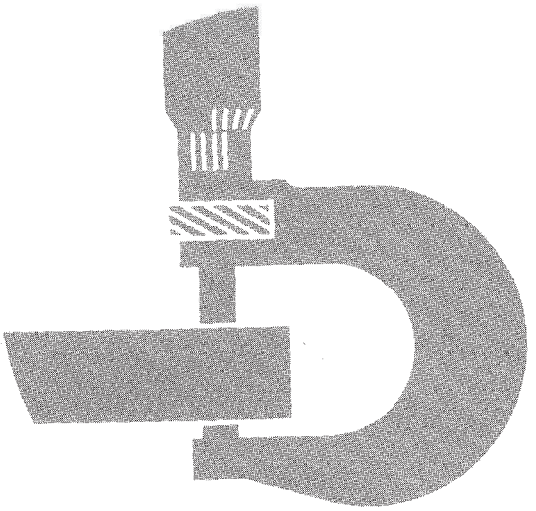
John Deere 340D and 440D Skidder 448D Grapple Skidder Repair



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

JOHN DEERE DEALERS

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

This is a complete revision for TM-1274, 340D and 440D Skidder, 448D Grapple Skidder.

TM-1437 (Repair) and TM-1436 (Operation and Tests) replaces TM-1274.

The new pages are dated (Jan-88). Listed below is a brief explanation of "WHAT" was changed and "WHY" it was changed.

This manual was revised:

1. Repair story for seals in oscillating support.
2. New art to show correct arrangement of low and high range shifter, and reverse range shifter.
3. Engine repair story is removed. For complete repair information see the component technical manual.
4. Repair story for new park brake and installation of seals with brake on unit.
5. Main pump repair is removed. For complete repair information, see the component technical manual.
6. General updating.

T64;TM1437 DCS 220388

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

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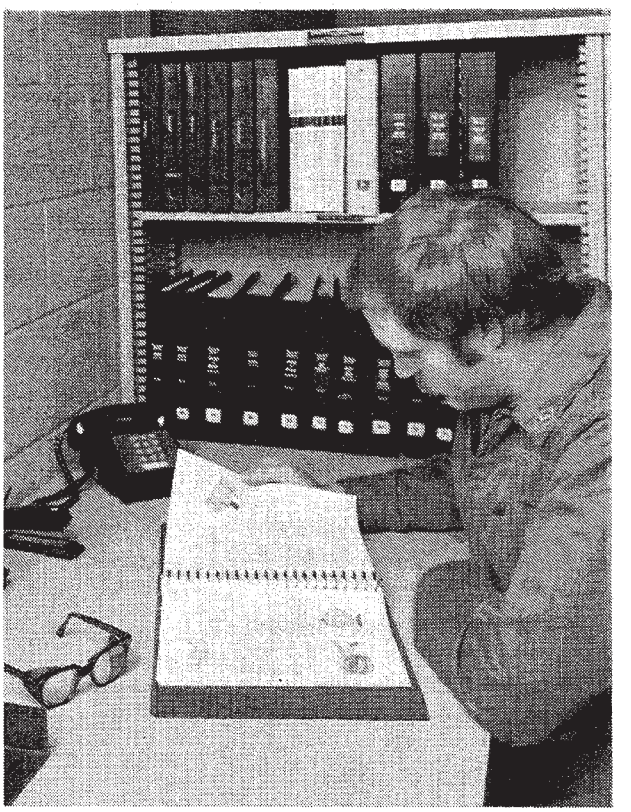


AB6;RW5559 053;INTRO2 030785

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.

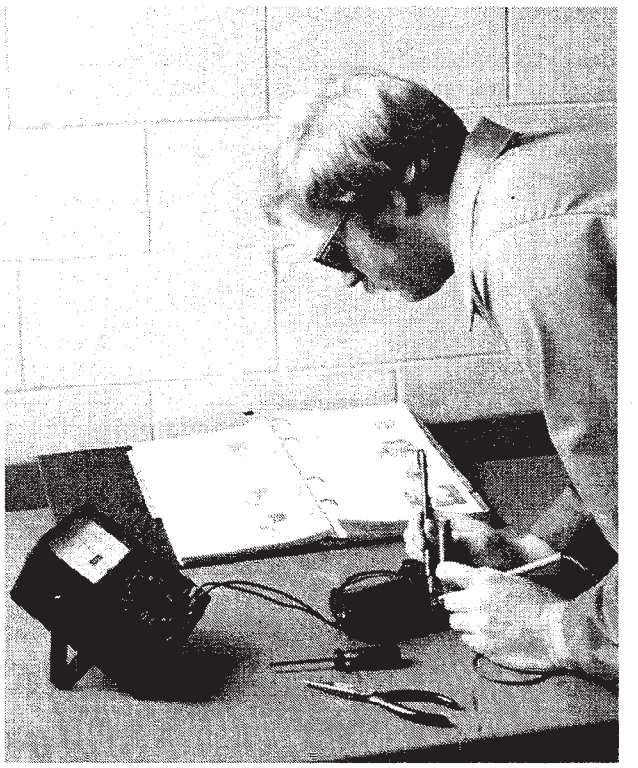
Diagnostic information presented with the most logical and easiest to isolate problems first to help you identify the majority of routine failures quickly.

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.



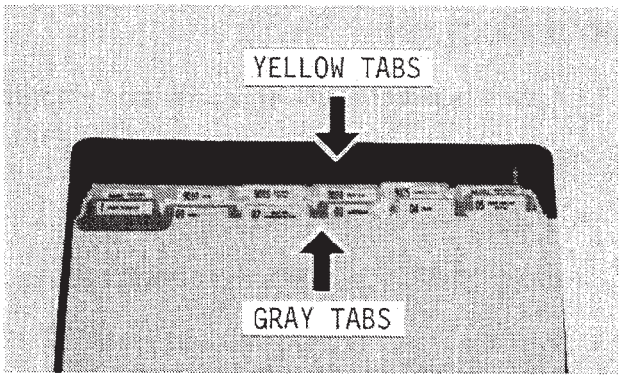
AB6;RW5560 053;INTRO3 071085

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

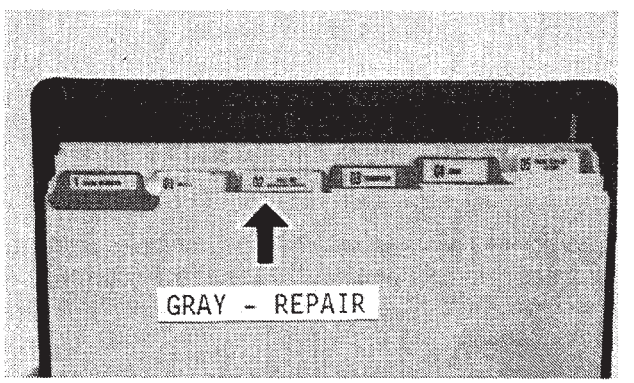
GRAY TAB SECTIONS

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.

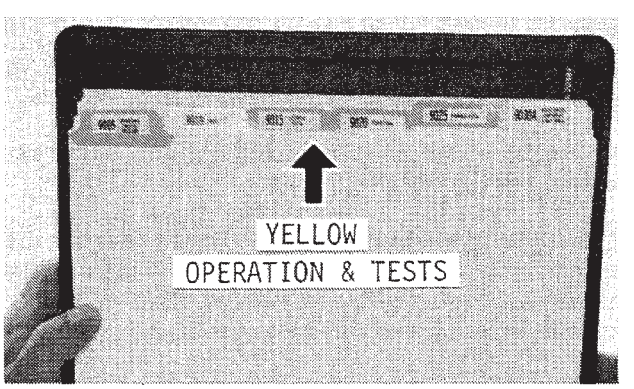


018;T5933AC T82;FLPD J 260785

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

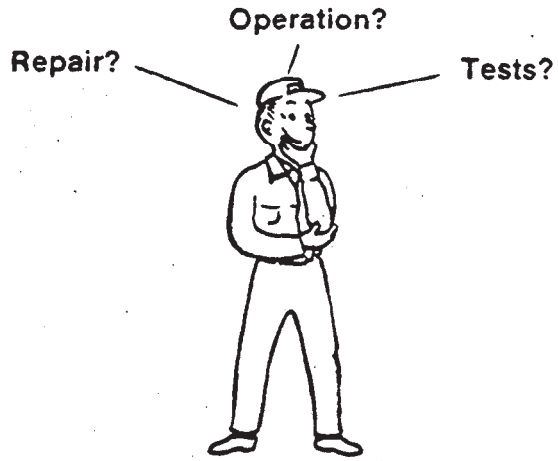
THREE-STEP PROCEDURE

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?

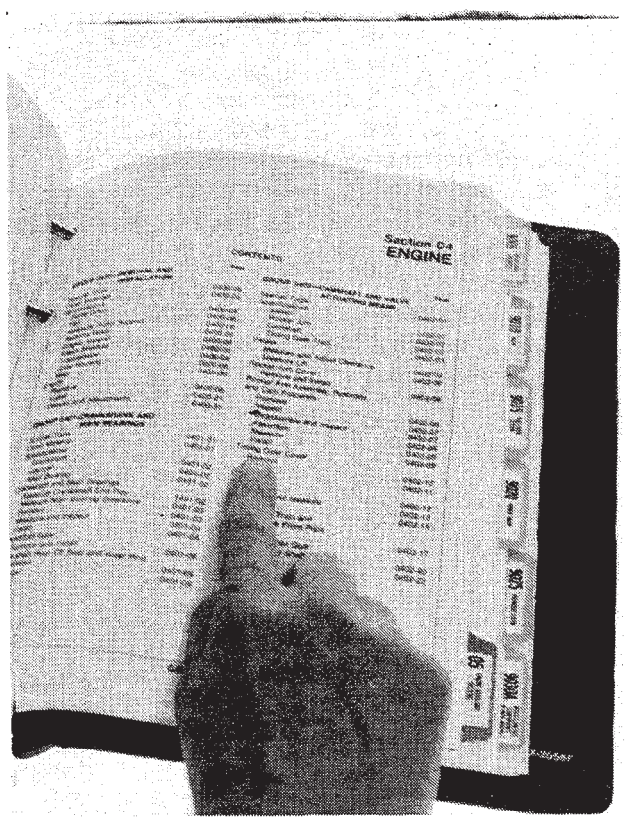
2. Go to the appropriate section tab:

   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.

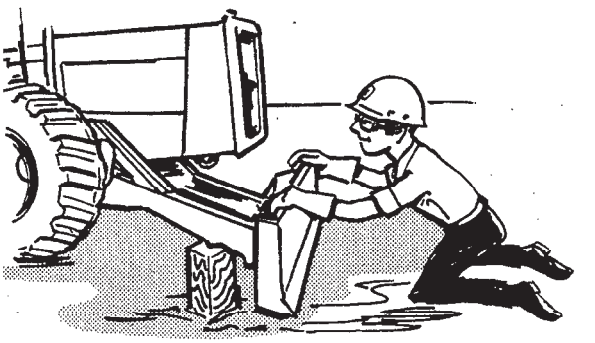
NEVER start engine while standing on ground. Start engine only from operator's seat, with transmission range lever in neutral, and park brake applied.

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;00I00I 05 150288

HANDLE STARTING FLUID SAFELY

Starting fluid is highly flammable.

Keep all sparks and flame away when using it. Keep starting fluid away from batteries and cables.

To prevent accidental discharge when storing the pressurized can, keep the cap on the container, and store in a cool, protected location.

Do not incinerate or puncture a starting fluid container.

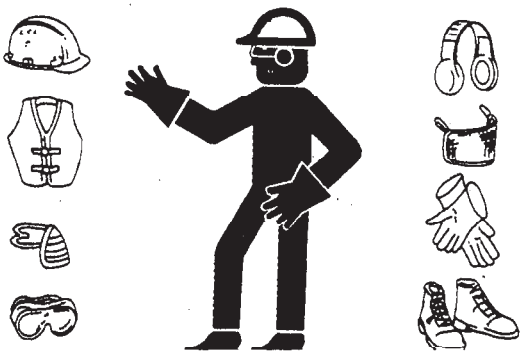
AB6;T6089A U 053;FIRE3 010288

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.



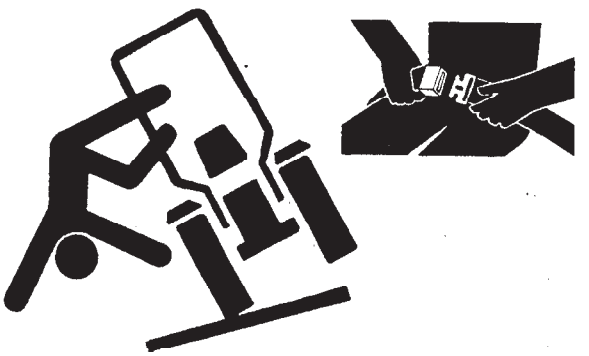
AB6;TS206 053;WEAR 230487

USE SEAT BELT PROPERLY

Use a seat belt when you operate with a roll-over protective structure (ROPS) to minimize chance of injury from an accident such as an overturn.

Do not use a seat belt if operating without a ROPS.

Do not remove roll-over protective structure (ROPS).



AB6;TS205 02T;05 J46 150188

AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before unhooking 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 to search for leaks.

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.

AB6;X9811 053;FLUID 180987

UNDERSTAND CORRECT MACHINE OPERATION AND SERVICE

Only qualified people should operate and service the machine.

Learn the location and purpose of all controls, instruments, indicators, and labels.

Be sure you understand a service procedure before you work on the machine.

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

If it is necessary to make checks with the engine running, ALWAYS USE TWO PEOPLE — with the operator at the controls, able to see the person doing the checking.

Be sure transmission shift lever is in neutral. Apply and lock park brake.

KEEP HANDS AWAY FROM MOVING PARTS.

8NA;T6073AO T82;BHSA C 030485

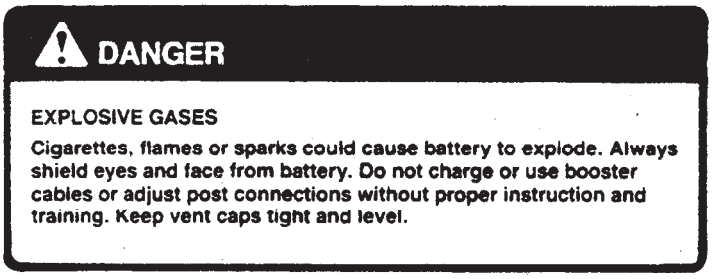
USE A LIFTING DEVICE FOR HEAVY COMPONENTS

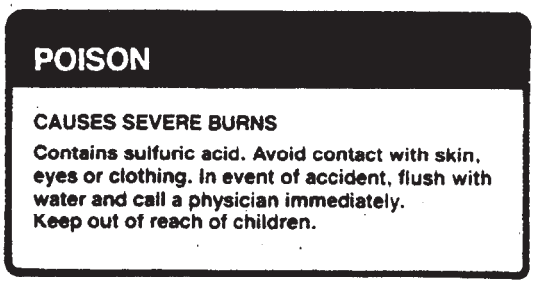
Lifting heavy components incorrectly can cause severe injury or machine damage.

Follow recommended procedure for removal and installation of components.

02T;05 K74 120188

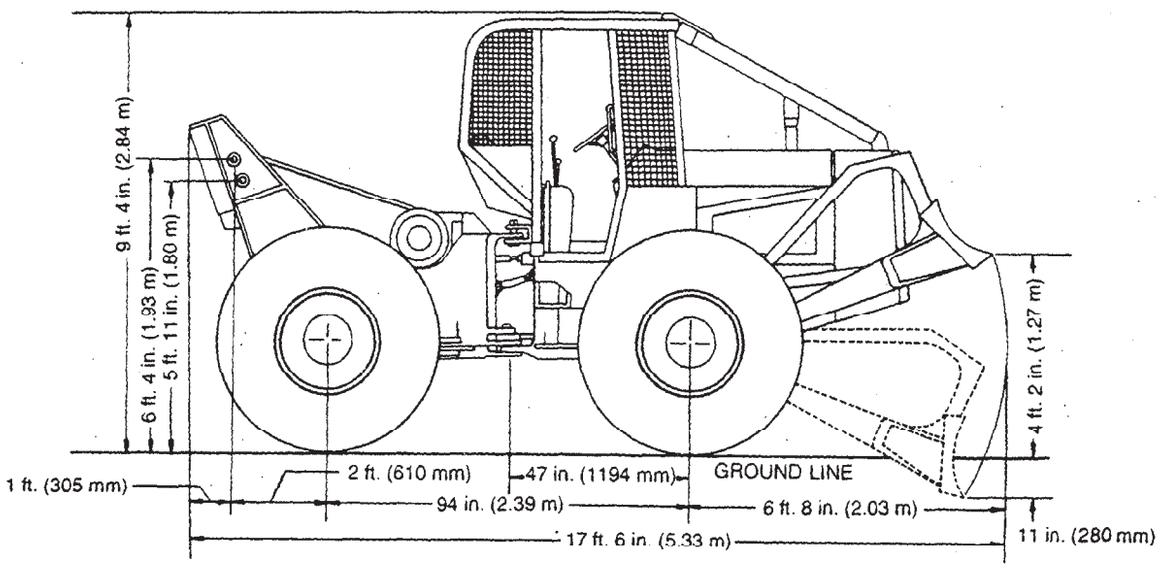
REPLACE SAFETY SIGNS





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

018;T6656CO 02T;05 K75 120188



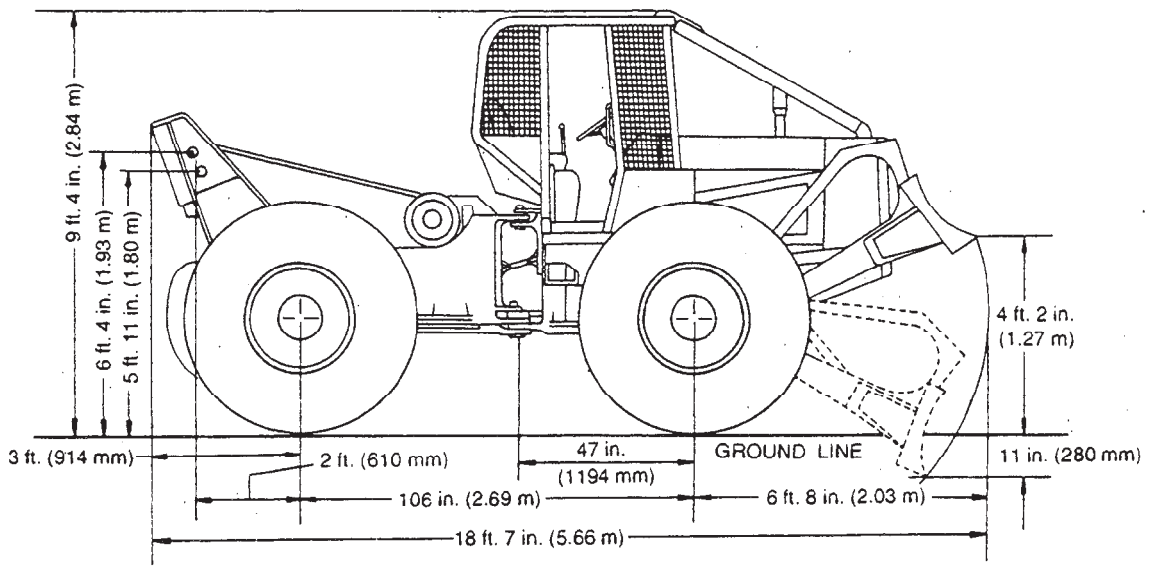
340D SKIDDER

Overall Width ..... 92.4 in. (2.35 m)
Ground Clearance (under differential case) ..... 18 in. (457 mm)
Turning Radius ..... 16 ft. 4 in. (4.97 m)
Turning Clearance Circle (with blade fully raised) ..... 34 ft. 5 in. (10.49 m)
Blade:
Width ..... 83 in. (2.11 m)
Height (ends) ..... 20 in. (508 mm)
Height (center) ..... 27 in. (686 mm)
Wheel Treads:
16.9-30 Tires ..... 74.0 in. (1.88 m)
18.4-26 Tires ..... 74.0 in. (1.88 m)
SAE Operating Weight w/blade ..... 13,469 lb. (6 121 kg)

Specifications and design subject to change without notice. Whenever applicable, specifications are in accordance with ICED and SAE Standards. Except where otherwise noted, these specifications are based on a unit equipped with Syncro-Range transmission, 18.4-26, 10 ply tires, and standard equipment.

Capacities:	U.S.	Liters
Fuel Tank	24 gal....	91
Cooling system	8 gal. ...	30.5
Engine oil, including filter	15 qts. ..	15
Transmission-hydraulic:		
Transmission (PIN 500782 thru 506153)...	6.4 gal. ..	24 L
Transmission (PIN 506216 and above) ...	4.5 gal. ..	17 L
System (PIN 500782 thru 506153)	10.8 gal. .	41 L
System (PIN 506216 and above)	9 gal. ...	34 L
Front differential	9 gal. ...	34
Rear differential	4.5 gal. ..	17
Winch	7 qts. ...	6.8

87A:T5910AL T82:SKSP A 040388



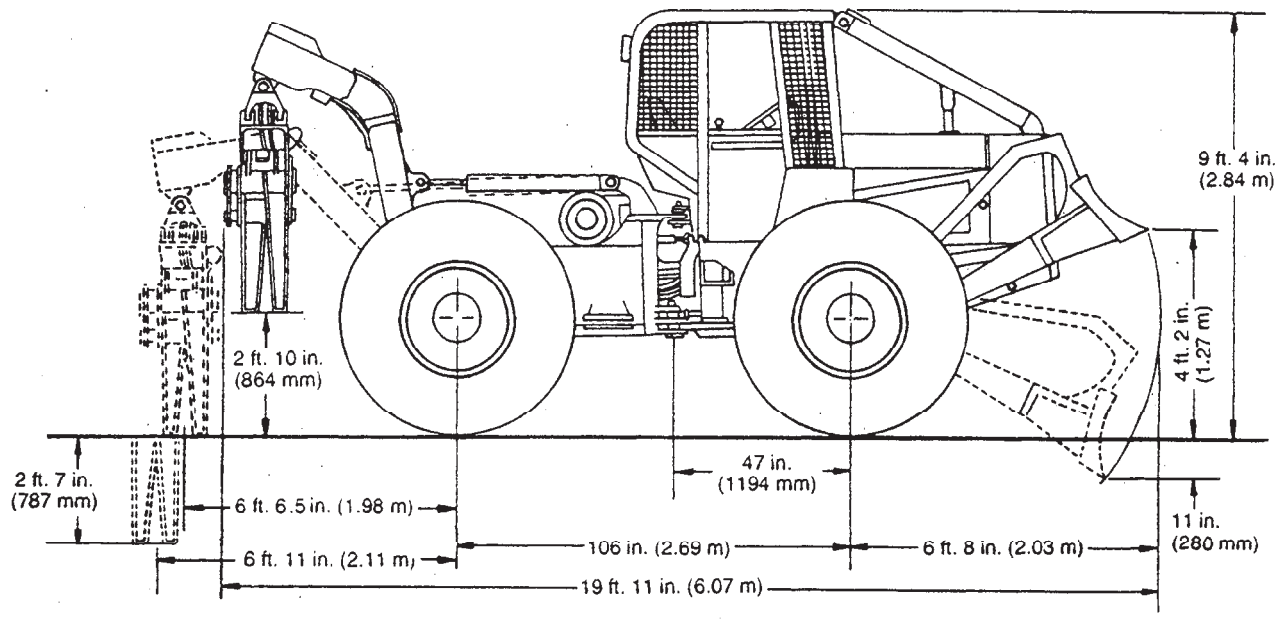
440D SKIDDER

Overall Width	94 in. (2.39 m)
Ground Clearance (under differential case)	18 in. (457 mm)
Turning Radius	16 ft. 11 in. (5.16 m)
Turning Clearance Circle (with blade fully raised)	34 ft. 10 in. (10.60 m)
Blade:	
Width	83 in. (2.11 m)
Height (ends)	20 in. (508 mm)
Height (center)	27 in. (686 mm)
Wheel Treads:	
16.9-30 Tires	76.0 in. (1.93 m)
18.4-26 Tires	76.0 in. (1.93 m)
18.4-34 Tires	76.5 in. (1.94 m)
23.1-26 Tires	82.0 in. (2.08 m)
28.1-26 Tires	85.4 in. (2.17 m)
68/34-26 Tires	85.4 in. (2.17 m)
SAE Operating Weight	15,090 lb (6845 kg) with blade 14,250 lb (6464 kg) without blade

Capacities:	**U.S.**	**Liters**
Fuel tank	41 gal.	155.8
Cooling system	8 gal.	30.3
Engine oil, including filter	15 qt.	14.2
Transmission-hydraulic:		
Transmission (PIN 500782 thru 506153)	6.4 gal.	24 L
Transmission (PIN 506216 and above)	4.5 gal.	17 L
System (PIN 500782 thru 506153)	10.8 gal.	41 L
System (PIN 506216 and above)	9 gal.	34 L
Front differential	9 gal.	34.1
Rear differential	4.5 gal.	17.0
Winch	7 qt.	6.8

Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with ICED and SAE Standards. Except where otherwise noted, these specifications are based on a unit equipped with Syncro-Range transmission, 18.4-26, 10-ply tires and standard equipment.

87A;T5910AM T82;SKSP B 030388



448D GRAPPLE SKIDDER

Overall Width	94 in. (2.39 m)
Ground Clearance (under differential case)	18 in. (457 mm)
Turning Radius	17 ft. 5 in. (5.31 m)
Turning Clearance Circle (with blade fully raised)	34 ft. 10 in. (10.60 m)
Maximum Grapple Opening	75 in. (1.91 m)
Blade:	
Width	83 in. (2.11 m)
Height (ends)	20 in. (508 mm)
Height (center)	27 in. (686 mm)
Wheel Treads:	
16.9-30 Tires	76.0 in. (1.93 m)
18.4-26 Tires	76.0 in. (1.93 m)
18.4-34 Tires	76.5 in. (1.94 m)
23.1-26 Tires	82.0 in. (2.08 m)
28.1-26 Tires	85.4 in. (2.17 m)
68/34-26 Tires	85.4 in. (2.17 m)
SAE Operating Weight	16,886 lb. (7659 kg)

Capacities:	**U.S.**	**Liters**
Fuel tank	41 gal.	155.8
Cooling system	8 gal.	30.3
Engine oil, including filter	15 qt.	14.2
Transmission-hydraulic:		
Transmission (PIN 500782 thru 506153)	6.4 gal.	24 L
Transmission (PIN 506216 and above)	4.5 gal.	17 L
System (PIN 500782 thru 506153)	17.8 gal.	67 L
System (PIN 506216 and above)	16 gal.	60 L
Front differential	9 gal.	34.1
Rear differential	9 gal.	34.1
Winch	7 qt.	6.8

Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with ICED and SAE Standards. Except where otherwise noted, these specifications are based on a unit equipped with Syncro-Range transmission, 18.4-26, 10-ply tires and standard equipment.

87A;T5910AN T82;SKSP C 030388

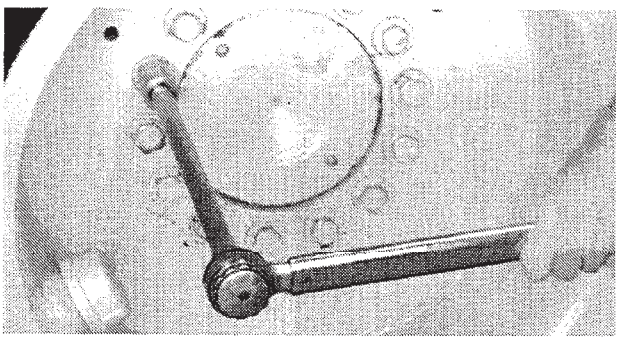
HARDWARE TORQUE SPECIFICATIONS

Check cap screws and nuts to be sure they are tight. If hardware is loose, tighten to torque shown on the following charts unless a special torque is specified.

T82;SKMA AT 270286

TIGHTEN WHEEL CAP SCREWS

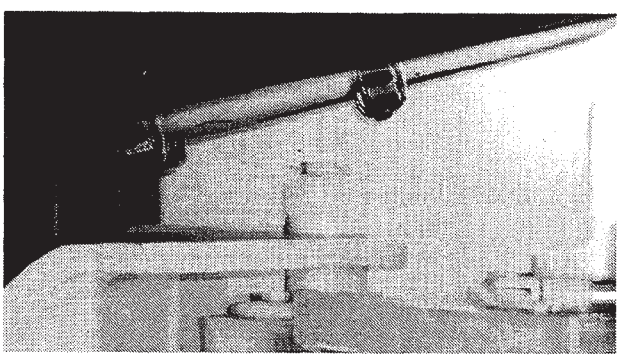
Every 100 to 250 hours, tighten wheel cap screws to 300 lb-ft (407 N·m).



87A;T85186 T82;SKMA M 030388

TIGHTEN UPPER PIVOT PIN

Annually or every 1000 hours, tighten upper pivot pin self-locking nut to 1000 lb-ft (1350 N·m).



87A;T85187 T82;SKMA N 030388

HARDWARE TORQUE VALUES

NOTE: Torque wrench tolerance is ± 10 per cent of specified torque.

Customary Hardware

Cap Screw Size-Inches	Grade B lb-ft.	Grade B (N-m)	Grade D lb-ft.	Grade D (N-m)	Grade F lb-ft.	Grade F (N-m)
1/4	6	(8)	10	(14)	14	(19)
5/16	10	(14)	20	(27)	27	(37)
3/8	20	(27)	35	(47)	50	(68)
7/16	30	(40)	55	(75)	80	(108)
1/2	45	(60)	85	(115)	120	(163)
9/16	70	(95)	120	(160)	170	(230)
5/8	95	(130)	165	(225)	235	(320)
3/4	165	(225)	300	(405)	420	(570)
7/8	170	(230)	450	(610)	675	(915)
1	255	(345)	720	(975)	1015	(1375)
1-1/8			900	(1220)	1430	(1940)
1-1/4			1250	(1700)	2025	(2750)

Seating Torque Values for Set Screws

INCH SCREWS

Screw Size	Seating Torque (Lb-in.)	Seating Torque (Nm)
5	9	1
6	9	1
8	20	2
10	33	4
1/4	87	10
5/16	165	19
3/8	290	33
7/16	430	49
1/2	620	70
9/16	620	70
5/8	1225	138
3/4	2125	240

METRIC SCREWS

Screw Size	Seating Torque (Nm)
M3	0.9
M4	2.5
M5	5.0
M6	8.5
M8	20
M10	40
M12	65
M16	160
M20	310
M24	520

018;T6603CK 04T;90 K64. 030987

METRIC HARDWARE TORQUE CHART

NOTE: Torque wrench tolerance is ± 10 percent of specified torque.

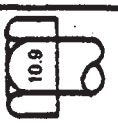
Metric Standard Thread

GRADE SIZE	8.8		10.9	
	Nm	LB FT	Nm	LB FT
M3	1.5	1.0	2.0	1.5
M4	3.5	2.6	5.0	4
M5	7.0	5	10.0	7
M6	12	9	12	12.0
M8	28	20	40	30
M10	55	40	80	59
M12	95	70	140	100
M14	150	110	220	160
M16	235	170	350	260
M20	475	350	675	500
M24	825	610	1170	860
M30	1630	1200	2320	1710
M36	2850	2100	4060	3000

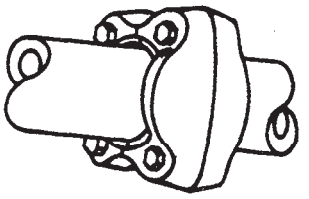
1 Nm = .7376 (lb-ft)

For 9.8 fasteners, use 8.8 torque.

Head Markings - Bolts are marked as shown and with a letter to identify the manufacturer.

PROPERTY CLASS			
8.8		10.9	
STANDARD	OPTIONAL	STANDARD	OPTIONAL
			

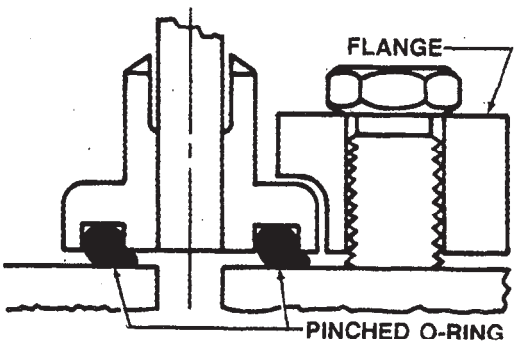
SAE FOUR BOLT FLANGE FITTING SERVICE RECOMMENDATIONS



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..
1/2	5/16 - 18 UNC	20	31	(15)	(23)
3/4	3/8 - 16 UNC	28	54	(21)	(40)
	M10 10.9	58	88	(43)	(65)
1	3/8 - 16 UNC	37	54	(27)	(40)
	M12 10.9	104	156	(77)	(115)
1-1/4	7/16 - 14 UNC	47	85	(35)	(63)
1-1/2	1/2 - 13 UNC	62	131	(46)	(97)
2	1/2 - 13 UNC	73	131	(54)	(97)
2-1/2	1/2 - 13 UNC	107	131	(79)	(97)
3	5/8 - 11 UNC	158	264	(117)	(195)
3-1/2	5/8 - 11 UNC	158	264	(117)	(195)
4	5/8 - 11 UNC	158	264	(117)	(195)
5	5/8 - 11 UNC	158	264	(117)	(195)

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.

018;T6575AG, T6561AG 04T;90 K68. 251187

SERVICE RECOMMENDATIONS FOR 37° FLARE AND 30° CONE SEAT CONNECTORS

1. Inspect the flare and the flare seat. They must be free of dirt or obvious defects.

2. Defects in the tube flare cannot be repaired. Overtightening a defective flared fitting will not stop leaks.

3. Align the tube with the fitting before attempting to start the nut.

4. Lubricate the male threads with hydraulic fluid or petroleum jelly.

5. Index angle fittings and tighten by hand.

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

STRAIGHT FITTING OR SPECIAL NUT TORQUE

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%.

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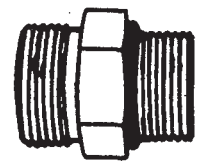
SERVICE RECOMMENDATIONS FOR O-RING BOSS FITTINGS

Straight Fitting

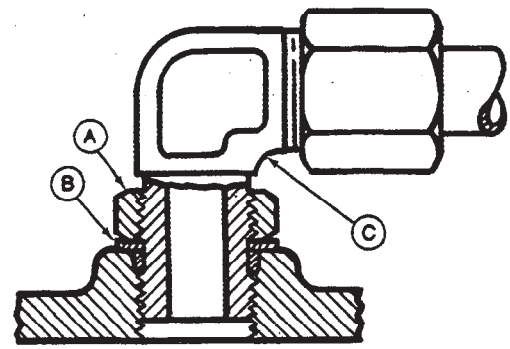


1. Inspect O-ring boss seat for dirt or defects.

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 valve shown on chart.

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.

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%.

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SERVICE RECOMMENDATIONS FOR FLAT FACE O-RING SEAL FITTINGS

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 male threads with petroleum jelly.

4.Push O-ring into the groove.

5. Index angle fittings and tighten by hand.

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

FLAT FACE O-RING SEAL FITTING TORQUE (1)

			O-Ring Face Seal End			O-Ring Boss End	
Nominal Tube O.D.		Dash	Thread Size	Swivel Nut Torque		Bulkhead Nut Torque	
mm	in.	Size	in.	Nm	lb-ft	Nm	lb-ft
4.76	0.188	-3	----------	-----	-----	-----	-----
6.35	0.250	-4	9/16-18	16	12	5.0	3.5
7.94	0.312	-5	----------	-----	-----	-----	-----
9.52	0.375	-6	11/16-16	24	18	9.0	6.5
12.70	0.500	-8	13/16-16	50	37	17.0	12.5
15.88	0.625	-10	1-14	69	51	17.0	12.5
19.05	0.750	-12	1 3/16-12	102	75	17.0	12.5
22.22	0.875	-14	1 3/16-12	102	75	17.0	12.5
25.40	1.000	-16	1 7/16-12	142	105	17.0	12.5
31.75	1.250	-20	1 11/16-12	190	140	17.0	12.5
38.10	1.500	-24	2-12	217	160	17.0	12.5

1. Tolerance: +15 −20%

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FUEL SPECIFICATIONS

Use ONLY clean, high-quality fuel.

Use Grade No. 2-D fuel above 4°C (40°F).

Use Grade No. 1-D fuel below 4°C (40°F).

Use Grade No. 1-D fuel for all air temperatures at altitudes above 1 500 m (5000 ft).

IMPORTANT: If fuel sulfur content exceeds 0.5 per cent, change the engine oil at one-half the normal interval.

Use fuel with less than 1.0 per cent sulfur. If possible, use fuel with less than 0.5 per cent sulfur.

For maximum filter life, sediment and water should not be more than 0.10 per cent.

The cetane number should be 40 minimum. If you operate your machine where air temperatures are normally low or where altitudes are high, you may need fuel with a higher cetane number.

Cloud Point—For cold weather operation, cloud point should be 6°C (10°F) below lowest normal air temperature.

02T;45 C25. 020487

FUEL STORAGE

NOTE: Diesel fuels stored for a long time may form gum or bacteria and plug filters.

Keep fuel in a clean container in a protected area. Water and sediment must be removed before fuel gets to the engine. Do not use de-icers to remove water from fuel. Do not depend on fuel filters to remove water.

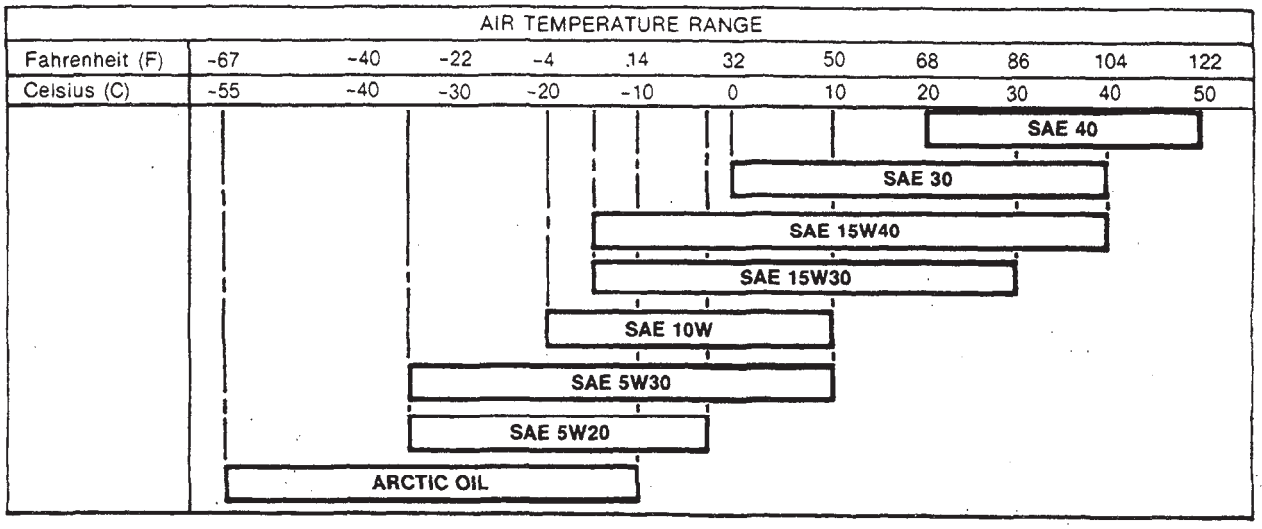
If possible, install a water separator at the storage tank outlet. (See your John Deere dealer).

IMPORTANT: Keep all dirt, scale, water or other foreign material out of fuel.

Store fuel drums on their sides.

02T;45 K8. 180387

ENGINE OIL



Depending upon the expected air temperature range between oil changes, use oil viscosity shown on the temperature chart above.

Additives are not required nor recommended.

John Deere TORQ-GARD SUPREME® engine oil is recommended because it is a specifically balanced formulation to provide maximum engine life. It provides excellent protection against mechanical wear, carbon deposits, and lacquer formation, plus providing superior cold weather starting performance.

If other oils are used, they must have one of the following specifications:

Oil Specification	Use
API Service: CD/SF, CD/SE, CD/SD, CD/SC, or MIL-L-2104C, MIL-L-2104D	Recommended
*API Service CC/SF, CC/SE, CC/SD, CC/SC or *MIL-L-46152, *MIL-L-46152B	For SAE 5W20, SAE 5W30 and arctic oil only, use if recommended oil is not available.
*MIL-L-46167A	For arctic oil only

**Change oil at one-half the normal interval.*

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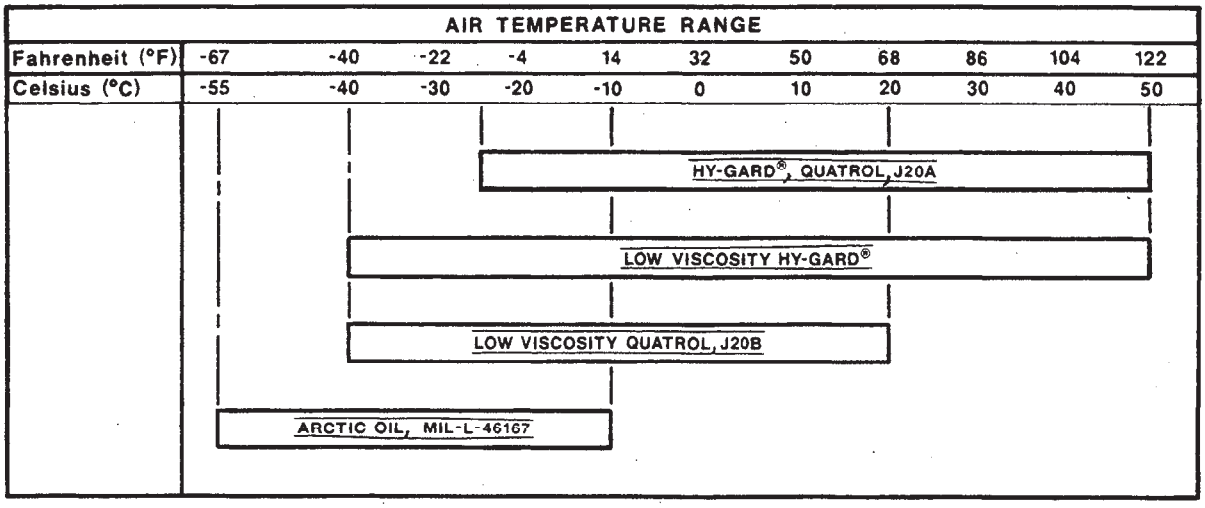
TRANSMISSION-HYDRAULIC, PARK BRAKE, DIFFERENTIAL, AND WINCH OIL



Depending on the expected air temperature range between oil changes, use oil viscosity shown on the chart above.

John Deere HY-GARD® transmission and hydraulic oil is recommended.

You may also use QUATROL® oils, which are oils that meet John Deere standards, or other oils meeting John Deere Standard JDM J20A or J20B.

Oils meeting MIL-L-46167 may be used as arctic oil.

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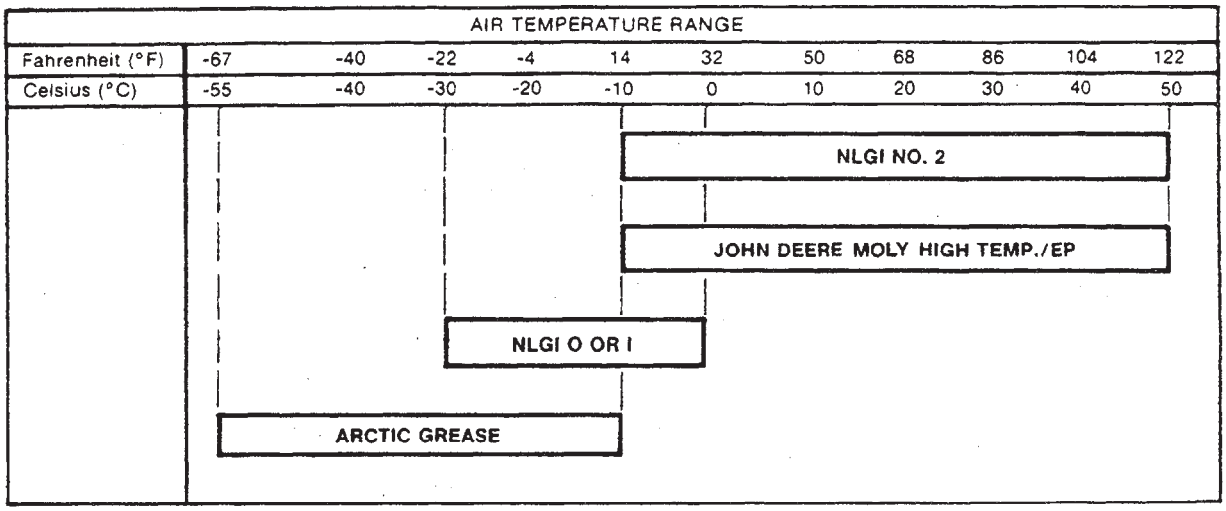
GREASE



Depending on the expected air temperature range during use, use grease shown on chart above.

Greases recommended are:

John Deere Moly High Temperature/EP Grease (preferred).

SAE Multipurpose Grease with Extreme Pressure (EP) performance and containing 3 to 5 per cent molybdenum disulfide (preferred).

SAE multi-purpose EP grease.

Grease meeting MIL-G-10924C specifications may be used as arctic grease.

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COOLANT REQUIREMENTS

Coolant solutions used in John Deere Engines must meet the following basic requirements:

Provide for adequate heat transfer.

Provide a corrosion—resistant environment within the cooling system.

Prevent formation of scale or sludge deposits in the cooling system.

Be compatible with cooling system hose and seal materials.

Provide adequate freeze protection during cold weather operation and boil-over protection in hot weather.

NOTE: In some areas outside United States and Canada, John Deere Engine Cooling Fluid is marketed for use in the engine cooling system. It protects the engine from corrosion and freezing down to −37°C (−35°F).

John Deere Engine Cooling Fluid is ready to use without dilution or mixing. Consult parts catalog and check for local availability. Where available, the cooling fluid is the preferred coolant to use.

02T;45 K32 231187

To meet the requirements, the coolant has to consist of high quality water, the correct type antifreeze, and adequate inhibitors.

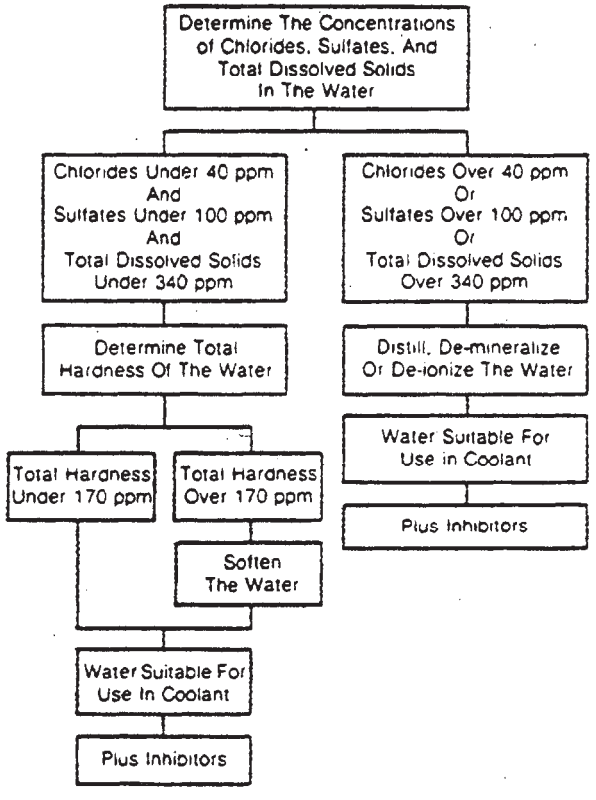
1. Water Quality

   Preferred—Distilled or deionized

   Acceptable—Softened to 170 Parts Per Million (10 Grains per Gallon)

WATER QUALITY SPECIFICATIONS

	Parts Per Million Max.	Grains per Gallon Max.
Chlorides	40	2.5
Sulfates	100	5.8
Total Dissolved Solids	340	20
Total Hardness	170	10



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2. Antifreeze

Must be ethylene glycol type, contain not more than 0.1% anhydrous metasilicate, and meet General Motors Performance Specification GM1899M, or be formulated to Specification GM6038M or an equivalent.

NOTE: Some types of ethylene glycol antifreeze commonly available on the open marked are intended for automotive use. These products are often labeled for use in aluminum engines and usually contain more than 0.1% anhydrous metascilicate. Use of this type antifreeze can cause a gel-like deposit to form that reduces heat transfer and coolant flow. When wet, the gel becomes the same color as the coolant. When dry, it is a white, powerdery deposit. Check container label or consult with antifreeze supplier before using.

Solutions containing 50—67% antifreeze are recommended.

Antifreeze solutions should be used year—round for freeze protection, boil—over protection, and stable environment for seals and hoses. Using antifreeze during warm weather is recommended.

Never use methyl alcohol base antifreeze.

Never use methoxy propanol antifreeze. Damage can occur to rubber seals on cylinder liners which are in contact with coolant.

If engine is equipped with a coolant filter/conditioner, do not use an antifreeze containing methoxy propanol or stop leak additive. These products may clog the coolant filter.

3. Inhibitors

Non—chromate inhibitors must be used.

NOTE: John Deere RE23182 Inhibitor is a nonchromate inhibitor and is recommended for use in all applications not having a coolant filter. If engine is equipped with a John Deere Coolant Filter Conditioner, the correct inhibitors are contained in the filter. With both inhibitor systems, follow service recommendation printed on the container.

Do not use soluble oil.

Always follow the supplier recommendations printed on the container. Over-inhibiting antifreeze solutions can cause silicate-dropout. When this happens, a gel-type deposit is created which retards heat transfer and coolant flow.

NOTE: John Deere Liquid Coolant Conditioner does not protect against freezing.

GENERAL RECOMMENDATIONS

Always maintain engine coolant at correct level.

CAUTION: Use extreme care when removing radiator filler cap. Remove cap only when coolant temperature is below the boiling point.

Coolant make-up should be mixed at same concentrations as original coolant, including inhibitors.

In tropical areas where antifreeze or John Deere Cooling fluid is not available, use the liquid coolant conditioner (or coolant filter conditioner) with water meeting the water quality specifications.

02T;45 K34 231187

COLD WEATHER OPERATION

Additional information on cold weather operation is available from your John Deere Industrial Region office.

T82;TLPD U 270183

ALTERNATIVE LUBRICANTS

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

T82;TLPD Y 270183

LUBRICANT STORAGE

Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contamination. Store drums on their sides.

T82;BHFL J. 230387

PREDELIVERY INSPECTION (PDI)

Do the predelivery services shown on the inspection checklist before you deliver the machine to the customer. The checklist is in the back of the Operator's Manual

06T;PIM C1 090586

AFTER-SALE INSPECTION (ASI)

Do the after-sale services shown on the inspection checklist during the warranty period after 50—100 hours of machine operation. The after-sale checks are also found on the inspection checklist in the back of the Operator's Manual

Terms of this inspection are outlined on the customers John Deere Delivery Receipt.

06T;PIM C2 090586

PLANNED INSPECTION PROGRAM I (PIP I)

When you deliver the machine, explain to the customer the advantages of the Planned Inspection Program I (PIP I):

Top production from the machine
Minimum downtime
Lower long-term operating costs
Overall greater satisfaction

Prepare a contract with the customer specifying the number of field inspections by your service technician and the cost.

Use the PIP I Inspection Checklists in this group as a guide in preparing the contract.

06T;PIM C3 140486

PLANNED INSPECTION PROGRAM II (PIP II)

PIP II is a continuation of PIP I.

This program tests critical machine systems and will enable the customer to keep the machine in the best possible condition.

Prepare a contract with the customer specifying the number of field inspections by your service technician and the cost. Use the PIP II Inspection Checklist in this group as a guide in preparing the contract.

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USING THE CHECKLISTS

Do an inspection procedure only if there is a "box" behind the procedure in the service column which you are following. Mark the box with an "x" when the procedure is done.

For specific instructions on how to do each procedure, refer to the operator's manual or the technical manual.

If a box is not marked, write an explanation in the comments column. For example:

If engine oil level is low, note amount of oil needed to fill crankcase.

If the machine is not lubricated according to the Periodic Maintenance Chart, note this.

When the inspection is done, put the checklist in the customer's file. Use the same checklist for additional inspections.

06T;PIM C5 120586

DELIVERY SERVICE

Use the operator's manual as a guide. Discuss the following points thoroughly with the customer:

The importance of safety.

Controls and instruments.

All functions of the hydraulic system.

How to start and stop the engine.

The importance of the break-in period.

The importance of lubrication and periodic maintenance.

Have the owner sign the Delivery Receipt.

Give the owner the operator's manual.

T82;TLPD P 040187

JOHN DEERE 340D, 440D, 448D SKIDDERS PRE-DELIVERY INSPECTION (PDI), AFTER-SALE INSPECTION (ASI)

MACHINE NUMBERS

Product Identification Number _____ Transmission Serial Number _____

Engine Serial Number _____ Winch Serial Number _____

PRE-DELIVERY INSPECTION
(Required Before Delivery of Machine to Owner)

Delivered by _____ Owner's Name _____

Dealer _____ Owner's Address _____

Date _____ City _____ State _____ Zip _____

AFTER-SALE INSPECTION
(Required During 50 to 100 Hours of Operation)

Machine Hours _____ Owner's Name _____

Inspected By _____ Owner's Address _____

Inspector's Signature _____ City _____ State _____ Zip _____

Dealership _____ Owner's Signature _____

05T;CL R1 120288

Procedure	INSPECTION COMPLETED PDI OK	ASI OK	Comments
1. Air cleaner	☐	☐	
2. Air intake hoses	☐	☐	
3. Alternator-fan belt tension	☐	☐	
4. Engine oil level	☐	☐	
5. Drain fuel filter	☐	☐	
6. Engine coolant level	☐	☐	
7. Drain fuel tank sump	☐	☐	
8. Winch oil level	☐	☐	
9. Differential oil level	☐	☐	
10. Check tire pressure	☐	☐	
11. Tighten wheel cap screws	☐	☐	
12. Check hardware tightness	☐	☐	
13. Lubricate grease fittings	☐	☐	
14. Check batteries	☐	☐	
15. Hydraulic oil filters (448D)		☐	
16. Transmission-hydraulic oil filter		☐	
17. Transmission-hydraulic oil level	☐	☐	
18. Neutral start system	☐	☐	
19. Gauges and indicators	☐	☐	
10. Engine speeds	☐	☐	
21. Transmission shifting	☐	☐	
22. Power steering	☐	☐	

05T;CL R2 120288