

SOLAR 150LC-7A

Operation and Maintenance Manual

022Y00059E

Jun 2009

Doosan reserves the right to improve our products in a continuing process to provide the best possible product to the market place. These improvements can be implemented at any time with no obligation to change materials on previously sold products. It is recommended that consumers periodically contact their distributors for recent documentation on purchased equipment.

This documentation may include attachments and optional equipment that is not available in your machine's package. Please call your distributor for additional items that you may require.

Illustrations used throughout this manual are used only as a representation of the actual piece of equipment, and may vary from the actual item.

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SAFETY

TO THE OPERATOR OF A DOOSAN EXCAVATOR



DANGER!

Unsafe use of the excavator could lead to serious injury or death. Operating procedures, maintenance and equipment practices or traveling or shipping methods that do not follow the safety guidelines on the following pages could cause serious, potentially fatal injuries or extensive damage to the machine or nearby property.

Please respect the importance of taking responsibility for your own safety, and that of other people who may be affected by your actions.

The safety information on the following pages is organized into the following sections:

1. "Location of Safety Labels" on page 1-4
2. "Summary of Safety Precautions for Lifting in Digging Mode" on page 1-12
3. "Unauthorized Modifications" on page 1-13
4. "General Hazard Information" on page 1-13
5. "Before Starting Engine" on page 1-21
6. "Machine Operation" on page 1-24
7. "Maintenance" on page 1-29
8. "Battery" on page 1-37
9. "Towing" on page 1-39
10. "Shipping and Transportation" on page 1-40
11. "Excavator Rated Lift Capacity Tables" on page 1-41



WARNING!

Improper operation and maintenance of this machine can be hazardous and could result in serious injury or death.

Operator and maintenance personnel should read this manual thoroughly before beginning operation or maintenance.

Keep this manual in the storage compartment to the rear of the operator's seat, and have all personnel involved in working on the machine read the manual periodically.

Some actions involved in operation and maintenance of the machine can cause a serious accident, if they are not done in a manner described in this manual.

The procedures and precautions given in this manual apply only to intended uses of the machine.

If you use your machine for any unintended uses that are not specifically prohibited, you must be sure that it is safe for any others. In no event should you or others engage in prohibited uses or actions as described in this manual.

Doosan delivers machines that comply with all applicable regulations and standards of the country to which it has been shipped. If this machine has been purchased in another country or purchased from someone in another country, it may lack certain safety devices and specifications that are necessary for use in your country. If there is any question about whether your product complies with the applicable standards and regulations of your country, consult Doosan or your Doosan distributor before operating the machine.



SAFETY ALERT SYMBOL



Be Prepared - Get To Know All Operating and Safety Instructions.

This is the Safety Alert Symbol. Wherever it appears in this manual or on safety signs on the machine you should be alert to the potential for personal injury or accidents. Always observe safety precautions and follow recommended procedures.

LEARN THE SIGNAL WORDS USED WITH THE SAFETY ALERT SYMBOL

The words "**CAUTION**," "**WARNING**," and "**DANGER**" used throughout this manual and on decals on the machine indicate degree of risk of hazards or unsafe practices. All three degrees of risk indicate that safety is involved. Observe precautions indicated whenever you see the Safety Alert "Triangle," no matter which signal word appears next to the "Exclamation Point" symbol.



CAUTION!

This word is used on safety messages and safety labels and indicates potential of a hazardous situation that, if not avoided, could result in minor or moderate injury. It may also be used to alert against a generally unsafe practice.



WARNING!

This word is used on safety messages and safety labels and indicates potential of a hazardous situation that, if not avoided, could result in serious injury or death. It may also be used to alert against a highly unsafe practice.



DANGER!

This word is used on safety messages and safety labels and indicates an imminent hazard of a situation that, if not avoided, is very likely to cause death or extremely serious injury. It may also be used to alert against equipment that may explode or detonate if handled or treated carelessly.

Safety precautions are described in SAFETY from page 1-4 on.

Doosan cannot predict every circumstance that might involve a potential hazard in operation and maintenance. Therefore the safety messages in this manual and on the machine may not include all possible safety precautions. If any procedures or actions not specifically recommended or allowed in this manual are used, you must be sure that you and others can do such procedures and actions safely and without damaging the machine. If you are unsure about the safety of some procedures, contact a DOOSAN distributor.

LOCATION OF SAFETY LABELS

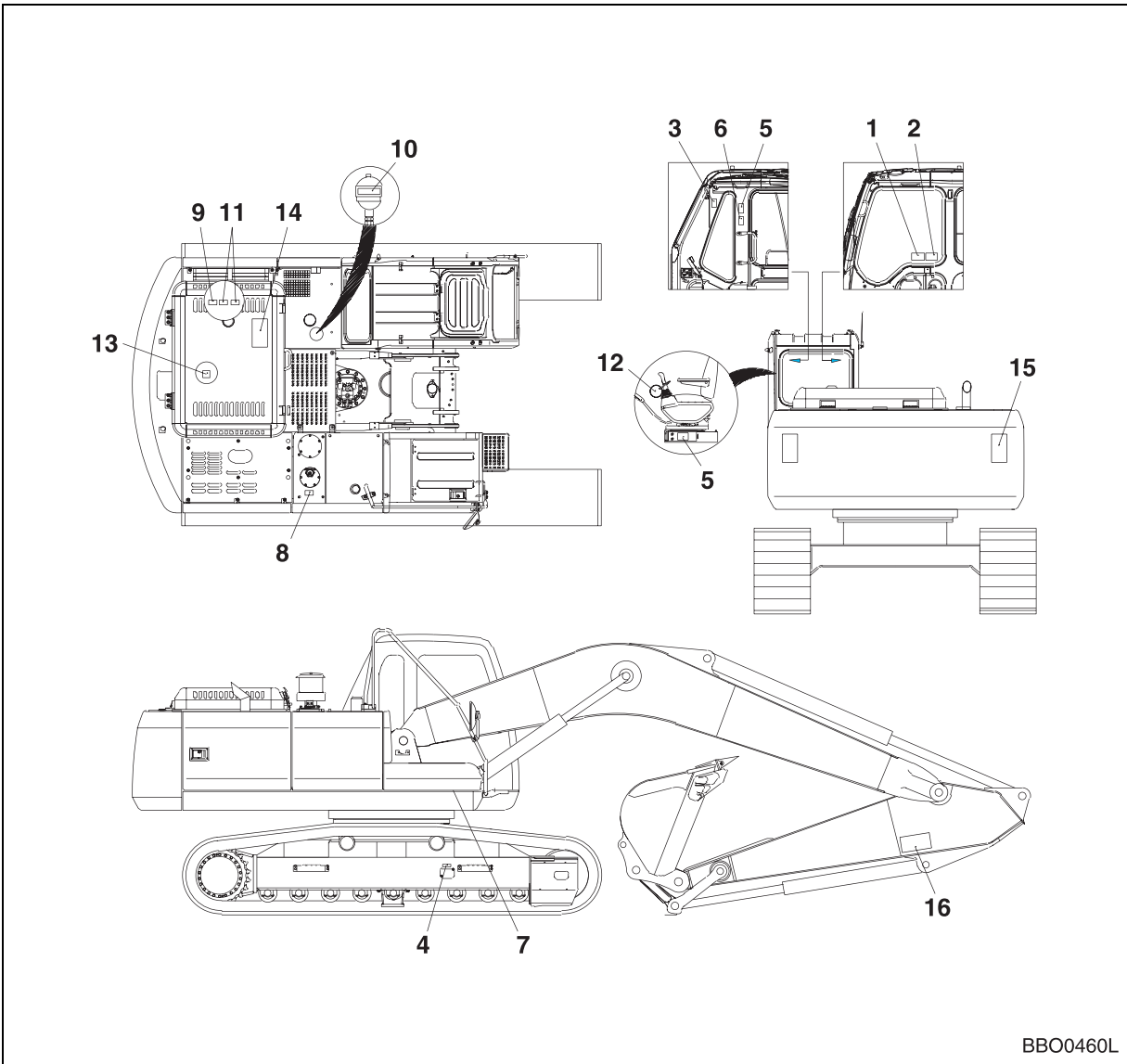


Figure 1


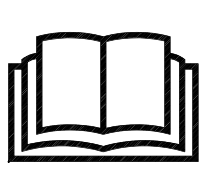
There are several specific warning signs on this machine. The exact location of hazards and the description of the hazards are reviewed in this section.

Please become familiarized with all warning signs.

Make sure that all of the warning signs are legible. Clean the warning signs or replace the warning signs if you cannot read the words. Replace the illustrations if the illustrations are not visible. When you clean the warning signs, use a cloth, water and soap. Do not use solvent, gasoline, or other harsh chemicals to clean the safety signs. Solvents, gasoline, or other harsh chemicals could loosen the adhesive that secures the warning sign. Loose adhesive will allow the warning sign to fall off.

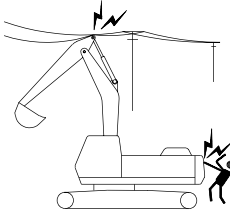

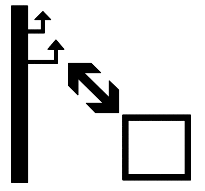
Replace any safety sign that is damaged, or missing. If a safety sign is attached to a part that is replaced, install a safety sign on the replacement part.

1. WARNINGS FOR OPERATION, INSPECTION AND MAINTENANCE (190-00688, 190-00092).

<p style="text-align: center;">⚠ WARNING</p> <ul style="list-style-type: none"> • AVOID DEATH OR SERIOUS INJURY. - READ AND UNDERSTAND OPERATION MANUAL AND SAFETY LABELS prior to operating this machine. • Never get in under the machine while it is being jacked up with boom and arm. • Sound the horn to alert the people nearby before operating, and make sure that all persons are clear of area. • Controls may be changed for attachments or operator preference. Try control pattern before operating. <p style="text-align: right;">190-00688</p>	  <p style="text-align: right;">190-00092</p>
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ARO1080L

2. WARNINGS FOR HIGH VOLTAGE (190-00689, 190-00096)

	<p style="text-align: center;">⚠ DANGER</p> <p>SERIOUS INJURY OR DEATH BY ELECTROUTION can occur if machine or attachments are not a safe distance from electrical power lines.</p> <table border="1"> <thead> <tr> <th>Line voltage</th> <th>Safe Distance</th> </tr> </thead> <tbody> <tr> <td>6.6 kv</td> <td>At least 3m(10ft)</td> </tr> <tr> <td>66.6 kv</td> <td>At least 5m(16ft)</td> </tr> <tr> <td>275.0 kv</td> <td>At least 10m(33ft)</td> </tr> </tbody> </table> <p style="text-align: right;">190-00689</p>	Line voltage	Safe Distance	6.6 kv	At least 3m(10ft)	66.6 kv	At least 5m(16ft)	275.0 kv	At least 10m(33ft)	  <p style="text-align: right;">190-00096</p>
Line voltage	Safe Distance									
6.6 kv	At least 3m(10ft)									
66.6 kv	At least 5m(16ft)									
275.0 kv	At least 10m(33ft)									

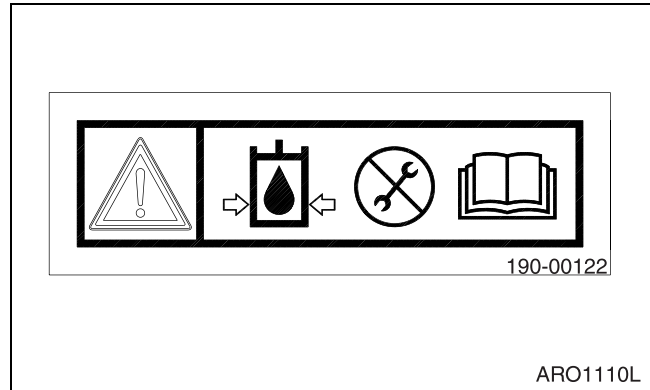
ARO1090L

3. WARNINGS WHEN OPENING A FRONT WINDOW (190-00690, 190-00093).


<p style="text-align: center;">⚠ WARNING</p> <p>Falling window can cause injury.</p> <p>When raising window, lock it in place with lock pin on left side.</p> <p style="text-align: right;">190-00690</p>	  <p style="text-align: right;">190-00093</p>
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ARO1100L

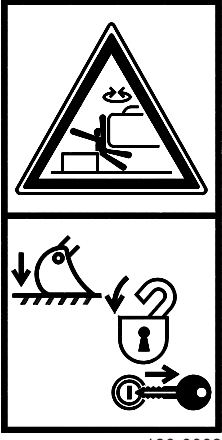
4. **WARNINGS FOR A HIGH-PRESSURE CYLINDER (190-00122).**



5. **WARNINGS WHEN ADJUSTING TRACK TENSION (2190-3386A, 190-00521).**

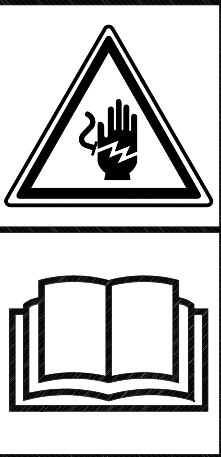
<p> WARNING</p> <p>The track adjuster adjustment and handling</p> <ul style="list-style-type: none">• The spring in the track adjuster is loaded with great force and the pressure in the cylinder is very high. For this reason there is a possibility of an accident which may involve injury to personnel. It is very dangerous to make mistakes when performing such an adjustment or disassembly.• Be sure to read the procedures described in the Operation and Maintenance Manual carefully before adjusting the track tension. <p>2190-3386A</p>	<p>190-00521</p> <p>ARO1120L</p>
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6. WARNINGS FOR LEAVING OPERATOR'S SEAT (190-00693, 190-00094).

<p>⚠ WARNING</p> <p>Sudden and unwanted machine movement can cause serious injury or death.</p> <p>Always make sure when leaving operator's seat to :</p> <ul style="list-style-type: none">• Lower equipment to the ground.• Move safety lever to LOCK position.• Turn key switch OFF. Remove key from switch. <p>190-00693</p>	 <p>190-00094</p>
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7. WARNINGS FOR BATTERIES MAINTENANCE (2190-2533A, 190-00100).

<p>⚠ DANGER</p> <ul style="list-style-type: none">• Battery fumes can explode. Keep sparks and flames away from batteries.• Always avoid storing metals like tools or flammable materials around or on the batteries. Explosion or fire can be caused by shortcircuiting batteries.• Sulfuric acid in battery is poisonous. It is strong enough burn skin, eat holes in clothing, and cause blindness if splashed eyes. <p>If you spill acid on yourself;</p> <ol style="list-style-type: none">1. Flush your skin with water.2. Apply baking soda or lime to help neutralize the acid.3. Flush your eyes with water for 10-15 minutes. <p>Get medical attention immediately.</p> <p>2190-2533A</p>	 <p>190-00100</p>
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8. WARNINGS FOR HIGH TEMPERATURE HYDRAULIC OIL (190-00691, 190-00097)

<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">⚠ WARNING</p> <p style="text-align: center;">HYDRAULIC OIL</p> <p>HOT OIL CAN CAUSE INJURY OR BLINDNESS.</p> <p>To prevent hot oil from spurting out:</p> <ul style="list-style-type: none"> • Turn engine off • Allow oil to cool • Slowly loosen cap to relieve pressure <p style="text-align: right; font-size: small;">190-00691</p> </div>	<div style="border: 1px solid black; padding: 5px;">  <p style="text-align: right; font-size: small;">190-00097</p> </div>
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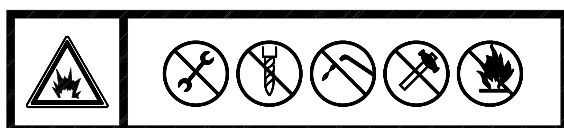
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9. WARNINGS FOR HOT COOLANT (190-00692, 190-00097)

<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">⚠ WARNING</p> <p>HOT COOLANT CAN CAUSE INJURY OR BLINDNESS.</p> <p>Never loosen or open radiator cap when coolant is hot and under pressure.</p> <p>To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.</p> <p style="text-align: right; font-size: small;">190-00692</p> </div>	<div style="border: 1px solid black; padding: 5px;">  <p style="text-align: right; font-size: small;">190-00097</p> </div>
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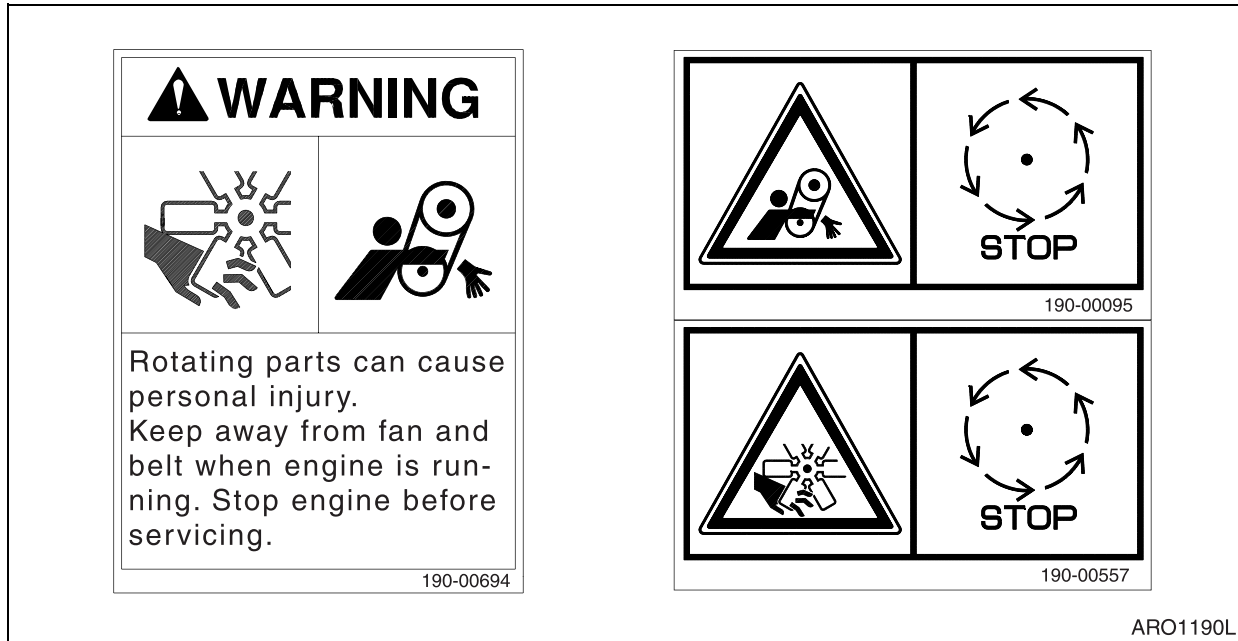
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10. WARNINGS FOR HANDLING AN ACCUMULATOR (190-00703, 190-00099).

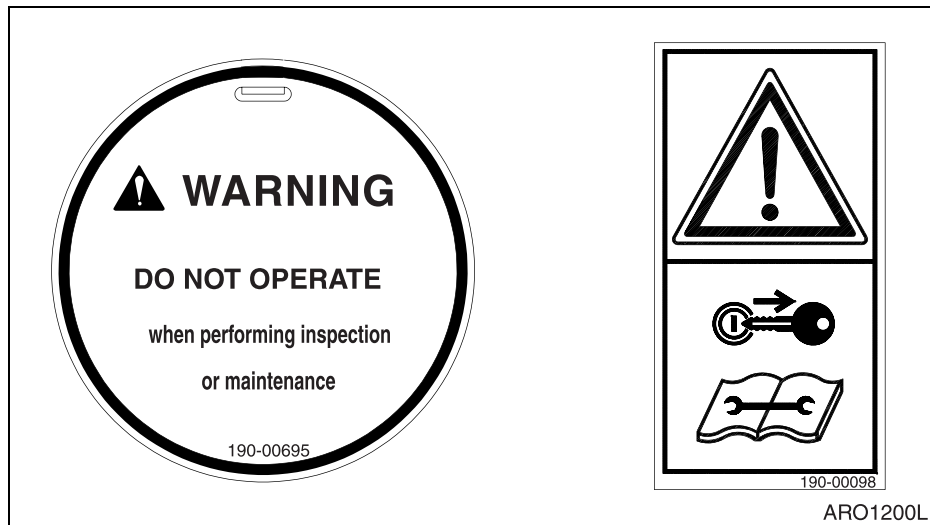
<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">⚠ WARNING</p> <p style="text-align: center;">EXPLOSION HAZARD</p> <p style="text-align: right; font-size: small;">190-00703</p> </div>	<ul style="list-style-type: none"> <li style="margin-right: 5px;">• Keep away from flame. <li style="margin-right: 5px;">• Do not weld on, or drill into the accumulator. <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">  <p style="text-align: right; font-size: small;">190-00099</p> </div>
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ARO1180L

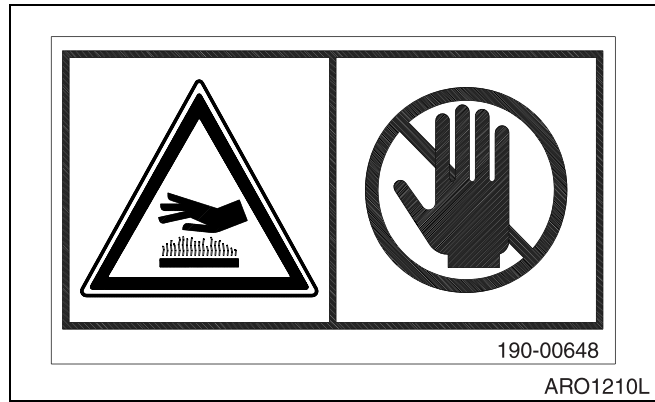
11. WARNINGS FOR ROTATING PARTS (190-00694, 190-00095, 190-00557).



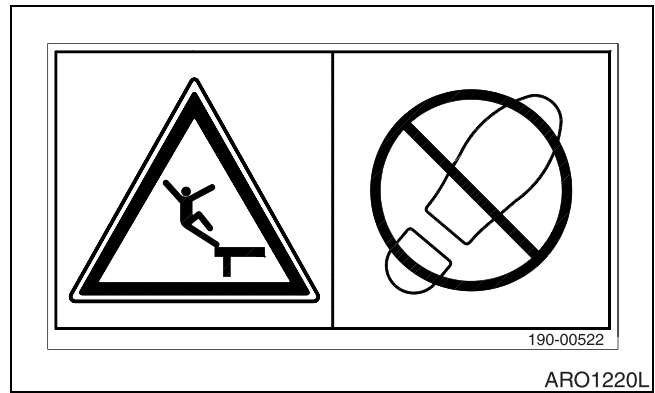
12. WARNING TAG - USED WHEN INSPECTION AND MAINTENANCE (190-00695, 190-00098).



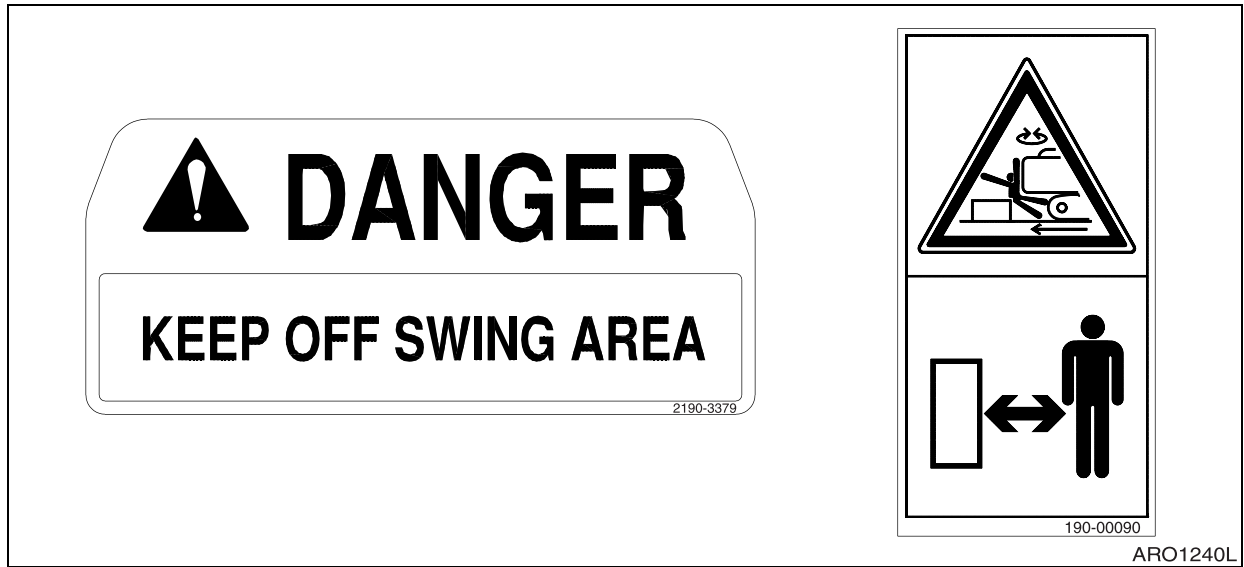
13. WARNING FOR A HOT SURFACE (190-00648).



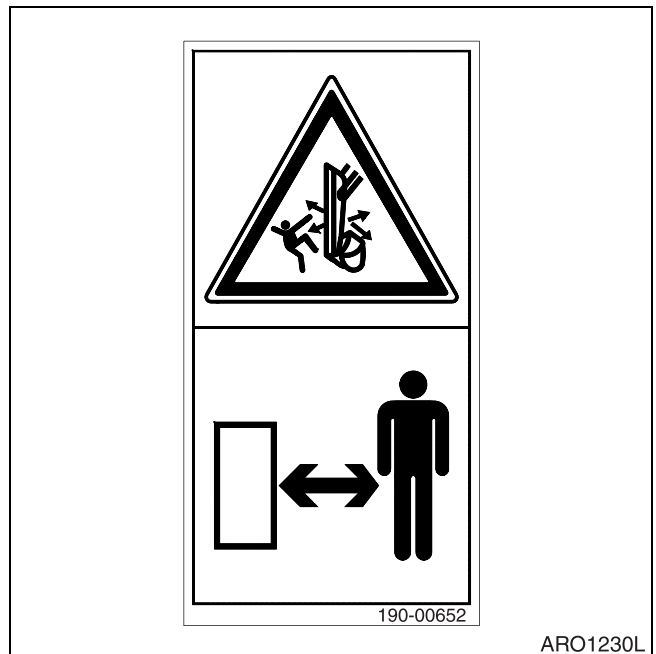
14. CAUTION FOR HOOD (190-00522).



15. KEEP OUT OF THE SWING AREA (2190-3379, 190-00090).



16. WARNINGS FOR FRONT ATTACHMENTS (190-00652)



SUMMARY OF SAFETY PRECAUTIONS FOR LIFTING IN DIGGING MODE



DANGER!

Unsafe use of the excavator while making rated lifts could cause serious, potentially fatal injuries or extensive damage to the machine or nearby property. Do not let anyone operate the machine unless they've been properly trained and understand the information in the Operation and Maintenance Manual.

To lift safely while in Digging Mode, the following items must be evaluated by the operator and the work site crew.

- Condition of ground support.
- Excavator configuration and attachments.
- Weight, lifting height and lifting radius.
- Safe rigging of the load.
- Proper handling of the suspended load.

Taglines on opposite sides of the load can be very helpful in keeping a suspended load secure, if they are anchored safely to control points on the ground.



WARNING!

NEVER wrap a tagline around your hands or body.

NEVER rely on taglines or make rated lifts when wind gusts are more than 48.3 km/h (30 MPH). Be prepared for any type of wind gust when working with loads that have a large surface area.

Always engage the "Digging Mode" control on the Instrument Panel before using the excavator for lifting work.



WARNING!

If you need more information or have any questions or concerns about safe operating procedures or working the excavator correctly in a particular application or in the specific conditions of your individual operating environment, please consult your local Doosan representative.

UNAUTHORIZED MODIFICATIONS

Any modification made without authorization or written approval from Doosan can create a safety hazard, for which the machine owner must be held responsible.

For safety's sake, replace all OEM parts with the correct authorized or genuine Doosan part. For example, not taking the time to replace fasteners, bolts or nuts with the correct replacement parts could lead to a condition in which the safety of critical assemblies is dangerously compromised.

GENERAL HAZARD INFORMATION

SAFETY RULES

Only trained and authorized personnel can operate and maintain the machine.

Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.

Do not operate the machine if you are not feeling well, if you are taking medication that makes you feel sleepy, if you have been drinking, or if you are suffering from emotional problems. These problems will interfere with your sense of judgement in emergencies and may cause accidents.

When working with another operator or with a person on work site traffic duty, be sure that all personnel know the nature of the work and understand all hand signals that are to be used.

Always observe strictly any other rules related to safety.

SAFETY FEATURES

Be sure that all guards and covers are installed in their proper position. Have guards and covers repaired immediately if damaged.

Be sure that you understand the method of use of safety features such as safety lock lever and the seat belt, and use them properly.

Never remove any safety features. Always keep them in good operating condition.

Failure to use safety features according to the instructions in the Operation and Maintenance Manual could result in serious bodily injury.

INSIDE OPERATOR'S COMPARTMENT

When entering the operator's compartment, always remove all mud and oil from the soles of your shoes. If you operate the travel pedal with mud or oil stuck to your shoes, your foot may slip and this may cause a serious accident.

After using the ashtray, make sure that any matches or cigarettes are properly extinguished, and be sure to close the ashtray. If the ashtray is left open, there is danger of fire.

Do not stick suction pads to the window glass. Suction pads act as a lens and may cause fire.

Do not leave lighters laying around the operator's compartment. If the temperature inside the operator's compartment becomes high, there is danger that the lighter may explode.

Do not use cellular telephones inside the operator's compartment when driving or operating the machine. There is danger that this may lead to an unexpected accident.

Never bring any dangerous objects such as flammable or explosive items into the operator's cab.

To ensure safety, do not use the radio or music headphones when operating the machine. There is danger that this may lead to a serious accident.

When operating the machine, do not put your hands or head out of the window.

When standing up from the operator's seat, always place safety lock lever securely in the "LOCK" position. If you accidentally touch the work equipment levers when they are not locked, the machine may suddenly move and cause serious injury or damage.

When leaving the machine, lower the work equipment completely to the ground, set safety lock lever to the "LOCK" position and shut down engine. Use the key to lock all the equipment. Always remove the key and take it with you.

CLOTHING AND PERSONAL PROTECTIVE ITEMS

Contain long hair, and avoid loose clothing and jewelry. They can catch on controls or in protruding parts and cause serious injury or death.

Do not wear oily clothes. They are highly flammable.

Full eye protection, a hard hat, safety shoes and gloves may be required at the work site.

While working on the machine, never use inadequate tools. They could break or slip, causing injury, or they may not adequately perform intended functions.

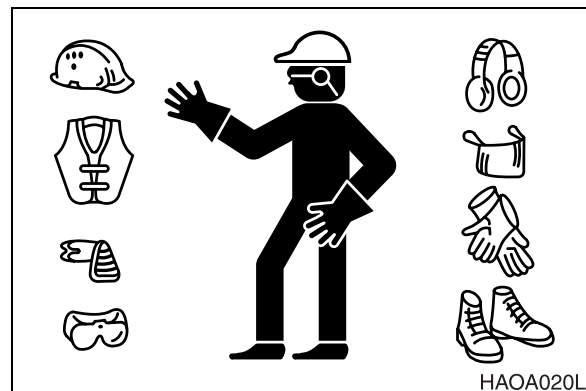


Figure 2