Operation & Maintenance Manual

SEAM011303T

BR500JG-1

MOBILE CRUSHER

SERIAL NUMBERS BR500JG-1201 and up

⚠ WARNING

Unsafe use of this machine may cause serious injury or death. Operators and maintenance personnel must read this manual before operating or maintaining this machine. This manual should be kept near the machine for reference and periodically reviewed by all personnel who will come into contact with it.

NOTICE

Komatsu has Operation & Maintenance Manuals written in some other languages. If a foreign language manual is necessary, contact your local distributor for availability.

KOMATSU

1. FOREWORD

This manual provides rules and guidelines which will help you use this machine safely and effectively. Keep this manual in the manual holder inside the tool box so that it is easy to use, and have all personnel read it periodically. If this manual has been lost or has become dirty and can not be read, request a replacement manual from Komatsu or your Komatsu distributor.

If you sell the machine, be sure to give this manual to the new owners.

Continuing improvements in the design of this machine can lead to changes in detail which may not be reflected in this manual. Consult Komatsu or your Komatsu distributor for the latest available information of your machine or for questions regarding information in this manual.

This manual may contain attachments and optional equipment that are not available in your area. Consult Komatsu or your Komatsu distributor for those items. you may require.

⚠ WARNING

- **Improper operation and maintenance of this machine can be hazardous and could result in serious injury or death.**
- **Operators and maintenance personnel should read this manual thoroughly before beginning operation or maintenance.**
- **Some actions involved in operation and maintenance of the machine can cause a serious accident, if they are not done in a manner described in this manual.**
- **The procedures and precautions given in this manual apply only to intended uses of the machine. If you use your machine for any unintended uses that are not specifically prohibited, you must be sure that it is safe for you and others. In no event should you or others engage in prohibited uses or actions as described in this manual.**
- **Komatsu delivers machines that comply with all applicable regulations and standards of the country to which it has been shipped. If this machine has been purchased in another country or purchased from someone in another country, it may lack certain safety devices and specifications that are necessary for use in your country. If there is any question about whether your product complies with the applicable standards and regulations of your country, consult Komatsu or your Komatsu distributor before operating the machine.**
- **The description of safety is given in SAFETY INFORMATION on page 0-4 and in SAFETY from page 1-1.**

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.

CALIFORNIA

Proposition 65 Warning

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

Wash hands after handling.

EMISSION CONTROL WARRANTY

EMISSION CONTROL WARRANTY STATEMENT (APPLIES TO CANADA ONLY)

1. Products Warranted

Komatsu America International Company, Komatsu Mining Systems Inc. and Komatsu Utility Corporation (collectively "Komatsu") produce and/or market products under brand names of Komatsu, Dresser, Dressta, Haulpak and Galion. This emissions warranty applies to new engines bearing the Komatsu name installed in these products and used in Canada in machines designed for industrial off-highway use. This warranty applies only to these engines produced on or after January 1, 2000. This warranty will be administered by Komatsu distribution in Canada.

2. Coverage

Komatsu warrants to the ultimate purchaser and each subsequent purchaser that the engine is designed, built and equipped so as to conform, at the time of sale by Komatsu, with all U.S. Federal emission regulations applicable at the time of manufacture and that it is free from defects in workmanship or material which would cause it not to meet these regulations within five years or 3,000 hours of operation, whichever occurs first, as measured from the date of delivery of the engine to the ultimate purchaser.

3. Limitations

Failures, other than those resulting from defects in materials or workmanship, are not covered by this warranty. Komatsu is not responsible for failures or damage resulting from what Komatsu determines to be abuse or neglect, including, but not limited to: operation without adequate coolant or lubricants; over fueling; over speeding; lack of maintenance of lubricating, cooling or intake systems; improper storage, starting, warm-up, run-in or shutdown practices; unauthorized modifications of the engine. Komatsu is also not responsible for failures caused by incorrect fuel or by water, dirt or other contaminants in the fuel. Komatsu is not responsible for non-engine repairs, "downtime" expense, related damage, fines, all business costs or other losses resulting from a warrantable failure.

KOMATSU IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

This warranty, together with the express commercial warranties, are the sole warranties of Komatsu. **THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICUALR PURPOSE.**

GARANTIE SUR LE CONTRÔLE DES ÉMISSIONS

ÉNONCÉ DE GARANTIE SUR LE CONTRÔLE DES ÉMISSIONS (APPLICABLE AU CANADA SEULEMENT):

1. Produits garantis:

Komatsu America International Company, Komatsu Mining Systems Inc. et Komatsu Utility Corporation (collectivement Komatsu) produisent et/ou font la mise en marché de produits portant les noms de marque Komatsu, Dresser, Dressta, Haulpak et Galion. Cette garantie sur les émissions s'applique à tous les nouveaux moteurs portant le nom Komatsu, installés dans ces produits et utilisés au Canada dans des machines conçues pour utilisation industrielle non-routière. Cette garantie s'applique seulement sur les moteurs produits à partir du 1er Janvier 2000. Cette garantie sera administrée par la distribution de Komatsu au Canada.

2. Couverture:

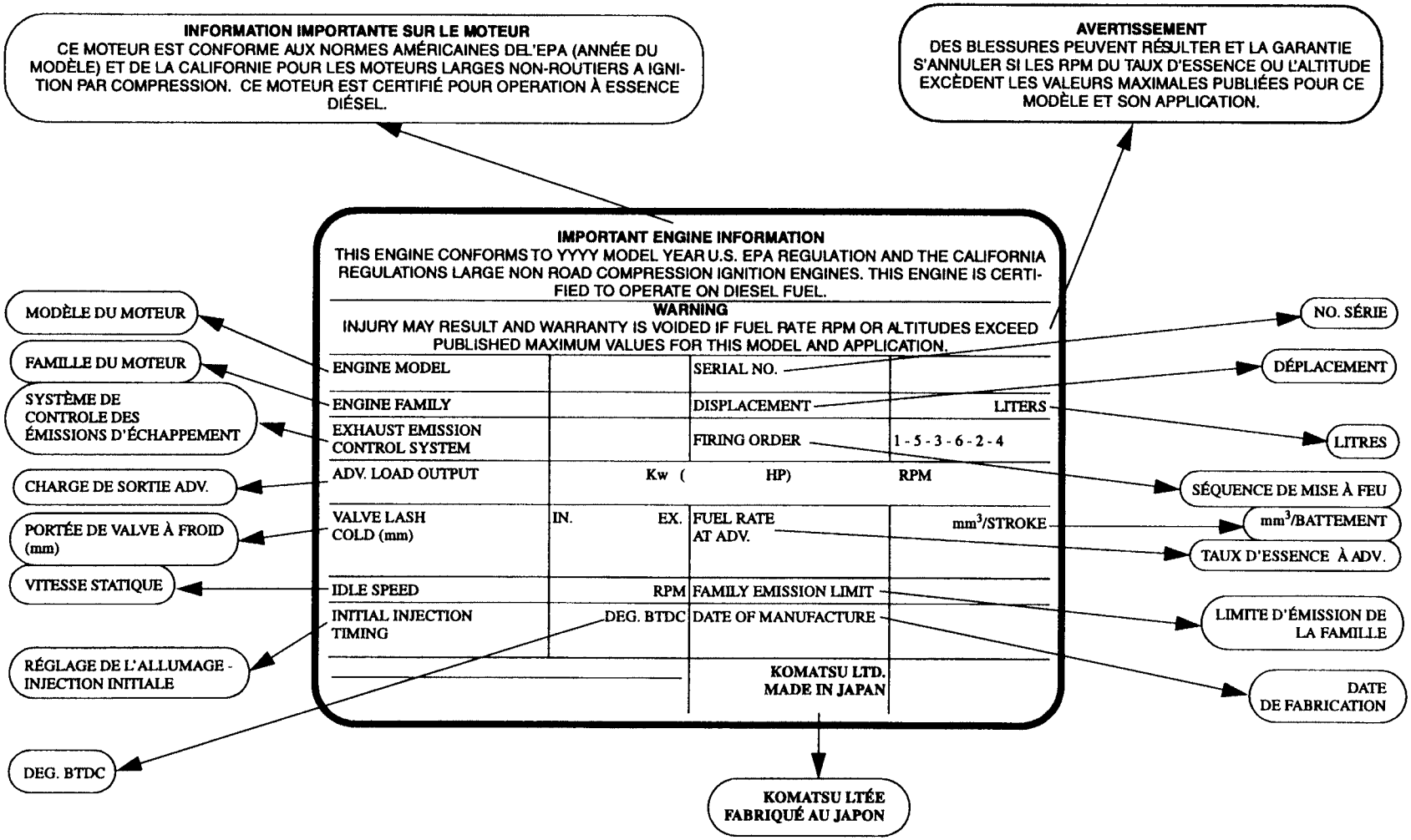
Komatsu garantit à l'acheteur ultime et chaque acheteur subséquent que le moteur est conçu, construit et équipé en toute conformité, au moment de la vente par Komatsu, avec toutes les Réglementations fédérales américaines sur les émissions applicables au moment de la fabrication et qu'il est exempt de défauts de construction ou de matériaux qui auraient pour effet de contrevenir à ces réglementations en dedans de 5 ans ou 3000 heures d'opération, mesuré à partir de la date de livraison du moteur au client ultime.

3. Limitations:

Les bris, autres que ceux résultant de défauts de matériaux ou de construction, ne sont pas couverts par cette Garantie. Komatsu n'est pas responsable pour bris ou dommages résultant de ce que Komatsu détermine comme étant de l'abus ou négligence, incluant mais ne se limitant pas à: l'opération sans lubrifiants ou agent refroidissants adéquats; la suralimentation d'essence; la survitesse; le manque d'entretien des systèmes de lubrification, de refroidissement ou d'entrée; de pratiques non-propices d'entreposage, de mise en marche, de réchauffement, de conditionnement ou d'arrêt; les modifications non-autorisées du moteur. De plus, Komatsu n'est pas responsable de bris causés par de l'essence inadéquate ou de l'eau, des saletés ou autres contaminants dans l'essence. Komatsu n'est pas responsable des réparations non-reliées au moteur, des dépenses encourues suite aux temps d'arrêts, des dommages relatifs, amendes, et de tout autre coût d'affaires ou autres pertes résultant d'un bris couvert par la garantie.

KOMATSU N'EST PAS RESPONSABLE DES INCIDENTS OU DOMMAGES CONSÉQUENTS.

Cette garantie, ainsi que les garanties expresses commerciales, sont les seules garanties de Komatsu. **IL N'Y A AUCUNE AUTRE GARANTIE, EXPRESSE OU SOUS-ENTENDUE, MARCHANDABLE OU PROPICE A UNE UTILISATION PARTICULIÈRE.**



ENGINE DATAPLATE - ENGLISH / FRENCH

2. SAFETY INFORMATION

Most accidents are caused by the failure to follow fundamental safety rules for the operation and maintenance of machines. To avoid accidents, read, understand and follow all precautions and warnings in this manual and on the machine before performing operation and maintenance.

To identify safety messages in this manual and on machine labels, the following signal words are used.

⚠ DANGER This word is used on safety messages and safety labels where there is a high probability of serious injury or death if the hazard is not avoided. These safety messages or labels usually describe precautions that must be taken to avoid the hazard, Failure to avoid this hazard may also result in serious damage to the machine.

⚠ WARNING This word is used on safety messages and safety labels where there is a potentially dangerous situation which could result in serious injury or death if the hazard is not avoided. These safety messages or labels usually describe precautions that must be taken to avoid the hazard. Failure to avoid this hazard may also result in serious damage to the machine.

⚠ CAUTION This word is used on safety messages and safety messages and safety labels for hazards which could result in minor or moderate injury if the hazard is not avoided. This word might also be word for hazards where the only result could be damage to the machine.

NOTICE This word is used for precautions that must be taken to avoid actions which could shorten the life of the machine.

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

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

3. TO THE USER

Thank you very much for purchasing this KOMATSU product. This operation and maintenance manual describes the correct operating procedures and routine inspection, maintenance and adjustment procedures for this machine.

Those who are well experienced in operating similar machines should read this manual because this machine includes its special mechanisms and operating techniques.

If you have unclear points or opinions about this operation and maintenance manual, please contact our company or our authorized service shop.

- Run-in

  The new machine is delivered to the user after undergoing complete adjustment and inspection. However, if it is put into unnatural operation, its performance will be deteriorated earlier and its life will be made shorter. For first 100 hours (hours indicated on the service meter) or so, perform run-in.

- Inspection and Maintenance

  To use the machine safely and prevent accidents from occurring, be sure to carry out inspection and periodic maintenance.

  The hours described in this text mean those indicated on the service meter. Practically, perform maintenance determining each maintenance service in units of day, week and month based on these hours.

4. LOCATION OF PLATES, TABLE TO ENTER SERIAL NO. AND DISTIBUTOR

4.1 MACHINE SERIAL NO. PLATE POSITION:

Provided at the front on the left side of the deck.

4.2 ENGINE SERIAL NO. PLATE POSITION;

Provided on the top surface of the engine cylinder head cover.

4.3 TABLE TO ENTER SERIAL NO. AND DISTIBUTOR

Machine serial No.
Engine serial No.
Distributor name: Address: Phone: Service personnel for your machine:

REMARKS

5. CONTENTS

SAFETY

OPERATION

MAINTENANCE

SPECIFICATIONS AND CIRCUIT DIAGRAMS

OPTIONS, ATTACHMENTS

SAFETY

⚠ WARNING

Read and follow all safety precautions. Failure to do so may result in serious injury or death.

This safety section also contains precautions for optional equipment and attachments.

1. GENERAL PRECAUTIONS

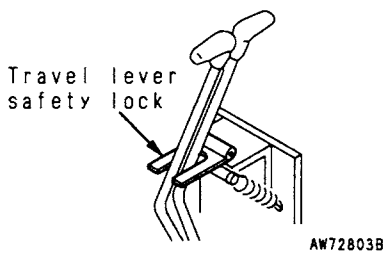
⚠ WARNING: For reasons of safety, always follow these safety precautions.

SAFETY RULES

- Only trained and authorized personnel can operate and maintain the machine.
- Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.
- Do not operate the machine if you are feeling unwell, if you are taking medication that makes you feel sleepy, if you have been drinking, or if you are suffering from emotional problems. These problems will interfere with your sense of judgement in emergencies and may cause accidents.
- When working with another operator or with a person on worksite traffic duty, be sure that all personnel know the nature of the work and understand all hand signals that are to be used.
- Always observe strictly any other rules related to safety.

SAFETY FEATURES

- Be sure that all guards and covers are installed in their proper position. Have guards and covers repaired immediately if damaged.
- Be sure that you understand the method of use of safety features such as safety lock for travel lever and use them properly.
- Never remove any safety features. Always keep them in good operating condition.
- Failure to use safety features according to the instructions in the Operation and Maintenance Manual could result in serious bodily injury.

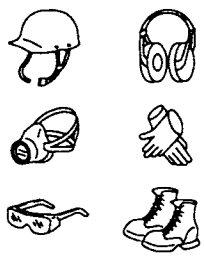


ON MACHINE

- When climbing on to the machine, always remove all mud and oil from the soles of your shoes. If you drive the machine or operate the work equipment with mud or oil stuck to your shoes, your foot may slip and this may cause a serious accident.
- Do not use cellular telephones when driving or operating the machine.
  There is danger that this may lead to an unexpected accident.
- Never bring any dangerous objects such as flammable or explosive items into the machine.
- To ensure safety, do not use the radio or music headphones when operating the machine. There is danger that this may lead to a serious accident.

CLOTHING AND PERSONAL PROTECTIVE ITEMS

- Avoid loose clothing and jewelry. They can catch on controls or in protruding parts and cause serious injury or death.
- Do not wear oily clothes. They are highly flammable.
- Wear a hard hat, safety glasses, safety shoes, mask, or gloves when operating or maintaining the machine.
  Always wear safety goggles, hard hat, gloves, and other protective equipment if your job involves scattering metal chips or minute materials - particularly when driving in pins with a hammer and when cleaning the air cleaner element with compressed air.
  Check also that there is no one near the machine.
- Check that all protective equipment works properly before using it.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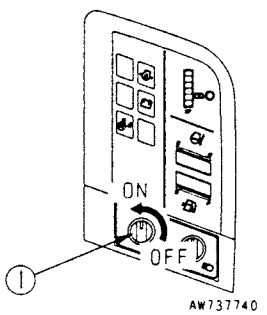
UNAUTHORIZED MODIFICATION

Any modification made without authorization from Komatsu can create hazards. Before making a modification, consult your Komatsu distributor.
Komatsu will not be responsible for any injury or damage caused by any unauthorized modification.

ALWAYS APPLY LOCK WHEN LEAVING OPERATOR'S SEAT

- When standing up from the operator's seat, always place travel lock switch ① securely in the ON position. If you accidentally touch the travel lever when they are not locked, the machine may suddenly move and cause serious injury or damage.
- When leaving the machine, stop the work equipment completely, set travel lock switch ① to the ON position, then stop the engine. In addition, set the travel lever safety lock to the LOCK position and use the key to lock all the equipment.
  Always remove the key and take it with you.



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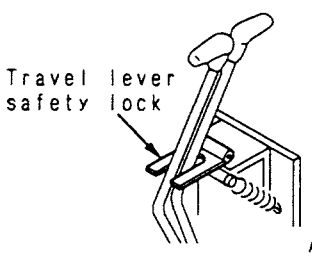

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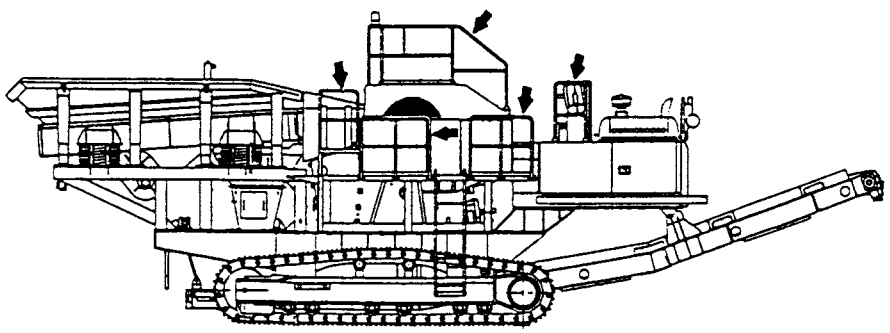
MOUNTING AND DISMOUNTING

- Never jump on or off the machine. In particular, never get on or off a moving machine. These actions may lead to serious injury.
- When getting on or off the machine, always face the machine, and maintain three-point contact (both feet and one hand or one foot and both hands) with the handrails, steps, and track shoes to ensure that you support yourself securely.
- Never hold any control levers when getting on or off the machine.
- Before getting on or off the machine, if there is any oil, grease, or mud on the handrails, steps, or track shoes, wipe it off immediately. Always keep these parts clean. Repair any damage and tighten any loose bolts.
- Never climb on to the engine hood or covers. To prevent personal injury caused by slipping, falling, or tripping over, use only the inspection passages provided with anti-slip pads.
- Use the points marked by arrows in the diagram when getting on or off the machine.



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FIRE PREVENTION FOR FUEL, OIL, AND ANTIFREEZE

Fuel, oil, and antifreeze will catch fire if it is brought close to a flame. Fuel is particularly flammable and can be hazardous.
Always strictly observe the following.

- Keep any lighted matches or cigarettes away from flammable materials.
- Stop the engine and do not smoke when refueling.
- Tighten all fuel and oil caps securely.
- Use well-ventilated areas for adding or storing oil and fuel.
- Keep oil and fuel in the determined place and do not allow unauthorized persons to enter.
- Do not leave the area when supplying fuel or oil.

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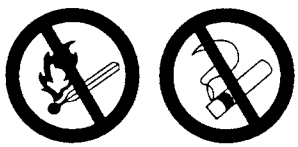

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PRECAUTIONS WHEN HANDLING AT HIGH TEMPERATURE

Immediately after operations are stopped, the coolant, engine oil, and hydraulic oil are at high temperature and the radiator and hydraulic tank are still under pressure. Attempting to remove the cap, drain the oil or coolant, or replace the filters may lead to serious burns. Always wait for the temperature to go down, and follow the specified procedures when carrying out these operations.

- To prevent hot water from spurting out, stop the engine, wait for the water to cool, then loosen the cap slowly to relieve the pressure before removing the cap.
  (When checking how much the water temperature has gone down, bring your hand close to the surface of the radiator without touching it, and check the temperature of the air at the radiator surface.)
- To prevent hot oil from spurting out, stop the engine, wait for the oil to cool, then loosen the cap slowly to relieve the pressure before removing the cap.
  (When checking how much the oil temperature has gone down, bring your hand close to the surface of the hydraulic tank without touching it, and check the temperature of the air at the hydraulic tank surface.)

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ASBESTOS DUST HAZARD PREVENTION

Asbestos dust in the air can cause lung cancer if it is inhaled. Komatsu does not use asbestos in its products, but if you handle materials containing asbestos fibers during demolition operations, always do as follows.

- Never use compressed air for cleaning.
- Use water to keep down the asbestos dust when cleaning.
- If there is danger that there may be asbestos dust in the air, operate the machine with the wind to your back whenever possible.
- Use an approved respirator if necessary.
- Do not allow any other person into the area during the operation.
- There is danger that non-genuine parts may contain asbestos, so use only Komatsu genuine parts.
- Always observe any rules and regulations related to the jobsite and working environment.

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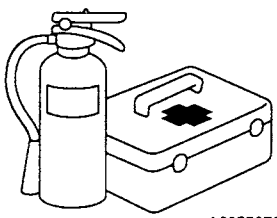
FIRE EXTINGUISHER AND FIRST AID KIT

As a precaution if any injury or fire should occur, always do as follows.

- Be sure that fire extinguishers have been provided and read the labels to ensure that you know how to use them.
- Provide a first aid kit at the storage point. Check the kit periodically and make any additions if necessary.
- Know what to do in the event of injury or fire.
- Make a list of the phone numbers of persons you should contact in case of an emergency (doctor, ambulance, fire station), and post the list at specified places to ensure that all workers can carry out the emergency contact.



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ESCAPE FROM FIRE

If the machine catches fire, it may lead to serious personal injury or death.
If a fire occurs during operation, escape from the machine as follows.

- Turn the starting switch OFF and stop the engine.
- If there is time, use the fire extinguisher to extinguish as much of the fire as possible.
- Use the handrails and steps to escape from the machine.

The above is the basic method for escaping from the machine, but it may be necessary to change the method according to the conditions, so carry out practice drills at the jobsite.

PRECAUTIONS FOR ATTACHMENTS

- When installing and using optional parts or attachments, read the instruction manual for the attachment and the information related to attachments in this manual.
- Do not use attachments that are not authorized by Komatsu or your Komatsu distributor. Use of unauthorized attachments could create a safety problem and adversely affect the proper operation and useful life of the machine.
- Any injury, accidents, or product failures resulting from the use of unauthorized attachments will not be the responsibility of Komatsu.

INDOOR VENTILATION

- When starting the engine, or using fuel, flushing oil, or paint indoors or in areas with poor ventilation, always open the windows and doors to improve the ventilation and prevent the danger of gas poisoning.
- If the ventilation is still insufficient even when the windows and doors are opened, use a ventilation fan.

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2.1 BEFORE STARTING ENGINE

SAFETY AT WORKSITE

- Before starting operations, thoroughly check the area for any unusual conditions that could be dangerous.
- Check the terrain and condition of the ground at the worksite, and determine the best and safest method of operation.
- Make the ground surface as hard and horizontal as possible before carrying out operations. If there is a lot of dust and sand on the jobsite, spray water before starting operations.
- If you need to operate on a street, protect pedestrians and cars by designating a person for worksite traffic duty or by erecting fences and posting "No Entry" signs around the worksite.
- Erect fences, post "No Entry" signs, and take other steps to prevent people from coming close to or entering the jobsite. If people come close to a moving machine, they may be hit or caught by the machine, and this may lead to serious personal injury or death.

CHECKS BEFORE STARTING ENGINE

Every day before starting the engine for the first time, carry out the following checks. If these checks are not carried out properly, there is danger of serious injury.

- Completely remove all wood chips, leaves, grass, paper and other flammable materials accumulated in the engine compartment and around the battery. They could cause a fire. Remove any dirt from the handrails and steps.
  Check before starting → See "3.1 CHECK BEFORE STARTING" (page 2-21).
- Do not leave tools or spare parts lying around in the operator's compartment. The vibration of the machine when traveling or during operations may cause them to fall and damage or break the control levers or switches. They may also get caught in the gap of the control levers and cause the work equipment to malfunction or move dangerously. This may lead to unexpected accidents.
- Check the coolant level, fuel level, and hydraulic tank oil level, and check for clogging of the air cleaner and damage to the electrical wiring.
  Check before starting → See "3.1 CHECK BEFORE STARTING" (page 2-21).
- Check the operation of the gauges and check that the control levers are at the LOCK position.
- Check that all the control linkages move properly.

If any abnormalities are found in the above checks, carry out repairs immediately.

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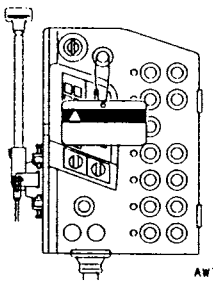
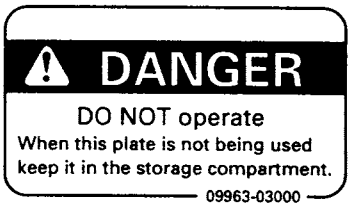
2.2 AFTER STARTING ENGINE

CHECK AFTER STARTING ENGINE

- Walk around your machine again just before mounting it, and check for people and objects that might be in the way.
- Never start the engine if a warning tag has been attached to the control levers.
- When starting the engine, sound the horn as an alert.
- Start and operate the machine only while seated.
- If another person is allowed on the machine, that person may sit only in the assistant's seat.
- Do not short circuit the starting motor to start the engine. This is not only dangerous, but may also damage the machine.





CHECK DIRECTION BEFORE STARTING MACHINE

- Before moving the machine off, check again that there is no person or obstacle in the surrounding area.
- Before operating the machine, sound the horn to warn people in the area.
- Always stand in the operator's compartment when operating the machine.
- If another person is allowed on the machine, that person may stand only in the operator's compartment.

PRECAUTIONS WHEN SWINGING OR CHANGING DIRECTION OF TRAVEL

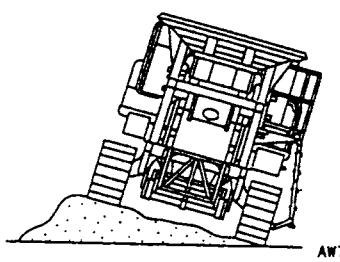
Before operating the machine or the work equipment, always observe the following precautions in order to prevent serious injury or death.

- When changing the direction of travel from forward to reverse or from reverse to forward, reduce speed early and stop the machine before changing the direction of travel.
- Sound the horn to warn people in the area.
- Check that there is no one in the area around the machine. There are blind spots behind the machine, so if necessary, check that there is no one behind the machine before traveling in reverse.
- When operating in areas that may be hazardous or have poor visibility, designate a person to direct worksite traffic.
- Ensure that no unauthorized person can come within the turning radius or direction of travel.

PRECAUTIONS WHEN TRAVELING

- Never turn the starting switch to the OFF position when traveling.
  It is dangerous if the engine stops when the machine is traveling. It will be impossible to operate the steering.
- It is dangerous to look at other things when operating. Always concentrate on your work.
- It is dangerous to drive too fast, start suddenly, stop suddenly, turn suddenly, or snake when driving the machine.
- If any abnormality in the machine (noise, vibration, smell, abnormality in gauges, leakage of air or oil, etc.) is seen during operations, stop the machine immediately at a safe place and look for the cause.
- Do not operate the steering suddenly. The work equipment may hit the ground and cause the machine to lose its balance, and this may damage the machine or structures in the area.
- When traveling on rough ground, travel at low speed, and avoid sudden changes in direction.
- Avoid traveling over obstacles as far as possible. If the machine has to travel over an obstacle, travel at low speed. Never travel over obstacles which make the machine tilt strongly (10° or more).
- When traveling and during operations, always keep a good distance to prevent contact with other machines and structures.
- When traveling over bridges or structures on private land, check first that the bridge or structure can withstand the weight of the machine. When traveling on public roads, check with the local authorities and follow their instructions.

INCORRECT



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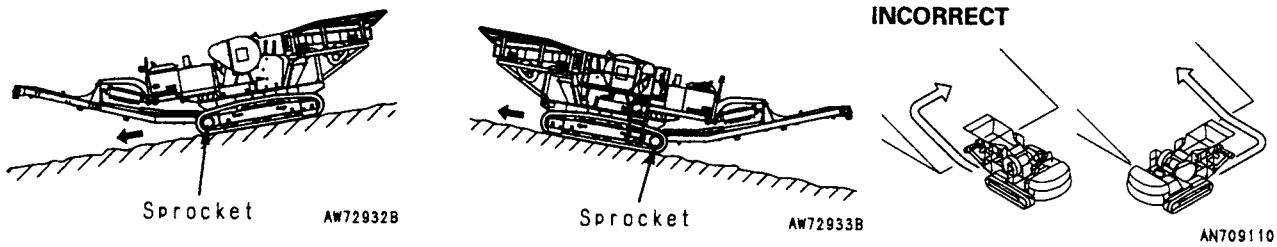
TRAVELING ON SLOPES

Never jump on to a machine that is running away in order to stop it. There is danger of serious injury.

- When traveling on slopes, there is danger of the machine turning over and causing serious personal injury. To prevent this, always observe the following.
- Do not turn on slopes or travel across slopes. Always go down to a flat place to perform these operations.
  Method of traveling on slopes → See "3.18 PRECAUTIONS WHEN TRAVELING UP OR DOWN HILLS" (page 2-44).
- Do not travel on grass, fallen leaves, or wet steel plates. Even slight slopes may cause the machine to slip to the side, so travel at low speed and make sure that the machine is always traveling directly up or down the slope.
- When traveling downhill, travel slowly at low speed. If necessary, use the brakes (shift the travel lever to neutral) and use the braking force of the engine.



PRECAUTIONS FOR OPERATION

- Use the machine only for its main purpose. Using it for other purposes will cause failures.
- To ensure an ample view, do as follows.
  - When working in dark areas, fit working lamps and front lamps to the machine. If necessary, set up lighting at the jobsite.
  - Stop operations when the visibility is poor, such as in fog, mist, snow, and rain. Wait for the visibility to improve to a level which causes no problems for the operation.
- In places where the view is poor, post a signalman and check that there is no one inside the working range.
- When working in confined spaces or in places where there are obstacles, be extremely careful not to hit the belt conveyor.

DO NOT GO CLOSE TO HIGH-VOLTAGE CABLES

- Do not let the machine touch overhead electric wires. In the case of high-voltage cables, even going close can cause electric shock.
- To prevent accidents, always do the following.
  - On jobsites where there is danger of the machine contacting electric wires, consult with the electric power company and check that the actions required by law are being taken before starting operations.
  - Wear shoes with rubber soles and rubber gloves, spread a rubber sheet on the seat and be careful not to let any part of your body not protected by rubber touch the machine.
  - Use a signalman to give warning if the machine approaches too close to the electric cables.
  - Check with the electricity company about the voltage of the cables before starting operations.

	Voltage	Min. safety distance
Low voltage	100 · 200 V	2 m
	6,600 V	2 m
Very high voltage	22,000 V	3 m
	66,000 V	4 m
	154,000 V	5 m
	187,000 V	6 m
	275,000 V	7 m
	500,000 V	11 m

OPERATE CAREFULLY ON SNOW

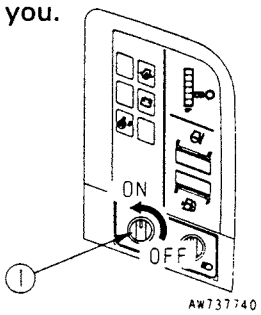
- When working on snow or icy roads, even a slight slope may cause the machine to slip to the side, so always travel at low speed and avoid sudden starting, stopping, or turning. There is particular danger of the machine slipping to the side when traveling up or down hills.
- When the temperature rises, frozen road surfaces become soft, so the machine travel becomes unstable.

WORKING ON LOOSE GROUND

- Avoid entering soft ground. It will be difficult for the machine to escape.
- Avoid operating your machine too close to the edge of cliffs, overhangs, and deep ditches. The ground may be weak in such areas. If the ground should collapse, the machine could fall or tip over and this could result in serious injury or death.
  Remember that the soil after heavy rain or blasting or after earthquakes is weakened in these areas.
- Earth laid on the ground and the soil near ditches is loose. It can collapse under the weight or vibration of your machine and cause your machine to tip over.
- Install the head guard (FOPS) if working in areas where there is danger of falling rocks.

PARKING MACHINE

- Park on level ground where there is no danger of falling rocks or landslides. When parking on low ground, park in a place where there is no problem of flooding.
- If the machine must be parked on a slope, block the tracks.
- When parking on public roads, provide fences, signs, flags, or lights, and put up any other necessary signs to ensure that passing traffic can see the machine clearly, and park the machine so that the machine, flags, and fences do not obstruct traffic.
- When leaving the machine, stop the work equipment completely, set travel lock switch ① to the ON position, then stop the engine. In addition, set the travel lever safety lock to the LOCK position and use the key to lock all the equipment.
  Always remove the key and take it with you.



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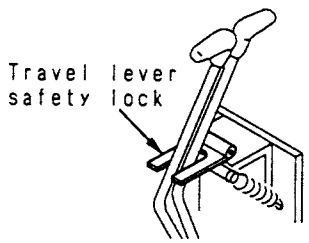

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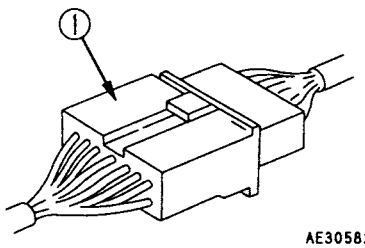
PRECAUTIONS IN COLD WEATHER

- After completing operations, remove any drops of water, snow, or mud stuck to the wiring harnesses, connector ①, switches, or sensors, and cover these parts.
  If drops of water get in and freeze, the machine may malfunction when it is next used, and this may lead to an unexpected accident.

- Carry out the warming-up operations thoroughly. If the control levers are operated before the machine is fully warmed up, the response of the machine will be slow, and this may lead to an unexpected accident.

- If the battery electrolyte is frozen, do not charge the battery or start the engine with power from another source. There is danger that the battery may catch fire.
  When charging the battery or starting with power from another source, let the battery electrolyte melt and check that there is no leakage of battery electrolyte before starting the operation.

- In cold weather, do not touch metal surfaces with your bare hands. If you touch a metal surface in extremely cold weather, your skin may freeze to the metal surface.



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2.3 CRUSHER (CRUSHING) OPERATIONS

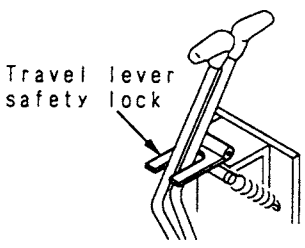
BASIC OPERATION 1: SURROUNDING CHECK

- As a safety measure for the surroundings, install screens around the machine beforehand.
- Crusher workers must wear protective glasses and a dust-proof mask as well as a helmet.

AW513200

BASIC OPERATION 2: SETTING TRAVEL LOCK SWITCH TO ON POSITION

- Set the travel lever safety lock to the LOCK position.
- After setting travel lock switch ① to the ON position, turn on the crusher motor switch.



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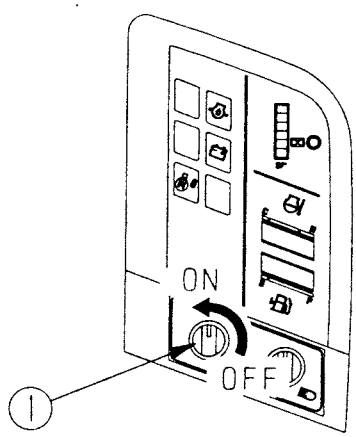
Monitor



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BASIC OPERATION 3: JOINT AND SAFE OPERATION WITH A HYDRAULIC EXCAVATOR

- The BR500JG operator must jointly operate together with a loader and hydraulic excavator. Perform safe operations by giving mutual signals and observing the following rules.

  ① The hydraulic excavator operator should arrange the machine in a position from which incidental workers in the hopper and the sorting worker at the belt conveyer can be seen. (Refer to the figure.)

  ② The BR500JG operator should stand in a position from which the bucket of the hydraulic excavator and the operator can be seen.
  The next loading operation should be started with the BR500JG operator's signal.

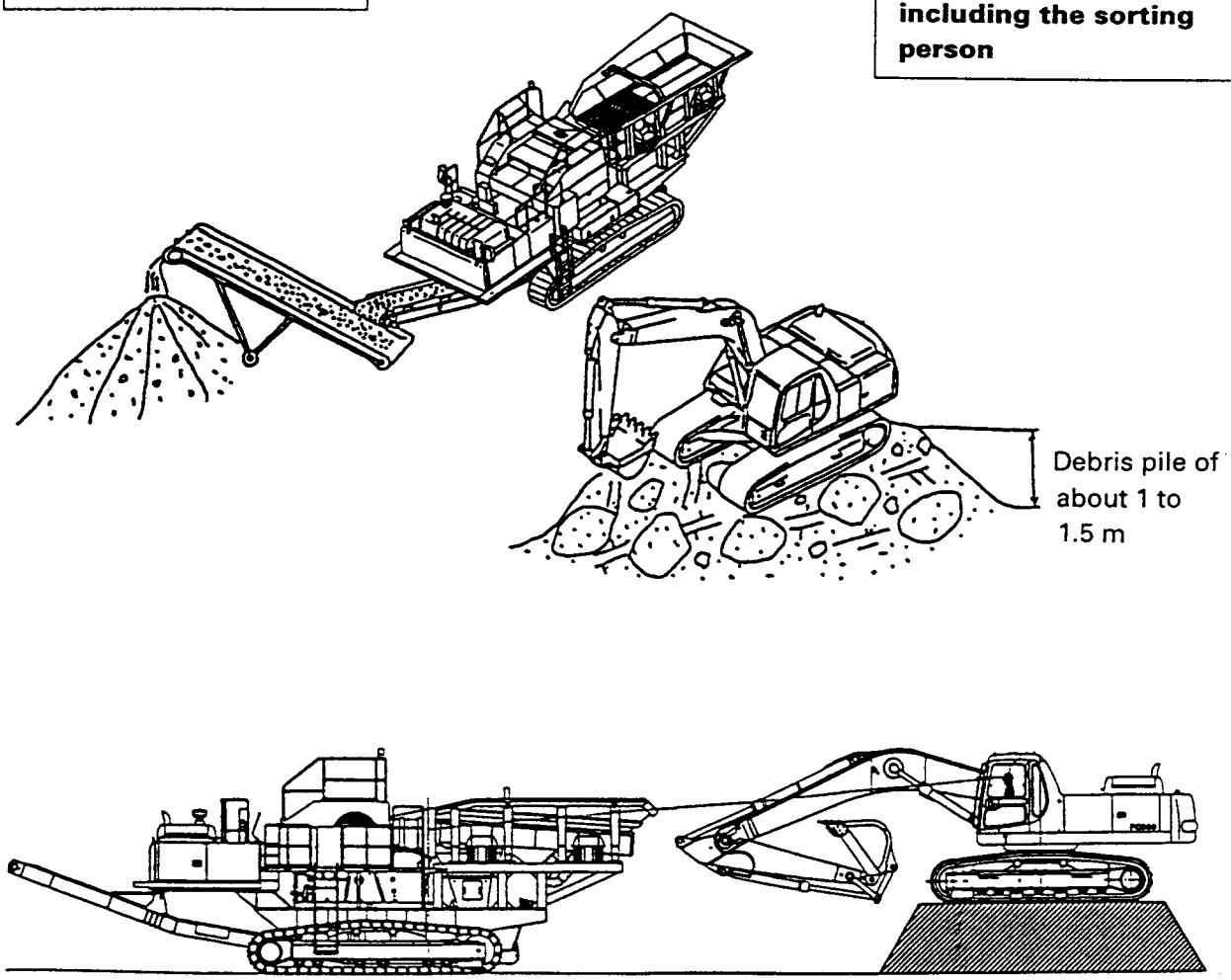
  (Refer to the figure shown on the next page.)

⚠ CAUTION

The operator should not stay riding on the BR500JG during its operation.

⚠ CAUTION

The debris loader operator must work at a position where he/she can see all workers including the sorting person



BASIC OPRATION 4:
INSPECT CRUSHER BEFORE STARTING OPERATIONS

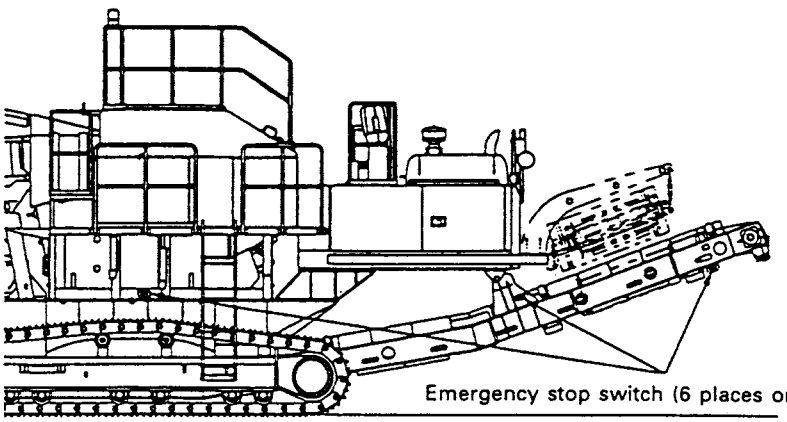
Before starting crusher operations, check the following points to confirm that there is no abnormality.

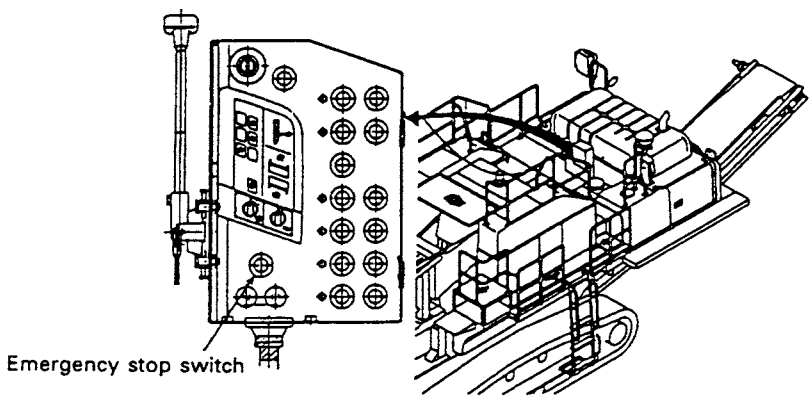
- Check that there is no debris inside the hopper or crusher.
- Check that there are no broken pieces or plastic caught in the clearance of the hopper and cutter. Remove any such material.
- Check that all the bolts are properly tightened.
  In particular, check the crusher mounting bolts and cutter mounting bolts carefully.
- Check that the hopper door is securely closed.
- Check that there are no cracks or deformation in the chassis frame or cutter.

BASIC OPRATION 5: DANGER AVOIDANCE DURING CRUSHING WORK (EMERGENCY STOP)

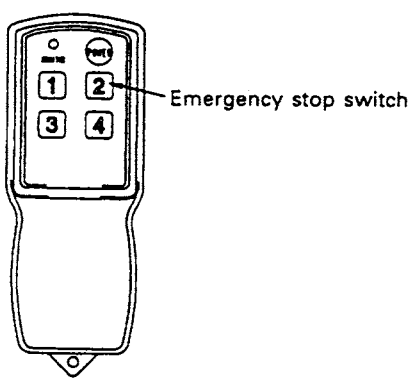
- Do not let any person near the machine during operations. There is danger of injury from flying pieces of crushed rock.
- Do not put your face over the hopper when the crusher is running.
- It is prohibited to push the debris jammed at the hopper inlet with a bar or breaker. There is risk that they may be sucked into the crusher together with the debris. When working around the hopper, stop the crusher and the engine.
- When feeling that the machine is abnormal or that you are going to face any danger during the crushing work, press the emergency stop switch immediately to stop all the work equipment.

Emergency Stop Switch Position





Machine monitor panel



Radio control

WHEN INSPCTING AND CLEANING CONVEYOR

STOP THE CONVEYOR

- During inspection and cleaning of the conveyor and the periphery, you are in danger of being caught in the rotating section. So, be sure to stop the conveyor before inspection and cleaning.

2.4 BATTERY

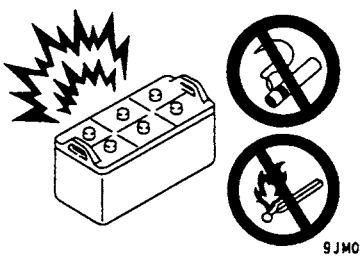
BATTERY HAZARD PREVENTION

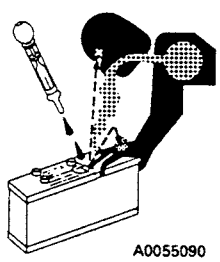
Battery electrolyte contains sulphuric acid, and batteries generate flammable hydrogen gas, which may explode. Mistaken handling can lead to serious injury or fire. For this reason, always observe the following precautions.

- Do not use or charge the battery if the battery electrolyte level is below the LOWER LEVEL line. This may cause an explosion. Always check the battery electrolyte level periodically and add distilled water to bring the electrolyte level to the UPPER LEVEL line.
- When working with batteries, always wear safety glasses and rubber gloves.
- Never smoke or use any flame near the battery.
- If you spill acid on your clothes or skin, immediately flush the area with large amounts of water.
- If acid gets into your eyes, flush them immediately with large quantities of water and seek medical attention.
- Before working with batteries, turn the starting switch to the OFF position.

As there is a hazard that sparks will be generated, always do as follows.

- Do not let tools or other metal objects make any contact between the battery terminals. Do not leave tools or other metal objects lying around near the battery.
- Always disconnect the negative (–) terminal (ground side) first when removing the battery; when installing the battery, connect the positive (+) terminal first, and connect the ground last. Tighten the battery terminals securely.
- Flammable hydrogen gas is generated when the battery is charged, so remove the battery from the chassis, take it to a well-ventilated place, and remove the battery caps before charging it.
- Tighten the battery caps securely.
- Install the battery securely to the determined place.

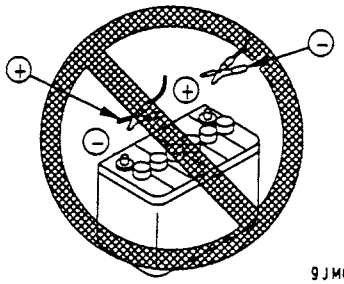




STARTING ENGINE WITH BOOSTER CABLES

If any mistake is made in the method of connecting the booster cables, it may cause the battery to explode, so always do as follows.

- When starting with a booster cable, carry out the starting operation with two workers (one worker sitting in the operator's seat and the other working with the battery).
- When starting from another machine, do not allow the two machines to touch.
- When connecting the booster cables, turn the starting switch OFF for both the normal machine and problem machine. There is a hazard that the machine will move when the power is connected.
- Be sure to connect the positive (+) cable first when installing the booster cables. Disconnect the ground or negative (–) cable (ground side) first when removing them.
- When removing the booster cables, be careful not to let the booster cable clips touch each other or to let the clips touch the machine.
- Always wear safety goggles and rubber gloves when starting the engine with booster cables.
- When connecting a normal machine to a problem machine with booster cables, always use a normal machine with the same battery voltage as the problem machine.
- For details of the starting procedure when using booster cables, see Starting Engine With Booster Cables (PAGE 2-58) in the OPERATION section.



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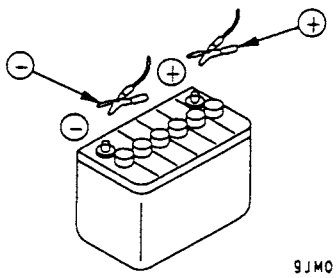

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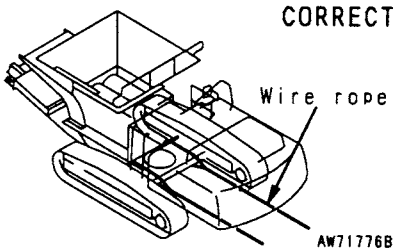
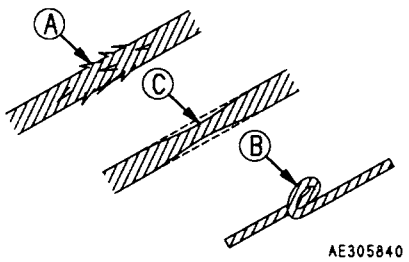
2.5 TOWING

SAFETY RULES FOR TOWING

Serious injury or death could result if a disabled machine is towed incorrectly or if there is a mistake in the selection or inspection of the wire rope.
When towing, always use the method given in the section "6.2 METHOD OF TOWING MACHINE".

- Always wear leather gloves when handling wire rope.
- Fix the wire rope to the track frame.
- During the towing operation, never stand between the towing machine and the machine being towed.
- Never tow a machine on a slope.
- When carrying out the preparation for towing with another worker, agree on signals before starting the operation.
- It is dangerous to tow a machine on a slope, so choose a place where there is a gradual slope. If there is no place with a gradual slope, carry out work to make the slope as small as possible.
- If a problem machine is towed by another machine, ALWAYS use a wire rope with a sufficient towing capacity for the weight of the problem machine.
- Never use a wire rope which has cut strands Ⓐ, reduced diameter Ⓑ, or kinks Ⓒ. There is danger that the rope may break during the towing operation.



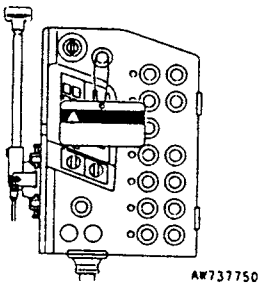


3. PRECAUTIONS FOR MAINTENANCE

⚠ WARNING: For reasons of safety, always follow these safety precautions.

WARNING TAG

- If others start the engine or operate the controls while you are performing service or lubrication, you could suffer serious injury or death.
- ALWAYS attach the WARNING TAG to the control panel to alert others that you are working on the machine. Attach additional warning tags around the machine, if necessary.
- These tags are available form your Komatsu distributor. (Part No.09963-03000)

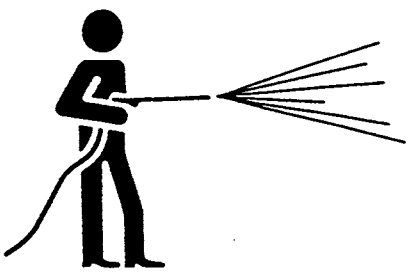


PERSONNEL

- Only authorized personnel can service and repair the machine. Extra precaution should be used when grinding, welding, and using a sledge-hammer.

KEEP THE MACHINE CLEAN

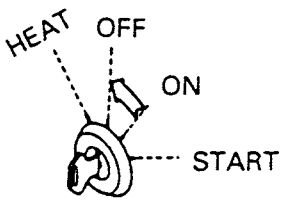
- Spilled oil or grease, or scattered tools or broken pieces are dangerous because they may cause you to slip or trip. Always keep your machine clean and tidy.
- If water gets into the electrical system, there is danger that the machine may not move or may move unexpectedly.
  Do not use water or steam to clean the sensors, connectors, or the inside of the operator's compartment.



STOP THE ENGINE BEFORE CARRYING OUT INSPECTION AND MAINTENANCE

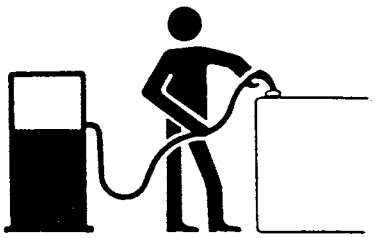
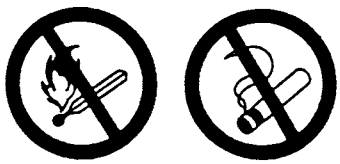
Before carrying out inspection and maintenance, always stop the machine on firm flat ground where there is no danger of falling rocks, landslides, or floods, set the travel lock switch to the ON position and stop the engine.

- If it is necessary to run the engine when carrying out maintenance, such as when cleaning the inside of the radiator, place the safety lock lever at the LOCK position and carry out the operation with two workers.
- One worker should sit in the operator's seat so that he can stop the engine immediately if necessary. He should also be extremely careful not to touch any lever by mistake. Touch the levers only when they have to be operated.
- The worker carrying out the maintenance should be extremely careful not to touch or get caught in the moving parts.



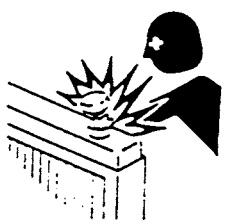
RULES TO FOLLOW WHEN ADDING FUEL OR OIL

- Spilled fuel and oil may cause you to slip, so always wipe it up immediately.
- Always tighten the cap of the fuel and oil fillers securely.
- Never use fuel for washing any parts.
- Always add fuel and oil in a well-ventilated place.

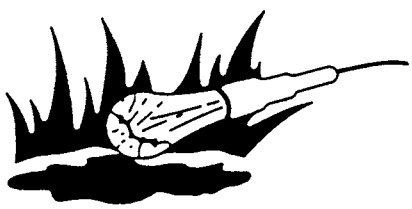
RADIATOR WATER LEVEL

- If it is necessary to add water to the radiator, stop the engine and allow the engine and radiator to cool down before adding the water.
- Slowly loosen the caps to relieve pressure before removing the caps.



USE OF LIGHTING

- When checking fuel, oil, coolant, or battery electrolyte, always use lighting with anti-explosion specifications.
  If such lighting equipment is not used, there is danger of explosion.



PRECAUTIONS WITH BATTERY

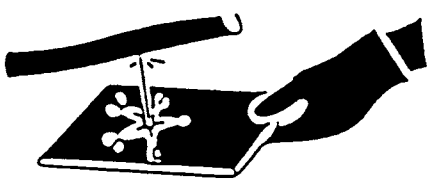
- When repairing the electrical system or when carrying out electrical welding, remove the negative (–) terminal of the battery to stop the flow of current.

HANDLING HIGH-PRESSURE HOSES

- Do not bend high-pressure hoses or hit them with hard objects. Do not use any bent or cracked piping, tubes or hoses. They may burst during use.
- Always repair any loose or broken fuel hoses or oil hoses. If fuel or oil leaks, it may cause a fire.

PRECAUTIONS WITH HIGH PRESSURE OIL

- Do not forget that the work equipment circuits are always under pressure.
- Do not add oil, drain oil, or carry out maintenance or inspection before completely releasing the internal pressure.
- If oil is leaking under high pressure from small holes, it is dangerous if the jet of high-pressure oil hits your skin or enter your eyes. Always wear safety glasses and thick gloves, and use a piece of cardboard or a sheet of wood to check for oil leakage.
- If you are hit by a jet of high-pressure oil, consult a doctor immediately for medical attention.



PRECAUTIONS WHEN CARRYING OUT MAINTENANCE AT HIGH TEMPERATURE OR HIGH PRESSURE

- Immediately after stopping operations, the engine cooling water and oil at all parts is at high temperature and under high pressure.
  In this condition, if the cap is removed, or the oil or water are drained, or the filters are replaced. this may result in burns or other injury. Wait for the temperature to go down, then carry out the inspection and maintenance in accordance with the procedures given in this manual.

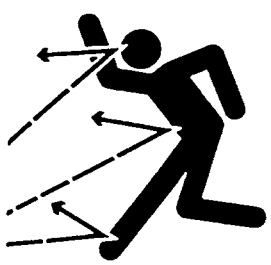
  Cleaning inside or cooling system → See "WHEN REQUIRED".
  Checking cooling water level, hydraulic oil level → See "CHECK BEFORE STARTING".
  Checking lubricating oil level, adding oil → See "PERIODIC MAINTENANCE".
  Changing oil, replacing filters → See "PERIODIC MAINTENANCE".

PRECAUTIONS WHEN USING HIGH PRESSURE GREASE TO ADJUST TRACK TENSION

Grease is pumped into the track tension adjustment system under high pressure.
If the specified procedure for maintenance is not followed when making adjustments, the plug or grease fitting may fly out and cause damage or personal injury.

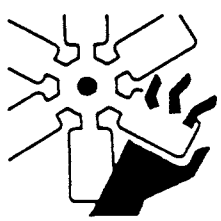
- When loosening the grease drain plug, never loosen it more than one turn.
- Never put your face, hands, feet, or any other part of your body directly in front of any grease drain plug or valve.

Adjusting track tension → See "WHEN REQUIRED".



ROTATING FAN AND BELT

- Keep away from rotating parts and be careful not to let anything get caught in them.
- If your body or tools touch the fan blades or fan belt, they may be cut off or sent flying, so never touch any rotating parts.



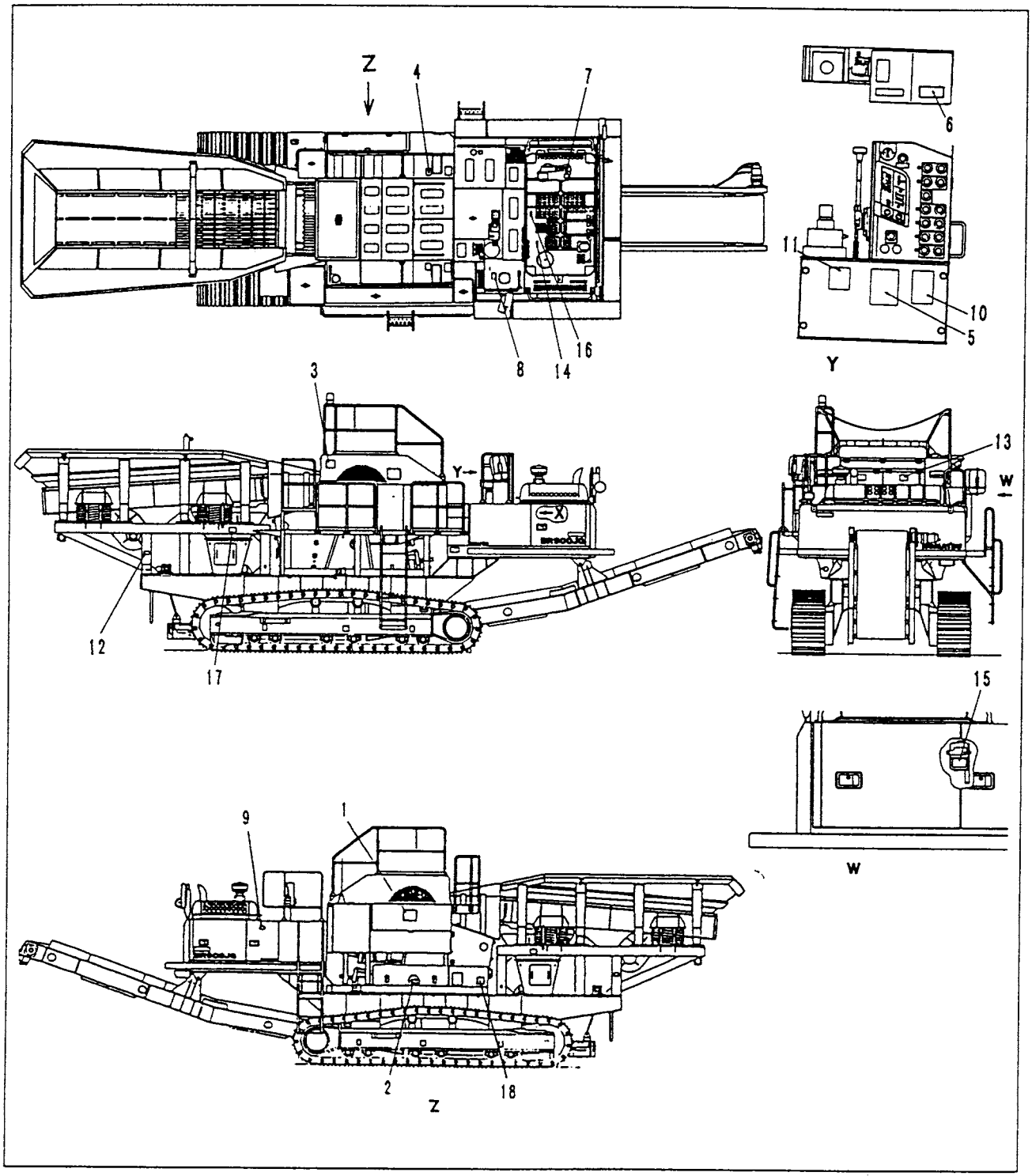
4. POSITION FOR ATTACHING SAFETY LABELS

Always keep these labels clean. If they are lost or damage, attach them again or replace them with a new label.

There are other labels in addition to the safety listed as follow, so handle them in the same way.

Safety labels may be available in languages other than English. To find out labels are available, contact your Komatsu distributor.

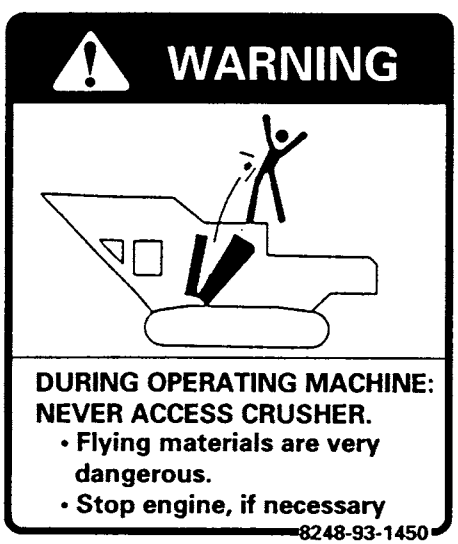
POSITION FOR ATTACHING SAFETY LABELS



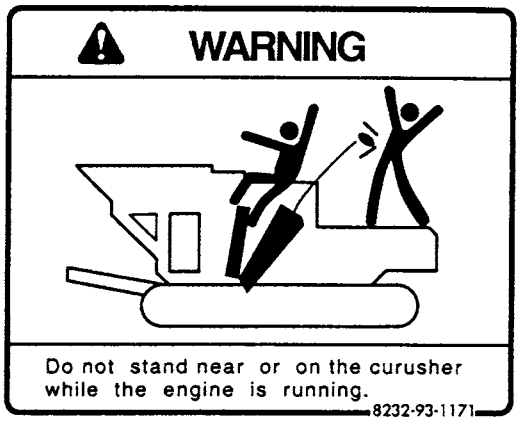
1. Danger for off limit area (8248-93-1471)

2. Danger for the plate (09963-03000)

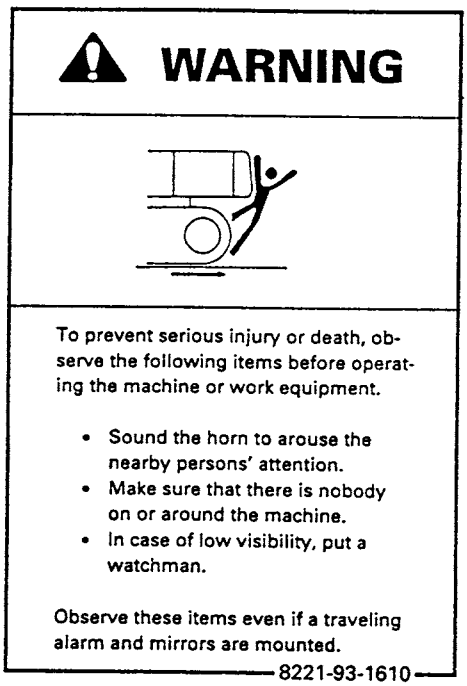
3. Warnig for the flying materials (8248-93-1450)



4. Warning for checking crusher (8232-93-1171)



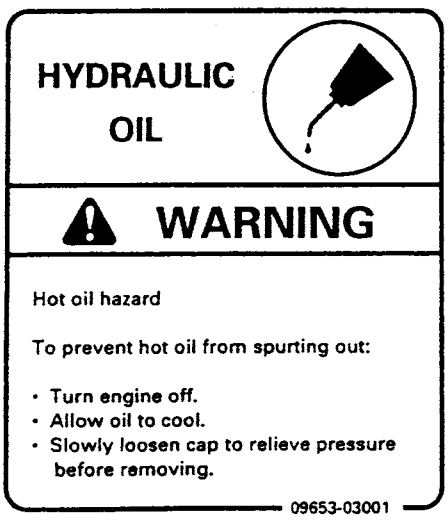
5. Warning for operation (8221-93-1610)



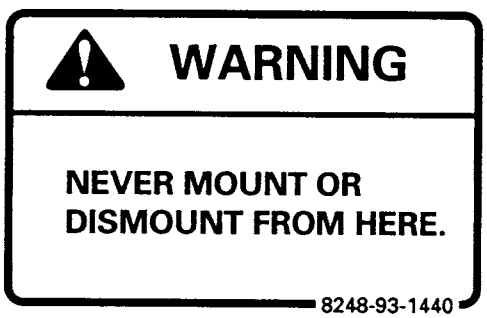
6. Warning for the travel lever (8229-93-1510)

7. Warning for the radiator cap (09668-03001)

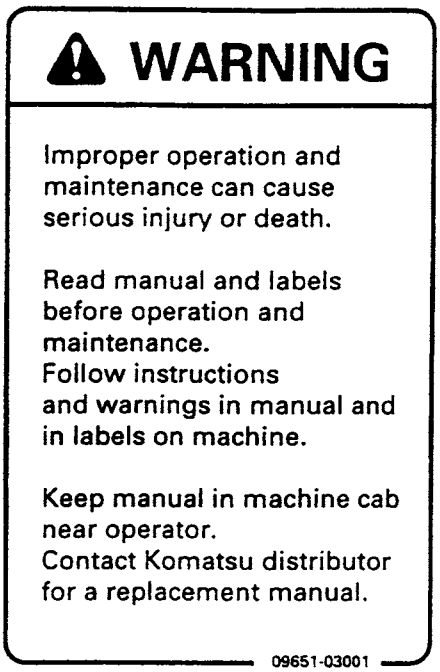
8. Warning for hot oil (09653-03001)



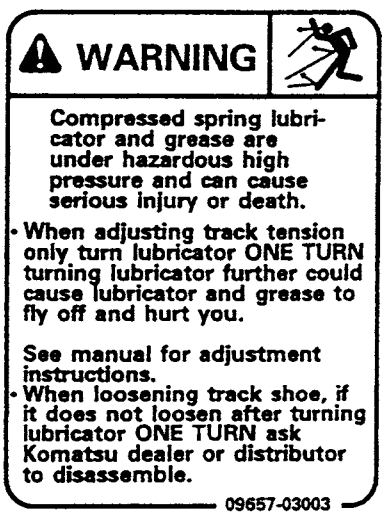
9. Warning for mounting or diamounting (8248-93-1440)



10. Warning for operation, inspection and maintenance (09651-03001)



11. Warning when adjusting track tension (09657-03003)



12. Caution for grizzly truck access (8242-93-1520)

13. Caution for crusher cover (8248-93-1650)

CAUTION

OBSERVE FOLLOWING PRECAUTIONS WHEN RUNNING ENGINE:

1. Never open cover.
2. Never enter inside of machine.

8248-93-1650

14. Caution for engine cover (09667-03001)

CAUTION

The followings must be observed while the engine is running.

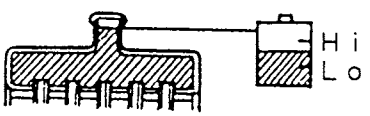
1. Do not open the engine cover.
2. Do not access the fan and fan belt.

09667-03001

15. Caution for radiator sub-tank (09650-30104)

CAUTION

- Prior to the daily operation, make sure that the coolant level is between the Hi-Lo scale.
- After the coolant is replacement is commplete, idle the engine for 5 to 10 minutes. Then make sure that the coolant level is between the Hi-Lo scale.



09650-30104

16. Notice for hood (20Y-00-21370)

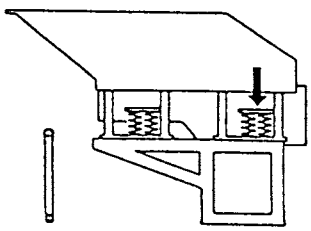
NOTICE

Do not mount or sit on this hood

20Y-11-21370

17. Notice for grizzly truck transportation (8242-93-1520)

NOTICE



8242-93-1530

18. Caution for food (09805-13000)

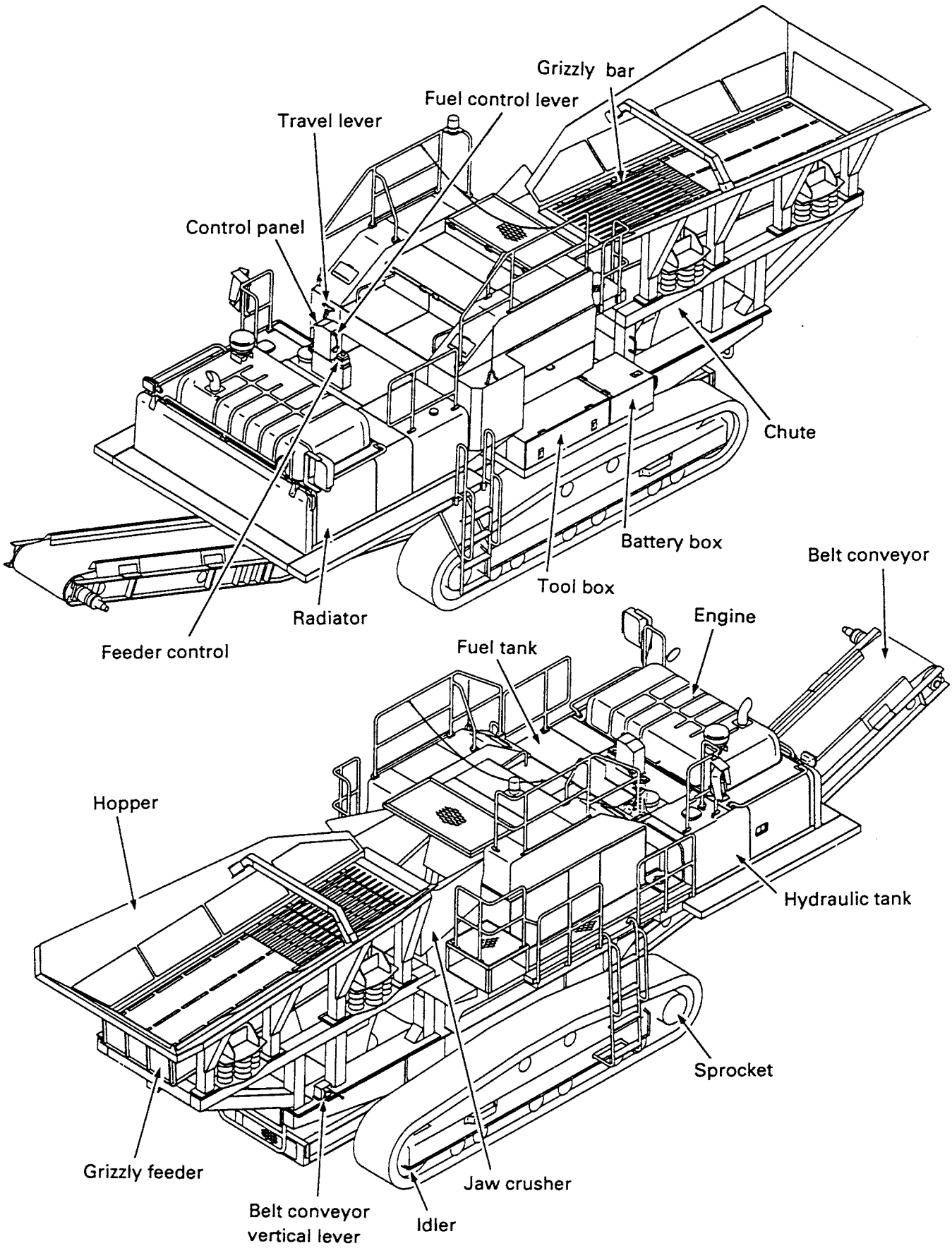
CAUTION

NEVER be on this hood.

09805-13000

OPERATION

1. GENERAL VIEW

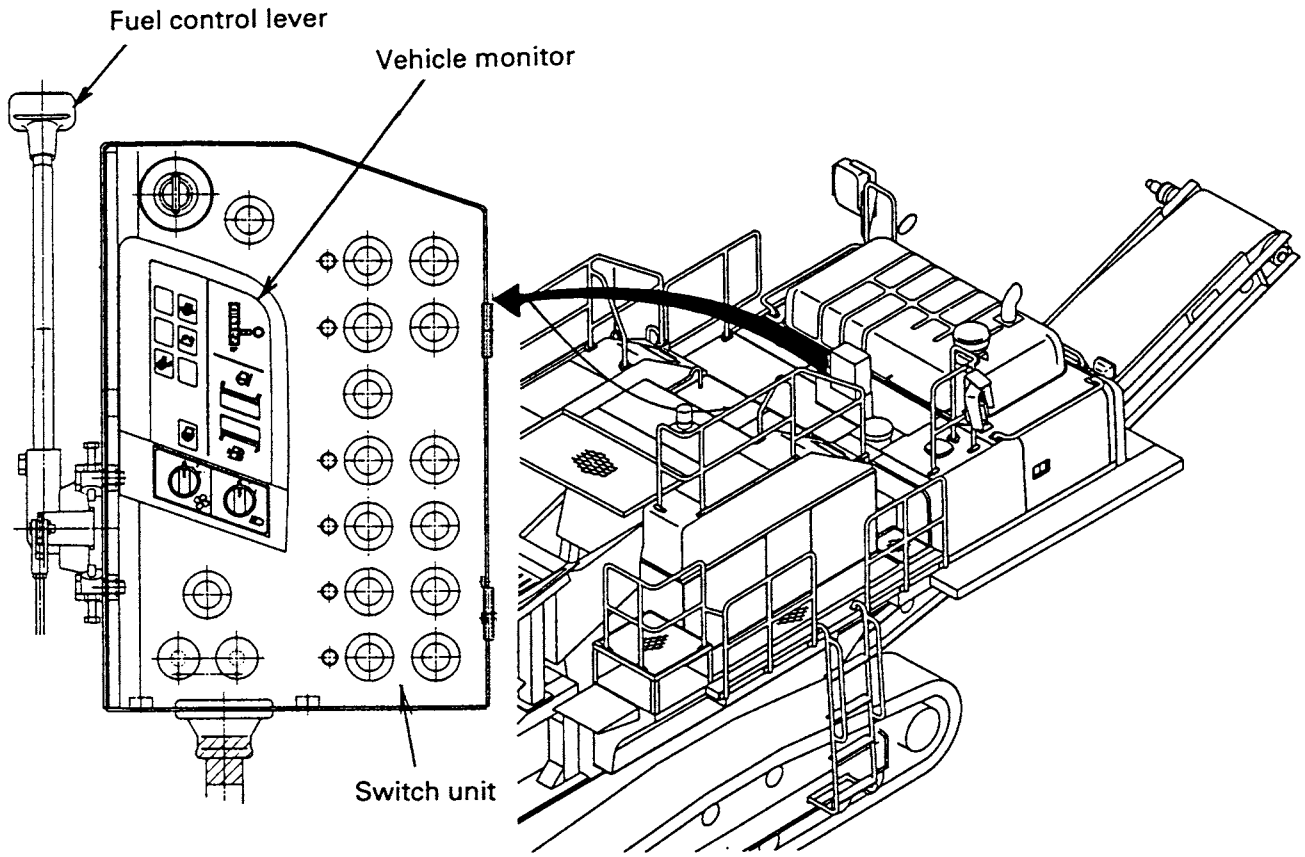


2. EXPLANATION OF INSTRUMENTS

The instruments must be fully understood by the operator to perform safe and satisfactory operations.

2.1 VEHICLE MONITORING SYSTEM

The vehicle monitoring system consists of a monitor unit, meter unit and switch unit.



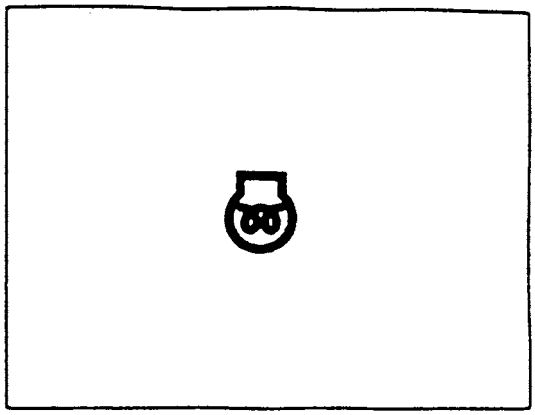
■ Operation checks in the vehicle monitoring system

- When the starting switch is set in the ON position before starting the engine, all the monitors and meters light for about 3 seconds and the alarm buzzer will sound.

  If they do not light on, any monitor may has burnt out or any wire may has been broken. Ask your Komatsu distributor for inspection.
- Be sure to check the vehicle by the vehicle monitoring system at intervals of 1 or 2 hours during operation.

NOTICE:
Make the check before starting not only by monitoring the system but also referring to the Inspection and Maintenance or "13. Operating Procedures."

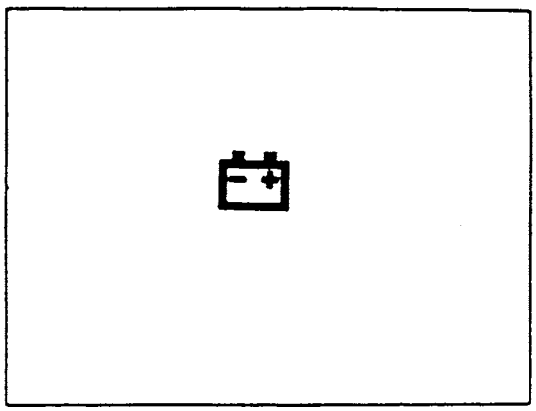
① Preheating monitor
The preheating monitor indicates the preheating time when the engine is started at a temperature below 0°C.
When the starting switch is set in the HEAT position, the monitor comes on and flickers for about 30 seconds to indicate that preheating has been completed.
(The flickering status ends in about 10 seconds.)



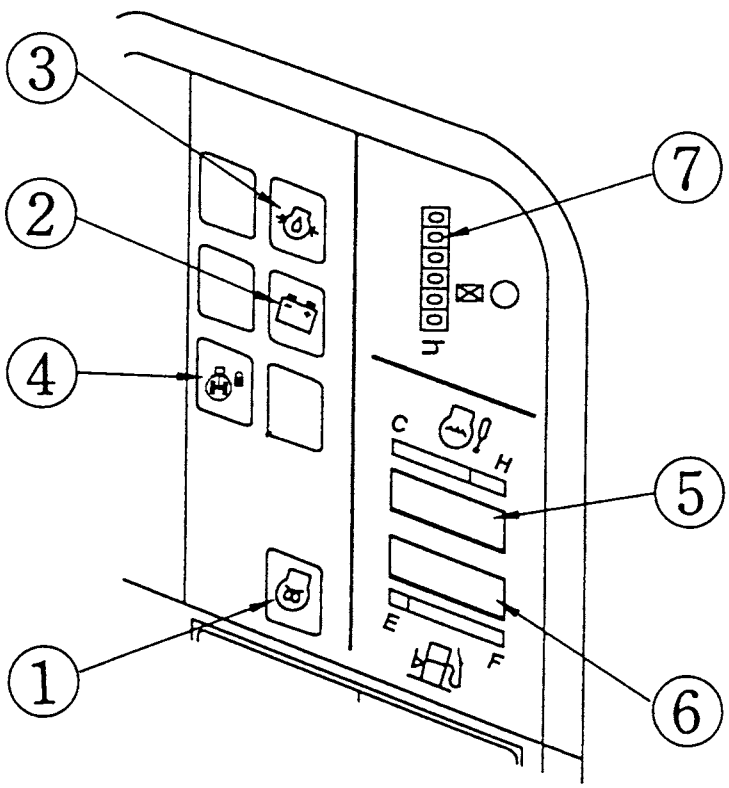
② Charging level monitor
The charging monitor indicates any abnormality of the charging system while the engine rotates. When the monitor flickers and buzzes intermittently, check the charging circuit.

⚠ CAUTION

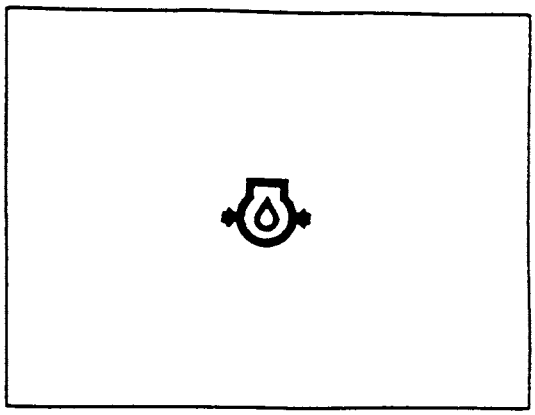
When the warning monitor flickers and buzzes intermittently, take a proper measure as soon as possible.



REMARKS:
With the starting switch ON, this monitor may flicker momentarily when the engine is started or stopped. This is not abnormal.



③ Engine oil pressure monitor
The engine oil pressure monitor warns that the pressure of the engine lubricant has lowered. When this monitor flickers and buzzes intermittently, check the engine.



⚠ CAUTION

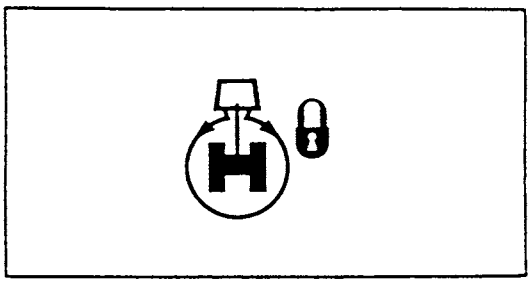
When the monitor flickers and buzzes intermittently, stop the engine or idle it at a low speed at once and take a proper measure.

⚠ CAUTION

While the engine is at a stop, check if monitors ② and ③ light for about 3 seconds when setting the starting switch in the ON position. If they do not light, ask your Komatsu distributor for inspection.

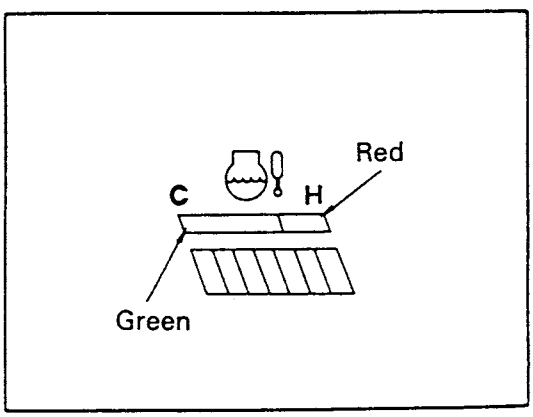
REMARKS:
Withe the starting switch ON, this monitor may flicker momentarily when the engine is started or stopped. This is not abnormal.

④ Travel lock monitor
The travel lock monitor informs the operator that the travel lock is actuated.
Actuated status: ON



⑤ Engine water temperature gauge
The engine water temperature gauge indicates the temperature of engine cooling water.

If its green range lights while the engine is in operation, this is normal. If its red range comes on and buzzes intermittently while the engine is in operation, stop the operation and idle the engine at a low speed, then wait until the green range comes on.

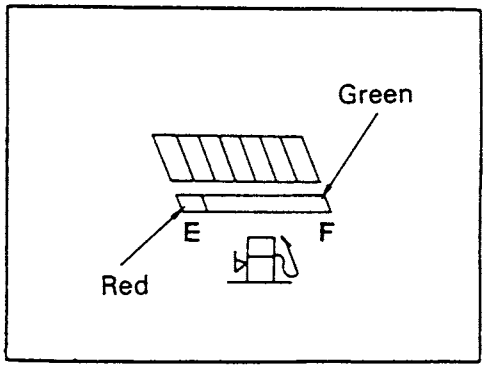


⚠ CAUTION

Make a check at a 2 hours' interval during operation.

⑥ Fuel gauge

The fuel gauge indicates the fuel level in the tank.
If its green range lights while the engine is in operation, this is normal.
If only its red range comes on while the engine is in operation, this indicates that the quantity of fuel is 14 litre or less. Make a check and replenish fuel.

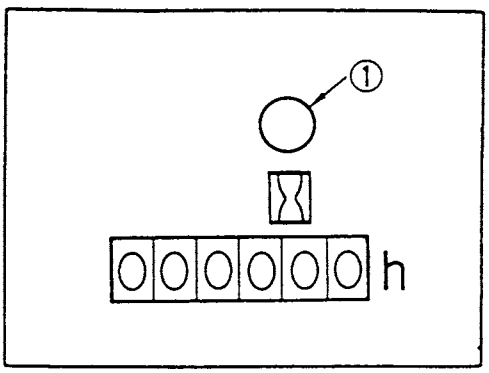


⚠ CAUTION

While the engine is at a stop, check if monitors ① and ② light for about 3 seconds when the starting switch is set in the ON position. If they do not light, ask your Komatsu distributor for inspection.

⑦ Service meter

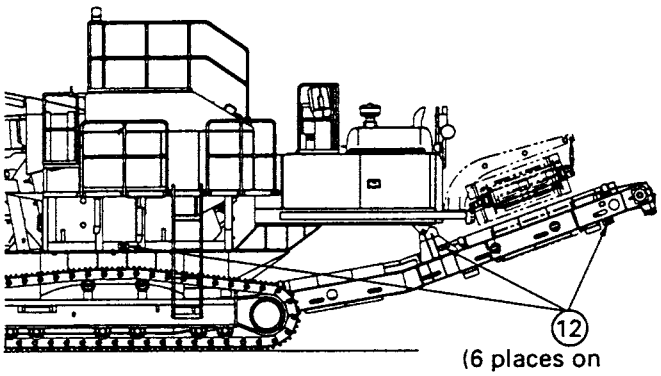
The service meter is the total operation time of the vehicle.
When the engine rotates, the service meter advances even if the vehicle does not move.

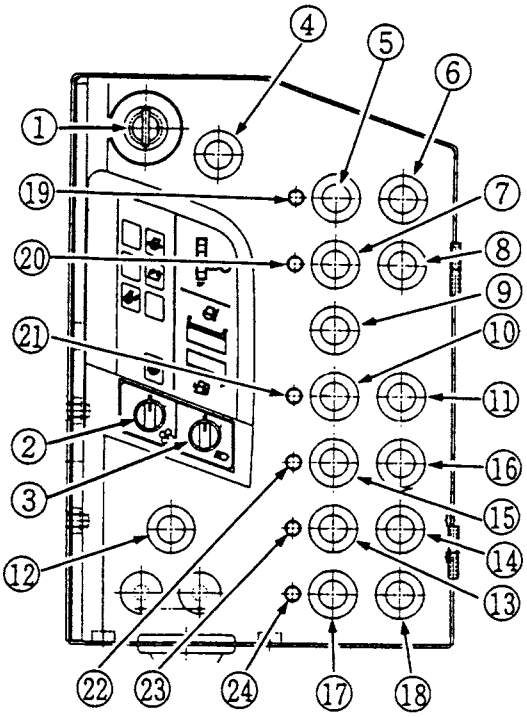


REMARKS:

- While the engine rotates, the operation indicator① in the upper part of the meter lights, indicating that the meter advances.
- When the engine has been operated for one hour, the meter is incremented by 1 regardless of engine rotation.

2.2 SWITCH UNIT





① Starting switch

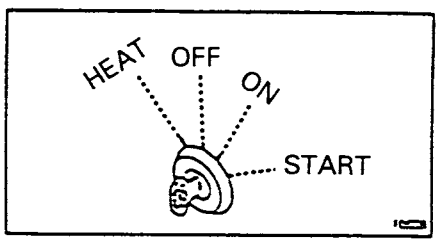
The starting switch starts the engine.

OFF: Permits the key to be inserted or pulled out, and turns off the all the switches in the electric system.

ON: Causes electric power to flow to the charging circuit and lamp circuit.

START: Engine starting position. Once the engine is started, release the switch.

HEAT: By setting the starting switch in this position, the intake of the engine is warmed to facilitate a start of the engine.
When the switch is released, it will return to the OFF position. Then, set it in the START position at once.

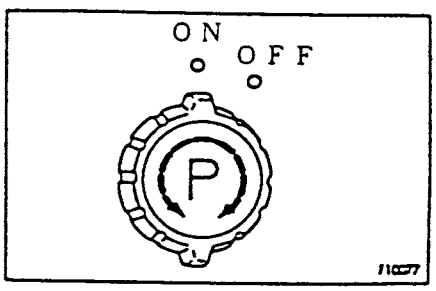


② Travel lock switch

This switch actuates the travel lock.

ON position (actuated): The travel lock is actuated at all times. In this condition, the vehicle cannot be moved if travelling operations are performed.

OFF position (released): The travel lock is released and traveling (re leased) operations are enabled.

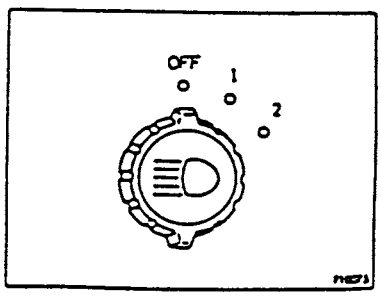


③ Lamp switch

This causes the head lamp and instrument panel lamp to come on.

Position 1: The instrument panel lamp comes on.

Position 2: The head lamp comes on.



④ Horn switch
Always press this to give a warning when starting the engine.

⑤ Conveyor start switch
This operates the conveyor and lamp ⑲ lights up.

⑥ Conveyor stop switch
This stops the conveyor and lamp ⑲ goes out.

⑦ Crusher start switch
This operates the crusher and lamp ⑳ lights up.

⑧ Crusher stop switch
This stops the crusher and lamp ⑳ goes out.

⑨ Crusher reversing switch
When the crusher outlet port becomes clogged, if this switch is pressed after stopping the crusher, it is possible to remove the blockage easily. The crusher is actuated while the switch is being pressed, and it stops when the switch is released.

⑩ Feeder start switch
This operates the feeder and lamp ㉑ lights up.

⑪ Feeder stop switch
This stops the feeder and lamp ㉑ goes out.

⑫ Emergency stop switch
When the switch is pressed, the buzzer sounds and all operations stop.

⑬ Magnetic separator start switch (option)
This operates the magnetic separator and lamp ㉓ lights up.

⑭ Magnetic separator stop switch (option)
This stops the magnetic separator and lamp ㉓ goes out.

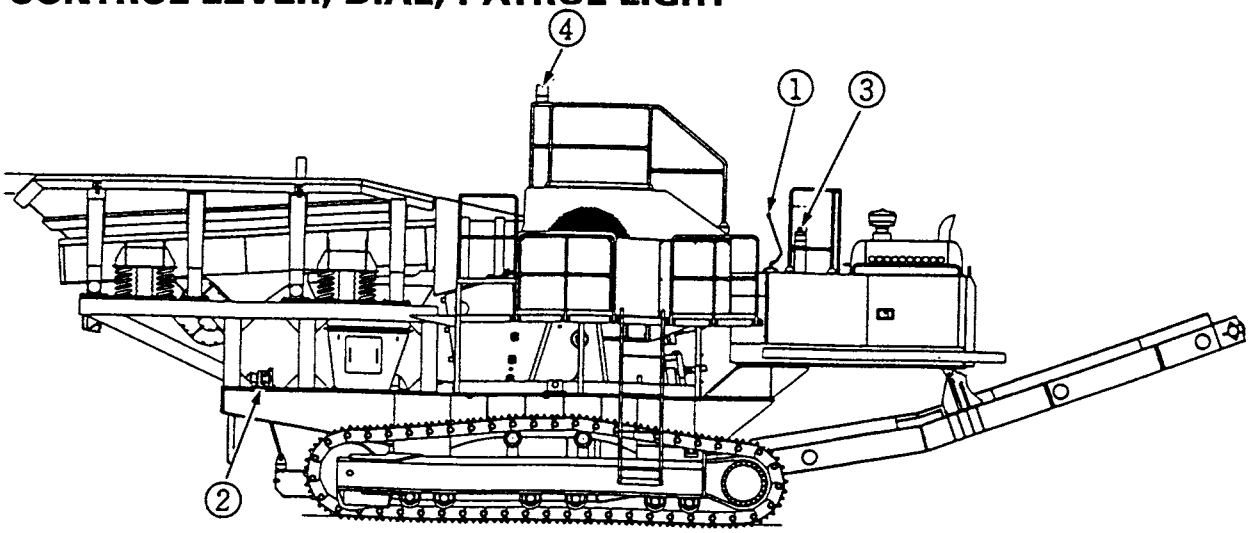
⑮ Muck discharge conveyor start switch (Option)
This operates the muck discharge conveyor and the lamp ㉒ lights up.

⑯ Much discharge conveyor stop switch (Option)
This stops the muck discharge conveyor and the lamp ㉒ goes out.

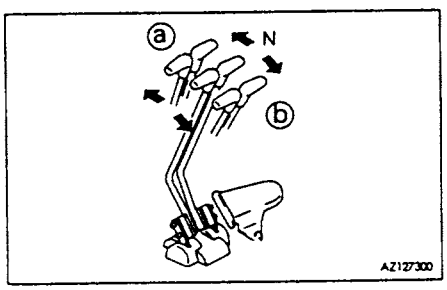
⑰ Option start switch

⑱ Option stop switch

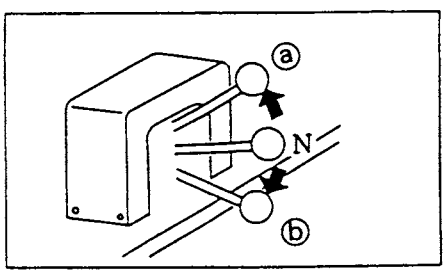
2.3 CONTROL LEVER, DIAL, PATROL LIGHT



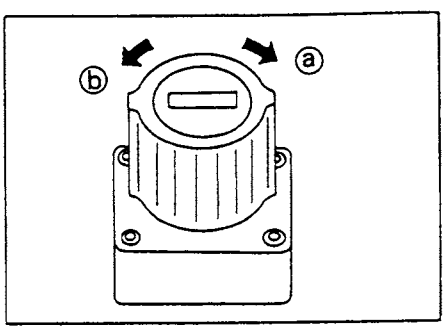
① Travel lever
(a) Conveyor travel:
The position where the lever is pushed forward to.
(b) Hopper travel:
The position where the lever is pulled this side.
N Neutral: The machine stops.



Supplementary Explanation :
Travel Alarm
When the lever is set from the neutral position to the forward or reverse position, the alarm will sound to inform people around that the machine starts moving.



② Conveyor Up/Down lever
(a) Conveyor Up:
The position where the lever is set up.
(b) Conveyor Down:
The position where the lever is set down.
N Neutral: The conveyor stops.



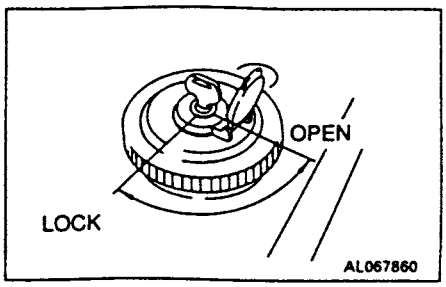
③ Feeder control dial
(a) Feeder vibration increase: The dial is turned right.
(b) Feeder vibration decrease: The dial is turned left.

④ Patrol light
- When the coneyor is raised, the the patrol light will light up (during travel).
(At the time, all work equipment do not operate.)

2.4 CAP AND COVER WITH LOCK

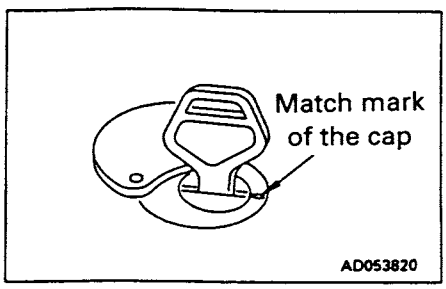
A lock is provided to each of the fuel tank oil filler, operator cab, engine hood, battery box cover, right side door and left side door of the machine. The cap is opened and closed by using the starting switch.

How to open and close the lock with a cap (At the oil filler of the fuel tank)

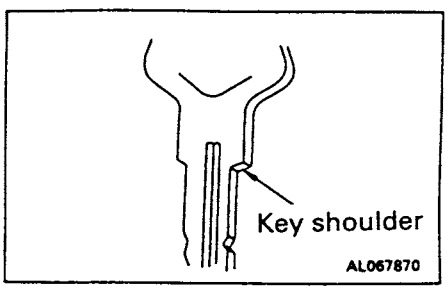


■ For opening
[1] Insert the key
[2] Turn the key clockwise and adjust the rotor groove to the match marks of the cap. Then, the cap can be opened.

■ For locking
[1] Screw the cap in.
[2] Turn the key and pull it out.



After surely inserting the key up to its shoulder, operate it. If the key is operated halfway, it may be broken.



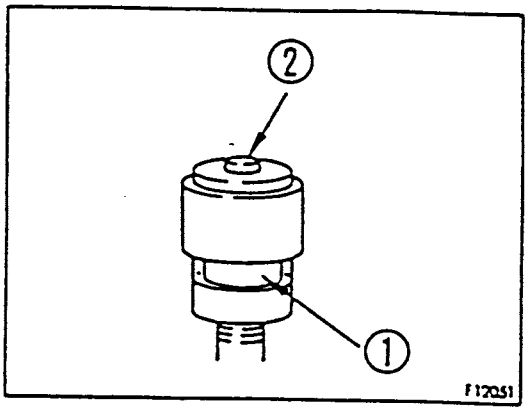
How to open and close the lock with a cover (For a cover with lock)

■ For opening (When locked)
[1] Insert the key
[2] Turn the key counterclockwise and pull the handle. Then, the cover can be opened.

■ For locking
[1] Close the cover and insert the key.
[2] Turn the key clockwise and pull it out.

2.5 DUST INDICATOR

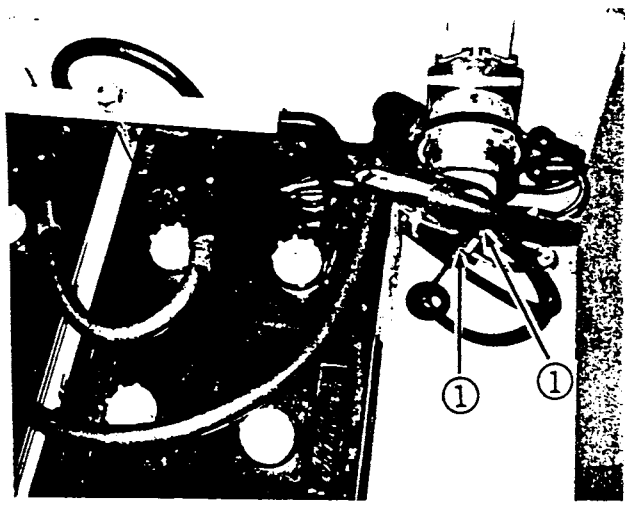
The dust indicator informs the operator of the clogging that has occurred in the element of the air cleaner.
When clogging occurs in the element, the red piston in transparent portion ① is kept in protruded status. Then clean the element at once.
After cleaning the element, press indicator button ② to return the red piston to its original status.
The dust indicator is provided on the engine side of the air cleaner pipe in the engine hood.



2.6 FUSIBLE LINK

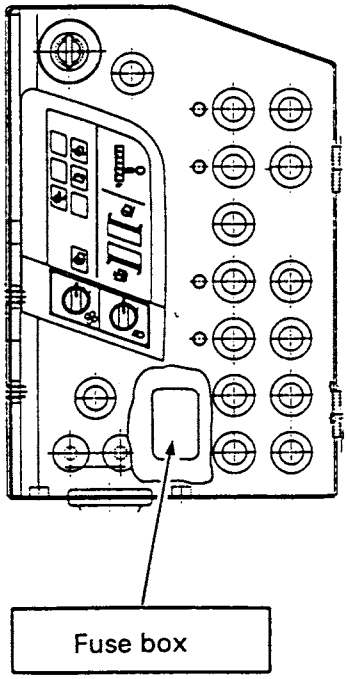
In case the power cannot be turned on by setting the starting switch in the ON position, this is attributable to wire breaking of the fusible link. Check and replace it.

Fusible link ①: Starting circuit
Body power source



REMARKS:
Fusible Link is a large fuse to be fitted in the circuit through which a large amount of current flows. The fuse link, like ordinary fuse, protects electric accessories and wiring against burning due to excess current.

2.7 FUSE



(Backside of control box)

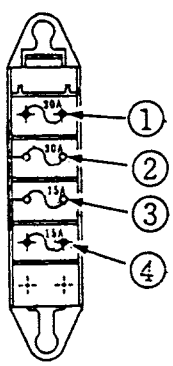
■ Fuse box

NOTICE:
Before replacing the fuse, be sure to turn off the power source (setting the starting switch in the off position)

This protects electrical equipment and wiring from burn-out. If white powder is produced by corroded fuse or any looseness is found between the fuse holder and the fuse, replace the fuse.

- Replace the fuse with one that has the same capacity.

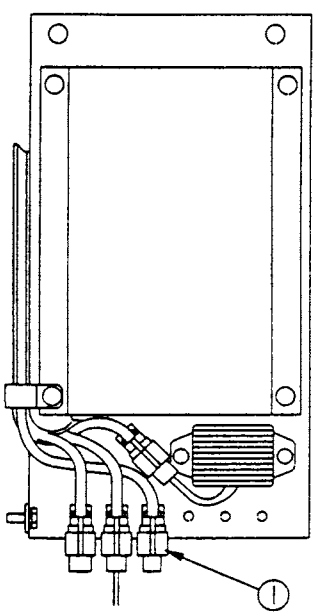
■ Fuse capacity and circuit names



No.	Fuse capacity	Circuit name	Remarks
①	30 A	Spare	
②	30 A	Head lamp, engine electrical equipment, horn, emergency stop switch, operation machine ON switch	
③	15 A	Travel alarm	
④	15 A	Spare	

2.8 ADDITIONAL LAMP CONNECTOR

■ Position and capacity
When adding an extra lamp to aid in maintenance or night operations, use additional lamp connector ① at the bottom of the control panel floor as the power source.
Max. capacity: 120 W



2.9 RADIO CONTROL

SPECIFICATIONS

SPECIFICATION OF TRANSMITTER

1. Transmission Frequency : Any one between 315 and 320 MHz
2. Modulation Techniques : FID (FSK Modulation Techniques)
3. Transmission Output : Very weak radio wave stipulated in the Radio Law
4. Control Method : Digital Cord Method
5. Number of Channels : 4 channels
6. Operation Switch : Pushbutton switch (Momentary) ON/OFF (Common to each channel)
7. Operable Range : 30 m max. (without radio interface and obstacle)
8. Antenna : Built-in antenna
9. Applicable Power Supply : 3 pieces. Unit-4 type dry batteries
10. Continuous Operating Time : 30 hours approx. (with alkaline dry battery)
11. Power Indication : (Green LED) Normal operating voltage (Red LED) Necessity of battery replacement
12. Structure : Drip proof (Conforming to Spray Test R1 of JIS D0203) Vibration proof (Conforming to Class 3 Type A Level 4 of JIS D1601) Shock proof (Conforming to Testing Method 2 of JIS D0912)
13. Operating Temperature Range : –20 – +60°C
14. Storage Temperature Range : –20 – +70°C (except battery)
15. Outside Dimensions : 141 x 55 x 24 mm (except protrusions and strap)
16. Total weight : 140 g approx. (including battery)

SPECIFICATION OF RECEIVER

1. Receiving Frequency : Any one wave between 315 and 320 MHz
2. Receiving Method : Double Space Heterodyne Method
3. Output : Relay type: Resistance load (COSø=0.1) 5 A
   Inductive load (COSø=0.4) 2 A
4. Number of Output Channels: 4 channels
5. Output Circuit : Relay contact output circuit
6. Operating Response Time : 0.2 sec. after switching on in the standby mode
   1.5 sec. when re-operated in 4 sec. approx.
7. Malfunction Preventive Mechanism: Identification of equipment by ID cord (16 bits = 65,536 cords)
8. Antenna : 1/4λ whip antenna (stainless steel rod, 260 mm long)
9. Power Supply Voltage : 9 – 31 V
10. Power Indication : Pilot lamp (red LED)
11. Current consumption : 1.2 A max.
    (150 mA max. at non-receiving (when all relays are switched off)
12. Vibration proof : 6.8 G (Conforming to Class 3 Type B Level 7 of JIS D1601)
13. Shock proof : 20 G (Conforming to Testing Method 2 of JIS D0912)
14. Structure : Dust proof (Conforming to F2 of JIS D0207)
15. Operating Temperature Range : –20 – +60°C
16. Storage Temperature Range : –20 – +70°C
17. Total weight : 370 g approx.

OUTLINE

Applicable Radio Wave

Since a very weak wave (output below the electric field strength stipulated in Article 6 of the Radio Law), no license from and no report to the authorities concerned are required.

Security of Safety

The machine is designed to stop all operations (all relays are out of operation and released) when receiving interference wave or noise.

The machine is also designed not to be operated with any transmitter and receiver other than those being set as the pairs by station code (ID code of each radio unit) even when there is a similar device of the same frequency in the same area.

Operable Range

15 m approx. (when there is not radio interference or obstacle and when the transmitter is directed to the receiver antenna and the receiver antenna is normally installed.)

Continuous Working Time

30 hours approx. (when alkaline dry battery is used)

Operating Method

Operate the machine as follows:

1. Start the engine.
2. Switch on the receiver. The receiver is interlocked to the engine switch when being used constantly.
3. Switch on the transmitter. Even if the switch is kept on when it is not used, the battery does not run out.
4. Stop the feeder and the horn perfectly.
5. Stop the engine and set the key switch to OFF.

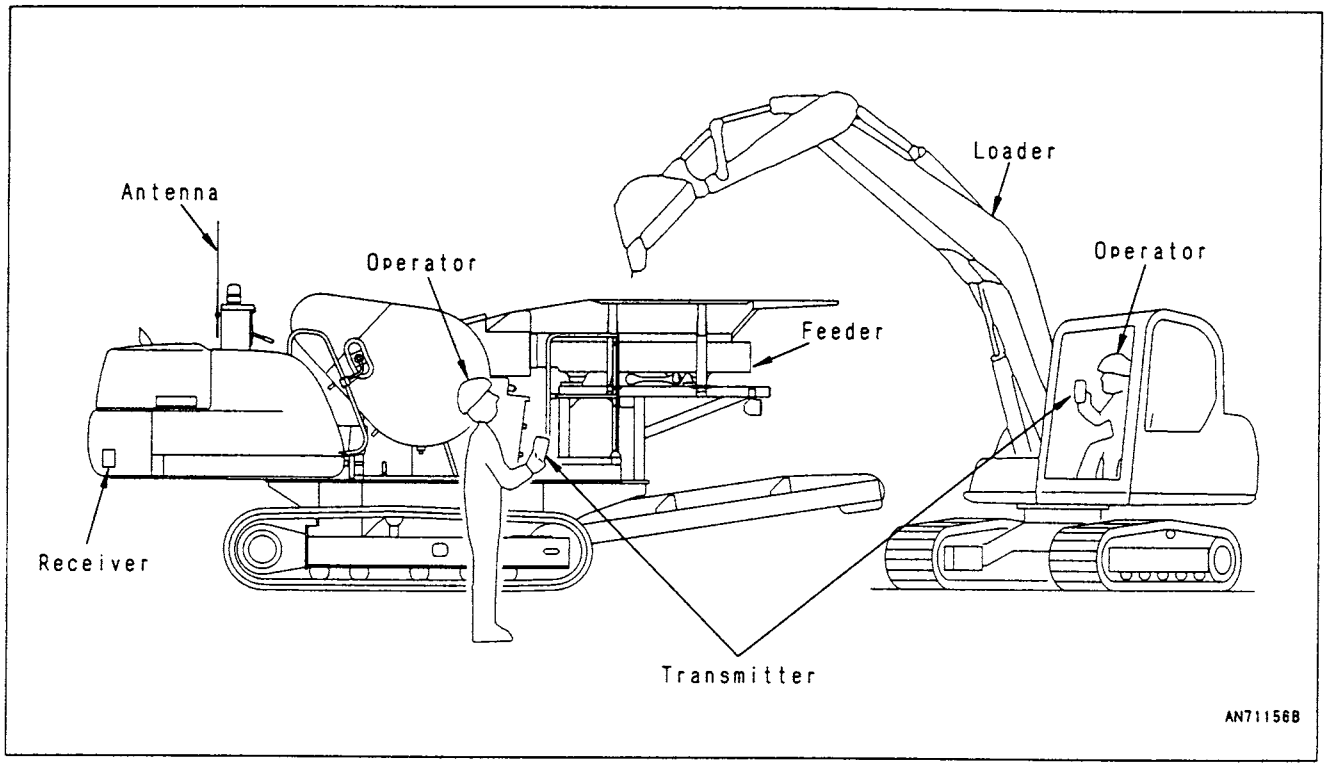
⚠ CAUTION

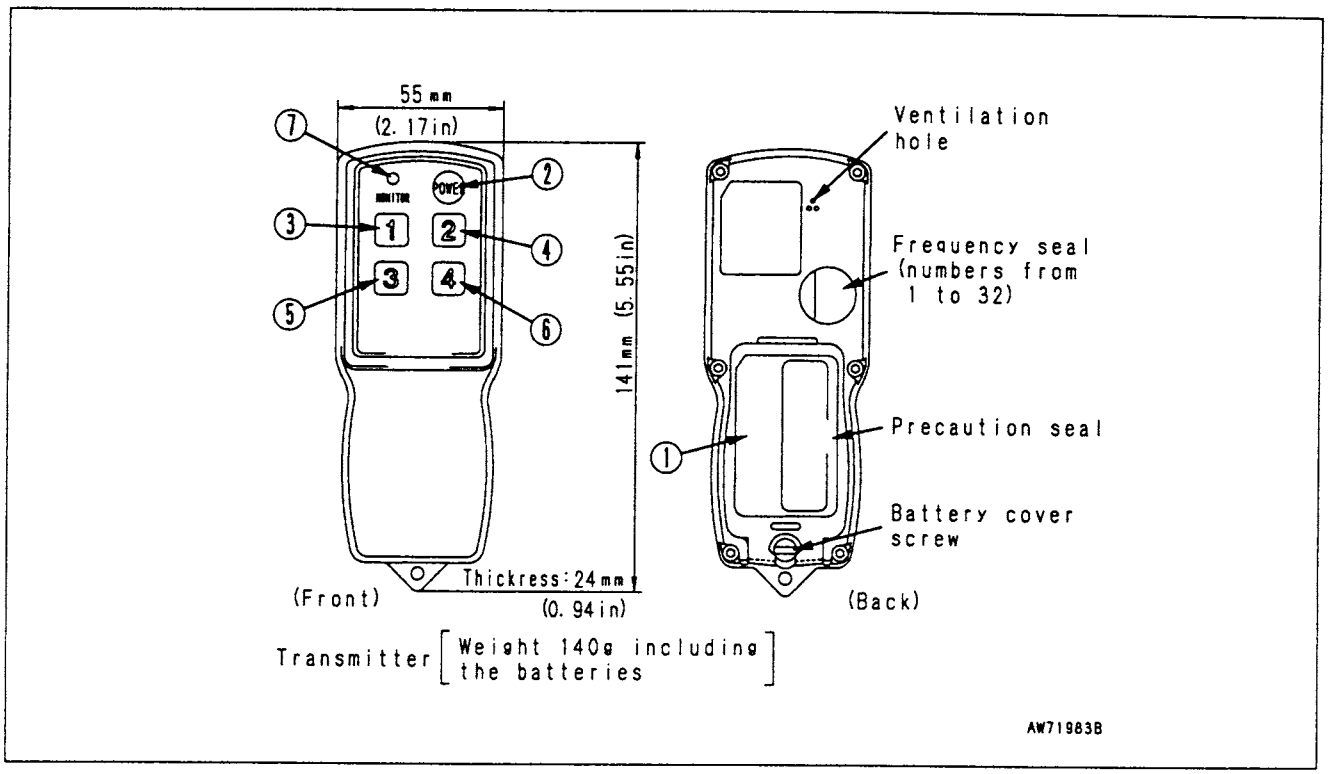
- **Before starting the operation of the machine by using the radio controller, make sure that all switches work normally.**
- **The radio controller can be used auxiliary for emergency stop from remote place, horn operation and feeder operation.**

HOW TO OPERATE

The operator operates the machine remotely from the ground or the loader by using the transmitter as shown below. The figure below shows how to operate it.

Since a very weak radio wave is used, no license from and no report to the authorities concerned are required.





1. Battery Cover : 3pieces. Unit-4 type dry batteries are used.
2. Power Switch : Set the switch to ON at the time of operation.
3. Horn Switch : The horn keeps sounding while the switch is pressed.
4. Master Stop Switch : All functions stop.
5. Feeder ON Switch : The feeder starts.
6. Feeder OFF Switch : The feeder stops.
7. Pilot Lamp : The lamp is on while any of the control switches ③ – ⑥ is pressed. Use the transmitter where the antenna can be seen.

⚠ CAUTION

- **Do not modify the radio controller for other operations such as travelling and crushing.**
- **When the radio controller switch and the machine panel switch are used at the same time, priority will be given to the machine panel switch.**

TROUBLES AND CORRECTIVE ACTIONS

TROUBLESHOOTING IN CASE OF FIRST OPERATION

Phenomena	Causes	Corrective actions
1. Though the control button of the transmitter is pressed, the pilot lamp does not come on.	• Shortage of battery capacity. • Battery insertion to different polarity. • The transmitter is not switched on.	• Replace the Unit-4 type dry batteries. • Insert batteries to correct polarities. • Set the power switch to ON.
2. Though the transmitter pilot lamp comes on, the machine does not operate.	(1) When the relay operation sound (clanging sound) is not heard from the receiver,	
	• The receiver is not switched on. • The receiver is placed under an abnormally high or low temperature. • The transmitter is for any other radio controller system. • The receiver inside is wet with water. • The transmitter was once dropped and received a strong shock. • The receiver power is connected to different polarity. • A high voltage was once supplied to the power source. • The receiver received a welding current at the welding. • The antenna cable is connected to the receiver.	• Set the power switch to ON. • Install the receive at a place of the ordinary temperature (20°C). • Only the transmitter set as the pair with the machine can be used. Check the frequency and the ID code. • Wetting with water will result in a trouble. Ask the maker to repair it. • Precision electrical parts are easily affected by shock. Repair the transmitter. • The receiver is protected from reverse connection, but maker's inspection is sometimes necessary. • When a higher voltage than the reference value is applied, the circuit will be broken. So, repair it. • A large welding current will break the circuit. So, repair it. • The receiver antenna is an important part for the radio unit. Connect it correctly.
	(2) When the replay operation sound is heard from the transmitter,	
	• The receiver load wiring is not correct.	• Check the output terminal and connect the cable correctly.

Phenomena	Causes	Corrective actions
3. The machine can be operated from the nearest place but not from a place slightly apart from the machine.	• The receiver antenna is not installed properly (surrounded with metals).	• The receive antenna is an important part of the radio unit, and the performance is greatly affected by the installation. Install it according to the explanation of receive antenna installation in the manual.
	• The antenna cable is broken halfway.	• The antenna cable is a solid thin cable. When it is broken, replace it.
	• The same frequency wave is used for other machine in the same operation area.	• The receiver will stop working when interrupted with the same frequency. Remove the frequency for other machine.
	• The power supply voltage is abnormal.	• Make the power supply voltage normal.
	• A motor or something else is causing noises near the receiver or the receiver antenna.	• Some motors generate noises very much from the brushes. These noise work like interference wave, so carry the motor away from the receiver antenna.
4. The machine can be operated (10m or more) away from it but does not operate sometimes.	• The working environment is surrounded with metal and concrete.	• Move the receiver antenna element away from the metal or building to where it can be clearly seen from the transmitter. Install the antenna as explained in this manual.
	• There are many obstacles between the transmitter and the receiver.	
	• The antenna is not installed in the optimum place.	
	• The same frequency for other machine (noise or other radio wave) interferes the operation.	• The receiver will stop working when interfered with the same frequency. Remove the frequency for other machine.

TROUBLES THAT OCCUR DURING GENERAL OPERATION

Phenomena	Causes	Corrective actions
1. The pilot lamp comes not to light even when the transmitter control button is pressed.	• Drop of battery capacity • The transmitter is not switched on.	• Replace the Unit-4 type dry batteries. • Set the power switch to ON.
2. Though the transmitter pilot lamp is on during operation, the receiver came not to react at all.	• The receiver antenna is broken. • The same frequency interferes the receiver. • The power supply voltage is abnormal. • Something is causing noises near the receiver or the antenna.	• The receiver antenna is an important part and influences the performance greatly. Replace the antenna. • The receiver will stop working when interfered. Remove the frequency. • Make the power supply voltage normal. A higher voltage than the reference value will damage the receiver, and repair will become necessary. • Noises from radio unit motor brushes interfere the receiver, and the receive will stop working when interfered. But this is not a failure. Remove the noises.
3. The machine can be operated from a bit shorter distance but does not operate sometimes.	• The working environment is surrounded with metal and concrete. • There are many obstacles between the transmitter and the receiver. • The same frequency for other machine (noise or other radio wave) interferes the operation.	• Move the receiver antenna element away from the metal and building to where it can be clearly seen from the transmitter. Install the antenna as explained in this manual. • The receiver will stop working when interfered with the same frequency. Remove the frequency for other machine.

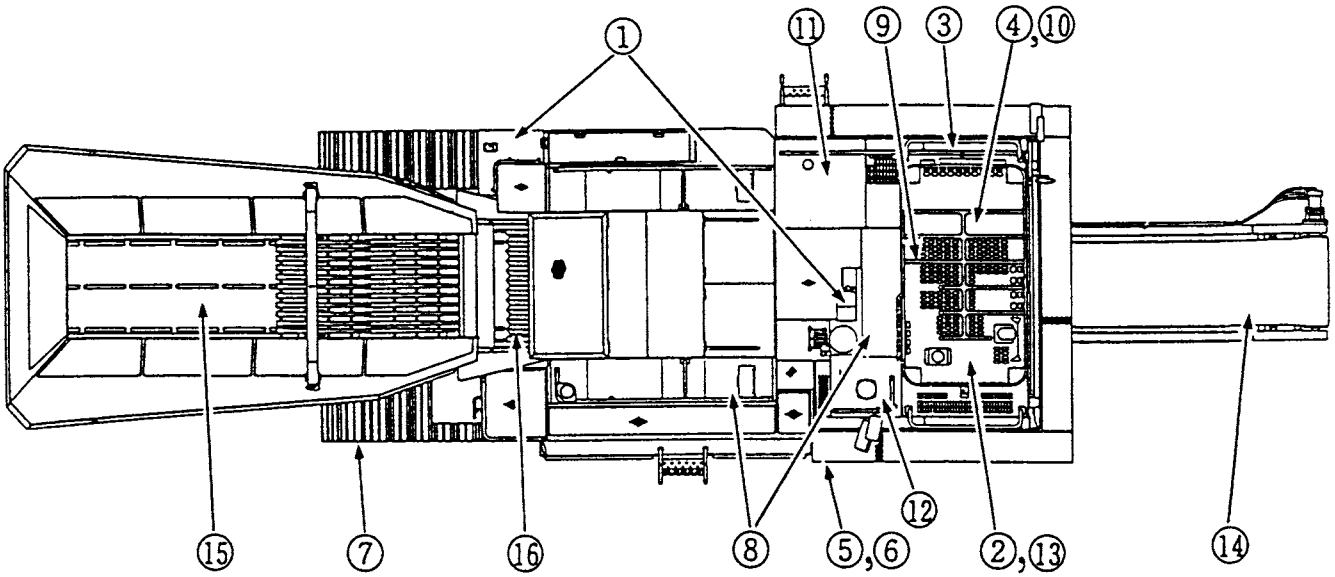
3. OPERATING PROCEDURES

This chapter describes the procedures for inspecting the vehicle before operation, operating the engine, and operating the vehicle, which will be required for operating the vehicle. Basic operating procedures can be mastered by reading through this chapter.

3.1 CHECK BEFORE STARTING

The following checks must be surely performed for the safety of the operator and for maintaining the performance of the vehicle.

a. Visual check
Before starting the engine, examine the environment and lower part of the vehicle while checking bolts and nuts for looseness, oil, fuel and cooling water for leakage, and operating equipment and hydraulic system for abnormality.
Check to see if there is any looseness and play in electric wiring and if there is dust accumulated on high-temperature portions.



⚠ WARNING

Piling inflammables on, fuel leak or oil leak to or around the engine hot area such as muffler and turbo or the battery will cause a fire to the machine. Check the engine and the battery carefully and repair it if anything is abnormal, or contact us or our service shop.

① Checking electric wiring
Check the fuse for damage and the electric wiring for wire breaking and short circuit, and also terminals for looseness. If any looseness is found, tighten the loose terminals.
In particular, check the wiring of the following parts.
- Battery
- Starting motor
- Alternator

② Checking the air cleaner mounting bolts for looseness

③ Checking the radiator for water leakage

④ Checking the periphery of the engine for water and oil leakage

⑤ Checking the final drive case for oil leakage

⑥ Checking the sprocket mounting bolts for looseness

⑦ Checking the idler mounting bolts for looseness

⑧ Checking the high-pressure hose joint and hydraulic motor for oil leakage

⑨ Checking the cooling water level and replenishing cooling water
Check the cooling water level.
The proper cooling water level must be between FULL and LOW in the sub tank.

⑩ Checking the oil level of the engine oil pan and replenishing engine oil. Check the engine oil level.
The proper engine oil level must be between H and L on the level gauge.

⑪ Checking the fuel level.
Check the residual quantity of fuel on the fuel gauge.

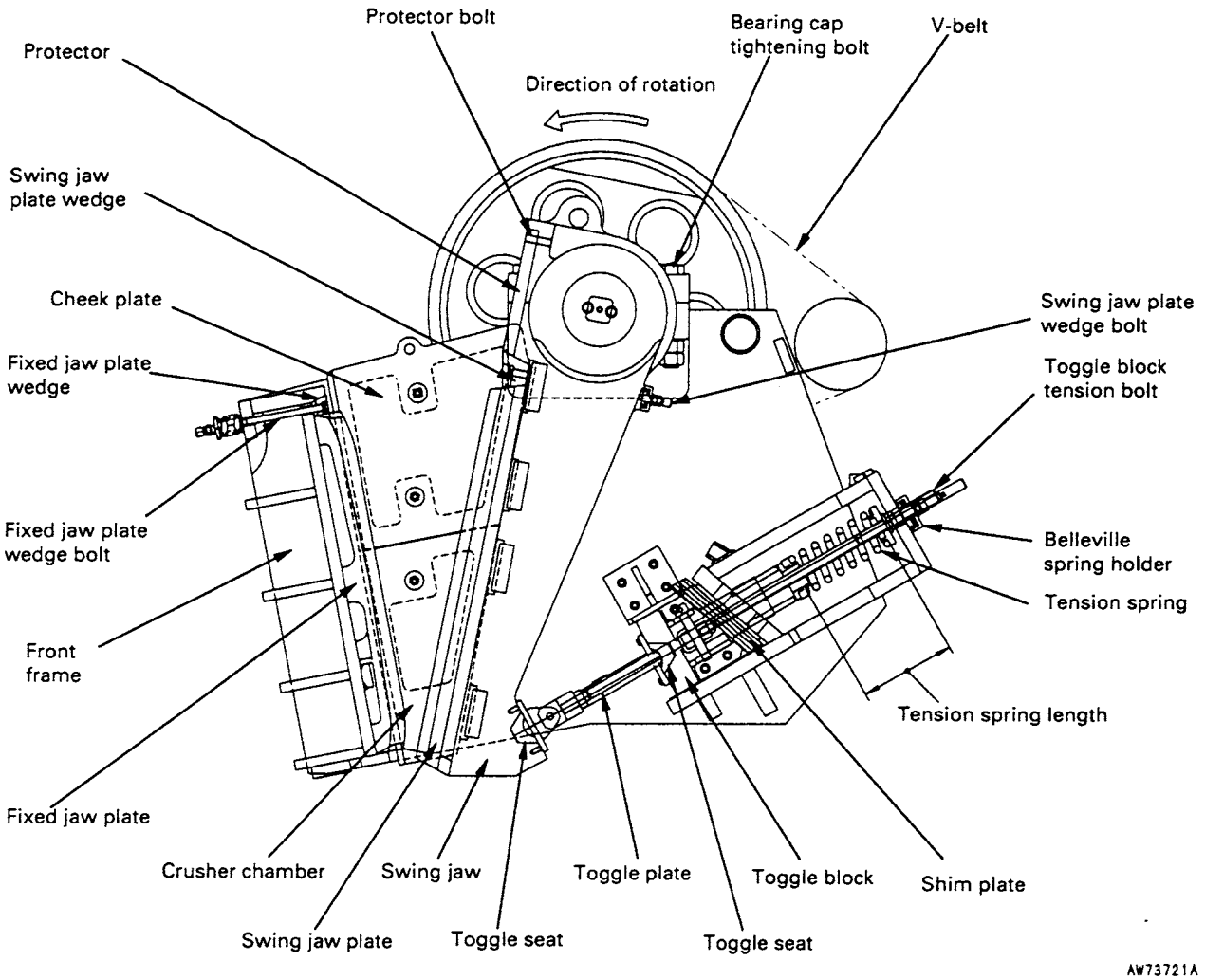
⑫ Checking the oil level in the hydraulic tank and replenishing hydraulic oil. The proper oil level must be between H and L on the sight gauge.

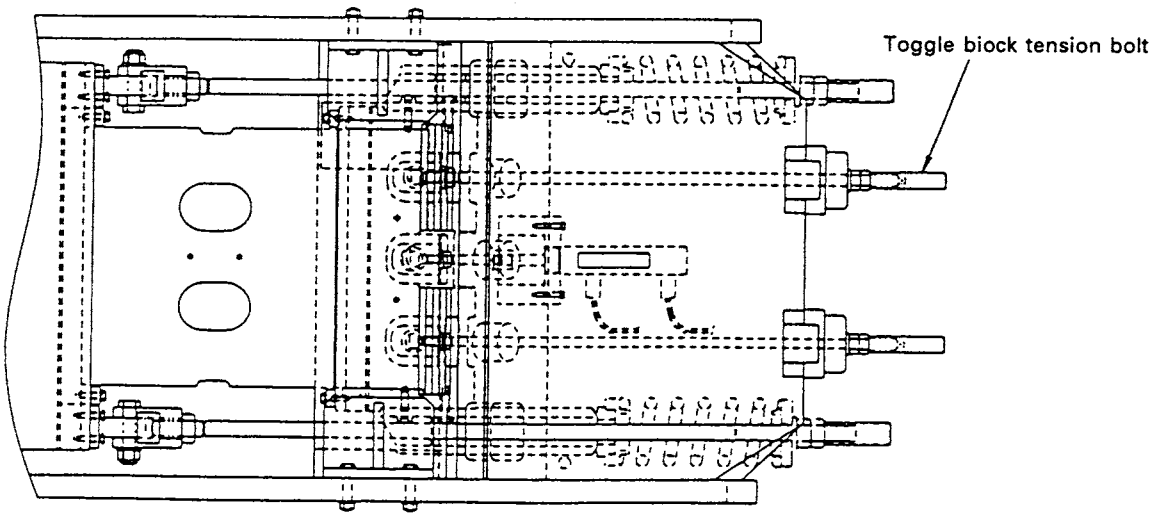
⑬ Checking the dust indicator
Check if the red piston of the dust indicator has reached the service level.

⑭ Checking the belt conveyor
(a) Check if there is any cut or flaw on the rubber belt.
(b) Check if there is any zigzag line of the belt. Check if the belt is biased excessively to one side. (For the adjusting procedure, see P 3-26.)

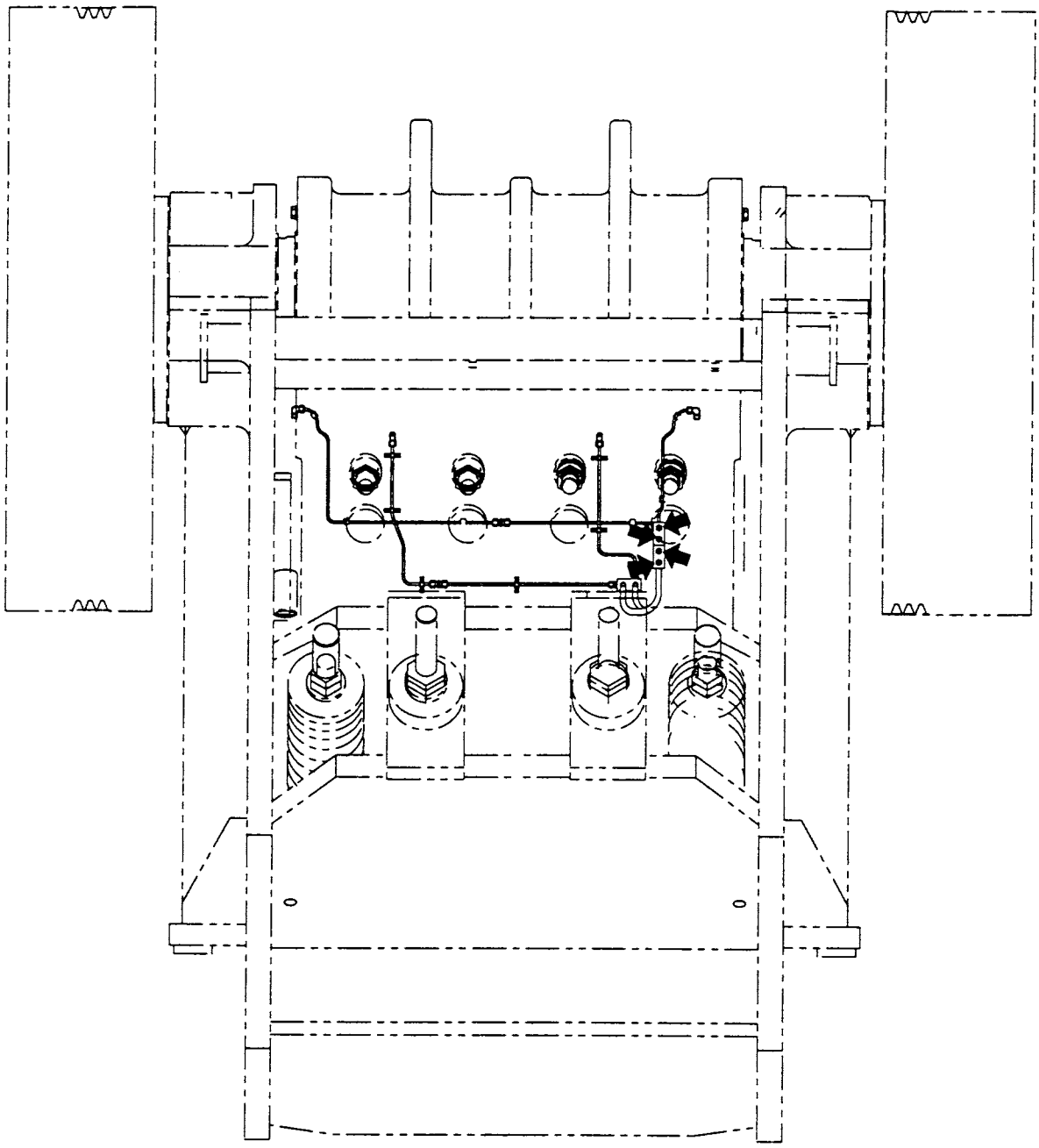
⑮ Checking the grizzly feeder
(a) Check if oil leakage is not occurring from the drive motor.
(b) Check if the grizzly bar is not blinded.
(c) Check if the oil level in the vibrator casing remains at the middle of the oil level gauge.

⑯ Checking crusher related parts



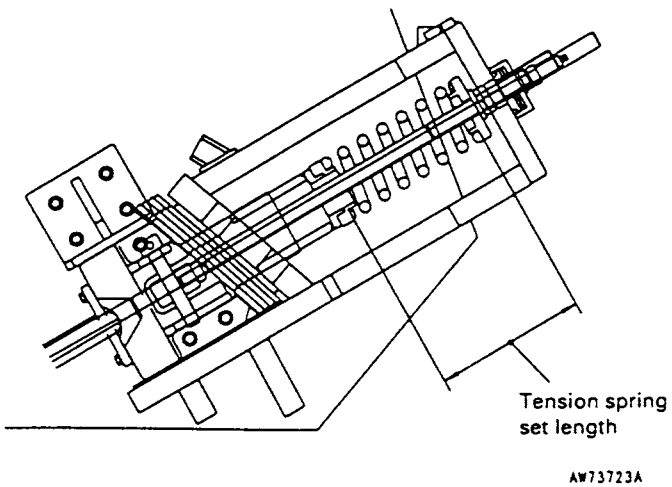


Grease fittings are provided to the machine for centralized lubrication to the crusher.



AW737220

(a) Check that there is no foreign material inside the crushing chamber.
(b) Check that all bolts are fully tightened.
Be particularly careful to check crushermounting bolt, toggle block tension bolt, bearing cap tightening bolt, the tooth plate wedge bolt, and cheek wedge bolt.
(c) Check that the direction of rotation is correct.
(d) Check that the tightening of the spring is correct.
The tightened length of the spring is a shown below.
Tightened length: 400 mm



⚠ CAUTION

If the tightened length is longer than the above dimension

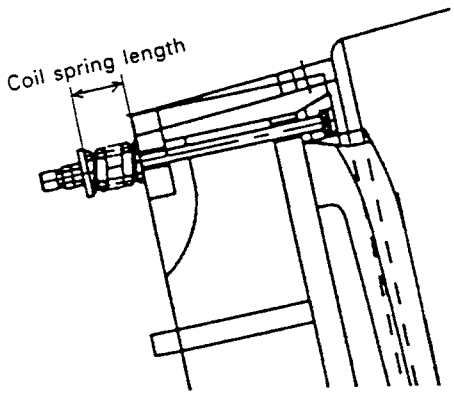
- **There will be slapping between the toggle plate and toggle seat, and this will reduce the life of the toggle plate and toggle seat.**
- **The toggle plate may fall.**

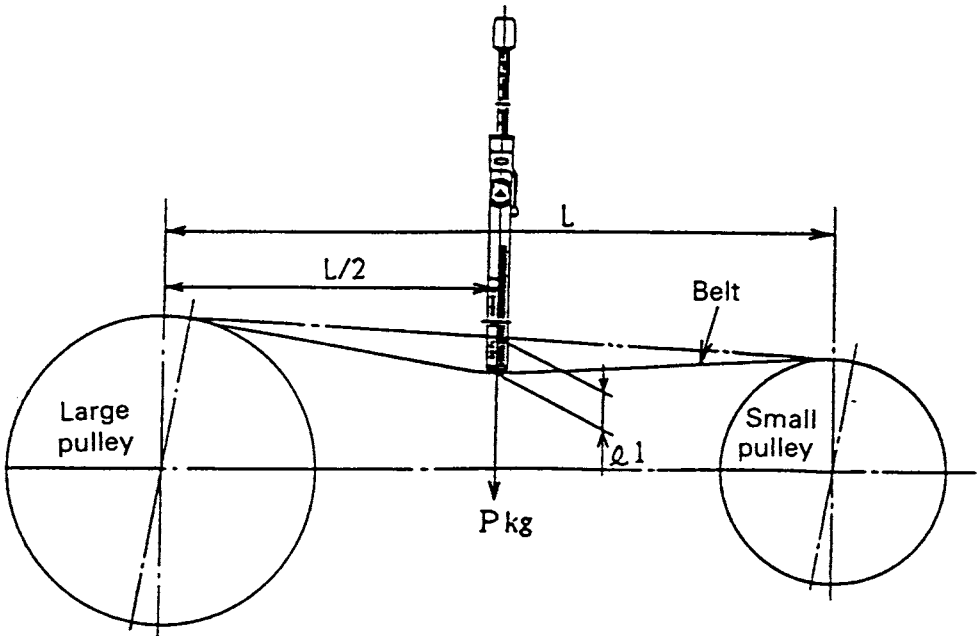
If the tightened length is shorter than the above dimension

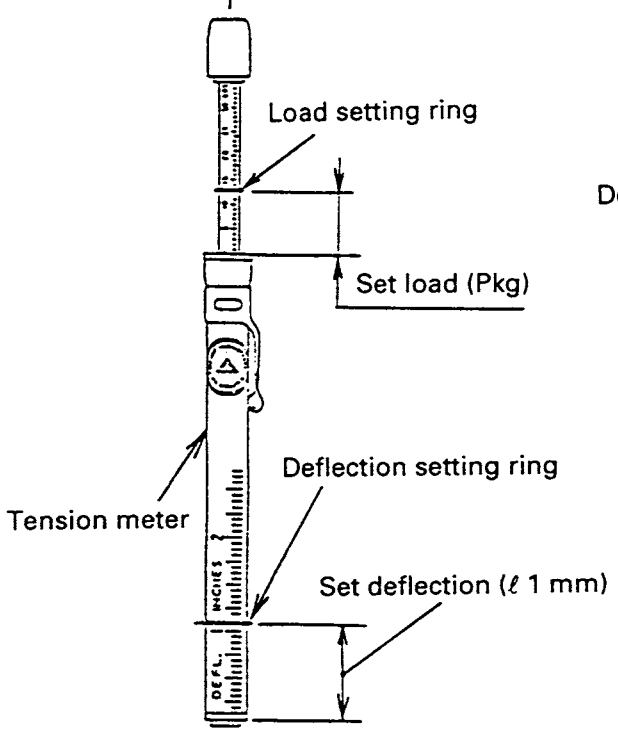
- **There is danger that the tension rod and coil spring may break.**

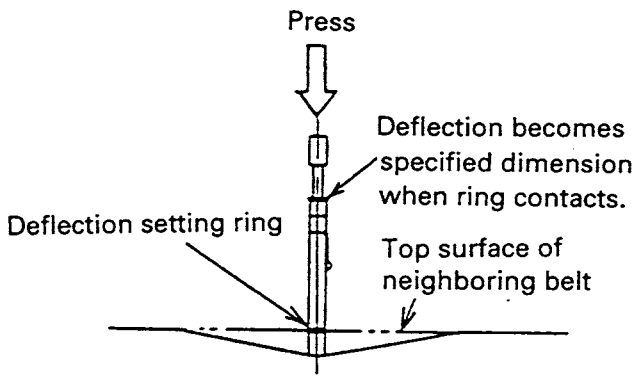
(e) Check that the tension of the V-belt is correct.
Adjustment by tension meter
Adjusting position of ring for setting deflection
Deflection ℓ = 17 mm
Adjusting position of load setting ring
When installing new belts P = 14.0 kg
When correcting tension P = 12.0 kg

(f) Are the coil springs of the fixed jaw plate and wedge bolt properly tightened?
Length of the coil springs shall be as follows when tightened:
Length when tightened: 100 to 105 mm

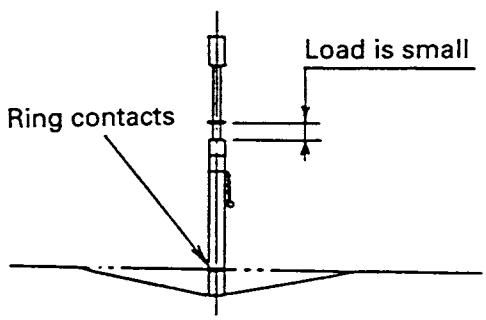




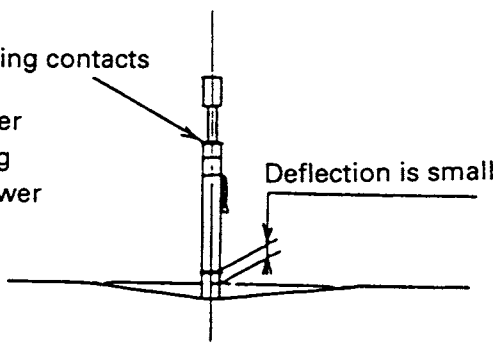




Suitable tension



When belt tension is slack



When belt tension is too tight

Adjustment of Belt Tension

Hold the tension meter cap in you hand and press it to the center of the belt, and adjust the belt tension so that the deflection ring touches the upper face of the neighboring belt when the cap lower end touches the load setting ring.

3.2 STARTING THE ENGINE

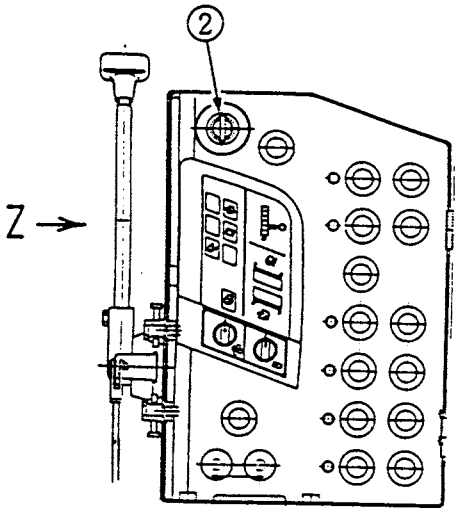
a. Normal starting

⚠ WARNING

Dirt, oil or fuel around the parts of the engine which reach high temperatures may cause fire and damage to the machine. Check carefully, and if any abnormality is found, always repair it or contact your Komatsu distributor.

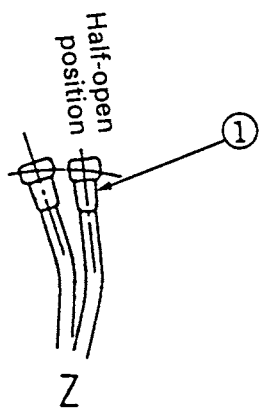
⚠ WARNING

Check that there are no persons or obstacles in the surrounding area, then sound the horn and start the engine.

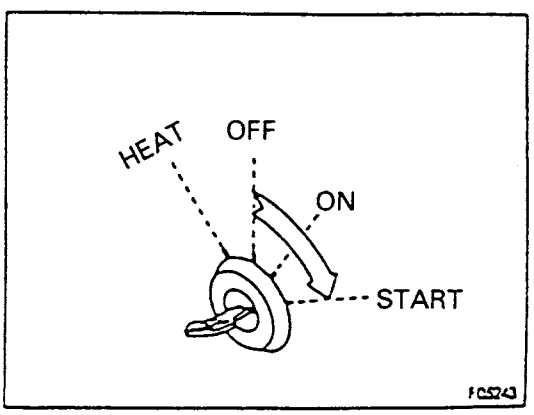


NOTICE:
Do not keep the starting motor rotating continuously for more than 20 seconds.
If the engine will not start, wait for at least 2 minutes before trying to start the engine again.

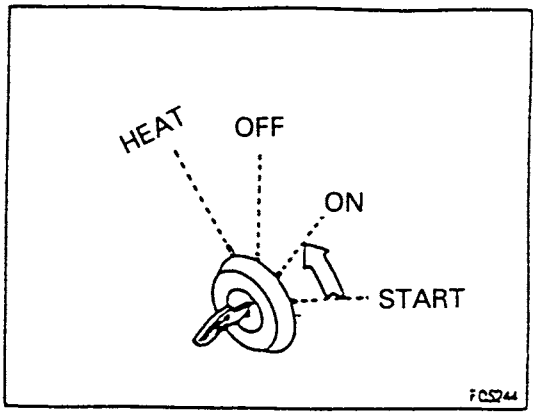
(1) Set fuel control lever ① to the half-open position.



(2) Turn starting switch ② to the START position to start the engine.



(3) After starting the engine, return starting switch ② key to the ON position. (It will be automatically returned by releasing the switch.)



b. Starting in cold weather

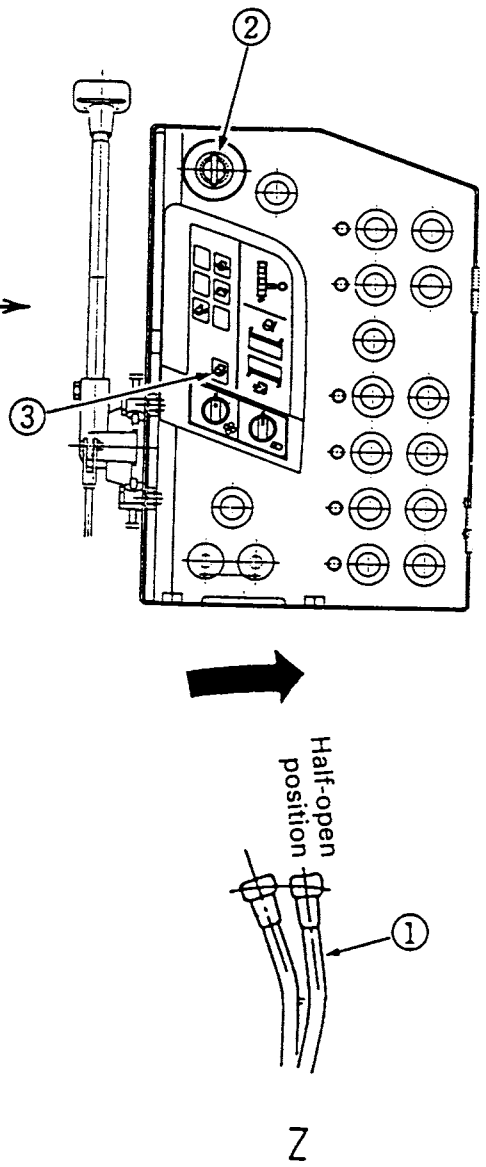
⚠ WARNING

- **Check that there are no persons or obstacles in the surrounding area, then sound the horn and start the engine.**
- **Don't use a starting auxiliary liquid in any case which may cause explosion at a start.**

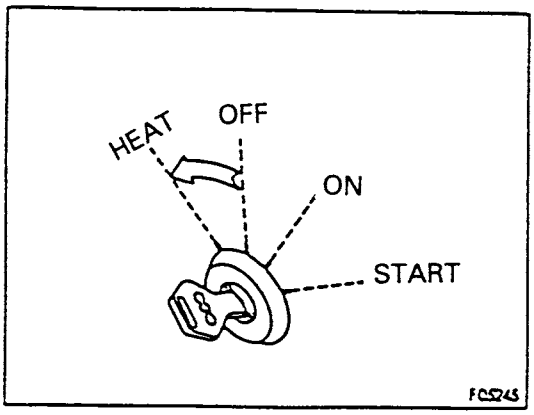
NOTICE:
Do not keep the starting motor rotating continuously for more than 20 seconds. If starting the engine fails, repeat the operations of 2 and 3 after the lapse of about 2 minutes.

When the temperature is low, start the engine by the following procedure.

(1) Set fuel control lever ① in the half-open position.

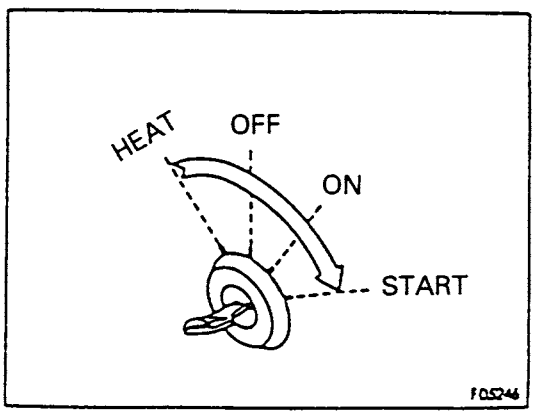


(2) Turn starting switch ② to the HEAT position and check that preheat monitor ③ is ON. After about 30 seconds, preheat monitor ③ will flicker to show the completion of preheating.



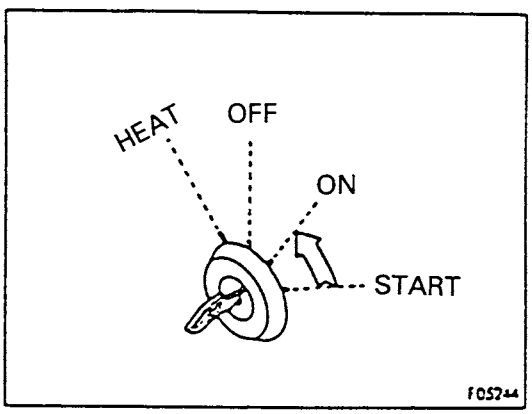
REMARKS:
When the switch is turned to the HEAT position, the monitor and the gauge will light up, but this is not an error.

(3) After preheat monitor ③ goes out, turn starting switch ② to the START position to start the engine.



(4) After starting the engine, return starting switch ② to the ON position. (The switch will be automatically returned by releasing it.)

c. Special starting
When fuel becomes short, fill the fuel filter cartridge with fuel after replenishment of fuel and bleed the fuel system of air. After that, start the engine.



- For the air bleeding procedure, refer to the paragraph pertaining to "Replacement of fuel filter cartridge."

3.3 OPERATIONS AND CHECKS AFTER STARTING ENGINE

⚠ WARNING

- **Emergency stop**
  If there has been any abnormal actuation or trouble, turn the starting switch key to the OFF position.
- **If the work equipment is operated without warming the machine up sufficiently, the response of the work equipment to the movement of the control lever will be slow, and the work equipment may not move as the operator desires, or the automatic operation may not be actuated as normal, so always carry out the warming-up operation. Particularly in cold areas, be sure to carry out the warming-up operation fully.**

NOTICE:

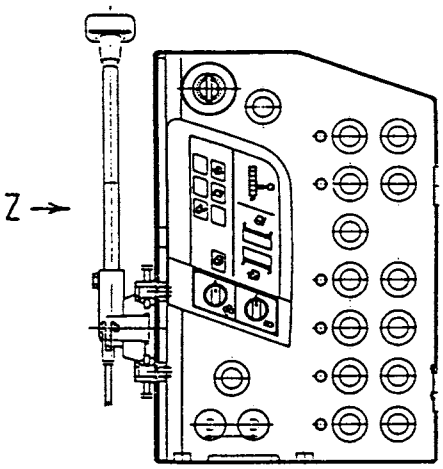
- **When the hydraulic oil is at a low temperature, do not carry out operations or move the levers suddenly. Always carry out the warming-up operation. This will help to extend the machine life.**
- **Do not suddenly accelerate the engine before the warming-up operation is completed.**
  Do not run the engine at low idling or high idling continuously for more than 20 minutes. This will cause leakage of oil from the turbocharger oil supply piping. If it is necessary to run the engine at idling, apply a load from time to time or run the engine at a mid-range speed.

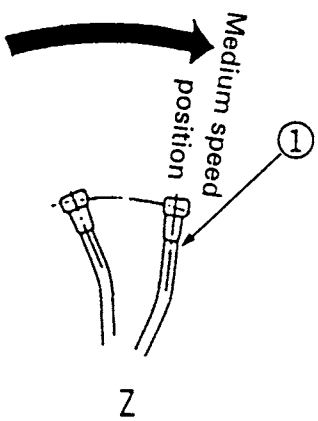
Don't operate the vehicle immediately after starting the engine, but perform the following operations and checks.

a. Pull fuel control lever ① to rotate the engine at a medium speed to perform a no-load run for about 5 minutes.

b. After performing a warm-up run, check if each instrument or caution lamp is normal.
   - Continue a light-load run until the engine water temperature gauge indicates the green range.

c. Check if there is any abnormal exhaust color, noise and vibration.

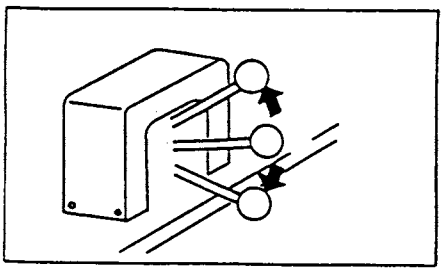




3.4 MOVING MACHINE OFF

⚠ WARNING

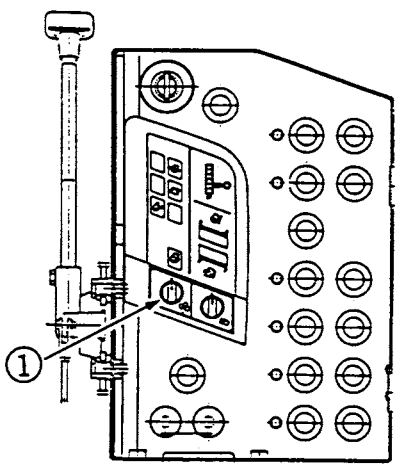
- **When moving off, check that the area around the machine is safe, and sound the horn before moving.**
- **Clear all personnel from the machine and the area.**
- **Clear all obstacles from the path of the machine.**

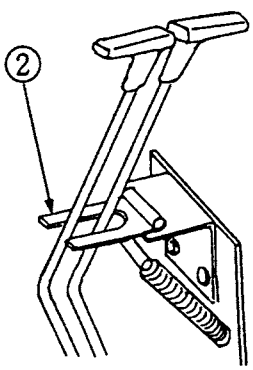


a. Push the Conveyor Up/Down Lever upward to raise the conveyor.

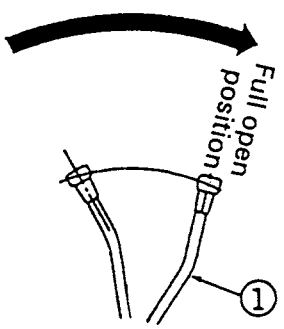
REMARKS:
When the conveyor is raised, the patrol light is light up to let workers know that the conveyor is raised. At the time, all work equipment do not operate.

b. Set the Travel Lock Switch ① to OFF to release the Travel Lever Lock Plate②.

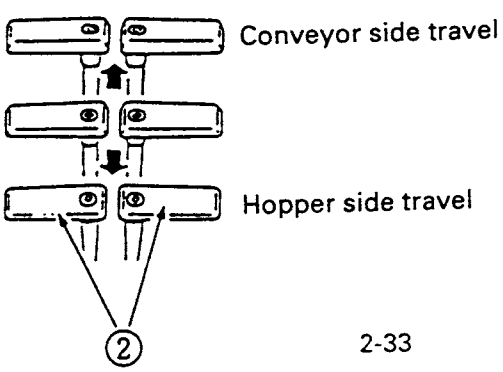




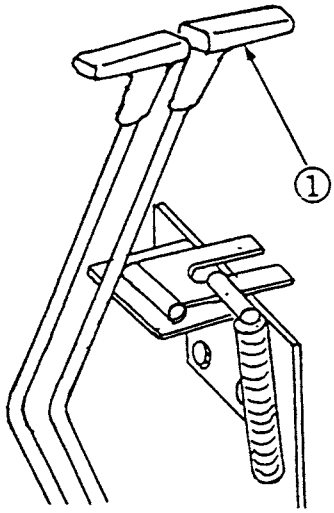
c. Pull fuel control lever ① to increase the engine speed.



d. Slowly tilt left/right travel lever ② forward (conveyor side travel) or in reverse (hopper side travel) to start the vehicle.



3.5 STEERING (CHANGING THE COURSE)

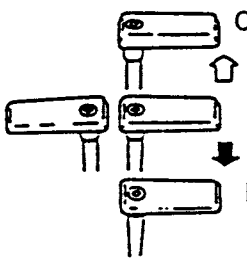


Change the course by operating the travel lever.

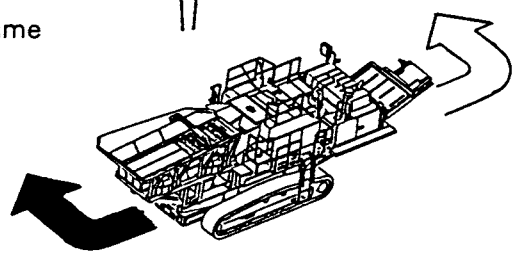
Operate two travel levers ① in the following way.

- Avoid changing the course suddenly if possible. When making a spin turn, specially, stop the vehicle once, then execute it.

■ To change the direction of the vehicle in the stop condition. To make a turn to the left, tilt the right travel lever forward. Then, the vehicle turns to the left with the conveyor side travel. When the same lever is tilted in reverse, the vehicle turns to the left with the hopper side travel.

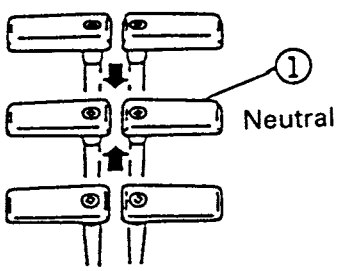


REMARKS:
To make a turn to the right, operate the left travel lever in the same way as the above.



3.6 STOPPING THE VEHICLE

Avoid stopping the vehicle suddenly, but do it with the presence of mind.



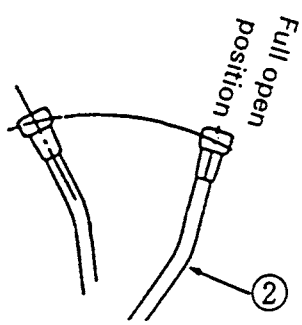
⚠ WARNING

When stopping the vehicle, select a good-foothold and flat ground which is free from danger. When stopping the vehicle on a slope inevitably, insert blocks underneath the track shoes.

a. Set travel lever ① in the neutral position.

⚠ WARNING

During a stop, be sure to lock travel lever ① by the stopper, and turn travel lock switch to ON.



b. Lower the engine speed with fuel control lever ②.

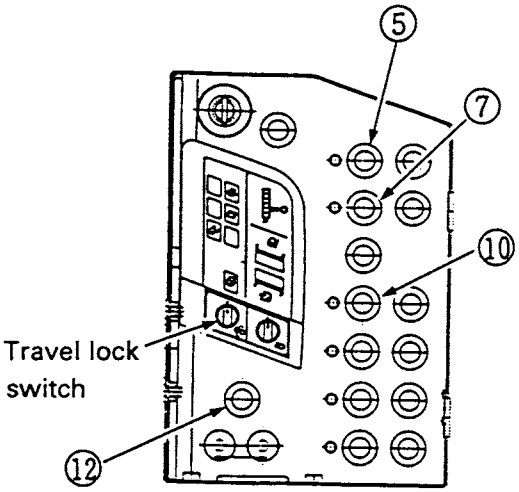
3.7 STARTING CRUSHER OPERATIONS

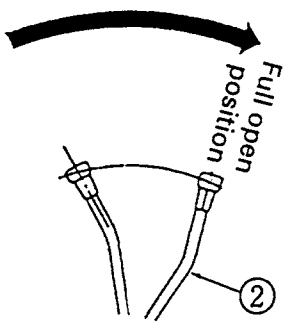
⚠ WARNING

When starting crusher operations, put the vehicle on a level place. Check the vehicle level with a level.

⚠ WARNING

- **While operating crusher, be sure to lock the travel lever.**
- **Before leaving from the travel lever, surely turn on the travel lock switch and lock the travel lever. If the travel lever is touched carelessly without locking the lever, the vehicle may happen to move, thereby causing a serious accident resulting in injury or death.**





a. Turn conveyor motor control switch ⑤ ON.

b. Turn crusher motor control switch ⑦ on.

c. Turn feeder control switch ⑩ ON.

NOTICE:
Set the engine at low idling and run under no load for approx. 5 minutes.

d. After the warming-up operation, check that there is no abnormality in the bearing temperature or vibration.
Do not suddenly accelerate the engine before the warming-up operation is completed.

e. Pull the fuel control lever up and increase the crusher speed.

f. Set the lever to the fully open position, then wait for 30 seconds before starting to feed demolition waste.

⚠ WARNING

g. When an abnormality occurs, press emergency stop button ⑫. The buzzer sounds and the crusher, feeder and belt conveyor will stop.

3.8 OPERATIONS STARTING PROCEDURES OF (NEW) CRUSHER

After checking that the crusher is in order, idle the crusher as follows:

a. Idling for over 8 hours
The crusher is idled to make the bearing temperature constant. Even if the temperature becomes constant before the above time elapses, keep idling it.

b. Measurement of Bearing Temperature
The bearing temperature hardly rises while idling it. If the temperature rises over +40°C, stop idling it and contact us.

c. Run under load
Start loading material when the machine reaches the specified speed. If blasted rocks strike the swing jaw head after the loading starts, improve the feeding method so that they do not strike it. Do not increase the feeding to 100% quickly and run the crusher with the load factors as shown in the table below.

Run under load (after idling)

Load factor (%)	Number of days
50	2 days
80	2 days
100	After 2 days of idling

d. Supply of Material
For normal operation after idling, adjust the supply to less than 80% of the crushed quantity.

e. Stopping
Stop the motor only after the supplied materials are completely crushed.

f. Re-tightening of Bolts after Operation
After start of operation, clamping bolts are apt to become loose. So, inspect and re-tighten these bolts referring to the table below after the start of a run under load:

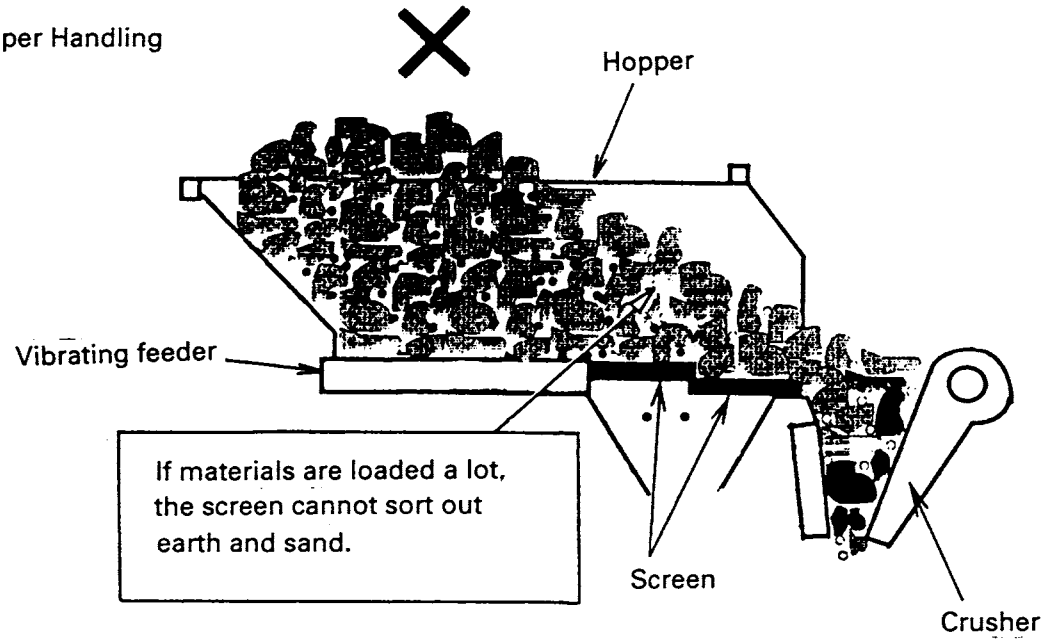
1st time	2nd time	3rd time	4th time
10 hours later	25 hours later	50 hours later	Every 100 hours

When the outlet gap is adjusted due to abrasion of the blade, re-tighten these bolts every 10 hours until it can be checked that the toggle block lifting bolts and the toggle block drawing bolts are no longer loose.

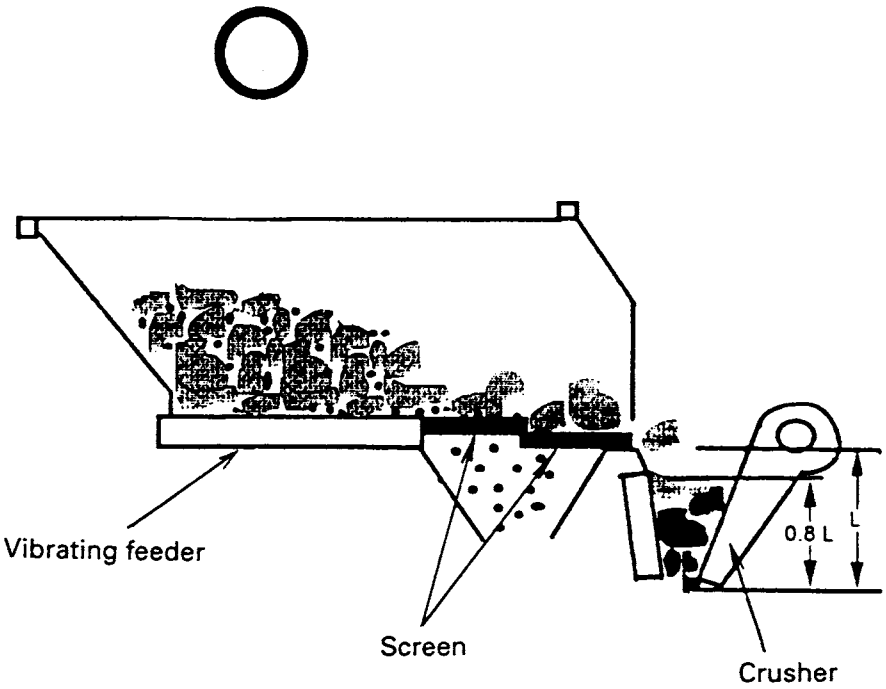
3.9 BASIC HANDLING OF GRIZZLY FEEDER (EFFECTIVE MUCK REMOVING METHOD)

Since the crusher is fitted with a vibrating feeder to sort out earth and sand from blasted rock or crushed concrete, carefully check the condition of the screen.

(a) Improper Handling

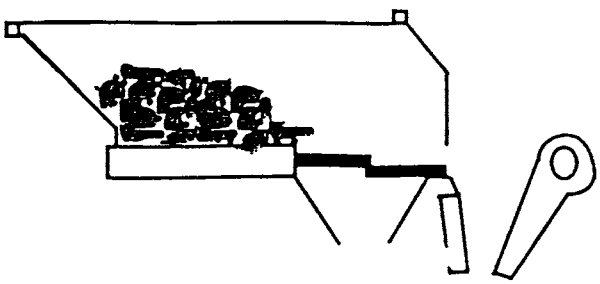


(b) Proper Handling

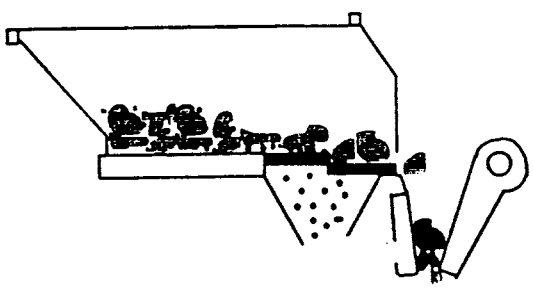


(c) Example of Proper Operation

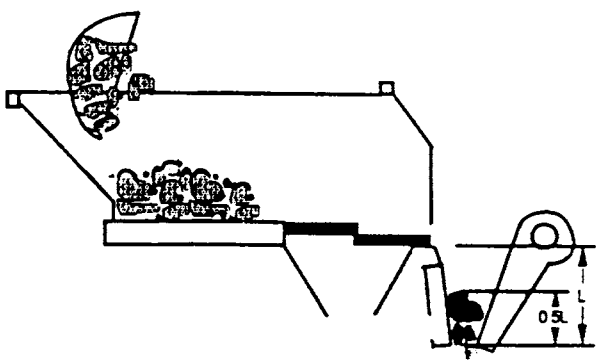
[Step 1]
The optimum amount of crushed rocks is 0.5 to 0.7m³ per loading. The amount is smaller than the hopper capacity but is most suitable for sorting out and for crushing.



[Step 2]
When an optimum amount is loaded, the screen can completely sort out earth, sand and crushed concretes.
Note: Do not feed the next load of crushed rocks soon after the first loading.

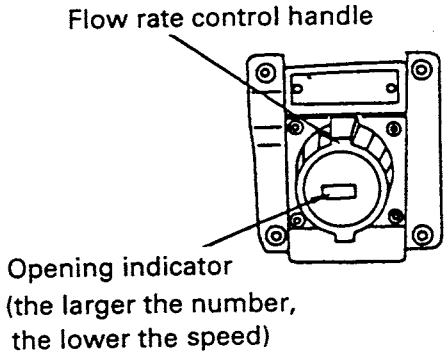


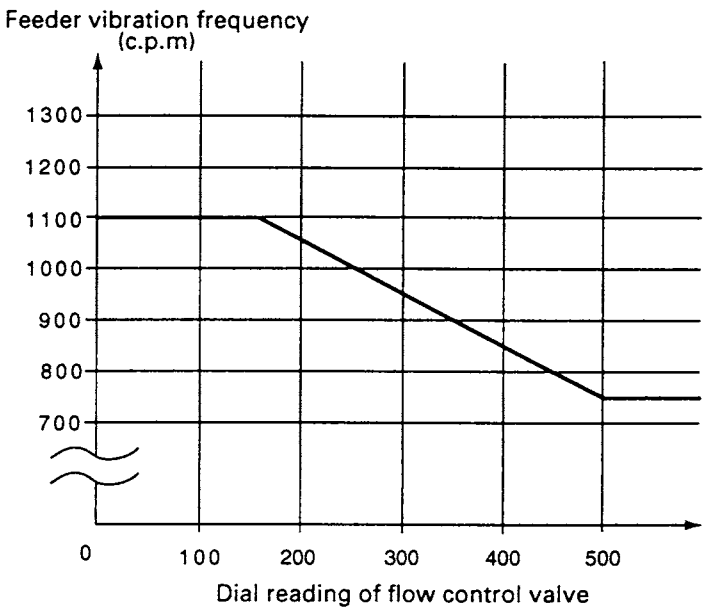
[Step 3]
When the first load reduces to about a half, feed the nest load of crushed rocks. Repeat the loading in this way.



■ Adjustment of feeder speed

It is possible to adjust the feeder amount for the feeder speed by turning the dial (see illustration below) of the oil flow control valve to the desired position.





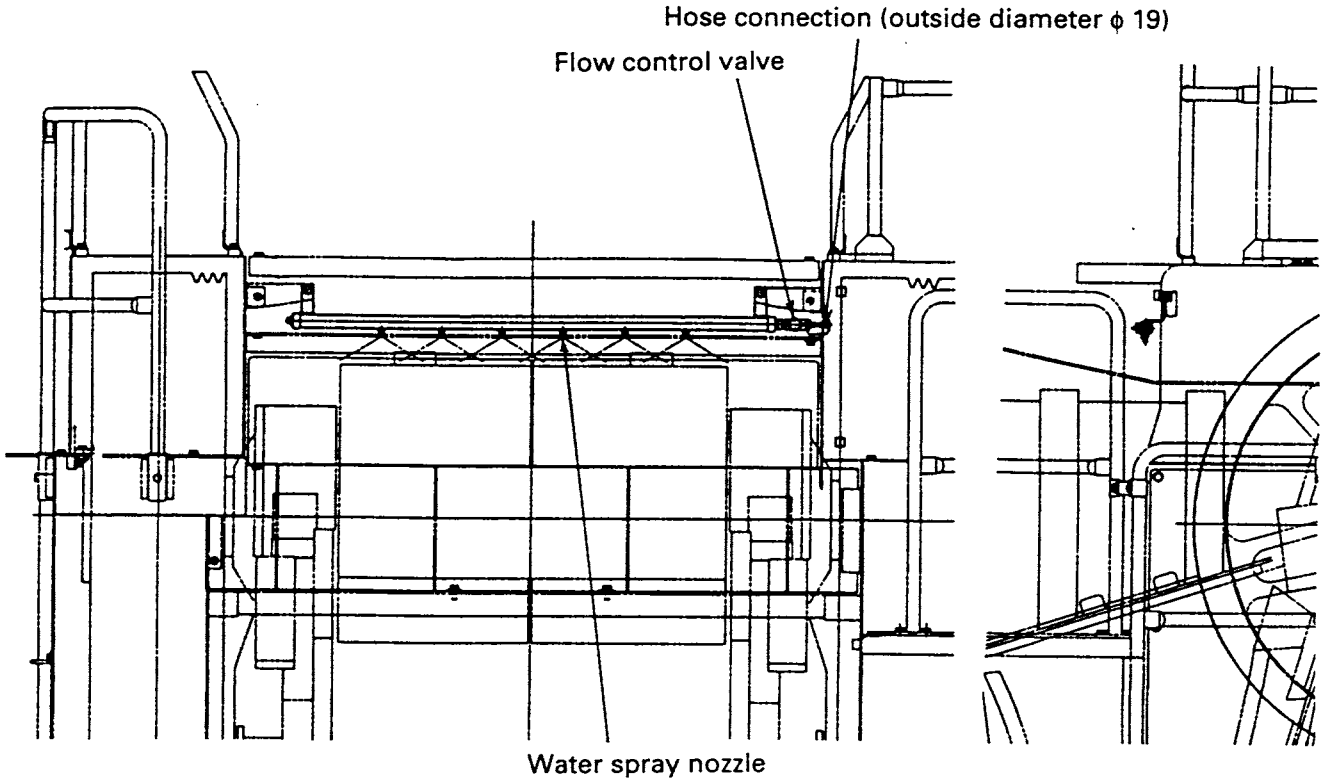
Characteristics of feeder vibration frequency

- **Guidelines for adjustment of crusher speed and feeder vibration**
  When the crusher outlet opening is small, over feeding occurs and the load may spill out over the top of the crusher and equipment failure may occur.
  Adjust the dial of the feeder speed control and lower the feeder vibration frequency to match the crushing capacity.

■ Loading of Wet Earth and Sand

When loading wet earth and sand, reduce their amounts per load and add some blasted rocks without muck or concrete wastes to prevent earth and sand from adhering each other.

3.10 WATER SPRINKLER



- This can be used simply by connecting the hose to a water tap. (Inside diameter of hose ϕ19)
- Adjusting the water flow with the flow control valve to match the condition of the dust.

3.11 FINISHING OPERATIONS

a. Check that no more crushed material comes out on the belt conveyor, then press feeder stop switch ⑪ to stop the feeder.

b. Next, press crusher stop switch ⑧ to stop the feeder

c. After the crusher stops completely, press belt conveyor stop switch ⑥ to stop the belt conveyor.

3.12 AFTER COMPLETING OPERATIONS

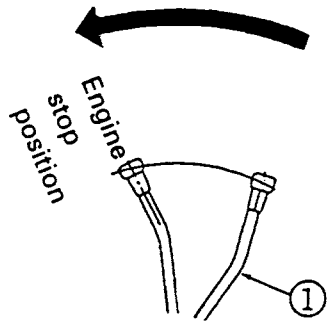
a. If the machine is to be stopped and left as it is, see STOPPING THE ENGINE below.

b. If the machine is to be moved and stored in a different place, see the section on travel, starting, and stopping.

3.13 STOPPING THE ENGINE

⚠ CAUTION

If the engine is suddenly stopped before it is cooled, the life of engine parts may be shortened. Don't stop the engine suddenly except in an emergency. If the engine is overheated, don't stop it at once but rotate it at a medium speed to cool it gradually. After that, stop it.

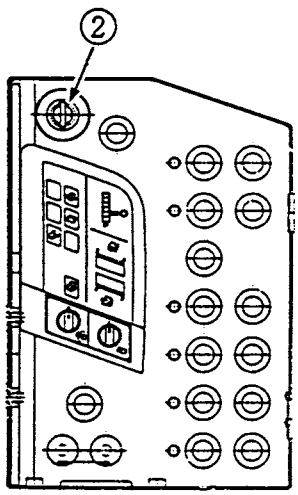


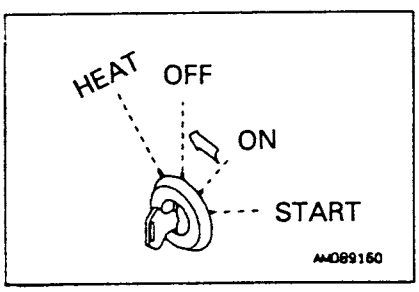
1 Idle the engine for about 5 minutes to gradually cool it.

2 Set fuel control lever ① in the engine stop position to stop the engine.

3 Set starting switch ② to the OFF position.

4 Pull out the starting switch ② key.



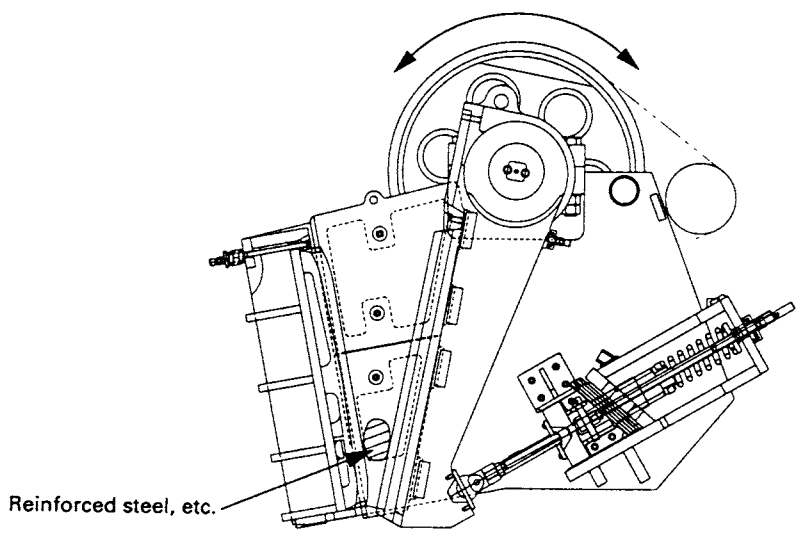


3.14 CHECKS AFTER STOPPING ENGINE

(1) Walk around the machine and check for leakage of oil or water. Check also the condition of the work equipment, body work, and undercarriage. If any leakage or abnormality is found, repair it.
(2) Fill the fuel tank.
(3) Remove any paper or other waste from the engine room. This will cause fire.
(4) Remove all mud stuck to the undercarriage.

3.15 REVERSE ROTATION FUNCTION OF CRUSHER

When the crusher outlet port becomes clogged, if the crusher reverse rotation switch is pressed after stopping the crusher, it is possible to remove the blockage easily.
The crusher is actuated while the switch is being pressed, and it stops when the switch is released.



3.16 AUTOMATIC STOPPING OF BELT CONVEYOR

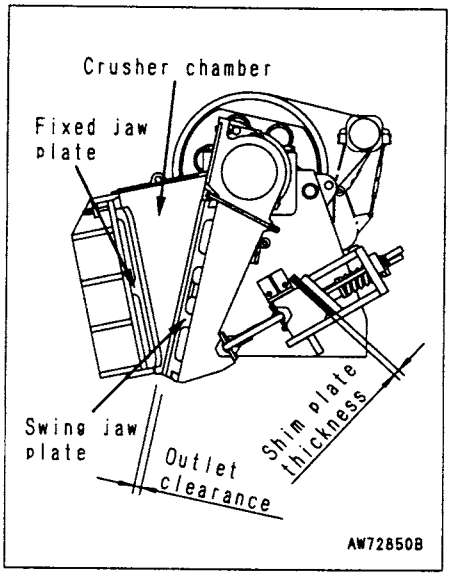
If any abnormality occurs in the belt conveyor, the belt conveyor, crusher, and feeder are automatically stopped. Then horn will sound for about 5 seconds to alarm abnormality.
When starting again after carrying out inspection and repair of the abnormality in the belt conveyor, operate the machine according to the specified procedure.

3.17 PROHIBITED OPERATIONS

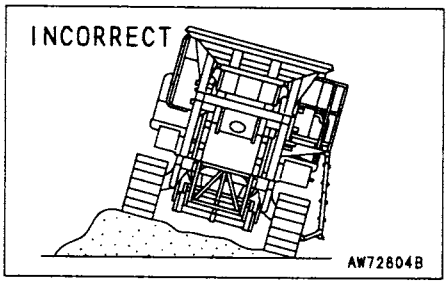
It is prohibited to adjust equipment to make clearance smaller than that specified in table below.
If the clearance of the outlet port is made less than the value in the table below, it may cause the following problems.

- The load on the jaw crusher will increase, and this will reduce the service life of the jaw crusher.
- The service life of the fixed jaw plate and movable jaw plate will be reduced.
- There is danger that the fixed jaw plate and movable jaw plate may contact each other during operations.

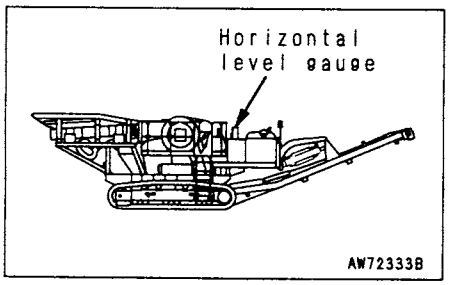
Material being crushed	Outlet clearance
Concrete	70 mm
Natural rock	100 mm



IT IS PROHIBITED TO CARRY OUT CRUSHING OPERATIONS ON A SLOPE.

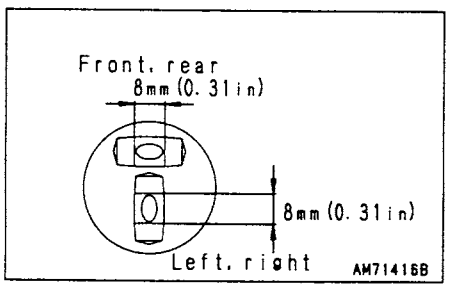


NOTICE:
Use the spirit level on the side of the control box to check that the machine is horizontal to the front-rear and left- right directions before starting crushing operations.

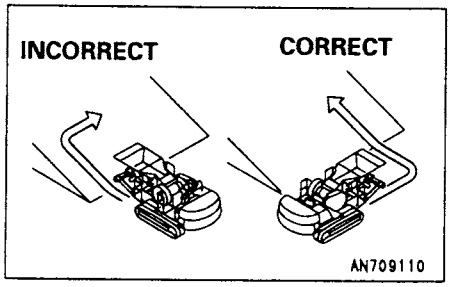


If crushing operations are carried out on slopes, it will cause the following problems.

- The debris (the materials being crushed) will gather on one side of the crushing chamber of the jaw crusher, and this will cause uneven wear of the plate.
- The debris crushed by the jaw crusher will not fall on the center of the primary conveyor belt (the load will be unbalanced) and this will cause snaking of the primary conveyor belt.



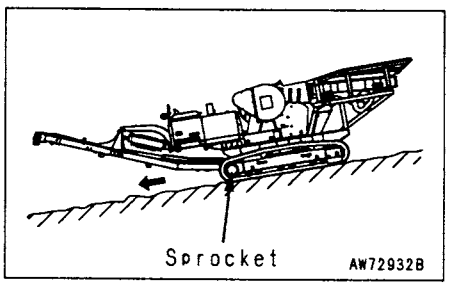
3.18 PRECAUTIONS WHEN TRAVELING UP OR DOWN HILLS



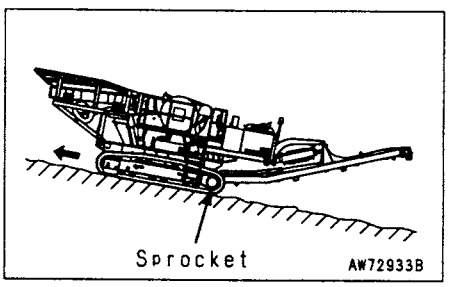
⚠ WARNING

- **When traveling, raise the primary belt conveyor.**
- **When traveling over ridges or other obstacles, travel slowly.**
- **It is dangerous to turn on slopes or to travel across slopes. Always go down to a flat place to correct the direction. It may be longer, but it will ensure safety.**
- **Never carry out operations on slopes.**
- **Do not travel on slopes of over 25° as there is danger that the machine may overturn.**

1. When traveling down steep hills, use the travel lever and fuel control dial to keep the travel speed low.
   When traveling down slopes of more than 10°, set the machine to the posture shown in the figure on the right, and lower the engine speed.
2. When traveling up a steep hill of more than 10°, set the machine to the posture shown in the diagram on the right as far as possible.



REMARK:
As fas as possible, set the sprocket at the downhill end when traveling up or down slopes. If the machine travels up or down hills with the sprocket at the uphill end, the track may become loose and jump the pitch.



Braking when traveling downhill
To brake the machine when traveling downhill, put the travel levers in the neutral position. This will cause the brakes to be automatically applied.

If engine stops
If the engine stops when traveling uphill, move the travel levers to the neutral position, stop the machine, then start the engine again.

4. TRANSPORTATION

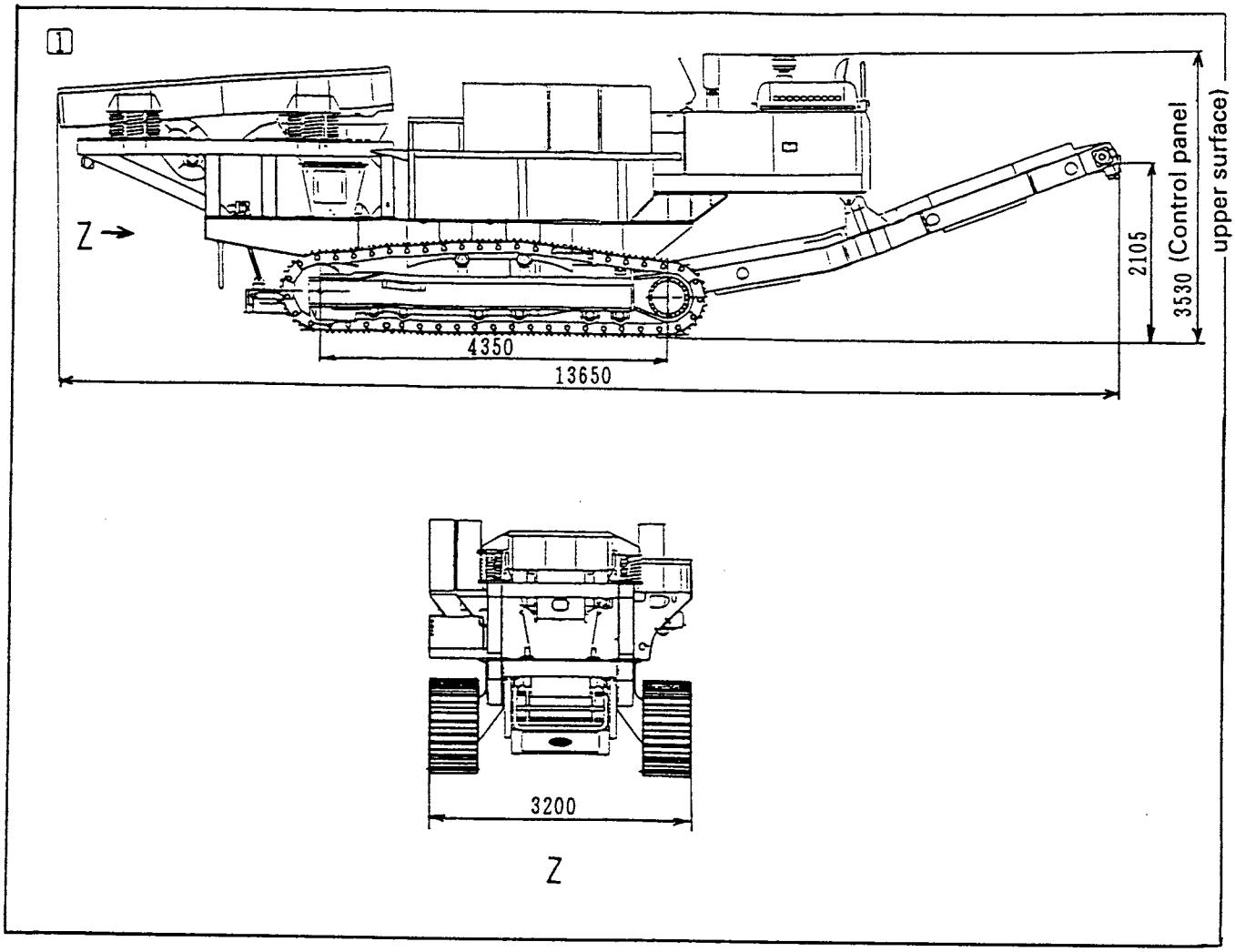
When transporting the machine, observe all related laws and regulations, and be careful to assure safety.

4.1 PACKING STYLE FOR TRANSPORTATION

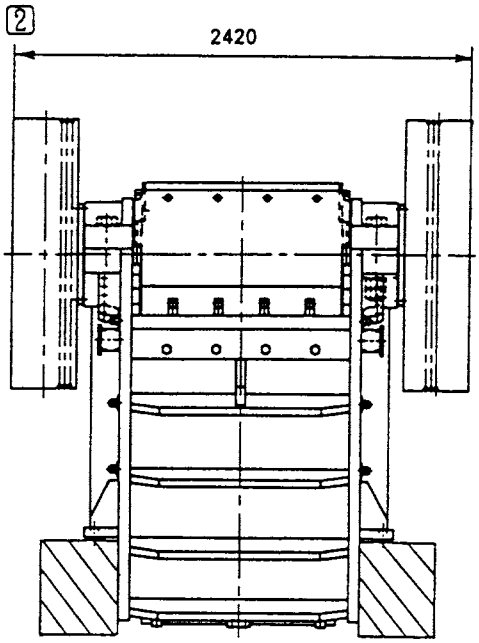
a. Sizes and Weights

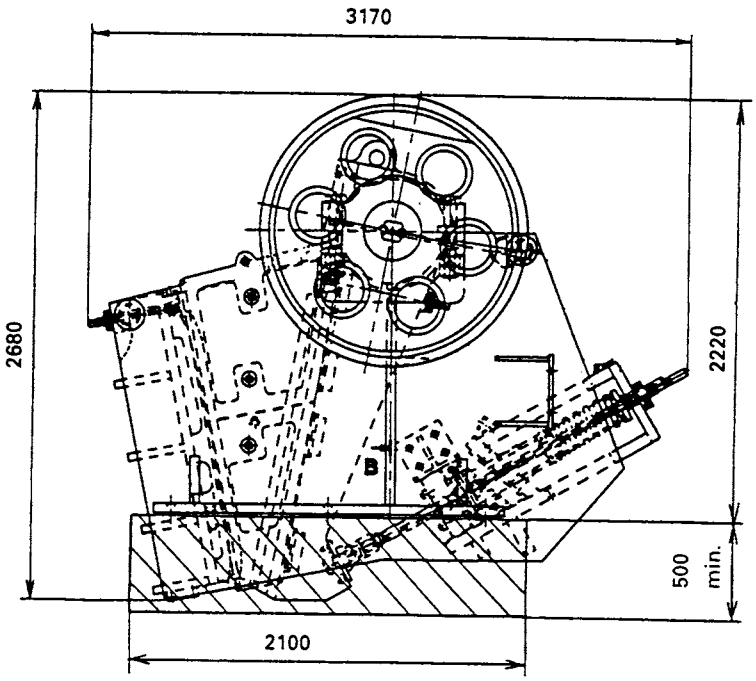
			kg	Total (kg)
[1]	Machine parts		32,000	32,000
Removal parts	[2]	Crusher	22,000	24,422
		Hopper	2,422	
	[3]	Step (on the back of the machine)	118	578
		Guard (Crusher)	331	
		Hand rail, Ladder	126	
		Pre-cleaner	3	

(The machine is divided into three packages for transportation.)

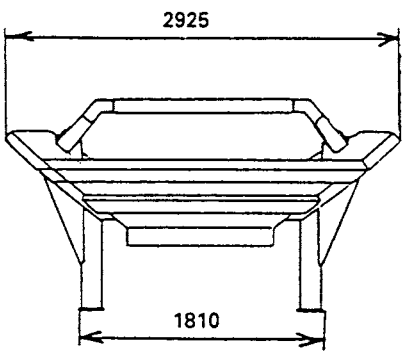


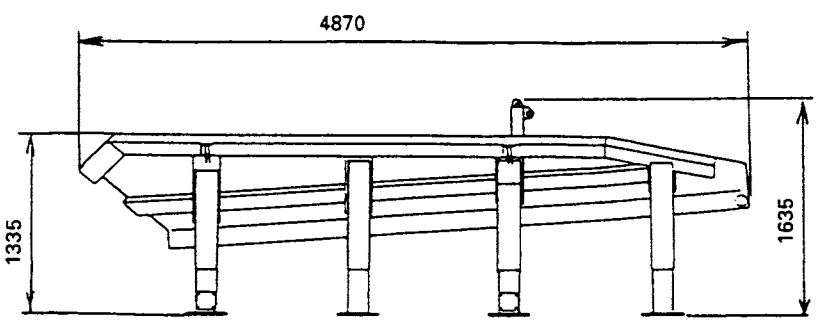
2





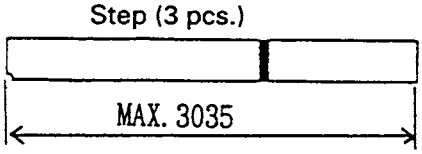
Note: Prepare blocks marked with hatching to let components stand on them.



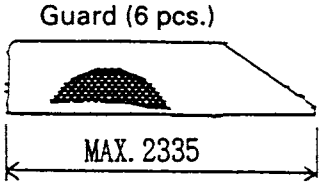


3

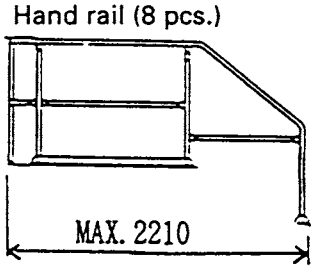
Step (3 pcs.)



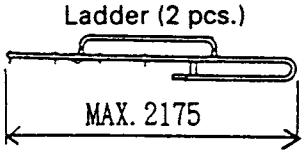
Guard (6 pcs.)



Hand rail (8 pcs.)



Ladder (2 pcs.)

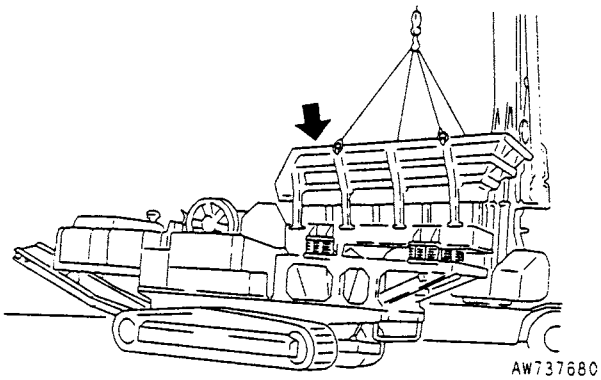


Others
(Pre-cleaner,
Sprinkler nozzle,
Mirror, Small
bracket, etc.)

b. Disassembling Procedures for Transportation

① Park the machine on a flat and strong ground.

② Remove the hopper. (Weight: 2,422 kg)



③ Remove the rotary lamp.

④ Remove the pre-cleaner.

⑤ Remove the upper covers of the crusher flywheel covers (right and left). (Unit weight: 105 kg max.)

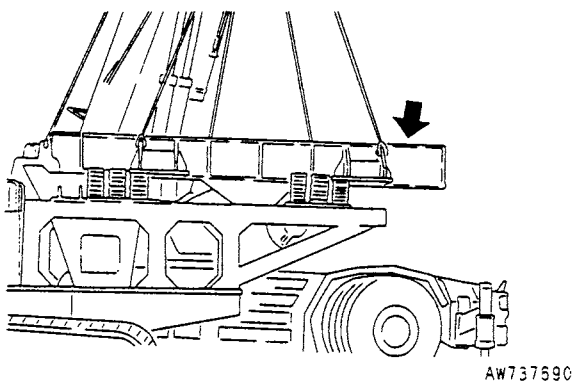
⑥ Remove the brackets of flywheel covers (right and left).

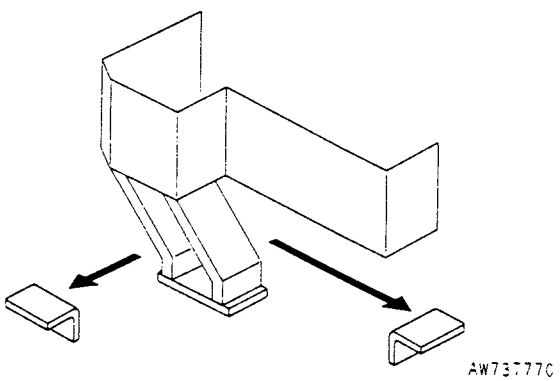
⑦ Disconnect the hose from the feeder motor and set a bull plug there.

⑧ Remove the feeder. (weight: 4,440 kg)

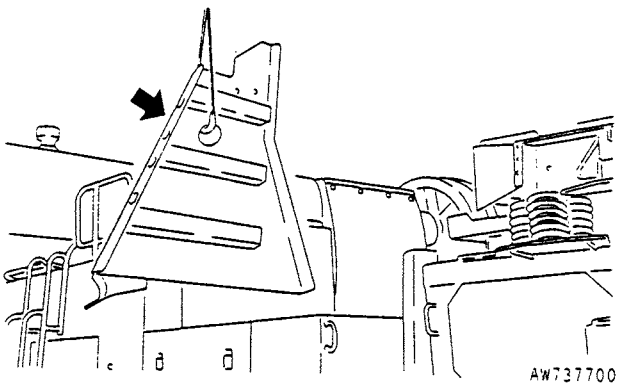
⑨ Disconnect the hose from the crusher motor and set a bull plug there.

⑩ Remove the overfeed sensors (right and left) (option).

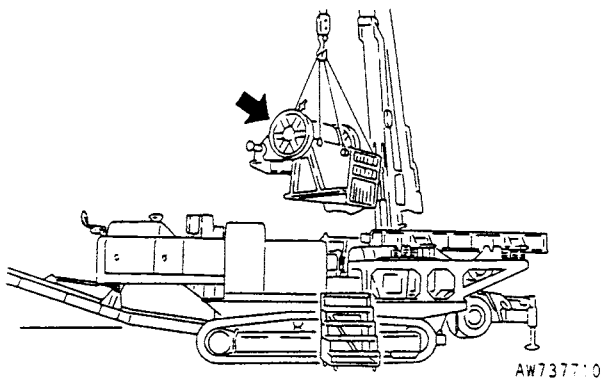




⑪ Remove the guards from the crusher loading ports (front, right and left). (Unit weight: 117 kg max.)



⑫ Lift the crusher and load it on a trailer.
- When loading the crusher on the trailer, lay blocks 500 mm or higher below the crusher.
(Weight: 22,000 kg)

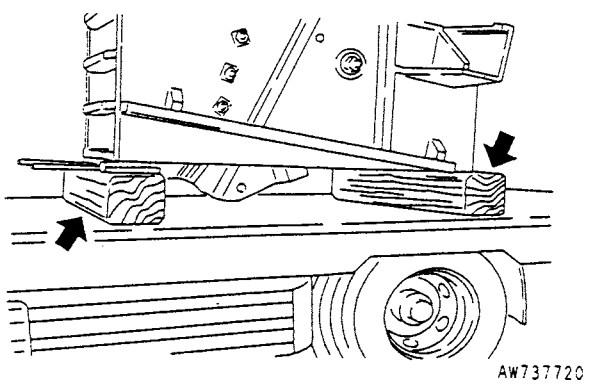


⑬ Remove the catwalk, hand rails and ladders, and arrange the machine body in a proper style for transportation.
(Weight: 108 kg max.)

⑭ Load the hopper and the crusher on a same trailer. (Weight: 2,422 kg)

⑮ Travel the machine body by itself and load it on a low floor trailer. (Weight: 32,000 kg)

⑯ Load the crusher covers, guards, catwalk, hand rails and ladders on a 4-ton truck. (Weight: 108 kg)

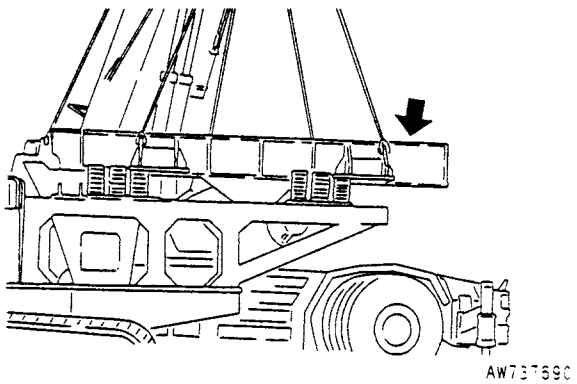


c. Assembling Procedures

① Park the machine body on a flat and strong floor.

② Moving of feeder
Remove the fixing pins from the feeder (2 places on the right and left sides), lift the feeder and move it horizontally to the opposite side of the crusher. (Weight: 4,400 kg)

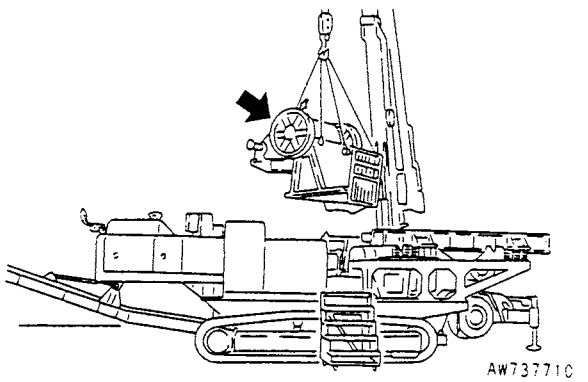
- Use care so that the exciter of the feeder motor does not interfere with other parts around.
- Store the fixing pins for transportation for re-use.



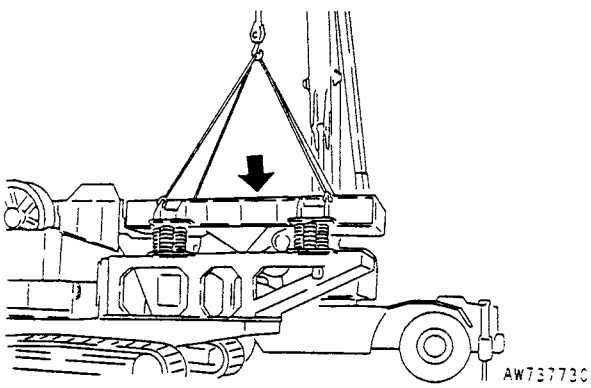
③ Assembling of Crusher
Lift the crusher and mount it on the machine body.

Note:
- Lift the crusher so that the fitting plane become horizontal. If being lifted aslant, the crusher cannot be mounted on the machine body. (Weight: 22,000 kg)
- When mounting the crusher, direct the motor to the engine si,de.

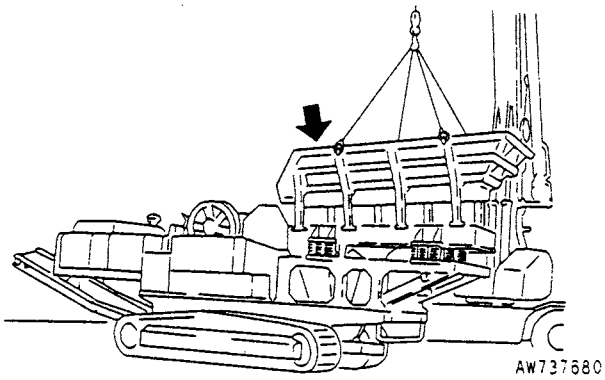
Tightening torque for crusher mounting bolt: 2750 ± 300 Nm (280 ± 30 kgm)



④ Connect the feeder. (Weight: 4,440 kg)

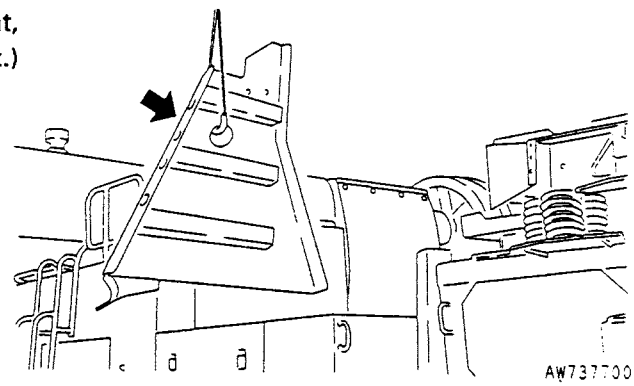


⑤ Set the hopper on the machine body. (Weight 2,150 kg)
Tightening torque for hopper mounting bolt: 549 ± 59 Nm (56.0 ± 6.0 kgm)



⑥ Connect the crusher motor hose to the motor.
- Use care not to let oil spurt.
- Store the bull plugs in the tool box for re-use.
- Use care to set O-rings in order.
- Since all hose mouthpieces are the same, be sure to meet same marks each other at "A" and "B" ports to prevent mis-assembling.

⑦ Set the crusher loading port guards (to the front, rear, left and right sides). (Weight : 108 kg max.)



⑧ Set the upper covers of the crusher flywheel covers (right and left). (Unit weight : 98 kg max.)

⑨ Set the catwalk, hand rails and ladders on the machine. (Unit weight : 48 kg max.)

⑩ Connect the feeder motor hose to the motor.
- Use care not to let oil spurt.
- Store the bull plugs for re-use.
- Use care to set O-rings in order.

⑪ Connect the grease hoses to the both sides of the crusher.

⑫ Connect the pre-cleaner.

⑬ Fix the rotary lamp to the machine.

⑭ Set the overfeed sensors (to the right and left sides). (Option)

4.2 LOADING, UNLOADING WORK

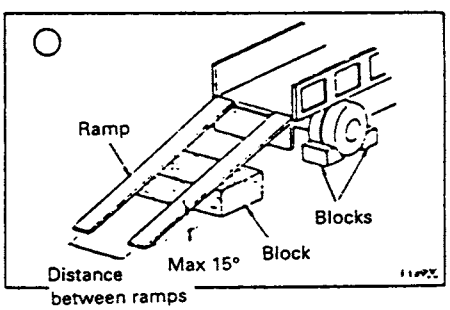
⚠ WARNING

- **Loading or unloading the machine can be dangerous operation, so be particularly careful. When loading or unloading the machine, run the engine at low idling and travel at low speed.**
- **Make sure the ramp has sufficient width, length and thickness to enable the machine to be safely loaded and unloaded.**
- **When loading and unloading the machine, park the trailer on a flat firm roadbed. Keep a fairly long distance between the road shoulder and the machine.**
- **Remove the mud from the undercarriage to prevent the machine from slipping to the side on slopes. Be sure the ramp surface is clean and free of grease, oil, ice and loose materials.**
- **Never change the direction of travel when on the ramps. If it is necessary to change direction, drive off the ramps and correct the direction, then drive on to the ramps again.**

When loading or unloading, always use ramps or a platform and carry out the operations as follows.

Properly apply the brakes on the trailer and insert blocks beneath the tires to ensure that it does not move. Then fix the ramps in line with the centers of the trailer and the machine. Be sure that the two sides are at the same level as one another.

Make the angle of the ramps a maximum of 15°.



4.3 PRECAUTIONS FOR LOADING

⚠ WARNING

When loading the machine, park trailer on a flat firm roadbed. Also, keep a fairly long distance between the road shoulder and the machine.

After loading to the specified position, secure the machine as follows.

(1) Stop the engine and remove the key from the starting switch.

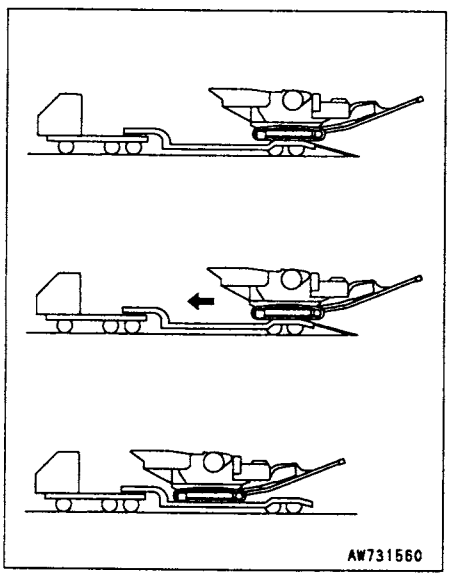
(2) Lock all the control levers securely with the safety lock lever.

(3) When transporting the machine, place rectangular timber underneath the front track shoes to prevent the machine from moving about. Also, hold it down with chains or rope. Be particularly careful to ensure that the machine does not slip sideways.

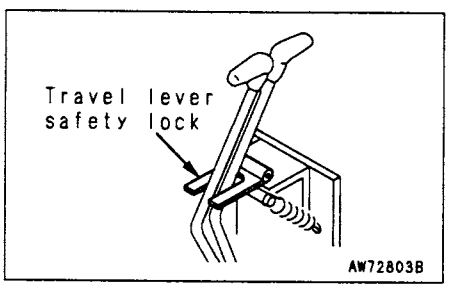
FIXING METHOD OF MACHINE

After loading the machine on the trailer, fix it according to the following procedure.

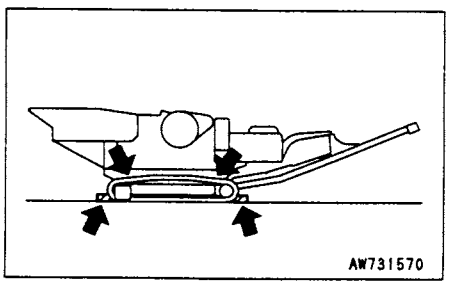
1. When the machine becomes level on the trailer, stop it.
2. Slowly move the machine forward on the trailer.
3. Stop the machine at the specified position on the trailer.
4. Stop the engine and pull out the starting switch key.



5. Securely lock the travel levers with the travel lever safety lock.



6. When transporting the machine, place rectangular timer under the front and rear track shoes to prevent the machine from moving. Furthermore, hold it with chains or wire ropes. Ensure that the machine will not slip sideways, in particular.



4.4 PRECAUTIONS FOR TRANSPORTATION

⚠ WARNING

Determine the route for transporting the machine by taking into account the width, height and weight of the machine.

When transporting, as specified value are set by the various laws and regulations, contact your Komatsu distributor for consultation.

5. LONG-TERM STORAGE

5.1 BEFORE STORAGE

When putting the machine in storage for a long time, do as follows.

- After every part is washed and cleaned, the machine shall be housed in a building. In case it is indispensable to leave it outdoors, park the machine on the flat ground and cover it with canvas, etc.
- Completely fill the fuel tank, lubricate and change the oil before storage.
- Apply a thin coat of grease to metal surface of the hydraulic piston rods.
- Disconnect the negative terminals of the battery and cover it, or remove it from the machine and store it separately.
- The cooling water is not particularly necessary to be changed for the ambient temperature above –10°C, as Komatsu Genuine Super Coolant (AF-ALC) has been added. If the ambient temperature is expected to drop below 10°C, refer to the paragraph on "WHEN REQUIRED" maintenance, and adjust the concentration
- Lock control lever and lock lever.

5.2 DURING STORAGE

⚠ WARNING

If it is unavoidably necessary to carry out the rustpreventive operation while the machine is indoors, open the doors and windows to improve ventilation and prevent gas poisoning.

Operate the engine and move the machine for a short distance once a month so that a new film of oil will be coated over movable parts and component surfaces. At the same time, also charge the battery.

5.3 AFTER STORAGE

NOTICE:
If the machine is stored without carrying out the monthly rust prevention operation, request your Komatsu distributor for service.

Carry out the following procedure when taking the machine out of long-term storage.

- Wipe off the grease from the hydraulic cylinder rods.
- Add oil and grease to all places.

6. TROUBLESHOOTING

6.1 PHENOMENA THAT ARE NOT FAILURES

The following phenomena are not failures.

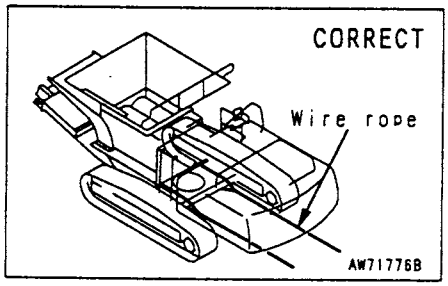
1) When the machine travels down a slope at low speed, sounds are heard from the travel motor.
2) When the starting switch is turned ON, 3 seconds, and the alarm buzzer will sound.

6.2 METHOD OF TOWING MACHINE

⚠ WARNING

Use the towing wire rope which is strong enough for the weight of machine to be towed.

When the machine sinks in mud and cannot get out by itself, or when towing heavy substances, use the wire rope as illustrated on the right. Place pieces of wood between the wire rope and the machine to prevent damages to the both of them.

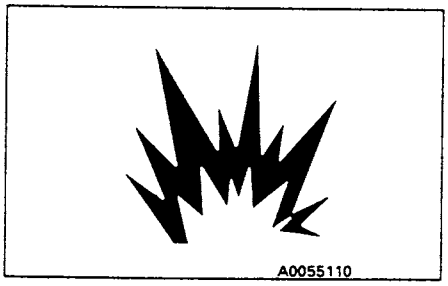


7. WHEN THE BATTERY HAS DISCHARGED

⚠ WARNING

Since the battery contains diluted sulfuric acid and produces hydrogen gas, wrong handling of it can cause injury and fire. Accordingly, observe the following items, as well as section on the battery in "PRECAUTIONS DURING OPERATION" of the volume of SAFETY.

- **When inspecting or handling the battery, stop the engine and turn off starting switch key to the OFF position**
- **Wipe dust off the top of the battery with clean wet cloths. Do not use organic solvent or detergent such as gasoline, paint thinner, etc**
- **Do not connect both terminals (positive and negative ones) to each other with a metallic piece such as a tool by mistake**
- **If the battery fluid level is near the LOWER LEVEL, add distilled water. Do not add distilled water more than the UPPER LEVEL, however. Tighten the battery caps securely**
- **Do not charge the battery or start the engine with another power source while the battery fluid is frozen. If it is done, the battery may catch fire.**
  Before charging the battery or starting the engine with another power source, thaw the battery fluid and check that it is not leaking
- **When removing the battery, disconnect the grounding cable (the negative terminal side, normally) first. When reinstalling, connect the positive cable first**
- **If the terminals are loosened, sparks may be produced because of bad contact. Tighten the terminals securely**
- **When removing and reinstalling the battery, check the positive and negative terminals**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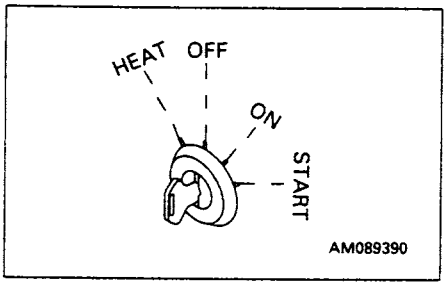

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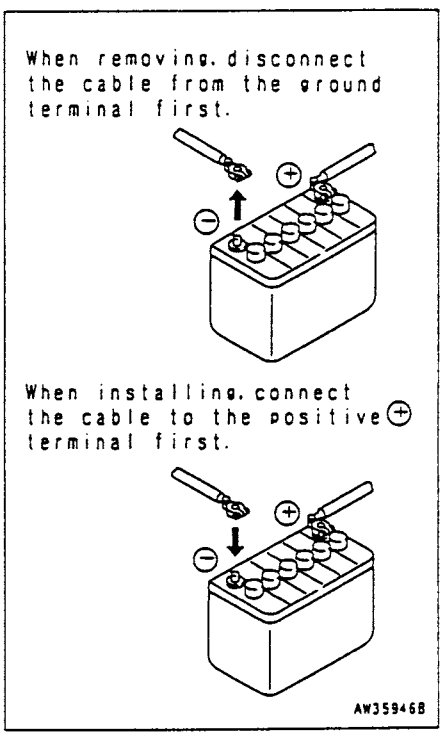

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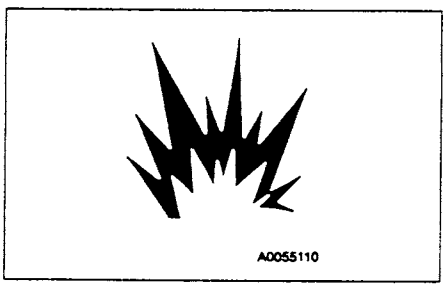
7.1 BATTERY REMOVAL AND INSTALLATION

- When removing the battery, disconnect the ground cable (normally the negative (–) terminal) first.
  Be careful not to touch with any tool between the terminal and the machine. There is danger that this may cause a spark.
- When installing the battery, connected the ground cable last.
- When replacing the battery, fix the battery securely with battery clamp.
  Tightening torque of mounting bolt: 9.8 – 14.7 Nm (1 – 1.5 kgf·m)

7.2 BATTERY CHARGES



When charging the battery, there is danger that the battery may explode if it is handled wrongly, so follow the instructions in "OTHER TROUBLE" and the instruction manual supplied with the charger, and be sure to observe the following precautions.

- Set the voltage of the charger to match the voltage of the battery to be charged. If the voltage is not selected correctly, the charger may overheat and cause an explosion.
- Connect the positive (+) charger clip of the charger to the positive (+) terminal of the battery, then connect the negative (–) charger clip of the charger to the negative (–) terminal of the battery. Be sure to fix the clips securely.
- Set the charging current to 1/10 of the value of the rated battery capacity; when carrying out rapid charging, set it to less than the rated battery capacity.
  If the charger current is too high, the electrolyte will leak or dry up, and this may cause the battery to catch fire and explode.
- If the battery electrolyte is frozen, do not charge the battery or start the engine with a different power source. There is a hazard that this will ignite the battery electrolyte and cause the battery to explode.
- Do not use or charge the battery if the battery electrolyte level is below the LOWER LEVEL line. This may cause an explosion. Always check the battery electrolyte level periodically and add distilled water to bring the electrolyte level to the UPPER LEVEL line.

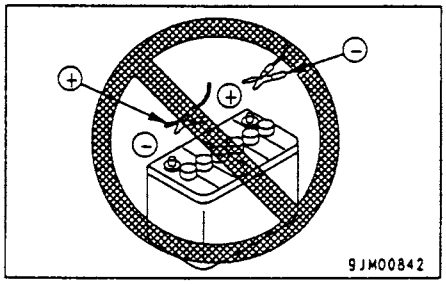
7.3 STARTING ENGINE WITH BOOSTER CABLES

When starting the engine with a booster cable, do as follows:

Connecting and Disconnecting Booster Cables

⚠ WARNING

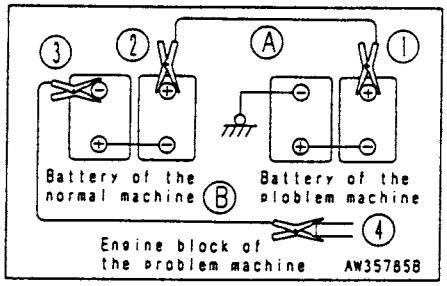
- **When connecting the cables, never contact the positive (+) and negative (–) terminals.**
- **When starting the engine with a booster cable, always wear safety glasses.**
- **Be careful not to let the normal machine and problem machine contact each other. This prevents sparks from generating near the battery which could ignite the hydrogen gas given off by the battery. If hydrogen gas explodes, it could cause serious injury.**
- **Make sure that there is no mistake in the booster cable connections. The final connection is to the revolving frame, but sparks will be generated when this is done, so connect to a place as far as possible from the battery. (However, avoid connecting the cable to the work equipment, as conduction is poor.)**
- **Use care when removing the cables from the machine that has been started. To avoid hydrogen explosion, do not allow the cable ends to contact each other or the machine.**



NOTICE

- **The size of the booster cable and clip should be suitable for the battery size.**
- **The battery of the normal machine must be the same capacity as that of the engine to be started.**
- **Check the cables and clips for damage or corrosion.**
- **Make sure that the cables and clips are firmly connected.**

Booster Cable Connections



Keep the starting switch of the normal machine and problem machine are both at the OFF position.

Connect the booster cable as follows, in the order of the numbers marked in the diagram.

1. Make sure that the starting switches of the normal machine and problem machine are both at the OFF position.
2. Connect one clip of booster cable Ⓐ to the positive ⊕ terminal of the problem machine.
3. Connect the other clip of booster cable Ⓐ to the positive ⊕ terminal of the normal machine.
4. Connect one clip of booster cable Ⓑ to the negative ⊖ terminal of the normal machine.
5. Connect the other clip of booster cable Ⓑ to the engine block of the problem machine.

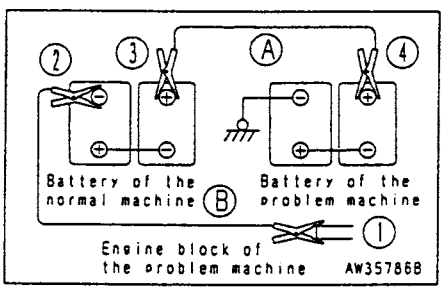
Starting the Engine

⚠ CAUTION

Always check that the safety lock lever is set to the LOCK position, regardless of whether the machine is working normally or has failed. Check also that all the control levers are at the HOLD or neutral position.

1. Make sure the clips are firmly connected to the battery terminals.
2. Start the engine of the normal machine and keep it to run at high idling speed.
3. Turn the starting switch of the problem machine to the START position and start the engine. If the engine doesn't start at first, try again after 2 minutes or so.

Booster Cable Disconnection



After the engine has started, disconnect the booster cables in the reverse of the order in which they were connected.

1. Remove one clip of booster cable Ⓑ from the engine block of the problem machine.
2. Remove the other clip of booster cable Ⓑ from the negative ⊖ terminal of the normal machine.
3. Remove one clip of booster cable Ⓐ from the positive ⊕ terminal of the normal machine.
4. Remove the other clip of booster cable Ⓐ from the positive ⊕ terminal of the problem machine.

MAINTENANCE

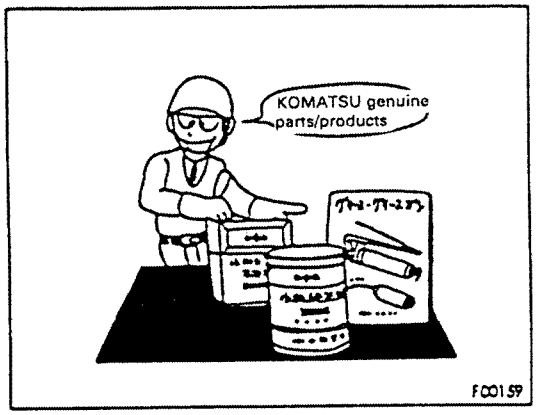
1. GENERAL INSTRUCTIONS ON MAINTENANCE OPERATIONS

KOMATSU genuine parts (spare parts):

USE KOMATSU genuine parts specified in the parts specifications as spare parts.

KOMATSU genuine products (oil and grease):

Use KOMATSU genuine products as oil and grease. Use those having specified viscosity according to the temperature.



Keeping the vehicle clean:

Keep the vehicle clean so as to facilitate trouble shooting. In particular, keep the oiling or greasing parts and oil level gauge clean to prevent dust invasion.

Using fresh oil and grease:

Use fresh oil and grease. Their containers should be also clean to prevent dust invasion.

Wiping out old grease:

After greasing, wipe out protruded old grease.
In particular, carefully wipe it out in the parts that tend to expedite the wear of the rotary portion by adherent sand or dust.

Voiding mixing water:

Be careful not to mix the water staying in the concave or bottom of the drum can when fuel is replenished.

Proper water and temperatures:

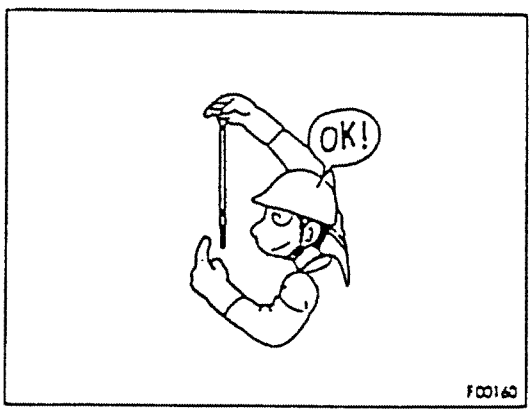
Just after a stop, the replacement of waste oil, waste water and filter will invite danger. Perform this operation after the temperature becomes low. Conversely, if oil is cold, raise the temperature of waste oil to a proper level (20 to 40°C), then discharge it.

Checking waster oil and filter:

Before oil replacement or filter replacement, check the waste oil and oil filter to see if lots of metal powder or foreign materials are included.

Caution on oiling:

When a strainer is provided at the oil filler, don't remove for oiling.



Prevention against dust inclusion:

Check or replace oil at a place that is free from dust to prevent dust inclusion.

Setting a warning tag:

After draining oil or cooling water, set a warning tag on the driver seat to prevent other operator from starting the engine carelessly.

Careful with fire:

Parts are washed with nonflammable cleaner or light oil. Don't use light oil near fire.

Checking the lubricant level:

Excessive or insuficient lubricant is not desirable. At a check or replenishment, check if the lubricant level is proper.

Attention to electrical equipment:

When washing the vehicle, be careful not to splash water on electrical equipment.

Keeping the mounting face clean:

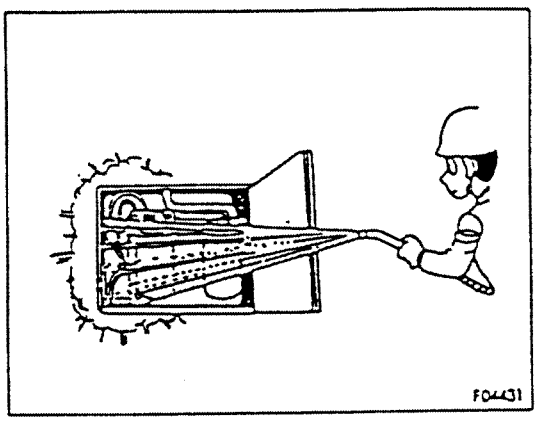
After dismounting a part that includes an O-ring or gasket seal, clean the mounting face and replace it with a new one.

Cautions at repair by welding:

- Turn off the power source. (Set the starting switch to the OFF position.)
- Don't apply 200 V or more continuously.
- Perform grounding within 1 m from the weld.
- Don't insert a seal or bearing between the weld and grounding.

Cautions at vehicle wash:

- Don't jet stream directly to mechatoronics and connectors.
- Don't splash on the panel box of the vehicle monitoring system.
- Don't splash high-pressure water directly to the radiator.

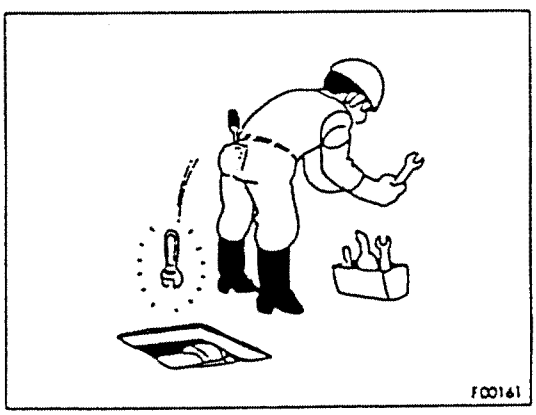


Cautions on electrical equipment:

When washing the vehicle, be careful not to splash water on electrical equipment.

Careful not to drop the content of pockets:

Before performing inspection and maintenance with a downward look after opening the cover, take out the contents to avoid dropping it.



Checking the undercarriage:

When working at a very rocky place, check the undercarriage for damage, the bolts and nuts for looseness, wear and breaking. The tension of the track shoe should be a little slacker than usual.

Checking and inspection before/after operations:

At work in muddy water, rain, seaside and snow, check each plug or cock for tightening before starting operations. After completion of operations, wash the vehicle and check each part for crack, damage and the bolts and nuts for looseness and falling-off.
Perform oiling and greasing a little earlier.
In particular, apply grease to the working equipment pins every day into which muddy water enters.

At a dusty work place:

When performing operations at a dusty place, take the following points into consideration.

- Carefully check the air cleaner for clogging with a dust indicator. Clean the aircleaner element a little earlier.
- Clean the radiator core a little earlier to avoid clogging. When it is dusty during operations, make a check from time to time.
- Clean or replace the fuel filter a little earlier.
- Clean electrical equipment, specially, the starting motor and alternator to prevent dust from being accumulated.

Cautions at maintenance of hydraulic equipment, circuit and hydraulic system:

- Be sure to stop the engine.
- Just after operation, the temperatures of hydraulic oil and lubricant are high. Start maintenance after the oil temperature of each part becomes low.
  In some cases, internal pressure may be still applied even after the temperature becomes low. Accordingly, loosen the connections of plugs, screws and hoses gradually and slowly without putting the human body at the front while reducing the internal pressure.
- Before making checks and maintenance for the hydraulic circuit, be sure to bleed the hydraulic tank of air to remove the internal pressure.

OUTLINE OF OIL, FUEL, AND COOLING WATER

Oil:

- The oil that is used in very severe conditions (high temperature, high pressure) in the engine or work equipment and degraded with the lapse of working time.
  Be sure to use the oil that complies with the grade and working temperature mentioned in the Operation and Maintenance Manual.
  Even if the oil has not become dirty, be sure to change the oil at a determined interval.

- Oil is equivalent for the blood in the human body. Be careful not to mix impurities (water, metal powder, dust, etc.) in handling the oil.
  Most machine trouble is attributable to the mixture of impurities. In particular, special care should be exercised to avoid mixing impurities during storage and oil supply.

- Don't mix oil of a different grade and brand.

- Supply a determined quantity of oil. Excessive or insufficient oil will lead to trouble.

- When the oil in the work equipment becomes turbid, water or air may have been mixed in the circuit. Contact your KOMATSU distributor.

- When replacing oil, be sure to replace the related filter.

- It is recommended to periodically make an oil analysis to grasp the vehicle condition. Ask your KOMATSU distributor for information on it if you desire.

Fuel:

- The fuel pump is a precision machine, and fails to operate if its fuel includes water or dust.

- Special care should be exercised not to mix impurities during storage or oil supply.

- Be sure to use the fuel mentioned in the Operation and Maintenance Manual. The fuel has the property of coagulating at some temperatures (specially, below −15°C). Therefore it is necessary to use a fuel fit for the temperature.

- To prevent humid air coagulated and consequent water mixing in the fuel tank, fill up the fuel tank with fuel after completion of daily operations.

- Before starting the engine or about 10 minutes after fuel replenishment, discharge sediment and water from the fuel tank.

- After fuel becomes short or the filter is replaced, it is necessary to perform air bleeding in the circuit.

Cooling water:

- River water contains lots of calcium, impurities, etc. If such water is used, fur adheres to the engine and radiator, thereby causing a heat exchanger failure with the result of overheating.
- When using an antifreeze solution, use it observing the precautions described in the Operation and Maintenance Manual.
- Our vehicles are delivered with our original antifreeze solution. This antifreeze solution is effective also in preventing corrosion for cooling system parts. This antifreeze solution can be continuously used for 2 years or 4,000 hours. Accordingly, it is directly usable in temperate regions.
- The antifreeze solution is inflammable, so be careful about fire.
- The mixture ratio of the antifreeze solution varies with atmospheric temperatures. For the mixture ratio, refer to the paragraph pertaining to "Cleaning the inside of the cooling system."
- When overheating occurs, replenish cooling water after the engine is cooled.
- The shortage of cooling water will cause not only overheating but also corrosion due to air inclusion.

Grease:

- Grease prevents a rub and noise from occurring at junctions.
- The nipple that is not mentioned in the Periodic Maintenance Part is for overhaul, and does not require grease any more. If any noise occurs after long-term use, replenish grease.
- Wipe away the old grease protruded after greasing.
  Completely wipe away the sand and dust adhering to the rotary portion where wear may be promoted by them.

Storage of Oil and Fuel:

- Store oil and fuel indoors so that impurities such as water and dust may not be mixed.
- When drum cans must be stored for a long time, lay them on their sides in such a way that their mouths are arranged in a horizontal line (to prevent humidity from being absorbed.) If they must be inevitably stored outside, cover them with a water-proof sheet.
- To avoid a change in quality as a result of long-time storage, use the oldest one first on the principle of "First In First Out."

Filter:

- The filter is a very important safety valve to prevent the impurities in the oil, fuel and pneumatic circuit from entering important equipment, thereby causing trouble.
  Periodically replace the filter according to the Operation and Maintenance Manual.
  However, it is necessary to shorten the replacement interval according to a severe working environment, type of oil and type of fuel (sulfur content.)
- Don't reuse the filter (cartridge type) by cleaning it.
- After replacing the oil filter, check if metal powder does not adhere to the used filter. If any metal powder adheres to it, consult your KOMATSU distributor.
- Don't unpack the replacement filter till it is about to be used.
- Be sure to use KOMATSU genuine filter.

OUTLINE OF ELECTRICAL EQUIPMENT

- Electrical equipment, when it is wetted or has film breaking, causes electric leakage, putting the machine out of order and causing it to malfunction. This trouble is very dangerous.
- At inspection and maintenance, check the fan belt for tension, the belt for flaw, and the battery for liquid level.
- Don't dismount the equipment (electrical equipment) mounted on the vehicle or don't disassemble it in any case.
- Don't mount any electrical equipment other than that prepared by KOMATSU.
- When washing the vehicle or when it rains, be careful not to splash the electrical equipment with water.
- The controller of the control system may malfunction because of radio interference from the outside. When radio equipment must be installed on the vehicle, consult with your KOMATSU distributor beforehand.
- At seaside operations, take good care of the electrical equipment to prevent corrosion.

OUTLINE OF HYDRAULIC EQUIPMENT

- The temperature of the hydraulic equipment is high during operation and at the end of operation. During operation, high pressure is applied. Accordingly, perform inspection and maintenance for the hydraulic equipment with care.
- At inspection and maintenance, check the oil level of hydraulic oil, replace the filter and change hydraulic oil.
- After disconnecting the high-pressure hose, check if the O-ring has any flaw. Replace it if any.
- After replacing or cleaning the hydraulic filter element strainer or after repairing and replacing hydraulic equipment and removing hydraulic pipes, perform air bleeding in the circuit.

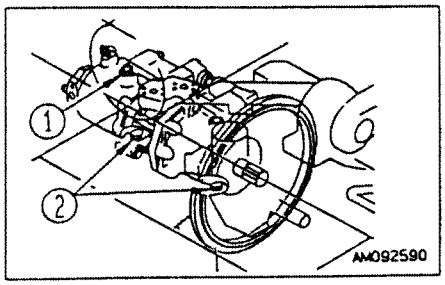
2. AIR BLEEDING FROM CIRCUIT

After replacing or cleaning the hydraulic oil, filter element and strainer and after repairing or replacing the hydraulic equipment and removing the hydraulic piping, bleed the circuit of air.

■ Contents of operations and air bleeding procedure

Air bleeding item / Contents of operations	Air bleeding procedure							
	1	2	3	4	5	6	7	8
	Air bleeding in the pump	Starting the engine	Air bleeding in the grizzly feeder motor	Air bleeding in the crusher motor	Air bleeding in the travel motor	Air bleeding in the belt conveyor motor	Air bleeding in the hydraulic cylinder	Starting operation
• Change of hydraulic oil • Cleaning of strainer	○	→ ○	→ ○	→ ○	→ ○			→ ○
• Replacement of return filter element		○						→ ○
• Replacement/repair of pump • Removal of suction piping	○	→ ○	→ ○	→ ○	→ ○			→ ○
• Replacement/repair of control valve		○	→ ○	→ ○	→ ○			→ ○
• Replacement of grizzly feeder motor • Removal of grizzly feeder motor piping		○	→ ○					→ ○
• Replacement of crusher motor • Removal of crusher motor piping		○		→ ○				→ ○
• Replacement of travel motor • Removal of travel motor piping		○			→ ○			→ ○
• Replacement of belt conveyor motor • Removal of belt conveyor motor piping		○				→ ○		→ ○
• Replacement of hydraulic cylinder • Removal of hydraulic cylinder piping		○					→ ○	→ ○

2.1 AIR BLEEDING IN THE MAIN PUMP



a. Loosen air bleed plug ① and check that oil oozes out from the air bleed plug.

b. If oil does not ooze out, remove the drain hose of the pump case, fill the pump case with hydraulic oil from drain port ②.

NOTICE:
Because oil comes out from the removed drain hose, fix the adapter of the hose at a higher position than the oil level of the hydraulic tank.

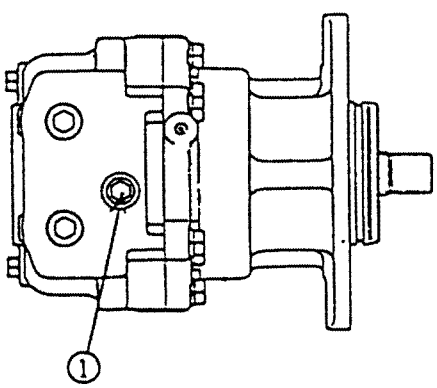
c. After completion of air bleeding, tighten air bleed plug ①, then set the drain hose.

NOTICE:
- **If the drain hose is set first, oil will spout out from the hole of plug ①.**
- **If the pump is operated without filling the pump case with hydraulic oil, heat will be generated abnormally, thereby causing breaking to the pump in an early stage.**

2.2 STARTING THE ENGINE

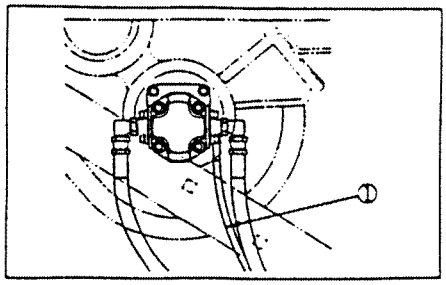
Start the engine referring to the paragraph pertaining to "Starting the engine." After that, idle the engine at a low speed for 10 minutes. Then, proceed to the next operation.

2.3 AIR BLEEDING IN THE CRUSHER MOTOR



Idle the engine at a low speed and loosen air bleed plug ①. When no more cloudy white oil flows out from air bleed plug ①, tighten the plug.

2.4 BLEEDING AIR FROM GRIZZLY FEEDER MOTOR



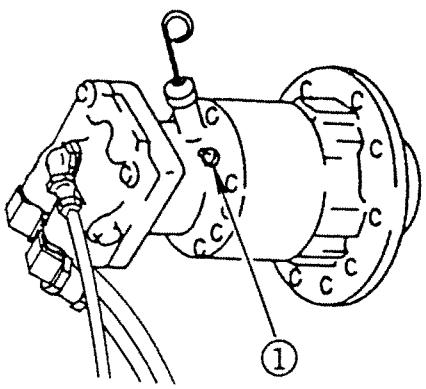
a. Run the engine at low idling, loosen drain hose ①, and check that oil oozes out from drain hose ①.

b. If oil does not ooze out, stop the engine, remove drain hose ①, and fill the motor case with hydraulic oil.

c. After completion of air bleeding, tighten drain hose ①.

d. Run the engine at low idling to rotate it slowly.

2.5 AIR BLEEDING IN THE BELT CONVEYOR MOTOR



[1] Idle the engine at a low speed and loosen air bleed plug ①. Then, check that oil oozes out from air bleed plug ①.

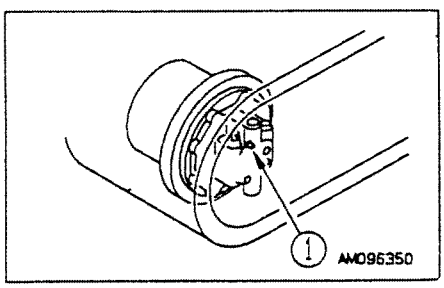
NOTICE:
At this time, don't operate conveyor.

[2] If oil does not ooze out, stop the engine and remove the air bleed plug ①. Then, fill the motor case with hydraulic oil.

[3] After completion of air bleeding, tighten the air bleed plug ①.

[4] Idle the engine at a low speed to rotate it slowly.

2.6 AIR BLEEDING IN THE TRAVEL MOTOR (Perform this only when the oil in the travel motor case is drained.)



Idle the engine at a low speed and loosen air bleed plug ①. When oil comes out, tighten the plug.

2.7 AIR BLEEDING IN THE CYLINDER

[1] Idle the engine at a low speed, and extend and contract the cylinder 4 or 5 times (up to about 100 mm before the stroke end) so that it does not reach the stroke end.

[2] Move the cylinder to the stroke end 3 or 4 times.

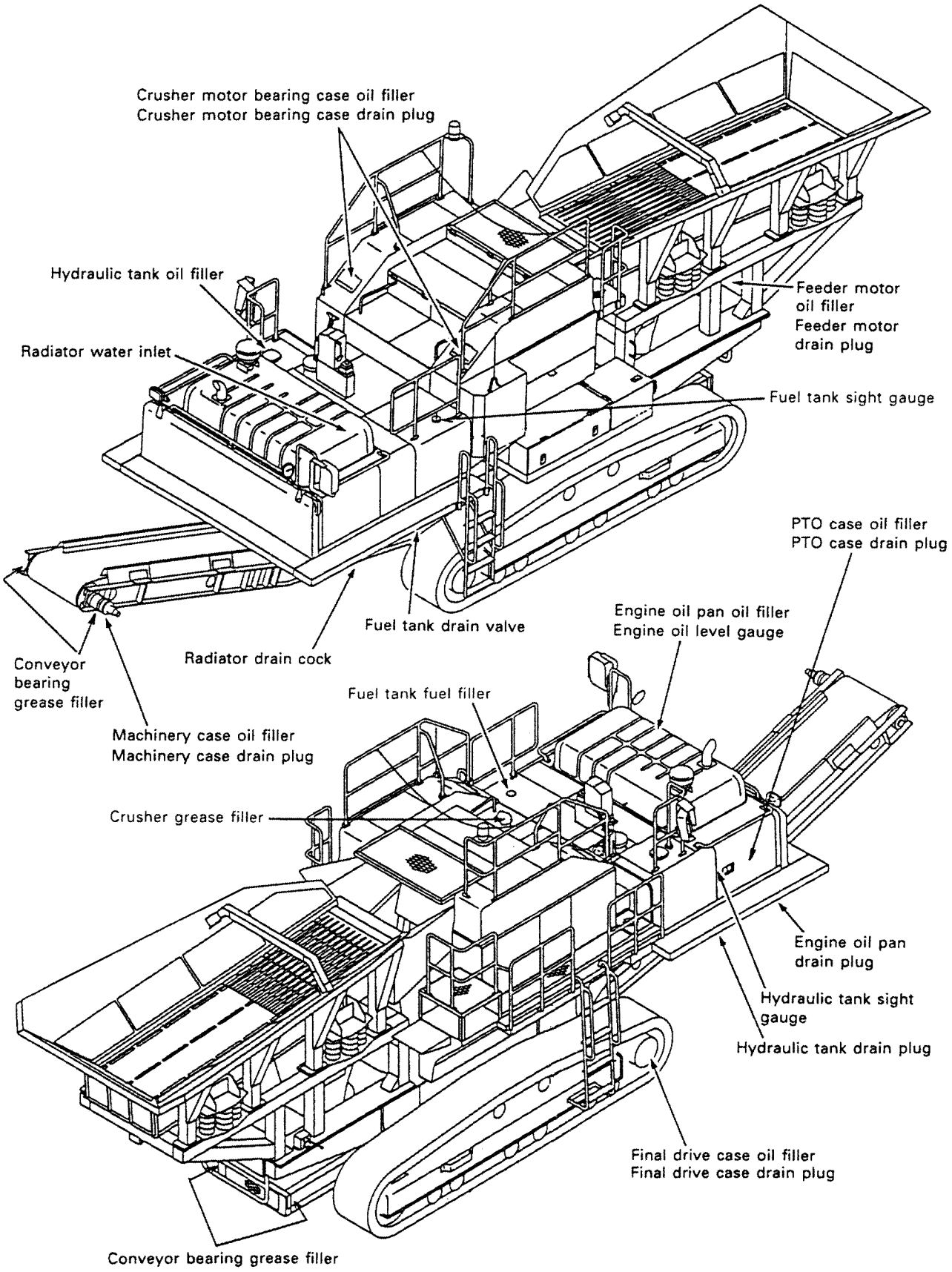
[3] Move the cylinder to the stroke end 4 or 5 times again to bleed air completely from the cylinder.

NOTICE:
Starting the engine at a high speed or moving the cylinder to the stoke end will cause air to enter the cylinder, and this may damage the piston packing.

2.8 STARTING OPERATIONS

After completion of air bleeding, stop the engine. Keep it in the stationary condition for 5 minutes or more, and then start the operations.
With this, air bubbles will be purged from the oil in the tank.

3. OIL FILLER AND OIL LEVEL GAUGE



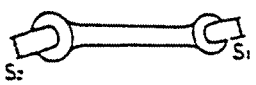
4. STANDARD TIGHTENING TORQUES FOR BOLTS AND NUTS

4.1 INTRODUCTION OF NECESSARY TOOLS

-

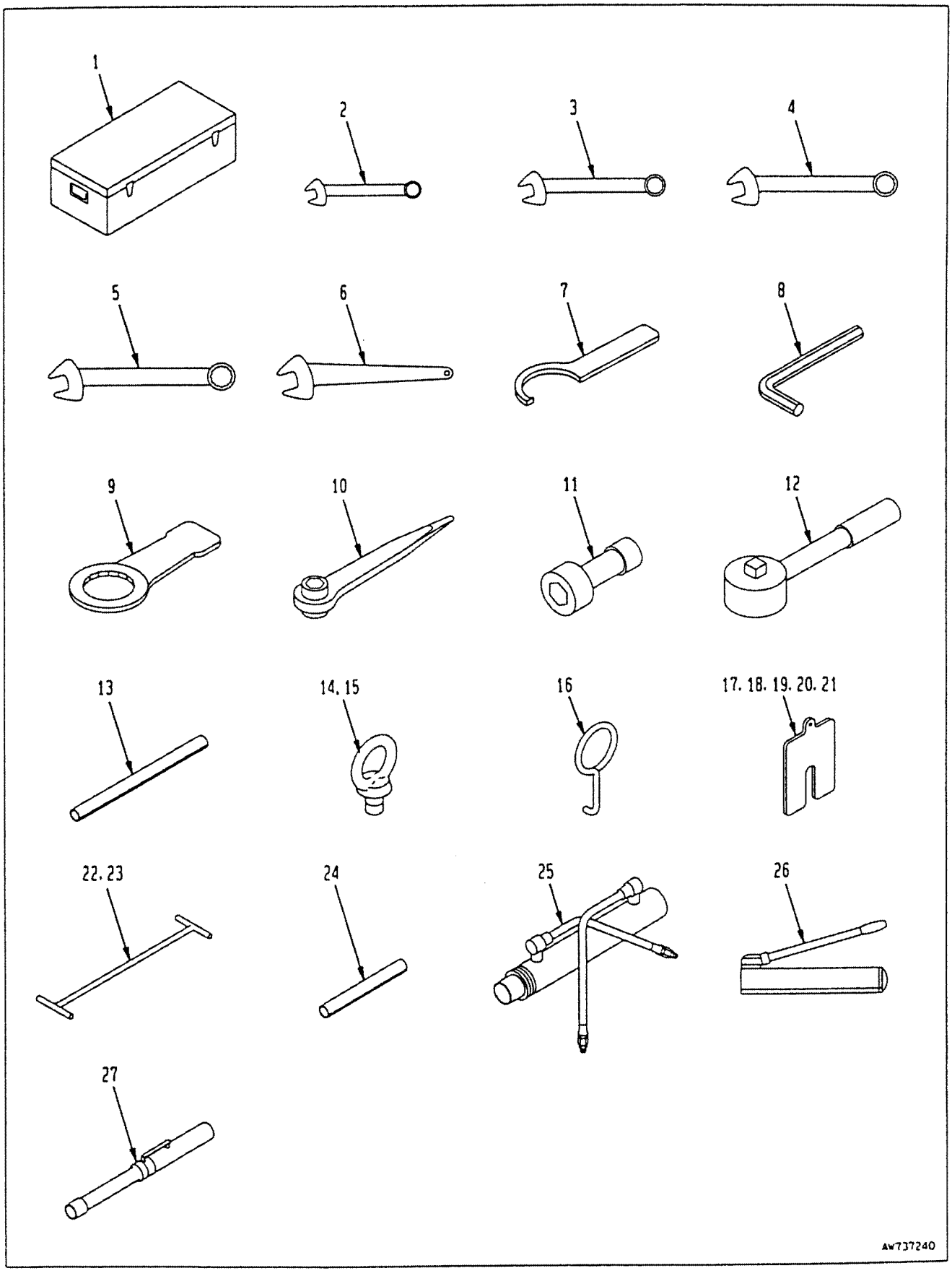
The following tools are needed when carrying out maintenance.

1) Body

No.	Name of tool	Part No.	Remarks
1	Wrench set	09000-30006 • 09002-01214 • 09002-00810 • 09002-01317 • 09002-01922 • 09002-02427 • 09002-03032	Applicable width across flats (S_1-S_2) 12 mm to 14 mm 8 mm to 10 mm 13 mm to 17 mm 19 mm to 22 mm 24 mm to 27 mm 30 mm to 32 mm 
2	Screw driver	09033-00190	Interchangeable flat-head and cross-head type
3	Socket wrench set	09020-10282	Applicable width across flats 10 mm, 13 mm, 14 mm, 17 mm, 19 mm, 22 mm, 24 mm, 27 mm, 30 mm, 32 mm Extension, Handle, Joint, Bar
4	Wrench	09002-03641	Applicable width across flats 36 mm to 41 mm
5	Filter wrench	09019-08035	
6	Grease pump	07952-80003	For greasing work
7	Nozzle	07951-31400	
8	Grease cartridge	07950-90403	(Lithium base grease, 400 g)
9	Hammer	09039-00150	
10	Wrench	09001-04600	Applicable width across flats 46 mm
11	Pliers	09036-00150	
12	Oiler	09040-00800	
13	Lever	560-98-12530	
14	Monkey wrench	09014-10200	

2) Crusher

No.	Tool Names	Part Numbers	Quantity	Remarks
1	Tool box	8242-70-5C72	1	600x200x170
2	Wrench	8242-70-5C80	1	24MM (M16)
3	Wrench	8242-70-5C90	1	30MM (M20)
4	Wrench	8242-70-5D10	1	36MM (M24)
5	Wrench	8242-70-5D20	1	46MM (M30)
6	Wrench	8248-70-5730	2	65MM (M42)
7	Wrench	8248-70-5740	1	230 – 250mm
8	Wrench	8248-70-5D70	1	6 mm
9	Wrench	8248-70-5750	1	95MM (M64)
10	Ratchet wrench for adjusting toggle tension bolt	8248-70-5760	1	46 mm (M30)
11	Fixed jaw plate adjustment socket	8248-70-5770	1	36mm (M24) x 105L
12	Ratchet handle	8242-70-5E30	1	500L
13	Extension pipe	8242-70-5E50	1	SGP 32A x 900L
14	Eyebolt	04530-11018	1	M10
15	Eyebolt	04530-12030	2	M20
16	Cheek plate hook	8285-70-5B60	1	
17	Shim	8248-70-5780	4	450 x 280 x t16
18	Shim	8248-70-5790	4	450 x 280 x t16
19	Shim	8248-70-5810	2	450 x 280 x t16
20	Shim	8248-70-5820	4	450 x 280 x t9
21	Shim	8248-70-5830	4	450 x 280 x t6
22	Clearance gauge	8248-70-5840	1	70/100mm
23	Clearance gauge	8248-70-5850	1	150/200mm
24	Swing jaw stopper	8248-70-5860	1	ø30 x 600L
25	Cylinder and hose	8248-70-3020	1	NR-1200 (ENERPAC)
26	Hydraulic ram	8221-70-2552	1	P-80 (ENERPAC)
27	Crusher driving V-belt tensioner	8242-70-5F40	1	68mmx16kg


1
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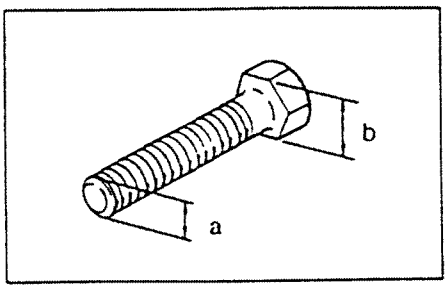
AW737240

4.2 TORQUE LIST

Unless otherwise specified, tighten the metric bolts and nuts to the torque shown in the table.

The tightening torque is determined by the width across the flats (b) of the nut and bolt.

If it is necessary to replace any nut or bolt, always use a KOMATSU genuine part of the same size as the part that was replaced.



Thread diameter of bolt (mm) (a)	Width across flat (b)	Tightening torque (kgm)	
		Target value	Allowed range
6	10	1.35	1.2 to 1.5
8	13	3.2	2.8 to 3.5
10	17	6.7	6.0 to 7.5
12	19	11.5	10.0 to 12.5
14	22	18.0	16.0 to 20.0
16	24	28.5	25.0 to 31.5
18	27	39.0	35.0 to 43.5
20	30	56.0	50.0 to 62.0
22	32	76.0	67.5 to 84.5
24	36	94.5	84.0 to 105.0
27	41	135.0	120.0 to 150.0
30	46	175.0	155.0 to 195.0
33	50	225.0	200.0 to 250.0
36	55	280.0	250.0 to 310.0
39	60	335.0	295.0 to 370.0

NOTICE:
When tightening or other parts having tightening fixtures made of plastic, be careful not to use excessive tightening torque: doing so will damage the tightening parts.

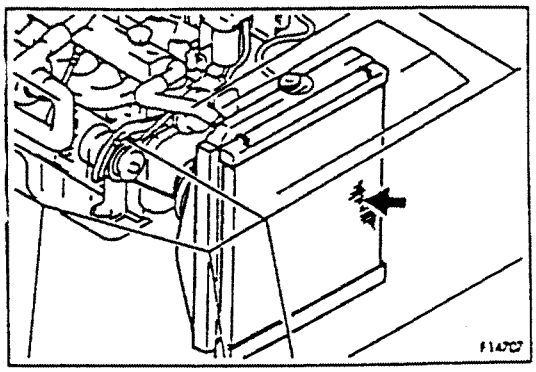
5. MAINTENANCE TABLE

MARK ★: Item related to the crusher, feeder and bolt conveyor
(Except optional parts)

6. PERIODIC MAINTENANCE

6. PERIODIC MAINTENANCE

6.1 CHECK BEFORE STARTING



a. Check and cleaning of radiator fin, oil cooler fin and net

NOTICE:

- **Check the rubber hose. If any crack or fatigue is found, replace it with a new one. Check the hose cramp for looseness.**
- **When the work site is dusty, make checks every day regardless of the maintenance interval.**

⚠ CAUTION

Clean the net on the front of the oil cooler.

Blow off the mud, dust and leaves with which the radiator fin and oil cooler fin are clogged, by using compressed air. Steam or water may be used instead of compressed air.

b. Cooling water level check and replenishment

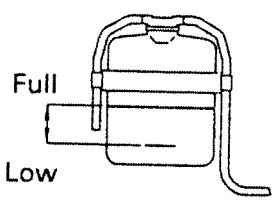
⚠ WARNING

Don't remove the radiator cap in normal case. Check cooling water in the subtank when the engine is cool.

[1] Open the engine hood and check if the cooling water level is within the FULL - LOW range of subtank ① (shown in the figure at right). If the level is low, replenish cooling water up to FULL level from water supply port ② of the subtank.

[2] After replenishing, tighten the cap.

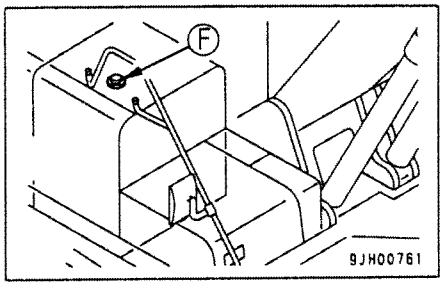
[3] If the subtank is empty, check water leakage and water level of the radiator. If the level is low, first fill water to the radiator and then to the radiator subtank.



c. Fuel level check

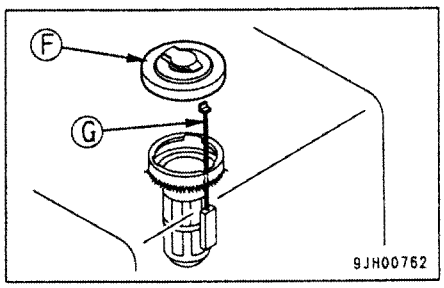
⚠ WARNING

When replenishing fuel, don't cause fuel to overflow so as not to set fire. If spilled, wipe off completely.



1 Check whether fuel is filled up by sight gauge Ⓖ on the front of the fuel tank.

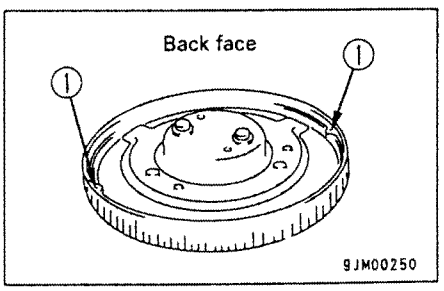
2 If fuel is not within the sight gauge, replenish fuel from fuel filler Ⓕ while observing the sight gauge Ⓖ.



Fuel tank capacity: 605 ℓ

For the fuel to use, refer to the paragraph on "9. Use of fuel, coolant and lubricants according to ambient temperature."

3 After replenishing fuel, be sure to tighten the cap.

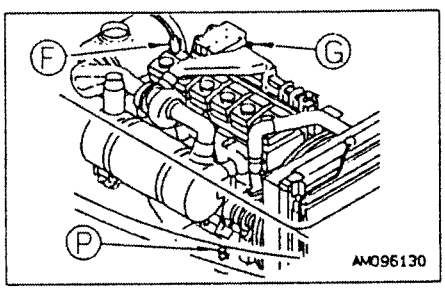


REMARK:
If breather hole ① of the cap is clogged, the pressure in the tank is lowered and fuel may be stopped. Clean it from time to time.

d. Oil level check and replenishment in the engine oil pan

⚠ WARNING

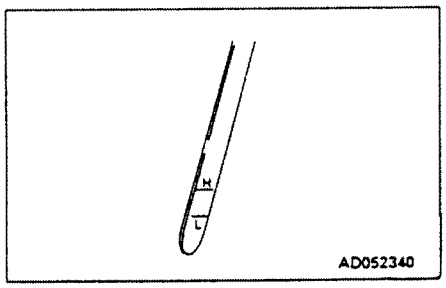
There is the turbocharger (with safety cover) exhaust manifold near oil level gauge Ⓖ. Be careful not to touch it.



1 Open the engine hood.

2 Pull out oil level gauge Ⓖ, and wipe it off with a waste.

3 Insert oil level gauge Ⓖ into the oil check tube fully again, then pull it out.



4 If the oil level is within the H - L marks on oil level gauge Ⓖ, it is proper. If the oil level is lower than L, replenish engine oil from oil filler Ⓕ.

For details of the oil to use, see "9. Use of fuel, coolant and lubricants according to ambient temperature."

[5] If the oil level is above H, drain the excessive engine oil from the drain valve Ⓟ. Then check the oil level again.

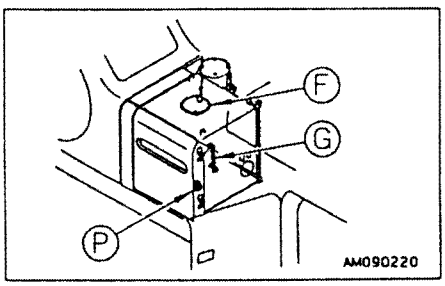
[6] If the oil level is proper, be sure to close the oil filling cap. Then close the engine hood.

REMARK:
For an oil level check after engine operation, start checking 15 minutes after stopping the engine. For the checking, place the vehicle at a level place.

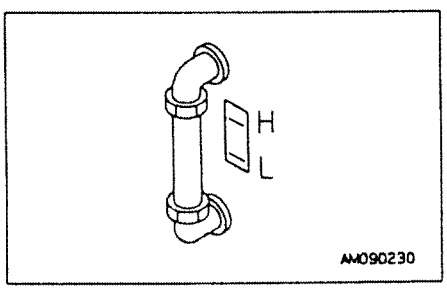
e. Oil level check and replenishment in the hydraulic tank

⚠ WARNING

- **To remove cap at the oil filler, turn it slow and carefully to let the internal pressure out, because the oil may spout out.**
- **If the oil is added above H level, stop the engine and wait until the hydraulic oil cools down. Then drain out the excessive oil from drain plug Ⓟ.**



[1] Open the door on the left side of the body and check sight gauge Ⓖ. If the oil level is between H and L lines, the oil quantity is proper.



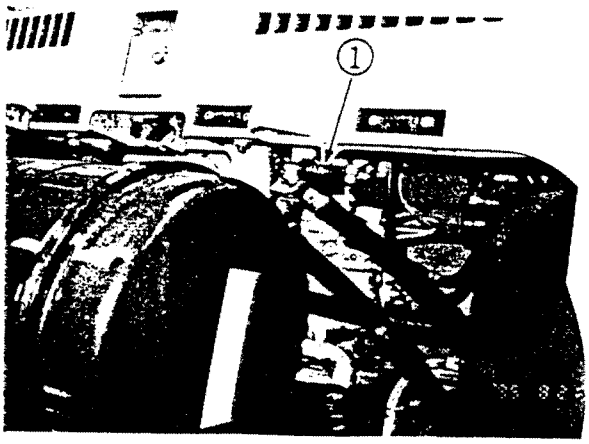
NOTICE:
Don't replenish oil over the H line. It may cause to damage the hydraulic circuit or spout out the oil.

[2] If the oil level is below L level, replenish oil from oil filler Ⓕ at the top of the hydraulic tank.

For details of the oil to use, see "9. Use of fuel, coolant and lubricants according to ambient temperature."

REMARK:
The oil level varies with oil temperatures. Check it with following as a standard.

- Near the L level before operation (oil temperature: 10 to 30°C)
- Near the H level at normal operation (oil temperature: 50 to 80°C)



f. Check of dust indicator

Check if the red piston of the dust indicator ① does not reach the service level. If the red piston is over the service level, clean or replace the element at once.
For cleaning the element, refer to the paragraph pertaining to "Check, cleaning and replacement of air cleaner."

g. Check of Wiring

⚠ WARNING

If the fuse is blown often, or if these are traces of short circuit on the wires, ask us or our service shop for investigation of the cause and for repair.

Check if the fuse is damaged, if the wires are disconnected or if there are traces of short circuit on the wires. Also, check if the terminal are loose. If they are, tighten them additionally.
Pay special attention to the wiring to the battery, starter and alternator.

⚠ WARNING

- **Inflammables such as dead leaves, dead branches and dead grasses piled around the battery may cause a fire. Be sure to remove them.**
- **Keep the battery upper surface clean and check if the battery cap air vent is clogged with mud. If it is, wash the battery cap in water to remove mud.**

At the time of walk-around check or operational check, be sure to check if inflammables gather around the battery and to remove them if any.

h. Inspection of crusher

Inspection and maintenance procedure

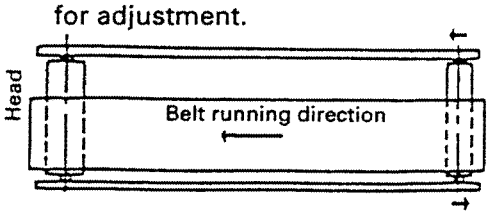
Check item	Check interval			Method	Standard value	Preparations and remedy of problem
	Every day	Every week (50 h)	Every month (250 h)			
Flow of material (bridging, choking, choke feed, etc.)	○			Visual	—	Be careful not to overfeed. Control amount dumped in hopper. Control feeder amount. See Operation and Maintenance Manual.
Abnormal heat from bearing	○			Touch by hand	Ambient temperature +40°C	If abnormally hot, stop and check. Check that oil level is correct
Abnormal noise from bearing	○			Listen	Must be no abnormal noise	Stop and check if there is any abnormality. Repair or replace.
Clearance at outlet port	○			Visual, scale	Opening setting: 70 mm to 200 mm	Adjust
Looseness of foundation bolts	○			Wrench	Must be no looseness	Tighten
Wedge bolt for pushing tooth stopper		○		Wrench	Must be no looseness	Tighten. When adjusting clearance of toggle block tension bolt, there is a tendency for looseness, so check every 2 or 3 hours.
Toggle block tension bolt						
Looseness of other bolts						
Wear of receiving teeth, pushing teeth		○		Visual	—	Turn or replace. See Operation and Maintenance Manual.
Wear of cheek plate		○		Visual	—	Replace. See Operation and Maintenance Manual
Wear of toggle seat, jaw liner tooth plate wedge		○		Visual	—	Same as above
Wear of toggle plate		○		Visual	—	Same as above
Wear of thrust bearing			○	Visual	—	Same as above
Tightened length of spring		○		Scale	400 mm	Adjust to specified length. See Operation and Maintenance Manual.
V-belt — Tension			○	Tension meter	—	Adjust tension. See Operation and Maintenance Manual.
V-belt — Lose belt	○			Visual	—	Be careful of lack of tension, misalignment
V-belt — Wear, cuts			○	Visual	—	Replace
Adding grease	○			Grease pump	—	Add

i. Check of belt conveyor before starting

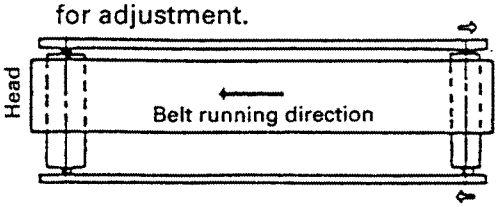
(1) Foreign materials (stone, wire, gravel, etc.) caught by each part of the belt conveyor
When stone, wire, gravel is caught inside the belt conveyor, between the roller and belt, in the hopper rubber and belt, and in the chain cover, remove it.

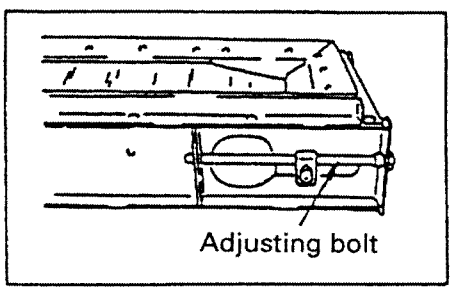
(2) Zigzag line of belt
When a zigzag line occurs on the belt, turn the adjustment bolt to adjust the tension of the left/right of the belt shown in the right figure.

a) When the belt is biased to the left, move it toward the mark for adjustment.



b) When the belt is biased to the right, move it toward the mark for adjustment.

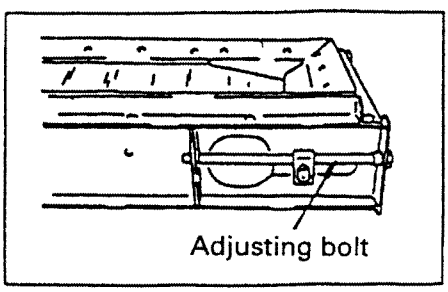




(3) Check the rubber belt for flaw and breaking.

- Inspection and Adjustment of Primary Belt Conveyor

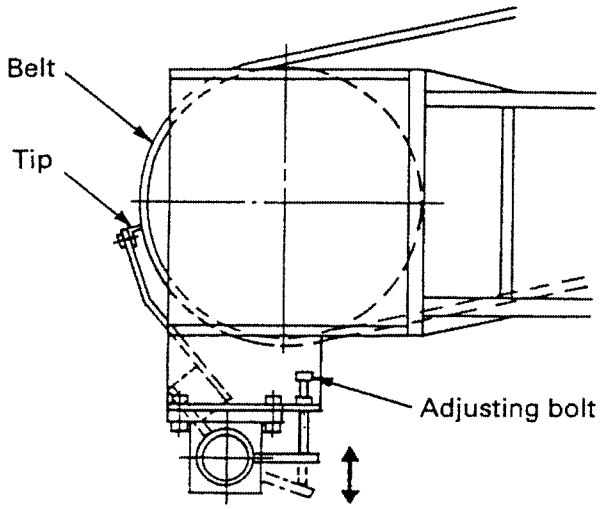
a. Adjustment of Belt Tension
Adjust the tension by turning the adjusting bolt shown.



b. Adjustment of Scraper Rubber

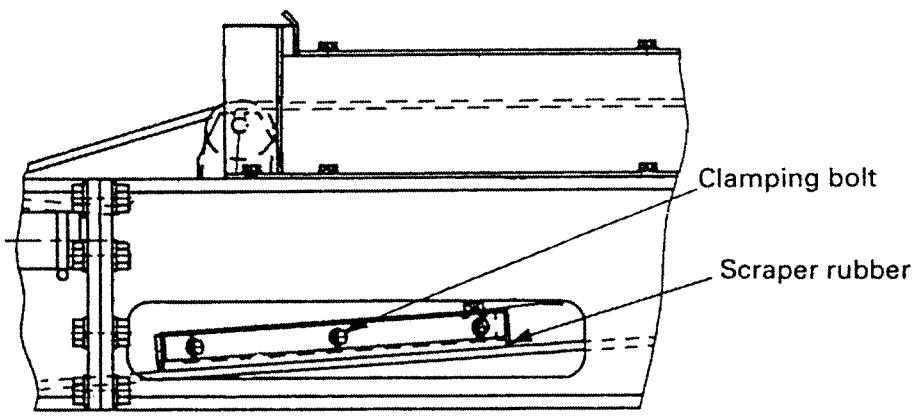
(1) Driving Pulley Side

Stick the tip of the belt cleaner to the belt by turning the adjusting bolt. (Standard clearance : 0 mm)



(2) Driven Pulley Side

If the scraper rubber is worn out, loosen the clamping bolt and replace it. (The scraper rubber shall be equally in touch with the right and left sides of the belt.)



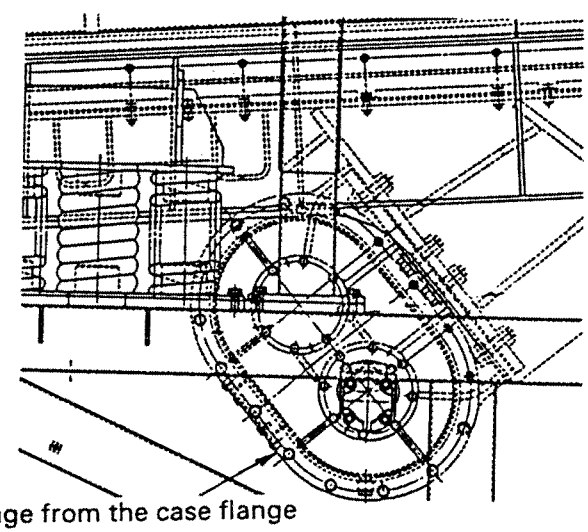
j. Check of grizzly feeder before starting

(1) Check that oil is not leaking from the drive motor

(2) Check that the grizzly bar is not blinded.

(3) Check that the oil level inside the vibrator case remains at the middle of the oil level.

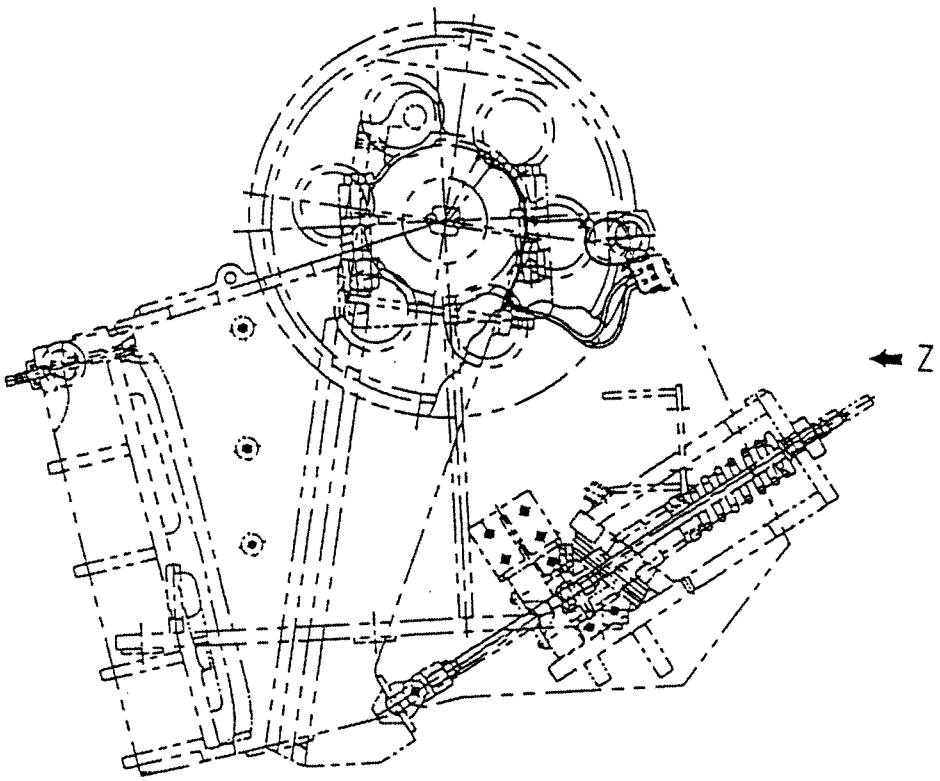
(4) Check of oil leakage from the vibrator case.

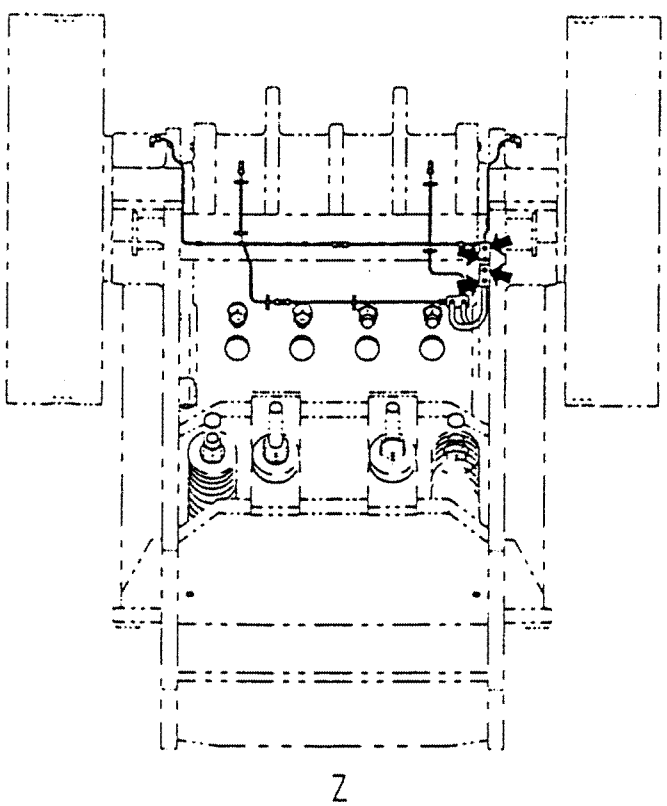


6.2 EVERY 100 HOURS SERVICE

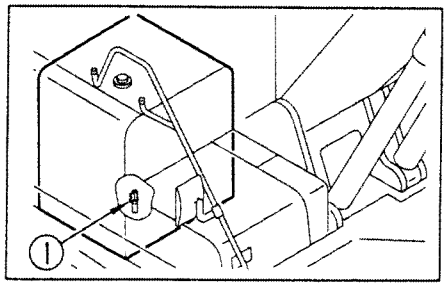
a. Grease crusher bearing

(1) Pump in grease through the centralized grease fittings at the side of the crusher





b. Drain water, sediment from fuel tank



[1] Drain before operating the vehicle.

[2] Prepare a container to receive the fuel to be drained.

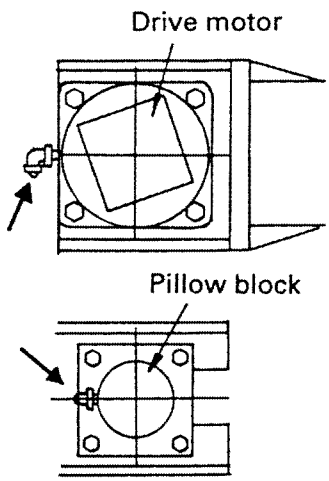
[3] Open ① at the bottom of the tank and drain the water and sediment at the bottom of the tank together with the fuel. Be careful not to be covered by the fuel.

[4] When clean fuel starts to come out, close the drain cock ①.

NOTICE:
For cleaning inside the tank, don't use Trichlene.

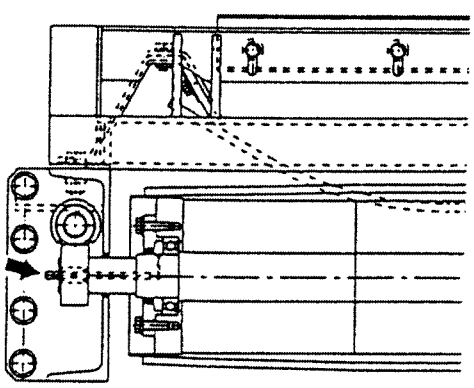
c. Grease belt conveyor

(1) Pillow block of head pulley
Pump in grease through the grease fitting marked by the arrow.



(2) Tail pulley bearing (2 points)
Pump in grease through the grease fitting marked by the arrow.

* Direct the grease fitting toward the side hole of the frame. (Oblique lines in the right figure)



6.3 EVERY 250 HOURS SERVICE

For operation in the period of the first 250 hours, perform the following maintenance.

a. Oil change in the engine oil pan and replacement of engine oil filter cartridge.
b. Replacement of fuel filter cartridge
c. Clearance check and adjustment for the engine valve

For the maintenance procedure, refer to "EVERY 500 HOURS AND 2000 HOURS SERVICE."

d. Liquid level check in the battery

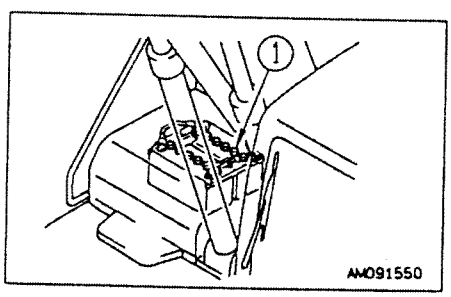
⚠ WARNING

- **Don't bring the battery close to fire because it produces combustible gas.**
- **The battery liquid is dangerous. Be careful not to admit it into the eye or attach it to the skin. If such trouble occurs, wash it away with much water and receive treatment from a doctor.**

Check the liquid level before starting operation for machine.

(1) Open the cover of the battery box on the right side of the body.

(2) Remove cap ①. If the liquid level is below the specified level (10 to 12 mm upper than the plates), replenish distilled water.



If the battery liquid is spilt, supply dilute sulfuric acid.

(3) Clean the breather of the battery cap, and be sure to tighten the cap.

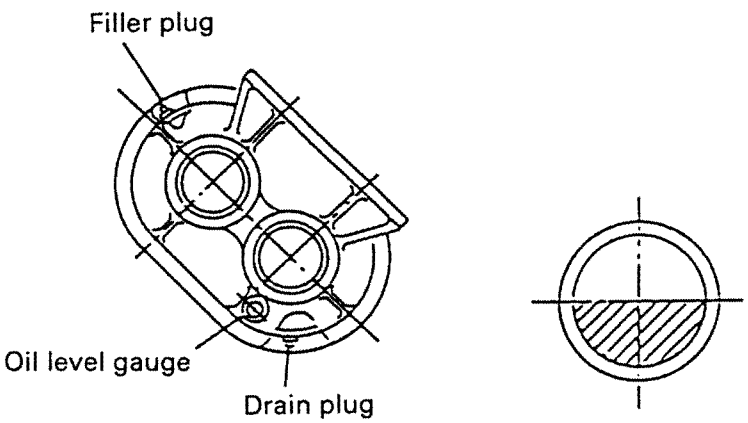
To prevent freezing, replenish distilled water before starting the operation on the next day.

e. Oil change of inside grizzly feeder vibrator case

- Lubricating oil

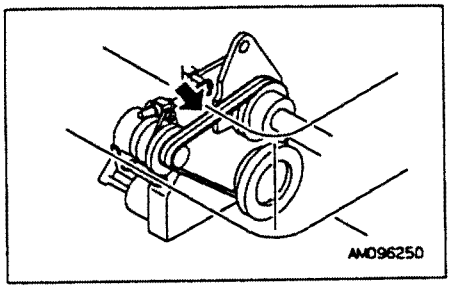
[1] Type: CD class SAE 30

[2] Oil level
The oil level is appropriate when it stay at the middle of the peephole. (17ℓ) When draining the oil, pull out the drain plug. When refilling it, remove the filler plug and supply oil until the oil level comes to the middle of the oil level peephole. Excessive oil level or too low oil level causes functional failures. Be sure to maintain the optimum oil level.



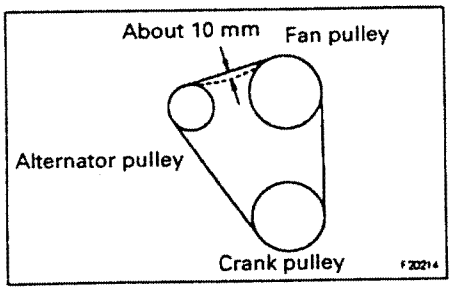
[3] Replacement of oil
Replace oil totally after 250 hours of the initial operation. After that, change oil totally after every 1000 hours, when the oil level is found too low, refill oil to the optimum level. Also, in order not to mix two different types of oil, when the available oil is of a different type, replace the oil content totally even before 1000 hours of operation after last replacement.

f. Tension check and adjustment for the fan belt and alternator belt



■ Check

If a flexure of about 10 mm is produced by pushing (approx. 6 kg) the middle point between the alternator and fan pulley by the thumb, this is normal.

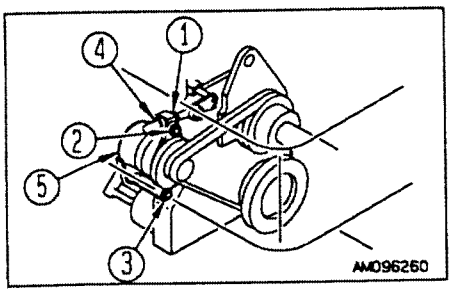


■ Adjustment

[1] Loosen bolt and nut ①, ②, ③.

[2] Turn nut ④ to the right and move alternator ⑤, so as to produce on the belt a flexure of about 10 mm (6 kg).

[3] Tighten bolt and nut ①, ②, ③, and secure the alternator ⑤.



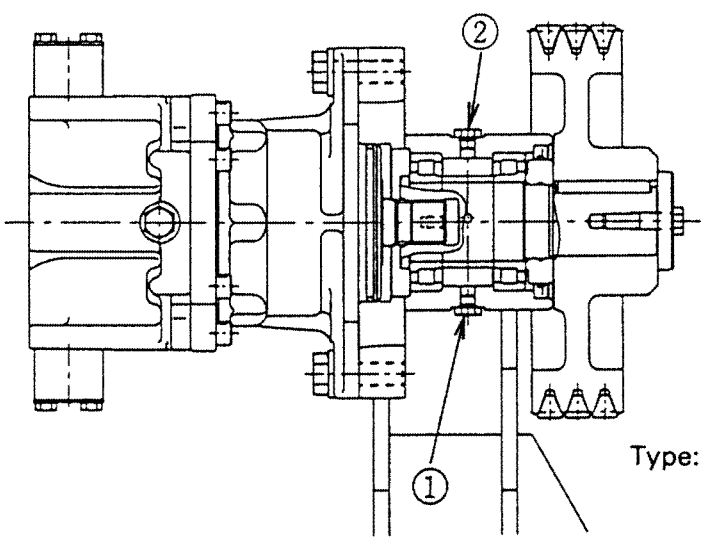
[4] Check each pulley for breaking, and also the groove and belt for wear. In particular, carefully check if the belt is in contact with the bottom of the groove.

[5] If the belt is so much extended that the adjustment allowance is lost or any cut or crack is found, replace it.

[6] When the belt is replaced, adjust again after operating for one hour.

g. Check oil level inside crusher motor bearing case, add oil

Remove plug ①, and check if oil come out. If the oil do not come out, remove plug ②, and then replenish oil.



Type: CD class SAE 30

6.4 EVERY 500 HOURS SERVICE

Perform maintenance at intervals of 100 hours and 250 hours together with this maintenance.

a. Oil change in the engine oil pan and replacement of engine oil filter cartridge

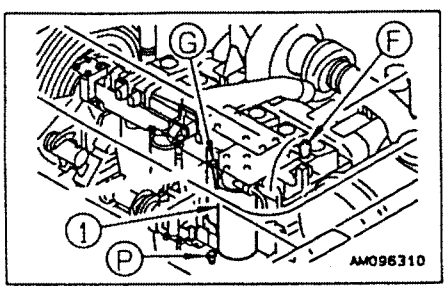
⚠ WARNING

After operation of the engine, every part has been heated to high temperature. So, do not change oil soon after stopping the engine. Wait until the oil cools down.

- The capacity of drained oil container shall be more than 37ℓ.
- Amount of oil to be changed : 37ℓ
- Prepare a filter wrench.

[1] Place a drained oil container right under the drain cock Ⓟ below the machine body.

[2] Use care not to splash yourself with oil and drain oil by lowering the drain cock Ⓟ lever slowly. After draining oil, raise the lever to close the clock.



[3] Check the drained oil, and if it contains much metal powder or many foreign matters, contact us or our service shop.

[4] Open the engine hood and remove the engine oil filter cartridge ① from the engine top by turning it counterclockwise with the filter wrench. Since much oil drains right after the engine is stopped, remove it about 10 minutes later.

[5] Clean the engine oil filter base, fill a new filter cartridge with clean engine oil, apply clean engine oil (or grease lightly) to the packing and the screw of the filter cartridge ① and fix the cartridge.

REMARKS:
Check that the old packing is not adhered to the filter base. If it is, it will cause oil leak.

[6] At installation, tighten the filter cartridge 3/4 to one turn or more after the packing surface is brought into the seal surface of the filter base.

[7] After replacing the filter cartridge, supply engine oil up to the range between H - L of the level gauge from oil filler Ⓕ.

[8] After idling the engine for a while, stop it and check that the oil level is between H - L of the level gauge by referring to the paragraph "Check before starting."

When operation time do not reach 500 hours even after 6 months operation, replace the filter cartridge after 6 months.
If operation reaches 500 hours during less than 6 months operation, replace it when it reaches 500 hours.

b. Replacement of fuel filter cartridge

⚠ WARNING

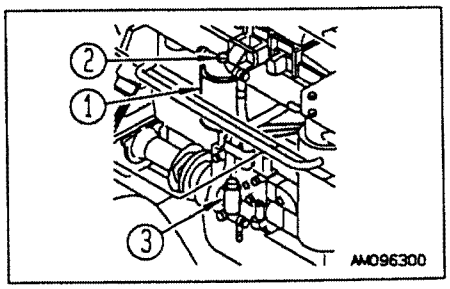
- **After operation of the engine, every part is heated to high temperature. So, do not replace the filter soon. Wait until they cool down.**
- **Keep any fire away from the filter cartridge.**

Prepare a filter wrench and the oil receiver.

[1] Set a vessel beneath the filter cartridge for receiving oil.

[2] Turn filter cartridge ① counterclockwise with a filter wrench and remove it.

[3] Clean the filter base, fill a new filter cartridge with clean fuel and apply engine oil on the packing surface. Then, install the filter cartridge on the filter base.



[4] At installation, tighten the filter cartridge about 2/3 turn after the packing surface is brought into contact with the seal surface of filter base.

Excessive tightening of the filter cartridge causes the damage on the packing and fuel leakage. Too loose tightening also causes fuel leakage through the packing clearance. Be sure to observe the tightening angle.

[5] When the replacement of the fuel filter cartridge is completed, let the air out.

[6] Fill up the fuel tank with fuel(to FULL position of the fuel gauge)

[7] After replacement of filter cartridge ①, loosen air bleeding plug ②.

[8] Loosen the knob of feed pump ③ and move it up and down. Then over flow the fuel until the air bubble stops coming out of air bleeding plug ②.

[9] Tighten air bleeding plug ②.
Use KOMATSU genuine filter cartridge.
After placing the filter cartridge, start the engine and check the filter seal surface or oil leakage.

c. Oil level check and replenishment in the final drive case

⚠ WARNING

- **Just after the machine has been operated, the temperature of oil is high. Carry out maintenance after the oil temperature drops.**
- **If any residual pressure is in the case, the oil or plug may jump off. Slowly loosen the plug to let the internal pressure out.**

- Prepare a handle.

[1] Set the TOP mark at the top with, with the TOP mark and plug P perpendicular to the ground surface.

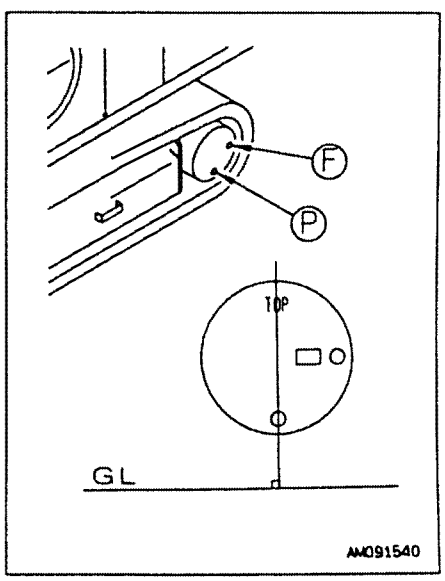
[2] Remove plug Ⓕ with a handle. If the oil level is found in the range of the lower end of the plug hole to 10 mm, it is appropriate.

[3] If the oil level is low, install plug Ⓕ again for the check. By operating the travel lever to forward and backward, rotate the sprocket one turn. Then check it again according to [2] above.

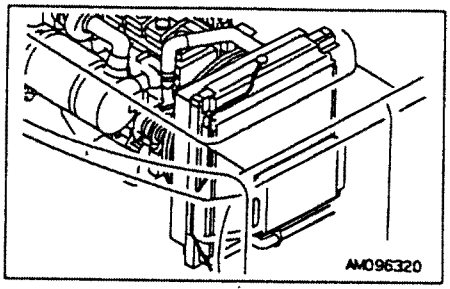
[4] If the oil is short, replenish engine oil until engine oil overflows from plug Ⓕ hole.

For details of oil to use, refer to the paragraph "9. Use of fuel, coolant and lubricants according to ambient temperature."

[5] After check, install plug Ⓕ.



d. Cleaning and Check of Radiator Fin and Oil Cooler Fin



⚠ WARNING

Compressed air, steam and water are dangerous to hurt you if they attack you directly. Put on safety goggles, mask and safety boots.

[1] Open the engine hood and the rear door on the right side of the machine body.

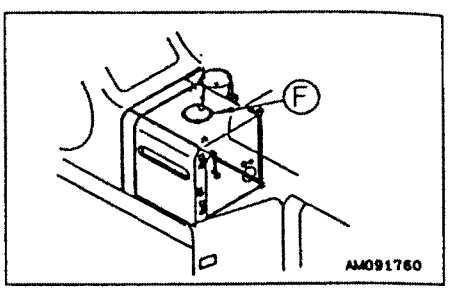
[2] Blow compressed air to the radiator fin and the oil cooler fin to remove mud, dusts and leaves clogging them. At the same time, clean the net in front of the oil cooler.

Steam or water may be used instead of compressed air.

[3] Check if the rubber hoses are cracked or become weak. If they are, replace them. Also, check if the hose clamps are loose, and tighten them if necessary.

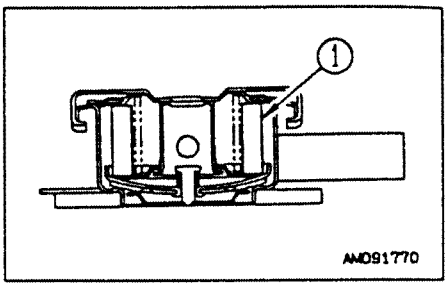
NOTICE :
Use compressed air away from these fins to prevent them from being damaged. Damaged fins will cause water leak and overheat of the engine. In dusty job site, inspect these fins everyday irrespective of the maintenance interval.

e. Replacement of Hydraulic Tank Breather Element



⚠ WARNING

Replace the breather element only after the oil in the tank cools down. Turn the cap of the oil filler port slowly to release the internal pressure, and remove the cap carefully.



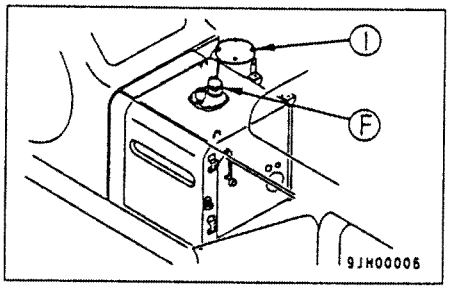
[1] Remove the cap from the oil filler port Ⓕ on the top of the hydraulic tank.

[2] Replace the element ① inside the cap.

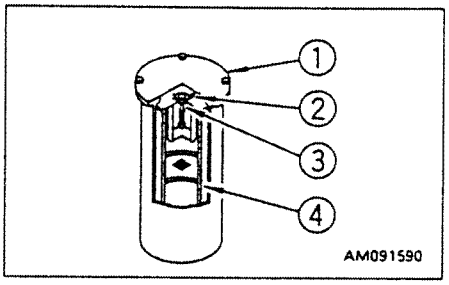
f. Replace hydraulic filter element

⚠ WARNING

When removing the oil filler cap, turn it slowly to release the internal pressure before removing it.



1. Remove the cap from oil filler Ⓕ, and release the internal pressure.
2. Loosen 4 bolts, then remove cover ①.
   When doing this, the cover may fly out under the force of spring ②, so hold the cover down when removing the bolts.
3. After removing spring ② and valve ③, take out element ④.
4. Clean the removed parts in diesel oil.
5. Install a new element in the place where old element 4 was installed.
6. Set valve ③ and spring ② on top of the element.
7. Set cover ① in position, push it down by hand, and install the cover with the mounting bolts.
8. Screw in the oil filler cap and install the cover.
9. To bleed the air, start the engine according to "STARTING ENGINE" and run the engine at low idling for 10 minutes.
10. Stop the engine.



REMARK

Operate the machine after halting for more than 5 minutes to eliminate bubbles in the oil inside the tank.

11. Check for oil leakage and wipe off any spilled oil.

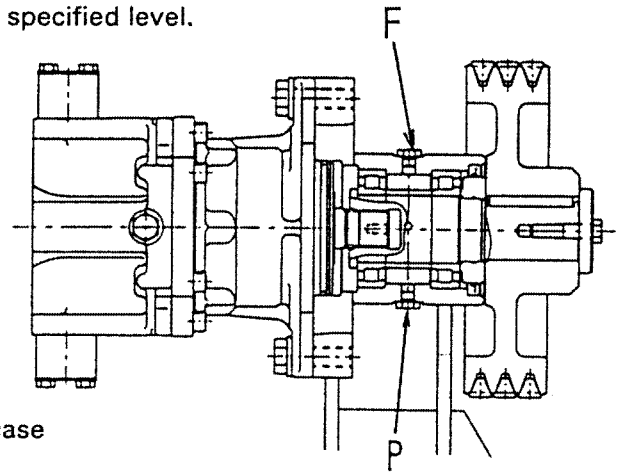
6.5 EVERY 1000 HOURS SERVICE

Perform maintenance at intervals of 100 hours, 250 and 500 hours together with this maintenance.

a. Change oil inside crusher motor bearing case (2 points)

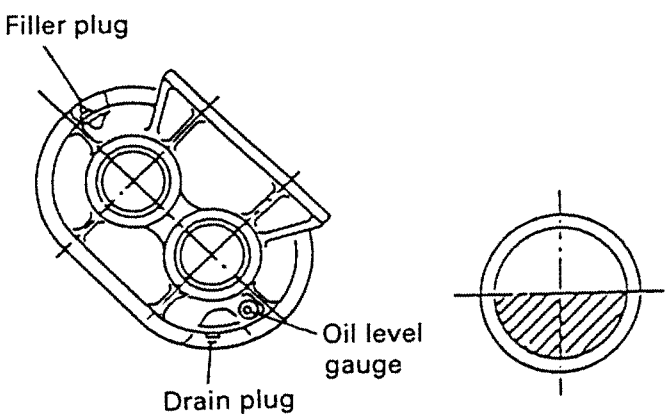
(1) Remove drain plug (P), drain the oil, then tighten drain plug (P) again.

(2) Add engine oil through oil filter (F) to the specified level.
Engine oil: CD class SAE30
Refill amount: 0.9ℓ



b. Change oil inside grizzly feeder vibrator case

(1) Oil level
The oil level is appropriate when it stays at the middle of the peephole. (17.0ℓ) When draining the oil, pull out the drain plug. When refilling it, remove the filler plug and supply oil until the oil level comes to the middle of the oil level peephole. Excessive oil level or too low oil level causes functional failures. Be sure to maintain the optimum oil level.



(2) Replacement of oil
Replace oil totally after 250 hours of the initial operation. After that, change oil totally after every 1000 hours of operation. Even before the operating time reaches 1000 hours, when the oil level is found too low, refill oil to the optimum level. Also, in order not to mix two different types of oil, when the available oil is of a different type, replace the oil content totally even before 1000 hours of operation after last replacement.

c. Check of Oil Level in Damper Case and Oil Supply

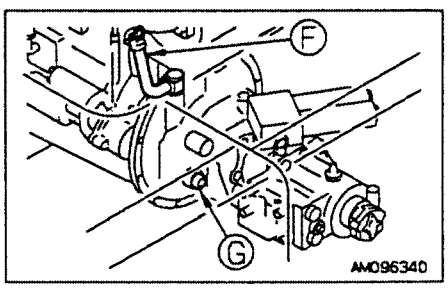
⚠ WARNING

The oil temperature is high right after operation. Check the oil level and supply oil only after the oil cools down.

NOTICE :
To check the oil level, park the machine on a flat ground and stop the engine for 30 minutes or more.

[1] Open the door on the left side of the machine.

[2] If oil has reached the lower edge of the plug hole when the plug Ⓖ is removed, the oil level is appropriate. If it hasn't, remove the cap Ⓕ and supply oil through the oil filler until the oil reaches the lower edge of the plug Ⓖ hole.



For applicable oils, refer to "9. Use of fuel, coolant and lubricant according to ambient temperature."

NOTICE :
When the oil level is too high, be sure to drain the oil until the level lowers to the specified level. Otherwise, the damper case will be overheated.

[3] Set the plug Ⓖ and the cap Ⓕ in position.

[4] Close the door.

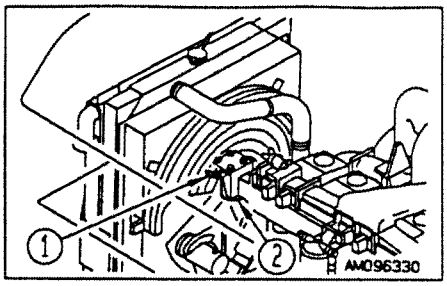
d. Check of Turbocharger Tightening Positions

Ask us or our service shop for check of each tightening position.

e. Check of Play of Turbocharger Rotor

Ask us or our service shop for check of play of turbocharger rotor.

f. Replacement of Corrosion Resistor Cartridge



[1] Screw in the valve ① on the corrosion resistor.

[2] Turn the cartridge ② counterclockwise with a filter wrench and remove it.

[3] Apply engine oil to the sealing surface of a new filter cartridge and fit it in position. When the packing surface touches the sealing surface of the filter base, give about 2/3 turns to the cartridge to tighten it. Be sure to use Komatsu genuine parts.

[4] Open the valve ①.

[5] Start the engine and check if water leaks from the sealing surface.

6.6 EVERY 2000 HOURS SERVICE

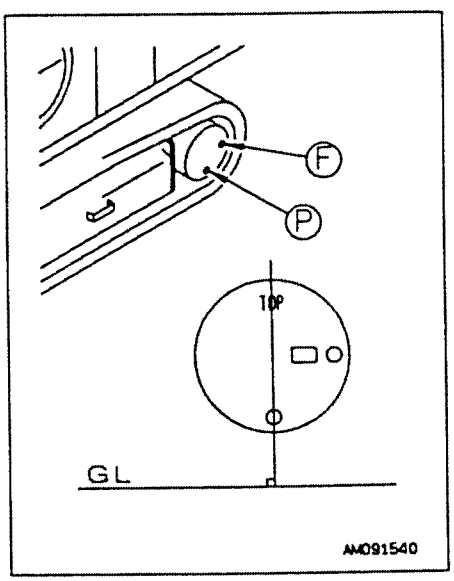
Perform maintenance at intervals of 100 hours, 250 hours, 500 hours and 1000 hours together with this maintenance.

a. Oil change in the final drive case

⚠ WARNING

- **Just after the machine has been operated, the temperature of oil is high.**
- **Carry out maintenance after the oil temperature drops. If any residual pressure is in the case, the oil or plug may jump off. Slowly loosen the plug to let the internal pressure out.**

- Vessel for receiving drained oil: More than 11.5ℓ capacity
- Refill capacity: 11.5ℓ each on the left and right
- Prepare a handle.



[1] Set the TOP mark at the top, with the TOP mark and plug Ⓟ set perpendicular to the ground surface.

[2] Set the oil receiving vessel below plug Ⓟ.

[3] Remove plug Ⓟ, Ⓕ with a handle, and drain the oil.

REMARK:
Check the O-ring attached to plug for damage, and replace if necessary.

[4] Tighten plug Ⓟ.

[5] Fill engine oil through plug Ⓕ hole.

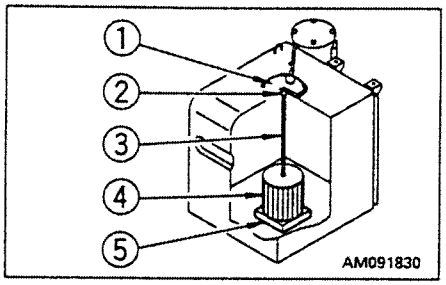
For details of oil to use, refer to the paragraph "9. Use of fuel and lubricants according to ambient temperature."

[6] When oil comes out from plug Ⓕ hole, install plug Ⓕ.
Tightening torque of plug Ⓟ, Ⓕ is 7±1 kgm.

b. Clean hydraulic tank strainer

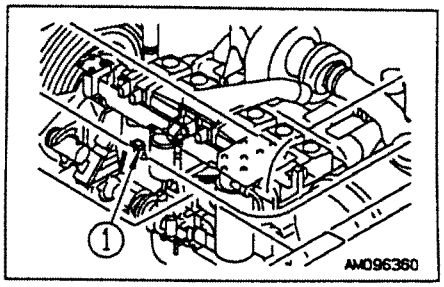
⚠ WARNING

The oil is at high temperature immediately after the machine has been operated. Wait for the oil to cool down before changing the oil. When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it carefully.



1. Remove 4 bolts, then remove cover ①. When doing this, cover ① may fly off because of the force of spring ②, so keep the cover pushed down when removing the bolts.
2. Hold the top of rod ③ and pull up to remove spring ② and strainer ④.
3. Remove any dirt stuck to strainer ④, then wash in clean diesel oil or flushing oil. If strainer ④ is broken, replace it with a new part.
4. When installing, insert strainer ④ into protruding part ⑤ of the tank, and assemble.
5. Tighten the bolts to install cover ①.

c. Cleaning of Engine Breather



[1] Wipe dust around the breather.

[2] Loosen the clamp, disconnect the hose and remove the breather ① from the cylinder head cover.

[3] Rinse the breather body in kerosene or cleaning oil. Dry it by compressed air and set it in position.

[4] Replace the breather O-ring with new one, apply engine oil to the O-ring and set it on the breather ①.

[5] Check the breather hose and pipe. If deteriorated oil has stuck to their insides, replace them with new ones.

d. Check play in the turbocharger rotor

Ask your KOMATSU distributor for this check.

e. Check of alternator, starter

There is a possibility that the brush may be worn out or the bearing grease may be short. Ask your KOMATSU distributor for this check.
If the frequency of starting the engine is high, request inspection at a 1000 hours' interval.

f. Check and Adjustment of Engine Valve Clearance

Special tools are necessary for the check and adjustment, so ask us or our service shop for the sames.

g. Check of Vibration Damper

Check if there is any crack or separation on the outside of the rubber. If there is, ask us or our service shop for replacement of parts.

6.7 EVERY 4000 HOURS SERVICE

Perform maintenance at intervals of 100 hours, 250 hours, 500 hours, 1000 hours and 2000 hours together with this maintenance.

a. Check of water pump

Check the pulley for play, water leakage, and clogging of drain hole, If any abnormality is found, ask your KOMATSU distributor for disassembly repairs or replacement.

6.8 EVERY 5000 HOURS SERVICE

Conduct maintenance works every 50 hours, 100 hours, 250 hours, 500 hours and 1000 hours at the same time.

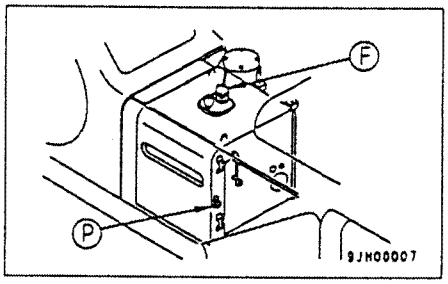
a. Change of Oil in Hydraulic Tank

⚠ WARNING

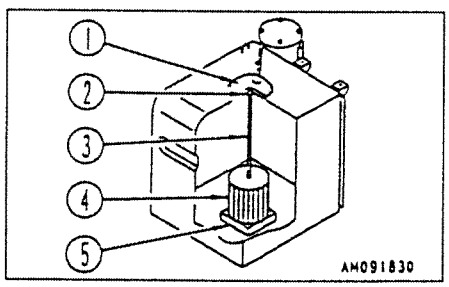
Right after operation, the oil is heated to a high temperature. Do not try to change it promptly. Wait until it cools down. Turn the cap at the oil filler port slowly to release the inner pressure and remove the cap carefully.

- The capacity of a drained oil pan shall be more than 207 ℓ.
- Oil amount to be changed : 207 ℓ
- Prepare a handle for the socket wrench set.

1. Lock the safety lock lever to stop the engine.
2. Remove the cap from the oil filler port Ⓕ on the hydraulic tank.
3. Place the oil pan below the drain plug on the bottom of the machine. Remove the drain plug Ⓟ using the handle to drain the oil. Check the O-ring fitted to the plug Ⓟ and replace it if damaged. After the draining, tighten the drain plug Ⓟ. The tightening torque shall be 7 ± 1 kgm. When removing the drain plug, be careful that the oil does not burst out.



4. Remove the four bolts and the cover ① in this order. At the time, the spring ② may force the cover ① up. So, remove the bolts while pressing the cover down.
5. Pull the upper part of the rod ③ from above and remove the spring ② and the strainer ④.
6. Remove soils, if any, from the strainer ④ and wash it in clean diesel fuel or detergent oil. Replace the strainer with a new one if it is damaged.
7. Place the strainer ④ in the protrusion ⑤ of the tank for assembling.
8. Fix the cover ① with the bolts.



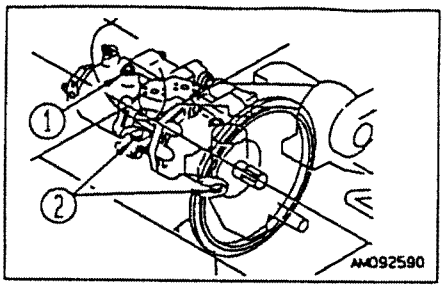
9. Pour the specified amount of engine oil in the oil filler port (F). Check that the oil reaches between H and L of the sight gauge.

NOTICE

For oils to be used, refer to the paragraph "9. Use of fuel, coolant and lubricants according to ambient temperature" (Page 3-79).

10. After change of hydraulic oil, replacement or washing of filter element and strainer, bleed air in the circuit according to the following procedures:

Air Bleeding Procedures
Bleed air in the following order 1 to 7:



1. Air Bleeding from Pump
   [1] Loosen the air bleed plug ① and check that oil oozes out from the air bleeder.

   [2] If oil does not ooze out, disconnect the drain hose from the pump case and fill the pump case with hydraulic oil through the drain port ②. Since oil comes out from the removed drain hose, fix the hose mouthpiece to any place higher than the oil level of the hydraulic tank.

   [3] After the air bleeding, tighten the air bleed plug ① and connect the drain hose to the pump case.

NOTICE :
If the drain hose is connected to the pump case first, oil will spout from the plug ① hole. If the pump is operated without filling the pump case with hydraulic oil, the pump will be heated abnormally and may be damaged earlier.

2. Starting of Engine
   Start the engine referring to Page, Starting the Engine, and idle it at a low speed for about 10 minutes before preceding to the next operation.

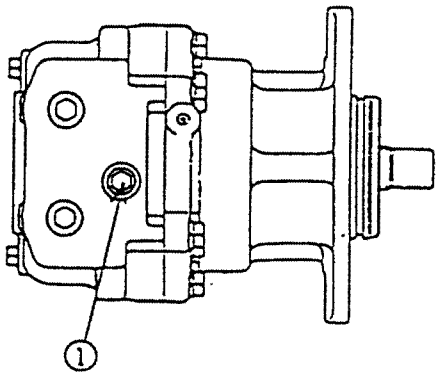
3. Air Bleeding from Cylinder
   [1] Idle the engine at a low speed, and extend and contract the cylinder 4 or 5 times (up to about 100mm from the stroke end) so that it does not reach the stroke end.

   [2] Move the cylinder to the stroke end 3 or 4 times.

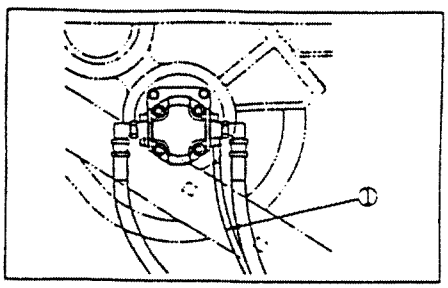
   [3] Also, move the cylinder to the stroke end 4 or 5 times to bleed air completely from the cylinder.

NOTICE:
Starting the engine at a high speed or moving the cylinder to the stoke end will cause air to enter the cylinder, and this may damage the piston packing.

4. Air Bleeding from Crusher Motor
   Idle the engine at a low speed, loosen the air bleed plug ①.
   When unclouded oil flows out through the plug, tighten it.



5. Air Bleeding from Grizzly Feeder
   [1] Idle the engine at a low speed, loosen the drain hose ① and check that oil oozes out from the hose. If oil does not ooze out, stop the engine, disconnect the drain hose ① and fill the motor case with hydraulic oil.
   After bleeding air, tighten the drain hose ① and idle the engine at a low speed.

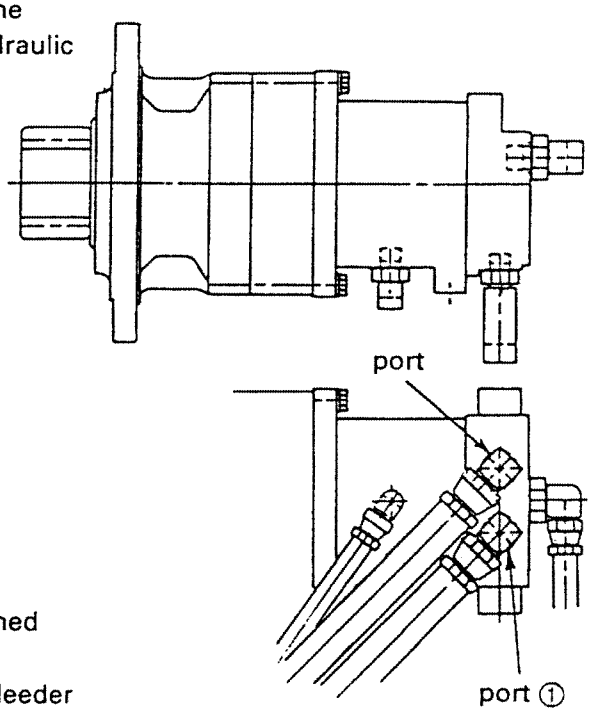


6. Air Bleeding from Belt Conveyor Motor
   [1] Idle the engine at a low speed, loosen the connecting port ① and check that oil oozes out from the port.

   [2] If oil does not ooze out, stop the engine, remove the connecting port ① and fill the motor case with hydraulic oil.

   [3] After bleeding air, tighten the connecting port ①.

   [4] Idle the engine at a low speed.

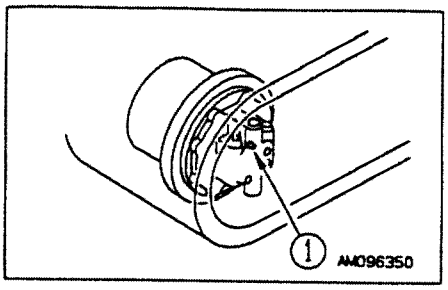


7. Air Bleeding from Travel Motor (only after oil was drained from the travel motor case)
   [1] Idle the engine at a low speed and loosen the air bleeder ①. When oil flows out from the bleeder, tighten it.

8. Operation

[1] After bleeding air, stop the engine for 5 minutes or more, and then operate the machine. This will discharge bubbles from the oil in the tank.

[2] Check if oil leaks. Wipe spilt oil clearly if any.



7. WHEN REQUIRED

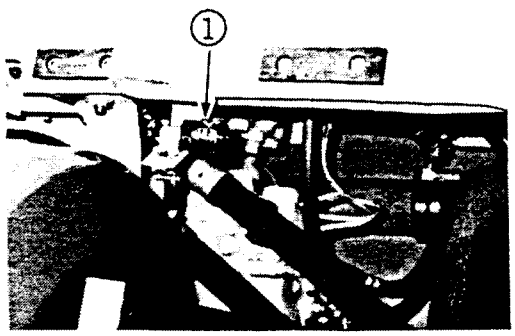
7.1 CHECK, CLEANING AND REPLACEMENT OF AIR CLEANER

⚠ WARNING

- **While the engine rotates, don't clean or replace the air cleaner.**
- **When using compressed air for cleaning the element, it is dangerous for eyes as dust will be blown off. Wear safety glasses.**

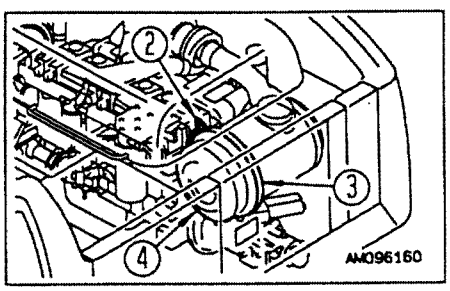
■ Check

When dust indicator ① piston becomes red, clean the air cleaner element.



■ Cleaning of outer element

1 Open the engine hood, loosen the wing nut ② and the band ③ to remove the cover ④. Then, remove the wing nut ⑤ and the element ⑥. Cover the air connector side deep inside the air cleaner body with a clean cloth or tape so that no dust enters the connector.



2 Clean the inside of the body and cover ④.

3 Blow dry compressed air (7 kg/cm² or less) along the folds from the inside of the element. Next, blow it along the folds from the outside, then blow again from the inside.

(1) Each time the outer element is cleaned, peel off a sheet.

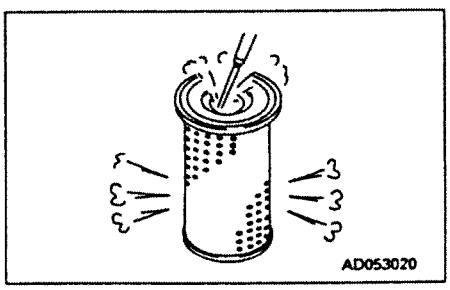
(2) Replace the outer element when it has been cleaned 6 times or one year has passed. Replace the inner element concurrently with the above replacement.

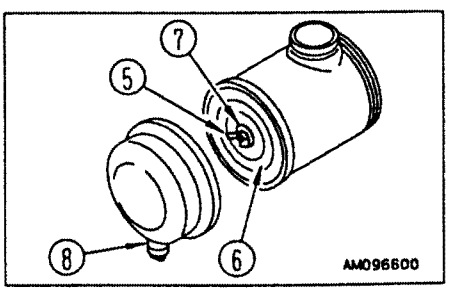
(3) If the monitor lamp ① flickers immediately after cleaning even when the number of cleaning times for the outer element is less than 6, replace both inner and outer elements.

(4) Check the inner element clamping nut for looseness. If it is found loose, tighten it.

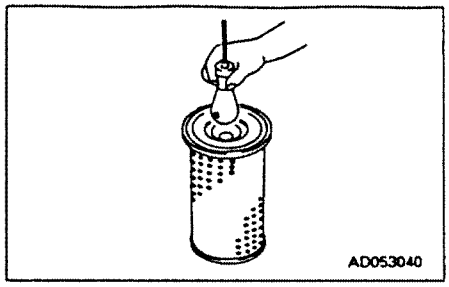
(5) When seal washer ⑦ or the screw of wing nut ⑤ is damaged, replace it with a new one.

(6) Remove the vacuator valve ⑧ and clean it by compressed air. After cleaning it, set it in position.





[4] Check the cleaned element by lightening with an electric bulb. If any small hole or thin portion is found, replace the element.



NOTICE:
When cleaning the element, don't strike it or bump it. The element which folds, gasket or seal is damaged must not be used.

[5] Remove the cover of cloth and tape used in [1].

[6] Set cleaned element ⑥, and then fix with wing nut ⑤.

■ Replacement of inner element

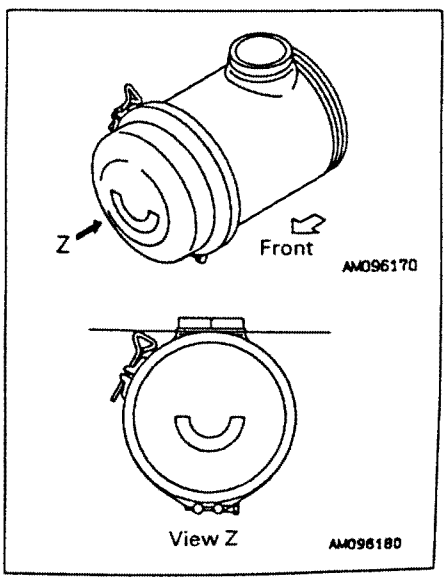
[1] After removing the cover and outer element, remove the inner element.

[2] Cover the air connector side (exit side) with a clear cloth or tape.

[3] Clean the inside of the body. Then remove the cover used in [2].

[4] Install the new inner element to the connector, and tighten the nut.
Don't reuse the inner element after cleaning.

[5] Set the outer element, and then fix with the wing nut.



REMARKS:
Set the wing bolt ② so that the bolt head is retained below the cover ④, and fix the bolt so that it does not interfere with the engine hood.

7.2 CLEANING OF THE INSIDE OF THE COOLING SYSTEM

⚠ WARNING

- **After operation of the engine, the coolant has been heated to high temperature. So, draining of the coolant soon after engine stop may cause burns on your skin. Be sure to drain it only after the engine cools down.**
- **It is very dangerous to be behind the machine for cleaning while the engine is rotating because the machine may start moving. Also, when the under-cover is not set in position, you may touch the fan. Never approach the rear section of the machine while the engine is rotating.**
- **When the temperature of radiator is high. Don't remove the cap. Boiling water may blow off. When removing the cap after the temperature falls, turn it slowly to let the internal pressure out, then remove it.**

Clean the inside of the cooling system and replace the coolant according to the following table.

Type of coolant	Cleaning of the inside of cooling system and replacement of coolant
Super Coolant AF-ALC antifreeze solution (anti-corrosive all season ype)	Earlier one of every 2 year (every other ear, autumn) and every 4000 hours

Stop the vehicle on an even place for cleaning and replacement.

This Super Coolant (AF-ALC) is provided with both antifreeze effect and anti-corrosive effect.
The mixture ratio depends on the temperature but should be at least 30% in cubic ratio to obtain the anticorrosive effect.

Determine a mixture ratio of water to the coolant according to the following mixture ratio table after investigating the past lowest temperature.
It is actually better to set the temperature about 10°C lower than the lowest temperature.

Water-coolant Mixture Ratio Table

Lowest temperature (°C) / Mixture volume (ℓ)	Above −10	−15	−20	−25	−30
Coolant volume	13.2	15.8	18.0	20.2	21.9
Water volume	30.7	28.1	25.9	23.7	21.9

⚠ WARNING

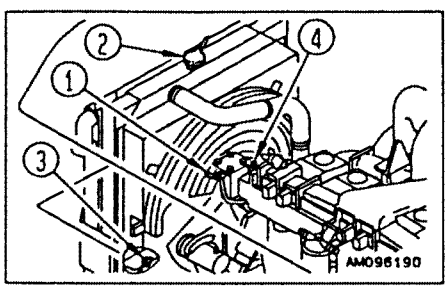
Coolant is inflammable. Be careful about fire.

Use tap water as cooling water. When river water or well water must be used inevitable, consult your KOMATSU distributor beforehand.

It is recommended to control the mixture ratio with an antifreeze solution concentration gauge.

⚠ WARNING

Remove the drain plug very carefully so that the coolant mixture does not dash over you.



- Prepare a container of over 44ℓ to receive the coolant mixture.

[1] Stop the engine and tighten the corrosion resistor valve ①. (This applies to machines fitted with corrosion resistor for hard water area.)

[2] Turn radiator cap ② slowly to remove it.

[3] Remove the undercover. Set a vessel to receive the coolant mixture solution below drain cock ③.
Open drain cock ③ at the lower part of the radiator, and drain the water.

[4] After drainage, close drain cock ③ and pour tap water. When the radiator is filled with water, start the engine and put it into the low idling condition.

[5] In the low idling condition, open drain cock ③, wash the inside with running water for 10 minutes.

While the inside is washed with running water, adjust the pouring water volume and drain water volume so as to keep the water filled status at all times. While running water, guard the pouring water hose separating from the radiator cap.

[6] After washing the inside with running water, stop the engine and pouring water. After drainage, close drain cock ③.

[7] After drainage, perform cleaning with a detergent.

[7] After drainage, perform cleaning with a detergent.

For the cleaning method, follow the instructions on the detergent.

[8] After cleaning, open drain cock ③. After draining the total water volume, close it and supply tap water up to the vicinity of the water supply port.

[9] After tap water is supplied up to the vicinity of the water supply port, start the engine. In the low idling condition, perform cleaning with running water until clean water comes out.

While the inside is washed with running water, adjust the pouring water volume and drain water volume so as to keep the water filled status at all times.

[10] After clean water comes out, stop the engine and close drain cock ③.

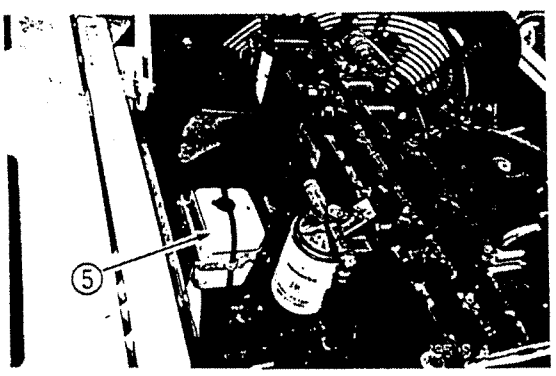
[11] Replace the corrosion resister and open the valve ①. For the replacing method, refer to "Replacement of Corrosion Resistor Cartridge."

[12] Mount the undercover.

[13] Open air bleeding cock ④ of the after-cooler, and pour tap water until it overflows from the water supply port. When water comes out, close air bleeding cock ④.

[14] To bleed the air mixed in cooling water, idle the engine at a low speed for 5 minutes and then idle it at a high speed for 5 minutes. (At this time, the cap of the water supply port must be left off.)

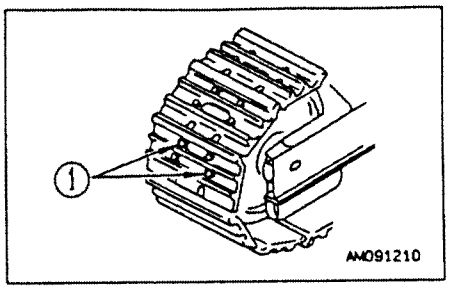
[15] Drain the cooling water in subtank ⑤ and wash the inside of the subtank. Then, supply cooling water up to the intermediate level between H and L.



[16] Stop the engine, wait for about 3 minutes, and supply tap water up to the vicinity of the water supply port. After that, set the cap securely.

7.3 CHECK AND ADJUSTMENT FOR LOOSENESS OF TRACK SHOE BOLT

When the track shoe bolt ① is loose, it will result in breakage of the same to keep using it. So, be sure to tighten it immediately when you find it loose.



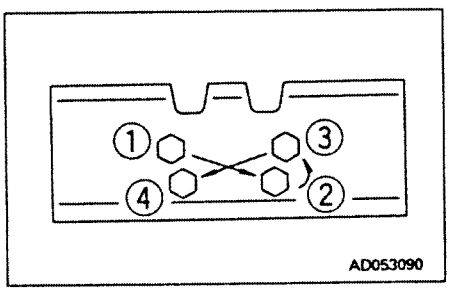
■ Additional Tightening Method

[1] Tighten it first with the torque of 40 ± 4 kgm and check that the nut and shoe have been stuck to the link mating surface.

[2] Then, tighten it further at the angle of 120°± 10°.

• Tightening Sequence

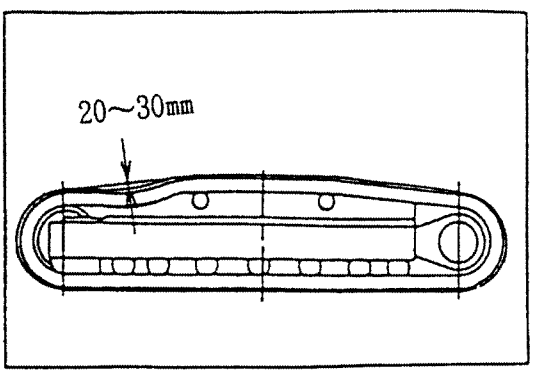
Tighten the bolt in the sequence shown in the right figure. Then, check that the nut and show have been stuck to the link mating surface.



7.4 TENSION CHECK AND ADJUSTMENT FOR THE TRACK SHOE

Regarding the track shoe pin and bushing, the wear condition varies with working condition and quality of ground. Accordingly, check the tension of the track shoe from time to time to keep the standard tension.

The tension is checked and adjusted in the same condition as that for the operating time (normal mud-filled condition).



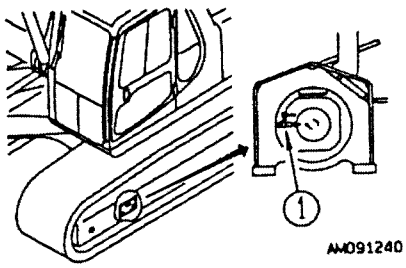
• Apply a stretch to the idler and the carrier roller and measure the shoe deflection. The standard deflection ranges from 20 mm to 30 mm.

If the tension is not within the range, adjust it as follows:

■ Adjustment

⚠ WARNING

Since the grease may be jumped out by internal high pressure, don't loosen plug ① exceeding one turn. At this time, don't loosen other parts than plug ①. Don't look at the fitting direction of the plug ①. If the track cannot be loosened by the sequence, ask us or our service shop for repair.



• To increase tension

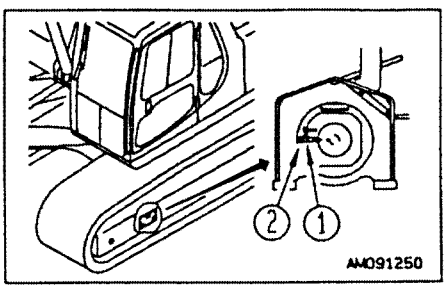
Prepare a grease pump.

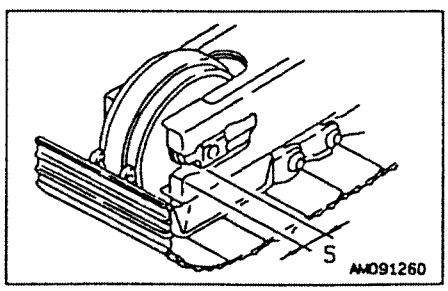
[1] Press in grease with a grease pump from grease fitting ②.

[2] To check if the tension is proper, move the vehicle a little forward or backward.

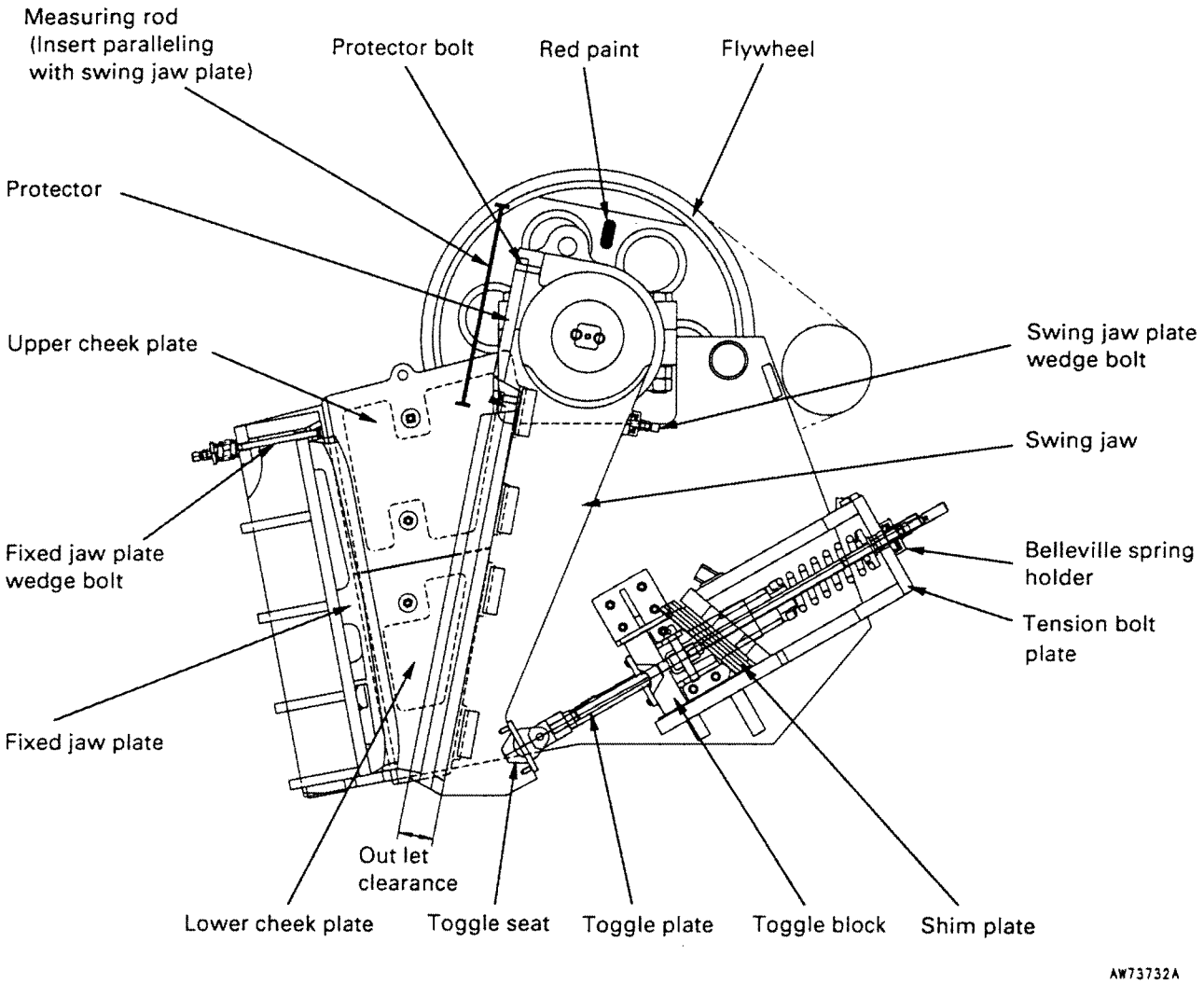
[3] Check the tension of the track shoe again. If not yet proper, adjust again.

[4] Grease may be applied with press until the S becomes 0 mm. If the tension is still low, it is due to a worn-out pin and bushing. At this time, it is necessary to turn or replace them. Ask your KOMATSU distributor.





7.5 CHECK, ADJUST, REPLACE CRUSHER



When adjusting outlet port clearance

Check that the red painted area (balance weight) is in the direction shown in the diagram.

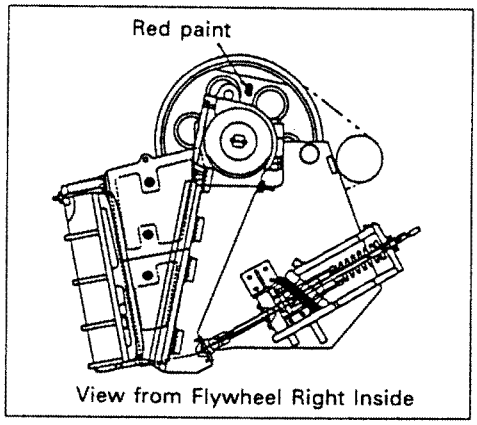
Turn the crusher switch ON/OFF to adjust in small amounts.

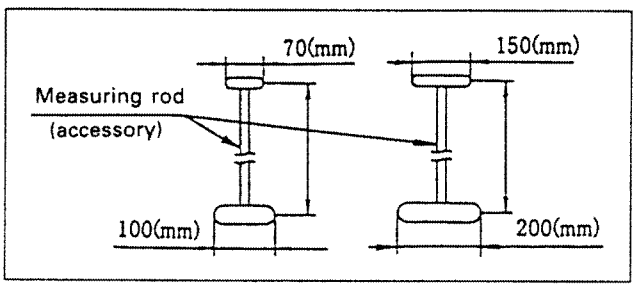
a. Inspection and adjustment of outlet clearance

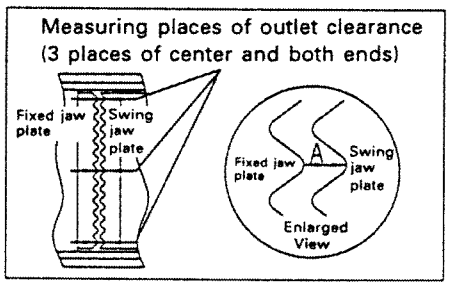
Inspection of Outlet Clearance

The outlet clearance (A) (open side) is the distance between the fixed jaw plate crest and the swing jaw plate root when the crusher outlet is fully open (when the balance weight (red paint) to the right of the flywheel is at the "1 o'clock position" in the view from the flywheel inside as shown in the right figure. The clearance is generally measured at the three places of the both ends and the center by using the measuring rod.

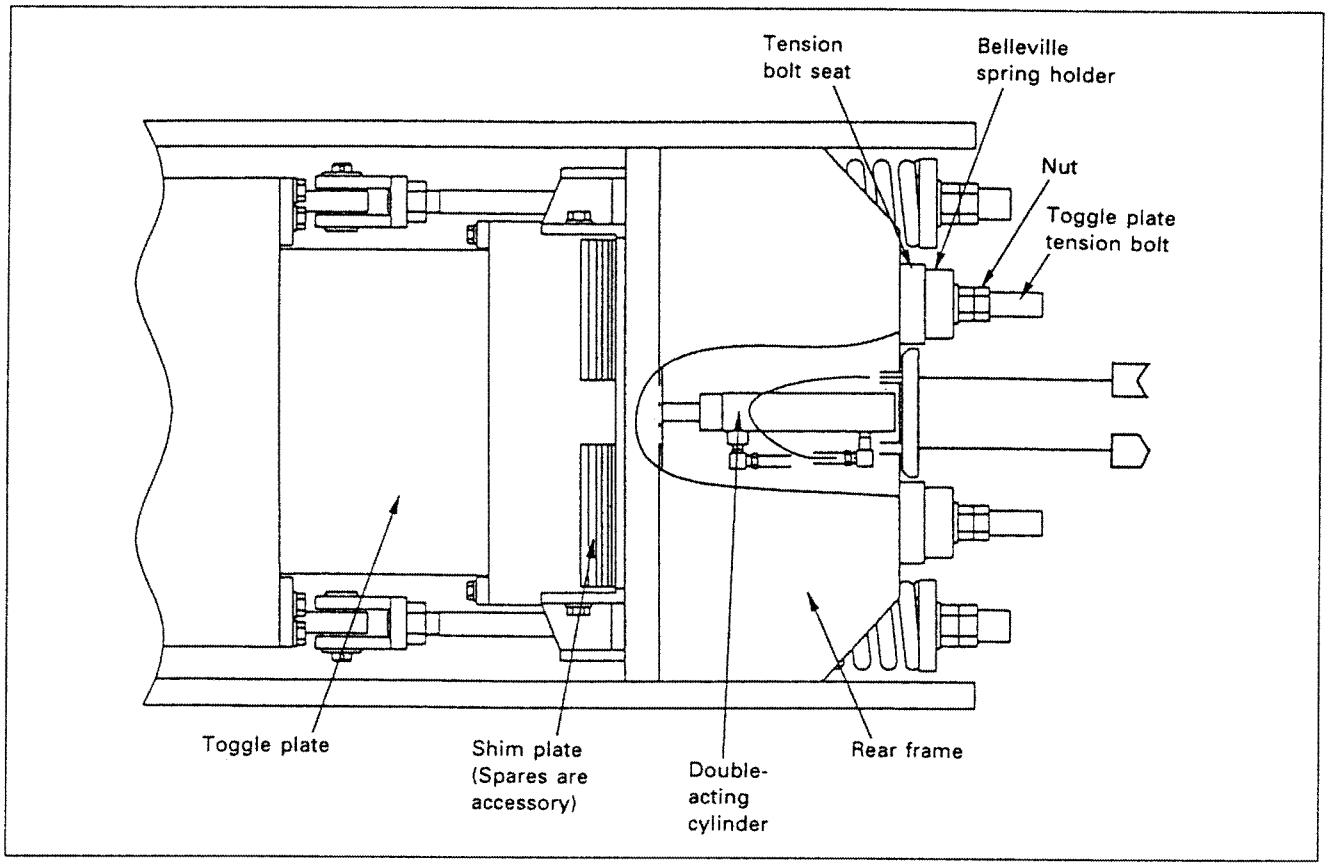
The relations between shim plate thickness (t) and outlet clearance of new fixed jaw plate and new swing jaw plate are shown on page 3-62.







b. Adjustment method of outlet clearance



1. Connect the rubber hose of the manual hydraulic pump to the coupler of the hydraulic ram.

2. Loosen the nut of the toggle tension bolt to a position where it does not contact the tension bolt holder seat even if the hydraulic ram is actuated. When changing the outlet clearance of the crusher from 200 mm (O.S.S) to 70 mm (O.S.S), loosen the nut about 90 mm.
   The ratchet wrench in the tools set (Part No. 8248-70-5760) attached to the crusher is useful for this work.

3. Operate a manual hydraulic pump to extract the cylinder of the hydraulic ram and move the toggle block to a degree that the shim plate can be removed.

4. Take out the shim plate upward or insert some so that a desired outlet clearance will be obtained to adjust the total thickness of the shim.

5. Turn the selector lever of the manual hydraulic pump, actuate the manual hydraulic pump, return the cylinder of the hydraulic ram, and pull back the toggle block.

6. Tighten the toggle tension bolts alternately.

7. After the disc spring holder is fitted to the tension bolt seat, further tighten by 30 – 45 degrees.

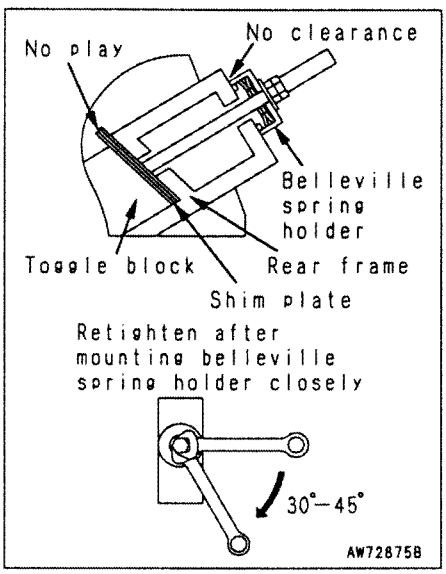
REMARK

O.S.S (Open Set Side) is the width when the outlet clearance of the jaw crusher is fully opened.

⚠ CAUTION

The gap between the disc spring holder and tension bolt seat and that between the adjustment plate and rear frame must be eliminated.

8. Measure the outlet clearance.



This completes the adjustment of the clearance, and it is now possible to start the operation.

⚠ CAUTION

After the outlet clearance is adjusted, retighten the toggle block tension bolts every day until they are not loosened any more, checking the following items.

<Items to be checked>

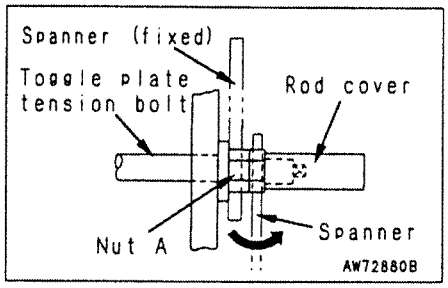
1. **Check that both toggle block tension bolts are tightened securely.**
2. **Check the shim plate for play by hitting it with the hand or hammer.**

REMARK

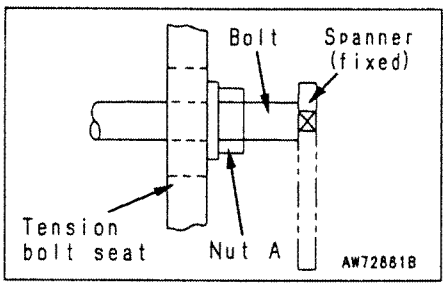
- If the play of the shim plate cannot be eliminated, push out the toggle block forward to the maximum by performing the outlet clearance adjusting procedure, then remove the all shim plates. Remove the all foreign matter by blowing air or spraying water from above the rear frame.

⚠ CAUTION

How to loosen toggle tension bolts
Remove the rod cover perfectly. At this time, secure nut "A" with a spanner, then remove the rod cover.
Apply the spanner to the bolt end to secure the bolt, then loosen nut "A".

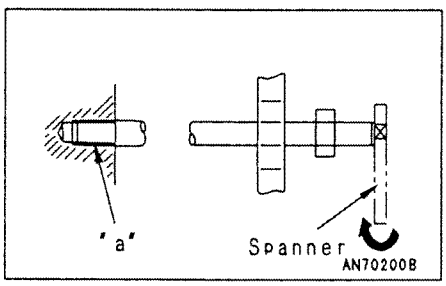


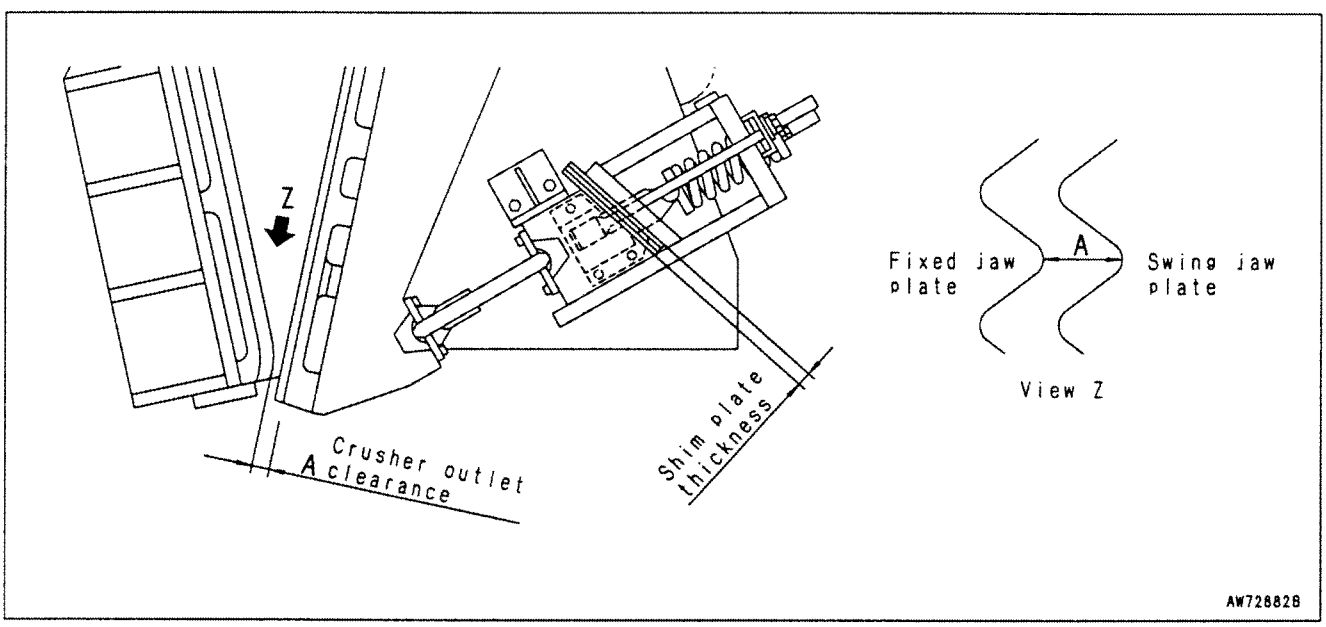
- When tightening the toggle tension bolts, turn the square head at each bolt end first to tighten the bolt in the base (part "a" of the toggle block) securely
  Next, tighten the bolts alternately with the nuts.



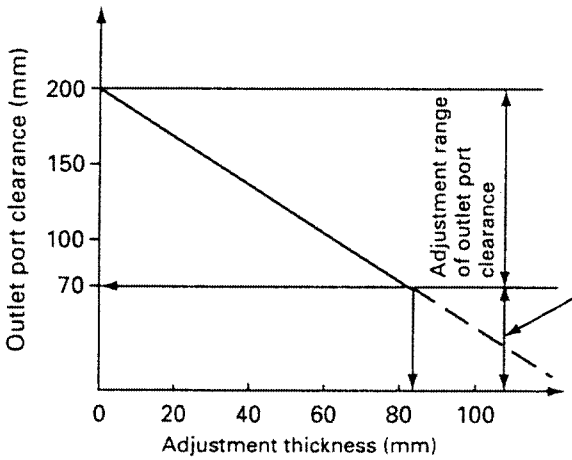
- Retightening
  When the toggle block is adjusted or machine is operated for test, the toggle tension bolts are loosened easily. Accordingly, be sure to retighten them.

- Outlet clearance and thickness of shim plate (t)
  For the relationship between the outlet clearance (open side) and the thickness of the shim plate, see the following page.

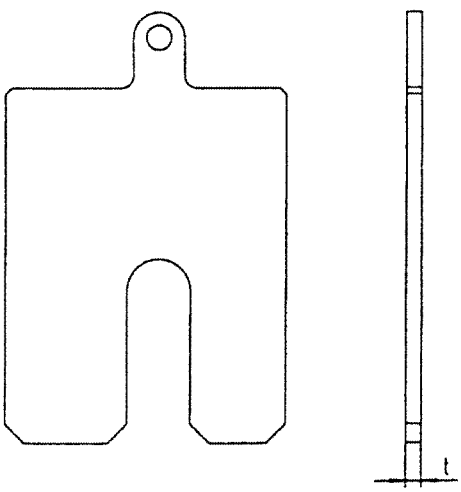




Adjustment range of outlet port clearance



When used in this range, jaw plates interfere with each other, and the crusher will be damaged. Never adjust in this range.



(Accessory shim plate)
t = 6 mm (4 pieces)
= 9 mm (4 pieces)
= 16 mm (10 pieces)

Numbers in ( ) include the numbers of plates installed per machine. Except for the above, prepare it necessary.

Wear Measurement of Major Consumable Parts
Fixed Jaw Plate

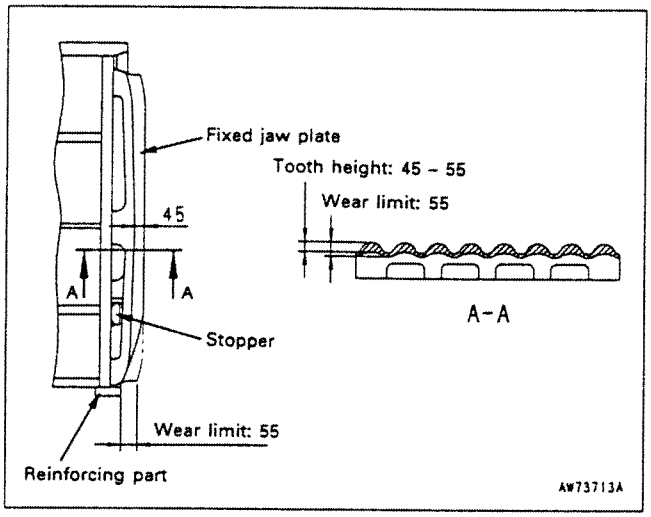
NOTICE

When the fixed jaw plate is still used though worn to the limit of the plate, the jaw crusher body will be seriously damaged.

① When the fixed jaw plate crest is worn 65 mm approx., reverse or replace it.

② Before the reinforcing part below the fixed jaw plate is worn out, reverse or replace the fixed jaw plate. (Wear limit : 55 mm)

③ When the fixed jaw plate crest is worn unevenly, reverse or replace it.



Swing Jaw Plate

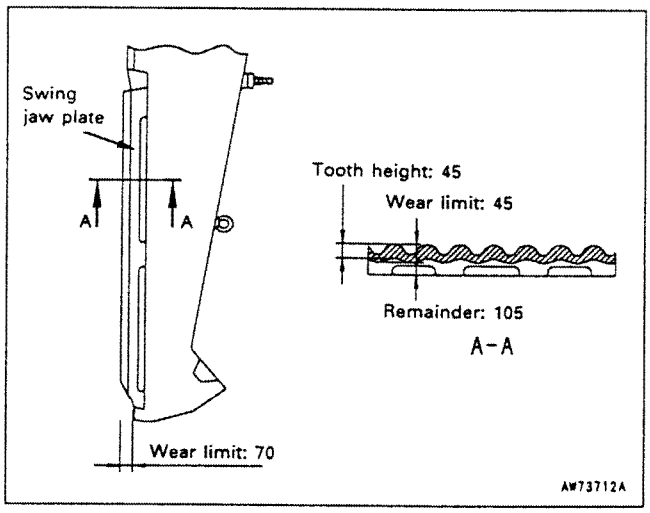
NOTICE

When the swing jaw plate is still used though worn to the limit of the plate, the jaw crusher body will be seriously damaged.

① When the swing jaw plate crest is worn 45 mm approx., reverse or replace it.

② Inspect the swing jaw plate periodically so that the swing jaw stopper is not worn.
(Wear limit : 70 mm)

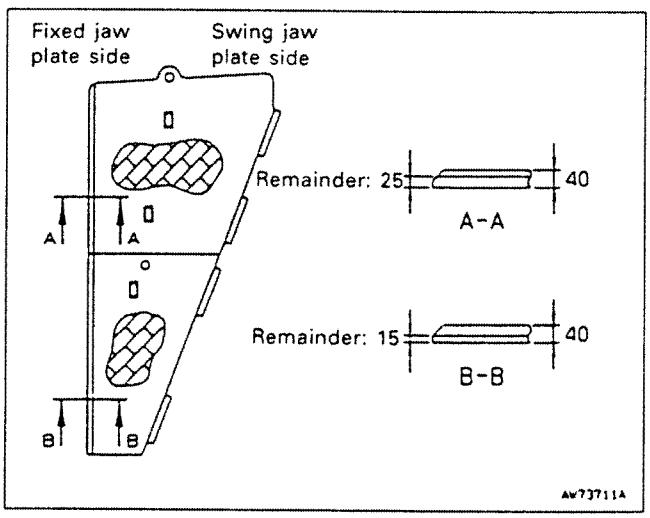
* When the plate is worn unevenly, rocks will not be discharged smoothly.



Cheek Plate

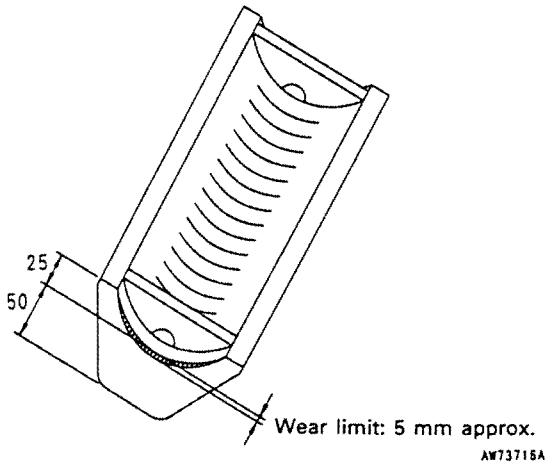
① When the upper part is worn to 25 mm approx., replace it.

② When the lower part is worn to 15 mm approx., replace it.



Toggle Seat

① When the toggle seat is worn 5 mm approx., replace it.



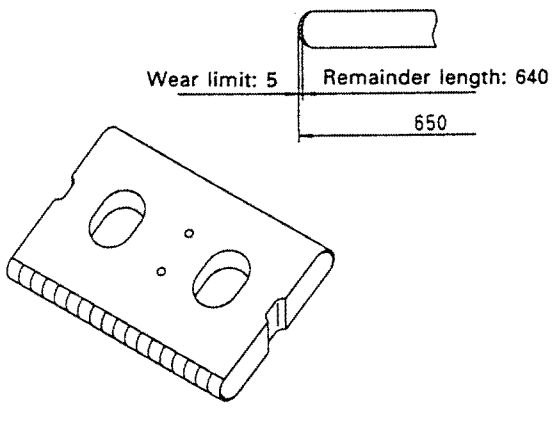
Toggle Plate

① When the toggle plate is worn 5 mm approx. on one side, replace it.

② When replacing the toggle plate, replace the dust cover as well.

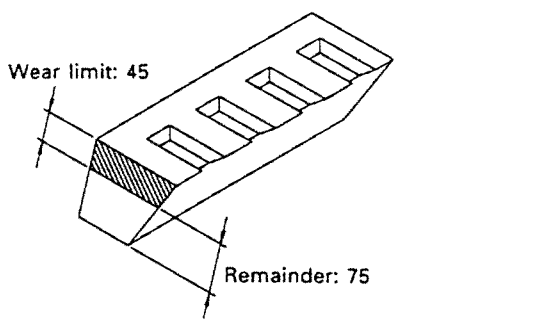
NOTICE

Check the sizes of the toggle seat and the toggle plate from one side of the toggle plate. When the mounting size between the toggle seats comes to 590 mm, replace them.



Wedge

① When the wedge is mount 45 mm approx., replace it.



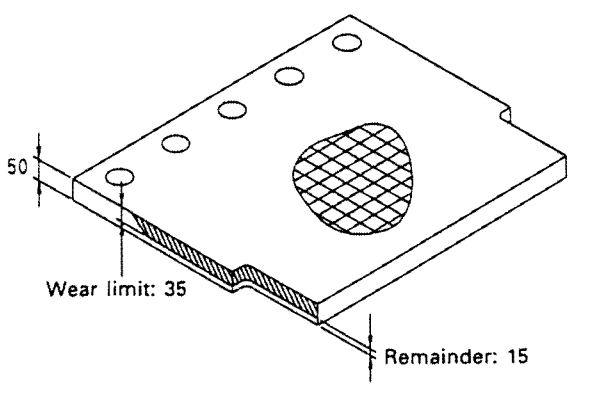
Protector

① When the remainder size comes to 15 mm approx., replace the protector.

② Also, replace the protector when part of the protector is worn unevenly.

REMARK

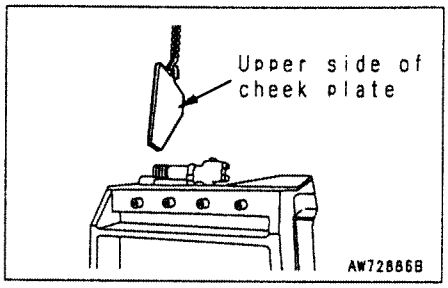
Noises occur sometimes from the toggle seat and the toggle plate. Rolling sounds that occur when the toggle plate rolls on the toggle seat do not affect the body. When striking sounds are heard, however, check if the tension rod tightening size is as specified.

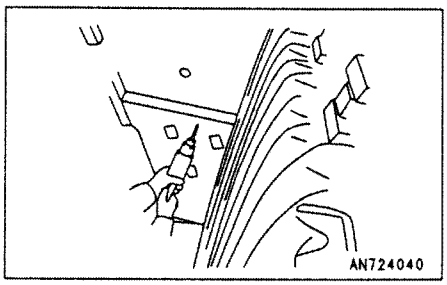


c. Replacement of cheek plates

1. Remove the cheek plate lock bolts.

2. Hang up the upper side of cheek plate with a wire.



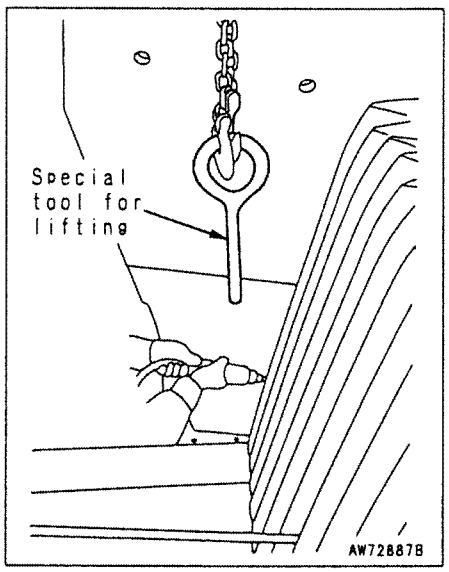


3. Remove soil, sand, etc. from the hanging hole of the lower cheek plate with compressed air or a wire brush, then hang the lower cheek plate with the special tool for cheek plate lifting (Part No. 8285-70-5860).

4. After removing the cheek plates, remove all soil and sand from the cheek plate fitting surfaces (front, rear, right and left).

5. Insert new cheek plates in order from underside, along the fixed jaw and guide of the side frame.

6. Tighten the cheek plate lock bolts (6 pieces on each side).



d. Turning and replacement of fixed jaw teeth

1. Fit the lifting wire to the fixed jaw teeth. (Note: Fit the wire securely.)

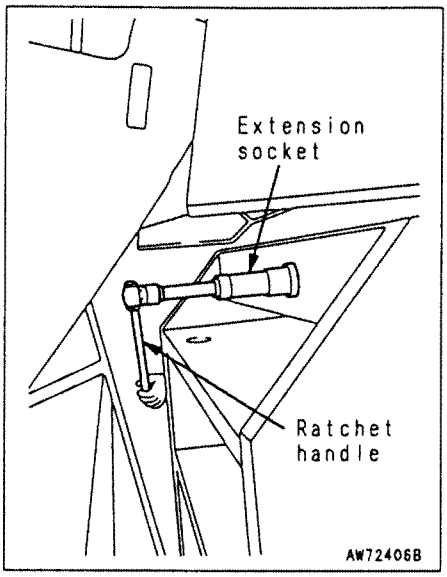
2. Remove the cheek plate.

3. Remove the fixed jaw wedge bolt from the front frame.
(The extension pipe will be used for the extension socket and ratchet handle.

4. Hang up the fixed jaw teeth with the wire.

(a) When turning: Lower the fixed jaw teeth onto the stand. Install the wire to the opposite side and insert the fixed jaw teeth between the front frame and swing jaw.

(b) When replacing: Lower the fixed jaw teeth onto the stand. Hang up new fixed jaw teeth with the wire and insert them between the front frame and swing jaw.



⚠ CAUTION

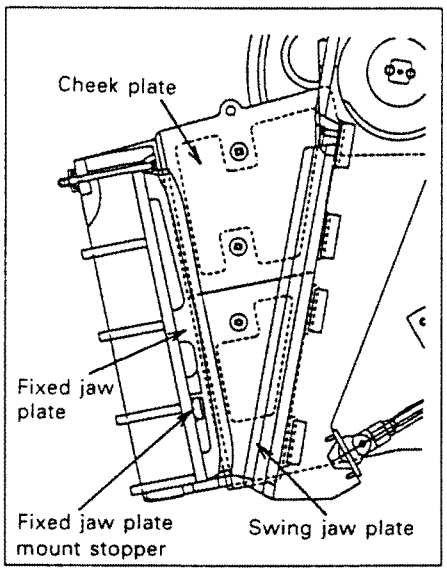
When the fixed jaw teeth are removed, remove the all soil and sand from the fitting surfaces (front frame and seat). If they are not removed thoroughly, the fixed jaw teeth will have play.

5. Align the fixed jaw teeth with the front frame.

6. Insert a railroad tie (or equivalent) between the fixed jaw teeth and swing jaw.

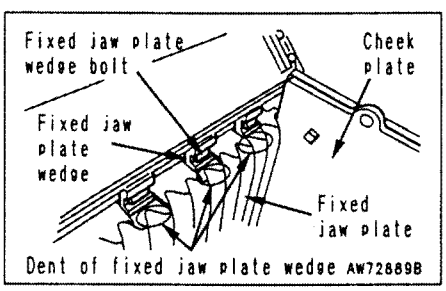
7. Move the fixed jaw teeth sideways to match their top to the dent of the fixed jaw wedge.

8. Mount the fixing bolt for the fixed jaw plate so that the length of the coil spring is 100 to 105 mm when tightened.

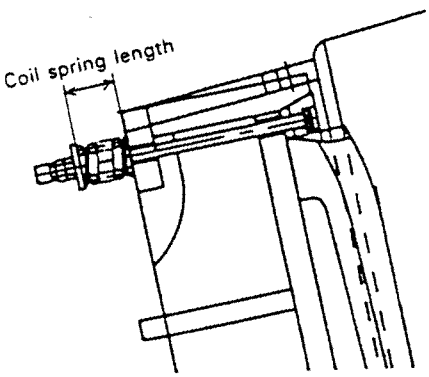


⚠ CAUTION

When installing the fixed jaw teeth, position them so that respective gaps X and Y between it and both cheek plates will be the same. If the gaps on both sides are not even, the tooth plate will be worn unevenly and the fixed jaw teeth lock bolts will be loosened.



9. Install the cheek plates.



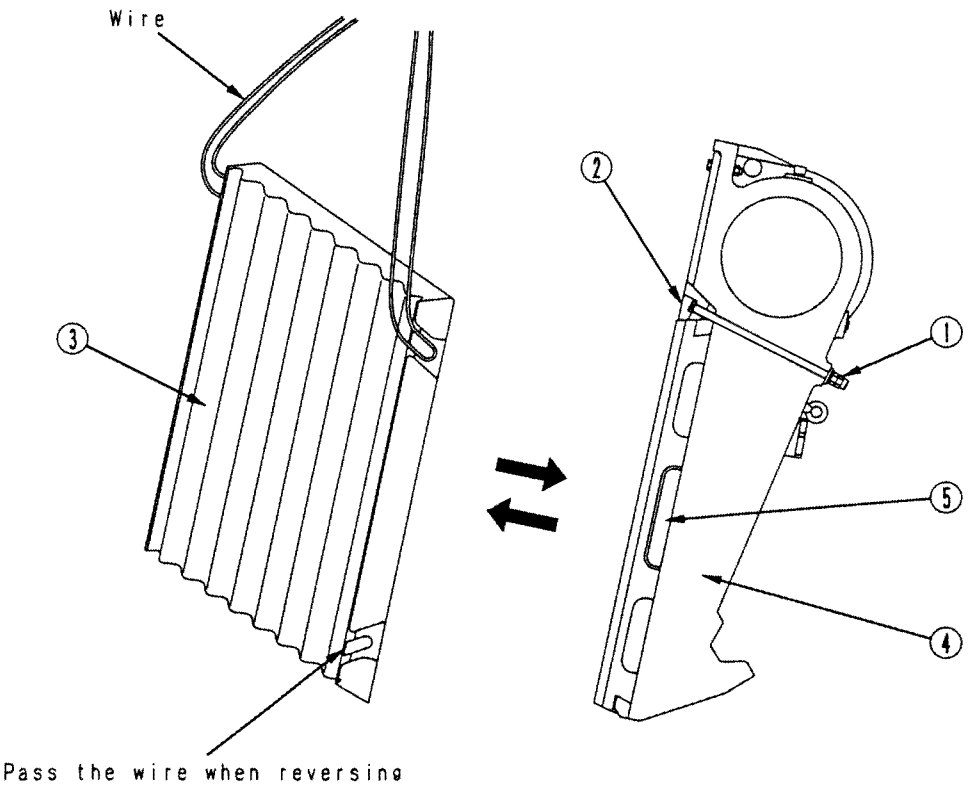
e. Turning and replacement of swing jaw teeth

1. Loosen swing jaw wedge bolt ① and remove swing jaw wedge ②.

2. Install wires to the hooks on both sides of swing jaw teeth ③, and hang up the jaw.

3. Fit swing jaw teeth ③ to swing jaw transverse stop piece ⑤ of swing jaw ④.

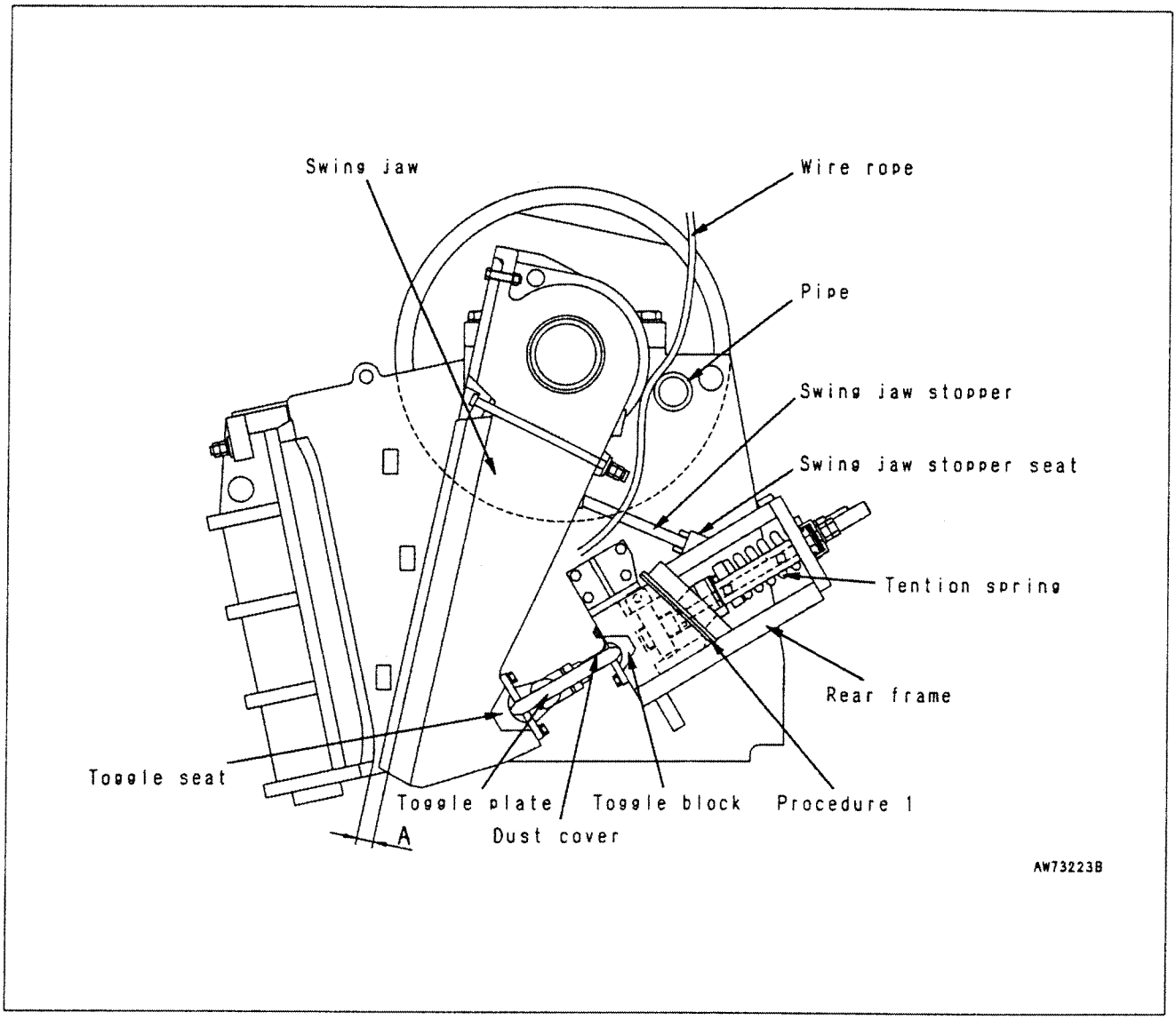
4. Install wedge ② and tighten the bolts. Hit the wedge surface to tighten the bolts securely.



⚠ CAUTION

When the swing jaw teeth are removed, remove the all soil and sand from the fitting surfaces (top of swing jaw). If they are not removed thoroughly, the fixed jaw teeth will have play.

f. Replacement of toggle plate

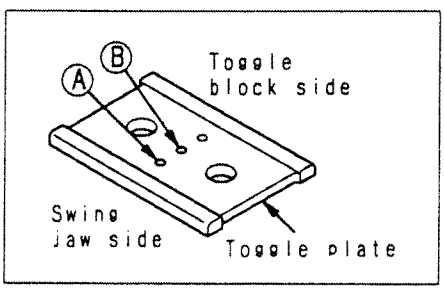


NOTICE

Before replacing the toggle plate, be sure to perform the following work.

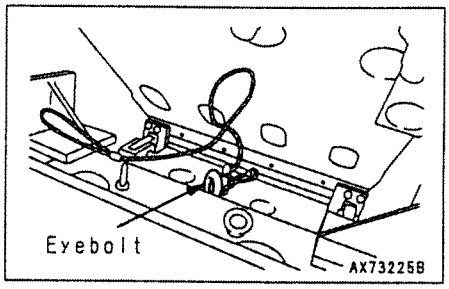
Procedure 1: Remove all the shim plates and set outlet clearance (A) of the crusher to the maximum.

Procedure 2: **Remove the hydraulic ram from the rear frame and install it to the hydraulic ram seat.**

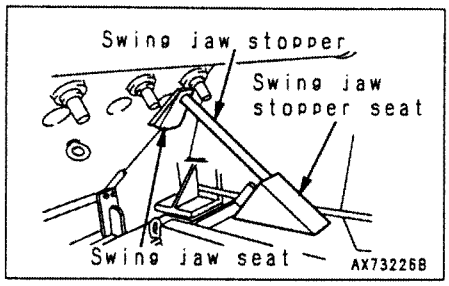


1. Remove the upper and lower dust covers from the toggle plate.
2. Install the eye-bolt to part Ⓐ of the toggle plate.
3. Pass a wire through the eye-bolt of the swing jaw and wind the wire around the eyebolt installed to tap (A) of the toggle plate, then pull up the wire slightly.

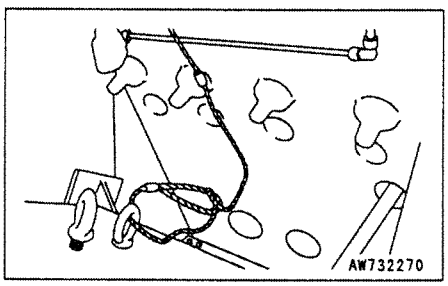
4. Remove the tension springs.
   (Remove the tension spring covers on both sides in advance.)



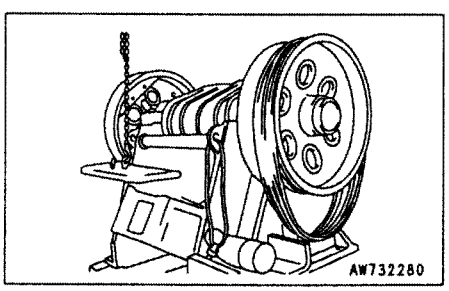
5. Push the toggle block with the double-acting cylinder.
6. Take out swing jaw stopper (Attached tool part No. 8248-70-5860) and insert it in the upper seat of the hydraulic ram securely.
7. Pull the toggle block with the double-acting cylinder, and support the swing jaw with the swing jaw stopper.



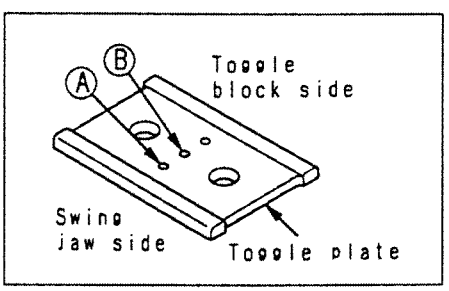
8. Lift and remove the toggle plate.
9. Place the toggle plate on the toggle block temporarily. Remove the wire from the swing jaw eye-bolt, and install it again.



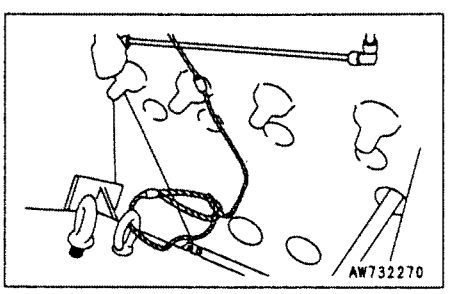
10. Lift the toggle plate and remove it from the body (Weight: 170 kg).



11. Install the eye-bolt to tap Ⓑ of a new toggle plate and wind the wire onto it.



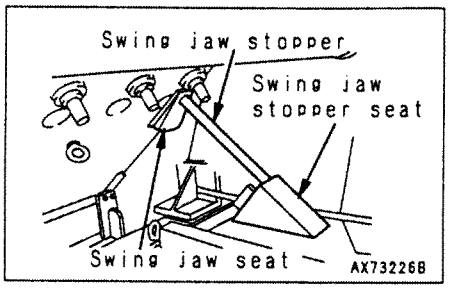
12. Lift the toggle plate and place it on the rear frame temporarily.
13. Fit the wire again to pass the wire between the pipe and swing jaw.



14. Lower the toggle plate slowly and match it to the center of the seat on the toggle block side.

15. Push the toggle block with the double-acting cylinder and remove the swing jaw stopper.

16. Adjust the wire and double-acting cylinder to determine the position so that the front contact surface of the toggle plate is aligned with the contact surface of the swing jaw seat.



17. Install the tension springs.

18. Compress the tension springs to the specified length.

19. Install the dust covers.

20. Check crusher outlet clearance Ⓐ.

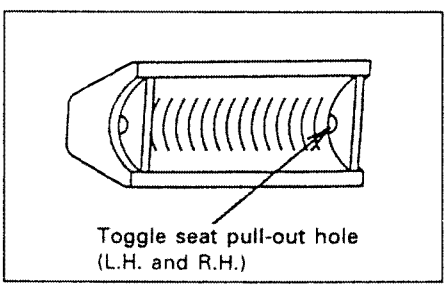
g. Replacement of toggle seat

⚠ CAUTION

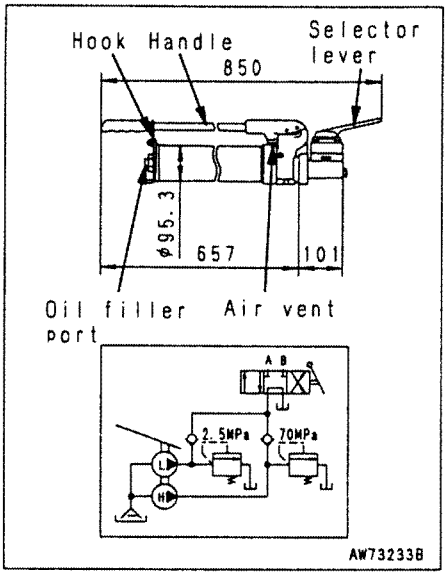
After a long-term operation, the toggle seat may have hardly adhered to the toggle block or the swing jaw due to deformation. In that case, cut the toggle seat in the center by using gas.

1. Pass a wire through the toggle seat pull-out hole or set a hook in it and pull out the worn toggle seat.

2. Insert a new toggle seat in the toggle seat mounting groove.



h. Handling hydraulic ram

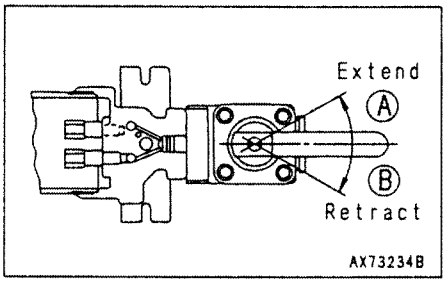


METHOD OF OPERATION

- Connect the hydraulic pump coupler securely to the double-acting cylinder coupler.
- Tighten the air vent.
- Turn the selector lever to the EXTEND (A) position.
- Move the handle up and down.
- The oil from the hydraulic tank passes through the high- pressure rubber hose, is sent inside the hydraulic ram, and moves the cylinder rod forward.
- Turn the selector lever to the RETRACT (B) position.
- Move the handle up and down.
- The oil from the hydraulic tank passes through the high-pressure rubber hose, is sent inside the hydraulic ram, and moves the cylinder rod back.

⚠ CAUTION

When carrying the hydraulic pump, always tighten the air vent securely. If it is not tightened, oil will leak.



METHOD OF ADDING OIL

- When the pump and hydraulic ram are connected, return all the oil in the cylinder to the pump, then stand the pump so that the oil filler plug is at the top, and add oil until the oil reaches the mark on the oil filler plug gauge.
- All genuine oils have extremely low viscosity and the operation is very smooth. However, if the genuine oil is not available, use ISO VG 32.
- Do not use oil with high viscosity, vegetable oil, or oil containing alcohol. This will make the operation defective and will cause damage to the packing or other failures.

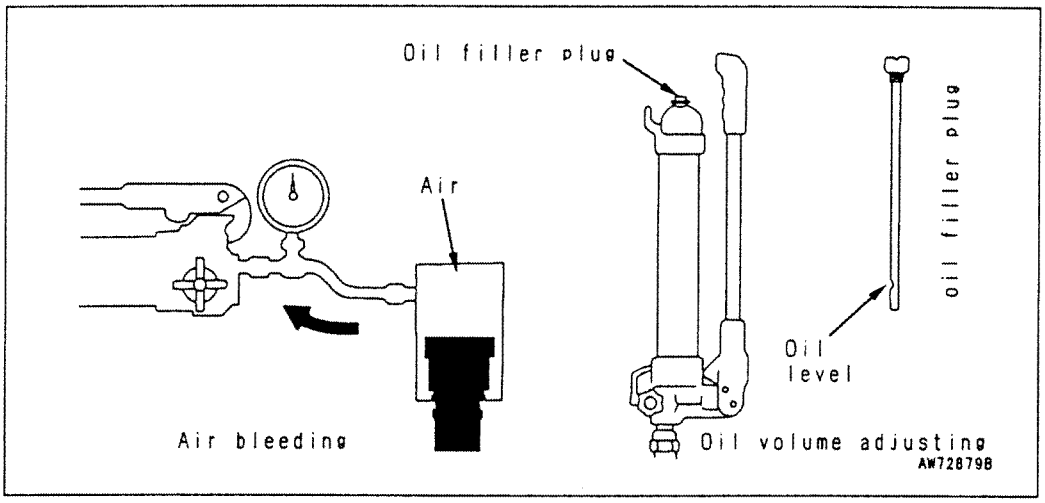
BLEEDING AIR FROM CYLINDER AND HOSE

- The cylinder may operate irregularly in the early period. This is caused by air in the piping and cylinder.

- To bleed air from the all hydraulic system, set the cylinder lower than the pump reservoir and extract the plunger fully. Then, retract the plunger with the cylinder port for the reservoir up, and the air is bled. If this operation is repeated two or three times, all the air will be bled.

(CAUTION)

Do not use this pump at pressure higher than the allowable tonnage of the cylinder or apply the maximum pressure with the piston rod fully extracted.



- When the air is bled, adjust the oil level
  Adjust the oil level while the cylinder is retracted.
- When adding oil, retract the cylinder to the stroke end.

Genuine hydraulic oil

The genuine hydraulic oil not only extracts the performance of the hydraulic tools sufficiently but protects them (Paraffin based, bluish).

Viscosity index	112
Viscosity (100°C)	26 S.U.S (5.543 cSt)
Viscosity (40°C)	149 S.U.S (31.73 cSt)
A.P.I specific gravity	0.8704
Flash point C.O.C.	218°C
Pour point	32.5°C
Aniline point	100°C

7.6 CHECK,ADJUST BELT CONVEYOR

⚠ WARNING

When inspecting and cleaning the conveyor and the periphery, be careful not to be caught in the rotating section.
Be sure to stop the conveyor before inspection and cleaning.

a. Turn the adjustment bolt in Fig. 1 to adjust the tension.

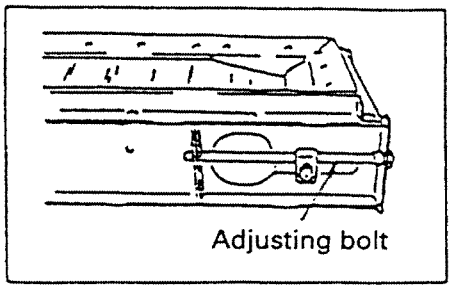


Fig. 1

b. Adjusting hopper rubber (Fig. 2)
If the hopper rubber is worn and there is a gap between the rubber and the belt, loosen the adjustment screw, and slide the bracket (long hole) to adjust.
(Standard clearance: 0 mm (tight contact)

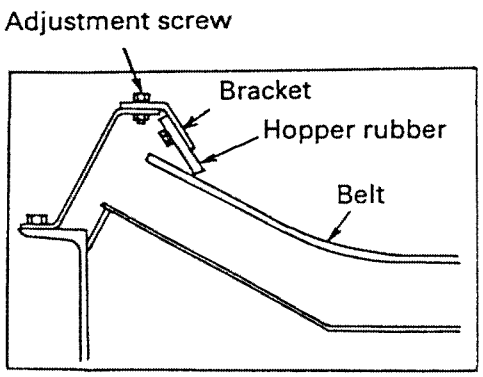
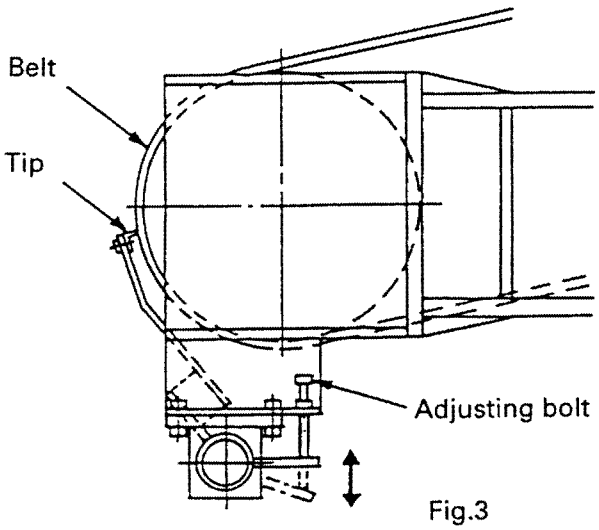


Fig. 2

c. Adjust scraper rubber

(1) Drive pulley end
Stick the belt cleaner tip to the belt by using the adjusting bolt.
(Standard clearance: 0 mm)



(When the tip is worn, replace.)

Fig.3

(2) Driven pulley end
If the scraper rubber is worn, loosen the tightening bolts to replace.
(Must be uniformity in contact on both left and right of belt)

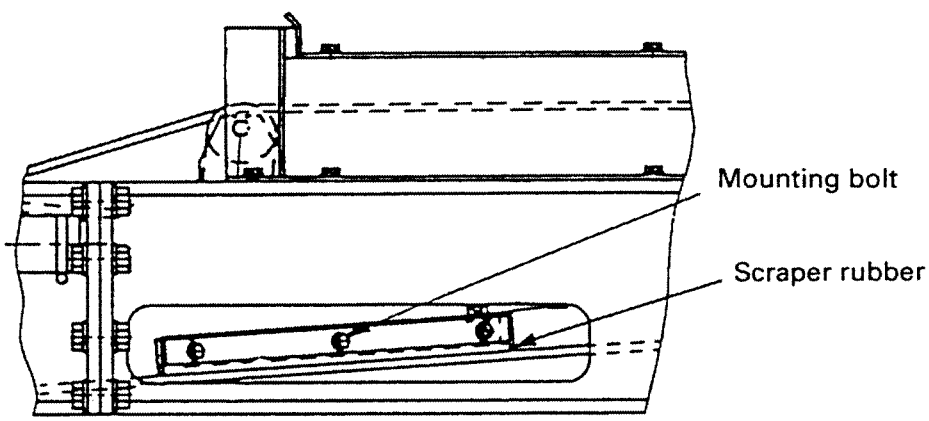


Fig. 4

8. WEAR PARTS

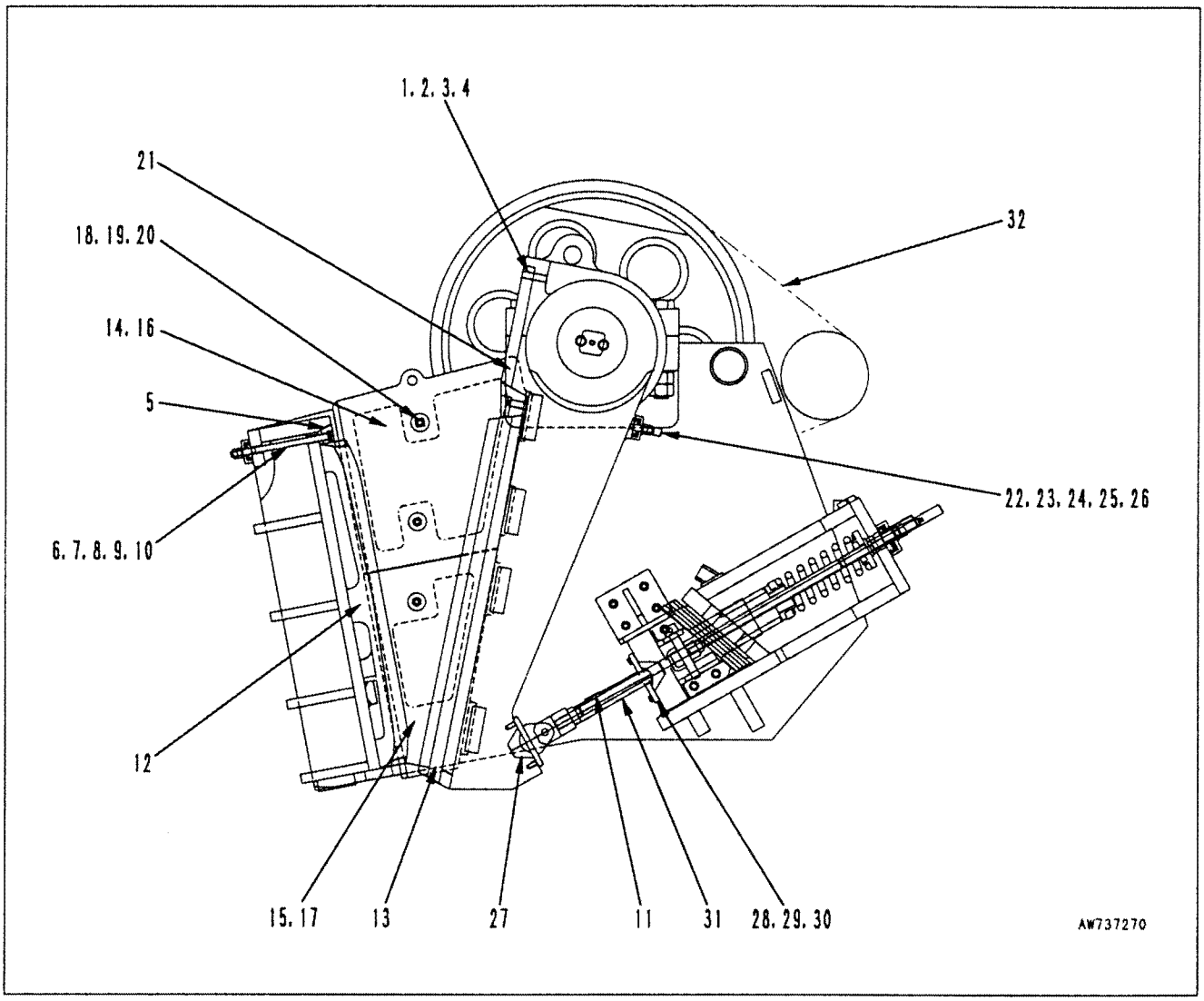
The wear parts including the filter element and packet tooth must be replaced at periodic maintenance or before the repair limit.
Replace those wear parts surely so that this machine may be used economically.
Use excellent KOMATSU genuine parts for parts replacement.
When asking for parts, check the parts number in the Parts Details.

The parts mentioned in parentheses should be replaced at the same time.

8.1 WEAR PARTS RELATED TO THE BODY

Item	Part No.	Part name	Quantity	Replacement
Hydraulic filter	208-60-61180 (07000-05210)	Element (O-ring)	1 (1)	Every 250 hours
Engine oil filter	600-211-1230	Cartridge	1	Every 250 hours
Fuel filter	600-311-8292	Cartridge	1	Every 500 hours
Hydraulic tank breather	20Y-60-21470	Element	1	Every 500 hours
Corrosion register	600-411-1150	Cartridge	1	Every 1,000 hours
Air cleaner	6125-81-7032	Element Ass'y	1	—
Electrical intake air heater	6150-11-4810	Gasket	12	—
Line filter	07063-21200 (07000-12055) (07001-02055)	Element (O-ring) (Ring)	2 (2) (2)	—

8.2 WEAR PARTS RELATED OF CRUSHER



No.	Tool name	Part number	Quantity	Unit weight (kg)	Remarks
1	Protector	8247-70-5210	1	230	
2	Protector bolt	01011-82035	4		
3	Protector nut	01580-12016	4		
4	Protector washer	01643-32060	4		
5	Wedge (for fixed jaw plate)	8248-70-5120	4	3, 15	
6	Wedge bolt	8248-70-5070	4		
7	Wedge nut	01580-12419	4		
8	Wedge belleville spring	8248-70-5110	4		
9	Wedge washer	01643-32460	4		
10	Wedge rod cover	8247-70-5130	4		
11	Dust cover	8247-70-5540	2		
12	Fixed jaw plate	8247-70-5060	1	1258	
13	Swing jaw plate	8247-70-5220	1	1227	
14	Cheek plate (Right upper)	8247-70-5160	1	127	
15	Cheek plate (Right lower)	8247-70-5170	1	107	
16	Cheek plate (Left upper)	8247-70-5140	1	127	
17	Cheek plate (Left lower)	8247-70-5150	1	107	
18	Cheek plate bolt	8247-70-5180	6		
19	Cheek plate nut	01580-12419	12		
20	Cheek plate washer	8248-70-5980	6		
21	Wedge (for Swing jaw plate)	8248-70-5230	1	95	
22	Wedge bolt	8248-70-5240	4		
23	Wedge nut	01580-12419	4		
24	Wedge belleville spring	8248-70-5110	4		
25	Wedge washer	01643-32460	4		
26	Wedge rod cover	8248-70-5130	4		
27	Toggle seat	8248-70-5520	2	41	
28	Toggle seat stopper	8248-70-5550	2		
29	Toggle seat stopper bolt	01016-51030	8		
30	Toggle seat stopper washer	01643-31032	8		
31	Toggle plate	8248-70-5560	1	132	
32	V-belt	8248-70-3610	6		8V-2420

8.3 WEAR PARTS RELATED TO THE BELT CONVEYOR

Belt specification (Maker: Bridgestone Corporation)

Size	Width	900 mm
	Endless length	21800 mm
Belt strength		315 kg/cm width
Ply number		2
Cover rubber thickness (Front x back)		Front: 6.0 mm, Back: 3.0 mm
Material		JIS-G
Total thickness (Reference value)		11.0 mm
Brand (Number)		Bridgestone (Rock Excel (RX315/2))

9. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE

■ Fuel and oil

Use proper fuels and oils taking ambient temperature into account as shown in the following table:

Specified capacity is the total amount of oil including oil for components and oil in piping. Refill capacity is the amount of oil needed to refill system during normal inspection and maintenance.

When starting the engine in an atmospheric temperature of lower than 0°C, be sure to use engine oil of SAE 10W, SAE10W-30 and SAE15W-40, even though an atmospheric temperature goes up to 10°C more or less in the day time.

■ Cooling water

Since KOMATSU genuine super coolant (AF-ACL) has been added in the coolant, it it not necessary for you to change it until the ambient temperature falls to –10°C. When the temperature falls below –10°C, adjust the density referring to "7.2, When Required."

Oiling position	Type of oil	Usage based on temperatures –22 –4 14 2 50 68 86 104°F	Specified capacity (ℓ)	Refill capacity (ℓ)
Engine oil pan	Engine oil	SAE30 SAE10W SAE10W-30 SAE15W-40	38 41 (With bypass filter)	34 37 (With bypass filter)
Crushe rmotor bearing case	Engine oil	SAE30	Each 0.9	Each 0.9
Final drive case			Each 12	Each 11.5
Damper case			0.75	—
Hydraulic system	Engine oil	SAE10W SAE10W-30 SAE15W-40	370	270
Fuel tank	Diesel fuel	ASTM D975 No. 2 D975 No. 1	605	—
Cooling system	Water	Add antifreeze	43.9	—

Special capacity: Total amout of oil including oil for components and oil in piping.
Refill capacity: Amount of oil needed to refill system during normal inspection and maintenance.

ASTM: American Society of Testing and Material
SAE: Society of Automotive Engineers
API: American Petroleum Institure

No.	Supplier	**Engine Oil [CD or CE]** SAE10W, 30, 40 10W30, 15W40 (The 15W40 oil marked * is CE.)	**Gear Oil [GL-4 or GL-5]** SAE80, 90, 140	**Grease [Lithium-Base]** NLGI No.2	**Anti-freeze Coolant [Ethylene Glycol Base] Permanent Type**
1	KOMATSU	EO10-CD EO30-CD EO10-30CD EO15-40CD	GO90 GO140	G2-LI G2-LI-S	AF-ACL AF-PTL AF-PT (Winter, one season type)
2	AGIP	Diesel sigma S Super dieselmulti-grade *Sigma turbo	Rotra MP	GR MU/EP	—
3	AMOCO	*Amoco 300	Multi-purpose gear oil	RYKON prenium grease	—
4	ARCO	*Arcofleet S3 plus	Arco HD gear oil	Litholine HEP 2 Arco EP moly D	—
5	BP	Vanellus C3	Gear oil EP Hypogear EP	Energrease LS-EP2	Antifreeze
6	CALTEX	*RPM delo 400 RPM delo 450	Universal thuban Universal thuban EP	Marfak all purpose 2 Ultra-duty grease 2	AF engine coolant
7	CASTROL	*Turbomax *RX super CRD	EP EPX Hypoy Hypoy B Hypoy C	MS3 Spheerol EPL2	Anti-freeze
8	CHEVRON	*Delo 400	Universal gear	Ultra-duty grease 2	—
9	CONOCO	*Fleet motor oil	Universal gear lubricant	Super-sta grease	—
10	ELF	Multiperformance 3C Performance 3C	—	Tranself EP Tranself EP type 2	Glacelf
11	EXXON (ESSO)	Essolube D3 *Essolube XD-3 *Essolube XD-3 Extra *Esso heavy duty Exxon heavy duty	Gear oil GP Gear oil GX	Beacon EP2	All season coolant
12	GULF	Super duty motor oil *Super duty plus	Multi-purpose gear lubricant	Gulfcrown EP2 Gulfcrown EP special	Antifreeze and coolant
13	MOBIL	Delvac 1300 *Delvac super 10W-30, 15W-40	Mobilube GX Mobilube HD	Mobilux EP2 Mobigrease 77 Mobilgrease special	—

No.	Supplier	**Engine Oil [CD or CE]** SAE10W, 30, 40 10W30, 15W40 (The 15W40 oil marked * is CE.)	**Gear Oil [GL-4 or GL-5]** SAE80, 90, 140	**Grease [Lithium-Base]** NLGI No.2	**Anti-freeze Coolant [Ethylene Glycol Base] Permanent Type**
14	PENNZOIL	*Supreme duty fleet motor oil	Multi-purpose 4092 Multi-purpose 4140	Multi-purpose white grease 705 707L White - bearing grease	Anti-freeze and summer coolant
15	PETROFINA	FINA kappa TD	FINA potonic N FINA potonic NE	FINA marson EPL2	FINA tamidor.
16	SHELL	Rimula X	Spirax EP Spirax heavy duty	Alvania EP greaes	—
17	SUN	—	Sunoco GL5 gear oil	Sunoco ultra prestige 2EP Sun prestige 742	Sunoco anti-freeze and summer coolant
18	TEXACO	*Ursa super plus Ursa premium	Multigear	Multifak EP2 Starplex 2	Code 2055 startex antifreeze coolant
19	TOTAL	Rubia S *Rubia X	Total EP Total transmission TM	Multis EP2	Antigel/anti-freeze
20	UNION	*Guardol	MP gear lube LS	Unoba EP	—
21	VEEDOL	*Turbostar *Diesel star MDC	Multigear Multigear B Multigear C	—	Antifreeze

10. PERIODIC REPLACEMENT OF IMPORTANT PARTS

To secure safety in operations and drive at all times, the user is requested to execute periodic maintenance without fail. To enhance the safety further, in particular, periodically replace the parts mentioned in the safety parts list on the next page which are particularly related to fire.

Regarding these parts, their materials tend to change with the lapse of time and they are apt to be worn away and degraded. For these reasons, the degree of each change, wear or degradation is hard to judge at periodic maintenance. Therefore, it is necessary to replace them with new ones after the lapse of a certain operating time even if special abnormality cannot be detected, with the object of maintaining full performance at all times.
As a matter of course, these parts must be repaired or replaced ever if any abnormality is found in them.
Regarding hoses, when degradation such as deformation or cracks is detected in hose clamps, replace both hoses and clamps.
Also, inspect hydraulic hoses not included among periodically replaced parts as follows and tighten them additionally or replace them if they are found out of order.

When replacing hoses, replace O-rings and gaskets together.

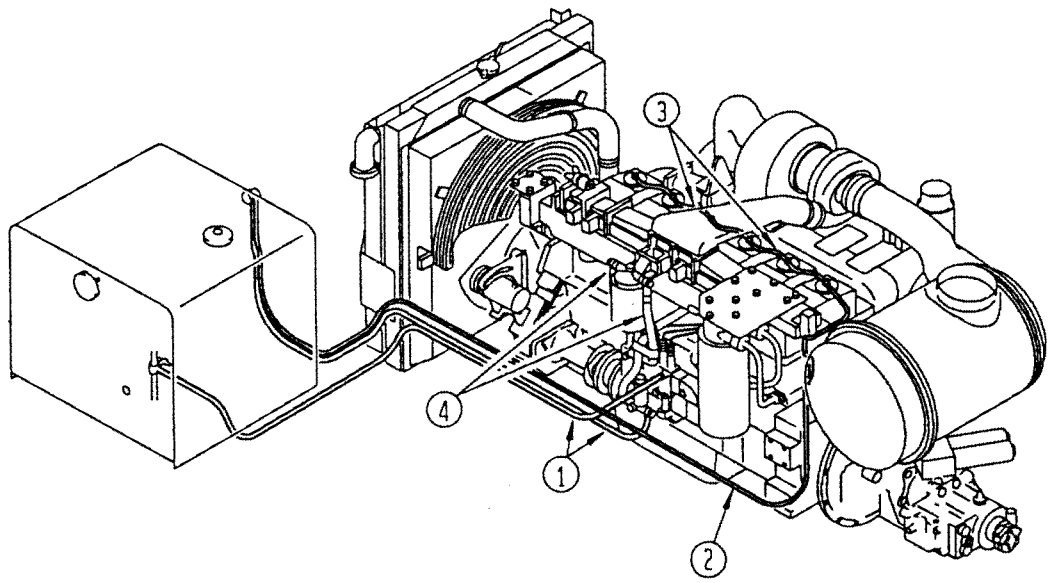
Regarding safety parts, ask your KOMATSU distributor for replacement.

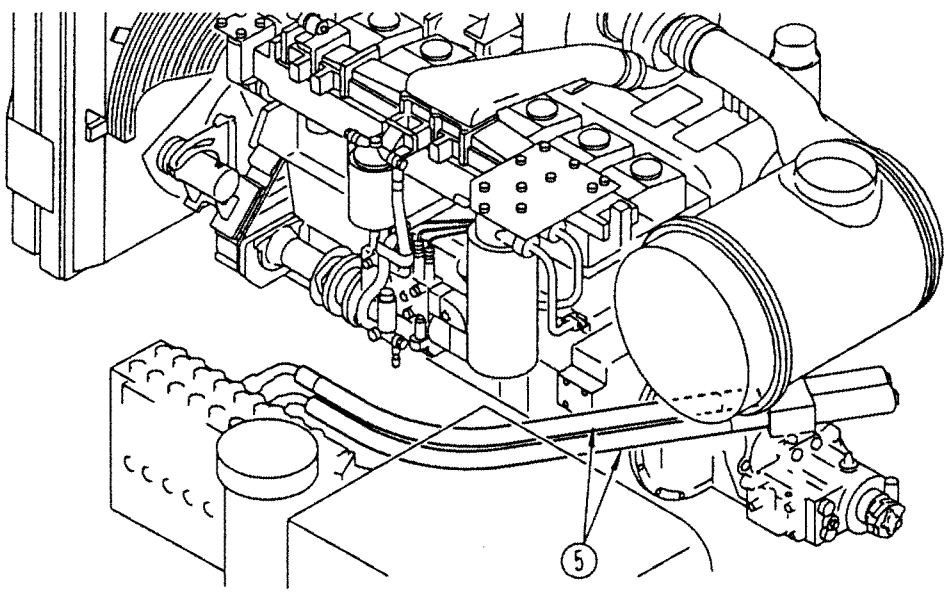
Inspect hydraulic hoses and fuel hoses as well at the times of the following periodic inspections:

Classification	Check Items
Check before start	• Oil leak from connections or caulked portions of fuel and hydraulic hoses.
Monthly check	• Oil leak from connections or caulked portions of fuel and hydraulic hoses. • Damage (crack, abrasion or tears) of fuel and hydraulic hoses.
Specific voluntary inspection (Yearly inspection)	• Oil leak from connection or caulked portions of fuel and hydraulic hoses. • Interference, crush, aging, twist and damage (crack, abrasion or tears) of fuel and hydraulic hoses.

■ List of important parts

No.	Safety parts to be replaced periodically	Q'ty	Replacement time
1	Fuel hose (fuel tank to engine	2	Earlier one of every 2 years and every 4000 hours
2	Spill hose (nozzle to fuel tank)	1	
3	Spill hose (between nozzles)	2	
4	Fuel hose (fuel filter to injection pump)	2	
5	Pump outlet hose (pump to control valve)	2	





11. TROUBLESHOOTING

11.1 CRUSHER

Regarding the corrective measure in parentheses, be sure to contact your KOMATSU distributor

Abnormal symptom	Main cause	Corrective measure
Abnormal noise is generated	Loose mounting bolts of crusher tooth plate	Tighten
	Wear, damage to bearing	(Check, replace)
	Worn toggle plate, seat	Replace
	Worn end plate of toggle seat	Replace
Excessive vibration	Machine is not in proper contact with ground	Make ground level
	Balance is poor after turning or replacing	(Adjust balance)
Abnormal heat generated at bearing	Dust in lubricating oil	Check, clean
	Lubricating oil is low	Check, add oil
	Machine is not in proper contact with ground (machine is not horizontal)	Put horizontally in contact with ground

11.2 ELECTRICAL EQUIPMENT

- Regarding the corrective measure in parentheses, be sure to contact your KOMATSU distributor
- When there seems to be any abnormality or cause other than the following, ask your KOMATSU distributor for repairs.

Abnormal symptom	Main cause	Corrective measure
The light is dark at the maximum engine speed	• Wiring fault	(• Check the terminal for looseness and wire breaking and repair it)
The light flickers while the engine rotates	• Improper belt tension adjustment	• Refer to EVERY 250 HOURS SERVICE, and adjust belt tension.
The charging level monitor flickers while the engine rotates.	• Alternator fault • Wiring fault	(• Replace) (• Check and repair)
Abnormal noise is generated from the alternator.	• Alternator fault	(• Replace)
The starting motor cannot rotate with the starting switch ON.	• Wiring fault • Starting motor fault • Insufficient battery charging level	(• Check and repair) (• Replace) • Charge
The pinion of the starting motor comes in and out repeatedly. (irregular condition)	• Insufficient battery charging level • Safety relay fault (Starter motor directly mounted)	• Charge (• Replace)
The starting motor cannot rotate the engine at a high speed	• Insufficient battery charging level • Starting motor fault	• Charge (• Replace)
The starting motor gets out of engagement before the engine starts.	• Wiring fault • Insufficient battery charging level	(• Check and repair) (• Replace)
The preheating monitor does not come on.	• Wiring fault • Glow relay fault • Monitor fault	(• Check and repair) (• Replace) (• Replace)
While the engine is at a stop, the engine oil pressure monitor does not light (with the starting switch ON).	• Monitor fault • Caution lamp switch fault	(• Replace) (• Replace)
Exterior of electrical intake air heater heater is not warm for hand touch.	• Wiring fault • Electrical intake air heater wiring breaking • Heater relay switch actuation fault	(• Check, repair) (• Replace) (• Replace)

11.3 BODY

- Regarding the corrective measure in parentheses, be sure to contact your KOMATSU distributor
- When there seems to be any abnormality or cause other than the following, ask your KOMATSU distributor for repairs.

Abnormal symptom	Main cause	Corrective measure
The speed of crusher, conveyor and feeder is slow.	• Insufficient hydraulic oil	• Refer to CHECK BEFORE STARTING, and replenish oil up to the specified oil level.
Abnormal noise is generated from the pump.	• Clogging in the hydraulic oil tank strainer element.	• Refer to EVERY 2000 HOURS SERVICE, and clean it.
The temperature of hydraulic oil rises too much.	• Slack fan belt	• Refer to EVERY 250 HOURS SERVICE, and adjust the fan belt tension.
	• Dirty oil cooler	• Refer to 500 HOURS SERVICE, and clean it.
	• Insufficient hydraulic oil	• Refer to CHECK BEFORE STARTING, and replenish oil up to the specified level.
The track shoe gets out of place.	• Too slack track shoe	• Refer to WHEN REQUIRED service, and adjust the tension.
The sprocket is abnormally worn away.		

11.4 ENGINE

- Regarding the corrective measure in parentheses, be sure to contact your KOMATSU distributor
- When there seems to be any abnormality or cause other than the following, ask your KOMATSU distributor for repairs.

Abnormal symptom	Main cause	Corrective measure
Engine oil pressure monitor flickers.	• Insufficient oil level in the oil pan (Air is sucked)	• Refer to CHECK BEFORE STARTING, and replenish oil up to the specified level.
	• Clogging in the oil filter element	• Refer to EVERY 250 HOURS SERVICE, and replace cartridge.
	• Oil leakage due to improper tightening or damage of the oil pipe or pipe joint	(• Check and repair)
	• Engine oil pressure sensor fault	(• Replace the sensor)
	• Monitor fault	(• Replace the monitor)
Steam blows off from the top (pressure valve) of the radiator.	• Insufficient cooling water, water leakage	• Refer to CHECK BEFORE STARTING, and check, replenish cooling water, and repair.
	• Loose fan belt	• Refer to every 250 hours service, adjust the tension.
The radiator water level monitor lights.	• Dust or fur accumulated in the cooling system.	• Refer to WHEN REQUIRED SERVICE, Replace cooling water, and clean the inside of the cooling system.
	• Clogging in the radiator fin or falling-down of the fin.	• Refer to EVERY 500 HOURS SERVICE, and clean or repair.
	• Thermostat fault	(• Replace the thermostat)
	• Loose radiator filler cap (work at high land)	• Tighten the cap or replace the packing.
	• Water level sensor fault	(• Replace the sensor)
	• Monitor fault	(• Replace the monitor)

ENGINE (Continued from the previous page)

Abnormal symptom	Main cause	Corrective measure
The engine cannot be started by turning the starting motor.	• Insufficient fuel	• Refer to CHECK BEFORE STARTING, and replenish fuel.
	• Air mixed in the fuel system.	• See the above paragraph on" the radiator water level monitor lights."
	• Fuel injection pump or nozzle fault	(• Repair the air mixed por tion.)
	• The starting motor rotates the engine at a low speed. • The preheating monitor does not come on.	Refer to the item pertaining to Electrical Equipment.
	• Compressed air fault ◦ Improper valve clearance	(◦ Adjust the valve clearance)
The exhaust color becomes white or bluish.	• Excessive oil level in the oil pan	• Refer to CHECK BEFORE STARTING, and replenish oil up to the specified level.
	• Fuel fault	• Replace the fuel with the specified one.
The exhaust color sometimes becomes black.	• Clogging in the air cleaner element	• Refer to WHEN REQUIRED service, and clean or re-place.
	• Nozzle fault	(• Replace the nozzle)
	• Compression fault	(• Refer to the previous item pertaining to compression fault.)
	• Turbocharger fault	• Clean or replace the turbo-charger
The combustion sound some-times become irregular.	• Nozzle fault	(• Replace the nozzle)
Abnormal noise is generated (combustion or mechanical)	• Poor-quality fuel	• Replace the fuel with the specified one.
	• Overheating	• Refer to the previous item pertaining to " The radiator water level monitor lights.)
	• Internal damage of the muffler	• Replace the muffler
	• Too large valve clearance	(• Adjust the clearance)

11.5 BELT CONVEYOR

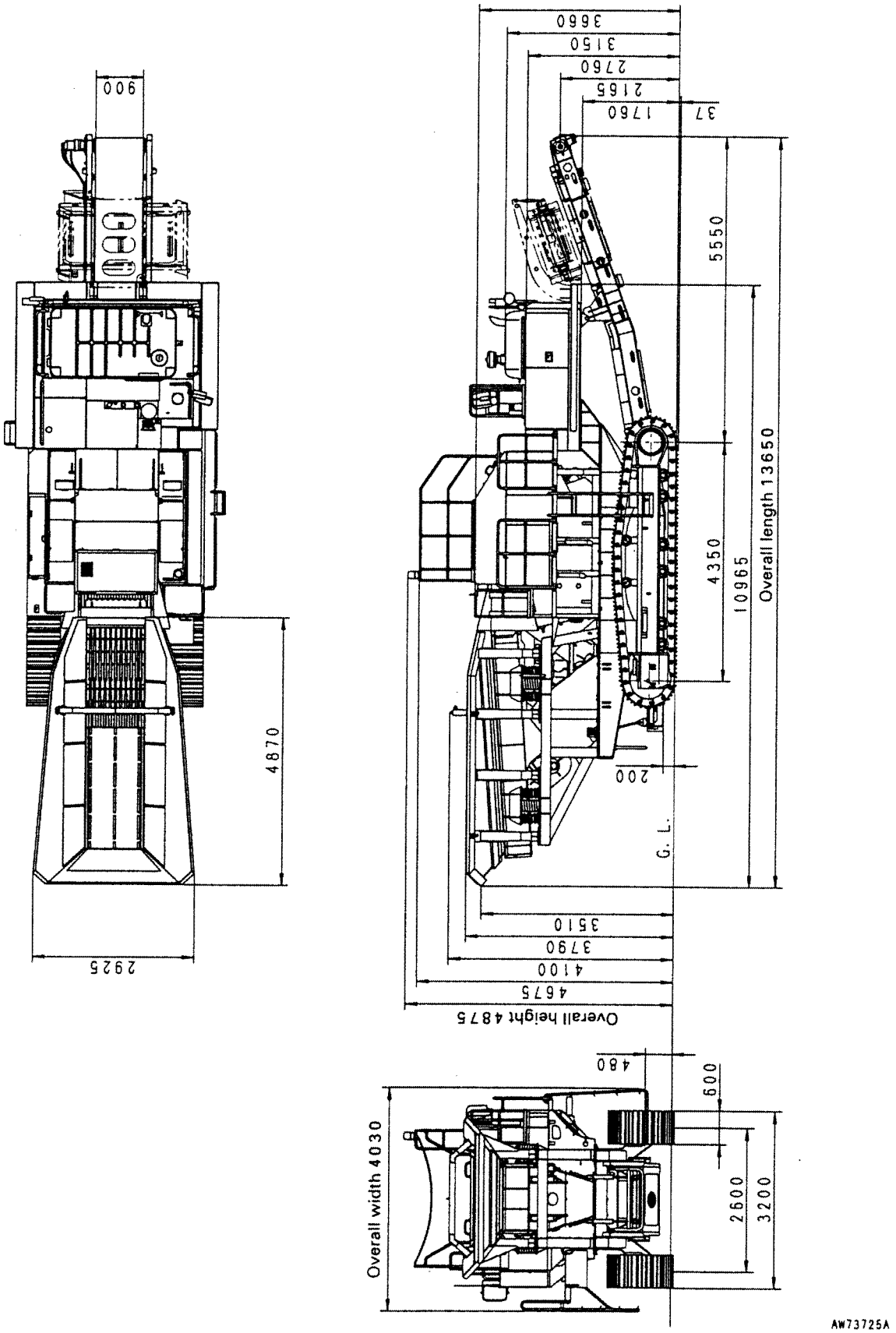
Most contents of conveyor trouble due to daily improper operation and maintenance may be prevented beforehand. Simple inspection leads to a longer life and full performance of the conveyor.

Classification	Abnormal symptom	Main cause	Corrective measure
Conveyor belt	(1) Not operable	① Electric circuit fault: Electric failure in the section fromswitch to solenoid valve	Correct the wiring or relay connections.
		② Relief valve operation fault	Measure the hydraulic oil pressure
	(2) Zigzag line	① Roller eccentricity, installation fault	Adjust the mounting angle of the roller.
		② Biased loading of transported materials	Load materials equally in the middle of the belt.
		③ Adhesion of transported materials to the roller (string winding)	Clean the outer circumference of the roller.
		④ Belt elongation	Adjust the belt elongation by take-up.
		⑤ Belt bend. Incorrect endless processing.	Retry endless processing or replace the belt.
		⑥ Frame torsion or bend	Correct the torsion or center at assembly or installation.
		⑦ Frame level fault (The belt is biased.)	
		⑧ Too rigid belt (misselection of belt thickness)	a. Put the belt in the wearing status by no load-run. b. Replace it with a soft (proper) belt.
	(3) Abnormal wear on the rear surface	① Slip on the motor pulley (drive pulley) surface	Adjust the belt elongation by take-up.
		② Foreign materials including transported materials interpose between the belt and pulley. (Foreign materials adhered on the pulley surface.)	a. Remove foreign materials. (Remove adherent materials.) b. Improve the loading condition in the loading part.
		③ Roller rotation fault	Replace the faulty roller.
	(4) Damage (vertical crack)	① Foreign materials including transported materials are caught on the contact surface of the belt (hopper, scraper, etc.)	Remove foreign materials
		② The roller falls down from the bracket, so that it is in contact with the belt.	Put the roller into the bracket correctly.
		③ The roller of faulty rotation is worn away and perforated.	Replace the faulty roller.
		④ Shock due to a drop of a large mass and heavy material	Reduce the shock or change it into a proper load.
		⑤ Transported materials have projections.	Stop transporting such materials.
	(5) Abnormal elongation	① Too tight take-up	Return to proper tightness.
		② Transport of hot materials	Change the belt into a heat-resistant belt.
		③ Abnormal load	Change it into a proper load.
		④ End of life	Replace with a new one.
	(6) Warpage	① Transported materials include oil. (Warpage to the lower cover side)	Remove the cause of oil or use an oil-resistant belt.
		② Hot materials are transported.	Use an oil-resistant belt.
		③ Transported materials include acid or alkali.	Use an acid-resistant or alkali-resistant belt.

Classification	Abnormal symptom	Main cause	Corrective measure
Scraper belt	Fatigue and damage	Caught transported materials	a. Remove caught materials and put the belt in equal contact with the scraper rubber. b. Replace the belt with a new one.
Roller	(1) Abnormal noise	① Roller rotation fault	Replace the roller with a new one.
		② Wire or string is wound on the shaft.	Remove foreign materials.
	(2) Breaking	Shock due to a drop of a large mass or heavy material	Reduce the shock and put a proper mass or load.
Motor	Operational fault	Insufficient hydraulic oil	a. Supply oil up to the specified oil level. b. Replace or repair the motor.

SPECIFICATIONS AND CIRCUIT DIAGRAMS

1. EXTERNAL VIEWS



2. SPECIFICATIONS

Total body weight		kg	57,000
Rated output		PS/rpm	310/1950
Dimensions	Overall length	mm	13,650
	Overall height	mm	4,875 (transporting 3,530)
	Overall width	mm	4,030 (transporting 3,200)
	Shoe width	mm	600
	Track shoe center distance	mm	2,600
	Grounding length	mm	4,350
Engine	Name		SA6D125
	Type		Direct injection + turbocharger + aftercooler
Feeder	Method		Grizzly feeder 2 steps deck
	Trough size (width × length)	mm	1,100 × 4,200
Crusher	Single toggle (Type)		FS4230SA
	Radial clearance	mm	70 to 200 (open side)
	Weight	kg	22,200
Belt conveyor	Belt (width × length)	mm	900 × 10,000
	Belt rotating speed	m/min	(107) (135)
	Vertical adjustment method		Hydraulic cylinder
Hopper	Capacity	m^3	3.15
	Type		Variable
Performance	Production performance	ton/h	120 to 400
	Dimension of maximum workable scrap	mm	1,200 × 850 × 600
	Travel speed	km/h	3.0
	Degradablility	degree	25
Drive	Travel drive method		Hydraulic
	Crusher drive method		Hydraulic
Capacity	Fuel tank	ℓ	555
	Hydraulic tank	ℓ	270
Noise	Noise in surrounding area (engine run at full throttle under no load, measurement radius: 16 m, LWA)	db	108

OPTIONS, ATTACHMENTS

1. GENERAL PRECAUTIONS

1.1 PRECAUTIONS RELATED TO SAFETY

If attachments or options other than those authorized by Komatsu are installed, this will not only affect the life of the machine, but will also cause problems with safety.

When installing attachments not listed in this Operation and Maintenance Manual, please contact your Komatsu distributor first.

If you do not contact Komatsu, we cannot accept any responsibility for any accident or failure.

⚠ WARNING

Precautions for removal and installation operations
When removing or installing attachments, obey the following precautions and take care to ensure safety during the operation.

- **Carry out the removal and installation operations on a flat, firm ground surface.**
- **When the operation is carried out by two or more workers, determine signals and follow these during the operation.**
- **When carrying heavy objects (more than 25 kg (55 lb)), use a crane.**
- **When removing heavy parts, always support the part before removing it.**
  When lifting such heavy parts with a crane, always pay careful attention to the position of the center of gravity.
- **It is dangerous to carry out operations with the load kept suspended. Always set the load on a stand, and check that it is safe.**
- **When removing or installing attachments, make sure that they are in a stable condition and will not fall over.**
- **Never go under a load suspended from a crane.**
  Always stand in a position that is safe even if the load should fall.

NOTICE

Qualifications are required to operate a crane. Never allow the crane to be operated by an unqualified person.

For details of the removal and installation operations, please contact your Komatsu distributor.

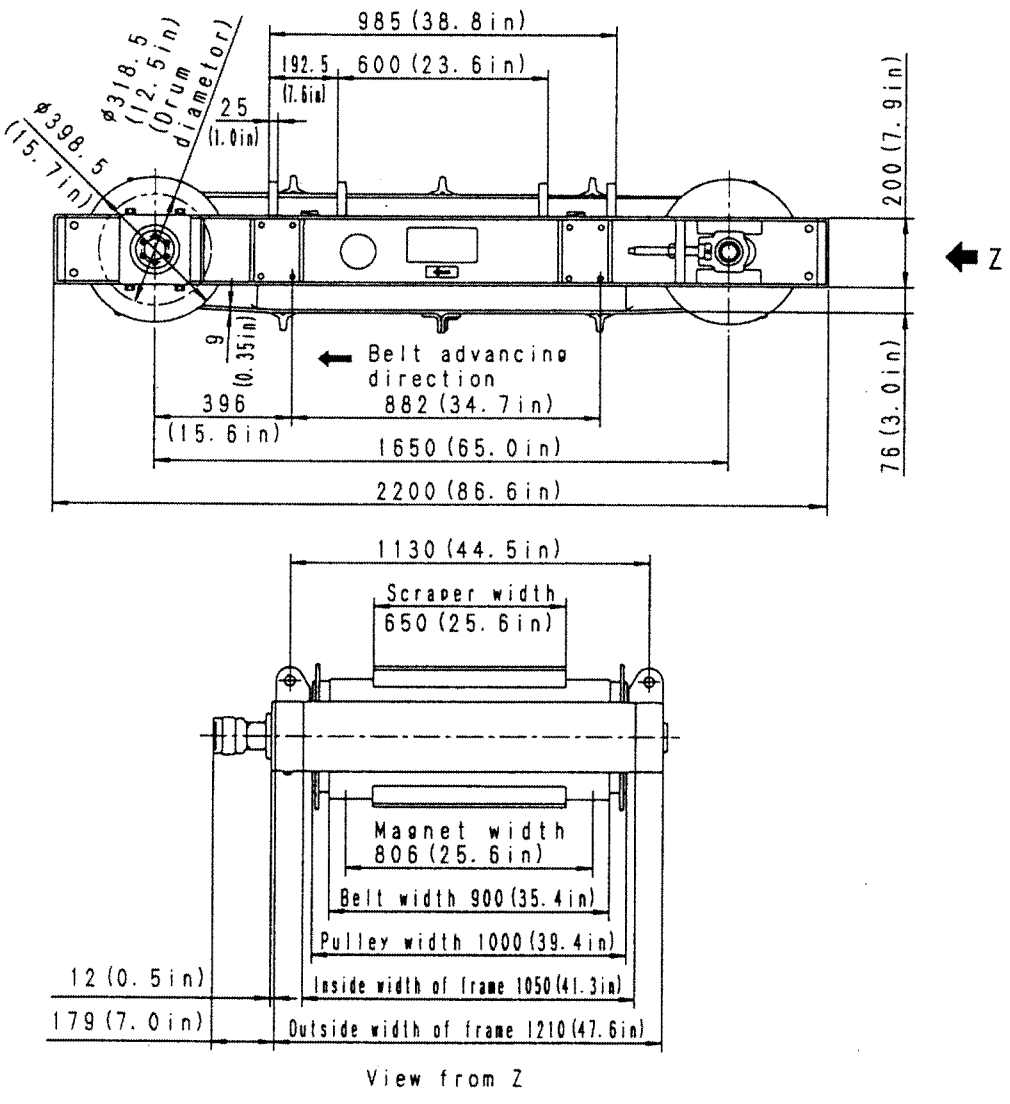
2. HYDRAULIC MAGNETIC SEPARATOR

Example : The magnetic separator is used to remove reinforced bars out of reinforced concrete.

2.1 SPECIFICATION (KMG900L)

- Type: KMG900L (62A-HP090SV)
- Belt speed: Max. 75 m/min.
- Conveyor belt: 900 mm (35.4 in) wide
- Driving method: Hydraulic motor
- Weight: 1130 kg (2492 lb)

2.2 GENERAL VIEW (KMG900L)



2.3 PRECAUTIONS ON SAFETY

⚠ WARNING

Do not approach the magnetic separator while wearing or carrying a precision instrument such as wrist watch and measuring instrument. If you approach the magnetic separator carrying some iron pieces with you, you will be in danger of being attracted to it.

⚠ CAUTION

- **In case of the trial run, be sure to rotate the motor at a low speed and check if the belt zigzags.**
- **If attracted with the magnetic separator, iron pieces are discharged at a high speed with the iron piece discharge belt. It is very dangerous to stay around the machine. Surround the discharging area with safety covers to prevent iron pieces from being scattered.**

2.4 CONNECTING METHOD TO MACHINE BODY

For details, see "4. Hydraulic magnetic separator hydraulic hose connecting method" and "5. Mucking conveyor hydraulic hose connecting method".

2.5 PRECAUTIONS FOR USE

- Use the belt conveyor and magnet in parallel.
- The optimum clearance between the magnet and the belt surface of the belt conveyor is 250 – 300 mm (9.8 – 11.8 in).
- The angle adjustment range is 18° – 12°.

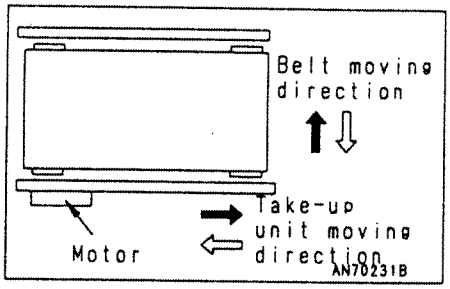
2.6 INSPECTION AND ADJUSTMENT

The discharge belt of the conveyor is structured equally with the one of general belt conveyors. At the times of the check before starting and of daily maintenance, inspect the belt paying attention to the following:

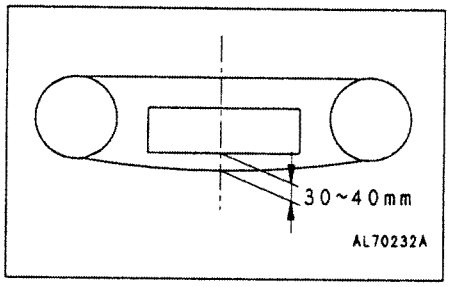
a. Has the belt been biased or does it zigzag?
b. Has the belt surface been scratched or peeled off?
c. Have debris been pinched on the back side of the belt?
d. Hasn't the belt scraper been damaged?
e. Haven't metal parts and bolts at the end connection of the belt been damaged or fallen?
f. Is the belt tension appropriate?

If you find something abnormal during the inspection, take proper corrective actions as follows:

(1) When the belt has been biased or zigzags,
Adjust the position of the takeup unit referring to the figure on the right side. The takeup unit consists of a base plate, a pillow block and a tap bolt. Loosen the lock bolt on the base plate and adjust the position of the takeup unit with the tap bolt. After the adjustment, tighten the lock bolt again. When there is a clearance of more than 10 mm (0.39 in), at the both ends, from the inner surface of the flange at the end of the pulley, the belt is position properly.

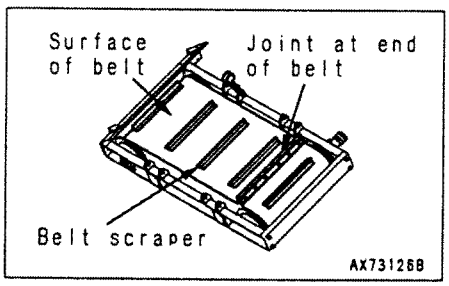


(2) When the belt tension is not appropriate,
Adjust belt tension in the same way as mentioned above. At the time, make the belt as loose as a clearance of 30 to 40 mm (1.18 to 1.57 in) is produced below the lower surface of the magnet of the body.



(3) When foreign materials are pinched on the back side of the belt,
These foreign materials will damage the belt and pulley. So, remove them promptly.

(4) Damage of Belt and other Parts
Replace them or repair them with necessary parts.



2.7 TROUBLES AND CORRECTIVE ACTIONS

Fault	Cause	Corrective measure
Abnormal noise from bearing	Bearing seizure	Replace the bearing
	Loose mounting bolt	Tighten the bolt
Zigzag line of belt	Improper adjustment of pulley	Adjust the pulley position by the take-up bolt
	Interposition of materials in the belt	Remove foreign materials
Belt damage or perforation	Wear, fatigue or inclusion of iron pieces on the attractive pieces on the attractive surface	Remove iron pieces. Replace the belt with a new one depending on the size of hole or the degree of wear.
Scraper		Replace the scraper with a new one.

2.8 MAINTENANCE SCHEDULE CHART

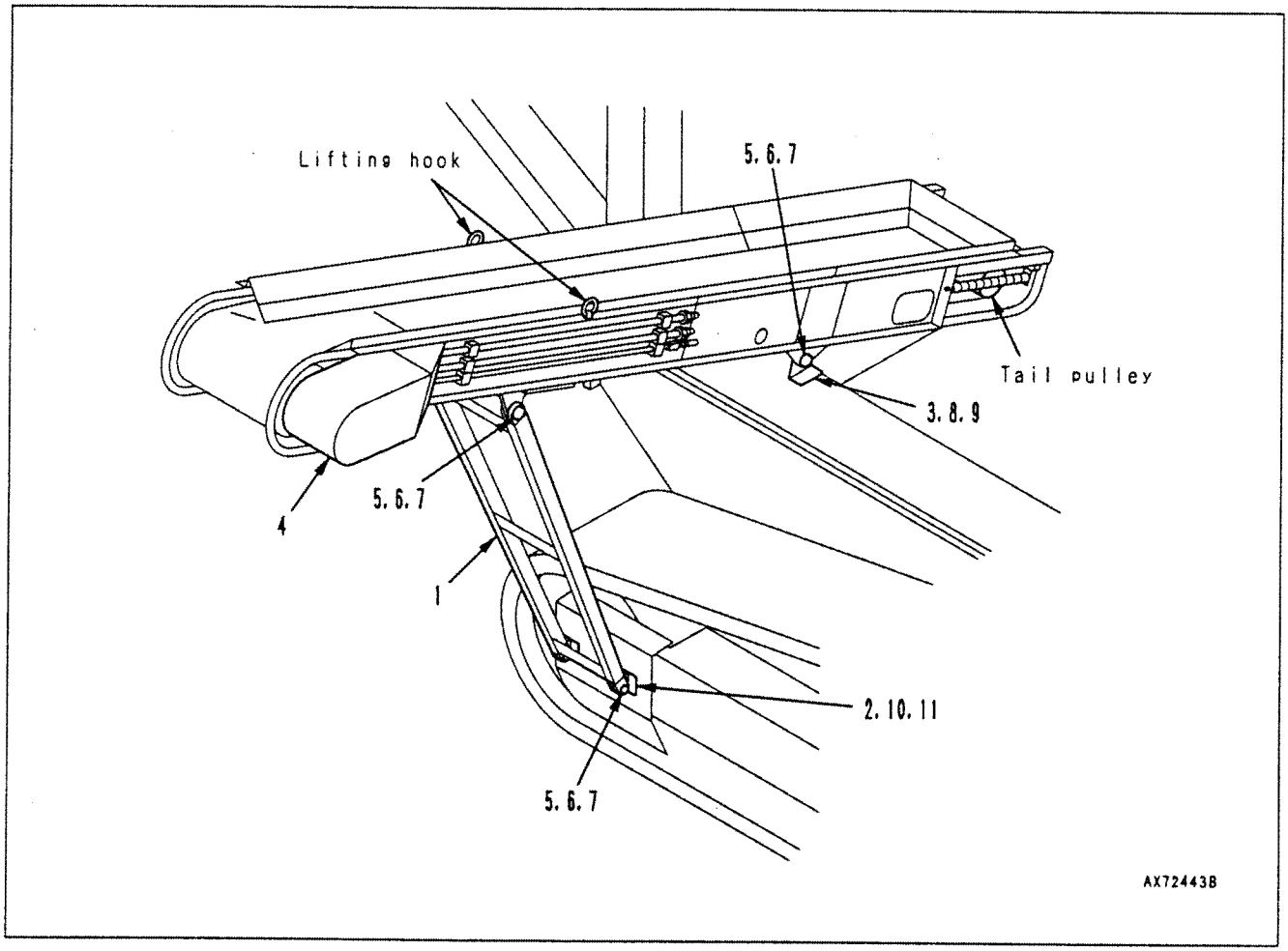
Checkpoint (Magnetic separator)	Daily maintenance	Monthly	Every 3 months	Every 6 months	Yearly
Damage of iron piece discharge belt	○				
Zigzag and slack of belt	○				
Looseness of clamping bolt				○	○
Abnormal sound of bearing	○				

3. DEBRIS DISCHARGE CONVEYOR

3.1 SPECIFICATION

Komatsu item Nos.		8248-75-4003
Belt width x machine length		60 cm x 4.5 m
Maximum angle of inclination	degree	10
Motor speed	rpm	100 ± 5
Belt speed	m/min	80
Weight	kg	622 (1372 lb)

3.2 ASSEMBLY PROCEDURE



3.2.1 ASSEMBLY

1. Install 2 brackets (3) to either the left or right side of the independent part. (The diagram shows the left side)
   (Use (8), (9).)

2. Install 2 brackets (2).
   (Use (10), (11).)

3. Using the lifting hooks, insert debris discharge conveyor (4) under the chassis hopper, then secure at 2 places at the tail pulley with pins as shown in the diagram.
   (Use (5), (6), (7).)

4. Install stay (1) to conveyor (4) with pins.
   (Use (5), (6), (7).)

5. Install stay (1) to bracket (2) with pins.

   * It is also possible to discharge to the right side.

3.2.2 REMOVAL

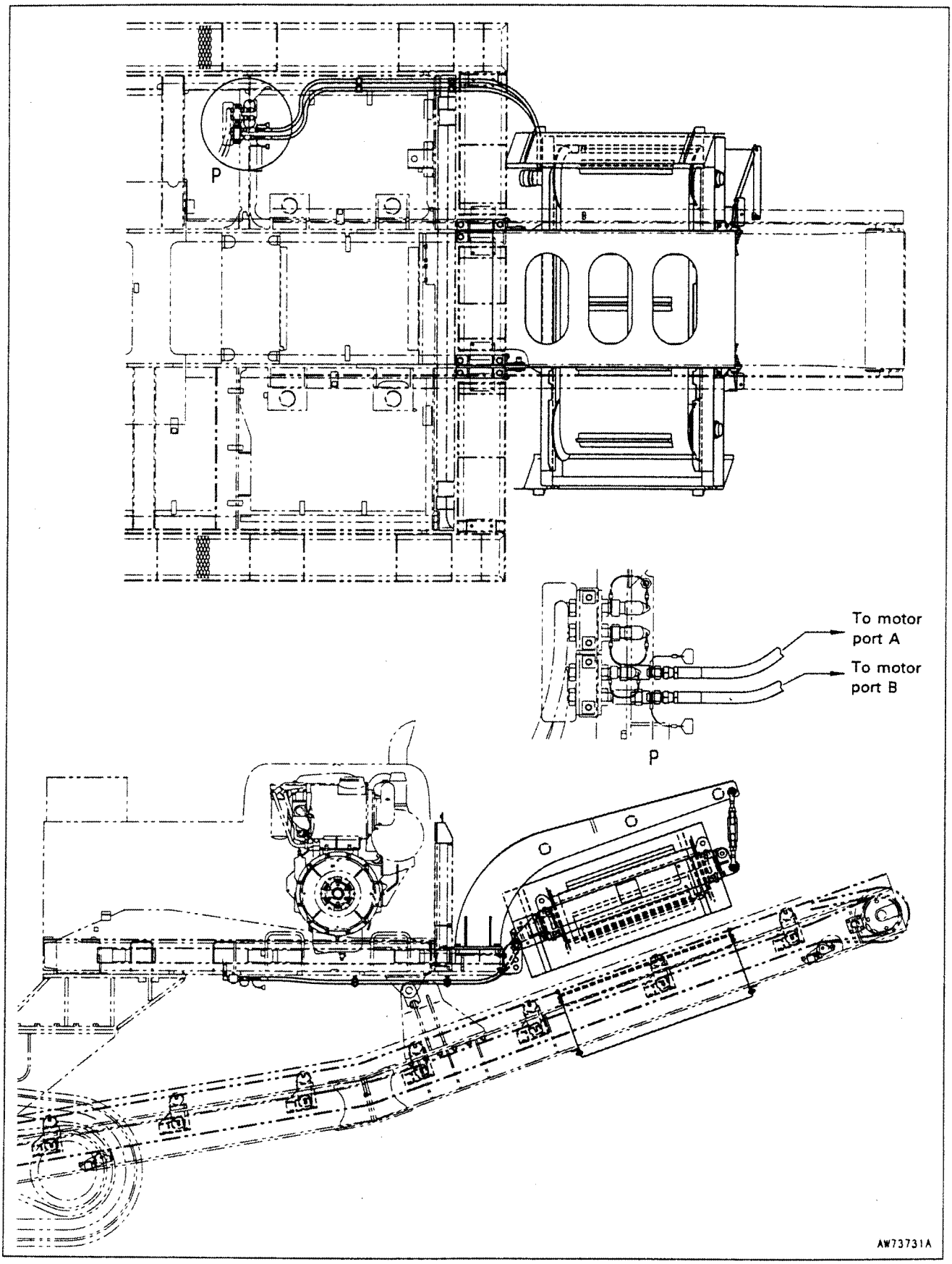
1. Remove in the reverse order to assembly.

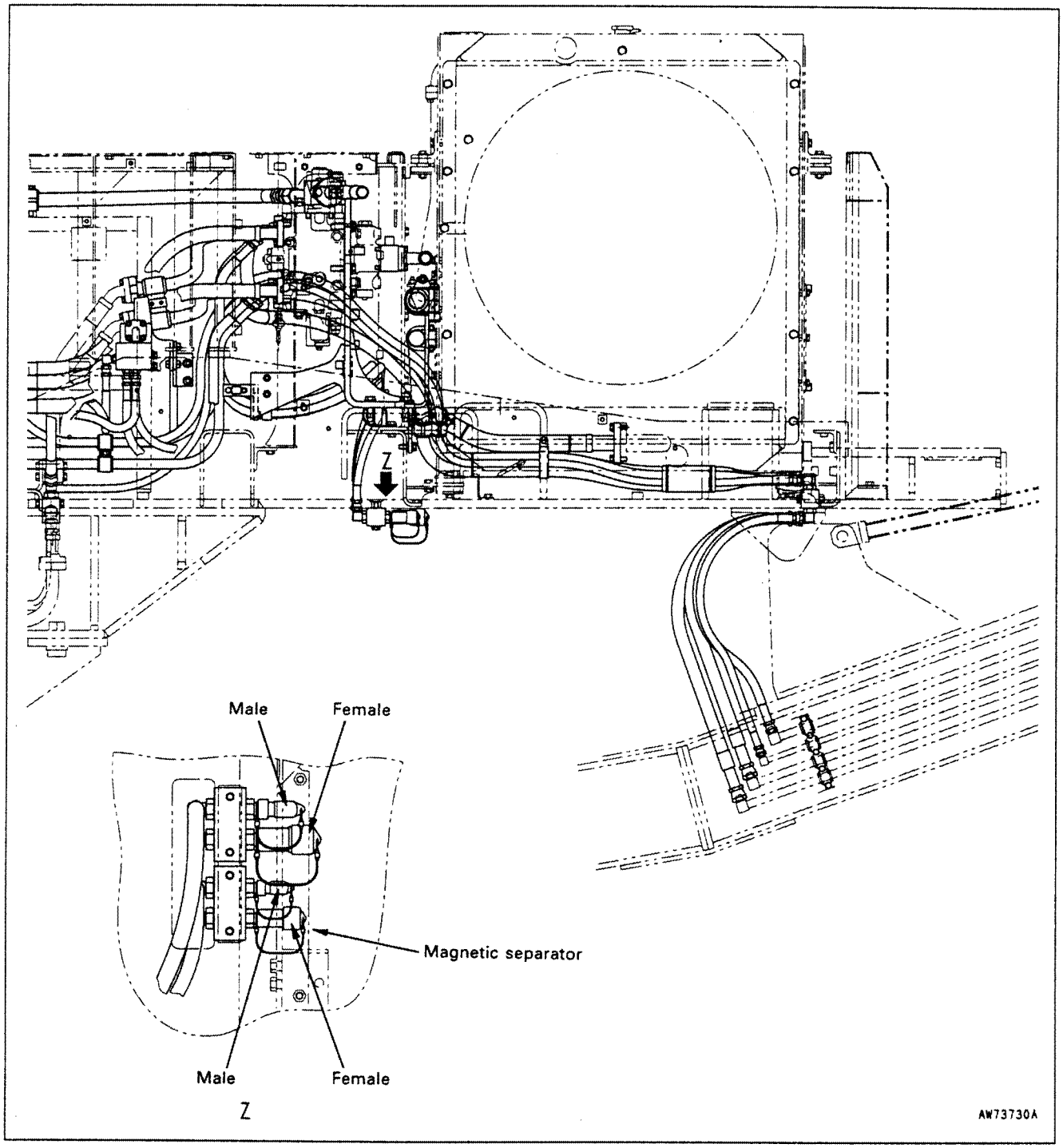
No.	Part No.	Part name	Q'ty
1	8248-70-3530	Stay	1
2	8233-75-1210	Bracket	2
3	8248-70-3340	Bracket	2
4	8248-75-4003	Conveyor	1
5	22X-46-14170	Pin	6
6	01640-23045	Washer	6
7	04050-15040	Cotter pin	6
8	01010-81230	Bolt	4
9	01643-31232	Washer	4
10	01010-81230	Bolt	8
11	01643-31232	Washer	8

Specification of Belt (Maker: Bando Chemical Industries, Ltd.)

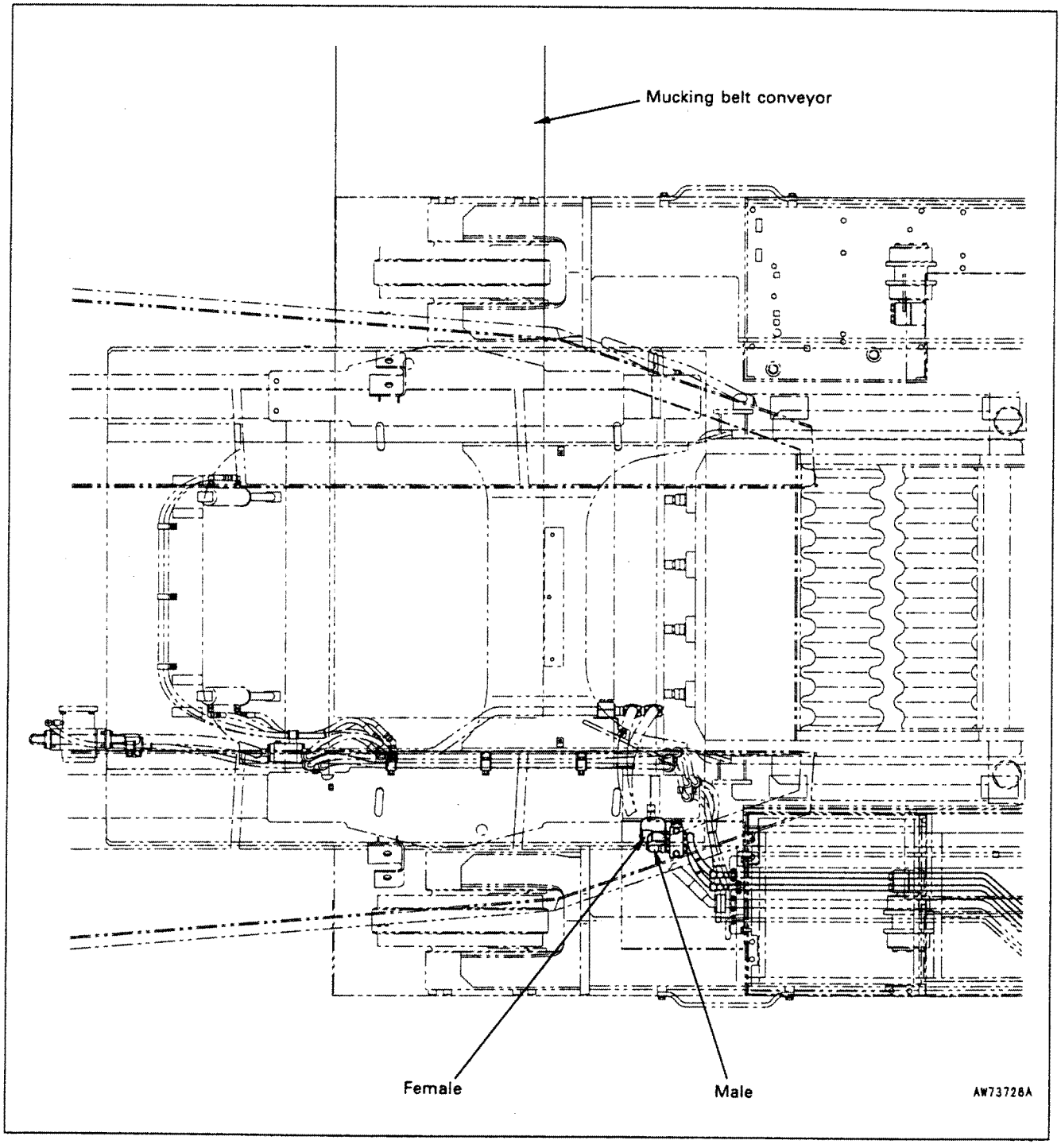
Width	(mm)	600
Endless length	(mm)	9600
Belt strength	(kg/cm width)	250
Ply number		2
Cover rubber thickness (Front x back)	(mm)	5.0 x 1.5
Total thickness (Reference value)	(mm)	8.2

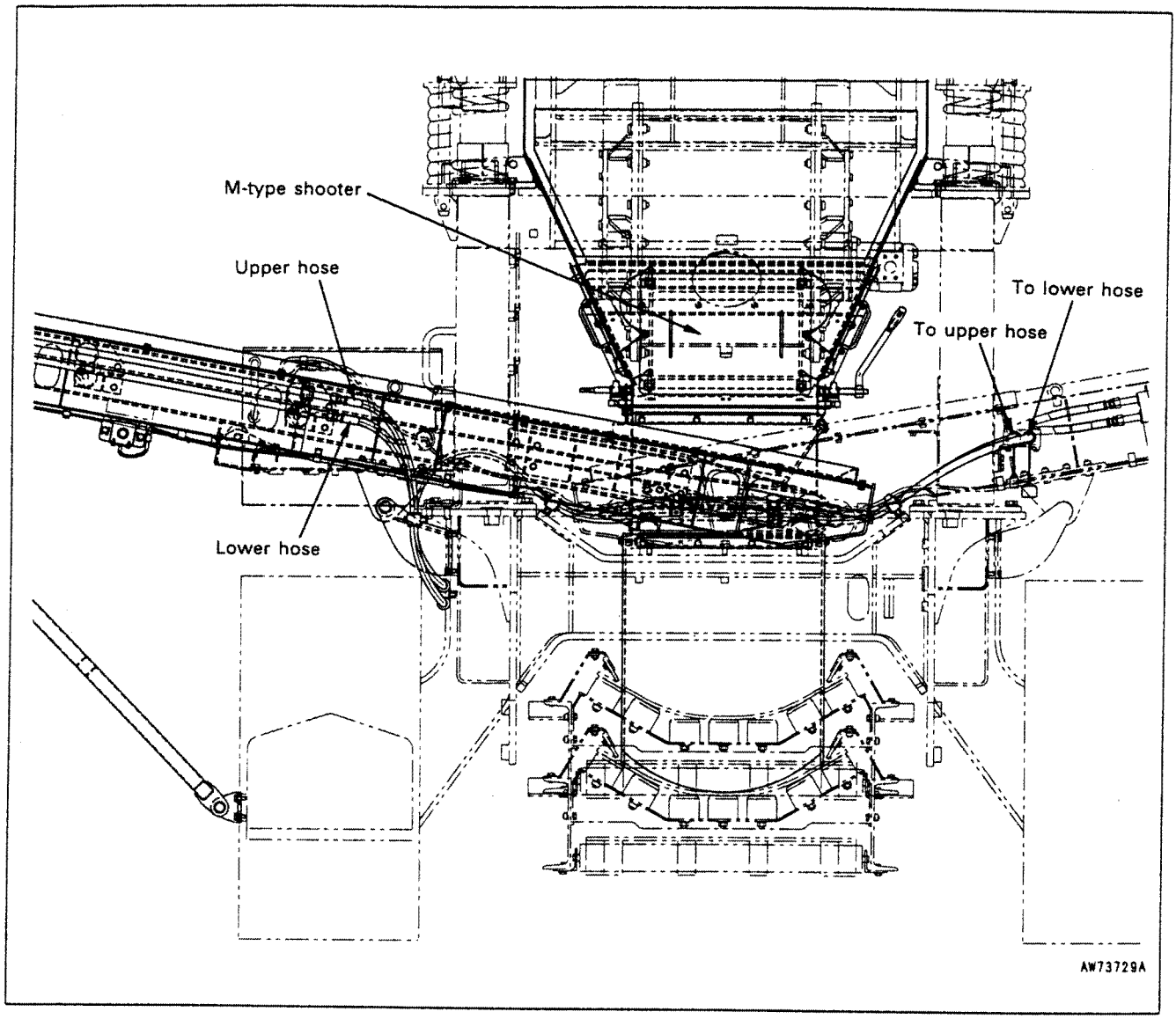
4. HYDRAULIC MAGNETIC SEPARATOR HYDRAULIC HOSE CONNECTING METHOD




Z
Male
Female
Magnetic separator
Male
Female
Z
AW73730A

5. MUCKING CONVEYOR HYDRAULIC HOSE CONNECTING METHOD




M-type shooter
Upper hose
Lower hose
To lower hose
To upper hose
AW73729A

BR500JG-1 MOBILE CRUSHER

Form No. SEAM011303T