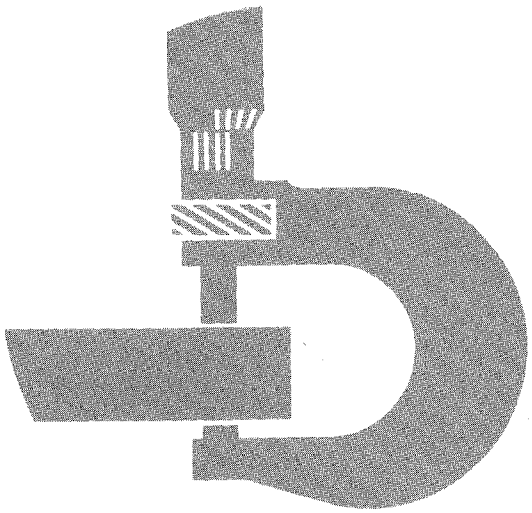
344E and 444E Loaders Repair



TECHNICAL MANUAL

For complete service information also see:

344E and 444E Loader
Operation and Test TM1421
Teammate Axles. CTM18
Teammate II Axles CTM43
4276 Engine CTM4
4045 Engine CTM8
Alternators and Starting Motors CTM77

John Deere Dubuque Works
TM1422 (02AUG94)

LITHO IN U.S.A.
ENGLISH

Introduction

FOREWORD

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

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

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.

DX,TMIFC -19-22MAY92

JOHN DEERE DEALERS

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

This is a complete revision for TM-1422 (Dec-91) 344E and 444E Loader—Repair.

Listed below is a brief explanation of "WHAT" was changed and "WHY" it was changed.

This manual was revised:

1. To update Groups 0200 and 0210.

   - 444E axle serial number break was added for TeamMate and TeamMate II axles.
   - 444E axle and differential repair procedures have been deleted from this manual. (CTM18 and CTM43 contain all the necessary information for complete repair of 444E TeamMate and TeamMate II differential and axle assemblies.)
   - Front and rear oscillating axle support procedures have been revised and moved to Group 0200.

2. To update Groups 0300 and 0360.

   - New procedure added for flushing the hydrostatic motor hoses and the hydrostatic oil cooler.
   - New art added, existing art revised, and text corrected in the HST Motor and HST Pump disassemble and assemble procedures.
   - The Starting Point Valve and Control Pressure Regulating Valve repair procedures have been revised to include an "initial setting" adjustment. New art and minor text changes has been added for later version.

3. To add new procedure for removing and installing the DB4 (retained shaft) injection pump in Group 0400.

4. To add new procedure for disassembling and assembling steering cylinder (Group 0960) for machines (S.N. 001192—).

5. To update Group 1060.

   - New art added and text revised to include repairing and charging brake accumulator for 444E machines (S.N. 001337—).
   - Brake bleed procedure for 344E has been revised.

6. To delete the alternator disassemble and assemble procedures on Group 1672. (CTM77 contains all necessary information for complete alternator repair.)

7. To revise and update the air conditioning procedures to include proper handling of R12 refrigerant and use of the R12 refrigerant recovery system.

8. To add new art for bucket and boom hydraulic cylinder repair procedure (Group 3160) for machines (S.N. 001192—).

9. To correct and update miscellaneous art and text throughout manual.

TX,1422,DLR -19-02AUG94

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Group 0250—Axle Shaft, Bearings and Reduction Gears

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All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

TM1422-19-02AUG94

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GENERAL INFORMATION

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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

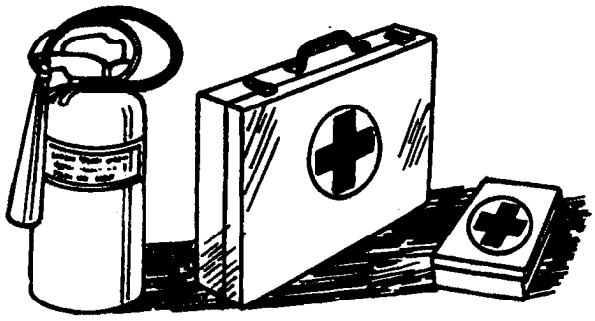
DX,SPARKS -19-03MAR93

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

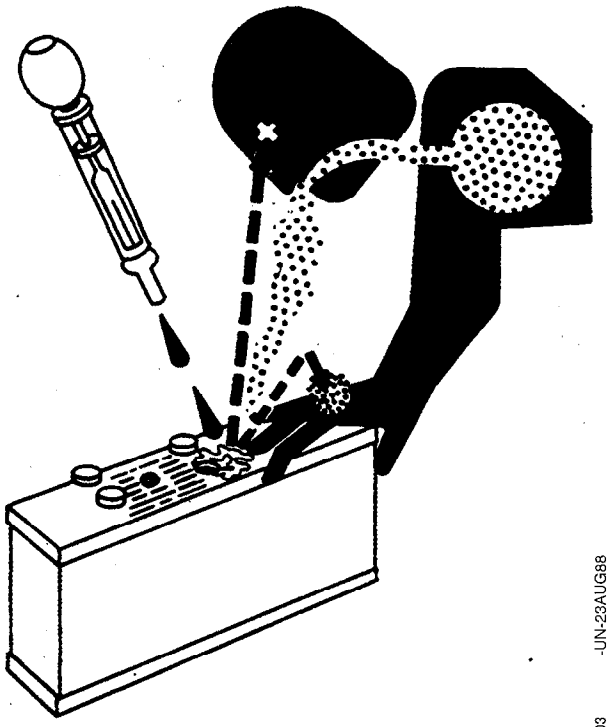
PREVENT ACID BURNS

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.

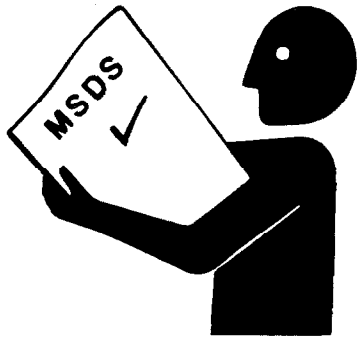
If acid is swallowed:
1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 quarts).
3. Get medical attention immediately.



TS203 -UN-23AUG88

DX,POISON -19-21APR93

HANDLE CHEMICAL PRODUCTS SAFELY



TS1132 -UN-26NOV90

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

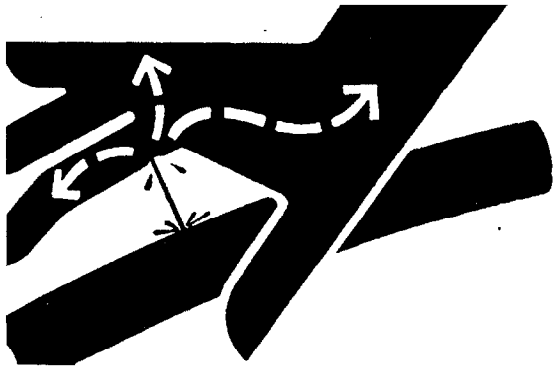
A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.

Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

(See your John Deere dealer for MSDS's on chemical products used with John Deere equipment.)

DX,MSDS,NA -19-03MAR93

AVOID HIGH-PRESSURE FLUIDS



X9811 -UN-23AUG88

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.

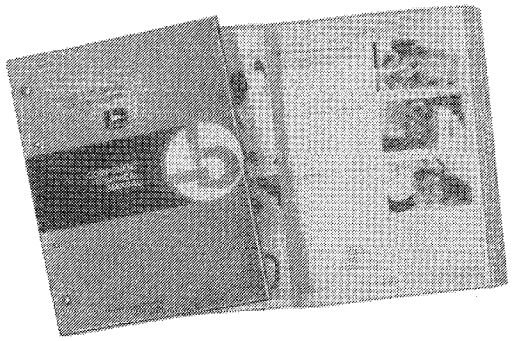
If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical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

DX,FLUID -19-03MAR93

JOHN DEERE 1200 TEAMMATE SERIES AXLES, 444E (AXLE SERIAL NO. —001151)—USE CTM18

For complete repair information the Component Technical Manual (CTM) is also required.

Use the component technical manual in conjunction with this machine manual.



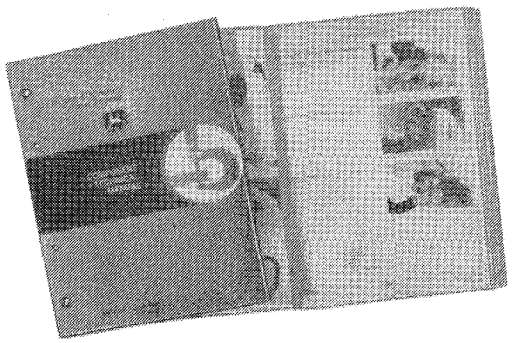
TS225 -UN-17JAN89

TX,0200,HH653 -19-02AUG94

JOHN DEERE 1200 TEAMMATE II SERIES AXLES, 444E (AXLE SERIAL NO. 001152—)—USE CTM43

For complete repair information the Component Technical Manual (CTM) is also required.

Use the component technical manual in conjunction with this machine manual.



TS225 -UN-17JAN89

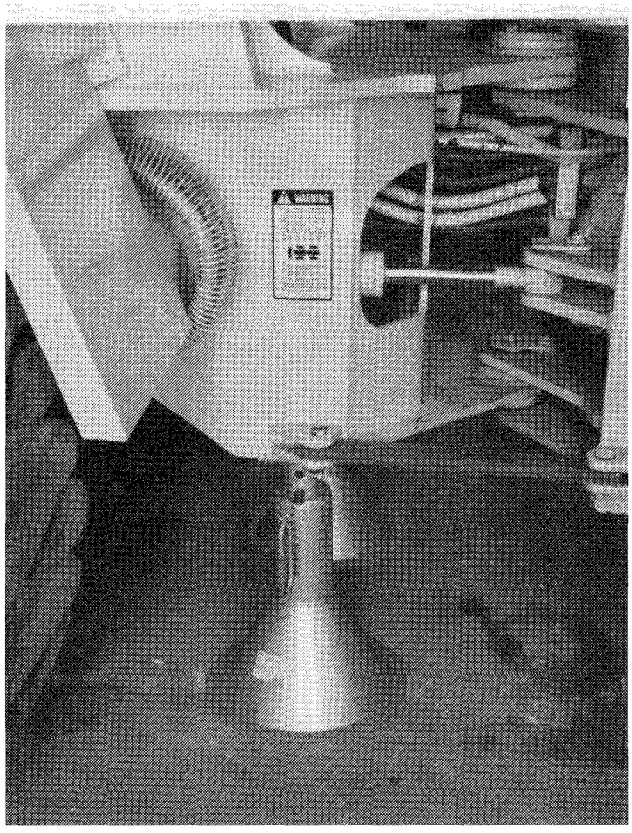
TX,0200,MM977 -19-02AUG94

REMOVE AND INSTALL FRONT AXLE

1. Install frame locking bar.
2. Raise front of machine.

CAUTION: Prevent bodily injury caused by accidental dropping of the front frame. Use floor stands with a minimum capacity of 4540 kg (10,000 lb)

3. Install floor stands under both sides of loader frame.
4. Stop engine.
5. Drain differential. Oil capacity is 16 L (17 qts).
6. Remove front wheels. (See Group 110.)



T6683CM -UN-26MAR90

TX,0200,UU1139 -19-21NOV91

CAUTION: The approximate weight of the bottom guard is 52 kg (115 lb). Weight may increase significantly due to buildup of mud or debris.

7. Remove bottom guard.

8. Remove cap screws (A) to disconnect drive shaft (B).

9. Disconnect brake line (G).

CAUTION: The approximate weight of final drive is:

344E ..... 430 kg (950 lb)
444E ..... 645 kg (1420 lb)

10. Place a hydraulic floor jack under the differential.

11. Remove bolts (D), washers (E) and nuts (F).

12. Slowly lower front axle.

13. Repair axle or differential. (See Group 210 or Group 250.)

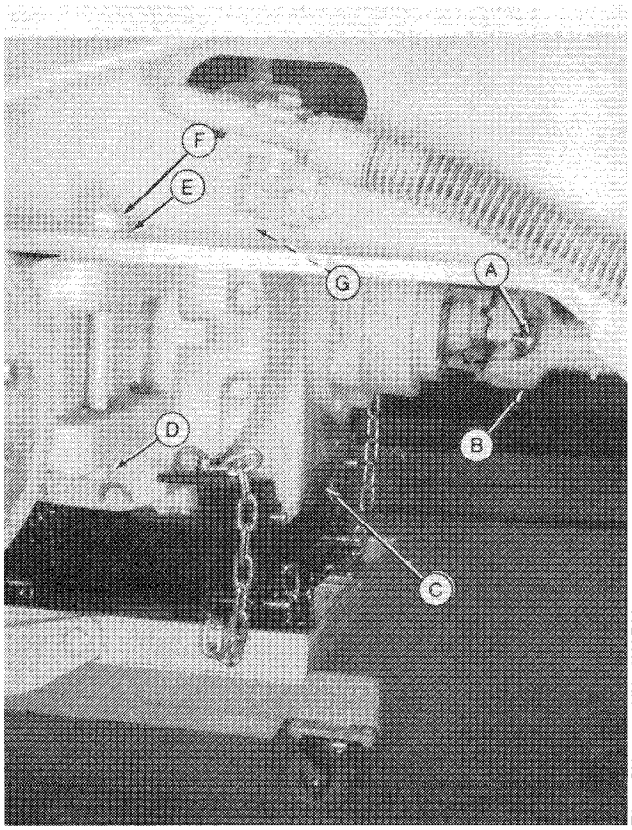
14. Slowly raise front axle into position.

15. Install bolts, washers and nuts. Tighten to 735 N·m (542 lb-ft).

16. Connect brake line.

18. Remove hydraulic floor jack.

19. Install wheels. (See in Group 110.)



A—Cap Screw (4 used)
B—Drive Shaft
C—Final Drive
D—Bolt (8 used)
E—Washer (16 used)
F—Nut (16 used)
G—Brake Line

TX,0200,UU1140 -19-21NOV91

REMOVE AND INSTALL REAR AXLE AND DIFFERENTIAL

1. Install frame locking bar.

CAUTION: Prevent bodily injury caused by accidental dropping of the rear frame. Use floor stands with a minimum capacity of 4540 kg (10,000 lbs).

2. Install floor stands under both sides of loader frame.

CAPACITY SPECIFICATION

Differential . . . . . 16 L (17 qts)

3. Disconnect lube lines (A and B).

4. Disconnect brake line (C).

5. Remove cap screws (D) to remove universal joint.

CAUTION: The approximate weight of rear axle and oscillating support is:

344E ..... 525 kg (1160 lb)
444E ..... 750 kg (1650 lb)

6. Place transmission jack under differential.

7. Remove bolts (E).

8. Remove and disassemble. (See Group 0210).

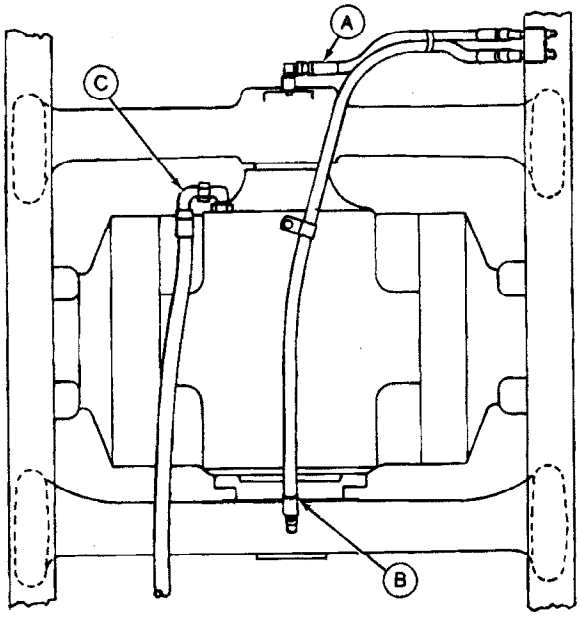
TORQUE SPECIFICATION

Final Drive-to-Frame Mounting Bolts . . . . . 735 N·m (540 lb-ft)

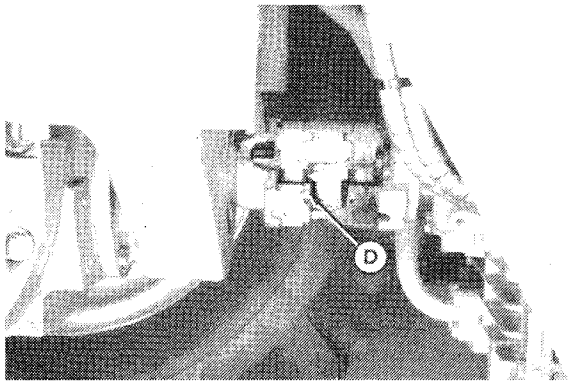
Universal Joint Cap Screws . . . . . 118 N·m (85 lb-ft)

9. Fill differential with oil. (See Section I, Group IV.)

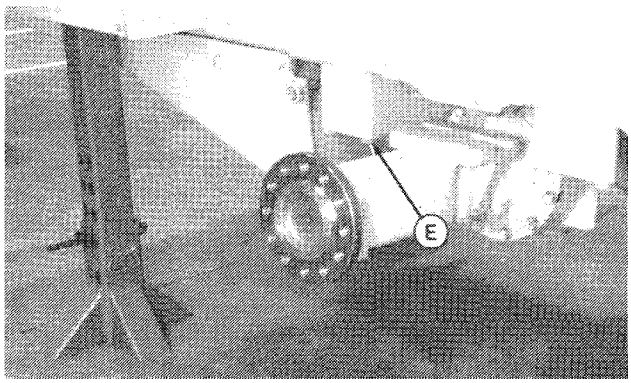
A—Lube Line
B—Lube Line
C—Brake Line
D—Universal Joint Cap Screw (8 used)
E—Final Drive-to-Frame Mounting Bolts



T6683DH -UN-27OCT88



T6935AB -UN-04DEC91



T6935AA -UN-04DEC91

TX,0200,UU1138 -19-13JUL94

REPLACE REAR AXLE OSCILLATING SUPPORT BUSHINGS—344E

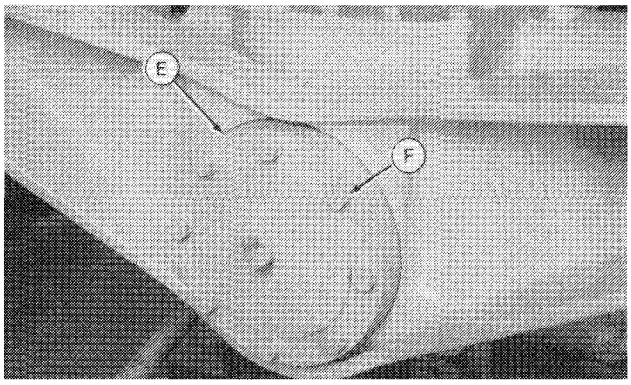
CAUTION: The approximate weight of the rear oscillating support is 59 kg (130 lbs).

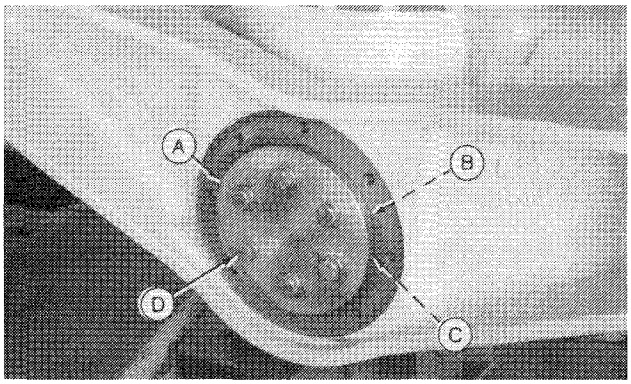
1. Remove rear axle assembly to remove front and rear supports. (See Remove and Install Rear Axle and Differential in this group).

2. Remove cover (E) and retaining plate (A).

3. Remove rear oscillating support.

A—Retaining Plate
B—Wear Ring
C—Seal
D—Cap Screw (6 used)
E—Cover
F—Cap Screw (8 used)



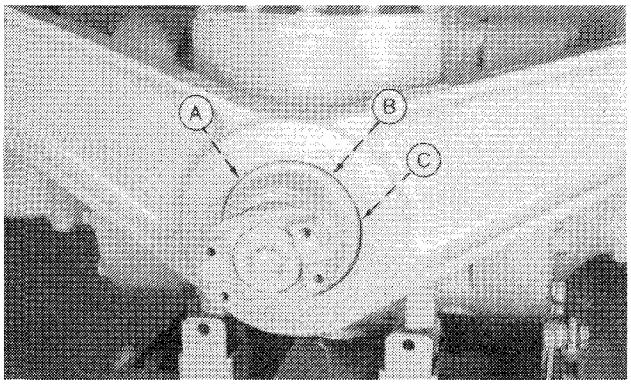


TX,0210,BB64 -19-13JUL94

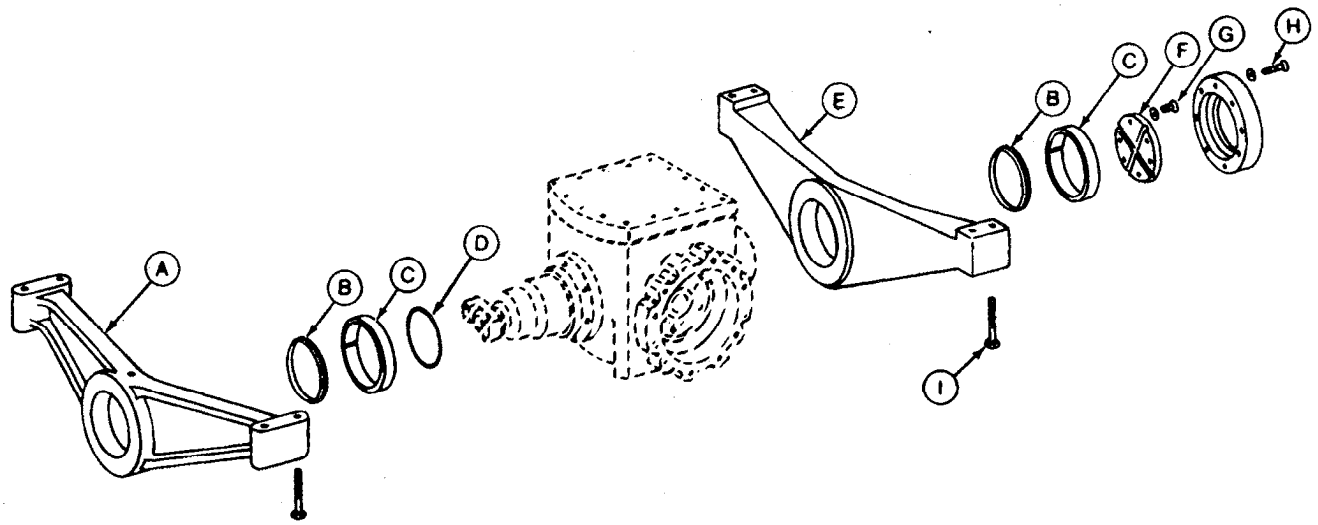
CAUTION: The approximate weight of the front oscillating support is 41 kg (90 lb).

4. Remove front oscillating support.

A—Seal
B—Wear Ring
C—O-Ring



TX,0210,BB62 -19-13JUL94



T6737DQ -UN-27OCT88

A—Front Support
B—Seal (2 used)
C—Wear Ring (2 used)
D—O-Ring
E—Rear Support
F—Retaining Plate
G—Cap Screw (6 used)
H—Cap Screw (8 used)
I—Cap Screw (8 used)

5. Remove parts (A—I).

6. Inspect parts for wear or damage and replace if necessary.

7. Lubricate seal (B) using multi-purpose grease.

TX,0210,BB63 -19-22APR88

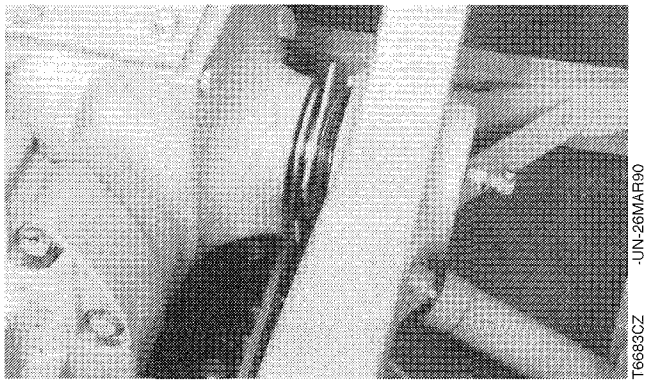
REPLACE REAR AXLE OSCILLATING SUPPORT BUSHINGS—444E (AXLE SERIAL NO. —001151)

NOTE: If only the rear oscillating support is to be removed, the rear axle assembly does not have to be removed, but must be supported.

1. Remove rear axle assembly. (See Remove and Install Rear Axle and Differential in this group.)

CAUTION: The approximate weight of the rear oscillating support is 68 kg (150 lbs).

2. Remove rear oscillating support.



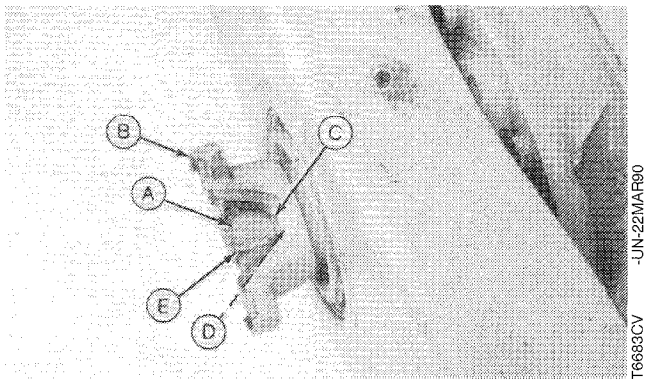
T6683CZ -UN-26MAR90

TX,0200,BB2 -19-13JUL94

CAUTION: The approximate weight of the front oscillating support is 77 kg (170 lbs).

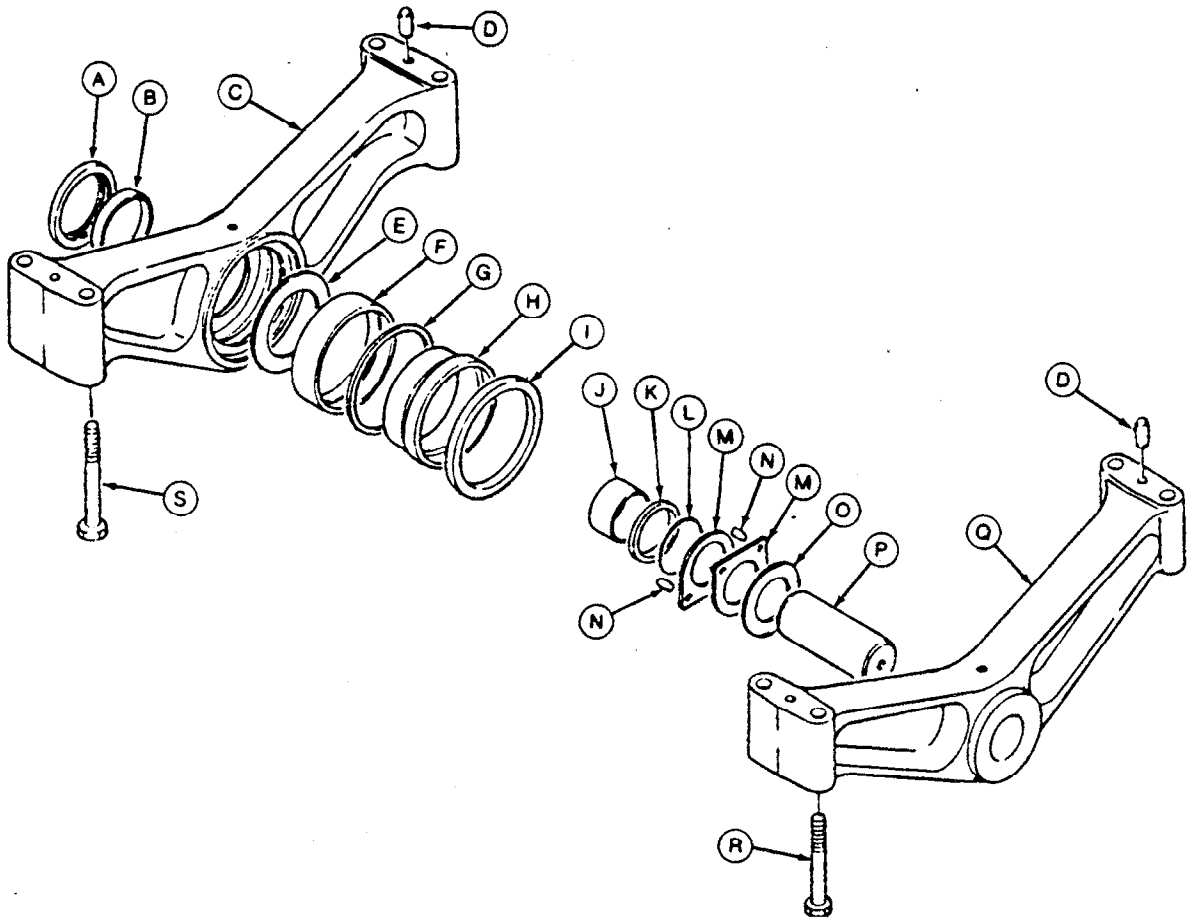
3. Remove parts (A—E) to remove front oscillating support.

A—Nut
B—Flange
C—Washer
D—O-Ring
E—Cotter Pin



T6683CV -UN-22MAR90

TX,0200,BB3 -19-13JUL94



T6683CT -UN-27OCT88

A—Seal
B—Wear Ring
C—Front Support
D—Dowel Pin (4 used)
E—Thrust Washer
F—Bushing
G—Snap Ring
H—Sleeve
I—Seal
J—Bushing
K—Seal
L—O-Ring
M—Thrust Plate (2 used)
N—Dowel Pin (2 used)
O—Shim (as required)
P—Pin
Q—Rear Support
R—Cap Screw (4 used)
S—Cap Screw (4 used)

4. Remove parts (A—B) and (E—P).

5. Inspect parts for wear or damage. Replace as necessary.

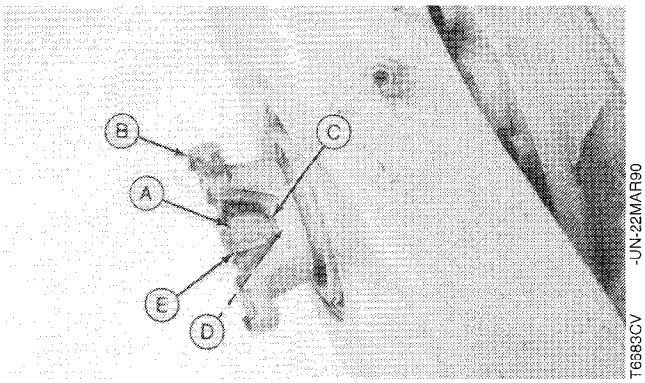
TX,0200,BB4 -19-13JUL94

6. Install front support.

7. Install parts (A—D). Tighten nut to 79 N·m (58 lb-ft).

8. Install cotter pin (E).

A—Nut
B—Flange
C—Washer
D—O-Ring
E—Cotter Pin



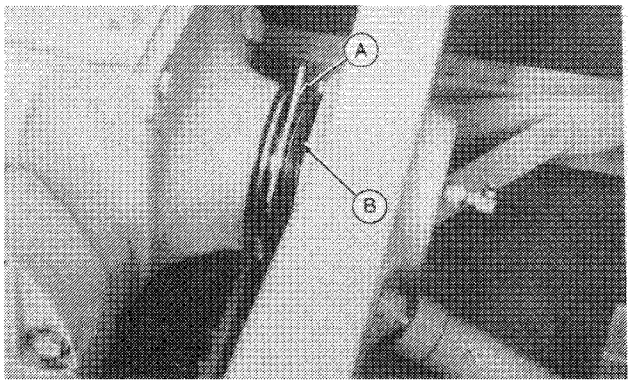
T6583CV -UN-22MAR90

TX,0200,BB6 -19-13JUL94

9. Install rear support.

10. Install rear axle assembly. (See Remove and Install Rear Axle and Differential in this group.)

11. Measure clearance between differential case and thrust plate (A). Clearance should be within 0.025—0.046 mm (0.001—0.0018 in.). Remove or install shims (B) until clearance is within specifications.



TX,0200,BB5 -19-13JUL94

0200
9

REPLACE REAR AXLE OSCILLATING SUPPORT BUSHINGS—444E (AXLE SERIAL NO.001152—)

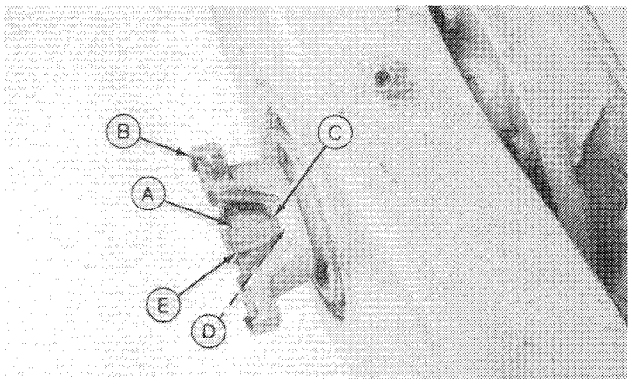
NOTE: If only the rear oscillating support is to be removed, the rear axle assembly does not have to be removed, but must be supported.

1. Remove rear axle assembly. (See Remove and Install Rear Axle and Differential in this group.)

CAUTION: The approximate weight of the rear oscillating support is 68 kg (150 lbs).

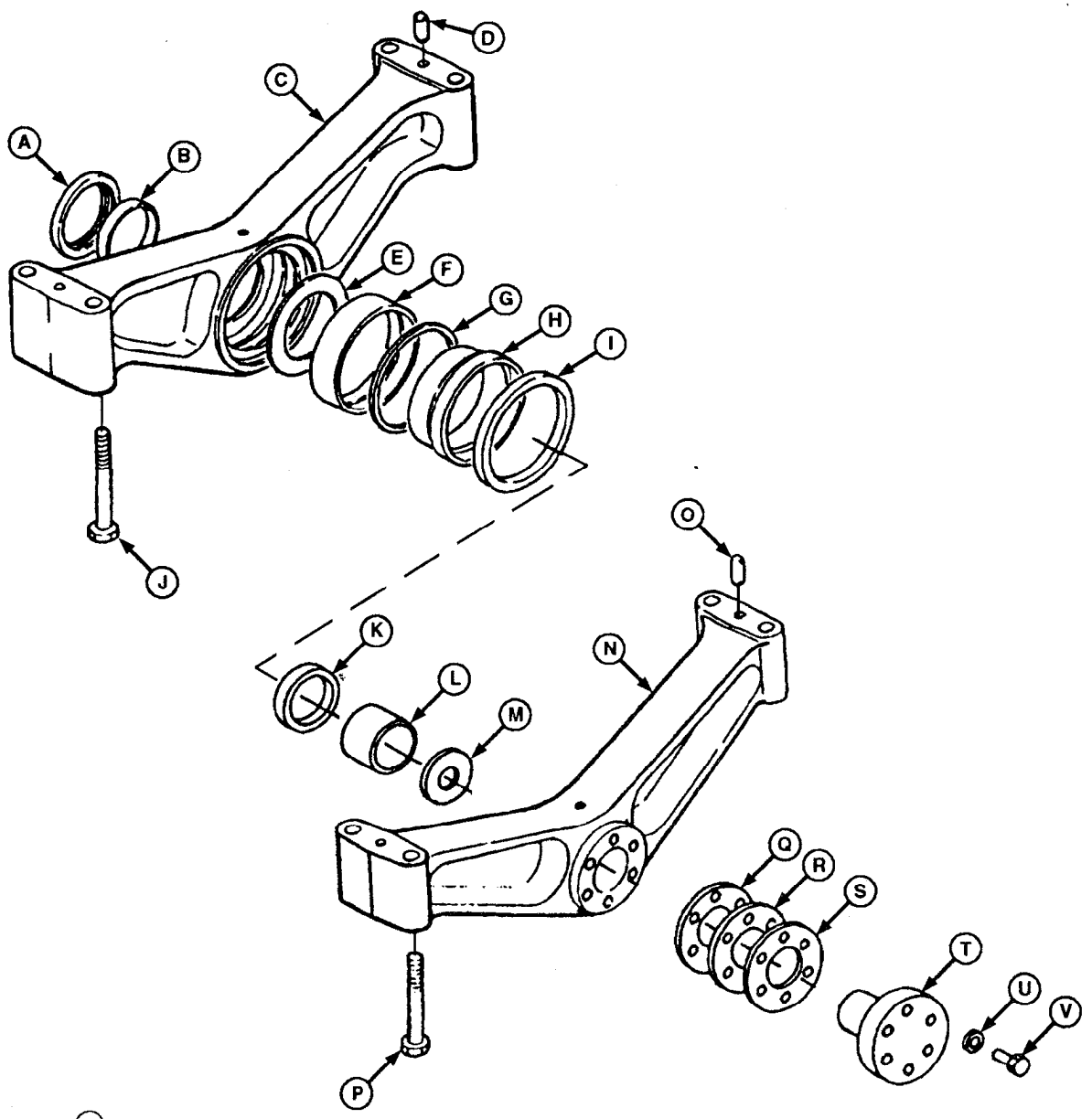
The approximate weight of the front oscillating support is 77 kg (170 lbs).

2. Remove parts (A—E) to remove front oscillating support.



A—Nut
B—Flange
C—Washer
D—O-Ring
E—Cotter Pin

TX,0200,BA1141 -19-13JUL94



T8286AK (CV)

A—Seal
B—Wear Ring
C—Front Support
D—Dowel Pin (2 used)
E—Thrust Washer
F—Bushing
G—Snap Ring
H—Sleeve
I—Seal
J—Cap Screw
K—Seal
L—Bushing
M—Washer
N—Rear Support
O—Dowel Pin (2 used)
P—Cap Screw (4 used)
Q—Shim
R—Shim
S—Shim
T—Cover/Pivot Pin
U—Lock Washer (6 used)
V—Cap Screw (6 used)

3. Remove parts (A—V).

4. Inspect parts for wear or damage. Replace as necessary.

5. Install parts (A—V).

TX,0200,BA1143 -19-02AUG94

6. Slide front support onto axle housing.

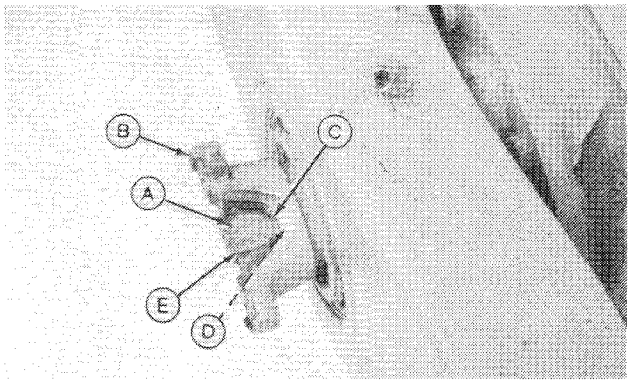
7. Install parts (A—D). Tighten nut to 79 N·m (58 lb-ft).

8. Install cotter pin (E).

9. Install rear support onto axle housing.

10. Install rear axle assembly. (See Remove and Install Rear Axle and Differential in this group.)

A—Nut
B—Flange
C—Washer
D—O-Ring
E—Cotter Pin



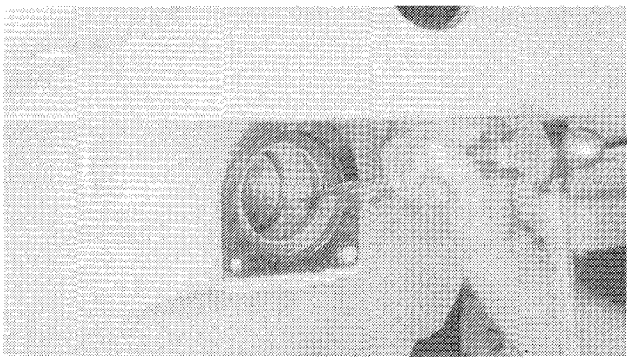
T6683CV -UN-22MAR90

TX,0200,BA1144 -19-13JUL94

REPLACE REAR PIVOT BUSHING AND DOWEL PIN—444E

1. Support rear axle assembly. Remove rear oscillating support.

2. Use a chisel to remove bushing.

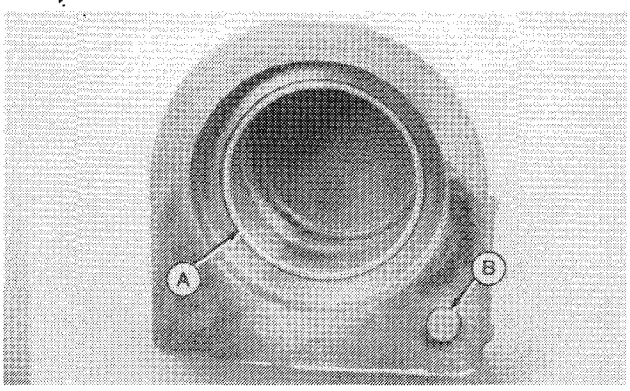


T77625 -UN-16MAR90

TX,0210,BB31 -19-13JUL94

3. Install new pin (B), if removed or if case is being replaced. Install pin until 6.1 mm (0.24 in.) of pin protrudes from mounting surface.

4. Install new bushing (A) flush with outside edge of inner bore, with the seam toward the case cover.



T5872AS -UN-23FEB89

R50,50300,2098 -19-13JUL94

SERVICE EQUIPMENT AND TOOLS

NOTE: Order tools from the U.S. SERVICE-GARD™ Catalog or from the European Microfiche Tool Catalog (MTC). Some tools may be available from a local supplier.

Name	Use
JDG-22 Seal Remover	To remove oil seals.
JDG-93 Disk (444E)	To remove oscillating pivot wear sleeve.
JDE-96 Ring Compressor	To remove oscillating pivot wear sleeve.
JDG-127 O-Ring Seal Tool Set (444E)	To remove O-rings.
JDG-185 Air Test Plug (444E)	To test lock passage for leaks.
JDG-92 Disk	To install differential drive shaft bearing cup.
17-1/2 and 30 Ton Puller Set	To remove bearings.

TX,0210,AA34 -19-04MAY88

OTHER MATERIALS

Number	Name	Use
AT38226 (3M No. 2158)	Epoxy	On pinion shaft cap screw—344E.
TY6305	Clean and Cure Primer	To prime surfaces for T43512, T43513, and T43514.
T43514	Plastic Gasket	To seal oil seal outside diameters. To seal bearing cup in lock side of differential.
TY6304	Flexible Sealant	Install axle cover and axle housing.
T43512 (344E)	Thread Lock and Sealer (Medium Strength)	Differential cap screws.

TX,0210,AA35 -19-13JUL94

SPECIFICATIONS—344E

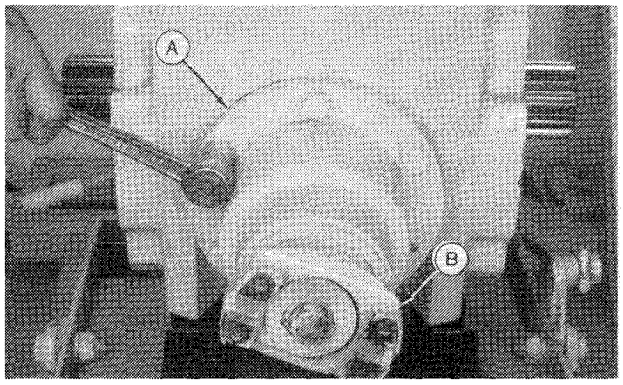
Item	Measurement	Specification
Rear Oscillating Support	Weight (Approximate)	59 kg (130 lb)
Front Oscillating Support	Weight (Approximate)	41 kg (90 lb)
Differential Cone Point	Dimension	See Procedure
Yoke-to-Pinion Shaft	Gap (Endplay)	0.00—0.05 mm (0.00—0.002 in.)
Pinion Shaft Cap Screw	Torque	390 N·m (290 lb-ft)
Differential (Standard)	Weight (Approximate)	55 kg (120 lb)
Differential (No-SPIN)	Weight (Approximate)	60 kg (132 lb)
Spiral Bevel Gear Cap Screw	Torque	49 N·m (36 lb-ft)
Differential Housing Cap Screw	Torque	88 N·m (65 lb-ft)
Differential Quill Cap Screw	Torque	88 N·m (65 lb-ft)
Differential Carrier	Rolling Drag Torque	8.9—10.2 N (2.0—2.4 lb force)
Differential Ring Gear	Backlash	0.19—0.39 mm (0.007—0.015 in.)
Input Shaft Pinion-to-Spiral Bevel Gear	Tooth Bearing Pattern Length	30 mm (1.2 in.) Minimum
Differential Cap Screws (Standard)	Torque	115 N·m (85 lb-ft)
Ring Gear Cap Screws	Torque	150 N·m (110 lb-ft)
Differential Case Cover Cap Screw	Torque	75 N·m (55 lb-ft)
Differential	Capacity	16 L (17 qt)

TX,0210,HH572 -19-13JUL94

REMOVE INPUT QUILL AND DRIVE SHAFT—344E

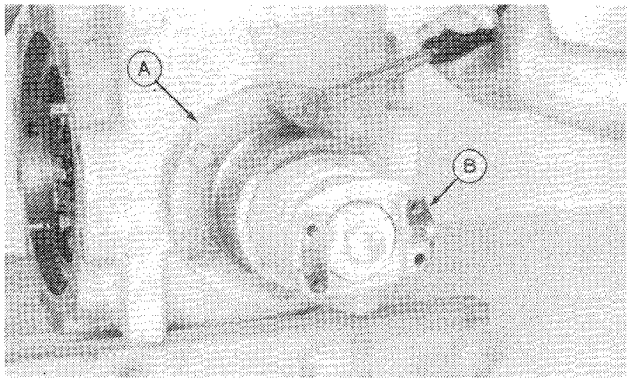
Remove yoke (B).

Remove input quill (A).



T6737DB -UN-02APR90

Front Axle

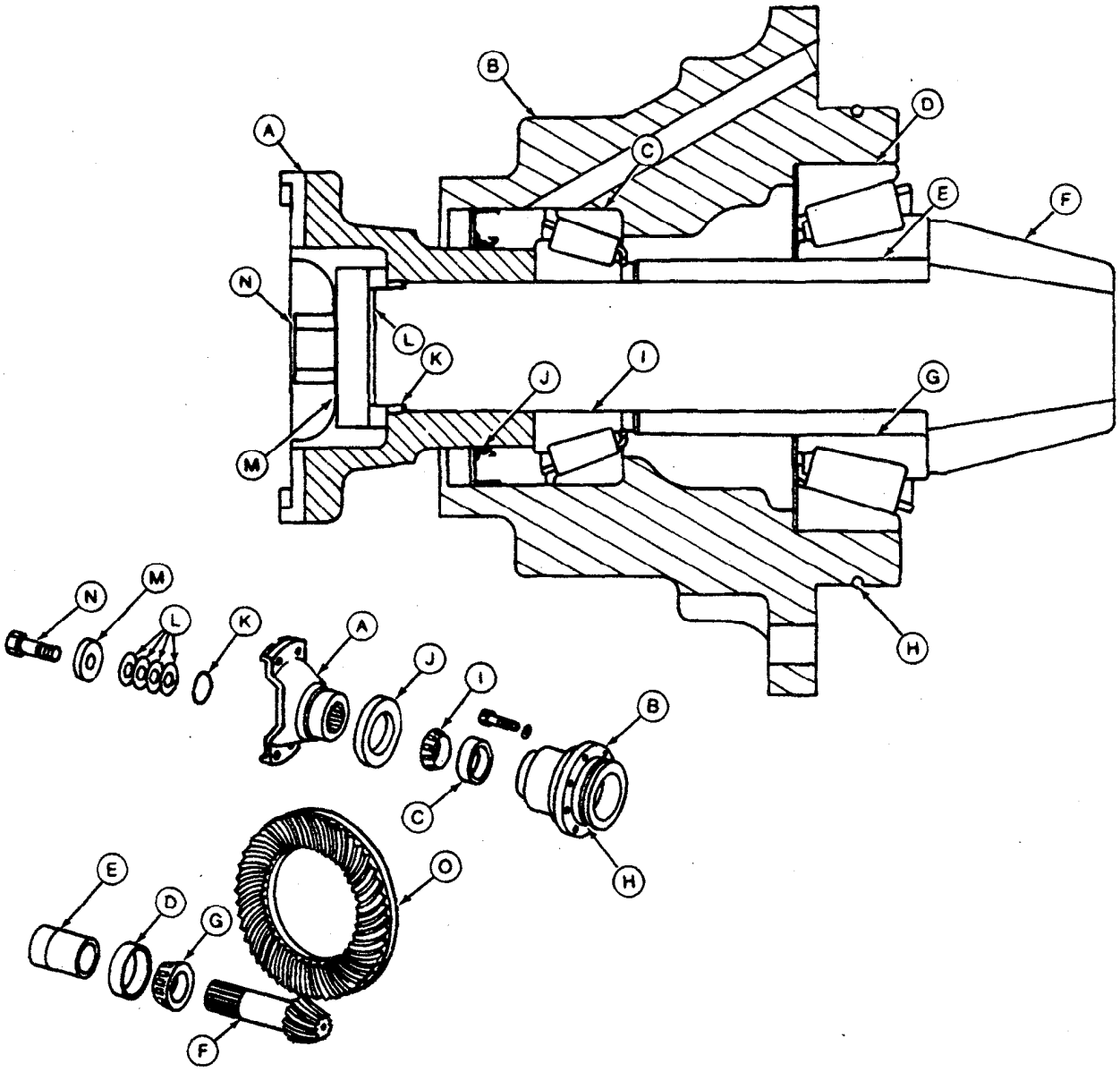


T6737DR -UN-02APR90

Rear Axle

TX,0210,RB61 -19-22APR88

DISASSEMBLE AND ASSEMBLE INPUT QUILL AND SHAFT—344E



A—Yoke
B—Quill
C—Bearing Cup
D—Bearing Cup
E—Shims (as required)
F—Spiral Bevel Shaft
G—Bearing Cone
H—O-Ring
I—Bearing Cone
J—Seal
K—O-Ring
L—Shims (as required)
M—Special Washer
N—Cap Screw
O—Spiral Bevel Gear

IMPORTANT: The spiral bevel shaft (F) and gear (O) must be replaced as a matched set.

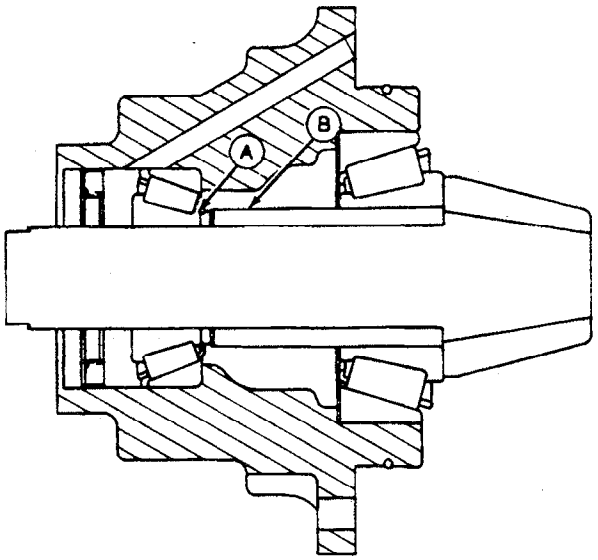
TX,0210,HH573 -19-21NOV91

Bearing cones and cups are a press fit.

1. Install spacer (B) with the small end toward bearing cone (A).

2. Make the following adjustments when replacing any of the bearing cups, bearing cones, ring gear, spiral bevel shaft, quill or differential case:

Differential Preload
Differential Backlash
Pinion Shaft
Tooth Bearing Pattern
Cone Point



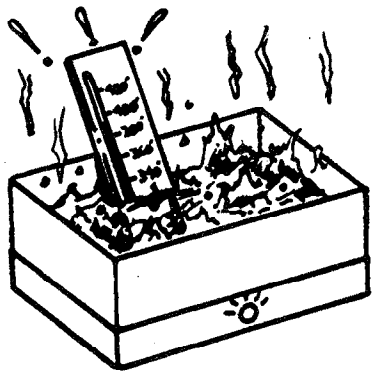
T6737CQ -UN-27OCT88

0210
5

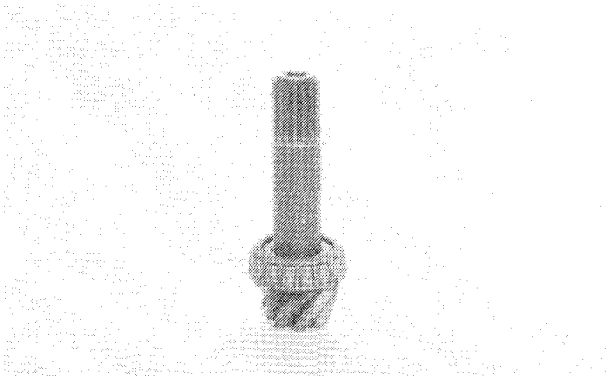
TX,0210,BB58 -19-22APR88

⚠ CAUTION: DO NOT heat oil over 182°C (360°F). Oil fumes or oil can ignite above 193°C (380°F). Use a thermometer. Do not allow a flame or heating element to come in direct contact with the oil. Heat the oil in a well ventilated area.

3. Heat bearing cone to 150°C (300°F) and install on shaft.



T81191 -UN-23FEB89



T6737EA -UN-02APR90

TX,0210,BB59 -19-22APR88

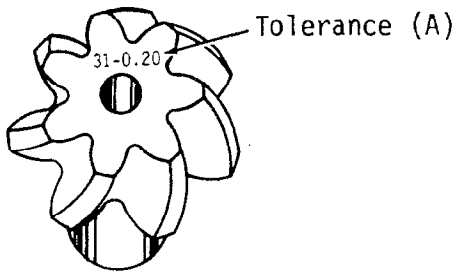
ADJUST CONE POINT—344E

IMPORTANT: Check cone point adjustment if bearing cup, cones, differential, drive shaft or bearing quill were installed new.

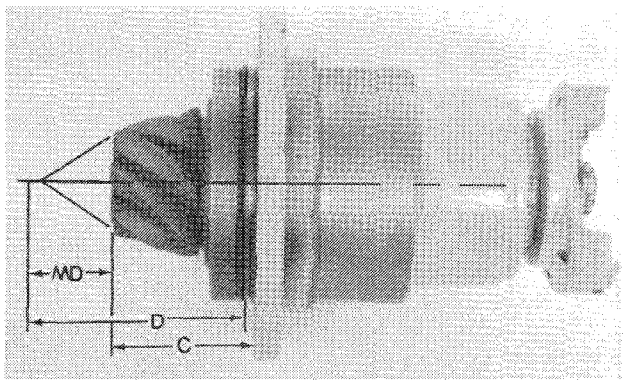
SHIM THICKNESS SPECIFICATION

(MD ± A + C - D = Shim Thickness).

MD = 123 mm (5.0 in.)
A = dimension etched on end of pinion shaft
C = distance between housing and end of input shaft
D = 203 mm (8 in.)



T6737GB -19-22NOV91



T6737DV -UN-02APR90

TX,0210,BB56 -19-04MAY88

ADJUST DRIVE SHAFT—344E

Tighten cap screw yoke to pinion shaft to 390 N·m (290 lb-ft)

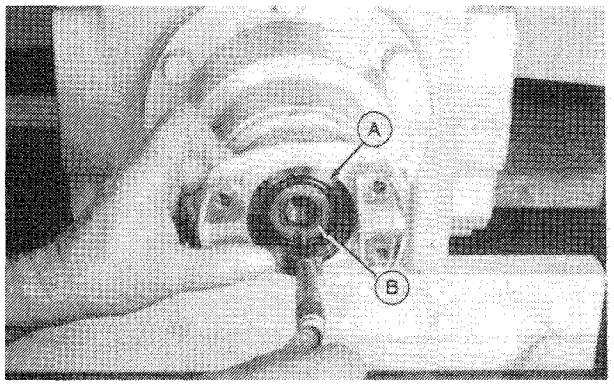
Remove cap screw, yoke and pinion shaft.

Measure distance between yoke (A) and pinion shaft (B) to determine shim needed.

SPECIFICATION

Yoke-to-Pinion Gap
(Endplay). . . . . 0.00—0.05 mm (0.00—0.002 in.)

Apply epoxy or equivalent to cap screw threads and tighten to 390 N·m (290 lb-ft).



T6737EB -UN-02APR90

TX,0210,BB57 -19-04JUN90