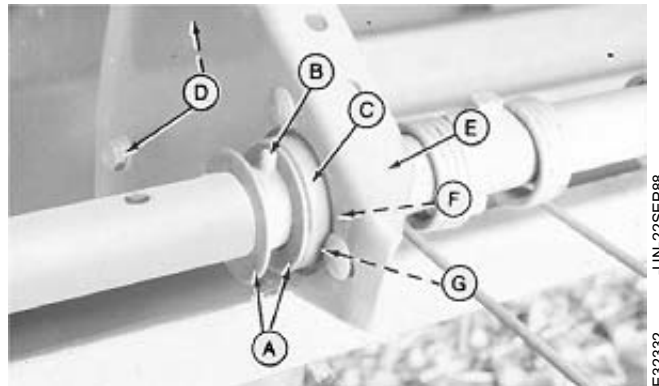
EX,1474,3020,R -19-26APR93

E25125
-UN-22SEP88

- If broken teeth are in center section, remove washers (A), spring pin (B), spacer (C), two cap screws and nuts (D), bracket (E), pipe bushing (F), and bushing retaining pin (G) from center support.

NOTE: Note location of washers for reassembly.

- | | |
|-----------------------|-------------------------|
| A—Washers | E—Bracket |
| B—Spring Pin | F—Pipe Bushing |
| C—Spacer | G—Bushing Retaining Pin |
| D—Cap screws and Nuts | |



EX,1474,3020,S -19-26APR93

E32332
-UN-22SEP88

Reel/Replace Reel Teeth in Left Section

6. Remove 3/8 x 2-in. cap screws, lock nuts, special washers, and teeth as necessary to replace damaged teeth.

NOTE: Torque tooth cap screws to 11—24 N·m (8—18 lb-ft). Torque 3/8 x 3/4 bat carriage bolts to 34—60 N·m (25—44 lb-ft)

IMPORTANT: When reinstalling pipe bushing and bushing retaining pin, make sure the pin locks into bushing. This prevents bushing from rotating which causes excessive wear.

7. Trim teeth to clear hold-downs at center of regular cutterbar, if necessary.



E19665
-UN-03OCT88

EX,1474,3020,T -19-26APR93

REPLACE REEL TEETH IN LEFT SECTION

1. Remove right-hand and center reel teeth. (See Replace Reel Teeth in Right and Center Sections in this section.)

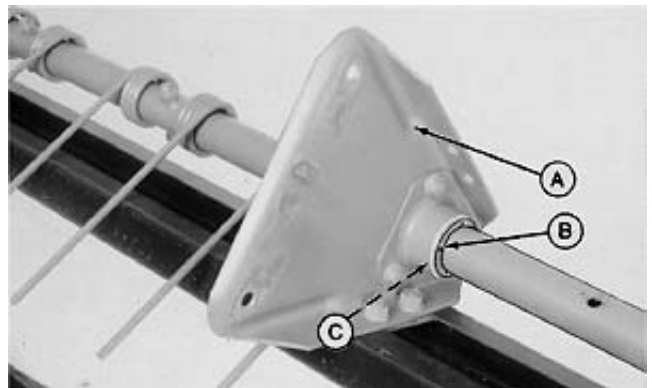
2. Remove two cap screws (A) and nuts from left mounting bracket. Remove tooth bar and place assembly on support.



E33445
-UN-24JUL89

EX,1474,3020,U -19-26APR93

3. Remove bracket (A), pipe bushing (B), and bushing retaining pin (C).



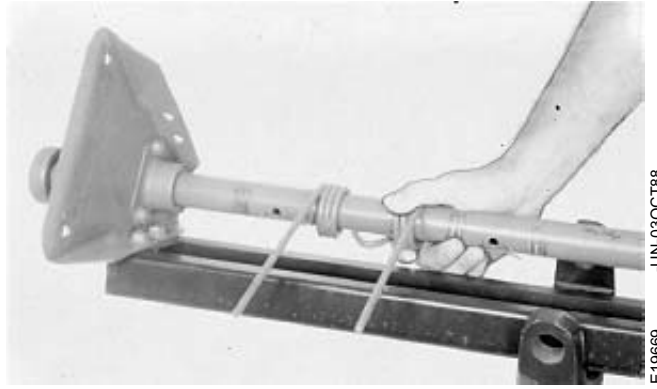
E19668
-UN-03OCT88

EX,1474,3020,V -19-26APR93

Reel/Replace Reel Teeth in Left Section

4. Remove 3/8 x 2-in. cap screws, lock nuts, special washers, and teeth necessary to replace damaged teeth in left-hand section.

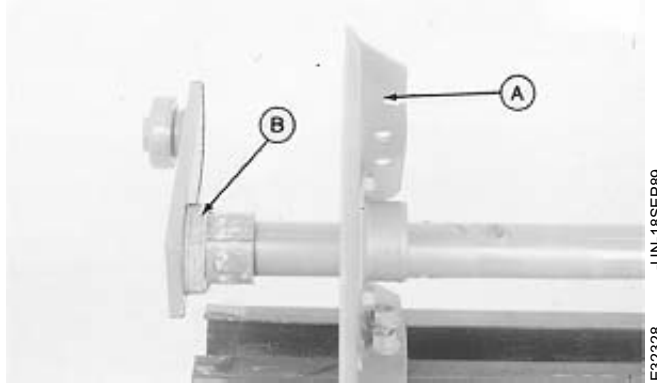
NOTE: Tighten tooth cap screws to 11—24 N·m (8—18 lb-ft). Tighten 3/8 x 3/4 bat carriage bolts to 34—60 N·m (25—44 lb-ft).



EX,1474,3020,W -19-26APR93

E19669 -UN-03OCT88

5. If necessary to remove bracket (A), note location of spacer (B).

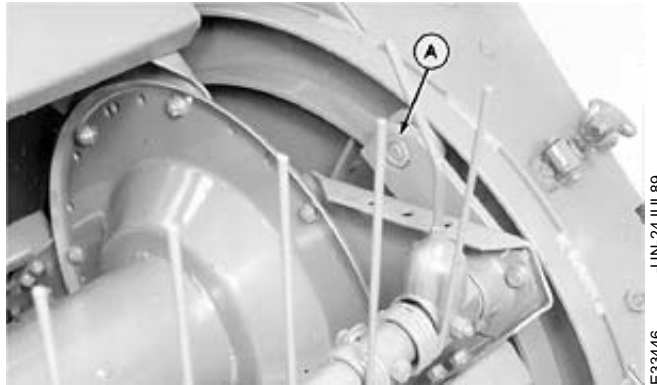


EX,1474,3020,X -19-26APR93

E32328 -UN-13SEP89

6. Replace tooth bar with cam follower bearing (A) in trailing position.

7. Adjust cam follower. (See Adjust Cam Followers in this section.)



EX,1474,3020,Y -19-26APR93

E33446 -UN-24JUL89

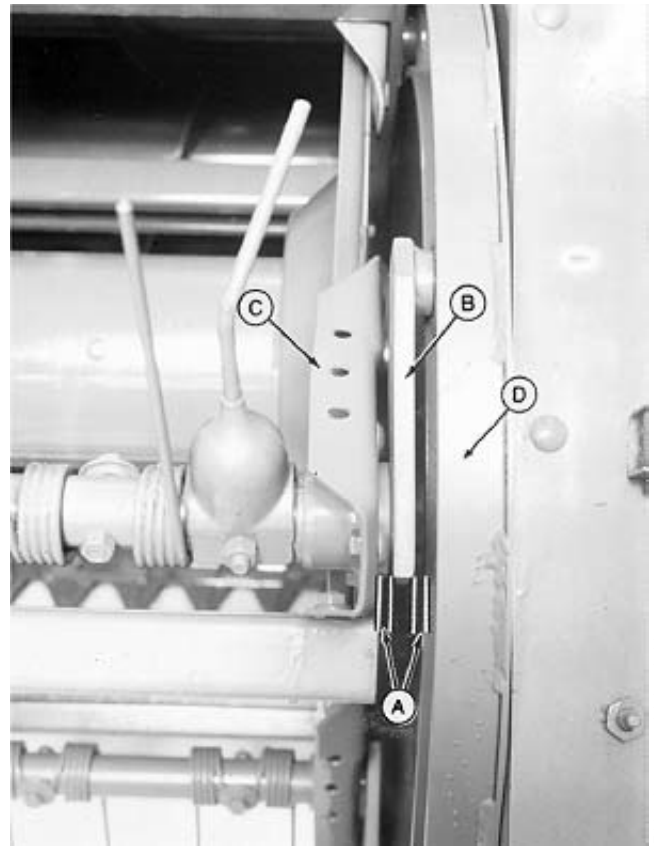
ADJUST CAM FOLLOWERS

A minimum of 3 mm (0.1 in.) clearance (A) is necessary between cam follower arm (B) and bracket (C), and between cam follower arm (B) and cam (D).

To adjust:

1. Loosen lock nuts (E).
2. Move bracket (C) until a 3 mm (0.1 in.) clearance is obtained. Rotate reel to make sure follower bearings are inside cam through 360° of rotation and that cam arms (B) clear track.
3. Tighten lock nuts (E).

- A—3 mm (0.1 in.)
Clearance
B—Cam Follower Arm
C—Bracket
D—Cam
E—Lock Nut



E33443 -UN-24JUL89



E33444 -UN-24JUL89

EX,1474,3020,Z -19-26APR93

Reel/Adjust Cam Followers

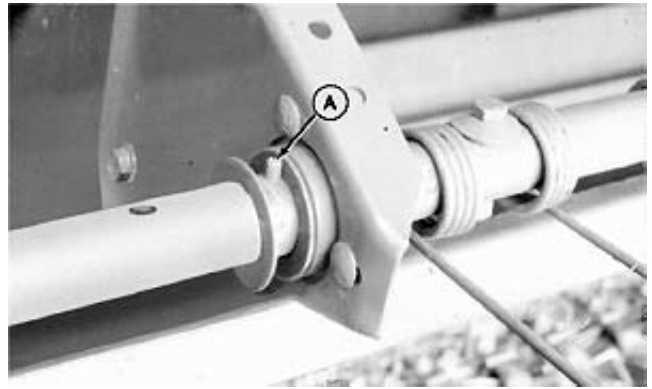
If a 3 mm (0.1 in.) clearance cannot be obtained in previous steps, proceed as follows:

4. Remove spring pin (A).
5. Add or remove number of washers needed to obtain 3 mm (0.1-in.) clearance between cam follower bracket and cam. Replace spring pin.

NOTE: Maintain tooth bar endplay of 0.3—2 mm (0.01—0.08-in.).

6. Reverse procedure for reassembly of tooth bar.

NOTE: Tighten 3/8 x 2-in. tooth cap screws to 11—24 N·m (8—18 lb-ft). Tighten 3/8 x 3/4 bat carriage bolts to 34—60 N·m (25—44 lb-ft).



-UN-22SEP88
E32331

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EX,1474,3020,AA-19-26APR93

REMOVE UPPER AUGER

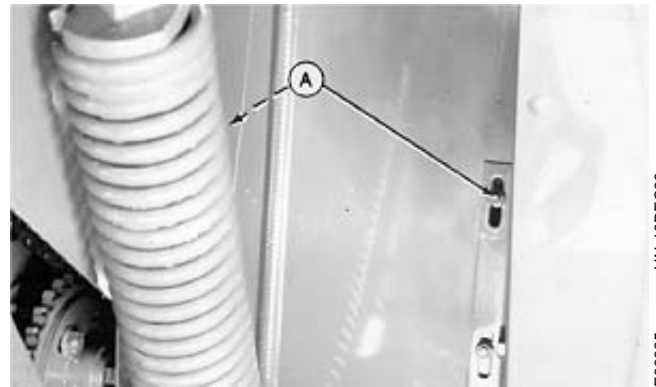
1. Lower platform to ground.
2. Support upper auger (A) with hoist.



EX,1474,3025,A -19-26APR93

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1
-UN-18DEC89
E33824

3. Remove carriage bolts (A) and upper right auger stripper.



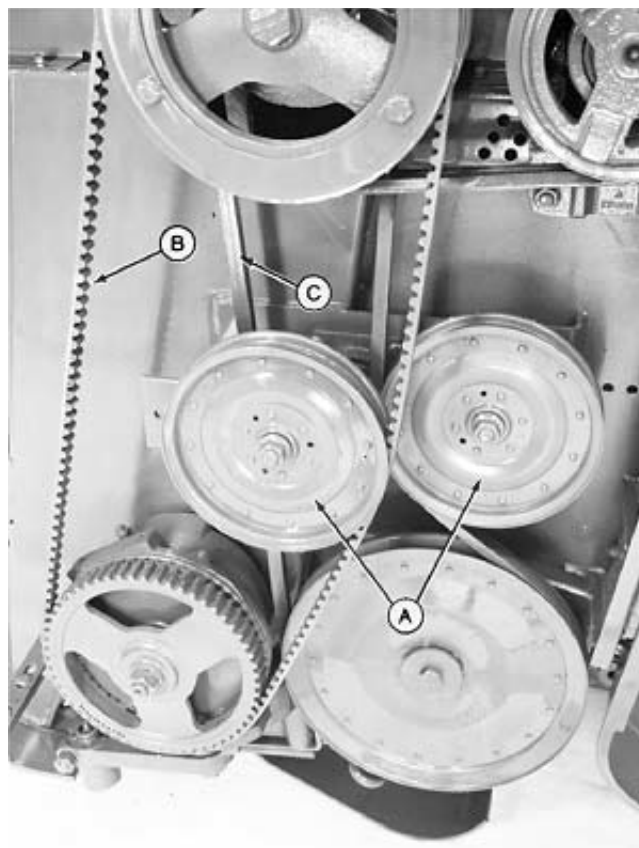
EX,1474,3025,B -19-26APR93

-UN-18DEC89
E33825

Augers/Remove Upper Auger

4. Loosen nuts and move two idlers (A) on left side of platform to release belt tension.

5. Remove knife drive belt (B). It is not necessary to remove auger drive belt (C).

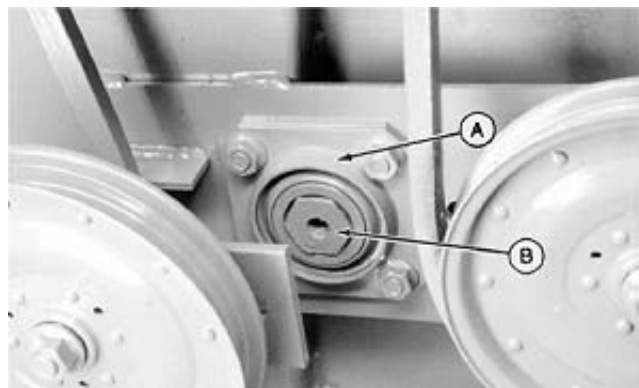


EX,1474,3025,C -19-26APR93

E33828 -UN-18DEC89

NOTE: Remove bearing for easier installation of auger.

6. Remove left flangettes (A) and bearing from upper auger shaft (B).



EX,1474,3025,D -19-26APR93

E33820 -UN-18DEC89

Augers/Remove Upper Auger

7. Remove nut and knife drive belt idler (A) from right side of platform.

8. Remove knife drive belt (B).

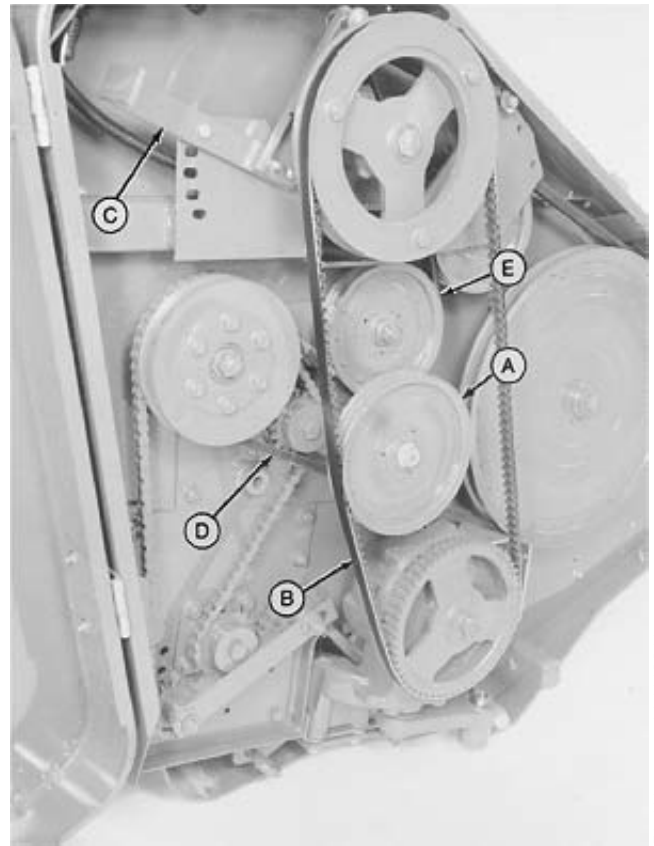
⚠ CAUTION: Lever is spring loaded. Hold firmly until spring tension is released.

9. Raise lever (C) to release reel belt tension.

10. Remove reel drive belt (D) from sheaves. It is not necessary to remove belt from platform.

11. Remove nut and reel drive idler (E).

A—Knife Drive Idler
B—Knife Drive Belt
C—Reel Belt Tension Lever
D—Reel Drive Belt
E—Reel Drive Idler



EX,1474,3025,E -19-26APR93

E37129 -UN-08APR93

12. Loosen lower nut (A) and remove upper nut (B).

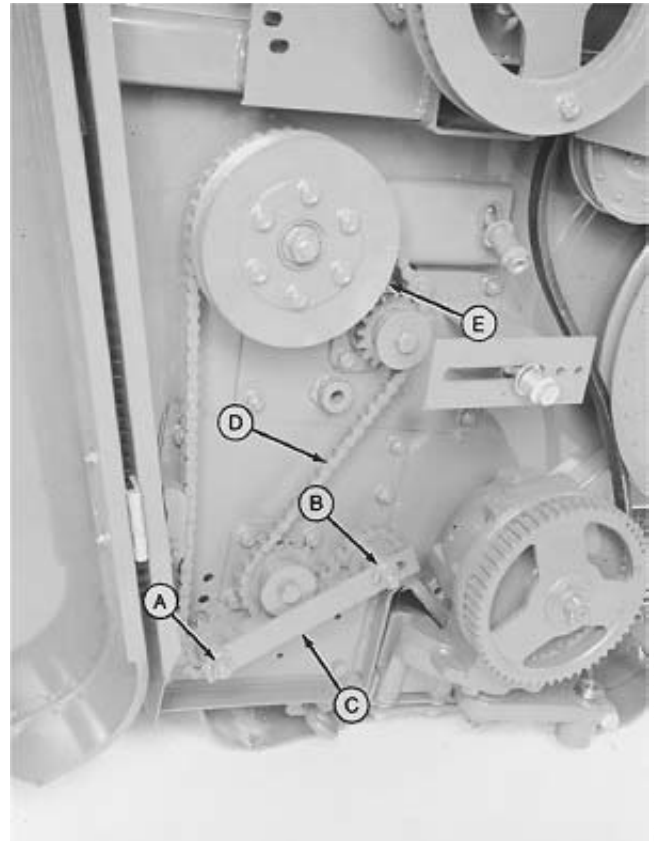
13. Pivot chain tension link (C) down, to release auger drive chain (D) tension.

14. Remove chain connector link and remove auger drive chain (D).

NOTE: Note location of washers for reassembly.

15. Remove nut and reel drive variable sheave (E).

A—Lower Chain Tension Linkage Nut
B—Upper Chain Tension Linkage Nut
C—Chain Tension Link
D—Auger Drive Chain
E—Reel Drive Sheave



EX,1474,3025,F -19-26APR93

E37130 -UN-08APR93

Augers/Remove Upper Auger

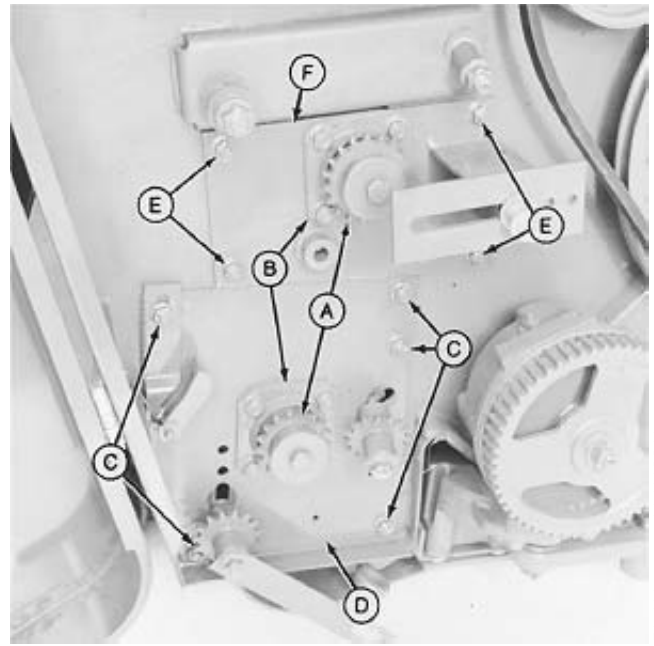
NOTE: Do not reuse Nylock cap screws.

16. Remove cap screws and auger sprockets (A).
Remove any paint, nicks, or burrs from auger hex shafts.

NOTE: Right flangettes (B) and bearings can now be removed if bearing replacement is needed. End plates (D) and (F) can be removed without removing flangettes and bearings.

17. Remove five flange nuts (C) and lower end plate (D).

18. Remove four flange nuts (E) and upper end plate (F).



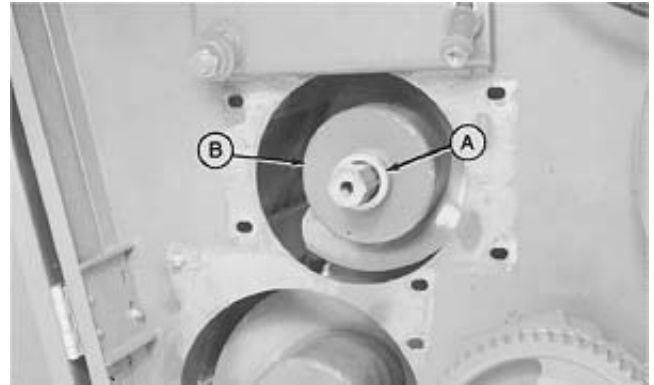
E37131
-UN-08APR93

EX,1474,3025,G -19-26APR93

NOTE: Note number of washers for reassembly.

19. Remove washers (A) from shaft.

20. Slide upper auger (B) to right and remove from platform.

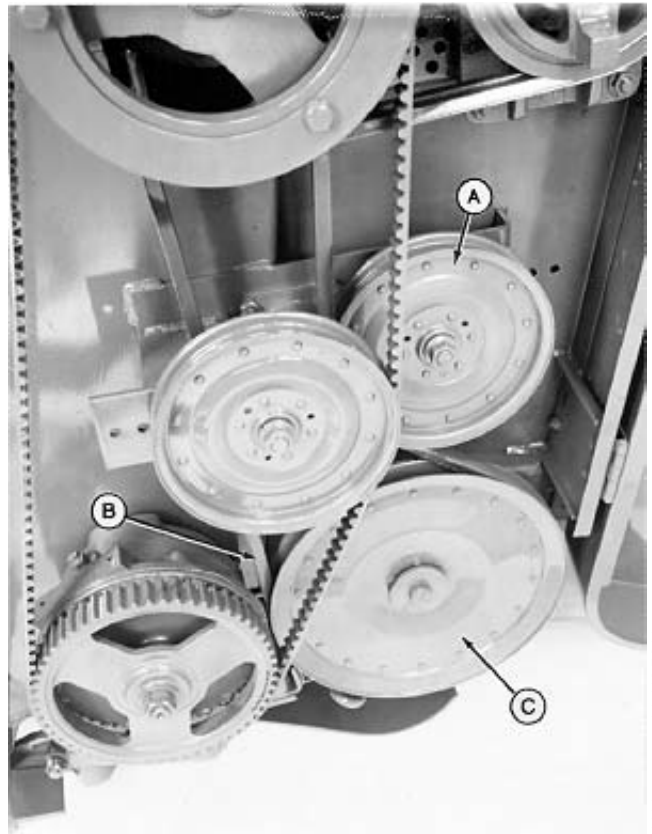


E37132
-UN-08APR93

EX,1474,3025,H -19-26APR93

REMOVE LOWER AUGER

1. Lower platform to ground.
2. Loosen nut and move auger drive belt idler (A) on left side of platform to release belt tension.
3. Remove auger drive belt (B) from auger driven sheave (C). It is not necessary to remove belt from platform.
4. Remove cap screw and auger driven sheave (C).



EX,1474,3025,I -19-26APR93

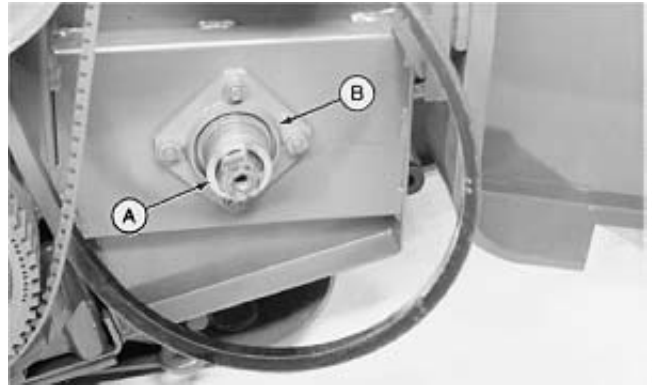
E33815 -UN-18DEC89

NOTE: Note amount of washers for reassembly.

5. Remove washers (A) from shaft.

NOTE: Remove bearing for easier installation of auger.

6. Remove left flangettes (B) and bearing.

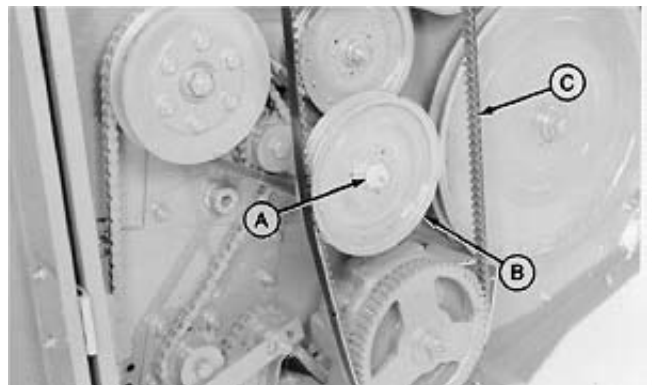


EX,1474,3025,J -19-26APR93

E33814 -UN-18DEC89

7. Loosen nut (A) and move right knife drive belt idler (B) to release belt tension.

8. Remove knife drive belt (C).



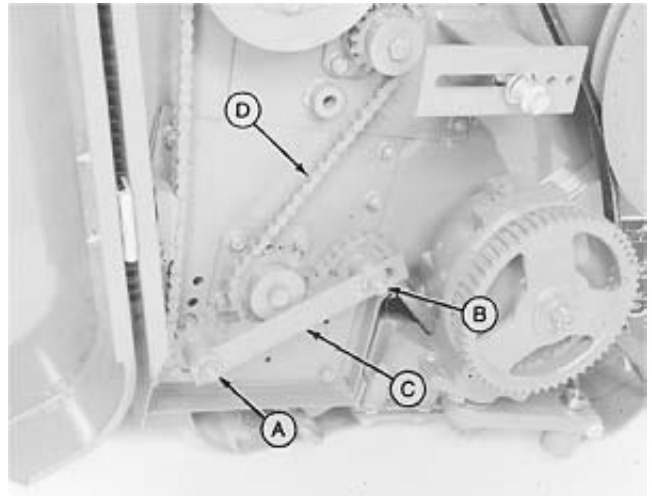
EX,1474,3025,K -19-26APR93

E37134 -UN-08APR93

Augers/Remove Lower Auger

9. Loosen lower nut (A) and remove upper nut (B).
10. Pivot chain tension link (C) down, to release auger drive chain (D) tension.
11. Remove chain connector link and remove auger drive chain (D).

A—Lower Flange Nut
B—Upper Flange Nut
C—Chain Tension Link
D—Auger Drive Chain



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E37133

EX.1474,3025,L -19-26APR93

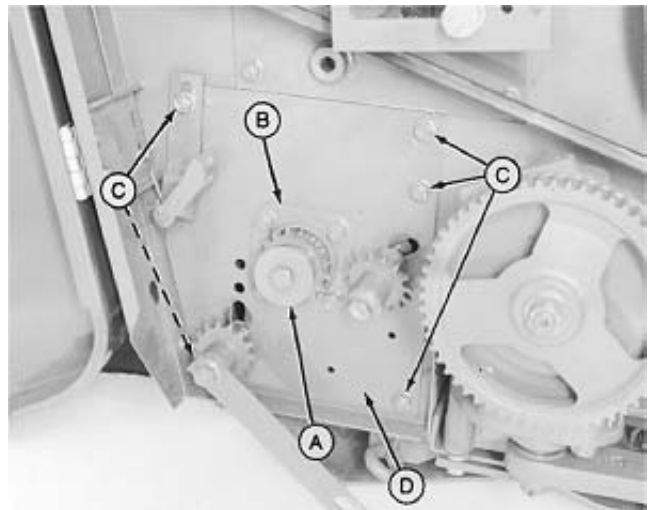
NOTE: Do not reuse Nylock cap screws.

12. Remove cap screw and auger sprocket (A). Remove any paint, nicks, or burrs from auger hex shaft.

NOTE: Right flangettes (B) and bearing can now be removed if bearing replacement is needed. End plate (D) can be removed without removing flangettes and bearing.

13. Remove five flange nuts (C) and lower end plate (D).

A—Sprocket
B—Flangette
C—Flange Nut
D—End Plate



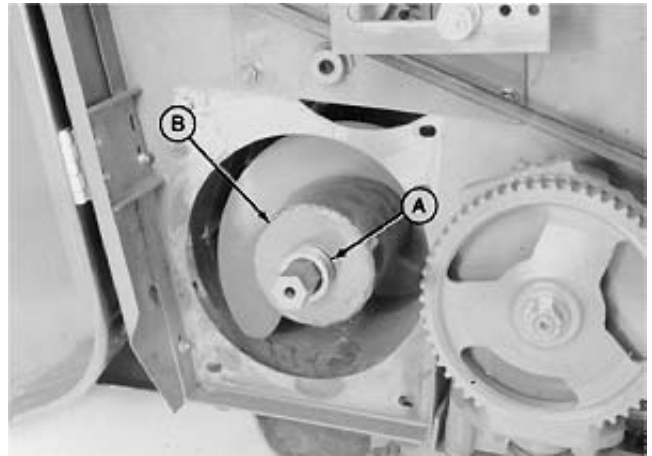
-UN-08APR93
E37151

EX.1474,3025,M -19-26APR93

Augers/Inspect Augers

NOTE: Note amount of washers for reassembly.

14. Remove washers (A) from auger shaft.
15. Slide lower auger (B) to the right and remove from platform.



-JUN-08APR93

E37152
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EX,1474,3025,N -19-26APR93

INSPECT AUGERS

1. Check flighting on augers for damage.
2. Check bearings for roughness.
3. Replace parts if necessary.

EX,1474,3025,O -19-26APR93

INSTALL AUGERS

1. Install augers in reverse order of removal using the following special instructions.

2. Install same number of washers removed from right end of auger shafts. Add or remove washers to center augers in side sheets.

3. Install upper end plate (A).

NOTE: Position chain tensioner (C) so that the bend in spring (D) is beyond the edge (E) of the brace.

4. Install lower end plate (B).

IMPORTANT: Install sprockets (F) and (G) with long hub to inside.

Make sure auger sprockets (F) and (G) are tight against bearings and retaining washer does not bottom on end of shaft.

Do not reuse Nylock cap screws (H).

5. Install 17 tooth sprocket (F) on upper auger and 19 tooth sprocket (G) on lower auger.

6. Tighten cap screws (H) to 250—247 N·m (185—210 lb-ft).

7. Install reel drive variable sheave (I) and tighten nut to 106—174 N·m (78—128 lb-ft).

IMPORTANT: Before installing idler sprockets (L), be sure washers (K) and spacers (L) are in correct location.

8. Position idler sprockets (L) and install chain tension link (Q).

9. Install auger drive chain (R) and adjust idler sprockets. (See 'REPLACE AND ADJUST AUGER DRIVE CHAIN' in this section.)

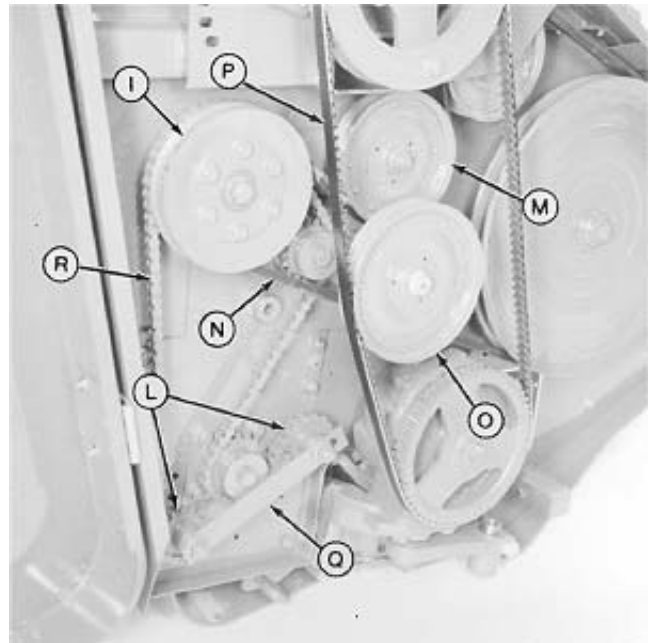
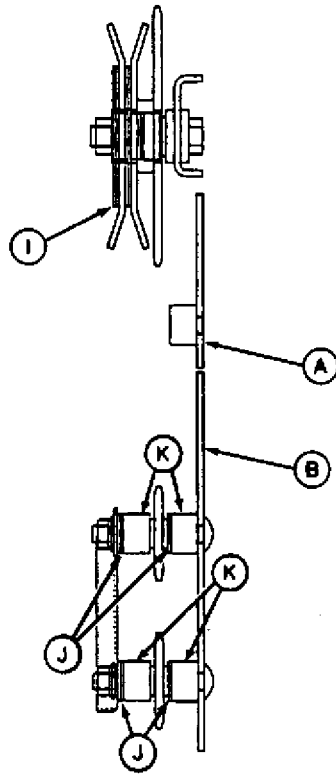
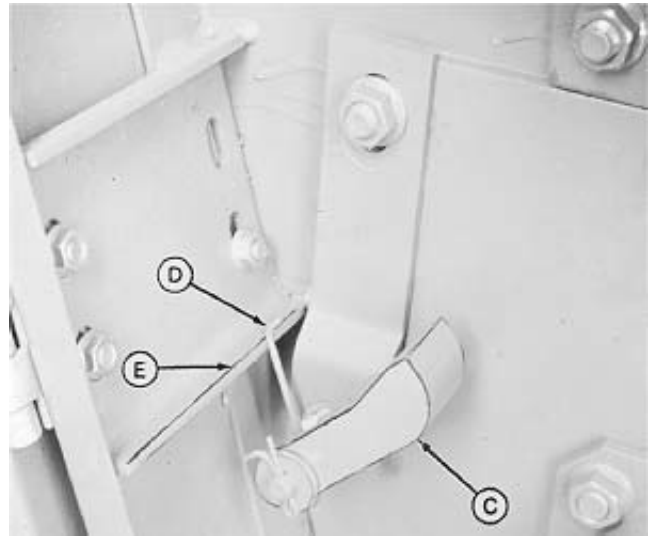
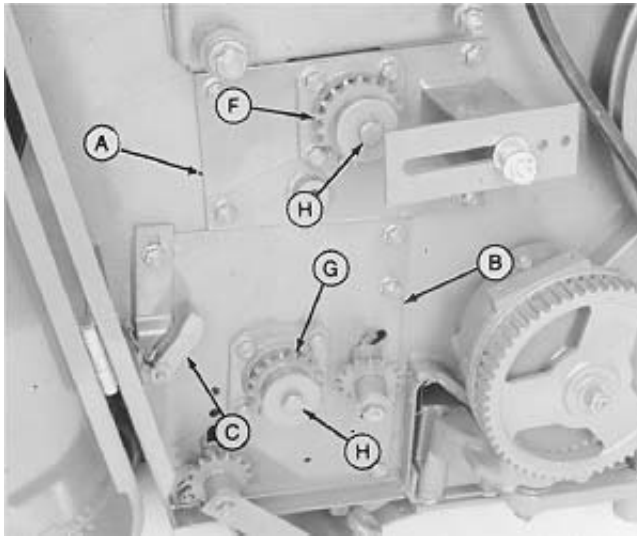
NOTE: Small idler sheave (M) tensions reel drive belt (N), and large idler sheave (O) tensions knife drive belt (P).

10. Install reel drive sheave (M) and reel drive belt (N). (See 'ADJUST REEL DRIVE BELT' in this section).

11. Install knife drive sheave (O) and knife drive belt (P). (See 'TIME KNIVES' in Section 20, and 'ADJUST KNIFE DRIVE BELT' in this section).

EX,1474,3025,P -19-26APR93

Augers/Install Augers



A—Upper End Plate
 B—Lower End Plate
 C—Tensioner
 D—Spring
 E—Edge

F—17 Tooth Sprocket
 G—19 Tooth Sprocket
 H—Cap Screw
 I—Variable Drive Sheave
 J—Washers

K—Spacers
 L—Idler Sprocket
 M—Reel Drive Sheave
 N—Reel Drive Belt

O—Knife Drive Sheave
 P—Knife Drive Belt
 Q—Chain Tension Link
 R—Auger Drive Chain

IMPORTANT: Add washers between auger and right-hand bearing if necessary to move shaft.

12. Install same number of washers (A) removed from left end of lower auger shaft. Add or remove washers to align auger driven sheave with upper drive sheave.

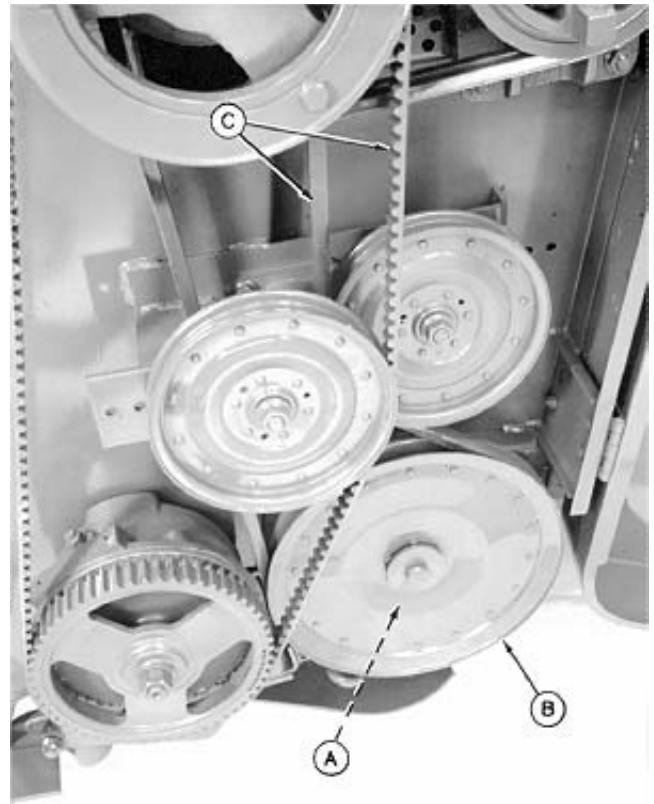
IMPORTANT: Make sure sheave hub is tight against washer stack and retaining washer does not bottom on end of shaft.

Do not reuse Nylock cap screws.

13. Install auger driven sheave (B) with long hub to inside and new cap screws.

14. Tighten cap screws to 250—247 N·m (185—210 lb-ft).

15. Adjust belt (C) tension. (See 'TIME KNIVES' in Section 20 and 'ADJUST AUGER DRIVE BELT' and 'ADJUST KNIFE DRIVE BELT' in this section.)



E33878 -UN-03JAN90

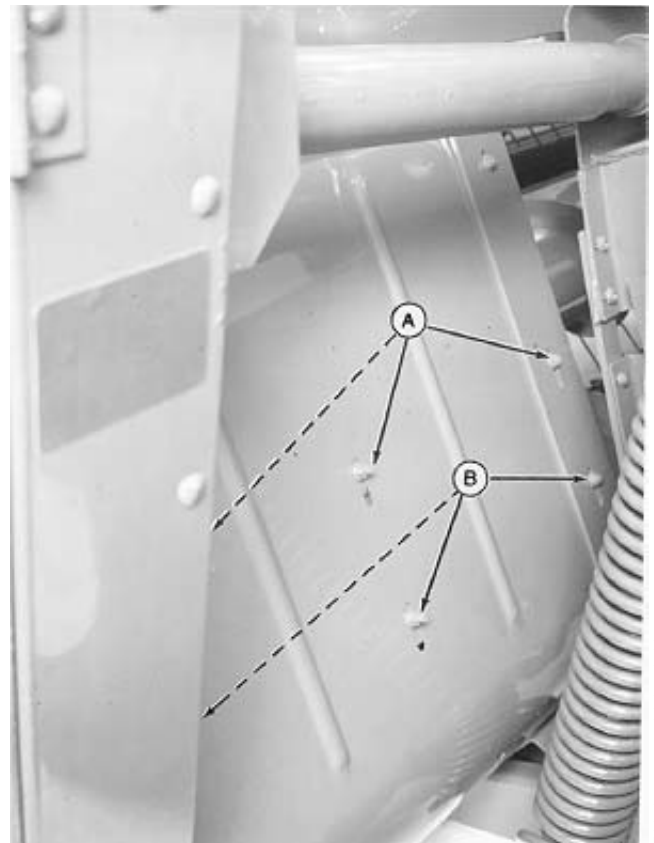
EX,1474,3025,Q -19-26APR93

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ADJUST UPPER AND LOWER AUGER STRIPPER

NOTE: 4.27 m (14 ft) platform illustrated.

1. Loosen bolts (A) to adjust upper stripper, and bolts (B) to adjust lower stripper.
2. Adjust strippers to maintain a 2—4 mm (0.01—0.2-in.) clearance between stripper and auger.
3. Tighten bolts.

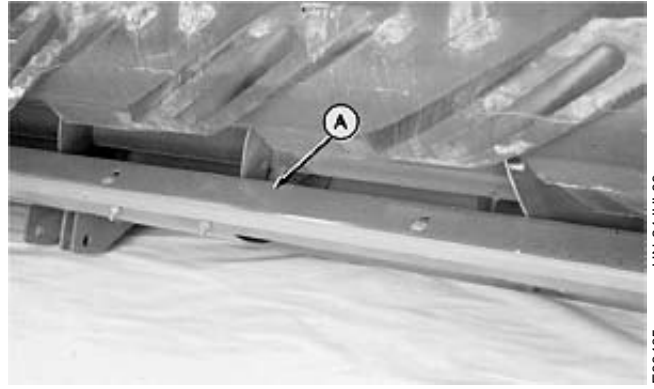


E33434 -UN-24JUL89

EX,1474,3025,R -19-26APR93

ADJUST CENTER AUGER STRIPPER

1. Loosen bolts to adjust center stripper (A).
2. Adjust stripper to maintain a 2—4 mm (0.1—0.2 in.) clearance between stripper and auger.
3. Tighten bolts.



EX,1474,3025,S -19-26APR93

E33435
-UN-24JUL89

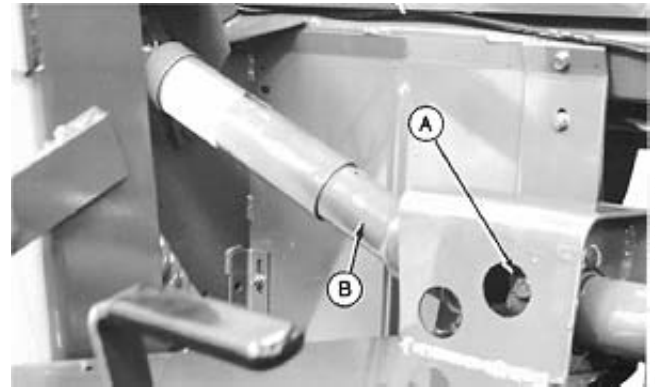
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REMOVE POWERSHAFT

1. Remove cap screw (A) and pull powershaft (B) from cross shaft.

NOTE: Count the washers on the cross shaft because they will be used to adjust endplay during assembly.



EX,1474,3030,A -19-26APR93

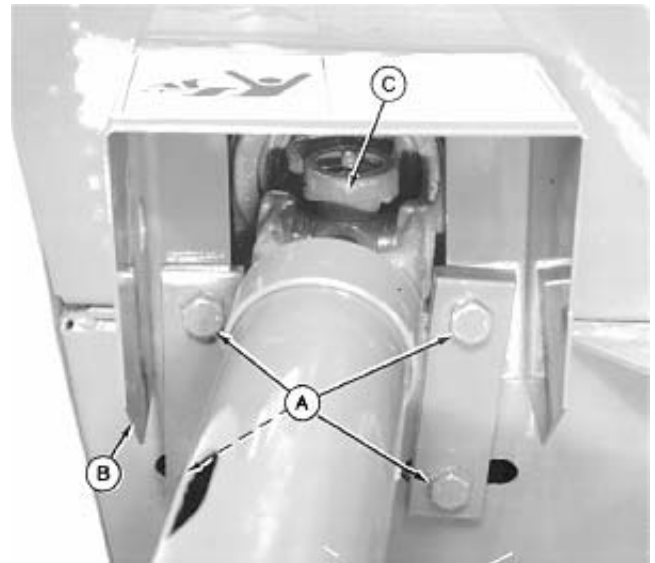
E33867
-UN-03JAN90

2. Loosen four cap screws (A) to release platform drive belt tension.

3. Spring shield (B) and remove from cap screws.

NOTE: Shield mounting holes are slotted.

4. Remove cap screw retaining U-joint (C), and disconnect left end of powershaft.

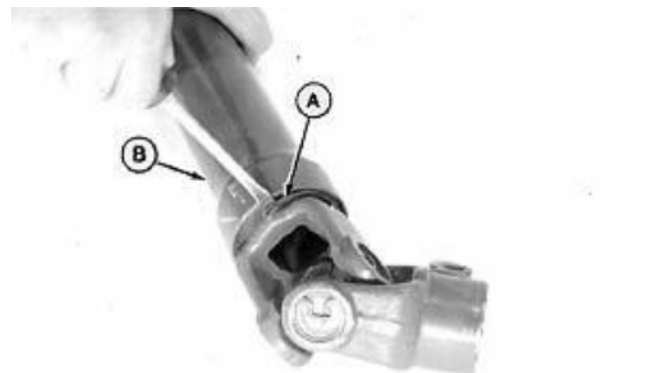


EX,1474,3030,B -19-26APR93

E33890
-UN-03JAN90

RECONDITION POWERSHAFT

1. Remove snap ring (A) from shield.
2. Remove shield (B) from yoke and shaft assembly.



EX,1474,3030,C -19-26APR93

E33888
-UN-03JAN90

3. Remove snap ring (A) from yoke.

NOTE: If snap ring sticks, loosen by striking bearing lightly with rubber mallet.



EX,1474,3030,D -19-26APR93

E33889 -UN-09JAN90

4. Position joint in an open vise with each ear of one yoke supported by a vise jaw.

5. Strike the top ear of unsupported yoke to drive top bushing outward approximately 9.5 mm (0.37 in.)



EX,1474,3030,E -19-26APR93

E19272 -UN-04OCT88

6. Clamp loosened bearing in vise and drive yoke off.

7. Repeat this procedure for removing bearing directly opposite the one just removed.

8. Remove yoke.



EX,1474,3030,F -19-26APR93

E19273 -UN-04OCT88

9. Support cross as shown making certain that vise jaws are covered with brass protectors. Strike yoke ear to remove remaining bushings.

10. Repeat procedure for remaining U-joint.



EX,1474,3030,G -19-26APR93

E19274 -UN-04OCT88

Platform Drives/Powershaft:

11. Remove nylon bearing (A) from shield (B).
12. Reverse steps 1 through 12 to assemble.



EX,1474,3030,H -19-26APR93

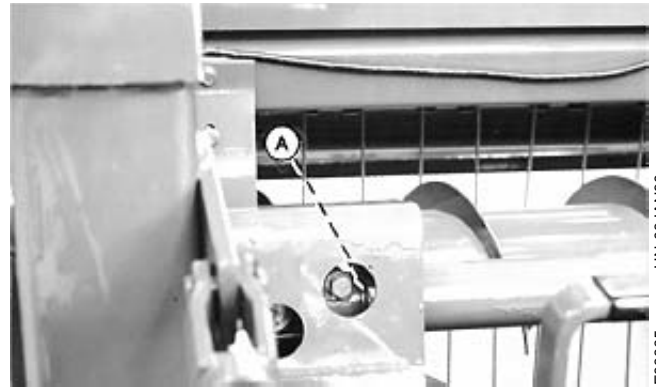
E33891 -UN-03JAN90

INSTALL POWERSHAFT

1. Install powershaft in reverse order of removal using the following special instructions.
2. Install left-hand U-joint using replacement cap screw.

NOTE: Do not reuse Nylock cap screws.

3. Tension platform drive belt.
4. Install the same number of washers (A) removed during shaft removal. Add or remove washers to obtain maximum carrier cross shaft endplay of 1.5 mm (0.06 in.).

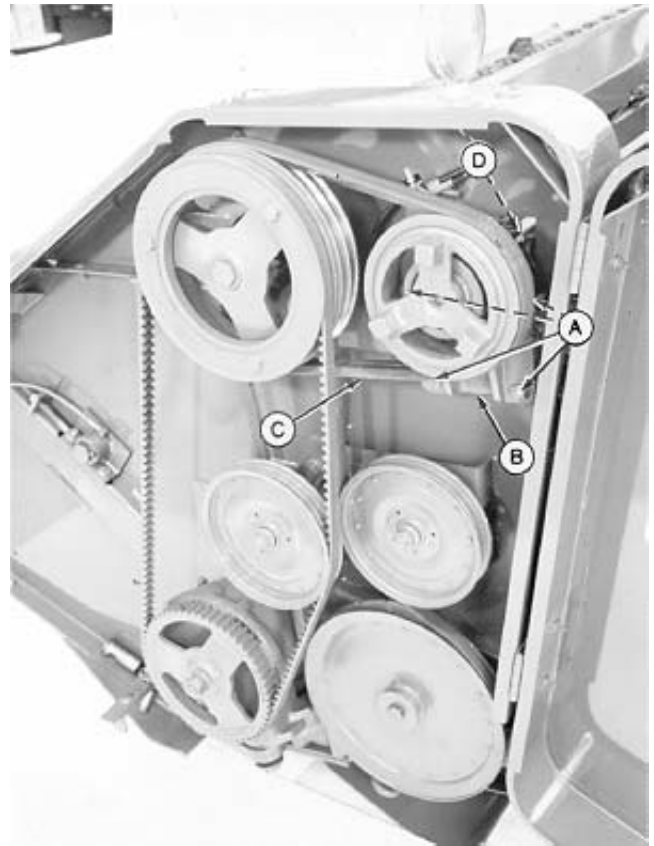


EX,1474,3030,I -19-26APR93

E33865 -UN-03JAN90

RECONDITION PLATFORM DRIVE SHEAVE

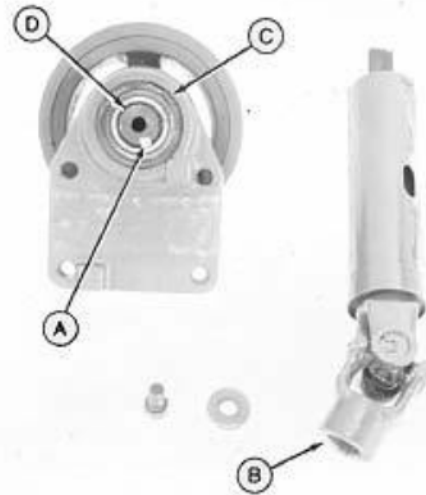
1. Remove powershaft. (See Remove Powershaft in this section.)
2. Loosen four cap screws (A) and move platform drive sheave housing (B) forward.
3. Remove belt (C) from sheave. It is not necessary to remove belt from driven sheave.
4. Remove cap screws and platform drive sheave housing.



EX,1474,3030,J -19-26APR93

E33879
-UN-09JAN90

5. Remove key (A) used with powershaft (B).
6. Remove snap ring (C) from housing.
7. Press shaft (D) from inside bearing.



EX,1474,3030,K -19-26APR93

E33860
-UN-09JAN90

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8. Check bearings for roughness and check shaft for excessive wear or damage. Replace damaged parts.

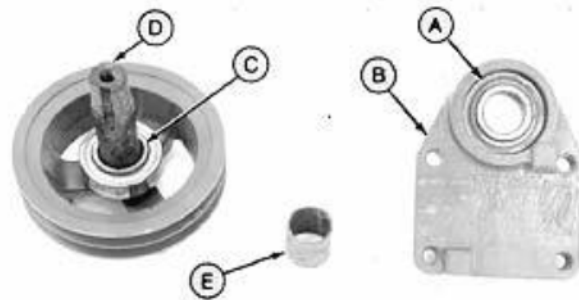
9. Assemble in reverse order of disassembly using following special instructions.

10. Press bearing (A) against shoulder of snap ring side of housing (B). Press against outer race.

11. Press bearing (C) against shoulder of shaft (D). Press against inner race.

12. Place spacer (E) on shaft and press bearing with housing onto shaft and against spacer. Press against inner race.

13. Install platform drive sheave on platform and tension belt. (See Adjust Platform Drive Belt in this section.)



A—Inside Bearing
B—Housing
C—Outside Bearing
D—Shaft
E—Spacer

EX,1474,3030,L -19-26APR93

-UN-09JAN90

E33861

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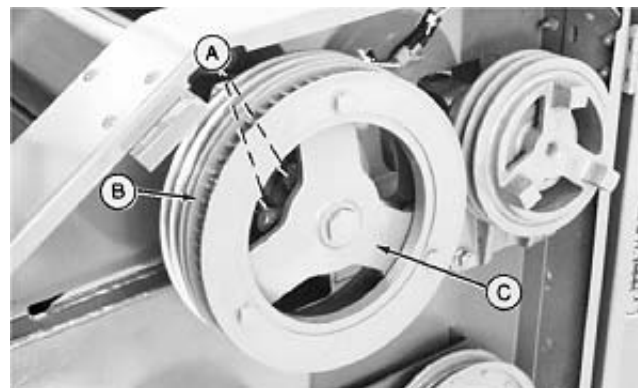
REMOVE PLATFORM CROSS SHAFT

1. Remove drive belts on left side. (See Replace Left Drive Belts in this section.)

2. Loosen two knife drive hub clamp bolts (A).

NOTE: Remove gear (B) from hub (C) for better access to clamp bolts on left side.

3. Slide hub from shaft.



EX,1474,3030,M -19-26APR93

-UN-09JAN90

E33880

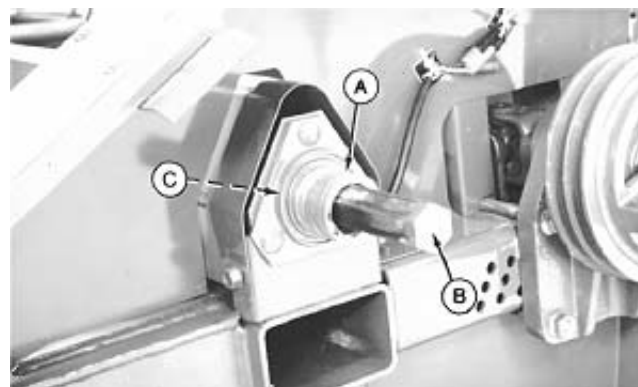
4. Remove washers (A) from shaft.

NOTE: Count washers. They will be used for alignment during assembly.

5. Repeat knife drive hub removal on right side.

6. Pull shaft (B) from bearings.

7. Check bearing (C) on each end for roughness. Replace by removing flangettes, if necessary.

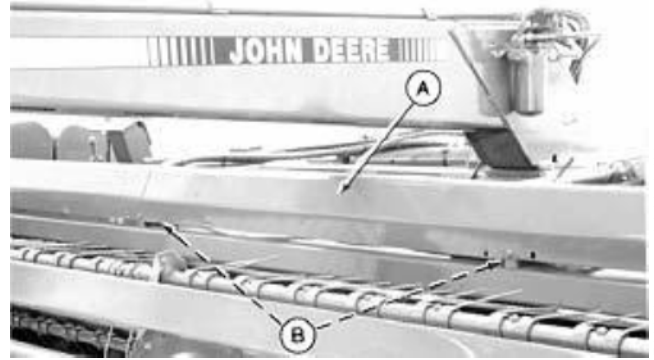


EX,1474,3030,N -19-26APR93

-UN-03JAN90

E33881

8. Remove shields (A) and check center support bearings (B). Replace if necessary.



E33682 -UN-03JAN90

EX,1474,3030,O -19-26APR93

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6

INSTALL PLATFORM CROSS SHAFT

1. Install shaft in reverse order of removal using the following special instructions.
2. Install the same number of washers (A) removed from each end of the shaft.
3. Add or remove washers to align driven sheave (B) with platform drive sheave (C) before belt is installed.

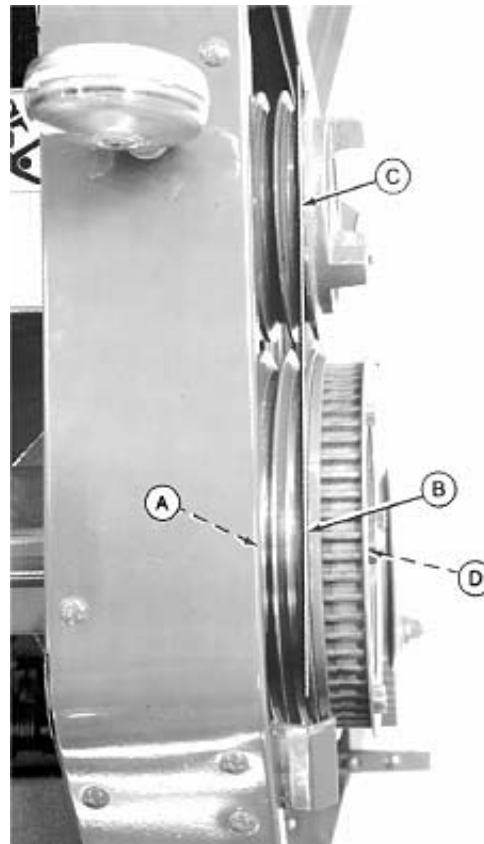
NOTE: Alignment changes when belts are installed due to shaft deflection. (See Align Knife Drive Belt in this section.)

4. Add or remove washers to align right knife drive gear with drive case gear before belt is installed.
5. Tighten hub clamp cap screws (D) to 271—379 N·m (200—280 lb-ft).
6. Install and tension belts.

7. Rotate knife drive gears in direction of machine operation to check timing belt tracking. Timing belt must be fully supported by knife drive case gear.

NOTE: Belt may track to edge, but must not overhang.

8. Adjust tracking by adding or removing washers under knife drive idler sheave.



E33683 -UN-03JAN90

- A—Washers
- B—Driven Sheave
- C—Platform Drive Sheave
- D—Hub Clamp Cap Screws

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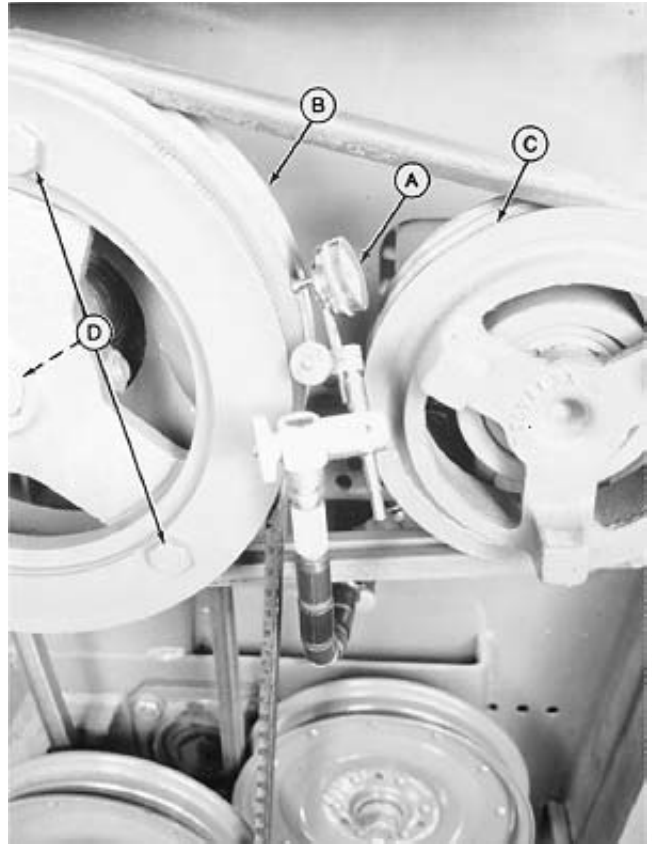
9. Use dial indicator (A) to check run out on platform driven sheave (B). Maximum run out should not exceed 0.76 mm (0.030 in.).

10. If run out exceeds 0.76 mm (0.030 in.), mark the (high) side of sheave and rotate it opposite of jack shaft sheave (C).

11. Loosen three cap screws (D) to allow sheave to center. Tighten cap screws (D).

12. Recheck run out. Readjust if necessary.

- A—Dial Indicator
- B—Driven Sheave
- C—Jack Shaft Sheave
- D—Cap Screws



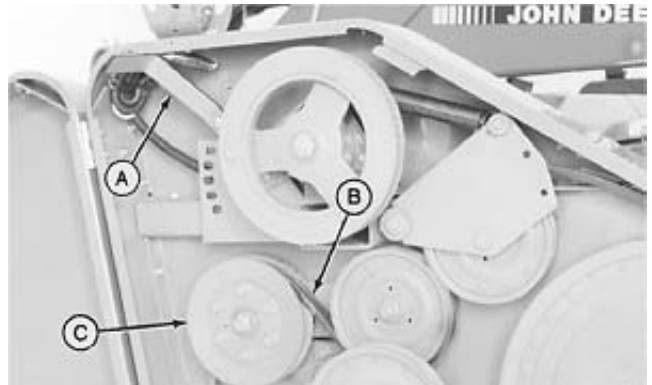
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E33978

RECONDITION REEL DRIVE VARIABLE SHEAVE

⚠ CAUTION: Lever is spring loaded. Hold firmly until spring tension is released.

1. Raise lever (A) to release reel belt tension.
2. Remove belt (B) from variable sheave. It is not necessary to remove belt from platform.
3. Remove six nuts, shims, and sheave halves (C).

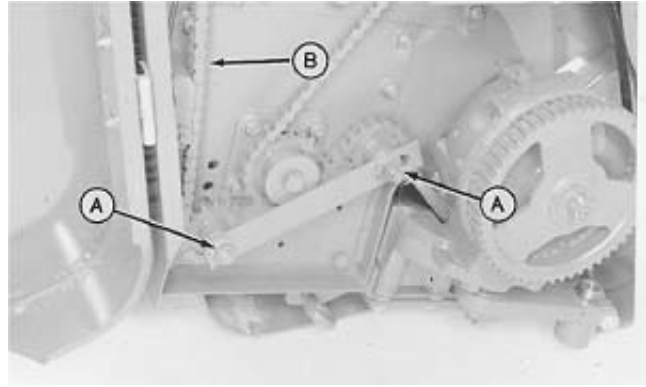


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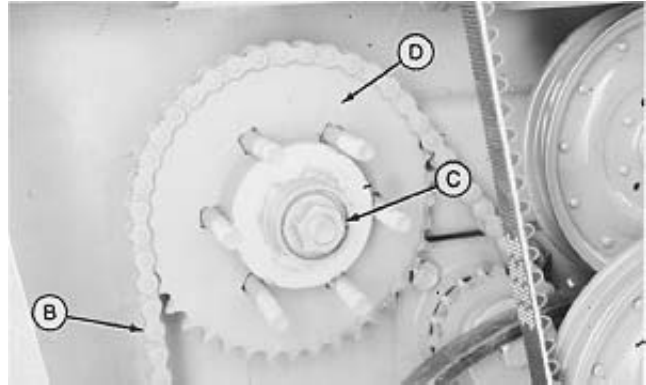
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4. Loosen two flange nuts (A) to release tension on auger drive chain (B).
5. Remove chain (B) from variable sheave sprocket. It is not necessary to remove chain from platform.
6. Remove nut (C) and sprocket (D).

A—Flange Nut
B—Chain
C—Nut
D—Sprocket



E37168 -UN-08APR93



E37169 -UN-08APR93

EX,1474,3030,R -19-26APR93

7. Check bearings (A) for roughness.
8. Press out hub (B) and bearings if parts are damaged.



E33894 -UN-03JAN90

EX,1474,3030,S -19-26APR93

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9. Press replacement bearings (A) into each end of hub (B) and against spacer (C). Press on outer bearing race.

NOTE: Bearings are to be flush to 0.38 mm (0.015 in.) into bore.

10. Press shoulder of hub against sprocket.

11. Install sprocket and sheave on platform. Tighten reel drive variable sheave mounting bolt to 106—174 N·m (78—128 lb-ft). Tighten six carriage bolts to 48—60 N·m (35—44 lb-ft).

12. Adjust reel speed. (See Adjust Reel Speed in this section.)

13. Tension chain and belt. (See Replace and Adjust Auger Drive Chain and Adjust Reel Drive Belt in this section.)



E33395 -UN-03JAN90

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EX,1474,3030,T -19-26APR93

ADJUST REEL SPEED

Reel speed should be 5 to 10 percent faster than ground speed.

Add shims between sheave halves to decrease reel speed. Remove shims to increase reel speed.

⚠ CAUTION: Lever is spring loaded. Hold firmly until spring tension is released.

1. Raise lever (A) to release belt tension.
2. Remove six nuts from drive sheave (B).
3. Remove adjustable sheave half.

IMPORTANT: Do not add more than four shims or damage to belt may occur.

4. Position shims to obtain desired reel speed.
5. Tighten six carriage bolts to 48—60 N·m (35—44 lb-ft).



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EX,1474,3030,U -19-26APR93

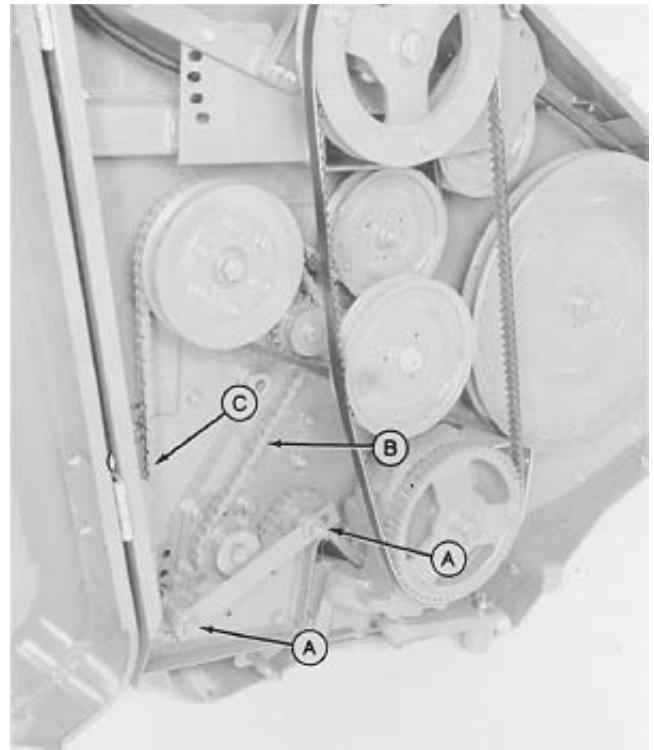
REPLACE AND ADJUST AUGER DRIVE CHAIN

IMPORTANT: Replace chain if it has stretched to the end of adjustment slots. Removing links and running stretched chain will damage sprockets.

1. Loosen nuts (A) to release chain tension.
2. Remove chain connector link from chain (B). Remove chain.

NOTE: The closed end of clip must face in direction of travel.

3. Install new chain. Fasten with connector link and spring clip.
4. Adjust idlers until there is 13 mm (0.5 in.) deflection measured at mid-span (C) of chain. Tighten nuts (A).
5. Add or remove washers at idler sprockets and variable reel sheave to align chain if necessary.

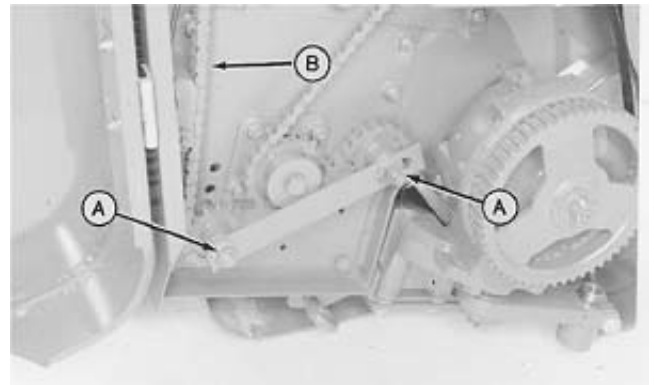


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EX,1474,3030,V -19-26APR93

REPLACE AND ADJUST AUGER DRIVE CHAIN TENSIONER

1. Loosen flange nuts (A) and release auger chain (B) tension.



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EX,1474,3030,VA-19-26APR93

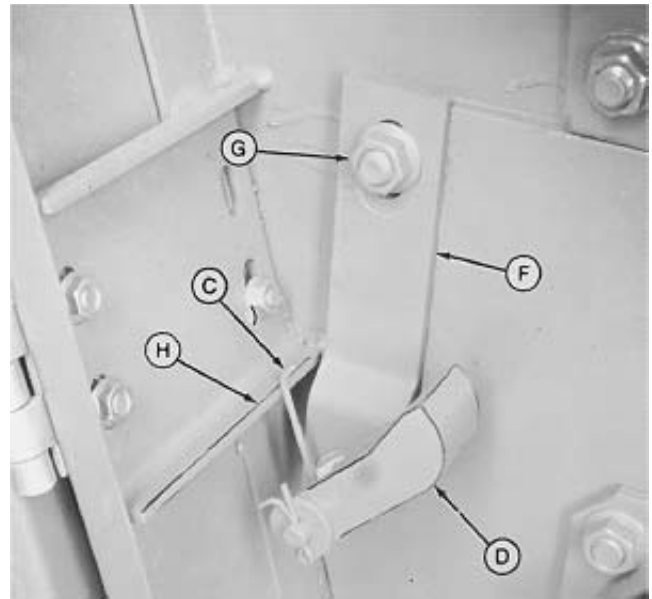
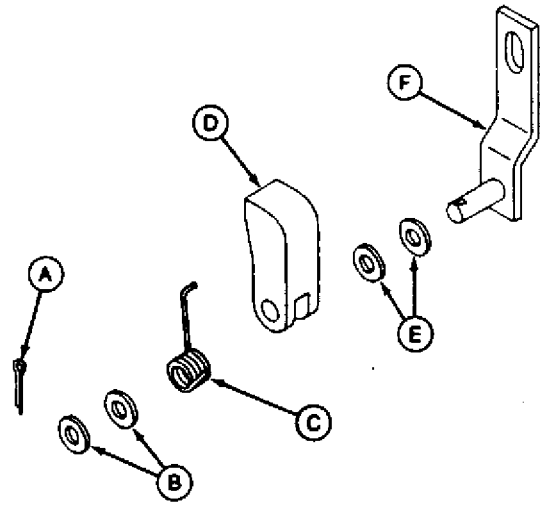
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2. Remove cotter pin (A) and two washers (B).
3. Remove torsion spring (C) and tensioner block (D).
4. Remove two washers (E) and check shaft on bracket (F) for wear. Replace bracket as necessary.
5. Check torsion spring and tensioner block for excessive wear. Replace as necessary.
6. Reverse steps 2 thru 4 and install tensioner block, with the following additional steps.

IMPORTANT: The bend in the spring (C) must be beyond the edge (H) of the bracket when the tensioner block (D) is rotated up into operating position.

7. Loosen flange nut (G) to move the bracket (F) close, not touching, to the edge (H) of the brace, and position the bend in the spring (C) beyond the edge (H) of the brace.

- A—Cotter Pin
- B—Washers
- C—Torsion Spring
- D—Tensioner Block
- E—Washers
- F—Bracket
- G—Flange Nut
- H—Edge



EX,1474,3030,VB-19-26APR93

-UN-08APR93

E37181

-UN-08APR93

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ALIGN KNIFE DRIVE BELT

IMPORTANT: Running machine with no load for long periods of time can cause damage. Knife drive belts must not hang over edge of drive and driven gears.

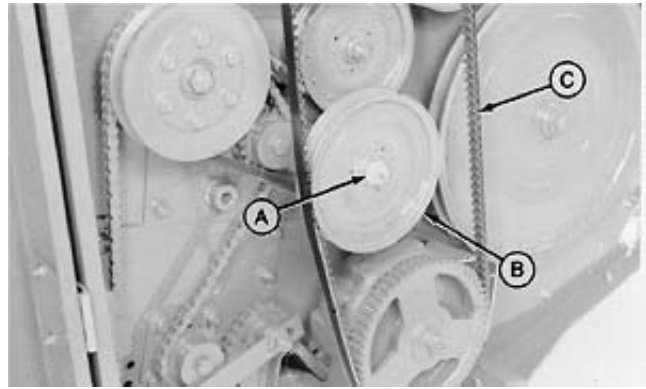
1. Run machine at low rpm long enough to check knife drive belt (B) tracking on drive and driven gears.
2. Check alignment of drive and driven gears. (See Install Platform Cross Shaft in this section.)

IMPORTANT: Overtensioning knife drive belt can cause belt to run out of alignment.

3. Check belt tension. (See Adjust Knife Drive Belt in this section.)

NOTE: Count washers on idler (B) whenever it is removed.

4. Remove nut (A), move washers to position idler (B) to adjust tracking of knife drive belt (C).



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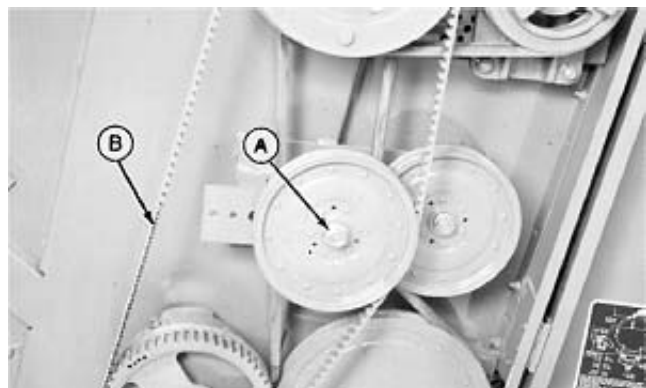
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EX,1474,3030,W -19-26APR93

REPLACE LEFT DRIVE BELTS

IMPORTANT: Do not bend timing belt sharply or back bend it. Sharp bends can damage internal tensile members and cause premature belt failure.

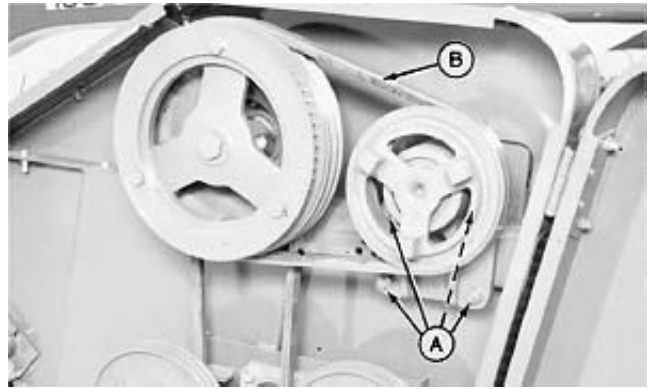
1. Loosen nut (A) to release belt tension.
2. Remove knife drive belt (B).



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EX,1474,3030,X -19-26APR93

3. Loosen four mounting bolts (A).
4. Remove platform drive belt (B).



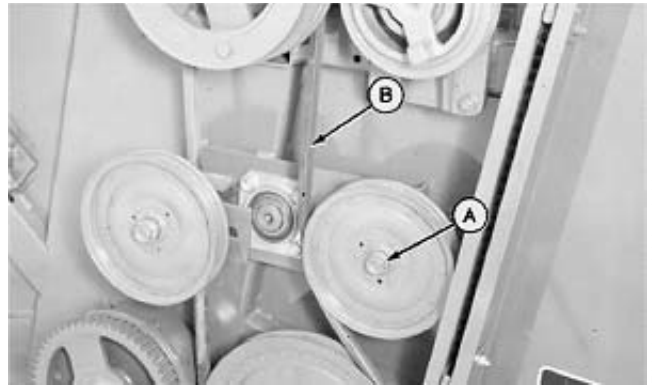
EX,1474,3030,Y -19-26APR93

E33389 -UN-24JUL89

5. Loosen nut (A) to release belt tension.
6. Remove auger drive belt (B).
7. Install replacement belts where needed by reversing order of removal.

*NOTE: Time knives before installing knife drive belt.
(See Time Knives in Section 20.)*

8. Adjust belt tensions. (See Adjust Knife Drive Belt, Adjust Platform Drive Belt, and Adjust Auger Drive Belt in this section.)



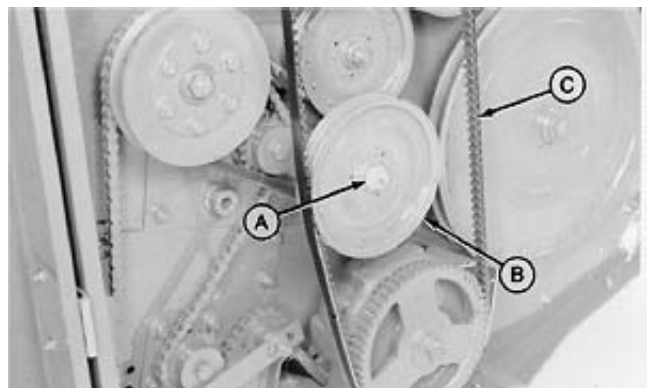
EX,1474,3030,Z -19-26APR93

E33390 -UN-24JUL89

REPLACE RIGHT DRIVE BELTS

IMPORTANT: To prevent damage to internal tensile members causing premature belt failure, do not hang belt on a hook, back bend it or bend it sharply.

1. Loosen nut (A) on idler (B) to release belt tension.
2. Remove knife drive belt (C).



EX,1474,3030,AA-19-26APR93

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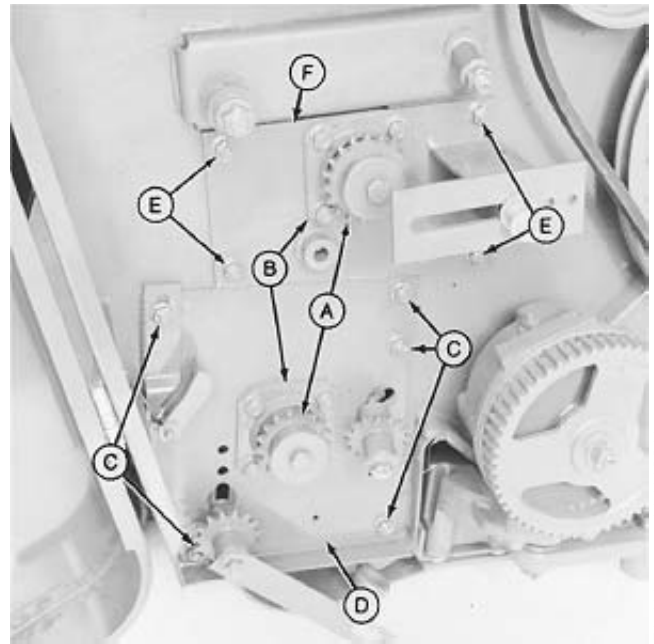
CAUTION: Lever (A) is spring loaded. Hold firmly until spring tension is released.

3. Raise lever (A) to release reel belt tension from normal position (D).
4. Loosen idler pivot (B).
5. Remove reel drive belt (C).

IMPORTANT: Time knives before installing knife drive belt. (See Time Knives in Section 20.)

6. Install replacement belts where needed by reversing order of removal.
7. Adjust belt tension. (See 'ADJUST KNIFE DRIVE BELT' and 'ADJUST REEL DRIVE BELT' in this section.)

- A—Lever
- B—Pulley
- C—Reel Drive Belt
- D—Fourth Hole

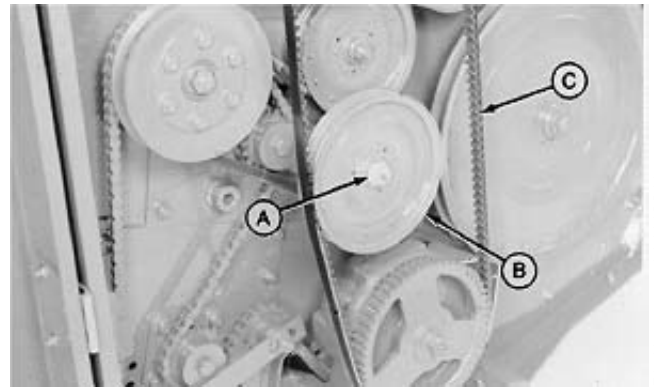


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EX,1474,3030,AB-19-26APR93

ADJUST KNIFE DRIVE BELT (BOTH SIDES)

1. Loosen nut (A).
2. Adjust idler (B) until drive belt (C) deflects 11.5 mm (0.45 in.) when 45—58 N (10—13 lb) is applied at the center of the belt span.
3. Tighten nut (A).



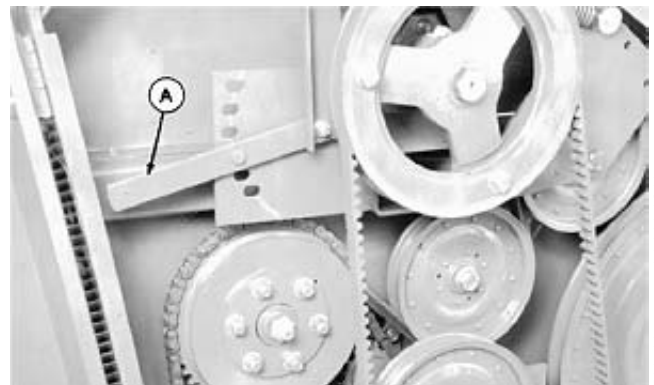
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EX,1474,3030,AC-19-26APR93

ADJUST REEL DRIVE BELT

CAUTION: Lever (A) is spring loaded. Hold firmly until spring tension is released.

Move lever (A) to the fourth hole for correct belt tension. If belt begins to slip or wear, move lever to the next hole.



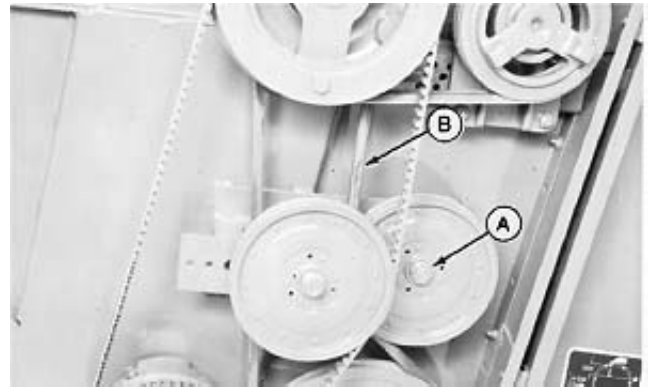
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EX,1474,3030,AD-19-26APR93

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ADJUST AUGER DRIVE BELT

1. Loosen nut (A).
2. Adjust pulley until drive belt (B) deflects 11.5 mm (0.45 in.) when 67—84 N (15—19 lb) is applied at the center of the belt span.
3. Tighten nut (A).

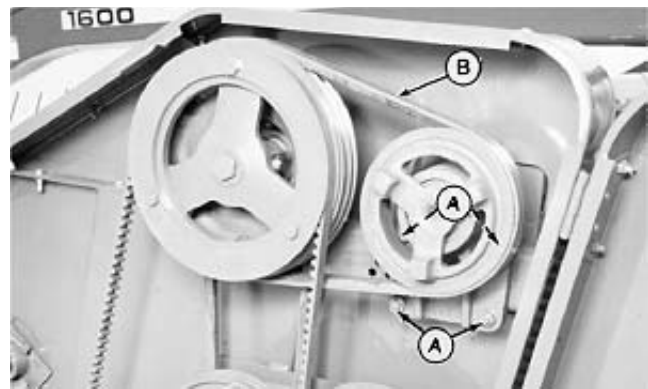


EX,1474,3030,AE-19-26APR93

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-UN-24JUL89

ADJUST PLATFORM DRIVE BELT

1. Loosen four mounting bolts (A)
2. Adjust pulley until drive belt (B) deflects 3.5 mm (0.13 in.) when 98—124 N (22—24 lb) is applied at the center of the belt span.
3. Tighten bolts (A).



EX,1474,3030,AF-19-26APR93

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CARE OF V-BELTS



CAUTION: To prevent injury, never attempt to install, check, or adjust V-belts or chains while platform is running. Disengage PTO and shut off tractor engine. Never operate platform with shields removed from chain or belt drives.

When installing V-belts, all tighteners should be loosened, or a sheave removed, to get belt into place. Never pry belt over the edge of a sheave, as this will rupture one or more cords and weaken the belt.

V-belts stretch when new. Check tension frequently for the first few days and take up the initial stretch so belt does not slip.

Occasionally, a belt may turn or roll in a sheave. Operating in this condition, even for a short time, will be detrimental. A rolled belt passes around the sheave on edge and is not to be confused with a crossed belt. Rolling of the belt is caused by lack of sufficient tension or improper installation.

Do not allow grease to remain on a belt.

The condition of sheave flanges has a definite bearing on belt life. If flanges are too narrow or are damaged, belts cannot give satisfactory service.

A slight raveling of the belt covering does not indicate premature failure. Raveling should be cut off if covering peels at the splice.

When operating the platform in a dry climate, belts tend to become covered with a fine dust glaze. This condition can be remedied by washing belts with a non-flammable cleaner.

EX,1474,3030,AG-19-26APR93

Section 40 Conditioner

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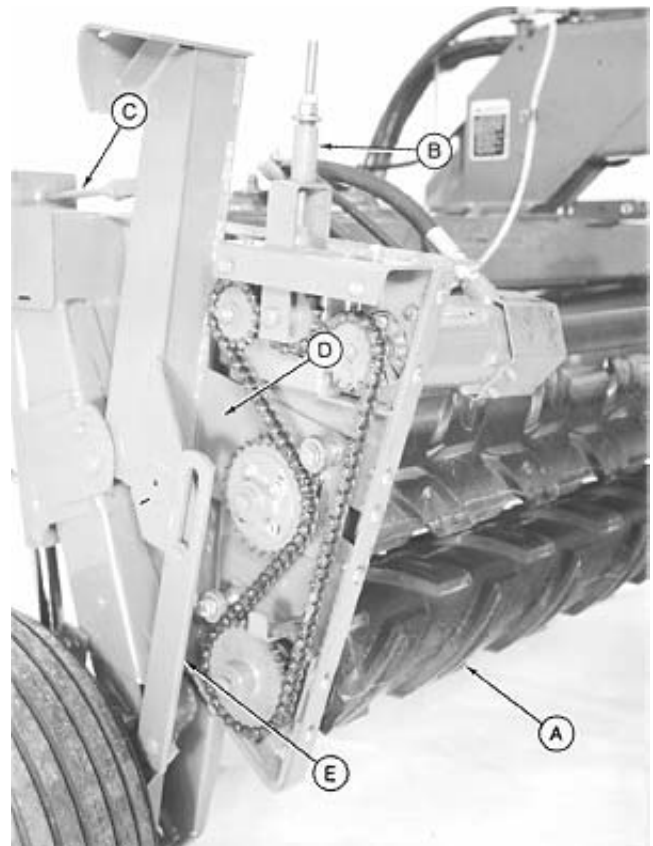
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CONDITIONER DESCRIPTION

The conditioner rolls (A) have intermeshing cleats to condition the crop. The tensioner (B) maintains proper tension on the roll drive chain, and roll spacing is controlled by adjuster bolts (C).

Straps (D) between the wheel supports and roll arms (E) separate the rolls when the platform is raised for easier clean out of obstructions.

- A—Conditioner Roll
- B—Chain Tensioner Adjuster
- C—Spacing Adjuster Bolt
- D—Strap
- E—Conditioner Roll Arm



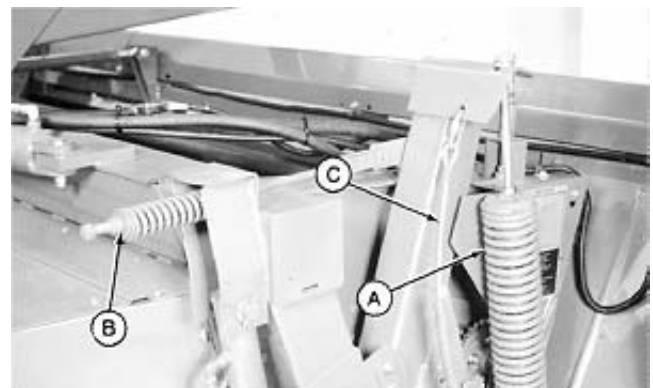
EX,1474,4005,A -19-26APR93

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The platform float springs (A) provide roll pressure.

Roll pressure can be increased or reduced as needed by the conditioner roll pressure adjustment (B).

The down stop cable (C) prevents the platform from damaging the power shaft during certain operating conditions.



EX,1474,4005,B -19-26APR93

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SPECIFICATIONS

ITEM	MEASUREMENT	SPECIFICATION
Roll Arm	Side Sheet Clearance	6—12 mm (0.2—0.5 in.)
Roll Sprocket to Idler Sprocket	Alignment	Plus or Minus 3 mm (0.1 in.)
Roll Timing	Lug Clearance	Equal within 1.5 mm (0.1 in.)
Roll Arm Bushings	Position	Flush to 2 mm (0.1 in.) into each end of bore
Roll Shaft	Total Indicated Runout	0.25 mm (0.010 in.) with dial indicator 25 mm (1.0 in.) from bearing center line

EX,1474,4005,C -19-26APR93

TORQUE VALUES

LOCATION	N·m	(lb-ft)
Roll Sprockets	250	185
Roll Chain Tensioner Sprocket	(Tight, then back off 3/4 turn)	
Roll Arm Pivot Pin Nut	(Tight, then back off 1/2 turn)	

EX,1474,4005,D -19-26APR93

SPECIAL TOOLS

D01045AA — Driver set used to install bushings in conditioner roll arm.

EX,1474,4005,E -19-26APR93

DIAGNOSING MALFUNCTIONS

Symptom	Problem	Solution	
Rolls plugging	Foreign objects between rolls.	Disengage tractor PTO, raise machine, and stop engine. When all moving parts are completely stopped, engage transport locks and remove foreign objects.	
	Very heavy crop.	Slow down or cut less than full width of cutterbar.	
	Uneven feeding in the machine.	Set roll gap to minimum clearance. (See Adjust Roll Spacing in this section.)	
	Conditioner roll pressure too high.	Install adjustable roll pressure kit. Reduce roll pressure. (See Adjust Roll Pressure in this section.)	
Leaf loss or crop damage	Ground speed too fast for condition of crop.	Slow down.	
	Rolls too close.	Increase roll spacing.	
	Conditioner roll pressure too high.	Install adjustable roll pressure kit. Reduce roll pressure. (See Adjust Roll Pressure in this section.)	
Improper conditioning	Platform is not feeding crop to conditioner properly.	Adjust reel down and back, and adjust cam so reel teeth just clear the auger. (See Adjust Reel and Adjust Cam in Section 30.)	
Improper drying	Crop is being bunched in windrow.	Adjust windrow width. (See Adjust Windrow Width in Section 50.) Decrease roll gap. (See Adjust Roll Spacing in this section.) Adjust reel. (See Adjust Reel in Section 30.)	
	Conditioner is not crimping crop enough.	Decrease roll gap. (See Adjust Roll Spacing in this section.)	
	Excessive drying or bleaching.	Conditioner is crimping crop too much.	Increase roll spacing (maximum of 6 mm (0.25 in.). Install adjustable roll pressure kit. Reduce roll pressure. (See Adjust Roll Pressure in this section.)
		Crop is being spread too wide in windrow.	Raise swath flap up. (See Adjust Windrow Width in Section 50.)

Continued on next page

Diagnosing Malfunctions

Symptom	Problem	Solution
Excessive conditioner noise	Rolls too close.	Adjust roll spacing. (See Adjust Roll Spacing in this section.)
	Rolls out of time.	Time the rolls. (See Adjust Roll Timing in this section.)
Excessive roller chain wear	Chain too loose.	Check automatic chain tightener. (See Remove and Install Conditioner Roll Drive Chain in this section.)
	Chains are dry.	Clean and lubricate chains.
	Sprockets worn or out of alignment.	Replace worn sprockets or align sprockets. (See Install Conditioner Rolls in this section.)
	Excessive load on chains.	Avoid overload on drives.
Conditioner drive noise	Chain worn out and climbing on sprocket teeth.	Replace chain. (See Remove and Install Conditioner Roll Drive Chain in this section.)
	Chains are dry.	Clean and lubricate.
	Chain tightener not working.	Check parts. (See Remove and Install Conditioner Roll Drive Chain in this section.)

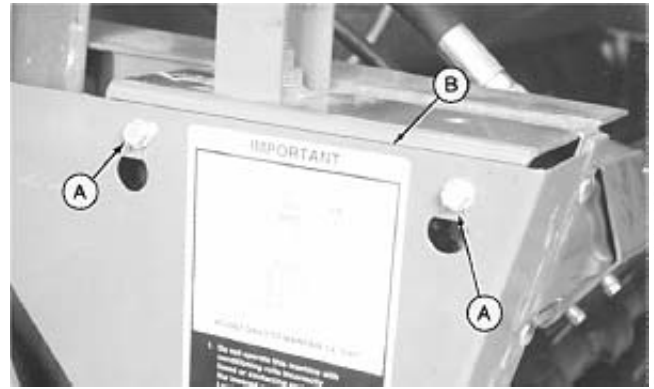
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REMOVE CONDITIONER ROLL DRIVE CHAIN

NOTE: Platform removed for illustration only.

1. Lower machine to ground.
2. Loosen cap screws (A) and remove shield (B).



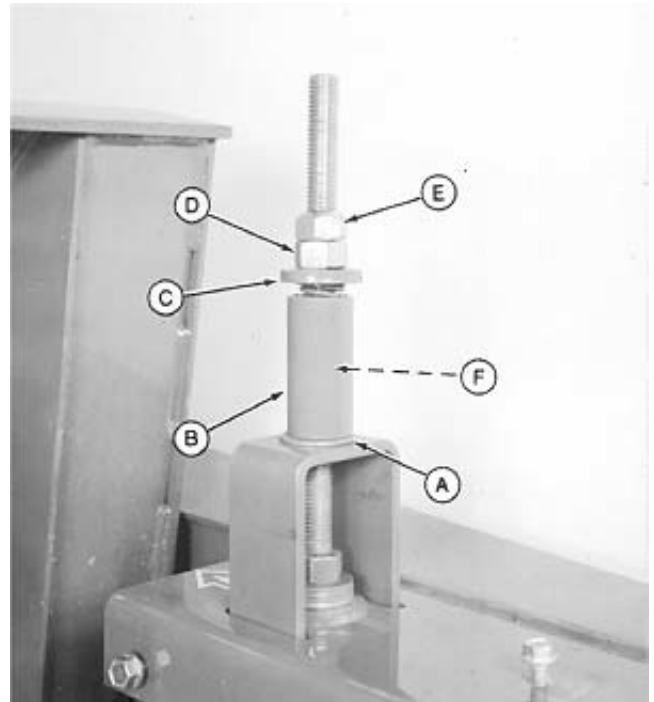
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! CAUTION: Spring (F) is under tension and will apply pressure against washer (C) beyond the end of the mounting bolt.

3. Remove lock nut (E), nut (D), and washer (C).
4. It is not necessary to remove spring (F), pipe spacer (B), and washer (A).

A—Washer
B—Pipe Spacer
C—Washer
D—Nut
E—Lock Nut
F—Spring



EX,1474,4015,B -19-26APR93

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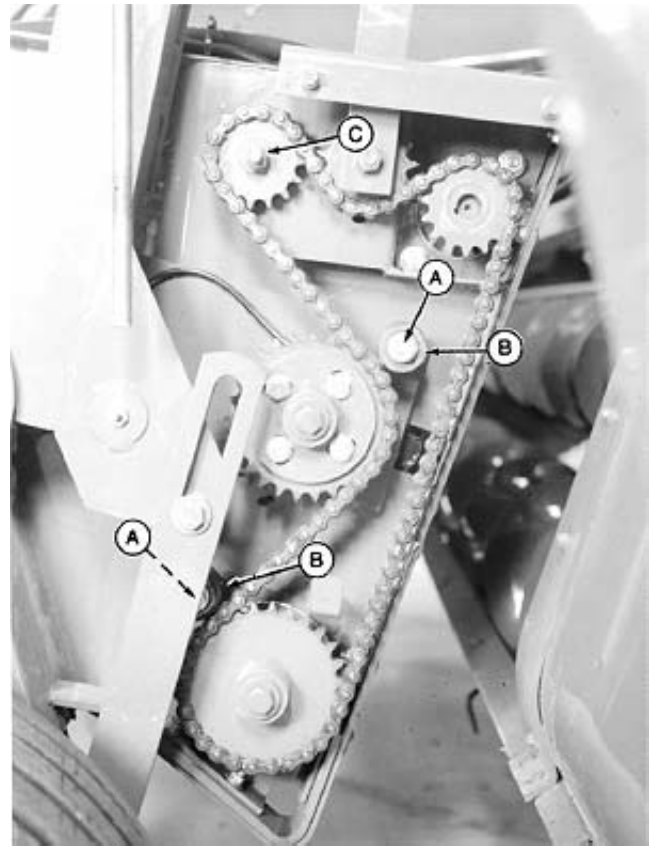
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5. Remove cap screws (A), washers, and chain retainers (B).

8. Loosen nut (C) and remove chain.

7. Loosely reinstall chain retainer (B) to prevent loss of washers.

8. Replace chain if worn or stiff. (See Care of Chains in this section.)



EX,1474,4015,C -19-26APR93

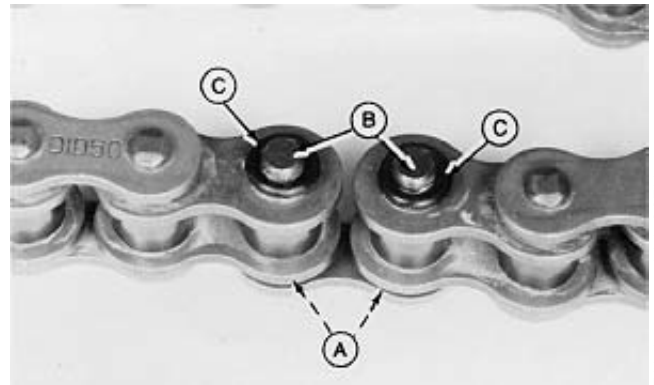
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INSTALL O-RING CONNECTOR LINK

The conditioner drive chain is an O-ring roller chain. Each pin is sealed with O-rings to keep lubricants in and contaminants out. Endless chains eliminate the weakness of the connector link. Chains can be repaired by using a special connector link.

1. Use chain breaker to remove damaged link.
2. Place one O-ring (A) on each connector pin (B).
3. Insert connector into chain ends.
4. Place one O-ring (C) on each connector pin (B).



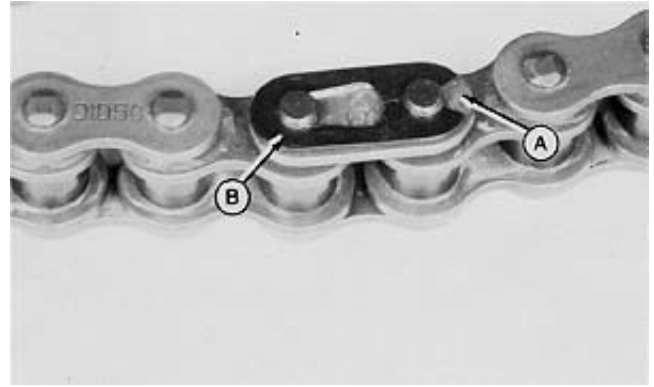
EX,1474,4015,D -19-26APR93

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NOTE: Vise grips or pliers may be necessary.

5. Place side plate (A) over pins and firmly compress to seat seal rings.

6. Slide spring clip (B) into place. Lock clip into annular grooves. The closed end of clip must face in the direction of chain travel.



EX,1474,4015,E -19-26APR93

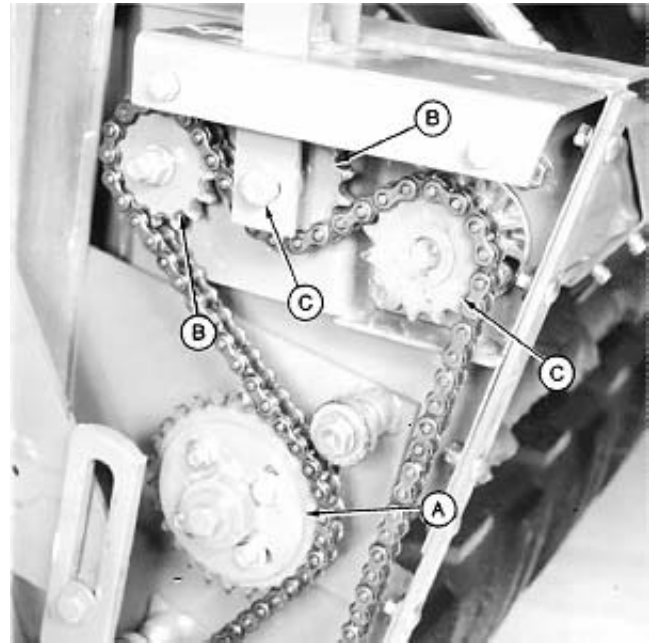
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INSTALL CONDITIONER ROLL DRIVE CHAIN

IMPORTANT: Sprocket and timing plate (A) must be timed for proper mesh of conditioning rolls. If sprocket and timing plate are not timed correctly, excessive vibration and roll damage may occur. Rolls are correctly timed when there is equal clearance on both side of roll cleats.

1. If necessary, align idler sprockets (B) with motor sprocket (C) by shifting washers side-to-side on mounting bolts.
2. Tighten chain tensioner carriage bolt and back off nut (D) 3/4 turn.
3. Install chain on sprockets.
4. Install chain retainer, washers, and cap screw.

A—Timing Sprocket
 B—Idler Sprocket
 C—Motor Sprocket
 D—Nut



EX,1474,4015,F -19-26APR93

E37105 -UN-17MAR93

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3

Chain Drive/Install Conditioner Roll Drive Chain

5. Install washer (A), spring (G), and pipe spacer (B).

NOTE: Compress spring (G) with washer (C).

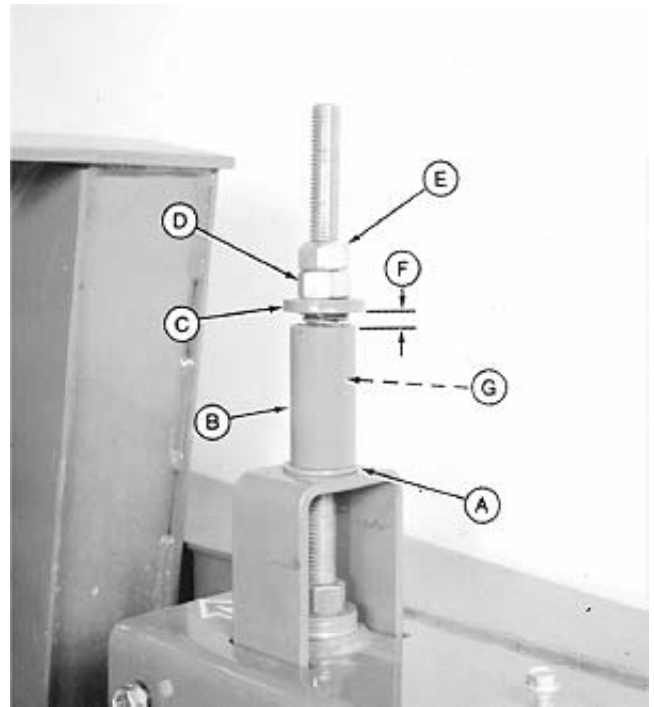
6. Install washer (C), nut (D), and lock nut (E).

7. Adjust nut (D) until there is a 6.35 mm (1/4 in.) gap (F) between washer (C) and pipe spacer (B).

8. Hold nut (D) in position with lock nut (E).

9. Time rolls. (See Adjust Roll Timing in this section.)

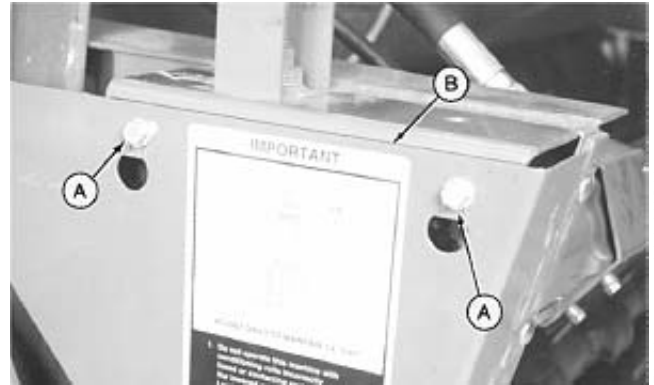
- A—Washer 7/64 x 5/8 x 1-15/32 in.
- B—Pipe Spacer
- C—Washer 1/4 x 21/32 x 1-5/8 in.
- D—Nut 5/8
- E—Lock Nut 5/8
- F—Gap 6.35 mm (1/4 in.)
- G—Spring



EX,1474,4015,G -19-26APR93

E37087 -UN-17MAR93

16. Install shield (B) and tighten cap screws (A).



EX,1474,4015,H -19-26APR93

E37104 -UN-17MAR93

CARE OF CHAINS

IMPORTANT: Do not use solvents such as gasoline, benzene, acetone, or other corrosive materials on conditioner drive O-ring chain as they may damage the elastic rubber compound O-rings. If chain needs cleaning, use kerosene applied to cloth. Do not apply kerosene directly to or submerge chain in kerosene.

Liberalily apply SAE 30 or heavier oil, or John Deere Chain Lube spray to chains every 10 hours or operation.

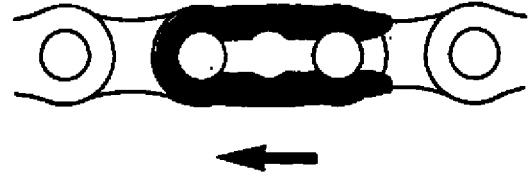
Applying oil to O-ring chains extends their life by keeping O-rings moist to give a better seal for grease inside the chain.

IMPORTANT: Replace chain if it has stretched to the end of adjustment slot. Removing links and running stretched chain will damage sprockets.

Do not run chains so loose that they slap or so tight that premature failure occurs.

Be sure sprockets in each drive are properly aligned. Inspect sprockets frequently to make sure teeth are not worn enough to cause damage to chain.

When securing a chain, be sure closed end of spring clip faces in the direction chain will travel.



E11025

-JUN-20SEP88
E11025

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EX,1474,4015.I -19-26APR93

REMOVE CONDITIONER ROLL ARM

NOTE: Left side illustrated.

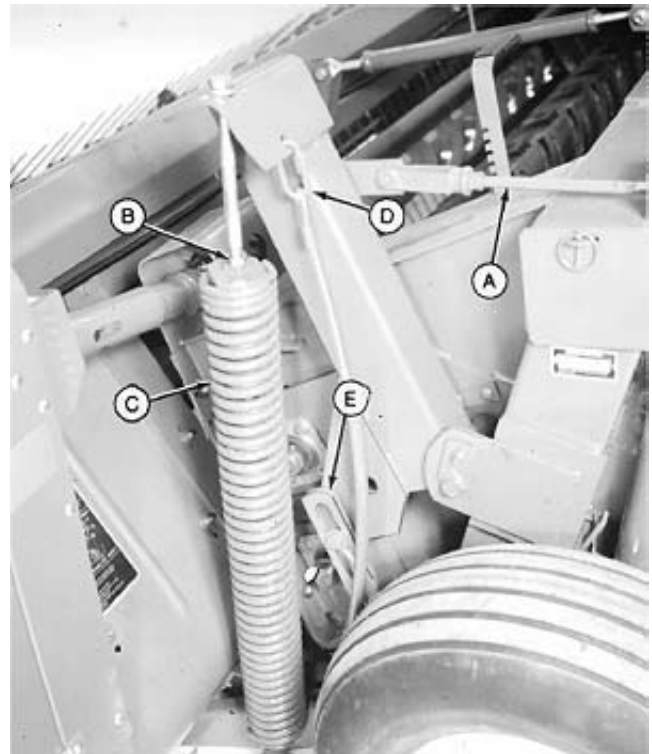
⚠ CAUTION: Release roll pressure before removing roll arm to prevent injury.

1. Raise platform and remove roll spacing adjusting bolt (A).
2. Lower platform to ground.

⚠ CAUTION: Close rolls before removing roll arm to prevent injury or machine damage.

3. Loosen jam nut (B) and remove float spring (C).
4. Disconnect down stop cable (D).
5. Remove cap screw and disconnect upper end of roll opening strap (E).

A—Adjusting Bolt
B—Jam Nut
C—Float Spring
D—Down Stop Cable
E—Strap



E37117
-UN-31MAR93
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EX,1474,4020,A -19-26APR93

NOTE: Tire removed for illustration only.

(—943000) is shown, procedure is the same for (943001—)

To remove right conditioner roll arm, chain and sprocket must be removed. (See REMOVE UPPER ROLL in this Section).

6. Remove locking collar (A), remove paint and burrs from shaft.

NOTE: Apply heat to the bearing before and during removal.

7. Remove flangettes (B) and bearing.

8. Remove pin and disconnect roll spacing clevis (C).

NOTE: Note position of washers. They will be used during assembly to adjust arm.

9. Remove locking nut, pivot pin (D), washers, and roll arm (E).

- A—Locking Collar
- B—Flangettes
- C—Clevis
- D—Pivot Pin
- E—Roll Arm



SN (—94300)

EX,1474,4020,B -19-26APR93

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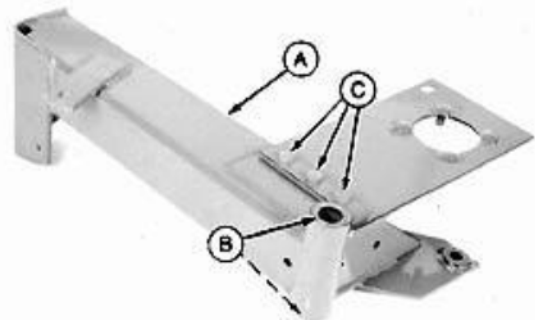
E36691 -UN-04FEB92

INSPECT CONDITIONER ROLL ARM

1. Check roll arm (A) for damage.
2. Check two bushings (B) for scoring or excessive wear.
3. Remove damaged bushings from bore.
4. Press replacement bushings flush to 2 mm (0.1 in.) into pivot pin bore.

NOTE: Minimum torque on cap screws (C) is 102 N·m (75 lb-ft).

5. Check cap screws (C) to insure they are tight.



E36692 -UN-07APR92

EX,1474,4020,C -19-26APR93

INSTALL CONDITIONER ROLL ARM

NOTE: Platform and float spring removed for illustration only.

(—943000) is shown, procedure is the same for (943001—)

1. Install roll arm parts in reverse order of removal using following special instructions:

2. Install roll arm (A) and tighten roll-opening strap cap screw to 244—298 N·m (150—220 lb-ft).

IMPORTANT: Clean shaft thoroughly and apply John Deere Primer TY6305 to shaft.

- Apply John Deere Retaining Compound T43515 on shaft (360 degrees) in the bearing area.

3. Install bearing and flangettes. Do not tighten locking collar or flangettes at this time. Rotate conditioner roll.

4. Check for 6—12 mm (0.2—0.5 in.) (B) roll arm to side sheet clearance.



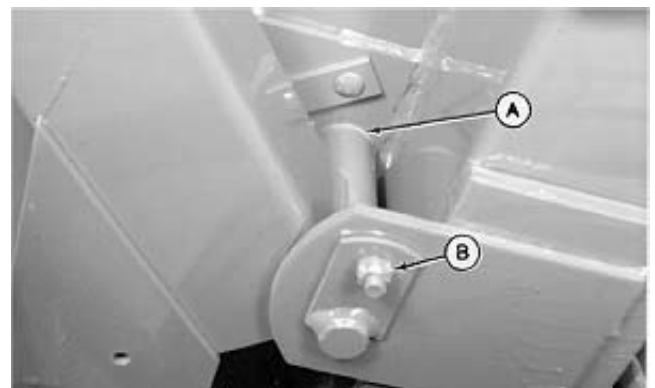
SN (—943000)

EX,1474,4020,D -19-26APR93

5. Adjust clearance, if necessary, by shifting washers (A) on pivot pin.

6. Tighten pivot pin locking nut (B) and back off 1/2 turn.

7. Tighten flangettes and locking collar. (See Tighten Bearing Locking Collar in this section.)



EX,1474,4020,E -19-26APR93

REMOVE UPPER CONDITIONER ROLL

⚠ CAUTION: Release roll pressure before removing rolls to prevent injury.

1. Raise platform and remove roll spacing adjusting bolt (A).
2. Lower and remove platform. (See Remove Platform in Section 30.)
3. Remove drive chain (B). (See Remove Conditioner Roll Drive Chain in this section.)
4. Remove reinforcement strap (C) on right front carrier frame side sheet.
5. Support upper conditioner roll (D) with hoist.

A—Adjusting Bolt
B—Drive Chain
C—Reinforcement Strap
D—Upper Conditioner Roll



EX,1474,4025,A -19-26APR93

6. Loosen cap screw from right end of upper roll and use three-jaw puller to loosen sprocket (A) from tapered splines.
7. Remove sprocket.



EX,1474,4025,B -19-26APR93

Rolls/Remove Upper Roll

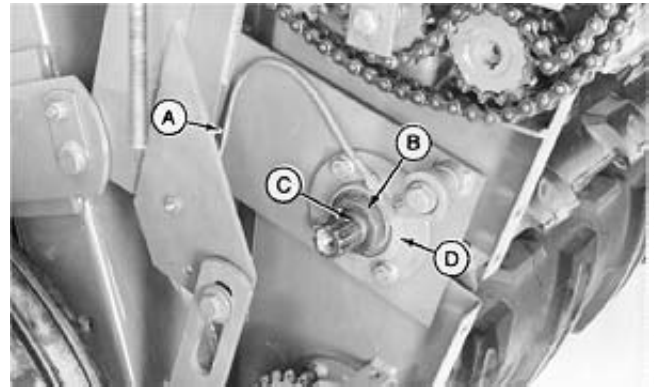
NOTE: SN (934001—) use non-relube bearings. Lube line (A) is not used.

8. Disconnect lube line (A) from float arm.
9. Remove locking collar (B).
10. Clean paint and burrs from upper roll shaft (C).

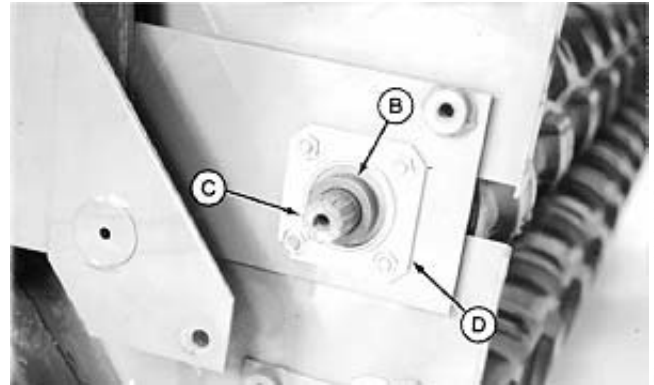
NOTE: Apply heat to the bearing before and during removal.

11. Remove flangettes (D) and bearing.

A—Lube Line
B—Locking Collar
C—Upper Roll Shaft
D—Flangettes



SN (—934000)



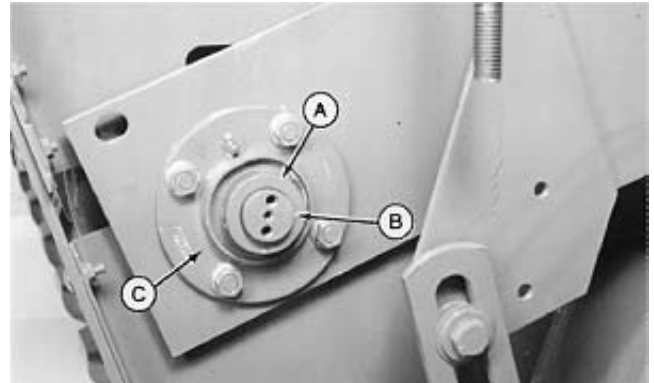
SN (934001—)

EX,1474,4025,C -19-26APR93

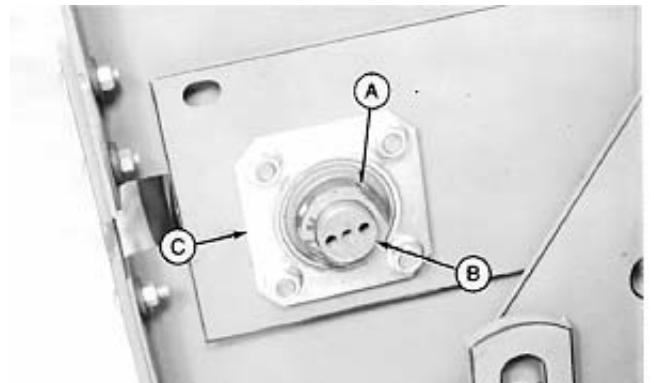
12. Remove locking collar (A) from left end of upper roll.
13. Clean paint and burrs from shaft (B).

NOTE: Apply heat to the bearing before and during removal.

14. Remove flangettes (C) and bearing.



SN (—934000)



SN (934001—)

EX,1474,4025,D -19-26APR93

Rolls/Remove Upper Roll

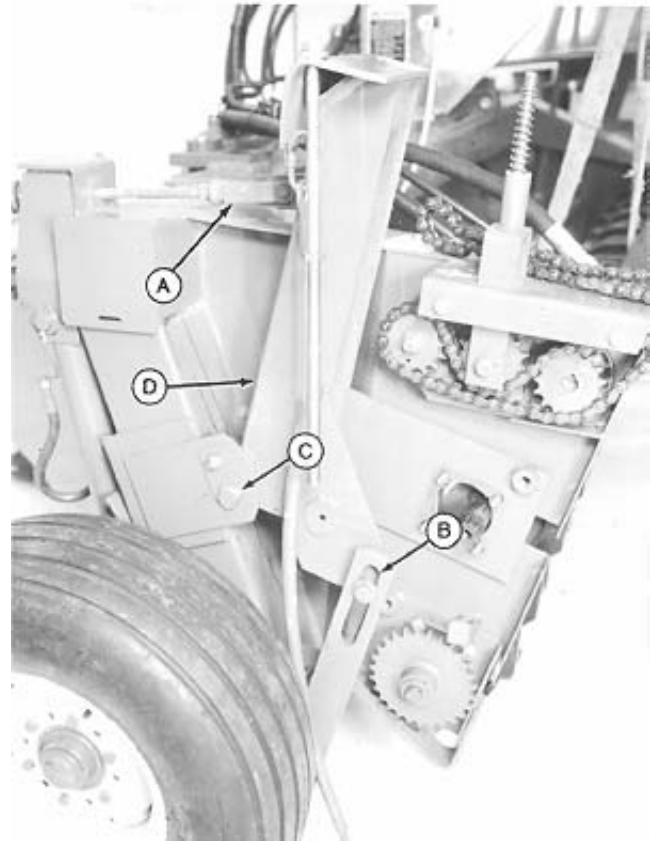
15. Remove pin and disconnect roll spacing clevis (A).

16. Remove cap screw and disconnect upper end of roll opening strap (B).

NOTE: Note position of washers because they will be used during assembly to adjust arm.

17. Remove locking nut, pivot pin (C) and conditioner roll arm (D).

- A—Clevis
- B—Roll Opening Strap
- C—Pivot Pin
- D—Conditioner Roll Arm

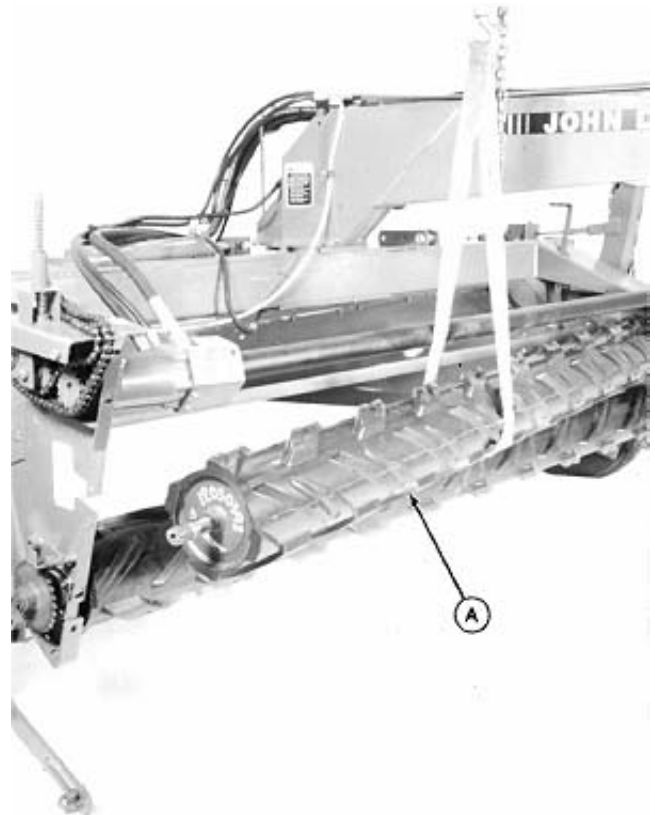


EX,1474,4025,E -19-26APR93

40-25-3
-UN-31MAR93
E36965

CAUTION: To prevent injury, two technicians are needed to keep roll balanced during removal.

18. Remove roll (A) by swinging forward and to right.



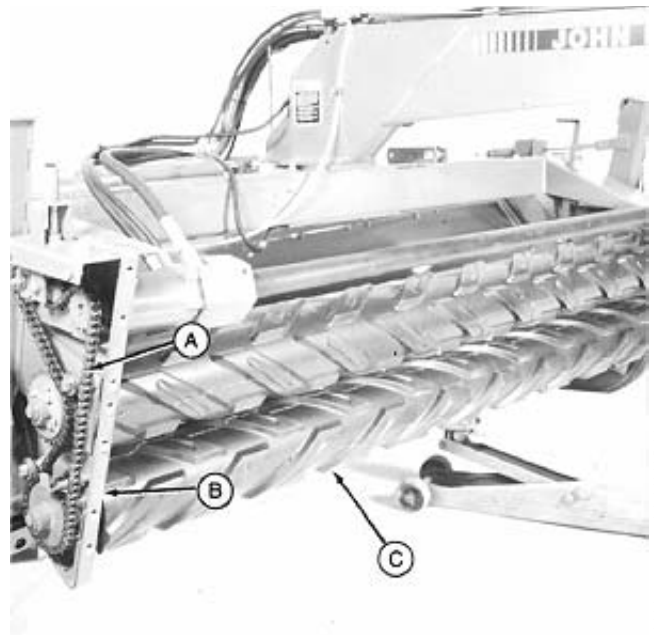
EX,1474,4025,F -19-26APR93

E36966
-UN-31MAR93

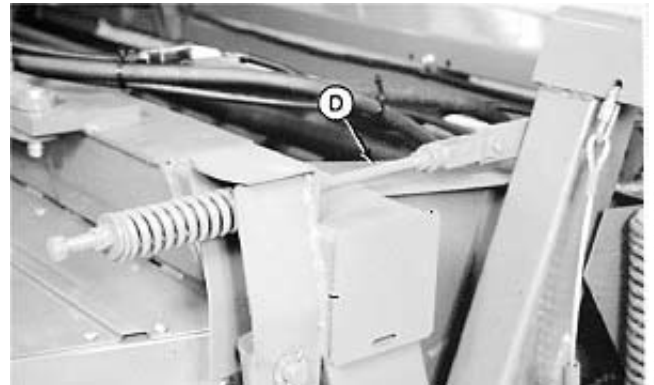
REMOVE LOWER ROLL

1. Remove platform. (See Remove Platform in this section.)
2. Remove drive chain (A). (See Remove Conditioner Roll Drive Chain in this section.)
3. Remove reinforcement strap (B) on front of right carrier frame side sheet.
4. Support lower roll (C) with floor jack.
5. Open rolls with left and right adjusting screws (D) to disengage cleats.

A—Drive Chain
B—Reinforcement Strap
C—Lower Conditioner Roll
D—Adjusting Screw



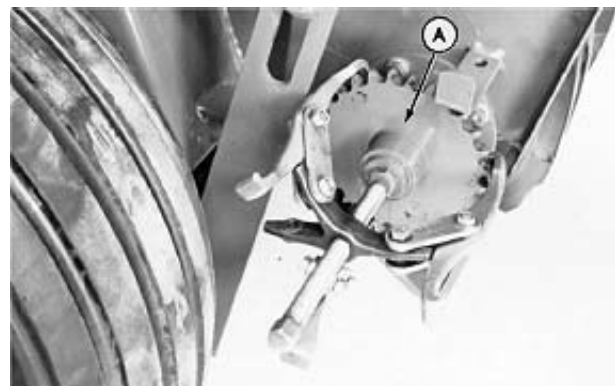
-UN-31MAR93
E36967



-UN-31MAR93
E36968

EX,1474,4025,G -19-26APR93

6. Loosen cap screw from right end of lower roll and use three-jaw puller to loosen sprocket (A) from tapered splines.
7. Remove sprocket.



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E33848

EX,1474,4025,I -19-26APR93

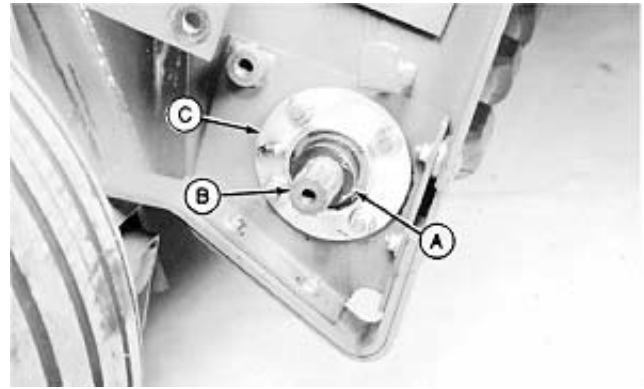
Rolls/Remove Lower Roll

8. Remove locking collar (A).

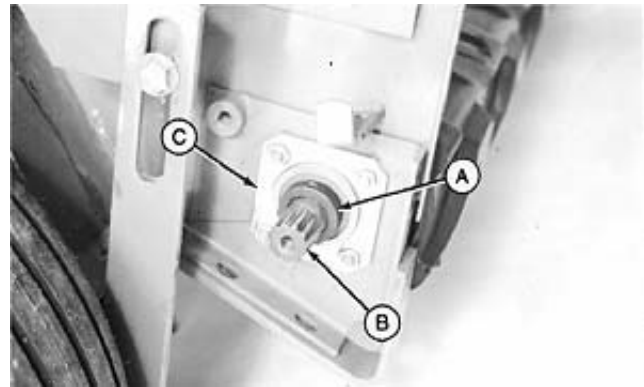
9. Clean paint and burrs from lower roll shaft (B).

NOTE: Apply heat to the bearing before and during removal.

10. Remove flangettes (C) and bearing.



SN (—934000)



SN (934001—)

EX,1474,4025,J -19-26APR93

E36694 -UN-04FEB92

E36969 -UN-31MAR93

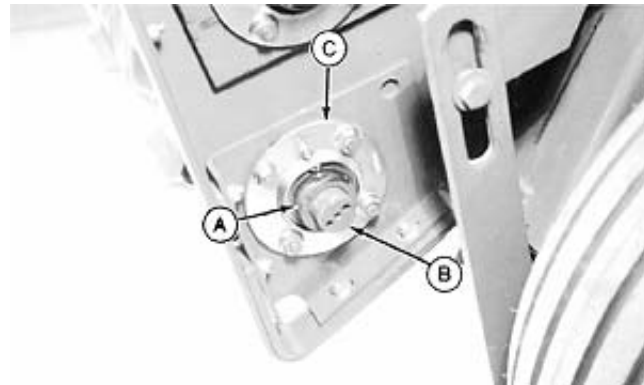
40-25-5

11. Remove locking collar (A) from left end of lower roll.

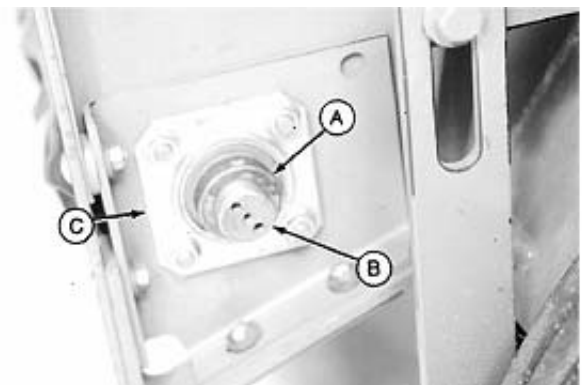
12. Clean paint and burrs from shaft (B).

NOTE: Apply heat to the bearing before and during removal.

13. Remove flangettes (C) and bearing.



SN (—934000)



SN (934001—)

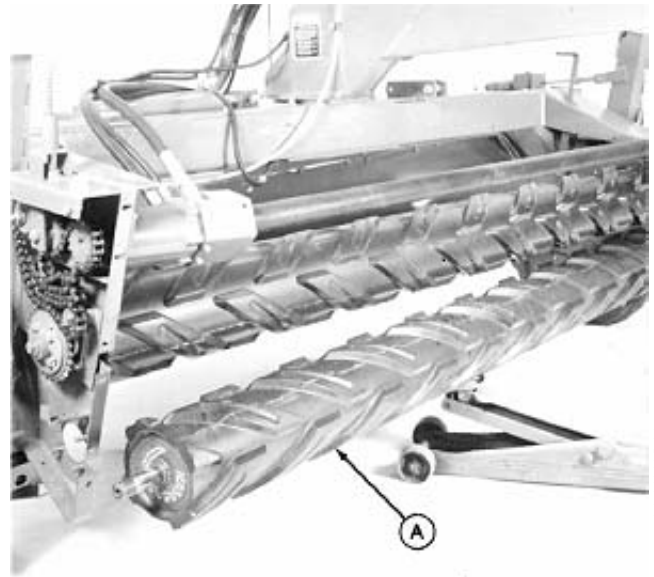
EX,1474,4025,K -19-26APR93

E36695 -UN-04FEB92

E37108 -UN-31MAR93

CAUTION: To prevent injury, two technicians are needed to keep roll balanced during removal.

14. Remove roll (A) by swinging forward and to right.



-UN-31MAR93
E37109

EX,1474,4025,L -19-26APR93

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INSPECT CONDITIONER PARTS

1. Clean all parts thoroughly.
2. Inspect all parts for wear or damage. Replace if necessary.
3. Check sprockets for irregular wear patterns, nicks and broken teeth.
4. Check bearings for roughness and be sure they rotate freely.
5. Check roll shafts (A) for damaged splines or bearing surfaces. Replace shaft if necessary. (See Replace Roll Shaft in this section.)
6. Check urethane cleats (B) for damage which would affect crop conditioning.

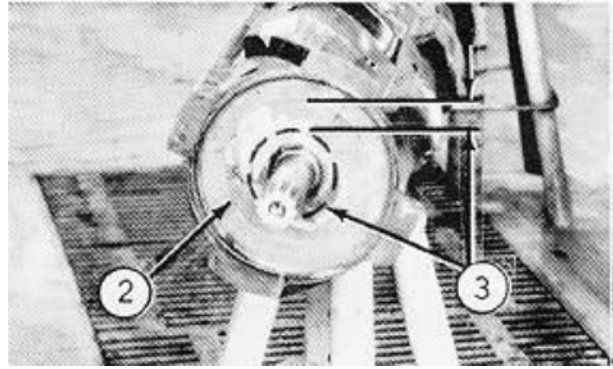


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E33899

EX,1474,4025,M -19-26APR93

REPLACE ROLL SHAFT

1. Remove roll. (See Remove Upper and Lower Roll in this section.)
2. Clean end thoroughly.
3. Measure half the distance between center and rim and mark a 108 mm (4.25-in.) circle.



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E33908

EX,1474,4025,N -19-26APR93

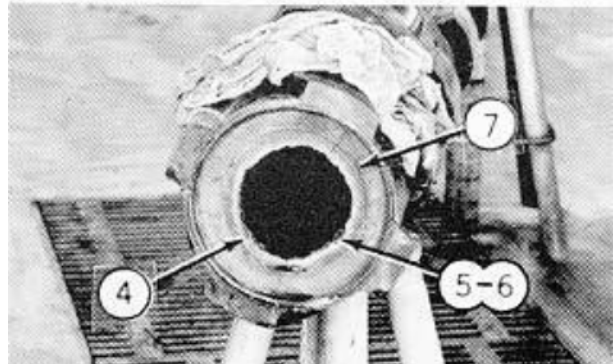
4. Use acetylene torch to remove marked section.

IMPORTANT: Due to the possibility of fire, have a fire extinguisher, bucket of water and shop towels for keeping roll wet.

5. Check that roll end fits.
6. File torched area smooth.

IMPORTANT: Due to criticality of final runout, make certain all weld spatter and foreign material are removed from area of machined step.

7. Hold new roll end centered in end of roll.
8. Place four 6 mm (0.25-in.) fillet welds 38 mm (1.5-in.) long.



-UN-09JAN90
E33909

EX,1474,4025,O -19-26APR93

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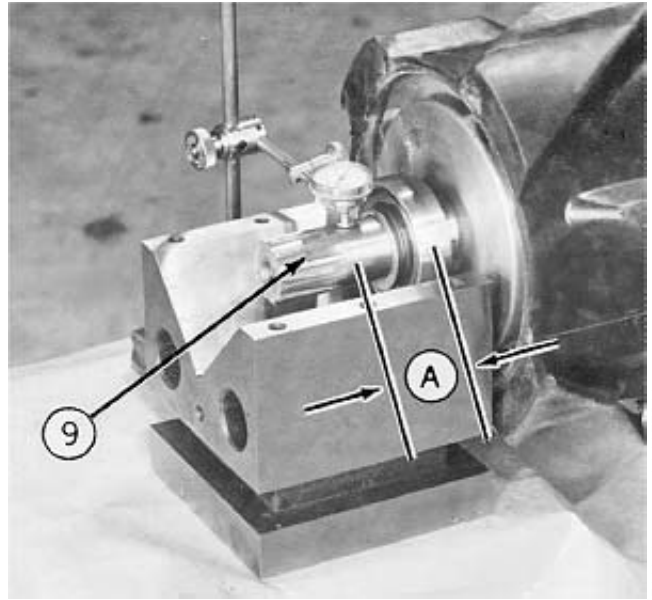
Rolls/Replace Roll Shaft

9. Check runout. Total indicated runout CANNOT exceed 0.25 mm (0.010-in.) with center of dial indicator located 25 mm (1.0 in.) (A) from center of bearing.

IMPORTANT: If runout exceeds 0.25 mm (0.010-in.) TIR, mark the high side, remove roll end and clean end thoroughly.

10. Repeat step 8 placing first weld directly across from high side.

11. Repeat step 9.

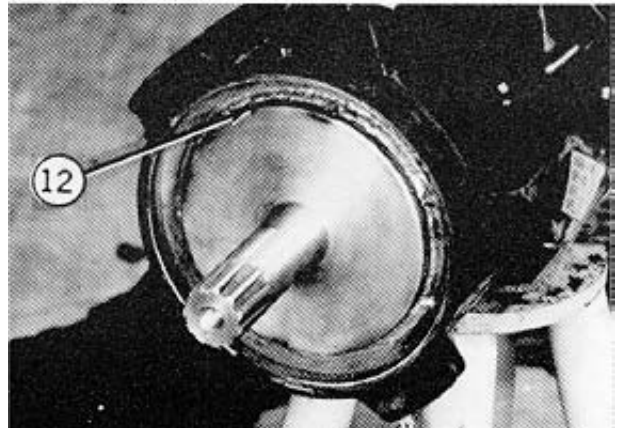


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E33958

EX,1474,4025,P -19-26APR93

12. Place 6 mm (0.25 in.) fillet weld the circumference of roll end.

13. Check that final runout has not exceeded 0.25 mm (0.010-in.) TIR.



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E33911

EX,1474,4025,Q -19-26APR93

INSTALL CONDITIONER ROLLS

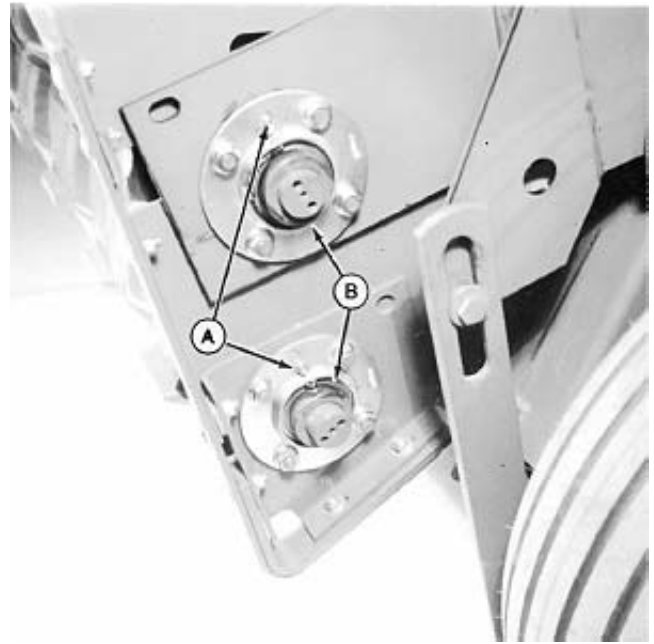
1. Install rolls in reverse order of removal using following special instructions.

IMPORTANT: Do not use NEVER-SEEZ or grease on roll shaft when installing bearing and sprocket.

- Install new bearings, do not reuse old bearings.
- Install bearings, SN (—934000), with relube hole aligned with lube fitting (A).
- Clean shaft thoroughly and apply John Deere Primer TY6305 to shaft.
- Apply John Deere Retaining Compound T43515 on shaft (360 degrees) in the bearing area.

NOTE: Bearings used on machines SN(934001—) are sealed bearings, and flangettes do not have lube fittings (A).

2. Install left bearings and flangettes on shafts with grease fittings (A) in upper position. Place locking collars (B) on bearings. Do not tighten flange nuts or locking collars at this time.



SN (—934000)



SN (934001—)

EX,1474,4025,R -19-26APR93

NOTE: Roll opening strap removed for illustration only.

3. Install right roll arm and adjust clearance with side sheet. (See Install Conditioner Roll Arm in this section.)

IMPORTANT: Clean shaft thoroughly and apply John Deere Primer TY6305 to shaft.
 • Apply John Deere Retaining Compound T43515 on shaft (360 degrees) in the bearing area.

NOTE: Flangettes with grease fittings are used on machines (—934000).

4. Install lower right bearing and flangettes with grease fitting (A) pointing to the rear. Place locking collar (B) on bearing. Do not tighten carriage bolts or locking collar at this time.

IMPORTANT: Clean shaft thoroughly and apply John Deere Primer TY6305 to shaft.
 • Apply John Deere Retaining Compound T43515 on shaft (360 degrees) in the bearing area.

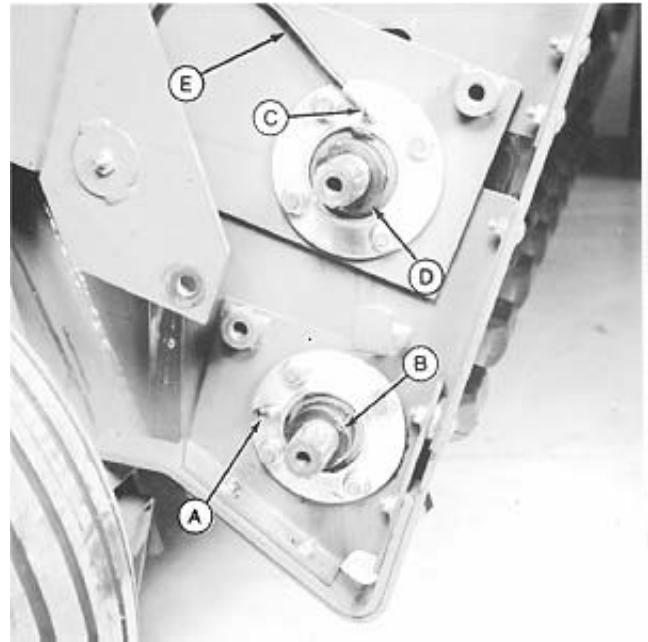
NOTE: Flangettes with grease fittings are used on machines (—934000).
Lube line (E) is used on machines (—934000)

5. Install upper right bearing and flangettes with grease hole up and elbow (C) with lube line pointing to rear. Place locking collar (D) on bearing. Do not tighten carriage bolts or locking collar at this time.

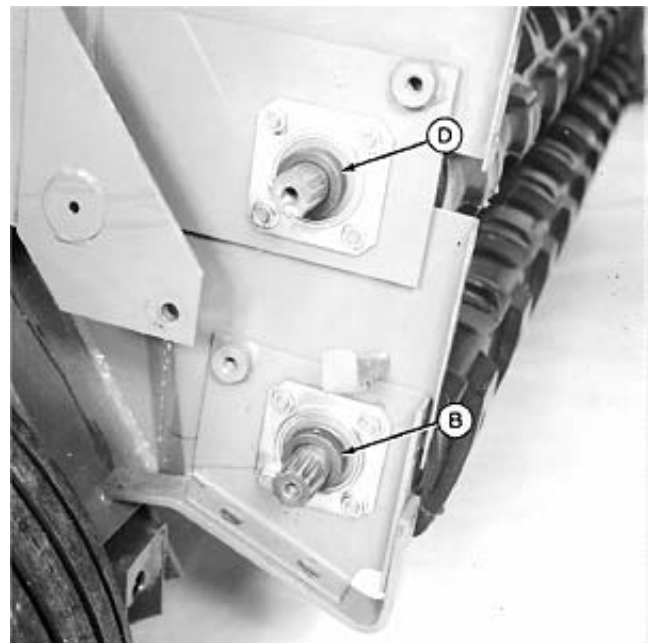
6. Rotate rolls and tighten carriage bolts holding flangettes in position.

7. Connect lube line to conditioner roll arm.

- A—Grease Fitting
- B—Lower Locking Collar
- C—Elbow
- D—Upper Locking Collar
- E—Lube Line (—934000)



(—934000)



(934001—)

-UN-31MAR93
E37111

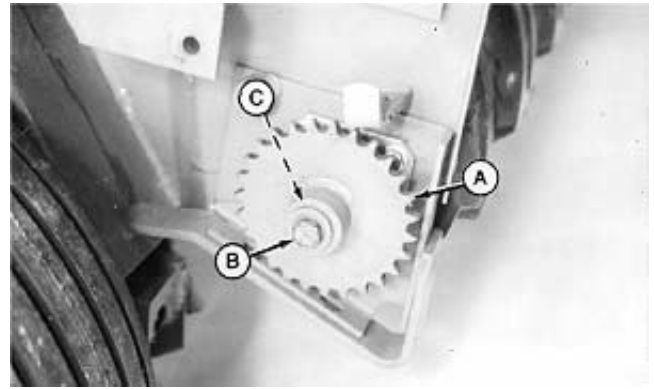
-UN-31MAR93
E37112

EX,1474,4025,S -19-26APR93

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NOTE: Do not reuse Nylock cap screws (B).

8. Install sprocket (A) and replacement cap screw (B) on lower conditioner roll. Tighten to 250 N·m (185 lb-ft), then strike hub with hammer to seat on tapered shaft splines (C). Tighten to 250 N·m (185 lb-ft).



(934001—) Shown

EX,1474,4025,T -19-26APR93

E37113 -UN-31MAR93

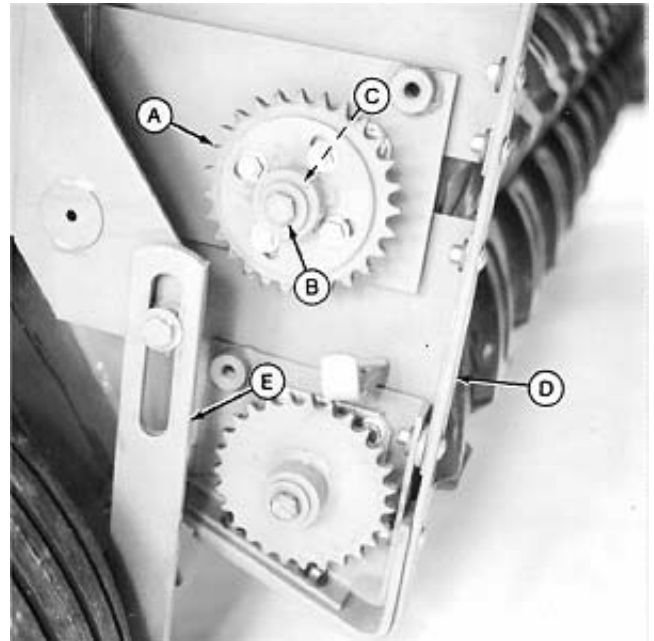
NOTE: Do not reuse Nylock cap screws (B).

9. Install sprocket (A) and replacement cap screw (B) on upper conditioner roll. Tighten to 250 N·m (185 lb-ft), then strike hub with hammer to seat on tapered shaft splines (C). Tighten to 250 N·m (185 lb-ft).

10. Install reinforcement strap (D).

11. Install roll opening strap (E).

- A—Sprocket
- B—Nylock Cap Screw
- C—Tapered Shaft Spline
- D—Reinforcement Strap
- E—Roll Opening Shaft



(934001—) Shown

EX,1474,4025,TA-19-26APR93

E37114 -UN-31MAR93

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NOTE: Reinforcement strap removed for demonstration purposes.

12. Move conditioner rolls to align driven sprockets (A) with two drive chain idler sprockets (B) within plus or minus 3 mm (0.1 in.) (C) of centerline.

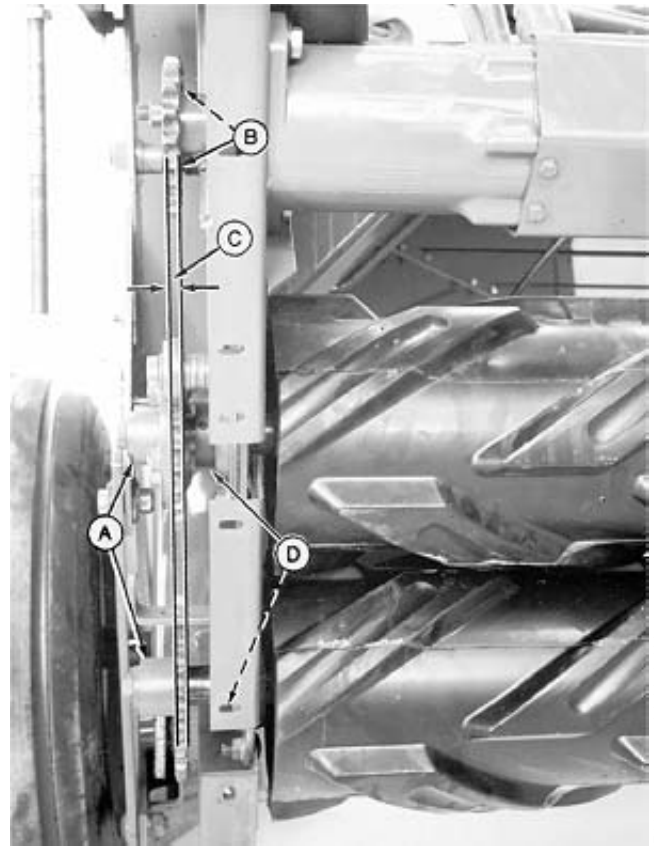
13. Tighten locking collars (D) on each end of shaft. (See Tighten Bearing Locking Collar in this section.)

14. Install conditioner drive chain. (See Replace Conditioner Roll Drive Chain in this section.)

15. Adjust roll spacing. (See Adjust Roll Spacing or Adjust Roll Tension in this section.)

16. Time rolls. (See Adjust Roll Timing in this section.)

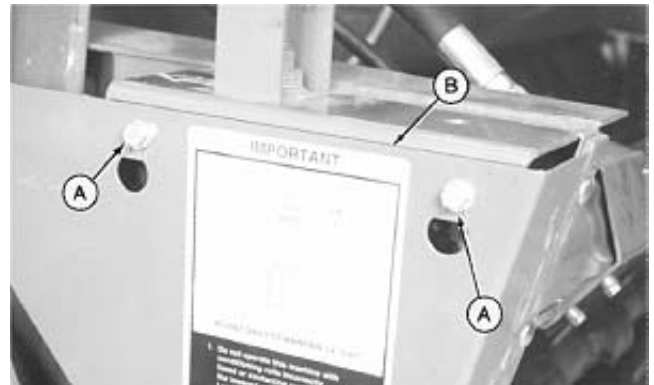
- A—Driven Sprockets
- B—Idler Sprockets
- C—3 mm (0.1 in.) of Centerline
- D—Locking Collars



EX,1474,4025,U -19-26APR93

-UN-09JAN90
E33905

13. Install shield (B) and tighten cap screws (A).



EX,1474,4025,V -19-26APR93

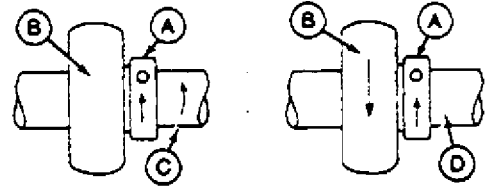
-UN-17MAR93
E37104

TIGHTEN BEARING LOCKING COLLAR

IMPORTANT: Overtightening of the locking collar may fail the bearing inner race.

1. Tighten all locking collars (A) on running shafts (C) in the direction of shaft rotation.
2. Tighten all locking collars on stationary shafts (D) in the opposite direction from that of bearing (B) rotation.

A—Locking Collar
B—Bearing
C—Running Shaft
D—Stationary Shaft



EX,1474,4025,W -19-26APR93

E12580 -UN-03/OCT88

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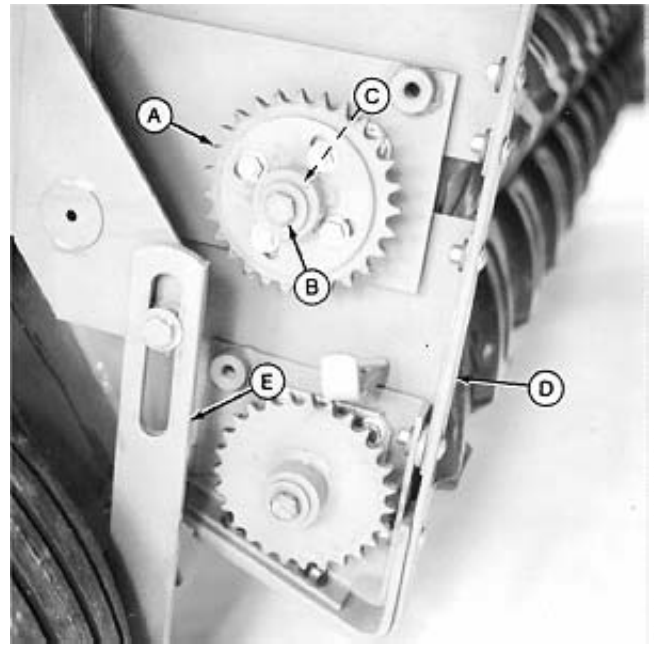
ADJUST ROLL SPACING

IMPORTANT: Roll stops control upper roll clearance with lower roll. Rolls should never be adjusted to allow contact during use or serious damage to machine may occur.

1. Attach mower-conditioner to tractor.
2. Place tongue in field operating position and lower machine to the ground.
3. Engage PTO tractor throttle at slowest engine speed.

CAUTION: To avoid bodily injury while performing this adjustment:

- Keep all shields in place.
- Keep hands and clothing away from moving parts.
- Carefully follow procedure.



4. Stand behind machine and loosen jam nuts (A). Turn adjusting bolt (B) counterclockwise a quarter of a turn.
5. Continue turning bolt (B) counterclockwise a quarter turn until roll contact causes vibration and a rumbling noise.
6. Turn adjusting bolt (B) clockwise a quarter turn
7. Continue turning bolt (B) clockwise a quarter turn until the noise stops.
8. Turn an additional 3/4 turn clockwise for minimum roll clearance.

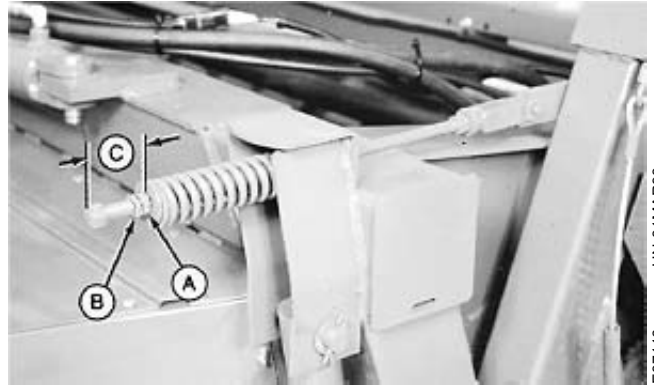
IMPORTANT: Failure to tighten jam nut may allow rolls to contact causing machine damage.

9. Tighten jam nut (A).
10. Repeat procedure on opposite side.

EX,1474,4025,X -19-26APR93

ADJUST CONDITIONER ROLL PRESSURE

- Loosen jam nut (B).
- Decrease roll pressure by turning jam nut (A) clockwise to increase spring pressure.
- Increase roll pressure by turning jam nut (A) counterclockwise to release spring pressure.
- Tighten jam nut (B) against jam nut (A) to hold setting.
- Initial dimensions (C) are as follows;



Machine (C) ± 5 mm (3/16 in.)

12 Foot 55 mm (2-5/16 in.)

14 Foot 65 mm (2-9/16 in.)

16 Foot 75 mm (2-15/16 in.)

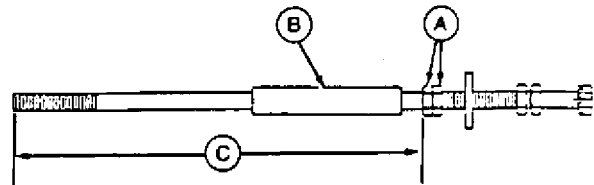
EX,1474,4025,Z -19-26APR93

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IMPORTANT: If bolt assembly is removed and lock nuts (A) and spacer (B) are removed from adjusting bolt..

- Apply John Deere Primer TY6305 to threads on adjusting bolt and lock nuts.
- Apply John Deere Retaining Compound T43515 to lock nuts (A) when assembling.



NOTE: Distance (C) from end of bolt to lock nut is 445 mm (17.5-in.).

EX,1474,4025,AA-19-26APR93

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E33955

ADJUST ROLL TIMING

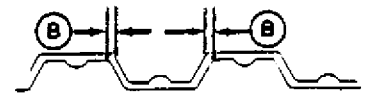
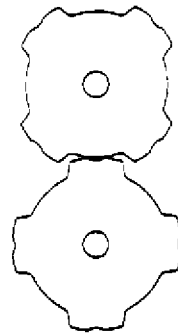
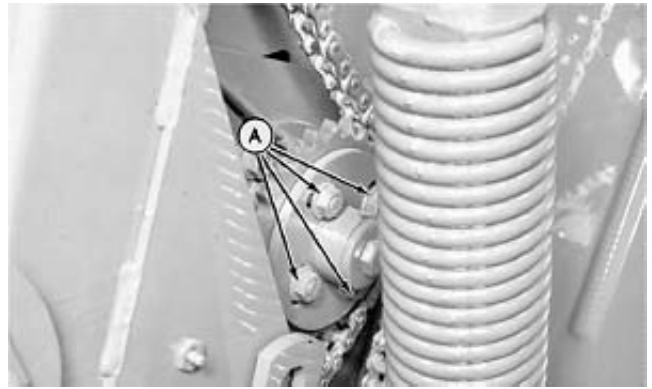
IMPORTANT: Check roll spacing, sprocket alignment and chain tension before attempting to time rolls.

1. Lower machine to the ground.
2. Loosen nuts (A) on roll timing plates.
3. Turn roll until roll cleats are centered. Cleats are centered when there is equal space (B) between cleats.

NOTE: Timing marks on roll sprockets are used to check timing during set up and predelivery. They do not need to be realigned if sprockets are removed.

4. Tighten nuts (A).
5. Check to see that roll cleats are still centered. If not, readjust.

NOTE: If rolls will not time properly, index chain on the timing sprocket.



Section 50 Carrier Frame

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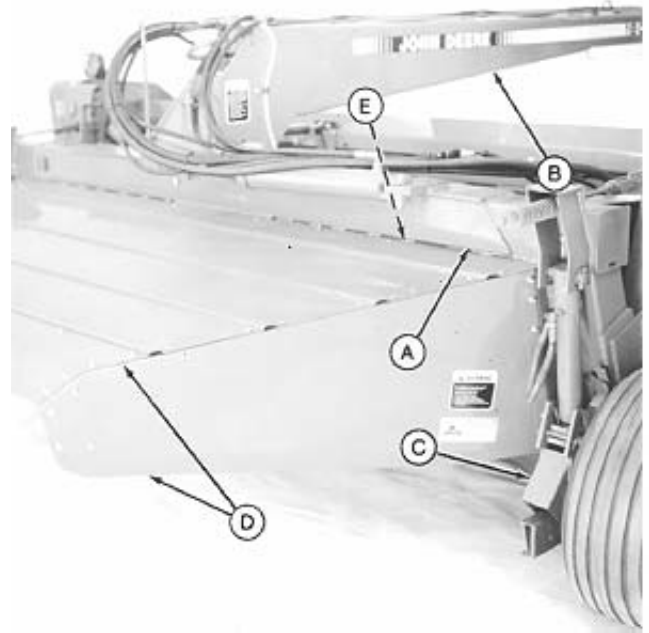
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CARRIER FRAME DESCRIPTION

The platform and conditioner rolls are mounted on the carrier frame (A). The frame pivots on the tongue (B), and wheel supports (C) pivot to raise the frame.

Windrow forming shields (D) and an adjustable swath flap (E) control the size of the windrow.

- A—Carrier Frame
- B—Tongue
- C—Wheel Support
- D—Forming Shields
- E—Swath Flap



E37118 -UN-31MAR93

EX,1474,5005,A -19-26APR93

SPECIFICATIONS

ITEM	MEASUREMENT	SPECIFICATION
Carrier Cross Shaft	Endplay	Maximum 1.5 mm (0.06 in.)
Tongue Pivot Bushing	Position	Flush to 0.8 mm (0.03 in.) into bore
Swing Cylinder Bushing	Position	Flush to 0.8 mm (0.03 in.) into bore
Wheel Support Bushing	Position	2 mm (0.078 in.) into bore

EX,1474,5005,B -19-26APR93

TORQUE VALUES

LOCATION	N·m	(lb-ft)
Carrier Frame Spindle	353	260
Wheel Bearing Nut	1.7	15
Wheel Bolts—12 FT. Machines	115	85
Wheel Bolts—14 and 16 FT.Machines	130	95

EX,1474,5005,C -19-26APR93

SPECIAL TOOLS

D01045AA — Driver set used to install bushings in tongue and wheel support.

EX,1474,5005,D -19-26APR93

DIAGNOSING MALFUNCTIONS

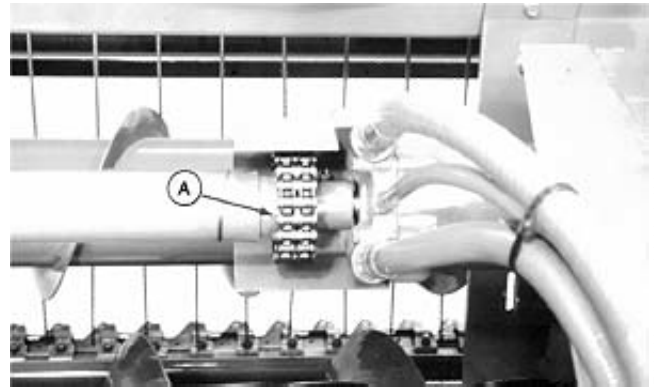
Symptom	Problem	Solution
Poorly formed windrows	Extremely light crop.	Decrease windrow width. (See Adjust Windrow Width in this section).
	Ground speed too slow.	Increase ground speed.
	Windrow forming shields catching material.	Check bolt direction on forming shields. Put bolt heads to the inside if material is catching.
Windrow bunching and formation uneven	Crop is gathering on guards.	Check knife and guard wear. Replace worn out knife section and guards. (See Install Regular or Non-Clog Guards in Section 20.) Add additional reel bat(s). Move reel down and back so crop is carried over guards and into augers. (See Adjust Reel in Section 30.)
	Reel not feeding properly in heavy crops.	Adjust reel speed. (See Adjust Reel Speed in Section 30.)
		Adjust reel position. (See Adjust Reel in Section 30.)
		Add additional reel bat(s).
	Worn cutterbar components.	Replace. (See Install Regular or Non-Clog Guards in Section 20.)
	Too much gap between auger and stripper.	Adjust stripper to maintain 2 to 4 mm (0.1—0.2 in.) clearance between stripper and auger. (See Adjust Upper and Lower Auger Stripper, and see Adjust Center Auger Stripper in Section 30.)
	Reel too high.	Lower reel until it barely clears the cutterbar and deck. (See Adjust Reel in Section 30.)
	Incorrect reel release.	Adjust reel cam. (See Adjust Cam in Section 30.)
	Too much gap between conditioner rolls.	Adjust roll gap. (See Adjust Roll Spacing in Section 40.)

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REPLACE CONDITIONER CROSS SHAFT

1. Disconnect powershaft. (See Remove Powershaft in Section 30.)
2. Remove coupler chain (A).



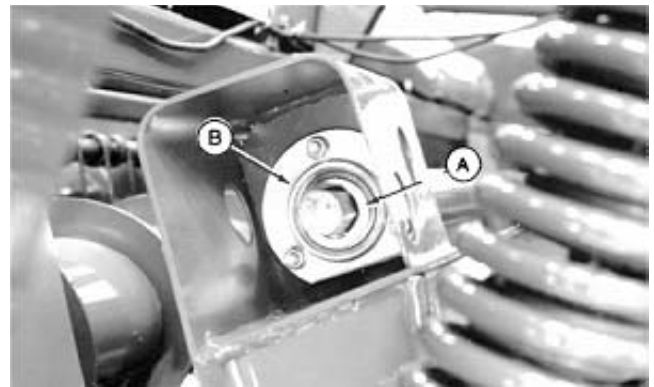
EX,1474,5015,A -19-26APR93

-UN-03JAN90
E33868

3. Remove washers (A).

NOTE: Count washers (A) because they will be used for adjustment during assembly.

4. Remove cross shaft from bearing by pulling toward right side.
5. Remove flangettes (B), and bearing.
6. Check bearing for roughness.



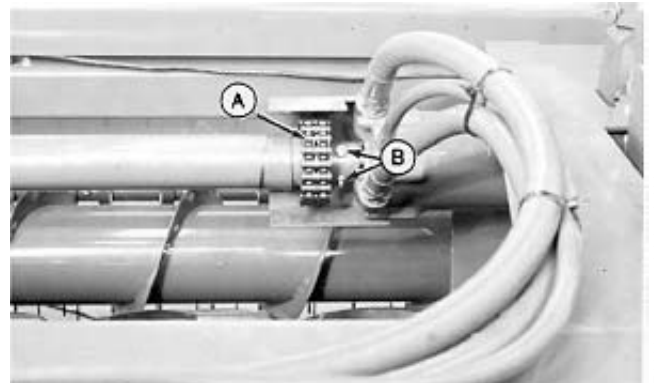
EX,1474,5015,B -19-26APR93

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E33862

7. Install cross shaft in reverse order of removal.
8. Install same number of washers which were removed from left end of shaft.
9. Install powershaft and adjust endplay, by adding or removing washers. (See Install Powershaft in Section 30.)

NOTE: Powershaft must be installed before coupler chain to position shaft correctly.

10. Install coupler chain (A) around sprockets and install connector link.
11. Loosen set screws (B) and slide cross shaft as far as possible on to motor shaft. Tighten set screws.

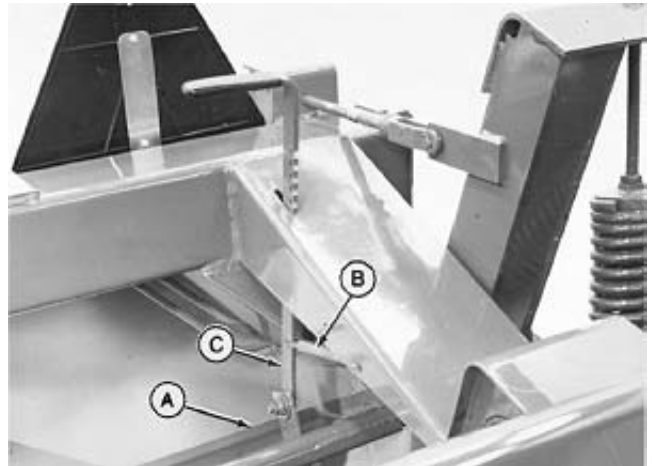


EX,1474,5015,C -19-26APR93

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E33937

REPLACE SWATH FLAP

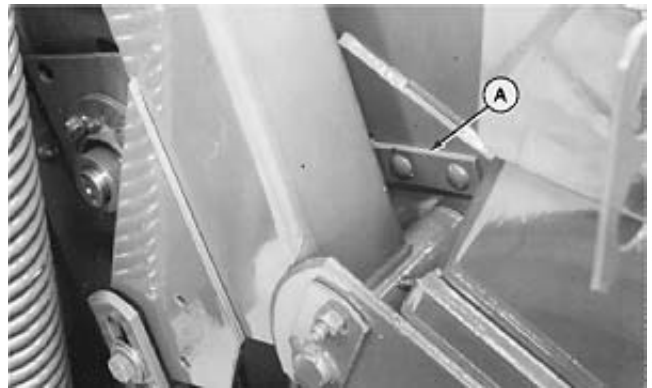
1. Raise flap (A) and disconnect spring (B).
2. Lower flap and disconnect adjuster lever (C).



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E33927

EX,1474,5015,D -19-26APR93

3. Remove two carriage bolts and retainer angle (A).
4. Install in reverse order.



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E33923

EX,1474,5015,E -19-26APR93

ADJUST WINDROW WIDTH

Adjust lever (A) to change windrow width.

To make wider windrows, adjust lever (A) down; to make narrow windrows adjust lever up.



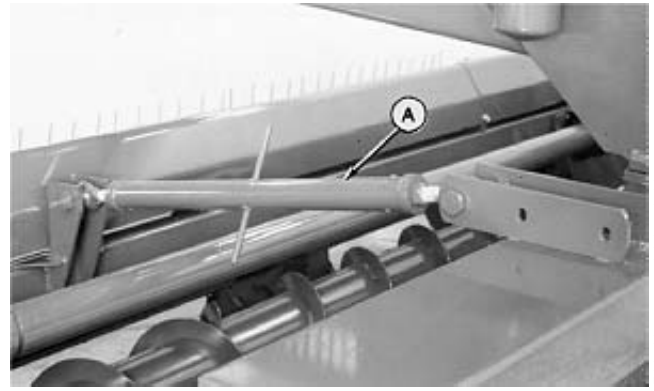
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EX,1474,5015,F -19-26APR93

REMOVE TONGUE

NOTE: Draining the hydraulic drive system is not necessary when removing tongue.

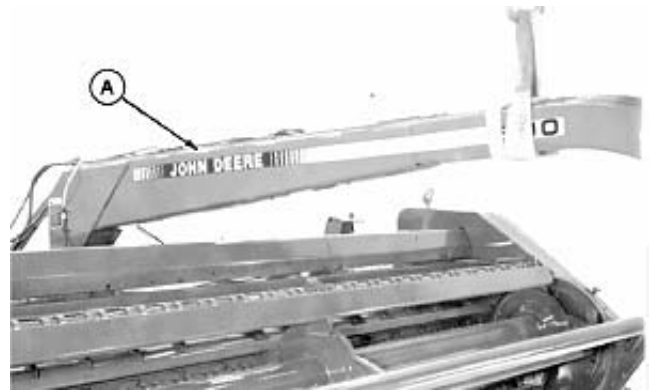
1. Park machine on level area with tongue straight forward, and lower platform.
2. Adjust upper link (A) so pivot spindle is vertical.
3. Disconnect electrical harnesses from tongue. Remove hydraulic hose tie bands.



-UN-24JUL89
E33402

EX,1474,5020,A -19-26APR93

4. Support tongue (A) with hoist.

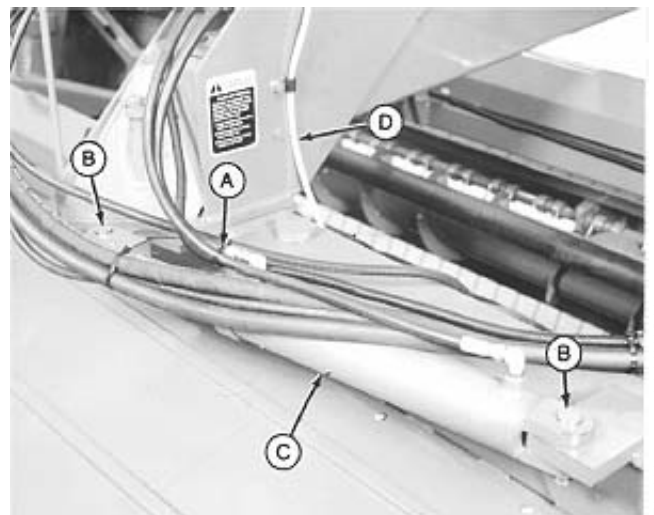


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E33677

EX,1474,5020,B -19-26APR93

5. Remove hose tie band (A) and pins (B) from swing cylinder (C). Wire cylinder to left side of tongue.
6. Disconnect lift cylinder hose at connection under right side of carrier frame and plug open lines.
7. Remove vent tube (D) from clamps under frame and remove clamps from right side of tongue.

- A—Tie Band
- B—Pin
- C—Swing Cylinder
- D—Vent Tube



-UN-31MAR93
E37120

EX,1474,5020,C -19-26APR93

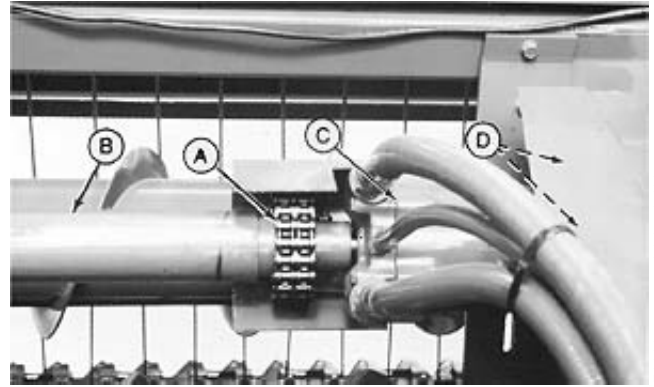
Tongue/Remove Tongue

8. Remove coupler chain (A) and disconnect cross shaft (B) from motor (C).

9. Disengage conditioner roll drive chain from motor sprocket. It is not necessary to remove chain from machine. (See Remove Conditioner Roll Drive Chain in Section 40.)

10. Remove two cap screws (D) and remove motor from carrier frame. Bolt motor to side of tongue using top vent hose clamp location.

A—Coupler Chain
B—Cross Shaft
C—Motor
D—Cap Screws



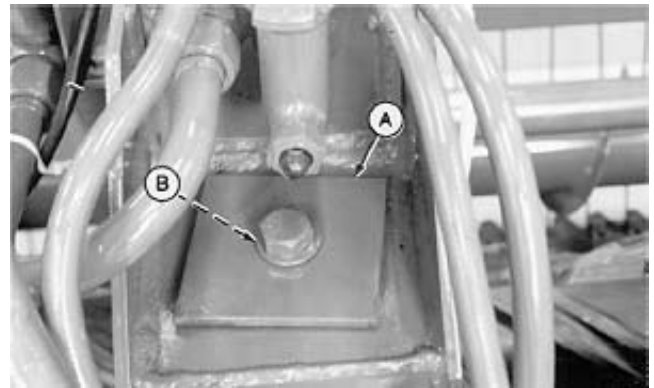
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E33925

EX,1474,5020,D -19-26APR93

11. Remove cap screw, hold-down (A), and five flat washers (B) from spindle.

CAUTION: Use two technicians when removing tongue to keep it balanced and to prevent injury.

12. Lift tongue from carrier frame.



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E33924

EX,1474,5020,E -19-26APR93

Tongue/Install Tongue

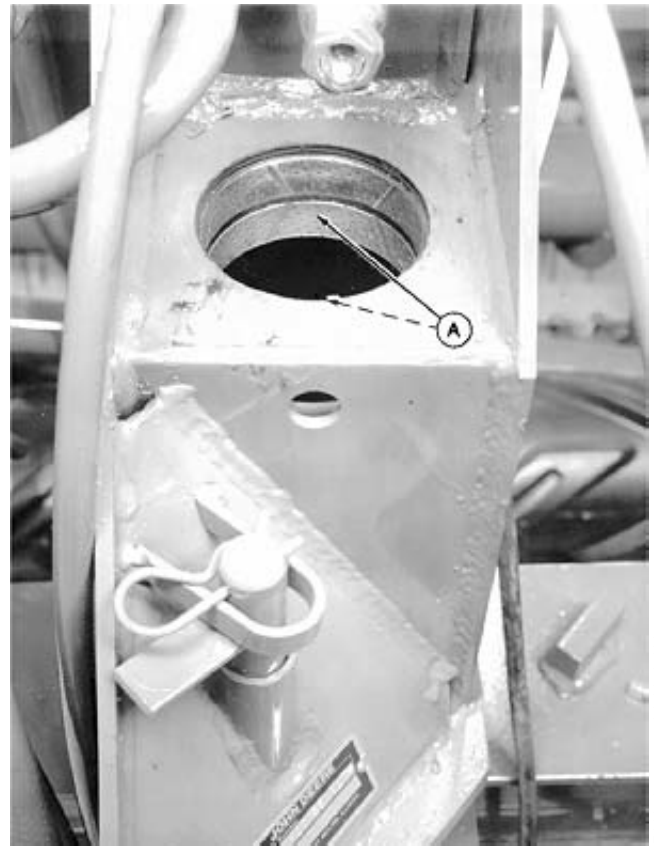
1. Check pivot bushings (A) for excessive wear or damage. Remove if necessary.
2. Drive replacement bushings into bore using 4 in. and 4-3/16 in. driver disks. Press both bushings flush to 0.8 mm (0.03 in.) into inner support of bore.
3. Check swing cylinder bushing and replace if necessary. Press bushing flush to 0.8 mm (0.03 in.) into bore.

4. Install tongue in reverse order of removal using the following instructions.

3. Grease spindle and bushing before installing tongue.

IMPORTANT: Five washers must be placed between pivot spindle and hold-down to prevent binding of hold-down with tongue.

4. Tighten hold-down cap screw to 353 N·m (260 lb-ft).



EX,1474,5020,F -19-26APR93

E33876 -UN-03JAN90

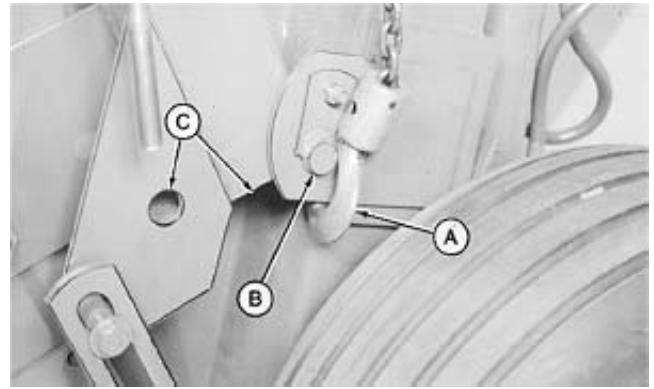
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LIFT AND SUPPORT CARRIER FRAME

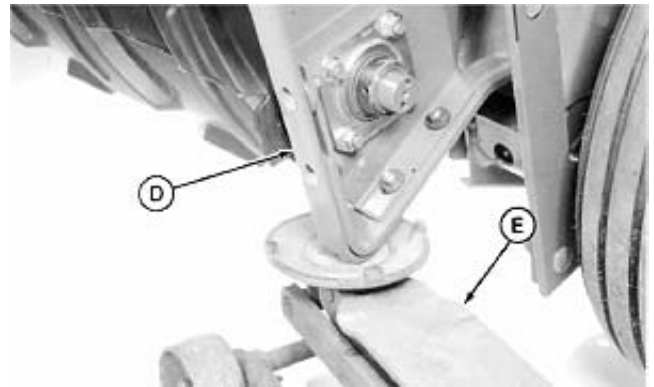
CAUTION: To prevent the carrier frame from becoming unstable, insure the jack stand on the tongue is functioning and steady. Lift only one side of the carrier frame at a time.

IMPORTANT: Do not lift carrier frame using the conditioner roll arm (C).

- If using an **overhead hoist** to lift the carrier frame, position hook (A) between pin (B) and carrier frame as shown.
- If using a **hydraulic floor jack** to lift the carrier frame, position hydraulic floor jack (E) under carrier frame (D) as shown.



Overhead Hoist

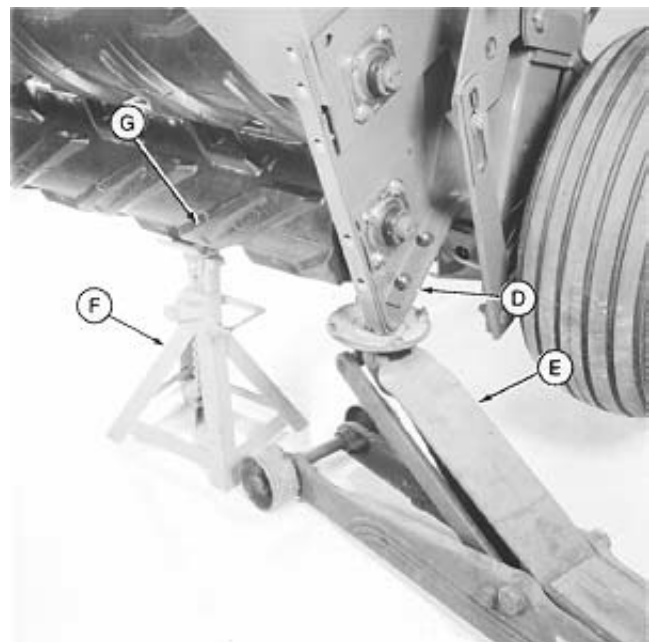


Hydraulic Floor Jack

1. Lift carrier frame (D).

CAUTION: Position jack stand (F) directly under the center of the lower conditioner roll (G), as the conditioner roll may rotate.

2. Position jack stand (F) under the lower conditioner roll (G) as close to the end of the roll as possible.
3. Lower carrier frame onto jack stand.

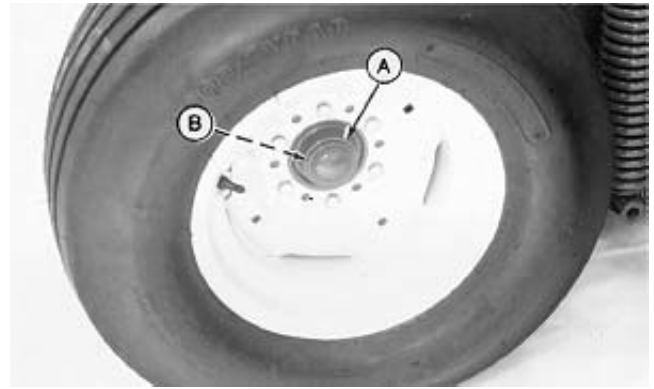


Hydraulic Floor Jack Shown

- A—Hook
- B—Pin
- C—Conditioner Roll Arm
- D—Carrier Frame
- E—Floor Jack
- F—Jack Stand
- G—Lower Conditioner Roll

RECONDITION WHEEL HUB

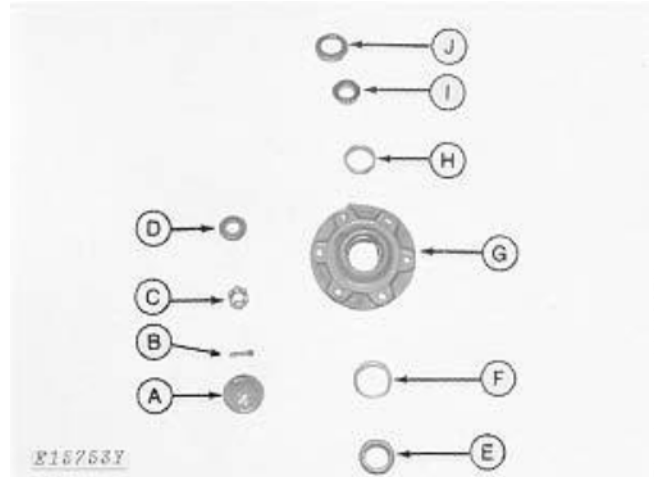
1. Raise carrier frame. (See 'LIFT AND SUPPORT CARRIER FRAME' in this section and group.)
2. Remove wheel and hub cap (A).
3. Remove cotter pin, adjusting nut (B), and retaining washer.
4. Remove wheel hub with two bearings.



E33433 -UN-24JUL89

EX,1474,5025,A -19-26APR93

5. Inspect bearings (E, I) for roughness or damage. Check seal (J) and bearing cups (F, H) for nicks or damage. Replace damaged parts.
6. If removed, press bearing cups into hub against shoulders. Press seal flush into hub.
7. Pack bearings with wheel bearing grease and install on shaft with hub.
8. Tighten adjusting nut to 1.7 N·m (15 lb-in). Back off to first castellation and install cotter pin.
9. Install wheel and torque bolts to 115 N·m (85 lb-ft).
10. Check that wheel spins freely and install hub cap.
11. Lower machine to ground.



E15753 -UN-03OCT88

- A—Hub Cap
- B—Cotter Pin
- C—Slotted Nut
- D—Retaining Washer
- E—Bearing Cones
- F—Bearing Cup
- G—Hub
- H—Bearing Cup
- I—Bearing Cone
- J—Seal

EX,1474,5025,B -19-26APR93

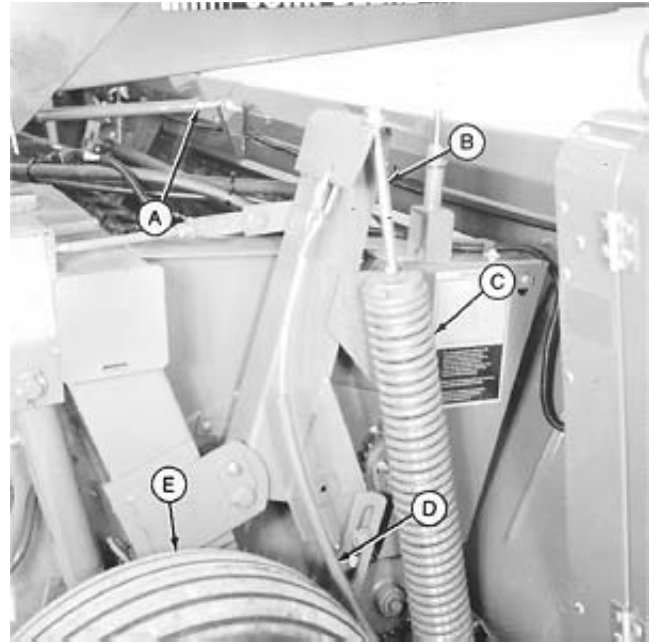
RECONDITION WHEEL SUPPORT

1. Move machine to level area.
2. Lower platform to ground.
3. Disconnect powershaft U-joint from power shaft on carrier frame. (See Remove Powershaft in Section 30.)

IMPORTANT: Pivot platform forward before removing wheel supports to prevent roll damage from contact with platform.

IMPORTANT: Support platform when removing upper link. Supporting platform at center of the knockdown bar can bend bar.

4. Support platform at both ends of the knockdown bar.
5. Loosen jam nut and float spring adjustment bolt (B). Remove float spring (C).
6. Disconnect front of upper link (A) and pivot front of platform to ground.
7. Remove downstop cable (D).
8. Raise carrier frame. (See 'LIFT AND SUPPORT CARRIER FRAME' in this section and group.)
9. Remove wheel (E)



A—Upper Link
B—Bolt
C—Float Spring
D—Downstop Cable

E37121 -UN-31MAR93

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EX,1474,5025,C -19-26APR93

CAUTION: Wheel support is heavy and weighted to side with the wheel spindle. Floor jack (A) will help support the lower lift link (B) and wheel support (C) during removal.

10. Position floor jack (A) under lower lift link (B) and wheel support (C), as shown.

11. Raise floor jack until there is light pressure on the lower lift link.

12. Remove cotter pin, pin (D), and spacer.

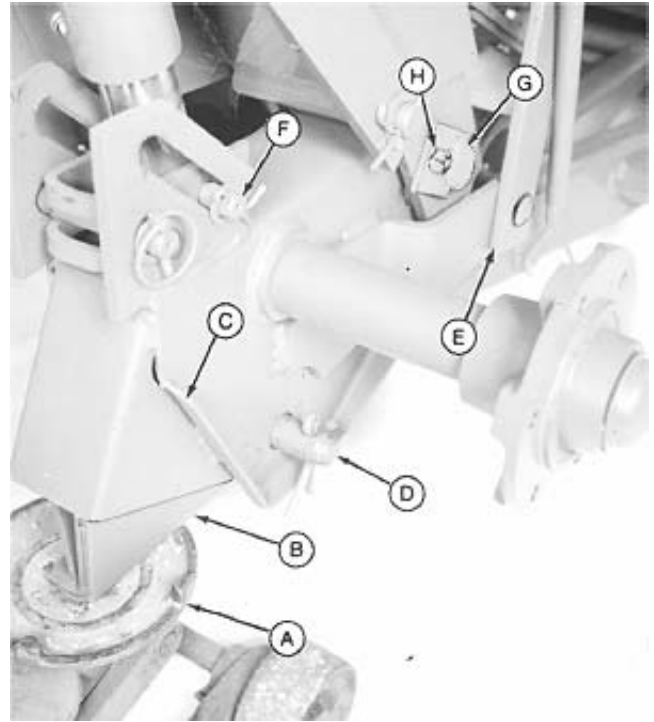
13. Disconnect lower end of roll opening strap (E).

14. Remove pin (F) to disconnect cylinder rod.

15. Remove lock nut (H) and pivot pin (G). Remove wheel support (C).

16. To install wheel support, reverse steps 1 through 15 with the following added note:

- Tighten lock nut (H) then back off one (1) complete turn.



- A—Floor Jack
- B—Lower Lift Link
- C—Wheel Support
- D—Pin
- E—Strap
- F—Pin
- G—Pivot Pin
- H—Lock nut

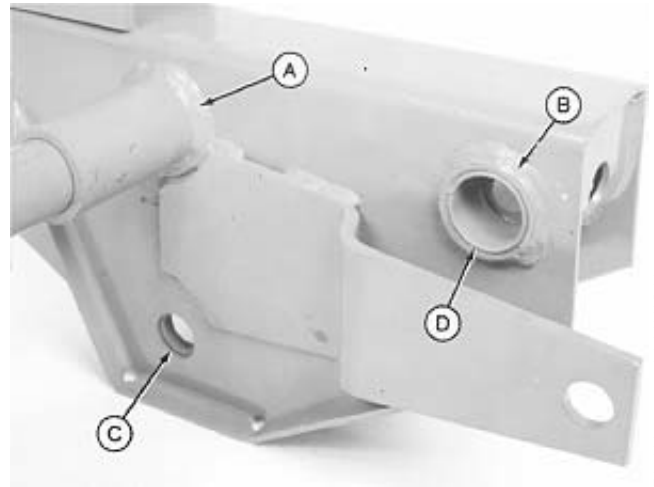
E37122 -UN-31MAR93

EX,1474,5025,E -19-26APR93

INSPECT WHEEL SUPPORT AND REPLACE BUSHINGS

IMPORTANT: Replace the wheel support, if cracks are found in the weld areas, the pivot hole is damaged, or the wheel support shows wear due to bushing failure.

1. Inspect wheel support for damage. Check lower link pivot holes (C) for excessive wear.
2. Check welds (A) and (B), on both sides of wheel support, for cracks.
3. Remove and discard worn or scored bushings (D). Inspect wheel support for wear due to bushing failure.



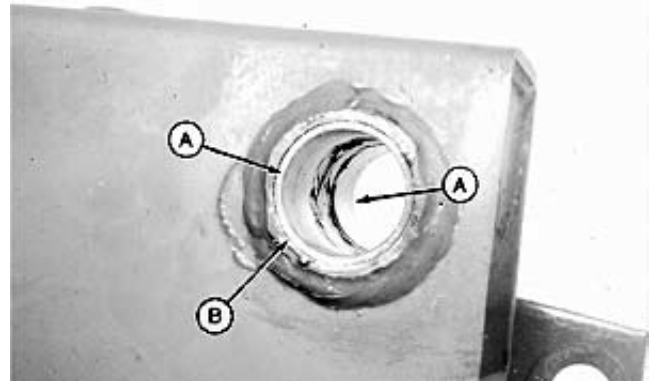
A—Weld
B—Weld
C—Pivot Hole
D—Bushing

E37123 -UN-31MAR93

EX,1474,5025,F -19-26APR93

NOTE: Install bushings (A) from both sides. Edge of bushing must be flush with wheel support (B).

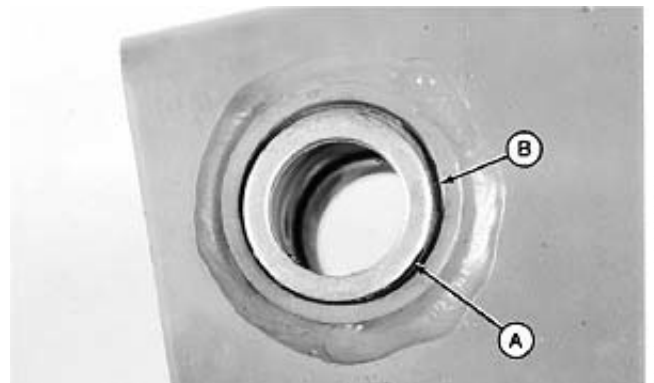
4. Install new bushings, using a 1—5/8 in. bearing driver.



E37124 -UN-31MAR93

NOTE: Recess both bushings. Edge of washer (A) must be flush with wheel support (B).

5. Position 1—7/16 x 1—7/8 x 5/64 in. washer (A) over bushing.
6. Recess bushing into wheel support, using 1—1/4 in. ID bearing driver.

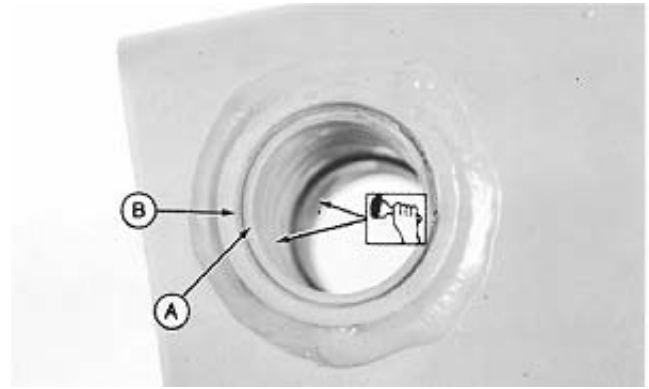


E37125 -UN-31MAR93

Wheel Hub and Support/Inspect Wheel Support and Replace Bushings

7. Insure bushing (A) is 2 mm (5/64 in.) below edge (B) of wheel support.

8. Apply a liberal coating of SAE Multipurpose EP grease to the bushing surfaces.



E37126 -UN-31MAR93

EX,1474,5025,I -19-26APR93

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INSTALL WARNING LIGHTS

1. Move nut (A) to the end of the threads on light assembly (B).
2. Install light assembly in slot (C) on guard (D). Do not tighten nut (A) at this time.

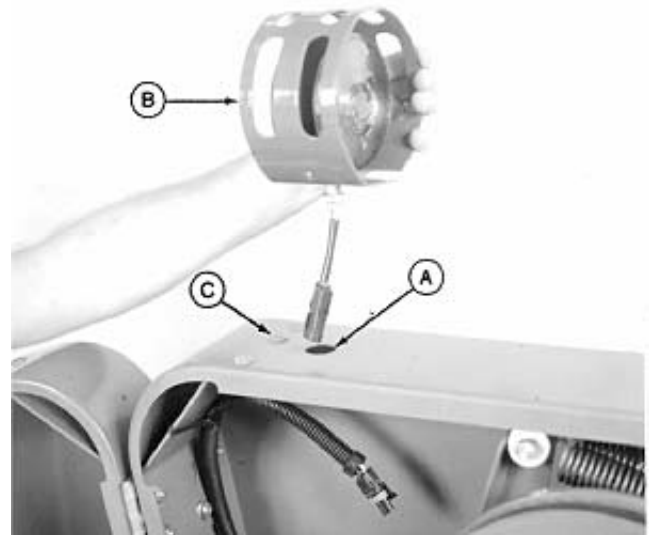
A—Nut
B—Light assembly
C—Slot
D—Guard
E—Clip



EX,1474,5030,AA-19-26APR93

E35970 -UN-21JUN91

3. Install connector, lead, and nut through hole (A).
4. Make sure guard (B) is not resting on round head bolt (C).



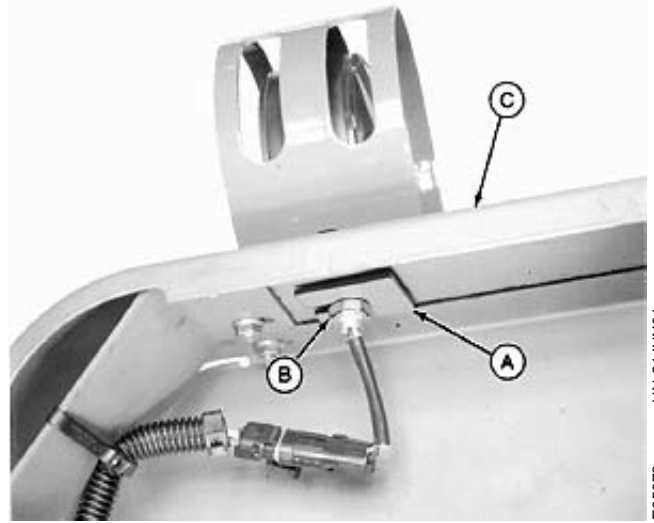
EX,1474,5030,AB-19-26APR93

E35971 -UN-21JUN91

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**IMPORTANT: Install clip with crimp next to nut.
Failure to do so will cause the light
assembly to loosen and fall off.**

- 5. Install clip (A) between nut (B) and panel (C). Tighten nut (B).
- 6. Connect light assembly to wiring harness.



E36972 -UN-21JUN91

EX,1474,5030,AC-19-26APR93

SPECIAL OR ESSENTIAL TOOLS

NOTE: Order tools according to information given in the U.S. SERVICE-GARD™ Catalog or in the European Microfiche Tool Catalog (MTC).

DX,TOOLS -19-05JUN91

Extraction Tool JDG364

JDG364 -UN-16JAN92

Remove contacts from Weather Pack electrical connectors.

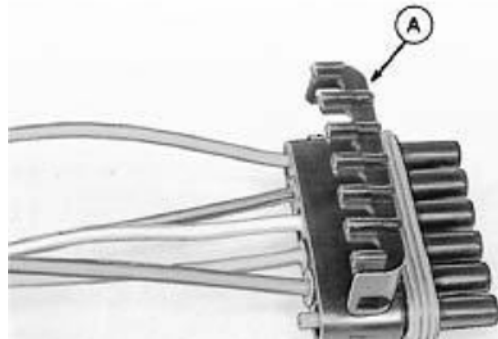


EX,1474,JDG364 -19-26APR93

REPLACE WEATHER PACK™ CONNECTOR

**IMPORTANT: Identify wire color locations with
connector terminal letters.**

- 1. Open connector body (A).

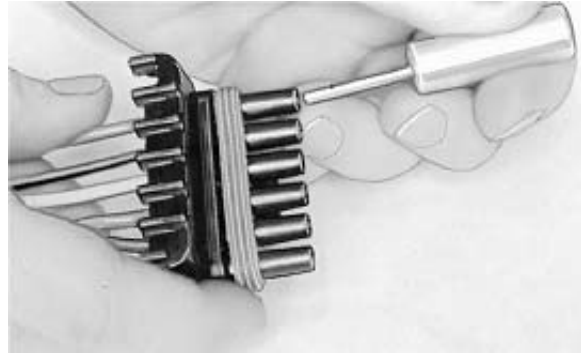


TS0127 -UN-23AUG88

WEATHER PACK is a trademark of PACKARD ELECTRIC

EX,1474,5030,AD-19-26APR93

2. Insert JDG364 Extraction Tool over terminal contact in connector body.



TS0128 -UN-23AUG88

DX,ECONN,P -19-04JUN90

3. Hold extractor tool fully seated and pull wire from connector body.

NOTE: If terminal cannot be removed, insert wire or nail through extractor tool handle and push terminal contact from connector.



TS0129 -UN-23AUG88

DX,ECONN,Q -19-04JUN90

IMPORTANT: Carefully spread contact lances to assure good seating on connector body.

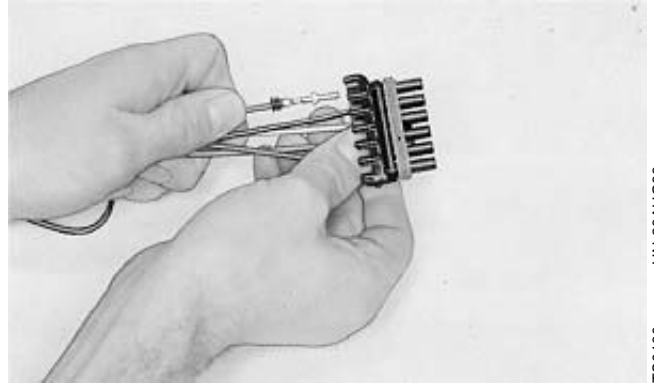
NOTE: Connector bodies are "keyed" for proper contact mating. Be sure contacts are in proper alignment.

4. Push contact into new connector body until fully seated.

5. Pull on wire slightly to be certain contact is locked in place.

6. Transfer remaining wires to correct terminal in new connector.

7. Close connector body.



TS0130 -UN-23AUG88

DX,ECONN,R -19-04JUN90

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INSTALL WEATHER PACK CONTACT

NOTE: Cable seals are color coded for three sizes of wire:

- Green - 18 to 20 gauge wire
- Gray - 14 to 16 gauge wire
- Blue - 10 to 12 gauge wire

1. Slip correct size cable seal on wire.
2. Strip insulation from wire to expose 6 mm (1/4 in.) and align cable seal with edge of insulation.



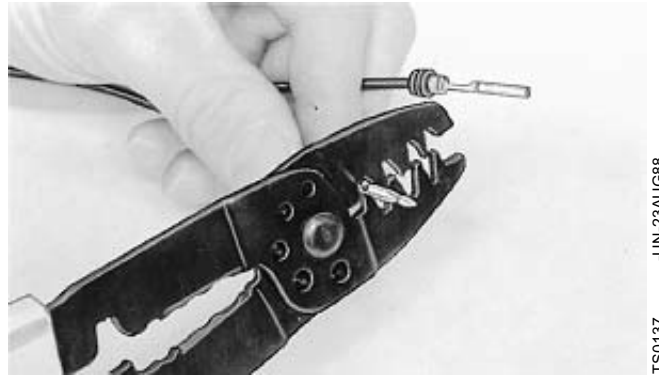
TS0136 -UN-23AUG88

EX,1474,5030,AE-19-26APR93

NOTE: Contacts have numbered identification for two sizes of wire:

- #15 - 14 to 16 gauge wire
- #19 - 18 to 20 gauge wire

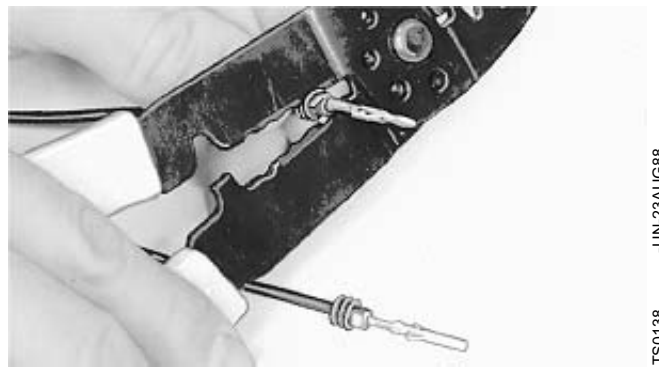
3. Place proper size contact on wire and crimp contact in place with a "W" type crimp.



TS0137 -UN-23AUG88

EX,1474,5030,AF-19-26APR93

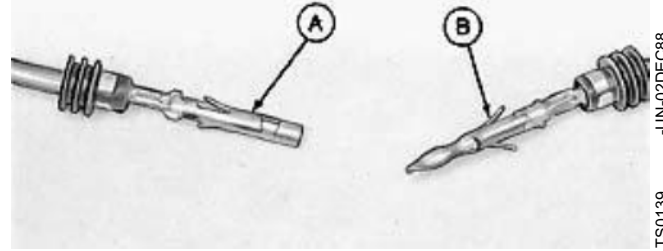
4. Position cable seal and contact as shown, and crimp.



TS0138 -UN-23AUG88

EX,1474,5030,AG-19-26APR93

IMPORTANT: Proper contact installation for “sleeve” (A) and “pin” (B) is shown.



-UN-02DEC88
TS0139

DX,ECONN,AD -19-04JUN90

ELECTRICAL GUARD ANGLE CONTROLLER

The electric guard angle controller is powered from the tractor convenience outlet. A three position switch in the control console directs power to the actuator to change the position of the platform.

1. Check tractor electrical system for a minimum 12 volts.
2. Remove control console from mounting plate to expose switch terminals.
3. Turn tractor key switch on and check for battery voltage between console switch terminals 1 and 4, and between 3 and 6. Check convenience outlet or harness to console if no voltage.
4. Disconnect console from convenience outlet and actuator harness. Check for continuity between terminals indicated below:

Control Switch in Neutral:

No continuity between any terminals

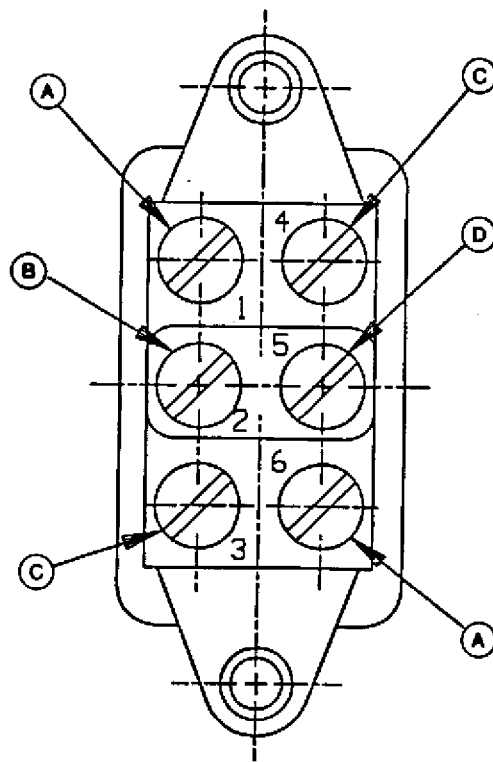
Control Switch in Retract Position
(Decrease Guard Angle):

- Continuity between 2 and 3
- Continuity between 5 and 6

Control Switch in Extend Position
(Increase Guard Angle):

- Continuity between 1 and 2
- Continuity between 4 and 5

Replace switch if incorrect continuity.



- A—Grey Wire
- B—Purple Wire
- C—Red Wire
- D—Tan Wire

-UN-04JAN90

E33954

EX,1474,5030,B -19-26APR93

5. Connect console to convenience outlet and actuator harness. Check for correct voltage at connector to actuator (A).

Control Switch in Neutral:

- Red Wire — No Voltage
- Green Wire — No Voltage

Control Switch in Retract Position
(Decrease Guard Angle):

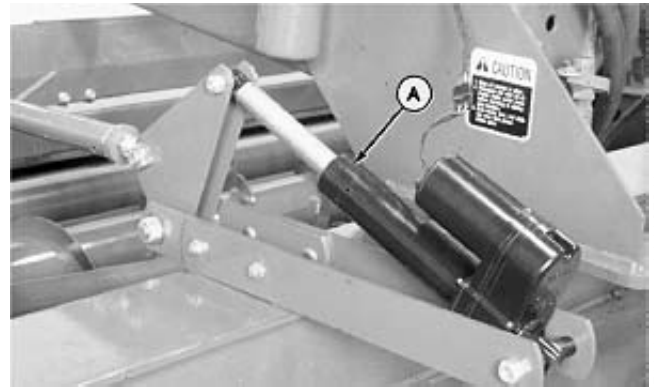
- Red Wire — No Voltage
- Green Wire — Battery Voltage

Control Switch in Extend Position
(Increase Guard Angle):

- Red Wire — Battery Voltage
- Green Wire — No Voltage

If voltage is incorrect, check connectors, switch, and harness. If voltage is correct, replace actuator.

6. Check current flow at connector to actuator if circuit breaker opens repeatedly. Maximum allowed current draw is 17 amps. Replace actuator if draw is excessive.



E33591 -UN-06SEP89

EX,1474,5030,C -19-26APR93

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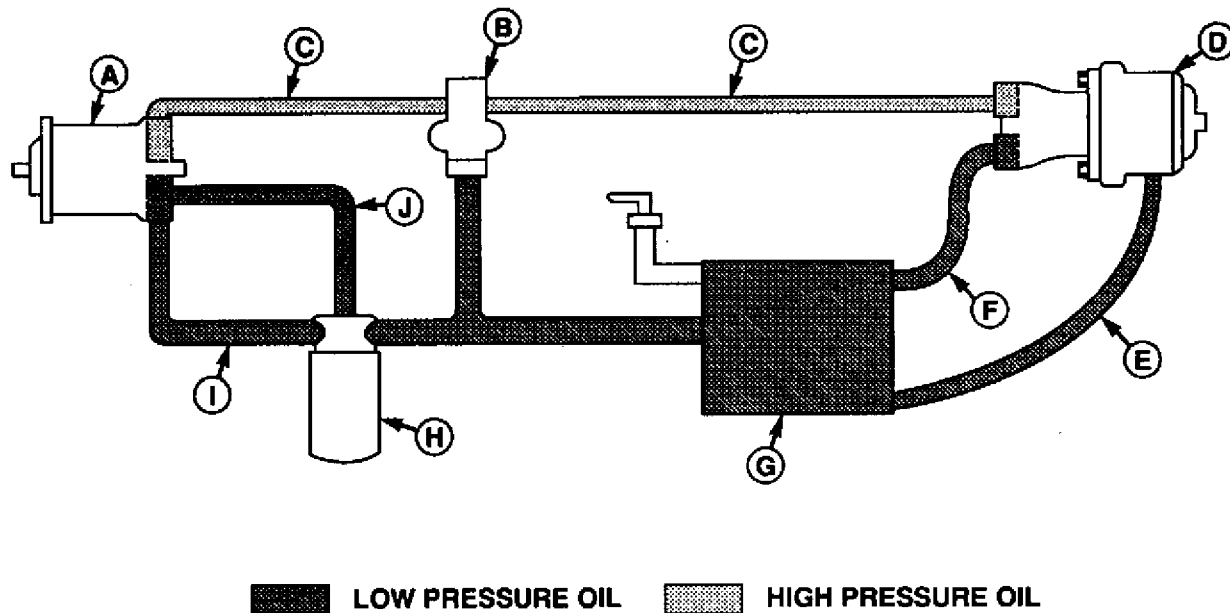
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Section 60 Hydraulics

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HYDRAULIC DRIVE



- | | | | |
|-----------------|--------------------------------|----------------|---------------------|
| A—Motor | D—Planetary Gear Case and Pump | F—Suction Line | I—Motor Return Line |
| B—Relief Valve | E—Pump Drain Line | G—Reservoir | J—Motor Drain Line |
| C—Pressure Line | | H—Filter | |

The reservoir (G) for the hydraulic drive system is the mower-conditioner tongue assembly.

IMPORTANT: The 540 and 1000 rpm planetaries and pump housings must not be interchanged.

Oil is drawn from the reservoir (G), through the suction line (F), by a PTO driven planetary and pump (D). The 540 rpm planetary has a four-to-one ratio which provides 2160 rpm at the pump. The 1000 rpm planetary has a three-to-one ratio giving 3000 rpm at the pump. Output is 81 L/min (21.5 gpm) at rated speed on both pumps. Normal leakage from the pump lubricates the planetary, and then returns to the reservoir through a drain line (E).

A pressure line (C) located along the tongue routes the oil to the relief valve (B) and then to the motor

(A). The relief valve opens at 27580 kPa (276 bar) (4000 psi) to protect the machine if the motor stalls due to an obstruction in the conditioner rolls or platform. The valve is not adjustable and is non-repairable. Oil going over relief is diverted to the reservoir.

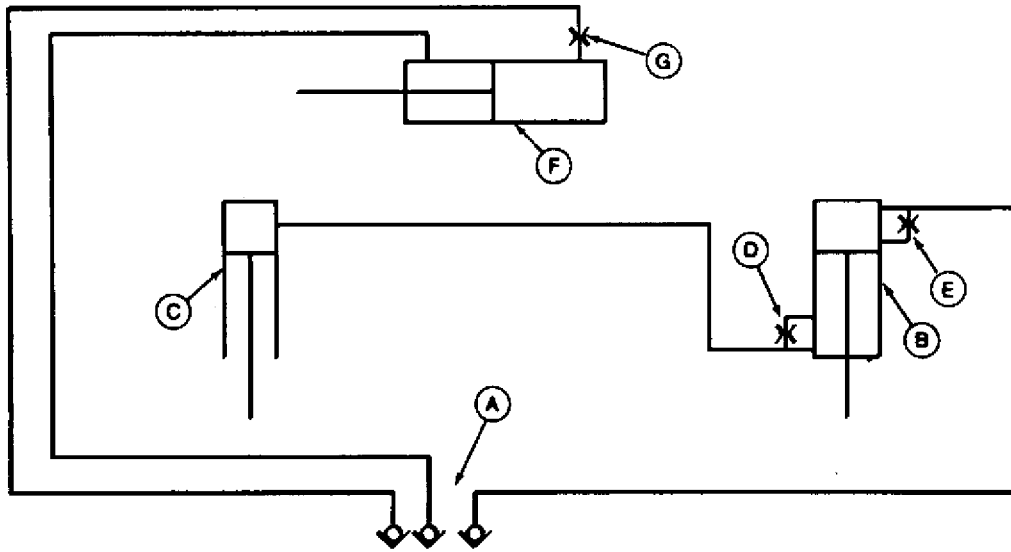
Normal oil flow is from the relief valve (B) to the motor (A), which rotates at 1176 rpm when the pump is running at rated speed. Leakage from the motor is routed to the filter base through a drain line (J).

Return oil from the motor (A) flows through the return line (I), a ten micron full flow filter (H), to the reservoir (G). If the filter becomes restricted, a bypass valve which operates on pressure differential allows oil to go around the filter.

E36765 -19-19MAR92

60-05-1

STEERING AND PLATFORM LIFT



A—Hose Couplers
B—Master Cylinder

C—Slave Cylinder
D—Rephasing Orifice

E—Rephasing Orifice
F—Steering Cylinder

G—Orifice

Carrier frame movement is controlled by tractor hydraulics.

Oil from a tractor hydraulic outlet (A) operates the single acting master cylinder (B) and slave cylinder (C) to raise the machine. A rephasing orifice (D) on the rod end of the master cylinder allows the slave cylinder to fully extend when the tractor operating lever is held in the extend position. The rephasing orifice (E) on the barrel end of the master cylinder

allows the slave cylinder to fully retract when the tractor lever is held in the retract position. These orifices keep the platform level during operation. Minimum pressure of 13740 kPa (138 bar) (2000 psi) is required to raise the platform.

A second tractor outlet is used to pivot the machine with a double acting steering cylinder (F). The orifice (G) in the barrel end of the cylinder restricts flow to limit extend and retract speeds.

EX,1474,6005,B -19-04MAY93

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SPECIFICATIONS

ITEM	MEASUREMENT	SPECIFICATION
Pump (540 rpm)	Displacement	45.4 cm ³ (2.77 cu in)
Pump (1000 rpm)	Displacement	32.9 cm ³ (2.01 cu in)
Pump (540 rpm)	Speed	2160 rpm
Pump (1000 rpm)	Speed	3000 rpm
Pump	Output	81 L/min (21.5 gpm) @ rated speed
Motor	Displacement	82.6 cm ³ (5.04 cu in)
Motor	Speed	1176 rpm
Hydraulic Drive	Relief Pressure	27579 kPa (276 bar) (4000 psi)
Normal Operating Temperature	Degrees	65—107° C (150—225° F)
Maximum Pump Leakage	Flow	19 L/min (5.0 gpm) @ rated speed 20684 kPa (207 bar) (3000 psi)
Maximum Motor Leakage	Flow	3.8 L/min (1.0 gpm) @ rated speed, no load, and 65°C (150°F)
Filter	Filtration	10 Micron Full Flow
Reservoir	Volume	12-Ft (3.66 m) - 95 L (25 gal) 14-Ft (4.27 m) - 95 L (25 gal) 16-Ft (4.88 m) - 102 L (27 gal)
Planetary Gear to Shaft	Radial Movement	Maximum 0.127 mm (0.0050 in.)
Planetary Gear	Inside Diameter	Maximum 0.19 mm (0.755 in.)
Motor Flange to Inside of Sprocket	Distance	62—65 mm (2.4—2.6 in.)

EX,1474,6005,C -19-04MAY93

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TORQUE VALUES

LOCATION	N·m	(lb-ft)
Pump Front Plate	22	16
Pump to Planetary	75—81	55—60
Motor Back Plate	22	16
Motor to Side Sheet	102	75

EX,1474,6005,D -19-04MAY93

General Information/Special Tools

- D01169AA — In-Line hydraulic tester with hoses.
- Used to check relief valve pressure, leakage at the pump, and oil temperature.



E36773 -UN-09MAR92

EX,1474,6005,E -19-04MAY93

- JT05470 — Pressure gauges and fittings.
- Used to check relief pressure.

EX,1474,6005,F -19-04MAY93

- JT05713 — Hydraulic pump parts tray.
- Used to identify pistons when disassembling hydraulic pump and motor.

EX,1474,6005,H -19-04MAY93

- D01045AA — Driver set.
- Used to install seals in pump and motor.

EX,1474,6005,I -19-04MAY93

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DIAGNOSING MALFUNCTIONS

Symptom	Problem	Solution
Conditioner rolls turning slow or stop.	Conditioner rolls plugging.	Slow ground speed Decrease roll pressure adjustment Check drive system adjustments
	Hydraulic failure	See TEST HYDRAULIC DRIVE SYSTEM in this Section, Group 15.
	Low relief valve pressure.	Replace relief valve cartridge and O-rings.
Motor turns while unloaded, but slows or stops when loaded	Excessive motor case drain rate.	Repair motor.
	Excessive pump case drain rate.	Repair pump.
	Hardware that mounts motor is loose.	Tighten hardware.
Hydraulic motor vibration	Worn chain coupler.	Replace.
	Bent cross shaft.	Straighten or replace.
	Low hydraulic fluid.	Check and add fluid as necessary.
Pump noise	Restricted suction line.	Check pump inlet and suction hose for kink or plug.
	Hydraulic fluid too thick in cold weather.	Check if correct hydraulic fluid. Run with no load until machine is warm.
	Pressure in hydraulic circuit approaching relief setting.	Slow ground speed.
	Crop is pulled into hay conditioner before it is cut off.	Install adjustable roll pressure kit. Decrease conditioner roll pressure.
Excessive power required in heavy, down crop	Low oil.	Fill reservoir. Check for leaks.
	Contaminated oil.	Drain and refill with clean oil.
	Dirty filter.	Replace.
	Oil too light.	Replace oil with proper viscosity oil.
	Relief valve malfunction.	Replace.

Continued on next page

Diagnosing Malfunctions

Symptom	Problem	Solution
	Tractor PTO running too fast.	Operate at rated PTO speed.
	Crop volume too high.	Operate at slower ground speed.
Foaming oil	Low oil.	Fill reservoir.
	Wrong kind of oil.	Replace with correct oil.
	Air leaking into suction line.	Tighten fitting.
Platform swings too fast (or too slow)	Incorrect tractor hydraulic flow control setting.	Adjust setting. See tractor Operator's Manual
Platform will not swing or raise.	Inadequate hydraulic pressure from tractor.	Check pressure. See tractor Operator's Manual.
	Hydraulic hoses not fully engaged.	Install hoses fully in tractor hydraulic outlet and open tractor hydraulic coupler valve (where applicable).
PTO splines damaged in pump.	Improper engagement to tractor PTO.	Properly install chain holding pump in position on tractor PTO shaft. See Operator's Manual.

EX,1474,6010,A -19-04MAY93

PRELIMINARY CHECKS

Many hydraulic system failures can be located by making preliminary checks of the mower-conditioner hydraulic system.

No special tools are required to make these preliminary checks, so repair obvious failures before making further tests.

1. Become acquainted with the hydraulic system and its components. Read the latest **SERVICE INFORMATION BULLETINS** on mower-conditioners.
2. If possible, talk with the operator about how the machine was performing when it failed.
3. With the machine shut off, check for evidence of external oil leakage around oil seals, castings, or hydraulic line connections. Check for pinched or kinked lines and hoses that could restrict oil flow and cause oil to heat.
4. Check for broken drives, broken or binding linkages, or other mechanical failures.
5. Check hydraulic oil level and determine the type of hydraulic oil used.
6. Check quality of oil for milky, dirty, or discolored condition. Smell the oil. A distinctive burned odor

indicates excessive heat that can destroy the lubricating qualities of the oil. Determine the cause of the condition, correct it, and change the oil.

7. Check for a damaged hydraulic oil filter. A faulty filter will permit oil to bypass the system, affecting system operation and tests. If the filter is plugged, an examination of the contaminant may indicate the cause of the failure.
8. Check mower-conditioner maintenance records to determine if the recommended service procedures have been made at the specified intervals. Note previous reports of unusual, frequent, or similar failures.
9. If possible, operate the mower-conditioner. Use the hydraulic functions and be alert for conditions that could isolate the problem. Also be alert for conditions that could cause further damage, and be prepared to stop the tractor immediately.



CAUTION: Keep hands away from moving parts. Shut off tractor before checking lines near moving parts.

If preliminary checks do not locate cause of hydraulic drive problems, make tests indicated in this section.

EX,1474,6015,A -19-04MAY93

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1

TEST HYDRAULIC DRIVE SYSTEM

NOTE: Plugging the conditioner rolls will stop them, simulating a hydraulic failure.

The following conditions will cause plugging of the conditioner rolls:

- Ground speed to fast for crop conditions.
- Roll pressure adjustment to high for crop conditions.
- Crop Conditions.
- Drive system adjustments not correct.

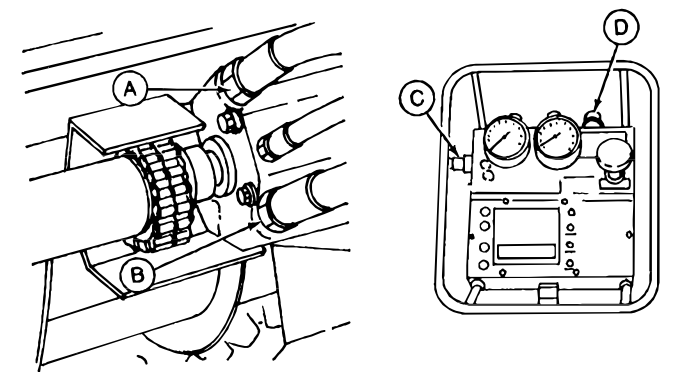
- Check tractor PTO rpms at rated speed.
 - Check hydraulic oil level.
 - Operate the mower-conditioner under normal conditions.
 - Observe the conditioner rolls.
- WHEN THE MACHINE PLUGGED, DID THE CONDITIONER ROLLS STOP?**

INSTALL FLOW METER

CAUTION: Install flow meter as instructed to prevent bodily injury and possible failure of the mechanical drives. Failure to replace hydraulic motor with flow meter will cause machine to operate while test are performed.

IMPORTANT: Flow meter must be equipped for testing at 41400 kPa (414 bar) (6000 psi) system, and register hydraulic oil temperature. (See 'ESSENTIAL TOOLS' in this section.) Perform all tests with oil temperature at 63–68° C (145–155° F).

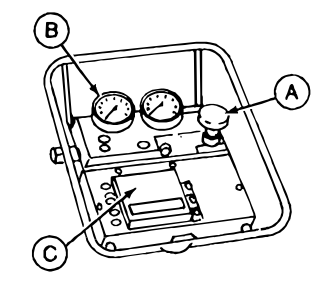
- Disconnect motor supply hose (A) and install on INLET port (C) on flow meter.
- Disconnect motor return hose (B) and install on OUTLET port (D) on flow meter.



WARM HYDRAULIC OIL

IMPORTANT: Do not warm oil by stalling machine to exceed relief valve setting. Operating machine at relief pressure can damage the system.

- Operate PTO at rated speed.
- Slowly close valve (A) on flow meter until 20684 kPa (207 bar) (3000 psi) registers on pressure gauge (B).
- Warm oil to 63–68° C (145–155° F) on temperature gauge (C).



CHECK FLOW

- Operate PTO at rated speed.
- Slowly close valve (A) on flow meter until 20684 kPa (207 bar) (3000 psi) registers on pressure gauge (B).
- Check flow gauge (C). Minimum flow should be 81 L/min (21.5 gpm).

• IS RATE OF FLOW OK?

REPLACE RELIEF VALVE CARTRIDGE AND SEALS.

CHECK FLOW

- Operate PTO at rated speed.
- Slowly close valve (A) on flow meter until 20684 kPa (207 bar) (3000 psi) registers on pressure gauge (B).
- Check flow gauge (C). Minimum flow should be 81 L/min (21.5 gpm).

• IS RATE OF FLOW OK?

CHECK RELIEF PRESSURE

- Operate PTO at rated speed.
- IMPORTANT:** Do not exceed 28958 kPa (290 bar) (4200 psi). Excessive pressure indicates relief valve will not open and requires replacement. Do not run hydraulic system in relief longer than thirty seconds, to prevent damage from oil heating.

NOTE: When system goes over relief the oil flow will stop, and the gauge (C) will register '0'.

- Slowly close valve (A) on flow meter, until system goes over relief.
- Check relief valve pressure on gauge (B) immediately. Reading should be 26200–28958 kPa (262–290 bar) (3800–4200 psi)
- Open valve as soon as reading is taken.

• IS RELIEF PRESSURE OK?

REPLACE RELIEF VALVE CARTRIDGE AND SEALS.

CHECK PUMP CASE DRAIN

NOTE: Reservoir will totally drain if pump case drain line (D) is not capped.

- Disconnect pump case drain line (D) and quickly cap hose to tongue. Install another hose on pump case drain port to make test.
- Operate PTO at rated speed.
- Slowly close valve (A) on flow meter until 20684 kPa (207 bar) (3000 psi) registers on pressure gauge (B).

- Place hose installed on pump case drain port in a bucket and measure flow for sixty seconds.
- Drainage for sixty seconds should be 7.2–19 L/min (1.9–5.0 gpm).

• IS PUMP CASE DRAIN OK?

CHECK MOTOR CASE DRAIN

- Remove flow meter.

CAUTION: The machine will be operating during this procedure. Ensure all shields are in place. Use a hose long enough to clear the platform and carrier frame.

NOTE: Reservoir will totally drain if motor drain line (A) is not capped.

- Disconnect motor drain line (A) at motor and quickly cap hose to tongue. Install another hose on motor drain port to make test.
- Operate PTO at rated speed.
- Place hose installed on motor drain port in bucket and measure flow for sixty seconds.
- Maximum drainage for sixty seconds should be 3.8 L/min (1.0 gpm).

• IS MOTOR CASE DRAIN OK?

THE COMPLAINT IS NOT THE RESULT OF A FAILURE IN THE HYDRAULIC SYSTEM.

- Plugging the conditioner rolls will stop them, simulating a hydraulic failure.
- The following conditions will cause plugging of the conditioner rolls:
 - Ground speed to fast for crop conditions.
 - Roll pressure adjustment to high for crop conditions.
 - Crop Conditions.
 - Drive system adjustments not correct.

- Check tractor PTO rpms at rated speed.
- Check Drive System Adjustments

REPAIR OR REPLACE MOTOR

- FLUSH SYSTEM
- CHANGE FILTER
- INSPECT PUMP

REPAIR OR REPLACE PUMP

- FLUSH SYSTEM
- CHANGE FILTER
- INSPECT MOTOR

REPLACE RELIEF VALVE HOUSING.

SPECIFICATIONS: AT RATED SPEED AND OIL TEMPERATURE AT 63–68° C (145–155° F)

ITEM	MEASUREMENT	SPECIFICATION
Pump (540 rpm)	Speed	2160 rpm
Pump (1000 rpm)	Speed	3000 rpm
Pump	Output	81 L/min (21.5 gpm)
Motor	Speed	1176 rpm
Hydraulic Drive	Relief Pressure	27579 kPa (276 bar) (4000 psi)
Maximum Pump Leakage at 20684 kPa (207 bar) (3000 psi)	Flow	19 L/min (5.0 gpm)
Maximum Motor Leakage (No Load)	Flow	3.8 L/min (1.0 gpm)
Reservoir	Volume	12-FT (3.66 m) - 95 L (25 gal) 14-FT (4.27 m) - 95 L (25 gal) 16-FT (4.88 m) - 102 L (27 gal)

E37208

INSTALL FLOW METER

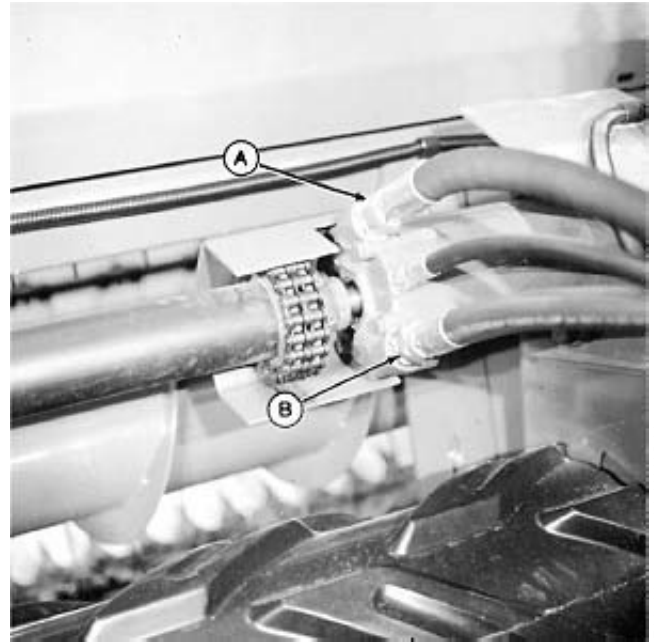
A flow meter can be used to create a restriction for warming oil, checking relief pressure, or checking pump case drainage.

CAUTION: Install flow meter as instructed to prevent bodily injury and possible failure of the mechanical drives.

IMPORTANT: Flow meter must be equipped for testing a 41400 kPa (414 bar) (6000 psi) system, and registering hydraulic oil temperature. (See **ESSENTIAL TOOLS** this Section.)

1. Disconnect motor supply hose (A) and install on INLET port (C) on flow meter.
2. Disconnect motor return hose (B) and install on OUTLET port (D) on flow meter.

A—Supply hose
B—Return hose
C—INLET port
D—OUTLET port



E36701 -UN-09MAR92



E36774 -UN-09MAR92

60-15-3

EX,1474,6015,B -19-04MAY93

WARM HYDRAULIC OIL

Normal operating temperature is 65—107°C (150—225°F). Oil temperature increases with increasing machine load and increasing ambient temperature. Lack of air movement around the machine also causes temperature to increase.

IMPORTANT: Do not warm oil by deliberately stalling machine to exceed relief valve setting. Damage to system can result.

1. Install flow meter. (See INSTALL FLOW METER in this Section.)
2. Operate PTO at rated speed.
3. Slowly close valve (A) on flow meter until 20684 kPa (207 bar) (3000 psi) registers on pressure gauge (B).
4. Warm oil to 63—68°C (145—155°F) on temperature gauge (C).
5. Maintain oil temperatures within 6°C (10°F) of each other during each test.



E36776 -UN-09MAR92

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EX,1474,6015,C -19-04MAY93

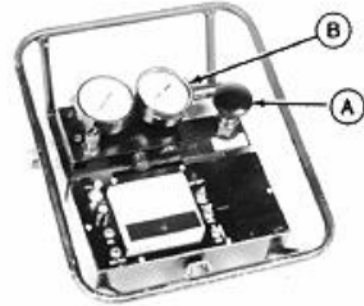
CHECK RELIEF PRESSURE

1. Install flow meter. (See INSTALL FLOW METER in this Section.)
2. Warm hydraulic oil. (See WARM HYDRAULIC OIL in this Section.)
3. Operate PTO at rated speed.

IMPORTANT: Do not exceed 28958 kPa (290 bar) (4200 psi). Excessive pressure indicates relief valve will not open and requires replacement. Do not run hydraulic system in relief longer than thirty seconds to prevent damage from oil heating.

NOTE: When system goes over relief the oil flow will stop and the guage (C) will register '0'.

4. Slowly close valve (A) on flow meter, until system goes over relief.
5. Check relief valve pressure on gauge (B) immediately. Specification is 26200—28958 kPa (262—290 bar) (3800—4200 psi).
6. Open valve as soon as reading is taken.



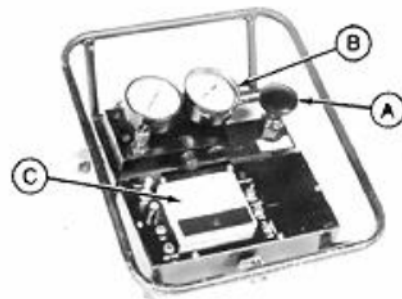
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EX,1474,6015,D -19-04MAY93

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CHECK FLOW

1. Install flow meter. (See INSTALL FLOW METER in this Section.)
2. Warm hydraulic oil. (See WARM HYDRAULIC OIL in this Section.)
3. Operate PTO at rated speed.
4. Slowly close valve (A) on flow meter until 20684 kPa (207 bar) (3000 psi) registers on pressure guage (B).
5. Check flow guage (C). Minimum flow should be 81 L/min (21.5 gpm)



E36776 -UN-09MAR92

EX,1474,6015,E -19-04MAY93

CHECK PUMP CASE DRAIN

1. Install flow meter. (See INSTALL FLOW METER in this Section.)

2. Warm hydraulic oil. (See WARM HYDRAULIC OIL in this Section.)

NOTE: Reservoir will totally drain if pump drain line (A) is not capped.

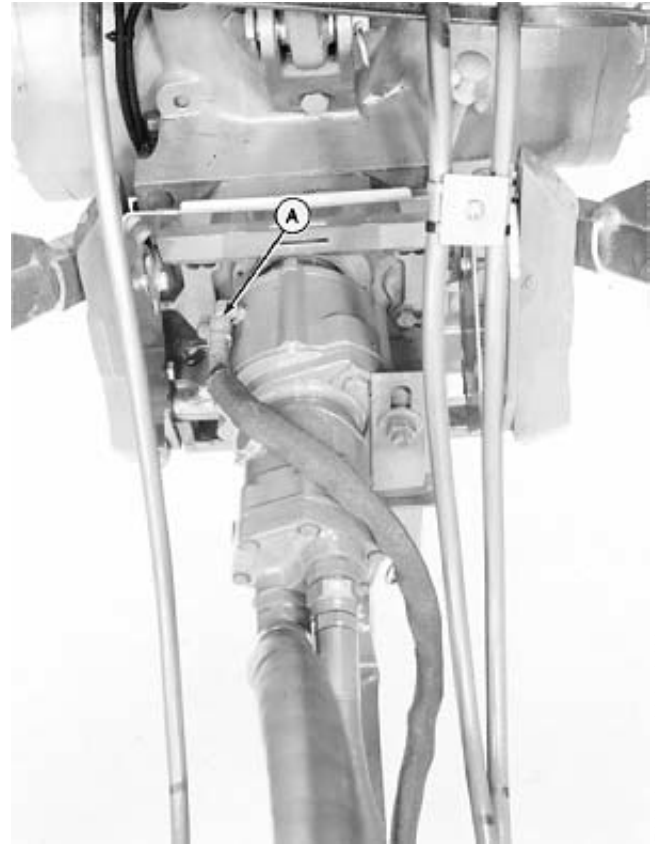
3. Disconnect pump drain line (A) at pump and quickly cap hose to tongue. Install another hose on pump drain port to make test.

4. Operate PTO at rated speed.

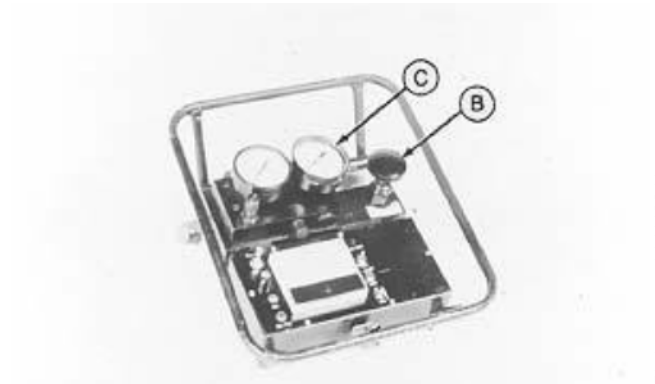
5. Slowly close valve (B) on flow meter until 20684 kPa (207 bar) (3000 psi) registers on pressure gauge (C).

6. Place hose installed on pump drain port in bucket and measure flow for sixty seconds.

7. Maximum drainage for sixty seconds should be 19 L/min (5.0 gpm).



E33940 -UN-04JAN90



E37275 -UN-30APR93

EX,1474,6015,G -19-04MAY93

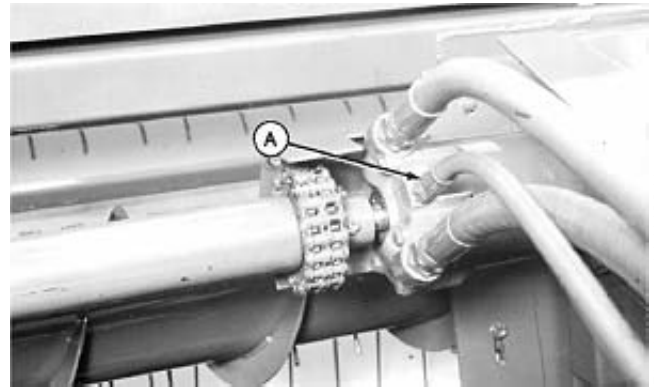
CHECK MOTOR CASE DRAIN

1. Install flow meter. (See INSTALL FLOW METER in this Section.)
2. Warm hydraulic oil. (See WARM HYDRAULIC OIL in this Section.)
3. Remove flow meter.

⚠ CAUTION: The machine will be operating during this procedure. Insure all shields are in place. Use a hose long enough to clear the platform and carrier frame.

NOTE: Reservoir will totally drain if motor drain line (A) is not capped.

4. Disconnect motor drain line (A) at motor and quickly cap hose to tongue. Install another hose on motor drain port to make test.
5. Operate PTO at rated speed.
6. Place hose installed on motor drain port in bucket and measure flow for sixty seconds.
7. Maximum drainage for sixty seconds should be 3.8 L/min (1.0 gpm).



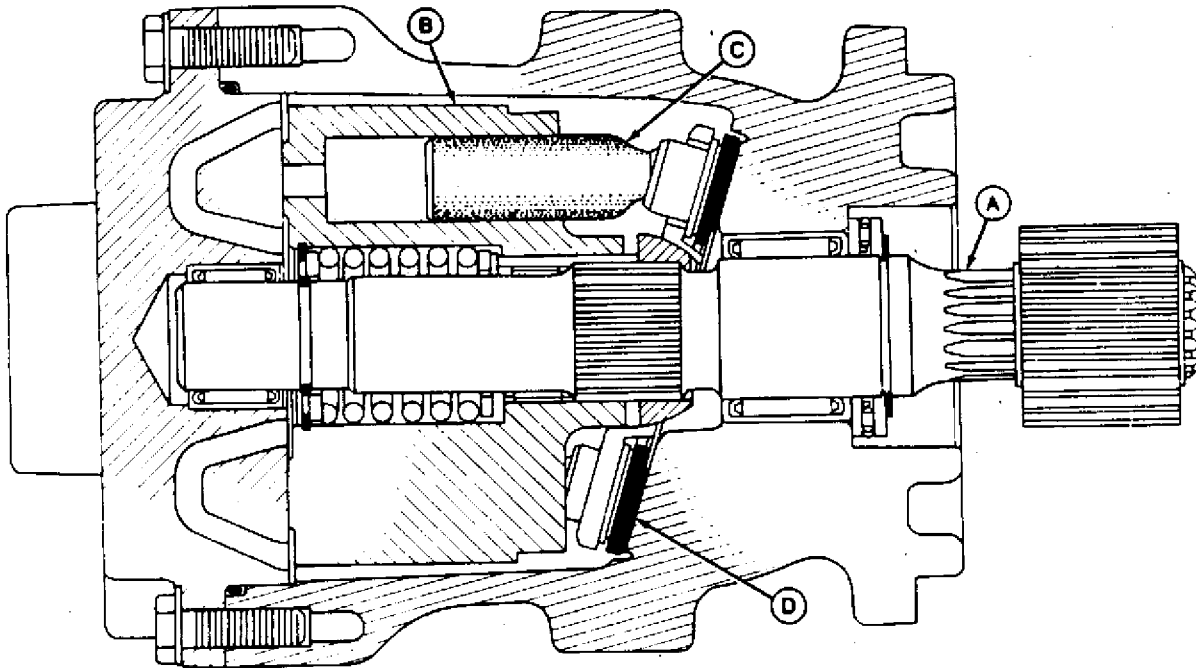
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EX,1474,6015,H -19-04MAY93

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GENERAL INFORMATION



A—Shaft

B—Cylinder Block

C—Piston

D—Swashplate Ramp

A PTO driven axial piston pump operates the hydrostatic drive of the mower-conditioner.

The shaft (A) rotates the cylinder block (B) forcing the pistons (C) up the swashplate ramp (D). Oil is pressurized and routed to the motor.

The 540 rpm pump has a 45.4 cm³ (2.77 cu. in.) displacement and operates at 2160 rpm.

The 1000 rpm pump has a 32.9 cm³ (2.01 cu. in.) displacement and operates at 3000 rpm.

Output is 81 L/min (21.5 gpm) on both pumps.

The pump is located at the front of the tongue and is attached to the planetary gear case which mounts on the tractor PTO shaft.

EX,1474,6020,A -19-04MAY93

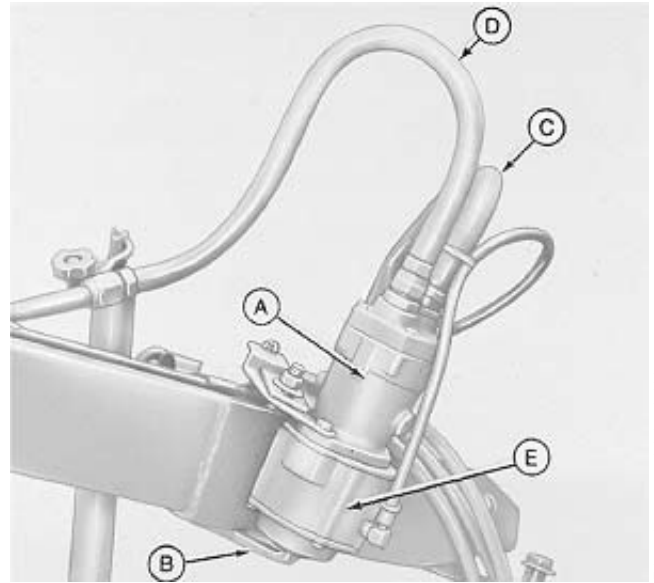
E33933 -JUN-04-JAN90

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REMOVE PUMP

1. Remove Pump (A) from tractor PTO and place on transport stud (B).
2. Drain complete hydraulic system.
3. Remove suction (C) and high pressure hoses (D) from pump.
4. Remove hose from planetary gear case (E).

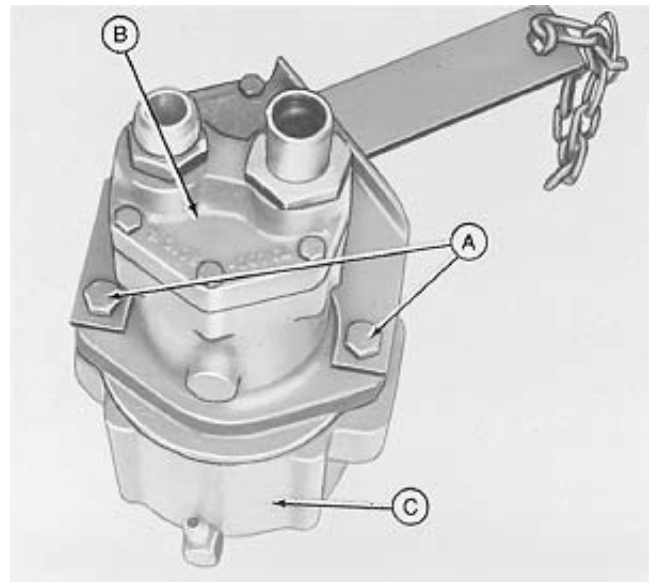
A—Hydraulic Pump
B—Stud
C—Suction Hose
D—Pressure Hose
E—Planetary Gear case



-UN-15JAN90
E 15579

EX,1474,6020,B -19-04MAY93

5. Drain oil from pump and planetary housings.
6. Remove two cap screws (A) from pump (B) and lift pump from planetary gear case (C).

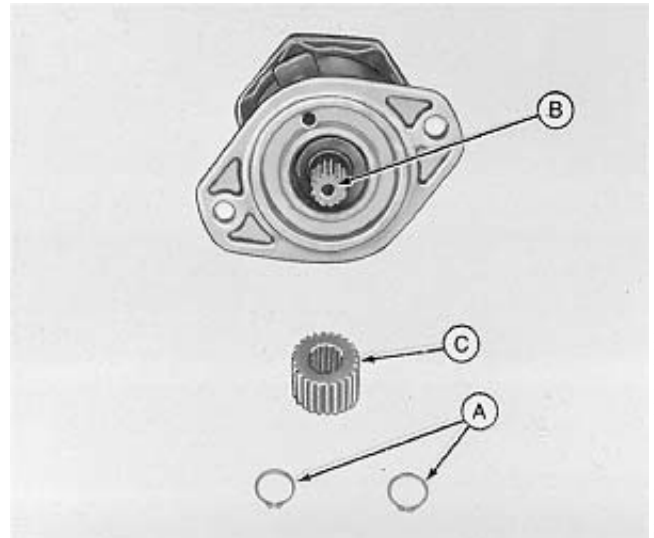


-UN-15JAN90
E 15580

EX,1474,6020,C -19-04MAY93

DISASSEMBLE PUMP

1. Remove snap (A) from drive shaft (B) and slide gear (C) from shaft.
2. Remove second snap ring (A).



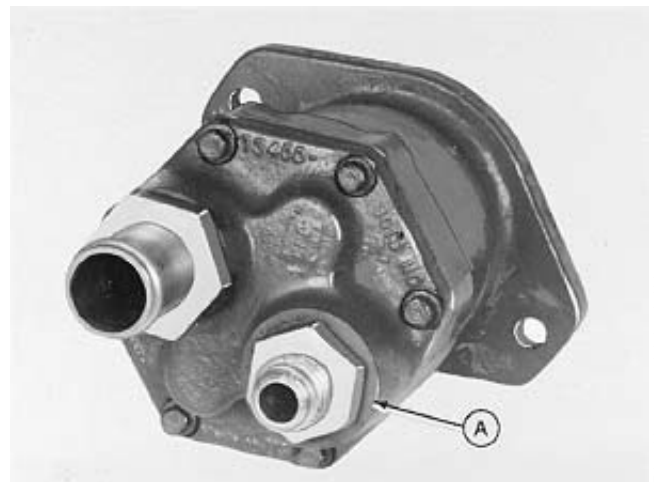
E15581 -UN-15JAN90

EX,1474,6020,D -19-04MAY93



CAUTION: End cap is under spring tension and may move out of housing as cap screws are loosened.

3. Remove six 5/16 x 1-in. cap screws from backplate (A).
4. Use a plastic mallet to loosen backplate. Pull backplate straight out of pump housing.



E15582 -UN-15JAN90

EX,1474,6020,E -19-04MAY93

5. Remove O-ring (A) from backplate (H).
6. Remove the complete piston block assembly (B) from the housing (C) and shaft.

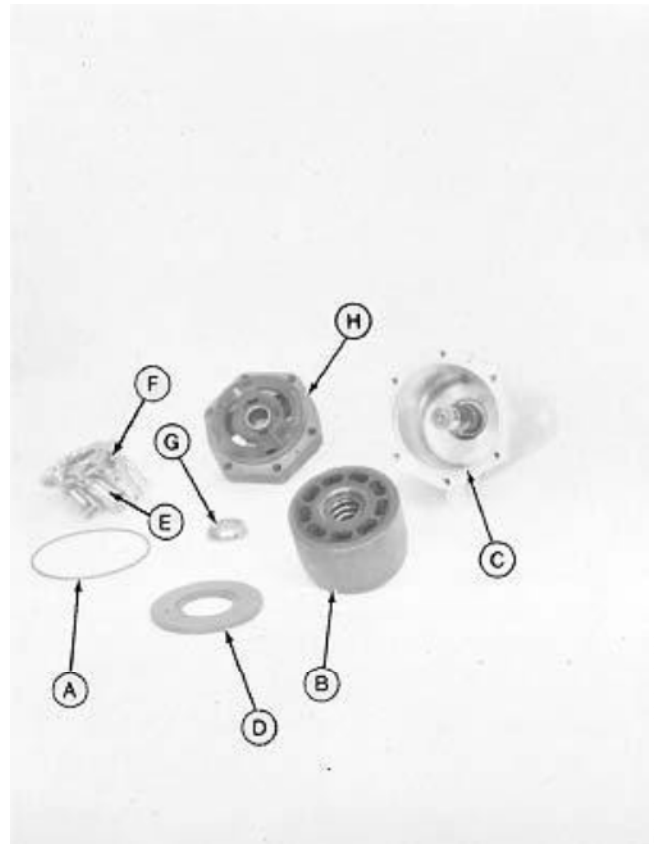
IMPORTANT: Mark pistons and piston block before removing pistons. Replace each piston in its original bore during assembly to prevent a slight loss of performance.

7. Remove thrust race (D), pistons (E), spider (F), and pivot (G) from piston block assembly.

CAUTION: Do not remove snap ring from piston block (B) at this time. Removing snap ring will cause spring to fly from block and could cause personal injury. Follow procedure in Disassemble Piston Block, this group, if spring is to be removed from the piston block.

NOTE: The piston block does not need to be disassembled unless the pins or spring are damaged.

- A—O-Ring
- B—Piston Block
- C—Housing
- D—Thrust Race
- E—Pistons
- F—Spider
- G—Pivot
- H—Backplate

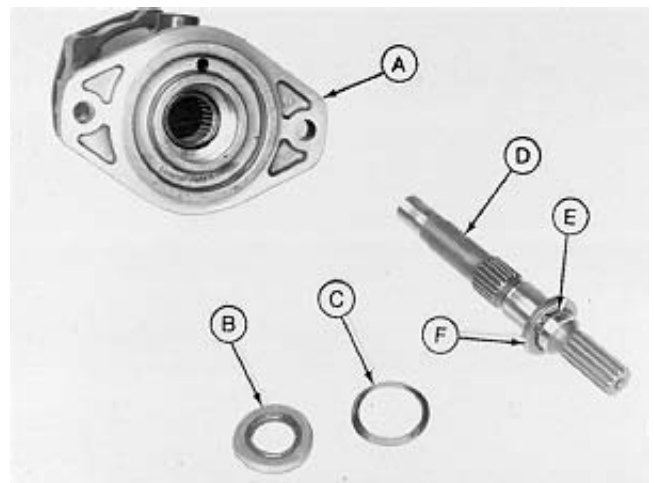


E21424 -JUN-15/JAN90

EX,1474,6020,F -19-04MAY93

8. Remove snap ring from housing (A).
9. Remove shaft seal (B) from housing. Replace with new seal during assembly.
10. Remove washer (C) from housing.
11. Remove drive shaft (D) from housing.
12. Remove the two snap rings (E), thrust washers and thrust bearing (F) from drive shaft.

- A—Housing
- B—Shaft Seal
- C—Washer
- D—Drive Shaft
- E—Snap Ring
- F—Washers and Bearing



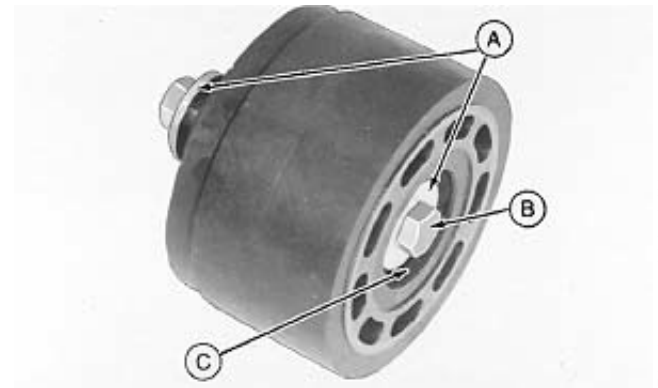
E15584 -JUN-15/JAN90

EX,1474,6020,G -19-04MAY93

DISASSEMBLE PISTON BLOCK

Two 3/8 I.D. X 1-1/8 in. O.D. washers, one 3/8 x 3-1/4 in. cap screw and one 3/8-in. nut will be needed to remove spring.

1. Place one flat washer (A) over the cap screw (B) and insert cap screw through center of piston block.
2. Place remaining washer over cap screw and let it rest on three pins on back of piston.
3. Thread nut on cap screw and compress spring (C).

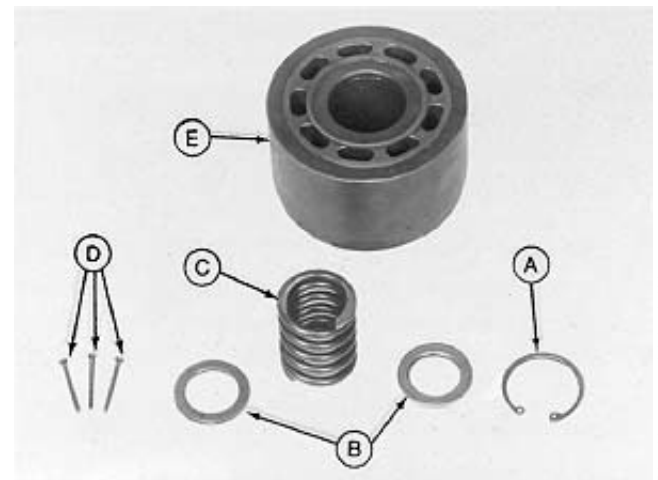


E15585 -UN-15JAN90

EX,1474,6020,H -19-04MAY93

4. Remove internal snap ring (A).
5. Remove cap screw and two flat washers installed previously.
6. Remove washers (B), spring (C), three pins (D), and pin keeper from block (E).

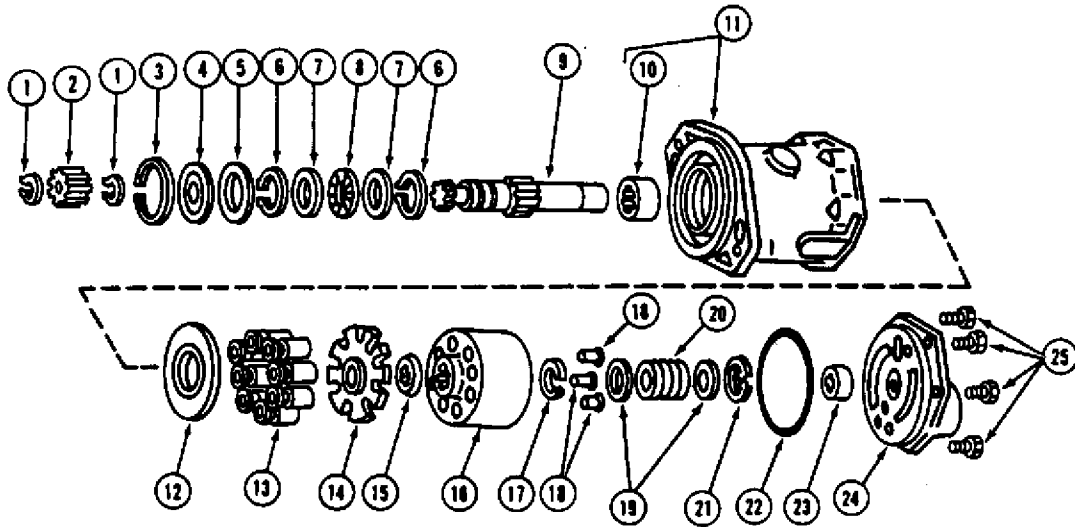
A—Snap Ring
B—Washers
C—Spring
D—Pins
E—Block



E15586 -UN-15JAN90

EX,1474,6020,I -19-04MAY93

Hydraulic Pump/Disassemble Piston Block



- 1—Snap Ring (2 Used)
- 2—Gear
- 3—Internal Snap Ring
- 4—Shaft Seal
- 5—Washer
- 6—Snap Ring (2 Used)
- 7—Thrust Washer (2 Used)

- 8—Thrust Bearing
- 9—Drive Shaft
- 10—Bearing
- 11—Housing
- 12—Thrust Race
- 13—Pistons
- 14—Spider

- 15—Spider Pivot
- 16—Piston Block
- 17—Pin Keeper
- 18—Loading Pin (3 Used)
- 19—Washer (2 Used)
- 20—Compression Spring

- 21—Snap Ring
- 22—O-Ring
- 23—Bearing
- 24—Backplate
- 25—Socket Screw (6 Used)

Hydraulic Pump

E21599 -UN-15JAN90

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EX,1474,6020,J -19-04MAY93

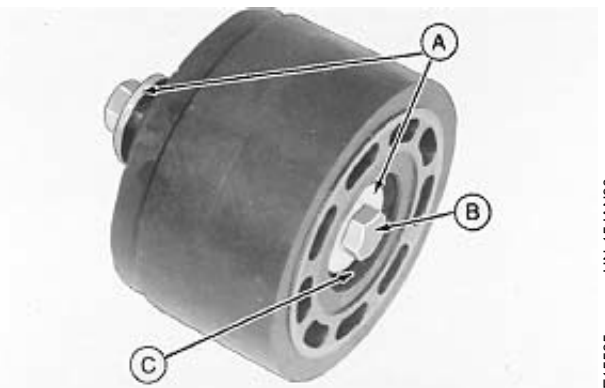
INSPECT PUMP

1. Wash all parts in clean solvent.
2. Examine needle bearings (10 and 23) in housing and backplate. If needles are free of excessive play and are still in bearing cage, there is no need to replace bearing.
3. Inspect thrust washers (7) and bearing (8). All surfaces should be free of any signs of wear.
4. Inspect spider (14) and pivot (15). Conical surfaces should be free of wear and score marks.
5. Inspect pistons (13). The O.D. surfaces should be smooth and free of scoring. Slippers should fit snugly to the piston. Slipper faces should be flat and free of scoring and flaking.
6. Inspect piston block (16). Bores should be free of scoring. The surface that contacts the backplate should be smooth and free of grooves or metal buildup.
7. Inspect the thrust race (12). Surface should show no signs of scoring or grooves.
8. Replace damaged or worn parts. Replace complete pump if major repairs are needed.

EX,1474,6020,K -19-04MAY93

ASSEMBLE PISTON BLOCK

Install one washer, spring and second washer. Use the two 3/8-in. I.D. flat washers (A) and the 3/8 x 3-1/4 in. cap screw (B) to compress the spring. Install snap ring (C) into piston block. Remove cap screw and flat washers.



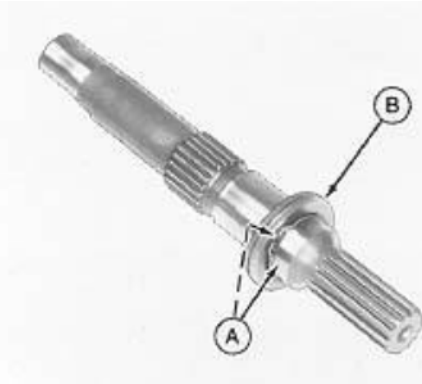
EX,1474,6020,L -19-04MAY93

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-JUN-15, JAN90
E15585

ASSEMBLE PUMP

1. Install snap ring (A) on outer groove of shaft. Slide one washer, thrust bearing and second washer (B) on shaft. Install snap ring in inner groove on shaft.

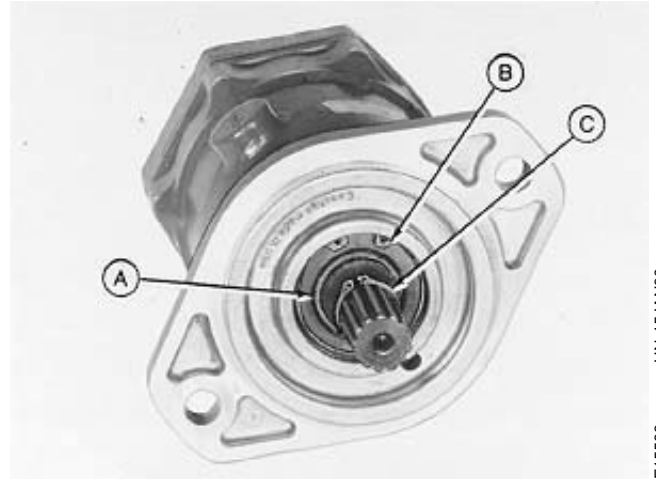


E15587
-UN-15JAN90

EX,1474,6020,M -19-04MAY93

2. Install shaft in housing. Install washer on shaft. Oil I.D. of new shaft seal (A) and press into housing. Retain with snap ring (B).

3. Install small snap ring (C) into rear groove on drive shaft splines.



E15588
-UN-15JAN90

EX,1474,6020,N -19-04MAY93

4. Place pivot (A) on piston block (B).

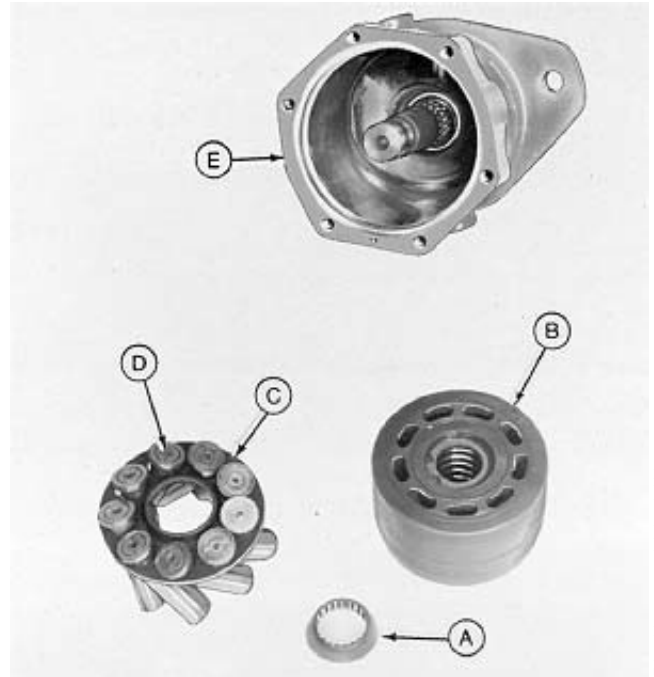
5. Install spider (C) and piston (D) assemblies in piston block. Reinstall each piston in its original bore.

6. Lubricate thrust race and install with grooved side toward housing (E).

7. Align splines of pivot and piston block. Slide onto drive shaft.

8. Piston slippers must contact thrust race. Be certain all parts are in their proper position.

- A—Pivot
- B—Piston Block
- C—Spider
- D—Pistons
- E—Housing

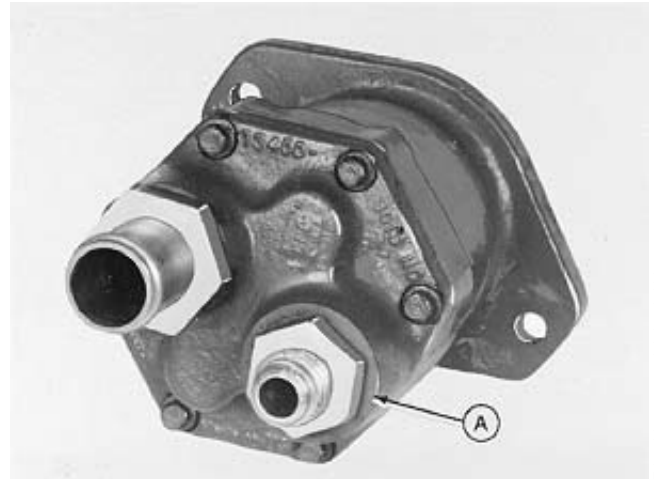


E 15589 -UN-15JAN90

EX,1474,6020,O -19-04MAY93

9. Install new O-ring on backplate (A) and install backplate by locating spring pin in hole in housing.

10. Install six cap screws and tighten to 20 to 24 N·m (15 to 18 lb-ft).

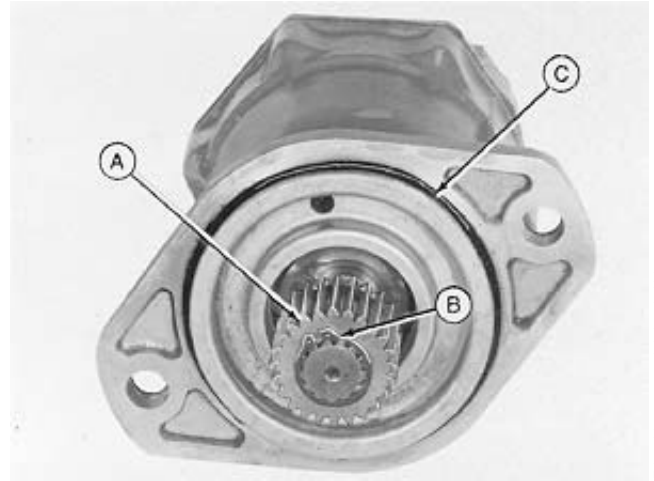


E 15582 -UN-15JAN90

EX,1474,6020,P -19-04MAY93

Hydraulic Pump/Assemble Pump

11. Slide drive gear (A) onto drive shaft and secure with snap ring (B).
12. Install new O-ring (C) onto housing assembly.



E15590 -UN-15JAN90

EX,1474,6020,Q -19-04MAY93

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INSTALL PUMP

1. Engage pump drive shaft gear to gear case gears. Position suction port 90 degrees counterclockwise from drain port when viewed from pump end. Use two cap screws (A) to secure pump (B) to planetary housing (C). Tighten cap screws to 75—81 N·m (55—60 lb-ft).

2. Connect all lines, change filter, and fill tongue with John Deere HY-GARD Transmission/Hydraulic Oil.

NOTE: Capacity is 95 L (25 gal) on 12-ft (3.66 m) and 14-ft (4.27 m) machines, and 102 L (27 gal) on 16-ft (4.88 m) machines.

3. Lubricate splines with grease and install on tractor PTO shaft.

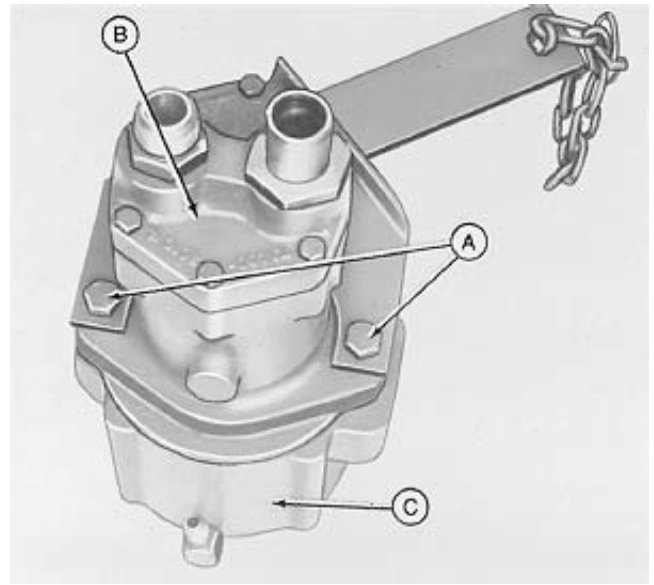
IMPORTANT: Install gear case with drain hose up to insure planetary lubrication.

4. Start tractor and run mower-conditioner slowly with no load for one minute to bleed air. Check hose connections and recheck oil level.

5. Run at full PTO speed for one minute and check operation.

NOTE: Do not run machine without load for long periods of time because it results in excessive wear.

6. Change filter after ten hours of operation.



-JUN-15-JAN90
E15580

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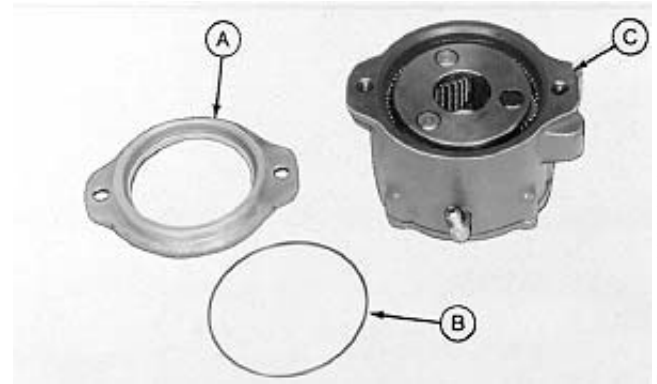
EX,1474,6020,R -19-04MAY93

Hydraulic Pump/Install Pump

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12

DISASSEMBLE AND INSPECT PLANETARY GEAR CASE

1. Drain oil and remove pump from planetary gear case.
2. Remove adapter plate (A) and O-ring (B) from housing (C).

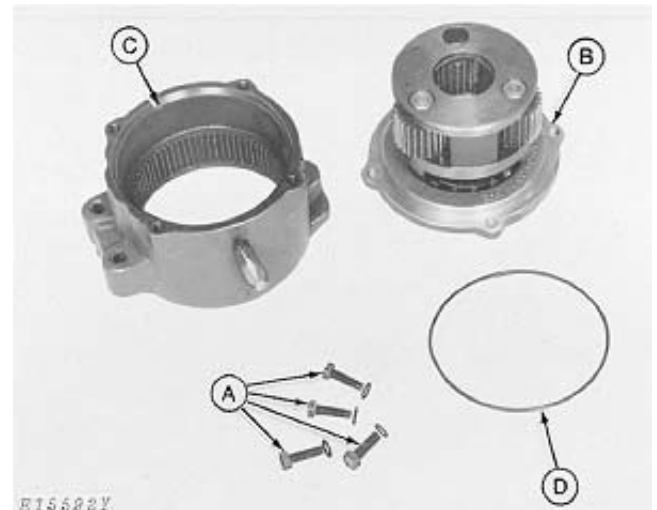


EX,1474,6025,A -19-04MAY93

E15591
-UN-21JAN90

3. Remove four cap screws and washers (A) from front plate (B). Remove housing (C).
4. Remove O-ring (D) from front plate.

- A—Cap Screws and Washers
- B—Front Plate
- C—Housing
- D—O-Ring



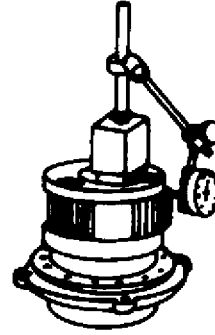
EX,1474,6025,B -19-04MAY93

E15592
-UN-16JAN90

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5. Check for excessive wear in one or more bushings.
Measure each gear as follows:

- Mount the dial indicator as shown.
- Push the gear radially inward toward the axis of the carrier with finger force and zero the dial indicator.
- Push the gear radially outward and record the total movement.
- Rotate the gear 90 degrees and repeat the measurement.
- Replace the gear case if any measurement is equal to or greater than 0.127 mm (0.0050-in.)



6. Check for evidence of bushing extrusion between the gear and housing.

7. Continue disassembly if gears do not rotate freely.

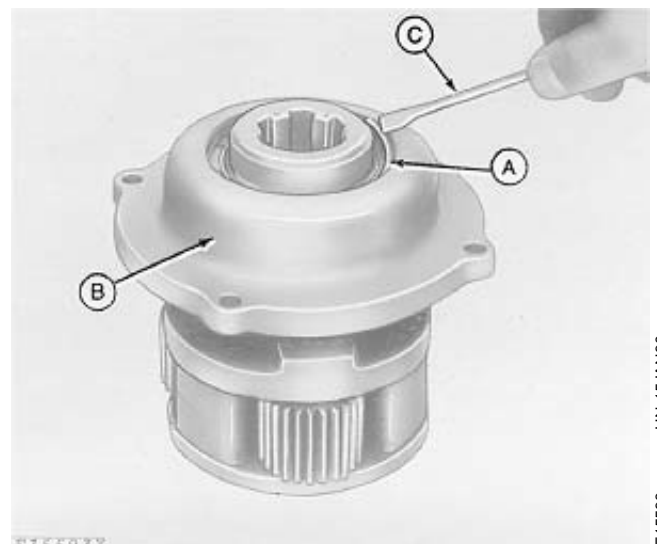
8. Replace damaged or worn parts.

E21425 -UN-15JAN90

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EX,1474,6025,C -19-04MAY93

9. Remove snap ring (A) from front plate (B) with screwdriver (C).



E15593 -UN-15JAN90

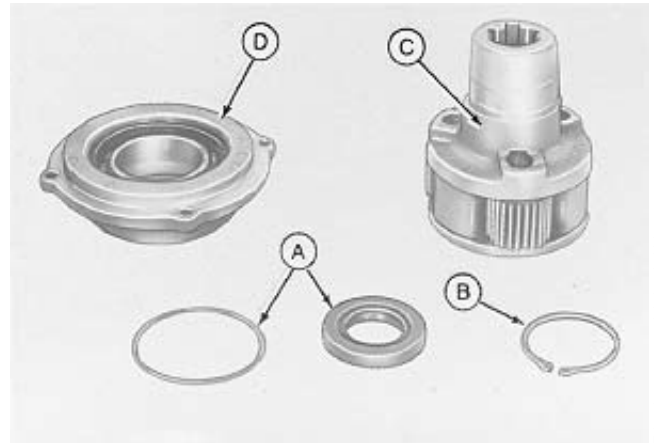
EX,1474,6025,D -19-04MAY93

Planetary Gear Case/Disassemble and Inspect Planetary Gear Case

10. Remove snap ring and shaft seal (A). It is necessary to destroy seal to remove. Replace with new seal when reassembling.

11. Remove snap ring (B) from carrier shaft. Remove carrier and gear assembly (C) from front plate (D). The carrier shaft is a light press fit in the bearing.

- A—Snap Ring and Seal
- B—Snap Ring
- C—Carrier and Gear Assembly
- D—Front Plate

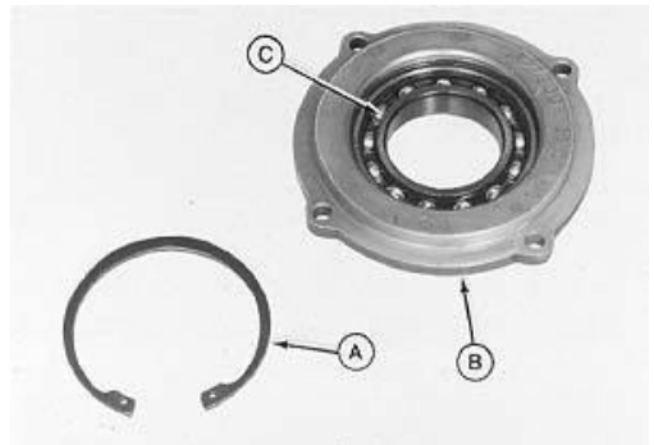


E15594 -UN-15JAN90

EX,1474,6025,E -19-04MAY93

12. Remove snap ring (A) from front plate (B).

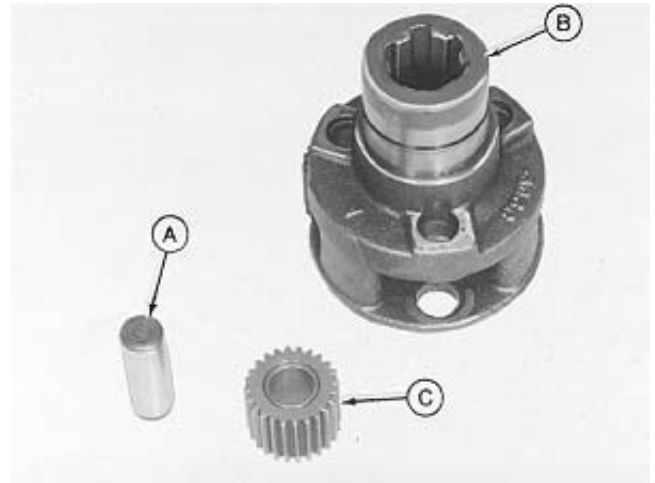
13. Remove bearing (C) from front plate. Inspect the bearing. It should roll freely.



E15595 -UN-15JAN90

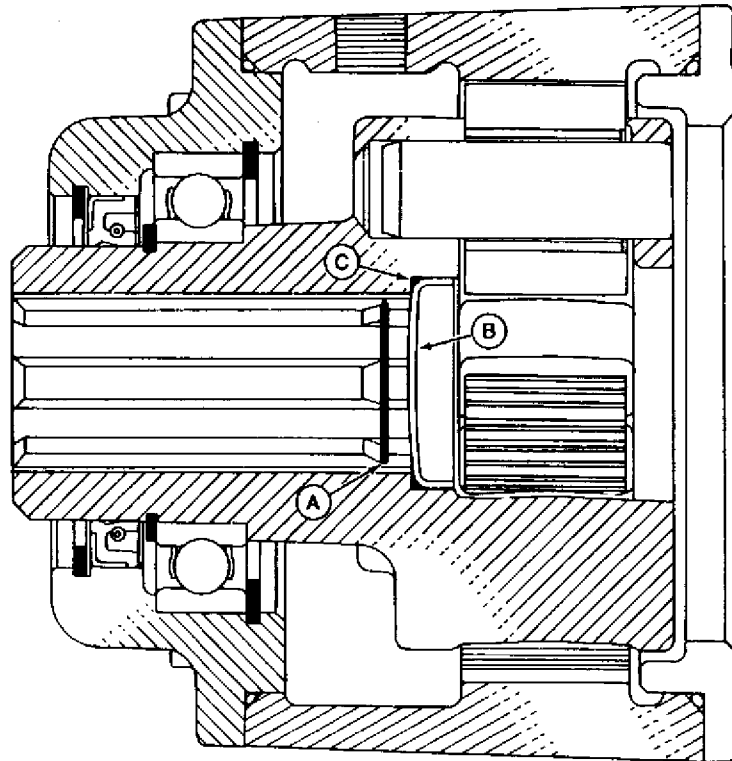
EX,1474,6025,F -19-04MAY93

14. Press dowel pin shafts (A) from the carrier (B) and remove gears (C).



E15596 -UN-15JAN90

EX,1474,6025,G -19-04MAY93



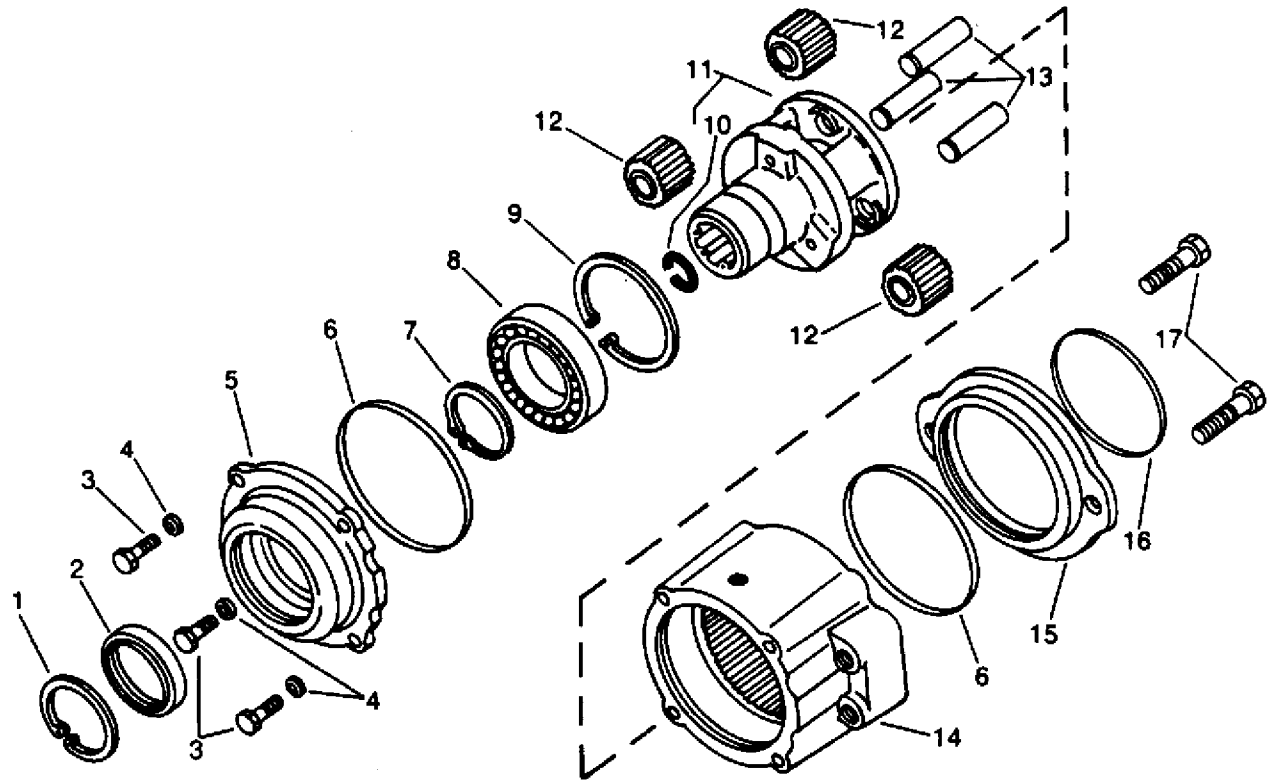
E21473 -UN-15JAN90

15. Wash all parts in clean solvent.

16. Inspect carrier for damage to stop ring (A).

17. Inspect plug (B) and O-ring (C) for signs of leakage.

EX,1474,6025,H -19-04MAY93



- | | | | |
|-----------------------|--------------------|---------------------|------------------------|
| 1—Snap Ring | 6—O-Rings (2 Used) | 10—Snap Ring (Stop) | 14—Housing |
| 2—Seal | 7—Snap Ring | 11—Carrier | 15—Adapter Plate |
| 3—Cap Screws (4 Used) | 8—Bearing | 12—Gears (3 Used) | 16—O-Ring |
| 4—Washers (4 Used) | 9—Snap Ring | 13—Shafts (3 Used) | 17—Cap Screws (2 Used) |
| 5—Front Plate | | | |

18. Inspect pins (13), gear teeth (12), and internal teeth in housing (14). Check pins and teeth for chipping or excessive wear.

19. Replace gear if I.D. exceeds 19.2 mm (0.755 in.).

E21426 -UN-15JAN90

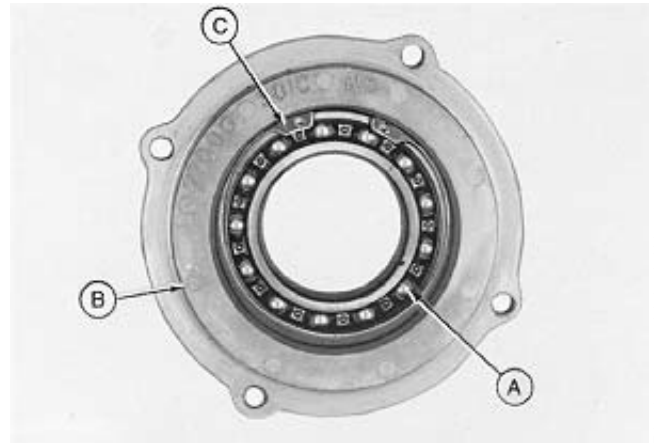
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EX.1474.6025.I -19-04MAY93

ASSEMBLE PLANETARY GEAR CASE

Lubricate all parts before assembly.

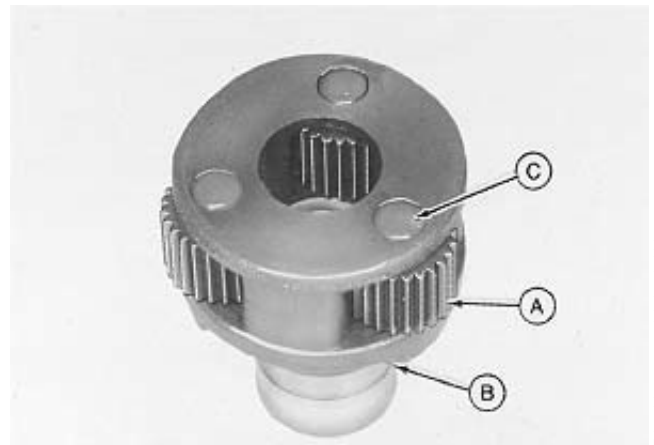
1. Install bearing (A) in front plate (B) and retain with snap ring (C).



E15597 -UN-15JAN90

EX,1474,6025,J -19-04MAY93

2. Install gears (A) in carrier (B) and press dowel pins (C) in until they are flush with carrier.

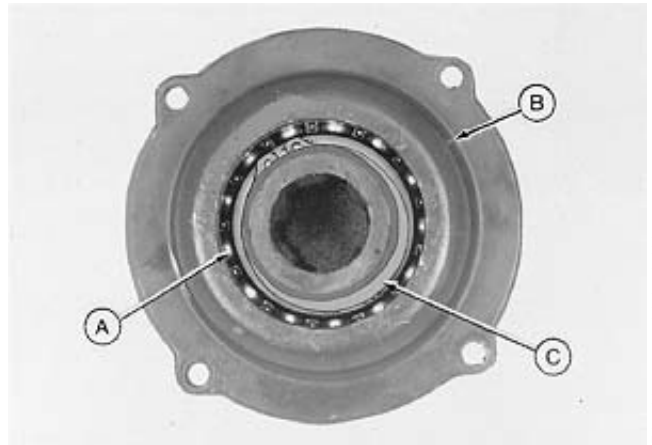


E15598 -UN-15JAN90

EX,1474,6025,K -19-04MAY93

Planetary Gear Case/Assemble Planetary Gear Case

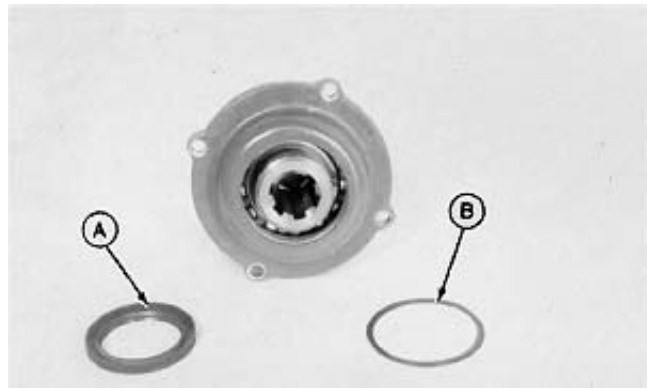
3. Press carrier shaft through bearing (A) in front plate (B).
4. Retain bearing with snap ring (C).



E15599 -UN-15JAN90

EX,1474,6025,L -19-04MAY93

5. Press new shaft seal (A) flush with snap ring groove. Retain with snap ring (B).
6. Install O-ring on front plate. Install the front plate into housing using four cap screws. Torque cap screws to 20—24 N·m (15—18 lb-ft).
7. Install adapter plate and O-ring.
8. Install pump on planetary and tighten cap screws to 75—81 N·m (55—60 lb-ft).
9. Bleed system. (See Install Pump in this section.)

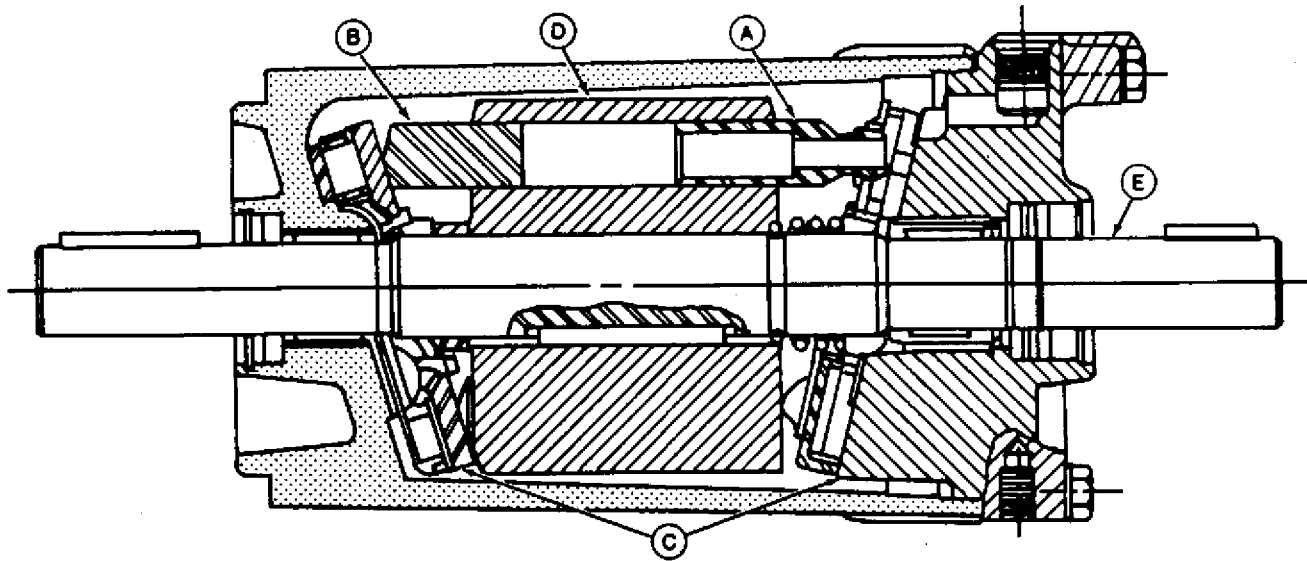


E21427 -UN-15JAN90

EX,1474,6025,M -19-04MAY93

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GENERAL INFORMATION



A—Hollow Piston
B—Solid Piston

C—Swashplate Ramps

D—Cylinder Block

E—Shaft

The axial piston motor has a hollow piston (A) and a solid floating piston (B). Oil enters through a hole in the slipper of the hollow piston and forces both pistons down the swashplate ramps (C). This rotates the cylinder block (D) and shaft (E).

The motor has a 82.6 cm³ (5.04 cu. in.) displacement and operates at 1176 rpm, no load.

The motor is located near the right side of the carrier frame.

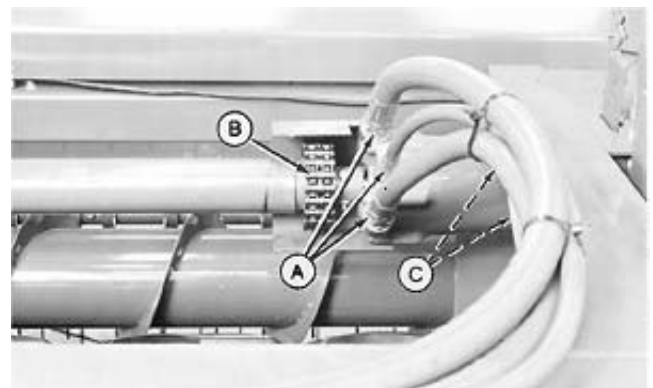
EX,1474,6030,A -19-04MAY93

E33932 -JUN-04JAN90

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1

REMOVE MOTOR

1. Remove three hydraulic lines (A) and place caps on lines.
2. Remove shield and coupler chain (B).
3. Disengage conditioner roll drive chain from motor sprocket. It is not necessary to remove chain from machine. (See Remove Conditioner Roll Drive Chain in Section 40.)
4. Remove two cap screws (C) and motor.



E33942 -JUN-04JAN90

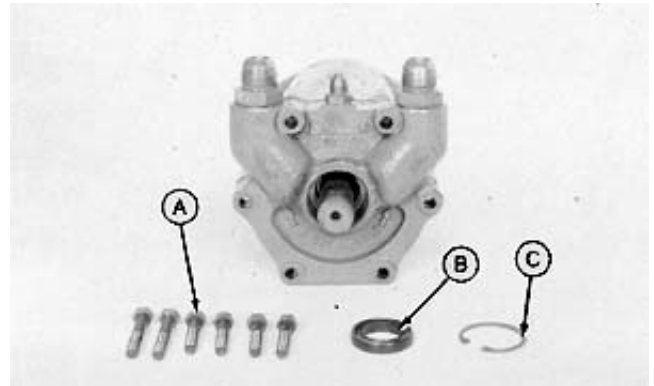
EX,1474,6030,B -19-04MAY93

DISASSEMBLE MOTOR

1. Remove sprockets, drain oil, and clean outside of motor thoroughly.
2. Remove snap ring (C) and seal (B). It is necessary to destroy seal to remove.

CAUTION: Backplate is under spring tension and may move out of housing as cap screws are loosened.

3. Remove six cap screws (A) from backplate.

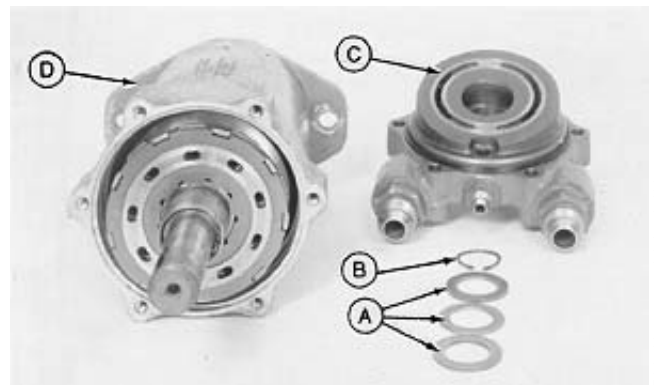


E21429 -UN-15JAN90

EX,1474,6030,C -19-04MAY93

4. Remove snap ring (B).
5. Remove bearing and washers (A).
6. Use a plastic mallet to loosen backplate (C). Rotate housing (D) and remove backplate.
7. Inspect needle bearing and replace if necessary.

A—Washers and Bearing
B—Snap Ring
C—Backplate
D—Housing



E21430 -UN-15JAN90

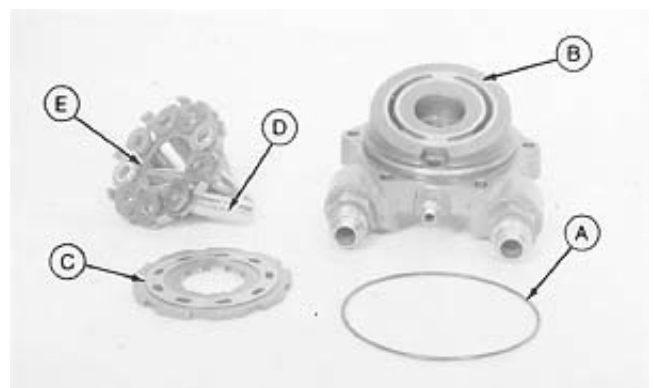
EX,1474,6030,D -19-04MAY93

8. Remove O-ring (A) from backplate (B).

IMPORTANT: Mark pistons and piston block before removing pistons. Replace each piston in its original bore during assembly to prevent a slight loss of performance.

9. Remove connector plate (C), pistons (D), and spider (E) from motor.

A—O-Ring
B—Backplate
C—Connector Plate
D—Pistons
E—Spider



E21431 -UN-15JAN90

EX,1474,6030,E -19-04MAY93

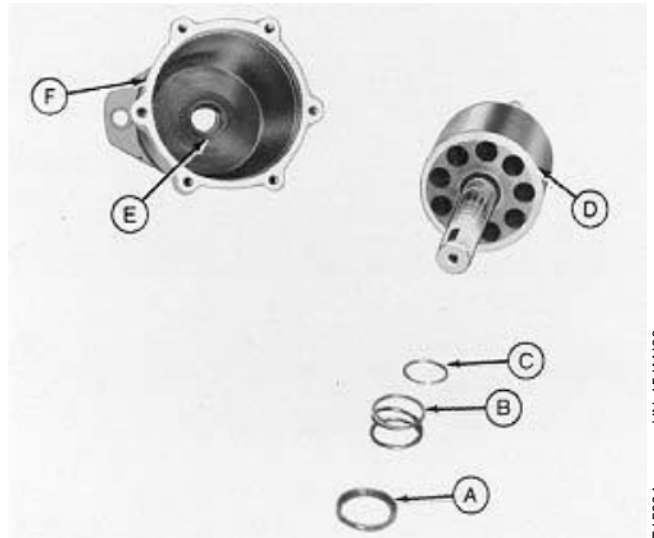
10. Remove pivot (not shown), spring (B), spring collar (A), and retaining ring (C) from drive shaft.

11. Remove complete piston block (D) and shaft assembly from motor.

12. Remove snap ring and seal from housing (F).

13. Inspect needle bearing (E) and replace if necessary.

- A—Spring Collar
- B—Spring
- C—Retaining Ring
- D—Piston Block
- E—Bearing Race
- F—Housing



EX,1474,6030,F -19-04MAY93

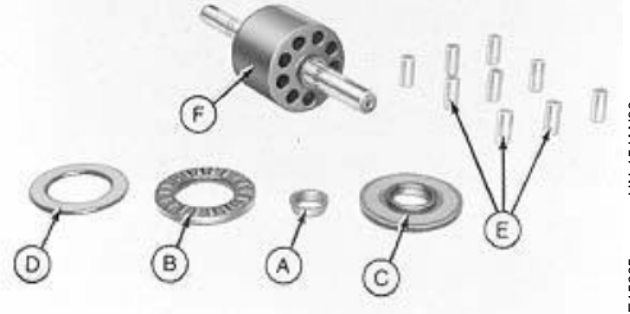
E15604 -JUN-15JAN90

14. Remove bearing (B), piston race (C), and pivot (A) from shaft.

15. Remove pistons (E) from piston block (F).

16. Remove bearing race (D) from housing.

- A—Pivot
- B—Thrust Bearing
- C—Piston Race
- D—Bearing Race
- E—Pistons
- F—Piston Block



EX,1474,6030,G -19-04MAY93

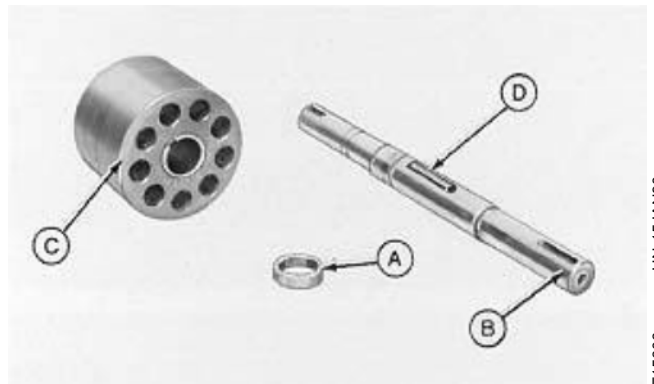
E15605 -JUN-15JAN90

17. Remove snap ring and spacer (A) from drive shaft (B).

18. Slide piston block (C) from shaft.

19. Remove snap ring and key (D) from shaft.

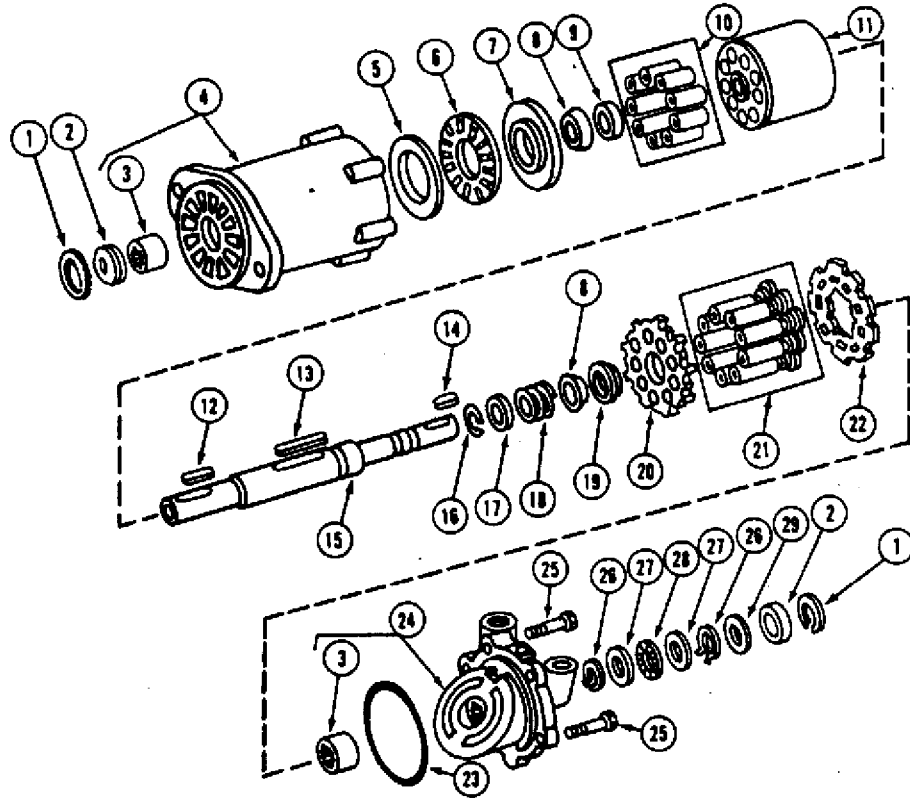
- A—Spacer
- B—Drive Shaft
- C—Piston Block
- D—Key



EX,1474,6030,H -19-04MAY93

E15606 -JUN-15JAN90

Hydraulic Motor/Disassemble Motor



- | | | | |
|---------------------------|-------------------|-----------------------|---------------------------|
| 1—Snap Ring | 9—Spacer | 16—Retaining Ring | 23—O-Ring |
| 2—Shaft Seal (2 Used) | 10—Pistons | 17—Spring Collar | 24—Backplate |
| 3—Needle Bearing (2 Used) | 11—Piston Block | 18—Compression Spring | 25—Cap Screw (6 Used) |
| 4—Housing | 12—Key (Hardened) | 19—Pilot | 26—Snap Ring (3 Used) |
| 5—Bearing Race | 13—Key (Hardened) | 20—Spider | 27—Thrust Washer (2 Used) |
| 6—Thrust Bearing | 14—Key (Hardened) | 21—Pistons | 28—Thrust Bearing |
| 7—Piston Race | 15—Drive Shaft | 22—Connector Plate | 29—Washer |
| 8—Pivot (2 Used) | | | |

Hydraulic Motor

EX.1474.6030.1 -19-04MAY93

E33936 JUN-04/JAN90

60
30
4

INSPECT MOTOR

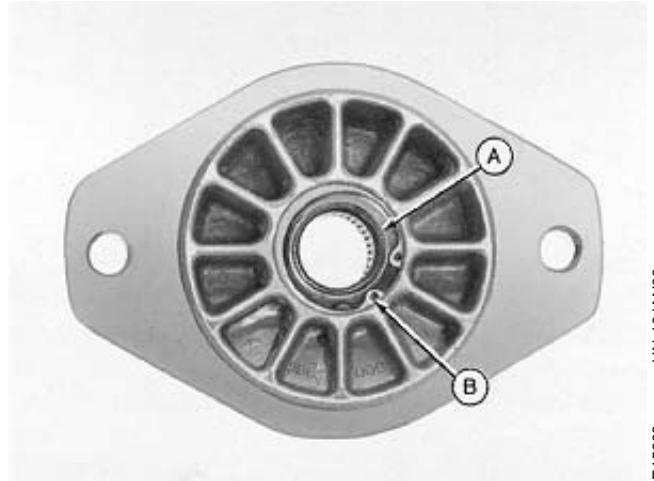
1. Wash all parts in a clean solvent.
2. Examine needle bearings (3) in housing (4) and backplate (24). If needles are free of play and remain in bearing cage, there is no need to replace bearing.
3. Inspect bearing race (5), thrust bearing (6), and piston race assembly (7). All surfaces should be free of any signs of wear.
4. Inspect pilot (19) and pivot (8). Conical surfaces should be free of wear and score marks.
5. Inspect pistons (10). Sides and rounded end should be smooth and free of surface marks.
6. Inspect piston block (11). Bores should be free of scoring. Keyway should be free of damage.
7. Inspect pistons (21). O.D. surfaces should be smooth and free of scoring. Slippers should be smooth and free of scoring. Slippers should be a snug fit to the piston. Face of slippers should be flat and free of scoring and flaking.
8. Inspect spider (20) for wear or damage.
9. Inspect connector plate (22) for excessive scoring.
10. Inspect flat surface of backplate (24). It should be free of excessive scoring.
11. Inspect thrust washers (27) and bearing (28). They should be free of wear and cracks.
12. Inspect shaft (15) for fretting in bearing areas. Inspect keyway and key for wear.

EX,1474,6030,J -19-04MAY93

60
30
5

ASSEMBLE MOTOR

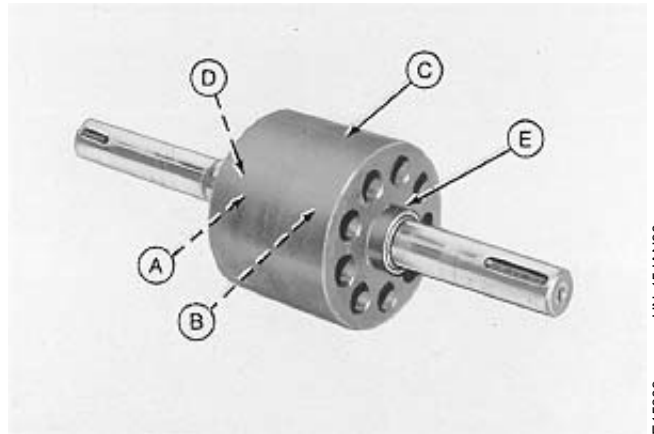
1. Install seal (A) and snap ring (B).



E15608 -UN-16JAN90

EX,1474,6030,K -19-04MAY93

2. Install snap ring (A) on shaft. Install key (B) in drive shaft.
3. Slide piston block (C) on shaft with 45 degree chamfer (D) on inside diameter toward round snap ring on shaft.
4. Slide spacer (E) on shaft.



E15609 -UN-15JAN90

EX,1474,6030,L -19-04MAY93

- A—Snap Ring
- B—Key
- C—Piston Block
- D—45° Chamfer
- E—Spacer

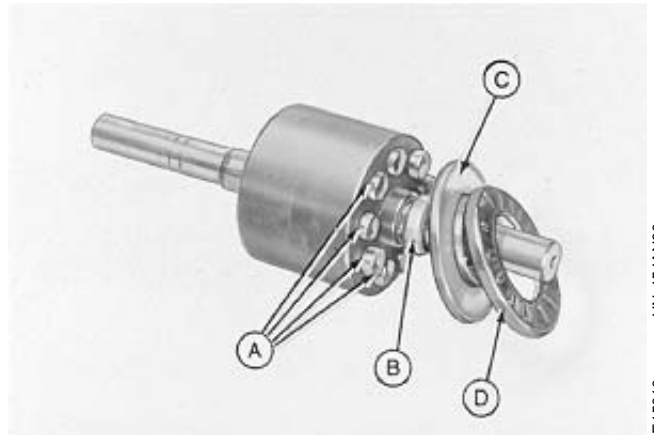
5. Lubricate the pistons (A) and install them in the bores next to the drive end of the shaft, rounded ends facing outward. Install each piston in its original bore.

6. Slide pivot (B) over shaft.

NOTE: The two pivots are identical.

7. Slide piston race (C) and thrust bearing (D) onto shaft.

- A—Pistons
- B—Pivot
- C—Piston Race
- D—Thrust Bearing



E15610 -UN-15JAN90

EX,1474,6030,M -19-04MAY93

8. Lubricate the bearing race (G) and install in housing.

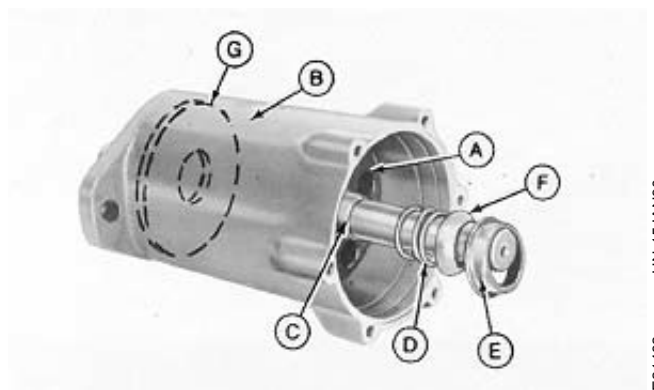
9. Lay housing on side and insert lubricated shaft and piston block assembly (A) in housing (B). Be certain parts are properly aligned and seated.

10. Place spring collar (C) and spring (D) over shaft.

11. Install pivot (F).

12. Install pilot (E).

- A—Piston Block
- B—Housing
- C—Spring Collar
- D—Spring
- E—Pilot
- F—Pivot
- G—Bearing Race



E21432 -UN-15JAN90

EX,1474,6030,N -19-04MAY93

13. Lubricate and assemble pistons (A) in spider (B).

14. Assemble piston assembly into piston block. Install each piston into its original bore.

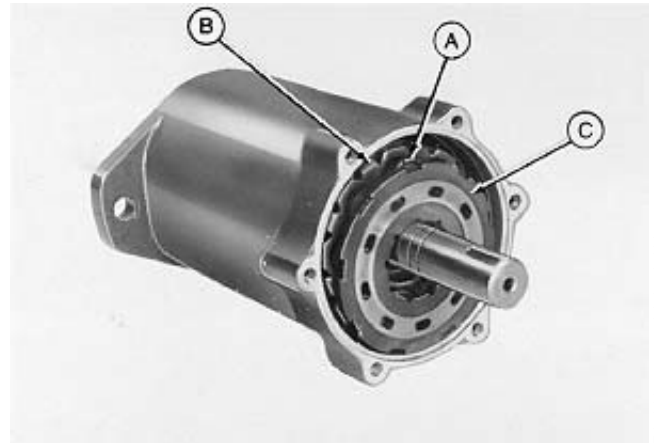
15. Lubricate shoes of pistons and lay flat part of connector plate (C) over pistons.

16. Install new O-ring on backplate.

17. Install and rotate backplate until all bolt holes are properly aligned. Insert six cap screws and tighten to 22 N·m (16 lb-ft).

18. Install snap ring, thrust washer, thrust bearing, thrust washer, and retain with snap ring.

19. Install washer and shaft seal. Retain with snap ring.



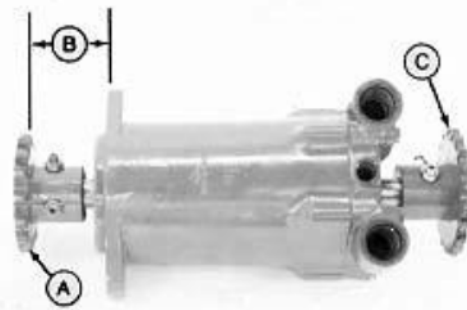
E15612 -UN-15JAN90

EX,1474,6030,O -19-04MAY93

IMPORTANT: Clean hydraulic motor shaft thoroughly.

20. Position conditioner drive sprocket (A) on hydraulic motor shaft with 62—65 mm (2.4—2.6 in.) (B) between motor flange and inside of sprocket, tighten set screws and jam nuts.

21. Install platform drive sprocket (C) on hydraulic motor shaft, and leave set screws and jam nuts loose.

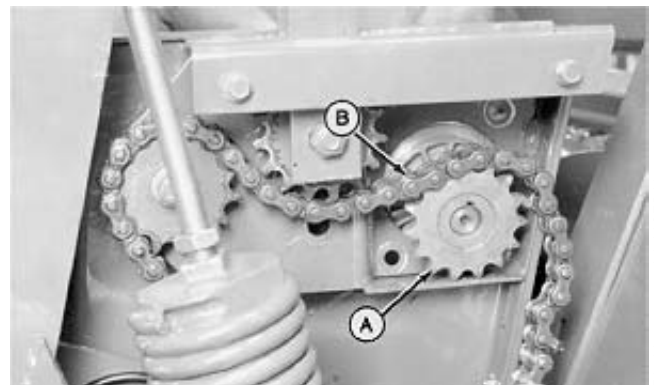


E33943 -UN-04JAN90

EX,1474,6030,P -19-04MAY93

INSTALL HYDRAULIC MOTOR

1. Install hydraulic motor (A) through side sheet. Tip motor down to install chain (B) over sprocket



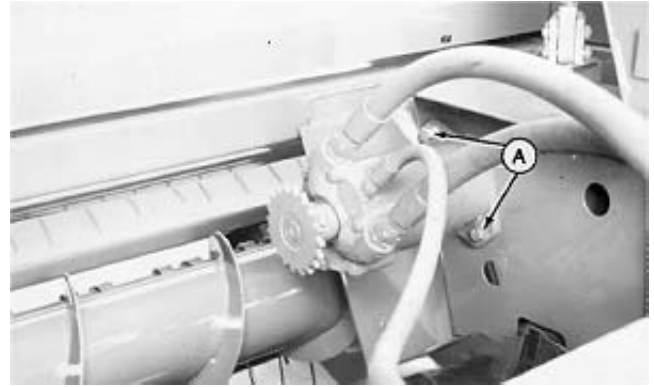
E35394 -UN-11SEP90

EX,1474,6030,Q -19-04MAY93

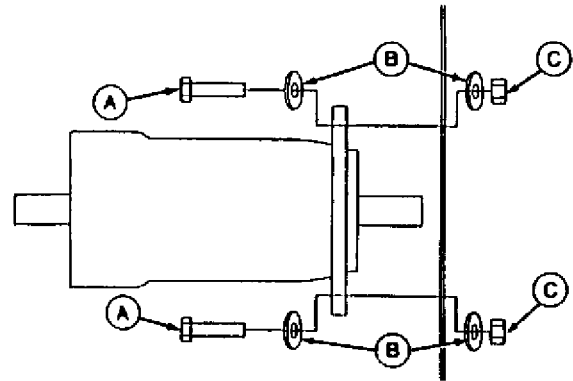
60
30
8

IMPORTANT: Make sure cap screws are tightened to 75 lb-ft (102 N·m). If cap screws are not tightened, machine damage may occur.

2. Fasten hydraulic motor to right side sheet with two 1/2 x 1-3/4-in. cap screws (A), four 0.531 x 1.00 x 0.125-in. hardened washers (B), and lock nuts (C). On each cap screw, install one washer under cap screw head and one washer under nut. Tighten cap screws to 75 lb-ft (102 N·m).



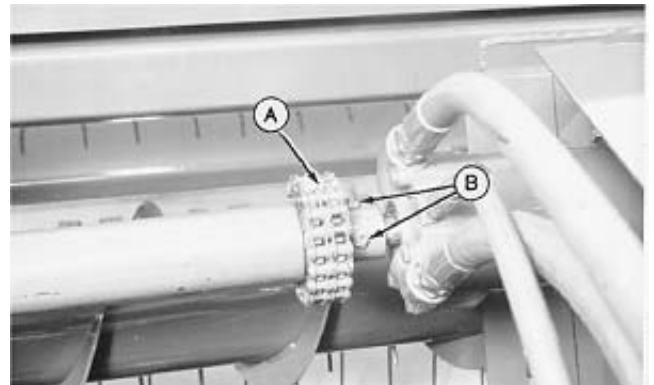
-UN-07JUL89
E32790



-UN-17MAR93
E37090

EX,1474,6030,R -19-04MAY93

3. Position cross shaft sprocket with hydraulic motor sprocket so coupler chain can be installed.
4. Install coupler chain (A) around sprockets.
5. Slide sprocket assembly and cross shaft as far as possible onto the motor shaft.
6. Tighten setscrews and jam nuts (B).



-UN-07JUL89
E32791

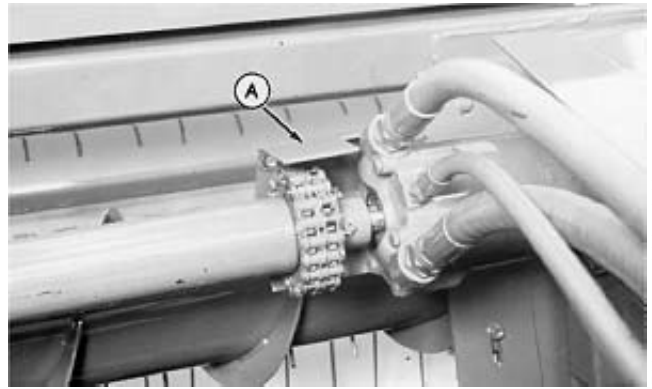
EX,1474,6030,S -19-04MAY93

60
30
9

7. Install shield (A) and spacers with two cap screws.
8. Change oil if system was contaminated.
9. Check oil level and install replacement filter.
10. Start tractor and run mower-conditioner slowly for one minute to bleed air.
11. Check hose connections for leaks and recheck oil level.

IMPORTANT: To prevent excessive wear or component failure, do not run machine without load for long periods of time.

12. Run at full PTO speed for one minute and check operation.
13. Change filter after ten hours of operation.

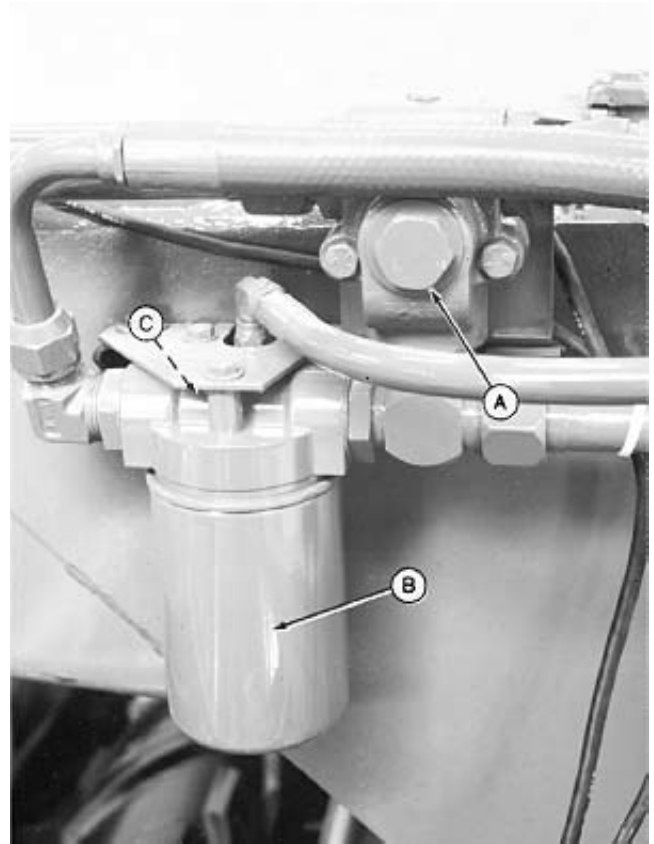


-UN-07.JUL89
E32792

EX,1474,6030,T -19-04MAY93

GENERAL INFORMATION

The system relief valve (A) and filter (B) are located on the left side of the tongue. The filter is a 10-micron full flow filter which has a bypass valve (C) in the filter base.



E33944 -UN-13APR93

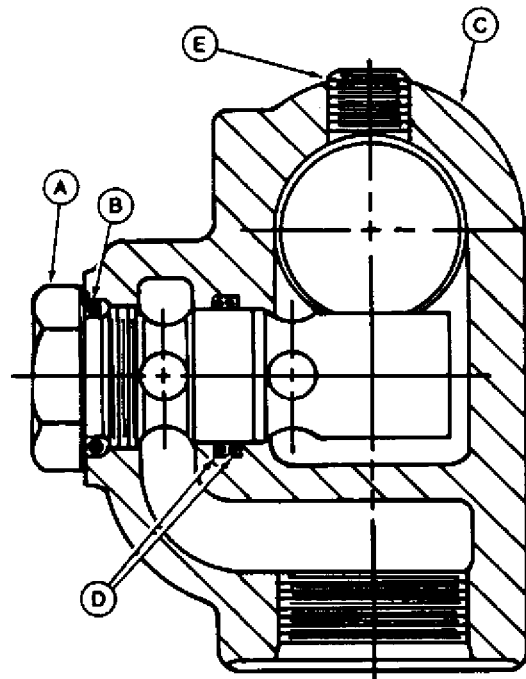
EX,1474,6035,A -19-04MAY93

RELIEF VALVE

The relief valve (A), external O-ring (B), and internal O-ring with backup ring (D) are the only replaceable items in the housing (C). When the relief valve is replaced, (B) and (D) should also be replaced.

A test port (E) is located in the top of the housing to measure drive system pressure and relief pressure. The port has a 1/4-in. NPT thread.

- A—Relief Valve
- B—O-Ring
- C—Relief Valve Housing
- D—O-Ring and Backup Ring
- E—Test Port



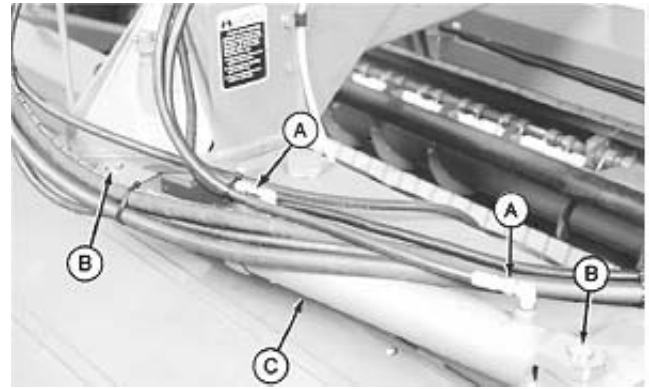
E21436 -UN-15JAN90

EX,1474,6035,B -19-04MAY93

60
35
2

REMOVE CYLINDER

1. Remove tie bands retaining hydraulic hoses.
2. Disconnect two hydraulic hoses (A) and cap open ends.
3. Remove two pivot pins (B) and steering cylinder (C).



EX,1474,6040,A -19-04MAY93

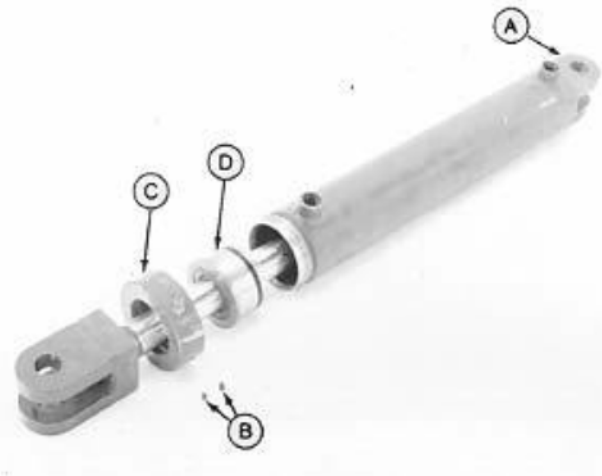
-UN-31MAR93
E37127

RECONDITION CYLINDER

IMPORTANT: Do not clamp cylinder barrel in vise because damage will result.

1. Clamp cylinder clevis (A) in vise.
2. Remove two set screws (B).
3. Use large pipe wrench to thread retainer (C) off barrel.
4. Insert screwdriver in hose port to pry end cap (D) from barrel.

A—Cylinder Clevis
B—Set Screws
C—Retainer
D—End Cap



EX,1474,6040,B -19-04MAY93

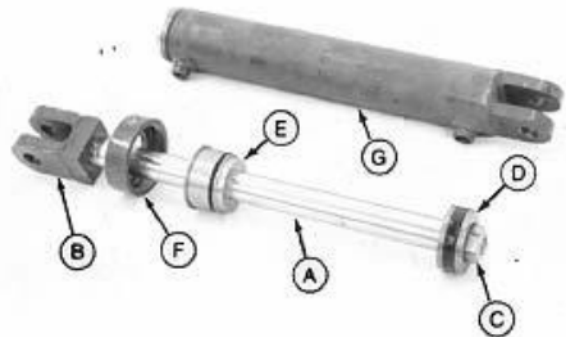
-UN-04JAN90
E33946

5. Pull cylinder rod (A) from barrel.
6. Clamp rod clevis (B) in vise and remove nut (C) with impact wrench.

NOTE: Note position of backup ring and seal lips for reassembly.

7. Remove piston (D), end cap (E), and retainer (F) from cylinder rod. Remove and discard seals, O-rings, and back-up rings.

8. Inspect rod (A) and inside diameter of barrel (G) for nicks, scratches, or score marks. Replace damaged or worn parts.



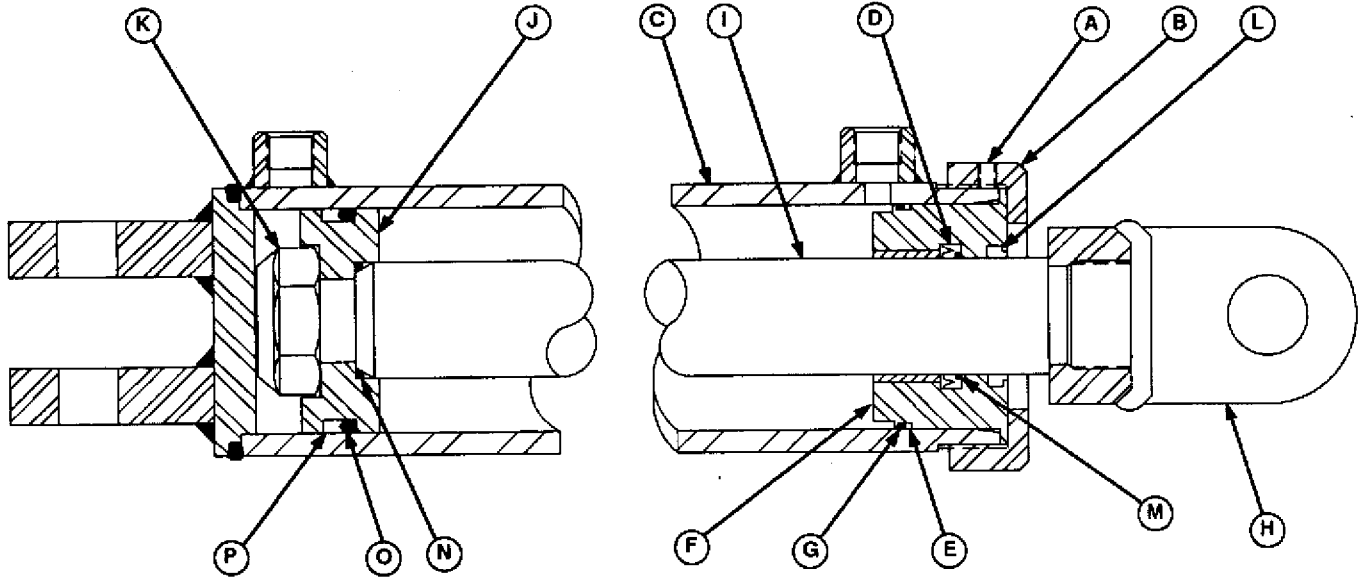
A—Rod
B—Clevis
C—Nut
D—Piston

E—End Cap
F—Retainer
G—Barrel

EX,1474,6040,C -19-04MAY93

-UN-12FEB92
E36722

ASSEMBLE STEERING CYLINDER

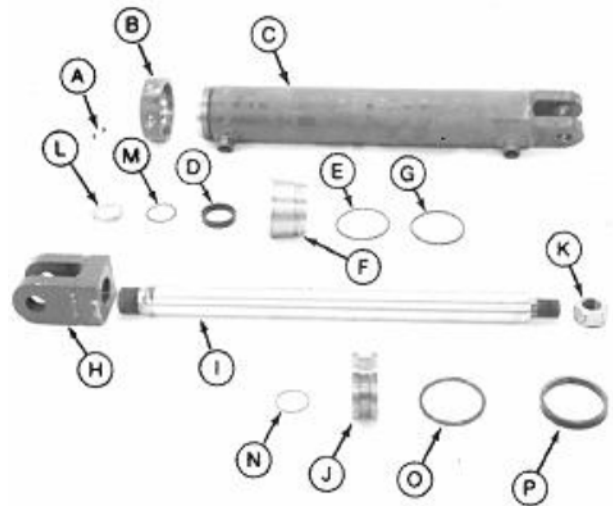


- Clean and dry all parts thoroughly.
- Replace all O-Rings and seals.
- Apply a light film of hydraulic oil on O-Rings and metal parts.

1. Assemble cylinder in reverse order of disassembly.

NOTE: Stake clevis on cylinder rod because pin-to-pin distance is not adjustable.

- A—Set Screws
- B—Retainer
- C—Barrel
- D—Seal 0.250 x 1.50 in. ID
- E—Backup Ring 0.125 x 3 in. ID
- F—End Cap
- G—O-Ring 0.139 x 2.734 in. ID
- H—Clevis
- I—Rod
- J—Piston
- K—Nut
- L—Seal 1.50 ID x 1.87 in. OD
- M—Backup Ring
- N—O-Ring 0.070 x 1.364 in. ID
- O—Seal 2.625 ID x 3 in. OD
- P—Backup Ring



60
40
2

-JUN-09MAR92
E36705

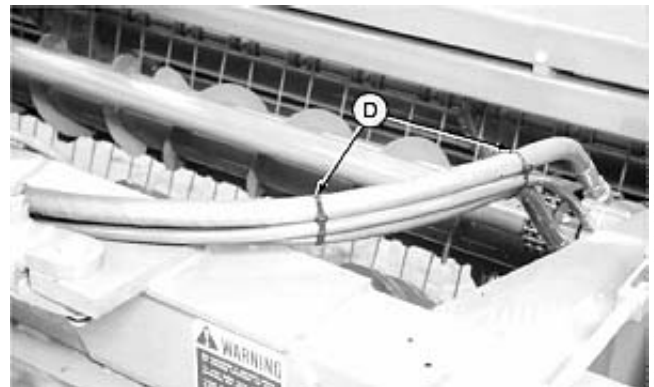
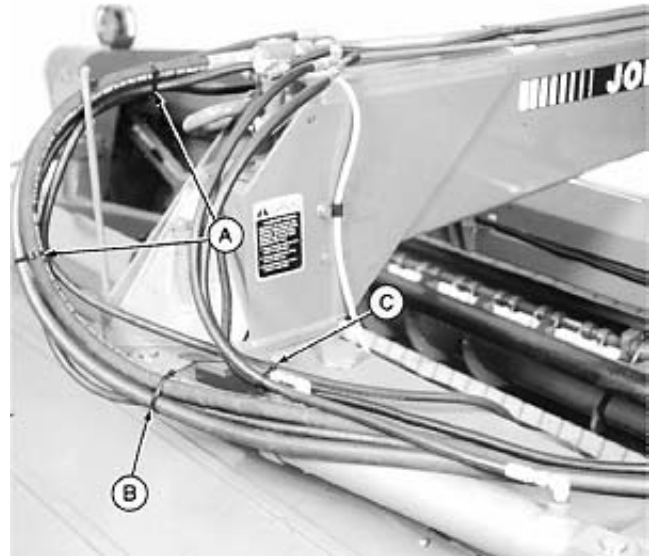
-JUN-20FEB92
E36733

EX,1474,6040,D -19-04MAY93

POSITION AND SECURE HOSES

1. Attach mower-conditioner to tractor hitch and fasten with quick-lock pin.
2. Connect two hydraulic steering cylinder hoses to tractor outlet.
3. Move tongue to the maximum right position (cylinder fully extended).
4. Starting from upper pivot area, secure three motor hoses and lift hose with two tie bands (A) as shown.
5. Secure the three motor hoses with tie band (B).
6. Pull hoses to the right until they are snug.
7. Secure cylinder lift hose, cylinder base hose, and wiring harness to cylinder rod end fitting with tie band (C).
8. Secure the three motor hoses with two tie bands (D) as shown.

- A—Tie Band Location (2)
- B—Tie Band Location (1)
- C—Tie Band Location (1)
- D—Tie Band Location (2)



EX,1474,6040,E -19-04MAY93

E37097 -JUN-17MAR93

E37098 -JUN-17MAR93

60
40
3

Steering Cylinder/Position and Secure Hoses

60
40
4

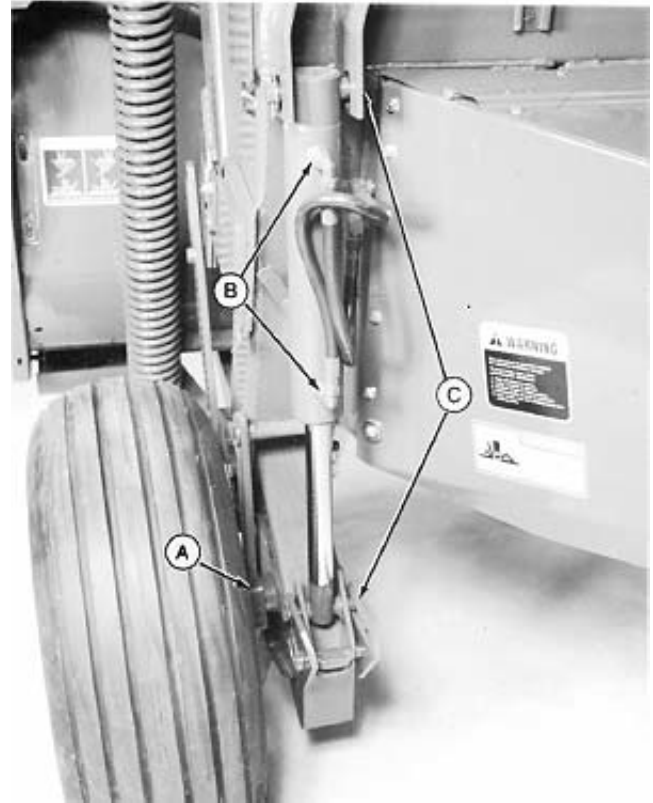
REMOVE LIFT CYLINDERS

1. Raise platform and lower both cylinder stops (A).
2. Lower machine onto cylinder stops and shut off tractor.

CAUTION: Relieve pressure in system by cycling tractor levers in both directions to avoid injury from escaping pressure oil.

NOTE: Master cylinder on left side illustrated.

3. Disconnect hydraulic hoses (B) and cap open ends.
4. Remove pins (C) and cylinder.



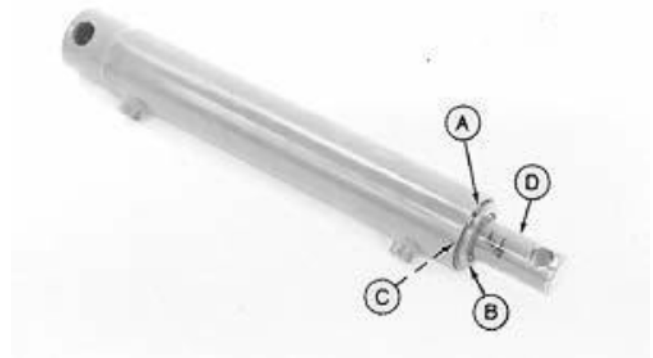
EX,1474,6045,A -19-04MAY93

E36702
-UN-04FEB92

RECONDITION MASTER CYLINDER

1. Remove external snap ring (A).
2. Push end cap (B) into barrel past internal snap ring (C).
3. Remove internal snap ring.
4. Pull rod (D) from cylinder barrel.

A—External Snap Ring
B—End Cap
C—Internal Snap Ring
D—Rod



EX,1474,6045,B -19-04MAY93

E33950
-UN-04JAN90

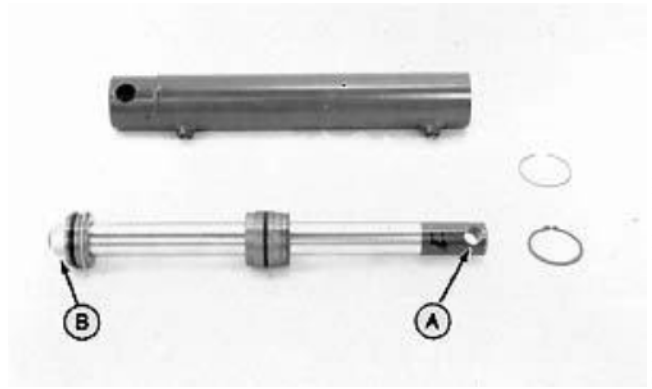
60
45
1

IMPORTANT: Clamp rod near pin hole (A) to prevent damage to finished surface.

5. Clamp end of rod in vise.
6. Use impact wrench to remove nut (B).
7. Remove piston (E) and end cap (J) from rod. Remove and discard seals, O-rings and backup rings.

NOTE: Note position of backup rings and seal lips for reassembly.

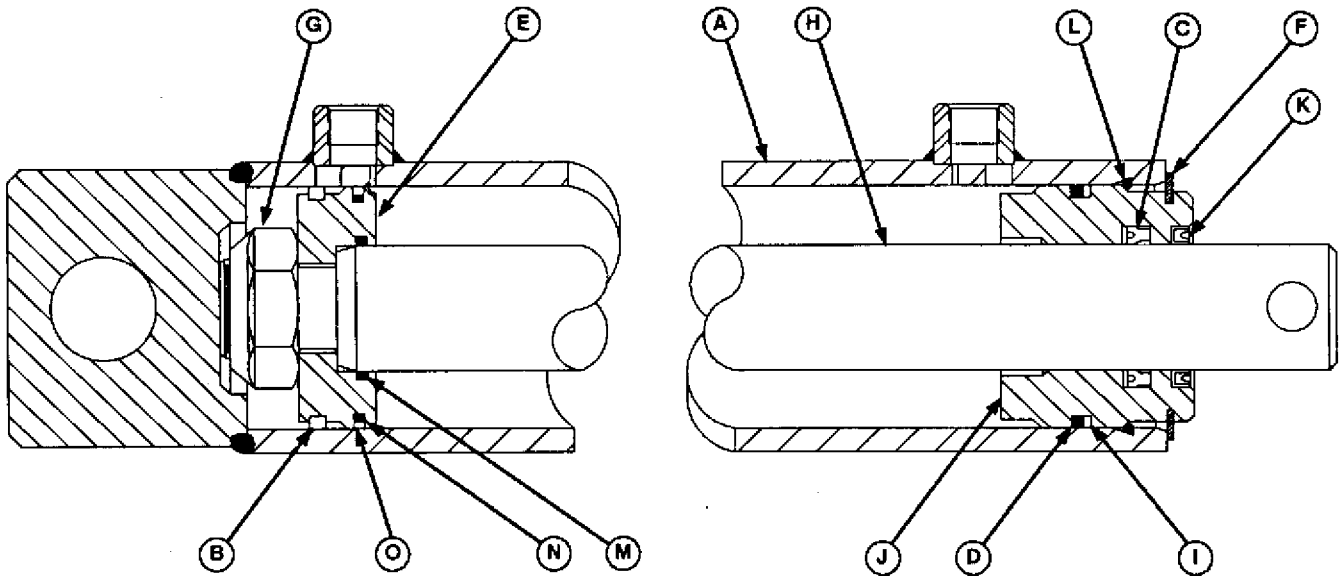
8. Inspect cylinder barrel (A) inside diameter and rod (H) outside diameter for nicks, scratches, or score marks. Replace damaged or worn parts.



E33951 -UN-04JAN90

EX,1474,6045.C -19-04MAY93

ASSEMBLE MASTER CYLINDER



- Clean and dry all parts thoroughly.
- Replace all O-Rings and seals.
- Apply a light film of hydraulic oil on O-Rings and metal parts.

1. Assemble in reverse order of disassembly.

- A—Barrel
- B—Wiper 0.190 x 2.375 ID x 2.500 in. OD
- C—Seal 0.310 x 1.500 ID x 1.870 in. OD
- D—O-Ring 0.094 x 2.312 in. ID
- E—Piston
- F—Snap Ring
- G—Nut
- H—Rod
- I—Backup Ring 0.050 x 2.312 ID x 2.400 in. OD
- J—End Cap
- K—Seal 1.689 ID x 1.879 in. OD
- L—Snap Ring
- M—O-Ring 0.094 x 1.500 in. OD
- N—O-Ring 0.094 x 2.187 in. OD
- O—Seal (4 grooves) 0.190 x 2.375 ID x 2.50 in. OD



E36706 -JUN-09MAR92

60
45
3

E36732 -JUN-20FEB92

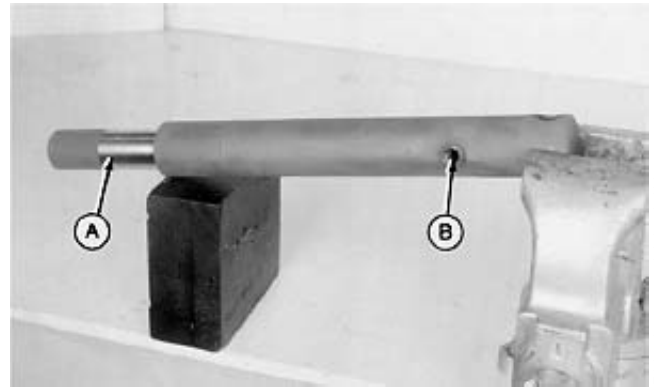
EX.1474,6045,D -19-04MAY93

RECONDITION SLAVE CYLINDER

Clean outside of cylinder thoroughly before disassembly.

IMPORTANT: Do not clamp barrel of cylinder in vise. Damage to cylinder may result.

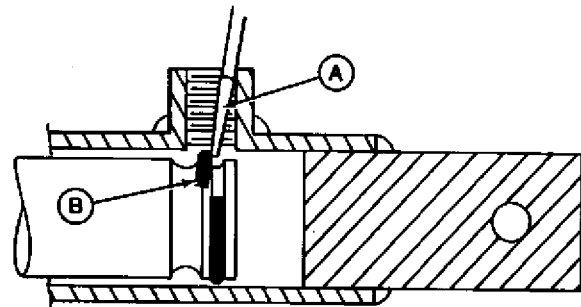
1. Clamp cylinder in vise by clamping at end cap as shown. Use a block of wood to support end of cylinder.
2. Pull rod (A) out until end of rod and snap ring can be seen through inlet port (B).



-UN-15JAN90
E21448

EX,1474,6045,E -19-04MAY93

3. Insert screwdriver (A) in inlet port and pry lock ring (B) into deep groove in the rod assembly. Rotate rod to insure entire ring is in groove.



E15632

-UN-15JAN90
E15632

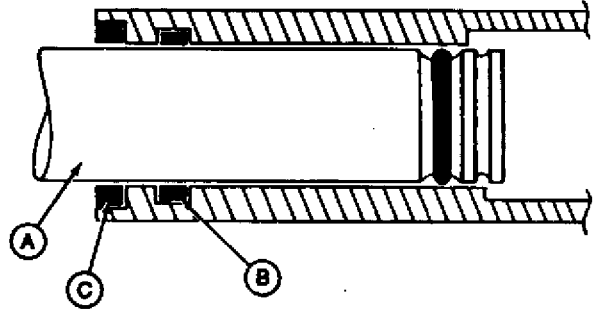
EX,1474,6045,F -19-04MAY93

4. Remove rod assembly (A) from cylinder housing.
5. Remove shaft seal (B) and wiper (C) from housing.

NOTE: Note position of seal lips for reassembly.

6. Inspect inside diameter of housing and outside diameter of rod for nicks, scratches or score marks. Replace damaged or worn parts.

NOTE: Replace shaft seal, wiper seal, and lock ring. Do not reuse.



-UN-15JAN90
E15633

EX,1474,6045,G -19-04MAY93

ASSEMBLE SLAVE CYLINDER



-UN-16JAN90
E15634

A—Lock Ring
B—Piston Rod

C—Housing

D—Shaft Seal

E—Wiper Seal

Clean and dry all parts thoroughly. Oil metal parts lightly before assembly.

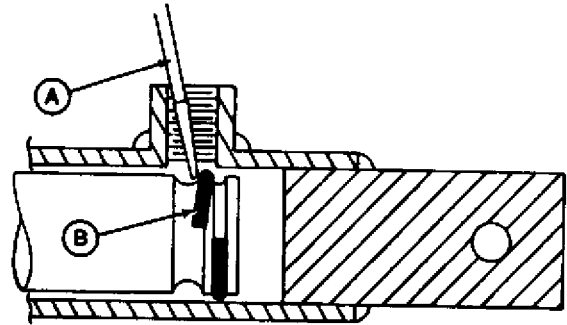
1. Install new lock ring (A) in deep groove of piston rod (B).
2. Install new shaft seal (D) and wiper (E) in cylinder housing (C).

3. Oil outside of piston rod and carefully insert rod in housing.

4. Push rod into housing until lock ring area of rod can be seen through the port.

EX,1474,6045,H -19-04MAY93

5. Insert screwdriver (A) through port and pop lock ring (B) into the locked position.
6. Extend rod fully to make sure lock ring is locked.



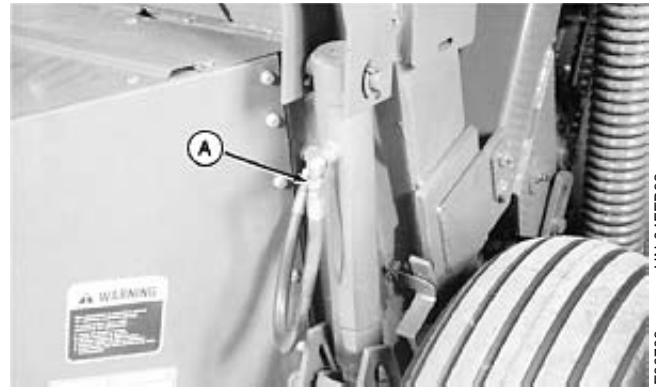
EX,1474,6045,I -19-04MAY93

E15635 -UN-15JAN90

BLEED LIFT CYLINDERS

⚠ CAUTION: Shield leaking oil during bleeding procedure. Escaping pressurized oil can cause injury.

1. Loosen hose fitting (A) at slave cylinder.
2. Raise machine and hold tractor lever for five seconds.
3. Tighten hose fitting.
4. Raise and lower machine to check phasing.
5. Repeat procedure until air is bled from hose and pipe between master and slave cylinders.



EX,1474,6045,J -19-04MAY93

E36703 -UN-04FEB92

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