♦ Error Codes and Explanations

Contact your authorized Mitsubishi forklift truck dealer when the error code is displayed.

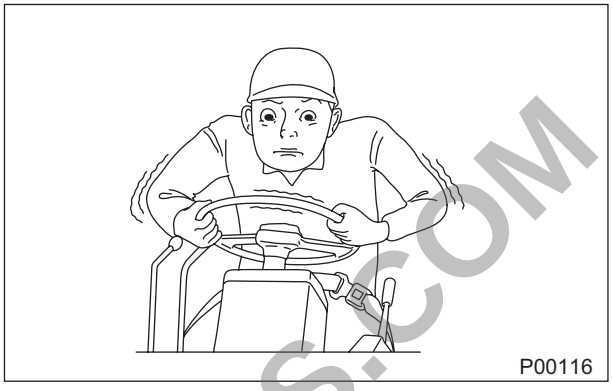
Error code	Explanation	Error code	Explanation
D-51	Memory check error	E-31	Electronic control throttle control error signal
D-52	Battery voltage error	E-32	Overheat signal (STEP1)
D-53	VCM communication error	E-33	Overheat signal (STEP2)
D-54	ECM communication error	E-34	Spark system error signal
D-55	DCM communication error	E-35	LPG fuel injector disconnection diagnostic result signal
D-57	MP communication error	E-36	LPG fuel pressure sensor diagnostic result signal
D-61	Engine overrun	E-38	LPG vaporizer diagnostic result signal
D-62	Revolution pulse error	E-39	Mast-high SW diagnostic result signal
D-63	Overheat signal (STEP1)	E-40	Oil pressure sensor diagnostic result signal
D-64	Overheat signal (STEP2)	E-41	Stop lamp SW error signal
D-71	Accelerator sensor error signal	E-42	Gas fuel system diagnostic result signal
D-73	Engine revolution sensor error	E-43	LPG fuel system diagnostic result signal
D-75	Idling SW error		
D-76	Throttle close position error		
D-77	Throttle open position error	F-01	Memory check fault
D-78	Throttle reference point error	F-02	Battery voltage error
D-79	Throttle close WS stick error	F-03	VCM communication error
D-91	Stepping motor error	F-04	ECM communication error
		F-05	DCM communication error
		F-06	OCM communication error
E-03	VCM communication error	F-07	MP communication error
E-04	ECM communication error	F-08	TMS communication error
E-05	DCM communication error	F-09	Lift lever type error
E-07	MP communication error	F-10	Lift lever neutral error
E-21	Air flow meter error signal	F-11	Tilt lever neutral error
E-22	Water temperature sensor error signal	F-12	Attach-1 lever neutral error
E-23	Throttle sensor error signal	F-13	Attach-2 lever neutral error
E-24	Accelerator sensor error signal	F-14	Attach-3 lever neutral error
E-25	0_2 sensor error signal	F-16	Shift lever abnormal signal
E-26	0_2 sensor heater error signal	F-17	Speed error
E-27	POS sensor error signal	F-20	Lift lever error
E-28	PHASE sensor error signal	F-77	Lift lock solenoid error
E-29	Self-shut system error	F-79	Unload / Lift lock solenoid leak
E-30	ECCS C/U error signal	F-26	Attach-2 lever error
F-22	Tilt lever error	F-28	Attach-3 lever error
F-24	Attach-1 lever error	F-29	Joystick duplicate error
F-30	Main Oil pressure sensor error	F-82	Tilt lock solenoid error

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♦ Stalled Engine

If the engine stalls, hydraulic pressure is lost in the power steering. This increases your steering effort. In this case, stop your forklift truck in a safe area and restart the engine.



♦ Starting With Jumper Cables

To start a forklift truck with a "run-down" battery, use a booster battery or jumper cables from the battery of a second forklift truck.

⚠ WARNING

- Improper jump start procedures could cause an explosion that could result in injuries. Turn OFF all lamps and accessories on the stalled forklift truck.
- Always connect battery positive (+) to battery positive (+) and battery negative (-) to engine body. Jump only with a battery source of the same voltage as the stalled forklift truck.
- DO NOT allow jumper cable ends to contact each other or the forklift truck.
- Electrolyte is an acid and could cause injury if it contacts skin or eyes. Always wear eye protector when starting an engine in the forklift truck with jumper cables.

⚠ WARNING

- DO NOT try to start the engine by pushing the forklift truck.
- BE SURE to connect the cable end 4 to the ENGINE BODY. If it is connected to the negative (-) terminal of the battery, sparks could ignite the gases.

⚠ WARNING

- Batteries give off flammable gas which could explode.
- Keep flames and sparks away from batteries. They could cause gas to explode.
- DO NOT smoke when checking battery electrolyte levels.

⚠ CAUTION

- Connect the jumper cables away from the moving parts in the engine compartment.
- When carrying batteries, provide short circuit prevention to the terminals. If metals come in contact with the terminals, a short circuit could result.
- DO NOT touch the cable with wet hands. If touched, it may result in an electrical shock.

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• Antifreeze Summer Coolant

	SPECIFICATIONS	
MANUFACTURER	**VISCOSITY**	Full Force USI Chemical Marcus Peak
Mobil	**BRAND NAME**	
Shell		
Exxon		
Castrol		

• Hydraulic Oils

	SPECIFICATIONS	ISO VG32
MANUFACTURER	**VISCOSITY**	—
Mobil	**BRAND NAME**	Mobiltrans HD 10W
Shell		Tellus T32
Exxon		Nuto H32
Castrol		Castrol Hyspin AWH-M32

♦ Specifications (Standard Models)

1 ton model

Item \ **Truck model**			FG15N	FG18N	FG20CN
Alternator Drive Belt Deflection when pushed inward with 98 N (10 kgf) [22 lbf] pressure, mm (in.)			11 to 13 (0.4 to 0.5)		
Spark Plug	Type	NGK	FR2A-D		
	Gap, mm (in.)		0.9 (0.04)		
Engine Idling Speed, rpm			700		
Steering Wheel Free Play when measured at rim with engine idling, mm (in.)			15 to 30 (0.6 to 1.2)		
Inching Pedal Free Play, mm (in.)			2.5 to 7.5 (0.1 to 0.3)		
Brake Pedal Free Play, mm (in.)			7 (0.3)		
Parking Brake Lever Operating Effort, N (kgf) [lbf]			150 to 200 (15 to 20) [34 to 45]		
Tire Size	Front Single		6.50×10-10PR		6.50×10/5.00
	Front Dual		—		—
	Rear		5.00×8-8PR		5.00×8/3.00
Tire Pressure, kPa (kgf/cm^2) [psi] (Pneumatic)	Front Single		700 (7.0) [100]		
	Front Dual		—		
	Rear		700 (7.0) [100]		
Tightening Torque for Wheel Nuts, N·m (kgf·m) [lbf·ft]	Front		141 to 172 (14 to 17) [104 to 127]		
	Rear	STD (2P)			
		OP (4P)			
Lift chain elongation limit, mm (in.) / 20 links			327 (12.9)		392 (15.4)

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♦ New Forklift Truck Break-in

Correct "break-in" is important for operation and the long life of your forklift truck. The first 100 service hours of operation are the "break-in period." Carefully read these precautionary instructions:

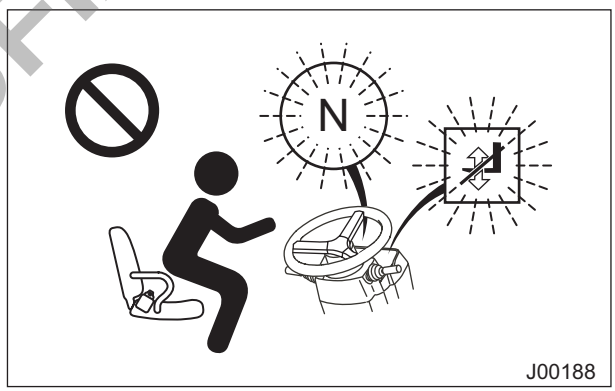
⚠ CAUTION

After starting the engine, BE SURE to run it at idle speeds with no load for about 5 minutes. During this time, check all the instrument panel indicator lamps.
DO avoid long periods of idling. This may cause cylinder wall glazing and prevent the piston rings from seating properly.
DO NOT pump the accelerator pedal and DO NOT rev up the engine. This may cause cylinder wall scuffing and scoring.
If the forklift truck does not have to be put to work immediately, or the operation is light and slow, break in the forklift truck under a simulated working condition.
Try NOT to drive the forklift truck continuously at the same speeds as the parts tend to better adjust themselves to other parts if various speeds are used. Also, try NOT to make severe brake applications to allow the brake linings to seat against the brake drums.
Operate the forklift truck under a lighter load and lower speeds than normal.
It is recommended to change and re-lubricate at shorter intervals than normal periods.
Carefully check on and around the forklift truck for loose bolts and nuts. Retighten them as needed.

♦ Before Starting Engine

⚠ WARNING

BE SURE to read the SAFETY RULES FOR FORKLIFT TRUCK OPERATORS for your safety and the safety of fellow workers.
BE SURE to perform the DAILY (PRE-START) INSPECTION.
Where forklift trucks are used on a round-the-clock basis, they must be inspected after each shift.



⚠ WARNING

If at any time a forklift truck is found to be in need of repair, defective, or in any way unsafe, the forklift truck must be taken out of service until it has been restored to safe operating condition. Report it immediately to the designated authority.

MC model

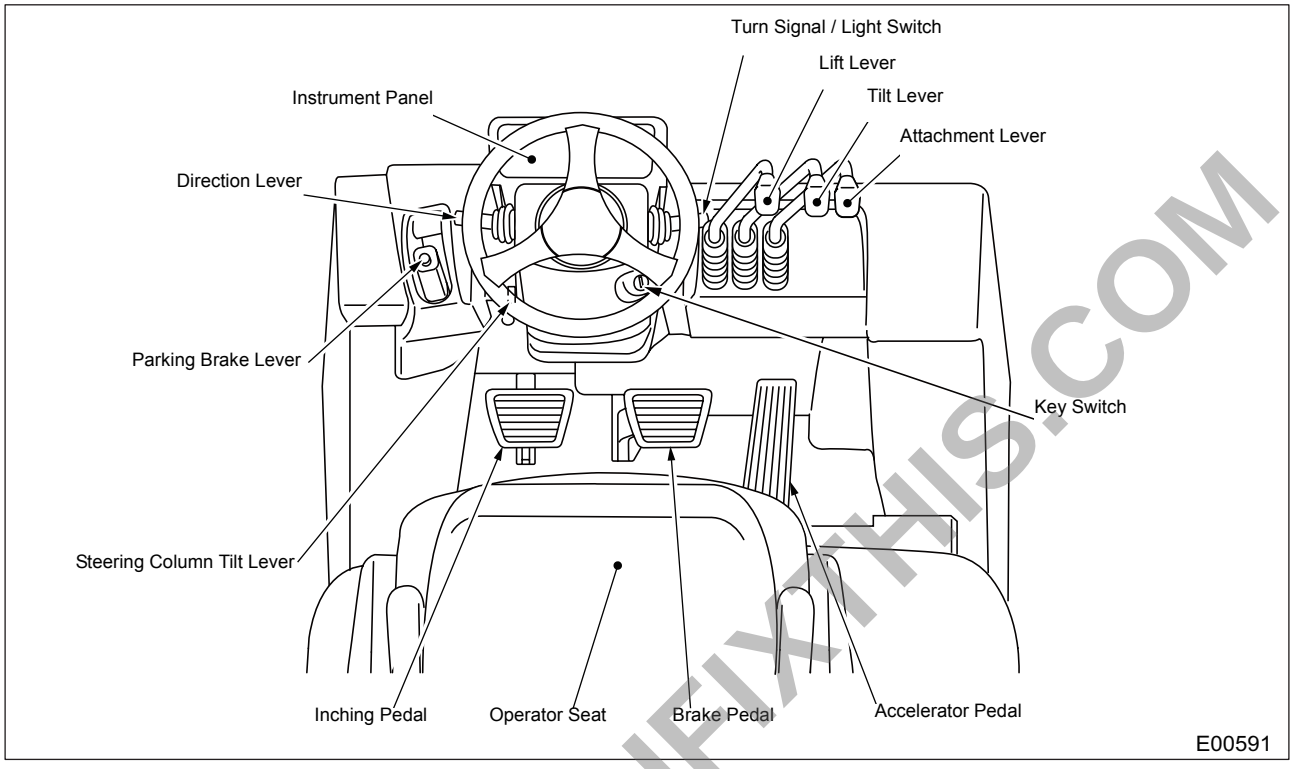
The mast interlock will work only for the lift and tilt levers.
Attachments can be moved regardless of whether the mast interlock function is operating or not. Therefore, when the attachment lever is operated, some of the attachments will move, even though the engine is not running or the key switch is in the ○ (OFF) position, as a result of the handling load or of its own weight.

When the key switch is in the | (ON) position, the mast interlock indicator lamp and driving interlock indicator lamp in the instrument panel flash unless an operator sits on the operator seat properly. In addition, the seat belt warning lamp glows when the seat belt is not worn or when it is not inserted into the seat belt buckle properly.

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• MC Model



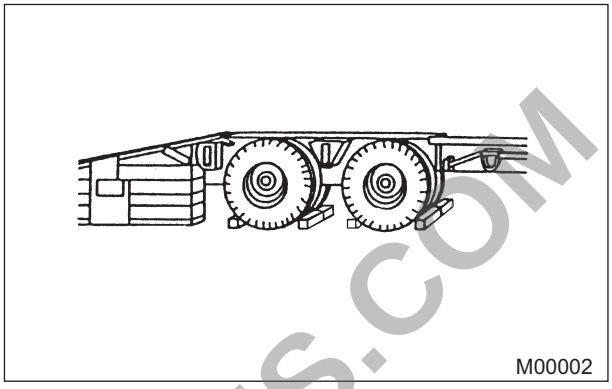
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♦ Forklift Truck Loading and Shipping

Be sure to take the following safety precautions before loading and shipping forklift trucks.

- Always block the trailer or rail car wheels before loading the forklift truck.
- Position the forklift truck on the truck bed or rail car.
- Apply the service brake and then apply the parking brake. Place the direction lever in the NEUTRAL position.
- Turn the key switch to the ○ (OFF) position and remove the key.
- Block the wheels and secure the forklift truck with tiedowns.
- Do not turn the steering wheel after the forklift truck has been secured. It may loosen the tiedowns.


M00002

⚠ WARNING

Check travel route for overpass clearances. Make sure there is adequate clearance if the forklift truck being transported is equipped with a high mast or cab. Remove ice, snow or other slippery material from the shipping forklift truck and loading dock.

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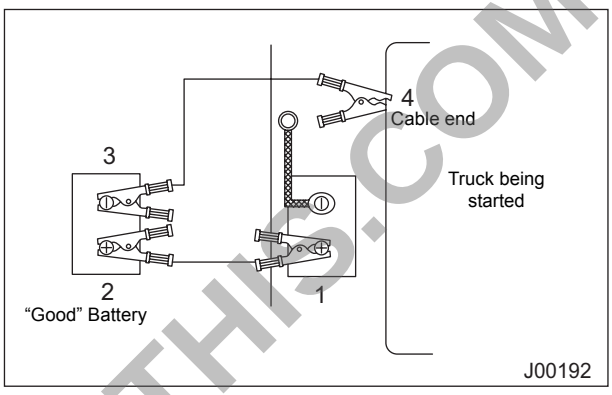
Error code	Explanation	Error code	Explanation
F-31	VCM-IM sensor voltage error	F-84	Knob position solenoid leak
F-32	Lift oil pressure sensor error	F-85	T/M forward solenoid error
F-34	Speed sensor error	F-87	T/M backward solenoid error
F-36	Tire angle sensor error	F-89	T/M solenoid leak
F-38	Tilt angle sensor error		
F-40	Steering error		
F-41	Output unit error	P-01	Memory check error
F-44	Output unit PWM power voltage error	P-03	VCM communication error
F-45	Output unit communication error	P-04	ECM communication error
F-46	Input unit error	P-05	DCM communication error
F-49	Input unit communication error	P-06	OCM communication error
F-50	Lift up solenoid error	P-07	MP communication error
F-52	Lift down solenoid error		
F-54	Lift solenoid leak		
F-55	Tilt forward solenoid error	S-01	Memory check error
F-57	Tilt backward solenoid error	S-02	Battery voltage error
F-59	Tilt solenoid leak	S-03	VCM communication error
F-60	Attach-1A solenoid error	S-04	ECM communication error
F-62	Attach-1B solenoid error	S-05	DCM communication error
F-64	Attach-1 solenoid leak	S-06	OCM communication error
F-65	Attach-2A solenoid error	S-07	PMP communication error
F-67	Attach-2B solenoid error	S-10	APS1 input signal error
F-69	Attach-2 solenoid error	S-11	APS2 input signal error
F-70	Attach-3A solenoid error	S-13	APS 1/2 correlated error
F-72	Attach-3B solenoid error	S-14	Idle switch error
F-73	Hour meter gap error	S-40	Service brake solenoid error
F-74	Attach-2 solenoid error	S-41	Service brake solenoid leak
F-75	Unload solenoid error	S-42	Parking brake solenoid error
F-80	Knob position solenoid error	S-43	Parking brake solenoid leak

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Note:
- Use a 12 volt jumper cables to jump start the forklift truck. This forklift truck has a 12 volt starting system. Use only equal voltage for jump starting. Use of a welder or higher voltage will damage the electrical system.
- You can buy jumper cables from your authorized Mitsubishi forklift truck dealer.
- Turn off the battery switch prior to the boost connection to prevent damage to electrical components on the stalled forklift truck. Many "dead" batteries can be recharged.

1. Position the second forklift truck, with its engine running, within jumper cable distance.
2. Connect the jumper cables in the sequence shown. Do not short across the positive (+) and negative (-) terminals.
3. After connecting the cables, increase the speed of the second forklift truck's engine and then start the engine of the stalled forklift truck that has the "run-down" battery.
4. After the engine starts, disconnect the jumper cables in the reverse sequence.



♦ If Lamps Won't Glow

⚠ CAUTION
- Always replace fuses with fuses of the correct amperage.
- If a fuse burns out immediately after being changed and you cannot locate the cause, have your authorized Mitsubishi forklift truck dealer make a circuit check.
- Always use a lamp bulb of the same wattage.

Circuit	Capacity	
	LPG or GAS	Diesel
VCM	20A	20A
Fuel Pump	10A	—
Fuel Cut	—	10A
Instrument Panel	10A	10A
Back-up Lamp	15A	15A
Working Lamp	15A	15A
ETC	15A	—
(Optional)	20A	20A
Spare	15A	15A
Head Lamp	15A	15A
Horn	10A	10A
Stop lamp	10A	10A
EGI	30A	—
EGI	30A	—

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2 ton model

Item \ Truck model			FG20N	FD20N	FG25N	FD25N
Alternator Drive Belt Deflection when pushed inward with 98 N (10 kgf) [22 lbf] pressure, mm (in.)			11 to 13 (0.4 to 0.5)	10 to 12 (0.4 to 0.5)	11 to 13 (0.4 to 0.5)	10 to 12 (0.4 to 0.5)
Spark Plug	Type	NGK	FR2A-D	—	FR2A-D	—
	Gap, mm (in.)		0.9 (0.04)	—	0.9 (0.04)	—
Engine Idling Speed, rpm			700	750	700	750
Steering Wheel Free Play when measured at rim with engine idling, mm (in.)			15 to 30 (0.6 to 1.2)			
Inching Pedal Free Play, mm (in.)			2.5 to 7.5 (0.1 to 0.3)			
Brake Pedal Free Play, mm (in.)			7 (0.3)			
Parking Brake Lever Operating Effort, N (kgf) [lbf]			200 to 250 (20 to 25) [45 to 56]			
Tire Size	Front Single		7.00×12-12PR			
	Front Dual		—			
	Rear		6.00×9-10PR			
Tire Pressure, kPa (kgf/cm^2) [psi] (Pneumatic)	Front Single		700 (7.0) [100]			
	Front Dual		—			
	Rear		700 (7.0) [100]			
Tightening Torque for Wheel Nuts, N·m (kgf·m) [lbf·ft]	Front		300 to 375 (30 to 38) [221 to 277]			
	Rear	STD (2P)	141 to 172 (14 to 17) [104 to 127]			
		OP (4P)	210 to 256 (21 to 26) [155 to 189]			
Lift chain elongation limit, mm (in.) / 20 links			392 (15.4)			

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• Gasoline / LP-Gas Dual Fuel Type

⚠ WARNING

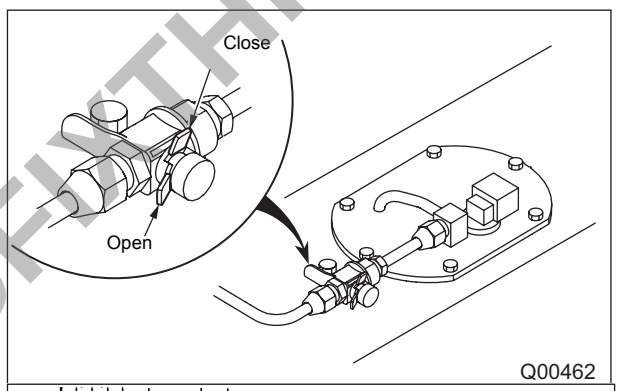
- LP-Gas and Gasoline are flammable. Leakage of these could cause a fire and explosion.
- Before changing the fuel from LP-Gas to gasoline, BE SURE to check the fuel line for deterioration and loose connection in accordance with the maintenance section shown in this manual.

⚠ CAUTION

If the forklift truck will be operated with LP-Gas for a long time, check gasoline fuel lines to make sure all the fuel lines are empty. If they are not empty, drain the fuel from the tank and run the engine until the fuel in the lines is used up.

Instruction for changeover of fuel between LP-Gas and gasoline

Open the fuel shut-off valve. The fuel shut-off valve is located inside the engine hood.

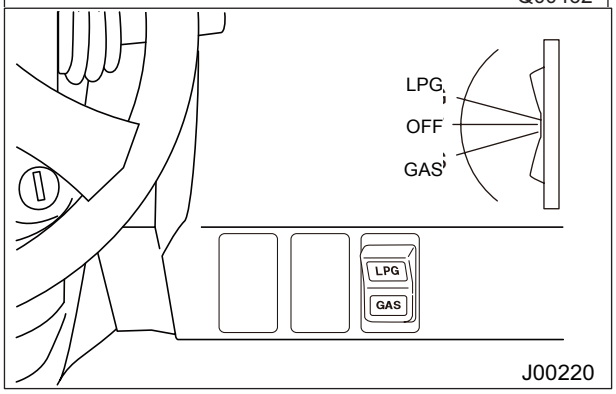


To change from LP-Gas to Gasoline

1. Turn the key switch to the ○ (OFF) position and close the valve on the LP-Gas tank. Leave the fuel selector switch in the (LPG) position.
2. Turn the key switch to the (START) position. The engine should not start. If the engine starts, leave it running until it stops by itself.
3. Turn the key switch to the ○ (OFF) position and then place the fuel selector switch to the (GAS) position. Now the engine can be started using gasoline.

To change from Gasoline to LP-Gas

1. Turn the key switch to the ○ (OFF) position and place the fuel selector switch to the OFF position.
2. Turn the key switch to the (START) position. The engine should not start. If the engine starts, leave it running until it stops by itself.
3. Turn the key switch to the ○ (OFF) position and then place the fuel selector switch to the (LPG) position. Open the valve on the LP-Gas tank. Now the engine can be started using LP-Gas.



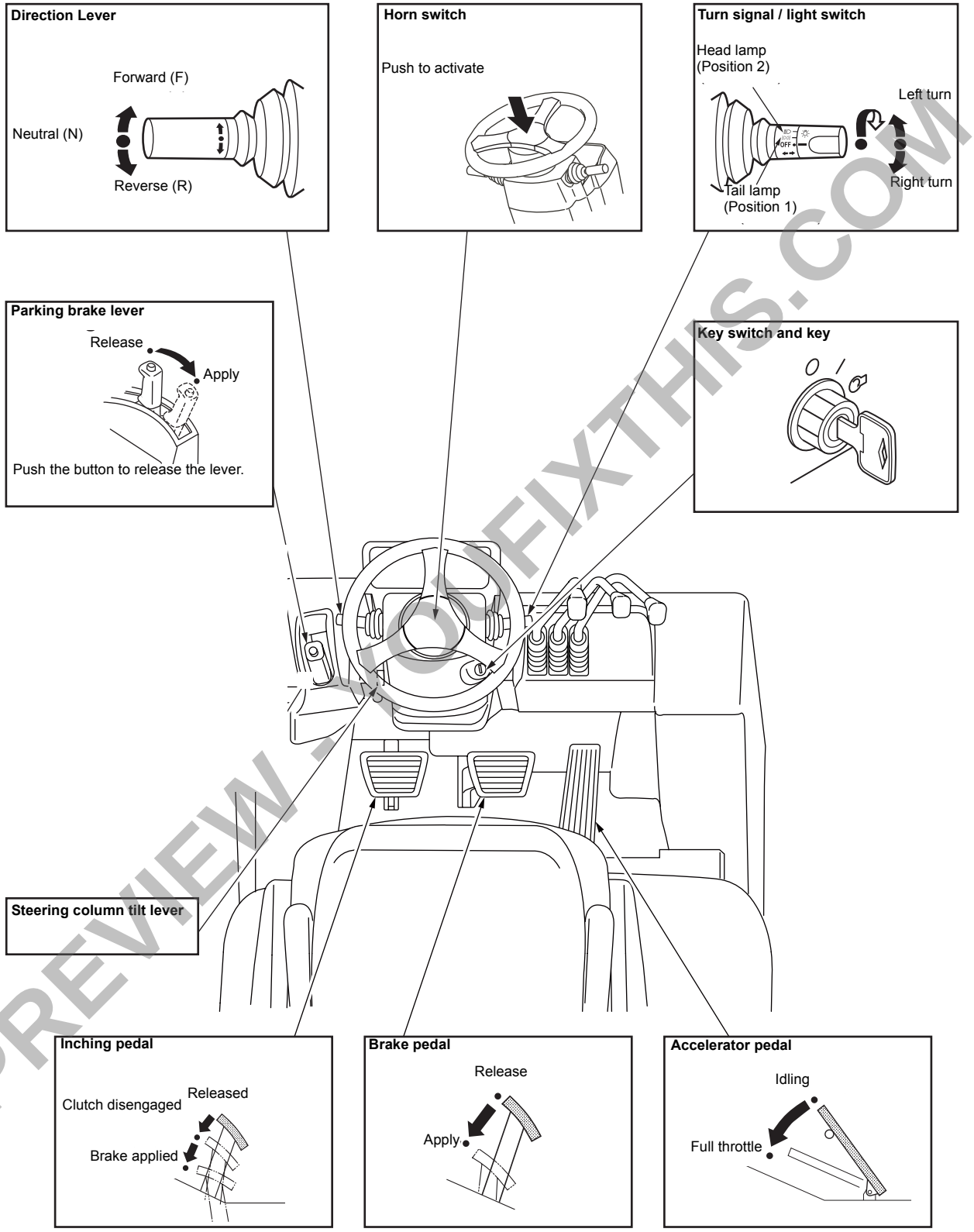
Note:

If operating on gasoline and with no LP tank installed, hook the LP hose to the bracket by screwing the coupling into place. It will secure the hose.

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♦ Driving Switches and Controls



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SPECIAL SITUATIONS

♦ **Care in Cold Weather 9-1**

- Fuel Oils and Lubrication Oils 9-1
- Battery 9-1
- Engine Coolant 9-1

♦ **Care in Hot Weather 9-2**

- Fuel Oils and Lubrication Oils 9-2
- Battery 9-2
- Engine Coolant 9-2

♦ **Severe Dust or Lint Conditions 9-2**

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