



Snorkel

**Operator's
Manual**

**TB
80**

diesel – gasoline – LPG



P/N 0112012
July, 2000





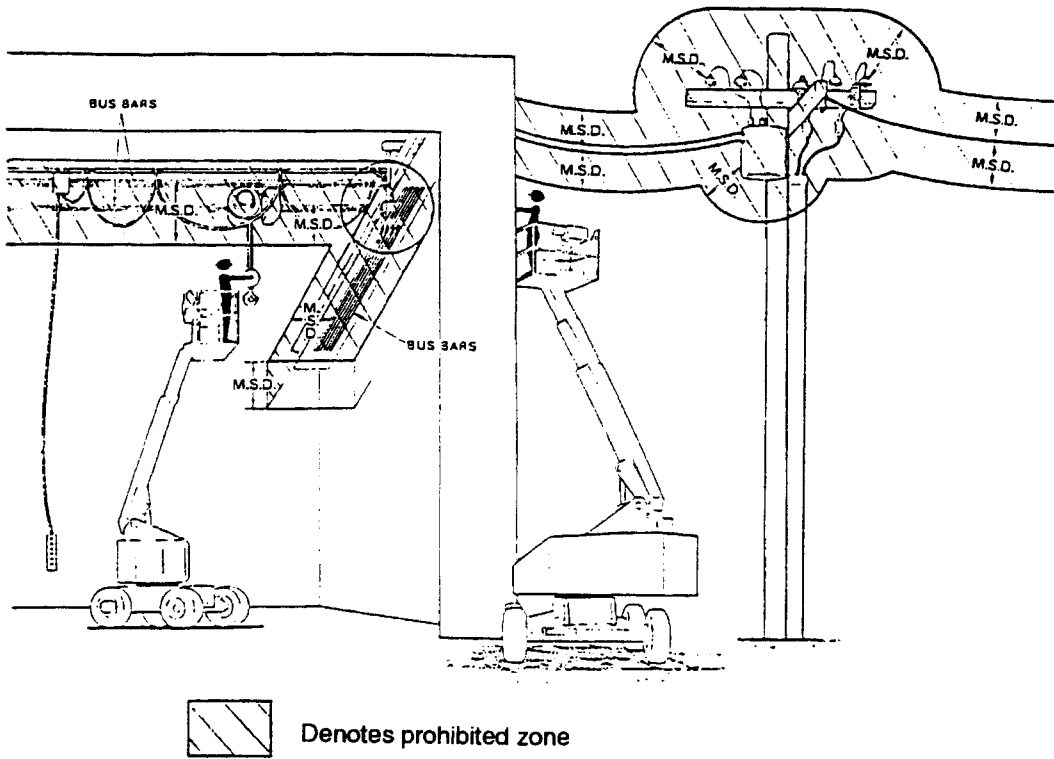
DANGER

ELECTRICAL HAZARD

The TB 80 is an all metal boom, NOT ELECTRICALLY INSULATED, aerial work platform. Do not operate it near ELECTRICAL conductors. Regard all conductors as being energized. Use the table and figure below to determine safe clearance from electrical conductors. Table 1 and Figure 3 are reprinted courtesy of Scaffold Industry Association, ANSI/SIA A92.5, page 23.

Table 1 - Minimum safe approach distance (M.S.A.D.)
to energized (exposed or insulated) power lines

Voltage range (phase to phase)	Minimum safe approach distance	
	(Feet)	(Meters)
0 to 300V	Avoid contact	
Over 300V to 50KV	10	3.05
Over 50KV to 200KV	15	4.60
Over 200KV to 350KV	20	6.10
Over 350KV to 500KV	25	7.62
Over 500KV to 750KV	35	10.67
Over 750KV to 1000KV	45	13.72



- Danger: - Do not allow machine personnel or conductive materials inside prohibited zone.
- Maintain M.S.A.D. from all energized lines and parts as well as those shown.
 - Assume all electrical parts and wires are energized unless known otherwise.
- Caution: - Diagrams shown are only for purposes of illustrating M.S.A.D. work positions, not all work positions.

Figure 3 - Minimum Safe Approach Distance (M.S.A.D.)



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INTRODUCTION

The most important chapter in this manual is "1. SAFETY." Take time, now, to study it closely. The information in that chapter might save your life or prevent serious injury.

■ SIGNS

The following two conventions are used throughout this manual.

1. This sign



means: **Attention! Become alert! Your safety is involved.**

2. This sign



means one of two things: (1) an action, about to be performed, is potentially hazardous and might result in minor personal injury if not done correctly, or (2) an action, about to be performed, can damage the TB 80 if not done correctly.

■ TYPE-STYLE CONVENTIONS

Throughout this manual the names of switches and gauges as well as the names of switch positions (ON/OFF, etc.) are capitalized. Furthermore, switch and gauge names are printed in bold type and, when they occur in section titles, are italicized. The purpose of all this is to emphasize the exact name of the switch, gauge, or switch position and thus reduce ambiguity.

Some paragraphs in this manual are printed in italic. Those paragraphs apply to optional equipment. If your TB 80 does not have the optional equipment ignore the paragraphs

■ QUALIFIED OPERATORS

The TB 80 aerial platform has built-in safety features and has been factory tested for compliance with Snorkel specifications and industry standards. However, any personnel-lifting device can be potentially dangerous in the hands of untrained or careless operators.

Training is essential and must be performed by a QUALIFIED person. Become proficient in knowledge and actual operation before using the TB 80 on the job. You must be trained and authorized to perform any functions of the TB 80. Operation of the TB 80 must be within the scope of the machine specifications.

Before operating the TB 80 you must read and understand the operating instructions in this manual as well as the decals, warnings, and instructions on the machine itself.

Before operating the TB 80 you must be AUTHORIZED by the person in charge to do so.

The following rules will help ensure the safety of personnel and help prevent needless downtime because of damaged equipment.

1. Only TRAINED and AUTHORIZED operators shall be permitted to operate the equipment.
2. All manufacturer's operating instructions and safety rules and all employers' safety rules and all OSHA and other government safety rules must be strictly adhered to.
3. Repairs and adjustments shall be made only by QUALIFIED TRAINED maintenance personnel.
4. No modification shall be made to the equipment without prior written consent of Snorkel.
5. You must make a pre-start inspection of the TB 80 at the beginning of each shift. A malfunctioning machine must not be used.
6. You must make an inspection of the work place to locate possible hazards before operating the TB 80.



Misuse of this machine can result in DEATH or SERIOUS INJURY.

Do not operate this equipment unless you are TRAINED and AUTHORIZED and have read and thoroughly understand all information given in this Operator's Manual and on all DANGER and CAUTION signs on the machine.



INTRODUCTION

■ MAINTENANCE

Every person who maintains, inspects, tests, or repairs these machines, and every person supervising any of these functions, must be properly trained.

This Operator's Manual provides a daily inspection procedure that will help you keep your TB 80 in good operating condition. Do not perform other maintenance unless you are a TRAINED mechanic, QUALIFIED to work on the TB 80. Call QUALIFIED maintenance personnel if you find problems or malfunctions.

Information contained in this manual concerns only current TB 80's, and the right is reserved to make changes at any time without obligation.

■ RESPONSIBILITIES OF PARTIES

It is imperative that all owners and users of the TB 80 read, understand, and conform to all applicable regulations. Ultimate compliance to OSHA regulations is the responsibility of the employer using the equipment.

ANSI Standard A92.5 identifies requirements of all parties who might be involved with Boom-Supported Elevating Work Platforms.

A reprint of the *Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors and Lessees of ANSI/SIA A92.5-1992 Boom-Supported Elevating Work Platforms* is available from Snorkel dealers or from the factory upon request.

Copies are also available from:

Scaffold Industry Association
20335 Ventura Blvd. Suite 310
Woodland Hills, CA 91364-2471 USA

■ ADDITIONAL INFORMATION

For additional information, contact your local dealer, or write:

Snorkel International, Inc.
P.O. Box 1160
St. Joseph, MO 64502-1160 USA
816-364-0317

<http://www.snorkelusa.com>



1. SAFETY

■ SAFE OPERATION

The following safety information is vitally important for safe operation of the TB 80. Failure to follow these instructions can result in personal injury or DEATH.

□ Pre-start Inspection

At the start of each work shift, the TB 80 shall be given a visual inspection and function test. See the "DAILY INSPECTION & MAINTENANCE" chapter in this manual for a list of items to inspect and test.

Do not operate the TB 80 unless you are trained and authorized, understand the operation characteristics of the TB 80, and have inspected and tested all functions to be sure they are in proper working order. See the "DAILY INSPECTION & MAINTENANCE" chapter.

□ Work Place Inspection and Practices

Do not use the TB 80 as a ground for welding. Ground to the work piece.

Before the TB 80 is used, and during use, check the area in which the TB 80 is to be used for possible hazards such as, but not limited to:

- drop-offs or holes,
- side slopes,
- bumps and floor obstructions,
- debris,
- overhead obstructions and electrical conductors,
- hazardous locations,
- inadequate surface and support to withstand all load forces imposed by the aerial platform in all operating configurations,
- wind and weather conditions,
- presence of unauthorized persons,
- other possible unsafe conditions.

Before using the aerial platform in any hazardous (classified) location, make certain it is approved and of the type required by ANSI/NFPA 505 for use in that particular location.

A recommended safety practice is to have personnel that are trained in the operation of the emergency controls working in the immediate area of the TB 80 to assist the platform operator in the event of an emergency.

When moving the platform, check the clearance around the TB 80 to avoid contact with structures or other hazards. Always look in the direction of motion.

Keep ground personnel from under the platform when the platform is raised.

Secure all accessories, containers, tools, and other materials in the platform to prevent them from accidentally falling or being kicked off the platform.

Remove all loose objects stored in or on the machine, particularly in the platform. Remove all objects which do not belong in or on the machine.

Do not engage in any form of "horseplay" or "stunt driving" while operating the TB 80.

Do not permit riders on the machine anyplace other than on the platform.

When other moving equipment is in the area, take special precautions to comply to local regulations regarding warnings.

Know and understand the job site traffic-flow patterns and obey the flagmen, road signs, and signals.

Watch for bystanders and never allow anyone to be under, or to reach through, the machine and its equipment while operating.

Never steady the platform by positioning it against another platform.

Do not operate the TB 80 if it is not functioning properly, or has been damaged, until the machine has been repaired by a qualified maintenance person.

Do not operate the TB 80 if it does not have all its decals and placards attached and legible.

Drive the machine with care and at speeds compatible with conditions. Use extra caution when driving over rough ground, on slopes, and when turning.



1. SAFETY

☐ **Electrocution**

The TB 80 is an all-metal boom, NOT ELECTRICALLY INSULATED, aerial work-platform. Do not operate it near ELECTRICAL conductors. Regard all conductors as being energized.

Do not operate outside during a thunderstorm.

☐ **Tipover & Falling Hazards**

Do not operate the TB 80 from a position on trucks, trailers, railway cars, floating vessels, scaffolds, or similar equipment unless the application is approved in writing by Snorkel.

If the platform or elevating assembly becomes caught, snagged, or otherwise prevented from normal motion by an adjacent structure or other obstacles such that control reversal does not free the platform, remove all personnel from the platform before attempts are made to free the platform using ground controls.

It is best not to transfer from the platform to another structure or from the structure to the platform, unless that is the safest way to do the job. Judge each situation separately taking the work environment into account. If it is necessary to transfer from the platform to another structure the following guidelines apply:

- Where possible, place the work platform over a roof or walking structure to do the transfer.
- Transfer your anchorage from one structure to another before you step across.
- Remember that you might be transferring to a structure where *personal fall arrest* is required.
- Use the platform entrance, do not climb over the rails.

All platform occupants **MUST** wear a fall restraint device connected to a lanyard anchor point.

Do not exceed the unrestricted platform capacity as indicated on the capacity placard at the entrance to the platform.

Do not raise the boom if the TB 80 is on soft ground. Operate the boom only on a firm surface capable of withstanding all load forces imposed by the aerial platform in all operating conditions.

Raise the platform only when the TB 80 is on level ground.

Do not carry loads from any point outside of the platform.

Care shall be taken to prevent rope, electric cords, and hoses, etc., from becoming entangled in the aerial platform.

Maintain a firm footing on the platform floor. Climbing on the guardrails is prohibited.

Do not use ladders, planks, or other devices to extend or increase your work position from the platform.

Do not jerk the controls. Move the controls slowly and deliberately to avoid jerky and erratic operation. Always stop the controls in the neutral, off, position before going in the opposite direction.

Do not use the boom for any purpose other than to position personnel, their tools, and materials.

Do not use the TB 80 as a crane, hoist, or jack.

Do not operate the TB 80 in winds, or wind gusts, of 28 mph (45 km/h) or more.

Do not add anything to the TB 80 that will increase the wind loading (billboards, banners, flags, etc).

☐ **Crushing**

Always look in the direction of travel. Avoid overhead obstructions.

Never cover the floor grating or otherwise obstruct your view below.

Make sure the area below the platform is free of personnel before lowering.

☒ **GENERAL SAFETY PRECAUTIONS**

☐ **Personnel Precautions**

If you encounter any suspected malfunction of the aerial platform, or any hazard or potentially unsafe condition relating to capacity, intended use, or safe operation, cease operation and seek assistance from management.

☐ **Operator General Precautions**

Make sure that all protective guards, cowlings, and doors are in place and secure.

Be sure the guardrail system, including the gate, is in place and secure.



1. SAFETY

❑ Mounting & Dismounting Precautions

Use three points of support (e.g., two hands and one foot) when getting on or off the platform.

Keep the platform clean.

Do not jump off the machine.

Do not dismount while the machine is in motion.

❑ Starting and Stopping Precautions

Do not start until all personnel are clearly away from the machine.

Before leaving the operator's station, place the machine in the stowed position.

When leaving the machine parked or unattended, remove the starter key from the **MASTER** switch and set the **BATTERY** switch to OFF.

❑ Operating Precautions

Do not modify the TB 80 in any way.

When parts or components are replaced, they shall be identical or equivalent to original Snorkel parts or components.

Do not override any of the safety features of the TB 80.

Limit travel speeds according to conditions. Take into account: grade, surface, congestion, visibility, side slope, location of personnel, and other hazards.

❑ Operator Maintenance Precautions

Do not use your hand to search for hydraulic oil leaks. High pressure hydraulic oil can easily cut and penetrate your skin — a very serious injury that requires immediate attention by a medical specialist trained in that type of injury. Use a piece of cardboard or wood to search for hydraulic oil leaks.

Do not attempt repairs unless you are trained. Refer to manuals and experienced repair personnel for help.

Charge batteries in a well-ventilated area free of flame, sparks, or other hazards that might cause fire or explosion.

Use extreme caution when removing radiator caps. Park the machine and let it cool down before opening a pressurized compartment.

❑ Fuel Handling Precautions

Do not smoke or permit open flames while fueling or near fueling operations.

Never remove the fuel cap or refuel a gasoline engine while the engine is running or hot. Never allow fuel to spill on hot machine components.

Maintain control of the fuel filler nozzle when filling the tank.

Do not fill the fuel tank to capacity. Allow room for expansion.

Clean up spilled fuel immediately.

Tighten the fuel tank cap securely. If the fuel cap is lost, replace it with an approved cap from Snorkel. Use of a non-approved cap without proper venting may result in pressurization of the tank.

Never use fuel for cleaning purposes.

For diesel engines, use the correct fuel grade for the operating season.

■ SAFETY DECALS & PLACARDS

There are several safety decals and placards on the TB 80. Their locations and descriptions are shown in this section. Take time to study them.

Be sure that all the safety decals and placards on the TB 80 are legible. Clean or replace them if you cannot read the words or see the pictures. Clean with soap & water and a soft cloth. Do not use solvents.

You must replace a decal or placard if it is damaged, missing, or cannot be read. If it is on a part that is replaced, make sure a new decal or placard is installed on the replaced part. See your Snorkel dealer for new decals and placards.

Refer to PLACARDS AND DECALS INSPECTION CHARTs and DRAWINGs in the "DAILY INSPECTION AND MAINTENANCE" chapter for part numbers, location, and required quantities of all placards and decals.



1. SAFETY

Refer to **PLACARDS AND DECALS INSPECTION CHART** and **DRAWING** in the “**DAILY INSPECTION AND MAINTENANCE**” chapter for part numbers, locations, and required quantities of all placards and decals.

▲ CAUTION

DO NOT USE BOOM TO LIFT OR PUSH MACHINE

0073668

▲ DANGER

Death or serious injury can result from not complying to the following safety rules.

- Do not operate this machine unless you are a qualified operator and have read and thoroughly understand all information given in the Operator's Manual and on DANGER and CAUTION signs on this machine.
- Maintain 10 feet minimum clearance from electrical power lines and apparatus. This machine is NOT electrically insulated.
- Do not exceed the unrestricted platform capacity shown on the platform.
- Do not operate this machine on soft or unstable ground.
- Operate this machine only on a flat level surface.

0072541

▲ CAUTION

- MOVE CONTROL HANDLE SLOWLY AND DELIBERATELY TO AVOID JERKY AND ERRATIC PLATFORM MOVEMENT.
- IN CASE OF EMERGENCY **DEPRESS** EMERGENCY STOP BUTTON. PULL OUT TO RESET.

0181856

▲ DANGER

- Perform the **DAILY INSPECTION & MAINTENANCE**, listed in the Operator's Manual, prior to each work shift.
- All platform occupants **MUST** wear fall restraint attached to lanyard anchor points provided.

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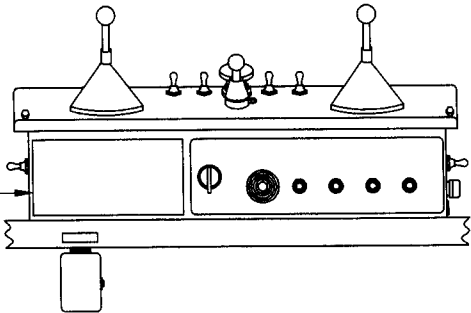
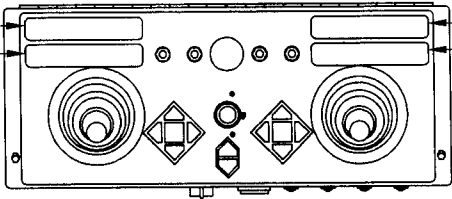
▲ DANGER

ELECTROCUTION HAZARD

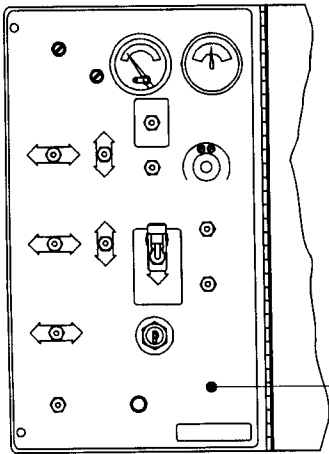
THIS MACHINE IS NOT ELECTRICALLY INSULATED

Maintain 10 feet minimum clearance from electrical power lines and apparatus. You must allow for platform sway, rock, or sag.
This aerial device does not provide protection from contact with or proximity to an electrically charged conductor.
Death or serious injury will result from such contact or inadequate clearance.

0072586



PLATFORM CONTROL BOX



GROUND CONTROL DOOR SHOWN OPEN

(Cold start option only)

▲ CAUTION

Use **COLDSTART** only when engine is cold.
For **COLDSTART**, depress and release once with starter actuated.

0073079



1. SAFETY

(Tow option only)

⚠ DANGER

A "RUNAWAY" SNORKELIFT CAN CAUSE **DEATH** OR SERIOUS INJURY. CHECK WITH TOW VEHICLE MANUFACTURER OR MANUFACTURER'S LITERATURE TO SEE THAT TOW VEHICLE CAN SAFELY TOW AND STOP TOTAL WEIGHT OF SNORKELIFT ON THE STEEPEST GRADE YOU WILL ENCOUNTER. REMEMBER, SNORKELIFT DOES NOT HAVE BRAKES WHEN IT IS TOWED.

BE CERTAIN TOW VEHICLE BRAKES ARE SET AND TOW BAR IS CONNECTED TO BOTH TOW VEHICLE AND SNORKELIFT BEFORE YOU TURN SNORKELIFT DISCONNECT-PLATES OVER.

AT THE END OF THE TOW, BEFORE YOU DISCONNECT THE SNORKELIFT FROM THE TOWING VEHICLE, TURN THE DISCONNECT-PLATES BACK OVER SO THE NIPPLES ARE OUT. THAT WILL PREVENT THE MACHINE FROM ROLLING WHEN YOU DISCONNECT IT FROM THE TOW VEHICLE.

DO NOT EXCEED 10 MPH (16 KM/HR) WHEN TOWING. AVOID SHARP TURNS.

(LPG option only)

⚠ CAUTION

THIS MACHINE IS EQUIPPED WITH

LIQUID WITHDRAWAL

L.P. GAS SYSTEM

- LIQUID OR VAPOR WITHDRAWAL L.P.-GAS CYLINDER MAY BE USED.
- ALWAYS KEEP L.P.-GAS CYLINDER SHUT-OFF VALVE CLOSED WHEN NOT USING L.P.-GAS SYSTEM.

⚠ DANGER

- THIS UNIT IS EQUIPPED WITH FOAM FILLED TIRES, WHEEL WEIGHT IS CRITICAL FOR UNIT STABILITY.
- REPLACE WITH FACTORY APPROVED FOAM FILLED TIRES ONLY.
- DO NOT ATTEMPT TO INFLATE.

OPERATING INSTRUCTIONS

- Check engine oil level and hydraulic oil level daily.
- Check tire condition daily.
- Inspect machine, including operation, prior to each work shift.
- Start and warm engine from ground control station - set **SELECTOR SWITCH** to GROUND.
- Extend and lock rear axle prior to extending or raising boom (see procedure below).
- Set **SELECTOR SWITCH** to PLATFORM and set **BOOMS/AXLES SWITCH** to BOOM for operation from platform-control station.
- See Operator's Manual for complete operation and function procedures.
- Observe all safety rules.

⚠ DANGER

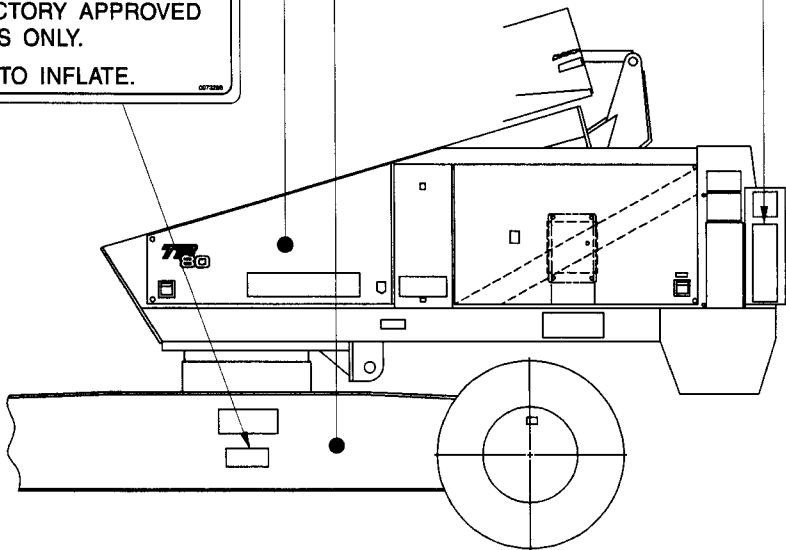
- Do not operate this machine unless you are a qualified operator and have read and thoroughly understand all information given in the Operator's Manual and on DANGER and CAUTION signs on this machine.
- Maintain 10 feet minimum clearance from power lines and apparatus. This machine is not electrically insulated.
- Do not exceed the UNRESTRICTED PLATFORM CAPACITY shown on the platform.
- Do not operate this machine on soft or unstable ground.
- Operate this machine only on firm level surfaces.
- Do not raise or extend main boom unless axle is extended and locked.
- Do not operate boom functions unless axle interlock system is functioning properly (see Operator's Manual).
- Do not use machine if not functioning properly or damaged in any way.
- Do not use boom as means of lifting or moving machine.
- Do not run engine while adding fuel or oil.
- Do not modify machine. Unauthorized equipment modification will void all warranties.

- TO EXTEND (RETRACT) REAR AXLE:**
1. Position machine on firm level surface.
 2. Completely lower and retract the main boom.
 3. Set **SELECTOR SWITCH** to GROUND, set **BOOMS/AXLE SWITCH** to AXLES.
 4. Use the jack control lever to RAISE the rear of the chassis.

⚠ DANGER

- Do not extend axle unless area adjacent to wheels is clear of all personnel and equipment.
- Do not get under machine when supported by jack.
- Do not use boom or drive functions while machine is supported by jack.
- Do not operate machine unless rear axle pin-lock is in place.

5. Remove axle pin-lock.
6. Fully EXTEND (RETRACT) axle.
7. Reinstall axle pin-lock in opposite hole and install snapper pin.
8. Lower machine to ground and fully retract jack.
9. Return **BOOMS/AXLES SWITCH** to BOOMS.



1. SAFETY



		ST JOSEPH, MISSOURI U.S.A.	
MODEL NUMBER		SERIAL NUMBER	
MONTH / YEAR OF MANUFACTURE		SLOPE SENSOR ALARM SETTING	deg
MAXIMUM MACHINE WEIGHT	lbs kg	MAXIMUM WHEEL LOAD	lbs kg
ENGINE POWERED MODELS	hp kW	BATTERY POWERED MODELS ONLY	DRIVE MOTORS V BATTERIES V Ah
MAXIMUM ALLOWABLE MANUAL FORCE (SIDE PULL)	lbs N	MAXIMUM ALLOWABLE WIND SPEED	mi/h m/s
PLATFORM SIZE	in cm	MAXIMUM PLATFORM REACH	ft m
MAXIMUM PLATFORM HEIGHT	ft m	MAXIMUM DRIVE HEIGHT	ft m

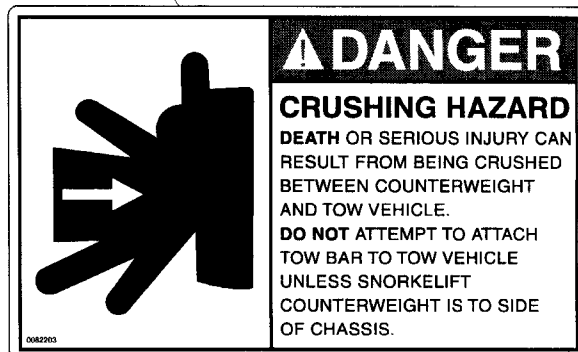
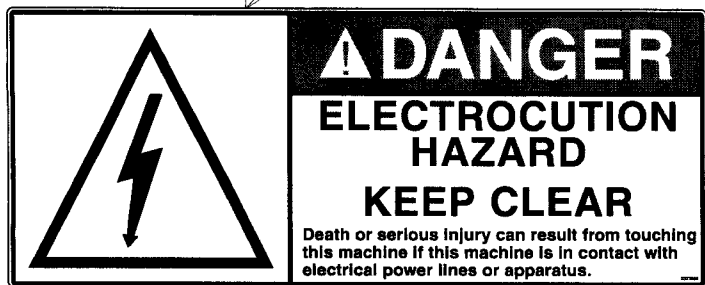
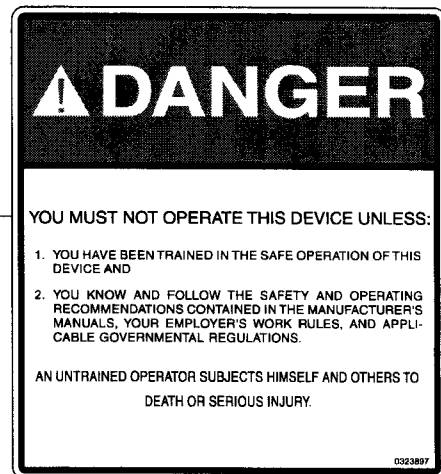
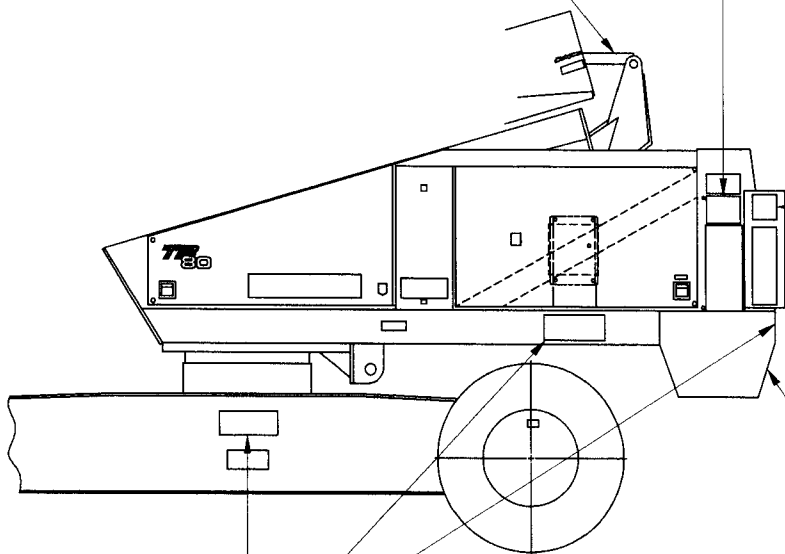
⚠ CAUTION

Do not remove any weight from this unit. Any weight added must be distributed equally on each axle. Proper stability and axle weights of this unit are based on the platform size shown above.

Axle weights with unit in the stowed - travel position.

STEER AXLE		lbs		kg
DRIVE AXLE		lbs		kg

0670901



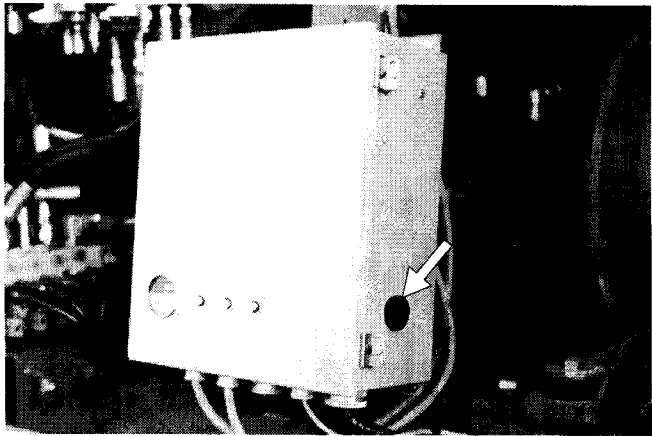


2. SAFETY DEVICES

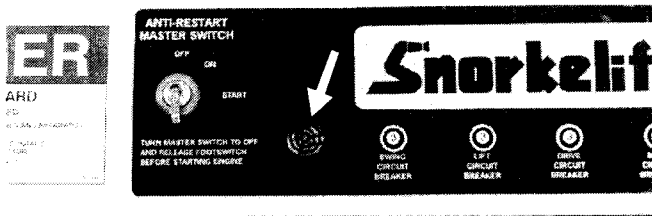
For emergency-operation controls and procedures, see the “EMERGENCY OPERATION” chapter in this manual.

The devices listed in this chapter are safety devices. They are on the TB 80 to increase safety in the work place for both the operator and other people near the TB 80. Do not by-pass, disable, modify, or ignore any of these devices. Check them carefully at the start of each work shift to see that they are in working order (see “DAILY INSPECTION & MAINTENANCE” chapter). If any is found to be defective, remove the TB 80 from service immediately until a qualified service technician can make repairs.

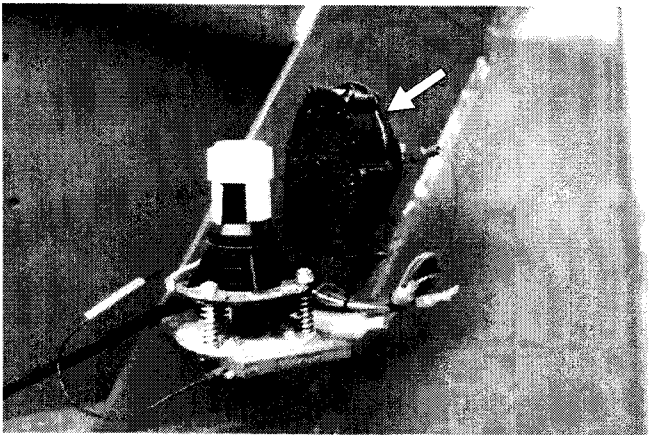
AUDIBLE ALARMS



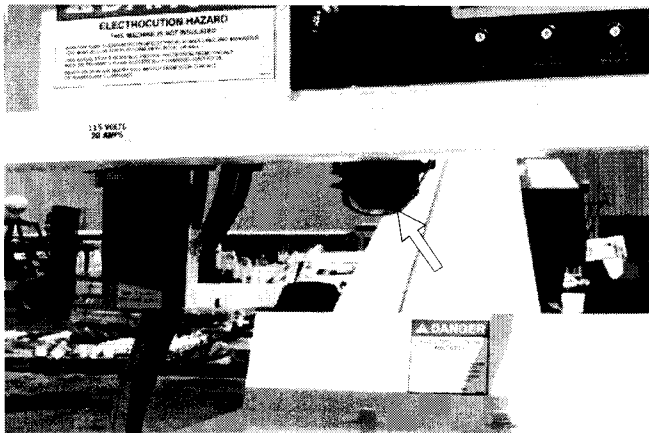
There are two buzzers on the TB 80. One is located on the right side of the wiring box,



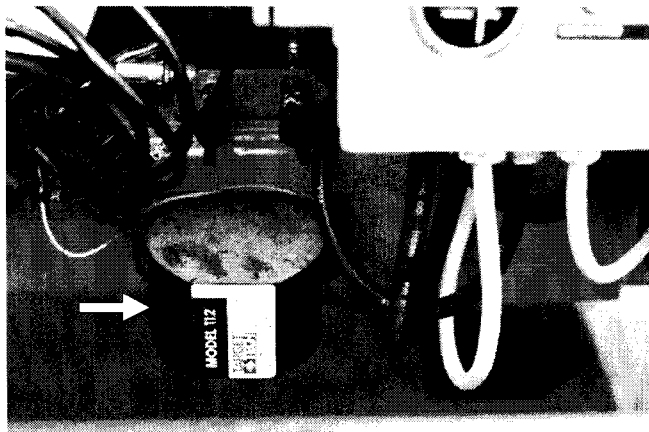
the other is located on the platform-control box. The buzzers are connected in parallel, they both emit the same pattern of sound at the same time.



There are two tilt alarm horns on the TB 80. One is located inside the left-rear of the turntable, next to the level sensor,



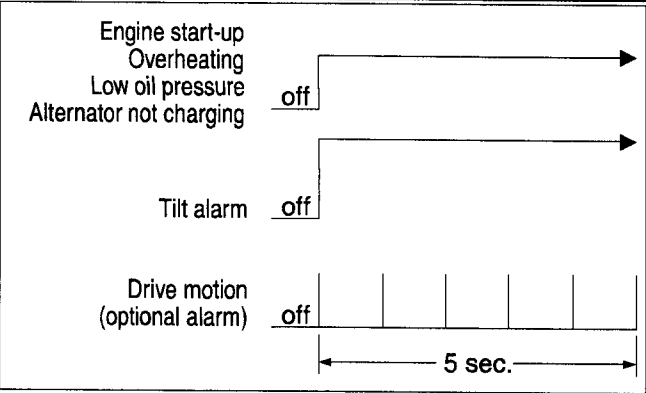
the other is under the platform-control box.



The optional drive-motion alarm horn is below the wiring box. The different alarm sound patterns the buzzers and horns make are shown in the following table and discussed below the table.



2. SAFETY DEVICES



❑ Engine Start-up Alarm

When the **MASTER** switch or **ANTI-RESTART MASTER SWITCH** is turned ON (just prior to Starting) the buzzers emit a loud continuous tone to alert others in the area that the TB 80 is about to start. The tone will continue until the TB 80 starts or the switch is turned OFF.

❑ Engine Shut-off Alarm

The engine shut-off alarm comes on when the engine is overheating or the oil pressure is low. When the alarm sounds you should immediately lower the platform completely down then turn the engine off until the condition that caused the alarm has been corrected. (See "AUTOMATIC SHUT-OFFS & CIRCUIT BREAKERS" chapter for more information.)

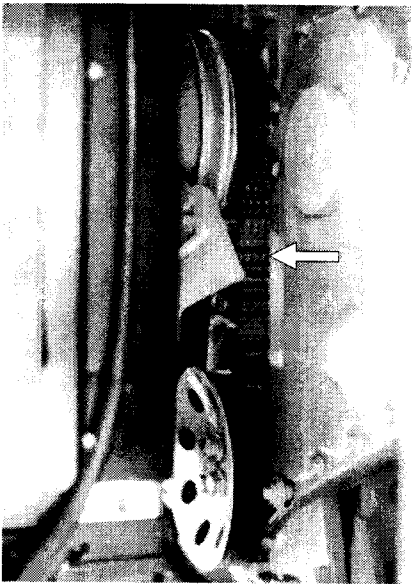
NOTE: If the engine has automatically shut off, and will not restart, go to the "EMERGENCY OPERATION" chapter and use emergency operation procedures to lower the platform.

❑ Alternator Not-Charging Alarm

!CAUTION

Do not continue to operate the TB 80 while the alternator alarm sounds. Without charging-current, the battery will discharge to the point it cannot operate the **EMERGENCY POWER** equipment.

If the engine alternator quits (usually because of a broken fan belt), a continuous-tone alarm will automatically sound. The alarm warns you that the battery is discharging.



Check the alternator/fan drive belt to see if it is broken or loose before you try to restart the engine. If the engine will not restart, refer the problem to a qualified service technician.

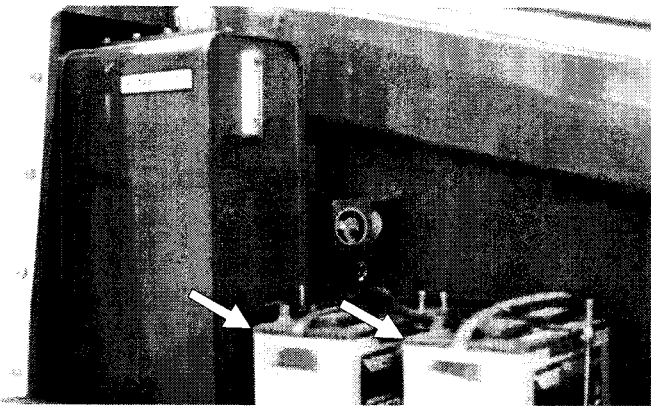
❑ Tilt Alarm

The tilt alarm warns the TB 80 operator that the TB 80 is over 5° out of level. If the tilt continues to increase, the TB 80 will eventually tip over. When you hear the tilt alarm horn, immediately retract and lower the platform. When the platform is completely down, determine and correct the cause of the tilt before raising the platform again.

❑ Drive Motion Alarm (option)

The drive motion alarm emits a loud beeping sound anytime the **DRIVE** controller is in FORWARD or REVERSE. This alarm alerts people on the ground that the TB 80 is traveling along the ground.

■ BATTERY



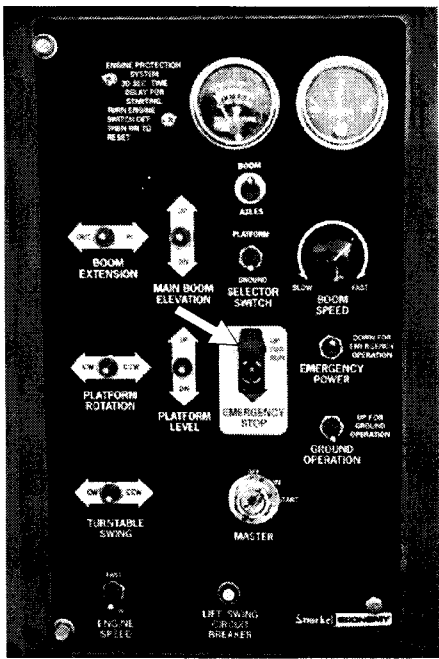
The batteries in the TB 80 are safety devices because they power the emergency operating circuits. Thus, battery maintenance is very



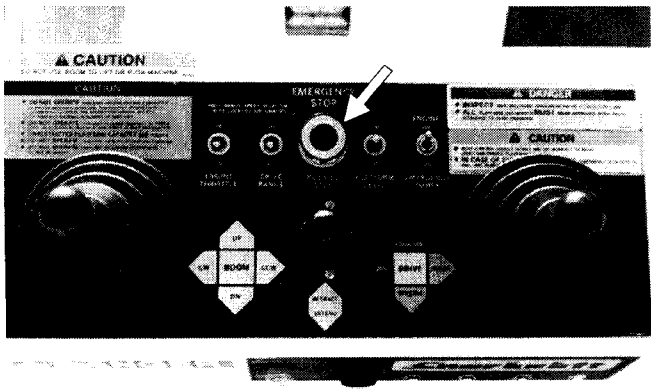
2. SAFETY DEVICES

important. Batteries should always be kept at full charge and the battery terminals kept free of corrosion.

■ EMERGENCY STOP SWITCHES



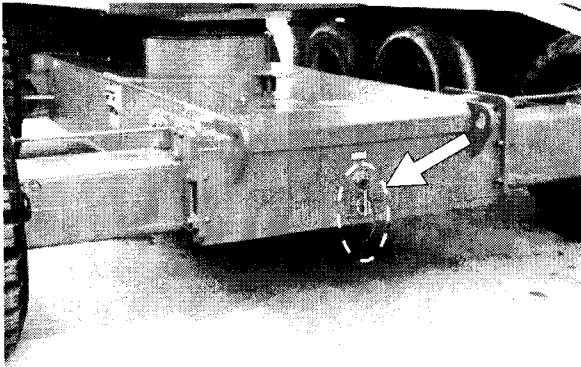
At the ground-control panel: Press the large red **EMERGENCY STOP** switch down, at any time, under any conditions, and the entire machine stops, the engine turns off, the brakes automatically set, and nothing moves. This switch must be set to UP FOR RUN for anything on the TB 80 to work.



At the platform-control box: Press the large red **EMERGENCY STOP** button down (off) and the entire machine stops, the engine turns off, the brakes automatically set, and nothing moves. This switch must be pulled to its up (on) position to control the TB 80 from the platform.

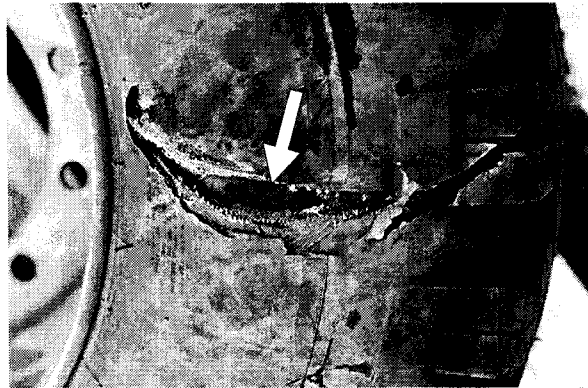
NOTE: The ground-control panel is designed to override the platform-control box. By switching the **SELECTOR SWITCH** (at the ground-control panel) from PLATFORM to GROUND, the TB 80 can be controlled from the ground-control panel, regardless of the platform-control box switch settings.

■ EXTENDIBLE AXLE INTERLOCKS



The left and right rear axles of the TB 80 must be extended and locked for safe-working machine stability. The booms cannot be raised much above horizontal nor extended unless the axles are completely extended and locked into place. Instructions for extending and locking the axles are given in the “OPERATION” chapter.

■ FOAM FILLED TIRES

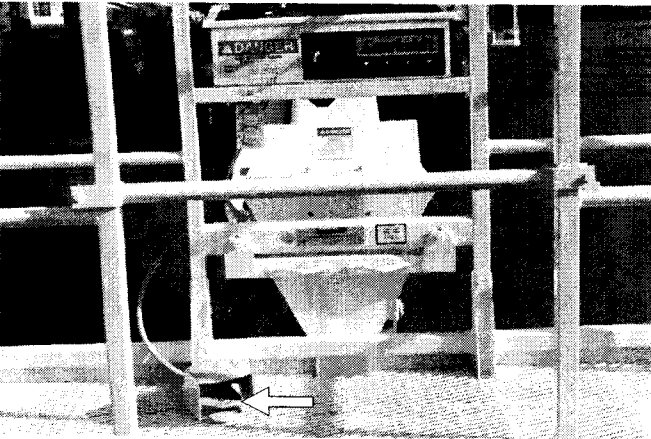


The weight of foam-filled tires is part of the ballast for TB 80's. Also, foam filled tires eliminate the possibility of air leaks or blow-outs which might cause a tipover. Foam-filled tires are therefore a safety device. Inspect them at the start of each work shift according to the procedures in the “DAILY INSPECTION & MAINTENANCE” chapter. The foam-filled tire shown here is not acceptable for service.



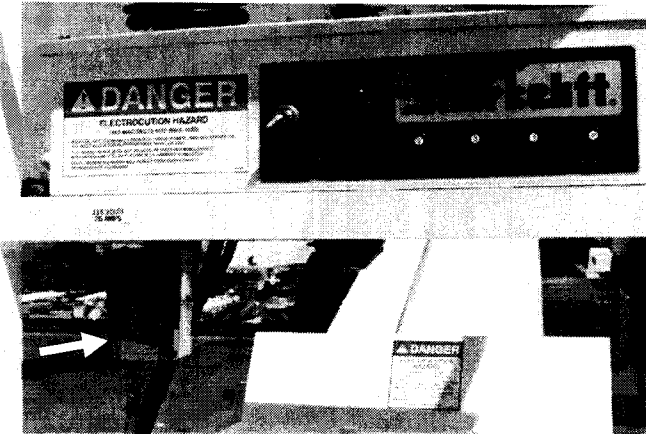
2. SAFETY DEVICES

■ FOOT SWITCH



The foot switch prevents the platform from moving if something accidentally pushes one of the platform-moving controls on the platform-control box. To make the platform move you must step on the foot switch at the same time you use a platform-moving control.

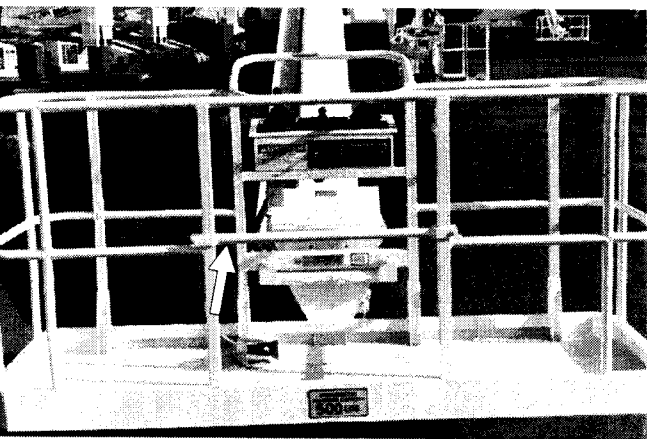
■ GFCI (Ground Fault Circuit Interrupt)



The GFCI protects against electricity flowing to ground. When electricity flows to ground the GFCI shuts off power to the electrical outlets.

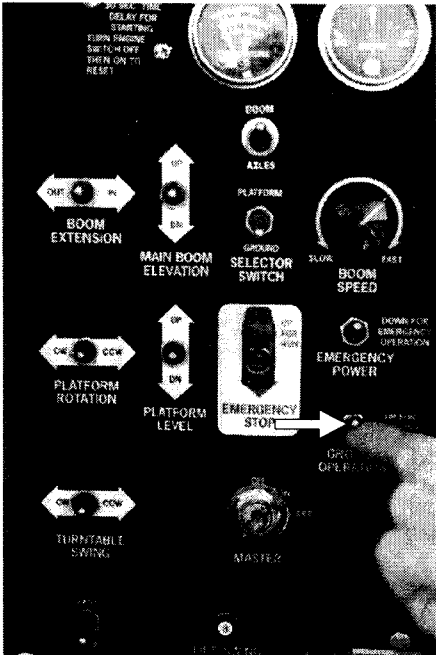
NOTE: See “125 V AC OUTLET (GFCI)” at the end of the “OPERATION” chapter for information about how to use the GFCI.

■ GRAVITY GATE



The gravity gate is the place in the platform guardrail system where you should enter and leave the platform. Raise the gate and step under it onto the platform. Once you have entered the platform and attached your fall restraint lanyard to an anchor point, check to see that the gravity gate has fallen back into place.

■ GROUND OPERATION SWITCH

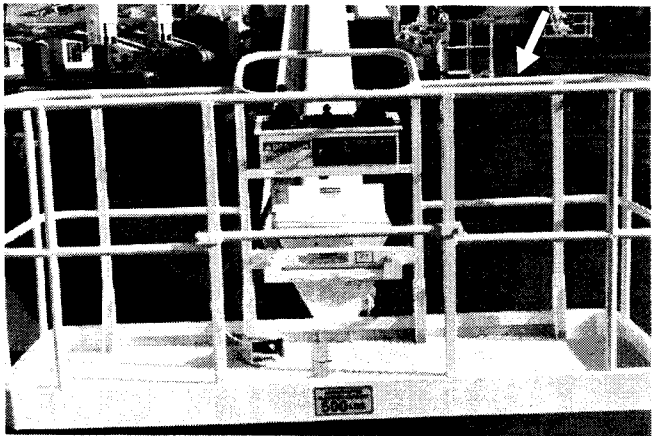


The **GROUND OPERATION** switch prevents the platform from moving if something accidentally pushes one of the platform-moving switches at the ground-control panel. To make the platform move you must push and hold the **GROUND OPERATION** switch up at the same time you use a platform-moving switch.



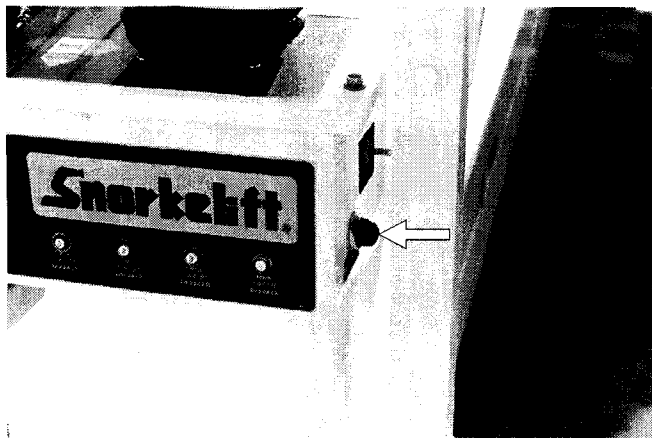
2. SAFETY DEVICES

■ GUARDRAILS



The guardrails help protect you from falling off the platform. Be sure the guardrails are properly installed and that the gravity gate or swinging gate is in place.

■ HORN



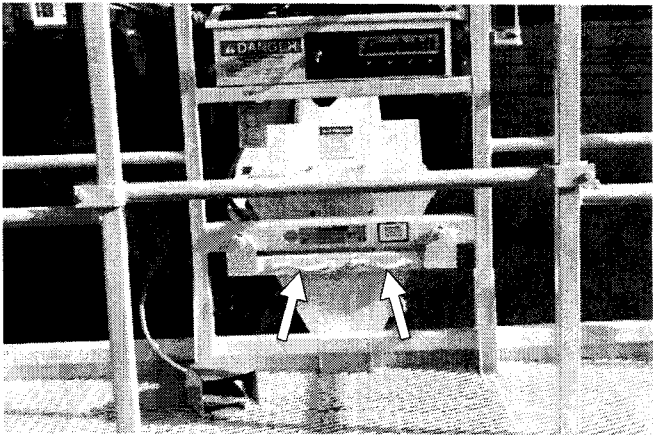
The operator **HORN** is used primarily to get the attention of people on the ground when you are working aloft. For the horn to work the **BATTERY** switch must be ON and the following switches must be set as indicated:

- MASTER**ON
- EMERGENCY STOP**
(at ground-control panel) ..UP FOR RUN
- SELECTOR SWITCH**GROUND

The **HORN** will also work if:

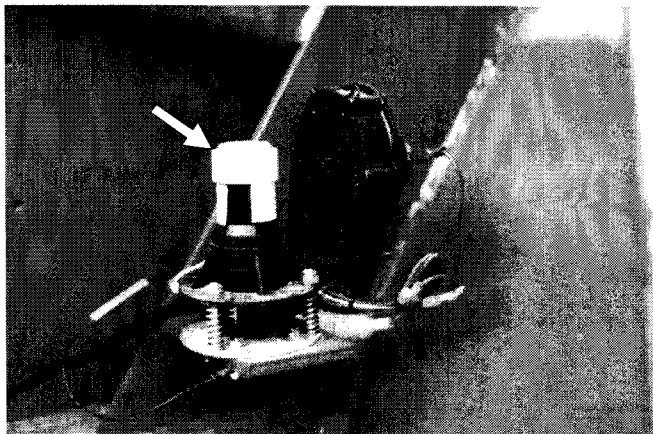
- MASTER**ON
- EMERGENCY STOP**
(at ground-control panel) ..UP FOR RUN
- SELECTOR SWITCH**PLATFORM
- EMERGENCY STOP**
(at platform-control box) ...on
- ANTI-RESTART**
MASTER SWITCHON

■ LANYARD ANCHOR POINTS



All personnel on the platform shall attach their fall restraint lanyards to one of the lanyard anchor points.

■ LEVEL SENSOR



The level sensor (located inside the left-rear of the turntable) detects how far out of level the turntable is. If the turntable gets over 5° out of level the level sensor activates the tilt alarm (described earlier in this chapter).



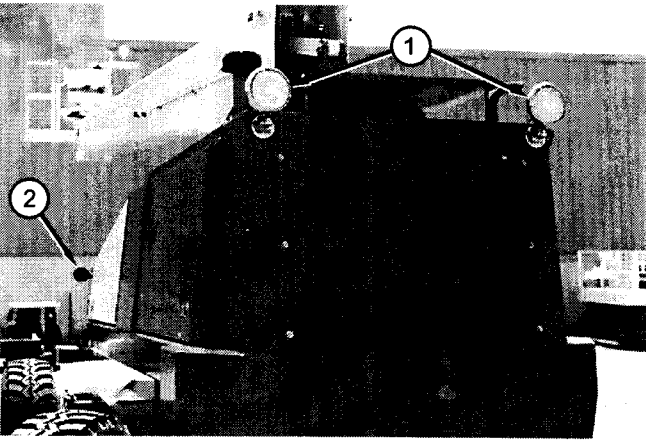
2. SAFETY DEVICES

■ LIGHTS (options)

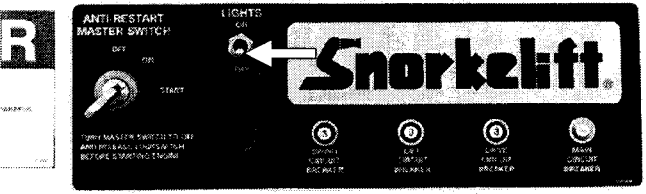
□ Driving Lights (option)

CAUTION

Together the four lights draw seven amperes. If you work with the lights turned on and the engine turned off, the batteries can discharge to the point they will neither start the engine nor run the **EMERGENCY POWER** hydraulic pump. If you cannot leave the engine running while the lights are on, start and run the engine at least 15 minutes in each hour.



Driving lights are for driving on dimly lit construction sites, they are not for driving on public thoroughfares. Two 30 watt headlights (1) are located on top of the front cowling, two 25 watt blinking taillights (2 typ.) are on the sides of the rear cowlings.



The lights are controlled by the **LIGHT** switch on the front of the platform-control box. For any of the lights to work both the **BATTERY** switch and the **MASTER** switch must be ON.

□ Flashing Light (option)



The flashing light alerts people that the TB 80 is present. The light flashes at about one flash per second when:

- BATTERY** ON
- EMERGENCY STOP**
(at ground-control panel) . UP FOR RUN
- MASTER**..... ON
- SELECTOR SWITCH** GROUND

The light also flashes when:

- BATTERY** ON
- EMERGENCY STOP**
(at ground-control panel) . UP FOR RUN
- MASTER**..... ON
- SELECTOR SWITCH** PLATFORM
- ANTI-RESTART MASTER SWITCH**..... ON
- EMERGENCY STOP**
(at platform-control box)... on

There is no ON/OFF switch for the flashing light.



2. SAFETY DEVICES

□ Platform Work Lights (option)



The platform work lights are located on top the platform guardrail. For the lights to work the **BATTERY** switch must be ON and the following switches, on the ground-control panel, must be set as indicated:

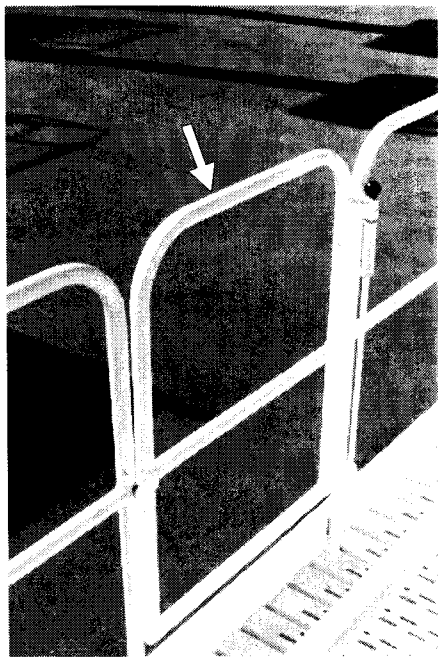
- SELECTOR SWITCH**PLATFORM
- EMERGENCY STOP**UP FOR RUN
- MASTER**ON

The toggle switch on the back of each light turns it on.

! CAUTION

Incandescent lights draw three amperes (35 watts) each. Halogen lights draw four amperes (50 watts) each. If you work with the lights turned on and the engine turned off, the batteries can discharge to the point they will not start the engine nor run the **EMERGENCY POWER** hydraulic pump. If you cannot leave the engine running while the lights are on, start and run the engine at least 15 minutes in each hour to keep the battery charged.

■ SWINGING GATE (option)



The swinging gate is designed to automatically close after you enter or leave the platform. It helps prevent people from falling off the platform.



3. SPECIFICATIONS

The Snorkelift TB 80 is a boom-supported elevating work-platform built to conform to the following standards:

OSHA Paragraph 1910.67 Title 29, C.F.R., Vehicle-Mounted Elevating and Rotating Work Platforms - Labor.

OSHA Paragraph 1926.556 Title 29, C.F.R., Aerial Lifts - Construction.

ANSI Standard A92.5-1992, Boom-Supported Elevating Work Platforms.

CSA Standard CAN3-B354.4-M82, Boom-type Elevating Work Platforms.

■ GENERAL SPECIFICATIONS

- Working height (nominal)86.0 ft (26.21 m)
- Platform height (maximum)80.0 ft (24.38 m)
- Platform reach (maximum)71.1 ft (21.67 m)
- Length
 - (booms down and retracted)38.8 ft (11.82 m)
- Width
 - axles retracted8.46 ft (2.58 m)
 - axles extended12.46 ft (3.80 m)
- Height (booms down)9.58 ft (2.92 m)
- Wheelbase12.0 ft (3.66 m)
- Ground clearance13.0 in (33.0 cm)
- Tailswing:
 - axles retracted6.6 ft (2.01 m)
 - axles extended4.6 ft (1.40 m)
- Weight (approximate) 30,300 lb (13,744 kg)
- Wheel loading, single (max.) 15,400 lb (6,985 kg)
- Ground pressure (max.) 84 psi (580 kPa)
- Boom elevation+70°/-13.5° to horizontal
- Gradeability
 - 4x2 (two-wheel drive)25%
 - 4x4 (four-wheel drive)30%

- Travel speeds (max.):
 - booms down and retracted 3.0 mph (4.8 km/h)
 - (4x4 option only) 1.5 mph (2.4 m)
 - booms up and/or extended 0.75 mph (1.2 km/h)
- Turning radius:
 - inside (rear axles extended) 17.42 ft (5.31 m)
- Tires (foam filled) 15 x 22.5, 16 ply
- Electrical system12 V dc (neg. ground)
- Environmental operating ranges:
 - ambient air temperature 0°F to +110°F (-18°C to +43°C)
 - wind speed (maximum gust or continuous) 28 mph (45 km/h)
- Fuel tank capacity:
 - standard gasoline
 - or diesel 40 gal (US) (151.4 liters)
 - optional LPG 43.5 lb (19.7 kg)
- Hydraulic oil:
 - pressure (max., 4x2) 2,500 psi (17,250 kPa)
 - pressure (max., 4x4) 2,800 psi (19,320 kPa)
 - system capacity 65 gal (US) (246 liters)
 - temperature (max. at tank) 200°F (93°C)
- Hydraulic oil recommended:
 - above 10°F (-13°C) Mobil DTE 13M (ISO VG32)
 - below 10°F (-13°C) Mobil DTE 11M (ISO VG15)
- Boom movement times, in seconds, for complete range of movement:
 - TURNTABLE SWING (360° continuous)
 - booms retracted90 - 100 seconds
 - booms extended190 - 220 seconds
 - PLATFORM ROTATION (180°) 16 - 20 seconds
 - MAIN BOOM ELEVATION
 - UP (booms retracted)65 - 75 seconds
 - UP (booms extended)100 - 120 seconds
 - DN (booms retracted)60 - 70 seconds
 - DN (booms extended)80 - 95 seconds
 - BOOM EXTENSION
 - OUT80 - 90 seconds
 - IN60 - 70 seconds

■ PLATFORM SPECIFICATIONS

PLATFORM	SIZE inches (cm)	Unrestricted rated work load (total weight of personnel, tools, and materials that the platform is designed to carry above its floor when the platform is within its working envelope -- same as UNRESTRICTED PLATFORM CAPACITY)
steel, standard	92 x 30 (234 x 76)	Rated work load: 500 lb (227 kg) Rated number of occupants: 2 people
aluminum, optional steel, optional	92 x 30 (234 x 76) 60 x 30 (152 x 76)	Rated work load: 600 lb (273 kg) Rated number of occupants: 2 people
aluminum, optional	60 x 30 (152 x 76)	Rated work load: 650 lb (295 kg) Rated number of occupants: 2 people

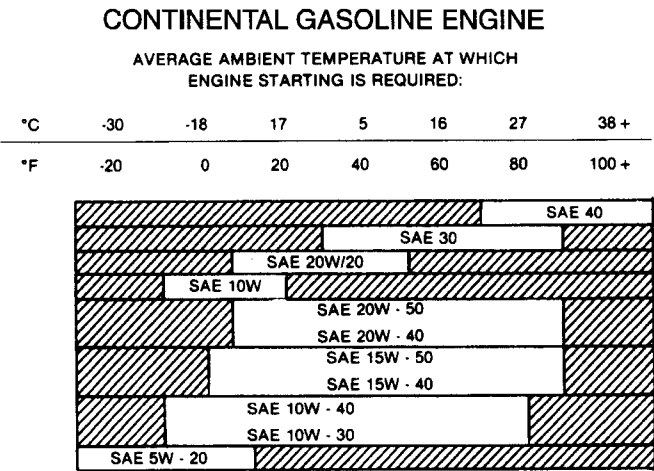
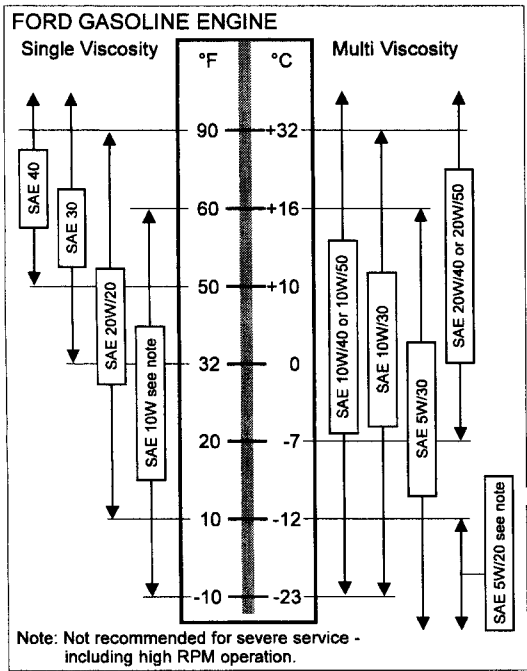


3. SPECIFICATIONS

ENGINE DATA (GASOLINE & LPG)

ENGINE MAKE	FORD		CONTINENTAL	
MODEL	LRG-423		TM27	
FUEL	Gasoline	LPG	Gasoline	LPG
FUEL GRADE	unleaded 85 octane (motor method)	HD5 Gas Processors Association Standard 2140 Category: special duty propane	unleaded 85 octane (motor method)	HD5 Gas Processors Association Standard 2140 Category: special duty propane
COOLANT	50% water + 50% ethylene glycol antifreeze			
OPERATING TEMPERATURE	160°F - 190°F (71°C - 88°C)		180°F - 202°F (81°C - 94°C)	
OIL SUMP CAPACITY	4 qt USA (3.8 liters)		6 qt USA (5.7 liters)	
OIL FILTER CAPACITY	1 qt USA (0.95 liters)			
OIL GRADE	API: SH (SG only if SH not available)	API: SG or SH	API: SE, SF, SE/CD, SF/CD	
OIL WEIGHT	See charts below.			
RUNNING TIME	One full tank of gasoline will last an entire eight hour shift, under normal working conditions. It normally takes two tanks of LPG per eight hour shift.			

ENGINE OIL CHARTS (FORD & CONTINENTAL)



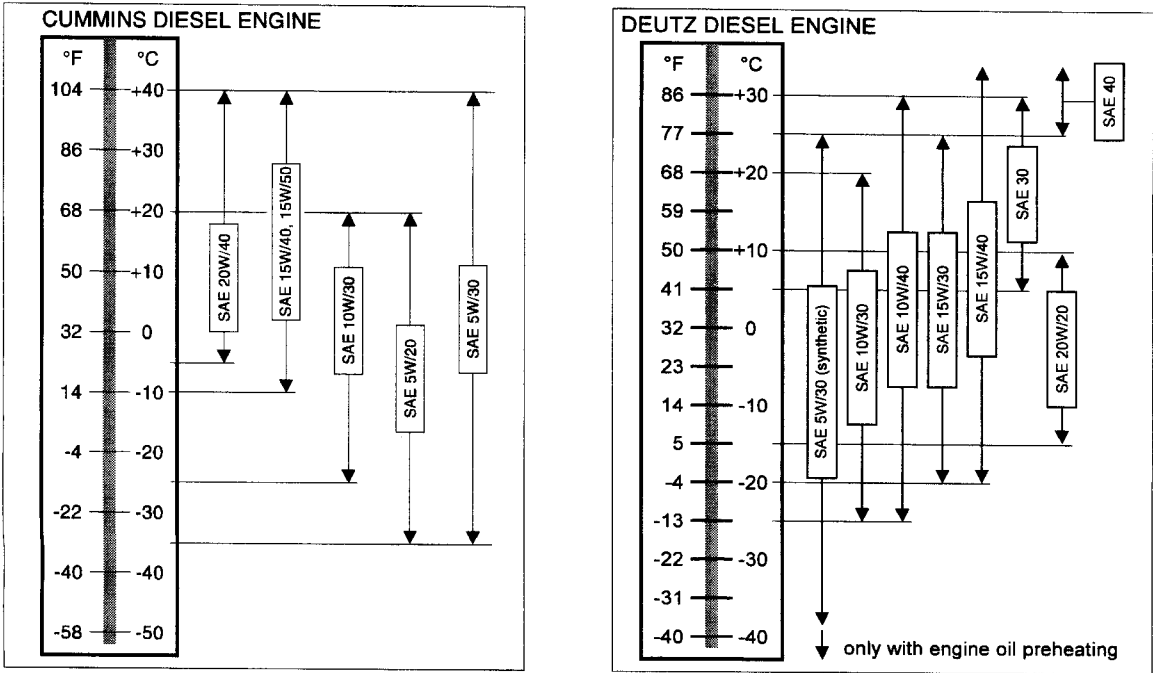


3. SPECIFICATIONS

■ ENGINE DATA (DIESEL)

ENGINE MAKE	CUMMINS	DEUTZ
MODEL	4B3.9	F4L-1011
FUEL	Diesel	
FUEL GRADE	ASTM No. 2 D Cetane # > 40 (For operating temp. below 32°F / 0°C use "winterized" No. 2 D.)	DIN 51601 - DK BS 2869: A1 and A2 ASTM D 975-81: 1-D and 2-D W-F-800C: DF-A, DF-1, and DF-2
COOLANT	50% water + 50% ethylene glycol antifreeze	Air
OPERATING TEMPERATURE	141°F - 211°F (60°C - 100°C)	172°F - 203°F (78°C - 95°C)
OIL SUMP CAPACITY	10 qt USA (9.5 liters)	10.5 qt USA (10 liters)
OIL FILTER CAPACITY	1 qt USA (0.95 liters)	0.5 qt USA (0.5 liters)
OIL GRADE	API: CE/SF, CD/SF	API: CC/SE CC/SF CD/SE CD/SF CE/SF CE/SG
OIL WEIGHT	See charts below.	
RUNNING TIME	One full tank of diesel will last an entire eight hour shift, under normal working conditions.	

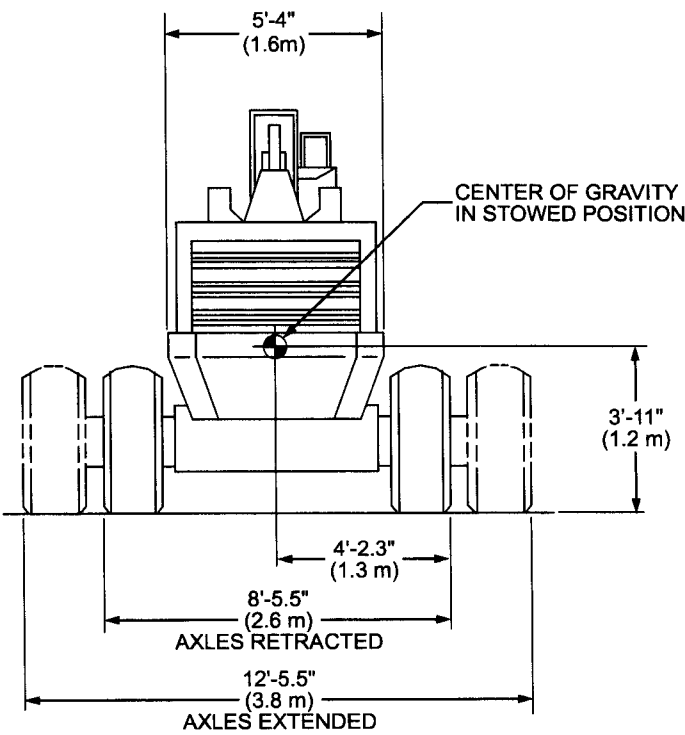
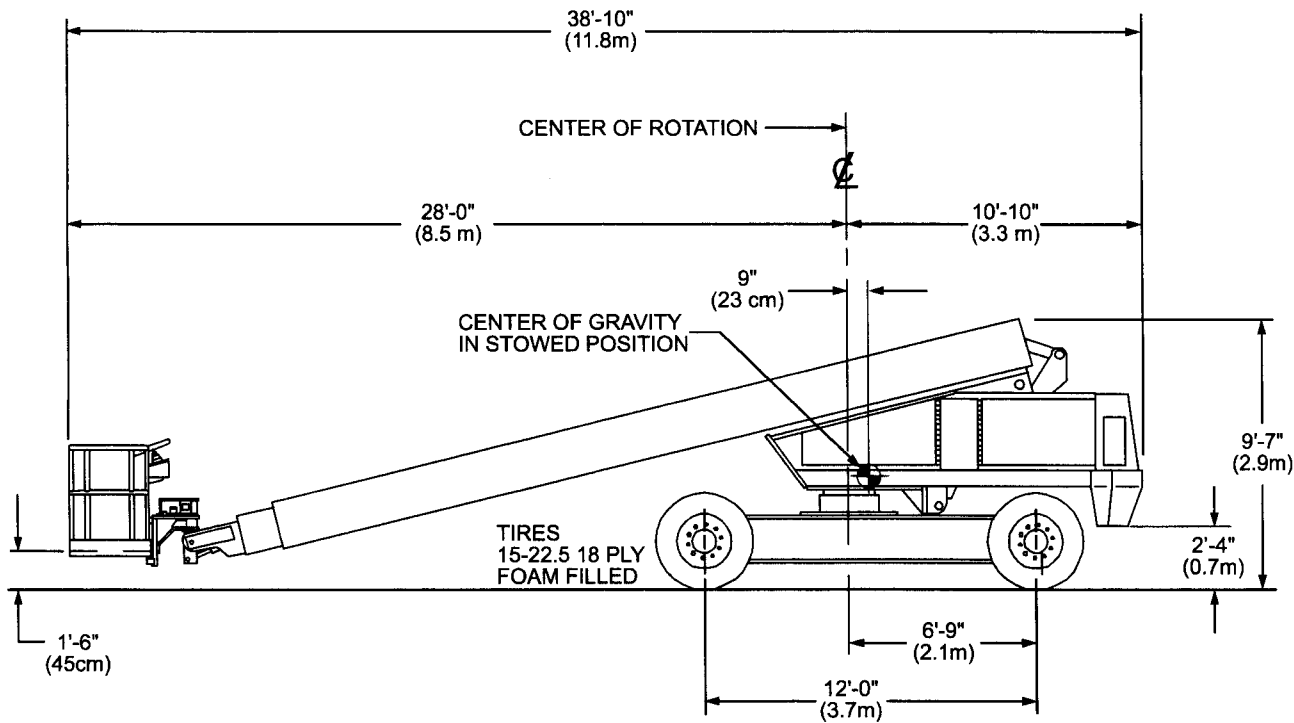
■ ENGINE OIL CHARTS (CUMMINS & DEUTZ)





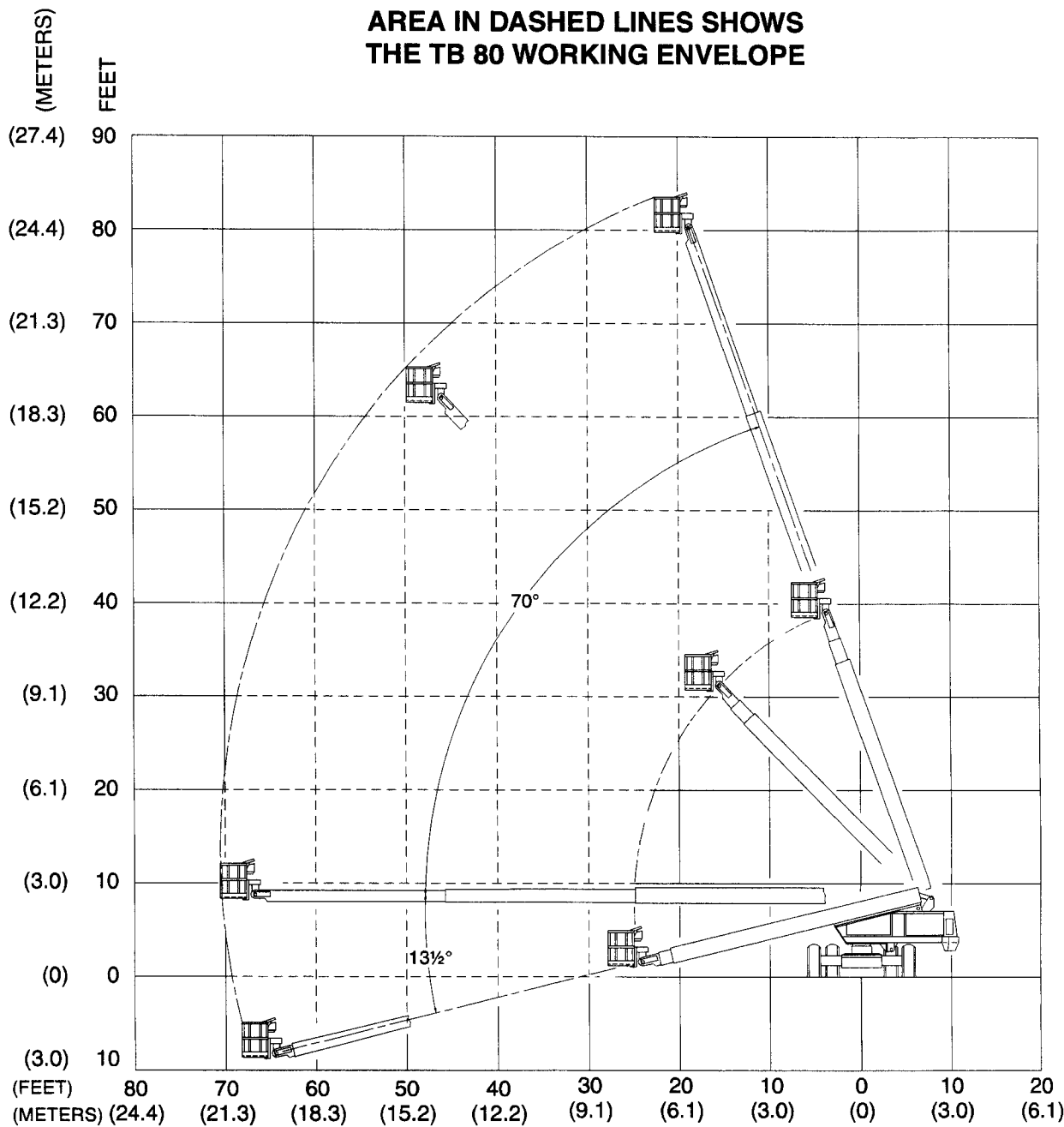
3. SPECIFICATIONS

OVERALL DIMENSIONS





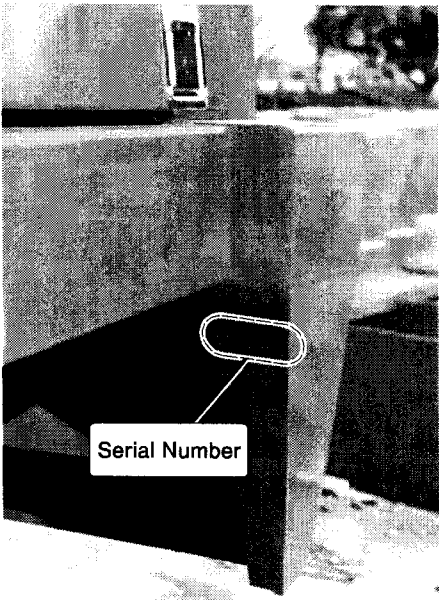
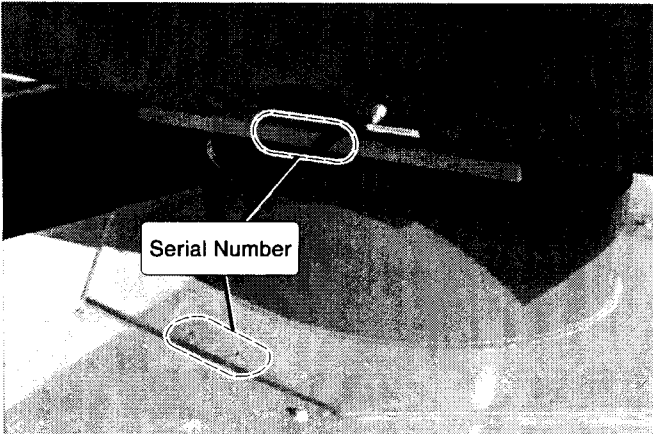
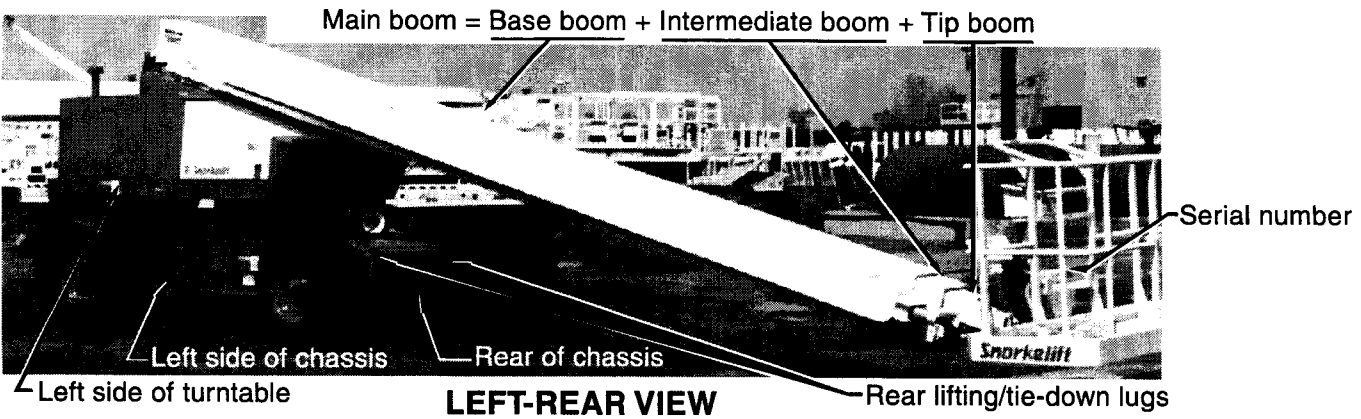
WORKING ENVELOPE





3. SPECIFICATIONS

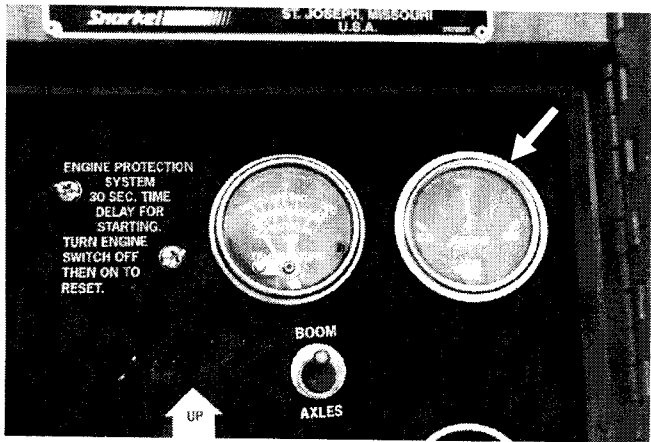
■ NOMENCLATURE & SERIAL NUMBERS





4. GAUGES

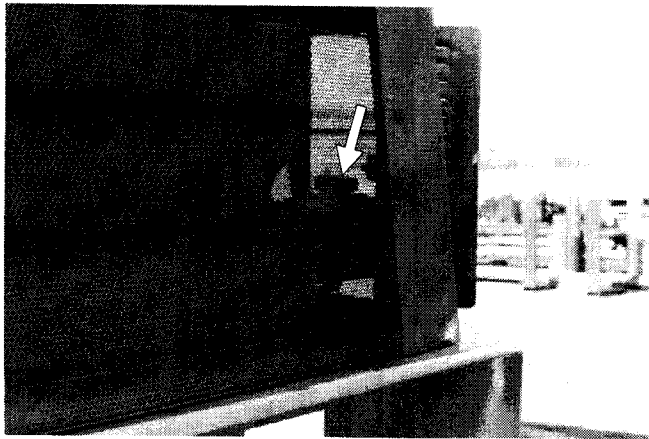
■ AMPS



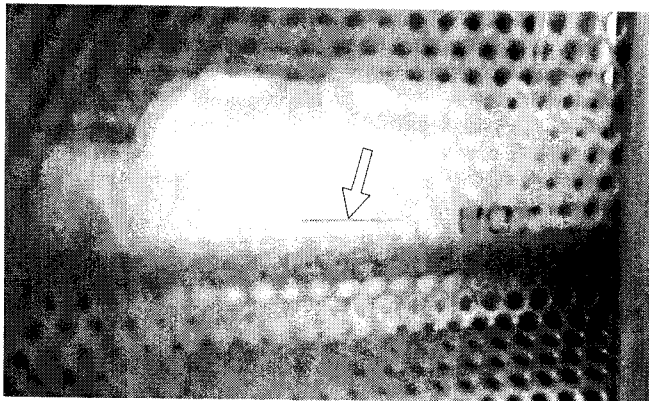
The **AMPS** gauge (at the top of the ground-control panel) shows the electric current from the alternator to the batteries. When the engine is running, the needle in the **AMPS** gauge should not be to the left of "0." Under normal operating conditions, after the engine has been running for a few minutes, this gauge should read "0."

■ ENGINE COOLANT

NOTE: Machines with Deutz engines do not have a coolant reservoir, Deutz engines are air cooled.



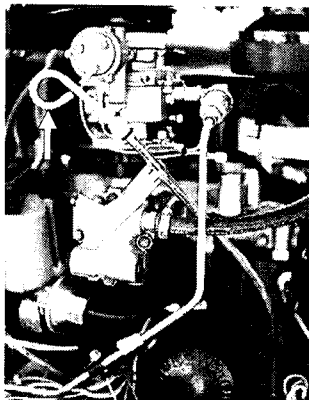
The engine coolant reservoir is behind the grill, inside the engine compartment.



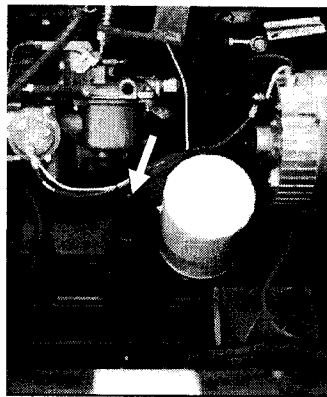
When the engine is at operating temperature the coolant should be at the HOT line. When the engine is cold there should be about one inch (2.54 cm) of coolant in the bottom of the reservoir.

■ ENGINE OIL

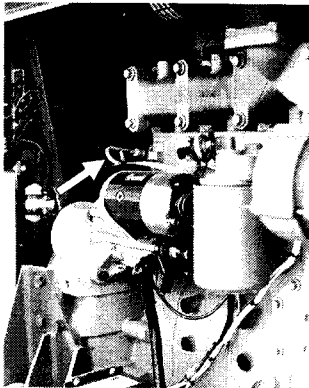
FORD



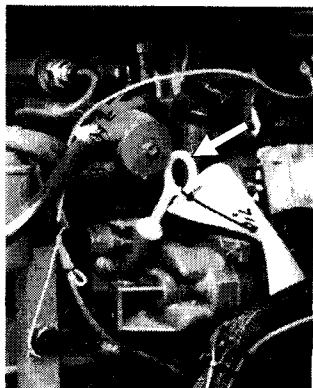
CONTINENTAL



CUMMINS



DEUTZ

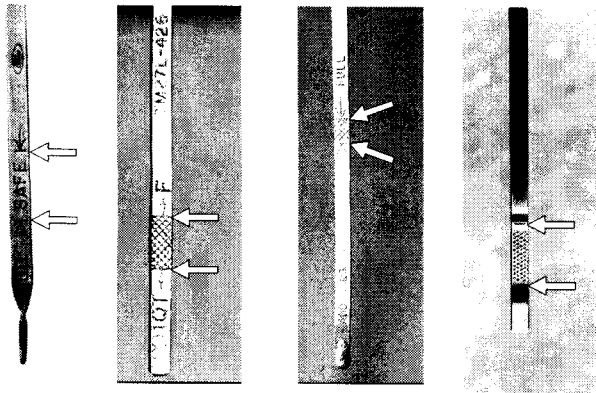


Engine oil level is measured with a dipstick. Oil capacities given in the "SPECIFICATIONS" chapter are approximate. True values may vary from machine to machine due to slight variations or modifications during production. The oil dipstick is the only way to accurately gauge if the engine oil level is correct.



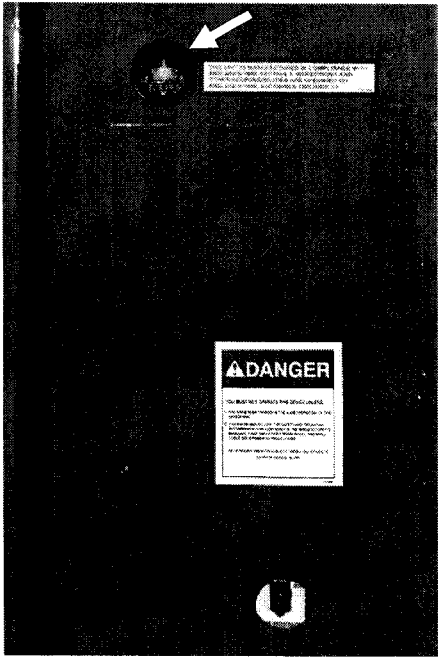
4. GAUGES

FORD CONTINENTAL CUMMINS DEUTZ

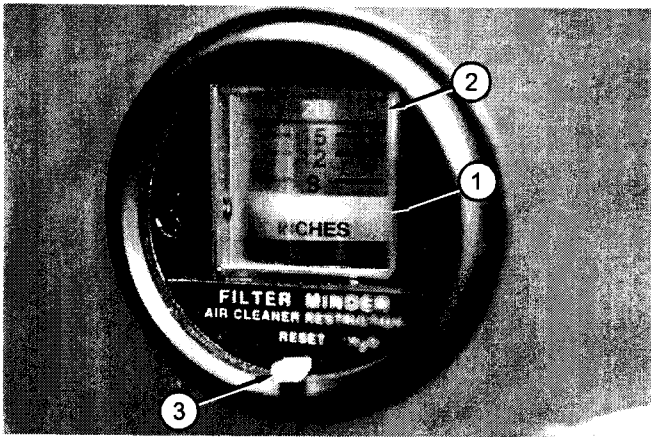


Engine oil level should always be between the lines on the dipstick — never above nor below them. The TB 80 should be on level ground when you check the dipstick. Check the oil level after the engine has been turned off a few minutes so that oil can run down out of the engine into the sump.

■ FILTER MINDER



The air filter gauge (**FILTER MINDER**) is located just above the ground-control panel. The gauge measures the vacuum (air pressure) between the intake manifold and the air filter.

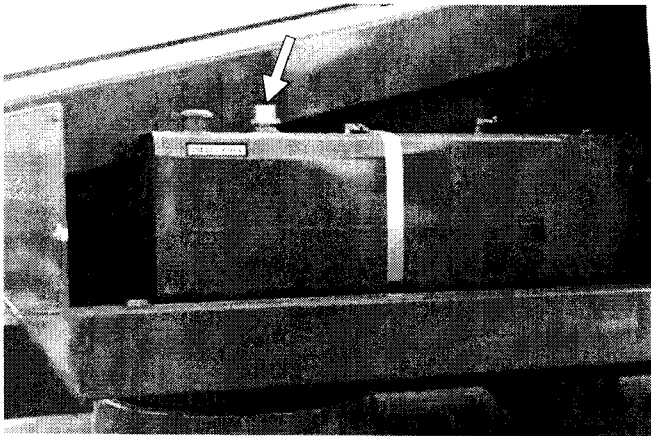


As the filter clogs, the vacuum increases (pressure drops). As the vacuum increases, the yellow indicator (1) raises toward the red area (2) of the sight glass. When the yellow indicator reaches the red, it's time to change the air filter.

The yellow indicator (1) stays at its highest setting, it does not go to the bottom of the sight glass when the engine is turned off. After the filter is changed, press the small **RESET** button (3) to reset the yellow indicator to the bottom of the sight glass.

■ FUEL

□ Gasoline and Diesel



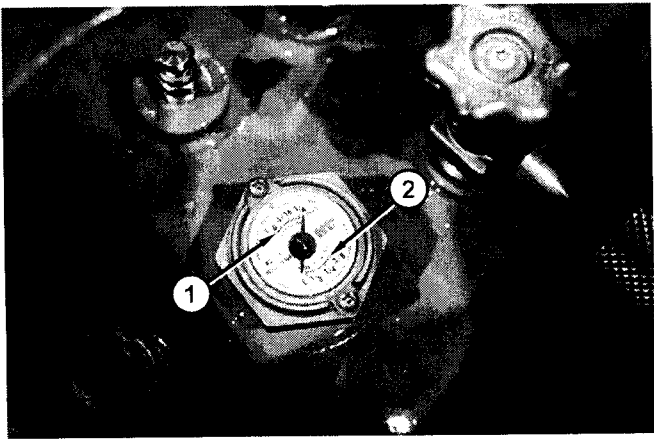
The fuel gauge is located on top of the gasoline or diesel fuel tank. Read the fuel gauge at the line in the clear plastic window. The gauge reads in fractions-of-a-full-tank.

NOTE: Do not run a diesel fuel tank dry. Air in the fuel line makes a diesel engine hard to start.



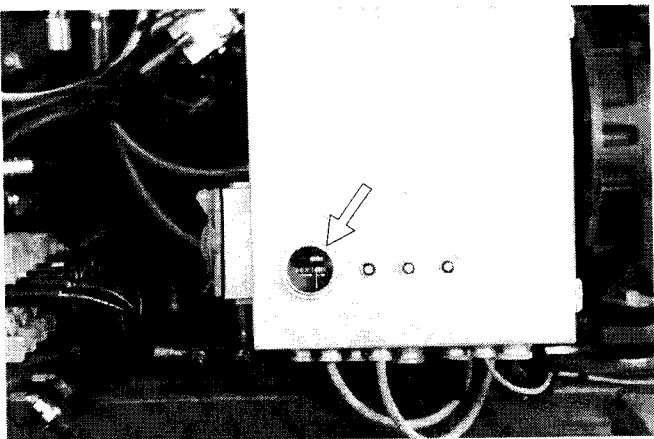
4. GAUGES

❑ **LPG (Liquefied Petroleum Gas) (option)**



LPG tanks have two fuel gauges (1) (2) on top. One measures correctly when the tank is standing on end (**VERTICAL**) the other measures correctly when the tank is laying down (**HORIZONTAL**). Both read in fractions-of-a-full-tank. TB 80 tanks are mounted horizontally. Therefore, you should read the **HORIZONTAL** scale (2).

■ **HOURS**



The **HOURS** gauge is basically an electric clock. It accumulates time when:

- BATTERY**..... ON
- SELECTOR SWITCH** GROUND
- EMERGENCY STOP**
(at ground-control panel) UP FOR RUN
- MASTER** switch ON.

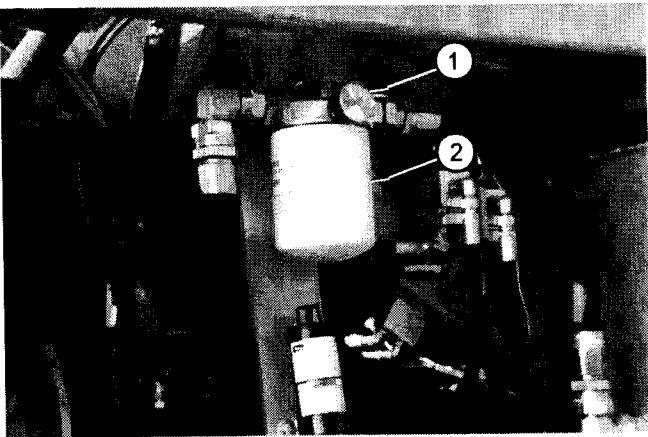
It also accumulates time when:

- BATTERY**..... ON
- SELECTOR SWITCH** PLATFORM

- EMERGENCY STOP**
(at ground-control panel)ON
- EMERGENCY STOP**
(at platform-control box)on
- ANTI-RESTART**
MASTER SWITCHON.

The **HOURS** gauge cannot be reset. Use it to tell when it is time to perform the periodic maintenance listed in the Maintenance Manual.

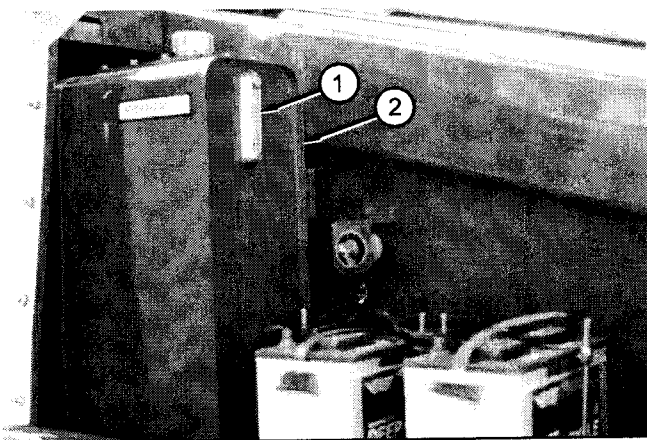
■ **HYDRAULIC-OIL FILTER GAUGE**



The hydraulic-oil filter gauge (1) is located above the hydraulic-oil filter (2). The gauge measures pressure into the filter. As the filter clogs, the pressure goes up.

The hydraulic-oil filter gauge should only be read by qualified trained maintenance personnel. An accurate reading requires very special conditions and should not be attempted by operators.

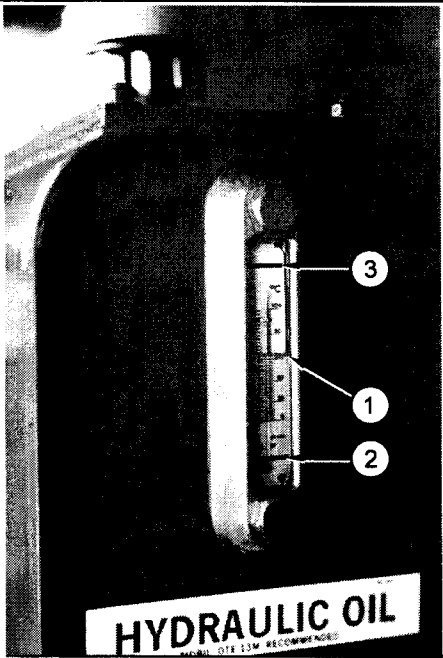
■ **HYDRAULIC OIL LEVEL**



The hydraulic-oil level gauge (1) is on the side of the hydraulic oil tank (2).

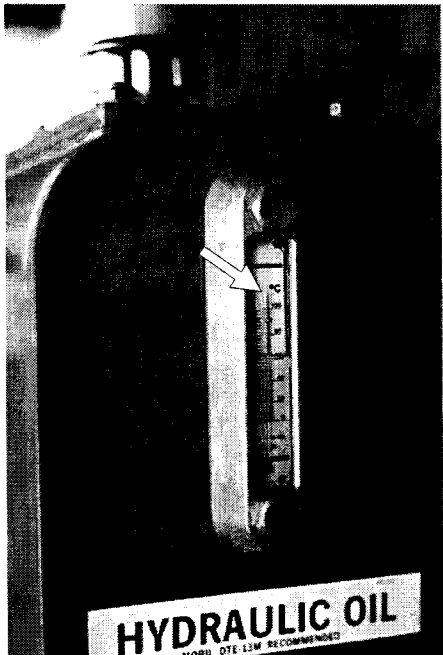


4. GAUGES



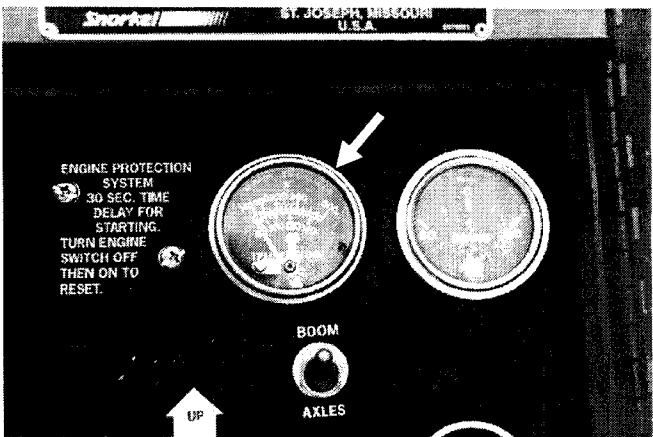
The gauge shows the actual level of oil inside the tank. Read it only when the booms are completely down and completely retracted. Otherwise, the boom hydraulic-cylinders become large reservoirs for hydraulic oil and the oil level in the tank will be low. The oil level (1) should be between the marks (2)(3).

■ HYDRAULIC OIL TEMPERATURE



The hydraulic-oil temperature gauge measures the temperature of the oil in the tank. The temperature should not exceed 200°F (93°C). If it does, reduce your driving speed or stop the engine and let the hydraulic oil cool.

■ TEMPERATURE



The **TEMPERATURE** gauge is located at the top of the ground-control panel. For Ford, Continental, and Cummins engines it shows the temperature of the water-antifreeze mixture in the engine block. Typical operating-temperature ranges are shown in the “SPECIFICATIONS” chapter.

The **TEMPERATURE** gauge for Deutz engines shows the temperature of the engine oil as the oil leaves the oil filter. The typical operating-temperature range for a Deutz engine is shown in the “ SPECIFICATIONS” chapter.



5. AUTOMATIC SHUT-OFFS & CIRCUIT BREAKERS

■ AUTOMATIC SHUT-OFFS

The TB 80 engine will automatically shut off if:

- the engine temperature gets too high,
- the engine oil pressure gets too low,
- there is no alternator current,
- the main circuit breaker trips.

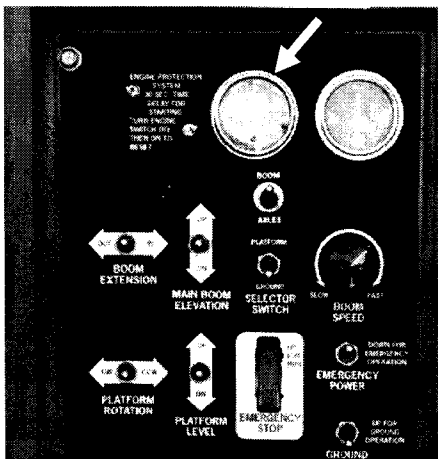
A continuous-tone alarm will sound as the engine begins to overheat, if the oil pressure gets low, or if the fan belt breaks (no alternator current). For circuit breaker problems there is no audible alarm.

There is only one “good” time when you will hear a continuous-tone alarm. That is just prior to starting the TB 80, after you turn the **MASTER** switch or **ANTI-RESTART MASTER SWITCH** to ON. Any other time you hear a continuous-tone alarm you should immediately lower the platform completely down then shut off the engine (if it is still running) and find the cause of the alarm. Check the engine temperature, oil pressure, and fan belt.

The subsections below explain the shut-offs in more detail.

NOTE: See the “SAFETY DEVICES” chapter for an alarm timing diagram.

□ Engine Temperature



If the temperature of either a gasoline or diesel engine reaches 220°F (104°C) an alarm will sound. If the temperature continues to climb to 230°F (110°C) the engine will automatically shut off and cannot be restarted until it cools. When you hear the continuous-tone alarm immediately lower the platform completely down then shut off the engine.

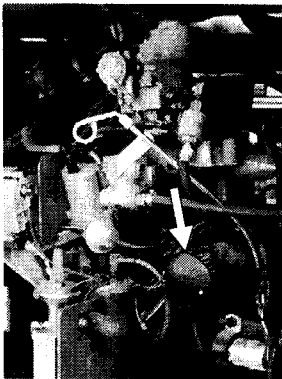
For a Ford, Continental, or Cummins engine, check the engine coolant level (see “DAILY INSPECTION & MAINTENANCE” chapter) before you try to restart the engine. If the coolant is low, replenish it then start the engine and visually check the radiator, radiator hoses, and engine head gasket for leaks. If the engine will not restart, or if it automatically shuts off a second time, refer the problem to a qualified service technician.

For a Deutz air-cooled engine, check the path of the engine-cooling air to see that it is free of obstructions.

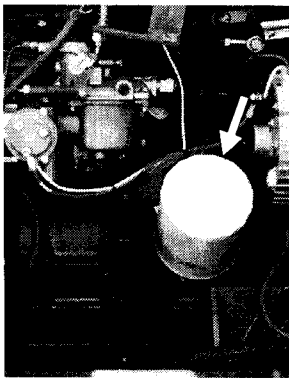
□ Engine Oil Pressure

If the engine oil pressure drops to an unsafe level the engine automatically shuts off and an alarm sounds. If the platform is aloft and the engine automatically shuts off and will not restart, use **EMERGENCY POWER** to completely lower the platform (see “EMERGENCY OPERATION” chapter). Use the **EMERGENCY BLEED DOWN VALVE** only if **EMERGENCY POWER** fails.

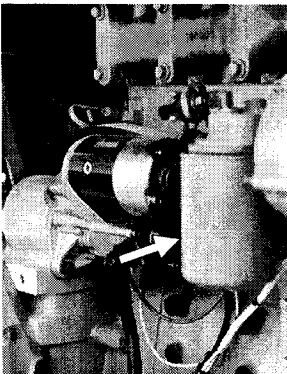
FORD



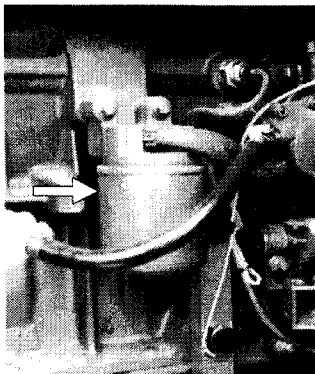
CONTINENTAL



CUMMINS



DEUTZ



Check the oil level with the dipstick then check the engine oil filter (with the engine turned off) to be sure it is in place and tight. If the engine will not restart, or if it automatically shuts off a second time, refer the problem to a qualified service technician.

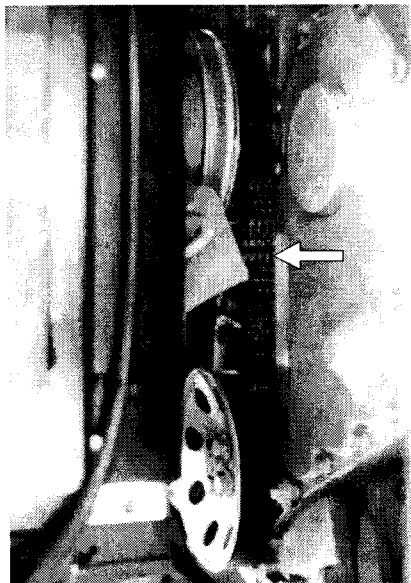


5. AUTOMATIC SHUT-OFFS

■ Alternator Current

If a Deutz engine starts and runs for 30 seconds without producing any alternator current, the engine will automatically stop. This feature protects the engine temperature in the event the fan/alternator drive-belt breaks. A continuous-tone alarm will be emitted when the engine stops.

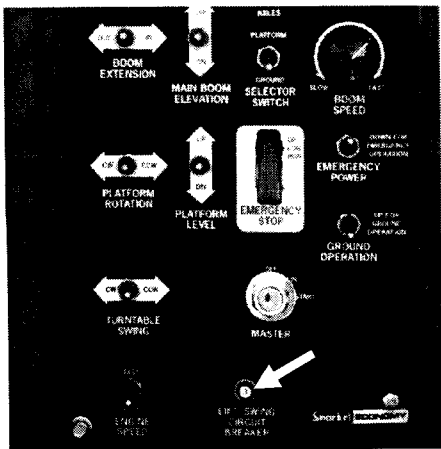
If the platform is aloft and the engine automatically shuts off and will not restart, use **EMERGENCY POWER** to lower the platform completely down (see "EMERGENCY OPERATION" chapter). Use the **EMERGENCY BLEED DOWN VALVE** only if **EMERGENCY POWER** fails.



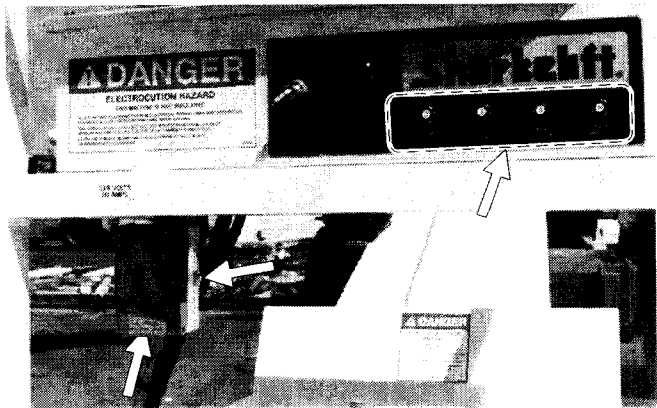
Check the fan belt to see if it is loose or broken.

■ CIRCUIT BREAKERS

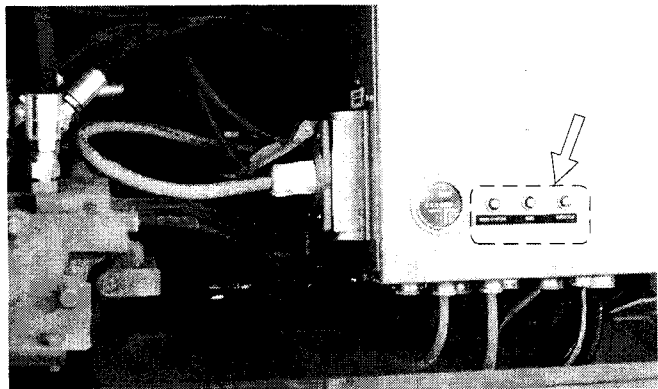
There are ten circuit breakers on the TB 80. Their purpose is to protect electrical circuits from electrical overloads.



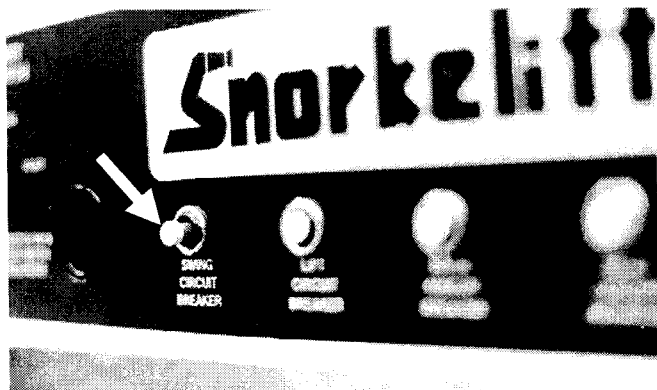
One is located on the ground-control panel.



Four are located on the front of the platform-control box. One is located on the side of the GFCI outlet box and one is the GFCI itself.



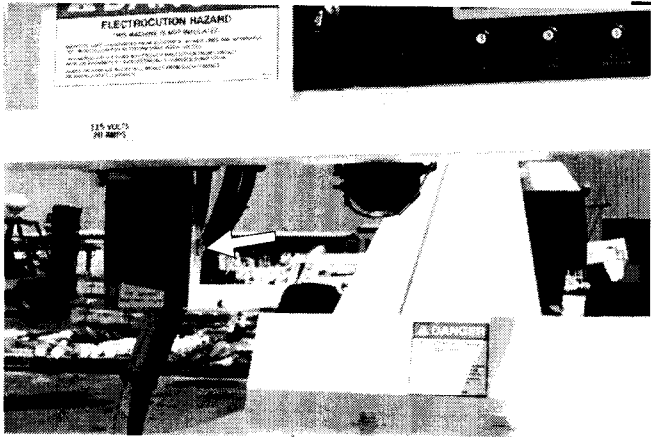
Three are on the wiring box.



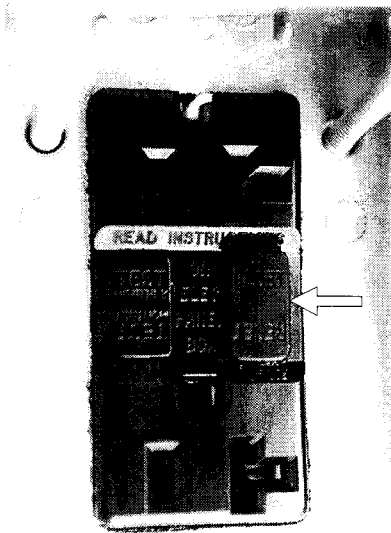
If any of the eight circuit breakers (on the control boxes or wiring box) trip, as shown here, wait one minute for it to cool then push it back in. If it trips a second time, there is a problem in the electrical system and you should immediately attempt to lower the platform to the ground by using normal operating procedures. If normal procedures do not work, use emergency procedures (see "EMERGENCY OPERATION" chapter) to lower the platform. If the cause of the problem is not immediately obvious, take the TB 80 out of service and refer the problem to a qualified service technician.



5. AUTOMATIC SHUT-OFFS



If the “overload” circuit breaker on the GFCI outlet trips, disconnect whatever is plugged into the outlet, wait one minute, then press the circuit breaker button back in. If the circuit breaker trips a second time, refer the problem to a qualified service technician.



If the ground-fault circuit breaker in the GFCI outlet trips, disconnect whatever is plugged into the outlet, wait one minute, then press the **RESET** button back in. If the circuit breaker trips a second time, refer the problem to a qualified service technician.



6. CONTROLS

This chapter explains what each control does. This chapter does not explain how to use the controls to produce useful work: refer to the "OPERATION" chapter for that, after you have read this chapter.

See the "EMERGENCY OPERATION" chapter for the locations of emergency bleed down controls and for correct emergency bleed down procedures.

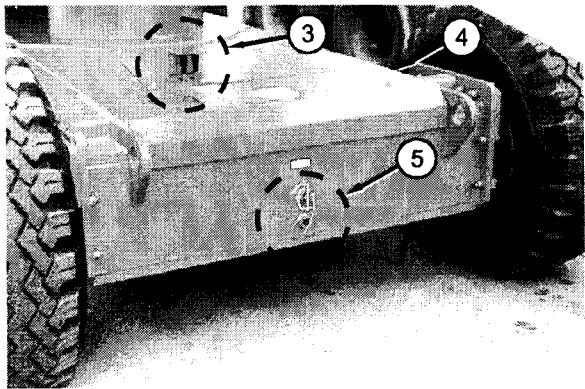
The only optional equipment discussed in this chapter is the control for dual-fuel. For other optional equipment controls, see the "OPTIONS" chapter.

The TB 80 can be controlled from either of two places:

- the GROUND-CONTROL PANEL (1),
- the PLATFORM-CONTROL BOX (2).



Controls (3) for operating the jack and extendible axles are on the rear of the chassis (4) along with the axle interlock (5).





6. CONTROLS

■ GROUND-CONTROL PANEL

Switches for operating the TB 80 from the ground are located on the right side of the turntable behind the small door.

NOTE: The number of each switch below corresponds to the switch's call-out on the next page.

1. **EMERGENCY STOP:** Press the red cover down, at any time, under any conditions, and the entire machine stops — the engine turns off, the brakes set, and nothing moves. This switch must be up for anything on the machine to work.
2. **EMERGENCY POWER:** If the engine stops and cannot be restarted, continuously holding this switch down activates a small, battery-powered hydraulic-pump that supplies emergency hydraulic power for the machine. Boom movements will be slow and have long lag times under EMERGENCY POWER.
3. **SELECTOR SWITCH:** Must be in the GROUND position for the ground-control panel to work. Must be in the PLATFORM position for the platform controls to work.
4. **BOOM SPEED:** This control determines how fast the main boom moves in, out, up, or down. Set it to SLOW until you are very familiar with the way the machine works or if the platform is working in dangerous or cramped surroundings.
5. **GROUND OPERATION:** You must manually hold this switch up any time you use one of the five platform-moving switches (see box at right) to move the platform. Holding the switch up increases the engine speed and activates the platform-moving switches in preparation to do work.
6. **MASTER:** This switch works like an automobile ignition switch. Hold it at START until the engine starts then release it to ON. If the engine dies in ON, the key must be turned to OFF before it will go back to START.

NOTE: On some machines you might have to pause about three seconds in the ON position before going to START so the starter can engage.

Turn the MASTER switch to OFF if the platform is to stay in a particular position for a long time. That will turn the engine off and save fuel.

7. **ENGINE SPEED:** Leave the switch set on SLOW unless you need to warm the engine and hydraulic oil up FAST. Return to SLOW after warm-up.

8 through 12 are the platform-moving switches. Each is a three position, momentary contact, normally-off switch.

8. **TURNTABLE SWING:** CW rotates the entire turntable clockwise (as seen from above). CCW rotates the turntable counterclockwise.

9. **PLATFORM ROTATION:** CW rotates the platform clockwise (as seen from above) relative to the end of the tip boom. CCW rotates the platform counterclockwise.

10. **PLATFORM LEVEL:** UP rotates the platform up relative to the end of the tip boom. DN (down) rotates the platform down.

11. **BOOM EXTENSION:** OUT extends the booms. IN retracts the booms.

12. **MAIN BOOM ELEVATION:** UP raises the base boom. DN (down) lowers the base boom.

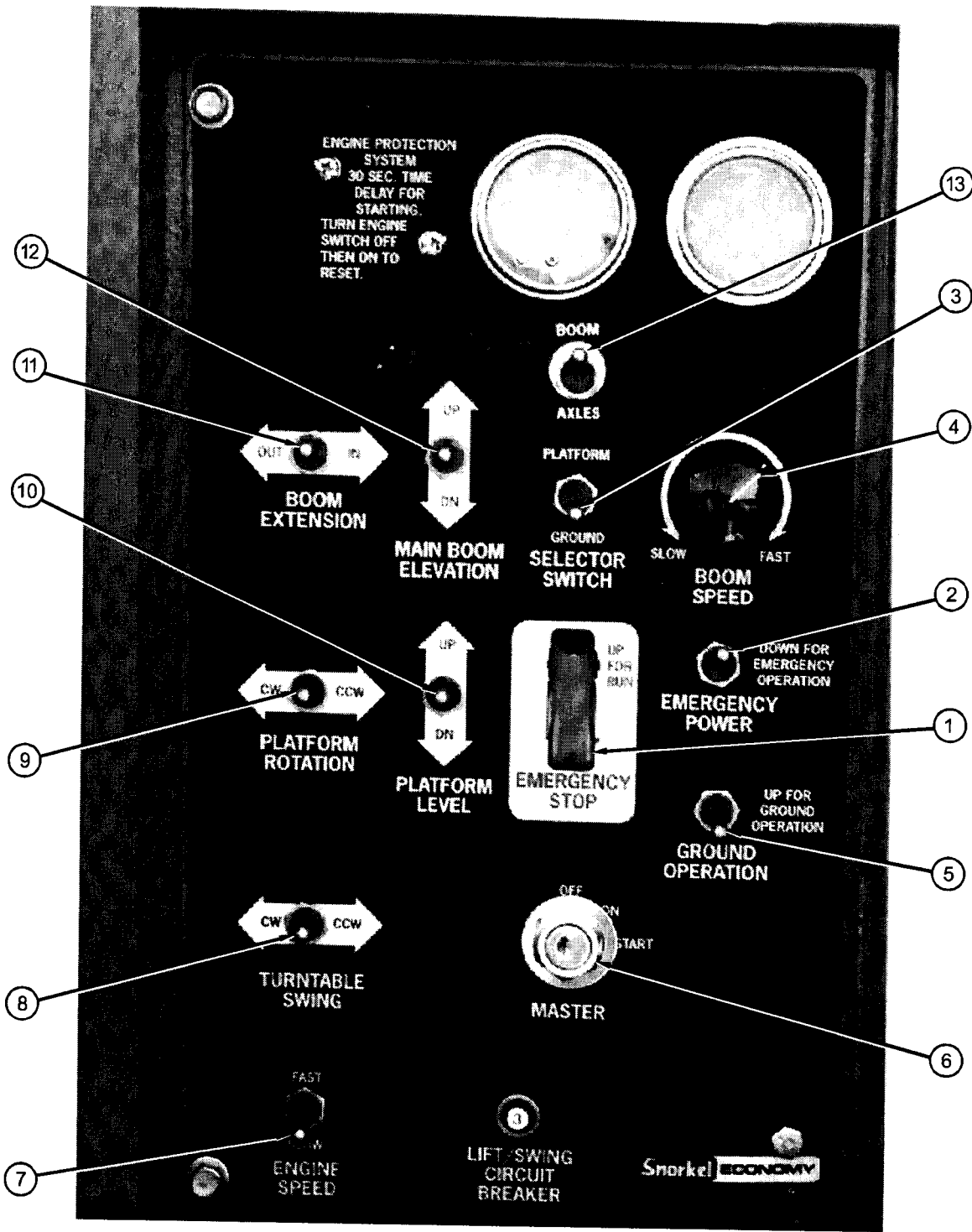
13. **BOOM/AXLES:** This switch must be up (BOOMS) for the booms to move. It must be down (AXLES) anytime you use the AXLES controls (on the top-rear of the chassis) to move the jack or the rear axles.

14. (OPTION - FUEL): Before starting the engine set the FUEL switch to GASOLINE or L.P.-GAS depending on which you want to use. If you select L.P.-GAS be sure to open the valve on top the LP gas tank. To switch fuels with the engine running, see the DUAL FUEL SYSTEM decal on the inside of the ground-control panel door.





6. CONTROLS



GROUND CONTROL PANEL



6. CONTROLS

■ PLATFORM-CONTROL BOX

Controls for operating the TB 80 from the platform are located on the platform-control box, with the exception of the yellow foot switch which is on the platform floor.

NOTE: The number of each control below corresponds to the control's call-out on the next page.

- 1. **EMERGENCY STOP:** Press the large red switch down any time the SELECTOR SWITCH is set to PLATFORM, and the entire machine stops — the engine turns off, the brakes automatically set, and nothing moves. This switch must be pulled to its up (or out) position if the TB 80 is to be controlled from the platform.
- 2. **EMERGENCY POWER:** If the engine stops and cannot be restarted, hold the switch toward you and a small, battery-powered hydraulic-pump comes on to supply power for the machine. Boom movements will be slow and have long lag times under EMERGENCY POWER.
- 3. **ENGINE THROTTLE:** Leave this switch set on LO unless you want to drive at maximum speed (see DRIVE RANGE below).
- 4. **DRIVE RANGE:** This switch, together with the position of the booms, determines how fast the TB 80 can travel along the ground. See the DRIVE RANGE Table below for settings and maximum speeds.

DRIVE RANGE Table

MAX. SPEED	DRIVE RANGE	boom position
3.0 mph (4.8 km/h)	HI	retracted and below horizontal
0.75 mph (1.2 km/h)	LO	retracted and below horizontal
0.75 mph (1.2 km/h)	--	extended or above horizontal

NOTE: ENGINE THROTTLE, at the platform-control box, must be set to HI for MAX. SPEED.

NOTE: For 4x4 machines see the "4-WHEEL DRIVE (4x4)" section of the "OPTIONS" chapter for additional information.

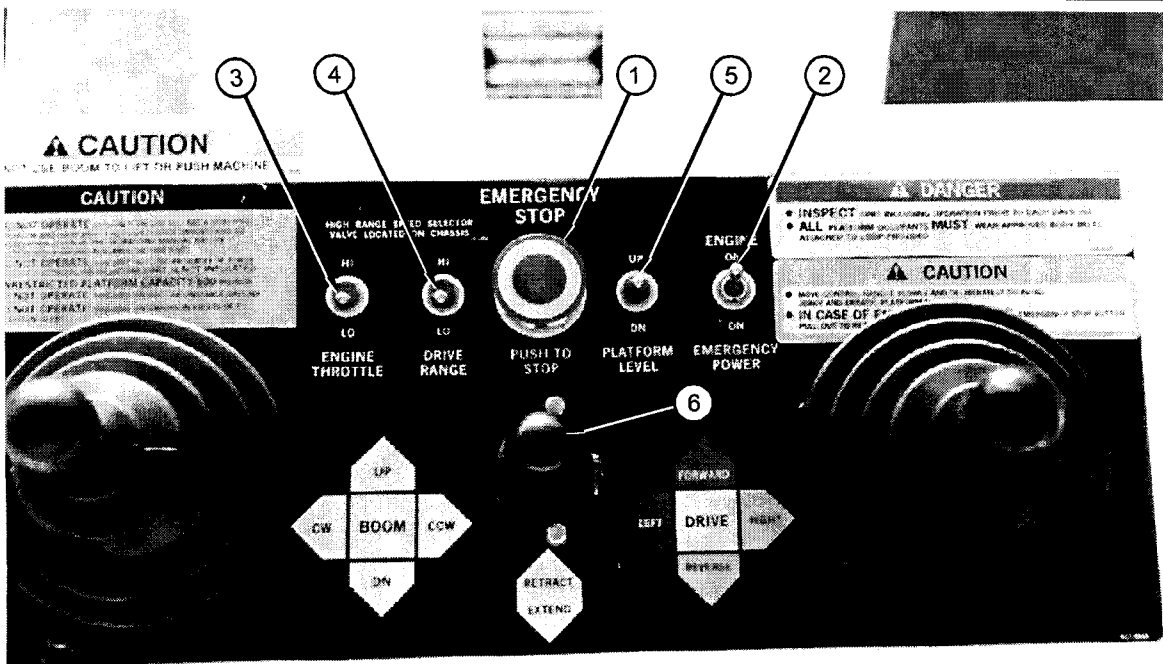
 CAUTION

Prolonged driving in HI (3 mph, 4.8 km/h) heats the hydraulic oil. Periodically check the thermometer at the hydraulic-oil tank sight-glass. Do not let the oil exceed 200°F (93°C). Stop the engine and let the hydraulic oil cool if necessary.

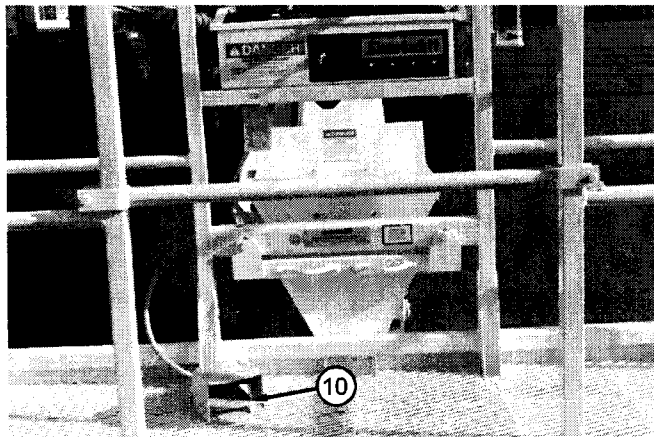
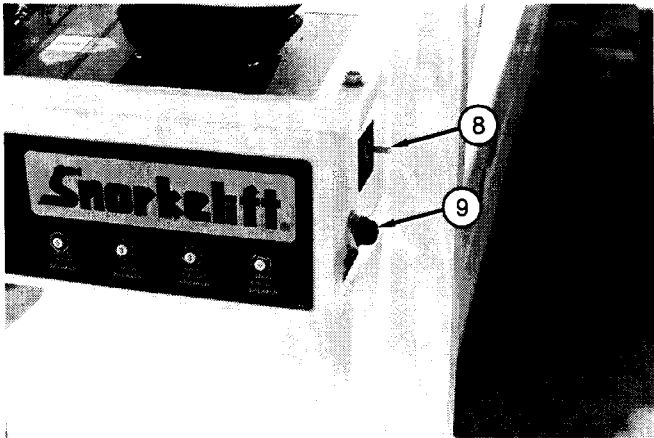
- Switching DRIVE RANGE from LO to HI changes the driving conditions from low speed and high torque to the wheels to high speed and low torque to the wheels.
- 5. **PLATFORM LEVEL:** UP rotates the platform up relative to the end of the tip boom. DN (down) rotates the platform down.
 - 6. **RETRACT/EXTEND:** EXTEND extends the booms. RETRACT retracts the booms. Speed of movement is proportional to how far you push the controller.
 - 7. **ANTI-RESTART MASTER SWITCH:** This switch works like an automobile ignition switch. Hold it at START until the engine starts then release it to ON. If the engine dies in ON, the key must be turned to OFF before it will go back to START. Turn the switch to OFF if the platform is to stay in one position for a long time. This will turn the engine off and save fuel.
 - 8. **PLATFORM ROTATOR:** CW rotates the platform clockwise (as seen from above) relative to the end of the tip boom. CCW rotates the platform counterclockwise.
 - 9. **HORN:** See "SAFETY DEVICES" chapter.
 - 10. **Foot Switch:** You must step down on the foot switch, and hold it down, any time you use any platform control that causes the platform to move. Stepping on the foot switch increases the engine speed and activates other switches/controls in preparation to do work. (The foot switch is to the platform what the GROUND OPERATION switch is to the ground-control panel.)



6. CONTROLS



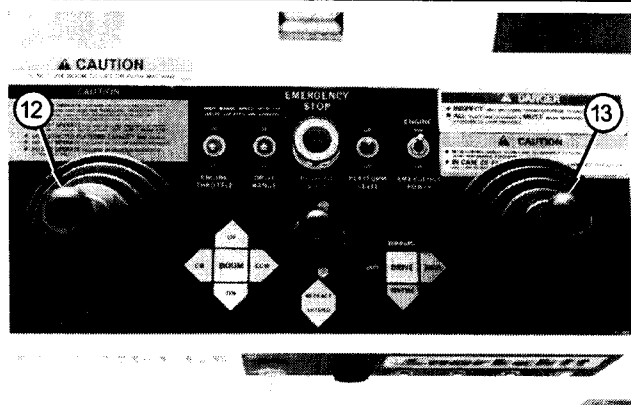
PLATFORM-CONTROL BOX



NOTE: Do not step on the foot switch while you are trying to start the engine.



6. CONTROLS



12. BOOM

UP: Slowly push the BOOM controller forward and the main boom rises. The further forward you push the controller the faster the main boom rises.

DN: Same as UP only the main boom goes down.

NOTE: If the rear axles are **not** extended the main boom will rise only slightly above horizontal and will not extend but a few inches (centimeters).

CW: Slowly push the BOOM controller to the left and the turntable swings clockwise (viewed from above). The further left you push the controller the faster the turntable swings.

CCW: Same as CW only the turntable swings counterclockwise.

13. DRIVE

FORWARD: Slowly push the DRIVE controller forward and the TB 80 moves forward. The further forward you push the controller the faster the TB 80 goes (max. 3 mph, 4.8 km/h).

REVERSE: Same as FORWARD except the TB 80 moves backward.

RIGHT: Push the DRIVE controller to the right and the front wheels turn in the direction for a right-hand turn. The longer you hold the controller to the right the further the wheels turn.

LEFT: Works the same as RIGHT only for a left-hand turn.

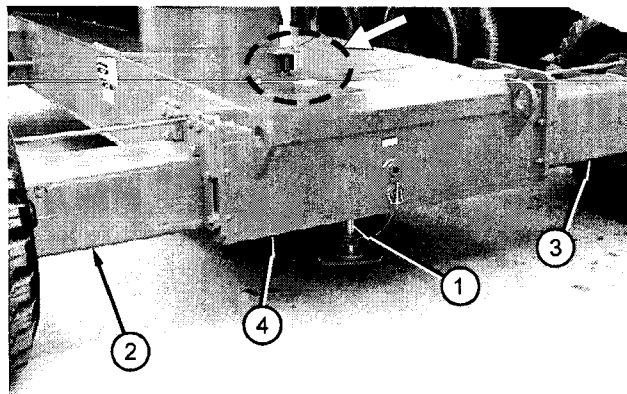
NOTE: The wheels stay the direction you turn them, they do not automatically return to center the way automobile wheels do.

NOTE: There are blue arrows and yellow arrows on top of the chassis. The blue

arrows point to the FORWARD end of the chassis and to the LEFT side of the TB 80. The yellow arrows point to the REVERSE end of the chassis and to the RIGHT side of the TB 80. The **DRIVE** controller is color coded to match the arrows. The color coding is designed to keep you from becoming disoriented when you are aloft and the platform is rotated with respect to the chassis.

■ CHASSIS

AXLES



RAISE: Lowers the jack (1), which raises the chassis (4).

LOWER: Raises the jack (1), which lowers the chassis (4).

EXTEND: Extends both rear axles (2) (3).

RETRACT: Retracts both rear axles (2)(3).

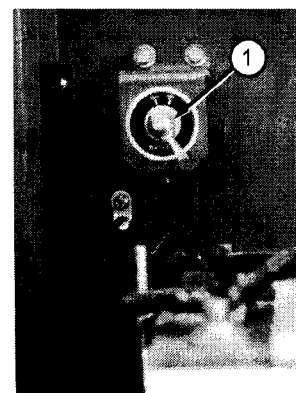
NOTE: The axles extend or retract one at a time, not simultaneously.

For the AXLES controls to work the BOOM/AXLES switch must be set to AXLES and the SELECTOR SWITCH set to GROUND. Also, the main boom must be down and retracted.

■ TURNTABLE

BATTERY:

When the **BATTERY** switch (1) is set to OFF, the batteries are disconnected from the electrical system.





7. OPERATION

Read and understand all the previous chapters in this manual before you begin to operate a TB 80.

Dual-fuel is the only optional equipment discussed in this chapter. For operation of other optional equipment, see the "OPTIONS" chapter.

■ CONTROL STATIONS

A TB 80 can be operated from the ground-control panel or from the platform-control box. There are basically two differences between ground-control and platform-control operations, both are safety related:

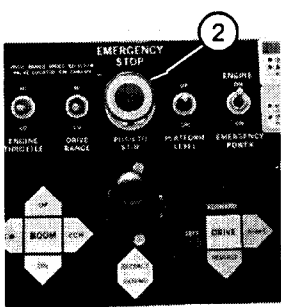
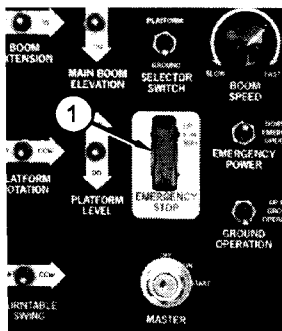
1. The ground-control panel can override the platform-control box at any time. If a person operating the machine from the platform becomes incapacitated, a person on the ground can always take over machine control.

DANGER

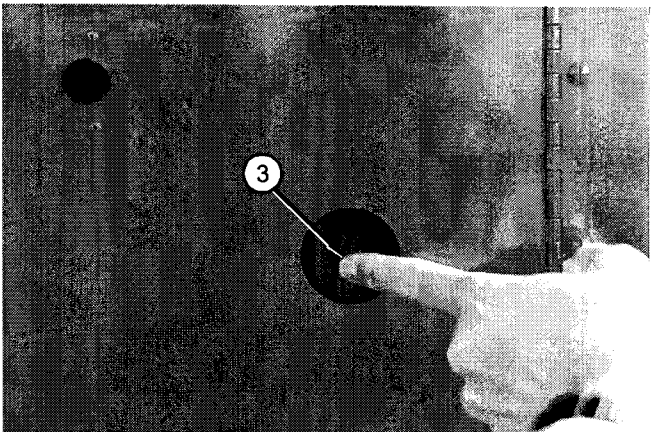
Do not attempt to operate the TB 80 ground controls when the platform, booms, or any other conducting part of an TB 80 is in contact with energized electrical wires or if there is an immediate danger of such contact.

2. The TB 80 can only be driven from the platform-control box. The wheels cannot be made to move from the ground-control panel. This prevents ground-control operators from running over themselves.

■ EMERGENCY STOPPING



To stop a TB 80, push either of the two **EMERGENCY STOP** switches (1) (2). (For a complete discussion of the EMERGENCY STOP switches, see the "CONTROLS" chapter.)



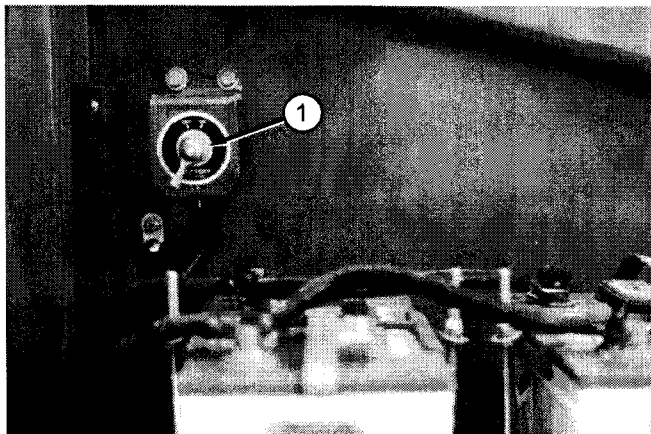
The **EMERGENCY STOP** switch (3), at the ground-control panel, can be used with the door closed.

■ STARTING FROM THE GROUND-CONTROL PANEL

Before you begin to operate the TB 80 a qualified operator must perform the "DAILY INSPECTION & MAINTENANCE" described in the chapter by that name in this manual.

□ Pre-start Conditions

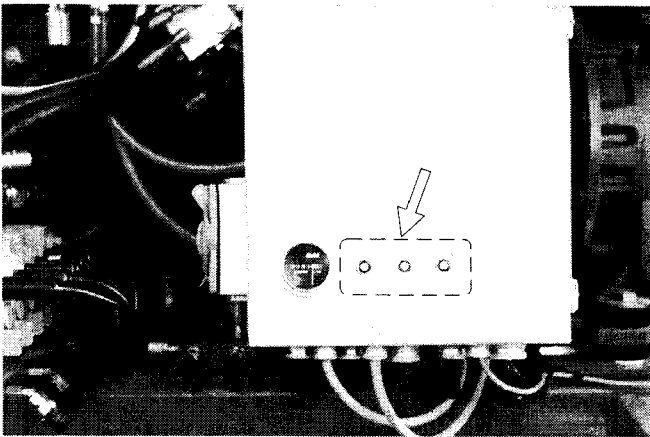
After the DAILY INSPECTION & MAINTENANCE has been performed, put the TB 80 into its pre-start conditions. Pre-start conditions for starting from the ground-control panel are:



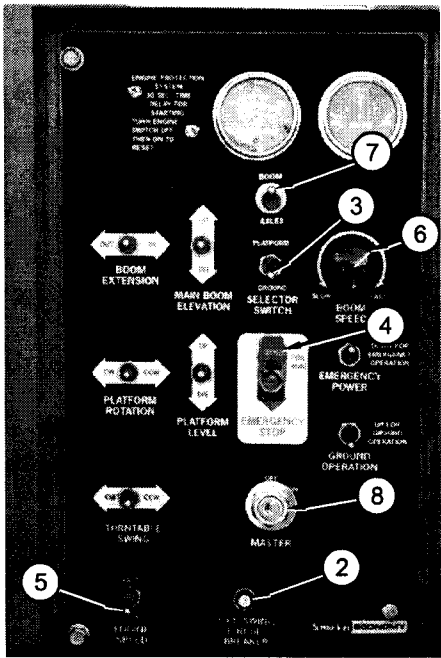
1. Set the **BATTERY** switch (1) to ON then close the battery-compartment door.



7. OPERATION



2. Check the circuit breakers on the junction wiring box to see that none has popped out.



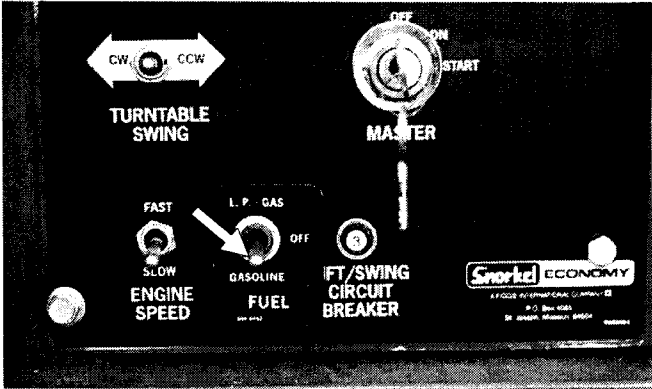
3. Check the circuit breaker (2) to see that it has not popped out.

NOTE: You do not need to check the circuit breakers on the platform-control box.

- 4. Set **SELECTOR SWITCH** (3) to GROUND.
- 5. Set **EMERGENCY STOP** (4) to UP FOR RUN (up).

NOTE: If the engine start-up alarm sounds, turn the **MASTER** switch (8) to OFF.

- 6. Set **ENGINE SPEED** (5) to SLOW.
- 7. Set **BOOM SPEED** (6) as shown.
- 8. Set **BOOM/AXLES** switch (7) to BOOM.

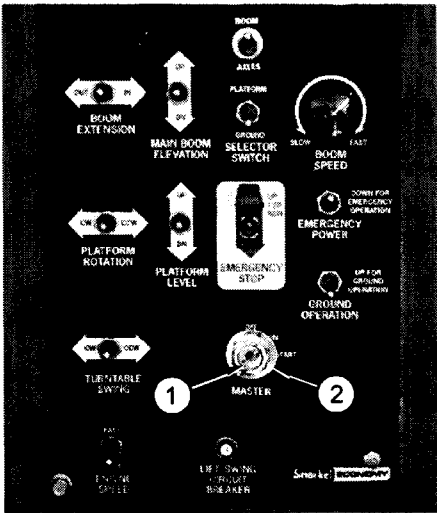


9. (OPTION - DUAL FUEL) For machines set up to run both gasoline and LP gas: Set the **FUEL** switch to GASOLINE or L.P.-GAS depending on which you want to use. If you select L.P.-GAS, open the valve on top the LP gas tank.

☐ **Starting (from the ground)**

Do not attempt to start a TB 80 until the actions in the previous part of this section ("STARTING FROM THE GROUND-CONTROL PANEL") have been completed.

NOTE: You cannot extend the main boom nor raise it much above horizontal unless the rear axles are extended and locked. If you want to move the platform, from the ground-control panel, go to the "EXTEND & LOCK REAR AXLES" section of this chapter.



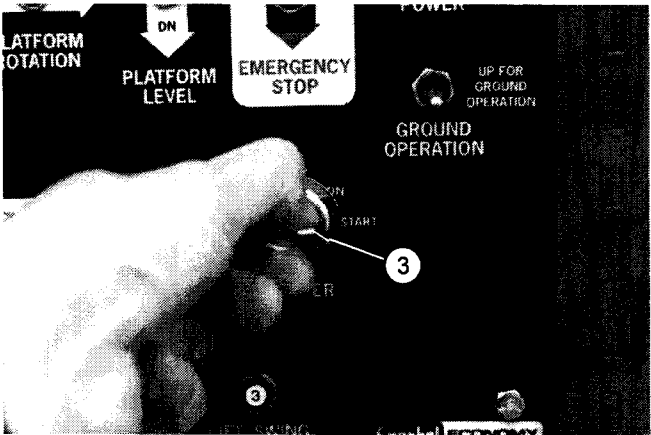
- 1. Insert the key (1) into the **MASTER** switch (2).
- 2. Turn the key (1) to ON and pause there a few seconds while an alarm sounds to alert others that the TB 80 is about to start.

NOTE: If you pause 30 seconds or more an automatic protection feature will prevent the TB 80 from starting. If that happens, turn the key to OFF and try again.



CAUTION

If the engine fails to start (at the next step) in 20 seconds, turn the key to OFF and wait 60 seconds before turning the key to START again.



3. Turn the key (3) to START and hold it there until the engine starts (or for a maximum of 20 seconds) then release the key to ON.

The engine should now be running.

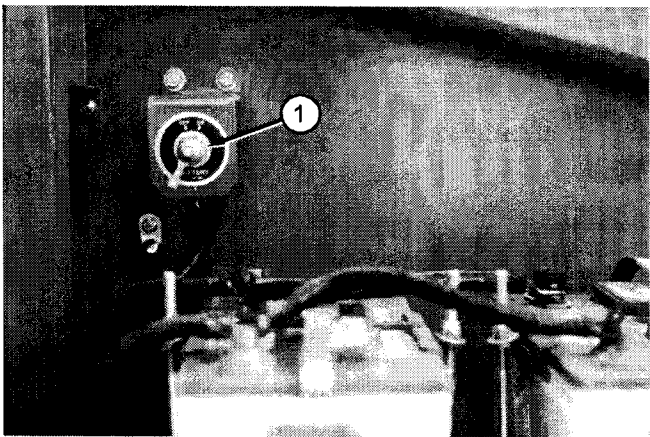
STARTING FROM THE PLATFORM-CONTROL BOX

Before you begin to operate the TB 80, a qualified operator must perform the "DAILY INSPECTION & MAINTENANCE" described in the chapter by that name in this manual.

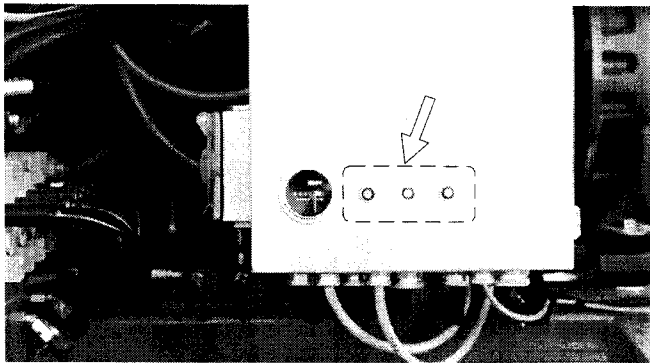
To drive the TB 80 with the main boom down and retracted, you do not need to extend the rear axles. Therefore, you should go on to "Pre-Start Conditions" immediately below. If you want to start the TB 80 from the platform-control box then extend or raise the main boom, you first need to extend and lock the rear axles for stability. Therefore, you should go to the "EXTEND & LOCK REAR AXLES" section in this chapter.

Pre-start Conditions

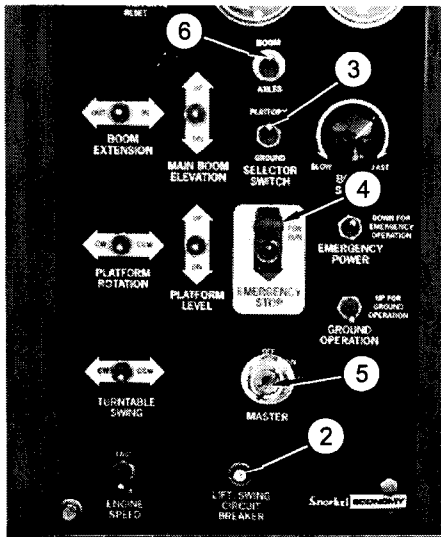
After the DAILY INSPECTION & MAINTENANCE has been performed, put the TB 80 into its pre-start conditions. Pre-start conditions for starting from the platform-control box are:



1. Set the **BATTERY** switch (1) to ON then close the battery-compartment door.



2. Check the circuit breakers on the junction wiring box to see that none has popped out.



3. Check the circuit breaker (2) to see that it has not popped out.

4. At the ground-control panel, set the **SELECTOR SWITCH** (3) to PLATFORM.

NOTE: This last step is often overlooked. Set the **SELECTOR SWITCH** to PLATFORM.



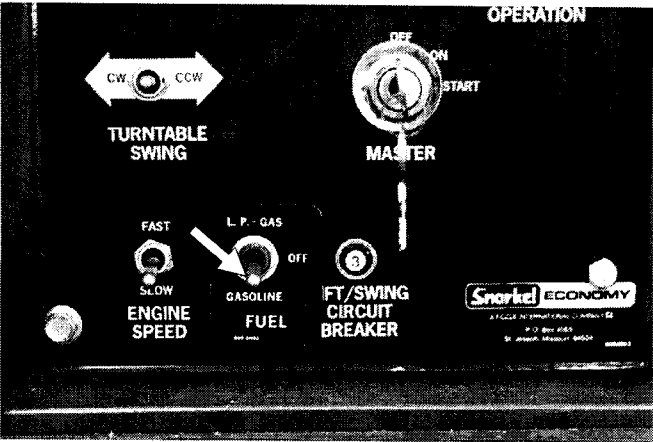
7. OPERATION

5. At the ground-control panel, set the **EMERGENCY STOP** switch (4) UP FOR RUN (up).

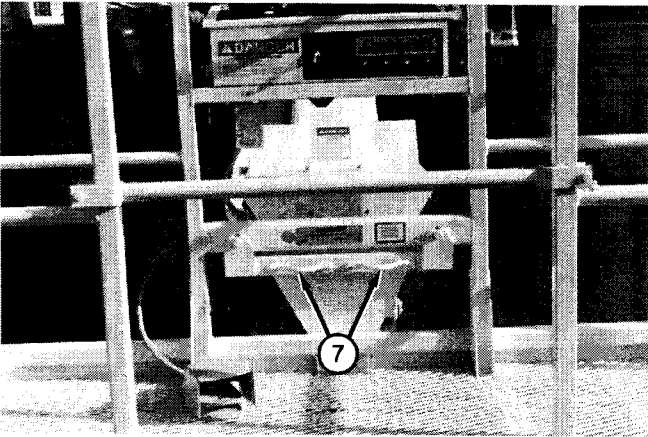
6. At the ground-control panel, insert the key into the **MASTER** switch (5) and turn it to ON.

NOTE: Because you set the **SELECTOR SWITCH** to PLATFORM, no alarm will sound when you set the **MASTER** switch to ON (unless the platform **EMERGENCY STOP** switch and **ANTI-RESTART MASTER SWITCH** are both ON).

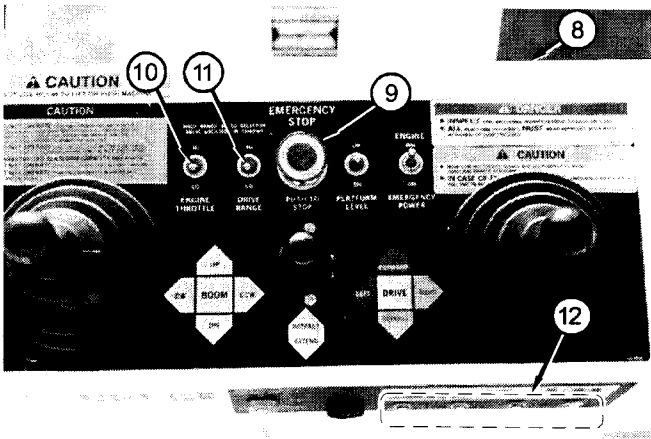
7. Set the **BOOM/AXLES** switch (6) to BOOM then close the ground-control door.



8. (OPTION - DUAL FUEL) For machines set up to run both gasoline and LP gas: Set the **FUEL** switch to GASOLINE or L.P.-GAS depending on which you want to use. If you select L.P.-GAS, open the valve on top the LP gas tank.



9. Put on your fall restraint, enter the platform, close the gate, and connect the lanyard of your fall restraint to an anchor point (7).



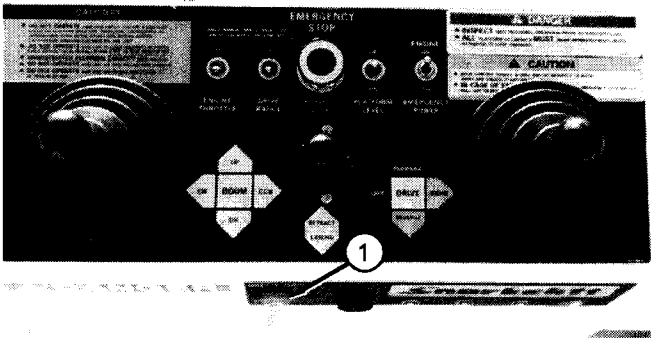
10. At the platform-control box (8) set the following:
EMERGENCY STOP (9).....pulled up
ENGINE THROTTLE (10).....LO
DRIVE RANGE (11).....LO

NOTE: With these settings the maximum ground speed is 0.75 mph (1.2 km/h). If you want to go faster, see the "PLATFORM-CONTROL BOX" section in the "CONTROLS" chapter. Pay particular attention to the DRIVE RANGE Table in that section.

11. Check the platform-control box circuit breakers (12) to see that none has popped out.

☐ **Starting (from the platform)**

Do not attempt to start a TB 80 until the actions in the previous part of this section (STARTING FROM THE PLATFORM CONTROL BOX) have been completed.



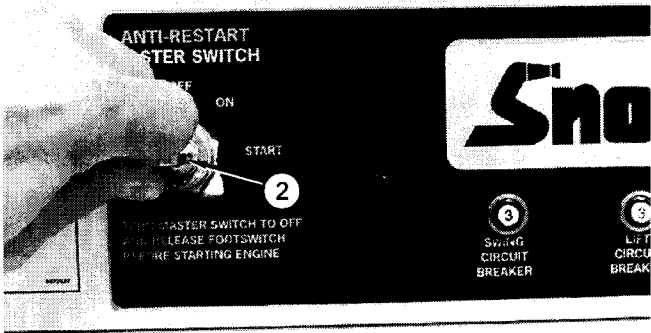
1. Turn the **ANTI-RESTART MASTER SWITCH** (1) to ON and pause there a few seconds while an alarm sounds to alert others that the TB 80 is about to start.

NOTE: If you pause 30 seconds or more an automatic protection feature will prevent the TB 80 from starting. If that happens, turn the **ANTI-RESTART MASTER SWITCH** to OFF and try again.



! CAUTION

If the engine fails to start (at the next step) in 20 seconds, turn the **ANTI-RESTART MASTER SWITCH** to OFF and wait 60 seconds before turning the switch to START again.



2. Turn the **ANTI-RESTART MASTER SWITCH** (2) to START and hold it there until the engine starts (or for a maximum of 20 seconds) then release the switch to ON.

NOTE: Do not step on the foot switch while you are trying to start the engine.

The engine should now be running.

■ MOVING THE PLATFORM

The engine should already be running (as described earlier in this chapter) before you start this section.

Before you can raise or extend the main boom the rear axles must be extended and locked (see "EXTEND & LOCK REAR AXLES" in this chapter).

! DANGER

Be certain that the space into which you are about to move the platform, boom, turntable, and chassis is free of obstructions. Always look in the direction of movement.

Do not operate near energized electrical conductors. See the inside-front cover of this manual for the minimum safe approach distance to energized power lines.

! DANGER

If you operate from the platform-control box, be sure that the lanyard of your fall restraint or harness is attached to an anchor point on the platform mount. Also, be sure the gate is closed behind you.

! DANGER

Serious injury can result from sudden stops. To avoid sudden stops, do not remove your foot from the foot switch while the TB 80 is in motion.

Each of the ways the platform can move is shown in the following two-page spread. The photos show the switches to push to move the platform. The switch call-out numbers (on the left-hand page) correspond to the illustration numbers on the right-hand page.

NOTE: At the end of each work day the TB 80 should be returned to the **STOWED POSITION** as described under **STOWING** in the "STOWING & TRANSPORTING" chapter.

! DANGER

Death or serious injury can result if a TB 80 tips over. A TB 80 might tip over if the rear axles are retracted while the booms are up or extended. The TB 80 should have its booms completely retracted and completely down before retracting the rear axles.

NOTE: The correct procedure for retracting the rear axles is shown at the end of this chapter under "RETRACT & LOCK REAR AXLES."

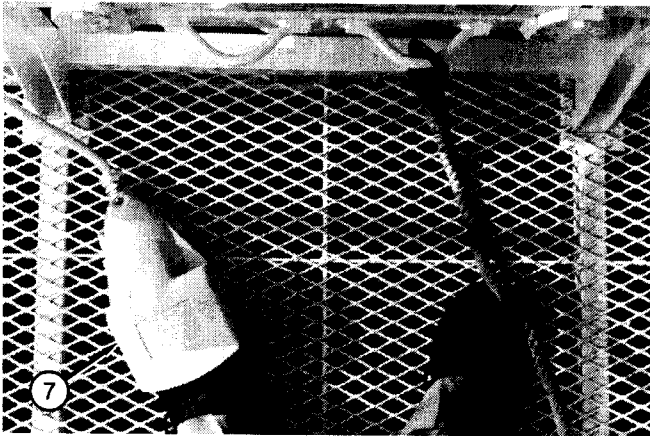


7. OPERATION

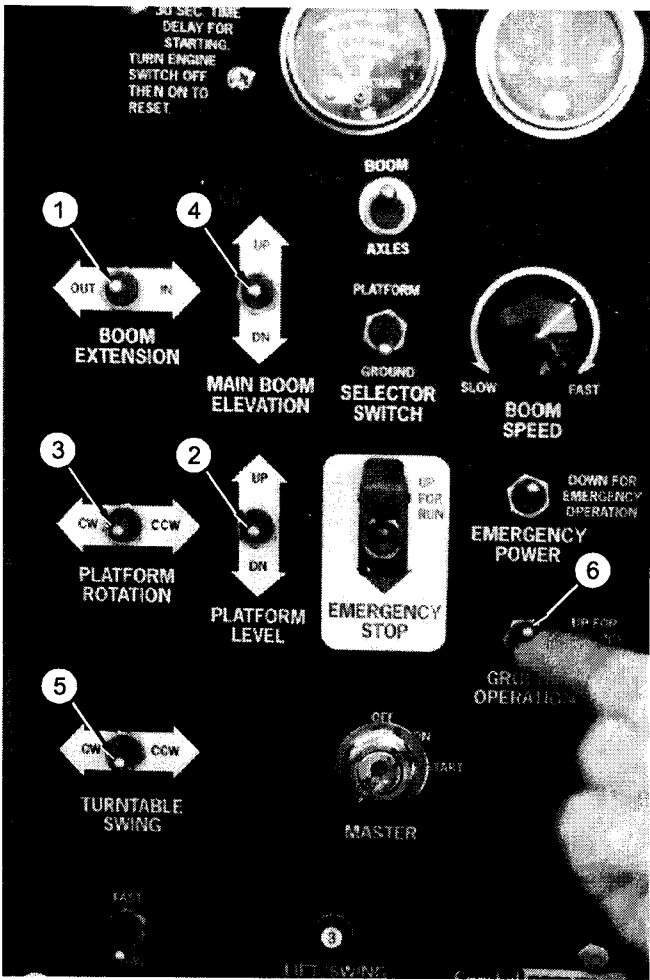
IMPORTANT (ground-control panel operation): You must hold the **GROUND OPERATION** switch (6) up when you use any of the platform-moving switches (1 through 5) to move the platform. This is a safety feature to prevent the platform from moving if a platform-moving switch is accidentally pushed.

IMPORTANT (platform-control box operation): You must be stepping on the foot switch (7) when you use any of the platform-moving switches (1 through 3) to move the platform. Also, you must be stepping on the foot switch to use either the **BOOM** controller or the **DRIVE** controller. The foot switch is a safety feature to prevent the platform from moving if a platform-moving switch or controller is accidentally pushed.

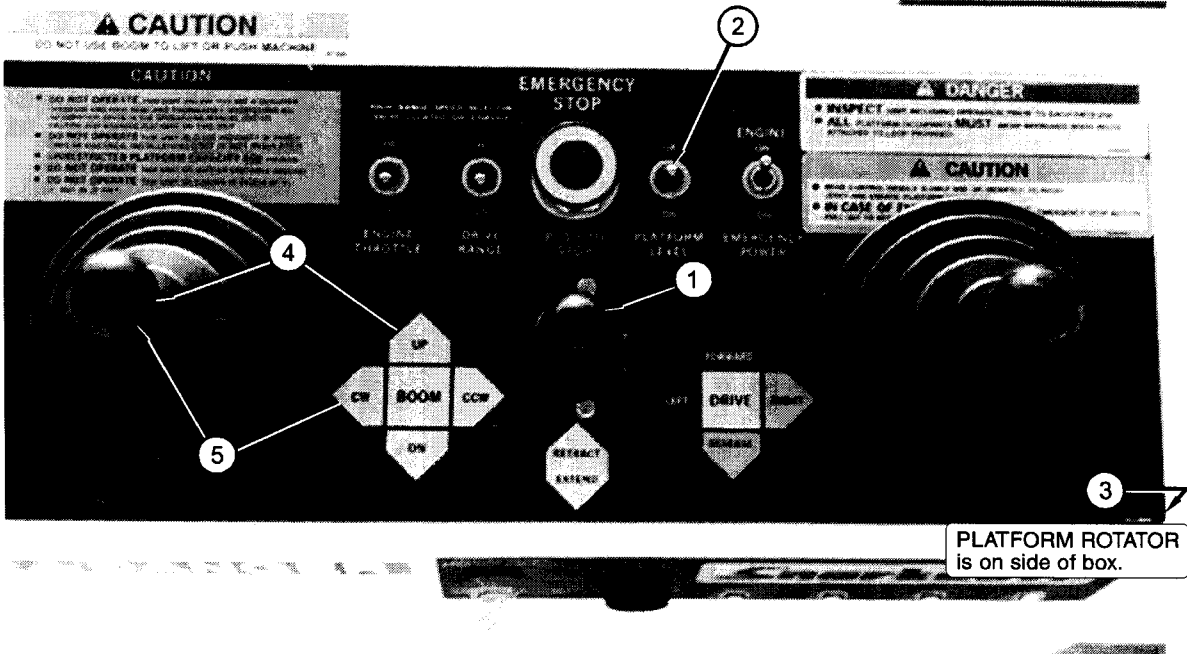
FOOT SWITCH



GROUND-CONTROL PANEL

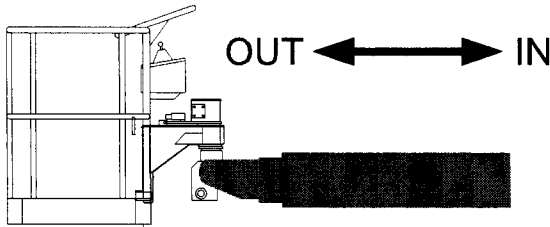


PLATFORM-CONTROL BOX

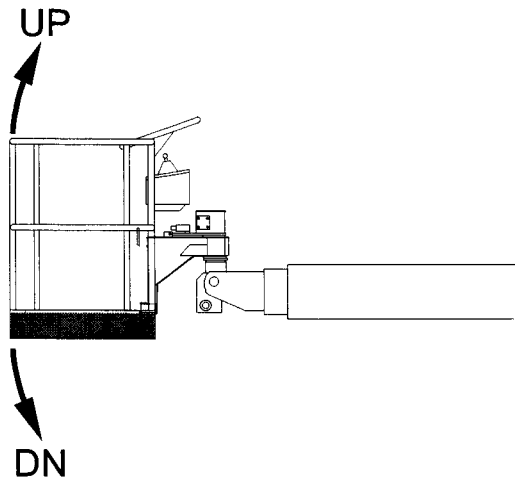




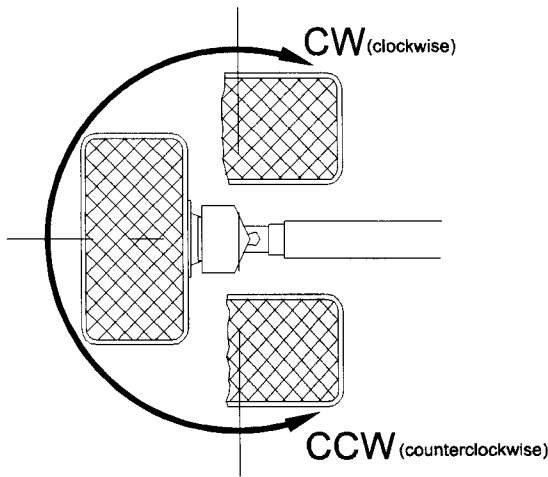
① BOOM EXTENSION
(EXTEND/RETRACT)



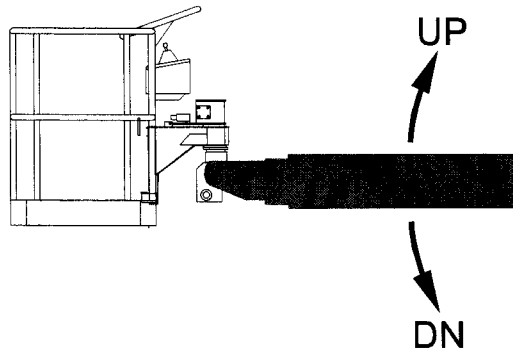
② PLATFORM LEVEL



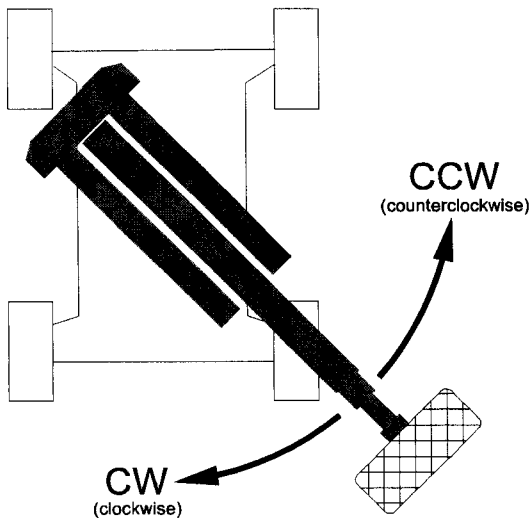
③ PLATFORM ROTATION
(PLATFORM ROTATE)



④ MAIN BOOM ELEVATION
(BOOM)



⑤ TURNTABLE SWING
(BOOM)





7. OPERATION

■ MOVING THE TB 80

The TB 80 chassis can only be moved from the platform-control box. You cannot move the chassis from the ground-control panel.



There is a blue arrow on the FORWARD end of the chassis and a yellow arrow on the REVERSE end of the chassis. Pushing the **DRIVE** controller to **DRIVE FORWARD** causes the chassis to move in the direction of the blue arrow on the end of the chassis. Pushing the **DRIVE** controller to **DRIVE REVERSE** causes the chassis to move in the direction of the yellow arrow on the opposite end of the chassis.

NOTE: You must be stepping on the foot switch for the **DRIVE** controller to work.

■ STEERING

The TB 80 can only be steered from the platform-control box. You cannot steer the TB 80 from the ground-control panel.



There are two blue arrows on the LEFT side of the chassis and two yellow arrows on the RIGHT side of the chassis. Pushing the **DRIVE** controller to **DRIVE LEFT** causes the front wheels to turn for a left turn. Pushing the

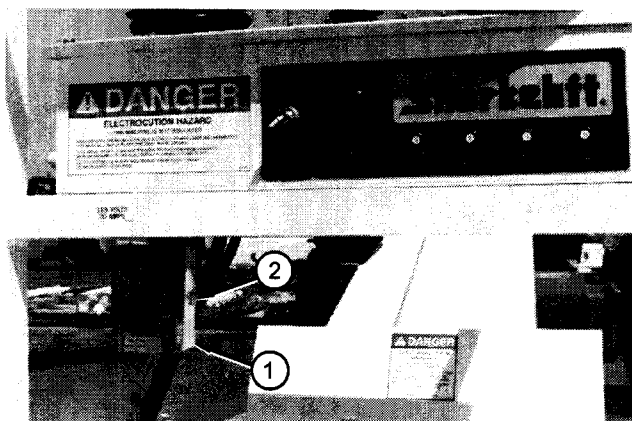
DRIVE controller to **DRIVE RIGHT** causes the front wheels to turn for a right turn.

NOTE: You must be stepping on the foot switch while you use the **DRIVE** controller.

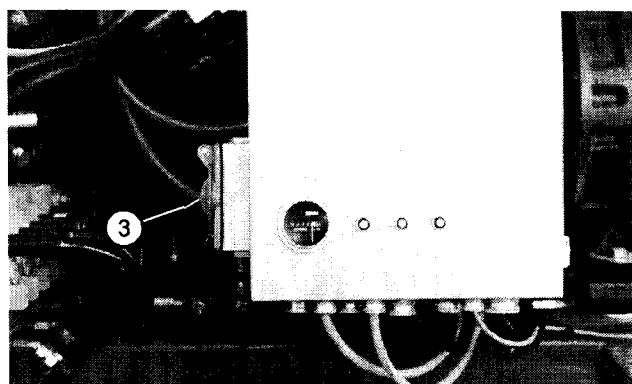
NOTE: You cannot steer the wheels while the brakes are set. This prevents high stresses from building up in the tires and steering mechanism. To release the brakes the **DRIVE** controller must be in a "drive position" -- not in its center, off, position.

NOTE: When you release the **DRIVE** controller the wheels stay where you set them. The wheels do not return to the "straight ahead" position the way automobile wheels do.

■ 125 V AC OUTLET (GFCI)



The electrical box (1) has two 3-prong, 125 V ac electrical connectors. Their combined output is limited by a slow-blow circuit breaker (2).



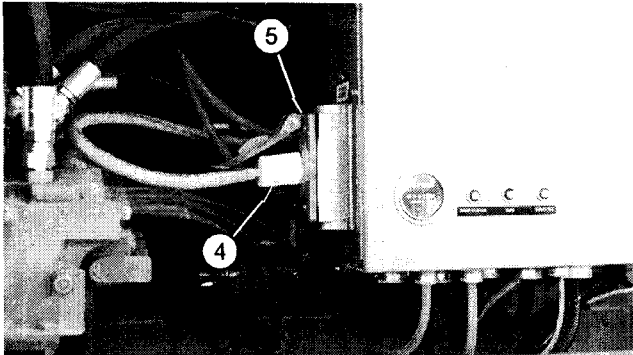
The power-input connector (3) for the electrical box (1) is on the side of the junction wiring box. Plug a source of power into the power-input connector (3) if you intend to use the electrical box (1) to power equipment.



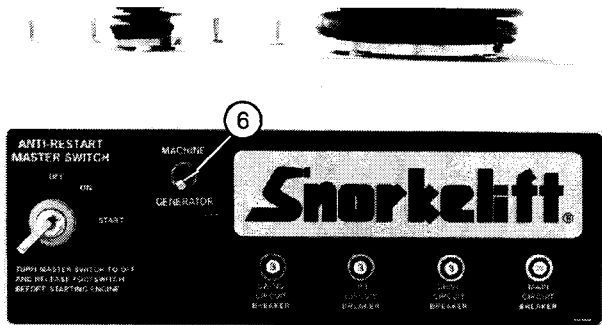
7. OPERATION

CAUTION

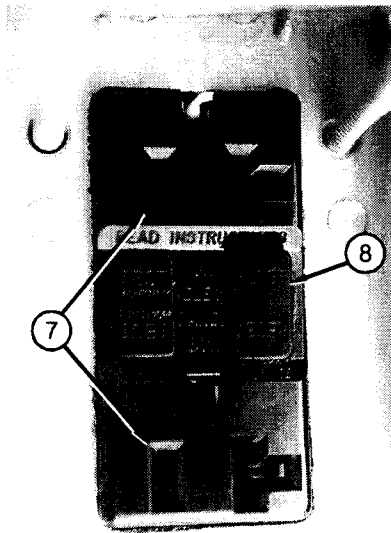
Unplug the source of power before you move the TB 80.



NOTE: If the TB 80 has the optional ac generator, plug the generator output (4) into the power-input connector (5).



Then, set the **MACHINE/GENERATOR** switch (6) to **GENERATOR**.



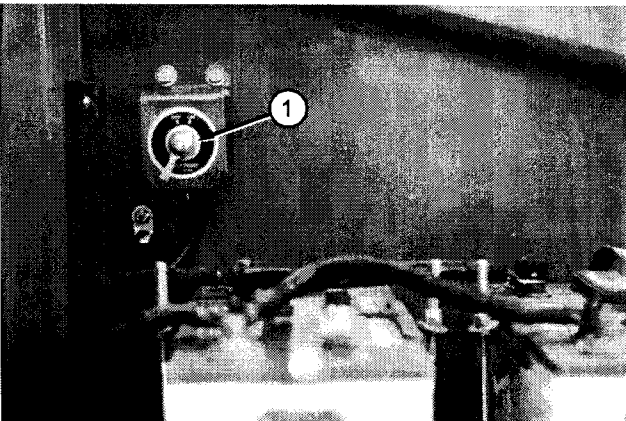
The GFCI, built into the outlets (7), protects against electrical current to ground. When there is current to ground the GFCI shuts off power to the electrical outlets (7).

If the GFCI trips, disconnect whatever is plugged into the outlets (7), wait one minute, then press the **RESET** button (8) back in. If the circuit breaker trips a second time, disconnect the source of power (or set the **MACHINE/GENERATOR** switch (6) to **MACHINE**, if equipped with an ac generator) and refer the problem to a qualified service technician.

■ EXTEND & LOCK REAR AXLES

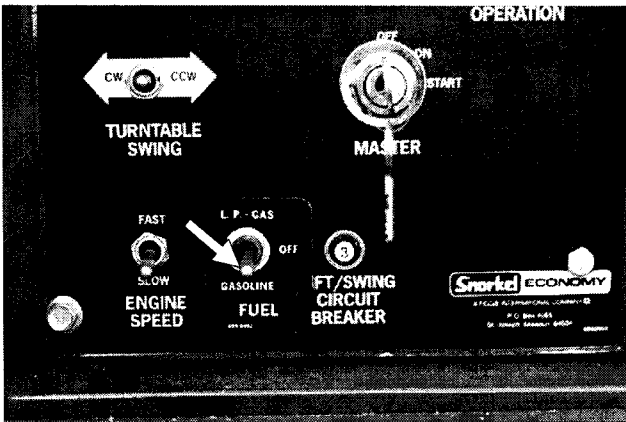
Before the main boom can be extended or raised much above horizontal, the rear axles of the TB 80 must be extended and locked. This section explains the procedure for extending and locking the rear axles.

● Inside the turntable:



1. Set **BATTERY** (1) to **ON** then close the battery-compartment door.

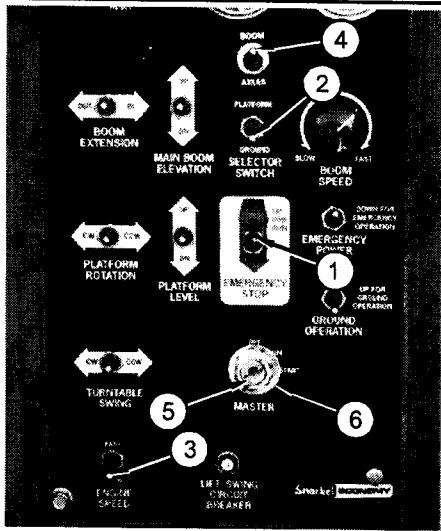
● At the ground-control panel:



(OPTION - DUAL FUEL) For machines set up to run both gasoline and LP gas: Set the **FUEL** switch to **GASOLINE** or **L.P.-GAS** depending on which you want to use. If you select **L.P.-GAS**, open the valve on top the LP gas tank.



7. OPERATION

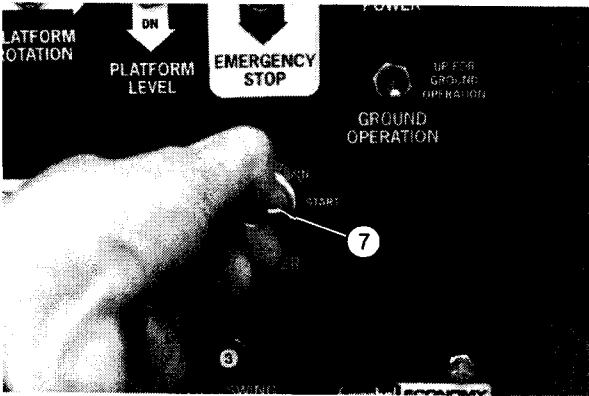


- 1. Set **EMERGENCY STOP** (1) to UP FOR RUN.
- 2. Set **SELECTOR SWITCH** (2) to GROUND.
- 3. Set **ENGINE SPEED** (3) to SLOW.
- 4. Set **BOOM/AXLES** switch (4) to BOOM.
- 5. Insert the key (5) into the **MASTER** switch (6).
- 6. Turn the key (5) to ON and pause there a few seconds while an alarm sounds to alert others that the TB 80 is about to start.

NOTE: If you pause 30 seconds or more an automatic protection feature will prevent the TB 80 from starting. If that happens, turn the key (5) to OFF and try again.

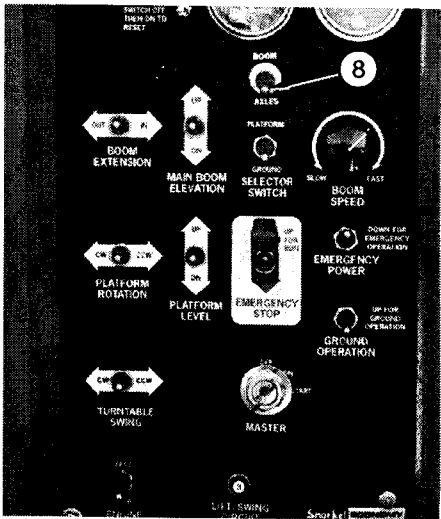
!CAUTION

If the engine fails to start (at the next step) in 20 seconds, turn the key (7) to OFF and wait 60 seconds before turning the key (7) to START again.



- 7. Turn the key (7) to **START** and hold it there until the engine starts (or for a maximum of 20 seconds) then release the key to ON.

The engine should now be running.



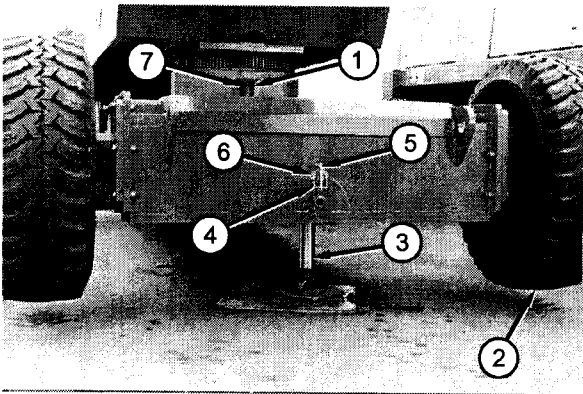
- 8. Set **BOOM/AXLES** switch (8) to AXLES.

NOTE: The engine rpm should automatically increase when you switch to AXLES.

● At the **AXLES** controls:

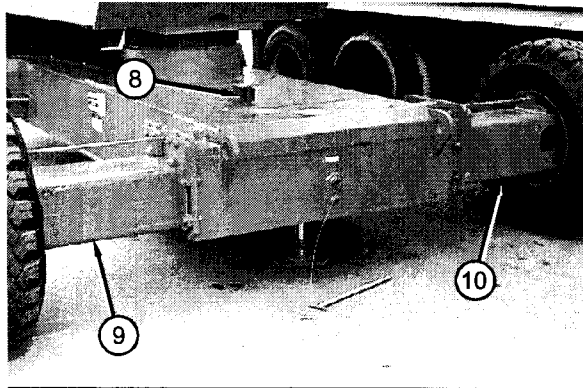
!CAUTION

Rear axle weight is about to be lifted by the jack (3). Check to be sure the area under the jack shoe plate will support that weight and that the area is clear of objects that might be crushed.



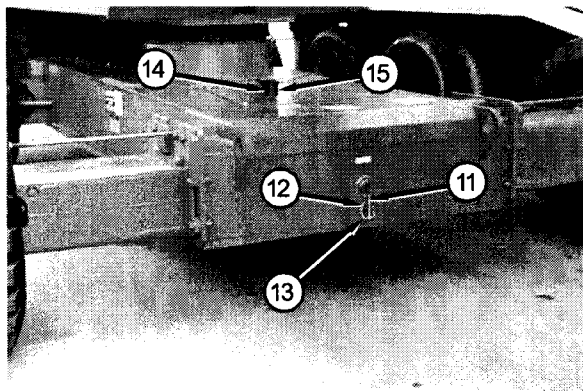
- 1. Push and hold the jack control lever (1) to **RAISE** until the rear wheels (2 typ.) are off the ground and the jack (3) has stopped lifting the chassis.
- 2. Remove the snapper pin (4) from the pin lock (5) then remove the pin lock (5) from the upper hole (6) in the chassis.

NOTE: You might have to cycle the axle control lever (7) back and forth, to relieve pressure on the pin lock (5), while you twist and pull the pin lock (5) out of the chassis.



3. Push and hold the axle control lever (8) to **EXTEND** until the axles (9) (10) stop extending.

NOTE: One axle will extend before the other, they do not extend together.

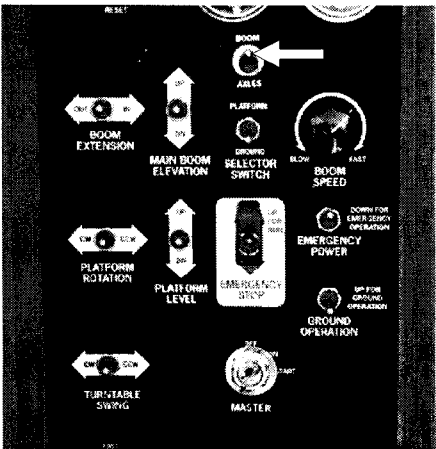


4. Completely insert the pin lock (11) into the lower hole (12) in the chassis and install the snapper pin (13) through the pin lock (11) and the hole lip.

NOTE: You might have to cycle the axle control lever (14) back and forth, to align holes inside the chassis, while you push the pin lock (11) into the chassis.

5. Pull and hold the jack control lever (15) to **LOWER** until the wheels are on the ground and the jack stops retracting.

● At the ground-control panel:



1. Set the **BOOM/AXLES** switch to **BOOM**.

● What next:

1. If you want to control the platform from the ground-control panel, go to the "MOVING THE PLATFORM" section of this chapter.
2. If you want to control the platform from the platform-control box, go to the "Pre-Start Conditions" in the "STARTING FROM THE PLATFORM CONTROL BOX" section of this chapter.

■ **RETRACT & LOCK REAR AXLES**

Retracting the rear axles is basically the reverse of extending them.

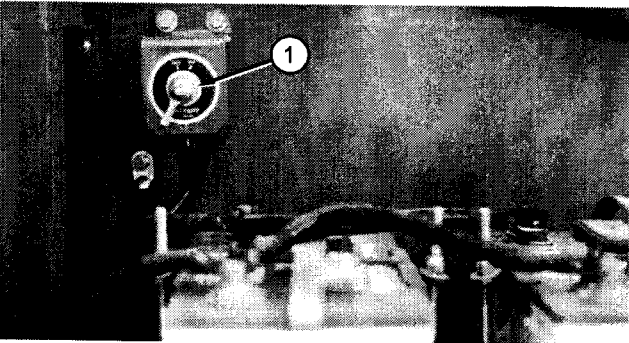
DANGER

Death of serious injury can result if a TB 80 tips over. A TB 80 might tip over if the rear axles are retracted while the booms are up or extended. The TB 80 should have its booms completely retracted and completely down before retracting the rear axles.



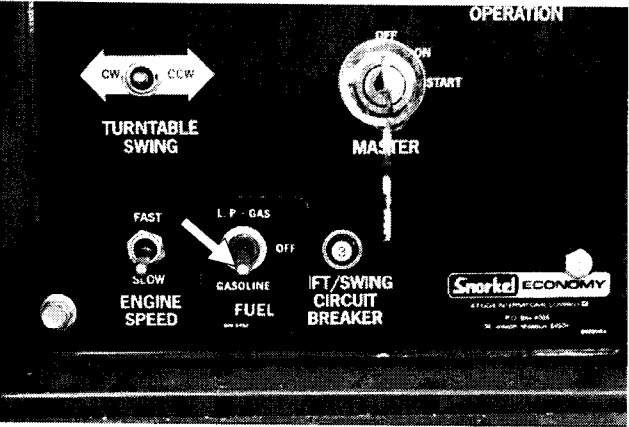
7. OPERATION

● Inside the turntable:

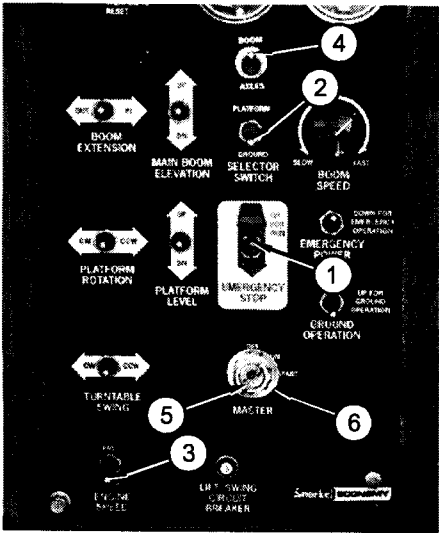


1. Set **BATTERY** (1) to ON then close the battery-compartment door.

● At the ground-control panel:



(OPTION - DUAL FUEL) For machines set up to run both gasoline and LP gas: Set the **FUEL** switch to GASOLINE or L.P.-GAS depending on which you want to use. If you select L.P.-GAS, open the valve on top the LP gas tank.



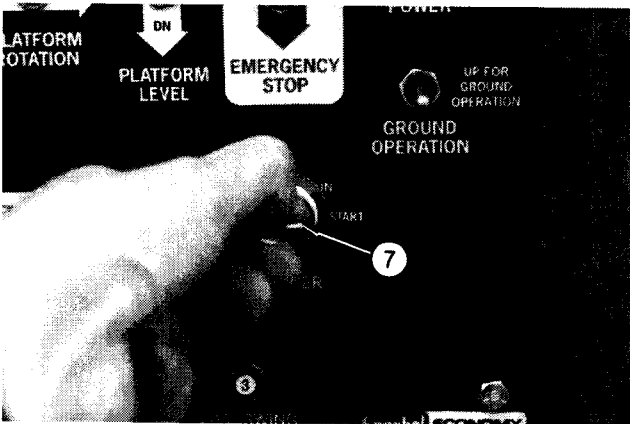
- 1. Set **EMERGENCY STOP** (1) to UP FOR RUN.
- 2. Set **SELECTOR SWITCH** (2) to GROUND.
- 3. Set **ENGINE SPEED** (3) to SLOW.

- 4. Set **BOOM/AXLES** switch (4) to BOOM.
- 5. Insert the key (5) into the **MASTER** switch (6).
- 6. Turn the key (5) to ON and pause there a few seconds while an alarm sounds to alert others that the TB 80 is about to start.

NOTE: If you pause 30 seconds or more an automatic protection feature will prevent the TB 80 from starting. If that happens, turn the key to OFF and try again.

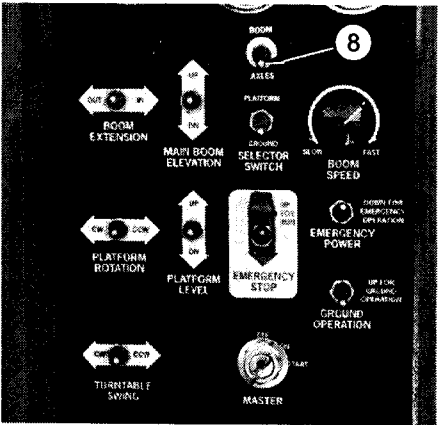
CAUTION

If the engine fails to start (at the next step) in 20 seconds, turn the key to OFF and wait 60 seconds before turning the key to START again.



7. Turn the key (7) to START and hold it there until the engine starts (or for a maximum of 20 seconds) then release the key to ON.

The engine should now be running.



- 8. Set **BOOM/AXLES** switch (8) to AXLES.

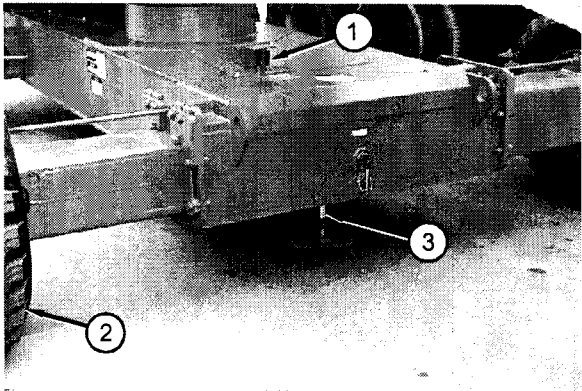
NOTE: The engine rpm should automatically increase when you switch to AXLES.



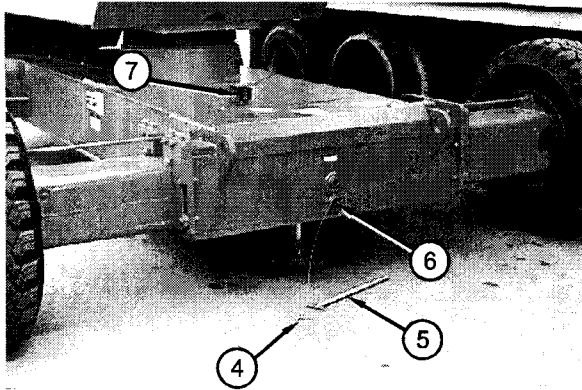
● At the AXLES controls:

CAUTION

Rear axle weight is about to be lifted by the jack. Check to be sure the area under the jack shoe plate will support that weight and that the area is clear of objects that might be crushed.

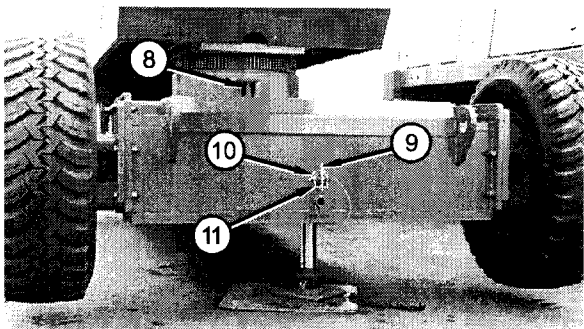


1. Push and hold the jack control lever (1) to RAISE until the rear wheels (2 typ.) are off the ground and the jack (3) has stopped lifting the chassis.



2. Remove the snapper pin (4) from the pin lock (5) then remove the pin lock (5) from the lower hole in the chassis (6).

NOTE: You might have to cycle the axle control lever (7) back and forth a few times, to relieve pressure on the pin lock (5), while you pull the pin lock (5) out of the chassis.

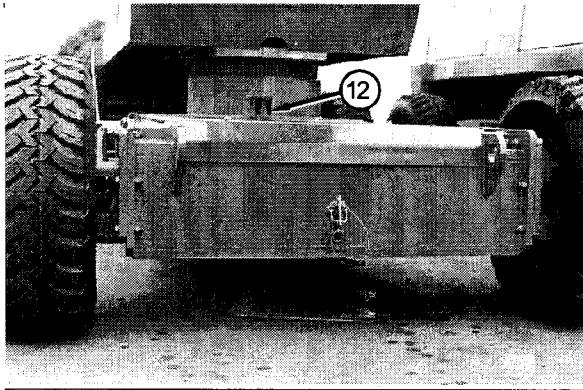


3. Push and hold the axle control lever (8) to RETRACT until the axles stop retracting.

NOTE: One axle will retract before the other, they do not retract together.

4. Completely insert the pin lock (9) into the upper hole (10) in the chassis and install the snapper pin (11) through the pin lock (9) and the hole in the lip.

NOTE: You might have to cycle the axle control lever (8) back and forth a few times, to align holes inside the chassis, while you push the pin lock (9) into the chassis.

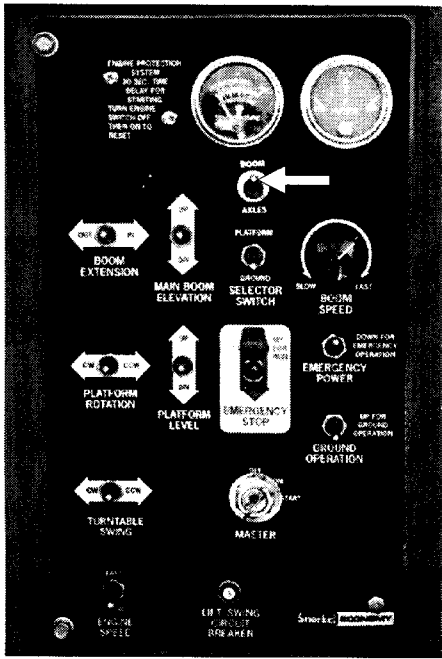


5. Pull and hold the jack control lever (12) to LOWER until the wheels are on the ground and the jack stops retracting.



7. OPERATION

● At the ground-control panel:



1. Set the **BOOM/AXLES** switch to **BOOM**.

● What next:

At this point you will probably want to do one of the following two things.

1. Turn the TB 80 off by pushing the **EMERGENCY STOP** button in and turning the **MASTER** switch to OFF.
2. Or you might want to drive the TB 80 as described under "MOVING THE TB 80" earlier in this chapter.

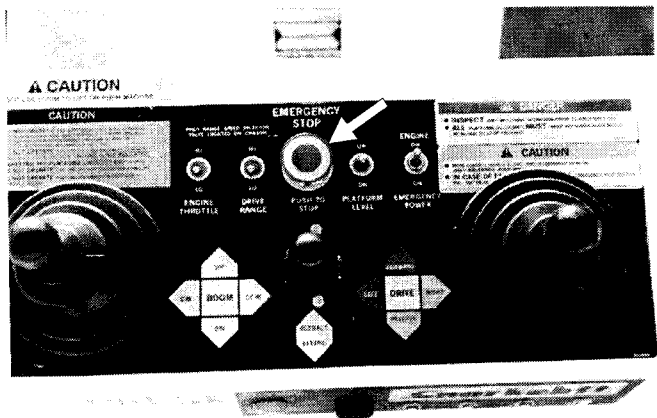


8. EMERGENCY OPERATION

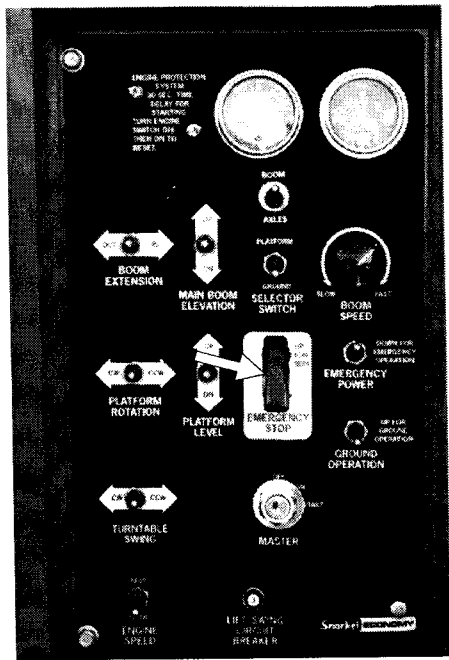
There are three forms of emergency operation for the TB 80: emergency stop, emergency power, and emergency bleed-down. Each is covered as a separate section below.

■ EMERGENCY STOP

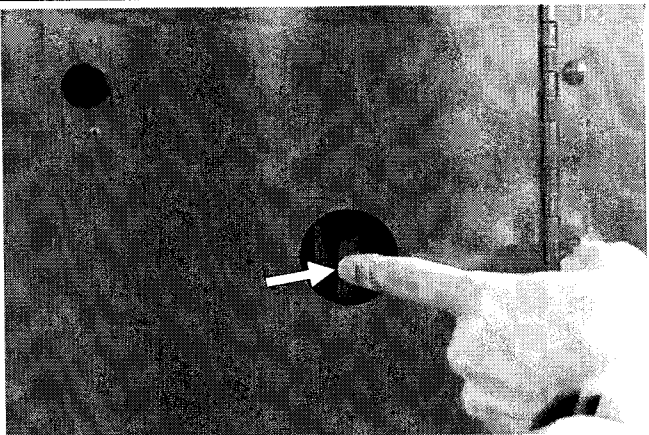
There are two **EMERGENCY STOP** switches on the TB 80.



One is located on the platform-control box.



One is located on the ground-control panel.



The **EMERGENCY STOP** switch on the ground-control panel can be used with the door open or with the door closed as shown here.

Push either **EMERGENCY STOP** switch down, at any time, and the entire machine stops, the engine turns off, the brakes set, and nothing moves.

Functionally, the **EMERGENCY STOP** switches do the same thing as turning the **MASTER** switch or the **ANTI-RESTART MASTER SWITCH** to OFF. The **EMERGENCY STOP** switches are designed to be easier to find and faster to use than key switches.

To reset the **EMERGENCY STOP** switches, pull or push them up. The TB 80 engine can then be restarted in the normal way.

■ EMERGENCY POWER

Use **EMERGENCY POWER** when the platform must be lowered or retracted but the TB 80 engine will not start.

! CAUTION

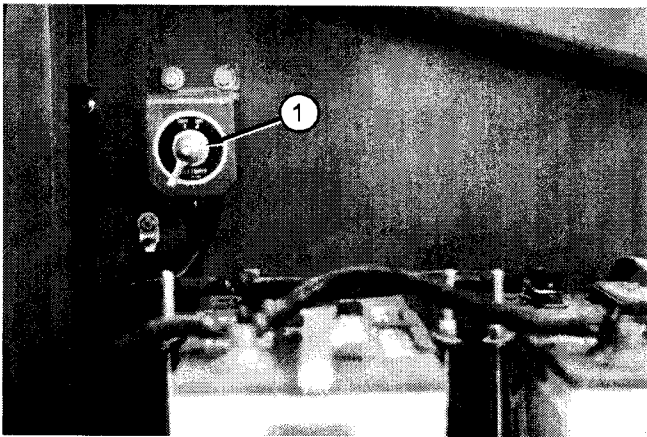
Limit the use of **EMERGENCY POWER** to ten minutes to keep the emergency pump and motor from overheating. Let the pump and motor cool at least 15 minutes before reuse.

NOTE: Boom movements will be slow and have long lag times under **EMERGENCY POWER**.



8. EMERGENCY OPERATION

❑ Used From the Ground-Control Panel



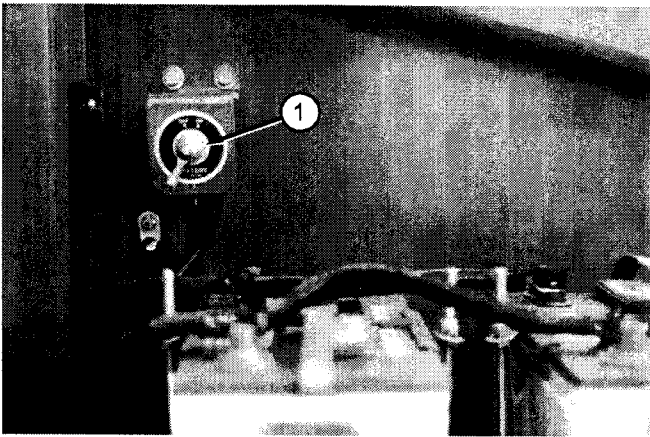
1. Set the **BATTERY** switch (1) to ON.



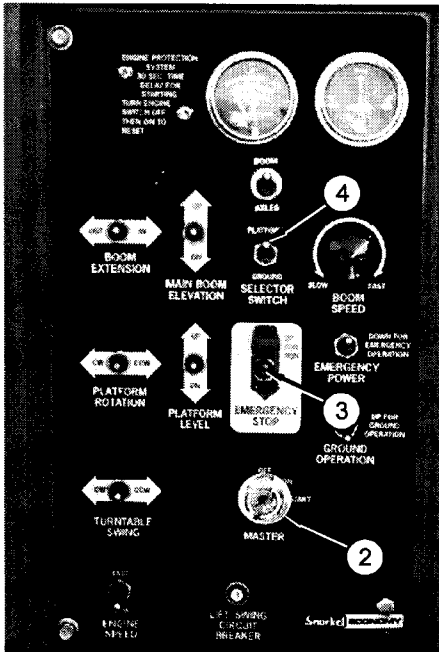
2. Set the **MASTER** switch (2) to ON.
3. Set the **EMERGENCY STOP** switch (3) to UP FOR RUN.
4. Set the **SELECTOR SWITCH** (4) to GROUND.
5. Push and continue to hold the **GROUND OPERATION** switch (5) up.
6. Push and hold a platform-moving switch (6) the way you want the platform to move.
7. Push and continue to hold the **EMERGENCY POWER** switch (7) down.
8. When the platform is safely lowered, release the switches and turn the **MASTER** switch (2) to OFF.

❑ Used From the Platform-Control Box

For **EMERGENCY POWER** to be used from the platform-control box, certain switch settings must exist at the ground-control panel and in the battery compartment. The switch settings are:



1. **BATTERY** switch (1) must be ON.

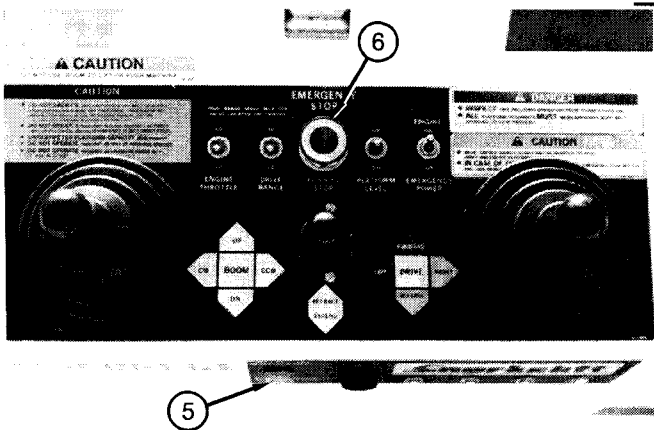


2. **MASTER** switch (2) must be ON.
3. **EMERGENCY STOP** (3) must be UP FOR RUN.
4. **SELECTOR SWITCH** (4) must be set to PLATFORM.

EMERGENCY POWER can now be used from the platform-control box by doing the following:



8. EMERGENCY OPERATION



5. Set the **ANTI-RESTART MASTER SWITCH** (5) to ON.
6. Pull **EMERGENCY STOP** (6) up.
7. Step on the foot switch.
8. Push and hold a switch or controller (on top of the platform-control box) the way you want the platform to move.



9. Push and continue to hold **EMERGENCY POWER** (7) to ON.
10. When the platform is safely retrieved, set the **MASTER** switch (2) to OFF.

■ **EMERGENCY BLEED-DOWN**

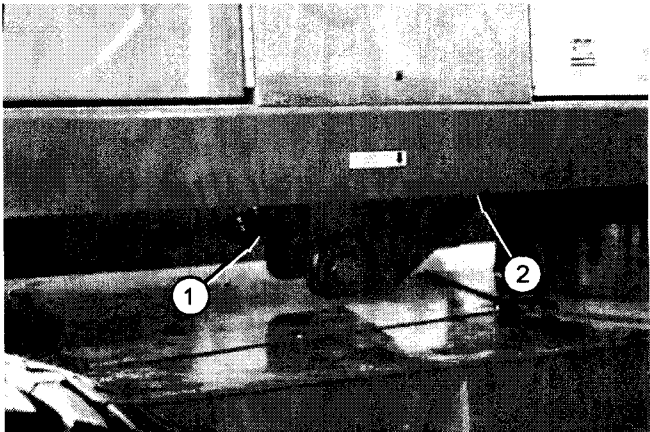
Use the **EMERGENCY BLEED-DOWN VALVE** when all three of the following conditions exist simultaneously:

- the platform needs to be lowered,
- the TB 80 engine will not start,
- **EMERGENCY POWER** does not work (dead batteries or other cause).

! DANGER

Do not lower the platform or booms onto electrical wires, people, or other obstructions.

NOTE: If the main boom is allowed to drop below the horizontal, the platform will not remain level.



The **EMERGENCY BLEED-DOWN VALVE** (1) is located under the turntable (2). To use the valve:

1. Very slowly open the **EMERGENCY BLEED-DOWN VALVE** (1) by turning it counterclockwise. The further it is opened, the faster the booms come down.

! DANGER

Be certain you close the **EMERGENCY BLEED-DOWN VALVE** (1) at the next step. Failure to do so prevents the main boom from remaining stationary in an elevated position.

2. Close the **EMERGENCY BLEED-DOWN VALVE** (1) when the main boom is horizontal.

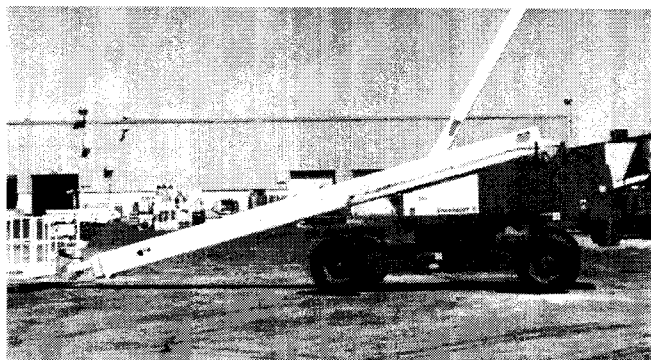


9. STOWING & TRANSPORTING

■ STOWING

At the end of each work day (or in preparation for transporting, lifting, towing, or storage) a qualified operator should put the TB 80 into its stowed position then lock it.

The correct stowed position is shown here.



To bring the TB 80 into the stowed position use the controls on the ground-control panel or platform-control box to:

1. Fully retract the main boom.
2. Fully lower the main boom.
3. Center the main boom between the rear wheels.
4. Use the **AXLES** controls to completely retract the axles and completely raise the jack.

To lock the TB 80:

1. If the engine has just been under load and is hot, set the **ENGINE SPEED** (or **ENGINE THROTTLE**) to SLOW (LO) and let the engine idle for one minute.
2. Set the **MASTER** switch to OFF, remove the key, and close the ground-control panel door.
3. Set the **BATTERY** switch to OFF and lock the **BATTERY** compartment door.
4. (OPTION - LPG) For machines equipped with LPG, close the valve on the LPG tank (completely screwed in).
5. Close and lock all other doors.

■ TRANSPORTING

The user assumes all responsibility for choosing the proper method of transportation, and the proper selection and use of transportation and tie-down devices, making sure the equipment used is capable of supporting the weight of the aerial platform and that all manufacturer's instructions and warnings, regulations and safety rules of their employer, the DOT and/or any other state or federal law are followed.

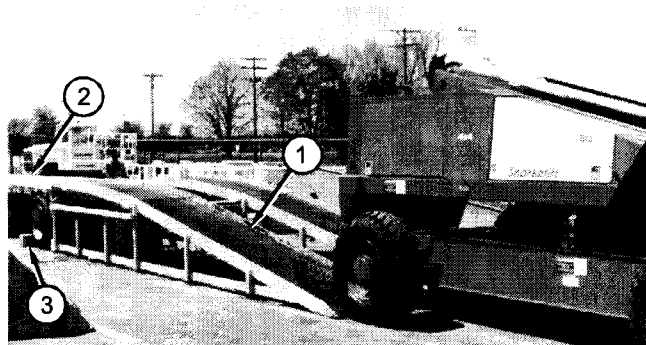
□ Trailering

! DANGER

A TB 80 weighs approximately 30,300 pounds (13,744 kg). Loading ramps must be able to support that weight. Transport trailers must be able to safely transport that weight.

Do not load a TB 80 on grades over 25% (4x2 model) or 30% (4x4 model) or on ramps with poor traction, uneven surfaces, or steps.

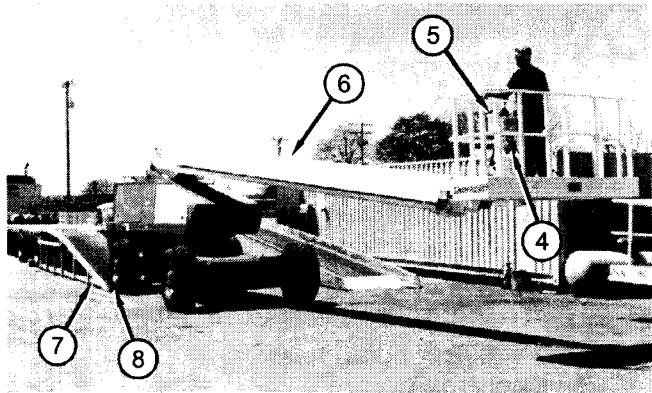
To safely drive a TB 80 onto a transport trailer:



1. Visually inspect the alignment of the loading ramp (1) and the truck or trailer (2). They should both be on the same straight line.
2. Chock (3) the wheels of the truck or trailer so it cannot roll away from the loading ramp (1) while the TB 80 is being loaded.
3. Set the ground-control panel for platform operation.



9. STOWING & TRANSPORTING



4. Enter the platform and attach the lanyard of your fall restraint to the anchorage point (4) on the platform.

5. Use the controls of the platform-control box (5) to raise the main boom (6) to its horizontal position.

6. Use the platform controls to bring the TB 80 into the stowed position (except main boom horizontal) at the foot of the loading ramp (7) with the steering wheels (8) nearest the ramp (7).

7. Visually check (from the platform) to be sure the TB 80 is aligned with the ramp and the ramp is still aligned with the truck or trailer. All should be in a straight line.

! DANGER

Death or serious injury can result from losing control of a TB 80 while loading. Always set the **ENGINE THROTTLE** and **DRIVE RANGE** to **LO** anytime you drive up or down a grade.

8. Set the **ENGINE THROTTLE** to LO.

9. Set the **DRIVE RANGE** to LO.

10. Use the **BOOM** controller to move the platform slightly to the side so you are aligned with the wheels and can see them better.

11. Use the **DRIVE** controller to slowly drive the TB 80 straight onto the ramp and trailer.

12. Use the **BOOM** controller to align the base boom between the rear wheels.

13. Lower the boom until it is about a foot (0.3 m) above the trailer.

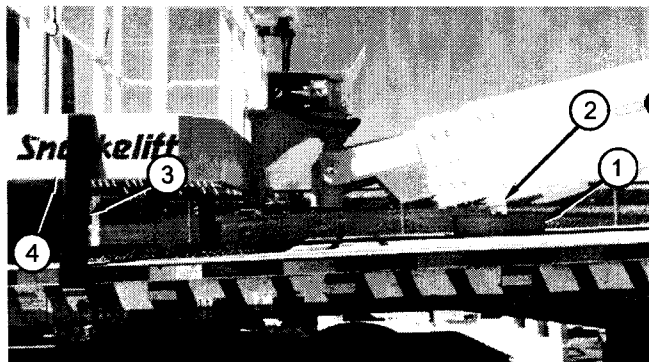
14. Leave the engine running in preparation for the next section.

15. Chock the TB 80 wheels.

NOTE: If you need to shift trailer axle-weight you can transport a TB 80 with the booms over the front axle. However, you should drive the TB 80 onto the trailer with the booms over the rear axle so that you do not get disoriented using the controls.

❑ Securing to a Transport Vehicle

This procedure assumes that you have just finished the previous section, that the TB 80 engine is still running, and that the wheels are chocked.



1. Place a wooden block (1) under the base boom (2) as shown then use the controls at the platform-control box to lower the boom (2) onto the block (1).

2. Set the **ANTI-RESTART MASTER SWITCH** to OFF.

3. Set the **MASTER** switch to OFF, remove the key, and close the ground-control panel door.

4. Set the **BATTERY** switch to OFF and lock the **BATTERY** compartment door.

5. (OPTION - LPG) For machines equipped with LPG, close the valve on the LPG tank (completely screwed in).

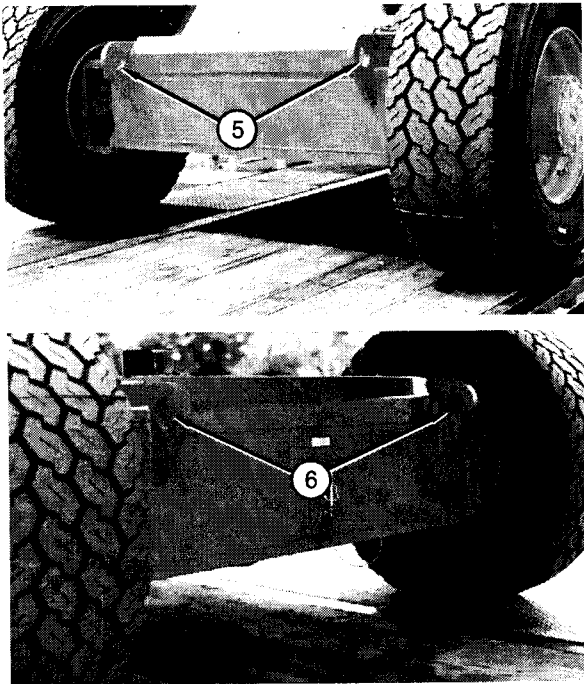
6. Use a nylon strap (3) to hold the platform (4) down as shown.

! DANGER

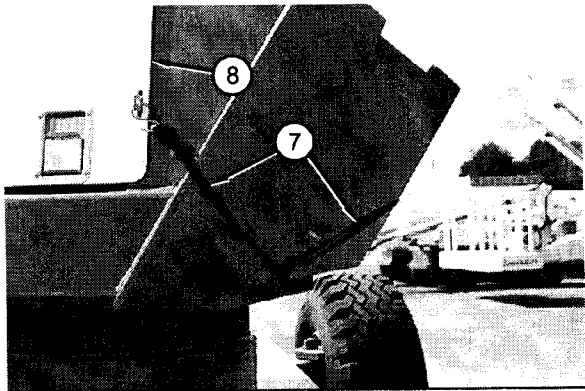
A loose TB 80 can cause death or serious injury. Do not attach tie downs to the steering tie rods. The tie rods are not strong enough to safely hold a TB 80.



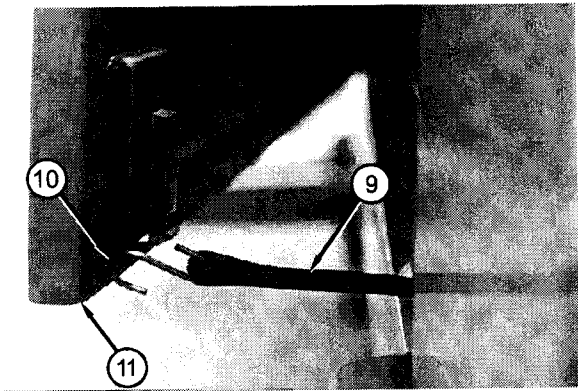
9. STOWING & TRANSPORTING



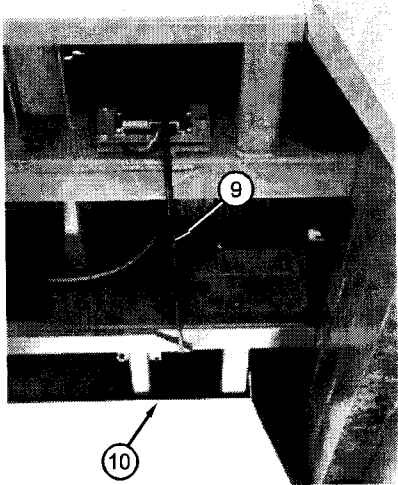
7. Attach chains to the front (5) and back (6) tie-down lugs. Chocks may be removed at this time, though it is a good idea to leave them in place.



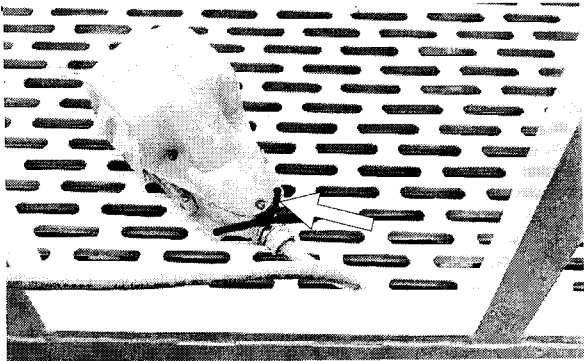
8. Use rubber straps (7), as shown, to keep the rear cowling doors (8) from opening during transport.



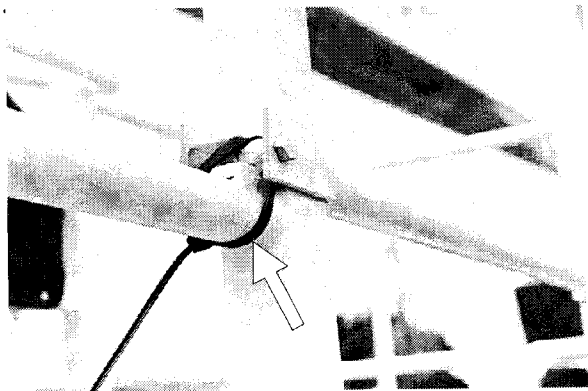
9. Hook a long rubber strap (9) through the hole (10) in the inside of one of the front cowling doors (11).



10. Stretch the rubber strap (9) under the turntable (10) to a similar hole in the opposite front cowling door. (This prevents the front doors from opening during transport.)



11. Use a wire-tie, as shown, to keep the foot switch from bouncing around the platform.



12. Use a wire-tie on each end of the gravity-gate to keep it from bouncing around.

Reverse the above procedure after transporting.

❑ Towing

Do not tow a TB 80 unless it is equipped with the optional tow package. See the "OPTIONS" chapter.



10. DAILY INSPECTION
& MAINTENANCE

At the start of each work day (or 8 hour shift) a TB 80 qualified operator must perform the DAILY INSPECTION AND MAINTENANCE listed in the table below.

The purpose of the daily inspection and maintenance is to keep the TB 80 in proper working condition and to detect signs of malfunction at the earliest possible time.

! DANGER

Do not operate a TB 80 that is known to be damaged or malfunctioning. Defective parts or equipment malfunctions jeopardize the safety of the operator and other personnel, and can cause damage to the machine.

DAILY INSPECTION AND MAINTENANCE TABLE

(Set the MASTER switch to OFF before you begin this inspection)

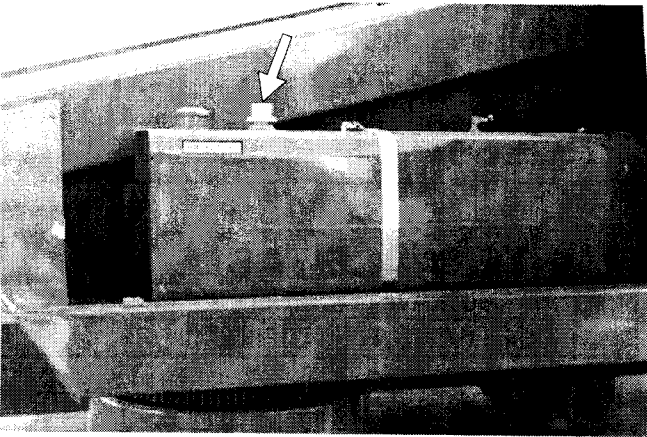
ITEM	SERVICE REQUIRED
1. Engine fuel level	Check fuel gauge (full)
2. Fuel tank cap	Visually inspect (installation)
3. Engine oil	Check oil level (between dipstick lines)
4. Fuel leaks	Visually inspect (hoses, connections, etc.)
5. Engine coolant	Check fluid level and radiator hoses
6. Electrical wiring	Visually inspect (installation, condition)
7. Battery terminals	Visually inspect (no corrosion)
8. Battery fluid level	Check fluid level (in contact with filler neck)
9. Hydraulic oil	Check fluid level (between lines on gauge)
10. Hydraulic oil leaks	Visually inspect (hoses, tubes)
11. Tires	Visually inspect (condition)
12. Bolts and fasteners	Visually inspect (looseness, condition)
13. Structural damage & welds	Visually inspect (weld cracks, dents)
14. Guardrails	Visually check condition
15. Platform gravity gate	Visually inspect (operation)
16. Self-closing gate	Actuate and visually check condition
17. Lanyard anchor points	Visually check condition
18. Axle/boom interlock	Check operation
19. Emergency power motor/pump	Check operation (causes correct motion)
20. Air filter	Check condition (gauge)
21. Charging system	Visually inspect (gauge)
22. Ground-control panel switches, alarms	Actuate and visually inspect for operation
23. Level sensor	Actuate and listen for alarm
24. Platform-control box switches, alarms	Actuate and visually inspect for operation
25. GFCI (ground fault circuit interrupt)	Actuate and visually check for operation
26. Platform work lights	Turn them on to see that they work
27. Flashing lights	Turn them on to see that they work
28. Driving lights	Turn them on to see that they work
29. Slide pads	Visually inspect (boom wear marks)
30. Placards and decals	Visually inspect (installation, condition)
31. Wire ropes	Visually inspect (even tension, condition)



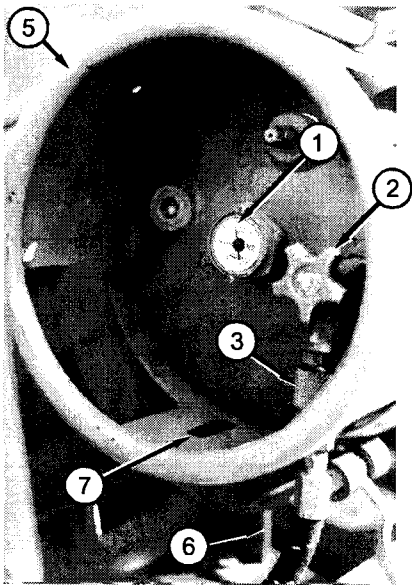
10. DAILY INSPECTION & MAINTENANCE

The rest of this chapter shows how to perform the SERVICE REQUIRED for each ITEM in the DAILY INSPECTION AND MAINTENANCE TABLE.

1. Engine fuel level



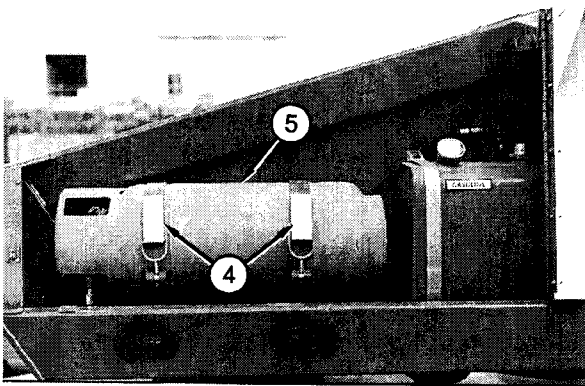
Visually check to see that the gasoline or diesel tank is full.



(OPTION - LPG) Visually check to see that the LPG tank is full (1).

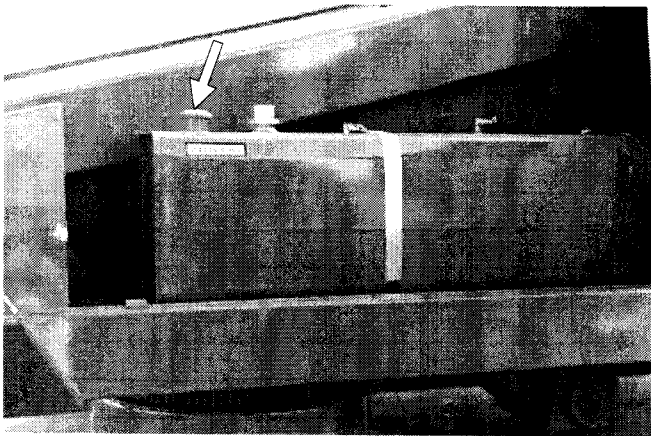
- To replace an LPG tank:
- Close the valve (2).
- Manually disconnect the fuel hose at the knurled ring (3).

NOTE: Notice the positioning pin (6). At re-installation be sure the slot (7) in the top of the LPG tank (5) aligns with the pin (6).



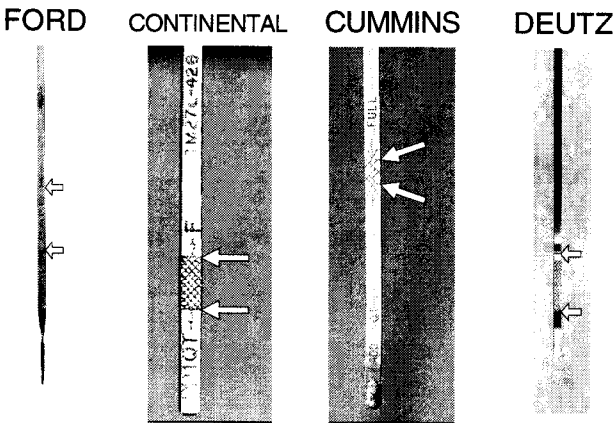
- Open the straps (4).
- Manually lift the tank (5) out.

2. Fuel tank cap



Check to see that the tank cap is in place and is tight.

3. Engine oil



Engine oil level should always be between the lines on the dipstick — never above nor below them. The distance between the top and bottom dipstick marks corresponds to about 1 qt USA (one liter).

The TB 80 should be on level ground when you check the dipstick. Check the oil level after the



10. DAILY INSPECTION & MAINTENANCE

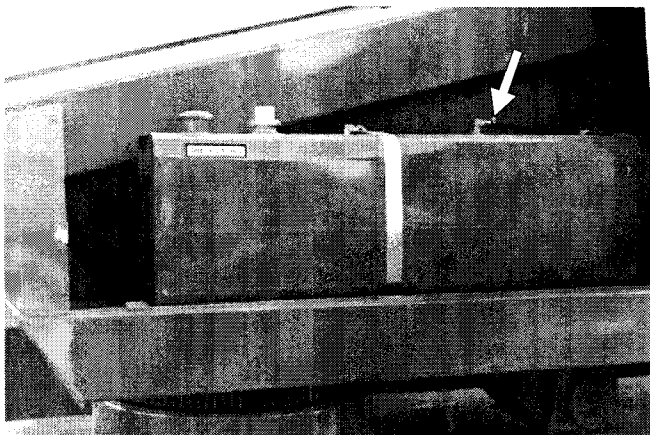
engine has been turned off a few minutes so that oil can run down out of the engine into the sump.

Add oil, if needed, at the top of the engine for Ford and Continental engines. Deutz engines take oil at the spout just to the right of the dipstick. Cummins oil openings might be on the top or side of the engine.

NOTE: Some Cummins engines have an oil funnel inserted into the side of the engine block just above the oil pan. The large end of the funnel is closed by an expansion plug. Unscrew (ccw) the handle on the plug until the expansion plug relaxes and contracts enough to remove from the funnel, then add oil at the funnel.

NOTE: See the "SPECIFICATIONS" chapter for the correct engine-oil grade and weight.

4. Fuel leaks

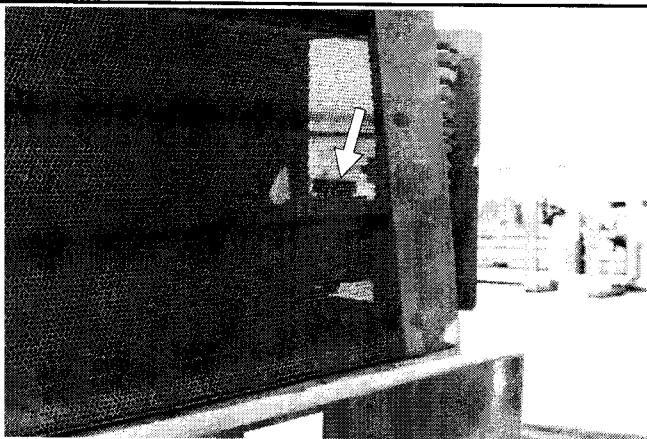


For diesel engines: Visually inspect the entire length of the fuel line, from the fuel tank to the engine and back to the fuel tank again, for leaks.

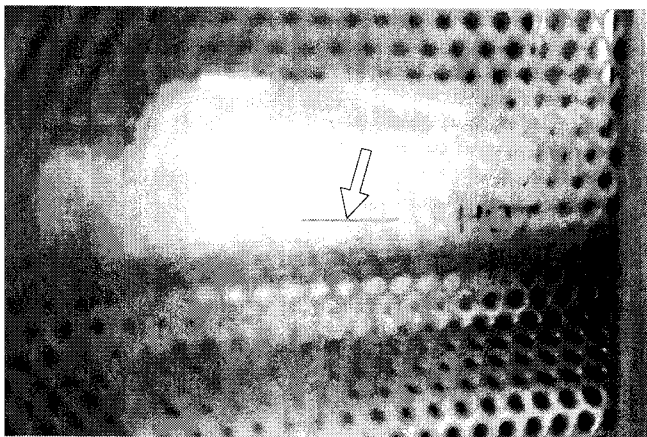
For gasoline engines: Visually inspect the entire length of the fuel line, from the carburetor to the fuel tank, for leaks.

5. Engine coolant

NOTE: This inspection does not apply to Deutz engines. Machines with Deutz engines do not have a coolant reservoir, Deutz engines are air cooled.



The engine coolant reservoir is inside the engine compartment.



When the engine is at operating temperature the coolant should be at the HOT line. When the engine is cold there should be about one inch (2.54 cm) of coolant in the bottom of the reservoir.

The coolant is half water and half ethylene glycol antifreeze.

To add coolant:

Turn the engine OFF at the ground-control panel **MASTER** switch.

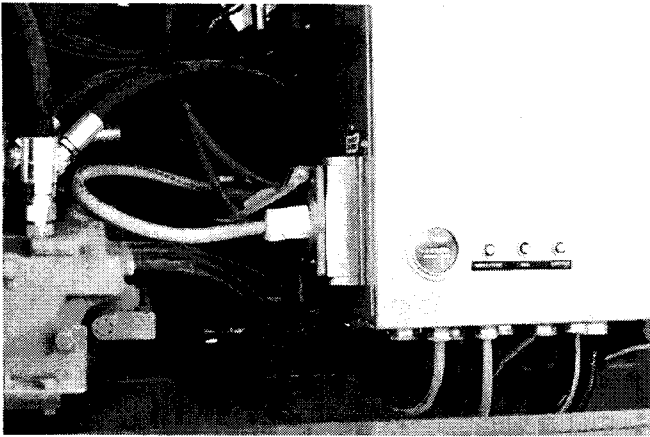
Remove the cap from the coolant reservoir.

Add coolant then replace the cap.



10. DAILY INSPECTION & MAINTENANCE

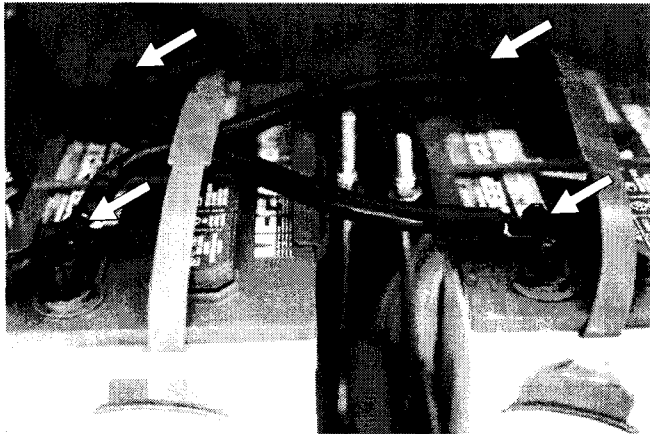
6. Electrical wiring



Visually inspect all exposed electrical wiring on the machine for loose connections, broken wires, and frayed insulation. Check wiring inside the turntable, along the booms, and at the platform.

NOTE: Do not open the wiring box or platform-control box for this inspection.

7. Battery terminals

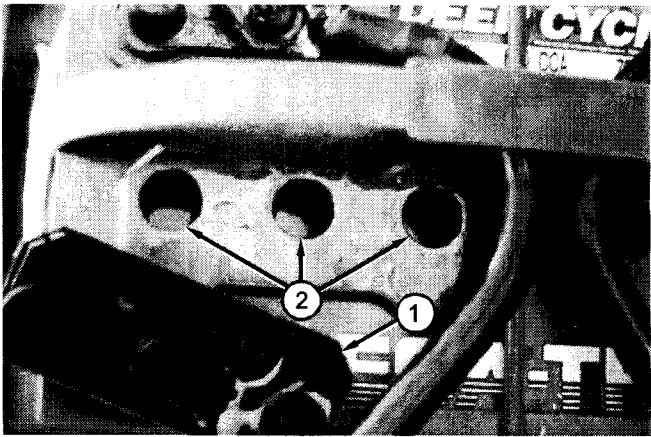


Battery terminals should be clean and free of corrosion.

8. Battery fluid level

DANGER

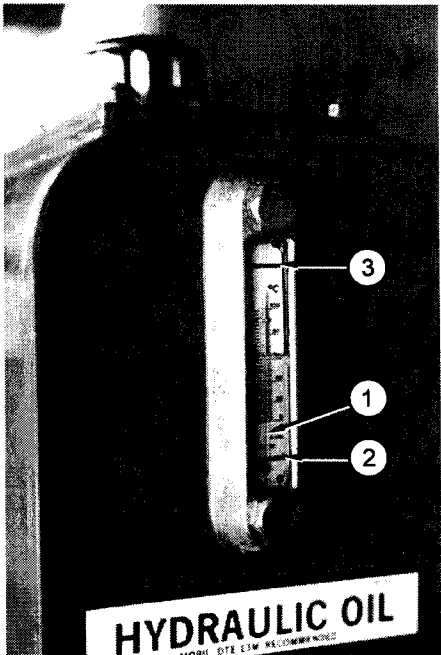
Batteries emit hydrogen and oxygen, elements that can combine explosively. Do not smoke or permit open flames or sparks when checking batteries.



Remove the caps (1 typ.) from each battery and visually check to see that the battery fluid (2) is within 1/4" (6 mm) of the bottom of the filler neck inside each hole.

9. Hydraulic oil

Completely lower and completely retract the booms to check the hydraulic oil level.



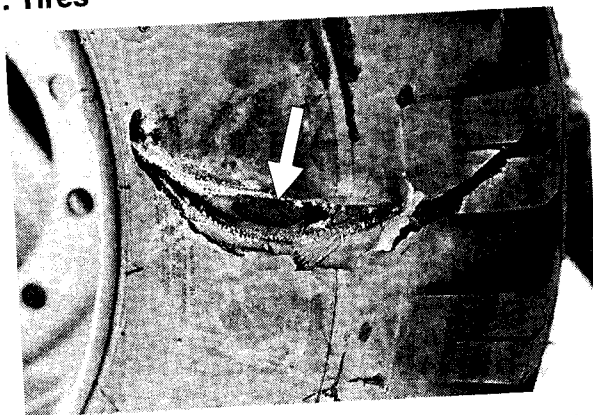
The hydraulic oil temperature (1) should be less than 200°F (93°C).

The hydraulic oil level should be between the two marks (2)(3) on the sight-glass gauge.



10. DAILY INSPECTION & MAINTENANCE

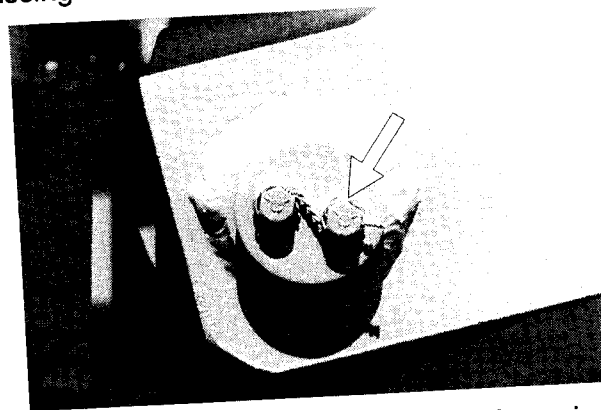
11. Tires



TB 80 tires are foam filled. Punctures of the type caused by bolts, screws, or nails are not a problem. Look for large holes or long cuts completely through the tire body: holes or cuts where foam is being forced or eroded out of the tire. Also, look for large imbedded objects, such as angle iron, that can rip a tire body open under some conditions.

12. Bolts & fasteners

Visually inspect all fasteners to see that none is missing or obviously loose.



Pay particular attention to all of the safety-wired bolts. Neither the wire nor the bolt heads should be damaged in any way. (Check the turntable end of the boom and the end of the lift cylinder for other safety-wired bolts. Check both sides of the machine.)

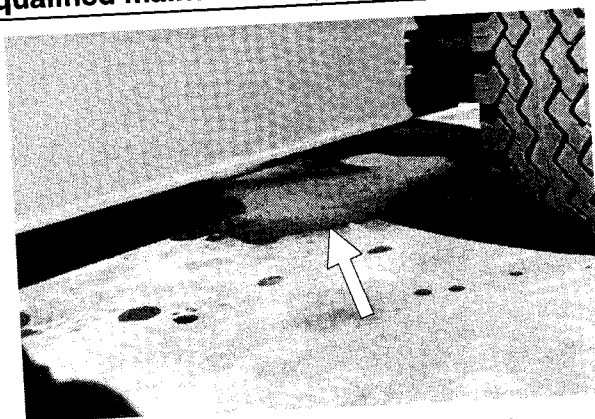


If necessary, add hydraulic oil at the filler cap. See the "SPECIFICATIONS" chapter for type and grade of hydraulic oil.

10. Hydraulic oil leaks

! DANGER

Leaking hydraulic oil can cause burns, fires, falls (slipping), cuts, and puncture wounds (if under high pressure). Have leaks repaired by a qualified maintenance person.

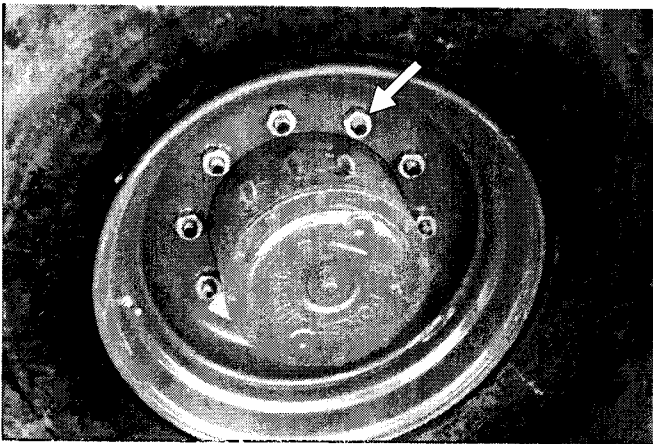


Hydraulic oil leaks are easily visible and can show up anywhere. Visually inspect the entire machine for hydraulic oil. Check the ground under the machine for leaked oil.

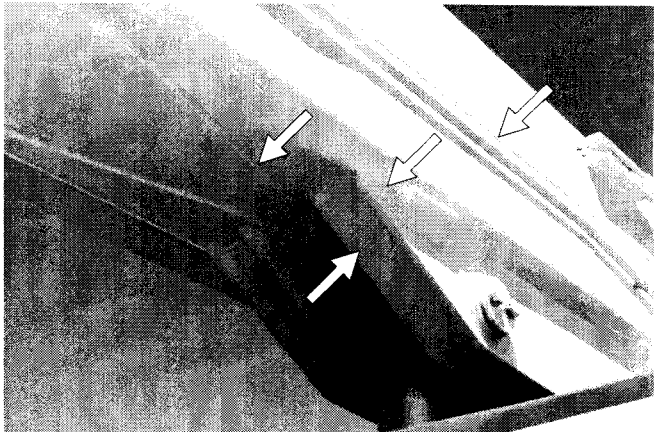
Look at the platform end of each boom. Oil can run down the inside of a boom and drip out the end.



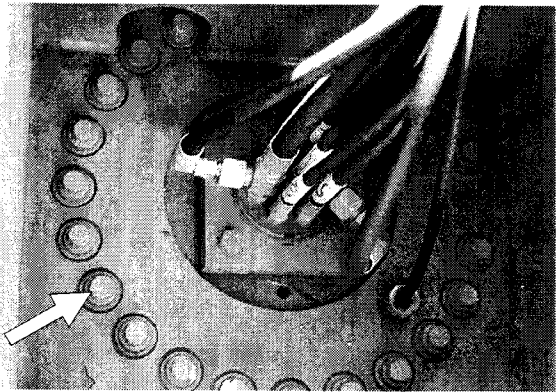
10. DAILY INSPECTION & MAINTENANCE



Pay particular attention to all of the wheel nuts. None should be visibly loose, missing, nor deformed.

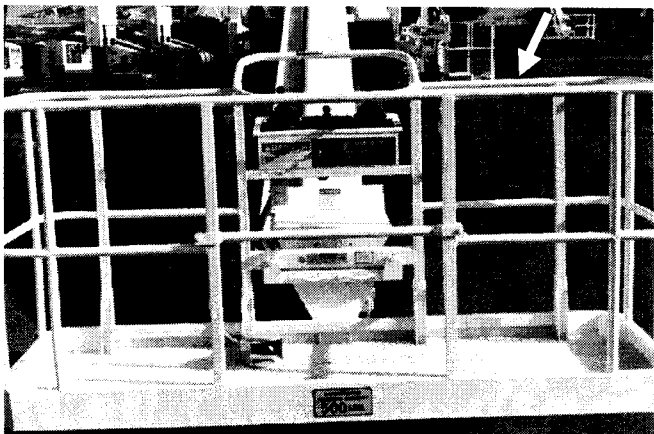


Pay particular attention to boom welds. Closely inspect all boom welds, along their entire length, for cracks.

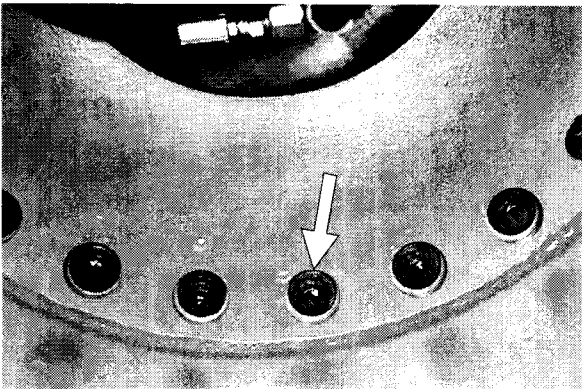


Pay particular attention to all of the upper rotation-bearing bolts. None should be visibly loose, missing, or have broken heads.

14. Guardrails



Visually inspect the guardrails to see that none of the tubing has been cut out, removed, nor deformed in any way. Visually check the guardrail welds to see that none is cracked nor ground down.

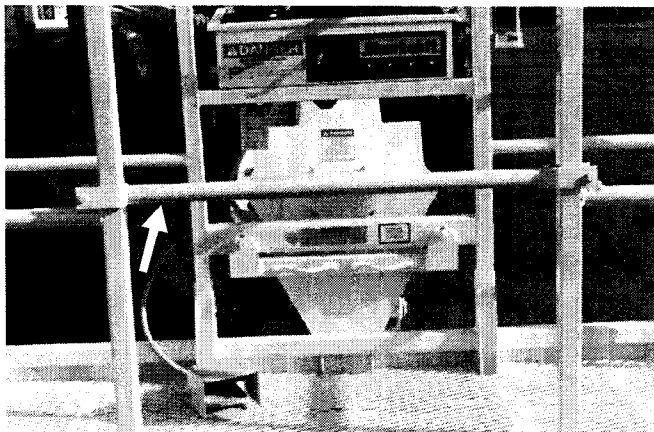


Pay particular attention to all of the lower (view from under the machine) rotation-bearing bolts. None should be visibly loose, missing, nor have broken heads.

13. Structural damage & welds

Visually inspect all welds for cracks, all structural members for deformity, and all sheet metal for dents that could interfere with machine operation.

15. Platform gravity gate

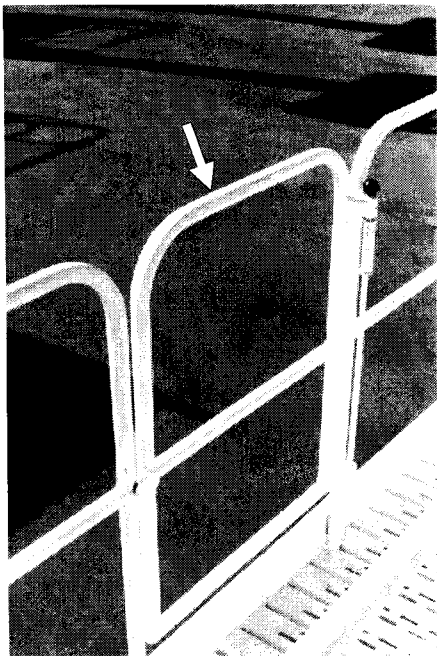


Inspect the gate to be sure it is present and moves freely.



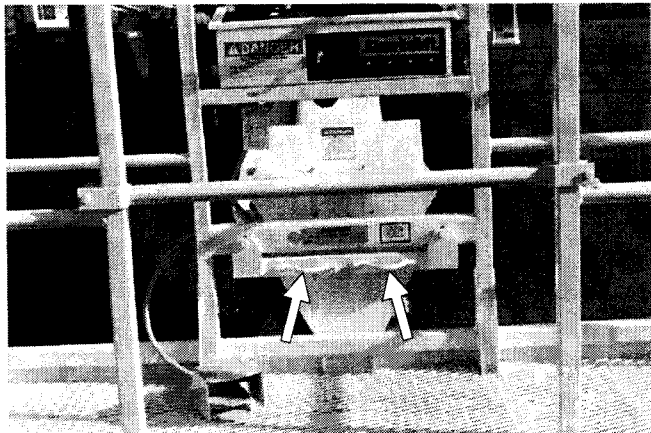
10. DAILY INSPECTION & MAINTENANCE

16. Self-closing gate (option)



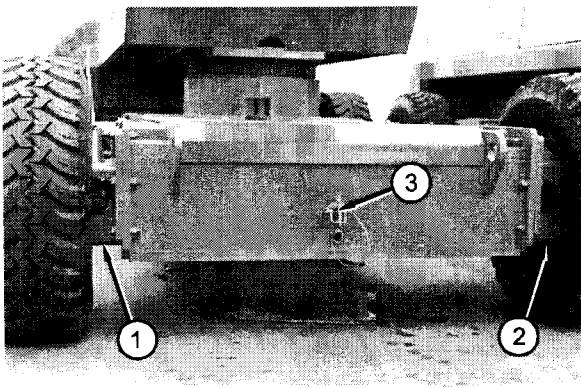
Inspect the self-closing gate to see that it swings freely, latches securely, and is not deformed in any way.

17. Lanyard anchor points

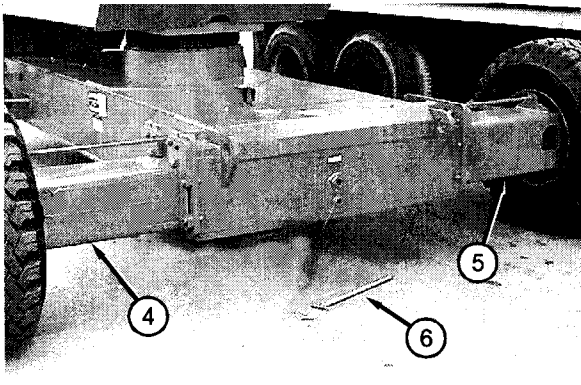


Neither lanyard anchor point should be visibly deformed, cut, nor worn. The welds should not be cracked nor ground down.

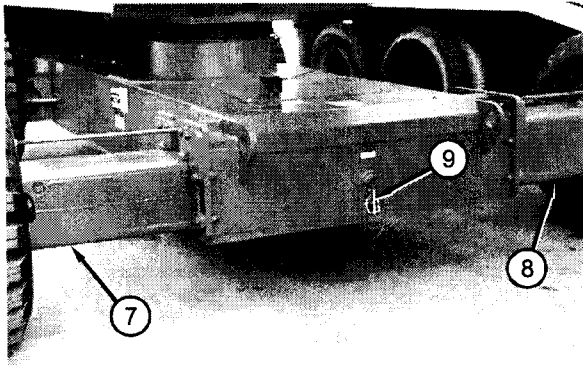
18. Axle/boom interlock



With the axles (1) (2) retracted and the pin lock (3) in place, you should not be able to raise the main boom over a couple of degrees above the horizontal nor should you be able to extend the platform over one foot (0.3 m).



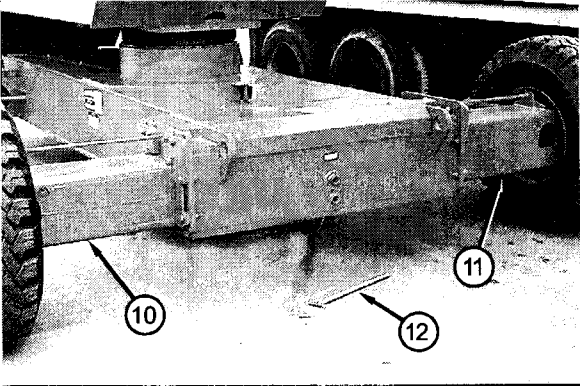
With the axles (4) (5) extended and the pin lock (6) out, you should not be able to raise the main boom over a couple of degrees above the horizontal nor should you be able to extend the platform beyond one foot (0.3 m).



With axles (7) (8) extended and pin lock (9) in lower hole, extend the main boom 10 - 20 feet (3 - 6 m).



10. DAILY INSPECTION & MAINTENANCE



Remove the pin lock (12). When the axles (10) (11) are extended and the pin lock (12) is out, you should not be able to lower the jack to raise the rear axles.

19. Emergency power motor/pump

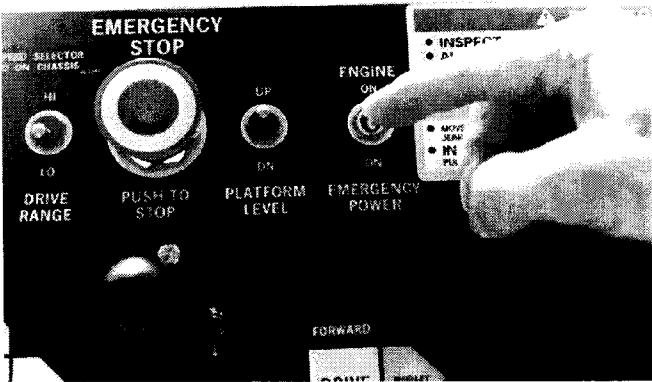
!

DANGER

When the turntable rotates clockwise (CW) it will move directly toward you. When you check **TURNTABLE SWING** at CW (1) be sure you have room to step backward.



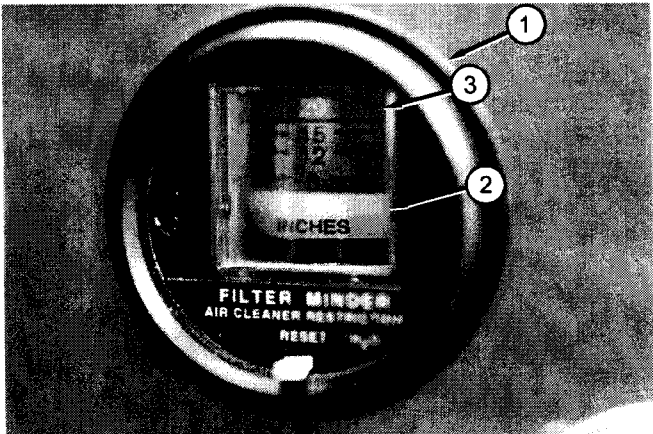
Check each of the five boom-movement switches (2), using **EMERGENCY POWER** (3), to see that they work correctly. Check both positions of each switch (2). (For correct emergency power operating procedures see the "EMERGENCY OPERATION" chapter.)



Check each of the boom-movement functions from the platform-control box (4), using **EMERGENCY POWER** (5). Check all positions of each control. (For correct emergency power operating procedures see the "EMERGENCY OPERATION" chapter.)

20. Air filter

Start the engine from the ground-control panel and set **ENGINE SPEED** to FAST.



The **FILTER MINDER** gauge (1) has a yellow indicator in it (2). As the air filter clogs the yellow indicator raises toward the red area (3) of the sight glass. If the indicator is in the red, after the engine has been running for 30 seconds in **ENGINE SPEED FAST**, the air filter needs to be replaced. (For further explanation of the **FILTER MINDER** gauge, see the "GAUGES" chapter.)

NOTE: Set **ENGINE SPEED** to SLOW and leave the engine running for the next step.



10. DAILY INSPECTION & MAINTENANCE

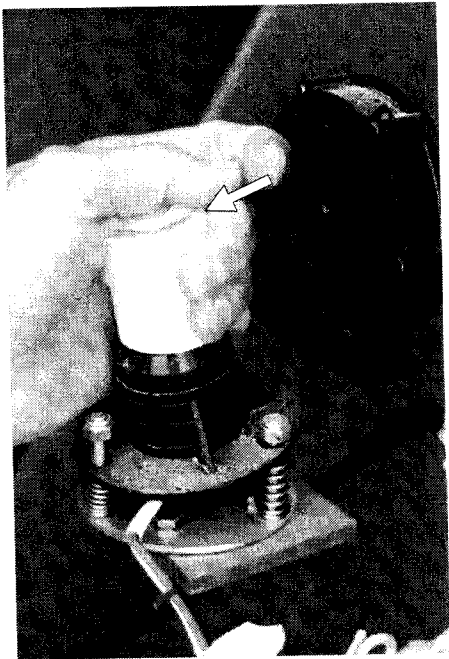
operating procedures see the "OPERATION" chapter.)

Pay particular attention to the **EMERGENCY STOP** switch (4) to see that it turns the TB 80 engine off when struck.

Listen for the start-up alarm when the **MASTER** switch (5) is first turned ON.

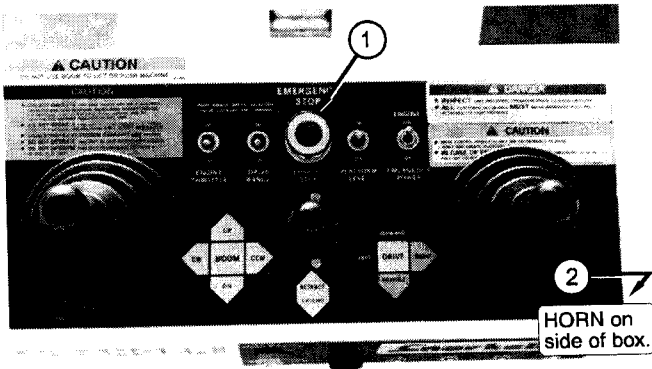
NOTE: Leave the engine running for the next step.

23. Level sensor



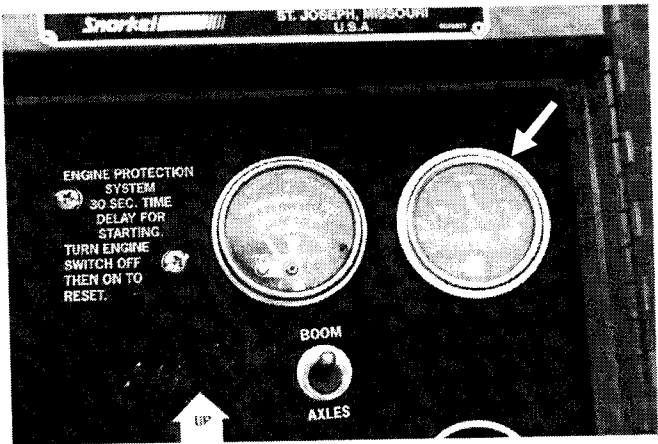
With the TB 80 engine running and the main boom raised to its horizontal position, pull the level sensor to the side as far as possible. The level sensor alarm should sound. (The level sensor is located in the left-rear side of the turntable, behind the cowling door.)

24. Platform-control box switches and alarms



Check all of the platform-moving, drive, and steering functions from the platform-control box to see that they cause the TB 80 to move the

21. Charging system



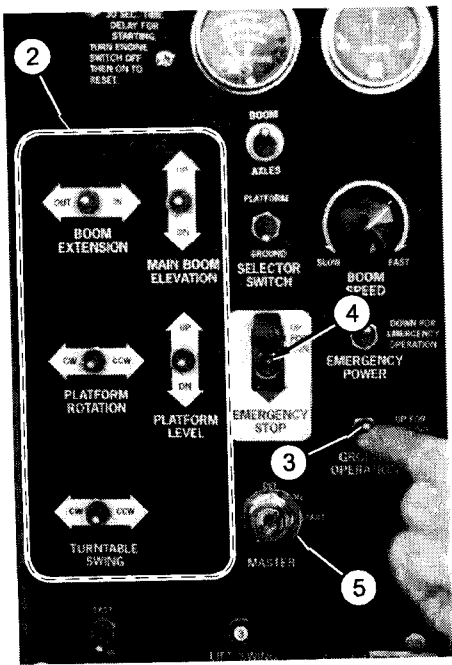
With the engine running in **SLOW ENGINE SPEED**, the needle in the **AMPS** gauge should not be to the left of "0" (left of "0" is discharging).

NOTE: Leave the engine running for the next step.

22. Ground-control panel switches and alarms

! DANGER

When you check **TURNTABLE SWING** at CW (1) the turntable will move directly toward you. Be sure you have room to step backward.



Check each of the five platform-moving switches (2) using **GROUND OPERATION** (3) to see that they cause the TB 80 to move the way it should. Check both positions of each switch. (For correct



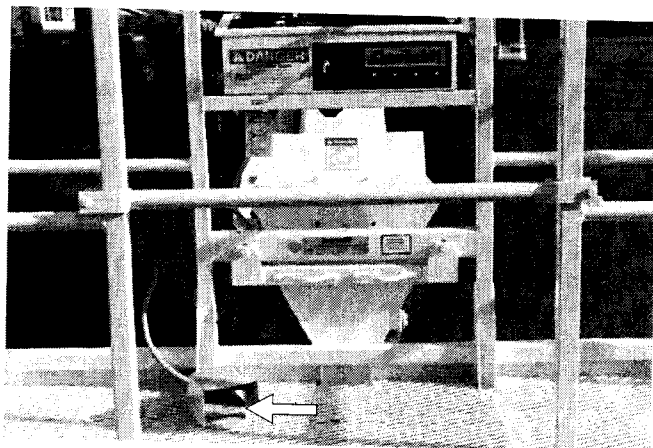
10. DAILY INSPECTION & MAINTENANCE

way it should. (For correct operating procedures see the "OPERATION" chapter.)

Pay particular attention to the **EMERGENCY STOP** switch (1) to see that it turns the TB 80 engine off when struck.

Press the operator **HORN** (2) to see that it works.

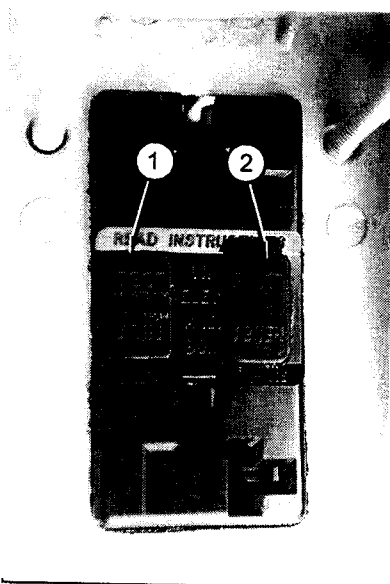
Listen for the motion alarm (if the TB 80 has that option) as you drive forward and backward. Listen for the start-up alarm when the **ANTI-RESTART MASTER SWITCH** is first turned ON.



Pay particular attention to the foot switch to see that it deactivates the platform-moving switches when the foot switch is not stepped on.

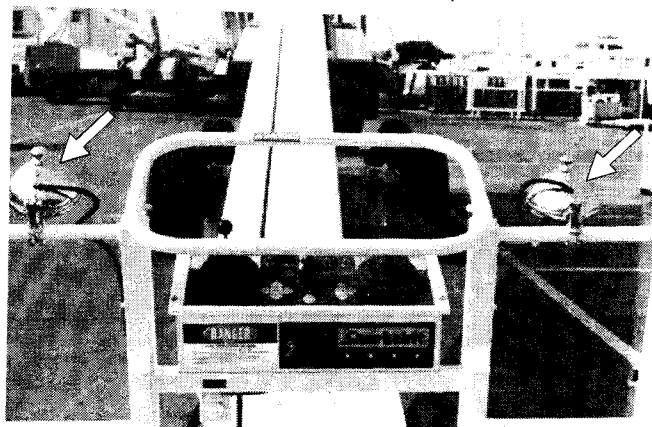
25. GFCI (Ground Fault Circuit Interrupt)

Start the TB 80 engine from the platform-control box. Set the **MACHINE/GENERATOR** switch (on front of platform-control box) to GENERATOR. If the TB 80 does not have the ac generator option, connect a source of 125 V ac power to the power input connector on the left side of the wiring box.



Push the **TEST** button (1), the **RESET** button (2) should pop out. Press the **RESET** button (2) back in then set the **MACHINE/GENERATOR** switch to MACHINE or disconnect the input power if the machine does not have the ac generator.

26. Platform work lights (option)



While the engine is running, momentarily turn each work light on (use the switch on the back of each light) to see that they both work.



10. DAILY INSPECTION & MAINTENANCE

27. Flashing light (option)



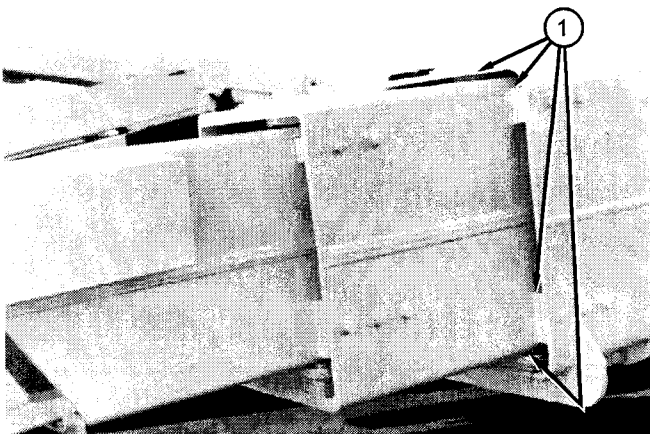
Visually check to see that the light flashes at approximately one flash per second when the engine is running.

28. Driving lights (option)



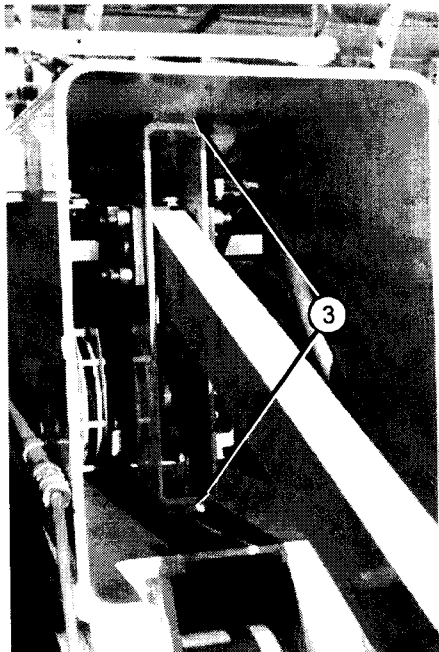
While the engine is running, momentarily turn the **LIGHTS** switch (front of platform-control box) ON to see that the driving lights work.

29. Slide pads



With the engine running and the rear axles extended, use the ground-control panel to extend the booms about 10 feet (three metres). Visually inspect to see that all six slide pads (1 typ.) are in place in the rear end of each boom.

Look at the surface (2) that slides on each slide pad. The paint should still be in place and there should not be any signs of bare metal gouging.



Check the slide pads (3) and paint inside the front end of the base boom similarly.

Completely retract the booms then turn the engine OFF at the ground-control panel **MASTER** switch.



10. DAILY INSPECTION & MAINTENANCE

30. Placards and decals

Look to see that all placards and decals are in place and legible. Replace any missing or illegible placards or decals before placing the TB 80 into service for the daily work shift.

Kits that contain all the TB 80 decals and placards are available from Snorkel dealers.

The **OPTIONAL PLACARDS AND DECALS**, listed below on this page, are only installed on machines that have the corresponding options.

PLACARDS AND DECALS INSPECTION CHART I

NO	PART #	DESCRIPTION	REQ
1	0073298	Danger - foam/solid tiers	2
2	0323896	Danger - electrocution hazard	5
3	0070420	Emergency bleed down valve	1
4	0070418	Snorkelift logo	2
5	0323897	Danger - you must not operate	1
6	0190988	Caution - ground control instructions	1
7	0073667	Inspect wire ropes	2
8	0073585	Made in USA	2
9	0070540	Yellow arrow	3
10	0070541	Blue arrow	3
11	0070901	Caution - serial number	1
12	0070921	125 volt 15 amp	1
13	0190989	Danger - do not reach	1
14	0181562	ANSI A92.5-1992	1
15	0071925	Gasoline (gasoline machines)	1
	0071926	Diesel (diesel machines)	1
16	0071927	Hydraulic oil	1
17	0073491	Safe operation information	1
18	0112027	TB-80 logo	2
19	0072276	Lug nut torque 450-500 ft lbs	4
20	7030003	Lube recommendations	1
21	0074311	Danger - cylinder failure (one per cylinder)	7
22	0073224	Notice manual re-order	1
23	0110708	Danger - axles/jack	1
24	0073492	Rotate while greasing	1
25	0082003	Ground controls	1
26	0111735	Main system/run/throttle	1
27	0110957	Boom/axles switch	1
28	0073043	Manual holder	1
29	0074372	Engine RPM	1
30	0073089	Battery disconnect switch	1

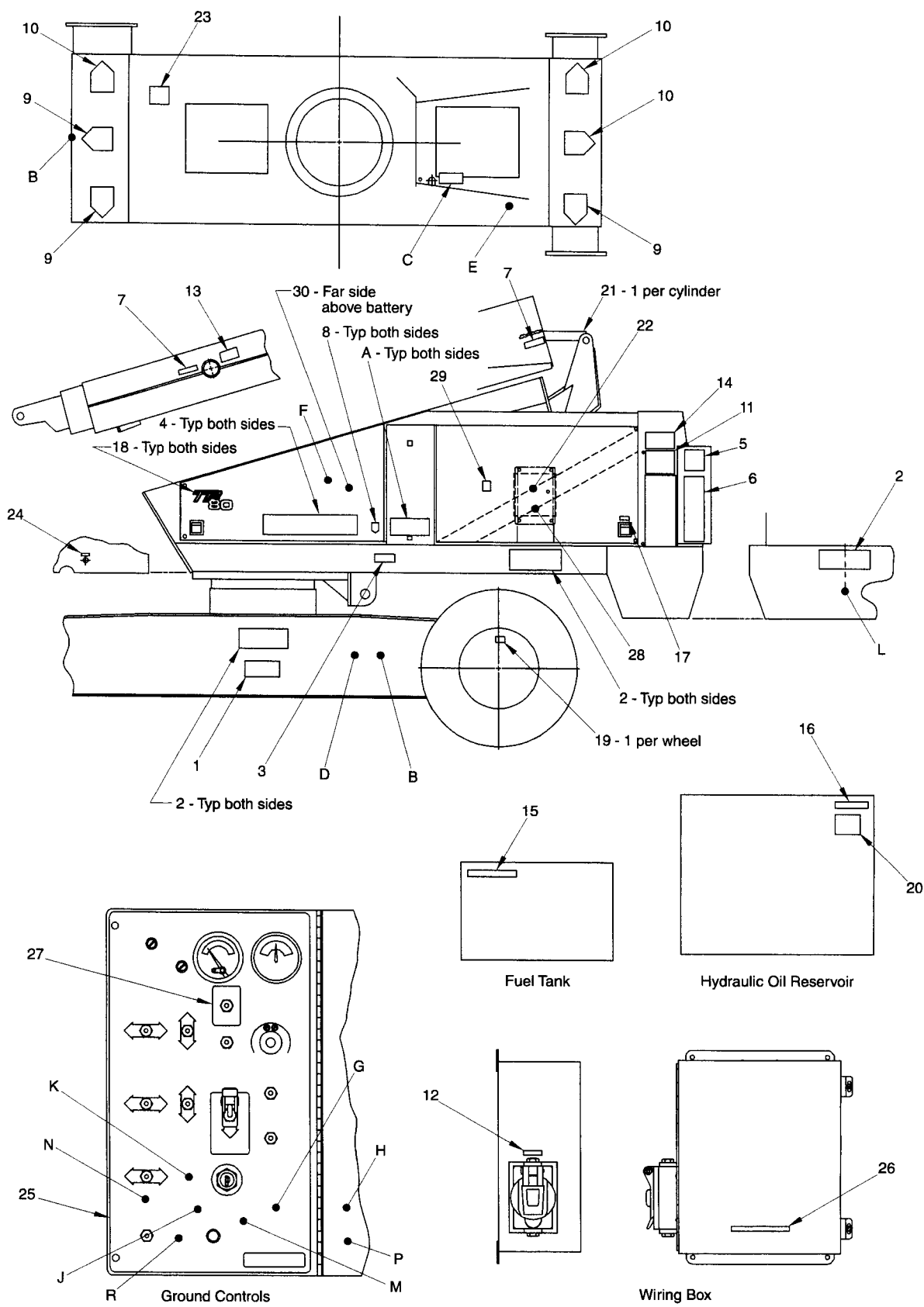
OPTIONAL PLACARDS AND DECALS

NO	PART #	DESCRIPTION	REQ
A	0111390	4x4 logo (four wheel drive option)	2
B	0082171	Towing instructions (tow kit option)	2
C	0111343	High range speed selector valve (four wheel drive option)	1
D	0082160	Danger - towing hazard (tow kit option)	1
E	0090760	Steering float valve (tow kit option)	1
F	0081441	Caution - liquid withdrawal (dual fuel or LP only option)	1
G	0073079	Caution - cold start instructions (cold start option)	1
H	0090493	Dual fuel instructions (dual fuel option)	1
J	0073080	Cold start (cold start option)	1
K	0090492	Dual fuel switch (dual fuel option)	1
L	0082203	Danger - crushing hazard (tow kit option)	1
M	0181634	Engine block heater (engine block heater option)	1
N	0082064	Manifold heater instructions (air inlet heater option)	1
P	0071793	Hydraulic system warm-up instructions (hydraulic warm-up option)	1
R	0071792	Hydraulic warm-up switch (hydraulic warm-up option)	1



10. DAILY INSPECTION & MAINTENANCE

PLACARDS AND DECALS INSPECTION DRAWING I





10. DAILY INSPECTION & MAINTENANCE

PLACARDS AND DECALS INSPECTION CHART II

NO	PART #	DESCRIPTION	REQ
40	0070418	Snorkelift logo	2
41	0090589	Platform capacity 500 lb	1
42	0323899	Danger - electrocution hazard	1
43	0071425	Platform identification	1
44	0181655	Caution - move control handle slowly	1
45	0181654	Danger - inspect machine	1
46	0070922	Platform rotator switch	1
47	0072531	Danger - electrocution hazard	1
48	0072541	Danger - do not operate	1
49	0110959	Platform control box top	1
50	0180846	Platform control box front	1
51	0072530	Danger - electrocution hazard	1
52	0151410	Danger - rotating parts	3
53	0073668	Caution - do not use boom	1
54	0070921	125 volt 20 amp	1
55	0150448	Attach fall restraint	1
56	451986	Danger - do not alter limit switch	1
57	0071269	Horn	1

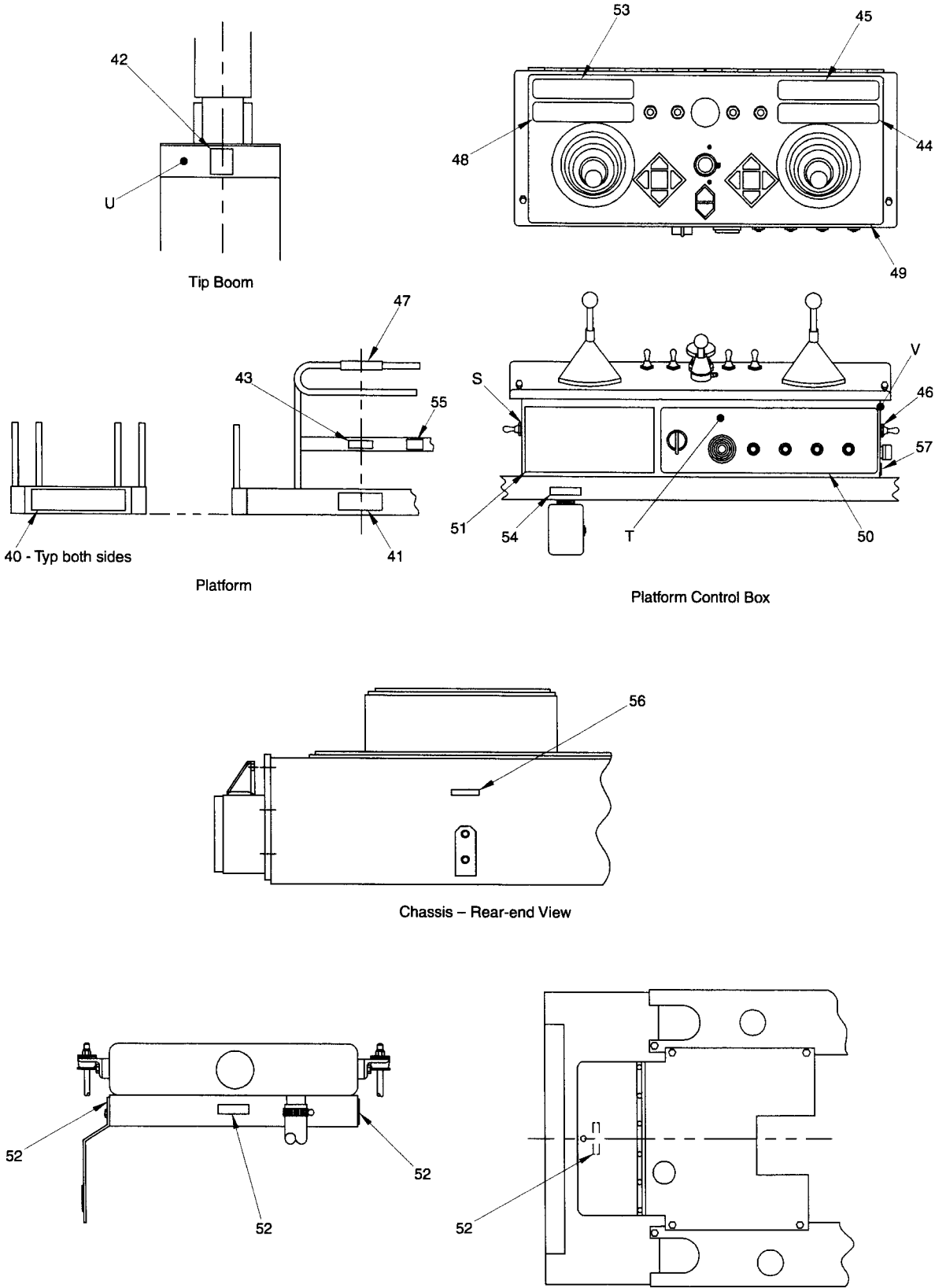
OPTIONAL PLACARDS AND DECALS

NO	PART #	DESCRIPTION	REQ
T	0191030	Machine/generator (hydraulic AC generator option)	1
S	0181376	Lights on/off (head light option)	1
U	0082164	Danger - do not ride in platform (tow kit option)	1
V	0071792	Hydraulic warm-up switch	1



10. DAILY INSPECTION & MAINTENANCE

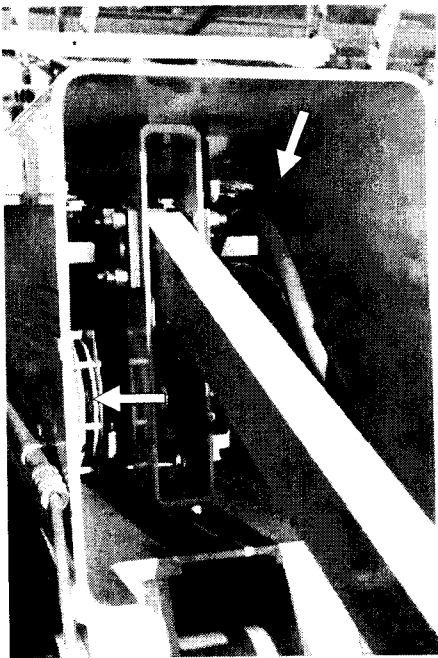
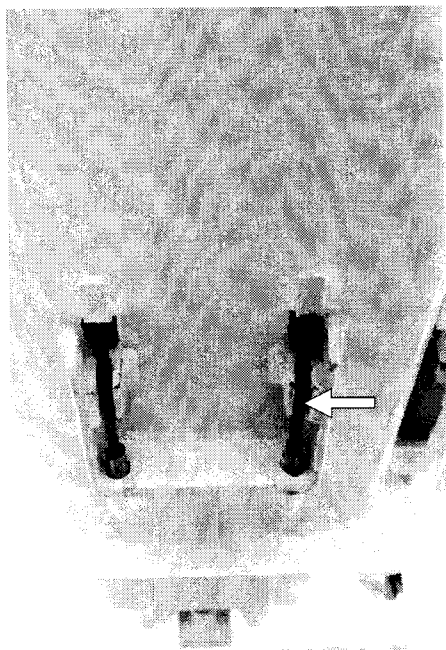
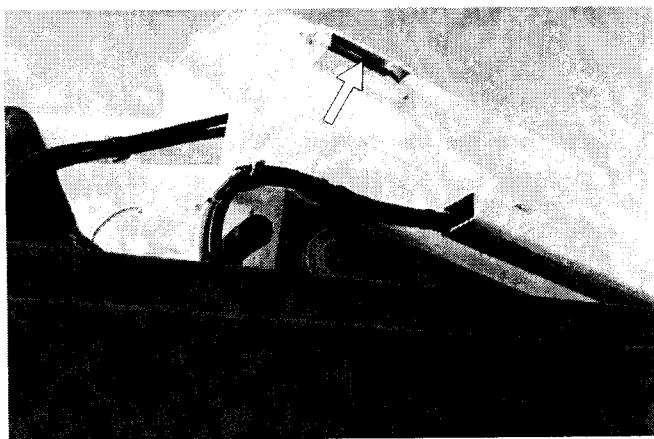
PLACARDS AND DECALS INSPECTION DRAWING II





10. DAILY INSPECTION & MAINTENANCE

31. Wire ropes



Visually check the wire ropes inside the front of the base boom similarly.

The wire ropes, outside the booms, should not have any broken strands, should not be distorted in any way, nor be rusted.



11. TROUBLESHOOTING

All of the actions described in this chapter may be performed by a TB 80 *operator* -- a trained and qualified service technician is not required. Any problem that cannot be fixed by actions listed below should be referred to a trained and qualified TB 80 *service technician*.

The first column, of the following chart, lists some common problems encountered by TB 80 operators. The second column lists some of the causes for each problem. The third column lists remedies.

TB 80 OPERATOR’S TROUBLESHOOTING CHART		
PROBLEM	CAUSE	REMEDY
Engine will not start from the <i>ground-control panel</i> .	1. Switches are set wrong. (Engine will not crank.)	A. Set BATTERY switch to ON. <u>At the ground-control panel:</u> B. Set MASTER switch to OFF. C. Set EMERGENCY STOP to UP FOR RUN. D. Set SELECTOR SWITCH to GROUND. E. Set MASTER switch to ON for 5 seconds then turn MASTER switch to START.
	2. The MAIN SYSTEM circuit breaker, on the wiring box, has tripped. (Engine will not crank.)	Push the MAIN SYSTEM (25) button back in. If the button pops out again, refer the problem to a qualified service technician.
	3. Out of fuel. (Engine cranks but will not start.)	Add fuel to tank then alternately crank engine for 20 seconds and let starter motor cool for 60 seconds (20 on / 60 off).
	4. LPG OPTION. FUEL switch on the ground-control panel is set wrong. (Engine cranks but will not start.)	A. Set FUEL switch (ground-control panel) to L.P.-GAS or GASOLINE. B. Check the fuel gauge, on top of the tank, to see if there is fuel in tank. C. For L.P.-GAS operation: Check to see that fuel valve, on top L.P. tank, is open. D. Alternately crank engine for 20 seconds then let starter motor cool for 60 seconds.
Engine will not start from the <i>platform-control box</i> .	1. Stepping on foot switch. (Engine will not crank.)	Be sure you are not stepping on the foot switch, or that the foot switch is not “blocked” in any way, while you are trying to start the engine.
	2. Switches are set wrong. (Engine will not crank.)	A. Set BATTERY switch to ON. <u>At the ground-control panel:</u> B. Set MASTER switch to ON. C. Set EMERGENCY STOP to UP FOR RUN. D. Set SELECTOR SWITCH to PLATFORM. <u>At the platform-control box:</u> E. Set the ANTI-RESTART MASTER SWITCH to OFF. F. Pull the EMERGENCY STOP button up. G. Turn the ANTI-RESTART MASTER SWITCH to ON. H. Turn the ANTI-RESTART MASTER SWITCH to START.



11. TROUBLESHOOTING

TB 80 OPERATOR'S TROUBLESHOOTING CHART		
PROBLEM	CAUSE	REMEDY
Engine will not start from the platform-control box. (Continued)	3. The MAIN CIRCUIT BREAKER , on the platform-control box, and/or the MAIN SYSTEM circuit breaker, on the wiring box, has tripped. (Engine will not crank.)	Push the circuit breaker button(s) in. If the button pops out again, refer the problem to a qualified service technician.
	4. Out of fuel. (Engine cranks but will not start.)	Add fuel to tank then alternately crank engine for 20 seconds and let starter motor cool for 60 seconds.
	5. LPG OPTION. FUEL switch on the ground-control panel is set wrong. (Engine cranks but will not start.)	A. Set FUEL switch (ground-control panel to L.P.-GAS or GASOLINE. B. Check the fuel gauge, on top of the tank, to see if there is fuel in tank. C. For L.P.-GAS operation: Check to see that fuel valve, on top L.P. tank, is open. D. Alternately crank engine for 20 seconds then let starter motor cool for 60 seconds.
Engine starts from the platform-control box but no other functions work.	AC GENERATOR option only: The MACHINE/GENERATOR switch is set to GENERATOR.	Set the MACHINE/GENERATOR switch to MACHINE.
Cannot extend nor completely raise the main boom.	1. Rear axles not extended.	Extend rear axles.
	2. Pin lock not installed.	Install pin lock.
Jerky platform movement during extension.	Loose cables.	Report problem to a trained & qualified service technician.
Cannot attain maximum speed (3 mph, 4.8 km/h).	1. Booms are not completely down and completely retracted.	Completely lower & completely retract the booms.
	2. DRIVE RANGE set to LO.	Set DRIVE RANGE to HI.
	3. 4x4 OPTION machines only: HIGH RANGE SPEED SELECTOR VALVE is down.	Pull the HIGH RANGE SPEED SELECTOR VALVE up.
Tilt alarm does not work.	Booms are completely down and completely retracted. (Tilt alarm is not designed to work under these conditions as a convenience to personnel loading and unloading TB 80 onto/from transport vehicle.)	Raise the main boom to horizontal.
Boom raises but will not stay elevated.	Manual EMERGENCY BLEED-DOWN VALVE is open.	Close the EMERGENCY BLEED-DOWN VALVE .
Front wheels do not turn during DRIVE RIGHT or DRIVE LEFT .	1. DRIVE controller must be in DRIVE FORWARD or DRIVE REVERSE for steer wheels to turn.	Push DRIVE controller slightly forward or backward when using DRIVE RIGHT or DRIVE LEFT .
	2. TOW OPTION machines only: The STEERING FLOAT VALVE is open.	Close the STEERING FLOAT VALVE .



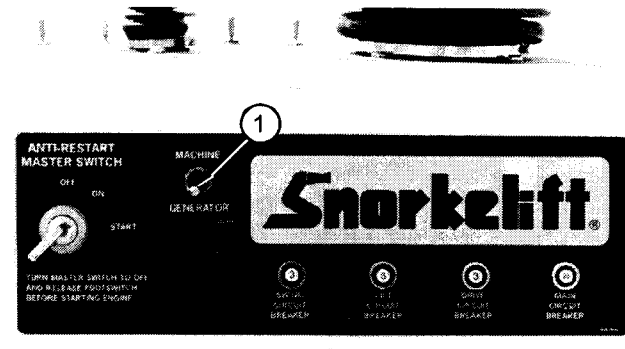
12. OPTIONS

■ AC GENERATOR

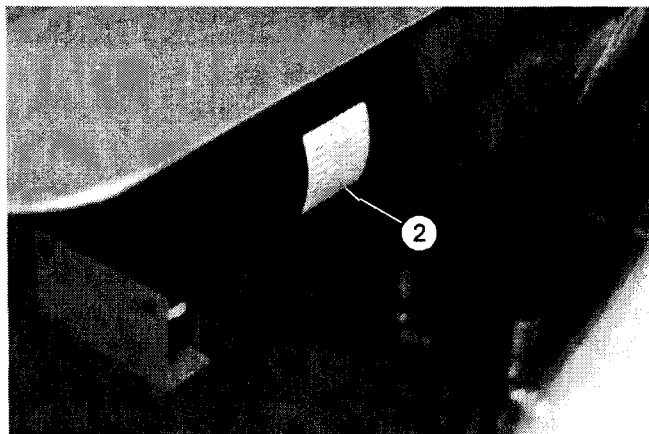
!CAUTION

Do not use the ac generator unless the hydraulic oil is over 70°F (21°C). The output voltage of the generator depends on the temperature of the hydraulic oil. Temperature below 70°F (21°C) will cause dangerously low output voltages that can burn out some kinds of electrical equipment.

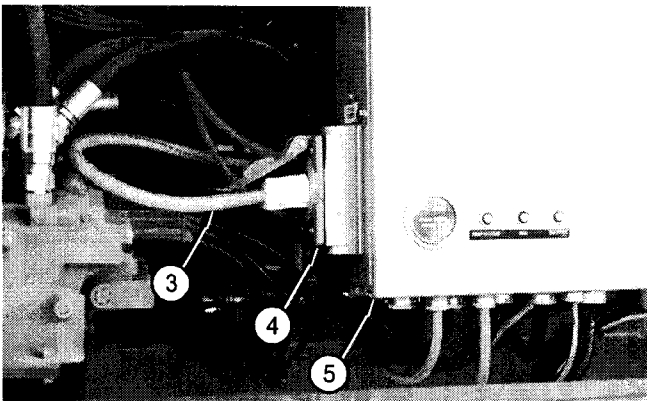
The hydraulically powered, 120 V ac generator can be used when the TB 80 engine is running. When the ac generator is ON, no DRIVE, STEER, boom, or platform-moving control works. The platform cannot be moved while the ac generator is ON.



Set the **MACHINE/GENERATOR** switch (1) to **GENERATOR** and a total of 2 kW, continuous duty, 120 V, 15 A ac power is available from the two electrical outlets under the platform-control box or from the electrical outlets on the end of the generator housing.

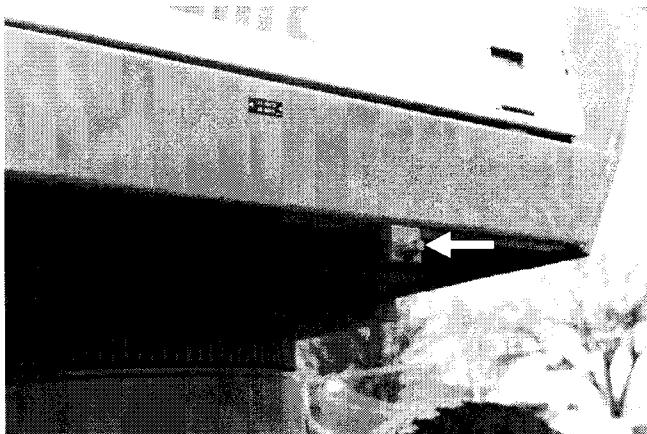


The generator (2) is inside middle-rear of the turntable, under the base boom and near the rotation bearing.



NOTE: To energize the two platform electrical outlets, the power cord (3) from the generator must be plugged into the power input connector (4) on the wiring box (5).

■ AIR LINE TO PLATFORM



The input to the air line is on the left-rear of the turntable. The outlet is on the platform mounting frame. The maximum safe working pressure for the air line is 250 psi (1725 kPa).

!CAUTION

Water or antifreeze solution in the air line might damage some air tools. If you use the air line to conduct water or antifreeze solution be sure to drain and blow out the air line before attaching air tools.

The air line can be used to conduct air, water, or antifreeze solution. If you want to conduct other fluids, contact your Snorkel dealer for compatibility information



12. OPTIONS

To drain the air line:

1. Close the turntable end of the air line.
2. Open the platform end of the air line.
3. Raise the main boom slightly above horizontal.
4. Open the turntable end of the air line.

■ COLD WEATHER START KIT

□ Air Inlet Heater (Deutz only)



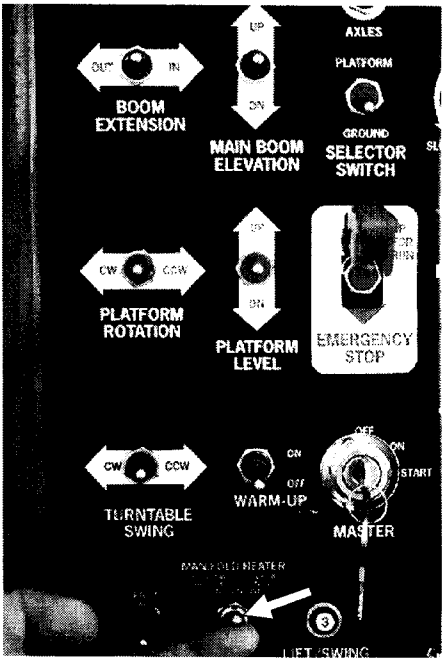
Do not use ether to start a Deutz engine that has a cold weather start kit installed. The glow plug in the KIT can ignite the ether and cause an explosion.

The cold weather start kit in a Deutz engine is a glow-plug type air-inlet-heater. The glow plug is located at the front of the air intake manifold just above the muffler. Use the heater to start the engine when the engine temperature is below 32°F (0°C). To use the heater:

1. Set the **BATTERY** switch to ON
2. **EMERGENCY STOP ... UP FOR RUN**
3. **MASTER**..... OFF
4. **ENGINE SPEED** SLOW
5. **SELECTOR SWITCH**... GROUND

Be sure the **MASTER** switch is OFF at this point.

NOTE: If the engine fails to start (at the next step) in 20 seconds, turn the **MASTER** switch to OFF and wait 60 seconds before turning the **MASTER** switch to START again.



6. Hold the **MANIFOLD HEATER** switch ON for about 60 seconds then turn and hold the **MASTER** switch to START until the engine starts (or for 20 seconds, whichever comes first).

NOTE: Do not release the **MANIFOLD HEATER** switch until the engine starts, even if you have to pause 60 seconds between starting attempts. The **MANIFOLD HEATER** switch does not go through the **MASTER** switch so the **MANIFOLD HEATER** stays on while the **MASTER** switch is off.

□ Block Heaters (Ford, Continental, Cummins)



CAUTION

Unplug the block heater just before starting the engine. That will keep you from driving off while the heater is still plugged in.

The block heater in a Continental, Cummins, or Ford engine is a freeze-plug type block-heater. The engine is heated by convection of water that is warmed by the heater. The heater is located in a freeze-plug hole just below the engine exhaust manifold. If the engine starting temperature is expected to be 32°F (0°C) or below, plug the power cord from the heater into 110 - 125 V ac, 600 watt source eight hours before starting the engine.

**❑ Ether Injection (Cummins only)**

Some Cummins diesel engines have ether injection instead of a block heater. Ether injection should only be used to start a cold engine when the ambient temperature is below 32°F (0°C).

Check to see that there is a can of ether installed in the holder in the engine compartment. If there is no can of ether:

1. Turn the **BATTERY** switch to OFF.
2. Unscrew the holding cup.
3. Put a can of ether in the cup.
4. Screw the cup firmly back into place.
5. Set the **BATTERY** switch to ON.

Start the engine from the ground-control panel in the normal way. While the **MASTER** switch is in START (and the engine is cranking) press the **COLD START** button. Pressing the **COLD START** button injects a measured amount of ether into the intake manifold regardless of how long you hold the button in.

NOTE: Do not crank the engine longer than 20 seconds. If the engine does not start, wait two minutes then try again.

■ DRIVE MOTION ALARM

The drive motion alarm emits loud beeps, at one second intervals, anytime the **DRIVE** controller is in FORWARD or REVERSE. This alarm alerts people on the ground that the TB 80 is traveling along the ground.

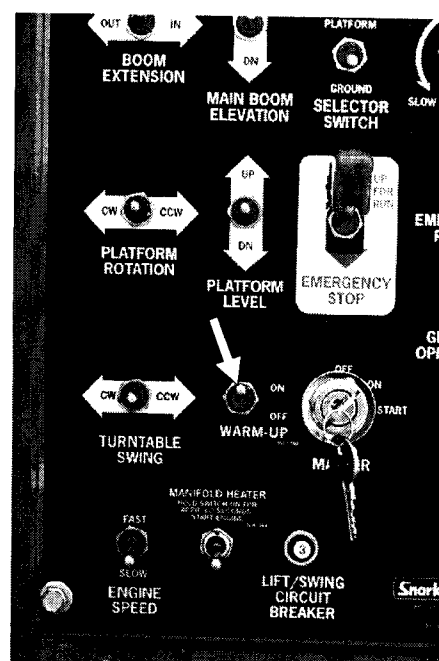
■ DUAL FUEL OR LP GAS ONLY

The dual fuel option lets you run a gasoline engine on either gasoline or liquefied petroleum gas. Instructions for using the option, and the LP gas only option, are listed throughout this manual.

■ HYDRAULIC SYSTEM COLD WEATHER WARM-UP KIT

The control switch for the hydraulic system cold weather warm-up kit is located on the ground-control panel near the **MASTER** switch and/or on the left side of the platform-control box. When the ambient air temperature is below 32°F (0°C) and boom movement is sluggish because of cold hydraulic oil, turn the **WARM-UP** switch to ON

until the hydraulic oil temperature, in the hydraulic oil tank, reaches 50°F.



For the warm-up system to work, the engine must be running and you must turn the **WARM-UP** switch ON from the same station that you started the engine. (If you started the engine from the ground-control panel, turn the **WARM-UP** switch on from the ground-control panel. If you started the engine from the platform-control box, turn it on there.)

NOTE: If you only have one **WARM-UP** switch you must start the engine from the station where the **WARM-UP** switch is located if you want to use the **WARM-UP** switch.

While the warm-up system is ON, no machine movement is possible.

■ LIGHTS

For a complete discussion of the following lights see the "LIGHTS" section in the "SAFETY DEVICES" chapter.

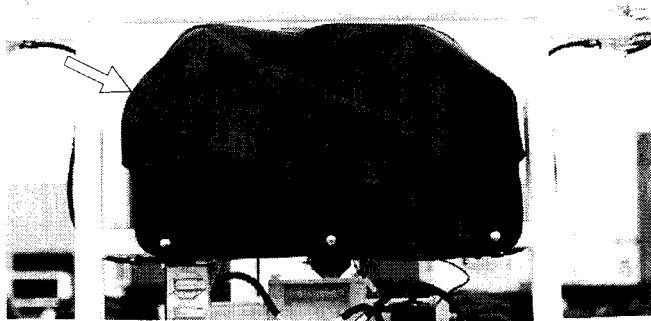
- Driving Lights
- Flashing Lights
- Platform Work Lights



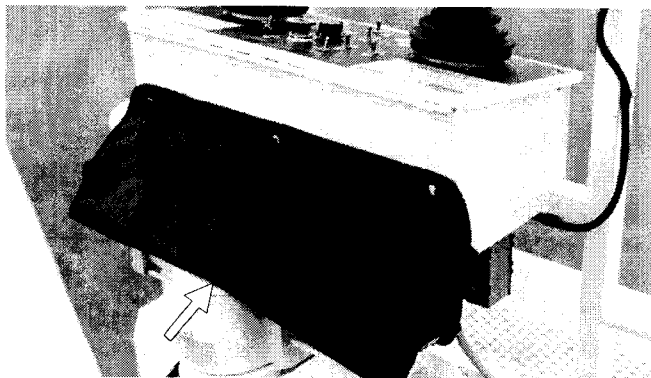
12. OPTIONS

■ PLATFORM-CONTROL BOX COVER

The platform-control box cover is designed to protect the platform-control box from being damaged by sandblasting, spray painting, weather conditions, and ocean salt-spray.

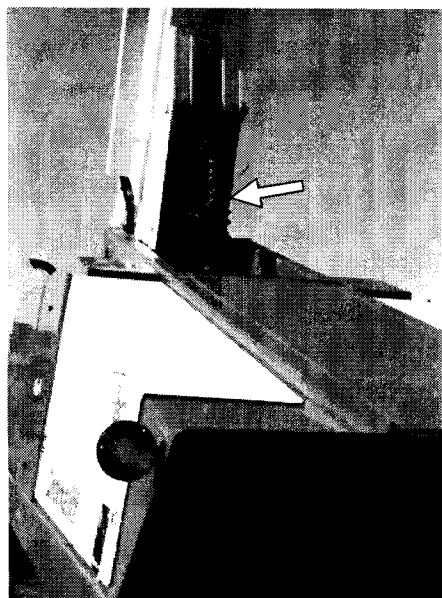


To protect the box, snap the cover in place as shown.



When the platform-control box is in use, store the cover as shown.

■ SANDBLAST PROTECTION KIT



Sandblast protection for the TB 80 consists of bellows over the boom hydraulic-cylinder rods. The bellows prevent sand and paint from

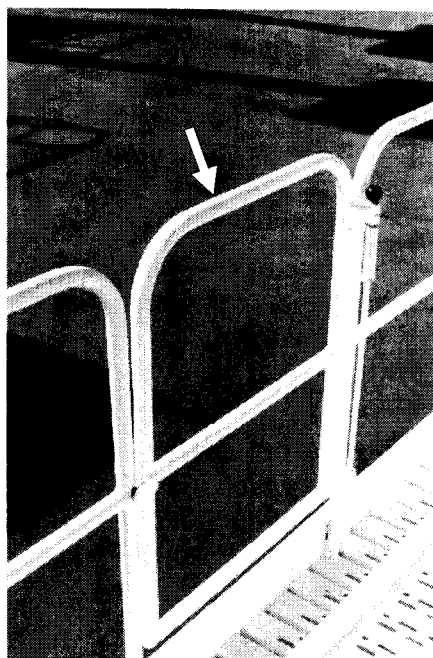
damaging the cylinder rods and seals, and thus prevent hydraulic oil leaks. Do not paint or sandblast from the TB 80 unless the cylinder rods are protected by bellows.

■ SPARK ARRESTOR (Deutz or Ford only)

The spark arrestor prevents incandescent carbon particles from coming out the tail pipe. Baffles in the spark arrestor slow the flow of particles through the exhaust system. The additional time spent in the exhaust system lets the carbon completely burn before it comes out the tail pipe.

NOTE: The spark arrestor is standard equipment on Cummins engines.

■ SWINGING GATE



The swinging gate is designed to automatically close after you enter or leave the platform. It helps prevent people from falling off the platform.



■ TOW KIT

! DANGER

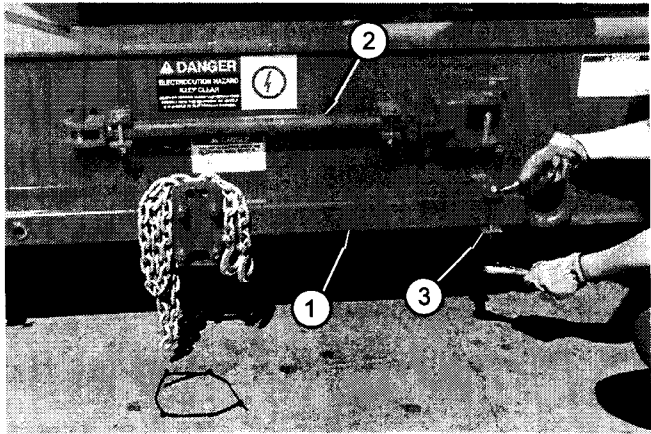
Improper towing can cause the TB 80 to break away from the towing vehicle. A “runaway” TB 80 can cause death or serious injury.

Do not tow the TB 80 faster than 10 mph (16 km/h). The TB 80 can behave erratically above 10 mph (16 km/h).

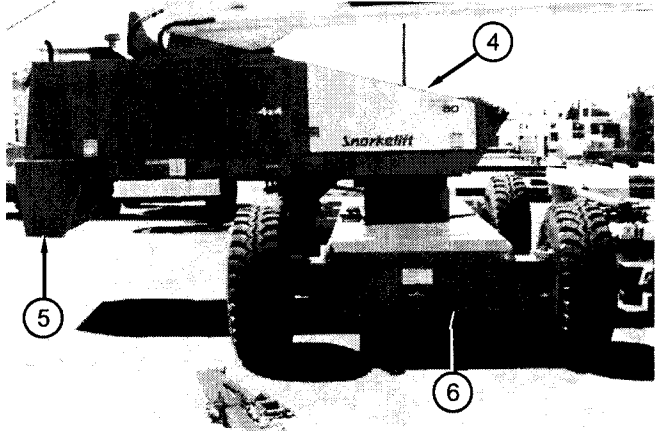
Check with the tow vehicle manufacture, or manufacturer's literature, to be sure the towing vehicle can safely tow and stop the 30,300 pound (13,744 kg) TB 80 on the steepest grade and type of surface you will encounter. Remember, the TB 80 does not have brakes when it is towed.

When you tow the TB 80 around a corner or a curve do not turn so sharply that either of the tow bar chains is pulled tight. If a chain is pulled tight the steering mechanism might be damaged or the tow vehicle and TB 80 might jackknife.

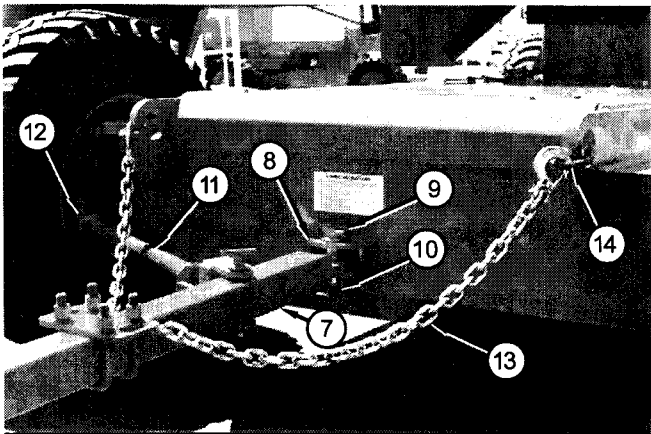
1. Put the TB 80 into its stowed position.



2. Remove the tow bar (1) and tie-rod weldment (2) from the storage cradles (3 typ.) and lay them near the front of the machine.



3. Use **TURNTABLE SWING** to rotate the turntable (4) so that the counterweight (5) is to the side of the chassis (6).



4. Attach the tow bar (7) to the towing lug (8) with the tow pin (9) and snap pin (10).

5. Attach the tie-rod weldment (11) to the tow bar (7) and the right hand steering yoke (12) as shown.

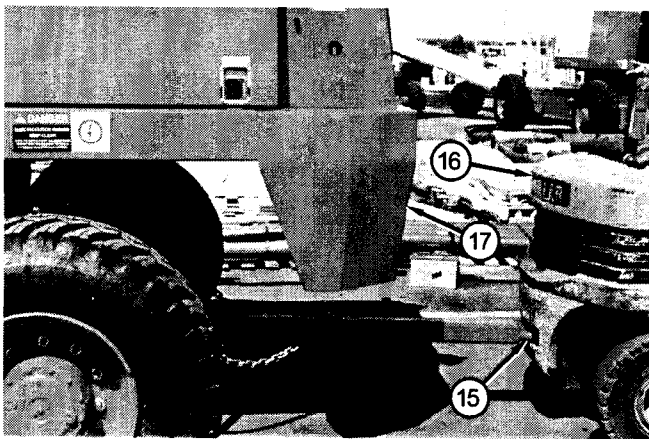
! CAUTION

Be sure the tow bar chain (shown on the left side of the photo) goes over the tie-rod weldment (11). If the chain goes under the tie-rod weldment (11) left-hand turns will be restricted and the tie-rod weldment might be damaged when slack is removed from the chain.

6. Attach the two tow bar chains (13 typ.) to the tie down lugs (14 typ.).



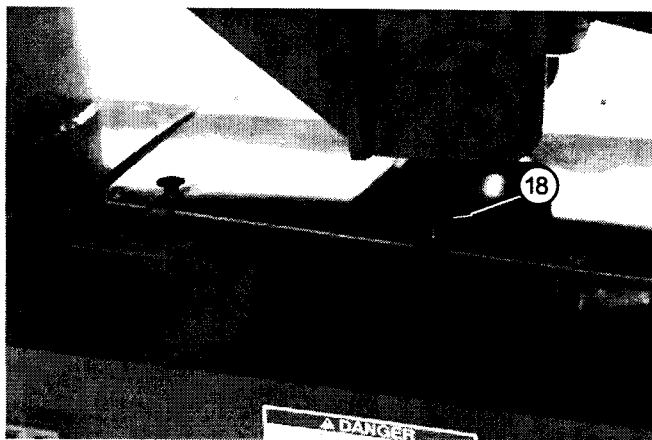
12. OPTIONS



7. Attach the ring-end (15) of the tow bar to the tow vehicle (16).

8. Use **TURNTABLE SWING** to rotate the counterweight (17) back to the front of the chassis.

9. Raise the platform approximately 3 feet (1 m) to keep the platform from scraping the ground when the TB 80 starts up a grade.



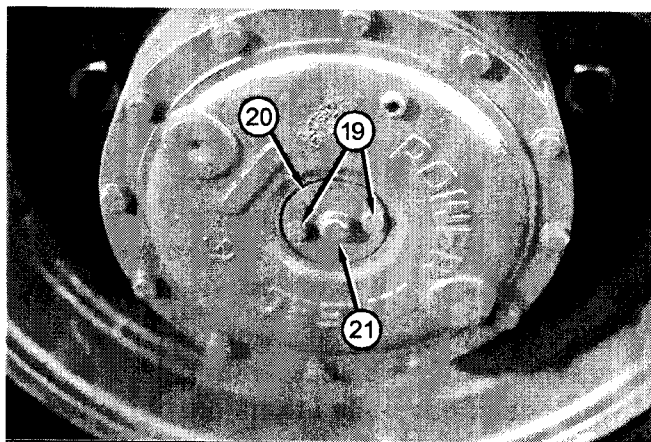
10. Pull and twist the **STEERING FLOAT VALVE** (18) to its "up" position.



NOTE: The **STEERING FLOAT VALVE** pin should be as shown.

! DANGER

A "runaway" TB 80 can cause death or serious injury. Disconnecting the disconnect-plates will allow the TB 80 drive wheels to turn freely. Before proceeding, be certain the tow bar is installed and connected to a towing vehicle that can safely control both itself and the TB 80. Be certain the tow vehicle brakes are set.



11. Remove the two bolts (19) that hold each drive-wheel disconnect-plate (20).

12. Turn each disconnect-plate (20) over so that the nipple (21) points inward, then retighten the bolts (19).

! DANGER

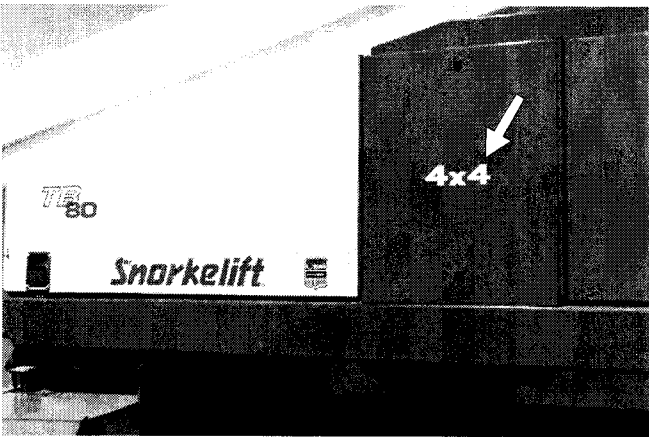
At the end of the tow, before you disconnect the TB 80 from the towing vehicle, turn the disconnect-plates back over so the nipples are out. This will prevent the TB 80 from rolling when you disconnect it from the tow vehicle.

13. Reverse the above procedure at the end of the tow.

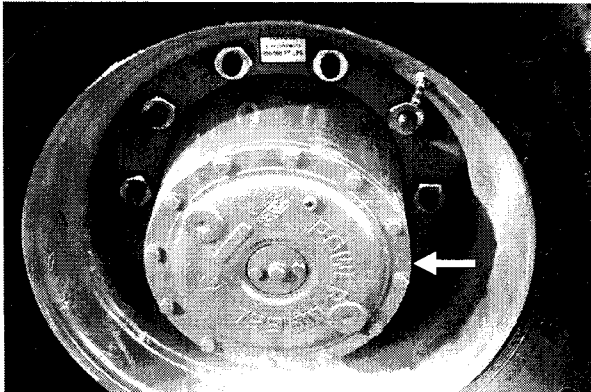


■ 4-WHEEL DRIVE (4x4)

4-wheel drive improves traction on all surfaces.

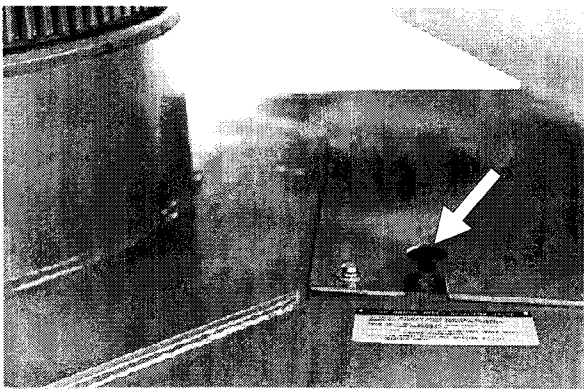


There are two ways to tell if the TB 80 has 4-wheel drive. One way is to look for the “4x4” on the turntable.



The second way is to look at the wheels. If the hubs of all four wheels look like this, the TB 80 has 4-wheel drive. The TB 80 shown on the front cover of this manual is a 2-wheel drive machine.

From the operator’s point of view, the only difference between the optional four-wheel drive (4x4) and the standard two-wheel drive is that the maximum speed of the 4x4 is determined, in part, by the settings of both the **DRIVE RANGE** switch and the **HIGH RANGE SPEED SELECTOR (HRSS) VALVE**.



The **HRSS VALVE** works with the **DRIVE RANGE** switch and boom position, according to the following table, to determine the maximum speed the chassis can travel along the ground.

DRIVE RANGE Table

MAX. SPEED	DRIVE RANGE	HRSS VALVE	boom position
3.0 mph (4.8 km/h)	HI	up	retracted and below horizontal
1.5 mph (2.4 km/h)	HI	down	retracted and below horizontal
0.75 mph (1.2 km/h)	LO	--	retracted and below horizontal
0.75 mph (1.2 km/h)	--	--	extended or above horizontal

NOTE: ENGINE THROTTLE, at the platform-control box, must be set to HI for MAX. SPEED.



13. FIRE FIGHTING & HAZARDOUS CHEMICAL CONTAINMENT

The TB 80 contains the following materials and objects that potentially could become significant fire or environmental hazards during the lifetime of the TB 80:

- Antifreeze (ethylene glycol)
- Battery, lead/acid
- Diesel fuel
- Foam in tires
- Gasoline
- Hydraulic oil
- Liquefied petroleum gas
- Motor oil

The rest of this chapter lists manufacturers' information you will need if you ever have to control any of the above items during an upset or emergency.

■ ANTIFREEZE (UN 1993)

Fire extinguishing media: Dry Chemical, foam, or CO₂.

Special fire fighting procedures: Water spray may be ineffective on fire but can protect fire fighters and cool closed containers. Use fog nozzles if water is used. Do not enter confined fire-space without full bunker gear. (Helmet with face shield, bunker coats, gloves & rubber boots). Use a NIOSH approved positive pressure self-contained breathing apparatus. Keep container tightly closed. Isolate from oxidizers, heat & open flame.

Spill or leak: Small - mop up with absorbent material & transfer to hood.

Waste disposal method: Small - evaporate until all vapors are gone. Dispose of remainder by legally applicable methods.

■ BATTERY, LEAD/ACID (UN 2794)

Extinguishing media: Dry chemical, foam, or CO₂.

Special fire fighting procedures: Use positive pressure, self-contained breathing apparatus.

Unusual fire and explosion hazards: Hydrogen and oxygen gases are produced in the cells during normal battery operation

(hydrogen is flammable and oxygen supports combustion). These gases enter the air through the vent caps. To avoid the chance of a fire or explosion, keep sparks and other sources of ignition away from the battery.

Spill or leak: Remove combustible materials and all sources of ignition. Contain spill by diking with soda ash (sodium carbonate) or quicklime (calcium oxide). Cover spill with either chemical.

Mix well. Make certain mixture is neutral then collect residue and place in a drum or other suitable container. Dispose of as hazardous waste.

Wear acid resistant boots, face shield, chemical splash goggles, and acid resistant gloves. DO NOT RELEASE UNNEUTRALIZED ACID!

Waste disposal method - Sulfuric Acid:

Neutralize as above for a spill, collect residue, and place in a drum or suitable container. Dispose of as hazardous waste.

DO NOT FLUSH LEAD CONTAMINATED ACID TO SEWER.

Waste disposal method - Batteries: Send to lead smelter for reclamation following applicable federal, state, and local regulations.

■ DIESEL FUEL (NA 1993)

Extinguishing media: Use water spray, dry chemical, foam, or CO₂.

Special fire fighting procedures: Use water to keep fire-exposed containers cool. If leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for personnel attempting to stop a leak. Water spray may be used to flush spills away from exposures.

Unusual fire and explosion hazards: Products of combustion may contain carbon monoxide, carbon dioxide, and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

Spill or leak: Contain spill immediately in smallest area possible. Recover as much of the product itself as possible by such methods as vacuuming, followed by soaking up of residual fluids by use of absorbent materials. Remove contaminated items including contaminated soil and place in proper containers for disposal. Avoid washing, draining, or directing material to storm or sanitary sewers.

Waste disposal method: Recycle as much of the recoverable product as possible. Dispose of nonrecyclable material as a RCRA hazardous waste by such methods as incineration, complying with federal, state, and local regulations.

■ FOAM IN TIRES

Extinguishing media: Water, dry chemical, foam, or CO₂.

Special fire fighting procedures: Evacuate non emergency personnel to a safe area.



13. FIRE FIGHTING

Unusual fire and explosion hazards: Fire fighters should use self-contained breathing apparatus. Avoid breathing smoke, fumes, and decomposition products. Use water spray to drench smoldering elastomer. Product may melt, after ignition, to form flammable liquid. Burning produces intense heat, dense smoke, and toxic gases, such as carbon monoxide, oxides of nitrogen, and traces of hydrogen cyanide.

Spill or leak: Pick up and handle as any other inert solid material.

Waste disposal method: Not considered a hazardous material. Dispose of material according to any local, state, and federal regulations.

■ GASOLINE (UN 1203)

Extinguishing media: Dry chemical, foam, or CO₂.

Special fire fighting procedures: Water may be ineffective to extinguish, but water should be used to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop a leak. Water spray may be used to flush spills away from areas of potential ignition.

Unusual fire and explosion hazards: Highly Flammable. Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

Spill or leak: Review fire and explosion hazards before proceeding with clean up. Use appropriate personal protective equipment during clean up. Dike spill. Prevent liquid from entering sewers, waterways, or low areas. Soak up with sawdust, sand, oil dry or other absorbent material. Shovel or sweep up.

Remove source of heat, sparks, flame, impact, friction or electricity including internal combustion engines and power tools. If equipment is used for spill cleanup, it must be explosion proof and suitable for flammable liquid and vapor.

NOTE: Vapors released from the spill may create an explosive atmosphere.

Waste disposal method: Treatment, storage, transportation and disposal must be in accordance with applicable federal, state, provincial, and local regulations. Do not flush to surface water or sanitary sewer system.

By itself, the liquid is expected to be a RCRA ignitable hazardous waste.

■ HYDRAULIC OIL (UN 1270)

Extinguishing media: Use water spray, dry chemical, foam, or CO₂.

Special fire fighting procedures: Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

Unusual fire and explosion hazards: Products of combustion may contain carbon monoxide, carbon dioxide, and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

Spill or leak: Contain spill immediately in smallest area possible. Recover as much of the product itself as possible by such methods as vacuuming, followed by soaking up of residual fluids by use of absorbent materials. Remove contaminated items including contaminated soil and place in proper containers for disposal. Avoid washing, draining or directing material to storm or sanitary sewers.

Waste disposal method: Recycle as much of the recoverable product as possible. Dispose of nonrecyclable material as a RCRA hazardous waste by such methods as incineration, complying with federal, state, and local regulations.

■ LIQUEFIED PETROLEUM GAS (UN 1075)

Extinguishing media: Water spray. Class A-B-C or BC fire extinguishers.

Special fire fighting procedures: Stop flow of gas. Use water to keep fire-exposed containers cool. Use water spray to disperse unignited gas or vapor. If ignition has occurred and no water available, tank metal may weaken from overheating. Evacuate area. If gas has not ignited, LP-gas liquid or vapor may be dispersed by water spray or flooding.

Spill or leak: Keep public away. Shut off supply of gas. Eliminate sources of ignition. Ventilate the area. Disperse with water spray. Contact between skin and these gases in liquid form can cause freezing of tissue causing injury similar to thermal burn.

Waste disposal method: Controlled burning.

■ MOTOR OIL (UN 1270) See HYDRAULIC OIL (UN 1270) above.



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LIMITED WARRANTY

Snorkel warrants each new machine manufactured and sold by it to be free from defects in material and workmanship for a period of one (1) year from date of delivery to a Customer or for one year after the machine has been placed in first service in a Dealer rental fleet, whichever comes first. Any part or parts which, upon examination by the Snorkel Service Department, are found to be defective, will be replaced or repaired, at the sole discretion of Snorkel, through its local Authorized Dealer at no charge.

Snorkel further warrants the structural components; specifically, the mainframe chassis, turntable, booms and scissor arms, of each new machine manufactured by it to be free from defects in material and workmanship for an additional period of four (4) years. Any such part or parts which, upon examination by the Snorkel Service Department, are found to be defective will be replaced or repaired by Snorkel through its local Authorized Dealer at no charge; however, any labor charges incurred as a result of such replacement or repair will be the responsibility of the Customer or Dealer.

The Snorkel Service Department must be notified within forty-eight (48) hours of any possible warranty situation during the applicable warranty period. Personnel performing warranty repair or replacement must obtain specific approval by Snorkel Service Department prior to performing any warranty repair or replacement.

Customer and Dealer shall not be entitled to the benefits of this warranty and Snorkel shall have no obligations hereunder unless the "Pre-Delivery and Inspection Report" has been properly completed and returned to the Snorkel Service Department within ten (10) days after delivery of the Snorkel product to Customer or Dealer's rental fleet. Snorkel must be notified, in writing, within ten (10) days, of any machine sold to a Customer from a Dealer's rental fleet during the warranty period.

At the direction of the Snorkel Service Department, any component part(s) of Snorkel products to be replaced or repaired under this warranty program must be returned freight prepaid to the Snorkel Service Department for inspection. All warranty replacement parts will be shipped freight prepaid (standard ground) from the Snorkel Service Department or from Snorkel's Vendor to Dealer or Customer.

REPLACEMENT PARTS WARRANTY

Any replacement or service part made or sold by Snorkel is not subject to the preceding **Limited Warranty** beyond the normal warranty period of the machine upon which the part was installed.

THIS WARRANTY EXCLUDES AND SNORKEL DOES NOT WARRANT:

1. Engines, motors, tires and batteries which are manufactured by suppliers to Snorkel, who furnish their own warranty. Snorkel will, however, to the extent permitted, pass through any such warranty protection to the Customer or Dealer.
2. Any Snorkel product which has been modified or altered outside Snorkel's factory without Snorkel's written approval, if such modification or alteration, in the sole judgment of Snorkel's Engineering and/or Service Departments, adversely affects the stability, reliability or service life of the Snorkel product or any component thereof.
3. Any Snorkel product which has been subject to misuse, improper maintenance or accident. "Misuse" includes but is not limited to operation beyond the factory-rated load capacity and speeds. "Improper maintenance" includes but is not limited to failure to follow the recommendations contained in the Snorkel Operation, Maintenance, Repair Parts Manuals. Snorkel is not responsible for normal maintenance, service adjustments and replacements, including but not limited to hydraulic fluid, filters and lubrication.
4. Normal wear of any Snorkel component part(s). Normal wear of component parts may vary with the type application or type of environment in which the machine may be used; such as, but not limited to sandblasting applications.
5. Any Snorkel product that has come in direct contact with any chemical or abrasive material.
6. Incidental or consequential expenses, losses, or damages related to any part or equipment failure, including but not limited to freight cost to transport the machine to a repair facility, downtime of the machine, lost time for workers, lost orders, lost rental revenue, lost profits or increased cost.

This warranty is expressly in lieu of all other warranties, representations or liabilities of Snorkel, either expressed or implied, unless otherwise amended in writing by Snorkel's President, Vice President-Engineering, Vice President-Sales or Vice President-Marketing.

SNORKEL MAKES NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THIS LIMITED WARRANTY. SNORKEL MAKES NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND DISCLAIMS ALL LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO INJURY TO PERSONS OR PROPERTY.

The Customer shall make all warranty claims through its local Authorized Dealer and should contact the Dealer from whom the Snorkel product was purchased for warranty service. Or, if unable to contact the Dealer, contact the Snorkel Service Department for further assistance.



CALIFORNIA

Proposition 65 Warning

Battery posts, terminals and related accessories contain lead and lead components, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

CALIFORNIA

Proposition 65 Warning

Diesel and gasoline engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects or other reproductive harm.