Gehl V400
Mustang 4000V

Form No.
50950064
Revision B
11/13

SKID-STEER LOADERS





Service Manual

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SPECIFICATIONS

Model		**V400 / 4000V**
Engine Make		Cummins
Engine Model		QSB4.5
Fuel		Diesel
Displacement		273 CID (4,5 L)
Horsepower - Net		99 hp (74 kW) @ 2200 rpm
Peak Torque		326 lbf-ft. (442 N•m) @ 1300 rpm
Rated Operating Capacity*		4000 lbs. (1814 kg)
Operating Weight		11,100 lbs. (5035 kg)
Shipping Weight		10,140 lbs. (4599 kg)
Capacities		
Engine Oil		11.75 US qts. (11,1 L)
Fuel Tank		31.25 US gal. (118,3 L)
Chaincase (each)		12.0 US qts. (11,4 L)
Bare Hydraulic Reservoir		16.75 US gal. (63,4 L)
Entire Hydraulic System		24.50 US gal. (92,7 L)
Engine Coolant		16.0 US qts. (15,1 L)
Electrical System		
Batteries (2)		12-V DC, Group 24, 675 CCA, 115 Res.
Starter		12-V DC (4.8 kW)
Alternator		130 A
Hydraulic System		
Hydraulic System Relief Pressure		3450 psi (238 bar)
High-Flow System Relief Pressure		3450 psi (238 bar)
Standard Auxiliary Flow Rate		32.0 gpm (121,1 L/min)
High-Flow Auxiliary Flow Rate		41.0 gpm (155,2 L/min)
Maximum Travel Speed - Low		0 to 6.42 mph (0 to 10,3 km/h)
Maximum Travel Speed - High		0 to 12.5 mph (0 to 20,0 km/h)
Tire Options		
14 x 17.5 Heavy-Duty 12-Ply		Flotation
14 x 17.5 Heavy-Duty 12-Ply		Flotation, Foam-Filled
14 x 17.5 Severe-Duty 14-Ply		Flotation
14 x 17.5 Severe-Duty 14-Ply		Flotation, Foam-Filled
14 x 17.5 Solid-Flex		Solid, Foam-Filled
Buckets and Capacities		
Width - Description		
84 inches (2134 mm) - Dirt/Construction		27.0 cubic feet; (0,76 cubic meters)
84 inches (2134 mm) - Landscaping/Grading		23.3 cubic feet; (0,66 cubid meters)
90 inches (2286 mm) - Dirt/Construction		29.0 cubic feet; (0,82 cubic meters)
90 inches (2286 mm) - Light Material		37.0 cubic feet; (1.05 cubic meters)
15.75-19.68-24 inches (400-500-610 mm) Pallet		Not Applicable

* Operating load rated with an 84 in. (2134 mm) 27.0 cu. ft. (0.76 m3) Dirt/Construction bucket and 14 x 17.5 NHS tires in accordance with SAE J818 and ISO 14397-1.

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General Information

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

Before operating or working on this machine, read and study the following safety information. In addition, be sure that everyone 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.

Manitou Americas ALWAYS consider the operator's safety when designing 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. The Operator's Manual and the decals on the machine warn of additional hazards and should be read and observed closely.

These topics in the *Safety* chapter of the service manual include procedures, which, when followed, will allow for safe performance of service procedures: Mandatory Safety Shutdown Procedure, Lift Arm Support Device, Roll-Over Protective Structure (ROPS/FOPS)/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 Gehl/ Mustang service parts, before operating this equipment.

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

Battery Safety - To avoid injury from a spark or short circuit, turn the electrical disconnect switch to the OFF position before servicing any part of the electrical system. Do not tip the battery more than 45º.



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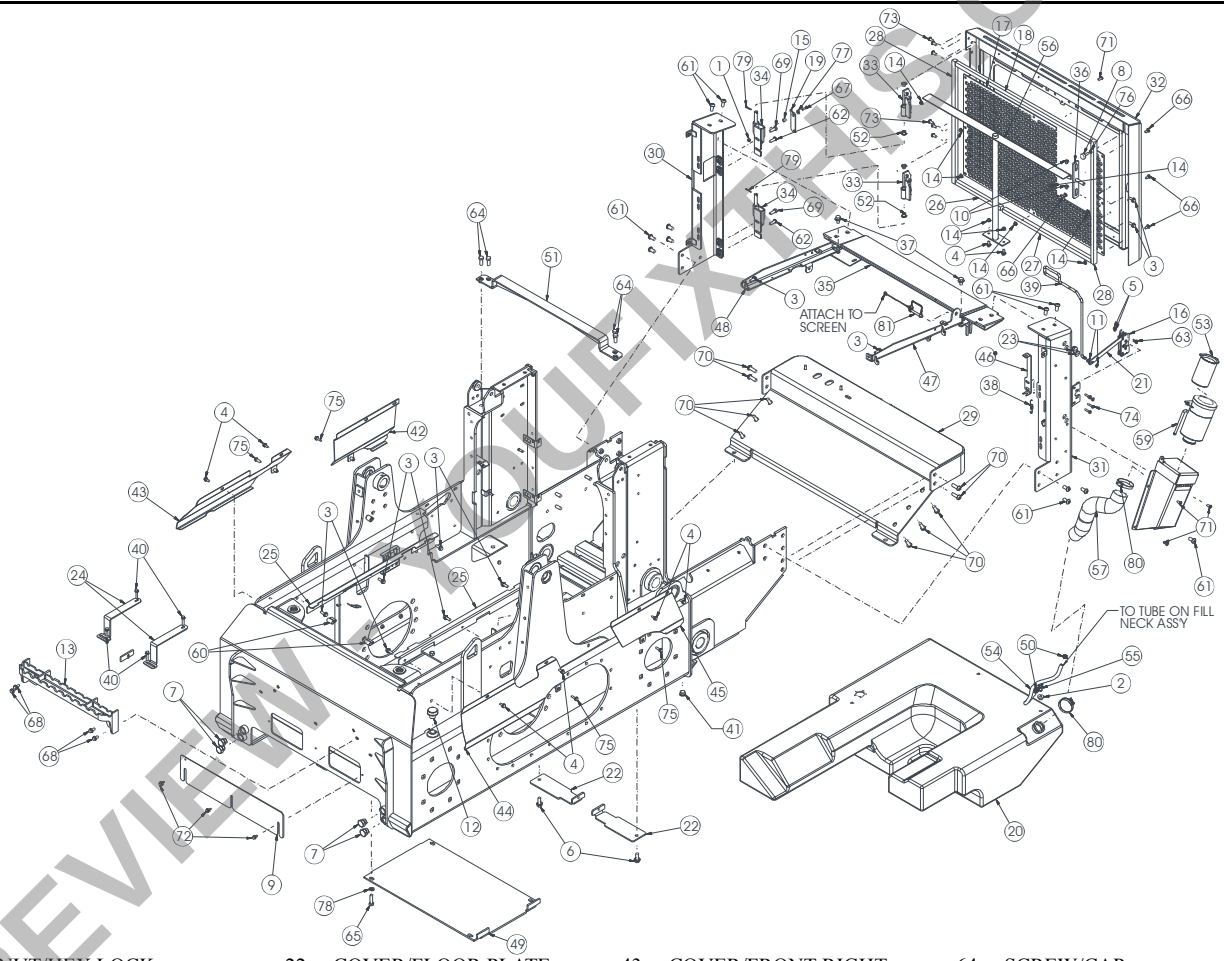
Introduction

Gehl V400 and Mustang 4000V model skid-steer loaders have a welded steel chassis. Maintenance, service and repair may be performed through standard access panels.

Two side chaincases provide mounting for the drive motors and for the front and rear axles. The side cases also serve as sealed housings for the drive chains and sprockets. Oil is used inside these cases to ensure the chains always receive proper lubrication.

The lift arm and the lift and tilt cylinders are mounted with pivot pins. Capscrews are used to secure the pivot pins. A Rollover Protective Structure/Falling Object Protective Structure (ROPS/FOPS) is standard for operator safety, and both the seat and restraint bar include safety interlock switches.

Mainframe (Chassis) and Rear Grille Components



1	NUT/HEX LOCK	22	COVER/FLOOR PLATE	43	COVER/FRONT RIGHT	64	SCREW/CAP
2	BUSHING/FUEL TANK	23	PLUG/HOLE	44	COVER/FRONT LEFT	65	SCREW/CAP
3	SCREW/CAP LOCKING	24	HOLD DOWN/BATTERY	45	COVER REAR LEFT	66	BOLT/CARRIAGE
4	SCREW/CAP LOCKING	25	SEAL PLATE/ROPS	46	GUIDE/ROD	67	SCREW/CAP
5	NUT/HEX LOCK	26	SEAL/FOAM	47	RAIL/LEFT	68	SCREW/MACHINE
6	SCREW/CAP LOCKING	27	SEAL/FOAM	48	RAIL/RIGHT	69	SCREW/CAP
7	PLUG MORB12	28	SEAL/FOAM	49	PLATE/FLOOR	70	SCREW/CAP
8	BUMPER	29	BUMPER/REAR	50	CLAMP/HOSE	71	SCREW/CAP
9	COVER/TOEPLATE	30	PANEL/RIGHT	51	BRACE/TOWER	72	SCREW/TAPPING
10	NUT/SPIRALOCK™	31	PANEL/LEFT	52	BUSHING/FLANGE	73	SCREW/CAP
11	CLIP/RETAINING	32	GRILLE/REAR	53	STRAINER/FUEL FILL	74	SCREW/CAP
12	BREATHER	33	HINGE/UPPER	54	HOSE/FUEL	75	SCREW/CAP
13	STEP	34	HINGE/LOWER	55	FITTING/TANK/90°	76	NUT/HEX JAM
14	NUT/HEX LOCK	35	CROSSMEMBER/TOWER	56	STIFFNER/DOOR	77	WASHER/FLAT
15	TUBE	36	ASSY/STRIKER	57	HOSE/FUEL	78	WASHER/LOCK
16	LATCH/DOOR	37	SCREW/CAP LOCKING	58	FILL/FUEL	79	PIN/COTTER
17	SCREEN	38	SPRING/EXTENSION	59	WELDMENT/FILL	80	CLAMP/HOSE
18	SEAL/FOAM	39	HANDLE/LATCH	60	SEAL/BULB	81	PIN/LOCK
19	STOP/DOOR	40	SCREW/CAP	61	SCREW/CAP		
20	TANK/FUEL	41	PLUG HH MORB10	62	SCREW/CAP		
21	EXTENSION/LATCH	42	COVER/REAR RIGHT	63	SCREW/CAP		

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Loader Stability - A skid-steer loader's stability is determined by its wheelbase and tread width. The following elements can affect stability: terrain, speed, load being carried or dumped, and sudden control movements. DISREGARDING ANY OF THESE FACTORS CAN CAUSE THE LOADER TO TIP, POSSIBLY RESULTING IN DEATH OR SERIOUS INJURY. Therefore, ALWAYS have the operator restraint bar lowered and wear the seat belt. Operate the controls only from the operator's seat. Operate the controls smoothly and gradually at an appropriate engine speed that matches the operating conditions.

DO NOT exceed the rated operating capacity of the machine. For additional stability when operating on inclines or ramps, ALWAYS travel with the heavier end of the loader toward the top of the incline.

ALWAYS look to the rear before backing up.

When parking machine, before leaving seat, check restraint bar for proper operation. The restraint bar, when raised, applies the parking brake and deactivates lift/tilt controls and auxiliary hydraulics.

Keyswitch - NEVER attempt to bypass the keyswitch to start the engine. Use the jump-starting procedure detailed in the *Service* chapter of the Operator's Manual.



Hydraulic Fluid Leaks - NEVER use hands to search for hydraulic fluid leaks. Instead, use paper or cardboard. Fluid under pressure can be invisible, penetrate the skin and cause a serious injury. If any fluid is injected into skin, see a doctor at once. Injected fluid MUST be surgically removed by a doctor or gangrene may result.



Wear Safety Glasses - ALWAYS wear safety glasses with side shields when operating the machine or striking metal against metal. In addition, it is recommended that a softer (chip-resistant) material be used to cushion the blow. Failure to heed could lead to serious injury to eyes or other parts of the body.

ALWAYS wear safety glasses when searching for hydraulic leaks or when working near batteries.

Loaded Bucket/Fork - DO NOT raise or drop a loaded bucket or fork suddenly. Abrupt movements under load can cause serious loader instability.

NEVER push the lift control into the "float" position with the bucket or attachment loaded or raised, because this will cause the lift arm to lower rapidly.

DO NOT drive too close to an excavation or ditch. BE SURE that the surrounding ground has adequate strength to support the weight of the loader and the load.

DO NOT smoke or have any spark-producing equipment in the area while filling the fuel tank or while working on the fuel or hydraulic systems.



Exhaust Gases - Exhaust fumes can kill. DO NOT operate this machine in an enclosed area unless there is adequate ventilation.

Engine - NEVER use ether or starting fluid.

People - NEVER carry riders. DO NOT allow others to ride on the machine or attachment, because they could fall or cause an accident.

BE SURE all persons are away from the machine and warn others in the area before starting the engine.

ALWAYS face the machine and use handholds and steps when getting on and off. DO NOT jump off machine.



Wear appropriate ear protection for prolonged exposure to excessive noise.

ALWAYS perform a daily inspection of the machine before using it. Look for damage, loose or missing parts, leaks, etc.

Remove trash and debris from the machine and engine compartment each day to minimize risk of fire.

New operators MUST operate loader in an open area away from bystanders. Practice with controls until the loader can be operated safely and efficiently.

Mandatory Safety Shutdown Procedure

BEFORE cleaning, adjusting, lubricating or servicing the unit or leaving it unattended:

1. Move drive control handle(s) to the neutral position.

2. Lower the lift arm and attachment completely. If the lift arm *must* be left in the "raised" position, BE SURE to properly engage the lift arm support device.

3. Move the throttle to the low idle position, shut off the engine and remove the key.

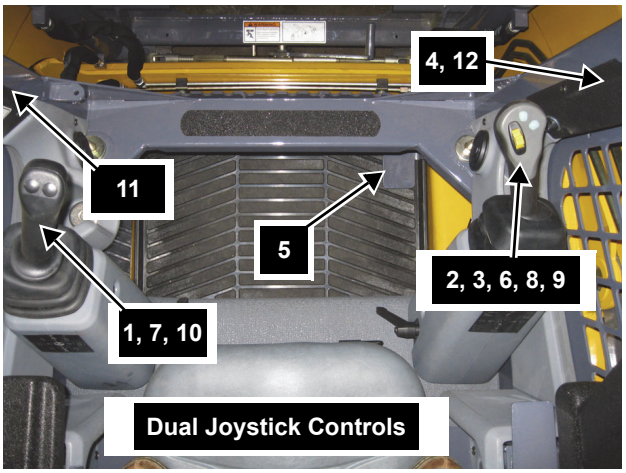
4. Before exiting, move the lift/tilt control(s) to verify that controls do not cause movement of the lift arm or hitch.

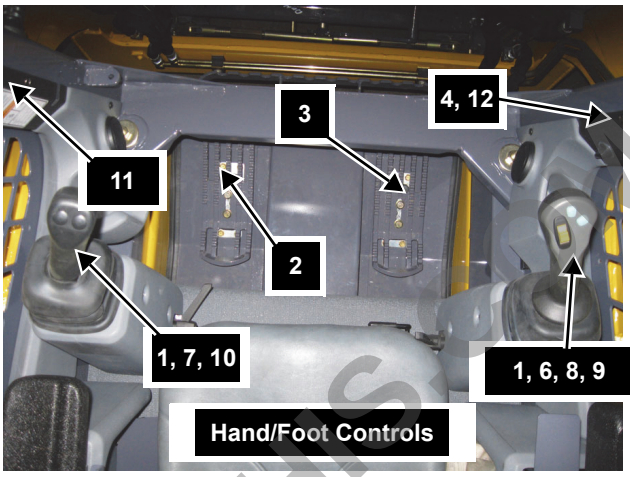
Only after these precautions can you be sure it is safe to proceed. Failure to follow the above procedure could lead to death or serious injury.

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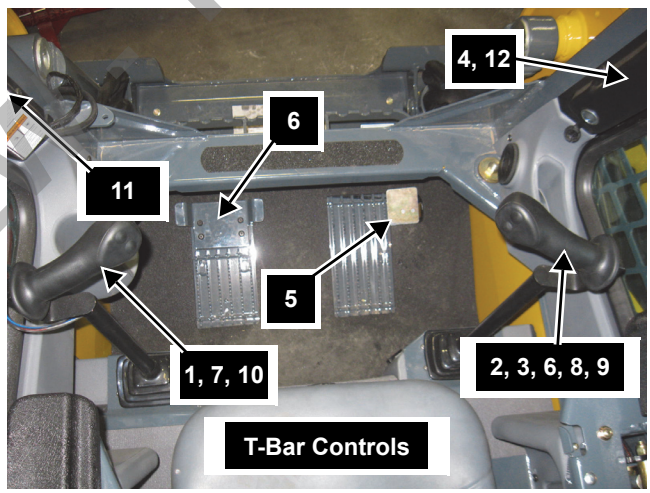
Control Locations - Dual Joystick and Hand/Foot Controls





1 - Drive Control
2 - Lift Control
3 - Tilt Control
4 - Hand Throttle
5 - Foot Throttle
6 - Standard Auxiliary Hydraulics Control
7 - Two-Speed Button Switch
8 - Hydraglide™ Ride Control Switch
9 - Float Control Switch
10 - Horn Button Switch
11 - High-Flow Auxiliary Hydraulics Control
12 - Power-A-Tach® Control (optional)

Control Locations - T-Bar Controls

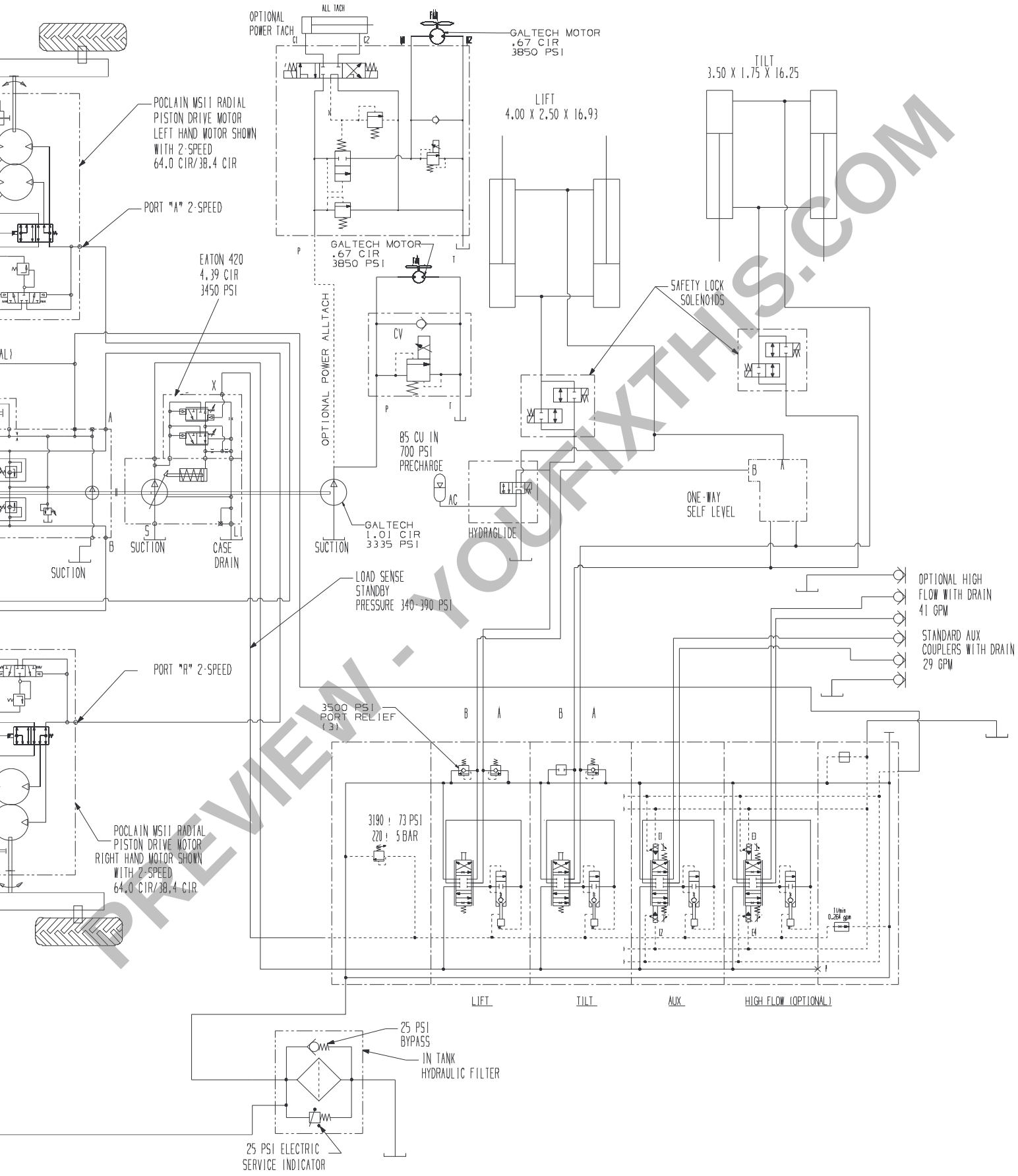


1 - Drive Control
2 - Lift Control
3 - Tilt Control
4 - Hand Throttle
5 - Foot Throttle
6 - Standard Auxiliary Hydraulics Control
7 - Two-Speed Button Switch
8 - Hydraglide™ Ride Control Switch
9 - Float Control Switch
10 - Horn Button Switch
11 - High-Flow Auxiliary Hydraulics Control
12 - Power-A-Tach® Control (optional)

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Hydrostatic/Hydraulic Schematic - T-Bar Controls



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Troubleshooting Guide

The troubleshooting guide lists potential hydrostatic system problems, as well as possible causes and remedies.

If you cannot locate a particular hydrostatic system problem in this chart, consult the troubleshooting chart in the *Hydraulic System* chapter.

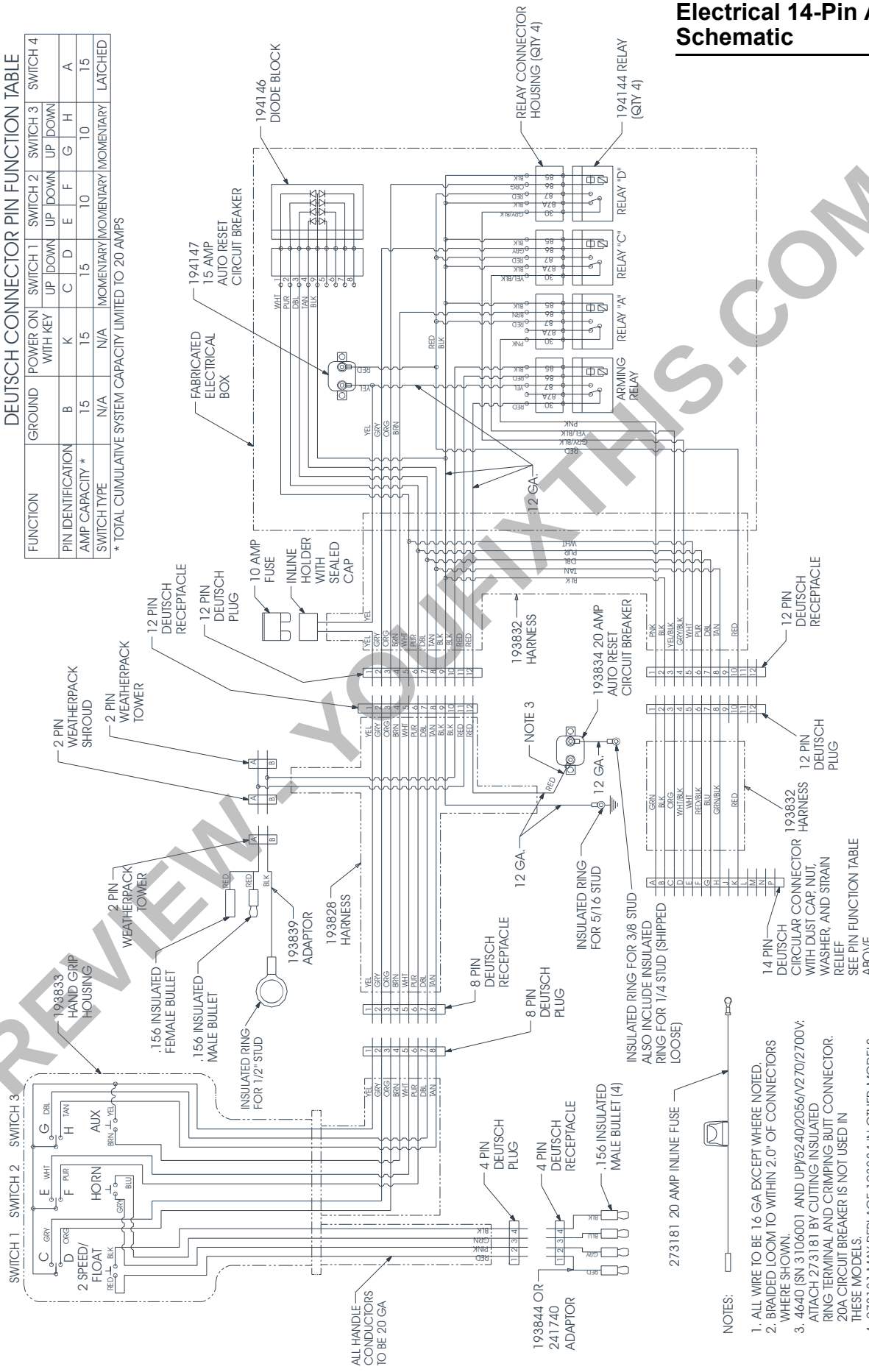
When a problem occurs, don't overlook simple causes. A malfunction could be caused by something as simple as low fluid level in the hydraulic reservoir. After a mechanical failure has been corrected, be sure to locate the cause of the problem.

Problem	Possible Cause	Remedy
No response from the hydrostatic drive or the lift/tilt systems	Restraint bar/seat switch malfunction	Check switches and interlock module.
	Hydraulic oil viscosity too high	Allow longer warm-up or replace oil with the proper viscosity oil.
	Hydraulic oil supply too low	Check for low oil level in reservoir. Add oil as needed.
	Hydrostatic pump drive disconnected Drive coupling failure	Check for broken or worn pump Drive Coupling and replace, as needed.
	Blown fuse or relay	Replace fuse or relay.
	Low or no charge pressure	See hydrostatic pump manual.
Traction drive will not operate in either direction	Parking brake engaged	Disengage parking brake.
	Hydraulic oil supply too low	Check for low oil level in reservoir. Add oil if necessary.
	Low or no charge pressure	See hydrostatic pump manual.
	Hydrostatic pump relief valves malfunctioning	Inspect and clean the relief valves. Replace them as needed.
	Inadequate pilot supply oil pressure to joystick control	Check pilot supply oil pressure. Check pilot supply cut-out solenoid.
	Restraint bar raised	Lower the restraint bar.
	Restraint bar or seat switch malfunctioning	Replace malfunctioning switch. Check indicator light on the interlock module.
	T-Bar Models: Control rod linkage disconnected	Check linkage connection at control levers and neutral centering mechanisms. Reconnect linkage.
Drive wheels do not turn in proper direction	High pressure hydraulic hoses between hydrostatic pump and drive motors connected incorrectly	Reconnect hoses to proper ports on the drive motors. Refer to schematic and figures in the *Hydrostatic System* chapter.
	Joystick pilot controller hoses connected incorrectly	Reconnect hoses to proper ports on hydrostatic pump. Refer to schematic and figures.

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Electrical 14-Pin Auxiliary Schematic



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Cummins QSB4.5 Engine Diagnostic Fault Codes

A1. J1939 FMIs and Descriptions

FMI=0 Data valid but above normal operational range—(applies to J1939)
The signal communicating information is within a range that is defined acceptable and valid, but the real world condition is above what would be considered normal by the predefined limits for that particular measure of the real world condition (Region **"e"** of signal range definition). Broadcast of data values is continued as normal.

FMI=1 Data valid but below normal operational range—(applies to J1939)
The signal communicating information is within a defined acceptable and valid range, but the real world condition is below what would be considered normal by the predefined limits for that particular measure of the real world condition (Region **"d"** of signal range definition). Broadcast of data values is continued as normal.

FMI=2 Data erratic, intermittent or incorrect—(applies to J1939)
Erratic or intermittent data includes all measurements that change at a rate that is not considered possible in the real world condition and must be caused by improper operation of the measuring device or its connection to the ECM.
Incorrect data includes any data not received and any data that is exclusive of the situations covered by FMIs 3, 4, 5, and 6 below. Data may also be considered incorrect if it is inconsistent with other information collected or known about the system.

- *For J1939, broadcast of data value is substituted with "error indicator" value*

FMI=3 Voltage above normal or shorted to high source—(applies to J1939)
a. A voltage signal, data or otherwise, is above the predefined limits that bound the range (Region **"g"** of the signal range definition).

- *For J1939, broadcast of data value is substituted with "error indicator" value*

b. Any signal external to an engine control module whose voltage remains at a high level when the ECM commands it to low.

- *For J1939, broadcast of data value is substituted with "error indicator" value*

FMI=4 Voltage below normal or shorted to low source—(applies to J1939)
a. A voltage signal, data or otherwise, is below the predefined limits that bound the range (Region **"f"** of the signal range definition).

- *For J1939, broadcast of data value is substituted with "error indicator" value*

b. Any signal external to an engine control module whose voltage remains at a low level when the ECM commands it to high.

- *For J1939, broadcast of data value is substituted with "error indicator" value*

FMI=5 Current below normal or open circuit—(applies to both J1939 and J1587)
a. A current signal, data or otherwise, is below the predefined limits that bound the range (Region **"f"** of the signal range definition).

- *For J1939, broadcast of data value is substituted with "error indicator" value*

b. Any signal external to an engine control module whose current remains off when the ECM commands it on.

- *For J1939, broadcast of data value is substituted with "error indicator" value*

FMI=6 Current above normal or grounded circuit—(applies to both J1939 and J1587)
a. A current signal, data or otherwise, is above the predefined limits that bound the range (Region **"g"** of the signal range definition).

- *For J1939, broadcast of data value is substituted with "error indicator" value*

b. Any signal external to an engine control module whose current remains on when ECM commands it off.

- *For J1939, broadcast of data value is substituted with "error indicator" value*

FMI=7 Mechanical system not responding or out of adjustment—(applies to J1939)
Any fault that is detected as the result of an improper mechanical adjustment, an improper response or action of a mechanical system that, with a reasonable confidence level, is not caused by an electronic or electrical system failure. This type of fault may or may not be directly associated with the value of general broadcast information.

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