2099
2107 (EU)
2109
SKID-STEER LOADER

SERVICE MANUAL

PART #917036

Mustang Manufacturing Company, Inc., a Gehl Company

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SPECIFICATIONS

	2099/2107	2109
Make of Engine	Perkins	Perkins (Turbo)
Model	1104C-44	1104C-E44T
Fuel	Diesel	Diesel
Displacement	269 CID (4,41 L)	269 CID (4,41 L)
Horsepower - Net	86 hp (64 kW) @ 2400 rpm	115 hp (86 kW) @ 2400 rpm
Peak Torque	223 lbf-ft (302 N•m) @ 1400 rpm	291 lbf-ft (394 N•m) @ 1400 rpm
*SAE Rated Operating Load	3400 lbs (1542 kg)	3675 lbs (1724 kg)
Operating Weight	10180 lbs (4618 kg)	10260 lbs (4654 kg)
Shipping Weight	8980 lbs (4073 kg)	9060 lbs (4110 kg)

Specifications below apply to all 2099, 2107 and 2109 models	
Capacities	
Hydraulic Reservoir	18.5 US gal (70 L)
Chaincases (each)	12 US qts (11,4 L)
Engine Oil	8.9 US qts (8,4 L)
Fuel Tank	28.9 US gal (109,4 L)
Electrical	
Battery	12-volt DC, 950 CCA
Starter	12-volt DC (3 kW)
Alternator	85 A
Hydraulic System	
Hydraulic System Pressure	3300 psi (228 bar)
Standard Auxiliary Flow Rate (Single)	2-29 gpm (8-110 L/min)
High-Flow Auxiliary Flow Rate (Dual)	40 gpm (151 L/min)
Travel Speed - Single-Speed	0 to 8.0 mph (0 to 13 km/h)
Travel Speed - Two-Speed (optional on 2099/2107)	0 to 14 mph (0 to 22,5 km/h)

Tire Options	
14 x 17.5 - 14 ply	Foam-Filled tires
14 x 17.5 - 14 ply	High Clearance Flotation tires
14 x 17.5 - 14 ply	Severe Duty tires
15 x 17.5 - 14 ply	Foam-Filled tires - Severe Duty
33 x 15.5 x 16.5 - 12 ply	Extra Wide Heavy Duty tires
12 x 35	Solid Rubber tires

Buckets and Capacities			
Width - inches (millimeters)	**Bucket Description**	**Capacity (Heaped)**	
84 inches (2134 mm)	Dirt/Construction	22.0 cubic feet	0,62 cubic meters
84 inches (2134 mm)	Dirt/Construction	28.0 cubic feet	0,79 cubic meters
90 inches (2286 mm)	Dirt/Construction	29.3 cubic feet	0,83 cubic meters
48 inches (1219 mm)	Pallet Fork	N/A	N/A

*Operating load rated with a 84 inch (2134 mm) dirt/construction bucket in accordance with SAE J818.

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General Information

The above safety alert symbol means: ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! It stresses an attitude of "Heads Up for Safety" and can be found throughout this service manual and on the decals on the machine.

Before operating or working on this machine, read and study the following safety information. In addition, be sure that every one who operates or works on this equipment is familiar with these safety precautions. It is essential to have competent and careful operators, who are not physically or mentally impaired, and who are thoroughly trained in the safe operation of the machine and the handling of loads. It is recommended that the operator be capable of obtaining a valid motor vehicle operator's license.

The use of skid steer loaders is subject to certain hazards that cannot be eliminated by mechanical means, but only by exercising intelligence, care and common sense. Such hazards include, but are not limited to, hillside operation, overloading, instability of the load, poor maintenance and using the equipment for a purpose for which it is not intended or designed.

The Mustang Company ALWAYS considers the operator's safety when designing its machinery and guards exposed moving parts for the operator's protection. However, some areas cannot be guarded or shielded in order to assure proper operation. Furthermore, the Operator's Manual and the decals on the machine warn of additional hazards and should be read and observed closely.

This section of the manual includes procedures, which when followed, will allow safe performance of service procedures: Mandatory Safety Shutdown Procedure, Lift Cylinder Liftarm Support Device, Roll Over Protective Structure (ROPS)/Falling Object Protective Structure (FOPS) Lock Mechanism, Loader Raising and Lowering Procedures, and Relieving Hydraulic Pressure.

Signal Words

DANGER

"DANGER" indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

"WARNING" indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

"CAUTION" indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. May also alert against unsafe practices.

Additional Safety Reminders



Read and understand the Service Manual and all decals before maintaining, adjusting or servicing this equipment.

Doors, Guards and Shields - Some photographs in this manual may show doors, guards and shields open or removed for illustrative purposes only. BE SURE all doors, guards and shields are in their proper operating positions BEFORE starting engine to operate unit.

Damaged or Worn-out Parts - For safe operation, replace damaged or worn-out parts with genuine Mustang service parts, BEFORE operating this equipment.

Attachments - Mustang loaders are designed and intended to be used only with Mustang Company attachments or approved referral attachments. The Mustang Company cannot be responsible for operator safety if the loader is used with a non-approved attachment.



Battery Safety - To avoid injury from a spark or short circuit, disconnect the negative battery cable (-) before servicing any part of the electrical system. Do not tip the battery more than 45º to avoid spilling electrolyte.

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Fig. 2-1 The lock pin secures the liftarm support device on the rear link of the liftarm.

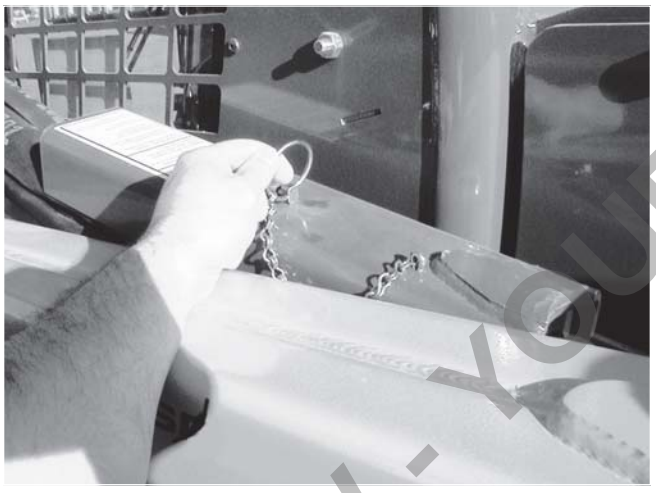


Fig. 2-2 Press in and hold the lock pin button and pull it out of the rear link.

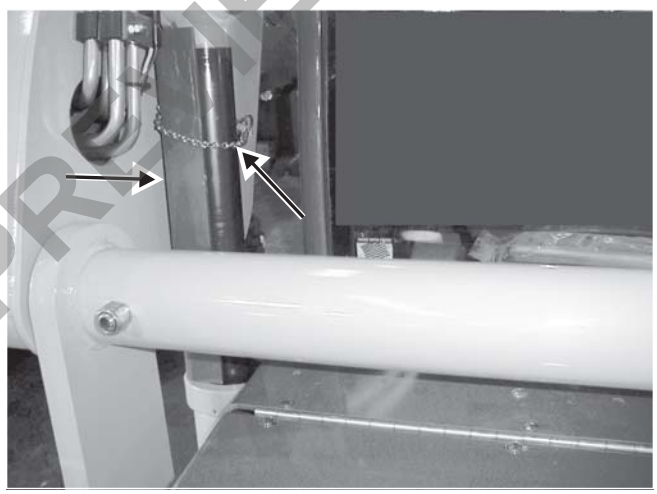


Fig. 2-3 The liftarm support device rests on top of the lift cylinder base on one end. Note the securing latch wraps around lift cylinder rod and secures to support device tab.

Liftarm Support Device

WARNING

BEFORE leaving the operator's compartment to work on the loader with the liftarm raised, ALWAYS engage the liftarm support device. Turn the keyswitch to OFF, remove the key and take it with you.

Many service procedures require a raised liftarm to allow easier access to loader components. For operator and service personnel safety, a liftarm support device is standard on Mustang skid-steer loaders. Used as a cylinder block, it helps prevent a raised liftarm from unexpectedly lowering.

BE SURE to engage liftarm support device whenever the liftarm is raised. When the device is not being used, secure it to left side of the timing link using the lock pin and cradle provided.

The liftarm support device is a safety device which must be kept in proper operating condition at ALL times.

The following procedures outline the correct way to engage and disengage the liftarm support device.

Liftarm Support Device Engagement

1. Lower liftarm until contact with loader frame.
2. Turn the keyswitch to the OFF position to stop the engine.
3. Leave operator's compartment. Press in and hold lock pin button to release its locking mechanism. Remove lock pin holding support device against liftarm hoses. Remove support device. **Figs. 2-1, 2-2**
4. Return to operator's compartment and restart engine. Use lift control to completely raise liftarm. Turn keyswitch to the OFF position to stop engine.
5. Leave operator's compartment. Vertically install support device around lift cylinder rod with u-shaped end up and out. Secure support device to lift cylinder rod with attached lock pin. **Fig. 2-3**
6. Return to operator's compartment and restart engine. Lower liftarm against support device. Then, stop the loader engine, remove the key and leave the operator's compartment.

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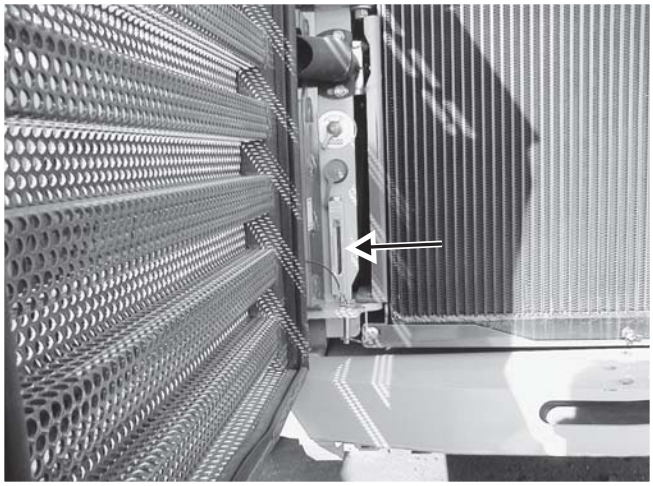


Fig. 3-1 Hydraulic oil level indicator located in front of rear grille.

General Information

WARNING

NEVER service this unit when any part of the machine is in motion. ALWAYS BE SURE to exercise the "Mandatory Safety Shutdown Procedure" (see *Safety* chapter) BEFORE servicing this equipment.

Routine lubrication is an important factor in preventing excessive part wear and early failure. Loader and engine operation depends on using correct grade, high-quality lubricating oils and anti-freeze coolant. This chapter and the chart below list locations, temperature ranges and types of recommended lubricants to be used when servicing this machine. In addition, refer to the engine

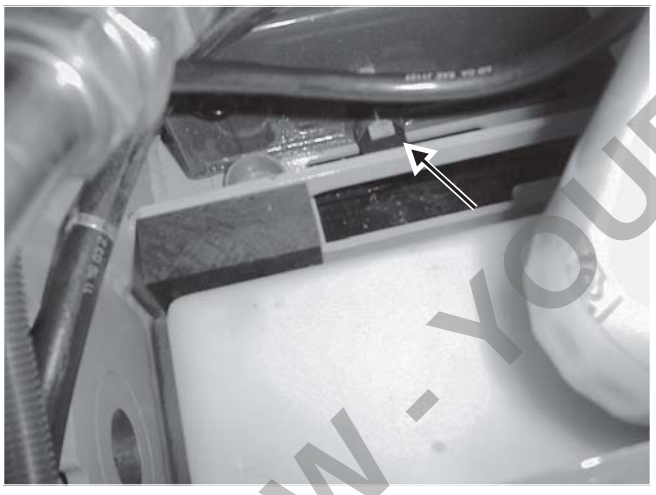


Fig. 3-2 Hydraulic oil drain plug accessed from underneath loader through small access panel.

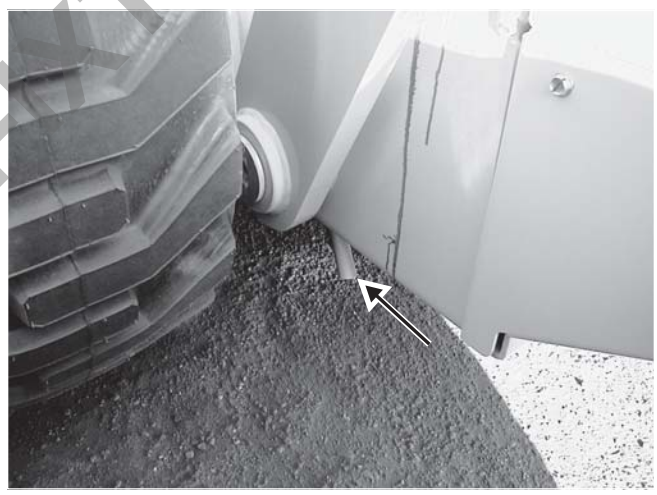
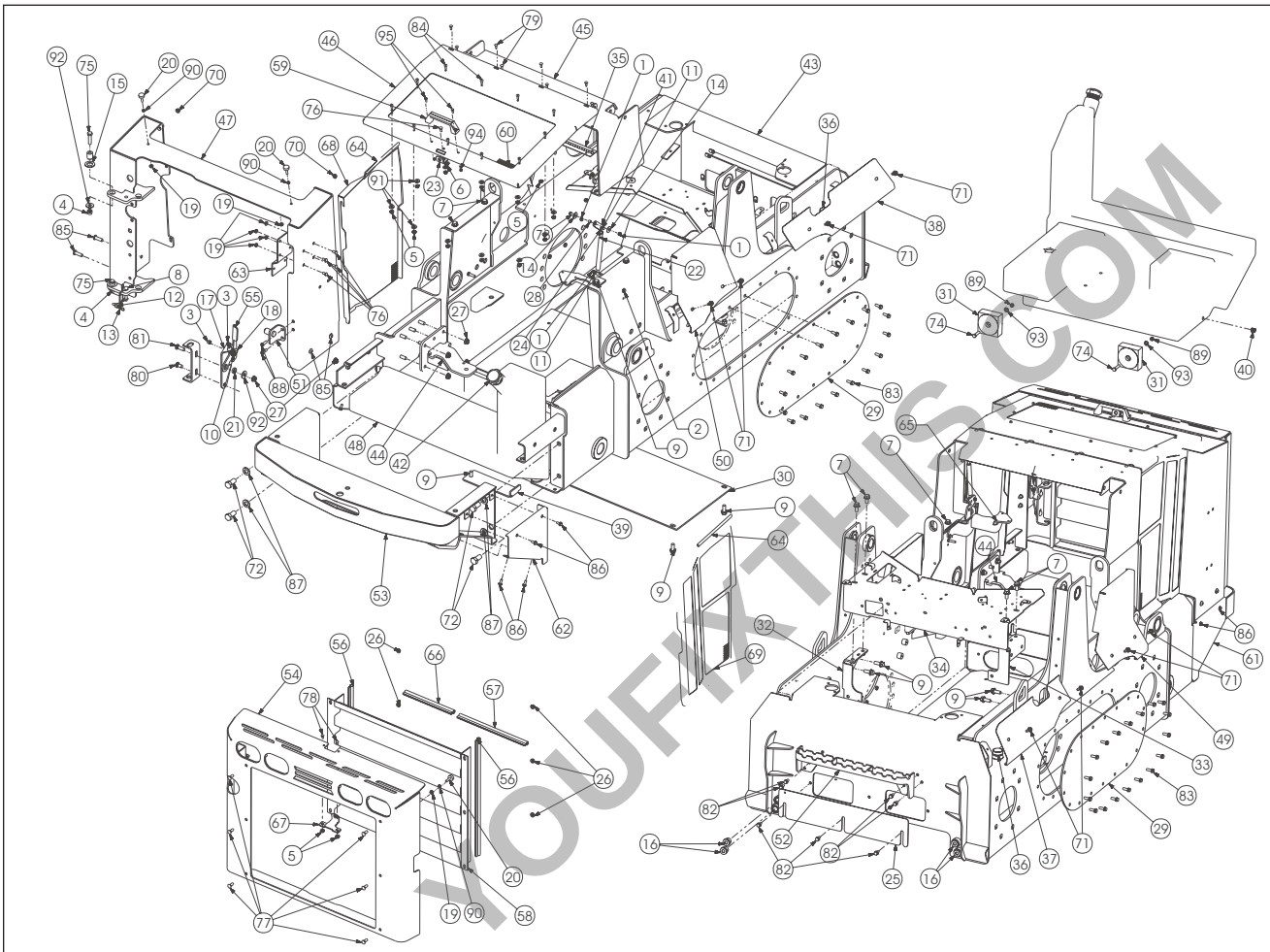


Fig. 3-3 Remote engine oil drain located behind the left rear tire, underneath the loader.

Hydraulic System Reservoir	Chaincases	Grease Fittings	Crankcase Oil (Diesel Engine)	Anti-freeze Coolant System
Use a Mobil DTE 15M, or Petro-Canada Premium HVI60, or equivalent that contains anti-rust, anti-foam, and anti-oxidation additives & conforms to ISO VG46. Capacity: 18.5 Gallons (70 L)	Use hydraulic system oil or SAE grade 15W-40 motor oil. Capacity (each side): 12 Quarts (11,4 L)	Use lithium-based grease	✪ Below 32°F (0°C) use SAE Grade* 10 or 10W-30 ✪ Above 32°F (0°C) use SAE Grade* 15W-40 *Service Classification: API - CF-4/CG-4 Capacity: 8.9 Quarts (8,4 L)	Add a mixture of 50% water, 50% ethylene glycol to the recovery tank if coolant level in recovery tank is low.

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Chassis, Covers, Floor Plates and Rear Grille Components



1 NUT/HEX	25 COVER/TOE PLATE	49 COVER/FRONT	73 SCREW/CAP
2 SCREW/CAP	26 NUT/LOCK	50 COVER/FRONT	74 SCREW/CAP
3 NUT/HEX	27 NUT/LOCK	51 STRIKER	75 SCREW/CAP
4 NUT/LOCK	28 SPACER	52 STEP	76 BOLT/CARRIAGE
5 NUT/HEX	29 COVER/CHAINCASE	53 BUMPER	77 BOLT/CARRIAGE
6 NUT/HEX	30 PLATE/FLOOR	54 GRILLE/REAR	78 BOLT/CARRIAGE
7 SCREW/CAP	31 STOP/SPROCKET	55 LATCH	79 BOLT/CARRIAGE
8 PIN/LOCK	32 SUPPORT/BAR	56 SEAL/SHROUD	80 BOLT/CARRIAGE
9 SCREW/CAP	33 SUPPORT/BAR	57 SEAL/SHROUD	81 BOLT/CARRIAGE
10 SPRING	34 CROSSMEMBER	58 GRILLE	82 SCREW/MACHINE
11 STUD/BALL	35 HINGE/PIANO	59 HANDLE/GRAB	83 SCREW/MACHINE
12 SLEEVE/CRIMP	36 BREATHER	60 SCREEN	84 SCREW/PHILLIPS
13 WIRE	37 COVER/FRONT	61 COVER/BUMPER	85 SCREW/CAP
14 WASHER	38 COVER/FRONT	62 COVER/BUMPER	86 SCREW/MACHINE
15 WASHER/SHIM	39 PLATE/COVER	63 BRACKET/PUMP	87 WASHER/FLAT
16 PLUG	40 PLUG	64 STRIP/TRIM	88 SCREW/CAP
17 MOUNT/LATCH	41 LINK/PIVOT	65 MOUNTING/FILTER	89 NUT/HEX
18 ROD/LATCH	42 CAP/FUEL	66 SEAL/SHROUD	90 NUT/JAM
19 NUT/LOCK	43 CHASSIS	67 BRACKET	91 WASHER/FLAT
20 BUMPER	44 MOUNT/FRONT	68 COVER/SIDE	92 WASHER/FLAT
21 BUSHING	45 COVER/ENGINE	69 COVER/SIDE	93 WASHER/FLAT
22 SPRING/GAS	46 COVER/ENGINE	70 NUT/HEX	94 NUT/HEX
23 BRACKET	47 BACK END	71 SCREW/THD CUT	95 SCREW/CAP
24 CLIP/GAS SPRING	48 TANK/FUEL	72 SCREW/CAP	

Fig. 4-6 Exploded view of the chassis components.

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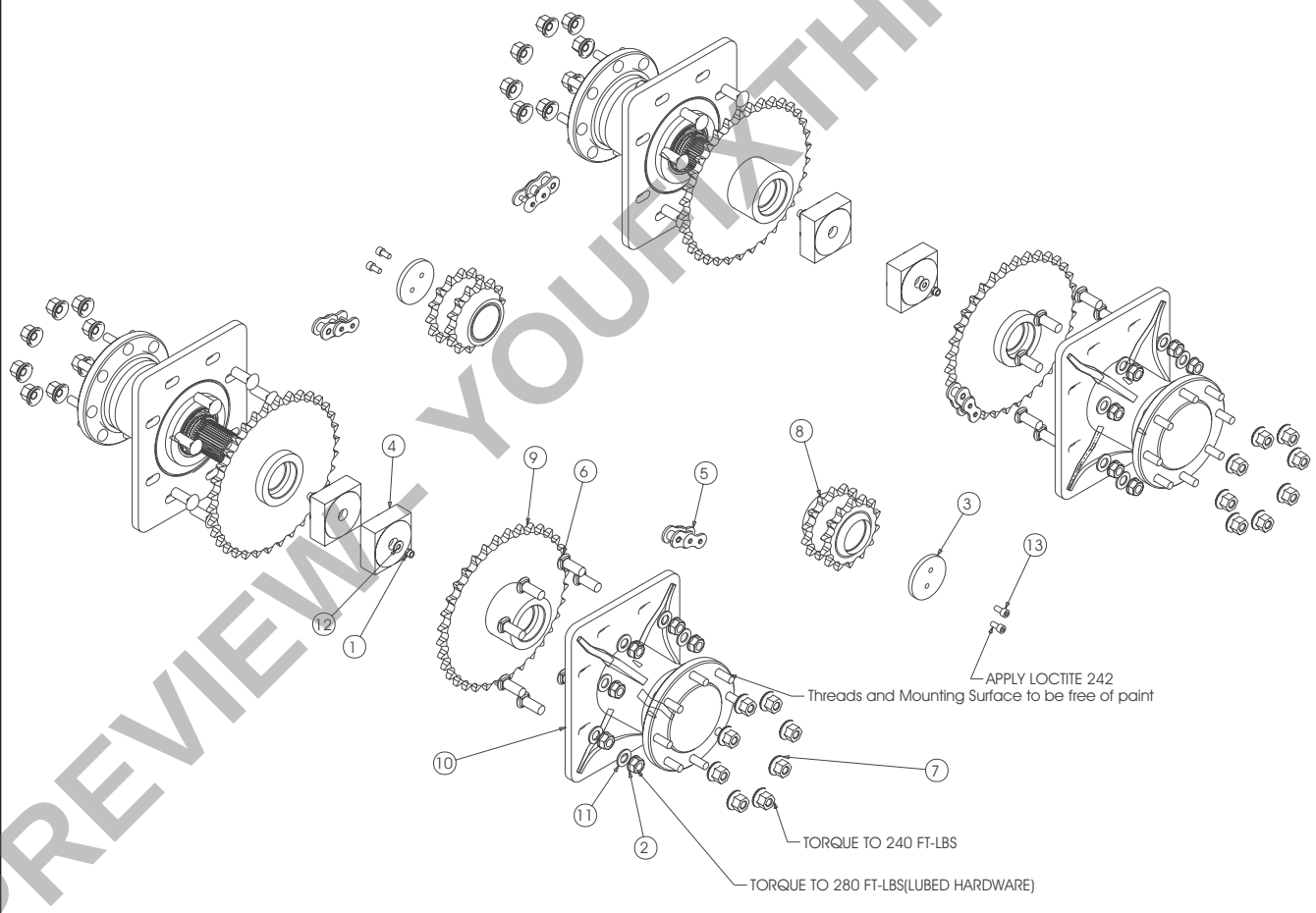
Introduction

This chapter covers removal, installation, assembly, and adjustment procedures for wheel drive system components on Mustang skid-steer loaders. Wheel drive components covered in this chapter are shown below.

Mustang skid-steer loaders are equipped with a hydrostatic pump assembly coupled to the diesel engine providing hydrostatic power to the two fixed-displacement hydrostatic drive motors. The drive motors are directly connected to chaincases. Single speed or two-speed, each motor drives one set of wheels on each side of the loader through a chain and sprocket system.

Service procedures related to the hydrostatic pump and drive motors can be found in the *Hydrostatic System* chapter.

Wheel Drives Components



1 NUT/LOCK	6 BOLT/CARRIAGE	11 WASHER/FLAT
2 NUT/LOCK	7 NUT/WHEEL	12 WASHER/FLAT
3 WASHER/SPECIAL	8 ASSEMBLY/SPROCKET	13 SCREW/CAP
4 STOP/AXLE SPROCKET	9 ASSEMBLY/SPROCKET	
5 CHAIN/ROLLER	10 ASSEMBLY/AXLE	

Fig. 5-1 Exploded view of the wheel drive components.

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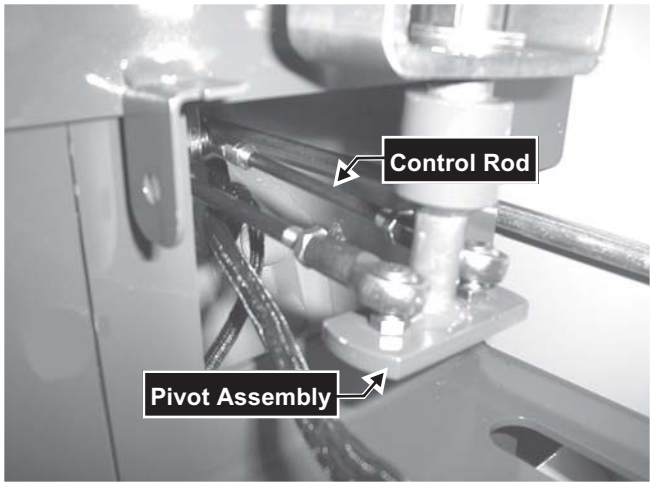


Fig. 6-9 Left T-Bar control handle.

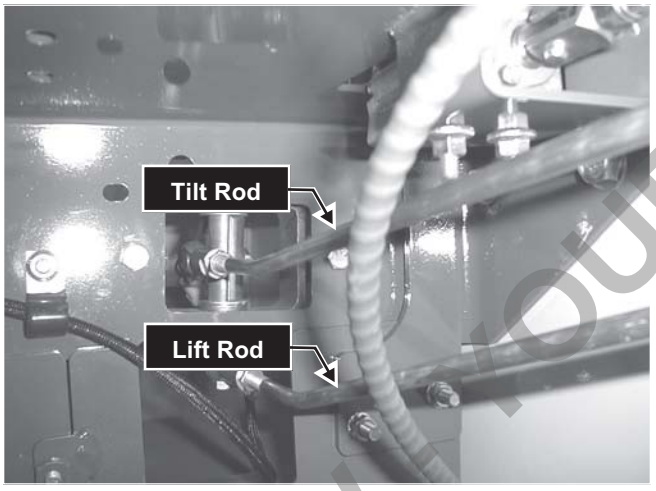


Fig. 6-10 Right T-Bar control handle view underneath crossmember looking forward.

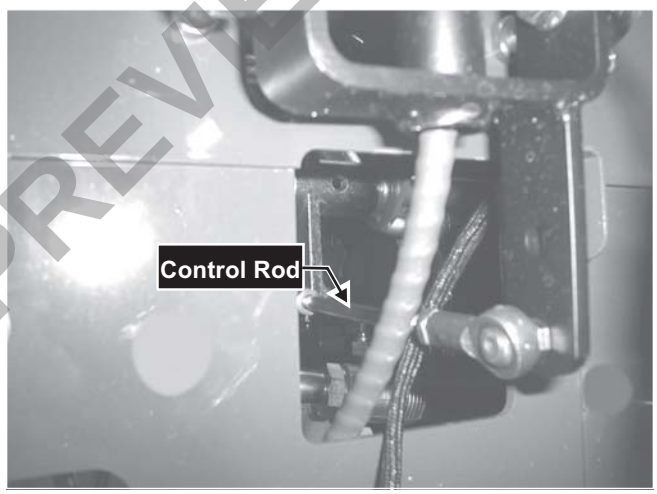


Fig. 6-11 Right Dual Hand control handle (Hand/Foot controls are similar). Left side similar.

Control Handle Position Adjustment

Control handles are adjusted two ways for proper operation; vertically straight appearance and handle orientation.

Adjustment Procedure

WARNING

BEFORE beginning this service procedure, perform the following SAFETY procedures:

- ❑ **Raise liftarm, engage liftarm support device.**
- ❑ **Shut off the engine.**
- ❑ **Roll ROPS back until lock engages.**

(For detailed instructions, refer to the *Safety* chapter of this manual.)

1. Left control handles:
   - a. **T-Bar:** Adjust two control rod lengths connected at the pivot assembly, so the bracket on pivot assembly is oriented 90° to the chassis. **Figs. 6-9, 6-13**
   - b. **Hand/Foot and Dual Hand:** Adjust by changing length of one control rod. **Figs. 6-11, 6-13**
2. Right control vertical orientation:
   - a. **T-Bar:** Change lift control rod length attached to bottom of pivot assembly. **Fig. 6-10**
   - b. **Hand/Foot and Dual Hand:** Change control rod length attached to bottom of handle assembly. **Fig. 6-11**
3. Right control handle orientation:
   - a. **T-Bar:** Change tilt control rod length attached to handle above pivot assembly. Adjust tilt rod length until oriented 90° to chassis. BE SURE adjustment allows for full activation of control valve in both directions of handle operation. **Figs. 6-10, 6-13**
   - b. **Dual Hand:** Change the cable length in the lower handle, connected at the grip assembly. Remove capscrew on rod end, loosen jam nut and adjust until the handle is properly oriented, retighten the jam nut and reinstall the capscrew. BE SURE adjustment allows for full activation

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Troubleshooting Guide

The following troubleshooting guide lists potential hydrostatic system problems, as well as possible causes and remedies, for Mustang skid-steer loaders.

When a problem occurs, don't overlook simple causes. A malfunction can be caused by something as simple as low oil level. After a mechanical failure has been corrected, be sure to locate and correct the cause of the problem.

IMPORTANT

DO NOT attempt to service or repair major hydrostatic system components, such as the hydrostatic pumps or drive motors, unless authorized to do so by your Mustang dealer. Any unauthorized repair will void the warranty.

Problem	Possible Cause	Remedy
No response from the hydrostatic drive or the lift/tilt systems.	Hydraulic oil viscosity is too high.	Allow longer warm-up or replace oil with the proper viscosity oil.
	Restraint bar is in its UP position.	Lower the restraint bar.
	Hydraulic oil supply is too low.	Check for low oil level in reservoir. Add oil as needed.
	Hydrostatic pump drive is disconnected. Drive coupling failure.	Check for broken or worn pump Drive Coupling and replace, as needed.
Traction drive will not operate in either direction.	Parking brake is engaged.	Disengage parking brake.
	Hydraulic oil supply too low.	Check for low oil level in reservoir. Add oil if necessary.
	Control rod linkage disconnected.	Check linkage connection at control levers and neutral centering mechanisms. Reconnect linkage.
	Broken charge line, low or no charge pressure.	See hydrostatic pump manual.
	Hydrostatic pump relief valves are malfunctioning.	Inspect and clean the relief valves. Replace them as needed.
Drive wheels do not turn in proper direction for T-Bar movement.	High pressure hydraulic hoses between hydrostatic pump and drive motors are connected wrong.	Reconnect hoses to proper ports on the drive motors. Refer to schematic and figures in hydrostatic chapter.

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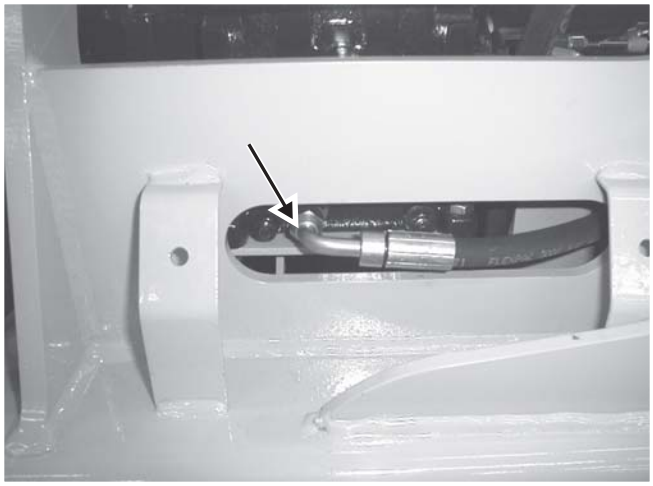


Fig. 8-6 Location of where to "tee" into system on the main control valve. (Right rear fender cover has been removed.)

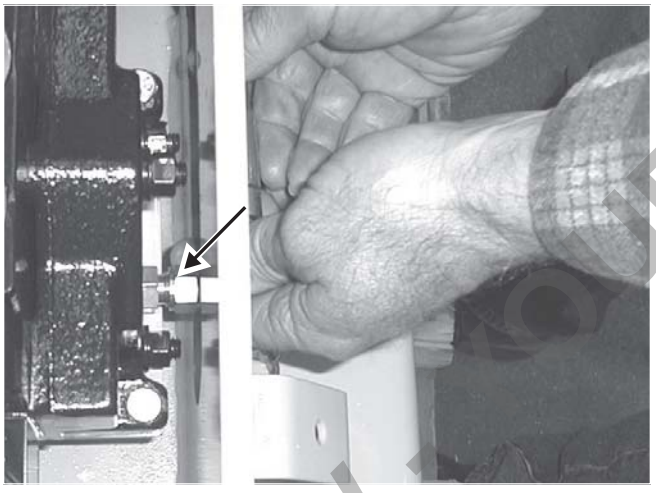


Fig. 8-7 Insert tee fitting into control valve and connect line and pressure gauge on opposite ends of tee fitting.

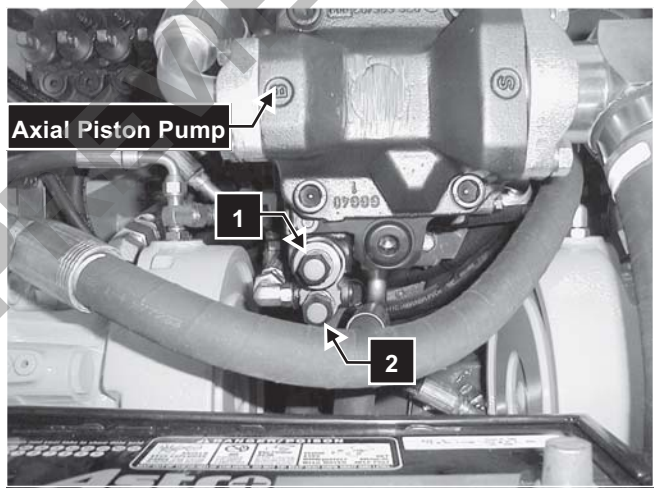


Fig. 8-8 Location of system high and low pressure compensator adjustment screws at front and bottom of the axial piston pump, (1) system pressure, (2) load-sense standby pressure.

Pressure Tests, System and Load-Sense Standby

The control valve, located inside right of the chassis, controls liftarm lift and tilt functions, standard and high flow auxiliary hydraulics. There are two adjustable pressure compensators on the bottom of the axial piston load-sensing pump. One is used to set maximum system pressure, the other, to set load-sense standby pressure.

System Pressure Test Procedure

WARNING

BEFORE beginning this service procedure, perform the following SAFETY procedures:

- ❑ **Raise liftarm, engage liftarm support device.**
- ❑ **Shut off the engine.**
- ❑ **Relieve hydraulic system pressure.**
- ❑ **Roll ROPS back until lock engages.**

(For detailed instructions, refer to the *Safety* chapter of this manual.)

NOTE: To prevent contamination, ALWAYS clean the area around the hydraulic fittings before disconnecting any hydraulic plug, hose or tube.

1. What you'll need: an assistant, and a minimum 5000 PSI (345 bar) pressure gauge, tee fitting and Allen wrench.
2. On right fender, remove two capscrews securing access cover to chassis at right of control valve.
3. Remove hose from fitting at side of inlet section of control valve and insert tee fitting. **Figs. 8-6, 8-7**
4. Attach hose just removed and pressure gauge to tee fitting.
5. Lower ROPS, climb into operator's seat, lower restraint bar, and start engine. For the test, engine should be running at HIGH idle. Have assistant read pressure gauge.
6. Using tilt control handle, roll bucket all the way back. Hold tilt control handle in this position.
7. Have assistant observe system pressure reading on gauge. Pressure reading should be at least 3250 PSI (224 bar), but NOT more than 3350 PSI (231 bar).

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