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***OPERATOR'S
AND
SAFETY
HANDBOOK***

RT600C Series

S/N _____

PUBLISHED: SEPTEMBER, 1992

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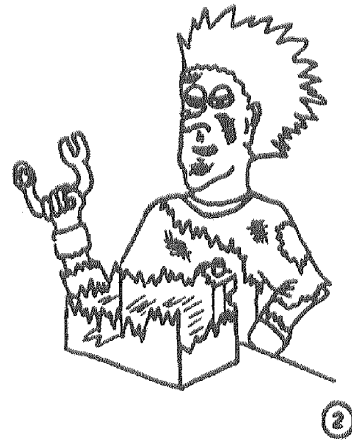
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Don't smoke while performing battery maintenance.

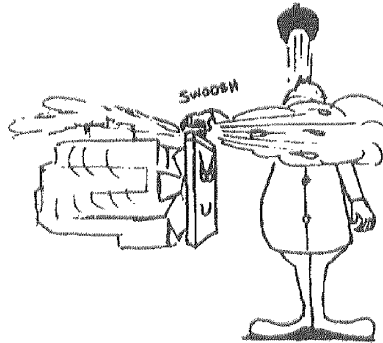
Disconnect the grounded battery clamp first when removing a battery and connect it last when installing battery.

Before charging a battery, consult the battery manufacturer's instructions.

Avoid battery acid contact with the skin and eyes. If accidentally contacted, flush the area with water and consult a doctor immediately.

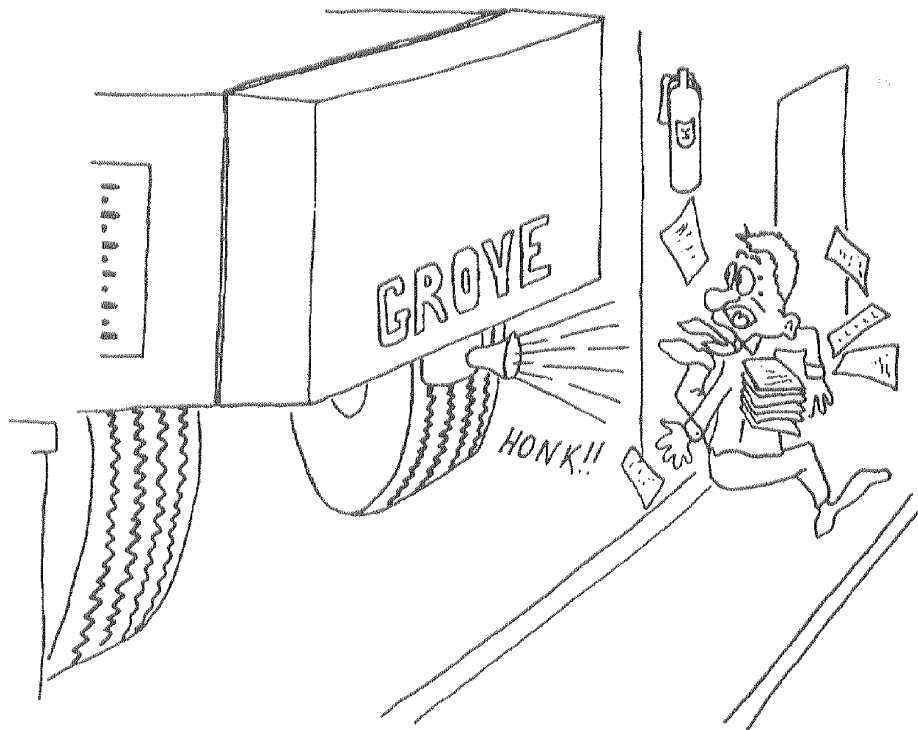
Follow standard safety precautions when refueling. **FUEL IT SAFELY.**

Be careful when checking the coolant level. Shut down the engine and allow the radiator time to cool before removing the radiator cap.



Unless authorized and approved by Grove Manufacturing Company, do not make any modifications, alterations, or changes to a crane which could in any way affect its original design. Such action invalidates all warranties and capacity charts, and makes the owner/user liable for any resultant accidents.

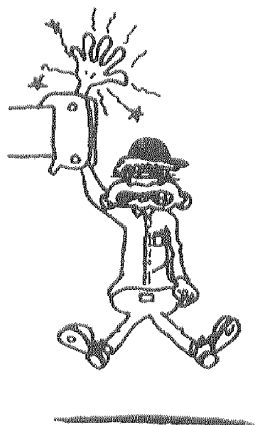
Keep the crane properly maintained and adjusted at all times. Shut down the crane while making repairs or adjustments.



Sound a warning before moving the crane or when approaching personnel.

Always move toward the load and move slowly. Use a tag line to control the load.

Stay clear of the sheave wheels, holes, and lattice work in telescoping booms and other potentially dangerous areas whenever the crane is in operation.



Pinch points are impossible to eliminate. Keep all portions of your body away from cable drums, sheaves, pulleys, lift cylinders, and other moving parts of the crane. Be extremely careful when performing maintenance on the crane.

Cranes equipped with an extendable counterweight must have the counterweight in extended position prior to lifting.

Use extreme caution when lifting with more than one hoist.

Stay outside of the jib sections.

Avoid falling or flying pins as they are freed or removed.

WIRE ROPE AND SHEAVES

The following information is taken from a National Consensus Standard as referenced by Federal Government Agencies.

All wire rope will eventually deteriorate to a point where it is no longer usable. Wire rope shall be taken out of service when any of the following conditions exist:

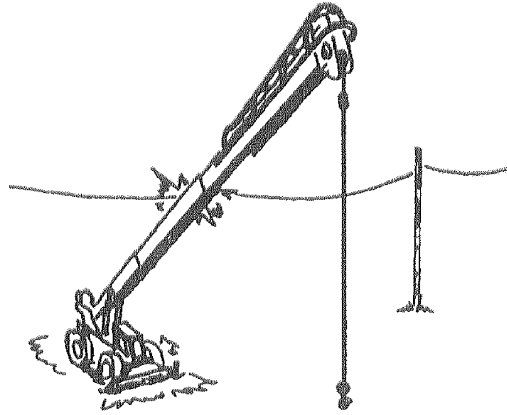
1. In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay.
2. Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure.
3. Evidence of any heat damage from any cause.
4. Reductions from nominal diameter of more than:
 - 1/64 inch for diameters up to and including 5/16 inch
 - 1/32 inch for diameters 3/8 and 1/2 inch inclusive
 - 3/64 inch for diameters 9/16 to 3/4 inch inclusive
 - 1/16 inch for diameters 7/8 to 1 1/8 inches inclusive
 - 3/32 inch for diameters 1 1/4 to 1 1/2 inches inclusive.
5. In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.

Refuse to work with worn or damaged wire rope.

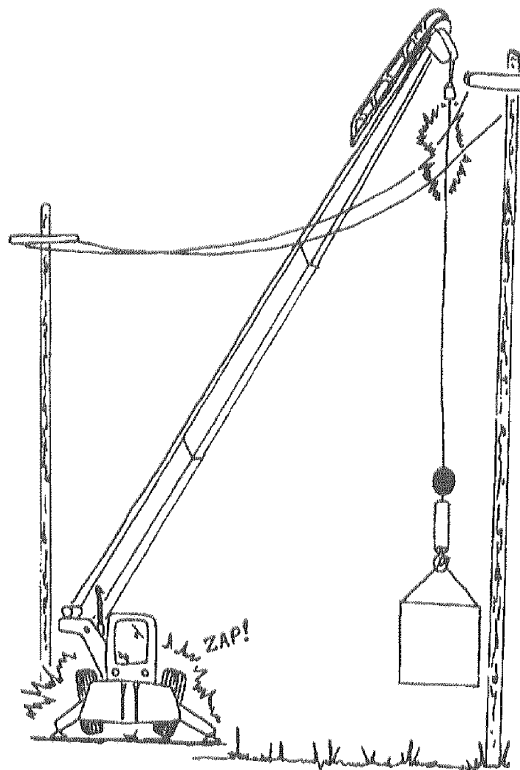
Demand to see the rope inspection record required by law and inspect the wire rope yourself. Don't take another person's word.

The use of cast nylon (nylatron) sheaves, as compared with steel sheaves, will substantially increase the service life of wire rope. However, conventional rope retirement criteria based only upon visible wire breaks may prove inadequate in predicting rope failure. The user of cast nylon sheaves is therefore cautioned that a retirement criteria should be established based upon the user's experience and the demands of his application.

Boom Cage/Guards afford limited protection from electrocution hazards. They are designed to cover only the boom–nose/point, and a portion of the boom. Performance of boom cages/guards is limited by their physical lengths, insulating characteristics, and the operating environment (e.g. dust, dirt, moisture, etc.).



Insulating links installed into the load–line afford limited protection for those handling the load. Links have limited lifting, insulating, and other properties that affect their performance. Moisture, dust, dirt, oils, etc. can cause a link to conduct electricity. Due to their capacity ratings, some links are not effective for large cranes and/or high voltages/currents.



Section 3

CAB CONTROLS AND INDICATORS

ENGINE CONTROLS AND INDICATORS

HAND THROTTLE LOCK CONTROL

The THROTTLE lock control (60) is located on the lower right side of the front console. The throttle lock is mechanically connected to the foot throttle and provides the operator with a means of maintaining specified engine rpm for crane operation. To use the throttle lock, depress the foot throttle to obtain the desired engine rpm, push the button on the throttle lock control knob and pull out on the knob. When pressure is felt, release the button and turn the collar in a clockwise direction to lock the throttle at the desired rpm. To release the throttle, rotate the collar counterclockwise, depress the button and push in on the cable.

ENGINE OIL PRESSURE GAUGE

The engine oil pressure (OIL PRESS) gauge (47) is located on the gauge cluster at the left side of the front console. The gauge indicates the engine oil pressure on the dual scale calibrated from zero (0) to 100 psi and zero (0) to 690 kPa. It receives a signal from an oil pressure sending unit on the engine.

TRANSMISSION OIL TEMPERATURE GAUGE

The transmission oil temperature (OIL TEMP) gauge (44) is located near the center of the front console. The gauge indicates the temperature of the transmission oil on a dual scale calibrated from 140 to 320 degrees F and 60 to 160 degrees C. The gauge receives a signal from a temperature sending unit in the oil line at the torque converter.

FUEL GAUGE

The fuel (FUEL) gauge (42) is located on the gauge cluster at the left side of the front console. The gauge indicates the quantity of fuel in the fuel tank and has a scale calibrated from zero (0) to 4/4. The fuel quantity gauge receives a signal from a sending unit in the fuel tank.

VOLTMETER

The voltmeter (BATTERY) gauge (40) is located on the gauge cluster at the left side of the front console. The voltmeter indicates the voltage being supplied to or from the battery and has a scale of 10 to 16 volts.

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SWING CONTROL LEVER (SINGLE AXIS CONTROLLER)

The SWING control lever (15) is located on the end of the left armrest. The lever controls the swing functions. The lever, when positioned forward or back actuates a control valve through hydraulic pilot pressure to provide 360 degree continuous rotation in the desired direction. When the optional non-free swing is provided, movement of this lever also controls the swing brake.

REAR STEER CONTROL

The REAR STEER control (45) is a three position, spring centered to off, rocker switch located on the left side of the front console. By positioning the switch to the right, a control valve is actuated to turn the rear wheels to the left, which causes the crane to turn to the right. By positioning the switch to the left, a control valve is actuated to turn the rear wheels to the right, which causes the crane to turn to the left. Releasing the switch allows it to spring center to the off position.

REAR STEER INDICATOR

The rear steer indicator (43) is located on the left side of the front console above the REAR STEER control. The indicator consists of a gauge with an indicator needle that shows the positioning of the rear wheels.

BOOM LIFT CONTROL LEVER (SINGLE AXIS CONTROLLER)

The boom LIFT control lever (17) is located on the right armrest. The lever, when positioned forward or back, actuates the control valve through hydraulic pilot pressure to raise or lower the boom.

MAIN HOIST CONTROL LEVER (SINGLE AXIS CONTROLLER)

The MAIN hoist control lever (18) is located on the right armrest. Pushing the lever forward will let out the hoist cable and pulling the lever back reels the cable in.

BOOM LIFT AND MAIN HOIST CONTROL LEVER (DUAL AXIS CONTROLLER)

The boom lift and main hoist (LIFT/MAIN) control lever (20) is located on the right armrest. The lever, when positioned to the left, actuates the control valve through hydraulic pilot pressure to raise the boom. Positioning the lever to the right lowers the boom. Pushing the lever forward will let out the hoist cable and pulling the lever back reels the cable in. Moving the lever in a diagonal direction actuates the two functions simultaneously.

ENGINE OPERATION

Starting and shutdown procedures for most diesel engines generally follow the same pattern. Therefore, the following procedures can be applied except where specific differences are noted. (Refer to applicable engine manufacturer's manual for detailed procedures.)

STARTING PROCEDURE

WARNING

BEFORE STARTING THE ENGINE, ENSURE THE PARKING BRAKE IS APPLIED AND SWING LOCK IS ENGAGED.

CAUTION

NEVER CRANK THE ENGINE FOR MORE THAN 30 SECONDS DURING AN ATTEMPTED START. IF THE ENGINE FAILS TO START AFTER 30 SECONDS, ALLOW THE STARTER MOTOR TO COOL FOR APPROXIMATELY TWO MINUTES BEFORE ATTEMPTING ANOTHER START.

CAUTION

IF THE ENGINE FAILS TO START AFTER FOUR ATTEMPTS, CORRECT THE MALFUNCTION BEFORE ATTEMPTING ANY FURTHER STARTS.

NOTE

The engine will not crank unless the transmission gearshift lever is in the neutral position.

NOTE

When starting a cold engine, ensure the hydraulic pumps are disengaged.

1. Turn the ignition switch to START and release immediately when the engine starts.
2. When start has been accomplished, check engine instruments for proper indications.

CONTROL LEVER OPERATION

The control lever operation for crane functions is standard, i.e., the closer the lever is to neutral (center), the slower the system responds. This applies to forward, rear, or side movement of the applicable lever. The control lever should be returned to neutral to hold the load. Never feather the hoist control to hold the load.

NOTE

Always operate the control levers with slow, even pressure.

PRELOAD CHECK

After the crane has been readied for service, an operational check of all crane functions (with no load applied) should be performed. Accomplish the Preload Check as follows.

CAUTION

OPERATE THE ENGINE AT OR NEAR THE GOVERNED RPM DURING PERFORMANCE OF ALL CRANE FUNCTIONS.

NOTE

Carefully read and become familiar with all crane operating instructions before attempting a preload check and operating the crane under load.

1. Extend and set the outriggers.
2. Raise, lower, and swing the boom right and left a minimum of 45 degrees.
3. Telescope the boom in and out, extending and retracting the boom sections equally at all times.
4. Raise and lower the cable a few times at various boom lengths. Ensure there is no kinking.

USING YOUR LOAD CHART

NOTE

One of the most important tools of every Grove crane is the load chart found in the crane operator's cab.

OPTIONAL EQUIPMENT OPERATION

ENGINE COLD START SYSTEM

The engine cold start system is provided as an aid for starting the engine during cold weather. The system consists of a switch, a solenoid valve, an ether container, and the necessary tubing. The COLD START switch is located on the front control panel in the cab. The solenoid valve and ether container are mounted inside the engine compartment. The cold start is energized only when the ignition switch is in the START position and the COLD START button is pushed. (See COLD WEATHER STARTING).

HI-SPEED GLIDE SYSTEM

Before operating the hi-speed glide system the following conditions must be met.

1. The boom must be fully retracted.
2. The boom must be elevated approximately 15 degrees.
3. There must be no load on the hook.

After the above conditions are met, place the hi-speed glide control switch in the ENGAGE position. When the indicator light illuminates, begin traveling. Place the switch in the DISENGAGE position when hi-speed glide travel is complete.

13. Lower Lift Cylinder Pivot Shaft.

NOTE

When greasing the lift cylinder pivot shafts, better distribution of grease within the shafts is obtained if the weight of the boom is removed from the shafts.

Lube Type – EP-MPG
Lube Interval – 10 hours
Lube Amount – Until grease extrudes
Application – 1 grease fitting per cylinder

14. Boom Pivot Shaft.

NOTE

When greasing the lift cylinder and boom pivot shafts, better distribution of grease within the shafts is obtained if the weight of the boom is removed from the shafts.

Lube Type – EP-MPG
Lube Interval – 10 hours
Lube Amount – Until grease extrudes
Application – 2 grease fittings – 1 each side

15. Model HO-30 Holst.

Lube Type – EPGL-5H
Lube Interval – Check every 250 hours
Lube Amount – Capacity 16 in. (40.6 cm) Drum – 12 qts. (11.6 L)
Application – With the crane level, position the drum so one of the plugs is directly at the top. Remove the other plug from the drum. The oil should be level with the bottom of this plug

16. Cable Follower and Idler Assembly.

Lube – EP-MPG
Lube Interval – Weekly
Lube Amount – Until grease extrudes
Application – 2 fitting on idler, 2 fittings on follower



Section 7

SET UP AND INSTALLATION PROCEDURES

GENERAL

This section provides procedures for installing the hoist cable on the hoist drum, cable reeving, and erecting and stowing the swingaway boom extension.

INSTALLING CABLE ON THE HOIST

CAUTION

IF CABLE IS WOUND FROM THE STORAGE DRUM, THE REEL SHOULD BE ROTATED IN THE SAME DIRECTION AS THE HOIST.

NOTE

The cable should preferably be straightened before installation on the hoist drum.

Install cable on the hoist drum in accordance with the following procedure.

1. Position the cable over the boom nose sheave and route to the hoist drum.
2. Position the hoist drum with the cable anchor slot on top.
3. Insert the cable through the slot and position around the anchor wedge.

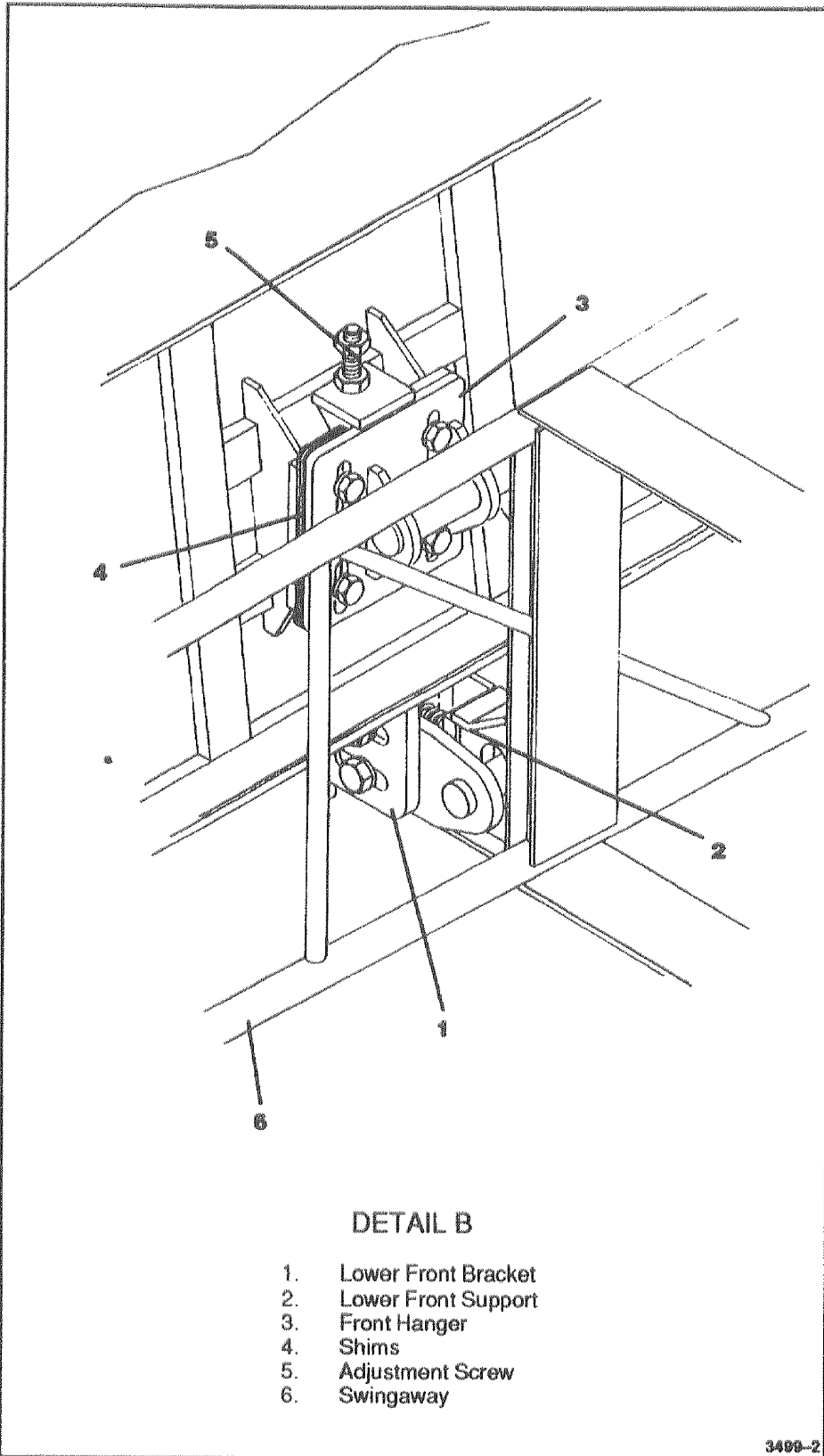
NOTE

The end of the cable should be even with the bottom of the anchor wedge.

4. Position the anchor wedge in the drum slot; pull firmly on the free end of the cable to secure the wedge.

NOTE

If the wedge does not seat securely in the slot, carefully tap the top of the wedge with a mallet.



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