



TADANO

Operation

Telescopic Boom Crawler Crane
GTC-1600 Operation Manual—US

GTC-1600

Serial Number: 160-____

Document Number: 99600151358_A

Do not operate the GTC-1600 without first reading and understanding this manual.
Keep this manual in the operator cab for reference.



OPTIMAL lifting performance at any track WIDTH

 **WARNING**

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do NOT modify or tamper with the exhaust system.
- Do NOT idle the engine except as necessary.

For more information, go to www.P65warnings.ca.gov/diesel

WARRANTY

TADANO Mantis Corporation (herein referred to as TMC) warrants that each new product manufactured by TMC shall be free from defects in material or workmanship under normal use and maintenance for a period of twelve (12) months or 2,000 hours, whichever occurs first, from the date of initial sale, lease, or rental. The distributor designated by TMC shall repair and replace free of charge, including related labor, any such defective parts.

This warranty does not apply in the following cases, even when they occur during the warranty period:

1. Damage or defects caused by accident, misuse, negligence, or natural calamity.
2. Damage or defects caused by using parts other than TMC recommended parts.
3. Damage or defects, ascribed to repair work or modification (etc.), carried out at workshops other than those designated by TMC.
4. Damage or defects arising from the use of a product beyond the operating limitations specified by TMC.
5. Damage or defects caused by failure to operate, service, or maintain products in accordance with the operation and maintenance manuals or other instruction of TMC.
6. Loss of use, loss of time, inconvenience, and other consequential damages such as expenses for fuel, telephone, travel, lodging, transportation, loss, or damages to personal property or loss of revenues.
7. Slight defects that generally do not affect the integrity or reliability of product.
8. Corrosion or discoloration of plated surfaces caused by aging.
9. Consumable articles such as oil, fan belts, packing, gaskets, fuses, brake linings, fuel filters, and other similar parts.

The present warranty is in lieu of any other warranties, expressed or implied, including any warranty of merchantability or fitness for a particular purpose.

PREFACE

PURPOSE OF THIS OPERATION MANUAL

This operation manual describes how to properly use the TADANO GTC-1600 telescopic boom crawler crane. This manual also describes inspection, maintenance, and emergency procedures. Read this manual before use. It is intended primarily for the operator and maintenance specialists, and must be available at all times. Retain this manual in the operator cab for reference. The manual is an integral part of the GTC-1600. Before putting the GTC-1600 into operation, please read this manual thoroughly. Familiarize yourself with **Chapter 1: Safety**, and the instruction plates mounted on the GTC-1600 and their meaning. Also, familiarize yourself with the arrangement, function, and operation of all controls before starting the GTC-1600 for the first time (**Cab Controls and Switches, pg 3-3**). Observe all instructions and precautions in this manual when using the GTC-1600.

USE OF THIS OPERATION MANUAL

This operation manual covers the GTC-1600 model supplied, plus any available optional equipment. Consult the **Table of Contents, pg ix** to find desired information in this manual. The controls, gauges, and switches installed in the operator cab are referenced in this document. The figures shown may differ from the GTC-1600 model actually supplied, but are relevant. Figures and other references marked in **blue** are linked to the relevant content, in the PDF, for ease of use.

For operation, inspection, and maintenance of related item(s) listed below, read the separate manuals:

- Engine

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NOTE: If this manual is lost or damaged, immediately order a replacement from your nearest TADANO distributor or dealer. When transferring this GTC-1600, also transfer this manual with it. If you have any questions regarding this GTC-1600, contact your nearest TADANO distributor or dealer.

OPERATION MANUAL ORGANIZATION

- **Chapter 1: Safety** describes the safe use of the GTC-1600.
- **Chapter 2: Specifications** provides detailed information on GTC-1600 dimensions, capacities, and other specifications.
- **Chapter 3: Component Location and Overview** provides basic information about the GTC-1600.
- **Chapter 4: Assembly from Transport** provides detailed instructions about assembling and disassembling the GTC-1600 for transportation, maintenance, and storage.
- **Chapter 6: Operation** provides detailed operation instructions for all systems of the GTC-1600.
- **Chapter 7: Maintenance and Inspection** provides the necessary information to maintain the GTC-1600 and troubleshoot faults or errors during operation.
- **Chapter 8: Backup System Operation** provides information on using the back-up controls in the event of electrical system or CAN BUS failure.
- **Appendix A: Jib Setup and Stowage** provides information about installing, mounting, and removing the jib.

WARRANTY

Read the details of the GTC-1600 **Warranty** policy.

The engine warranty is specified in the warranty policy issued by the engine manufacturer.

NOTE: Handle this GTC-1600 only as described in this manual. The warranty of TADANO or the engine manufacturer does not cover any failure or accident caused by improper handling.

NOTE: Do NOT modify this GTC-1600. Failure or accident caused by customer modification is not covered by the warranty.

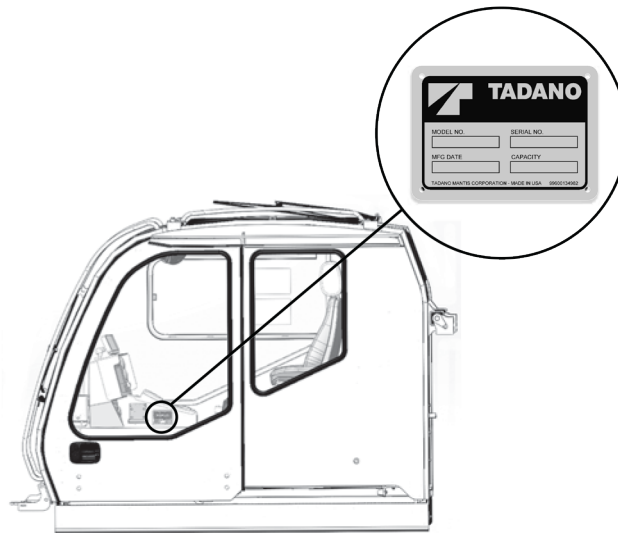
IN EVENT OF FAILURE

If service or replacement parts are necessary, contact your nearest TADANO distributor or dealer.

Have the following information ready:

- Model (GTC-1600) and serial number
- Details of the problem and parts needed

Figure 1: Location of model and serial tag information



USING GTC-1600 OUTSIDE OF THE UNITED STATES (INCLUDING SATELLITE COMMUNICATION TERMINAL)

This is a United States (US) specified machine, conforming to the laws and standards of the US. If used outside of the US, observe the laws and standards of the country where the GTC-1600 is used. Do NOT use until after confirming the GTC-1600 conforms to the laws and standards of the country.

For GTC-1600 equipped with a cellular (GSM) communication terminal, termination of communication contracts and removal of the communication terminal may be required before shipping the GTC-1600 outside of the US.

Please contact TADANO before shipping the GTC-1600 outside the US.

FOR SAFETY

Read and understand all of the safety precautions before operating the GTC-1600, and before any inspection or maintenance.

This GTC-1600, as shipped from TADANO, is equipped with the following safety devices and operational aids:

- AML-E2 rated capacity indicator
- Anti-two-block device
- Emergency machine off device
- Audible motion alarm
- External visual rated capacity indicator light
- Controls disable 'Deadman' in seat
- Controls disable switch

Many accidents that occur during operation, inspection, and maintenance are caused by ignoring basic safety rules and precautions. Disregarding even one safety precaution can result in a serious accident.

In order to prevent accidents, it is important to anticipate dangerous situations. The GTC-1600 manager and operator must recognize potential hazards specific to operation, and take proper precautions appropriate to the hazard.

See [Chapter 1: Safety](#), [Chapter 7: Maintenance and Inspection](#), and the markings (nameplates) on the GTC-1600 for more information.

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CHAPTER 1: SAFETY

SAFETY INTRODUCTION

Pay attention to the safety precautions found in this manual. These precautions are crucial for proper operation and maintenance. Safety precautions describe the actions necessary to prevent accidents when using the GTC-1600. All operators and service personnel must comply with the safety precautions found in this manual.

In actual operation, risks associated with the GTC-1600 can vary greatly depending on the working conditions—for example, operation method, work site, and/or weather. Therefore, observe the safety precautions in this manual and on the markings found on the GTC-1600. Also, anticipate potential risks to prevent accidents and damage to the GTC-1600.

Create a safe working environment for yourself and others around the GTC-1600.

BASIC SAFETY RULES

The operator should:

- Be trained and qualified as a crane operator.
- Have sufficient experience working with cranes in the anticipated working conditions.
- Be in good physical health, emotionally stable, and physically able to perform the operations described in this manual.
- Not use any medicine/drug that impairs physical, visual, or mental responsiveness.
- Ensure all personnel who enter the work site wear a hard hat, safety shoes, and gloves—in accordance with local regulations or in-house rules.
- Master the techniques for safe control of the GTC-1600 and be completely familiar with the operation and maintenance instructions in this manual.
- Keep the cab, walkways, and any other access areas free of mud, oil, grease, and water.
- Keep the control console clear of any objects that may obstruct free operation of the controls.
- Not climb on the boom or jib—it is very easy to suffer a fall and injury.
- Use a platform when working at an elevated position, to help prevent an accident.
- Be aware of overhead clearance and footing, when on the GTC-1600 for inspection or other purposes.
- Walk on the anti-slip strips provided, to avoid slipping, and replace worn anti-slip strips.
- Never get on or off a moving GTC-1600.

SAFETY DEVICES

The rated capacity indicator (RCI) functions properly only when used exactly as instructed in this manual. Failure to follow the instructions given could cause GTC-1600 damage, overturning, or other serious accident.

Ensure the safety devices (see [For Safety, pg viii](#) for a list) and alarm devices are always in good working order. Should any device malfunction, do not use the GTC-1600 until it is repaired. Avoid any act that could impair normal operation of the GTC-1600.

A safety device is not a substitute for operator experience, skill, or good judgment. Safety devices are provided only as an aid to the operator. They cannot control the GTC-1600. For example, the RCI does not provide a warning when the GTC-1600 is on soft, loose ground or when the number of parts-of-line is set insufficiently. It cannot predict the effect of wind, improperly adjusted devices, side loads on the boom, or any other potentially hazardous condition on the GTC-1600. Many safety devices can assist the operator in achieving safe results, but the operator should not depend solely on them to prevent accidents. Safe operation requires skill, experience, judgment, and safety awareness.

SIGNAL WORDS

The signal words DANGER, WARNING, CAUTION, and NOTICE are used throughout this manual to highlight important information. Ensure all who operate and service the GTC-1600 know the meaning of these signal words.



This safety alert symbol appears with most safety statements. It means pay attention, be alert, your safety is involved! Read and obey the message that follows the safety alert symbol.

DANGER

Indicates a hazardous situation that, if not avoided, *will* result in death or serious injury.

WARNING

Indicates a hazardous situation that, if not avoided, *could* result in death or serious injury.

CAUTION

Indicates a hazardous situation that, if not avoided, *could* result in minor or moderate injury.

NOTICE

Indicates a situation that, if not avoided, could cause damage to the GTC-1600, personal property, the environment, or cause the GTC-1600 to operate improperly.

NOTE: Indicates a procedure or condition that should be followed, or other necessary details, for the GTC-1600 to function in the manner intended.

GENERAL SAFETY PRECAUTIONS

PRECAUTIONS BEFORE STARTING THE ENGINE

WARNING

The following safety precautions have **WARNING** level hazards.

READ THIS MANUAL

Ensure all operators read this manual carefully to fully understand how to operate, inspect, and maintain the GTC-1600. Do NOT start work until you understand this manual. Incorrect crane operation, inspection, or maintenance can damage the GTC-1600 and cause injury or death. Keep this manual in the cab, for reference, at all times.

FOLLOW SAFETY PRECAUTIONS AND MARKINGS

Always read and understand the safety precautions within this manual and the markings on the GTC-1600. They warn of potential hazards when operating the GTC-1600.

Figure 2: Read all safety messages



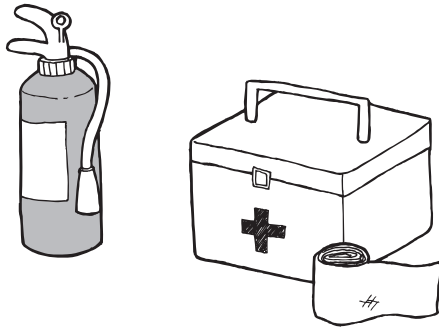
CARE OF MARKINGS

Always keep markings clean and legible. The markings attached to the GTC-1600 give important precautions necessary for safe crane operation. If a safety label is lost or illegible, order a replacement from your nearest TADANO distributor or dealer and attach it to the GTC-1600 as shown in [Safety and Instruction Markings, pg 1-26](#).

PREPARE FOR EMERGENCY

Know where the first-aid kit (**Figure 39**) and fire extinguishers are kept and how to use them. Prepare a list of emergency contacts and communication methods before starting work.

Figure 3: Be prepared for an emergency



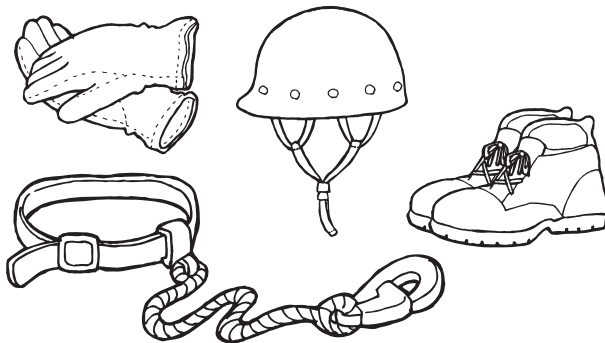
WEAR PROPER CLOTHING

Always wear appropriate, fitted clothing. Loose clothing or clothing with holes could catch on control joysticks or protrusions or not provide adequate protection. Wear safety shoes with non-slip soles.

WEAR PROTECTIVE EQUIPMENT

Always wear OSHA-approved protective equipment such as a hard hat, safety shoes, hearing protection, and protective gloves to ensure safety while you work. Wear a safety belt when you work at a height of 6.5 ft (2 m) or higher.

Figure 4: Wear protective equipment



NEVER OPERATE GTC-1600 WHEN TIRED OR UNDER THE INFLUENCE OF ALCOHOL OR DRUGS

Never operate the GTC-1600 when you are tired or when you are under the influence of intoxicants and/or narcotics. If you are sleep deprived or under the influence of drugs or alcohol, your judgment and attention are compromised—making you a hazard to yourself and others.

KEEP FLOORS AND SHOE SOLES CLEAN

Always completely clean oil and mud from shoe soles and floors before operation. Always keep shoe soles and floors clean. Always wear slip-proof shoes. Oil and mud on shoe soles, pedals, steps, or walking surfaces can make your feet slip. This can cause a fall or an operation error. Never place parts or tools on the floor of the operator cab or the walkways. Loose items will obstruct safe operation.

GET ON AND OFF GTC-1600 SAFELY

Use caution when getting on or off the GTC-1600.

- Always wait until the GTC-1600 has stopped completely before getting on or off the GTC-1600.
- Always face the GTC-1600 while getting on and off.
- Always secure your body with three or more contact points when using the handrails and steps.
- Never jump on or off the GTC-1600.
- Never get on or off the GTC-1600 while carrying something in your hand.
- Never use the GTC-1600 controls to support your body.

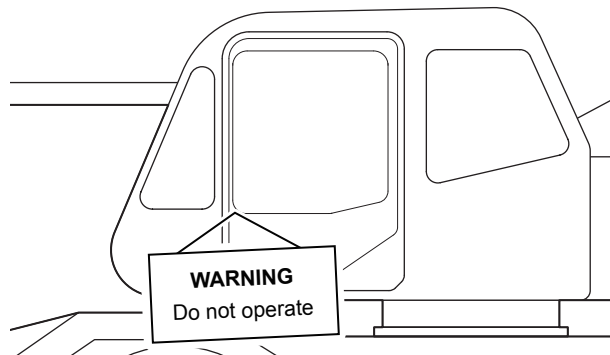
MAINTAIN GOOD VISIBILITY

Always keep the window glass and lights clean to ensure good visibility. Poor visibility hinders safe operation.

NEVER OPERATE GTC-1600 DURING INSPECTION OR MAINTENANCE

Never operate the GTC-1600 during inspection or maintenance. When a warning tag is hung on a door or joystick, never operate the GTC-1600 until the warning tag is removed by the maintenance technician. Operation during inspection or maintenance can cause bodily injury or damage to the GTC-1600.

Figure 5: "Do not operate" sign



HOLD PLANNING MEETING BEFORE WORK

Hold adequate pre-work planning meetings to coordinate activities and help prevent accidents. Ensure all decisions are obeyed. Make detailed arrangements before the start of work between the supervisor and rigging and signalling workers for the following considerations:

- Plan the work based on the load chart, the weight of the load to be lifted, the lifting height, the site conditions for loading and unloading the GTC-1600, the site conditions for crane setup, work procedures, rigging method, etc..
- Check ground conditions where the GTC-1600 will be set up—look for buried objects such as water or gas pipes.
- Consider methods to help prevent overturning, such as extension of the tracks and use of steel plates on the ground.
- Select rigging and signalling workers, and agree on the signaling method.
- Set an off-limits zone with fencing and ropes.
- Check the positions of workers.
- Establish clear communication between the crane operator and any ground personnel.
 - ◇ If using hand signals, both the crane operator and ground personnel must decide on the hand signals that they will be using during the job before the work begins (**Recommended Hand Signals, pg 1-23**).
 - ◇ If hand signals are not used, proper radio communication must be set up and tested before the job begins.
- Check emergency communication methods, contact addresses, and confirm relevant safety and health organizations.

CONFIRM SAFE CONDITIONS AROUND GTC-1600 BEFORE STARTING ENGINE

Before starting the engine, always sound the horn to alert anyone around the GTC-1600. Confirm there are no people or obstacles under or around the GTC-1600 before starting the engine. If you start the engine without confirming safe conditions around the GTC-1600, damage, injury, or death may occur.

KEEP ENGINE SURROUNDINGS CLEAN

Always remove dead leaves, trash, oil, and other flammable objects near the engine before operation to help prevent a fire.

BE CAREFUL WHEN REFUELING

Always use caution when handling fuel, oil, and grease. They are highly flammable and can be dangerous. Always observe the following precautions when refueling the GTC-1600.

- Stop the engine.
- Refuel the GTC-1600 in a well-ventilated, open area.
- Keep open flame (such as a lit cigarette) away from flammable objects and fuel.

WHEN YOU LEAVE GTC-1600

Use the following precautions to help prevent anyone not authorized from operating the GTC-1600:

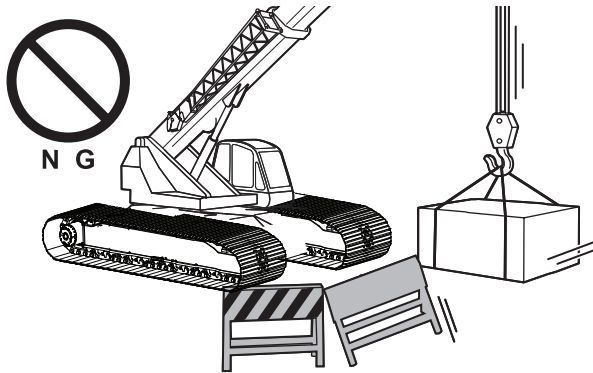
- Always press the controls enable switch to the OFF position before leaving the cab.
- Park the GTC-1600 on a level surface.
- Apply all brakes and locks, and set the joysticks to neutral position.
- Stop the engine and remove the key from the starter switch.
- Lock all doors, windows, and covers.

PRECAUTIONS DURING OPERATION

CHECK WORK SITE CONDITIONS

Always pay close attention to the surrounding conditions when operating the GTC-1600. Watch for any changes in the surroundings during work. Before starting work, check the location where the GTC-1600 will operate. Check the crane passageways, for the presence of obstacles, how other machines are set up, etc..

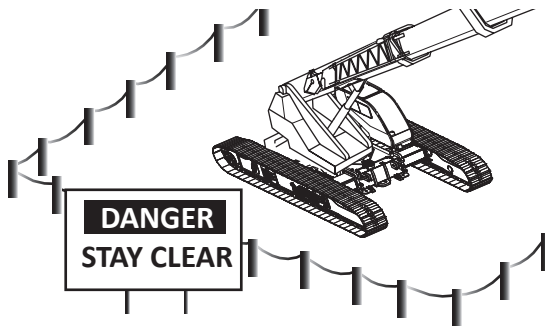
Figure 6: Consider work site conditions



PROHIBIT UNAUTHORIZED ACCESS TO WORK SITE

Ensure there are no obstacles and only authorized personnel at the work site before starting work. Designate the work site as an off-limits zone. Take measures to prevent unauthorized access to the off-limits zone—for example, install fencing and assign a guide person to prevent accidents while working in a site with heavy traffic. If unauthorized people or vehicles enter the work site, accidents such as collisions, injuries, or deaths could occur.

Figure 7: Restrict access to work site



ASSIGN SIGNAL PERSON

Always assign a signal person ([Recommended Hand Signals, pg 1-23](#)) and ensure the instructions from the signal person are obeyed. It is particularly important in the following cases:

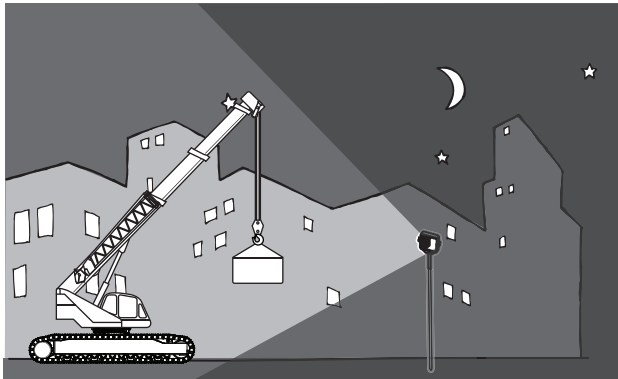
- When working near electrical lines
- When the operator cannot see the lifted load
- When moving the GTC-1600 into a narrow passage or in a direction where the view is unclear
- When working jointly with two or more machines

Always use portable radio equipment, if possible, for communication between the signal person and operator.

USE SUFFICIENT ILLUMINATION AT NIGHT

Always use work lights when working at night so that you can clearly see the movements of the GTC-1600 and lifted load. Install additional lights to illuminate the areas surrounding the GTC-1600. In a dark, unlit area, people and obstacles around the GTC-1600 cannot be easily seen, which increases the risk of accidents.

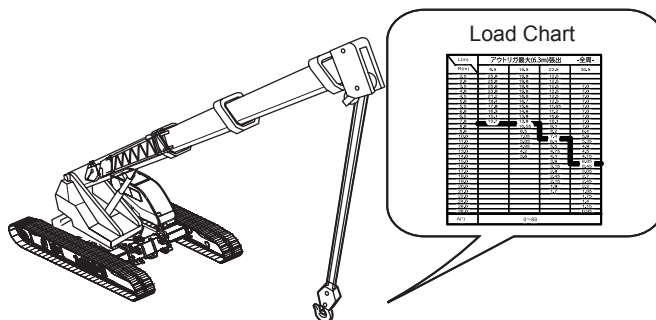
Figure 8: Do NOT operate the GTC-1600 in the dark



OBSERVE CONDITIONS FOR WORK

Always strictly observe the conditions for the work specified in the load chart. If the track position, boom length, load radius, etc. are outside of the specifications in the load chart, the GTC-1600 could overturn even if a load is not lifted.

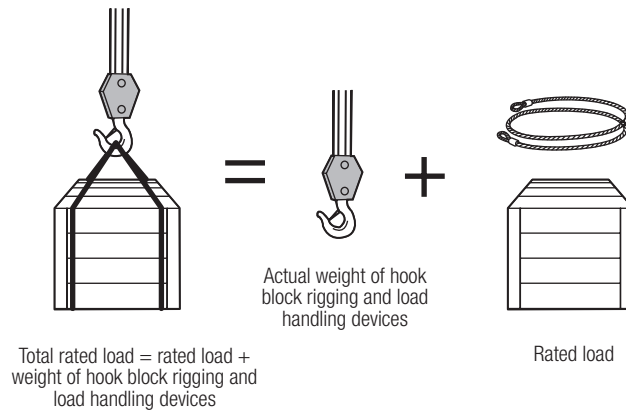
Figure 9: Review applicable load charts



NEVER OPERATE GTC-1600 WITH LOAD EXCEEDING RATED LIFTING CAPACITY

Always check the rated lifting capacity before lifting a load. The rated lifting capacity differs depending on boom length, load radius, and other factors. Never lift a load exceeding the values specified in the load chart. If a load with a weight that exceeds the rated lifting capacity is lifted, the GTC-1600 is overloaded and damage or an overturning accident can occur.

Figure 10: Total rated load weight



USE SAFETY DEVICES CORRECTLY

Always use the safety devices (for example, the automatic moment limiter) as instructed in this manual. Damage to the GTC-1600 or an overturning accident could result from safety devices that are used incorrectly or with functions obstructed.

PROTECT AGAINST NOISE

Always protect against noise-induced hearing loss. If working outside the cab, wear hearing protection (such as earplugs). Operate the crane components and engine smoothly, without sudden movements, to help reduce overall crane noise.

During crane operation, close the following:

- Engine, hydraulic, and other compartment doors and covers
- Operator cab door and windows

CONDUCT INSPECTION AFTER STARTING ENGINE

Always check the devices and instrument readings after starting the engine. Ensure no obstacles or people are around the GTC-1600. Then, under a no-load condition, check the operation of the control systems, lifting systems and safety systems. Carry out inspections in a sufficiently large space without people and obstacles around the GTC-1600. Neglecting the inspections after engine start-up will delay detection of GTC-1600 abnormalities. This can cause damage to the GTC-1600 and injury or death.

CHECK BEFORE LIFTING LOAD

Always check the following before lifting a load:

- The weight of the lifting load does not exceed the rated lifting capacity.
- The number of parts of line for the wire rope is set according to the standard number of parts of line specified in the load chart.
- Proper lifting devices are used and the load is rigged securely.
- The hook block is positioned directly over the center of gravity of the load.
- The load lines are vertical so that the load is lifted vertically.
- The safety latch of the hook block functions properly.
- The wire ropes are not intertwined and are wound orderly.

SECURELY RIG LOAD

Always rig the load securely. If the rigging method is incorrect, the lifted load can fall and cause an accident.

Consider the following precautions to ensure secure rigging:

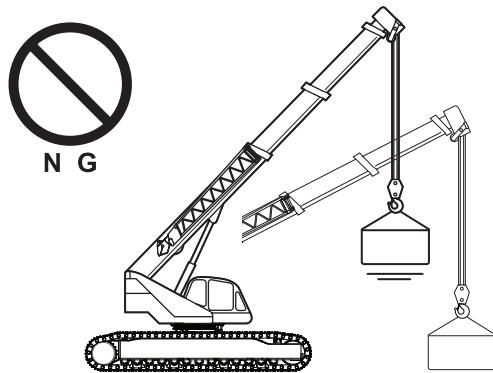
- Understand the weight and center of gravity of the load, and use the lifting devices best suited for the weight and shape of the load.
- The lifting devices, such as wire ropes and chains, must be sufficiently strong and in good condition, with no damage or wear.
- Rig a load directly over its center of gravity so that the lifted load does not overturn or slip out when lifted off the ground. Also, rig a load properly so that the lifting devices never cross over each other or intertwine.
- Never rig a load with a single rope. The lifted load can turn and create a hazard, and the turn of the load untwists the rope and reduces its strength.
- If a load has sharp corners, apply pads to the corners to protect the rigging wire ropes and loads from damage.

CAREFULLY LIFT LOAD OFF GROUND

Always raise the load, just clear of the ground, carefully and by winch operation. Never lift a load just clear of the ground by raising or extending the boom. Such operations can damage the GTC-1600 and cause an overturning accident.

- When lifting a load just clear of the ground, stop the winch with the rigging ropes tensioned.
- Ensure the load is rigged above its center of gravity and that the load does not stick to the ground or touch other loads or structures.
- Lift the load vertically and stop when the load is several inches above the ground to stop the sway of the load.
- Confirm the rigging is satisfactory, the load is securely held at the position, and the GTC-1600 is not overloaded. Then, continue lifting.

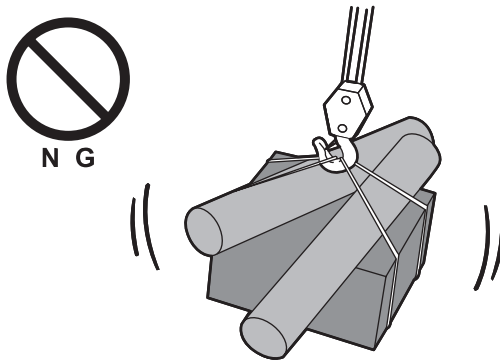
Figure 11: Lift load carefully



LIFT SINGLE LOAD ONLY

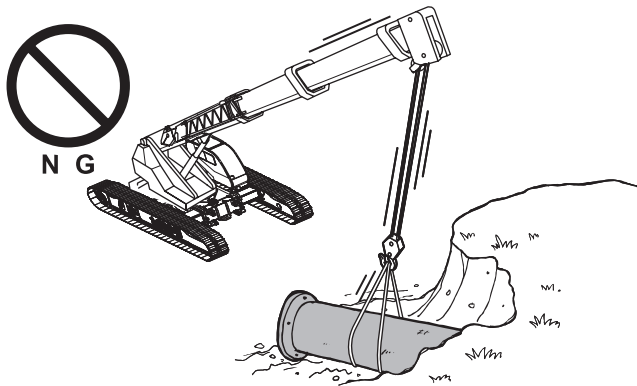
Only lift a single load at a time. Never lift two or more loads at once. Even if the total load weight is within the rated lifting capacity, the loads can lose balance and create a hazard. Also, the operator cannot fully concentrate on multiple loads.

Figure 12: Lift one load at a time

**NEVER LIFT BURIED LOAD**

Never lift objects driven into the ground such as poles, piles, trees, or objects buried in mud or sand. Lifting buried objects can apply an unexpected load to the GTC-1600. This load can damage the GTC-1600 or cause an overturning accident.

Figure 13: Do NOT lift buried loads



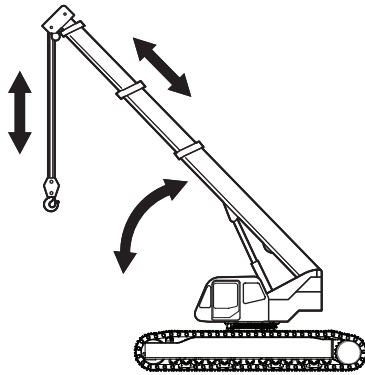
AVOID OVERLOADING (EXCEEDING CAPACITY)

Always operate the GTC-1600 with extreme care if a load is close to the rated lifting capacity. Overloading can occur when the load sways. If overloading occurs, lower the load to the ground by winch down operation. When extending or lowering the boom, be careful to avoid overloading caused by the increased load radius.

BE CAREFUL OF SIMULTANEOUS OPERATION OF GTC-1600 FUNCTIONS

Do NOT operate GTC-1600 functions simultaneously, until you are very familiar with their operation. An operation warning can occur during simultaneous operations. During simultaneous operations, GTC-1600 movements tend to be slower than those of independent operations. Conversely, when the simultaneous operations are switched to independent operation, movement can become faster. When you carry out simultaneous operations, always be aware of and avoid a sudden change in operation speed.

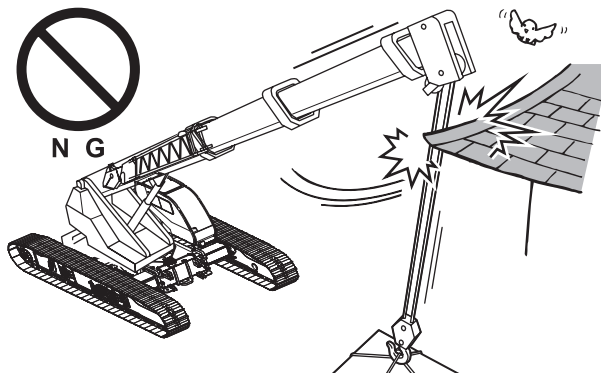
Figure 14: Avoid simultaneous crane functions



BE CAREFUL TO AVOID COLLISIONS WITH STRUCTURES NEARBY

When moving a lifted load, do not allow the GTC-1600 or the load to collide with a building or other structure. In a site with many such obstacles, post a signal person and follow the instructions from the signal person to prevent a collision.

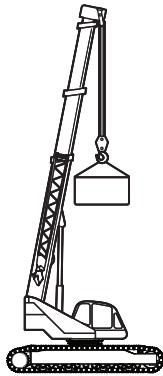
Figure 15: Do NOT let the lifted load hit an obstruction



CAREFULLY OPERATE WHILE BOOM IS RAISED HIGH

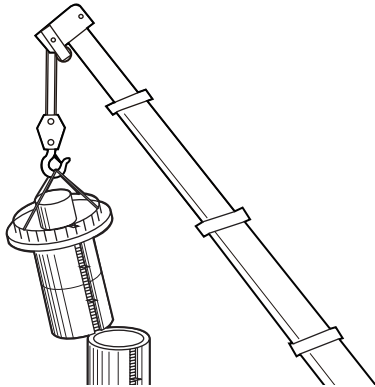
Always operate carefully when the boom is raised high to prevent the load from colliding with the boom or jib. When the boom angle is close to the upper limit, the horizontal clearance between a lifted load and the boom is small. If the lifted load sways in this condition, the load can collide with the boom or jib. This can damage the boom or jib or the load itself.

Figure 16: Do NOT allow load to collide with boom or jib

**CARRY OUT DEMOLITION WORK CAREFULLY**

Always check the weight and center of gravity of the load before operation, and decide the lifting method accordingly. Never lift a structure during demolition work if its weight and center of gravity are unknown.

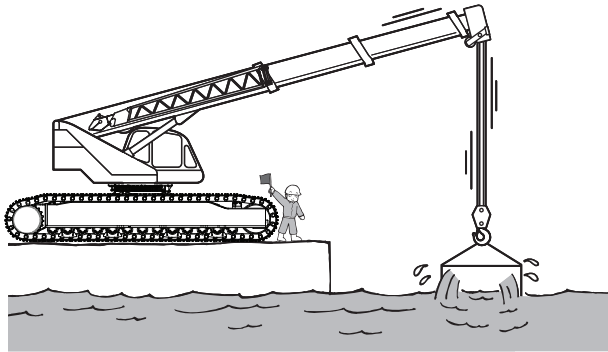
Figure 17: Use care with demolition work



LIFT SUBMERGED LOAD CAREFULLY

Use extreme caution to avoid overloading, when lifting a load submerged under water. If the load contains water, it can be several times heavier than the expected weight. Never lift a load from water in one quick operation. Drain water while slowly lifting the load. Even if water is completely drained, a load raised out of water is much heavier than when it is buoyant.

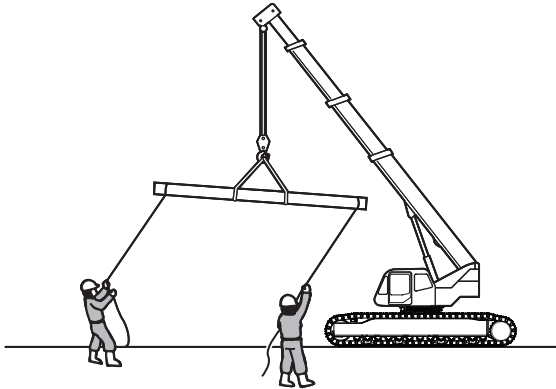
Figure 18: Use care with submerged loads



PAY ATTENTION TO A LONG LOAD

Always be careful when lifting a long load. The load can turn and collide with rigging workers, the GTC-1600, or structures around the GTC-1600. Attach guide rope(s) to one or both ends of the load to maintain its position and prevent it from turning or swaying.

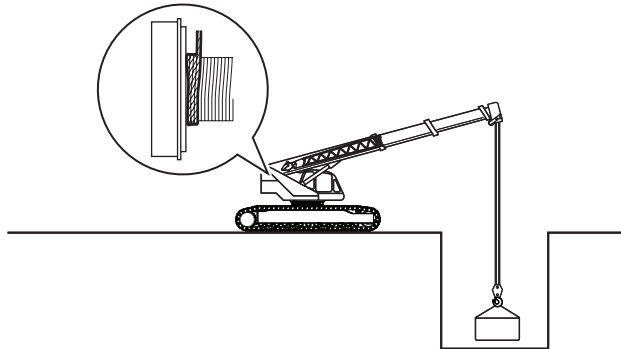
Figure 19: Use tether lines to help control the load



PAY ATTENTION TO THE TURNS OF WIRE ROPES ON WINCH DRUM

Never allow a wire rope to be completely reeled out from the winch drum. If a wire rope is completely reeled out from the winch drum, the load is directly applied to the rope end due to loss of friction. This can damage or break the wire rope. Ensure that three or more extra turns always remain on the winch drum. Be especially careful when the load is lowered below ground level.

Figure 20: Do NOT allow wire rope to be completely reeled out from winch drum



NEVER SUSPEND LOADS FOR LONG TIME

Always arrange the work procedure to minimize the load lifting duration.

USE GTC-1600 ONLY FOR THE SPECIFIED PURPOSES

Always use the GTC-1600 for its specified application of lifting objects. Never use the GTC-1600 for other applications, such as pushing an object with the boom.

NEVER ADD COUNTERWEIGHT

Never install counterweights other than those specified, or objects substituting as counterweights, onto the GTC-1600. Addition of counterweights other than the specified ones can damage the GTC-1600. This can affect backward stability and cause the GTC-1600 to overturn to the rear.

Figure 21: Never add counterweight



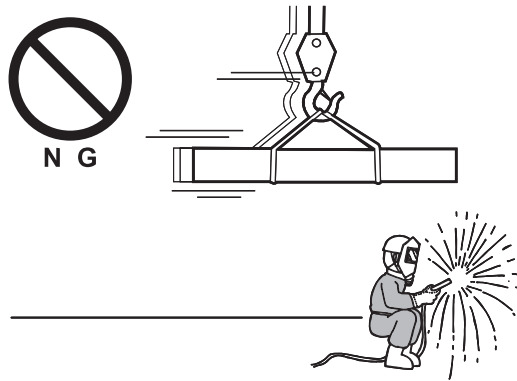
AVOID DISTRACTION

Do NOT look away from the signal person and lifted load. Always concentrate on the crane operation. Inattentive operation is very dangerous.

NEVER PASS A LOAD OVER A PERSON

Always avoid dangerous operations such as passing a hook block or a lifted load over a person. Never allow anyone to enter the area under the boom or lifted load.

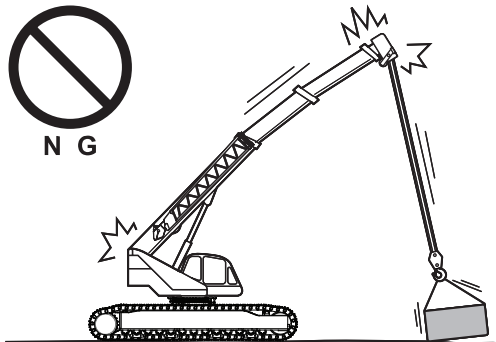
Figure 22: Never pass a load over someone



AVOID SIDEWAYS PULLING, DIAGONAL LIFTING, AND PULLING IN OF LOAD

Never forcibly pull in a load that lies out of the load radius. Move the GTC-1600 close to the load, and lift it vertically. It is very dangerous to pull a load sideways, to lift it diagonally or to pull in a load. Such operations damage the boom, jib, and swing mechanism, and they may also overturn the GTC-1600.

Figure 23: Do NOT apply sideways pressure to boom



BEFORE LEAVING OPERATOR CAB

Always take the following measures before leaving the operator cab:

1. Lower the load onto the ground.
2. Fully retract the boom and stow it.
3. Apply the house locks.
4. Return the control joysticks to the neutral position.
5. Press the controls enable switch to the OFF position.
6. Stop the engine, and remove the key from the starter switch.
7. Lock all the doors and covers.

NEVER LET PERSONNEL OTHER THAN OPERATOR GET ON GTC-1600

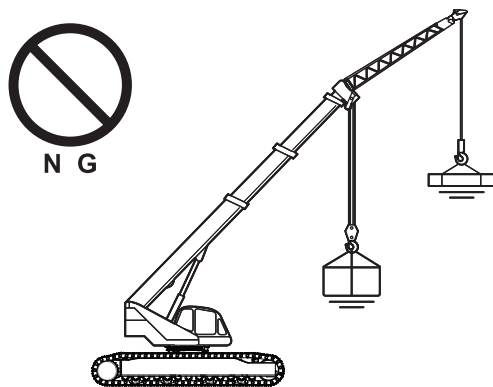
Never allow anyone other than the operator to get on the GTC-1600 during operation. If anyone other than the operator rides on the GTC-1600, the person can be caught by or fall from the GTC-1600. Presence of other people also hinders crane operation.

PRECAUTIONS WHEN JIB IS MOUNTED

Always pay attention to the following points during a boom lift operation with the jib mounted.

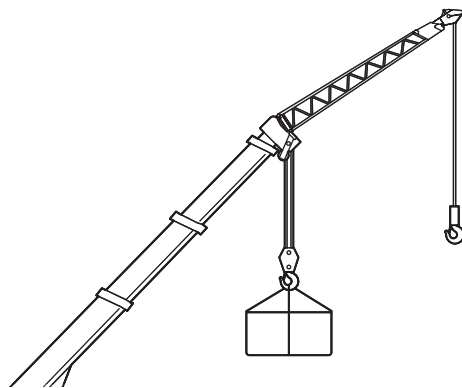
- Never lift individual loads using the boom and jib at the same time. The boom and jib can be damaged, and the GTC-1600 can overturn.

Figure 24: Do NOT lift from boom and jib simultaneously



- Observe the value of the rated lifting capacity chart according to the actual boom and jib conditions.
- During a boom lift operation with the jib mounted, the GTC-1600 stops just before the moment load ratio reaches 100%.

Figure 25: Use caution lifting from boom when jib is installed



STOP OPERATION WHEN VISIBILITY IS POOR

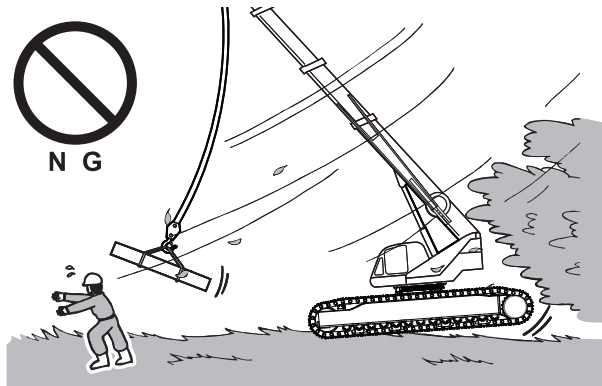
Always stop operation and stow the GTC-1600 when visibility becomes poor due to bad weather such as rain, snow or fog. Wait until good visibility returns before resuming operation.

STOP OPERATION DURING STRONG WIND CONDITIONS

Always pay attention to wind speed. A strong wind will sway the lifted load. This is dangerous to workers and surrounding structures, and can damage the boom and overturn the GTC-1600.

- The longer the boom and the larger the load, the more the wind will affect GTC-1600 operation.
- Stop crane operation if you cannot control the load because of strong wind.
- Reduce the load considering the wind speed, if the wind speed exceeds 20 mph (9 m/s). When strong winds with maximum instantaneous wind speed of 31 mph (14 m/s) or more blow, stop operation, and stow the boom.
- Pay special attention when the boom is long or the lifted load has a large area. Stop operation as the situation requires even if the wind speed is less than 20 mph (9 m/s).

Figure 26: Stop operation in strong wind



Wind Speed Values

Table 1: Visual wind speed conditions^α

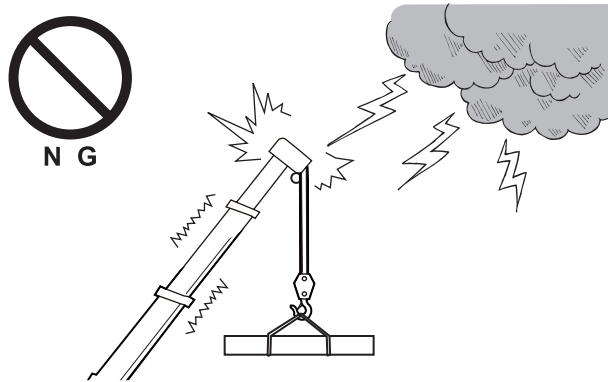
Wind Speed (m/second)	Wind Speed (mph)	Ground Conditions
5–8	12–18	Dust and loose papers rise. Small tree branches begin to move.
8–11	18–24	Low trees with leaves start to sway. Water surfaces in ponds or marshes start to form waves
11–14	24–31	Large branches move. Whistling is heard in overhead wires. Umbrella use becomes difficult.
14–17	31–38	Whole trees sway. Effort is needed to walk against the wind.

^α Based on a height of 30 ft (10 m) above open, flat ground.

STOP OPERATION WHEN THERE IS RISK OF LIGHTNING STRIKE

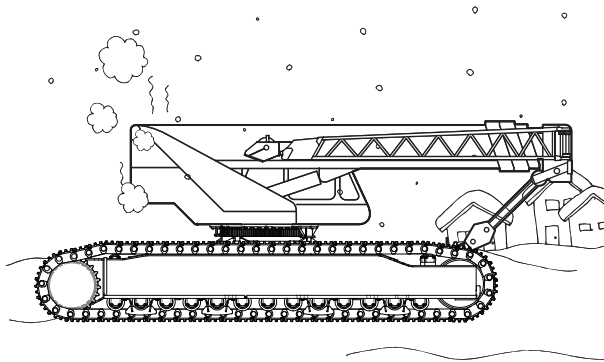
Always stop operation, stow the boom and leave the GTC-1600 when there is a risk of a lightning strike. If the GTC-1600 is struck by lightning, the GTC-1600 can be damaged and the operator and workers around it can be injured. If the GTC-1600 is struck by lightning, stay in the cab to avoid another lightning strike.

Figure 27: Stop operation if risk of lightning strike



COLD WEATHER PRECAUTIONS

Figure 28: Be aware of cold weather precautions



Always pay attention to the following points when operating the GTC-1600 during cold weather:

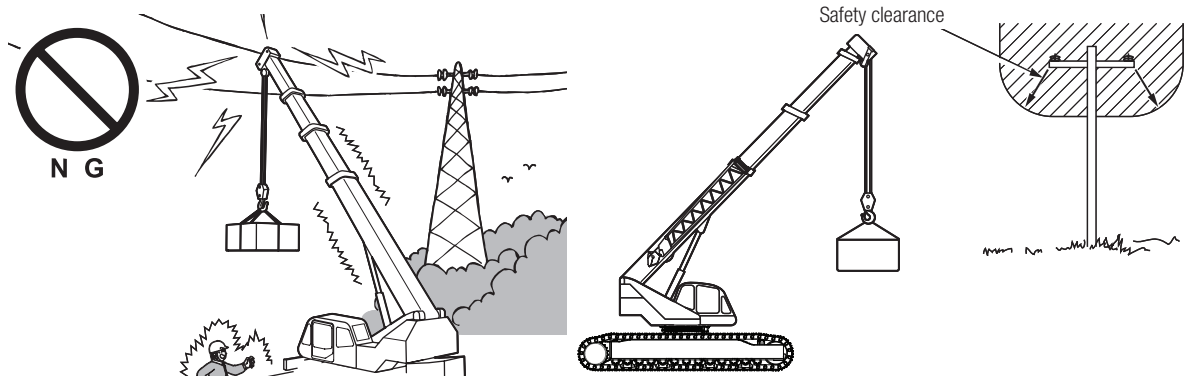
- Remove any snow or ice on the GTC-1600. Pay special attention to the boom to clear it completely—snow or ice could fall during operation, creating a hazardous situation.
- Never touch the metal surfaces of the GTC-1600 in extreme cold. Skin can stick to the frozen metal surface.
- Warm up the GTC-1600 sufficiently.
- After warm-up, ensure the GTC-1600 operates normally. Properly unfreeze and dry the components as needed.
- When beginning operation, operate the GTC-1600 slowly until the oil warms up and grease lubrication becomes effective.
- Ensure the load is not frozen and stuck to the ground. It is dangerous to lift a load when it is stuck to the ground.
- At the end of an operation, clean the mud around the tracks to prevent accidents caused by freezing.
- Pay extra care to battery maintenance. Use oils, greases, and fuels suitable for cold climates.

AVOID ELECTRIC SHOCK

Grounding the GTC-1600 has little or no effect in preventing electric shock accidents. Its effectiveness varies depending on the length and thickness of the lead, condition of the ground, and intensity of the electric current and voltage. In addition, a grounded crane may produce an intense arc if it touches a power line.

Always avoid electric shock. You can be shocked simply by approaching electric lines, depending on the voltage. If operation near power cables or main lines is unavoidable, take the following preventative measures.

Figure 29: Be aware of electrical hazards



- Consult with the power company, in detail, and take all necessary precautions to ensure safety before working around power lines.
- Ensure workers, such as riggers, wear rubber or leather shoes.
- Always keep the specified or larger clearance between a power line and a lifted load or a GTC-1600 during operation.
- Assign a dedicated signal person to prevent GTC-1600 and lifted load from approaching an electric line as well as unauthorized persons from entering the work area.
- Never allow workers on the ground to touch the GTC-1600 or a lifted load. If it is necessary to control a lifted load, attach a dry fiber rope to the load as a guide rope to prevent a load from turning and swaying.
- Never place loads below electric lines or near power sources.

Should the GTC-1600 or load touch a power line, do the following:

1. Keep calm and do not leave the cab.

NOTE: A mistake may directly result in loss of life. Warn all personnel not to touch the GTC-1600 or load, and to keep clear of them.

2. Ask someone outside of the danger zone to shut off the power supply.
3. If the GTC-1600 is still operational, break contact with the power line by driving away or by swinging/adjusting the boom away from the power line. Move the GTC-1600 until the arc breaks.

NOTE: An arc can extend over a very long distance.

4. If the GTC-1600 is still operational, remove the crane from the danger zone by driving away from the power line until the GTC-1600 is at least the minimum required distance from the power lines ([Table 2](#)).
 - a. If the GTC-1600 is not on fire and no arc is passing through the cab but the GTC-1600 cannot be detached from the power lines, wait in the operator cab until the power is shut off.
 - b. If you must get out of the GTC-1600, jump directly from the cab as far as possible after confirming the landing place is safe. Never touch the GTC-1600 and the ground at the same time. Touching other parts of the GTC-1600 when you descend will cause electric shock.
5. After moving away from the power lines, carefully check the GTC-1600 for possible damage. Before restarting operation, contact an authorized TADANO distributor or dealer to discuss the measures, and inspection and repairs required.

Table 2: Minimum required clearance from power lines

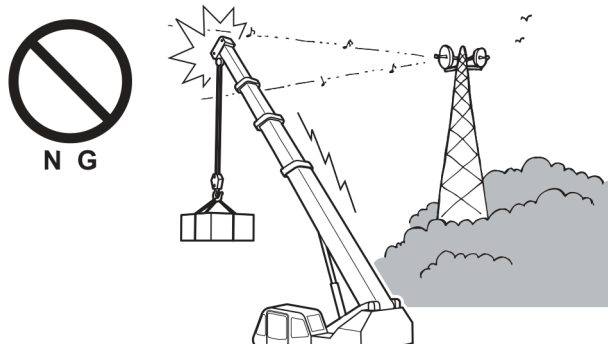
	Normal Voltage, kV (Phase to Phase)	Minimum Required Clearance, ft (m) ^β
Operation near high-voltage power lines	Up to 50	10 (3.05)
	Over 50–200	15 (4.57)
	Over 200–350	20 (6.10)
	Over 350–500	25 (7.62)
	Over 500–750	35 (10.67)
	Over 750–1000	45 (13.72)
Operation in transit with no load and boom or mast lowered	Up to 0.75	4 (1.22)
	Over 0.75–50	6 (1.83)
	Over 50–345	10 (3.05)
	Over 345–750	16 (4.87)
	Over 750–1000	20 (6.10)

^β Environmental conditions such as fog, smoke, or precipitation may require increased clearances.

PAY ATTENTION TO HIGH-POWER RADIO WAVES

Always contact the broadcasting company and seek safety advice before operating near high-power radio wave generating sources such as television and radio transmission towers. When operating the GTC-1600, take preventative measures such as wearing rubber gloves to avoid electric shocks and burns. Induction current is generated in the structural part of the GTC-1600 near high-power radio wave generating sources. Induction current may cause electric shock by electrification or burns from heated GTC-1600 parts, such as the hook block. Also, electronic equipment can be damaged or destroyed.

Figure 30: Operate near high-power radio wave sources carefully



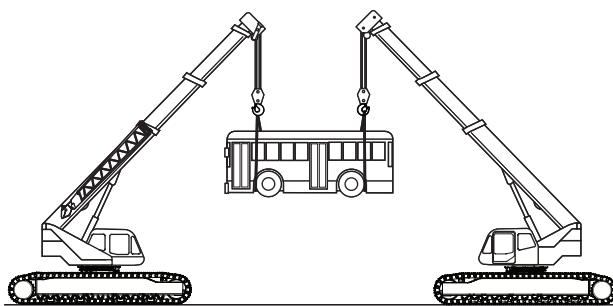
EXERCISE CAUTION FOR MULTI-CRANE OPERATION

Always avoid using two or more cranes to lift a load. Multi-crane operation is hazardous because of the deviations of the center of gravity. It can cause overturning, dropping of lifted loads, and damage to the boom.

If a multi-crane operation is unavoidable, observe the following points with the closest attention:

- Make detailed arrangements with the involved workers about the operating methods in advance.
- Assign a supervisor and follow the instructions. If necessary, give all involved workers communication equipment.
- Set up the cranes level and on solid ground, with the tracks fully extended.
- Use cranes of the same type and the same performance with sufficient capacity for the loads. Set all the boom lengths, boom angles and number of parts of line to be equal.
- Lift the load so that the wire ropes of each crane are always vertical.
- Rig the load so that each crane evenly bears the load.
- Move the load by winch operation and boom elevation operation, and avoid swing operation wherever possible. Never do simultaneous operations of hoisting, boom elevating, swinging, etc.
- Operate each crane simultaneously so that the load is distributed evenly by both cranes.

Figure 31: Use caution for multi-crane operations



STOW GTC-1600 AFTER OPERATION IS COMPLETE

Always stow the GTC-1600 after completing operation. It is dangerous to leave the GTC-1600 in the operating configuration.

SAFETY INSTRUCTIONS

RECOMMENDED HAND SIGNALS

During all intended GTC-1600 movements (with or without load), the operator must always have the load or the load lifting device in his field of vision. Loads fixed by hand may only be moved by the crane operator after he has received a corresponding signal from the person fixing the load or from another responsible person who has been determined in advance.

If the operator's field of vision is impaired by obstacles, he may only move the GTC-1600 or the load with the help of an assistant, determined in advance, to give him appropriate instructions.

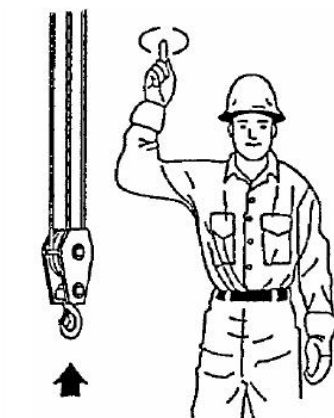
The instructions can be relayed by radio equipment or hand signals. However, clear communication—free from misunderstanding—must always be ensured between the assistant giving the instructions and the operator.

The following hand signals shown are excerpted from ASME B30.5-2014.

DANGER

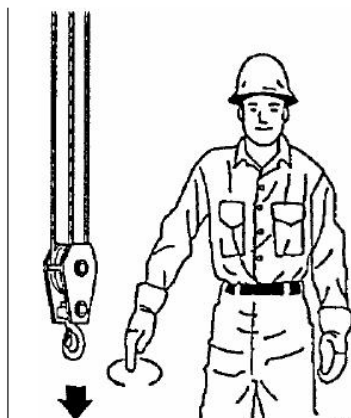
- Hand signals and special verbal expressions must be agreed upon between the operator and his assistant and observed precisely.
- Any mistakes regarding the interpretation of the hand signals or verbal expressions may result in accidents.
- The person giving the hand signals must always be placed so that he can see the operator, and keep at a safe distance from the hook or the load.

Figure 32: Hand signals



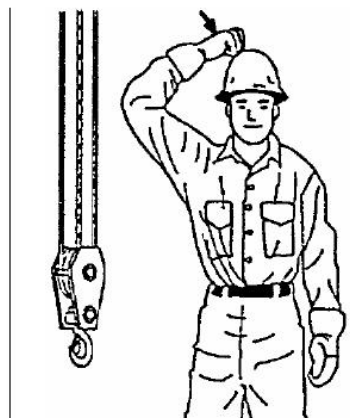
Hoist

With forearm vertical, forefinger pointing up, move hand in small horizontal circle.



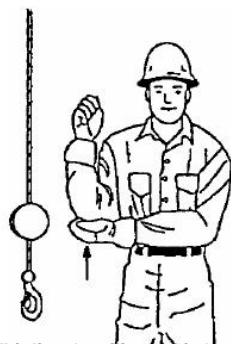
Lower

With arm extended down, forefinger pointing down, move hand in small horizontal circle.



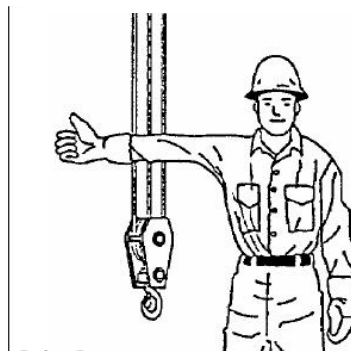
Use main hoist

Tap fist on head, then use regular signals.



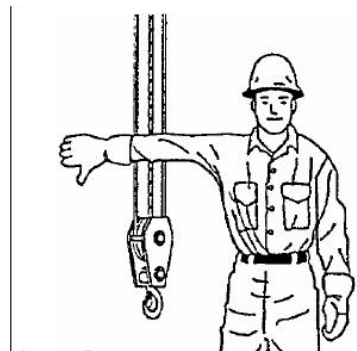
Use Whipline (auxiliary hoist)

Tap elbow with one hand, then use regular signals.



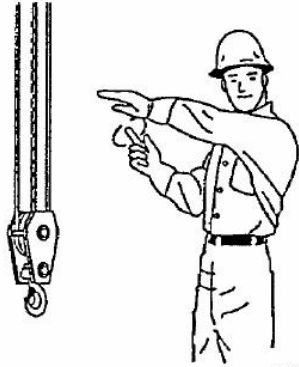
Raise Boom

Arm extended, fingers closed, thumb pointing up.



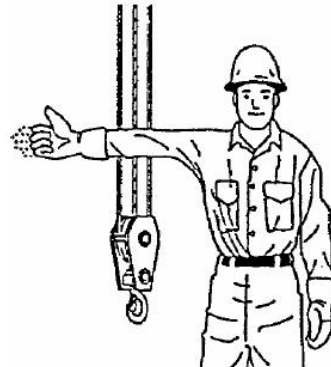
Lower Boom

Arm extended, fingers closed, thumb pointing down.



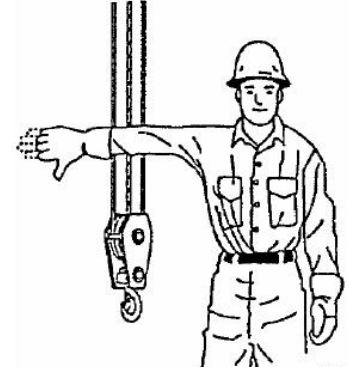
Move Slowly

Use one hand to give any hand signal and place the other hand motionless in front of signal hand (hoist slowly shown).



Raise Boom and Lower Load

With arm extended, thumb pointing up, flex fingers in and out as long as movement is desired.



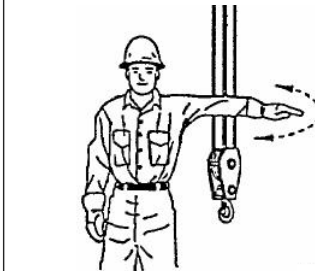
Lower Boom and Raise Load

With arm extended, thumb pointing down, flex fingers in and out as long as movement is desired.



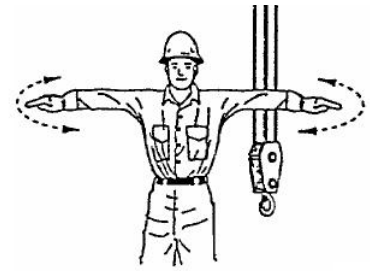
Swing

With arm extended, point with finger in direction of boom.



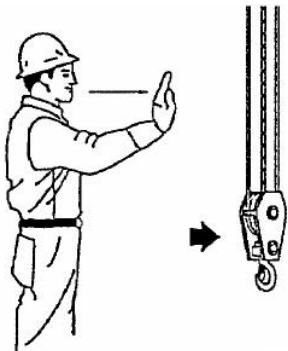
Stop

With arm extended, palm down, move arm back and forth horizontally.



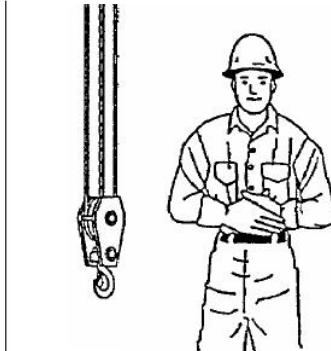
Emergency Stop

With both arms extended, palms down, move arms back and forth horizontally.



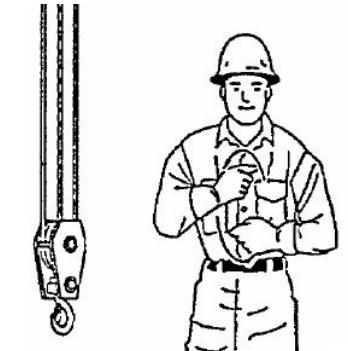
Travel

With arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.



Dog Everything

Clasp hands in front of body.

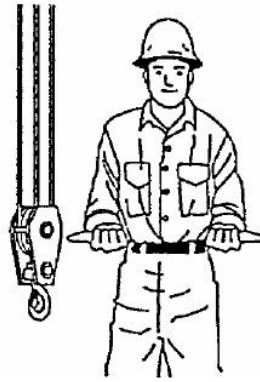


Travel (Both Tracks)

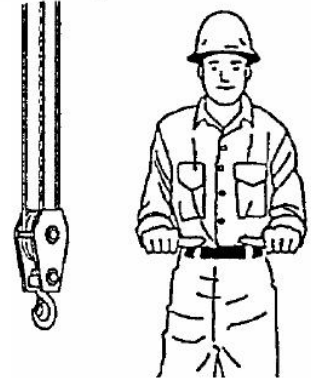
Use both fists in front of body, making circular motion about each other, indicating direction of travel, forward or backward (for land cranes only).


Travel (One Track)

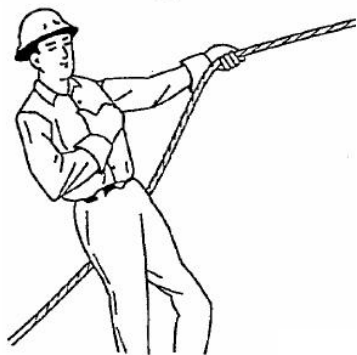
Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist (for land cranes only).


Extend boom (Telescope Booms)

Both fists in front of body with thumbs pointing out.


Retract boom (Telescope Booms)

Both fists in front of body with thumbs pointing in, toward each other.


Extend boom (Telescope Booms)

One hand signal: one fist in front of chest with thumb tapping chest.


Retract boom (Telescope Booms)

One hand signal: one fist in front of chest with thumb pointing out and heel of fist tapping chest.

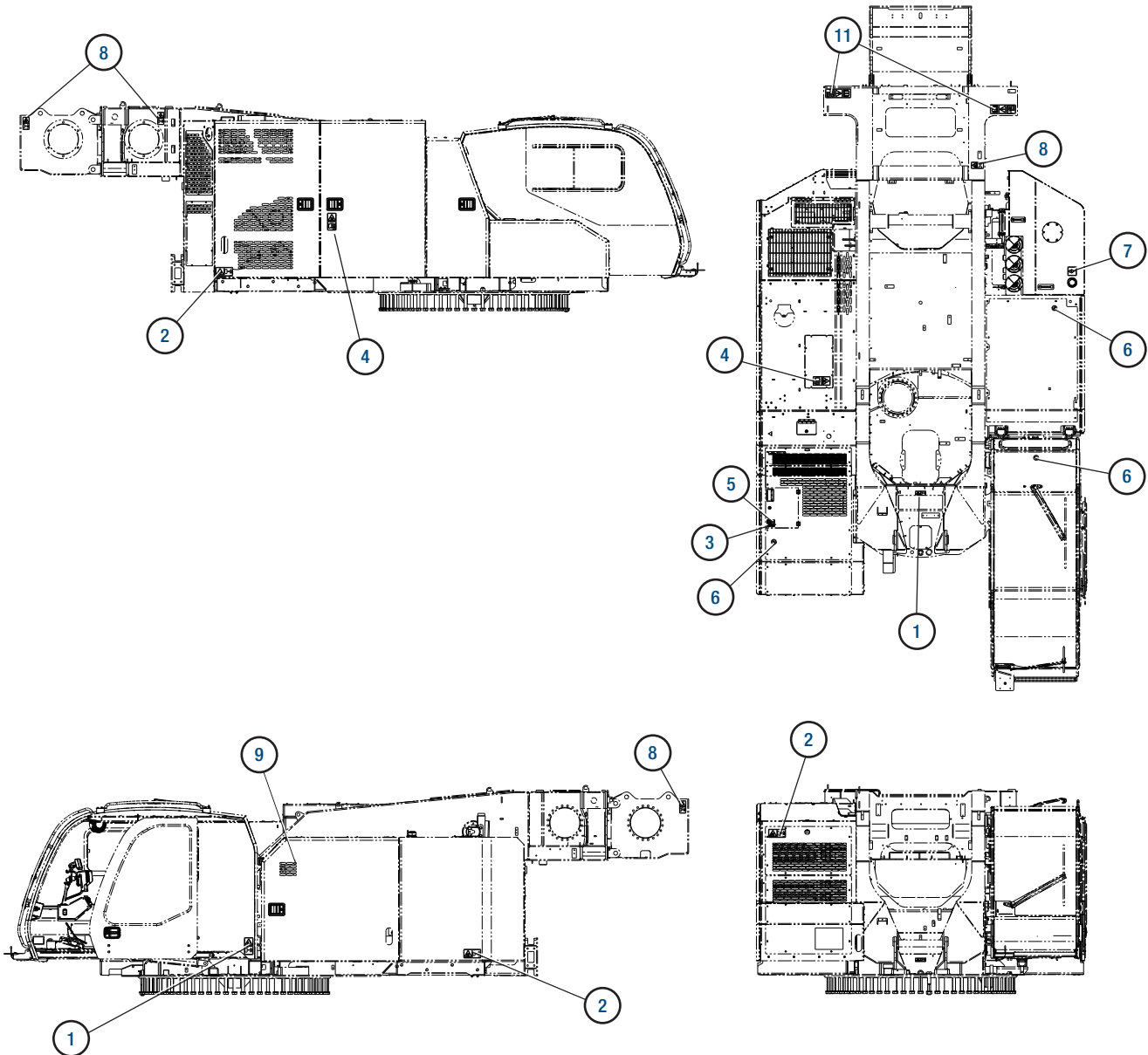
SAFETY AND INSTRUCTION MARKINGS

The following markings are attached to the GTC-1600.

They must be checked regularly. If the markings are unreadable or missing, they must be replaced before operating the GTC-1600.

UPPER ROTATING FRAME MARKINGS

Figure 33: Upper rotating frame safety and instruction marking locations



See [pg 1-27](#) for upper rotating frame markings.

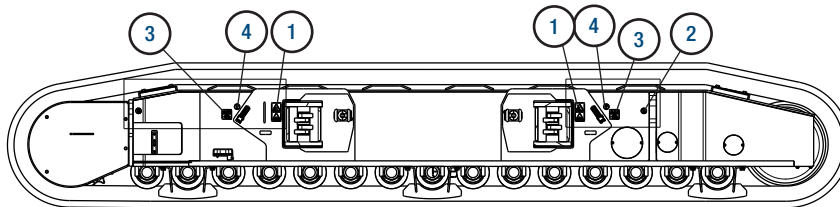
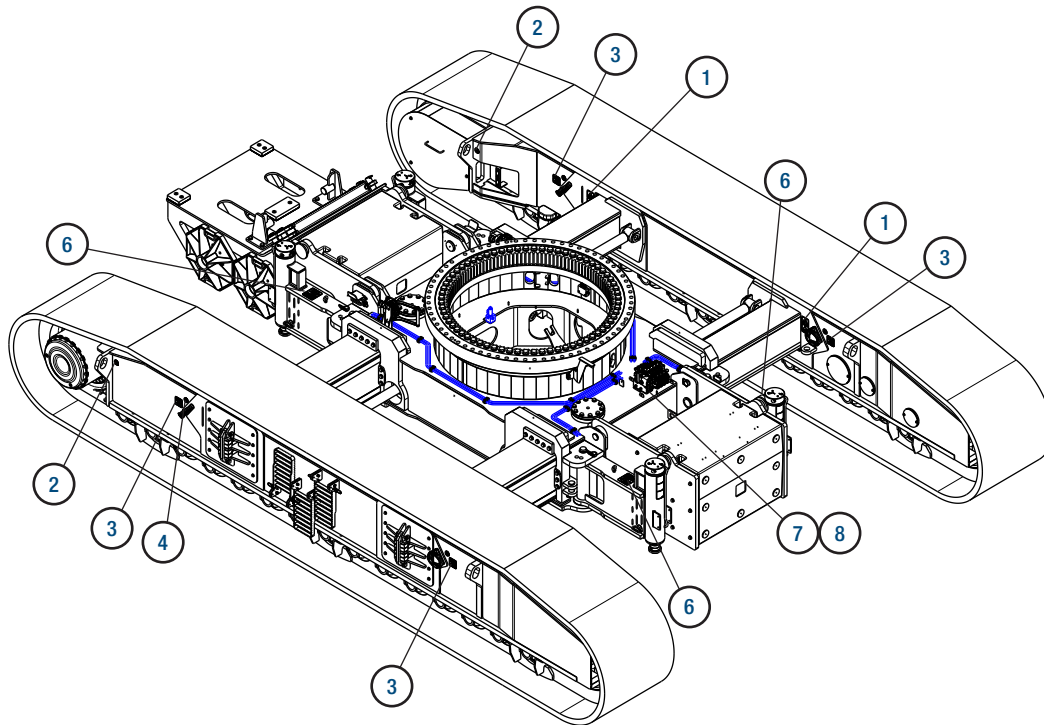
Figure 34: Upper rotating frame safety and instruction markings



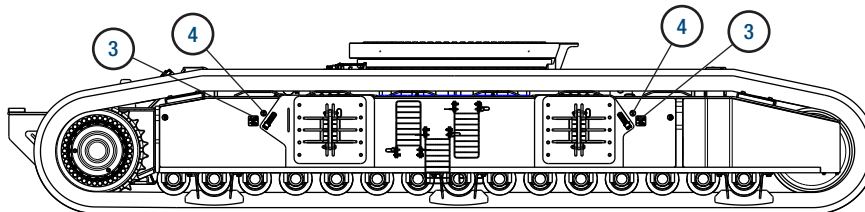
Item Number	Qty per GTC-1600	Part Number	Description
1	1	99600136338	Decal, Warning, Crushing Hazard
2	3	99600146263	Decal, Warning, Keep Away from Swinging Structure
3	1	99600143718	Decal, Ultra Low Sulfur Diesel
4	2	99600147838	Decal, Warning, Hot Surface
5	1	99600149970	Decal, DEF Fluid
6	3	99600136555	Decal, Do Not Step
7	1	99600136675	Decal, Hydraulic Oil
8	4	99600137428	Decal, Warning, Entanglement, Small
9	1	99600147926	Decal, Caution, No High Pressure Wash

UNDERCARRIAGE MARKINGS

Figure 35: Undercarriage safety and instruction marking locations



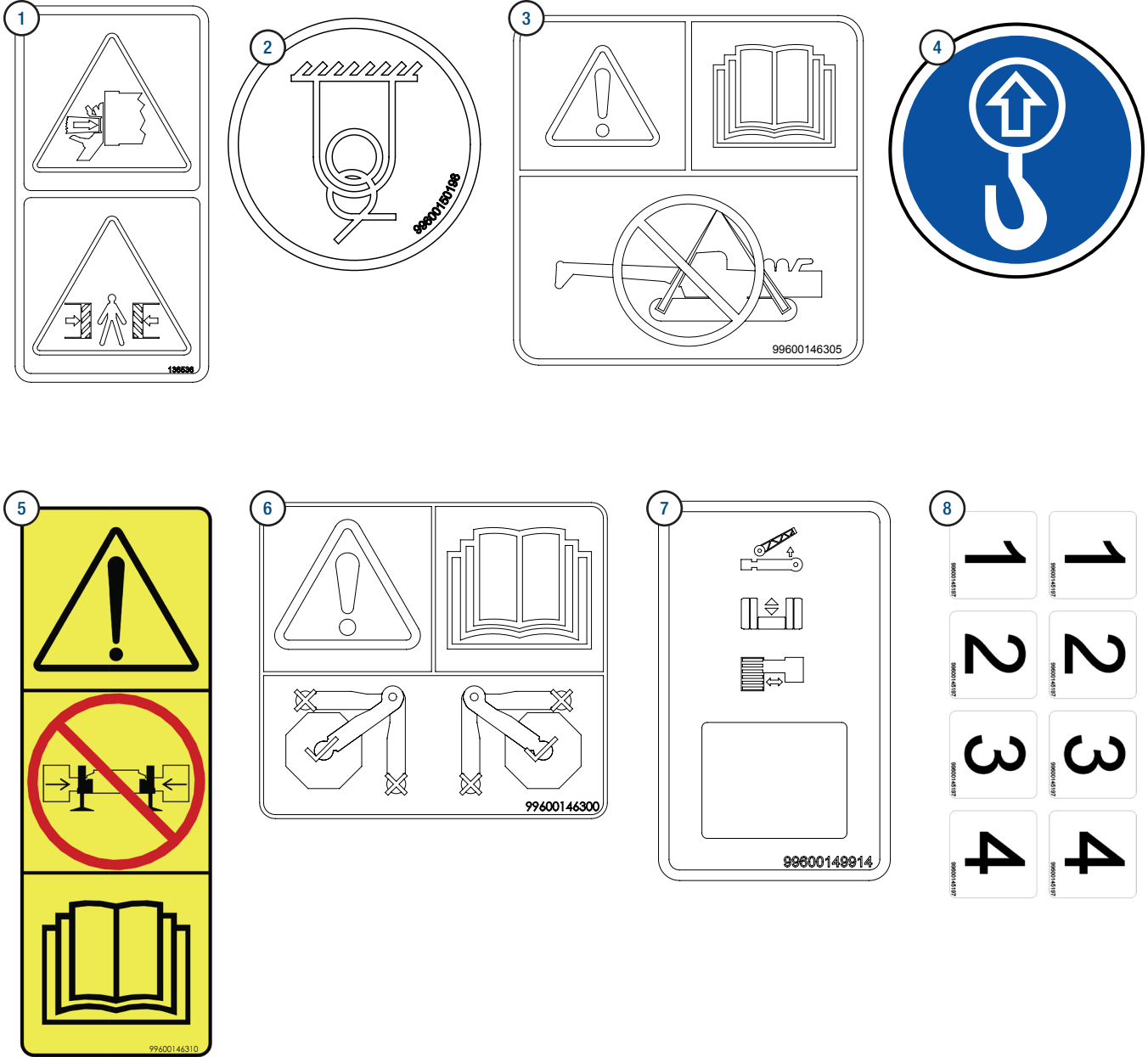
Inner side of track frame



Outer side of track frame

See [pg 1-29](#) for undercarriage markings.

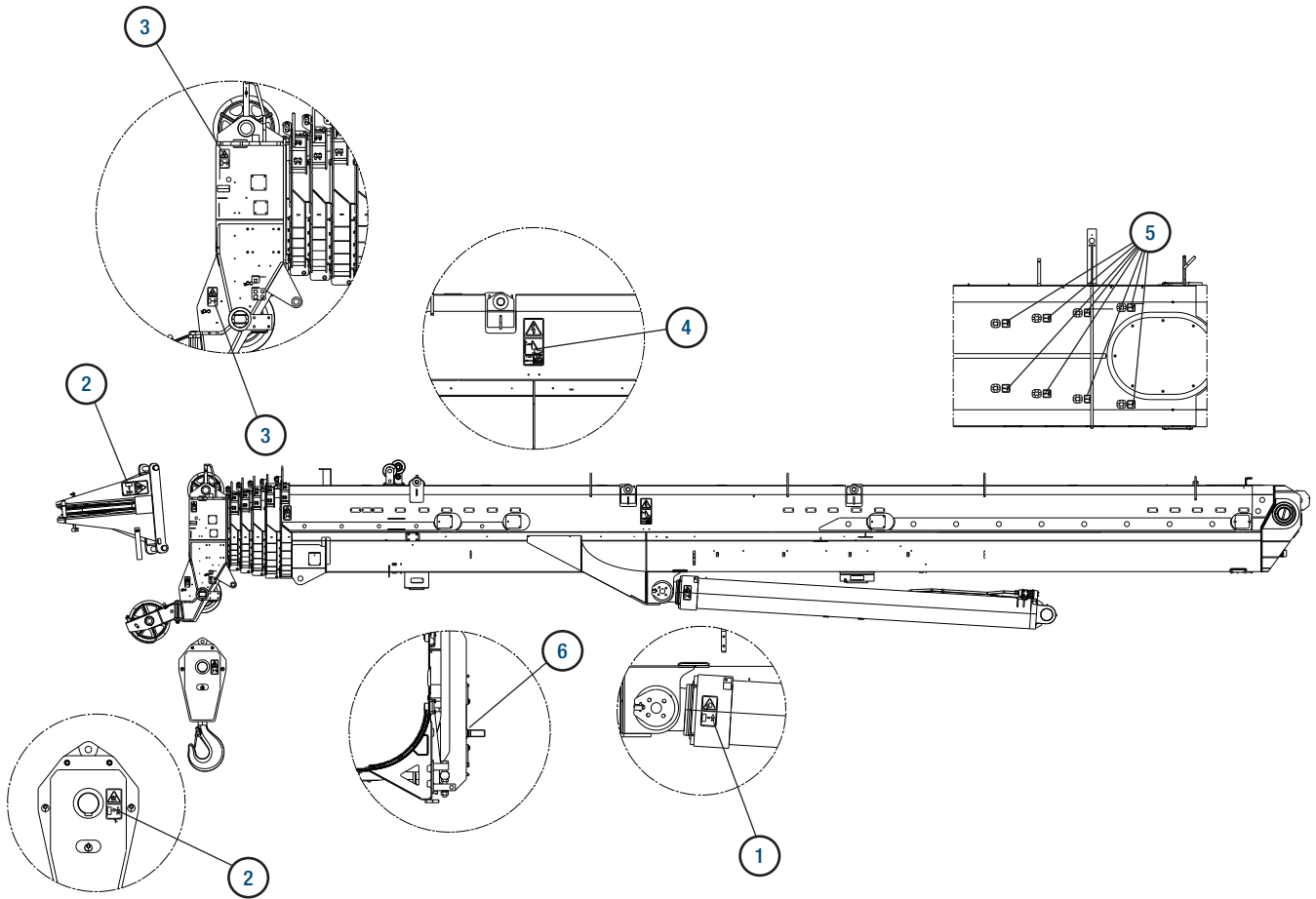
Figure 36: Undercarriage safety and instruction markings



Item Number	Qty per GTC-1600	Part Number	Description
1	4	99600136536	Decal, Warning, Crush/Pinch Hazard
2	8	99600150198	Decal, Tie Down Point
3	8	99600146305	Decal, Warning, Track Frame Removal
4	8	99600136636	Decal, Lifting Point
5	4	99600146310	Decal, Caution Travel QD
6	4	99600146300	Decal, Warning Carbody Jack Lifting Point
7	1	99600149914	Decal, Tethered Remote
8	1	99600145197	Decal, Carbody Jack Cylinder Numbers

BOOM MARKINGS

Figure 37: Boom safety and instruction marking locations



Tip stage

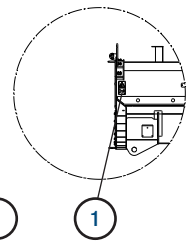
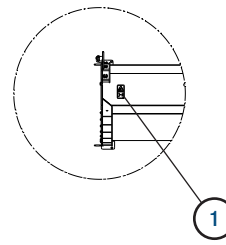
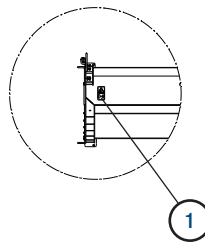
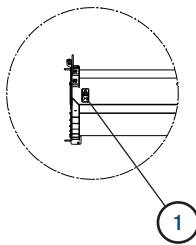
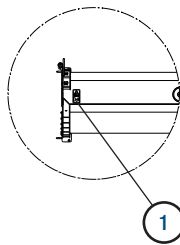
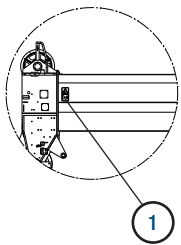
Fifth stage

Fourth stage

Third stage

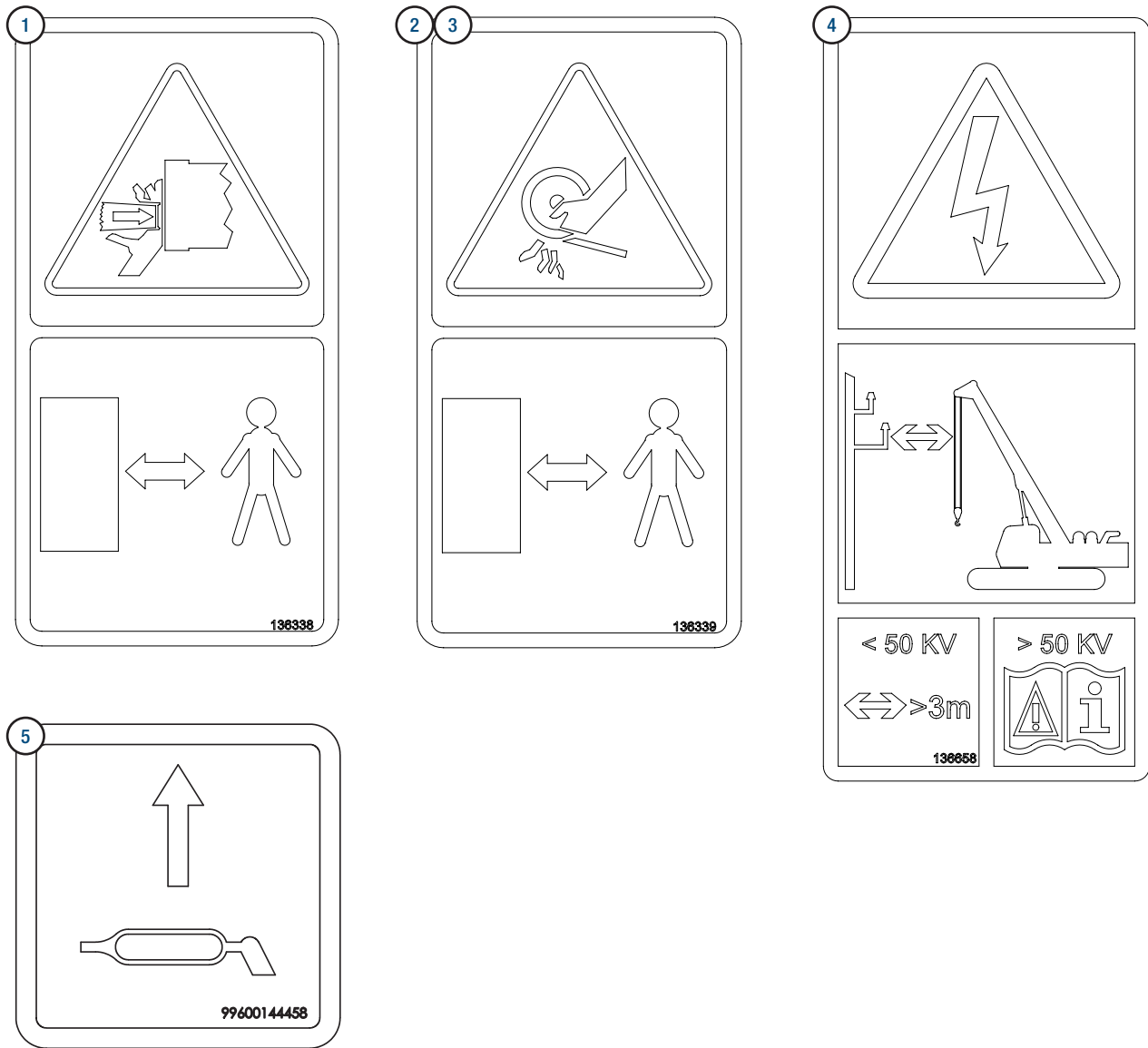
Second stage

Butt stage



See [pg 1-31](#) for boom markings.

Figure 38: Boom safety and instruction markings



Item Number	Qty per GTC-1600	Part Number	Description
1	14	99600136338	Decal, Warning, Crushing Hazard
2	3	99600136339	Decal, Warning, Entanglement Hazard
3	4	99600137428	Decal, Warning, Entanglement Hazard, Small
4	2	99600136658	Decal, Warning, Electrical Power Line Hazard
5	8	99600144458	Decal, Grease Point
6	1	34395751900	Decal, Jib Stowage

OPERATOR CAB MARKINGS

Figure 39: Interior of operator cab safety and instruction marking locations

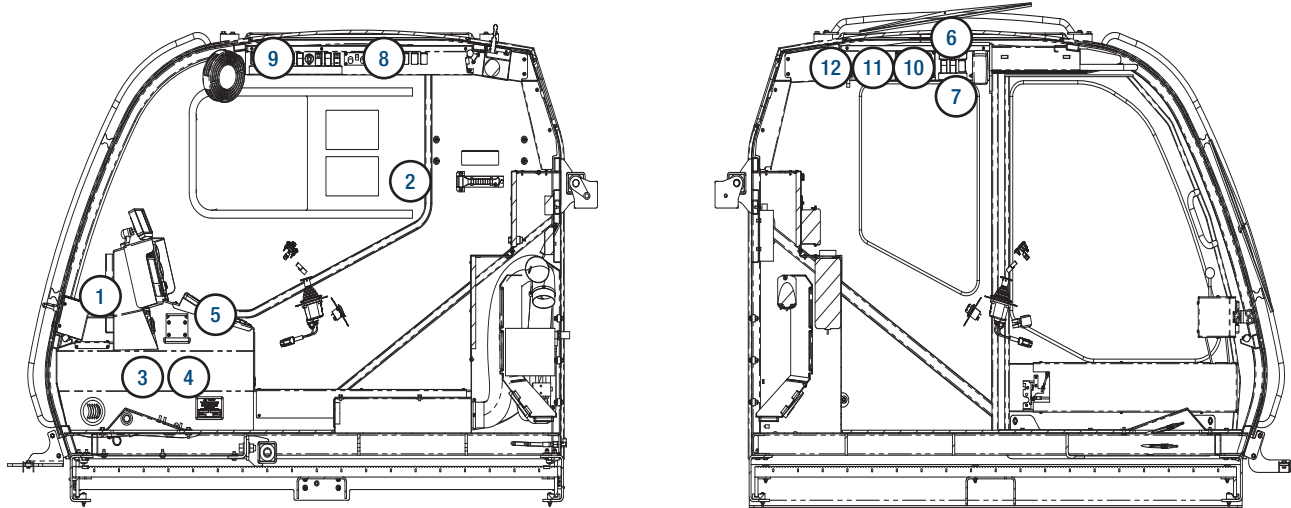
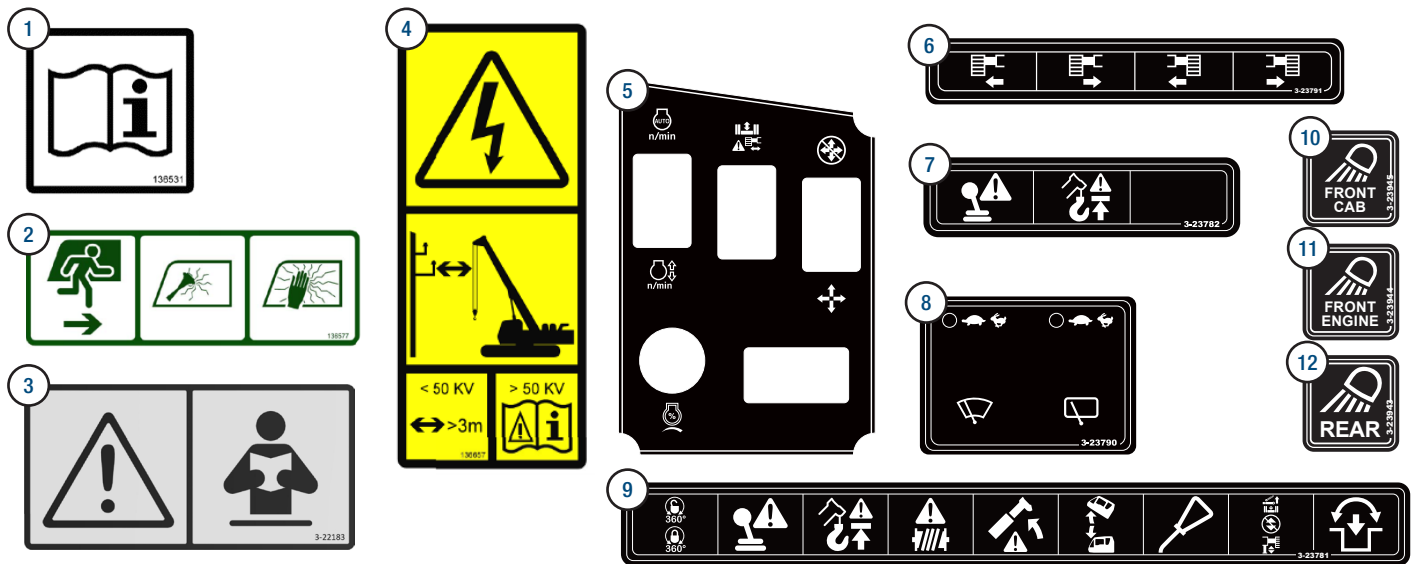


Figure 40: Interior of operator cab safety and instruction markings



Item Number	Qty per GTC-1600	Part Number	Description
1	1	99600136531	Decal, Storage, Operation Manual
2	1	99600136577	Decal, Emergency Exit, Window, Cab
3	1	99600146176	Decal, Warning, Read Operation Manual
4	1	99600136657	Decal, Warning Electrical Hazard, Power Lines
5	1	99600154433	Decal, Operator Cab, Lower Right Console
6	1	99600154442	Decal, Operator Cab, Track Extend/Retract
7	1	99600154436	Decal, Operator Cab, Upper Left Console
8	1	99600154434	Decal, Operator Cab, Wipers
9	1	99600154435	Decal, Operator Cab, Upper Right Console
10	1	99600154439	Decal, Operator Cab, Work Light, Front Cab Side
11	1	99600154438	Decal, Operator Cab, Work Light, Front Engine Side
12	1	99600154437	Decal, Operator Cab, Work Light, Rear

NOTE: See [Figure 51](#) and [Figure 52](#), pg 3-6 for Joystick window markings.

CHAPTER 2: SPECIFICATIONS

GENERAL DATA

Table 3: General GTC-1600 crane data

Crane Capacity	160 Ton at 8 ft (145 t at 2.5 m)
Boom	Six section, 42.8–200.1 ft (13.1–61.0 m)
Dimensions	
Overall Width (Tracks Extended)	19.01 ft (5.8 m)
Overall Width (Tracks Retracted)	11.98 ft (3.7 m)
Overall Width (Tracks Removed)	11.98 ft (3.7 m)

BOOM

Six section, round-box telescope boom. System consists of a single double-acting hydraulic cylinder with load-holding valves.

- Retracted Length: 42.8 ft (13.1 m)
- Extended Length: 200.1 ft (61.0 m)
- Extension Time: approximately 9 minutes
- Elevating Angles: -1.5° to 81.5°
- Elevating Time: 53 seconds
- Boom Head: Seven, 15.8 in. (400 mm) diameter cast steel sheaves on heavy-duty roller bearings (six load bearing and two lead-in sheaves). Designed for quick reeving of head and load block.

AUXILIARY BOOM HEAD

Quick reeve, single 17.5 in. (445 mm) diameter high strength, cast steel sheave mounted on a heavy-duty roller bearing. Allows single or two-part reeving.

UPPER COUNTERWEIGHT

Total counterweight = 70,100 lb (31,797 kg):

- Upper Counterweight—Base Section
 - ◇ 40,300 lb (18,280 kg)
- Upper Counterweight—Middle Section
 - ◇ 14,650 lb (6,645 kg)
- Upper Counterweight—Top Section
 - ◇ 15,050 lb (6,827 kg)

NOTE: Using only the base assembly counterweight will require reduced counterweight load charts. Do NOT use one Middle/Top Section without the other.

CARBODY COUNTERWEIGHT

- Front Carbody Counterweight
 - ◇ 12,457 lb (5,650 kg)
- Rear Carbody Counterweight
 - ◇ 12,374 lb (5,613 kg)

WINCHES

Planetary geared two-speed winch includes a hydraulic motor, multi-disc internal brake and counterbalance valve. Drum rotation indicator is included.

- Main Winch
 - ◇ Wire Rope Diameter and Length: 0.75 in. x 1050 ft (19 mm x 320 m), Rotation Resistant, Starlift Xtra™
 - ◇ Single Line Pull: 21,833 lb (97.1 kN) (first layer)
 - ◇ Single Line Speed: 454.6 ft/min (138.6 m/min) (fifth layer)
 - ◇ Drum Diameter: 15 in. (382 mm)

Table 4: Main winch specifications ^χ

Rope Layer	Maximum Line Pull		No Load Line Speed		Full Load Line Speed		Pitch Diameter		Layer		Total	
	lb	kN	ft/min	m/min	ft/min	m/min	in.	mm	ft	m	ft	m
1	21,833	97.1	339.1	103.4	243.4	74.2	15.8	401.9	147.1	44.8	147.1	44.8
2	19,866	88.4	368.0	112.2	264.2	80.5	17.4	441.7	159.6	48.6	306.6	93.5
3	18,224	81.1	396.8	120.9	284.9	86.8	18.9	481.5	172.1	52.5	478.7	145.9
4	16,833	74.9	425.7	129.8	305.7	93.2	20.5	521.3	184.6	56.3	663.4	202.2
5	15,639	69.6	454.6	138.6	326.4	99.5	22.1	561.1	197.2	60.1	860.5	262.3
6	14,603	65.0	483.5	147.4	347.1	105.8	23.7	600.9	209.7	63.9	1070.2	326.2

^χ Starlift Xtra™ Rotation Resistant 0.75 in. (19 mm), maximum allowable line pull = 16,276 lb (72.4 kN / 7383 kg)

- Auxiliary Winch
 - ◇ Wire Rope Diameter and Length: 0.75 in. x 738 ft (19 mm x 225 m), Rotation Resistant, Starlift Xtra™
 - ◇ Single Line Pull: 21,833 lb (97.1 kN) (first layer)
 - ◇ Single Line Speed: 454.6 ft/min (138.6 m/min) (fifth layer)
 - ◇ Drum Diameter: 15 in. (382 mm)

TRAVEL

Each side frame contains a pilot controlled, two-speed track drive with hydraulic axial piston motor and parking brake. Travel system provides skid steering and counter rotation.

- Travel Speed
 - ◇ Low: 0.6 mph (1.0 km/hr)
 - ◇ High: 1.6 mph (2.5 km/hr)
- Gradeability (unladen): 52%

SWING

The gear pump provides flow to the electronically operated swing valve with cross-port relief valves and selectable free swing with counterswing or controlled swing with hydraulic braking. The double swashplate axial piston swing motor provide smooth rotation even at low speeds. The planetary gear reducer drives the pinion and the external gear shear ball slew bearing to allow the superstructure to rotate 360°.

- Swing Speed: 0–1.2 rpm
- Swing Parking Brake: Spring applied fail-safe brake with hydraulic release that is controlled from the operator cab
- Swing Service Brake: Hydraulically applied, controlled through foot-actuated pedal
- House Lock System: 360° house lock, actuated from the operator cab

AUTOMATIC MOMENT LIMITER

TADANO AML-E2 automatic moment limiter and anti-two-block system:

- Control function shutdown. Audible and visual warnings.
- MFD screen provides a continuous display of working boom length, boom angle, working load radius, tip height, swing position, parts-of-line (operator set), GTC-1600 track configuration, relative load moment, maximum permissible load, and actual load.
- Anti-two-block weight allows quick reeving of hook block.

FRAME

The frame is an all-steel, welded structure, precision machined to accept attachment of the boom and swing components.

OPERATOR CAB

Fully-enclosed, air conditioned all-steel modular cab with lockable sliding door, acoustical lining, anti-slip floor, and tinted safety glass.

- Cab tilts up 20°.
- Rear view, winch view, and left and right side cameras.
- Front left side, front right side, and rear right side remote control work lights.
- Grab bars and steps are located for easy access to the cab.
- Defroster, heater, and circulating fan.
- Two-speed windshield wiper, top glass wiper.
- Six-way adjustable fabric seat with headrest and seat belt.
- Dome light.
- Dry-chemical fire extinguisher.
- Four-way electronic adjustable armrest mounted joysticks control swing, main winch, auxiliary winch, boom hoist, and boom telescope. Electronic foot pedals control travel and a hydraulic foot pedal controls the swing service brake.
- Selectable modes for Fine Control and Travel (using hand control for GTC-1600 travel).
- Seat termination switch immediately disables all hydraulic functions (excluding those used for setup) as the operator rises from the seat. Functions can also be disabled by switch on console.
- Dash instrumentation (**Cab Controls and Switches, pg 3-3**):
 - ◇ Tachometer
- MFD Instrumentation (**Multifunction Display, pg 6-8**):
 - ◇ Hour meter
 - ◇ Fuel gauge
 - ◇ Hydraulic oil temperature gauge
 - ◇ Diesel Exhaust Fluid (DEF) level gauge
 - ◇ Crane level
 - ◇ Swing position
 - ◇ Load moment
 - ◇ Drum rotation
 - ◇ Warning alerts
 - ◇ Engine oil temperature and pressure
 - ◇ Hydraulic oil temperature and level
 - ◇ Hydraulic and air filter restriction
 - ◇ Low voltage

ENGINE

- Make/Model: Cummins B6.7
- Type: 6 cylinder, water cooled, 4 cycle
- Aspiration: turbocharged and aftercooled
- Maximum Output: 326 hp (243 kW) at 2,200 rpm
- Maximum Torque: 770 lb-ft (1,044 N•m) at 1,500 rpm
- Piston Displacement: 6.7 L
- Emission Certification: U.S. EPA Tier 4f, Euromot Stage V
- Throttle Control: Accelerator Pedal, Auto-idle, Adaptive Throttle Control, or manually control with potentiometer
- Alternator: 70 amp

ELECTRICAL SYSTEM

- 24 VDC

FUEL SYSTEM

- Capacity: 85 gal (321 L)
- Filtration: In-line fuel/water separator and engine mounted fuel filter

SIDE FRAMES

Two welded steel side frames are paired with a track group. The side frames extend and retract hydraulically and are controlled from the cab.

- Track Rollers: Two top and 13 bottom sealed rollers on each track frame. Idler is oil-filled, self-lubricating with nitrogen-type tensioner.
- Track Shoes: 36 in. (900 mm), three-bar semi grousers are standard (other shoe widths and types available)

TELEMATICS

GTC-1600 data logging and monitoring system with HELLONET via Internet.

HYDRAULIC SYSTEM

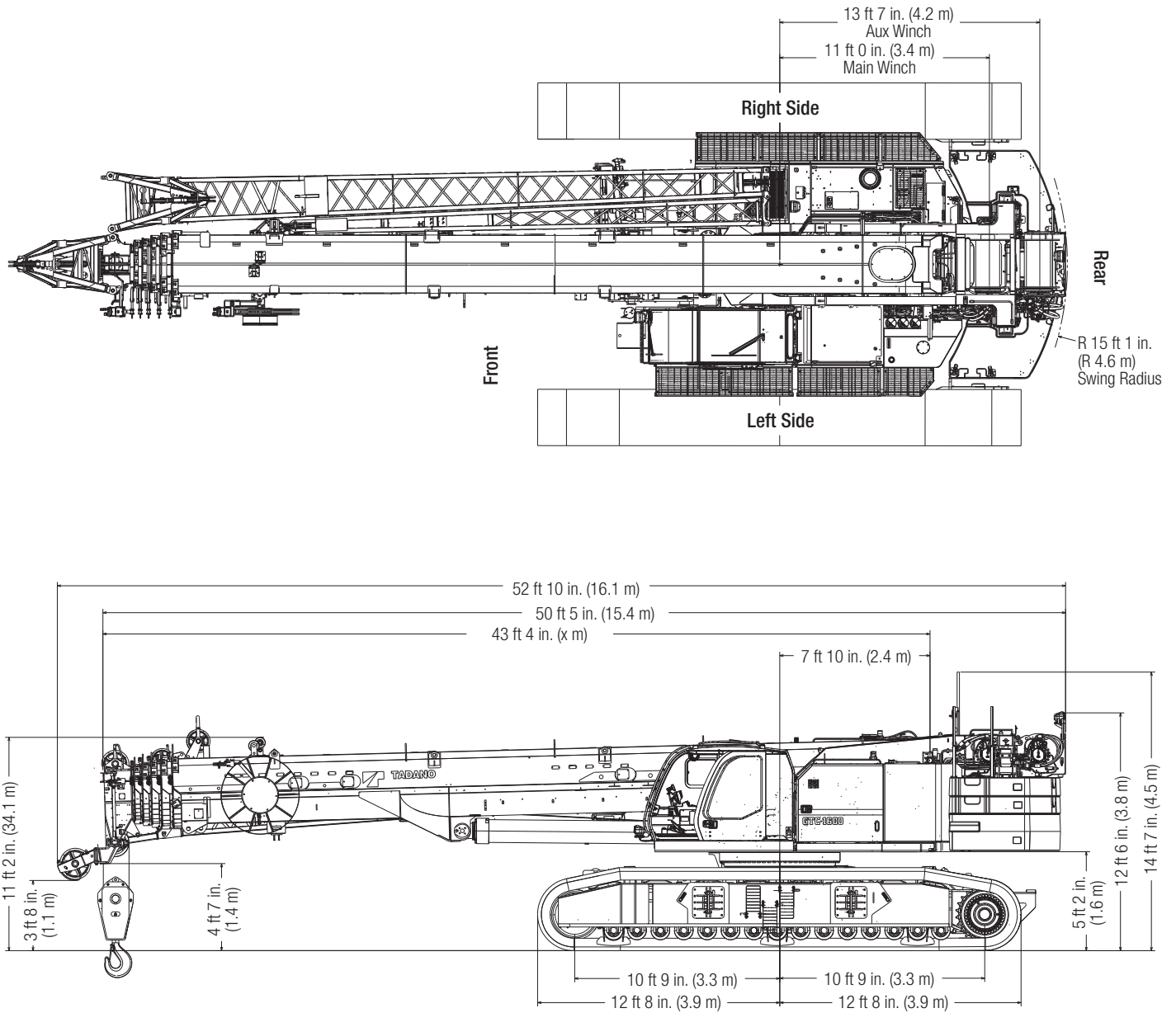
- Hydraulic Pumps: Two high-pressure, variable axial piston pumps with positive displacement control and power limiting control for crane functions. Three (3) gear pumps for swing, pilot/auxiliary, and cooling.
- Directional Valves: Multiple pressure and flow compensated valves with electrically-controlled, integrated relief valves.
- Pump output: 250 gpm (946 L/min) at 1,900 rpm engine speed. 4,713 psi (325 bar) maximum pressure.
- Reservoir: 197 gallon (746 L) capacity; filler/breather, sight gauge, cleanout, low level switch, and sump drain.
- Filtration: Three (3) five-micron, full-flow tank-mounted return filters with electrical clogging indicator. Three-micron pilot oil in-line pressure filter. Two (2) ten-micron case flow filters.

OPTIONAL EQUIPMENT

- Carbody jack system
- Jibs
 - ◇ Heavy lift jib:
 - Total Length: 8.2 ft (2.5 m)
 - Offset Angles: 20° and 40°
 - Maximum Lifting Height: 155.2 ft (47.3 m)
 - ◇ Main jib:
 - Total Length: 33.1 ft (10.1 m)
 - Offset Angles: Continuously variable
 - Maximum Lifting Height: 180.4 ft (55.0 m)
 - ◇ Fly jib:
 - Total Length: 58.1 ft (18.0 m)
 - Offset Angles: Continuously variable
 - Maximum Lifting Height: 205.1 ft (62.5 m)
- Hook blocks
 - ◇ 110 Ton (100 t) hook block—Seven 18.1 in. (460 mm) steel sheaves, lockable swivel hook, and safety latch
 - ◇ 49 Ton (45 t) hook block—Three 17.9 in. (455 mm) steel sheaves, lockable swivel hook, and safety latch
- Overhaul ball
 - ◇ 11 Ton (10 t) with swivel hook and safety latch
- Track Shoes
 - ◇ 36 in. (900 mm) flat shoes
 - ◇ 39.4 in. (1000 mm) flat shoes
 - ◇ 39.4 in. (1000 mm) triple-grouser shoes
- Cold Weather Packages
 - ◇ Options available for operation to -40 °F (-40 °C)
 - ◇ Consult factory for application support
- Work Platform
 - ◇ Model WP750
 - ◇ 36 in. x 72 in. (0.9 m x 1.8 m)
 - ◇ All-steel, welded, two-person platform
 - ◇ Maximum capacity 750 lbs (340 kg)
- Anemometer
- Radio Control Package
- Boom Beacon Light
- Boom Tram System
- Automatic Lubrication System
- Boom Removal System
- Guardrails

DIMENSIONS

Figure 41: GTC-1600 dimensions and directional references



TRANSPORT DIMENSIONS

Figure 42: GTC-1600 transport dimensions, with tracks

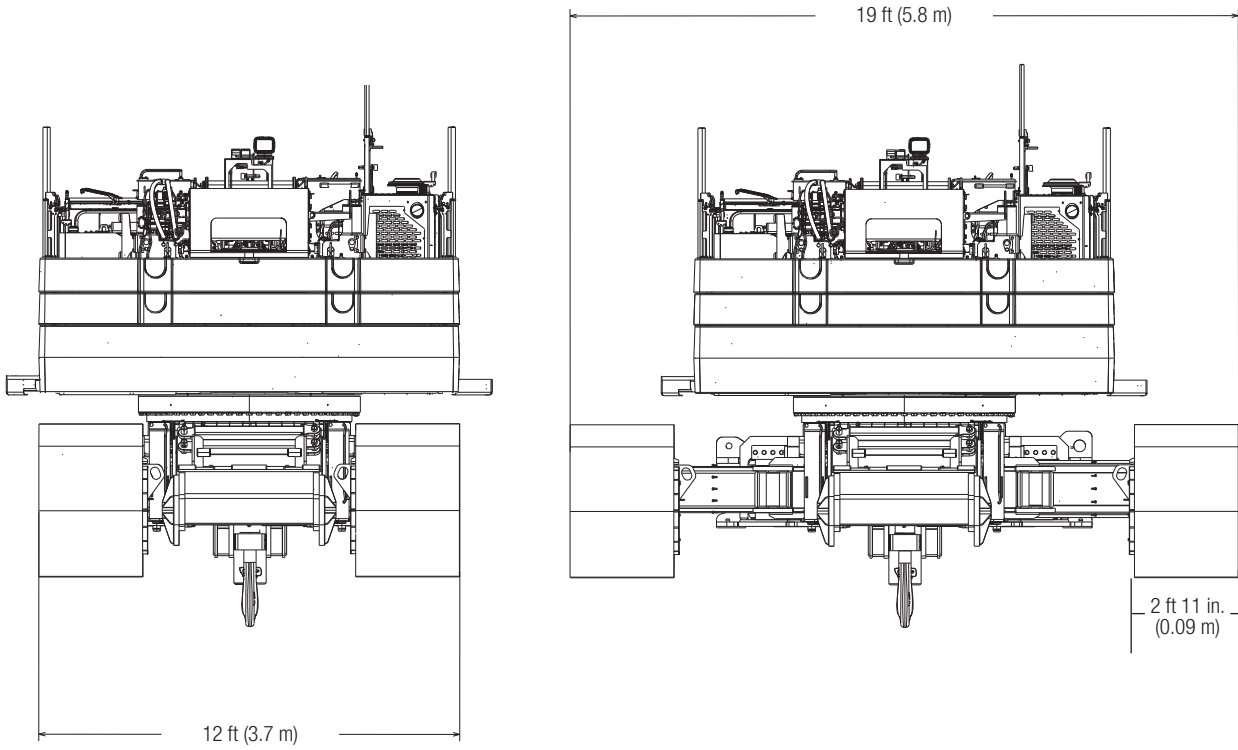
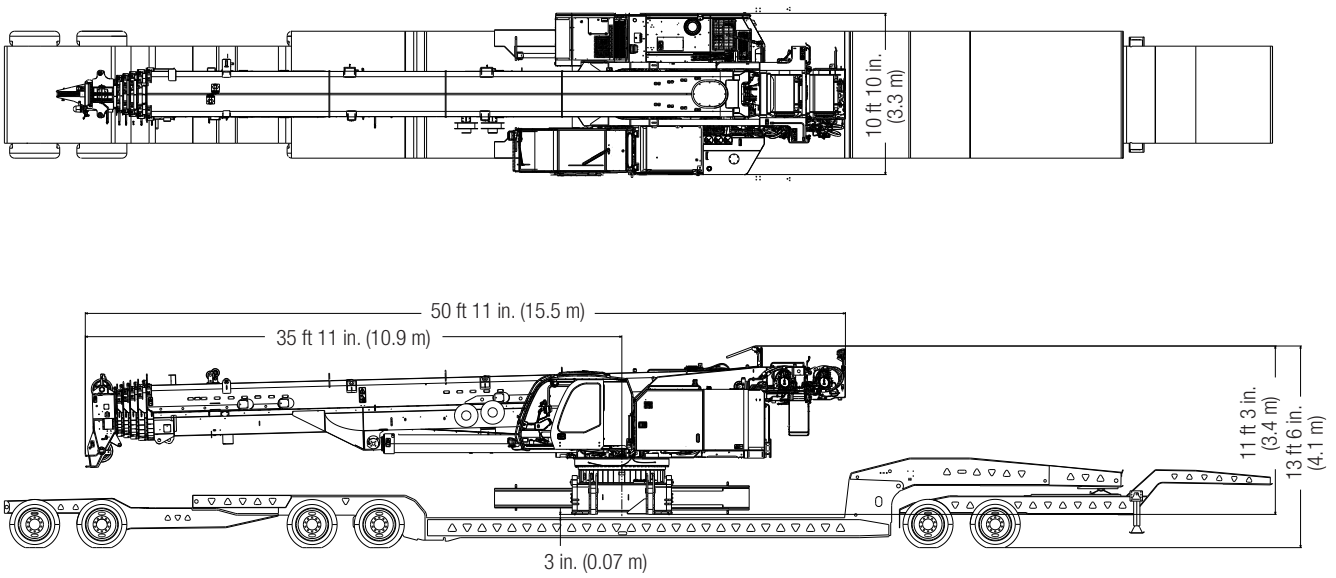


Figure 43: GTC-1600 transport dimensions, without tracks

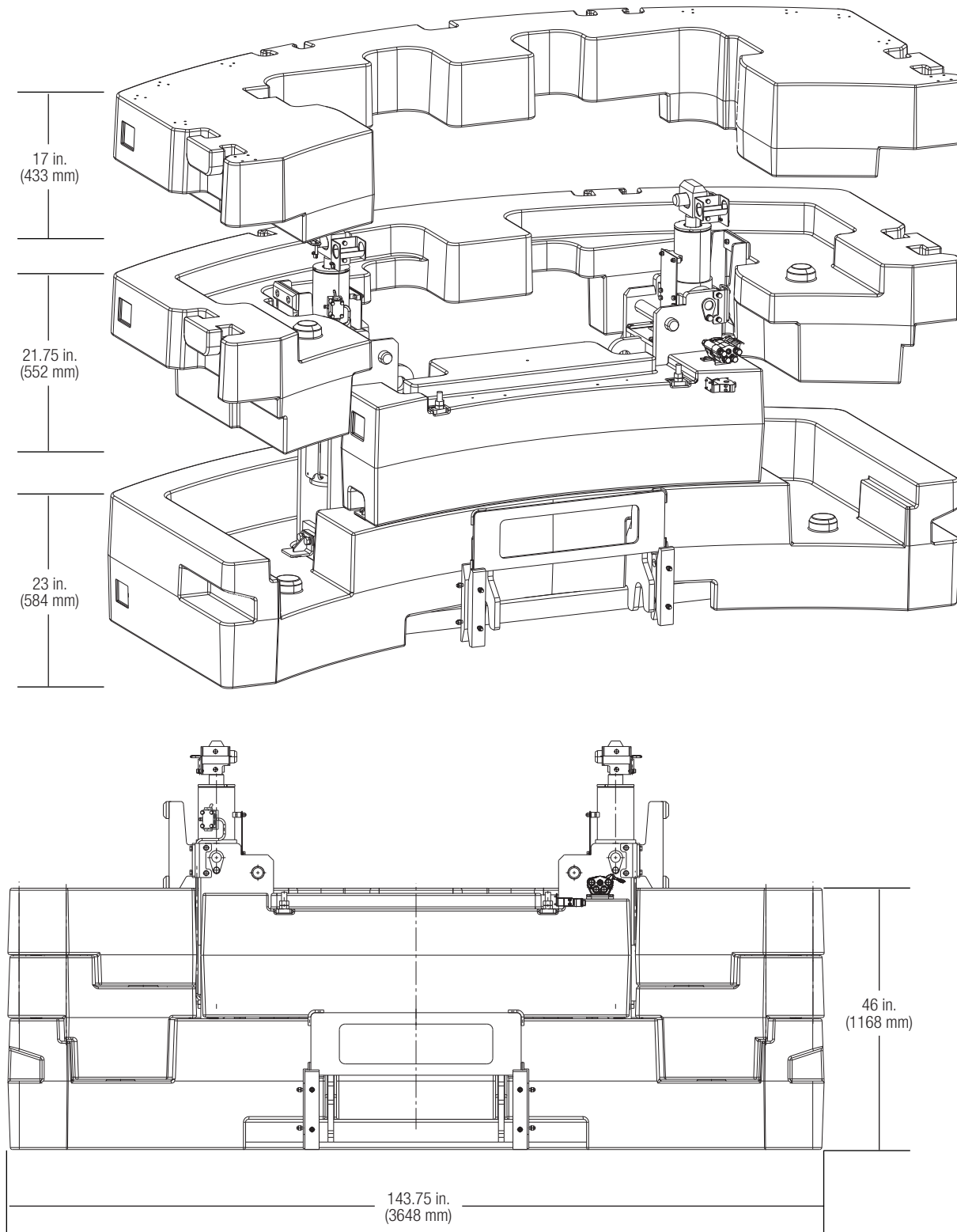


TRANSPORT DIMENSIONS—UPPER COUNTERWEIGHT

See [Table 9, pg 4-2](#) for weight information.

NOTE: The Upper Counterweight will ship disassembled.

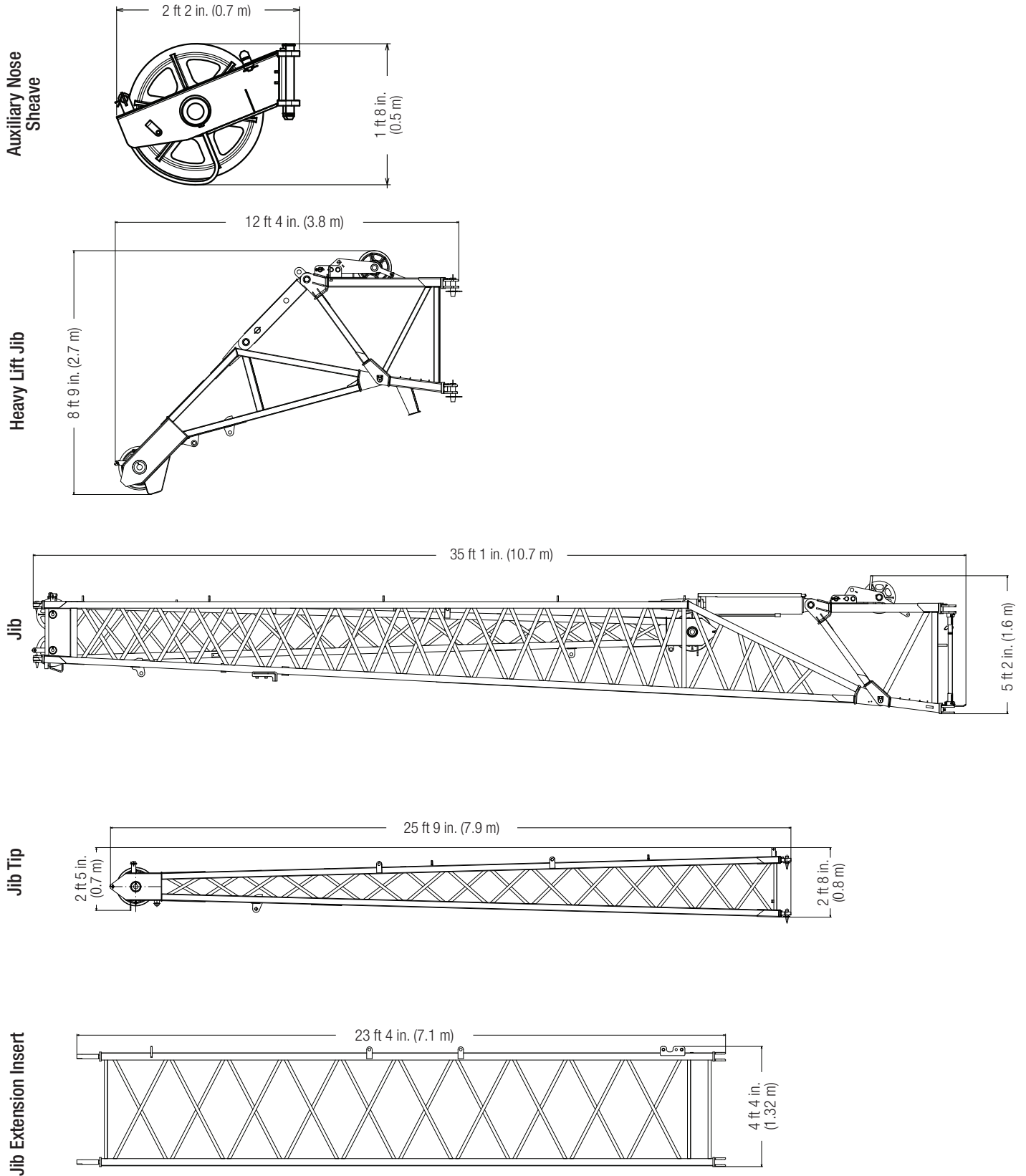
Figure 44: GTC-1600 counterweight dimensions—components and assembled



TRANSPORT DIMENSIONS—OPTIONAL LIFTING ATTACHMENTS

See **Table 9, pg 4-2** for weight information.

Figure 45: Optional lifting attachments



OIL SPECIFICATIONS

Table 5: Oil temperature operating ranges

Fluid	Temperature Range for 15–40 CST (Optimal Operating Range)		Temperature Range for 10–200 CST (Minimum and Maximum Operating Range—Limited Time)		Temperature for 1000 CST (Minimum Cold Start)	
	°F	°C	°F	°C	°F	°C
Shell S2VX22	68–122	20–50	14–149	-10–65	-12	-24
Chevron Clarity AW22	75–127	24–53	21–154	-6–68	-16	-27
Hydrex MV22	77–126	25–52	23–149	-5–65	-42	-41
Hydrex AV22	78–122	26–50	28–145	-2–63	-4	-20
Shell S2VX32	93–145	34–63	39–171	4–77	1	-17
Chevron Clarity AW32	99–145	37–63	50–170	10–77	16	-9
Hydrex AW32	99–144	37–62	46–169	8–76	10	-12
Hydrex MV36	95–145	35–63	37–174	3–79	0	-18
Shell S4VX32	90–158	32–70	5–212	-15–100	-58	-50
Hydrex Extreme	89–192	32–89	-13–230	-25–110	-54	-48
Shell S2VX46	111–136	44–58	62–144	17–62	23	-5
Chevron Clarity AW46	109–158	43–70	57–183	14–84	21	-6
Hydrex AW46	109–158	43–70	57–185	14–85	21	-6
Hydrex XV	109–170	43–77	34–216	1–102	-15	-26
Shell S2VX68	127–194	53–90	64–216	18–102	12	-11
Chevron Clarity AW68	120–172	49–78	66–199	19–93	28	-2
Hydrex AW68	124–178	51–81	66–207	19–97	27	-3
Hydrex AW80	131–183	55–84	75–210	24–99	37	3
Hydrex AW100	140–192	60–89	82–221	28–105	43	6

NOTE: Shaded cells indicate that the maximum operating temperature should not exceed 176 °F (80 °C) to protect seals.

Table 6: Oil temperature thresholds for system activation

Fluid	Maximum Temperature for Warm-up Valve Operation		Temperature for Cooling Fan Minimum Speed for Crane Operations		Temperature for Cooling Fan Maximum Speed for Crane Operations		Temperature for Cooling Fan Minimum Speed with Travel Brake Released		Temperature for Cooling Fan Maximum Speed with Travel Brake Released		Temperature for Activation of Automatic Cooling Circulation		Temperature for Warning	
	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C
Shell S2VX22	75 °F	24 °C	110 °F	43 °C	125 °F	52 °C	95 °F	35 °C	110 °F	43 °C	130 °F	54 °C	145 °F	63 °C
Chevron Clarity AW22														
Hydrex MV22														
Hydrex AV22	90 °F	32 °C	130 °F	54 °C	145 °F	63 °C	115 °F	46 °C	103 °F	54 °C	155 °F	68 °C	170 °F	77 °C
Shell S2VX32														
Chevron Clarity AW32														
Hydrex AW32														
Hydrex MV36														
Shell S4VX32														
Hydrex Extreme	100 °F	38 °C	115 °F	46 °C	130 °F	54 °C	100 °F	38 °C	115 °F	46 °C	160 °F	71 °C	176 °F	80 °C
Shell S2VX46														
Chevron Clarity AW46														
Hydrex AW46														
Hydrex XV	115 °F	46 °C	145 °F	63 °C	160 °F	71 °C	130 °F	54 °C	145 °F	63 °C	160 °F	71 °C	176 °F	80 °C
Shell S2VX68														
Chevron Clarity AW68														
Hydrex AW68														

CAPACITIES AND SPECIFICATIONS

Table 7: GTC-1600 fluid specifications

Equipment	Type	Amount	Comments
Boom Bearing Pads	Lube-A-Boom®	As necessary	
Automatic Lubrication System	NLGI 2 Grease	2 L (4 lb)	
Boom Cylinder Pins	NLGI 2 Grease	Apply until new grease is visible	
Boom Foot Pins	NLGI 2 Grease	Apply until new grease is visible	
Hoist Cylinder Pins	NLGI 2 Grease	Apply until new grease is visible	
Boom Sheaves	NLGI 2 Grease	Apply until new grease is visible	
Stage V / T4 Diesel Fuel	Ultra Low Sulfur Diesel	322 L (85 gallons)	
Diesel Emission Fluid (DEF)	ISO 22241	38 L (10 gallons)	
Stage V / T4 Engine Coolant	50/50 mix of Antifreeze and Water	57.2 L (15.1 gallons)	
Stage V / T4 Engine Oil	5W/40	17.5 L (18.5 qt)	
Hydraulic Oil	Shell Tellus S2VX-32	746 L (197 gallon)	
Slew Ring Race	NLGI 2 Grease	Apply until new grease is visible	
Slew Ring Teeth	Texaco Crater 2X or 5	Coat teeth at each greasing	
Swing Drive Reducer Oil	ISO VG320	4.3 L (4.5 qt)	
Track Drive Reducer Oil	ISO VG220	27 L (28.5 qt)	
Track Tension	NLGI 2 Grease	Apply according to track tensioning requirements	See Inspect and Adjust Track Tension, pg 7-21
Auxiliary Winch Oil	Mobilgear 600XP150 (ISO VG150)	7.7 L (8.1 qt)	
Main Winch Oil	Mobilgear 600XP150 (ISO VG150)	7.7 L (8.1 qt)	

Table 8: GTC-1600 filter specifications—Tier 4 or Stage V Cummins B6.7 engine

Filter	Manufacturer	P/N	TADANO Part Number
Engine Oil	Fleetguard / Cummins	LF3970 / 39337736	99600124943
Primary Fuel	Fleetguard / Cummins	FS20121 / 5528103	99600153226
Secondary Fuel	Fleetguard / Cummins	FF63009 / 5303743	99600143497
Air Cleaner—Primary	Fleetguard / Cummins	AF26124	99600153728
Air Cleaner—Secondary	Fleetguard / Cummins	AF26125	99600153729
Hydraulic Return	Schroeder	18LZ5	99600148422
Hydraulic Pilot	Hydac	0095D003BN4	99600151171
Hydraulic Drain (Upper)	Wako Filter Technology	C11-06632	366-737-20030
Hydraulic Drain (Lower)	Hydac	0035D0100N	99600151270

Figure 46: GTC-1600 engine filters



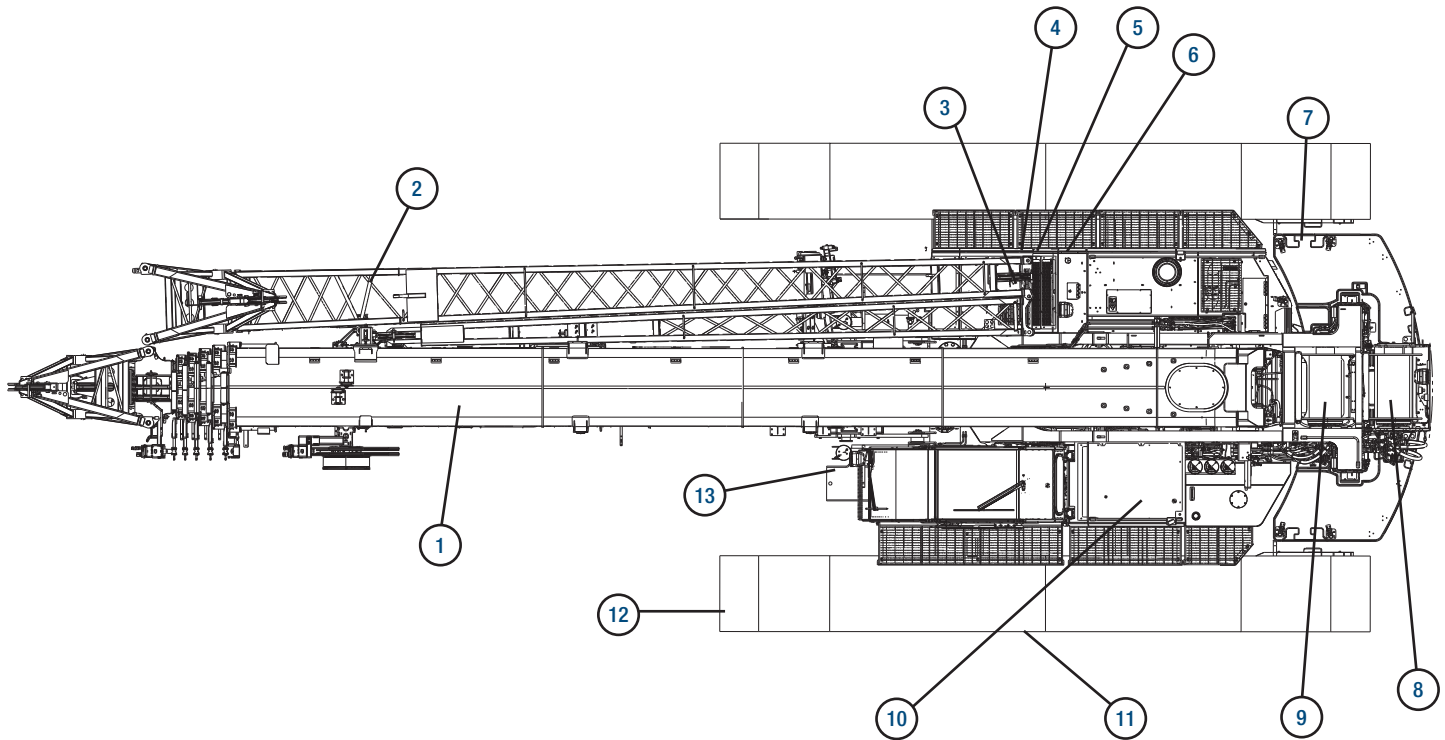
Primary fuel filter Secondary fuel filter Engine oil filter

CHAPTER 3: COMPONENT LOCATION AND OVERVIEW

EXTERIOR VIEWS

Right, left, front, and rear are determined from the operator seat in the cab, with the operator sitting in the seat facing forward in the normal operating position. The right, left, front, and rear designation does not change, regardless of the swing direction or position of the superstructure.

Figure 47: Location of components on GTC-1600



- | | |
|---|----------------------------|
| 1 Boom | 8 Auxiliary Winch |
| 2 Jib | 9 Main Winch |
| 3 Automatic Moment Limiter External Warning Lamps | 10 Hydraulic Oil Reservoir |
| 4 Diesel Fuel Fill | 11 Steps |
| 5 Diesel Emission Fluid (DEF) Tank | 12 Track |
| 6 Engine Compartment | 13 Cab |
| 7 Upper Counterweight | |

Figure 48: Location of components on GTC-1600—side view

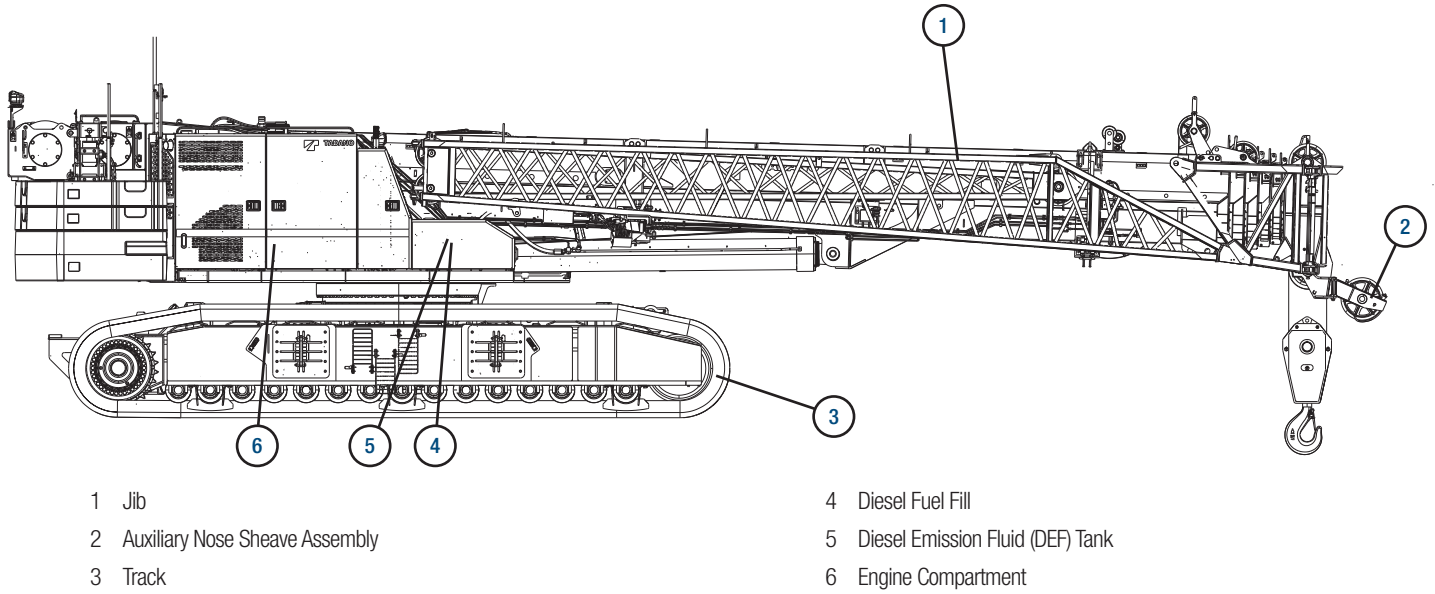
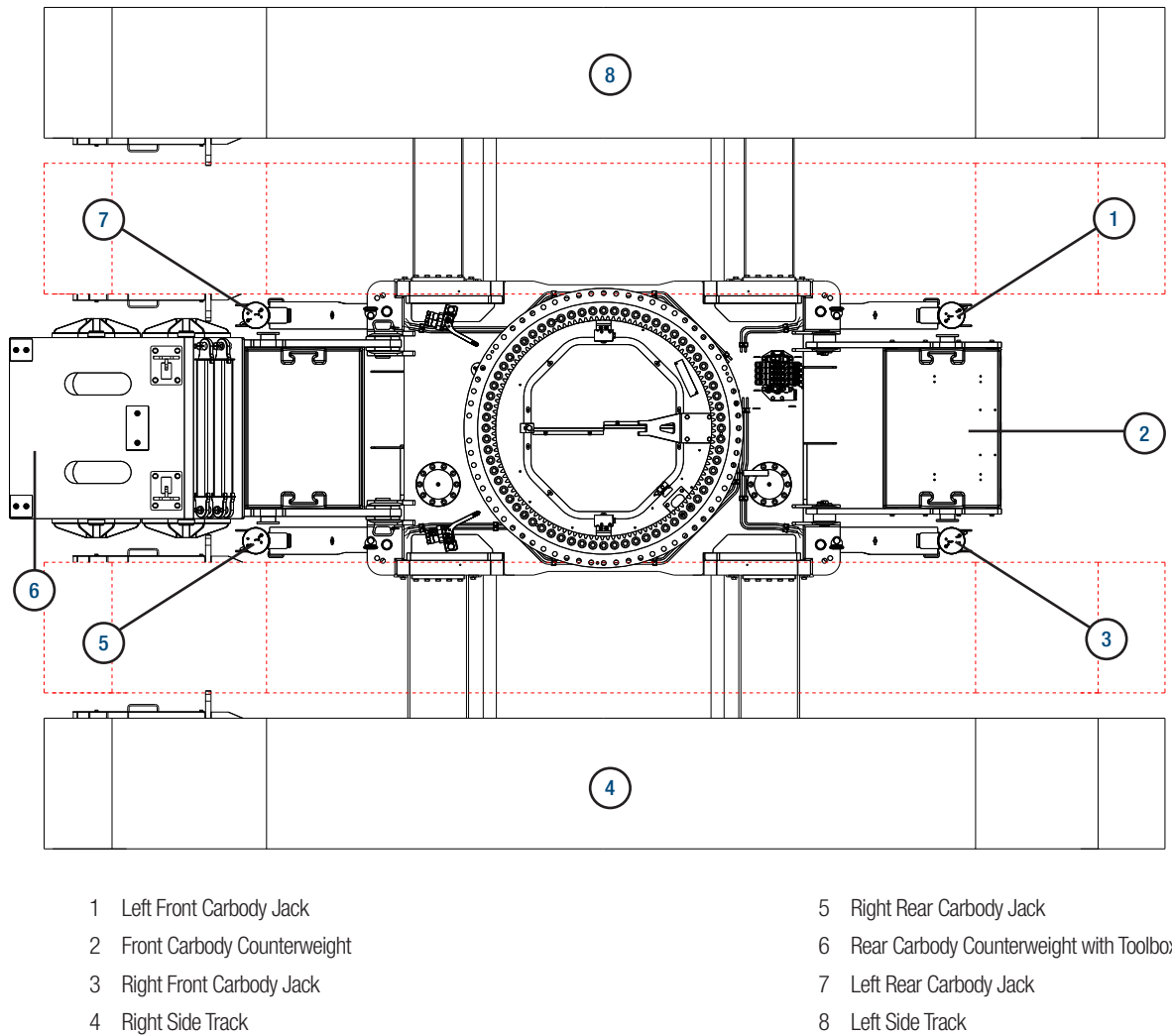


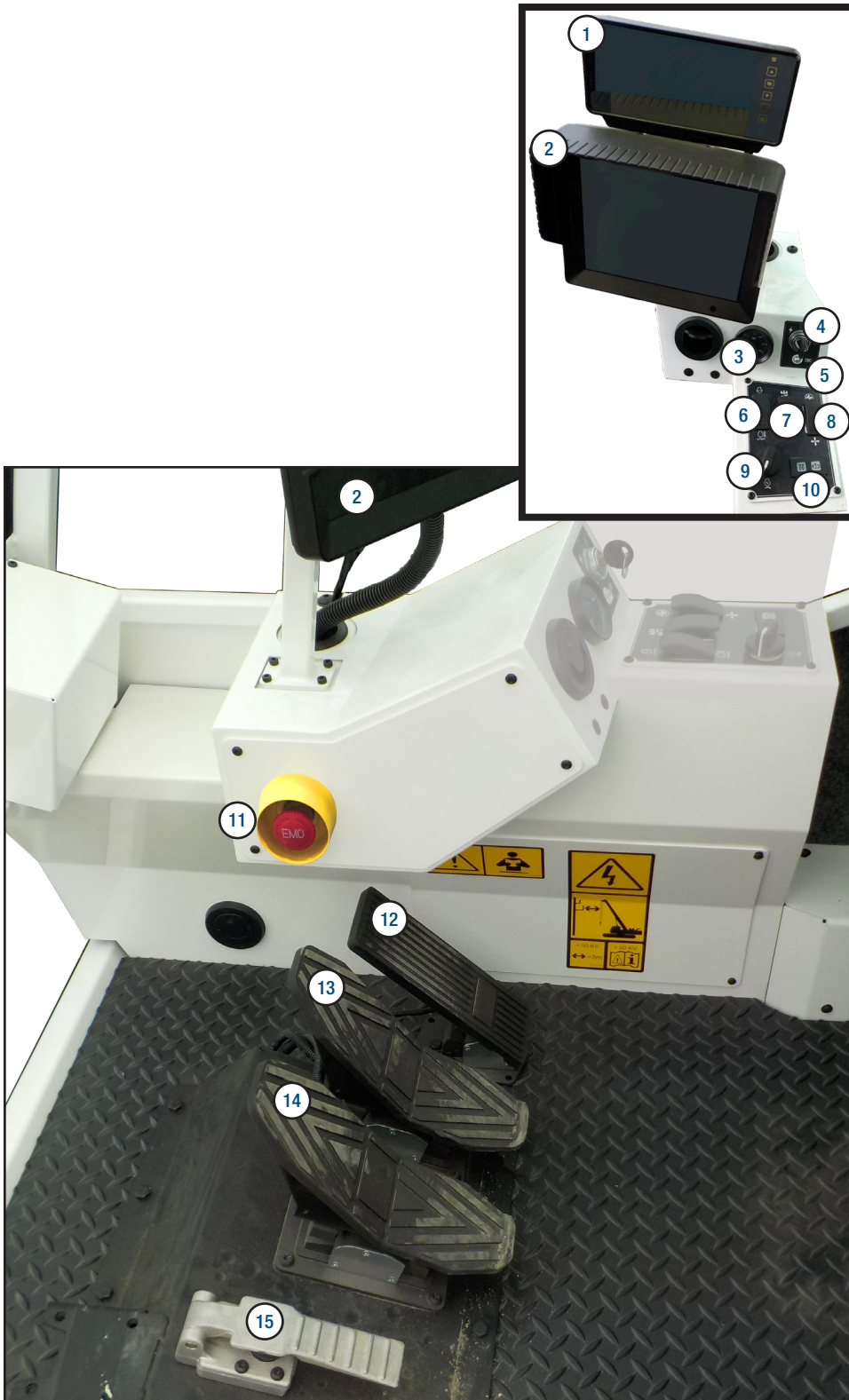
Figure 49: Location of undercarriage (optional) carbody jack components on GTC-1600



CAB CONTROLS AND SWITCHES

Figure 50: Cab controls and switches

Item Number	Description
1	Video Camera Monitor
2	Multifunction Display (MFD)
3	Tachometer
4	Ignition Switch
5	Emergency Off (EMO) LED
6	Auto Idle Switch
7	AML Configuration Override Switch
8	Controls Enable Switch
9	Engine Throttle Potentiometer
10	Wait to Start / Engine Stop
11	Emergency Off (EMO) Switch
12	Throttle Pedal
13	Right Travel Pedal
14	Left Travel Pedal
15	Swing Service Brake



1. Video Camera Monitor

Shows views from the four (4) externally mounted cameras ([Exterior Cameras, pg 6-73](#)).

2. Multifunction Display

Displays the automatic moment limiter information for the operator ([Automatic Moment Limiter, pg 6-22](#)).

The control system display shows extensive information and warnings regarding the boom, engine, hydraulic system, electrical system, and maintenance information ([Home Page, pg 6-9](#)).

3. Tachometer

Displays the current engine rpm.



4. Ignition Switch

A four position switch with ACCESSORY, OFF, RUN, and START positions ([Starting the Engine, pg 6-5](#)).

NOTE: When ignition switch is in ACCESSORY position a warning will appear on the MFD screen noting that communication with engine ECM is not possible.



5. Emergency Off (EMO) LED



6. Auto Idle Switch

Pressing the top of the switch will turn on the auto idle function. The operator can select from several modes to control the engine speed ([Auto Idle Engine Control, pg 6-6](#)):

Standard

- ◇ Foot throttle (Gray icon on MFD)
- ◇ Throttle potentiometer (Gray icon on MFD)

Auto Idle

- ◇ Adaptive (Green icon on MFD)
- ◇ Set point (Blue icon on MFD)

NOTE: The dedicated tachometer indicates the actual engine speed. Adaptive Throttle mode is active when Auto Idle switch is ON and throttle potentiometer dial is at 0%. In this mode, the engine RPM will increase to match the engine load and then return to idle.



7. AML Configuration Override Switch

Switching this to ON will override track position and counterweight AML configurations.



⚠ WARNING

Use the AML Configuration Override switch only in case of sensor failure. Use of some chart configurations, when GTC-1600 is not properly configured, can result in loss of stability and overturning.

8. Controls Enable Switch

The operator must be sitting in the seat and switch this to ON to begin GTC-1600 operation. The switch will not automatically reset itself. The switch will remain in the ON position until it is manually turned to the OFF position.

Switching this to OFF will disable the following GTC-1600 operations:

- Boom telescope operation
- Boom elevate operation
- Swing operation
- Winch operation
- Jib tilt operation (only for hydraulic offset jibs)
- Travel operation

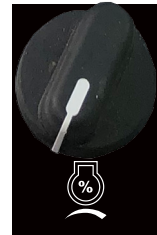
NOTE: While switched to OFF, the operation disabled icon will be displayed on the MFD.

NOTE: If switched to OFF, while an operation is being performed, the operation will stop.



9. Engine Throttle Potentiometer

Engine rpm can be set at a fixed speed using this dial. Turning clockwise will increase engine rpm and turning counterclockwise will decrease the engine rpm ([Auto Idle Engine Control, pg 6-6](#)).



10. Wait to Start / Engine Stop

The Wait to Start indicator is on the left and the Engine Stop indicator on the right will illuminate if there is an engine problem.

NOTE: Return load to a safe position and turn the engine OFF. Other engine warnings are displayed on the MFD.



11. Emergency Off (EMO) Switch

In the case of an emergency, pressing this switch will immediately shut down the engine.

NOTE: After using the EMO switch a System error may occur due to a loss of communication with the engine ECM.



12. Throttle Pedal

Press the pedal down to increase the engine rpm and release the pedal to decrease the engine rpm ([Standard Engine Control, pg 6-6](#)).

13. Right Travel Pedal

Pressing down on the pedal will drive the right track. The farther the pedal is pushed, the faster the travel speed will be. Releasing the pedal will stop the right track from driving. The pedal is bidirectional. Toe down drives the track forward; heel down drives the track backward. See [Cab Controls and Switches, pg 3-3](#) for more information.

NOTE: Forward and reverse are determined by the position of the tracks, not the cab/boom. See [Figure 41, pg 2-6](#) for more information.

14. Left Travel Pedal

Pressing down on the pedal will drive the left track. The farther the pedal is pushed, the faster the travel speed will be. Releasing the pedal will stop the left track from driving. The pedal is bidirectional. Toe down drives the track forward; heel down drives the track backward. See [Cab Controls and Switches, pg 3-3](#) for more information.

NOTE: Forward and reverse are determined by the position of the tracks, not the cab/boom. See [Figure 41, pg 2-6](#) for more information.

15. Swing Service Brake

Press down on the swing brake pedal to slow rotation of the superstructure or hold it in position (when the swing parking brake is not engaged). Release the pedal to release the brake. See [Cab Controls and Switches, pg 3-3](#) for more information.

JOYSTICKS

Figure 51: Joystick usage decal—standard mode

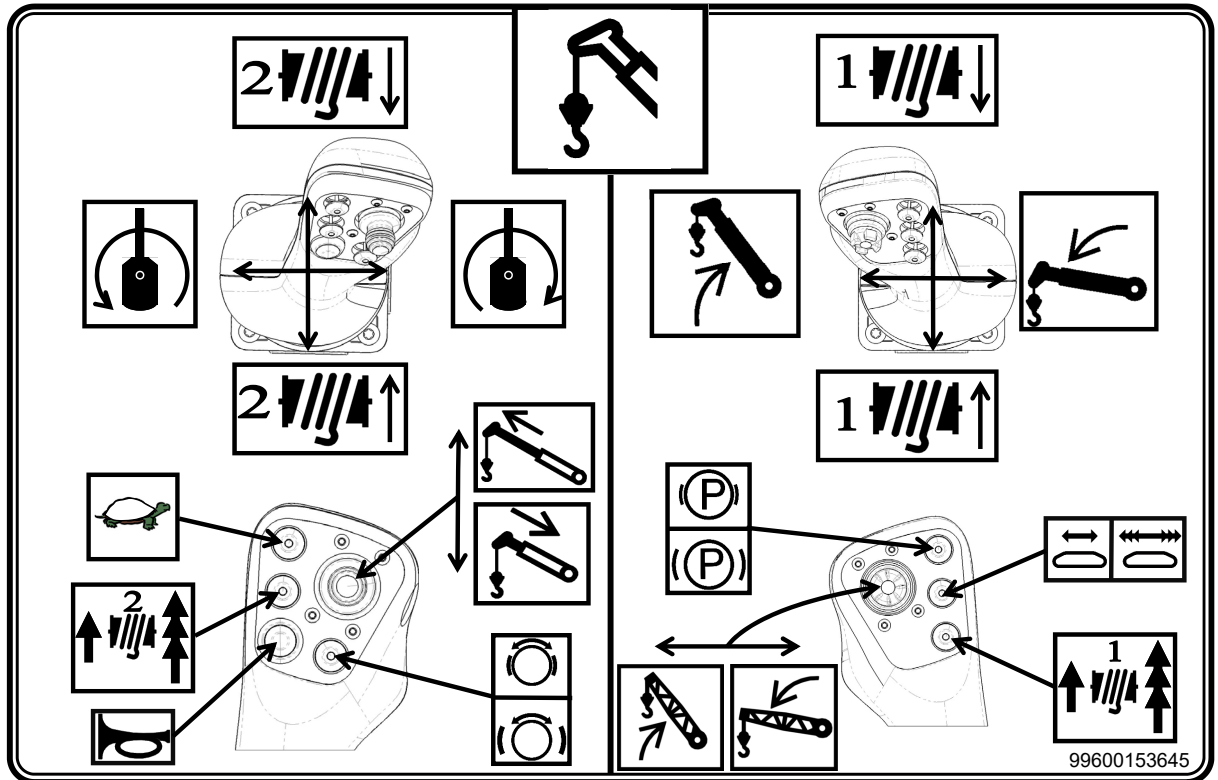
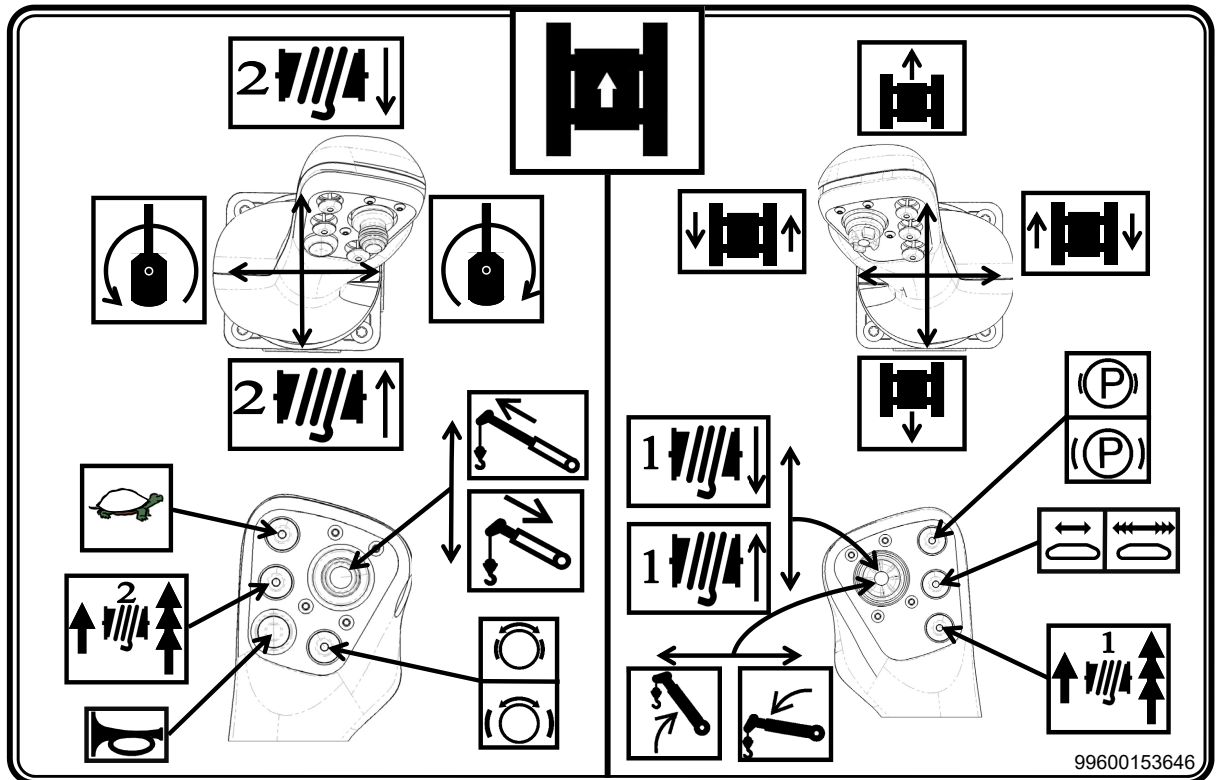
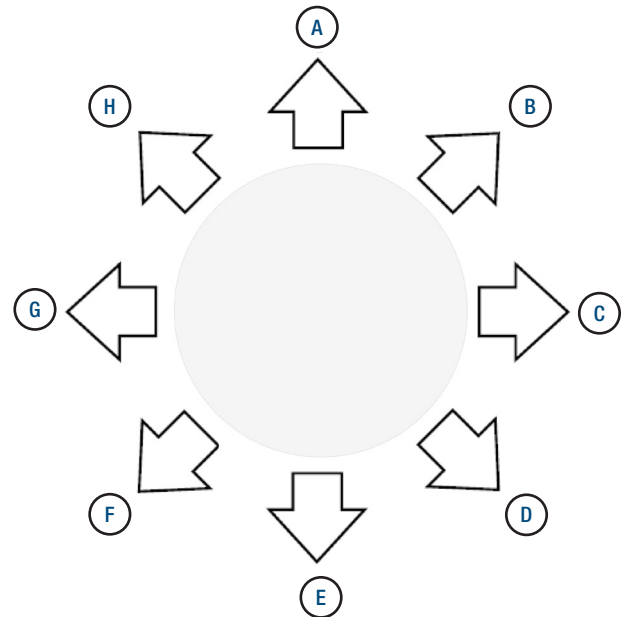
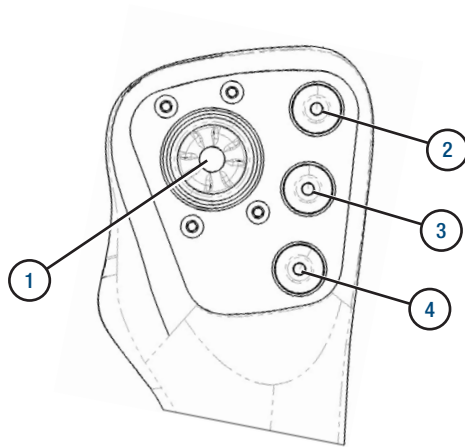


Figure 52: Joystick usage decal—travel mode



RIGHT JOYSTICK
Figure 53: Right joystick

STANDARD MODE
1. Mini Joystick

Move the mini joystick left or right to adjust jib luffing.

2. Travel Parking Brake ON/OFF Switch

Press the button to turn the parking brake off. The LED light in the center of the switch will illuminate when the parking brake is OFF. Press the button again to apply the brake.

3. Travel Speed High/Low Switch

Press the button to activate high speed travel. The LED light in the center of the switch will illuminate when high speed travel is ON. Press the button again to activate low speed travel.

4. Main Winch Speed High/Low Switch

Press the button to activate main winch high speed. The LED light in the center of the switch will be lit when high speed is ON. Press the button again to activate low speed.

Major Axis Functions

- A.** Pushing the joystick forward will lower the main winch.
- B.** Pushing the joystick forward and to the right will lower the main winch and the boom hoist.
- C.** Pushing the joystick to the right will lower the boom hoist.
- D.** Pulling the joystick back and to the right will raise the main winch and lower the boom hoist.
- E.** Pulling the joystick back will raise the main winch.
- F.** Pulling the joystick back and to the left will raise the main winch and the boom hoist.
- G.** Pushing the joystick to the left will raise the boom hoist.
- H.** Pushing the joystick forward and to the left will lower the main winch and raise the boom hoist.

TRAVEL MODE

1. Mini Joystick Main Boom Hoist Control

Press UP for main winch to lower. Press DOWN for main winch to raise. Press to the right for boom hoist down. Press to the left for boom hoist up. Directions between UP-DOWN and RIGHT-LEFT activate both functions.

2. Travel Parking Brake ON/OFF Switch

Press the button to turn the parking brake off. The LED light in the center of the switch will be lit when the parking brake is OFF. Press the button again to apply the brake.

3. Travel Speed High/Low Switch

Press the button to activate high speed travel. The LED light in the center of the switch will be lit when high speed is ON. Press the button again to activate low speed.

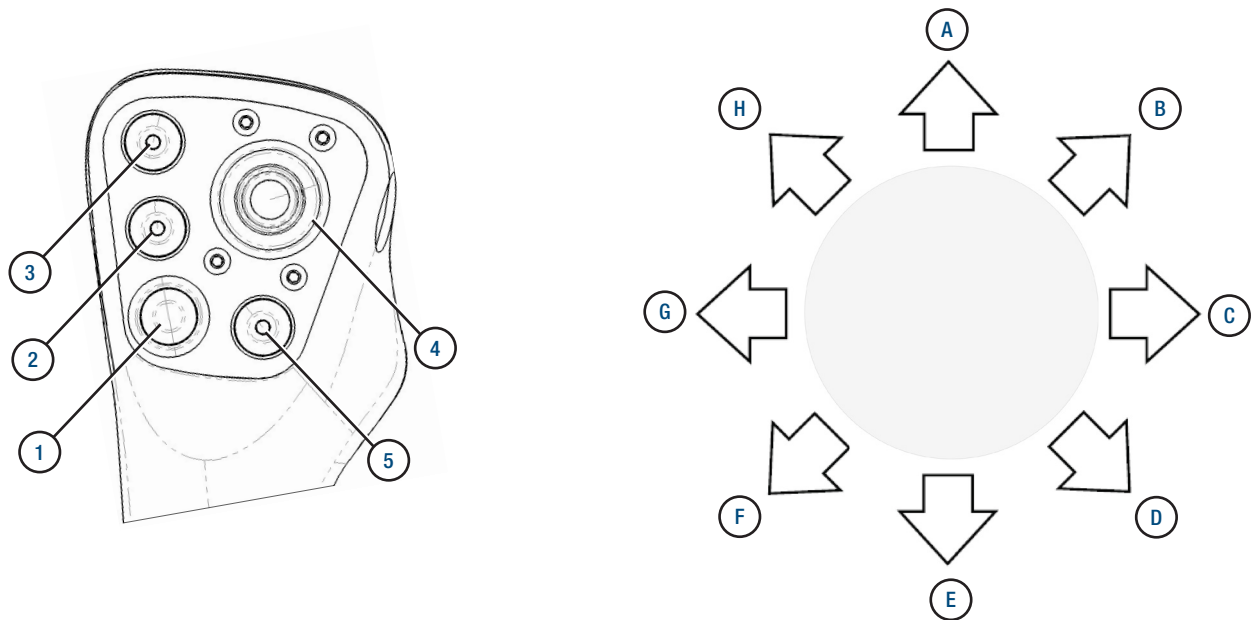
4. Main Winch Speed High/Low Switch

Press the button to activate main winch high speed. The LED light in the center of the switch will be lit when high speed is ON. Press the button again to activate low speed.

Major Axis Functions

The right joystick can also be used to drive and steer the GTC-1600 in travel mode. The joystick is analog (proportional), so the farther the joystick is moved from the center (neutral) position the faster the movement will occur.

- A. Pushing the joystick forward will move both tracks forward.
- B. Pushing the joystick forward and to the right will move the left track forward, causing the GTC-1600 to turn to the right.
- C. Pushing the joystick to the right will move the right track in reverse and the left track forward, causing the GTC-1600 to counter rotate to the right.
- D. Pulling the joystick back and to the right will move the right track in reverse, causing the GTC-1600 to turn right.
- E. Pulling the joystick straight back will move both tracks in reverse.
- F. Pulling the joystick back and to the left will move the left track in reverse, causing the GTC-1600 to turn left.
- G. Pushing the joystick to the left will move the left track in reverse and the right track forward, causing the GTC-1600 to counter rotate to the left.
- H. Pushing the joystick forward and to the left will move the right track forward, causing the GTC-1600 to turn to the left.

LEFT JOYSTICK
Figure 54: Left joystick

STANDARD AND TRAVEL MODES
1. Horn

Pressing the button will sound the horn. The horn is always functional whether the key switch is ON or OFF. Always sound the horn before starting the engine.

2. Auxiliary Winch Speed High/Low Switch

Press the button to activate auxiliary winch high speed. The LED light in the center of the switch will be lit when high speed is ON. Press the button again to change to low speed.

3. Fine Control ON/OFF Switch

Press the button to activate Fine Control mode. When the Fine Control indicator is OFF, functions operate at full speed. When the Fine Control indicator is ON, the precision of controls is increased and the maximum function speeds are limited.

4. Boom Telescope Slider

Moving the slider forward will extend the telescope boom stages. Sliding back will retract the telescope boom stages.

5. Swing Brake ON/OFF Switch

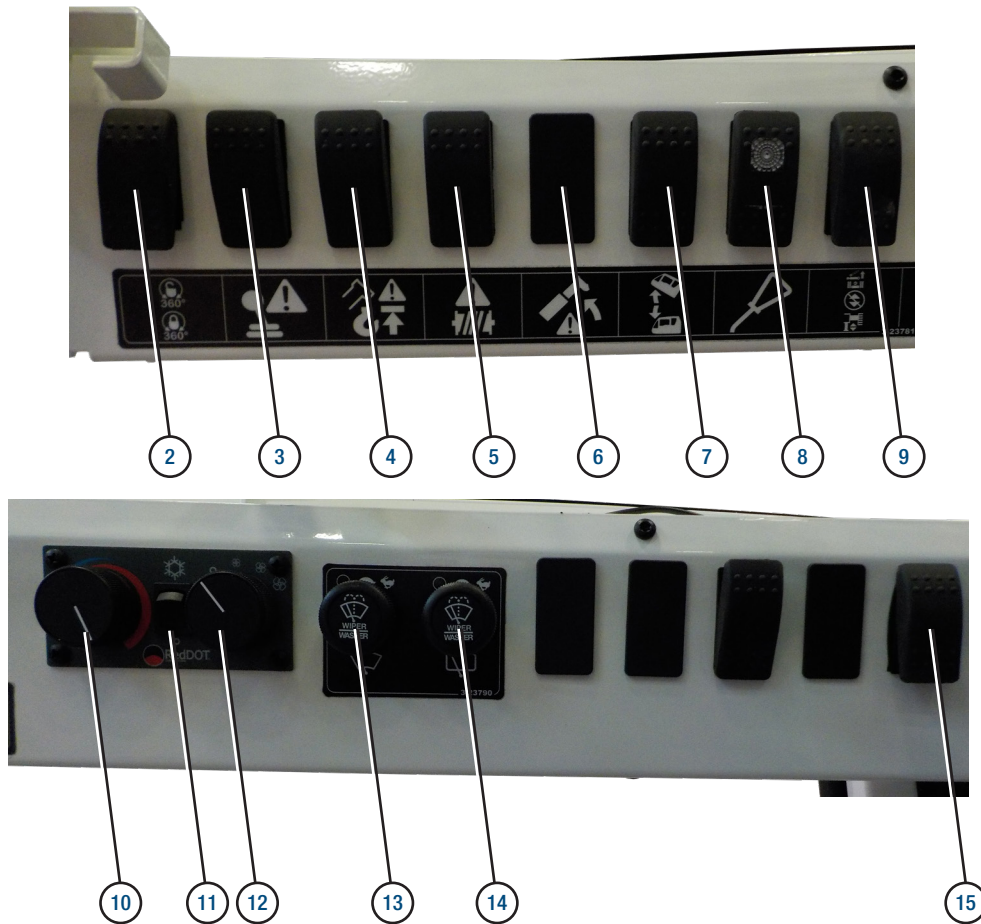
The LED light in the center of the switch will be lit when the swing brake is OFF. When the swing brake is ON, the swing function is disabled. Press the button to turn the swing brake off. Press the button again to apply the swing brake.

Major Axis Functions

- A.** Pushing the joystick forward will lower the auxiliary winch.
- B.** Pushing the joystick forward and to the right will lower the auxiliary winch and swing the boom right.
- C.** Pushing the joystick to the right will swing the boom right.
- D.** Pulling the joystick back and to the right will raise the auxiliary winch and swing the boom right.
- E.** Pulling the joystick back will raise the auxiliary winch.
- F.** Pulling the joystick back and to the left will raise the auxiliary winch and swing the boom left.
- G.** Pushing the joystick to the left will swing the boom left.
- H.** Pushing the joystick forward and to the left will lower the auxiliary winch and swing the boom left.

UPPER RIGHT CONTROL CONSOLE

Figure 55: Right roofline control console



Item Number	Description
1	Fan Switch (not pictured)
2	360° House Lock Switch
3	Rated Capacity Indicator (RCI) Override Switch
4	Anti-Two-Block (A2B) Override Switch
5	Last Wrap Override Switch
6	Boom Hoist Up Override Switch
7	Cab Tilt Switch
8	Lube Pump Switch
9	Remote Enable Switch
10	Temperature Control Switch
11	Air Conditioner Switch
12	Fan Speed Switch
13	Front Window Wiper/Washer Knob
14	Top Window Wiper/Washer Knob
15	Pump Summation Switch

1. Fan

Turn on the toggle switch to start the fan and circulate air inside the cab.

2. 360° House Lock Switch

Press the switch down to engage the 360° house lock. The upper rotating frame can be held at any position with the 360° house lock. To disengage the 360° house lock, press the top of the switch. It may be necessary to release the swing parking brake and gently activate the swing function to allow the mechanism to release. To engage the 360° house lock, position the upper rotating frame in the desired position and press the bottom of the switch. Release the swing parking brake and gently activate the swing function to allow the mechanism to engage, and then operate the swing again to verify it is engaged.



⚠ CAUTION

Do NOT engage while the swing is in motion.

⚠ WARNING

Never use the override switches during normal GTC-1600 operations. Override switches are not intended for use during normal operation. Pressing an override switch cancels the stop function of the AML and/or GTC-1600 control system. Using these switches during normal operation can be extremely dangerous. Use these switches only when operation has been disabled due to failure of the AML and/or GTC-1600 control system, or by a trained technician for service or rigging.

3. Rated Capacity Indicator (RCI) Override Switch

Press the switch to override the RCI stop functions: Boom hoist raise and lower, Boom telescope out, Main winch raise, and Aux winch raise. This can also override backward stability and work area functions: Boom retract and extend, boom hoist raise and lower, swing left and right. There is another RCI override switch on the upper left control console (pg 3-14). Only one needs to be pressed to override the RCI.



NOTE: When this switch is ON, operator inputs and crane conditions are logged.

4. Anti-Two-Block (A2B) Override Switch

Press the switch to override the anti-two-block system to enable the stop functions: Boom telescope out, Main winch raise, Aux winch raise, and Boom hoist lower. There is another anti-two-block switch on the upper left control console (pg 3-14). Only one needs to be pressed to override the anti-two-block system. See **Anti-Two-Block (A2B) Control, pg 6-60** for more information.



5. Last Wrap Override Switch

Press the switch to override the last wrap shutdown. The winch requires a minimum number of wraps on the drum for operation. When the minimum number of wraps is reached on the main or auxiliary winch, the lower function for that winch will be blocked. The raise functions are not blocked. The Last Wrap Override switch may be used when it is necessary to remove all rope from the drum, such as for replacement. See **Last Wrap Control, pg 6-60** for more information.



6. Boom Hoist Override Switch

CE option only.



7. Cab Tilt Switch

Press on the top of the switch to tilt the cab up. Press on the bottom of the switch to lower the cab.



8. Lube Pump Switch

The green LED will illuminate when pump is operating (approximately ten minutes). The red LED will flash when the grease reservoir needs to be refilled. If necessary, press the switch to activate the lube pump manually. See [Operate Automatic Lubrication System, pg 7-18](#) for more information.

NOTE: This switch is only present in GTC-1600 cranes specified with the optional automatic lubrication system.



9. Remote Enable Switch

The center position of the switch is normal operation position. Press on the top of the switch to enable the counterweight and jib stowage remote. Press on the bottom of the switch to enable the carbody jack remote. See [Remote Controls, pg 3-16](#) for more information.



10. Temperature Control Switch

Turn the knob clockwise to increase the temperature and counterclockwise to decrease the temperature.



Temperature control knob

AC switch

Fan speed control knob

11. Air Conditioner Switch

Press on the top of the Air Conditioner switch to turn ON the air conditioner. Press on the bottom of the switch to turn OFF the air conditioner.

12. Fan Speed Switch

Turn the knob clockwise to turn ON the fan and increase speed. Turn the knob counterclockwise to decrease fan speed or turn fan OFF.

13. Front Window Wiper/Washer Knob

Turn the knob clockwise to turn on the front window wiper. The wiper has 2 speeds; continuing to turn the knob will put the wiper in high speed. Press the button to activate the washer fluid.



14. Top Window Wiper/Washer Knob

Turn the knob clockwise to turn on the top window wiper. The wiper has 2 speeds; continuing to turn the knob will put the wiper in high speed. Press the button to activate the washer fluid.



15. Pump Summation Switch

Switching this to ON (high speed) will engage both main hydraulic pumps to increase the speed of some single and/or simultaneous GTC-1600 operations. To use this increased speed, switch to ON before operating the joysticks. Switching this to OFF (normal speed) will engage only one main hydraulic pump and functions will operate at normal speed.

NOTE: When the Pump Summation Switch is used for simultaneous GTC-1600 operations, it may cause some shock—depending on the operation performed.

NOTE: This function is enabled automatically when the travel brake is released.

UPPER LEFT CONTROL CONSOLE

! WARNING

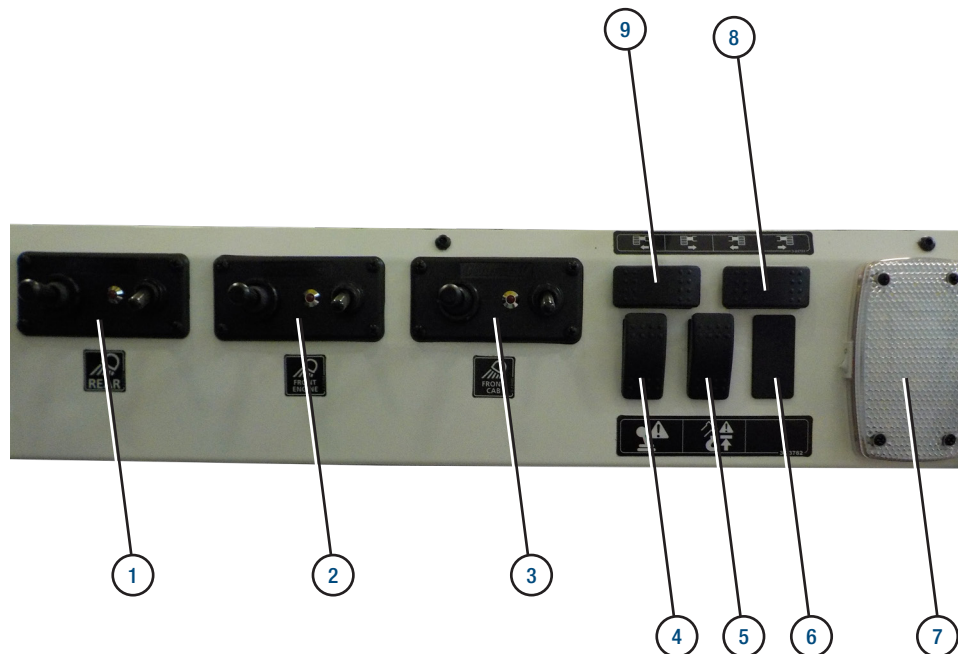
Never use the override switches during normal GTC-1600 operations. Override switches are not intended for use during normal operation. Pressing an override switch cancels the stop function of the AML and/or GTC-1600 control system. Using these switches during normal operation can be extremely dangerous. Use these switches only when operation has been disabled due to failure of the AML and/or GTC-1600 control system, or by a trained technician for service or rigging. When the switch is ON, operator inputs and crane conditions are logged.

! CAUTION

To help prevent equipment damage:

- Do NOT fully retract tracks when travel hose quick-disconnect is stowed. Install in operating position before fully retracting tracks. See [Chapter 4: Assembly from Transport, pg 4-1](#) for more information.
- Do NOT fully retract jacks when (optional) carbody jacks are deployed. See [Chapter 4: Assembly from Transport, pg 4-1](#) and [Carbody Jack Remote, pg 3-18](#) for more information on stowing the carbody jacks.

Figure 56: Upper left control console



Item Number	Description
1	Rear Light
2	Front Engine Light
3	Front Cab Light
4	Rated Capacity Indicator (RCI) Override Switch
5	Anti-Two-Block (A2B) Override Switch
6	Option
7	Interior Cab Light
8	Right Track Switch
9	Left Track Switch

1. Rear Light

Move the toggle switch to turn the light on. When the light is on, the red indicator will illuminate. Move the directional control knob to control the direction of the light beam.



2. Front Engine Light

Move the toggle switch to turn the light on. When the light is on, the red indicator will illuminate. Move the directional control knob to control the direction of the light beam.



3. Front Cab Light

Move the toggle switch to turn the light on. When the light is on, the red indicator will illuminate. Move the directional control knob to control the direction of the light beam.



4. Rated Capacity Indicator (RCI) Override Switch

Press the switch to override the RCI stop functions:

- Boom telescope out and retract
- Main winch raise
- Aux winch raise
- Boom hoist raise and lower
- Swing left and right



NOTE: There is another RCI override switch on the upper right control console. Only one needs to be pressed to override the RCI.

NOTE: This switch does NOT override the anti-two-block system.

NOTE: When the switch is ON, operator inputs and crane conditions are logged.

! WARNING

Using this switch will override backward stability and work area function.

5. Anti-Two-Block (A2B) Override Switch

Press the switch to override the anti-two-block system to enable the stop functions:

- Boom telescope out
- Main winch raise
- Aux winch raise
- Boom hoist lower



See [Anti-Two-Block \(A2B\) Control, pg 6-60](#) for more information.

NOTE: There is another anti-two-block switch on the upper right control console. Only one needs to be pressed to override the anti-two-block system.

NOTE: When the switch is ON, operator inputs and crane conditions are logged.

6. Option

Not used on this model.

7. Interior Cab Light

Press the switch in to turn on the light. Press the switch again to turn off the light.

8. Right Track Switch

Press and hold the right side of the switch to extend the track. Press and hold the left side of the switch to retract the tracks ([OPTI-WIDTH™ Track Width Zones, pg 6-58](#)).



9. Left Track Switch

Press and hold the left side of the switch to extend the track. Press and hold the right side of the switch to retract the tracks ([OPTI-WIDTH™ Track Width Zones, pg 6-58](#)).



REMOTE CONTROLS

The GTC-1600 includes a remote control for removing and installing the counterweights, and for stowing and deploying the jib. Another remote control is included with the carbody jack system. It is used for raising and lowering the GTC-1600 on carbody jacks and controlling the track extend functions for removing and installing the track assemblies.

To use the remote controls, the remote enable switch inside the cab must be in the correct position.

NOTICE

When raising and lowering the counterweight, ensure the counterweight remains level throughout the operation.

Use the Both Counterweight Raise and Both Counterweight Lower buttons to raise and lower the counterweight evenly. If necessary, during operation, use the Left Side Counterweight Raise, Left Side Counterweight Lower, Right Side Counterweight Raise, and/or Right Side Counterweight Lower buttons to adjust the counterweight position and keep it level.

COUNTERWEIGHT AND JIB REMOTE

Figure 57: Counterweight and jib remote



- **Emergency Stop Switch**
Press down on the red Emergency Stop button to immediately stop all remote functions. To reset, rotate the button clockwise or counterclockwise and cycle power. The button will pop up when reset.
- **OFF/ON/Speed Switch**
This is a three-position switch with OFF, ON, and Speed selection positions.
At startup, hold the switch in the Speed position to establish a radio connection with the control module.
- **Status LED Indicators**
Displays the current speed range that is selected. 25% is the slowest and 100% is the fastest.

NOTE: To decrease the speed range of the remote, hold the OFF/ON/Speed switch in the Speed position and press and release the Left Counterweight button. The speed will display on the status LED indicator. Press again until desired speed is reached.

To increase the speed range of the remote, hold the OFF/ON/Speed switch in the Speed position and press and release the Right Counterweight button. The speed will display on the status LED indicator. Press again until desired speed is reached.

- **Left Counterweight**
Press and hold the button and either the Counterweight Raise or Counterweight Lower button to raise/lower the left counterweight cylinder.
- **Right Counterweight**
Press and hold the button and either the Counterweight Raise or Counterweight Lower button to raise/lower the right counterweight cylinder.
- **Counterweight Raise**
Press and hold the button to raise the right and left counterweight cylinders together.
- **Counterweight Lower**
Press and hold the button to lower the right and left counterweight cylinders together.
- **Jib Pin Lock**
Press and hold the button to lock the jib stowage pins.
- **Jib Pin Unlock**
Press and hold the button to unlock the jib stowage pins.
- **Jib Stow**
Press and hold the button to retract the jib stowage cylinder.
- **Jib Release**
Press and hold the button to extend the jib stowage cylinder.

CARBODY JACK REMOTE

Figure 58: Carbody jack remote



- **Emergency Stop Switch**
Press down on the red Emergency Stop button to immediately stop all remote functions. To reset, rotate the button clockwise or counterclockwise and cycle power. The button will pop up when reset.
- **OFF/ON/Speed Switch**
This is a three-position switch with OFF, ON, and Speed selection positions.
At startup, hold the switch in the Speed position to establish a radio connection with the control module.
- **Status LED Indicators**
Displays the current speed range that is selected. 25% is the slowest and 100% is the fastest.
- **'1' Button Left Front Jack**
To operate just the left front carbody jack cylinder, press and hold the '1' button and press and hold the Jack Extend button to extend the lift cylinder or the Jack Retract button to retract the lift cylinder.
- **'2' Button Right Front Jack**
To operate just the right front carbody jack cylinder, press and hold the '2' button and press and hold the Jack Extend button to extend the lift cylinder or the Jack Retract button to retract the lift cylinder.
- **'3' Button Left Rear Jack**
To operate just the left rear carbody jack cylinder, press and hold the '3' button and press and hold the Jack Extend button to extend the lift cylinder or the Jack Retract button to retract the lift cylinder.
- **'4' Button Right Rear Jack**
To operate just the right rear carbody jack cylinder, press and hold the '4' button and press and hold the Jack Extend button to extend the lift cylinder or the Jack Retract button to retract the lift cylinder.
- **Jack Retract**
Press the 'Jack Number' button and the Jack Retract button to retract the jack cylinders individually.
- **Jack Extend**
Press the 'Jack Number' button and the Jack Extend button to extend the jack cylinders individually.
- **All Jacks Retract**
Press and hold the All Jacks Retract button to retract all the jack cylinders at the same time.
- **All Jacks Extend**
Press and hold the All Jacks Extend button to extend all the jack cylinders at the same time.
- **Left Track Extend**
Press and hold the Left Track Extend button to extend the left side track.
- **Right Track Extend**
Press and hold the Right Track Extend button to extend the right side track.
- **Left Track Retract**
Press and hold the Left Track Retract button to retract the left side track.
- **Right Track Retract**
Press and hold the Right Track Retract button to retract the right side track.

MULTIFUNCTION DISPLAY

The multifunction display (MFD) provides access to GTC-1600 status and warning information. It may also be used to select operation modes. In addition, it is possible to adjust certain parameters, measure input and output values, set operator preferences, and view GTC-1600 information on other pages. See [Multifunction Display, pg 6-8](#) for information about GTC-1600 warnings and errors on the MFD, using the AML, and navigating the MFD menus.

Figure 59: Multifunction (MFD) display



Use the MFD to:

Operate

- Boom telescope (ESP System)
- Warmup circuit functions

Adjust

- AML settings (work area limits)
- Engine settings (exhaust cleaning)
- Crane configuration

Access

- Hydraulic system information
- Wind speed (for cranes with optional anemometer)
- Engine warnings and information (DEF level, fuel level)
- User settings (function speed, winch/swing alerts, swing mode, control mode)
- Diagnostics and troubleshooting

CHAPTER 4: ASSEMBLY FROM TRANSPORT

The GTC-1600 will need to be assembled at the work site before operation can begin.

WARNING

Never prepare the GTC-1600 for the work site on uneven, loose ground. Always prepare on a flat, level, hard surface. Do NOT allow unauthorized personnel in the assembly/disassembly area. The GTC-1600 can tip, causing serious injury or death.

The following items can be installed/removed without assistance from another crane:

- Counterweight(s)
- Track frame assemblies (using the carbody jack system)

NOTE: Free swing is not available when the GTC-1600 is configured for carbody jacks.

WARNING

The assembly instructions in this manual apply only to this described configuration. Discuss with TADANO customer support before deviating from this configuration.

During assembly/disassembly, NEVER lower the boom angle below 20° when on Carbody Jacks—unless the GTC-1600 is supported with blocks under the (extended) extend beam ends, and the boom and upperworks are parallel to the extend beams.

Required GTC-1600 transport configuration:

- Hook Block reeved with 4 parts of line
- Jib stowed on the side of the boom, or transported separately
- Crane transported on removable gooseneck (RGN) trailer with sufficient capacity to meet local/national transport regulations
- Crane supported under the (extended) extend beam ends
- Crane oriented with extend beams parallel to the trailer direction

To Assemble the GTC-1600

1. [Unload GTC-1600 from Trailer, pg 4-3](#)
2. [Install Track Frames, pg 4-6](#)
3. [Install Carbody Counterweights, pg 4-10](#)
4. [Install Upper Counterweight, pg 4-12](#)
5. [Mount Main Jib, pg A-5](#) (if desired)

NOTICE

The assembly procedures detailed in this section assume the use of the carbody jack system.

If an additional crane or lifting device is used to remove any of the following items, it must be able to handle the lifting capacities of these components:

Table 9: GTC-1600 removable component weights

Component	Weight		Trailer				
	lb	kg	1	2	3	4	5
Crane Transporter (with two (2) winches, boom, wire rope, auxiliary nose sheave, four (4) carbody jack pads)	95,913	43,505	•				
Left Track Frame	30,220	13,708		•			
Right Track Frame	30,220	13,708			•		
Upper Counterweight—Base Section	40,300	18,280				•	
Upper Counterweight—Middle Section	14,650	6,645					•
Upper Counterweight—Top Section	15,050	6,827					•
Carbody CWT with toolbox and OHB	13,180	5,978		•			
Carbody CWT with CWT shelf, two (2) bars	12,462	5,653			•		
Jib—Heavy lift	2,300	1,040					•
Main Jib	1,003	454				•	
Jib Tip	1,000	452				•	
Jib Insert	1,053	477					•
Jib Insert	1,053	477					•
Hook Block (110 T)	2,405	1,091	•				
Miscellaneous Items (Including two (2) three-legged lifting slings and other items)	500	227				•	
Total Weight on Trailer			98,120 lb	43,400 lb	43,200 lb	42,803 lb	34,106 lb

UNLOAD GTC-1600 FROM TRAILER

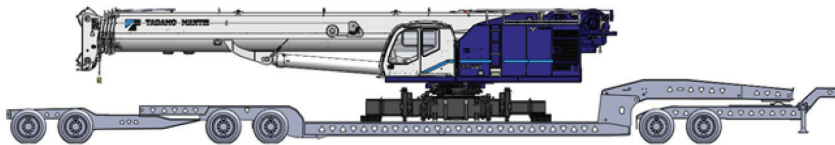
WARNING

Always park the trailer on a hard, flat, level surface, before unloading the GTC-1600, to prevent the crane from tipping.


WARNING

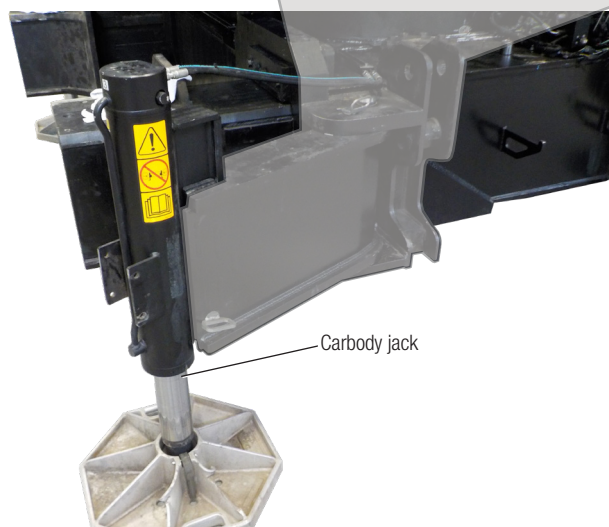
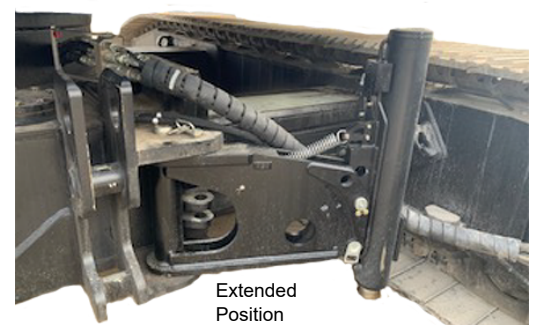
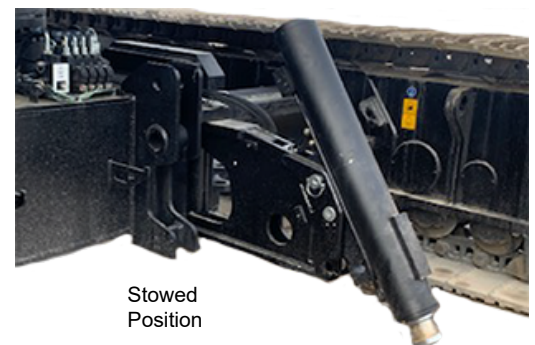
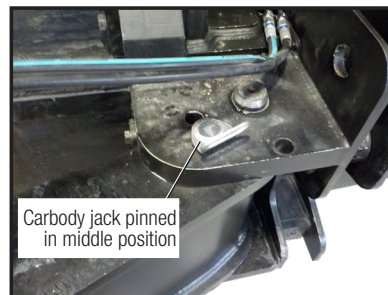
Never use the carbody jacks to raise the GTC-1600 unless the crane is in the proper configuration. The upper counterweight must be removed before using the carbody jacks.

Figure 60: GTC-1600 secured to trailer



1. Confirm the lift plan and ensure all personnel understand their responsibilities. Establish a clear form of communication between personnel.
2. Start the engine. Ensure the swing brake is locked and the boom is aligned with the trailer.
3. Confirm the automatic moment limiter (AML) is operating properly ([Multifunction Display, pg 6-8](#)).
4. Confirm On Carbody Jacks mode is selected in the AML.
5. Swing each carbody jack from the transport position away from the extend beams to the middle position and pin them in place.
6. If the crane is equipped with 2-stage carbody jacks, position jacks to the upright position using the pivot pins.

Figure 61: Carbody jack pinned in middle position



7. Install the carbody jack pads on each cylinder and verify the surface is flat and smooth.
8. Position proper dunnage, if required, under each carbody jack pad. Do NOT 'bridge' the pads. Use cribbing material, if necessary.

WARNING

Verify the AML system is set to the On Carbody Jacks mode before extending the carbody jacks to lift the GTC-1600.

WARNING

When lowering the carbody jacks, the boom angle should be set to 55–60° for optimal stability.

9. Enable the Carbody Jack Remote ([Enable Remote Control, pg A-4](#)).
10. Extend the jacks to make firm contact with the ground or dunnage.

NOTE: Press the All Jacks Retract / All Jacks Extend button, to operate all four jacks at once. Or, to operate jacks individually, fully press the button for the desired jack and the Jack Extend / Jack Retract button:

- 1 = front left
- 2 = front right
- 3 = rear left
- 4 = rear right

NOTE: See [Carbody Jack Remote, pg 3-18](#) for more information.

DANGER

Never raise the GTC-1600 from the trailer if the crane is not level (i.e., is not less than 1°) or it will not remain stable. The operator is responsible for keeping the GTC-1600 level.

NOTE: To raise the GTC-1600 with automatic leveling, press the All Jacks Extend button. The system should automatically maintain level within 1° relative to gravity. If the GTC-1600 is not level, operate the individual jacks to level the crane before using the automatic leveling feature.

NOTE: If jacks are operated in with All Jacks Extend / All Jacks Retract button before the jacks are in firm contact with the ground, they will not extend/retract equally.

11. Raise the boom from the transport position. The boom angle should be set to 55–60°.
12. Raise the GTC-1600 using the carbody jacks until there is enough clearance to remove the trailer.

Figure 62: GTC-1600 on carbody jacks



- 13.** Remove the trailer from beneath the GTC-1600.
- 14.** Lower the crane on jacks until the small stage is fully retracted.

INSTALL TRACK FRAMES

WARNING

Always maintain clear communication between the crane operator and any ground personnel.

- If using hand signals, both the crane operator and any ground personnel must decide on the hand signals that they will be using during the job before the work begins ([Recommended Hand Signals, pg 1-23](#)).
 - If hand signals are not used, set up and test proper radio communication before the job begins.
1. After unloading GTC-1600 ([Unload GTC-1600 from Trailer, pg 4-3](#)), ensure On Carbody Jacks is selected in automatic moment limiter (AML).
 2. Position the track frames beside the GTC-1600 within the rated radius of the rigging mode chart. Adjust the carbody jacks for track frame clearance, if necessary.
 3. Extend the track frame beams for both left and right sides.
 4. If necessary, raise the boom to 55–60° and keep the boom fully retracted.
 5. Swing the boom directly over the side, positioning the hook over the center of the first track to be installed.

Figure 63: Boom raised, over side

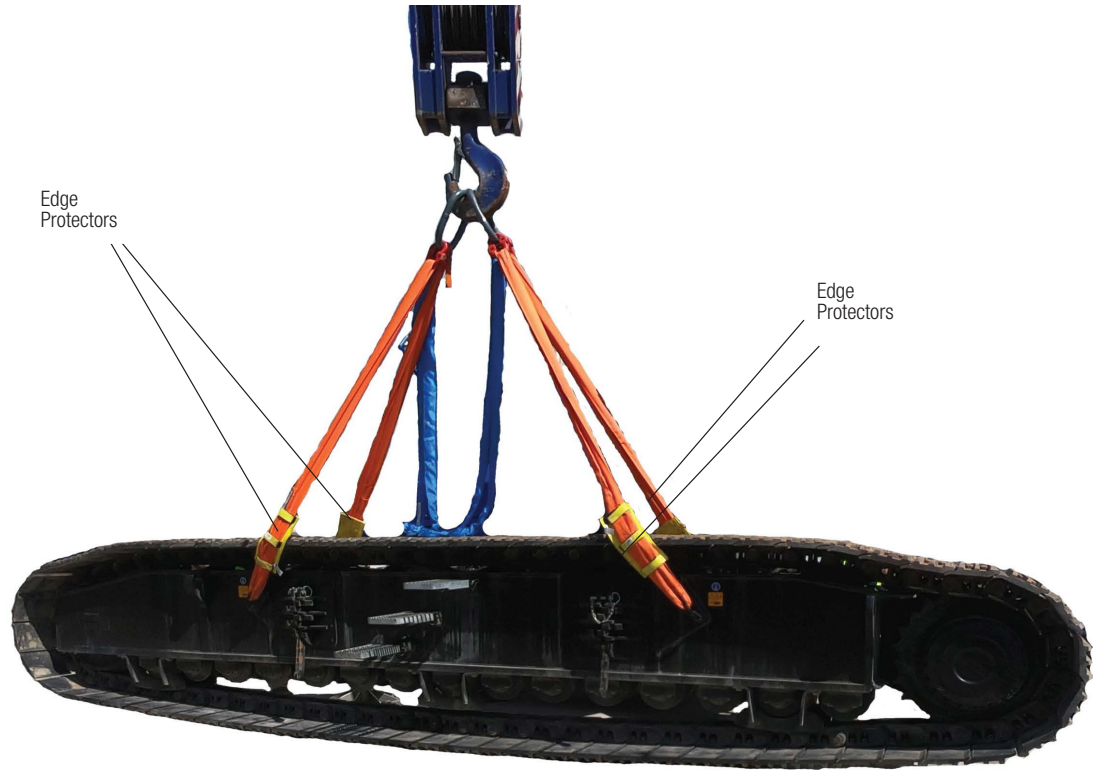


6. Press the Cab Tilt Switch ([Upper Right Control Console, pg 3-10](#)) to tilt the operator cab up.
7. Attach the factory-supplied track frame sling to each of the shackles ([Figure 64](#)).

NOTE: Attach the 2 included 3-legged slings to the hook block and install the track edge protectors on the 4 orange legs. Use these 4 orange legs to rig the trackframes.

NOTE: There are two lift points on the outer side of the frame and two on the inner side of the frame.

Figure 64: Rig track frame



NOTICE

Use track shoe edge protectors when lifting the track frames to help prevent sling damage.

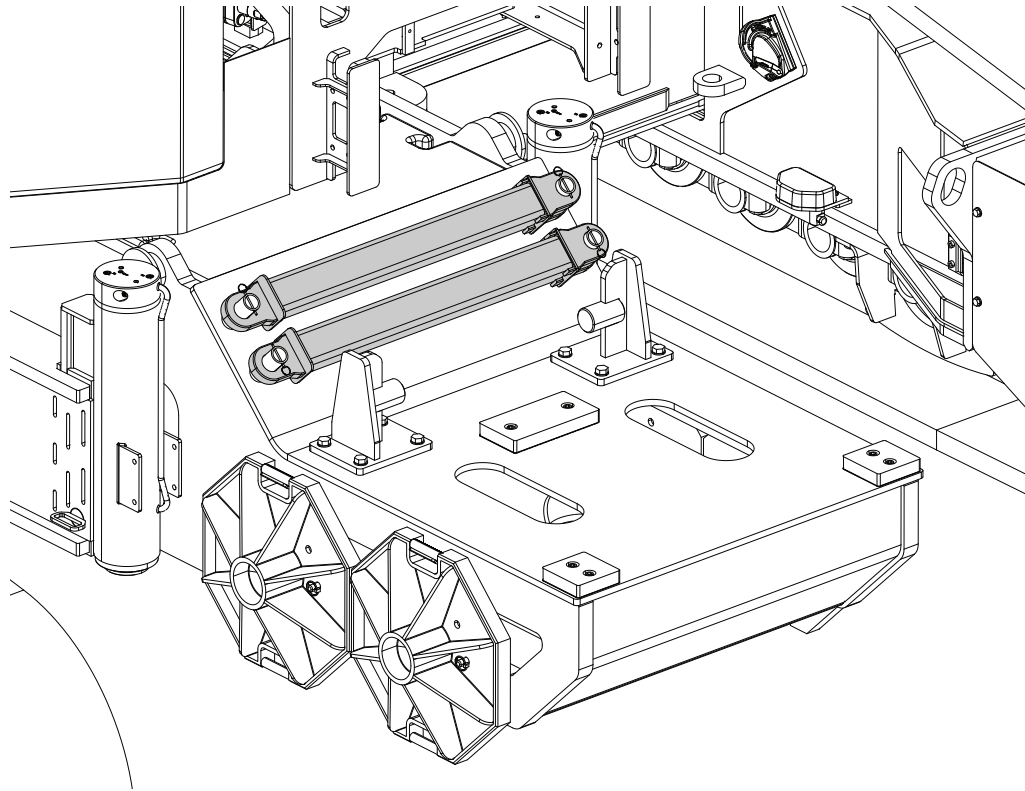
8. On the track frame at each extend beam interface, remove retaining pins and release latch plate. Rotate locking bars alternately to right and left.

Figure 65: Track frame latch plate—unlatched



9. Remove the track frame assembly bars from the transport storage area.

Figure 66: Track frame assembly bars



10. Connect the track frame assembly bars to the GTC-1600 carbody.
11. Using the GTC-1600, lift the track frame into place.
12. Connect the track frame assembly bars between the carbody and track frame.
13. Extend the track extend beams until they are fully engaged in the track frame beam box.
14. Engage the latch bars with the end of the extend beam.
15. On the track frame at each extend beam interface, rotate the center plates to realign the vertical notch. Swing up the latch plate and reinstall retainer pin.

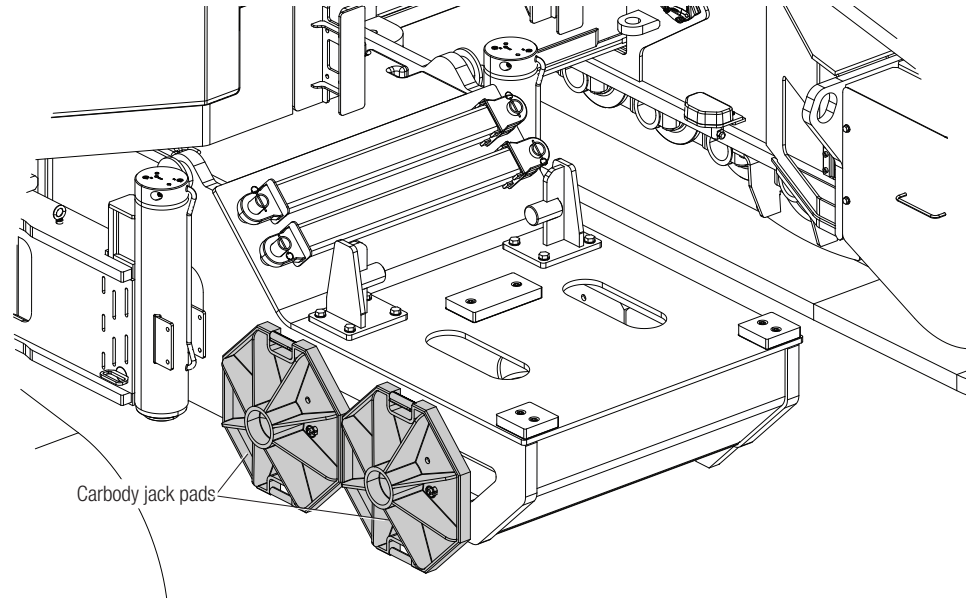
Figure 67: Track frame latch plate—latched



16. Repeat steps 7–15 to install the remaining track frame on the opposite side.

17. When the track frames and carbody counterweights are properly installed, carefully lower the GTC-1600 off the carbody jacks.
18. Install the carbody counterweights ([Install Carbody Counterweights, pg 4-10](#)).
19. Swing the carbody jacks into the stowage position, and pin in place ([Figure 61, pg 4-3](#)).
20. Stow the carbody jack pads on the carbody counterweight ([Figure 68](#)).

Figure 68: Carbody jack pads stowed for worksite accessibility



INSTALL CARBODY COUNTERWEIGHTS

Depending on how the GTC-1600 was transported, the front and rear carbody counterweights may need installation.

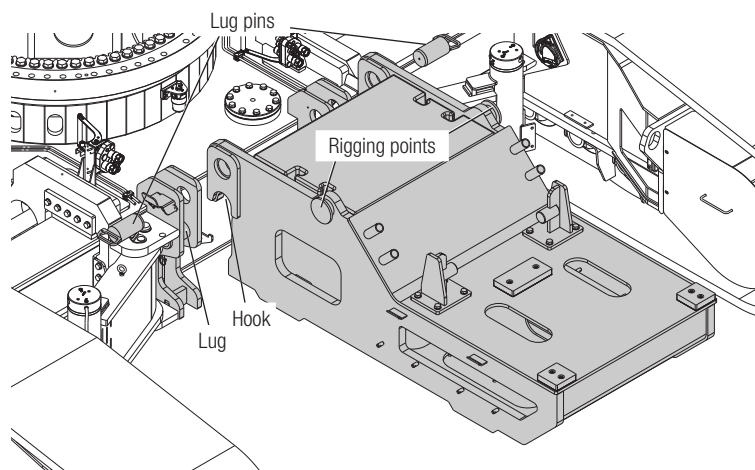
WARNING

Always stay clear of and NEVER beneath the counterweight, when it is lifted.
The counterweight can spin and swing when lifted.

NOTE: The front and rear carbody counterweights are different and are not interchangeable. Mounting provisions only allow for installing the carbody counterweights in their proper positions.

1. Press the Cab Tilt Switch (**Upper Right Control Console, pg 3-10**) to tilt the operator cab up.
2. Position the boom with the hook block positioned directly above the carbody counterweight.
3. Using two of the orange legs on a factory-supplied sling, attach the carbody counterweight to the hook block.

Figure 69: Lift carbody counterweight (rear carbody counterweight shown)



NOTE: The front and rear carbody counterweights are not interchangeable. The mounting provisions help ensure they are installed in the correct positions.

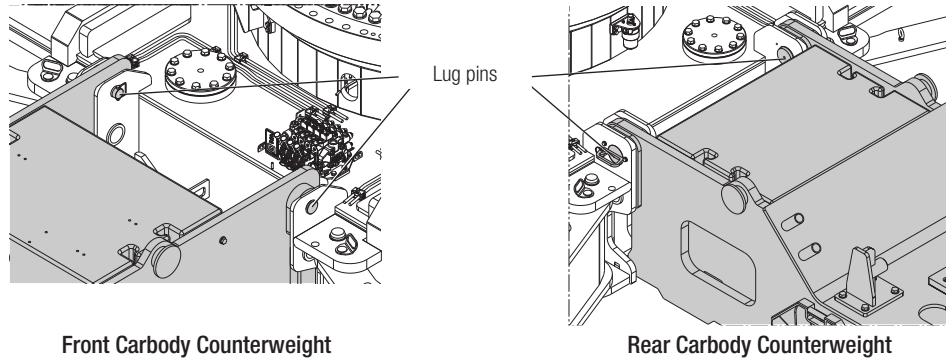
- Slowly lift the carbody counterweight and move it toward the GTC-1600.

NOTICE

Ensure all travel hoses and obstacles are clear of the carbody counterweight when it is lifted.

- Lower the carbody counterweight—placing the carbody counterweight hooks on the lugs.
- Install the lug pins through the lugs, and install the lug pin locking pins to secure the carbody counterweight in place.

Figure 70: Carbody counterweights installed with retaining pins



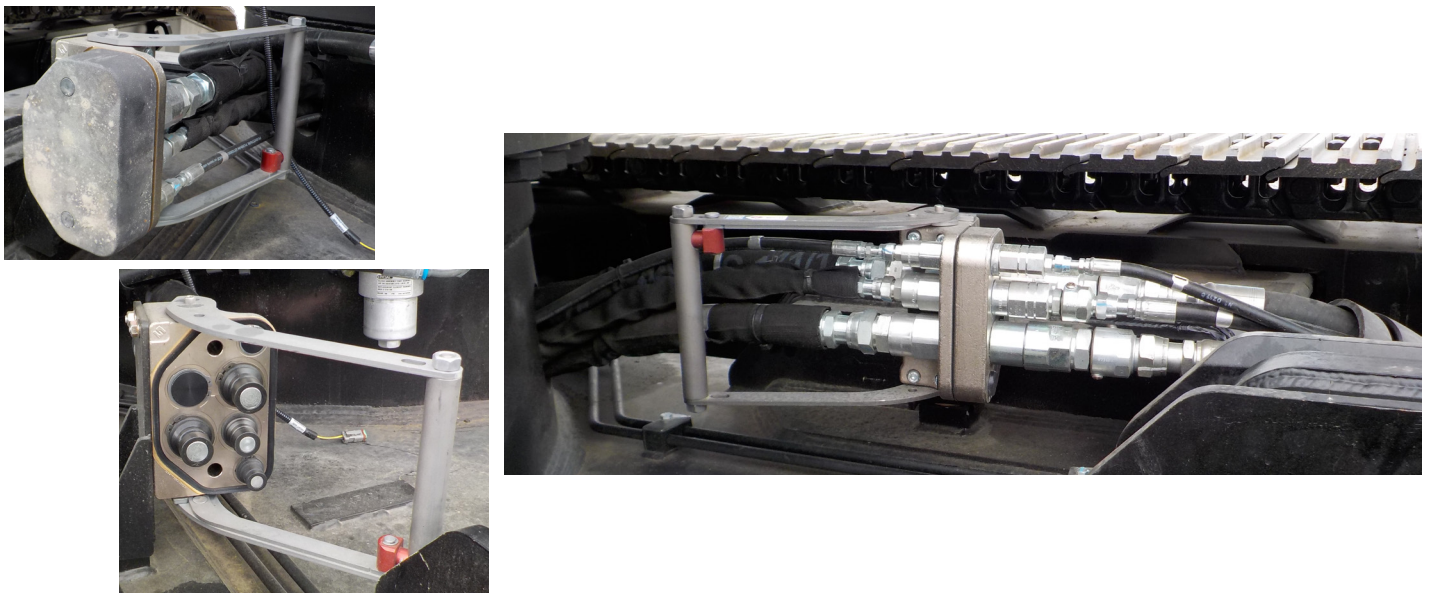
- Repeat steps 2–6 to install the remaining carbody counterweight on the opposite side.
- Turn the Carbody Jack Mode OFF and register the proper crane configuration on the AML.

NOTICE

Before connecting quick couplers, ensure that both the male and female quick couplers are clean (free of any dirt and debris).

- Connect the quick couplers to the drive motor hydraulic lines, and stow the covers.

Figure 71: Drive motor hydraulic lines



- Swing the carbody jacks back to the stowed position.
- Press the Cab Tilt Switch (**Upper Right Control Console, pg 3-10**) to tilt the operator cab down.

INSTALL UPPER COUNTERWEIGHT

UPPER COUNTERWEIGHT CONFIGURATIONS

⚠ WARNING

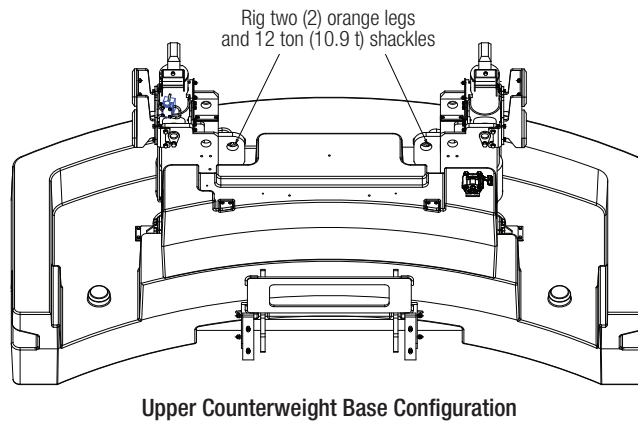
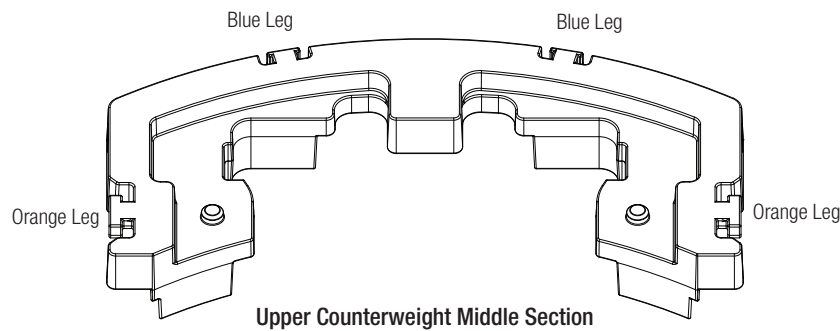
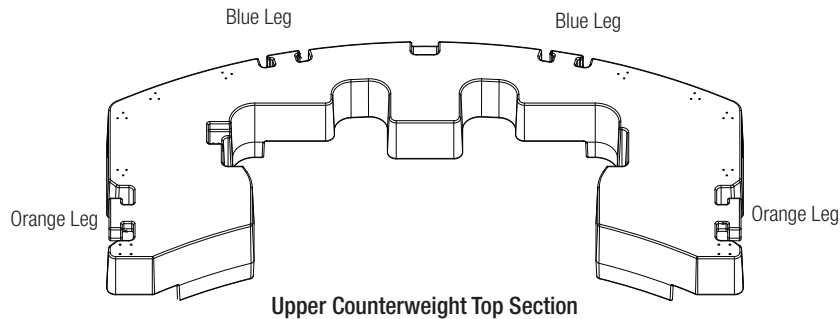
Do NOT use one Middle/Top Upper Counterweight Section without the other. Only install correct Upper Counterweight configurations as described below.

Each of the GTC-1600 load charts reflect one of these three counterweight configurations:

- **Full Counterweight Configuration:** Base Section, Middle Section, and Top Section (70,100 lb / 31,797 kg total)
- **Base Counterweight Configuration:** Base Section only (40,300 lb / 18,280 kg)
- **No Counterweight Configuration:** No Upper Counterweight components are installed

See [Figure 44, pg 2-8](#) for counterweight component dimensions. Use the two factory-supplied 3-legged slings together for all counterweight lifting. For top and middle counterweight section lifting, use two blue legs and 2 orange legs as shown.

Figure 72: Counterweight rigging



ASSEMBLING AND INSTALLING UPPER COUNTERWEIGHT CONFIGURATIONS

WARNING

Always stay clear of and NEVER beneath the counterweight, when it is lifted.

The counterweight can spin and swing when lifted.

The counterweight can tilt to one side, resulting in GTC-1600 damage.

Do NOT spill hydraulic oil when disconnecting the hydraulic hoses. This could cause a fire. Immediately remove any spilled hydraulic oil. Do NOT remove the hydraulic hose connectors near open flame.

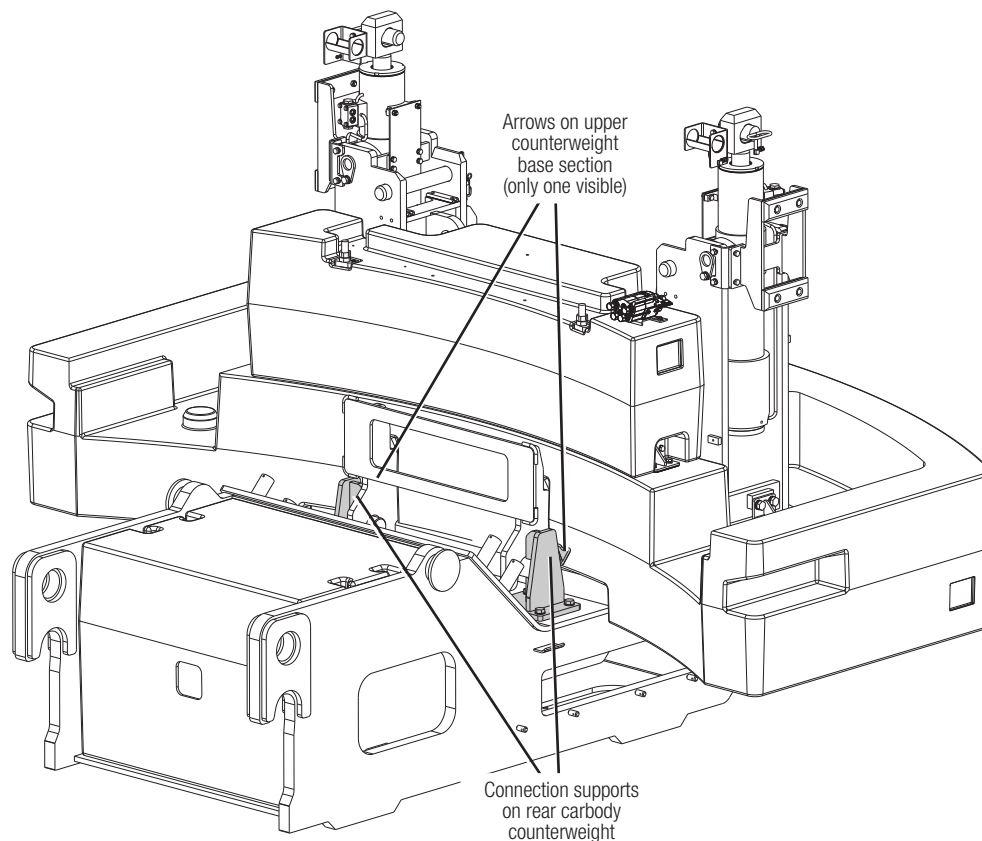
Lift the counterweight ONLY at the designated rigging points (Figure 72, pg 4-12).

1. Carbody counterweights must be installed before installing upper counterweights (Install Carbody Counterweights, pg 4-10).
2. Extend the tracks fully and ensure the GTC-1600 is on firm, level ground.
3. Confirm that the counterweight installation pins—two (2) places—and the counterweight cylinder connection pins—two (2) places—are not in the locked positions.
4. Rig the Upper Counterweight Base Section with two (2) blue slings and two (2) 12 ton (10.9 t) shackles (Figure 72, pg 4-12).
5. Lift and position the Base Section so that the arrows are aligned with the connection supports on the Rear Carbody Counterweight (Figure 73).


WARNING

Do NOT lift the Base Section with the Middle or Top Section(s) placed on it.

Figure 73: Upper counterweight base section on rear carbody counterweight



6. Lower the Upper Counterweight Base Section and confirm that it is positioned on the connection supports correctly.

7. For the Full Counterweight Configuration (see [Upper Counterweight Configurations, pg 4-12](#)), install the Middle and then the Top Sections onto the Base Section.

NOTE: Use the included slings to rig the Middle Section then the Top Section (Figure 72, pg 4-12).

NOTE: It may be necessary to deploy grab handles (if installed) to ensure clearance with lifting slings.

NOTICE

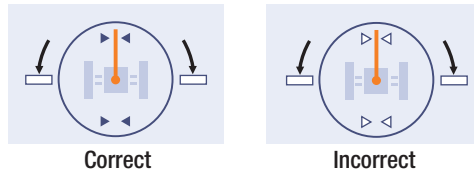
Do NOT let the counterweights touch the counterweight cylinder or any piping.

Figure 74: Lifting upper counterweight top section



8. Slew the boom over the front until the Counterweight / Boom Installation/Removal Position Indicator illuminates (Figure 75).

Figure 75: Counterweight / Boom Installation/Removal Position Indicator



NOTICE

Ensure grab handles and guardrails, if installed, are in the stowed position.

NOTE: The indicator illuminates when the swing angle is 0°.

NOTICE

Do NOT engage the swing lock.

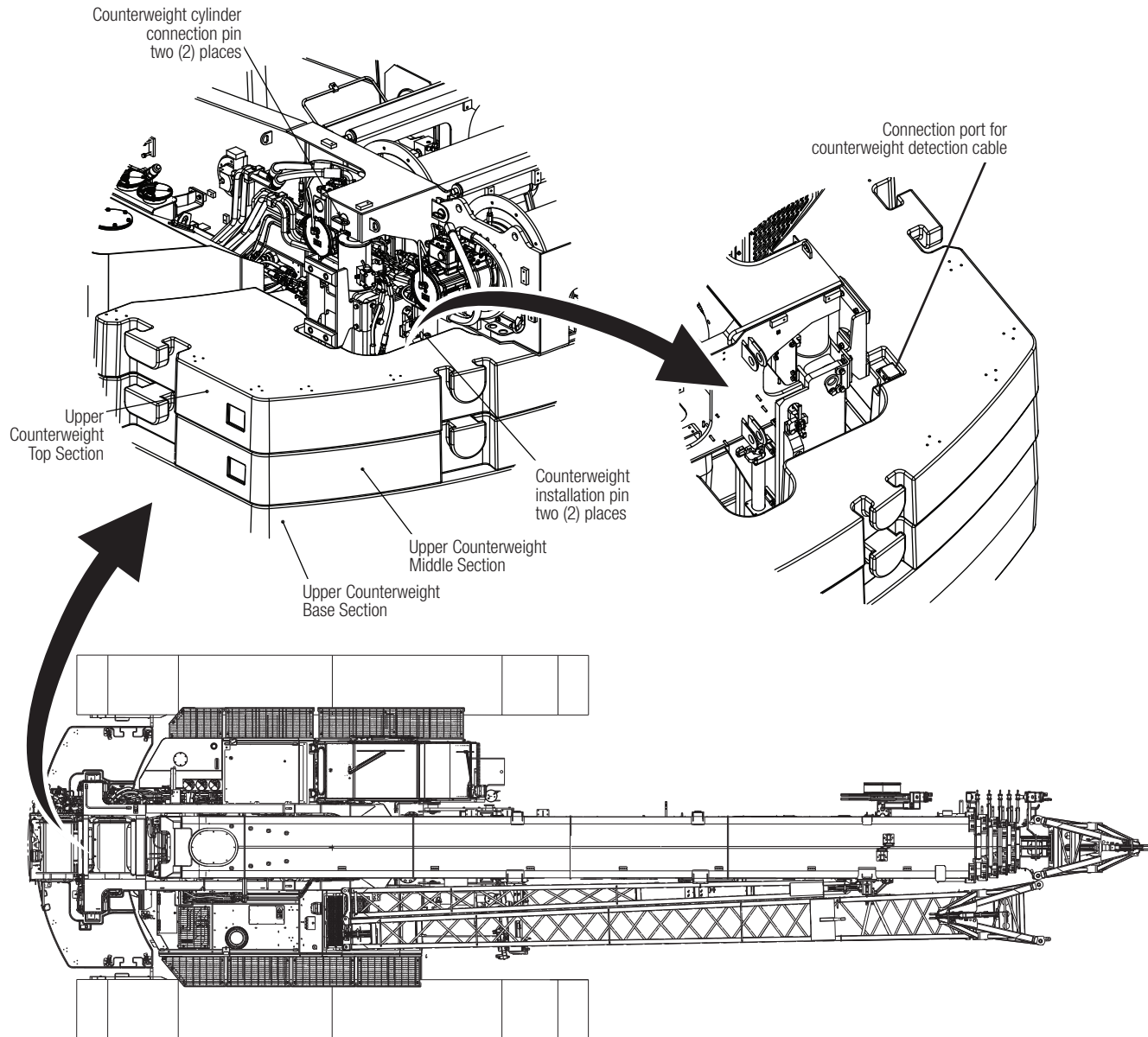
9. Set the swing brake switch to ON.
10. Set the boom angle to 70°.
11. Connect the hydraulic hoses for counterweight installation/removal. Connect the hoses so that the markings on the hydraulic hoses match the markings on the support on the counterweight.

NOTICE

Do NOT slew the upper works until the counterweight is installed.

12. Enable the Counterweight and Jib Remote ([Enable Remote Control, pg A-4](#)).

Figure 76: GTC-1600 upper counterweight



13. Extend the cylinders fully by pressing the Lower button on the remote control.
14. Confirm that the pin holes on the left and right of the upper works are aligned with the pin holes on the cylinders.
15. Insert the Left and Right Section counterweight cylinder connection pins, and turn the pins to install them.
16. Retract the cylinders by pressing the Raise button on the remote control. This will lift the counterweight.

NOTE: Ensure that the counterweight is level during this operation. Operating the remote control 10–13 ft (3–4 m) from the counterweight rear will provide a good position to watch the counterweight lift.

⚠ WARNING

Stop operation immediately if the counterweight is significantly out of level.

Set the Left/Right selector switch to LEFT or RIGHT and press the Lower/Raise button on the remote control, as necessary, to adjust and maintain level.

17. Insert the left and right counterweight installation pins, and turn the pins to lock them.

NOTE: If the pins do not install easily, press Lower/Raise on the remote control to help align the holes.

18. Extend the cylinders slightly by pressing the Lower button on the remote control until the counterweight is supported by the counterweight installation pins.

NOTE: The counterweight cylinder connection pins should be hand movable. Do NOT remove the pins.

19. Stop the GTC-1600 engine.

20. Connect the counterweight detection cable. Take out the connector from the stowing position at the rear of the upper works, and connect it to the port for the counterweight detection cable.

NOTE: If the Middle and Top Counterweight Sections aren't used, it's not necessary to connect the counterweight detection cable.

NOTE: Confirm cable for connector is routed through clamps and in front of the pin, so that the pin cannot be removed without disconnecting cable.

21. Start the engine.

22. On the MFD, tap the Counterweight Status Select button, and confirm that the counterweight value shown on the MFD matches the crane condition.

NOTE: To cancel registration, tap the Cancel button. The display will return to the operation status registration page without changing registration.

23. After confirming the counterweight, tap the Set button and register the status.

NOTE: When registration is complete, the display will return to the operation status registration page.

Figure 77: Upper counterweight installed



OPTIONAL JIB DEPLOYMENT AND INSTALLATION

For detailed jib information, see [Appendix A: Jib Setup and Stowage](#).

CHAPTER 5: DISASSEMBLY FOR TRANSPORT

Due to the weight and overall width of TADANO GTC-1600 cranes, it may be necessary to remove some components from the GTC-1600 to meet local weight and width requirements in the area for transportation.

WARNING

Never prepare the GTC-1600 for the work site on uneven, loose ground. Always prepare on a flat, level, hard surface. Do NOT allow unauthorized personnel in the assembly/disassembly area. The GTC-1600 can tip, causing serious injury or death.

The following items can be installed/removed without assistance from another crane:

- Counterweight(s)
- Track frame assemblies (using the carbody jack system)

NOTE: Free swing is not available when the GTC-1600 is configured for carbody jacks.

WARNING

The disassembly instructions in this manual apply only to this described configuration. Discuss with TADANO customer support before deviating from this configuration.

During disassembly, NEVER lower the boom angle below 20° when on Carbody Jacks—unless the GTC-1600 is supported with blocks under the (extended) extend beam ends, and the boom and upperworks are parallel to the extend beams.

Required GTC-1600 transport configuration:

- Hook Block reeved with 4 parts of line
- Jib stowed on the side of the boom, or transported separately
- Crane transported on removable gooseneck (RGN) trailer with sufficient capacity to meet local/national transport regulations
- Crane supported under the (extended) extend beam ends
- Crane oriented with extend beams parallel to the trailer direction

To Disassemble the GTC-1600

1. [Stow Main Jib, pg A-23](#) (if installed)
2. [Remove Upper Counterweight, pg 5-3](#)
3. [Stow Hydraulic Connectors, pg 5-5](#)
4. [Remove Carbody Counterweight, pg 5-6](#)
5. [Remove Track Frames, pg 5-7](#)
6. [Load on Trailer, pg 5-10](#)

NOTICE

The disassembly procedures detailed in this section assume the use of the carbody jack system.

If an additional crane or lifting device is used to remove any of the following items, it must be able to handle the lifting capacities of these components:

Table 10: GTC-1600 removable component weights

Component	Weight		Trailer				
	lb	kg	1	2	3	4	5
Crane Transporter (with two (2) winches, boom, wire rope, auxiliary nose sheave)	95,715	43,416	•				
Left Track Frame	30,220	13,708		•			
Right Track Frame	30,220	13,708			•		
Upper Counterweight—Base Section	40,300	18,280				•	
Upper Counterweight—Middle Section	14,650	6,645					•
Upper Counterweight—Top Section	15,050	6,827					•
Carbody CWT with toolbox and OHB	13,180	5,978		•			
Carbody CWT with CWT shelf, two (2) bars, four (4) carbody jack pads	12,660	5,742			•		
Jib—Heavy lift	2,300	1,040					•
Main Jib	1,003	454				•	
Jib Tip	1,000	452				•	
Jib Insert	1,053	477					•
Jib Insert	1,053	477					•
Hook Block (110 T)	2,405	1,091	•				
Miscellaneous Items (Including eight (8) rigging slings and other items)	500	227				•	
Total Weight on Trailer			98,120 lb	43,400 lb	43,200 lb	42,803 lb	34,106 lb

REMOVE UPPER COUNTERWEIGHT

WARNING

Always stay clear of and NEVER beneath the counterweight, when it is lifted.

The counterweight can spin and swing when lifted.

The counterweight can tilt to one side, resulting in GTC-1600 damage.

Do NOT spill hydraulic oil when disconnecting the hydraulic hoses. This could cause a fire. Immediately remove any spilled hydraulic oil. Do NOT remove the hydraulic hose connectors near open flame.

Lift the counterweight ONLY at the designated rigging points (Figure 72, pg 4-12).

1. Extend the tracks fully and ensure the GTC-1600 is on firm, level ground.
2. Slew the boom over the front until the Counterweight / Boom Installation/Removal Position Indicator illuminates (Figure 75, pg 4-15).

NOTE: The indicator illuminates when the swing angle is 0°. When lowering the counterweight, visually confirm the orientation.

NOTICE

Do NOT engage the swing lock.

3. Set the swing brake switch to ON.
4. Set the boom angle to 70°.

NOTE: If the Middle and Top Counterweight Sections aren't used, skip Step 5.
5. Disconnect the counterweight detection cable from the port for the counterweight detection cable. Stow the removed counterweight detection cable in the stowing support at the rear of the swing table.

NOTICE

Do NOT lower the counterweight while the counterweight detection cable is connected.

6. Enable the Counterweight and Jib Remote (Enable Remote Control, pg A-4).
7. Retract the cylinders fully by pressing the Raise button on the remote control, until weight is removed from the counterweight installation pins.
8. Turn and pull the counterweight installation pins to remove them. Stow the pins in the brackets on the counterweight.

NOTE: If the pins do not remove easily, press Lower/Raise on the remote control to help align the holes.
9. Extend the cylinders by pressing the Lower button on the remote control. This will lower the counterweight.

NOTE: Ensure that the counterweight is level during this operation. Operating the remote control 10–13 ft (3–4 m) from the counterweight rear will provide a good position to watch the counterweight lift.

WARNING

Stop operation immediately if the counterweight is significantly out of level.

Set the Left/Right selector switch to LEFT or RIGHT and press the Lower/Raise button on the remote control, as necessary, to adjust and maintain level.

10. Turn and pull the left and right Base Section counterweight installation pins to remove them. Stow the pins in the brackets on the counterweight.

NOTE: If the pins do not remove easily, press Lower/Raise on the remote control to help align the holes.
11. Retract the cylinders fully by pressing the Raise button on the remote control.
12. Disconnect the hydraulic hoses for installing/removing the upper counterweight.

13. Press the Lower button to lower the counterweight onto the rear carbody counterweight support.

CAUTION

Do NOT overextend the cylinders. Stop extending when the counterweight is in position.

14. Stow the disconnected hydraulic hoses ([Stow Hydraulic Connectors](#), pg 5-5).

NOTE: Reinstall the cap on the fixed portion of the quick disconnect.

15. Fold and stow all handrails/handles attached to counterweight.

NOTICE

Failure to stow can result in damage when swinging.

16. Disconnect the remote control.

17. On the MFD, tap the Counterweight Status Select button.

18. Confirm that the counterweight value shown on the MFD is 0.0 klbs.

19. Tap the Set button to register.

NOTE: When registration is complete, the display will return to the operation status registration page. The alarm will stop.

NOTE: If the Middle and Top Counterweight Sections aren't used, skip Step 20 through Step 22.

20. Rig the Top Counterweight Section ([Figure 72](#), pg 4-12) and wind the winch until the wire ropes are tensioned slightly.

NOTE: Use the included slings to rig the Middle/Top Sections ([Figure 72](#), pg 4-12) separately.

NOTE: If necessary, deploy grab handles to allow sling clearance.

21. Lift the Top Counterweight Section and load it onto a trailer.

WARNING

Do NOT move the GTC-1600 while the counterweight is mounted on the support.

NOTICE

Do NOT let the counterweights touch the counterweight cylinder.

Use a tagline, if necessary, to align counterweight when raising/lowering into place

22. Remove the Middle Counterweight Section in the same manner.

23. Rig the Base Section ([Figure 72](#), pg 4-12) and wind the winch until the wire ropes are tensioned slightly.

NOTE: Use the blue slings and shackles to rig the Base Section ([Figure 72](#), pg 4-12).

24. Lift the Base Section and load it onto the trailer.

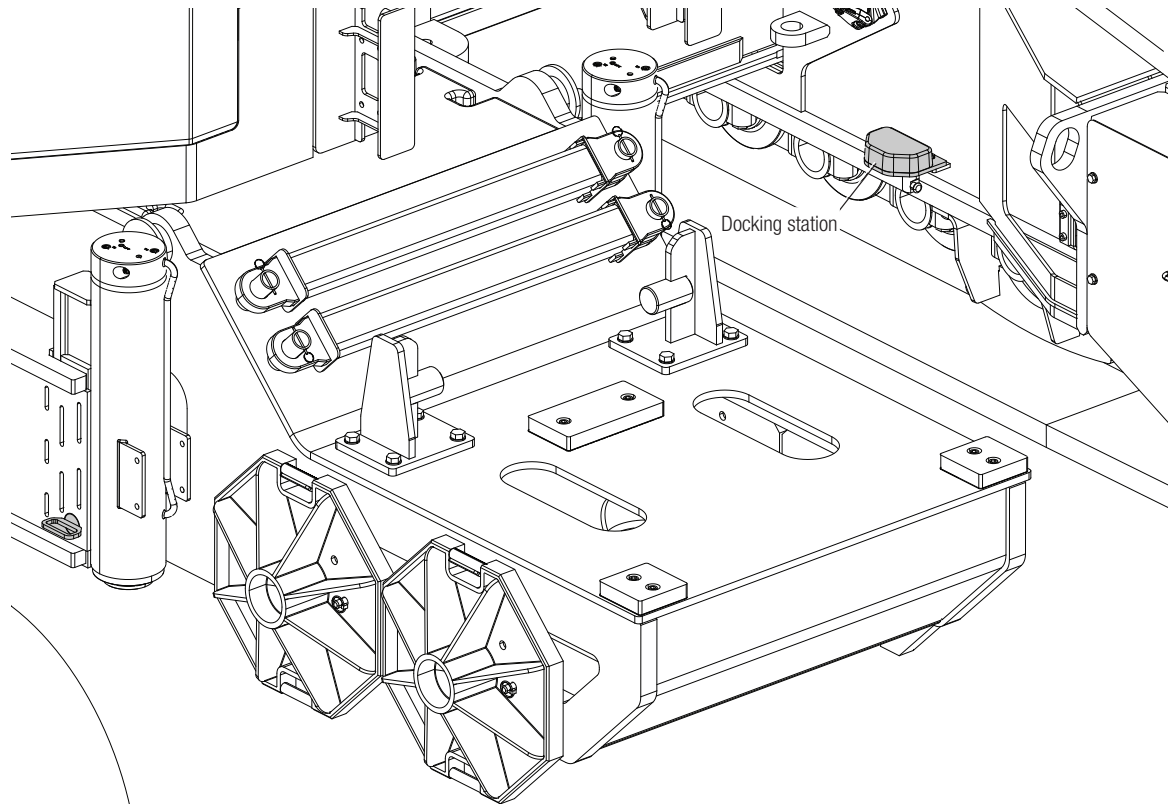
STOW HYDRAULIC CONNECTORS

CAUTION

Hydraulic hoses and coupler may be hot.

1. Locate the hydraulic hose quick coupler docking stations on each track frame (Figure 78).

Figure 78: Hydraulic hose quick coupler docking station



2. Pull the release handle out and remove the cover from the docking station.
3. Insert the mobile end of the quick coupler into the docking station by aligning the two (2) pins. Press down until locked in place.
4. Install the quick coupler fixed end cover on the carbody.

REMOVE CARBODY COUNTERWEIGHT

WARNING

Always stay clear of and NEVER beneath the counterweight, when it is lifted.
The counterweight can spin and swing when lifted.

NOTICE

Tilt the cab back to its highest position to provide the most clearance between the lifting slings and the cab.

1. Position the boom so that the hook block is positioned directly above the carbody counterweight being removed.

NOTICE

Ensure all travel hoses and obstacles are clear of the carbody counterweight when it is lifted.

2. If necessary, disconnect the hydraulic hose quick couplers (**Figure 71, pg 4-11**) from the track drive and stow them on the stowage tray on the carbody jack. See **Stow Hydraulic Connectors, pg 5-5** for more information.
3. Swing each carbody jack from the stowed position toward the track frames to the middle position and pin them in place with the track frame bars (**Figure 66, pg 4-8**).
4. Using two of the orange legs on a factory-supplied sling, attach the carbody counterweight to the hook block.
5. Remove the carbody counterweight retaining pins.
6. Slowly lift the carbody counterweight until the hooks clear the carbody lug pins. Slowly move the counterweight away from the carbody (**Figure 69, pg 4-10**).
7. Place the counterweight on the ground or trailer.
8. Repeat steps 1–7 to uninstall the remaining carbody counterweight on the opposite side.

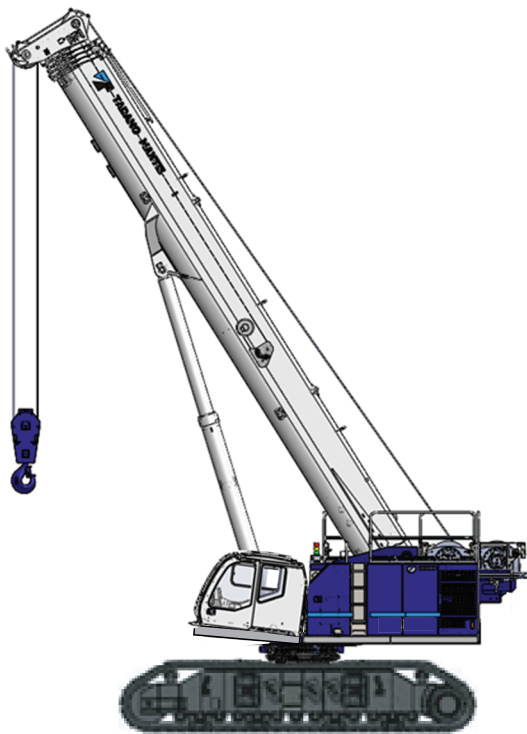
REMOVE TRACK FRAMES

WARNING

Never use the carbody jacks to raise the GTC-1600 unless the crane is in the proper configuration. The upper counterweight must be removed before using the carbody jacks.

1. Position the GTC-1600 on hard, flat, level ground to ease the removal of the track frames.
2. If necessary, fully extend both the left and right track frames.
3. Raise the boom to 55–60° and keep the boom fully retracted.
4. Ensure On Carbody Jacks is selected in automatic moment limiter (AML).
5. Position the superstructure with the boom facing forward.

Figure 79: Position boom forward



6. Enable the Carbody Jack Remote ([Enable Remote Control, pg A-4](#)).
7. If necessary, swing each carbody jack from the stowed position toward the track frames to the middle position and pin them in place with the track frame bars ([Figure 66, pg 4-8](#)).
8. Install the carbody jack pads on each cylinder and verify the surface is flat and smooth. Do NOT 'bridge' the pads. Use cribbing material, if necessary.
9. Position proper dunnage, if required, under each carbody jack pad.


WARNING

Verify the AML system is set to the On Carbody Jacks mode before extending the carbody jacks to lift the GTC-1600.

10. After positioning each carbody jack, extend each jack individually until making firm contact with the ground or dunnage.

NOTE: Press the All Jacks Retract / All Jacks Extend button, to operate all four jacks at once. Or, to operate jacks individually, fully press the button for the desired jack and the Jack Extend / Jack Retract button:

- 1 = front left
- 2 = front right
- 3 = rear left
- 4 = rear right

NOTE: See [Carbody Jack Remote, pg 3-18](#) for more information.

DANGER

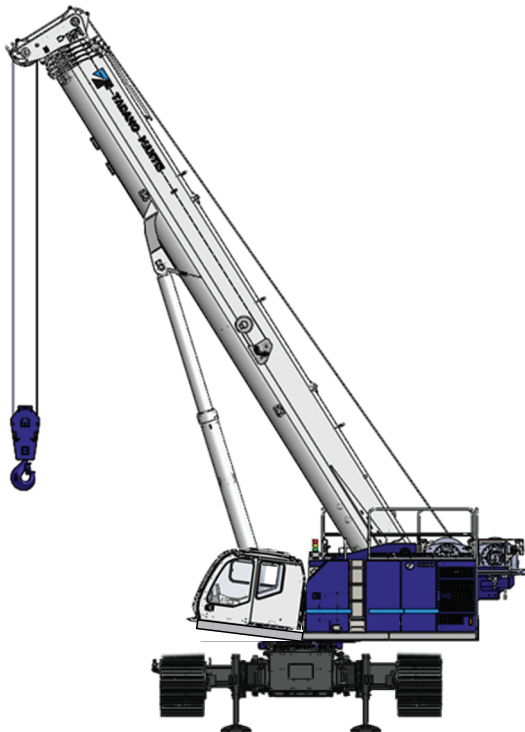
Never raise the GTC-1600 if the crane is not level (i.e., is not less than 1°) or it will not remain stable. The operator is responsible for keeping the GTC-1600 level.

NOTE: To raise the GTC-1600 with automatic leveling, press the All Jacks Extend or All Jacks Retract button. The system should automatically maintain level within 1° relative to gravity. If the GTC-1600 is not level, operate the individual jacks to level the crane before using the automatic leveling feature.

11. Raise the GTC-1600 using the carbody jacks until the track frames just leave the ground.

12. Swing the superstructure so the boom is over the track frame being removed.

Figure 80: Position boom over track frame



13. Stow all catwalks.
14. Install the track frame assembly bars between the carbody and the track frame (Figure 66, pg 4-8).
15. Attach the factory-supplied track frame sling to each of the shackles (Figure 64, pg 4-7).

NOTE: Attach the two included 3-legged slings to the hook block and install the track edge protectors on the four orange legs. Use these four orange legs to rig the trackframes.

NOTE: There are two lift points on the outer side of the frame and two on the inner side of the frame.

NOTICE

Use track shoe edge protectors when lifting the track frames to help prevent sling damage.

16. On the track frame at each extend beam interface, remove the retaining pins and move the plate down for each beam. Recheck the rigging connections and crane configuration (Figure 64, pg 4-7).
17. Rotate locking bars alternately to right and left (Figure 65, pg 4-7).
18. Lift the track frame slowly until the track is freely supported. Start retracting the track frame beams on the side being removed. When the track frame is freely suspended and beams are disengaged from the track frame, uninstall the track frame removal bars and then lift the track frame to the minimum height required to place onto the transport trailer. The trailer should clear the carbody with the track beams retracted. Stay within the radius and load limits for On Carbody Jacks charts.
19. Place the track frame on the trailer. Swing to the opposite side and repeat steps 12–18 to uninstall the remaining track frame on the opposite side.

LOAD ON TRAILER

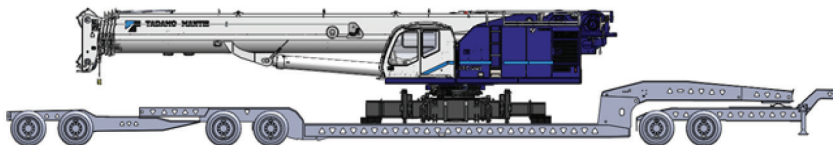
1. If necessary, press the Cab Tilt Switch (**Upper Right Control Console, pg 3-10**) to tilt the operator cab down.
2. Wind the winch rope onto the winch.
3. If necessary, raise the boom enough for trailer clearance.
4. The GTC-1600 is ready to load on the trailer. The trailer should be backed under the GTC-1600 in line with the extend beams.
5. Confirm the track extend beams are extended before the truck lifts the trailer under the GTC-1600. Place dunnage under the ends of the extend beams so that the GTC-1600 rests on the extend beams when the trailer is raised beneath the GTC-1600.

! WARNING

Do NOT retract the carbody jacks until the GTC-1600 is secured to the trailer and the boom is lowered to the transport position. The carbody jacks must remain set and in firm contact with ground until the GTC-1600 is secured to the trailer and the boom lowered to the transport position.

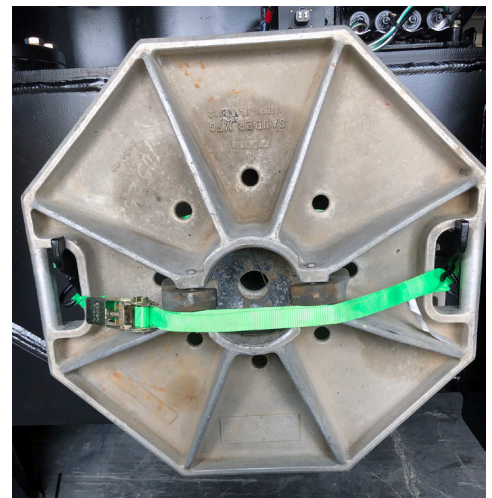
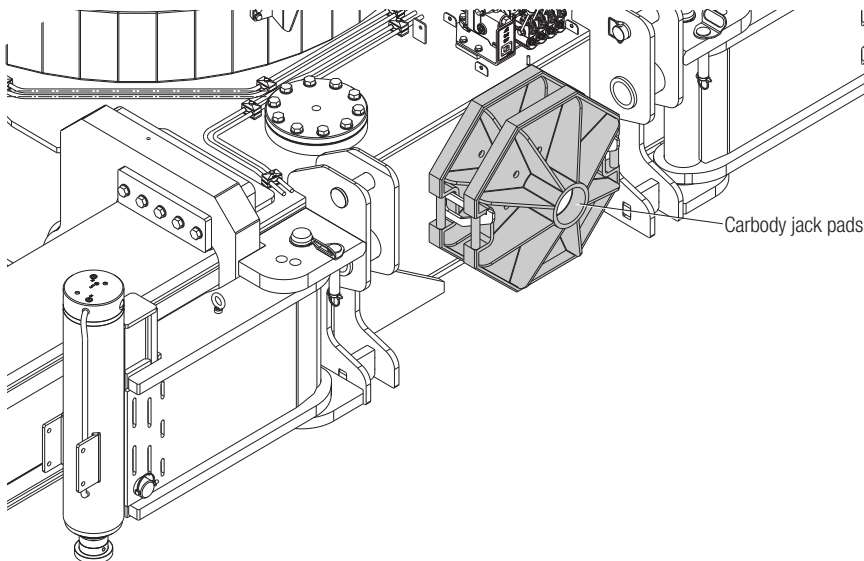
6. Chain the track extend beams and carbody securely to the trailer.

Figure 81: GTC-1600 secured to trailer



7. If necessary, lower the boom for transport.
8. Retract the carbody jacks after the GTC-1600 is fully secured and stowed for transport.
9. Stow the carbody jack pads on the undercarriage, and secure with ratchet straps (**Figure 82**).

Figure 82: Carbody jack pads stowed for transport



OPTIONAL JIB STOWAGE

For detailed jib information, see **Appendix A: Jib Setup and Stowage**.

CHAPTER 6: OPERATION

Before operating the GTC-1600, review all safety information in the safety section of this manual. The GTC-1600 should be operated only by a trained, skilled operator. For more information, see [Chapter 1: Safety, pg 1-1](#). Visually examine the GTC-1600 and test the functions before each lift.

NOTICE

Before operating the GTC-1600, confirm the automatic moment limiter (AML) is operating properly ([Multifunction Display, pg 6-8](#)).

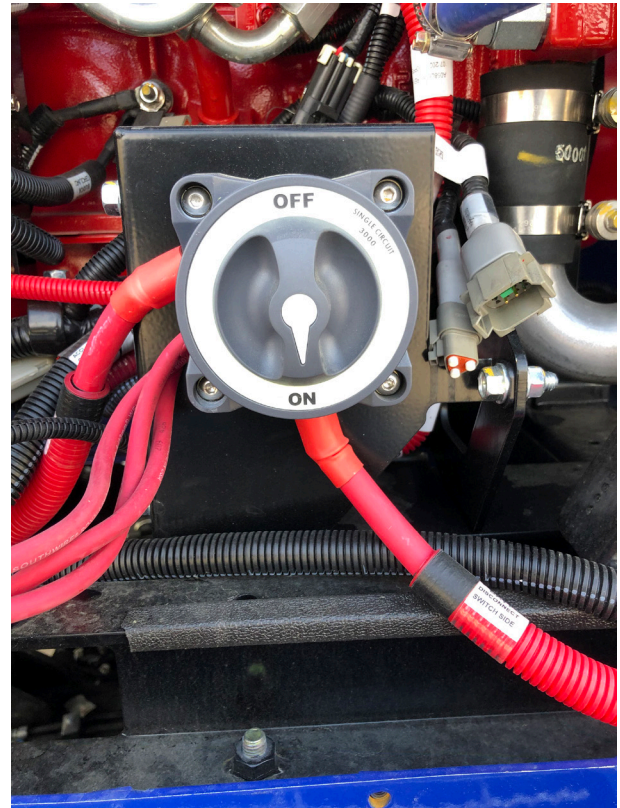
NOTE: When the GTC-1600 is overloaded (working status light is red—[Working Status Lights, pg 6-72](#)) and/or the RCI Override switch ([Rated Capacity Indicator \(RCI\) Override Switch, pg 3-11](#)) is ON, operator inputs and crane conditions are logged.

USING THE BATTERY DISCONNECT SWITCH

The battery disconnect switch is located on the right side of the GTC-1600 inside the engine access door.

1. Open the access door and turn the switch to the ON position.

Figure 83: Battery disconnect switch



2. When finished operating for the day or when storing the GTC-1600, turn the switch to the OFF position.
3. Close and lock the engine access door.

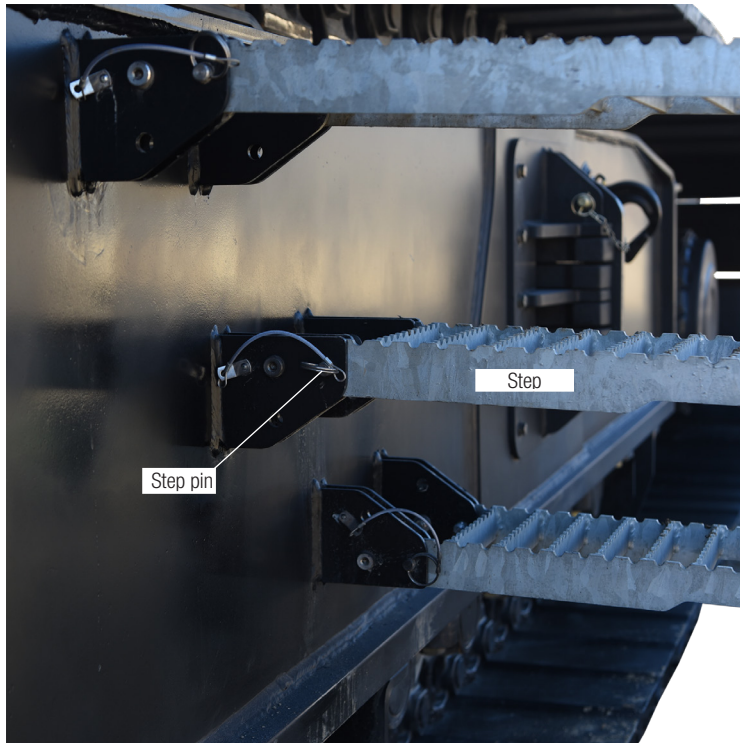
NOTICE

Wait two (2) minutes after stopping engine before turning the battery disconnect switch to the OFF position. This ensures the DEF fluid is cleared from all hoses and prevents the hoses from freezing in cold temperatures.

ENTERING THE CAB

1. Steps on the track frames can be folded out to allow easy access to the cab. To fold out, lift the step up and insert the step pin to lock the step in place. Repeat for all steps.

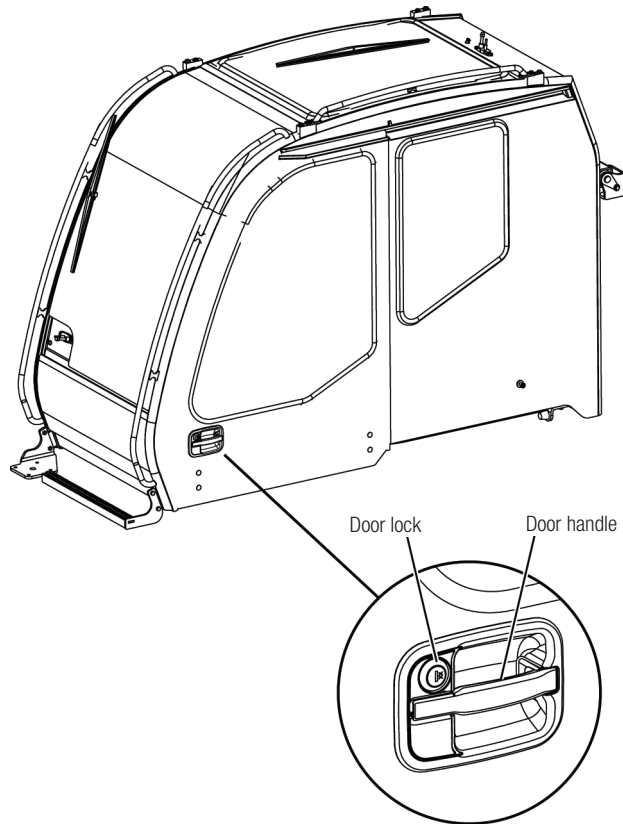
Figure 84: Track frame steps



2. Enter the cab from the left side of the GTC-1600.

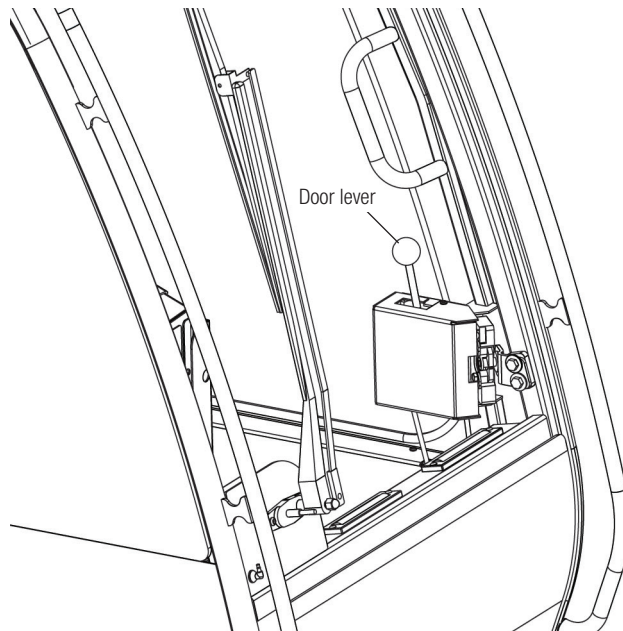
3. Pull on the door handle to open the door. The door can be locked when the GTC-1600 is not in use.

Figure 85: Door handle and lock



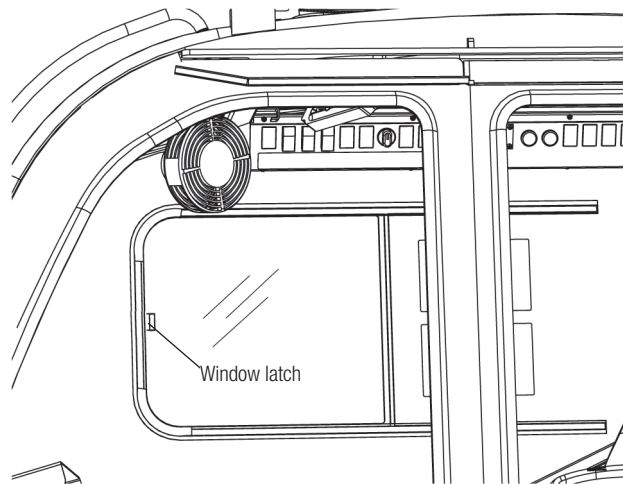
4. The door can be opened from the inside by pulling the door lever.

Figure 86: Door lever



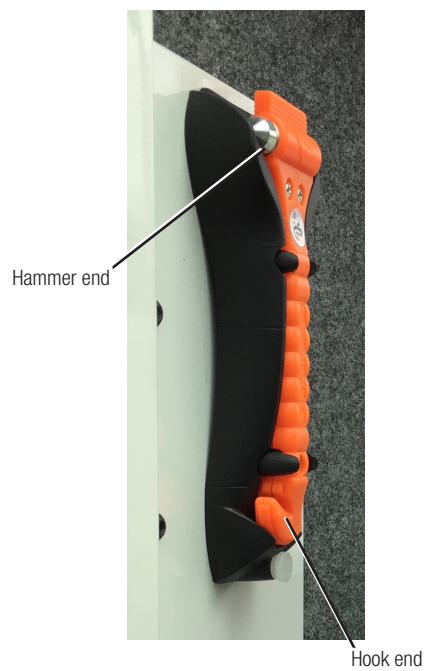
5. The window on the right side of the cab can be opened by unlatching it and sliding the window to the rear.

Figure 87: Right side window



6. In the event of an emergency, and if necessary, use the escape tool located behind the seat to exit the cab.
 - ◇ Use the hook end of the tool to cut off the seat belt, if necessary.
 - ◇ Use the hammer end to break the operator cab glass for escape, if using the door is not an option.

Figure 88: Window escape tool



STARTING THE ENGINE

WARNING

The horn button is always powered whether the key switch is ON or OFF. Always sound the horn before starting the engine to alert any bystanders in the area that the engine is going to be started.

NOTE: At temperatures of 0 °F (-18 °C) or below, using a starting aid and/or block heater will greatly improve engine starting.

CAUTION

The GTC-1600 is equipped with hydraulic oil warming functionality. The temperature of stored bulk oil is not reflected in the temperature shown on the MFD, but is available on another page. Use caution when operating before sufficient warm-up—cold oil can cause GTC-1600 hydraulic functions to operate sluggishly. See [Hydraulic Fluid Operating Temperature, pg 6-76](#) for more information.

NOTICE

Before starting the engine, perform the daily checks listed in [GTC-1600 Inspection and Maintenance—Daily, pg 7-11](#).

1. Sit in the seat and securely fasten the seat belt.
2. Ensure all control pedals, joysticks, and switches are in the neutral or OFF position.
3. Sound the horn.
4. Turn the key to the RUN position and wait until the engine preheat light turns off.
5. Turn the key to the START position, and release the switch as soon as the engine starts.

NOTICE

Do NOT crank the engine for more than 30 seconds. If the engine fails to start, allow the starter to cool for two minutes before cranking again.

6. Wait to ensure the oil pressure is sufficient. Oil pressure should rise 15 seconds after the engine starts. Confirm the oil pressure warning isn't illuminated.
7. Once the engine starts, allow it to run at low idle speed for 3–5 minutes. Increase engine speed to high idle only after the engine is running smoothly at low idle.

NOTE: At lower engine speeds, there may not be enough hydraulic oil flow to operate multiple functions simultaneously.

8. Operate the engine at low load and low rpm until the engine temperature is within normal range. Monitor all gauges during this warm-up period.

NOTE: There is an emergency off switch ([Figure 50, pg 3-3](#)). If necessary, press the switch to immediately shut down the engine and stop all GTC-1600 functions.

STANDARD ENGINE CONTROL

When the auto-idle switch is in the OFF position, the engine speed is controlled with the foot throttle or the throttle potentiometer, whichever is higher.

FOOT THROTTLE

The engine speed can be continuously varied from minimum to maximum speed (RPM) with the far right foot pedal ([Figure 50](#)). When the pedal is released, the engine will operate at minimum speed or the speed selected with the potentiometer. Increasing pressure on the pedal will increase engine speed, up to the maximum.

THROTTLE POTENTIOMETER

The engine speed can be continuously varied from minimum to maximum speed (RPM) with the potentiometer located on the left armrest. Turning the potentiometer clockwise will increase engine speed; turning it counterclockwise will decrease it.

AUTO IDLE ENGINE CONTROL

When the auto-idle switch is in the ON position, the engine will remain at low idle while all functions are in neutral. When a function is activated, the engine speed will increase. These modes can potentially reduce the amount of fuel consumed by the GTC-1600 as it can reduce the amount of time the engine is operated at higher speeds.

ADAPTIVE THROTTLE

When the throttle potentiometer is in the far counterclockwise position, adaptive throttle is selected. The engine speed will automatically adjust when the GTC-1600 is operated, according to the operation load and operating amount. For example, if one function is operated at a low to medium speed, the engine speed will remain at low idle. However, as the function speed is increased or multiple functions are operated, the engine speed will increase. The engine speed may also increase to provide more torque if the function load is high, even at low function speeds. After all functions are returned to neutral, the engine speed will return to low idle. If swing function is activated while in adaptive throttle mode, the engine speed will not vary while swinging because it could cause surges in swing speed.

Set Point

When the throttle potentiometer is in any position except the far counterclockwise position, set point is selected.

The engine speed will be at one of two points: low idle or set speed.

When a function is activated, the engine speed will increase to the speed selected by the throttle potentiometer. Turning the potentiometer clockwise will increase the auto idle set point and turning it counterclockwise will decrease it. After all functions are returned to neutral, the engine will remain at the set speed for a short period of time before returning to low idle. The dedicated tachometer ([Figure 50, pg 3-3](#)), indicates the actual engine speed.

ENGINE EXHAUST AFTERTREATMENT SYSTEM

The engine exhaust aftertreatment system reduces harmful emissions from the GTC-1600 diesel engine and is comprised of these subsystems:

- **Selective Catalytic Reduction (SCR) system**—The SCR mixes a gaseous reductant (DEF) with exhaust gas to convert nitrogen oxides (NO_x) into diatomic nitrogen (N_2) and water (H_2O).
 - ◇ **Diesel Emission Fluid (DEF)**—DEF is an aqueous urea solution made with 32.5% urea and 67.5% deionized water.
- **Diesel Particulate Filter (DPF)**—This filter collects particulate matter from the exhaust. See [Inspect Engine Exhaust Aftertreatment System, pg 7-16](#) for service information.

NOTE: See [Engine Exhaust Aftertreatment System Status, pg 6-13](#) for more information.

STOPPING THE ENGINE

NOTICE

Stopping the engine immediately after working under load can result in overheating and accelerated wear of engine components. Follow the stopping procedure outlined below to allow the engine to cool properly. Excessive temperatures in the turbocharger center housing could cause an oil coking problem.

1. Remove all loads from the engine by returning all hydraulic functions to neutral.
2. Reduce engine speed to low idle.
3. Let the engine idle for 3–5 minutes.
4. Turn the ignition switch to the OFF position to stop the engine.

AFTER STOPPING THE ENGINE

1. After the engine cools, fill the fuel tank to prevent accumulation of moisture in the fuel.
2. Maintain the engine coolant fluid levels.
3. If expecting freezing temperatures, allow the engine cooling system to cool, and then check the coolant for proper antifreeze protection. The system must be protected against freezing to the lowest expected outside temperature.

NOTE: Ensure the GTC-1600 is on a flat, level surface when checking the engine oil level.

4. Always wait at least 5 minutes after shutting off the engine before checking the oil level to allow oil to drain back into the oil pan.
5. Check the engine crankcase oil level. The correct oil level is between the high (H) and low (L) marks on the dipstick.
6. Repair any leaks, perform minor adjustments, tighten loose bolts, etc.
7. If the GTC-1600 will be left unattended for an extended period of time (overnight or over a weekend, for example), turn OFF the battery disconnect switch. This will help prevent unauthorized use of the GTC-1600 and/or accidental battery discharge.

NOTICE

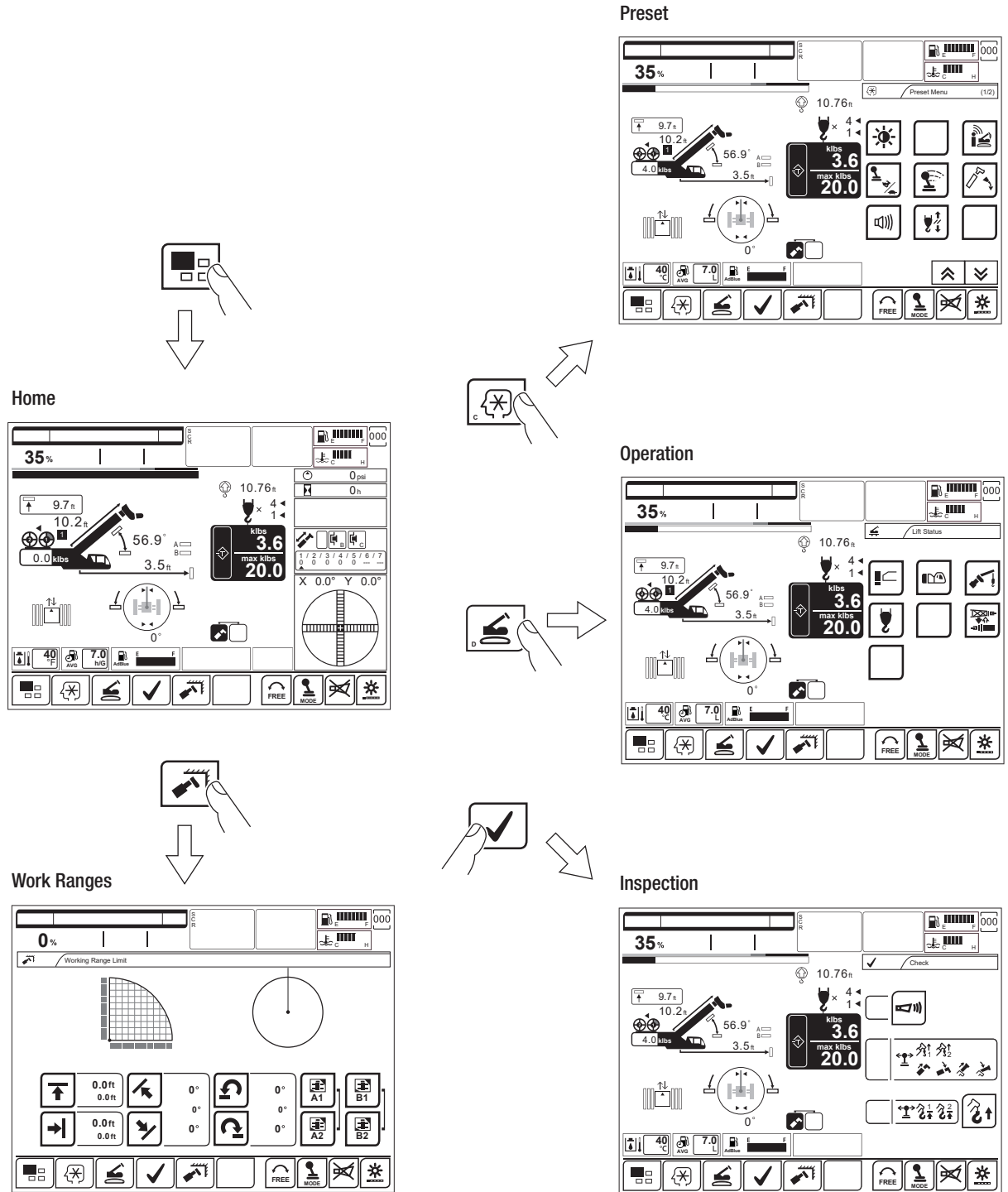
Wait two minutes after stopping engine before turning the battery disconnect switch to the OFF position. This ensures the DEF fluid is cleared from all hoses and prevents the hoses from freezing in cold temperatures.

MULTIFUNCTION DISPLAY

Tapping icons on the multifunction display (MFD) screen can open new pages to access additional information and functions.

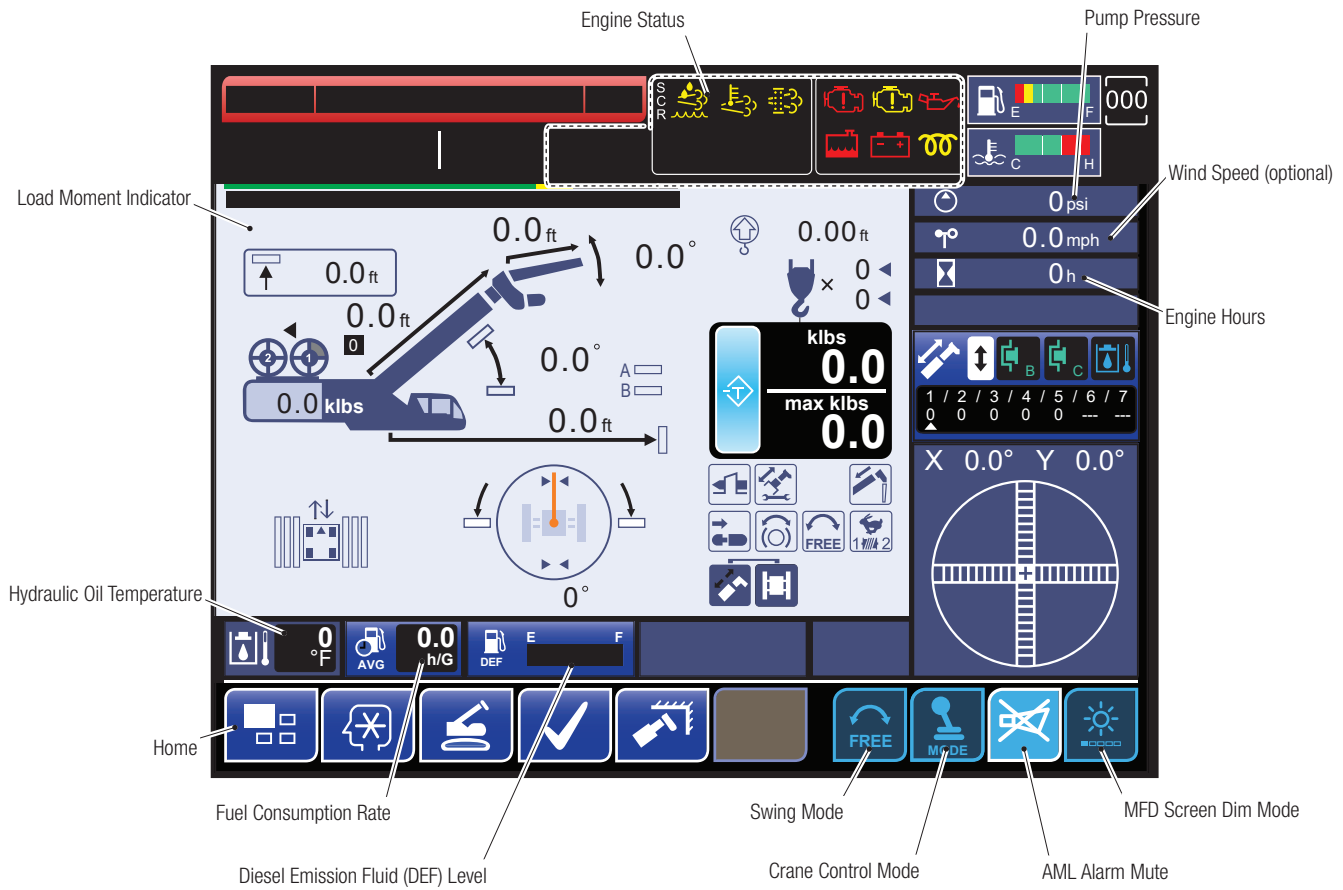
NOTE: When icons are 'grayed out', they are not eligible to be selected.

Figure 89: Using the multifunction display



HOME PAGE

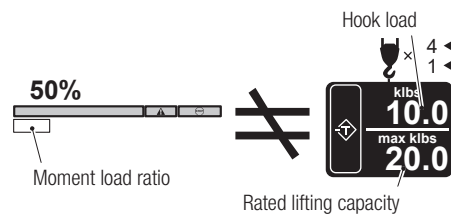
Figure 90: Multifunction display—home page information



NOTICE

Moment load ratio is not a ratio of the hook load to the rated lifting capacity. Determine the correct lifting capacity by reading the load chart.

The automatic moment limiter (AML) is not a hook load indicator. The hook load is a reference value, and not necessarily the correct weight of the lifted load.



Load Moment Indicator

Shows the condition of the GTC-1600 load.

Engine Status

Shows the overall condition of the GTC-1600 engine. See [Table 11, pg 6-12](#) for more information.

Pump Pressure

Shows the highest hydraulic system pressure.

Wind Speed

Shows the wind speed at the head of the boom (or jib), when the (optional) anemometer is installed.

Engine Hours

Shows the number of hours the engine has operated.

MFD Screen Dim Mode

Use to easily dim the MFD screen. See [MFD Screen Dim Mode, pg 6-19](#) for more information.

AML Alarm Mute

Use to mute the load moment indicator alarm.

Crane Control Mode

Use to toggle between standard operation mode and travel mode. See [Travel Controls, pg 6-57](#) and [Winch Operation, pg 6-59](#) for more information.

Swing Mode

Use to select swing mode. The icon is highlighted when free swing mode is on. See [Swing Modes, pg 6-19](#) for more information.

Diesel Emission Fluid (DEF) Level

Shows the diesel emission fluid (DEF) level. Tap this icon to display the engine exhaust aftertreatment system settings page.

Fuel Consumption Rate

Shows fuel consumption rate. Tap this icon to display the fuel consumption history page.

Home

Use to return to the main home page from any other page.

Hydraulic Oil Temperature

Shows the hydraulic oil temperature.

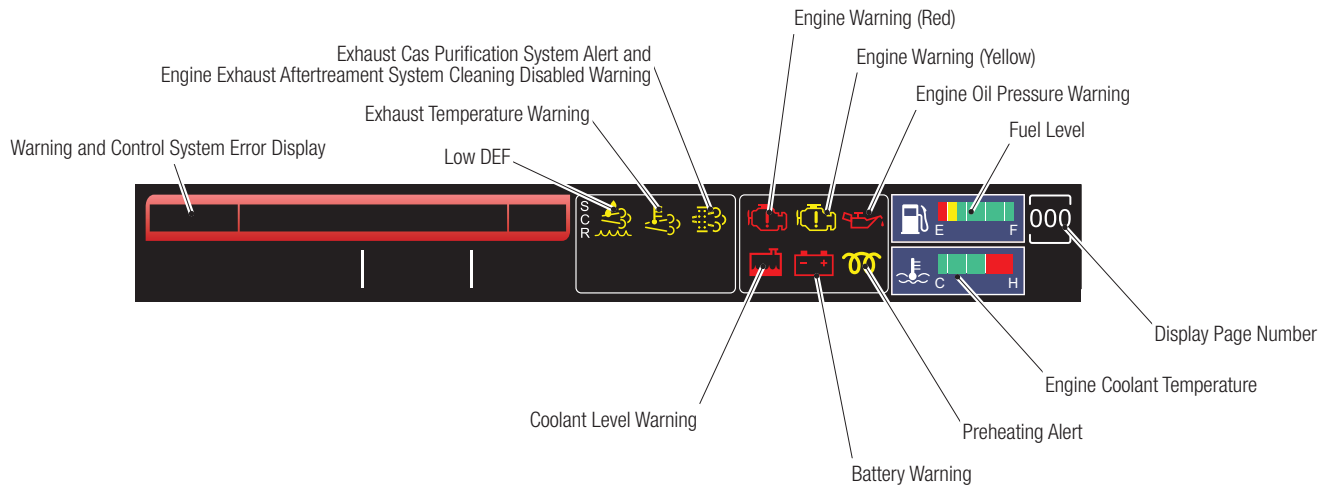
WARNINGS, WARNING CODES, AND ALARMS ON HOME PAGE

⚠ WARNING

Pay attention to all warnings, warning codes, and alarms on the MFD, and address them appropriately in a timely manner.

Warnings

Figure 91: Multifunction display—warnings—engine status



When a warning illuminates, immediately address the warning with the appropriate remedy procedures (Table 11, pg 6-12). After remedy procedures are implemented, the warning will no longer be illuminated.

Table 11: MFD engine status icons

Description	Meaning	Remedy	Icon
Fuel Level	Shows the fuel level with a bar.	Refuel the GTC-1600 when the fuel level is low.	
Engine Coolant Temperature	Shows the temperature of the engine coolant with a bar. When the coolant temperature is approximately 167 °F (75 °C), the first marking will display. The temperature is normal when the bar is in the green zone.	If a red colored bar is displayed, the engine is overheated. Park the GTC-1600 in a safe place, and keep the engine at idle to lower the coolant temperature.	
Engine Warning (Red)	A serious problem has occurred in the engine (a warning code will appear on the MFD, also). For more details, see Warning Codes, pg 6-17 and Alarm and Recovery Operation, pg 6-35 . NOTE: This warning is also displayed with an illuminated LED on the console. NOTE: When the SCR Warning is also illuminated, see Engine Exhaust Aftertreatment System Status, pg 6-13.	Immediately turn the starter switch to OFF for 100 seconds (or more), and then restart the engine. If the warning remains illuminated, note the warning code, and contact a TADANO Dealer or TADANO Customer Support for assistance.	
Engine Warning (Yellow)	A problem has occurred in the engine (a warning code will appear on the MFD, also). For more details, see Warning Codes, pg 6-17 and Alarm and Recovery Operation, pg 6-35 . NOTE: When the SCR Warning is also illuminated, see Engine Exhaust Aftertreatment System Status, pg 6-13.		
Engine Oil Pressure Warning	Engine oil pressure is low. NOTE: Normally, illuminates when the starter switch is turned to ON, until the engine is started.	Park the GTC-1600 in a safe place, and stop the engine. Check the engine oil level (Inspect Engine Oil Level, pg 7-11). If the oil level is not low, or this warning remains illuminated after oil is added to the specified level, contact a TADANO distributor or dealer for assistance.	
Battery Abnormal Warning	A failure has occurred in the battery charging system. NOTE: Normally, illuminates when the starter switch is turned to ON, until the engine is started.	Park the GTC-1600 in a safe place, and stop the engine. Contact a TADANO distributor or dealer for assistance.	
Coolant Level Warning	The engine coolant level is low.	Add coolant to the radiator.	
Preheating	Illuminates while engine is preheating. NOTE: This alert is also displayed with an illuminated LED on the console.	Start the engine when the preheating indicator is no longer illuminated.	

Engine Exhaust Aftertreatment System Status

The current state of the engine exhaust aftertreatment system is displayed on the MFD. To manually clean the engine exhaust aftertreatment system ([Manual Cleaning of Engine Exhaust Aftertreatment System, pg 6-53](#)) or to disable cleaning, tap the Diesel Emission Fluid (DEF) Level icon on the MFD to access the controls and settings.

NOTE: For more information about the engine exhaust aftertreatment system, see [Engine Exhaust Aftertreatment System, pg 6-6](#).

NOTE: The Engine Exhaust Aftertreatment System Cleaning Disabled Warning appears when engine exhaust aftertreatment system cleaning is not allowed. For more information, see [Disabling and Enabling Cleaning of Engine Exhaust Aftertreatment System, pg 6-54](#).

DEF Level Gauge

The remaining level, and frozen status, of DEF is shown by a bar graph on the MFD ([Figure 90, pg 6-9](#)).

NOTE: See [Table 7, pg 2-12](#) for DEF tank capacity.

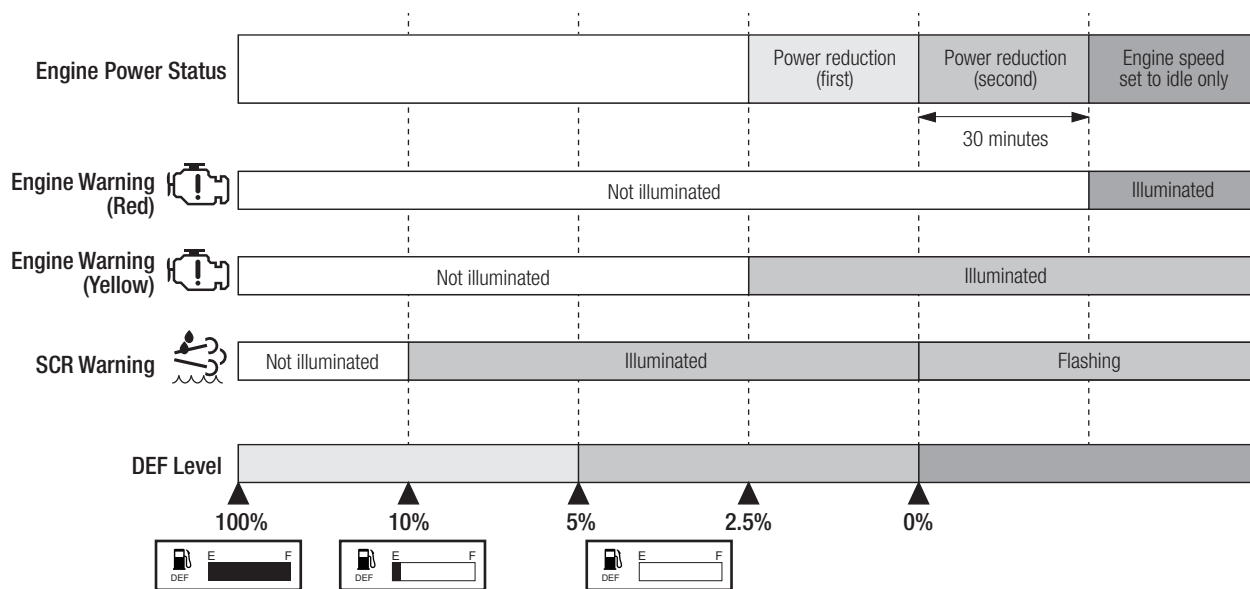
DEF Level and Engine Power

As DEF level lowers, engine power decreases and eventually the engine speed will be set to idle only.

If this occurs, to restore engine power, stop the engine and add DEF. In some cases, it might take an hour or more for the warning to disappear—after restarting the engine. See [Inspect Engine Exhaust Aftertreatment System, pg 7-16](#), for information about adding DEF.

NOTE: Avoid this issue by keeping the DEF tank topped up.

Figure 92: Multifunction display—DEF level and engine power



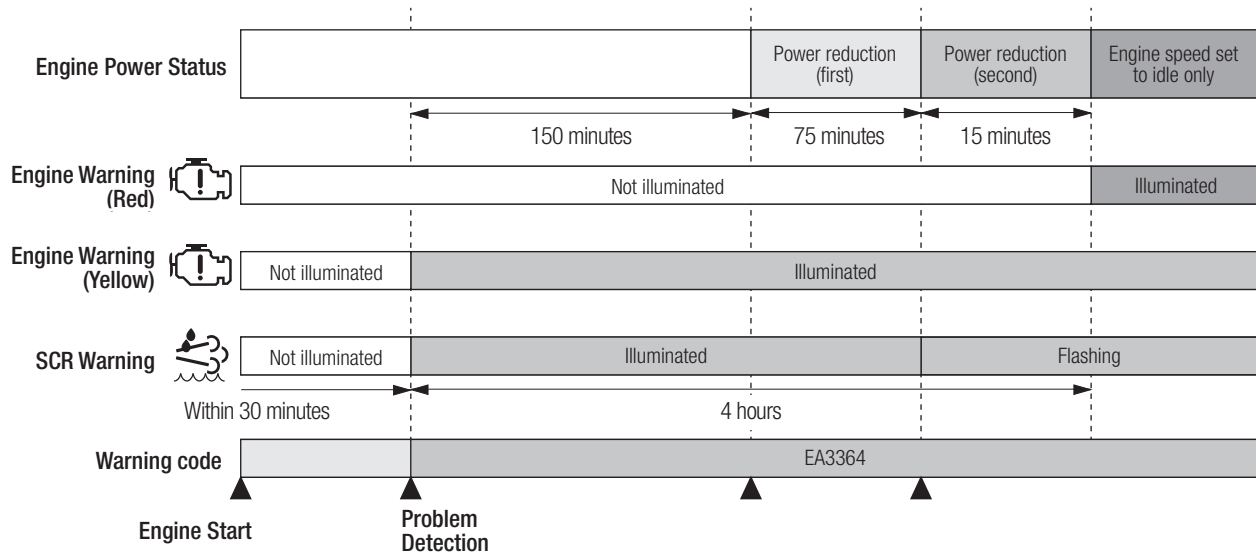
DEF Quality Problems

When a DEF quality issue is detected, the system will decrease engine power over time and eventually limit the engine to idle only. If this happens, stop the engine and replace the entire contents of the DEF tank ([Inspect Engine Exhaust Aftertreatment System, pg 7-16](#)). It will take approximately five (5) minutes for the warning to disappear, after replacing the DEF and restarting the engine.

NOTE: If the error is corrected before engine power reduction, and another error occurs within forty (40) hours of actual engine operation, time is counted from the previous error correction.

NOTE: If the error is corrected after engine power reduction, and another error occurs within forty (40) hours of actual engine operation, engine speed is limited to idle only—thirty (30) minutes after detecting the error.

Figure 93: Multifunction display—DEF quality and engine power



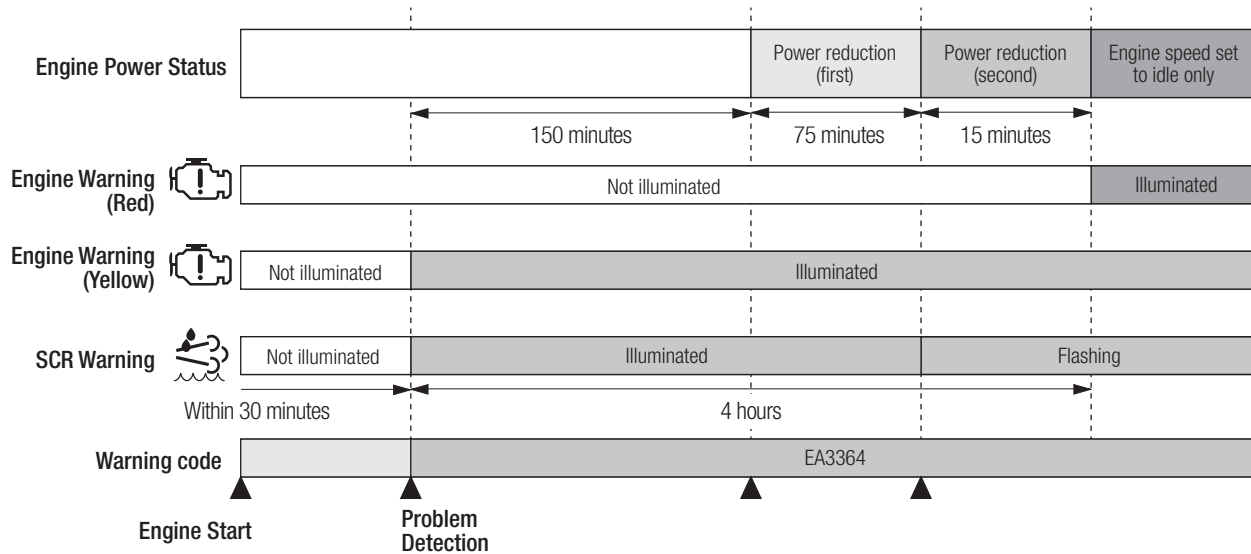
SCR System Problems

When an SCR system problem is detected, the system will decrease engine power over time and eventually limit the engine to idle only. Contact a TADANO Dealer or TADANO Customer Support if an SCR system warning is shown on the MFD.

NOTE: If the error is corrected before engine power reduction, and another error occurs within forty (40) hours of actual engine operation, time is counted from the previous error correction.

NOTE: If the error is corrected after engine power reduction, and another error occurs within forty (40) hours of actual engine operation, engine speed is limited to idle only—thirty (30) minutes after detecting the error.

Figure 94: Multifunction display—SCR system problems and engine power



Frozen DEF

If the SCR Warning (Figure 91, pg 6-11) is illuminated, the Engine Warning (Table 11, pg 6-12) is illuminated, and one (or more) of the warning codes below (Table 12) is shown on the MFD, the DEF is frozen.

NOTE: DEF will freeze at 12.2 °F (-11 °C), or below.

Table 12: Multifunction display—DEF is frozen

Warning Code	Meaning	Remedy
EA1761 EA1569	DEF is frozen	Thaw the frozen DEF (If DEF Is Frozen, pg 6-76)

Exhaust Gas

WARNING

While cleaning the engine exhaust aftertreatment system, exhaust gas can heat to dangerous temperatures. These temperatures can ignite, burn, or melt many materials. Remove combustible materials from the area near the exhaust pipe and muffler.

Do NOT touch the exhaust system and stay away from the exhaust gas. Danger of severe injury or death.

Table 13: Multifunction display—exhaust gas warnings

Illumination Status		Meaning	Remedy	Icon
SCR Warning	Illuminated	Low DEF level, DEF quality problem, or problem in the SCR system. If remaining DEF level is $\leq 2.5\%$ or 150 minutes have passed since problem detection, engine power is reduced (1st stage).	When the warning is illuminated, refer to: DEF Level and Engine Power, pg 6-13 DEF Quality Problems, pg 6-14 SCR System Problems, pg 6-15	
	Flashing	If remaining DEF level is 0% or 225 minutes have passed since problem detection, engine power is reduced (2nd stage). Thirty (30) minutes after DEF level reaches 0% or 15 minutes after engine power is reduced (2nd stage), engine power is limited to idle.		
Exhaust Temperature Warning	Illuminated	engine exhaust aftertreatment system cleaner is operating.	Wait for the cleaner to complete normally.	
		Exhaust temperature is $\geq 1,184$ °F (640 °C).	Run the engine at idle speed until the exhaust temperature warning is no longer illuminated.	
Engine Exhaust Aftertreatment System Alert	Illuminated	Automatic cleaning of the engine exhaust aftertreatment system did not complete normally.	Perform manual cleaning. See Manual Cleaning of Engine Exhaust Aftertreatment System, pg 6-53 .	
	Flashing	Engine exhaust aftertreatment system cleaner is operating.	Wait for the cleaning process to complete normally.	
Engine Exhaust Aftertreatment System Cleaning Disabled Warning	Illuminated	Operating the engine exhaust aftertreatment system cleaner is disabled. Automatic and manual cleaning of the engine exhaust aftertreatment system will not work.	Enable cleaning. See Disabling and Enabling Cleaning of Engine Exhaust Aftertreatment System, pg 6-54 .	

Warning Codes

NOTICE

If any warning code that is not described in this manual is displayed, or the warning code does not disappear after the condition associated with the warning code is registered or recovery operation is performed, or if the engine cannot be started, a repair is necessary. Contact a TADANO Dealer or TADANO Customer Support.

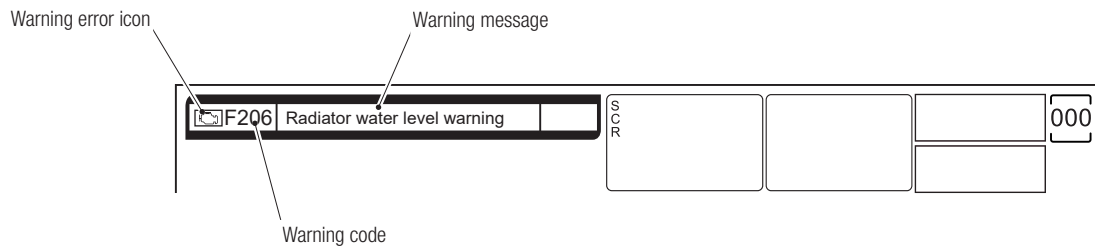
When a failure occurs or an improper operation is performed while traveling, the alarm will sound and a warning code will display on the MFD, for safety and to help avoid damage to the GTC-1600. Check the warning code and perform all necessary recovery operations.

NOTICE

If the retarder error icon or the engine error icon is displayed, an unrecoverable error has occurred. Contact a TADANO Dealer or TADANO Customer Support.

Warning codes and messages are displayed on the MFD (Figure 95).

Figure 95: Multifunction display—warning codes



AML Alarms

The AML alarm uses different sounds, depending on the cause. See [Alarm and Recovery Operation, pg 6-35](#) for more information.

NOTICE

*If the alarm is muted (**Muting AML Alarm**), the alarm will not sound. Warnings will be given only through warning codes and warnings on the MFD.*

For safety, do NOT operate the GTC-1600 with the alarm muted.

The following alarms can be muted.

- AML alarm that sounds when the moment load ratio is 90% or more (intermittent audible alarm).
- AML alarm that sounds when the moment load ratio exceeds 100% (continuous audible alarm).

In the following instances, a muted alarm will be re-enabled automatically:

- If the AML alarm is necessary for other causes.
- If the causes to sound the alarm no longer exist.

Muting AML Alarm

To mute the alarm, while it is emitting the audible alarm:

1. Tap the AML Alarm Mute icon on the MFD ([Figure 90, pg 6-9](#)).

NOTE: This will highlight the AML Alarm Mute icon, and the audible alarm will stop.

To re-enable the alarm, while it is muted:

1. Tap the AML Alarm Mute icon on the MFD ([Figure 90, pg 6-9](#)).

NOTE: This will de-highlight the AML Alarm Mute icon, and the audible alarm will resume, if the alarm condition is still present.

SWING MODES

Free Swing Mode

When Free Swing mode is active, the upper rotating frame is free to move based on gravity or inertia when the joystick is in neutral. The swing service brake pedal can be used to slow and stop the swing motion. In addition, the swing joystick can be gently moved in the opposite direction of the swing motion to slow, stop and reverse the direction of the swing.

NOTICE

When in Free Swing mode, use care while swinging—inertia will prevent the boom from stopping immediately.

CAUTION

Free swing mode is restricted when the GTC-1600 is on Carbody Jacks or in radio control mode.

NOTE: Free swing is restricted by registering a swing limit ([Work Range Limits, pg 6-40](#)), configuring for operation on carbody jacks, or selecting a swing restricted chart when approaching a swing limit.

Controlled Swing Mode

When Controlled Swing mode is active, the upper rotating frame is generally held in place when the joystick is in neutral. When the joystick is activated then returned to neutral, the swing will slow and stop.

WARNING

This feature is not intended as a brake and some movement is possible.

Select Swing Mode

1. Tap and hold the Swing Mode icon ([Figure 90, pg 6-9](#)) on the MFD.
 - ◇ The Swing Mode icon will be highlighted when Free Swing mode is enabled.
 - ◇ The Swing Mode icon will not be highlighted when Controlled Swing mode is enabled.

CRANE CONTROL MODE

See [Travel Controls, pg 6-57](#) for more information.

To switch between Standard (crane operation) and Travel modes:

1. Tap and hold the Crane Control Mode icon ([Figure 90, pg 6-9](#)) on the MFD.

NOTE: When disabling/enabling Standard/Travel mode:

- The Crane Control Mode icon will be highlighted when Travel mode is enabled.
- The Crane Control Mode icon will not be highlighted when Standard mode is enabled.

MFD SCREEN DIM MODE

Use the MFD Screen Dim mode if the MFD screen is too bright or if MFD screen reflections on the operator cab windows hamper visibility.

To enable/disable MFD Screen Dim mode:

1. Tap the MFD Screen Dim Mode icon ([Figure 90, pg 6-9](#)) on the MFD.

NOTE: When disabling/enabling MFD Screen Dim mode:

- The MFD Screen Dim Mode icon will be highlighted when MFD Screen Dim mode is enabled, and the MFD screen will dim.
- The MFD Screen Dim Mode icon will not be highlighted when MFD Screen Dim mode is disabled, and the MFD screen will return to the original screen brightness setting.

CRANE STATUS

Figure 96: Crane status icons—locations

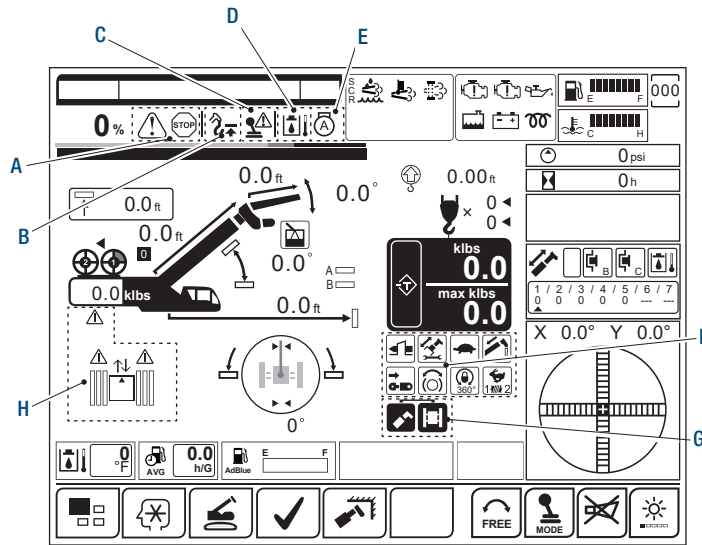




















Table 14: Crane status icons

Icon	Name	Location	Note
	Pre-Warning Alert	A	Moment load ratio is 90% or more and 100% or less.
	Auto-Stop Warning		Moment load ratio exceeds 100% and the machine is stopped automatically, or when the auto-stop function is canceled.
	Emergency Operation Warning		Operation status is registered while the Rated Capacity Indicator (RCI) Override Switch is set to ON.
	Two-Blocking (Red)	B	Two-blocking status occurs and operation is stopped.
	Two-Blocking (Yellow)		Anti-two-block function is canceled.
	Emergency Telescope Operation	C	Emergency Telescope switch, ET1 icon, or ET2 icon is ON.
	Control Disable / Deadman		Control Disable / Deadman switch is ON.
	Hydraulic Oil Temperature Warning	D	Hydraulic oil temperature is too high.
	Hydraulic Oil Level Warning		Hydraulic oil level is low.
	Hydraulic Oil Filter Warning		Hydraulic oil filter (air intake) is clogged.
	Hydraulic Oil Filter Warning (PILOT)		Hydraulic oil filter (pilot valve) is clogged.
	Hydraulic Oil Filter Warning (Return)		Hydraulic oil filter (return filter) is clogged.

Table 14: Crane status icons

	Throttle Mode	E	Displays the throttle mode selection status. White: Normal Green: Adaptive Blue: Set Point
	Jib Lock	F	Automatic pin of the jib lock device is inserted in the jib set status.
	Jib Tilt Cylinder Full Retraction		Jib tilt cylinder is fully retracted in jib set status.
	Jib Extending/Stowing Operable		Jib set status when the boom angle is 75° or more and the jib swing up angle is 30° or more.
	Maintenance Telescope		Maintenance telescope mode.
	Fine Control		Fine control function is set to ON.
	Swing Brake		Swing brake switch is ON.
	Swing Control ON		360° house lock is ON.
	Swing Control OFF		360° house lock is OFF.
	360° House Lock Error		360° house lock detection error has occurred.
	Boom Retractable		Boom retraction is available in jib set status.
	Main Winch High Speed Hoist Down		Main winch high speed hoist down function is ON.
	Auxiliary Winch High-Speed Hoist Down		Auxiliary winch high speed hoist down function is ON.
	Main Winch and Auxiliary Winch High-Speed Hoist Down		Main winch high speed hoist down function and auxiliary winch high speed hoist down function are ON.
	Crane Operation Mode	G	Crane/traveling mode icon is tapped and the crane operation mode is entered.
	Track Traveling Mode		Crane/traveling mode icon is tapped and the traveling mode is entered.
	Counterweight Warning	H	Detected counterweight condition differs from the registered value.
	Track Warning		Emergency Track Operation switch is ON.

AUTOMATIC MOMENT LIMITER

⚠ WARNING

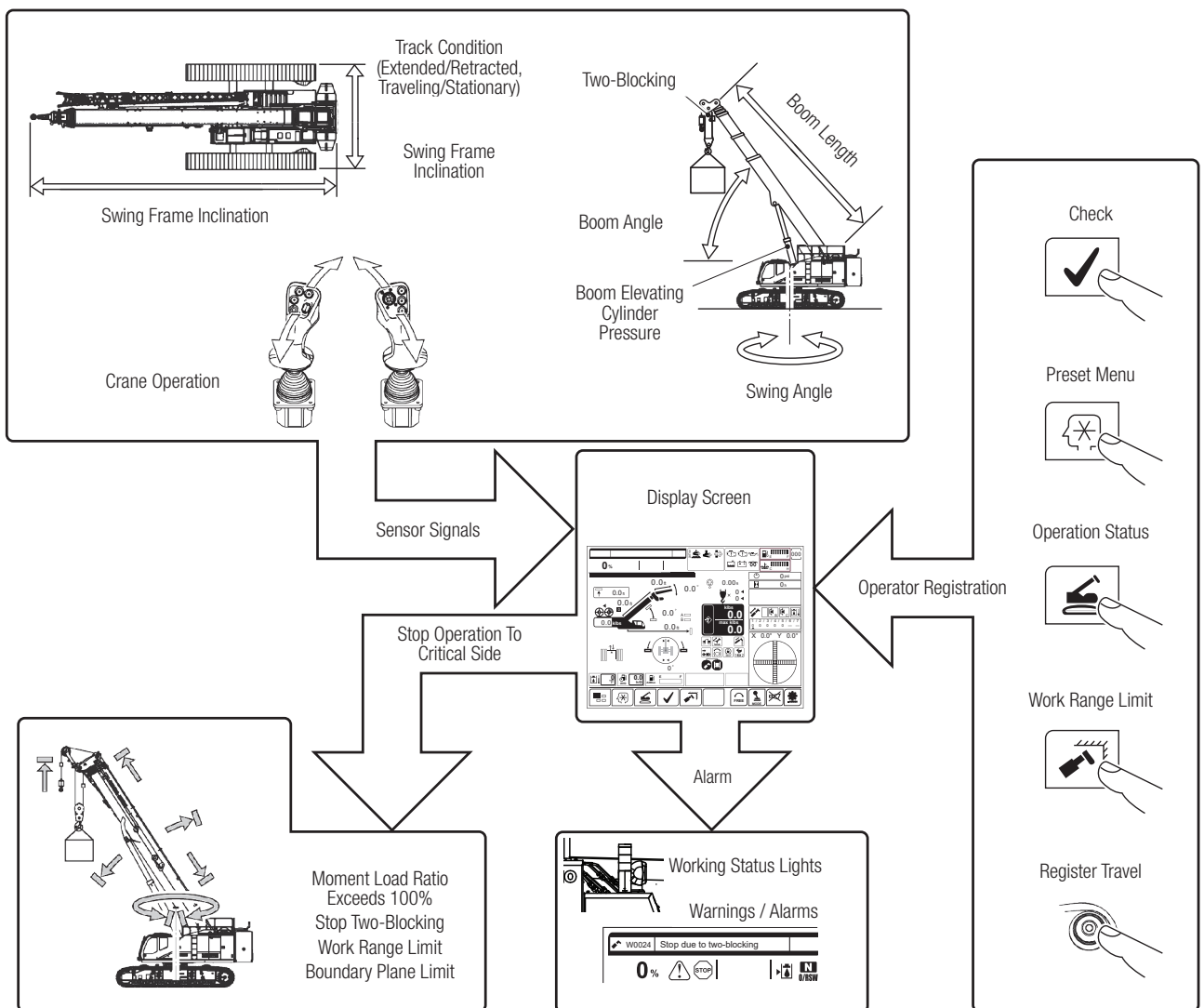
Never operate the GTC-1600 with the automatic stop function of the automatic moment limiter canceled. Using the automatic moment limiter incorrectly can cause the GTC-1600 to overturn or suffer damage, and cause a fatal injury.

When the load ratio reaches 100% or more, the automatic moment limiter stops the crane operations toward the critical side and warns with the warning codes and alarm. The automatic moment limiter is a safety device that is provided to prevent accidents such as overturning of the GTC-1600, and also to prevent GTC-1600 damage caused by overloading.

NOTE: The automatic moment limiter is not a load meter. Regard the load shown on it as a reference value—precision is not guaranteed.

NOTE: If operation status is registered while the RCI Override Switch is ON and the AML is overridden, the MFD alarm will sound for five (5) seconds, and a warning code will display.

Figure 97: AML operation



NOTICE

Do NOT touch the MFD screen with a sharp object.

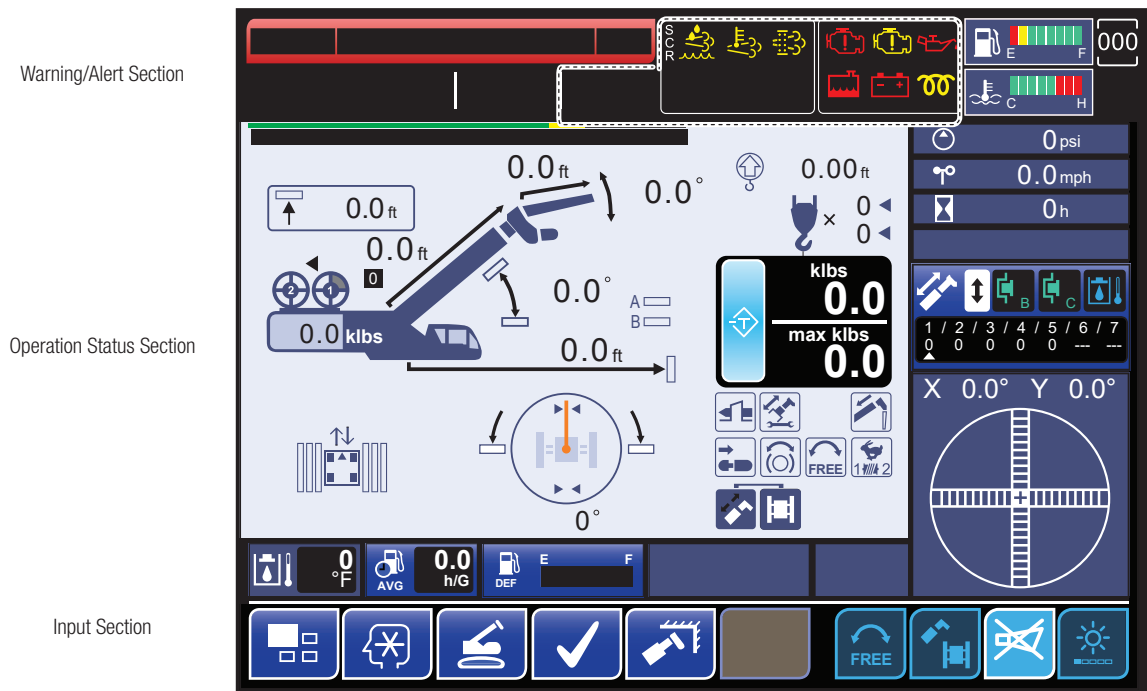
The Automatic Moment Limiter (AML) calculates the working moment and rated moment based on the operation status registered by the operator and input signals from the sensors, and displays them on the Multi Function Display (MFD) as moment load ratio.

AML SCREEN SECTIONS

The AML consists of (see [Multifunction Display, pg 6-8](#) for more information):

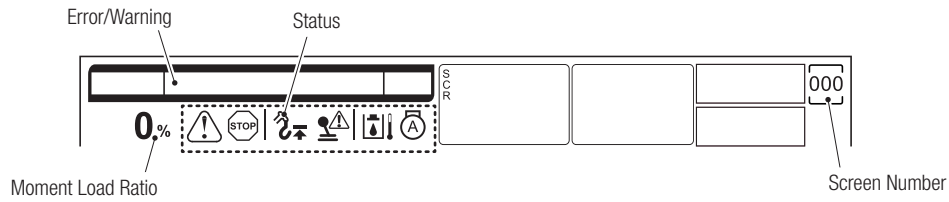
- **Warning/Alert Section**—Displays warnings/alerts, warning/error codes/messages, and operation indicators
- **Operation Status Section**—Displays moment load ratio, crane status, track status, swing position, fuel consumption status, restriction status in each work range, rotating status of winch drums, and AML control status
- **Input Section**—Displays icons/buttons for inputs

Figure 98: AML display



Warning/Alert Section

Figure 99: AML—Warning/Alert Section

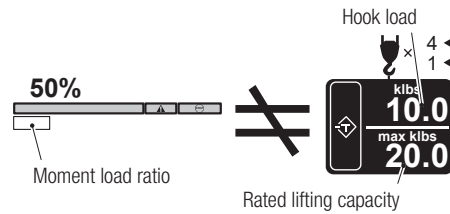


- **Error**—Shows an error code and message.
- **Warning**—For more details, see [Warning Codes, pg 6-17](#) and [Alarm and Recovery Operation, pg 6-35](#).
- **Status**—Shows the overall condition of the GTC-1600. See [Table 11, pg 6-12](#) for more information.
- **Moment Load Ratio**—Shows the condition of the GTC-1600 load.

NOTICE

Moment load ratio is not a ratio of the hook load to the rated lifting capacity. Determine the correct lifting capacity by reading the load chart.

The automatic moment limiter (AML) is not a hook load indicator. The hook load is a reference value, and not necessarily the correct weight of the lifted load.

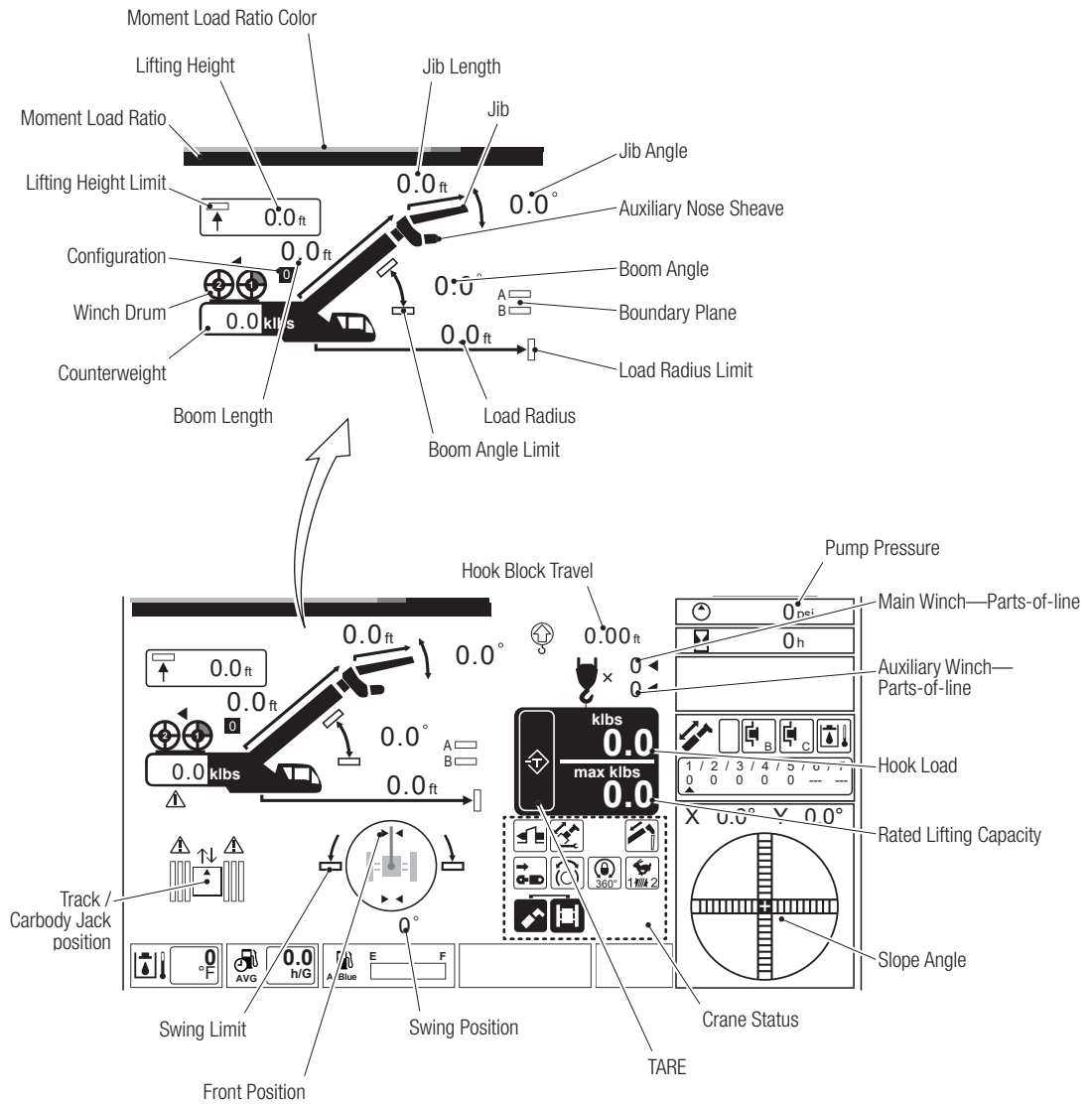


- **Page Number**—Shows the unique page number for the page currently displayed on MFD.

NOTE: The page number may be needed if you contact a TADANO Dealer or TADANO Customer Support.

Operation Status Section

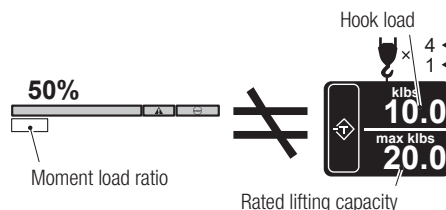
Figure 100: AML—Operation Status Section



NOTICE

Moment load ratio is not a ratio of the hook load to the rated lifting capacity. Determine the correct lifting capacity by reading the load chart.

The automatic moment limiter (AML) is not a hook load indicator. The hook load is a reference value, and not necessarily the correct weight of the lifted load.



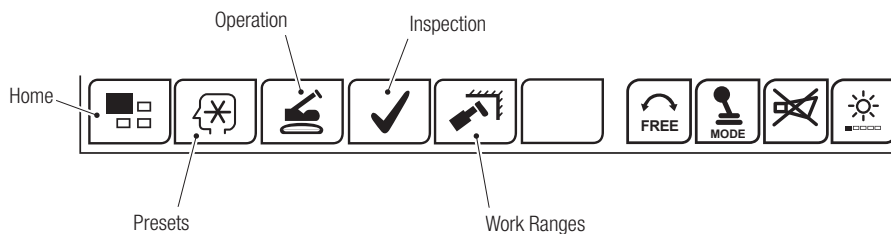
- **Moment Load Ratio**—Shows the moment load ratio with a bar graph. The value is displayed in the warning display section.
 - **Moment Load Ratio Color**—Shows the status of moment load ratio by color:
 - ◇ **Green**—Safe
 - ◇ **Yellow**—Warning
 - ◇ **Red**—Critical
 - **Jib**—Appears when jib lift is registered. Shown with lines when the jib set status is registered.
 - **Auxiliary Nose Sheave**—Appears when the auxiliary nose sheave is registered.
 - **Counterweight**—Shows the status of the mounted counterweight.
 - **Winch Drum**—Shows winch drum rotation.
 - **Configuration**—Shows selected configuration. See [Boom Telescope on MFD, pg 6-64](#) for more information.
 - **Slope Angle**—Shows working area of the crane.
 - **Engine Status**—Shows engine status with icons. See [Table 11: MFD engine status icons, pg 6-12](#) for more information.
 - **Swing Position**—Shows the current swing position.
 - **Front Position**—Appears when the boom is at the front of the GTC-1600. Important when counterweight is removed.
 - **Track / Carbody Jack Configuration**—Shows the status of:
 - ◇ **Tracks**
 - Extended/Retracted
 - Travel/Stationary
 - ◇ **Carbody Jacks**
- NOTE:** When the track condition (travel) is registered, the crawler icon will move; when the track condition (stationary) is registered, the crawler icon will illuminate.
- **TARE**—Tap to set the TARE function.

Input Section

The following features are accessed through the input section:

- **Home**—See [Home Page, pg 6-9](#).
- **Presets**—See [Presets, pg 6-46](#).
- **Operation**—See [Registration of Operating Status and Function Check of Automatic Moment Limiter, pg 6-27](#).
- **Inspection**—See [Inspect the Registration in AML, pg 6-33](#).
- **Work Ranges**—See [Work Range Limits, pg 6-40](#).

Figure 101: AML—Input Section



REGISTRATION OF OPERATING STATUS AND FUNCTION CHECK OF AUTOMATIC MOMENT LIMITER

Before AML Registration and Function Check

! WARNING

Before operating the GTC-1600, confirm the correct configuration is registered and the automatic moment limiter system functions normally. If the operation configuration is registered incorrectly or the automatic moment limiter system does not function normally, the GTC-1600 can overturn or suffer damage, and this can cause a fatal injury.

Before crane operation, observe the following steps to register the operation condition and check the automatic moment limiter functions.

1. Start the engine.

Configure the Counterweight in AML

1. Tap the Operation icon (Figure 101, pg 6-26).
2. Tap the Counterweight Set icon.

Figure 102: AML—counterweight set



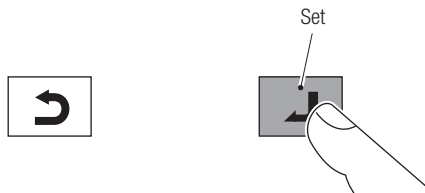
3. Ensure the display properly represents the actual track / carbody jack configuration.

! WARNING

The AML setting and the actual counterweight configuration MUST match. Failure to follow this warning could result in an overturning accident or GTC-1600 damage can occur.

4. If the display properly represents the actual condition, tap the Set icon to register the configuration.

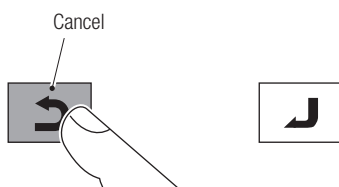
Figure 103: AML—set icon



NOTE: When registration is complete, the MFD will return to the Operation page (Figure 89, pg 6-8).

NOTE: If necessary, to cancel the operation without setting the registration, tap the Cancel icon.

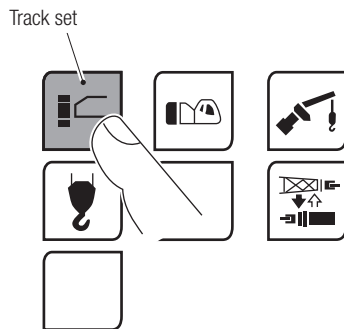
Figure 104: AML—cancel icon



Configure the Tracks and Carbody Jacks in AML

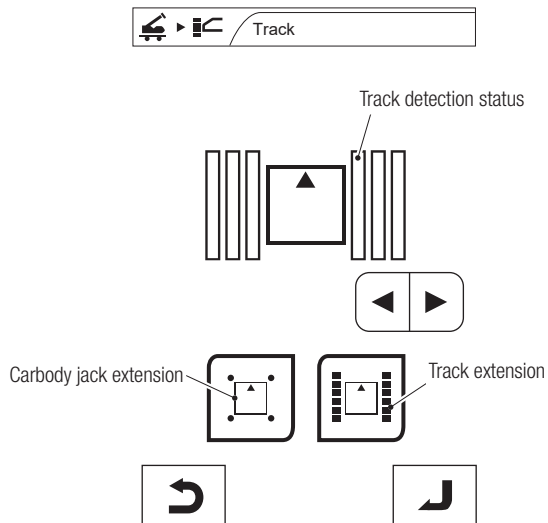
1. Tap the Operation Status icon ([Figure 101, pg 6-26](#)).
2. Tap the Track Set icon.

Figure 105: AML—track set



3. Tap the Carbody Jack Extension or the Track Extension icon.

Figure 106: AML—track set

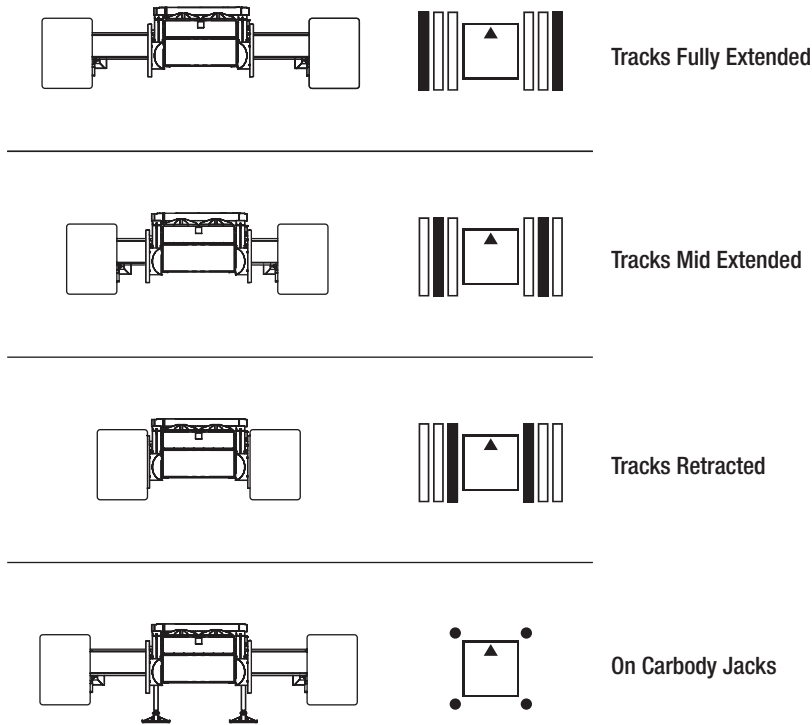


NOTE: See [OPTI-WIDTH™ Track Width Zones, pg 6-58](#) for more information.

NOTE: A configuration change prompted by a change in one of these inputs requires confirmation of the condition by the operator.

4. Ensure the display properly represents the actual track / carbody jack configuration.

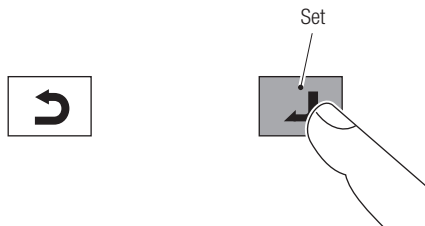
Figure 107: AML—track positions



NOTE: OPTI-WIDTH tracks do not have to be deployed symmetrically. Many more variations are possible than those shown.

5. If the display properly represents the actual condition, tap the Set icon to register the configuration.

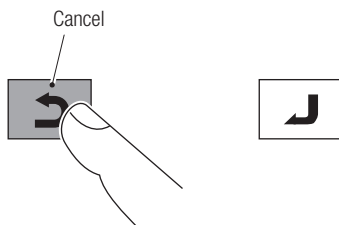
Figure 108: AML—set icon



NOTE: When registration is complete, the MFD will return to the Operation page (Figure 89, pg 6-8).

NOTE: If necessary, to cancel the operation without setting the registration, tap the Cancel icon.

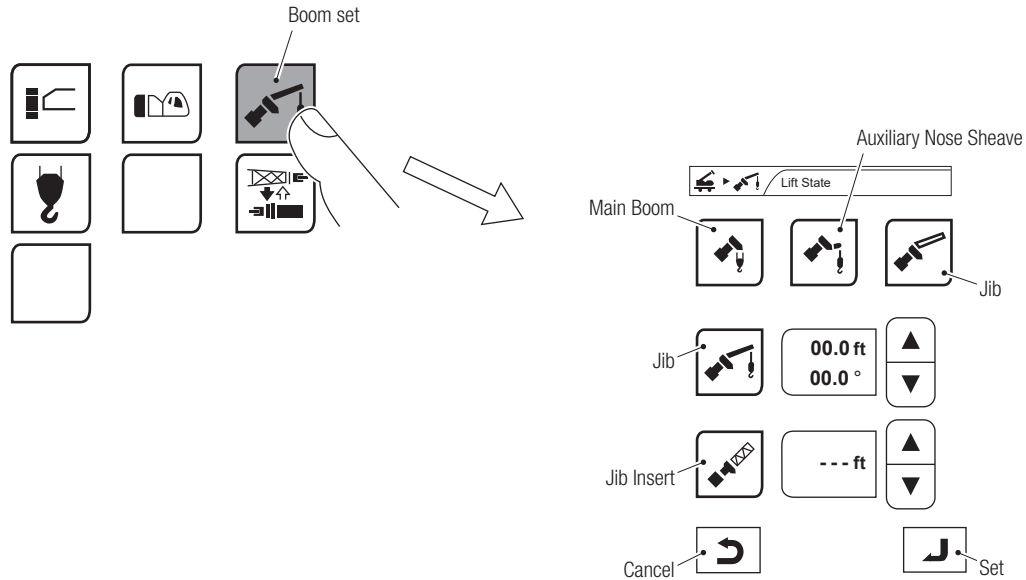
Figure 109: AML—cancel icon



Configure the Boom in AML

1. Install main or auxiliary hook blocks as needed for the intended application.
2. Tap the Operation Status icon ([Figure 101, pg 6-26](#)).
3. Tap the Boom Set icon to register the boom configuration.

Figure 110: AML—boom set



4. Tap the desired boom lift configuration (Main Boom / Auxiliary Nose Sheave / Jib / Work Platform).

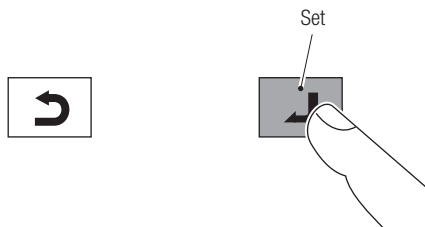
NOTE: When the AML is powered on, Auxiliary Nose Sheave is selected by default.

NOTE: If using the Jib, tap Jib and select the correct jib length with the arrow icons.

NOTE: If using the Jib Insert, select the jib (see above) and select the correct jib insert length with the arrow icons.

5. If the display properly represents the actual condition, tap the Set icon to register the configuration.

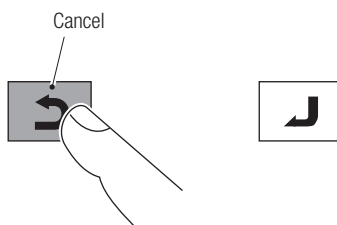
Figure 111: AML—set icon



NOTE: When registration is complete, the MFD will return to the Operation page ([Figure 89, pg 6-8](#)).

NOTE: If necessary, to cancel the operation without setting the registration, tap the Cancel icon.

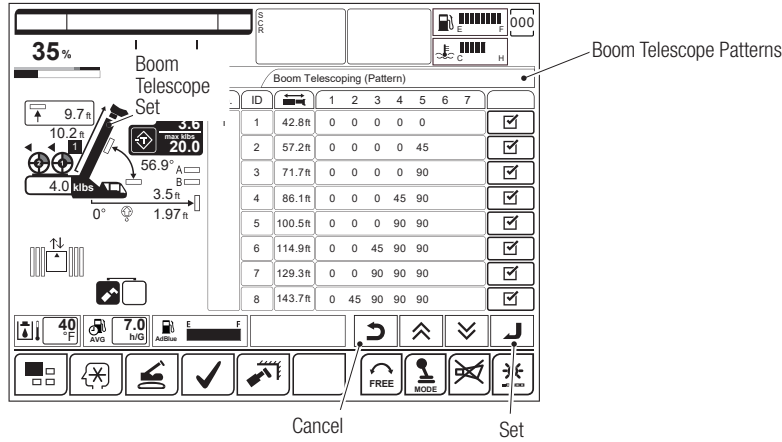
Figure 112: AML—cancel icon



Configure the Boom Telescope Pattern in AML

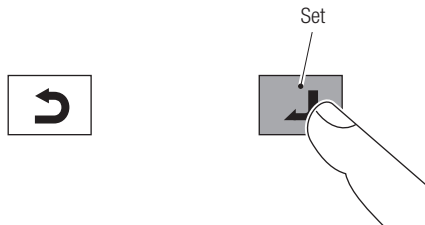
1. Configure the boom ([Configure the Boom in AML, pg 6-30](#)).
2. Tap the Operation Status icon ([Figure 101, pg 6-26](#)).
3. Tap the Boom Telescope Set icon.

Figure 113: AML—boom telescope pattern set



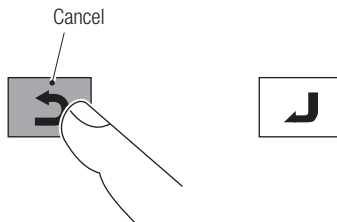
4. Tap the desired boom telescope pattern.
5. If the display properly represents the actual condition, tap the Set icon to register the configuration.

Figure 114: AML—set icon



NOTE: If necessary, to cancel the operation without setting the registration, tap the Cancel icon.

Figure 115: AML—cancel icon



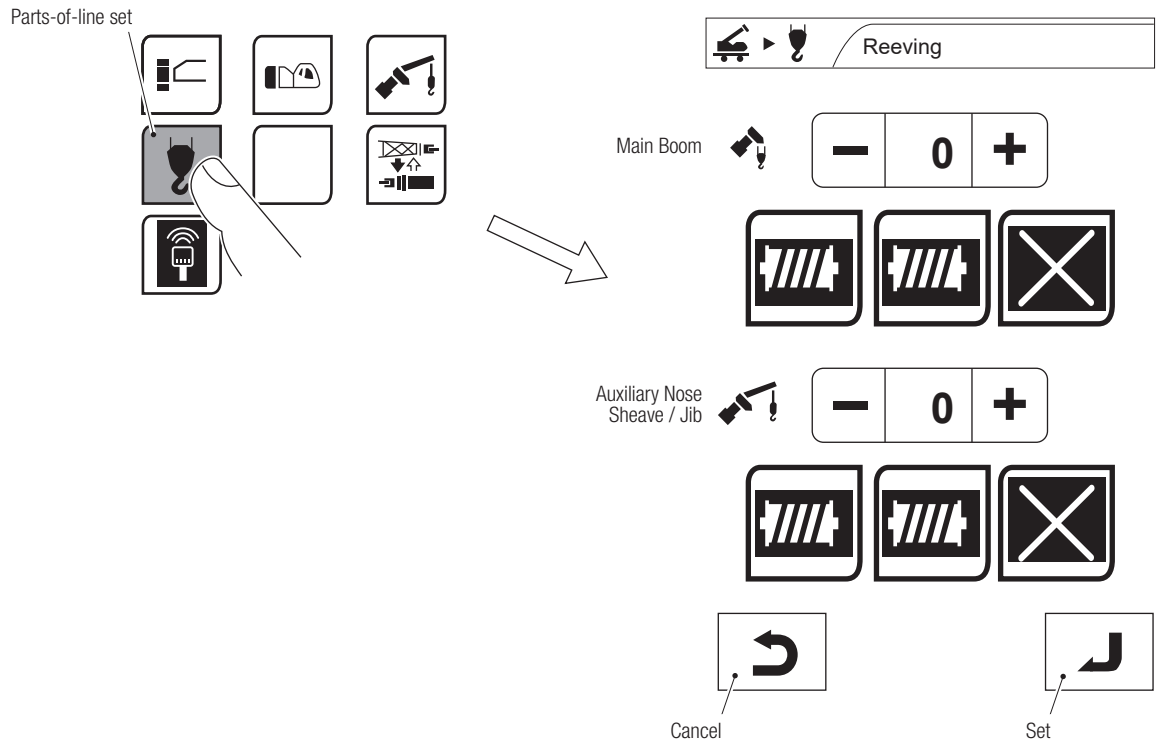
6. Using the left joystick slider ([Left Joystick, pg 3-9](#)), telescope the boom to the desired working condition.

NOTE: When registration is complete, the MFD will return to the Operation page ([Figure 89, pg 6-8](#)).

Configure the Parts of Line in AML

1. Tap the Operation Status icon (Figure 101, pg 6-26).
2. Tap the Parts-of-Line Set icon to register the parts-of-line configuration.

Figure 116: AML—parts-of-line set



3. Tap the Minus (-) / Plus (+) icons to select the desired parts-of-line configuration.

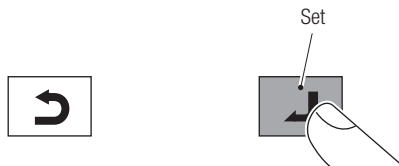
NOTE: Each icon tap will toggle between the available parts-of-line options.

NOTICE

If the number of parts-of-line is incorrectly registered, the hook block travel and hook load will NOT display correctly.

4. If the display properly represents the actual condition, tap the Set icon to register the configuration.

Figure 117: AML—set icon



NOTE: When registration is complete, the MFD will return to the Operation page (Figure 89, pg 6-8).

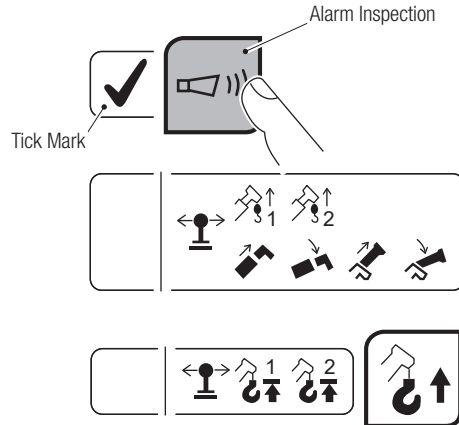
NOTE: If necessary, to cancel the operation without setting the registration, tap the Cancel icon.

NOTE: The hook block weight shown varies depending on the crane configuration, etc..

Inspect the Registration in AML

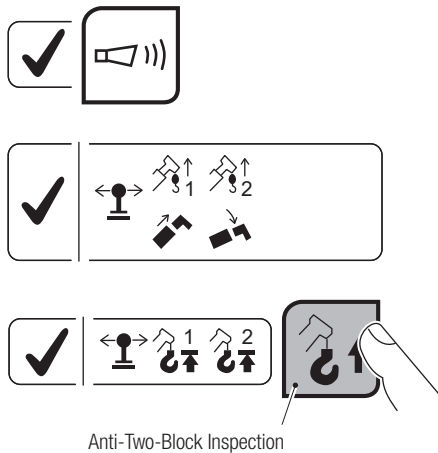
1. Tap the Inspection icon (**Figure 101, pg 6-26**).
NOTE: During inspection, all AML external warning lamps (option) will illuminate.
2. Tap the Alarm Inspection icon, and confirm that the alarm sounds.
NOTE: A tick mark will appear next to the inspected item.

Figure 118: AML—alarm inspection



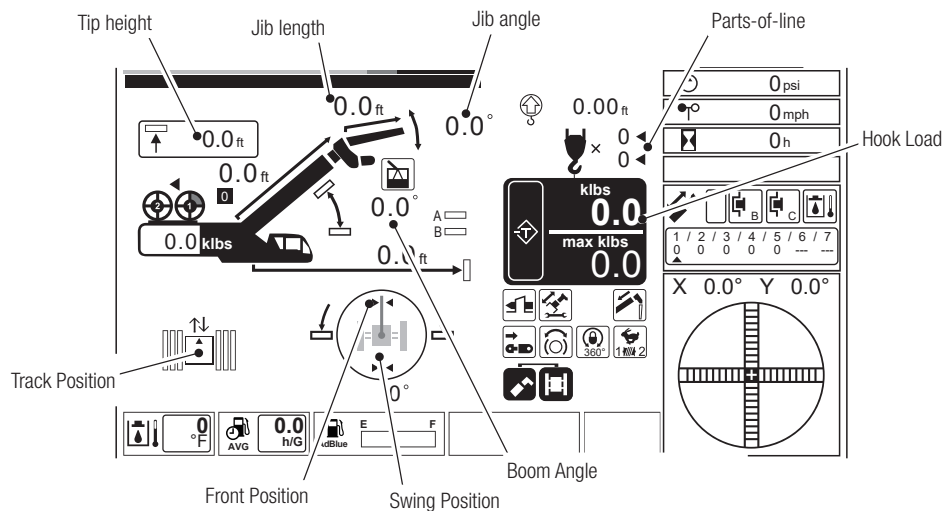
3. Perform main (auxiliary) winch hoist up, boom extension, and boom lowering operations to ensure that the crane does not operate.
NOTE: The icons for inspected items will darken.
NOTE: A tick mark will appear when all inspections are complete.
NOTE: When jib lift is registered, also inspect jib extension and jib tilt lowering operations.
4. Tap the Anti-Two-Block Inspection icon, and hoist up winch slowly until A2B weight touches hook block.
NOTE: The icons for inspected items will darken.
NOTE: A tick mark will appear when all inspections are complete.
NOTE: When the anti-two-block inspection icon is tapped, winch operation becomes possible.

Figure 119: AML—anti-two-block inspection



5. Confirm that the items on the display panel, listed below, match the actual GTC-1600 status.
 - ◇ **Hook load**—Displays the approximate hook block mass, under a no-load condition
 - ◇ **Swing position**
 - ◇ Boom telescope pattern
 - ◇ Counterweight
 - ◇ **Front position symbol**—Displays when the boom is directed toward the front of the vehicle
 - ◇ **Boom angle**
 - ◇ **Track configuration symbol**
 - ◇ **Boom length**
 - ◇ **Number of parts of line**
 - ◇ **Jib length**—When jib lift is registered
 - ◇ **Jib angle**—When jib lift is registered

Figure 120: AML—checklist



NOTE: The hook block mass shown will vary, depending on crane configuration, etc..

After the AML Registration and Inspection

Operate the GTC-1600 normally, after successfully completing registration of the automatic moment limiter.

NOTE: The registered information in the automatic moment limiter is retained for approximately two hours after the power is turned off. When the power of the automatic moment limiter is turned on, the operation starts with the retained information.

After the two-hour period, the registered information will be erased and it is necessary to register the operation configuration from the beginning.

ALARM AND RECOVERY OPERATION

See **Warning Codes, pg 6-17** and **AML Alarms, pg 6-18** for more information.

NOTICE

All GTC-1600 warning codes require repair. Additionally, repair is necessary if any of the following occurs:

- A warning code not listed here is shown.
- The warning code does not disappear after registering the relevant condition or performing the recovery operation.
- The GTC-1600 does not operate.

Contact your nearest TADANO Dealer or TADANO Customer Support.

When any failure occurs or improper operation is performed during crane operation, the alarm sounds and a warning code is shown to ensure safety and to prevent damage to the GTC-1600. Examine the meaning of the warning code, and perform recovery operation.

WARNING CODES AND ALARM

The warning codes appear on the display panel. The automatic moment limiter has three (3) built-in alarms. Each alarm indicates different warning(s). For details of the warning codes, see **Table 14: Crane status icons, pg 6-20**.

1. If a warning occurs, tap the MFD Warning/Alert Section (**AML Screen Sections, pg 6-23**) to see the list of warnings.

STOP/WARNING ALARMS

This table contains warning codes that are not applicable to this model.

Table 15: Warning codes

Warning Code	Alarm	Cause	Remedy
W0005] "BM ang out of specified range"	MFD built-in alarm: Beep-beep-beep Short beeps repeat for five (5) seconds	Boom angle is insufficient when the jib is mounted or stowed.	Perform boom raising operation until the boom angle becomes 78° or more.
[W0006] "Improperly inserted jib pin"		After the jib side up cylinder is extended, the boom is extended without pulling out the jib connecting pin E.	Pull out the jib connecting pin E.
[W0007] "Stop at slewing angle limit"		Overload occurs during the swing operation.	Slew in the opposite direction, retract or raise the boom, or retract or raise the jib.
[W0012] "Backward stability stop range"		The crane has taken a posture with no backward stability capacity during crane operation.	Extend or lower the boom.
[W0013] "Over front SW is defective"		The status of the front position detector switch and the actual swing angle do not match.	Contact a TADANO distributor or dealer for inspection.
W0015] "Two-blocking condition"	Two-blocking alarm: Tremolo sound MFD built-in alarm: Beep-beep-beep Short beeps repeat for five (5) seconds	The stop function is canceled with the anti-two-block disable switch while the hook block is two-blocking.	Unwind the winch, retract the boom or retract the jib to lower the hook block
[W0016] "State 1 is not applied"	MFD built-in alarm: Beep-beep-beep Short beeps repeat for five (5) seconds.	Lift status is out of the statuses that are registered to the load moment indicator.	Register the lift status again.
[W0017] "State 2 is not applied"		A lift status with no capacity rated is registered to the load moment indicator.	
[W0022] "Jib full retract SW1 faulty"		The status of the jib full retraction detector switch and actual jib length do not match.	Contact a TADANO distributor or dealer for inspection
[W0023] "100% of crane performance"	MFD built-in alarm: Beep-beep-beep Short beeps repeat for five (5) seconds. Alarm: continuous (low tone)	Crane is operated toward a critical side while the moment load ratio exceeds 100%.	Unwind the winch, retract or raise the boom, retract or raise the jib, or slew to the non-critical side.

Table 15: Warning codes

Warning Code	Alarm	Cause	Remedy	
[W0024] "Stop due to two-blocking"	Two-blocking alarm: Tremolo sound MFD built-in alarm: Beep-beep-beep Short beeps repeat for five (5) seconds.	Crane is operated toward a critical side while the hook block is two-blocking.	Unwind the winch, retract the boom, raise the jib or retract the jib to lower the hook block	
[W0025] "Stopped due to backward stability"	MFD built-in alarm: Beep-beep-beep Short beeps repeat for five (5) seconds.	Backward stability decreases and the crane can overturn.	Lower or extend the boom.	
[W0026] "Upper angle limit restriction"		The boom angle has reached the upper limit.	Lower the boom.	
[W0027] "Lower angle limit restriction"		The boom angle has reached the lower limit.	Raise the boom.	
[W0028] "Lifting height restriction"		The boom head or jib head has reached the lifting height limit.	Retract or lower the boom, or retract or lower the jib.	
[W0029] "Load radius restriction"		The load radius has reached the limit.	Retract or raise the boom, or retract or raise the jib.	
[W0041] "Counterweight mismatch"		The counterweight mounted on the crane differs from the registration to the load moment indicator.	Register counterweight conditions to the load moment indicator.	
[W0042] "Right slewing restriction limit"		The boom is slewed to the swing limit.	Slew the boom in the opposite direction.	
[W0043] "Left slewing restriction limit"				
[W0044] "Jib stowed condition"				Jib tilt operation is performed while the jib is stowed.
[W0045] "Tele1 stroke end"	While telescope section 1 is extended in emergency telescope operation, the B-Pin 100% connecting position is exceeded.			Retract telescope section 1. See Chapter 9: Emergency Boom Operation
[W0054] "Elevating cylinder stroke end"	MFD built-in alarm: Beep-beep-beep Short beeps repeat for five (5) seconds.	The boom is lowered at elevation lower limit stroke end while the elevation slow stop function is canceled.	Raise the boom.	
[W0055] "Elevating cylinder stroke end"		The boom is raised at elevation upper limit stroke end while the elevation slow stop function is canceled.	Lower the boom.	
[W0057] "Front right O/R state change"		An carbody jack beam retracts during crane operation, and the performance (lifting capacity) changes to the one with smaller extension width of outriggers.	Extend the carbody jack again, and insert the pin. Then, register the carbody jack status again.	
[W0058] "Rear right O/R state change"				
[W0059] "Front left O/R state change"				
[W0060] "Rear left O/R state change"				
[W0097] "Wind speed limit"		MFD built-in alarm: Beep-beep-beep Short beeps repeat for five (5) seconds.	Wind speed at the boom head has exceeded the limit of the crane.	Stow the boom and jib, and stop operation until wind speed becomes below the limit.
[W0102] "Low temperature mode override"	The cold weather telescope mode is canceled.		Operate slowly until the hydraulic oil is warmed up.	

Table 15: Warning codes

Warning Code	Alarm	Cause	Remedy
[W0106] "Elevating speed is reducing"	MFD built-in alarm: Beep-beep-beep Alarm sounds during deceleration.	The elevation slow stop function is activated and boom elevating operation speed is decelerating.	The crane is approaching the stop position. Operate with care.
[W0107] "Telescope speed is reducing"		The telescope slow stop function is activated and the boom telescope operation speed is decelerating.	
[W0108] "Slewing speed is reducing"		The swing stop function is activated and the swing operation speed is decelerating.	
[W0121] "Elevating cylinder stroke end"	MFD built-in alarm: Beep-beep-beep Short beeps repeat for five (5) seconds.	The boom is raised at the elevation upper limit stroke end while the elevation slow stop function is activated.	Lower the boom.
[W0124] "Limit range of boom with jib"		Moment load ratio has reached the overloading status during boom lift operation with the jib mounted.	Unwind the winch, or retract or raise the boom. Stow the jib.
[W0190] "Auto stopped at critical range"		Crane is operated toward the critical side while the load moment indicator override switch is turned to EMERGENCY.	Turn the load moment indicator override switch to NORMAL.
[W0191] "Override SW is defective"		A lift status is registered while in the override status, or while the switch has a failure.	Turn the override switch to OFF, or contact a TADANO distributor or dealer for inspection or maintenance.
[W0214] "Tension rod interference"		Raise the boom or lower the jib in the interference area of the tension rod.	Lower the boom or raise the jib.

Table 15: Warning codes

Warning Code	Alarm	Cause	Remedy	
[W0253] "B-Pin detection trouble"	MFD built-in alarm: Beep-beep-beep Short beeps repeat for five (5) seconds.	On one side, detections of B-Pin lock (insert) and unlock (removal) contradict.	Contact a TADANO distributor or dealer for inspection.	
[W0254] "C-Pin detection trouble"		On one side, detections of C-Pin lock (insert) and unlock (removal) contradict.		
[W0262] "Jib angle out of specified range"		The jib swing up angle is insufficient.	Swing up the jib head by performing jib tilt raising or boom raising operation until the jib extending/stowing operatable icon lights up.	
[W0281] "jib set possibility range"		Boom angle has reached the upper limit for jib mounting or stowing by boom raising operation.	Stop boom raising operation and mount or dismount the jib.	
[W0295] "Inside of jib set support"		The roller for jib extension/stowing is within the support when the jib is set.	Perform operation according to the jib mounting/stowing procedure.	
[W0296] "Jib set support interference"		The roller for jib extension/stowing may collide with the support when the jib is set.		
[W0297] "Radio control operation"		The boom length limit by a radio controller operation is exceeded.	Perform boom retraction operation.	
[W0339] "Pedal 1 front contradiction"		The control pedal detection has a failure.		Contact a TADANO distributor or dealer for inspection.
[W0340] inspection. "Pedal 1 rear contradiction"				
[W0341] "Pedal 2 front contradiction"				
[W0342] "Pedal 2 rear contradiction"				
[W0343] "Pedal 3 front contradiction"				
[W0344] "Pedal 3 rear contradiction"				
[W0345] "Lever 1 front contradiction"				
[W0346] "Lever 1 rear contradiction"				
[W0347] "Lever 2 front contradiction"	The joystick detection has a failure.			

Table 15: Warning codes

Warning Code	Alarm	Cause	Remedy
[W0348] "Lever 2 rear contradiction"	MFD built-in alarm: Beep-beep-beep Short beeps repeat for five (5) seconds.	The joystick detection has a failure.	Contact a TADANO distributor or dealer for inspection.
[W0349] "Lever 3 front contradiction"			
[W0350] "Lever 3 rear contradiction"			
[W0351] "Lever 4 front contradiction"			
[W0352] "Lever 4 rear contradiction"			
[W0353] "Lever 5 front contradiction"			
[W0354] "Lever 5 rear contradiction"		The joystick detection has a failure.	
[W0371] "Ope. lever stowing position"		The PTO is ON and the lever stand is tilted.	Raise the lever stand.
[W0372] "Engine emergency stop"		The stop switch in the cab is pressed.	Release the stop switch after danger is eliminated.
[W0373] "Engine emergency stop (S)"		The stop switch for radio control at the left side of the swing table is pressed.	
[W0374] "Engine emergency stop (L)"		The stop switch for radio control at the left side of the vehicle is pressed.	
[W0375] "Engine emergency stop (R)"		The stop switch for radio control at the right side of the vehicle is pressed.	
[W0376] "Boundary line A restriction"		The boom head or jib head reaches the limit value of the boundary plane A.	Retract or raise the boom, or retract or raise the jib.
[W0377] "Boundary line A restriction"			Slew toward the opposite side of the registered limit.
[W0378] "Boundary line B restriction"		The boom head or jib head reaches the limit value of the boundary plane B.	Retract or raise the boom, or retract or raise the jib.
[W0379] "Boundary line B restriction"			Slew toward the opposite side of the registered limit.
[W0380] "AML vent circuit check"		Load moment indicator stop circuit is being checked.	An error is canceled when check is completed. If an error is not canceled, contact a TADANO distributor or dealer for inspection and maintenance.
[W0999]	AML built-in alarm	When the power is turned on, the AML built-in clock battery is low.	Contact a TADANO distributor or dealer to replace the battery.

OTHER FUNCTIONS

WORK RANGE LIMITS

NOTICE

If the work range limit is registered too close to an obstacle, the GTC-1600 can hit the obstacle—depending on configuration and operation. Consider a sufficient allowance when registering the limit.

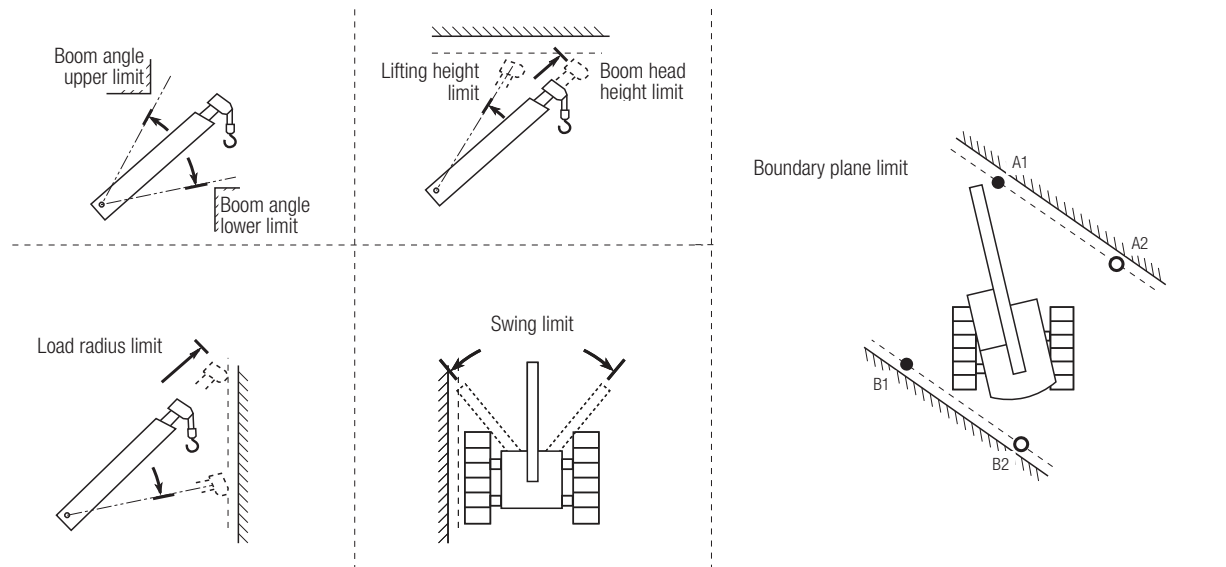
Before reaching the limit, functions will slow and a warning will display. The limit may not be fully reachable.

The work range limit function restricts the operation of the GTC-1600 to the pre-registered boom angle (upper limit, lower limit), lifting height, load radius, swing angle (left or right), and boundary planes (inside the straight lines that pass through 2 points [A1 and A2] and other 2 points [B1 and B2]). Use this function when operating the GTC-1600 in a place where there are obstacles around the crane or when requiring the work range limit of the boom.

When the GTC-1600 reaches the registered work range, the limit function works as shown in the following table.

NOTE: Free swing (Free Swing Mode, pg 6-19) is restricted by registering a swing limit.

Table 16: Registered work range limits



Work Range Limits	Crane State
Boom angle upper limit	Crane stops automatically Automatic moment limiter built-in alarm: beep-beep-beep (Every second for 5 seconds)
Boom angle lower limit	
Lifting height limit	
Load radius limit	
Left swing limit	
Right swing limit	

Display of Limit Function State

Monitor the registered state of the work range limit on the normal screen and the registration page for work range limit in the AML.

Table 17: AML—caution color codes

Display	Caution
—	Limit function is not set.
Blue	Limit function is set.
Yellow	Approaching to a set limit.
Red	Stopped at a set limit. At the same time, a warning code/message are displayed

1. Tap the Work Range Limit icon (Figure 101, pg 6-26) to display the work range limit registration page.

NOTE: Each set value and current position are displayed with images and numbers.

Table 18: AML—work range limits







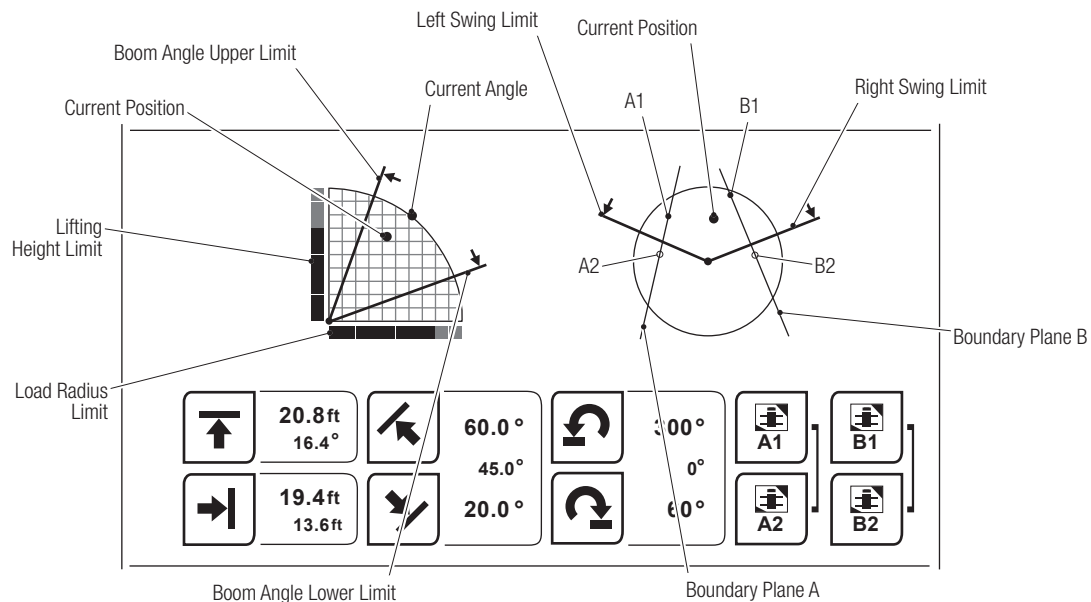
Item	Function	Item	Function
 000.0ft 00.0°	Lifting height limit is indicated in numeric values. The limit registration value is displayed in the top line and the current boom angle is displayed in the bottom line.	 000.0ft 000.0ft	The load radius limit is indicated in numeric values. The limit registration value is displayed in the top line and the current load radius is displayed in the bottom line.
 00.0° 00.0°  00.0°	The boom angle upper limit and lower limit are indicated in numeric values. The registration value of boom angle upper limit is displayed in the top line and that of boom angle lower limit is displayed in the bottom line. The middle line shows the current boom angle.	 000° 000°  000°	The left swing limit and right swing limit are displayed in numeric values. The registration value of left swing limit is displayed in the top line and that of right swing limit is displayed in the bottom line. The middle line shows the current swing angle.

Figure 121: AML—work range limits



NOTE: When using Jib Set, cannot use the lifting height limit, load radius limit, and boundary plane limit functions.

NOTE: The current position shows the lifting height in the two-blocking status. The current angle shows the boom angle. The current position and angle in each operation are of the following end positions.

- **Main boom lift**—Boom head
- **Auxiliary nose sheave lift**—Auxiliary nose sheave
- **Jib lift**—Jib head

NOTE: Numeric values for the boundary plane limit aren't displayed.

Registering Boom Angle, Lifting Height, and Load Radius Limit

1. Tap the Work Range Limit icon (**Figure 101, pg 6-26**) to display the work range limit registration page.
2. Operate the boom / auxiliary nose sheave / jib to the desired limit state, and tap the appropriate icon (**Figure 121, pg 6-41**) to register the desired limit:
 - ◇ Lifting height limit
 - ◇ Boom angle upper/lower limit
 - ◇ Load radius limit
 - ◇ Left/right swing limit

NOTE: See **Display of Limit Function State, pg 6-41** for more information.

NOTE: If necessary, to cancel the operation without setting the registration, tap the Home icon.

3. Operate the boom / auxiliary nose sheave / jib to a position within the limit range.

NOTE: If the crane status reaches a registered limit value, the operation is automatically stopped, and a warning code and message will display on the AML. The built-in alarm will sound in a short cycle for five (5) seconds.

Cancelling Boom Angle, Lifting Height, and Load Radius Limit

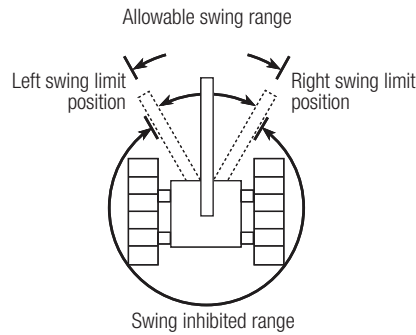
1. Tap the Work Range Limit icon (**Figure 101, pg 6-26**) to display the work range limit registration page.
2. Tap the appropriate icon for the desired registered work range to cancel.
3. Tap the Home icon, and the display will return to crane Operation (**Figure 89, pg 6-8**).

Registering Swing Range Limit

NOTICE

The swing range limit function determines the allowable swing range.

Register both the left swing limit and right swing limit. Registering only one side (right or left) will cause the GTC-1600 to operate incorrectly.



1. Tap the Work Range Limit icon (**Figure 101, pg 6-26**) to display the work range limit registration page.
2. Swing the upper rotating frame to the desired left swing limit position, and tap the Left Swing Limit Registration icon (**Figure 121, pg 6-41**).
3. Swing the upper rotating frame to the desired right swing limit position, and tap the Right Swing Limit Registration icon (**Figure 121, pg 6-41**).

NOTE: For work range display, see **Display of Limit Function State, pg 6-41**.

4. Swing the upper rotating frame to a position within the registered swing limit range.

NOTE: If the upper rotating frame reaches the registered swing range limit, then swing operation will stop automatically and a warning code/message will display on the MFD. The MFD built-in alarm will sound in a short cycle for five (5) seconds.

Cancelling Swing Range Limit

1. Tap the Work Range Limit icon (**Figure 101, pg 6-26**) to display the work range limit registration page.
2. Tap the Left Swing Limit Registration icon.
3. Tap the Right Swing Limit Registration icon.
4. Tap the Home icon, and the display will return to crane Operation (**Figure 89, pg 6-8**).

Registering Boundary Plane Limit

WARNING

When the boundary plane limit is registered, if simultaneous operations (e.g., boom lowering and swing) are performed near the boundary plane, then the crane could stop suddenly. This could cause load sway or an accident. Operate carefully when performing simultaneous operations.

NOTICE

The area outside of a straight line that passes through the two (2) registered points (i.e., A1 and A2, or B1 and B2) is registered as dangerous. The boundary plane limit will not function properly if it is not registered on both sides.

Registering Boundary Plane A1 to A2

1. Tap the Work Range Limit icon (**Figure 101, pg 6-26**) to display the work range limit registration page.
2. Operate the boom / auxiliary nose sheave / jib to the desired position where the limit is to be set, and tap the Boundary Plane A1 Registration icon (**Figure 121, pg 6-41**).

NOTE: To cancel the registration, tap the Home icon.

3. Operate the boom / auxiliary nose sheave / jib to the desired position where the limit is to be set, and tap the Boundary Plane A2 Registration icon (**Figure 121, pg 6-41**).

NOTE: To cancel the registration, tap the Home icon.

NOTE: Point A2 cannot be registered in an area that is within 5° of point A1, and in its symmetrically opposite area.

NOTE: A straight line, that passes through points A1 and A2 will be shown.

4. Operate the boom / auxiliary nose sheave / jib to a position inside the boundary plane.

NOTE: If the GTC-1600 approaches the registered boundary plane A1 to A2, then operation will stop automatically and a warning code/message will display on the MFD. The MFD built-in alarm will sound in a short cycle for five (5) seconds.

Registering Boundary Plane B1 to B2

Repeat Step 1 thru Step 4 above to register the boundary plane B1 to B2.

Cancelling Boundary Plane Limits

1. Tap the Work Range Limit icon (**Figure 101, pg 6-26**) to display the work range limit registration page.
2. Tap the Boundary Plane A Registration icons (**Figure 121, pg 6-41**).
3. Tap the Boundary Plane B Registration icons (**Figure 121, pg 6-41**).
4. Tap the Home icon, and the display will return to crane Operation (**Figure 89, pg 6-8**).

Alarm for Work Range Limit and Recovery Operation

When the crane operation reaches the registered limit value, the automatic moment limiter alarm sounds, and a warning code/message appear on the display panel. Examine the meaning of the warning code and perform recovery operation.

REGISTERING TARE

NOTE: The rated load is not changed and the GTC-1600 will go into overload before the indicated load reaches the rated load.

The weight of the load (before or after lifting) is shown on the hook load display.

1. Before lifting a load, tap the TARE icon ([Figure 100, pg 6-25](#)).

NOTE: The hook load display will show 0 klbs.

NOTE: The TARE icon is illuminated during TARE function setting.

2. Perform hoist-up operation to lift the load.

NOTE: The hook load display will show the weight of the load.

Cancelling TARE

1. Tap the TARE icon again.

⚠ CAUTION

Never operate the Presets menu during other crane operation. Distraction can cause a serious accident.

The following functions are available on the Presets page (Figure 89, pg 6-8):

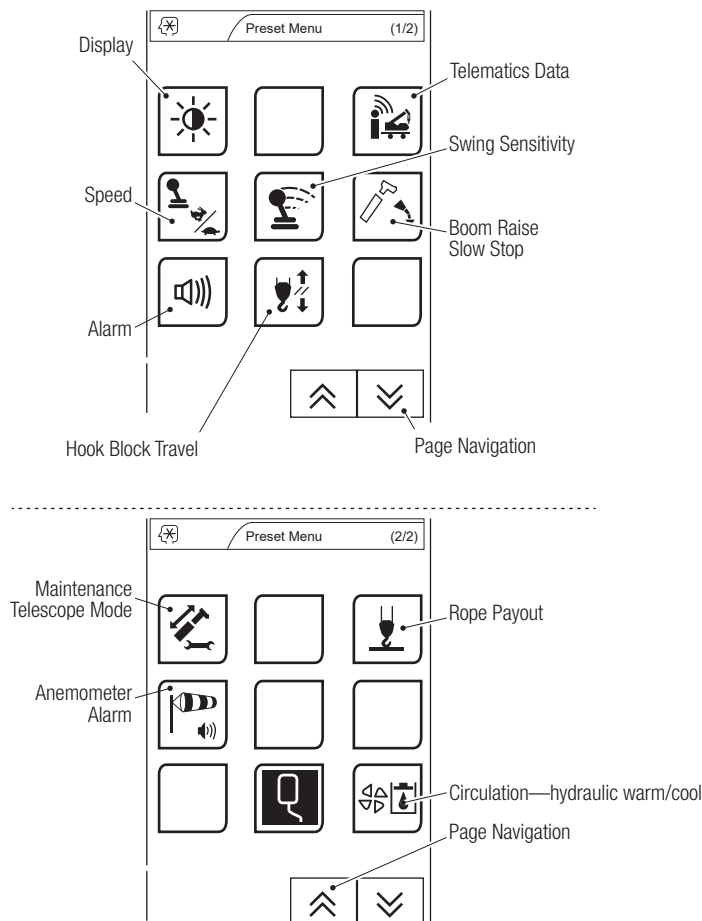
- Adjusting MFD screen brightness/contrast
- Transmitting telematics data
- Adjusting speed
- Adjusting swing sensitivity
- Setting alarm
- Resetting hook block travel
- Activating/deactivating maintenance telescope mode
- Setting rope payout length
- Setting (optional) anemometer alarm threshold
- Circulation—hydraulic warm/cool

1. Tap the Presets icon (Figure 89, pg 6-8).
2. Tap the icon for the desired function (Figure 122, pg 6-46).

NOTE: To cancel the registration, tap the Home icon.

NOTE: Faded icons cannot be selected.

Figure 122: AML—presets



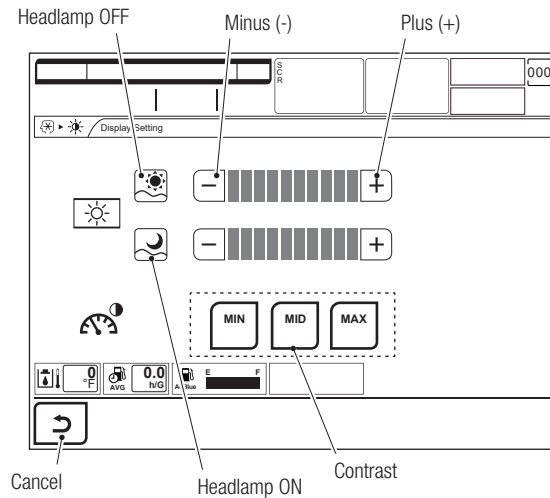
Adjusting MFD Screen Brightness/Contrast

⚠ CAUTION

If the screen brightness affects visibility (e.g., traveling at night, MFD screen reflection on window obscures view, etc.), adjust the screen brightness.

1. Tap the Presets icon (Figure 89, pg 6-8).
2. Tap the Display icon (Figure 122, pg 6-46).
3. Tap the Plus (+) and/or Minus (-) icons to adjust the screen brightness.

Figure 123: AML—adjusting MFD screen brightness/contrast



NOTE: The screen has eleven (11) brightness step possibilities.

NOTE: For safety, limit screen brightness to the minimum necessary level.

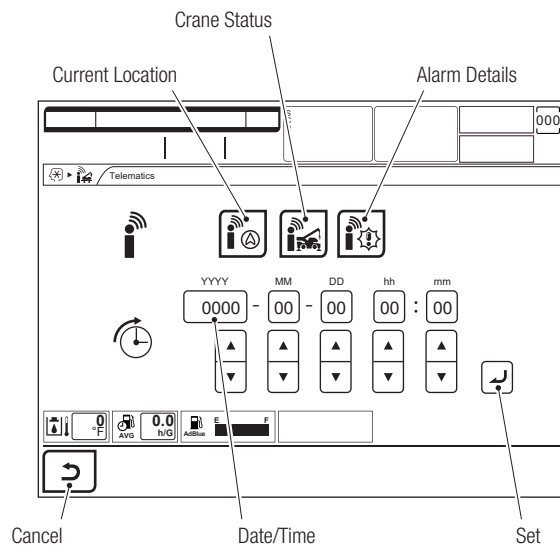
4. When adjustments are complete, tap the Cancel icon to return to the Presets page.

NOTICE

For GTC-1600 trouble, contact your authorized TADANO Dealer or TADANO Customer Support and operate accordingly.

1. Tap the Presets icon (Figure 89, pg 6-8).
2. Tap the Telematics Data icon (Figure 122, pg 6-46).
3. Tap the icon (Figure 124, pg 6-48) for the desired data to be transmitted:
 - ◇ **Current location**—The current location, as detected by the GPS, is transmitted.
 - ◇ **Crane status**—The current crane status is transmitted.
 - ◇ **Alarm details**—When there is an error in the machine, the details of the alarm (warning) are transmitted.

Figure 124: AML—transmitting telematics data



NOTE: There will be a time lag before the data is actually transmitted after the icon is tapped. The required time for transmission varies depending on the communication environment.

NOTE: Communication is impossible in a tunnel/indoors/etc., where radio wave reception is poor. Move the GTC-1600 to an open environment with good reception.

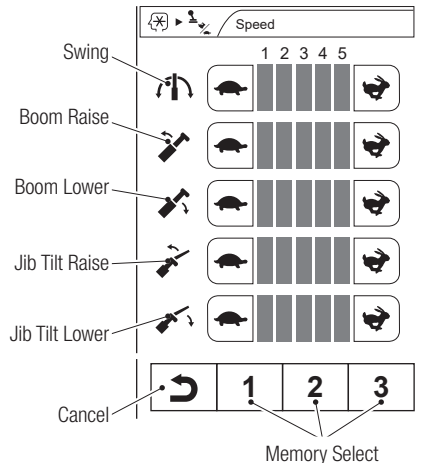
NOTE: During data transmission registration, the Telematics Data icon on the Presets page will fade, and new data cannot be transmitted. To transmit additional data, wait until the icon returns to normal.

4. Check the displayed date and time. If the date and time are not correct, adjust them.
 - a. Tap the Up Arrow and Down Arrow icons to adjust the values.
 - b. After the date and time are correctly adjusted, tap the Set icon.
5. When transmission is complete, tap the Cancel icon to return to the Presets page.

Adjusting Speed

1. Tap the Presets icon (**Figure 89, pg 6-8**).
2. Tap the Speed icon (**Figure 122, pg 6-46**).
3. Tap a Memory Select icon to highlight, then make adjustments.

Figure 125: AML—adjusting speed



4. Tap the Turtle/Rabbit icons to decrease/increase the speed of the displayed functions to the desired speeds.

NOTE: Boom raise speed is the speed limit for operation with the boom fully extended. Speed will increase when the boom shortens. When the boom is fully retracted, operation is standard speed.

NOTE: The maximum speed of boom raise and jib tilt changes by approximately 1/5 with each step. The maximum speed of swing changes by approximately 1/8 with each step.

NOTE: When swing operation is not possible due to crane loading conditions caused by wind, crane position, etc., increase the speed.

5. When adjustments are complete, tap the Cancel icon to return to the Presets page.

NOTE: The AML retains the registered settings, even after being powered off. When the AML is powered on, operation will start with the previously registered settings.

Adjusting Swing Sensitivity

Adjust swing speed for additional control beyond swing joystick. Select one of three (3) settings. The registered number is linked to the speed adjustment.

1. Tap the Presets icon (**Figure 89, pg 6-8**).
2. Tap the Swing Sensitivity icon (**Figure 122, pg 6-46**).
3. Tap the Turtle/Rabbit icons to decrease/increase the swing speed of the joystick to the desired sensitivity.
4. When adjustments are complete, tap the Cancel icon to return to the Presets page.

NOTE: The AML retains the registered settings, even after being powered off. When the AML is powered on, operation will start with the previously registered settings.

Setting Alarm

Select whether alarm will sound for winch drum rotation and/or swing operation.

NOTE: Winch drum rotation and swing use the same alarm. Operating both, at the same time, will make it impossible to distinguish the cause of the alarm.

1. Tap the Presets icon (Figure 89, pg 6-8).
2. Tap the Alarm icon (Figure 122, pg 6-46).
3. Tap the desired Winch Rotation / Swing Alarm icons.

NOTE: The function is active when the icon is highlighted, and inactive when it is not.

4. When adjustments are complete, tap the Cancel icon to return to the Presets page.

NOTE: The AML retains the registered settings, even after being powered off. When the AML is powered on, operation will start with the previously registered settings.

Winch Drum Rotation

The alarm sounds only while the winch drum turns at a low speed. When the winch drum rotation speed increases, the alarm stops sounding.

- Normal time: Short beep
- When a load slightly lowers during hoisting-up (high load very slow hoist-up): Long beep

NOTE: Even when the lifted load is not visible, the operation sound indicates the status of the load.

Swing Operation

The alarm sounds only while the swing is at a low speed. When the swing speed increases, the alarm stops sounding.

- Normal time: Short beep
- When slewing in the opposite direction of operation due to wind, etc.: Long beep

Resetting Hook Block Travel

Reset hook block after registering number of parts-of-line.

1. Tap the Presets icon (Figure 89, pg 6-8).
2. Tap the Hook Block Travel icon (Figure 122, pg 6-46).
3. Tap the Hook Block Travel Amount Reset icon and/or Auxiliary Winch Hook Block Travel Amount Reset icon.

NOTE: When reset, the hook block travel amount (Figure 100, pg 6-25) displays “0.00 ft (0.00 m)”, returns to the Operation page.

NOTE: The AML retains the registered settings, even after being powered off. When the AML is powered on, operation will start with the previously registered settings.

Setting Rope Payout Length

Use to clear any discrepancies between the indicated hook block travel and the actual hook block travel.

1. Register the lift status and the number of parts of line to the load moment indicator (Registration of Operating Status and Function Check of Automatic Moment Limiter, pg 6-27).
2. Tap the rope payout length correction icon.
3. Lower the hook block so that it contacts the ground lightly.

NOTE: There are no restrictions on the length or angle of the boom and jib.

4. Tap the icon of the winch drum to be adjusted.

NOTE: When reset, the hook block travel amount (Figure 100, pg 6-25) displays “0.00 ft (0.00 m)”, returns to the Operation page.

5. Tap the Home icon.

Setting (Optional) Anemometer Alarm Threshold

Use with anemometer, to notify if the wind speed measured by the anemometer reaches the set value. If the wind speed measured by the anemometer exceeds the set threshold, an alarm will sound and the warning code “W0097” will display on the AML.

1. Tap the Presets icon (Figure 89, pg 6-8).
2. Tap the Anemometer Alarm icon (Figure 122, pg 6-46).
3. Tap the Plus (+) and/or Minus (-) icons to adjust the threshold value.

NOTE: The threshold can be set between 0.0 mph (0.0 m/s) and 31.3 mph (14.0 m/s).




4. When adjustments are complete, tap the Cancel icon to return to the Presets page.

NOTE: The AML retains the registered settings, even after being powered off. When the AML is powered on, operation will start with the previously registered settings.

Circulation—Hydraulic Warm/Cool

Switches hydraulic oil heating ON and OFF.

Table 19: AML—circulation

	White	Standby	Not operating
	Red	Heating	Hydraulic oil being heated
	Blue	Cooling	Cooling in progress. Reheating not possible

1. Tap the Presets icon (Figure 89, pg 6-8).
2. Tap the Circulation icon (Figure 122, pg 6-46) to start heating.

NOTE: Tap the Circulation icon (Figure 122, pg 6-46) again to cancel heating.

NOTE: Cooling activates automatically, depending on the state of the GTC-1600.

3. When complete, tap the Cancel icon to return to the Presets page.

ENGINE EXHAUST AFTERTREATMENT SYSTEM CLEANER

Over time, the components of the engine exhaust aftertreatment system collect soot and other residues that degrade system performance. The GTC-1600 includes a tool to clean the engine exhaust aftertreatment system.

WARNING

While cleaning the engine exhaust aftertreatment system, exhaust gas can heat to 1,500 °F (800 °C), and exhaust system components can reach 1,300 °F (700 °C). These temperatures can ignite, burn, or melt many materials. Remove combustible materials from the area near the exhaust pipe and muffler.

Do NOT touch the exhaust system and stay away from the exhaust gas. Danger of severe injury or death.

While the engine exhaust aftertreatment system cleaner is operating, the Engine Exhaust Aftertreatment System Alert ([Table 13, pg 6-16](#)) will flash on the MFD.

Automatic Cleaning of Engine Exhaust Aftertreatment System

The cleaner will activate automatically to maintain proper working condition of the engine exhaust aftertreatment system. In addition, this cleaning tool can be manually initiated as desired.

NOTE: During the cleaning operation, the Engine Exhaust Aftertreatment System Alert will flash and the Exhaust Temperature Warning will illuminate ([Table 13, pg 6-16](#)).

At times, an automatic cleaning of the engine exhaust aftertreatment system may not complete correctly. This is usually caused by frequent starts and stops or by continued low speed traveling.

If the automatic cleaning does not complete normally, the Engine Exhaust Aftertreatment System Alert will illuminate on the MFD ([Table 13, pg 6-16](#)). Initiate a manual engine exhaust aftertreatment system cleaning operation. See [Manual Cleaning of Engine Exhaust Aftertreatment System, pg 6-53](#) for more information.

NOTE: After manually cleaning the engine exhaust aftertreatment system, subsequent automatic cleaning will activate normally.

Manual Cleaning of Engine Exhaust Aftertreatment System

See [Table 13: Multifunction display—exhaust gas warnings, pg 6-16](#) for more information about the warnings shown on the MFD. Manual cleaning isn't possible if the system determines it isn't required.

WARNING

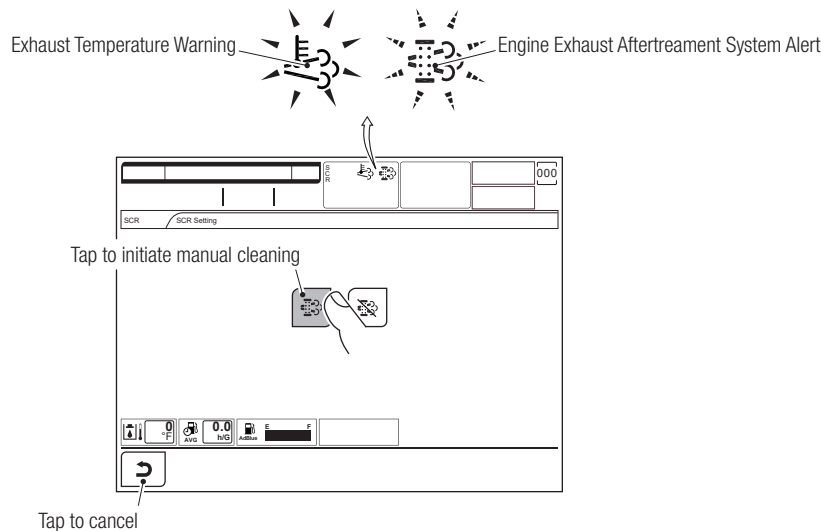
While cleaning the engine exhaust aftertreatment system, exhaust gas can heat to 1,500 °F (800 °C), and exhaust system components can reach 1,300 °F (700 °C). These temperatures can ignite, burn, or melt many materials. Remove combustible materials from the area near the exhaust pipe and muffler.

Do NOT touch the exhaust system and stay away from the exhaust gas. Danger of severe injury or death.

To initiate a manual cleaning operation:

- Set the controls to these positions:
 - ◇ Release pressure on travel pedals
 - ◇ Release joysticks to the neutral position
 - ◇ Set parking brake
- Tap the Diesel Emission Fluid (DEF) Level icon on the MFD ([Figure 90, pg 6-9](#)) to display the SCR Settings page.

Figure 126: Multifunction display—SCR Settings page



- On the SCR Settings page, tap the icon as shown ([Figure 126](#)) to initiate the manual cleaning operation.

NOTE: During the cleaning operation:

- The Engine Exhaust Aftertreatment System Alert will flash and the Exhaust Temperature Warning will illuminate ([Table 13, pg 6-16](#)).
- The engine speed will increase and the exhaust will sound louder.

NOTE: The cleaning operation lasts approximately 20–60 minutes. When the cleaning operation is complete:

- The Engine Exhaust Aftertreatment System Alert will stop flashing and the Exhaust Temperature Warning will no longer be illuminated.
- The engine will return to normal idle.

NOTE: Do NOT apply pressure to the travel pedals or joysticks during a cleaning operation. This will stop the cleaning. If the cleaning operation is stopped, repeat the manual cleaning process starting at Step 1 above. If the Engine Exhaust Aftertreatment System Cleaning Disabled Warning is illuminated ([Table 13, pg 6-16](#)), see [Disabling and Enabling Cleaning of Engine Exhaust Aftertreatment System, pg 6-54](#) to re-enable cleaning.

WARNING

The exhaust pipes and muffler remain hot for approximately five (5) minutes after the cleaning operation.

Disabling and Enabling Cleaning of Engine Exhaust Aftertreatment System

If the cleaning indicator illuminates while cleaning is disabled, move to a location where cleaning can be performed safely, enable cleaning, and perform a manual cleaning ([Manual Cleaning of Engine Exhaust Aftertreatment System, pg 6-53](#)).

NOTICE

If the engine exhaust aftertreatment system is not cleaned regularly, engine power can be restricted.

! WARNING

While cleaning the engine exhaust aftertreatment system, exhaust gas can heat to 1,500 °F (800 °C), and exhaust system components can reach 1,300 °F (700 °C). These temperatures can ignite, burn, or melt many materials. Remove combustible materials from the area near the exhaust pipe and muffler.

Do NOT touch the exhaust system and stay away from the exhaust gas. Danger of severe injury or death.

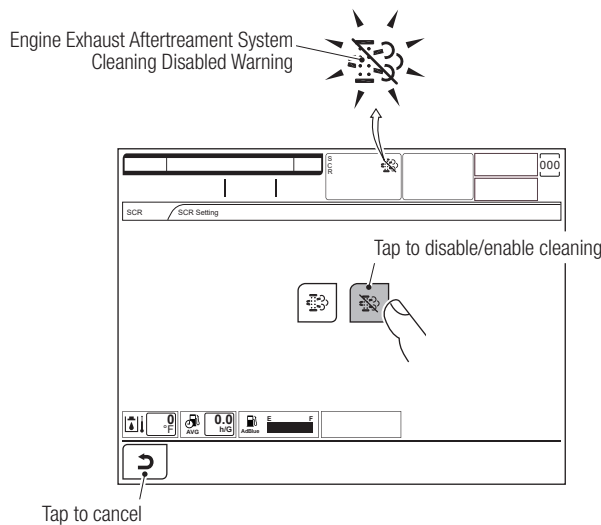
NOTICE

When the Engine Exhaust Aftertreatment System Cleaning Disabled Warning is illuminated on the MFD, the GTC-1600 will not automatically clean the engine exhaust aftertreatment system. When automatic cleaning is disabled, manual cleaning is not possible. Ensure the engine exhaust aftertreatment system cleaner is operating properly and cleaning automatically. See [Inspect Engine Exhaust Aftertreatment System, pg 7-16](#) for more information.

To disable/enable automatic cleaning:

- Set the controls to these positions:
 - ◇ Release pressure on travel pedals
 - ◇ Release joysticks to the neutral position
 - ◇ Set parking brake
- Tap the Diesel Emission Fluid (DEF) Level icon on the MFD ([Figure 90, pg 6-9](#)) to display the SCR Settings page.

Figure 127: Multifunction display—SCR Settings page



3. On the SCR Settings page, tap the icon as shown (Figure 127) to disable/enable the manual cleaning operation.

NOTE: When disabling/enabling cleaning:

- The Engine Exhaust Aftertreatment System Cleaning Disabled Warning will illuminate (Table 13, pg 6-16) when cleaning is disabled.
- The Engine Exhaust Aftertreatment System Cleaning Disabled Warning will not be illuminated (Table 13, pg 6-16) when cleaning is enabled.

FUEL CONSUMPTION RATE

Use the Fuel Consumption Rate feature to help better understand fuel usage during various work applications. This will help in using the GTC-1600 more efficiently and in a more environmentally-friendly way.

CAUTION

Do NOT check fuel information while traveling or operating other GTC-1600 functions. Inattentive operation can lead to a serious accident.

To check the fuel consumption rate:

1. Find the Fuel Consumption Rate icon (Figure 90, pg 6-9) on the MFD Home page. The fuel consumption data provided describes fuel used with the GTC-1600 while on standby.

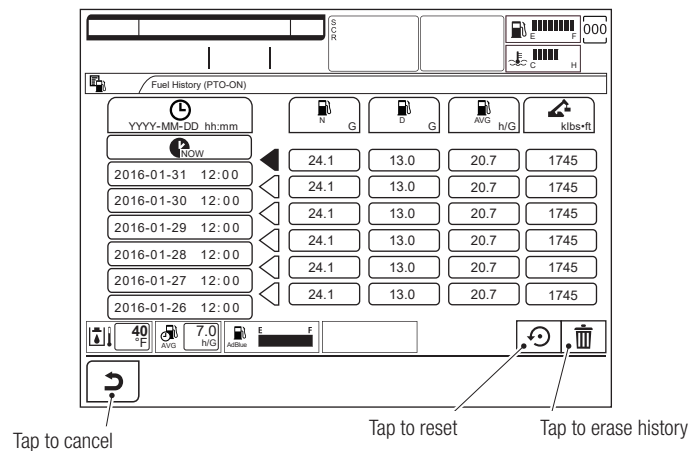
NOTE: The GTC-1600 is on standby when the joysticks and pedals are in neutral positions. Displayed values may differ from actual values, depending on operating conditions. Refer to the Fuel Level icon (Figure 91, pg 6-11 and Table 11, pg 6-12) to see the amount of remaining fuel.

Fuel Consumption History

To view the fuel consumption history:

1. Tap the Fuel Consumption Rate icon (**Figure 90, pg 6-9**) on the MFD to display the Fuel Consumption History page.

Figure 128: Multifunction display—fuel consumption history page



On the Fuel Consumption History page, access the data shown in **Table 20** for the time periods specified on the left side.

Table 20: Multifunction display—fuel consumption history page available data

	G(N)	Fuel consumption during standby (gallon)
	G(D)	Fuel consumption during crane operation (gallon)
	klbs•ft	Crane work rate (actual weight of lifted load (ton) × travel amount of lifted load (feet))

- Tap and hold the History Erase icon for three (3) seconds to erase fuel consumption history.
- Travel of a lifted load is its vertical, left/right, and front/rear travel distance.
- Multiply klbs•ft value ×1,000.
- When the displayed value exceeds the maximum of four (4) displayable digits (more than 9999 k), the history will be erased.
- Tap the Cancel icon (**Figure 128**) to close the Fuel Consumption History page and return to the MFD Home page.

Creating New Historical Records

1. Tap the Reset icon (**Figure 128**) to create a new record.

NOTE: With each tap of the Reset icon, the previous records will move down, and a maximum of five (5) previous records (including the current record) will be displayed.

TRAVEL CONTROLS

STANDARD MODE

In standard mode, the travel function is controlled by two floor-mounted foot pedals (**Figure 50**).

In the forward direction with the boom facing forward over the track idler end, the left foot pedal controls the left track and the right foot pedal controls the right track.

- Push the travel parking brake ON/OFF switch on the right joystick to turn off the parking brake.
- Push the pedal(s) toe-down to move the GTC-1600 forward.
- Push the pedal(s) heel down to move the GTC-1600 backward.
- The speed of travel is directly proportional to engine speed and how far down the pedal is pushed. The farther the pedal is pushed down, the faster the travel.
- Pushing down on the toe of the left pedal will turn the GTC-1600 to the right. Pushing down on the toe of the right pedal will turn the GTC-1600 to the left.
- Pushing down on the heel of the left pedal will turn the GTC-1600 to the left. Pushing down on the heel of the right pedal will turn the GTC-1600 to the right.
- Pushing the travel speed high/low switch on the right joystick will allow selection between high and low travel speeds.

TRAVEL MODE

In travel mode, the travel function is controlled by the right joystick (**Right Joystick, pg 3-7**).

- Moving the joystick forward moves the GTC-1600 forward and moving it backward moves the GTC-1600 backward.
- To turn the GTC-1600, counter-rotate by moving the joystick left or right.
- To skid steer, move the joystick to an intermediate position, such as one of the corners.

HIGH SPEED / LOW SPEED TRAVEL

Press the button on the right joystick (**Right Joystick, pg 3-7**) to activate high speed travel. The LED light in the center of the switch will illuminate when high speed travel is ON. Press the button again to activate low speed travel.

NOTICE

High speed travel is disabled when these conditions are present:

- Boom length exceeds 65 ft (19.8 m), or
- Hook load exceeds 2.5 T (2.3 t)

TRACKS EXTEND/RETRACT

WARNING

Always ensure the correct track condition is selected on the AML before lifting a load.

TRACKS EXTEND

1. Press and hold right Track Extend switch to extend the right track, and press and hold the left Track Extend switch to extend the left track.

NOTE: Slowly traveling may reduce friction and ease track extension.

2. Releasing the switch will stop the tracks from extending.

NOTE: The AML will sense when the tracks are fully extended.

TRACKS RETRACT

1. Press and hold the right Track Retract switch to retract the right track, and press and hold the left Track Retract switch to retract the left track.

NOTE: Slowly traveling may reduce friction and ease track retraction.

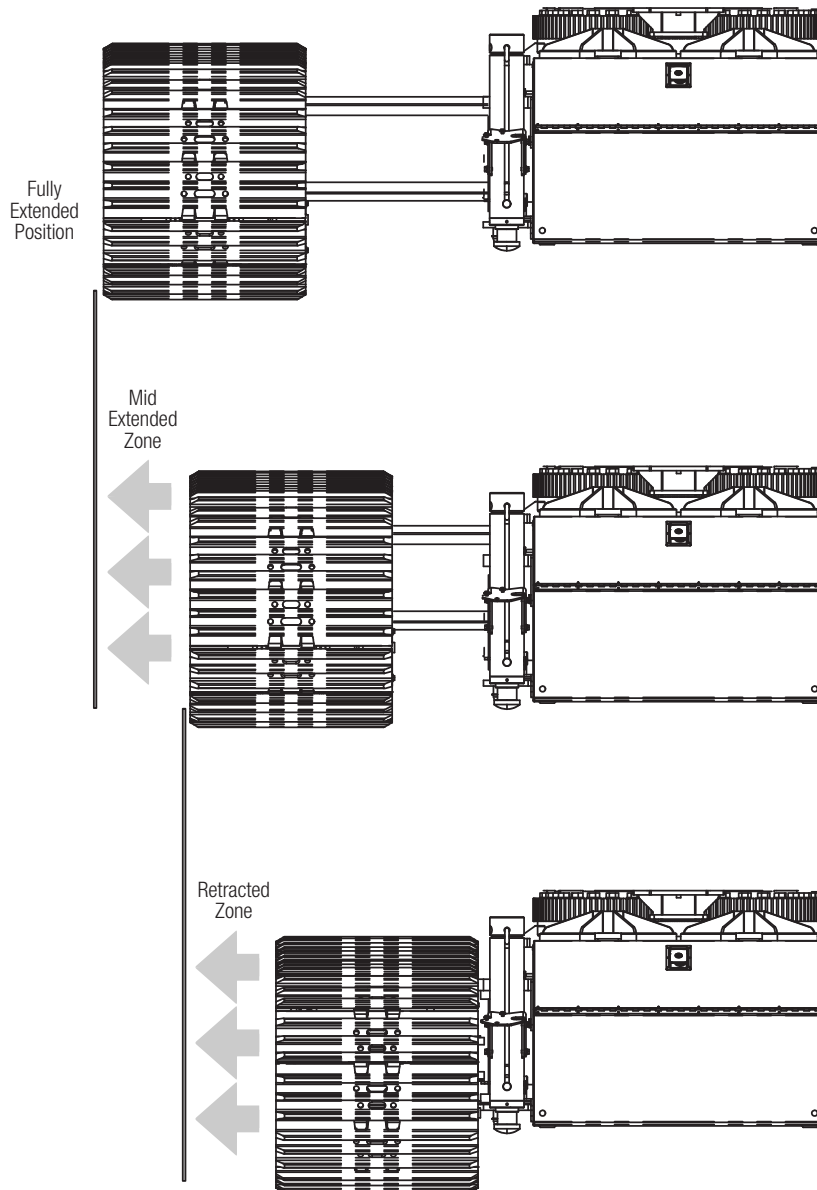
2. Releasing the switch will stop the tracks from retracting.

OPTI-WIDTH™ TRACK WIDTH ZONES

The GTC-1600 can extend and retract the tracks hydraulically. As necessary, each track side can be independently deployed in three basic ways:

- Fully Extended Position—widest possible track extension
- Mid Extended Zone—from the mid position to just short of the fully extended position
- Retracted Zone—from the fully retracted position to just short of the mid position

Figure 129: Track width zones



Often, the GTC-1600 will be used with the tracks in a symmetric configuration. When configured symmetrically, both track sides will be in the same position (e.g., Fully Extended Position, Mid Extended Zone, Retracted Zone).

For other applications, the GTC-1600 will be used with the tracks in an asymmetric configuration. When configured this way, the track sides will not be in the same position. The GTC-1600 can be deployed in six OPTI-WIDTH™ track configurations:

- Max/Min—Left track side in the Fully Extended Position and the right track side in the Retracted Zone
- Min/Max—Left track side in the Retracted Zone and the right track side in the Fully Extended Position
- Max/Mid—Left track side in the Fully Extended Position and the right track side in the Mid Extended Zone
- Mid/Max—Left track side in the Mid Extended Zone and the right track side in the Fully Extended Position
- Mid/Min—Left track side in the Mid Extended Zone and the right track side in the Retracted Zone
- Min/Mid—Left track side in the Retracted Zone and the right track side in the Mid Extended Zone

WINCH OPERATION

WINCH WARM-UP PROCEDURE

Warm up the winch at each start-up, especially at ambient temperatures below 39 °F (4 °C).

WARNING

Failure to properly warm up the winch, particularly in low temperatures, may result in temporary brake slippage. If brake slippage occurs, it will create a hazardous situation that may result in serious injury, death, and/or equipment damage.

1. Run the engine at low RPM until it has reached the proper operating temperature.
2. Operate the winch with no load at low speed, forward and reverse, several times to prime all lines with warm hydraulic oil and to circulate gear lubricant through the planetary gear sets.

MAIN WINCH

The right joystick (**Right Joystick, pg 3-7**) controls the main winch raise/lower function. The speed of the winch is directly proportional to engine speed and how far forward or backward the joystick is moved.

The button on the right joystick controls the main winch speed range. Pressing the button once switches from low to high speed. The LED light in the center of the switch will illuminate when high speed is on. The winch cannot be shifted to high speed with load in the air. Pressing the button again switches back to low speed.

STANDARD MODE

- To raise a load, pull the joystick back and the winch will reel in the wire rope.
- To lower a load, push the joystick forward and the winch will reel out the wire rope.

TRAVEL MODE

In travel mode, the main winch is controlled by the mini joystick on the right joystick.

- To raise a load, push the mini joystick down and the winch will reel in the wire rope.
- To lower a load, push the mini joystick up and the winch will reel out the wire rope.

AUX WINCH

The left joystick (**Left Joystick, pg 3-9**) controls the auxiliary winch raise/lower function. The speed of the auxiliary winch is directly proportional to engine speed and how far forward or backward the joystick is moved.

The button on the left joystick controls the auxiliary winch speed range. Pressing the button once switches from low to high speed. The LED light in the center of the switch will illuminate when high speed is on. Pressing the button again switches back to low speed. The winch cannot be shifted to high speed with load in the air.

- To raise a load, pull the joystick back and the winch will reel in the wire rope.
- To lower a load, push the joystick forward and the winch will reel out the wire rope.

ANTI-TWO-BLOCK (A2B) CONTROL

The winch functions employ an A2B operator aid to prevent a ‘two-block’ situation. When the hook block or overhaul ball trips the anti-two-block switch, the controller will disable the main and auxiliary winch functions in the raise direction. The anti-two-block override switch located in the cab (**Anti-Two-Block (A2B) Override Switch, pg 3-11**) can be used for rigging and setup.

WARNING

When the anti-two-block override switch is activated, the winch will not stop, even if there is a two-block condition.

OVERLOAD CONTROL

The winch functions employ an RCI/overload operator aid to prevent an overload condition. When the actual load is 100% or more of the rated load or an RCI system error occurs, the controller will disable the main and auxiliary winch function in the raise direction. The overload override switch (**Rated Capacity Indicator (RCI) Override Switch, pg 3-11**) located in the cab can be used to stow the boom in the event of an RCI system error.

WARNING

Activating the override switch cancels the stop function of the RCI and crane control system. Using this switch during normal operation is extremely dangerous. Never use this switch during normal operation. Use the switch only when an operation has been disabled due to failure of the RCI system.

LAST WRAP CONTROL

The winch functions employ a last wrap operator aid to maintain a minimum amount of rope on the drum. When the last wrap is reached on the main or auxiliary winch, the micro-controller will disable the respective winch function in the lower direction. The last wrap override switch (**Last Wrap Override Switch, pg 3-11**) on the right console may be used to allow removal of the rope from the winch.

WARNING

When the last wrap override switch is used, the winch will not stop, even if there is an under wind condition.

BOOM CONTROLS

BOOM HOIST

The right joystick controls the boom raise/lower function. The speed of the boom is directly proportional to engine speed and how far to the right or left the joystick is moved.

- To raise the boom, move the right joystick to the left.
- To lower the boom, move the right joystick to the right.

BOOM TELESCOPE

The boom uses one telescope cylinder for all telescope operations. Each boom section is extended, and then secured in place with pins (in sequence from the top) before the next boom section is extended.

The following boom telescope modes are selectable:

- **Standard Telescope Mode**
Use this mode for normal boom and jib lift operations. The specified boom sections are telescoped according to registered telescope pattern.
- **Maintenance Telescope Mode**
Use this mode for maintenance work (e.g., lubrication) or to extend specific boom section(s).

The following mode will activate automatically, when appropriate, regardless of whether in Standard Telescope Mode or Maintenance Telescope Mode:

- **Cold Weather Telescope Mode**
See [Boom Telescope Operating Temperature, pg 6-77](#) for more information.

BOOM TELESCOPE EXAMPLES

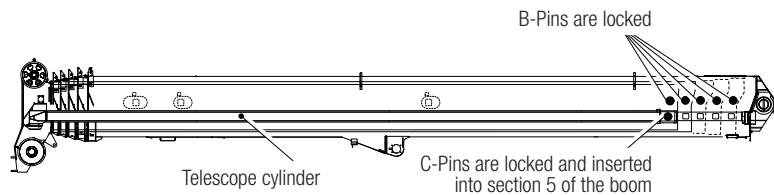
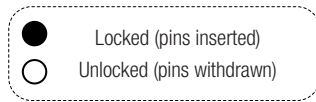
[Figure 130, pg 6-62](#) shows an example of the boom telescope and pinning process.

[Figure 131, pg 6-63](#) shows an example of the boom extension percentage (i.e., when boom section 1 is extended 45%, 90%, and 100%).

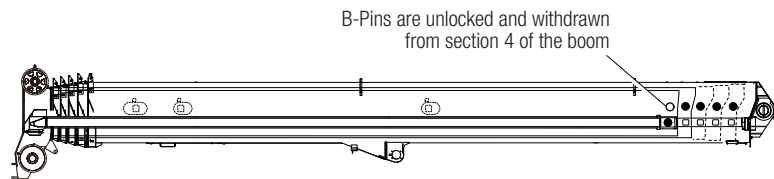
NOTE: The other boom sections are extended similarly.

Figure 130: GTC-1600 boom telescope and pinning example

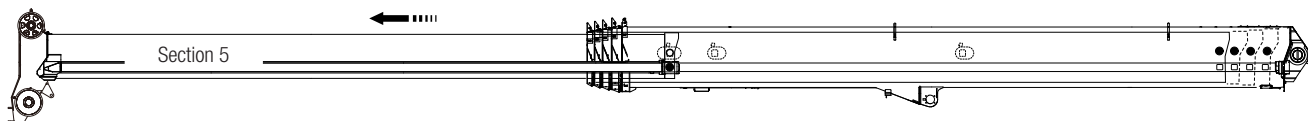
Boom fully retracted



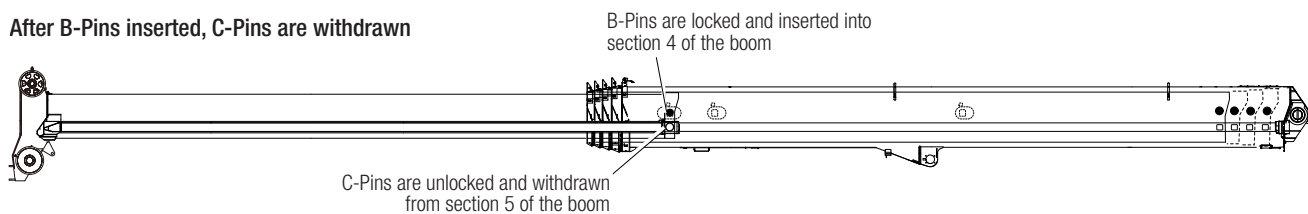
B-Pins are withdrawn



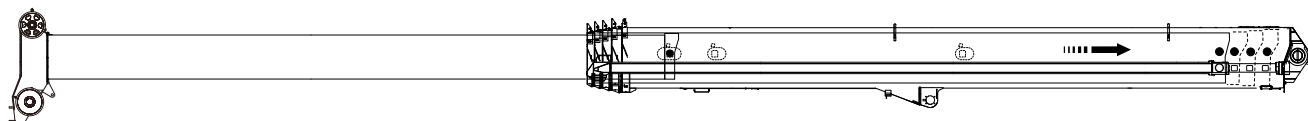
Section 5 of the boom is extended



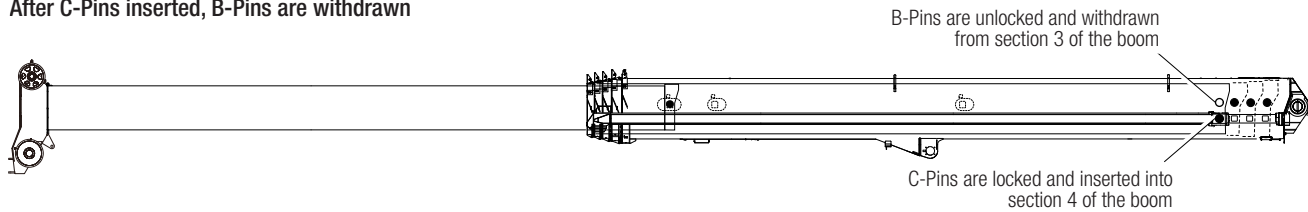
After B-Pins inserted, C-Pins are withdrawn



Telescope cylinder is retracted to section 4 of the boom



After C-Pins inserted, B-Pins are withdrawn



Section 4 of the boom is extended (repeat until boom is fully extended)

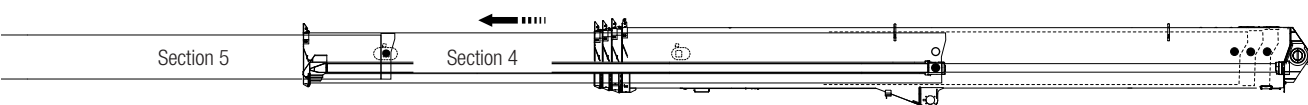
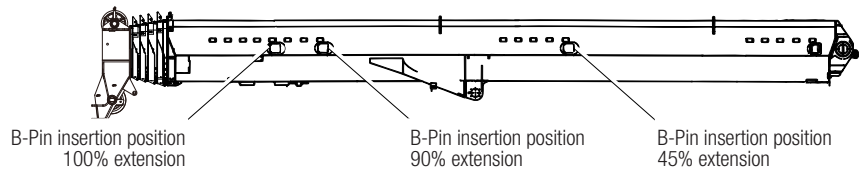
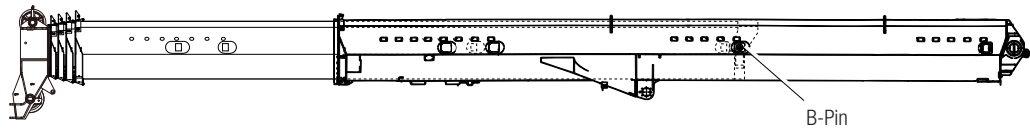


Figure 131: GTC-1600 boom extension percentage example (section 1)

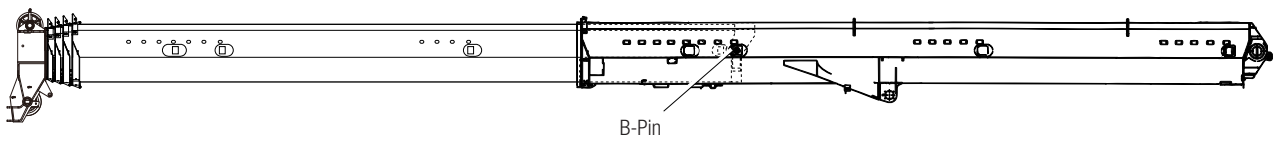
Section 1 (and boom), fully retracted



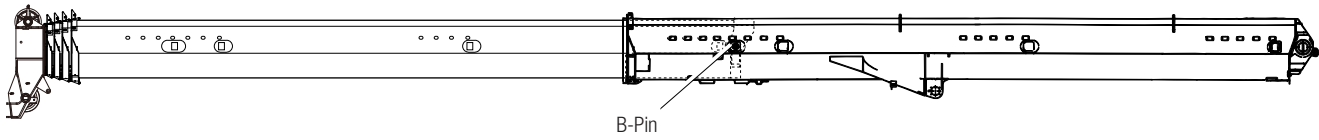
Section 1, 45% extended



Section 1, 90% extended



Section 1, 100% extended

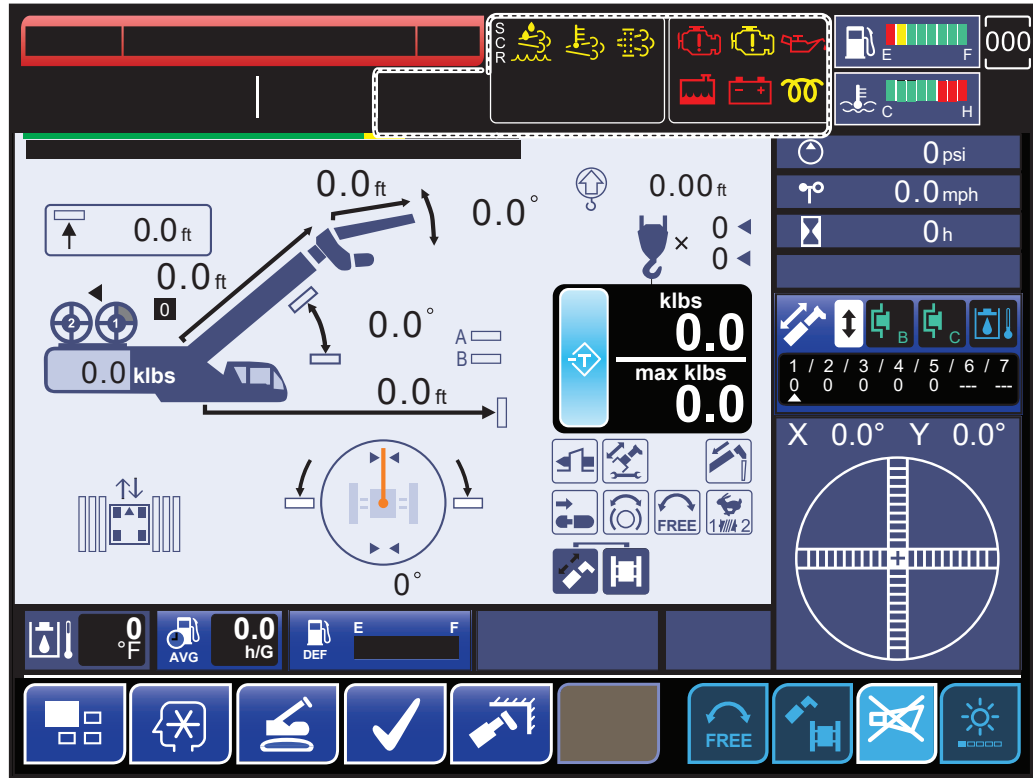


BOOM TELESCOPE ON MFD

Boom Telescope Settings

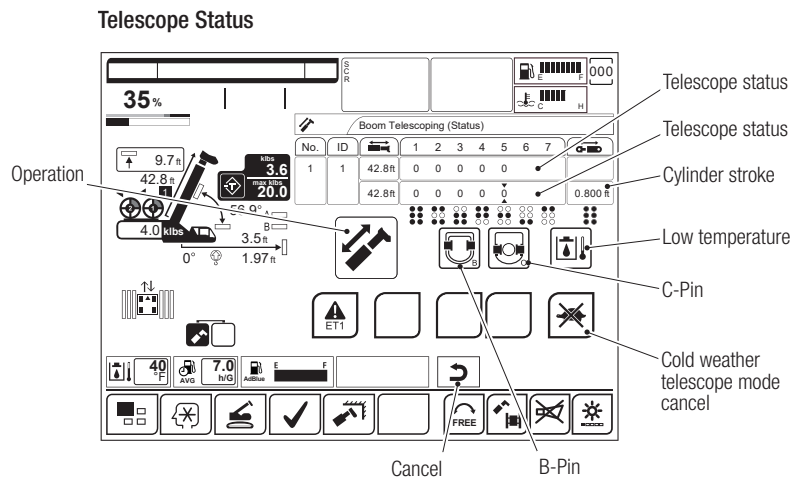
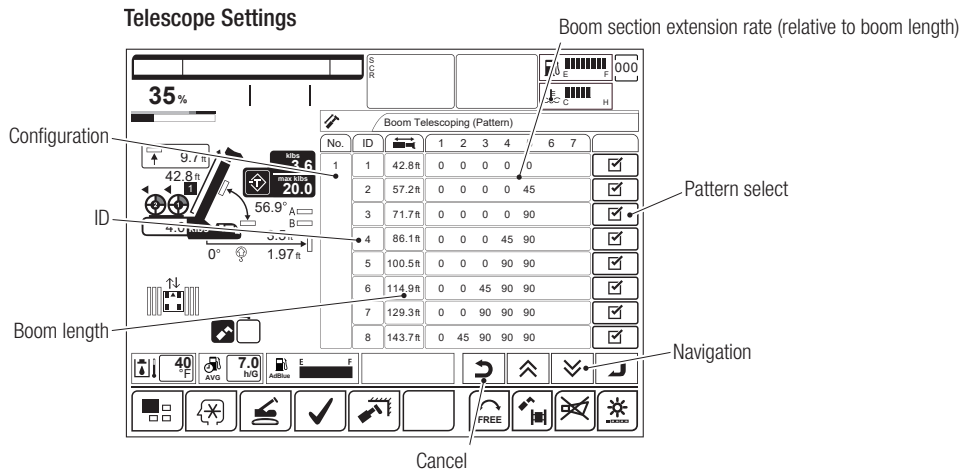
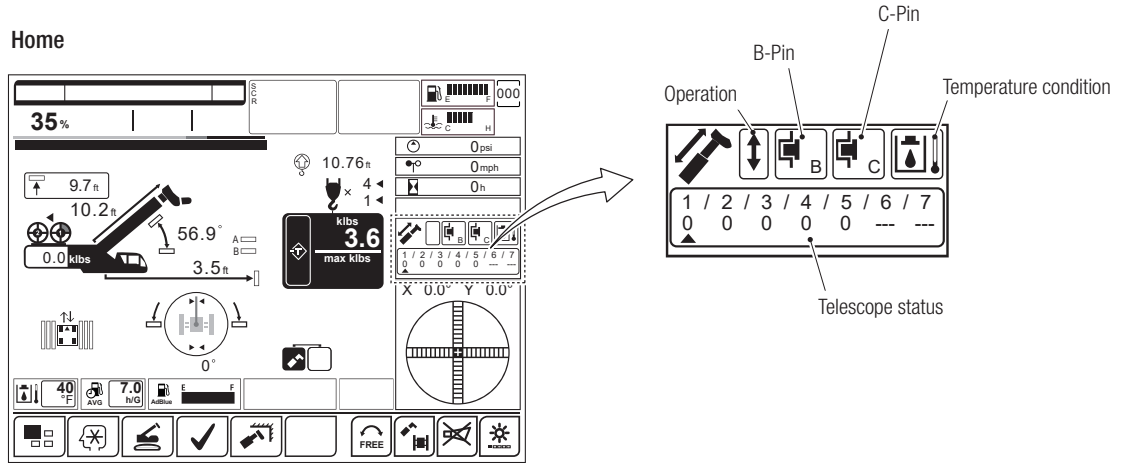
Sets the boom telescope pattern and lift status for boom telescope. See [Figure 132](#) for available boom telescope information:

Figure 132: Multifunction display—boom information and settings













See [Chapter 9](#) for emergency boom telescope procedures.

Figure 133: Multifunction display—boom telescope pages



Operation Status

Table 21: MFD telescope settings—operation







Icon on Home Page	Icon on Telescope Status Page	Status
		Extend or retract the boom.
		Extend the boom.
		Retract the boom.
		The boom is now in selected telescope status.
		Return the joysticks to the neutral position.

Telescope Status

Indicates the extension rate of each boom section and the boom section that has been connected (▲ or ▼ indicates the telescope section where the telescope cylinder is connected).







B-Pins Status

Table 22: MFD telescope settings—B-Pins status

Icon on Home Page	Icon on Telescope Status Page	Color	Status
		Green	Lock (B-Pins are inserted)
		Yellow	B-Pins are operating
		White	Unlock (B-Pins are removed)
		Red	An error has occurred

C-Pins Status







Table 23: MFD telescope settings—C-Pins status

Icon on Home Page	Icon on Telescope Status Page	Color	Status
		Green	Lock (C-Pins are inserted)
		Yellow	C-Pins are operating
		White	Unlock (C-Pins are removed)
		Red	An error has occurred

Temperature Condition

Appears for cold weather telescope mode or when raising engine speed is otherwise required.

Table 24: MFD telescope settings—temperature control

Icon on Home Page	Icon on Telescope Status Page	Color	Status
		Blue	Increasing engine speed.
		White	In the cold weather telescope mode.
		White	Cancelling the cold weather telescope mode.

STANDARD TELESCOPE MODE

Telescope without a Lifted Load

! WARNING

Abrupt joystick and pedal operations can cause the load to bounce or sway, resulting in an accident causing injury or death, or GTC-1600 damage. Operate the joysticks and pedals slowly.

Do NOT push or pull a load by telescope the boom. This could damage the GTC-1600, and/or cause an accident.

Do NOT abruptly raise/lower boom when telescoping. This could damage the telescope cylinder moving inside the boom, and/or cause an accident.

Do NOT operate the joysticks without knowing all of the joysticks functions. This could result in unexpected movement of the GTC-1600, and/or cause an accident.

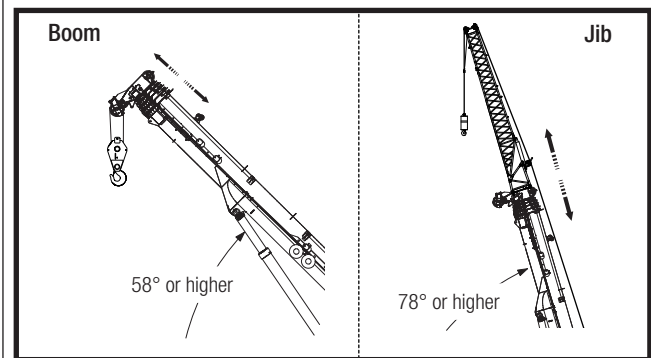
Before operation, confirm that the telescope joystick control selector switch is set to Boom Telescope, and the boom telescope icon is displayed on the MFD.

NOTICE

If the boom is telescoped while a load is lifted or the boom angle is small, automatic telescope will not function correctly.

Before telescoping the boom, set the GTC-1600 to:

- No Load
- **For boom lift:** boom angle 58° or higher.
- **For jib lift:** boom angle 78° or higher.



NOTE: To ensure smooth boom telescope operation, apply grease to the lower surfaces of the telescope sections. See [Lubricate Boom, pg 7-20](#) for more information.

Use the left joystick ([Left Joystick, pg 3-9](#)) and the MFD to telescope the boom. Adjust the boom telescope speed by changing how far the telescope slider is moved, and/or by using the pump summation switch ([Pump Summation Switch, pg 3-13](#)).

1. Set the AML for the actual lift conditions. See [Registration of Operating Status and Function Check of Automatic Moment Limiter, pg 6-27](#).
2. Tap the Boom Telescope Settings icon ([Figure 132, pg 6-64](#)) to access the boom telescope settings pages ([Figure 133, pg 6-65](#)).
3. On the Telescope Settings page, tap the desired Pattern Select icon, and tap the Set icon.

NOTE: The status shown by each 'No.' constitutes a block. Boom lift status is divided into eleven (11) blocks and jib lift status is divided into four (4) blocks. The IDs correspond with the boom number in the load chart. Within any block, the boom length can be changed only by a boom extend/retract operation.

4. Use the joystick to telescope the boom ([Left Joystick, pg 3-9](#)) until the boom reaches the registered telescope status.

NOTE: During the boom telescope operation, the Operation icon ([Figure 133, pg 6-65](#)) will display on the Telescope Settings page until the boom reaches the registered telescope status.

NOTICE

Continue telescoping the boom until the checkmark icon displays on the MFD (Table 21, pg 6-66). Do NOT stop telescoping, unless necessary for brief hook/boom adjustment. Until the checkmark icon displays, the B-Pins for the telescope boom section will remain unlocked. While operating in this status, the rated lifting capacity is limited to the maximum capacity without boom pin load chart.

While telescoping the boom, Temperature Condition (Temperature Condition, pg 6-67) may display and operation may stop.

If Temperature Condition (Temperature Condition, pg 6-67) displays on the MFD (Figure 133, pg 6-65):

- **When the engine speed is low:** Telescope boom again with increased engine speed—especially at B-Pin and C-Pin insertion/removal positions.
- **When boom angle is small:** Raise the boom angle first and telescope boom again.

NOTE: To change the boom telescope status before completing registration, return the joystick to the neutral position and tap the Cancel icon. The telescope status page will change to the telescope settings page.

Telescope with a Lifted Load

WARNING

Do NOT telescope the GTC-1600 boom before contacting a TADANO Dealer or TADANO Customer Support.

Contact a TADANO Dealer or TADANO Customer Support for specific information about how and when to telescope the boom with a lifted load.

Low Temperature Telescope

See **Boom Telescope Operating Temperature, pg 6-77** for information about using the GTC-1600 boom in low temperatures.

WARNING

Do **NOT** operate the GTC-1600 in maintenance telescope mode. This could damage the GTC-1600 or cause a serious accident. Operate in maintenance telescope mode only for maintenance purposes.

NOTICE

Fully retract the boom before switching between the standard telescope and maintenance telescope modes.

See [Lubricate Boom, pg 7-20](#) for information regarding the necessary schedule and process for standard boom telescope maintenance.

NOTE: Crane operation may stop if there is no stability capacity—depending on the hook block weight. If the operation stops, remove the hook block or lower the hook block to the ground.

1. Set the AML for the actual lift conditions. See [Registration of Operating Status and Function Check of Automatic Moment Limiter, pg 6-27](#).
2. Tap the Presets icon ([Figure 101, pg 6-26](#)).
3. Tap the Page Navigation icon to view the next page ([Figure 122, pg 6-46](#)).
4. Tap the Maintenance Telescope Mode icon ([Figure 122, pg 6-46](#)).
5. Tap the desired Pattern Select icon, and tap the Set icon.
6. Use the joystick to telescope the boom ([Left Joystick, pg 3-9](#)) until the boom reaches the registered telescope status.

NOTE: During the boom telescope operation, Operation ([Figure 133, pg 6-65](#)) will display until the boom reaches the registered telescope status.

BACKWARD STABILITY CONTROL

The boom functions employ a backward stability operator aid. In the event of a backward stability condition, the controller will disable the boom function in the up direction and the boom telescope function in the retract direction. The overload override switch located in the cab can be used to stow the boom in the event of an RCI system error.

WARNING

Activating the override switch cancels the stop function of the RCI and crane control system. Using this switch during normal operation is extremely dangerous. Never use this switch during normal operation. Use the switch only when an operation has been disabled due to failure of the RCI system.

SWING CONTROLS

The swing function is controlled by the left joystick ([Left Joystick, pg 3-9](#)). The swing brake ON/OFF switch is located on the left joystick. When the swing brake is off, the LED in the center of the switch will illuminate. The swing speed is directly proportional to engine speed and how far to the left or right the joystick is moved.

- To swing to the left, move the left joystick to the left.
- To swing to the right, move the left joystick to the right.

NOTICE

Do NOT use the park brake to stop swing motion of the upper structure.

Use the swing service brake, located on the floor of the cab ([Figure 50](#)), to slow rotation or hold the superstructure in place when the swing brake is not activated.

NOTICE

Do NOT rest your foot on the swing brake pedal during swing operation—any pressure will cause excessive wear of the swing brake mechanism.

FREE AND CONTROLLED SWING MODES

Before operating the GTC-1600—on the MFD—select the appropriate swing mode for the desired crane application and/or operator preference:

- Free Swing
- Controlled Swing

NOTE: See [Swing Modes, pg 6-19](#) for more information.

WARNING

This feature is not intended as a brake and some movement is possible.

SWING PARK BRAKE

The upper rotating frame can be held at any position with the swing park brake. To release the swing park brake, press the button on top of the left joystick. When the indicator is on, the swing brake is released and the motion alarm is on. To engage the swing park brake, press the button again. When the indicator is off, the swing brake is engaged and the motion alarm is off. The swing brake will not release unless the operator is in the seat and controls enable/disable switch is set to enable. If the swing brake is released and the operator rises from the seat or the controls enable/disable switch is set to disable, the swing park brake will engage. Apply the swing service brake with the foot pedal before releasing the swing park brake.

CAUTION

Do NOT engage swing park brake while the swing is in motion.

WORKING STATUS LIGHTS

The GTC-1600 is equipped with an external working status light with three lights that indicate the current working status.

Figure 134: Working status lights



1. With a load factor of less than 90%, the green light will be on, indicating normal operation status.
2. With the load factor 90% to less than 100%, the working status light changes from green to yellow, notifying the operator and those around that the actual load is close to the rated total load.
3. With the load factor of 100% or higher, the working status light changes from yellow to red and an alarm in the cab will sound a series of three beeps once or twice. The following GTC-1600 functions will stop immediately:
 - ◇ Boom out
 - ◇ Boom hoist down
 - ◇ Winch raise

NOTE: In this situation, immediately reduce the load moment by reducing the load radius and/or lowering the load.

NOTE: When the GTC-1600 is overloaded (working status light is red), operator inputs and crane conditions are logged.

NOTE: The working status light illuminates red when the RCI Override Switch is ON (**Rated Capacity Indicator (RCI) Override Switch**, pg 3-11).

EXTERIOR CAMERAS

Figure 135: Exterior camera locations

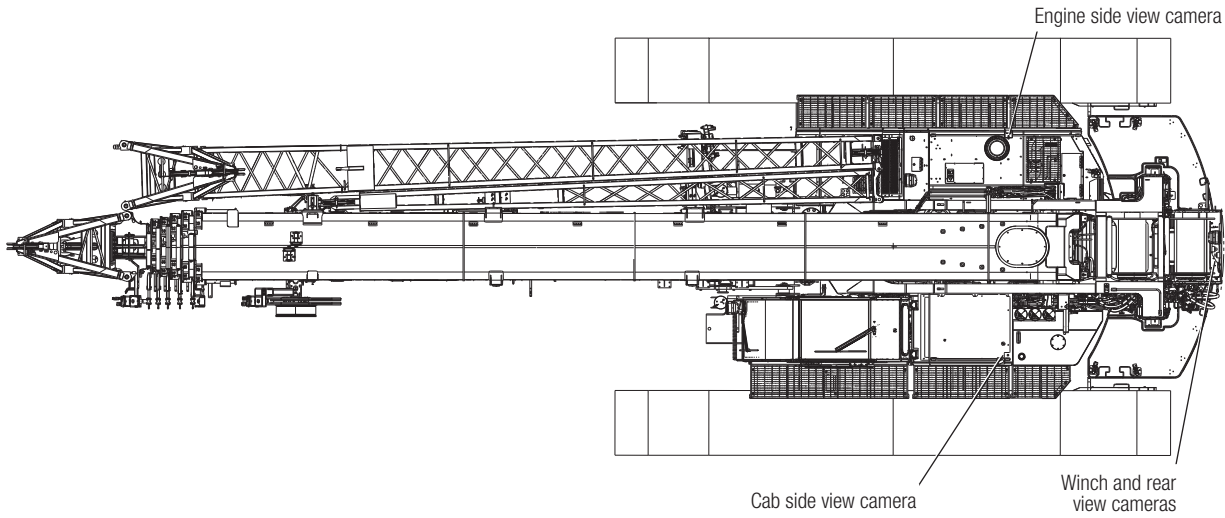


Figure 136: Video camera display

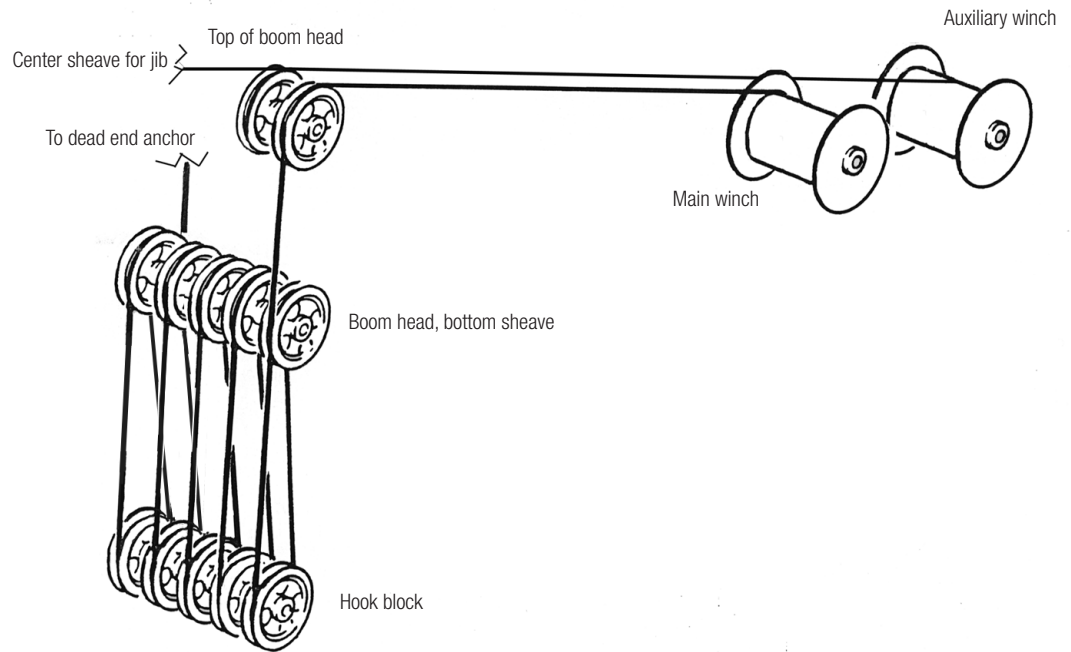


Description	Function
Menu	Access adjustment of brightness, contrast, color, and other options.
V1/V2	Selects winch, rear, engine side, cab side, or quad (all) view
ON/OFF	When the GTC-1600 is turned on, the display will turn on automatically, if it wasn't turned off during the last use. It will automatically turn off when the ignition switch is turned to OFF or it can be turned off.

REEVING

The diagram below illustrates the correct reeving procedure.

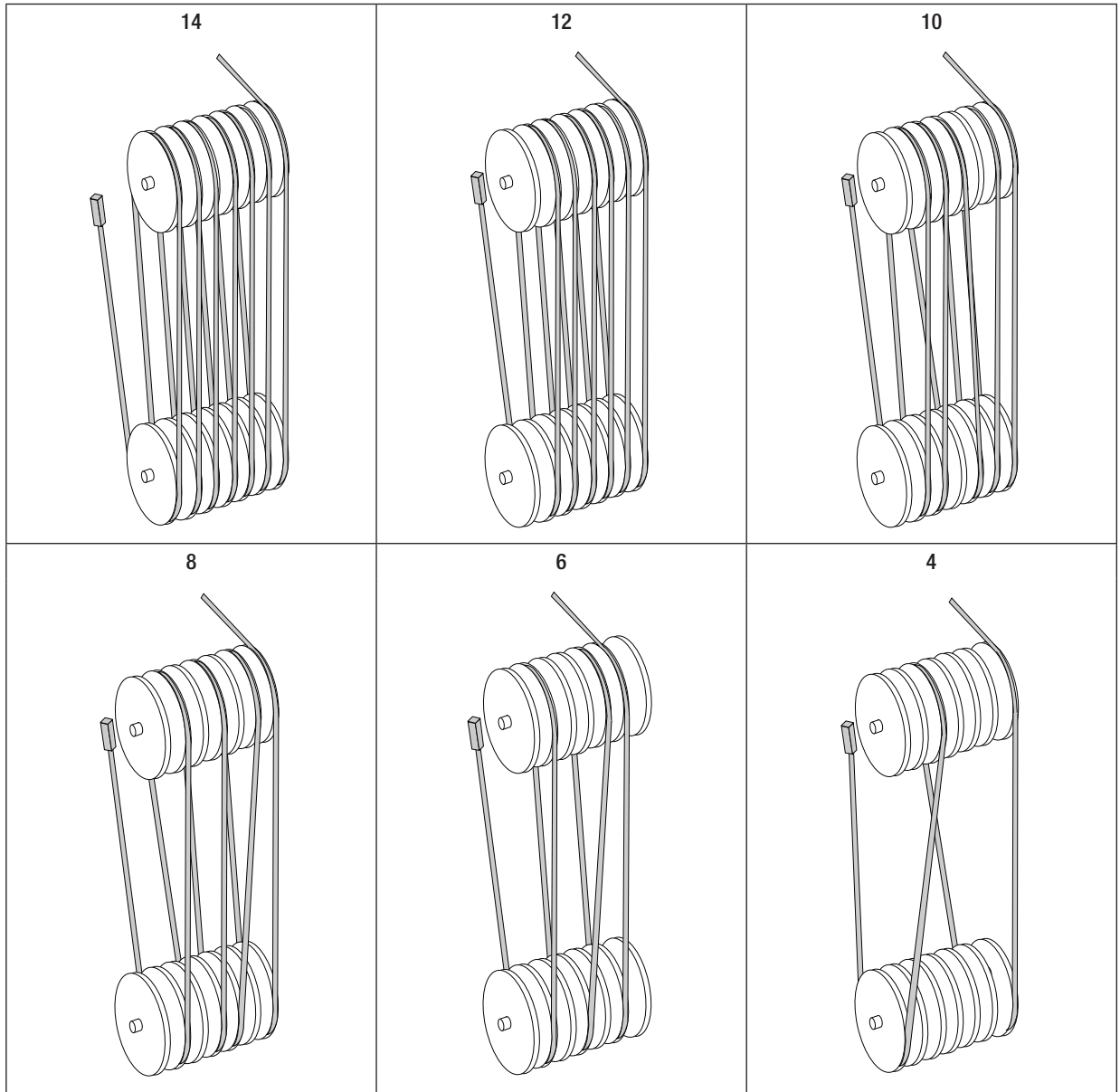
Figure 137: Sample reeving diagram



PARTS-OF-LINE

Select the number of parts of line (**Figure 138**) that ensures the most efficient operation. Consider boom length, radius, load weight, hoisting speed, and other factors such as winch drum wire rope capacity. See the GTC-1600 Load Charts manual for more information.

Figure 138: Reeving—parts of line



⚠ DANGER

Do NOT exceed the manufacturer's specified maximum reeving of 14 parts-of-line. 14-part reeving is required for full capacity lifting.

COLD WEATHER OPERATION

FUEL SELECTION

Diesel engines can operate effectively in cold weather. Engine operation in cold weather, however, is dependent on the type of fuel used and how well the fuel moves through the fuel-related components.

NOTICE

Failure to use ULSD may result in severe engine damage.

There are two major differences between No. 1 and No. 2 diesel. No. 1 diesel has a lower cloud point and a lower pour point. The cloud point is the temperature at which a cloud or haze of wax crystals begins to form in the fuel and cause fuel filters to plug. The pour point is the temperature at which diesel fuel begins to thicken and becomes more resistant to flow through fuel pumps and lines. Be aware of these fuel values when purchasing your diesel fuel and anticipate the average outside (ambient) temperature for the area where your GTC-1600 will be operating. Engines fueled in one climate may not operate satisfactorily if moved to another because of problems that result from cold weather.

HYDRAULIC FLUID OPERATING TEMPERATURE

⚠ CAUTION

The GTC-1600 is equipped with hydraulic oil warming functionality. The temperature of oil in the hydraulic reservoir is not reflected in the temperature shown on the MFD (Multifunction Display, pg 6-8) Main page, but is available on the Measure page. Use caution when operating before sufficient warm-up—cold oil can cause GTC-1600 hydraulic functions to operate sluggishly.

For best performance and component longevity, use the hydraulic fluid warm-up circuit to increase the fluid temperature before operating the GTC-1600 functions. As a standard, cranes use Shell Tellus S2VX-32. With this fluid, the temperature should be at least 40 °F (5 °C) before operation and ideally 95 °F (35 °C). See [Table 5, pg 2-10](#) for more information.

When idling the engine for warm-up in cold weather, observe the following recommendations:

- In temperatures below 32 °F (0 °C), warm-up requires approximately 30 minutes.
- In temperatures below 0 °F (-18 °C), warm-up requires up to 60 minutes.

After the warm-up period, carefully operate the boom hoist cylinder to circulate warm oil and confirm proper hydraulic operation.

DEF OPERATING TEMPERATURE

NOTICE

DEF will freeze at ≤ 12.2 °F (-11 °C). Do NOT operate the GTC-1600 with frozen DEF, except as described in [If DEF Is Frozen](#).

See [Frozen DEF, pg 6-15](#) for information about using the MFD to see if DEF is frozen.

IF DEF IS FROZEN

1. Start the engine.
2. Perform warm-up, crane travel, or ordinary crane operations. See [Starting the Engine, pg 6-5](#) and [Cold Weather Operation, pg 6-76](#) for more information.
3. DEF will thaw as the engine warms up.

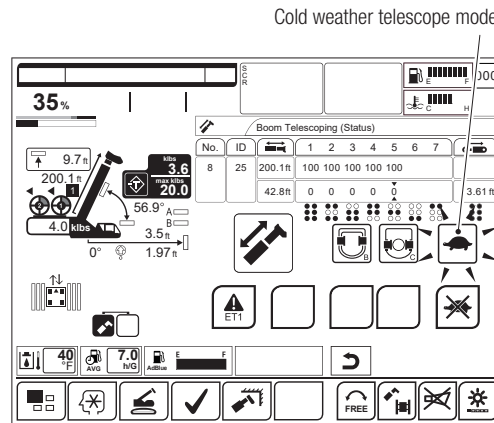
NOTE: The SCR Warning ([Table 12, pg 6-15](#)) will not be illuminated when the DEF is sufficiently thawed.

BOOM TELESCOPE OPERATING TEMPERATURE

When the hydraulic oil temperature lowers, its viscosity increases and the operating speed of the boom pins decrease. The GTC-1600 automatically monitors the operating speed of the boom pins, and can adjust the operating speed of the telescope cylinder when the pins are inserted or removed in cold temperatures. When the monitor senses the ambient temperature is below the predetermined threshold, the GTC-1600 goes into cold weather telescope mode.

In cold weather telescope mode, the telescope cylinder speed will be reduced and Cold Weather Telescope Mode will appear on the MFD (**Figure 139**).

Figure 139: Multifunction display—cold weather telescope mode



The GTC-1600 will enter the cold weather telescope mode when:

- The ambient temperature is below 14 °F (-10 °C)
- The GTC-1600 is left for extended periods with the boom extended

NOTE: If left with the boom extended for an extended period, without telescope operation, the GTC-1600 can initiate the cold weather telescope mode—regardless of the ambient temperature.

CANCEL COLD WEATHER TELESCOPE MODE

To cancel the cold weather telescope mode, when the ambient temperature is above 32 °F (0 °C):

1. Tap the Boom Telescope Settings icon (**Figure 132, pg 6-64**), to display the Telescope Settings page (**Figure 133, pg 6-65**).
2. Tap the Set icon.
3. Tap the Cold Weather Telescope Mode Cancel icon (**Temperature Condition, pg 6-67**).

NOTE: The Cold Weather Telescope Mode Cancel icon will illuminate, and the icon will change. Warning code W0102 and a message will display on the MFD.

4. Telescope the boom until the icon is no longer illuminated.

NOTE: The icon will not be illuminated when the hydraulic oil temperature is raised sufficiently, with boom telescope operation.

NOTE: For the self-check purpose, the B-Pins can be inserted/removed at the beginning of the telescope operation. This is not a fault. When the starter switch is turned to OFF, the cold weather telescope mode is canceled.

CHAPTER 7: MAINTENANCE AND INSPECTION

Contact your authorized TADANO Dealer or TADANO Customer Support at (833) TADANO1 (823-2661) for more information.

MAINTENANCE SAFETY

WARNING

Exhaust Hazard

NEVER operate the GTC-1600 in an enclosed area without proper ventilation.

NEVER block windows, vents, or other means of ventilation if the GTC-1600 is operating in an enclosed area. All internal combustion engines create carbon monoxide gas during operation. Accumulation of this gas within an enclosure could cause illness or death.

ALWAYS ensure all connections are tightened to specifications after any work on the exhaust system.

WARNING

Fire and Explosion Hazard

Diesel fuel is flammable and explosive under certain conditions.

ALWAYS keep sparks, open flame, or any other form of ignition away from diesel fuel and the battery while the engine is running or battery is charging..

Use the key switch to start the engine. Use care if jump-starting the engine. Sparks caused by shorting the battery to the starter terminals may cause a fire or explosion.

ALWAYS keep the area around the battery well-ventilated. While the engine is running or the battery is charging, hydrogen gas is produced and can be easily ignited.

NEVER remove the fuel cap while the engine is running.

Before starting the GTC-1600, ensure all bystanders are clear of the area.

NEVER leave the key in the key switch when servicing the GTC-1600. Someone may accidentally start the GTC-1600 during service.

WARNING

Entanglement / Sever Hazard

Keep hands and other body parts away from moving / rotating parts such as the cooling fan or the winches.

ALWAYS wear tight-fitting clothing and keep hair short or tie it back while the GTC-1600 is running.

ALWAYS remove all jewelry before operating or servicing the GTC-1600.

NEVER operate the GTC-1600 without the guards and shields in place.

Before starting the GTC-1600, ensure all bystanders are clear of the area.

WARNING

Sudden Movement Hazard

Before starting the engine, ensure all bystanders are clear of the area.

ALWAYS allow the engine to warm up for at least 5 minutes and allow the idle speed of the engine to return to normal before operation.

WARNING

Burn Hazard

ALWAYS keep hands and other body parts away from hot engine surfaces—such as the muffler, exhaust pipe, turbocharger (if equipped), and engine block—during operation and shortly after engine shutdown. These surfaces are extremely hot while the engine is operating and could cause serious burns.

WARNING

Exposure Hazard

ALWAYS wear personal protective equipment such as gloves, work shoes, and eye/hearing protection as necessary. **NEVER** operate the GTC-1600 while wearing a headset to listen to music or radio because it will be difficult to hear the warning signals. **ALWAYS** wear safety glasses while servicing the GTC-1600 to help prevent possible eye injury.

WARNING

Flying Object Hazard

ALWAYS wear eye protection when servicing the GTC-1600, and when using compressed air or high-pressure water. Dust, flying debris, compressed air, pressurized water, and steam can cause eye injury.

WARNING

Coolant Hazard

NEVER remove the radiator cap for the cooling system when the engine is hot. The system is under pressure, and steam and hot engine coolant can spray out and cause injury. Wear eye protection and rubber gloves when handling long life coolant (LLC). If contact with the eyes or skin should occur, flush eyes and wash immediately with clean water.

WARNING

High Pressure Hazard

NEVER check for high pressure diesel fuel or hydraulic leaks with hand contact.

WARNING

Crush Hazard

NEVER stand under a hoisted component. **ALWAYS** use the proper lifting device when hoisting components.

REPLACEMENT PARTS

A detailed list of replacement parts, diagrams, and schematics can be found in the GTC-1600 Parts Manual.

NOTICE

Use only official TADANO replacement parts. Other parts could cause equipment damage and void the warranty.

WARNING

If periodic part replacement is neglected, GTC-1600 failure or a serious accident can occur. Replace parts in accordance with the specified inspection criteria and at the specified intervals.

Overload testing may only be required after major overhaul or following the modification or repair of load bearing parts (e.g., repair of welded structural parts); in this case, the selection of configuration and test loads will ensure the proof of competence of the repaired part only. Contact TADANO Customer Support for more information.

Some components of the GTC-1600 deteriorate over time. Even without visible wear, these parts must be replaced periodically for safety. The following tables give recommended/required replacement intervals for the two types of such parts:

- **Important periodic replacement parts:** Parts for which periodic replacement is required to ensure the safety of GTC-1600 operations.
- **Ordinary periodic replacement parts:** Parts for which periodic replacement is recommended.

The replacement intervals are either based on the hour meter reading or calendar months/years. Replace the parts according to whichever interval comes first. If local laws and regulations specify shorter replacement intervals, observe them. Contact a TADANO Dealer or TADANO Customer Support to have these parts replaced at the periodic intervals.

INSPECTION

If the GTC-1600 is used heavily (severe condition), inspect the items below for damage, wear, breakage, deformation, and abnormal noise when performing monthly periodic self-inspection at intervals within 1 month.

- Boom structure—head and rear ends of each boom section
- Jib structure—rear end of top jib and head of base jib sections
- Swing frame
- Carbody jacks
- Chassis frame
- Track frames—rollers, chain, and track drive motors

If any abnormality is found as a result of the inspection, contact your nearest TADANO distributor or dealer for repair.

LUBRICATION AND MAINTENANCE

Proper and timely lubrication and maintenance are essential for satisfactory performance of the GTC-1600. Only qualified personnel should perform maintenance.

After the first 100 hours of operation, tighten all nuts, bolts, and hydraulic/electrical connectors on the GTC-1600. Periodically re-inspect them to ensure everything remains tight.

At least once a month, thoroughly inspect the GTC-1600. Find and correct minor problems before they become serious to prevent considerable downtime.

Protect against dirt intrusion. Before removing inspection covers, panels, filler caps, etc., from any part of the GTC-1600, clean all dirt from around the opening. Keep all fuel and lubricants clean—use only new, clean fuel and lubricants. Keep all filler caps in place except when adding fluid, and then replace them promptly.

MAINTENANCE INTERVALS

NOTICE

When determining when to perform maintenance, consider the number of GTC-1600 operating hours and a set time period, defined in this manual, for each maintenance function—ALWAYS use the value that is reached first.

The number of operating hours is indicated in the hour meter on the system monitor. Maintenance intervals depend on GTC-1600 operating conditions.

NOTICE

Maintenance intervals apply for a GTC-1600 subject to normal operating and environmental conditions. If used in extreme operating and environmental conditions, maintenance intervals must be adapted to the prevailing conditions.

When major maintenance work is performed, also complete upcoming required maintenance that coincides with the date.

NOTE: Properly tension fasteners at periodic inspection.

Table 25: Maintenance intervals

Assemblies / Maintenance Work and Inspections	Pg #	Initial maint. after ...	Regular maintenance every ...					Minimum Intervals	Notes		
			Daily, before start-up	50 / Weekly	100	200	500			1000	2000
			... operating hours								
Engine	Inspect for Engine Oil Leaks	7-11	•								
	Inspect Engine Oil Level	7-11	•								
	Clean Engine Crankcase Breather	7-23				•				Replace engine crankcase breather after 2000 hours	
	Change Engine Oil and Filter	7-25					•		6 months		
	Inspect Starter	7-29						•			
	Fuel Hoses								2 years		
	Long Life Coolant								2 years / 2400 hours		
	Aftertreatment DEF dosing unit filter								3 years / 4,500 hours		
	Coolant Hoses								4 years		
Fuel Tank	Inspect Fuel Level	7-15	•								
	Drain Fuel/Water Separator	7-15	•								
	Drain Water and Sediment from Fuel	7-23				•					
	Replace Fuel Filter	7-23				•					
Engine Cooling System	Inspect Coolant System for Leaks	7-11	•								
	Inspect Engine Coolant Level	7-12	•								
	Inspect Engine Cooling Fan for Proper Operation	7-28						•			
	Change Engine Coolant	7-32							•	2 years	
Air Cleaner	Inspect Air Filter Clog Indicator	7-14	•								
	Clean Air Cleaner	7-16	•								
	Clean Charge Air and Water Radiator	7-25					•				
Hydraulic System	Piping, Hose, Mounting Status, Abnormal Vibration, Heat Generation, Abnormal Noise									1 month	
	Hydraulic Oil Tank, Mounting, Crack, Contamination, Oil Leakage									1 month	
	Hydraulic Oil Tank, Clogging and Contamination of Air Breather									1 month	
	Filter, Hydraulic Drain Filters, Case, Clogging, Oil Leakage, Damage									1 month	
	Hydraulic Pump, Operation, Oil Leakage, Abnormal Noise			•							
	Hydraulic Pump, Mounting, Looseness, Crack, Damage									1 month	
	Control Valve, Mounting, Operation, Looseness									1 month	
	Oil Cooler, Mounting, Motor Operation, Looseness, Oil Leakage, Damage, Abnormal Noise									1 month	
	Inspect Hydraulic Oil Level	7-13		•							
	Inspect Return Filter Clog Indicator and Pilot Filter Clog Indicator	7-14		•							

Table 25: Maintenance intervals

Assemblies / Maintenance Work and Inspections		Pg #	Initial maint. after ...	Regular maintenance every ...						Minimum Intervals	Notes	
				Daily, before start-up	50 / Weekly	100	200	500	1000			2000
				... operating hours								
Hydraulic System	Inspect Hydraulic System for Leaks	7-15		•							Replace hydraulic hoses every 4 years	
	Clean Hydraulic Oil Cooler Fins	7-24					•					
	Inspect Hydraulic Fan for Proper Operation	7-27						•				
	Change Hydraulic Filter Elements	7-27	100 hr						•		1 year	
	Change Hydraulic Oil	7-31								•	2 years	
Electrical Equipment	Inspect Electrical Equipment	7-16		•								
	Inspect Batteries and Cables	7-22				•						
	Control Release Switches										4 years / 4,800 hours	
	Operation Detect Switches											
	Position Sensors										8 years / 9,600 hours	
	Load Sensors											
Swing Mechanism	Swing Frame, Crack, Deformation, Damage										1 month	
	Swing Frame, Damage, Wear, Breakage, Deformation, Abnormal Noise of Swing Frame Structure										1 month	
	Swing Frame, Welded Structural Parts										1 month	
	Swing Frame, Important Structure Mounting Parts (Pin, Bolt, etc.)										1 month	
	Swing Speed Reducer, Swing Motor, Operation			•								
	Swing Speed Reducer, Swing Motor, Mounting, Looseness, Crack, Soiling, Damage										1 month	
	Swing Brake, Braking Performance			•								
	Swing Lock System, Mounting, Operation, Crack, Damage										1 month	
	Hydraulic Swivel, Mounting, Looseness, Leakage (Oil, Water, Air), Abnormal Noise, Greasing										1 month	
	Piping, Hose, Mounting, Looseness, Crack, Oil Leakage, Damage, Deterioration										1 month	
	Inspect Swing System	7-16			•						1 year	
	Lubricate Slew Ring Gear and Pinion	7-20				•						
Inspect Swing Drive Reducer Oil Level	7-22					•				1 month		

Table 25: Maintenance intervals

Assemblies / Maintenance Work and Inspections		Pg #	Initial maint. after ...	Regular maintenance every ...						Minimum Intervals	Notes	
				Daily, before start-up	50 / Weekly	100	200	500	1000			2000
				... operating hours								
Swing Mechanism	Inspect Slew Ring	7-26						•				
	Inspect Slew Ring Fasteners	7-26	100 hr					•				
	Inspect Slew Device for Wear	7-26						•				
	Change Swing Drive Reducer Oil	7-28	50 hr						•		1 year	
	Inspect Swing Mechanism	7-33							•			
	Bleed Swing Drive Brake	7-33							•			
	Inspect Swing Drive Brake	7-33							•			
Winches	Winch Drive Unit, Operation, Crack, Damage, Abnormal Noise			•								
	Winch Drive Unit, Soiling, Wire Rope Winding Status, Wire Rope Mounting, Looseness in Drum Bearing										1 month	
	Winch Brake, Operation, Brake Performance										1 month	
	Wire Rope, Mounting Status of Rope Socket, Disorderly Winding, Wear, Damage, Condition of places wire ropes passes			•								
	Wire Rope, Corrosion, Deformation, Cut Wire, Entangling, Lubrication			•								
	Piping, Hose, Mounting, Looseness, Crack, Oil Leakage, Damage, Deterioration										1 month	
	Inspect Winches and Wire Rope	7-34		•								
	Inspect Winch Oil Level	7-36						•				
	Inspect Winch Drum	7-36						•			3 months	
	Change Winch Oil	7-37	100 hr						•		6 months	
Inspect Winch Mounting Bolts for Proper Torque	7-37	100 hr						•		6 months		
Hook Block	Main Hook Block (including attachments), Mounting, Damage			•								
	Main Hook Block (including attachments), Operation, Crack, Deformation, Wear, Lubrication										1 month	
	Auxiliary Hook Block, Mounting, Damage			•								
	Auxiliary Hook Block, Operation, Crack, Deformation, Wear, Lubrication										1 month	
Carbody Jack System	Jack Cylinder (including holding valve), Operation, Oil Leakage, Spontaneous Lowering			•								
	Jack Cylinder (including holding valve), Mounting, Looseness, Damage, Spontaneous Extension										1 month	

Table 25: Maintenance intervals

Assemblies / Maintenance Work and Inspections		Pg #	Initial maint. after ...	Regular maintenance every ...						Minimum Intervals	Notes	
				Daily, before start-up	50 / Weekly	100	200	500	1000			2000
				... operating hours								
Travel System	Control Valve, Mounting, Operation, Oil Leakage									1 month		
	Piping, Hose, Mounting, Looseness, Crack, Oil Leakage, Damage, Deterioration									1 month		
	Inspect Track Drive Reducer Oil Level	7-19			•							
	Clean and Lubricate Track Extend Beams	7-19			•							
	Inspect and Adjust Track Tension	7-21			•							
	Inspect Undercarriage	7-25										
	Change Track Drive Reducer Oil	7-30	100 hr						•		6 months	
Extend Beams and Track Extend Cylinders	Extend Cylinders and Length Sensors, Operation, Oil Leakage			•								
	Extend Beams, Cylinder Pins/ Keepers, Pads/Shims, Mounting, Damage, Looseness									1 month		
Wire Rope	Inspect Winches and Wire Rope	7-34		•				•				
	Removing Wire Rope	7-38									As necessary	
	Unwinding Wire Rope	7-39									As necessary	
	Cutting Wire Rope	7-40									As necessary	
	Installing Wire Rope	7-40									As necessary	
	Handling Wire Rope	7-43									As necessary	
	Disentangling Wire Rope	7-44									As necessary	
Operator Cab	Lubricate Operator Cab	7-22			•					2 weeks		
	Inspect and Clean Windshield Wiper Blades	7-24					•			1 month		
	Inspect Windshield Washer Fluid	7-24					•					
	Treat Door Lock and Seal	7-29						•		1 year		
	Inspect Air Conditioning and Heating System	7-29						•		1 year		

Table 25: Maintenance intervals

Assemblies / Maintenance Work and Inspections	Pg #	Initial maint. after ...	Regular maintenance every ...					Minimum Intervals	Notes		
			Daily, before start-up	50 / Weekly	100	200	500			1000	2000
			... operating hours								
Boom (see Maintenance Telescope Mode, pg 6-70)			•								
										1 month	
										1 month	
										1 month	
										1 month	
				•							
										1 month	
				•							
				•							
										1 month	
										1 month	
				•							
				•							
		7-20			•					2 weeks	

Table 25: Maintenance intervals

Assemblies / Maintenance Work and Inspections	Pg #	Initial maint. after ...	Regular maintenance every ...							Minimum Intervals	Notes
			Daily, before start-up	50 / Weekly	100	200	500	1000	2000		
			... operating hours								
Jib		Jib, Mounting, Crack, Deformation, Damage	•								
		Jib, Installing and Stowing Status, Lubrication, Wear on Pivot								1 month	
		Jib, Damage, Wear, Breakage, Deformation, Abnormal Noise on Jib Structural Parts								1 month	
		Jib, Welded Structural Parts								1 month	
		Jib, Important Structure Mounting Parts (Pin, Bolt, etc.)								1 month	
		Sheave, Mounting, Operation, Deformation, Damage, Wear								1 month	
		Jib Cylinder (Tilt, Fix, Mount/ Stow), Operation	•								
		Jib Cylinder (Tilt, Fix, Mount/Stow), Mounting, Looseness, Oil Leakage, Spontaneous Extension/Retraction, Wear of Pivot, Greasing								1 month	
		Hose Reel, Mounting, Operation, Damage, Deformation, Looseness, Oil Leakage, Hose Deterioration								1 month	
		Cord Reel, Operation, Flaw								1 month	
Other		Operate Manual Lubrication System, Unless Automatic System Installed	•							2 weeks	
		Operate Automatic Lubrication System	•							2 weeks	
		Inspect AML Rated Capacity Indicator					•				
		Inspect Automatic Lubrication System						•			

⚠ Overhaul every 4,800 hours or 4 years. Overhaul every 2,400 hours or 2 years if the GTC-1600 is used for foundation work or stevedoring. Remove dust in the boom with blown air, as necessary, if the GTC-1600 is used in an environment with a large quantity of dust (e.g., near sandblasting).

GTC-1600 INSPECTION AND MAINTENANCE—DAILY

Perform daily inspections at the start of the day or shift before operating the GTC-1600.

NOTE: See the engine manual supplied with the GTC-1600 for additional maintenance procedures recommended by the engine manufacturer.

INSPECT FOR ENGINE OIL LEAKS

Visually inspect around the GTC-1600 for oil leaks.

INSPECT ENGINE OIL LEVEL

1. Ensure the GTC-1600 is on a flat, level surface.
2. Turn off the engine and wait 15 minutes to allow the oil to drain back into the crankcase.
3. Open the engine access door and remove the dipstick.
4. Confirm the oil is between the low and high level marks on the dipstick.

INSPECT COOLANT SYSTEM FOR LEAKS

1. Ensure the GTC-1600 is on a flat, level surface.
2. Inspect the cooling system for leaks and debris build-up. Clear any accumulation with compressed air or high-pressure water.
3. Inspect the water pump for leaks.

NOTE: The water pump seal is lubricated by engine coolant. A small amount of leakage as the engine cools and parts contract is acceptable.

4. Inspect system hoses and crankcase breather hose for cracks and loose clamps.
5. Inspect fan and accessory drive belts for cracks, breaks, or other damage. Check for proper belt tension.

INSPECT ENGINE COOLANT LEVEL

DANGER

Inspect the coolant level with the engine stopped and cold. Do NOT remove the pressure cap from a hot engine. Wait until the coolant temperature is below 122 °F (50 °C) before removing the pressure cap. Heated coolant spray or steam can cause personal injury.

1. Ensure the GTC-1600 is on a flat, level surface.
2. Remove the filler cap slowly, to relieve pressure gradually.

NOTE: The cooling system filler cap is located on top of the radiator and can be accessed through the fluids access door.

3. Inspect the coolant level. As necessary, add coolant until fluid level is within 1/2 in. (13 mm) of the bottom of the fill pipe.
4. Reinstall the filler cap.

CAUTION

To prevent engine damage, never add coolant to an overheated engine. Allow the engine to cool first.

5. Start the engine, and operate at low speed until it reaches operating temperature. Check the coolant level and add coolant if necessary. Check for any obvious cooling system leaks or loose connections. Inspect the water pump for evidence of leaks.

NOTICE

The GTC-1600 engine is equipped with a variable speed cooling fan, allowing the engine to match cooling capacity with the loads/conditions under which it operates. At startup, the fan will engage fully until the engine reaches sufficient RPM to disengage the cooling fan slip clutch—causing a significant decrease in engine noise. After this startup period, the engine ECM will adjust the fan speed to match operating load/conditions.

6. Inspect the fan and accessory drive belts for cracks, breaks, or other damage. Confirm proper belt tension.

INSPECT HYDRAULIC OIL LEVEL

Confirm the low hydraulic oil level warning isn't displayed on the MFD (**Multifunction Display, pg 6-8**).

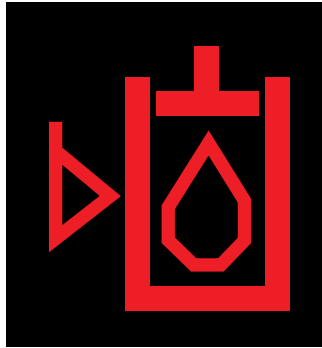
Only inspect the hydraulic oil level if:

- The engine is stopped, and the telescope cylinders and boom elevation cylinder are retracted
- Hydraulic oil temperature is approximately 68 °F (20 °C)

To manually inspect the hydraulic oil level:

1. Confirm the GTC-1600 is on a flat, level surface and that all hydraulic cylinders are in the fully-retracted position.
2. Open the left rear access door.
3. Hydraulic oil level should be visible in the sight glass, at or near the high level line.

Figure 140: Low hydraulic oil level warning

**NOTICE**

A warning icon (**Figure 140**) will appear on the GTC-1600 display if the hydraulic oil level is below the minimum allowable level. If the icon appears, shut down the GTC-1600, and inspect/add hydraulic oil, as necessary, before resuming GTC-1600 operation.

INSPECT RETURN FILTER CLOG INDICATOR AND PILOT FILTER CLOG INDICATOR

Visually confirm the return filter clog and pilot filter clog indicators (**Figure 141**) aren't illuminated on the control display (**Multifunction Display, pg 6-8**).

Figure 141: Confirm pilot filter clog and return filter clog indicators are not illuminated



Pilot filter clogged



Return filter clogged

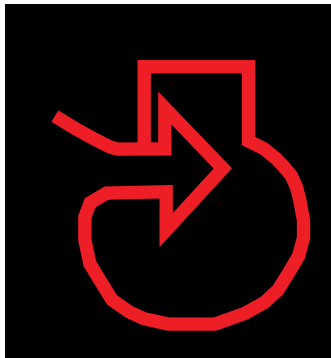
If the filter icon and pilot icon are illuminated, then one (or both) return filter is clogged. Replace clogged hydraulic return filter elements, located in the tank (**Change Hydraulic Filter Elements, pg 7-27**).

If the filter icon and pilot symbol are illuminated, at least one of the pilot/charge filters is clogged. Replace clogged hydraulic pilot/charge filter elements, located near the pumps (**Change Hydraulic Filter Elements, pg 7-27**).

INSPECT AIR FILTER CLOG INDICATOR

Visually confirm the air clog indicator isn't illuminated on the MFD (**Multifunction Display, pg 6-8**).

Figure 142: Confirm air filter clog indicator is not illuminated



INSPECT HYDRAULIC SYSTEM FOR LEAKS

 **DANGER**

NEVER work on the hydraulic system while the engine is running.

1. Inspect and retighten the hydraulic couplings and adapters.
2. Inspect the hydraulic system for leakage at regular intervals.

 **CAUTION**

The shut-off valves may only be closed for repair work (e.g., at the hydraulic pumps).

Inspect the piping systems for leakage according to the maintenance schedule.

In the event of leakage of hydraulic hose couplings:

1. Disconnect the hose at the leaking coupling.
2. Replace the O-ring or seal washer.
3. Reconnect the coupling—be careful not to pinch the seal—and tighten to appropriate torque.

In the event of leakage at the hydraulic adapter:

1. Disconnect the hose coupling.
2. Remove the hydraulic adapter.
3. Replace the O-ring or seal washer.
4. Reinstall the hydraulic adapter and tighten to appropriate torque.
5. Reconnect the coupling—be careful not to pinch the seal—and tighten to appropriate torque.

INSPECT FUEL LEVEL

1. Ensure the GTC-1600 is on a flat, level surface.
2. Confirm the fuel level on the gauge on the MFD ([Multifunction Display, pg 6-8](#)).

DRAIN FUEL/WATER SEPARATOR

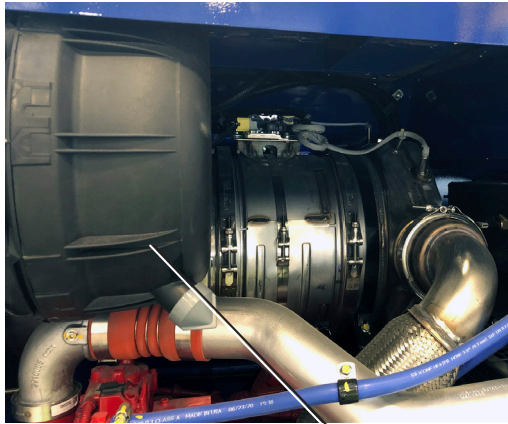
Open the drain valve of the fuel/water separator and allow the collected condensation water to drain into an appropriate vessel. As necessary, replace the fuel/water separator:

1. Drain the entire filter contents of the fuel/water separator.
2. Disconnect the electrical connector from the bottom of the filter.
3. Disconnect the filter from the filter top together with the filter base.
4. Lubricate new sealing elements with diesel fuel and insert them into the gaskets.
5. Screw-fasten filter base by hand to the new filter cartridge to filter top.
6. Tighten all components securely and reattach the electrical connector.
7. Bleed the system.

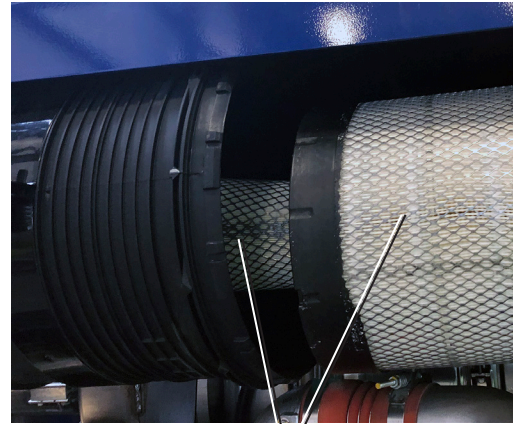
CLEAN AIR CLEANER

1. Locate latch on air cleaner cap.

Figure 143: Locate air cleaner cap and filters



Air cleaner cap



Air cleaner filters

2. Lift latch. Rotate and remove cap.
3. Remove filters (inner and outer filter).
4. Install new filters (see [Table 8, pg 2-12](#) for more information).

NOTE: Ensure the filters are nested properly and seated completely within air cleaner body.

5. Align cap using cap locking markings on air cleaner body and rotate to lock cap in place.

INSPECT SWING SYSTEM

1. Inspect the swing system for any visible external oil leaks.
2. Inspect the mounting fasteners for the proper torque.
3. Operate the swing system and listen for any unusual or abnormal sounds.
4. Visually inspect the swing drive reducer.

INSPECT ELECTRICAL EQUIPMENT

1. Inspect lamps and indicator lights for proper operation and damage.
2. Ensure lights are working correctly ([Upper Left Control Console, pg 3-14](#)).
3. Inspect the different camera views on the display screen. Ensure all views are appropriate and the picture is clear. Clean the camera lenses, if necessary.

INSPECT ENGINE EXHAUST AFTERTREATMENT SYSTEM

1. Ensure the GTC-1600 is on a flat, level surface.
2. Confirm the DEF level on the gauge on the MFD ([Multifunction Display, pg 6-8](#)).
3. If necessary, add DEF fluid.

NOTE: See [Table 7, pg 2-12](#) for DEF specifications.

4. Visually inspect the DPF to ensure it's installed and not clogged.

DRAIN AND REPLACE DEF, IF NECESSARY

See [Table 7, pg 2-12](#) for DEF specifications.

OPERATE MANUAL LUBRICATION SYSTEM, UNLESS AUTOMATIC SYSTEM INSTALLED

1. Start the GTC-1600.
2. Place operator cab in the forward position.
3. Locate the manual lubrication grease fitting, under the fuel tank / DEF fill hatch.
4. Attach a grease gun to the manual lubrication grease fitting, and pump 20 cycles into the system.

 **DANGER**

During the slew operation, ensure all personnel are clear of the GTC-1600 tracks and undercarriage.

5. For approximately five (5) minutes, alternate GTC-1600 motion between:
 - a. Slowly swing upper assembly to the right and left 90° and then return to front position.
 - b. Slowly raise and lower boom through full range of motion.
6. Repeat steps 4–5.
7. Ensure additional lubrication isn't necessary. Shorter lubricating intervals may be required in:
 - ◇ Tropical areas
 - ◇ High relative humidity conditions
 - ◇ Excessively dusty conditions
 - ◇ Significant temperature fluctuations

NOTE: Before placing the GTC-1600 out of operation for an extended time, and before restoring it to operating condition, re-grease the GTC-1600 using the procedure above.

NOTE: When cleaning the GTC-1600, ensure no water enters the raceways. When cleaning is finished, lubricate the GTC-1600 thoroughly. The grease filling is intended to prevent friction, and to seal and protect the assembly against corrosion. Use enough grease that a grease bead forms around the entire circumference of the bearing grooves.

OPERATE AUTOMATIC LUBRICATION SYSTEM

NOTICE

Every four hours the ignition key is switched to ON, the system will pump grease to the slew ring, boom heel pin, and boom cylinder pin. The green LED on the lubrication pump switch on the upper right console in operator cab will illuminate while the pump is operating.

NOTICE

If necessary, press the automatic lubrication pump switch to activate a manual lubrication cycle (To Activate the Automatic Lubrication System Manually). Completing a manual lubrication cycle will not affect the hourly count interval.

CAUTION

Ensure additional lubrication isn't necessary. Shorter lubricating intervals may be required in:

- Tropical areas
- High relative humidity conditions
- Excessively dusty conditions
- Significant temperature fluctuations



Table 26: Lubrication pump alarm codes

Message	LED	Alarm	Remedy
A L L	1 Flash	Low lubricant level in reservoir	Refill with clean lubricant.
A C S	2 Flashes	Cycle sensor overrun	The cycle sensor signal was not received within the specified time. Ensure timer overlong is set to appropriate value and that there is no problem on the lubrication circuit.
A E D	3 Flashes	Pause timer overrun	Verify input pause sensor.
A L P	4 Flashes	Pump motor blocked	Replace the motor unit.
A O L	5 Flashes	Pump motor overloaded	Allow system to cool, if the problem persists, replace the motor unit.
A C O	6 Flashes	C.COU counter in pulse mode	Modify C.COU parameter.
A E E	7 Flashes	Eprom error	Electronic Board memory error. Board requires replacement.

NOTE: To cancel the alarm message press the UP/DOWN arrow buttons at the same time.

TO ACTIVATE THE AUTOMATIC LUBRICATION SYSTEM MANUALLY

1. Press the lubrication pump switch (Figure 55, item 8) on upper right console in operator cab.
2. Alternate GTC-1600 motion between:
 - a. Slowly swing upper assembly to the right and left 90° and then return to front position.
 - b. Slowly raise and lower boom through full range of motion.
3. Repeat steps a–b until the green LED turns off (approximately 10 minutes).

NOTE: Before placing the GTC-1600 out of operation for an extended time, and before restoring it to operating condition, re-grease, using the procedure above. When cleaning the GTC-1600, ensure no water enters the raceways. When cleaning is finished, lubricate thoroughly. The grease filling is intended to prevent friction, and to seal and protect the assembly against corrosion. Use enough grease that a grease bead forms around the entire circumference of the bearing grooves. See Table 26 for information about automatic lubrication system errors.

GTC-1600 INSPECTION AND MAINTENANCE—50 HOURS/WEEKLY

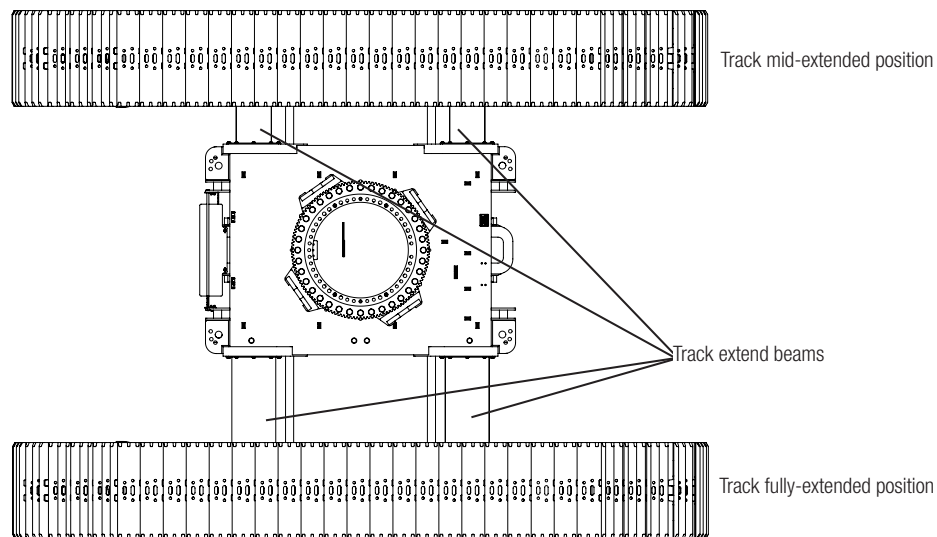
INSPECT TRACK DRIVE REDUCER OIL LEVEL

1. Ensure the GTC-1600 is on a flat, level surface.
2. Position the drive reducer (**Figure 153**) so the oil drain is at the bottom (or 6 o'clock) position.
3. Remove the oil fill plug. The oil should be at the oil fill plug hole level or just beginning to trickle out.
4. Add oil, if necessary.
5. Repeat steps 1–4 for the other track drive reducer.

CLEAN AND LUBRICATE TRACK EXTEND BEAMS

1. Move the left and right track frames to the fully-extended position.

Figure 144: Lubricate track extend beams



2. Clean dirt, debris, and old grease from the track extend beams.
3. Apply fresh grease to all four sides of each extend beam with a brush.

LUBRICATE BOOM

Lubricate the boom sheaves, boom bearing pads, and boom pins. Set the GTC-1600 to maintenance telescope mode (**Maintenance Telescope Mode, pg 6-70**) before lubricating or otherwise servicing the boom.

NOTE: See **Figure 170, pg 7-49** and the markings on the GTC-1600 boom for more information.

WARNING

Do **NOT** operate the GTC-1600 in maintenance telescope mode. The GTC-1600 could be damaged, overturn, or result in some other serious accident. Operate in maintenance telescope mode only for maintenance purposes.

NOTICE

Fully retract the boom before switching between the standard telescope and maintenance telescope modes.

NOTE: Crane operation may stop if there is no stability capacity—depending on the hook block weight. If the operation stops, remove the hook block or lower the hook block to the ground.

LUBRICATE SLEW RING GEAR AND PINION

Lubrication intervals depend on swing frequency. Apply the Texaco 'Crater' 2X or 5X grease to the gearing with a brush or spray gun. Never leave blank areas on the tooth faces.

NOTICE

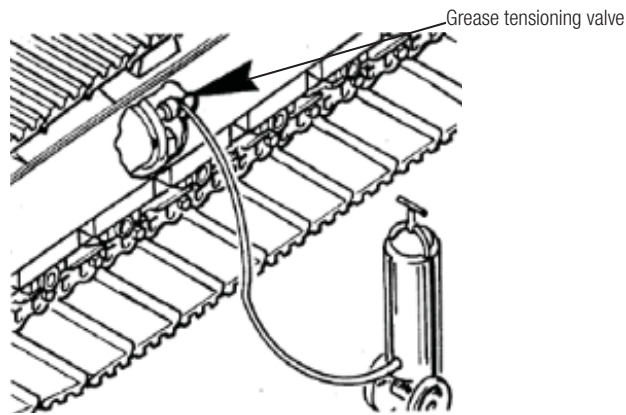
Always inspect the lubrication of the ring gear and pinion of the swing mechanism after each cleaning operation—especially after using a steam-jet unit. Always lubricate the ring gear and the pinion.

INSPECT AND ADJUST TRACK TENSION

1. Ensure all components of the tracks are correctly positioned.
2. Connect a grease gun to the grease nipple of the grease-tensioning valve.

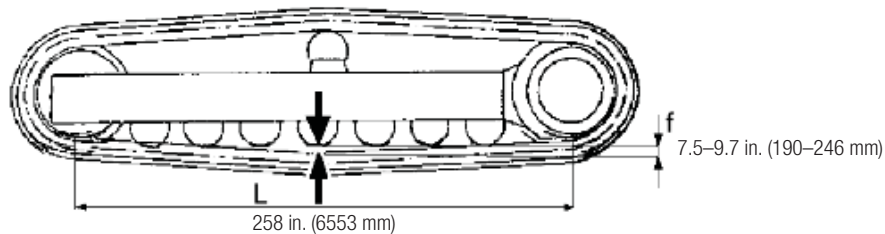
NOTE: Do NOT disconnect the grease gun until track tensioning is completed. Attach a pressure gauge to the grease gun, if necessary.

Figure 145: Connecting a grease gun to the track grease tensioning valve



3. Set the track tension using one of the following two methods:
 - ◇ Measure the pressure in the tensioning element
 - ◇ Lift the undercarriage and measure the sag of the lower strand.

Figure 146: Measuring track lower strand sag



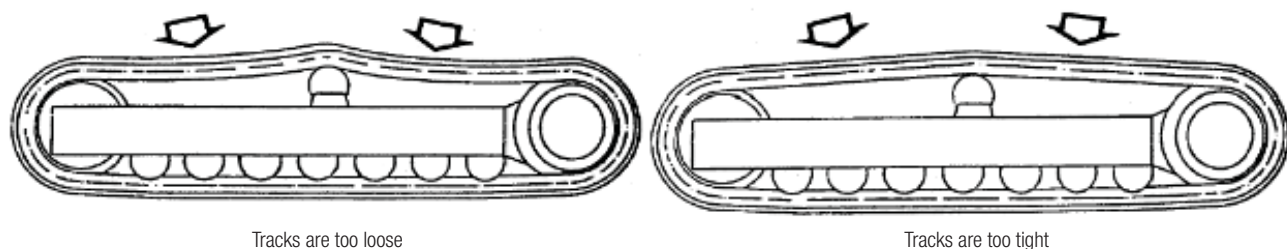
NOTE: Measure sag at center roller position between contact surfaces of track chain and bottom roller.

4. Disconnect the grease gun.
5. Move the undercarriage back and forth (about 1 sprocket turn).
6. Inspect the position of the tracks on the front idler and sprocket for proper positioning.

⚠ CAUTION

Tracks that are too loose can slip out of the flanges of the rollers, sprocket, and front idler and increase wear. Tracks that are too tight increase the wear on the front idler, drive bearings, track pins, and bushings. They also necessitate greater motor output for driving and consequently a higher fuel consumption.

Figure 147: Incorrect track tension

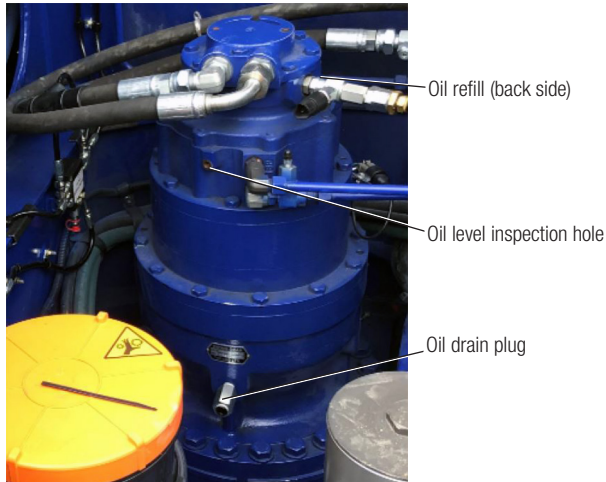


GTC-1600 INSPECTION AND MAINTENANCE—100 HOURS

INSPECT SWING DRIVE REDUCER OIL LEVEL

1. Ensure the GTC-1600 is on a flat, level surface.

Figure 148: Swing drive reducer



2. Oil level should be to the bottom edge of the oil level port.
3. If oil level is low, add oil to the oil fill port until the oil level is to the bottom edge of the oil level port

NOTE: See [Table 7, pg 2-12](#) for oil specifications.

INSPECT BATTERIES AND CABLES

1. Inspect the battery terminals for corrosion.
2. Ensure the cable connections on the battery terminals are tight.
3. Ensure the battery retention clamps are tight and the batteries are properly secured.

LUBRICATE OPERATOR CAB

Lubricate all moveable parts of the operator cab:

- Joints
- Pins
- Hinges
- All other moveable components

GTC-1600 INSPECTION AND MAINTENANCE—200 HOURS

CLEAN ENGINE CRANKCASE BREATHER

See the GTC-1600 engine manual for details.

DRAIN WATER AND SEDIMENT FROM FUEL

In extreme weather conditions, condensation may form in the fuel tank.

1. Operate the GTC-1600 until fuel level is low (< 1/8 tank).
2. Ensure the GTC-1600 is on a flat, level surface.
3. Place a vessel beneath the fuel tank drain to collect the condensed water.
4. Unscrew the drain plug from the tank bottom and drain the condensed water into the vessel.
5. Leave the drain port open until clean fuel flows out.
6. Replace the drain plug and screw it into place.

NOTICE

NEVER dispose of drained fuel by dumping it into a sewer, on the ground, or into groundwater or waterways. ALWAYS act responsibly with the natural environment. Follow all EPA (or other relevant government agency) guidelines regarding the proper disposal of hazardous materials. Contact local authorities or reclamation facility.

REPLACE FUEL FILTER

See the GTC-1600 engine manual for details.

See [\(Figure 46, pg 2-12\)](#) to help locate filter, and [Table 8, pg 2-12](#) for filter specifications.

CLEAN HYDRAULIC OIL COOLER FINS

1. Remove accumulated dust from the hydraulic oil cooler fins with compressed air or a clean paintbrush.

NOTICE

Accumulated dust on the cooling fins will reduce cooling efficiency, and can cause system overheating.

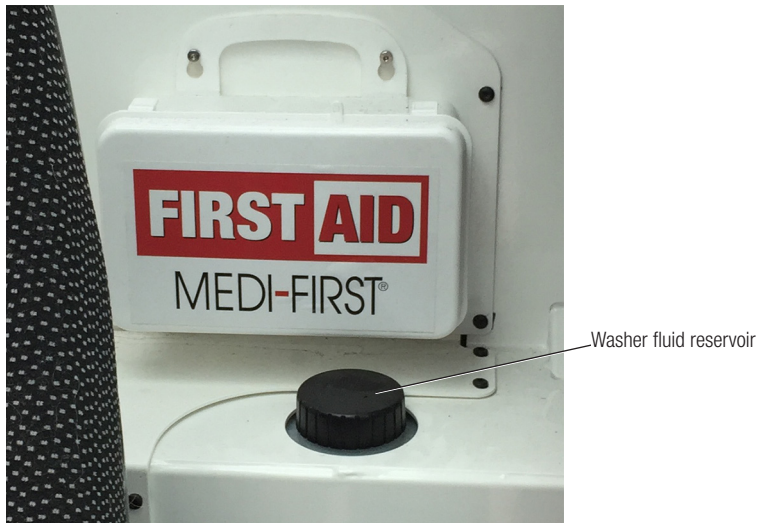
INSPECT AND CLEAN WINDSHIELD WIPER BLADES

1. Clean dirt, debris, and mud build-up from the edge of windshield wiper blades with a mild detergent mixed with water.
2. Inspect the windshield wiper blades for cuts or tears, and replace as necessary.

INSPECT WINDSHIELD WASHER FLUID

1. Determine the correct type of windshield washer fluid for the environmental working conditions.
2. Locate the windshield washer fluid reservoir in the rear left corner of the operator cab.

Figure 149: Windshield wiper fluid reservoir



3. Remove the reservoir cap and add the selected windshield washer fluid, as necessary. Reinstall reservoir cap.

GTC-1600 INSPECTION AND MAINTENANCE—500 HOURS

CHANGE ENGINE OIL AND FILTER

NOTICE

Replace the engine oil and oil filter every 500 operating hours or once per year, whichever occurs first. Comply with all specifications regarding consumables set by the engine manufacturer.

If not reused, dispose of oil in accordance with local environmental regulations.

WARNING

Some sources have determined that used engine oil can be carcinogenic and cause reproductive toxicity. Do NOT inhale vapors or ingest, and avoid prolonged contact with used engine oil.

To reduce the possibility of personal injury, avoid direct skin contact with hot oil.

Ensure the GTC-1600 is on a flat, level surface. For detailed oil change procedures, see the GTC-1600 engine manual.

For lubrication oil specifications and capacities see [Other Specifications, pg 7-45](#).

See [\(Figure 46, pg 2-12\)](#) to help locate filter, and [Table 8, pg 2-12](#) for filter specifications.

CLEAN CHARGE AIR AND WATER RADIATOR

1. Remove accumulated dust from the cooler fins of the charge air and water radiator with compressed air or a clean paintbrush.

INSPECT UNDERCARRIAGE

1. Inspect the undercarriage for damage or premature wear.
2. Inspect the drive sprocket and idler for damage or wear.
3. Inspect the pins and cleats for damage or wear.
4. Ensure the tracks are properly tensioned ([Inspect and Adjust Track Tension, pg 7-21](#)).

INSPECT SLEW RING

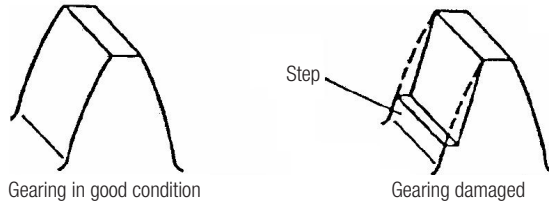
NOTICE

Never allow excessive swing gear backlash.

After the running-in period, the tooth faces should show a smooth, bright surface from normal wear.

1. Inspect the swing gear for damage or wear.
2. If the swing gear show scrub marks, seizing, pits, flaking, blistering, cracks, or plastic deformations, replace the gear wheels.

Figure 150: Swing gear condition



INSPECT SLEW RING FASTENERS

1. Inspect the slew ring, hydraulic swivel, and swing drive assembly bolts for tight fit.
2. If necessary, re-tighten the fasteners. See **Other Specifications, pg 7-45** for more information.

NOTICE

Use a torque wrench for checking or re-tightening screws and bolts.

NOTE: All plated (yellow galvanized) bolts must use the *1 (lubricated) columns for wrench settings. Clean the threads, if necessary, but never apply lubricant. The plating is the lubricant.

INSPECT SLEW DEVICE FOR WEAR

DANGER

If increased backlash or advanced wear is suspected, contact TADANO customer support.

Over years of operation, the raceway system will wear and consequently the backlash of the slew device will increase.

1. Inspect the slew device for proper operation.

INSPECT AML RATED CAPACITY INDICATOR

NOTICE

The AML must be serviced exclusively by a qualified service technician.

NEVER tamper with the electronic system of the AML.

1. Confirm AML rated capacity indicator is functional and undamaged.
2. Confirm anti-two-block switch weight and chain are correctly mounted.
3. Confirm electric cable connections are inserted.
4. Confirm cables are correctly wound and tensioned in the electrical cable/length sensor reel.
5. Confirm cables are neither damaged nor are any strands broken.
6. Confirm the systems are checked with calibrated weights according to applicable legal regulations.
7. If a meaningful difference from the original setting is detected, re-calibrate the system with a qualified service technician.

GTC-1600 INSPECTION AND MAINTENANCE—1000 HOURS

INSPECT HYDRAULIC FAN FOR PROPER OPERATION

1. Visually inspect the hydraulic oil cooling fan to ensure proper operation.

CHANGE HYDRAULIC FILTER ELEMENTS

DANGER

Do NOT work on the hydraulic system while engine is running. Replace filter elements only if the engine is stopped.

CAUTION

The shut-off valves may only be closed in case of repair work (e.g., at the hydraulic pumps).

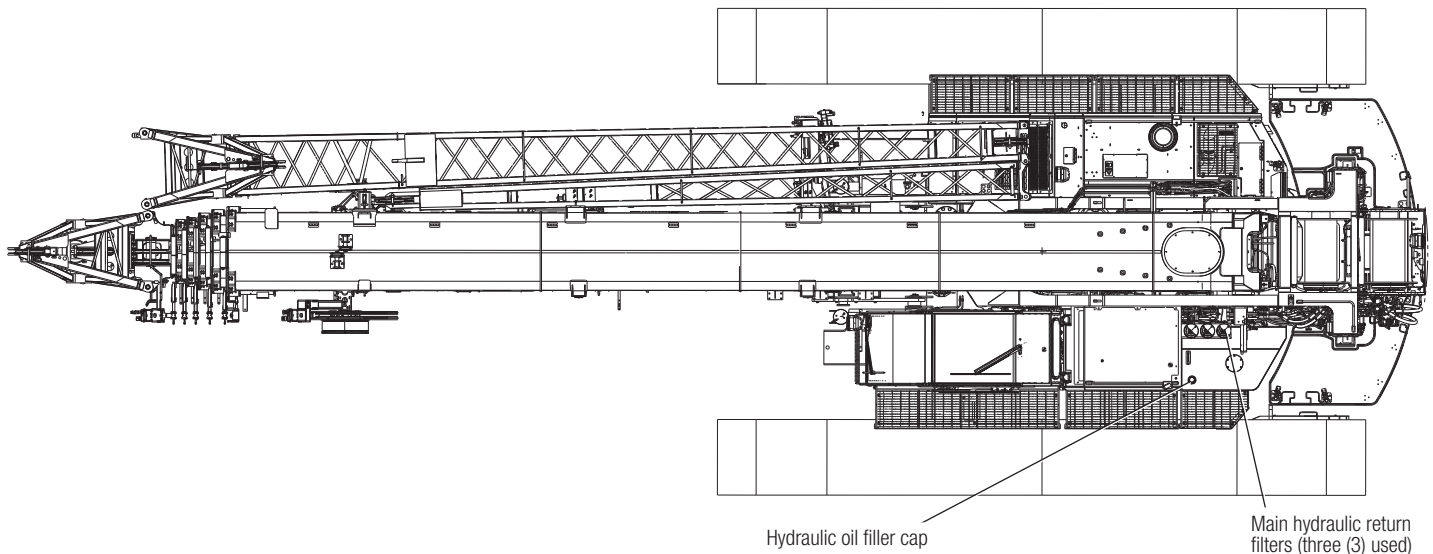
The individual components installed in the valves, pumps and hydraulic motors have very tight tolerances. Even very small impurities entering the hydraulic system can cause malfunction.

Replace filter element during each hydraulic oil change, when the Pilot Filter Clog or Return Filter Clog warnings illuminate ([Inspect Return Filter Clog Indicator and Pilot Filter Clog Indicator, pg 7-14](#)), and according to the maintenance schedule. NEVER attempt to clean the filter element.

The hydraulic oil tank is pressurized. Drain air from tank before removing filler cap, or any other component.

1. Ensure the GTC-1600 is on a flat, level surface.
2. Retract the boom hoist, boom extend, and track extend cylinders.
3. Remove hydraulic oil filler cap to release any trapped air.

Figure 151: Location of hydraulic oil filter elements



4. Inspect filler cap for any damage and replace if needed. Reinstall filler cap.
5. Remove the hydraulic return filter cap assemblies.
6. Remove the return filter elements. Allow the residual oil to drip.
7. Inspect the cap O-ring seal and replace, if necessary.
8. Clean the sealing surfaces using a lint-free cloth.
9. Ensure the seal fits correctly.
10. Install the hydraulic return filter cap assemblies and secure in place with the mounting bolts.
11. Inspect hydraulic system for leakage.

INSPECT ENGINE COOLING FAN FOR PROPER OPERATION

1. Confirm fan turns freely, does not make abnormal noise, and is not contacting the guard, cooling fins or anything else. See the GTC-1600 engine manual for details.

CHANGE SWING DRIVE REDUCER OIL

1. Ensure the GTC-1600 is on a flat, level surface.
2. Position the swing drive shaft in the downward position.
3. Place a drain pan below the swing drive reducer. See [Capacities and Specifications, pg 2-12](#) for more information.
4. Drain the swing drive reducer ([Figure 148](#)) by removing the oil drain plug.

NOTE: For faster oil draining, operate GTC-1600 for 15 minutes before service—to heat oil and lower viscosity. Also, remove the fill plug for quicker draining.

DANGER

Risk of scalding. Do NOT let hot oil contact skin or eyes.

NOTICE

Dispose of swing drive reducer oil in accordance with local environmental regulations.

5. Reinstall the oil drain plug.
6. Add oil until the oil level is to the middle of the sight gauge ([Table 7, pg 2-12](#) for oil specifications).

CAUTION

Inspect oil for foreign matter when an oil change is performed. Coarse impurities may be a result of excessive stress or improper operation. Determine the cause and eliminate it. Dismantle the gear reducer, and check it for damage. If necessary, submit to manufacturer for a general overhaul.

Inspect oil for possible blackening and foreign matter; if necessary, reduce oil change intervals.

INSPECT STARTER

See the GTC-1600 engine manual for details.

TREAT DOOR LOCK AND SEAL

1. Lubricate the lock and door latches with light oil.
2. Treat the door seal and other rubber components with acid-free grease or French talc before the start of cold season.

INSPECT AIR CONDITIONING AND HEATING SYSTEM

1. Inspect the heating and air conditioning system for proper operation.
2. Inspect the condenser fins for collected dirt/debris. Clean the fins, as necessary.

INSPECT AUTOMATIC LUBRICATION SYSTEM

NOTICE

The slew bearing, boom heel pin, and boom hoist cylinder barrel end pin are greased with an electrically driven lubrication pump.

The LED of the lubrication pump switch (Figure 55, item 8, pg 3-10) will flash when lubrication level is low.

1. The lubrication reservoir is located on the upper structure, beneath the boom. Visually confirm the lubrication reservoir is full.

Figure 152: Automatic lubrication system reservoir

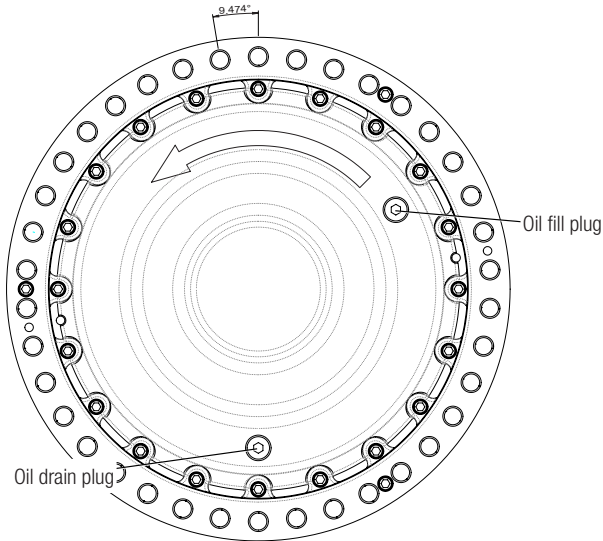


2. If the reservoir level is low, use the fill port behind the fuel tank/DEF fill access door to refill the reservoir.
3. See [Operate Manual Lubrication System, Unless Automatic System Installed, pg 7-17](#) for information on using the automatic lubrication system..

CHANGE TRACK DRIVE REDUCER OIL

1. Ensure the GTC-1600 is on a flat, level surface.
2. Position the track drive reducer (**Figure 153**) so the oil drain is at the bottom (or 6 o'clock) position.

Figure 153: Track drive reducer



3. Place a drain pan below the track drive reducer oil drain hole. See **Capacities and Specifications, pg 2-12** for more information.
4. Remove the oil drain plug.
5. Remove the oil fill plug.
6. Allow oil to drain into pan.
7. When oil has finished draining, reinstall oil drain plug.
8. Add new oil (**Table 7, pg 2-12**) to the oil fill hole, until the oil level reaches the oil fill hole or just begins to trickle out.
9. Reinstall the oil fill plug.
10. Repeat steps 1–9 for the other track drive reducer.

GTC-1600 INSPECTION AND MAINTENANCE—2000 HOURS

CHANGE HYDRAULIC OIL

 **DANGER**

NEVER work on the hydraulic system while the engine is running.

 **CAUTION**

Only use new hydraulic oil, from clean vessels.

The shut-off valves may only be closed for repair work (e.g., at the hydraulic pumps).

Inspect the piping systems for leakage according to the maintenance schedule.

1. Ensure the GTC-1600 is on a flat, level surface.
2. Retract the boom hoist, boom extend, and track extend cylinders.
3. Close the butterfly valve in the suction port of the hydraulic tank.
4. Remove the hydraulic oil drain plug and drain the hydraulic oil completely into an appropriate container.

NOTE: Alternately, use the drain quick-disconnect fitting and transfer pump to drain the majority of the oil before draining the remainder via gravity at the drain plug.

NOTICE

Dispose of hydraulic oil in accordance with local environmental regulations.

5. Reinstall the hydraulic oil drain plug.
6. Remove the hydraulic oil filter and replace with new filter.
7. Filter new hydraulic oil ([Table 7, pg 2-12](#)) to ISO specification 18/15/13 before adding it to the GTC-1600.
8. Add new, filtered hydraulic oil via the quick disconnect (QD) fitting:
 - a. Locate the fill QD fitting on the hydraulic tank. It is mounted high on the rear of the tank so that new hydraulic oil is filtered as it enters the tank.
 - b. Connect a container of new hydraulic oil to the rear QD fitting.
 - c. Add new hydraulic oil to the tank until the level displayed in the sight glass is between the high and low level lines ([Figure 140, pg 7-13](#)).
 - d. Disconnect the oil dispensing container

NOTE: Mating fittings for the quick disconnects are shipped with the GTC-1600, in the plastic tote.

9. Re-open the butterfly valve in the suction port of the hydraulic tank.
10. Bleed the system.
11. Confirm the low hydraulic oil icon is not displayed on the GTC-1600 display.

CAUTION

Before starting the engine, ensure the butterfly valves in the hydraulic tank suction ports are open.

12. Inspect and retighten the hydraulic hoses and adapters, as necessary.
 13. Inspect the hydraulic system for leakage.
- For capacity and specifications of hydraulic oil see **Other Specifications, pg 7-45**.

NOTICE

The hydraulic system can be converted to biodegradable oils according to VDMA 23568.

When changing over the hydraulic system from oils based on mineral oil to biodegradable oils, comply with the directives of VDMA 24569.

CHANGE ENGINE COOLANT

1. Ensure the GTC-1600 is on a flat, level surface.
2. Place a drain pan under the radiator. See **Capacities and Specifications, pg 2-12** for more information.
3. Open the drain valve on the radiator and remove the drain plug in the water inlet. Drain coolant into the drain pan.

NOTICE

Dispose of coolant in accordance with local environmental regulations.

4. Inspect the cooling system for damaged hoses and loose or damaged hose clamps. Replace, as necessary.
5. Inspect the radiator for leaks, damage, and dirt buildup. Clean and replace, as necessary.
6. Reinstall the drain plugs
7. Add coolant mix by pouring it into the overflow tank.
8. Start the engine and run it at various speeds for approximately one minute.
9. Stop the engine.
10. Inspect the coolant level in the overflow tank. Top off, as necessary.

NOTE: For information on draining all coolant from the engine, see the GTC-1600 engine manual.

INSPECT SWING MECHANISM **DANGER**

Before or after any extended continuous operation, and if the maximum load is reached frequently, check all screws and bolts within the load path for proper torque.

1. Check all fasteners for proper torque ([Other Specifications, pg 7-45](#)).
2. Inspect the swing mechanism for abnormal sounds.

BLEED SWING DRIVE BRAKE **CAUTION**

Bleed the swing drive brake after repairs to hydraulic components of the brake circuit, and before GTC-1600 operation. Maximum pressure to brake is 3000 psi.

1. Bleed air from the swing drive brake using the service brake drain valve.

INSPECT SWING DRIVE BRAKE **CAUTION**

ALWAYS engage the swing house lock before performing any work on the swing brake.

1. Confirm swing drive brake functions properly, without leakage during operation.
2. Disassemble the swing drive brake whenever it is removed to change the swing drive brake oil. Inspect the internal parts for wear. If the brake is worn or damaged, repair the brake or replace with a new brake.

WINCH INSPECTION AND MAINTENANCE—DAILY

INSPECT WINCHES AND WIRE ROPE

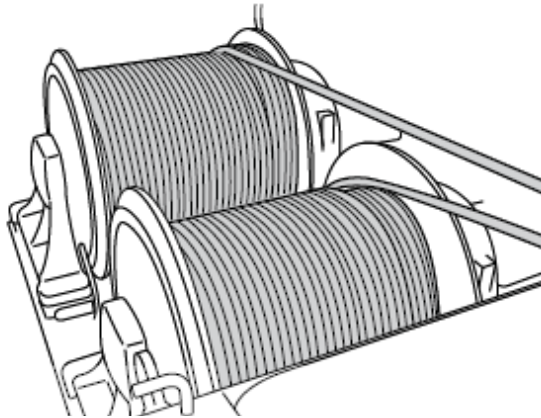
1. Inspect the winches and the area around them for visible oil leaks.
2. Inspect the drain and fill plugs for visible oil leaks.
3. Inspect the winch speed reducers and the winch mounting brackets and hardware, and ensure they are not deformed or damaged.
4. Visually inspect the wire rope for fraying, broken strands, bruising, kinking, corrosion, reduced rope diameter and/or wear ([How to Inspect Wire Rope, pg 7-35](#)). Inspect the entire length, including at the fastening device.

Figure 154: Example of damaged wire rope



5. If the end of the wire rope is not in good condition, cut off the damaged end (See [Cutting Wire Rope, pg 7-40](#)).
6. Confirm the wire rope is wound evenly on the winch spools ([Figure 155](#)). If it is not wound correctly, unwind and rewind it correctly.

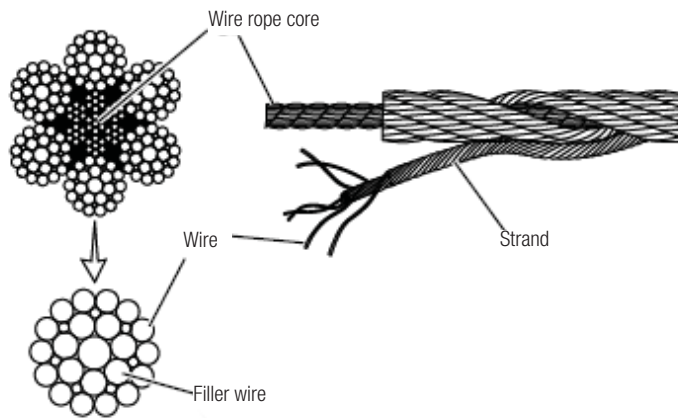
Figure 155: Wire rope evenly wound on winch



HOW TO INSPECT WIRE ROPE

Wire rope is constructed of multiple strands composed of filler wire (**Figure 156**), laid helically around a multi-wire core.

Figure 156: Wire rope construction definitions



Wire rope is considered damaged and must be replaced if:

- For standard construction ropes, the running ropes have six or more randomly distributed broken wires in one lay or three or more broken wires in one strand of one lay.
- For rotation-resistant rope, running ropes have two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters.
- The standing ropes have more than two broken wires in one lay in the sections beyond the end connections or more than one broken wire at an end connection.
- The wire rope must be replaced if its diameter is reduced more than 5% from nominal. Use the table below to determine if the rope should be replaced.

Figure 157: Measuring wire rope diameter

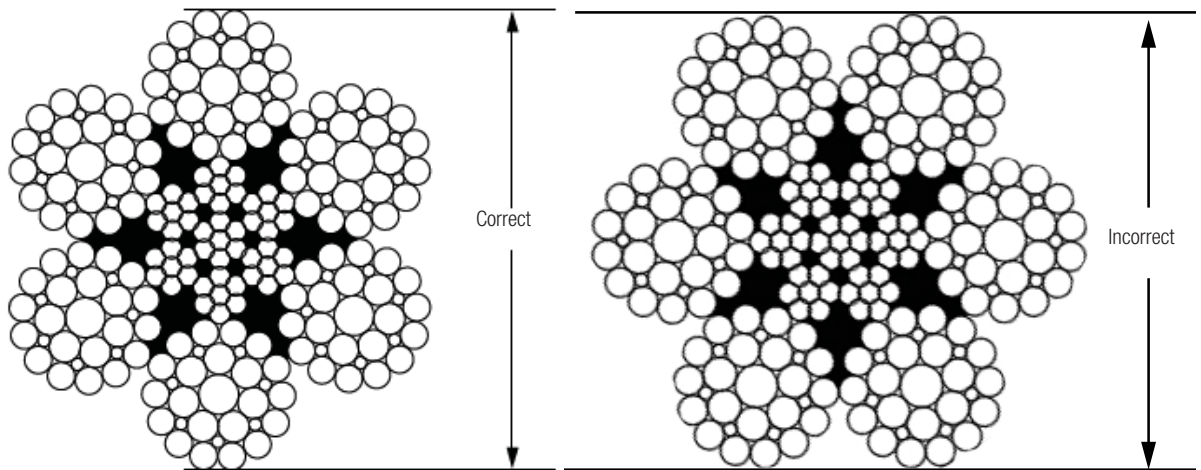


Table 27: Nominal wire rope diameters

Wire Rope Size	Wear Limit
Up to 5/16 in. (8.0 mm)	1/64 in. (0.4 mm)
3/8–1/2 in. (9.5–12.7 mm)	1/32 in. (0.8 mm)
9/16–3/4 in. (14.3–19.0 mm)	3/64 in. (1.2 mm)
7/8–1-1/8 in. (22.2–28.6 mm)	1/16 in. (1.6 mm)
1-1/4–1-1/2 in. (32.0–38.0 mm)	3/32 in. (2.4 mm)

WINCH INSPECTION AND MAINTENANCE—500 HOURS

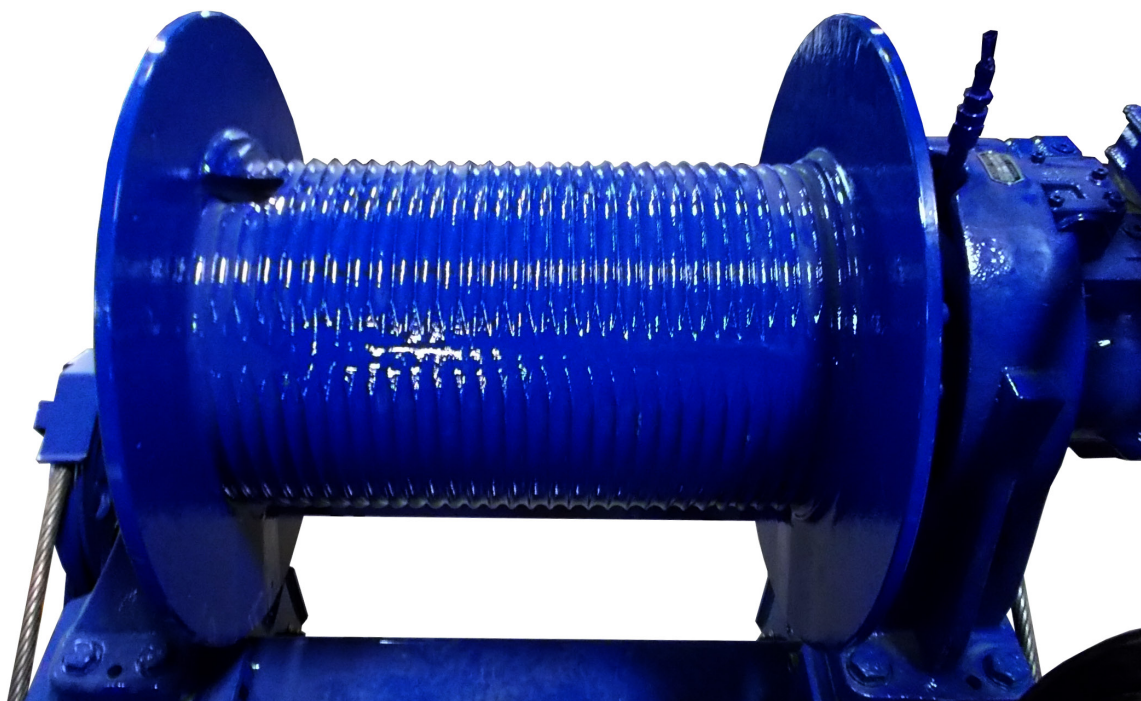
INSPECT WINCH OIL LEVEL

1. Ensure the GTC-1600 is on a flat, level surface.
2. Remove the winch oil inspection plug.
3. Oil level should be at the bottom of the oil inspection hole or just beginning to trickle out.
4. If winch oil level is low, add oil to the winch oil fill hole until oil begins trickling out of the winch oil inspection hole.
5. Apply pipe thread sealant to the threads of the oil inspection plug and reinstall.

INSPECT WINCH DRUM

1. Visually inspect the winch drum for wear and damage.

Figure 158: Inspect winch drum



If replacing the wire rope:

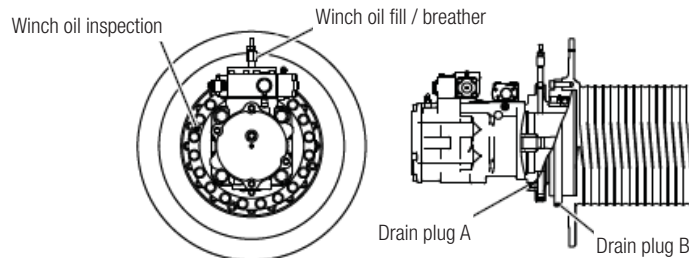
1. Clean the winch drum surface thoroughly. Remove all grease, oil, paint, dirt, and debris.
2. Inspect the winch drum thoroughly. The drum must be smooth and be free of any deep scratches, gouges, or rough surfaces.

WINCH INSPECTION AND MAINTENANCE—1000 HOURS

CHANGE WINCH OIL

1. Ensure the GTC-1600 is on a flat, level surface.
2. Operate the winch to orient Drain plug B downward.

Figure 159: Change winch oil level



3. Place a drain pan under Drain plug A and Drain plug B. See [Capacities and Specifications, pg 2-12](#) for more information.
4. Remove Drain plug A, Drain plug B, Winch oil fill plug, and Winch oil inspection plug.
5. Allow the oil to drain into the pan.

NOTICE

Dispose of winch oil in accordance with local environmental regulations.

6. Wrap sealing tape around Drain plug A and Drain plug B, and reinstall the plugs.
7. Add new oil at the Winch oil fill hole, until oil overflows from the Winch oil inspection hole.
NOTE: See [Table 7: GTC-1600 fluid specifications, pg 2-12](#) for more information.
8. Wrap sealing tape around the Winch oil fill plug and Winch oil inspection plug, and reinstall the plugs.

INSPECT WINCH MOUNTING BOLTS FOR PROPER TORQUE

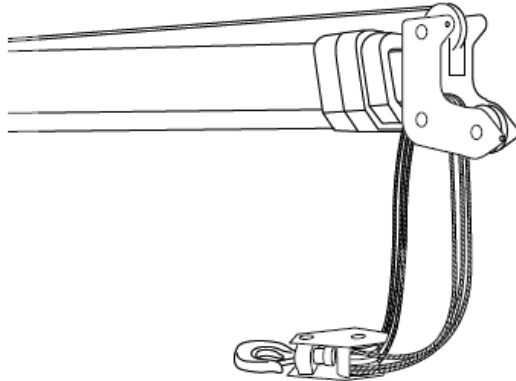
See [Other Specifications, pg 7-45](#) for proper torque values.

WIRE ROPE INSPECTION AND MAINTENANCE—AS NECESSARY

REMOVING WIRE ROPE

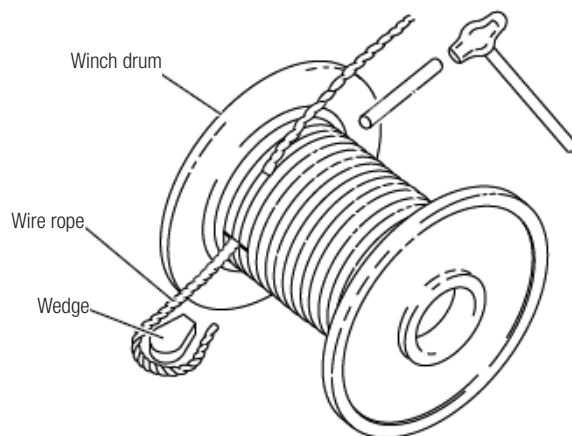
1. Extend the track frames.
2. Lower the boom fully, and place the hook block on the ground.

Figure 160: Place the hook block on the ground



3. Remove the rope socket from the hook block or boom head.
4. Remove the wire clip.
5. Remove the wedge from its position with a hammer.
6. Remove the wire rope from the rope socket.
7. Remove the wire rope from the hook block and the anti-two-block device weight.
8. Pull the wire rope to unwind the winch.
9. Wind the wire rope around a wooden spool.
10. Spool out the wire rope until there is no wire rope left on winch drum.
11. Remove the wedge from winch drum with a hammer (**Figure 161**).

Figure 161: Remove wire rope wedge from winch drum

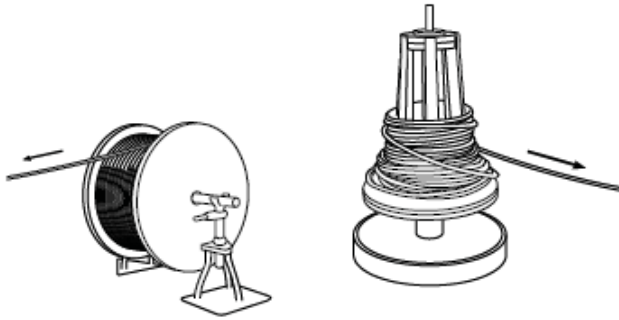


12. Remove remaining wire rope from winch drum.
13. Inspect winch drum for wear and damage (**Inspect Winch Drum, pg 7-36**).

UNWINDING WIRE ROPE

Wire rope is supplied wound in a coil or on a wooden spool.

Figure 162: Unwinding wire rope



1. Unwind the wire rope by either rolling the coil, or pulling wire rope to turn the spool.

NOTICE

If the wire rope is unwound improperly, it can become twisted, or kinked, rendering it unusable. Even a small amount of twisting can cause the wire rope to become tangled.

CUTTING WIRE ROPE

NOTICE

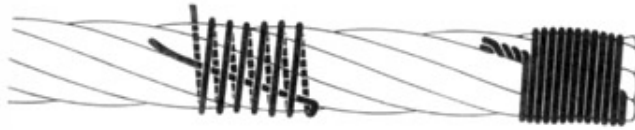
Category 1 rotation-resistant wire ropes are handled differently than other types of wire ropes. The outer strands are not preformed and must be tightly restrained when the rope is cut to maintain its operational properties.

Do NOT remove the welded ends provided.

Follow the listed procedures for cutting and preparing a Category 1 rotation-resistant wire rope.

1. Wrap the section of wire rope to be cut securely with soft wire or hose clamp seizing (**Figure 163**). Wrap three separate bands of seizing on each side of the intended cut area (six bands of seizing for each cut).

Figure 163: Wire rope seizing



NOTICE

Tightly wrap each band of seizing with a minimum length of one and one half times the rope diameter.

Place the two bands of seizing closest to the cut a distance equal to one rope diameter away from the cut. Place the remaining four bands of seizing evenly spaced at a distance equal to three rope diameters.

2. Cut the wire rope with a saw or acetylene torch:
 - a. If a welder is available, cut the wire rope with an abrasive saw.
 - b. Cap weld both cut ends of wire rope so that all inner and outer strands are welded together, preventing movement between them.
 - a. If a welder is not available, cut the wire rope with an acetylene torch.
 - b. Ensure both cut ends of wire rope are completely fused so all inner and outer strands are bonded, preventing any movement between strands.

NOTICE

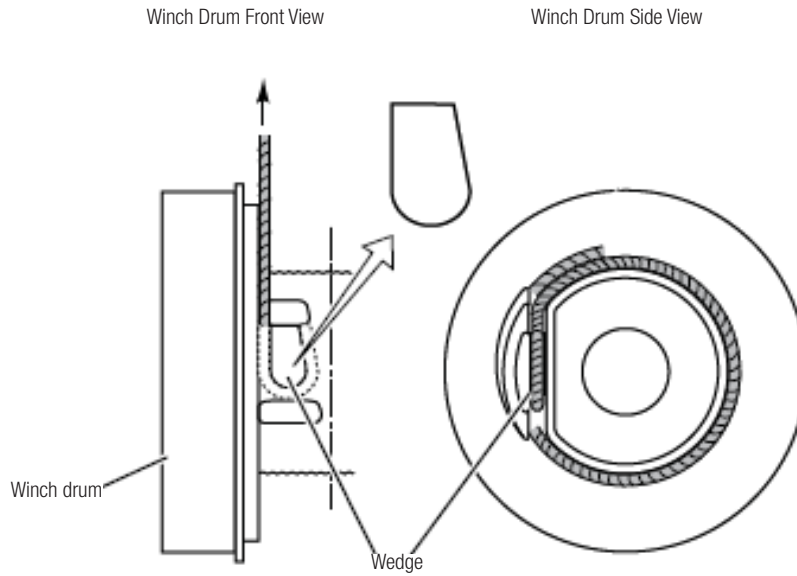
For both cutting methods, the outer strands must not be able to move separately from the inner strands. The weld must not exceed the diameter of the rope.

3. If possible, leave the seizing bands in place.

INSTALLING WIRE ROPE

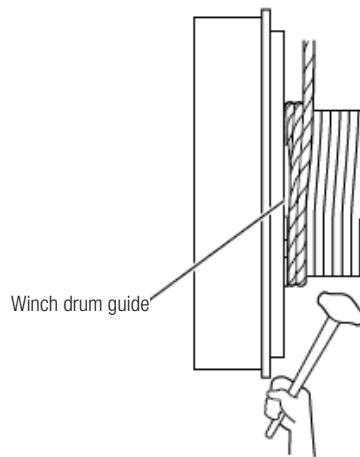
1. Inspect the winch drum for wear and damage (**Inspect Winch Drum, pg 7-36**).
2. Reeve the new wire rope through from the boom head or jib head to the winch drum.
3. Secure the end of the wire rope to the winch drum with the wire rope wedge (**Figure 164**).

Figure 164: Installing wire rope wedge in winch drum



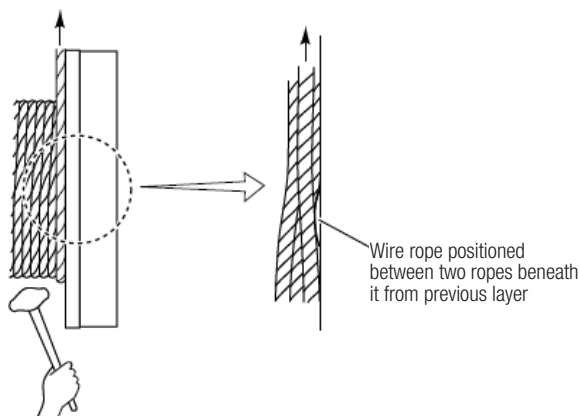
4. Turn the winch slowly to wind the wire rope around the drum.
 - a. Start winding the wire rope at the guide on the edge of the winch drum (Figure 165).

Figure 165: Start winding wire rope at edge of winch drum



- b. For the first layer of wire rope winding, align the rope with the grooves of the winch drum.
 - c. For subsequent layers, position the wire rope between the ropes of the previous wire rope layer (Figure 166).

Figure 166: Wind subsequent layers of wire rope between ropes of previous layer



- d. Wind the wire rope onto the winch drum. Leave enough wire rope unwound to attach it to the hook block.

5. Reeve the rope through the boom and hook block sheaves in an appropriate pattern for the parts of line.
6. Pass the wire rope through the anti-two-block device weight.
7. Pass the wire rope through wire rope socket, and secure with wire clip.

NOTICE

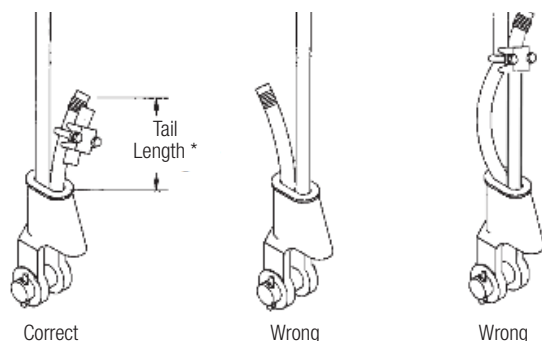
Always inspect socket, wedge and pin before using. Do NOT use parts showing cracks. Do NOT use modified or substitute parts. Repair minor nicks or gouges to socket or pin by lightly grinding until surface is smooth. Do NOT reduce original dimension more than 10%. Do NOT repair by welding.

Inspect permanent assemblies annually, or more often in severe operating conditions. Do NOT mix and match wedges or pins between models or sizes. Always select the wedge and socket for the wire rope size. Use only with standard 6- to 8-strand wire rope of designated size. For intermediate size rope, use next larger size socket.

For example: When using 9/16 in. diameter wire rope use a 5/8 in. size wedge socket assembly. Welding of the tail on standard wire rope is not recommended. Seizing of the tail is preferred following the recommended practices of the wire rope manufacture. The tail length of the dead end should be a minimum of 6 rope diameters but not less than 6 in..

To use with Rotation Resistant wire rope (special wire rope constructions with 8 or more outer strands) ensure that the dead end is welded, brazed or seized before inserting the wire rope into wedge socket to prevent core slippage or loss of rope lay. The tail length of the dead end should be a minimum of 20 rope diameters but not less than 6 in..

Figure 167: Install wire rope in socket



* Tail length
 Standard 6–8 strand wire rope
 A minimum of 6 rope diameters, but not less than 152 mm (6 in.)
 (i.e., for 25 mm (1 in.) rope: Tail length = 25 mm (1 in.) x 6 = 152 mm (6 in.)
 Rotation resistant wire rope
 A minimum of 20 rope diameters, but not less than 152 mm (6 in.)
 (i.e., for 25 mm (1 in.) rope: Tail length = 25 mm (1 in.) x 20 = 508 mm (20 in.)

- a. Align live end of wire rope, with center line of pin.
- b. Secure dead end section of rope. Do NOT attach dead end of wire rope to live end.
- c. Insert the lock pin and secure the rope socket to the hook block or boom head.

NOTICE

Always install the becket socket so the flat side is oriented toward the boom (Figure 167).

8. Apply first load to fully seat the wire rope and wedge and in the winch drum socket. This load should be of equal or greater weight than loads expected in use.

! WARNING

Efficiency rating of the wedge socket termination is based on the catalog breaking strength of wire rope. The efficiency of properly assembled wedge socket is 80%.

During use, do not strike the dead end section with any other elements of the rigging (two-blocking).

Do NOT allow a direct load to contact the wedge.

BREAK IN NEW WIRE ROPE BEFORE FIRST USE

 **CAUTION**

Do NOT lift a load with new-installed wire rope until completion the following procedure.

When wire rope is replaced, new wire rope wound around winch drum does not have correct tension. If a load is hoisted with wire rope in this condition, outer rope layer digs into the inner layer. This will deform the wire rope or cause uneven winding, cut wires, and other wire rope damage.

1. Extend the boom and unwind the new wire rope. Leave three (3) or more dead turns of wire rope on winch drum.
2. Lift a load approximately 10% of the allowable load per wire rope to provide tension to the wire rope, and then wind the rope tightly around the winch drum.

NOTICE

A new wire rope is prone to uneven winding.

3. If the wire rope is wound unevenly, unwind it and wind it again.

HANDLING WIRE ROPE

Always handle wire ropes carefully. If handled improperly, wire rope can become unusable, or must be replaced prematurely.

 **CAUTION**

NEVER handle wire rope with bare hands.

Wire rope may have sharp edges. **ALWAYS** wear heavy leather protective gloves.

DISENTANGLING WIRE ROPE

CAUTION

If a new wire rope is used with a long boom and a small number of parts of line, the rope can become tangled. This condition causes the hook block or a load to rotate and is dangerous.

1. Extend the track frames, and slew the boom to the rear or side of the GTC-1600.
2. Lower the boom fully, and place the hook block on the ground (**Figure 160, pg 7-38**).
3. Remove the wire rope socket from the hook block or boom head.
4. Let the rope socket turn freely until it no longer turns on its own.

WARNING

ALWAYS monitor the movement of the wire rope and rope socket. Wire rope twisting turns the rope socket.

5. Reattach the rope socket to the hook block.
6. Hoist the hook block up and down several times to make twists even throughout the rope.
7. If wire rope twists remain, remove the wire rope socket from the hook block or boom head. Twist the wire rope an additional half turn.

NOTICE

NEVER twist or untwist wire rope more than one turn at a time.

8. Hoist the hook block up and down several times to make twists even throughout the rope.
9. If twists remain, repeat steps 7–8.
10. Ensure the wire rope is wound neatly on the winch drum. If necessary, unwind and rewind it.

OTHER SPECIFICATIONS

NOTICE

Use a torque wrench for checking or re-tightening screws and bolts

Table 28: GTC-1600 fasteners torque values—SAE Grade 8

Coarse Thread Size	Foot Pounds (lb-ft)		Newton Meter (N•m)	
	1 ^ε	2 ^φ	1 ^ε	2 ^φ
1/4 20	9	12	12	16
5/16 18	18	25	25	33
3/8 16	33	44	44	59
7/16 14	52	70	71	94
1/2 13	80	106	108	144
9/16 12	115	154	156	208
5/8 11	159	212	215	287
3/4 10	282	376	382	510
7/8 9	455	606	617	822
1 8	682	909	924	1233
1-1/8 7	966	1288	1309	1746
1-1/4 7	1363	1817	1848	2464
1-3/8 6	1787	2382	2423	3231
1-1/2 6	2371	3162	3215	4288
1-3/4 5	3117	4157	4227	5637
2 4-1/2	4688	6251	6356	8477
2-1/4-4-1/2	6855	9142	9296	12397
2-1/2-4	9375	12503	12713	16953
2-3/4-4	12710	16950	17235	22985
3-4	16791	22391	22768	30364

^ε Torque for threaded parts that are clean, free of rust and contamination, and are well lubricated with 30 weight motor oil.

^φ Torque for threaded parts that are clean, free of rust and contamination, and are dry.

All plates (yellow galvanized) bolts are to use the *1 (lubricated) columns for torque wrench setting and hydraulic torque wrench settings. The threads are to be clean, but do not apply the actual lubricant. The plating is the lubricant.

Table 29: GTC-1600 fasteners torque values—property class 10.9

Coarse Thread Size	Foot Pounds (lb-ft)		Newton Meter (N•m)		Nominal Wrench Size	
	1 ^γ	2 ^η	1 ^γ	2 ^η	H Hex Cap Screw	Wrench Size
M3	1.0	1.4	1.4	1.9	M3	5
M4	2.4	3.2	3.2	4.3	M4	7
M5	4.9	6.5	6.6	8.8	M5	8
M6	8.3	11.0	11.2	15.0	M6	10
M8	20.2	27.0	27.4	36.6	M8	13
M10	40.2	53.6	54.5	72.6	M10	15
M12	70.2	93.6	95.2	127	M12	18
M14	112	150	152	203	M14	21
M16	176	234	238	318	M16	24
M18	277	370	376	502	M18	
M20	343	458	466	621	M20	30
M22	471	627	638	850	M22 (HH)	36
M24	594	791	805	1073	M24	36
M27	875	1167	1187	1583	M27 (HH)	46
M30	1184	1579	1606	2141	M30	46
M33	1806	2408	2449	3265	M33	
M36	2075	2767	2814	3752	M36	55
M39	3047	4062	4131	5508	M39	

^γ Torque for threaded parts that are clean, free of rust and contamination, and are well lubricated with 30 weight motor oil.

^η Torque for threaded parts that are clean, free of rust and contamination, and are dry.

All plates (yellow galvanized) bolts are to use the *1 (lubricated) columns for torque wrench setting and hydraulic torque wrench settings. The threads are to be clean, but do not apply the actual lubricant. The plating is the lubricant.

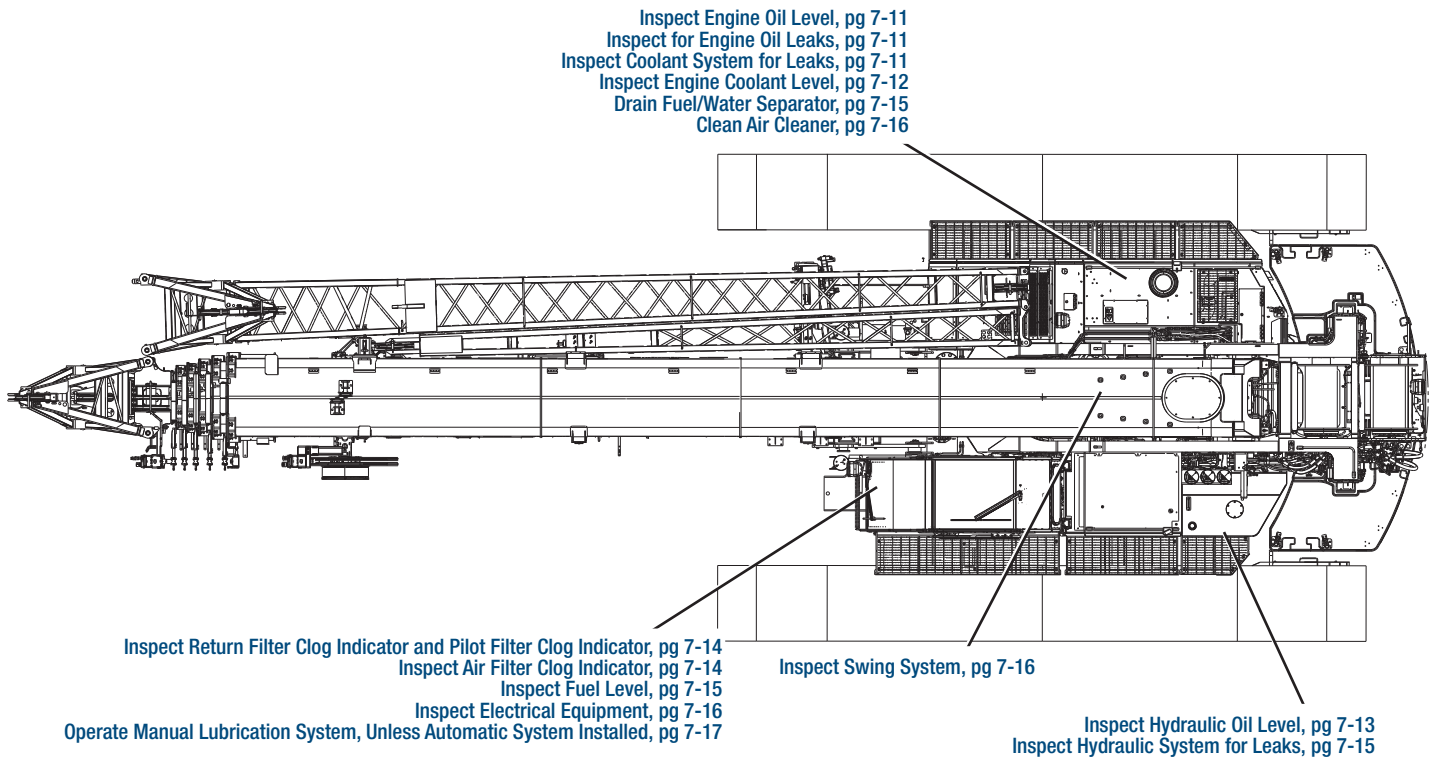
MAINTENANCE—VISUAL OVERVIEWS
Figure 168: Daily (before startup) inspection scheme


Figure 169: Fluid level inspection and change

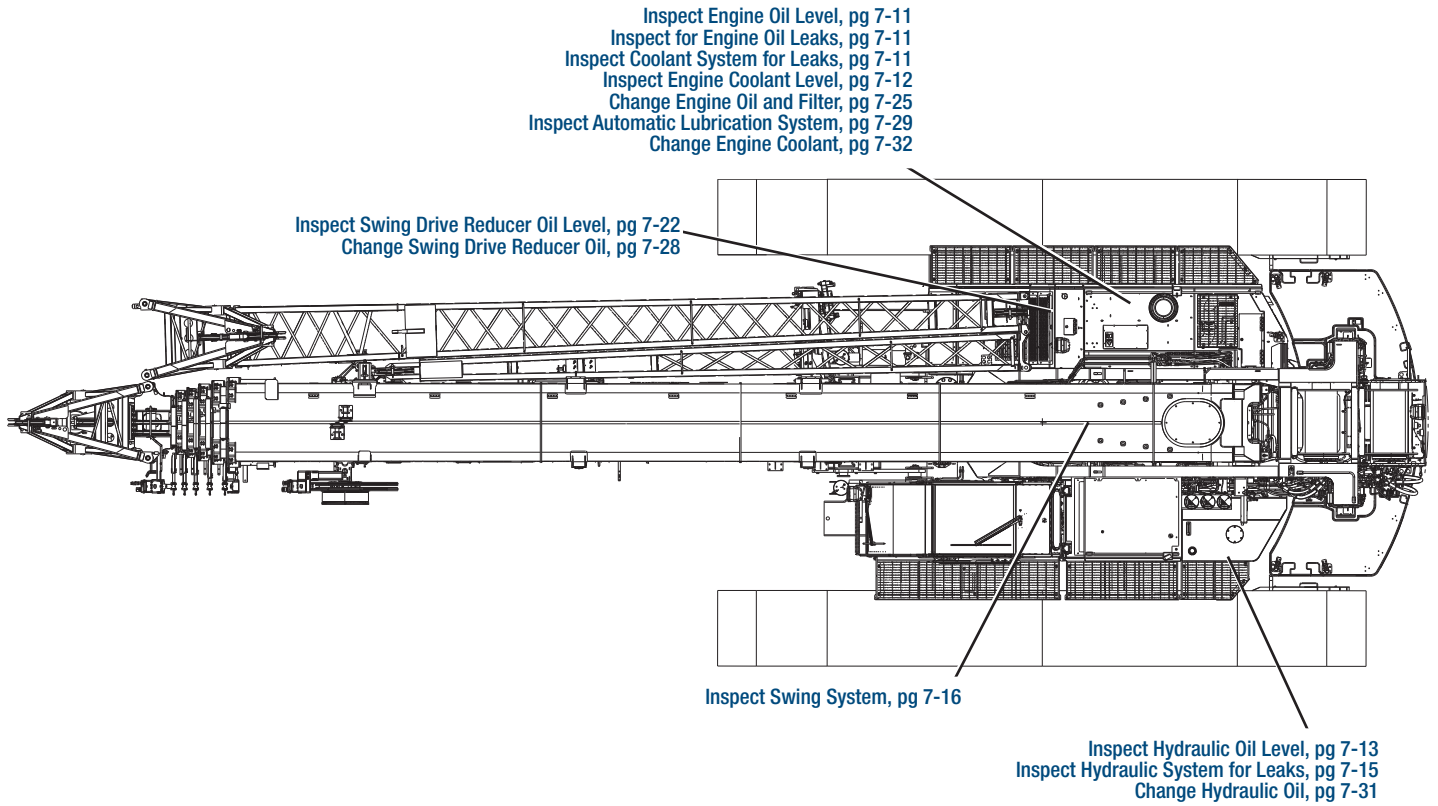
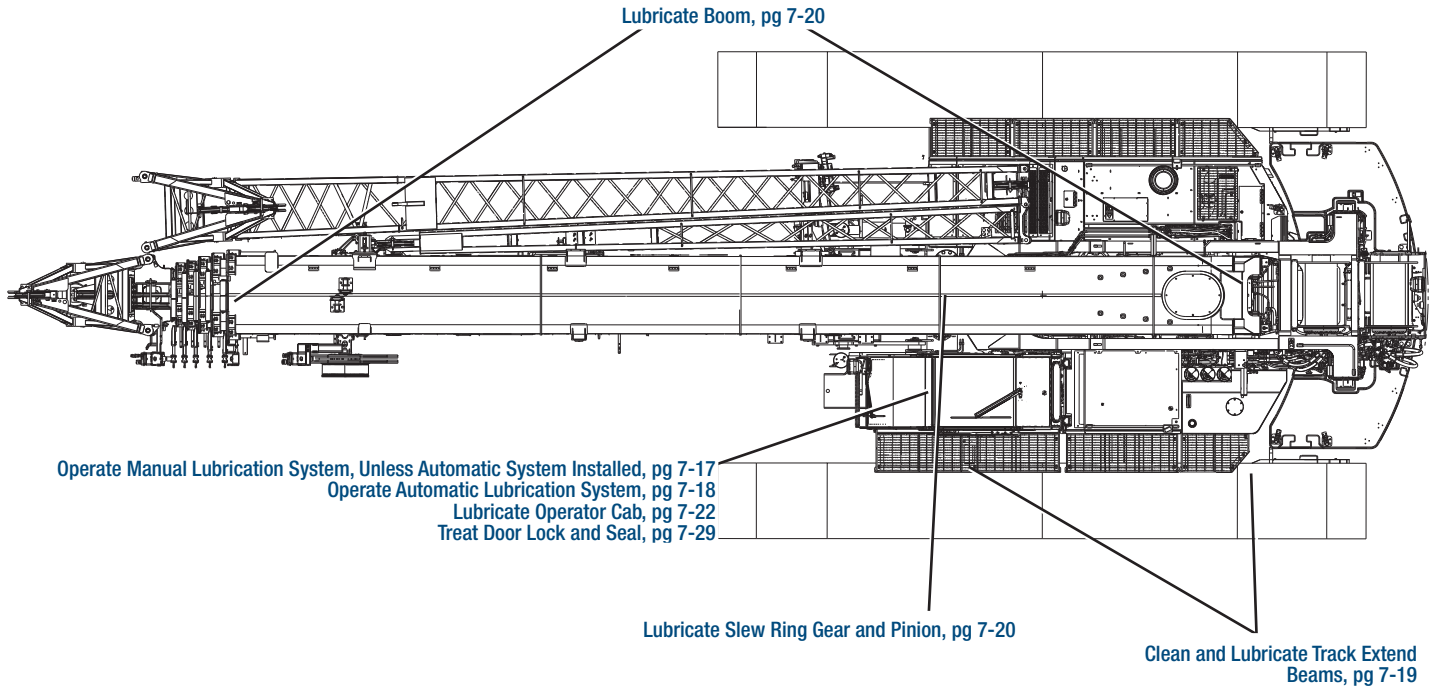


Figure 170: Lubrication points



CHAPTER 8: BACKUP SYSTEM OPERATION

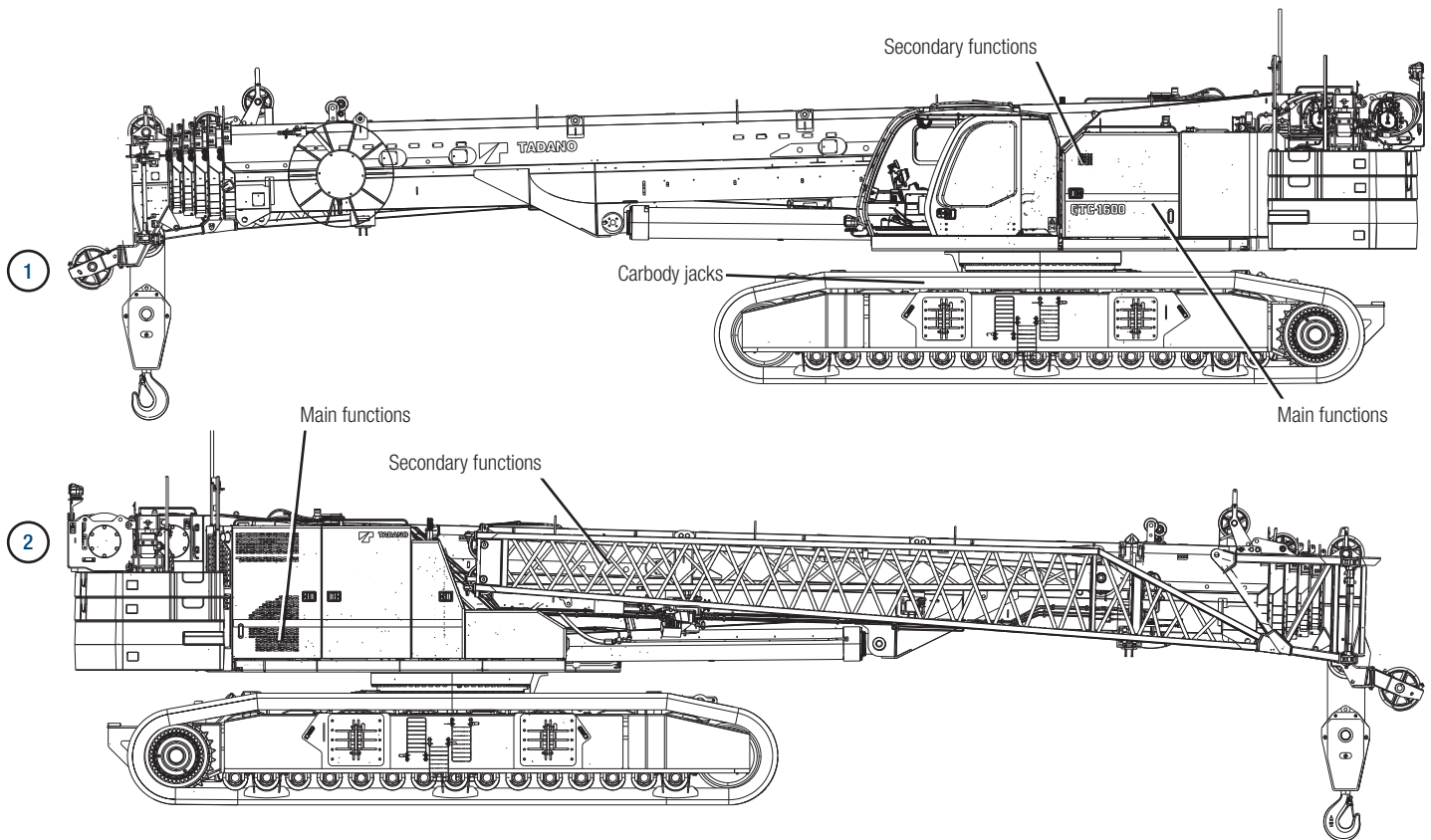
BACKUP CONTROL SYSTEM

NOTICE

In the event of an electrical system or CAN BUS failure, some or all of the GTC-1600 functions may be inoperable.

If GTC-1600 functions are inoperable and it is necessary to operate the crane to move it to a different location for service or to reposition it for safety, it is possible to bypass the normal control system and operate one or two functions at a time. Main functions can be operated by manual control levers on the directional control valves. Secondary functions are operated manually via push pins in the solenoids for each valve. These controls are located behind the compartment doors shown in **Figure 171**.

Figure 171: Backup controls locations



		Systems Controlled	
1	Main functions	Swing, Left and Right Travel, Main and Aux Winch, Boom Hoist, Boom Telescope	
	Secondary functions	Cab Tilt, Counterweight Cylinders, Boom Foot Pin Removal (Optional), Carbody Jacks	
2	Main functions	Jib Tilt, Left and Right Track Extend/Retract	
	Secondary functions	Jib Pin, Jib Stow, Boom Elevation Cylinder Pin Removal (Optional)	

⚠ DANGER

Use backup controls only if normal cab controls are not operable and the GTC-1600 must be repositioned for safety or service. Main functions will operate slowly when using the manual control lever override. Secondary functions will operate at full speed. NEVER use backup control system for normal operation.

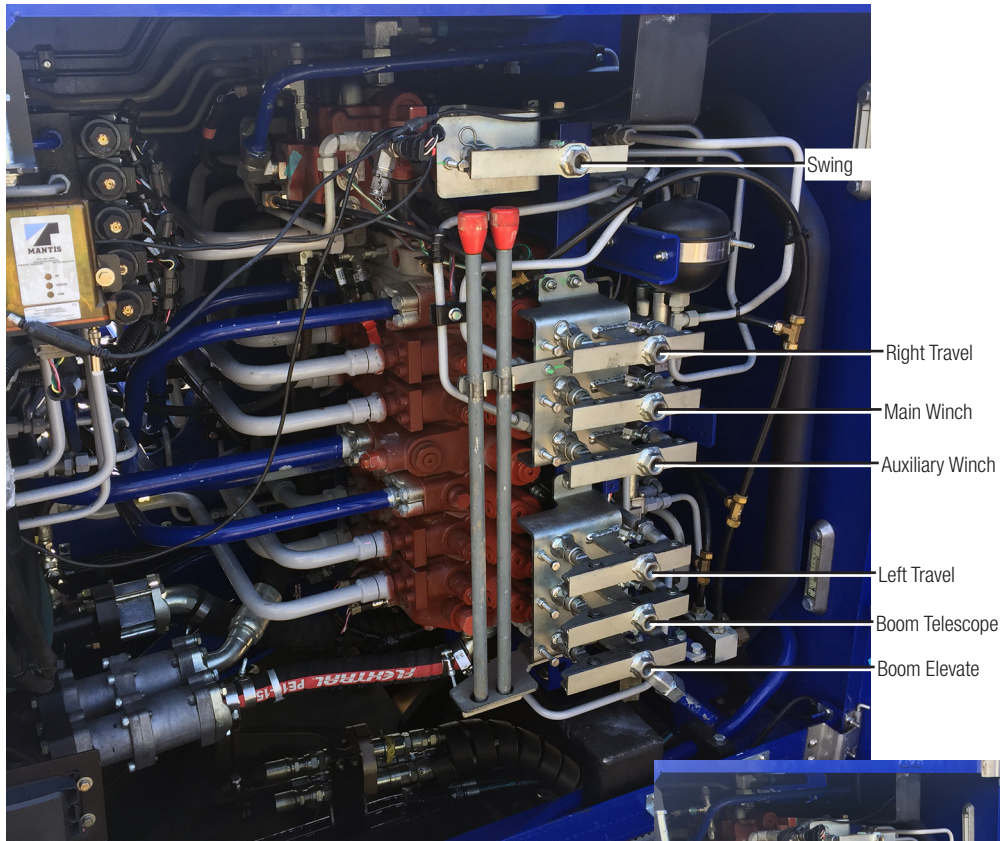
The operator is responsible for ensuring safe operation when using the backup control system, as all normal interlocks are bypassed, including but not limited to the following: seat and armrest switch, AML and A2B, and winch last wrap indication.

OPERATING MAIN FUNCTIONS

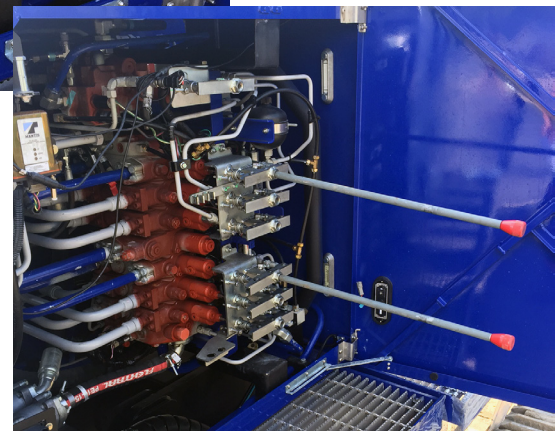
The GTC-1600 comes with two (2) manual control lever handles.

NOTE: If numerous functions are required, the manual control valve lever handles may need to be removed from one directional control valve and moved to the desired valve.

Figure 172: Manual control valves



Manual Control Handles Stowed



Manual Control Handles Installed

1. Locate the manual control handles stowed near the main valve.
2. Identify the function(s) to be operated (**Figure 172**) and install the manual control handles in the desired valves.

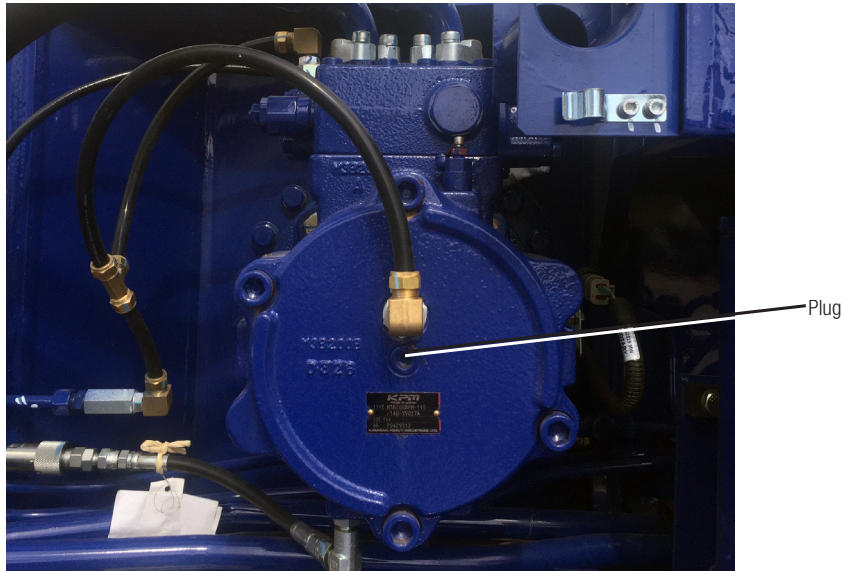
NOTE: If necessary, identify desired control valve via attached wire harness labels.

3. Move the manual control levers(s) in the desired direction for that function.

NOTE: Operation is proportional—the farther the handle is moved the faster the function operates.

4. To rotate the winches, manually release the winch motor brake before starting winch operation. Remove the plug from the center of the winch motor brake.

Figure 173: Winch motor brake

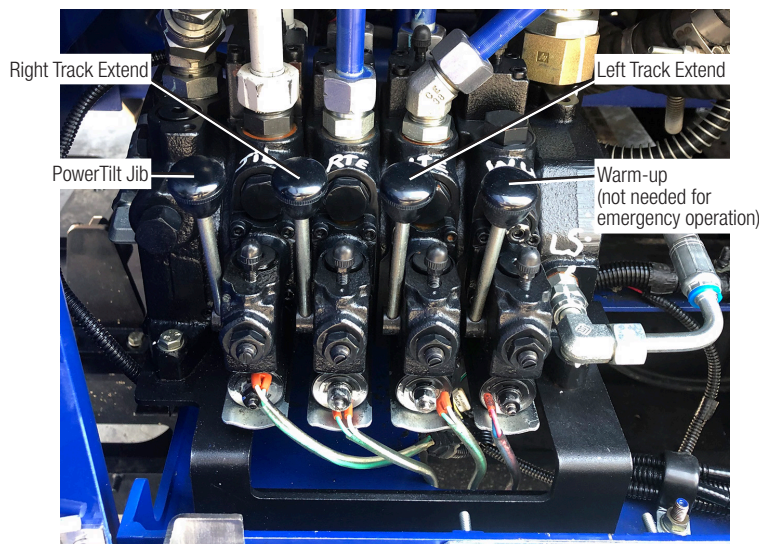


5. Replace the plug with an M16-2.0 x 45 bolt. Turn the bolt 1.5 rotations clockwise to fully release the brake. The bolt will push on the brake piston and it will move 0.12 in. (3 mm) and then hit a mechanical stop.

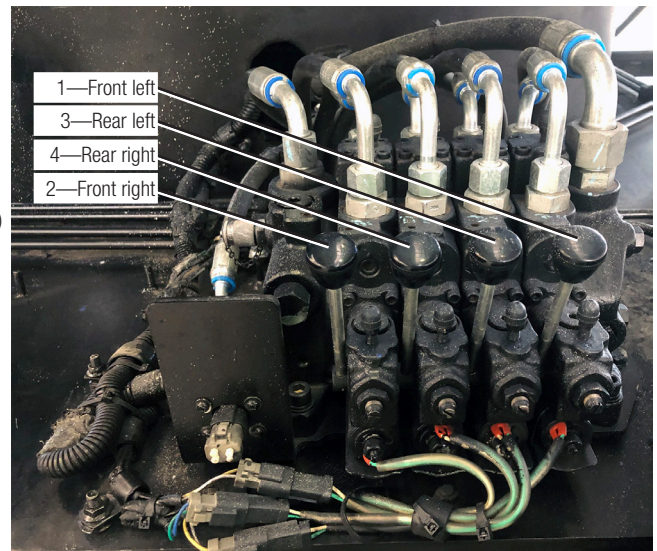
NOTE: A suspended load will be held hydraulically by the counterbalance valves.

6. When winch operation is finished, remove the M16-2.0 x 45 bolt and replace the original plug.
7. After the GTC-1600 is repositioned, release the manual control levers to return the control valve back to the neutral position.

Figure 174: Auxiliary and carbody jack valves



Auxiliary Valve



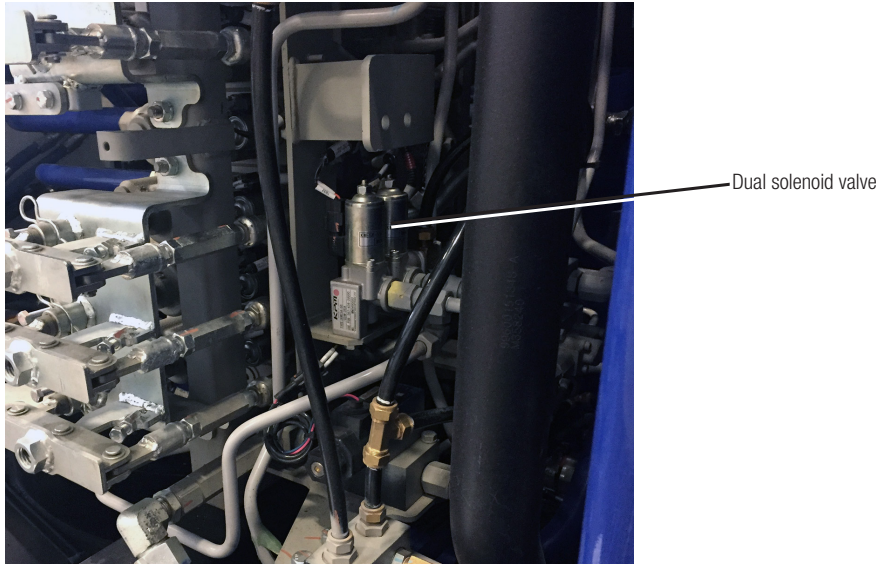
Carbody Jack Valve

NOTICE

To operate swing with the manual handle, the swing brake must be released.

1. Locate the dual solenoid valve on the rear side of the main valve. The swing brake release is the outboard solenoid on that valve.

Figure 175: Dual solenoid valve



2. Loosen the locknut on top of the solenoid.

WARNING

The next step will allow the GTC-1600 to swing freely. Be prepared for sudden movement.

4. With a flathead screwdriver, turn the shaft clockwise 2.5 turns to activate the swing brake release.

NOTICE

Manually releasing the swing brake with the solenoid valve will damage the solenoid valve—necessitating replacement.

Do NOT manually release the swing brake unless absolutely necessary.

Replacement solenoid part number is 367.426.25010.

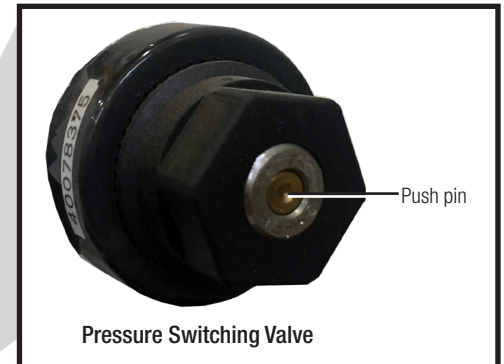
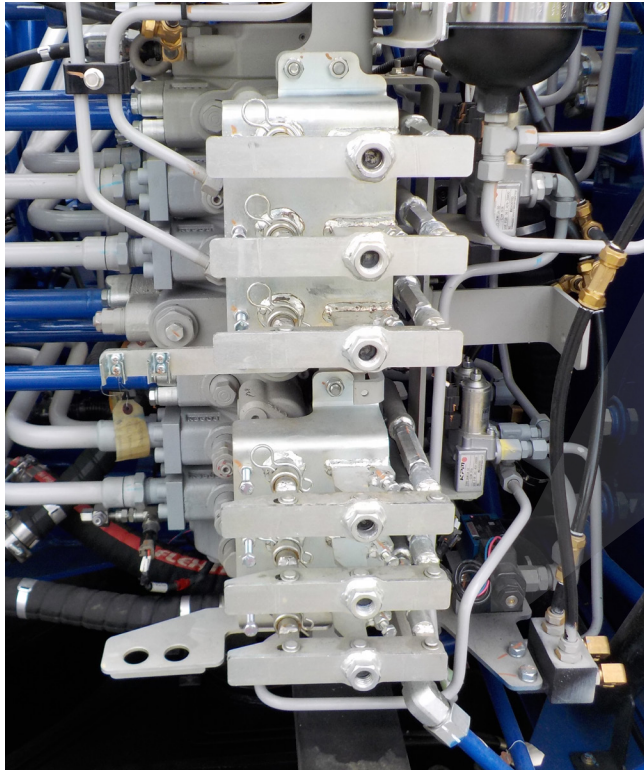
OPERATING SECONDARY FUNCTIONS

To operate the secondary functions, it is necessary to actuate a valve in one location to enable high pressure and activate a valve in another location to activate the function. Some functions can be activated at low pressure without activating the high pressure circuit, but will operate at lower speeds.

ENABLING HIGH PRESSURE

1. Locate the pressure switching valve to enable high pressure to the circuit.

Figure 176: High pressure valve and push pin closeup



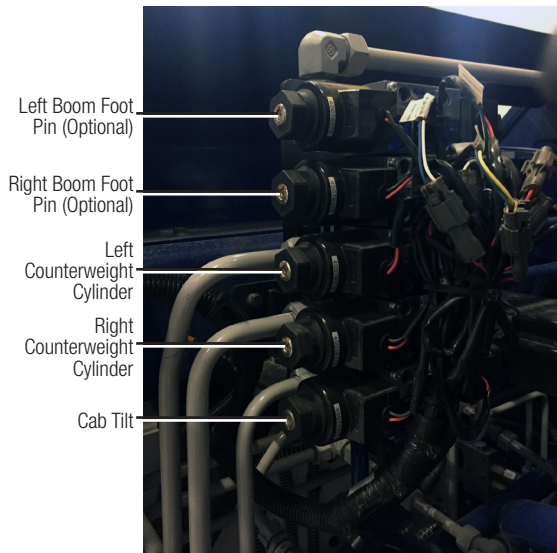
2. Locate the push pin in the end of the solenoid. Use a small rod, such as a punch, to press the push pin.

NOTE: When the pin is depressed, high pressure is enabled in the circuit. Pressure will remain in the circuit until the pin is released.

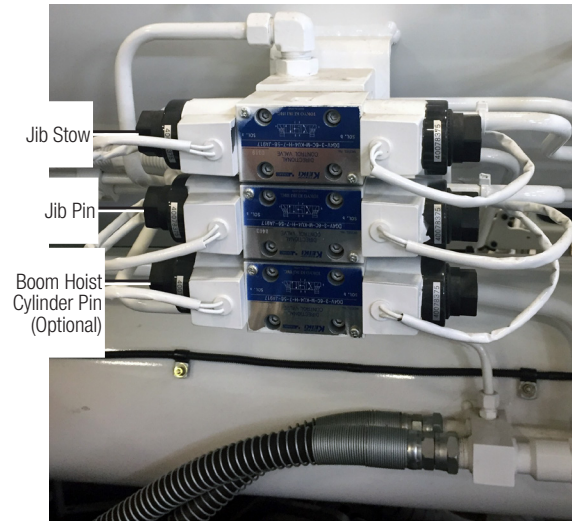
ACTIVATING THE FUNCTIONS

1. Locate the valve section(s) for the necessary functions. For the jib pin, stow cylinders, or boom hoist cylinder pin operate the cylinder, then remove the cover from the valve on the right side of the boom.

Figure 177: Secondary function valves



Valve behind Cab



Valve on Boom

WARNING

Use caution working in close proximity to the jib

2. Each valve section has a manual push pin in the end of the solenoid (one for each direction). Use a small rod, such as a punch, to press the push pin.

NOTE: When the pin is depressed, the function will operate, and will continue until the pin is released.

CHAPTER 9: EMERGENCY BOOM OPERATION

EMERGENCY BOOM OPERATION OVERVIEW

WARNING

Do NOT travel or operate the crane if the machine is out of order. Traveling or operating the crane while faults are present can cause a serious accident. Follow emergency procedures, and then contact a TADANO distributor or dealer for inspection and maintenance.

IF BOOM TELESCOPE IS NOT POSSIBLE

If the boom cannot be telescoped due to a machine failure or machine conditions, the Emergency Telescope Operation icon (Figure 178) or an error code and a message will display on the MFD.

Figure 178: Emergency Telescope Operation icon



Check the Warning and Control System Error Display section on the MFD (Figure 91, pg 6-11) and complete recovery operations:


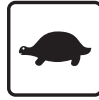
- **When the C-Pin Position or B/C-Pin Sensor Fails, pg 9-5**
- **When the C-Pin Position and B/C-Pin Sensors Work Properly, but the Cylinder Length Detector Fails, pg 9-15**
- **When the MFD or Telescope Control Output Fails, but the Cylinder Length, C-Pin Position, and B/C-Pin Sensors Function Normally, pg 9-24**

NOTICE

When performing emergency telescope operation:

- Do NOT operate the boom with a load lifted. Lower any load to the ground before performing emergency telescope operation.
- Set the boom angle to 63° or more (when jib is mounted, 78° or more).
- Perform B-Pin removal operation while C-Pins are locked.
- Perform C-Pin removal operation while B-Pins are locked.
- Operate slowly. Do NOT abruptly elevate boom.
- Perform operation with engine speed at idle.
- When engine speed is raised with the Idling Adjuster switch, turn the switch to SLOW and keep the engine speed at idle.
- Display the Telescope Status page on the MFD to monitor telescope conditions.

Table 30: Boom telescope MFD icons and errors¹

Icon or Error Message	Cause	Remedy
	Low temperature, B-Pins and C-Pins operate slowly.	<p>Perform warm-up operation. When the hydraulic oil temperature rises, attempt to operate again.</p> <ul style="list-style-type: none"> • If the ambient temperature is 32 °F (0 °C) or over and the Low Temperature Telescope Mode icon displays on the MFD, refer to Cancel Cold Weather Telescope Mode, pg 6-77. • If the status does not return to normal, refer to When the C-Pin Position or B/C-Pin Sensor Fails, pg 9-5 to retract the boom.
	The boom angle is too small or the engine speed is too low.	Return the joysticks to the neutral position. Raise the boom angle and engine speed before attempting boom telescope operation again.
E2089 "Boom section detection trouble"	Cylinder length detector failure, or wire rope is wound poorly.	<p>Tap the ET1 icon on the MFD to highlight it. Extend/retract boom several times—to extend/retract the telescope cylinder within 26.25 ft (8 m) range. Tap the ET1 icon again, and telescope the boom normally.</p> <ul style="list-style-type: none"> • If the status does not return to normal, refer to When the C-Pin Position or B/C-Pin Sensor Fails, pg 9-5 and retract the boom.
E2090 "B-Pin detection trouble"	—	<p>Return the joysticks to the neutral position and telescope the boom again.</p> <ul style="list-style-type: none"> • If the status does not return to normal, refer to When the C-Pin Position or B/C-Pin Sensor Fails, pg 9-5 and retract the boom.
E2091 "C-Pin detection trouble"		
E2092 "B, C-Pin trouble"		
E2093 "Boom section - C-Pin det. trouble"		
E2119 "Boom section - B-Pin det. trouble"		
E2134 "Tele-ID fault on both sides"		
E2022 "Boom tele CYL length trouble"		
E8010 "PWM0 upper limit over (TTC30)"	Telescope control output (etc.) of the controller is faulty.	<p>Refer to When the MFD or Telescope Control Output Fails, but the Cylinder Length, C-Pin Position, and B/C-Pin Sensors Function Normally, pg 9-24 and retract the boom.</p>
E8011 "PWM1 upper limit over (TTC30)"		
E8023 "PWM0 OFF trouble (TTC30)"		
E8024 "PWM1 OFF trouble (TTC30)"		
E8036 "PWM0 ON trouble (TTC30)"		
E8037 "PWM1 ON trouble (TTC30)"		

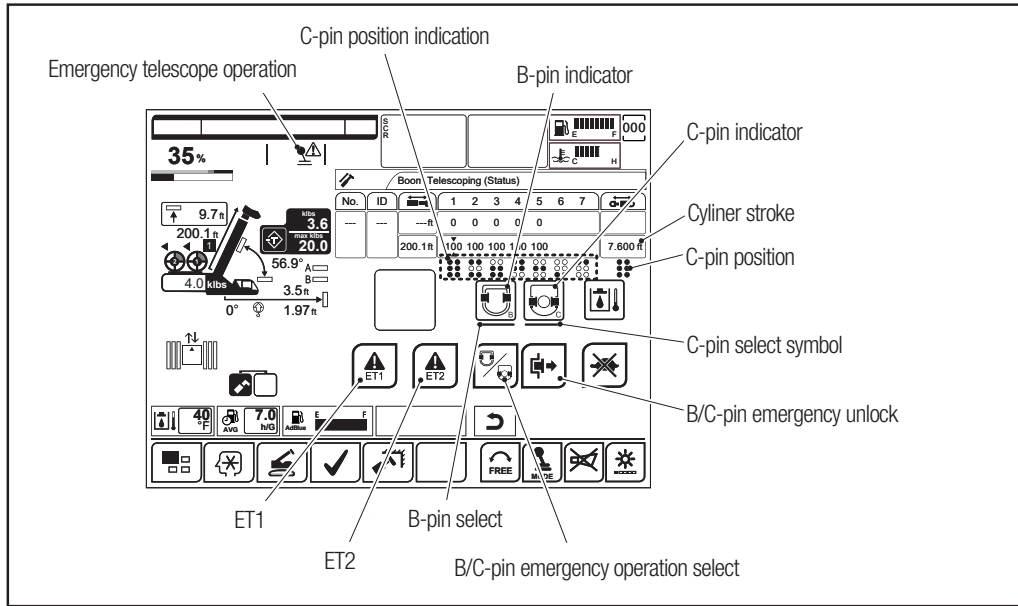
¹ See **Boom Telescope on MFD, pg 6-64** for more information.

If boom telescope is not possible after recovery operation, contact your TADANO Dealer or TADANO Customer Support at (833) TADANO1 (823-2661) for more information..

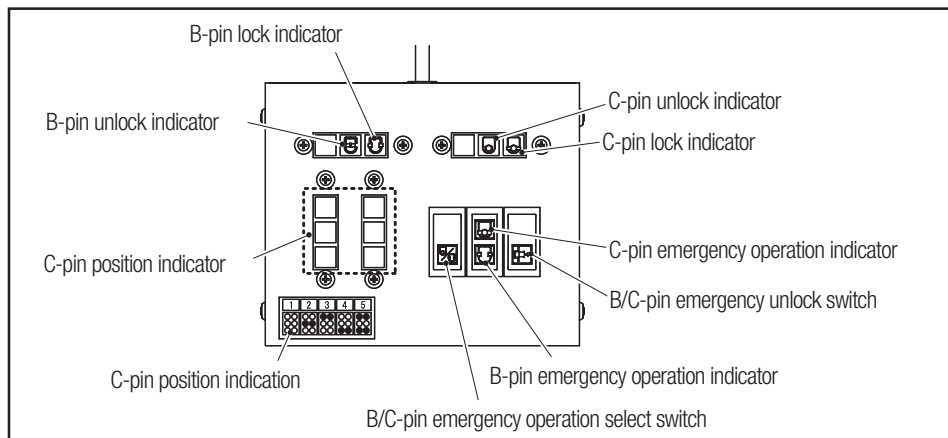
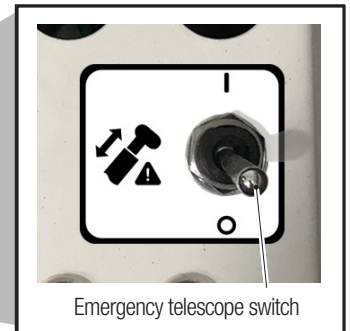
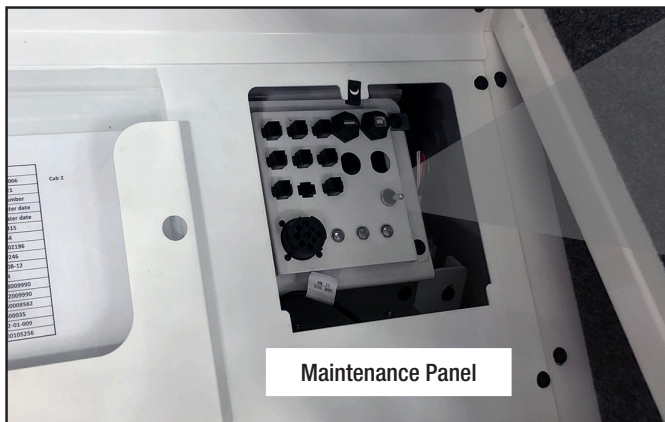
MONITOR MFD DURING EMERGENCY TELESCOPE OPERATION

Monitor the condition of emergency telescope operation on the Telescope Status page.

Figure 179: Pin position indicators and emergency telescope controls



Multifunction Display



Emergency Telescope Operation Box

Table 31: Using MFD for emergency telescope operation

Mode / Operation Status		Telescope Status on MFD																											
Normal	—	<p>An icon that shows the direction of an operation displays.</p> <p>Boom Telescoping (Status)</p> <table border="1"> <thead> <tr> <th>No.</th> <th>ID</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> </tr> </thead> <tbody> <tr> <td>8</td> <td>25</td> <td>200.1R</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td></td> </tr> <tr> <td></td> <td></td> <td>42.8R</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>3.61 ft</td> </tr> </tbody> </table> <p>ET1 icon is not highlighted.</p> <p>Operation guide icon is visible.</p>	No.	ID	1	2	3	4	5	6	7	8	25	200.1R	100	100	100	100	100				42.8R	0	0	0	0	0	3.61 ft
No.	ID	1	2	3	4	5	6	7																					
8	25	200.1R	100	100	100	100	100																						
		42.8R	0	0	0	0	0	3.61 ft																					
Emergency Telescope 1	ET1 icon is tapped	<p>ET1 icon is highlighted</p> <p>Emergency telescope warning</p> <p>ET1 icon is highlighted.</p> <p>Emergency telescope warning bar at 0%.</p> <p>ET1 button is highlighted.</p>																											
Emergency Telescope 2	ET2 icon is tapped in emergency telescope 1 mode	<p>ET1 icon and ET2 icon are highlighted</p> <p>Emergency telescope warning</p> <p>ET1 icon and ET2 icon are highlighted.</p> <p>Emergency telescope warning bar at 0%.</p> <p>ET2 button is highlighted.</p>																											
Emergency Operation ^φ	<p>The Emergency Telescope switch is toggled to EMERGENCY.</p> <p>To carry out an emergency operation, use the emergency telescope operation box.</p>	<p>EMERGENCY</p> <p>NORMAL</p> <p>Emergency telescope switch</p> <p>Emergency telescope operation box</p> <p>Emergency telescope warning</p>																											

^φ In this mode, joysticks are non-functional—MUST use the handle on the valve.

WHEN THE C-PIN POSITION OR B/C-PIN SENSOR FAILS

- If during Telescope Operation, the Boom Extends/Retracts, pg 9-7
- If during Telescope Operation, the Telescope Cylinder Extends/Retracts, but the Boom Does Not, pg 9-10
- If during Telescope Operation, Neither the Telescope Cylinder Nor the Boom Extends/Retracts, pg 9-14

Before performing emergency telescope operation:

1. Press the AML Override switch, and hold for the duration of Steps 2–3.
2. Access the Telescope Status page (tap the Set icon on the Telescope Pattern page) on the MFD.
3. Tap the ET1 icon (icon should highlight).

OPERATE WITH MFD

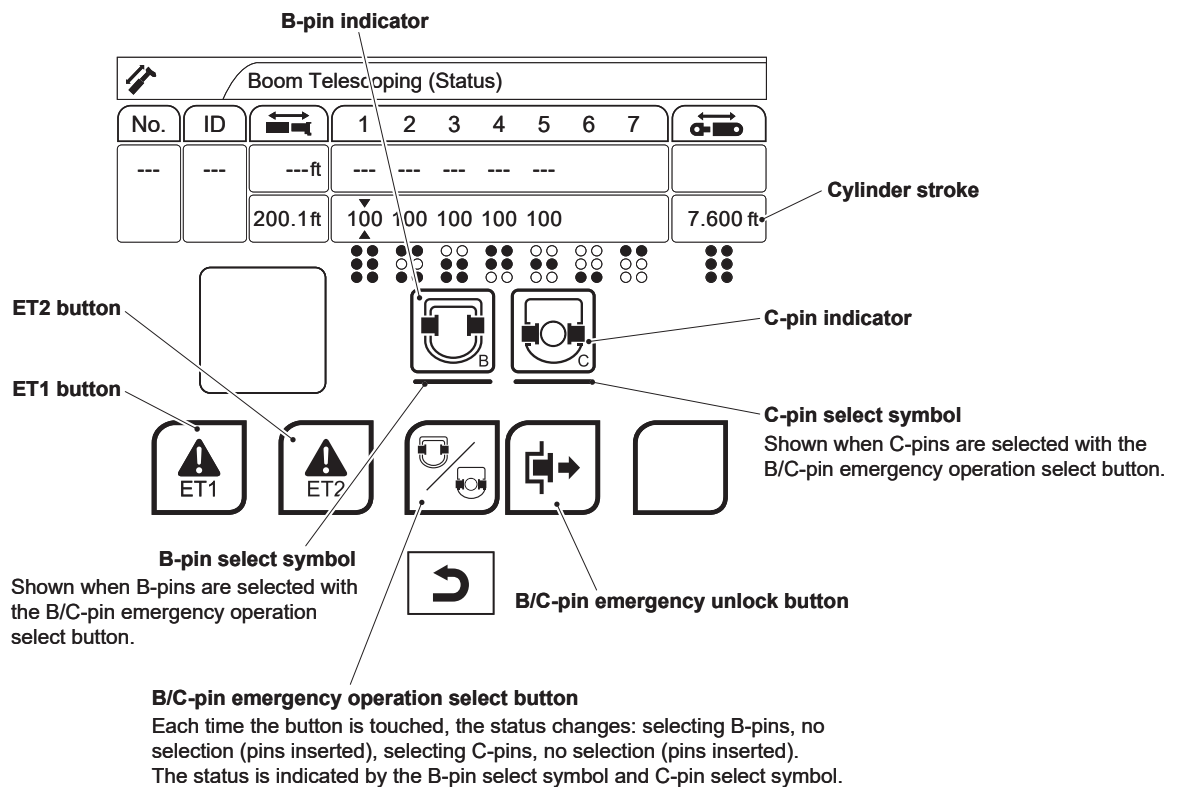
NOTICE

Do NOT turn off power while the B-Pins and/or C-Pins are removed.

Doing so will cause the pins to extend to the lock side by spring force. If the power has been turned off while the pins are removed, perform pin removal operation again when power is restored.

Tapping the ET1 icon will highlight it and cause the telescope cylinder to extend/retract with joystick controls. To operate the B-Pins and C-Pins manually, use the B/C-Pin Emergency Operation Select icon and the B/C-Pin Emergency Unlock icon.

Figure 180: Operating B-Pins and C-Pins manually



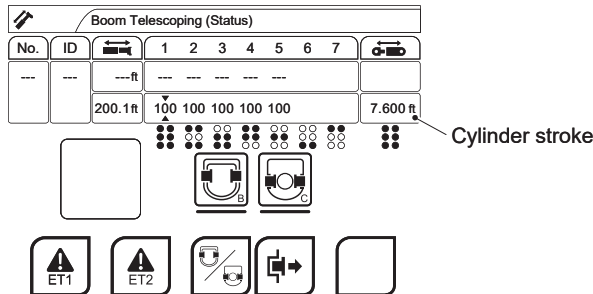
- **B-Pin Unlock Operation**—Tap the B/C-Pin Emergency Operation Select icon to display the B-Pin Select icon. Tap the B/C-Pin Emergency Unlock icon to retract the B-Pins to the unlock side.
- **B-Pin Lock Operation**—Tap the B/C-Pin Emergency Operation Select icon and enter the no selection status (B-Pin and C-Pin Select icons are not shown) to extend the B-Pins to the lock side.
- **C-Pin Unlock Operation**—Tap the B/C-Pin Emergency Operation Select icon to display the C-Pin Select icon. Tap the B/C-Pin Emergency Unlock icon to retract the C-Pins to the unlock side.
- **C-Pin Lock Operation**—Tap the B/C-Pin Emergency Operation Select icon and enter the no selection status (B-Pin and C-Pin Select icons are not shown) to extend the C-Pins to the lock side.

MONITOR MFD DURING EMERGENCY TELESCOPE OPERATION

The status of the B-Pins and C-Pins is displayed on the Telescope Status page of the MFD. If the Detection switch fails, the information on the Telescope Status page may be incorrect. However, the cylinder stroke value of the telescope cylinder will be correct.

NOTE: This section assumes the Boom Telescope Status page is correct.

Figure 181: Boom Telescope status page



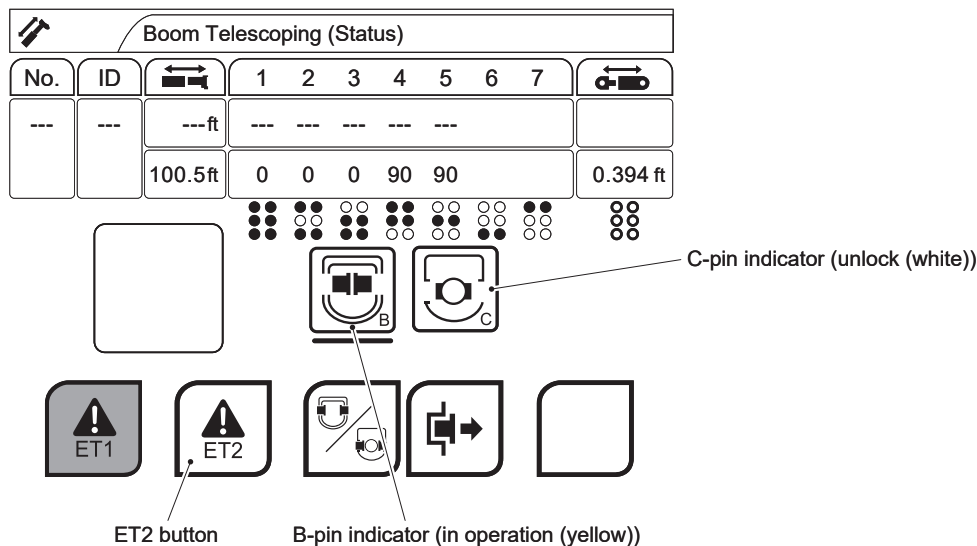
RETRACT BOOM

Retract the boom section nearest to the base section first. When telescope sections 4 and 5 are extended, retract section 4 first. If the Detection switch fails (or a detection error occurs) during boom telescope operation and the Telescope Status page appears as seen in **Figure 182**, telescope cylinder operation will stop. In this condition, the telescope cylinder cannot activate in Emergency Telescope 1 Mode (via the ET1 icon). In this case, switch the emergency telescope operation mode from Emergency Telescope 1 Mode to Emergency Telescope 2 Mode, and stow the boom. While in Emergency Telescope 1 Mode, tap the ET2 icon (it will highlight) to enter Emergency Telescope 2 Mode. To change from Emergency Telescope 2 Mode to Emergency Telescope 1 Mode, tap the ET2 icon (this will cancel the highlight).

CAUTION

In the Emergency Telescope 2 Mode, telescope operation is possible regardless of the status of B-Pins or C-Pins. Use Emergency Telescope 2 Mode only when the B-Pin or C-Pin detector has failed (or detection error has occurred) and the boom cannot be stowed in the Emergency Telescope 1 Mode. If the telescope cylinder is extended/retracted while both the B-Pins and C-Pins are physically disengaged, the B-Pin and C-Pin locking mechanisms can be seriously damaged.

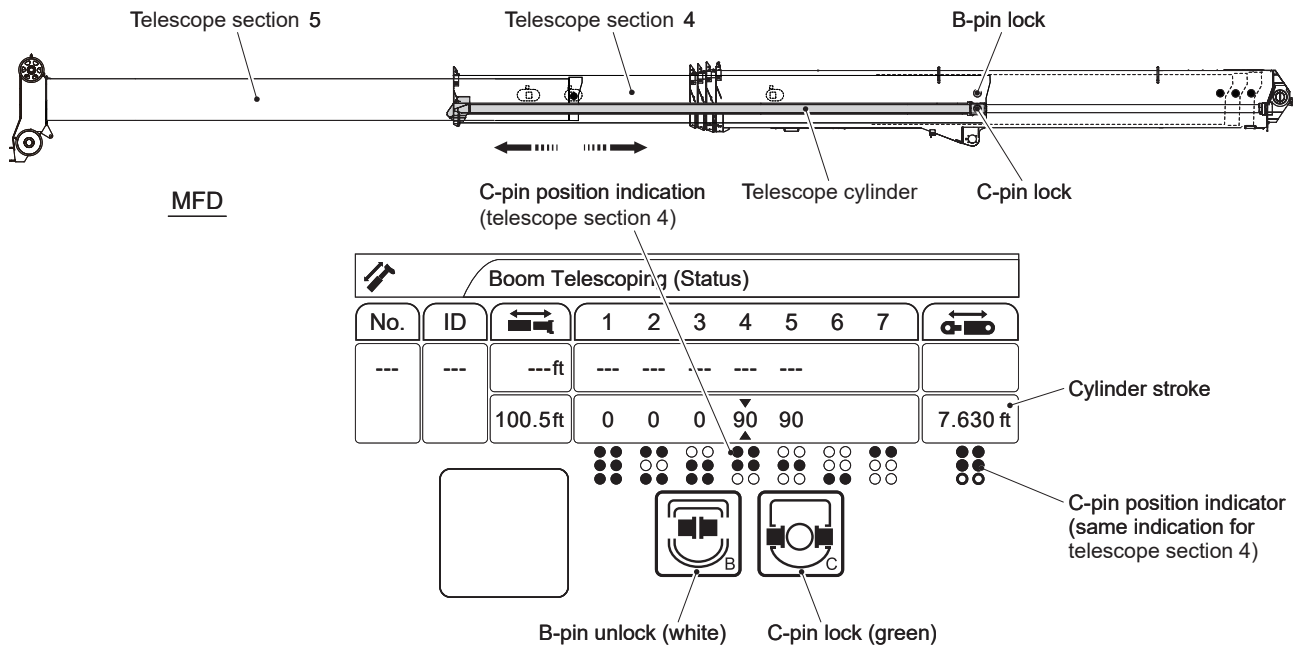
Figure 182: Telescope Status page requiring Telescope 2 Mode



IF DURING TELESCOPE OPERATION, THE BOOM EXTENDS/RETRACTS

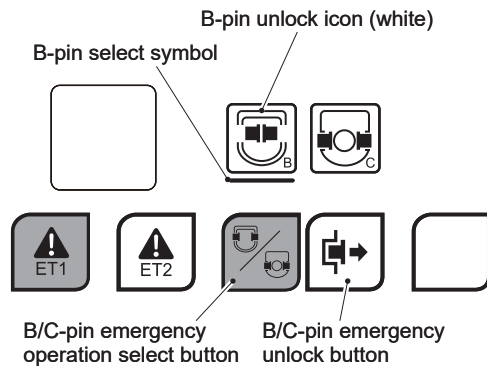
In this condition, the telescope section nearest the base section (telescope section 4 in this illustration) can be retracted. When the Detection switch is working correctly, the display should be as shown.

Figure 183: Telescope Status page—detection working correctly



1. Tap the B/C-Pin Emergency Operation Select icon and select the B-Pins. The B-Pin Select icon will display. If the boom can be extended/retracted, but the B-Pin Unlock icon (white) is not shown, tap the B/C-Pin Emergency Unlock icon to unlock the B-Pins. Once the B-Pins are completely withdrawn and the B-Pin Unlock icon has changed from yellow to white, release the icon.

Figure 184: B/C-Pin Emergency Operation Select icon and B-Pins



2. Fully retract the telescope section nearest the base section. The B-Pin Select icon will display. When a telescope section is fully retracted, the cylinder stroke indicated on the MFD should be close to the values shown in Table 32.

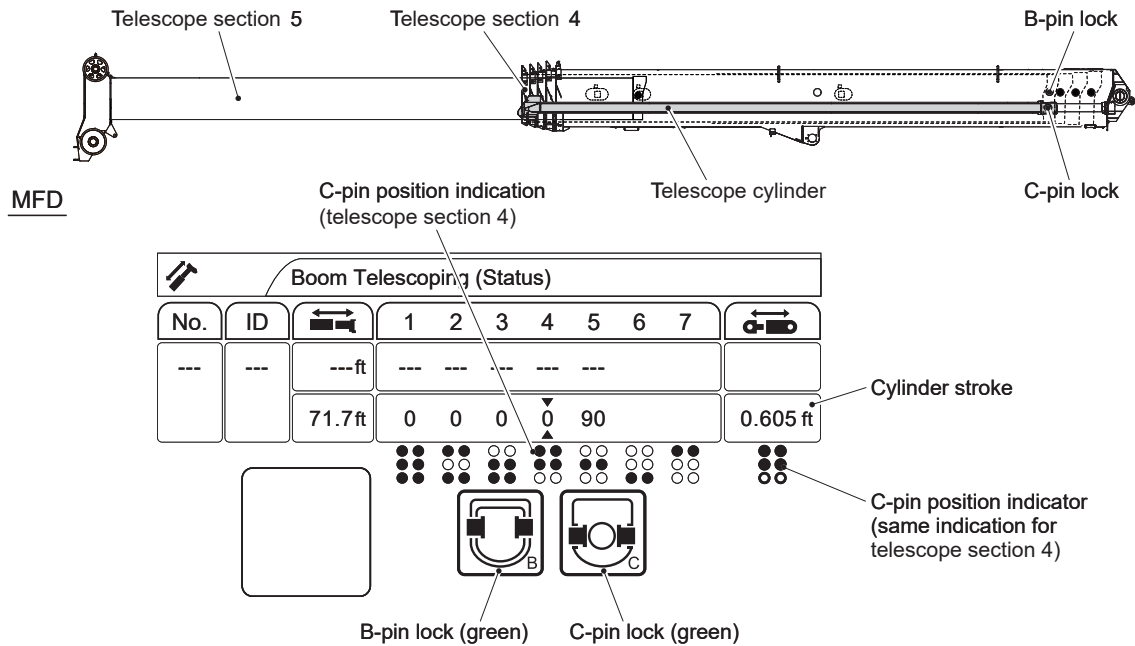
Table 32: Cylinder stroke value when a telescope section is fully retracted

Section 1	Section 2	Section 3	Section 4	Section 5
0.0 ft (0.00m)	0.92 ft (0.28m)	1.83 ft (0.56m)	2.72 ft (0.83m)	3.61 ft (1.10m)

3. Tap the B/C-Pin Emergency Operation Select icon (Figure 184, pg 9-7) and insert the B-Pins. The B-Pin Select icon will disappear. When the Detection switch is working correctly, the B-Pin Lock icon (green) will display.

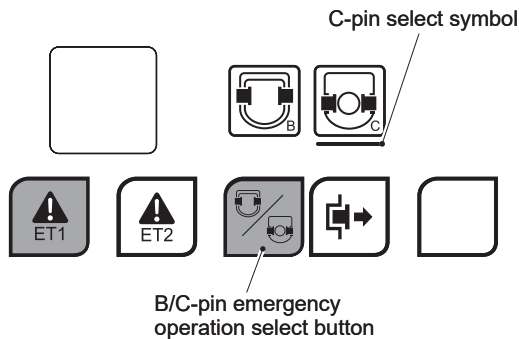
NOTE: After the B-Pins are inserted, the cylinder stroke will not change more than the amount of play in the pins, even when boom telescope operation is attempted.

Figure 185: Stowing telescope sections



4. Stow any remaining telescope sections, and stow the boom. When all the sections (up to telescope section 5) are retracted, this operation is complete.
 - a. Retract the boom and retract the telescope cylinder only by the amount of the pin hole looseness (until the cylinder stroke no longer changes).
 - b. Tap the B/C-Pin Emergency Operation Select icon and select the C-Pins. The C-Pin Select icon will display.

Figure 186: B/C-Pin Emergency Operation Select icon and C-Pin Select icon



- c. Staying within the appropriate cylinder stroke range (Table 33, pg 9-9), slowly extend boom while tapping/holding the B/C-Pin Emergency Unlock icon.

Table 33: Cylinder stroke values when the C-Pins are removed

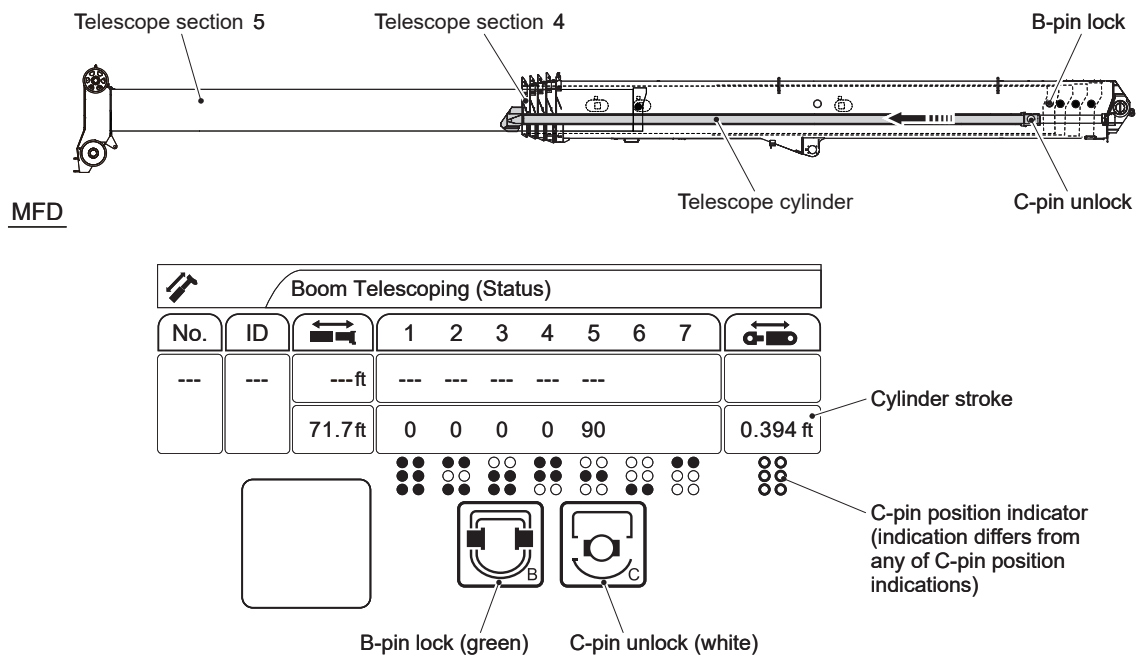
Section 1	Section 2	Section 3	Section 4	Section 5
-0.03–0.16 ft (-0.01–0.05 m)	0.75–1.08 ft (0.23–0.33 m)	1.67–2.00 ft (0.51–0.61 m)	2.56–2.89 ft (0.78–0.88 m)	3.44–3.77 ft (1.05–1.15 m)

- After the C-Pins are removed, the telescope cylinder is extended. Confirm that the C-Pins have been removed when the cylinder stroke value exceeds the upper limit value in [Table 33](#).
- When the Detection switch is working correctly, the C-Pin Unlock icon (white) is shown. When the cylinder stroke exceeds the upper limit value of [Table 33](#), C-Pin Position changes as seen in [Figure 187](#).

⚠ CAUTION

Do NOT remove C-Pin when outside the cylinder stroke range shown in [Table 33](#). This could severely damage interior boom components.

Figure 187: Cylinder stroke limits and C-Pin Position



- d. If the C-Pins cannot be removed, tap the B/C-Pin Emergency Operation Select icon—the C-Pin Select icon will disappear—and slowly retract the boom. Retract the telescope cylinder until the cylinder stroke no longer changes. Then, go back to Steps a–b and perform C-Pin removal operation again.
- e. Complete Steps 2–8 of [If during Telescope Operation, the Telescope Cylinder Extends/Retracts, but the Boom Does Not](#), [pg 9-10](#), and connect the extended telescope section and the telescope cylinder, so that the next telescope section is ready for telescope operation.

⚠ CAUTION

Do NOT remove the B-Pins and/or insert the C-Pins outside of the cylinder stroke ranges shown in [Table 34](#), [pg 9-11](#). This could severely damage the boom interior.

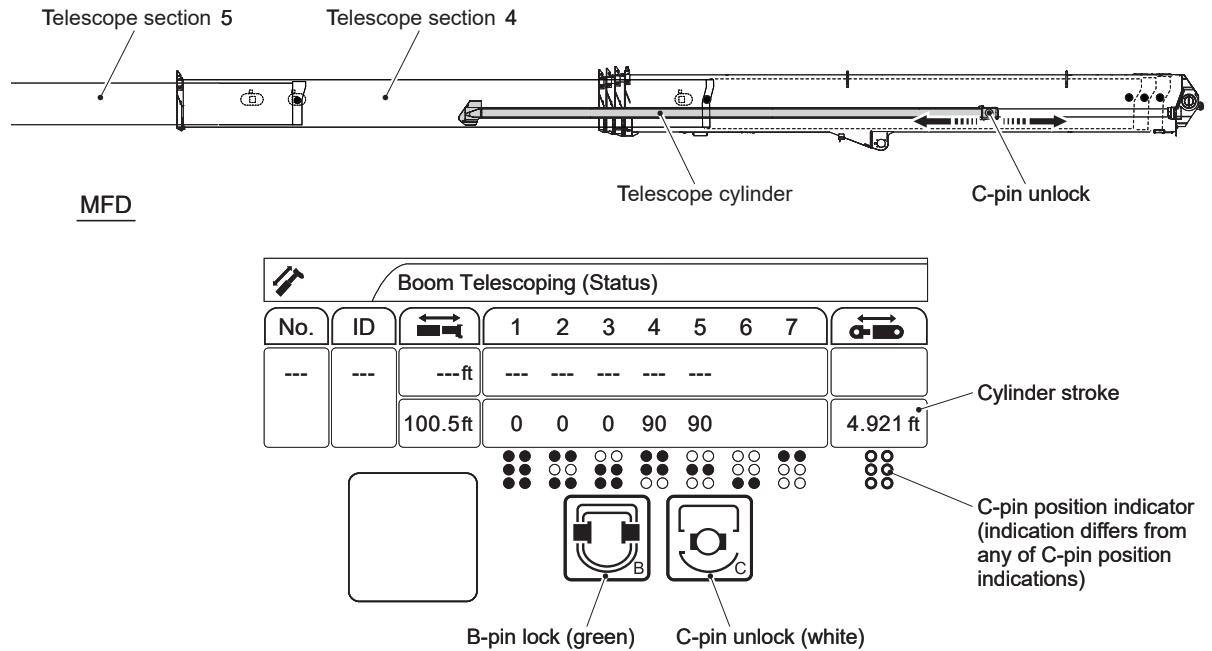
5. Go back to Step 2 and retract the next telescope section in sequence, until all sections are retracted.

IF DURING TELESCOPE OPERATION, THE TELESCOPE CYLINDER EXTENDS/RETRACTS, BUT THE BOOM DOES NOT

If during telescope operation, the telescope cylinder extends/retracts, but the boom doesn't, the telescope cylinder is not connected to the boom.

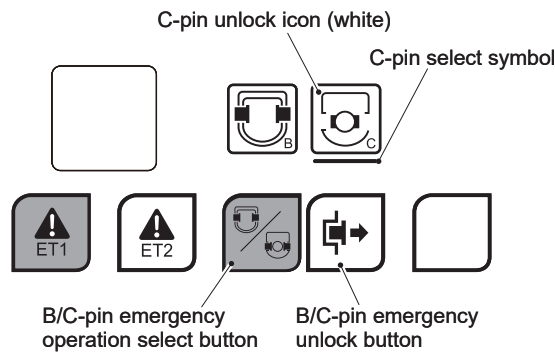
When the Detection switch is working correctly, the MFD should look like **Figure 188**. Connect the extended telescope section (telescope section 4 in this illustration) and the telescope cylinder, so that the boom can be stowed.

Figure 188: MFD when telescope cylinder is not connected to boom



1. Tap the B/C-Pin Emergency Operation Select icon and select the C-Pins. The C-Pin Select icon will display. If the telescope cylinder can be extended/retracted, but the C-Pin Unlock icon (white) is not displayed, tap the B/C-Pin Emergency Unlock icon to unlock the C-Pins. When the C-Pins are completely withdrawn and the C-Pin Unlock icon has changed from yellow to white, release the icon.

Figure 189: B/C-Pin Emergency Operation Select icon



2. Extend the boom and extend the telescope cylinder to the connection position of the next telescope section to be stowed. Extend so that the cylinder stroke shown on the MFD matches the lower limit value in **Table 34, pg 9-11**.

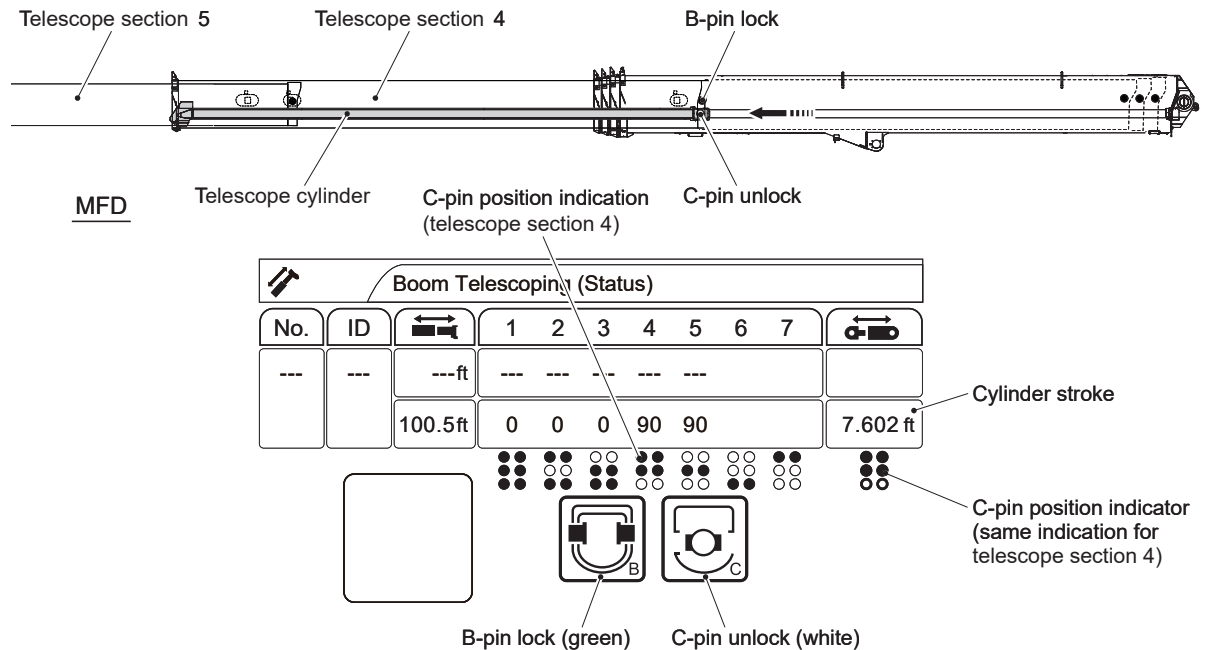
NOTE: When stowing telescope section 4, with a 90% extension rate, select 24.8 ft (7.550 m).

Table 34: Cylinder stroke at the boom connection position

Extension Rate	Section 1	Section 2	Section 3	Section 4	Section 5
45%	14.23–14.57 ft (4.34–4.44 m)	15.16–15.49 ft (4.62–4.72 m)	16.08–16.40 ft (4.90–5.00 m)	16.96–17.29 ft (5.17–5.27 m)	17.84–18.17 ft (5.44–5.54 m)
90%	28.67–29.00 ft (8.74–8.84 m)	29.59–29.92 ft (9.02–9.12 m)	30.51–30.83 ft (9.30–9.40 m)	31.40–31.73 ft (9.57–9.67 m)	32.28–32.61 ft (9.84–9.94 m)
100%	31.40–31.73 ft (9.57–9.67 m)	32.32–32.64 ft (9.85–9.95 m)	33.23–33.56 ft (10.13–10.23 m)	34.12–34.45 ft (10.40–10.50 m)	34.55–34.88 ft (10.53–10.63 m)

- When the Detection switch is working correctly, the C-Pin position and the C-Pin Position for the telescope section at the connection point should match.

Figure 190: Ensuring C-Pin positions match



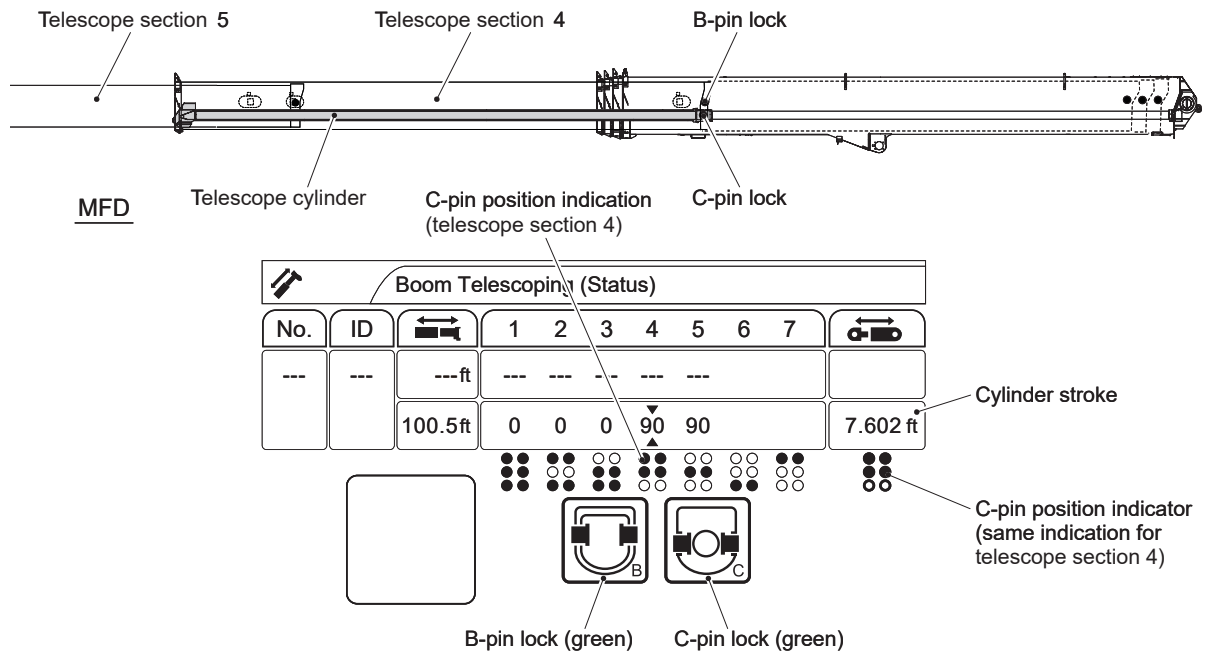
- Tap the B/C-Pin Emergency Operation Select icon—the C-Pin Select icon will disappear. Staying within the appropriate cylinder stroke range (Table 34), slowly extend the boom. When the Detection switch is working correctly, the C-Pin Lock icon (green) will display.

CAUTION

Do NOT remove the B-Pins and/or insert the C-Pins outside of the cylinder stroke ranges shown in Table 34, pg 9-11. This could severely damage interior boom components.

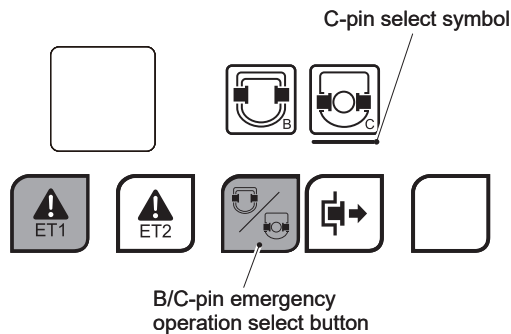
NOTE: After the C-Pins are inserted, the cylinder stroke will not change more than the amount of play in the pins, even when boom telescope operation is attempted.

Figure 191: C-Pin Position Indicator



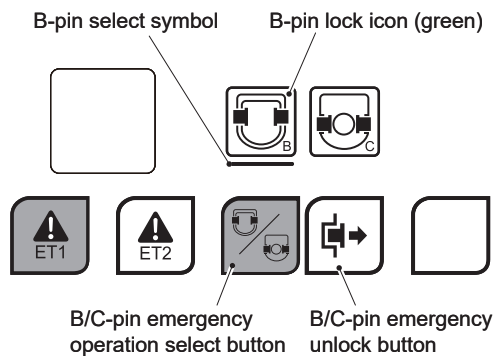
- If the C-Pins cannot be inserted, tap the B/C-Pin Emergency Operation Select icon. The C-Pin Select icon will display. Slowly retract the boom while tapping/holding the B/C-Pin Emergency Unlock icon. Retract until the cylinder stroke shown on the MFD matches the lower limit value in the [Table 34, pg 9-11](#). Then, return to Step 2 and insert C-Pins again.

Figure 192: B/C-Pin Emergency Operation Select icon



- Slightly retract the boom and telescope cylinder—until the cylinder stroke no longer changes.
- Tap the B/C-Pin Emergency Operation Select icon and select the B-Pins. The B-Pin Select icon will display.

Figure 193: B/C-Pin Emergency Operation Select icon

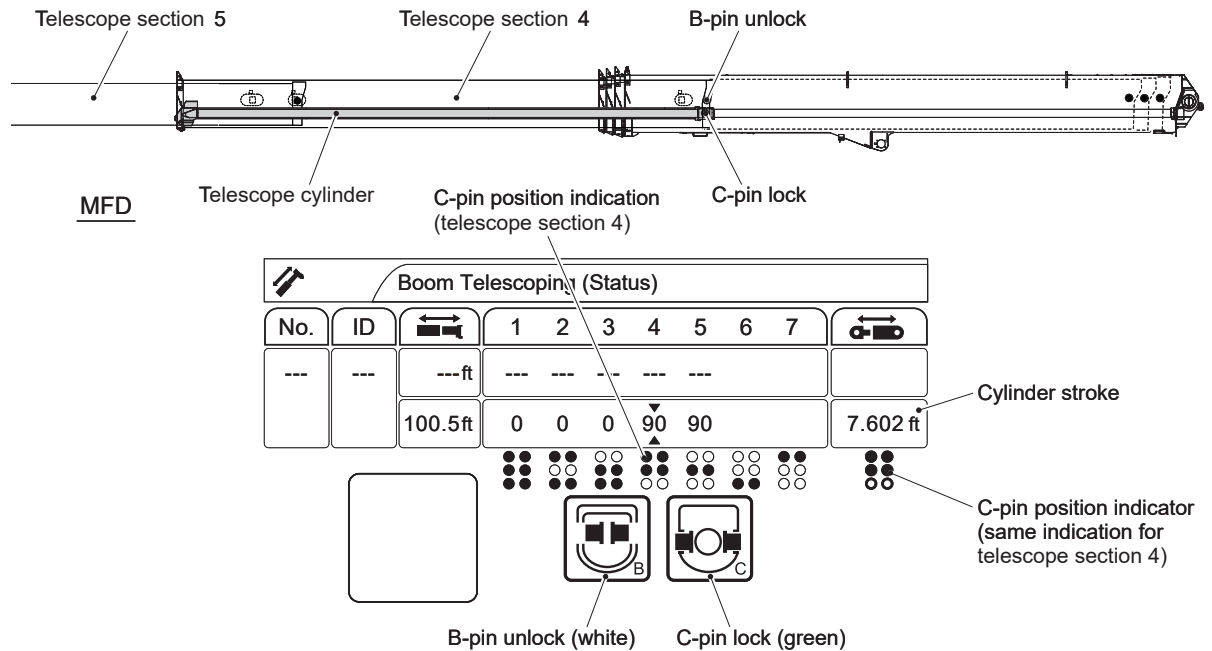


7. Staying within the appropriate cylinder stroke range (Table 34, pg 9-11), slowly extend boom while tapping/holding the B/C-Pin Emergency Unlock icon.
 - ◇ After the B-Pins are removed, extend/retract the boom with the joysticks.
 - ◇ When the Detection switch is working correctly, the B-Pin Unlock icon changes from yellow to white.

⚠ CAUTION

Do NOT remove the B-Pins and/or insert the C-Pins outside of the cylinder stroke ranges shown in Table 34, pg 9-11. This could severely damage interior boom components.

Figure 194: C-Pin position



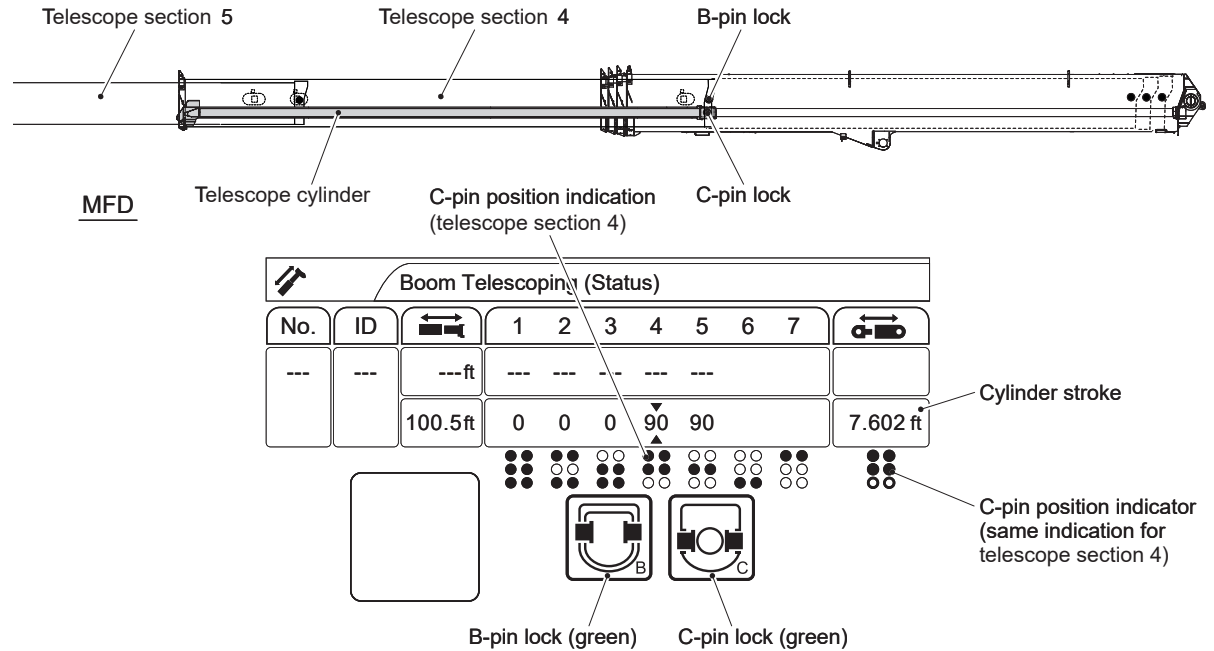
8. If the B-Pins cannot be removed, tap the B/C-Pin Emergency Operation Select icon. The B-Pin Select icon will disappear. Slowly retract the telescope cylinder until the cylinder stroke no longer changes. Then, return to Steps 6–7 to remove B-Pins.
9. Perform Steps 2–4 of **If during Telescope Operation, the Boom Extends/Retracts, pg 9-7**, and retract the connected boom section.

IF DURING TELESCOPE OPERATION, NEITHER THE TELESCOPE CYLINDER NOR THE BOOM EXTENDS/RETRACTS

If during telescope operation, neither the telescope cylinder nor the boom extends/retracts, then the telescope cylinder is connected to a telescope section, but the connection between the telescope sections has not been released (B-Pins are inserted). When the Detection switch is working correctly, the MFD should look like **Figure 195**.

1. The cylinder stroke is within the range of the values shown in **Table 34, pg 9-11**. Unlock the B-Pins and retract the boom.

Figure 195: MFD when telescope cylinder is connected but B-Pins not released



2. Perform Steps 5–9 of **If during Telescope Operation, the Telescope Cylinder Extends/Retracts, but the Boom Does Not, pg 9-10**, and retract the boom.

⚠ CAUTION

Do NOT perform B-Pin removal operation outside the cylinder stroke range shown in **Table 34, pg 9-11**. This could severely damage interior boom components.

WHEN THE C-PIN POSITION AND B/C-PIN SENSORS WORK PROPERLY, BUT THE CYLINDER LENGTH DETECTOR FAILS

CAUTION

Perform B-Pin operation only when the C-Pin Position indicator matches the C-Pin position of one of the telescope sections, and the C-Pin Lock icon (green) is shown. Perform C-Pin operation only when the C-Pin Position indicator matches the C-Pin position of one of the telescope sections, and the B-Pin Lock icon (green) is shown. Failure to follow these instructions could severely damage interior boom components.

The measures explained here are performed when the C-Pin position Detection switch and the B/C-Pin Status Detector switch work properly, but the cylinder length detector has failed. The following points are described.

- [If C-Pin Position Indicator Displays Correct Telescope Section 1–5 Info, and C-Pin Lock Icon \(Green\) and B-Pin Unlock Icon \(White\) Display, pg 9-18](#)
- [If C-Pin Position Indicator Displays Incorrect Telescope Section 1–5 Info, and C-Pin Unlock Icon \(White\) and B-Pin Lock Icon \(Green\) Display, pg 9-21](#)
- [If C-Pin Position Indicator Displays Correct Telescope Section 1–5 Info, and C-Pin Lock Icon \(Green\) and B-Pin Lock Icon \(Green\) Display, pg 9-23](#)

Before performing emergency telescope operation:

1. Press the AML Override switch, and hold for the duration of Steps 2–3.
2. Access the Telescope Status page (tap the Set icon on the Telescope Pattern page) on the MFD.
3. Tap the ET1 icon (icon should highlight).

OPERATE WITH MFD

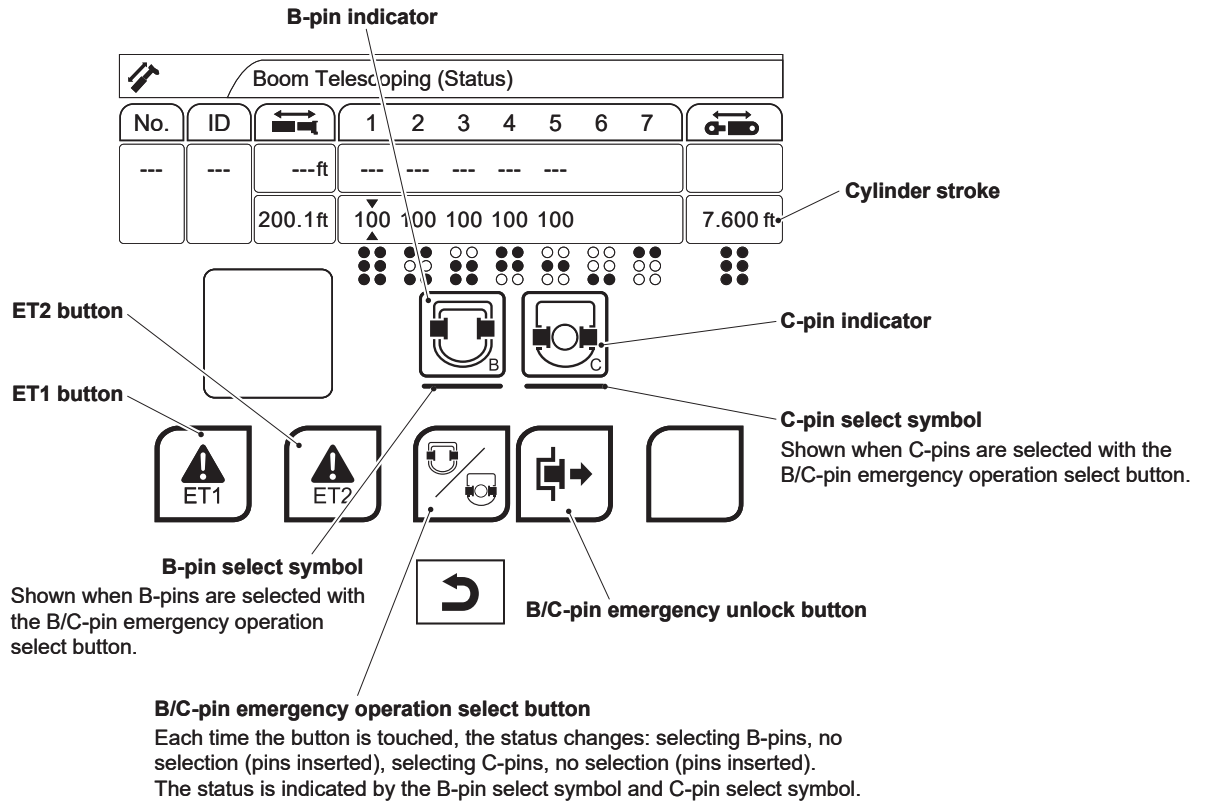
NOTICE

Do NOT turn off power while the B-Pins and/or C-Pins are removed.

Doing so will cause the pins to extend to the lock side by spring force. If the power has been turned off while the pins are removed, perform pin removal operation again when power is restored.

Tapping the ET1 icon will highlight it and cause the telescope cylinder to extend/retract with joystick controls. To operate the B-Pins and C-Pins manually, use the B/C-Pin Emergency Operation Select icon and the B/C-Pin Emergency Unlock icon.

Figure 196: Operating B-Pins and C-Pins manually



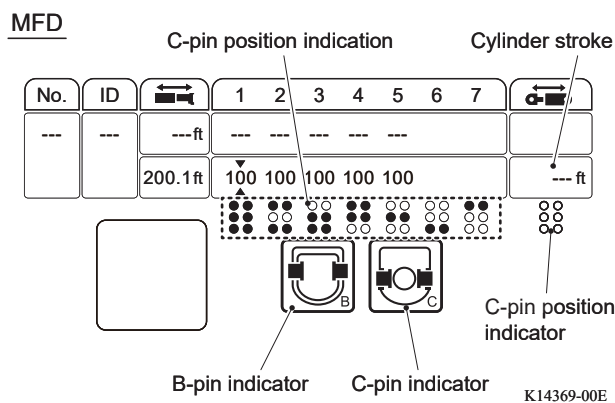
- **B-Pin Unlock Operation**—Tap the B/C-Pin Emergency Operation Select icon to display the B-Pin Select icon. Tap the B/C-Pin Emergency Unlock icon to retract the B-Pins to the unlock side.
- **B-Pin Lock Operation**—Tap the B/C-Pin Emergency Operation Select icon and enter the no selection status (B-Pin and C-Pin Select icons are not shown) to extend the B-Pins to the lock side.
- **C-Pin Unlock Operation**—Tap the B/C-Pin Emergency Operation Select icon to display the C-Pin Select icon. Tap the B/C-Pin Emergency Unlock icon to retract the C-Pins to the unlock side.
- **C-Pin Lock Operation**—Tap the B/C-Pin Emergency Operation Select icon and enter the no selection status (B-Pin and C-Pin Select icons are not shown) to extend the C-Pins to the lock side.

MONITOR MFD DURING EMERGENCY TELESCOPE OPERATION

The cylinder stroke of the telescope cylinder is displayed on the Telescope Status page of the MFD. If the Cylinder Length Detector fails, the information on the Telescope Status page may be incorrect. When the Detection switch is working correctly, stow boom using the B-Pin, C-Pin, and C-Pin Position indicators.

NOTE: This section assumes the Boom Telescope Status page is correct.

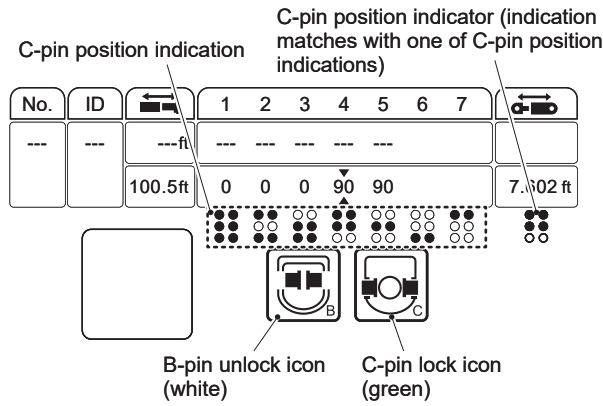
Figure 197: Boom Telescope status page



RETRACT BOOM

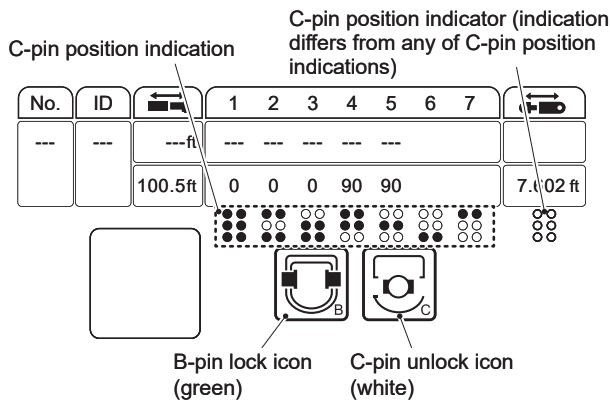
If C-Pin Position Indicator Displays Correct Telescope Section 1–5 Info, and C-Pin Lock Icon (Green) and B-Pin Unlock Icon (White) Display, pg 9-18

Figure 198: Info for retracting boom



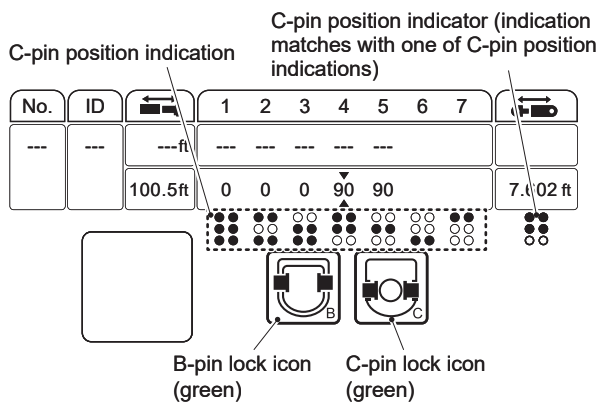
The C-Pin Position indicator differs from any of the C-Pin position displays of telescope section 1, 2, 3, 4, or 5, and the C-Pin Unlock icon (white) and the B-Pin Lock icon (green) are shown.

Figure 199: C-Pin Position indicator



The C-Pin Position indicator displays one of the C-Pin positions of telescope section 1, 2, 3, 4, or 5. Also, the C-Pin Lock icon (green) and the B-Pin Lock icon (green) are displayed.

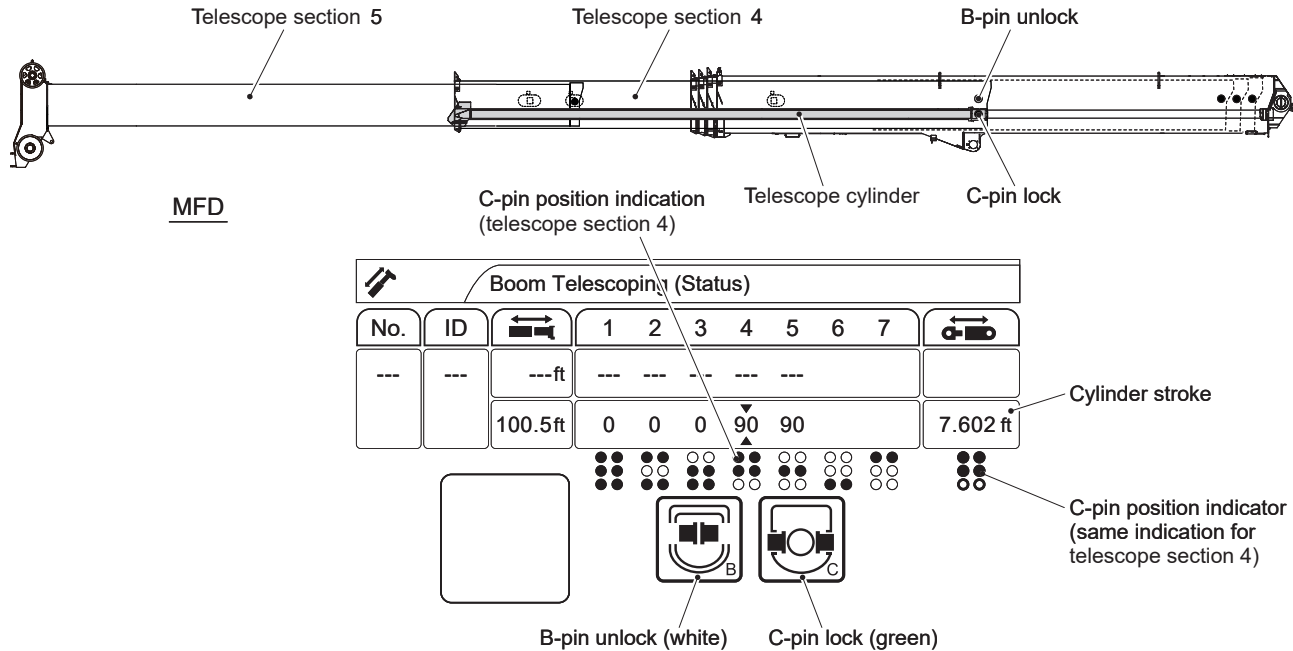
Figure 200: C-Pin Position indicator



IF C-PIN POSITION INDICATOR DISPLAYS CORRECT TELESCOPE SECTION 1–5 INFO, AND C-PIN LOCK ICON (GREEN) AND B-PIN UNLOCK ICON (WHITE) DISPLAY

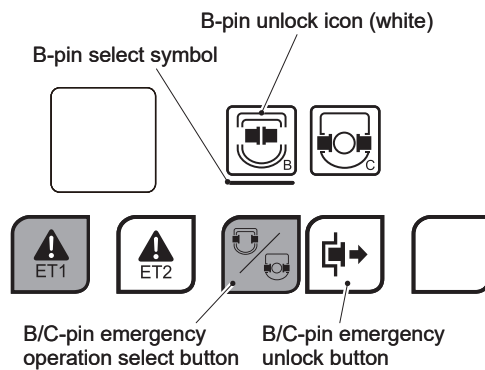
If C-Pin position indicator displays correct telescope section 1–5 info, and C-Pin Lock icon (green) and B-Pin Unlock icon (white) display, then, the telescope cylinder is connected to the boom. When retracting the boom, the telescope section connected to the telescope cylinder will retract. **Figure 201** shows telescope section 4 on the C-Pin Position indicator.

Figure 201: Telescope section 4 on the C-Pin Position indicator



1. Tap the B/C-Pin Emergency Operation Select icon and select the B-Pins. The B-Pin Select icon will display. If the B-Pin Unlock icon (white) is not shown, tap the B/C-Pin Emergency Unlock icon to unlock the B-Pins. Then, retract the B-Pins—the B-Pin Unlock icon will change from yellow to white. Release the icon.

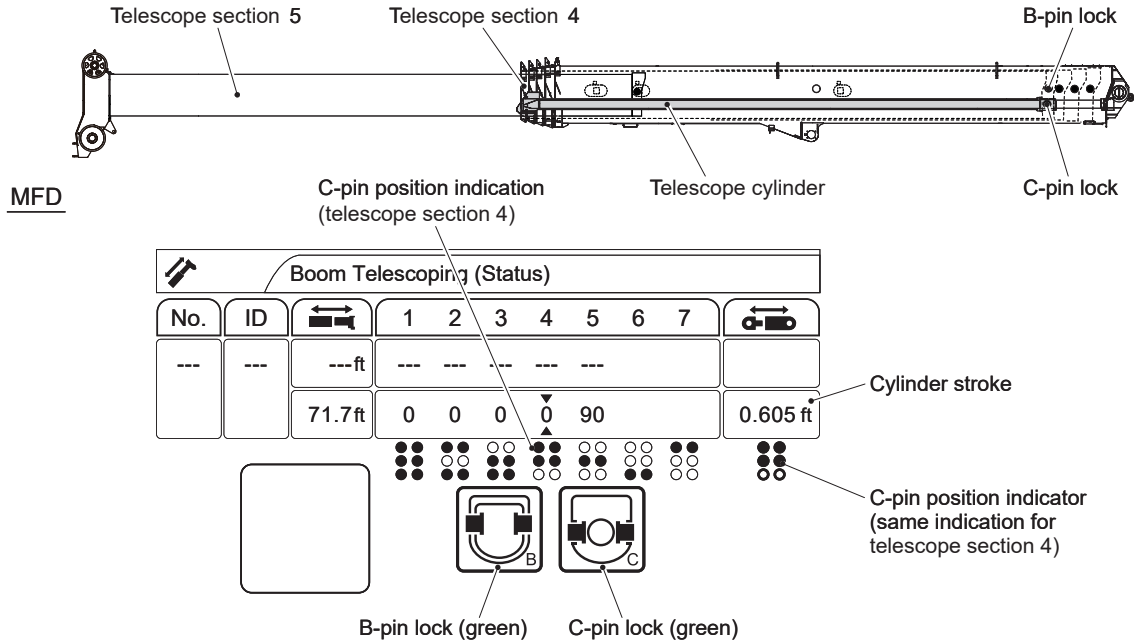
Figure 202: B/C-Pin Emergency Operation Select icon



2. Retract the boom so that the connected telescope section is fully retracted.
3. Tap the B/C-Pin Emergency Operation Select icon and insert the B-Pins. The B-Pin Select icon will disappear. When the Detection switch is working correctly, the B-Pin Lock icon (green) will display.

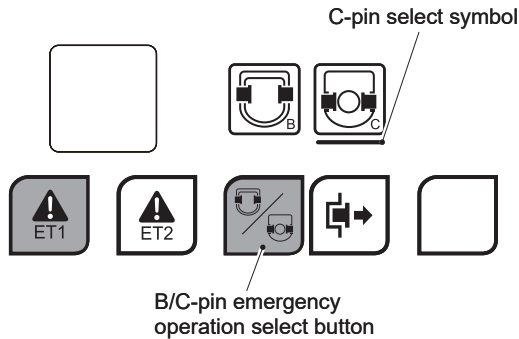
NOTE: After the C-Pins are inserted, the cylinder stroke will not change more than the amount of play in the pins, even when boom telescoping operation is attempted.

Figure 203: Insert the B-Pins.



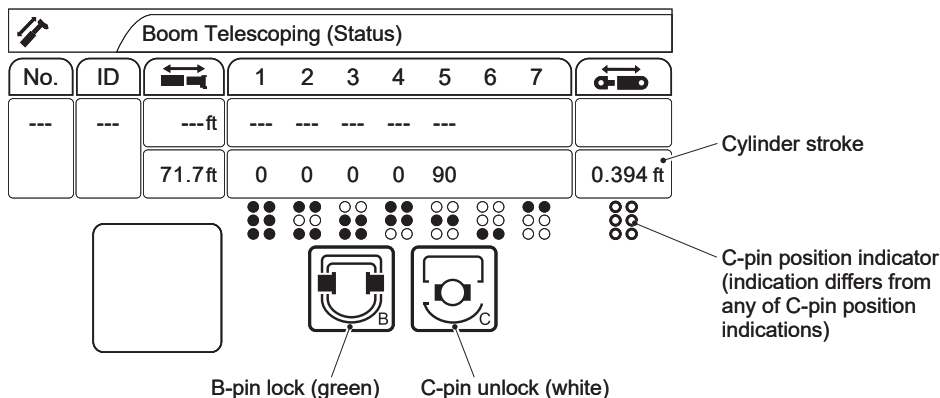
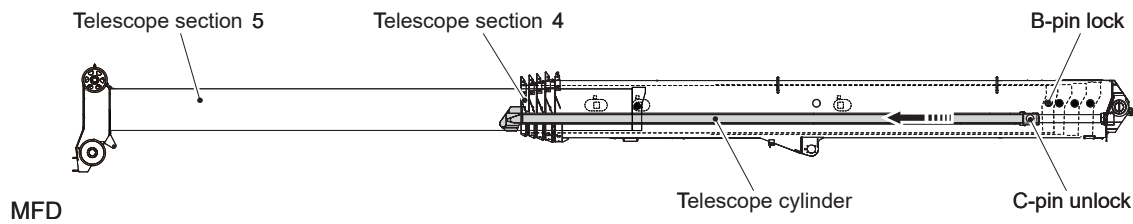
4. Stow any remaining telescope sections, and stow the boom. When all the sections (up to telescope section 5) are retracted, this operation is complete.
 - a. Retract the boom and retract the telescope cylinder only by the amount of the pin hole looseness (until the cylinder stroke no longer changes).
 - b. Tap the B/C-Pin Emergency Operation Select icon and select the C-Pins. The C-Pin Select icon will display.

Figure 204: B/C-Pin Emergency Operation Select icon and C-Pin Select icon



- c. Slowly extend boom while tapping/holding the B/C-Pin Emergency Unlock icon.
 - ◇ When the C-Pins are removed, the connection to the boom is released and the telescope cylinder extends.
 - ◇ The C-Pin Lock icon (green) goes out, and the C-Pin Unlock icon (white) is shown. When the connecting range of the C-Pins is exceeded, the C-Pin Position Indicator appears as in [Figure 205, pg 9-20](#).

Figure 205: Cylinder stroke limits and C-Pin Position



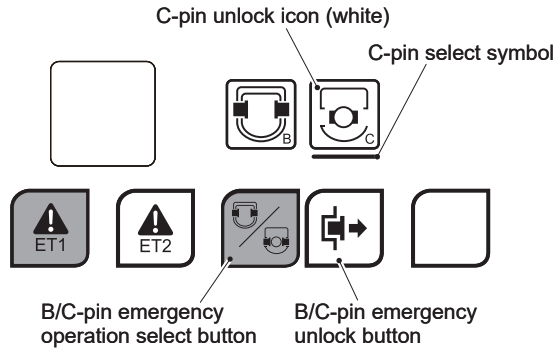
- d. If the C-Pins cannot be removed, tap the B/C-Pin Emergency Operation Select icon—the C-Pin Select icon will disappear—and slowly retract the boom. Retract the telescope cylinder until the cylinder stroke no longer changes. Then, go back to Steps a–b and perform C-Pin removal operation again.
 - e. Complete Steps 3–9 of **If C-Pin Position Indicator Displays Incorrect Telescope Section 1–5 Info, and C-Pin Unlock Icon (White) and B-Pin Lock Icon (Green) Display, pg 9-21**, and extend the telescope cylinder to the connection position and insert the C-Pins, and remove the B-Pins.
5. Go back to Step 2 and retract the next telescope section in sequence, until all sections are retracted.

IF C-PIN POSITION INDICATOR DISPLAYS INCORRECT TELESCOPE SECTION 1–5 INFO, AND C-PIN UNLOCK ICON (WHITE) AND B-PIN LOCK ICON (GREEN) DISPLAY

If C-Pin position indicator displays incorrect telescope section 1–5 info, and C-Pin unlock icon (white) and B-Pin lock icon (green) display, the telescope cylinder is not connected to the boom. To retract the boom, connect the extended telescope section nearest to the base section with the telescope cylinder.

1. Tap the B/C-Pin Emergency Operation Select icon and select the C-Pins. The C-Pin Select icon will display.
If the C-Pin Unlock icon (white) is not displayed, tap the B/C-Pin Emergency Unlock icon and unlock the C-Pins. When the C-Pin Unlock icon changes from yellow to white, release the icon.

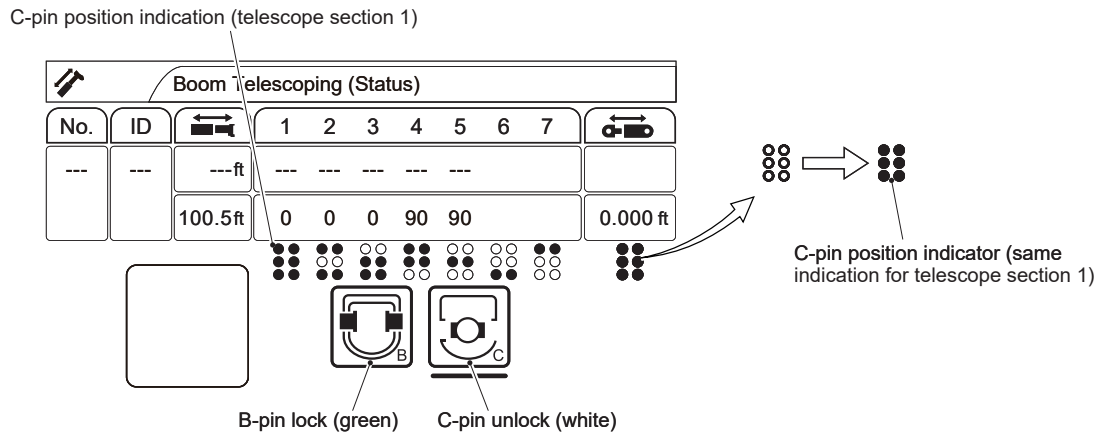
Figure 206: B/C-Pin Emergency Operation Select icon



2. Because the position of the telescope cylinder is unknown, retract the telescope cylinder fully.
The C-Pin Position indicator should match the C-Pin position of telescope section 1 as in Figure 207.

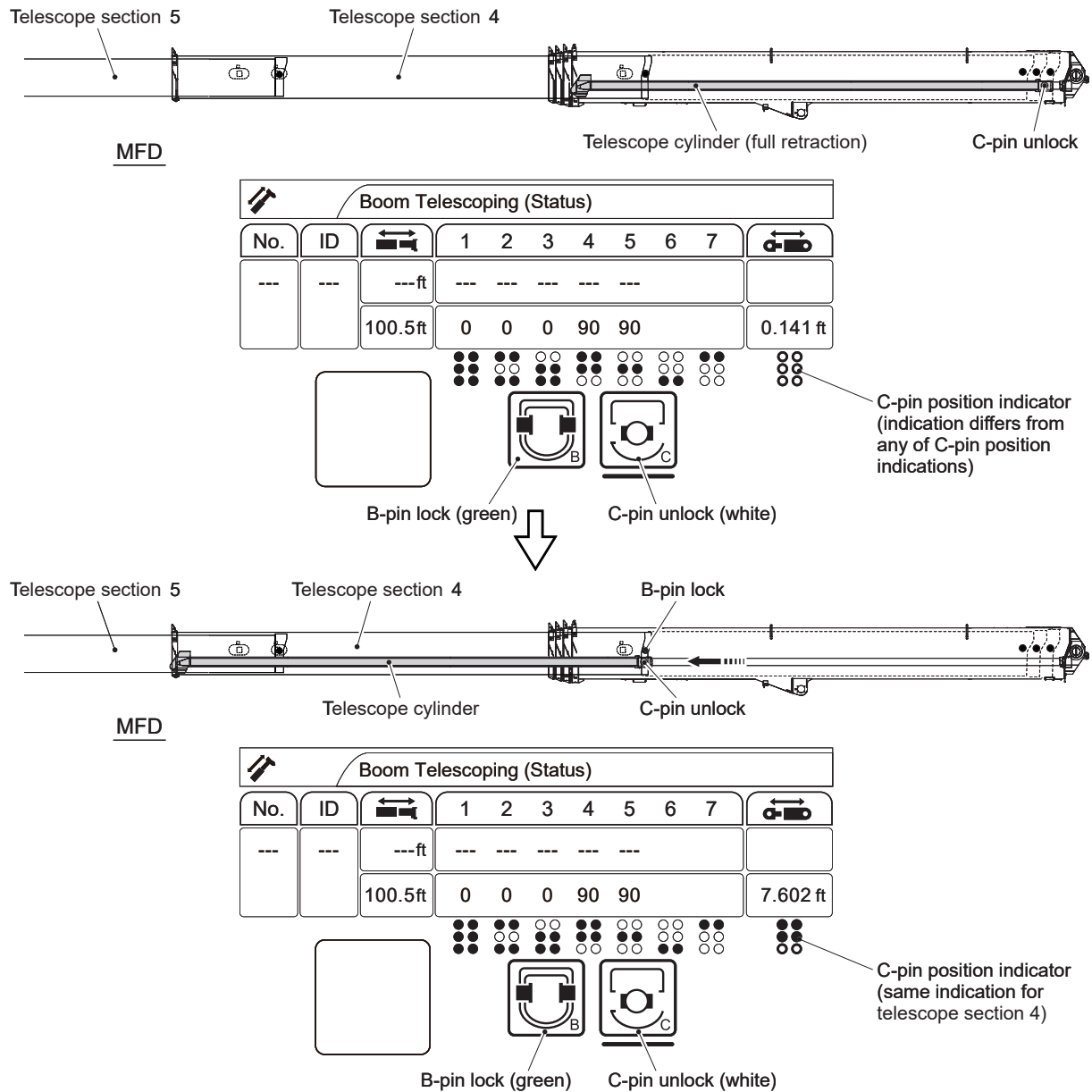
Figure 207: Ensuring C-Pin positions match

MFD



3. Extend the telescope cylinder to the connection position of the next telescope section to be stowed (the C-Pin Position indicator shows the C-Pin position of the telescope section to be stowed).
The illustrated example in Figure 208 shows that the telescope cylinder extended to the connection position of telescope section 4—to be stowed next. When extending the boom, the C-Pin Position indicator displays the C-Pin position at telescope section 1, telescope section 2, and telescope section 3—and when the telescope cylinder has extended to the connection position, the indicator shows the C-Pin position at telescope section 4.

Figure 208: Telescope extension example



4. Within the range where the C-Pin Position indicator shows the C-Pin position of a telescope section, tap the B/C-Pin Emergency Operation Select icon—the C-Pin Select icon will disappear—and slowly extend the boom. When the C-Pins are inserted, the C-Pin Unlock icon (white) will disappear, and the C-Pin Lock icon (green) will display.

⚠ CAUTION

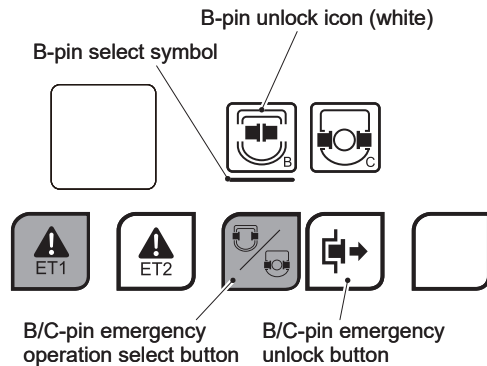
Do NOT insert the C-Pins when the C-Pin Position indicator displays as shown in the top of Figure 208. This could severely damage interior boom components.

5. In the following cases:
 - ◇ The C-Pins cannot be inserted (The C-Pin Lock icon (green) is not displayed).
 - ◇ The Telescope cylinder is extended beyond the C-Pin connection position (the C-Pin Position indicator is as shown in the top of Figure 208).

Tap the B/C-Pin Emergency Operation Select icon—this will display the C-Pin Select icon—and while touching the B/C-Pin Emergency Unlock icon, slowly retract the boom. Retract the telescope cylinder until the C-Pin Position indicator matches the C-Pin position of a telescope section. Then, repeat Step 4 to insert the C-Pins again.

6. Retract the boom and retract the telescope cylinder only by the amount of the pin hole looseness (until the cylinder stroke no longer changes).
7. Tap the B/C-Pin Emergency Operation Select icon and select the B-Pins. The B-Pin Select icon will display.

Figure 209: B/C-Pin Emergency Operation Select icon and B-Pin Select icon



8. Slowly extend boom while tapping/holding the B/C-Pin Emergency Unlock icon. The B-Pin Lock icon (green) will disappear, and the B-Pin Unlock icon (white) will display.
9. If the B-Pins cannot be removed, tap the B/C-Pin Emergency Operation Select icon—the B-Pin Select icon will disappear—and slowly retract the boom. Retract and telescope cylinder only by the amount of the pin hole looseness. After that, go back to the Steps 7–8 to remove the B-Pins again.
10. Complete the steps of [If C-Pin Position Indicator Displays Correct Telescope Section 1–5 Info, and C-Pin Lock Icon \(Green\) and B-Pin Unlock Icon \(White\) Display, pg 9-18](#), and retract the telescope section connected to the telescope cylinder.

IF C-PIN POSITION INDICATOR DISPLAYS CORRECT TELESCOPE SECTION 1–5 INFO, AND C-PIN LOCK ICON (GREEN) AND B-PIN LOCK ICON (GREEN) DISPLAY

If the C-Pin position indicator displays correct telescope section 1–5 info and C-Pin lock icon (green) and B-Pin lock icon (green) display, then the telescope cylinder is connected to a telescope section, but the connection between the telescope sections is not released (B-Pins are inserted).

1. Unlock the B-Pins and retract the boom.
2. Complete Steps 6–10 of [If C-Pin Position Indicator Displays Incorrect Telescope Section 1–5 Info, and C-Pin Unlock Icon \(White\) and B-Pin Lock Icon \(Green\) Display, pg 9-21](#) and retract the boom.

WHEN THE MFD OR TELESCOPE CONTROL OUTPUT FAILS, BUT THE CYLINDER LENGTH, C-PIN POSITION, AND B/C-PIN SENSORS FUNCTION NORMALLY

WARNING

Do NOT operate the GTC-1600 with the Emergency Telescope switch toggled to EMERGENCY. Speed control by the joystick is disabled when the Emergency Telescope switch is toggled to EMERGENCY. This can cause functions to start or stop suddenly—leading to a serious accident. Use this switch only to stow the crane in an emergency. When an emergency occurs, the top priority should be to lower the load to the ground and fully retract the boom. Especially, when slewing operation is performed with the boom extended during strong wind, slewing operation can start or stop suddenly.

CAUTION

Perform B-Pin operation only when the C-Pin Position indicator matches the C-Pin position of one of the telescope sections, and the C-Pin Lock icon (green) is displayed. Perform C-Pin operation only when the C-Pin Position indicator matches with the C-Pin position of one of the telescope sections, and the B-Pin Lock icon (green) is shown. Incorrect operation could severely damage interior boom components..

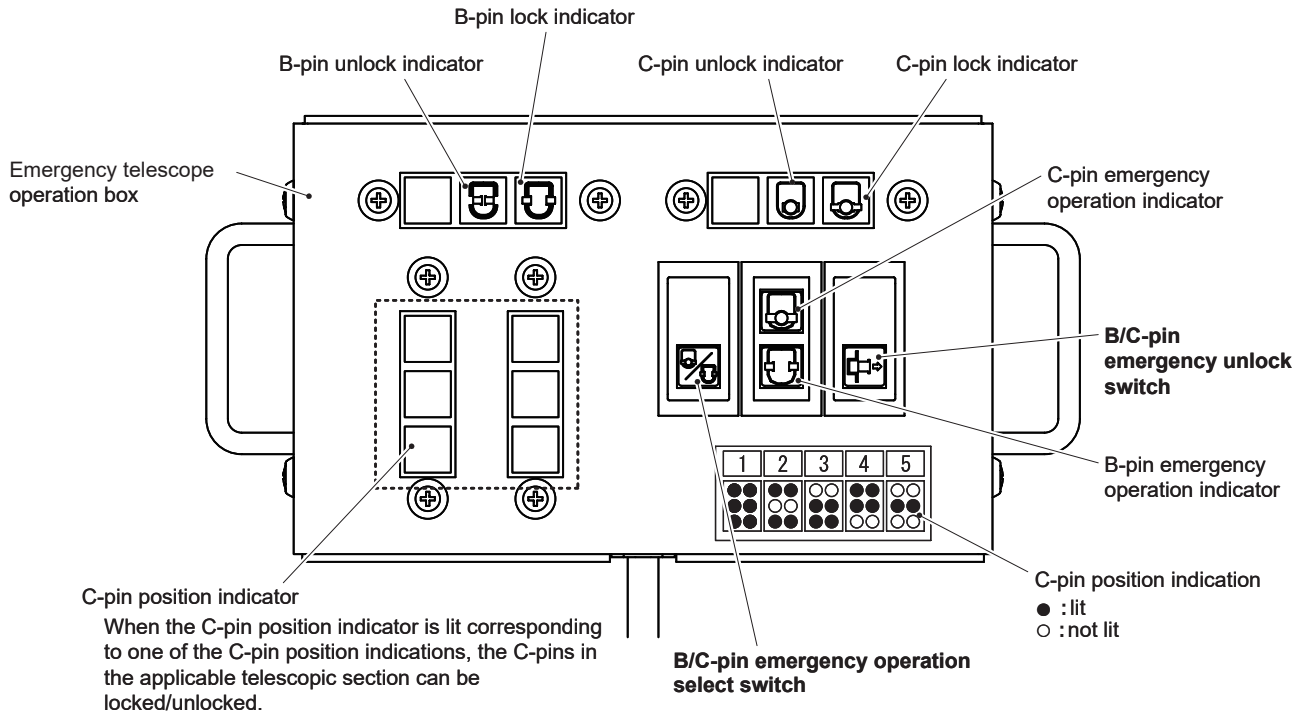
This section explains the procedures for when the standard MFD or telescope control has failed, while the cylinder length detector, the C-Pin position Detection switch, and the B/C-Pin status Detection switches are working correctly.

OPERATE WITH EMERGENCY TELESCOPE OPERATION BOX

NOTICE

These procedures are performed with the emergency telescope operation box. Carefully monitor boom telescope conditions.

Figure 210: Emergency telescope operation box



Perform manual operation of B/C-Pins using the B/C-Pin Emergency Operation Select switch and B/C-Pin Emergency Unlock switch.

- **B-Pin Unlock Operation**—Move the B/C-Pin Emergency Operation Select switch to B-Pin. Press the B/C-Pin Emergency Unlock switch to retract the B-Pins to the unlock side.
- **B-Pin Lock Operation**—Move the B/C-Pin Emergency Operation Select switch is to the neutral position to extend the B-Pins to the lock side.
- **C-Pin Unlock Operation**—Move the B/C-Pin Emergency Operation Select switch to C-Pin. Press the B/C-Pin Emergency Unlock switch to retract the C-Pins to the unlock side.
- **C-Pin Lock Operation**—Move the B/C-Pin Emergency Operation Select switch to the neutral position to extend the C-Pins to the lock side.

To use the emergency telescope operation box, connect it to the unit located at the rear left of the operator seat.

1. Open and remove the cover located at the rear left of the operator seat.
2. Connect the to the connector at the side of the maintenance panel.

MONITOR MFD DURING EMERGENCY TELESCOPE OPERATION

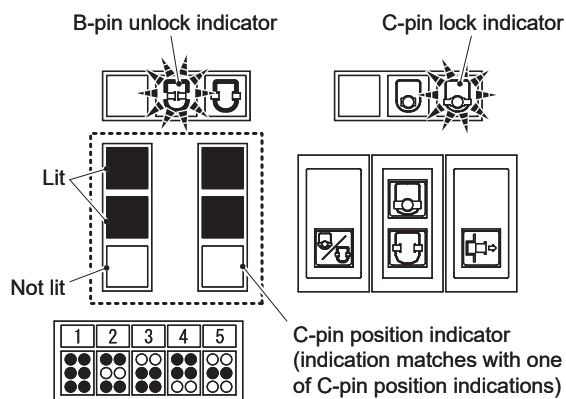
When the cylinder length detector and Detection switch are working correctly, the C-Pin Position indicator is also normal. Perform a boom stowing operation using the emergency telescope operation box.

RETRACT BOOM

See the details of the applicable conditions. **If C-Pin Position Indicator Displays Correct Telescope Section 1–5 Info, and C-Pin Lock and B-Pin Unlock Indicators Illuminate, pg 9-27.**

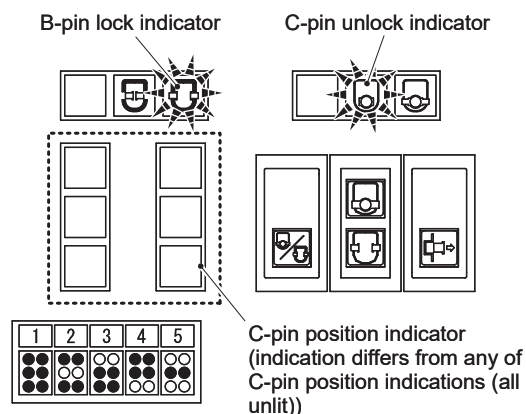
In the illustration, the illumination of the C-Pin indicator shows the C-Pin position display of telescope section 4.

Figure 211: C-Pin indicator example



If C-Pin Position Indicator Displays Incorrect Telescope Section 1–5 Info, and C-Pin Unlock and B-Pin Lock Indicators Illuminate, pg 9-30

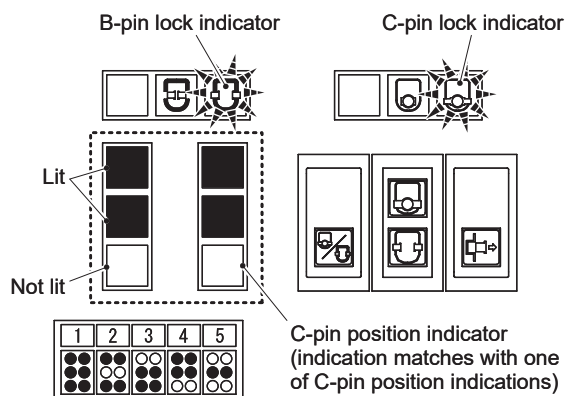
Figure 212: C-Pin indicator example



If C-Pin Position Indicator Displays Correct Telescope Section 1–5 Info, and C-Pin Lock and B-Pin Unlock Indicators Illuminate, pg 9-34

In the illustration, the illumination of the C-Pin indicator shows the C-Pin position display of telescope section 4.

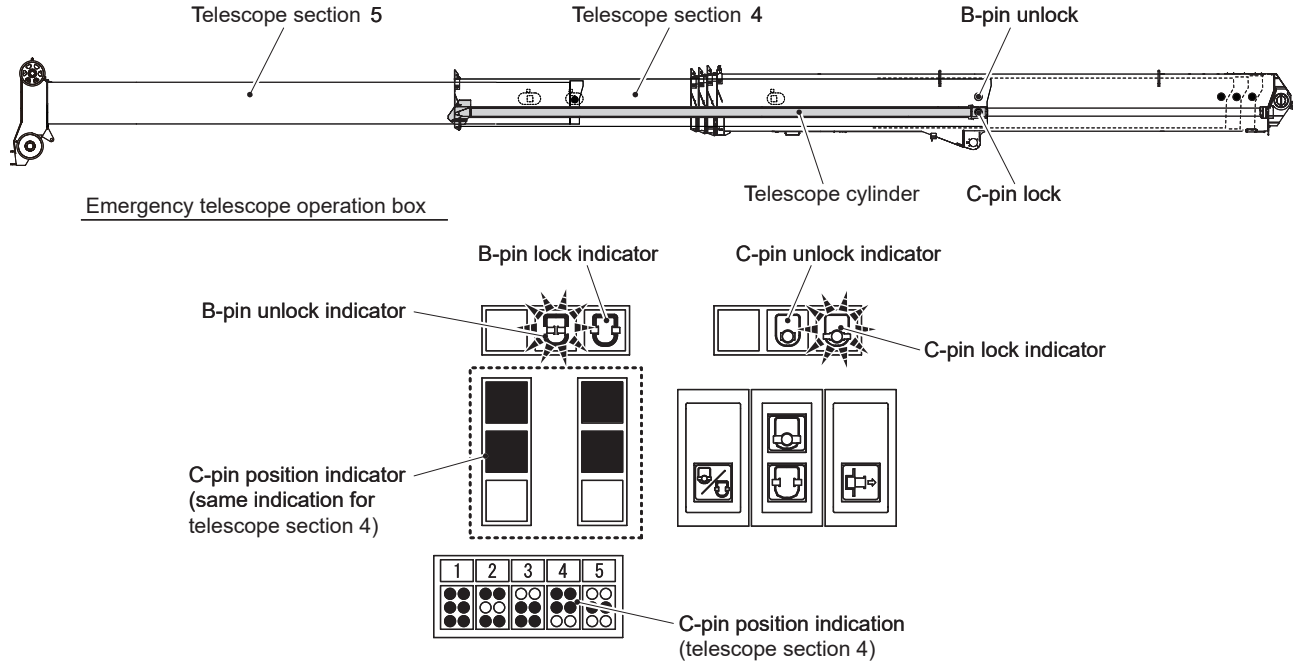
Figure 213: B/C-Pin indicator example



IF C-PIN POSITION INDICATOR DISPLAYS CORRECT TELESCOPE SECTION 1–5 INFO, AND C-PIN LOCK AND B-PIN UNLOCK INDICATORS ILLUMINATE

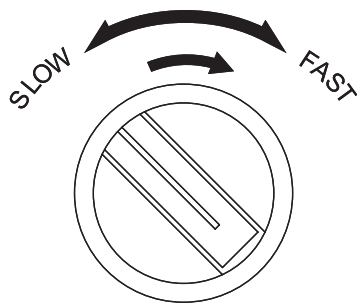
In this condition, the telescope cylinder is connected to the boom. When the boom is retracted, the telescope section that is connected to the telescope cylinder retracts. This illustration shows that illumination of the C-Pin Position indicator is of the telescope section 4.

Figure 214: Example telescope cylinder connected to the boom



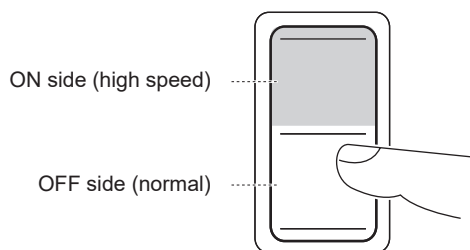
1. Turn the Idling Adjuster switch to FAST or press the accelerator pedal and keep the engine RPM high.

Figure 215: Idling Adjuster switch



2. Set the Pump Summation switch ([Pump Summation Switch, pg 3-13](#)) to OFF.

Figure 216: Pump Summation switch



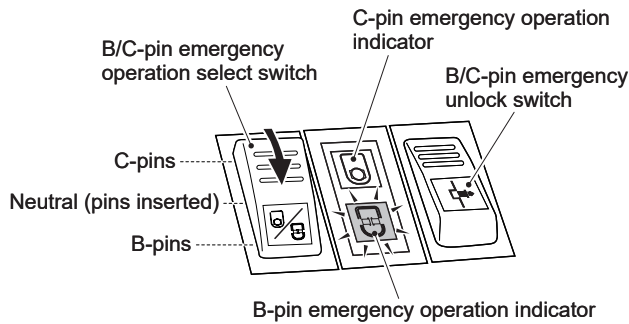
3. Toggle the Emergency Telescope switch to EMERGENCY. The Emergency Telescope Operation warning on the MFD will illuminate.

Figure 217: Emergency Telescope switch



- Set the B/C-Pin Emergency Operation Select switch to the B-Pin side. The B-Pin Emergency Operation indicator will illuminate. If the B-Pin Unlock indicator is not lit, press the B/C-Pin Emergency Unlock switch to unlock the B-Pins. When the B-Pin Unlock indicator illuminates, release the switch.

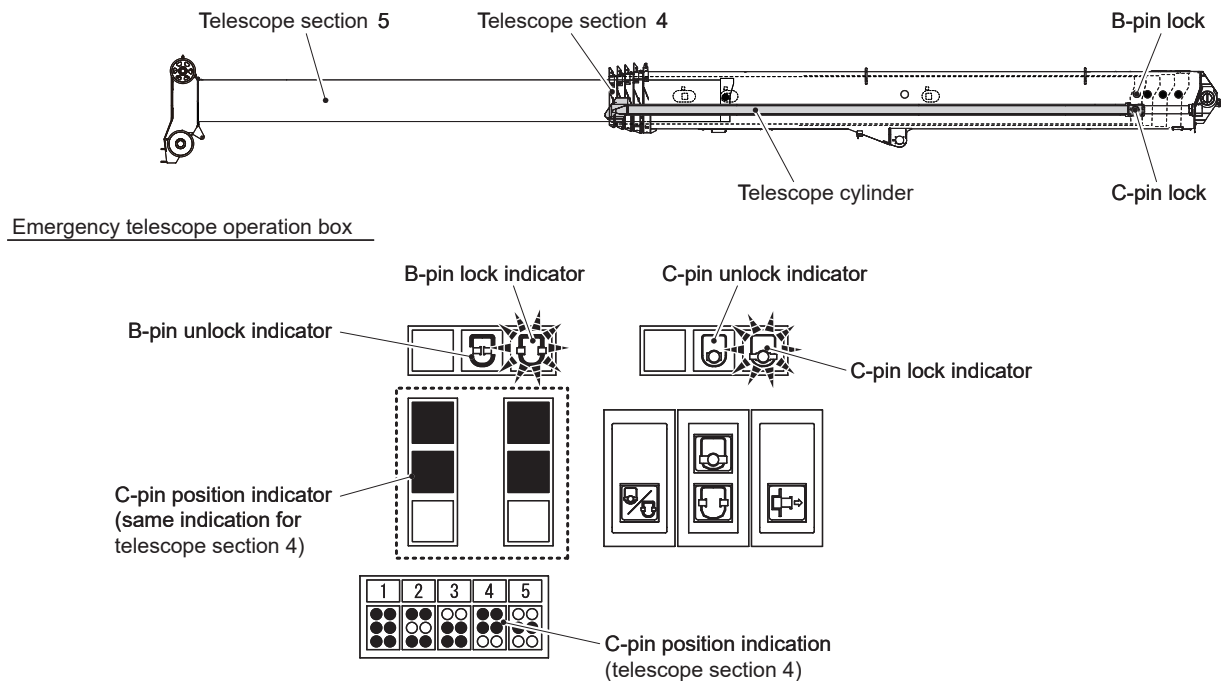
Figure 218: B/C-Pin Emergency Operation Select switch



- Retract the boom so that the connected telescope section is fully retracted.
- Return the B/C-Pin Emergency Operation Select switch to the neutral position and insert the B-Pins. The B-Pin Unlock indicator will disappear and the B-Pin lock indicator will illuminate.

NOTE: Once the B-Pins are inserted, the cylinder stroke will not change more than the play amount of the pins even when boom telescope operation is attempted.

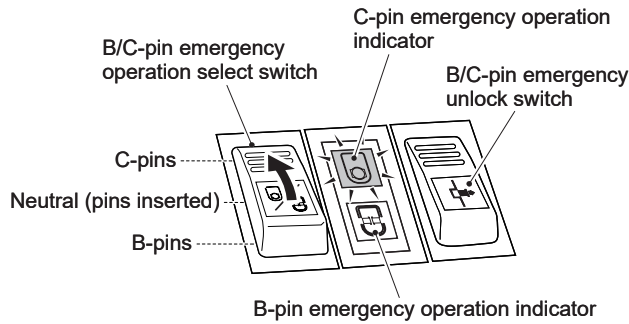
Figure 219: B/C-Pin Unlock/Lock indicator status



- If there are any more sections to be stowed, follow the procedure below and stow the boom. When all the sections (up to the telescope section 5) are retracted, this operation is completed.

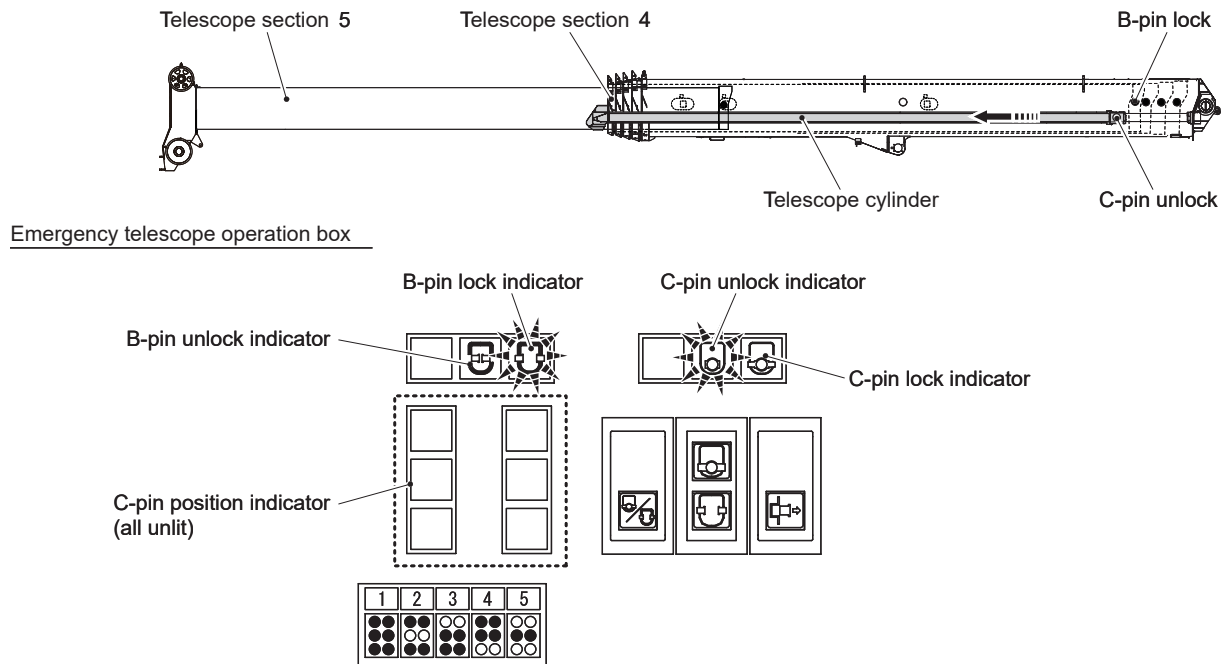
- a. Retract the boom and retract the telescope cylinder only by the amount of the pin hole looseness (until the cylinder stroke no longer changes).
- b. Set the B/C-Pin Emergency Operation Select switch to the C-Pin side. The C-Pin Emergency Operation indicator will illuminate.

Figure 220: B/C-Pin Emergency Operation Select switch



- c. Carefully, extend the boom—while tapping/holding the B/C-Pin Emergency Unlock switch.
 - ◇ When the C-Pins are retracted, the connection to the boom will release and the telescope cylinder will extend.
 - ◇ The C-Pin Lock indicator will darken and the C-Pin Unlock indicator will illuminate. When the connection range of the C-Pins is exceeded, the C-Pin Position indicator will darken.

Figure 221: B/C-Pin Unlock/Lock indicator status



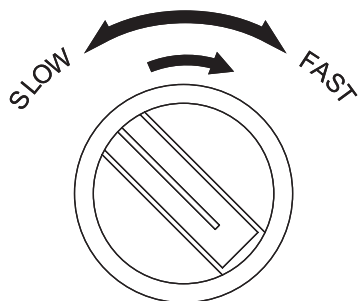
- d. If the C-Pins cannot be removed, set the B/C-Pin Emergency Operation Select switch to the neutral position, and carefully retract the boom. Then, return to the Steps b–c and perform C-Pin removal operation again.
 - e. Perform Steps 6–12 of **If C-Pin Position Indicator Displays Incorrect Telescope Section 1–5 Info, and C-Pin Unlock and B-Pin Lock Indicators Illuminate, pg 9-30**, and extend the telescope cylinder to the connection position and insert the C-Pins, and remove the B-Pins.
8. Go back to Step 3 and retract the next telescope section.

IF C-PIN POSITION INDICATOR DISPLAYS INCORRECT TELESCOPE SECTION 1–5 INFO, AND C-PIN UNLOCK AND B-PIN LOCK INDICATORS ILLUMINATE

If the C-Pin position indicator displays incorrect telescope section 1–5 info, and C-Pin unlock and B-Pin lock indicators illuminate, the telescope cylinder is not connected to the boom. To retract the boom, connect the extended telescope section nearer to the base section with the telescope cylinder.

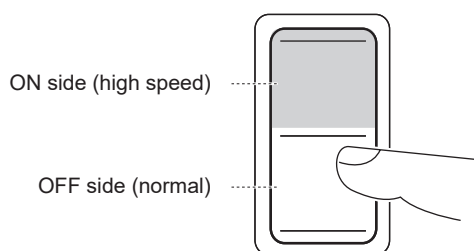
1. Turn the Idling Adjuster switch to FAST or press the accelerator pedal and keep the engine RPM high.

Figure 222: Idling Adjuster switch



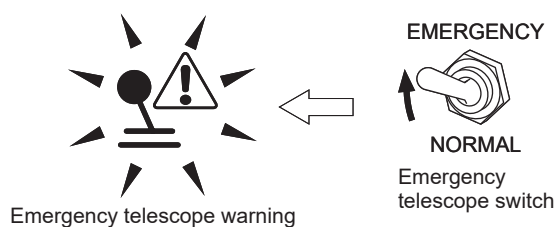
2. Set the Pump Summation switch (**Pump Summation Switch, pg 3-13**) to OFF.

Figure 223: Pump Summation switch



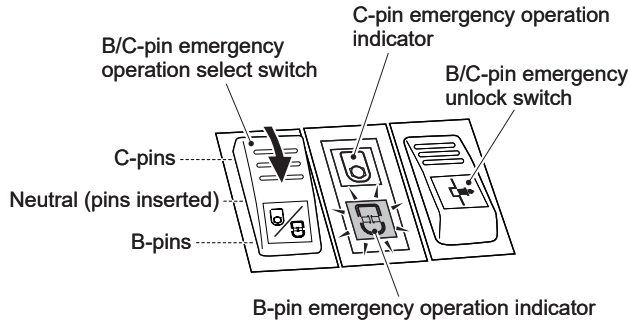
3. Toggle the Emergency Telescope switch to EMERGENCY. The Emergency Telescope Operation warning on the MFD will illuminate.

Figure 224: Emergency Telescope switch



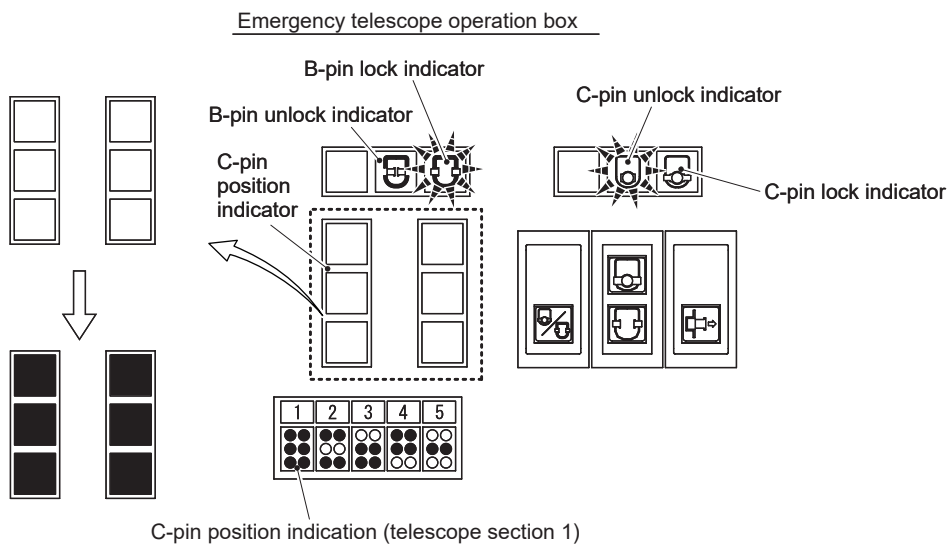
4. Set the B/C-Pin Emergency Operation Select switch to the C-Pin side. The C-Pin Emergency Operation indicator will illuminate. If the C-Pin Unlock indicator is not lit, press the B/C-Pin Emergency Unlock switch to unlock the C-Pins. When the C-Pin Unlock indicator illuminates, release the switch.

Figure 225: B/C-Pin Emergency Operation Select switch



5. Because the position of the telescope cylinder is unknown, retract the boom and the telescope cylinder fully. The C-Pin Position indicator will illuminate similarly to the C-Pin position indicator (telescope section 1).

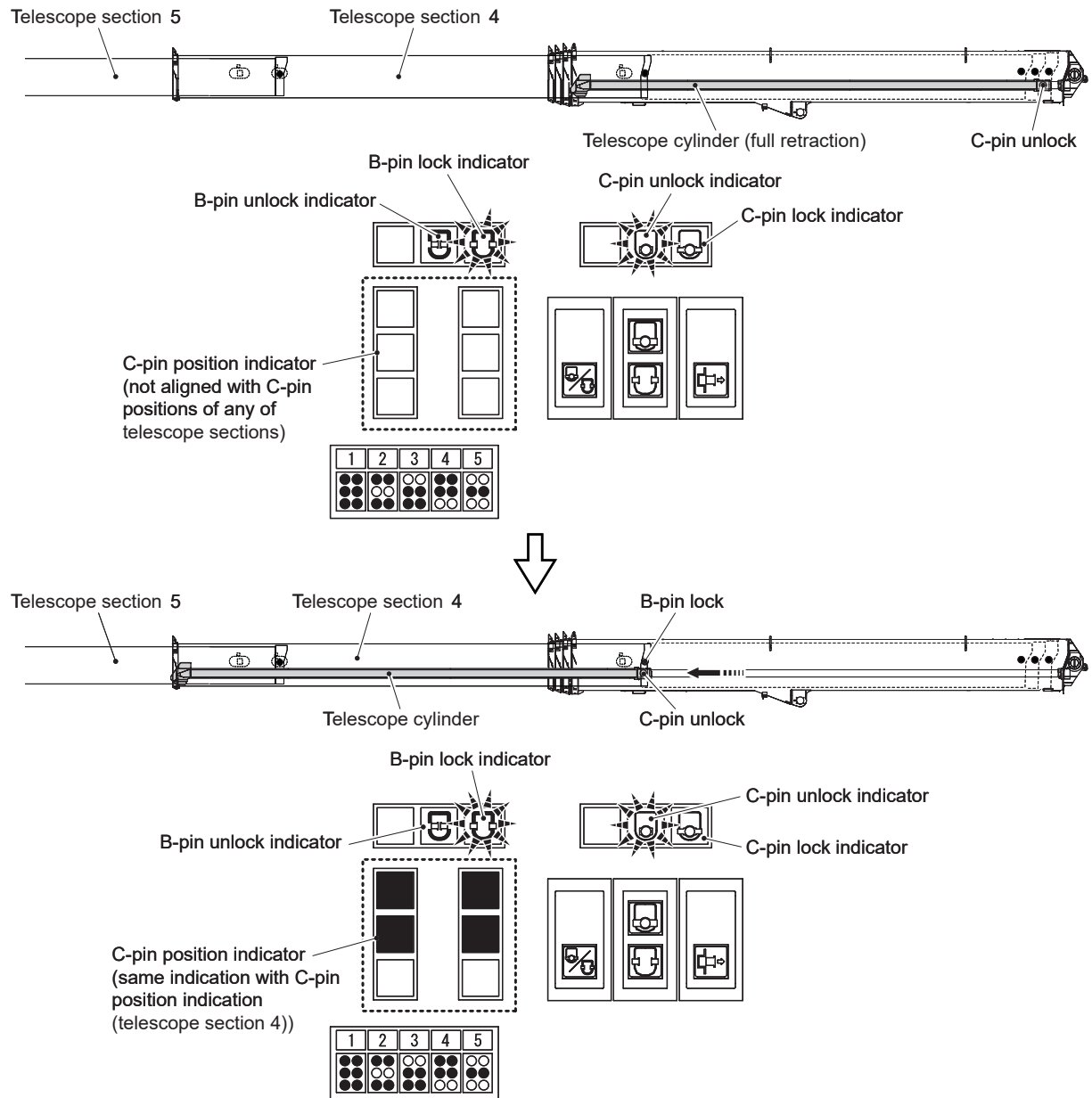
Figure 226: B/C-Pin indicator example



6. Extend the boom and extend the telescope cylinder to the connection position of the next telescope section to be stowed (the C-Pin Position indicator shows the C-Pin position of the telescope section to be stowed).

NOTE: The illustrated example shows that the telescope cylinder is extended to the connection position of the telescope section 4, which is stowed next. When boom extending operation is performed, the C-Pin Position indicator will illuminate similarly to the C-Pin position at the telescope section 1, telescope section 2, and telescope section 3, and then when the telescope cylinder has extended to the connection position, the indicator will illuminate similarly to the C-Pin position at telescope section 4.

Figure 227: Telescope extension example



7. Within a range where the C-Pin Position indicator shows the C-Pin position display of a telescope section, return the B/C-Pin Emergency Operation Select switch to neutral, and carefully extend boom. When the C-Pins are inserted, the C-Pin Unlock indicator goes out and the C-Pin Lock indicator lights up.

⚠ CAUTION

Do NOT insert C-Pins when the C-Pin Position indicator is not lit. This could severely damage interior boom components.

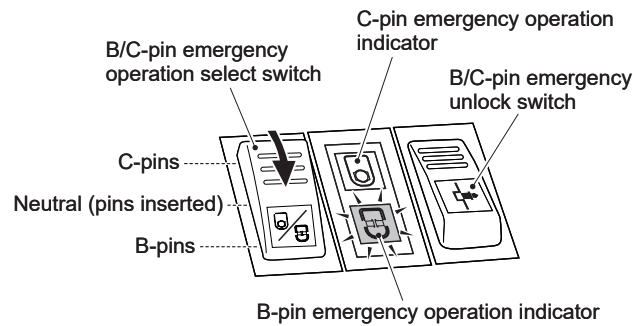
8. In the following cases:
 - ◇ The C-Pins cannot be inserted (The C-Pin Lock indicator does not illuminate).
 - ◇ The telescope cylinder is extended beyond the C-Pin connection position (the C-Pin Position indicator is not lit).

Set the B/C-Pin Emergency Operation Select switch to the C-Pins side, and while tapping/holding the B/C-Pin Emergency Unlock switch, carefully retract the boom. Retract the telescope cylinder to the position where the C-Pin Position indicator matches the C-Pin position of a telescope section. Then, return to Step 7 and insert the C-Pins.

9. Retract the boom to retract the telescope cylinder by the amount of the pin hole looseness.

10. Set the B/C-Pin Emergency Operation Select switch to the B-Pin side. The B-Pin Emergency Operation indicator will illuminate.

Figure 228: B/C-Pin Emergency Operation Select switch



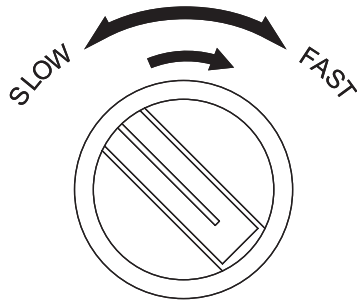
11. Carefully extend the boom while tapping/holding the B/C-Pin Emergency Unlock switch.
- ◇ When the B-Pins are retracted, the connection between the telescope sections is released and boom telescope is enabled.
 - ◇ The B-Pin lock indicator will darken and the B-Pin Unlock indicator will illuminate.
12. If the B-Pins cannot be removed, return the B/C-Pin Emergency Operation Select switch to the neutral position and retract the boom carefully. Retract the telescope cylinder by the amount of the pin hole looseness. Then, return to Steps 10–11 and perform B-Pin removal operation again.
13. Following the procedure of [If C-Pin Position Indicator Displays Correct Telescope Section 1–5 Info, and C-Pin Lock and B-Pin Unlock Indicators Illuminate, pg 9-27](#), retract the telescope section connected to the telescope cylinder.

IF C-PIN POSITION INDICATOR DISPLAYS CORRECT TELESCOPE SECTION 1–5 INFO, AND C-PIN LOCK AND B-PIN UNLOCK INDICATORS ILLUMINATE

If C-Pin position indicator displays correct telescope section 1–5 info, and C-Pin lock and B-Pin unlock indicators illuminate, the telescope cylinder is connected to a telescope section, but the connection between the telescope sections is not released (B-Pins are inserted).

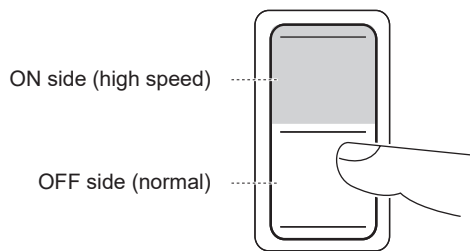
1. Turn the Idling Adjuster switch to FAST or press the accelerator pedal and keep the engine RPM high.

Figure 229: Idling Adjuster switch



2. Set the Pump Summation switch (**Pump Summation Switch, pg 3-13**) to OFF.

Figure 230: Pump Summation switch



3. Toggle the Emergency Telescope switch to EMERGENCY. The Emergency Telescope Operation warning on the MFD will illuminate.

Figure 231: Emergency Telescope switch



4. Unlock the B-Pins and retract the boom.
5. Perform Steps 9–13 of **If C-Pin Position Indicator Displays Incorrect Telescope Section 1–5 Info, and C-Pin Unlock and B-Pin Lock Indicators Illuminate, pg 9-30** and retract the boom.

APPENDIX A: JIB SETUP AND STOWAGE

DANGER

When installing or removing the jib/extension, follow the same safety procedures used when making any other lift with the GTC-1600.

JIB OVERVIEW

WARNING

Position the GTC-1600 on firm, level ground.

Ensure the wire rope is not wound on the drum incorrectly.

Ensure the stowing pins, pivot pin, or locking pins are installed before any operation. If these pins aren't installed as instructed, the jib will fall off when used or moved.

WARNING

Before jib lift, register jib lift status and winch selection on the AML. If the jib state is set incorrectly, the AML will not function properly. This could create a hazardous situation.

CAUTION

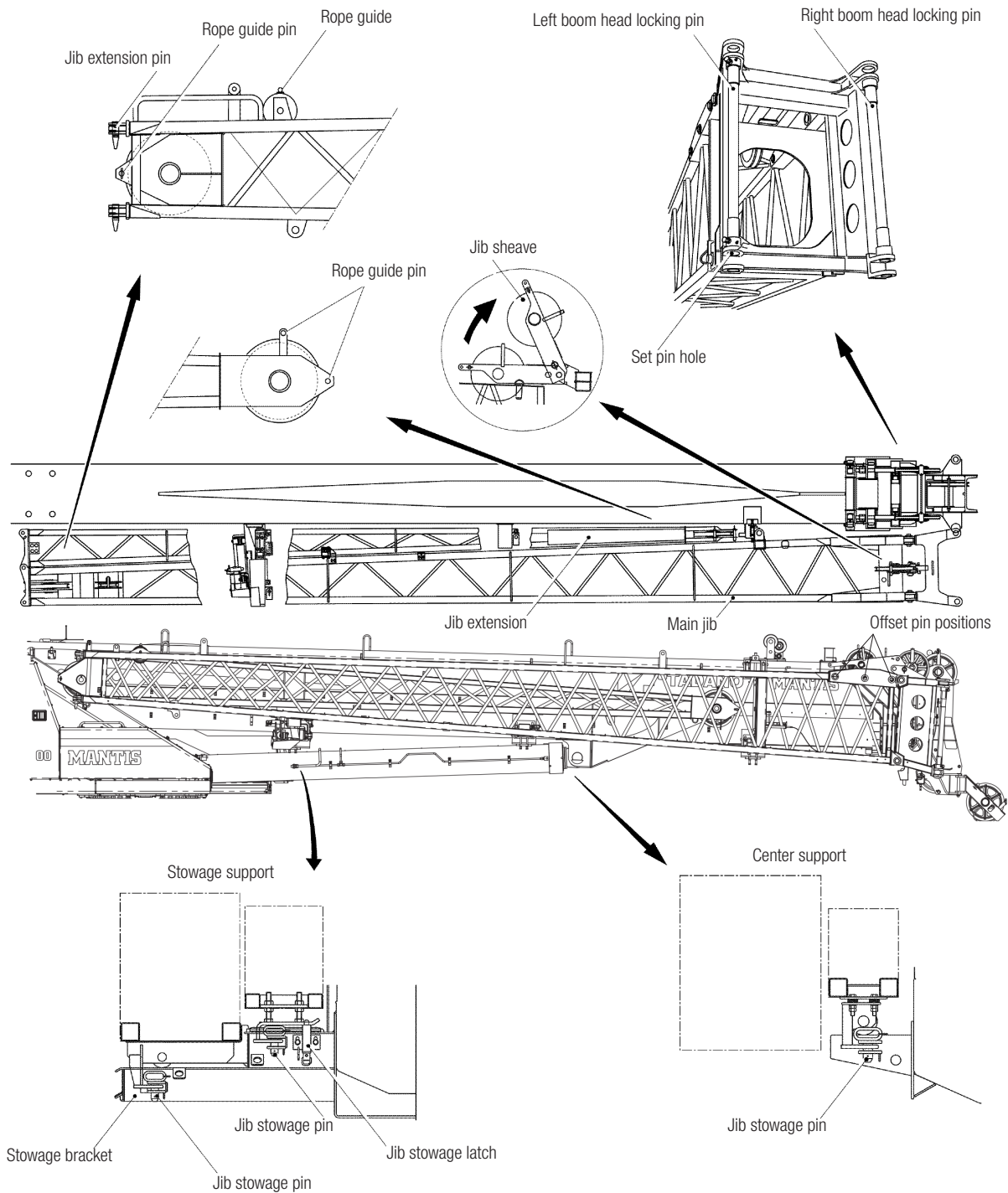
Do NOT mount or stow the jib with the anti-two-block function disabled—operation will not stop, even if the hook block is overwound. Two-blocking will damage the GTC-1600. Do NOT over hoist when mounting or stowing the jib.

Ensure the auxiliary nose sheave is stowed before mounting the jib.

The main jib is mounted on the boom head. The jib extension is mounted on the main jib. They are used to lift relatively light loads higher/farther than the boom can reach. Three jib offset angles are available for multiple applications:

- 3.5°
- 25°
- 45°

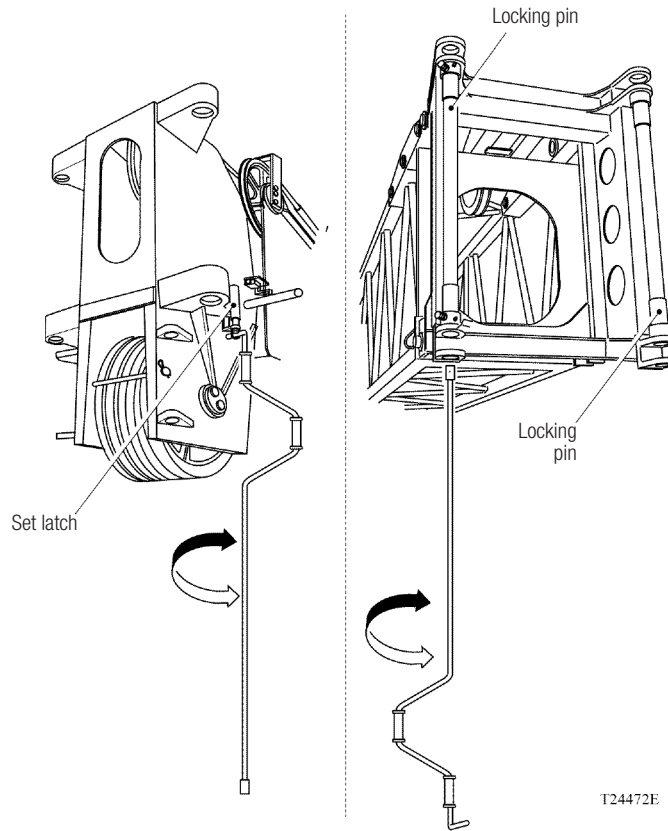
Figure 232: Jib components



CRANK HANDLE TOOL

Use the crank handle tool when mounting or stowing the main jib.

Figure 233: Using the crank handle tool



ENABLE REMOTE CONTROL

The GTC-1600 is equipped with two (2) wireless radio remote controls. See [Counterweight and Jib Remote, pg 3-16](#) and [Carbody Jack Remote, pg 3-18](#) for more information.

1. Press the top of the Remote Enable switch in the operator cab ([Upper Right Control Console, pg 3-10](#)).
2. Verify the Emergency Stop switch on the remote is released.
3. Rotate the ON/START switch to START, press and hold for three (3) seconds, and then release to the ON position.
4. Verify the status lights on the receiver module located on the upper right behind the rear door and the light on the carbody are green, indicating the remote and receiver are communicating.

Figure 234: Remote receiver module



NOTE: Keep remote within 30 ft (9.1 m) of remote receiver module to maintain a proper connection.

5. When the remote is no longer needed, or in the event of a system fault, disable the remote. Press the Emergency Stop switch on the remote to prevent communication between the remote and receiver module. Store the remote in a dry, secure location.

MOUNT MAIN JIB

WARNING

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

Ensure the stowing pins, pivot pin, or locking pins are installed before any operation. If these pins aren't installed as instructed, the jib will fall off when used or moved.

Do NOT allow unauthorized personnel in the work area. Do NOT allow any personnel to enter the area where the jib will swing as this could result in injury. Check the adjacent work area for structures that may obstruct mounting or stowing the jib.

The AML control and automatic stop functions are deactivated when Jib Set is selected. Mount the jib carefully, with no load on the GTC-1600.

When working at an elevated position, use a platform or scissor lift to ensure safety.

Use the included cotter pins to secure the installation/stowing pins.

Ensure the wire rope is wound properly on the winch drum before operating the winch.

1. Position the GTC-1600 on level ground with enough room to maneuver the jib.
2. Fully retract the boom, and lower it to an angle of 2°.

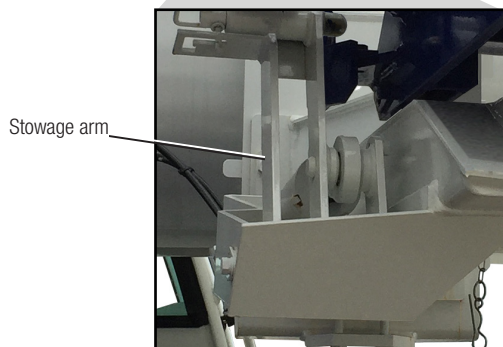
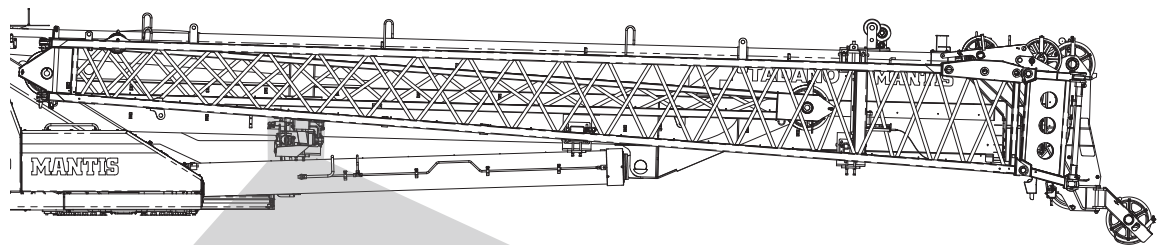

WARNING

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

3. Enable the Counterweight and Jib Remote ([Enable Remote Control, pg A-4](#)).
4. Press and hold the Jib Stow icon on the remote control ([Figure 57, pg 3-16](#)) to ensure the jib stowage arm is fully retracted.

NOTE: The jib stowage arm enabled LED is off when the stowage arm is disabled (sensors detect an unsafe condition).

Figure 235: Jib stowage arm retracted



5. Press and hold the Jib Pin Lock button on the remote control ([Figure 57, pg 3-16](#)) to ensure the jib pivot weldment ([Figure 241, pg A-9](#)) is engaged.
6. Configure the AML ([Registration of Operating Status and Function Check of Automatic Moment Limiter, pg 6-27](#)) to Jib Set.

7. Attach a guide rope to the jib.

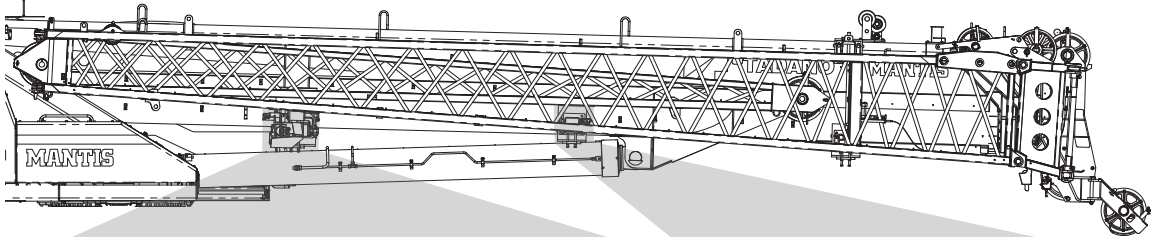
Figure 236: Jib guide rope



Guide rope

8. Uninstall the three (3) jib stowage pins.

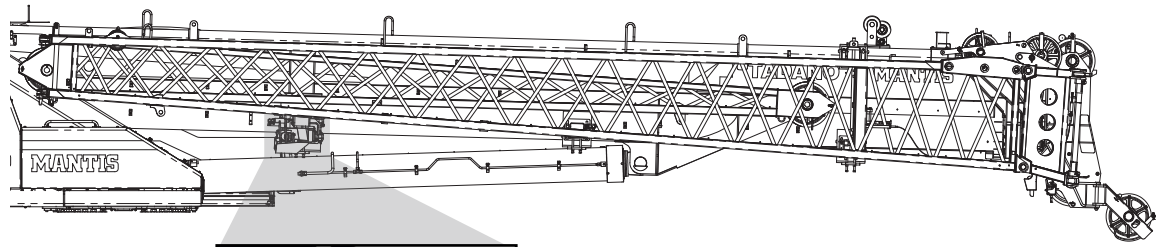
Figure 237: Jib stowage pins



9. If necessary, stow auxiliary nose sheave to prevent jib obstruction.

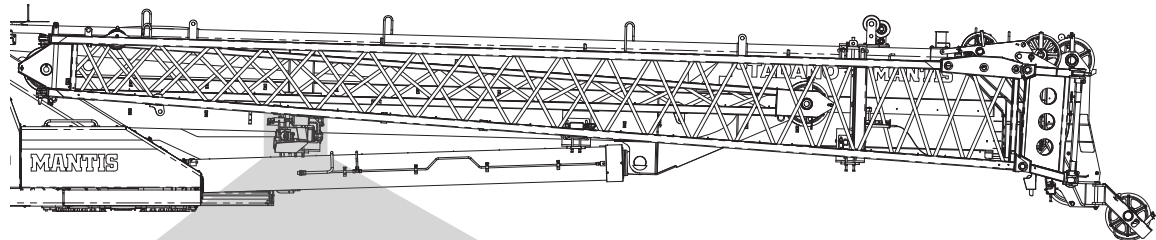
10. Pull down and twist to release the jib stowage latch

Figure 238: Jib stowage latch



11. Swing jib away from boom until jib is securely attached to jib stowage arm via jib stowage arm latch.

Figure 239: Jib stowage arm



12. Ensure the right side jib locking pins and right side boom mounts are aligned ([Figure 240, pg A-8](#)).

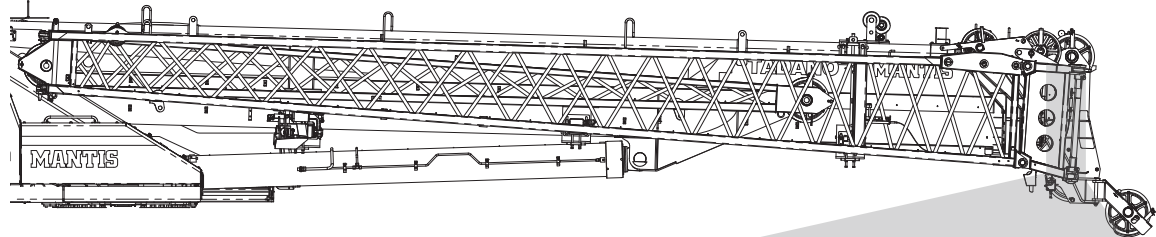
13. Set the jib lock pin switch to Extension, and fully extend the center support jib lock pin.

NOTICE

Do NOT insert the pivot pin while the jib lock pin isn't fully extended. This can damage the jib.

14. Use crank handle tool to install the upper and lower right side boom head locking pins into place.

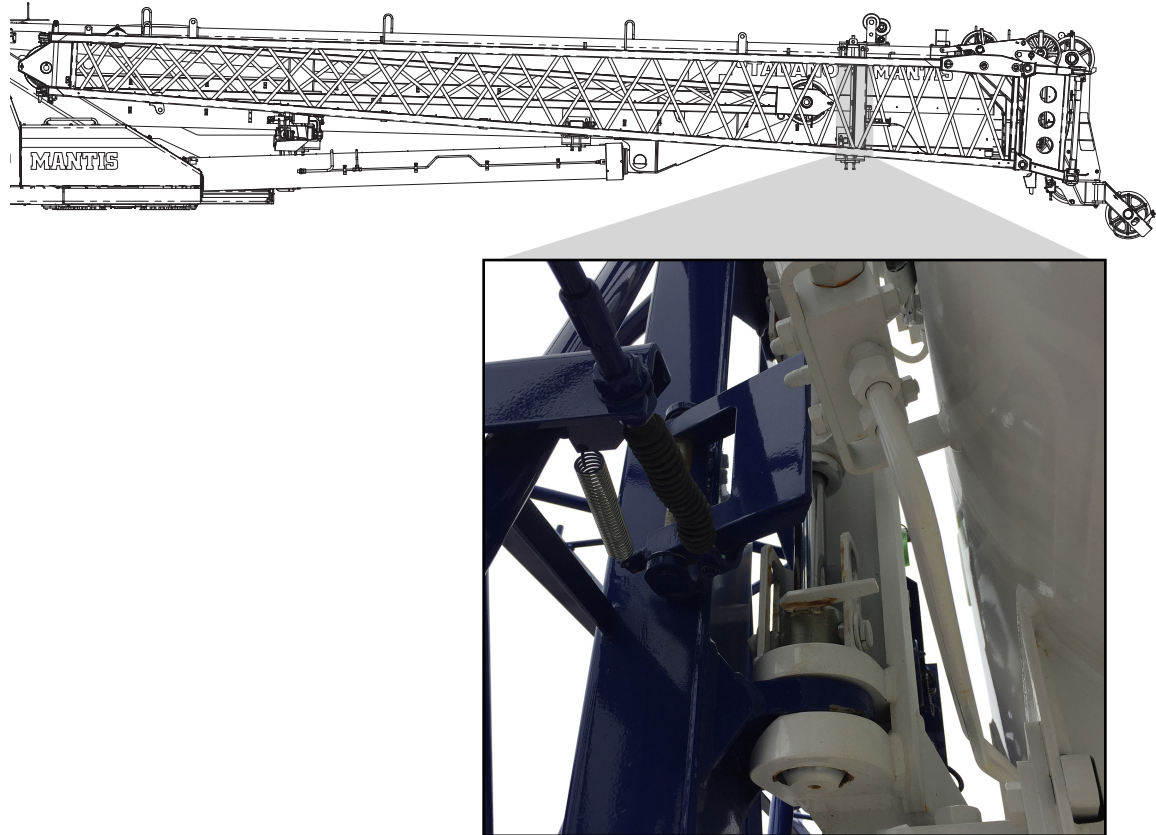
Figure 240: Right side boom head locking pins



NOTE: The boom head locking pins are fully seated when the upper and lower red pin decals are visible.

- Press and hold the Jib Pin Unlock button on the remote control to disengage the jib pivot weldment. See [Counterweight and Jib Remote, pg 3-16](#) for more information.

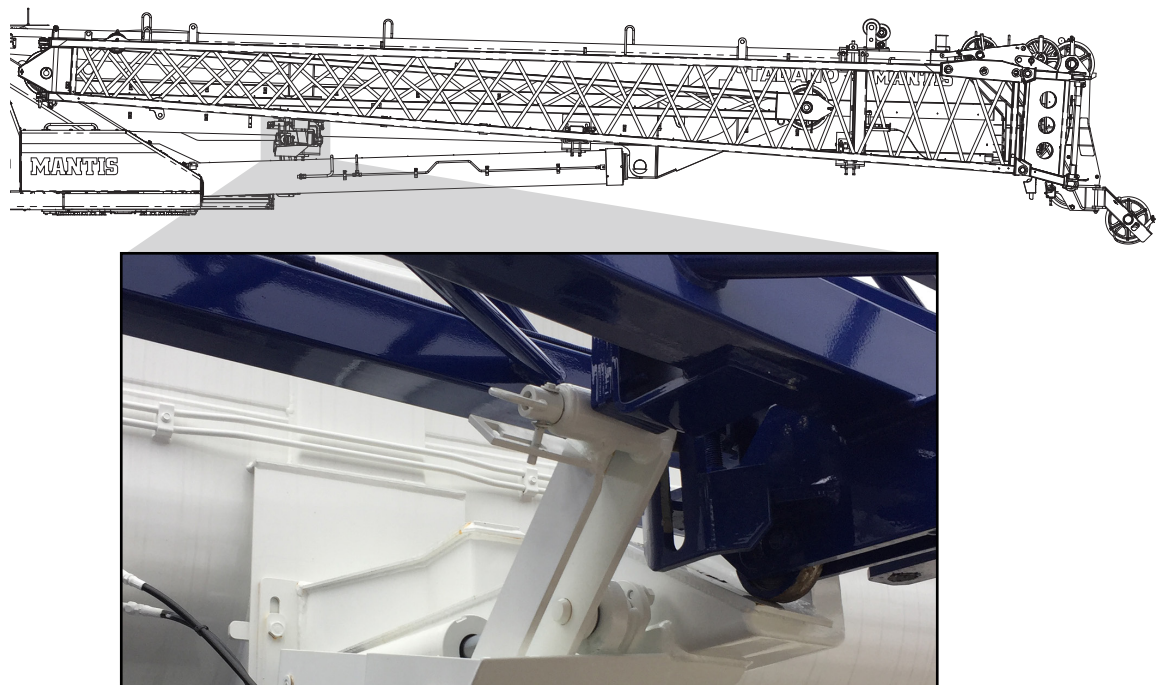
Figure 241: Jib pivot weldment



- Press and hold the Jib Release button on the remote control until the jib stops moving. See [Counterweight and Jib Remote, pg 3-16](#) for more information.

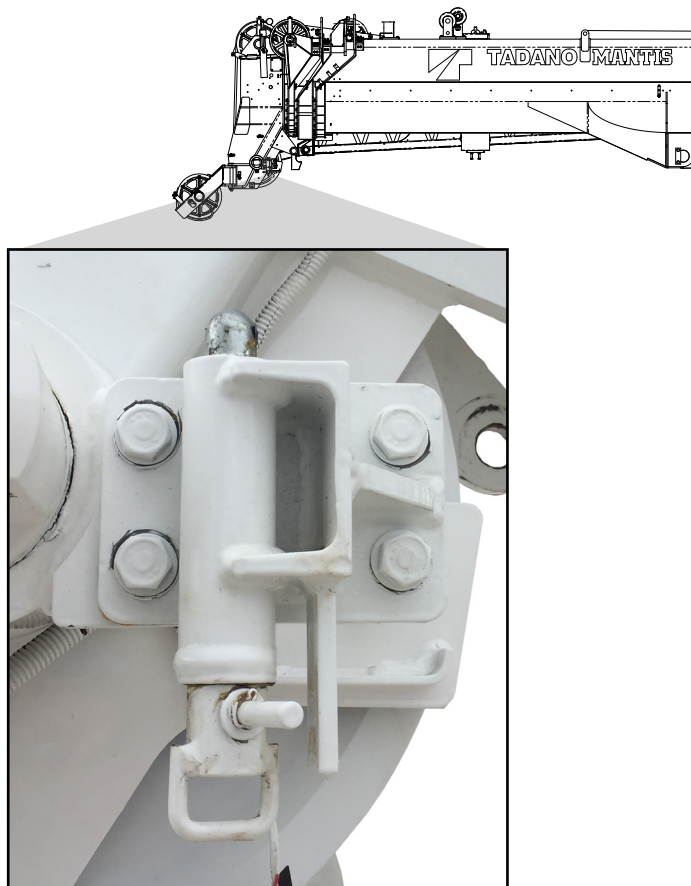
NOTE: This will move the jib stowage arm and jib away from the boom, as far as the jib stowage arm will travel.

Figure 242: Jib stowage arm fully extended



17. If necessary, pull down and twist boom head set latch to ensure mechanism is ready (as shown) to engage jib.

Figure 243: Prepare boom head set latch



18. Secure the guide rope.

CAUTION

The next step will allow the jib to swing freely. Be prepared for sudden jib movement.

19. Pull out and twist to release the stowage arm latch to allow the jib to swing freely.

WARNING

Do NOT allow anyone to stand in the path of, or beneath the jib.

20. Use the guide rope to swing the jib out fully in line with the boom. Ensure the boom head set latch engages the jib.

Figure 244: Jib connected to boom head set latch



21. Press and hold the Jib Stow button on the remote control until the jib stowage arm stops moving. See [Counterweight and Jib Remote, pg 3-16](#) for more information.

NOTE: This will move the jib stowage arm toward from the boom, as far as the jib stowage arm will travel.

CAUTION

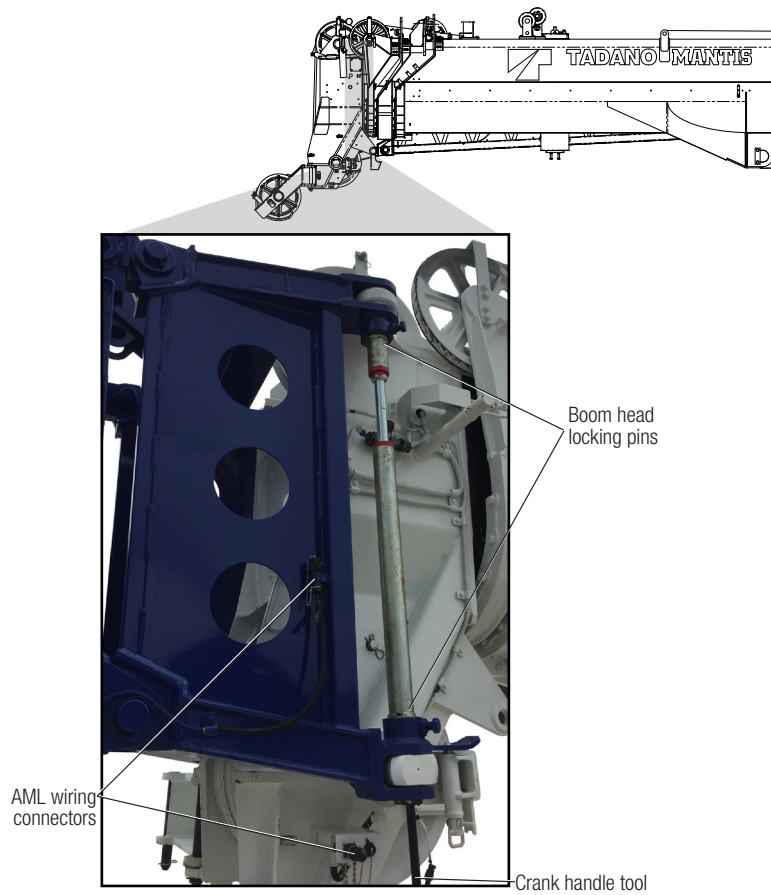
If the jib stowage arm is left extended, it can hinder operation and/or cause GTC-1600 damage.

22. Ensure the left side jib locking pins and left side boom mounts are aligned.

NOTE: If the jib locking pins won't align with the boom mounts, see [Support Main Jib or Jib Extension Weight with Wire Rope, pg A-14](#) to reduce the pressure on the connection points and assist the process.

23. Use the crank handle tool to install the upper and lower left side boom head locking pins into place.

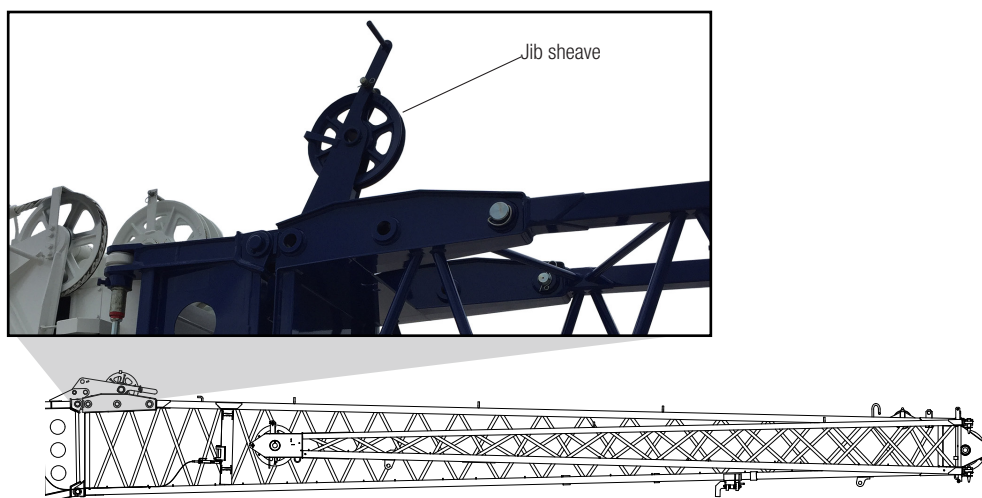
Figure 245: Left side boom head locking pins and AML wiring



NOTE: The boom head locking pins are fully seated when the upper and lower red pin decals are visible.

24. Connect the boom head and jib AML wiring ([Figure 245](#)).
25. If necessary, re-mount the auxiliary nose sheave.
26. If necessary, raise and install the jib sheave.

Figure 246: Jib sheave



27. Reeve the wire rope for the desired application ([Installing Wire Rope, pg 7-40](#)).

CAUTION

Do NOT reeve the jib wire rope over the top boom sheave. Doing so can damage the rope guide pin.

WARNING

NEVER operate the main jib with the jib extension ([Figure 232](#)) stowed on the side of the main jib. If using the main jib but not the jib extension, remove the jib extension and stow on the side of the boom. See [Chapter 8: Backup System Operation, pg 8-1](#) for more information.

SUPPORT MAIN JIB OR JIB EXTENSION WEIGHT WITH WIRE ROPE

When mounting, stowing, or adjusting the main jib or jib extension, pressures caused by the weight of the jib may hinder movement for the desired operation. These pressures can make aligning sections or installing/removing the installation pins difficult. Alleviate this pressure by connecting the wire rope to a rope connection point and winding the rope to lift the jib head.

WARNING

Ensure the stowing pins, pivot pin, or locking pins are installed before any operation. If these pins aren't installed as instructed, the jib will fall off when used or moved.

Do NOT allow unauthorized personnel in the work area.

When working at an elevated position, use a platform or scissor lift to ensure safety.

Use the included cotter pins to secure the installation/stowing pins.

Ensure the wire rope is wound properly on the winch drum before operating the winch.

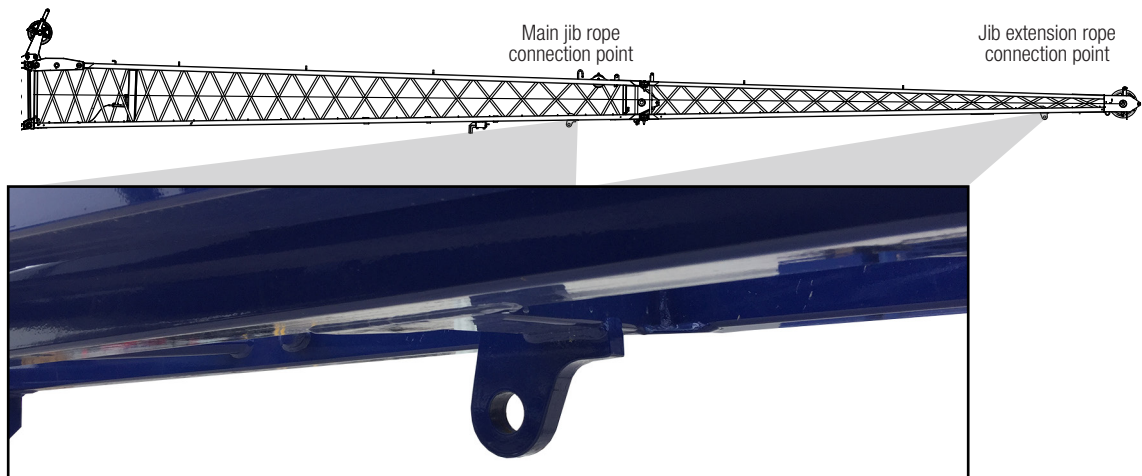
1. Position the GTC-1600 on level ground with enough room to maneuver the jib.
2. Fully retract the boom, and lower it to an angle of 2°.

WARNING

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

3. Locate the appropriate rope connection point (Figure 247), whether on the main jib or jib extension.

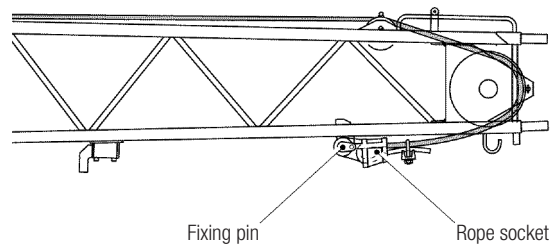
Figure 247: Jib and jib extension rope connection points



NOTE: If only the main jib is mounted, use the main jib rope connection point. If the jib extension is also mounted, use the jib extension rope connection point.

4. Attach the winch wire rope to the correct jib extension rope connection point (Figure 248).

Figure 248: Wire rope attached to main jib rope connection point



CAUTION

Ensure the rope socket is positioned correctly (Figure 248) when attaching it to the rope connection point. If positioned incorrectly, the rope socket could contact the bottom of the jib, causing damage to the jib and/or the rope socket.

5. Wind the wire rope until it is slightly taut.
6. Slowly and carefully, continue to wind the wire rope until the weight of the jib is supported and the pressure is alleviated.

MOUNT JIB EXTENSION

WARNING

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

Ensure the stowing pins, pivot pin, or locking pins are installed before any operation. If these pins aren't installed as instructed, the jib will fall off when used or moved.

Do NOT allow unauthorized personnel in the work area. Do NOT allow any personnel to enter the area where the jib will swing as this could result in injury. Check the adjacent work area for structures that may obstruct mounting or stowing the jib.

The AML control and automatic stop functions are deactivated when Jib Set is selected. Mount the jib carefully, with no load on the GTC-1600.

When working at an elevated position, use a platform or scissor lift to ensure safety.

Use the included cotter pins to secure the installation/stowing pins.

Ensure the wire rope is wound properly on the winch drum before operating the winch.

1. Position the GTC-1600 on level ground with enough room to maneuver the jib.
2. Fully retract the boom, and lower it to an angle of 2°.

WARNING

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

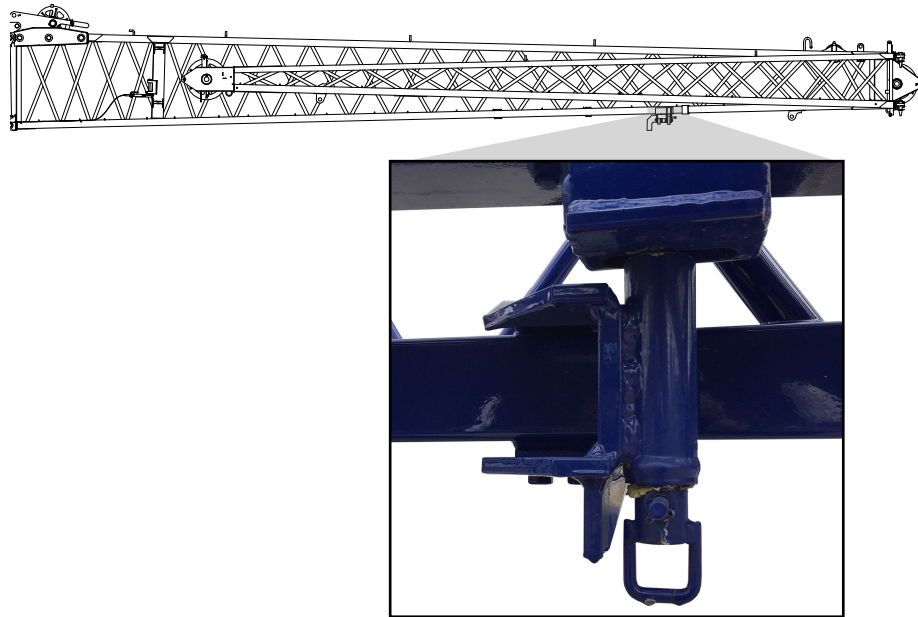
3. If necessary, install main jib. See [Mount Main Jib, pg A-5](#) for more information.
4. Configure the AML ([Registration of Operating Status and Function Check of Automatic Moment Limiter, pg 6-27](#)) to Jib Set.
5. Attach a guide rope to the jib extension.
6. Secure the guide rope.

CAUTION

The next step will allow the jib extension to swing freely. Be prepared for sudden jib movement.

7. Pull down and twist to release the jib extension stowage latch to allow the jib extension to swing freely.

Figure 249: Jib extension stowage latch



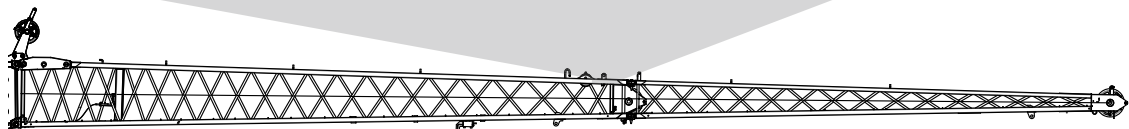
8. Swing out the jib extension fully, aligning it with the main jib head.

⚠ WARNING

Do NOT allow anyone to stand in the path of, or beneath the jib.

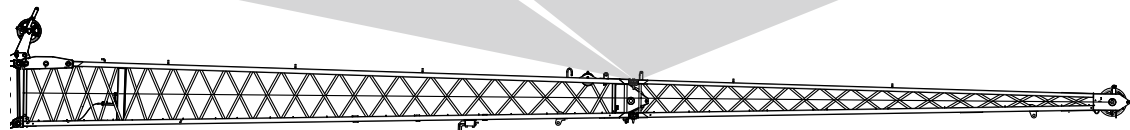
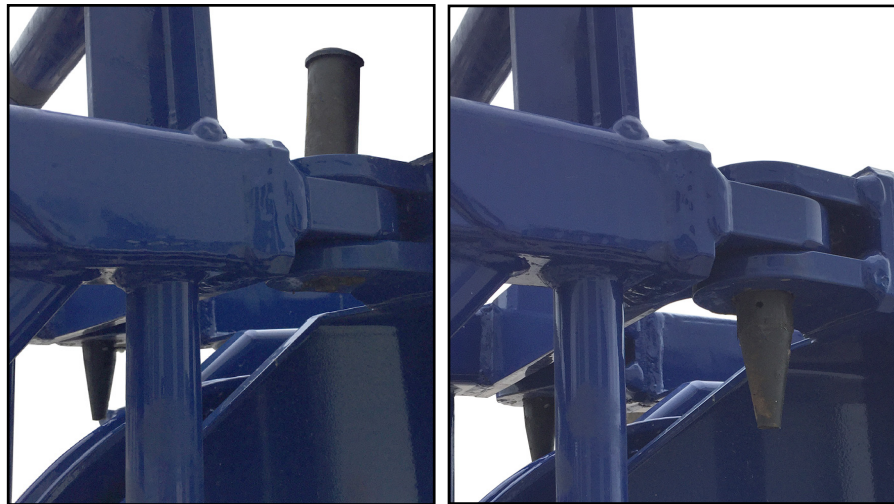
9. Locate the two (2) jib extension pins in the stowage rack in the inner, top area of the jib extension.

Figure 250: Jib extension pins—stowed



10. Ensure the jib extension mounting tab is fully inserted into the main jib mounting bracket, and insert the two (2) jib extension pins in the top and bottom holes, as shown. Reinstall the cotter pins to prevent the jib extension pins from sliding out.

Figure 251: Jib extension pins—installed



NOTE: If the jib extension pins will not slide into place with minimal effort, see [Support Main Jib or Jib Extension Weight with Wire Rope, pg A-14](#) to reduce the pressure on the connection points and assist the process.

11. Connect main jib and jib extension AML wiring.

Figure 252: Jib extension and AML wiring



12. Reeve the wire rope for the desired application ([Installing Wire Rope, pg 7-40](#)).

⚠ CAUTION

Do NOT reeve the wire rope around the guide sheave on the base jib section.

MANUALLY CHANGE JIB ANGLE

NOTE: The GTC-1600 comes with auto-luffing standard.

WARNING

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

Do NOT lower the boom with the wire rope under tension. This could damage the jib or wire rope, and create a hazard.

Ensure the stowing pins, pivot pin, or locking pins are installed before any operation. If these pins aren't installed as instructed, the jib will fall off when used or moved.

Do NOT allow unauthorized personnel in the work area. Do NOT allow any personnel to enter the area where the jib will swing as this could result in injury. Check the adjacent work area for structures that may obstruct mounting or stowing the jib.

The AML control and automatic stop functions are deactivated when Jib Set is selected. Mount the jib carefully, with no load on the GTC-1600.

When working at an elevated position, use a platform or scissor lift to ensure safety.

Use the included cotter pins to secure the installation/stowing pins.

Ensure the wire rope is wound properly on the winch drum before operating the winch.

1. Position the GTC-1600 on level ground with enough room to maneuver the jib.
2. Fully retract the boom, and lower it to an angle of 2°.

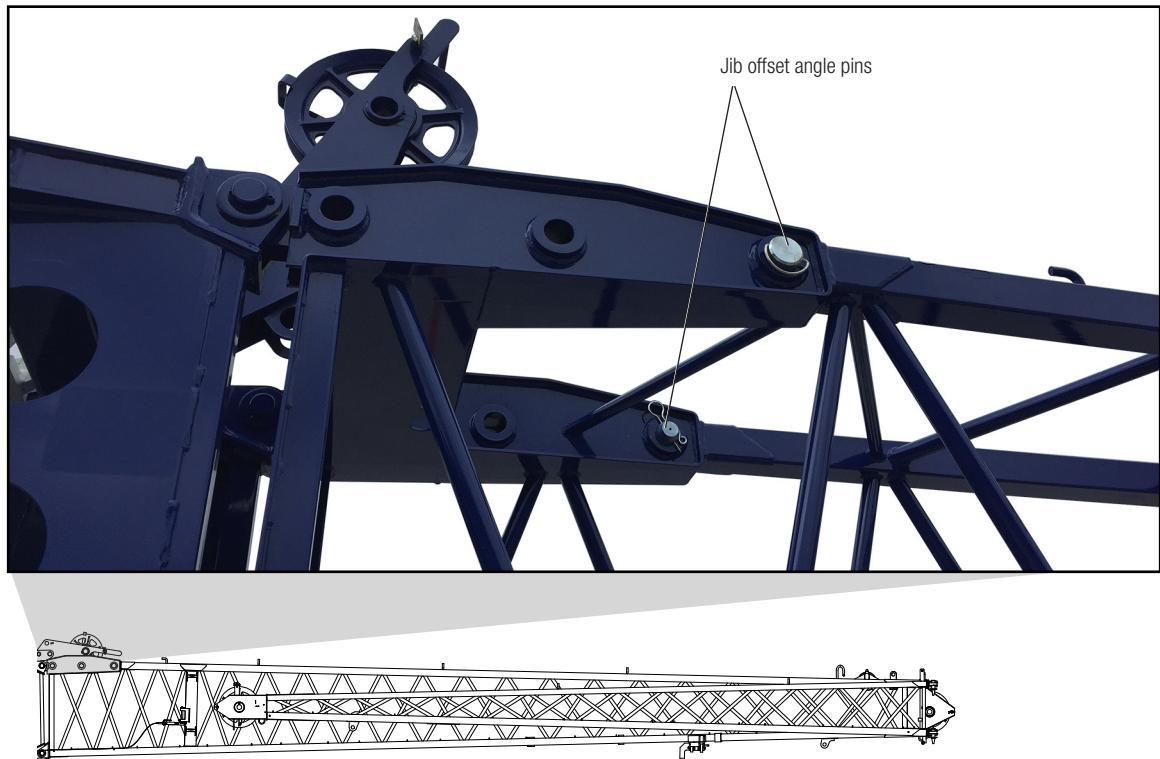
WARNING

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

3. Configure the AML ([Registration of Operating Status and Function Check of Automatic Moment Limiter, pg 6-27](#)) to Jib Set.
4. Ensure the main jib ([Mount Main Jib, pg A-5](#)) or jib extension ([Mount Jib Extension, pg A-16](#)) are properly installed.
5. Use the winch to slightly raise the jib head to alleviate the pressure on the jib offset angle pins. See [Support Main Jib or Jib Extension Weight with Wire Rope, pg A-14](#) for more information.

- Remove the jib offset angle pins.

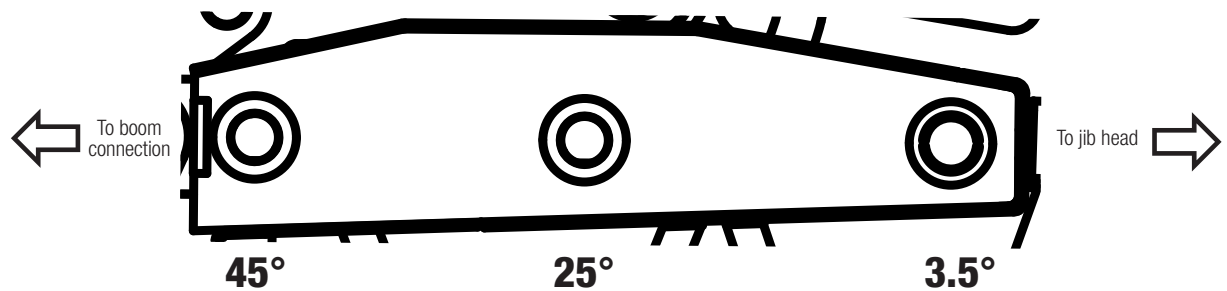
Figure 253: Jib offset angle pins



- Use the winch to raise/lower jib head to align internal angle positioning bars with the desired offset angle hole (Figure 254).

NOTE: The internal angle positioning bars are only visible through the offset angle positioning holes.

Figure 254: Offset angle positioning holes



⚠ CAUTION

If necessary, raise the boom when the jib lowers to prevent jib head from contacting the ground.

- With the angle positioning bars properly aligned, reinstall the jib offset angle pins through the offset angle positioning holes and internal angle positioning bars. Reinstall retaining cotter pins.
- Slowly unwind the winch to release the wire rope tension.

⚠ CAUTION

If applicable, stow the auxiliary wire rope with slack. If stowed under tension, the wire rope could damage the stowage support when the boom is raised.

STOW JIB EXTENSION

WARNING

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

Ensure the stowing pins, pivot pin, or locking pins are installed before any operation. If these pins aren't installed as instructed, the jib will fall off when used or moved.

Do NOT allow unauthorized personnel in the work area. Do NOT allow any personnel to enter the area where the jib will swing as this could result in injury. Check the adjacent work area for structures that may obstruct mounting or stowing the jib.

The AML control and automatic stop functions are deactivated when Jib Set is selected. Mount the jib carefully, with no load on the GTC-1600.

When working at an elevated position, use a platform or scissor lift to ensure safety.

Use the included cotter pins to secure the installation/stowing pins.

Ensure the wire rope is wound properly on the winch drum before operating the winch.

NEVER operate the main jib with the jib extension (Figure 232) stowed on the side of the main jib. If using the main jib but not the jib extension, remove the jib extension and stow on the side of the boom. See [Stow Jib Extension on Boom, pg A-25](#) for more information.

1. Position the GTC-1600 on level ground with enough room to maneuver the jib.
2. Fully retract the boom, and lower it to an angle of 2°.

WARNING

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

3. Configure the AML ([Registration of Operating Status and Function Check of Automatic Moment Limiter, pg 6-27](#)) to Jib Set.
4. If the jib offset angle is greater than 3.5°, set it to 3.5°. See [Manually Change Jib Angle, pg A-20](#) for more information.
5. Attach a guide rope to the jib extension, and secure it.

CAUTION

The next step will allow the jib extension to swing freely. Be prepared for sudden jib movement.

6. Disconnect main jib and jib extension AML wiring ([Figure 252, pg A-19](#)).

WARNING

Failure to disconnect the AML wiring will damage the wiring and result in non-functionality. Ensure the anti-two-block device is functioning properly before performing any lift.

7. Use a mallet to uninstall the two (2) left jib extension pins from the top and bottom holes, as shown ([Figure 251, pg A-18](#)).

NOTE: If the jib extension pins will not slide out with minimal effort, slightly lift the jib extension head to reduce pinching stress on the mounting brackets. See [Support Main Jib or Jib Extension Weight with Wire Rope, pg A-14](#) for more information.

8. Install the two (2) jib extension pins in the stowage rack in the inner, top area of the jib extension ([Figure 250, pg A-17](#)). Reinstall the cotter pins to prevent the jib extension pins from sliding out.
9. Uninstall the winch wire rope from the jib extension.
10. Pull down and twist the jib extension stowage latch to allow it to engage the jib extension securely ([Figure 249, pg A-17](#)).
11. Swing in the jib extension fully, aligning it with the main jib.
12. If fully stowing jib, stow main jib ([Stow Main Jib, pg A-23](#)).
13. Reeve the wire rope for the desired application ([Installing Wire Rope, pg 7-40](#)).

STOW MAIN JIB

WARNING

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

Ensure the stowing pins, pivot pin, or locking pins are installed before any operation. If these pins aren't installed as instructed, the jib will fall off when used or moved.

Do NOT allow unauthorized personnel in the work area. Do NOT allow any personnel to enter the area where the jib will swing as this could result in injury. Check the adjacent work area for structures that may obstruct mounting or stowing the jib.

The AML control and automatic stop functions are deactivated when Jib Set is selected. Mount the jib carefully, with no load on the GTC-1600.

When working at an elevated position, use a platform or scissor lift to ensure safety.

Use the included cotter pins to secure the installation/stowing pins.

Ensure the wire rope is wound properly on the winch drum before operating the winch.

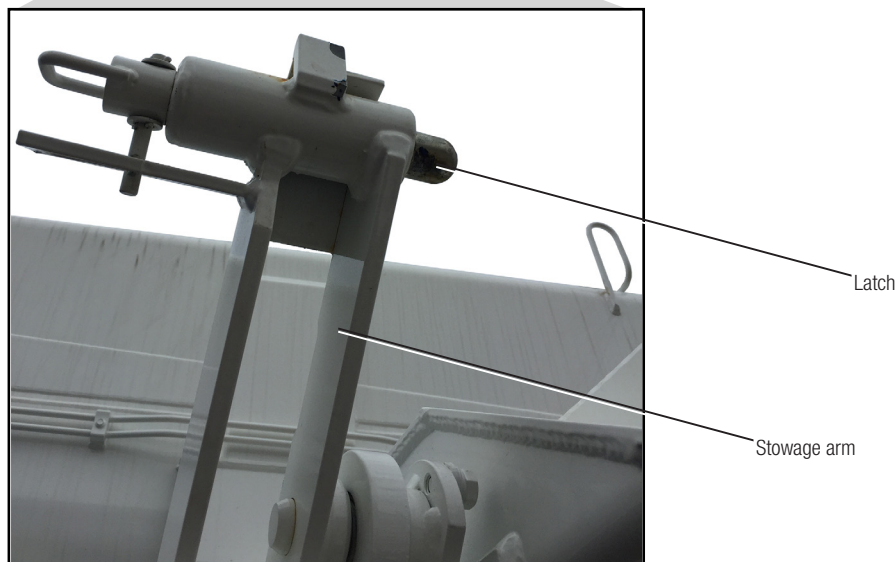
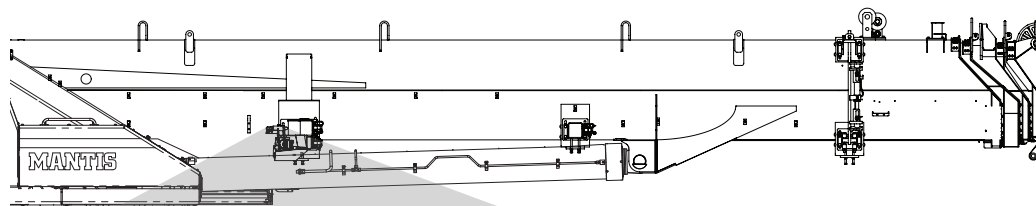
1. Position the GTC-1600 on level ground with enough room to maneuver the jib.
2. Fully retract the boom, and lower it to an angle of 2°.


WARNING

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

3. Enable the Counterweight and Jib Remote ([Enable Remote Control, pg A-4](#)).
4. Press and hold the Jib Release button on the remote control ([Figure 57, pg 3-16](#)) to ensure the jib stowage arm is fully extended.

Figure 255: Jib stowage arm extended



5. Press and hold the Jib Pin Lock button on the remote control (Figure 57, pg 3-16) to ensure the jib pivot weldment (Figure 241, pg A-9) is engaged.
6. Configure the AML (Registration of Operating Status and Function Check of Automatic Moment Limiter, pg 6-27) to Jib Set.
7. If the jib offset angle is greater than 3.5°, set it to 3.5°. See Manually Change Jib Angle, pg A-20 for more information.
8. Ensure the jib extension is properly stowed (Stow Jib Extension, pg A-22).
9. Attach a guide rope to the jib (Figure 236, pg A-6).
10. Wind the winch wire rope off the jib sheaves.
11. Lower and stow the jib sheave (Figure 246, pg A-13).
12. Disconnect the boom head and jib AML wiring (Figure 245, pg A-12).

WARNING

Failure to disconnect the AML wiring will damage the wiring and result in non-functionality. Ensure the anti-two-block device is functioning properly before performing any lift.

13. Use crank handle tool to uninstall the upper and lower left side boom head locking pins from the left side boom mounts (Figure 245, pg A-12).
NOTE: If the jib locking pins won't disengage from the boom mounts, see Support Main Jib or Jib Extension Weight with Wire Rope, pg A-14 to reduce the pressure on the connection points and assist the process.
14. If necessary, pull out and twist the jib stowage arm latch to ensure it is ready (Figure 255) to engage the jib.
15. Secure the guide rope.

CAUTION

The next step will allow the jib to swing freely. Be prepared for sudden jib movement.

16. Pull down and twist to release the boom head set latch (Figure 244, pg A-11).
17. Use the guide rope to swing the main jib back to the boom.
18. Ensure the jib is securely attached to jib stowage arm via jib stowage arm latch (Figure 239, pg A-7).
19. Press and hold the Jib Stow button on the remote control until the jib stops moving. See Counterweight and Jib Remote, pg 3-16 for more information.
NOTE: This will move the jib stowage arm and jib toward the boom.
20. Press and hold the Jib Pin Lock button to engage the jib pivot weldment (Figure 241, pg A-9). See Counterweight and Jib Remote, pg 3-16 for more information.
NOTE: When the jib lock pin is properly extended, the marks on the cylinder (red) and the jib (blue) will align.
21. Use crank handle tool to uninstall the upper and lower right side boom head locking pins from the right side boom mounts (Figure 240, pg A-8).
NOTE: If the jib locking pins won't disengage from the boom mounts, see Support Main Jib or Jib Extension Weight with Wire Rope, pg A-14 to reduce the pressure on the connection points and assist the process.
22. Pull out and twist to release the stowage arm latch to allow the jib to swing freely.
23. Swing jib toward the boom until jib is securely attached to the boom by the jib stowage latch (Figure 238, pg A-7).
24. Install the three (3) jib stowage pins (Figure 237, pg A-6).
25. Reeve the wire rope on the boom for the desired application (Installing Wire Rope, pg 7-40).

STOW JIB EXTENSION ON BOOM

 **WARNING**

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

Confirm the stowing pins, pivot pin, or locking pins are installed before any operation. If these pins aren't installed as instructed, the jib will fall off when used or moved.

Do NOT allow unauthorized personnel in the work area. Do NOT allow any personnel to enter the area where the jib will swing as this could result in injury. Check the adjacent work area for structures that may obstruct mounting or stowing the jib.

The AML control and automatic stop functions are deactivated when Jib Set is selected. Mount the jib carefully, with no load on the GTC-1600.

When working at an elevated position, use a platform or scissor lift to ensure safety.

Use the included cotter pins to secure the installation/stowing pins.

Confirm the wire rope is wound properly on the winch drum before operating the winch.

NEVER operate the main jib with the jib extension (Figure 232) stowed on the side of the main jib. If using the main jib but not the jib extension, remove the jib extension and stow on the side of the boom.

If using ONLY the main jib, stow the jib extension on the boom.

1. Position the GTC-1600 on level ground with enough room to maneuver the jib.
2. Fully retract the boom, and lower it to an angle of 2°.

 **WARNING**

Do NOT lower the boom to an angle less than 0°. This could cause the jib to fall off.

3. Configure the AML (Registration of Operating Status and Function Check of Automatic Moment Limiter, pg 6-27) to Jib Set.
4. If the jib offset angle is greater than 3.5°, set it to 3.5°. See [Manually Change Jib Angle, pg A-20](#) for more information.
5. Ensure the jib is installed. See [Mount Main Jib, pg A-5](#) and [Mount Jib Extension, pg A-16](#).
6. If connected, disconnect the jib extension AML wiring (Figure 252, pg A-19).
7. Wind the winch wire rope off the jib extension.
8. With another crane or a forklift, properly rig and fully support the weight of the jib extension.

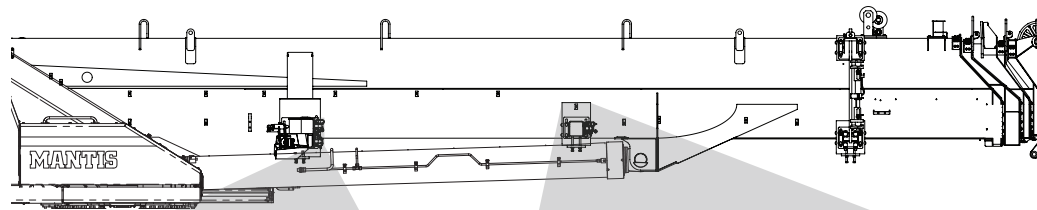
 **WARNING**

Do NOT allow any personnel beneath the jib.

9. Uninstall the four (4) jib extension pins (Figure 251, pg A-18) and stow them (Figure 250, pg A-17).
10. Position the jib extension along the right side of the boom with the tip facing the boom head (Figure 232).

- Align the jib extension stowage pin holes (Figure 256) with the pin holes in the stowage support and center support (Figure 232, pg A-2).

Figure 256: Jib extension stowage pin holes and pins



Stowage support



Center support

Jib extension stowage pin holes

Jib extension stowage pins

- Install the jib stowage pins in the stowage support and center support to secure the jib extension to the boom.
- Install the included cotter pins in the jib extension stowage pins.
- Remove the supporting crane/forklift and rigging.
- Reeve the wire rope on the boom for the desired application (Installing Wire Rope, pg 7-40).

APPENDIX B: ANEMOMETER (OPTIONAL)

WARNING

A strong wind will sway a lifted load. This is dangerous to workers and surrounding structures, and can damage the boom and overturn the GTC-1600. Note that the longer the boom is, and the larger the area of the load is, the more the wind will affect the GTC-1600.

The rated lifting capacity does not include the effect of the wind on the load, boom or jib.

If it is difficult to control the load because of the wind, stop GTC-1600 operation.

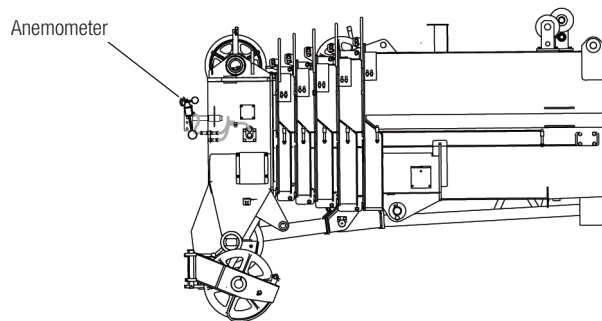
Consult TADANO for rated capacities when wind speed exceeds 20 mph.

The anemometer measures the wind speed at the boom head in order to prevent damages to the GTC-1600 or an overturning accident caused by a strong wind. See [Stop Operation during Strong Wind Conditions, pg 1-18](#) for more information.

INSTALLING THE ANEMOMETER

1. Set the boom to the stowed position.
2. Turn the GTC-1600 off.
3. Install the anemometer to the mounting support on the head of the boom and secure it with the fixing pin.

Figure 257: Anemometer location



WARNING

To prevent the anemometer from falling, ensure the fixing pin is mounted securely.



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