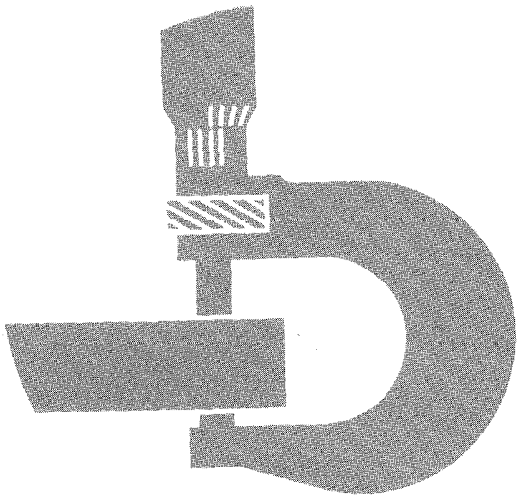
John Deere 340D and 440D Skidder 448D Grapple Skidder Repair



TECHNICAL MANUAL

TM-1437 (Jan-88)

LITHO IN U.S.A.

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 diagnostics. Repair sections tell how to repair the components. Diagnostic sections help you identify the majority of routine failures quickly.

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

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

This manual is part of a total product support program.

FOS Manuals-reference

Technical Manuals-machine service

Component Manuals-component service

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

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

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

053;TMIFC 190188

340D AND 440D SKIDDERS
448D GRAPPLE SKIDDER
TECHNICAL MANUAL
TM-1437 (JAN-88)

SECTION AND GROUP CONTENTS

Continued on next page

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

T64;1437 M1 230388

T64;1437 M2 230388

INTRODUCTION

This manual is part of a total service support program.

FOS Manuals—reference

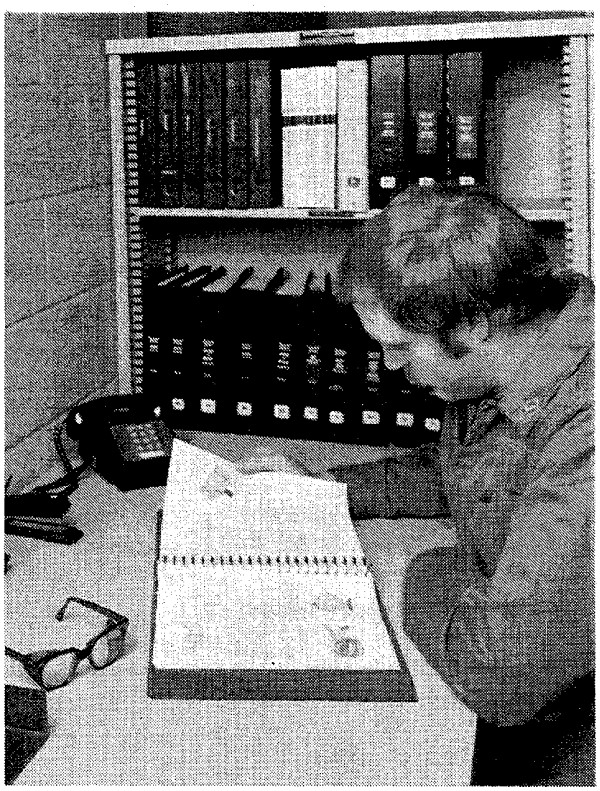
Technical Manuals—machine service

Component Manuals—component service

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

Technical Manuals are concise service guides for specific machines. Technical manuals are on-the-job guides containing only the vital information needed by an experienced service technician.

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



AB6;RW5559 053;INTRO2 030785

FEATURES OF THIS TECHNICAL MANUAL

John Deere ILLUSTRUCTION format emphasizing illustrations and concise instructions in easy-to-use modules.

Emphasis on diagnosis, analysis, and testing so you can understand the problem and correct it.

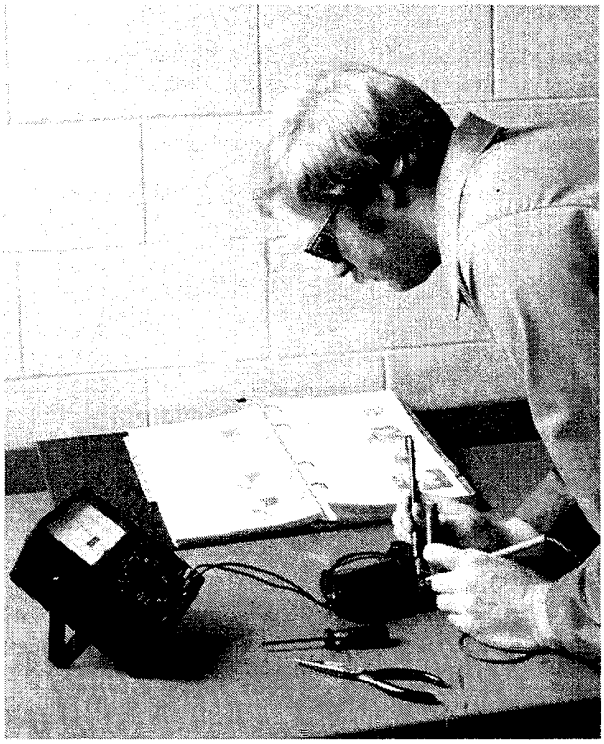
Diagnostic information presented with the most logical and easiest to isolate problems first to help you identify the majority of routine failures quickly.

Step-by-step instructions for teardown and assembly.

Summary listing at the beginning of each group of all applicable specifications, wear tolerances, torque values, essential tools, and materials needed to do the job.

An emphasis throughout on safety—so you do the job right without getting hurt.

This technical manual was planned and written for you—an experienced service technician. Keep it in a permanent binder in the shop where it is handy. Refer to it when you need to know correct service procedures or specifications.



AB6;RW5560 053;INTRO3 071085

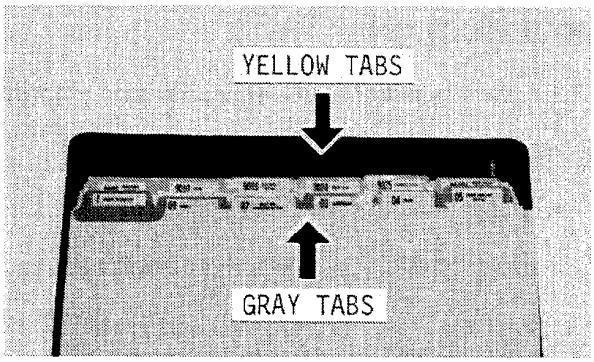
T74;00I00I 01 150288

USING TABS

To fully utilize this technical manual, you must understand how it is organized.

Only two tab colors are used—gray and yellow. Each color represents a different type of information.

Spend a minute reading this now and save many minutes of searching later.



018;T5933AB T82;FLPD I 260785

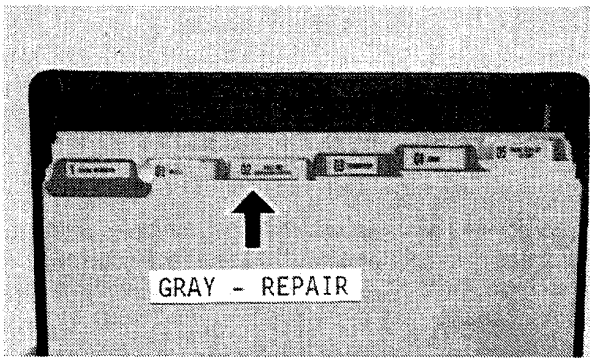
GRAY TAB SECTIONS

The gray tab sections are repair sections that tell how to repair the components of the various systems.

Repair of a component includes:

- Removal from machine (when necessary)
- Disassembly
- Inspection
- Replacement of parts
- Assembly
- Adjustment
- Installation on machine (when necessary)

The numbers used for the repair (gray tab) sections are part of an overall service publication numbering system. The numbers identify the same sections in the parts catalog, flat rate manual, service information bulletins, and service training courses.

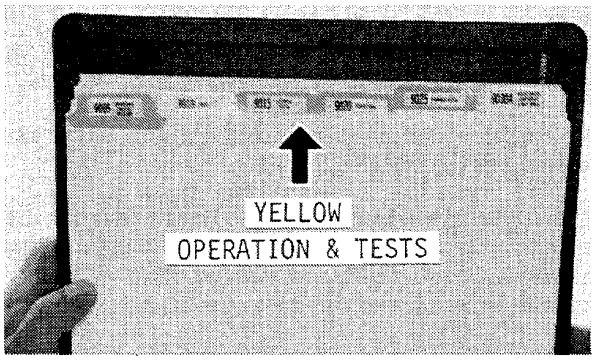


018;T5933AC T82;FLPD J 260785

YELLOW TAB SECTIONS

Each yellow tab section contains information on:

Groups	
05	Theory of Operation
10	System Operational Checks
15	System Diagnostic Information
20	Adjustments
25	Tests



018;T5933AD T82;FLPD K 260785

T74;001001 02 150288

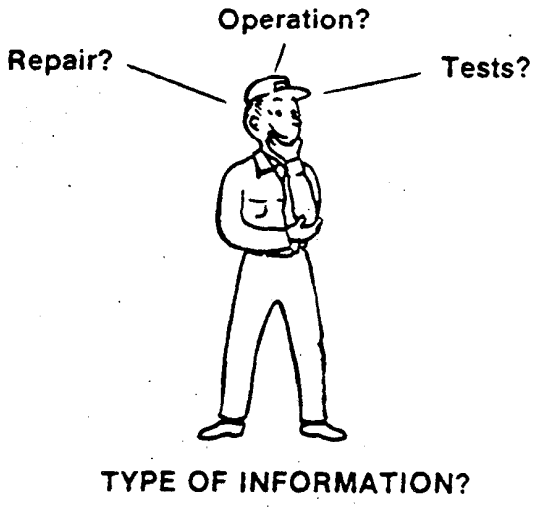
THREE-STEP PROCEDURE

Use the following three-step procedure to locate the desired information.

1. Determine the type of information you need. Is it repair, operation, or tests?

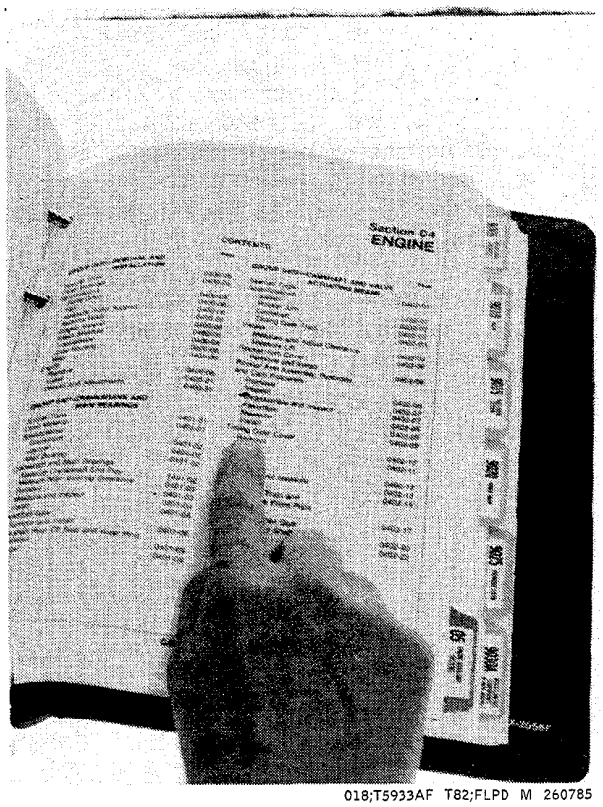
2. Go to the appropriate section tab:

   Gray for Repair
   Yellow for Operation or Tests



018;T5940AT T82;FLPD L 260785

3. Use the table of contents on the first page of the section to locate the information.



018;T5933AF T82;FLPD M 260785

RECOGNIZE SAFETY INFORMATION

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

Follow recommended precautions and safe operating practices.

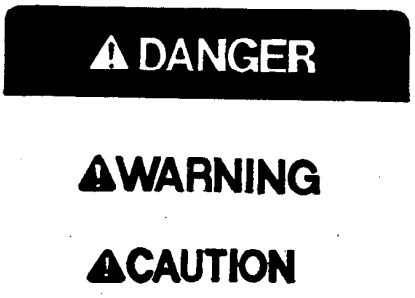
AB6;T81389 053;ALERT 160687

UNDERSTAND SIGNAL WORDS

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

Safety signs with signal word DANGER or WARNING are typically near specific hazards.

General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.



AB6;TS187 053;SIGNAL 071085

USE HANDHOLDS AND STEPS

When you get on and off machine, always maintain a three point contact with steps and handrails and face machine. Do not use any controls as handholds.

Never jump either on or off the machine. Never mount or dismount a moving machine.

Be careful of slippery conditions on platforms, steps, tracks and handrails when mounting or dismounting.

018;T6192AH 02T;05 M34 060787

START ENGINE FROM OPERATOR'S SEAT

Avoid possible injury or death from machinery runaway.

Do not start engine by shorting across starter terminals. Machine will start in gear and will move if normal circuitry is bypassed.

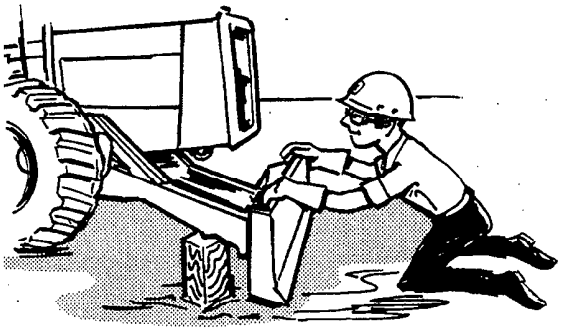
NEVER start engine while standing on ground. Start engine only from operator's seat, with transmission range lever in neutral, and park brake applied.

T82;BHSA G 190784

SUPPORT RAISED EQUIPMENT

Do not work under raised equipment unless it has a support under it.

If a support is not available, lower equipment to the ground.



87A;T85417 T82;SKSA K 280884

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.

AB6;TS186 053;FIRE2 080785

HANDLE FUEL SAFELY—AVOID FIRES

Handle fuel with care: it is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks.

Always stop engine before refueling machine. Fill fuel tank outdoors.

Prevent fires by keeping machine clean of accumulated trash, grease, and debris. Always clean up spilled fuel.

AB6;TS202 053;FIRE1 230487

T74;0010101 05 150288

Section 02
AXLES AND SUSPENSION SYSTEM

CONTENTS

T47;0200 79 110588

CONTENTS

T47;0200 80 110588

SERVICE EQUIPMENT AND TOOLS

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

Name	Use
20-Ton Floor Stand	To support unit when removing and installing front and rear axles and front and rear differential assemblies.
Low-Lift Transmission Jack	To remove and install front and rear differential and axle assemblies.
Mounting Arm	Used with Low-Lift Transmission Jack.
JD292 Torque Converter Box Wrench	Used with 406.4 mm (16 in.) torque wrench to install front differential drive line-to-front differential yoke special cap screws.

T47;0200 73 100588

OTHER MATERIALS

Number	Name	Use
T43511	John Deere Clean and Cure Primer	Clean axle housing and differential housing mating surfaces.
T43514	John Deere Plastic Gasket	Seal axle housing and differential housing mating surfaces.
PT569	John Deere NEVER-SEEZ® Lubricant	Lubricate mating parts of front differential-to-engine frame parts.
TY9371	John Deere Thread Lock and Sealer (high strength)	Apply to rear differential drive line-to-parking brake special cap screw threads.

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

T47;0200 74 080488

SPECIFICATIONS

Item	Measurement	Specification
Engine Frame Front Bottom Guard:		
Guard	Approximate weight	34 kg (75 lb)
Guard-to-engine frame cap screws	Torque	230 N·m (170 lb-ft)
Engine Frame Rear Bottom Guard:		
Guard	Approximate weight	23 kg (50 lb)
Guard-to-engine frame cap screws	Torque	203 N·m (170 lb-ft)
Front Axle Housing:		
Housing	Approximate weight	159 kg (350 lb)
Housing-to-differential case cap screws (use alternating sequence from one to the other)	Torque	244 N·m (180 lb-ft)
Front Differential and Axle Assembly:		
Axle Assembly	Approximate weight	556 kg (1225 lb)
Oscillating support cap screws	Torque	929 N·m (685 lb-ft)
Pivot pin cap screw	Torque	115 N·m (85 lb-ft)
Axle Assembly	End play	0.03—0.91 mm (0.001—0.036 in.)
Force to oscillate axle assembly measured at axle flange without tires and wheels	Maximum force	223 N (50 lb force)
Drive line special cap screws	Torque with 406 mm (16 in.) long torque wrench and JD292 Torque Converter Box Wrench	95 N·m (70 lb-ft)
Drive line special cap screws	Torque	129 N·m (95 lb-ft)
Rear Differential and Axle Assembly:		
Axle assembly	Approximate weight	544 kg (1200 lb)
Axle-to-frame nuts	Torque	576 N·m (425 lb-ft)
Drive line-to-park brake hub special cap screws	Torque	129 N·m (95 lb-ft)
Equipment frame-to bottom guard cap screws	Torque	407 N·m (300 lb-ft)

T47;0200 M2 080588

REMOVE FRONT AXLE

1. Install lock bar between engine frame and equipment frame.

2. Disconnect battery ground strap.

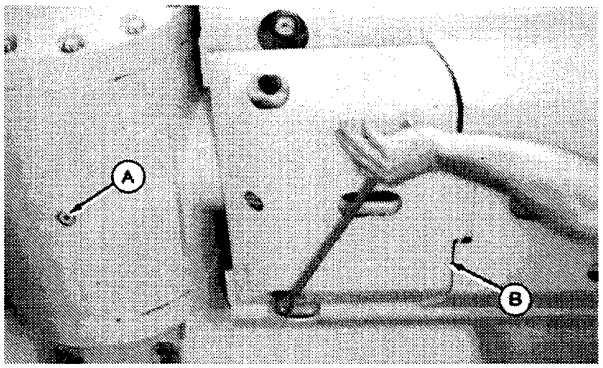
3. Operate control levers to relieve pressure in the hydraulic system. Pump the brake pedal to discharge brake accumulator.

4. Raise unit. Install two 20-ton floor stands under engine frame.

5. Remove differential drain plug. Drain oil and install plug. Hydraulic oil capacity is approximately 34 L (9 gal).

6. Remove wheel from axle housing to be serviced. (See Remove Wheel, Group 0110.)

7. Use wooden blocks under opposite wheel to pivot assembly enough to provide clearance between axle housing and frame.



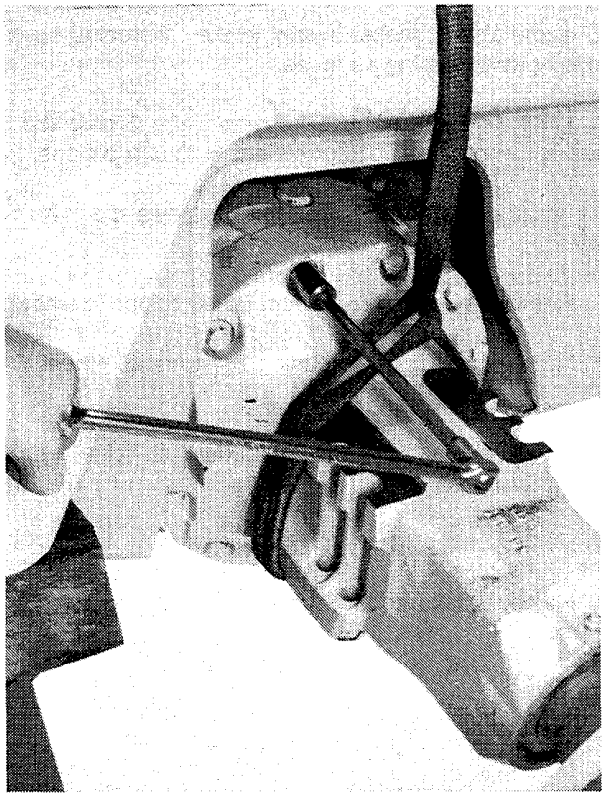
5AG;T95384 T47;0200 32 080488

CAUTION: The approximate weight of axle is 159 kg (350 lb).

8. Connect axle housing to hoist using a lifting strap.

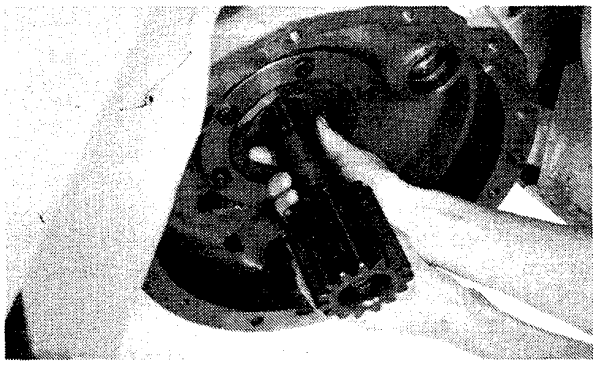
9. Remove cap screws to remove axle. (See Group 0250 for disassembly of axle.)

10. Clean mating surfaces using clean and cure primer.



5AG;T95387 T47;0200 35 100588

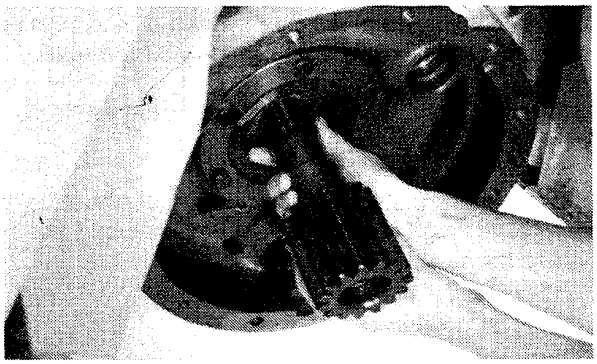
11. Remove and inspect sun drive gear.



5AG;T95388 T47;0200 36 080488

INSTALL FRONT AXLE

1. Install sun drive gear.



5AG;T95388 T47;0200 37 141083

2. Apply plastic gasket evenly to the differential case and axle housing mating surfaces.

3. Immediately install axle housing while turning sun drive gear slowly to align planet pinions with sun pinions.

4. Install and alternately tighten cap screws to 244 N·m (180 lb-ft).

5. Remove wooden block from under opposite wheel.

6. Install wheel on axle housing. (See Install Wheel, Group 0110.)

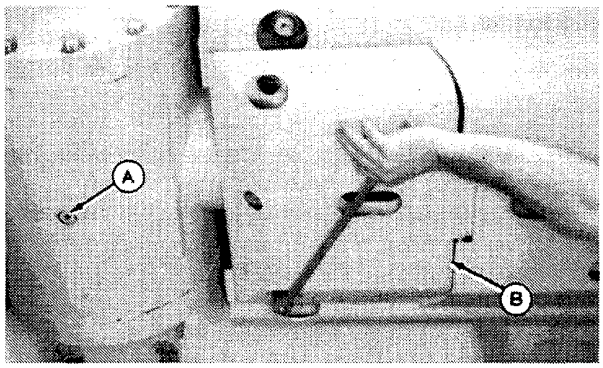
7. Fill differential with recommended oil. (See Section I, Group IV.)

8. Remove shop stands and lower unit.

9. Remove lock bar between engine frame and equipment frame.

5AG;T95389 T47;0200 38 080488

REMOVE FRONT DIFFERENTIAL AND AXLE ASSEMBLY



1. Install lock bar between engine frame and equipment frame.

2. Disconnect battery ground strap.

3. Operate control levers to release pressure in the hydraulic system. Pump the brake pedal to discharge brake accumulator.

NOTE: The bottom of the main frame must be approximately 457 mm (18 in.) plus the lowered height of service jack used.

4. Raise unit. Install two 20-ton floor stands under frame.

5. Remove wheels. (See Group 0110).

6. Remove drain plug (A). Drain oil and install plug. Hydraulic oil capacity is approximately 34 L (9 gal).

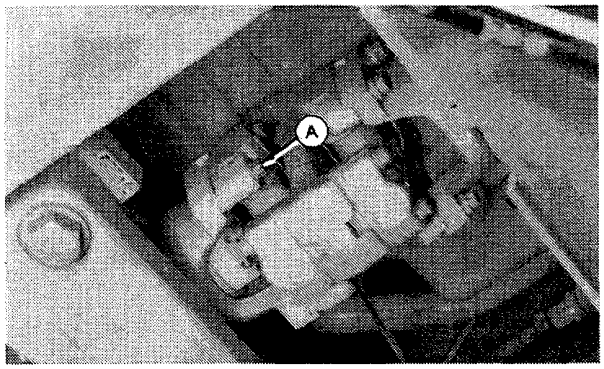
CAUTION: The approximate weight of engine frame front and rear bottom guards are:
front ..... 34 kg (75 lb)
rear ..... 23 kg (50 lb)

Weight may increase due to buildup of mud and debris.

7. Remove engine frame front and rear bottom guards (B).

5AG;T95384 T47;0200 41 100588

8. Remove four special cap screws (A) to disconnect front differential drive line.



5AG;T95392 T47;0200 42 141083

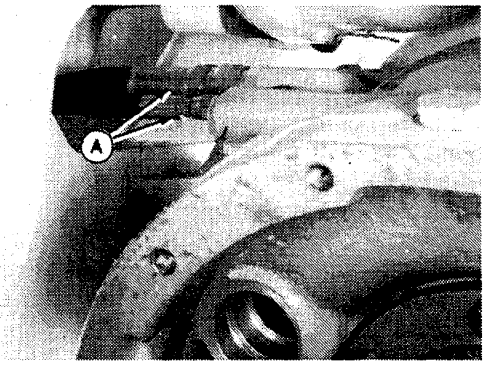
9. To provide clearance to disconnect differential lock lines (A), raise right side of assembly and put a support stand under axle housing.

NOTE: Axle housings removed for clarity of photograph.

10. Put identification tags on all lines to aid assembly.

11. Disconnect differential lock lines.

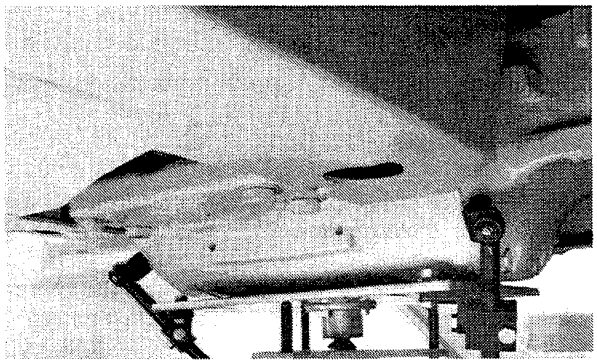
12. Close all openings using caps or plugs.



5AG;T95394 T47;0200 M3 090588

CAUTION: The approximate weight of front differential and axle assembly is 556 kg (1225 lb).

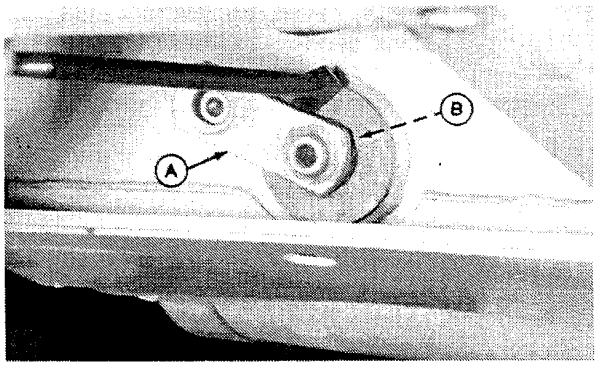
13. Install low lift transmission jack under differential section. Remove one axle cap screw from each side and install two mounting arms. Install and tighten cap screws.



5AG;T95397 T47;0200 48 080488

14. For later units, disconnect grease line.

15. Remove cap screw and washer to remove pivot pin (A), shims, and thrust plate (B).

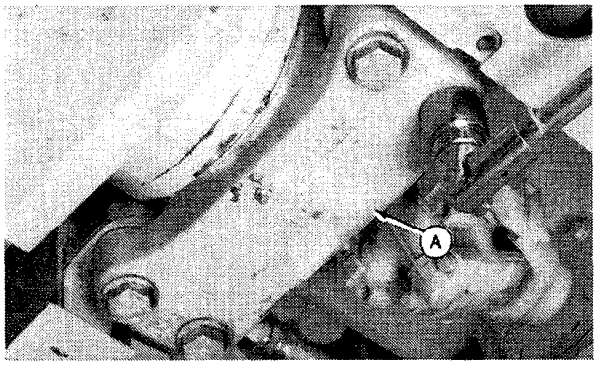


5AG;T95396 T47;0200 47 080488

16. Remove rear oscillating support (A).

17. Carefully lower differential and axle assembly.

18. Inspect dowels for wear or damage. Replace if necessary.



5AG;T95398 T47;0200 49 080488

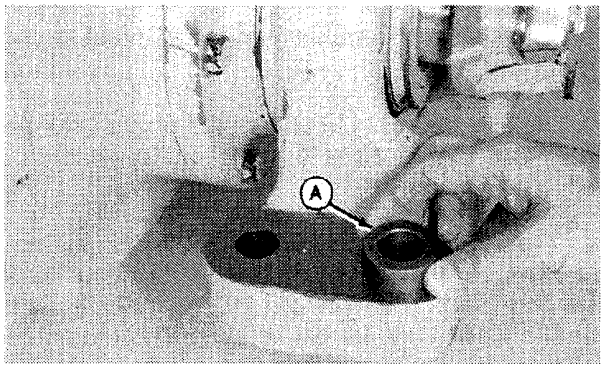
INSTALL AND ADJUST DIFFERENTIAL

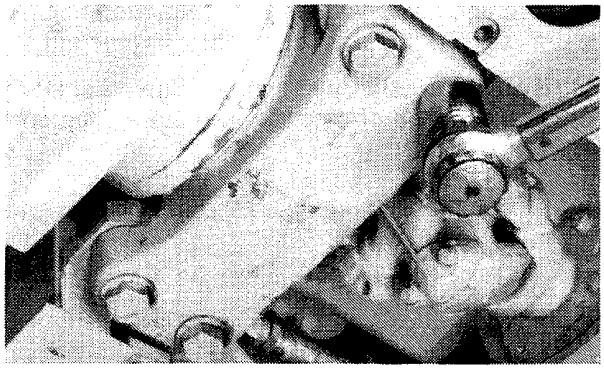
1. Clean and dry engine frame and rear oscillating support mounting surfaces.

2. Install dowels (A).

3. Carefully raise differential and axle housing assembly into position under engine frame. Make sure front pivot pin hole in differential case is aligned with pivot pin hole in engine frame.

4. Install rear oscillating support cap screws. Tighten to 929 N·m (685 lb-ft).





5AG;T95399 T95400 T47;0200 M4 110488

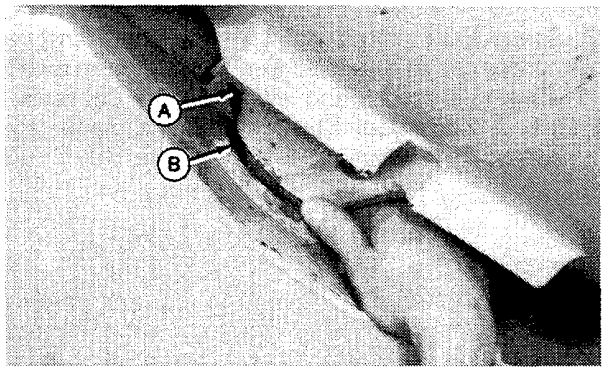
5. Apply John Deere NEVER-SEEZ lubricant or equivalent to pin bore of engine frame.

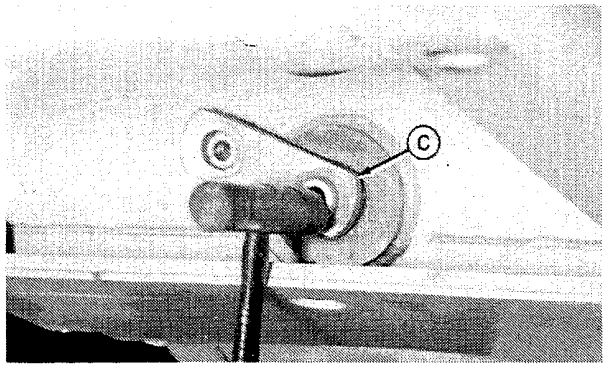
6. Apply NEVER-SEEZ lubricant or equivalent to mating surfaces of thrust plate (A) and differential case. Install thrust plate next to differential case, with longest leg pointing up. Install four shims (B) between thrust plate and engine frame.

7. Install pivot pin (C).

8. Install cap screw and washer. Tighten cap screw to 115 N·m (85 lb-ft).

9. For later units, connect grease lines to pin and oscillating support.



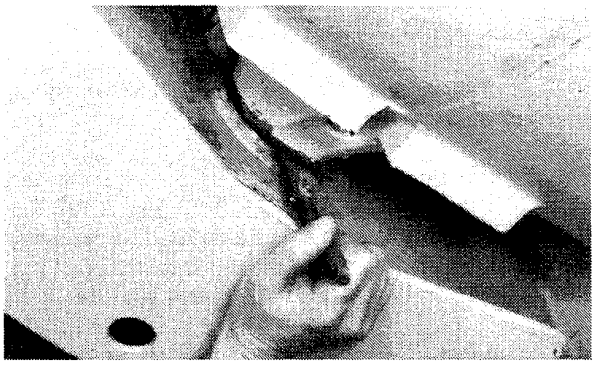


5AG;T95401, T95402 T47;0200 52 100588

10. Force assembly rearward as far as possible using a prybar.

11. Measure front differential end play using a feeler gauge. Adjust end play to 0.03—0.91 mm (0.001—0.036 in.) by adding or deducting shims.

12. A force of 223 N (50 lb) maximum, measured at the axle flange without tires or rims, must move the front differential assembly freely. If a force of more than 223 N (50 lb) is required to move differential, readjust end play.



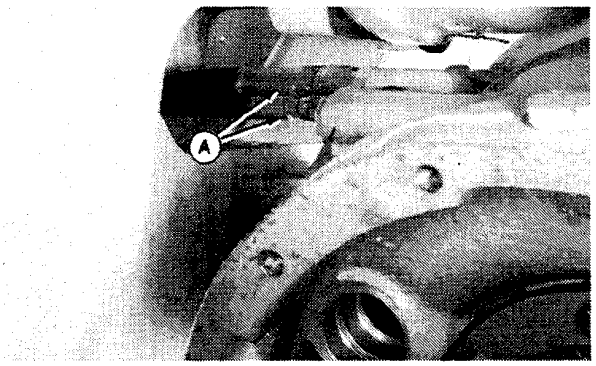
5AG;T95405 T47;0200 55 100588

13. To provide clearance to connect differential lock lines (A), raise right side of assembly and put a support stand under axle housing.

NOTE: Axle housings removed for clarity of photograph.

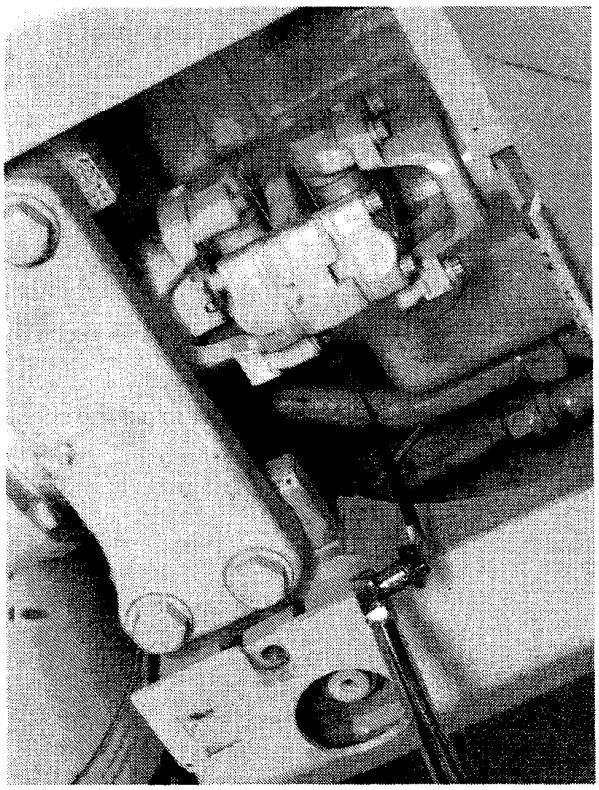
14. Connect differential lock lines.

15. Remove supports from under right axle.



5AG;T95394 T47;0200 58 110488

16. Connect front differential drive line. Install and tighten four special cap screws to 95 N·m (70 lb-ft) using a 406 mm (16 in.) torque wrench and JD292 Torque Converter Box Wrench. If special tool JD292 is not used, tighten special cap screws to 129 N·m (95 lb-ft).



5AG;T95406 T47;0200 59 110488

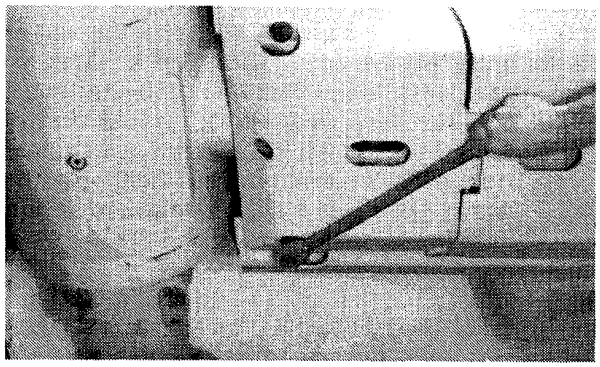
17. Install engine frame front and rear bottom guard. Install and tighten cap screws to 230 N·m (170 lb-ft).

18. Fill differential with the recommended oil (Section I, Group IV). Oil capacity is approximately 34 L (9 gal).

19. Install wheels. (See Group 0110.)

20. Remove floor stands and lower unit.

21. Remove lock bars. Connect battery.



5AG;T95391 T47;0200 60 110488

REMOVE REAR DIFFERENTIAL AND AXLE ASSEMBLY

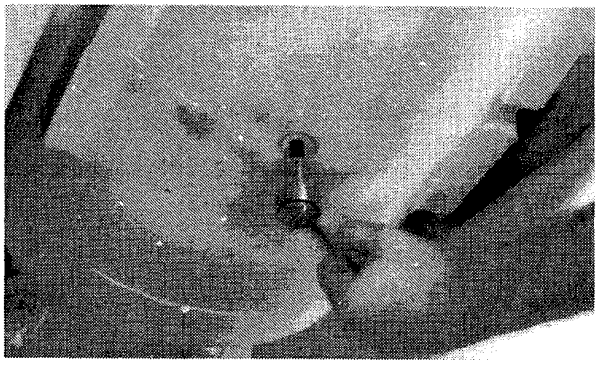
NOTE: An alternate method of removal is to disconnect axle housings from equipment frame, lift equipment frame, and roll assembly out from under frame.

1. Steer rear equipment frame fully to the right, and install lock bar between engine frame and equipment frame.

2. Disconnect battery ground strap.

3. Operate control levers to release pressure in the hydraulic system. Pump the brake pedal to discharge brake accumulator.

4. Remove drain plug. Drain oil, and install plug. Hydraulic oil capacity is approximately 34 L (9 gal).



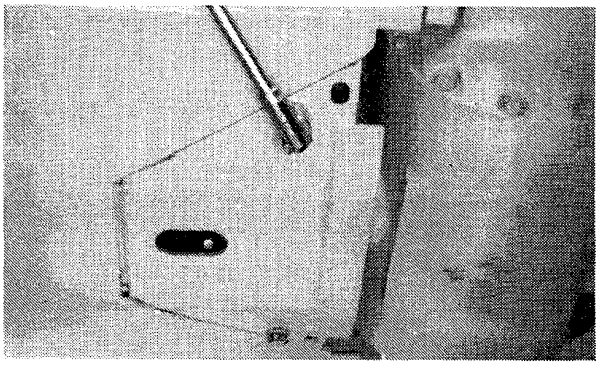
5AG;T95407 T47;0200 62 110488

NOTE: The bottom of frame must be approximately 457 mm (18 in.) plus the lowered height of service jack used.

5. Raise unit. Install two 20-ton floor stands.

6. Remove wheels. (See Group 0110).

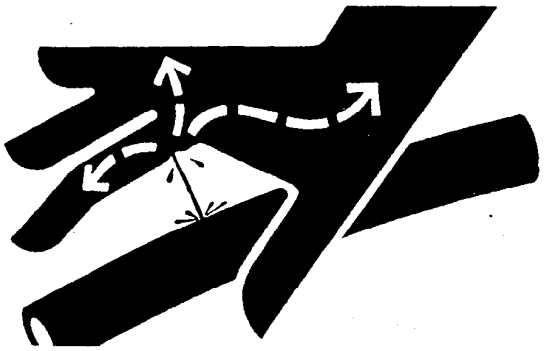
7. Remove equipment frame bottom guard.

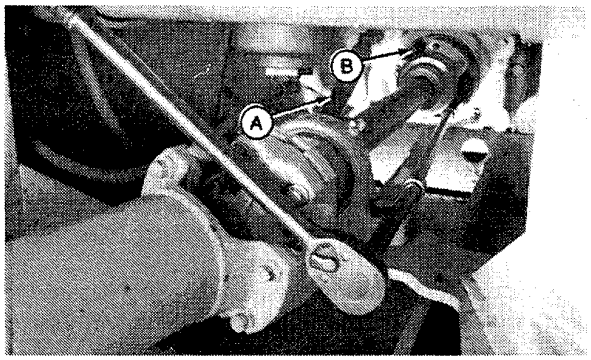


5AG;T95408 T47;0200 63 110488

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

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





8. Disconnect hydraulic line (A).

9. Close opening with a cap or plug.

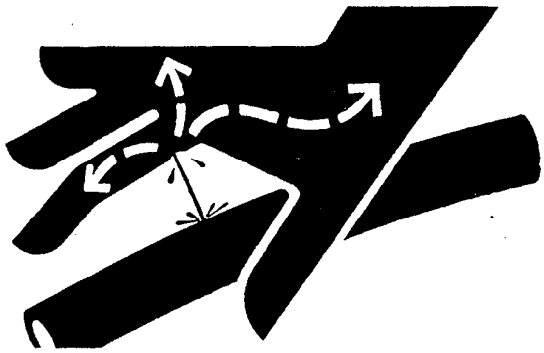
10. Remove four special cap screws (B) to disconnect rear differential drive line.

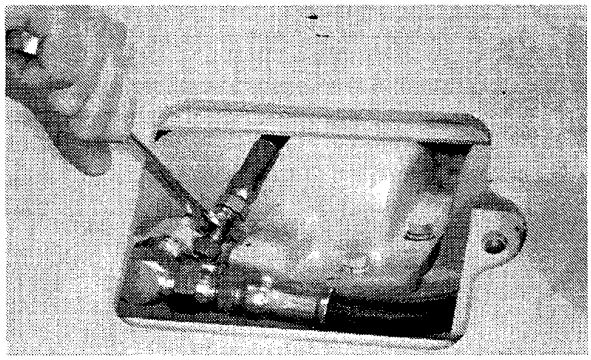
5AG;X9811, T95409 T47;0200 64 141083

11. Remove access cover (448D shown).

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

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





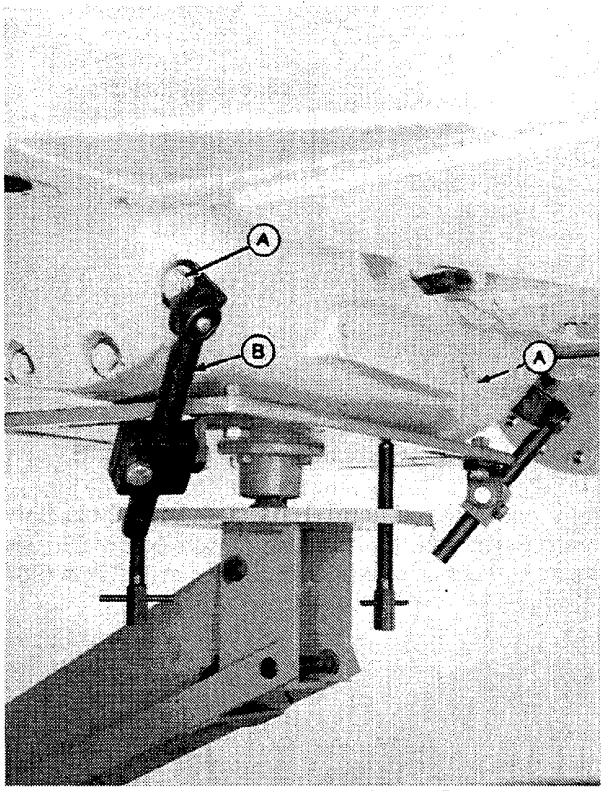
12. Disconnect differential lock hydraulic lines (448D shown).

13. Close all openings with caps and plugs to keep dirt out of the hydraulic system.

5AG;X9811, T95411 T47;0200 66 110488

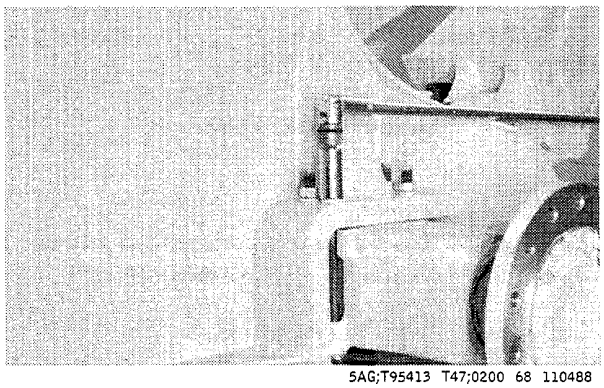
CAUTION: The approximate weight of rear differential and axle assembly is 544 kg (1200 lb).

14. Install a low lift transmission jack under differential section. Remove one axle cap screw from each side and install two mounting arms (B). Install and tighten cap screws (A).



5AG;T95412 T47;0200 67 100588

15. Remove four cap screws and nuts from each side. Carefully lower assembly from unit.



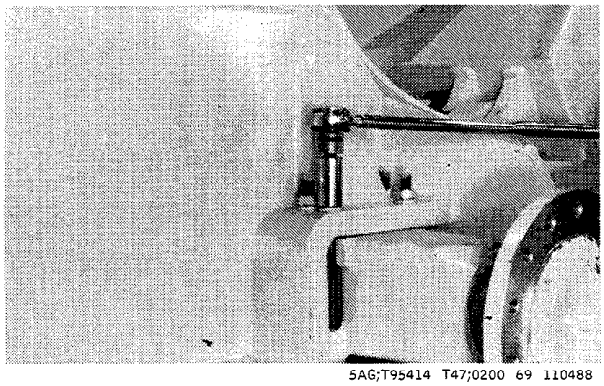
5AG;T95413 T47;0200 68 110488

INSTALL REAR DIFFERENTIAL AND AXLE ASSEMBLY

1. Carefully raise differential and axle assembly into position under frame.

2. Install four cap screws with washers and nuts. Tighten nuts to 576 N·m (425 lb-ft).

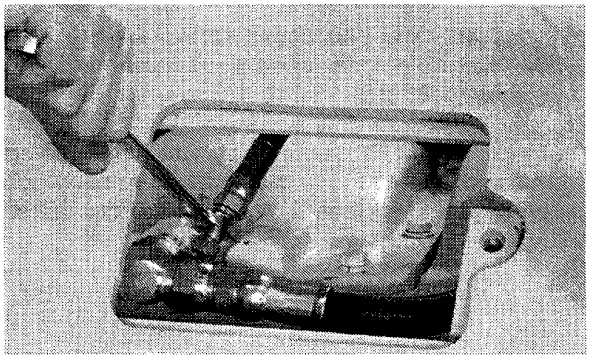
3. Remove low lift transmission jack and mounting arms.



5AG;T95414 T47;0200 69 110488

4. Connect differential lock hydraulic lines (448D shown).

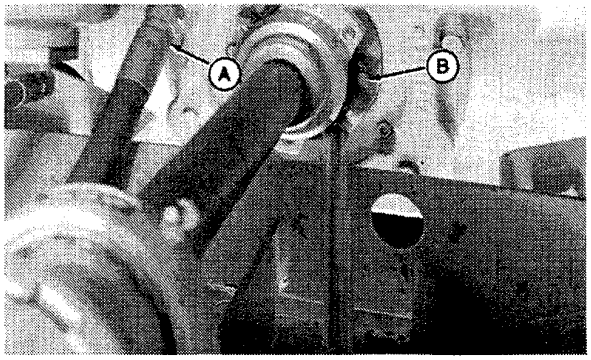
5. Install access cover. Install and tighten cap screw.



5AG;T95411 T47;0200 70 110488

6. Connect hydraulic line (A).

7. Connect rear differential drive line. Apply thread lock and sealer (high strength) to special cap screw (B) threads. Install and tighten special cap screws to 129 N·m (95 lb-ft).



5AG;T95416 T47;0200 72 110488

8. Install equipment frame bottom guard. Install and tighten cap screws to 407 N·m (300 lb-ft).

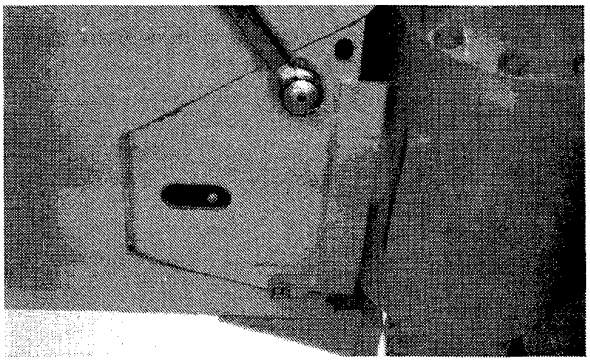
9. Install wheels. (See Group 0110).

10. Lower unit.

11. Fill differential with the recommended oil (Section I, Group IV). Oil capacity is approximately 34 L (9 gal).

12. Connect battery ground strap.

13. Remove lock bar from between engine frame and equipment frame.



5AG;T95417 T47;0200 31 110488