

9100 Series Tractor
Service Manual
Table of Contents

	Description	Section No.	Form No.
General		Tab 1	
Safety Suggestions			M00103
Metric Conversion			M00104
Torque Values			M00105
Specifications and Capacities			
9110, 9130, Puma and Wildcat			37-189
9150, Bearcat and Cougar			37-156
9170, 9180, PIN 17900699 and After			
Panther and Lion PIN 17900255 and After			37-188
Panther and Lion Prior to PIN 17900255			37-175
Specifications, Engine 6-830	1426		8-28421
Engines 9110, 9130, Puma and Wildcat Only		Tab 2	
Aftercooler	2011		8-91700
Cylinder Head and Valve Train	2415		8-28430
Cylinder Block - Camshaft, Pistons, Rods, Sleeves, Bearings, Camshaft, Seals and Flywheel	2425		8-28440
Lubrication System - Oil Pan, Oil Pump, Oil Cooler and Oil Filter Housing	2445		8-28450
Cooling System - Thermostat, Water Pump, Fan Pulley and Belt Tensioner	2455		8-28460
Turbocharger	2465		8-28470
Turbocharger Failure Analysis	2565		9-78235
Fuel System 9110, 9130, Puma and Wildcat Only		Tab 3	
Fuel System and Filters	3410		8-28480
Injection Pump - Pump Drive Gear, Timing Pin, Fuel Shutoff Solenoid and Primer Pump	3412		8-28490
Fuel Injectors	3413		8-28500
Electrical		Tab 4	
Wiring Schematics			
9110 and 9130 PIN 17900564 and Below			
9150 PIN 17900705 and Below			
Puma PIN 17900250 and Below			
Bearcat/Cougar PIN 17900270 and Below			37-16OR1
9110 and 9130 PIN 17900564 and After			
9150 PIN 17900705 and After			
9170 and 9180 PIN 17900669 and After			
Puma PIN 17900250 and After			
Wildcat PIN 1790001 and After			
Bearcat/Cougar PIN 17900270 and After			
Panther/Lion PIN 17900255 and After			37-187
9170/9180 SN 17900150			
Panther/Lion SN 6501 and After			37-178
Solid State Electronic Dash and ROPS Instrument Panel	4003		8-81130
Alternators			
Niehoff Model N1056			37-155
Motorola LHB Series			37-169

Reprinted

**9100 Series Tractor
Service Manual
Table of Contents**

Description	Section No.	Form No.
Steering	Tab 5	
Steering Column		37-093
Steering Control Unit.....		37-153
Front Axle Steering.....	5001	8-81100
 Power Train	 Tab 6	
Controlled Traction Electric Shift Unit.....		M0100
K598-60/70 and K598-64/74 Axle.....		37-163
K598-60/70 Axle ("NOK" Seal).....	6002	8-81090
AP3445 Axle		37-171
K592-20/30 Axle.....	6003	8-81120
EW-16 Powershift Transmission, Removal and Installation		37-174
EW-16 PowerShift Transmission, Repair		37-168
Powershift Transmission Charge Pump	6012	8-81660
PTO Drive Unit		37-170
 Brakes	 Tab 7	
Caliper Disc Brake System		37-179
 Hydraulics	 Tab 8	
Hydraulic Specifications and Schematics		37-166
Three Point Hitch Alignment and Valve Service	8021	8-81670
 Chassis	 Tab 9	
Cab Removal and Installation.....		37-172
Heating, Ventilating, Air Conditioning 9110, 9130, 9150, Puma, Wildcat, Bearcat and Cougar		37-177
Heating, Ventilating, Air Conditioning 9170, 9180, Panther and Lion.....		37-136
Air Ride Seat		37-180
 How It Works	 Tab 10	

Safety Suggestions

The manufacturer, dealer and/or agent can not anticipate every possible circumstance that might involve potential hazard. The Warnings, Cautions and Safety Suggestions in this manual are therefore not all inclusive. If an operating procedure, tool device, maintenance or work method not specifically recommended is used, you must also ensure that the product will not be damaged or made unsafe by the procedures you choose.



Whenever you see this symbol, it means Attention! Become Alert! Your safety is involved.

- **Always** observe and heed all caution and warning signs or other decals wherever they may appear.
- **Always** install the locking bar between the front and rear frames whenever possible -
 - A. Before service work is done near center of tractor
 - B. Before lifting or transporting the tractor on another vehicle
 - C. Before operating stationary PTO driven equipment
- **Never** perform any service or maintenance in the center hinge area of a 4 wheel-drive articulated tractor unless the engine is shut off and the switch key removed.
- **Never** clean, service or adjust the tractor or any equipment operated by it until the tractor engine is shut down and all machine motion is stopped, unless specific instructions are given for a particular repair or procedure.
- **Always** direct compressed air away from the body and towards a safe area. Use only an approved air nozzle and wear adequate eye protection.
- **Always** keep hand tools in good condition and proper working order. Replace any that are damaged.
- **Always** have electrical equipment and cords serviced and/or inspected periodically. Use only properly grounded electrical equipment.
- **Always** keep shop floors dry and clean to prevent falls of people and/or equipment.
- **Always** weld and/or grind only in safe areas away from any flammable or explosive materials.
- **Always** read the operation instructions and understand the proper use of test equipment or other special tooling.
- **Always** inspect all lift tie chains and/or slings periodically, replace any that show signs of damage.
- **Always** use a rated alloy chain for lifting or a sling of a size and type adequate for the intended usage.
- **Always** relieve all pressure in air, oil or water systems before any lines, fittings or related items are disconnected or removed. Be alert for possible fluid pressure or spring force when disconnecting or repairing any device from a system that utilizes fluid pressure or spring force.
- **Always** reinstall all fasteners with the same part number. **Do not** use a lesser quality fastener if replacements are necessary.
- **Always** wear eye protection when charging, boosting or performing other services to or around batteries.
- **Never** spin or rotate bearings with compressed air.
- **Never** attempt to lift or jack an object that exceeds the weight capacity of the lifting fixture (jack, hoist, fork lift etc.).
- **Never** wear loose fitting clothing around rotating shafts or machinery. Long hair should always be netted.
- **Do not** try to locate high pressure fluid leaks with your hands. Use cardboard or wood to search for suspected leaks. High pressure fluid escaping from a very small area can be nearly invisible. If injured by high pressure fluid, seek immediate medical attention. Serious infection or reaction can develop if proper medical treatment is not administered immediately.
- **Do not** use unguarded grinding tools or other power tools requiring a guard. Wear safety glasses and safety shoes whenever they may be required.

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- **Do not** attempt to separate or disassemble hydraulic cylinders with the use of compressed air or hydraulic pressure.
- **Do not** attempt tire repairs unless you have the proper equipment and know how to perform the repair correctly and safely.
- **Do not** work on anything that is supported only by lift jacks or a hoist. **Always** use adequate blocks or proper stands to support the product before performing any service work.
- Use **only** approved cleaning solvents. **Never** use gasoline or other flammable or explosive materials for cleaning.
- Report or correct any unsafe areas or practices immediately.
- **Before** doing any electrical work, disconnect the battery. Do not damage wiring during removal operations. Reinstall the wiring so it is not damaged nor will it be damaged in operation by contacting sharp corners, or by rubbing against objects or sharp corner.
- If guards or shields must be removed to perform the repair or service, use extra caution. After the repair is completed, be sure to reinstall any guard or shield that was removed.

These are a few of the most common causes of personal injuries. There are a great many more and shops are continually finding accidents happening that they never heard of before.

The only known way to reduce personal injury, is to teach and practice **Safety First**.

GENERAL SPECIFICATIONS AND CAPACITIES

**Case IH 9110 and 9130 Series
P.I.N. 17900564 and After**

**Steiger Puma 1000 Series
P.I.N. 17900250 and After**

**Steiger Wildcat 1000 Series
P.I.N. 17907001 and After**

Service Manual

CASE CORPORATION

37-189 (2M, 10-87)

Issued October, 1987
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Contents

Axle	1
Brakes	1
Cab	2
Fuel System	2
Electrical	3
Transmission	3
Hydraulic System	4
3-Point Hitch	4
PTO System	4
Engine	5
Shipping Weight & Warranted Weight	6
Speed Chart	6
Frame Dimensions	7
Tire Loads & Inflation Pressures	8
Ballast	9, 10
Tread Setting Dimensions	10-13
Wheel Adjustment Procedure	13, 14
Torque Values	15-17

IMPORTANT: All fluid capacities listed throughout this section are a guide to the quantities required. Always use dipsticks or level plugs to ensure that the units are filled to the correct level.

General Specifications

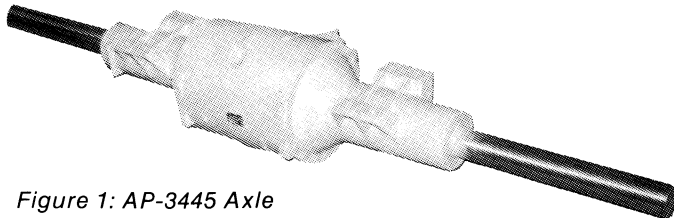


Figure 1: AP-3445 Axle

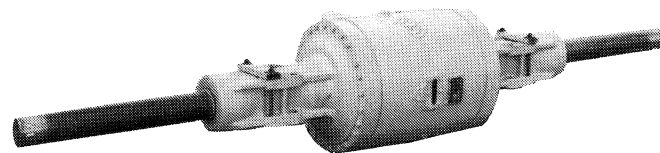


Figure 2: K592 Axle

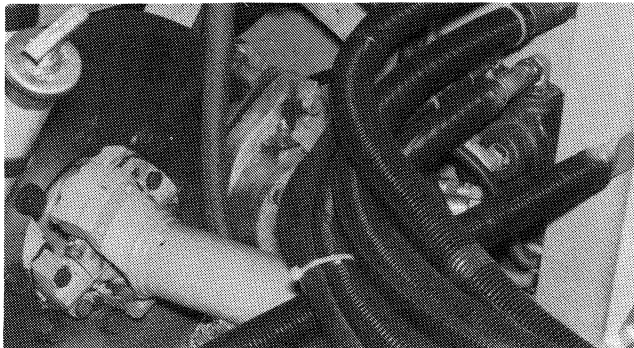


Figure 3:

Axle (Puma and 9110)

Model: AP-3445 Adjustable Bar (front & rear torque proportional limited slip differential)
Type: Single reduction inboard planetary, spiral bevel ring gear and pinion
Bar Diameter: 4.0 in. (10.16 cm)
Axle Length: 119.5 in. (303.5 cm)
Wheel Spacing: Adjustable from 60.0 in. (152.4 cm) to 130.0 in. (330.2 cm)
Ratio: 26.15:1
Oil Capacity: 8.0 US gal. (30.2 L)
Oil Type: HD 80W-90 gear oil or other quality oils that meet API classification GL-5 and/or MII-L-2105B military specifications

Axle (Wildcat and 9130)

Model: Raba K592 Adjustable Bar
Type: Single reduction inboard planetary, spiral bevel ring gear and pinion
Bar Diameter: 4.0 in. (10.16 cm)
Axle Length: 119.5 in. (303.5 cm)
Overall Ratio: 25.294:1
Wheel Spacing: Adjustable from 60.0 in. (152.4 cm) to 130.0 in. (330.2 cm)
Oil Capacity: 11.75 US gal. (44.5 L)
Oil Type: HD 80W-90 gear oil or other quality oils that meet API classification GL-5 and/or MII-L-2105B military specifications

Brakes

Type: Hydraulic, self-adjusting single caliper, dual piston, disc brake
Disc Diameter: 15 in. (38.1 cm)
Mounting: Transmission
Park Brake: Integral with service brake caliper, hand operated, cable actuated
Master Cylinder: Hydraulic
Fluid Type: SAE-J1703D or DOT-3 brake fluid
Fluid Capacity: 1 qt (0.946L)
Disc Resurfacing Limits: 0.015 in. (0.38 mm) maximum per side

General Specifications

Cab

ROPS: Four post design certified to OSHA-29CFR 1928 subpart C and/or ASAE S383, SAE J1194 to 44,000 lb (19,958 Kg) and CSA B352-M1980 clause 5 @ 44,000 lb.

Mounting: Rubber isolator (4)

Glass: Tinted-all

Access Door: Left hand; damper used for opening

Seat: Mechanical deluxe, fabric covered cushion, swiveling, fully adjustable (air suspension optional).

Radio: Optional AM/FM stereo or AM/FM stereo cassette

Steering Wheel: Tilt/Telescoping type column

Climate Control: Constant flow cab pressurization, A/C and heating, aspirated cab air intake filtration system

Instruments: Centralized solid state electronic dash display with function indicator lights and digitized LCD readouts for MPH, Engine and PTO rpm and gear selected. ROPS post gauge panel for hourmeter, fuel level, voltmeter, engine coolant temperature, engine and transmission oil pressure.

Windshield Wipers: electric front center (std)

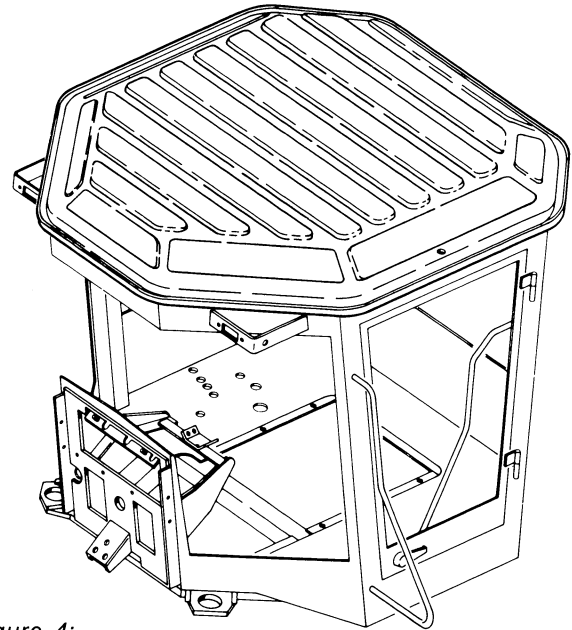


Figure 4:

Fuel System

Capacity: 115 US gals. (435L), integral with rear frame

Fuel Type: Grade No. 1D or Grade No. 2D fuel as defined by ASTM designation D975 for Diesel Fuels. Use No. 2D when ambient temperatures are consistently above 32° F (0° C).

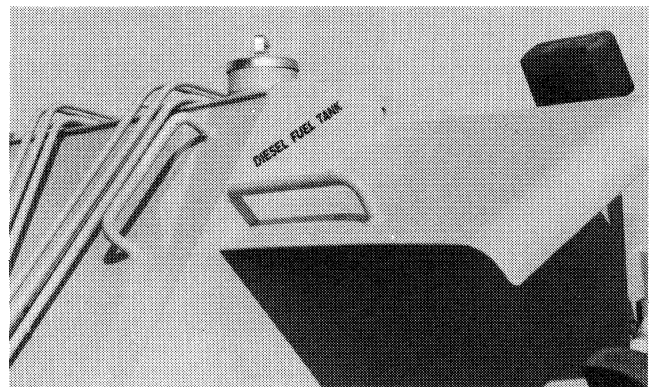


Figure 5:

General Specifications

Electrical

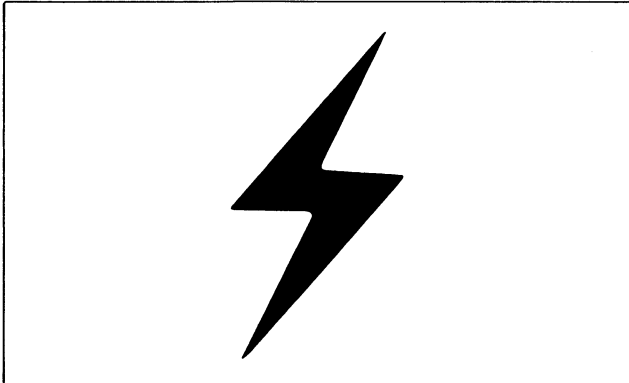


Figure 6:

Type: Parallel 12 volt, negative ground system
Batteries: Two (2) 12 volt. 1250 CCA @ 0° F (-17.8° C) 625 CCA per battery @ 0° F (-17.8° C)
Alternator: 105 amp with built-in regulator
Engine Block Heater: 750 watt, 110 volt
Ether Start Aid: Optional
Starter: 12 volt negative ground, solenoid activated positive engagement
Lighting: Six (6) halogen sealed beam lights (four front and two rear); 2 rear reflectors. Hazard flasher with integral turn signals. Rear remote electrical receptacle, one cab dome light. Diagnostic warning lights and back lighting of dash readout, eyebrow lighting of overhead console and right side control console.
Hourmeter: RPM actuated (300 rpm minimum)
Tractor Monitor System: Audio warning alarm and indicator warning lights for both critical and non-critical functions.
Circuit Breakers: Automatic reset type
Overhead Console: Drop down type for access to electrical circuitry

Bulb or Lamp Replacement

Front Headlamps (65W high - 35 low)	No. H6054
Front & Rear Flood Lamps (60W)	P/N 20-1822T1
Electronic Dash Indicator Bulbs	No. 194
Overhead Console Bulbs	No. 53
Right Side Control Console Bulbs	P/N 20-1384T1
ROPS Post Gauge Panel Bulbs	No. 1893
Stop/Tail Lamp Bulb	No. 1157
Cab Dome Lamp Bulb	No. 1141
Hazard Flasher Lamp Bulb	No. 1156

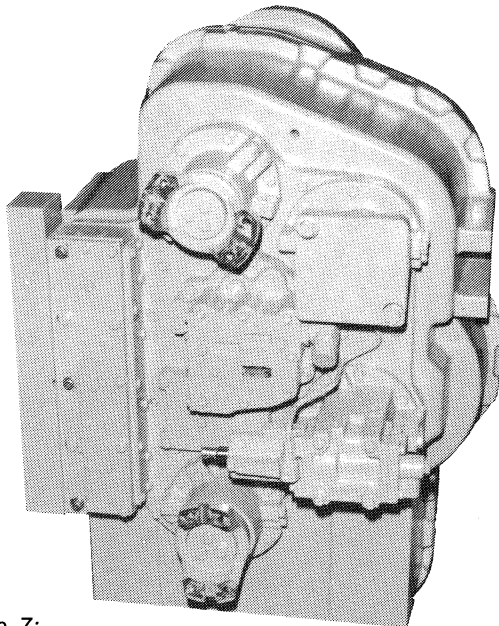


Figure 7:

IMPORTANT: Do not use multi-viscosity oil. Check transmission oil level once every ten hours of operation. Check oil level only after engine has been stopped for at least 30 minutes and tractor is parked on a level surface. Fill only to full mark on the dipstick. Do not overfill.

Transmission

Type: Powershift
Model: EW16
Speeds: 12 forward, 2 reverse
Master Clutch: Wet hydraulic type, integral with transmission. Modulated engagement, pressure lubricated and oil cooled.
Oil Type: Hydraulic/Transmission oil, blended to JDM J20B or equivalent. DO NOT use multi-viscosity oils.
Oil Capacity: 9 US gal. (34.0L) approx

Always allow transmission fluid ample time to warm up following engine startup before shifting out of neutral when ambient temperatures fall to 40° F (5° C) or lower. If temperatures remain consistently below 40° F (5° C) oil blended to JDM J20A or equivalent is acceptable.

General Specifications

Hydraulic System

Type: Closed center, load sensing, pressure compensating

Reservoir Capacity: 18.0 US gals. (68.0L). Pressurized to 5 psi (34.45 kPa) and 225°F (105° C) warning sensor.

Steering: Articulated, full priority, load sensing hydrostatic with 2 double acting cylinders

Front Steer Axle (Optional)

Type: Single double acting cylinder, operated from load sensing hydrostatic steering control valve. Provides 6° left/right front axle turning capability. Micro-processor controlled system.

Remote Control Valve: Closed center, stack type. Remote mounted and direct linkage actuated. Detented in the working position with hydraulic kick-outs. Individual section float positions and flow control; 2 to 27 gpm (7.6 to 102.2 L/min)

System Operating Pressure: 2500 psi (172.4 bar, 17,225 kPa) maximum

Pump Capacity: Approx 27 gpm (102.2 L/min) @ 2100 rpm

Filtering System: Eight micron special micro-glass element. Suction screen inside reservoir

Oil Type: Hytran Plus Hydraulic/Transmission fluid, or 10W Antiwear Hydraulic Fluid

Couplers: ISO standard, lever type couplers and male tips

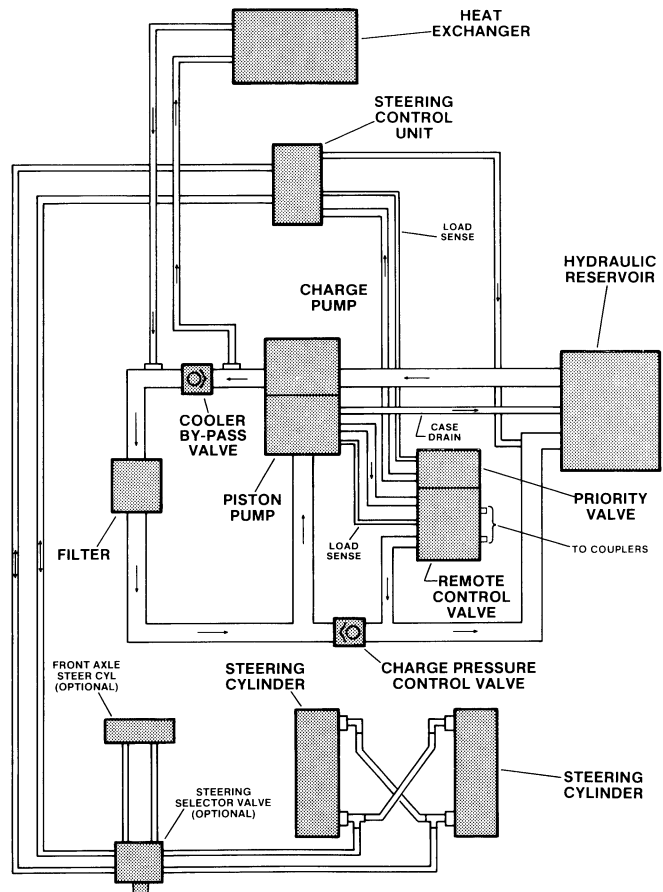


Figure 8:

3-Point Hitch (Optional)

Type: Category III free-link hitch - meets or exceeds SAEJ715 standards for attachment to Category III implements. Lift capacity 24 in. (61 cm) behind draft arm uniball - 10,000 lbs (4540 kg)

Quick-Coupler: Category III, meets or exceeds SAE-J909b standards for attachment to Category III implements.

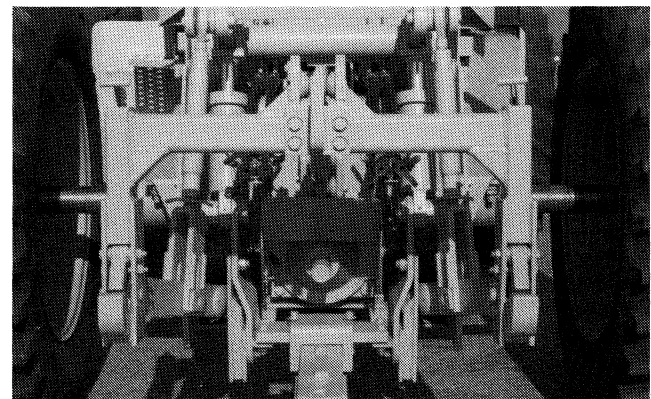


Figure 9:

PTO System (Optional)

Type: Live and independent system integral with transmission. Lever actuated, hydraulically operated wet clutch with integral hydraulically applied brake when control is shut-off. Shaft turns free when engine is shut off.

Speed: 1000 rpm @2100 engine rpm

Output Shaft: 1.75 in. (4.4 cm) diameter, 20 splines and flip-up shield

Lubrication Type: SAE 10W 30

Capacity: 1.7 US qts (1.6 L)

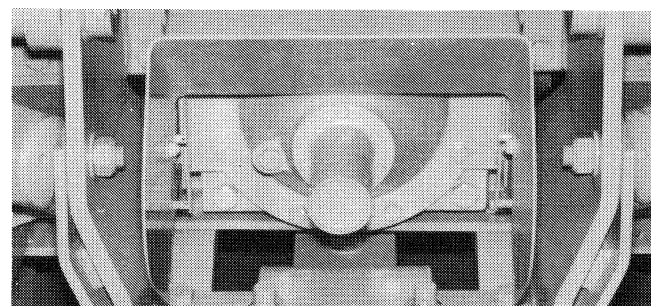
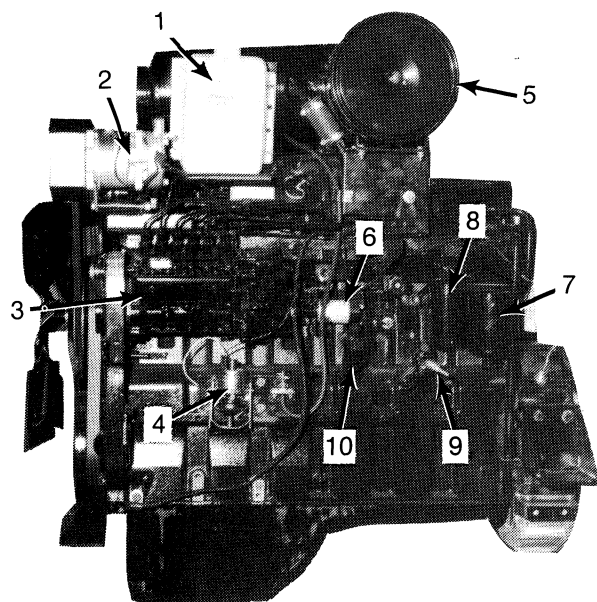


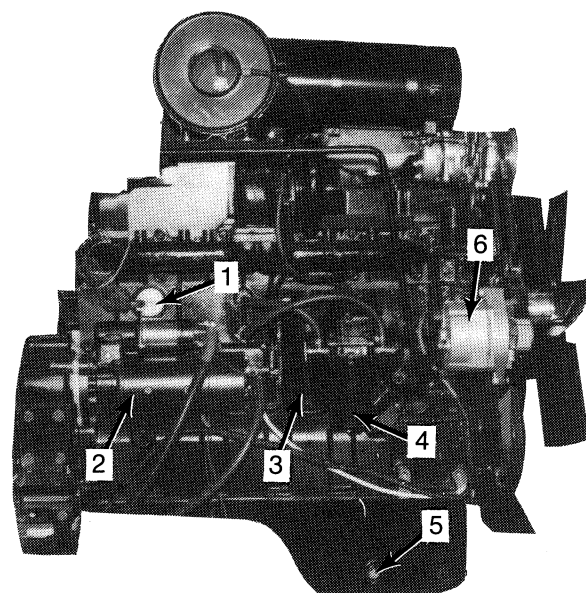
Figure 10:

General Specifications



Engine Left Side

- 1-Coolant Surge Tank
- 2-A/C Compressor
- 3-Fuel Injection Pump
- 4-Ether Start
- 5-Engine Air Cleaner
- 6-Fuel Shutoff Solenoid
- 7-Water Separator
- 8-Fuel Filter
- 9-Fuel Lift Pump
- 10-Oil Fill



Engine Right Side

- 1-Coolant Heater
- 2-Starter
- 3-Oil Filter
- 4-Coolant Filter
- 5-Oil Drain
- 6-Alternator

Engine

Tractor Model	Puma and 9110	Wildcat and 9130
Engine Make	Case	Case
Type	In-Line 6	In-Line 6
Model	6T830	6TA830
Displacement	504.5 cu in. (8.27L)	504.5 cu in. (8.27L)
Rated Horsepower	190 (141.5 Kw)	220 (163.9 Kw)
Rated RPM (R/min)	1700-2100	1700-2100
High Idle (no load)	2310 approx	2310 approx
Low idle	850 approx	850 approx
Operating Torque (2100 rpm)	475 ft lb (644 N.m)	550 ft lb (746 N.m)
Torque Rise	30%	30%
Bore & Stroke	4.49 x 5.32 in. (114 x 135 mm)	4.49 x 5.32 in. (114 x 135 mm)
Compression Ratio	16.5:1	16.5:1
Firing Order	1-5-3-6-2-4	1-5-3-6-2-4
Valve Setting (cold)	Intake - 0.012 in. (0.30 mm) Exhaust - 0.024 in. (0.61 mm)	Intake - 0.012 in. (0.30 mm) Exhaust - 0.024 in. (0.61 mm)
Oil Capacity (includes filters)	23.7 US qts (22.4L)	23.7 US qts (22.4L)
Coolant Capacity	35 US qts (33.1L)	35 US qts (33.1L)
Oil Pressure (minimum)	Low idle 10 psi (69 kPa) High idle 30 psi (207 kPa)	Low idle 10 psi (69 kPa) High idle 30 psi (207 kPa)

Lubricating Oil: Use multi-viscosity, preferable 15W-40 meeting API Classification CC/CD

NOTE: 10W-30 may be used in ambients consistently below 23°F (-5° C).

General Specifications

Approximate Shipping Weight

Puma 1000 & 9110

18,879 lbs. (8,571 Kg) with 18.4 x 38 R1 (6 ply) singles, PTO and steerable front axle less fuel and operator. Add 1736 lb (788 Kg) for TPH and Quick Coupler.

Wildcat 1000 and 9130

25,022 lbs. (11,334 Kg) with 18.4 x 38 R1 Hub Style Duals. 21,530 lbs. (9,775 Kg) with 18.4 x 38 R1 singles. Front steer axle, PTO and TPH with Quick Coupler, less fuel and operator.

Maximum Warranted Weight

24,000 lbs. (10,896 Kg) Puma and 9110

26,000 lbs. (11,778 Kg) Wildcat and 9130

NOTE: *The maximum warranted weight listed is the maximum ballasted GVW with a 60% front and 40% rear static split.*

Speed Chart

Engine RPM: 2100

Transmission: Powershift

Puma and 9110		
Gear	MPH	(KPH)
1	1.9	(3.1)
2	2.3	(3.7)
3	2.9	(4.7)
4	3.5	(5.6)
5	4.2	(6.7)
6	5.1	(8.2)
7	6.2	(9.9)
8	7.4	(11.9)
9	9.1	(14.6)
10	11.2	(18.0)
11	13.4	(21.5)
12	16.5	(26.5)
R1	2.5	(4.0)
R2	4.6	(7.4)

Wildcat and 9130		
Gear	MPH	(KPH)
1	2.0	(3.3)
2	2.5	(3.9)
3	3.0	(4.9)
4	3.7	(5.9)
5	4.4	(7.1)
6	5.5	(8.8)
7	6.5	(10.5)
8	7.8	(12.5)
9	9.6	(15.4)
10	11.7	(18.9)
11	14.1	(22.7)
12	17.3	(27.9)
R1	2.7	(4.3)
R2	4.8	(7.8)

Speeds shown represent following tire sizes at rated rpm (2100):

18.4 x 38 R1 23.1 x 34 R1 24.5 x 32R1
 24.5 x 32 LS2 20.8 x 38 R1 30.5L x 32 R1

Tire And Ground Speed Data

There are many variables to consider when determining ground speed. For example, the rolling radii of tires are not absolute values, on some tire sizes there could be as much as 3% variation between tire manufacturers. The indicated values shown are static dimensions; dynamic values cannot be used because they vary with tractor weight, weight transfer, soil conditions and tire air pressure. These variables can account for another 3-5% variation. In addition, normal field operations are performed with 10-15% slip.

With all of these variables considered, the published ground speed chart is for reference only. Use the chart provided with multiplier factors for the various tire sizes and engine speeds if more precise speed data is required.

NOTE: *Variable ground speeds are possible with high torque rise engines within 2100 rpm and 1700 rpm.*

To determine speed for other tire sizes use the following chart multipliers:

Average Static Loaded R.R.	Tire Size	Factor
30.5	14.9 x 38	.96
30.5	16.9 x 38	.96
30.7	20.8 x 34 R1	.96
33.5	20.8 x 38 R2	1.05
33.7	18.4 x 42 R1	1.05
34.6	20.8 x 42 R1	1.09
33.0	30.5L x 32 R2	1.03
32.5	30.5L x 32 LS2	1.02

Example of Use:

If chart speed was 14.6 MPH and tractor was equipped with 20.8 x 34 R1 tires,

Then: MPH = (Chart) x (Factor)
 MPH = 14.6 x .96 = 14.0 MPH

Engine Speeds

If MPH is wanted for engine speeds other than rated,

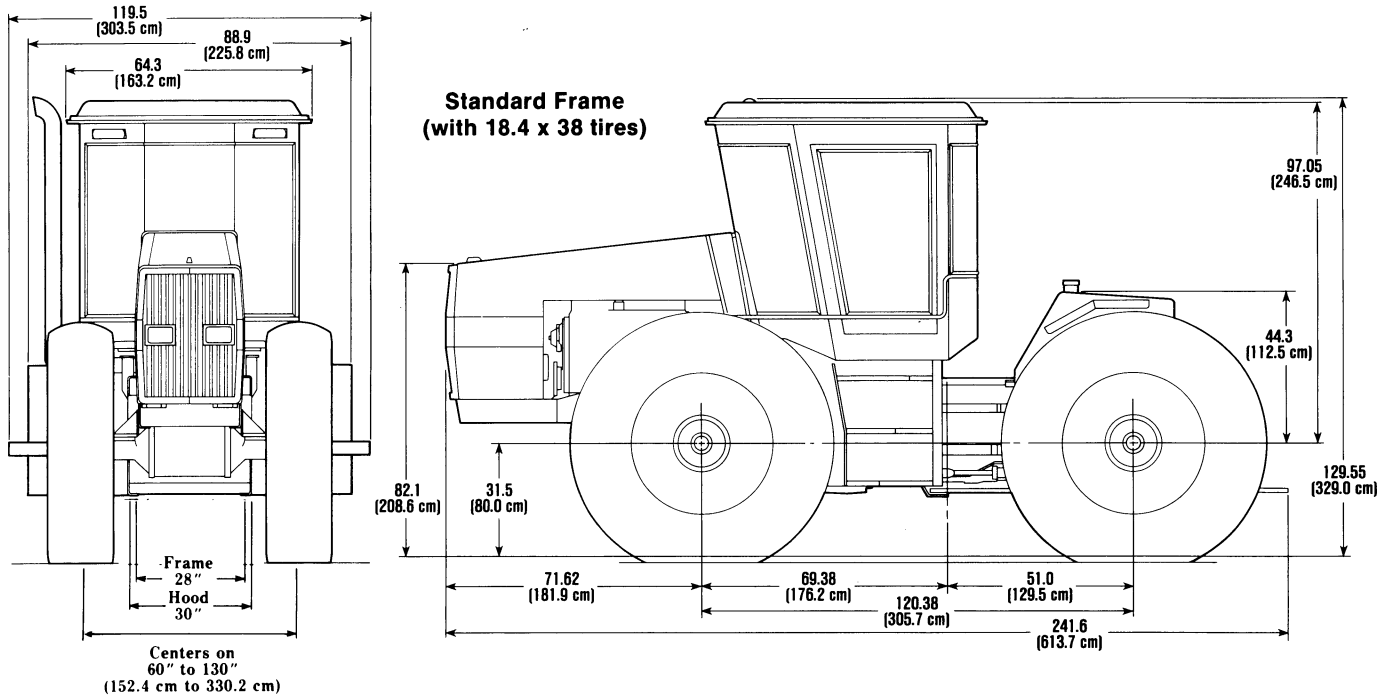
$$\text{MPH} = \frac{\text{MPH (Chart)} \times \text{Engine RPM}}{\text{Rated RPM}}$$

Example:

If chart speed was 14.6 MPH and tractor has engine with rated speed of 2100 RPM and MPH wanted at 1800 RPM;

Then: MPH = $\frac{14.6 \times 1800}{2100}$ = 12.5 MPH

General Specifications



Frame Dimensions

Wheel Base:

120.0 in (304.8 cm) std. frame
 124.0 in. (314.9 cm) with front steer

Turning Radius (SAE):

14.0 ft (4.25 m) std. frame
 12.8 ft (3.9 m) with front steer

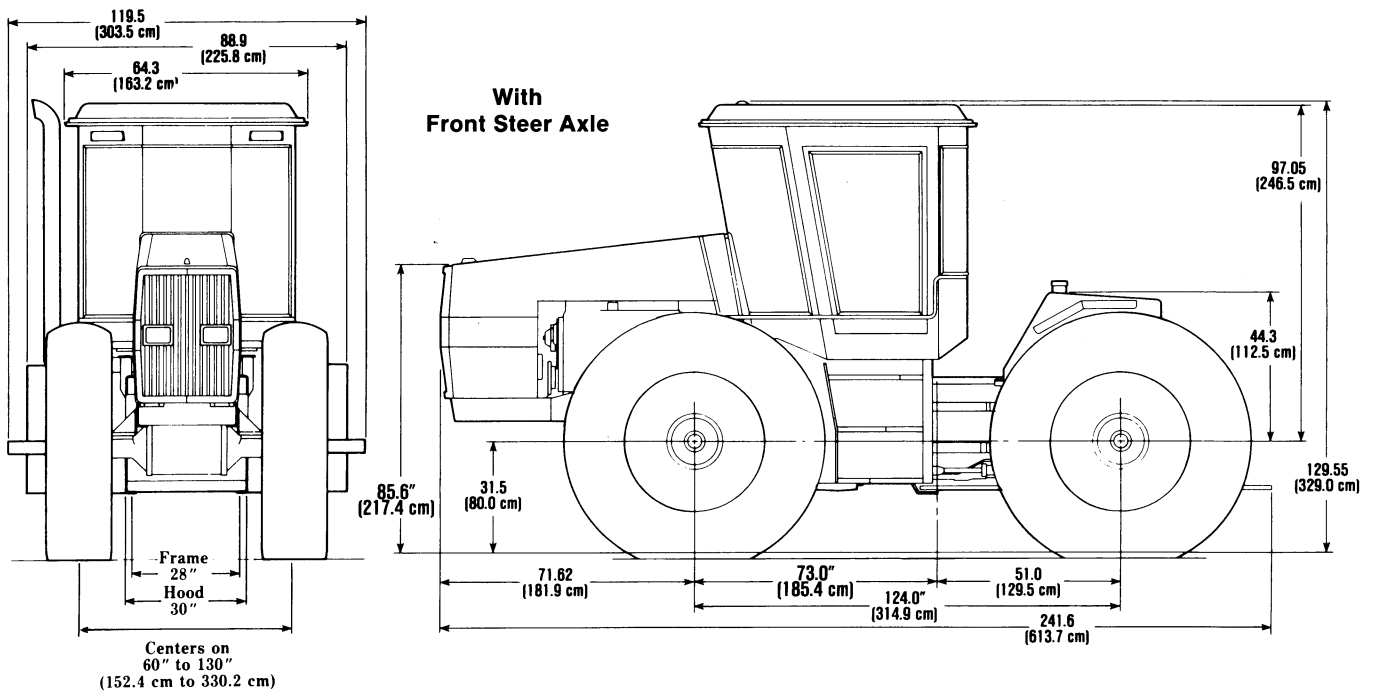
Ground Clearance at Drawbar: 16.0 in. (40.6 cm)

Frame Articulation: 40° left/right

Frame Oscillation: ±13° (26° total)
 ± 11° (22° total) w/PTO

Front Axle Steer (optional): 6° left/right

Specifications are subject to change without prior notice.



General Specifications

Recommended Tire Loads & Inflation Pressures

Tire load limits at cold inflation pressure at 20 mph (32.1 kph) maximum speed

Tire Type (ply)	Single or Dual	Maximum Tire Load @ rated Inflation	Recommended PSI (kPa) (see Note 2)	Maximum PSI (kPa) (see Note 3)	Maximum GVW (see Note 1)
14.9 x 38 R-1 (6)	D	3630 lb @ 20 psi (1644 Kg) @ (138 kPa)	18-16 (124)-(110)	20-18 (138)-(124)	24,000 lbs (10,896 Kg)
16.9 x 38 R-1 (6)	D	4140 lb @ 18 psi (1875 Kg) @ (124 kPa)	16-14 (110)-(96)	18-16 (124)-(110)	24,000 lbs (10,896 Kg)
16.9 R x 38 R-1*	D	4340 lb @ 18 psi (1966 Kg) @ (124 kPa)	16-14 (110)-(96)	18 (124)	24,000 lbs (10,896 Kg)
18.4 x 34 R-1 (6)	D	4360 lb @ 16 psi (1975 Kg) @ (110 kPa)	14-12 (96)-(83)	16-14 (110)-(96)	24,000 lbs (10,896 Kg)
18.4 x 38 R-1, R-2 (6)	D	4620 lb @ 16 psi (2093 Kg) @ (110 kPa)	14-12 (96)-(83)	16-14 (110)-(96)	24,000 lbs (10,896 Kg)
18.4 x 38 R-1 (8)	S	5980 lb @ 20 psi (2709 Kg) @ (138 kPa)	20 (138)	20 (138)	21,500 lbs (9740 Kg)
18.4 R x 38 R-1*	S	6000 lb @ 18 psi (2718 Kg) @ (124 kPa)	18 (124)	18 (124)	21,500 lbs (9740 Kg)
18.4 x 42 R-1 (10)	S	7360 lb @ 20 psi (3334 Kg) @ (138 kPa)	20 (138)	20 (138)	24,000 lbs (10,896 Kg)
18.4 R x 42 R-1**	S	7400 lb @ 24 psi (3352 Kg) @ (169 kPa)	24 (169)	24 (169)	24,000 lbs (10,896 Kg)
20.8 x 38 R-1, R-2 (8)	S	6820 lb @ 18 psi (3089 Kg) @ (124 kPa)	18 (124)	18 (124)	22,500 lbs (10,192 Kg)
20.8 R x 38 R-1*	S	7150 lb @ 18 psi (3239 Kg) @ (124 kPa)	18 (124)	18 (124)	24,000 lbs (10,896 Kg)
20.8 x 38 R-1 (10)	S	3475 Kg @ (152 kPa)	(138)	(152)	(10,896 Kg)
23.1 x 34 R-1, R-2 (8)	S	7110 lb @ 16 psi (3221 Kg) @ (110 kPa)	16 (110)	16 (110)	24,000 lbs (10,896 Kg)
24.5 x 32 R-1, R-2 (10)	S	8700 lb @ 20 psi (3941 Kg) @ (138 kPa)	16 (110)	16 (110)	24,000 lbs (10,896 Kg)
24.5 x 32 LS-2 (12)	S	9680 lb @ 24 psi (4385 Kg) @ (169 kPa)	16 (110)	24 (169)	24,000 lbs (10,896 Kg)
30.5 L x 32 R-1, R-2 (10)	S	9120 lb @ 18 psi (4131 Kg) @ (124 kPa)	16 (110)	18 (124)	24,000 lbs (10,896 Kg)
30.5 LR x 32 R-1*	S	10,500 lb @ 18 psi (4757 Kg) @ (124 kPa)	16 (110)	18 (124)	24,000 lbs (10,896 Kg)
30.5 L x 32 LS-2 (12)	S	(4707 Kg) @ (138 kPa)	(110)	(138)	(10,896 Kg)

NOTE 1: The weight indicated is the maximum ballasted tractor weight with a 60% front and 40% rear static split. Maximum CVW is also limited by tire rating.

NOTE 2: When two numbers appear, they represent the inflation pressures of the inside main and outside dual tires respectively.

NOTE 3: Tractor drive tires used in severe service, it is permissible to increase inflation pressure up to 4 psi (28 kPa) above that shown in the "Maximum PSI" table with no increase in tire load.



WARNING: Use safety cage or chain, clip on chuck, extension hose, wear eye protection and stand away from the tire while inflating to prevent the possibility of personal injury due to blowoffs, etc.

General Specifications

Ballast & Weight Information

Rather than weighting the tractor down to pull heavy loads, try reducing the load. Pulling a lighter load at higher speed is cheaper and more efficient.

Liquid ballast should never be added until a determination is made for the need, however, there may

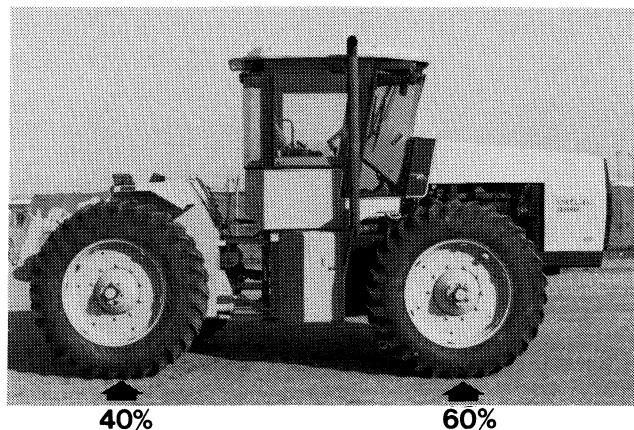
be times when it is desirable to weight the tractor to decrease slippage and increase balance or stability. Use no more ballast than necessary, and remove ballast when it is no longer needed.

Liquid Weighting Valve Level (75%) Table

The following table provides data on the filling of front and rear tractor tires with calcium chloride solution, based on 75% fill or approximately valve level. The table is based on the use of Type 1 (77%) commercial calcium chloride flake. If Type 2 (94%) calcium chloride flake is used, reduce the "Lbs. CaCl²" weights in the table by 25%.

Tire Size	Water Only		3-1/2 lbs. CaCl ²			5 lbs. CaCl ²		
	Gallons	Wt. Lbs.	Gal. H ² O	Lbs CaCl ²	Total Wt.	Gal. H ² O	Lbs. CaCl ²	Total Wt.
14.9-38	67	559	57	200	675	54	270	720
16.9-38	90	751	77	270	912	73	365	974
18.4-34	100	834	85	298	1007	81	405	1081
18.4-38	110	917	94	329	1113	89	445	1187
18.4-42	115	959	98	343	1160	93	465	1240
20.8-38	140	1168	120	420	1420	114	570	1521
20.8-42	148	1234	127	444	1503	120	600	1600
23.1-34	159	1326	136	476	1610	128	640	1708
24.5-32	170	1418	146	511	1729	138	690	1841
30.5L-32	217	1809	186	651	2202	176	880	2347

To extend tire life and avoid excessive wear of drive train components, avoid continuous full load operations at ground speeds below 3.5 mph (5.6 km/h).



There are many factors that affect traction and balance that need to be considered before adding liquid ballast; such as soil conditions and/or topography, draft load of the implement or equipment being used etc.

Desirable tractor static weight distribution is approximately 40 percent of the weight on the rear axle and 60 percent of the weight on the front axle. If it becomes necessary to add liquid ballast for better

traction or stability, this ratio should be maintained in all drawbar applications. When dual wheels are used **do not** add liquid ballast to the outside dual tires.

NOTE: If 3-Pt hitch or PTO equipped, it may not be possible to achieve a 60-40% static split.

Desirable wheel slippage should be 10-15 percent in average conditions. This slippage rate is important in order to gain the optimum tire and power train life.

If liquid ballast is required, ballast to 60-40 percent, which will result in approximately 50 percent weight distribution under load. For example: if 4000 lbs of weight is to be added, the 60-40 percent static weight ratio must be maintained. Do not exceed the maximum warranted vehicle gross weight for Agriculture or continuous duty drawbar usage.

When using liquid ballast, use a solution of water and calcium chloride to prevent water from freezing. Where freezing temperatures never occur, plain water can be used, but the weight added will be 20% less than calcium chloride solution.

Where anti-freeze protection is needed, use 3-1/2 lbs of commercial calcium chloride flake per gallon

General Specifications

of water, which is completely safe to 12° below zero. For protection to 52° below 0° use 5 lbs. of calcium chloride flake per gallon of water.

Utility blades and other mounted equipment must be considered as ballast. Because of this, to maintain stability and balance, specific ballast instructions must be followed. Liquid ballast should always be removed when not required, if liquid ballast is required, it must always be used in the proper ratio for the intended application.

Front Ballast

When fully or semi-mounted rear attachments are used it may be desirable to add liquid ballast to the front tires to maintain stability and balance. Do not add ballast to the rear tires when using fully or semi-mounted rear attachments.

Fill the front inside tires to the required level to provide stability and balance.

Combined static weight of the tractor and front ballast must not exceed maximum vehicle gross warranted weight.

Rear Ballast

When using front mounted utility blades or other attachments it will usually be required to add liquid ballast to the rear tires only to provide stability and balance. Fill the rear inside tires to the level required to achieve approximately 50 percent of the total static weight on each axle.

Combined static weight of front attachment and rear ballast must not exceed the maximum vehicle gross warranted weight.

Front Mount Attachments

SPECIAL NOTE: *Total maximum allowable weight is 2500 lbs (1135 Kg) for front frame mounted liquid tanks. Weighting beyond 2500 lbs (1135 Kg) requires additional front frame structure. Remove all ballast from the front axle tires.*

Tread Setting Dimensions

Dual combinations using Steiger wheel equipment will provide spacing for 30 inch and 32 inch rows. However, if 18.4 x 42 R-1 or 20.8 x 38 R-1 tires are used some tread settings will require the use of steering cylinder stops and oscillation stop adjustment to prevent cab/tire interference and/or front to rear tire interference in a full turn and/or oscillation mode.

IMPORTANT: *If other after market wheel equipment is used, you must always check for cab/tire interference in a full turn and/or oscillation mode.*

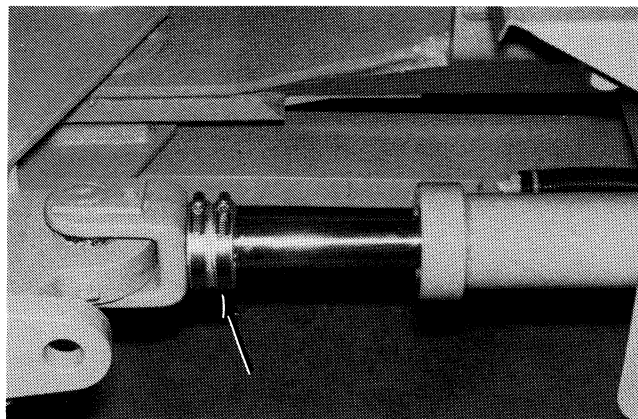


Figure 12: Articulation Cylinder Stop

General Specifications

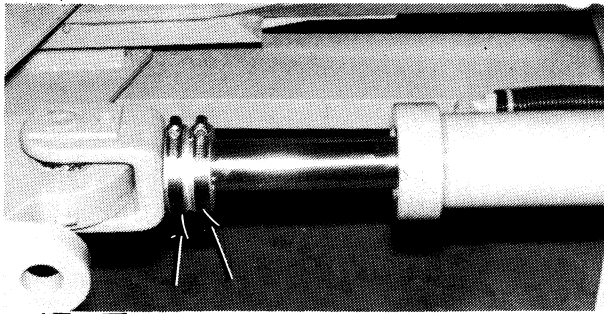


Figure 13: Articulation Cylinder Stops

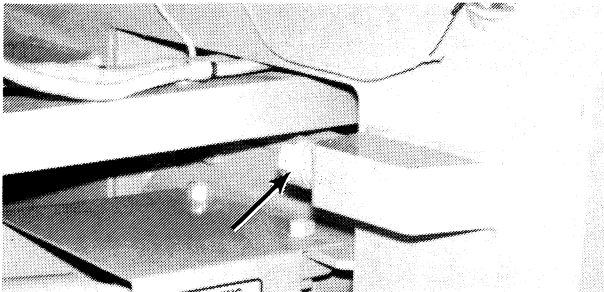


Figure 14: Oscillation Stops

Tread Setting Dimensions

Steering cylinder stops are furnished with the tractor only if the tractor is shipped from the factory with wheel equipment requiring stops. Contact your dealer if articulation or oscillation stops are needed. (Each set of stops measure 0.75 in. (19 mm) in length. Some tread settings may require one set of stops per cylinder while other settings may require two sets of stops per cylinder.)

In addition to the steering cylinder stops, the oscillation stop bolt may require the installation of one or more 0.25 in. (6.35 mm) thick washers in addition to the one washer installed as standard.

Reference the Articulation and Oscillation Stop Setting Chart for steering cylinder stop requirements and oscillation stop washer requirements. If chart shows standard (std) in the respective oscillation or steering cylinder stop column, no stop adjustment is required.

**Articulation and Oscillation Stop Settings
For Steiger Wheel Equipment**

Row Spacing	Duals			
	30 Inch		32 Inch	
Tread Width	60 in.	120 in.	64 in.	128 in.
Tire Type	Oscillation Stop Setting (see Note 2)	Articulation Stop (see Note 1)	Oscillation Stop Setting (see Note 2)	Articulation Stop (see Note 1)
14.9 x 38	Std	Std	Std	Std
16.9 x 38	Std	Std	Std	Std
18.4 x 34	Std	Std	Std	Std
18.4 x 38 R-1	Std	Std	Std	Std
18.4 x 38 R-2	Std	Std	Std	Std
Singles				
18.4 x 38 R-1, R-2	Std	Std	Std	Std
18.4 x 42 R-1	1.25 in. (5)	1.50 in.	1.25 in. (5)	1.50 in.
20.8 x 38 R-1	1.25 in. (5)	1.50 in.	1.25 in. (5)	1.50 in.
20.8 x 38 R-2	1.50 in. (6)	1.50 in.	1.50 in. (6)	1.50 in.
23.1 x 34 R-1, R-2	See Note 3	See Note 3	See Note 3	See Note 3
24.5 x 32	See Note 3	See Note 3	See Note 3	See Note 3
30.5 x 32	See Note 3	See Note 3	See Note 3	See Note 3

NOTE 1: Dimension stated is length of steering cylinder stops required.

NOTE 2: Number in () denotes total number of .25 in. washers required.

NOTE 3: If these size tires are used as singles, in tread widths of 118 in. or greater, always check for cab/tire and/or front to rear tire interference, adjust oscillation stops and/or add steering cylinder stops as required to obtain clearance.

SPECIAL NOTE: If PTO is installed, 1.50 in. of oscillation stop adjustment is required.

IMPORTANT NOTICE:

When 18.4 x 38 or 18.4 x 42 tires are used at a 60 inch tread setting on models equipped with an optional front steer axle, tire wall to cab mount clearance is normally close.

To avoid tire damage due to production tolerances, if 18.4 x 38 or 18.4 x 42 tires are used at a 60 inch tread setting, tire wall to cab mount interference must always be checked in both directions.

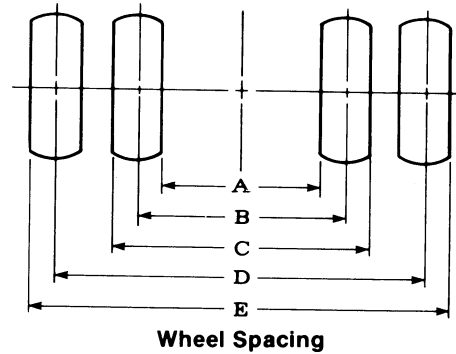
There should be a minimum of one-fourth (1/4) inch clearance between the tire wall and front cab mount in both directions of steering. Adjust the wheel hub on the axle slightly if necessary to assure the minimum clearance requirements.

20.8 x 38 tires cannot be used at a 60 inch tread setting on models equipped with a front steer axle.

General Specifications

Tread Setting Dimensions

NOTE: Minimum tread width "B" for singles is 60 in. (152.4 cm) maximum tread width "C" or "E" for singles or duals and all wheel combinations is limited to 130 in. (330.2 cm).



Tread Setting Dimensions

Tire Size see Note(1)	A	B	C	D		E	
	Min	Min (Max)	Max	Disc In Min (Max)	Disc Out Min (Max)	Disc In Min (Max)	Disc Out Min (Max)
14.9 x 38	45	60 (71)	75	119 (130)	109 (120)	134 (145)	124 (135)
16.9 x 38	43	60 (71)	77	119 (130)	109 (120)	136 (147)	126 (137)
18.4 x 34	42	60 (71)	117	119 (130)	109 (120)	137 (148)	127 (138)
18.4 x 38 (1)	42	60 (71)	117	119 (130)	109 (120)	137 (148)	127 (138)
18.4 x 42	42	60 (119)	137	N/A	N/A	N/A	N/A
"Disc out"							
18.4 x 42	54	72 (130)	148	N/A	N/A	N/A	N/A
"Disc in"							
20.8 x 38	39	60 (119)	140	N/A	N/A	N/A	N/A
"Disc out"							
20.8 x 38	51	72 (130)	151	N/A	N/A	N/A	N/A
"Disc in"			Note 2				
23.1 x 34	41	64 (122)	145	N/A	N/A	N/A	N/A
"Disc out"			Note 2				
23.1 x 34	46	69 (127)	150	N/A	N/A	N/A	N/A
"Disc in"			Note 2				
24.5 x 32	40	64 (123)	147	N/A	N/A	N/A	N/A
"Disc out"			Note 2				
24.5 x 32	44	68 (126)	150	N/A	N/A	N/A	N/A
"Disc in"			Note 2				
30.5 32	39	70 (119)	150	N/A	N/A	N/A	N/A
"Disc out"			Note 2				
30.5 x 32	39	70 (130)	161	N/A	N/A	N/A	N/A
"Disc in"			Note 2				

Letters refer to Wheel Spacing Chart. All dimensions are stated in inches.

"N/A" denotes not approved in dual configuration.

NOTE 1: Max single dimension is same as the max dual dimension.

NOTE 2: Refer to steering cylinder and oscillation stop chart. Check for need of steering cylinder stops and/or oscillation stop adjustment.

Refer to the following page for "Disc In" or "Disc Out" information.

General Specifications

Tread Setting Dimensions

Inner wheel hub locking bolts must face to the outside. With dual tires, space "A" between bias-ply tires must be at least 4 in. (100 mm). More space may be needed between radial ply tires.

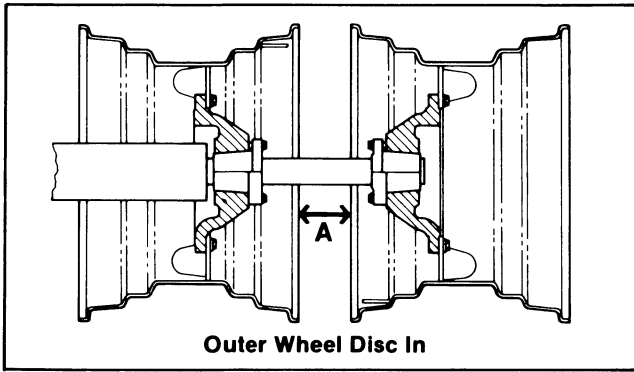


Figure 15: Inner Wheel Hub Bolts to Outside

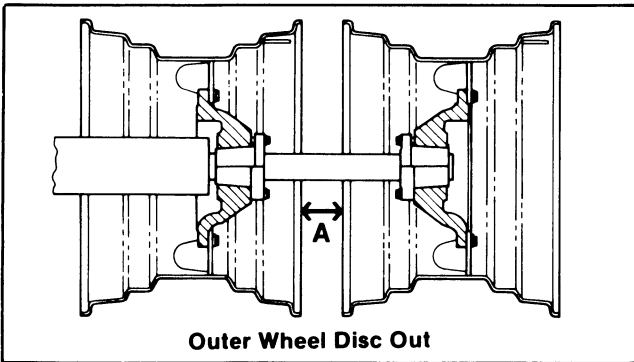


Figure 16: Inner Wheel Hub Bolts to Outside

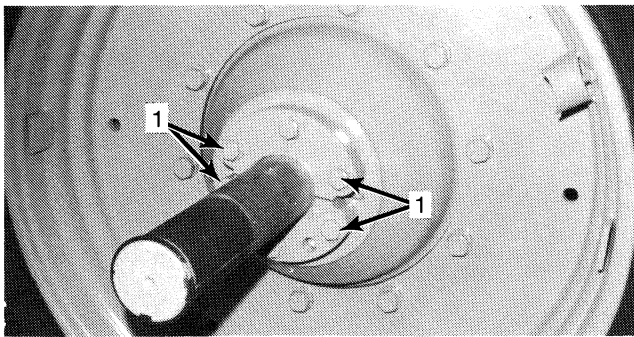


Figure 17:

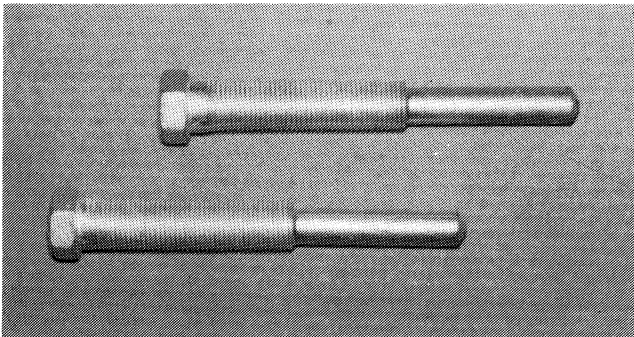


Figure 18: Jack Screws

Wheel Adjustment Procedure

1. Park the tractor on a level surface, apply the park brake. Lift and support the tractor only high enough to allow the tire to clear so that the wheel assembly will slide on the axle shaft.
2. Loosen and remove the four hub locking cap-screws and washers (Item 1). Replace these cap-screws with the four special jack screws supplied with the tractor.

General Specifications

- Loosen and back the other two remaining capscrews (3) out three complete turns (approx. 1/4 in. 63.5 mm).
- Tighten the four special jack screws (2) on each bushing half alternately and evenly to break loose the tapered bushing halves from the wheel hub and axle.
- Adjust the wheel(s) to the desired working position along the bar axle. Reference the wheel spacing chart for correct dimensions relative to tire size and disc "in" or "out" placement. Normally all wheels should be the same distance from the tractor center line. Reference the Tread Setting Chart.

If the desired dual wheel tread setting cannot be obtained because of outer wheel disc position, the outer wheel disc position cannot be changed on the same side of tractor. To change wheel rim disc position and maintain proper direction of tire rotation, move each tire to the opposite side of the tractor.

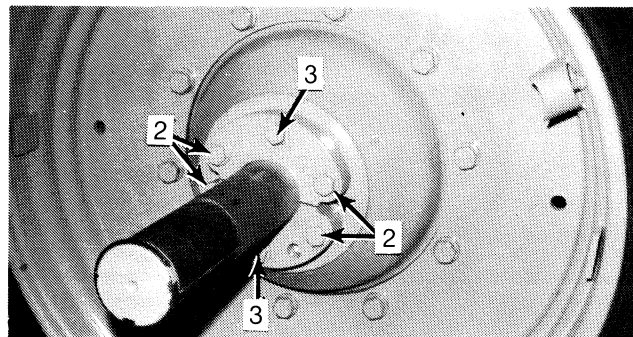


Figure 19:

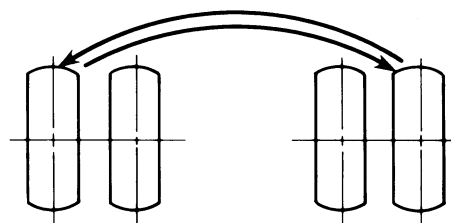


Figure 20:

- After the wheel hub is positioned on the bar, remove the four special jacking screws and replace them with the original capscrews and washers removed in step No. 2.
- Next tighten the three (3) capscrews on the bushing half assembly (A), with the key and dowel pins, alternately and evenly to 280 ± 14 lb ft ($379 \pm$ N.m). The face of this bushing half **must** contact the face of the hub.
- Repeat the same procedure described above to tighten the capscrews on the remaining bushing half (B) without the dowel. The face of this bushing **must not** contact the face of the hub.

IMPORTANT: Follow the above described procedure for each wheel requiring removal or adjustment.

- After the wheel spacing setting is completed, and **before** placing the tractor under load, run the tractor a short distance (approx. 200 yards (183 m)) and recheck each bushing capscrew for the specified torque.

IMPORTANT: On new tractors, check the hub bushing capscrews to the specified torque after the first 3 hours of operation and every 10 hours of operation thereafter until the capscrews remain tight. This must be done any time the wheel hubs have been loosened for any reason. **Be sure axle bar end snap ring is in place after wheel removal or other work to reduce the possibility of the wheel sliding off if loosened.**

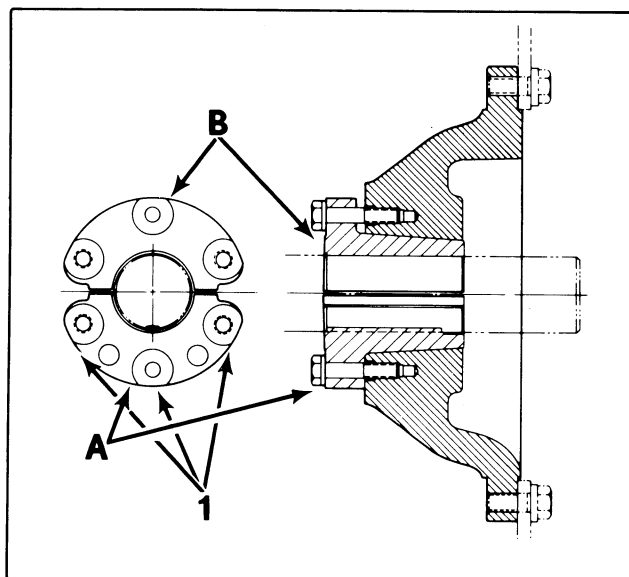


Figure 21:

General Specifications

Special Torque Values

Cab Mount Attaching Bolts

Torque all cab mount attaching bolts to 564 ± 34 ft lb (765 ± 46 N.m).



CAUTION: If the ROPS cab must ever be removed or replaced, make certain that the proper hardware is used and that the proper torque values are applied to the attaching bolts.



WARNING: The protection offered by the ROPS cab will be impaired if it is subjected to any modification, structural damage, or has been involved in an overturn. The ROPS cab must be replaced after a roll over.

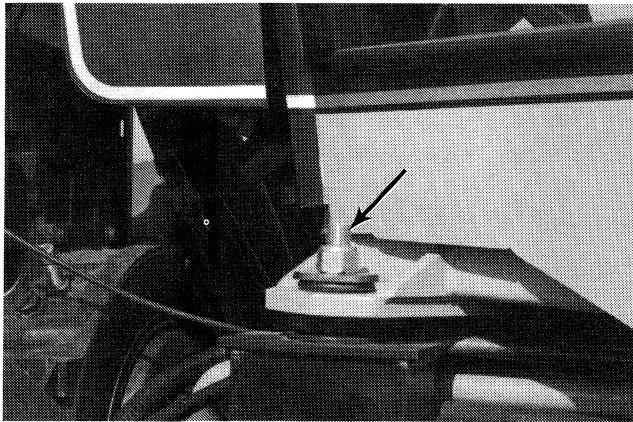


Figure 22:

Wheel Bolt Torque

Tighten the wheel lug bolts to 600 lb ft (814 N.m) every 10 hours for the first 50 hours. Repeat whenever the wheels are removed and remounted.

IMPORTANT: The 600 lb ft (814 N.m) specification will apply when lug bolts are clean and dry. If lug bolts are clean and dipped in SAE 30 oil, tighten the bolts to 450 lb ft (610 N.m).

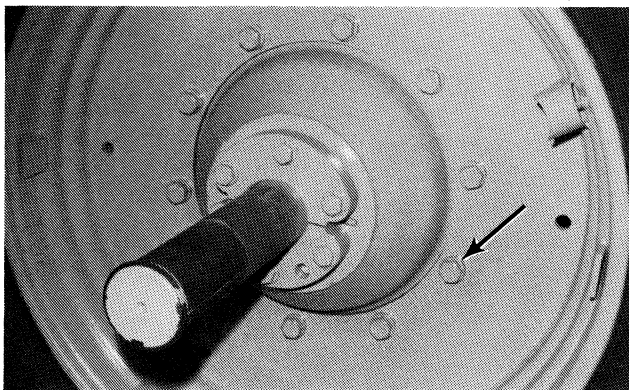


Figure 23:

Dual Bolt Torque (Spacer Band Style)

Tighten the dual bolts on spacer band style wheels to 200 lb ft (271 N.m) every 10 hours for the first 50 hours. Repeat whenever the wheels are removed and remounted.

Tighten the dual bolts evenly until the spacer is seated. Then tighten alternately and evenly in a star configuration to 200 lb ft (271 N.m). **Do not** over tighten.

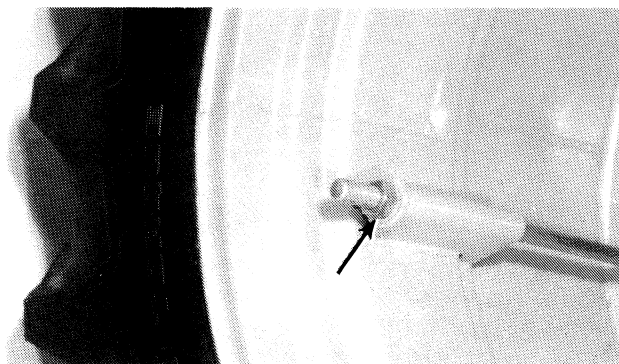


Figure 24:

General Specifications

Adjustable Wheel Bushing Capscrew Torque

Tighten the bushing half capscrews to 280 ft lb (379 N.m) after the first 3 hours of operation and every 10 hours of operation thereafter until the capscrews remain tight. This **must** be done any time the hub bushings have been loosened for any reason.

NOTE: See *Axle Wheel Adjustment Procedure* for additional information. Whenever the wheel hubs are removed, all the contact surfaces of the wheel bushings should be greased before installation. Use multi-purpose gun grease.

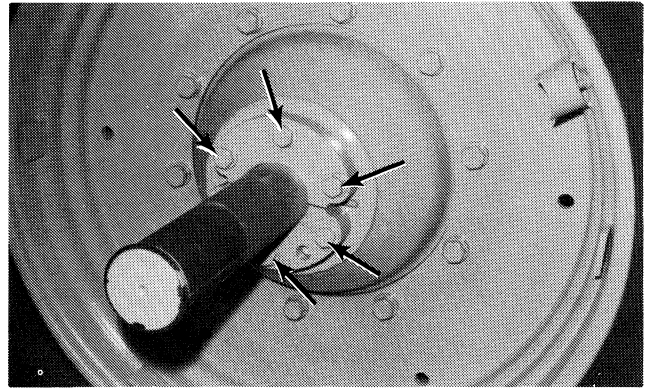


Figure 25:

Axle To Frame Bolt Torque

The front and rear axle mounting bolts - tighten to 695 ft lb (942 N.m).

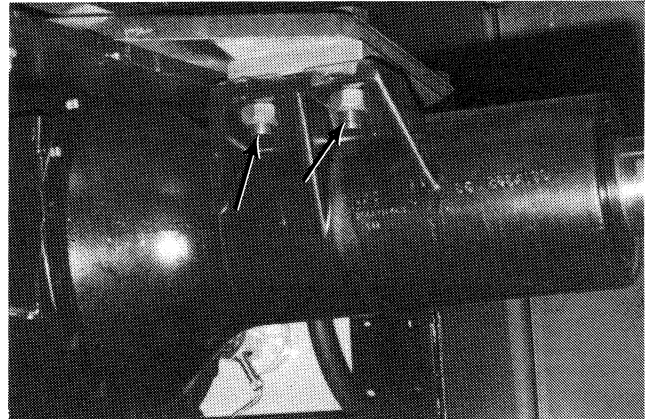


Figure 26:

Lower Vertical Hinge Pin

Lower vertical hinge pin - tighten 1200 ft lb (1627 N.m)

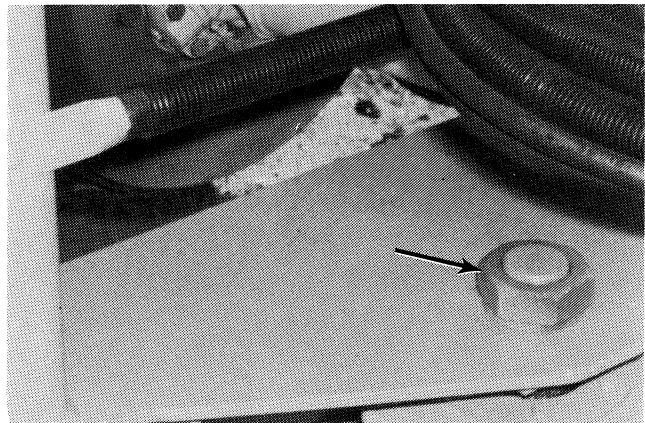


Figure 27:



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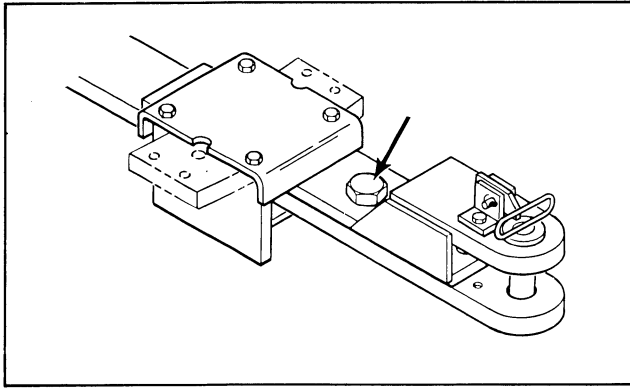


Figure 28:

Drawbar clevis Bolt Torque

The drawbar clevis bolt must be tightened to 600 ft lb (814 N.m) whenever the clevis is rotated from top to bottom.

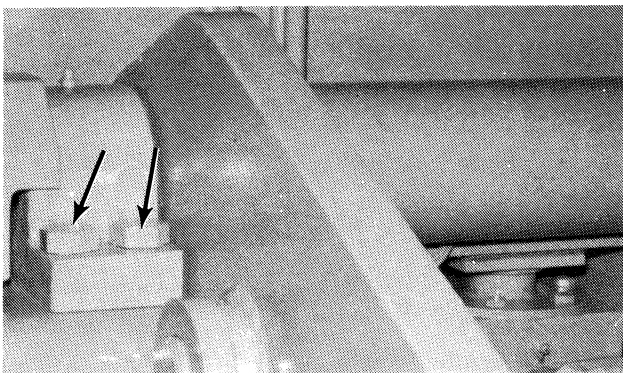


Figure 29:

3-Point Hitch (Option)

Rockershaft pillow block bolts - tighten to 460 ft lb (624 N.m).

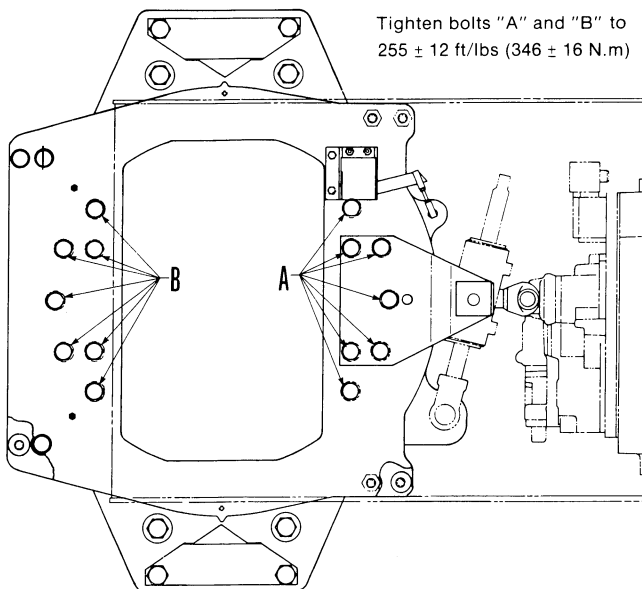


Figure 30:

Front Steerable Axle Bolt Torque

The optional front steerable axle structure must have bolts "A" and "B" checked and tightened to the specified torque at the first 50 and 100 hours of operation.

Tighten bolts "A" and "B" to 255 ± 12 ft lb (346 ± 16 N.m)

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