TROUBLESHOOTING

Electrical System

Problem	Possible Cause	Remedy
Entire electrical system does not function.	Battery disconnect switch in OFF position. Main wiring harness connectors at rear of ROPS not properly plugged in. Battery terminals or cables loose or corroded. Battery is faulty.	Turn battery disconnect switch to ON. Check main harness connectors. Clean battery terminals and cables and retighten them. Test battery, replace as needed.
No instrument panel lamps with keyswitch turned to "ON."	Battery terminals or cables are loose or corroded.	Clean battery terminals and cables and retighten them.
Fuel gauge does not work.	Faulty fuel gauge sender. Faulty fuel gauge. Loose wiring/terminal connections.	Replace fuel gauge sender. Replace fuel gauge. Verify wiring connections.
Engine temperature gauge does not work.	Faulty temperature sender. Faulty temperature gauge. Loose wiring/terminal connections.	Replace temperature sender. Replace temperature gauge. Verify wiring connections.
Hourmeter does not work.	Loose wiring/terminal connections. Faulty alternator. Faulty hourmeter.	Verify wiring connections. Repair alternator. Replace hourmeter.

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SPECIFICATIONS

Loader Specifications

Specification	4640E
Operating Weight	6300 lbs. (2858 kg)
Shipping Weight	5700 lbs. (2585 kg)
Rated Operating Capacity[1]	1650 lbs. (748 kg)
Engine	
Make	Yanmar (water cooled)
Model	4TNV98
Displacement	202 cu. in. (3,31 L)
Power (net)	68 hp (51 kW) @ 2500 rpm
Peak Torque	180 ft.-lb. (244 N·m) @ 1600 rpm
Hydraulic System (theoretical)	
Main Hydraulic System Pressure	2750 psi (190 bar)
Standard-Flow Rating	19.0 gpm (72 L/min)
High-Flow Rating	30.0 gpm (114 L/min)
Electrical	
Battery	12-Volt DC, 950 CCA
Starter	12-Volt DC (3,0 kW)
Alternator	95 amperes
Capacities	
Chaincase (each)	8 U.S. qts. (7.5 L)
Engine Oil[2]	without filter: 9.0 U.S. qts. (8,5 L) with new filter: 9.5 U.S. qts. (9,0 L)
Fuel Tank	14 U.S. gal. (53 L)
Hydraulic Reservoir	15 U.S. gal. (57 L)
Coolant Reservoir	9.7 U.S. qts. (9,18 L)
Sound (with Deluxe Sound Kit)	
Pressure Level (Operator Ear)	83 dB(A)
Power Level (Environmental)	101 dB(A)

1. Operating capacity rated with an 66 in. (1676 mm) 15.1 ft.^{3} (0.43 m^3) dirt/construction bucket in accordance with SAE J818 and ISO14397.

2. Approximate value can vary depending on oil tray or cooler version (external cooling system). Use mark on dipstick to determine FULL oil level.

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CHAPTER 4

OPERATION

⚠ WARNING **Before starting the engine and operating the loader, review and comply with all safety recommendations in the Safety chapter of this manual. Know how to stop the loader before starting it. Also, be sure to fasten and properly adjust the seatbelt(s) and lower the operator restraint bar.**

Before Starting the Engine

Before starting the engine and running the loader, refer to the *Controls and Safety Equipment* chapter and familiarize yourself with the various operating controls, indicators and safety devices on the loader.

Starting the Engine

The following procedure is recommended for starting the engine:

1. Carefully step up onto the back of the bucket or attachment and grasp the handholds to get into the operator's compartment.
2. Fasten the seatbelt(s) and lower the restraint bar.
3. Verify the following:
   - the lift/tilt, drive and auxiliary hydraulic controls are in their neutral positions,
   - the parking brake switch is on.
4. Push the throttle lever forward to approximately half speed.

Note: *When the key is turned to the RUN position, an indicator will light on the instrument panel and a buzzer will sound momentarily to remind you to check that your seatbelt is fastened.*

5. Turn the key to the start position.

Note: *If temperature is below 32°F (0°C), see Cold-Starting Procedure, on page 44.*

Important: *Do not engage the starter for longer than 15 seconds at a time. Longer use can overheat and damage the starter. If the engine fails to start within 15 seconds, return the key to the off position. Allow the starter to cool for 20 seconds and repeat Step 5.*

After the engine starts, allow a sufficient warm-up time before attempting to operate the controls.

Important: *If the indicator warning lights do not go off, stop the engine and investigate the cause.*

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Instrument Panels

The instrument panels contain the switches and indicator lights. Symbols on the indicator lights are visible only when the indicator light are on.

Left Panel

1. **Two-Speed Transmission (optional)** – Lights when high speed is engaged.
2. **Parking Brake** – Lights when the parking brake is applied.
3. **Power-A-Tach® Hitch (optional)** – Used to operate the Power-A-Tach hitch.
4. **Fan (optional)** – Used to control the fan speed for the air conditioner and heater.
5. **Heater/Air Conditioner Selector** – Used to control the heater and air conditioner.
6. **Accessory Plug** – 12-volt DC power outlet.
7. **Engine Malfunction** – Lights when the engine electronic control unit (ECU) has detected a failure warranting an automatic shutdown. The indicator lamp also displays error codes when the key switch is turned to the "on" position. See Engine Diagnostics chart on page 70.
8. **Hydraglide™ Ride Control System (optional)** – Lights when the ride control system is activated.
9. **Float Indicator (T-Bar/Joystick and Dual Joystick control options only)** – Lights when float function is activated.
10. **Parking Brake Switch** – Used to apply the parking brake.

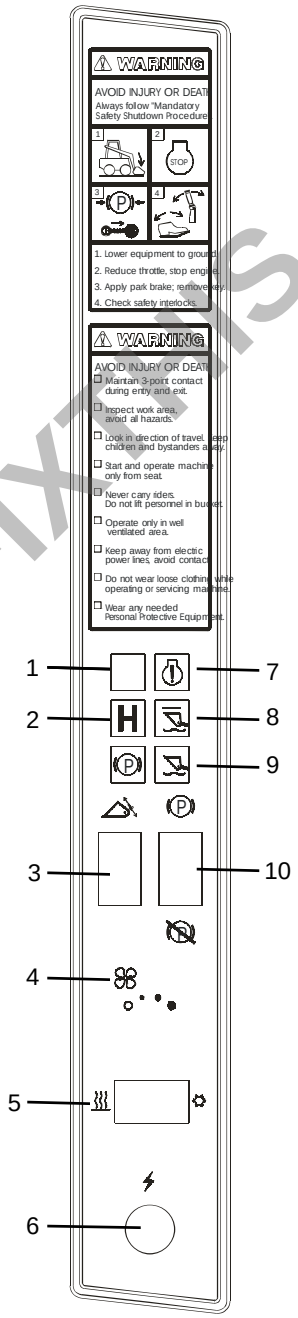


Figure 10 Left Panel

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⚠ WARNING To prevent unexpected release of the attachment from the hitch, be sure to properly secure the hitch latch pins by rotating the latch levers fully(manual All-Tach® hitch) or by ensuring that the pin flags are all the way to the outside (Power-A-Tach® hitch).

The skid-steer loader features either a manual or a power hitch for mounting a bucket or other attachment conforming to SAE Standard J2513.

On a manual All-Tach® hitch (Figure 21), two latch levers engage the latch pins to secure the attachment. On a Power-A-Tach® hitch (Figure 22), a switch on the left instrument panel (page 28) activates the latch pins to secure the attachment.

Connecting Attachments

1. **Manual hitch:** Rotate the latch levers until the handles are vertical to retract the lock pins.

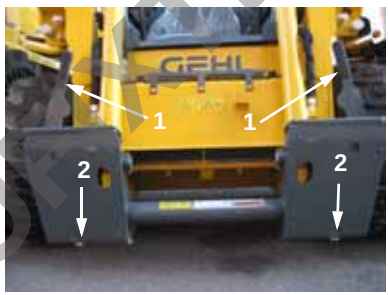


Figure 21 Manual Hitch – disengaged

1. Latch Levers
2. Latch Pins

2. **Power hitch:** Activate the switch to unlock the hitch and fully retract the latch pins.
3. Start the loader engine. Be sure the lift arm is lowered and in contact with the loader frame.
4. Align the loader squarely with the back of the attachment.
5. Tilt the hitch forward until the top edge of the hitch is below the flange on the back side of the attachment and centered between the vertical plates.
6. Slowly drive the loader forward and, at the same time, tilt the hitch back to engage the flange on the back side of the attachment.

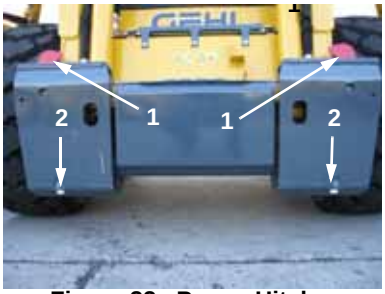


Figure 22 Power Hitch – disengaged

1. Pin Flags
2. Latch Pins

7. Stop forward travel when the flange is engaged, but continue to tilt the hitch back to lift the attachment off the ground.

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⚠ WARNING **Park the truck or trailer on a level surface. Be sure the vehicle and its ramps have the weight capacity to support the loader. Be sure the vehicle surface and its ramps are clear of debris and slippery material that may reduce traction. Move the loader on and off the vehicle ramp slowly and carefully. Failure to follow these instructions could result in an overturn accident.**

Observe all local regulations governing the loading and transporting of equipment (Reference: U.S. Federal Motor Carrier Safety Regulations, Section 392). Ensure that the hauling vehicle meets all safety requirements before loading the skid-steer loader.

1. Place blocks at the front and rear of the hauling vehicle's tires.
2. If the loader has an attachment, lift it slightly off the ground.
3. Back the loader slowly and carefully up the ramp onto the vehicle.
4. Lower the loader attachment to the vehicle deck, turn off the engine and remove the key.
5. Fasten the loader to the hauling vehicle at the points indicated by the tie-down decals (Figure 29 and Figure 30).
6. Measure the clearance height of the loader and hauling vehicle. Post the clearance height in the cab of the vehicle.

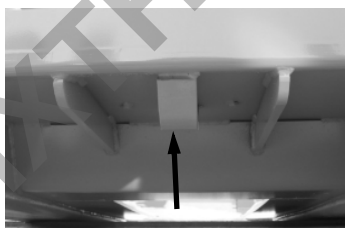


Figure 29 Front Tie-Downs/ Retrieval Points



Figure 30 Rear Tie-Down/ Retrieval Points

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CHAPTER 7

MAINTENANCE

This *Maintenance Interval* chart was developed to match the *Service* chapter of this manual. Detailed information on each service procedure may be found in the *Service* chapter. A *Maintenance Log* follows this chart for recording the maintenance performed. Recording the 10-hour (or daily) service intervals would be impractical and is therefore not recommended.

Important: *Under severe operating conditions, more frequent service than the recommended intervals may be required. You must decide, based on your use, if your operation requires more frequent service.*

Service Procedure	Maximum Interval		
	10 Hours (or Daily)	250 Hours	500 Hours (or Annually)
Foreign Material Removal (page 62)	●		
Check Engine Air Cleaner Restriction Indicator (page 67)	●		
Check Engine Oil Level (page 69)	●		
Check Hydraulic Oil Level (page 74)	●		
Check Tire Pressures (page 77)	●		
Grease Lift Arm, Hitch, Cylinder Pivots and Latch Pins (page 62)	●		
Check Bucket Cutting Edge (page 75)	●		
Test Safety Interlock System (page 20)	●		
Check Coolant Level (page 76)	●		
Clean Cooling System (page 76)	●		
Check Drive Chain Tension (page 65)		●	
Check Wheel Nuts Torque (page 75)	❍	●	
Check All-Tach Pivot Torque (page 75)		●	
Check Oil Level in Chaincases (page 65)		●	
Check Alternator/Fan Belt Tensions (page 75)		●	
Change Engine Oil and Filter (page 69)	☐	●	
Change Hydraulic Oil Filter (page 74)	☐		●
Check Battery (page 79)			●
Check Engine Mounting Hardware (page 68)			●
Change Fuel Filters (page 70)			●
Change Hydraulic Oil (page 75)			◆
Change Chaincase Oil (page 65)	☐		◆

❍ Perform the initial procedure at 2 hours then at "●" intervals.

☐ Perform the initial procedure at 50 hours then at "●" or "◆" intervals.

❖ Severe operating conditions.

◆ Perform the procedure at 1000 hours.

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TORQUE SPECIFICATIONS

Use these torque values when tightening hardware (excluding locknuts, and self-tapping, thread-forming, and sheet metal screws) unless otherwise specified.

UNIFIED NATIONAL THREAD	GRADE 2		GRADE 5		GRADE 8	
	DRY	LUBED	DRY	LUBED	DRY	LUBED
8-32	19*	14*	30*	22*	41*	31*
8-36	20*	15*	31*	23*	43*	32*
10-24	27*	21*	43*	32*	60*	45*
10-32	31*	23*	49*	36*	68*	51*
1/4-20	66*	50*	9	75*	12	9
1/4-28	76*	56*	10	86*	14	10
5/16-18	11	9	17	13	25	18
5/16-24	12	9	19	14	25	20
3/8-16	20	15	30	23	45	35
3/8-24	23	17	35	25	50	35
7/16-14	32	24	50	35	70	55
7/16-20	36	27	55	40	80	60
½-13	50	35	75	55	110	80
½-20	55	40	90	65	120	90
9/16-12	70	55	110	80	150	110
9/16-18	80	60	120	90	170	130
5/8-11	100	75	150	110	220	170
5/8-18	110	85	180	130	240	180
3/4-10	175	130	260	200	380	280
3/4-16	200	150	300	220	420	320
7/8-9	170	125	430	320	600	460
7/8-14	180	140	470	360	660	500
1-8	250	190	640	480	900	680
1-12	270	210	710	530	1000	740
METRIC COARSE THREAD	**GRADE 8.8**		**GRADE 10.9**		**GRADE 12.9**	
	DRY	**LUBED**	**DRY**	**LUBED**	**DRY**	**LUBED**
M6-1	8	6	11	8	13.5	10
M8-1.25	19	14	27	20	32.5	24
M10-1.5	37.5	28	53	39	64	47
M12-1.75	65	48	91.5	67.5	111.5	82
M14-2	103.5	76.5	145.5	108	176.5	131
M16-2	158.5	117.5	223.5	165.5	271	200

*All torque values are in ft-lbs., except those marked with an * which are in lbs. For metric torque value (N·m), multiply the ft-lbs value by 1.355 or the in-lbs value by 0.113.

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Engine Diagnostic Chart (continued)

No.	Item	Failure detection conditions	Operation when failure occurs	Action/ condition for recovery	Category	Number of flashes
1	Coolant temperature sensor failure	Sensor voltage is 4.8 V or more, or 0.2 V or less.	Engine runs with a coolant temperature of 30°C.	Correct failure.	Always enable	4
2	Accelerator sensor failure	Sensor voltage is 4.6 V or more, or 0.2 V or less.	[Without optional backup accelerator sensor] Engine runs at 1500 min^{-1}. (Option can change) [With optional backup accelerator sensor] Select backup accelerator sensor: No limitation Backup accelerator sensor failure: Engine runs at 1500 min^{-1}.(Option can change)	Correct failure.	Default to disable	5
3	Speed sensor failure	Engine start signal (E8) is on, but the engine speed is zero.	[With optional backup speed sensor] Backup speed sensor becomes active; speed is limited to 1800 min^{-1}.(Option can change) Backup speed sensor failed: Engine stops. [Without optional backup speed sensor] Engine stops.	Turn key off.	Always enable	6
		Engine speed decreases by 480 min^{-1} or more in 40 ms.				
4	Rack position sensor failure	Correlation between rack actuator output and rack position exceeds threshold upper limit by 0.32 sec. or more.	Engine runs with limited output and speed. (Rack position control is inactive and speed control is active).	Turn key off.	Always enable	7
		Correlation between rack actuator output and rack position exceeds threshold lower limit by 0.16 sec. or more.				
5	Rack actuator failure	Rack actuator current is too high.	Engine stops.	Turn key off.	Always enable	8
		Rack actuator current is too low.				
		Engine accelerates with minimum rack actuator output.				
		Engine stalls while rack position sensor is failed.				
6	Overspeed	Idling engine speed exceeds high idling speed plus 600 min^{-1}.	Engine stops.	Turn key off.	Always enable	9

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Loader Raising Procedure

To raise the skid-steer loader so all four tires ARE NOT contacting the ground, use the procedure below:

⚠ WARNING **Do not rely on a jack or hoist to maintain the raised position without additional blocking and supports. Serious personal injury could result from improperly raising or blocking the loader.**

1. To block the loader, obtain enough solid wooden or metal blocks, so that when stacked, all of the tires are raised off the ground.

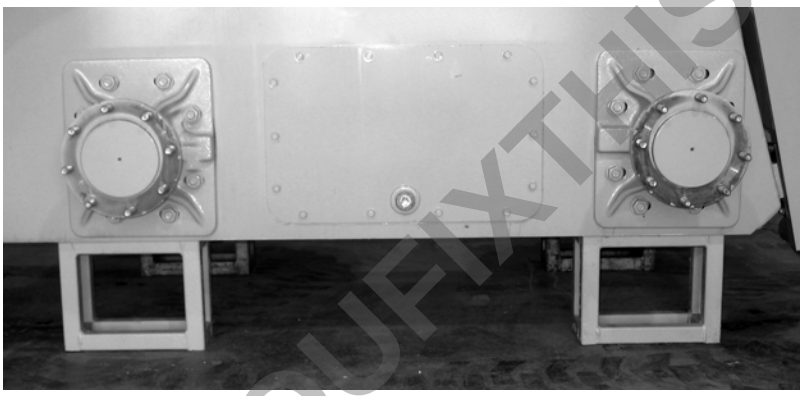


Figure 34 Loader Properly Blocked
(Tires and wheels removed to show blocks)

2. Using a jack or hoist capable of lifting at the fully-equipped weight of the loader (with all attached options), lift the rear of the loader until the rear tires are off the ground.
3. Stack wooden blocks under the flat part of the loader chassis. They should run parallel with, but not touch, the rear tires.
4. Slowly lower the loader until its weight rests on the blocks. If the tires still touch the ground, raise the loader again, add more blocks and lower again.
5. Repeat Steps 2 through 4 for the front end. When the procedure is finished, all four tires are off the ground so they could be removed.

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Electrical System

Problem	Possible Cause	Remedy
Starter will not engage when key is turned to START.	Seat or restraint bar switch malfunctioning or not actuated.	Contact your dealer.
	Poor connections to starter relay in instrument panel.	Verify relay connections.
	Battery terminal or cables loose or corroded.	Clean terminal, cables and retighten.
	Faulty starter relay in instrument panel.	Contact your dealer.
	Battery discharged or defective.	Recharge or replace battery.
	Starter solenoid not functioning.	Contact your dealer.
	Ignition wiring, seat switch, restraint bar switch, etc. loose or disconnected.	Check wiring for poor connections, broken leads; repair wiring or connection.
	Starter relay malfunctioning.	Verify relay is working properly, replace.
	Starter or pinion faulty.	Remove starter; repair/ replace as needed.
Work lights not functioning properly.	Single light not working; light bulb burned out, faulty wiring.	Check and replace light bulb as needed. Check wiring connection to light.
	No lights; 30 ampere light fuse blown.	Check circuit and locate trouble before replacing fuse.
	Faulty light switch or poor ground.	Check ground wire connections. Replace light switch.
Lift/Tilt and/or drive lock solenoids do not work.	Wiring to solenoids disconnected or faulty.	Troubleshoot circuit, repair.
	Restraint bar or seat switch malfunction.	Contact your dealer.
	Faulty solenoid valve coil.	Contact your dealer.
	Solenoid relay malfunctioning.	Verify relay is working properly, replace.
	Faulty hydraulic solenoid relay in instrument panel.	Contact your dealer.

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High-Flow Rating	30 gpm (114 L/min)
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Alternator	95 amperes
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Chaincase (each)	8.0 U.S. qts (7.5 L)
Engine Oil[2]	without filter: 9.0 U.S. qts. (8,5 L) with new filter: 9.5 U.S. qts. (9 L)
Fuel Tank	16 U.S. gal (60 L)
Hydraulic Reservoir	15 U.S. gal (57 L)
Coolant Reservoir	9.7 U.S. qts. (9,18 L)
Sound (with Deluxe Sound Kit)	
Pressure Level (Operator Ear)	83 dB(A)
Power Level (Environmental)	101 dB(A)

1. Operating capacity rated with an 66 in. (1676 mm) 15.1 ft.^{3} (0.43 m^3) dirt/construction bucket in accordance with SAE J818 and ISO14397.

2. Approximate value can vary depending on oil tray or cooler version (external cooling system). Use mark on dipstick to determine FULL oil level.

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