

# What You Should Know When Working in Automobile Maintenance Industry in Japan



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JICA Chubu



独立行政法人 国際協力機構  
Japan International Cooperation Agency

English Edition

# Preface

## **To All Technical Intern Trainees Learning Automobile Maintenance**

Welcome to Japan!

This document contains important information for carrying out automobile maintenance such as knowledge on health and safety necessary to protect both yourself and colleagues from danger. In this document, you will also find information you should understand when working together with Japanese workers.

The information in this document is very important, and this document is intended for workers to understand the contents as quickly as possible. Please make full use of this document.

The contents of this document may seem full of surprises for anyone encountering with new culture in a new country for the first time, though you will realize each time you learn something new, you open up a new world.

We sincerely hope that the activities you take part in while in Japan will help provide you with the technical skills and knowledge that will allow you to contribute to the development of your country when you return home.

## **To All Japanese Automobile Maintenance Companies Receiving Foreign Personnel Such as Technical Intern Trainees**

Japan International Cooperation Agency (JICA) is a governmental organization that implements international cooperation in developing countries, and provides support with the vehicle inspection/maintenance program, and with the training of automobile mechanics in developing countries.

One of the reasons for creating this material was to provide foreign personnel such as Technical Intern Trainees learning the technical skills required for automobile maintenance with the knowledge required to carry out automobile maintenance in Japanese companies. This English material is intended to cater to the needs of interns' initial few months in Japan when their Japanese language ability is still limited, helping them study on their own in the language they understand.

This may also be used as teaching material for foreign personnel studying Japanese, but differs from "plain Japanese", but rather, is intended to help Japanese companies receiving foreign personnel understand what they are studying in the English edition, as well as to help Japanese understand what considerations are necessary when receiving foreign personnel.

Furthermore, a separate bilingual edition of Chapter 4 on health and safety containing both English and Japanese (with furigana) has been created to allow both Japanese and foreign personnel to discuss the contents.

We hope this document will be widely utilized as a supplementary teaching aid for foreign personnel learning the technical skills required for automobile maintenance, as reference material to help Japanese receiving foreign personnel to better understand their interns, or as a useful tool alongside the English edition for mutual understanding.

Director General, Chubu Center, JICA

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# 1. Automobile Maintenance Work You Should be Proud of

## (1) What is automobile maintenance work?

You are engaged in automobile maintenance work.

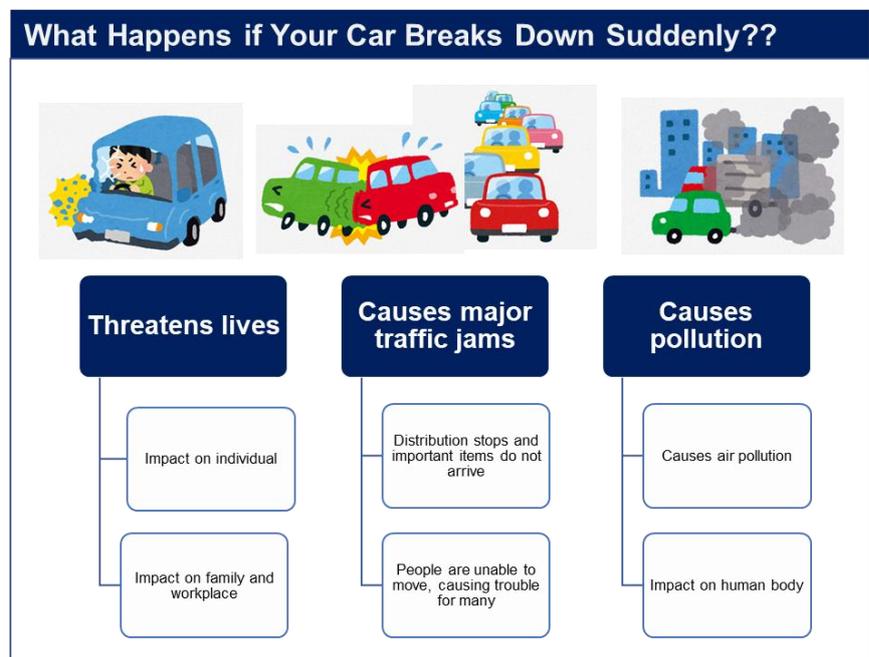
Automobile maintenance work carries great significance for society.

What would happen if we failed to carry out automobile maintenance properly?

Serious problems would occur such as accidents and major traffic jams. People's lives would be at risk, and air pollution would become worse<sup>1</sup>.

So why do we carry out inspections and maintenance for vehicles that are not even broken down?

The parts used in vehicles are consumable parts. For example, they contain parts such as bearings, belts, and tires that wear down and become damaged with use. Furthermore, there are also components such as batteries and oil which degrade even when vehicles are not used. There are also parts such as tires, the clutch, and brake parts that wear down and become damaged depending on how vehicles are used.



Automobiles are driven on public roads. Breakdowns will therefore result in significant inconvenience to others. We should therefore carry out maintenance work not only to restore vehicle functionality, but to make sure they do not break down during use. In this sense, it is necessary for us to consider this work as preventative maintenance.<sup>2</sup>

An automobile is a precision machine consisting of several thousands to more than several tens of thousands of parts depending on the models. As technology advances year by year, new devices and mechanisms are being employed in vehicles. Automobile maintenance demands extensive automotive knowledge and a high level of maintenance technical skills. We need to thoroughly understand basic vehicle structure and functionality to judge a situation properly.

<sup>1</sup> Summary of P.50 of "Technical Intern Training Guidelines for Automobile Maintenance", Technical Intern Training Program for Foreigners Automobile Maintenance Business Council (March 2018) <https://www.mlit.go.jp/common/001247297.pdf> (last access: February 15, 2021)

<sup>2</sup> Source: From P.1 of "Basic Automobile Maintenance Work", a textbook for Car Mechanic Training Course under the supervision of Road Bureau, Ministry of Land, Infrastructure and Transport

Furthermore, automobile maintenance workers should have the ability to carry out actual work such as vehicle disassembly and assembly, inspection, adjustments, and fault investigations quickly and reliably. Accumulating learning and experience is vital to this. Moreover, maintenance work does not only mean maintaining vehicles. Maintenance workers must also explain the cause of breakdowns and failures to users in a way that is easy to understand, as well as offer advice on how to use new devices or equipment. In the broad sense, it can therefore be said that the power to persuade people is an extremely important maintenance skill<sup>3</sup>.

You will all be required to carry out such important work.

## **(2) Japanese vehicle inspection/maintenance program necessary to protect lives**

Many of those coming to Japan from developing countries are surprised at the well-disciplined driving by most drivers on Japan's roads.

They wonder why in Japan they rarely see old broken down cars still on the road, or see cars breaking down suddenly and blocking the roads.

One reason for this is Japan's vehicle inspection/maintenance program (Motor-vehicle inspection (Japan)). This program is required by law in Japan under the "Road Transport Vehicle Act", and involves periodic vehicle inspection and registration to ensure the safety of vehicles.

This act has a long history stretching back over 70 years.



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<sup>3</sup> Source: From P.1 of "Basic Automobile Maintenance Work", a textbook for Car Mechanic Training Course under the supervision of Road Bureau, Ministry of Land, Infrastructure and Transport

Initially, mainly only vehicles used for public transport or haulage such as buses and trucks were required to undergo inspection and registration. As the number of standard size cars increased with the growing economy, the program was expanded to cover all cars, even light vehicles. Furthermore, as the number of traffic accidents increased, vehicles were obliged to be covered by mandatory

Year	History of legislation relating to automobile maintenance
1951	The "Road Transport Vehicle Act" was established. Registration, inspection, maintenance and testing systems were made mandatory.
1956	Due to the increase in traffic accidents, drivers were obliged to take out mandatory vehicle liability insurance to help victims.
1962	The Local Land Transport Office was unable to keep up with inspections due to the rapid increase in the number of vehicles owned, and therefore a new "private car inspection" program (designated automobile maintenance businesses program) was established.
1973	Inspection and registration became mandatory for all vehicles, even light vehicles.
2020	With the popularization of cars employing advanced technologies such as automatic braking technology to prevent collision accidents, a "Specified Improvement Project" system was introduced in response to the electronization and sophistication of automobile technology.

## References:

"Automobile "Inspection" and its Evolution" by Hideyo Kobayashi (2014)  
 JAMAGAZINE (Issha) Japan Automobile Manufacturers Association, October 2014 issue "Special Feature: The History of the Vehicle Inspection/Maintenance Program and the Significance and Role of Vehicle Inspection" P. 6 to P. 7

[http://www.jama.or.jp/lib/jamagazine/jamagazine\\_pdf/201410.pdf](http://www.jama.or.jp/lib/jamagazine/jamagazine_pdf/201410.pdf)

Access the following link for details on the 2020 Specified Improvement Project:

<https://www.mlit.go.jp/jidosha/content/001332203.pdf>

Last access: March 1, 2021

vehicle liability insurance. In recent years, a program for advanced automobiles equipped with new technology such as automatic brakes has also been introduced. In this way, laws and rules have been gradually established along with the popularization of automobiles and in connection with changing needs of the society. Observing these laws has led to the protection of Japan's land, transportation facilities, and people.

In Asia, this vehicle inspection/maintenance program has also been introduced in Cambodia. JICA has been providing assistance to improve automobile maintenance technical skills and vehicle management administration systems in developing countries.

To begin with, let's gain some experience of automobile maintenance work in Japan, and learn more about the automotive technology. This experience as an automobile mechanic will help protect those in your own country. As a mechanic, each and every one of you play a vital role both in Japan and in your own country.

### (3) Understanding Japan's "Road Transport Vehicle Act"

Let's begin by discussing Japan's "Road Transport Vehicle Act"<sup>4</sup>.

This Road Transport Vehicle Act is intended to establish a vehicle inspection and registration program, and to regulate the automobile maintenance business in order to ensure automobile safety and prevent pollution.

<sup>4</sup> The following is an excerpt from P.51 to 55 of "Technical Intern Training Guidelines for Automobile Maintenance", Technical Intern Training Program for Foreigners Automobile Maintenance Business Council (March 2018).

This act consists of 6 pillars.

1) General rules

These rules stipulate automobile types and the purpose of each type.

2) Automobile registration

This stipulates the vehicle registration method to clarify property rights and identify vehicle owners.

3) Road transport vehicle safety standards

These stipulate the minimum technical criteria necessary to ensure safety or to prevent pollution for vehicle structure and equipment, seating capacity, or maximum loading capacity.

4) Automobile inspection and maintenance

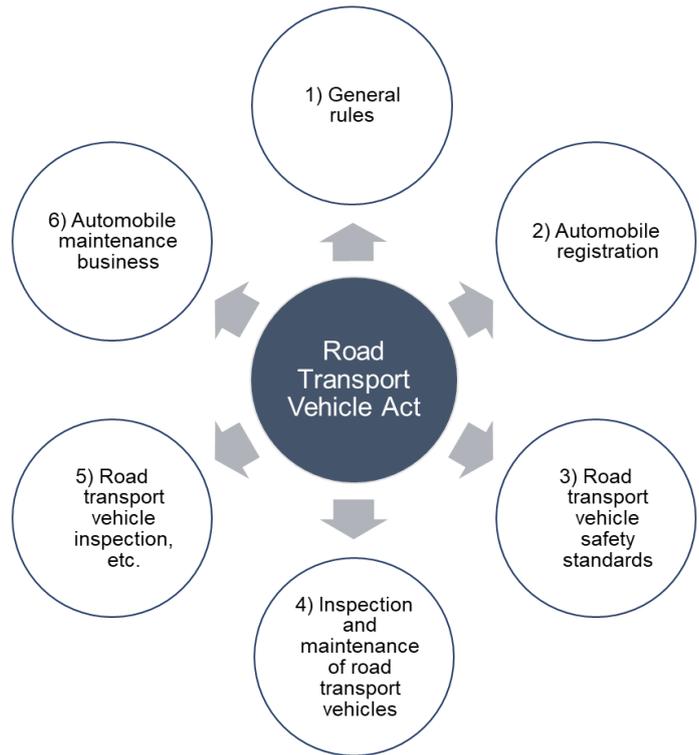
The Road Transport Vehicle Act states that the responsibility for ensuring that automobiles are inspected and maintained, and that safety standards are met lies with the automobile users (owners). Automobile users are responsible for daily inspection and maintenance and ensuring that periodic inspection and maintenance are carried out. Furthermore, illegal modifications are prohibited in order to eliminate illegally modified vehicles.<sup>5</sup>

5) Road transport vehicle inspection, etc.

The Road Transport Vehicle Act stipulates how and when automobile inspections are carried out. Japanese government has established objective safety and environmental criteria (safety standards), and this “vehicle inspection” provides a means of verifying whether an individual automobile meets these criteria.

6) Automobile maintenance business

Businesses bear a heavy responsibility for ensuring that criteria are met when carrying out automobile maintenance.



<sup>5</sup> “Illegally modified vehicles” refers to vehicles that have been modified in ways which differ from the conditions stipulated in the Road Transport Vehicle Act. For example, those with a black film affixed to the front door glass, those with the silencer (muffler) cut or removed, or those with the tires or wheels extended beyond the vehicle body (fender). Search for more information on the Internet by entering “Illegally modified vehicles, Ministry of Land, Infrastructure, Transport and Tourism”. Reference: <https://www.mlit.go.jp/jidosha/jidosha/tenkenseibi/huseikaizou/h1/h1-2/> (last access: March 16, 2021)

Furthermore, there are businesses called “designated automobile maintenance businesses (designated workshops)”. They are certified by the District Transport Bureau as having a certain level of equipment (examples: indoor workshop, vehicle storage area, inspection area, inspection equipment) and workers or organizations with a certain level of technical skills (examples: percentage of workers with automobile mechanic qualification, number of workers). At these “designated automobile maintenance businesses”, vehicle maintenance is carried out, and if the results of final inspection by automobile inspectors meet the criteria, a “safety regulations conformity certificate” is submitted to the Transport Bureau or Office for Motor Vehicle Inspection and Registration. This allows the period of motor vehicle inspection certificate validity to be renewed without taking the vehicle to a national inspection center. This is generally known as “private car inspection”. Furthermore, the vehicle inspection sites for these “designated automobile maintenance businesses” are known as “private vehicle inspection sites”.

Many of you most likely work in either “designated automobile maintenance businesses (designated workshops)” or at “private vehicle inspection sites”. The vehicle inspection and maintenance system in Japan is a little complicated, but it is related to the work that you all carry out.

In Japan, vehicle owners must have their vehicles inspected, maintained, and examined at the timing specified by the act. Furthermore, this program mandates that both vehicle users and maintenance businesses observe the rules, and take responsibility for carrying out appropriate maintenance. The roads on which vehicles run and the lives of people are protected through the efforts of many people including vehicle users, those carrying out maintenance work, those inspecting vehicles, and those certifying vehicles.

## **2. Information Necessary for Working with Japanese Staff**

This chapter describes the things you will need to know to work with Japanese staff.

This is because workers in Japan from many countries struggled at Japanese companies. Japanese companies, who are unfamiliar with people with different cultures, ways of thinking, and customs, such as yourselves, also have experience of similar struggles.

Japanese people complain about foreign staff members they work with, thinking things like, “They do not apologize.”, “They are always late.”, “They do not report, inform us, or consult with us properly.”, and that “The quality of their work is not up to the standard we are looking for.” On the other hand, foreign staff members feel anxiety about the language and behavior of Japanese people.

“Instructions and replies tend to be vague and difficult to understand.”, “Their faces are expressionless, and I have no idea of their intentions.”, “There is no explanation of the background behind the work nor the reason why the work is necessary.”, “Many people are involved in decision making, and it takes too much time to make decisions.”, and “Japanese superiors scold in front of others.”, etc.

This kind of discomfort or dissatisfaction often arise from cultural differences.

Everyone is different. This includes visible differences in communication styles, including facial expressions, language, speech patterns, gestures, and direct or euphemistic expressions. In addition, there are also differences such as customs, rules, manners, and organizational cultures of the social groups to which each person belongs. There are also differences in individual principles, values, assumptions, and beliefs that are not visible to others.

People communicate with each other through words and other means, filtering what they convey through these differences in values and behaviors.

### Examples of Cultural Friction in Companies



**Examples of common complaints from Japanese employees about foreign employees**

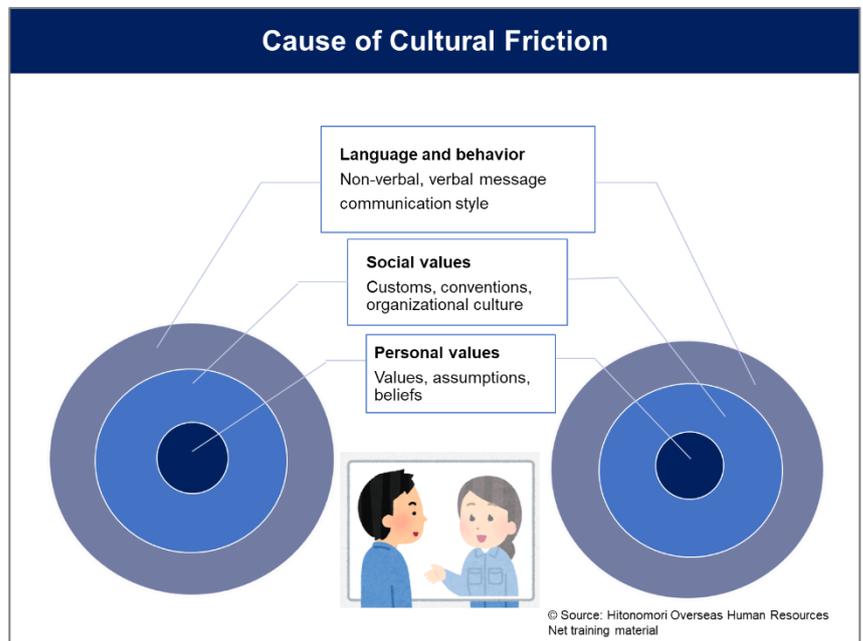
- They do not apologize.
- They are not punctual.  
(do not take preparation time into account)
- They do not report, inform, or consult.  
(conceal mistakes in particular)
- The quality of their work is not up to the standard.



**Examples of common complaints from foreign employees about Japanese employees**

- The instructions are vague. (a little, somehow, regards, etc.)
- Their faces are expressionless (do not smile during work.)
- They provide no purpose, background, or reason with detailed questions or instructions.
- They take too long to make decisions.
- They scold in front of others.

© Source: Hitonomori Overseas Human Resources Net training material



However, different interpretations are often made as messages pass through the filters of each value. This creates misunderstanding, making it difficult for both foreigners and Japanese to communicate and understand each other well. This is not simply based on language ability, such as not being able to communicate in Japanese. It is also based on differences in values between individuals and organizations.

We should recognize and respect the differences and deepen communication. By doing so, people can work together as a team with a stronger relationship.

## (1) Values cherished by Japanese -- “harmony”, “thoughtfulness”, “form”

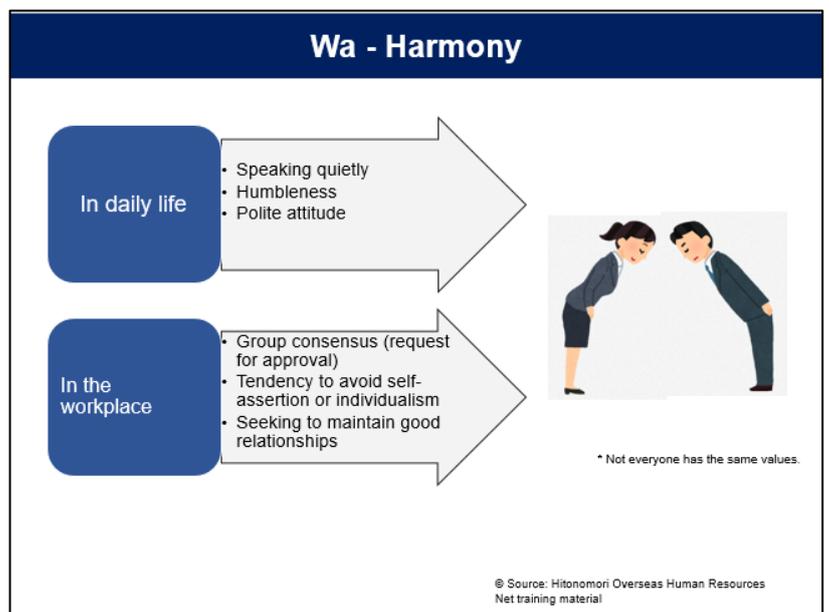
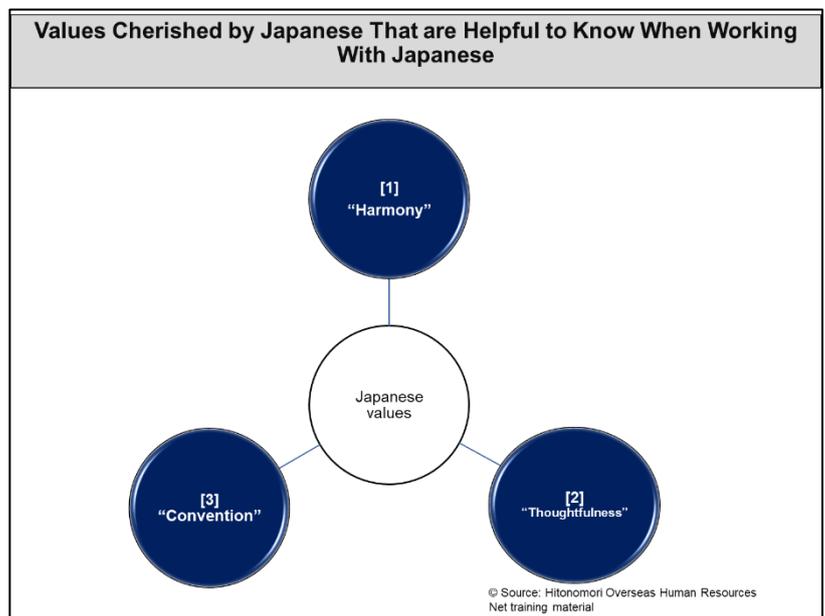
Next, let’s learn three values that Japanese companies place importance on in their work.

Japanese people tend to place great importance on “harmony” or “Wa” in Japanese. This refers to the overall harmony and peace in the workplace. This is cultural aspect that people value and cooperate with each other to foster good relationships.

Japanese culture respects “thoughtfulness”. For example, in Japanese, the subject is often omitted. Therefore, the listener is expected to understand what the other person is saying while

considering the situation and position of the speaker. Those who study Japanese would understand the difficulty of omitting the subject. It can be said that Japanese people are trained to always think about other people’s feelings while talking in Japanese every day.

Although there are individual differences in people’s daily behaviors, quiet speech, humbleness, and politeness are expected. And in the workplace, Japanese show great respect for group consensus, respect for



harmony as a team or company rather than self-assertion or individualism, and try to maintain good long-term relationships.

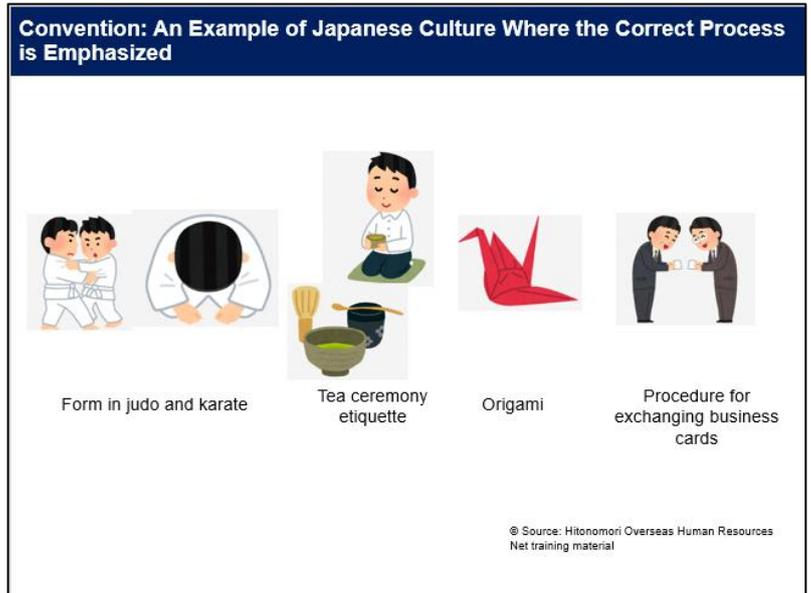
### **Column: Japanese do not smile?**

In particular, those who are from cultural areas known for their smiles (Asian countries such as Cambodia and Thailand) work in Japanese companies might be surprised to see Japanese people working silently without smiling. You may be worried, or wonder if your “Japanese bosses, senior staff, or coworkers are angry. But generally speaking, Japanese people are not accustomed to expressing their feelings with facial expressions or gestures, particularly at work. In most cases, they are not angry, but just working normally. There is therefore no need to be concerned. If this bothers you, please ask the person if there is a problem directly. This will lead to mutual understanding.

Japan also has a strong “apology” culture.

Japanese often use such phrases as “I’m sorry” or “Excuse me”. This apology culture has even spread throughout companies. It can be said that this is a sign of “thoughtfulness”, where people respect the feelings of others. However, when foreigners who are unfamiliar with this apology culture work at Japanese companies, many Japanese staff end up complaining that they do not apologize. In some cultures, apology means admitting your fault or wrongdoing one-sidedly, and may wish to avoid using expressions such as, “I’m sorry.” or “Excuse me.” for fear of punishment. However, to Japanese people, “Excuse me.” means in many cases “When I think about your feelings, I feel bad.”, meaning that they think highly of you. The Japanese expression for “Excuse me.” lubricates relationships, and therefore use it when necessary.

Finally, Japan is a culture that values “form”. “Form” refers to the correct way of doing things. In martial arts, traditional performing arts, and in some sports, this means the normal method. For example, martial arts such as kendo, aikido, and judo also have correct “forms,” and there are a series of movements that should be regarded as the norm in traditional Japanese performing arts such as Noh, Kabuki, classical Japanese dances, and the tea ceremony, as well as familiar origami folding methods.



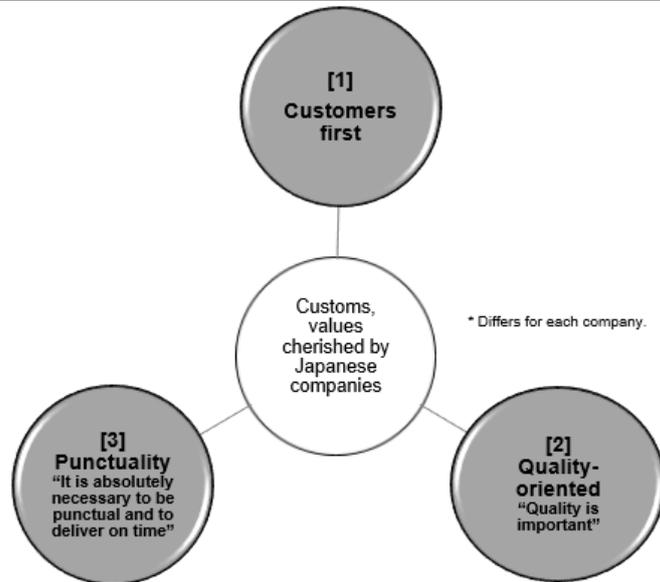
This “form” culture, which Japanese themselves are not always aware of, has also found its way into companies and work methods. A characteristic of Japanese companies is that they often specify the correct methods and processes in details when conducting business. People from different cultures often complain about this, but it is also true that respecting a series of “forms” has resulted in an excellent reputation for Japan’s high-quality services and products.

## (2) Values that Japanese companies place importance on in their work -- “putting the customers first”, “punctuality”, “quality-oriented”

Next, let’s learn three values that Japanese companies place importance on in their work.

First, there is the concept of “customers are most important”. This refers to the idea that the customers are positioned at the top, and the companies taking on the work are positioned at the bottom.

### Helpful Things to Know When Working for a Japanese Company Work Values Cherished by Japanese Companies



© Source: Hitonomori Overseas Human Resources  
Net training material

In Japan, people work by the business custom that the customers’ demands are absolute. Specifically, if the customers require something, people strive to comply with their requests (price, quality, delivery due date). Companies do business with their customers over a long period, and therefore maintaining their customers’ trust is critically important.

It is common to see people in Japanese companies working hard until late at night. The reason why Japanese people work so hard is that they are under pressure to meet the demands of their customers.

The next value is “quality-oriented”.

Probably, you are well aware that the Japanese demand for quality is very high. Firstly, the level of quality demanded by Japanese consumers is very high. In addition to this, Japanese workers are given very specific quality instructions and requirements for each job in their companies. Japan has a “form” culture, and so the approach to quality places much emphasis on processes. You may wonder why there are such specific work procedures and rules in Japan. However, by responding to specific demands through the efforts of every employee, Japanese are able to make superior durable products. Therefore, each of you might want to show the same diligence, and pay meticulous attention to each and every process.

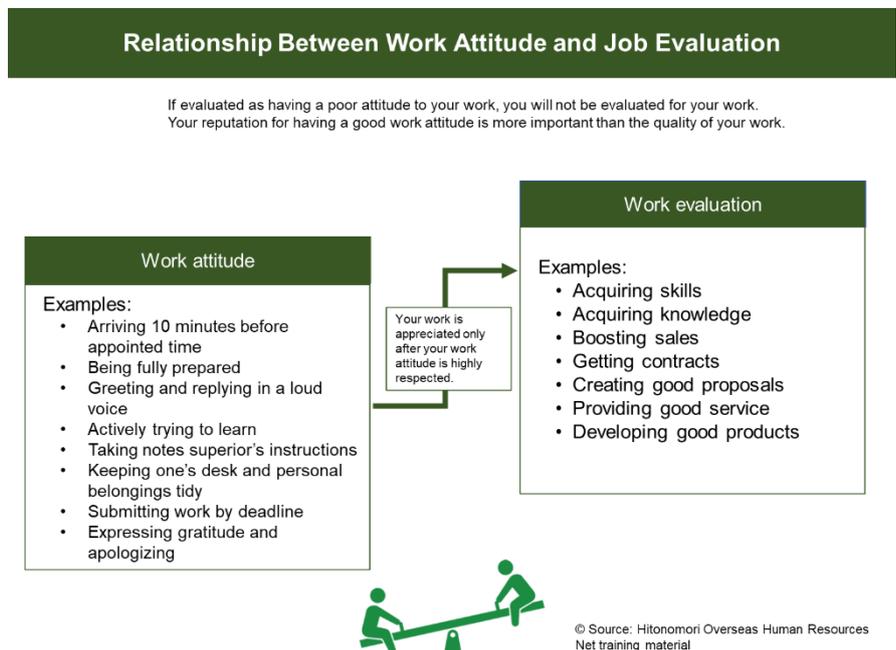
The third value involves “time”.

The Japanese have very strict rules regarding “time”. Failure to be punctual leads to a disruption in “harmony” and causes inconvenience to others. Some of you may have been surprised to hear announcements on Japan’s trains apologizing for being as little as 1 minute late. Bear in mind that these rules on punctuality are even stricter in the workplace. For example, never be late for work (even if the cause of lateness is not your fault, such as train delays.) Furthermore, once you promise a customer that you will deliver a product or service by the delivery due date, this promise must be kept. This is what is known as “on-time delivery”, and is a very important value in Japan. For this reason, Japanese people tend not to promise to deliver products or services by deadlines that they may be unable to meet, and arriving 10 minutes before the appointed time is seen as being the accepted proper manner.

When people from countries with a culture that is tolerant of time work for a Japanese company, the most likely problem they will encounter is this “punctuality” rule. Please be conscious of “punctuality”, and ensure to make it a habit to be punctual.

Finally, if you wish to be highly evaluated by your superiors, senior staff, and colleagues when working in a Japanese company, please be sure to place importance on a business manner referred to as “work attitude”.

For example, arriving 10 minutes before the appointed time, preparing in advance (reading materials, learning beforehand, completing any necessary homework, preparing materials, etc.), organizing and tidying your desk and surroundings, and saying thank you or apologizing when necessary.



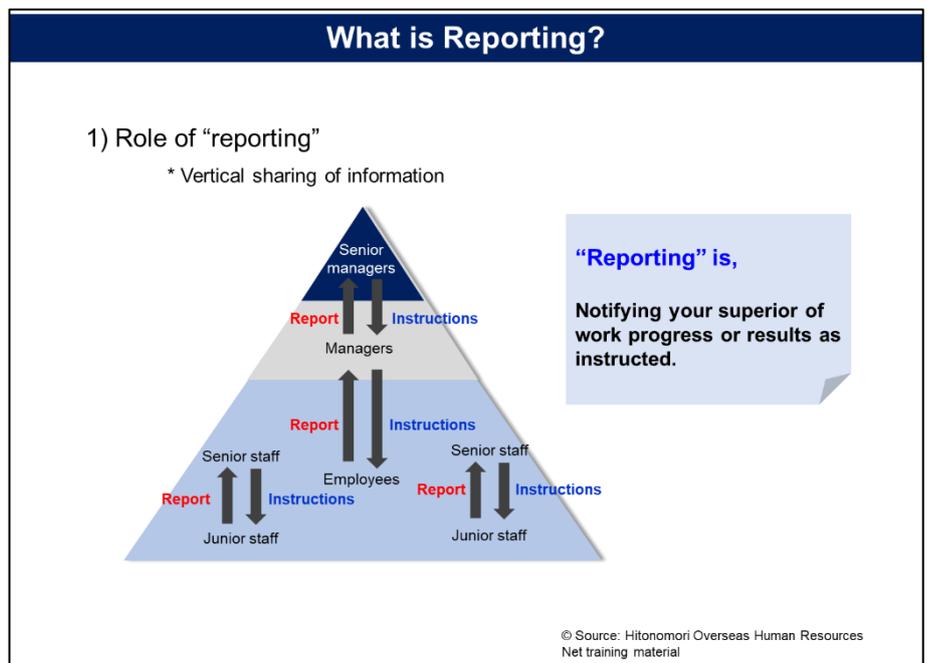
Good work attitude would help you learn the skills you will need to get the job done in Japan. There was one case in which their superiors very poorly evaluated the work of a capable worker with great knowledge and technical skills. Close investigations revealed that the “work attitude” of the worker was regarded as a problem based on Japanese values. The worker was often late, failed to apologize, and did not keep the area around them neat and organized. It is important that you know in advance that much emphasis is placed on work attitude in Japanese companies.

### (3) Things to keep in mind when communicating with Japanese people

In order to carry out automobile maintenance work safely and appropriately, you need to communicate well with Japanese people. In this section, let's learn "reporting (Houkoku), informing (Renraku), and consulting (Soudan)", the three customs unique to Japan. This is a method of communication known in Japan as "Hou-Ren-Sou" for short. In Japanese companies, a lecture on "reporting, informing, and consulting" is given as very important part of new employee training.

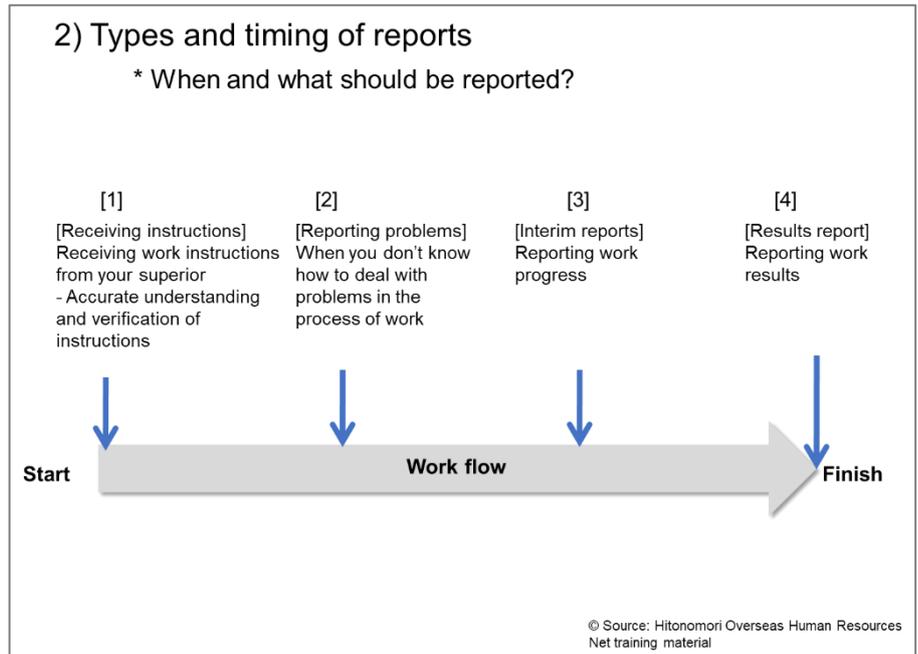
#### 1) What is reporting?

Reporting is to keep your superior informed of the progress, the on-going status, and the results of the work carried out as instructed by your superior. You may think that reporting is a business practice employed by companies in your own country also. Indeed, reporting to superiors is a common business practice in the world. However, Japanese companies have their own way of reporting in terms of timing, frequency, and the detailed contents of reports.



Specifically, "reporting" involves the following stages: [1] receiving instructions from superiors, [2] reporting when there is a change in the schedule or when a problem occurs, [3] providing interim and on-going status reports on the work, and [4] reporting the results of the work.

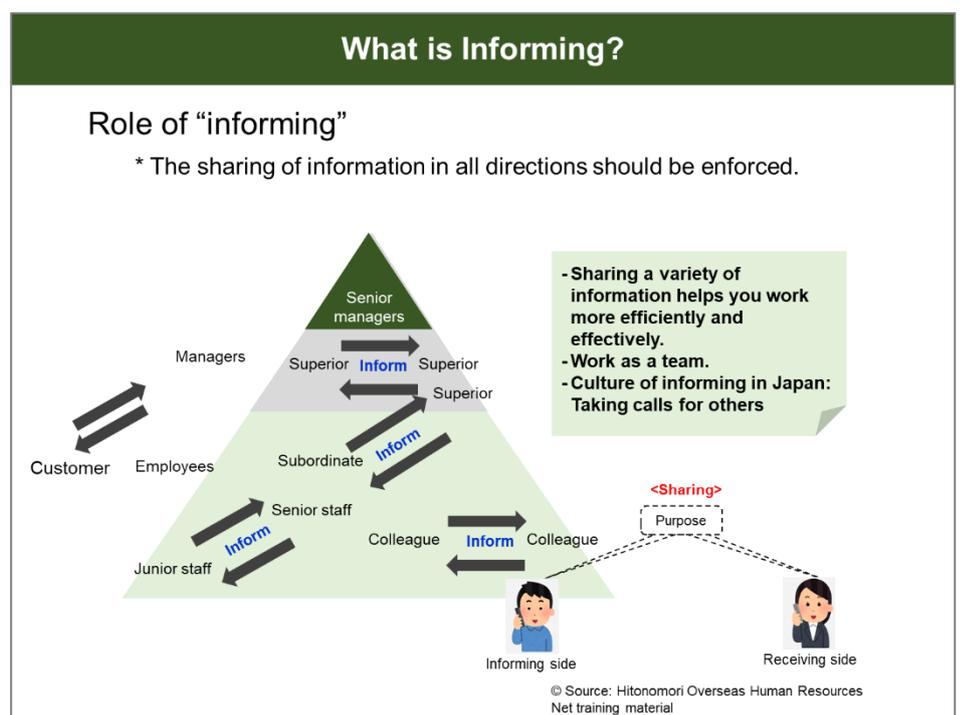
When you receive instructions, make sure you understand them correctly. Specifically, ensure that you understand the parameters of the work, such as who the work is for, when it is to be completed by, what is to be done, how you should proceed, and when on-going status reports are to be submitted, and ensure that your understanding is consistent with the



instructions of your superior. Furthermore, when the contents confirmed at [1] are changed or any problems occur, you must [2] report any changes or problems promptly. You must also provide on-going status reports whenever necessary. And finally, you must report the results of work for which instructions were received. It is common worldwide to [4] report results after completing the work for [1]. The high frequency of [2] and [3] is unique to Japan. The frequency of [2] and [3] tends to vary depending on the company and the superior. While you are unfamiliar with this custom, you should report frequently, and learn the knack of frequency and timing. If your workplace has meetings before or after work, it is a good idea to report at that time. This is also explained separately in “5) Dealing with vague Japanese instructions”.

## 2) What is informing?

Informing refers to the sharing of information between superiors, between colleagues, with the superiors and colleagues of other departments, and with customers and any other participants. This is the Japanese way of running an organization with a sense of working together.

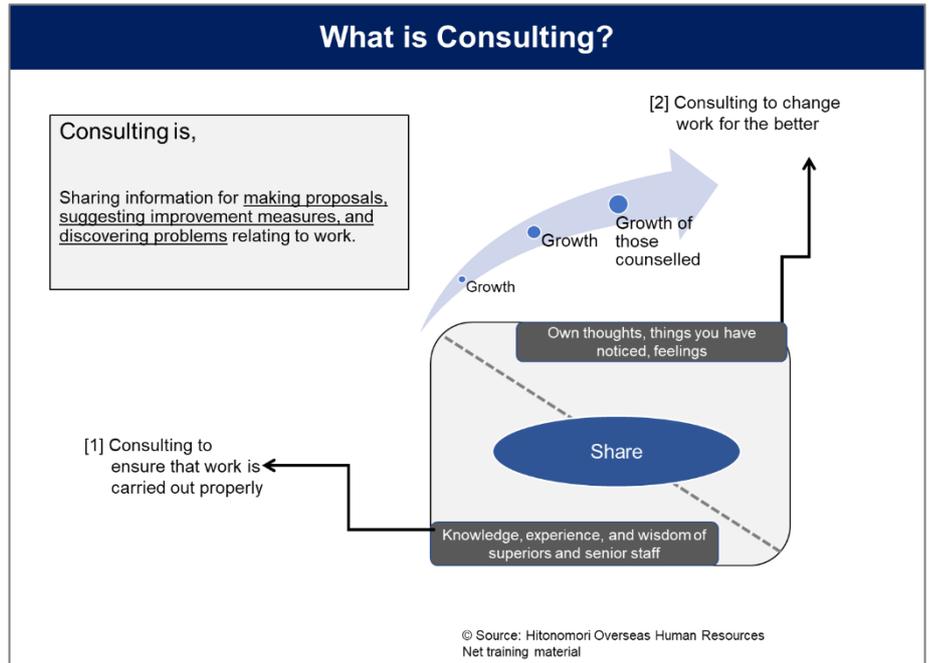


In Japanese offices, desks are arranged in large rooms, and even superiors work in the same room as their subordinates. Even when there is a phone call for someone away from their desk or off duty, someone else in the room will handle the call. At Western companies, on the other hand, management tends to work in their own separate offices, and no one else handles their calls. In Japan, everyone works together as a team, and deals with those from outside the company as a person in charge. Therefore, each worker “informs” those working around him/her of the work and shares information to carry out work smoothly. For this reason, there is a tendency to share e-mails (use CC) with a large number of people when contacting those in charge of work at Japanese companies.

### 3) What is consulting?

Finally, let’s discuss “consulting”. Consultations are held mainly with superiors by sharing information to make improvement proposals, report on discovered problems, and to propose solutions. There are two types of consulting: [1] consulting to ensure that work is carried out correctly, and [2] consultation to discuss changes that will improve work. Consulting [1] means you consult with senior staff or with your superiors if you do not know how to do a particular job, or are worried about how to do it.

You will be able to carry out your job responsibly by consulting with your superiors instead of sticking to your own way of working and thinking. If there is something you do not know or something you feel uneasy about, do not make decisions on your own. Furthermore, if you are able to carry out your work according to prescribed work procedures, and understand the contents of



your work, you will be able to propose improvements in [2]. Even in this case, you must not change work procedures without consulting your superior. Changes to work procedures must only be made after obtaining the approval of your superior.

### 4) Characteristics of Japanese organizational management

Why are Japanese companies so strict about “reporting, informing, and consulting”?

One reason is that Japanese companies operate differently from companies in other countries.

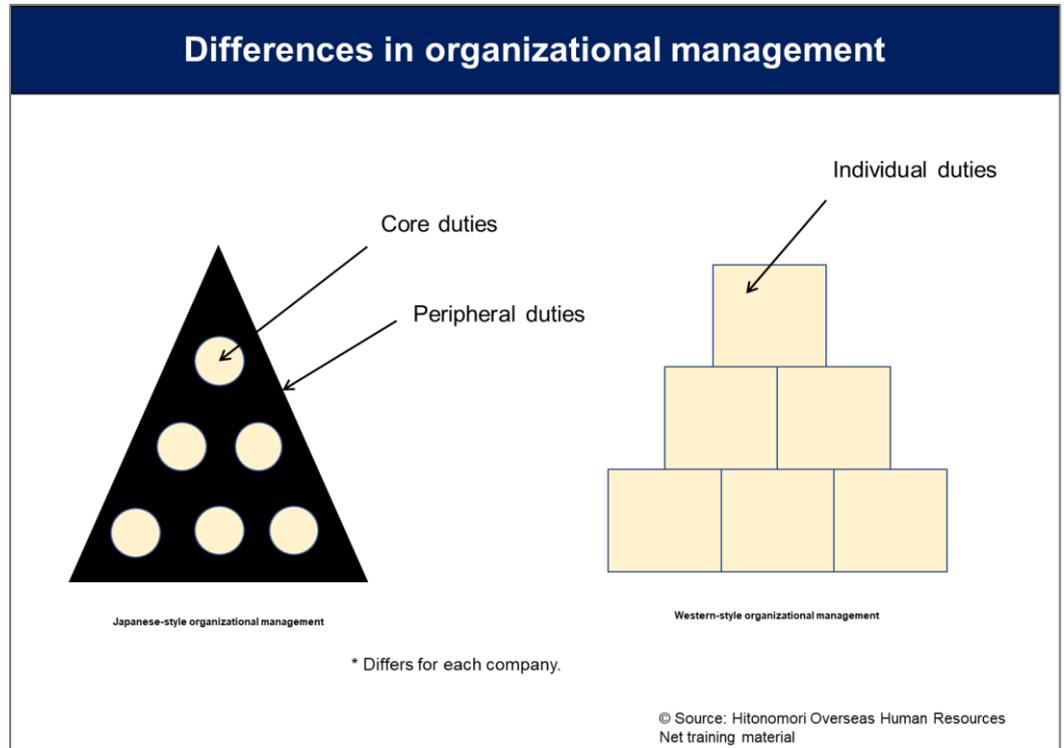
The figure on the right schematically shows the difference between organizational management in Japan and in the West.

The Western style of organizational management is like a stack of blocks with clear boundaries. Each person has

a clear job description, each job description is determined with a contract, and there are clear lines between the jobs of one person and others. Each person is responsible only for his or her own work. Accordingly, there is no need for detailed reports, to keep superiors informed, or to consult with them. People who adhere to the “Hou-Ren-Sou” philosophy are poorly evaluated as not being professional.

With organizational management in Japan, on the other hand, the scope of work is limited to that of each person. There is a wide range of “peripheral duty” areas (black area in left triangle above) that does not fall under the responsibility of anyone. The boundary between the work of others is not strictly defined. This is based on the idea that workplace members unite to cooperate as a team and solve problems. Even if something goes wrong, the team they work in is responsible for it rather than each member. For this reason, people in Japan have expanded the scope of information sharing, adhere to the philosophy of “reporting, informing, and consulting”, and try to deliver results as a team.

The important thing here is not to hide away even if you make a mistake, but to exactly “report”, “inform”, and “consult”. Complaints about foreign employees, such as, “They hide their mistakes.”, “They do not consult.”, or “They do not submit interim reports.”, are often cited from Japanese workers. In Japan, make sure you “report” your mistakes, or “consult” your superior as soon as possible. In Japan, there is no need to feel guilty for making a mistake. The blame for mistakes or



failures is not considered to be the responsibility of the individual who made the mistake, but the responsibility of the group. Rather, your superior would appreciate the fact that you reported the mistake, and the team would work with you to resolve the situation. In particular, mistakes in automobile maintenance can lead to accidents, and so “not reporting your failure is much worse than the failure itself”<sup>6</sup>.

## 5) Dealing with vague Japanese instructions

If your boss is a Japanese person who has little experience of working with people with different values, such as those who have never been posted overseas on long-term assignments, you should be aware that the instructions of him/her are often unclear.

This is a characteristic of the style of communication that develops between people working in the same environment, or those with similar values, and tends to be as follows.

- There is no explanation of the background behind the work nor the reason why the work is necessary.  
(The superior presumes that the worker understands them.)
- Japanese use many demonstrative pronouns such as this (Kore) and that (Are, Sore).
- Japanese tend to issue instructions using many adverbs such as a little, a bit more, somehow, neatly, nicely, properly, and quickly, as well as many adjectives such as correct methods.
- The subject is often omitted.
- Japanese tend not to say no.

Even if your Japanese ability is very high, this type of communication makes it very difficult to understand work instructions accurately.

So, what should you do?

When issued with vague work instructions, ask your superior [1] who does it, [2] by when, [3] what is to be done, and [4] how it is to be done in terms of methods, frequency, specific actions, and numbers.

For example, you replace adverbs and adjectives such as “a little more,” “quickly,” “neatly”, or “correctly” with numbers. If you are told, “a little longer”, you should confirm by asking, “Do you mean I should make it 2 centimeters longer?” If you are told, “A little neater”, confirm the method to be used, as well as the number of times the action should be carried out. For example, you should ask, “Do you mean I should wipe the floor and walls once a day with this cloth?” Before confirming,

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<sup>6</sup> P.27 of “Technical Intern Training Guidelines for Automobile Maintenance”, Technical Intern Training Program for Foreigners Automobile Maintenance Business Council (March 2018)

saying "Excuse me" will give an impression that you show respect to the person you are asking. Initiatively confirm the meaning of the person's instructions with saying "Excuse me".

What would happen if you simply agree with the instructions of senior staff or your superior without actually understanding what it is they are saying? You may end up being reproached for not being able to do what you were asked. It is often better to be reproached. In many cases, Japanese people do not express their dissatisfaction with you clearly. This unique Japanese style of communication could hinder mutual understanding. It is not easy, but you should actively communicate with and confirm the intention of instructions issued by Japanese.

#### **(4) The basis of 5S Kaizen -- Why do Japanese clean?**

In your country, religious or social norms may dictate that cleaning is not the job of those of higher rank.

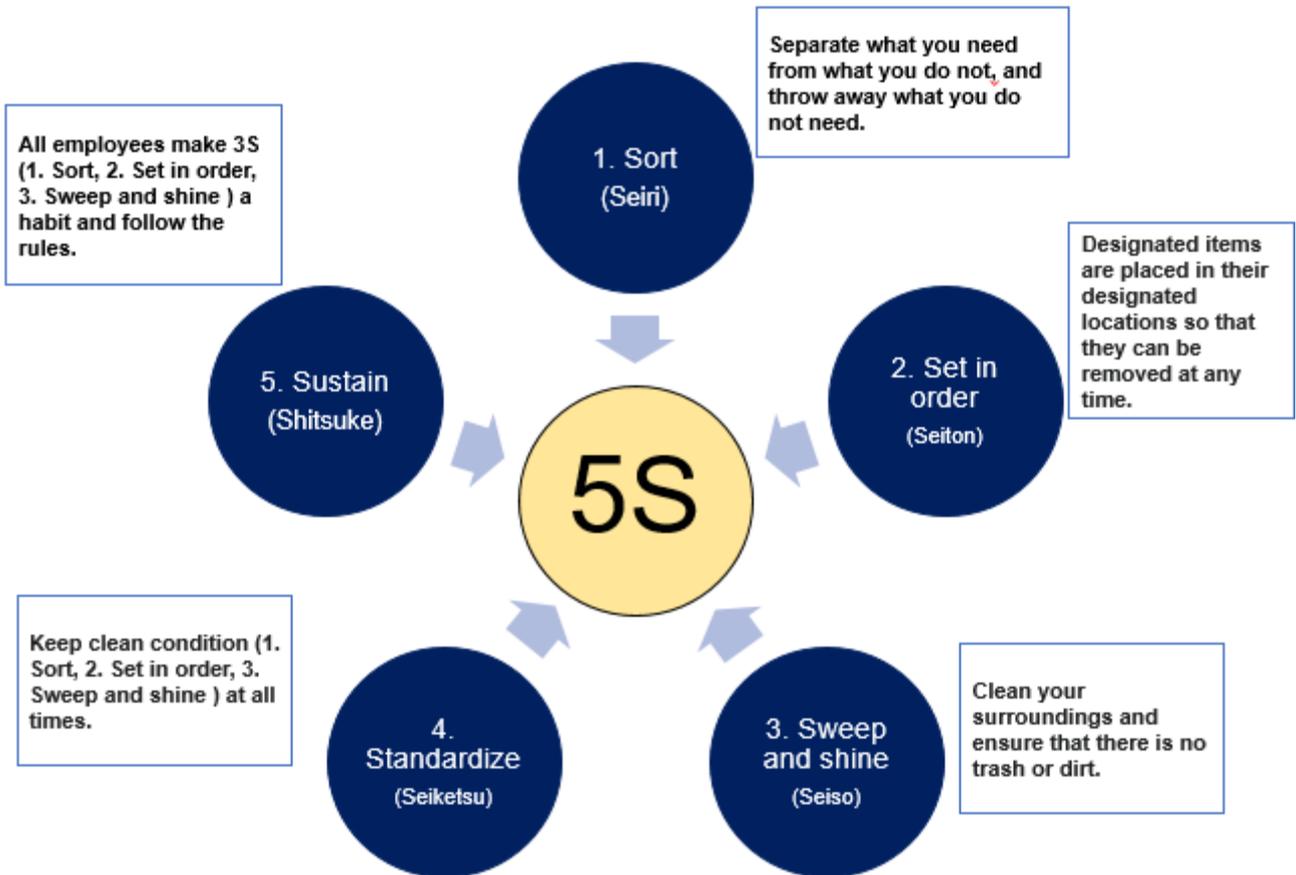
However, in Japan, religious and social norms dictate that "cleaning" has the important meaning of "purifying the mind". Since the Heian period (8th to 12th centuries), Japanese people has regarded cleaning as not simply cleaning but also as a Shinto ritual, and cleaning tools have been treated as sacred treasures and cherished.

Even today, it is important to keep your surroundings organized and tidy not only to purify your mind, but also to express your compassion for others.

Some of you may "clean" a room before you use it. However, the Japanese way of thinking is to keep it clean after use "for the benefit of others". After you have finished using a room, please keep it clean, tidy, and organized for others.

The concept of keeping work areas clean, tidy, and organized is widespread among companies that place importance on safety and efficiency.

Japanese methodology known as 5S is enforced in the manufacturing industry. 5S stands for the 5 Ss (seiri, seiton, seiso, seiketsu, shitsuke), which are 1. Sort (separate what is necessary from what is not, and throwing out what is not necessary), 2. Set in order (storing things in the correct place so that they are readily accessible), 3. Sweep and shine (cleaning one's surroundings so that there is no dust or dirt), 4. Standardize (keeping work areas clean), and 5. Sustain (getting into the habit of observing 3S [seiri, seiton, seiso]).



First of all, putting 5S into practice diligently on a daily basis will prevent accidents and disasters. Furthermore, 5S practice also makes your working environment comfortable, and improves quality, productivity, and efficiency by eliminating variations in work. And carrying out these activities in teams enhances teamwork, promotes communication, and continuously improves the work itself.

In everyday work, let's make the following three basics a habit:

- [1] Organize tools, etc., while giving careful consideration to work procedures.
- [2] Be sure to return tools, etc. to their original location after use.
- [3] Put away any unnecessary tools.

You need to organize, tidy, and clean during the course of daily work. Please learn a work method which allows you to keep the work area clean and tidy as you work<sup>7</sup>.

Japan's high-quality manufacturing and high-level services are underpinned by the 5S efforts of each individual. The 5S Kaizen concept has an excellent reputation worldwide. Many countries are currently working on projects to expand the Japanese concepts of 5S Kaizen.

You will practice 5S Kaizen at the companies you are assigned to. The very foundation of Japan's economic development was built on the accumulation of even the smallest efforts of each and every person. Let's value the contribution that 5S brings to your work.

## **(5) Why learning Japanese is so important and how to do it**

This section explains the importance of continuing to learn Japanese, as well as methods and tips for how to do it.

To begin with, in the field of automobile maintenance, you need to understand work instructions correctly in Japanese to ensure the safety of yourself and those you work with. Accurate Japanese is indispensable to acquiring knowledge of automobile maintenance and to enhancing your technical capabilities. Moreover, it is essential to work as a team while building strong working relationships. If you become proficient in Japanese, you will be appreciated at the offices where you will be working.

Furthermore, in the first, third and fifth years of your technical intern training, you will take examinations to evaluate the skills you have acquired. In order to pass these examinations, it is necessary to continue to improve your Japanese ability.

In particular, when a technical intern trainee is assigned to work with a co-worker having high level of Japanese ability, the trainee tends to rely on co-worker's Japanese skill. There have also been reported cases of new trainees relying on senior staff who arrived earlier from the same country, and as a result, their Japanese skills do not improve. If you are good at Japanese language, even when returning to your home country after completing your work in Japan, you will find a wider range of possibilities available by using the Japanese to find a job or start a business. So, try your best to study Japanese actively.

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<sup>7</sup> P.8 of "Technical Intern Training Guidelines for Automobile Maintenance", Technical Intern Training Program for Foreigners Automobile Maintenance Business Council (March 2018)

If you want to study Japanese with a Japanese trainer at the company who receives you, you should use a Japanese textbook for foreigners, rather than a textbook for Japanese students (example: elementary school textbooks)<sup>8</sup>.

Furthermore, at companies that have received many foreign employees and succeeded in developing their Japanese language skills, a words and phrases note has been used to improve mutual understanding. Let's use a note to write the [1] date, [2] the words you learn each day, and [3] the phrases or sentences you learn each day in Japanese. At the end of your working week, show it to your Japanese trainers and ask them to make comments. Repeating this process allows Japanese trainers and superiors to understand the words and phrases you have learned. They would have conversations and issue work instructions using words that you have learned. This words and phrases note not only helps you learn Japanese, but allows Japanese staff to understand what you have learned.



Example of words and phrases note (Direct feedback from Japanese motivates technical interns to learn.)

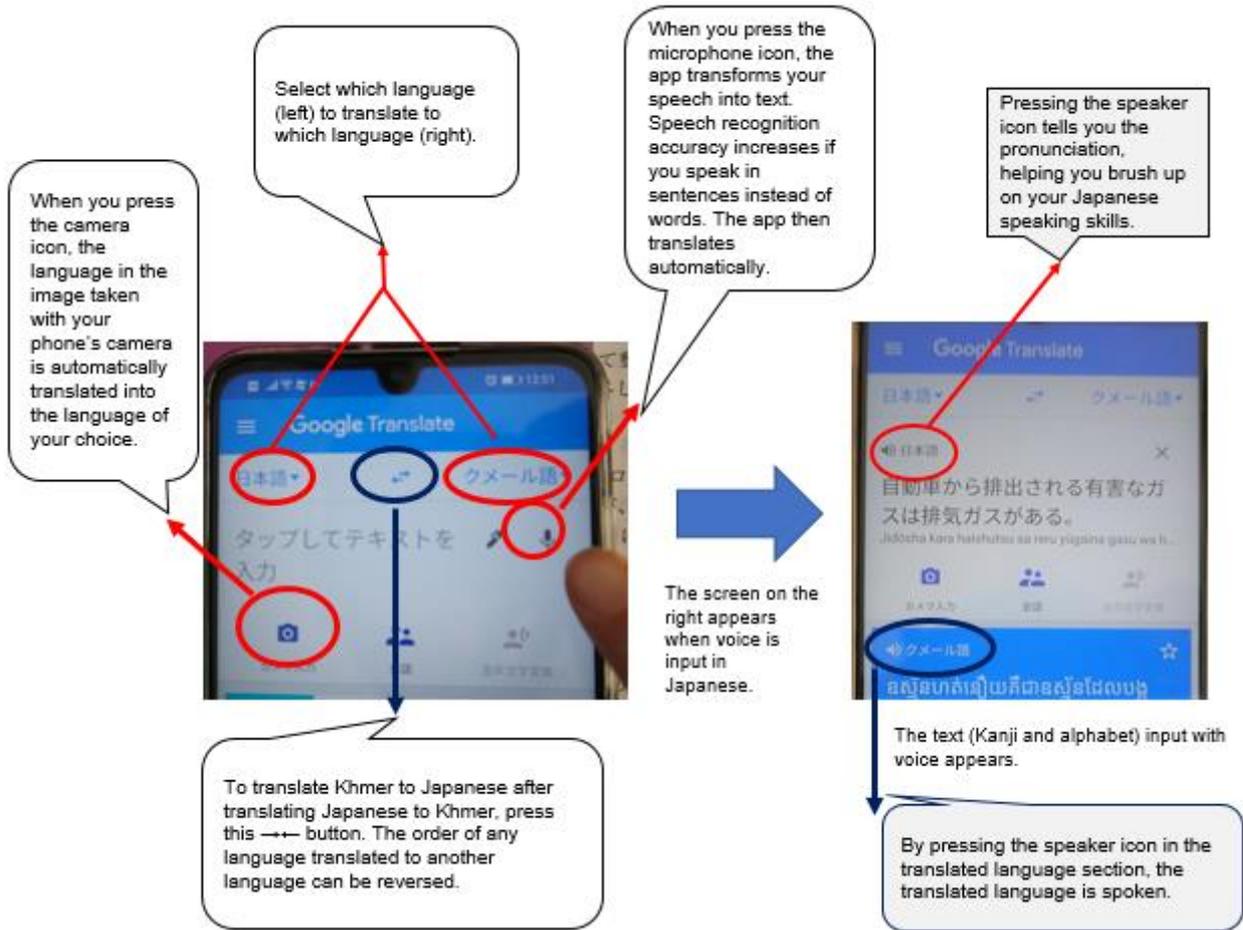
For documents written in advanced-level Japanese, use a machine translation app to translate it and deepen your understanding. The accuracy of free machine translation services has improved dramatically since the introduction of AI (artificial intelligence) technology. Machine translations for rare languages can be a little strange, but you can get the general gist. Machine translation technology is improving every day, so you should take advantage of these free tools<sup>9</sup>.

For example, “Google Translate” allows you to use various functions by downloading the app to your cell phone (smartphone).

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<sup>8</sup> Information about textbooks on the Japanese language can be found on the website of the Japan International Trainee & Skilled Worker Cooperation Organization (<https://www.jitco.or.jp/>) or the Organization for Technical Intern Training website (<https://www.otit.go.jp/>).

<sup>9</sup> In the case of fee-based AI translation services, if the service offers extensive databases of technical terms in each specialized field, or databases of terms unique to each company, the translation accuracy will be higher even for rare languages.



When you input speech in Japanese, the Google Translate app converts your speech into Kanji and Hiragana characters, and furigana is displayed in alphabet characters. And by selecting your native language, the app will automatically translate to your language. By pressing the speaker icon and asking it to pronounce a word, the pronunciation of both languages is spoken. The app is an excellent tool for learning Japanese.

And by pressing the camera icon, the app can also convert Japanese contained in text or printed materials to the selected language automatically.



The Google Translate “camera function” allows users to read Japanese text in their chosen language (Khmer in photo).

You should use these functions to help you read many documents written in Japanese and enhance your Japanese skills.

The following documents and materials are especially worth reading.

1. Corporate brochures or websites of the company to which you are assigned (information such as company outline, history, and corporate philosophy, and major customers, etc.)
2. Company rules and regulations
3. Text relating to automobile maintenance techniques, various work manuals, material for certification testing, books, etc.

If you do not have a cell phone, use the cell phones or computers of your Japanese colleagues or trainers to communicate more closely.

If your company has PCs connected to the Internet, it is also a good idea to use “Google Translate” on those PCs to read Japanese documents or websites.

#### **Column: Company rule -- Photography prohibited! –**

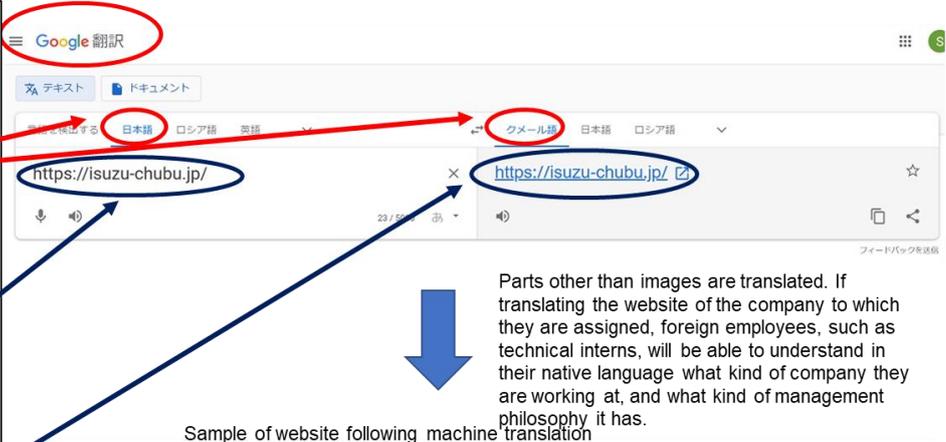
Most companies prohibit their employees from taking pictures inside the factory or in the company. The reason for this is to prevent important company information being leaked. In particular, the customer's vehicle or its license plate, etc. must not appear in photographs taken at the automobile maintenance site. Furthermore, the appearance of another person's face may breach rules on the protection of personal information, or it may be an infringement of portrait rights.

There have been cases where employees were severely reprimanded by the company for taking photos with their cell phone and posting them on SNS sites. They wanted to send photos of their workplace to family or friends back home. You must check the rules of your company before taking photos.

The following section describes how to translate websites on a PC, and how to translate documents such as Word, Excel, or PDF files on a PC using machine translation. You should translate and read a variety of materials written in Japanese together with the trainer at your company.

**To Translate and View Websites**

- Step 1**  
Search for the website on your computer and open the "Google Translate" screen.
- Step 2**  
Select a language. (The language on the left is translated to the language on the right.) The photo shows a translation from Japanese to Khmer.
- Step 3**  
Copy the address of the website you want to translate and paste it into the blank field on the left.
- Step 4**  
Click on the link that automatically appears on the right to translate to the selected language (Khmer in photo).



Parts other than images are translated. If translating the website of the company to which they are assigned, foreign employees, such as technical interns, will be able to understand in their native language what kind of company they are working at, and what kind of management philosophy it has.

Sample of website following machine translation

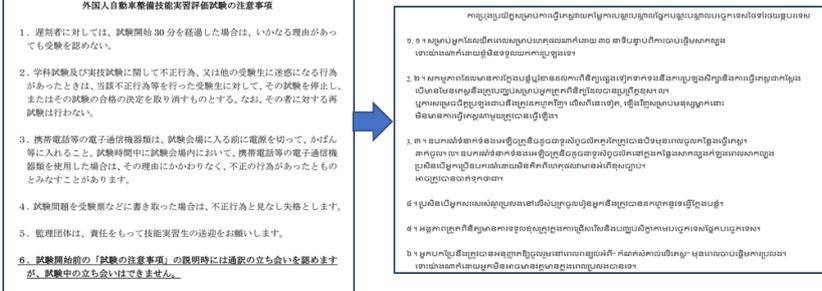


**To Translate Various Documents (Word, Excel, PDF, etc.)**

- Step 1**  
Search for the website on your computer and open the "Google Translate" screen.
- Step 2**  
Press the [Document] button.
- Step 3**  
Select a language. (The language on the left is translated to the language on the right.) The photo shows a translation from Japanese to Khmer.
- Step 4**  
Press the "Browse your computer" button, and select the material you want to translate.
- Step 5**  
When you press the [Translate] button, the material is translated into the selected language (Khmer in photo).



Sample of PDF document following machine translation (automobile mechanic examination precautions)



The section containing characters is translated. It may not be possible to translate the entire document if there are many pages. Try again after reducing the number of pages. Furthermore, technical terms, etc. are not always translated accurately, and so it is important to understand the approximate meaning through machine translation, and then obtain practical training directly from a trainer while matching the translated terms with the actual objects to deepen understanding.

### 3. Glossary of Terms Used Frequently in Automobile Maintenance Work

A glossary of terms used frequently at automobile maintenance sites (example: 360 terms/sentences) has been provided below.

There are of course many other terms used at the site, and these should be added as appropriate.

Examples of terms used frequently in automobile maintenance work			
1	Tool name	77	Terms
2	Part name	86	Terms
3	Verb	60	Terms
4	Adjective	44	Term
5	Conversation	17	Sentences
6	Other terminology	76	Terms
Total		360	Terms/sentences

Review the terms listed here before visiting the automobile maintenance site.

It is also important to bear in mind that even among Japanese people, language (dialect) can vary depending on the prefecture or region where you will be working. Pronunciation can differ even for the same word. There is also more than one way of saying the same thing. For example, even with the task of lowering a lever, there are various ways of saying it. There are even several dialects for the word “lower” depending on the region. And in some regions, when you pronounce “lower” in Japanese, it can mean “lift up”. These differences will be very difficult for many of you to understand. At the Japanese companies you will be working for, there may not be many Japanese who appreciate how difficult it is to understand work instructions in Japanese with dialect.

Therefore you must learn the terms that will frequently be used with the Japanese staff you will be working with. Ask the Japanese staff issuing work instructions at the site to actually pronounce the words they use, and ensure that you fully understand the instructions before carrying out work. The Japanese staff should use the terms listed here as much as possible.

#### (1) Tool names (examples: 77 terms)

Tool names (examples: 77 terms)			
1	Open-end wrench	41	Gear puller
2	Adjustable wrench	42	Bearing puller

3	Box-end wrench	43	Sliding hammer
4	Combination wrench	44	Chisel
5	Floor nut wrench	45	Press
6	Ratchet	46	Vice
7	Socket	47	File
8	Deep socket	48	Bench grinder
9	Hexagon socket	49	Drill
10	Torx socket	50	Drill press
11	Plug wrench	51	Tap
12	Cross wrench	52	Die
13	Spinner handle	53	Vernier calipers
14	T wrench	54	Micrometer
15	T-shaped slide handle	55	Dial gauge
16	Extension bar	56	Thickness gauge
17	Universal joint	57	Plug gauge
18	Impact wrench	58	Compression gauge
19	Pipe wrench	59	Plug cleaner
20	Hex wrench	60	Nozzle tester
21	Torque wrench	61	Circuit tester
22	Flat-blade screwdriver	62	Battery coolant tester
23	Phillips head screwdriver	63	Hydrometer
24	Penetration type screwdriver	64	Spring compressor
25	Long driver	65	Battery tester
26	Stubby driver	66	Fuel pressure gauge
27	Hammer	67	Air conditioner manifold gauge
28	Plastic hammer	68	Tire gauge
29	Rubber hammer	69	Depth gauge
30	Pliers	70	Car washer
31	Nippers	71	Jack
32	Long nose pliers	72	Rigid rack/jack stand
33	Water pump pliers	73	Transmission jack
34	Vice pliers	74	Lift (Car lift)

35	Disk brake piston tool	75	Tire changer
36	Center punch	76	Wheel balancer
37	Wire brush	77	Battery charger
38	Scraper		
39	Air blow gun		
40	Oil filter wrench		

**(2) Part names (examples: 86 terms)**

Part names (examples: 86 terms)			
1	Automobile (Vehicle)	44	Brake pipe
2	Motorcycle (Motorbike)	45	Brake pad
3	Bus	46	Disc brake (Disc)
4	Truck	47	Brake caliper
5	Front engine front wheel drive (FF)	48	Drum brake (Drum)
6	Front engine rear wheel drive (FR)	49	Parking brake
7	Engine	50	Wheel cylinder
8	Battery	51	Brake shoe
9	Belt	52	Headlight
10	Spark plug	53	Clearance light
11	Air filter	54	Fog light
12	Intake manifold	55	Brake light
13	Exhaust manifold	56	Backup light
14	Fan	57	License plate light
15	Radiator	58	Turn signal light
16	Thermostat	59	Hazard warning light
17	Starter motor	60	Windshield wiper
18	Alternator	61	Windshield washer
19	Ignition coil	62	Horn
20	Injector	63	Mirror
21	Fuel tank	64	Window

22	Fuel pump	65	Glass
23	Muffler	66	Door
24	Clutch	67	Bumper
25	Transmission	68	Hood
26	Drive axle	69	Trunk
27	Drive shaft	70	Meter
28	Differential	71	Warning lamp
29	Tire	72	Accelerator pedal
30	Wheel	73	Seat
31	Suspension	74	Air conditioner
32	Shock absorber	75	Ignition switch
33	Coil spring	76	Bolt
34	Stabilizer bar	77	Nut
35	Lower arm	78	Wiring
36	Upper arm	79	Brake fluid
37	Steering	80	Engine oil
38	Gearbox	81	Differential oil
39	Tie rod	82	Transmission oil
40	Brake	83	Automatic transmission fluid
41	Brake pedal	84	Coolant
42	Master cylinder	85	Wheel alignment
43	Brake hose	86	Side slip

**(3) Verbs (examples: 60 terms)**

Verbs (examples: 60 terms)					
1	Attach	21	Dry	41	Check (Confirm)
2	Disconnect (Remove)	22	Tighten	42	Insert
3	Assemble	23	Loosen	43	Pull-out (Remove)
4	Disassemble (Take apart)	24	Move	44	Prepare
5	Return (Restore)	25	Rotate (Turn)	45	Hold
6	Raise (Lift)	26	Adjust	46	Open

7	Lift up	27	Inspect	47	Close
8	Lower (Down)	28	Replace	48	Stop
9	Turn ON	29	Tidy up (Arrange neatly)	49	Clean
10	Turn OFF	30	Be careful (Take care)	50	Wash
11	Press (Push)	31	Lay down	51	Take
12	Pull (Drag)	32	Raise	52	Place
13	Pull	33	Polish	53	Hurry
14	Heat up (Warm up)	34	Wash	54	Climb onto
15	Cool	35	Scrape (Shave)	55	Climb down from (Climb down into)
16	Lock	36	Put together (Align)	56	Tell (Teach)
17	Release (Cancel)	37	Measure	57	Cut
18	Step on	38	Connect (Tie)	58	Read
19	Wipe (Wipe off/up)	39	Secure (Fix)	59	Touch
20	Apply	40	Bend	60	Write

**(4) Adjectives (examples: 44 terms)**

<b>Adjectives (examples: 44 terms)</b>			
1	Hot	23	Far (Distant)
2	Cold	24	Many (A lot)
3	Warm	25	Few (A little)
4	Rough	26	Lukewarm (Tepid)
5	Sharp	27	Cool
6	Loose	28	Heavy
7	Dark (in color), Thick (for liquid)	29	Light (Weight)
8	Thick	30	Wide (Broad)
9	Thin	31	Narrow (Slim)
10	Deep (Depth)	32	Long
11	Shallow	33	Short
12	Big (Large)	34	Dark (Brightness)

13	Small	35	Bright
14	New	36	Dangerous
15	Old	37	Strong
16	Good (Satisfactory)	38	Weak
17	Bad (Poor)	39	Thin (Slim)
18	In good shape (Going well)	40	Thick (Big)
19	In poor shape (Going badly)	41	Hard
20	High	42	Soft
21	Low	43	Dirty (Soiled)
22	Near	44	Clean

**(5) Conversation (conversation examples)**

Conversation examples			
1	Welcome. (May I help you?)	10	Start the engine.
2	Please wait.	11	I am going to move it.
3	We have a customer.	12	You are all right at the back (when reversing, etc.).
4	I cannot.	13	Watch out!
5	Tell me. (Teach me.)	14	Stop!
6	I will not make it.	15	Safety first, good!
7	It is broken (I broke it.)	16	It hurts.
8	It is done.	17	I injured myself.
9	Please confirm. (Please check it.)		

**(6) Other terminology (examples: 76 terms)**

Other terminology (examples: 76 terms)					
1	Front (of vehicle)	26	Suspension (Underbody)	51	Rust
2	Rear (of vehicle)	27	Underbody parts	52	Leakage
3	Front left, front right	28	Width	53	Clogging (Blockage)
4	Rear left, rear right	29	Length	54	Looseness
5	Outer side (Outside)	30	Height	55	Runout (Deflection)

6	Inner side (Inside)	31	Depth	56	Wear
7	Inspection	32	Temporarily tighten	57	Gap
8	Maintenance	33	Tighten (Fasten)	58	Clearance (Necessary gap created for a purpose)
9	Repair	34	Scale (Graduation)	59	Play (Clearance that increases with use (within threshold value))
10	Part	35	Reference value	60	Backlash (Looseness) (clearance that increases when play exceeds threshold)
11	Work	36	Quantity (Amount)	61	Red
12	Disassembly	37	Distance	62	Blue
13	Replacement	38	Temperature	63	Yellow
14	Adjustment	39	Speed	64	Green
15	Keep tidy (Arrange)	40	Quantity	65	Brown
16	Keep tidy (In good order)	41	Lubrication	66	Black
17	Cleaning	42	Angle	67	White
18	Good (Satisfactory)	43	Air pressure	68	Pink
19	Bad (Unsatisfactory)	44	Specific gravity	69	Silver
20	Danger	45	Vehicle delivery	70	Gold
21	Breakdown (Fault)	46	Car wash	71	Electrical (Electricity)
22	Diagnosis (Diagnostics)	47	Finished (Complete)	72	Voltage
23	Cause	48	Flaw (Wound)	73	Electric current
24	State (Condition)	49	Dirt	74	Resistance
25	Interior (Cabin)	50	Dust	75	Time
				76	Accident

## 4. Importance of Health and Safety

Finally, this chapter explains the “health and safety” in automobile maintenance<sup>10</sup>. This chapter describes items that are very important for ensuring safety in the workplace. Let’s learn about them before carrying out actual maintenance work at the site. You should look back over your daily work and review the following items.

### (1) Proper clothing to ensure safe work

#### 1) What is proper clothing?

Wearing the proper clothing correctly is the first step in working safely. Wear work clothes correctly to prevent accidents at work<sup>11</sup>, and to improve efficiency.

#### 2) Precautions

- Attach fasteners and buttons securely.
- Wear work clothes that fit you.
- Mend any tears or open seams, and always wear clean clothes.
- To protect the head and prevent the inside of vehicles from getting dirty, wear a work cap properly.
- Attach a name tag in the correct place.



<sup>10</sup> Reproduction of text of “Technical Intern Training Program for Foreigners, Automobile Maintenance Occupational Health & Safety Guidebook” prepared in September 2016 by the Working Group for Automobile Maintenance under the Technical Intern Training Program for Foreigners. The photographs and illustrations used in this manual were prepared with the cooperation of related companies in the four prefectures of the Chubu region based on the same judgment principles as those applied in the original. The translation of the English edition was supervised by an automobile mechanic; however, it should be used under the responsibility of a host company.

<sup>11</sup> Hereinafter, accidents at work are described as “accidents”, as in the original text.

### To prevent accidents [1]

A mechanic was carrying out work in the pit without wearing a hat, and suffered lacerations when he hit his head against the bumper.



### To prevent accidents [2]

While conducting an engine noise check with sleeves rolled up, a mechanic got his sleeve caught in the fan belt and suffered lacerations.



### To prevent accidents [3]

A mechanic entered the pit wearing work clothes that were too big, the hem became entangled, and he fell over and suffered a bone fracture.



## (2) Precautions for each task

### 1) Lift work (2 columns, 4 columns, plate type)

#### [1] Daily inspections and checks before starting work

- The lift should move up and down smoothly without any abnormal noises.
- There should be no oil leakage or oozing from cylinders.
- The safety lock should operate smoothly and reliably.
- The operating switch should provide a click feeling and operate reliably.
- The cradle should not be bent, cracked, or damaged.

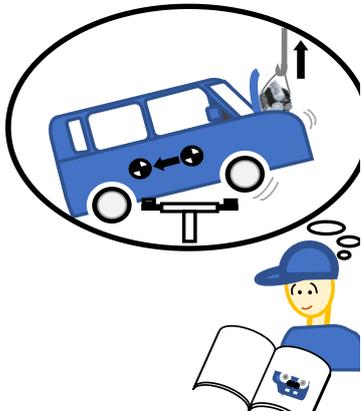
#### [2] Precautions when carrying out work

- Check the vehicle center of gravity in the service manual beforehand.
- Check the vehicle lift up point in the service manual. (The vehicle body will become deformed if the rigid rack is placed in a wrong location.)
- With the vehicle slightly raised, shake it lightly to confirm that it is stable.
- When operating the lift, call out to those around you to ensure that it is safe to begin.
- The wearing of helmets is recommended when carrying out work underneath raised vehicles.
- Lower the lift after ensuring that there are no people or transmission jacks, etc. underneath.
- Always apply the safety lock during work.
- When interrupting the work, lower the lift to the bottom.
- If the vehicle looks like it is about to fall, move away from the vehicle as quickly as possible without attempting to support it.



Photo: Courtesy of BANZAI, LTD.

### To prevent accidents [1]



Check the vehicle center of gravity in the service manual.



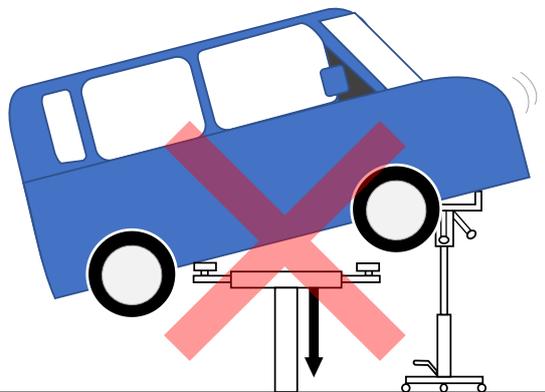
Check the stability of the vehicle with it slightly raised.

### To prevent accidents [2]

When operating the lift, call out to those around you to check safety.



### To prevent accidents [3]



Ensure that there is nothing underneath when lowering the lift.

## 2) Garage jack, pantograph jack work

### [1] Daily inspections and checks before stating work

- Hydraulic valves should operate smoothly, and there should be no oil leakage. (hydraulic type)
- Air valves should operate smoothly, and there should be no air leakage. (air type)
- Saddle should not be bent, cracked, or damaged.
- It should be possible to maintain the jack height for a certain time period.
- The wheels should rotate smoothly.

### [2] Precautions when carrying out work

- Jacks should be used on flat, firm ground.
- Do not get into the vehicle while it is supported only with a garage jack.
- Do not use jacks and lifts together.
- Be sure to apply wheel stops to wheels that are in contact with the ground.
- Ensure that the saddle is firmly secured to the jack body. (There should be no abnormal play or tilting.)
- Check the vehicle jack-up points in the service manual. (The vehicle body will become deformed if the jack is placed in a wrong location.)
- Support jacked up vehicles with rigid racks. (Jacks are not capable of supporting the vehicle continuously.)

Note: Rigid racks must be placed at the specified locations.

- Do not move the vehicle while it is jacked up. (The vehicle will become deformed if the saddle disengages from the jack-up point.)
- Before lowering the jack, ensure that there is nothing underneath.
- Do not operate the relief handle abruptly.

(Do not loosen all at once, but operate a little at a time while watching the vehicle go down.)

Relief valve should operate smoothly.



Pin should not be bent or damaged.

Saddle should not be bent, cracked, or broken.  
Should be possible to maintain height for a certain time period.

Pedal should operate smoothly.

Photo [1]



Photo [1] [2]: Courtesy of BANZAI, LTD.

Cradle should not be bent or damaged.



Legs should not be bent or damaged.

Photo [2]



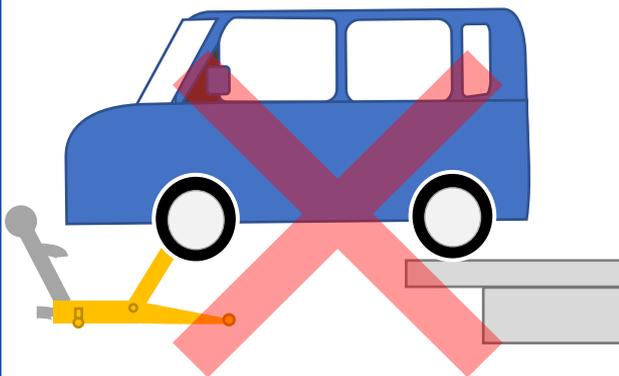
Also use wheel stops.

To prevent accidents [1]



Check the jack-up position beforehand.

To prevent accidents [2]

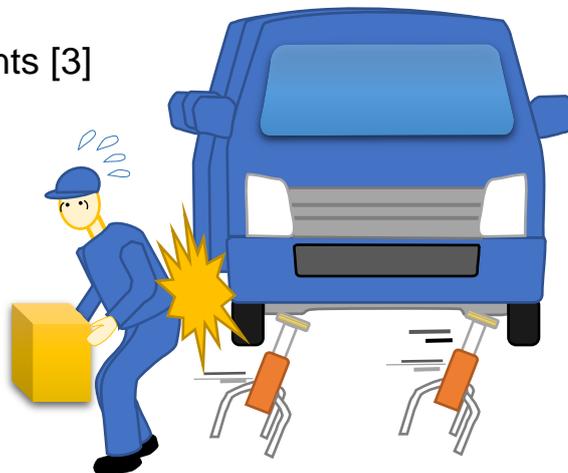


Do not use jacks and lift together.



Turn the handle slowly.

To prevent accidents [3]



Ensure that legs of rigid rack are not pointing in the same direction.

### 3) Transmission jack work

- Carry out work with others, and not on your own. In cases such as where the vehicle becomes unbalanced, move away from the vehicle as quickly as possible without attempting to support it.
- If carrying out work on raised vehicles, raise the jack cradle with extreme care to ensure that the vehicle is not apart from the lift. (The lift must not be lowered.)
- When removing parts from a raised vehicle, pay close attention to changes in the vehicle's center of gravity.

#### ■ Daily inspections and checks before starting work

- Cradle should not be damaged.
- There should be no oil leakage or oozing from cylinders.
- The cradle should be raised and lowered smoothly.
- The lift pedal and wheels should move smoothly.

#### ■ Precautions when carrying out work

- Ensure that the weight of parts being removed is within the permissible load.
  - Use jacks on flat, firm ground.
  - Secure a location for placing parts, as well as a movement path before removing parts.
  - Place parts in a stable condition while checking the part center of gravity.
  - Thoroughly check to ensure that all hoses or harnesses have been disconnected before lowering the jack.
  - Adjust the positions with the jack, not with the lift. (Do not lower the lift.)
  - When raising the vehicle, be careful not to let the vehicle be apart from the lift cradle.
  - When removing parts, pay close attention to changes in the center of gravity of the raised vehicle.
  - Do not place hands between the parts and the transmission jack for support.
  - When moving the jack, be sure to do so with the cradle lowered to its lowermost point.
- If it is difficult to stabilize, secure the jack and transmission with a chain, etc.
- Secure a sufficient work space to escape in the unlikely event such as the vehicle collapses.

### To prevent accidents [1]

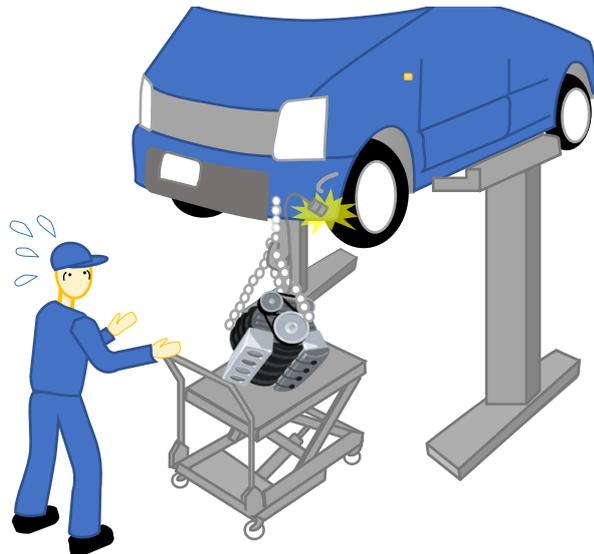
There is always a danger of parts or tools being dropped even when being careful, and therefore you must wear safety shoes when entering the factory. Furthermore, any objects protruding out into passageways may lead to injury, and therefore keep the inside of the factory clean and tidy at all times.



Object drops on foot.

### To prevent accidents [2]

When removing the AT (automatic transmission) assembly, the worker forgot to disconnect the harness connector. The AT assembly was subsequently pulled by the harness, resulting in loss of balance, and the transmission fell from the jack onto the worker's foot, resulting in injury.



#### 4) Hoist and chain block work

- Use a batten, etc. to protect parts from damage caused by wires or chains.
- Do not lift objects that are heavier than the weight limit.

##### ■ Daily inspections and checks before starting work

- Chains should not be broken or have open links.
- Gear parts should move smoothly.
- Hooks should not be bent.

##### ■ Precautions when carrying out work

- Ensure that the weight of parts being hoisted is within the permissible load capacity.
- Secure a location for placing parts, as well as a movement path.
- Decide the position to which the hook is attached taking the part's center of gravity into consideration.
- Thoroughly check to ensure that all hoses or harnesses have been disconnected before hoisting parts.
- When hoisting parts such as engine assemblies from raised vehicles, be careful not to let the vehicle be apart from the lift cradle.
- When hoisting parts such as engine assemblies from raised vehicles, pay close attention to changes in the vehicle's center of gravity.
- Do not wind chains when they are slack.
- When not carrying out work, move the hoist to a place where it will not get in the way. (Do not leave it on traffic lines.)
- Secure a sufficient work space to escape in the unlikely event that chains or wires break, or hooks come off.

#### Caution!

Qualifications are required for hoisting work.

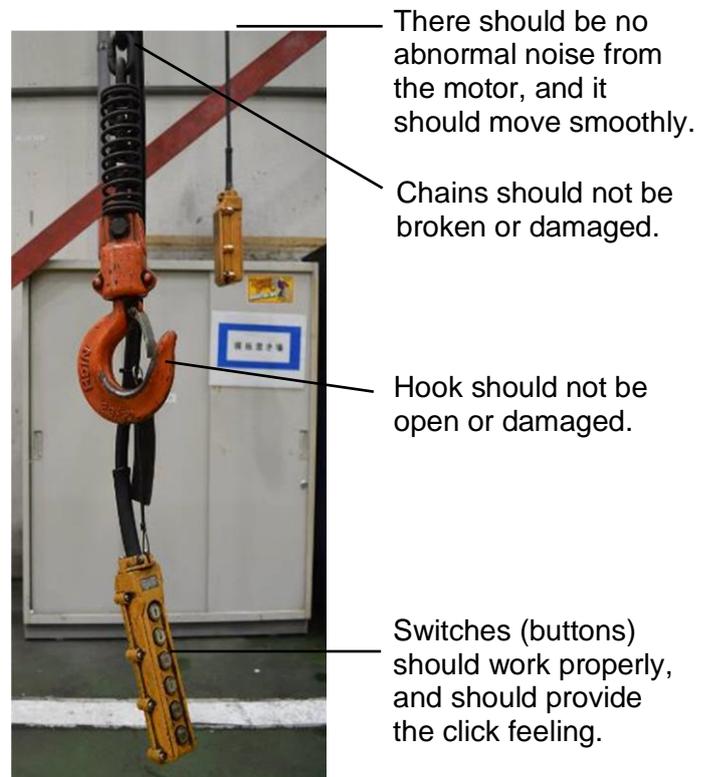
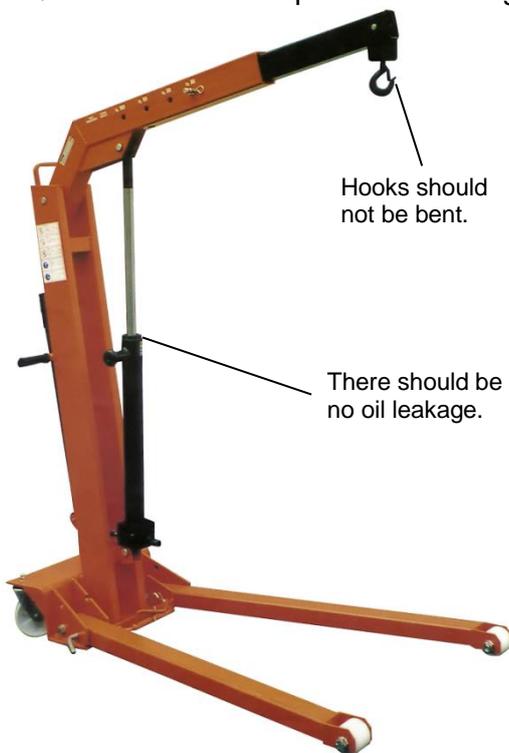


Photo: Courtesy of BANZAI, LTD.

To prevent accidents [1]



Raise parts slowly from directly above.

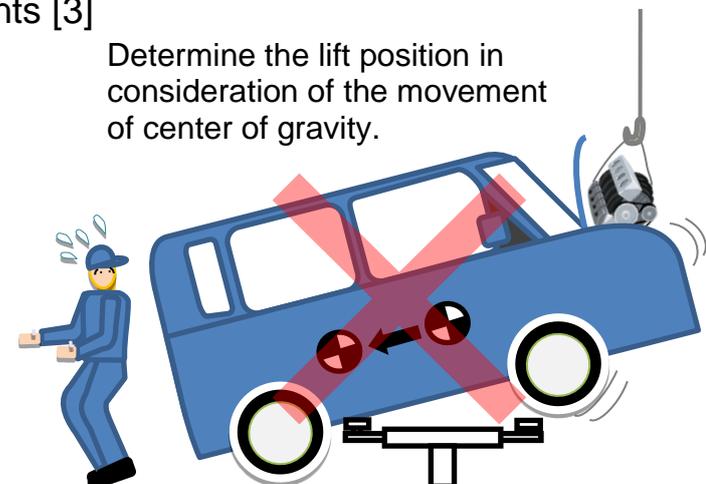
To prevent accidents [2]



There is a risk of gear damage if parts are hoisted with chain slack.

To prevent accidents [3]

Determine the lift position in consideration of the movement of center of gravity.



## 5) Wheel balancer work

### ■ Daily inspections and checks before starting work

- Abnormal rotation or abnormal noises during operation should be checked.

### ■ Precautions when carrying out work

- Fit wheels securely.  
→ Accurate balance adjustment will not be possible when the center of the wheel has shifted or there is any rattling.
- Rotate wheels by hand to ensure that “there is no looseness or rattling when fitted”, and that “there is no foreign material trapped in the tire tread grooves”.  
→ Foreign matter will be scattered by centrifugal force, which is dangerous.
- Do not touch the wheels until they have completely stopped rotating. (Do not hold tires by hand.)
- When standing up, be careful not to hit your hips or lower back against the shaft.



Photo: Courtesy of BANZAI, LTD.

To prevent accidents [1]



Do not stop wheels by hand.

To prevent accidents [2]



Pay attention to the shaft when standing up.

To prevent accidents [3]



A small pebble flew out while the wheel balancer was rotating.

<Example>

When the wheel was set on the wheel balancer and rotated, a small pebble caught in the tread groove of the tire flew out, causing injury to the forehead.

## 6) Tire changer work

### ■ Daily inspections and checks before starting work

- Turntable rotation should be smooth, and there should be no abnormal noises.
- The arm and clamp should move smoothly.
- There should be no air leakage. (pneumatic type)

### ■ Precautions when carrying out work

- Do not place your foot on the pedal except during operation.
- Be careful not to damage the wheel with the turntable or the mounting head of the arm.
- Be careful not to damage the wheel by holding it with the bead breaker.
- When a tire is inflated and the bead is fitted following tire change, it makes a loud “bang” sound and inflates vigorously (bead fits to the rim flange). Therefore, never place objects or hands on tires when inflating them.
- Overfilling the tires may cause them to burst. Before inflating tires, check them for cracks or damage, confirm that air pressure on site has been adjusted to the appropriate pressure, and then inflate them at a safe distance (avoid getting too close).

\* When inflating tires, be sure to set them in the changer.



Photo: Courtesy of BANZAI, LTD.

### **Caution!**

Tire inflation work must be carried out by qualified personnel (those who have completed special education on tire inflation).

(Item 33 of Article 36 of Ordinance on Industrial Safety and Health) (Article 20 of Rules on Special Education for Safety and Health)

### To prevent accidents [1]



Operate pedal after confirming contact position.



Do not rotate turntable without locking arm.

### To prevent accidents [2]



Finger trapped in tire changer.

#### <Example>

When changing a tire using the tire changer, a worker accidentally pressed the pedal and rotated the turntable, and trapped their finger between the wheel and the tire.

### To prevent accidents [3]



Tire burst while being inflated.

#### <Example>

When inflating a tire following tire change, a worker had difficulty in fitting the bead into the prescribed position. So, he inflated the tire with a higher pressure than standard, and subsequently caused a burst. Tire fragments hit the worker's face when it burst, causing injury to the face. The explosive sound also caused damage to the worker's eardrum.

## 7) Tire change work

### ■ Precautions when carrying out work

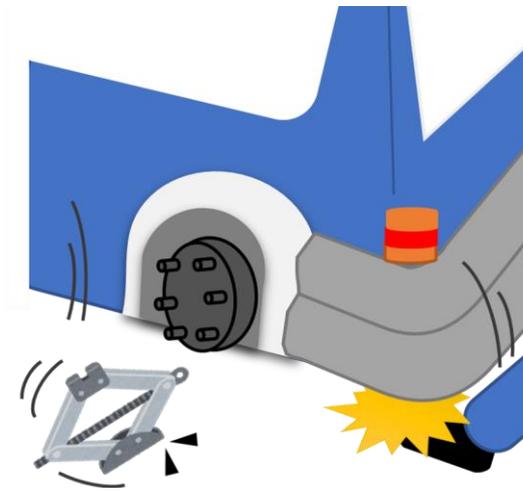
- Check the appropriate air pressure beforehand, and be careful not to fill tires with too much air. (Tires should be fitted to the vehicle before inflating them.)
- Check the tire rotation direction in the service manual or owner's manual.
- Be careful not to over-tighten the wheel nuts. (Wheel nuts should not be fully tightened with an impact wrench, and the tightening torque should be controlled with a torque wrench.)
- Be careful not to damage the wheel when holding it with the bead breaker of the tire changer.
- When tires are inflated and the bead is fitted following tire change, they make a loud "bang" sound and inflate vigorously (bead fits to the rim flange). Never place objects or hands on tires when inflating.
- Overfilling the tires may cause them to burst. Before inflating tires, check them for cracks or damage, confirm that the air pressure on site has been adjusted to the appropriate pressure, and then inflate them at a safe distance (avoid getting too close).

### **Caution!**

Tire inflation work must be carried out by qualified personnel (those who have completed special education relating to tire inflation).

(Item 33 of Article 36 of Ordinance on Industrial Safety and Health) (Article 20 of Rules on Special Education for Safety and Health)

### To prevent accidents [1]



#### <Example>

When a worker was changing a tire with a car jack in a gravel parking lot, the jack slipped, and his left foot was trapped between the vehicle and the road surface. The cause of accident was insufficient confirmation of the ground condition when using the jack.

### To prevent accidents [2]



#### <Example>

When the removed front wheel was leaned against the tool box during vehicle inspection/maintenance, the wheel fell over and hit the worker's right foot. The cause of the accident was that the place to put the removed wheel was unstable and the place was not specified.

## 8) Grinder and drill press work

### 1. Grinder work

(1) Application: Used to polish workpieces.

(2) Types, structures, and functions

- Types: Double-ended type, disk type
- The double-ended type on the right (Fig. 1) consists of a motor, grinding wheels, a base, etc. Flat type grinding wheels are generally used, and those with different sized grains on the left and right sides are generally mounted. This type is used to remove burrs from parts and tools, and to sharpen drills and lathe cutting tools.
- The grinder on the right (Fig. 2) is a handheld type, and is compact, lightweight, and portable. This type uses a grinding wheel that is relatively thinner than those on double-ended grinders, and is used for surface treatment after welding, for deburring, and in some cases, for cutting material.



(Fig. 1)



(Fig. 2)

Photo: Courtesy of BANZAI, LTD.

(3) Precautions

\* Maintenance: Grinding wheel replacement and trial runs must be conducted by “those who have completed special education”.

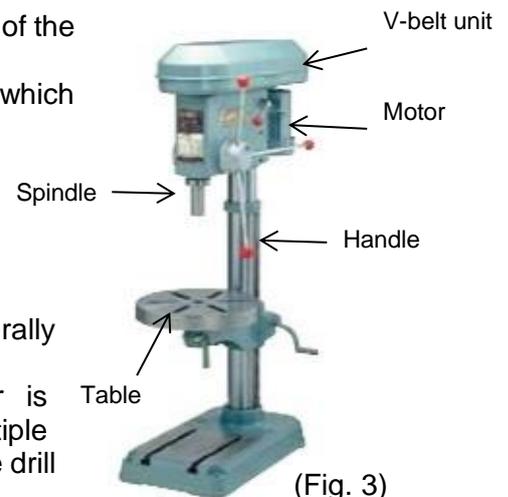
- Idle the grinder for at least 1 minute before starting work to check for any abnormal noises or vibration.
- Be sure to wear safety glasses and a dust mask.
- Never use grinders without a safety cover.
- Never use the surface other than the specified surface of the grinding wheel.
- Ensure that there is no one present in the direction in which grinding powder is scattered.

### 2. Benchtop drill press work

(1) Applications: Used for drilling holes in metal or wood materials.

(2) Types, structures, and functions

- Used for drilling both large and small holes, but is generally used for drilling holes of 13 mm or wider.
- Fig. 3 shows a typical drill press. Motor power is transmitted to the spindle via a V-belt and built-in multiple pulleys to change the rotation speed depending on the drill diameter and workpiece material.
- The spindle is fed with the handle, and the amount of feed is shown with graduations on the spindle.
- The table can be moved up and down, left and right, or tilted to a suitable position and secured to make it easier to carry out drilling work depending on the size of the workpiece.



(Fig. 3)

Photo: Courtesy of BANZAI, LTD.

(3) Precautions

- Do not carry out work with gloves on.
- Holes should be punched at the drilling position.
- If there is a possibility that the workpiece may rotate together with the drill, secure the workpiece in a vice beforehand.
- Do not use benchtop drill presses in places with materials which pose a risk of ignition or explosion.
- Drill bits should be securely fitted.
- Do not apply excessive force.

### To prevent accidents [1]

**During deburring of the section of a steel plate with a handheld grinder, a rotating grinding wheel hit the worker, who subsequently died.**



#### <Conditions under which accident occurred>

This occurred when a worker was deburring the section of a steel plate with a handheld grinder. The accident occurred when the grinder recoiled for some reason during cutting, and the rotating grinding wheel hit the worker. The worker was wearing work clothes, safety shoes, and cotton work gloves, but was wearing no protectors.

#### <Causes> Conceivable factors

- [1] There was insufficient work space.
- [2] The worker was not wearing protectors to prevent contact with the grinding wheel during rotation.
- [3] Health and safety training was not provided.

#### <Countermeasures>

- [1] Secure sufficient work space.
- [2] Enforce the wearing of protectors.
- [3] Provide safety training.

### To prevent accidents [2]

**“Chips” scattered during drilling with a benchtop drill press. A chip got into the worker’s eye, resulting in ocular trauma.**



#### <Conditions under which accident occurred>

Chips scattered while a worker was drilling holes in a steel plate. A chip pierced the right eye of the worker.

#### <Cause>

The worker was not wearing safety glasses.

#### <Countermeasures>

Always use safety glasses when working with benchtop drill presses, no matter how short the length of time that work is carried out. Thorough safety training

### To prevent accidents [3]

#### [3] Fire caused by sparks from grinder.

Cause: Combustible material was placed nearby, or was present.

Countermeasure: Clean and check the workspace.

#### [4] -1 Using the wrong side of the grinding wheel of the benchtop grinder led to a damage.

Cause: The worker did not know that there was a particular surface that was to be used.

Countermeasure: Enforce safety training.

#### [4] -2 While performing a trial run with a disk grinder to which a non-standard grinding wheel had been mounted, the wheel fragmented, injuring a worker nearby.

Cause: A non-standard grinding wheel was mounted.

Countermeasure: Enforce safety training.



## 9) Car washing and parts cleaning

### 1. Car washer

(1) Application: Used to clean the exterior and underbody of vehicles.

(2) Types and car washing methods

Types of car washers include hot water car washers (Fig. -1), steam cleaners, and car washers, etc.

- Body exterior: The most common type is gantry car washing machine (Fig. -2).
- Underbody: High-pressure water spray gun (Fig. -3). Avoid using this tool for the parts inside the engine room as best as possible.

(3) Precautions

[1] The vehicle exterior is washed after maintenance work is complete, but the consent of the customer must be obtained.

[2] When cleaning inside the engine room with a high-pressure water spray gun, do not apply directly to electrical or electronic components.



(Fig. -1)



(Fig. -2)



(Fig. -3)

Photo: Courtesy of BANZAI, LTD.

### 2. Parts cleaning

(1) Application: Used for cleaning parts.

(2) Types, structures, and functions

- Fig. -4 shows an example of a parts washer having a washing table, a filtration tank, an oil transfer pump, and a return valve.
- When washing parts, wash oil in the filtration tank is pumped up to the washing table by an oil transfer pump.
- After use, the oil is returned to the filtration tank by the return valve, where mud and dirt are separated and filtered.

(3) Precautions

- The prescribed amount of kerosene or dedicated wash oil should be used for the wash oil.
- Never use highly flammable solvents such as gasoline or thinner.

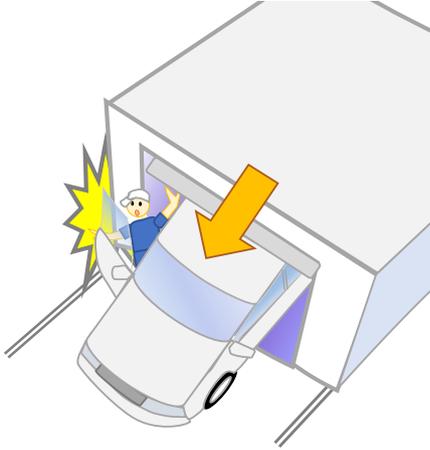


(Fig. -4)

Photo: Courtesy of BANZAI, LTD.

### To prevent accidents [1]

**When getting out of the driver's seat, the driver became trapped between the washing machine frame and the front door.**



#### <Conditions under which accident occurred>

- When the driver opened the door and got out of the car for some reason, he was caught between the car washing machine frame that was turning back and the front door.

#### <Causes>

- [1] The worker tried to get into or out of the car while the car washer was running.
- [2] An insufficient number of emergency stop buttons had been installed.
- [3] No training on how to operate the car washer had been provided.
- [4] No safety education had been provided for employees.

#### <Countermeasures>

- [1] Post a notice indicating that "Do not get into or out of the vehicle while the car washer is running", and provide regular car wash safety training.
- [2] Take safety measures, install surveillance cameras, and increase the number of emergency stop buttons.

### To prevent accidents [2]



#### <Conditions under which accident occurred>

- The worker's palm got dirty when cleaning mud from the inside of the wheelhouse, and he suffered a laceration when holding his palm over the water spray gun nozzle to wash it.

#### <Causes>

- [1] The worker was not aware of the power of the high pressure water.
- [2] No training on operation methods had been provided.
- [3] No safety education had been provided for employees.

#### <Countermeasures>

- [1] Post a notice to the effect that "Do not point the water spray gun at anyone".
- [2] Provide safety training on high-pressure washer work regularly.

#### <Other precautions>

The water temperature can be set to 80°C or higher. Both the water and nozzle will become very hot, and be careful not to burn yourself. Use protective equipment.

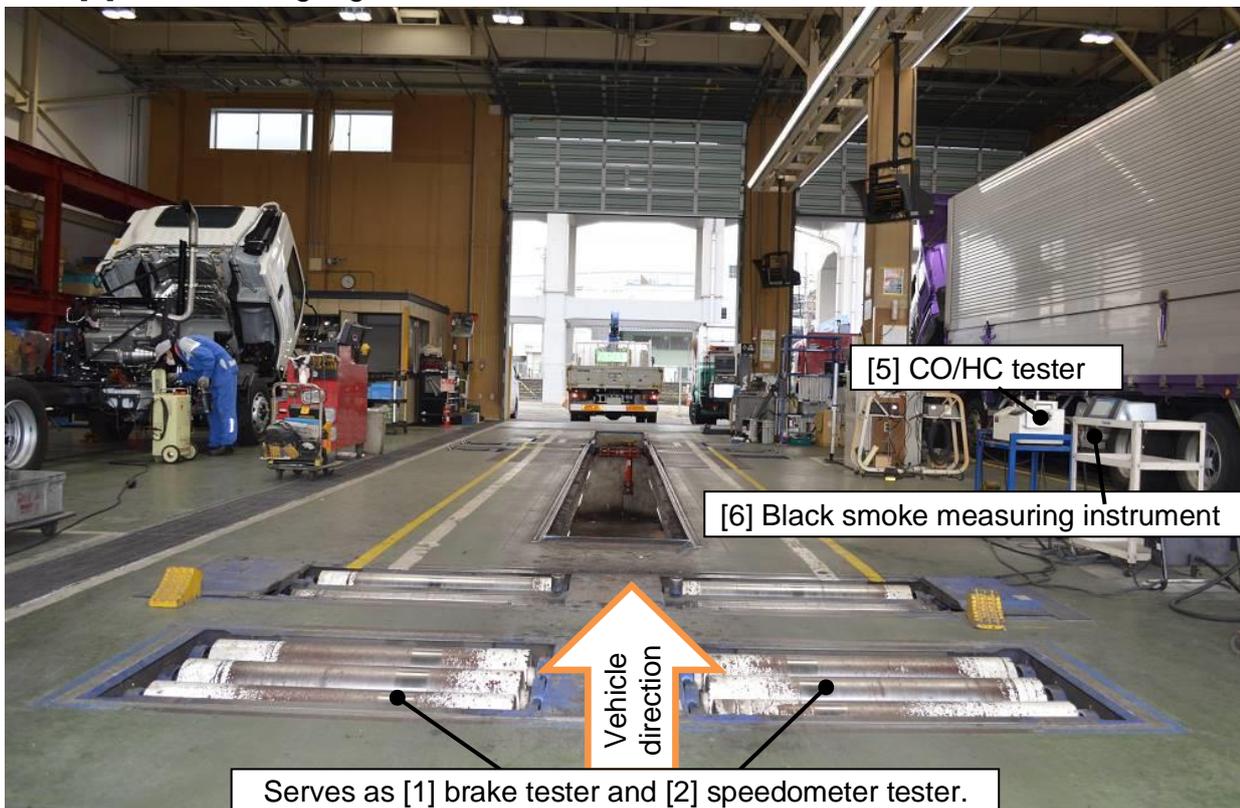
## 10) Inspection line work

### Inspection equipment

(1) Application: Equipment used mainly for continuous inspection (vehicle inspection)

(2) Types and functions

- [1] Brake tester: Used to measure the braking force of front, rear, and parking brakes.
  - The braking force and difference between the right and left sides are checked by operating the front wheel brakes, rear wheel brakes, and parking brake.
- [2] Speedometer tester: Used to measure the indication error of the speedometer, as well as pointer oscillation.
  - The vehicle to be inspected is driven at its speedometer reading 40 km/h on the tester, and the error with the tester measurement value is checked.
- [3] Headlight tester: Used to check headlight luminous intensity and alignment of the main optical axis.
  - At a distance of 1 m between the tester and headlights, the luminous intensity of the main beam and the alignment of the main optical axis are checked.
- [4] Sideslip tester: Used to measure front wheel sideslip.
  - Sideslip is checked when driving slowly on the tester (1 m) (steering wheel is held lightly).
- [5] CO/HC (carbon monoxide/hydrocarbon measuring instrument) tester: Used to measure concentrations of CO and HC in the exhaust gas of gasoline-engine vehicles.
  - CO and HC concentrations are checked by inserting a probe into the exhaust pipe while the warmed up engine is idling.
  - Units: CO (%), HC (ppm)
- [6] Smoke meter (black smoke measuring instrument): Used to measure the concentration of black smoke in the exhaust gas of diesel-engine vehicles.
  - A probe is inserted into the exhaust pipe, and exhaust gas is drawn with a pump while the vehicle is accelerating. The black smoke concentration is then checked by examining dirty filter paper. Unit: Degree of filter paper contamination (%)
- [7] Sound level gauge: Used to measure horn volume and exhaust noise volume.



## To prevent accidents [1]

A worker entered the inspection line, and stumbled and fell on the multi-tester (brake/speedometer tester)

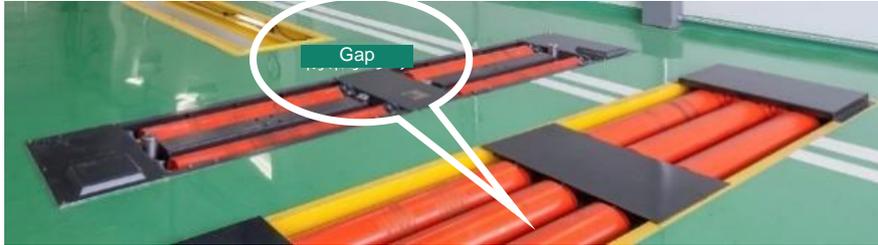


Photo: Courtesy of BANZAI, LTD.

### <Conditions under which accident occurred>

- While cleaning the tester, a worker accidentally stepped on a roller, the roller moved, and the worker caught their foot in the gap, resulting in a sprain.

### <Causes>

- [1] There was no fence to prohibit entry to the inspection line.
- [2] The worker did not realize that the rollers rotate even when testing is not being carried out.
- [3] There were no countermeasures for dangerous locations in place.
- [4] No safety education had been provided for employees.

### <Countermeasures>

- [1] Post signs warning workers of dangerous locations.
- [2] Provide regular safety training to employees.

## 11) Pit work

### Pit work - Point of work

- Pits are openings in the ground that allow work to be carried out underneath vehicles without having to raise them.
- Pits make it easier to change oil and inspect the underbody.
- You can work in a standing position at pits.
- Pits are suitable for trucks when attaching and detaching transmissions, etc.

### Precautions

- Wear helmets at all times.
- Keep pits clean at all times because there is a tendency for moisture to build up.
- Wipe immediately any oil or water spilled on the pit floor. Wet floor is slippery and dangerous.
- When pits are not in use, take measures to prevent workers from falling in.  
(Examples: Enclosure with chains, installation of triangular cones, applying yellow tape/paint to the edges of pits to indicate danger, etc.)
- Pits are narrow, and therefore be careful not to hit the walls when working.



### Accident example [1]

- A worker fell into the pit because no fall prevention measures had been taken.
- The worker was not wearing a helmet, and suffered an injury to the head.



### To prevent accidents

- Use stairs properly for climbing down into the pit as shown on the right.
- The floor may be slippery, and it is dangerous to jump down into the pit.



## 12) Replacement, attachment and removal of large components

### Replacement, attachment and removal of large components - Point of work

#### Team work

Maintenance work is often carried out in teams of two or more workers.

If your team has poor communication and cooperation, and if the skills and physical strength of each team member is different, you may be involved in unexpected accidents.

When carrying out work in teams, your team members must hold meetings beforehand to decide each other's roles, and to confirm "signals" to be used during work.



Always check through such methods as pointing and calling, or telling what you are going to do.



### To prevent accidents [1]

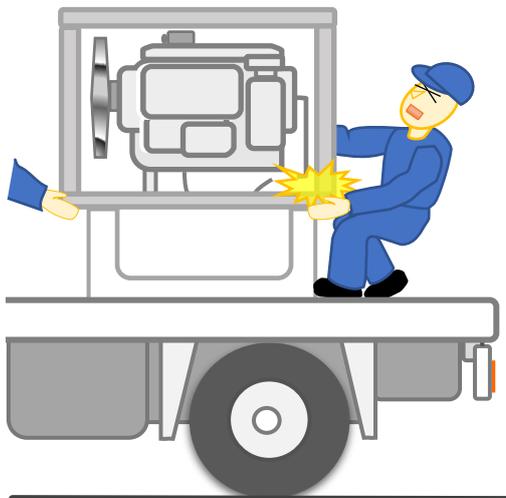


Heavy object drops on foot.

Even if you are careful, there is always a risk of parts or tools being dropped, and therefore you must wear safety shoes before entering the factory.

Furthermore, objects protruding out into other passageways may lead to foot injuries, and therefore keep the inside of the factory clean and tidy at all times.

### To prevent accidents [2]



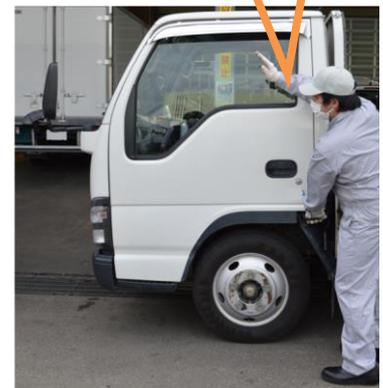
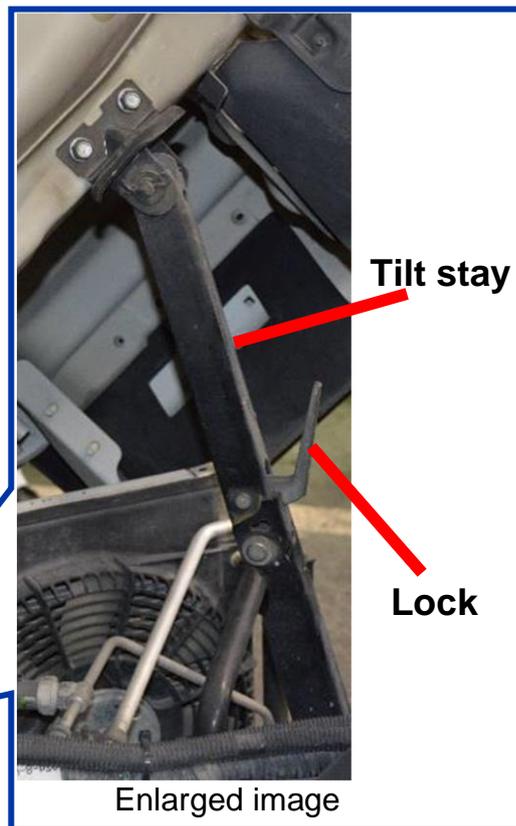
The workers failed to work together as a team.

#### <Example>

When unloading an engine from a vehicle with five people, one of the workers got their left hand caught between the steel frame of the engine packing and the truck bed.

### 13) Cab tilting

- Check items prior to cab tilting
- Park the vehicle on a level and flat ground when tilting up the cab.
- Ensure that there are no obstacles in front of or above the cab. (Pay utmost attention when vehicles are equipped with wind deflectors, etc.)
- Secure luggage in the cab or removed it from the cab to prevent it from sliding or toppling and breaking when tilting the cab.
- Unload any luggage on roof racks beforehand.
- Be sure to stop the engine beforehand.
- Do not tilt the cab with the headlights on. (vehicles with headlights installed on the cab front panel)
- Close the left and right doors securely. If the cab is tilted without closing the doors properly, the doors may fall open and be damaged.
- If absolutely necessary to open or close the doors with the cab tilted, support the doors firmly, and open or close them slowly. Never release doors while they are being opened or closed.
- After closing the doors, ensure that they have been closed properly.
- When tilting up the cab, give signals (tell what you are going to do) to warn other workers in the surrounding area.



### To prevent accidents [1]

- Be sure to confirm that the cab is locked when tilting the cab.
- If the cab is not locked completely, you will be trapped as shown on the right.
- Never try to support the cab if it falls.



### To prevent accidents [2]

- Ensure that there are no obstacles in front of or above the cab before tilting.
- Failure to carry out a thorough check will result in an accident as shown on the right.



## 14) Electrical equipment work

Observe the following precautions when carrying out electrical work.

- Ensure that electrical equipment or electrical devices with ground wire are properly grounded.
- Do not place flammable or explosive substances near motors or control panels.
- Check cables for coating damage or cuts before use.
- Do not touch machinery or switches (buttons) directly with wet hands.
- Use grounded outlets for retractable cable reels. Furthermore, cables can get hot, and therefore pull out the entire cable during use.
- Do not connect wires to distribution panels without receiving permission beforehand. (Permission required)
- In the case of a short circuit or accidental fire, turn OFF the switch (button) before putting out the fire.
- Never touch switches (buttons) with a "needs to be fixed"/"warning" tag attached.
- Keep away from cables with wire breaks, or cables that are dangling.
- A blown fuse is a danger signal indicating an electrical failure. Be sure to notify the relevant person concerned.
- Do not pass cables through wet or oily areas, or place them on hot objects or sharp edges.
- Do not pull cables forcefully, or step on them.

### To prevent accidents

- Touching with wet hands causes electric shock.



## 15) Battery handling

Observe the following precautions when handling batteries.

Batteries emit hydrogen gas at all times, and the electrolyte in batteries contains dilute sulfuric acid. Consequently, mishandling batteries may result in an accident or injury, and therefore make sure that you handle batteries properly.

Wear safety glasses and rubber gloves when handling batteries for inspection, etc.

### [The use of fire is strictly prohibited in work areas]

- Keep fire (lit cigarettes, grinder sparks, fire from stoves, etc.) away from work areas.
- Hydrogen gas emitted by batteries can ignite, causing an explosion.

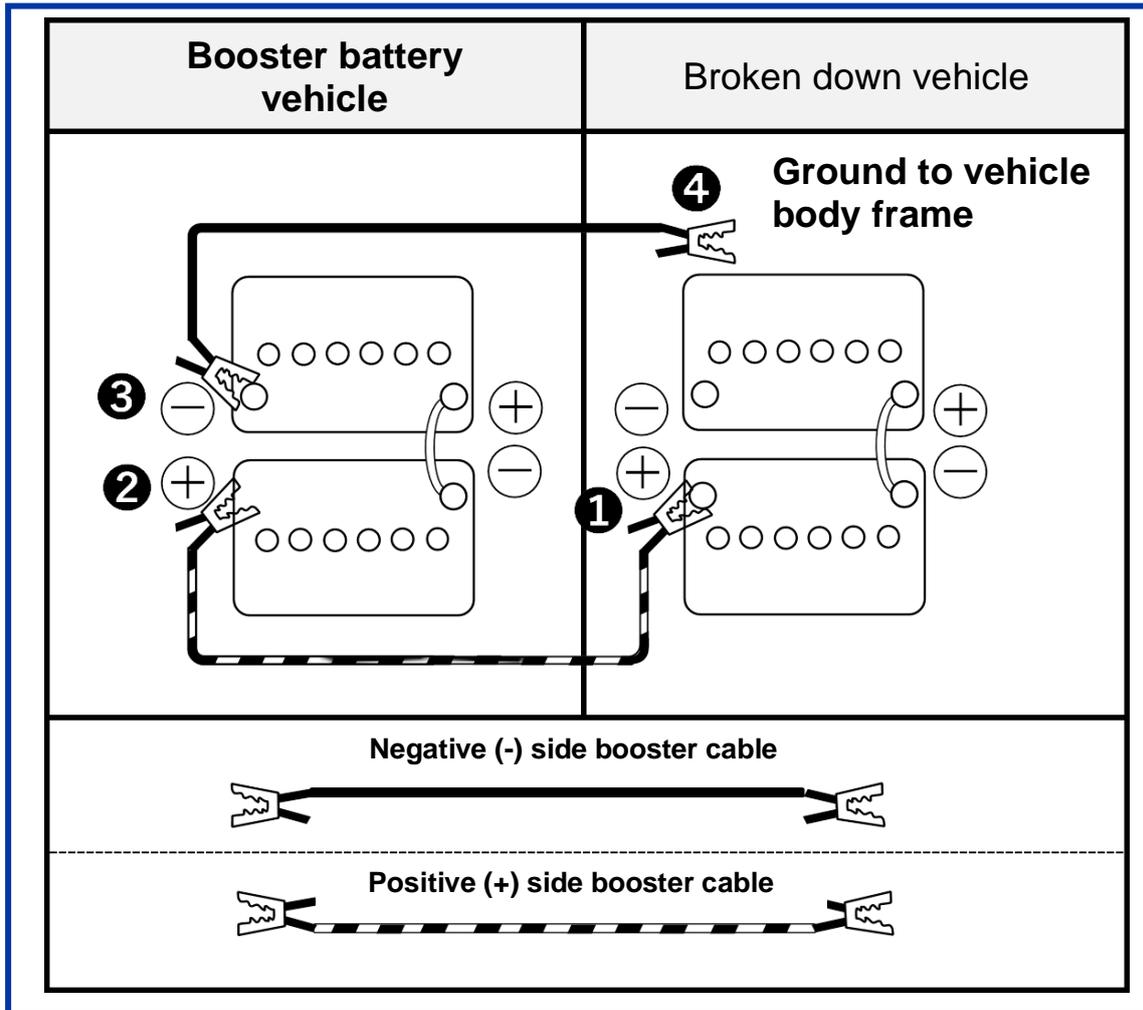
### [Handling booster cables]

Observe the following precautions when handling batteries.

- When connecting booster cables, never short the positive (+) terminal to the negative (-) terminal.
- Be careful not to get cables or clothing caught in the cooling fan or belt.
- Use normal car batteries that have the same voltage (12 V or 24 V) and same capacity as vehicles with flat batteries.
- Batteries emit flammable gas (hydrogen gas) while charging, and therefore keep fire (lit cigarettes, grinder sparks, fire from stoves, electric sparks, etc.) away from batteries, and do not handle batteries in work areas with fire.
- Since battery fluid contains dilute sulfuric acid, be sure to handle batteries with care.
- Do not pass cables through wet or oily areas, or place them on hot objects or sharp edges.
- Do not pull cables forcefully, or step on them.



- Starting the engine using a booster cable may lead to an accident, and therefore follow the correct procedure described in the instruction manual.
- In the interests of safety and to protect the vehicle, do not push vehicles to start the engine.
- The positive (+) and negative (-) electrodes must not be allowed to come into contact with each other.
- When connecting the booster cable, the clips must not be allowed to come into contact with each other.
- Do not disconnect the battery terminals while the engine is running, as this may cause electrical system failure.



- **Never use an open flame at site**



## 16) Welding and cutting work

Observe the following precautions when carrying out welding and cutting work.

- Inspect instruments and tools, and check hose connections for gas leakage before starting work.
- Fit a flame arrester to the torch side or cylinder side of gas and oxygen hoses.
- Provide fire extinguishers in a welding and cutting site.
- Use AC arc welders equipped with a “voltage reduction device”.
- When welding work is interrupted temporarily, be sure to remove the welding rod from the holder, and turn the welding machine power OFF when taking breaks.
- Be sure to turn OFF the power when taking breaks or when work is complete.
- Wear welding safety glasses (face shields) and the prescribed protective equipment during work.
- When using a welding machine, post a sign indicating that it is “In use”, and when not using it, post a sign indicating that it is “Not in use”.
- Use retractable cable reels only after pulling out the entire cable.

### [Before welding work]

- Remove the battery and disconnect any cables.
- Disconnect wire harnesses from all control units.
- Turn OFF all switches (buttons).
- Ground the welding machine as close to the point of welding as possible.



## To prevent accidents

- Wear protective equipment when welding

(safety glasses,  
face shields,  
leather gloves, etc.)



## Caution!

Welding work must be performed by qualified persons.

## 17) Other maintenance work

Points to note when working on transmission, leaf springs, etc., with the dump truck's vessel raised



The vessel is raised by hydraulic pressure.

The vessel will fall gradually if oil pressure leaks, and therefore do not work underneath the vessel.

### Note:Precautions



If absolutely necessary to work underneath the vessel, be sure to insert a "stopper" between the vessel and frame to prevent the vessel from falling.

**To prevent accidents: The worker hit their right index finger with a hammer.**



The drive shaft of a large tractor truck was placed on a dolly, and the spider was replaced. In order to remove the bearing, the worker hit the head of the bar with a hammer, but he accidentally hit his right index finger.

(The index finger of the worker's right hand which was holding a hammer hit against the head of the bar in the worker's left hand.)

**Precautions**

Use a press for removal as described in the service manual.

**To prevent accidents: The worker hit their left hand hard with a brake shoe.**

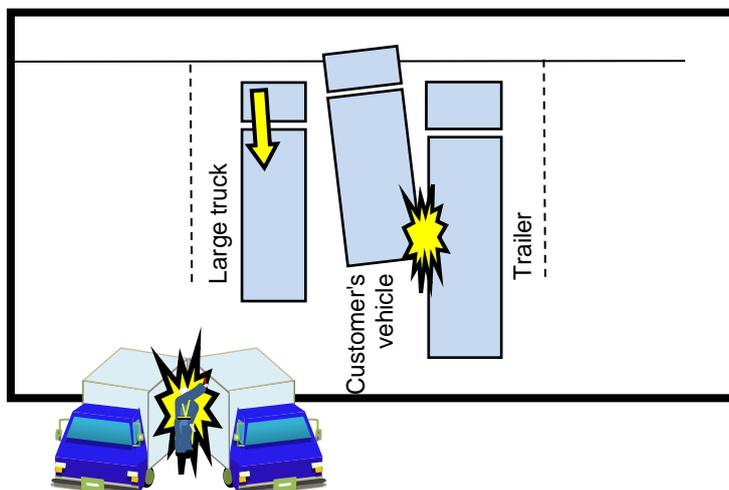


When installing the brake shoe after overhaul of the wheel cylinder, the return spring did not hook on properly, and the worker tried to fit it forcefully. As a result, the spring hook tool came off, and the worker hit their left hand hard against the brake shoe, resulting in injury.

**Precautions**

If unable to hook the spring on properly using the correct procedure, stop work, and resume again after reviewing the situation. Furthermore, be sure to wear cotton work gloves.

**To prevent accidents: The worker becoming trapped while guiding vehicle.**



The guide was standing on the right side of the reversing vehicle during guiding, but while doing so, was trapped between the vehicle and the adjacent parked vehicle.

**Precautions**

The guide must stand diagonally behind the reversing vehicle on the left where they are visible in the outside mirror, and must guide the driver by blowing a whistle.

## 18) Painting work

### Precautions

1. Equipment maintenance and inspection  
Inspect paint booths and drying equipment at least once a year, and record the inspection results in a periodic self-inspection sheet and retain the sheet for three years.
2. Handling of paints  
Tightly seal paint cans except during painting to prevent ignition or poisoning due to the vapor produced. In particular, the curing agent for two-component polyurethane resin paints consists mainly of isocyanate compounds, and the agent requires careful handling.
3. Waste cloth disposal  
In order to prevent spontaneous ignition due to high temperature and humidity, store waste cloths with paint, thinner, etc. in a safe place in a metal container.
4. Prohibiting open flames and keeping work area tidy and organized  
Watch out for welding sparks, lit cigarettes, and sparks caused by static electricity. Clean, organize, and tidy the inside of the factory to prevent accidents from occurring.
5. Clothes and respiratory protection  
In order to prevent the penetration of paint from clothing, wear suitable painting work clothes, a hat, gloves, as well as an organic vapor respirator.



### (3) 5S, environmental protection and work safety regulations

#### 5S

Before improvement



After improvement



Keep the workplace clean to improve work efficiency by properly implementing 5S (sort, set in order, sweep and shine, standardize, sustain).

#### Environmental protection

There is a risk of oil leakage when filters are thrown away casually.

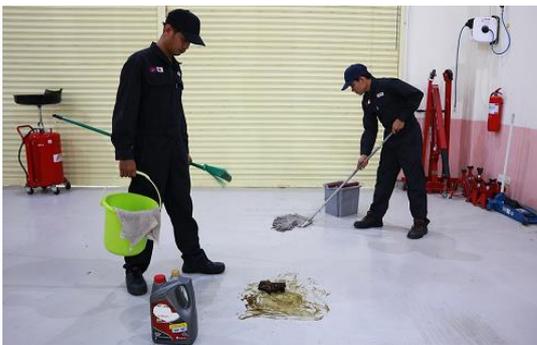


Discard oil and grease etc. in steel drums.



Do not spill oil, grease, or other oils and fats into drainage ditches, as this will lead to water pollution. Install oil/water separators to remove oil and mud, etc. leaked into the drainage ditch.

#### 5S, environmental protection



If oil and grease or water is spilled on the floor, there is a danger of slipping and falling, and therefore wipe it up immediately. Furthermore, be sure to return tools and maintenance equipment to their original locations after use, and do not leave them on the floor unnecessarily.

#### Work safety regulations



Be sure to wear appropriate protective equipment for your work.

Example: When using a grinder, wear a hat, safety glasses, dust mask, leather gloves, and safety shoes.

## 5. Reference Material and Links

You can also learn a lot from websites. Some useful links can be found in the following table. Please use them for your reference.

Reference materials	URLs of websites for downloading materials	Descriptions
	<p>Learn Through Manga The Safety and Health of the Automobile Maintenance Industry (Ministry of Health, Labour and Welfare) English edition <a href="https://www.mhlw.go.jp/content/11300000/05_Car_01English.pdf">https://www.mhlw.go.jp/content/11300000/05_Car_01English.pdf</a></p>	<p>Study material designed to ensure worker safety when carrying out automobile maintenance work. Manga story makes it easy to understand safe work procedures.</p>
	<p>Learn through Manga Health, Safety, and Injury Prevention for Workers (Ministry of Health, Labour and Welfare) English edition <a href="https://www.mhlw.go.jp/content/11300000/01_kyoutu_01English.pdf">https://www.mhlw.go.jp/content/11300000/01_kyoutu_01English.pdf</a></p>	<p>Describes the basics of safety and work-related accidents. An appendix sheet will help you communicate what is wrong with your body and health condition by pointing at pictures.</p>
	<p>Health and safety of workers explained with manga (educational material) (Ministry of Health, Labour and Welfare) <a href="https://www.mhlw.go.jp/stf/newpage_13668.html">https://www.mhlw.go.jp/stf/newpage_13668.html</a></p>	<p>Contains a list of all of the above material. You will also find teaching materials on other work (nursing care, manufacturing, food service industry, hospitality industry, etc.) Please share this URL with your friends.</p>
<p>Technical Intern Training Guidelines for Automobile Maintenance (Ministry of Land, Infrastructure and Transport) <a href="https://www.mlit.go.jp/common/001247297.pdf">https://www.mlit.go.jp/common/001247297.pdf</a></p>		<p>Guidelines for companies accepting technical intern trainees.</p>

Partner companies (listed in alphabetical order):

In preparing this teaching material, we received help from the following companies, including the provision of images and material for creating teaching materials, and feedback from field instructors and technical intern trainees.

BANZAI, LTD., Hitonomori Co. Ltd., ISUZU MOTORS CHUBU Co., Ltd., ReNet.jp HR Co., Ltd., SHINMEI INDUSTRY CO., LTD.

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