



Safety Instructions

Section 01-02

Komatsu has made every effort to make this manual as accurate as possible based on the information available at the time of publication and printing. Continuous improvement and advancement of product design may cause changes to machines, which may not have been included in this publication. Komatsu reserves the right to make changes and improvements at any time. To ensure the most current information, please contact your service center.

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Scope of This Publication, 01-02

This publication contains general and specific safety precautions. The operator and maintenance personnel should read these safety precautions carefully and understand them before operating, or performing maintenance operations to the machine

NOTICE

Komatsu cannot anticipate every possible circumstance that might involve a potential hazard. The Warnings and Cautions in this publication and on the product are therefore not all inclusive. These rules will not apply to all situations. If a tool, procedure, work method, or operating technique not specifically recommended by Komatsu is used, the owner must be satisfied that it is safe for all personnel. Also, ensure that the product will not be damaged or made unsafe by the operation, lubrication, maintenance, or repair procedures chosen. Operating the machine on different job sites and under various environments can create safety hazards unique to that particular situation. If a dangerous situation develops under these circumstances, only the alertness of the operator and their proficiency in operating the machine are available to cope with the situation. Only properly trained personnel are allowed to operate this machine.

Local legislation rules, laws, and regulations shall be obeyed for accident prevention and environmental protection during operation, service, maintenance, parking, or storage of the machine.

Any unusual or unexpected sounds heard during the operation of the machine, should be investigated before continuing operation. Any damage or defect determined to affect the operation of the machine shall be repaired before continuing operation.

Values used in this document are subject to change without notice. Always check the latest version of schematics, troubleshooting charts, service information letters, service alerts, specifications, and all other appropriate documentation before performing any type of work on the equipment. Online documentation of values can be accessed through the local service center.

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Safety

This publication contains special instructions that pertain to safety, operation, maintenance, and repair of the machine. Listed below are the signal words and symbols that precede these instructions and their meanings:


DANGER

- The danger label indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

- The warning label indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

- The caution label, used with the safety alert symbol indicates a hazardous situation which, if not avoided, could result in minor or moderate injury (includes the safety alert symbol ).

CAUTION

- The caution label (without safety alert symbol) is used to address practices not related to personal injury – only equipment damage.

NOTICE

The NOTICE graphic is to indicate areas of importance to the reader that are not related to personal injury or machine damage.

Safety, Warnings, and Cautions

The safety and instructional symbols in this manual contain information for two levels of hazards and appear as shown below:

WARNING

CRUSH HAZARD

- Crush hazards exists if the machine is started or moved while work processes are being performed on the machine. Place bucket flat and level on the ground. Place frame lock in the locked position and lock out the machine's starting capability before performing any work process. Follow all applicable lockout procedures and local rules and regulations for performing work processes. Serious personal injury or death could occur if the machine is started or moves while any type of work process is being conducted on the machine.
- Crush hazards exist if the operator seat belt or harness is improperly adjusted or improperly maintained. Improper adjustment or maintenance of the seat belt or harness could result in loss of machine control during operation, resulting in a crush hazard. Adjust the seat and seat belt or harness for proper access to all controls and fasten seat belt or harness before operating the machine. Always check the condition of the operator seat belts and mounting hardware before operating the machine. Failure to do so could result in serious injury. Loss of machine control could cause a crush hazard resulting in serious injury or death to personnel in the operating area.

- Crush hazards exist if the machine is operated outside the safe operating parameters of the tires and loss of machine control occurs. Speed, distance, and weight load (as well as other factors), can affect tire reliability, safety and possibly warranty. Refer to tire manufacturer tramping guidelines before operating the machine outside of truck loading cycles. Failure to consult with the tire manufacturer to determine safe tramping guidelines can cause crush hazards from loss of machine control, resulting in serious injury or death.
- Crush hazards exist under rear of machine. Counter weight mounted under the rear frame. Do not enter this area unless the counterweights have been externally supported to prevent falling. Do not loosen the bolts for the counterweight structure unless the counter weights are externally supported. Entering the area under the counterweights or loosening the counterweight bolts without externally supporting the counterweights could cause a crush hazard resulting in serious injury or death.
- Crush hazards exist when operating the loader. Komatsu equipment is designed as off-highway equipment for use in open pit applications that are in remote locations. Due to their very large size they must work in an area with few machines, and their only proximity to buildings would be for routine maintenance or repair. They are not to be operated near office buildings or residential areas. Operating the loader near office buildings or residential areas can cause crush hazards resulting in serious injury or death.

CRUSH, SHOCK, OR OTHER HAZARDS

- Crush, shock, or other hazards exist if stored energy is not removed or isolated prior to working on the machine. Stored energy (hydraulic, electrical, pneumatic, etc.) may be present if not isolated or released prior to working on the machine. Do not work on the machine without removing this stored energy (suspended loads, electrical power, air pressure, etc.). Risk of crushing, shock, or other physical injury exists if stored energy is not removed or isolated prior to working on the machine which could result in serious injury or death.

STRUCK-BY OR STRUCK AGAINST HAZARDS

- Struck-by or struck against hazard exists if untrained personnel attempt to service the fire suppression system. Only personnel trained by the system's manufacturer should service the system. Certain components of the system contain a high pressure nitrogen charge that can cause serious personal injury if not handled properly. Using the wrong procedures/process during system maintenance could result in struck by/struck against hazards resulting in serious injury or death.
- Struck-by hazards exist when working around pressurized hoses. Do not work around pressurized hoses. Hoses can rupture or come loose from connections and strike, with deadly force, personnel working around them. Shut down the machine and relieve system pressure before working on any system containing pressurized fluid. Pressurized hoses that rupture or come loose from connections can strike personnel with deadly force. Failure to de-pressurize systems before working on them can cause stuck-by hazards resulting in serious injury or death.

FALL HAZARD

- Fall hazard exists when working at elevated locations. Take appropriate "fall arrest" safety precautions as required by local rules, regulations, and procedures when working at heights on the machine, as example, on the rear and front frames. Follow all required statutory regulations for working at height. Failure to follow all locally required "fall arrest" procedures can cause a fall hazard, resulting in serious injury or death.
- Fall hazard exists when working at elevated heights without wearing a fall restraint device. Always wear a fall restraint device, as provided by local rules and regulations, when working at elevated heights. Follow all local rules, regulations, and laws regarding working at elevated heights, while working on the machine. Failure to follow all local rules and regulations for working at elevated heights can cause a fall that might result in serious injury or death.

FALL AND CRUSH HAZARDS

- Fall hazard or crush hazard exists if the bucket or lift arms are used to lift personnel. Never allow personnel to be lifted in the bucket or by use of the lift arms. Lifting personnel with the bucket or lift arms can cause falls and crush hazards that might result in serious injury or death.

ELECTRICAL SHOCK HAZARD

- Electrical shock hazard exists by contact in the electrical cabinet if the engine is running, the LINC'S software indicates voltage on the bus, or the red bus LED's in the electrical cabinet are illuminated. All Generation II SR equipment has the ability to produce voltage at low throttle. Even with the engine off, there may be a residual of 12-15VDC on the bus. Do not enter the electrical cabinet or touch any components in the electrical cabinet without performing the Bus Discharge Verification Procedure. Failure to do so may result in fatal electrical shock or other injury.
- Electrical shock hazard exists if using an improperly rated meter. High voltage may be present. Risk of shock or equipment damage by use of an improperly rated meter is possible. Use a CAT III 1000V rated volt meter to take voltage readings. Failure to use a properly rated meter could result in serious injury or death.
- Electrical shock hazard exists inside the electrical converter cabinet when the red LED lights inside the cabinet are illuminated. DO NOT ENTER the electrical converter cabinet if the engine is running. Do not enter the electrical converter cabinet if the bus voltage indicator LED's on the SR converter assemblies are illuminated. Do not enter the electrical converter cabinet if the machine park brake is not set. Do not touch any electrical component, assembly or electrical connection on the machine if the bus voltage indicator LED's on the SR converter assemblies are illuminated. Check ALL converter panel LED's for voltage. Entering the electrical cabinet or touching electrical components anywhere on the machine while the red LED lights are illuminated or there is voltage on the electrical bus might cause electrical shock, resulting in serious injury or death.
- Electrical shock hazard exists if touching the dynamic braking grids when the drive is enabled. High voltage is present when the drive is enabled. Do NOT touch the braking grids (or any electrical connection on the machine) when the key switch is ON, or the generator is primed, or until five minutes after the engine has been shut down and the absence of bus voltage is verified. Contact with the braking grid can cause fatal electrical shock, resulting in serious injury or death.
- Electrical shock hazard exists if opening the electrical converter cabinet while the engine is running. NEVER open the electrical converter cabinet while the engine is running. High voltage is present when the drive is enabled (at any throttle speed) and may be present even if the machine is shut down. Do not touch any drive system component electrical connection on the machine for at least 5 minutes after the machine is shut down. Always verify the absence of bus voltage before touching drive system component electrical connections. If inspection or service procedures involve contact with any electrical component of the drive system, opening the converter cabinet, or removing axle access covers, or touching drive system electrical component connections, the key switch must be off, the machine not running, the electrical system MUST be locked out by using the battery isolation switch, and the absence of bus voltage verified. Accidental contact with energized terminals or components could result in serious injury or death.
- Electrical shock hazard exists inside the axle if axle access panel on either axle is removed without locking out the electrical system. Always verify the absence of bus voltage before removing the axle access panels and touching any electrified component inside the axle. Failure to lockout the electrical system, and touching electrified components inside the axle could cause electrical shock which might result in serious injury or death.

ENTANGLEMENT HAZARD

- Entanglement hazard exists if attempting to work on rotating equipment. Do not work on the machine with the engine running unless specifically instructed to do so by the engine manufacturer or so stated within a specified work procedure. KEEP CLEAR OF ROTATING SHAFTS. The shaft between the Hydraulic Pump Drive (HPD) and the generator rotates any time the engine is rotating, even while the engine is being cranked. Wrapping, entanglement, or contact of clothing or extremities may cause an entanglement hazard that results in serious injury or death.

LEAD PRESENCE HAZARD

- Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California, USA to cause cancer and birth defects or other reproductive harm. Do not handle battery posts, terminals or related accessories containing lead or lead compounds without wearing proper personal protective equipment (PPE) as required by local rules, regulations, or policies.

SICKNESS OR ASPHYXIATION HAZARDS

- Sickness or asphyxiation hazard exists from diesel fumes if the equipment is operated in an area that does not have adequate atmospheric ventilation. If necessary to start the engine in an enclosed area, be sure adequate ventilation is provided. Running the equipment in an area without adequate ventilation could cause sickness or asphyxiation from lack of oxygen, resulting in serious injury or death.

SKIN INJECTION HAZARD

- Skin injection hazard exists if diesel fuel, hydraulic fluid, or grease under pressure penetrates the skin. Avoid all fluids under pressure and wear the proper personal protective equipment (PPE) for working around fluids under pressure. If any fluid is injected into the skin, it must be removed as soon as possible by a doctor familiar with treating this type of injury. Failure to avoid fluids under pressure can cause skin injection which could result in serious personal injury, blindness, or death.

BURN HAZARDS

- Burn hazards exist when the machine is running and for some time after the machine is shut down. Fluids such as hydraulic fluid, converter panel coolant, or engine coolant will remain hot for some period of time. Always allow these fluids to cool before breaking any connection, or opening any fill or drain component on any system that uses them for coolant or lubrication. Working on systems containing hot fluids can cause burn hazards resulting in serious injury or death.
- Burn hazards exist when around hot hydraulic fluid that is under pressure. Hoses under pressure can blow out or come loose from connections, causing a burn hazard from leaks or spraying. DO NOT tighten or loosen hydraulic connections without first relieving the pressure. DO NOT make adjustments to any fluid pressures or flow while the machine is running. Shut down the machine, make the adjustment, then restart the machine to check the adjustment. Wear safety goggles for eye protection and wear all other locally required personal protective equipment (PPE) when working around possibly hot pressurized liquids. Failure to use proper PPE or to shut down the machine before making adjustments can cause a burn hazard resulting in serious injury or death.

CAUTION

STRUCK BY HAZARDS

- Struck by hazard exists if the park brake is set while the machine is in motion. This will stop the machine suddenly, possibly causing the operator to be thrown unexpectedly and rapidly against the seat belt or harness. Do not use the park brakes to stop the machine unless in an EMERGENCY situation. Use the service brake to stop the machine during normal operation. Using the park brake to stop the machine can cause the operator to be thrown forward rapidly against the seat belt or harness, resulting in serious injury.

FALL AND SLIPPING HAZARDS

- Fall hazards and slipping hazards exists when mounting or dismounting the machine. Before mounting or dismounting the machine, ensure the ground conditions are stable, to prevent slipping or falling when climbing onto or stepping off the ladder. Always ensure firm ground before releasing the ladder/handrail. Slipping and falling hazards are present which could result in serious injury.

Environmental Precautions

WARNING

Some environmental hazards can exist during the performance of a maintenance, repair, or adjustment procedure. Komatsu cannot anticipate all hazards present during a specific procedure. The following suggestions/requirements are provided to help avoid hazards that may have been identified during some procedures.

- **Be prepared to catch/contain all fluids to prevent environmental spills.**
 - Engine radiator coolant
 - Electrical converter system coolant
 - Engine oil
 - Hydraulic fluid
 - Battery acid
 - Engine fuel (diesel)
 - Lubricating grease
 - Window washer fluid
 - Oil in pressure gauges
 - Other
- **Dispose of all materials such as (but not limited to): fluids, tires, wiper blades, used filters, hoses, wiring, metal, plastic, or glass parts, rubber, gaskets, and batteries, as required by local regulations, rules, and laws.**
- **Decommissioning of the machine requires specialization. Contact your Komatsu Service Center for any available instructions on decommissioning.**

Safety Standards

Komatsu endeavors to comply with the purposes and the applicable occupational safety and health standards as set forth by the Mine Safety and Health Administration (MSHA), Society of Automotive Engineers (SAE), Institute of Electrical and Electronics Engineers (IEEE), and International Standards Organization (ISO).

The customer should acknowledge that compliance with the above applicable organizations under the law is the responsibility of each employer, and the employer should take all actions necessary to maintain and operate the Komatsu equipment or accessories according to applicable standards. Carefully review the procedures given in this manual with all operators ANNUALLY. It is essential that all operators be familiar with, AND FOLLOW, safety precautions. Operating instructions must be given to everyone using the machine before operation and at least once a year thereafter.

Machine Safety and Instructional Labels

Safety and instructional labels/placards are attached to the machine near areas that have been identified as having specific hazards. Other hazards may exist on the machine.

Label/Placard Maintenance

These guidelines should be followed in the maintenance of the safety and instructional labels/placards affixed to the machine:

These labels/placards should be inspected daily and any that are damaged, deteriorated or missing should be replaced as soon as possible. Make sure that all safety and instruction labels/placards can be read. Clean or replace these labels/placards if the words or pictures cannot be read or seen.



The safety and instructional labels/placards on the machine should be legible for many years under normal conditions.

When cleaning the signs, use a cloth, water, and soap. Do not use solvent, gasoline or high-pressure washer, etc.

Refer to illustration "IDENTIFICATION AND SAFETY GROUP" for information on the location and type of labels/placards found on the machine.

NOTICE

If a safety or instructional sign is on a part that is replaced, make sure a new sign is installed on the replaced part.

Refer to PARTS MANUAL for information on ordering replacement labels.

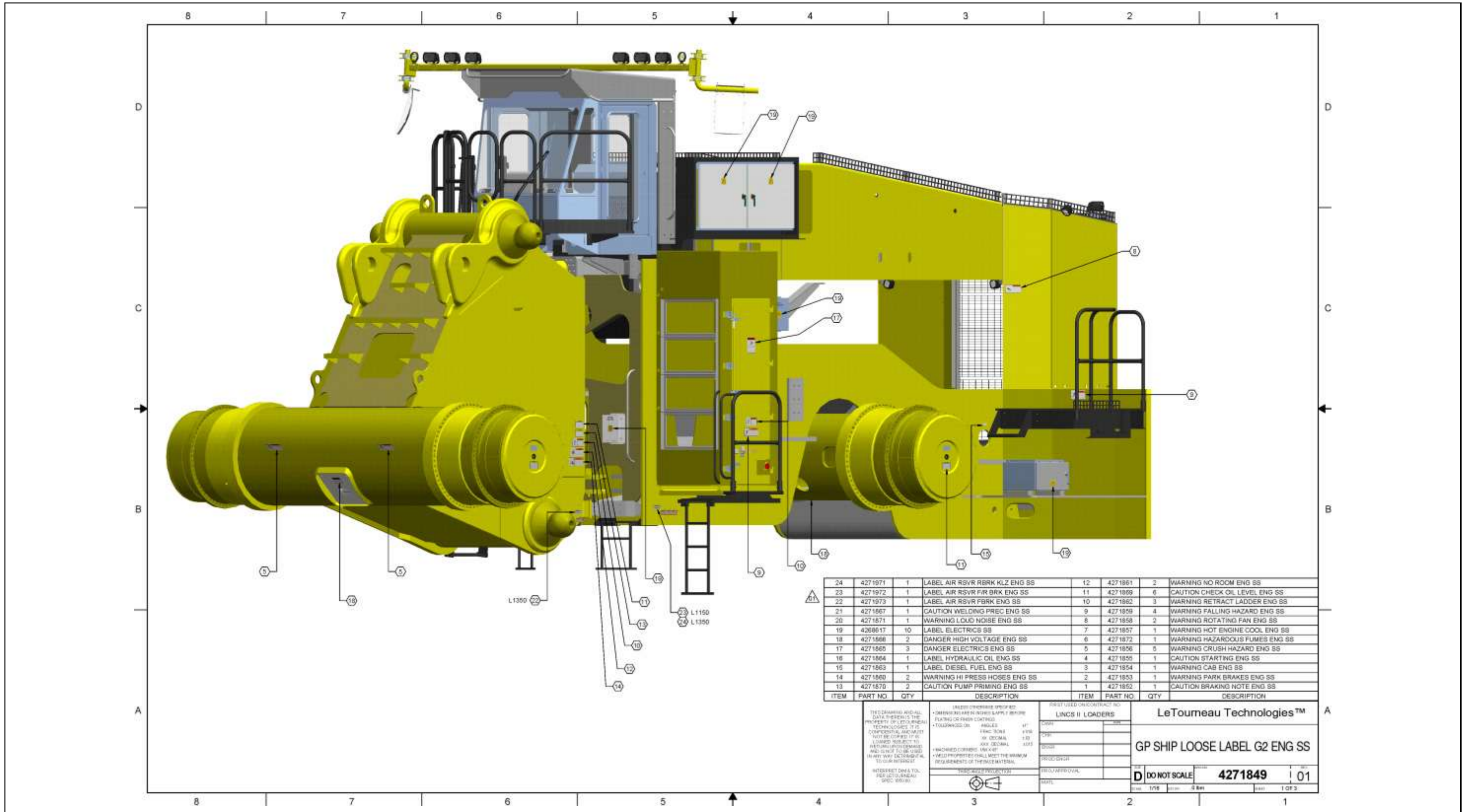


Figure 1. Identification and safety group (sheet 1 of 12)

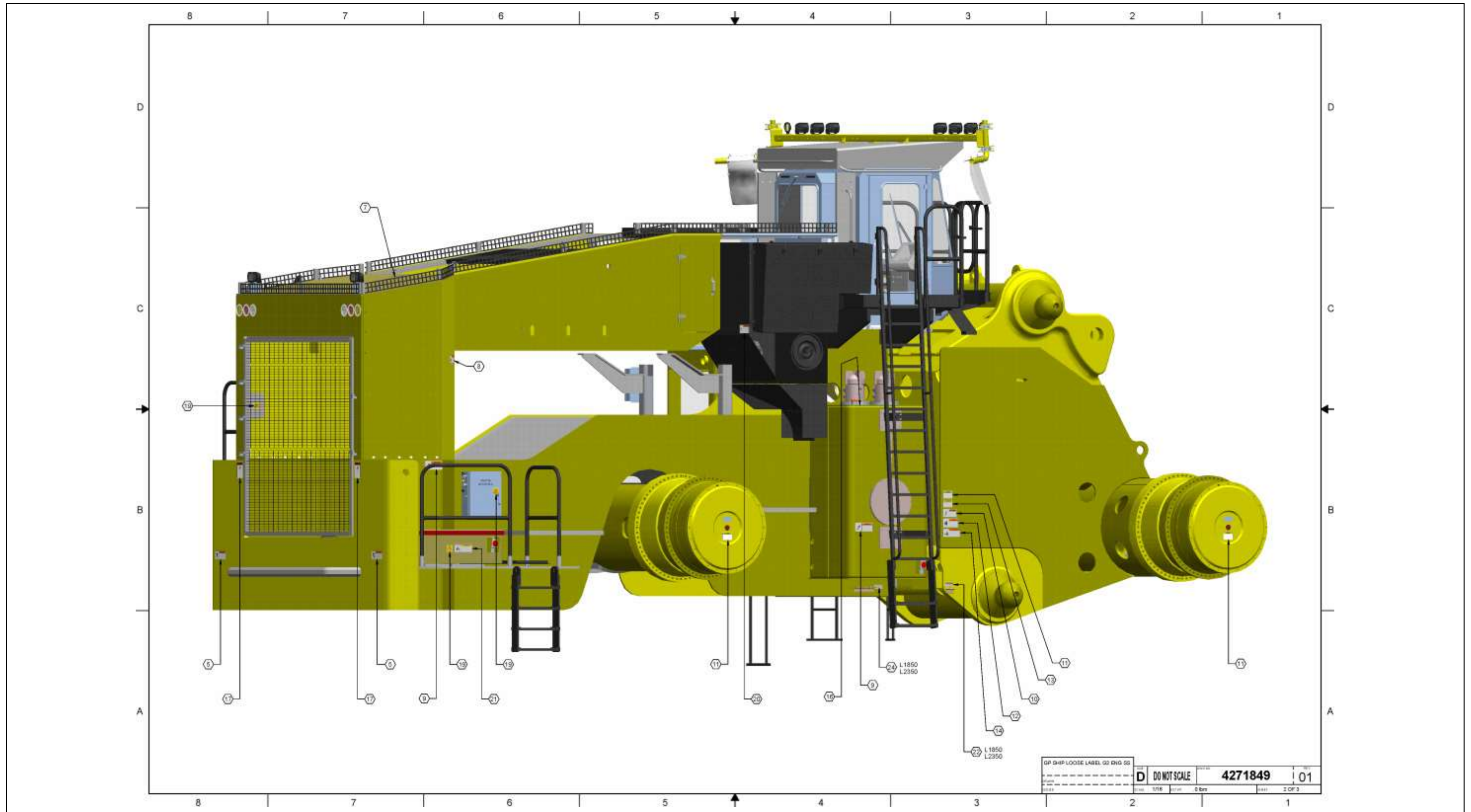


Figure 2. Identification and safety group (sheet 2 of 12)

(Numbers on drawing refer to legend on sheet 1 of 12)

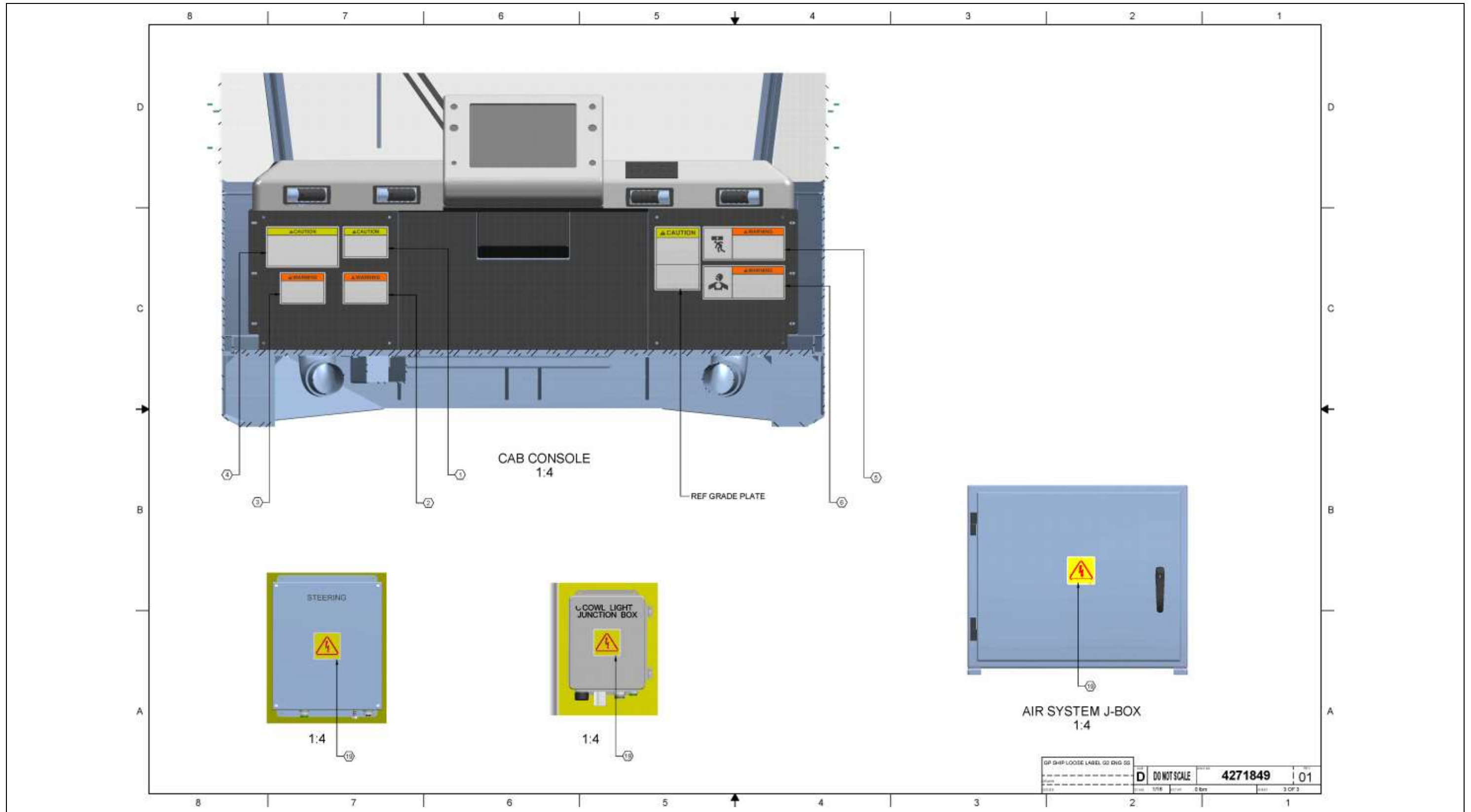






Figure 3. Identification and safety group (sheet 3 of 12)

(Numbers on drawing refer to legend on sheet 1 of 12)

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English	Spanish	Portuguese	Chinese
<p>①</p> <p>CAUTION</p> <p>DO NOT USE left hand pedal for normal braking.</p>	<p>①</p> <p>PRECAUCIÓN</p> <p>NO USE el pedal lado izquierdo para frenado normal en trabajo.</p>	<p>①</p> <p>PRECAUÇÃO</p> <p>NÃO USE o pedal esquerdo para frenagem normal.</p>	<p>①</p> <p>注意</p> <p>正常制动不要使用左踏板</p>
<p>②</p> <p>WARNING</p> <p>USE OF PARKING BRAKES</p> <ul style="list-style-type: none"> Set the motor brakes for parking and when men are working on the equipment. Use only in emergencies for stopping the equipment. 	<p>②</p> <p>ADVERTENCIA</p> <p>USO DE FRENOS DE ESTACIONAMIENTO</p> <ul style="list-style-type: none"> Aplique los frenos mecánicos para estacionar o cuando hayan personas trabajando en la máquina. Use solo en casos de emergencias para detener el equipo. 	<p>②</p> <p>ADVERTÊNCIA</p> <p>UTILIZAÇÃO DOS FREIOS DE ESTACIONAMENTO</p> <ul style="list-style-type: none"> Aplique os freios de estacionamento para estacionar e quando o equipamento estiver em manutenção. Utilize somente em emergências para parar o equipamento. 	<p>②</p> <p>警告</p> <p>停车制动的使用</p> <ul style="list-style-type: none"> 当有人操作机器时 要使用电机制动来停车 仅用于紧急情况下停车
<p>③</p> <p>WARNING</p> <p>NEVER LEAVE OPERATOR'S CAB</p> <ul style="list-style-type: none"> With a load suspended. With engine running at high throttle. With the park brakes released. 	<p>③</p> <p>ADVERTENCIA</p> <p>NUNCA ABANDONE LA CABINA DEL OPERADOR</p> <ul style="list-style-type: none"> Con carga suspendida. Con el Motor Diesel corriendo en altas revoluciones. Con el freno de estacionamiento liberado. 	<p>③</p> <p>ADVERTÊNCIA</p> <p>NUNCA SAIA DA CABINE DO OPERADOR</p> <ul style="list-style-type: none"> Com a carga elevada. Com o motor em alta rotação. Com o freio de estacionamento liberado. 	<p>③</p> <p>警告</p> <p>以下情况绝对不能离开驾驶室</p> <ul style="list-style-type: none"> 有负载时 发动机高怠速 泊车制动释放
<p>④</p> <p>CAUTION</p> <p>BEFORE STARTING ENGINE:</p> <ul style="list-style-type: none"> Study the controls and operating instructions sections of the service manual. Read all safety signs on machine. Clear the area of other persons. Learn and practice SAFE use of controls before operating. <p>It is your responsibility to understand and follow the manufacturer's instructions on machine operation and service, and to observe pertinent laws and regulations. The service manual operator's handbook may be obtained through your equipment dealer.</p>	<p>④</p> <p>PRECAUCIÓN</p> <p>ANTES DE ENCENDER EL MOTOR:</p> <ul style="list-style-type: none"> Estude las instrucciones de control y operación en el manual de servicio. Lea todos los letreros de seguridad de la máquina. Despeje el área de otras personas. Aprenda y practique el uso SEGURO de los controles antes de la operación. <p>Es su responsabilidad entender y seguir las instrucciones de fabricante en la operación y servicio de la máquina para observar regulaciones y leyes pertinentes. El manual de servicio y del operador podrán ser obtenidos a través del representante del equipo.</p>	<p>④</p> <p>PRECAUÇÃO</p> <p>ANTES DE DAR PARTIDA NO MOTOR:</p> <ul style="list-style-type: none"> Estude a seções de controles e instruções de operação do manual de serviço. Leia toda a sinalização de segurança da máquina. Alerte outras pessoas de área. Aprenda e pratique o uso SEGURO dos controles antes de operar a máquina. <p>É sua responsabilidade entender e seguir as instruções do fabricante na operação, manutenção e observância em leis e regulamentações pertinentes, no manual de serviço e operação da máquina, as quais podem ser obtidas através dos representantes dos equipamentos.</p>	<p>④</p> <p>注意</p> <p>启动发动机前</p> <ul style="list-style-type: none"> 学习维修手册中的控制和操作指导部分 阅读机器上所有安全标志 清除作业区内的人员 确保学习并练习控制功能的安全使用 <p>操作人负有责任按照厂商的指导和维护手册并遵守相关的法律法规。维修手册和操作手册 可以通过经销商获得</p>
<p>⑤</p> <p>WARNING</p> <p>CRUSH HAZARD when raising machine. Do not use bucket and lift arm hydraulic system to raise front of machine for service or maintenance. Loss of hydraulic pressure can cause serious injury or death.</p> 	<p>⑤</p> <p>ADVERTENCIA</p> <p>RIESGO DE GOLPE Cuando sube a la máquina. No utilice el sistema hidráulico de la balsa o el brazo de levante para levantar el chasis delantero de la máquina para servicio o mantenimiento. Fuga de presión hidráulica puede causar serias lesiones o muerte.</p> 	<p>⑤</p> <p>ADVERTÊNCIA</p> <p>PERIGO DE ESMAGAMENTO Não use o sistema hidráulico do braço de levantamento e do chassis para levantar a parte frontal da máquina para serviço de manutenção. A perda de pressão hidráulica pode causar ferimentos sérios ou morte.</p> 	<p>⑤</p> <p>警告</p> <p>挤压危险 当举升机器时 不要使用斗臂和大臂的液压系统抬起机器前部。液压油压力丧失会导致严重伤害或死亡。</p> 

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Figure 4. Identification and safety group (sheet 4 of 12)


















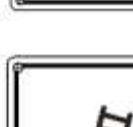


(numbers on drawing refer to legend on sheet 1 of 12)

English	French	Turkish	Russian
<p>①</p> <p>CAUTION</p> <p>DO NOT USE left hand pedal for normal braking.</p>	<p>①</p> <p>MISE EN GARDE</p> <p>NE PAS UTILISER la pédale de gauche pour le freinage normal.</p>	<p>①</p> <p>DİKKAT</p> <p>KULLANMAYIN: normal frenleme için sol pedali kullanmayın.</p>	<p>①</p> <p>ОСТОРОЖНО</p> <p>Не используйте левую педаль для обычного торможения</p>
<p>②</p> <p>WARNING</p> <p>USE OF PARKING BRAKES</p> <ul style="list-style-type: none"> Set the motor brakes for parking and when men are working on the equipment. Use only in emergencies for stopping the equipment. 	<p>②</p> <p>ATTENTION</p> <p>UTILISATION DU FREIN DE STATIONNEMENT</p> <ul style="list-style-type: none"> Engager le frein de stationnement pour stationner et lorsque le personnel d'entretien intervient sur la machine. N'utiliser qu'en cas d'urgence pour arrêter la machine. 	<p>②</p> <p>UYARI</p> <p>PARK FRENLERİNİN KULLANIMI</p> <ul style="list-style-type: none"> Park etmek için ve ekipman üzerinde çalışırken motor frenlerini kullanın. Yalnızca ekipmanın durdurulmasını gerektiren acil durumlarda kullanın. 	<p>②</p> <p>ВНИМАНИЕ</p> <p>Использован тормозов стояночных</p> <ul style="list-style-type: none"> Всегда при «парковке» и когда люди работают на оборудовании. Использовать только в экстренных случаях для остановки оборудования.
<p>③</p> <p>WARNING</p> <p>NEVER LEAVE OPERATOR'S CAB</p> <ul style="list-style-type: none"> With a load suspended. With engine running at high throttle. With the park brakes released. 	<p>③</p> <p>ATTENTION</p> <p>NE JAMAIS QUITTER LA CABINE</p> <ul style="list-style-type: none"> Avec une charge en hauteur. Avec le moteur à haut régime. Sans avoir engagé le frein de stationnement. 	<p>③</p> <p>UYARI</p> <p>AŞAĞIDAKİ DURUMLARDA OPERATOR KABİNİNDEN ASLA AYRILMAYIN:</p> <ul style="list-style-type: none"> Asılı bir yük varsa. Motor yüksek devirde çalışıyorsa. Park frenleri serbestse. 	<p>③</p> <p>ВНИМАНИЕ</p> <p>НИКОГДА НЕ ПОКИДАЙТЕ КАБИНУ ОПЕРАТОРА</p> <ul style="list-style-type: none"> Когда загруженный ковш в верхнем положении. Когда двигатель работает на высоких оборотах. Когда отпущены стояночные тормоза.
<p>④</p> <p>CAUTION</p> <p>BEFORE STARTING ENGINE:</p> <ul style="list-style-type: none"> Study the controls and operating instructions sections of the service manual. Read all safety signs on machine. Clear the area of other persons. Learn and practice SAFE use of controls before operating. <p>It is your responsibility to understand and follow the manufacturer's instructions on machine operation and service, and to observe pertinent laws and regulations. The service manual and operator's handbook may be obtained through your equipment dealer.</p>	<p>④</p> <p>MISE EN GARDE</p> <p>AVANT DE DÉMARRER LE MOTEUR:</p> <ul style="list-style-type: none"> Lire les sections des commandes et d'opération du manuel d'entretien. Lire toutes les étiquettes de sécurité sur la machine. Dégager l'endroit de tout personnel. Apprendre et pratiquer l'utilisation sécuritaire des commandes avant l'opération. <p>Il est de votre responsabilité de comprendre et de suivre les instructions relatives à l'opération et à l'entretien de votre machine. Les manuels d'entretien et d'opération sont disponibles auprès de votre concessionnaire.</p>	<p>④</p> <p>DİKKAT</p> <p>MOTURU ÇALIŞTIRMADAN ÖNCE:</p> <ul style="list-style-type: none"> Servis kılavuzunun denetim ve çalışma bölümlerinde ilgili bölümleri okuyun. Maşina üzerindeki tüm güvenlik etiketlerini okuyun. Alanda diğer kişilerin bulunmadığından emin olun. Çalışmadan önce denetimlere EMNİYETLİ kullanımı öğrenin ve edinin. <p>Maşinanın güvenli ve doğru olarak kullanılmasını sağlamak için, işletme ve bakım talimatlarını okuyun ve öğrenin. İşletme ve bakım talimatları, emniyetli kullanımı öğrenin ve edinin.</p>	<p>④</p> <p>ОСТОРОЖНО</p> <p>ПЕРЕД ЗАПУСКОМ ДВИГАТЕЛЯ:</p> <ul style="list-style-type: none"> Изучите инструкцию по управлению и эксплуатационный раздел руководства по обслуживанию. Обязательно ознакомьтесь со всеми знаками безопасности. Прочтите все знаки безопасности на машине. Изучите и практикуйтесь в БЕЗОПАСНОМ использовании элементов управления перед началом работы. <p>Ваша ответственность заключается в том, чтобы понимать и следовать инструкциям производителя по эксплуатации машины и обслуживанию, и соблюдать соответствующие законы и постановления. Руководство по обслуживанию и руководство по эксплуатации могут быть получены у вашего дилера.</p>
<p>⑤</p> <p>WARNING</p> <p>CRUSH HAZARD when raising machine. Use proper jacks and blocking whenever raising the machine. Loss of hydraulic pressure can cause serious injury or death.</p>	<p>⑤</p> <p>ATTENTION</p> <p>DANGER D'ÉCRASEMENT en levant la machine. Utilisez vannes, chandelles et autre outillage sécuritaire pour soulever la machine. La perte de pression hydraulique peut causer des blessures graves, voire la mort.</p>	<p>⑤</p> <p>UYARI</p> <p>KIZILMA TEHLİKESİ kaldırma sırasında. Kaldırma sırasında doğru şekilde kullanın. Hidrolik basınç kaybı ciddi yaralanmalara veya ölüme sebep olabilir.</p>	<p>⑤</p> <p>ВНИМАНИЕ</p> <p>Повышенная опасность при подъеме машины. Используйте правильные подставки и блокировку при подъеме машины. Потеря гидравлического давления может вызвать серьезные травмы или смерть.</p>

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Figure 5. Identification and safety group (sheet 5 of 12)

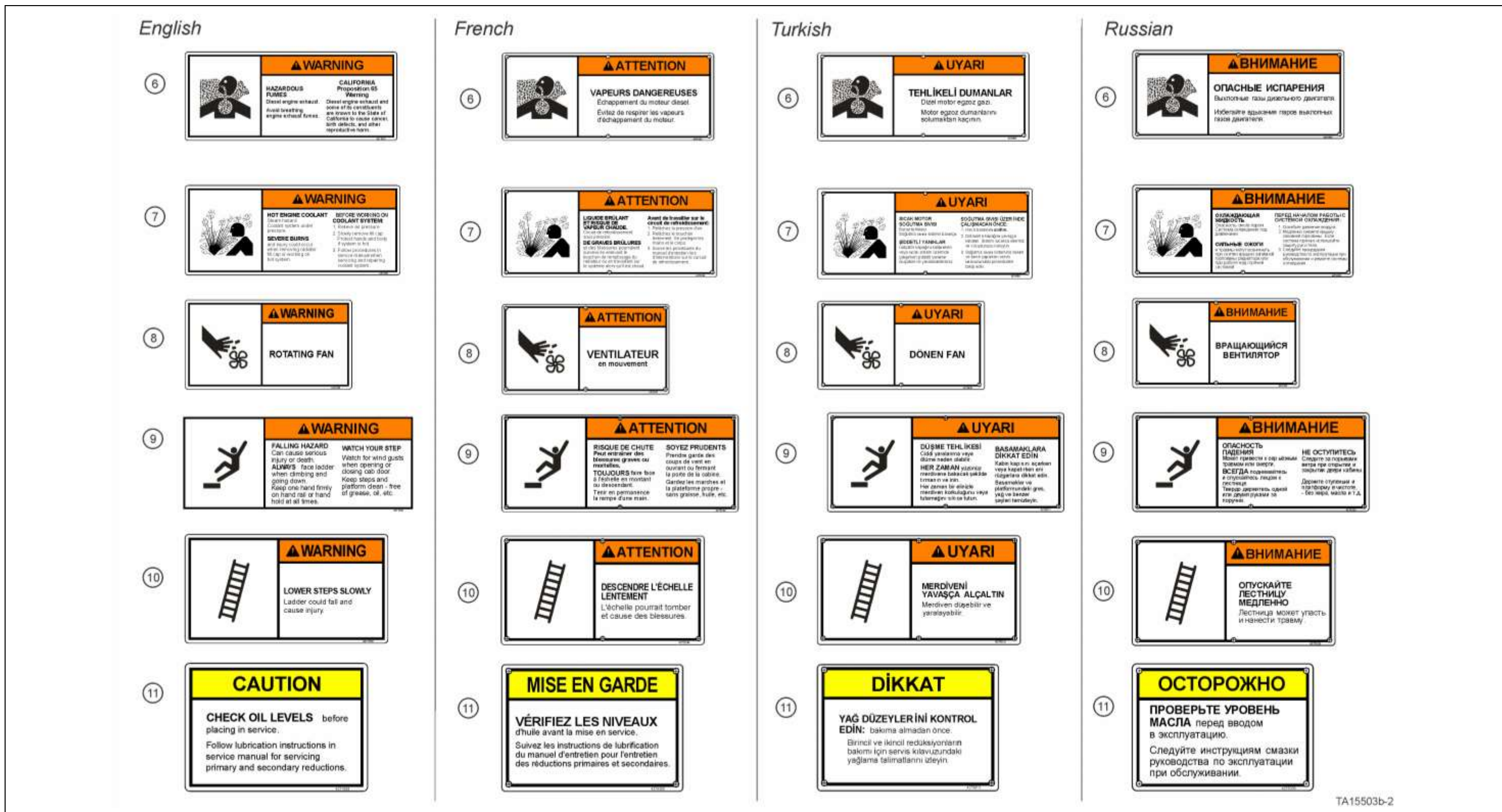
(numbers on drawing refer to legend on sheet 1 of 12)

English	Spanish	Portuguese	Chinese
<p>6</p>  <p>▲ WARNING</p> <p>HAZARDOUS FUMES Diesel engine exhaust. Avoid breathing engine exhaust fumes.</p> <p>CALIFORNIA Proposition 65 Warning Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.</p>	<p>6</p>  <p>▲ ADVERTENCIA</p> <p>HUMOS PELIGROSOS Esaes de emisin del motor diesel. Evite la inhalacin.</p>	<p>6</p>  <p>▲ ADVERTÊNCIA</p> <p>FUMOS TÓXICOS Esaes de emisin do motor Diesel. Evite inalar fumes de escape de motores.</p> <p>Preposiçaõ do CALIFÓRNIA A fumaça do motor de diesel e alguns dos seus componentes são conhecidos por causarem cancro, defeitos de nascença e outros danos reprodutivos.</p>	<p>6</p>  <p>▲ 警告</p> <p>柴油发动机 排出气体有毒 避免吸入发动机排出气体</p> <p>加州 65号提案 警告 柴油发动机排出气体及其成分中某些物质被证实会导致癌症、出生缺陷及其他生殖危害。</p>
<p>7</p>  <p>▲ WARNING</p> <p>HOT ENGINE COOLANT Coolant leaks under pressure.</p> <p>SEVERE BURNS Hot engine coolant can scald or burn you if you spill it on you or splash it on your face.</p> <p>BEFORE WORKING ON COOLANT SYSTEM 1. Release air pressure. 2. Shut off engine and wait 10 minutes. 3. Place a rag on and keep it open. 4. Use proper tools to service coolant system. 5. Do not use water to clean up coolant.</p>	<p>7</p>  <p>▲ ADVERTENCIA</p> <p>REFRIGERANTE DE MOTOR CALIENTE Puede escapar a alta presin. Quemaduras severas.</p> <p>ANTES DE TRABAJAR EN EL SISTEMA DE ENFRÍAMENTO 1. Quite el aire de la presin. 2. Detenga el motor y espere 10 minutos. 3. Coloque un trapo y mantngalo abierto. 4. Use herramientas apropiadas para el servicio del sistema de enfriamiento. 5. No use agua para limpiar el refrigerante.</p>	<p>7</p>  <p>▲ ADVERTÊNCIA</p> <p>ADVERTÊNCIA PARA RADIADOR QUENTE O refrigerante do motor quente pode escapar sob alta pressõ. Queimaduras severas.</p> <p>ANTES DE TRABALHAR NO SISTEMA DE ARREFECIMENTO 1. Libere a pressõ do ar. 2. Desligue o motor e espere 10 minutos antes de trabalhar no sistema de arrefecimento. 3. Coloque um pano e mantenha-o aberto. 4. Use as ferramentas adequadas para o trabalho no sistema de arrefecimento. 5. No utilize a água para limpar o refrigerante.</p>	<p>7</p>  <p>▲ 警告</p> <p>发动机高温冷却液漏出 蒸汽灼伤危险 发动机冷却液有压力 打开散热器盖或在热的系统上工作可能 导致严重烫伤</p> <p>在冷却系统工作前 必须 1. 释放冷却系统压力 2. 等待发动机冷却液温度下降 10分钟 3. 散热器盖保持打开 4. 使用适当的工具修理冷却系统 5. 切勿用水清洗冷却液</p>
<p>8</p>  <p>▲ WARNING</p> <p>ROTATING FAN</p>	<p>8</p>  <p>▲ ADVERTENCIA</p> <p>VENTILADOR GIRANDO A ALTA VELOCIDAD</p>	<p>8</p>  <p>▲ ADVERTÊNCIA</p> <p>VENTILADOR EM ROTAÇÃO</p>	<p>8</p>  <p>▲ 警告</p> <p>旋转风扇</p>
<p>9</p>  <p>▲ WARNING</p> <p>FALLING HAZARD Can cause serious injury or death. ALWAYS face ladder when climbing and going down. Keep one hand firmly on hand rail or hand hold at all times.</p> <p>WATCH YOUR STEP Watch for wind gusts when opening or closing cab door. Keep steps and platform clear - free of grease, oil, etc. hold at all times.</p>	<p>9</p>  <p>▲ ADVERTENCIA</p> <p>RIESGO DE CAIDA Puede causar serios daos o muerte. SIEMPRE mire hacia la escalera cuando suba y baje. Mantenga una mano firmemente en el costamano o en una mano todo el tiempo.</p> <p>MIRE POR DONDE CAMINA Observe si hay ráfagas de viento cuando abra o cierre la puerta de cabina. Mantenga peldaos y suelo limpio - libre de grasa, aceite, etc.</p>	<p>9</p>  <p>▲ ADVERTÊNCIA</p> <p>PERIGO: cair pode causar serios ferimentos ou morte. SEMPRE olhe a escada quando estiver subindo ou descendo de máquina. Sempre mantenha uma mao firme no costamõ.</p> <p>CUIDADO ONDE PISA. Observe os ventos fortes quando abrir ou fechar a porta de cabina. Mantenha os degraus e plataformas limpas, sem óleo ou graxa.</p>	<p>9</p>  <p>▲ 警告</p> <p>跌到危险 可能导致严重人身伤亡 上下阶梯时一定要注意 鞋子 时刻保持有一只手抓牢扶手</p> <p>小心脚下 开门时留意门框注意 风 保持台阶和平台干净 无油渍与污垢</p>
<p>10</p>  <p>▲ WARNING</p> <p>LOWER STEPS SLOWLY Ladder could fall and cause injury.</p>	<p>10</p>  <p>▲ ADVERTENCIA</p> <p>BAJE LOS PELDAOS LENTAMENTE La escalera podria caer y causar daos.</p>	<p>10</p>  <p>▲ ADVERTÊNCIA</p> <p>DESCA OS DEGRAUS LENTAMENTE A escada pode cair e causar ferimentos.</p>	<p>10</p>  <p>▲ 警告</p> <p>慢慢放下梯子至低位 有可能落下造成伤害</p>
<p>11</p> <p>CAUTION</p> <p>CHECK OIL LEVELS before placing in service. Follow lubrication instructions in service manual for servicing primary and secondary reductions.</p>	<p>11</p> <p>PRECAUCIÓN</p> <p>REVISE LOS NIVELES DE ACEITE Antes de poner la máquina en servicio. Siga las instrucciones de lubricación del manual de servicio para revisión o mantenimiento de las reducciones primaria y secundaria.</p>	<p>11</p> <p>PRECAUÇÃO</p> <p>VERIFIQUE OS NÍVEIS DE ÓLEO antes de colocar em serviço. Siga as instruções de lubrificação do manual de serviço para manutenção das reduções primária e secundária.</p>	<p>11</p> <p>注意</p> <p>维护前请检查油位 按服务手册内的润滑指示 维护一级和二级减速齿轮</p>

TA15503b

Figure 6. Identification and safety group (sheet 6 of 12)













(numbers on drawing refer to legend on sheet 1 of 12)



TA15503b-2

Figure 7. Identification and safety group (sheet 7 of 12)













(Numbers on drawing refer to legend on sheet 1 of 12)

English	Spanish	Portuguese	Chinese
<p>12</p>  <p>WARNING</p> <p>NO ROOM for a man in this area when machine is started. DO NOT STAND or work in this area when machine is running. USE SAFETY LINK when servicing machine.</p>	<p>12</p>  <p>ADVERTENCIA</p> <p>NO HAY ESPACIO para personas en esta área cuando la máquina está en marcha. NO PARARSE o trabajar en esta área cuando la máquina está en movimiento. UTILICE BARRA DE SEGURIDAD cuando la máquina está en revisión, refresco de fluidos o mantenimiento.</p>	<p>12</p>  <p>ADVERTÊNCIA</p> <p>NÃO HÁ ESPAÇO para uma pessoa nesta área, quando a máquina estiver em funcionamento. NÃO PERMANEÇA OU TRABALHE nesta área, quando a máquina estiver em operação. USE BARRAS DE SEGURANÇA quando a máquina estiver em manutenção.</p>	<p>12</p>  <p>警告</p> <p>转向时 此区域不得有人 机器运行时 不得在此区域逗留或作业 维护机器时 使用安全连杆</p>
<p>13</p> <p>CAUTION</p> <p>PUMP PRIMING Prior to starting engine, ensure hydraulic reservoir is pressurized. All pumps must be re-primed whenever hydraulic oil is changed or hydraulic system is maintained.</p>	<p>13</p> <p>PRECAUCIÓN</p> <p>CEBADO DE BOMBAS Previo al encendido del motor, asegúrese que el tanque hidráulico está presurizado. Todas las bombas deben ser sangradas cuando el aceite hidráulico es cambiado o el sistema hidráulico es mantenido.</p>	<p>13</p> <p>PRECAUÇÃO</p> <p>ESCORVAMENTO DA BOMBA Antes de dar partida ao motor assegure-se que o sistema hidráulico está pressurizado. Todas as bombas precisam ser escorvadas sempre que for trocado o óleo hidráulico ou após manutenção do sistema hidráulico.</p>	<p>13</p> <p>注意</p> <p>泵排气 启动发动机前 确保液压油箱有压力 在更换液压油和液压系统维护后 所有的泵必须排气</p>
<p>14</p>  <p>WARNING</p> <p>HIGH PRESSURE Hydraulic hoses with special thick flange fittings. Improper parts installation could cause serious injury or death.</p> <ul style="list-style-type: none"> Use forged flange dome halves. (P/N 4199401) Use grade-8 bolts, with 3/4-inch minimum thread engagement. Use hardened washers. (P/N 4210349) Torque to 85 ft-lb torqued. 	<p>14</p>  <p>ADVERTENCIA</p> <p>ALTA PRESIÓN Mangueras hidráulicas con bridas de espesor adecuado. Instalación de componentes inadecuados podrían causar serias lesiones o muerte.</p> <ul style="list-style-type: none"> Utilice bridas hidráulicas forjadas (P/N 4199401). Utilice pernos de grado 8. Con 3/4 de pulgada de hilo como mínimo. Utilice juntas templadas (P/N 4210349). Torque de 80 lb-pie torcido. 	<p>14</p>  <p>ADVERTÊNCIA</p> <p>ALTA PRESSÃO Mangueiras hidráulicas com bridas de espessura especial. Instalação inadequada de tais peças pode causar ferimentos sérios ou morte.</p> <ul style="list-style-type: none"> Use abraçadeiras roscas forjadas. (P/N 4199401) Use parafusos de grau 8, com 3/4 de polegada de comprimento mínimo de rosca. Use arruelas tratadas. (P/N 4210349) Torque com 80 lb-pie, torcido. 	<p>14</p>  <p>警告</p> <p>高压液压软管 有特 殊加厚法兰 件。不正 确的安 装 可 能 导 致 严 重 伤 害 或 死 亡。</p> <ul style="list-style-type: none"> 使用 锻造 法兰 正 头 螺 母 (P/N 4199401) 使用 美 制 8 级 螺 丝 钉 螺 母 配 合 长 度 至 少 20mm 以上 使用 硬化 垫 圈 (P/N 4210349) 螺栓 扭矩 80 磅-尺
<p>15</p> <p>DIESEL FUEL</p> <p>4271883</p>	<p>15</p> <p>COMBUSTIBLE DIESEL</p> <p>4271883</p>	<p>15</p> <p>COMBUSTÍVEL DIESEL</p> <p>4271883</p>	<p>15</p> <p>柴油</p> <p>4271884</p>
<p>16</p> <p>HYDRAULIC OIL</p> <p>4271884</p>	<p>16</p> <p>ACEITE HIDRAULICO</p> <p>4271887</p>	<p>16</p> <p>ÓLEO HIDRÁULICO</p> <p>4271817</p>	<p>16</p> <p>液压油</p> <p>4271885</p>
<p>17</p> <p>DANGER</p>  <p>750 VOLTS can be present whenever keyswitch is on. 750 VOLTS can be present up to five (5) minutes after batteries have been isolated.</p>	<p>17</p> <p>PELIGRO</p>  <p>ALTO VOLTAJE puede estar presente todo el tiempo que la llave contacto está posición encendida (ON). ALTO VOLTAJE puede estar presente hasta de cinco (5) minutos después que se han desconectado las baterías.</p>	<p>17</p> <p>PERIGO</p>  <p>ALTA VOLTAGEM pode estar presente sempre que a chave estiver ligada. ALTA VOLTAGEM pode estar presente até cinco (5) minutos após as baterias terem sido desconectadas.</p>	<p>17</p> <p>危险</p>  <p>当开关打开时随时会出现 750 伏高压电 电池断开后 750 伏高压电 还会持续 5 分钟</p>

TA15503c

Figure 8. Identification and safety group (sheet 8 of 12)

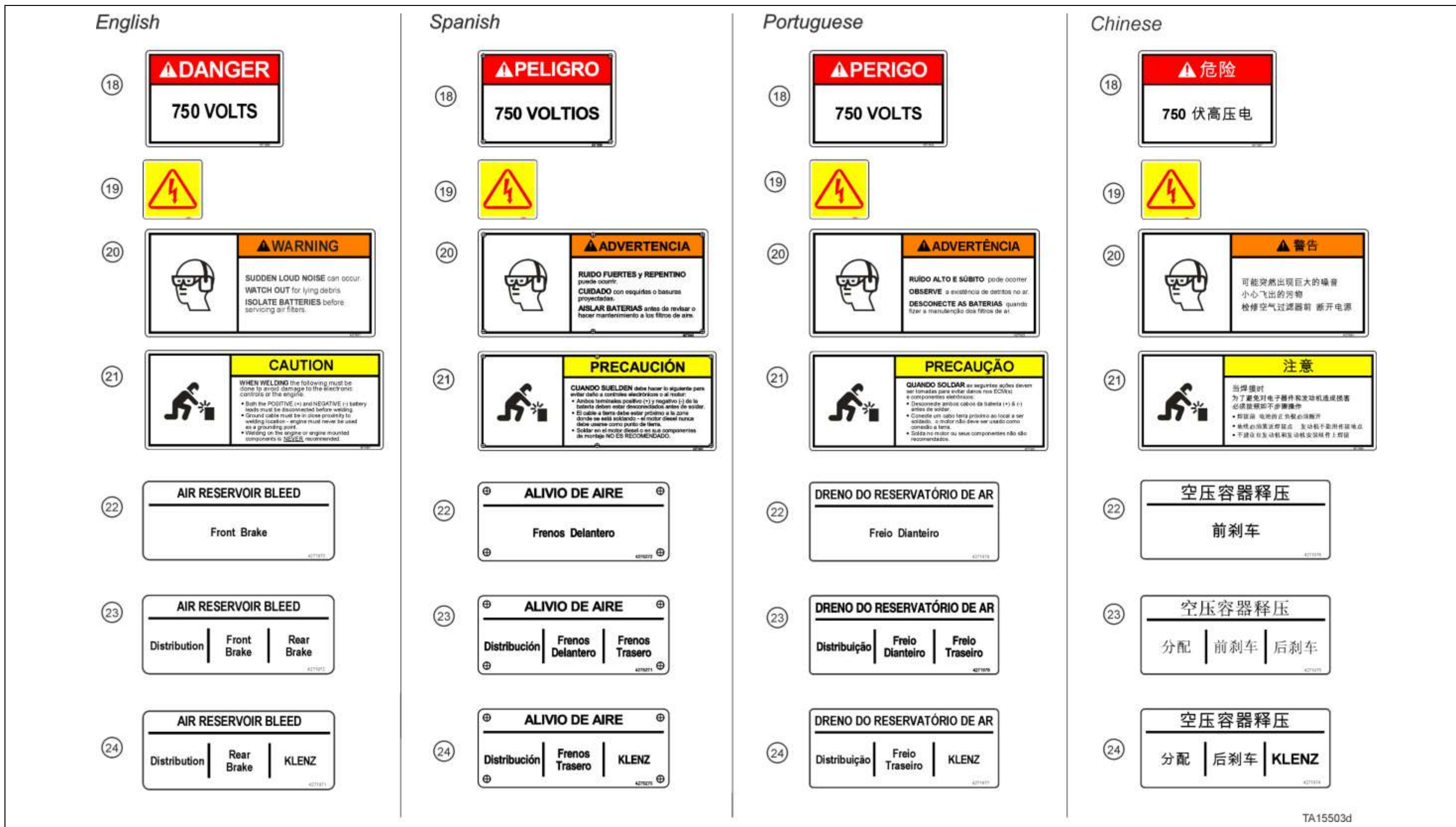
(Numbers on drawing refer to legend on sheet 1 of 12)

English	French	Turkish	Russian
<p>12</p>  <p>WARNING</p> <p>NO ROOM for a man in this area when machine is steered. DO NOT STAND or work in this area when machine is running. USE SAFETY LINK when servicing machine.</p>	<p>12</p>  <p>ATTENTION</p> <p>PAS D'ESPACE pour un travailleur dans cet endroit quand la machine est actionnée. NE PAS SE TENIR ou travailler dans cette région quand la machine est en opération. INSTALLER LA BARRE DE SÉCURITÉ avant d'intervenir sur la machine.</p>	<p>12</p>  <p>UYARI</p> <p>KİMSE OLMAMALI makine çalışırken bu bölgede çalışmaya kalkışmayın. DURMAYIN makine çalışırken bu bölgede çalışmaya kalkışmayın. GÜVENLİK BAĞLANTISI KULLANIN makine bakımını yapmadan önce güvenli bağlantı kullanın.</p>	<p>12</p>  <p>ВНИМАНИЕ</p> <p>Не находитесь вблизи поворачивающейся машины. Не стойте и не работайте в месте, где работает машина. Используйте предохранительный рычаг при обслуживании машины.</p>
<p>13</p> <p>CAUTION</p> <p>PUMP PRIMING Prior to starting engine, ensure hydraulic reservoir is pressurized. All pumps must be re-primed whenever hydraulic oil is changed or hydraulic system is maintained.</p>	<p>13</p> <p>MISE EN GARDE</p> <p>AMORÇAGE DES POMPES Avant de démarrer le moteur, s'assurer que le réservoir hydraulique est sous pression. Toutes les pompes doivent être réamorçées chaque fois que l'huile hydraulique est remplacée ou qu'il y a intervention sur le système hydraulique.</p>	<p>13</p> <p>DİKKAT</p> <p>POMPA HAZIRLAMA Motörü çalıştırmadan önce hidrolik deposunun basınçlı olduğundan emin olun. Hidrolik yağı değiştirilince veya hidrolik sisteminin bakımı yapıldınca tüm pompalar yeniden çalıştırmaya hazırlanmalıdır.</p>	<p>13</p> <p>ОСТОРОЖНО</p> <p>ТОПЛИВНЫЙ НАСОС Перед запуском двигателя убедиться, что гидравлический резервуар находится под давлением. Все насосы должны быть повторно заправлены маслом, когда меняется гидравлическое масло или обслуживается гидравлическая система.</p>
<p>14</p>  <p>WARNING</p> <p>HIGH PRESSURE Hydraulic hoses with special thick flange fittings. Improper parts installation could cause serious injury or death.</p> <ul style="list-style-type: none"> Use forged flange clamp halves. (PN 4186401) Use grade-8 bolts, with 3/4-inch minimum thread engagement. Use hardened washers. (PN 4210349) Torque to 80 ft-lb (torque). 	<p>14</p>  <p>ATTENTION</p> <p>HAUTE PRESSION Borçes hydrauliques avec raccords à embouts épais. L'installation incorrecte des pièces pourrait causer des blessures graves ou la mort.</p> <ul style="list-style-type: none"> Utiliser seulement des brides forgées. (REF. 4186401) Utiliser des vis grade 8, avec une longueur de filetage de 19 mm au minimum. Utiliser des rondelles durcies. (PN 4210349) Serrage avec couplet 80 lb-ft. 	<p>14</p>  <p>UYARI</p> <p>YÜKSEK BASINÇ Özel kalite borus borçes ve özel kalite flanşlar kullanın. Yanlış parça montajı ciddi yaralanmalara veya ölüme neden olabilir.</p> <ul style="list-style-type: none"> Doğru borus borçes yarılar kullanın. (PN 4186401) En az 3/4 inç vıdılaması boylu 8 kalite vidalar kullanın. Sartlandırılmış rondelalar kullanın. (PN 4210349) Yaklaşık olarak 80 lb-ft torkla sıkın. 	<p>14</p>  <p>ВНИМАНИЕ</p> <p>ВЫСОКОЕ ДАВЛЕНИЕ Гидравлические шланги с уплотнительными фланцами. Неграмотная установка деталей может привести к серьезным травмам или смерти. Используйте только специальные фланцы. (PN детали 4186401) Используйте болты класса 8, с минимальной длиной резьбы 19 мм. Используйте закаленные шайбы. (PN детали 4210349) Затяните до 80 фунтов-силы.</p>
<p>15</p> <p>DIESEL FUEL</p> <p>4271893</p>	<p>15</p> <p>CARBURANT DIESEL</p> <p>4273284</p>	<p>15</p> <p>DİZEL YAKIT</p> <p>4279517</p>	<p>15</p> <p>ДИЗЕЛЬНОЕ ТОПЛИВО</p> <p>4273334</p>
<p>16</p> <p>HYDRAULIC OIL</p> <p>4271894</p>	<p>16</p> <p>HUILE HYDRAULIQUE</p> <p>4273290</p>	<p>16</p> <p>HİDROLİK YAĞI</p> <p>4279618</p>	<p>16</p> <p>ГИДРАВЛИЧЕСКОЕ МАСЛО</p> <p>4273330</p>
<p>17</p> <p>DANGER</p>  <p>750 VOLTS can be present whenever keyswitch is on. 750 VOLTS can be present up to five (5) minutes after batteries have been isolated.</p>	<p>17</p> <p>DANGER</p>  <p>HAUTE TENSION peut être présente quand la clé est à la position "ON". HAUTE TENSION peut demeurer présente jusqu'à cinq (5) minutes après que les batteries aient été isolées.</p>	<p>17</p> <p>TEHLİKE</p>  <p>YÜKSEK GERİLİM: kontak anahtar açık konumdayken yüksek gerilim olabilir. YÜKSEK GERİLİM: anahtar izole edildikten beş (5) dakika sonrasında kadar yüksek gerilim bulunabilir.</p>	<p>17</p> <p>ОПАСНО</p>  <p>ВЫСОКОЕ НАПРЯЖЕНИЕ когда включен пусковой выключатель. ВЫСОКОЕ НАПРЯЖЕНИЕ может оставаться до 5 минут после отключения аккумуляторных батарей.</p>

TA15503e-2

Figure 9. Identification and safety group (sheet 9 of 12)

(Numbers on drawing refer to legend on sheet 1 of 12)



TA15503d

Figure 10. Identification and safety group (sheet 10 of 12)

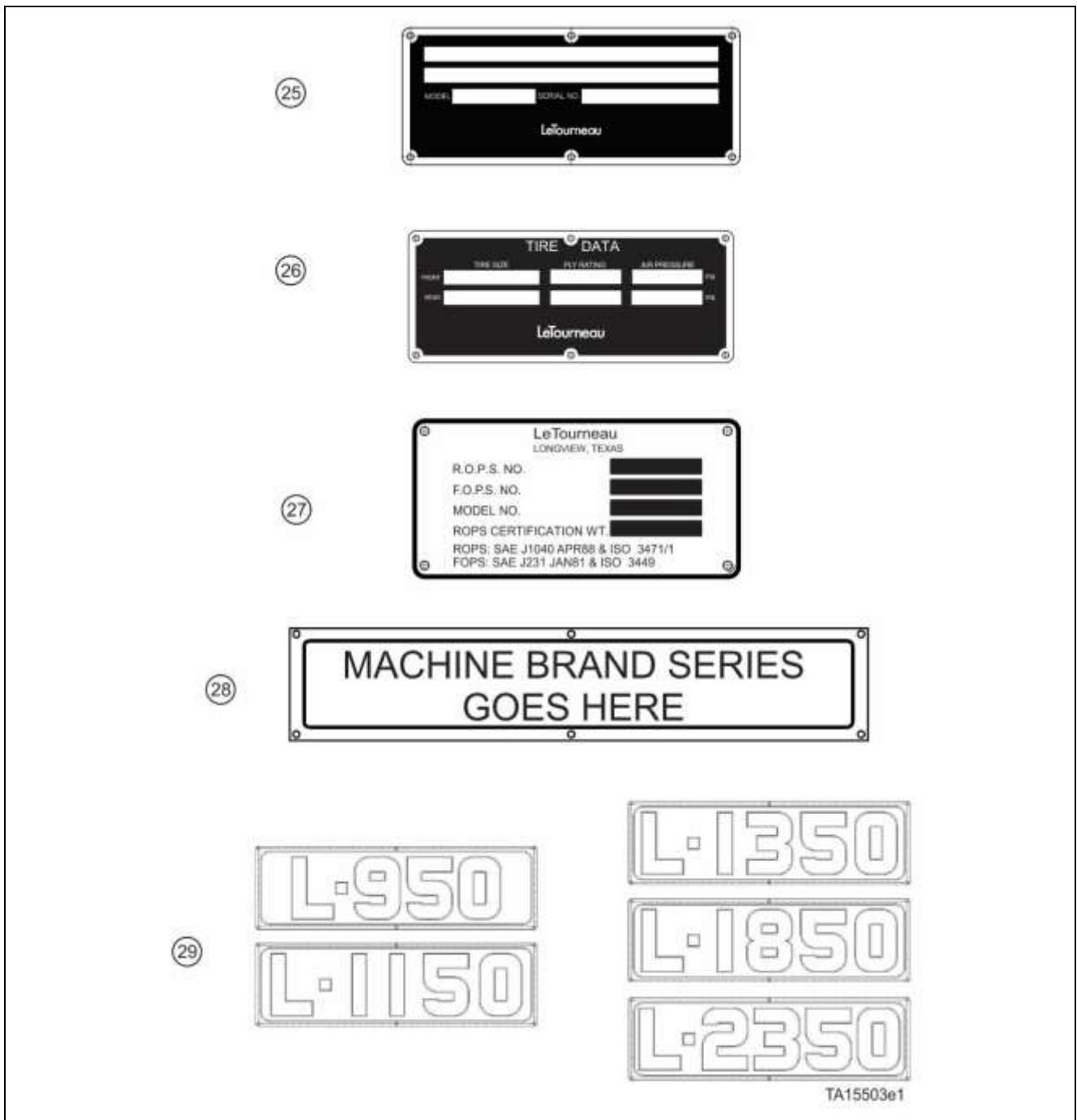
(Numbers on drawing refer to legend on sheet 1 of 12)

English	French	Turkish	Russian
<p>18 ▲ DANGER 750 VOLTS</p>	<p>18 ▲ DANGER 750 VOLTS</p>	<p>18 ▲ TEHLİKE 750 VOLT</p>	<p>18 ▲ ОПАСНО 750 ВОЛЬТ</p>
<p>19 </p>	<p>19 </p>	<p>19 </p>	<p>19 </p>
<p>20 ▲ WARNING SUDDEN LOUD NOISE can occur. WATCH OUT for flying debris. ISOLATE BATTERIES before servicing air filters.</p>	<p>20 ▲ ATTENTION POSSIBILITÉ DE BRUIT FORT soudain. ATTENTION aux particules en suspension. ISOLEZ LES BATTERIES avant de faire l'entretien des filtres à air.</p>	<p>20 ▲ UYARI ANİ YÜKSEK GÜRÜLTÜ ortaya çıkabilir. UÇUŞAN dökümlüye dikkat edin. AKÜLERİ YALITIN: hava filtrelesine servis yapmadan önce.</p>	<p>20 ▲ ВНИМАНИЕ Может возникнуть ВНЕЗАПНЫЙ ГРОМКИЙ ШУМ. ОСТЕРЕГАЙТЕСЬ летящих обломков. ОТКЛЮЧИТЕ АККУМУЛЯТОРЫ перед обслуживанием воздушных фильтров.</p>
<p>21 CAUTION WHEN WELDING the following must be done to avoid damage to the electronic controls of the engine. • Both the POSITIVE (+) and NEGATIVE (-) battery leads must be disconnected before welding. • Ground cable must be in close proximity to welding location - engine must never be used as a grounding point. • Working on the engine or engine mounted components is NEVER recommended.</p>	<p>21 MISE EN GARDE LORS D'INTERVENTIONS DE SOUDURE, les précautions suivantes doivent être prises afin d'éviter des dommages aux commandes électroniques du moteur. • Les deux bornes POSITIVE (+) et NEGATIVE (-) des batteries doivent être débranchées. • Le câble de mise à la terre doit être proche du lieu de soudure - le moteur ne doit jamais servir de point de mise à la terre. • Il n'est JAMAIS recommandé de travailler sur le moteur ou ses composants.</p>	<p>21 DİKKAT KAYNAK YAPARKEN elektronik denetimlerde veya motorun hasarı görünebilir. Önemli işleri sürdürürken: • Her iki (+) ve (-) kutup da NEGATİF (-) olarak kesilmelidir. Saldırıya başlamadan önce ayrılmalıdır. • Tutarlı yerleri yakında tutulmalı ve yerel topraklamalar için motorun kullanılmaması gerekir. • Motoru çalıştırmak için asla motorun gövdesi kullanılmamalıdır.</p>	<p>21 ОСТОРОЖНО ПРИ СВАРКЕ необходимо сделать следующие вещи, чтобы избежать повреждения электронного управления или двигателя. • Как ПОЗИТИВНЫЙ (+) так и ОТРИЦАТЕЛЬНЫЙ (-) выводы аккумуляторных ячеек должны быть отключены. • Кабель заземления должен быть в непосредственной близости от места сварки - двигатель никогда не должен использоваться в качестве заземления. • Работа на двигателе или установленных на двигателе компонентах НЕ РЕКОМЕНДУЕТСЯ.</p>
<p>22 AIR RESERVOIR BLEED Front Brake</p>	<p>22 PURGE DES RÉSERVOIRS À AIR Frein Avant</p>	<p>22 HAVA DEPOSU TAHL İYESİ Ön Fren</p>	<p>22 ВОЗДУХООТВОД ВОЗДУШНОГО РЕЗЕРВУАРА Передний Тормоз</p>
<p>23 AIR RESERVOIR BLEED Distribution Front Brake Rear Brake</p>	<p>23 PURGE DES RÉSERVOIRS À AIR Distribution Frein Avant Frein Arrière</p>	<p>23 HAVA DEPOSU TAHL İYESİ Dağıtım Ön Fren Arka Fren</p>	<p>23 ВОЗДУХООТВОД ВОЗДУШНОГО РЕЗЕРВУАРА Распределение Передний Тормоз Задний Тормоз</p>
<p>24 AIR RESERVOIR BLEED Distribution Rear Brake KLENZ</p>	<p>24 PURGE DES RÉSERVOIRS À AIR Distribution Frein Arrière KLENZ</p>	<p>24 HAVA DEPOSU TAHL İYESİ Dağıtım Arka Fren KLENZ</p>	<p>24 ВОЗДУХООТВОД ВОЗДУШНОГО РЕЗЕРВУАРА Распределение Задний Тормоз KLENZ</p>

TA15503d-2

Figure 11. Identification and safety group (sheet 11 of 12)

(Numbers on drawing refer to legend on sheet 1 of 12)



- 25 Plate, model/serial number
- 26 Plate, tire data
- 27 Plate, roll bar approval
- 28 Machine brand series placard
- 29 Placard, (machine model specific)

Figure 12. Identification and safety group (sheet 12 of 12)

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General Operational Safety Guidelines

Be Prepared Before Starting

These guidelines should be followed before attempting to operate the machine.

- a. **KNOW THE EQUIPMENT:** Read all sections of this manual thoroughly. **BE SURE** to understand all control functions, capacities, clearances, limitations, and routine maintenance required for safe operation. Support personnel should also be familiar with this information. Learn the location and function of ALL controls, indicators, warning devices and caution instructions. Improper operation or improper maintenance of this machine can result in hazardous conditions.
- b. This machine must be operated in accordance with the information and instructions contained in this manual.

WARNING

Crush hazards exist when operating the loader. Komatsu equipment is designed as off-highway equipment for use in open pit applications that are in remote locations. Due to their very large size they must work in an area with few machines, and their only proximity to buildings would be for routine maintenance or repair. They are not to be operated near office buildings or residential areas. Operating the loader near office buildings or residential areas can cause crush hazards resulting in serious injury or death.

- c. Be familiar with the machine's safety devices (if so equipped) such as:
 1. Seat belts
 2. Rollover protective structure (ROPS) and falling object protective structure (FOPS)
 3. Articulated steering frame lock
 4. Shields and guards
 5. Visual and audible warning devices
 6. Manual fire suppressor or the fire suppression system
 7. Isolation and Control Switch Box
 8. Battery Isolation switch
 9. Starter Isolation switch
 10. Emergency Stop buttons
 11. Rearview mirrors
 12. All lighting
- d. Know the work area; clear away trash and debris. Remove anything that could puncture a tire.
- e. Check overhead clearances. Know the size of doorways and canopies. Know how much clearance there is under power and telephone lines.
- f. Complete the daily walk-around inspection and services. Perform the inspections and maintenance per Section 02. Check thoroughly for visual defects, such as leaks, cracks, frayed hoses, worn insulation, and loose parts. Pre-operation/pre shift inspections are a vital step in the safe operation of the equipment. Maintaining equipment in a safe operating condition ensures the operator can operate the equipment safely. Some items to consider are:

- Brakes
 - Steering components
 - Lighting
 - Sounding devices such as a horn or back up warning system
 - Unobstructed view of direction of travel and of surroundings in general, mirrors, etc.
 - Seat belts.
- g. The operator should know many factors, before and during operation of the machine, including but not limited to considerations such as:
- The local safety programs
 - The grades on which the equipment will be operating
 - Traffic patterns, routes, and road conditions
 - Limitations of the equipment

Mounting and Dismounting the Machine

These guidelines should be followed when mounting and dismounting the machine:

Ladder and Walkway to Cab

WARNING

Fall and slipping hazards exist if persons are transported other than the operator. Do not allow the transportation of any other person other than the operator, seated in the operator seat, unless a training seat is provided. There are no provisions on any P&H wheel loaders to accommodate the transportation of any persons other than the operator alone, unless a training seat in the cab is optionally provided. Ladders and catwalks attached to the machine are designed for servicing of the machine while the machine is stopped only. They are NOT designed for transporting riders at any time. Crush hazards and falling could occur, resulting in serious injury or death.

WARNING

Crush hazards exist if attempting to transport personnel on the machine. There are no provisions on the machine to accommodate the transportation of any persons other than the operator alone, unless a training seat in the cab is optionally provided. Ladders and catwalks attached to the machine are designed for servicing of the machine while the machine is stopped only. They are NOT designed for transporting riders at any time. Do not transport personnel or allow riders on the machine. A crush hazard is present while riding on any location of the machine other than the cab Operator's seat or training seat (if so equipped), which could result in serious injury or death.

- a. Always use "three-point support" with the machine, and face the ladder while entering or leaving it. "Three point support" means that three out of four arms and legs are in contact with the machine at all times during mount and dismount.

CAUTION

Slipping and falling hazards are present when mounting or dismounting the machine. Before mounting or dismounting the machine, ensure the ground conditions are stable, to prevent slipping or falling when climbing onto or stepping off the ladder. Always ensure firm ground before releasing the ladder/handrail. Slipping and falling hazards are present which could result in serious injury.



- b. Clean shoes and wipe hands before attempting to climb on the machine.
- c. Look for icy conditions that could make use of a ladder or stairway treacherous. Follow all local work rules used during icy conditions.
- d. Use handholds, ladders, or steps (as provided) when mounting and dismounting.
- e. NEVER attempt to mount or dismount a moving machine.
- f. NEVER jump off the machine.
- g. NEVER try to climb on or off the machine when carrying tools or supplies. Use a hand line to pull equipment up onto the platform.
- h. Observe proper shutdown procedures before dismounting.

Ladder Mounted On Hydraulic Reservoir

A ladder is mounted on the hydraulic reservoir. When using this ladder, refer to instructions in “Mounting and Dismounting the Machine”, as previously explained in this document.

Start Up Safely

These guidelines should be followed in the normal operation of the machine:

- a. Do not wear loose clothing or jewelry that can catch on controls or other parts of the machine.
- b. Make certain all protective guards and covers are secured in place on the machine.
- c. Keep the machine, especially walkways, platforms and steps, free of foreign material, such as debris, oil, tools, and other items that are not part of the machine.
- d. Secure all loose items such as lunch boxes, tools, and other items that are not part of the machine.



- e. Start up safely. Use all local procedures such as blowing the horn before starting up.

1. Allow at least 30 seconds for anyone working on or around the machine to exit the area. The operator should also inspect the machine before the shift and after work breaks to be sure no one is around it before starting.
2. Visually determine the area is clear before moving the machine.

WARNING

Crush hazard is present when the machine is steered (articulated). Do not allow anyone to stand in area of the machine, particularly between the tires when the engine is running. There is no clearance for persons in this area when the machine is steered. Failure to clear the area of personnel before moving the machine could cause a crush hazard that results in serious injury or death.

- f. Attach the frame lock before performing service work or lifting the machine or transporting on another vehicle. Before operating, be sure the frame lock is removed and securely stored.
- g. Follow the engine manufacturer's recommended starting procedure. After the engine has been started, check all gauges and instruments to be sure that everything is operating properly.

WARNING

Sickness or asphyxiation hazard exists from diesel fumes if the equipment is operated in an area that does not have adequate atmospheric ventilation. If necessary to start the engine in an enclosed area, be sure adequate ventilation is provided. Running the equipment in an area without adequate ventilation could cause sickness or asphyxiation from lack of oxygen, resulting in serious injury or death.



- h. Operate bucket and hoist controls through a complete cycle when area conditions permit — check for faulty operation. Report any sluggishness, binding, or over travel to the appropriate personnel.
- i. To be sure direction of travel and speed can be controlled, move the direction control switch to forward and reverse positions, and press the accelerator pedal slowly.
- j. Test brakes before operating. Test park brakes to make sure the machine will be able to stop and stay stopped. (when first moved, check dynamic braking).
- k. Check lights, backup alarm or other warning and safety devices.
- l. Sit properly, in an alert position. Check out controls in a safe area while moving slowly. STEER MACHINE BOTH RIGHT AND LEFT to be sure steering is operating properly.

- m. Never carry an unauthorized rider. The operator's cab is designed for one person only (unless equipped with a training seat). If a training seat is used, make certain the training seat belt restraint is used at all times.

WARNING

Fall hazard or crush hazard exists if the bucket or lift arms are used to lift personnel. Never allow personnel to be lifted in the bucket or by use of the lift arms. Lifting personnel with the bucket or lift arms can cause falls and crush hazards that might result in serious injury or death.

- n. Watch out for overhead dangers. Keep a safe distance from overhead power lines.



Safety in Material Handling Operations

Knowing and understanding essential information concerning the safe operation of equipment is vital to everyone's safety. The operator shall use undivided attention for the operation and to the condition of the equipment, and to the surroundings, when operating the equipment. Maintaining full control of the mobile equipment being operated is not only needed to safely perform operation duties, but it's also the law.

- a. Before and during operation, think of others and ask questions such as:

- Is visibility obstructed?
- Where are they now?
- What are they doing?
- Do they know what I plan on doing?
- Can they see me?

When in proximity to equipment being operated, ask the same questions.

- b. Effective communication plays a key role in preventing accidents and can often be the difference between life and death in a mine environment. Failure to communicate movements to others could lead to an accident. Miners use many methods to communicate their intentions and to acknowledge messages received from others, such as:

- Cap lamps
- Horns
- Bells
- Hand signals
- Their voices, and two way radios

Remember these rules when working with the machine in mining operations:

- c. Stay out of the turning radius of a machine and limit exposure to the equipment's pathway.
- d. Go slowly in congested areas, over rough ground and on slopes. Keep the machine's speed slow enough to be in COMPLETE CONTROL AT ALL TIMES. Follow all local rules and regulations concerning operation of equipment near a high wall.

- e. Give loaded vehicles the right of way. Follow local traffic rules for the job site. Watch out for other vehicles.
- f. Position the bucket three or four feet above the ground and rolled back so it does not block vision when traveling.
- g. The bucket should not be used as a brake except in an emergency if all other means fail.
- h. Load, carry and unload safely. Start and stop smoothly when carrying a load.
- i. Stay back from the edge of banks and pits. Edges can cave off or the machine can lose its footing and slide over the edge.
- j. Know the employer's hand signals. It is important to know the exact meaning of all hand signals applicable to and used during operation. Failure to correctly respond to a hand signal could result in severe injury or death. Accept operational signals from one person only, but accept an emergency shutdown signal from anyone who gives it.
- k. Be alert. Be aware of what is going on around the machine. Maintain a safe operating distance between the machine and other equipment and personnel.
- l. When dumping into hauling vehicles, **BE CAREFUL NOT TO CONTACT THE VEHICLE** with the loader lift arms, bucket or tires.
- m. Use caution on slopes. Operate straight up and down slopes whenever possible. Use extreme caution during any side hill operations. **NEVER DESCEND A GRADE FASTER THAN THE MACHINE COULD CLIMB THAT SAME GRADE.** Refer to Grade Plate located in the cab for grade operation requirements.
- n. Keep the bucket close to the ground for stability. If an overload causes the machine to tip forward, **DO NOT PANIC - - LOWER THE LOAD TO THE GROUND** and the machine will stabilize.
- o. Be careful in a hazardous area. Whenever possible, two people should work together in hazardous areas - one to operate the machine and the other to direct and watch for dangers.
 - 1. **NEVER** enter a dust cloud or a dark area such as an underpass or building before checking it for obstructions or hazards that cannot be seen.
 - 2. Watch for overhead dangers, such as overhanging trees or falling rocks. Do not undercut banks. Keep a safe distance from overhead power lines – and check for buried power and utility lines before digging.
- p. Report a malfunctioning machine. **EVEN A MINOR PROBLEM CAN BECOME SERIOUS.** Report any mechanical problems to supervision.

NOTICE

There are two entry/exit doors (left and right) in the cab. During an emergency, determine which door is to be used as the emergency exit.

If The Machine Must Be Left Unattended

- a. Lower the bucket to ground.
- b. Set the park brake switch.
- c. Push the engine select switch to the LOW position and let it idle for four to five minutes.
- d. Turn the key switch to the OFF position.

- e. Place a "DO NOT OPERATE" sign on the controls if the machine must be left unattended and safety or maintenance deficiencies exist. Follow all local rules for each situation.

End The Operating Period Safely

- a. Park in an unobstructed, flat area.
- b. Lower the bucket flat and level with the ground.

Shutdown Properly

- a. Set the park brake switch.
- b. Push the engine select switch to the LOW position and let the engine idle for four or five minutes.
- c. Place all controls in the OFF position and turn the key switch to the OFF position.
- d. To prevent unauthorized starting, remove the ignition key.
- e. To prevent tampering, lock the cab door.

Proximity Detection System

If the machine is equipped with a proximity detection system, the operator must be trained in its use before operating the machine. Various settings, such as warning distance, can be set to various distances, depending on local rules and regulation requirements.

The system consists of a panel in the cab for visual and audible alarms and an external receiver/transmitter. The system detects other vehicles (with installed systems) and provides visual or audible warnings when the machines come within the set detection distance.

Follow the manufacturer recommendations for operation and maintenance.



Figure 13. Typical proximity detection system components

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Safety in Service and Repair Operations

The following guidelines are provided as a process to remove stored energy within various systems before performing maintenance, service, or repair procedures.

Safety Preparations

Use the following process and local rules, requirements, and regulations to remove stored energy and to reduce the possibility of crush hazards before performing any work process on or around the machine.

Machine Shutdown and lockout

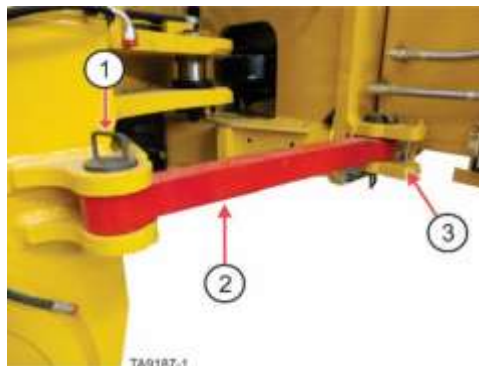
WARNING

Crush hazards exist if the machine is started or moved while work processes are being performed on the machine. Place bucket flat and level on the ground. Place frame lock in the locked position and lock out the machine's starting capability before performing any work process. Follow all applicable lockout procedures and local rules and regulations for performing work processes. Crush hazard could occur if the machine is started or moves while any type of work process is being conducted on the machine, resulting in serious injury or death.

- a. Stop the wheel loader on flat level ground.
- b. Place bucket flat and on level ground.
- c. Move the frame lock to the locked position so that the frame cannot be steered.

WARNING

Crush hazard exists if the frame lock is not locked to prevent machine articulation while personnel are in the machine articulation area. Do not enter this area unless you have verified that the operator has control over the steering and that you have good communication with the operator. Crush hazard is possible if personnel are in this area while the machine is articulated, which could result in serious injury or death.



- 1) Retaining pin for locked position, 2) Frame lock - shown in locked position,
- 3) Retaining pin bracket for un-locked position

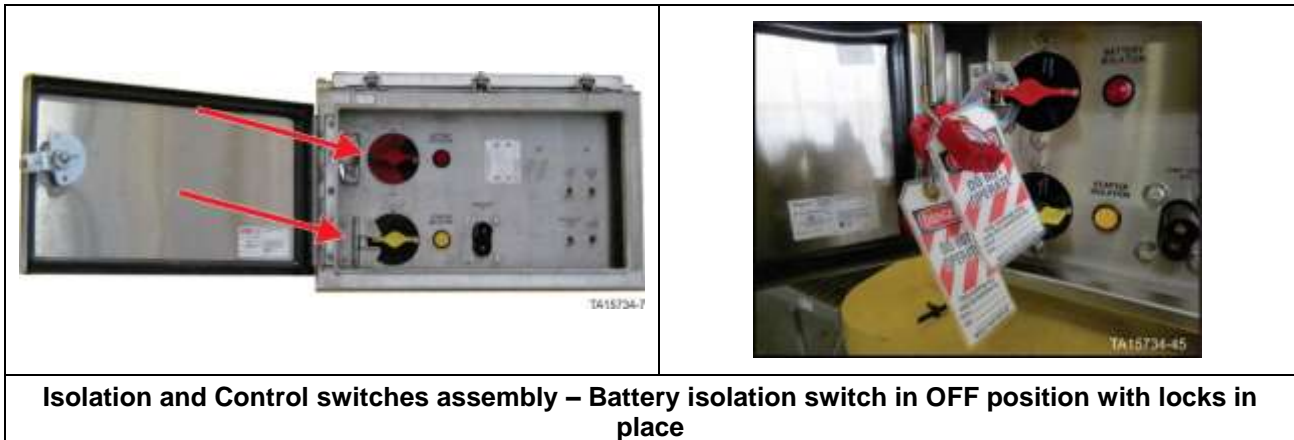
Frame lock in locked position

- d. Set the parking brakes.
- e. Shut off the engine.
- f. Place wheel chocks in front and behind each wheel.
 - Chocking against motion must be done using chocks rated for the equipment being chocked. Heavy mobile equipment must be chocked with appropriate chocks. Factors such as machine weight, size, wheel diameter, ground grade and others must be considered when selecting chocks.
- g. Lock out the machine's starting capability before performing any cleaning, inspections, or installation and repair procedure.

WARNING

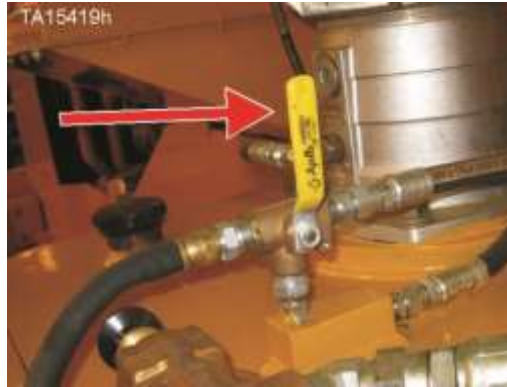
Crush, shock, or other hazards exist if stored energy is not removed or isolated prior to working on the machine. Stored energy (hydraulic, electrical, pneumatic, mechanical, etc.) may be present if not isolated or released prior to working on the machine. Do not work on the machine without removing this stored energy (suspended loads, electrical power, air pressure, etc.). Risk of crushing, shock, or other physical injury exists if stored energy is not removed or isolated prior to working on the machine which could result in serious injury or death.

- h. Turn the battery and engine isolation switches to the off position and install locks on the battery isolation switch.



- i. Release the air from the hydraulic reservoir by using the hydraulic reservoir air valve (ball valve) on top of the reservoir. The supply line from main air system will be blocked and reservoir air will vent out the hose that runs down the outside of the hydraulic reservoir.

- j. Turn the handle to the up position as shown.



Hydraulic reservoir air valve handle UP

- k. Release the air from the various air storage reservoirs by opening all of the air bleed valves.

Three valves on right side of rear frame under hydraulic reservoir

One valve on right side of front frame near hoist cylinder ball cap

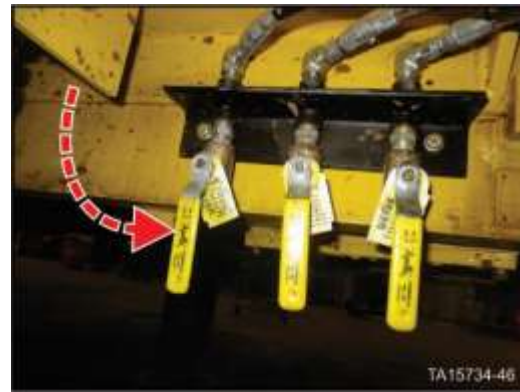


Figure 14. Open air reservoir bleed valves

WARNING

Crush hazard exists by the lift arms or bucket if all personnel are not cleared from the bucket and lift arm area before using the hydraulic hoist and bucket pilot pressure bleed down valves to relieve pressure from the hoist and bucket pilot circuit. Clear all personnel from the area around the bucket and lift arms before operating hydraulic hoist and bucket pilot pressure bleed down valves. Using the hydraulic bleed down valves could result in some movement of the lift arms and bucket which could cause injury or death.

- l. Use the hydraulic pressure bleed down valves located in the front frame underneath the Husco valves to bleed any stored pressure in the hoist and bucket circuit.
- m. Turn each valve slowly counterclockwise as shown below and allow the pressure to bleed down.
- n. Open the valve completely and leave it open during repairs.



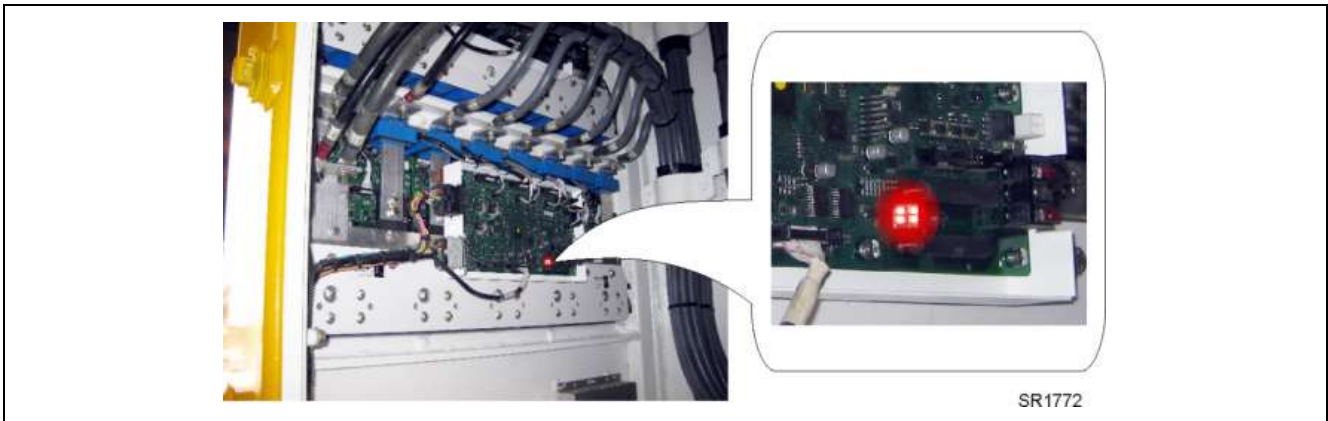
- o. Drain the hydraulic reservoir if applicable to the procedure being performed.

Converter Bus Voltage

⚠ WARNING



Electrical shock hazard exists by contact in the electrical cabinet if the engine is running, the LINCS software indicates voltage on the bus, or the red bus LED's in the electrical cabinet are illuminated. All Generation II SR equipment has the ability to produce voltage at low throttle. Even with the engine off, there may be a residual of 12-15VDC on the bus. Do not enter the electrical cabinet or touch any components in the electrical cabinet without performing the Bus Discharge Verification Procedure. Failure to do so may result in fatal electrical shock or other injury.



Converter assembly bus LED's

Verification of the Absence of Bus Voltage

There are three different methods that are combined to verify when it is safe to enter the electrical cabinet.

1. LINCS II display in cab
2. Visual indication in electrical cabinet
3. Physical measurement

These steps are required in order to ensure that the system is properly discharged.

In Cab Verification Using LINCS II Display

1. Make sure that the LINCS II system is booted (key switch ON) with the engine NOT running and the park brake SET.
2. As shown in the figure below, on the touch panel in the dash, press the Main Menu button in the lower left corner, then select Data Logging then Logging/Monitoring.

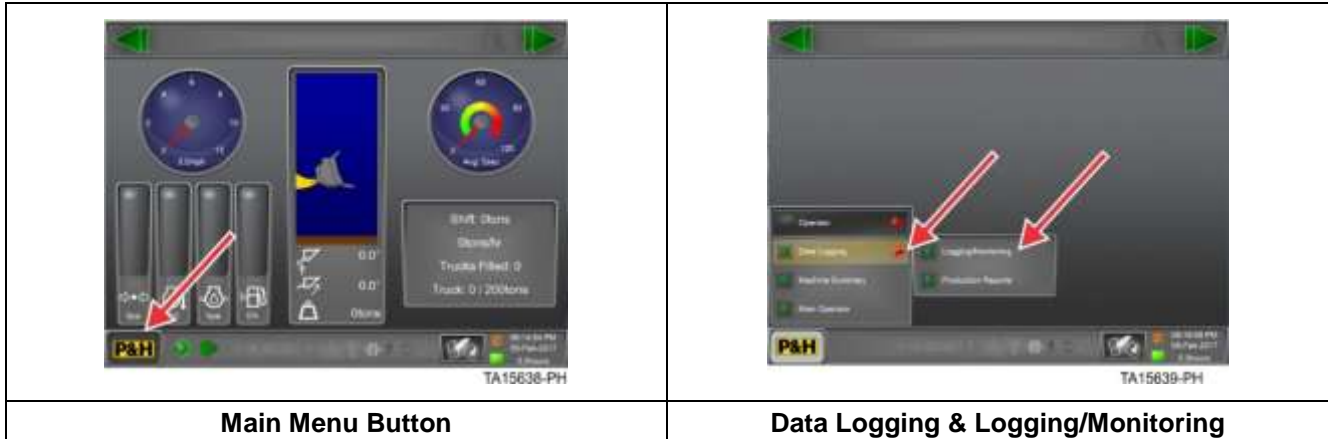


Figure 15. LINCS logging/monitoring menu access

3. Select the Trash Can icon and the select the Check Mark to clear any selection on the right hand side of the screen (if applicable).



Figure 16. Remove channels

4. Scroll down the left hand list until Drive Fuses is displayed.



Figure 17. Left hand scroll

5. Drag the Drive Fuses category to the right hand side of the screen, all of the bus voltage channels should now be visible.



Figure 18. Bus voltage indication

6. Verify bus voltage is less than 24VDC.

NOTICE

Should any voltage (greater than 24VDC) be present on any of the DC busses, allow the system to discharge for a period of no less than 10 minutes. Re-test the bus voltages prior to continuing.

7. Turn the key switch to the OFF position and proceed to the next step in the verification process.

Verification by Visual Indication

Following the verification by LINCS II software, the next step is to verify the existence of bus voltage by the array of four LED indicators located on the main SR control board on each converter assembly.

To conduct this test, ensure that:

- The 24V DC power is isolated at the battery disconnect (turned off and locked out) per site requirements.

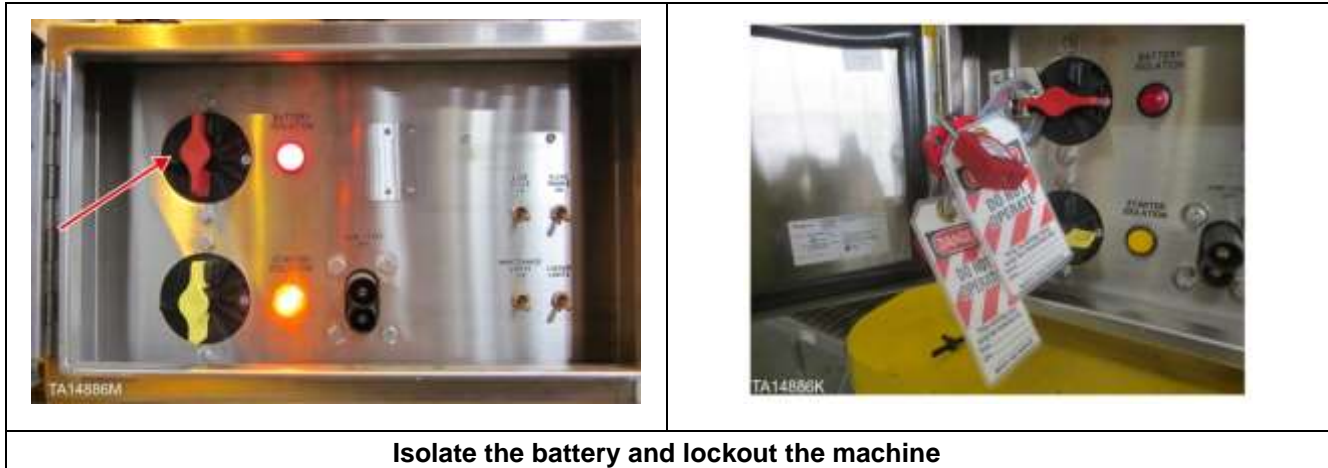
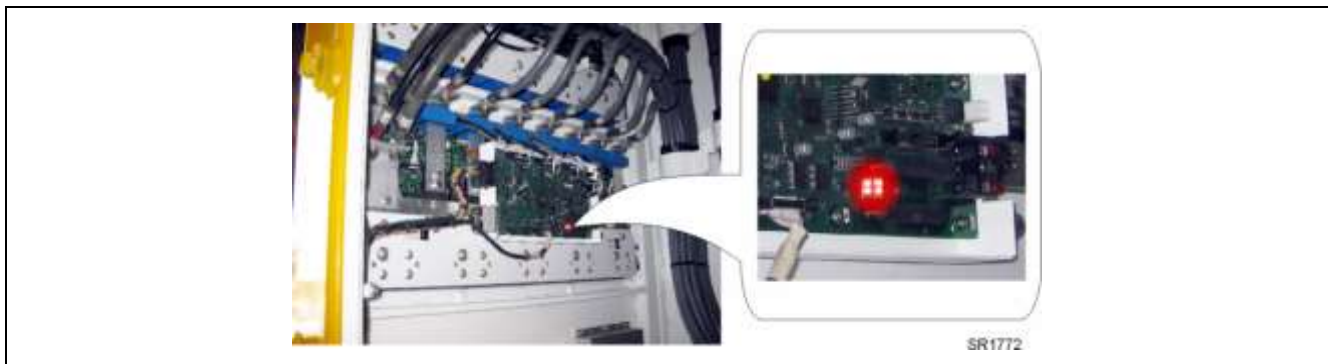


Figure 19. Isolation and control switch assembly

- The SR electrical converter cabinet door should now be opened.
 - DO NOT enter the cabinet at this time.
- a. View the LED arrays on each of the converter assemblies and verify the LED's are not illuminated. The LED's will be glowing red when a potential of greater than approximately 35VDC is present on the DC bus connections on the converter assemblies. The light intensity varies with voltage and a greater intensity indicates a higher bus voltage.



Bus voltage LED array on SR control board

Physical Verification

Once the visual indicators have been verified, the bus voltage should be physically measured. The bus voltage should be fully discharged based on the previous check of the LED displays.

- a. Measure between the positive and negative bus bars using a voltmeter rated for 1000V. The potential voltage on a bus that has not discharged could be over 700VDC. A properly discharged bus should be less than 24VDC as verified by the completion of LINCS system verification.

WARNING

Electrical shock hazard exists if using an improperly rated meter. High voltage may be present. Risk of shock or equipment damage by use of an improperly rated meter is possible. Use a CAT III 1000V rated volt meter to take voltage readings. Failure to use a properly rated meter could result in serious injury or death.



1) Positive bus bar, 2) Negative bus bar

Main bus bars

Fire Suppression Systems

- a. If creating a significant heat source such as grinding, cutting, or welding on the machine or machine components, remove the fire suppression circuit monitor panel's in-line fuse.

CAUTION

Before performing heat generating processes such as grinding, cutting, or welding on a machine, the fire suppression system circuit monitors panel's in-line fuse must be removed. The fuse is located in the battery box on the loader. Failure to do so may cause the system to actuate and/or damage the solid-state components of the system. Replace the in-line fuse before the machine has been started or after all welding operations have been completed.



Fire suppression in-line fuse located in loader battery box.

- b. If creating a significant heat source such as grinding, cutting, or welding on the machine or machine components, remove the fire suppression internal battery, if present.

NOTICE

Some fire suppression systems have an internal battery and are not hard wired to the machine batteries. This fuse will not exist on these machines. Before beginning any heat producing work on the machine, appropriate steps must be taken to prevent the heat producing activity from activating the fire suppression system.

CAUTION

Have qualified fire watch personnel present, and keep a fire extinguisher that meets all statutory regulations nearby during all cutting and welding operations.

Working at Elevated Locations

WARNING

Fall hazard exists when working at elevated locations. Take appropriate “fall arrest” safety precautions as required by local rules, regulations, and procedures when working at heights on the machine, as example, on the rear and front frames. Follow all required statutory regulations for working at height. Failure to follow all locally required “fall arrest” procedures can cause a fall hazard, resulting in serious injury or death.

Suspended Loads

WARNING

Crush hazard exists when a load is suspended. Suspended loads can fall. Never work under suspended loads. Working under suspended loads could cause a crushing hazard which might result in serious injury or death.

When all procedures are complete, follow all lockout tag out rules, local rules, and local regulations to return the machine back to service.

Pre-Service or Repair Preparations and Cautions

The machine’s large size and diesel-electric power unit make it necessary to take special precautions to ensure a safe working environment.

The following precautions and procedures should be adhered to anytime the machine is brought in for service or repair: All local rules should also be followed.

NOTICE

In addition to the following instructions, anyone performing service operations to the machine should be familiar with the location and operation of all service switches and connections as described in “SERVICE SWITCHES”, located in Section 01 of the Service Manual.

WARNING

Electrical shock hazard exists inside the electrical converter cabinet when the red LED lights inside the cabinet are illuminated. DO NOT ENTER the electrical converter cabinet if the engine is running. Do not enter the electrical converter cabinet if the bus voltage indicator LED’s on the SR converter assemblies are illuminated. Do not enter the electrical converter cabinet if the machine park brake is not set. Do not touch any electrical component, assembly or electrical connection on the machine if the bus voltage indicator LED’s on the SR converter assemblies are illuminated. Check ALL converter panel LED’s for voltage. Entering the electrical cabinet or touching electrical components anywhere on the machine while the red LED lights are illuminated or there is voltage on the electrical bus might cause electrical shock, resulting in serious injury or death.

NOTICE

SR converter assemblies are inverted on the opposite wall of the high voltage cabinet.

Electrical Hazards

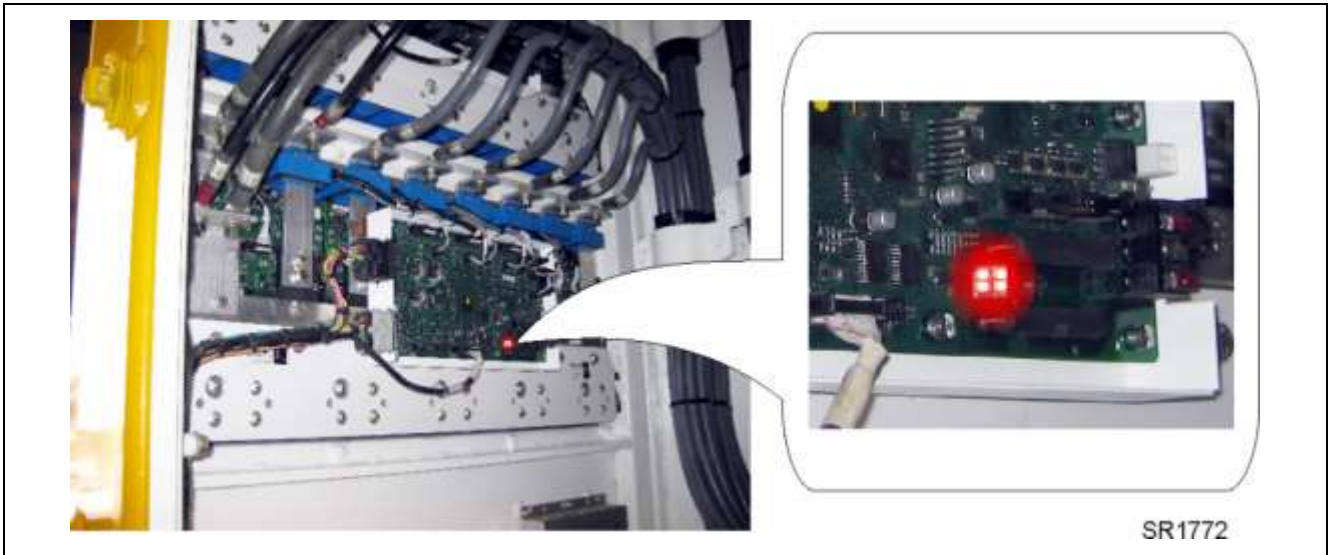


Figure 20. High voltage indicator lights


<p>Braking grids on other models might appear different, located at rear of machine</p>	<div style="background-color: #f4a460; padding: 10px; text-align: center;">  WARNING </div> <p>Electrical shock hazard exists if touching the dynamic braking grids when the drive is enabled. High voltage is present when the drive is enabled. Do NOT touch the braking grids (or any electrical connection on the machine) when the key switch is ON, or the generator is primed, or until five minutes after the engine has been shut down and the absence of bus voltage is verified. Contact with the braking grid can cause fatal electrical shock, resulting in serious injury or death.</p>
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Figure 21. Typical braking grid (shock hazards)



⚠ WARNING



Electrical shock hazard exists if opening the electrical converter cabinet while the engine is running. NEVER open the electrical converter cabinet while the engine is running. High voltage is present when the drive is enabled (at any throttle speed) and may be present even if the machine is shut down. Do not touch any drive system component electrical connection on the machine for at least 5 minutes after the machine is shut down. Always verify the absence of bus voltage before touching drive system component electrical connections. If inspection or service procedures involve contact with any electrical component of the drive system, opening the converter cabinet, or removing axle access covers, or touching drive system electrical component connections, the key switch must be off, the machine not running, the electrical system MUST be locked out by using the battery isolation switch, and the absence of bus voltage verified. Accidental contact with energized terminals or components could result in serious injury or death.

Figure 22. Electrical converter cabinet (shock hazard)

⚠ WARNING

Electrical shock hazard exists inside the axle if axle access panel on either axle is removed without locking out the electrical system. Always verify the absence of bus voltage before removing the axle access panels and touching any electrified component inside the axle. Failure to lockout the electrical system, and touching electrified components inside the axle could cause electrical shock which might result in serious injury or death.



Some Warning labels/placards may not be shown in above photo. Similar access panel is found on rear axle.

Figure 23. Front axle access panel (shock hazards)

Frame Lock



MACHINE STEERED STRAIGHT
(Arrows indicate crush hazard areas-present on BOTH sides of machine)

WARNING



Crush hazard exists because there is no room for a person in the pivot area or the area between the tires when the machine turns (articulates). The frame lock should be moved to the locked position EACH TIME service or repair operations are being conducted. This is especially important when energized tests of components are performed, when work is being done in the pivot area of the machine, or if the machine is jacked up. Service personnel should enter this area only when absolutely necessary. Entering the pivot area or the area between the tires can cause a crush hazard, resulting in serious injury or death.



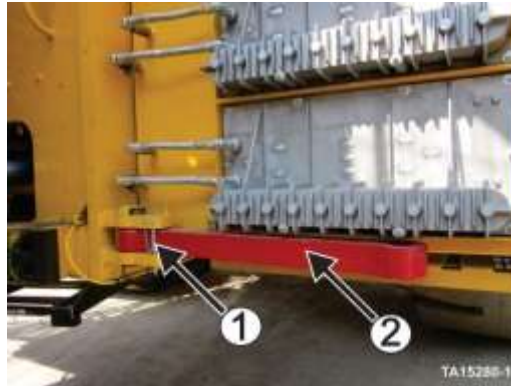
WARNING

Crush hazard exists on both sides of machine in the articulation area and the area between the tires. Do not enter these areas when the machine is running. Entering the articulation area or the area between the tires when the machine is turning can cause a crush hazard, resulting in serious injury or death.

Area between front and rear of machine (crush hazard areas) machine articulated to left

(Arrows indicate crush hazard areas-present on BOTH sides of machine.)

Figure 24. Crush hazard areas



NOTICE

Some models have a holding pin (#1), on the frame lock pivot bracket, that holds the frame lock (#2) in position when the frame is not locked.

CAUTION

Following completion of service or repair operations, it is critically important that the frame lock be removed from the locked position and properly secured in the unlocked position or machine damage will result.

(Left side of machine at pivot area)

Figure 25. Move frame lock into unlocked position and secure with retaining pin (crush hazard areas)

General Service or Repair Precautions

- a. Wear a hard hat, protective glasses and other protective equipment as required by job conditions.



- b. NEVER use an open flame to check the battery, fuel, coolant, or to look for leaks anywhere on the machine. Use lights as provided or a flashlight.
- c. DO NOT make unauthorized modifications to the machine. These modifications may impair the function and safety and affect machine life.
- d. NEVER put maintenance fluids such as oils, solvents, diesel, etc. into glass containers.
- e. NEVER use gasoline for cleaning purposes.



- f. Pressurized air can cause personal injury. When using pressurized air for cleaning, wear a face shield, protective clothing, and a vented nozzle.



- g. Use approved access per local safety standards to reach service or repair points.
- h. The operator should use assistance from other personnel, when moving the machine around the service area, and into and out of buildings.
- i. Ensure ramps, floors, doors, and aisles are adequate to support and clear the machine when moving in and out of a building. Refer to “GENERAL INFORMATION”, located in Section 01, for dimensions and weight of the machine.
- j. Consider the size and weight of the machine and its components when jacking it up or removing components and assemblies. BE SURE to have adequate hoisting devices, tools and support facilities to accommodate the weight of the machine or its components.
- k. If possible, conduct all service and repair operations with the machine parked on a level, hard surface

NOTICE

If the machine becomes disabled in the field, it is recommended that only sufficient repairs be made at the machine failure location to allow the machine to be moved. Then, move the machine to a safe work area for completion of repairs. Test the machine, as required by the nature of the repairs, before returning it to work.

⚠ WARNING

Crush hazards exist under rear of machine. Counter weight mounted under the rear frame. Do not enter this area unless the counterweights have been externally supported to prevent falling. Do not loosen the bolts for the counterweight structure unless the counter weights are externally supported. Entering the area under the counterweights or loosening the counterweight bolts without externally supporting the counterweights could cause a crush hazard resulting in serious injury or death.

- l. Block the machine to prevent it from rolling while working on or under it.
- m. Lower the bucket to the ground and use the main bleed valve assembly to vent pressure in the hoist and bucket circuit before beginning inspection, service, or repair operations. Refer to Section 04 in the Service Manual for information to vent pressure in the hoist and bucket circuit.
- n. Set the park brakes.
- o. Turn the Klenz enable switch to the OFF position. The KLENZ enable switch is located inside the Isolation and Control Switch Box Assembly, mounted on the left side, near the rear of the machine.



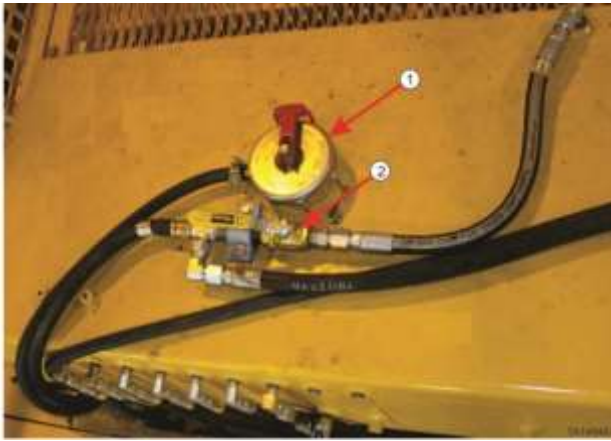
1) Auto lube switch inside 2) KLENZ enable 3) ladder lights 4) maintenance lights
Located on left rear of machine

Figure 26. Isolation and control switch box assembly

NOTICE

Component weights are provided in Section 01 of the Service Manual.

- p. **BE CAREFUL** when working with or around a hot cooling system. Liquid cooling systems build up pressure as the engine gets hot. Before removing the radiator cap, stop the engine and let the system cool. Remove the radiator cap (slowly) only after the coolant is cold and de-pressurized. Refer to illustration "Radiator cap" below. A drain hose will drain hot coolant down to ground level near the radiator/engine area. Be aware of hot coolant that can be expelled automatically or manually any time the system is pressurized.



(Located on top of rear frame)

- 1) Radiator cap
- 2) Vent valve

Figure 27. Radiator cap and vent valve

- q. Keep clear of all rotating components. Wrapping, entanglement, or contact by clothing or extremities may result in serious injury or death.



WARNING

Entanglement hazard exists if attempting to work on rotating equipment. Do not work on the machine with the engine running unless specifically instructed to do so by the engine manufacturer or so stated within a specified work procedure. **KEEP CLEAR OF ROTATING SHAFTS.** The shaft between the Hydraulic Pump Drive (HPD) and the generator rotates any time the engine is rotating, even while the engine is being cranked. Wrapping, entanglement, or contact of clothing or extremities may cause an entanglement hazard that results in serious injury or death.

WARNING

Skin injection hazard exists if diesel fuel, hydraulic fluid, or grease under pressure penetrates the skin. Avoid all fluids under pressure and wear the proper personal protective equipment (PPE) for working around fluids under pressure. If any fluid is injected into the skin, it must be removed as soon as possible by a doctor familiar with treating this type of injury. Failure to avoid fluids under pressure can cause skin injection which could result in serious personal injury, blindness, or death.

Fluid leaks under pressure may not be visible. When searching for leaks, **NEVER** use your hand; use a piece of metal. Wear work gloves and keep your hand well away from the possible source of leakage. **DO NOT** tighten or loosen fuel, hydraulic, or grease lines without first relieving the pressure. Wear safety goggles for eye protection.

- r. Hot oil and components can cause personal injury. Do not allow hot oil or components to contact the skin.
- s. Avoid prolonged and repeated skin contact with used oil. With prolonged and repeated contact, serious skin or bodily injury may develop. Wash thoroughly after contact.

- t. BE CAREFUL with fluids under pressure. The hydraulic system is under pressure whenever the engine is running and will hold pressure after shutdown.

⚠ WARNING

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California, USA to cause cancer and birth defects or other reproductive harm. Do not handle battery posts, terminals or related accessories containing lead or lead compounds without wearing proper personal protective equipment (PPE) as required by local rules, regulations, or policies.

- u. Refer to safety instructions in Section 03 in the Service Manual before inflating, deflating, removing, or installing tires and rims.

Fall Arrest Attachment Points

⚠ WARNING

Fall hazard exists when working at elevated heights without wearing a fall restraint device. Always wear a fall restraint device, as provided by local rules and regulations, when working at elevated heights. Follow all local rules, regulations, and laws regarding working at elevated heights, while working on the machine. Failure to follow all local rules and regulations for working at elevated heights can cause a fall that might result in serious injury or death.

Machines may be fitted with fall arrest attachment points. If available, use the fall arrest attachment points located on the machine in areas where it is typically necessary to use a safety harness, in order to access that area safely. The areas where the attachment points are located are:

- One either side of the main hood above the engine safety filters access door.



Figure 28. Fall arrest attachment points-main hood

- One either side of the Falling Object Protection Structure (FOPS) used when accessing either left hand or right hand front wing platforms.



Figure 29. Fall arrest attachment points-FOPS sides

- One located at the front of the FOPS used when accessing the top front frame area between the lift arms.



Figure 30. Fall arrest attachment points-main hood-FOPS front

Sound Abatement Panels

Machines may be fitted with sound abatement panels (optional) designed to lower the sound emitted by the power unit components. One panel is opened by using a locking handle latch on the outside of the panel. The companion panel can be opened by releasing the latch inside the panel by simultaneously pulling up on the bottom latch and pulling down on the top latch and pulling it open.

The panels should be lubricated with grease as needed to ensure free operation.

WARNING

Fall hazard or struck-by hazard exists when opening the sound abatement panels. If the loader is on a slight incline or in high wind, the panel could quickly swing wide open. The panels are heavy. Do not stand in front of the panel when releasing the handle or internal latches. Stand on the opposite side of the door hinge when opening the door. Standing in front of the door can cause a fall or a struck-by injury that results in serious injury or damage to the panel and hinges.

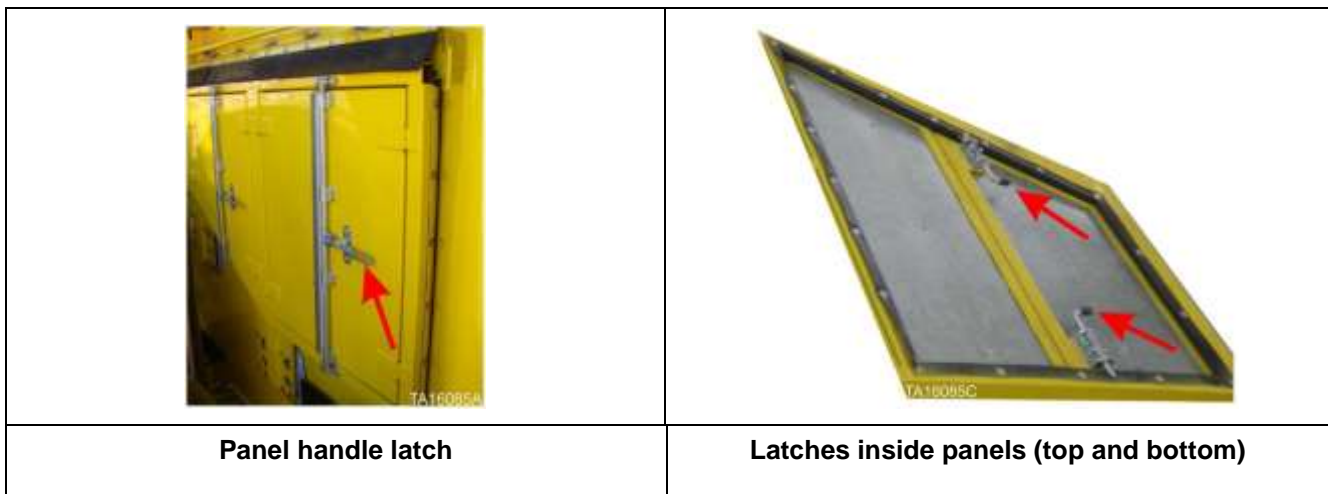


Figure 31. Typical sound abatement panel handle latch and inside latches

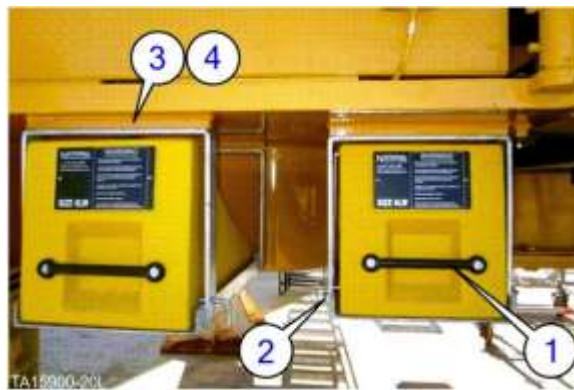
Wheel Chocks

Wheel chocks and mounting brackets are optionally provided on some models. Wheel chocks are used to block the tire to deter equipment movement during work procedures.

A chock should be placed in front of and behind each tire. Failure to prevent equipment movement could result in serious injury or death.

WARNING

Crush hazard exists if not using wheel chocks to prevent machine movement, as necessary. When chocks are not provided as an option, chocks shall still be used according to local rules and regulations. Local rules and regulations shall be used to determine appropriate chock size to prevent equipment movement. Failure to use wheel chocks could cause a crush hazard which might result in serious injury or death.



1) Wheel chock, 2) Wheel chock holder bracket, 3) Screws, 4) Wheel chock mount bar

Figure 32. Wheel chocks and mount brackets (optional)

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Roll Over Protective Structure (ROPS) and Falling Object Protective Structure (FOPS)

The machine is equipped with a Roll Over Protective Structure (ROPS) and a Falling Object Protective Structure (FOPS). The ROPS provides the operator crush protection in a rollover and the FOPS provides protection from objects falling onto the cab from above. The FOPS is bolted to the top of the ROPS. Refer to illustration “Rollover protection structure and falling object protective structure assembly”. Refer to Section 03 in the Service Manual for service requirements of the FOPS and ROPS.

NOTICE

The ROPS structure is certified per government regulations. Any modifications to the ROPS, such as welding on or drilling holes in the structural members will affect the capability of the ROPS to provide adequate protection. Any modification or repair to the ROPS without the specific approval of Komatsu will void its certification. Contact your authorized Komatsu distributor before making any modifications or repairs to ensure that such will not void the certification.



Figure 33. Typical torque nut as used on ROPS

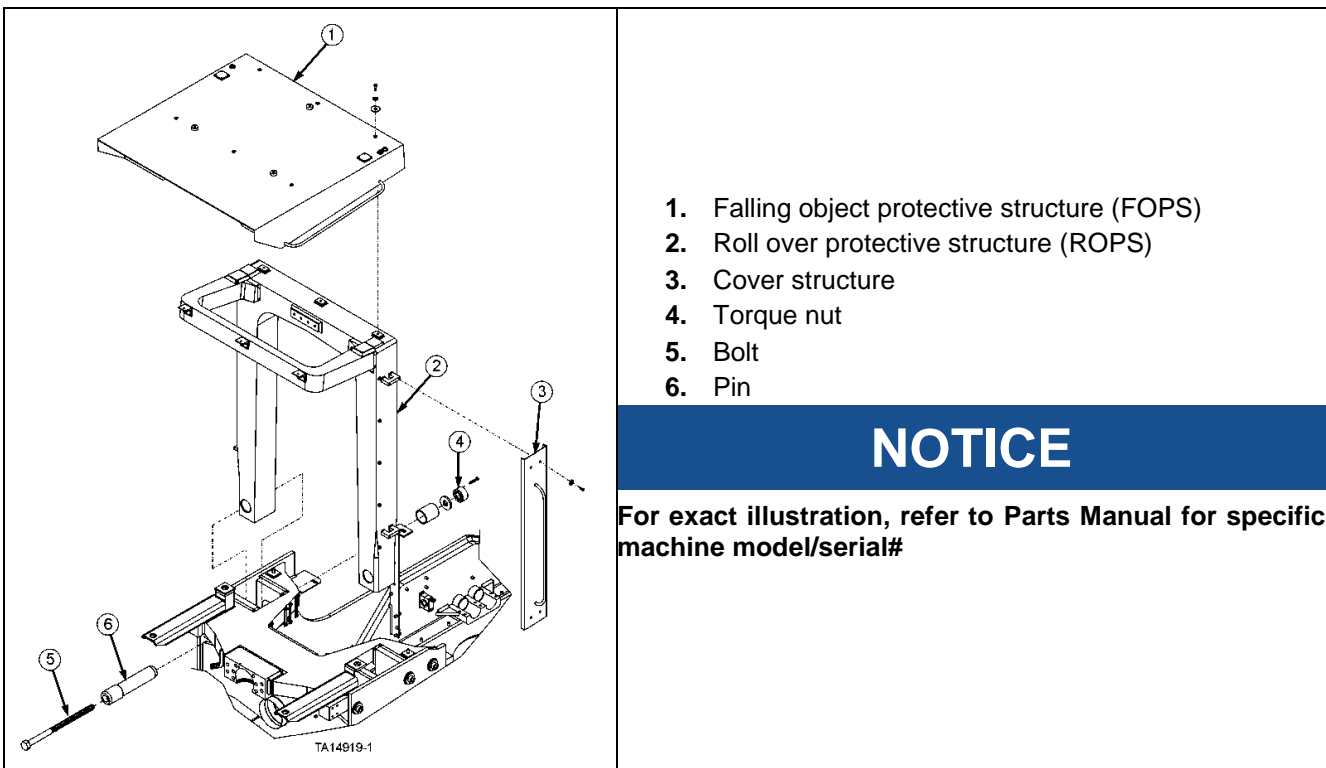


Figure 34. Rollover protection structure and falling object protective structure assembly (typical)

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Emergency Shutdown Switches

A palm operated, (push to actuate, twist to release), pushbutton type emergency shutdown switch is provided on the operator console in standard applications. Refer to illustration “Emergency shutdown switch” below.

Four ground-level emergency shutdown switches are provided on the machine. These switches are palm operated (push to actuate, pull to release), pushbutton type switches. Two are mounted on each side of the machine (right and left rear). One is located at the bottom of the hydraulic reservoir on the right of the machine, and one is located at the bottom of the high voltage cabinet. Refer to illustration “Emergency shutdown switches – typical locations” for the typical mounting locations on the machine. Number and mounting locations for the switches may vary depending on machine model, configuration, or options.

NOTICE

Locations may vary depending on model. Check the machine and note of all switch locations before operating machine.

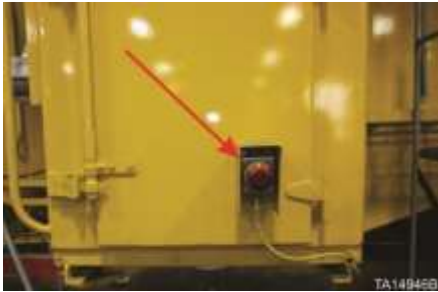




 <p>Mounted on electrical converter cabinet</p>	 <p>Console mounted (inside cab)</p>
 <p>Mounted on right side, on hydraulic reservoir</p>	 <p>Mounted on left side, near rear of machine</p>
 <p>Mounted on right side, near rear of machine</p>	

Figure 35. Emergency shutdown switches

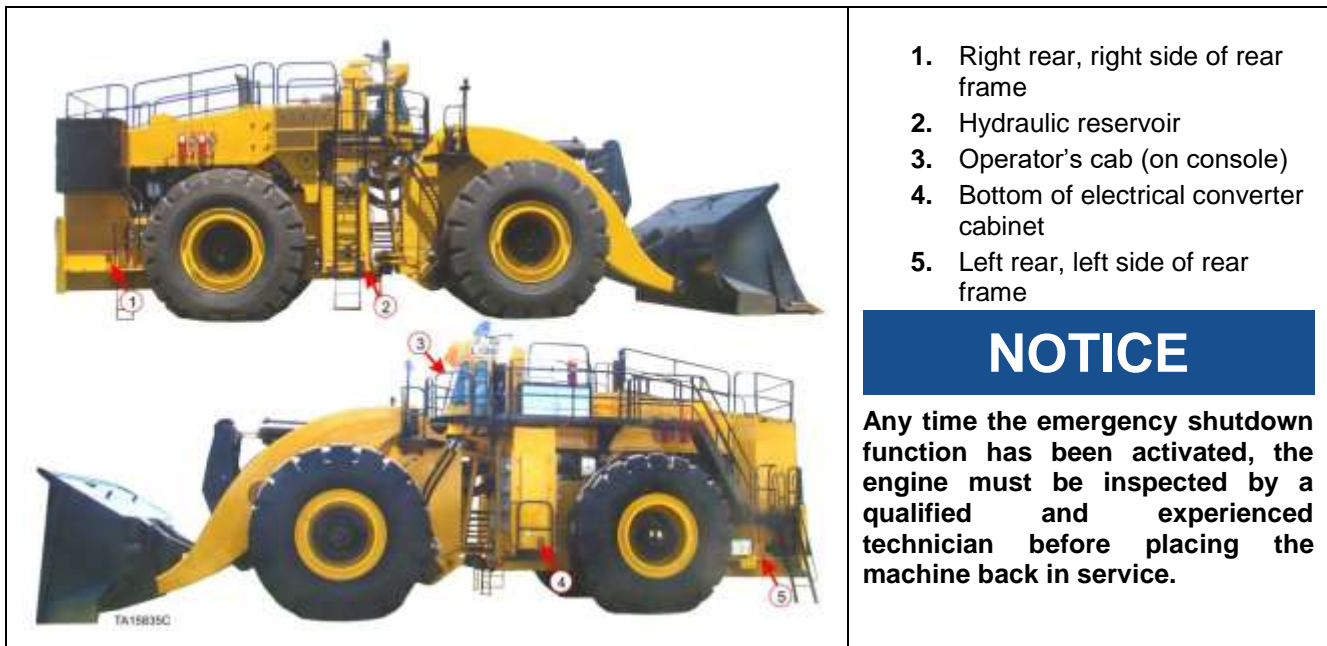


Figure 36. Emergency shutdown switches - typical locations

Operation of Switches

When pressed, these switches remove engine ignition electrical power, which in turn kills the engine. Most DC control voltages are deactivated when the emergency shutdown circuit is actuated. The park brake is immediately set.

After an emergency stop has been pushed, normal startup procedures must be followed to start the machine, including a complete reboot of the LINCS II system.

When the emergency shutdown or fire suppression systems are actuated, the automatic air release valve, located on top of the hydraulic reservoir, will automatically release air pressure from the hydraulic reservoir. Once tripped, the valve must be manually reset by pushing the button IN to the closed position. Refer to illustration "Hydraulic reservoir air release valve" below.



Figure 37. Hydraulic reservoir air release valve

CAUTION

Struck by hazard exists if the park brake is set while the machine is in motion. This will stop the machine suddenly, possibly causing the operator to be thrown unexpectedly and rapidly against the seat belt or harness. Do not use the park brakes to stop the machine unless in an EMERGENCY situation. Use the service brake to stop the machine during normal operation. Using the park brake to stop the machine can cause the operator to be thrown forward rapidly against the seat belt or harness, resulting in serious injury.

CAUTION

Use of the emergency stop buttons can cause engine turbo damage. Follow the proper engine shutdown process if there is not an emergency to stop the machine. Use the emergency stop switches only in an emergency. Immediate machine shutdown could result in damage to the engine turbochargers.

Switch Testing Procedure

Refer To Section 02-01-09 "PM 24VDC System".

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Rearview Mirrors

Side Rearview Mirrors

Side rearview mirrors are mounted on each side of the operator’s cab to provide a rectangular view of each side of the machine. The operator can use the rearview mirrors to check most blind areas when BACKING UP or MOVING SLOWLY, to see if people, equipment, or other obstacles are in a dangerous position for operation of the machine.

NOTICE

The side rearview mirrors do not eliminate all potential blind spots behind and to the side of the machine. The operator must be continually aware of other personnel, vehicles, and objects within the work area. Advise support personnel to ALWAYS maintain a safe distance and visual contact with the operator when in the area of machine operation. If unsure of location of personnel or vehicles in the work area, exit the cab and look!

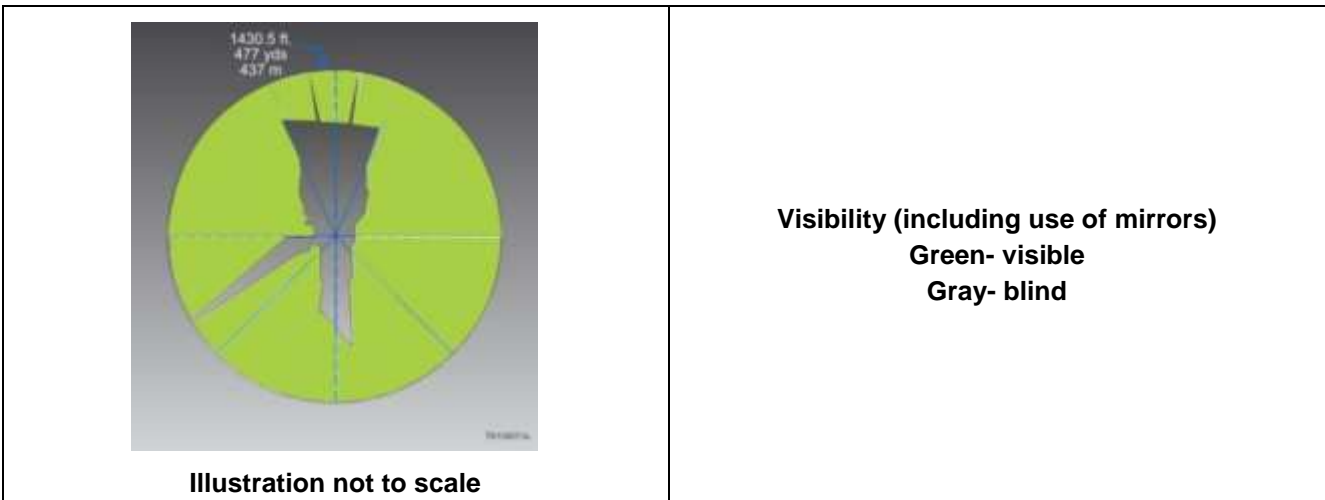


Illustration not to scale

Figure 38. Typical “blind” areas on the machine (not model specific)

NOTICE

Due to the size of the machine, the end-user must provide for a secured and controlled working environment. Komatsu cannot anticipate all possible scenarios.

Adjustments for Viewing

The view scene includes the top edge of the rear frame and rear tire ground contact area. The angles of view are approximately 70° vertical and 48° horizontal (refer to illustration “Recommended side rearview mirror adjustment and approximate field of vision”).

The mirrors are convex with a spherical radius of 30” and are rectangular 20” long by 12” wide. The support and mounting system provides protection from most contact with solid objects. The mirrors also have a protective top cover that will readily swing aside if pushed by another object.

The mirror’s sub-assemblies, consisting of hold down plates, clamps, friction rings, and fasteners are designed to perform two functions (refer to “Side rearview mirror installation”):

- The first function is to allow easily and accurately adjusted angle positioning of the tubular support, with the fasteners tightened sufficiently to hold the arm in trial positions.
- The second function is to prevent damage to the mirrors by destructive forces such as caused by the mirror’s encounter with an obstruction. This requires additional tightening of the fasteners as described below. The U-bolt fasteners that attach the mirrors to the support arm are not intended to slip during use. They are loosened only during adjustment.

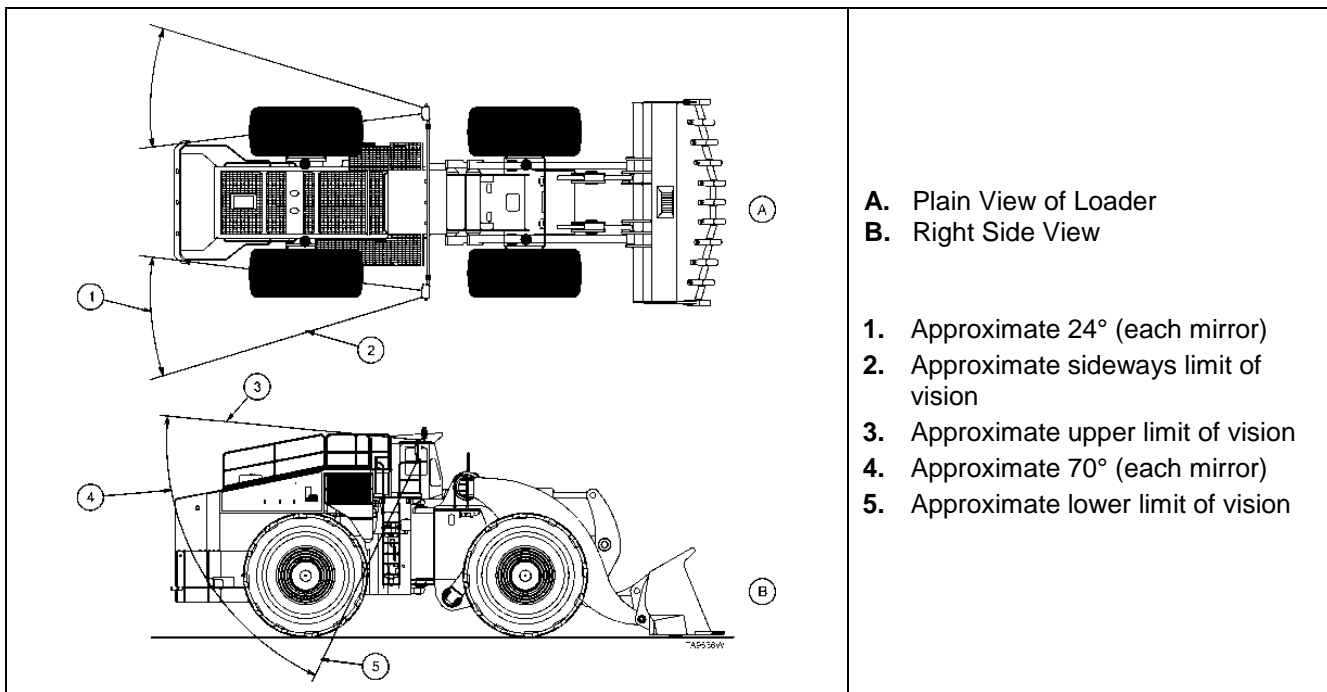


Figure 39. Recommended side rearview mirror adjustment and approximate field of vision

Pan, Tilt, and Reach Adjustments

To make mirror adjustments the operator should be seated in his normal position and operating posture. An additional person should be positioned on the platform outside the cab to adjust the mirrors as directed by the operator. Refer to illustration "Side rearview mirror installation" for component locations described in the following instructions.

- a. Loosen the post clamps and U-bolts enough for easy movement but tight enough to prevent undesired position change during adjustment.
- b. Move the mirror up and down (rotate around support arm) for vertical tilt angle adjustment.
- c. Slide the mirror housing inboard and outboard on the support arm for reach adjustment.
- d. Swing the support post for horizontal pan angle adjustment.

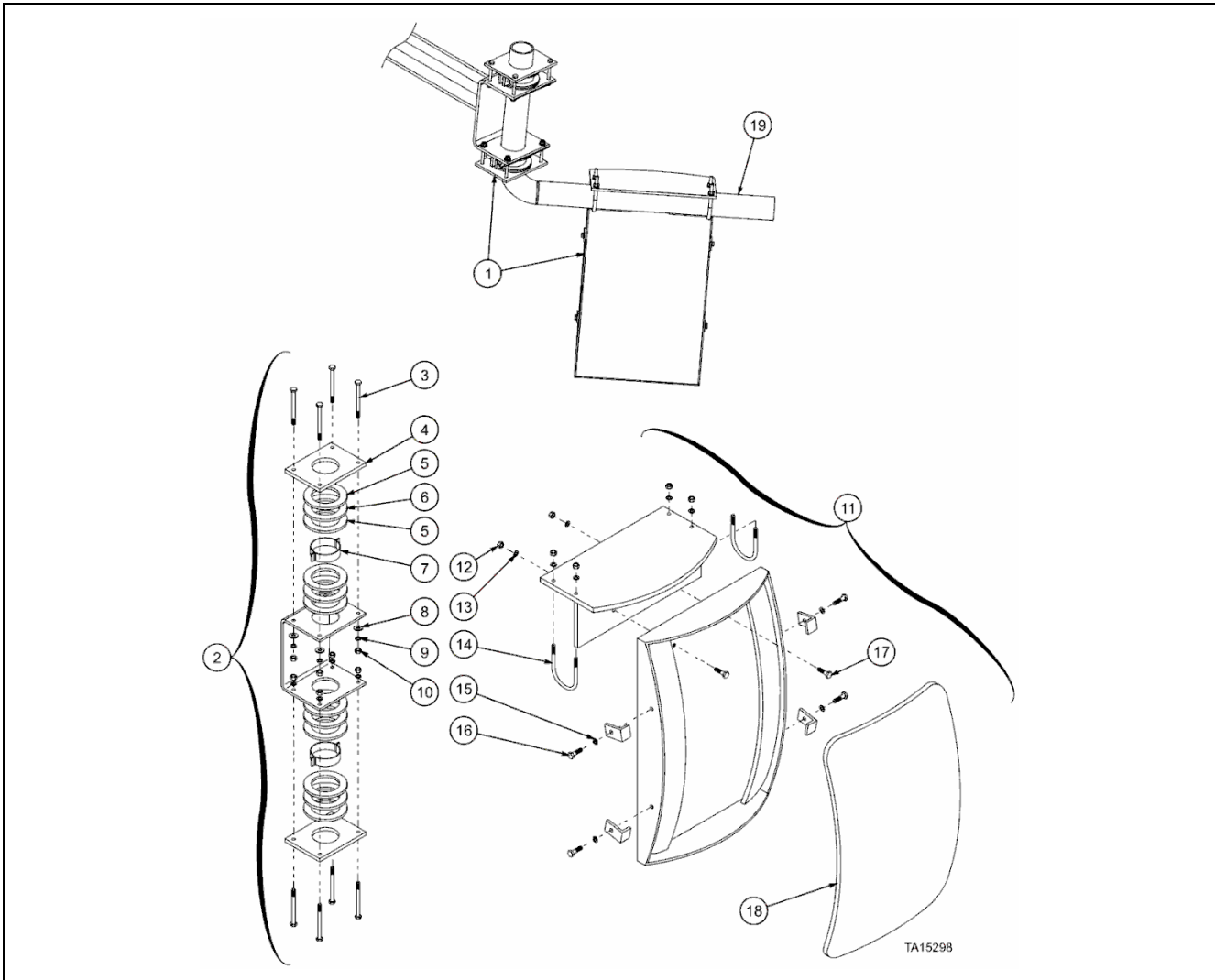
NOTICE

The best possible mirror adjustment will produce a view scene including the top rear of the rear frame and the bottom of the rear tire, and without losing too much of the side of the rear frame and tire, and as large an area as possible to each side of the machine. This must be accomplished with the reach adjustment locating the mirror as near to the machine as possible.

- e. After the mirror is moved to the desired position, fully tighten the pipe clamps.
- f. Tighten the four fasteners on the top friction assembly so that when pressing at the outboard end of the support arm pipe, maximum possible thumb-only pressure will swing the arm. Loosen these four fasteners exactly two turns.
- g. Repeat Step "f" with the bottom friction assembly, except in this case, after thumb pressure test, leave as adjusted and retighten the top friction assembly exactly two turns of each fastener.
- h. Check final adjustment with two thumbs.
- i. If support arm extends more than two inches outboard from the mirror, cut off the excess.

Maintenance

- a. Replace damaged parts when necessary. Refer to the PARTS MANUAL for ordering replacement parts
- b. Keep mirror glass clean by using window washing solution and wiping with paper towel.
- c. If paint touch up is required, use RUSTOLEUM® #659.



NOTICE

Typical cab light/bar light installation shown. Actual machine installation and light model may vary

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> 1. Mirror assembly and mounting group 2. Mounting hardware kit 3. Bolt, 1/4"-20 x 2-3/4" 4. Plate, hold down 5. Ring, friction - polyethylene 6. Ring, friction - steel | <ul style="list-style-type: none"> 7. Clamp half, support post 8. Flatwasher 9. Lockwasher 10. Nut 11. Mirror assembly, convex 12. Nut | <ul style="list-style-type: none"> 13. Lockwasher 14. Clamp, u-bolt 15. Lockwasher 16. Bolt 17. Bolt 18. Mirror, convex 19. Pipe structure, mirror |
|--|--|---|

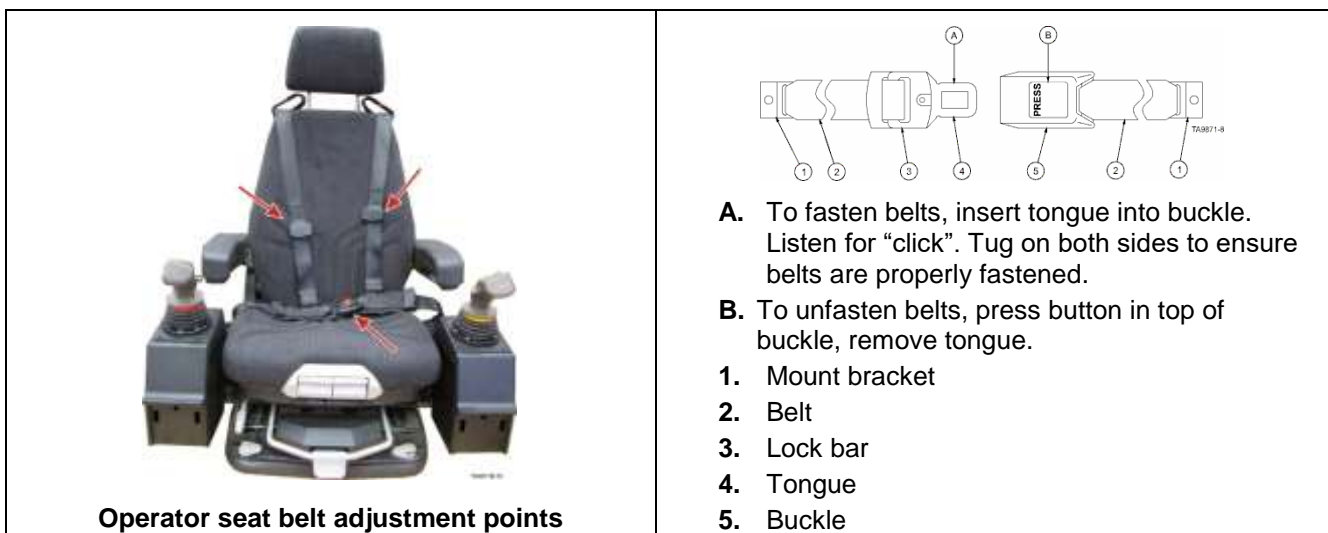
Figure 40. Side rearview mirror installation

Seat Belt Operation and Adjustment

The machine is equipped with an adjustable four point seat belt harness to accommodate various requirements of operators. The seat belts are mounted to the operator's seat.

WARNING

Crush hazards exist if the operator seat belt or harness is improperly adjusted or improperly maintained. Improper adjustment or maintenance of the seat belt or harness could result in loss of machine control during operation, resulting in a crush hazard. Adjust the seat and seat belt or harness for proper access to all controls and fasten seat belt or harness before operating the machine. Always check the condition of the operator seat belts and mounting hardware before operating the machine. Failure to do so could result in serious injury. Loss of machine control could cause a crush hazard resulting in serious injury or death to personnel in the operating area.



Fastening the Belt

Insert the tongue into the buckle. Listen for the “click” that indicates the belts are fastened. Tug on the belt to be sure it is securely fastened. Adjust the vertical straps until the entire seat harness is properly adjusted.

Unfastening the Belt

Press the release button in the buckle and pull the tongue from the buckle.

Adjustments

The belt should be tight but comfortable. The vertical straps and horizontal belt have adjustment points that can be tightened or loosened.

Lengthening the Belt

With the belt unfastened, move the lock bar slide toward the buckle.

Pull on the buckle until the slack is removed from the outer belt loop.

Readjust the belt if it does not fit snugly.

Shortening the Belt

With the belt fastened, pull on the outer loop to tighten the belt.

Inspection

Inspect for worn or frayed webbing.

Check for worn or damaged buckle or lock bar. Replace the entire assembly if worn or damaged.

Inspect the belt and harness mounting hardware. Replace any damaged or worn hardware. Keep the mounting bolts tight.

Fire Prevention and Control

In the event of a fire, the machine is optionally equipped with either a manually operated hand held fire suppressor or a manually activated fire suppression system.

Fire Prevention

Proper machine inspection and maintenance is **CRITICALLY IMPORTANT** to prevent a disastrous fire. The following guidelines should be followed to reduce the chances of a fire:

- a. Daily inspection and preventive maintenance at points where fires are most likely to start - engine block, electrical system, turbochargers, exhaust manifolds, brake system and hydraulic gearbox/pump area is critically important.
- b. Regular cleaning of all areas where flammable materials such as fuel, oil, grease, hydraulic fluid, and combustible debris may collect is also critically important.

NOTICE

Refer to Section 02 in the Service Manual for tips on cleaning your machine

- c. NEVER smoke while checking fuel level or refueling. Unguarded trouble lights, flames or spark-producing devices should be kept at a safe distance while refueling. ALWAYS stop the engine before refueling the machine.
- d. Keep all fuel and lubricants stored in properly marked containers and away from unauthorized persons.
- e. Store oily rags or other flammable material in a protective container, in a safe place.
- f. Make sure all clamps, guards and heat shields are installed correctly to prevent vibration, rubbing or chaffing against other parts and creating excessive heat during operation.
- g. DO NOT weld or cut on pipes, tubes or reservoirs that contain flammable liquids or gases.

Manual Fire Suppressor

Inspect the machine's manual hand-held fire suppressor regularly, and read and understand its operation. This fire suppressor is capable of putting out fires in the following materials: wood, paper, cloth, electrical, gasoline, and oil.

- a. If the suppressor is equipped with a gauge, ensure the needle is in the green portion of the gauge.
- b. Ensure the pin is installed and the seal has not been broken.
- c. Have the fire suppressor inspected and serviced by licensed personnel at the required interval or immediately if it has been discharged.
- d. Read and understand your employer's policy in regards to extinguishing fires before attempting to manually extinguish any fire.

Fire Suppression System - AFEX or ANSUL Systems (Optional)

The machine is equipped with either a manual or automatic discharge fire suppression system. Operator safety is greatly enhanced; however, the operator's cab is not protected. It is the responsibility of the equipment owner to ensure operators and service technicians read and understand the manufacturer's owner's manual.



Figure 42. Fire suppression system bottles - AFEX system shown

CAUTION

Before operating the machine, the operator must review the manufacturer literature for operation of the fire suppression system. Manual activation may vary by manufacturer and model. Failure to do so can result in equipment damage.

NOTICE

- The fire system provided on the machine is a suppression system only and is not designed or intended to extinguish all fires, particularly when unusual amounts of combustible materials and an ample oxygen supply are present. It is extremely important that alternative firefighting equipment be available in case the system does not totally extinguish a fire.
- Use extreme care to prevent the accumulation of debris, combustible materials, and fluids that could intensify the fire or cause it to spread to areas where there was no previous potential for fire.
- If modifications are made to the machine, or if the fire suppression system is disconnected for any reason, make sure the fire equipment is immediately inspected and tested by an authorized distributor for the system's manufacturer.
- The fire suppression system's dry chemical dispersion nozzles are strategically located inside the front and rear frames. The operator's cab is **NOT** protected. The fire suppression system will **NOT** suppress fires outside the machine or in the operator's cab. The hand-held portable fire suppressor is recommended and is useful if re-ignition occurs or when fires originate independently of the machine or outside the protected areas.
- The discharge of the dry chemical fire suppression agent may create personnel hazards such as obscured vision or temporary breathing difficulties.
- Bring machine to a complete stop and shut down engine before deploying. System actuation will result in immediate discharge, which may obscure vision.

- The fire suppression system is a **MANUALLY OR AUTOMATICALLY DISCHARGED** system. Fire detection is optionally provided, but the fire suppression system **WILL NOT** automatically discharge unless it is equipped with the automatic fire detection activation system.

Circuit Monitor Panel - ANSUL System

The fire detection system circuit monitor panel (optional) is mounted inside the cab (refer to illustration “Fire suppression system actuator switches – AFEX and ANSUL systems”). The circuit monitor’s function is to monitor the fire suppression system’s electrical detection and manual actuation circuits and provide the operator with both visual and audible warnings of a fire.

Visual indicators:

The circuit monitor panel provides LED indicators for battery, alarm, detection, release, and power to the panel. In the event of fire detection, an audible alarm accompanies the LED Alarm indicator.

Controls

The front panel contains a “DELAY” and “RESET” button. The DELAY button is functional when automatic discharge is used.

The RESET button is used to reinitialize the control panel when depressed; it provides an indication that all LEDs and the audible alarm are functional.

Sequence of Operation

Upon receiving an input signal indicating a fire, the alarm LED will flash and the audible alarm will pulse at the rate of two times per second. Refer to “Manual Actuation – AFEX and ANSUL Systems”, located below.

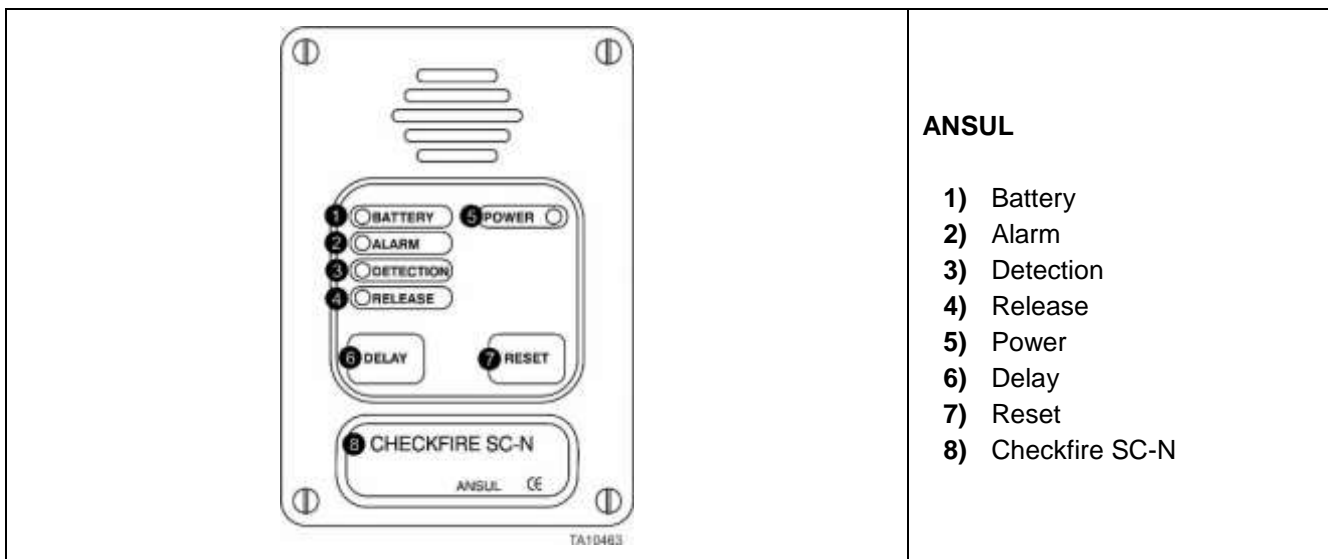


Figure 43. Circuit monitor panel (CHECKFIRE SC-N)



Located on operator dash, left side of left foot rest

Figure 44. Ansul circuit monitor panel (CHECKFIRE 210)

CAUTION

Before performing heat generating processes such as grinding, cutting, or welding on a machine, the fire suppression system circuit monitors panel's in-line fuse must be removed. The fuse is located in the battery box on the loader. Failure to do so may cause the system to actuate and/or damage the solid-state components of the system. Replace the in-line fuse before the machine has been started or after all welding operations have been completed.

NOTICE

Some fire suppression systems have an internal battery and are not hard wired to the machine batteries. This fuse will not exist on these machines. Before beginning any heat producing work on the machine, appropriate steps must be taken to prevent the heat producing activity from activating the fire suppression system.



Fire suppression in-line fuse located in loader battery box.

Circuit Monitor Panel - AFEX System

A circuit monitor panel is mounted on the rear inside cab wall. Refer to “Fire suppression system actuator switches – AFEX and ANSUL systems” and “Circuit monitor panel”. The circuit monitor’s function is to monitor the fire suppression system’s electrical detection and actuation circuits, including the power source, squib (compressed charge which actuates the discharge of the fire suppression agent), and continuity of the detection wiring.

NOTICE

The AFEX fire suppression system retains its manual discharge capabilities should the circuit monitor panel or any of its internal circuitry fail. If the circuit monitor panel must be removed for any reason, the fire suppression system can be wired to retain its manual actuation feature. Refer to the manufacturer’s owner’s manual through their respective website.

The circuit monitor panel provides audible and visual indicators of alarm conditions. The operator can monitor detection and release circuits and power supply. A system reset button and restart time delay is also provided.

Visual Indicators

- Green LED - Power to circuit monitor panel
- Red LED - Alarm
- Amber LED - Alarm silence activated - Trouble with squib - Trouble with detection circuit

Controls

- Alarm Silence
- Push to test
- System reset
- Push-on, Push-off operation (flush mounted behind panel cover)

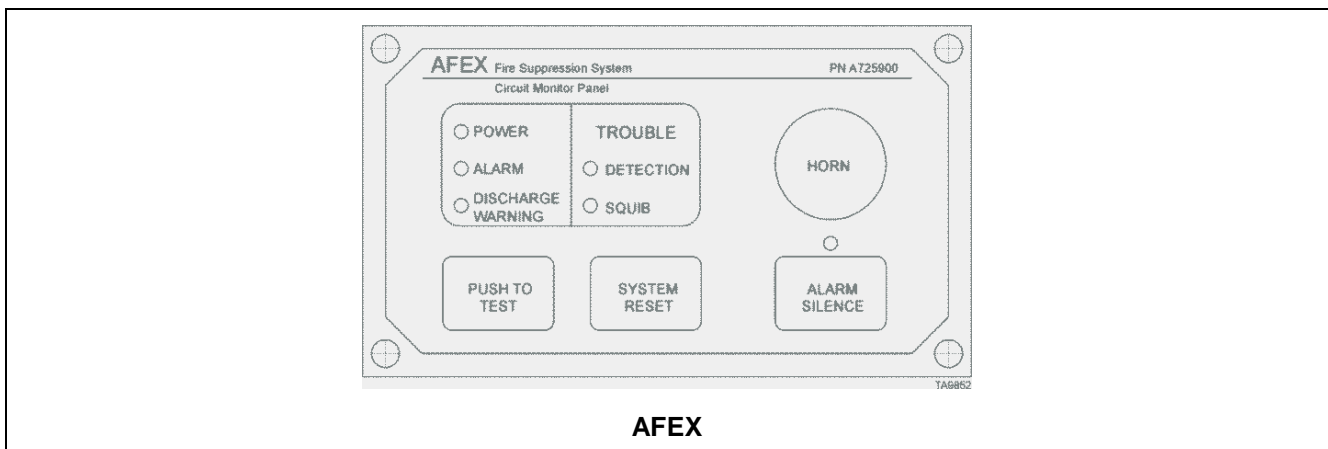


Figure 45. Circuit monitor panel

CAUTION

Before performing heat generating processes such as grinding, cutting, or welding on a machine, the fire suppression system circuit monitors panel's in-line fuse must be removed. The fuse is located in the battery box on the loader. Failure to do so may cause the system to actuate and/or damage the solid-state components of the system. Replace the in-line fuse before the machine has been started or after all welding operations have been completed.



Fire suppression in-line fuse located in loader battery box.

Manual Actuation - AFEX and ANSUL Systems

The machine is equipped with manual firing mechanisms. One mechanism is located in the operator's cab (refer to illustration "Fire suppression system actuator switches - AFEX and ANSUL systems (inside cab)"). The other ground level mechanism locations may vary.

- On the electrical converter cabinet on the left side of the machine.
- On the hydraulic reservoir on the right side of the machine.
- On the right rear side of the machine
- On the left rear side of the machine

Refer to illustration "Typical ground level manual firing mechanism locations (typical)". Check and note locations on the actual machine before operating it.

If the operator notices or is alerted to a fire, the following actions should be taken:

- a. Quickly bring the machine to a complete stop and shut down the engine.
- b. Manually actuate the fire suppression system.
 - Some systems require pulling the safety pin from the neck of the firing mechanism and strike down hard on the push knob/lever (as applicable).
 - Some systems are manually activated by using the fire suppression system console.
- c. Quickly exit the machine and move to a safe distance away from the machine.
- d. Call fire department or mine safety personnel to extinguish the fire.



1) Pull pin, 2) Strike knob to actuate fire suppression system
AFEX cab mounted firing mechanism with circuit monitoring panel (typical)

<p>1. Pull pin 2. Strike knob to actuate fire suppression system ANSUL CHECKFIRE SC-N cab mounted discharge mechanism</p>	<p>1. Lift protective cover 2. Press 'PRESS to activate" ANSUL CHECKFIRE 210 cab mounted discharge mechanism</p>

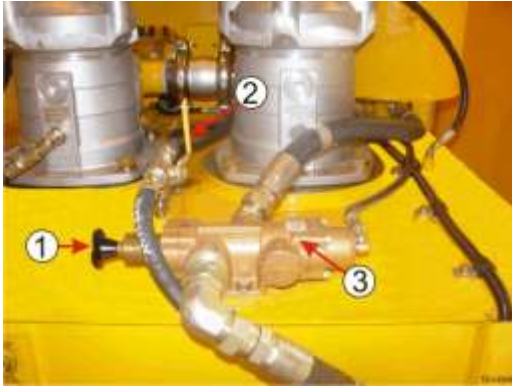
Figure 46. Fire suppression system actuator switches - AFEX and ANSUL systems (inside cab)

<p>(Pull pin & strike knob to actuate)</p>	

Figure 47. Typical ground level manual firing mechanism locations (typical)

NOTICE

When the fire suppression system is discharged, the hydraulic reservoir automatic air release will be tripped. This will release the air pressure in the hydraulic reservoir and in the rest of the hydraulic system. Before restarting the machine, the automatic air release valve must be manually reset by pushing the knob IN to the closed position (refer to “Hydraulic reservoir air release valve”).



1. Reset button
2. Manual air release valve
3. Automatic air release valve

Figure 48. Hydraulic reservoir air release valve

Fire Detection Engine Shutdown Option

The LINCS II vehicle control system is equipped with an engine shutdown feature that will stop the machine and shut down the engine when the fire suppressant is discharged.

NOTICE

Fire systems, installed at the factory, are either manual or automatic discharge systems. The LINCS II computer system or a factory-installed fire system **WILL NOT** automatically discharge the fire suppressant in the event of a fire. An electronic fire detection option that will audibly and visually alert the operator of a fire is available through fire system manufacturers. However, the discharge of fire suppressant and actuation of the Fire Detection Engine Shutdown Option may be actuated by discharging the fire suppressant with any of the actuator switches. All operators of the machine should be trained in the operation and capabilities of the fire suppressant system on the machine before operation.

The following sequence of events will occur following discharge of the fire suppressant:

1. Propulsion is disabled.
2. The engine will shut down and park brakes set once vehicle is slowed.
3. The automatic air release valve will release hydraulic reservoir pressure.

System Maintenance and Troubleshooting

The fire suppression system requires regular inspection and maintenance. The manufacturer's recommended maintenance schedules are also located in the owner's manual, which may be obtained from the manufacturer's website. System troubleshooting and wiring information is also provided in the manufacturer's owner's manual appended to this publication.

WARNING

Struck-by or struck against hazard exists if untrained personnel attempt to service the fire suppression system. Only personnel trained by the system's manufacturer should service the system. Certain components of the system contain a high pressure nitrogen charge that can cause serious personal injury if not handled properly. Using the wrong procedures/process during system maintenance could result in struck by/struck against hazards resulting in serious injury or death.

CAUTION

- Electronic components of the system can be damaged if not handled in the proper manner. Only trained personnel should service the fire suppression system.
- Before performing heat generating processes such as grinding, cutting, or welding on a machine, the fire suppression system circuit monitors panel's in-line fuse must be removed. The fuse is located in the battery box on the loader. Failure to do so may cause the system to actuate and/or damage the solid-state components of the system. Replace the in-line fuse before the machine has been started or after all welding operations have been completed.



Fire suppression in-line fuse located in loader battery box.

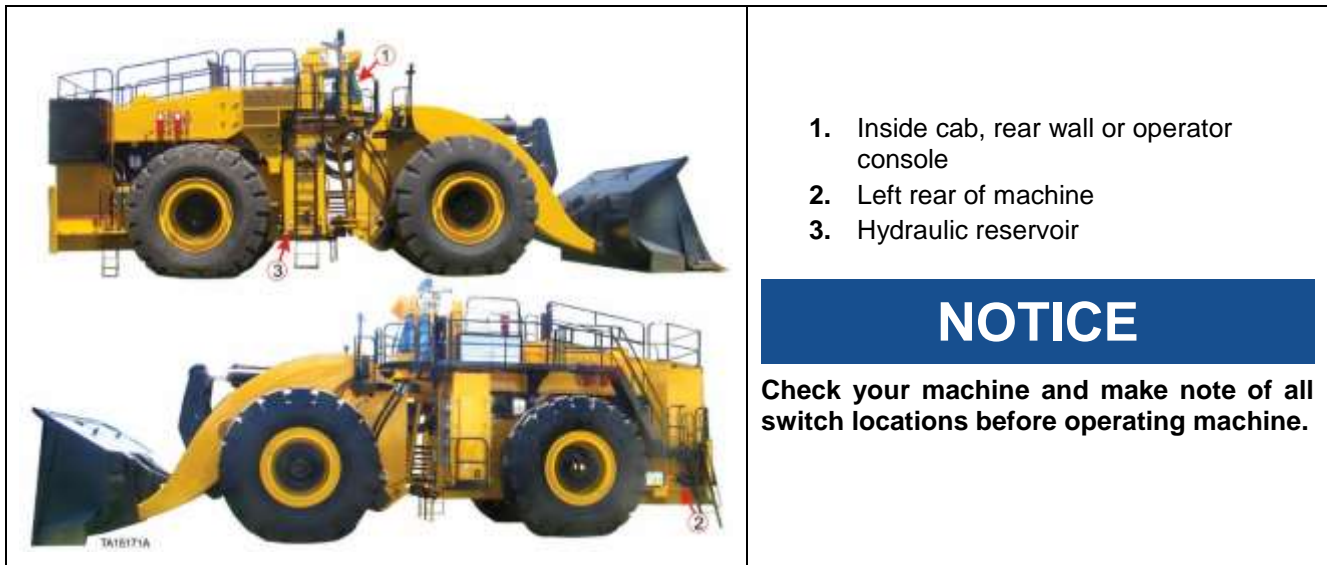


Figure 49. Locations of fire suppression system actuation switches (typical locations - standard installation)

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Tires

One advantage of a P&H wheel loader versus a track machine is mobility. The loaders can easily travel, or tram, from one location in the mine to another as necessary. However, utilization of this advantage necessitates that tramping limitations of the tires are not exceeded.

WARNING

Crush hazards exist if the machine is operated outside the safe operating parameters of the tires and loss of machine control occurs. Speed, distance, and weight load (as well as other factors), can affect tire reliability, safety and possibly warranty. Refer to tire manufacturer tramping guidelines before operating the machine outside of truck loading cycles. Failure to consult with the tire manufacturer to determine safe tramping guidelines can cause crush hazards from loss of machine control, resulting in serious injury or death.

Machine Operation: Normal, Tramping and Load/Carry

The tires for a loader application are designed for low speed loading and will typically heat up rapidly when exposed to load and carry operation or continuous high speeds.

- **Normal operation:** Loading a truck from a bank with a short distance between bank and truck. Tires supplied and specified by Komatsu have been designed for this application.
- **Load and carry:** Driving the loader with a loaded bucket more than 100 feet before dumping. This cycle requires special attention to maximum speeds in both the empty and loaded runs to assure critical tire temperatures are not exceeded.
- **Tramping:** (Driving machine at continuous speed over a distance) requires special attention to maximum speeds and time to assure critical tire temperatures are not exceeded.

NOTICE

There are many types of tires available for each machine and each tire manufacturer sets the limits for tramping and load and carry applications considering many factors such as the tire type, tire size, tire construction, ambient temperatures, type of material, loading conditions, use of chains, etc.

CAUTION

Speed restrictions should be determined in consultation with the tire and chain application engineering groups. Failure to consult with the tire manufacturer regarding your specific tire and application can result in severe tire damage or tire failure.

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