SideHill 9500 Combine Repair Operation And Tests

For complete service information also see:

John Deere Harvester Works
TM1545 (04JAN01)
LITHO IN U.S.A.
ENGLISH

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.

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 operation and tests. Repair sections tell how to repair the components. Operation and tests 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.

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

Fundamental service information is available from other sources covering basic theory of operation, fundamentals of troubleshooting, general maintenance, and basic type of failures and their causes.

HX,1545,INTR -19-18NOV92

This technical manual covers information unique to the SideHill 9500 Combine:

- Tune Up and Adjustment
- Electrical System
- Power Train Repair
- Power Steering and Brakes
- Header Repair
- Feeder House Repair

See TM1401; 9400, 9500 and 9600 Combines—Repair—for information on the following:

HX,1545,IFC -19-09AUG93

Contents

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.

TM1545-19-04JAN01

Section 10
GENERAL

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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.

TS227 -UN-23AUG88

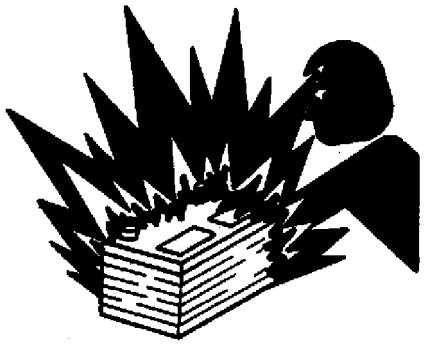
DX,FLAME -19-04JUN90

PREVENT BATTERY EXPLOSIONS

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16˚C (60˚F).



TS204 -UN-23AUG88

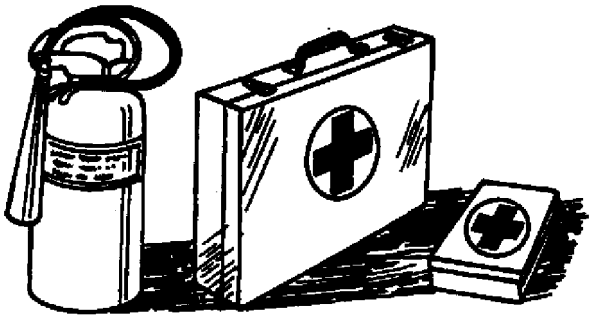
DX,SPARKS -19-03MAR93

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.



TS291 -UN-23AUG88

DX,FIRE2 -19-03MAR93

PREVENT ACID BURNS

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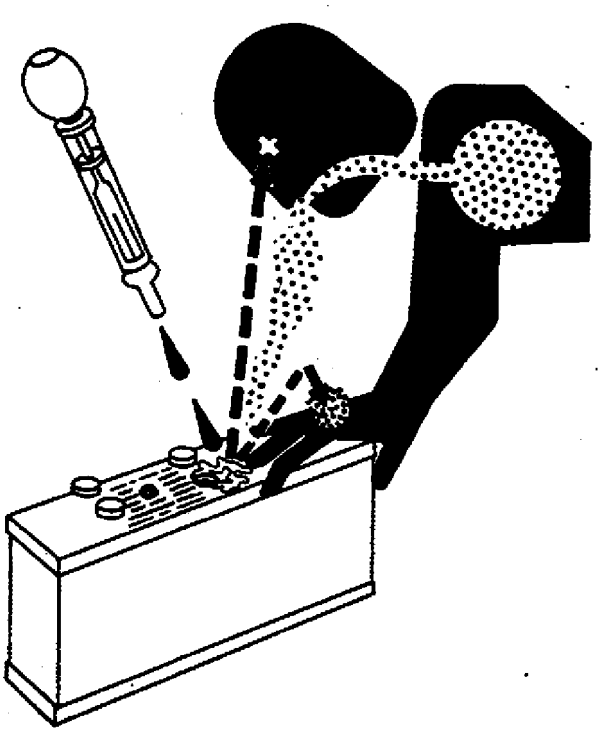
Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:
1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15—30 minutes. Get medical attention immediately.

If acid is swallowed:
1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 quarts).
3. Get medical attention immediately.



TS203 -UN-23AUG88

DX,POISON -19-21APR93

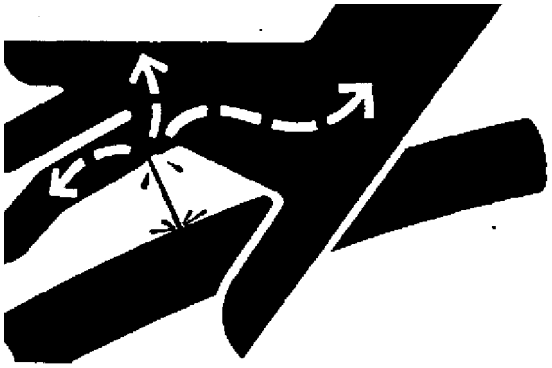
AVOID HIGH-PRESSURE FLUIDS

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.

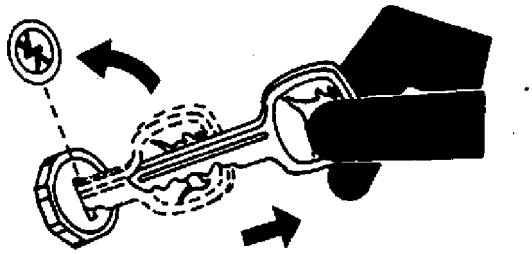


X9811 -UN-23AUG88

DX,FLUID -19-03MAR93

PARK MACHINE SAFELY

Before working on the machine:
- Lower all equipment to the ground.
- Stop the engine and remove the key.
- Disconnect the battery ground strap.
- Hang a “DO NOT OPERATE” tag in operator station.



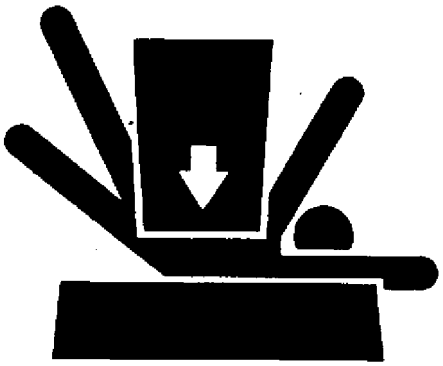
TS230 -UN-24MAY89

DX,PARK -19-04JUN90

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.



TS229 -UN-23AUG88

DX,LOWER -19-04JUN90

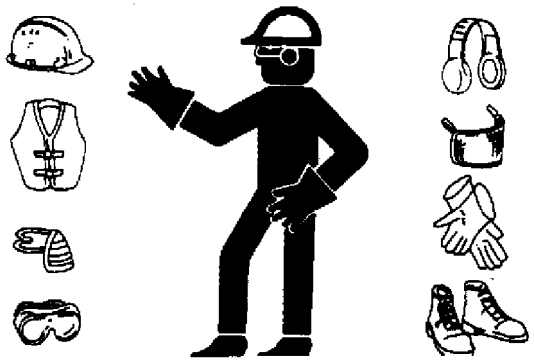
WEAR PROTECTIVE CLOTHING

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.

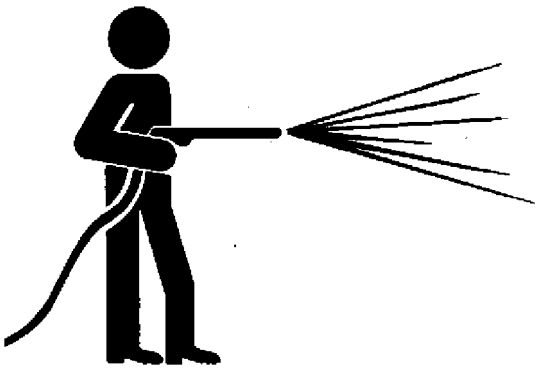


TS206 -UN-23AUG88

DX,WEAR -19-10SEP90

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.



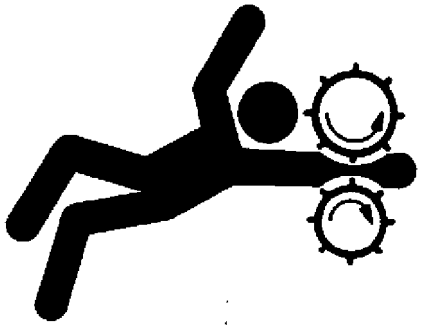
T6642EJ -UN-18OCT88

DX,CLEAN -19-04JUN90

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.



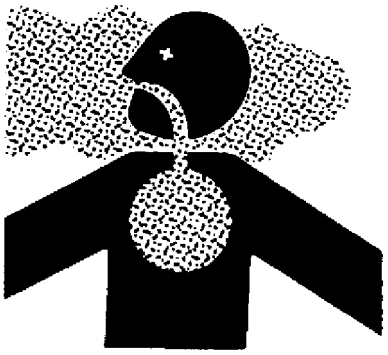
TS228 -UN-23AUG88

DX,LOOSE -19-04JUN90

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.

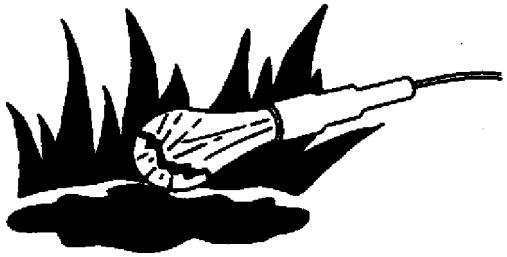


TS220 -UN-23AUG88

DX,AIR -19-04JUN90

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.

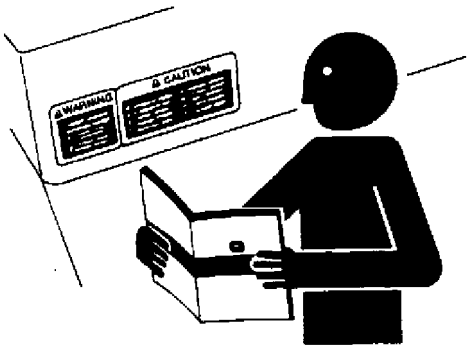


TS223 -UN-23AUG88

DX,LIGHT -19-04JUN90

REPLACE SAFETY SIGNS

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



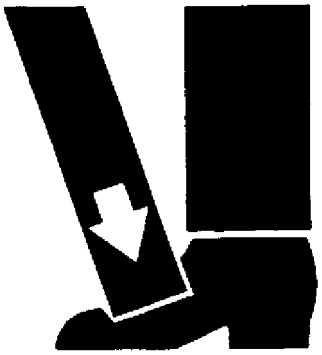
TS201 -UN-23AUG88

DX,SIGNS1 -19-04JUN90

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.



TS226 -UN-23AUG88

DX,LIFT -19-04JUN90

SERVICE TIRES SAFELY

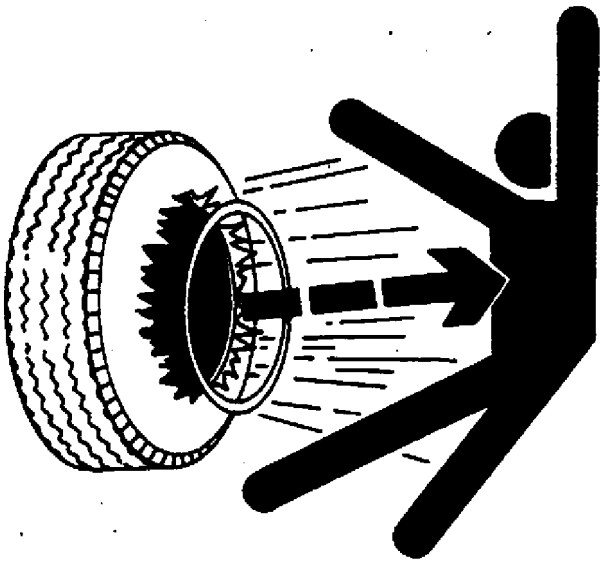
Explosive separation of a tire and rim parts can cause serious injury or death.

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.



TS211 -UN-23AUG88

DX,RIM -19-24AUG90

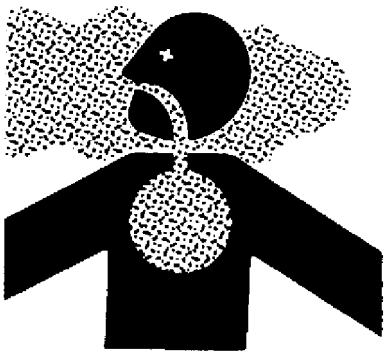
AVOID HEATING NEAR PRESSURIZED FLUID LINES

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.

TS953 -UN-15MAY90

DX,TORCH -19-03MAR93

REMOVE PAINT BEFORE WELDING OR HEATING



TS220 -UN-23AUG88

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

USE PROPER TOOLS

TS779 -UN-08NOV89

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.

DX,REPAIR -19-04JUN90

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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.

TS218 -UN-23AUG88

DX,SERV -19-03MAR93

DISPOSE OF WASTE PROPERLY

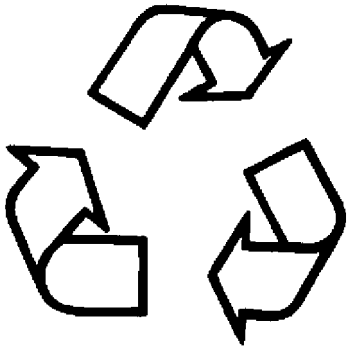
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

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

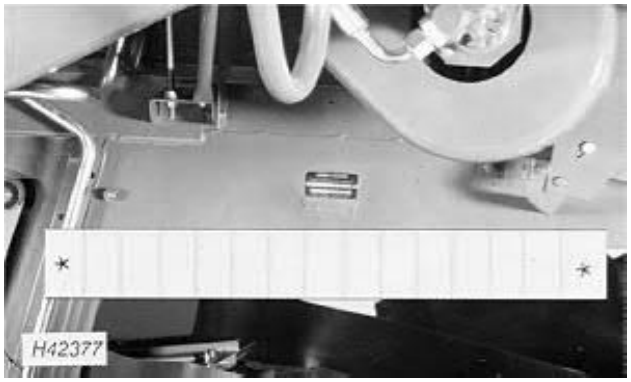
Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

TS231 -19-07OCT88

DX,LIVE -19-25SEP92

COMBINE IDENTIFICATION NUMBER

Located on left-hand side above rear axle.

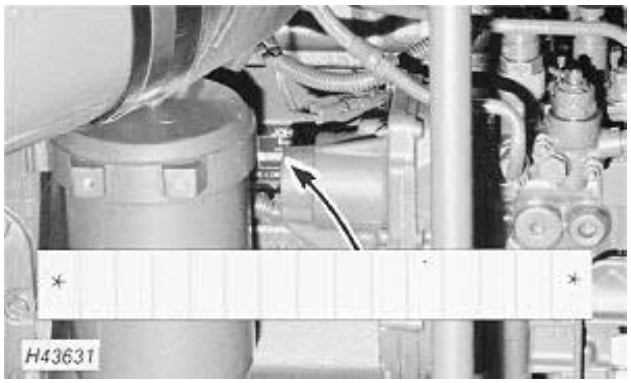


-UN-29OCT90
H42377

H01,9000ID,B -19-09AUG93

ENGINE SERIAL NUMBER

The engine serial number is located on rear side of engine.



-UN-24JUN91
H43631

SH,9500ID,D -19-29APR92

SPECIFICATIONS

Engine:	Make	John Deere
	Model	6076II
	Type	six-cylinder, in line, valve-in-head, diesel, turbocharged.
	Brake Horsepower	175 to 194 kW (235 with 250 boost)
	Displacement	7.6L (466 cu. in.)
	Bore and Stroke:	116 x 121 mm (4.56 x 4.75 in.)
	Firing Order	1-5-3-6-2-4
	Air Cleaner	Dry Type with Safety Element
	Thermostats (Two)	82˚C (180˚F)
Electrical System:		12 volt, negative ground with 95 amp alternator
Transmission:		three speeds
Brakes:		hydraulic shoe
Cylinder:	Types	rasp bar or spike tooth
	Diameter	660 mm (26 in.)
	Width	1362 mm (53-1/2 in.)
	Number of bars: rasp bar	10
Concave:	Types	open bar or spike tooth
	Area	81 sq. cm (1259 sq. in.)
Beater:	Diameter	396 mm (15-1/2 in.)
	Number of wings	8
Beater Grate:	Type	open bar two-position adjustable
	Area	53 sq. cm (821.5 in.)

HX,TM1545,BA -19-10AUG93

SPECIFICATIONS

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Finger Bar:	Type	adjustable
	Area	0.48 m^2 (744 sq. in.)
Separator:	Type	straw walkers
	Width	1397 mm (55 in.)
Cleaning Shoe:	Chaffer width	1286 mm (51 in.)
	Chaffer length	1220 mm (48 in.)
	Sieve width	1286 mm (51 in.)
	Sieve length	1159 mm (46 in.)
	Precleaner width	1286 mm (51 in.)
	Precleaner length	840 mm (33 in.)
	Total area	4.11 m^2 (6370 sq. in.)
Straw Walkers:	Type	Lip
	Number of walkers	4
	Length	4500 mm (177 in.)
	Total area	6.26 m^2 (9702 sq. in.)
Grain Tank:	Capacity	182 Bu (S.N. 645301—)
		204 Bu (S.N. 650301—)
	Average unloading rate	4200L/min (120 bu./min.)
Weights:	Less header (base equipment on a Corn Combine)	12 154 kg (26,795 lbs.)
Capacities:	Fuel tank	530L (140 gal.)
	Cooling system (with heater)	36L (38 U.S. qts.)
	Engine crankcase (with filter)	25L (26-1/2 U.S. qts.)
	Transmission	9.6L (10 U.S. qts.)
	Final Drives (each)	8.5L (9 U.S. qts.)
	Feeder House Reverser Gearcase	1.9L (2 U.S. pts.)
	Primary Countershaft Gearcase	1.4L (2-1/2 U.S. pts.)
	Straw Walker Drive Gearcase	0.7L (1-1/2 U.S. pts.)
	Dual-Range Cylinder Drive Gearcase	1.9L (2 U.S. qts.)
	Engine Gearcase	16L (17 U.S. qts.)
	Loading Auger Gearcase	4.7L (5 U.S. qts.)
	Hydraulic/Hydrostatic Reservoir	34L (36 U.S. qts.)

TM1545,1015,A -19-29MAR93

OPERATING SPEEDS

Speeds shown are average and can vary from machine to machine. Speeds are rated at high idle with separator engaged, no load.

Engine:
Slow Idle (Separator Off)- 1200 rpm.
Mid Speed- 1680 rpm.
Fast Idle (Separator Engaged)- 2340 rpm.
Full Load Rated Speed- 2200 rpm.

Separator Drive Shaft Speed- 1550 rpm.

Main Countershaft Speed- 1550 rpm.

Hydrostatic Pump Speed With:
Ring and Pinion Final Drives-3510 rpm.

Cylinder Speed:
High Range-480-980 rpm.
Low Range-240-480 rpm.

Feeder House Lower Shaft- Variable Speed 520-715.

Secondary Countershaft- 530 rpm.

Cleaning Fan:
Standard- 750-1350 rpm.
Optional- 500-980 rpm.

Clean Grain Elevator- 400 rpm.

Tailings Elevator- 465 rpm.

Shoe Crankshaft- 280 rpm.

Straw Walkers- 170 rpm.

Unloading Auger Countershaft- 1060 rpm.

SH,9500SP,A -19-29APR92

Loading Auger- 430 rpm.

Inner Grain Tank Unloading Augers-Front and Rear-
360 rpm.

Vertical and Horizontal Unloading Augers-390 rpm.

Straw Chopper:
High (Grain) 2130 rpm.
Low (Corn) 1595 rpm.

Straw Spreader Shaft- 235 rpm.

Shoe Grain Supply Augers Shaft- 405 rpm.

SH,9500SP,B -19-18MAR93

DIMENSION REFERENCE POINTS

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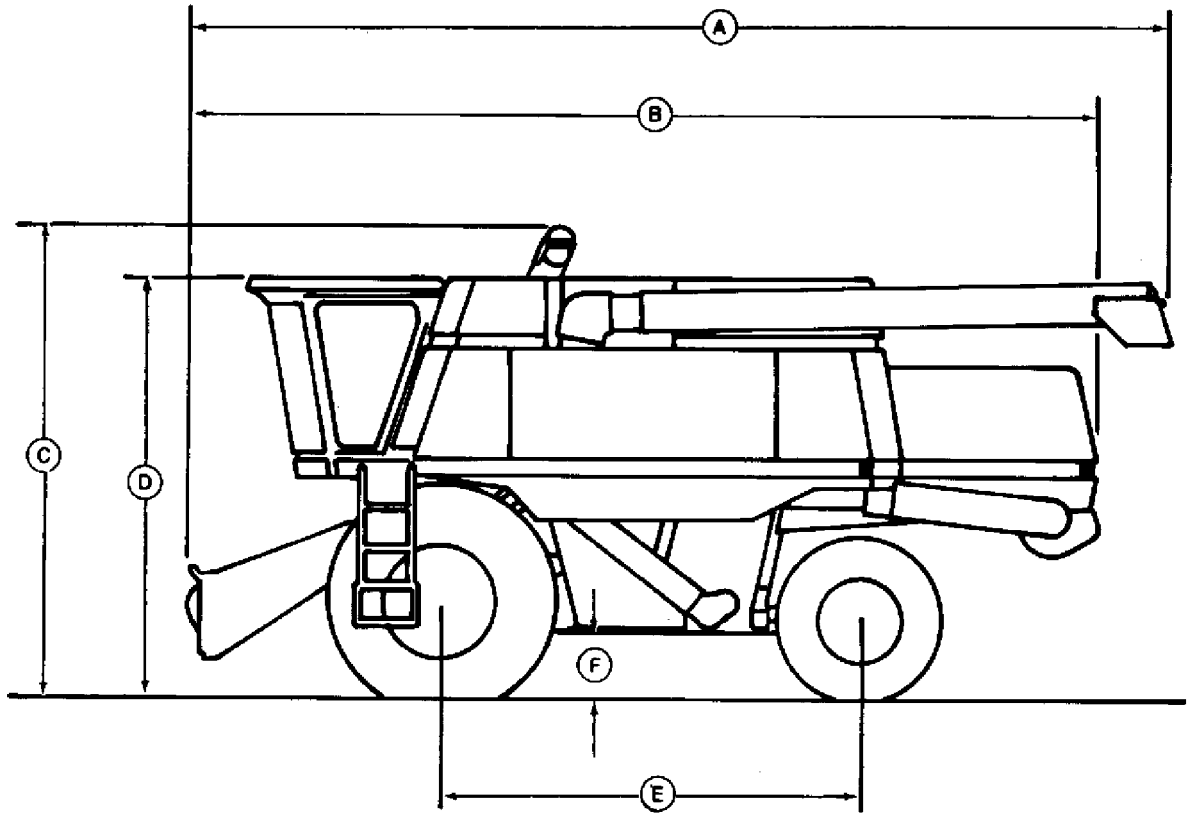
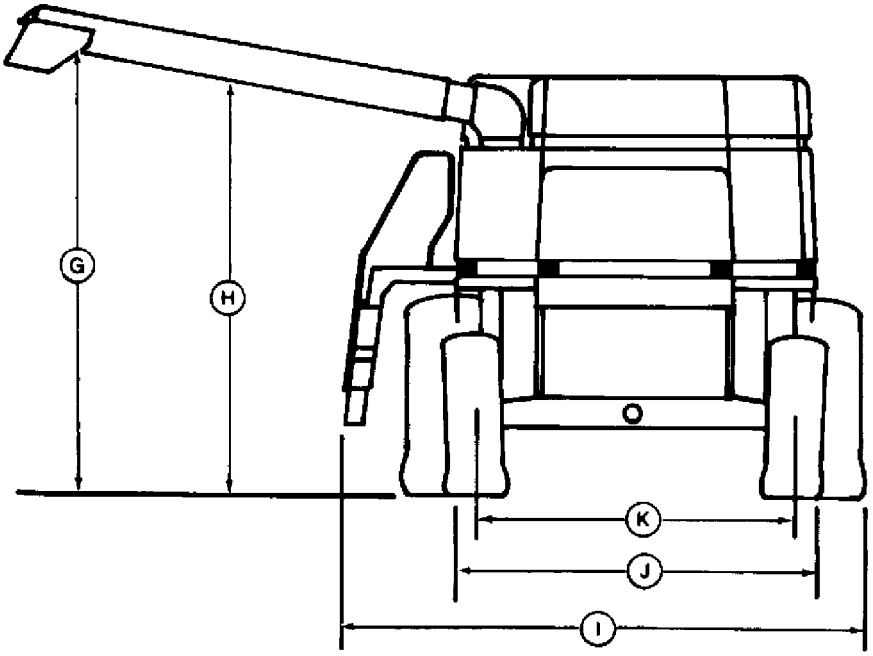




H44451

H44451 -UN-27APR92

SH,9500SP,J -19-29APR92

DIMENSIONS

The grain tank auger is 217 mm (8-1/2 in.) above the cab roof.

Additional clearance can be gained by removing the grain tank loading auger. See “REMOVING GRAIN TANK LOADING AUGER”.

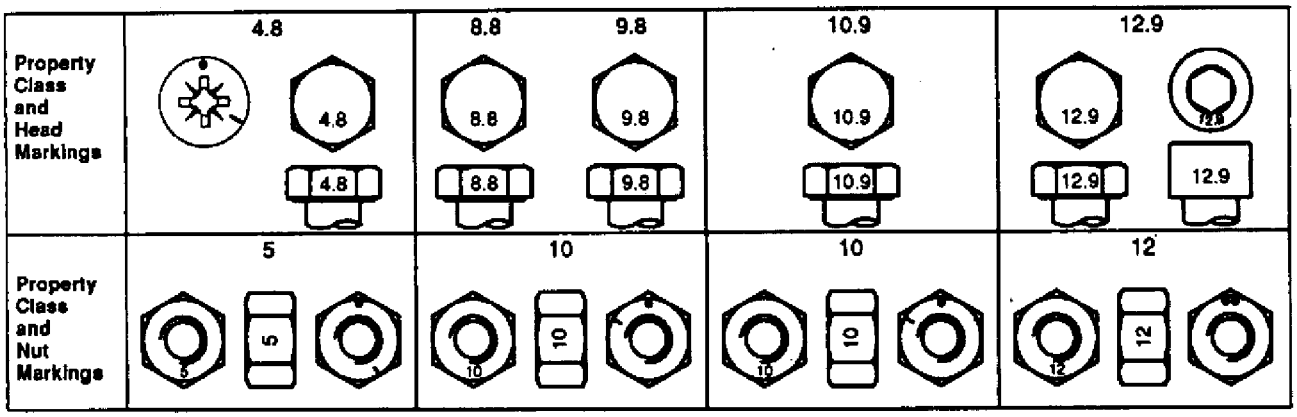
DIMENSION*	w/14 ft. Unloading Auger	w/17 ft. Unloading Auger	w/20 ft. Unloading Auger
A	7.8 m (25 ft. 7 in.)	8.7 m (28 ft. 7 in.)	9.6 m (31 ft. 7-in.)
B	8.1 m (26 ft. 7 in.)	8.1 m (26 ft. 7 in.)	8.1 m (26 ft. 7-in.)
C	4.28 m (14 ft. 1 in.)	4.28 m (14 ft. 1 in.)	4.28 m (14 ft. 1-in.)
D	4.01 m (13 ft. 2 in.)	4.01 m (13 ft. 2 in.)	4.01 m (13 ft. 2-in.)
E	3.92 m (12 ft. 10 in.)	3.92 m (12 ft. 10 in.)	3.92 m (12 ft. 10-in.)
F	0.74 m (2 ft. 5 in.)	0.74 m (2 ft. 5 in.)	0.74 m (2 ft. 5-in.)
G	4.19 m (13 ft. 9 in.)	4.35 m (14 ft. 3 in.)	4.51 m (14 ft. 10-in.)
H	4.02 m (13 ft. 2 in.)	4.18 m (13 ft. 8 in.)	4.34 m (14 ft. 3-in.)
I	4.53 m (14 ft. 10-in.)	4.53 m (14 ft. 10-in.)	
J	3.44 m (11 ft. 4 in.)	3.44 m (11 ft. 4 in.)	
K**	-	-	-

* Dimensions shown are with 24.5 x 32 drive tires.

** For adjustable rear axle, see REAR AXLE ADJUSTMENT.

SH,9500SP,C -19-29APR92

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.

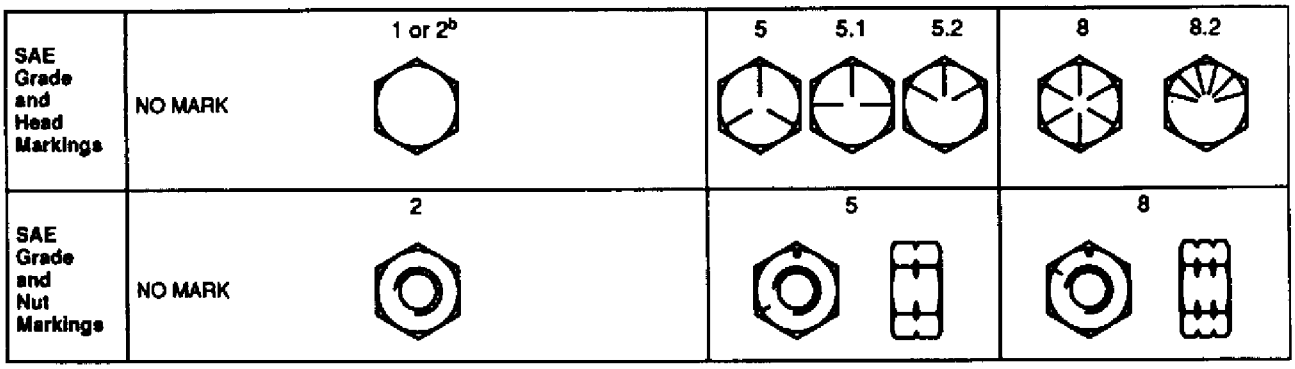
Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

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.

DX,TORQ2 -19-16APR92

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES



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.

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

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.

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.

DX,TORQ1 -19-15MAR91

O-RING BOSS FITTING TORQUE CHART

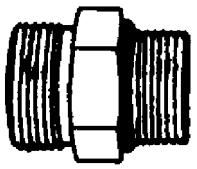
10
15
10

STRAIGHT FITTING

1. Inspect O-ring boss seat for dirt or defects.

2. Lubricate O-ring with petroleum jelly. Place electrical tape over threads to protect O-ring. Slide O-ring over tape and into O-ring groove of fitting. Remove tape.

3. Tighten fitting to torque value shown on chart.



T6243AE -UN-18OCT88

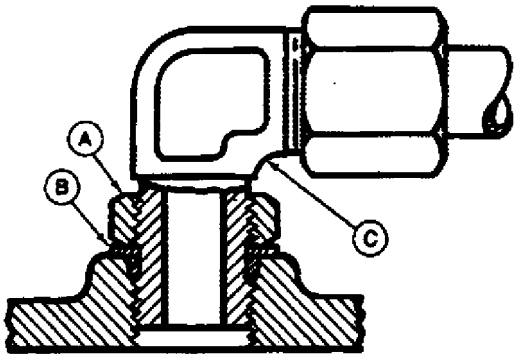
ANGLE FITTING

1. Back-off lock nut (A) and back-up washer (B) completely to head-end (C) of fitting.

2. Turn fitting into threaded boss until back-up washer (B) contacts face of boss.

3. Turn fitting head-end (C) counterclockwise to proper index (maximum of one turn).

4. Hold fitting head-end (C) with a wrench and tighten locknut (A) and back-up washer (B) to proper torque value.



T6520AB -UN-18OCT88

NOTE: Do not allow hoses to twist when tightening fittings.

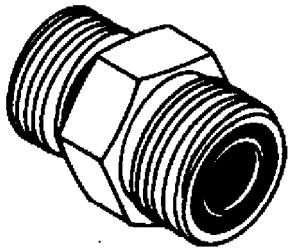
TORQUE VALUE CHART

Thread Size	Torque N·m	(lb-ft)
3/8-24 UNF	8	(6)
7/16-20 UNF	12	(9)
1/2-20 UNF	16	(12)
9/16-18 UNF	24	(18)
3/4-16 UNF	46	(34)
7/8-14 UNF	62	(46)
1-1/16-12 UN	102	(75)
1-3/16-12 UN	122	(90)
1-5/16-12 UN	142	(105)
1-5/8-12 UN	190	(140)
1-7/8-12 UN	217	(160)

NOTE: Torque tolerance is ± 10%.

1401,1010,T -19-12SEP91

FLAT FACE O-RING SEAL FITTING TORQUE CHART



T6243AD -UN-18OCT88

1. Inspect the fitting sealing surfaces. They must be free of dirt or defects.

2. Inspect the O-ring. It must be free of damage or defects.

3. Lubricate O-rings and install into groove using petroleum jelly to hold in place.

4. Push O-ring into the groove with plenty of petroleum jelly so O-ring is not displaced during assembly.

5. Index angle fittings and tighten by hand pressing joint together to insure O-ring remains in place.

6. Tighten fitting or nut to torque value shown on the chart per dash size stamped on the fitting. Do not allow hoses to twist when tightening fittings.

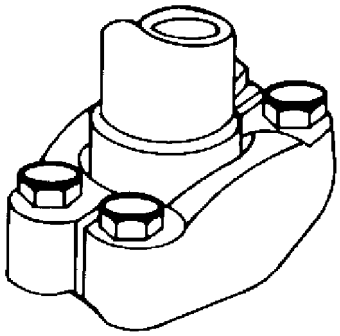
FLAT FACE O-RING SEAL FITTING TORQUE

Nominal Tube mm	O.D. (in.)	Dash Size	Thread Size in.	Swivel Nut Torque N·m	(lb-ft)
6.35	0.250	-4	9/16-18	24	18
9.52	0.375	-6	11/16-16	30	22
12.70	0.500	-8	13/16-16	47	35
15.88	0.625	-10	1-14	75	55
19.05	0.750	-12	1 3/16-12	114	84
22.22	0.875	-14	1 3/16-12	114	84
25.40	1.000	-16	1 7/16-12	155	115
31.75	1.250	-20	1 11/16-12	193	142
38.10	1.500	-24	2-12	225	166

NOTE: Torque tolerance is +15 -20%.

1401,1010,U -19-02MAR93

SAE FOUR BOLT FLANGE FITTING TORQUE CHART



H41160 -UN-31OCT89

1. Inspect the sealing surfaces for nicks or scratches, roughness or out-of-flat condition. Scratches cause leaks. Roughness causes seal wear. Out-of-flat causes seal extrusion. If these defects cannot be polished out, replace the component.

2. Install the correct O-ring (and backup washer if required) into the groove using petroleum jelly to hold it in place.

3. For split flange; loosely assemble split flange halves, being sure that the split is centrally located and perpendicular to the port. Hand tighten cap screws to hold parts in place. Do not pinch O-ring.

4. For single piece flange; put hydraulic line in the center of the flange and install four cap screws. With the flange centrally located on the port, hand tighten cap screws to hold it in place. Do not pinch O-ring.

5. For both single piece flange and split flange, be sure the components are properly positioned and cap screws are hand tight. Tighten one cap screw, then tighten the diagonally opposite cap screw. Tighten the two remaining cap screws. Tighten all cap screws within the specified limits shown in the chart.

DO NOT use air wrenches. DO NOT tighten one cap screw fully before tightening the others. DO NOT overtighten.

SAE FOUR BOLT FLANGE FITTING TORQUE

Nominal Flange Size	Cap Screw Size[1]	Torque[2] N·m Min.	N·m Max.	(lb-ft) Min.	(lb-ft) Max.
1	7/16 - 14 UNC	56	68	(42)	(50)
/	M10 X 1.5*	66	81	(49)	(60)

1. SAE Grade 5 or better cap screws with plated hardware.

2. Tolerance ± 10%. The torques given are enough for the given size connection with the recommended working pressure. Torques can be increased to the maximum shown for each cap screw size if desired. Increasing cap screw torque beyond this maximum will result in flange and cap screw bending and connection failures.

**Metric 10.9*

1401,1010,V -19-02MAR93

PREVENT HYDRAULIC SYSTEM CONTAMINATION

IMPORTANT: Cleanliness is very important when working on the hydraulic system. Prevent contamination by assembling the cylinders, hoses, couplers, and valves in a clean area of the shop.

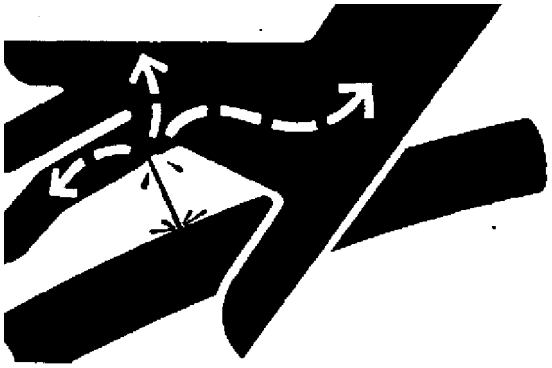
Leave protective caps on the fluid openings until ready to make the connection. Keep couplers clean. Abrasive particles, like sand or metal fragments, can damage seals, barrels and pistons, causing internal leakage.

HX,TM1545,FA -19-09AUG93

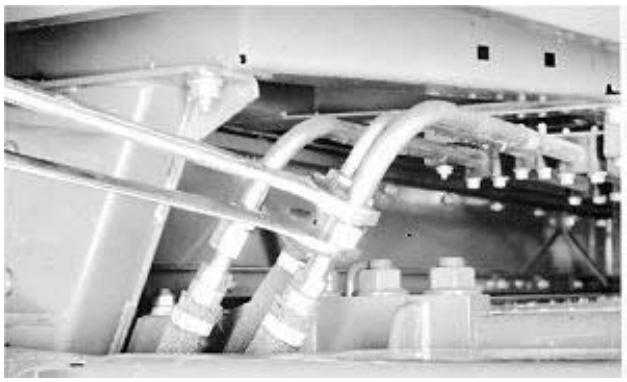
CHECK OIL LINES AND FITTINGS

CAUTION: 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 may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.



X9811 -UN-23AUG88



H44023 -UN-23FEB92

Check all oil lines, hoses and fittings regularly for leaks or defects. Make sure all clamps are in position and tight. Make sure hoses are not twisted or touching machine parts which are moving. Replace damaged parts.

IMPORTANT: Tighten fittings as specified in torque chart.

If necessary, use two wrenches to prevent hoses from twisting, bending or breaking tubing and fittings.

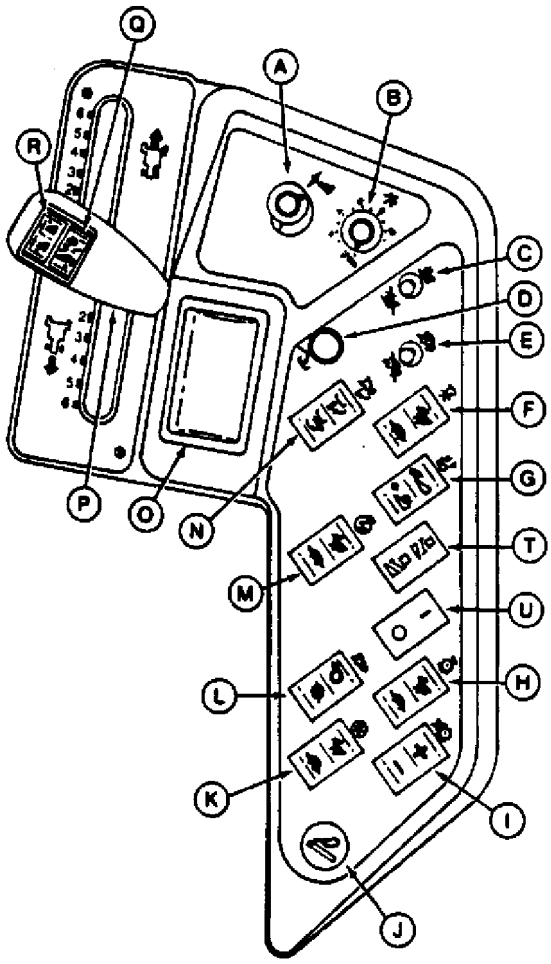
HX,1401,1010X -19-11DEC92

Section 40
ELECTRICAL SYSTEM

Contents

ARMREST CONTROL PANEL

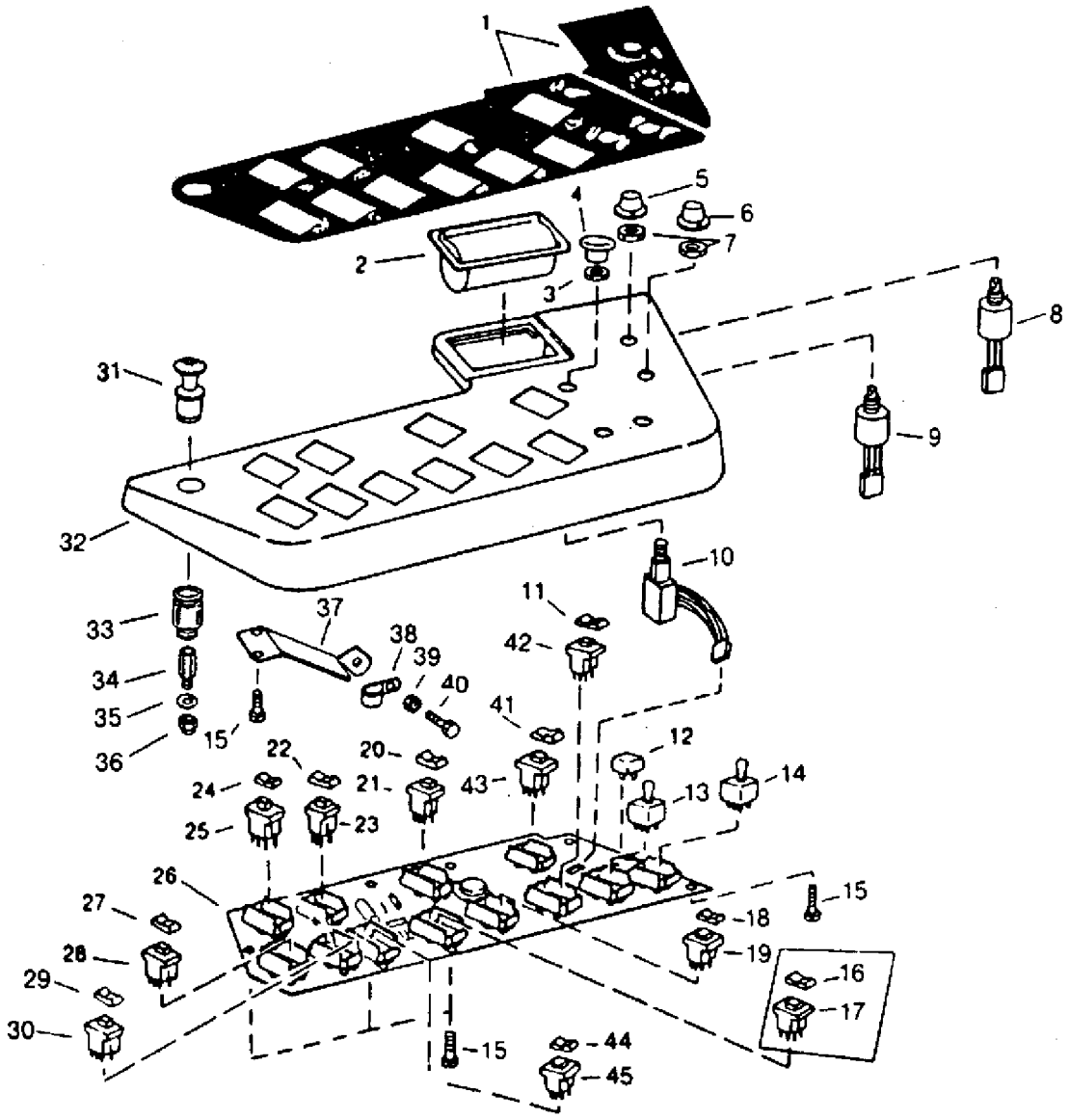
A—DIAL-A-MATIC™ (Optional)
B—DIAL-A-SPEED™ Control (Optional)
C—Header Engage
D—Unloading Auger Engage
E—Separator Engage
F—Manual Reel Speed
G—Reel Fore-and-Aft (Optional)
H—Cylinder Speed
I—Concave Spacing
J—Lighter
K—Cleaning Fan Speed
L—Four-Wheel Drive (Optional)
M—Engine Speed
N—Unloading Auger Swing
O—Ash Tray
P—Hydrostatic Drive Control Lever
Q—Reel Lift/Feederhouse Speed
R—Header Lift
T—Manual Tilt Control
Sidehill 9500
U—Auto Leveling System On\Off,
Sidehill 9500



H43549

H43549 -19-11JUN91

HX,1401,4005,AE-19-18NOV92



HX,1545,4005,AB-19-18NOV92

1—Panel
2—Ashtray
3—Nut
4—Knob, Unloading Auger
5—Knob, Dial-A-Matic
6—Knob, Dial-A-Speed
7—Lock Nut
8—Switch, Dial-A-Matic
9—Switch, Dial-A-Speed
10—Switch, Unloading Auger-ENGAGE
11—Switch Cap, Black, Rabbit/Turtle (Manual Reel Speed)
12—Relay, Header Engage
13—Toggle Switch, Yellow, (Separator Engage)
14—Toggle Switch, Yellow, (Header Engage)
15—Screw (4 used)
16—Switch Cap, Black, Manual Tilt Control
17—Rocker Switch, Black, Manual Tilt Control
18—Switch Cap, Black, Reel Fore/Aft
19—Rocker Switch, Reel Fore/Aft
20—Switch Cap, Orange, Engine Speed
21—Rocker Switch, Engine Speed
22—Switch Cap, Orange, Four Wheel Drive
23—Rocker Switch, Four Wheel Drive
24—Switch Cap, Black, Fan Speed
25—Rocker Switch, Fan Speed
26—Printed Circuit Board
27—Switch Cap, Black, Concave Clearance
28—Rocker Switch, Concave Clearance
29—Switch Cap, Black, Cylinder Speed
30—Rocker Switch, Cylinder Speed
31—Lighter
32—Cover
33—Lighter Housing
34—Spacer
35—Washer
36—Nut
37—Bracket
38—Clamp
39—Flange Nut
40—Cap Screw
41—Switch Cap, Unloading Auger Swing
42—Rocker Switch, Manual Reel Speed
43—Rocker Switch, UA Swing
44—Switch Cap, Auto Tilt/ON/OFF
45—Rocker Switch, Auto Tilt/ON/OFF

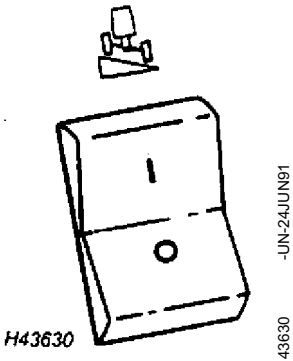
Legend for Armrest Control Panel

HX,1545,4005,A -19-18NOV92

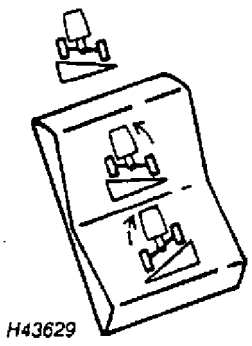
SWITCH KNOB DESCRIPTION/COLOR CODE

Before operating this combine, become familiar with the switches and controls.

Orange - ground drive and engine speed.
Yellow - drive engagement.
Black - operating adjustments and controls.



Automatic Level OFF/ON Switch



Manual Leveling Switch

TM1545,4005,A -19-09AUG93

CONTROL PANEL ROCKER TYPE SWITCH REPLACEMENT

1. Pry off switch cap (A).

2. Pull switch (B) straight up with pliers.

3. To install the new switch push it straight down, making sure that rib and groove (C) align.

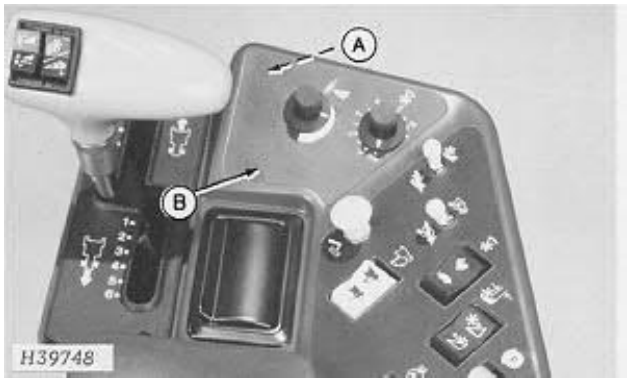
H42730 -UN-25OCT90

TM1545,4005,B -19-09AUG93

CONTROL PANEL KNOB AND TOGGLE TYPE SWITCH REPLACEMENT

1. Remove four screws (A) under control panel (B). One is under ashtray. Lift up panel, pulling harness with it.

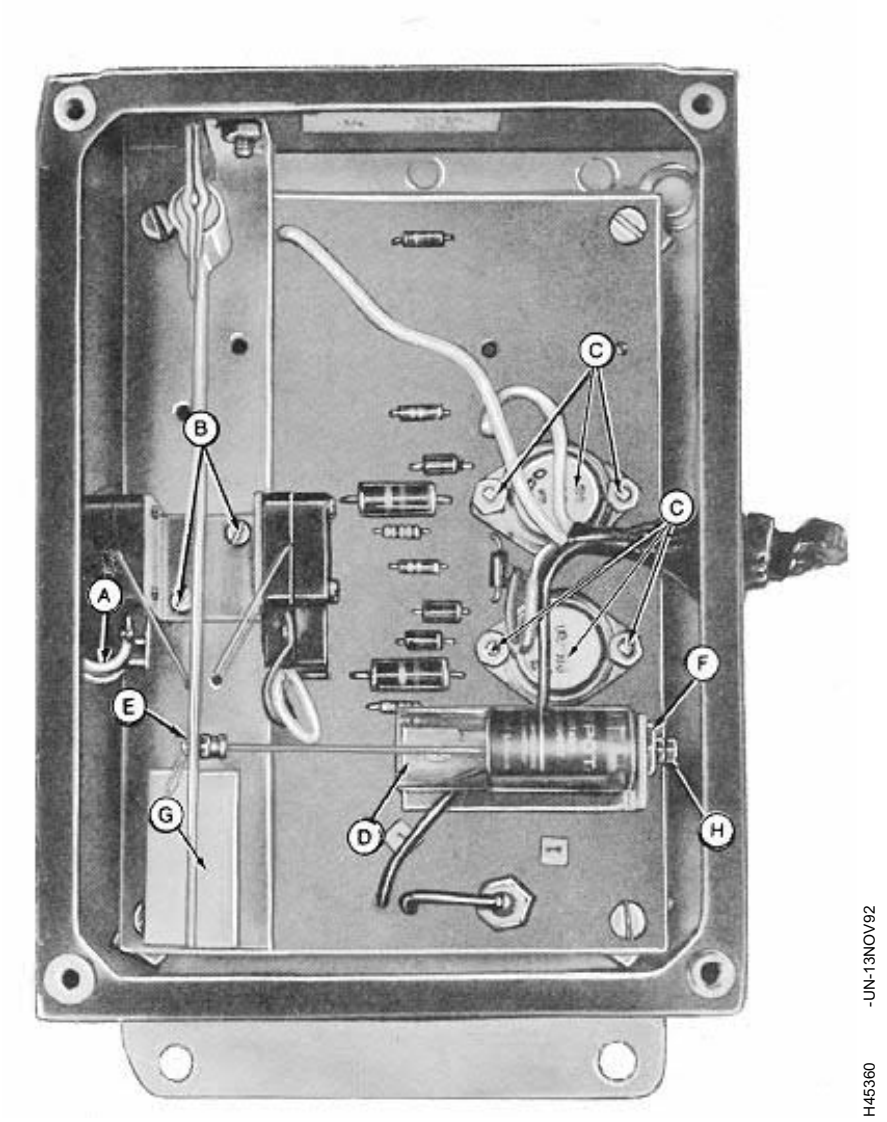
2. Turn panel over and remove four screws. Remove circuit board if you are replacing toggle switch or unloading auger engage switch.



H39748 -UN-11OCT88

TM1545,4005,C -19-09AUG93

REMOVE AND INSTALL LEVEL SENSING CONTROL SWITCHES, TRANSISTORS AND DASHPOT



A—Wiring Lead
B—Switch
C—Transistor
D—Dashpot
E—Nut
F—Nut
G—Pendulum
H—Orifice Screw

TM1545,4010,A -19-09AUG93

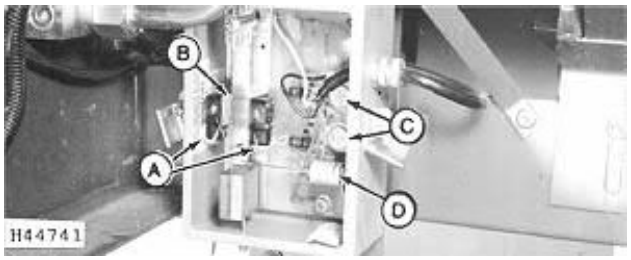
NOTE: Switch, transistors, and dashpot, CAN NOT be repaired. They MUST be replaced.

1. Remove control box cover.

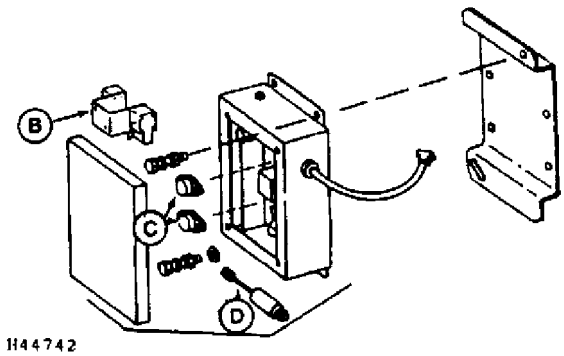
2. Replace switch (B) and transistor (C) as required.

3. Swing pendulum (G) to left to replace dashpot (D). Remove nuts (E and F). Install dashpot with NEW nuts (E and F).

4. Turn in adjusting orifice screw (H) until tilting the control box with the hands will not cause the pendulum to move. Back out orifice screw (H) until the pendulum (G) sluggishly swings when the control box is tilted.



H44741 -UN-01MAR93



H44742 -UN-29JUN92

TM1545,4010,B -19-09AUG93

DASHPOT ORIFICE ADJUSTMENT

IMPORTANT: Never steam clean or spray water on leveling control box. Moisture could condense in control box and cause malfunction.

When transporting or hauling combine, turn in the screw (B) on the bottom of the level sensing control box. This prevents the pendulum from moving. Turn screw out ten turns and lock with locking nut for field operation.

1. Manually move pendulum to either side; then release after combine is tilted. Leveling system should return combine to level position and then shut off. Two conditions could result, indicating needed dashpot orifice adjustment.

A. Combine stays fully tilted to same side. This indicates that the dashpot orifice is too small, causing pendulum to always actuate the tilt switch. This condition may affect the adjustment of the level sensing control box when replacing complete control box. Screw dashpot orifice outward until condition B occurs. Proceed to corrective action for condition B.

B. Combine comes to level and then levels in opposite direction. This condition indicates that the dashpot orifice is too large, causing pendulum to swing to other side rather than stopping in centered position. Turn the absorber orifice screw inward until correct leveling action is obtained.

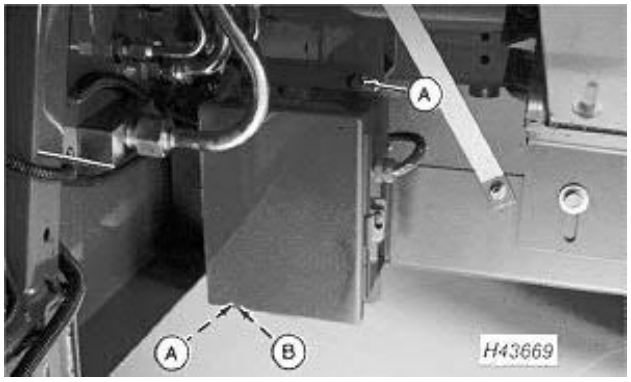
TM1545,4010,C -19-09AUG93

2. Loosen bolts (A) to adjust the control box.

3. Rotate bottom edge of control box toward high side of separator.

NOTE: Rotating bottom edge of control box 3 mm (1/8 in.) will change level of separator about one degree.

4. Tighten bolts (A).



HX,1545,4010,C -19-18NOV92

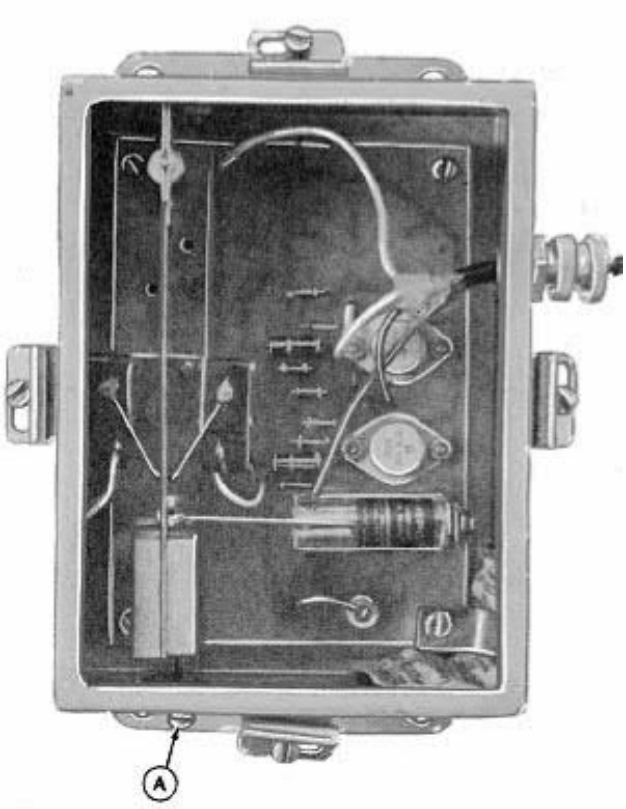
REPLACING COMPLETE CONTROL BOX

1. Remove defective control box from combine.

2. Loosen locking nut (A); then back off ten complete turns on the shipping screw. Retighten lock nut.

3. Install new control box on combine.

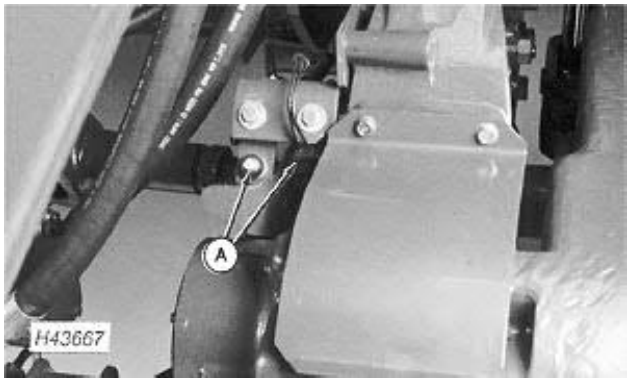
4. Adjust dashpot orifice. (See instructions in this group.)



HX,1545,4010,D -19-09AUG93

TILT LIMIT SWITCHES

The right and left tilt limit switches (A) are located in front of the left-hand side leveling cylinder. These limit switches stop the leveling action when the machine is at the end of its leveling cycle by cutting off electrical current flow to the tilt solenoids of the leveling control valve. This prevents the combine hydraulic system pressure from going to relief valve setting when at full tilt which can cause overheating if sustained.



TM1545,4010,D -19-29MAR93

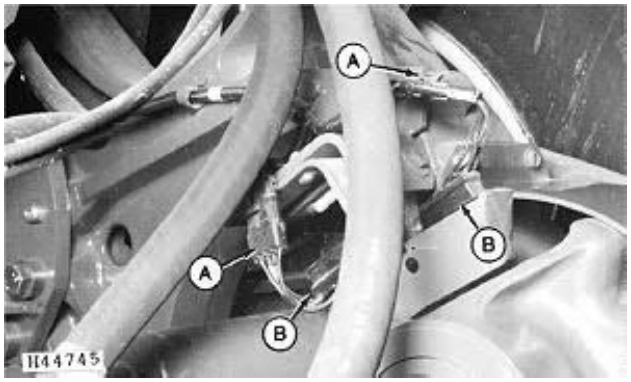
REMOVE AND INSTALL SIDEHILL LEVELING LIMIT SWITCHES

1. Disconnect wiring lead connectors (A).

2. Remove limit switches (B).

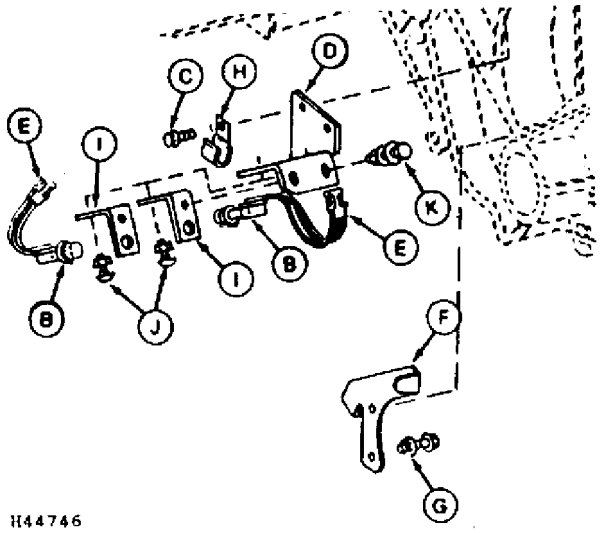
3. Switches CANNOT be repaired. They **MUST** be replaced.

4. Install switches.



H44745 -UN-29JUN92

A—Wiring Lead (2 used)
B—Switch (2 used)
C—Self-Locking Screw (2 used)
D—Bracket
E—Connector (2 used)
F—Bracket
G—Screw and Flange Nut (2 used)
H—Clip
I—Angle (2 used)
J—Bolt and Flange Nut (4 used)
K—Cap Screw, Washer, and Lock Nut (2 used)



H44746 -UN-29JUN92

HX,1545,4010,AD-19-09AUG93

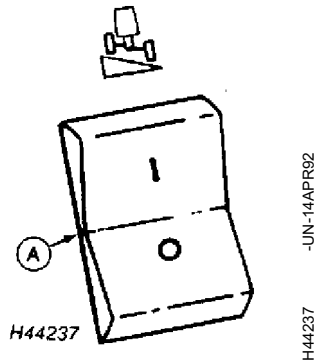
ADJUST SIDEHILL LEVELING LIMIT SWITCHES

IMPORTANT: Damage to hydraulic system may result if switches are not adjusted properly.

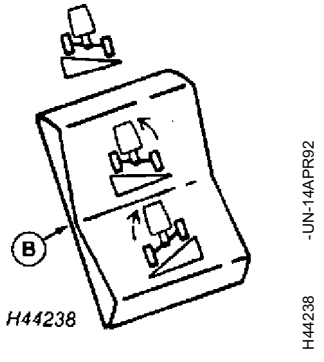
1. Start engine and press bottom (O) of leveling control switch (A) to turn off automatic leveling system.

IMPORTANT: Parking brake must be disengaged before tilting combine.

2. Press top of manual leveling switch (B) until combine reaches leveling limit (right-hand cylinder fully extended and left-hand cylinder fully retracted). Hold leveling switch in left tilt position for approximately 15 seconds to be certain right-hand cylinder is fully extended. Turn off engine.



-UN-14APR92
H44237



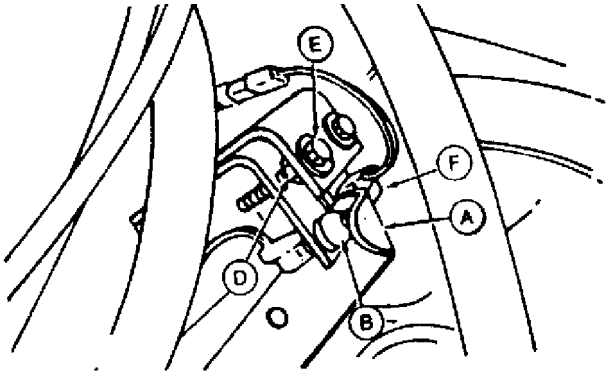
-UN-14APR92
H44238

HX,1545,4010,AE-19-09AUG93

3. Check to be certain stop (A) is against limit switch plunger (B) and switch is actuated (indicated by yellow eight in middle of steering column at (C)). If stop is not against limit switch, loosen nut (D) and turn cap screw (E) to move switch against stop.

4. If leveling cylinder stops before it reaches its leveling limit, loosen nut (D) and turn cap screw (E) to move switch away from stop. Press leveling switch to allow cylinder to fully extend. Move switch against stop.

5. Tilt combine in opposite direction and repeat procedure for switch (F).



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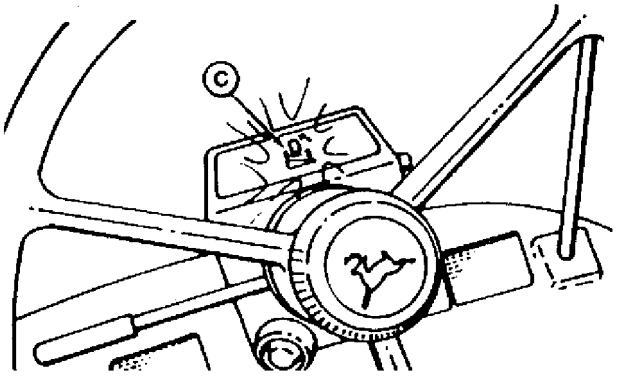
H45361



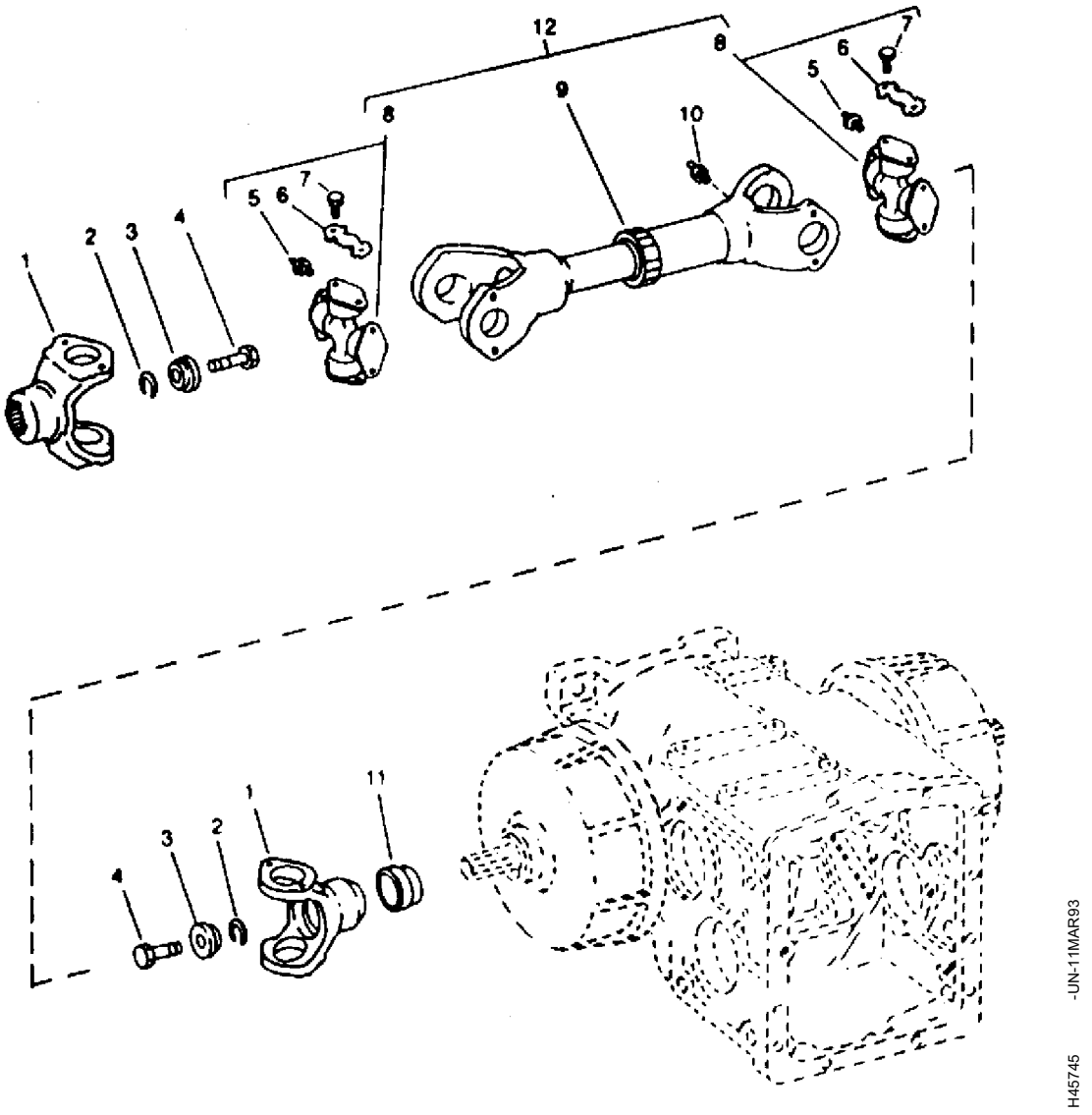
-UN-13NOV92
H45362

HX,1401,4025,F -19-18NOV92

Section 50
POWER TRAIN REPAIR

Contents

TRANSMISSION DRIVE SHAFT ASSEMBLY

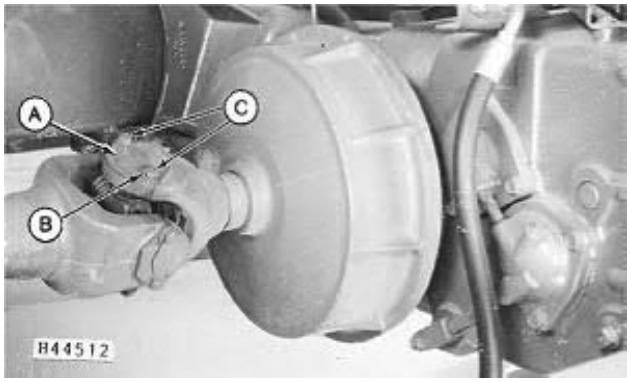


1—Yolk	4—Bolt	7—Cap Screw	10—Lubrication Fitting
2—Snap Ring	5—Lubrication Fitting	8—U-Joint Assembly	11—Spacer
3—Washer	6—Strap	9—Seal	12—Drive Shaft

Legend—Transmission Drive Shaft

TM1545,5005,A -19-09AUG93

REMOVE TRANSMISSION



-UN-21MAY92
H44512

CAUTION: Approximate weight of transmission is 306 kg (675 lbs).

Raise feeder house and lower safety stop.

Block wheels before working on combine.

1. (Not Illustrated) Remove hydrostatic motor. (See procedure in TM1401, Section 50, Group 20.)

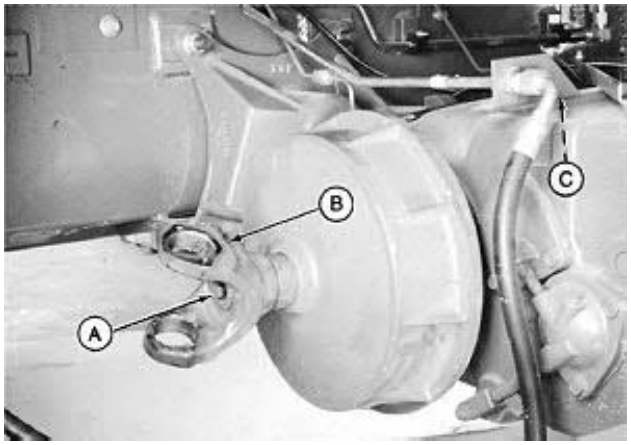
2. Tap down lock straps (B).

3. Remove four cap screws (C) from yoke.

4. Remove bearing caps (A). Both sides.

5. Remove U-Joint.

HX,1545,5005,A -19-18NOV92



-UN-03AUG92
H44857

6. Remove cap screw and washer (A).

7. Remove yoke and spacer (B).

8. Disconnect hydraulic line mounting bracket from transmission (C).

9. (Not Illustrated) Disconnect shift cable at front of transmission.

HX,1545,5005,AB-19-18NOV92

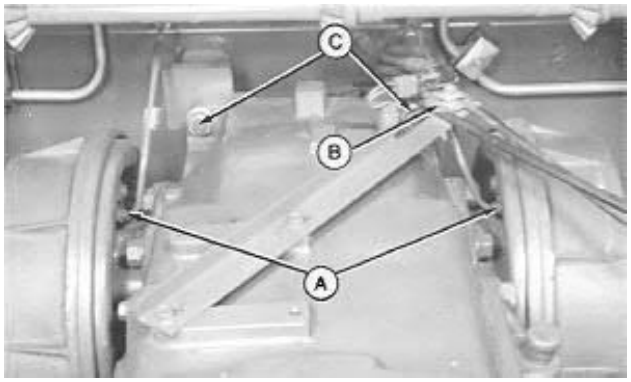
10. Disconnect service brake lines (A).

11. Disconnect parking brake cables (B).

12. Place a jack under transmission.

13. Remove two lower attaching cap screws to front axle. Raise jack slightly and remove two upper cap screws (C).

14. Remove transmission.



HX,TM1545,BC -19-09AUG93

INSTALL TRANSMISSION

CAUTION: Use a lifting device for heavy components.

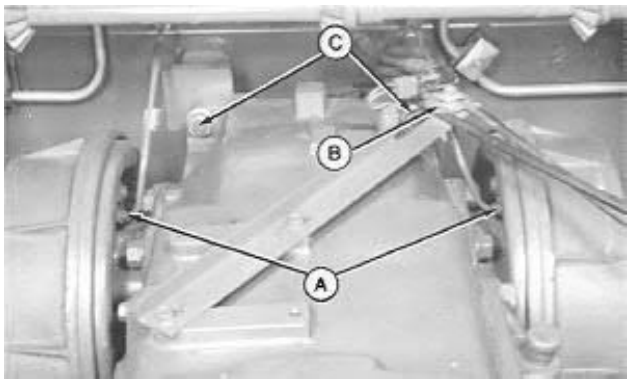
Raise feeder house and lower safety stop.

1. Use jack to position transmission, install four cap screws (C) to front axle. Tighten to 320 N·m (235 lb-ft).

2. Fill transmission with 9.6L (10 qt) 80W90 lubricant.

3. Connect service brake lines (A) and parking brake cables (B).

4. Connect shift cable (not shown).

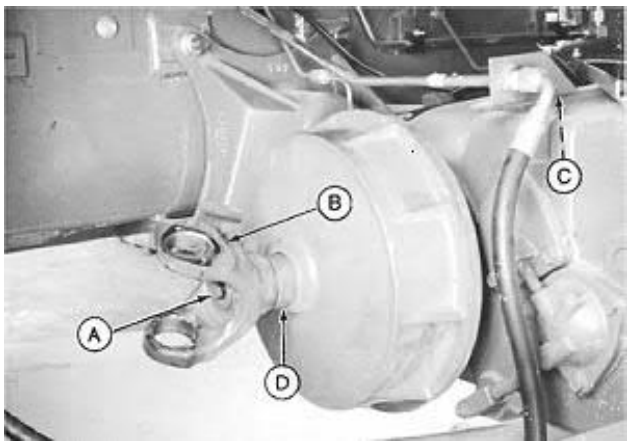


TM1545,5005,B -19-09AUG93

5. Attach hydraulic line mounting brake (C) to transmission.

6. Install spacer (D) with small diameter into bore of brake drum against snap ring.

7. Install yoke (B) with cap screw and washer (A). Torque cap screw (A) to 87 N·m (64 lb-ft).



TM1545,5005,C -19-29MAR93

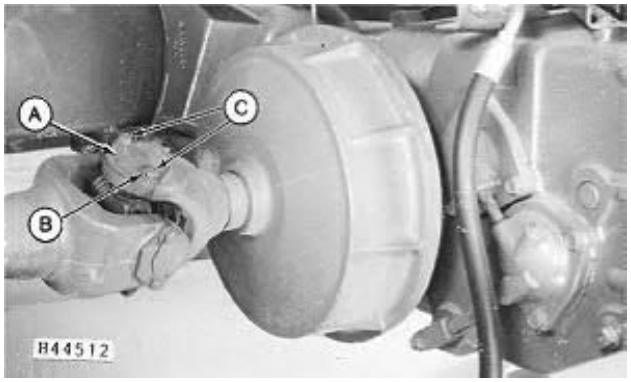
8. Install U-joint.

9. Place bearing caps (A) into yoke and install with four cap screws (C). Torque cap screws (C) to 28 N·m (25 lb-ft).

10. Bend lock straps (B) up against head of cap screws.

11. Install hydrostatic motor (not shown). (See procedure in TM1401, Section 50, Group 20).

12. Adjust gear shift linkage. **(See Adjust Gearshift Linkage in this group.)**



H44512 -UN-21MAY92

TM1545,5005,D -19-09AUG93

ADJUST GEARSHIFT LINKAGE

1. Shift transmission into second gear. Gearshift lever should be leaning slightly forward.

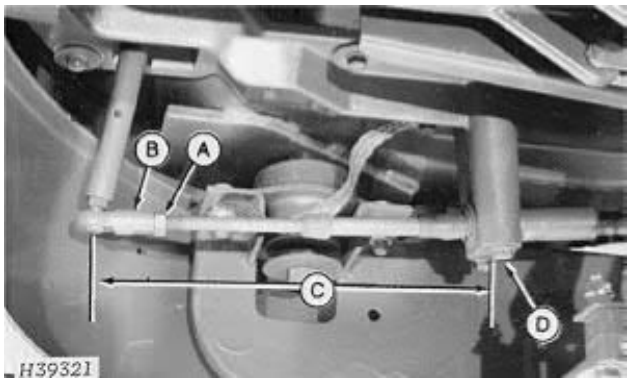
2. From under cab, loosen nut (A). Remove and adjust balljoint (B) to get 237 mm (9 5/16 in.) dimension, center line of ball joint to center line of bolts (C). Do not adjust clamp (D).

3. Remove ball joint (G) from shift arm (E). Adjust shift arm straight down.

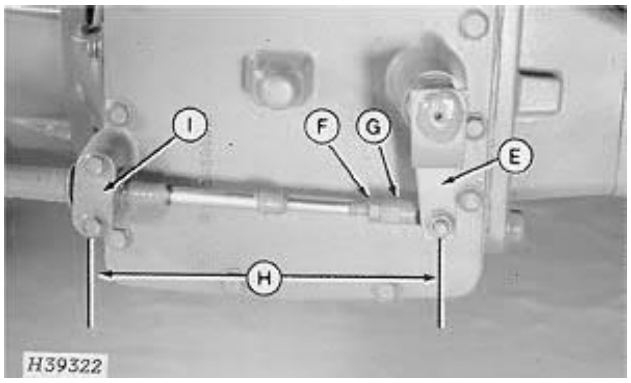
4. Loosen nut (F) and adjust balljoint (G) until stud on balljoint aligns with hole in shift arm (E). Reinstall balljoint (D) to shift arm (E).

5. Check for 237 mm (9 5/16 in.) dimension (H). Do not adjust clamp (I).

A—Nut
B—Balljoint
C—237 mm (9.3 in.) Dimension
D—Ball Joint and Clamp
E—Shift Arm
F—Nut
G—Balljoint
H—237 mm (9-5/16 in.) Dimension
I—Clamp



H39321 -UN-11OCT88



H39322 -UN-11OCT88

TM1545,5005,E -19-09AUG93

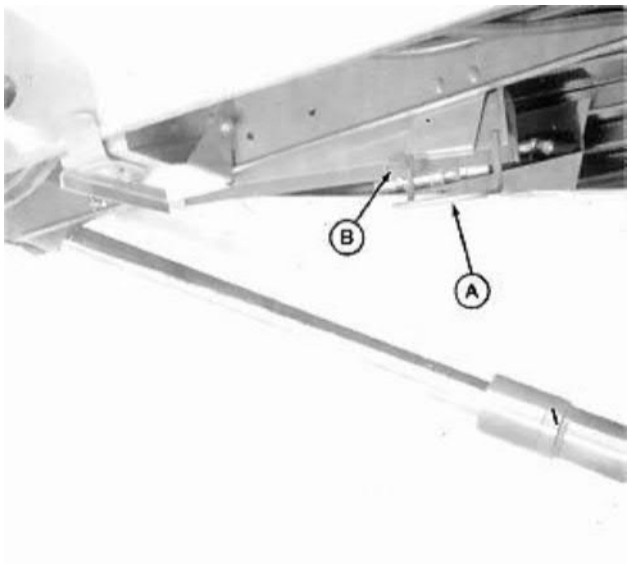
REMOVE FINAL DRIVE

CAUTION: To prevent personal injury be certain to have all safety locking stops in place.

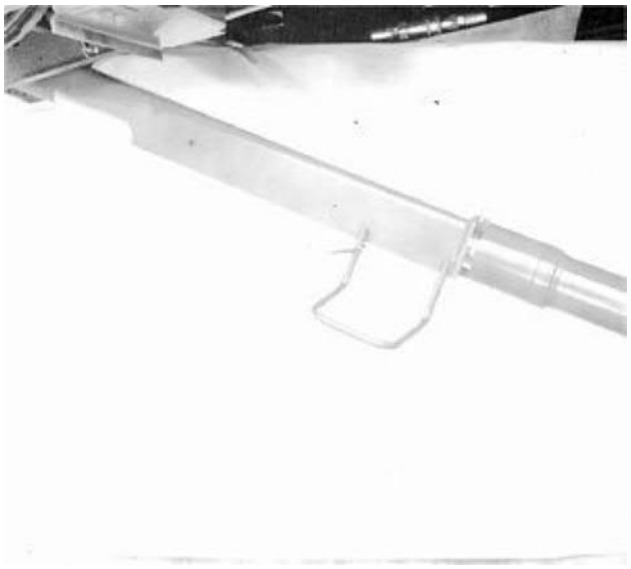
1. Hold handle (A) and release safety stop by removing spring locking pin (B).

2. Lift stop off of catch and lower it down into cylinder rod.

3. Insert spring locking pin in handle.



H45378 -UN-18NOV92



H45379 -UN-18NOV92

HX,1545,5010,A -19-18NOV92

4. Loosen wheel bolts one turn. Do NOT remove at this time.

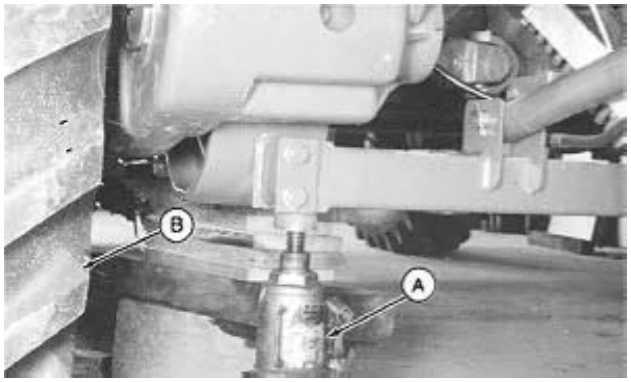
CAUTION: Block up front axle before removing wheels. Jack must have a minimum rating of 5443 kg (6 ton).

5. Raise combine with jack (A).

6. Block up front axle.

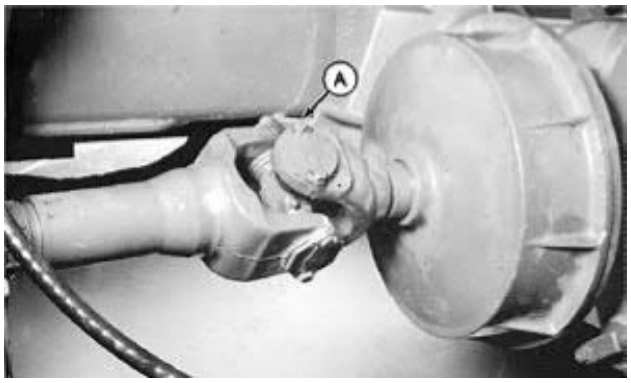
CAUTION: The approximate weight of tire and wheel is 340 kg (750 lb) (without liquid ballast).

7. Support tire and wheel (B) and remove wheel bolts to remove front tire and wheel.



HX,1545,5010,CA-19-09AUG93

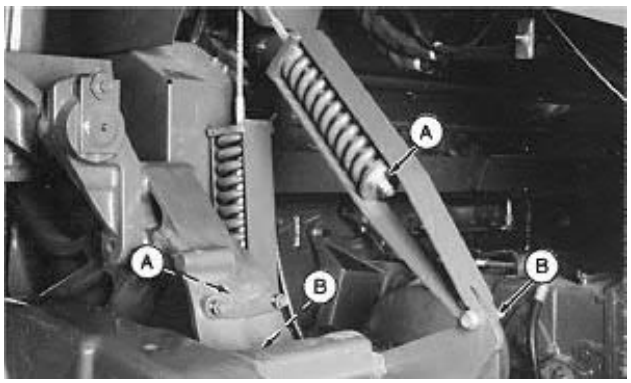
8. Disconnect U-Joint (A) at transmission.



HX,1545,5010,CB-19-18NOV92

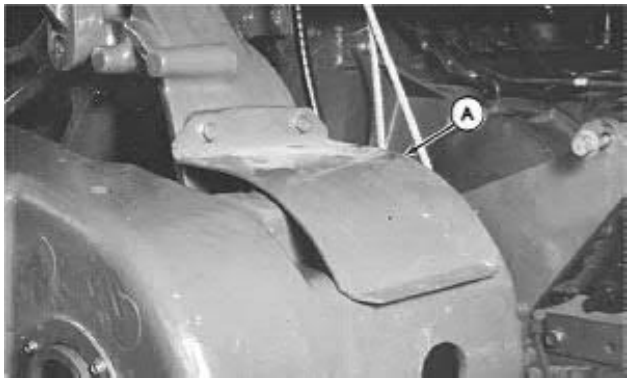
9. Release tension on springs (A).

10. Disconnect spring assemblies at (B).



HX,1545,5010,CC-19-18NOV92

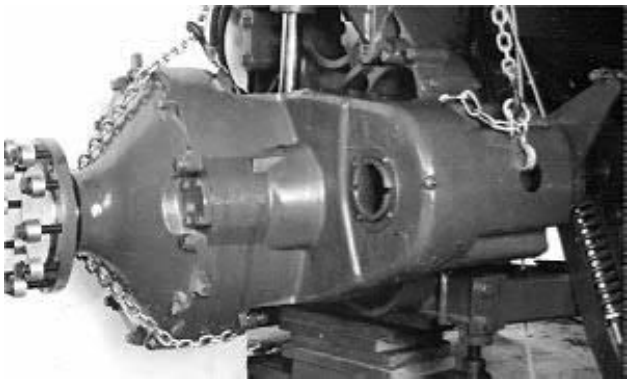
11. Remove cover (A).



HX,1545,5010,CD-19-18NOV92

CAUTION: Use hoist and attach chain as illustrated to prevent housing from pivoting when cylinder is disconnected.

12. Attach chain and hoist.



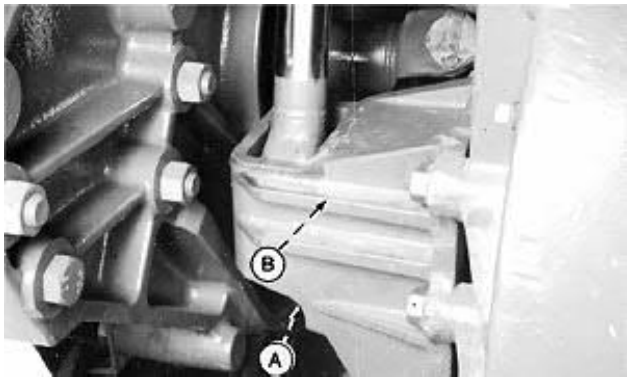
HX,1545,5010,CE-19-18NOV92

13. Remove retainer (A) on both sides.

HX,1545,5010,CF-19-18NOV92

14. Remove cap screw (A).

15. Push pin with retainer (B) toward outside of combine and remove from cylinder.



HX,1545,5010,CG-19-18NOV92

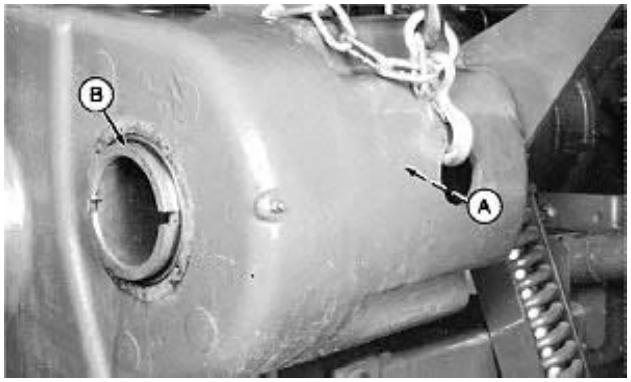
16. Remove cap screw (A).

17. Drive out pivot (B) from inside.

CAUTION: The approximate weight of final drive is 340 kg (750 lb).

18. Remove final drive (See procedure in TM1401, Section 50, Group 15).

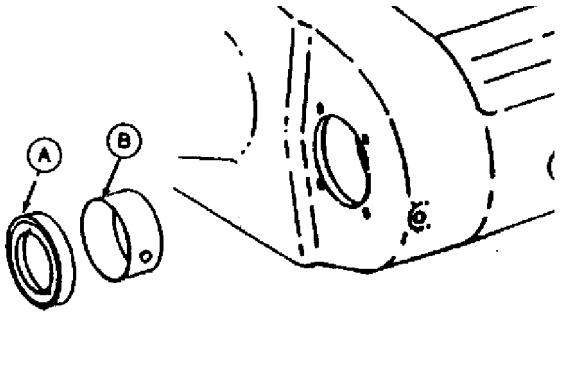
19. Repair final drive as required. (See procedure in TM1401, Section 50, Group 15).



HX,1545,5010,B -19-09AUG93

20. Replace seal (A) and bushing (B) as required.

NOTE: Seal and bushing are press fit. Press seal flush to pivot bore. Seal lip facing into housing.

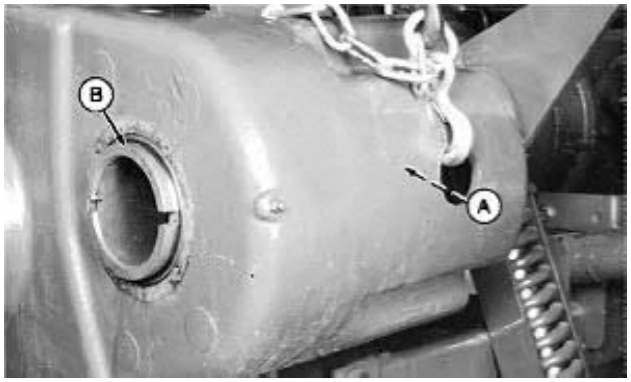


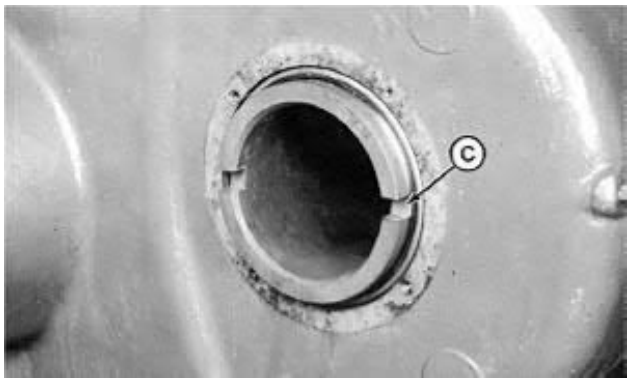
TM1545,5010,A -19-29MAR93

INSTALL FINAL DRIVE

1. Line up final drive and drive pivot (B) in from outside.

2. Use spanner wrench at notches (C) to line up hole in pivot and install cap screw (A). Torque to 500 N·m (369 lb-ft).



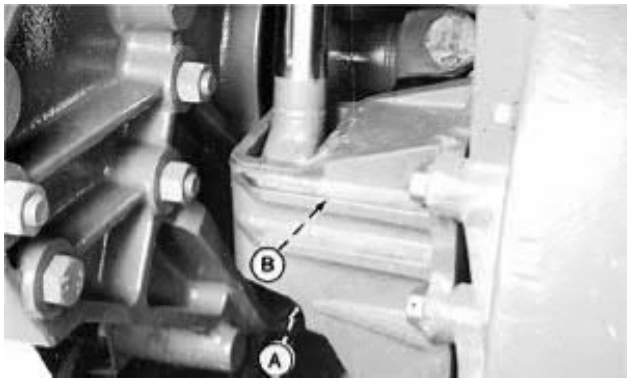


TM1545,5010,B -19-09AUG93

3. Line up piston rod end.

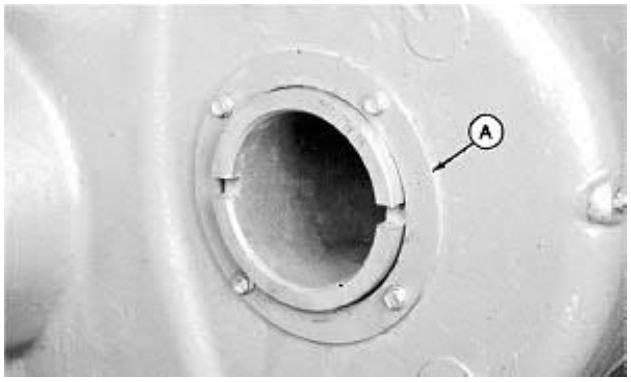
4. Push pin with retainer (B) toward inside of combine.

5. Install cap screw (A). Torque to 130 N·m (96 lb-ft).



TM1545,5010,C -19-29MAR93

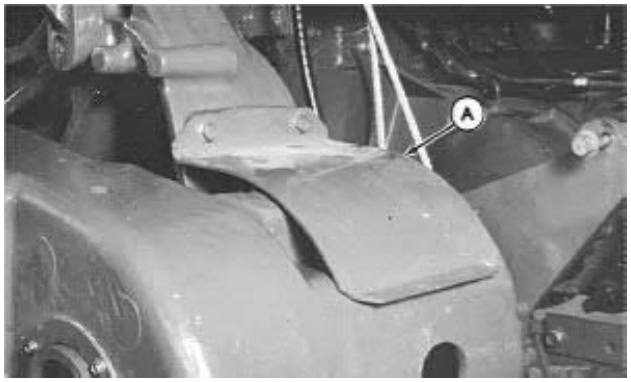
6. Install retainer (A) on both sides.



HX,1545,5010,CK-19-18NOV92

7. Remove chain and hoist.

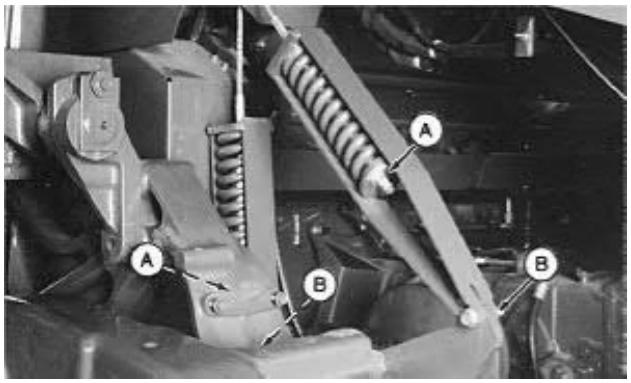
8. Install cover (A).



HX,1545,5010,CL-19-18NOV92

9. Connect spring assemblies at (B).

10. Tighten spring tension (A).



TM1545,5010,D -19-09AUG93

11. Washer (A) on front spring should align with lower mark (B) on front spring carrier (C).

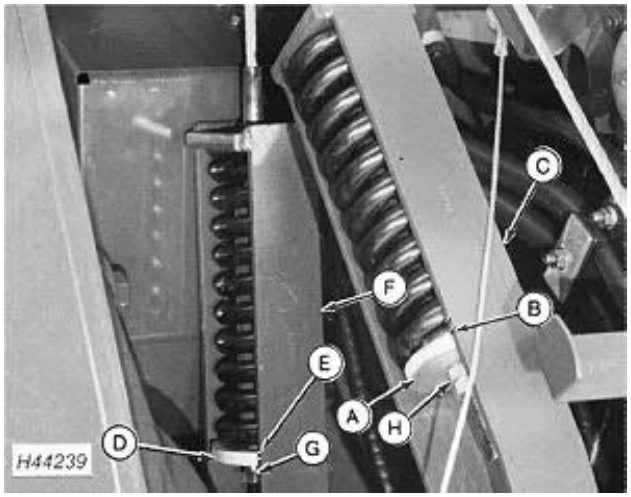
Washer (D) on rear spring should align with upper mark (E) on rear spring carrier (F).

To raise left-hand side of header, tighten adjusting nut (G) on rear spring and loosen adjusting nut (H) on front spring an equal amount.

NOTE: Large cutting platforms are heavy on left-hand side which may require rear spring to be adjusted approximately 3 mm (1/8 in.) above upper mark.

To lower left-hand side of header, loosen adjusting nut on rear spring and tighten adjusting nut on front spring an equal amount.

Check to be certain header is level by tilting combine to left and right. Readjust springs if necessary.



A—Washer
B—Lower Mark
C—Front Spring Carrier
D—Washer
E—Upper Mark
F—Rear Spring Carrier
G—Adjusting Nut
H—Adjusting Nut

TM1545,HX5010,A-19-09AUG93

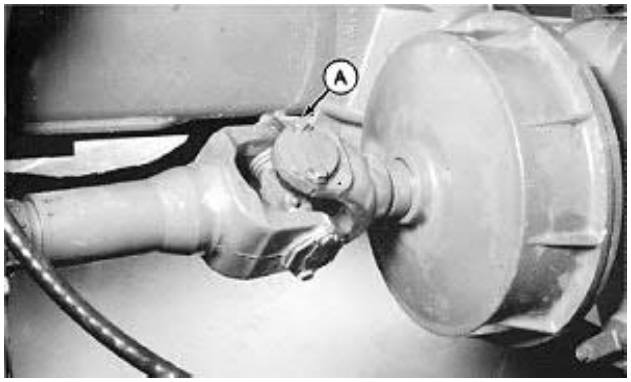
12. Connect U-joint (A) at transmission. Torque bolts to 28 N·m (21 lb-ft).

13. Install tire and wheel.

14. Tighten bolts to 200 N·m (150 lb-ft) then an additional 90˚.

15. Remove blocks and jack.

16. Release cylinder lock bar and lower feeder house.



TM1545,5010,E -19-09AUG93

Section 60
POWER STEERING AND BRAKES

Contents

Page

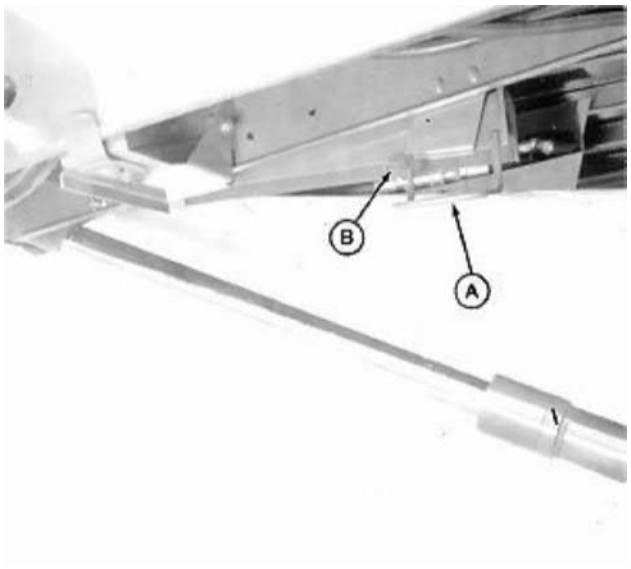
REMOVE BRAKE DRUM

CAUTION: Raise feeder house and lower safety stop. Block up wheels before working on machine.

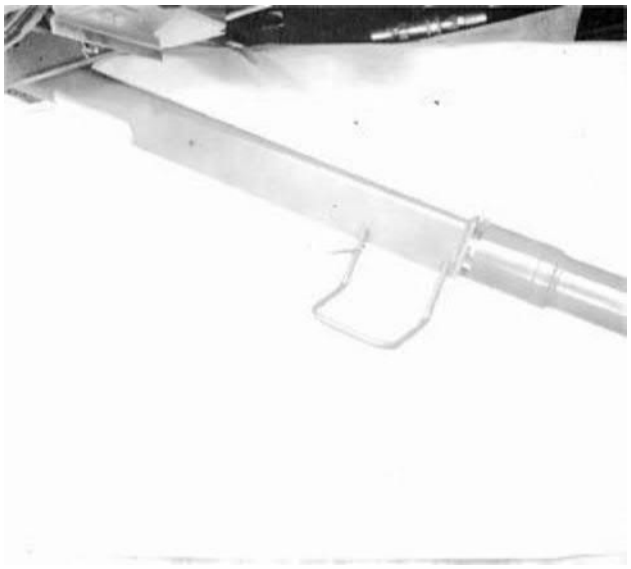
Engine must be off and key removed.

Cracking of hydraulic line fittings to lower feeder house results in an instantaneous dropping of feeder house and header.

1. Hold handle (A) and release safety stop by removing spring locking pin (B). Lift stop off latch and lower it down onto cylinder rod. Insert spring locking pin in handle.



H45378 -UN-18NOV92



H45379 -UN-18NOV92

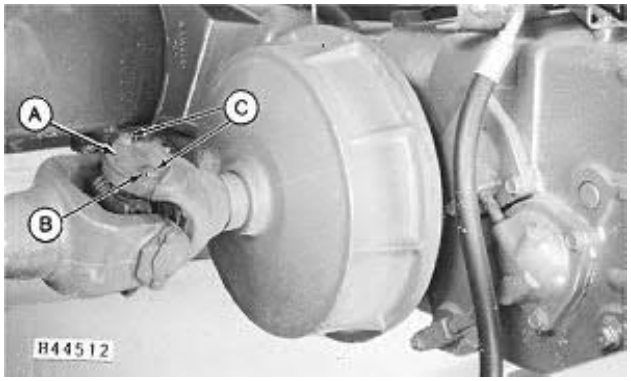
HX,1545,6010,A -19-18NOV92

2. Tap down lock straps (B).

3. Remove four cap screws (C) from yoke.

4. Remove bearing caps (A) on both sides.

5. Remove U-Joint.



H44512 -UN-21MAY92

HX,1401,6010,AC-19-30SEP92

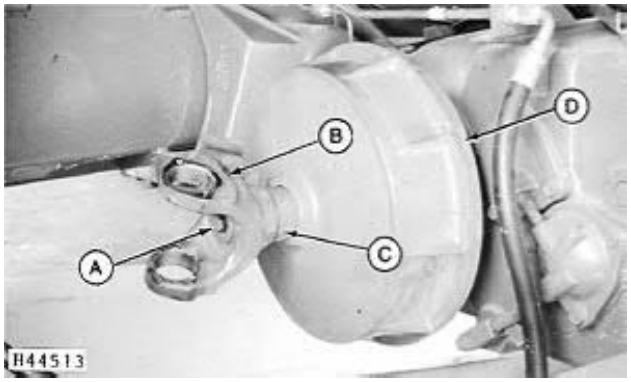
6. Remove cap screw and washer (A).

7. Remove yoke (B) and spacer (C).

8. Remove brake drum (D).

9. Inspect parts and replace as required.

A—Cap Screw and Washer
B—Yoke
C—Spacer
D—Brake Drum



HX,1545,6010,CA-19-18NOV92

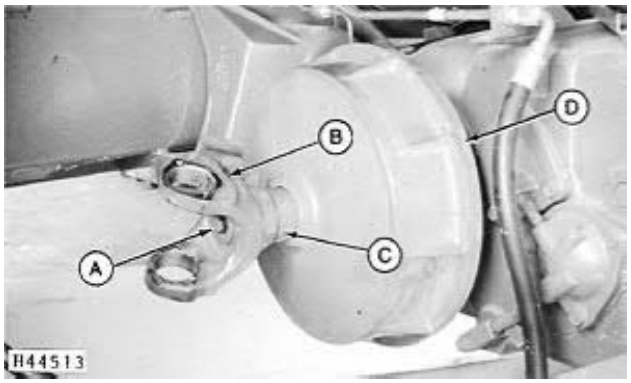
INSTALL BRAKE DRUM

1. Install brake drum (D).

2. Install spacer (C) with small diameter into bore of brake drum against snap ring and yoke (B).

3. Install washer and cap screw (A). Torque to 87 N·m (64 lb-ft).

A—Cap Screw and Washer
B—Yoke
C—Spacer
D—Brake Drum

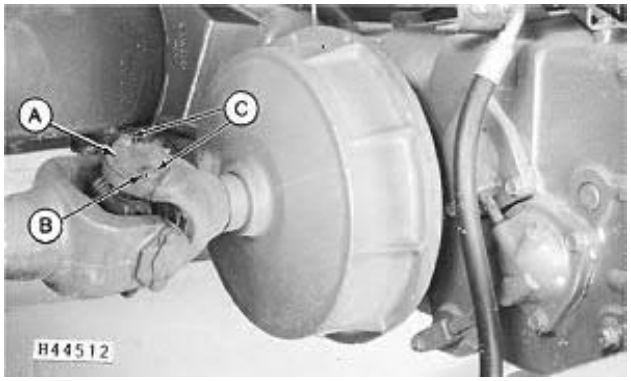


TM1545,6005,A -19-09AUG93

4. Install U-joint.

5. Install parts (A—C). Torque bolts (C) to 28 N·m (21 lb-ft).

6. Secure lock strap around cap screw heads.



TM1545,6005,B -19-29MAR93

Section 70
HYDRAULIC REPAIR

Contents

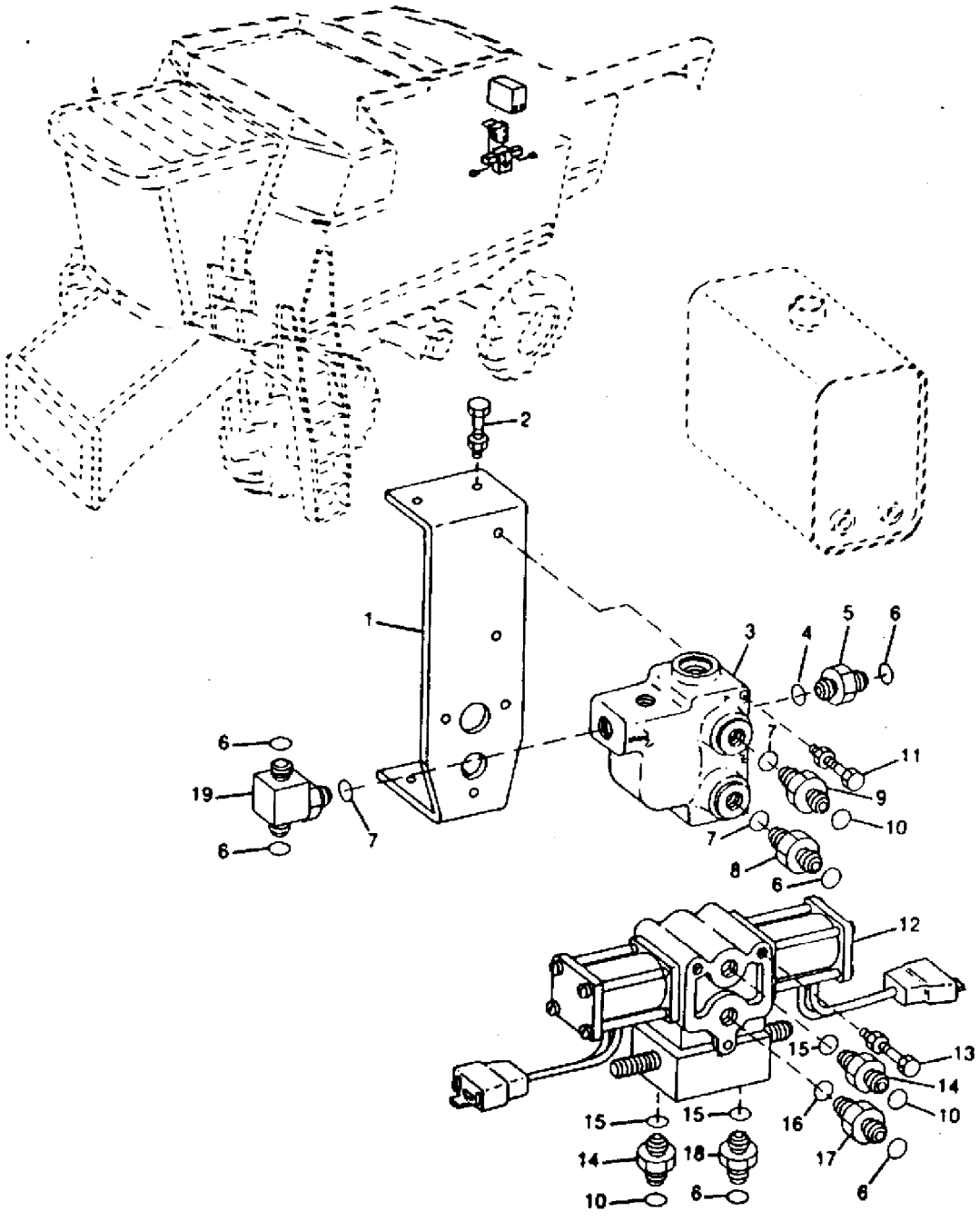
SERVICE EQUIPMENT AND TOOLS

NOTE: Order tools from the SERVICE-GARD™ Catalog. Some tools may be available from a local supplier.

Number	Name	Use
D15032NU	Vacuum Pump Kit	To pull vacuum on the reservoir when removing and installing system components

TM1545,7005,A -19-29MAR93

LEVELING SOLENOID VALVE AND FLOW DIVIDER



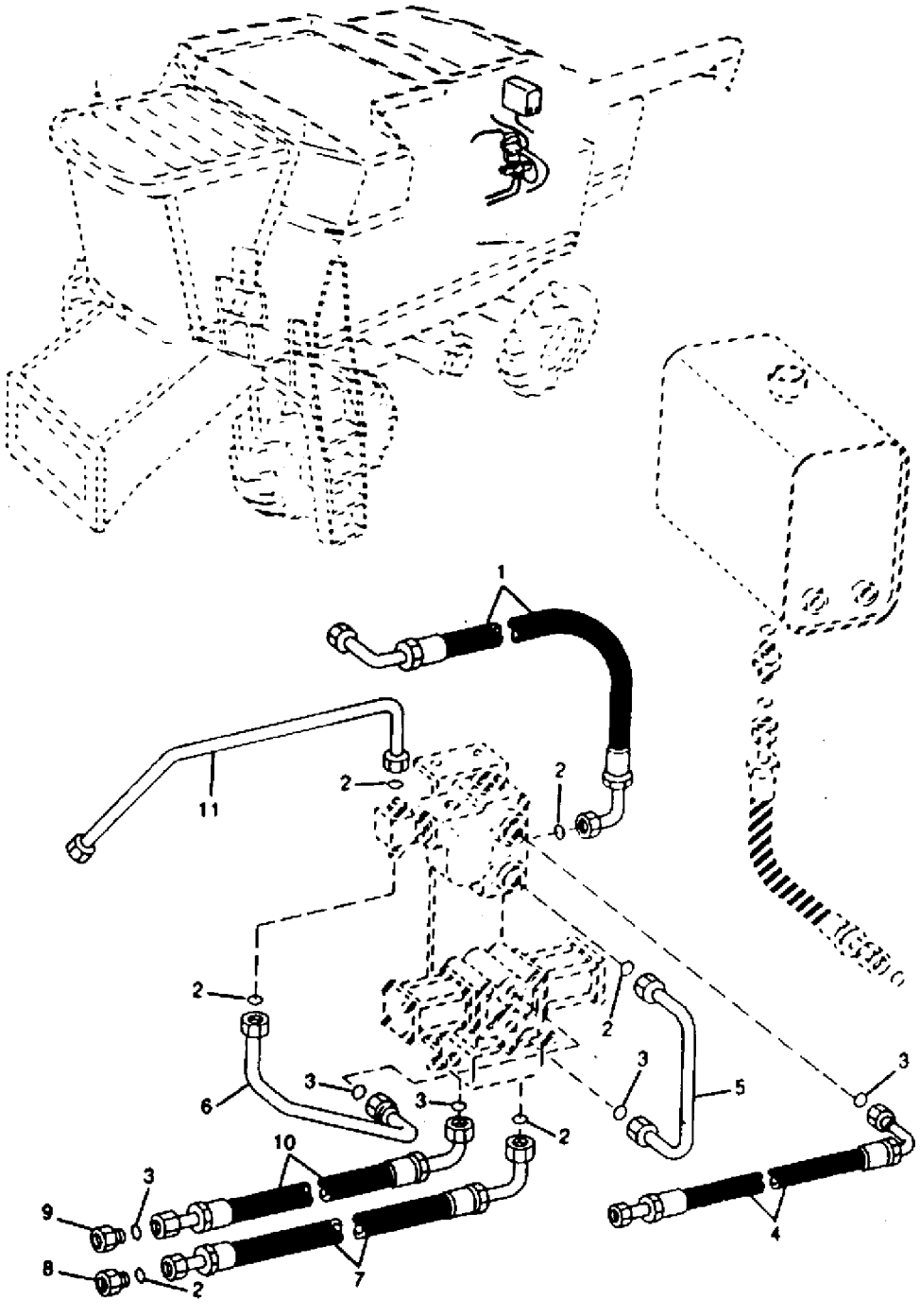
HX,1545,7005,A -19-18NOV92

1—Bracket
2—Screw, M8 x 20 (2 used)
3—Flow Divider
4—O-Ring
5—Straight Adapter
6—O-Ring (6 used)
7—O-Ring (3 used)
8—Straight Adapter
9—Straight Adapter
10—O-Ring (3 used)
11—Screw, M8 x 70 (2 used)
12—Solenoid Valve
13—Screw, M8 x 80 (3 used)
14—Straight Adapter (2 used)
15—O-Ring (3 used)
16—O-Ring
17—Straight Fitting
18—Straight Fitting
19—Tee Fitting

Legend—Leveling Valve/Flow Divider

TM1545,7005,B -19-09AUG93

LEVELING VALVE OIL LINES AND HOSES



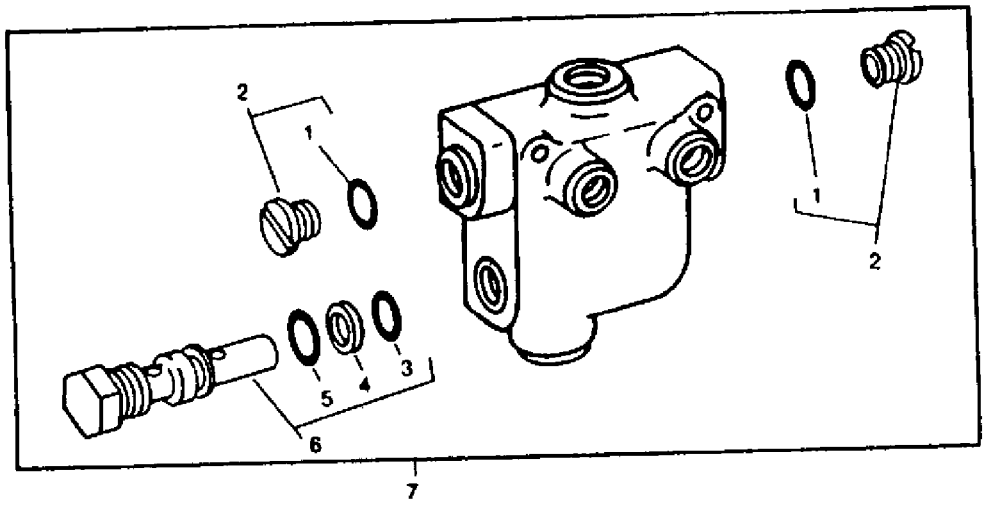
HX,1545,7005,C -19-18NOV92

1—Hose, 34-1/2 x 1 in.
2—O-Ring (4 used)
3—O-Ring (5 used)
4—Hose, 30-1/2 x 1 in.
5—Pressure Oil Line
6—Return Oil Line
7—Hose, 30-1/2 x 1 in.
8—Plug
9—Plug
10—Hose, 26-1/4 x 13/16 in.
11—Oil Line

Legend for Valve Oil Lines

HX,1545,7005,D -19-09AUG93

FLOW DIVIDER VALVE

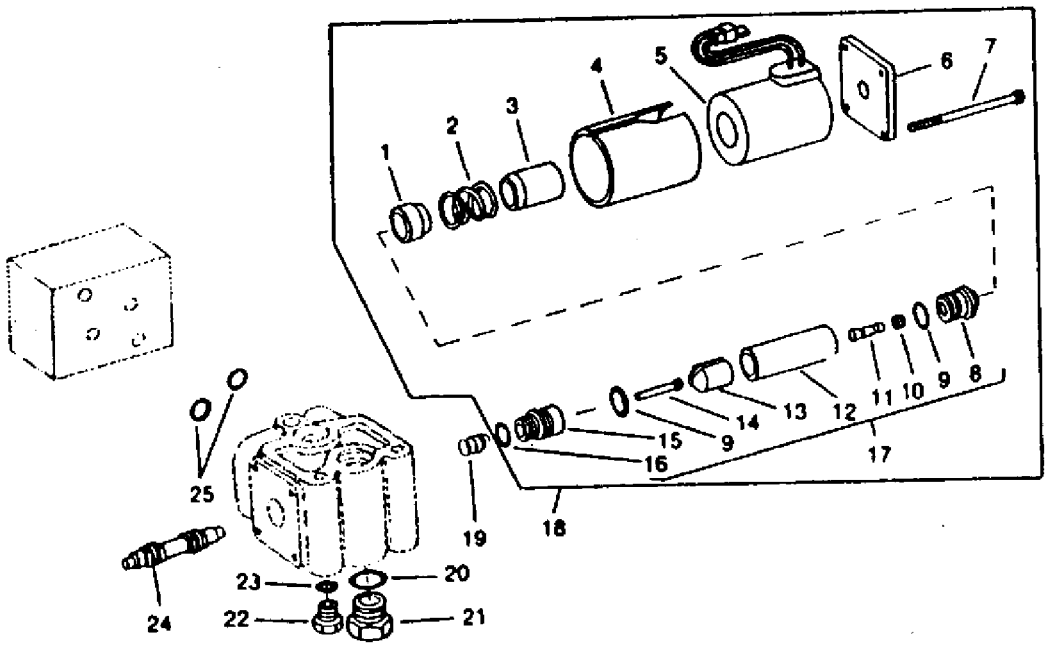


-UN-16OCT92
H45312

1—O-Ring (2 used)
2—Plug (2 used)
3—O-Ring
4—Rubber Back-Up Ring
5—O-Ring
6—Valve
7—Flow Divider

HX,1545,7005,E -19-18NOV92

REMOVE AND INSTALL VALVE BLOCK SOLENOID



1—Short Spool (2 used)
2—Spring (2 used)
3—Long Spool (2 used)
4—Case (2 used)
5—Electrical Coil (2 used)
6—End Plate (2 used)
7—Screw (8 used)
8—Guide (2 used)
9—Ring (4 used)
10—O-Ring (2 used)
11—Pin (2 used)
12—Tube (2 used)
13—Plunger (2 used)
14—Pin (2 used)
15—Bearing Cone (2 used)
16—O-Ring (2 used)
17—Cap (2 used)
18—Solenoid Kit
19—Bushing (2 used)
20—O-Ring
21—Drain Plug
22—Fitting
23—O-Ring
24—Spool Kit
25—O-Ring (2 used)

HX,1545,7005,F -19-09AUG93

PREVENT HYDRAULIC SYSTEM CONTAMINATION

IMPORTANT: Cleanliness is very important when working on the hydraulic system. Prevent contamination by assembling the cylinders, hoses, couplers, and valves in a clean area of the shop.

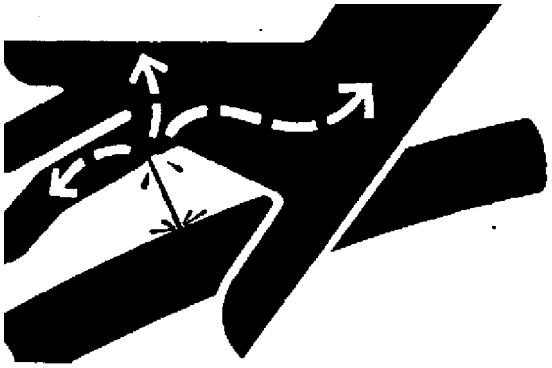
Leave protective caps on the fluid openings until ready to make the connection. Keep couplers clean. Abrasive particles, like sand or metal fragments, can damage seals, barrels and pistons, causing internal leakage.

HX,TM1545,FA -19-09AUG93

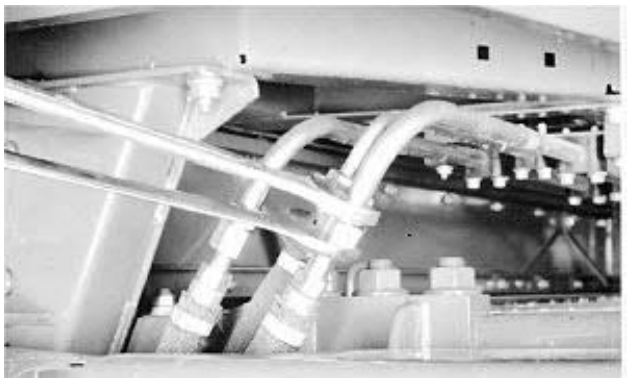
CHECK OIL LINES AND FITTINGS

CAUTION: 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 may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.



X9811 -UN-23AUG88



H44023 -UN-23FEB92

Check all oil lines, hoses and fittings regularly for leaks or defects. Make sure all clamps are in position and tight. Make sure hoses are not twisted or touching machine parts which are moving. Replace damaged parts.

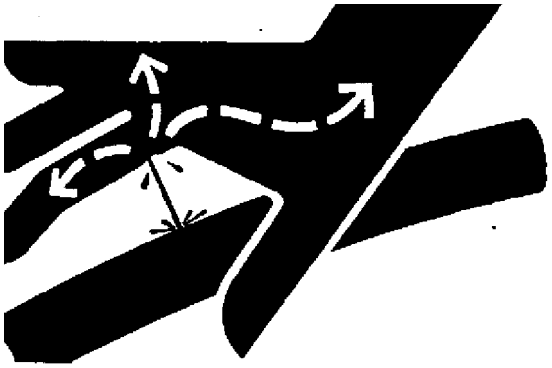
IMPORTANT: Tighten fittings as specified in torque chart.

If necessary, use two wrenches to prevent hoses from twisting, bending or breaking tubing and fittings.

HX,1401,1010X -19-11DEC92

70 05 7

REMOVE AND INSTALL VALVE BLOCK SOLENOID



X9811 -UN-23AUG88

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydrauolic 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 may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

"Cracking" hydraulic lines fitting to lower header will result in an instantaneous dropping of the header and expulsion of the sealing O-ring in the fitting.

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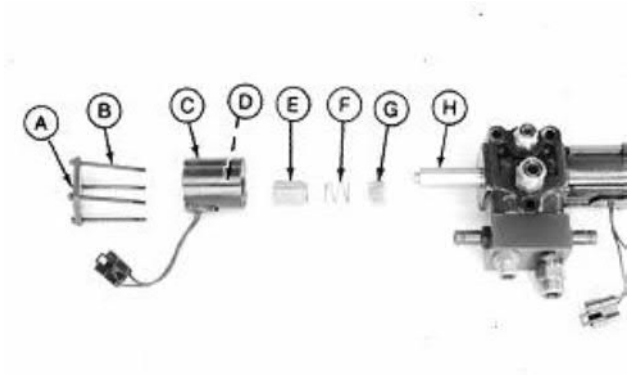
1. Lower header to ground. Stop engine. Operate hydraulic controls to relieve pressure.

HX,1545,7005,G -19-09AUG93

2. Install D15032NU Vacuum pump on reservoir. This will allow removing the valve without draining the reservoir. If vacuum pump is NOT available, drain reservoir. Approximate capacity is 34 L (36 qt).

3. Remove parts (A—G).

4. Remove cap (H).



H44548 -UN-03AUG92

A—End Plate
B—Screws (4 used)
C—Case
D—Electrical Coil
E—Spool
F—Spring
G—Spool
H—Cap

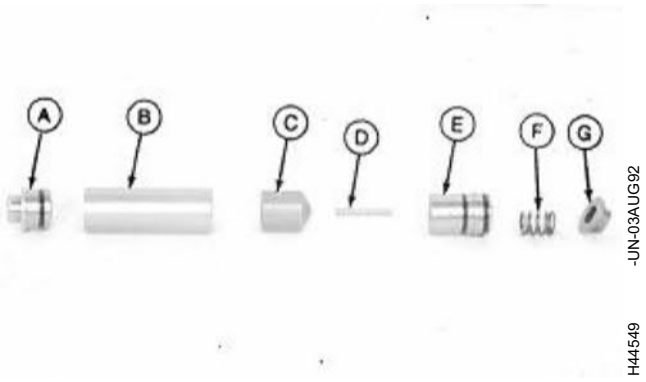
HX,1401,7015,C -19-12AUG92

5. Disassemble cap parts (A—G).

6. Inspect parts. Replace parts that are worn or damaged.

7. Assemble parts (A—G).

A—Guide
B—Tube
C—Plunger
D—Pin
E—Bearing Cone
F—Spring
G—Bushing

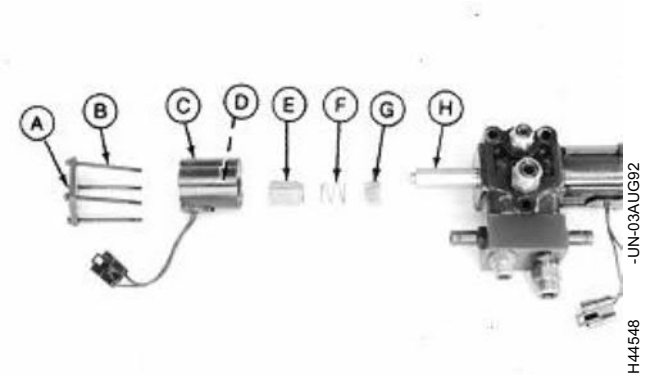


HX,1401,7015,D -19-12AUG92

8. Install cap (H).

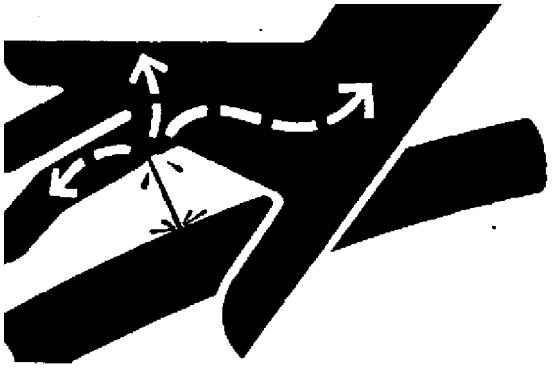
9. Install parts (A—G).

A—End Plate
B—Screws (4 used)
C—Case
D—Electrical Coil
E—Spool
F—Spring
G—Spool
H—Cap



HX,1401,7015,E -19-12AUG92

REPAIR CHECK VALVE



X9811 -UN-23AUG88

1. Lower header to ground. Stop engine. Operate hydraulic controls to relieve pressure.

CAUTION: 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 may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

CAUTION: "Cracking" hydraulic lines fitting to lower header will result in an instantaneous dropping of the header and expulsion of the sealing O-ring in the fitting.

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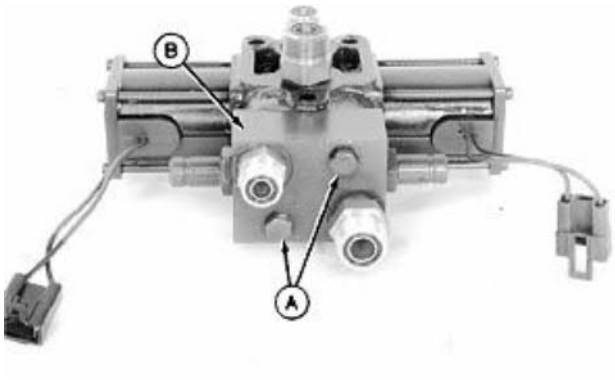
HX,1545,7005,H -19-18NOV92

2. Install D15032NU Vacuum Pump on reservoir. This will allow removing the valve without draining the reservoir. If vacuum pump is not available, drain reservoir. Approximate capacity is 34 L (36 qt.).

3. Remove two cap screws (A) and check block (B).

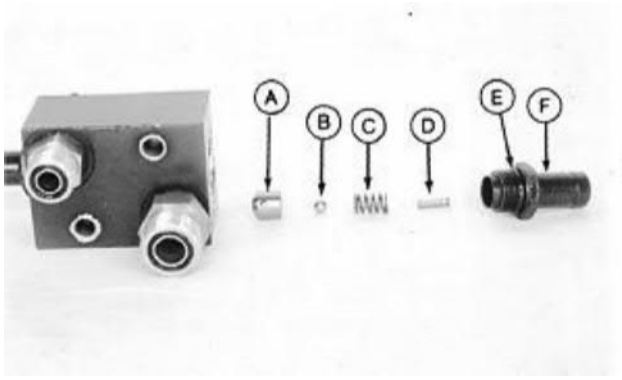


H44550 -UN-03AUG92

HX,1545,7005,I -19-09AUG93

4. Remove parts (A—F).

A—Poppet
B—Ball Check
C—Spring
D—Spring
E—O-Ring
F—Plug



-UN-03AUG92
H44551

HX,1401,7015,H -19-09AUG93

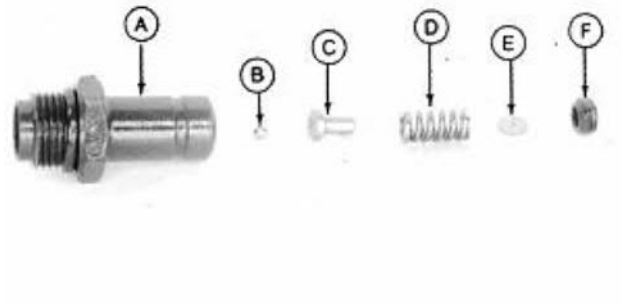
5. Disassemble parts (A—F).

6. Inspect parts. Replace parts that are worn or damaged.

7. Assemble parts (A—E).

8. Install set screw.

A—Plug
B—Ball
C—Poppet
D—Spring
E—Restrictor
F—Set Screw



-UN-03AUG92
H44552

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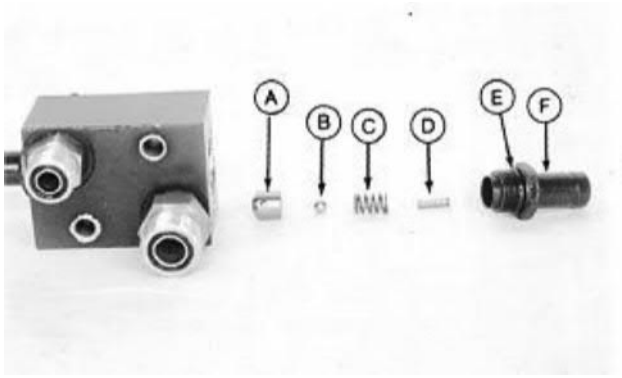
HX,1545,7015,BA-19-09AUG93

9. Install parts (A—F).

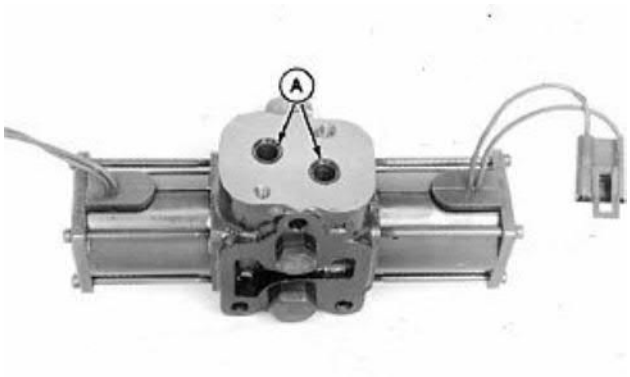
A—Poppet
B—Ball Check
C—Spring
D—Spring
E—O-Ring
F—Plug



-UN-03AUG92
H44551

HX,1545,7015,BB-19-09AUG93

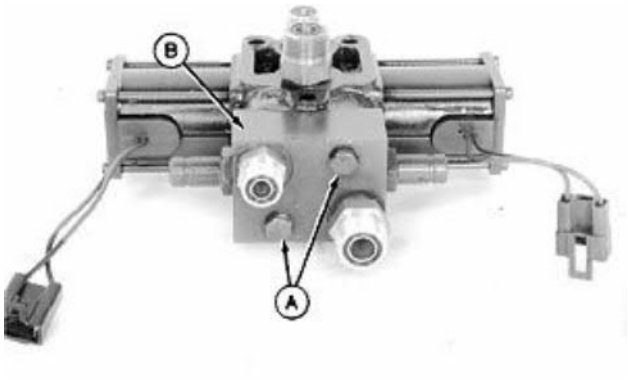
10. Inspect O-rings (A). Replace if necessary.



-UN-03AUG92
H44553

HX,1401,7015,K -19-09AUG93

11. Install check block (B) using cap screws (A).



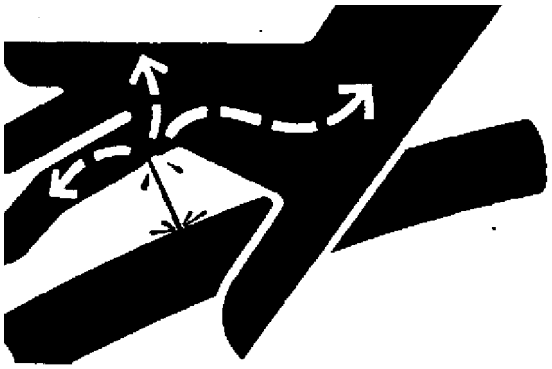
-UN-03AUG92
H44550

HX,1401,7015,L -19-09AUG93

REMOVE RIGHT LEVELING CYLINDER

CAUTION: 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.

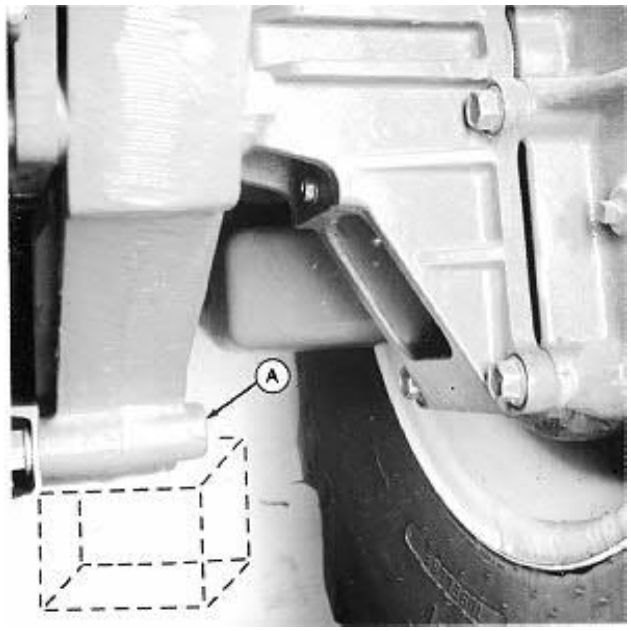
If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with type of injury may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.



-UN-23AUG88
X9811

1. Turn off engine and remove key.

2. Place block under combine frame (A).

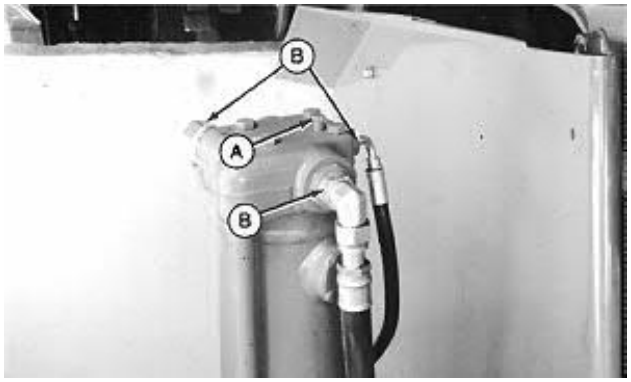


-UN-03AUG92
H44559

TM1545,7005,D -19-09AUG93

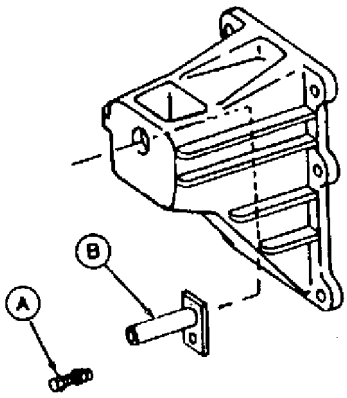
3. Open bleed screw (A) allowing combine to settle on block. Do not close bleed screw.

4. Disconnect hydraulic lines (B).



HX,1401,7020,D -19-12AUG92

5. Remove cap screw (A) and pin (B).



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HX,1401,7020,E -19-12AUG92

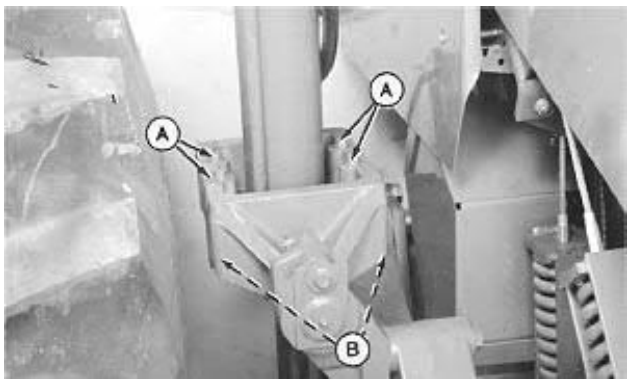
CAUTION: The approximate weight of cylinder is 36 kg (80 lbs).

6. Attach lifting device.

7. Remove four cap screws (A) and pillow blocks (B).

8. Turn cylinder 90˚ and separate cylinder from trunnion.

9. Inspect parts and repair as needed.



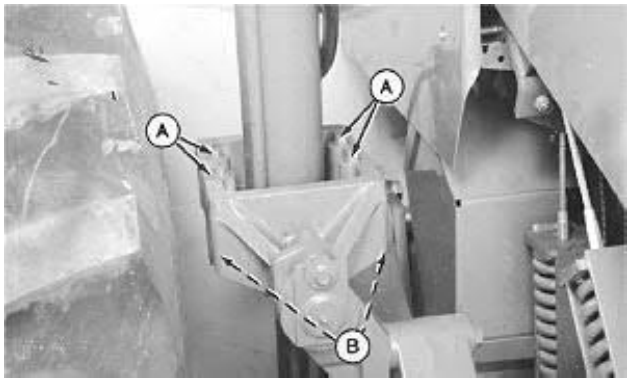
HX,1545,7005,M -19-09AUG93

INSTALL RIGHT LEVELING CYLINDER

1. Assemble cylinder to trunnion.

CAUTION: The approximate weight of cylinder is 36 kg (80 lbs).

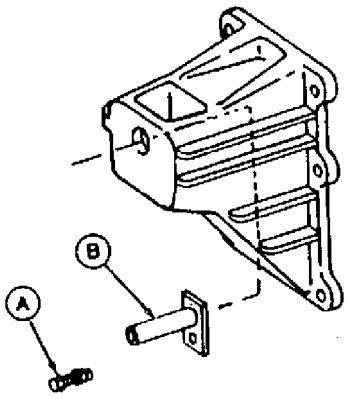
2. Install four cap screws (A) and pillow blocks (B). Torque to 130 N·m (96 lb-ft).



H44558 -UN-03AUG92

TM1545A,7005A,A-19-09AUG93

3. Install pin (B) and cap screw (A). Torque to 130 N·m (96 lb-ft).

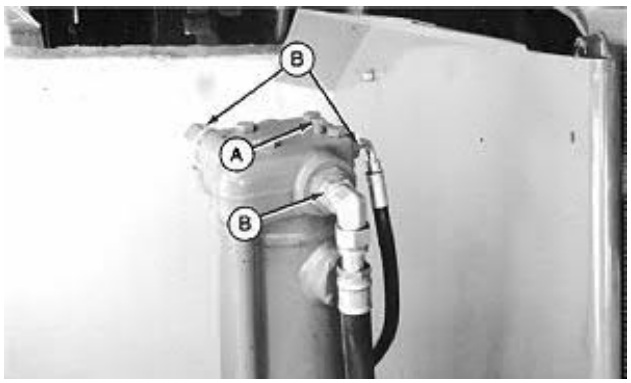


H44560 -UN-03AUG92

TM1545,7005,F -19-29MAR93

4. Connect hydraulic lines (B).

5. Close bleed screw (A).



H44557 -UN-03AUG92

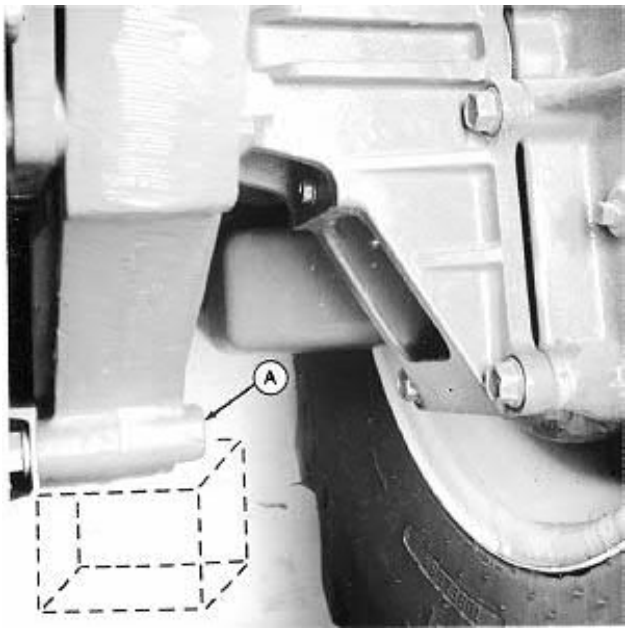
TM1545,7005,G -19-29MAR93

6. Start engine.

7. Remove block (A).

8. Manually tilt to either side and hold for fifteen seconds. Return combine to level. Repeat tilting in opposite direction.

9. Perform tilting cycle three times to rephase system.



-UN-03AUG92
H44559

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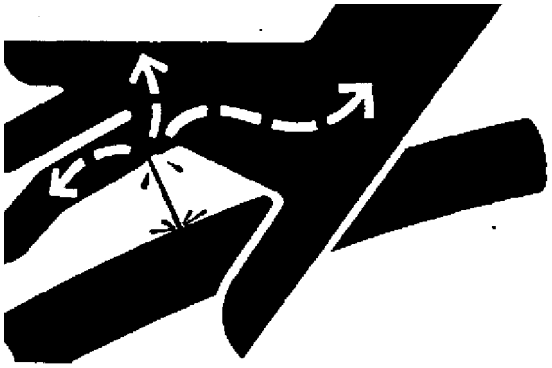
TM1545,7005,H -19-09AUG93

REMOVE LEFT LEVELING CYLINDER

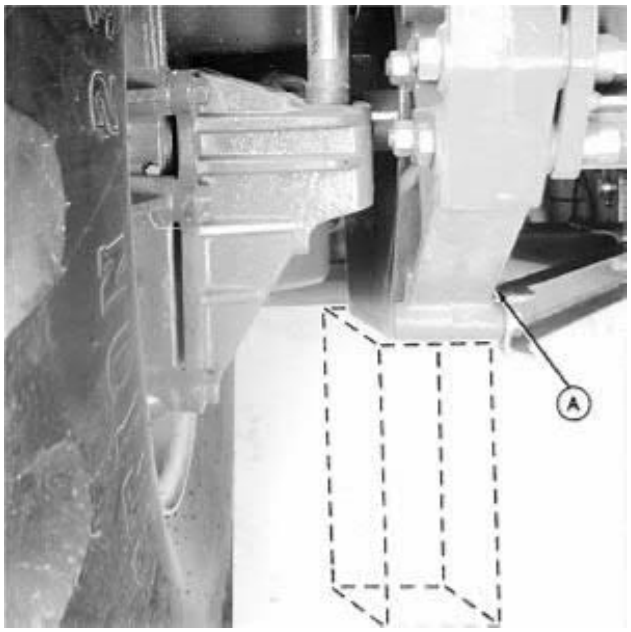
CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnectin hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure 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 may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.



1. Turn off engine and remove key.

2. Place block under combine frame (A).



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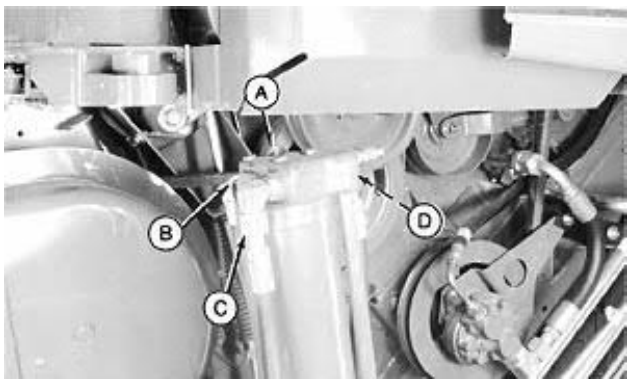
TM1545,7005,I -19-09AUG93

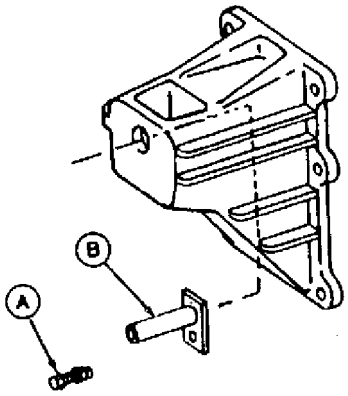
3. Open bleed screw (A) allowing combine to settle on block. Do not close bleed screw.

4. Remove hydraulic lines (B—D).



HX,1401,7020,M -19-12AUG92

5. Remove cap screw (A) and pin (B).



H44560 -UN-03AUG92

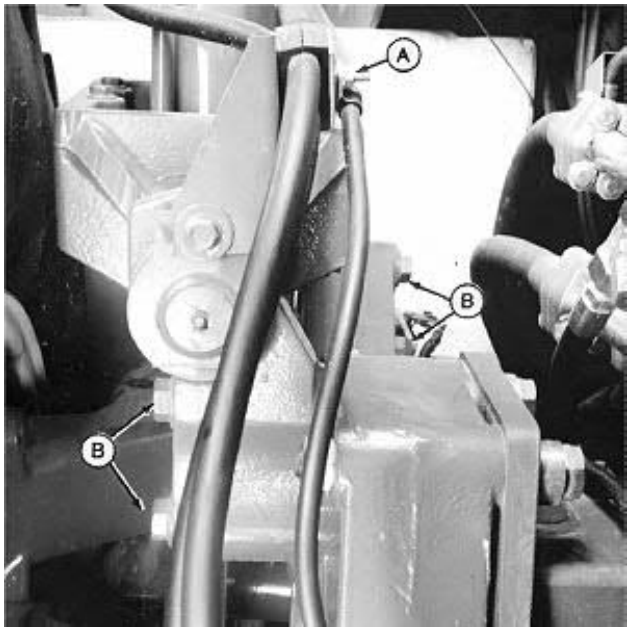
HX,1401,7020,N -19-12AUG92

CAUTION: The approximate weight of cylinder and trunnion is 45 kg (100 lbs).

6. Attach a safe lifting device.

7. Remove hose clamp (A) and four cap screws (B) retaining trunnion assembly to final drive.

8. Remove cylinder and trunnion assembly from final drive.



H44556 -UN-03AUG92

TM1545,7005,J -19-29MAR93

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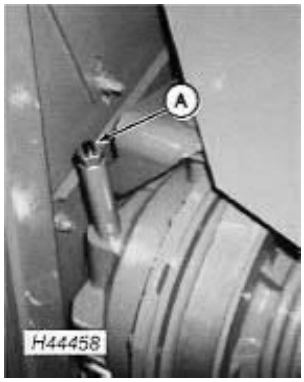
9. Remove four cap screws (A) and pillow blocks (B).

10. Turn cylinder 90° and separate cylinder from trunnion.

11. Inspect parts and repair as needed.



TM1545,7005,K -19-09AUG93

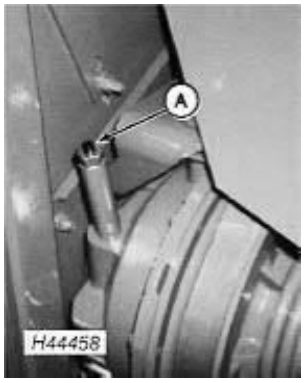
INSTALL LEFT LEVELING CYLINDER

CAUTION: The approximate weight of cylinder and trunnion is 45 kg (100 lbs.).

1. Attach a safe lifting device.

2. Assemble cylinder and trunnion assembly.

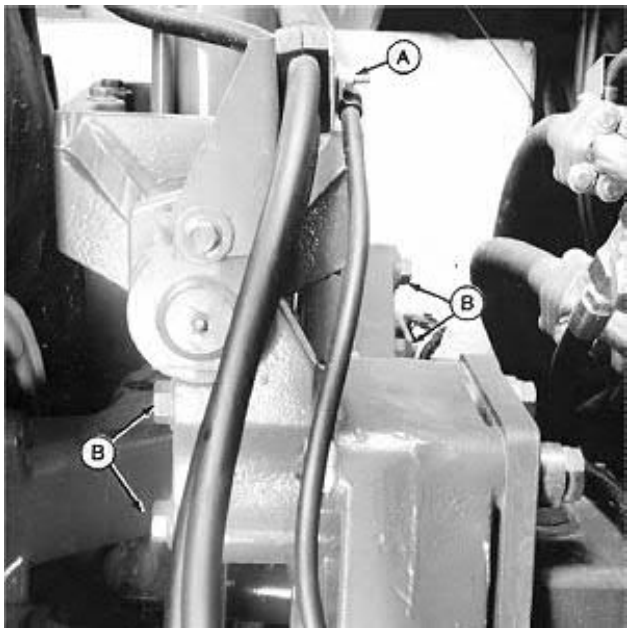
3. Install pillow blocks (B) and four cap screws (A). Torque to 130 N·m (96 lb-ft).



TM1545,7005,L -19-09AUG93

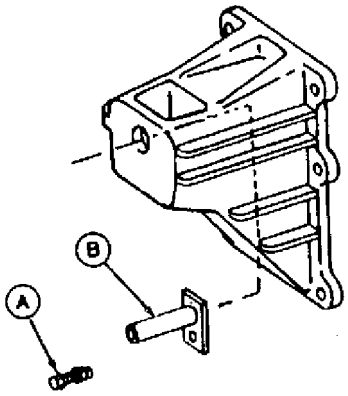
4. Assemble trunnion assembly to final drive. Install four cap screws (B). Torque to 620 N·m (457 lb-ft).

5. Attach hose clamp (A) to bracket.



TM1545,7005,M -19-09AUG93

6. Install pin (B) and cap screw (A). Torque to 130 N·m (96 lb-ft).

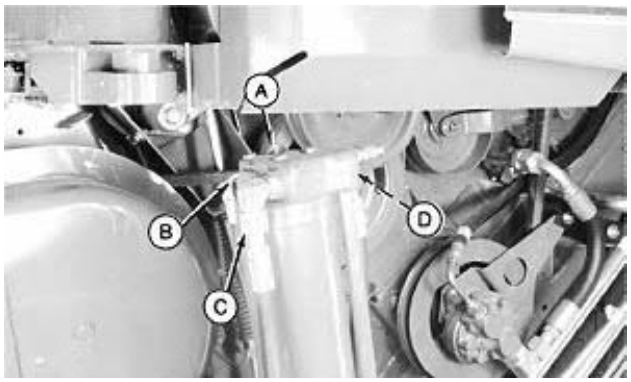


H44560 -UN-03AUG92

HX,TM1545,FB -19-09AUG93

7. Attach hydraulic lines (B—D).

8. Close bleed screw (A).



H44555 -UN-03AUG92

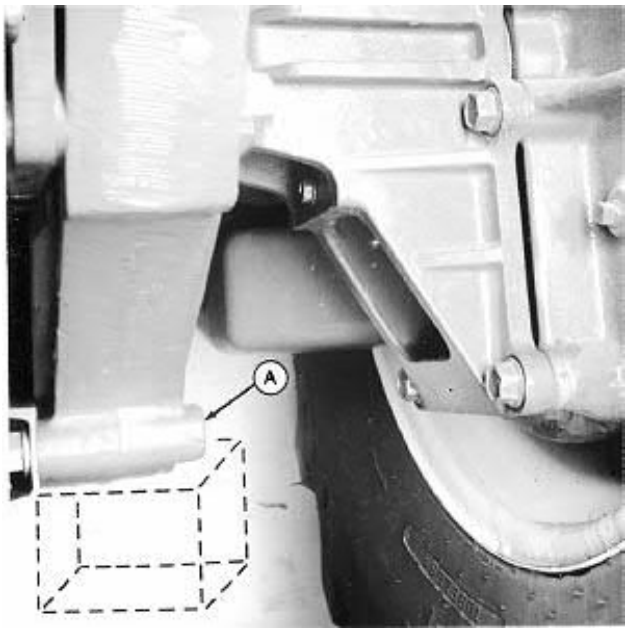
TM1545,7005,N -19-29MAR93

9. Start engine.

10. Remove block (A).

11. Manually tilt to either side and hold for fifteen seconds. Return combine to level. Repeat tilting in opposite direction.

12. Perform tilting cycle three times to rephase system.



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TM1545,7005,O -19-09AUG93

REMOVE AND DISASSEMBLE LEVELING CYLINDER VALVE BLOCK

CAUTION: The valve block may be serviced with the leveling cylinder on the combine. Be certain to support both leveling cylinders before removing valve block.

CAUTION: 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.

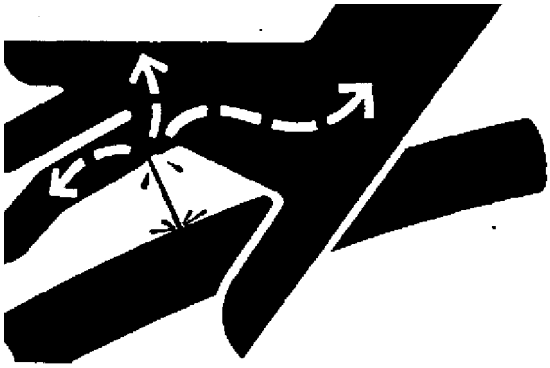
If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

1. Turn off engine and remove key.

2. Place block under combine frame (A) on both sides.

3. Drain leveling system. Disconnect hoses from valve block. Mark hoses to insure correct installation.

4. Plug all outlets in valve block. Clean valve block for disassembly.



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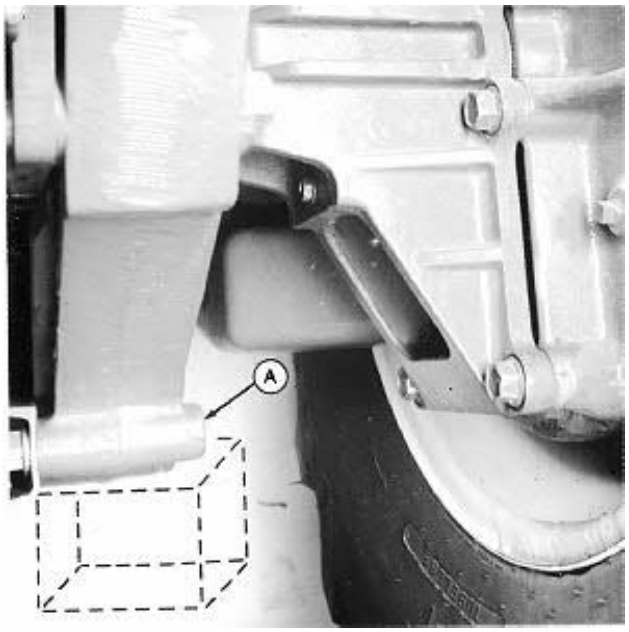

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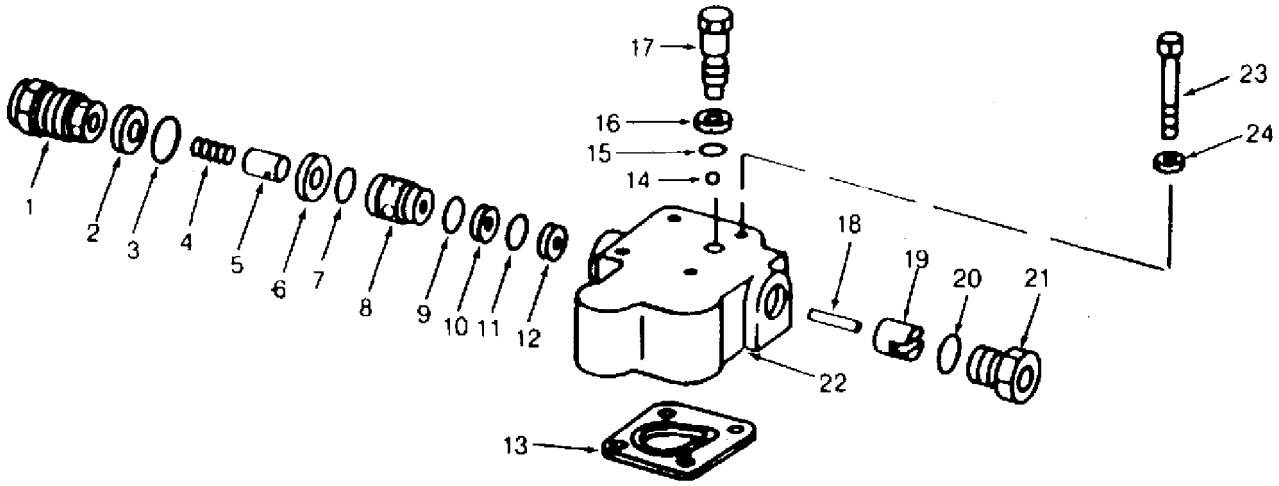
TM1545,7005,P -19-09AUG93



1—Fitting	**8—Seat**	**14—Ball**	**20—O-Ring**
2—Back-Up Ring	**9—O-Ring**	**15—O-Ring**	**21—Fitting**
3—O-Ring	**10—Washer**	**16—Ring**	**22—Valve Block**
4—Spring	**11—O-Ring**	**17—Bleed Screw**	**23—Cap Screw, 3/8 x 2-1/2 (4 used)**
5—Case	**12—Ring**	**18—Pin**	
6—Back-Up Washer	**13—Gasket**	**19—Plunger**	**24—Washer**
7—O-Ring			

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22

Legend For Valve Block

5. Remove four cap screws (23) from valve block to cylinder.

6. Remove valve block.

7. Disassemble valve block. Remove all O-rings and backup washers. Replace with new parts.

8. Wash parts in clean solvent and dry with compressed air.

9. Inspect valve block and components. Continuous settling of a leveling cylinder and frequent rephasing, indicates defective backup washer (6), O-ring (7) or O-ring (11). A defective seat (8), or valve block (22) may also cause this. These parts may cause leakage of oil from balance beam hose to drain line.

10. Plunger (19) and pin (18) must move freely in valve block. If one or both of these parts stick. Combine will not level and relief valve will open.

TM1545,7005,Q -19-09AUG93

ASSEMBLE/INSTALL VALVE BLOCK

1. Install internal components of valve block. Coat parts with hydraulic oil during installation.

2. Ring (16) must be heated in hot oil to allow installation on bleed screw (17). Tighten bleed screw to 8—11 N·m (6—8 lb-ft).

3. Attach valve block to cylinder with four bolts (23) previously removed. Torque to 40 N·m (30 lb-ft).

TM1545,7005,S -19-09AUG93

4. Connect hoses to valve block.

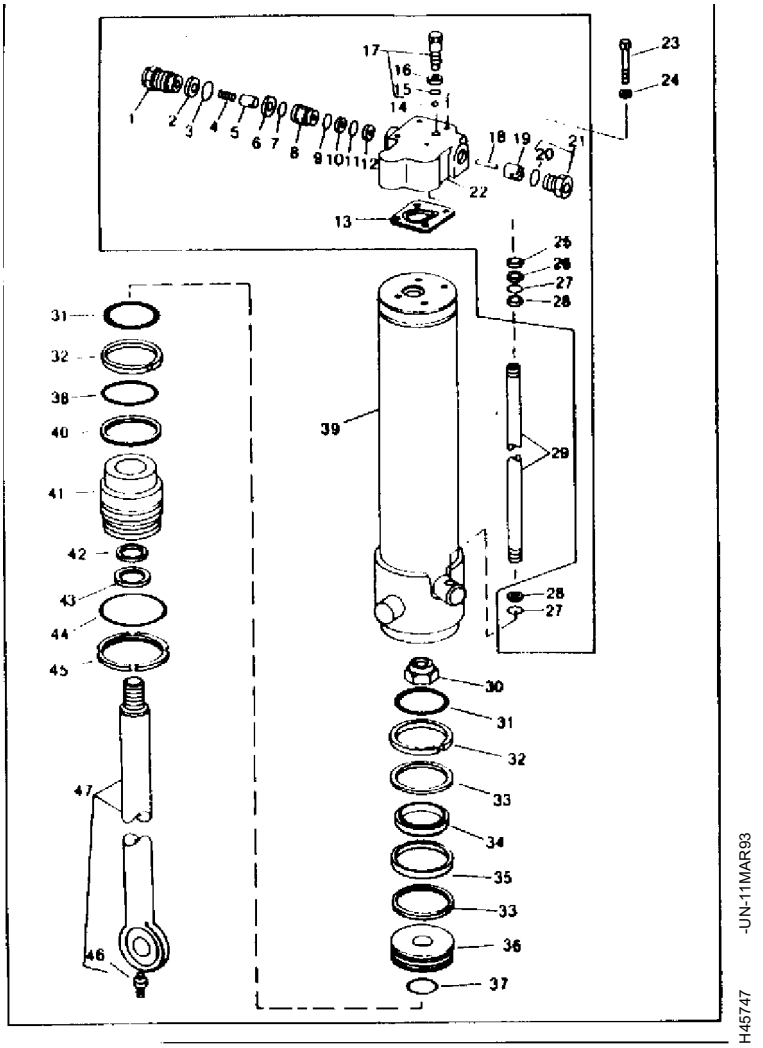
5. Fill reservoir with oil.

6. Start engine, manually tilt combine to either side and hold for fifteen seconds. Return combine to level. Repeat tilting opposite direction.

7. Perform tilting cycle three times to rephase system.

TM1545,7005,T -19-29MAR93

DISASSEMBLE LEVELING CYLINDERS



1—Fitting
2—Back-Up Ring
3—O-Ring
4—Spring
5—Case
6—Back-Up Washer
7—O-Ring
8—Seat
9—O-Ring
10—Washer
11—O-Ring
12—Ring
13—Gasket
14—Ball
15—O-Ring
16—Ring
17—Bleed Screw
18—Pin
19—Plunger
20—O-Ring
21—Plug
22—Valve Block
23—Cap Screw, 3/8 x 2-1/2 in. (4 used)
24—Washer, 3/8 in. (4 used)
25—Shim, 3/4 x 0.038 in.
26—Shim, 3/4 x 0.015 in.
27—O-Ring (2 used)
28—Back-Up Ring (2 used)
29—Tube
30—Nut
31—O-Ring (2 used)
32—Wear Ring (2 used)
33—Back-Up Ring (2 used)
34—Seal
35—Piston Ring
36—Piston
37—O-Ring
38—O-Ring
39—Barrel
40—Back-Up Ring
41—Guide
42—Seal
43—Seal
44—Lock Ring
45—Nut
46—Lubricating Fitting
47—Rod

TM1545,7005,U -19-09AUG93

NOTE: If cylinder is to be serviced with valve block in place, open bleed screw to remove cylinder pressure.

1. Clean cylinder to prevent contamination of internal parts.

2. Remove four cap screws (23) and remove valve block (22) if needed.

3. Use a JDG-28 spanner wrench or brass drive to loosen nut (45) from rod guide.

4. Push guide (41) into barrel (39) and remove lock ring (44).

5. Pull and turn rod (47) out of barrel with guide and piston assemblies.

6. Remove nut (30).

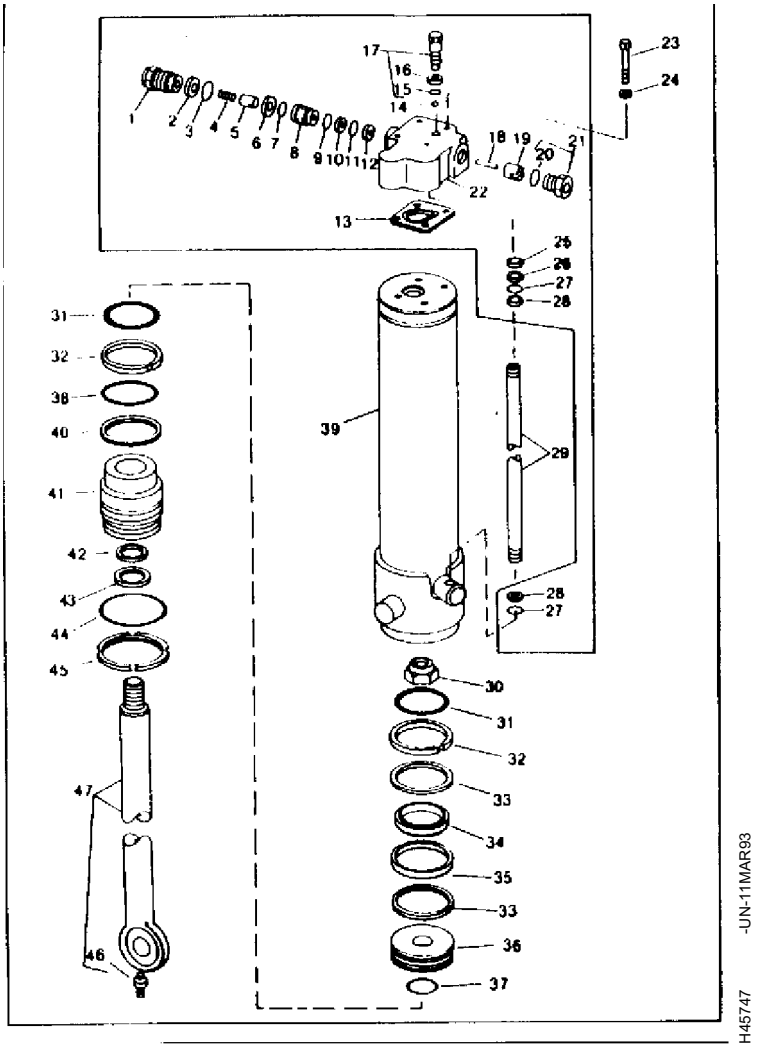
7. Remove piston assembly (36) and guide assembly (41) from rod (47).

8. Inspect parts. Contamination, causing scoring of barrel (39) and damage to piston ring (35) and wear ring (32) is most likely failure. Wear ring (32) centers piston (36) in barrel (39) and does not seal. Sealing is done by the seal (34) and is forced against the cylinder wall by backup rings (33). A damaged seal (34) may cause settling of the leveling cylinder.

9. Remove all O-rings and seals, clean parts and dry with compressed air.

TM1545,7005,V -19-29MAR93

ASSEMBLE LEVELING CYLINDERS



1—Fitting
2—Back-Up Ring
3—O-Ring
4—Spring
5—Case
6—Back-Up Washer
7—O-Ring
8—Seat
9—O-Ring
10—Washer
11—O-Ring
12—Ring
13—Gasket
14—Ball
15—O-Ring
16—Ring
17—Bleed Screw
18—Pin
19—Plunger
20—O-Ring
21—Plug
22—Valve Block
23—Cap Screw, 3/8 x 2-1/2 in. (4 used)
24—Washer, 3/8 in. (4 used)
25—Shim, 3/4 x 0.038 in.
26—Shim, 3/4 x 0.015 in.
27—O-Ring (2 used)
28—Back-Up Ring (2 used)
29—Tube
30—Nut
31—O-Ring (2 used)
32—Wear Ring (2 used)
33—Back-Up Ring (2 used)
34—Seal
35—Piston Ring
36—Piston
37—O-Ring
38—O-Ring
39—Barrel
40—Back-Up Ring
41—Guide
42—Seal
43—Seal
44—Lock Ring
45—Nut
46—Lubrication Fitting
47—Rod

TM1545,7005,W -19-09AUG93

1. Install parts from seal kit in guide (41). Coat parts with hydraulic oil before installation. Install nut (45) on rod (47) and install guide assembly (41) on rod (47).

2. Install seal kit on piston (36). Coat parts with hydraulic oil before installation.

3. Install piston assembly (36) on rod (47).

4. Install rod nut (30). Torque nut to 463 N·m (341 lb-ft).

5. Coat cylinder barrel bore (39) with hydraulic oil.

6. Slide rod assembly into barrel (39).

7. Push guide assembly (41) into barrel bore far enough to install lock ring (44).

8. Thread nut (45) on rod guide (41).

9. Use JDG-28 Spanner Wrench and torque nut (45) to 390 N·m (287 lb-ft).

TM1545,7005,X -19-29MAR93

LEVELING HEADER

IMPORTANT: Check leveling each time a header is changed.

Gearshift lever must be in neutral and the parking brake lever released before tilting combine.

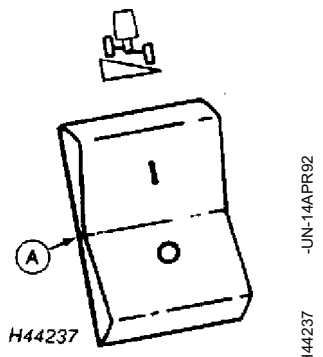
1. Press bottom of switch (A) to turn off leveling system.

2. Press switch (B) to tilt combine to the far left and far right positions for 15 seconds. This rephases leveling cylinders.

3. Drive combine onto a level surface and shut off engine.

4. Lubricate feeder house front sheets.

5. Check drive tire inflation for correct pressure.



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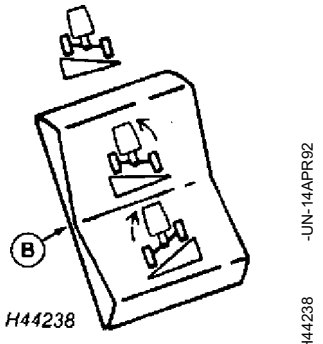
H44237



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TM1545,7005,Y -19-09AUG93

6. Washer (A) on front spring should align with lower mark (B) on front spring carrier (C).

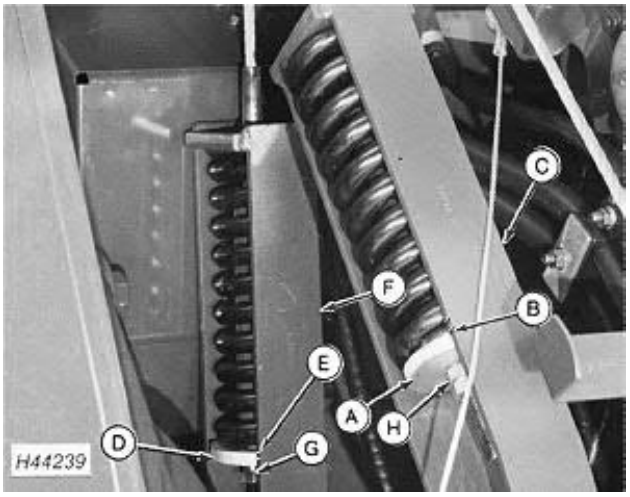
7. Washer (D) on rear spring should align with upper mark (E) on rear spring carrier (F).

8. To raise left-hand side of header, tighten adjusting nut (G) on rear spring and loosen adjusting nut (H) on front spring an equal amount.

NOTE: Large cutting platforms are heavy on left-hand side which may require rear spring to be adjusted approximately 3 mm (1/8 in.) above upper mark.

9. To lower left-hand side of header, loosen adjusting nut on rear spring and tighten adjusting nut on front spring an equal amount.

10. Check to be certain header is level by tilting combine to left and right. Readjust springs if necessary.



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H44239

A—Washer
B—Gauge Mark
C—Front Spring Carrier
D—Washer
E—Gauge Mark
F—Rear Spring Carrier
G—Nut

70
05
28

TM1545,7005,Z -19-09AUG93

Section 100
HEADER DRIVE REPAIR

Contents

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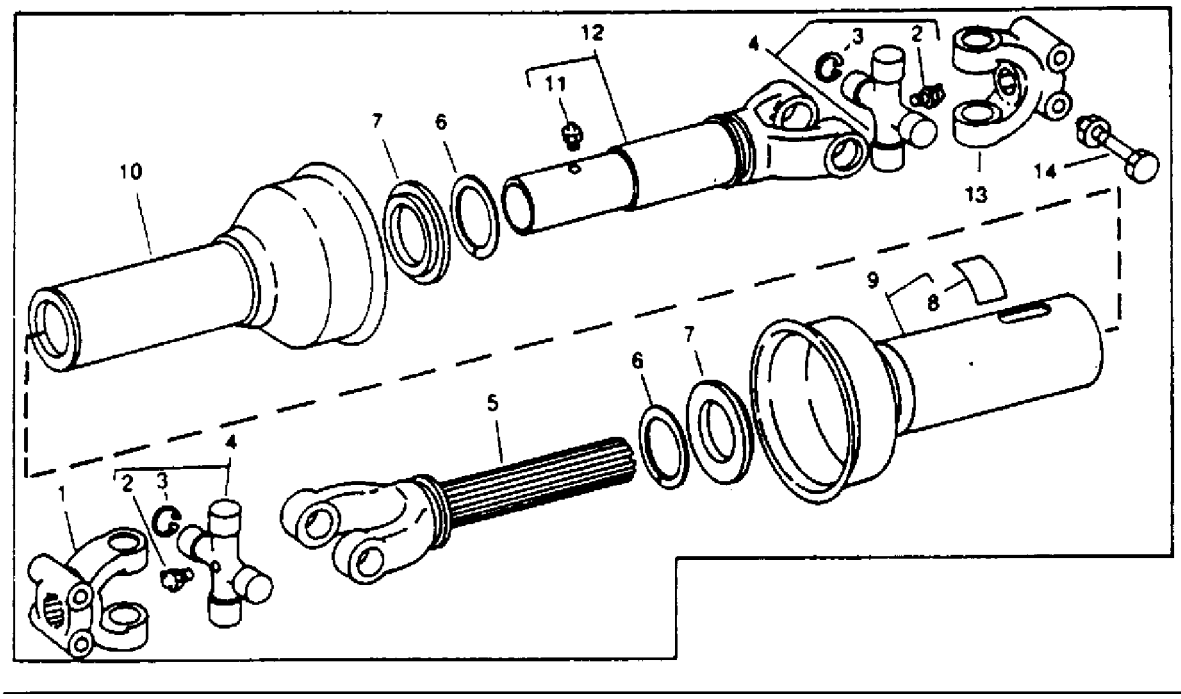
HEADER DRIVE SHAFT



1—Yoke	5—Shaft	9—Shield	13—U-Joint
2—Lubrication Fitting	6—Bearing	10—Shield	14—Bolt, M12 x 70 (4 used)
3—Snap Ring	7—Snap Ring	11—Lubrication Fitting	
4—U-Joint	8—Decal	12—Tube	

*Legend—Header Drive Shaft**

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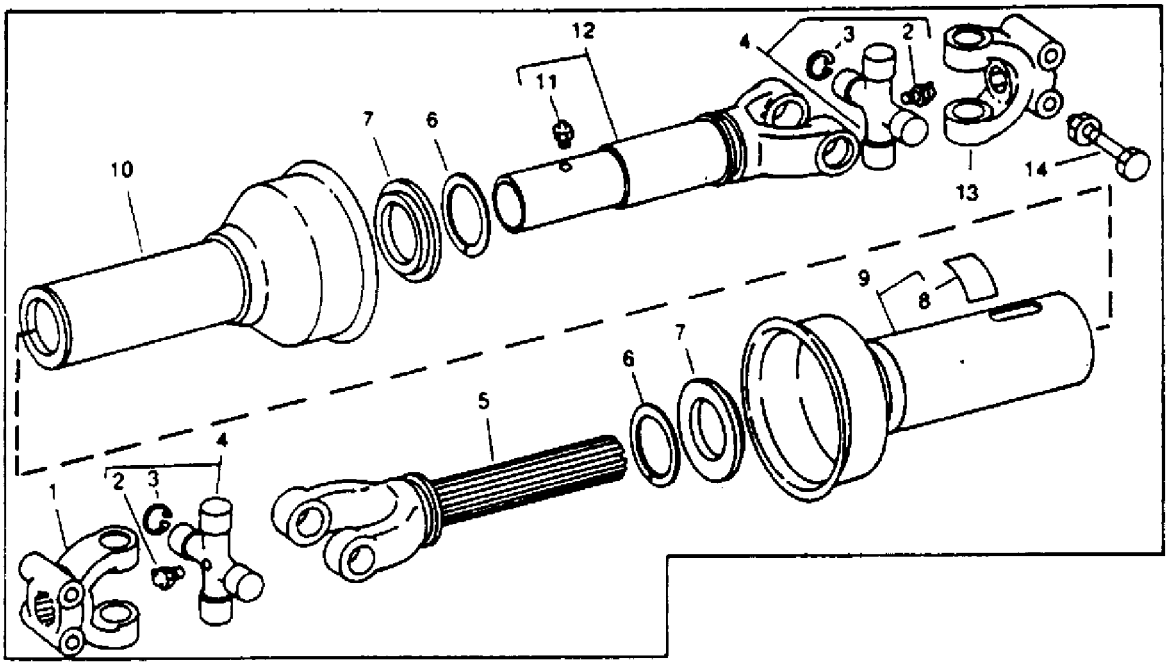
1

**444 Corn Head and 914 BPU ONLY*

TM1545,10005,A -19-09AUG93

HEADER CV DRIVE SHAFT



1—Yoke
2—Lubrication Fitting
3—Snap Ring
4—U-Joint
5—U-Joint Yoke
6—Lubrication Fitting
7—Yoke Shaft
8—Snap Ring
9—Shield Retainer
10—Decal
11—Shield
12—Shield
13—Bearing
14—Yoke Tube
15—U-Joint
16—Bolt, M12 x 70 (4 used)

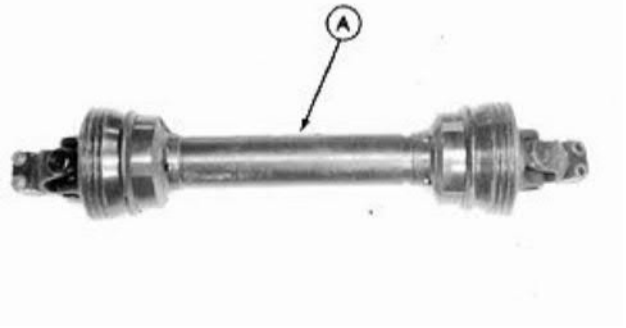
100
05
2

Legend—CV Header Drive Shaft

TM1545,10005,B -19-09AUG93

DISASSEMBLE HEADER CV DRIVE SHAFT

1. Separate shaft (A) into two halves by pulling apart.



H45751 -UN-22MAR93

H45752 -UN-22MAR93

TM1545,10005,C -19-29MAR93

2. Insert screw driver in shaft shield holes (A) and push snap ring (B) toward U-joints.

3. Remove shield from shaft assembly.

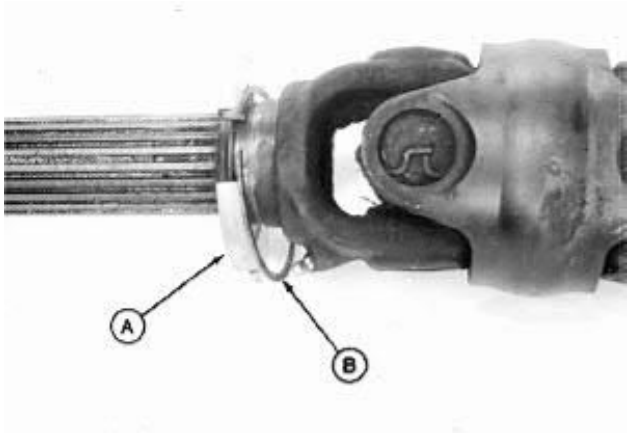
H45753 -UN-22MAR93

H45754 -UN-22MAR93

TM1545,10005,D -19-29MAR93

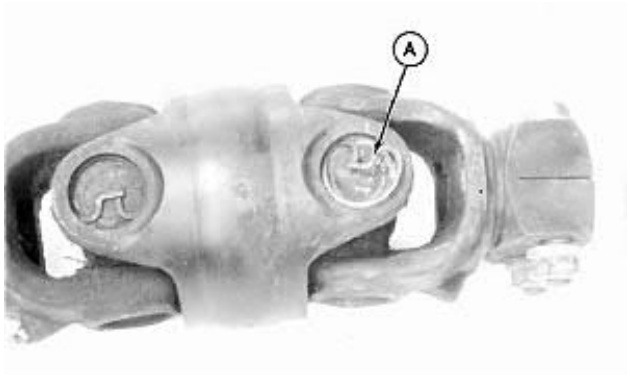
4. Remove shield bearing (A) and snap ring (B) from shaft.

5. Inspect bearing for wear. Replace as necessary.



TM1545,10005,E -19-29MAR93

6. Remove all snap rings (A) from u-joint yokes.

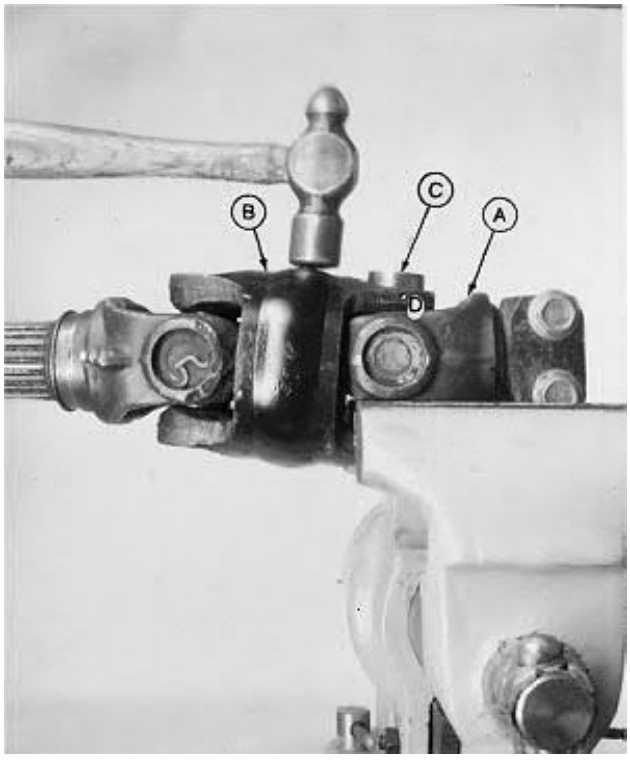


TM1545,10005,F -19-29MAR93

7. Support center yoke (A) on bottom and drive U-joint bearing out with driver. Bearing cap will be partially forced out of yoke.

TM1545,10005,G -19-29MAR93

8. Rotate shaft with exposed bearing cap (C) up. Support end yoke (A) in vise and drive center yoke (B) down to push out bearing cap (C).



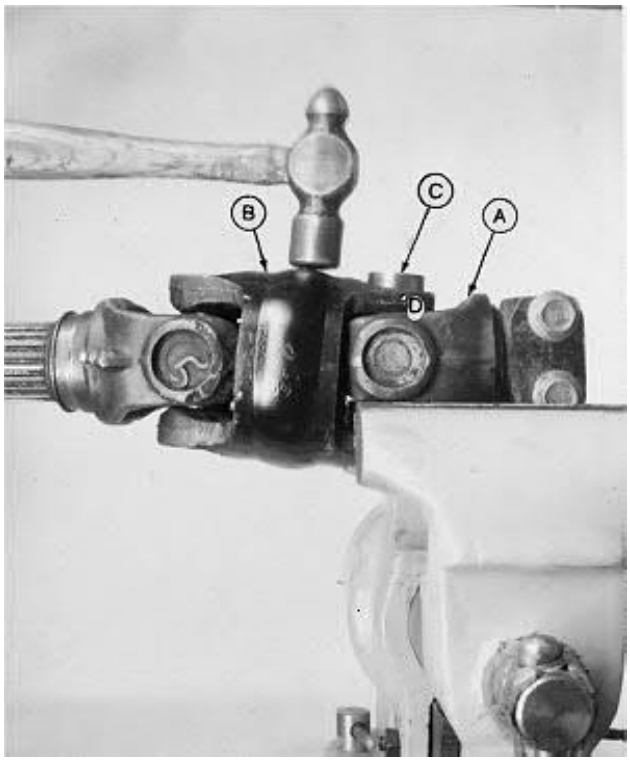
TM1545,10005,H -19-09AUG93

9. Remove drive shaft assembly from vise and rotate. Clamp exposed bearing cap in vise.

10. Drive center yoke (A) up off bearing cap.

TM1545,10005,I -19-09AUG93

11. Remove drive shaft from vise and rotate. Support end yoke (A) in vise and drive center yoke down (B) to drive out opposite bearing cap (C).



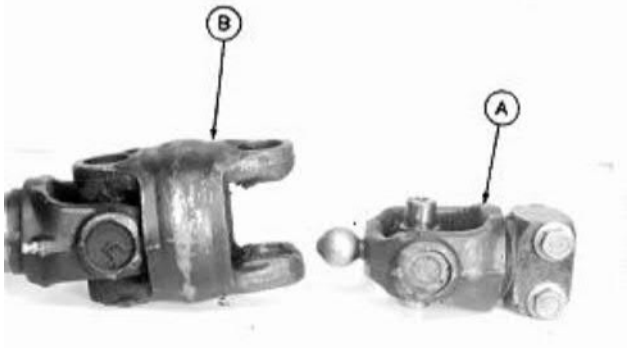
TM1545,10005,J -19-09AUG93

12. Rotate shaft in vise and clamp bearing cap in vise.

13. Drive center yoke (A) up off bearing cap.

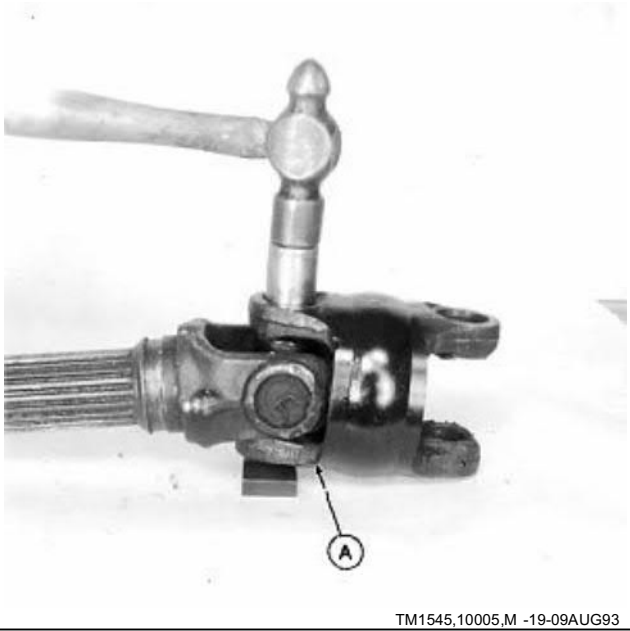
TM1545,10005,K -19-09AUG93

14. Separate end yoke (A) from center yoke (B).



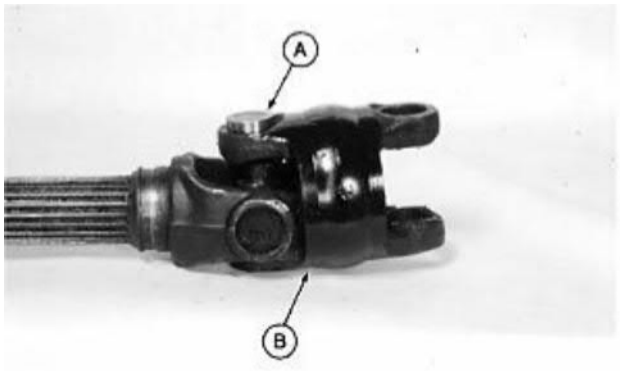
TM1545,10005,L -19-09AUG93

15. Support center yoke (A) on bottom and drive U-joint bearing out with driver.



TM1545,10005,M -19-09AUG93

16. Clamp bearing cap (A) in vise and drive center yoke (B) up as done previously.



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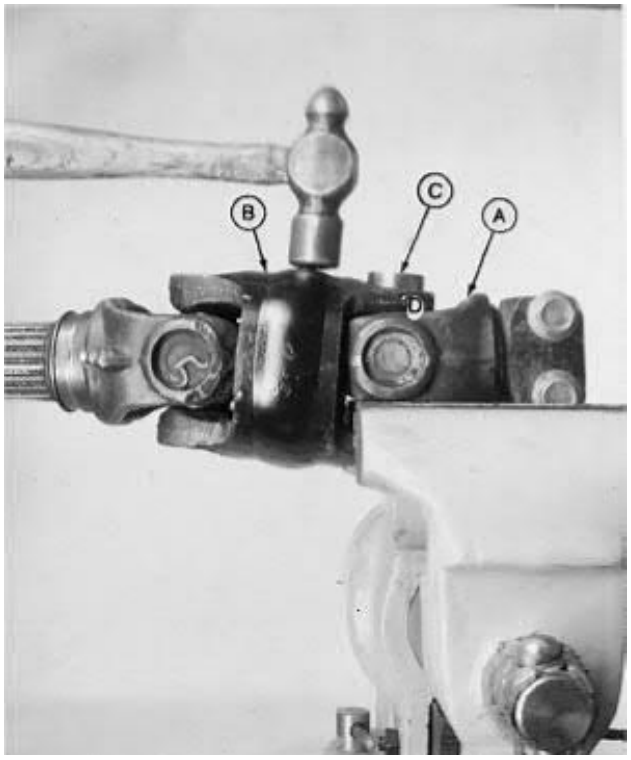
TM1545,10005,N -19-09AUG93

17. Support shaft yoke (A) in vise. Drive down center yoke (B) to partially remove opposite bearing yoke (C).



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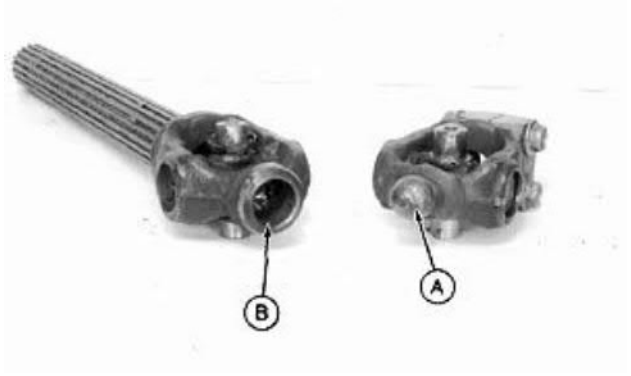
H46069

TM1545,10005,O -19-09AUG93

18. Separate center yoke from shaft yoke.

19. Inspect ball (A) and socket (B) of yoke ends for wear or galling.

20. Replace yoke and shaft if worn.



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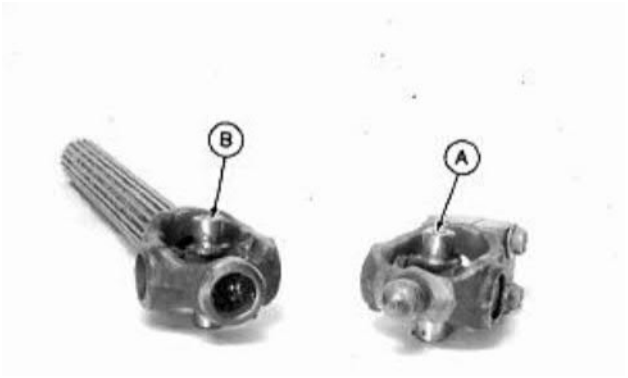
H45763

TM1545,10005,P -19-09AUG93

21. Remove U-joint from end yoke (A) and shaft yoke (B) using same procedure. Note position of grease fittings before removal of U-joints.

22. Clean all yokes in solvent. Inspect yokes for wear. Replace as necessary.

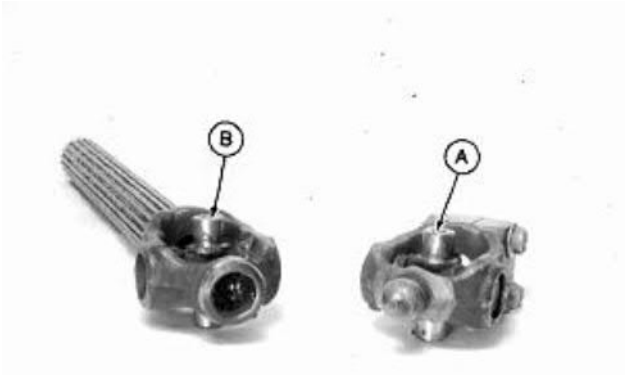


TM1545,10005,Q -19-09AUG93

ASSEMBLE HEADER CV DRIVE SHAFT

1. Install new U-joints in end yoke (A) and shaft yoke (B). Check position of grease fittings.

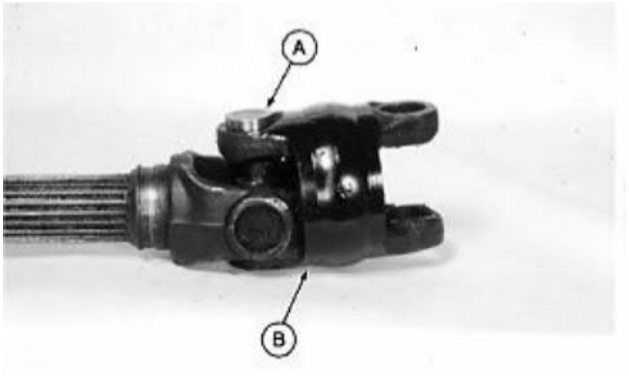
2. Install bearing caps and snap rings.



TM1545,10005,R -19-09AUG93

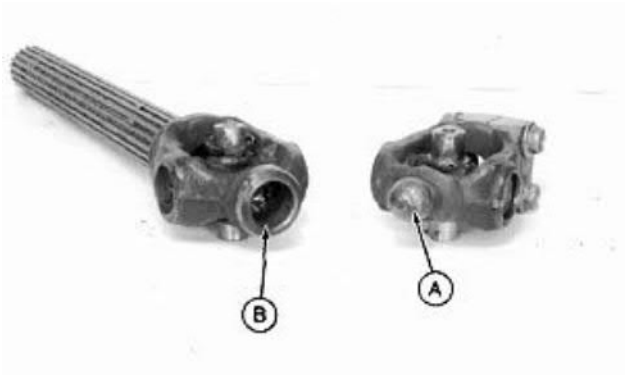
3. Install center yoke (B) on shaft yoke.

4. Install bearing caps (A) and snap rings.



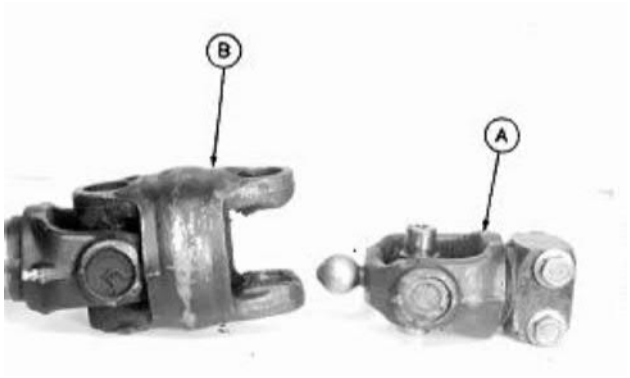
TM1545,10005,S -19-09AUG93

5. Grease ball (A) and socket (B) before assembly.



TM1545,10005,T -19-29MAR93

6. Install end yoke (A) to center yoke (B). Be sure ball engages socket.



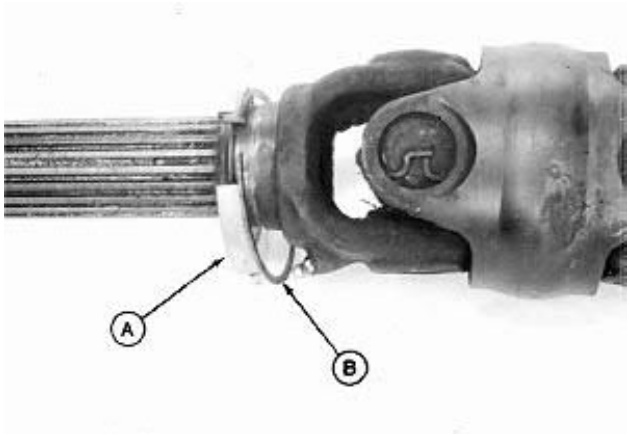
TM1545,10005,U -19-09AUG93

7. Install bearing caps and snap rings.

TM1545,10005,V -19-29MAR93

8. Install snap ring (B) on shaft.

9. Install bearing (A) smooth side to U-joints on shaft in groove.



TM1545,10005,W -19-09AUG93

10. Slide shield over shaft and bearing. Align tabs on bearing with holes in shield (A).

11. Insert screw drivers in holes (A).

12. Pry snap ring (B) into groove of shield.

H45753 -UN-22MAR93

H45754 -UN-22MAR93

TM1545,10005,X -19-29MAR93

13. Repeat disassembly and assembly procedures for opposite half of drive shaft if necessary.

14. Assemble two shaft halves together to complete shaft assembly.

TM1545,10005,Y -19-09AUG93

Section 110
FEEDER HOUSE REPAIR

Contents

Page

REMOVE AND INSTALL FEEDER HOUSE

1. Leave header attached to feeder house to act as a counterbalance.

2. Remove feeder house side shields.

3. Remove hose clamps on both sides.

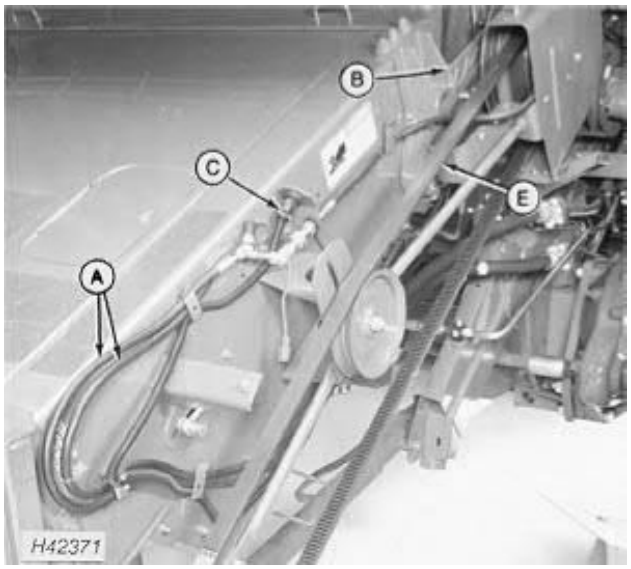
4. Push hoses (A) up and through conveyor drive support (B) on both sides.

5. Disconnect wiring harness (C) and push harness up through conveyor drive support.

IMPORTANT: Do NOT disconnect hoses or dirt will get into hydraulic system.

6. Disconnect reverser cable (D) under feeder house.

A—Hoses
B—Support
C—Harness
D—Reverser Cable



-UN-25SEP90
H42371

-UN-25SEP90
H42614

TM1545,11005,A -19-09AUG93

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7. Loosen nuts (A) to loosen belt (D).

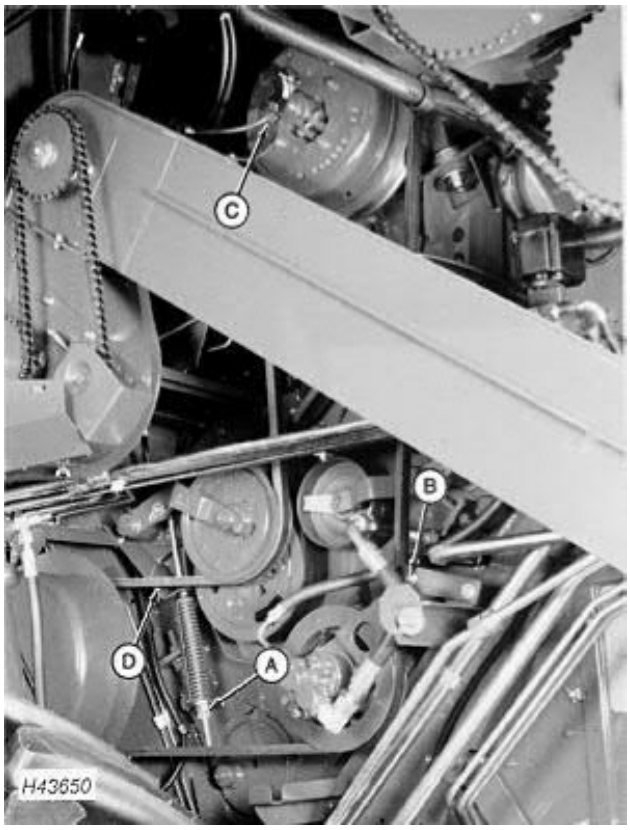
8. Remove cap screw (B) from pump strap.

9. Remove cap screw from electric clutch module strap (C).

10. Remove belt (D) from upper sheave.

11. Lay belt (B) on top of feeder house.

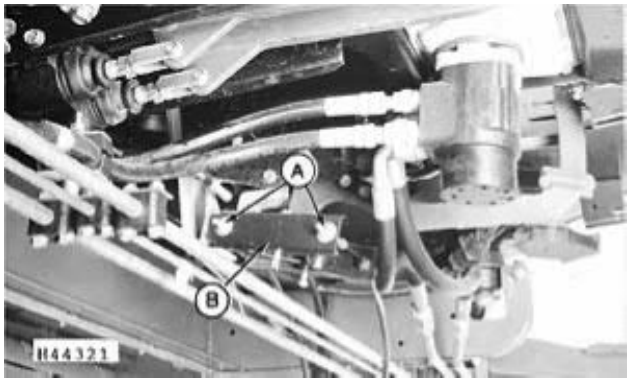
A—Nut
B—Cap Screw
C—Strap
D—Belt



-UN-01JUL91
H43650

TM1545,11005,C -19-09AUG93

12. Disconnect parking brake cables (A) from support (B).

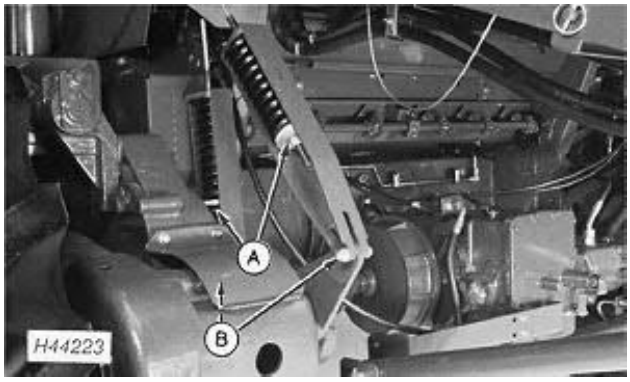


-UN-11JUN92
H44321

TM1545,11005,B -19-29MAR93

13. Loosen nuts (A) to relieve spring tension.

14. Remove cap screws (B) to remove spring assembly.

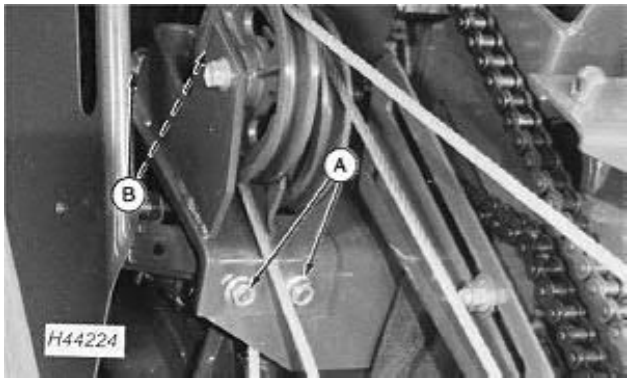


-UN-13APR92
H44223

TM1545,11005,E -19-29MAR93

15. Remove cap screws (A) and (B) securing pulley assembly.

16. Lay cable and spring assembly on top of feeder house.



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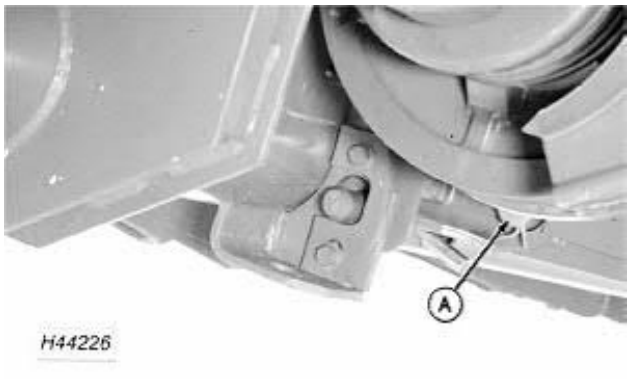
H44224

TM1545,11005,F -19-29MAR93

17. Remove cylinder rod pin (A) on both sides.

CAUTION: To prevent injury, block feeder house securely.



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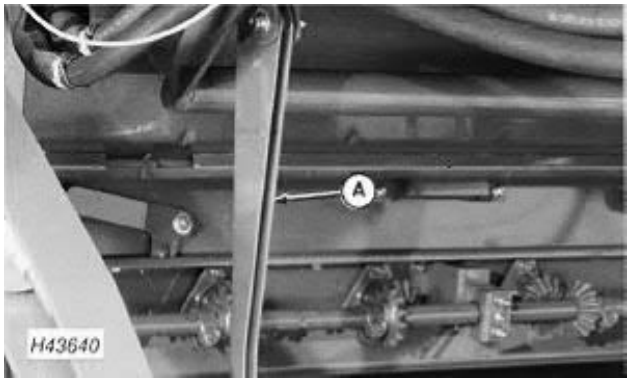
H44226

TM1545,11005,G -19-29MAR93

18. Pull down lever (A) to drop feed plate.



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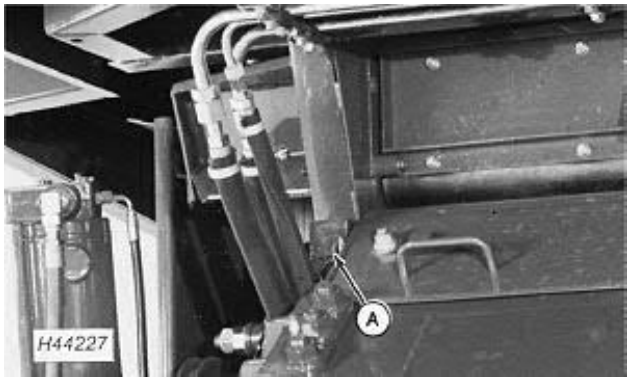
H43640

TM1545,11005,H -19-29MAR93

19. Remove cap screw (A) on both sides with 30 mm socket.

20. Back combine away slowly.

21. Inspect feeder house components. Repair or replace as necessary.



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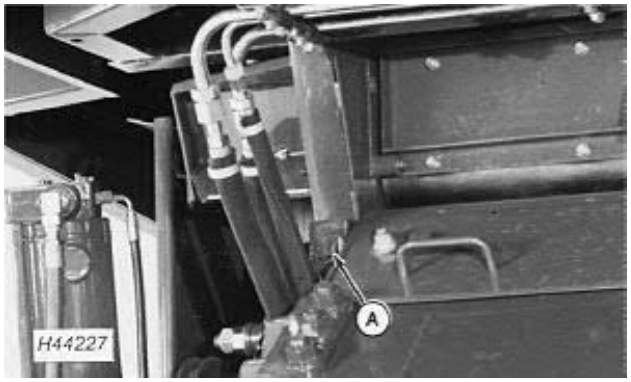
TM1545,11005,I -19-09AUG93

INSTALL FEEDER HOUSE

1. Slowly drive forward to connect feeder house.

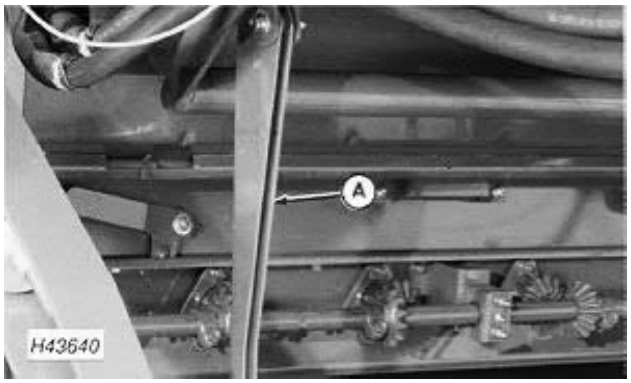
2. Apply thread lock and sealer (medium strength) to cap screw threads (A).

3. Install cap screw (A). Tighten to 620 N·m (457 lb-ft).



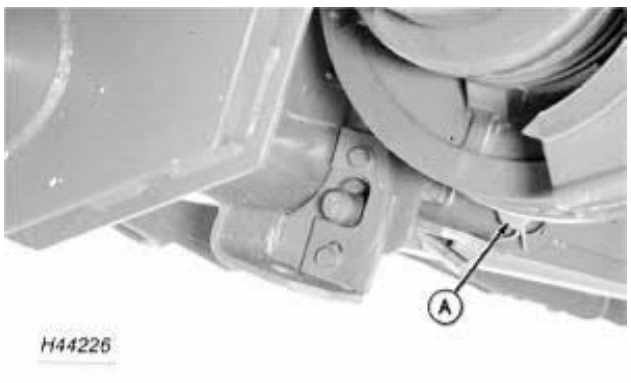
TM1545,11005,J -19-29MAR93

4. Pull up lever (A) to raise feed plate.



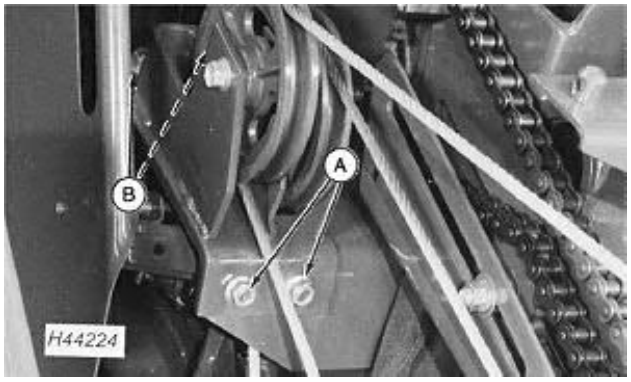
TM1545,11005,K -19-29MAR93

5. Install cylinder pin (A) on both sides.



TM1545,11005,L -19-29MAR93

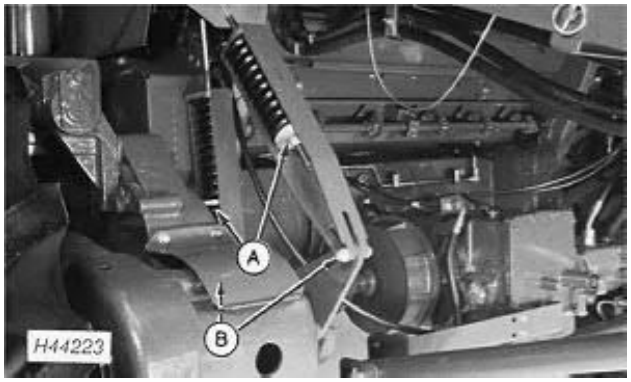
6. Install cap screws (A) and (B) to pulley assembly.



TM1545,11005,M -19-29MAR93

7. Install cap screws (B) to secure spring assembly.

8. Tighten nuts (A) to adjust spring tension.



TM1545,11005,N -19-29MAR93

9. Washer (A) on front spring should align with lower mark (B) on front spring carrier (C).

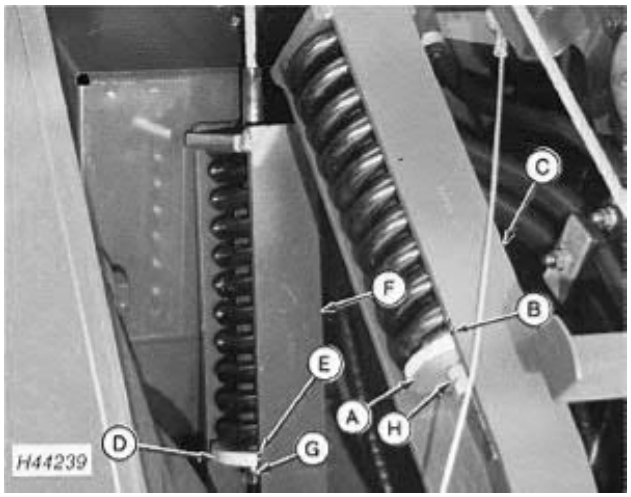
10. Washer (D) on rear spring should align with the upper mark (E) on rear spring carrier (F).

11. To raise left-hand side of the header, tighten adjusting nut (G) on rear spring and loosen adjusting nut (H) on front spring an equal amount.

NOTE: Large cutting platforms are heavy on left-hand side which may require rear spring to be adjusted approximately 3 mm (1/8 in.) above upper mark.

12. To lower left-hand side of header, loosen adjusting nut on rear spring and tighten adjusting nut on front spring an equal amount.

13. Check to be certain header is level by tilting combine to left and right. Readjust springs if necessary.



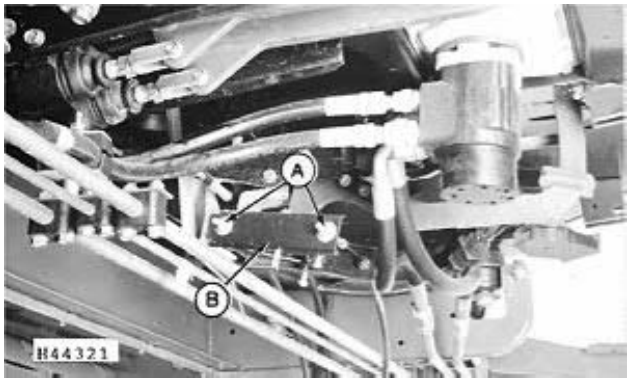
A—Washer
B—Gauge Mark
C—Front Spring Carrier
D—Washer
E—Gauge Mark
F—Rear Spring Carrier
G—Nut
H—Nut

TM1545,HX110,AA-19-09AUG93

14. Connect reverser cable (D) under feeder house.

TM1545,11005,O -19-09AUG93

15. Install ends of parking brake cables (A) through support (B) and reassemble.



TM1545,11005,P -19-09AUG93

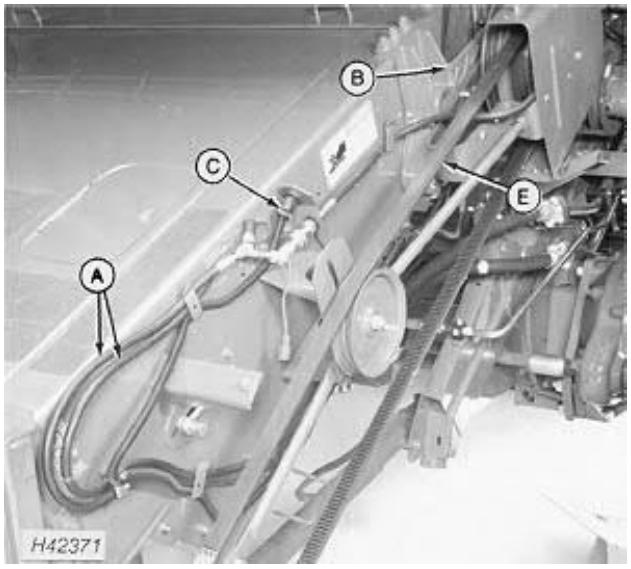
16. Pull wiring harness (C) through conveyor drive support (B) and connect.

17. Pull hose (A) through conveyor drive support on both sides.

18. Install hose clamps on both sides.

19. Install feeder house side shields.

A—Hoses
B—Support
C—Harness
E—Belt



TM1545,11005,S -19-09AUG93

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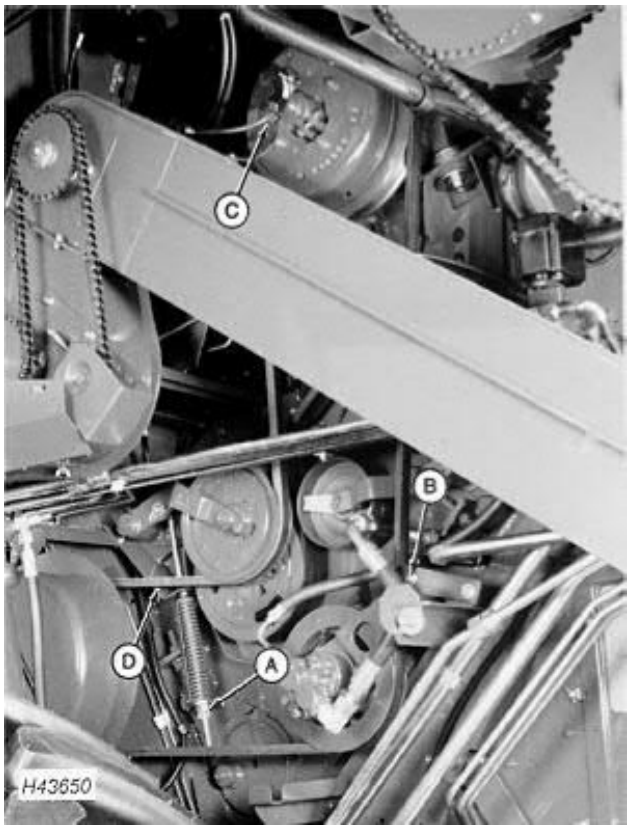
20. Install feeder house drive belt (D) to electric clutch sheave.

21. Install cap screw to electric clutch module strap (C).

22. Install cap screw (B) in reel pump strap.

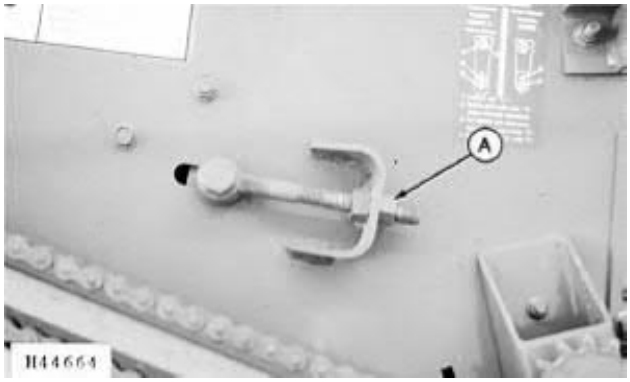
23. Tighten nuts (A) to align washer with gauge.



TM1545,11005,Q -19-09AUG93

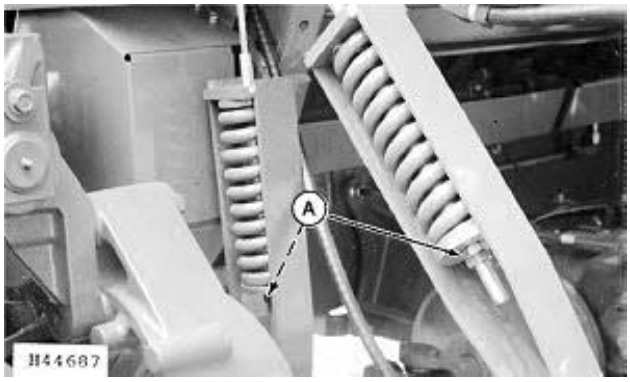
DISASSEMBLE AND ASSEMBLE FEEDER CONVEYOR

1. Loosen nut (A) to release tension on conveyor chain on both sides.



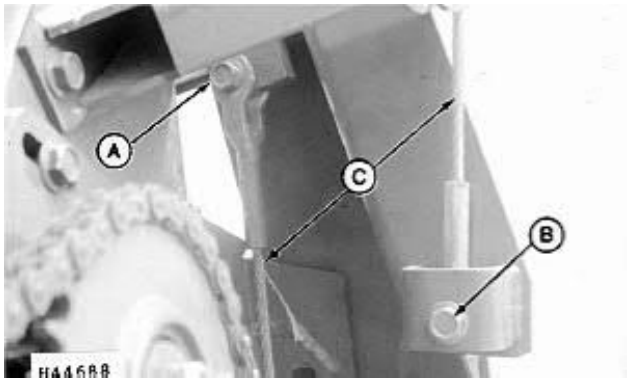
HX,1545,1105,DA-19-18NOV92

2. Loosen nuts (A) to relieve spring tension.



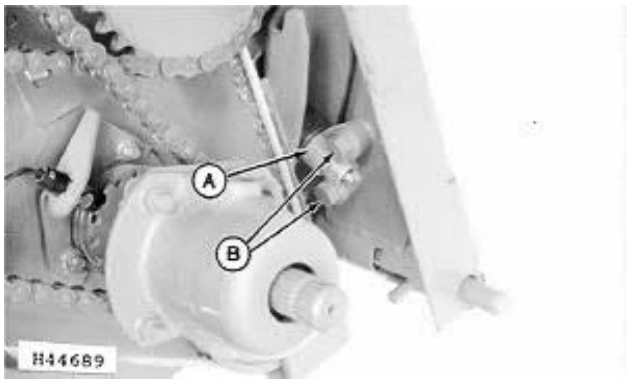
TM1545,HX110,AC-19-09AUG93

3. Remove cap screw (A) and (B) to disconnect cables (C).



HX,1401,1105,AA-19-25AUG92

4. Remove two cap screws (B) to remove roller (A) on both sides.



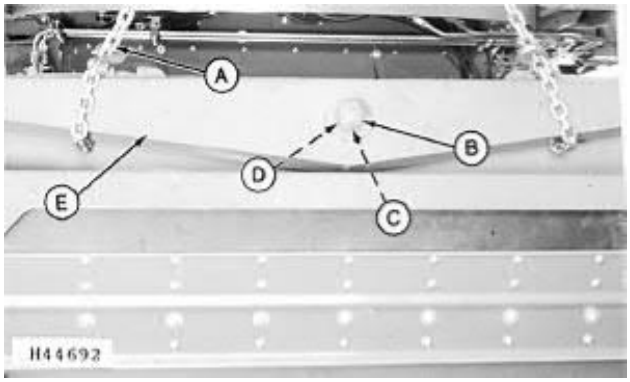
HX,1401,1105,AB-19-25AUG92

CAUTION: Approximate weight of feeder house frame is 79 kg (175 lbs).

5. Attach lifting device (A) to frame.

6. Remove parts (B—D) and remove frame (E).

A—Lifting Chain
B—Lock Nut
C—Nut
D—Washer
E—Frame



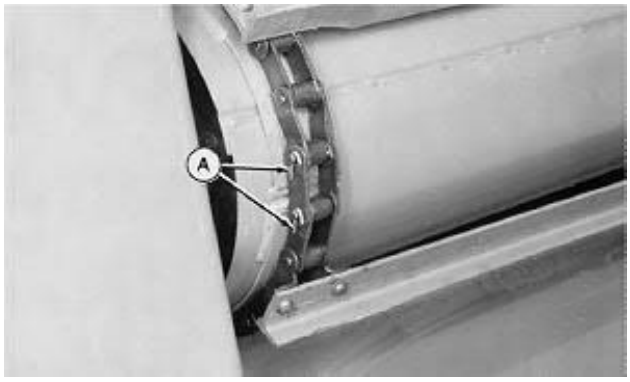
HX,TM1545,BD -19-09AUG93

7. Rotate conveyor to gain access to master link.

8. Remove hooks (A) to remove connector links.

9. Pull conveyor out of feeder house.

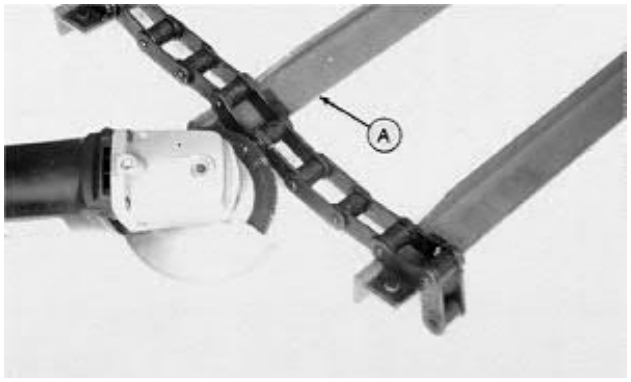
10. Inspect chain and slats. Repair or replace as required.



HX,1401,1105,AD-19-25AUG92

11. Grind off rivets to replace slats (A).

12. Rivet slats to chain. If riveting is not possible, a 1/4 x 3/4 in. cap screw and two nuts can be used. Be sure cap screw head is on chain link side.



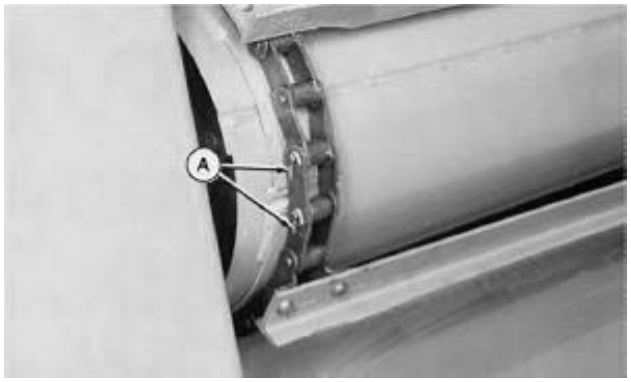
HX,1401,1105,AE-19-25AUG92

13. Pull conveyor into feeder house using a rope (A).

HX,1401,1105,AF-19-25AUG92

IMPORTANT: When shortening conveyor chain, remove an offset link from each strand using a chain breaker. Connector link can be reused to connect chain.

14. Connect chain ends with connector links and new hooks (A). On outside chains, install connector links so hooks are toward outside edge of feeder house to prevent pins from striking drum ring.

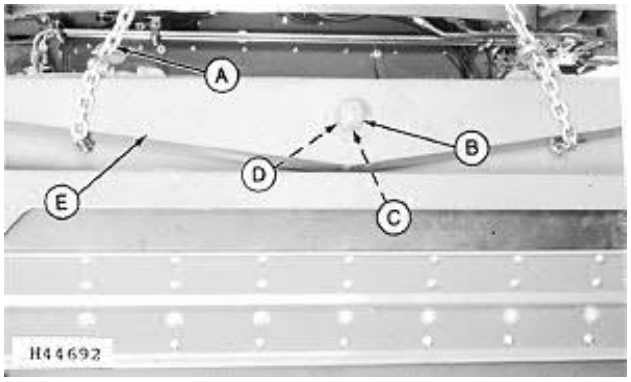


HX,1401,1105,AG-19-09AUG93

15. Install frame (E) and parts (B—D).

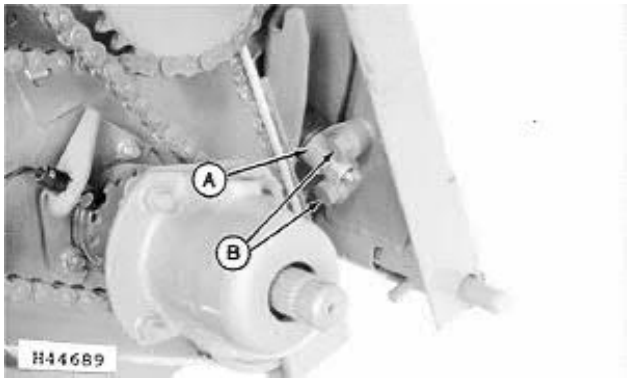
16. Remove lifting device (A).

A—Lifting Chain
B—Lock Nut
C—Nut
D—Washer
E—Frame



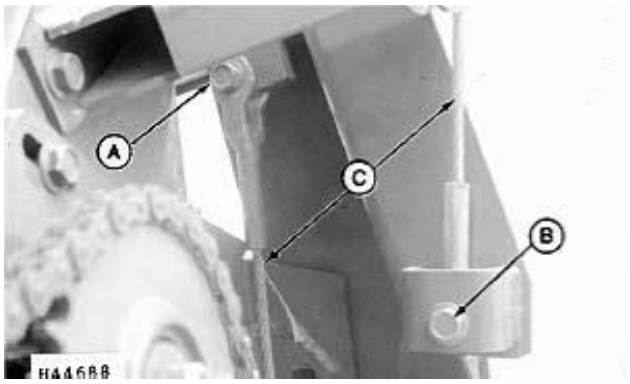
HX,TM1545,BE -19-09AUG93

17. Install roller (A) and cap screws (B) on both sides.



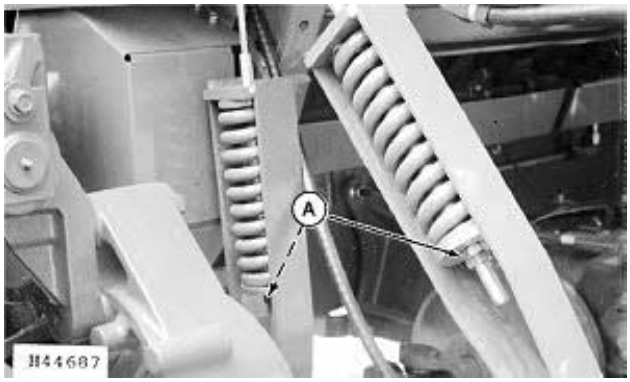
HX,1401,1105,AI-19-25AUG92

18. Install cap screw (A) and (B) to connect cables (C).



HX,1401,1105,AJ-19-25AUG92

19. Tighten nuts (A) to adjust tension.



HX,1401,1105,AK-19-25AUG92

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20. Washer (A) on front spring should align with lower mark (B) on front spring carrier (C).

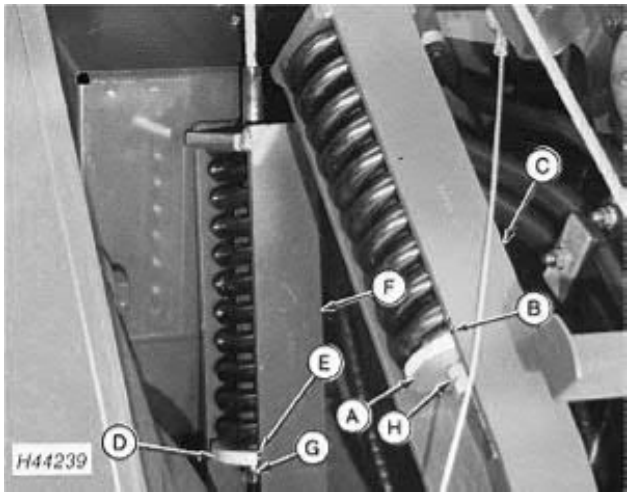
21. Washer (D) on rear spring should align with upper mark (E) on rear spring carrier (F).

22. To raise left-hand side of the header, tighten adjusting nut (G) on rear spring and loosen adjusting nut (H) on front spring an equal amount.

NOTE: Large cutting platforms are heavy on left-hand side which may require rear spring to be adjusted approximately 3 mm (1/8 in.) above upper mark.

23. To lower left-hand side of header, loosen adjusting nut on rear spring and tighten adjusting nut on front spring an equal amount.

24. Check to be certain header is level by tilting combine to left and right. Readjust springs if necessary.



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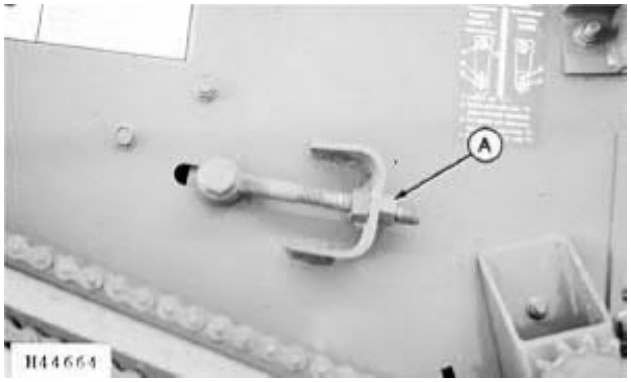
A—Washer
B—Gauge Mark
C—Front Spring Carrier
D—Washer
E—Gauge Mark
F—Rear Spring Carrier
G—Nut
H—Nut

TM1545,HX110,AE-19-09AUG93

25. Tighten nut (A) to adjust conveyor chain tension on both sides.



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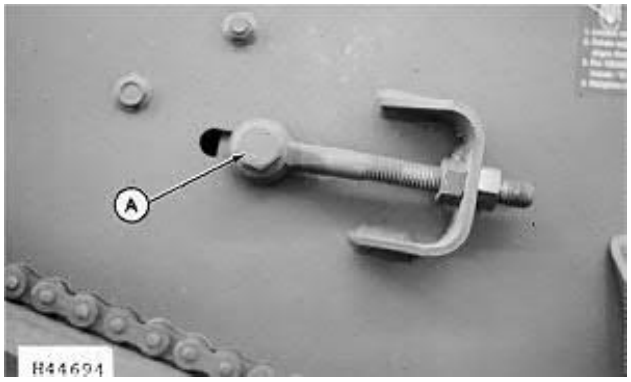
HX,TM1545,BF -19-09AUG93

26. Tighten bolt (A).



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H44694

HX,TM1545,FC -19-09AUG93

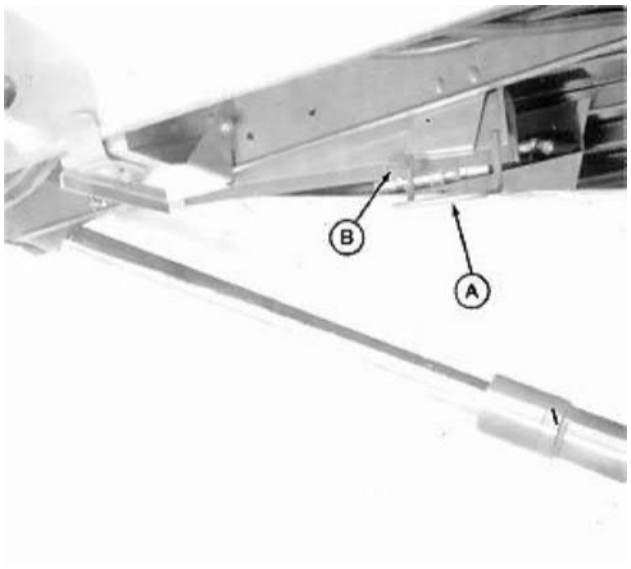
REMOVE AND INSTALL FLOOR PLATE

1. Raise feeder house.

CAUTION: Engine must be off and key removed.

CAUTION: Cracking of hydraulic line fittings to lower feeder house results in an instantaneous dropping of feeder house and header.

Hold handle (A) and release safety stop by removing spring locking pin (B). Lift stop off of latch and lower it down onto cylinder rod. Insert spring locking pin in handle.



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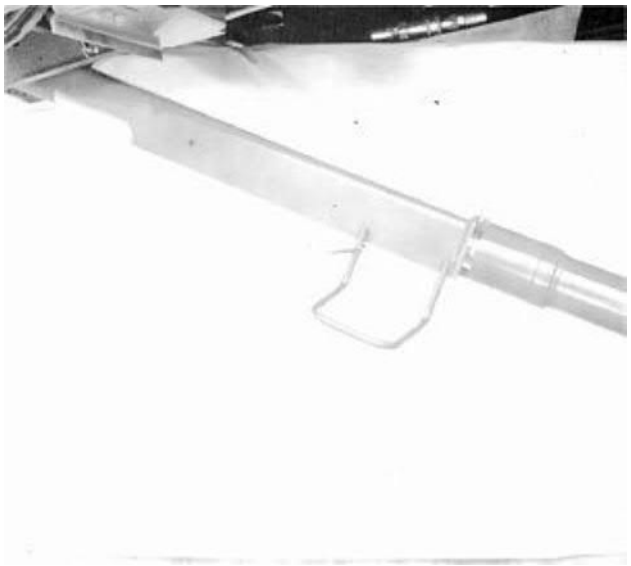

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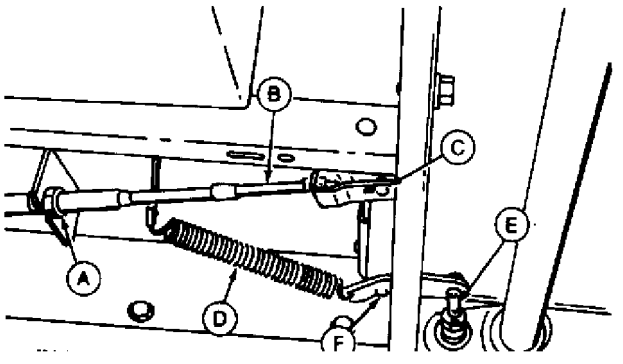
HX,1545,1105,DB-19-18NOV92

2. Loosen nut (A) on reverser cable (B).

3. Remove parts (C—F).

A—Nut
B—Cable
C—Pin
D—Spring
E—Pin
F—Cap Screw



-UN-16JUN92
H44713

HX,1545,1105,DC-19-09AUG93

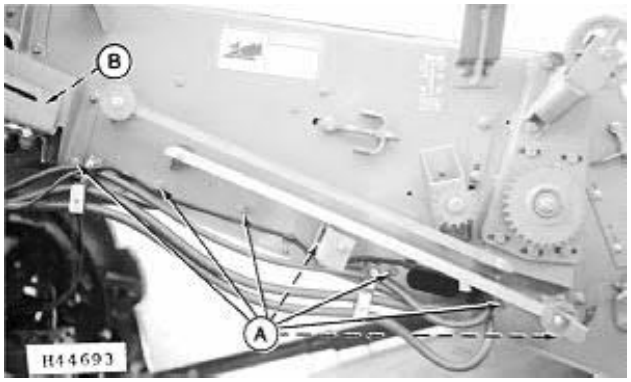
4. Remove floor extension (B) from rear of floor.

5. Remove 20 cap screws and nuts (A) from side and front of feeder house floor.

6. Remove floor.

7. Inspect floor and seal plate. Repair or replace as required.

8. Install floor. Attach with cap screws and nuts (A).



HX,1401,1105,AP-19-25AUG92

ADJUSTING CONVEYOR TENSION

Float cams are located on both sides of feeder house.

To set float:

1. Loosen nut (A).

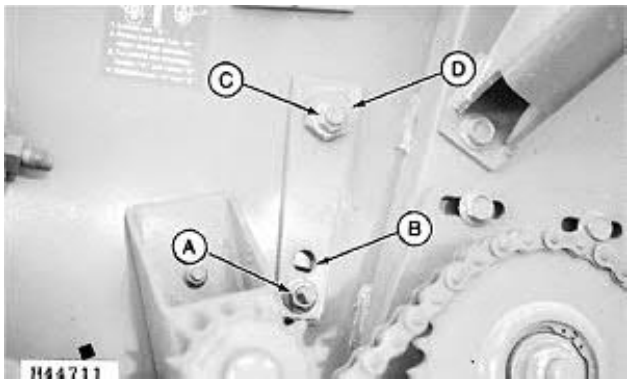
2. For small grain, rotate bolt until hole (B) aligns through side sheet. A wrench flat is provided on bolt.

3. For grain slot clearance, loosen nut (C) and rotate cam (D) to get 3 mm (1/8 in.) slot clearance between slot and feeder house bottom on both sides.

4. To get the 25 mm (1 in.) clearance for corn, loosen nut (A). Rotate bolt until hole (B) is aligned in upper end of slot. Torque nut (A) to 115 N·m (85 lb-ft).

5. Retighten nut (A) and (C).

NOTE: The original cap screws and flange nuts in the feeder conveyor drum pivots were replaced by NEW cap screws (19 M 7399, M16 x 85) and lock nuts (W39621, M16). This will eliminate the need to reach through the inspection hole, with a wrench, to keep bolt from turning.



A—Nut
B—Hole
C—Nut
D—Cam

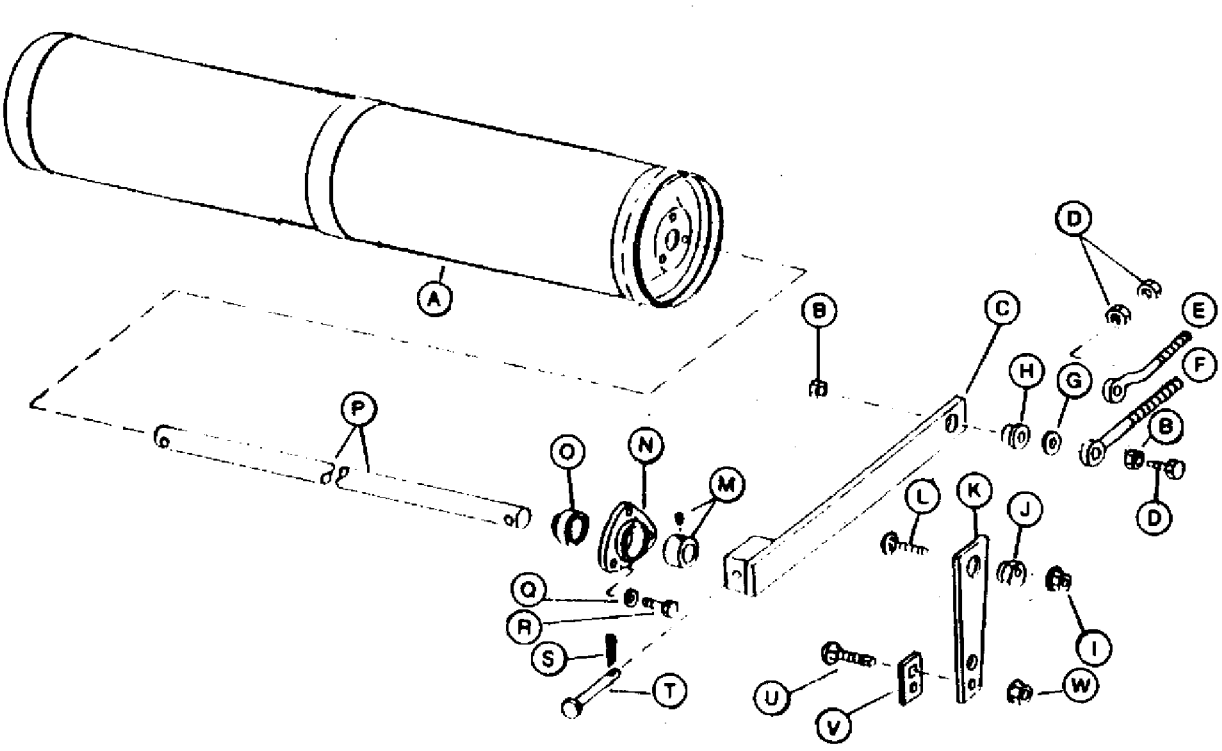
HX,1545,1105,DD-19-18NOV92

SPECIFICATIONS

Item	Measurement	Specification
Conveyor Drum	Approximate Weight	36 kg (80 lb)

1401,11010,A -19-12SEP91

DISASSEMBLE AND ASSEMBLE FEEDER HOUSE CONVEYOR DRUM



H44790 -UN-17JUL92

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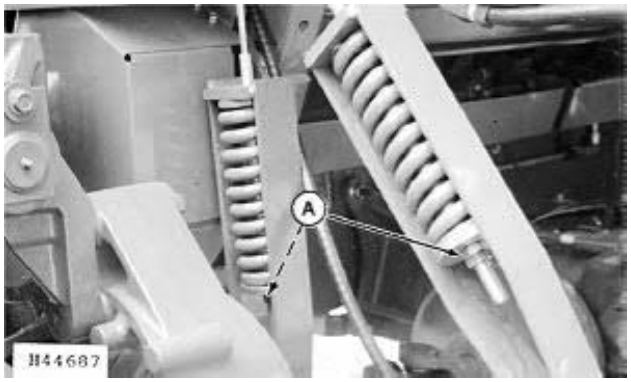
A—Drum
B—Nut (4 used)
C—Arm (2 used)
D—Flange Nut, M16 (6 used)
E—Eyebolt
F—Eyebolt
G—Washer (2 used)
H—Bushing (2 used)
I—Nut, M12 (2 used)
J—Cam (2 used)
K—Plate (2 used)
L—Bolt, M12 x 50 (2 used)
M—Collar with Set Screw (2 used)
N—Housing (2 used)
O—Ball Bearing (2 used)
P—Shaft
Q—Lock Washer, 3/8 in. (6 used)
R—Cap Screw, M12 x 35 (6 used)
S—Cotter Pin (2 used)
T—Pin (2 used)
U—Bolt (2 used)
V—Strap (2 used)
W—Flange Nut, M12 (2 used)

HX,1545,1110,BA-19-18NOV92

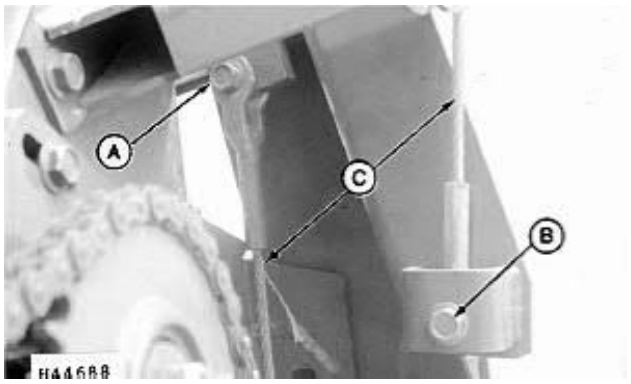
NOTE: It is not necessary to remove feeder house to service drum.

1. Loosen nuts (A) to relieve spring tension.



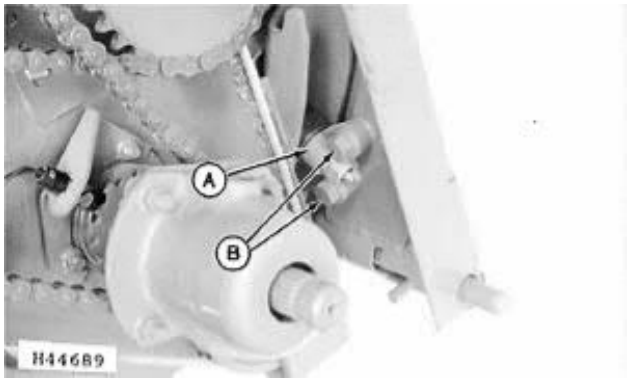
HX,1545,1110,BB-19-18NOV92

2. Remove cap screw (A) and (B) to disconnect cables (C).



HX,1401,1102,G -19-25AUG92

3. Remove two cap screws (B) to remove roller (A) on both sides.



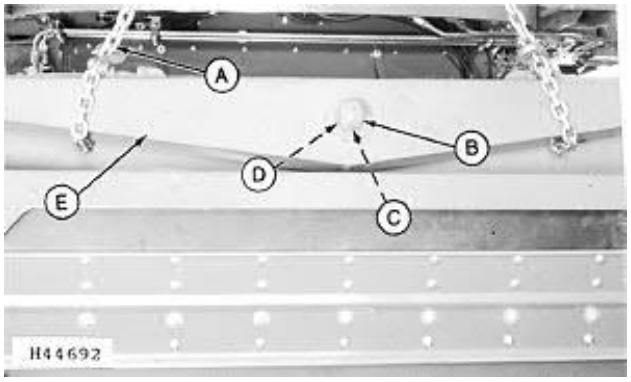
HX,1401,1102,H -19-25AUG92

CAUTION: Approximate weight of feeder house pivot frame is 79 kg (175 lb).

4. Attach lifting device (A) to frame (E).

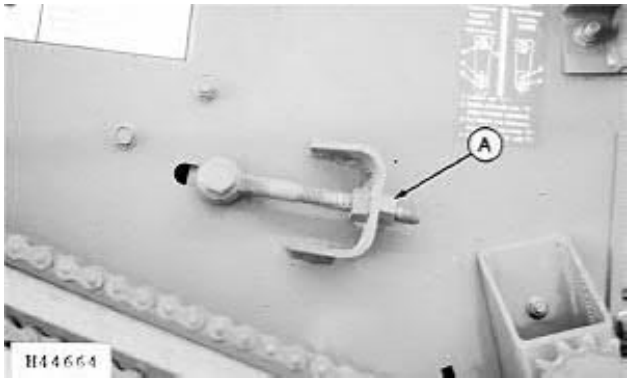
5. Remove parts (B—D) and remove frame (E).

A—Lifting Chain
B—Lock Nut
C—Nut
D—Washer
E—Frame



HX,1401,1102,I -19-25AUG92

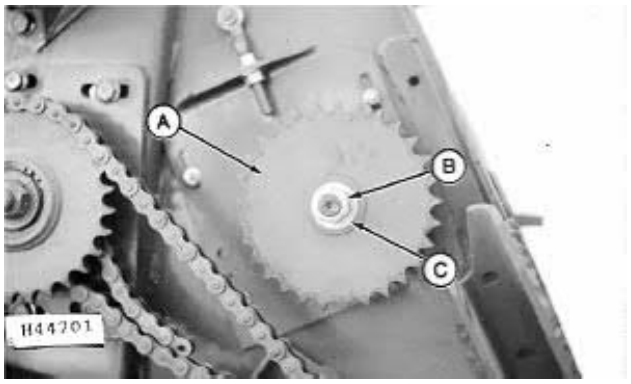
6. Loosen nut (A) to release tension on conveyor chain on both sides.



HX,1401,1102,J -19-25AUG92

7. Disconnect and remove chain.

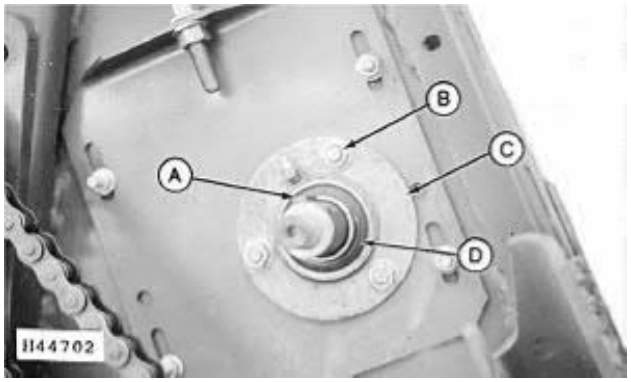
8. Remove nut (B), washer (C) and sprocket (A).



HX,1401,1102,K -19-25AUG92

9. Remove parts (A—D) on both sides.

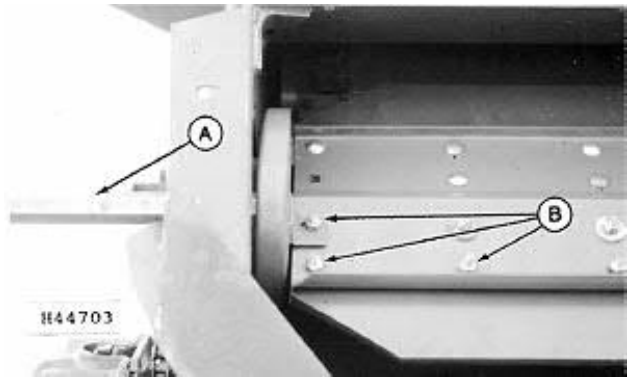
A—Shaft Key
B—Nut (6 used)
C—Flange Housing (4 used)
D—Bearing (2 used)



HX,1545,1110,BC-19-18NOV92

10. Loosen 36 nuts (B).

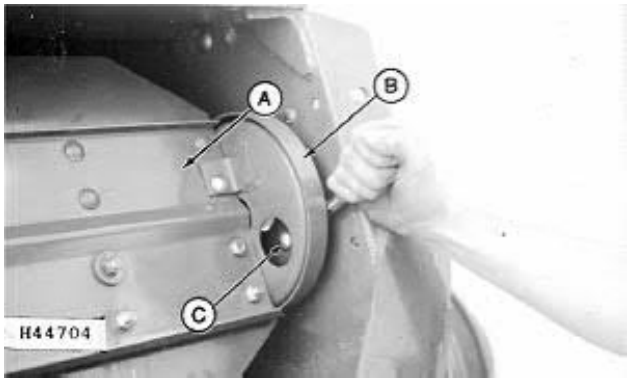
11. Remove shaft (A) from paddles.



HX,1401,1102,M -19-25AUG92

12. Remove three bolts (C) through access hole in deflector (B) on both sides.

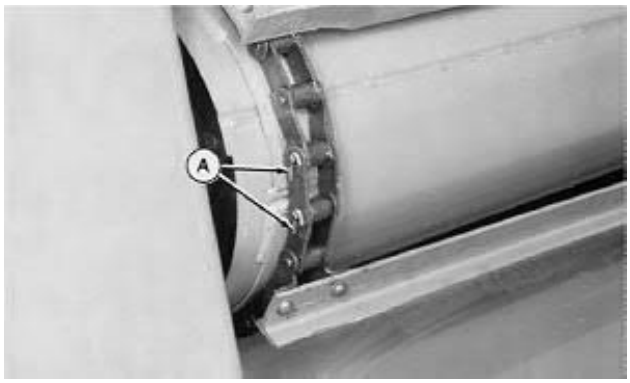
13. Remove paddle assembly (A).



HX,1401,1102,N -19-25AUG92

14. Rotate chain so connector links are accessible.

15. Remove hooks (A) and master links.

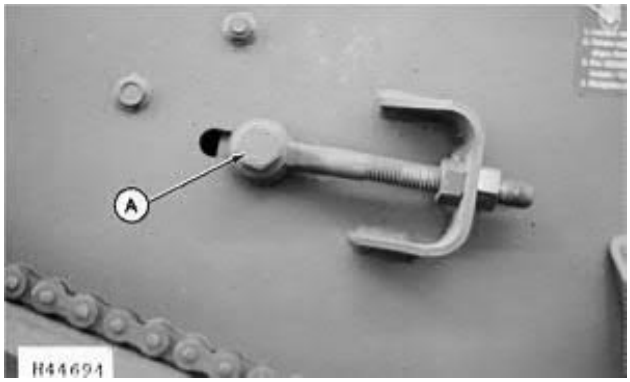


HX,1401,1102,O -19-25AUG92

CAUTION: The approximate weight of conveyor drum is 36 kg (80 lb).

16. Remove cap screw (A) on both sides.

17. Remove drum assembly from feeder house.



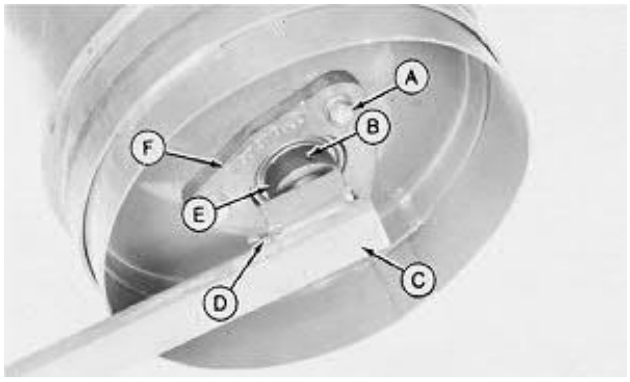
HX,1401,1102,P -19-25AUG92

18. Remove cotter pin and pin (D) to remove arm (C).

19. Loosen set screw (B). Remove collar (E).

20. Remove three cap screws (A) and housing (F).

A—Cap Screw (3 used)
B—Set Screw
C—Arm
D—Cotter Pin and Pin
E—Collar
F—Housing

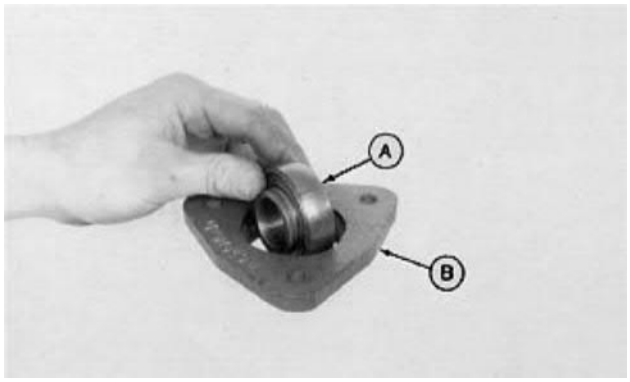


HX,1401,1102,Q -19-25AUG92

21. Rotate bearing (A) to align with oblong slots in housing (B). Remove bearing.

22. Inspect parts. Repair or replace as required.

23. Align bearing (A) with oblong slots in housing (B) and install bearing.



-UN-20MAR89
H40382

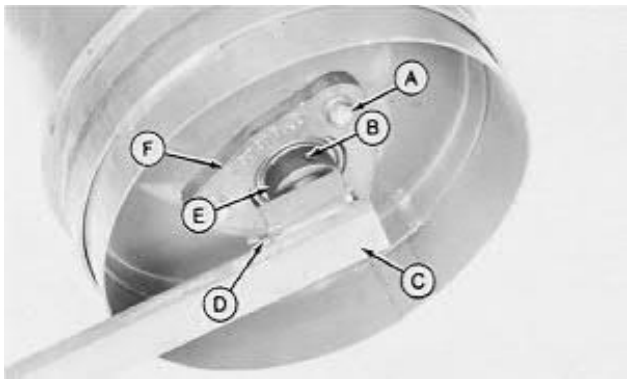
HX,1401,1102,R -19-25AUG92

24. Install housing (F) on drum using three cap screws (A).

25. Install collar (E) and set screw (B).

26. Install arm (C) on shaft with pin and cotter pin (D).

A—Cap Screw (3 used)
B—Set Screw
C—Arm
D—Cotter Pin and Pin
E—Collar
F—Housing



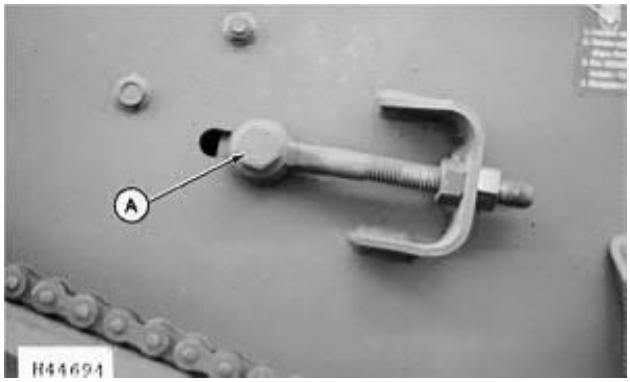
-UN-20MAR89
H40381

HX,1401,1102,S -19-25AUG92

CAUTION: The approximate weight of conveyor drum is 36 kg (80 lb).

27. Install drum in feeder house.

28. Secure drum to feeder house with cap screws (A).

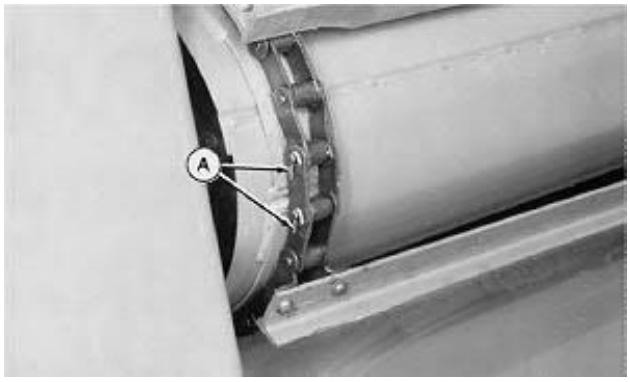


-UN-16JUN92
H44694

HX,1401,1102,T -19-25AUG92

29. Connect conveyor chain ends. Use connector links and new hooks (A).

On outside chains, install connector links so hooks are toward outside edge of feeder house to prevent pins from striking drum ring.

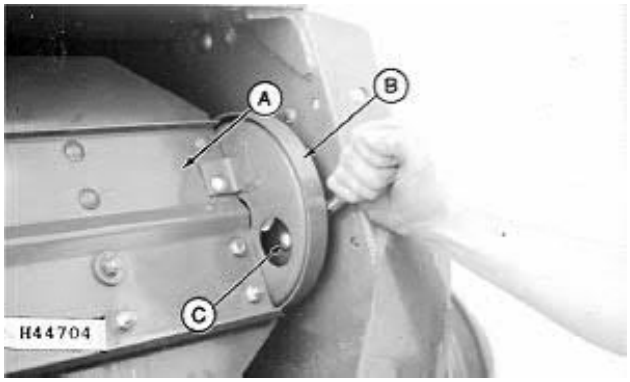


-UN-20MAR89
H40359

HX,1401,1102,U -19-25AUG92

30. Install paddle assembly (A).

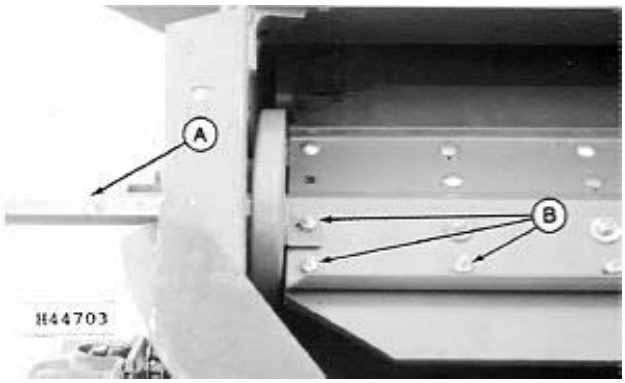
31. Install bolt (C) through access hole in deflector (B).



HX,1401,1102,V -19-09AUG93

32. Install shaft (A).

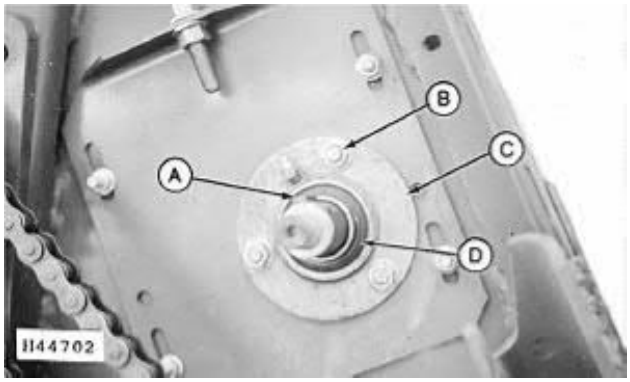
33. Tighten nuts (B) to 4 N·m (30 lb-ft).



HX,1401,1102,W -19-25AUG92

34. Install parts (A—D) on both sides.

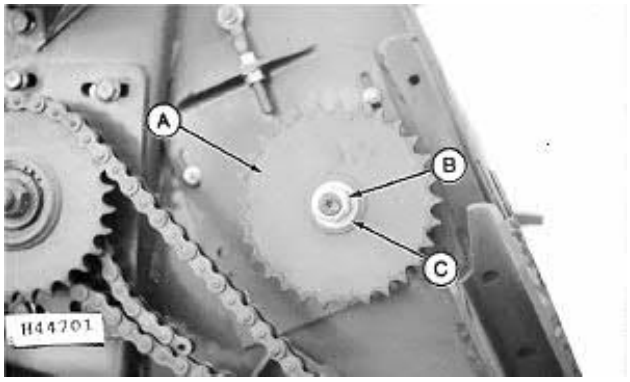
A—Shaft Key
B—Nut (6 used)
C—Flange Housing (4 used)
D—Bearing (2 used)



HX,1545,1110,BD-19-18NOV92

35. Install sprocket (A), washer (C), and nut (B).

36. Install and connect chain.

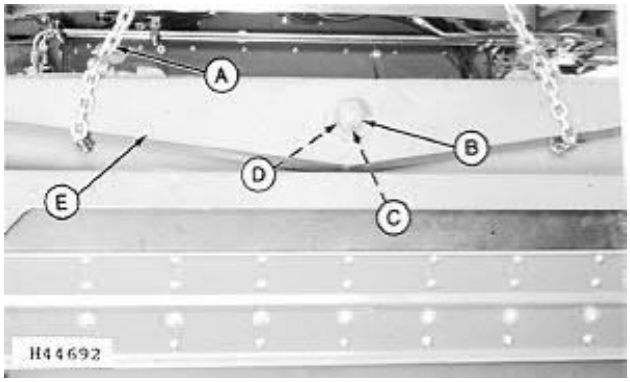


HX,1401,1102,Y -19-25AUG92

37. Install frame (E) using lifting device (A).

38. Install parts (B—D).

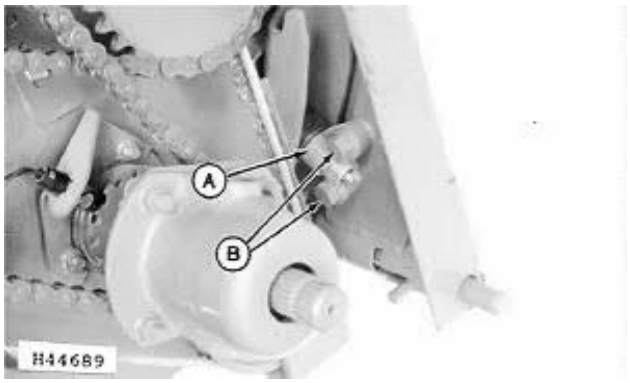
A—Lifting Chain
B—Lock Nut
C—Nut
D—Washer
E—Frame



-UN-16JUN92
H44692

HX,1545,1110,BE-19-18NOV92

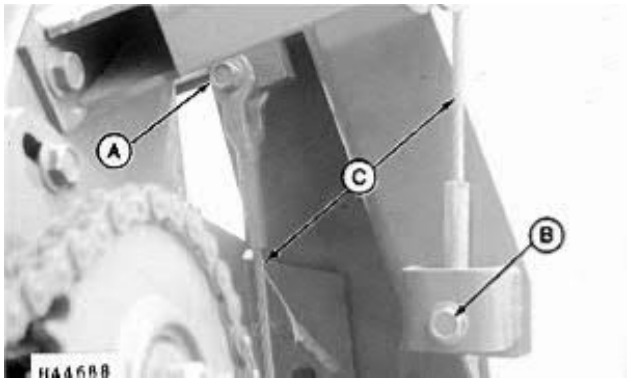
39. Install roller (A) and cap screw (B) on both sides.



-UN-16JUN92
H44689

HX,1401,1102,AA-19-25AUG92

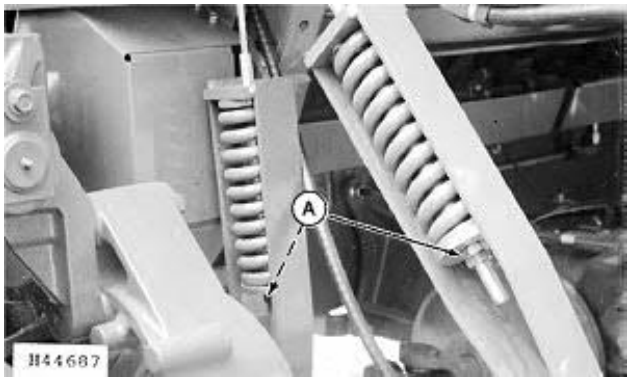
40. Install cap screws (A) and (B) to connect cables (C).



-UN-16JUN92
H44688

HX,1401,1102,AB-19-25AUG92

41. Tighten nuts (A) to adjust spring tension.



-UN-16JUN92
H44687

HX,1401,1102,AC-19-25AUG92

42. Washer (A) on front spring should align with lower mark (B) on front spring carrier (C).

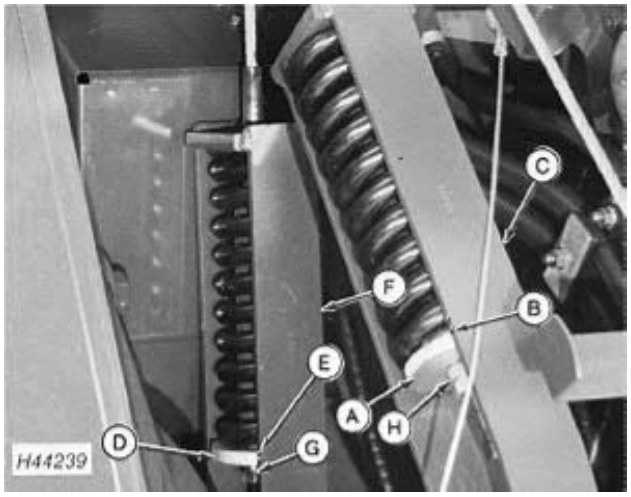
43. Washer (D) on rear spring should align with upper mark (E) on rear spring carrier (F).

44. To raise left-hand side of the header, tighten adjusting nut (G) on rear spring and loosen adjusting nut (H) on front spring an equal amount.

NOTE: Large cutting platforms are heavy on left-hand side which may require rear spring to be adjusted approximately 3 mm (1/8 in.) above upper mark.

45. To lower left-hand side of header, loosen adjusting nut on rear spring and tighten adjusting nut on front spring an equal amount.

46. Check to be certain header is level by tilting combine to left and right. Readjust springs if necessary.

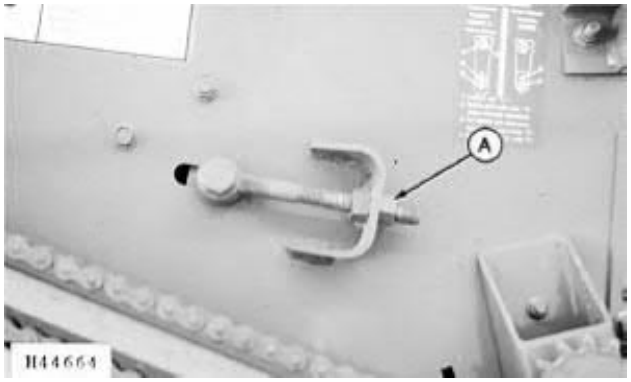


-UN-14APR92
H44239

A—Washer
B—Gauge Mark
C—Front Spring Carrier
D—Washer
E—Gauge Mark
F—Rear Spring Carrier
G—Nut
H—Nut

TM1545,HX110,AG-19-09AUG93

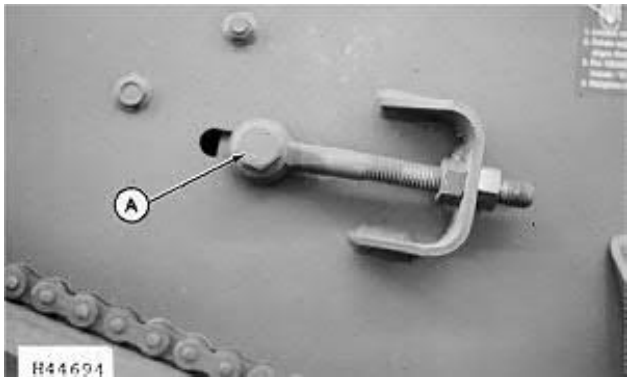
47. Tighten nut (A) to adjust conveyor chain tension on both sides.



-UN-16JUN92
H44664

HX,TM1545,BG -19-09AUG93

48. Tighten bolt (A).



-UN-16JUN92
H44694

HX,TM1545,BH -19-09AUG93

OTHER MATERIAL

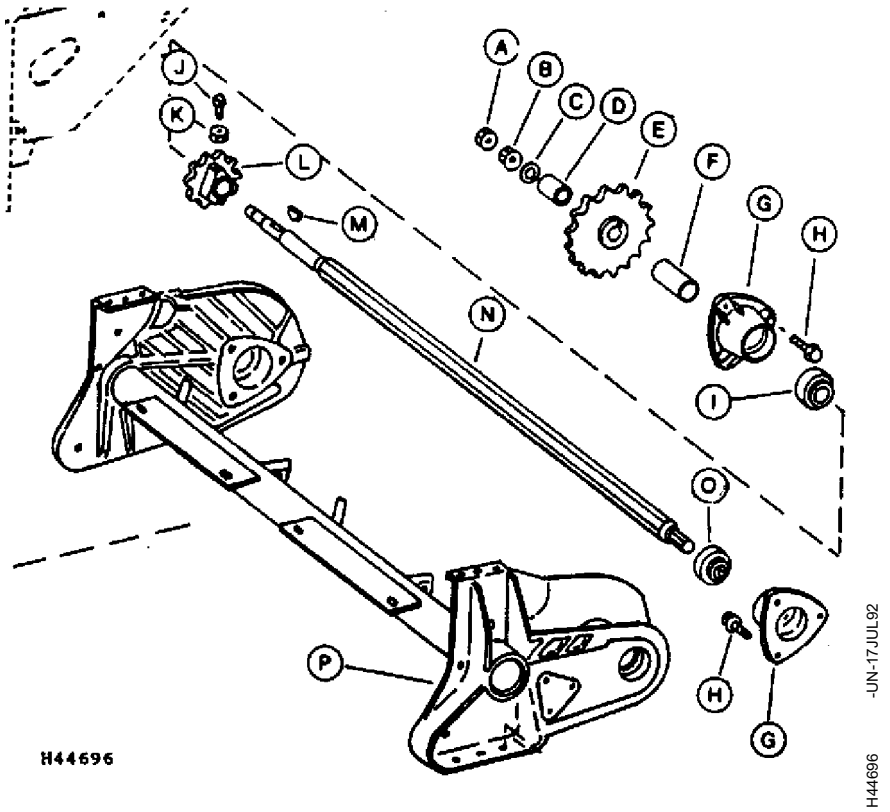
Number	Name	Use
T43512	Thread Lock and Sealer (Medium Strength)	To seal threads of bolts.

1401,11015,A -19-12SEP91

SPECIFICATIONS

Item	Measurement	Specification
Slip Clutch Shaft Nut	Torque	200 N·m (150 lb-ft)

1401,11015,B -19-12SEP91



A—Lock Nut, M24
B—Nut, M24
C—Washer
D—Spacer
E—Drive Sprocket—34 Tooth
F—Spacer
G—Housing (2 used)
H—Screw, M12 x 25 (6 used)
I—Ball Bearing
J—Set Screw (6 used)
K—Nut, 3/8 in. (6 used)
L—Chain Sprocket, 10 Tooth (3 used)
M—Shaft Key, 1/4 x 2 1/8 in.
N—Shaft
O—Ball Bearing
P—Shaft Support

HX,1545,1115,BA-19-09AUG93

110
15
2

REMOVE AND INSTALL TOP CONVEYOR SHAFT

1. Remove shield (A).

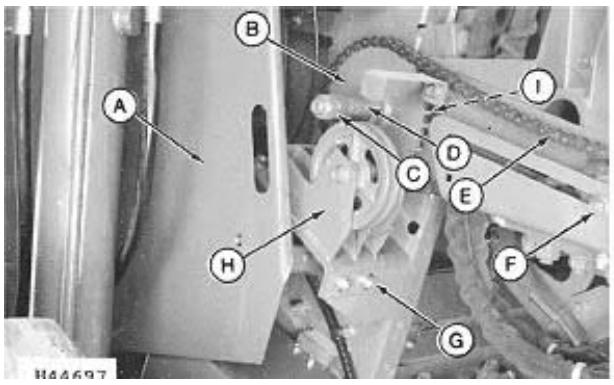
2. Remove five cap screws and nuts (G) to remove pulley (H).

3. Loosen nut (F) to release idler sprocket tension on chain.

4. Disconnect and remove chain (E).

5. Remove nuts and washer (C), spacer (D), sprocket (B) and spacer (I).

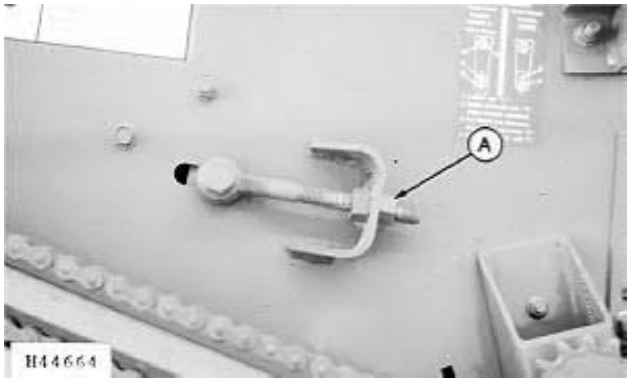
6. Remove feeder house. (See procedure in Group 05.)



A—Shield
B—Sprocket
C—Nut (2 used)
D—Spacer
E—Chain
F—Nut
G—Nut (5 used)
H—Pulley
I—Spacer

HX,1545,1115,BB-19-18NOV92

7. Loosen nut (A) to release tension on conveyor chain, both sides.



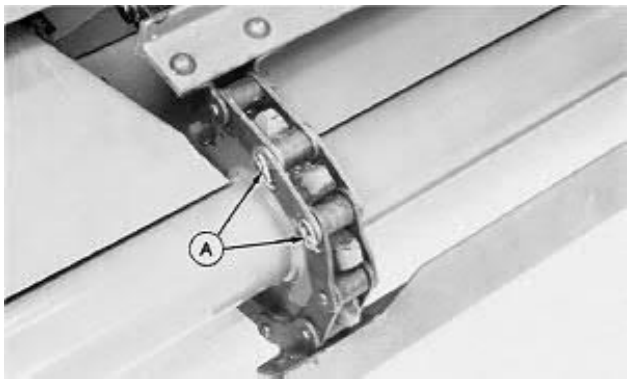
-UN-16JUN92
H44664

HX,1401,11015,U-19-25AUG92

8. Rotate conveyor chain so connecting links are over shaft.

9. Tie and secure conveyor to feeder house frame.

10. Remove hooks (A) and connecting links to separate chains.



-UN-20MAR89
H40433

TM1545,11015,A -19-29MAR93

11. Remove two cap screws to remove side strippers (G), both sides.

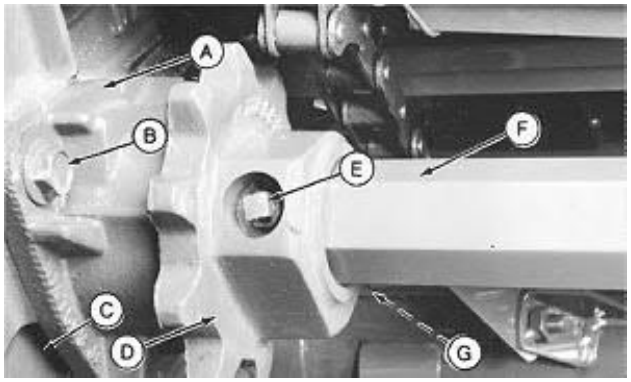
12. Remove cap screws (B), both sides.

13. Loosen screws (E) on side sprockets (D).

IMPORTANT: Note the alignment of sprocket screw indent on shaft.

14. Slide left side bearing housing (A) and sprocket toward center shaft.

15. Remove left end shaft through slot (C) in top shaft support to remove shaft (F).



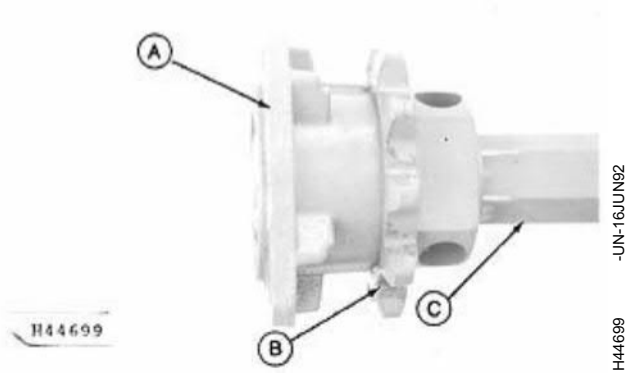
-UN-16JUN92
H44698

A—Bearing Housing
B—Cap Screw (6 used)
C—Slot
D—Sprocket
E—Screw (4 used)
F—Shaft
G—Stripper (2 used)

HX,1401,11015,W-19-25AUG92

16. Remove bearing housing (A) and sprocket (B), both sides from shaft (C).

17. Inspect shaft and sprocket for excessive wear. Replace as necessary.



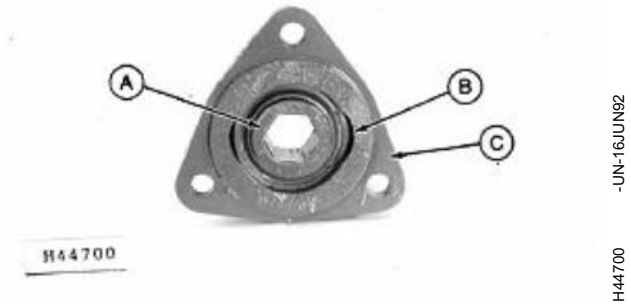
HX,1401,11015,X-19-25AUG92

18. Tap down on one side of bearing (A) until bearing is vertical in housing (C).

19. Rotate bearing to cut-out (B) in housing (C). Remove bearing.

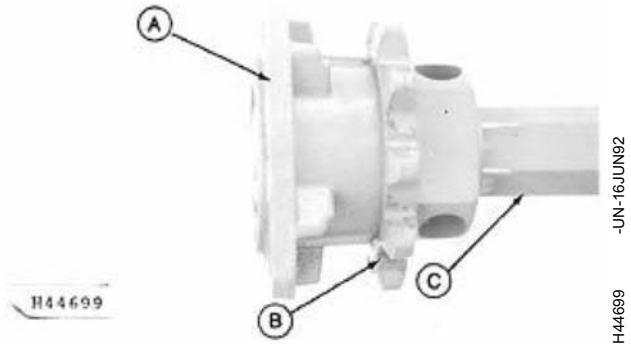
20. Inspect parts. Replace as necessary.

21. Install bearing (A) through cut-out (B).



HX,TM1545,FD -19-09AUG93

22. Install sprocket (B) and bearing housing (A) to shaft (C), both sides.



HX,1401,11015,Z-19-25AUG92

110
15
4

23. Install right end shaft (F) into upper shaft support.

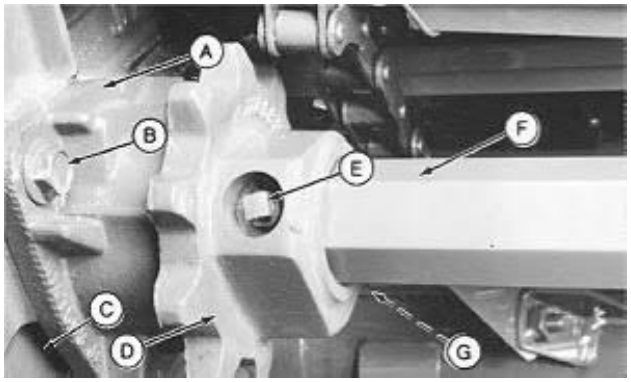
24. Install left end shaft (A) through slot (C) in upper shaft support.

IMPORTANT: Be sure sprocket bores are aligned with screw indents, both sides.

25. Install and tighten screws (E), both sides of sprocket (D).

26. Install and tighten cap screws (B), both sides.

27. Install side strippers (G) to 7 mm (1/4 in.) from shaft.

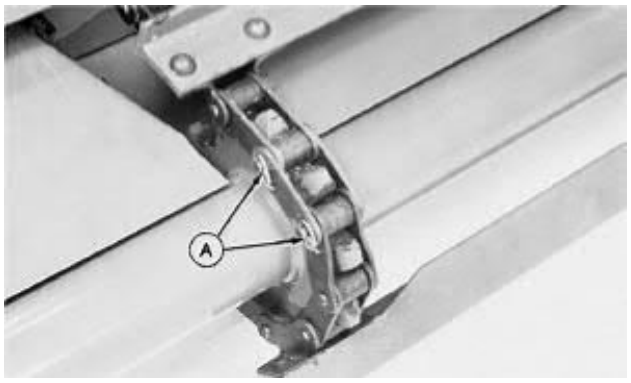


H44698 -UN-16JUN92

A—Bearing Housing
B—Cap Screw (6 used)
C—Slot
D—Sprocket
E—Screw (4 used)
F—Shaft
G—Stripper (2 used)

HX,TM1545,FE -19-09AUG93

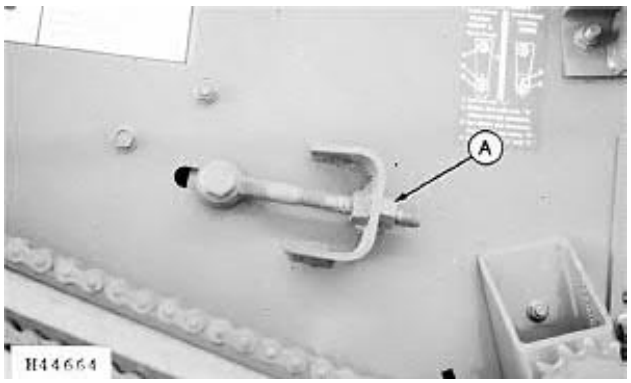
28. Join chains and connect links. Install hooks (A).



H40433 -UN-20MAR89

HX,1401,11015AB-19-25AUG92

29. Tighten nut (A) to tighten conveyor chain on both sides.



H44664 -UN-16JUN92

HX,TM1545,BI -19-09AUG93

30. Install feeder house. (See procedure in Group 05.)

31. Install spacer (I), sprocket (B), spacer (D), washer and nuts (C).

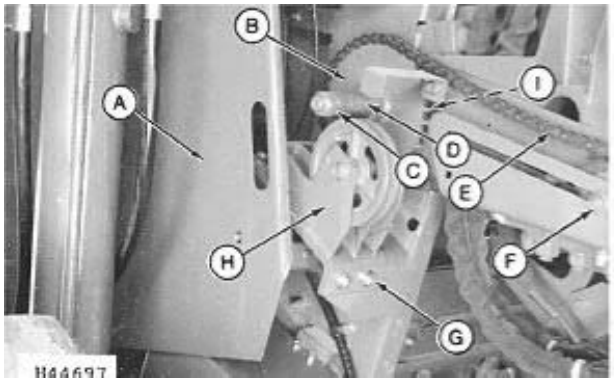
32. Install and connect chain (E).

33. Remove slack from chain and tighten nut (F).

34. Install pulley (H) and cap screws and nuts (G).

35. Install shield (A).

A—Shield
B—Sprocket
C—Nut (2 used)
D—Spacer
E—Chain
F—Nut
G—Nut (5 used)
H—Pulley
I—Spacer

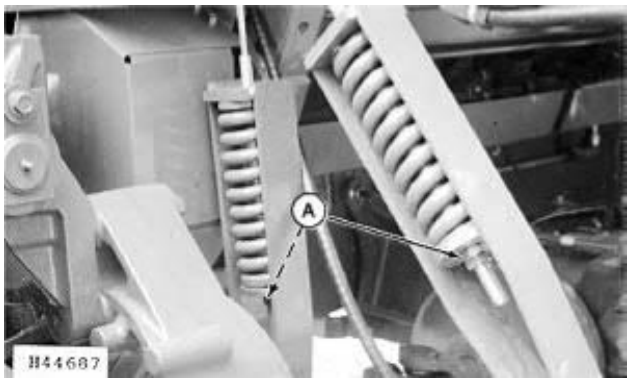


-UN-16JUN92
H44697

HX,TM1545,FF -19-09AUG93

REMOVE AND INSTALL LOWER PADDLE SHAFT

1. Loosen nuts (A) to relieve spring tension.



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H44687

HX,1545,1115,BD-19-18NOV92

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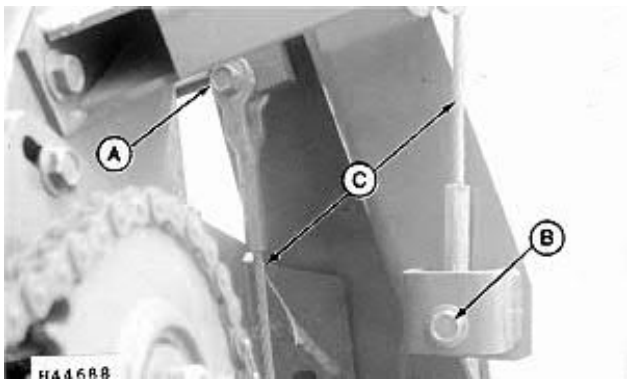
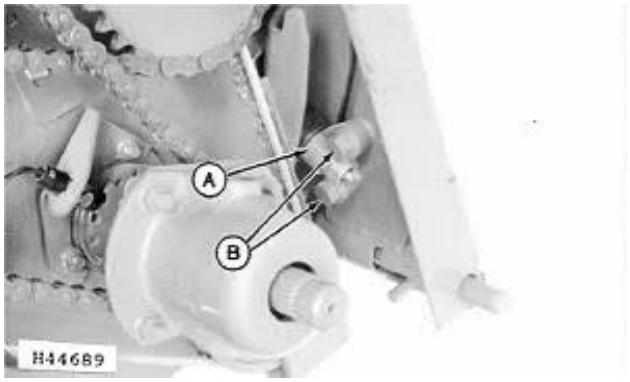
2. Remove cap screw (A) and (B) to disconnect cables (C).



-UN-16JUN92
H44688

HX,1401,11015AF-19-25AUG92

3. Remove two cap screws (B) to remove roller (A), both sides.



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H44689

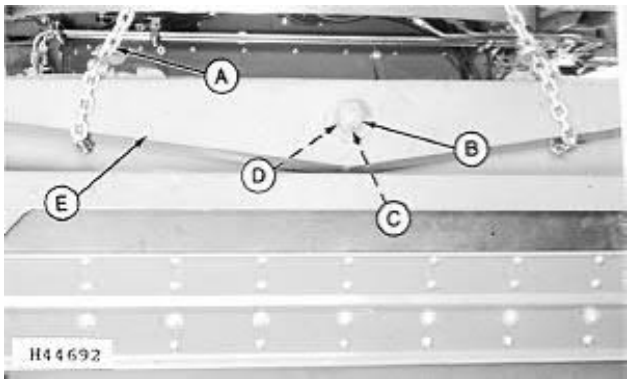
HX,1401,11015AG-19-25AUG92

CAUTION: Approximate weight of feeder house frame is 79 kg (175 lbs).

4. Attach lifting device (A) to frame.

5. Remove parts (B—D) and remove frame (E).

A—Lifting Chain
B—Lock Nut
C—Nut
D—Washer
E—Frame

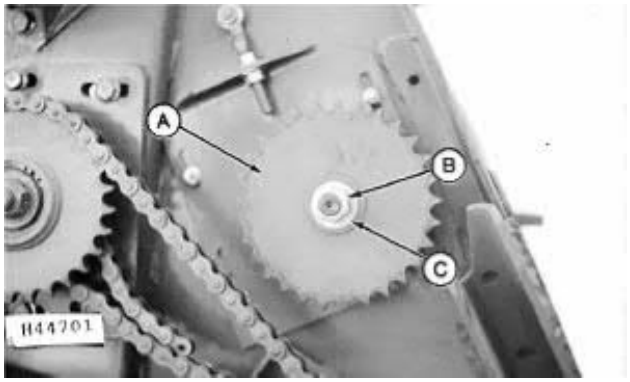


-UN-16JUN92
H44692

HX,1401,11015AH-19-25AUG92

6. Disconnect and remove chain.

7. Remove nut (B), washer (C) and sprocket (A).



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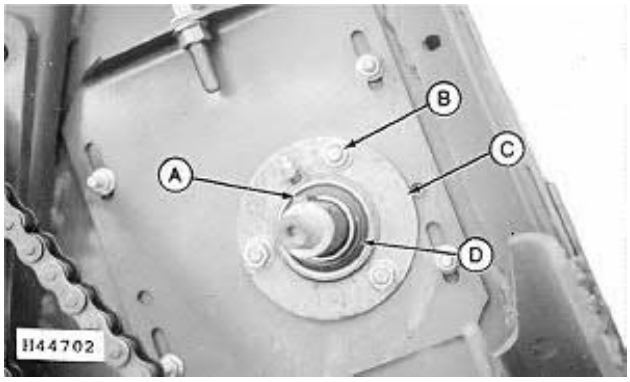
H44701

HX,1401,11015AI-19-25AUG92

8. Remove parts (A—D), both sides.

A—Shaft Key
B—Nut (6 used)
C—Flange Housing (4 used)
D—Bearing (2 used)



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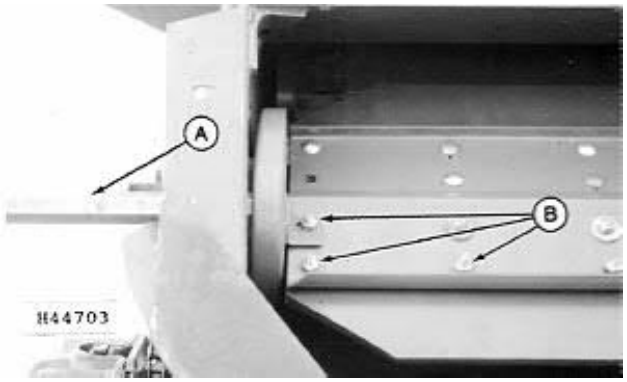
H44702

HX,1401,11015AJ-19-25AUG92

9. Loosen 36 nuts (B).

10. Remove shaft (A) from paddles.

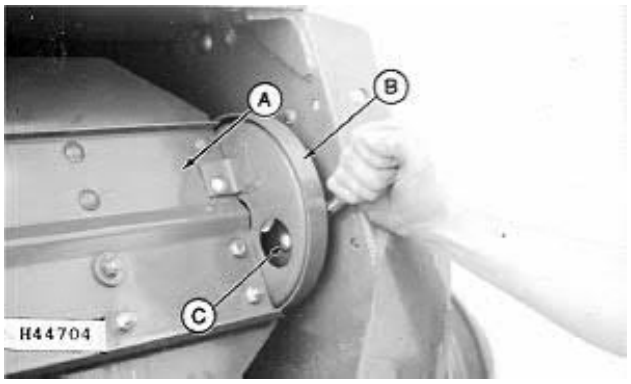


HX,1401,11015AK-19-25AUG92

11. Remove three bolts (C) through access hole in deflector (B), both sides.

12. Remove paddle assembly (A).

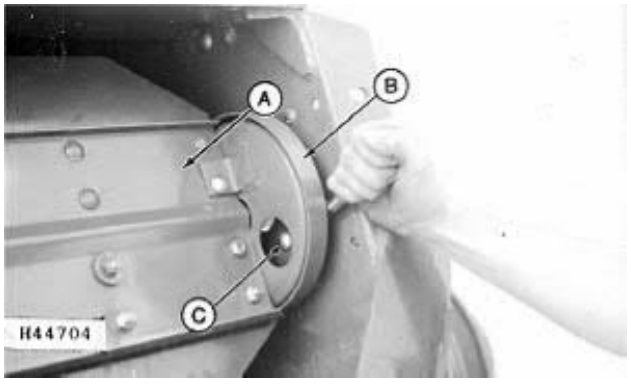
13. Inspect parts. Repair or replace as necessary.



HX,1401,11015AL-19-25AUG92

14. Install paddle assembly (A).

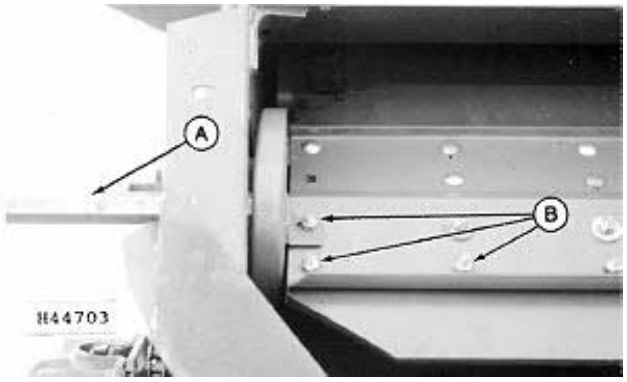
15. Install bolt (C) through access hole in deflector (B).



HX,1401,11015AM-19-25AUG92

16. Install shaft (A).

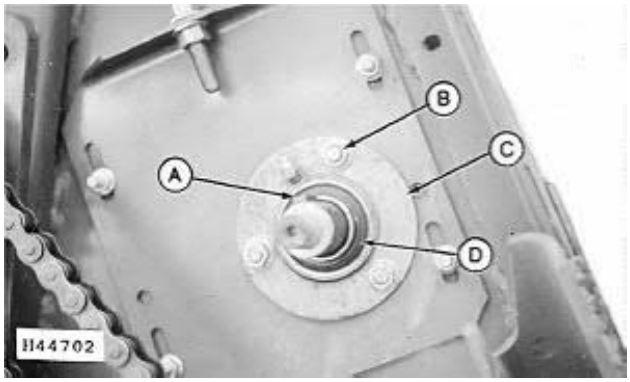
17. Tighten nuts (B) to 40 N·m (30 lb-ft).



HX,1401,11015AN-19-25AUG92

18. Install parts (A—D), both sides.

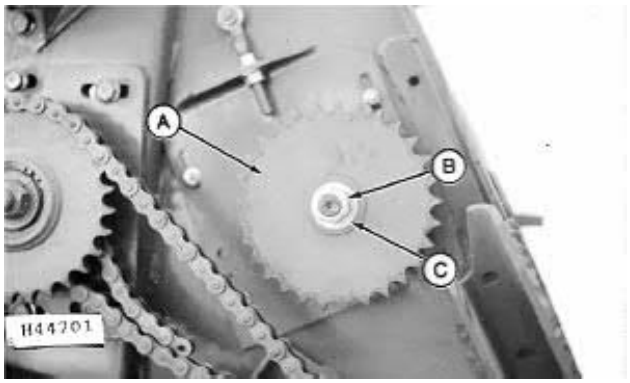
A—Shaft Key
B—Nut (6 used)
C—Flange Housing (4 used)
D—Bearing (2 used)



HX,1401,11015AO-19-25AUG92

19. Install sprocket (A), washer (C) and nut (B).

20. Install and connect chain.



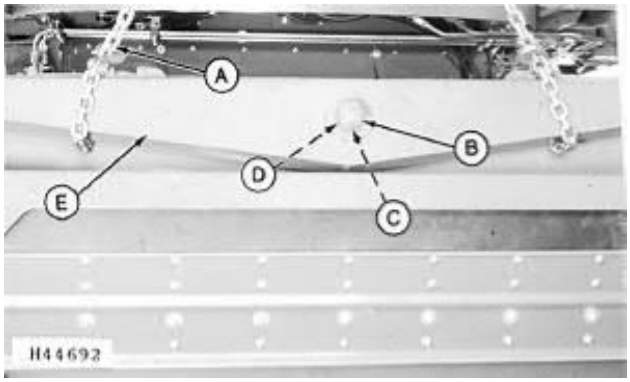
HX,1401,11015AP-19-25AUG92

21. Install frame (E).

22. Install parts (B—D).

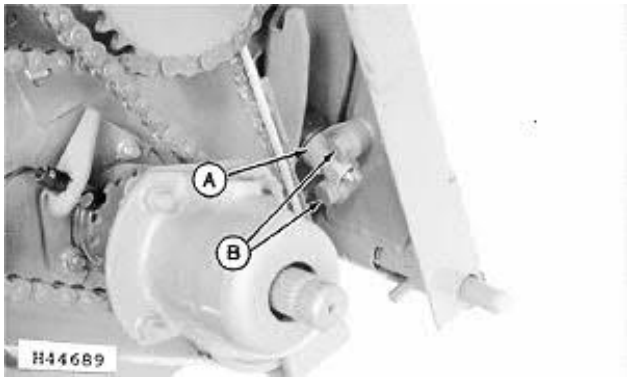
23. Disconnect lifting device (A).

A—Lifting Chain
B—Lock Nut
C—Nut
D—Washer
E—Frame



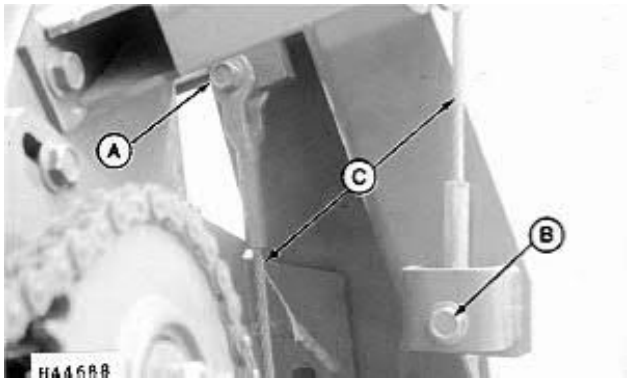
HX,1401,11015AQ-19-25AUG92

24. Install roller (A) and cap screws (B), both sides.



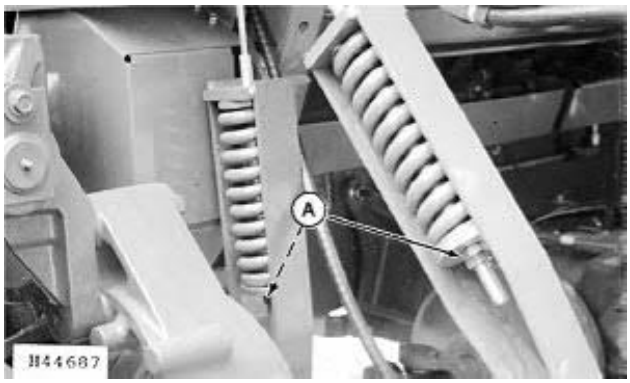
HX,1401,11015AR-19-25AUG92

25. Install cap screw (A) and (B) to connect cables (C).



HX,1401,11015AS-19-25AUG92

26. Tighten nuts (A) to adjust tension on spring assembly.



HX,1401,11015AT-19-25AUG92

27. Washer (A) on front spring should align with lower mark (B) on front spring carrier (C).

28. Washer (D) on rear spring should align with upper mark (E) on rear spring carrier (F).

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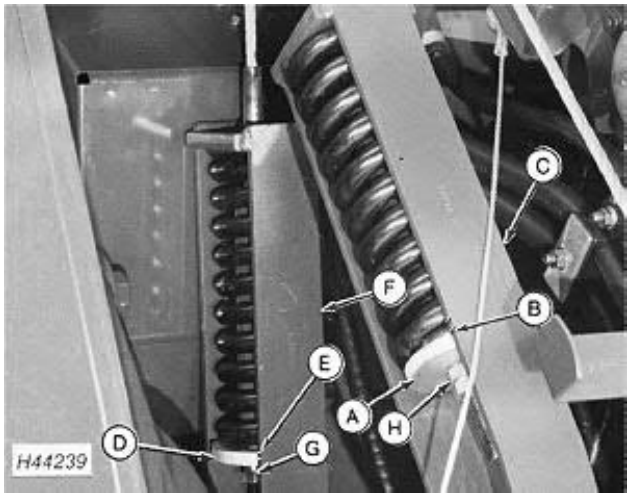
29. To raise left-hand side of header, tighten adjusting nut (G) on rear spring and loosen adjusting nut (H) on front spring and equal amount.

NOTE: Large cutting platforms are heavy on left-hand side which may require rear spring to be adjusted approximately 3 mm (1/8 in.) above upper mark.

30. To lower left-hand side of header, loosen adjusting nut on rear spring and tighten adjusting nut on front spring an equal amount.

31. Check to be certain header is level by tilting combine to left and right. Readjust springs if necessary.

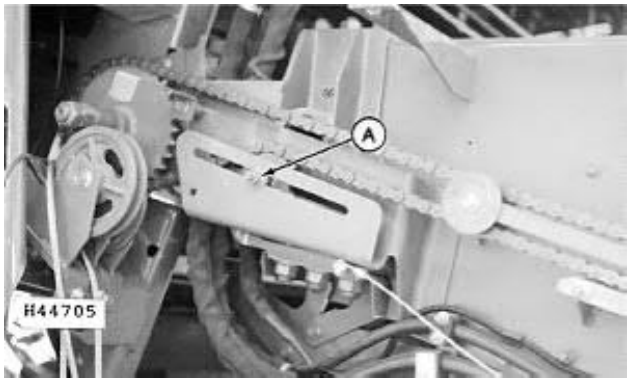


A—Washer
B—Gauge Mark
C—Front Spring Carrier
D—Washer
E—Gauge Mark
F—Rear Spring Carrier
G—Nut
H—Nut

TM1545,HX110,AJ-19-09AUG93

REMOVE AND INSTALL DRIVE CHAIN IDLERS

1. Loosen nut (A) to relieve chain tension.



HX,1545,1115,BE-19-18NOV92

2. Disconnect chains (C) and (D) and remove.

3. Remove three nuts (A) to remove chain sprocket assembly (E).

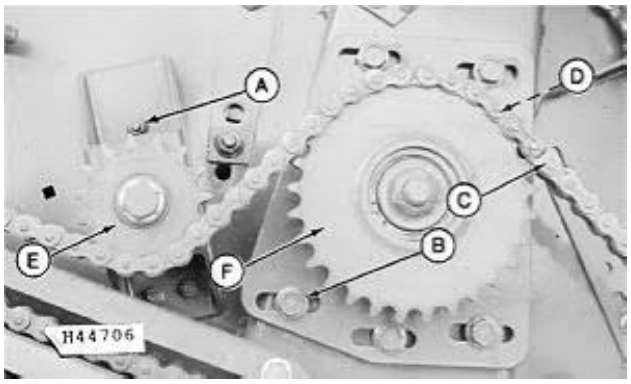
4. Remove five cap screws (B) to remove drive sprocket assembly (F).

5. Inspect parts. Replace as necessary.

6. Install drive sprocket assembly (F) and five cap screws (B).

7. Install chain sprocket assembly (E) and three nuts (A).

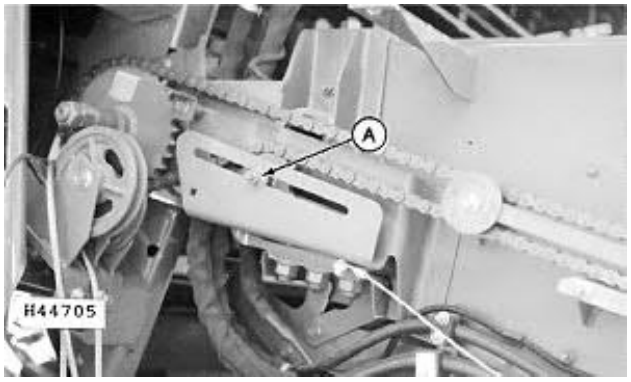
8. Install and connect chains (C) and (D).



A—Nut (3 used)
B—Cap Screw (5 used)
C—Drive Chain
D—Chain-to-Paddle Shaft
E—Drive Sprocket
F—Chain Sprocket

HX,1401,11015AV-19-25AUG92

9. Tighten nut (A) to adjust chain tension.



HX,1401,11015AW-19-25AUG92

10. Washer (A) on front spring should align with lower mark (B) on front spring carrier (C).

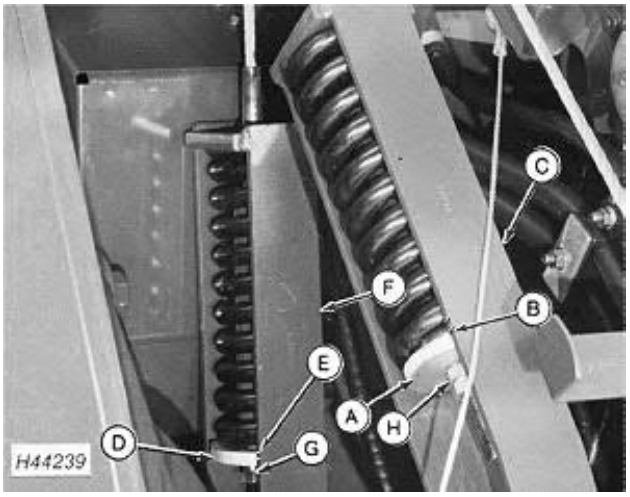
11. Washer (D) on rear spring should align with upper mark (E) on rear spring carrier (F).

12. To raise left-hand side of header, tighten adjusting nut (G) on rear spring and loosen adjusting nut (H) on front spring an equal amount.

NOTE: Large cutting platforms are heavy on left-hand side which may require the rear spring to be adjusted approximately 3 mm (1/8 in.) above upper mark.

13. To lower left-hand side of header, loosen adjusting nut on rear spring and tighten adjusting nut on front spring an equal amount.

14. Check to be certain header is level by tilting combine to left and right. Readjust springs if necessary.



A—Washer
B—Gauge Mark
C—Front Spring Carrier
D—Washer
E—Gauge Mark
F—Rear Spring Carrier
G—Nut
H—Nut

TM1545,HX110,AK-19-09AUG93

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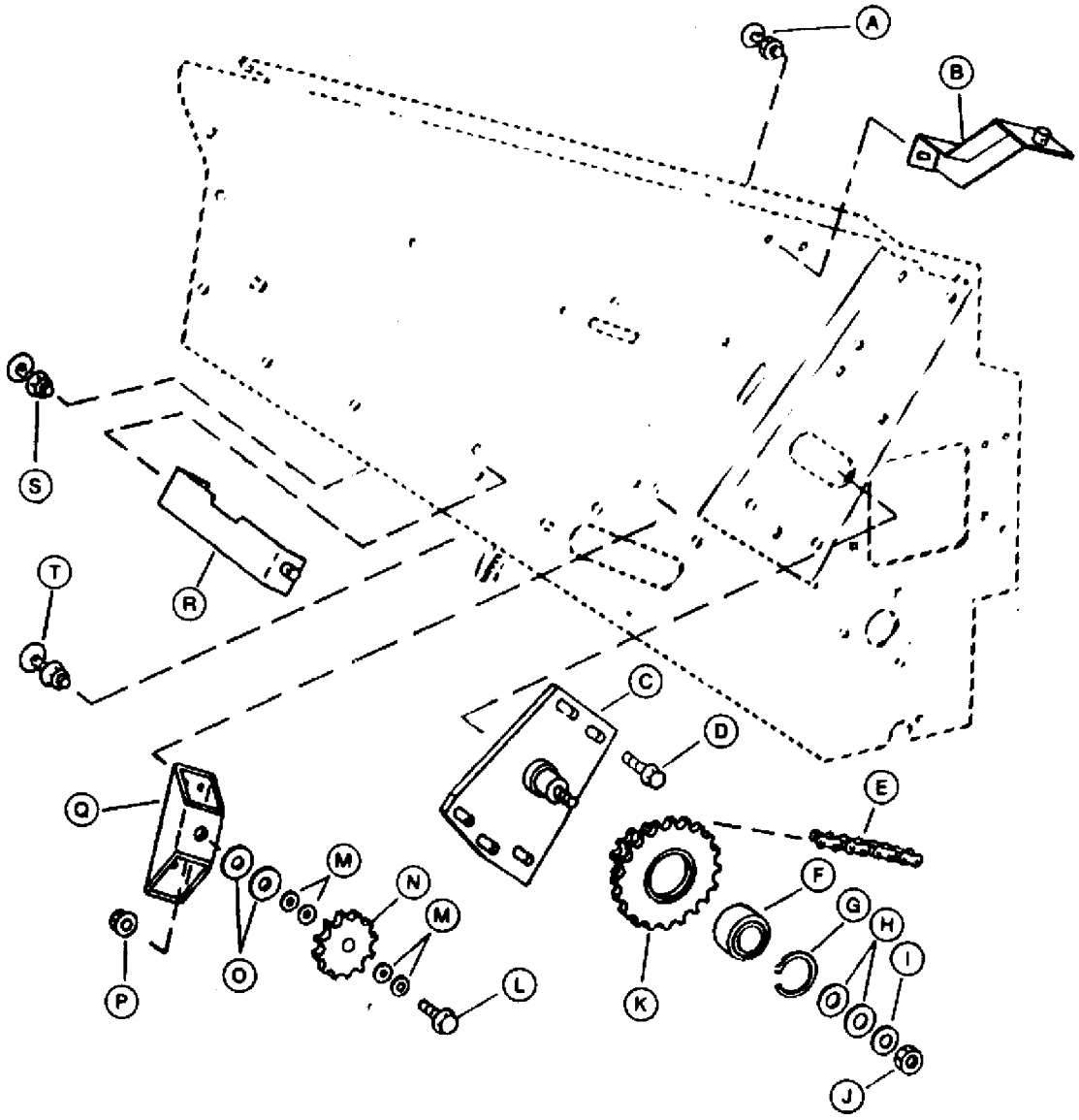
DISASSEMBLE AND ASSEMBLE IDLERS



H44792 -UN-17JUL92

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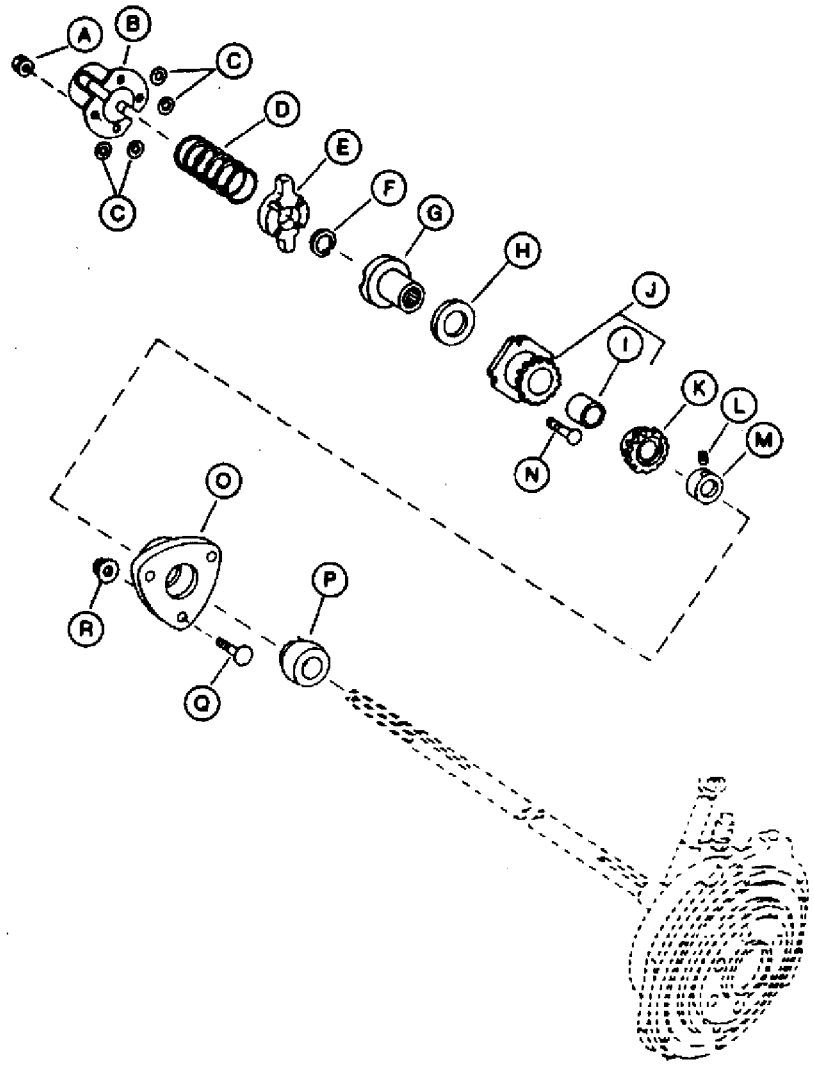
A—Bolt, M10 x 30 (2 used)
B—Bracket
C—Shaft
D—Screw, M12 x 30 (5 used)
E—Chain, 54 Links
F—Bearing
G—Snap Ring
H—Washer, 3/16 x 2 x 0.149 in. (2 used)
I—Washer, 21.4 x 42 x 5 mm
J—Lock Nut, M24
K—Sprocket
L—Screw, M16 x 60
M—Washer, 21/32 x 15/16 x 0.036 in. (4 used)
N—Sprocket
O—Washer (2 used)
P—Flange Nut, M16
Q—Support
R—Retainer
S—Bolt, M10 x 20 (3 used)
T—Bolt, M8 x 20 (3 used)

1. Disassemble parts (F—K; L—O). Inspect parts. Replace as necessary.

2. Assemble parts (F—K; L—O).

HX,1545,1115,BF-19-18NOV92

DISASSEMBLE AND ASSEMBLE LOWER SHAFT AND SLIP CLUTCH



H44793 -UN-17JUL92

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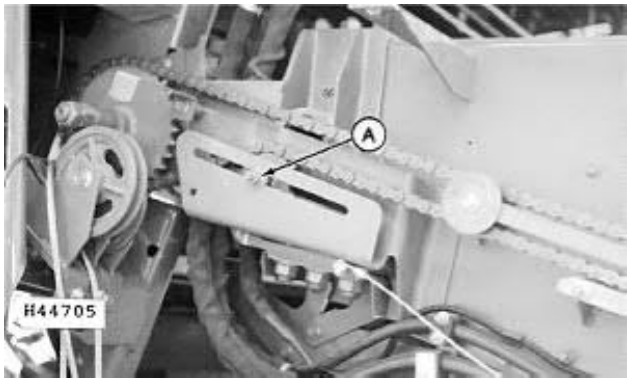
A—Flange Nut, M12 (4 used)
B—Cover
C—Washer (8 used)
D—Spring
E—Jaw
F—Snap Ring
G—Hub
H—Washer
I—Bushing
J—Drive Sprocket
K—Wheel
L—Set Screw
M—Eccentric Locking Collar
N—Bolt, M12 x 40 (4 used)
O—Housing
P—Bearing
Q—Bolt, M10 x 35 (3 used)
R—Flange Nut, M10 (3 used)

HX,1545,1115,BG-19-18NOV92

1. Remove side shield.

2. Loosen nut (A) to relieve chain tension.



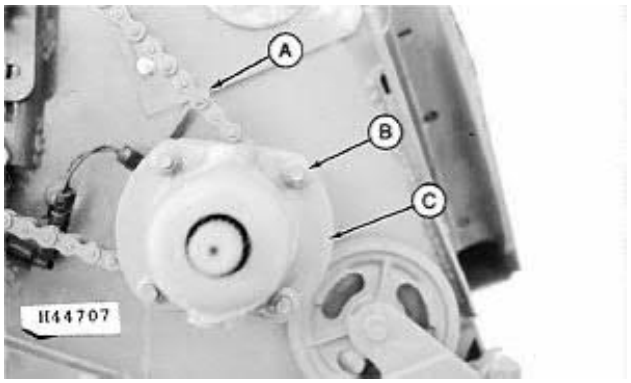
HX,1401,11015AZ-19-25AUG92

3. Remove chain (A).

CAUTION: Spring under cover (C) is under tension. Remove cover slowly.

4. Remove four nuts and bolts (B), making certain all are removed equally to prevent binding.

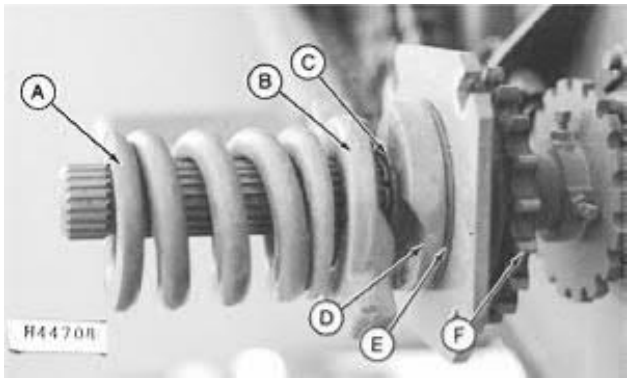
5. Remove cover (C).



HX,1401,11015BA-19-25AUG92

6. Remove parts (A—F).

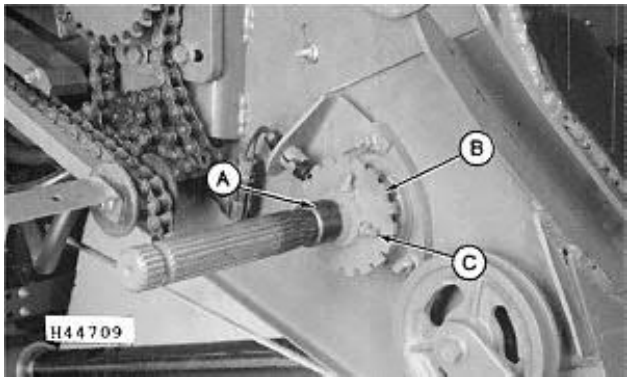
A—Spring
B—Jaw
C—Snap Ring
D—Hub
E—Washer
F—Drive Sprocket



HX,1401,11015BB-19-25AUG92

7. Remove parts (A—C).

A—Bushing
B—Wheel
C—Set Screw (2 used)



HX,1401,11015BC-19-25AUG92

8. Remove sensor (A) from bearing housing (E).

9. Remove eccentric locking collar (C).

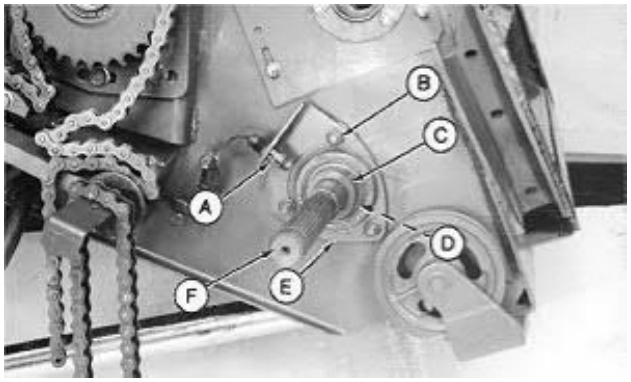
10. Remove three carriage bolts, nuts (B) and bearing housing (E).

11. Inspect bearing (D). Replace if necessary.

12. Remove shaft (F).

13. Inspect all parts. Replace as necessary.

A—Sensor
B—Nut (3 used)
C—Eccentric Locking Collar
D—Bearing
E—Housing
F—Shaft



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H44710

HX,1401,11015BD-19-25AUG92

14. Install shaft (F).

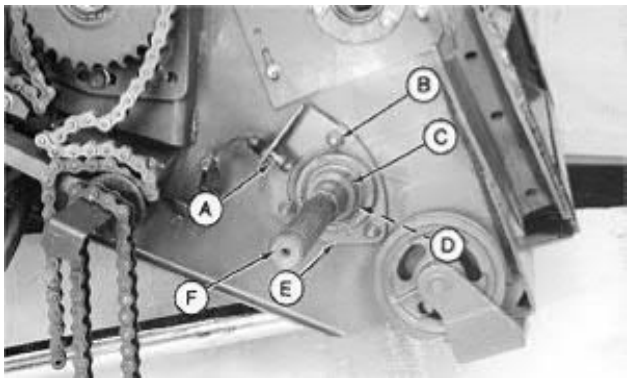
15. Install bearing housing (E).

16. Install three carriage bolts and nuts (B).

17. Install eccentric locking collar.

18. Install sensor (A).

A—Sensor
B—Nut (3 used)
C—Eccentric Locking Collar
D—Bearing
E—Housing
F—Shaft



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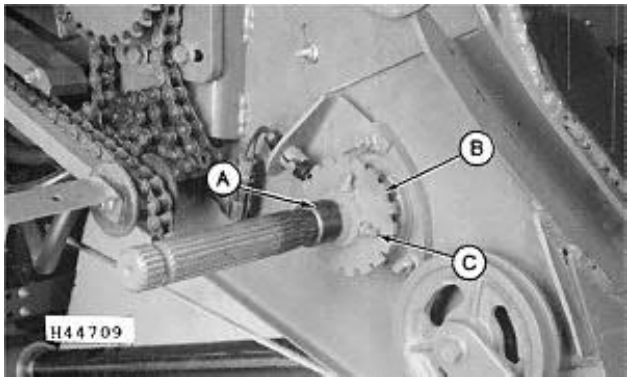
H44710

HX,1401,11015BE-19-25AUG92

19. Install parts (A—C).

A—Bushing
B—Wheel
C—Set Screw (2 used)



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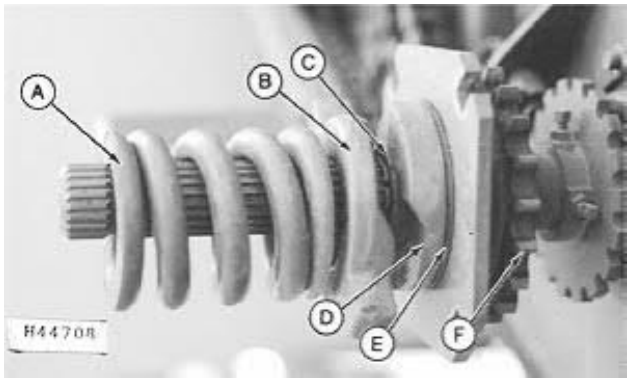
H44709

HX,1401,11015BF-19-25AUG92

20. Install parts (A—F).

A—Spring
B—Jaw
C—Snap Ring
D—Threshing Cylinder
E—Washer
F—Drive Sprocket



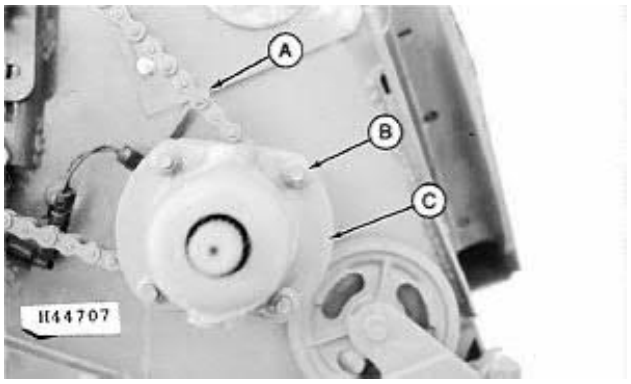
HX,1401,11015BG-19-25AUG92

21. Apply thread lock and sealer (medium strength) to threads of bolts used to hold cover.

22. Install cover (C).

23. Install bolts and nuts (B).

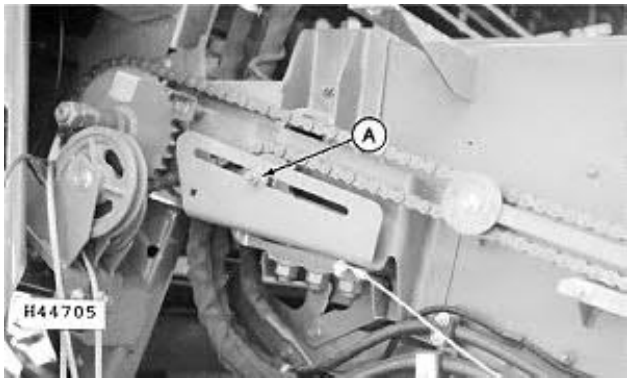
24. Install chain (A).



HX,1401,11015BH-19-25AUG92

25. Adjust chain tension and tighten nut (A).

26. Install side shield.



HX,1401,11015BI-19-25AUG92

Section 350
SIDEHILL 9500 LEVELING SYSTEM—DIAGNOSTICS

Contents

Page

HOW THE SYSTEM WORKS

The SideHill Combine has been designed for use on slopes up to 18 percent. The electro-hydraulic leveling system automatically keeps the separator level as the combine moves across changing hill slopes.

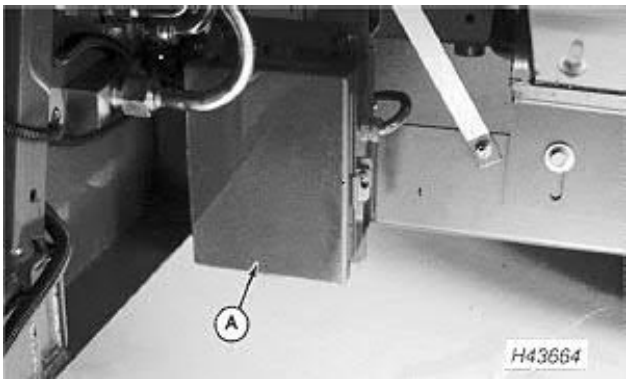
A level sensing control box (A), located on the left-hand rear side contains a pendulum which senses if the combine separator is in a level position. As the combine moves onto a slope and starts to lean, the pendulum swings against either the right or left sensing switch, depending upon the direction of the slope. The sensing switch then activates the electrical leveling circuit which sends electrical current to the right or left tilt solenoid on the leveling control valve.

After the sensing switch has activated the solenoid on the leveling control valve, the spool in the control valve moves, directing hydraulic oil under pressure to the appropriate level cylinder, causing it to retract. Hydraulic oil under pressure is forced out the top of the retracting cylinder and into the top of the opposite cylinder, causing it to extend.

The hydraulic oil from the rod end of the extending cylinder then flows back through the control valve, and on to the main hydraulic reservoir. One cylinder continues to extend while the other cylinder continues to retract until the combine is level. The pendulum then returns to a vertical position, releasing the sensing switch.

Oil for the leveling hydraulic system is supplied from a flow divider in the main hydraulic system. This flow divider directs approximately 50 percent of the system's oil supply to the leveling system. The remaining 50 percent of the oil supply is used to operate the other various hydraulic functions in the combine.

H43663 -UN-08JUL91



H43664 -UN-08JUL91

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TM1545,11020,A -19-09AUG93

BRIEF DESCRIPTION

The leveling electrical system consists of level sensing control box, tilt limit switches, manual tilt switch, leveling control cut-out switch, circuit breaker, ignition switch, which is the source of electrical current, and the two solenoids on leveling control valve.

TM1545,35010,A -19-09AUG93

BASIC OPERATION

As the combine comes into a slope, a pendulum in the level sensing control box swings to one side, causing a tilt switch in the box to close. Current is sent to the appropriate solenoid on the leveling control valve. The activated solenoid pushes the spool in, causing pressure oil to be always directed to the rod end of the retracting cylinder. Pressure oil is obtained from the proportional flow divider. Return oil is directed to a tee on the proportional flow divider and then returned to the reservoir.

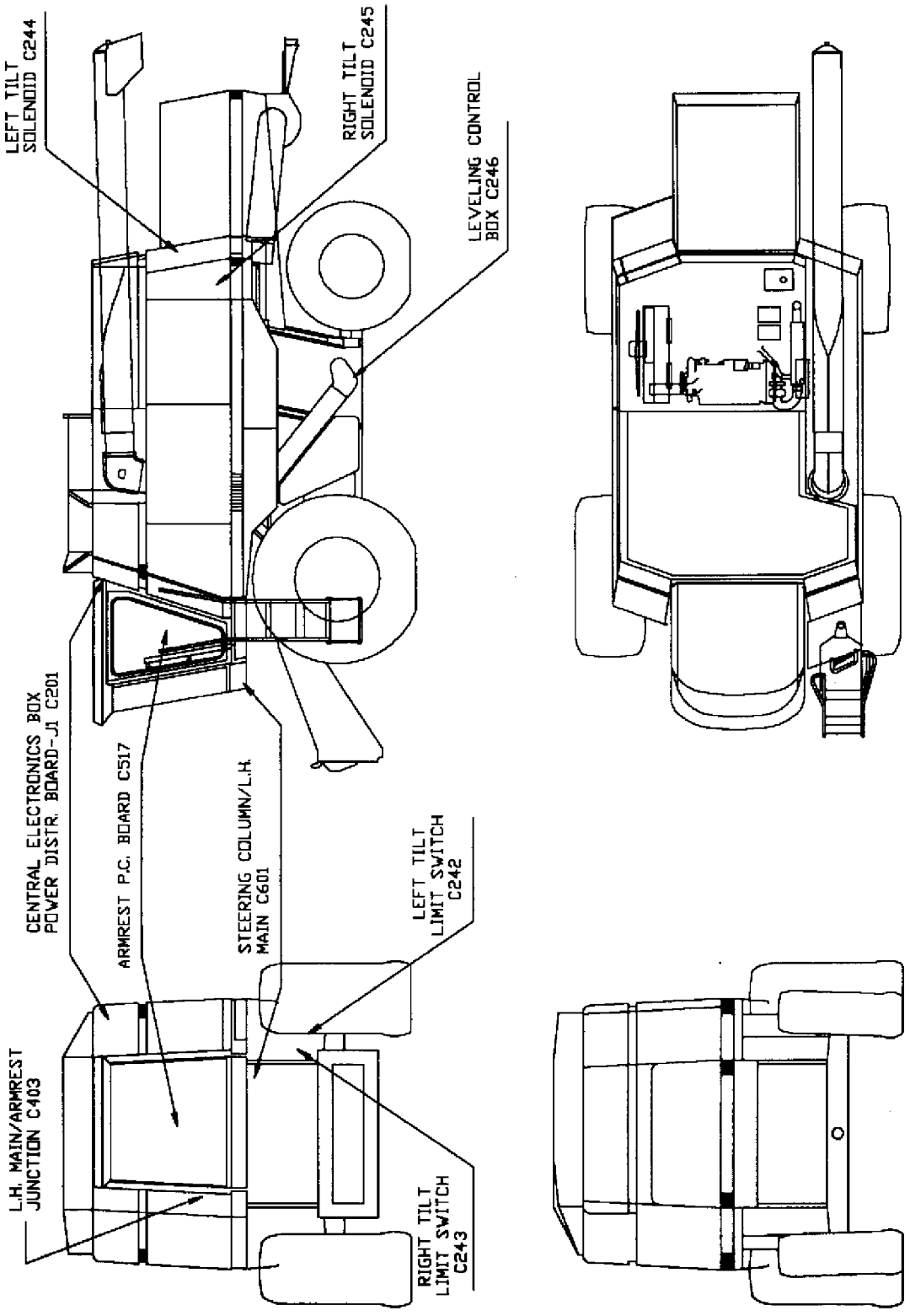
TM1545,35010,B -19-05FEB93

ELECTRICAL SYSTEM

The electrical system consists of two sensing switches, a pendulum in the level sensing control box, right and left tilt solenoids located on leveling control valve, right and left tilt limit switches located on the left-hand final drive pivot, a manual leveling control switch and a leveling control cut-out switch. The electrical system actuates the hydraulic system.

The electrical system is protected from overload by a circuit breaker located in the central electronics box.

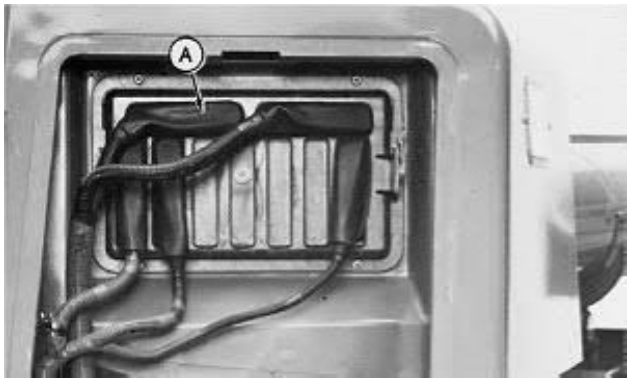
TM1545A,35010,A-19-29MAR93



TM1545A,35010,B-19-29MAR93

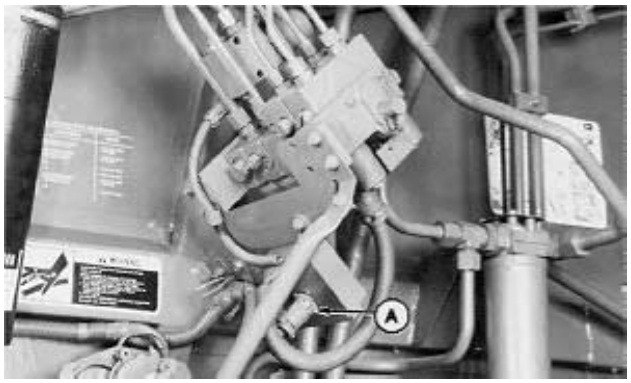
H45704 -19-20APR93

C201—POWER DISTRIBUTION BOARD CONNECTOR (J1) (A)



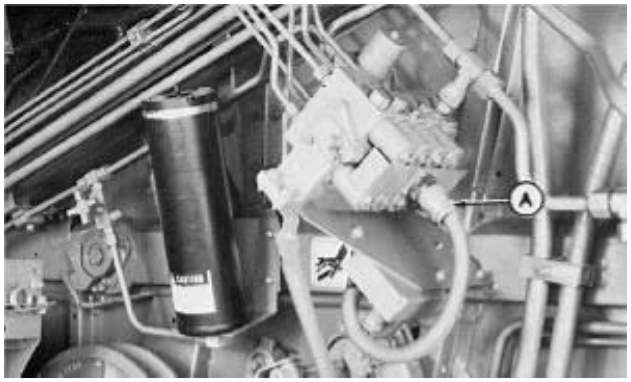
TM1545,35010,D -19-05FEB93

C221—HYDRAULIC VALVE STACK LOGIC MODULE CONNECTOR (A)



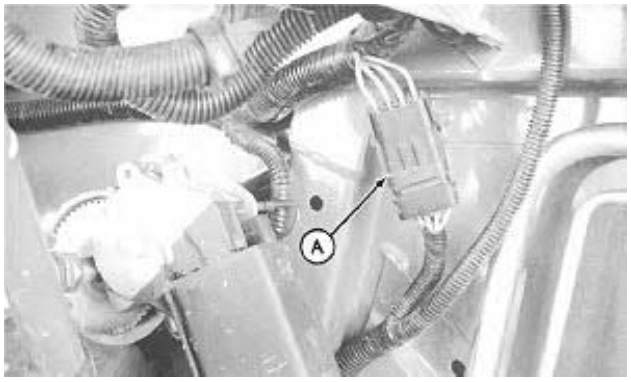
TM1545,35010,H -19-05FEB93

C222—HYDRAULIC VALVE STACK CONNECTOR (A)



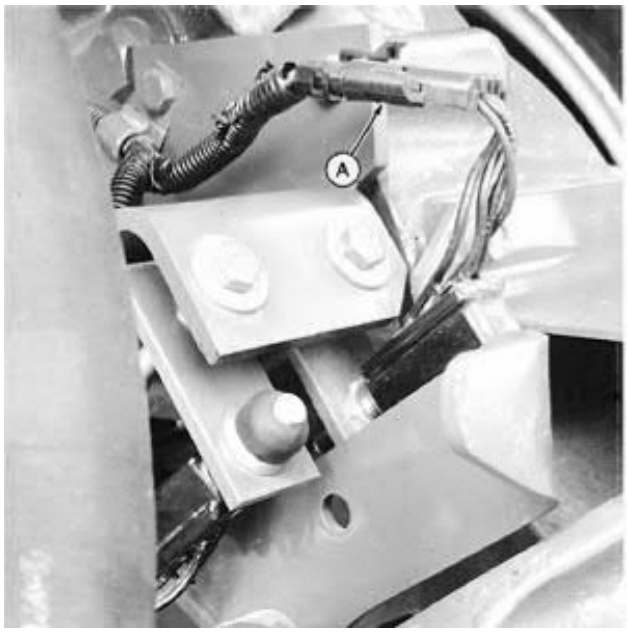
TM1545,35010,I -19-05FEB93

C241—SIDEHILL LEVELING HARNESS TO LEFT-HAND MAIN HARNESS CONNECTOR (A)



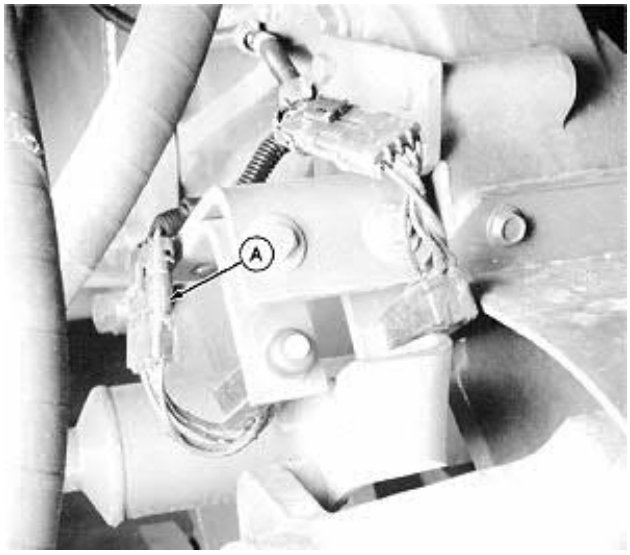
TM1545,35010,O -19-05FEB93

C242—LEFT TILT LIMIT SWITCH CONNECTOR (A)



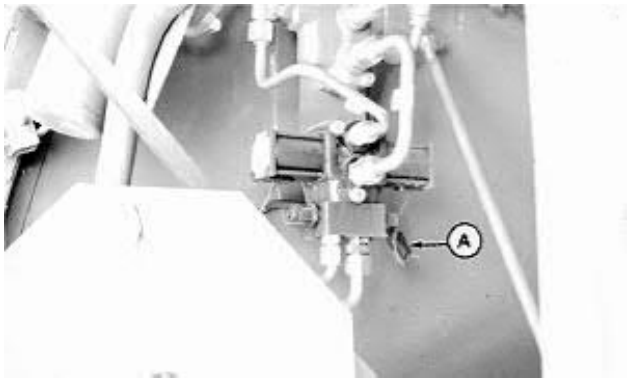
TM1545,35010,K -19-09AUG93

C243—RIGHT TILT LIMIT SWITCH CONNECTOR (A)



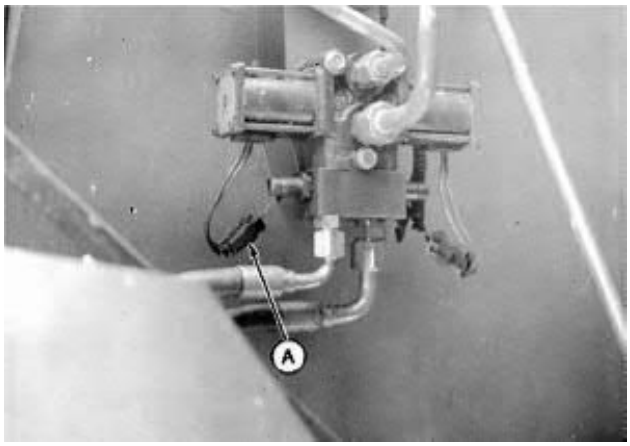
TM1545,35010,L -19-05FEB93

C244—LEFT TILT SOLENOID CONNECTOR (A)



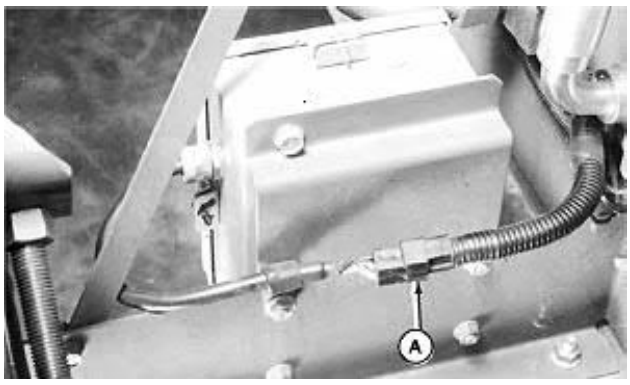
TM1545,35010,M -19-05FEB93

C245—RIGHT TILT SOLENOID CONNECTOR (A)



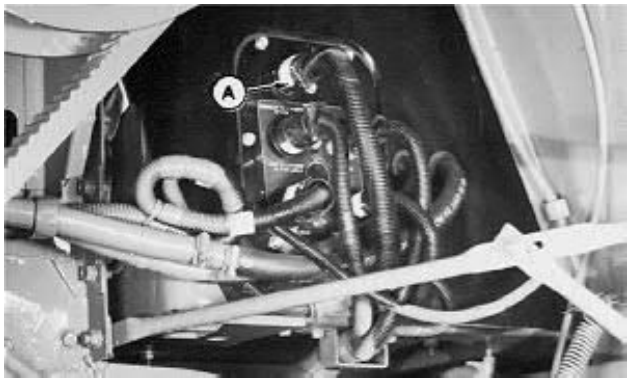
TM1545,35010,N -19-05FEB93

C246—LEVELING CONTROL BOX CONNECTOR (A)



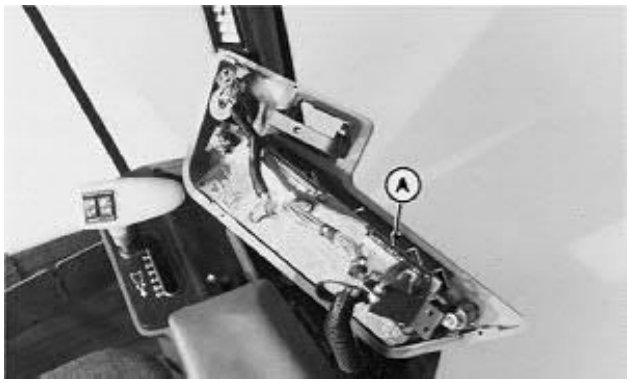
TM1545,35010,G -19-05FEB93

C403—L.H.MAIN/ARMREST CONNECTOR (A)



TM1545,35010,F -19-05FEB93

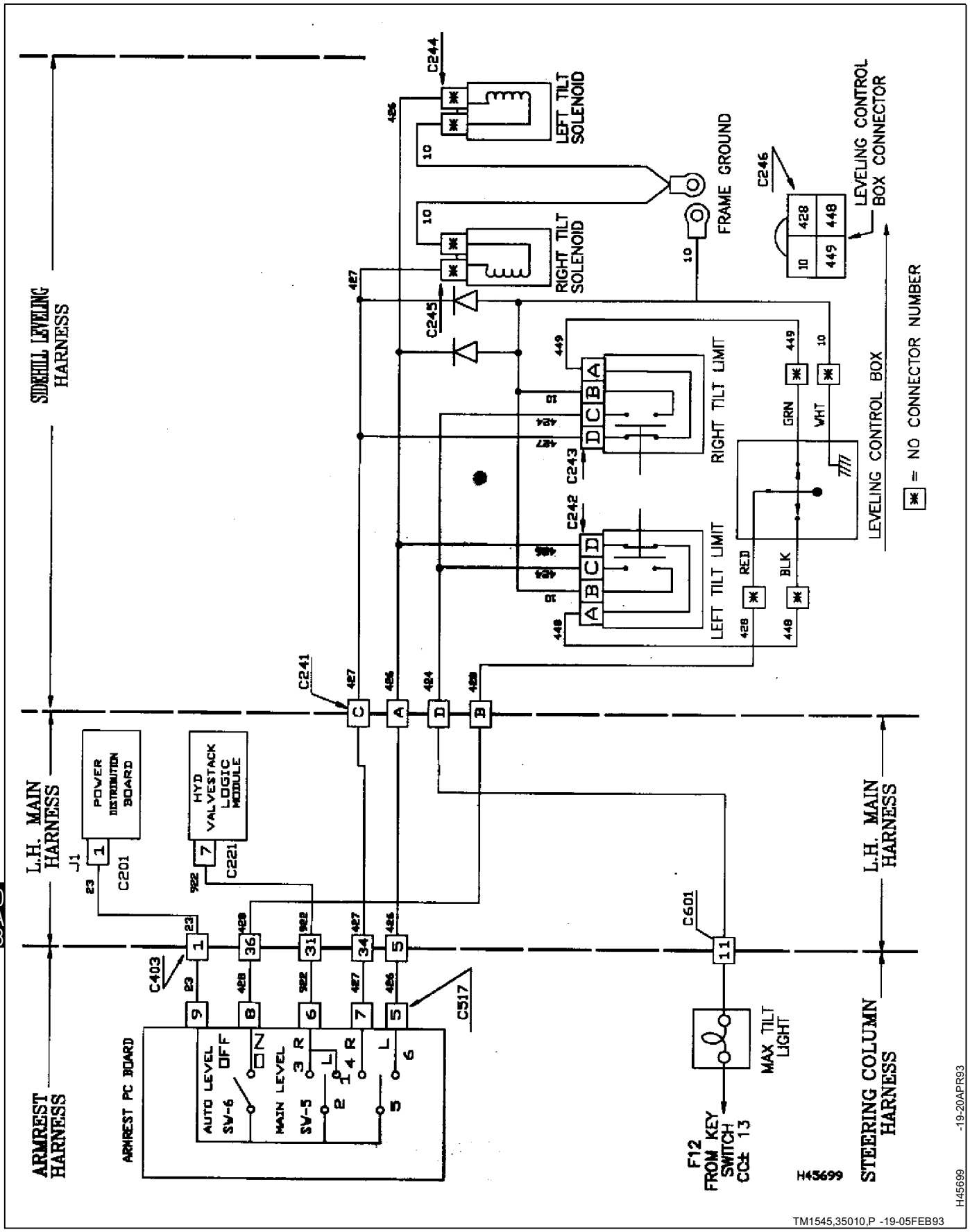
C517—ARMREST P.C.BOARD CONNECTOR (J2) (A)



TM1545,35010,E -19-05FEB93

C601—STEERING COLUMN/L.H.MAIN HARNESS CONNECTOR (A)

TM1545,35010,J -19-05FEB93



TM1545,35010,P -19-05FEB93

The Service-Gard Automatic Header Height Control and SideHill 6620 Leveling Tester (D1402DJ) and (JT07186) SideHill 9500 Harness Adapter Kit is available for testing SideHill 9500 leveling system electrical problems. If tester and kit are not available, a voltmeter will be needed to diagnose problem from troubleshooting flowcharts.

H46041 -UN-06MAY93

TM1545,HX350,A -19-09AUG93

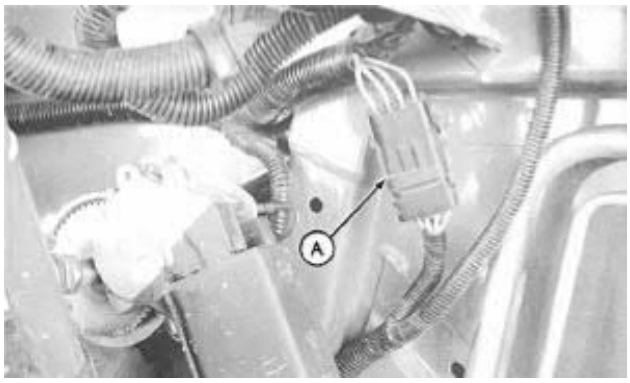
CHECKING SIDEHILL UPPER WIRING HARNESS

If using D1402DJ SideHill 6620 leveling tester, follow the procedure given.

1. Disconnect four pin connector C241 (A), located below hydraulic valve stack logic module.

2. Install four pin weatherpack adapter harness between connector C241 (A). Connect alligator clamp of adapter harness to a good frame ground.

3. Connect three pin connector of the tester to the adapter harness.



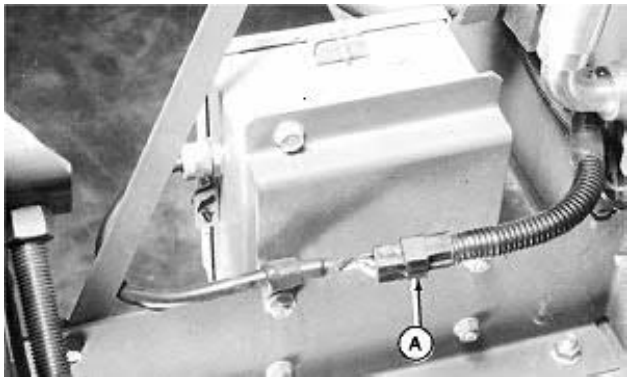
H45706 -UN-01FEB93

TM1545,HX350,B -19-09AUG93

350
10A
9

4. Disconnect C246 four pin connector (A) from leveling control box.

5. Connect ground clamp of tester to frame ground on combine. Position tester for observation from cab seat.



H45291 -UN-29SEP92

TM1545,HX350,C -19-09AUG93

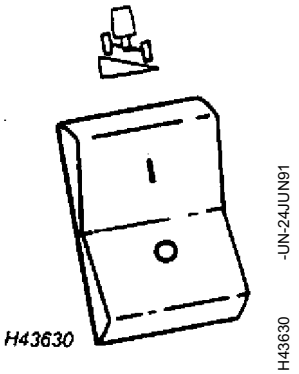
6. Turn selector switch (A) on tester to position 1.

7. Turn ignition key to “ON”. DO NOT START ENGINE.

H46070 -UN-04AUG93

TM1545,HX350,D -19-09AUG93

8. Move automatic level control ON/OFF switch at armrest, to the ON (1) position.



H43630 -UN-24JUN91

TM1545,HX350,E -19-09AUG93

350
10A
10

9. Power test light (B) should glow. If it does not, check for loose connection at test box. If power test light still does not glow, refer to Electrical Diagnostics Flowchart for “Automatic Level Right Does Not Work”.

NOTE: Failure of the test light to glow indicates that the defective component lines between C241 connector and the armrest console.

10. Press RIGHT TILT position of MANUAL level control switch. The RIGHT TILT light (C) should glow. If it does not, GO TO ELECTRICAL DIAGNOSTIC FLOWCHART for “MANUAL LEVEL RIGHT DOES NOT WORK”.

11. Press the LEFT tilt position of the manual level control switch. The LEFT tilt light (D) should glow. If it does not, GO TO ELECTRICAL DIAGNOSTIC FLOWCHART for “MANUAL LEVEL LEFT DOES NOT WORK”.

12. Turn off ignition switch, disconnect tester. Connect C241 and C248.

H46043 -UN-06MAY93

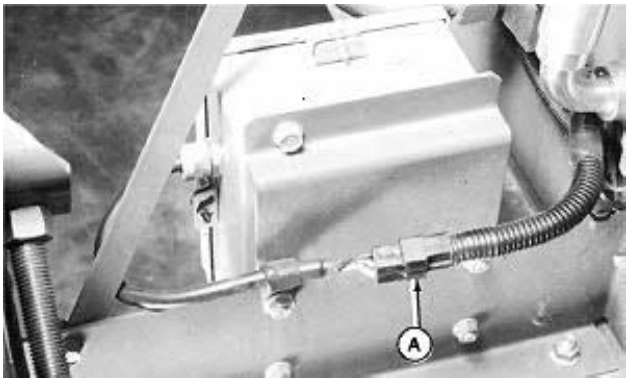
TM1545,HX350,F -19-09AUG93

CHECKING SIDEHILL LOWER WIRING HARNESS

1. Disconnect four pin connector C248 (A), at leveling control box.

2. Install extension harness between the four pin connector (A). Connect opposite end of extension harness to tester.

3. Connect ground clamp of tester to frame ground of combine. Position tester for observation from cab seat.



H45291 -UN-29SEP92

TM1545,HX350,H -19-09AUG93

4. Turn selector switch (A) on the tester to Position 2.

5. Combine must be in level position. Turn on ignition key to “ON”. DO NOT START ENGINE.

6. Press RIGHT tilt of the MANUAL level control switch. Right tilt test light (B) should glow. If it does not, check for loose connection at test box and adjustment of RIGHT limit switch. If the right tilt light still does not glow, refer to ELECTRICAL DIAGNOSTIC FLOWCHART for “MANUAL LEVEL RIGHT DOES NOT WORK”.

7. Press LEFT tilt of the MANUAL level control switch. Left tilt test light (C) should glow. If it does not, check for loose connection at test box and adjustment of LEFT limit switch. If the left tilt light still does not glow, refer to ELECTRICAL DIAGNOSTIC FLOWCHART for “MANUAL LEVEL LEFT DOES NOT WORK”.

NOTE: Failure of test light to glow at any point indicates defective component lies in harness between C241 and C248.

H46045 -UN-06MAY93

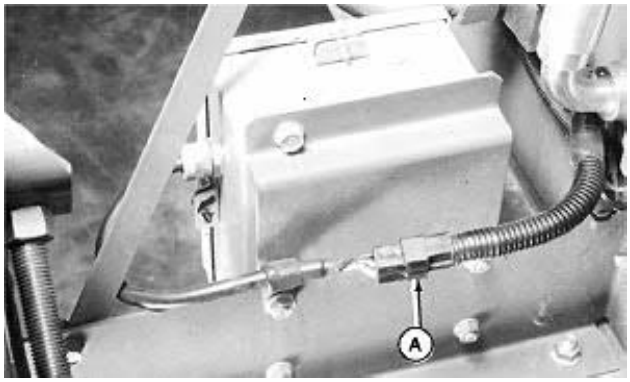
TM1545,HX350,I -19-09AUG93

CHECKING SIDEHILL LEVEL SENSING CONTROL BOX

1. Disconnect the four pin connector C248 (A), at leveling control box.

2. Connect mating four pin connectors of tester between C248 (A). Connect clamp of tester to frame ground.

3. Locate test box on ground so it is visible while moving level sensing control box.

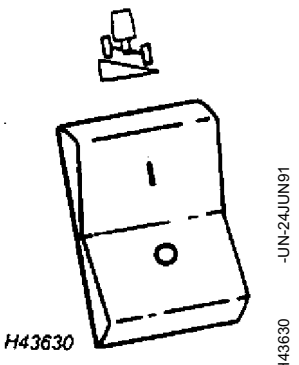


H45291 -UN-29SEP92

TM1545,HX350,L -19-09AUG93

350
10A
12

4. Turn on ignition key. DO NOT START ENGINE. Turn on automatic level switch (I) on armrest console.



H43630 -UN-24JUN91

TM1545,HX350,M -19-09AUG93

5. Turn tester selector switch (A) to position 2.

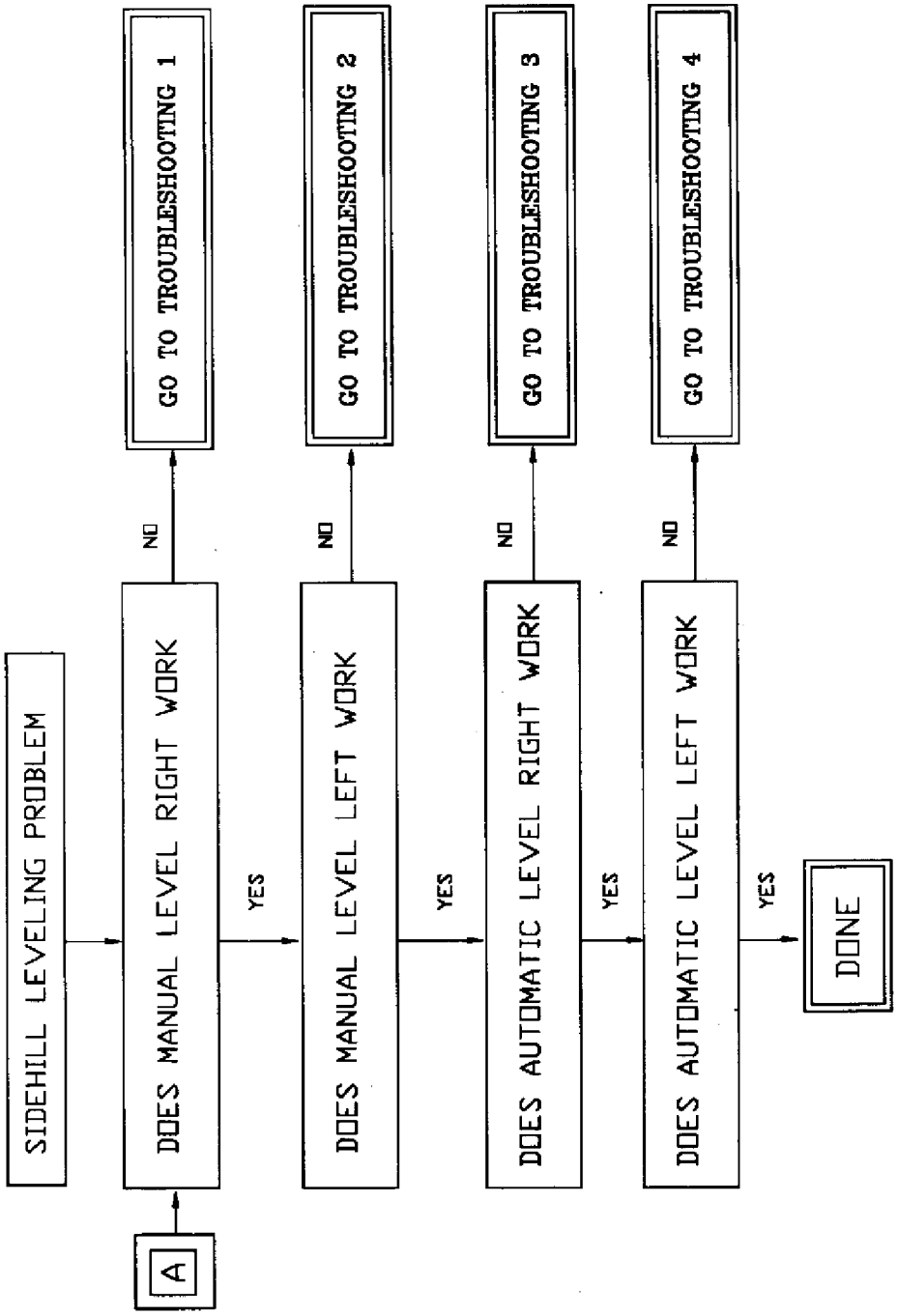
6. Loosen control box mounting bolts and move bottom of box toward combine left side (counterclockwise). The RIGHT tilt light (B) should glow. If it does not proceed to step 8.

7. Rotate bottom of control box toward combine right side (clockwise). The **LEFT** tilt light (C) should glow. If it does not, proceed to step 8.

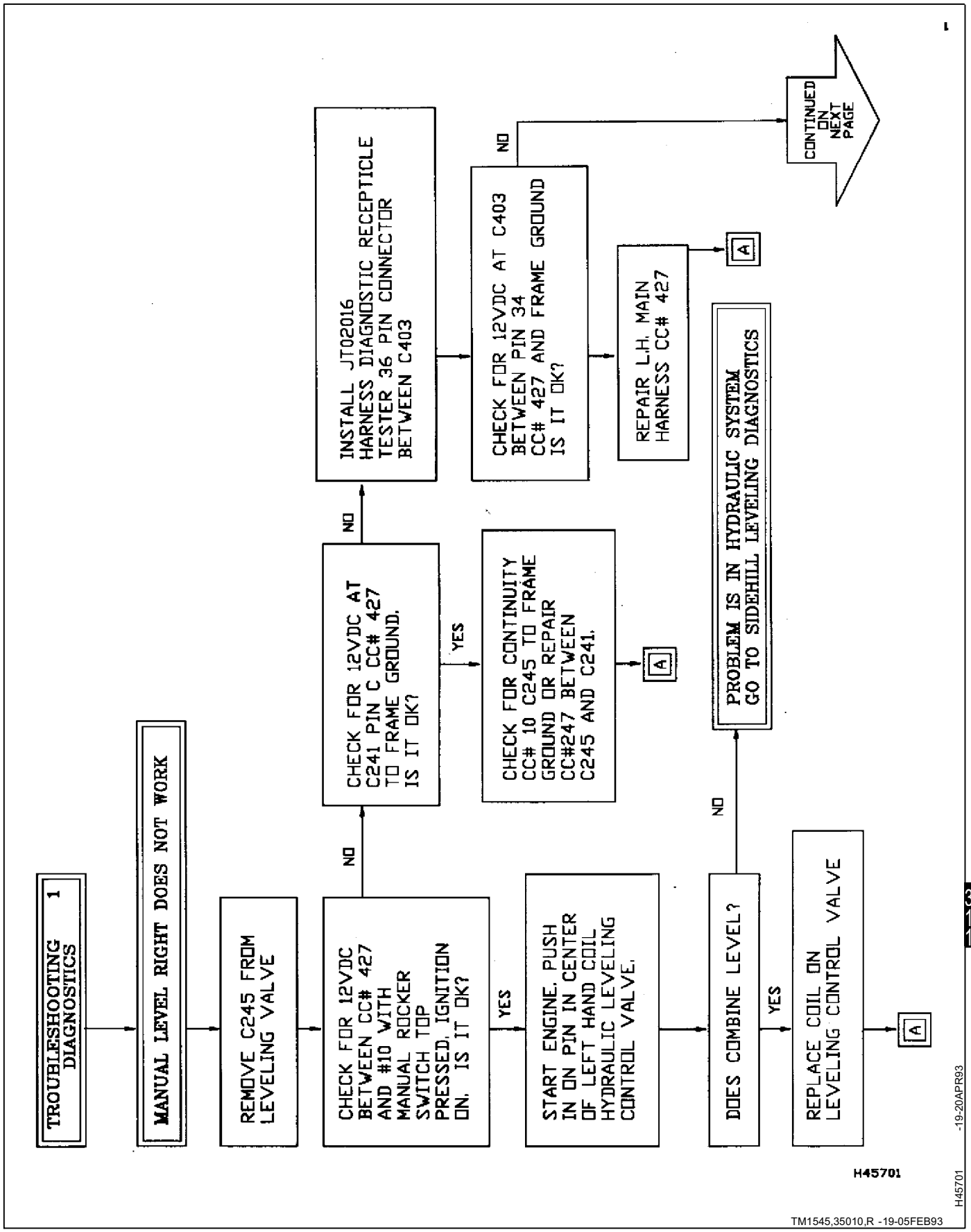
8. GO TO SIDEHILL LEVELING BOX DIAGNOSTICS.

H46045 -UN-06MAY93

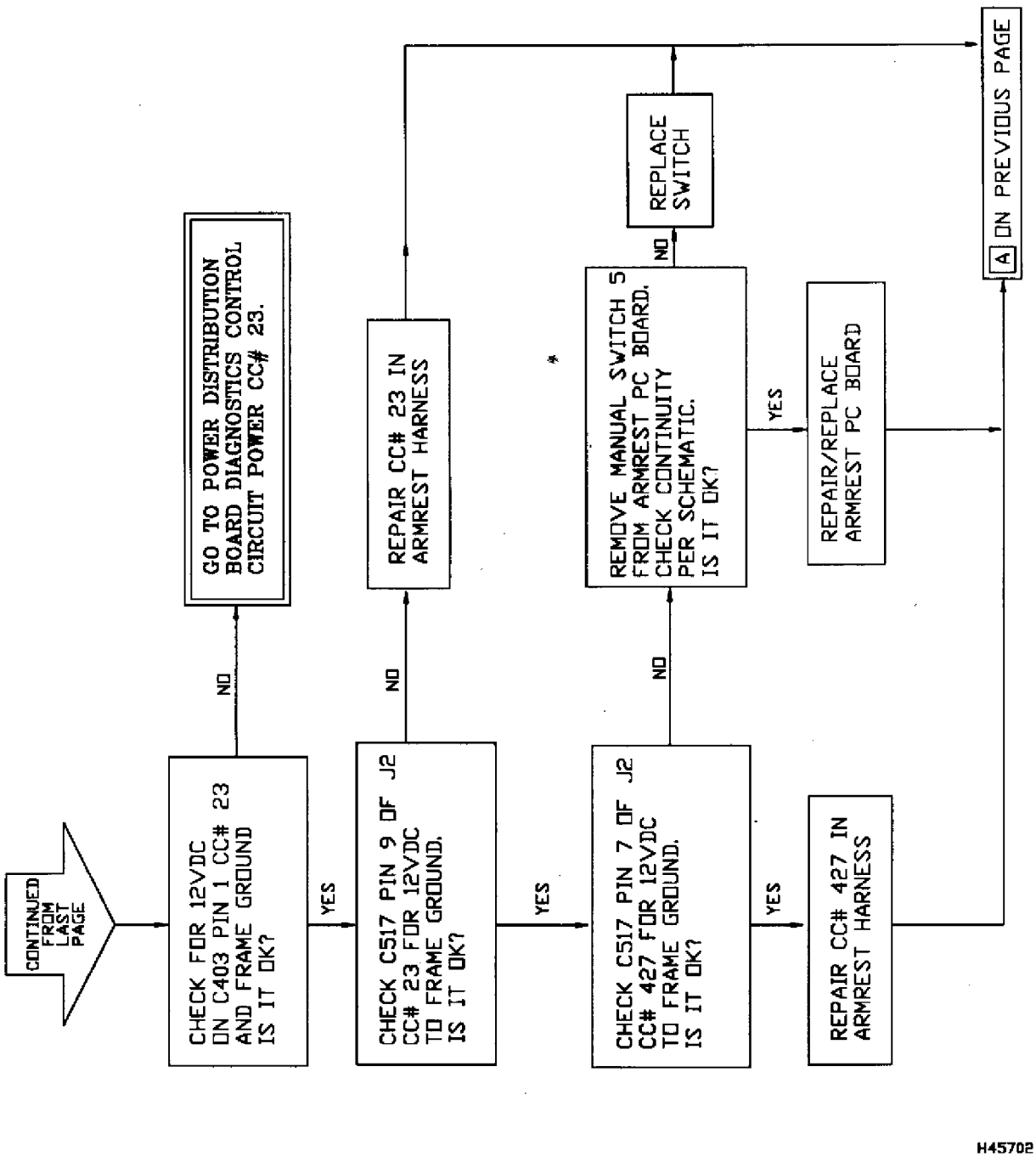
TM1545,HX350,N -19-09AUG93



TM1545,35010,Q -19-05FEB93

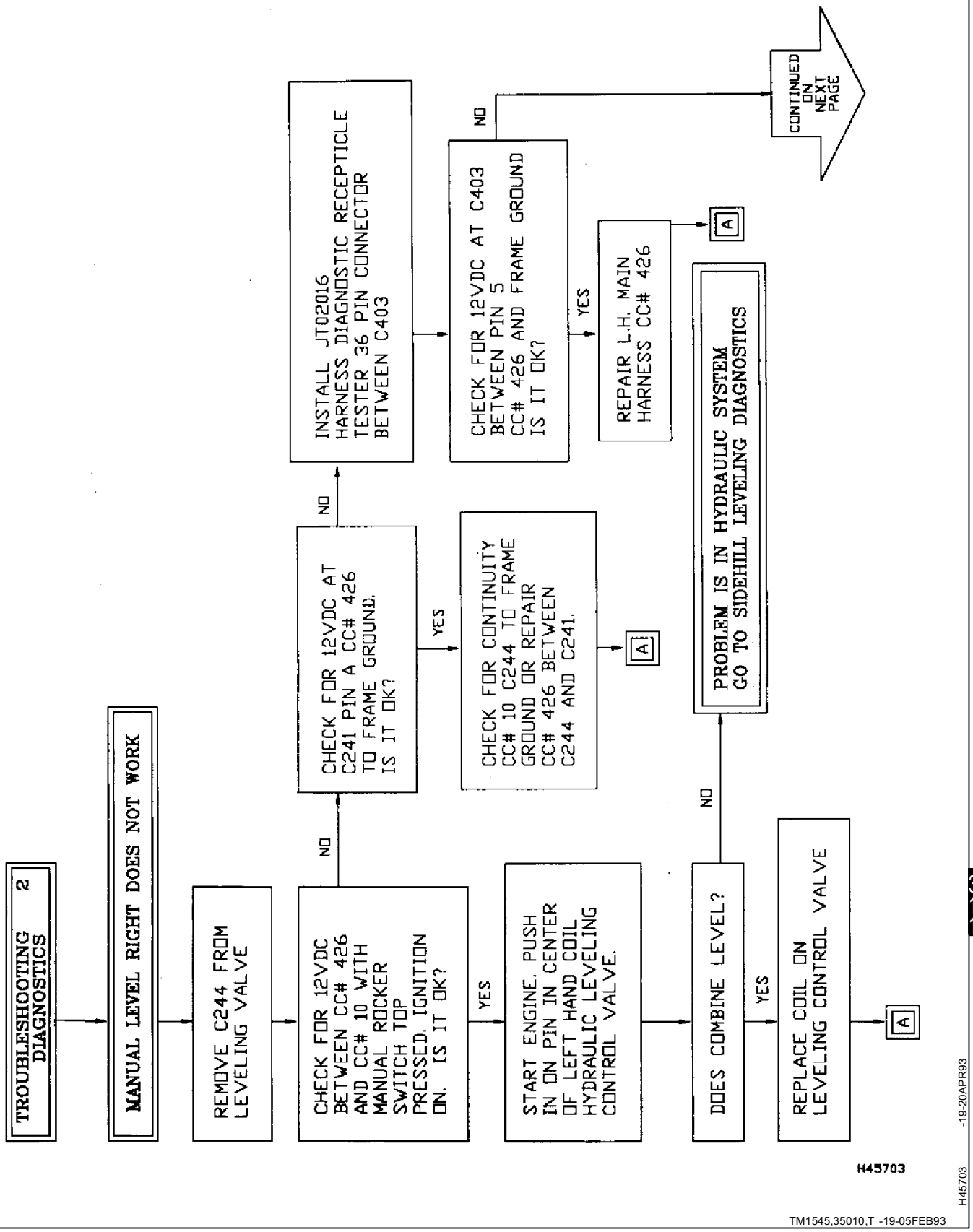


TM1545,35010,R -19-05FEB93



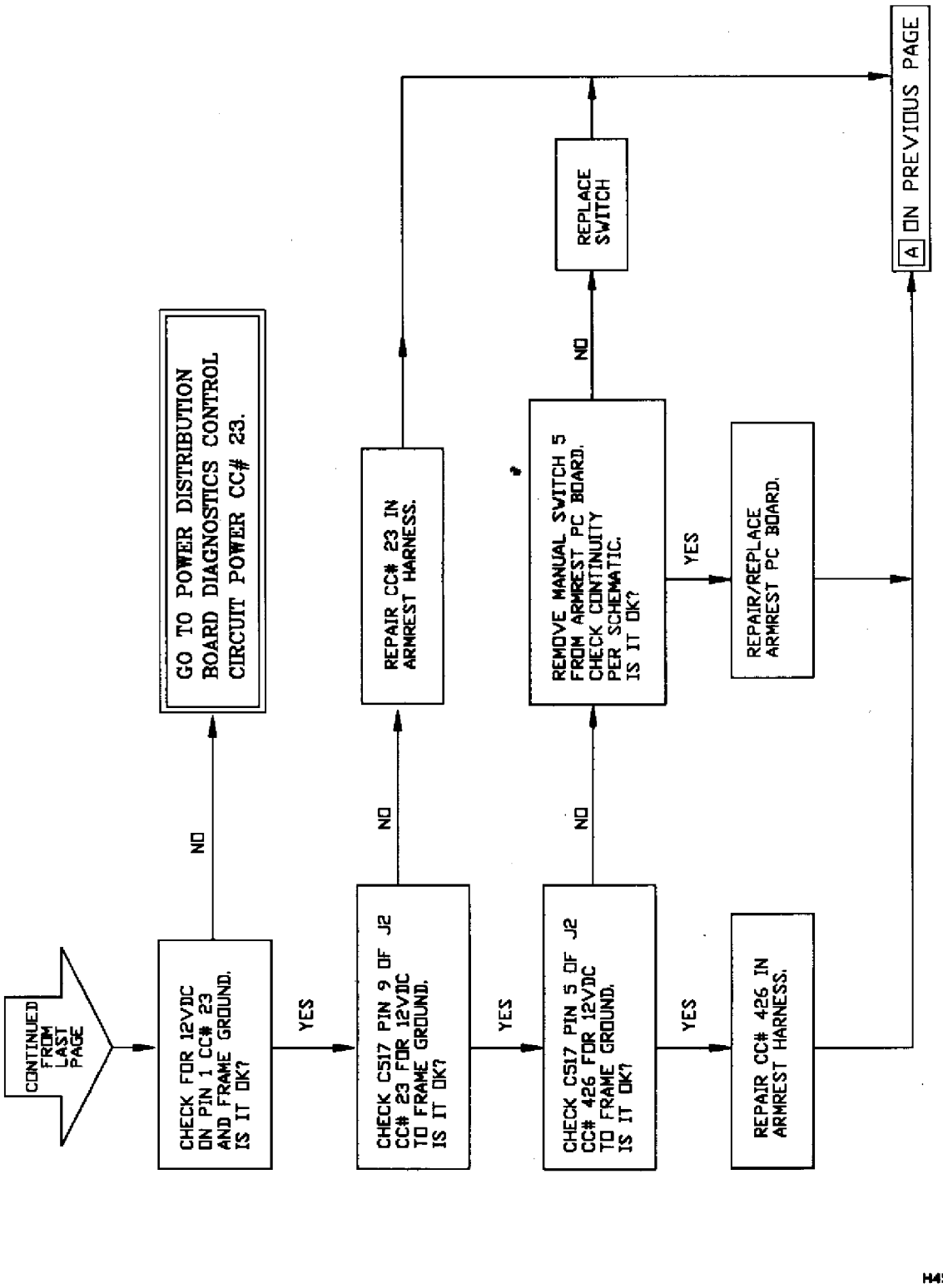
TM1545,35010,S -19-05FEB93

350
10A
16

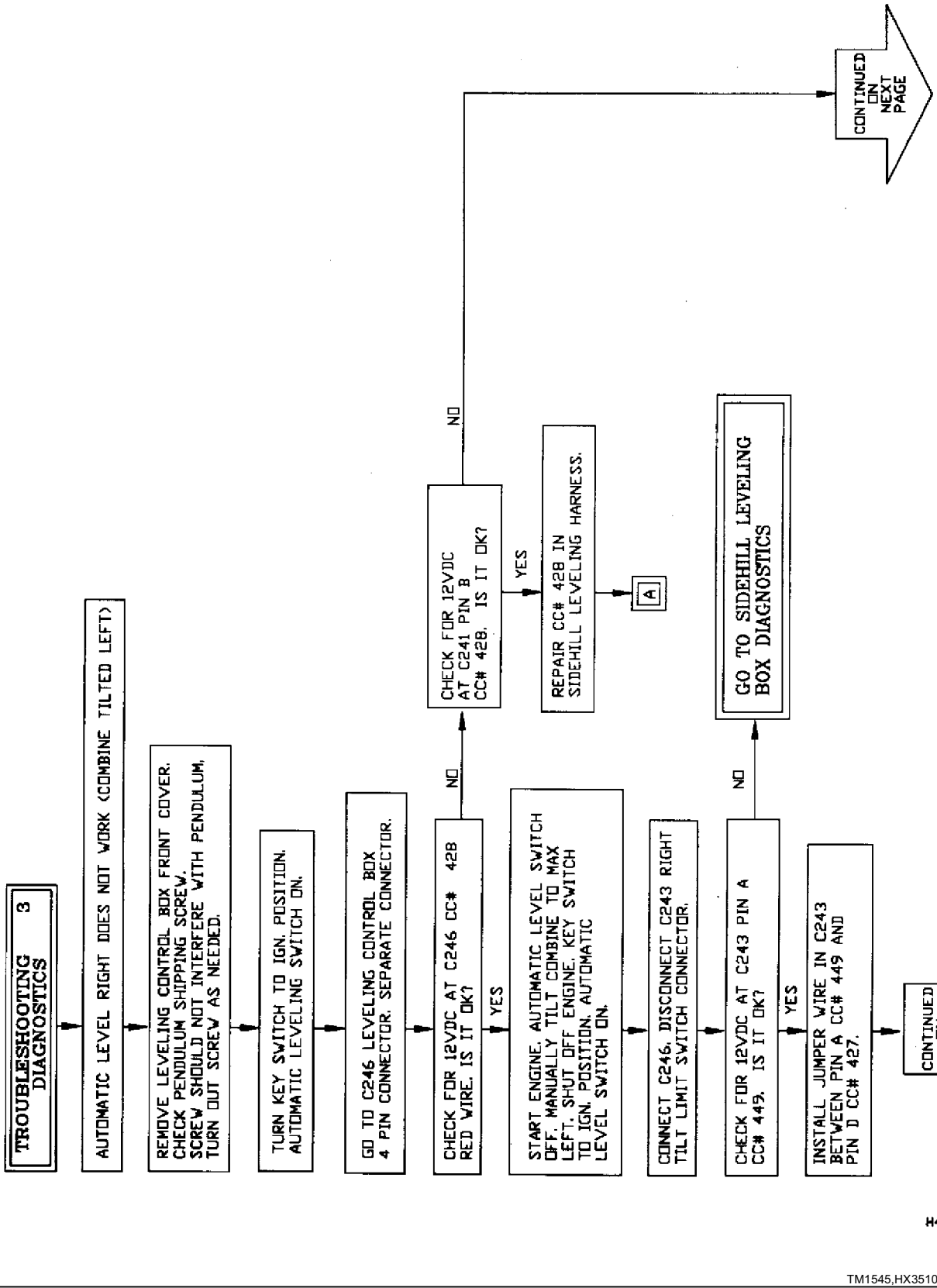


TM1545,35010,T -19-05FEB93

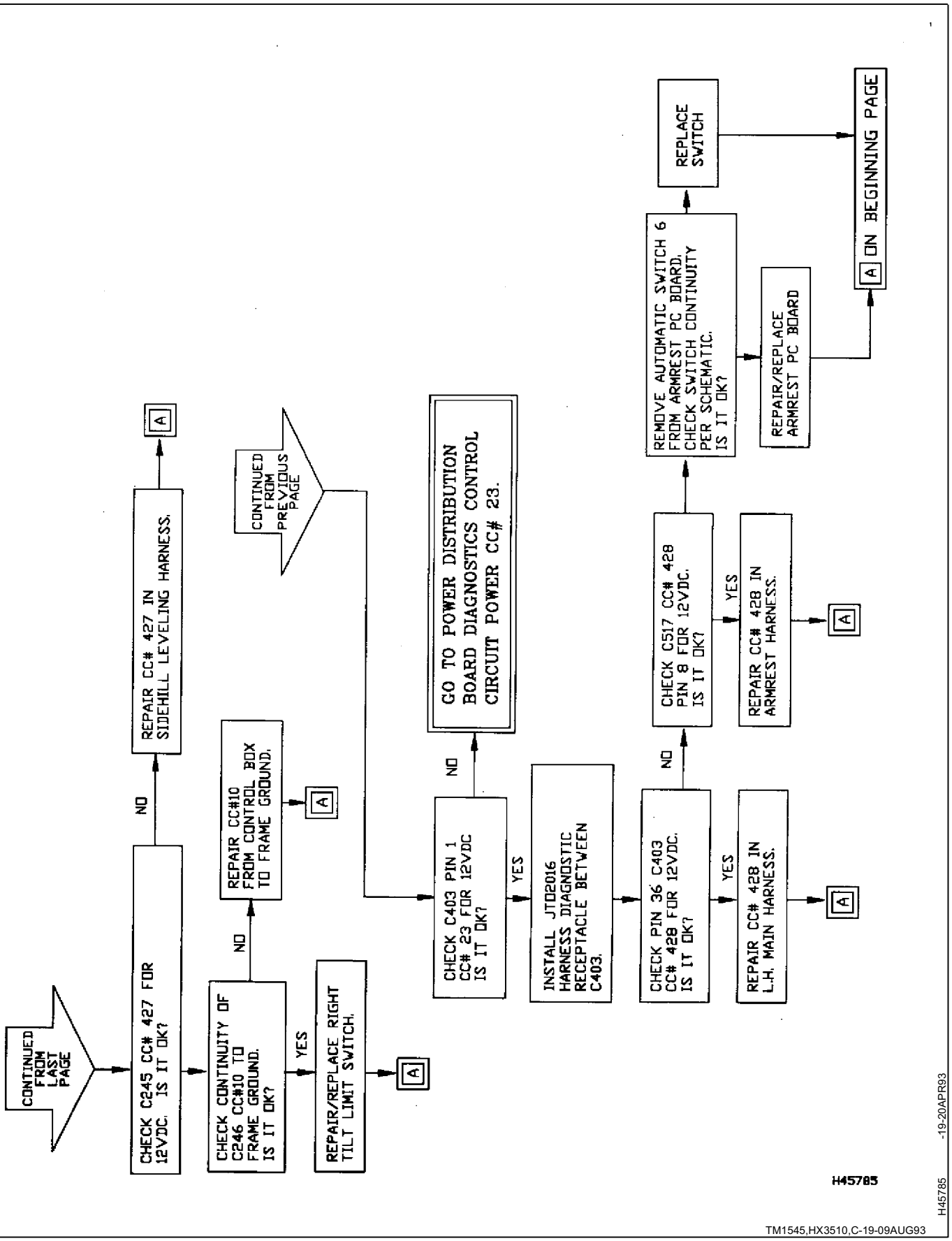
350
10A
17



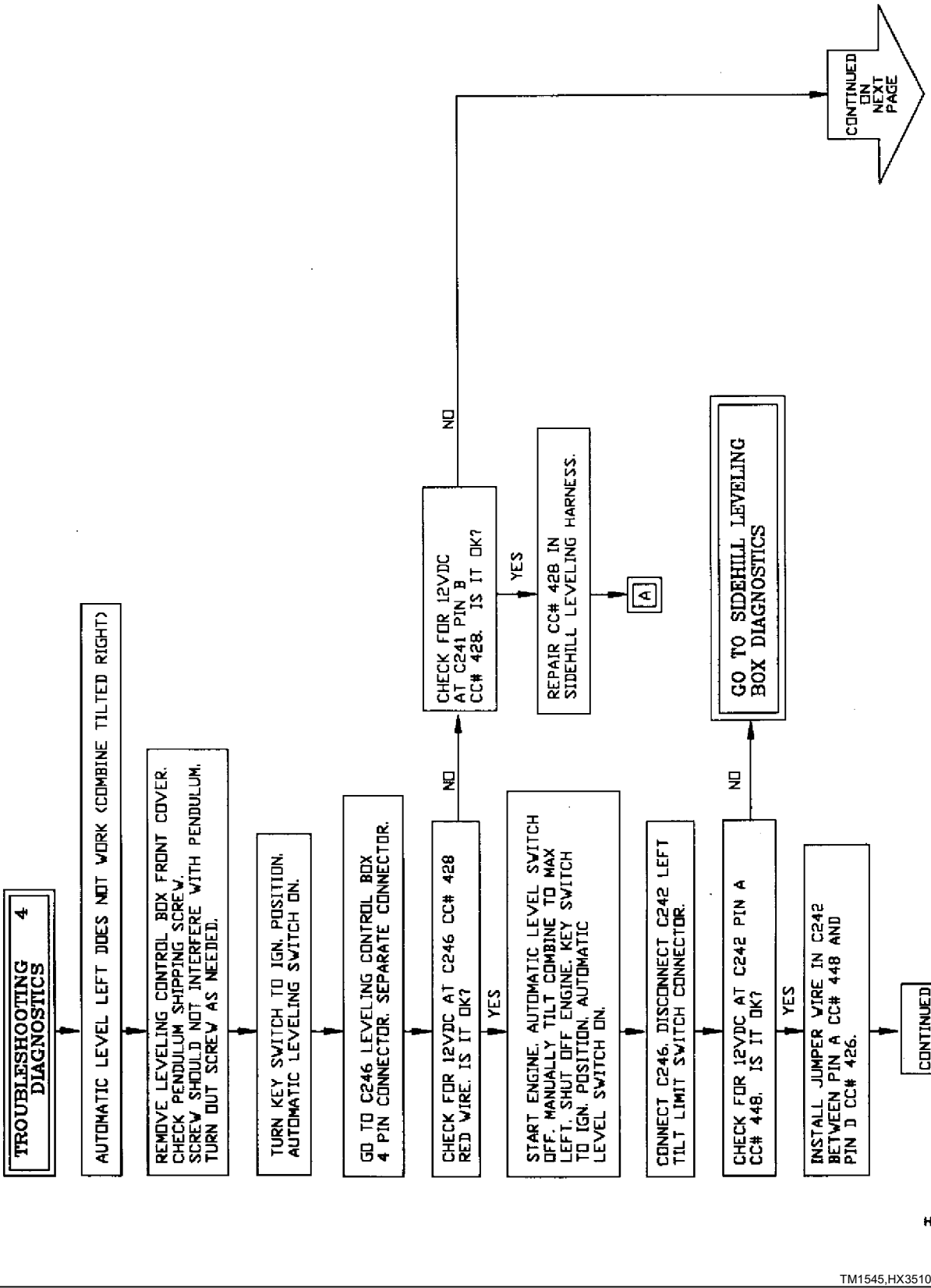
TM1545,HX3510,A-19-09AUG93



TM1545,HX3510,B-19-09AUG93

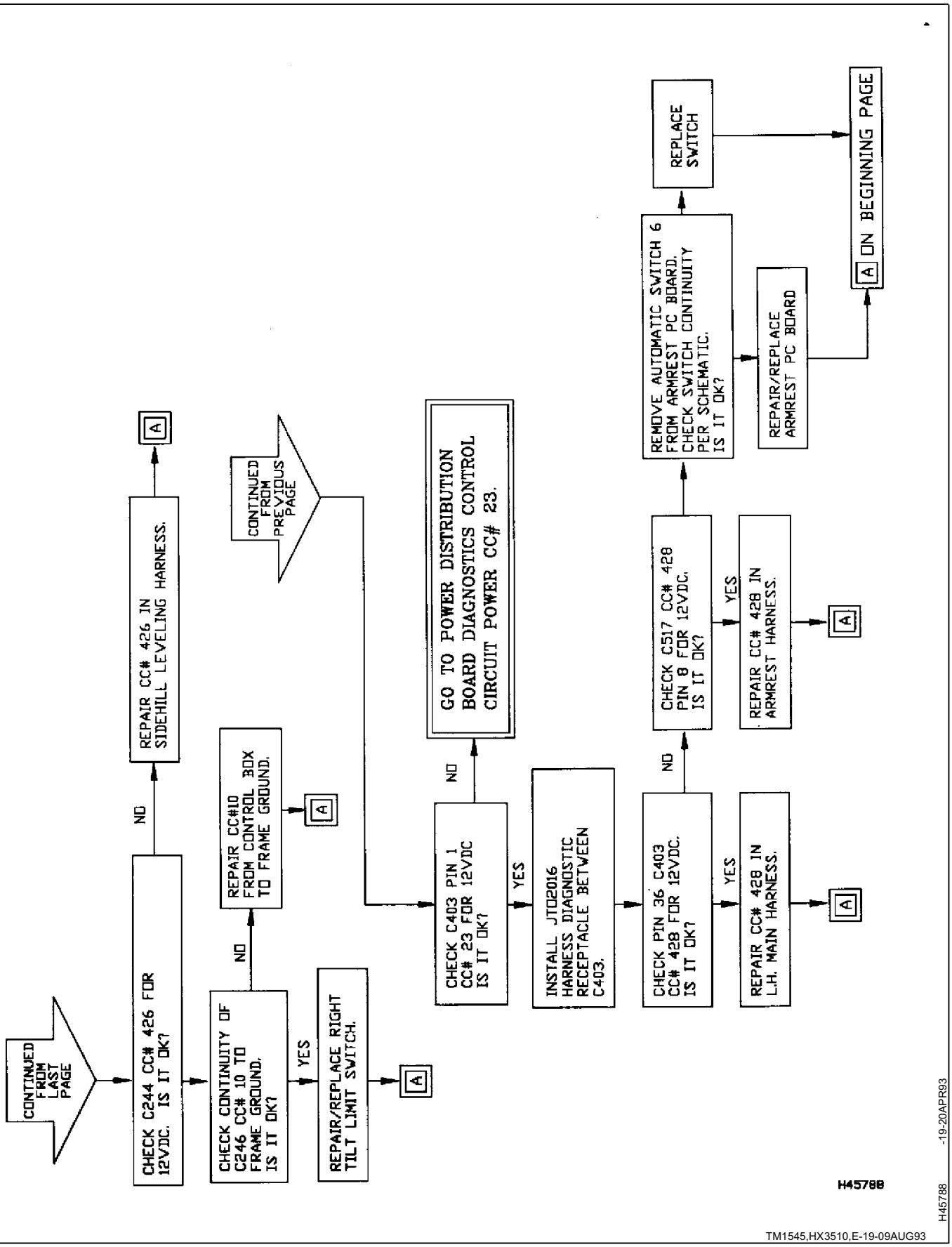


TM1545,HX3510,C-19-09AUG93



TM1545,HX3510,D-19-09AUG93

350
10A
21



TM1545,HX3510,E-19-09AUG93

350
10A
22

SIDEHILL LEVELING BOX DIAGNOSTICS

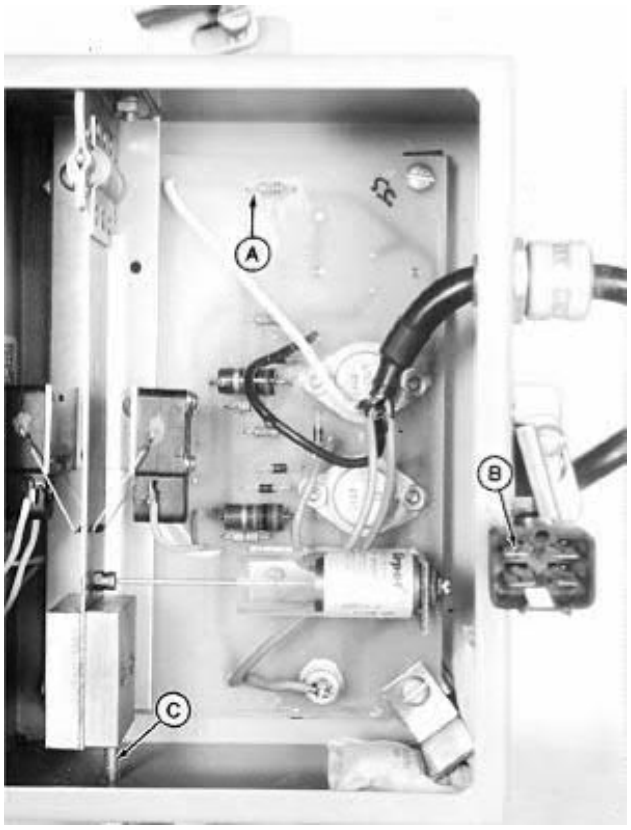
NOTE: Be sure shipping screw (C) is not restricting movement of pendulum.

1. Remove front cover on control box and disconnect control box harness.

2. Check for continuity between left leg of resistor (A) and C246 connector pin (B) CC #10 WHITE wire.

NOTE: Scratch contact point with probe to remove insulating coating to get a good contact.

3. If NO continuity, repair CC #10.



TM1545,35010,U -19-05FEB93

4. Check continuity between (A) and C246 connector pin (B) CC #428 RED wire.

5. If NO continuity, repair CC #428.

TM1545,35010,V -19-05FEB93

6. Check continuity between (A) top transistor and C246 connector pin (B) CC #448 BLACK wire.

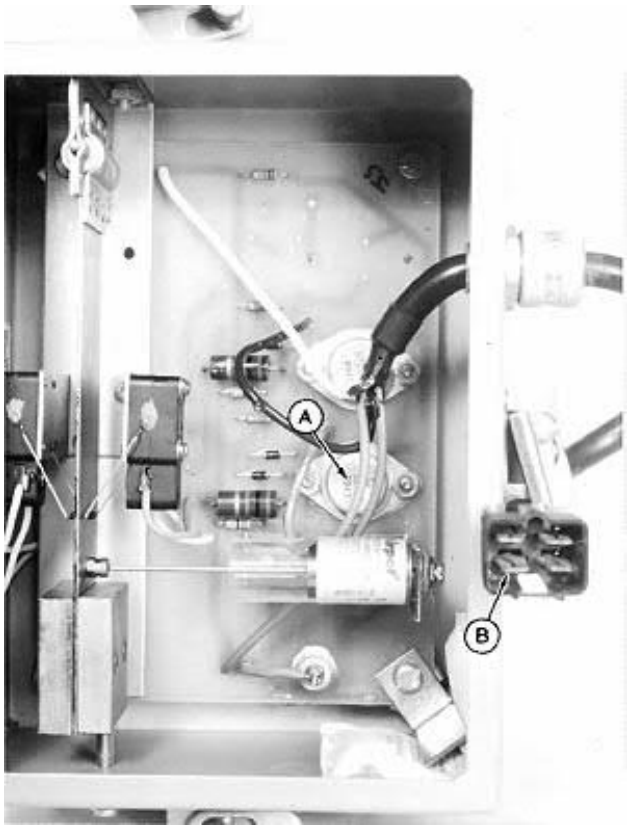
7. If no continuity, repair CC #448.

NOTE: Scratch contact point on top of transistor with probe to remove insulating coating to get a good contact.

TM1545,35010,W -19-05FEB93

8. Check continuity between (A) bottom transistor and C246 connector pin (B) CC #449 GREEN wire.

9. If NO continuity, repair CC #449.



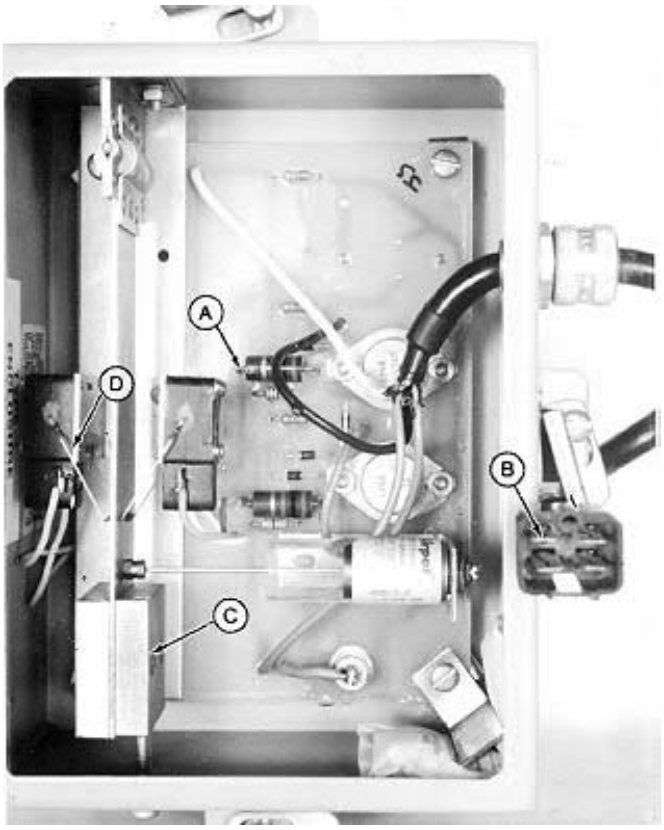
TM1545A,35010,C-19-29MAR93

10. Check continuity between (A) left switch WHITE wire and C246 connector pin (B) CC #10 WHITE wire.

11. Check continuity between (C) right switch WHITE wire and C246 connector pin (B) CC #10 WHITE wire.

12. If NO continuity, check wire solder joints from switches and printed circuit board.

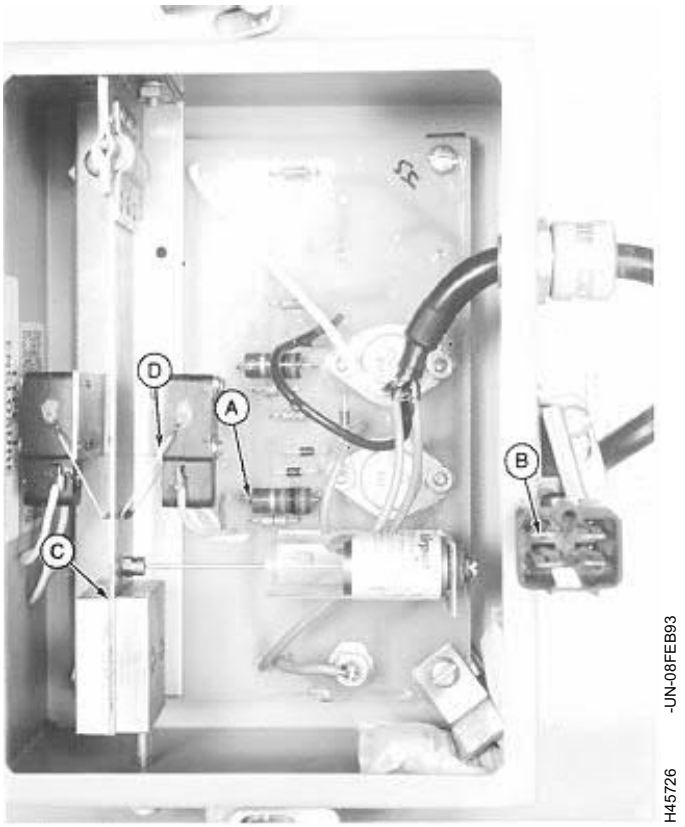
TM1545,35010,Y -19-05FEB93



13. ATTACH continuity tester probes to left leg of top large diameter resistor (A) and C246 connector pin (B) CC #10 WHITE wire. Swing pendulum (C) to left to close left switch (D).

14. If NO continuity, replace switch (D).

TM1545,35010,Z -19-05FEB93



15. ATTACH continuity tester probes to left leg of bottom large diameter resistor (A) and C246 connector pin (B) CC #10 WHITE wire. Swing pendulum (C) to right to close right switch (D).

16. If NO continuity, replace switch (D).

TM1545,35010,AA-19-05FEB93

17. Connect leveling control box harness.

18. Turn ignition key to IGN position.

19. Turn on automatic leveling armrest switch.

TM1545,35010,AB-19-05FEB93

20. Check voltage at (A). Voltmeter should read 10—11 volts.

NOTE: Scratch contact point with probe to remove insulating coating to get a good contact.

21. Check voltage at (B) and (C) with pendulum centered. Voltmeter should indicate battery voltage 10—12 volts.

If NOT, control box is defective.

22. Check voltage at (B) with pendulum swung to left. Voltmeter should indicate a drop in voltage.

If NOT replace control box.

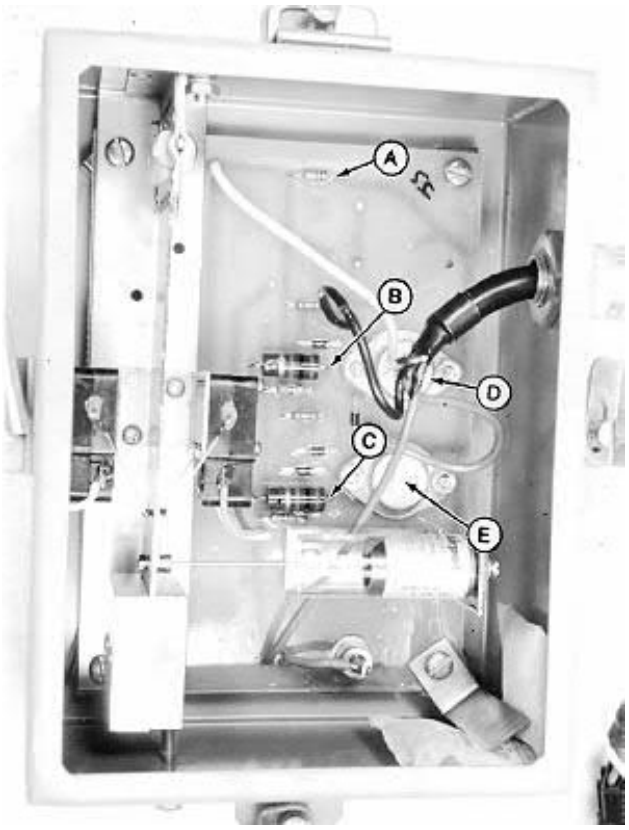
23. Check voltage at (C) with pendulum swung to right. Voltmeter should indicate a drop in voltage.

If NOT, replace control box.

24. Check voltage to top of transistor (D). With pendulum swung right, voltmeter should indicate 9—10 volts. Center pendulum. Voltmeter should indicate zero volts. If either voltage is incorrect, replace transistor. John Deere service part transistor is supplied with installation instructions.

NOTE: Scratch top of transistor with probe to remove insulating coating to get a good contact.

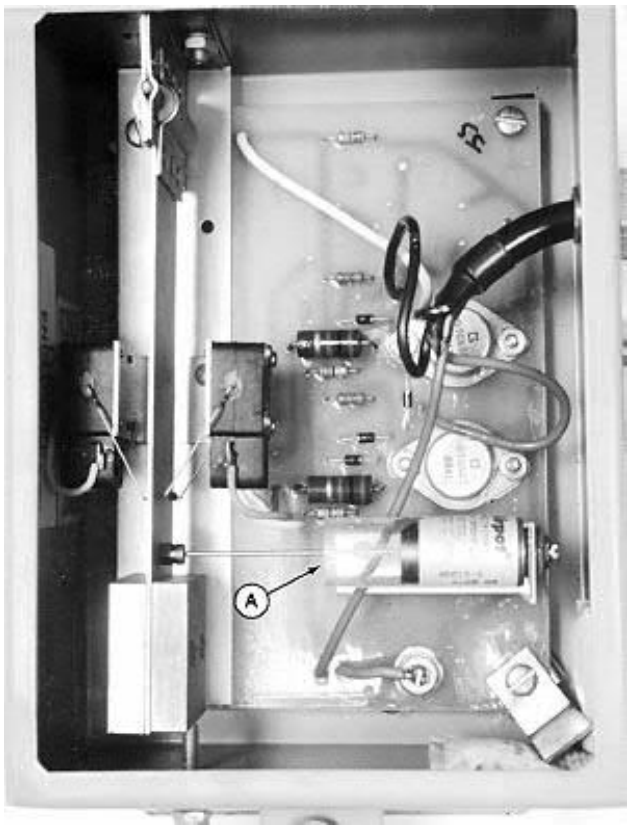
25. Check voltage to top of transistor (E). With pendulum swung left, voltmeter should indicate 9—10 volts. Center pendulum. Voltmeter should indicate zero volts. If either voltage is incorrect, replace transistor.



H45728 -UN-08FEB93

TM1545A,35010,D-19-29MAR93

26. Pendulum dashpot (A) should not allow the pendulum to swing freely. Pendulum should sluggishly swing when control box is tilted. If not, adjust or replace.



TM1545,35010,AE-19-09AUG93

BRIEF DESCRIPTION

The hydraulic leveling system consists of proportional flow divider, leveling control valve, and leveling cylinders.

HX,1546,350,A -19-18DEC92

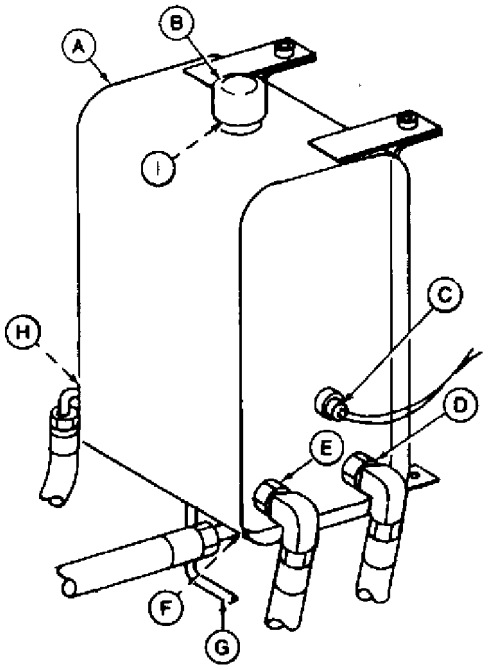
BASIC OPERATION

As the combine comes into a slope, a pendulum in the level sensing control box swings to one side, causing a tilt switch in the box to close. Current is sent to the appropriate solenoid on the leveling control valve. The activated solenoid pushes the spool in, causing pressure oil to be always directed to the rod end of the retracting cylinder. Pressure oil is obtained from the proportional flow divider. Return oil is directed to a tee on the proportional flow divider and then returned to the reservoir.

HX,TM1545,FG -19-09AUG93

HYDRAULIC RESERVOIR

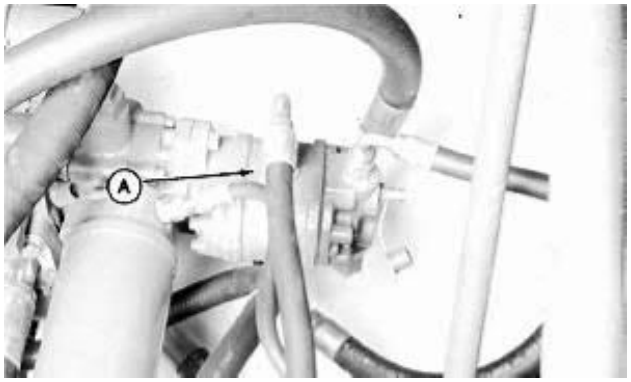
A—Hydraulic Reservoir
B—Reservoir Cap
C—Oil Temp Sensor
D—Oil Line From Hydraulic Filter
E—Oil Line to Hydraulic Pump
F—Oil Line to Charge Pump
G—Oil Line From Four Wheel Drive (Optional)
H—Oil Line to Oil Cooler
I—Oil Filter/Screen



H45132 -UN-14SEP92

TM1545,35020,A -19-29MAR93

HYDRAULIC PUMP (A)

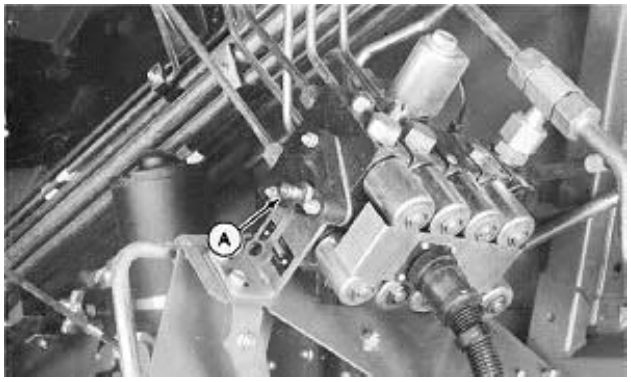


H45103 -UN-14SEP92

HX,1546,350,E -19-18DEC92

350
20A
2

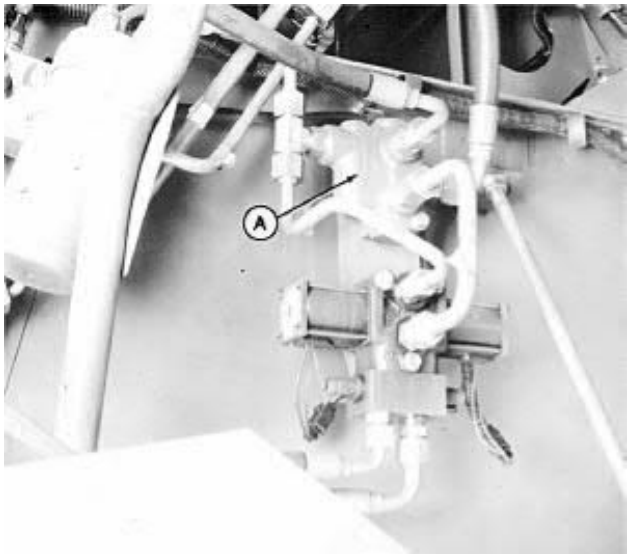
HYDRAULIC VALVE STACK DIAGNOSTIC RECEPTACLE (A)



H45089 -UN-10SEP92

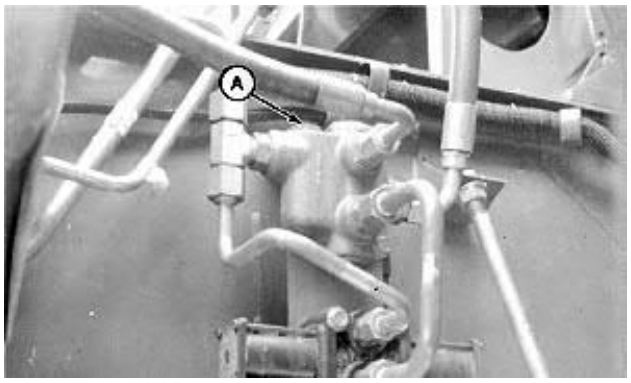
HX,1546,350,F -19-18DEC92

PROPORTIONAL FLOW DIVIDER (A)



TM1545,35020,B -19-29MAR93

SIDEHILL CIRCUIT RELIEF VALVE (A)



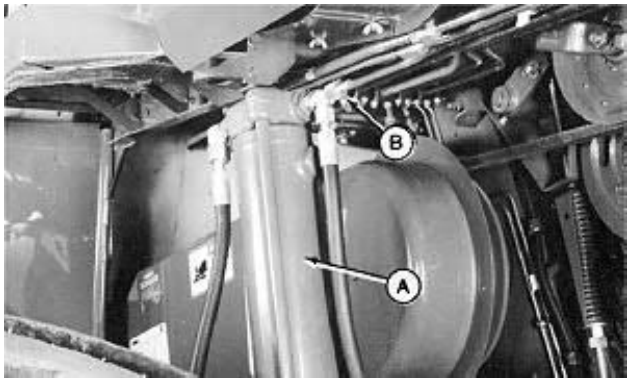
TM1545,35020,C -19-29MAR93

LEVELING VALVE (A)

HX,1546,350,I -19-18DEC92

LEFT-HAND LEVELING CYLINDER (A)

B—Diagnostic Receptacle

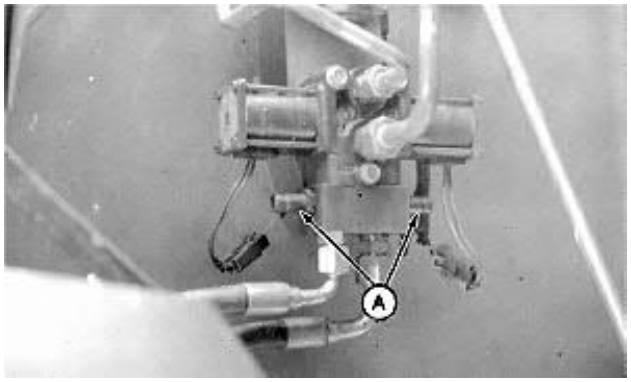


HX,1546,350,J -19-18DEC92

RIGHT-HAND LEVELING CYLINDER (A)

HX,1546,350,K -19-18DEC92

THERMAL RELIEF VALVES (A)



TM1545,35020,D -19-29MAR93

350
20A
5

LEVELING CYLINDERS

There are two double-acting cylinders located at the front of the separator.

As oil is delivered to the rod end of one cylinder, the cylinder retracts. Displaced oil from the head end of this cylinder is forced out and into the head end of opposite cylinder, causing that cylinder to extend. Oil in the lower end of the extending cylinder is forced out and flows through the leveling control valve and to the main hydraulic reservoir.

Cylinders are equipped with pressure operated safety check valves to prevent loss of oil from extended cylinder in case a hose or line ruptures.

TM1545,35020,E -19-09AUG93

If combine sits for a period of time, the feeder house picture frame may tilt slightly, this is due to settling in one or both leveling cylinders.

CAUTION: Do not readjust leveling cables until combine leveling cylinders have been rephased.

IMPORTANT: When park brake is applied and locked, leveling system could be impaired. Park brake must be released before manually tilting machine.

To rephase leveling cylinders:

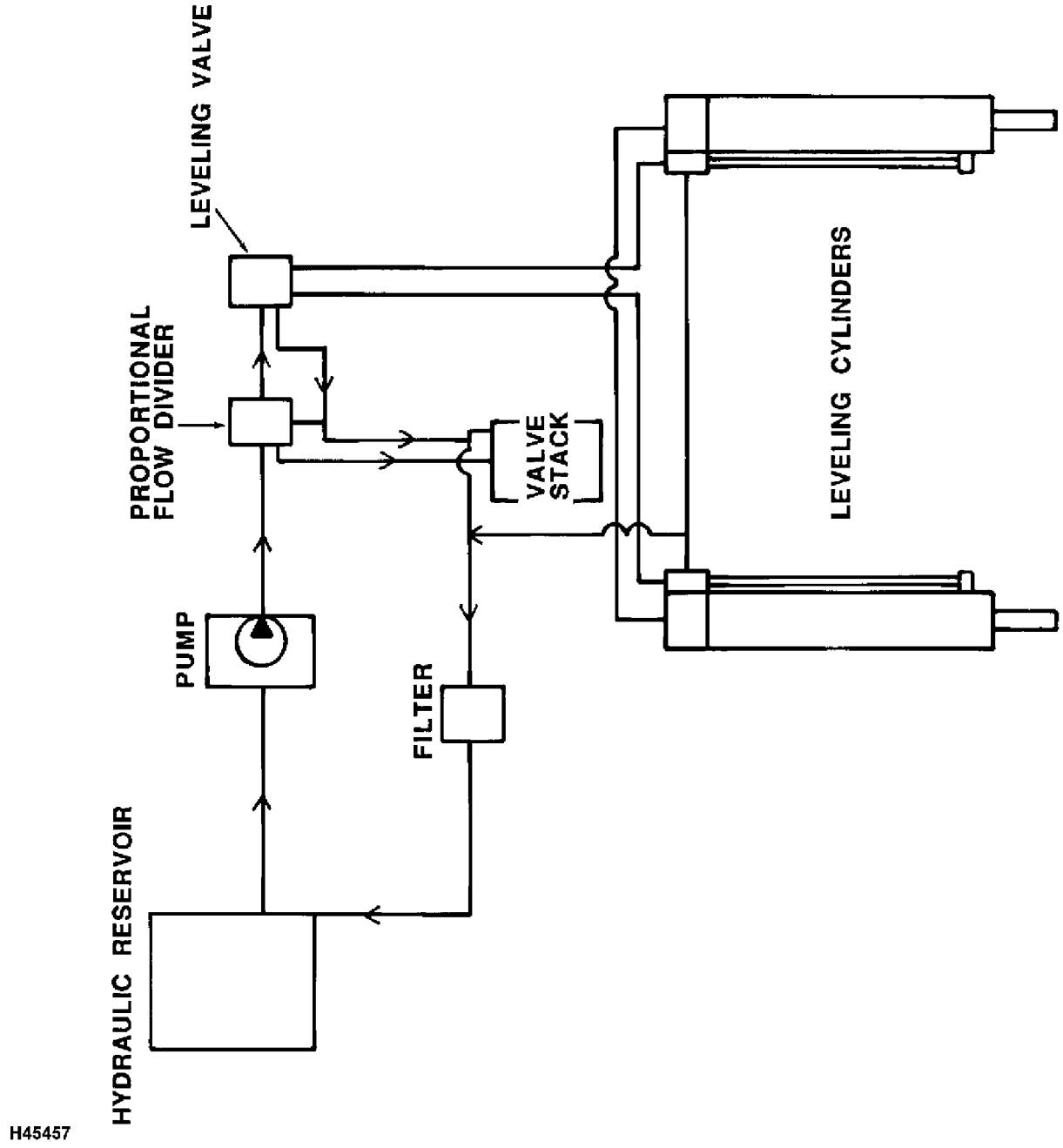
Start engine and tilt combine to each side.

Hold leveling switch in this position for 15 seconds.

Allow combine to return to level position.

Repeat procedure three times to insure complete rephasing of cylinders.

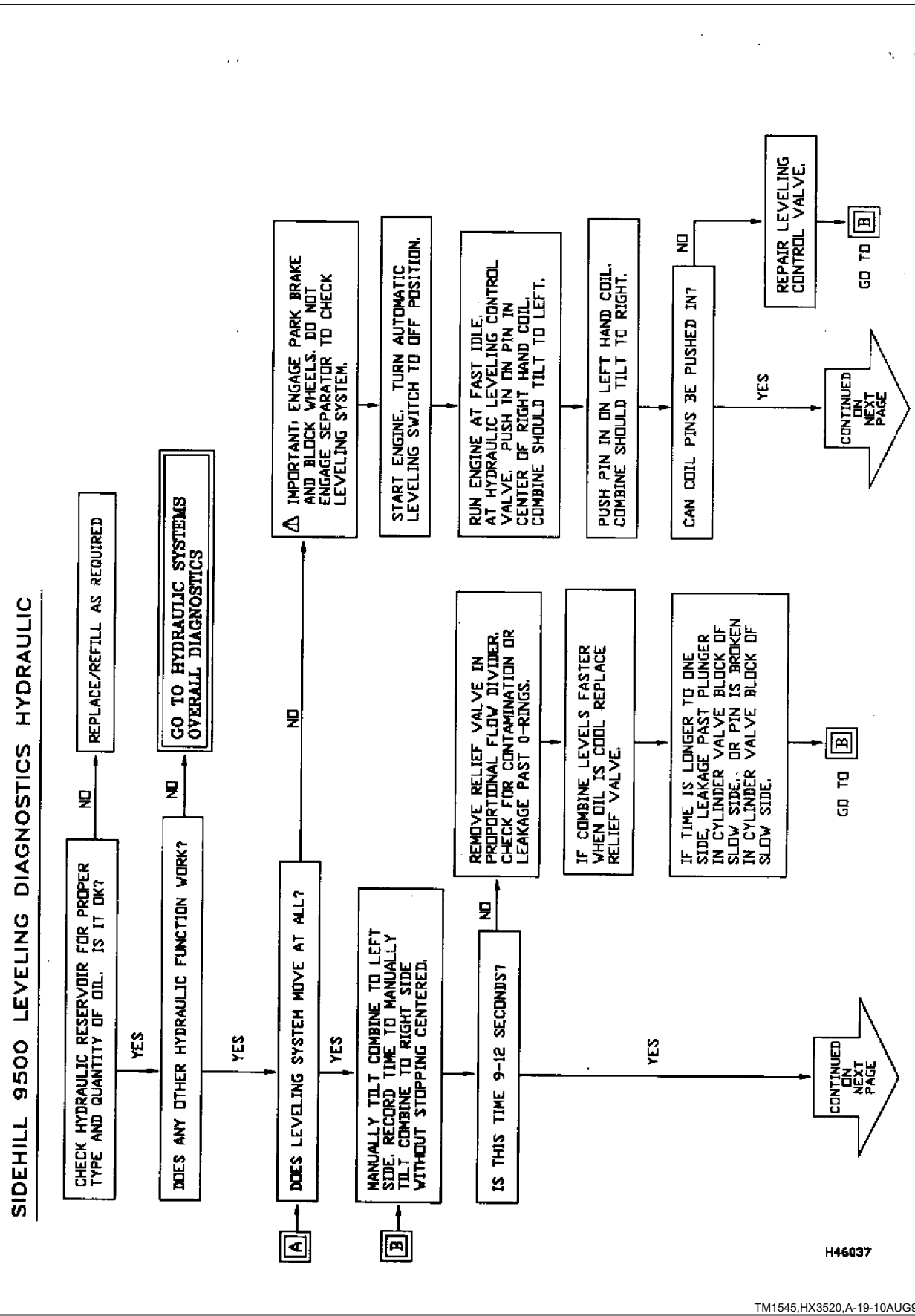
TM1545,35020,F -19-29MAR93



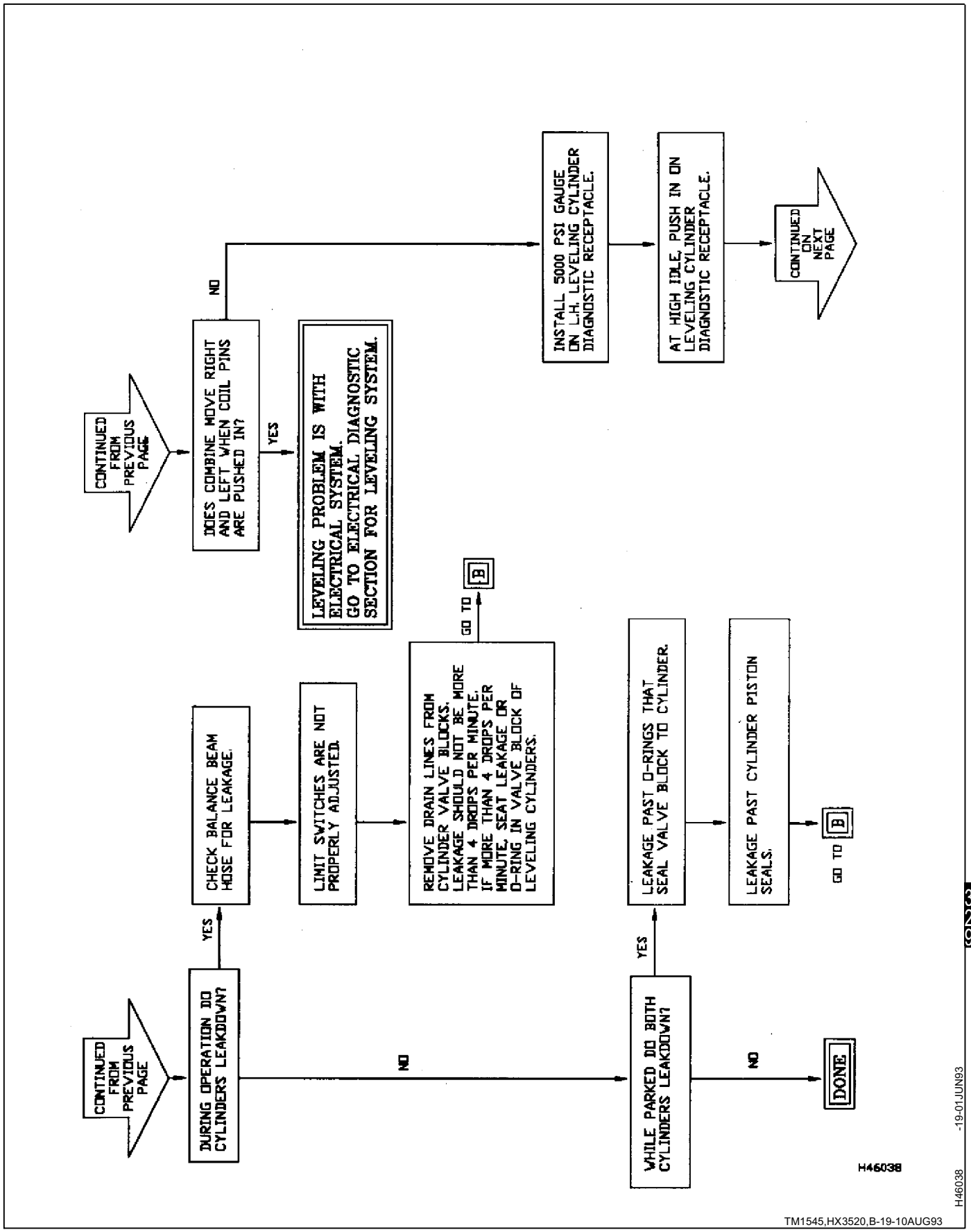
H45457 -19-05NOV97

350 20A 7

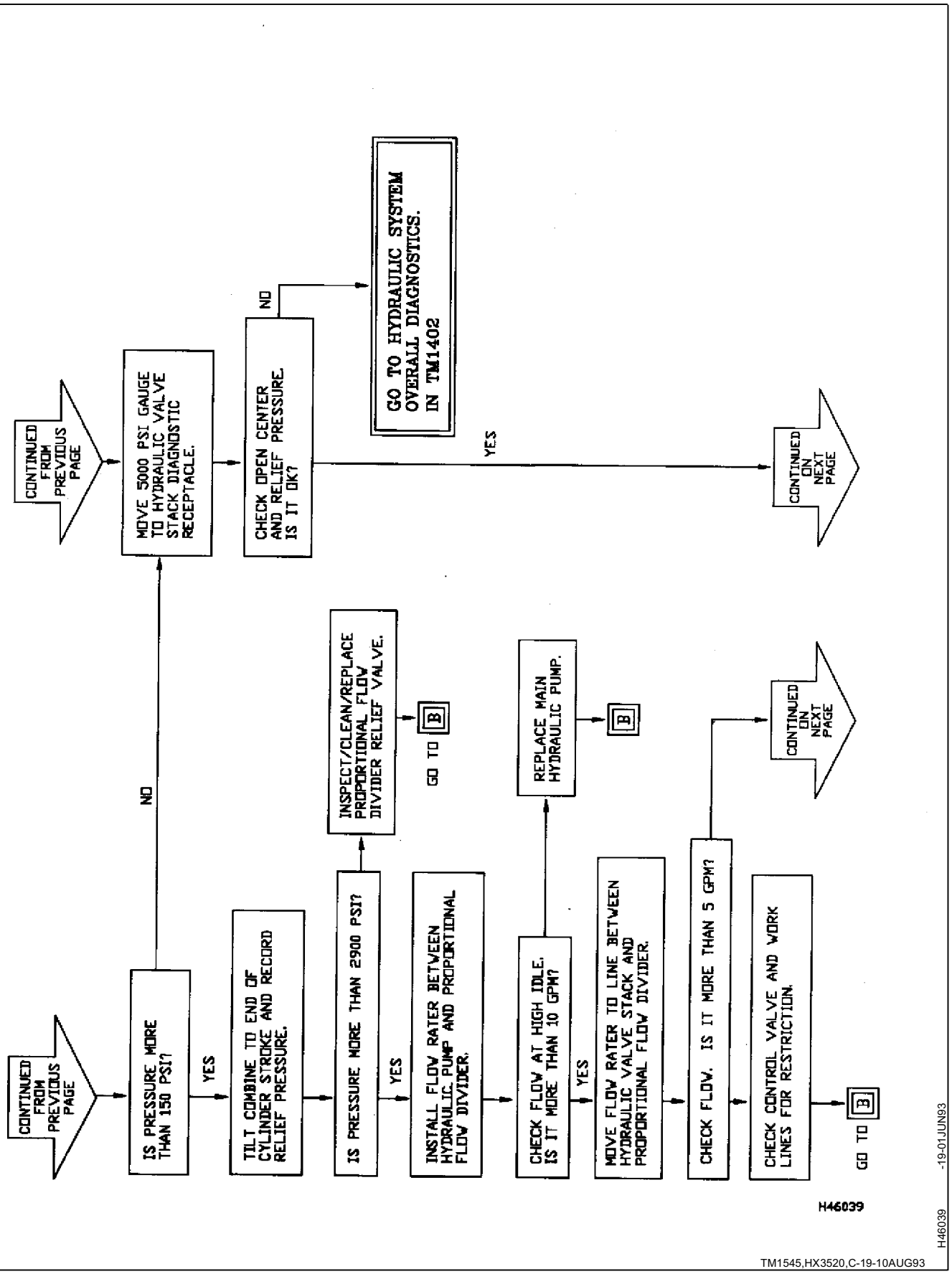
HX,TM1545,FH -19-10AUG93



TM1545,HX3520,A-19-10AUG93

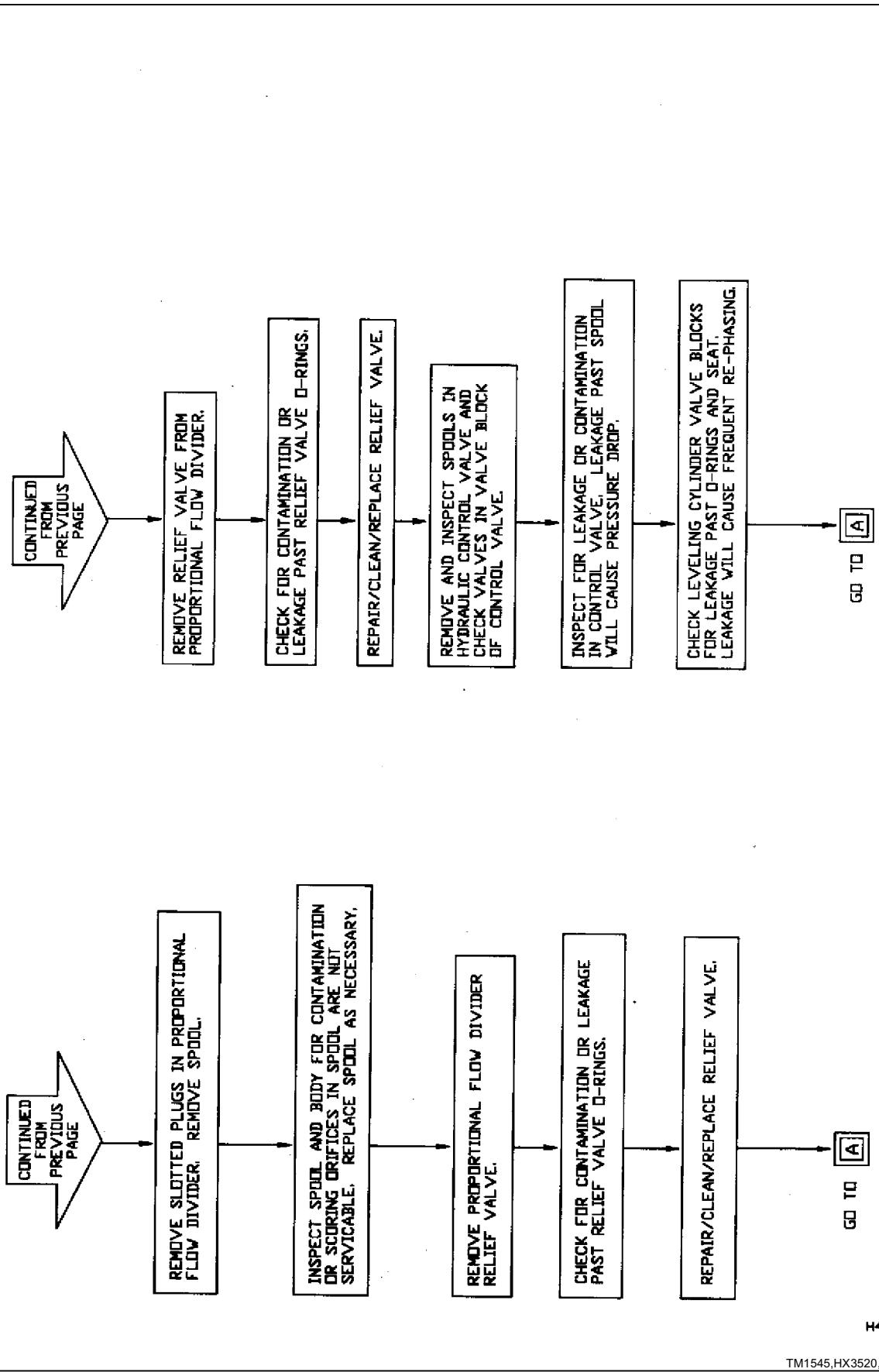


TM1545,HX3520,B-19-10AUG93



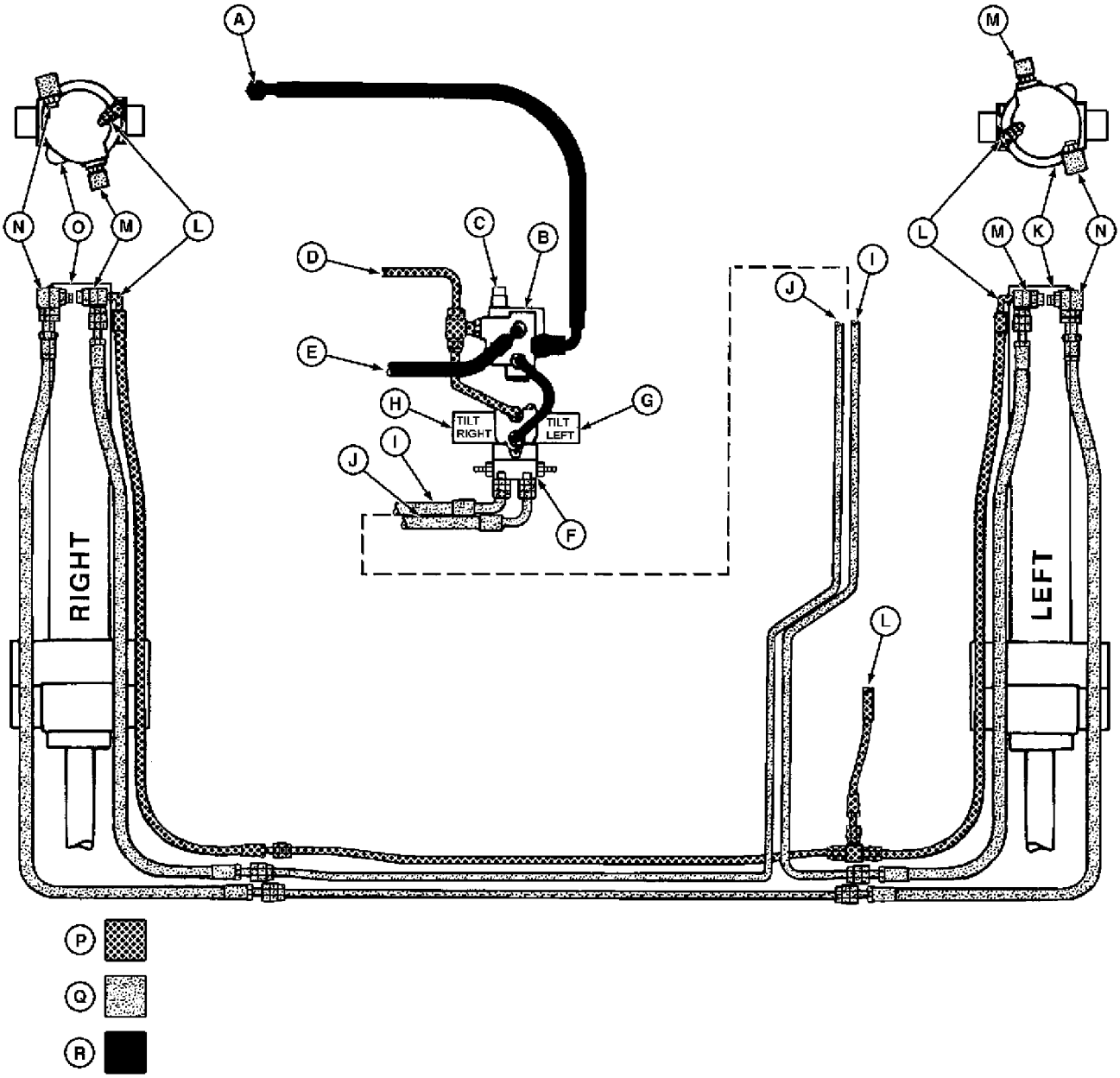
TM1545,HX3520,C-19-10AUG93

350
20A
10



TM1545,HX3520,D-19-10AUG93

350
20A
11



H45454

-19-05NOV97

H45454

A—From Main Hydraulic Pump
B—Proportional Flow Divider
C—Leveling Relief Valve
D—Return to Reservoir
E—To Solenoid Control Valve
F—Leveling Valve
G—Left Tilt Solenoid
H—Right Tilt Solenoid
I—To Rod of Left Leveling Cylinder
J—To Rod of Right Leveling Cylinder
K—Left Leveling Cylinder
L—Drain Line
M—Valve Block
N—Balance Beam Line
O—Right Leveling Cylinder
P—Pressure Free Oil
Q—Trapped Oil
R—Pressure Oil

TM1545,35020,G -19-10AUG93

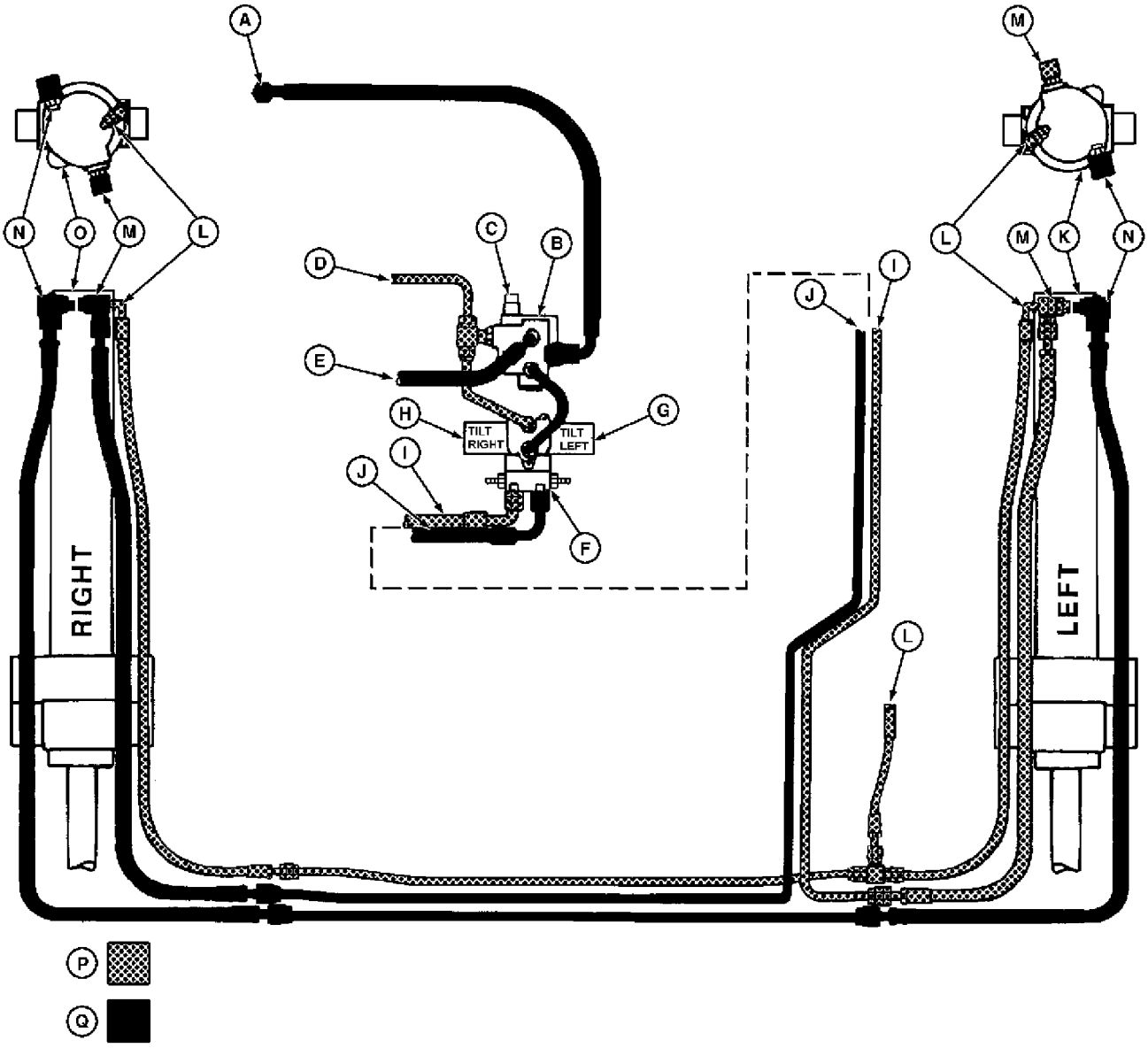
LEVELING SYSTEM IN NEUTRAL

When the leveling system is not activated, the solenoids on the leveling valve (F) are not activated.

Valve blocks (K and O) trap oil in the head ends of both leveling cylinders. The leveling valve (F) traps oil in the rod end of the cylinders.

Pressure free oil from the proportional flow divider (B) flows to the leveling valve (F) and then flows back to the reservoir.

HX,1546,350,S -19-18DEC92



H45455

-UN-10NOV97

H45455

A—From Main Hydraulic Pump
B—Proportional Flow Divider
C—Leveling Relief Valve
D—Return to Reservoir
E—To Solenoid Control Valve
F—Leveling Valve
G—Left Tilt Solenoid
H—Right Tilt Solenoid
I—To Rod of Left Leveling Cylinder
J—To Rod of Right Leveling Cylinder
K—Left Leveling Cylinder
L—Drain Line
M—Valve Block
N—Balance Beam Line
O—Right Leveling Cylinder
P—Return Oil
Q—Pressure Oil

TM1545,35020,H -19-10AUG93

LEVELING TO THE RIGHT (LEFT CYLINDER EXTEND, RIGHT CYLINDER RETRACT)

When the combine moves onto a slope that causes the combine to lean to the left, the electrical system activates the forward solenoid or right tilt solenoid (H). The activated solenoid pushes in the spool, causing a demand for pressure oil from the main hydraulic pump. This pressure oil flows from the main hydraulic pump (A) to the proportional flow divider (B).

The proportional flow divider directs 50 percent of the oil to the leveling valve (F). The remaining 50 percent is sent to the solenoid control valve. The proportional flow divider will always maintain the 50-50 percent flow regardless of pressure and flow requirements in either the leveling system or the main hydraulic system.

Leveling valve (F) directs pressure oil to the valve block on top of the right hand leveling cylinder (M) through hydraulic line (J).

The valve block directs the pressure oil to the rod side of the right leveling cylinder causing it to retract. The oil is forced out of the head side of the right cylinder and sent through balance beam line (N) to the head side of the left hand cylinder (K) causing it to extend.

Oil from the rod side of the left cylinder is returned to the leveling valve (I) and on to the reservoir through line (D).

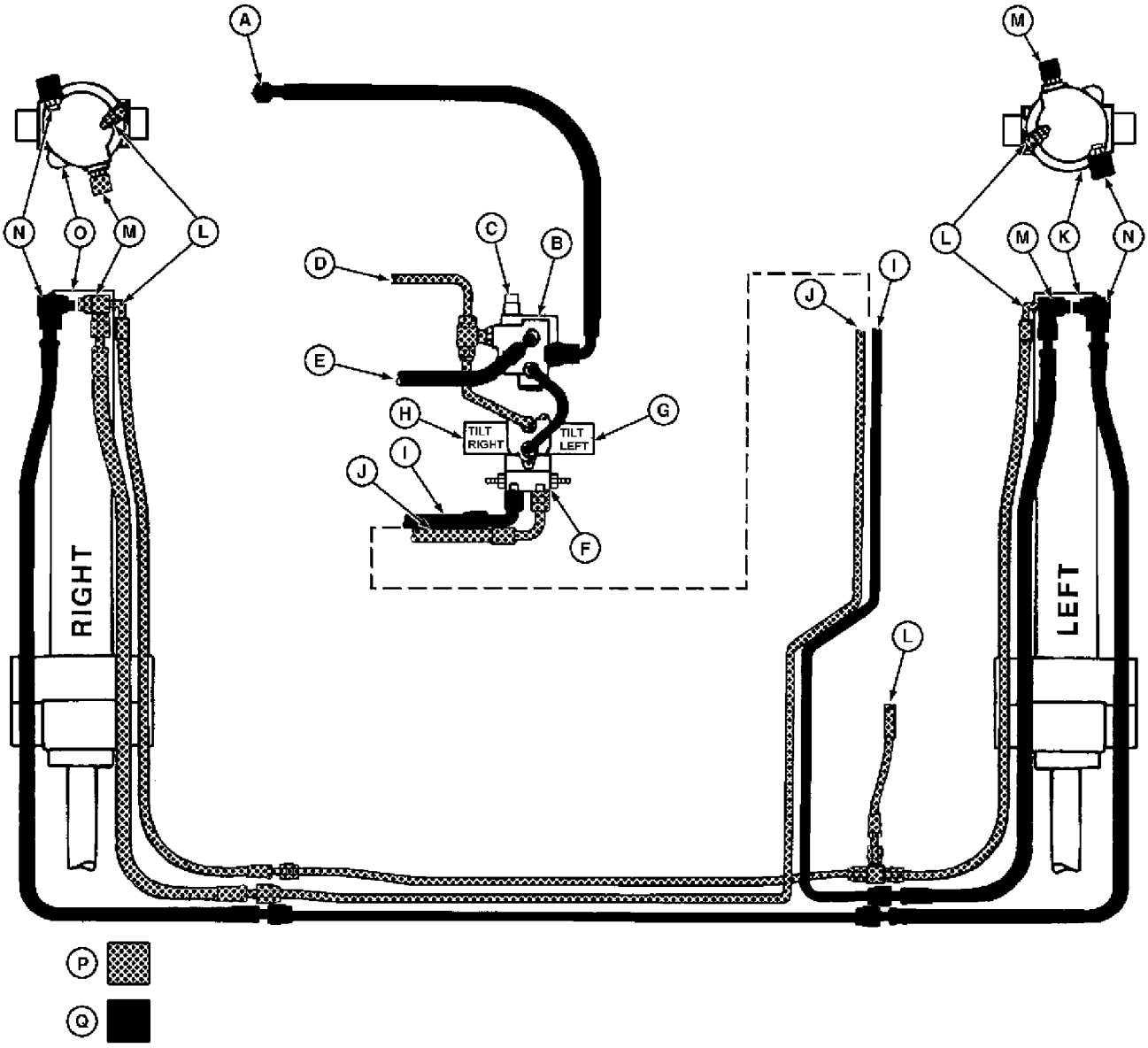
When the leveling system brings the combine separator to a level position, the electrical system shuts off the current to the right tilt solenoid (H). The spool in the leveling valve centers, causing the leveling system to then trap oil in the cylinders and maintain a leveled position.

If the combine is leveled to its maximum tilt capability, limit switches in the electrical system shuts off current to the right tilt solenoid, preventing unnecessary pressure oil and oil heating.

Drain line (L) provides a drain for both valve blocks (K and O) on the top of each leveling cylinder. A small amount of internal leakage can occur that would affect the operation of the valve blocks if there was no drain line. The drain line is also used if the bleed screw is opened to allow the cylinders to retract.

Pressure oil can occur in the line to the solenoid control valve (E) when a hydraulic function is used at the same time when leveling or when the manual tilt switch is used (the manual tilt switch activates coil one on the solenoid control valve, this is not required for operation.)

TM1545,35020,I -19-10AUG93



H45456

-UN-10NOV97

H45456

A—From Main Hydraulic Pump
B—Proportional Flow Divider
C—Leveling Relief Valve
D—Return to Reservoir
E—To Solenoid Control Valve
F—Leveling Valve
G—Left Tilt Solenoid
H—Right Tilt Solenoid
I—To Rod of Left Leveling Cylinder
J—To Rod of Right Leveling Cylinder
K—Left Leveling Cylinder
L—Drain Line
M—Valve Block
N—Balance Beam Line
O—Right Leveling Cylinder
P—Return Oil
Q—Pressure Oil

TM1545,35020,J -19-10AUG93

LEVELING TO THE LEFT (RIGHT CYLINDER EXTEND, LEFT CYLINDER RETRACT)

When the combine moves onto a slope that causes the combine to lean to the right, the electrical system activates the rear solenoid or left tilt solenoid (G). The activated solenoid pushes in the spool, causing a demand for pressure oil from the main hydraulic pump. This pressure oil flows from the main hydraulic pump (A) to the proportional flow divider (B).

The proportional flow divider directs 50 percent of the oil to the leveling valve (F). The remaining 50 percent is sent to the solenoid control valve (E). The proportional flow divider will always maintain the 50-50 percent flow regardless of pressure and flow requirements in either the leveling system or the main hydraulic system.

Leveling valve (F) directs pressure oil to the valve block on top of the left hand leveling cylinder (K) through hydraulic line (I).

The valve block directs the pressure oil to the rod side of the left leveling cylinder, causing it to retract. The oil is forced out of the head side of the left cylinder and sent through balance beam line (N) to the head side of the right hand cylinder (O), causing it to extend.

Oil from the rod side of the right hand cylinder is returned to the leveling valve (J) and on to the reservoir through line (D).

When the leveling system brings the combine separator to a level position, the electrical system shuts off the current to the left tilt solenoid (G). The spool in the leveling valve centers, causing the leveling system to then trap oil in the cylinders and maintain a leveled position.

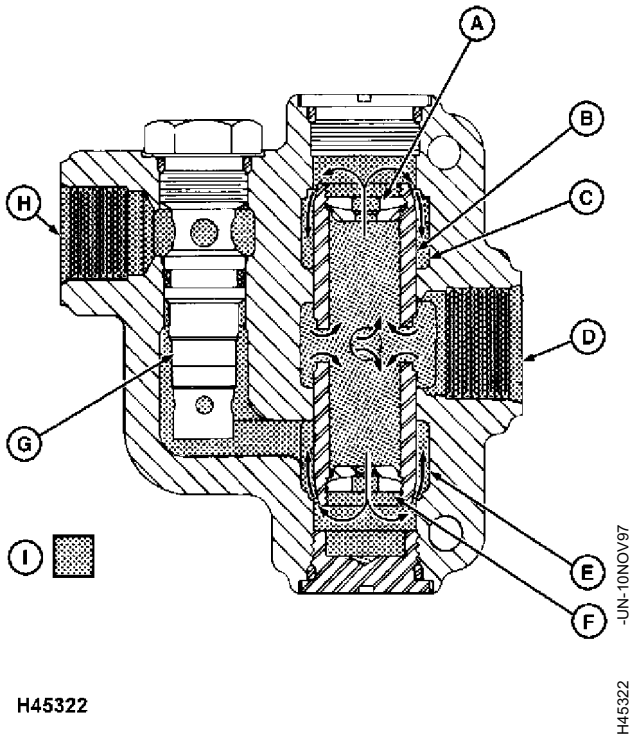
If the combine is leveled to its maximum tilt capability, limit switches in the electrical system shuts off current to the left tilt solenoid, preventing unnecessary pressure oil and oil heating.

Drain line (L) provides a drain for both valve blocks (K and O) on the top of each leveling cylinder. A small amount of internal leakage can occur that would affect the operation of the valve blocks if there was no drain line. The drain line is also used if the bleed screw is opened to allow the cylinders to retract.

Pressure oil can occur in the line to the solenoid control valve (E) when a hydraulic function is used at the same time when leveling or when the manual tilt switch is used (the manual tilt switch activates coil one one the solenoid control valve, this is not required for operation).

TM1545,35020,K -19-10AUG93

PROPORTIONAL FLOW DIVIDER LEVELING SYSTEM AND MAIN SYSTEM NOT ACTIVATED



H45322

A—Main System Orifice
B—Spool
C—Main System Port
D—From Main Hydraulic Pump
E—Leveling System Port
F—Leveling System Orifice
G—Leveling System Relief Valve
H—To Reservoir
I—Return Oil

The proportional flow divider directs 50 percent of the pump output to the leveling valve and 50 percent to the solenoid control valve. The 50/50 ratio is maintained regardless of pressure requirements in the leveling system or the main hydraulic system.

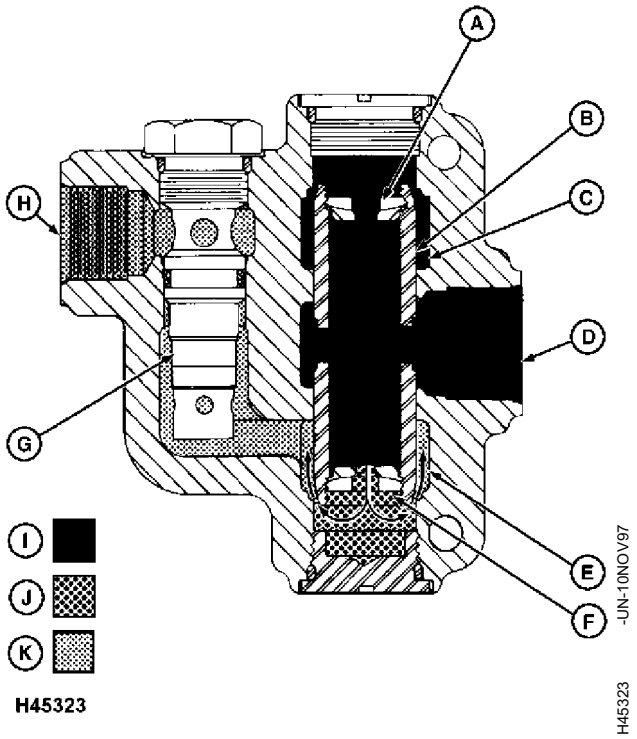
Oil flows from the main hydraulic pump to port (D). Oil flows through four holes into spool (B).

For an equal 50/50 flow division, half of the flow must pass thru orifice (A). The other half of flow must pass thru orifice (F) with equal flow thru (A) and (F). There are equal pressure drops across orifices (A and F) and spool (B) remains centered.

The flow divider directs 50 percent of the oil to the leveling system through port (E) and 50 percent to the main system (C).

TM1545,35020,L -19-10AUG93

LEVELING SYSTEM NOT ACTIVATED HYDRAULIC SYSTEM IS ACTIVATED



H45323

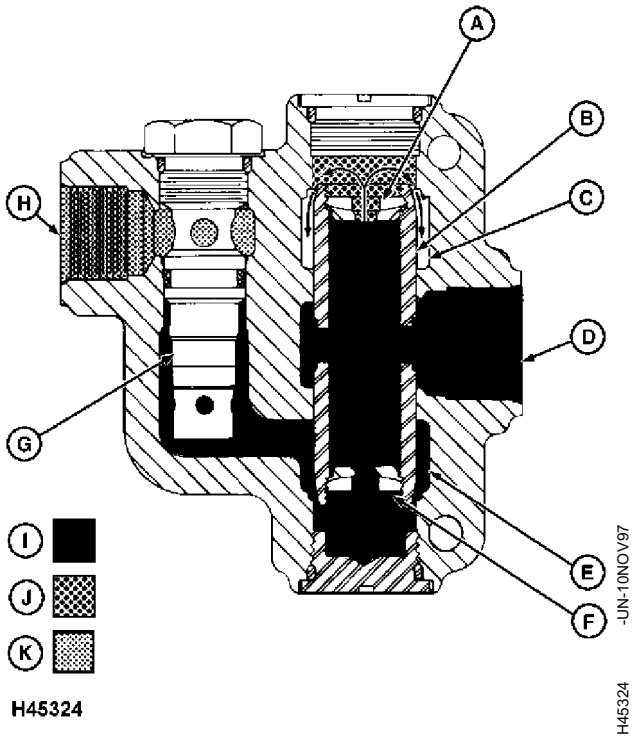
A—Main System Orifice
B—Spool
C—Main System Port
D—From Main Hydraulic Pump
E—Leveling System Port
F—Leveling System Orifice
G—Leveling System Relief Valve
H—To Reservoir
I—Pressure Oil
J—Low Pressure Oil
K—Return Oil

When one or more hydraulic systems are activated and the leveling system is not activated, the pressure drop across orifice (F) moves the spool (B) down. The pressure drop occurs since the other side of orifice (F) is seeing reservoir pressure. The other side of orifice (A) sees the load of the leveling cylinders and builds high pressure.

TM1545,35020,M -19-10AUG93

350
20B
9

LEVELING SYSTEM ACTIVATED HYDRAULIC SYSTEM NOT ACTIVATED



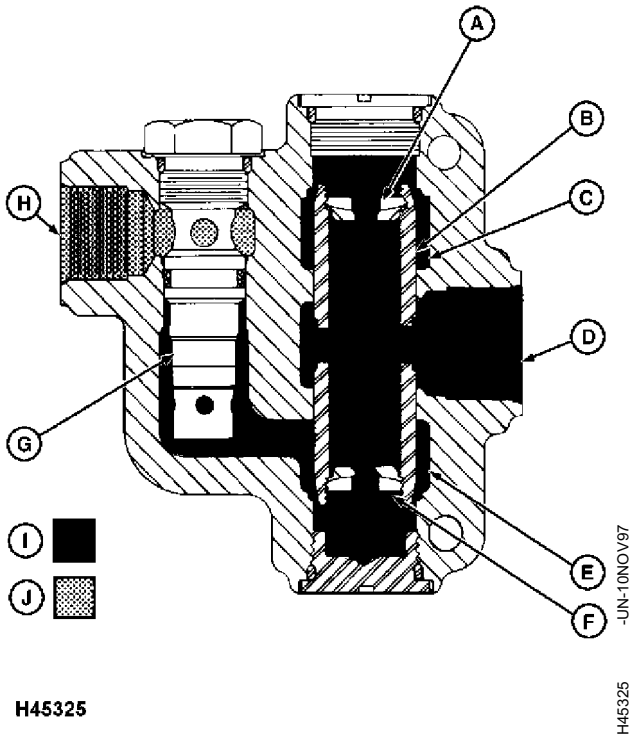
A—Main System Orifice
B—Spool
C—Main System Port
D—From Main Hydraulic Pump
E—Leveling System Port
F—Leveling System Orifice
G—Leveling System Relief Valve
H—To Reservoir
I—Pressure Oil
J—Low Pressure Oil
K—Return Oil

When the leveling system is activated and the main hydraulic system is not activated, the pressure drop across orifice (A) moves the spool (B) up. The pressure drop occurs since the other side of orifice (A) is seeing reservoir pressure. The other side of orifice (F) sees the load of the hydraulic system and builds high pressure.

If the high pressure reaches 3000 psi the relief valve (G) will open and the oil will flow to the reservoir through port (H).

TM1545,35020,N -19-10AUG93

LEVELING SYSTEM ACTIVATED
HYDRAULIC SYSTEM ACTIVATED



H45325

A—Main System Orifice
B—Spool
C—Main System Port
D—From Main Hydraulic Pump
E—Leveling System Port
F—Leveling System Orifice
G—Leveling System Relief Valve
H—To Reservoir
I—Pressure Oil
J—Return Free Oil

When the leveling system and the main hydraulic system are both activated, 50 percent of the high pressure oil flows to each system.

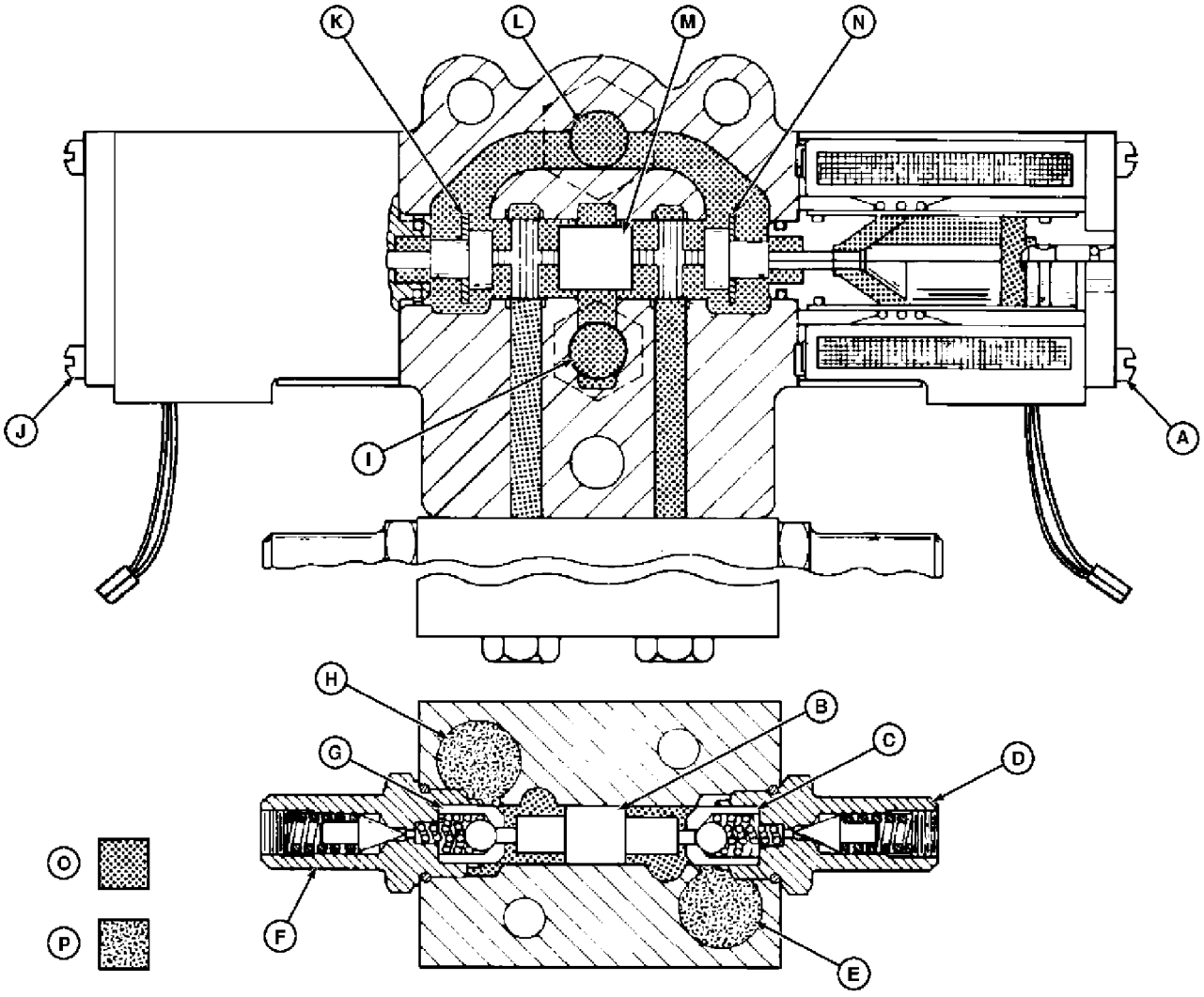
Because high pressure oil is required for both the leveling system and the main hydraulic system, the pressure drop across the orifices (A and F) is equal and spool (B) remains centered.

If the pressure requirement increases on either side of the flow divider, the spool will shift accordingly. This shift in the spool will maintain the 50/50 percent divided flow and will also maintain the speed at which the function should operate.

TM1545,35020,O -19-10AUG93

350
20B
11

LEVELING CONTROL VALVE
LEVELING SYSTEM NOT ACTIVATED



H45333

-UN-10NOV97

H45333

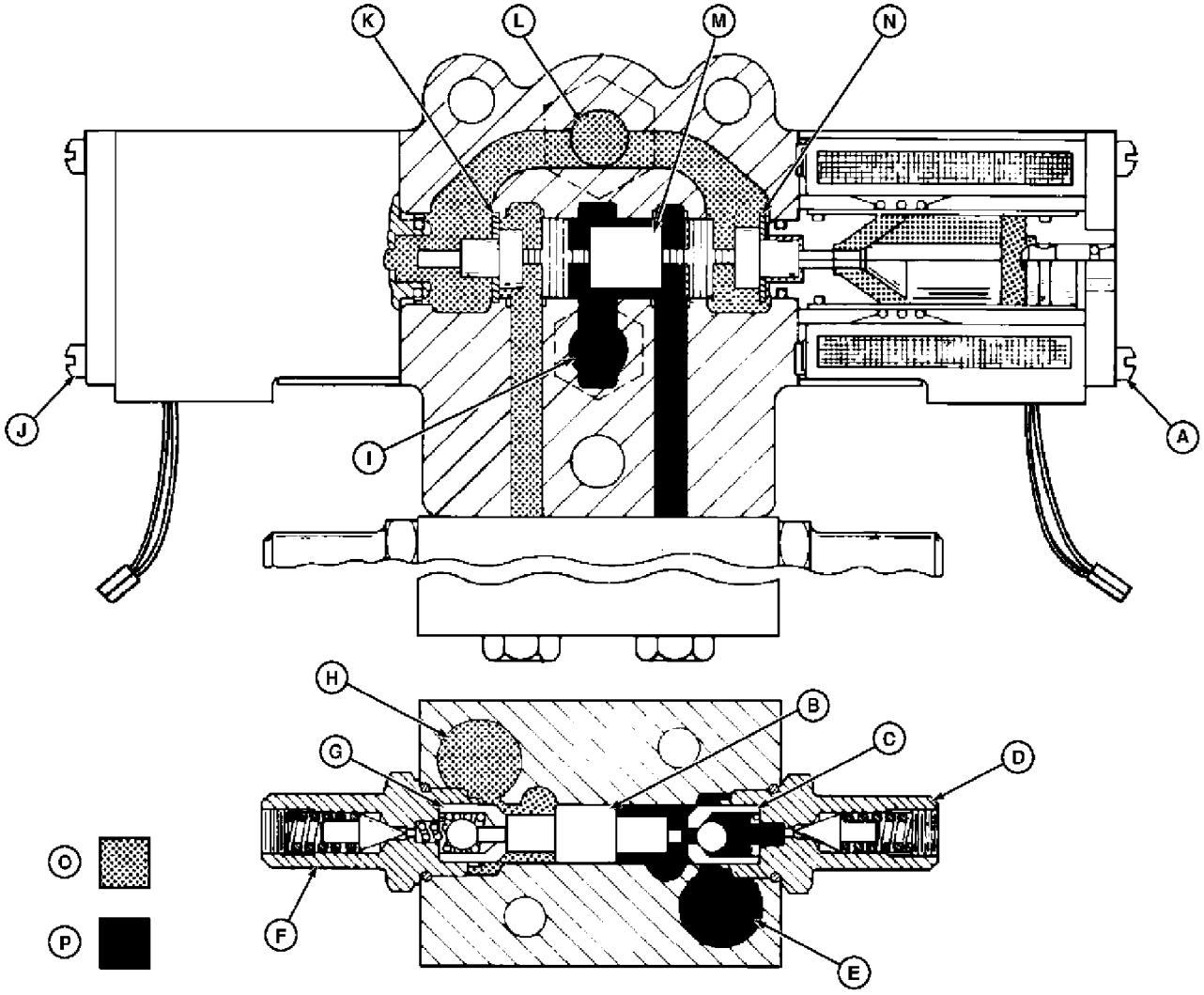
A—Left Tilt Solenoid
B—Spool
C—Pilot Check Valve
D—Thermal Relief Valve
E—To R.H. Leveling Cylinder
F—Thermal Relief Valve
G—Pilot Check Valve
H—To L.H. Leveling Cylinder
I—Pressure Port
J—Right Tilt Solenoid
K—Slotted Washer
L—Return Port
M—Spool
N—Slotted Washer
O—Return Oil
P—Trapped Oil

With the combine level, electric current is shut off and solenoids (A and J) are not activated.
Spool (M) is kept centered by spring pressure, allowing oil to flow into port (I) around spool (M), through slotted washers (N and K). Oil then flows out port (L) and returns to reservoir.

The thermal relief valves (D and F) are primarily for manufacturing purposes. When the combine moves through the painting process at the factory, temperatures reach 93˚C (200˚F). The thermal relief valves will leak, this prevents the leveling cylinders and hydraulic hoses from bursting.

TM1545,35020,P -19-10AUG93

LEVELING TO THE RIGHT



H45335

-UN-10NOV97

H45335

350
20B
13

A—Left Tilt Solenoid
B—Spool
C—Pilot Check Valve
D—Thermal Relief Valve
E—To R.H. Leveling Cylinder
F—Thermal Relief Valve
G—Pilot Check Valve
H—To L.H. Leveling Cylinder
I—Pressure Port
J—Right Tilt Solenoid
K—Slotted Washer
L—Return Port
M—Spool
N—Slotted Washer
O—Return Oil
P—Pressure Oil

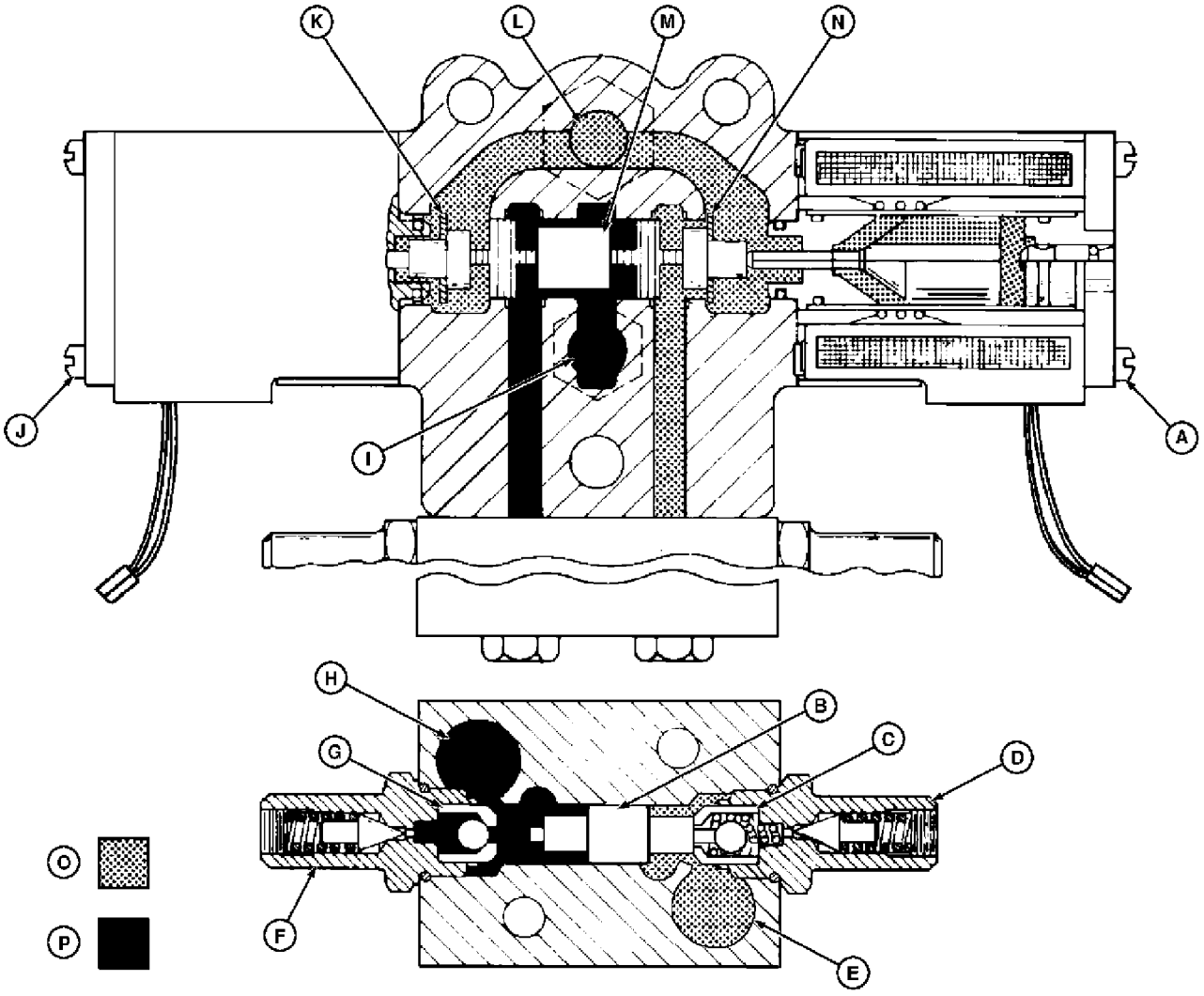
The right tilt solenoid is activated by the electrical leveling system.

The activated right tilt solenoid (J) pushes spool (M) in, permitting pressure oil from port (I) to flow around spool (M) to pilot check valve (C) causing it to open. This allows pressure oil to flow to the retracting right side leveling cylinder.

The pressure oil also forces spool (B) to the left, causing pilot check valve (G) to open. This allows oil from the extending left leveling cylinder to flow around spool (M), through slotted washer (N), to port (L). The oil then returns to the reservoir.

TM1545,35020,Q -19-10AUG93

LEVELING TO THE LEFT



H45334

-UN-10NOV97

H45334

A—Left Tilt Solenoid
B—Spool
C—Pilot Check Valve
D—Thermal Relief Valve
E—To R.H. Leveling Cylinder
F—Thermal Relief Valve
G—Pilot Check Valve
H—To L.H. Leveling Cylinder
I—Pressure Port
J—Right Tilt Solenoid
K—Slotted Washer
L—Return Port
M—Spool
N—Slotted Washer
O—Pressure Oil
P—Return Oil

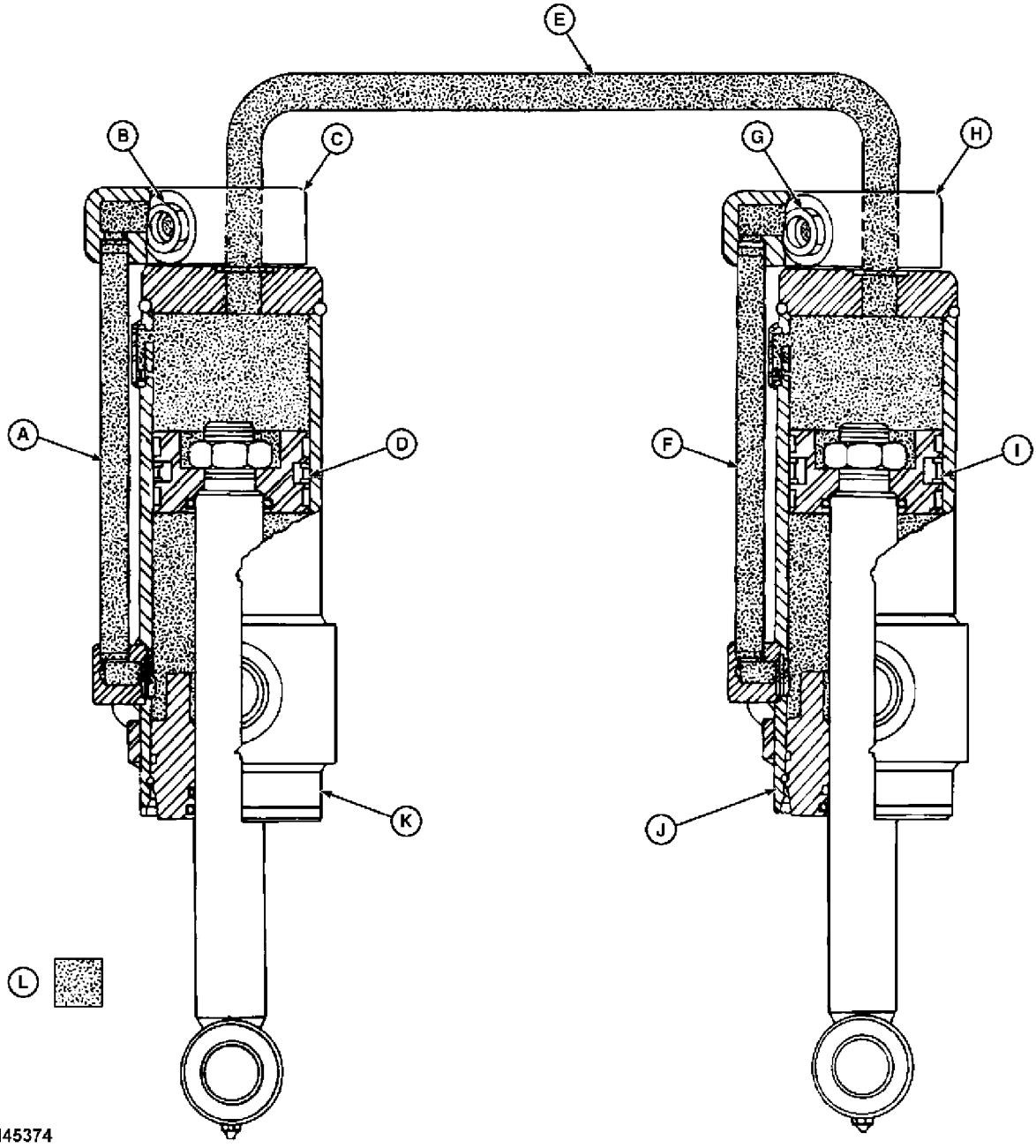
The left tilt solenoid is activated by the electrical leveling system.

The activated left tilt solenoid (A) pushes spool (M) in, permitting pressure oil from port (I) to flow around spool (M) to pilot check valve (G) causing it to open. This allows pressure oil to flow to the retracting left side leveling cylinder.

The pressure oil also forces spool (B) to the right, causing pilot check valve (C) to open. This allows oil from the extending right leveling cylinder to flow around spool (M), through slotted washer (K) to port (L). The oil then returns to the reservoir.

TM1545,35020,R -19-10AUG93

LEVELING CYLINDERS
LEVELING SYSTEM NOT ACTIVATED



-UN-10NOV97

H45374

350
20B
15

A—Transfer Tube
B—Pressure Port From Leveling Control Valve
C—Valve Block
D—Piston
E—Balance Beam Hose
F—Transfer Tube
G—Pressure Port from Leveling Control Valve
H—Valve Block
I—Piston
J—R.H. Leveling Cylinder
K—L.H. Leveling Cylinder
L—Trapped Oil

When the leveling system is not activated, pilot check valve in valve blocks (C and H) trap oil in the head end of both leveling cylinders (J and K).

Pilot check valves (inside leveling control valve), trap oil in lines going to ports (B and G). Oil is also trapped in transfer tubes (A and F) and the rod ends of both cylinders (J and K).

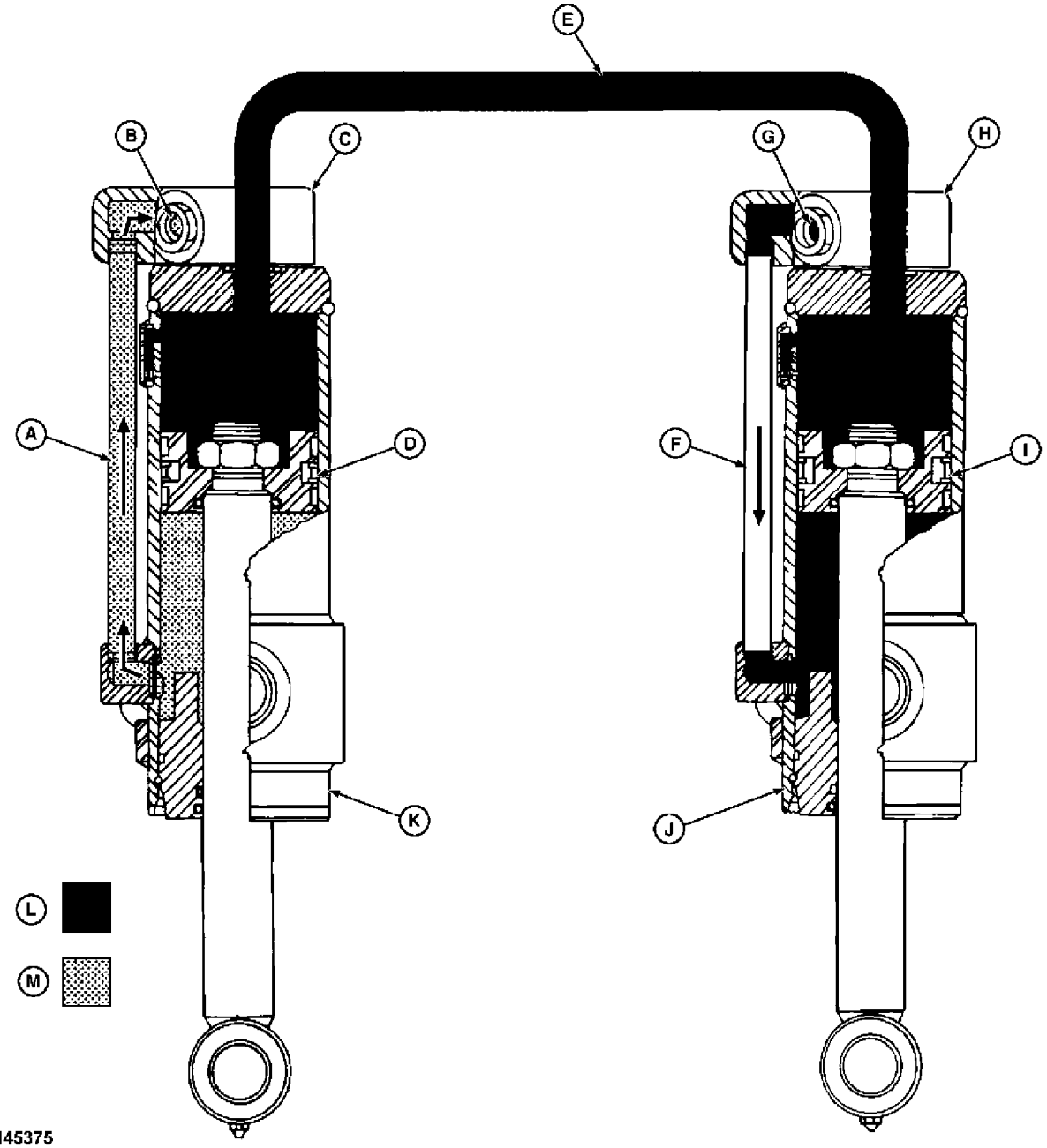
TM1545,35020,S -19-11AUG93

LEVELING CYLINDERS
LEVELING TO THE RIGHT

A—Transfer Tube
B—Pressure Port from Leveling Control Valve
C—Valve Block
D—Piston
E—Balance Beam Hose
F—Transfer Tube
G—Pressure Port from Leveling Control Valve
H—Valve Block
I—Piston
J—R.H. Leveling Cylinder
K—L.H. Leveling Cylinder
L—Pressure Oil
M—Return Oil

When the electrical system activates the leveling control valve, pressure oil flows to port (G) of the right hand leveling cylinder (J), valve block (H) directs oil down the transfer tube (F) to the rod end of cylinder, causing it to retract. Oil is forced out of the head end of right-hand cylinder (J) and flows through balance beam hose (E) to valve block (C). The valve block directs the oil to the head end of left hand cylinder (K), causing it to extend. Oil is then forced out of the rod end of cylinder (K), flows up the transfer tube to the valve block (C). Oil is then returned through port (B) to the leveling control valve.

TM1545,35020,T -19-10AUG93



H45375 -UN-10NOV97

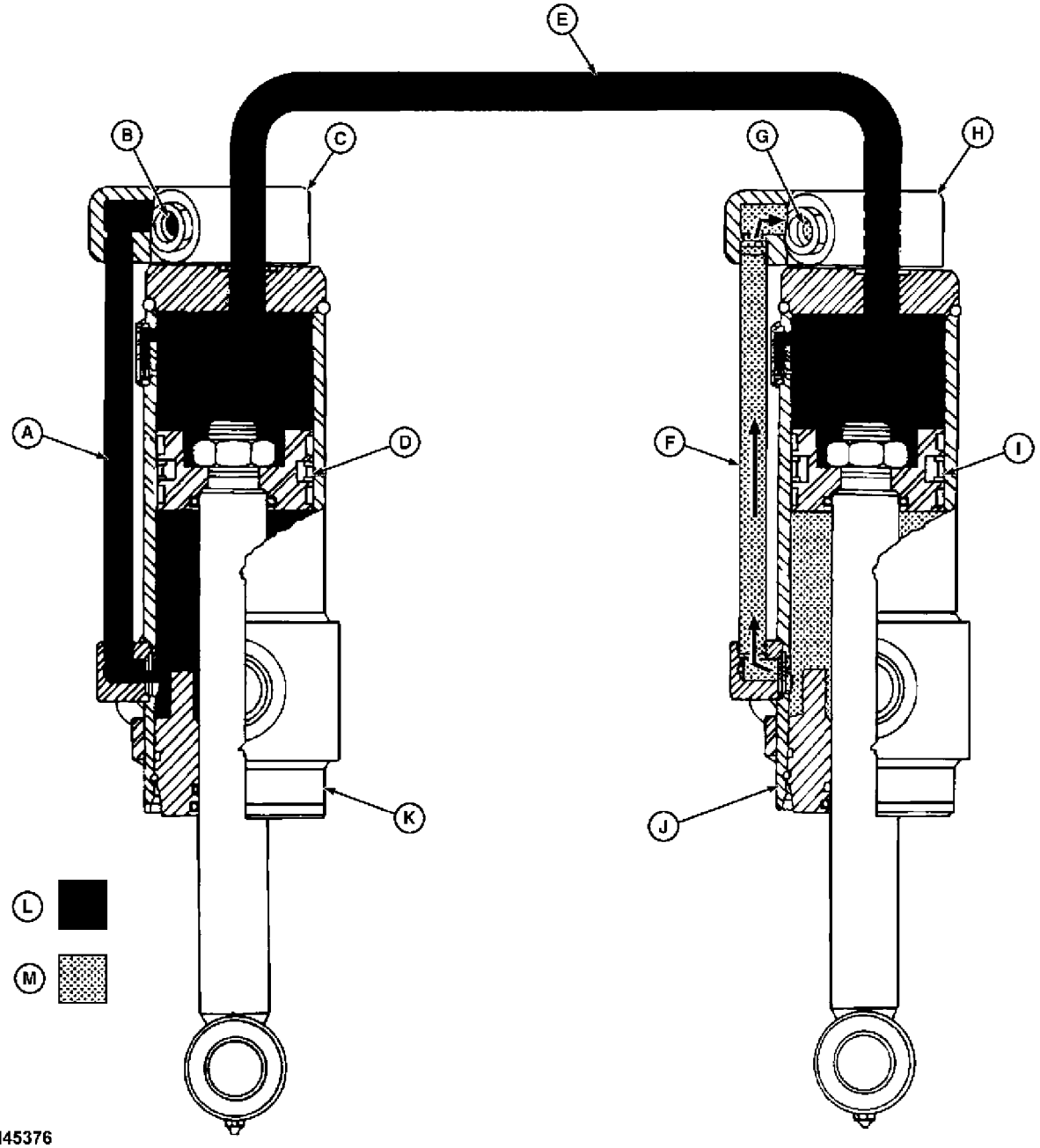
DXJSSA1071 -19-04JAN01

LEVELING TO THE LEFT

A—Transfer Tube
B—Pressure Port From Leveling Control Valve
C—Valve Block
D—Piston
E—Balance Beam Hose
F—Transfer Tube
G—Pressure Port From Leveling Control Valve
H—Valve Block
I—Piston
J—R.H. Leveling Cylinder
K—L.H. Leveling Cylinder
L—Pressure Oil
M—Return Oil

When the electrical system activates the leveling control valve, pressure oil flows to port (B) of the left-hand leveling cylinder (K), valve block (C) directs oil down the transfer tube (A) to the rod end of cylinder, causing it to retract. Oil is forced out of the head end of left-hand cylinder (K) and flows through balance beam hose (E) to valve block (H). The valve block directs the oil to the head end of right-hand cylinder (J), causing it to extend. Oil is then forced out of the rod end of cylinder (J), flows up the transfer tube to the valve block (H). Oil is then returned through port (G) to the leveling control valve.

TM1545,35020,U -19-10AUG93



DXJSSA1072 -19-04JAN01

H45376 -UN-10NOV97

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20B
19

OPERATION OF VALVE BLOCK— LEVELING CYLINDER NOT ACTIVATED

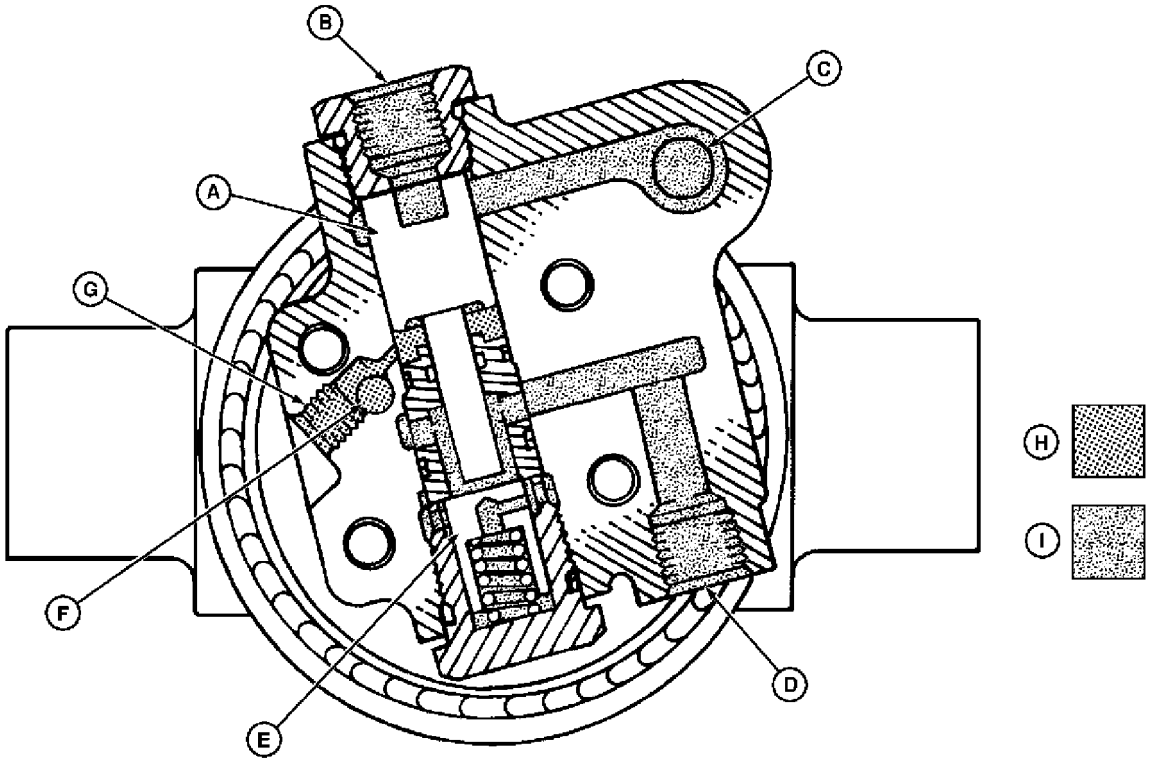
A—Plunger and Dowel Pin
B—Pressure Port to Leveling Control Valve
C—To Rod End
D—To Opposite Leveling Cylinder
E—Pilot Check Valve
F—Bleed Valve
G—Drain Line
H—Return Oil
I—Trapped Oil

With the leveling cylinders not activated, both pilot check valves in the leveling control valve are closed, trapping oil in the hoses going to port (B). This also traps the oil in the rod end of both leveling cylinders.

Pilot check valve (E) in both leveling cylinders, is closed, trapping oil in the head end of the cylinder. This head of oil supports the weight of the combine. Oil is also trapped in the balance beam hose connected between the cylinders at port (D).

Bleed valve (F) can be opened to drain oil from the head end of the leveling cylinders. This will lower the front of the combine for transporting or storage. With the bleed valve (F) closed, the cylinders can be rephased to fill the head ends with the proper volume of oil to raise the combine to its operating height.

TM1545,35020,V -19-10AUG93



DXJSSA1073 -19-04JAN01

OPERATION OF VALVE BLOCK—LEVELING CYLINDER RETRACTING

A—Plunger and Dowel Pin
B—Pressure Port to Leveling Control Valve
C—To Rod End
D—To Opposite Leveling Cylinder
E—Pilot Check Valve
F—Bleed Valve
G—Drain Line
H—Return Oil
I—Pressure Oil

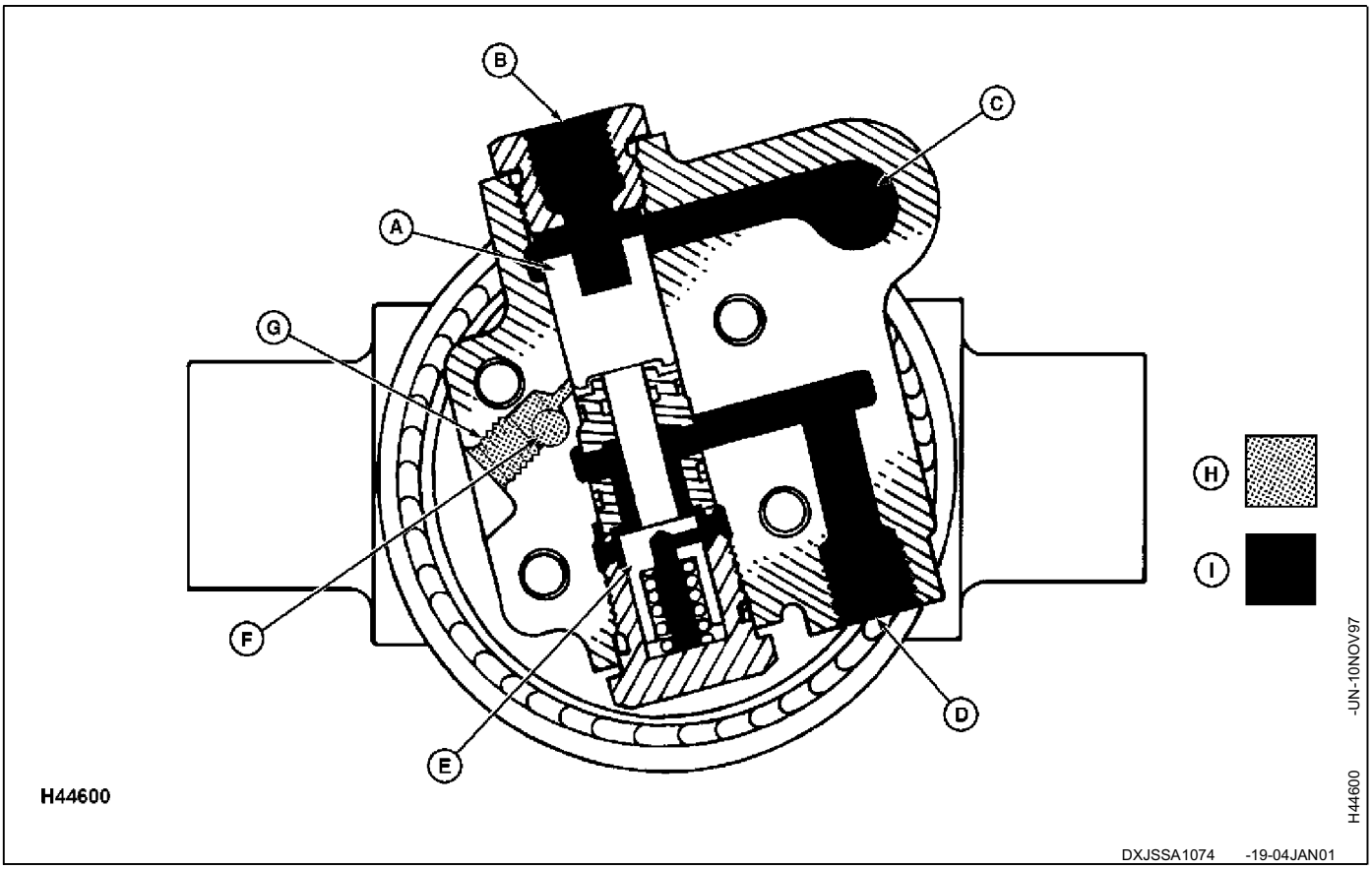
Pressure oil from the leveling control valve flows into the valve block through port (B). This oil moves plunger and dowel pin (A), causing pilot check valve (E) to open.

Pressure oil also flows to the rod end of the cylinder by flowing through port (C) to the transfer tube along side the cylinder.

Oil, forced out of the head end, flows through the open pilot check valve (E) and to port (D). Then the oil flows to the opposite leveling cylinder through the balance beam hose.

Port (G) is a drain to the reservoir. Any internal leakage is drained off, preventing a hydrostatic lock of plunger and dowel pin (A).

TM1545,35020,W -19-10AUG93


B
C
A
G
F
E
D
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DXJSSA1074 -19-04JAN01

OPERATION OF VALVE BLOCK— LEVELING CYLINDER EXTENDING

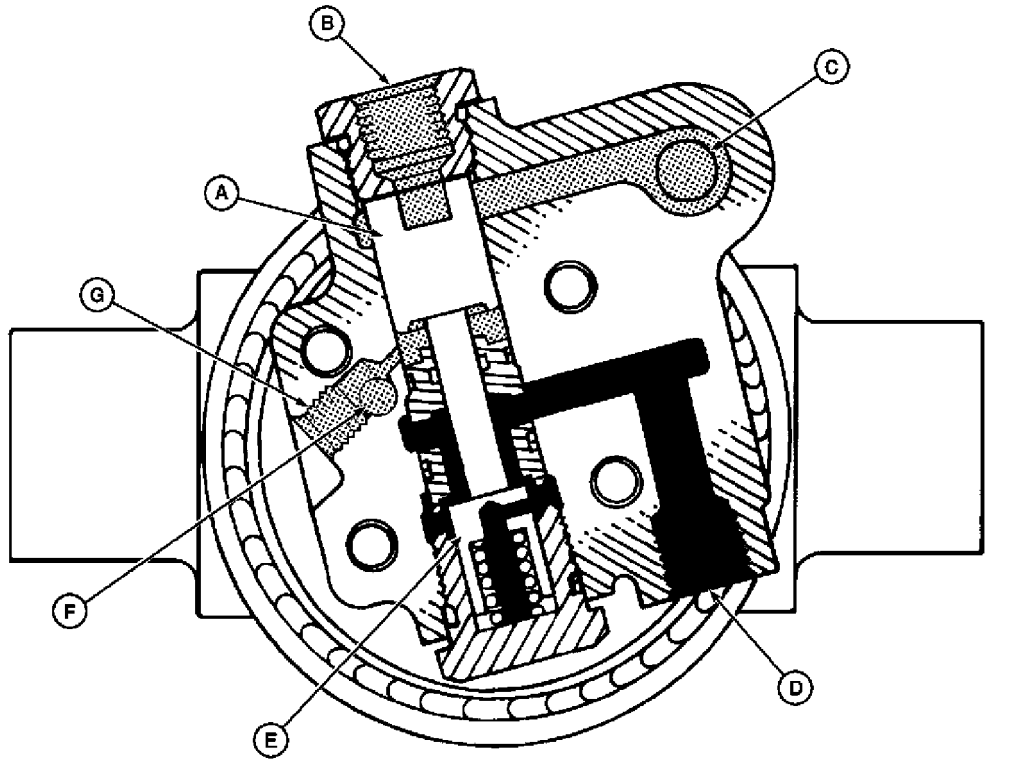
A—Plunger and Dowel Pin
B—Pressure Port to Leveling Control Valve
C—To Rod End
D—To Opposite Leveling Cylinder
E—Pilot Check Valve
F—Bleed Valve
G—Drain Line
H—Return Oil
I—Pressure Oil

Pressure oil, from the head end of the retracting cylinder, flows through the balance beam hose into port (D) of the extending cylinder.

As the cylinder extends, oil is forced out of the rod end and flows up the transfer tube to port (C). This oil then returns out of port (B) to the leveling control valve.

Port (G) is a drain to the reservoir. Any internal leakage is drained off preventing a hydrostatic lock of the plunger and dowel pin (A).

TM1545,35020,X -19-10AUG93



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