

# 60 Skid-Steer Loader



## TECHNICAL MANUAL

### 60 Skid-Steer Loader

TM1185 (01APR81) English

John Deere  
Lawn & Grounds Care Division  
TM1185 (01APR81)

LITHO IN U.S.A.  
ENGLISH





# 60 SKID-STEER LOADER

Technical Manual  
TM-1185 (Apr-81)

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*(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).*

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## INTRODUCTION

This technical manual contains service and maintenance information for the John Deere 60 Skid-Steer Loader.

The manual is divided into sections. Each section pertains to a certain component or operational system of the loader. The information is divided into groups within each section.

All sections of this technical manual should be carefully studied by the service technician. Much basic information such as the principles of 4-cycle engine operation, carburetion and ignition have been omitted. Such information can be found in any good library and is recommended reading for the new service technician before consulting this manual for service procedures.

Emphasis is placed on diagnosing malfunctions, analysis and testing. Diagnosing malfunctions lists possible troubles, their causes and how to correct them. Under specific components these troubles are analyzed to help the service technician understand what is causing the problem so it can be corrected rather than just replace parts and have the same problem keep recurring.

Specifications are found at the beginning of each Section for easy reference.



**This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.**

Metric equivalents have been included, where applicable, throughout this technical manual.

### FOR YOUR CONVENIENCE

Vertical lines appear in the margins of many of the pages. These lines identify new material and revised information that affects specifications, procedures, and other important instructions.

**Thanks very much for your reading,  
Want to get more information,  
Please click here, Then get the complete  
manual**

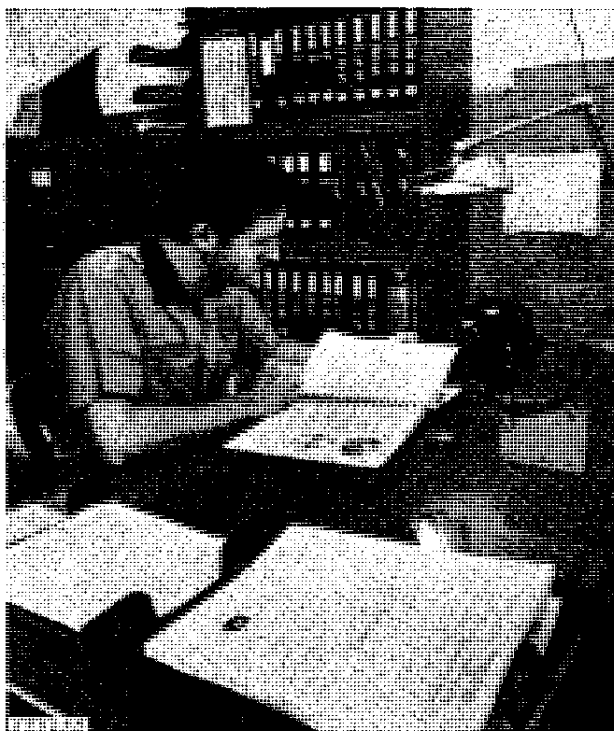
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## INTRODUCTION



*Use FOS Manuals for Reference*

This technical manual is part of a twin concept of service:

- **FOS Manuals — for reference**
- **Technical Manuals — for actual service**

The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

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

*Technical Manuals* are concise on-the-job service guides containing only the vital information needed for a specific machine.



When a service technician should refer to a FOS Manual for more information, a FOS symbol like the one at the left is used in the TM to identify the reference.



*Use Technical Manuals for Actual Service*

Some features of this technical manual:

- *Table of contents at front of manual*
- *Exploded views showing parts relationship*
- *Photos showing service techniques*
- *Specifications grouped for easy reference*

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 whenever in doubt about correct service procedures or specifications.

Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.

### SI UNITS OF MEASURE

Because John Deere sells its products worldwide, U.S. units of measure are shown with their respective Metric equivalents throughout this technical manual. These equivalents are the SI (International System) Units of Measure.



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## Group 5 Specifications

### ENGINE

	Serial No. ( -120,000)	Serial No. (120,001- )
Make.....	Kohler	Kohler
Model.....	K-312S	KT17QS
Cylinders.....	One	Two
Cycle.....	Four	Four
Bore.....	3.50 in. (88.9 mm)	3.125 in. (79.2 mm)
Stroke.....	3.25 in. (82.5 mm)	2.75 in. (69.8 mm)
Displacement.....	31.27 cu. in. (512 cm <sup>3</sup> )	42.18 cu. in. (691.4 cm <sup>3</sup> )
Horsepower*.....	14 @ 3600 rpm (10.44 kW)	17 @ 3400 rpm (12.58 kW)
Speeds		
Idler.....	1300 rpm	1200 rpm
High (No Load).....	3600 rpm	3400 rpm

\*Horsepower rating is established by engine manufacturer in accordance with Standard International Combustion Institute procedure. It is corrected to 60°F and 29.92 inches hg barometric pressure. Laboratory test engines are equipped with an air cleaner and muffler.

### ELECTRICAL SYSTEM

	Serial No. ( -120,000)	Serial No. (120,001- )
Battery, John Deere.....	AM30094 or TY6024	AM31186
Volts.....	12V      12V	12V
BCI Group.....	U1      U1	22F
Cold Cranking Amps @ 0°F (17.7°C).....	160      200	260
Reserve Capacity @ 25 amps.....	23      32	50
Charging Capacity.....	15 amps	15 amps
System Polarity.....	Negative Ground	Negative Ground
Spark Plug.....	Champion RH-10 or equivalent	Champion RBL15Y or equivalent
Spark Plug Gap.....	0.025 in. (0.64 mm)	0.025 in. (0.64 mm)
Breaker Point Gap.....	0.020 in. (0.508 mm)	0.020 in. (0.508 mm)
Ignition Timing.....	20° BTDC ("S" mark on flywheel)	Align "S" mark on flywheel

### TRAVEL SPEEDS

Forward or Reverse.....	0 to 4.2 mph
Turning radius.....	360 Degrees in its own length

### DRIVE CHAINS

Long chain.....	74 links, No. 60 roller chain
Short chain.....	50 links, No. 60 roller chain

**HYDRAULIC SYSTEM**

Pump	Serial No. ( -020,303)	Serial No. (020,304- )
Type.....	Borg Warner fixed displacement gear pump	Webster Electric fixed displacement gear pump
Displacement.....	0.58 in. <sup>3</sup> /rev. (9.50 cm <sup>3</sup> /rev.)	0.58 in. <sup>3</sup> /rev. (9.50 cm <sup>3</sup> /rev.)
System Relief.....	1500 psi (10 342 kPa) (103.5 bar)	
Control Valve		
Main (Open Center).....	Cessna, two-spool valve, foot-pedal operated	
Auxiliary (Open Center).....	Cessna, single-spool valve. foot-pedal operated	
Filter		
Serial No. ( -120,000).....	One 25 micron	
Serial No. (120,001- ).....	Mesh screen in reservoir	
Hydraulic Cylinders		
Lift (double acting)		
Bore diameter.....	2 in. (51 mm)	
Rod diameter.....	1 in. (25.4 mm)	
Stroke.....	22 in. (559 mm)	
Tilt (double acting)		
	Serial No. ( -020303)	Serial No. (020304- )
Bore diameter.....	2-1/2 in. (63.5 mm)	2 in. (50.8 mm)
Rod diameter.....	1-1/4 in. (31.8 mm)	1 in. (25.4 mm)
Stroke.....	13 in. (330.2 mm)	13-1/8 in. (333.4 mm)

**TIRES**

Size	Tire Inflation
5.70 x 12.....	30 psi (206.9 kPa) (2.1 bar)
23 x 8.5 x 12.....	35 psi (241.3 kPa) (2.4 bar)

**CAPACITIES**

	Serial No. ( -120,000)	Serial No. (120,001- )
Fuel tank.....	6 U.S. gallons (22.8 L)	5 U.S. gallons (18.9 L)
Engine lubrication oil.....	2 U.S. quarts (1.9 L)	3.5 U.S. pints (1.65 L)
Loader hydraulic system.....	18 U.S. gallons (68.5 L)	18 U.S. gallons (68.5 L)

## HYDROSTATIC SYSTEM

## Pump

Type.....Sunstrand variable displacement pump  
Displacement.....0 to 0.913 in.<sup>3</sup>/rev.  
(0 to 14.967 cm<sup>3</sup>/rev.)

## Motor

Type.....TRW-Ross fixed displacement gerota motor  
Displacement.....11.80 in.<sup>3</sup>/rev.  
(193.37 cm<sup>3</sup>/rev.)

**Maximum Operating Pressure.....3000 psi (20 685 kPa) (206.9 bar)**

### Charge Pump

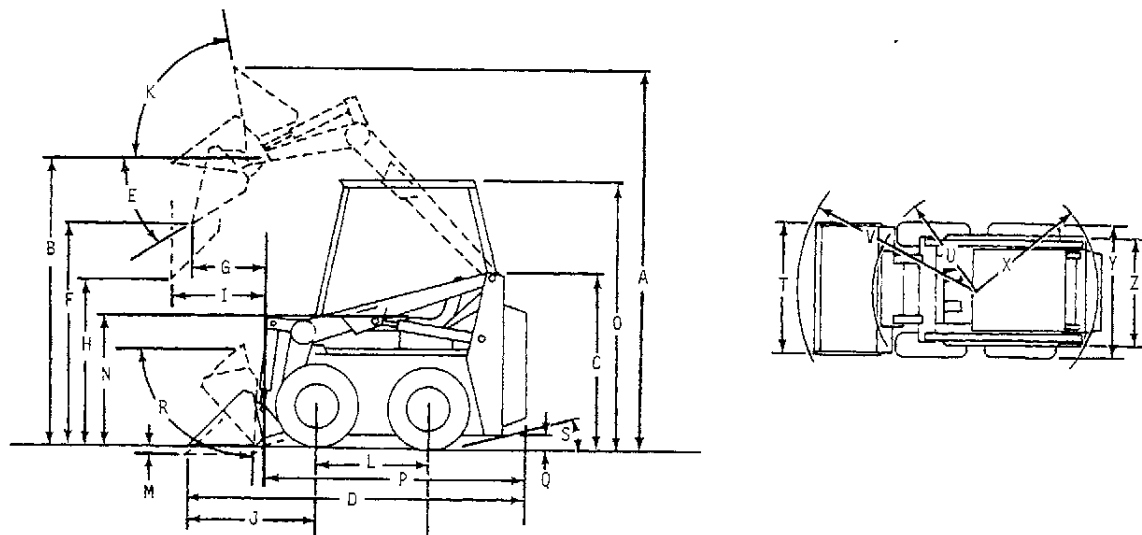
Type.....Sunstrand gear pump  
Displacement.....0.330 in.<sup>3</sup>/rev. (5.41 cm<sup>3</sup>/rev.)  
Charge pressure.....70 to 150 psi (483 to 1 034 kPa) (4.83 to 10.34 bar)

Filters.....Two 10 micron

## OPERATIONAL SPECIFICATIONS

	Serial No. (-120,000)	Serial No. (121,000- )
Tipping load w/35 in. (889 mm) bucket.....	1100 lbs (498.3 kg)	1200 lbs (544.8 kg)
Operating capacity (SAE).....	550 lbs. (249.4 kg)	600 lbs (272.4 kg)
Operating weight.....	1935 lbs (876.6 kg)	2076 lbs (942.5 kg)
Raising time w/full bucket.....	5.7 seconds	5.7 seconds
Lowering time.....	3.8 seconds	3.8 seconds
Dump time.....	2.8 seconds	2.8 seconds
Rollback time.....	1.9 seconds	1.9 seconds

## DIMENSIONAL SPECIFICATIONS



M27173

Fig. 1 — Dimensional Specifications

Specifications are in accordance with IEMC Standards.  
Dimensions are with 5.70-12 Tires and 35-Inch (889 mm) Earth Bucket.

A	Overall height (Lift arms raised).....	127 in. (3 226 mm)
B	Height to hinge pin (Maximum).....	97-3/4 in. (2 483 mm)
C	Overall height.....	51 in. (1 295 mm)
D	Overall length (with bucket).....	91-3/4 in. (2 330 mm)
E	Dump angle.....	34°
F	Dump height.....	77-3/4 in. (1 975 mm)
G	Reach at maximum height.....	15-1/2 in. (394 mm)
H	Specified height.....	49-1/2 in. (1 257 mm)
I	Reach (specified height).....	22 in. (559 mm)
J	Reach (bucket on ground).....	39-1/2 in. (1 003 mm)
K	Maximum rollback (fully raised).....	86°
L	Wheelbase.....	29-3/16 in. (741 mm)
M	Digging depth (above ground).....	3/4 in. (19 mm)
N	Height to seat.....	34-1/2 in. (876 mm)
O	Overall height (with operator guard).....	74-1/2 in. (1 892 mm)
P	Overall length (less bucket).....	68-1/2 in. (1 740 mm)
Q	Ground clearance.....	6-1/8 in. (156 mm)
R	Maximum grading angle (bucket).....	89°
S	Angle of departure.....	21°
T	Bucket width.....	35 in. (890 mm)
U	Clearance circle, front (less bucket).....	31 in. (787 mm)
V	Clearance circle, front (with bucket).....	56-7/8 in. (1 445 mm)
X	Clearance circle, rear.....	43-1/4 in. (1 098.6 mm)
Y	Overall width (less bucket).....	35-1/4 in. (895.4 mm)
Z	Tread (5.70-12 tires).....	29-1/4 in. (743 mm)

**BUCKET AND FORK SPECIFICATIONS**

Item	Width	Length	Capacity		Weight
			SAE Struck	SAE Heaped	
Earth Bucket	35 in. (890 mm)	_____	3.5 cu. ft. (0.10 m <sup>3</sup> )	4.5 cu. ft. (0.13 m <sup>3</sup> )	105 lbs. (47.63 kg)
Earth Bucket	44 in. (1 117.6 mm)	_____	4.5 cu. ft. (0.13 m <sup>3</sup> )	5.5 cu. ft. (0.15 m <sup>3</sup> )	120 lbs. (54.43 kg)
Utility Bucket	47 in. (1 193.8 mm)	_____	7 cu. ft. (0.20 m <sup>3</sup> )	9 cu. ft. (0.25 m <sup>3</sup> )	147 lbs. (66.68 kg)
Pallet Fork and Frame	38 in. (965.2 mm)	36 in. (914.4 mm)	_____	_____	220 lbs. (99.79 kg)
Utility Fork	39 in. (990.6 mm)	28 in. (711.7 mm)	_____	_____	155 lbs. (70.31 kg)
Utility Fork	35 in. (889 mm)	28 in. (711.7 mm)	_____	_____	141 lbs. (64.0 kg)



## Group 10

# LUBRICATION AND PERIODIC SERVICE

SERIAL NO. (        -120,000)

### LUBRICANTS

#### Engine Oil

If oil other than Torq-Gard® Supreme is used, it must conform to the following specifications:

Single Viscosity Oils	Multi-Viscosity Oils
API Service CD/SD MIL-L-2104C* Series 3*	API Service CC/SE, CC/SD or SD MIL-L-46152

Select oil viscosity depending on the highest expected prevailing temperature for the fill period.

Air Temperature	John Deere Torq-Gard Oil	Other Oils	
		Single Viscosity Oil	Multi-Viscosity Oil
Above 32°F (0°C)	SAE 30	SAE 30	Not recommended
-10°F to 32°F (-23°C to 0°C)	SAE 10W-20	SAE 10W	SAE 10W-30
Below -10°F (-23°C)	SAE 5W-20**	SAE 5W**	SAE 5W-20**

*\*As further assurance of quality, the oil should be identified as suitable for API Service Designation SD.*

*\*\*Some increase in oil consumption may be expected when SAE 5W-20 or SAE 5W oils are used. Check oil level more frequently.*

#### Hydraulic Fluid

Use John Deere All-Weather Hydrostatic Fluid or an equivalent Type "F" Automotive Automatic Transmission Fluid.

#### Greases

Use John Deere Multi-Purpose Lubricant or equivalent SAE multipurpose-type grease for all grease fittings.



## LUBRICATION



**CAUTION:** Stop engine before lubricating loader.

Replace missing grease fittings.

## SYMBOLS



Lubricate with John Deere Multi-Purpose Lubricant or an equivalent SAE multipurpose-type grease at the hourly intervals indicated on the symbols.



Lubricate periodically with John Deere PT508 or equivalent oil.

## LUBRICATION CHART

Component	5 Hours or Daily	Reference
1. Grapple Cylinder Pivot Points	Lubricate grease fittings.	See page 10-10-3.
2. Tilt Cylinder* and Quik-Tatch Pivot Points	Lubricate grease fittings.	See page 10-10-3.
3. Lift Arm and Cylinder Pivot Points	Lubricate grease fittings.	See page 10-10-3.
<b>25 Hours or Weekly</b>		
4. Control Lever Pivot Points	Lubricate grease fittings.	See page 10-10-3.
5. Quik-Tatch Pin	Lubricate grease fittings.	See page 10-10-3.
<b>100 Hours or Quarterly</b>		
6. Lift Arm Stop Pins	Lubricate guide rails and lock shafts.	See page 10-10-3.

\* A single tilt cylinder was used until Serial Number 020,303. From Serial Number (020,304-120,000), dual tilt cylinders were used. Lubricate both cylinders per the specifications given here.

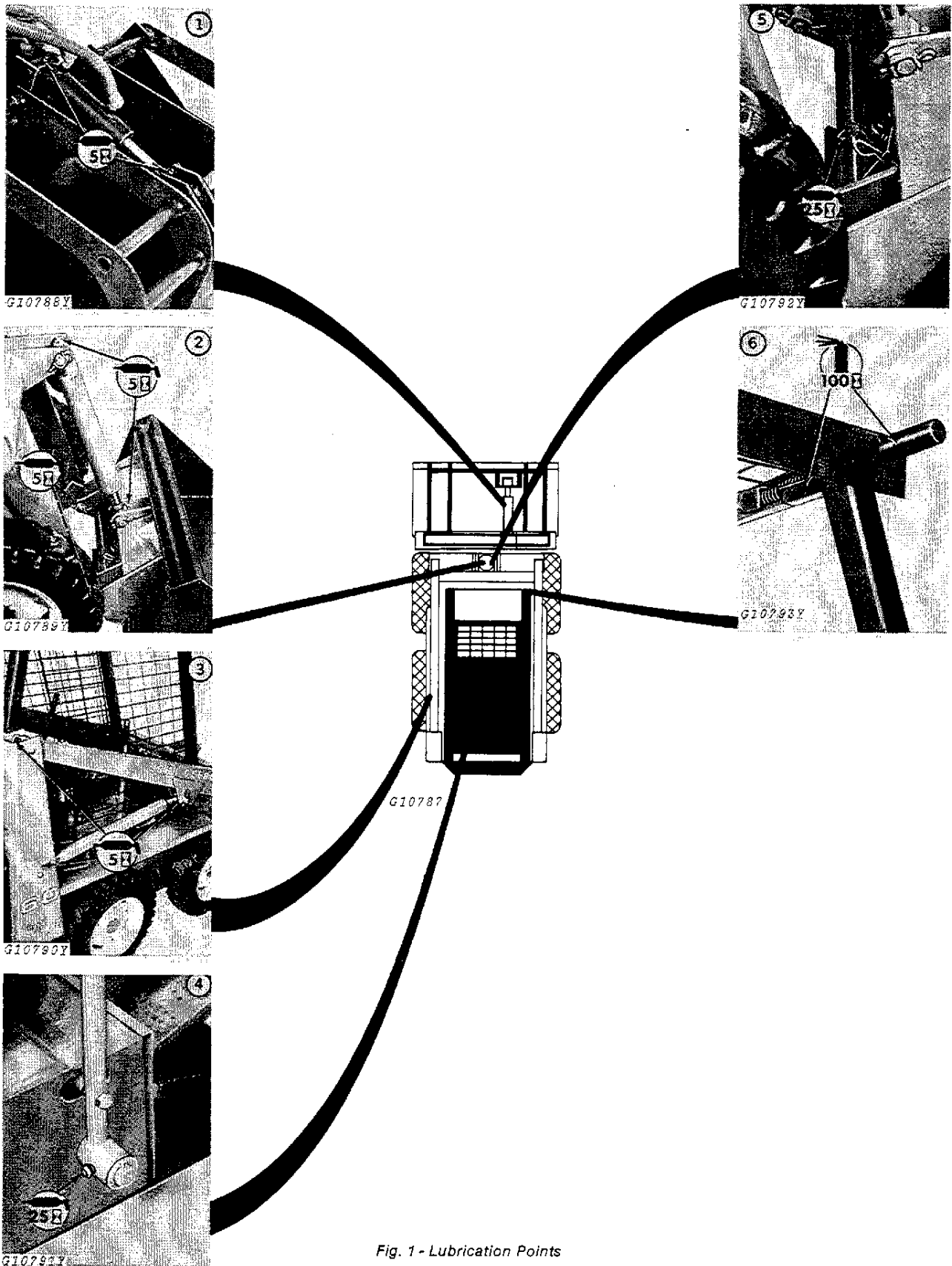


Fig. 1 - Lubrication Points

## PERIODIC SERVICE

Component	As Required	Reference
1. Carburetor	Adjust.	Page 10-10-5
2. Hydraulic Pump Belt	Check tension.	Page 10-10-6
3. Fuse	Replace.	Page 10-10-6

## 5 Hours or Daily

4. Air Cleaner	Check element.	Page 10-10-6
5. Engine Crankcase Oil	Check oil level.	Page 10-10-6
6. Brakes	Check tension.	Page 10-10-7, 10-10-9

## 25 Hours or Weekly

7. Tires	Check inflation.	Page 10-10-9
8. Engine Crankcase Oil	Drain and refill.	Page 10-10-9
9. Hydraulic System	Check oil level.	Page 10-10-9
10. Hydrostatic Pump Belt	Check alignment.	Page 10-10-10
11. Battery	Check electrolyte level.	Page 10-10-10, 10-10-11

## 100 Hours or Quarterly

12. Hydrostatic Filters (2)	Replace elements.	Page 10-10-12
13. Hydraulic Filter	Replace element.	Page 10-10-12
14. Spark Plug	Clean and regap.	Page 10-10-12

## 200 Hours or Semi-Annually

15. Air Cleaner	Replace element.	Page 10-10-13
16. Drive Chains	Check and adjust.	Page 10-10-13

## 500 Hours or Annually

17. Fuel Filter	Replace filter.	Page 10-10-13
18. Hydraulic Reservoir	Drain and refill.	Page 10-10-14
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20. Cylinder Head Bolts	Tighten.	Page 10-10-15
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22. Fuel Tank	Drain and refill.	Page 10-10-15
23. Engine Speed	Check rpm.	Page 10-10-16
24. Carburetor	Clean sediment bowl.	Page 10-10-16