

HITACHI

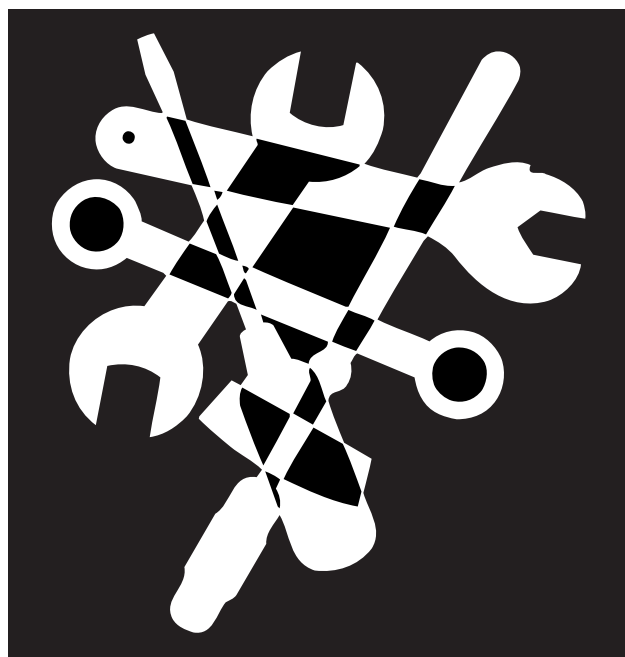
TEMPORARY

**ASSEMBLY
PROCEDURE
MANUAL**

ZAXIS

800

850H



Foreword

Assembly work is the final touch that gives the machine life. The quality of a machine's assembly affects its operative performance and service life of the machine.

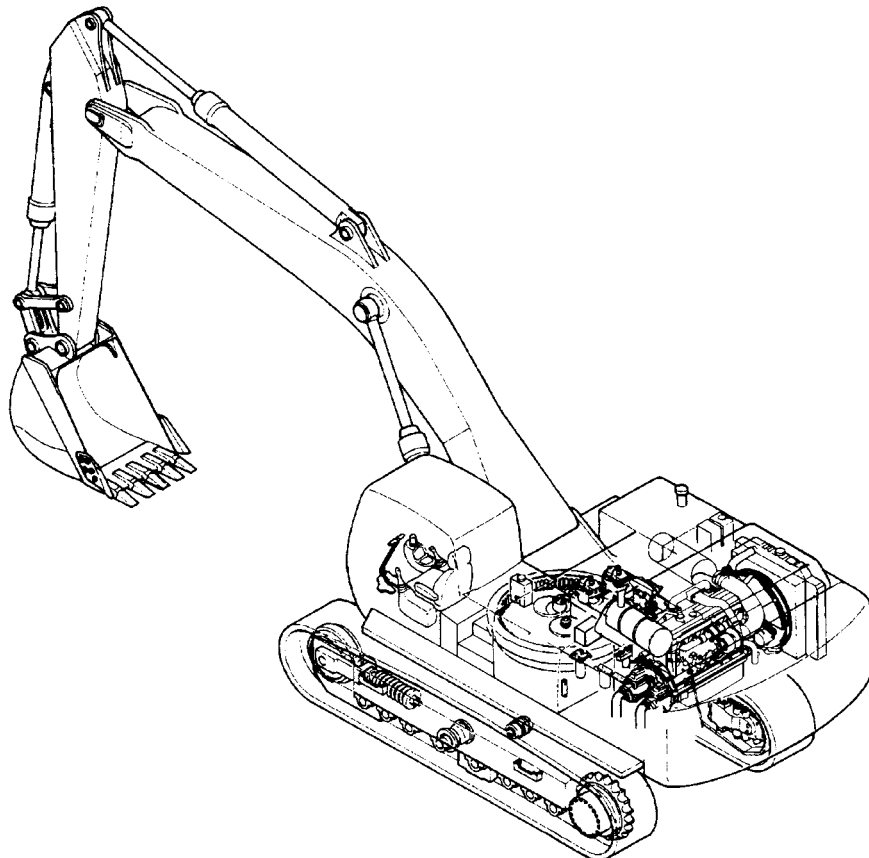
Because a machine's value is determined by its assembly, those who do this work are required to have sufficient know-how about assembly.

This manual basically contains assembly know-how such as methods and useful hints for assembling the ZX800/ZX850H Hydraulic Excavator. Please read this manual carefully and try to keep it for reference before you engage in assembly or while you work.

This manual is a practical compilation of the following three viewpoints: "the improvement of work safety", "the improvement of efficiency" and "the enhancement of product quality."

- 1) Safety: Some hints and information for safe work are provided, such as the weight of the parts, their lifting points when raised with wire ropes and their handling procedures.
Work safety is attained with this manual.
- 2) Quality: Procedures and hints are described for correct machine assembly. They include the part numbers, tightening torque values of bolts, etc. Correct assembly is essential to provide the machine with a longer service life at maximum performance.
- 3) Efficiency: Tool jigs, the facilities necessary to do the work and the preparation needed for each work stage are introduced to assure speedy and effective completion.

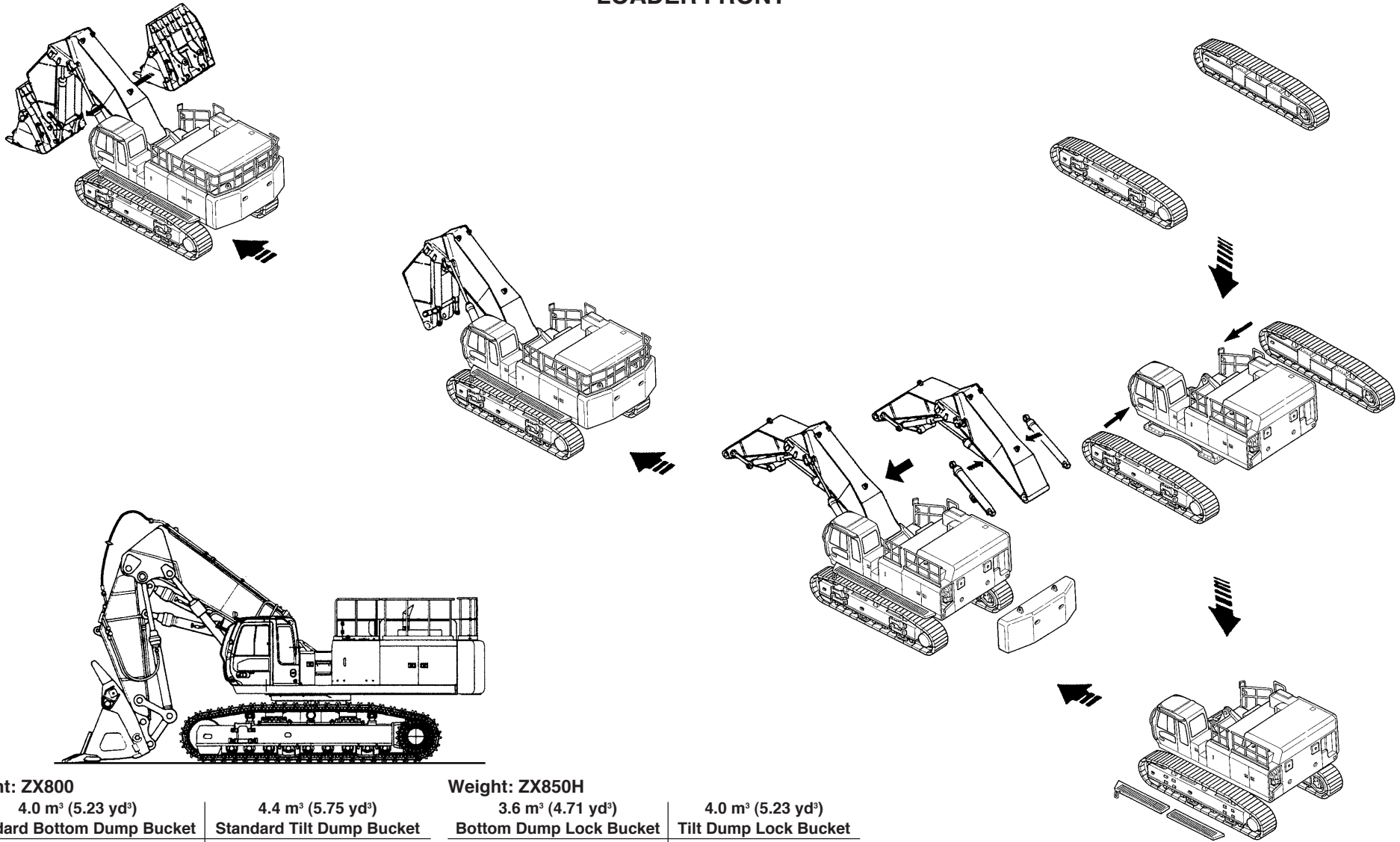
We hope this manual will be helpful to you in assembling the machine without a hitch.



ZX800/ ZX850H Assembly Chart



LOADER FRONT



iv

Weight: ZX800

4.0 m³ (5.23 yd³)

Standard Bottom Dump Bucket

77 700 kg (171 300 lb)

4.4 m³ (5.75 yd³)

Standard Tilt Dump Bucket

76 700 kg (169 100 lb)

Weight: ZX850H

3.6 m³ (4.71 yd³)

Bottom Dump Lock Bucket

78 400 kg (172 800 lb)

4.0 m³ (5.23 yd³)

Tilt Dump Lock Bucket

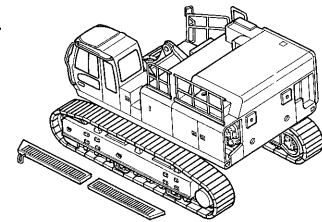
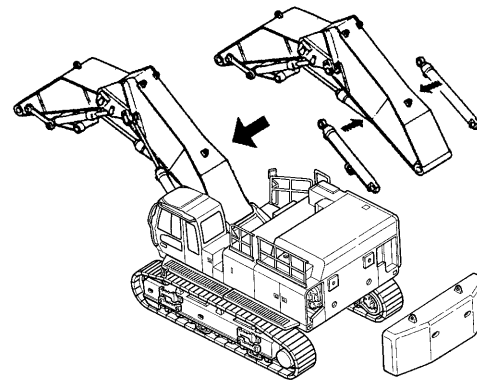
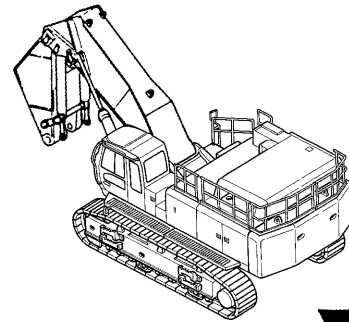
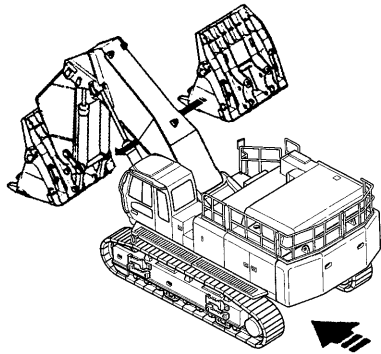
77 300 kg (170 400 lb)



ZX800/ ZX850H Assembly Chart



LOADER FRONT



Weight: ZX800

4.0 m ³ (5.23 yd ³)
Standard Bottom Dump Bucket
77 700 kg (171 300 lb)

4.4 m ³ (5.75 yd ³)
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Weight: ZX850H

3.6 m ³ (4.71 yd ³)
Bottom Dump Lock Bucket
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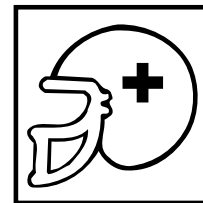
4.0 m ³ (5.23 yd ³)
Tilt Dump Lock Bucket
77 300 kg (170 400 lb)



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1. Precautions



1-1 Safety precautions for servicemen

1 RECOGNIZE SAFETY INFORMATION

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



Fig. 1-1

2 UNDERSTAND SIGNAL WORDS

Machine safety signs incorporate signal words - DANGER, WARNING and CAUTION - to designate the degree or level of hazard.

DANGER indicates an imminently hazardous situation which, if not avoided, will potentially result in death or serious injury.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

DANGER and WARNING safety signs are located near specific hazards.

General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety items in this manual.

To avoid confusing machine protection with personal safety messages, IMPORTANT is used to indicate a situation which, if not avoided, could result in damage to the machine.



Fig. 1-2

3 FOLLOW SAFETY INSTRUCTIONS

Carefully read and follow all safety signs on the machine and all safety messages in this manual.

Safety signs should be installed, maintained, and replaced when necessary.

If a safety sign or this manual is damaged or missing, order a replacement from your Hitachi dealer in the same way as you order other replacement parts (be sure to state the machine model and serial number when ordering.)

Learn how to operate the machine and its controls correctly and safely.

Allow only trained, qualified, authorized personnel to operate the machine.

Keep your machine in proper working condition.

Unauthorized modifications to the machine may impair its functions and/or safety, and affect machine life.

The safety messages in this chapter are intended to illustrate basic safety procedures for hydraulic excavators. However it is impossible for these safety messages to cover every hazardous situation you may encounter. If you have any questions, you should first consult your supervisor before operating or performing maintenance work on the machine.



Fig. 1-3

4 DESIGNATE ONE LEADER AND TWO SUBLEADERS

In order to work with the greatest safety and ease, designate a foreman and two subleaders as working partners. When assembling the superstructure, station the subleaders at the front and rear of the machine. They should carry out and follow the leader's signals with utmost care to avoid breakage of components and personal injury.



Fig. 1-4

5 CLEAN THE MACHINE REGULARLY

Remove any grease, oil or dirt build-up to avoid possible injury or machine damage.

Do not spray water or steam inside the cab.

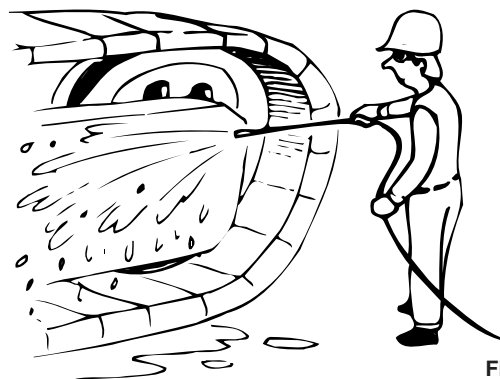


Fig. 1-5

6 WEAR PROTECTIVE CLOTHING

Avoid wearing loose clothing, jewelry, or other items that can catch on control levers or other parts of the machine.

Wear close fitting clothing and safety equipment appropriate to the job.

You may need:

- A hard hat
- Safety shoes
- Safety glasses, goggles, or a face shield
- Heavy gloves
- Hearing protection
- Reflective clothing
- Wet weather gear
- Respirator or filter mask.

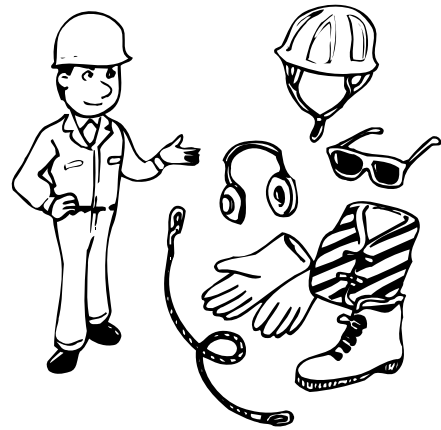


Fig. 1-6

7 PREPARE FOR EMERGENCIES

Be prepared for the eventuality of a fire.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, a hospital, and the fire department near your telephone.



Fig. 1-7

8 PREPARE SUITABLE LIFTING TOOLS

Work with this machine involves lifting heavy and bulky items with a crane. Pay attention to the following points:

- Prepare suitable lifting tools.
- To prevent unnecessary mishaps due to broken wire cables, do not use damaged chains or frayed cables, slings, or ropes. Be sure to use a proper protector and patch.
- Before proceeding with the work, agree on specific signals with the crane operator and the designated leader/subleader team.
- Always keep the area directly below any load clear of people during slinging work.
- Service personnel and mechanics must check the weights given in this manual, and apply the proper lifting procedures when removing any components.
- When using hydraulic excavators for lifting operations, be sure to comply with all local regulations.

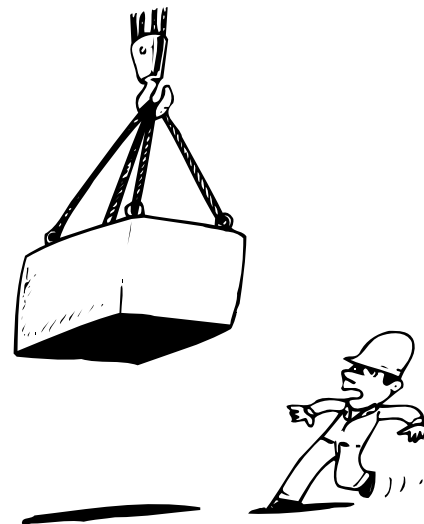


Fig. 1-8

9 ENGINE SAFETY

- a) No one should be allowed inside the hydraulic excavator while it is being operated or during assembly.
- b) Keep hands away from moving parts.
- c) Sound the horn as an alert to those nearby before starting up the engine.
- d) Start the engine from the operator's seat and never while standing on the ground.
- e) To avoid injury or possible machine damage, never start the engine by shorting across the starter terminals.

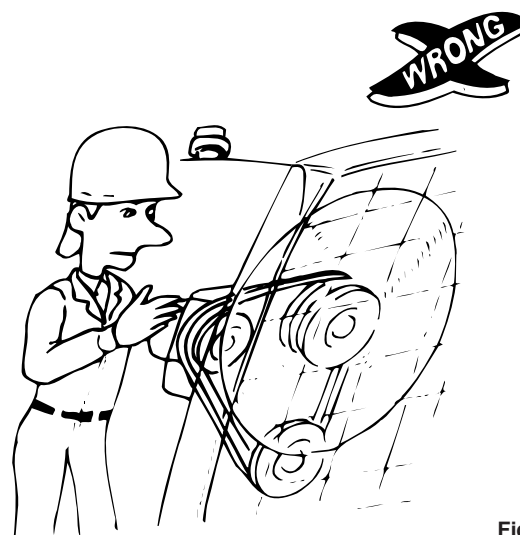


Fig. 1-9

10 SUPPORT RAISED EQUIPMENT

Never work under or near a raised bucket. Lower the bucket to the ground or onto secure blocks.

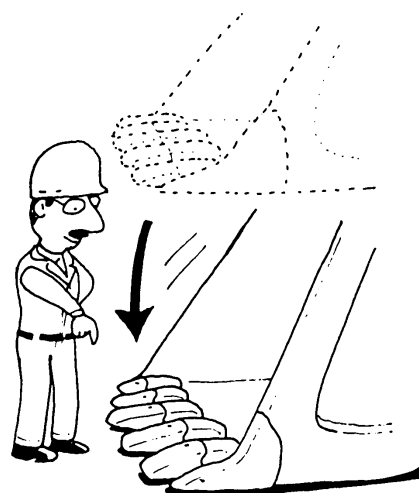


Fig. 1-10

11 SAFETY AT HEIGHT

Take adequate measures to avoid falling from high spots during work. Clean any mud or debris from the steps, walkways, or work platforms before work, and use a safety belt during work.

Falling is one of the major causes of personal injury.

When you get on and off the machine, always face the machine and maintain a three-point contact with the steps and handrails. Do not use any controls as handholds.

Before getting off, be sure to align the cab parallel with the tracks.

Never jump on or off the machine. Never mount or dismount a moving machine.

Be careful of slippery conditions on platforms, steps, and handrails when getting off the machine.

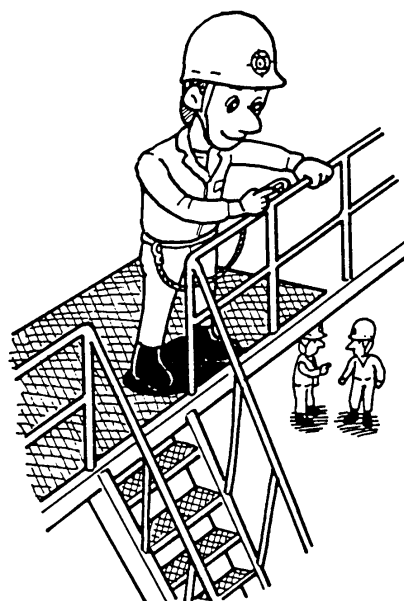


Fig. 1-11

12**FUEL SAFETY AND FLAMMABLE MATERIALS**

- a) Never smoke while refueling or handling flammable materials.
- b) Shut the engine off while refueling.
- c) Exercise caution when refueling while the engine is still hot.
- d) Do not clean parts using opened cans of gasoline or diesel fuel. Use good, commercial, non-flammable solvents.

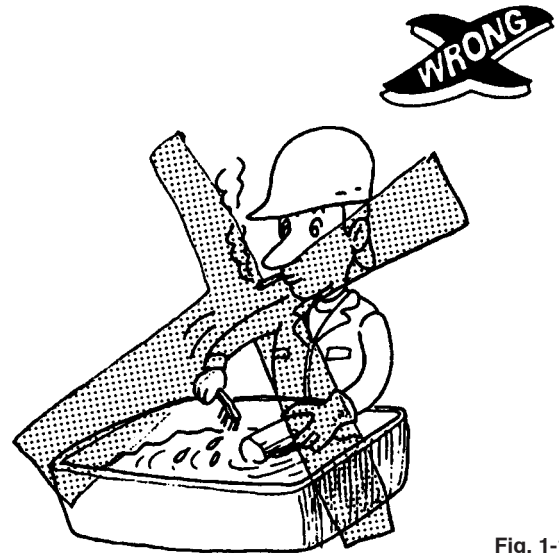


Fig. 1-12

13**PREVENT BATTERY EXPLOSIONS**

Keep sparks, lighted matches, and flame away from the top of the battery. Battery gas can explode.

Never check the battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Do not charge a frozen battery - it may explode. Warm the battery to 16°C (60.8°F).

Disconnect the negative ground cable before working on the electrical system or making major repairs.



Fig. 1-13-1

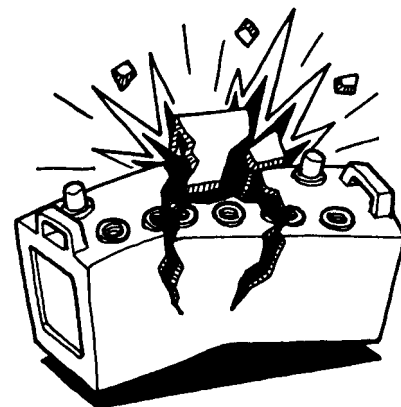


Fig. 1-13-2

14**AVOID HIGH-PRESSURE FLUIDS**

- Fluids such as diesel fuel or hydraulic oil under pressure, can penetrate the skin or eyes causing serious injury, blindness or death.
- Avoid this hazard by relieving pressure before disconnecting hydraulic or other lines. Relieve the pressure by moving the control levers several times. Tighten all connections before pressurizing the hydraulic system.
- Search for leaks with a piece of cardboard, taking care to protect your hands and body from high-pressure fluids. Wear a face shield or safety goggles for eye protection.
- If an accident occurs, see a doctor familiar with this type of injury immediately. Any fluid injected into the skin must be surgically removed within a few hours, or gangrene may result.

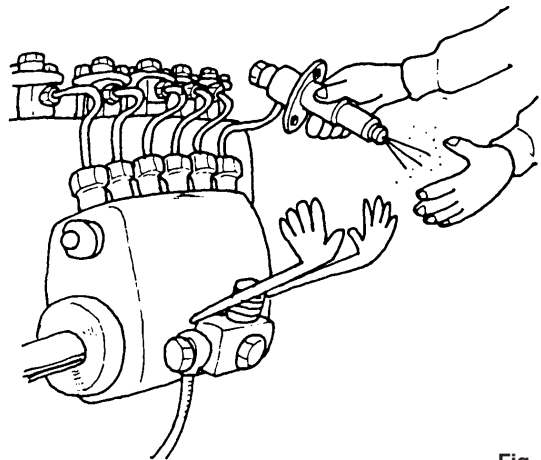
WRONG

Fig. 1-14-1

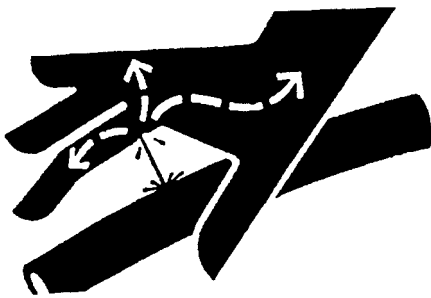


Fig. 1-14-2



Fig. 1-14-3

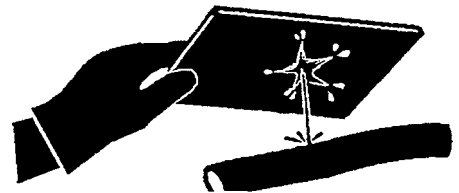


Fig. 1-14-4

15**CHECK EQUIPMENT SAFETY**

- Use a piece of cardboard or paper to safely check for leaks in all systems, including the following:
 - Hydraulic system
 - Fuel system
- Use the correct testing gauge type when checking the hydraulic pressure.
- Check all protective parts on the machine (shields, guards, pins, etc.). They should be in good condition and securely fastened.
- Inspect electrical wiring for worn or frayed insulation, and install new wiring if damage has occurred.

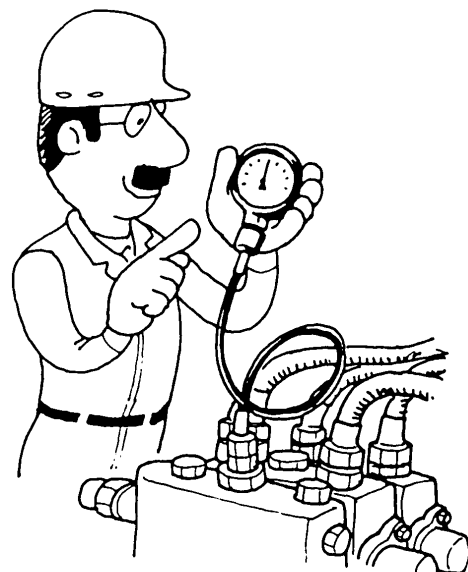


Fig. 1-15

16

PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



Fig. 1-16

17

FASTEN YOUR SEAT BELT

Prior to operating the machine, thoroughly examine the belt, buckle and attaching hardware. If any item is damaged or worn, replace the seat belt or component in question before operating the machine.

Be sure to remain seated with seat belt securely fastened at all times when the machine is in operation.

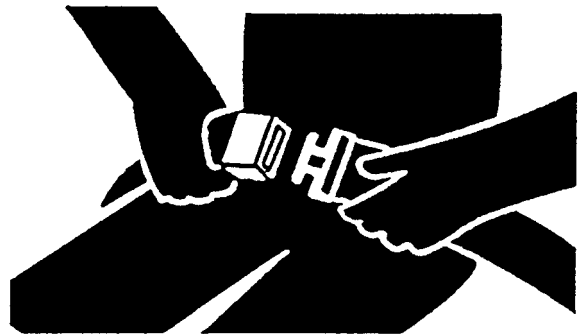


Fig. 1-17

18

BEWARE OF EXHAUST FUMES

Prevent asphyxiation. Engine exhaust fumes can cause sickness or death.

If you must operate in a building, be sure there is adequate ventilation. Either use an exhaust pipe extension to remove the exhaust fumes, or open doors and windows to bring enough fresh air into the area.

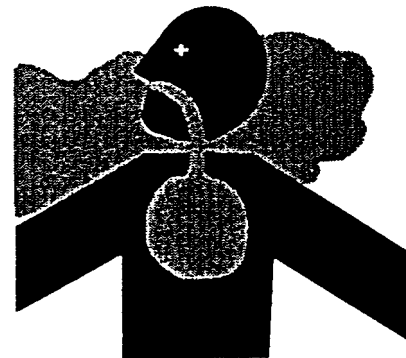


Fig. 1-18

19**PRACTICE SAFE MAINTENANCE**

Understand service procedures before performing any work. Keep the work area clean and dry.

Never lubricate or service the machine while it is moving.

Keep hands, feet and clothing away from power-driven parts.

Before servicing the machine.

- Park the machine on a level surface.
- Lower the bucket to the ground.
- Turn the auto-idle switch off.
- Run the engine at slow idle speed without load for 3 minutes.
- Turn the ignition OFF to stop the engines.
- Relieve the pressure in the hydraulic system by moving the control levers several times.
- Remove the key from the ignition.
- Attach a "Do Not Operate" tag to the travel speed select/pilot control shut-off lever
- Set the travel speed select/pilot control shut-off lever to the P position.
- Allow the engine to cool.

If a maintenance procedure must be performed with the engine running, do not leave the machine unattended.

If the machine must be raised, maintain a 90 to 110° angle between the boom and arm. Securely support any machine elements that must be raised for service work. Never work under a machine raised by the boom.

Inspect certain parts periodically, and repair or replace as necessary. Refer to the relevant section of the Operation Manual.

Keep all parts in good condition and properly installed. Fix any damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil or debris.

Disconnect the battery ground cable (-) before making adjustments to the electrical system or performing welding work on the machine.



Fig. 1-19-1

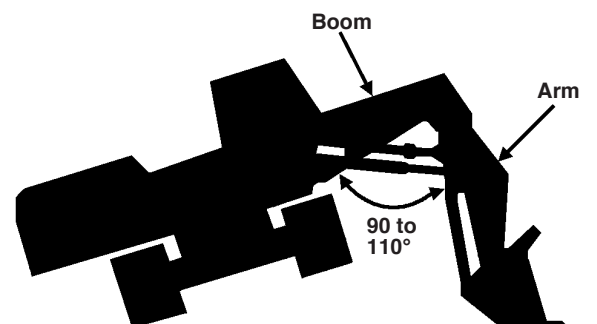


Fig. 1-19-2

20 **WARN OTHERS OF SERVICE WORK**

Unexpected machine movement can cause serious injury.

Before performing any work on the machine, attach a "DO NOT OPERATE" tag to the travel speed select/pilot control shut-off lever. This tag is available from your authorized dealer.

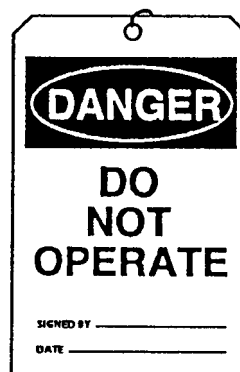


Fig. 1-20

21 **AVOID HARMFUL ASBESTOS DUST**

Avoid breathing in dust generated from the handling of components containing asbestos fiber. Inhaled asbestos fiber may cause lung cancer.

Components that potentially contain asbestos fiber are certain types of gaskets. The asbestos used in these components is usually found in a resin or sealed in some way. Normal handling is not hazardous as long as airborne dust containing asbestos is not generated.

Avoid creating dust. Never use compressed air for cleaning. Avoid brushing or grinding asbestos-containing materials. When servicing, wear an approved respirator. A special vacuum cleaner is recommended to clean away asbestos. If not available, wet the asbestos-containing materials with a mist of oil or water.

Be sure to comply with all applicable rules and regulations for the work place. Follow all local environmental rules and regulations for the disposal of asbestos.

Keep bystanders away from areas where asbestos particles may be in the air.

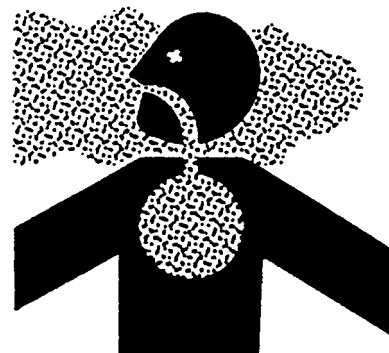


Fig. 1-21

22 **PROTECT AGAINST FLYING DEBRIS**

Guard against injury from flying pieces of metal or debris - wear goggles or safety glasses.

In order to avoid personal injury, keep bystanders away from the working area when striking any object.

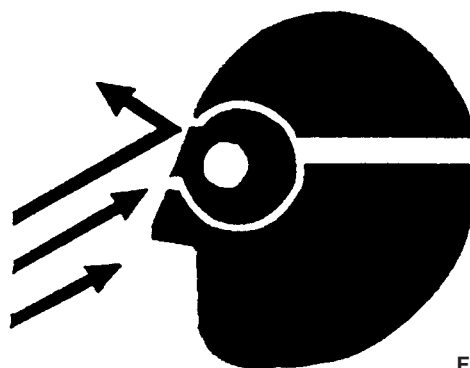


Fig. 1-22

23 PREVENT AGAINST FLYING PARTS

Grease in the track adjuster is under high pressure.

Do not attempt to remove a GREASE FITTING or VALVE ASSEMBLY.

Be sure to keep your body and face away from any valve, as pieces may fly off.

The travel reduction gears are under pressure.

So as to avoid injury from flying parts, be sure to keep your body and face away from the AIR RELEASE PLUG.

GEAR OIL is hot. Wait for the GEAR OIL to cool, then gradually loosen the AIR RELEASE PLUG to release pressure.

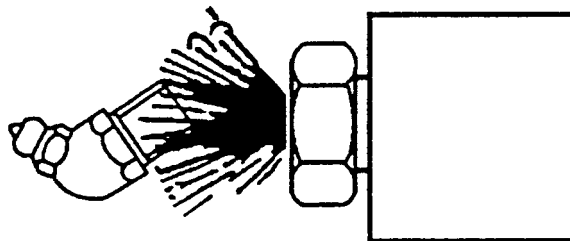


Fig. 1-23

24 PREVENT BURNS

Hot spraying fluids:

- After operation, the engine coolant is hot and under pressure. Also, hot water or steam is contained in the engine, radiator and heater lines.

Prevent possible injury from hot spraying water.

DO NOT remove the radiator cap until the engine is cool. When opening, turn the cap slowly to the stop position.

Allow all pressure to release before removing the cap.

- The hydraulic oil tank is pressurized. Again, be sure to release all pressure before removing the cap.

Hot fluids and surfaces:

- Skin contact with escaping hot water or steam can cause severe burns.

Be sure to stop the engine, and let the engine and radiator cool. Once the system has cooled, slowly loosen the radiator cap to release pressure, then remove it.

- Engine oil, gear oil and hydraulic oil also become hot during operation.

The engine, hoses, lines and other parts also become hot.

Wait for the oil and components to cool before starting any maintenance or inspection work.

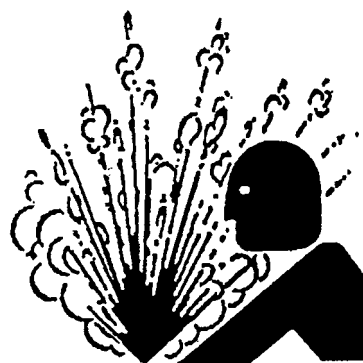


Fig. 1-24-1



Hot Surface

Fig. 1-24-2

25 STORE ATTACHMENTS SAFELY

Stored attachments such as buckets, hydraulic hammers, and blades can fall and cause serious injury or death.

Securely store attachments and implements to prevent them falling. Keep playing children and bystanders away from the storage area.



Fig. 1-25

26**DISPOSE OF WASTE PROPERLY**

Improper waste disposal can threaten the environment and ecology. Potentially harmful waste used with HITACHI equipment includes such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Allowing air conditioning refrigerants to escape into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire as to the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your HITACHI dealer.

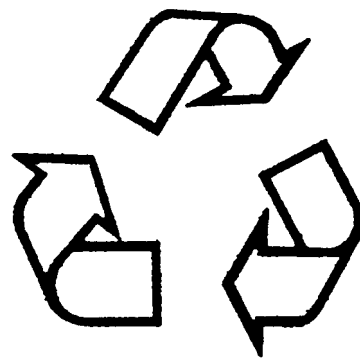


Fig. 1-26

27**SERVICE THE AIR CONDITIONING SYSTEM SAFELY**

Refer to the outside of the freon container for proper handling procedures when servicing the air conditioning system.

Use a recovery and recycling system to avoid venting freon into the atmosphere.

Never let the freon stream make contact with your skin. Severe frost burns will result.

28**HANDLE CHEMICAL PRODUCTS SAFELY**

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with your machine include such items as lubricants, coolants, paint, and adhesives.

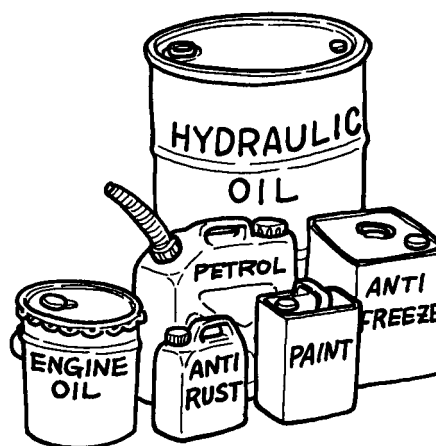


Fig. 1-27

HANDLE POWER WRENCHES CORRECTLY

Misuse of power wrenches (part nos. 4093800 and 4229414) may lead to their breakage or personal injury. Please use power wrenches correctly and in accordance with this manual.

- 1 For your safety, do not enter into the turning circle of the wrench. After tightening is complete, a torque acting in the opposite direction will be applied to the wrench. Therefore, do not suddenly let go of the handle, but let it gently rotate back in the opposite direction until the torque is zero.

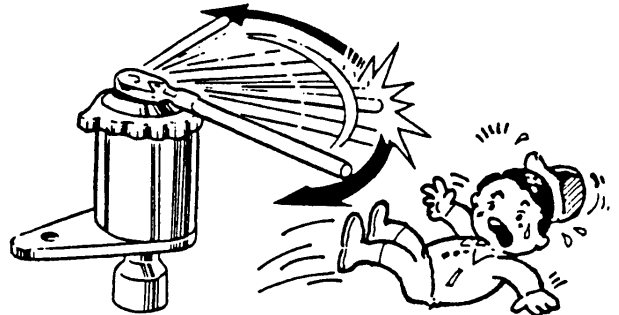


Fig. 1-28

- 2 Excessive input torque may cause the output end or reaction lever to break, causing the wrench to fall from the machine. The wrench may also fall if it slips off the reaction member. Secure the wrench so that it cannot drop, especially when working on vertical surfaces.



Fig. 1-29



Fig. 1-30

- 3 It is sometimes difficult to remove the power wrench from a nut or bolt after tightening. This is generally due to elastic deformation (elastic force) between the wrench and bolt. Try changing the clutch direction to L to make the wrench easier to remove. Release the torque on the ratchet handle gradually, since a force will be acting in the opposite direction after changing over the clutch. If it is not possible to change the clutch by hand, do not attempt to use force (a hammer, etc.).

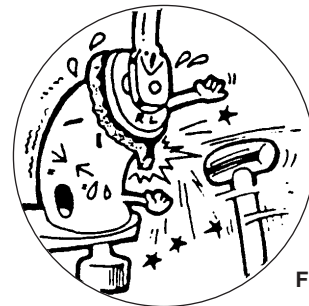


Fig. 1-31

- Try turning the wrench handle slightly in the L direction to make the clutch easier to change over.

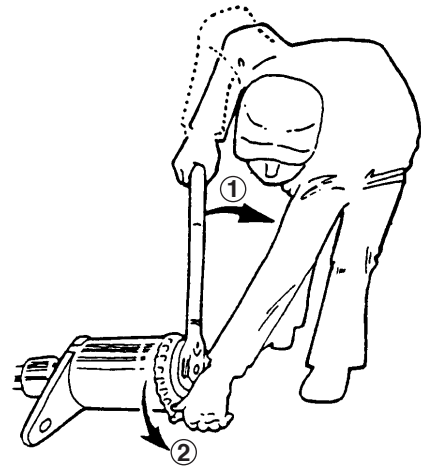


Fig. 1-32

30 COMMUNICATION

- 1 When slinging work is performed on heavy loads, a predetermined hand signalling method should be used for trouble-free communication.
- 2 In order to facilitate remote teamwork during assembly, workers should wear headsets for reliable communication.

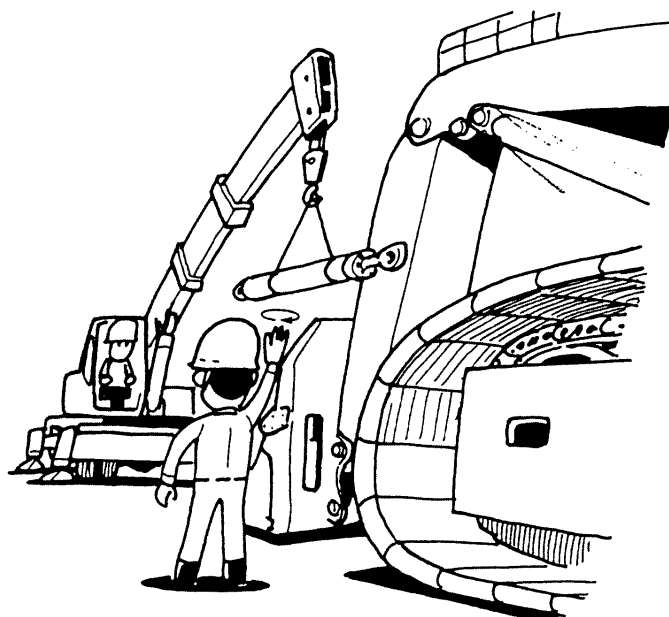


Fig. 1-33

31 COMPONENT NAMES

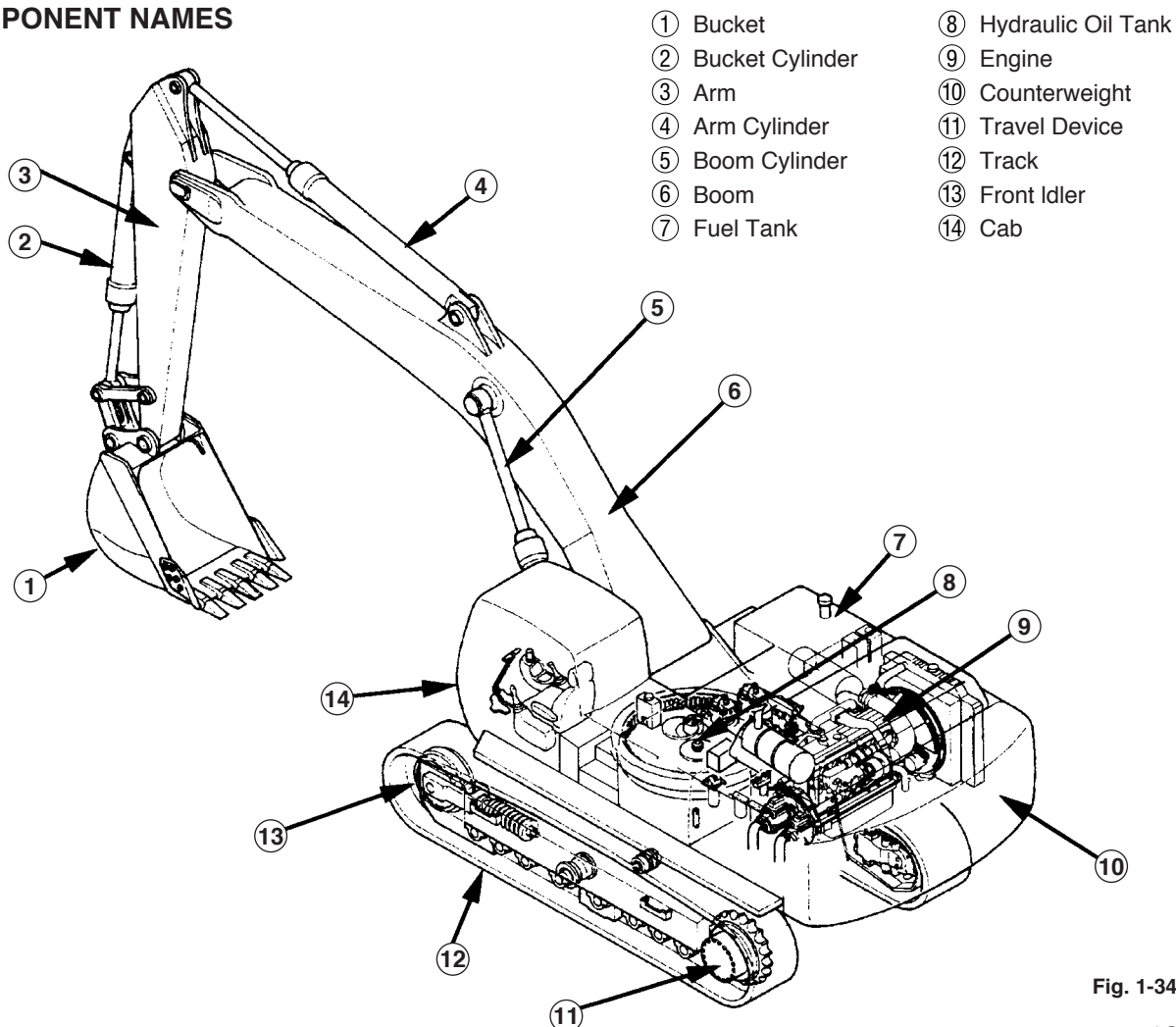


Fig. 1-34