Body/equipment mounting directives

FUSO eCANTER

Australia

FUSO

Body/equipment mounting directives
FEA, FEB, FEC
Common Section

MITSUBISHI FUSO TRUCK & BUS CORPORATION
KAWASAKI, JAPAN

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1 Introduction

MITSUBISHI FUSO TRUCK & BUS CORPORATION, as the manufacturer of MITSUBISHI FUSO vehicles, publishes this body/equipment mounting directive to provide body manufacturers with important technical information about the basic vehicle. This information must be observed by the body manufacturer in the production of bodies and equipment, fittings and modifications for MITSUBISHI FUSO vehicles.

Due to the large number of body manufacturers and body types, MITSUBISHI FUSO TRUCK & BUS CORPORATION cannot take into account all the possible modifications to the vehicle, e.g. performance, stability, load distribution, center of gravity and handling characteristics, that may result from the design of attachments, bodies, equipment or modifications. For this reason, MITSUBISHI FUSO TRUCK & BUS CORPORATION can accept no body manufacturer liability for accidents or injuries sustained as a result of such modifications to the vehicles if such modifications have a negative impact on the overall vehicle. Accordingly, MITSUBISHI FUSO TRUCK & BUS CORPORATION will only assume liability as vehicle manufacturer within the scope of the design, production and instruction services which it has performed itself.

The body manufacturer is bound to ensure that its bodies and equipment, fittings and modifications are themselves not defective, nor capable of causing defects or hazards to the overall vehicle. If this obligation is violated in any way, the body manufacturer shall assume full product liability. The body/equipment mounting directives enable MITSUBISHI FUSO TRUCK & BUS CORPORATION to instruct the body manufacturer about important aspects that must be observed when mounting its bodies and equipment, fittings and modifications.

These body/equipment mounting directives are primarily intended for the professional manufacturers of bodies, equipment, fittings and modifications for our vehicles. As a result, these body / equipment mounting directives assume that the body manufacturer has suitable background knowledge. If you intend to mount attachments, bodies and equipment on or carry out modifications to our vehicles, please be aware that certain types of work (e.g. welding work on load-bearing components) may only be carried out by qualified personnel. This will avoid the risk of injury while also ensuring that the degree of quality required for the attachments, bodies, equipment and modifications is given.

1.1 The aim of these directives

These directives serve as instructions for the manufacture of attachments, bodies, equipment and modification to other make bodies and major assemblies. These directives are divided into 10 interlinked chapters to help you find the information you require more quickly:

Additional information

The index, in PDF format, is linked to help you find the information you require quickly.

Make absolutely sure that you observe the technical threshold values selected in Section 4 as planning must be based on these values.

Section 6 "Modifications to the basic vehicle" and Section 7 "Construction of bodies" represent the main source of technical information contained in these body/equipment mounting directives.

1.1 The aim of these directives

⚠ Risk of accident

Before installing any attachments, special-purpose bodies, equipment or carrying out any modifications to the basic vehicle and/or its assemblies, you must read the relevant sections of the Owner's Handbook, as well as the operating and assembly instructions issued by the manufacturer of the accessories and items of optional equipment.

You could otherwise fail to recognize dangers, which could result in injury to yourself or others.

The instructions listed herein must be observed in full to maintain the operational reliability and road safety of the chassis and for observance of material defect claims.

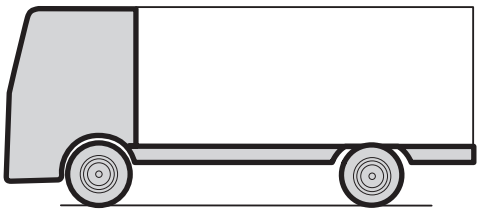
Illustrations and schematic drawings are examples only and serve to explain the texts and tables.

References to regulations, standards, directives etc. are given in keywords and serve for information only.

Additional information is available from an authorized MITSUBISHI FUSO authorized Distributer.

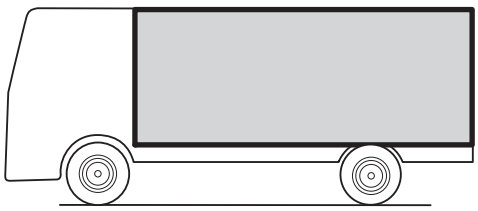
Your
MITSUBISHI FUSO TRUCK & BUS CORPORATION

The illustrations below explain the difference between "Basic vehicle" and "Body":



N00.00-3192-00

Basic vehicle



N00.00-3193-00

Body

1.2 Symbols

The following symbols are used in these directives:

Risk of accident

A warning draws your attention to possible risks of accident and injury to yourself and others.

Environmental note

An environmental note gives you tips on the protection of the environment.

Property damage

This note draws your attention to possible damage to your vehicle.

Additional information

This note points out any additional information.

▷

This symbol indicates the item on which you will find further information on the subject. These items are cross-linked in the PDF file.

1.3 Vehicle safety

⚠ Risk of accident and injury

The use of parts, assemblies or conversion parts and accessories which have not been approved may jeopardize the safety of the vehicle.

Before installing any attachments, special-purpose bodies, equipment or carrying out any modifications to the basic vehicle and/or its assemblies, you must read the relevant sections of the Owner's Handbook, as well as the operating and assembly instructions issued by the manufacturer of the accessories and items of optional equipment.

You could otherwise fail to recognize dangers, which could result in injury to yourself or others.

Official acceptance by public testing bodies or official approval does not rule out safety hazards.

In many countries, parts that make extensive changes to the vehicle can invalidate the general operating permit. Specifically, this concerns parts which:

- change the vehicle type approved in the general operating permit
- could endanger road users
- could adversely affect noise levels

ⓘ Additional information

Make absolutely sure that you comply with national registration regulations as attachments, bodies, equipment on or modifications to the vehicle will change the vehicle type approved and may invalidate the general operating permit.

Notes on vehicle safety

MITSUBISHI FUSO recommends

using appropriate parts only for each particular vehicle model.

1.4 Operational safety

⚠ Risk of accident

Before installing any attachments, special-purpose bodies, equipment or carrying out any modifications to the basic vehicle and/or its assemblies, you must read the relevant sections of the Owner's Handbook, as well as the operating and assembly instructions issued by the manufacturer of the accessories and items of optional equipment.

You could otherwise fail to recognize dangers, which could result in injury to yourself or others.

Work incorrectly carried out on electronic components and their software could prevent this equipment from working correctly. Since the electronic systems are networked, this might also affect systems that have not been modified.

Malfunctions in the electronic systems could seriously jeopardize the operating safety of the vehicle.

1.5 Accident prevention

Observe the requirements and precautions set out in this manual when carrying out body-building work or modification work.

The body, the attached or installed equipment and any modifications must comply with the applicable laws and ordinances as well as work safety or accident prevention regulations, safety rules and accident insurer requirements.

All technical means shall be used to avoid operating conditions that may be unsafe or liable to cause an accident.

All national laws, directives and registration requirements must be complied with.

The manufacturer of the attachment, body, equipment or conversion or the device manufacturer is responsible for compliance with these laws and regulations.

1.6 Note on copyright

All the text, illustrations and data contained in these body/equipment mounting directives are protected by copyright.

If you have any questions, contact the department responsible ▷ 2.2.

1.7 Parts order

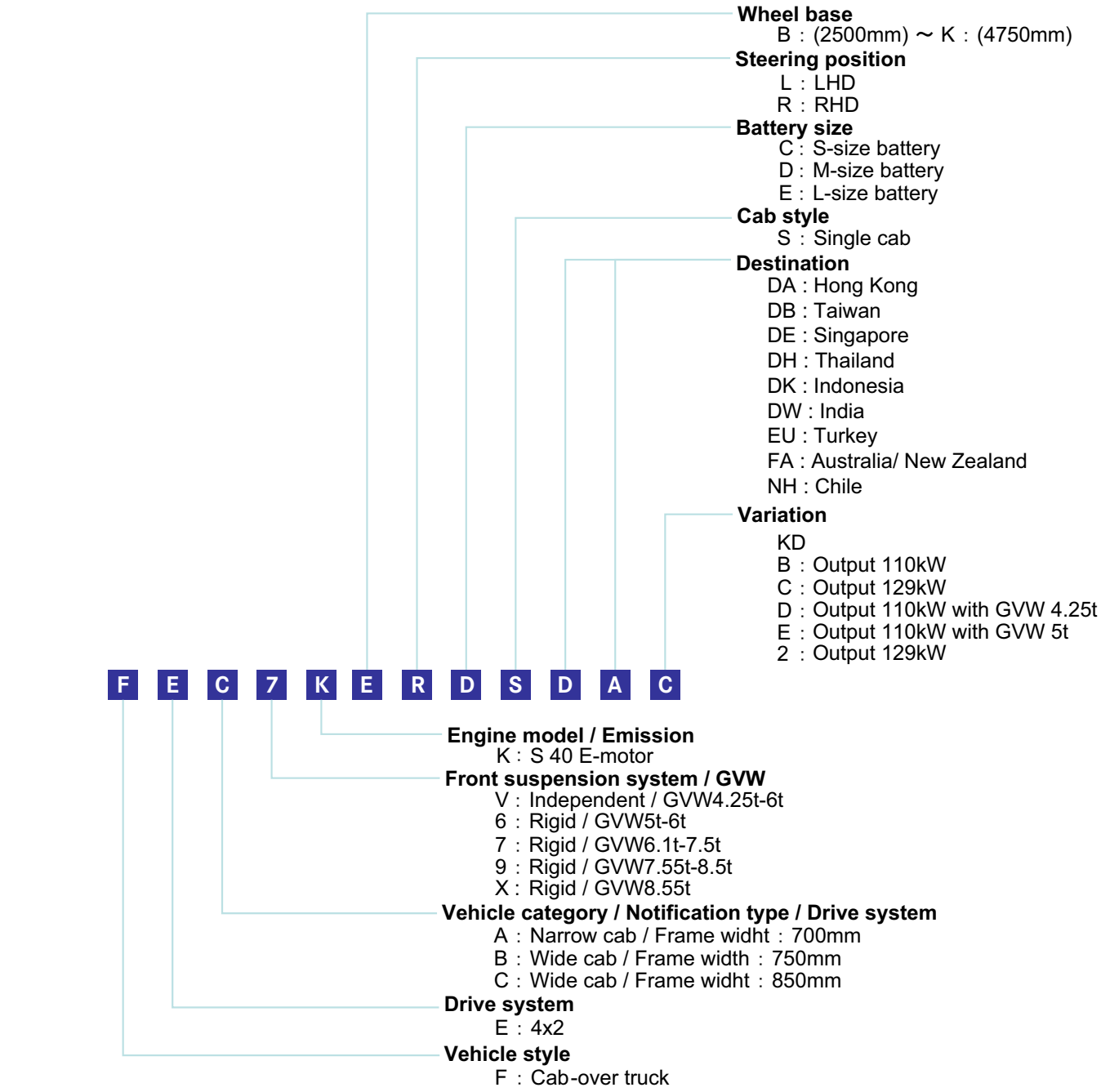
Use M******* (8 digits) as the parts numbers to purchase parts described herein.

Orders cannot be placed using parts numbers like (A**********).

Example:
MX929999(A0195450707)

2.1 Vehicle and model designations

2.1.1 Model coding system



2.2 Technical advice and contact persons

Please log in from the following BODYBUILDER PORTAL URL and contact us.
https://bb-portal.mitsubishi-fuso.com/en/

2.3 Product safety

Both the vehicle manufacturer and the body manufacturer must always ensure that they introduce their scopes into the market in a safe condition and that third parties are not at risk of any safety hazard. If this is not adhered to they may be subject to civil, criminal and public law consequences. Every manufacturer is liable for the products it manufactures.

From this, it follows that the vehicle body/conversion manufacturer therefore also bears responsibility for the following:

- the operating and road safety of the body
- the operating and road safety of parts and modifications
- testing and maintaining the operating and handling safety of the vehicle after the body/equipment is mounted (the body and/or equipment must not have a negative effect on the driving, braking or steering characteristics of the vehicle)
- influences of parts on or modifications to the chassis
- consequential damage resulting from the body, attachment, equipment or modification
- consequential damage resulting from retrofitted electrical and electronic systems
- maintaining the operational reliability and freedom of movement of all moving parts of the chassis after the body/equipment is mounted (e.g. axles, springs, drive shafts, steering, transmission linkage, etc.) even in the case of diagonal torsion between the chassis and the bodies

Be careful of the following points when carrying out body-building or modification work.

Safety design

- Securing adequate safety and reliability, and preparing safety devices (design which is fail-safe and takes account of misoperation and misuse, safety evaluation)
- Storing technical material, drawings and documents during development

Manufacturing quality

- Manufacturing according to the drawings in order to prevent errors, missing parts and defective assembly, and secure high manufacturing quality
- Implementing a quality confirmation inspection, and storing the records of the inspection
  Use the post-body-building/modification inspection sheet.

Preparing an instruction manual and warning indications

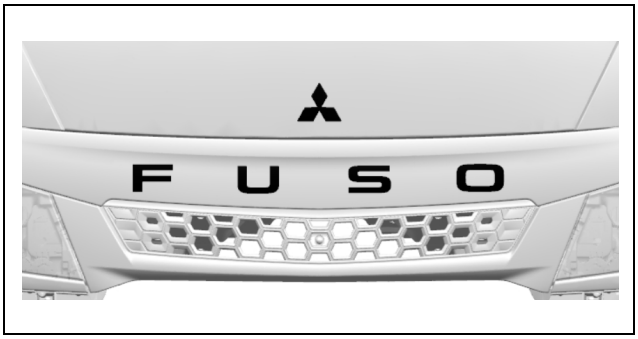
- Instruction manual
  Concrete indication of the effect of incorrect operation on the human body, the vehicle, and other locations (elimination of indications that are likely to cause misunderstanding, and also ambiguous expressions)
- Warning indications
  To ensure that the vehicle is used as safely as possible, warning indications must use expressions that are easy to understand and letters that are large enough to read easily, include pictures, and be applied to locations that are readily visible to the driver.

2.4 Ensuring traceability

Hazards in your implement/body which become known after delivery may necessitate supplementary measures in the market (customer notification, warnings, recalls). In order to make these measures as efficient as possible, your product must be traceable after delivery.

For this purpose and to enable the Federal Office for Motor Vehicles' Central Vehicle Register (ZFZR) or comparable registers abroad to be used for determining which owners are affected, we advise you to promptly file the serial number/identification number of your equipment/add-on part linked to the vehicle identification number for the truck in your databases.
Similarly, it is also advisable to store the addresses of your customers for this purpose and to grant subsequent purchasers the opportunity to register.

2.5 Mitsubishi three diamonds and Fuso emblem



The Mitsubishi three diamonds and Fuso emblem are owned or controlled by MITSUBISHI FUSO.

They must not be removed or affixed in another position.

Mitsubishi three diamonds and Fuso emblems supplied separately must be attached at the points specified by MITSUBISHI FUSO.

Overall appearance of the overall vehicle

If the vehicle fails to comply with the appearance and quality standards as required by MITSUBISHI FUSO TRUCK & BUS CORPORATION, the trademarks such as the Mitsubishi three diamonds and Fuso emblem must be removed.

Third-party trademarks

- may not be affixed next to MITSUBISHI FUSO trademarks

Binding ruling

The MITSUBISHI FUSO Brand Trademark Directive governs the use of trademarks by body manufacturers on integrated bodies mounted on chassis. MITSUBISHI FUSO TRUCK & BUS CORPORATION reserves the right to prohibit the body manufacturer from using MITSUBISHI FUSO trademarks in the event of any violations to this body/equipment mounting directive, including the trademark directive.

- If you have any question, contact the department responsible ▷ 2.2.

2.6 Trademarks

Labels and marks must be applied to the predetermined positions.

For details of the location and method of applying labels and marks, refer to "10.11 Other Equipment" ▷ 10.11.

2.7 Recycling of components

Environmental note

When planning attachments, bodies, equipment and modifications, the following principles for environmentally-compatible design and material selection shall be taken into account.

Materials with risk potential and restriction by REACH, such as halogen additives, heavy metals, asbestos, CFCs and CHCs, are to be avoided.

- It is preferable to use materials which permit recycling and closed material cycles.
- Materials and production processes are to be selected such that only low quantities of waste are generated during production and that this waste can be easily recycled.
- Plastics are to be used only where they provide advantages in terms of cost, function or weight.
- In the case of plastics, and composite materials in particular, only compatible substances within one material family are to be used.
- For components which are relevant to recycling, the number of different types of plastics used must be kept to a minimum.
- It must be assessed whether a component can be made from recycled material or with recycled elements.
- It must be ensured that components can be dismantled easily for recycling, e.g. by snap connections or predetermined breaking points. These components should generally be easily accessible and should permit the use of standard tools.
- Service products must be capable of being removed simply and in an environmentally responsible manner by means of drain plugs, etc.
- Wherever possible, components should not be painted or coated; colored plastic parts are to be used instead.
- Components in areas at risk from accidents must be designed in such a way that they are damage-tolerant, repairable and easy to replace.
- All plastic parts are to be marked in accordance with VDA code of practice 260, e.g. "PPGF30R".

2.8 Quality system

World-wide competition, increased quality standards demanded by the customer from the product as a whole, national and international product liability laws, new organisational forms and rising cost pressures make efficient quality assurance systems a necessity in all sectors of the automotive industry.

For the reasons quoted above, MITSUBISHI FUSO TRUCK & BUS CORPORATION urgently advises body manufacturers to set up a quality management system with the following minimum requirements:

- Does the quality management system clearly define responsibility and authority?
- Is there a description of processes/workflows?
- Are the contracts checked/is the feasibility of construction checked?
- Are product checks on the basis of specified instructions carried out?
- What provisions are made for the handling of faulty products?
- Are the inspection results documented and archived?
- Do all employees concerned have currently valid proof of the qualification required?
- Is the test equipment systematically monitored?
- Is there a system for labelling materials/parts?
- Are quality assurance measures carried out at suppliers?

3.1 Selecting the chassis

Property damage

When planning attachments, bodies, equipment or modification work, the selected vehicle must be checked to verify whether it fulfils the necessary requirements.

In order to ensure safe operation of the vehicle, it is essential to choose the chassis and equipment carefully in accordance with the intended use.

Along with the selection of the correct vehicle version, the required series and special equipment such as

- Axle ratio
- Position of the center of gravity
- Legal registration requirements (e.g. Underrun protection)
- Permissible and technical gross vehicle weight

should be taken into consideration and be appropriate for the intended use.

Property damage

Observe the Model. The axle designation or the load capacity of the tires has only limited relevance to the gross weight of the vehicle.

Additional information

The non-availability of a vehicle version may be an indication that the vehicle is not suitable for the intended application.

<Vehicle with LDWS> (lane departure warning system)

LDWS may be disabled in the following cases:

- Any item which interferes with the camera's field of view exists near the camera.
- Any equipment (snowplough, etc.) is attached in front of the vehicle.

3.2 Vehicle modifications

⚠ Risk of accident

Do not carry out any modifications to major assemblies (steering, brake system etc.). Any modifications to the steering and the brake system may result in these systems malfunctioning and ultimately failing. The driver could lose control of the vehicle and cause an accident.

Alterations to the basic vehicle are permitted only within the framework of the procedures described in this body/equipment mounting directive.

The eCanter has high-voltage (approx. 348V).

This field of work might require decommissioning of the vehicle. Refer to "6.12.2 High voltage shutoff and reset" ▷ 6.12.2.

❗ Property damage

The vehicle has a G-sensor on the frame side of the emergency stop button, which shuts off the high-voltage system in case of a collision. Be sure to avoid impact while operating.

Do not press the emergency stop button. The restarting of the high-voltage battery system requires the distributor's assistance.

When handling batteries, observe the items specified below to prevent damage to equipment operated at low voltage and fire.

- The vehicle's electrical system uses a combination of 12 V and 24 V power supplies. Refer to the Electrical system. ▷ 8.1
- Do not loosen or disconnect battery cable terminals while high voltage is in use.
- For quickly charging the low-voltage battery, be sure to disconnect the cables from both the (+) and (-) terminals of the battery.
- The cables should be routed so they will not rub against each other.
- Isolate the low-voltage battery cables from the high-voltage battery cables.

Otherwise, the vehicle's electrical harness and electronic components may be damaged during electrical welding.

Observe the Precautions for electric welding and welding. ▷ 8.6

3.2 Vehicle modifications

The vehicles are shipped after adequate consideration has been given to safety, reliability and maintainability. Ensure that these functions remain intact after body-building or modification work.

The vehicles must still comply with the regulation of the country where the vehicles are used after modifications have been carried out.

Do not change critical safety parts because this may cause a serious accident and is also illegal.

When selecting body-building or modification parts, give consideration to strength, robustness and safety, and also strive to minimize weight.

Install body-building or modification parts in such a way that visibility in the forward direction is not impaired.

Take care not to damage or impair the function of parts on the chassis side.

Upon completion of the work, check to see if the manufacturing quality conforms to the design and also if the specified performance and functions have been secured.

Drive the vehicle and confirm that there is no unusual vibration or noise and also that the vehicle performance is stable.

If the method of handling or maintaining the vehicle changes as a result of carrying out body building or modification, prepare an instruction manual and keep a copy in the vehicle, and also apply warning labels to the vehicle.

The body or equipment manufacturer must apply an Intermediate or Final Stage Manufacturer's Label and inform the officially recognized approval authority or inspector of any modifications to the chassis when the vehicle is inspected.

Following all work on the brake system, i.e. even if merely disassembling parts, a complete check (operation, effectiveness and visibility) of the entire brake system must be performed.

3.3 Dimensions, weights, overall vehicle height

Risk of accident

The vehicle tire load capacity may not be exceeded by overloading the vehicle beyond its specified gross vehicle weight. The tires could overheat and suffer damage. This could cause you to lose control of the vehicle and cause an accident with possible injury to yourself and others.

Information on the permissible axle loads can be found on the vehicle model plate.

All legal provisions governing the permissible vehicle height must be taken into account when planning bodies.

In the Federal Republic of Germany the permissible vehicle height is limited to max. 4 m. In other countries (and if the vehicle is operated on international services), comply with all the relevant national regulations.

Dimensions and weight details can be found in the drawings and technical data. They are based on a vehicle that is fitted with standard equipment. Weight tolerances of ±3% in production must be taken into consideration.

For the minimum mass of the vehicle, refer to "10.2 Specification".

The permissible axle loads and the maximum permissible gross vehicle weight specified in the technical data may not be exceeded.

The technical data can be found in the vehicle documents or on the vehicle model plate.

	Weight tolerances
Hong Kong	374A (Road Traffic regulation)
Australia	ADR43/04 (Vehicle Configuration and Dimensions)
New Zealand	LTR41001 (Vehicle Dimensions and Mass)
Taiwan	02 The requirement of specification for motorvehide

* For countries not listed above, Weight tolerances need to adapt in accordance with each countries local regulations.

Unit: m

	The permissible vehicle height is limited to max
Hong Kong	3.5
Australia	4.3
New Zealand	4.25
Taiwan	3.8

* For countries not listed above, Vehicle height need to adapt in accordance with each countries local regulations.

Additional information

Information about changes in weight is available from the department responsible ▷ 2.2.

For details of maximum rear body width, refer to "4.7 Others" ▷ 4.7.

Lamps

The maximum total width of a vehicle should be as shown below in accordance with the specifications for the headlamps and position lamps.

Some versions of the F*A model should be equipped with end outline marker lamps if the overall width is to be more than 2100 mm.

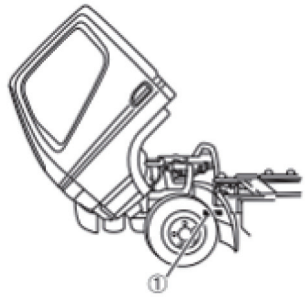
If the rear body prevents the visibility of the front and side turn signal indicator lamps from meeting the regulatory requirements, additional side turn signal lamps must be installed to ensure compliance with visibility regulations.

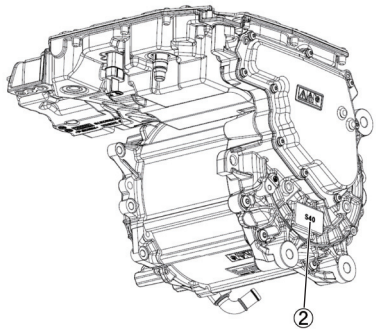
Unit: mm

MODEL	Maximum total width of vehicle
F*A	2250
F*B / F*C	2550

3.4 Vehicle type identification data

If presented at the time of repair or parts order, the chassis number ① and motor generator number ② will facilitate the quick and smooth processing of your requests.

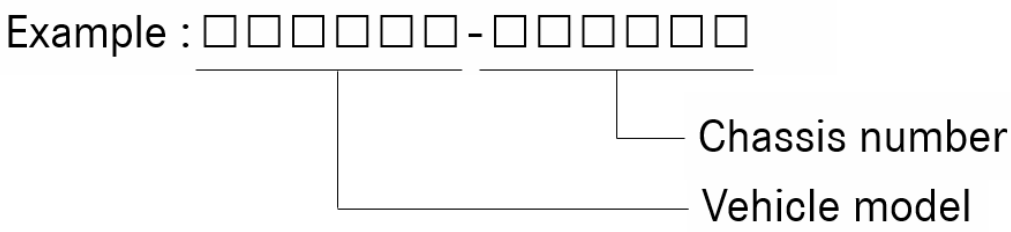




3.4.1 Chassis number

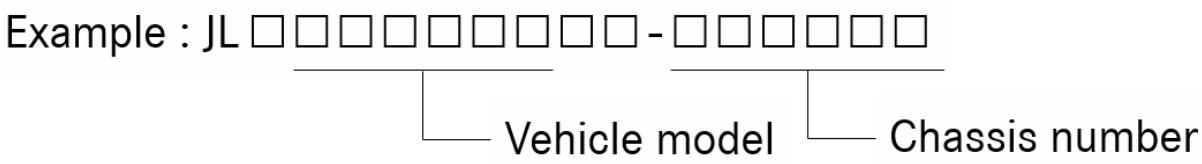
<TYPE 1>

The chassis number is indicated on the left frame near the left front wheel.



<TYPE 2>

The vehicle identification number (V.I.N) is indicated on the left frame near the left front wheel.



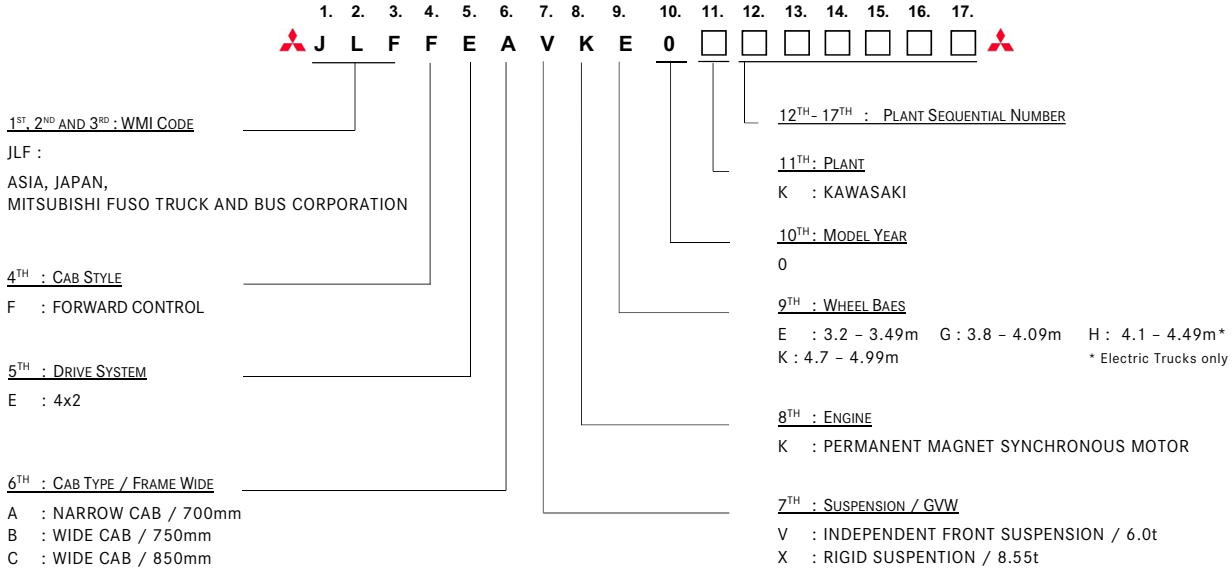
3.4.2 Vehicle identification number (V.I.N.)

The vehicle identification number is indicated on the right frame, near the front wheel.

<Australia>

VEHICLE IDENTIFICATION NUMBER FOR AUSTRALIA

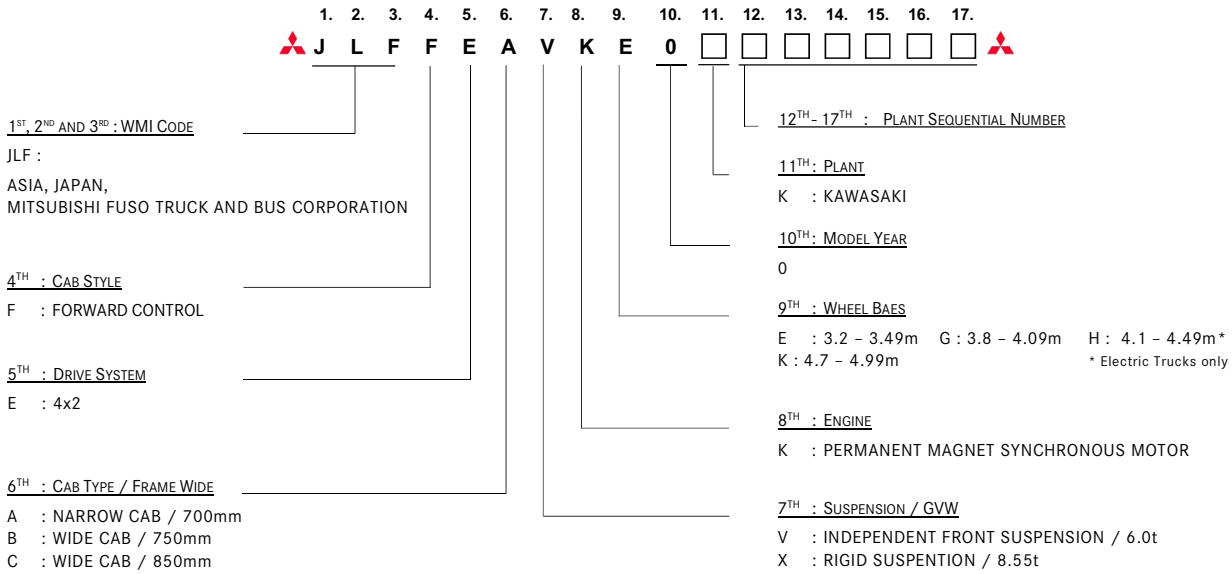
(MITSUBISHI FUSO TRUCK AND BUS CORPORATION)



<New Zealand>

VEHICLE IDENTIFICATION NUMBER FOR NEW ZEALAND

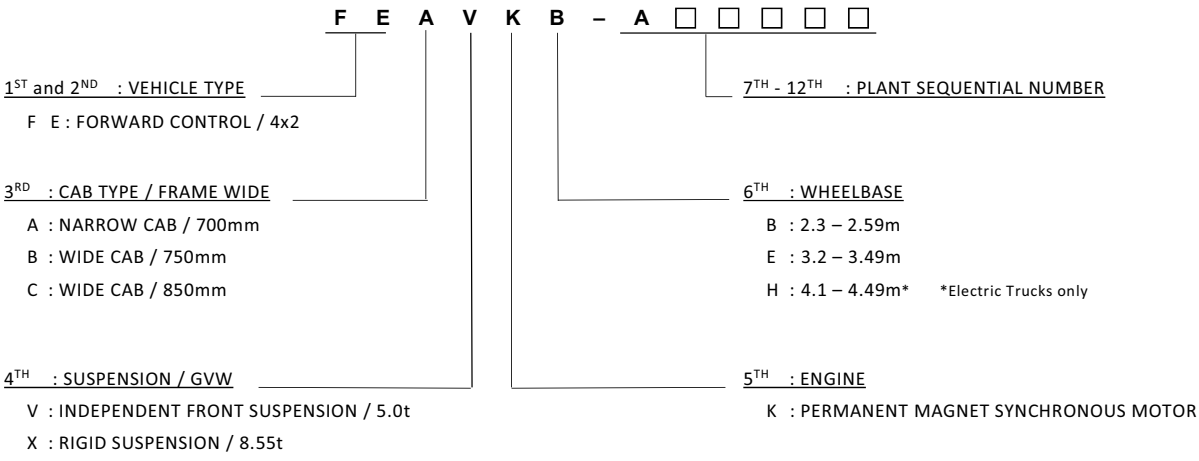
(MITSUBISHI FUSO TRUCK AND BUS CORPORATION)



3.4 Vehicle type identification data

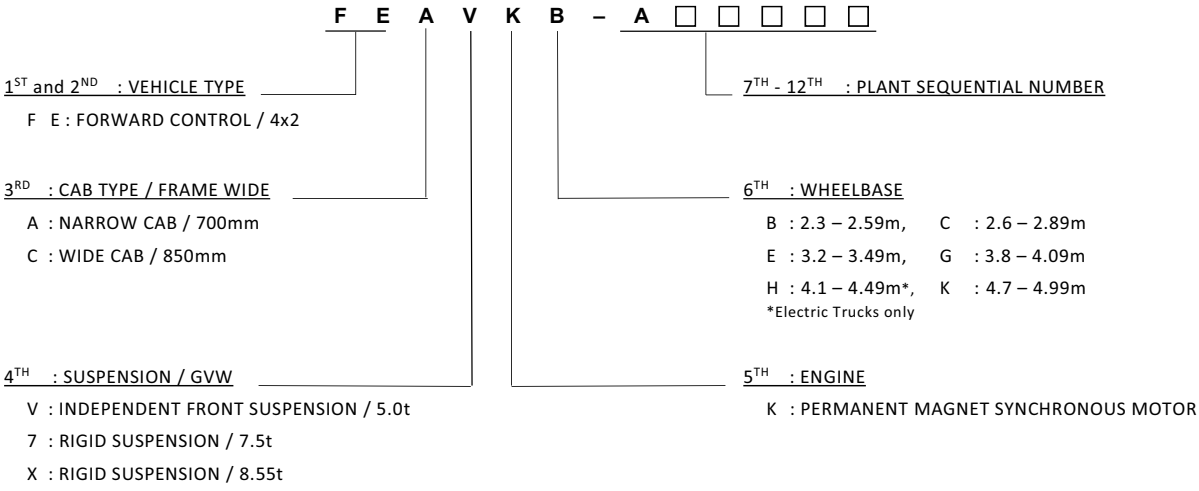
<Singapore>

VEHICLE IDENTIFICATION NUMBER FOR SINGAPORE
(MITSUBISHI FUSO TRUCK AND BUS CORPORATION)



<Hong Kong>

VEHICLE IDENTIFICATION NUMBER FOR HONG KONG
(MITSUBISHI FUSO TRUCK AND BUS CORPORATION)



3.4 Vehicle type identification data

<Taiwan>

VEHICLE IDENTIFICATION NUMBER FOR TAIWAN
(MITSUBISHI FUSO TRUCK AND BUS CORPORATION)

F E A V K B – A □ □ □ □ □

1ST and 2ND : VEHICLE TYPE
F E : FORWARD CONTROL / 4x2

3RD : CAB TYPE / FRAME WIDE
A : NARROW CAB / 700mm
C : WIDE CAB / 850mm

4TH : SUSPENSION / GVW
V : INDEPENDENT FRONT SUSPENSION / 5.0t
X : RIGID SUSPENSION / 8.55t

5TH : ENGINE
K : PERMANENT MAGNET SYNCHRONOUS MOTOR

6TH : WHEELBASE
B : 2.3 – 2.59m, C : 2.6 – 2.89m
E : 3.2 – 3.49m, G : 3.8 – 4.09m

7TH - 12TH : PLANT SEQUENTIAL NUMBER

<Chile>

2024 VEHICLE IDENTIFICATION NUMBER FOR CHILE HEAVY DUTY TRUCK

(MITSUBISHI FUSO TRUCK AND BUS CORPORATION)

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
J	L	6	B	D	G	6	3	□	R	K	□	□	□	□	□	□

1ST, 2ND AND 3RD : WMI CODE
JLC :
ASIA, JAPAN,
MITSUBISHI FUSO TRUCK AND BUS CORPORATION

4TH : GVW / BRAKE SYSTEM
B : 14,001 – 16,000 lbs / HYDRAULIC
C : 16,001 – 19,500 lbs / HYDRAULIC

5TH : LINE
A : FEB7KS
B : FEC7KS
C : FEC9KS
D : FECXKS

6TH : SERIES (WHEELBASE)
E : 3.2 – 3.49 m
G : 3.8 – 4.09 m
H : 4.1 – 4.49 m*

* Electric Trucks only

12TH - 17TH : PLANT SEQUENTIAL NUMBER

11TH : PLANT
K : KAWASAKI

10TH : MODEL YEAR
R : 2024

9TH : CHECK DIGIT

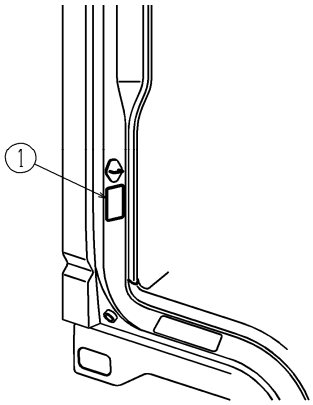
8TH : ENGINE
3 : PERMANENT MAGNET SYNCHRONOUS MOTOR

7TH : CAB/CHASSIS TYPE
6 : CAB TYPE (INCOMPLETE), CAB OVER

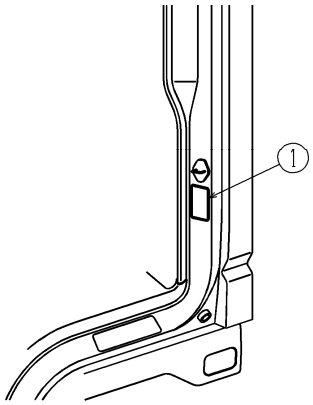
3.4.3 Nameplate

A nameplate ① is located inside the cab.

<Single cab models - 1>
The door opening portion of assistant driver's side

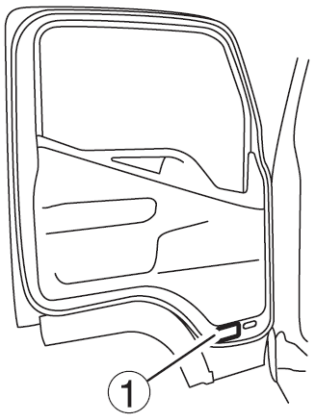


LHD vehicles

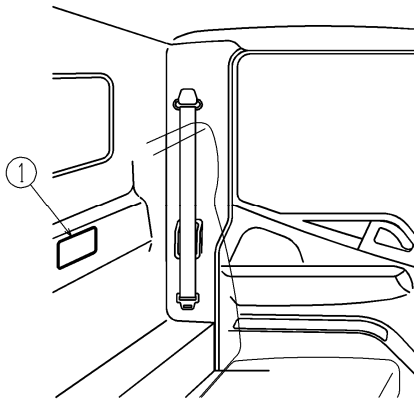


RHD vehicles

<Single cab model - 2>
Under the door of driver's side

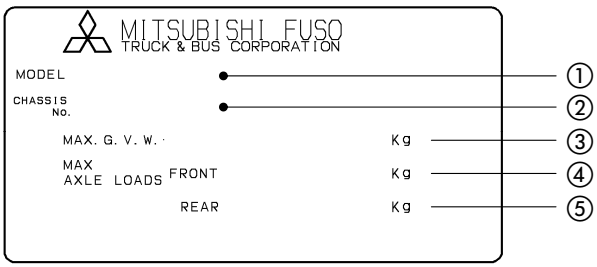


<Single cab models - 3>
Under the rear window



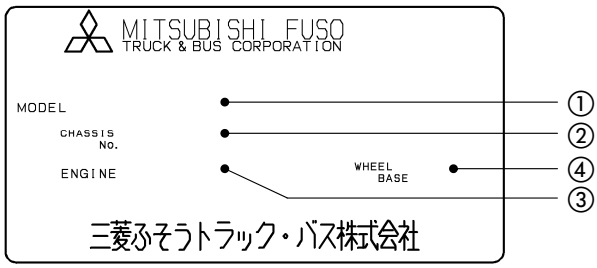
The nameplate shows the following.

<Type 1>



① *Model*
② *Chassis number*
③ *Maximum permitted laden mass of the vehicle*
④ *Maximum permitted load mass for front axle*
⑤ *Maximum permitted load mass for rear axle*

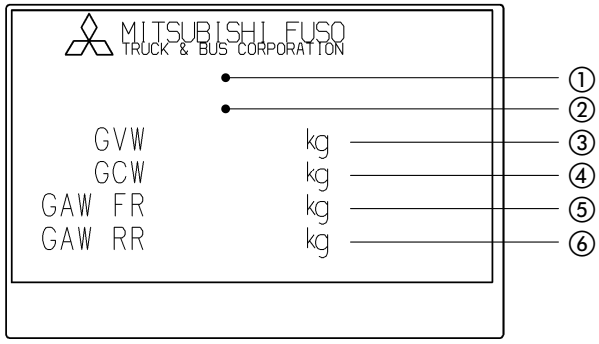
<Type 2>



① *Model*
② *Chassis number*
③ *Engine*
④ *Wheel base*

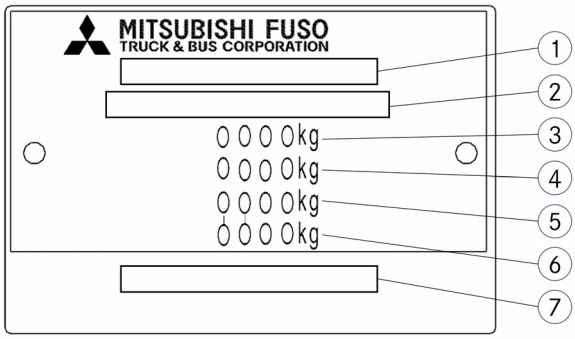
3.4 Vehicle type identification data

<Type 3>



① *Model & Chassis number*
② *Vehicle identification number*
③ *Maximum permitted laden mass of the vehicle*
④ *Maximum permitted laden mass of the combination*
⑤ *Maximum permitted load mass for front axle*
⑥ *Maximum permitted load mass for rear axle*

<Type 4>



① *Whole vehicle type-approval number*
② *Vehicle identification number*
③ *Maximum permitted laden mass of the vehicle*
④ *Maximum permitted laden mass of the combination*
⑤ *Maximum permitted load mass for 1st axle*
⑥ *Maximum permitted load mass for 2nd axle*
⑦ *GB Type Approval number*

3.5 Tires

The body manufacturer must ensure that:

- the largest permissible MITSUBISHI FUSO authorized tires can be fitted.
- the distance between the tire and the mudguard or wheel housing is sufficient even when snow or anti-skid chains are fitted, with the suspension fully compressed (including any twist) (Adherence to valid regulations).
- that the relevant information in the drawings is observed.

If the option of fitting snow and anti-skid chains cannot be guaranteed, the operator should be informed by the body manufacturer (operating instructions).

⚠ Risk of accident

Exceeding the specified tire load-bearing capacity or the permissible maximum tire speed can lead to tire damage or failure. You can lose control of the vehicle, cause an accident and injuries.

For this reason, only fit tires of a type and size approved for your vehicle and observe the tire load-bearing capacity required for your vehicle. Observe tire speed index.

Comply with national regulations governing the approval of tires. These regulations may define a specific type of tire for your vehicle or may forbid the use of certain tire types which are approved in other countries.

❗ Property damage

If you have other wheels fitted

- the brakes or components of the suspension system could be damaged
- wheel and tire clearance can no longer be guaranteed
- the brakes or components of the suspension system can no longer function correctly.

3.6 Bolted and welded connections

Risk of accident

Do not modify any bolted connections that are relevant to safety, e.g. that are required for wheel alignment, steering or braking functions.

When unfastening bolted connections make sure that, when work is complete, the connection again corresponds with the original condition.

Welding work on the chassis/body may only be carried out by trained personnel.

The body, the attached or installed equipment and any modifications must comply with the applicable laws and ordinances as well as work safety or accident prevention regulations, safety rules and accident insurer requirements.

Additional information

Further information on bolted and welded connections can be found in Section 5 "Damage prevention" ▷ 5.2 and Section 6 "Modifications to the basic vehicle" ▷ 6.1.

3.6.1 Welded connections

Welding work on the chassis/body may only be carried out by trained personnel.

Property damage

Parts which must not be welded:

- Assemblies such as the motor generator, transmission, axles, etc.
- The chassis frame (except frame modifications).

Additional information

Further information on bolted and welded connections can be found in Section 5 "Damage prevention" ▷ 5.2 and Section 6 "Modifications to the basic vehicle" ▷ 6.1.

3.7 Soundproofing

The following modifications can lead to noise problems:

- Change of motor generator model
- Change of reduction gear
- Replacement of tires with non-registered ones

Do not modify the vehicle except for those indicated in the body/equipment mounting directives.

- Noise-insulating parts fitted as standard must not be removed or modified.
- The level of interior noise must not be adversely affected.

Additional information

Comply with all national regulations and directives.

	Noise regulation	Detail
Hong Kong	Chapter 4001	Noise Control (Motor Vehicles) Regulation
Australia	ADR83/00	External Noise
New Zealand	LTR32017	Vehicle Equipment
Taiwan	-	Moter Vehicle Noise Control Standard

* For countries not listed above, Noise control need to adapt in accordance with each countries local regulations.

3.8 Maintenance and repairs

⚠ Risk of accident and injury

Always have maintenance work performed at a qualified specialist workshop possessing the required expertise and tools in order to perform the necessary work.

MITSUBISHI FUSO recommends an authorized MITSUBISHI FUSO authorized Distributer this work.

It is absolutely essential that all safety-relevant work and all work on safety-relevant systems is performed by a qualified specialist workshop.

Before performing any maintenance work, always read the technical documentation, such as the Instruction Manual and the workshop information. Always have all maintenance work performed at the correct time. If this is not done, malfunctions or failures may occur in systems that could be relevant to safety. This could make you cause an accident, which could result in injury to yourself or others.

Maintenance and repair of the vehicle should not be made unnecessarily difficult by the body.

Maintenance points and major assemblies must be easily accessible.

- The Instruction Manual must be complied with and supplemented as necessary.
- Stowage boxes must be fitted with maintenance flaps or removable rear panels.
- The battery compartment must be sufficiently ventilated, with provision for air to enter and exit.
- Check the condition and capacity of batteries and service them in accordance with the manufacturer's specifications ▷ 3.8.2 and ▷ 3.8.3.

Any additional expenses arising from the body in connection with warranty, maintenance or repair will not be borne by MITSUBISHI FUSO TRUCK & BUS CORPORATION.

3.8.1 Maintenance instructions

The following must be observed by the body manufacturer before delivery of the vehicle:

- Due date of inspection
- Be sure to set up the brake system.
- Check the condition and capacity of batteries and service them in accordance with the manufacturer's specifications.
- Check the headlamp setting or have this checked at a qualified specialist workshop.
- Retighten the wheel nuts to the specified torque.
- Instruction Manual and directives for maintenance of attachments, bodies, installations or conversions, which have been installed by the body manufacturer, must be provided with the vehicle in the language of the country of use.
- MITSUBISHI FUSO recommends adapting to each individual body the scope of maintenance work which has to be carried out on the body, coordinating it by means of the valid MITSUBISHI FUSO service systems. This applies both to the scope and type of service work, and for determining the service due dates for servicing intervals based on time elapsed and distance covered.

3.8.2 Preparation for storing the vehicle

Property damage

For vehicle deliveries in winter (gritted roads). To prevent surface damage, please clean the vehicle at the earliest opportunity. Particular attention should be paid to the motor generator housing and light-alloy wheels.

Storage in an enclosed space:

- Clean the overall vehicle.
- Check the oil levels.
- Inflate the tires to 0.5 bar above the specified tire pressures.
- Release the handbrake and chock the wheels.
- Disconnect the battery and grease battery lugs and terminals.

Storing the vehicle in the open (< 1 month):

- Carry out the same procedure as for storing in an enclosed space.
- Close all air inlets and set the heating system to "Off".

Storing the vehicle in the open (> 1 month):

- Carry out the same procedure as for storing in an enclosed space.
- Fold the windscreen wipers away from the windscreen.
- Close all air inlets and set the heating system to "Off".
- Remove the battery and store it in accordance with the manufacturer's specifications.

Maintenance work on stored vehicles (in storage for > 1 month):

- Check the oil level once a month.
- Check the coolant once a month.
- Check the tire pressures once a month.
- Remove the battery.

Removing the vehicle from storage:

- Check the fluid levels in the vehicle.
- Correct the tire pressures to the manufacturer's specifications.
- Check the battery charge and install the battery.
- Clean the overall vehicle.

3.8.3 Battery maintenance and storage

To avoid damage to the battery, disconnect the battery if the vehicle is to be immobilized for a period of longer than 1 week.

If the vehicle is immobilized for periods of longer than 1 month, remove the battery and store it in a dry place at temperatures of between 0 °C to 30 °C.

Store the battery in an upright position.

The battery charge must be kept above 12.55 V at all times.

Property damage

If the battery voltage drops below 12.1 V, the battery is damaged and it will have to be replaced.

Leaving the vehicle parked up for long periods of time can lead to battery damage. This can be avoided by disconnecting the battery and storing it appropriately.

3.8.4 Work before handing over the modified vehicle

The manufacturer must confirm the work and modifications carried out by making an entry in the Service Booklet.

Checking the overall vehicle

Check the vehicle for perfect condition. All damage must be repaired.

If it is not known how long a vehicle equipped with a hydraulic clutch operating system has been in storage, the brake fluid must be renewed.

Checking the batteries:

Test the battery charge before handing over the vehicle.

Checking the tires

Before handing over the vehicle, check that the tires are inflated to the specified pressure and check the tires for damage. Damaged tires must be replaced.

Checking wheel alignment

When equipment, attachments and bodies have been mounted, it is recommended to have the toe setting checked by a qualified specialist workshop. MITSUBISHI FUSO recommends an authorized MITSUBISHI FUSO authorized Distributer for this work.

It is absolutely essential that all safety-relevant work and all work on safety-relevant systems is performed by a qualified specialist workshop.

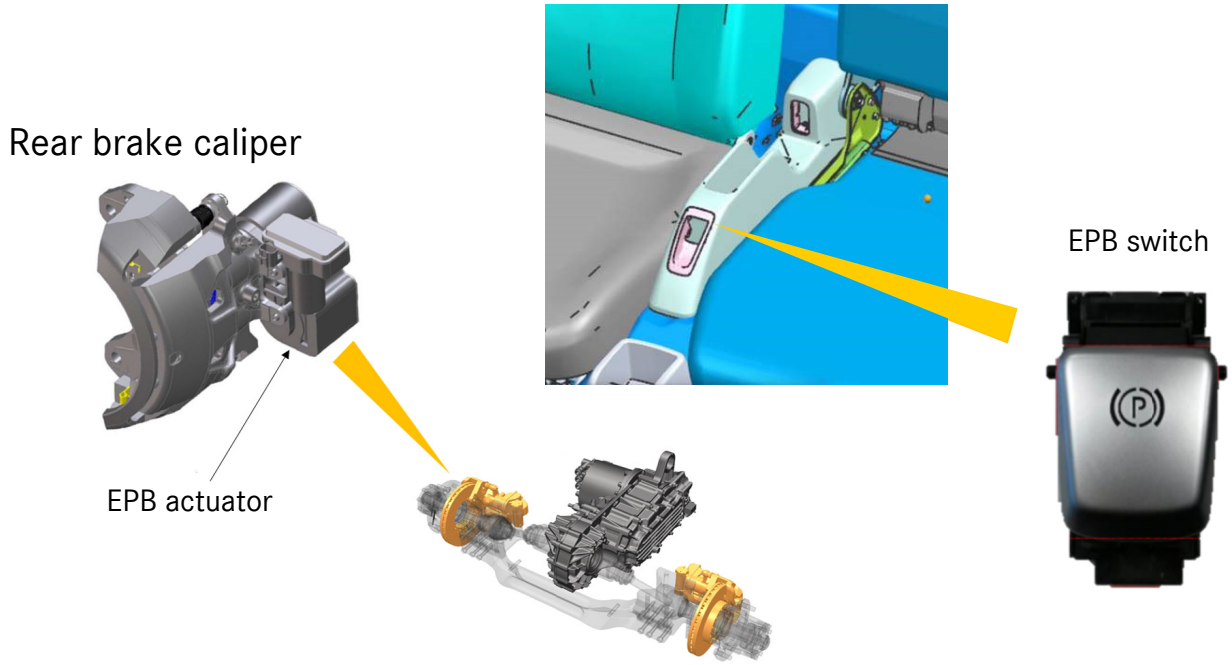
Additional information

Further details are available from an Authorized MITSUBISHI FUSO authorized Distributer.

3.9 Electric parking brake (EPB)

The ON/OFF operation of the EPB switch manipulates the EPB motor gear unit (MGU) and activates/releases the electric parking brake.

1 Operating instructions and nomenclature
Pulling up the EPB switch activates the parking brake.
Press the EPB switch while stepping down the brake pedal to release the parking brake.



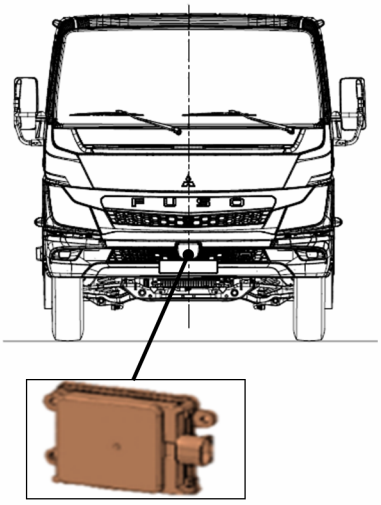
2 Precautions for mounting
Never relocate or modify any electric parking brake component, as it may affect the effectiveness of the parking brake.
3 Initial settings
Initial settings may be required if the parking brake is removed and reinstalled.
4 Contact your local MITSUBISHI FUSO authorized Distributer if you have any questions about the electric parking brake.

3.10 Active Brake Assist 5 (ABA5)

<Vehicle with ABA5>

Active Brake assist operates when there is a danger of collision with the vehicle, and it helps to alleviate collision damage.

- Place the starter switch in the "OFF" position before disconnecting the harness connector of the system control unit.
- For precautions when performing electric welding, refer to 5.2 "Welding work" ▷ 5.2.
- Radar unit and radar unit cover may cause trouble if repainted.
  Mask these parts and components before starting painting to protect them against paint spray.
  Remove radar unit if forced drying around radar unit.
- Contact a MITSUBISHI FUSO authorized Distributor to have calibration of radar if radar unit removed.
- Change to new radar unit if radar get damaged due to fallen
- Do not put any equipment in front of radar view area (fig. radar view area).



Radar unit

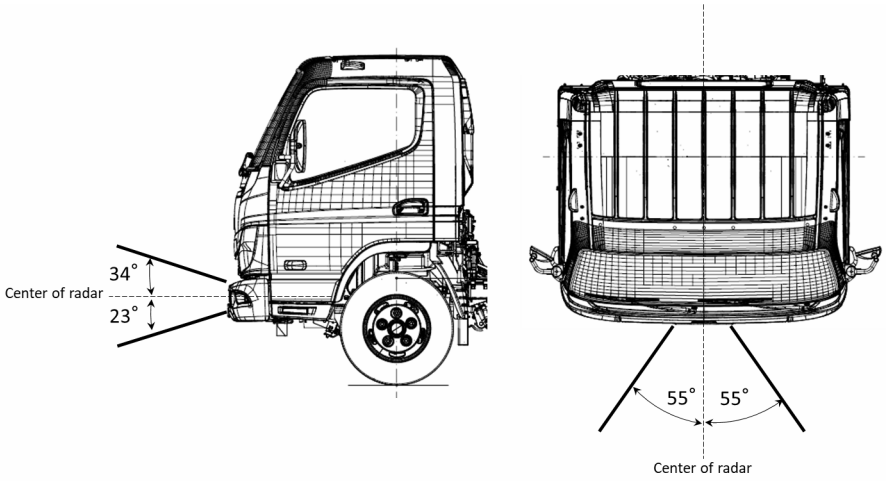


fig. Radar view area

3.11 Lane Departure Warning System (LDWS) / Active Attention Assist

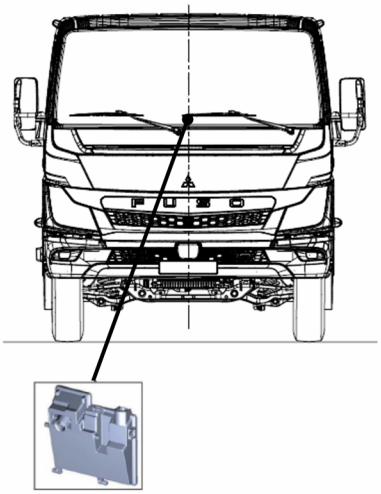
3.11 Lane Departure Warning System (LDWS) / Active Attention Assist

<Vehicle with LDWS>

The lane departure warning system alerts the driver with a warning display and buzzer if the driver has left their lane unintentionally.

The active attention assist is a preventive safety system that detects driver fatigue and alertness using a forward recognition camera and a driver monitoring camera to assist driving.

- Place the starter switch in the "OFF" position before disconnecting the harness connector of the system control unit.
- For precautions when performing electric welding, refer to 5.2 "Welding work" ▷ 5.2
- Camera unit may cause trouble if repainted.
  Mask camera unit before starting painting to protect them against paint spray.
- Check if lane detection is displayed to meter cluster correctly if camera unit removed.
  (Clear lane marking and vehicle speed is over 60km/h).
  Contact a MITSUBISHI FUSO authorized Distributor if lane cannot be detected.
- Change to new camera unit if camera get damaged due to fallen
- Do not put any equipment in front of camera view area (fig. radar view area).



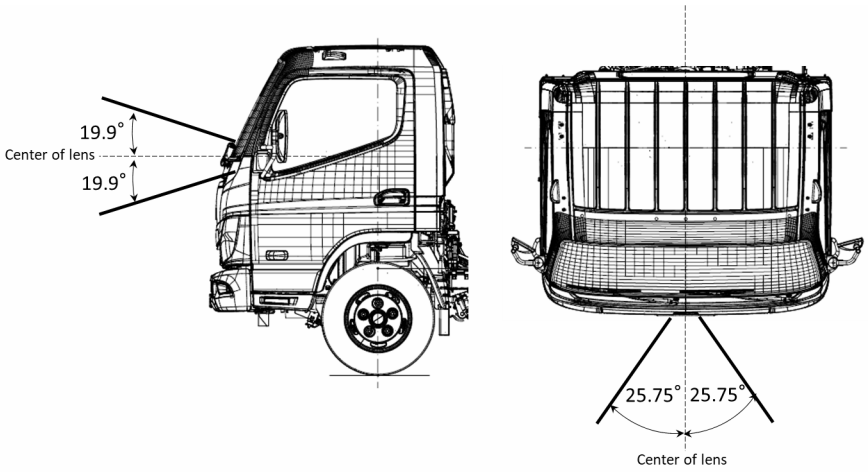


fig. camera view area

3.12 Electronic Stability Program (ESP®)

- The ESP® supports hazard avoidance when there is a risk of skidding or rollover on curves.
- Do not change the motor-generator output, transmission, final reduction ratio (except for options, if available), tire size, suspension system, or wheelbase.
- Never make device, sensor, harness, or connector modifications associated with the ESP®.

3.13 Active Sideguard Assist®

Active sideguard assist® alerts the driver with a collision warning lamp, a warning display and buzzer if the side millimeter wave radar detects any objects within the expected vehicle passing range when turning LHD for turning right. RHD for turning left or changing lanes LHD for right side. RHD for left side.

Preparations

- Turn the starter switch to OFF when performing installation work that involves electric welding.
- Disconnect the negative terminal (-) of the battery cable.
- Ground the welding machine near the welded section.

When painting

Mask radar unit before starting painting to protect it against paint spray.

Removal of the radar unit

Do not remove the radar unit.
If the radar unit is removed, be sure to consult an authorized MITSUBISHI FUSO distributor or distributer to have the calibration of radar.

When dropped

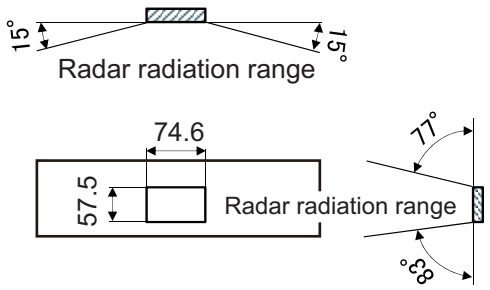
A radar unit is precision equipment. If it is subjected to impact by dropping, etc., replace it.

Equipment

Do not put any equipment (including side guards) in the radiation range of the radar unit. It may cause a false alarm or malfunction.

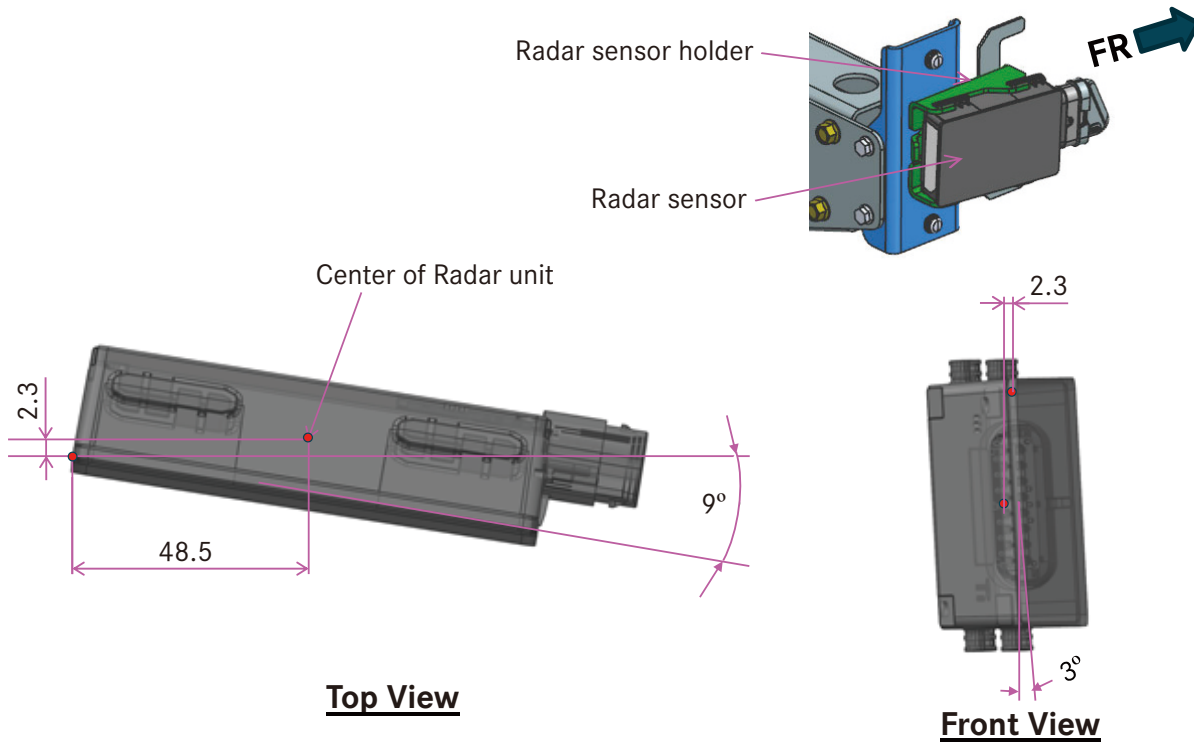
Radar installation position

See 10.11 "Other equipment" for the radar coverage and radar mounting position when installed in a vehicle.
▷ 10.11



Radar radiation range toward surface

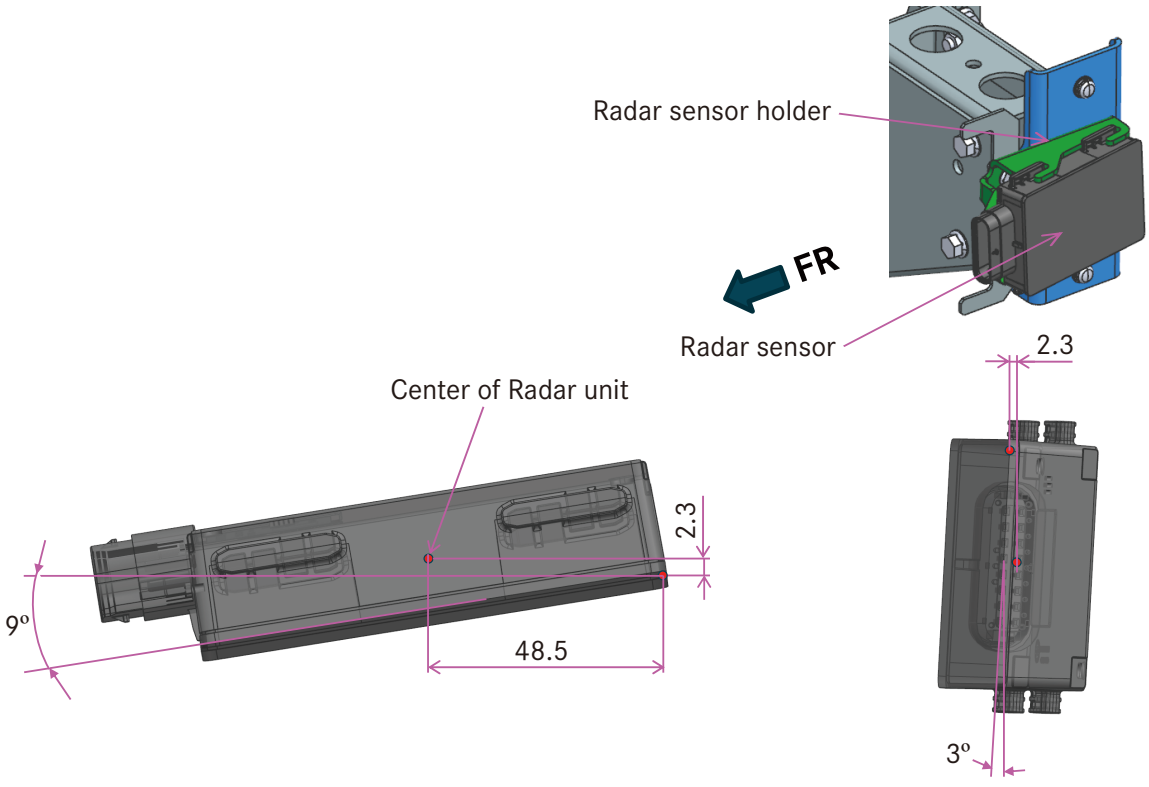
<LHD>



Top View

Front View

<RHD>



Top View

Front View

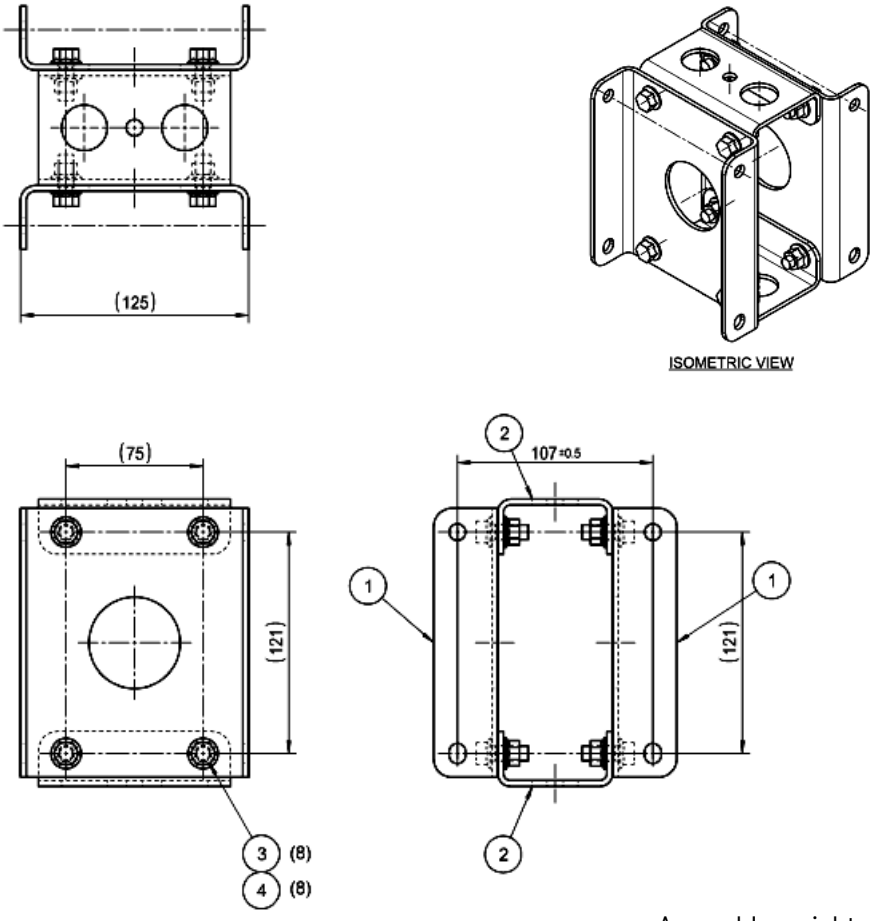
3.13.1 Extension bracket manufacturing instructions

Please use this as a reference when making brackets when not using Fuso genuine parts.
If a bracket is manufactured, the manufacturer is responsible for manufacturing the bracket.

requirements

Material	: Use instructed material or same strength or more.
	: Use instructed thickness.
Weight	: Not exceed instructed weight.
Corrosion protection	: Refer “Corrosion protection measures”.
Fastener	: Use instructed fastener size and strength.
Tightening torque	: 19～28 Nm

125mm extension bracket assembly (MX986026(A8205401120))

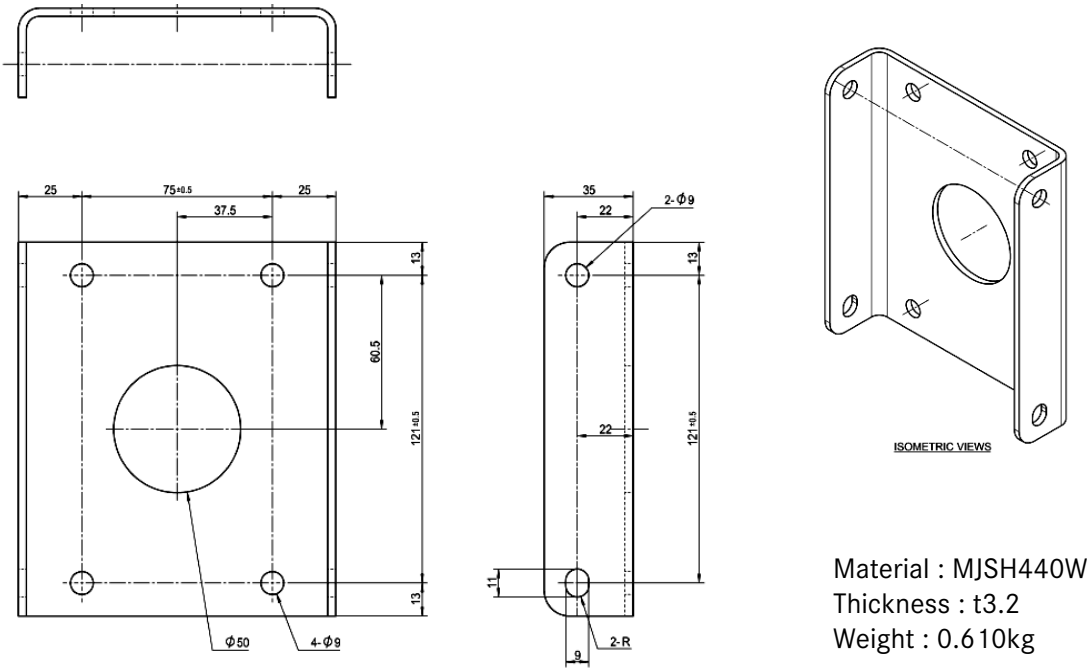


Assembly weight : 1.91kg

SYM	Part name	Quantity	Ref. Fuso Part Number
①	BRACKET	2	MX986027(A8205419802)
②	BRACKET	2	MX986028(A8205419902)
③	BOLT, FLANGE (8x20, P1.25, 7T)	8	MF140225
④	NUT, FLANGE (8, P1.25, 4T)	8	MF434104

D

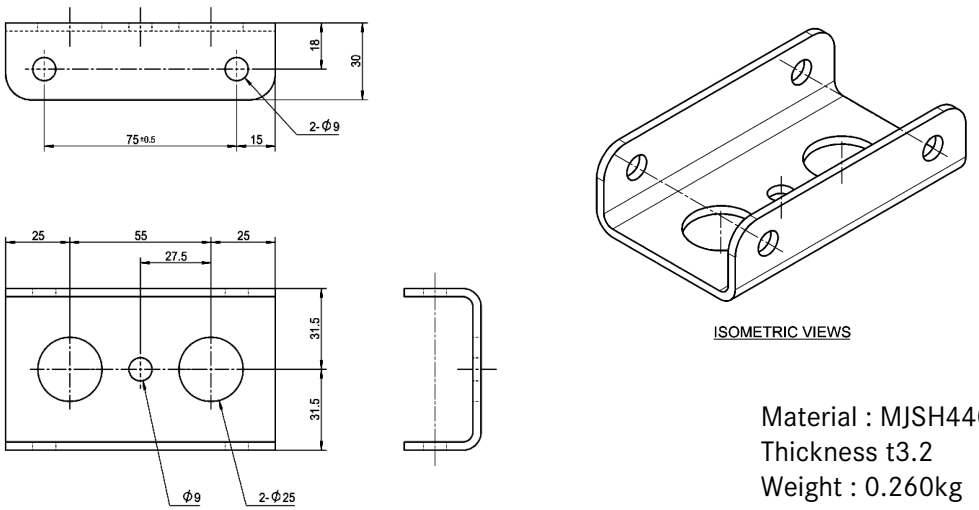
125mm extension bracket structure part ① (MX986027(A8205419802))



Material : MJSH440W
Thickness : t3.2
Weight : 0.610kg

3. ALL PARTS MUST BE FREE FROM CRACK AND BURRS.
2. CORNER RADIUS MUST BE R10 UNLESS OTHERWISE SPECIFIED.
NOTE 1. INSIDE BEND RADIUS MUST BE R5, UNLESS OTHERWISE SPECIFIED.

125mm extension bracket structure part ② (MX986028(A8205419902))

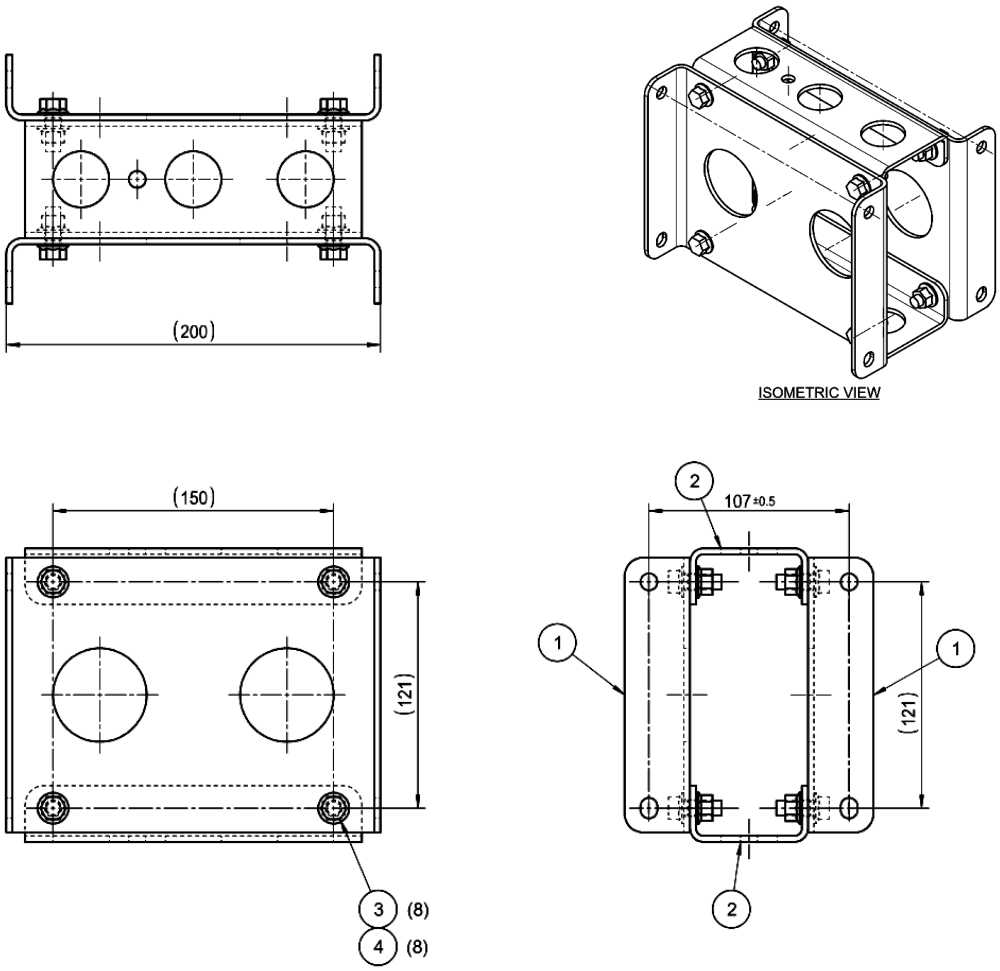


Material : MJSH440W
Thickness t3.2
Weight : 0.260kg

3. ALL PARTS MUST BE FREE FROM CRACK AND BURRS.
2. CORNER RADIUS MUST BE R10 UNLESS OTHERWISE SPECIFIED.
NOTE 1. INSIDE BEND RADIUS MUST BE R4, UNLESS OTHERWISE SPECIFIED.

D

200mm extension bracket assembly (MX985675(A8205405719))

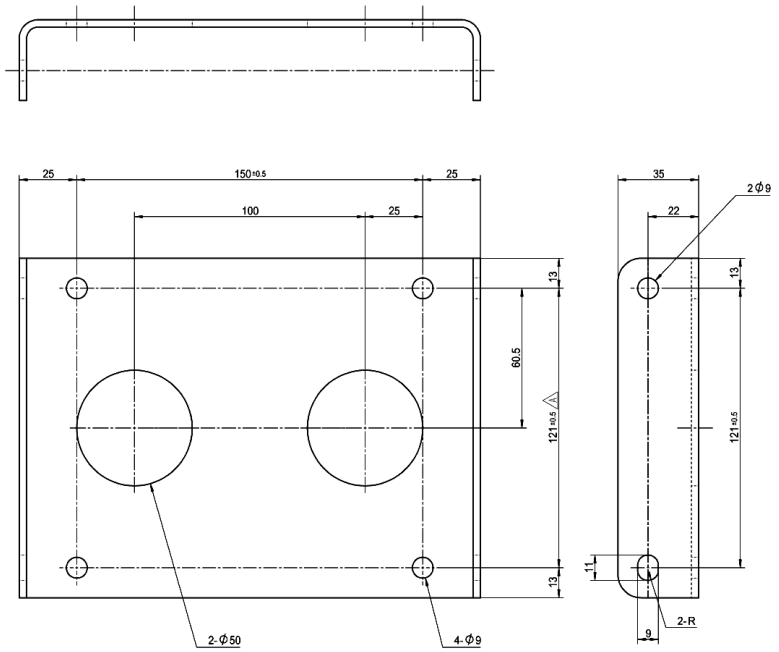


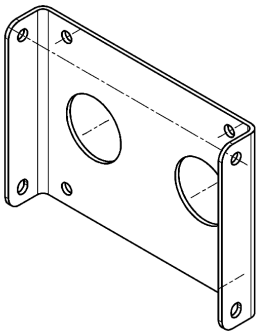
Assembly weight : 2.73kg

SYM	Part name	Quantity	Ref. Fuso Part Number
①	BRACKET	2	MX985678(A8205414702)
②	BRACKET	2	MX985679(A8205414802)
③	BOLT, FLANGE (8x20, P1.25, 7T)	8	MF140225
④	NUT, FLANGE (8, P1.25, 4T)	8	MF434104

D

200mm extension bracket structure part ①(MX985678(A8205414702))



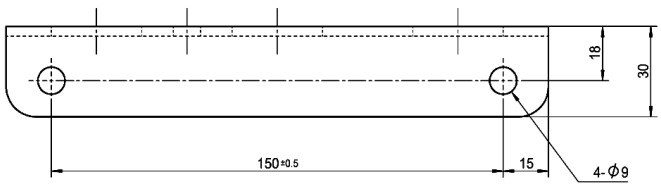


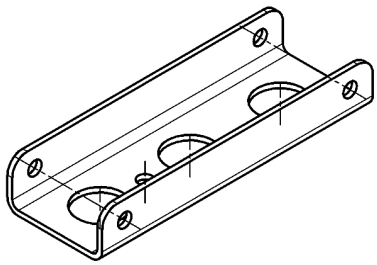
ISOMETRIC VIEWS

Material : MJSH440W
Thickness t3.2
Weight : 0.836kg

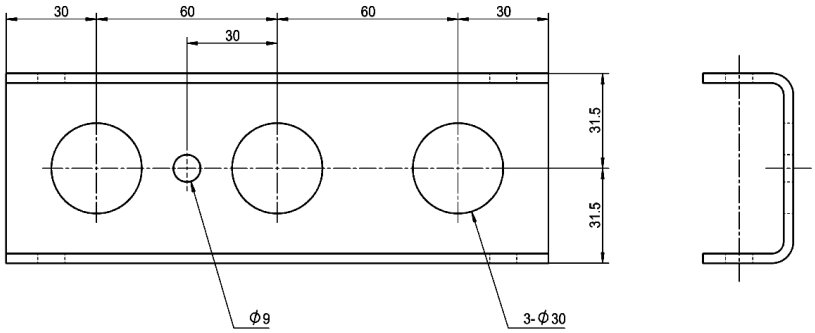
3. ALL PARTS MUST BE FREE FROM CRACK AND BURRS.
2. CORNER RADIUS MUST BE R10 UNLESS OTHERWISE SPECIFIED.
NOTE 1. INSIDE BEND RADIUS MUST BE R5, UNLESS OTHERWISE SPECIFIED.

200mm extension bracket structure part ②(MX985679(A8205414802))





ISOMETRIC



Material : MJSH440W
Thickness t3.2
Weight : 0.442kg

3. ALL PARTS MUST BE FREE FROM CRACK AND BURRS.
2. CORNER RADIUS MUST BE R10 UNLESS OTHERWISE SPECIFIED.
NOTE 1. INSIDE BEND RADIUS MUST BE R4, UNLESS OTHERWISE SPECIFIED.

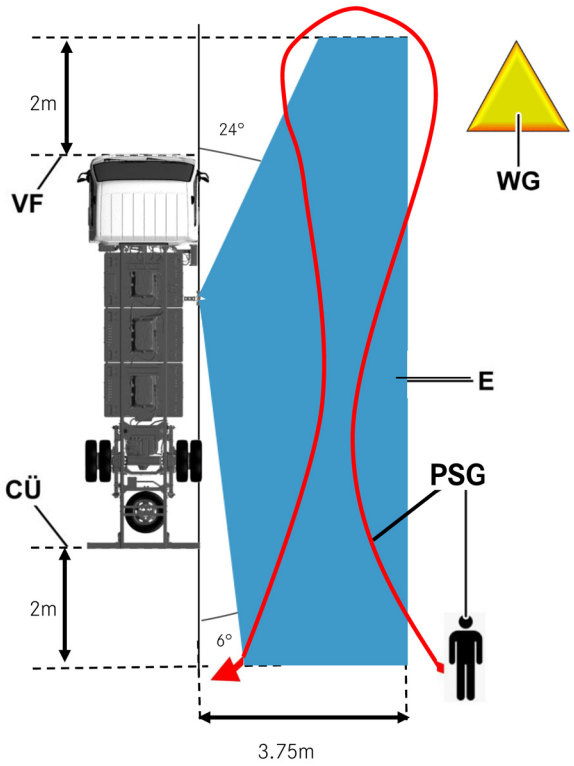
3.13.2 Function check after modification

(1) Requirements before function check

- Body and vehicle are fully assembled.
- All detachable parts and radar sensors at side are in final position.
- Parameterization was performed.
- Service calibration was performed.
- No Active Sideguard Assist system fault messages was present in instrument cluster.
- No fault memory entry was present in control units VRDU2 and SRR01T Active Sideguard Assist system was active.

(2) Procedure of vehicle standstill function check

- Engage vehicle stationary and parking brake.
- Turn on the ignition switch.
- Person (PSG) enters detection range (E) by at walking pace.
- The yellow warning display (WG) must light up as long as the person continues to move around the detection range (E).
- No lighting up of the yellow warning display or a sporadic lighting up of the yellow display only mean the system is not functioning properly.
  The reason lies in the modified vehicle or the detachable parts and it must be corrected accordingly.



Note: This illustration shows a left-hand drive vehicle.

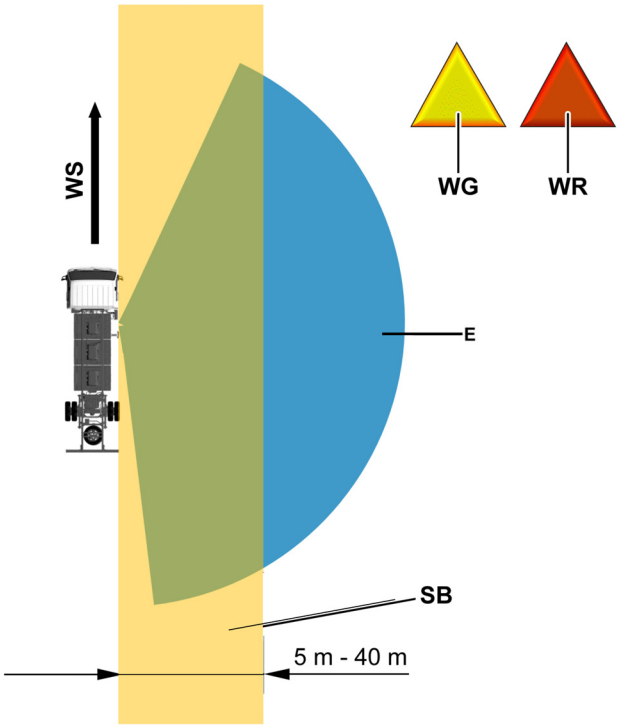
E : Sensor detection ranges.
CÜ : End of chassis-frame overhang.
PSG : Person at walking pace.
VF : Vehicle front edge.
WG : "Yellow" warning display.

D

(3) Procedure of driving function check

- Additional front passenger required to observe function display and surrounding area.
- Requirements on distance (test track):
  3 km long distance should be selected so that side area (SB) width from the outside edge of the sensor is 5 m or more ideally 40 m away from any stationary and/or moving objects (where possible, no traffic and a level open space)

Example: Country road without built-up roadsides, and sufficient distance to traffic following behind.



Note: This illustration shows a left-hand drive vehicle.

E : Sensor measuring ranges.
SB : Side area.
WG : "Yellow" warning display.
WR : "Red" warning display.
WS : Distance (test track).

Recommend to travel the scheduled or locally available distance with a vehicle first (ideally with the vehicle on which the retrofit modification is to be done) in unchanged ex factory delivery condition as a reference

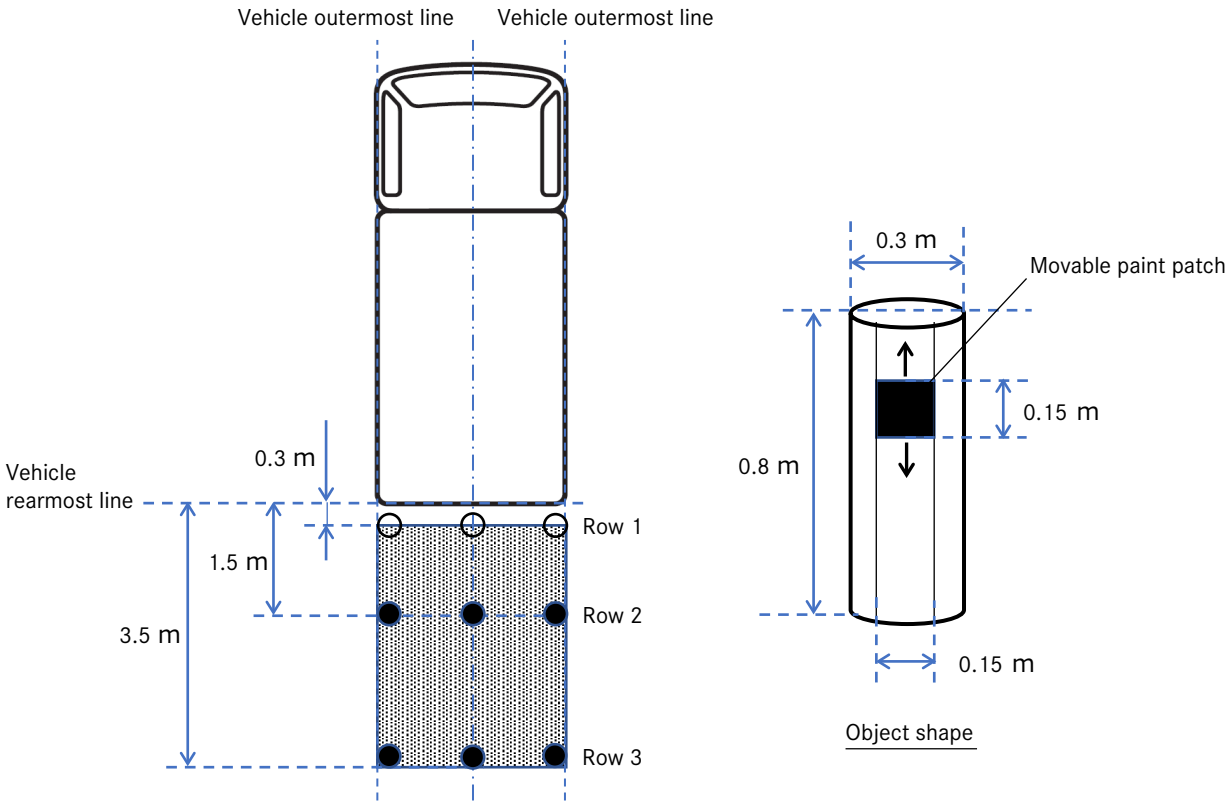
- Taking road safety into consideration, vary the speed between 0-50 km/h, braking and accelerating several times in succession to generate relative movement in the vehicle parts or detachable parts, if necessary
- The front passenger must continuously observe the readiness display while driving the given distance. The specified distance must be completed without unwarranted system warning displays (yellow/red warnings)
- If a warning message is issued when driving the specified distance, even if a stationary and/or moving object was clearly not located in the detection range (check by front passenger and comparison with results from reference drive), then the system is not functioning properly.
- The reason for the warning messages lies in the modified vehicle or the detachable parts and it must be corrected accordingly

If you have any questions, contact the department esponsible ▷ 2.2.

3.14 Rear view camera system <Option>

A rear view camera that complies with the rear view camera system (R158) must be installed.

<R158>



Row 1: The paint patch (area of 0.15 m × 0.15 m) or the top surface of each object must be visible.
Row 2: All objects must be visible.
Row 3: All objects must be visible.

3.14 Rear view camera system <Option>

3.14.1 Installation of rear view camera (rear view camera system)

All components are already installed except for the rear view camera and camera cable.

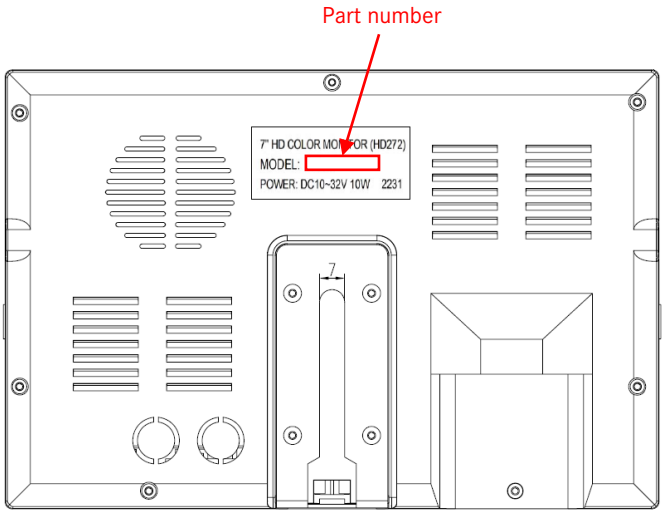
Install the rear view camera and camera cable, which are in the cab, following the procedure below.

Always perform an operational check after installation.

(1) Installation of the rear view camera

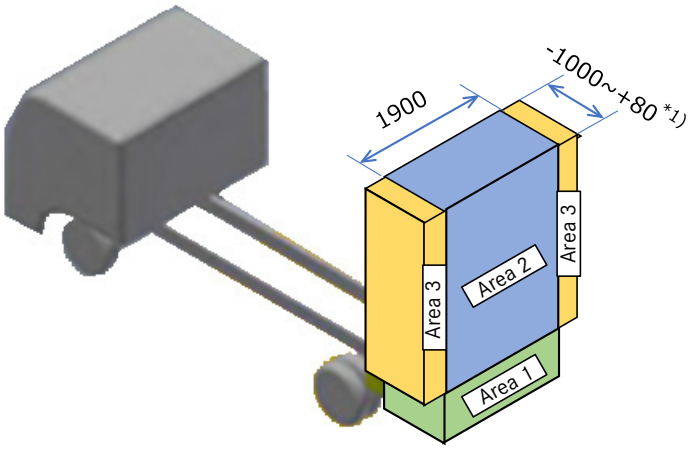
(a) The method of camera installation may vary depending on the specifications of the monitor installed at the time of shipment.
Check the part number of the installed monitor and proceed with the camera installation.

	Monitor part number	Installation method	Field of view
160° camera system	ML357084	①	160° x 90°
120° camera system	ML357090	②	120° x 90°

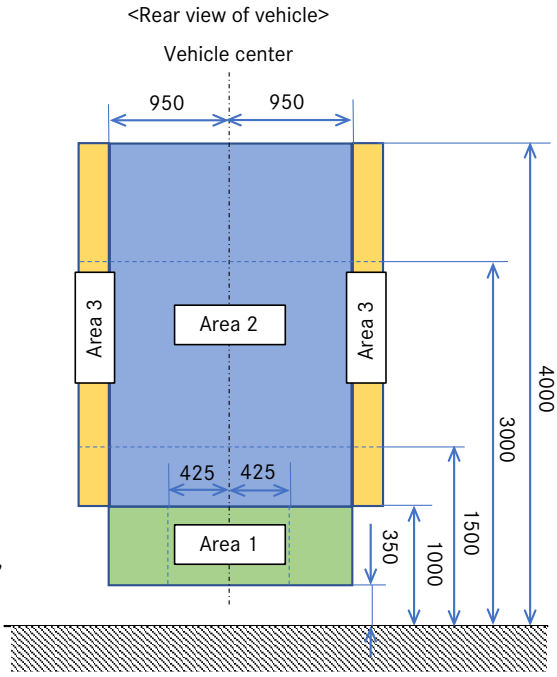


(b) Installation method

a. 160° camera system



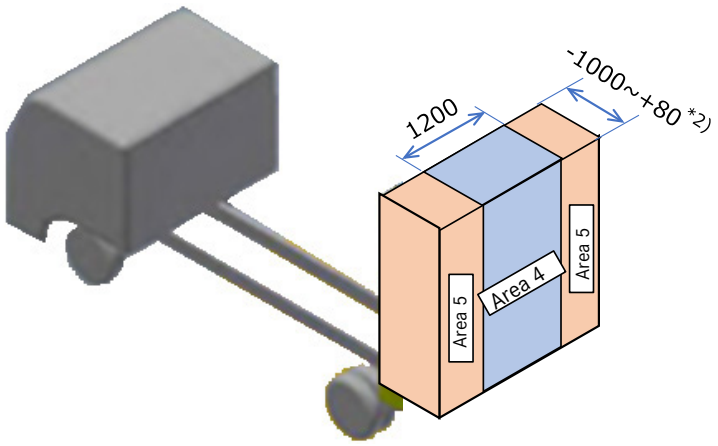
*1) Distance from the rear end of the vehicle, including the body, to the tip of the camera lens



Camera											Image display device	
Camera model	Camera mounting area											
	Vehicle maximum width (mm)	Distance from the vehicle rear end (mm)	Camera mounting area		Area 1		Area 2			Area 3			Image display device model	Distance to the center of the image display device (mm)
FHD685	2320	+80~ -1000	Installation height of the camera mounting area		350 ~1000 mm		1000~ 1500 mm	1500~ 3000 mm	3000~ 4000 mm	1000~ 1500 mm	1500~ 3000 mm	3000~ 4000 mm	HD272-002	Max. 925
			Distance from the vehicle center		0~ 425 mm	425~ 950 mm	0~950 mm			950 mm or more				
			Camera mounting angle	Vertical	20°(+4, -4) Downward	20°(+4, -0) Downward	47° (+0, -5) Downward	47° (+3, -3) Downward	47° (+7, -0) Downward	47° (+0, -5) Downward	47° (+3, -3) Downward	47° (+7, -0) Downward		
				Horizontal	0°(+5, -0) Toward the vehicle center		0°(+5, -0) Toward the vehicle center			30°(+5, -0) Toward the vehicle center				

3.14 Rear view camera system <Option>

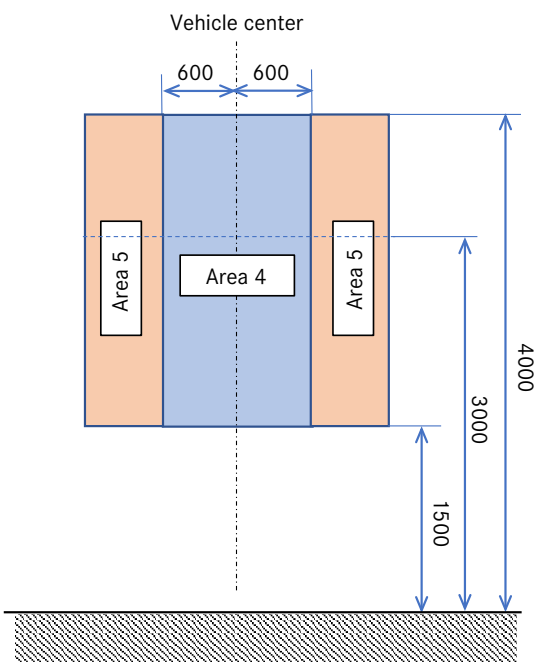
b. 120° camera system



*2) Distance from the rear end of the vehicle, including the body, to the tip of the camera lens

Horizontal reference plane

<Rear view of vehicle>

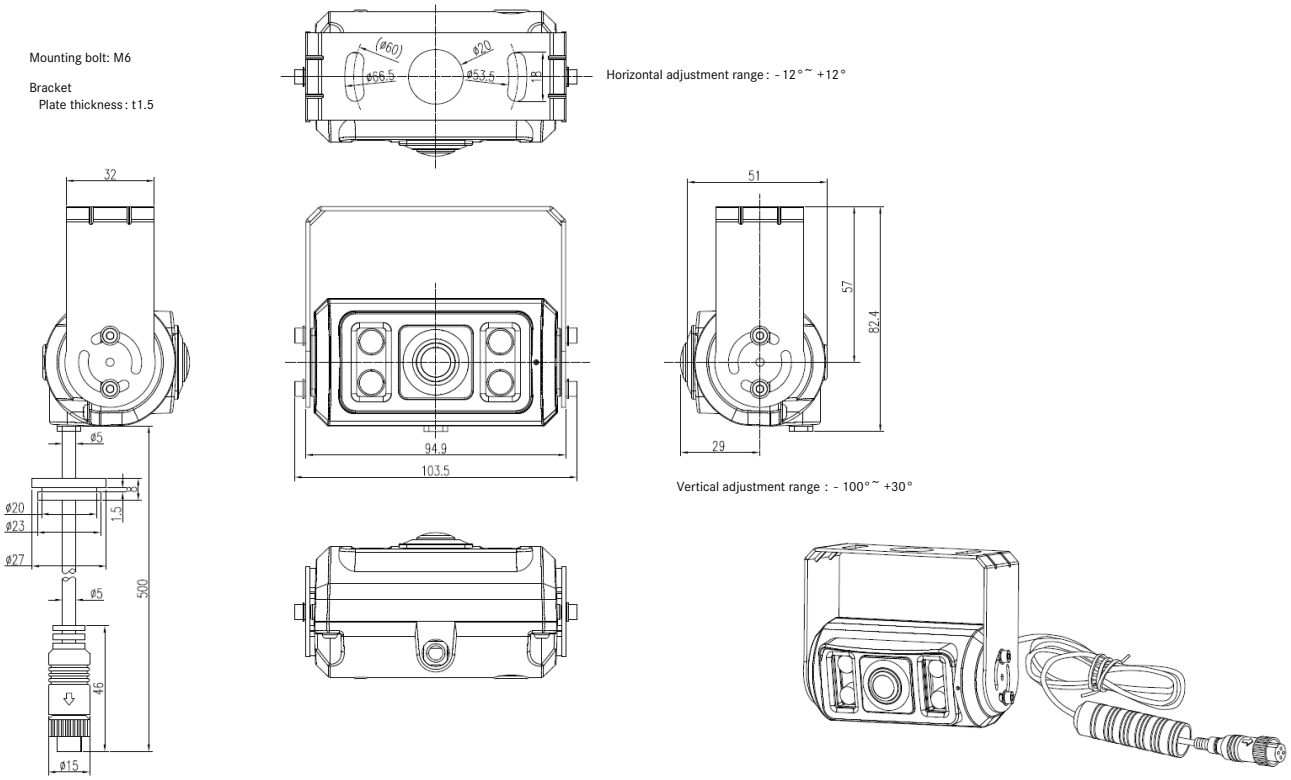


Camera									Image display device	
Camera model	Camera mounting area									
	Vehicle maximum width (mm)	Distance from the vehicle rear end (mm)	Camera mounting area		Area 4			Area 5		Image display device model	Distance to the center of the image display device (mm)
FHD685	2320	+80~ -1000	Installation height of the camera mounting area		1000~ 1500 mm	1500~ 3000 mm	3000~ 4000 mm	1500~ 3000 mm	3000~ 4000 mm	HD272-002	Max. 925
			Distance from the vehicle center		0~600 mm			600 mm or more			
			Camera mounting angle	Vertical	47°(+0, -5) Downward	47°(+3, -3) Downward	47°(+7, -0) Downward	47°(+3, -3) Downward	47° (+7, -0) Downward		
				Horizontal	0°(+5, -0) Toward the vehicle center			10°(+5, -0) Toward the vehicle center			

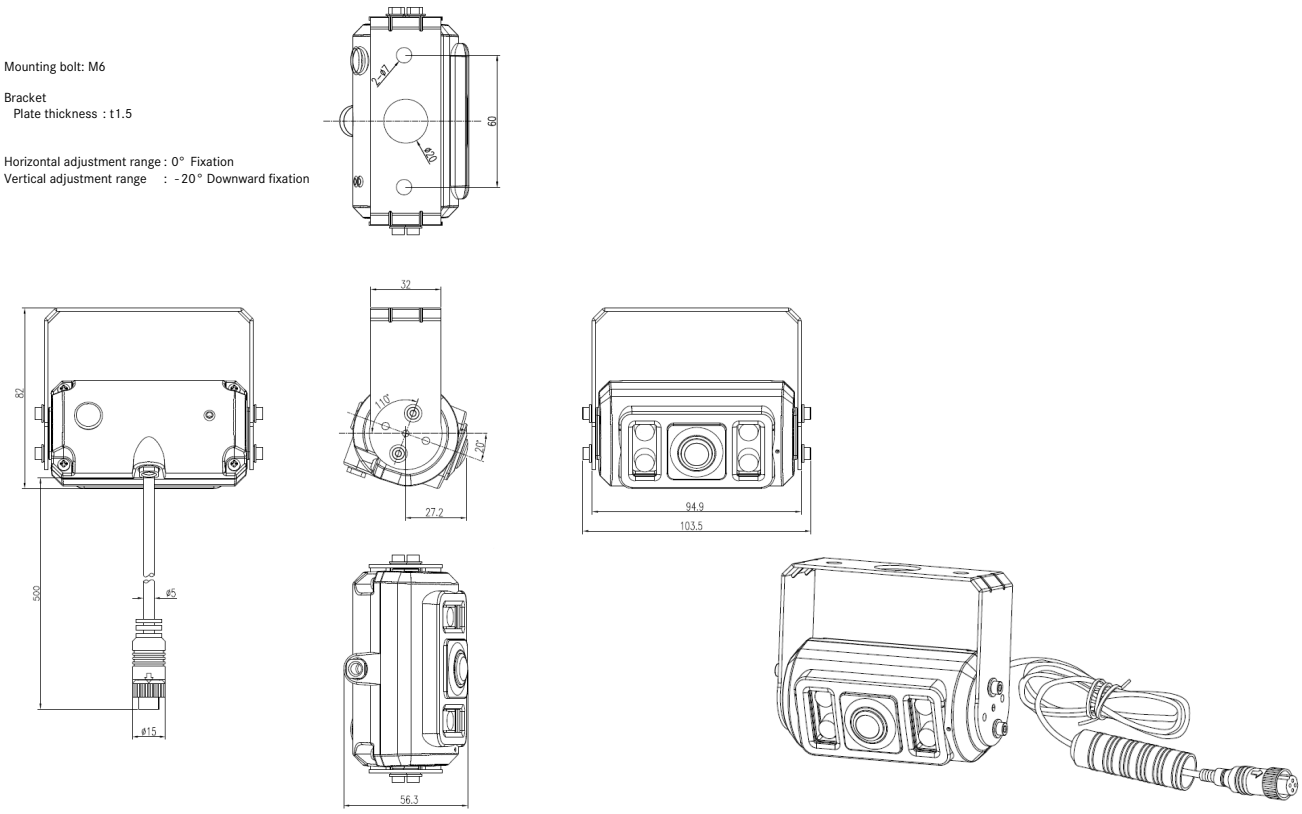
3.14 Rear view camera system <Option>

(c) Rear view camera dimensions

- Body standard camera (ASSY part number: ML357093)



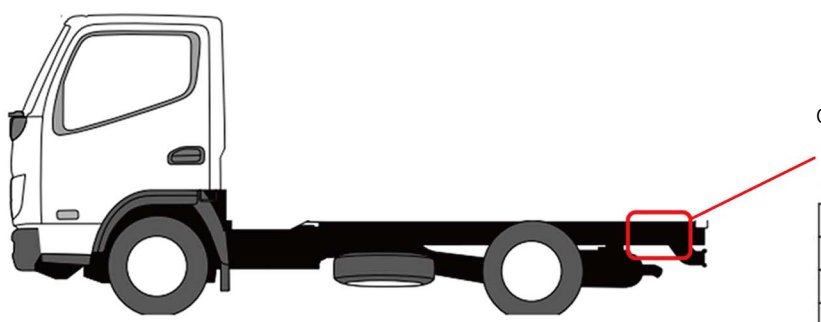
- Camera dedicated to Area 1 (ASSY part number: ML357092)

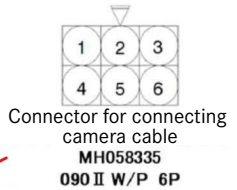


(2) Routing of camera cable

(a) Follow the instructions in "5.2 Electrical wiring" (▷ 5.2) for the wiring of the camera cable.

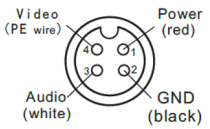
(b) The connector for the camera cable connection is located at the rear end of the left chassis. Remove the waterproof cap and ensure a secure connection.

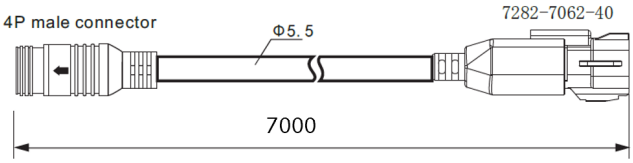


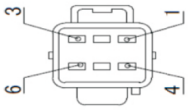


Connector for connecting camera cable
MH058335
090 II W/P 6P

1	VIDEO(+)
2	CAMERA (+9V)
3	OUTPUT (+12V)
4	SHIELD
5	GND







Camera cable（ML357098）

7282-7062-40	1	2	3	4	5
Color of wires	White (PE)	White	Red	Shielded wire	Black
Definition	Video	Audio	Power	Video GND	GND

(c) Arrange for an extension cable if the length is insufficient.

Extension Cable	Part Number
5m	MX995358(A8208210600)
10m	MX995359(A8208210700)
15m	MX995360(A8208210800)

3.15 FUSO Easy Access System

The FUSO Easy Access System allows users to lock and unlock doors by operating the lock/unlock switch on the doorknob while carrying the FUSO Easy Access Key in their pocket.

1 Prohibited items

Strictly adhere to the items specified below. Ignoring any of these items will affect the detection range of the FUSO Easy Access Key, causing the system not to operate properly and the key to become trapped inside the vehicle.

(a) Modification

Do not relocate or modify the ECU, antenna, rotary ignition switch (steering lock device), lock/unlock switch, or harness.

(b) Antenna position change

An antenna (see the figure below) is mounted inside the vehicle to detect the location of the FUSO Easy Access Key. Do not change the position or orientation of the antenna, as it will affect detection performance.

(c) Change of ECU mounting position

The ECU for the FUSO Easy Access System is mounted in the rear of the front passenger seat. The ECU has a built-in receiver for radio signals from the FUSO Easy Access Key. Do not change the position or orientation.

(d) Antenna and ECU peripherals

Do not install radio shields or devices that generate radio waves or noise around the antenna or ECU.

(e) Modification of cab shape and structure

The FUSO Easy Access System may not operate properly if the cab is extended, cut, or modified. Select the option to disable the FUSO Easy Access System for cab modifications, as the modifications will affect the signal area of the FUSO Easy Access Key.

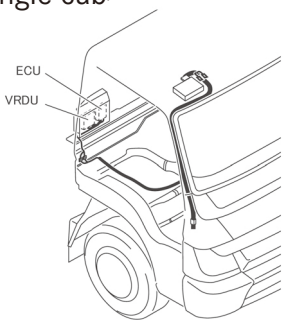
(f) Installation of wireless equipment and accessories

The FUSO Easy Access System provides radio communications in the 100 to 150 kHz band and the 300 to 350 MHz band.

Do not install any wireless devices or accessories that may cause radio interference to the FUSO Easy Access System. Furthermore, do not route the antenna wiring of radio equipment along the vehicle harness.

ECU mounting position

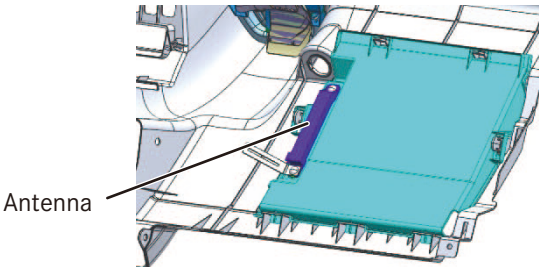
<Single cab>



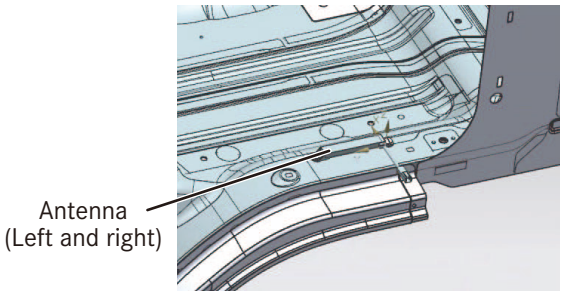
Rear of the front passenger seat

Note: Drawings for LHD vehicles should be considered as symmetrical position to those for RHD vehicle to obtain.data for RHD vehicles.

Antenna mounting position



Back of the lower instrument panel



Under scuff plate

2 Precautions

(a) Parts replacement

The registration process is required if the ECU, FUSO Easy Access Key, or EMCM for the FUSO Easy Access System is replaced. The FUSO Easy Access System will not work without the registration process. Receive this service at an authorized MITSUBISHI FUSO authorized Distributer.

The ECU and FUSO Easy Access Key for the FUSO Easy Access System cannot be re-registered. Be sure to replace them with new ones (unregistered products).

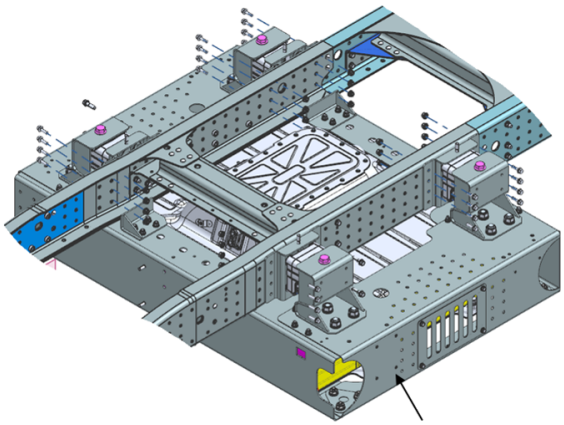
(b) At the end of the installation

Be sure to check the operation of the FUSO Easy Access System after the installation is completed.

3.16 High-voltage battery bracket

Mounting precautions for high-voltage battery bracket

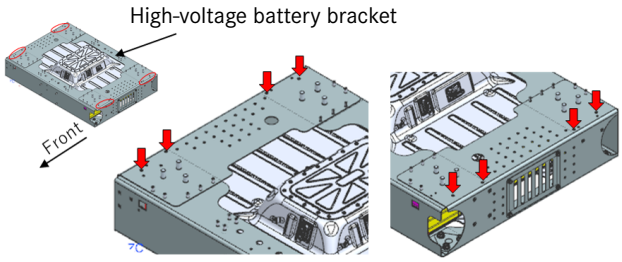
- Do not drill holes or modify the battery bracket to install mounting equipment.
- The installation of equipment using existing holes is possible. (10 kg max./battery bracket)
- When using existing holes, be careful of the gap with the high voltage battery.
  (e.g., contact between the bolt and high-voltage battery) The battery bracket moves back/forth, up/down, and left/right by a maximum of 10 mm when running.
- The battery bracket is rubber mounted. Do not mount the battery bracket to connect to the frame or to connect to another battery bracket.



High-voltage battery bracket

Mounting precautions for slinging the high-voltage battery bracket

- In the case of suspending the high-voltage battery bracket assembly by a crane or other means, lift it at the designated position.
- Designated sling position
  Four locations on one side, i.e., eight locations on both sides, per high voltage battery (see figure below)
  (Sling screw size: M10 x P1.5)



Vehicle right-side sling position

Vehicle left-side sling position

3.17 Optional equipment

⚠ Risk of accident and injury

The use of parts, assemblies or conversion parts and accessories which have not been approved may jeopardize the safety of the vehicle.

Before installing any attachments, special-purpose bodies, equipment or carrying out any modifications to the basic vehicle and/or its assemblies, you must read the relevant sections of the vehicle Instruction Manual, as well as the operating and assembly instructions issued by the manufacturer of the accessories and items of optional equipment.

You could otherwise fail to recognize dangers, which could result in injury to yourself or others.

MITSUBISHI FUSO recommends using equipment available as option codes to adapt the vehicle to the body optimally.

All code-specific special equipment is available from an authorized MITSUBISHI FUSO authorized Distributer or the department responsible ▷ 2.2.

Optional equipment (e.g. , anti-roll bars, etc.) or retrofitted equipment increases the unladen weight of the vehicle.

When chassis are fitted with different springs or tire sizes, the frame height can change considerably in both the laden and unladen state.

The actual vehicle weight and axle loads must be determined by weighing before mounting.

Not all optional equipment can be installed in any vehicle without problems. This applies, in particular, for retrofitted equipment because the installation space may already be occupied by other components or the special equipment may require other components.

If the current value falls outside the specified range when body building and modification work are performed for electrical parts, a fault is detected, causing a warning lamp to go on and remain on or a function not to operate.

- If an electrical part is to be added or a lamp is to be replaced with an LED lamp, the current value of the electrical part should be ensured to fall within a specified range. This is, however, does not guarantee that the electrical part to be mounted will be fully operational when its current value falls within the specified range.
- For the specified current value, ask an authorized MITSUBISHI FUSO authorized Distributer or the department responsible ▷ 2.2.
- Some electrical parts to be mounted require that the SAM control unit parameters be changed. For the electrical parts to be mounted, see "8.1.2 Signal detection and actuation module-related parts" ▷ 8.1.2.
  Ask an authorized MITSUBISHI FUSO authorized Distributer.
- When adding or replacing a lighting unit, be sure to mount one that complies with the applicable laws and regulations, and observe the regulations governing visibility.

3.18 ADR/GGVS

⚠ Risk of accident

The vehicles cannot fulfil the ADR/GGVS requirements due to the vehicle equipment.
If it is required and cannot be avoided, contact the department responsible.
See ▷ 2.2.

4.1 Vehicle overhang and technical wheelbases

⚠ Risk of accident

The body must be designed in such a way that a placing of excessive load weight at the rear is prevented. It is important to comply with the points listed below, otherwise the necessary steering and braking forces for safe vehicle operation cannot be transferred to the road.

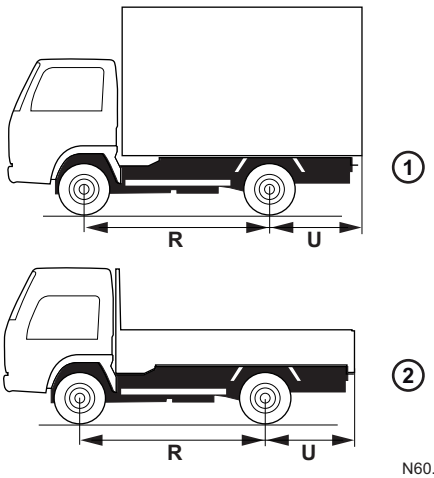
- When calculating the length of the vehicle overhang, always take into account the permissible axle loads and the minimum front axle load.
- Comply with the minimum front axle load ▷ 4.3.
- Take the weight of special equipment into consideration when making calculations.

4.1 Vehicle overhang and technical wheelbases

4.1.1 Maximum vehicle overhangs

	Maximum vehicle overhang (U)
①	65% of wheelbase
②	50% of wheelbase

① Vehicle with body whereby no load extends over the rear end of the vehicle.
Example: box body
② Vehicle except ①



N60.10-2256-00

R=Wheel base
U=Rear overhang

Additional information

All national laws, directives and registration requirements must be complied with.

4.2 Weight distribution, CoG height, anti-roll bars

⚠ Risk of accident

The body must be designed in such a way that a placing of excessive load weight at the rear is prevented. It is important to comply with the points listed below, otherwise the necessary steering and braking forces for safe vehicle operation cannot be transferred to the road.

4.2.1 Weight distribution

Avoid one-sided weight distribution.

The wheel load (1/2 the axle load) may be exceeded by no more than 4%. Observe the tire load capacity.

Example:

- Permissible axle load 5,000 kg
- Permissible wheel load distribution 2,600 kg to 2,400 kg

4.2.2 CoG height

B

For approval of a vehicle with body/attachments mounted, a calculation of the height of the center of gravity of the laden vehicle must be submitted in accordance with all national regulations and laws. The calculation basis for permissible heights of center of gravity can be requested from the responsible department ▷ 2.2.

For CoG height of the kerb weight, see "10.7 Spring Characteristic" ▷ 10.7.

MITSUBISHI FUSO cannot vouch for the handling, braking and steering characteristics of vehicles with attachments, installations or modifications for payloads with unfavourable centers of gravity (e.g. rear-mounted. overheight and side-mounted loads). The vehicle body/equipment manufacturer/converter is responsible for the safety of the vehicle in the case of these bodies.

4.2.3 Stabilizers roll control

Make sure that the vehicle you are building is correctly equipped. MITSUBISHI FUSO provides stabilizers as factory equipment for different model series, and does not offer optional stabilizers for any model.

4.3 Steerability

⚠ Risk of accident

The body must be designed in such a way that a placing of excessive load weight at the rear is prevented. The following points must be complied with otherwise the steering and braking forces necessary for safe driving cannot be transmitted.

To ensure sufficient vehicle steerability, the minimum front axle load (25% of gross vehicle weight) must be maintained under all load conditions. Consult the department responsible in the event of any deviations ▷ 2.2.

Property damage

The permissible front axle load must not be exceeded.

Observe the notes on product safety ▷ 2.3.

4.4 Clearance for the basic vehicle and bodies

Certain clearances must be maintained in order to ensure the function and operational safety of assemblies.

Dimensional data in the body/equipment mounting directives must be observed.

The minimum clearance between chassis parts and rear body parts must be kept according to the following table of minimum clearance standard.

4.4.1 Minimum clearance and notes

Section behind cab

In the section behind the cab, there are a cab tilt locking unit, etc. Ensure there is a clearance of at least 100 mm between the cab and rear body to facilitate trouble-free operation, inspection and filling works.

Provide a protector in order to prevent loads from falling from the rear body front window of the dump or other rear body.

Areas around motor generator

Vertical direction 40 mm

Lateral direction 30 mm

Longitudinal direction 25 mm

Brake hose (which connects to the front and rear wheel)

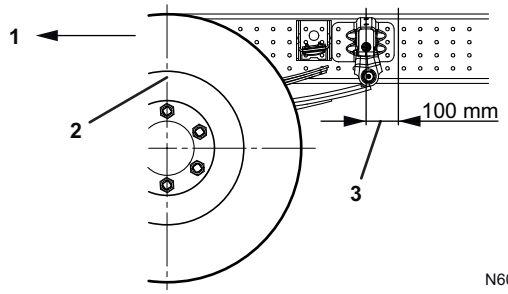
Keep min. 50 mm of clearance at worst. This brake hose is considered to move when vehicle is driven.

Other hoses

40 mm

Rear springs

The link at the rear of the main spring may move while driving. Do not fit any mounting hardware within the range indicated in the figure.



1 Front of vehicle
2 Rear axle center line
3 No components may be attached in this area

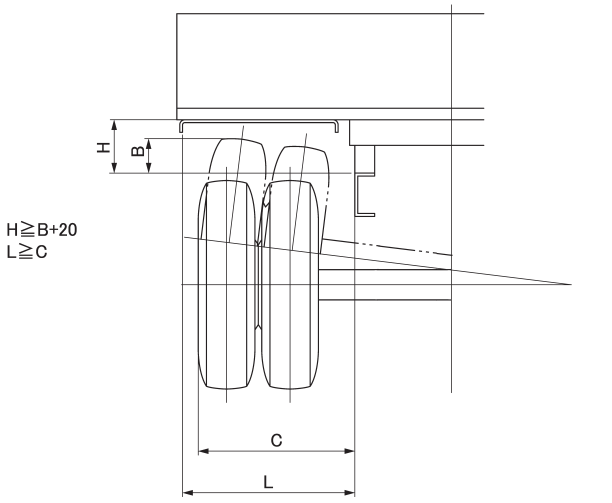
4.4 Clearance for the basic vehicle and bodies

Space above rear axle

Air and electrical lines such as the brake hose and wiring harness are laid on top of the rear axle.

Provide enough space above the rear axle so that these lines will not come into contact with any of the mounting parts even when the axle is elevated to the highest position.

Refer to "Differential and tire bound height" ▷ 10.7.2.



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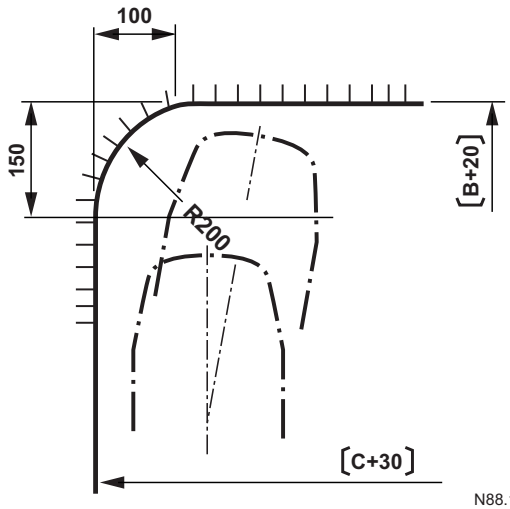
Attaching the rear fender

The clearance between the rear fender and tire must be designed to be optimum assuming that the vehicle is travelling in bad conditions.

Determine the standard clearance from the fender and top and side surfaces of the frame as follows from dimensions B and C listed in 10.7 "Differential and tire bound height" ▷ 10.7.2.



N88.10-2030-00

Note: The fender must not be inside the shaded area.

4.4 Clearance for the basic vehicle and bodies

Battery

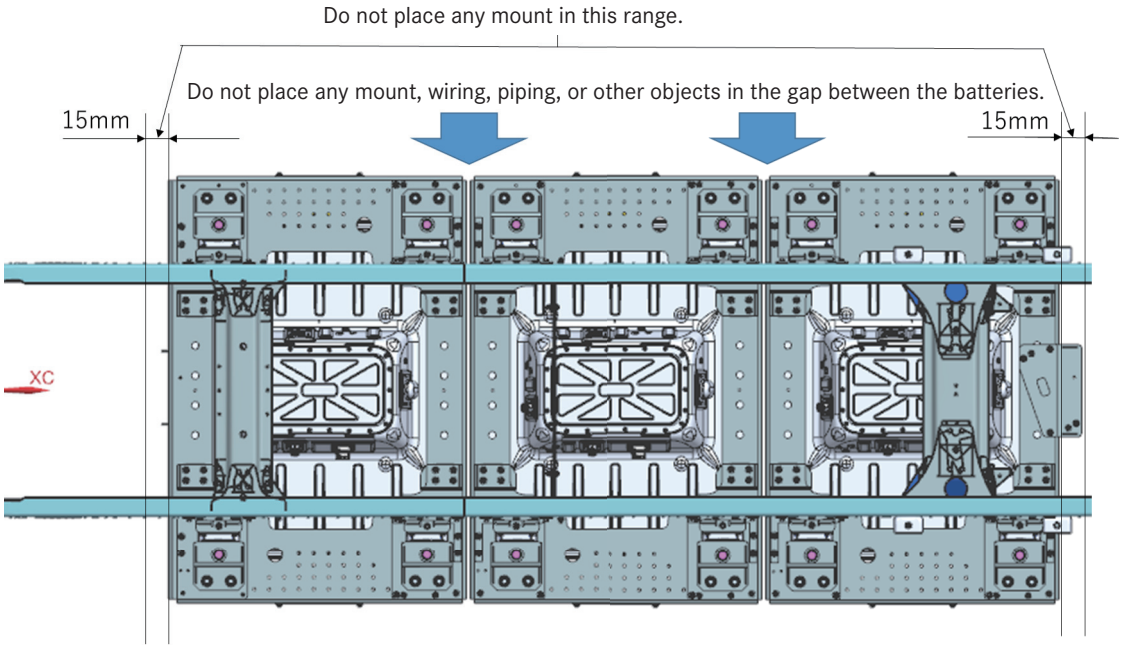
Mounting hardware must be located so that battery removal/installation and inspection as well as battery cover detaching/attaching can be done easily.

High-voltage battery peripherals

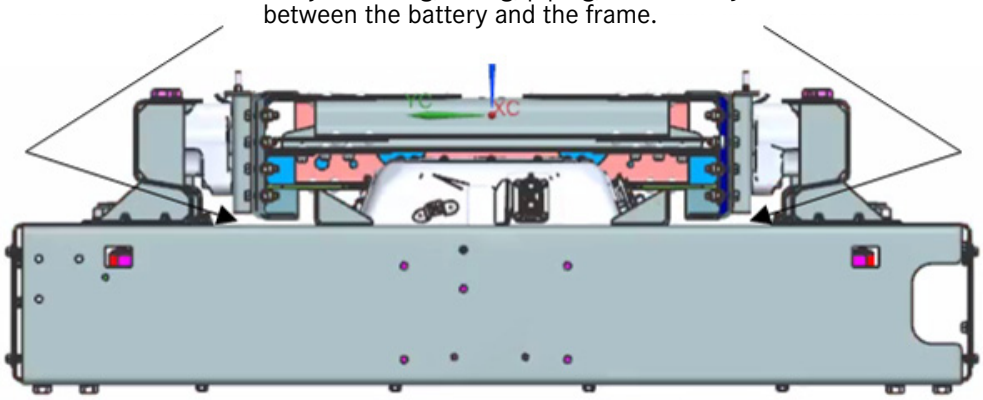
Do not place any mount, wiring, piping, or other objects in the batteries gap as shown below.

Additional information

Read and comply with the relevant sections of the body/equipment mounting directives.



Do not install any mounting, wiring, piping, or other objects between the battery and the frame.

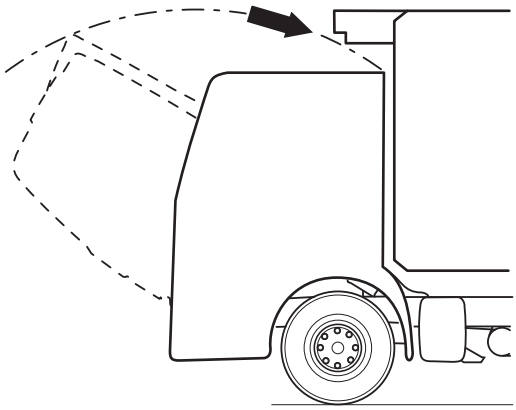


Inlet charge box

If installing side guards or other objects around the charging socket, ensure that they do not interfere with the charging socket box that opens and closes or the charging socket to be inserted.

4.4.2 Attachment above cab

- Observe the permissible center of gravity location and the front axle load.
- Make sure that there is sufficient space for tilting Refer to "10.5.3 Cab side view" ▷ 10.5.3.



N60.80-2157-00

Cab tilting range clearance

4.5 Permissible load on cab roof

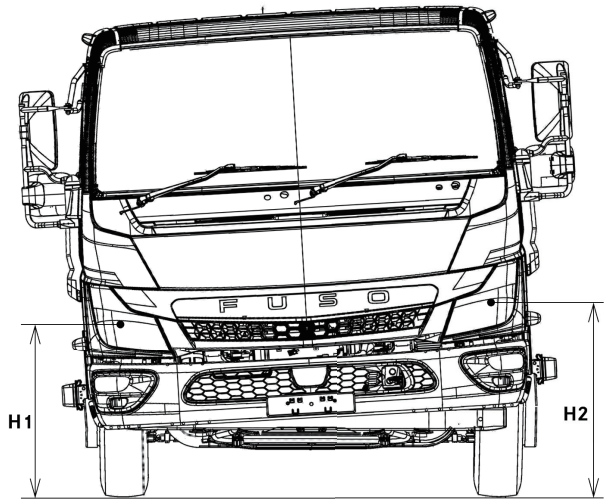
When attaching externally mounted parts such as roof deck or ladder onto the roof, take care to prevent the weight of these parts from exceeding 50 kg.

4.6 Vehicle body incline

As far as possible, take steps to ensure that the weight of the body-building part is balanced in the left-right direction. If it is not possible to ensure left-right weight balance, carry out adjustment by adding a counterweight or adding a spacer to the mounting frame, for example.

When carrying out body-building work, be sure to observe the following items in order to ensure that the vehicle does not topple over or become twisted.

- Be sure to carry out the work on flat ground.
- As far as possible, carry out the work with both the front and rear tires on the ground.
- When installing the body, ensure that the chassis is horizontal.
- When installing the body, place it symmetrically on the chassis to prevent it from tilting.



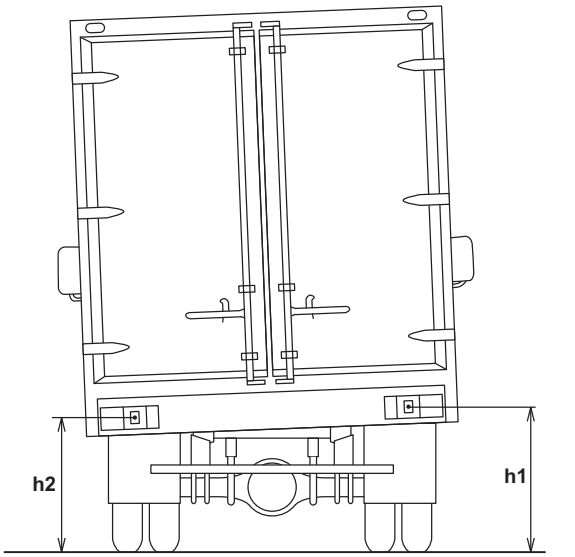
N60.00-2258-0

H1 Right front
H2 Left front

4.6.1 Measuring the tilt of the body

When carrying out body-building work, measure the tilt of the body shown below. If the tilt of the body of the completed vehicle when empty exceeds the target value, correct it.

- Front tilt: ΔHf
  Left-right difference at the headlamp center height
  ΔHf = H1 – H2
  Target: | ΔHf | ≤ 10 mm
- Rear tilt: ΔHr
  Left-right difference at the stop lamp center height
  ΔHr = h1 – h2
  Target: | ΔHr | ≤ 10 mm
- Twisting in the longitudinal direction of the vehicle: Tw
  Tw = ΔHf – ΔHr = (H1 – H2) – (h1 – h2)
  Target: | Tw | ≤ 10 mm



N60.00-2259-00

h2 Left rear
h1 Right rear

4.6.2 Correction method

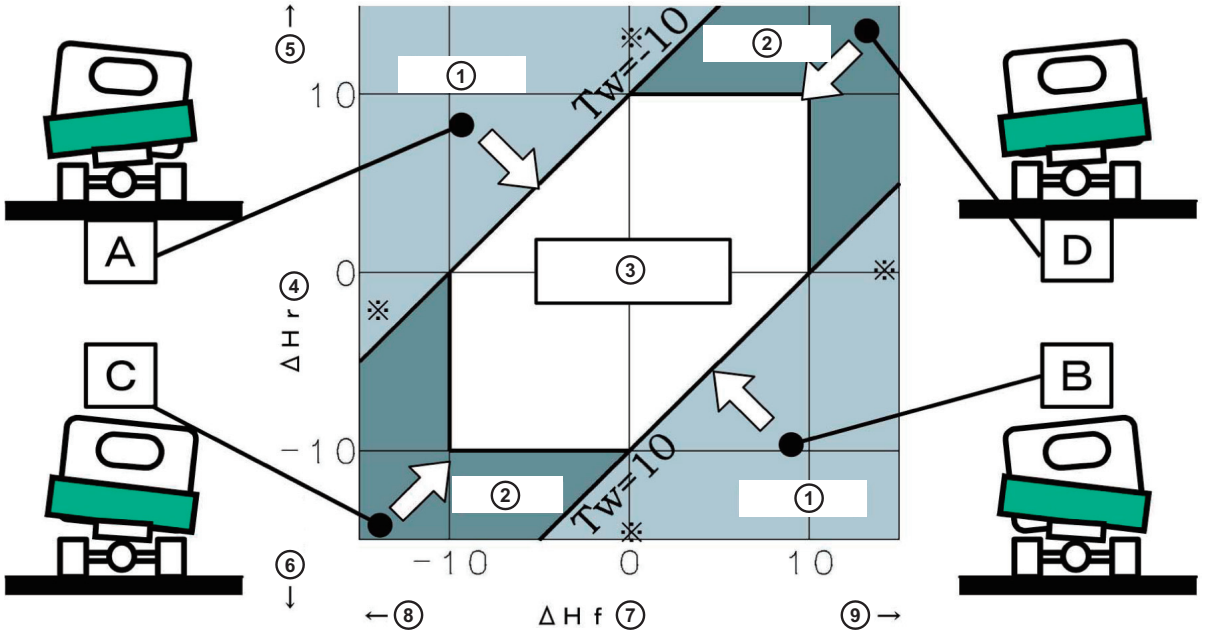
The correction method differs depending upon the posture of the actual vehicle.

Check to see which condition of A to D shown in the graph below the measurement results correspond to, and then carry out correction as follows. (Note that if you carry out a different kind of correction, the results may actually become worse.)

Additional information

Measure the tilt of the body with the body-building part mounted.

Body posture and applicable correction method



N60.00-2260-00

① *Twist*
② *Droop*
③ *Target range*
④ *Rear*
⑤ *Right rising*
⑥ *Right falling*
⑦ *Front*
⑧ *Right falling*
⑨ *Right rising*

Twist correction (in the case of A and B: | Tw | > 10 mm)

4.6 Vehicle body incline

When clamping the body-building part, the twist can be corrected by applying a twist to the chassis in the opposite direction.

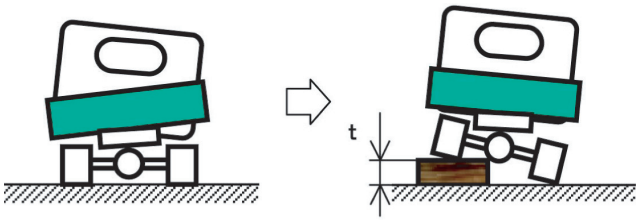
- Place chocks firmly beneath the front wheels.
- In the case of A (Tw < –10), place the left rear wheel on a plate of thickness t corresponding to the amount of twist. In the case of B (Tw > 10), place the right rear wheel on the plate.

Amount of lift-up of the wheel on one side for correcting twist

Unit: mm

Twist "| Tw |"	Plate thickness (lift-up) "t"
10 to 15	100
15 to 20	150

(Lift-up on one side is also permissible.)



- After clamping the body-building part, first slacken all of the clamping bolts. (Take care to ensure that it is safe.)
- Lift the tire onto the plate, and then once again tighten the clamping bolts.
- Lower the tire from the plate, and confirm that there is no looseness in the clamped part or any other part.

Additional information

In the case of a vehicle whose initial position is close to one of the ※ markings on the illustration "Body posture and applicable correction method" (▷ 4.6.2) (body both cambered and twisted), the position will sometimes become C or D after multiple applications of this correction method. In this case, continue with tilt correction.

Tilt correction (C and D: | ΔHf | > 10 mm, or | ΔHr | > 10 mm)

With the body-building part clamped to the vehicle, insert a spacer between the axle spring washer and the spring.

By inserting a spacer at either the front wheel or the rear wheel, both the front and rear of the vehicle will be corrected. First, insert a spacer at the rear wheel, and only if correction is insufficient insert a spacer at the front wheel as well.

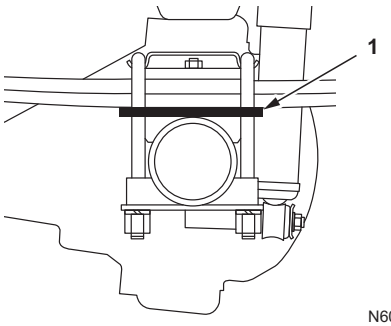
Additional information

When implementing the following operations, please contact your local MITSUBISHI FUSO authorized Distributer.

- Place chocks beneath the front wheels, then jack up the rear axle in order to firmly support the frame or the body-building part.
- Note that the spacer insertion position for an over-slung vehicle (spring is above the axle) is different from that for an under-slung vehicle (spring is beneath the axle).

4.6 Vehicle body incline

Over-slung vehicle



N60.00-2262-00

1 Spacer insertion position

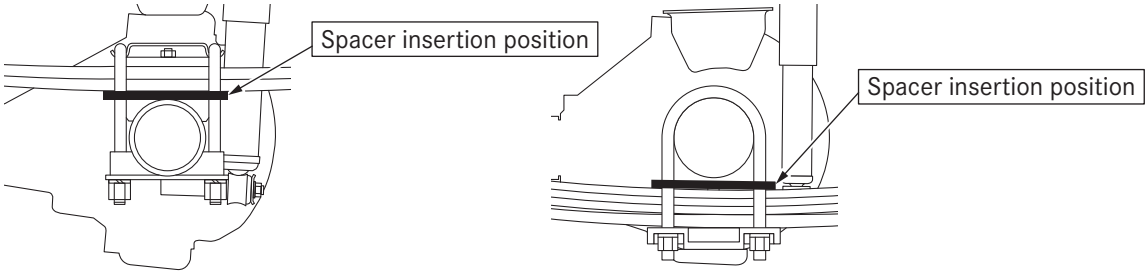
Additional information

If the length of the center bolt is insufficient, replace the bolt with one which is between one and two sizes longer.

Number of spacers to be inserted in order to correct tilt

Unit: mm

Tilt | Hf | or | Hr |	Number of spacers
10 to 14	1
14 to 18	2



Over-slung vehicle

Under-slung vehicle

- Remove the center bolt of the spring, then while referring to the table below select a suitable number of spacers, insert them, and retighten the center bolt to the specified torque.

Note: If the length of the center bolt is insufficient, replace the bolt with one that is between one and two orders longer.

4.6 Vehicle body incline

Spacer part number and insertion position

Vehicle model	Spacer part number (All t = 4.5)	Insertion position of rear wheel spacer	
		In the case of C (Right falling)	In the case of D (Right rising)
FEA	MB161772	Above left spring	Above right spring
FEB		Below right spring	Below left spring
FEA5, FEB7, FEC, FGB	MB161776	Below right spring	Below left spring

- Clamp the spring to the axle by tightening the U-bolt to the specified torque.

Additional information

If the length of the U-bolt is insufficient, replace the bolt with one which is between one and two sizes longer.

Additional information

- The center bolt for the spring does not need to be loosened.
- If the length of the center bolt is insufficient, replace the bolt with one which is between one and two sizes longer.

- Re-check the tilt, and if the amount of correction is insufficient, insert a spacer at the front wheel as well.
  - Place chocks beneath the rear wheels, then jack up the rear axle in order to firmly support the frame.
  - Insert a spacer (MC110153) between the front axle and the left or right front wheel, whichever is lower (the tilt will be corrected by approximately 5 mm).

If it is still necessary to correct the vehicle tilt even after performing the above corrective procedure, please contact the department responsible.

▷ 2.2.

4.7 Others

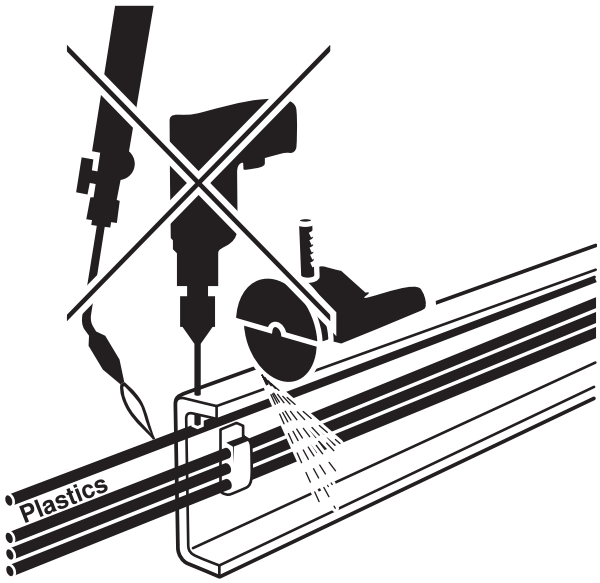
4.7.1 Maximum rear body width

The maximum limits on the rear body width is prescribed in the local laws and regulations.
Refer to "10.11 Other equipment" ▷ 10.11.

5.1 Brake hoses/cables and lines

Risk of accident

Work carried out incorrectly on the brake hoses, cables and lines may impair their function. This may lead to the failure of components or parts relevant to safety.



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- Hydraulic lines and brake hoses must be covered or removed if necessary before carrying out any welding, drilling and grinding work and before working with cutting discs.
- After installing, hydraulic lines and brake hoses, the system must be tested for pressure loss and leaks.
- No other lines may be attached to brake hoses.
- Lines must be protected from heat by means of appropriate insulation.
- Line routing must be designed to prevent any increase in pressure loss.

Comply with all national regulations and laws.

Additional information

Further information on brake hoses can be found in 6.11 "Brake systems" ▷ 6.11.

5.2 Welding work

⚠ Risk of accident

The eCanter has high-voltage (approx. 348V).

This field of work requires decommissioning of the vehicle. Refer to "6.12.2 High voltage shutoff and reset" ▷ 6.12.2.

⚠ Risk of injury

Welding work in the vicinity of the airbags can cause the restraint system to malfunction.

Welding work near the airbags is strictly forbidden.

The airbag could be triggered or may no longer function correctly.

The legal stipulations regarding the transport and storage of airbag units must be observed.

All laws governing explosive substances must be complied with.

The following safety measures must be observed to prevent damage to components caused by overvoltage during welding work:

- Disconnect the positive and negative terminals from the battery and cover them.
- Connect the welding-unit ground terminal directly to the part to be welded.
- Do not touch electronic component housings (e.g. control modules) and electric lines with the welding electrode or the ground contact clamp of the welding unit.
- Before welding, cover spring to protect them from welding spatter. Do not touch springs with welding electrodes or welding tongs.
- Avoid welding work on inaccessible cavities in the cab.
- Welds must be ground down and reinforced with angular profiles to prevent notching from welding penetration.
- Avoid welds in bends.
- The distance from a weld to the outer edge should always be at least 15 mm.

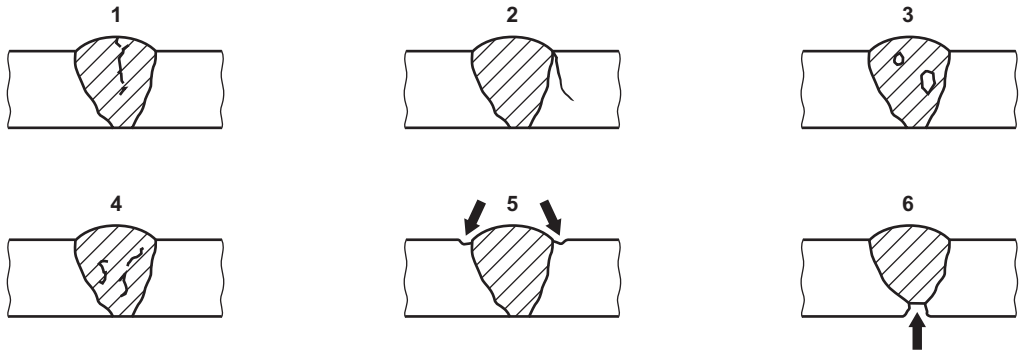
! Property damage

Do not connect the arc welder ground clamp to assemblies such as the motor generator or axles.

Welding work is not permitted on assemblies such as the motor generator, axles, etc.

- Avoid defects such as deposited metal cracking, toe crack, blow holes, slag inclusion, under cut, poor penetration, etc.

5.2 Welding work



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1 *Deposited metal cracking*
2 *Toe crack*
3 *Blow hole*
4 *Slag inclusion*
5 *Under cut*
6 *Poor penetration*

Additional information

Additional information on welded connections can be found in Section 6 "Modifications to the basic vehicles" ▷ 6.1. and Section 8 "Electrics/electronics" ▷ 8.1.

The following safety measures must be observed to prevent damage to welding parts;

- Do not weld any item to the frame to hold it temporarily.
- Clean parts thoroughly with a wire brush and dry them off before welding.
- Make sure the paint is completely removed, before welding a painted part.
- Use a low hydrogen type welding electrode. The welding electrode absorbs moisture when it is used, so it is necessary to dry it thoroughly before use.
- When welding, maintain the optimum welding speed and conditions for the preservation of the welding electrode.
- Maintain the welding current at the optimum value for safety.
- Make several short welding beads rather than one long bead.
- Make symmetrical beads to limit shrinkage.
- Avoid more than 3 welds at any one point.
- Avoid welding in strain hardened zones.
- When connecting the ground cable of the arc welder, make sure to disconnect the negative terminal from the battery. The ground of the welder should be connected to the side rail near the welded part. Never connect around the transmission, front and rear axles, etc.
- When performing welding work on the chassis, take proper measure to prevent the tubes, harnesses, rubber parts, springs, etc. from heat or spatter.
- Do not cool parts off with water after welding.

Risk of accident and injury

Before performing electric of arc welding as part of vehicle repair operation, disconnect the negative (-) cable from the battery. The ground cable of the welding machine should be connected to a point as close to the welding area as possible.

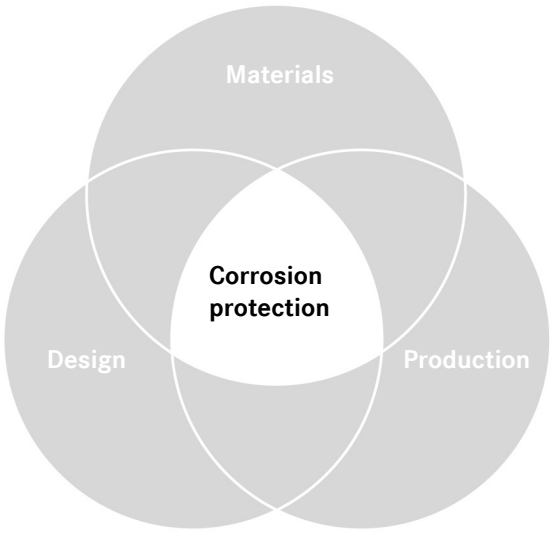
5.3 Corrosion protection measures

General

In order to preserve the durability and quality standard of the vehicle, measures must be taken to protect it against corrosion when the vehicle is modified and after installing bodies and fittings.

Information on the design, execution of work and the requirements of the materials and components to be used with regard to corrosion protection is listed below.

To achieve good corrosion protection, the areas of design (1), production (2) and materials (3) must be perfectly matched.



N97.00-2015-00

Optimum corrosion protection

5.3 Corrosion protection measures

Disassembly of components

If the body manufacturer makes structural modifications to the chassis, the corrosion protection in the affected areas must be restored to match the production standards of MITSUBISHI FUSO. The areas must also be finished with appropriate paintwork. Information on approved MITSUBISHI FUSO refinishing paint suppliers is available on request from the department responsible ▷ 2.2.

Damage to components

If components are damaged during disassembly (scratches, scuff marks), they must be professionally repaired. This applies especially for drilled holes and openings. Two-component epoxy primers are particularly suitable for repair work.

Cutting of components

When cutting and grinding work is carried out, the adjacent painted components must be protected against flying sparks and shavings. Grinding dust and shavings must be carefully removed because these contaminants can spread corrosion. Edges and drilled holes must be cleanly deburred in order to guarantee optimum corrosion protection.

Corrosion protection on reinforcements and fittings

Reinforcements and fittings must receive adequate anti-corrosion priming prior to installation. In addition to galvanising, cataphoretic dip-priming and zinc-rich paint in sufficient coatings have proved satisfactory for this purpose.

5.3 Corrosion protection measures

Corrosion prevention in welding work

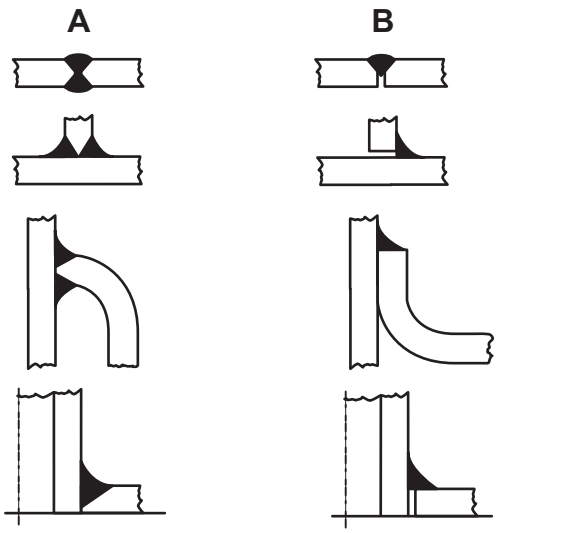
In order to avoid crevice corrosion at weld seams, the welds should be made in accordance with the examples shown.

Preparation

The welding area must be free from corrosion, grease, dirt or similar contamination. If painted surfaces are to be welded, the paint coat must first be removed by grinding or chemical stripping. If this is not done, the paint will burn and the residues can impair corrosion resistance.

After welding work

- Remove drilling shavings.
- Deburr sharp edges.
- Remove any burned paint and thoroughly prepare surfaces for painting.
- Prime and paint all unprotected parts.
- Preserve cavities with wax preservative.
- Carry out corrosion protection measures on the underbody and frame parts.



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Example: Weld seams

A – Suitable
B – Unsuitable

Additional information

Plug and slot welds, particularly on horizontal surfaces, should be avoided due to the risk of corrosion. If they are unavoidable, these welds must receive additional preservation. Furthermore, avoid designs which allow moisture to accumulate. These must be fitted with additional drainage holes or gaps in the weld seam.

5.4 Bolted connections

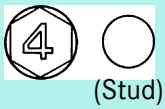
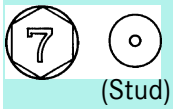
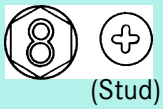
Use the specified bolts and nuts. Unless otherwise specified, tighten to the torques shown in the table below.

Make sure that the thread and washer are dry when tightening.

If strength categories differ between a nut and bolt (or stud bolt), tighten the nut to the torque specified for the bolt.

- Hex bolt and stud bolt

Unit: N·m {kgf·m}

Strength category	4T		7T		8T	
Indication / Nominal diameter mm	 (Stud)		 (Stud)		 (Stud)	
M5	2 to 3 {0.2 to 0.3}	–	4 to 6 {0.4 to 0.6}	–	5 to 7 {0.5 to 0.7}	–
M6	4 to 6 {0.4 to 0.6}	–	7 to 10 {0.7 to 1.0}	–	8 to 12 {0.8 to 1.2}	–
M8	9 to 13 {0.9 to 1.3}	–	16 to 24 {1.7 to 2.5}	–	19 to 28 {2.0 to 2.9}	–
M10	18 to 27 {1.8 to 2.7}	17 to 25 {1.8 to 2.6}	34 to 50 {3.5 to 5.1}	32 to 48 {3.3 to 4.9}	45 to 60 {4.5 to 6.0}	37 to 55 {3.8 to 5.7}
M12	34 to 50 {3.4 to 5.1}	31 to 45 {3.1 to 4.6}	70 to 90 {7.0 to 9.5}	65 to 85 {6.5 to 8.5}	80 to 105 {8.5 to 11}	75 to 95 {7.5 to 10}
M14	60 to 80 {6.0 to 8.0}	55 to 75 {5.5 to 7.5}	110 to 150 {11 to 15}	100 to 140 {11 to 14}	130 to 170 {13 to 17}	120 to 160 {12 to 16}
M16	90 to 120 {9.0 to 12}	90 to 110 {9 to 11}	170 to 220 {17 to 23}	160 to 210 {16 to 21}	200 to 260 {20 to 27}	190 to 240 {19 to 25}
M18	130 to 170 {14 to 18}	120 to 150 {12 to 16}	250 to 330 {25 to 33}	220 to 290 {22 to 30}	290 to 380 {30 to 39}	250 to 340 {26 to 35}
M20	180 to 240 {19 to 25}	170 to 220 {17 to 22}	340 to 460 {35 to 47}	310 to 410 {32 to 42}	400 to 530 {41 to 55}	360 to 480 {37 to 49}
M22	250 to 330 {25 to 33}	230 to 300 {23 to 30}	460 to 620 {47 to 63}	420 to 560 {43 to 57}	540 to 720 {55 to 73}	490 to 650 {50 to 67}
M24	320 to 430 {33 to 44}	290 to 380 {29 to 39}	600 to 810 {62 to 83}	540 to 720 {55 to 73}	700 to 940 {72 to 96}	620 to 830 {63 to 85}

- Hex flange bolt

Unit: N·m {kgf·m}

Strength category	4T		7T		8T	
Indication / Nominal diameter mm						
M6	4 to 6 {0.4 to 0.6}	–	8 to 12 {0.8 to 1.2}	–	10 to 14 {1.0 to 1.4}	–
M8	10 to 15 {1.0 to 1.5}	–	19 to 28 {2.0 to 2.9}	–	22 to 33 {2.3 to 3.3}	–
M10	21 to 30 {2.1 to 3.1}	20 to 29 {2.0 to 3.0}	45 to 55 {4.5 to 5.5}	37 to 54 {3.8 to 5.6}	50 to 65 {5.0 to 6.5}	50 to 60 {5.0 to 6.5}
M12	38 to 56 {3.8 to 5.5}	35 to 51 {3.5 to 5.2}	80 to 105 {8.0 to 10.5}	70 to 95 {7.0 to 9.5}	90 to 120 {9 to 12}	85 to 110 {8.5 to 11}

- Hex nut

Unit: N·m {kgf·m}

Strength category	4T		6T	
Indication / Nominal diameter mm				
	Standard thread	Coarse thread	Standard thread	Coarse thread
M5	2 to 3 {0.2 to 0.3}	–	4 to 6 {0.4 to 0.6}	–
M6	4 to 6 {0.4 to 0.6}	–	7 to 10 {0.7 to 1.0}	–
M8	9 to 13 {0.9 to 1.3}	–	17 to 24 {1.7 to 2.5}	–
M10	18 to 27 {1.8 to 2.7}	17 to 25 {1.8 to 2.6}	34 to 50 {3.5 to 5.1}	32 to 48 {3.3 to 4.9}
M12	34 to 50 {3.4 to 5.1}	31 to 45 {3.1 to 4.6}	70 to 90 {7.0 to 9.5}	65 to 85 {6.5 to 8.5}
M14	60 to 80 {6.0 to 8.0}	55 to 75 {5.5 to 7.5}	110 to 150 {11 to 15}	100 to 140 {11 to 14}
M16	90 to 120 {9.5 to 12}	90 to 110 {9 to 11}	170 to 220 {17 to 23}	160 to 210 {16 to 21}
M18	130 to 170 {14 to 18}	120 to 150 {12 to 16}	250 to 330 {25 to 33}	220 to 290 {22 to 30}
M20	180 to 240 {19 to 25}	170 to 220 {17 to 22}	340 to 460 {35 to 47}	320 to 410 {32 to 42}
M22	250 to 330 {25 to 33}	230 to 300 {23 to 30}	460 to 620 {47 to 63}	420 to 560 {43 to 57}
M24	320 to 430 {33 to 44}	290 to 380 {29 to 39}	600 to 810 {62 to 83}	540 to 720 {55 to 73}

- Hex flange nut

Unit: N·m {kgf·m}

Strength category	4T	
Indication / Nominal diameter mm		
	Standard thread	Coarse thread
M6	4 to 6 {0.4 to 0.6}	–
M8	10 to 15 {1.0 to 1.5}	–
M10	21 to 31 {2.1 to 3.1}	20 to 29 {2.0 to 3.0}
M12	38 to 56 {3.8 to 5.5}	35 to 51 {3.5 to 5.2}

5.4 Bolted connections

Preventing contact corrosion

Direct contact between materials with different electrode potentials can lead to corrosion of the less noble material when exposed to moisture and salt ions.

When selecting materials, avoid the following combinations:

- Chrome/nickel-steel with aluminium
- Chrome/nickel-steel with zinc-coated steel

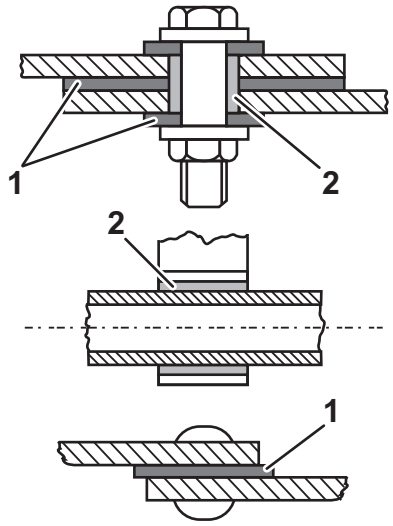
Insulation by coating

Contact corrosion can be prevented by using insulation such as washers, sleeves or bushings. Even in this case, however, the connecting points must not be persistently exposed to moisture.

Vehicle cleaning and care

When the vehicle is handed over to the body manufacturer, it must immediately be cleaned of salt and dirt. If it is to be stored for some time, the vehicle must be preserved.

During modification it must be ensured that load-bearing components are additionally protected against aggressive chemicals and environmental influences. If the vehicle comes into contact with chemicals or salts (e.g. snow-clearing operations), it must be cleaned thoroughly at regular intervals.



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1 Insulating washer
2 Insulating sleeve

Property damage

A conductive connection occurs if two different metals are brought into contact with each other through an electrolyte (e.g. air humidity). This causes electrochemical corrosion and the less base of the two metals is damaged. The further apart the two metals are in the electrochemical potential series, the more intense electrochemical corrosion becomes.

For this reason, electrochemical corrosion must be prevented by insulation or by treating the components accordingly, or it can be minimised by selecting suitable materials.

5.5 Painting work

Risk of accident

The eCanter has high-voltage (approx. 348V).

This field of work might require decommissioning of the vehicle. Refer to "6.12.2 High voltage shutoff and reset" ▷ 6.12.2.

Environmental note

Paints and lacquers are harmful to health and to the environment if they are not handled correctly.

Dispose of paints and lacquers in an environmentally responsible manner.

General precautions

- If you removed parts, be sure to reinstall them in their original positions.
- If you removed any labels, obtain new labels and apply them to the same positions from which you removed the old labels.
- Paint compatibility should be checked when repainting. In order to avoid color variations on painted bodies, MITSUBISHI FUSO recommends that paints be used only if they have been tested and approved for the vehicle model in question. There may be paint colors and parts not available for some vehicle types. Contact an authorized MITSUBISHI FUSO authorized Distributer to confirm which colors or parts are available for the vehicle.

5.5.1 Areas which must not be repainted

If you repaint the following parts and areas, trouble may occur. For this reason, before repainting the body areas, apply masking tape or other protective material to these areas to prevent them from being exposed to paint.

If you removed parts, be sure to reinstall them in their original positions. Also, if you removed any labels, obtain new labels and apply them to the same positions from which you removed the old labels.

- Sealing surfaces
- Windows
- Cotact areas between the wheels and wheel hubs, contact areas between the disc wheels of the double tires
- Contact areas for wheel nuts
- Brake hose and brake associated parts
- Various vinyl tubes and identification tape
- Breathers on axles, etc.
- Door locks
- Door retainers in the rear door hinges
- Spring mounting area
- Rubber hoses
- Cab suspension, motor generator, chassis suspension and steering system rubber or plastic parts
- Electric control unit
  SAM (Body electronics control unit with integrated relay and fuse)
- Electrical wiring and connectors
- Lamps, switches, batteries and other electrical parts, high-voltage equipment and other related parts, ePTO motor and inverter
- Drive shaft connecting flange
- Piston rods for the hydraulic and pneumatic cylinders
- Control valves for the air lines
- Ground terminal (to frame)
- Various caution plates and nameplates

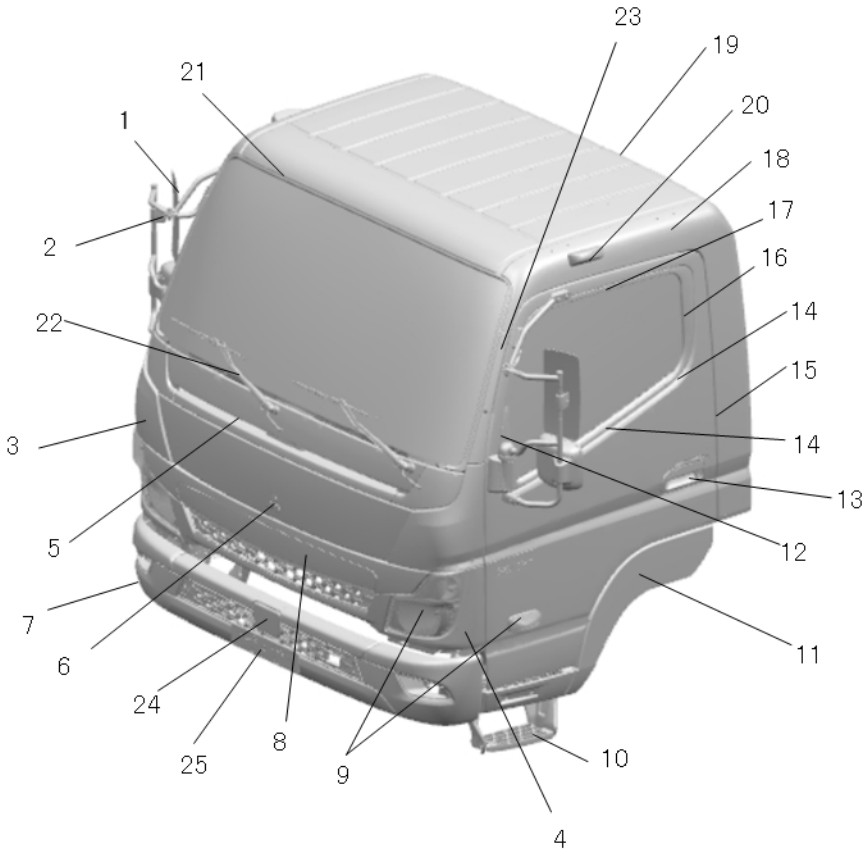
- Rubber or polypropylene parts for cab
  - Weatherstrips
  - Rear view mirror bodies
  - Mud guard aprons
  - Washer nozzles
  - Splash aprons
  - Mud guards
  - Steps
  - Fenders
  - Runchannels
  - Bumper corner covers
  - Packing rubbers (mirror fitting, antenna fitting, and grip fitting bases)
  - Antenna
  - Rader Cover
- The following parts should not be repainted for appearance reasons.
  - Emblems (such as FUSO)
  - Rear view mirror stays
  - Fenders
  - Wiper arms and blades
  - Antenna and its bracket
  - High-voltage battery box side cover

5.5.2 Precautions to be observed when drying the paint

- Forced drying
  In order to protect resin and rubber parts, ensure that the temperature of the painted surface does not exceed 80°C.
  If the temperature is likely to exceed 80°C, either remove the following parts or take steps to protect them from heat.

Parts to be removed or shielded from heat when repainting at temperatures exceeding 80°C

1. *Exterior mirror*
2. *Mirror stay*
3. *Corner panel*
4. *Corner panel Lower*
5. *Front cover*
6. *Emblem*
7. *Bumper corner cover*
8. *Front grille (Including caps screws for fitting hole in cab)*
9. *Lamp, etc.*
10. *Step*
11. *Fender*
12. *Door delta garnish*
13. *Door outer handle*
14. *Door belt line molding*
15. *Door weatherstrip*
16. *Door sash garnish*
17. *Door runchannel*
18. *Screw seal washer*
19. *Rear window weatherstrip (cab)*
20. *Lamps*
21. *Wind shield weatherstrip*
22. *Wiper*
23. *Antenna*
24. *Rader Cover*
25. *License Plate Brkt Cover*



Natural drying

In this case, no resin or rubber parts must be removed from the vehicle.

Additional information

- Clear acrylic urethane can be susceptible to blistering. More information can be obtained from the paint manufacturer/supplier.
- The surfaces must be roughened before repainting, otherwise the paint layer might adhere poorly.

5.5.3 Painting vehicles prior to shipment

- Cab

Part name	Painting specifications		
	Body color (color name)	Color code	Paint manufacturer
Outside of cab (body color)	Natural white	AC17031	Kansai Paint
	Sonic blue	CTB10000	Nippon Paint
	Forest green	CTG10058	Nippon Paint
	Arcadia silver	CTH10090	Dai Nippon Toryo
	Light blue	AC17120	Dai Nippon Toryo
	Shannon blue	AC17089	Nippon Paint
	Jupiter green	AC17010	Kansai Paint
	Fiji green	AC17088	Kansai Paint
	Bright orange	AC17024	Kansai Paint
	Mars red	AC17023	Kansai Paint
	Warm silver	AC17130	Dai Nippon Toryo
	Active yellow	CFY10013	Kansai Paint
	Ice blue-silver	CFH10002	Dai Nippon Toryo
	sirius silver	CTA10013	Dai Nippon Toryo

- Chassis

Part name	Paint specifications	
Frame	RN chassis black or Emaron MS chassis black	Dai Nippon Toryo
Axles [front and rear]	Chassis Super MZ or chassis black M	Dai Nippon Toryo
Spring	Spring black No. 1000	Dai Nippon Toryo

5.5.4 Repainting of the cab

- When a standard-color-coated cab is repainted, plastic and rubber parts on it should be removed where possible to protect them from adverse effects.

Removable parts	Parts to be masked
• Emblems • Front grille *1 • Corner panels *1 • Front cover • Steps • Fenders • Wipers • Antenna • Lamps • Exterior mirrors, mirror stays • Bumper corner covers • Heat protector (at back of cab) • Sealing washers for screws • Rader Cover	• Door outer handles • Weatherstrips *2 • Caution labels • Door delta garnish • Door runchannels • Door sash garnish • Door beltline moldings

*1 The caps covering the holes in the cab for mounting the radiator grille and corner panels cannot be reused once removed. Replace them with new ones.

Part name	Part No.
Clip	MK676916 (MITSUBISHI FUSO part number)

*2 Before reinstalling removed door weatherstrips, check their plastic clips for deformation in claws and defects preventing smooth insertion. Any defective clips must be replaced with new ones.

Part name	Part No.
Clip	MK402586 (MITSUBISHI FUSO part number)

- Before the cab is shipped from the factory, it is coated with a non-sanding type high-adhesion natural white paint only. However, in order to completely remove oil, grease and other contaminants from the surfaces to be painted, it is recommended that you sand these surfaces.
  Paint other than natural white is not high-adhesion paint. When using paint of a different color, be sure to sand the surfaces to be painted before applying the paint.
  (Sanding procedure: Sand the surfaces uniformly with #400 sandpaper until the gloss disappears from the surface.)

- Repainting the cab
  Paint
  When repainting the cab with lacquer or urethane paint, it is recommended that you use one of the following kinds of paint because it has been confirmed that they form a high-adhesion film even when applied without sanding the surfaces to be painted.

Manufacturer	Name of paint
Kansai Paint	Retan PG80 Retan PG60 Acric #1000
Rock Paint Co., Ltd.	38 Line Co-Rock 79 Line Rock Ace 73 Line Hi Rock 35 Line Rock Lacquer
Isamu Paint Co., Ltd.	AU21 Hi-Art #3000
Dai Nippon Toryo Co., Ltd.	Auto V Top Monarch Auto Squall Auto Acrose Super Auto Swift Acrytan 1000 T-300LINE
Nippon Paint Co., Ltd.	Nax Mighty Lac Nax Sperio Nax Besta Nippe Acrylic

For brands other than the above, you must confirm whether or not it is necessary to sand the surfaces to be painted, by asking the paint manufacturer, for example.

- Outline of repair-painting using arcadia silver or warm silver paint
  Carry out repair-painting using arcadia silver (CTH10090) or warm silver (AC17130) paint, by means of the following procedure.

5.5 Painting work

Process	Description of work
1. Preparing faulty areas for repainting	Remove graining and runs by wet-rubbing with #400 sandpaper, and after the surface is smooth, finish by wet-rubbing with #600 – 800 sandpaper. If there are areas where the paint film is insufficiently thick, wet-rub them with #800 sandpaper. If there are areas on the outside of the above which are to be coated with clear paint, wet-rub them with #1500 sandpaper.
2. Degreasing and masking	Air-blow areas to be repair-painted and also the vicinity thereof, carry out degreasing with a silicone remover, and then carry out masking as necessary.
3. Applying an intermediate coat	If the substrate (ED) is visible through the baked paint film, apply an intermediate coat. • Apply the intermediate coat to a thickness which is sufficient to adequately hide exposed ED areas. The film thickness should be 15 – 20 µm. • Wipe away misted areas using thinner. • Wait 3 to 5 minutes to allow the paint film to set, then force-dry it at 80°C for 15 minutes. • After force-drying, allow the paint film to cool down, then wet-rub the intermediate coat with #600 waterproof sandpaper. • Using #800 waterproof sandpaper, finish the base painting area (the outer side of the intermediate coat) by wet-sanding. * If the substrate (ED) is not exposed, there is no need to apply an intermediate coat. Paint used: Primer surfacer STX-2K-HS 2-liquid type paint hardener 25 % 2-liquid type paint thinner 10 % (STX-2K-TH-0D)

Process	Description of work
4. Applying the base coat	First determine the color of the base repair-painting areas, and then shade the peripheral areas. Do not apply a thick coat to the base. (12 – 15 µm) Lightly apply one coat of paint to the areas which the mist of the base coat (17130 colors) reach (shaded areas). Promptly proceed to the next process within 2 to 3 minutes (before the paint becomes touch-dry). In some cases this process can be omitted. [Paint blending] Use the undiluted paint after filtering it. Return the unused paint to its original container and store it. If the area to be repair-painted is small, you can carry out shading more easily by adding a further 10 to 20 % of thinner to reduce the viscosity and also spraying at a lower air pressure. Wait for about 7 minutes to allow the paint to set, and then apply clear paint. [Mixing ratio of paint] Base coat AC-17130 (quick-drying) 100 (VOLUME) (When the room temperature is between 10 and 20°C) Base coat thinner 11070 approx. 70 (16 – 18 seconds by the use of Iwata cup*3) (When the room temperature is between 20 and 25°C) Base coat thinner 11050 (Standard 20°C) (When the room temperature is between 25 and 35°C) Base coat thinner 11040
5. Clear painting	Lightly mist-coat all of the areas to be repair-painted, finish continuously with one wet coat of paint, and then immediately shade the mist area. [Mixing ratio of paint] 2-liquid type paint Clear 20 – 60 100 2-liquid type paint MS hardner 50 2-liquid type paint Thinner quick-drying Approx. 10 (18 – 20 seconds by the use of Iwata cup*3) [Mixing ratio for ombre painting] Clear paint blended according to the above 10 2-liquid type paint Thinner For shading 11031 50 * The blended clear paint can be used for up to about 4 hours at normal temperature.
6. Drying	After applying clear paint, wait for 2 to 3 minutes to allow it to set, then force-dry it at 80°C for 15 minutes.

*3: The Iwata cup:
is a simple paint viscometer, viscocity cup, NK-2 produced by ANEST IWATA Corporation.

For details, please address inquiries to an authorized MITSUBISHI FUSO authorized Distributer.

5.5.5 Procedure for painting plastic parts

- Do not paint, bake or dry plastic parts of the cab while they are installed. Remove plastic parts and paint them as described below. It is recommended that you use the paint and painting method indicated in the table below.

Paint manufacturer	Dai Nippon Toryo Co., Ltd.
Paint type	Acrylic and urethane type
Name of paint	Planitto #3000
Curing agent	Planitto #721 curing agent
Blending ratio	Main ingredient : Curing agent = 100 : 15
Diluting thinner	Planitto #30 thinner
Paint viscosity	12 – 14 seconds/by the use of Iwata cup*1
Dry film thickness	20 – 35 μ
Setting	Normal temperature × 5 – 10 minutes
Drying the paint film	60 – 70° × 30 – 40 minutes Touch-drying ≈ 15 – 20 minutes
Pre-treating the surface to be painted	1. Sanding white painted surfaces 2. IPA degreasing 3. Air blow
Painting method	Hand spraying with gun

Note 1. Acrylic lacquer type paint may be prone to blistering. For details, ask the paint manufacturer/supplier.

2. Be sure to sand the surfaces before repainting, otherwise the paint film may not adhere well.

*1: The Iwata cup:
is a simple paint viscometer, viscocity cup, NK-2 produced by ANEST IWATA Corporation.

- Custom vehicles and optional plated parts cannot be repainted.

- Solvent for removing contamination
  Synthetic resin used for the grille, and so on, do not readily withstand organic solvents. For this reason, if you select the wrong kind of solvent for wiping such a part, cracks may occur and also marks may remain on the surface of the part.

- Organic solvents which can be used
  - Kerosene
  - Light oil
  - Anti-freeze
  - Wax spray can (Nihon Parkerizing Co., Ltd.) Neo lider
  - Industrial soap
  - Unigold
  - Car Spray 99

- Solvents which must not be used
  - Paint thinner
  - Turpentine
  - Gasoline
  - Escort
  - Origin veil
  - Torepika
  - Emulsion wax
  - Commercially available wax
  - Acetone
  - Reagent alcohol (The Japanese Pharmacopoeia Grade 1)
  - Ketones
  - Esters
  - Chlorinated hydrocarbon

5.5.6 Laminated glass

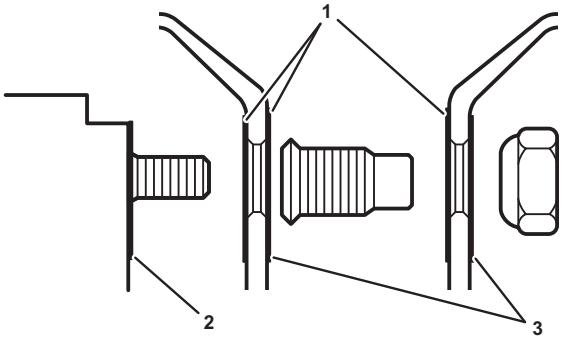
- When a repainted cab body is forced-dried, the temperature should not exceed 100 °C and the process must be completed within 60 minutes. When using a temperature above 100 °C, cover the glass surfaces with shields to prevent them from being heated beyond 100 °C or remove the glass.
- Laminated glass is marked by a double slash (//) in the lower left corner.

5.5.7 Painting the disc wheels

Disc wheels are sometimes painted in the specified color in addition to the original paint on the wheels as shipped by the wheel manufacturer. However, this could lead to loose wheel nuts depending on the thickness of the paint coating.

Prohibition of additional painting

- Do not apply additional painting to disc wheel mounting surfaces, wheel nut seating surfaces and wheel hub mounting surfaces. This makes the paint coating thicker, which could lead to loose wheel nuts. If additional painting has been applied, remove it and clean the surface with a wire brush.



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1 Disc wheel mounting surface
2 Wheel hub mounting surface
3 Wheel nut seating surface

- If you removed parts, securely reinstall them in their original positions. If you peeled off labels, obtain new labels and stick them in their original locations.

Tire rotation

- If additional paint on a disc wheel mounting surface becomes the mounting surface for the mating part (wheel hub or wheel) as a result of tire rotation, remove the paint on the wheel mounting surface and wheel nut seating surface and clean the surfaces with a wire brush before installing the disc wheel. If it is installed without removing the paint, the thick paint coating could lead to loose wheel nuts.

5.6 Chassis springs

5.6.1 Leaf springs

- Only use spring leaves which have been tested and approved for the vehicle model in question. Reinforcement by installing additional spring leaves is not permitted.
- Do not damage the surface or the corrosion protection of the spring leaves when carrying out installation work.
- Before carrying out welding work, cover the spring leaves to protect them against welding spatter. Do not touch springs with welding electrodes or welding tongs.

5.7 Tilting the cab

Risk of injury

Before tilting the cab, please make sure that you read the "Tilting the cab" section in the detailed Instruction Manual.

You could otherwise fail to recognize dangers, which could result in injury to yourself or others.

5.8 Towing and Vehicle movement procedure

⚠ Risk of accident and injury

Be sure to read this section before towing or starting tow. You may cause an accident without realizing the danger and injure yourself or others.

❗ Property damage

Failure to follow the instructions in this section may damage your vehicle.

5.8 Towing and Vehicle movement procedure

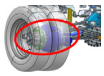
5.8.1 Overview

When towing a vehicle, turn on the EV system ("Starter ON + READY" is displayed on the meter) and set the shift lever to the N position.

Tow or push the vehicle with the drive axle disengaged if the EV system does not start (e.g., in the case of an error in the high-voltage system or the high-voltage battery is dead). When the EV system is not ON (no forced cooling of the inverter), strictly follow the towing and vehicle movement procedure specified below.

5.8.2 Towing and vehicle movement procedure

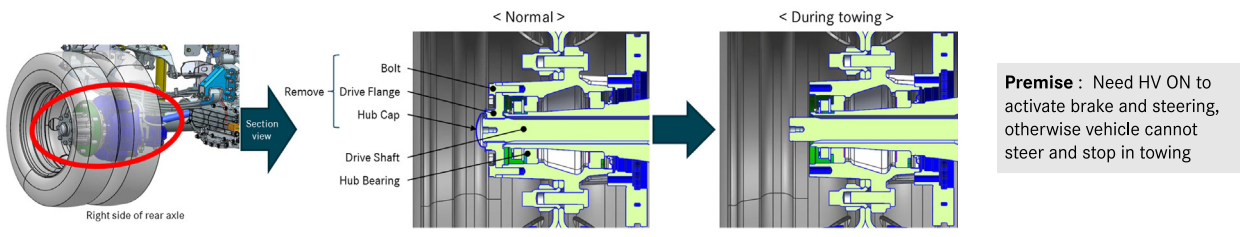
(1) Failure to observe the following procedure for moving or towing a vehicle may damage the vehicle.

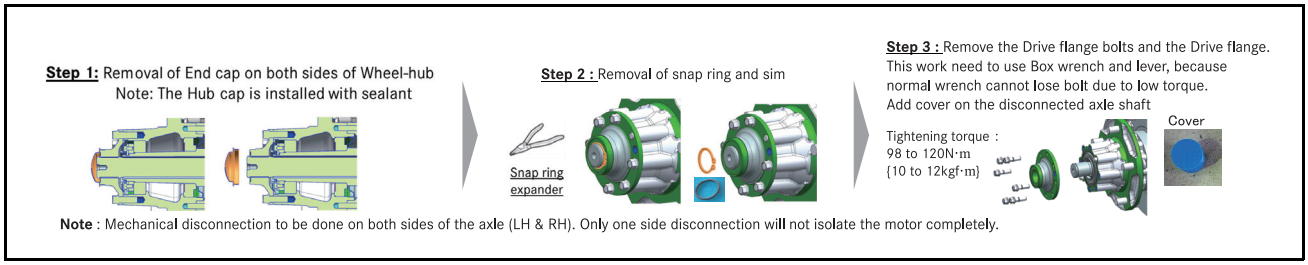
<table>
<tr><th></th><th colspan="2">Public road, Production line, Body builder, Work shop</th><th>Note</th></tr>
<tr><td rowspan="2">Recommend ation
(Lift wheel)</td><td colspan="2">- All -wheel lift - Carrier truck
 
 
Pulled by winch
Need HV ON (Meter display “ready”) to be worked cooling system when going up and down the slope. if do not work HV, keep speed less than 3km/h (0.8m/s)</td><td>Max. speed : 30km/h (Case of towing)
At slope of carrier, If you feel strong resistance or vibration from motor, stop work immediately. Vibration or resistance means motor rotates at higher RPM (vehicle speed is > 3km/h) and if moving is continued, risk of motor failure !!.</td></tr>
<tr><td colspan="2">- Rr wheel Lift
 
 
Need HV ON (Meter display “ready”) to activate brake and steering, otherwise vehicle cannot steer and stop in towing. If HV does not activate, please keep controllable slow speed</td><td>To use equipment suitable for truck.
Recommend to use, especially at Production line, Body builder, Work shop</td></tr>
<tr><td rowspan="3">Unavoidable
(Not lift wheel)</td><td colspan="2">- Push by person
 
Very slowly speed that is less than 3km/h (0.8m/s or half of walking speed) with short range for evacuation. As premise condition, Key position is Ready or ON, Shift lever is N-range, ePB is released</td><td>While pushing, If you feel strong resistance to push or vibration from motor, stop pushing immediately. Vibration or resistance means motor rotates at higher RPM (vehicle speed is > 3km/h) and if pushing is continued, risk of motor failure !!.</td></tr>
<tr><td>- Disconnect Rr axle drive shaft and wheel
 
See next page on detail</td><td>- Towing by another vehicle
 
Need HV ON (Meter display “ready”) to activate brake and steering, otherwise vehicle cannot steer and stop in towing. If HV does not activate, please keep controllable slow speed</td><td>Max. speed : 30km/h (Case of HV activate)
Tools needed to disconnect drive shaft and wheel (not included in the vehicle). If driver work this, could you do at safety place. And could you add cover on the disconnect axle.</td></tr>
<tr><td>- Push by person
 
No need HV ON and limit pushing speed.</td><td>Keep controllable speed.
Tools needed to disconnect drive shaft and wheel (not included in the vehicle). If driver work this, could you do at safety place. And could you add cover on the disconnect axle.</td></tr>
</table>

Note : If LV battery became flat, vehicle cannot move, because it cannot release from P-range and ePB. The case, replace LV battery or have jump start.
Then, key position change ON, and shift lever is N, release ePB, then vehicle can move.

(2) How to remove and install the drive flange of the rear axle shaft

- Activate the high-voltage battery system so that the brake system and steering will be operational when towing.
- Towing is impossible if the high-voltage battery system cannot be activated.
- Disconnect the rear axle driveshaft from the wheel only if it is unavoidable to do so.





5.9 Risk of fire

⚠ Risk of fire

Work on live electrical lines carries a risk of short circuit.

Before starting work on the electrical system, disconnect the on-board electrical system from the power source, e.g. battery.

With all bodies make sure that neither flammable objects nor flammable liquids can come into contact with hot assemblies (including through leakages in the hydraulic system) such as the transmission, etc.

Appropriate caps, seals and covers must be installed on the body in order to avoid the risk of fire.

5.10 Electromagnetic compatibility (EMC)

The different electrical consumers on board the vehicle cause electrical interference in the vehicle's electrical circuit. MITSUBISHI FUSO tests the electromagnetic compatibility in the vehicle of all factory-installed electrical and electronic components.

When retrofitting electric or electronic systems, they must be tested for electromagnetic compatibility and this must be documented.
The equipment must possess type approval in accordance with EC Directive 72/245/EC (in its currently valid version) and must bear the CE mark.

An alternative to this is testing and labeling as per UN-R 10 with the corresponding CE mark.

The following standards provide information on this:

- The current valid version of EC directive 72/245/EC (currently 2009/19/EC)
- UN regulation UN-R 10
- CISPR 12
- ISO 7637
- ISO 11451
- ISO 11452

When retrofitting two-way radio systems, the installation notes as per ISO/TS 21609 must be observed.

Additional information

Observe the notes on operational and vehicle safety (▷ 1.3) and (▷ 1.4).

5.11 Storing and handing over the vehicle

Storage

To prevent any damage while vehicles are in storage, MITSUBISHI FUSO recommends that they be serviced and stored in accordance with the manufacturer's specifications ▷ 3.8.2 and ▷ 3.8.3.

Handover

To prevent damage to the vehicle or to repair any existing damage, MITSUBISHI FUSO recommends that the vehicle be subjected to a full function check and a complete visual inspection before it is handed over ▷ 3.8.4.

6.1 General

Risk of injury

Do not modify any bolted connections that are relevant to safety, e.g. that are required for wheel alignment, steering or braking functions.

When unfastening bolted connections make sure that, when work is complete, the connection again corresponds with the original condition.

Welding work on the chassis/body may only be carried out by trained personnel.

The body, the attached or installed equipment and any modifications must comply with the applicable laws and directives as well as work safety or accident prevention regulations, safety rules and accident insurer requirements.

Additional information

Further information on bolted and welded connections can be found in Section 3 "Planning of bodies" ▷ 3.6 and Section 5 "Damage prevention" ▷ 5.1.

- Never modify (weld, padding, additional work, etc.) or heat critical safety parts such as the axle, steering, brake, suspension related components. If you study the movement of critical safety parts owing to unavoidable circumstances, be sure to consult the department responsible.
  ▷ 2.2

Main critical safety parts

- Knuckle arm
- Knuckle arm bolt
- Tie rod assembly
- Tie rod arm
- Tie rod arm bolt
- Axle
- Steering shaft assembly
- Power steering booster
- Power steering booster bracket
- Pitman arm ball stud
- Steering drag link
- Steering ball stud
- Steering universal yoke
- Steering slip joint
- Steering spider
- Brake hose, brake pipe
- Brake booster
- Vacuum tank
- Wheel bolt
- Wheel nut
- Spring bracket
- Spring U-bolt

6.2 Chassis frame material

If the frame is extended, the material of the extension element and reinforcing bracket must have the same quality and dimensions as the standard chassis frame.

Model	Material/part					
	Side rail		Stiffener ①	Stiffener ②	Stiffener ③	Stiffener
	MJSH440 (S355J2C+N)	HTP540 (S500MC)	MJSH440 (S355J2C+N)	HTP540 (S500MC)	MJSH440 (S355J2C+N)	MJSH440 (S355J2C+N)
FEA	×	–	×	×	–	–
FEB	×	–	×	×	–	–
FEC	–	×	–	–	–	×

Additional information

For the member dimensions and the position of stiffener ① or stiffener ②, ③, refer to "10.6.2 Frame section modulus" ▷ 10.6.2.
For further information of the material, refer to "7.1.1 Body mounting methods" ▷ page 164.

6.3 Drilling work on the vehicle frame

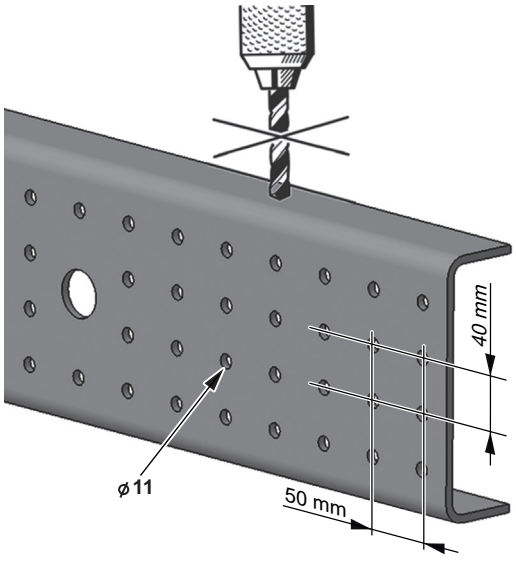
⚠ Risk of accident

The eCanter has high-voltage (approx. 348V).

This field of work requires decommissioning of the vehicle. Refer to "6.12.2 High voltage shutoff and reset" ▷ 6.12.2.

Drilling holes in side rail

- Holes have been drilled in the side rail at regular intervals (longitudinal pitch 50 mm, vertical pitch 40 mm). Use the existing holes.
- The drilling of further holes is not permitted.
- Never drill holes in the upper and lower surfaces of the flange.
- As a rule, no holes may be enlarged. If it is absolutely necessary to enlarge one, keep its diameter within 13 mm.
- No load may be applied to the center of the web of the side rail (diaphragm effect). If this is unavoidable, make sure that there is a large area of support on both sides of the web.
- After drilling deburr all holes.



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6.3 Drilling work on the vehicle frame

Drilling work on the cross members

- The holes and distances between the holes should conform to the values specified in the chart below.

Unit: mm

Cross member type	Hole diameter	Center-to-center distance of holes
• Alligator type (see Fig. 1) • Channel type (see Fig. 2)	9 max.	30* min.

Note*: Maintain the dimensions of previously drilled holes.

- Holes should be more than 100 mm away from the end of the side rail flange or the end of the gusset.
- Holes in the web of the channel type cross member should be 50 mm min. from the end of the cross member. (Refer to Fig. 2)
- Holes in the flange should be more than 25 mm from the end.
- Holes should be drilled more than 20 mm from the curved part of the flange.

Alligator type

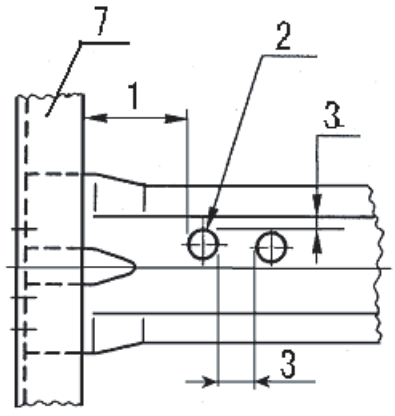


Fig. 1

1 100 mm min
2 DIA 9 mm max
3 25 mm min
4 20 mm min

Channel type

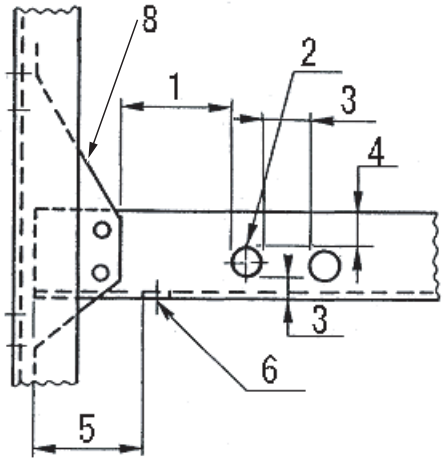


Fig. 2

5 50 mm min (Web surface)
6 DIA 13 mm max (Web surface)
7 Side rail
8 Gusset

6.4 Welding work on the vehicle frame

Welding anything onto chassis frame is prohibited in principle, as the welding increases the risk of cracks in the member. For detailed instructions about rear body mounting, see 7.2 "Mounting Frame" ▷ 7.2.

⚠ Risk of accident

The eCanter has high-voltage (approx. 348V).

This field of work requires decommissioning of the vehicle. Refer to "6.12.2 High voltage shutoff and reset" ▷ 6.12.2.

ⓘ Additional information

Further information on welded connections can be found in Section 5 "Damage prevention" ▷ 5.2.

6.5 Modifications to the wheelbase

The wheelbase should not be extended or shortened because considerations on brake piping and harness length are required.
If this is unavoidable, contact the department responsible ▷ 2.2.

6.6 Frame modifications

- The maximum permissible axle loads must not be exceeded, while the minimum front axle load must be exceeded.
- Rear underride guard: fastened in the same way as on a standard vehicle.
- Extend the mounting frame to the end of the frame.

6.6.1 Precautions for modification

In the case that a rear body of special design is mounted or the vehicle is to be used in special conditions, use utmost care that neither the structure nor the strength of the frame is impaired during mounting or modification work.
When mounting a rear body of special design, pay full attention to even weight distribution on the frame.
Refer to "10.6.2 Frame section modulus" ▷ 10.6.2.
Attaching stiffeners, drilling holes or welding objects to the frame can affect the strength of the frame greatly, possibly resulting in a deformed or cracked frame. Avoid performing any unnecessary reinforcement, drilling or welding work on the frame.

6.6.2 Extending and shortening

- Frame rear overhang extending procedure
  Perform the following steps to extend the frame rear overhang.

  - Extension members

Extension member		Reinforcement		Electrode	
Material	**Thickness**	**Material**	**Thickness**	**Shielded metal arc welding**	**CO_2 gas shielded arc welding**
MJSH440 (S355J2C+N) HTP540 (S500MC)	Same as the side rail	MJSH440 (S355J2C+N)	3.2 - 4.5 mm	Illuminite base, for 540 MPa, D4301 or equivalent as per JIS Z3211	YGW11 or equivalent as per JIS Z3312

As high tensile strength steel (540 MPa class) hardens more easily at welds than automotive structural steel (MJSH440), follow the instructions below.

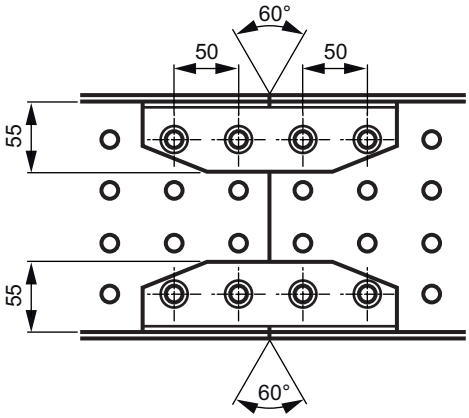
(a) Be sure to use a low-hydrogen type electrode. Especially, where the weld must have the same strength level as the base metal, use a low hydrogen, high tensile strength type electrode.
(b) Short weld beads are more likely to crack due to low hardening rate, so in areas requiring many short weld beads, perform continuous welding instead.

- Extending and shortening procedure

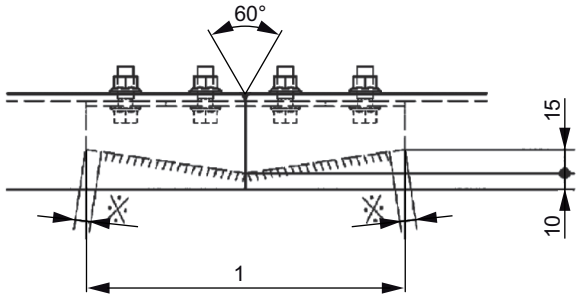
Comply with the reinforcement procedure illustrated below.

The reinforcement member should be bolted at two points each in the base metal and extension member. Use M10 bolts (8T) and nuts (6T) and a tightening torque of 60 to 80 N·m {6 to 8 kgf·m}.

Use utmost care about finishing the flange end face of the side rail butt welded joint. Carefully finish it with a grinder to ensure that the end face is free of undercut or padding protrusions. Make also sure that there is no step between the side rail and extension member. Smoothly finish any steps.



N31.00-2214-00



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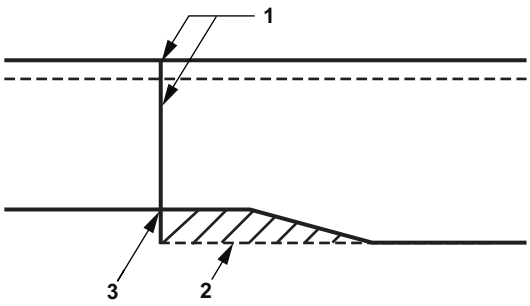
1 More than 200 mm

Additional information

The length of 20 mm marked with ※ should not be welded.

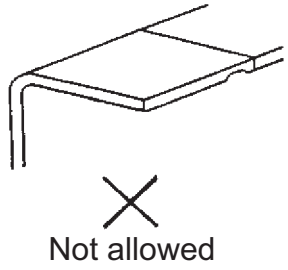


N31.00-2213-00

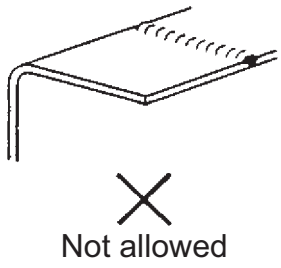
1 Finish surface with a grinder
2 Eliminate any steps
3 Finish end face with a grinder

- Cautions for finishing the side rails.
  Be especially careful when finishing the flange end of the butt-welded side rails. Ensure a clean finish by grinding the weld so it is free of undercut, pileup or convex bead.

Under cut

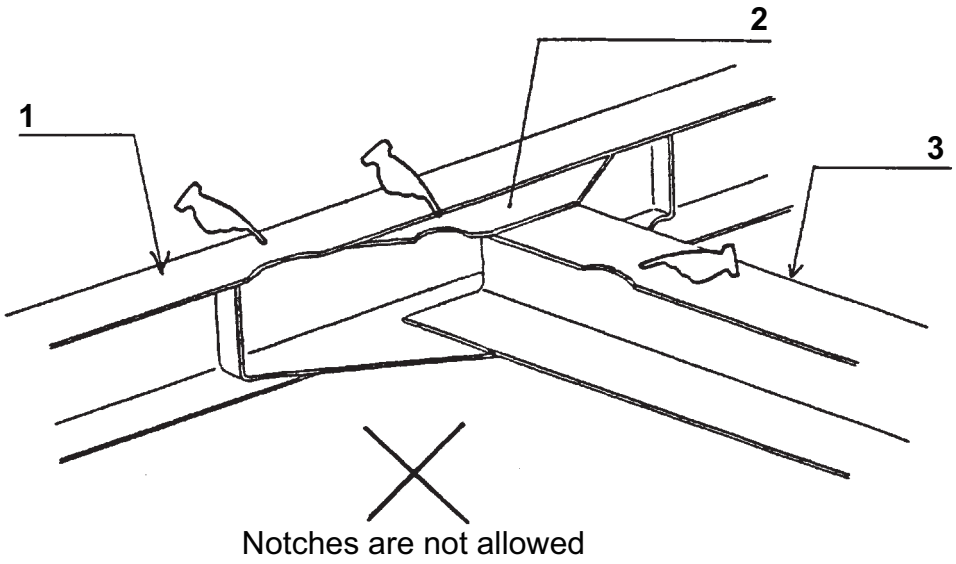


Pile up



6.6.3 Others

Never drill or grind any notches in the side rail, cross member flange, or cross member gusset.



1 Side rail
2 Cross member gusset
3 Cross member

6.7 Mounting of implements and auxiliary components

⚠ Risk of accident

The use of parts, assemblies or conversion parts and accessories which have not been approved may jeopardize the safety of the vehicle.

Before installing any attachments, special-purpose bodies, equipment or carrying out any modifications to the basic vehicle and/or its assemblies, you must read the relevant sections of the vehicle Instruction Manual, as well as the operating and assembly instructions issued by the manufacturer of the accessories and items of optional equipment.

You could otherwise fail to recognize dangers, which could result in injury to yourself or others.

Official acceptance by public testing bodies or official approval does not rule out safety hazards.

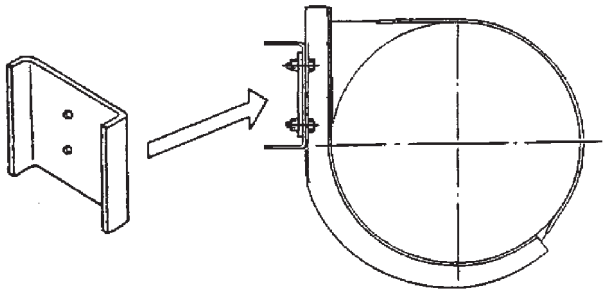
All national laws, directives and registration requirements must be complied with.

6.7.1 Mounting equipment on the side rail

- Attach a stiffener to the inside of the side rail as shown below when installing bolts to support heavy components on the side rail overhang. This will prevent cracks in the frame due to resonance of the component if the static load caused by the weight of the component exceeds 100 kg of force for each bolt.

Example:

- As a rule, avoid attaching additional equipment together with components (battery, etc.) which are already installed to the frame side. When this is absolutely necessary, increase the size of the bolts, or the number of bolt locations, to decrease the stress on each bolt.



6.7.2 Wheel chocks

Mounting

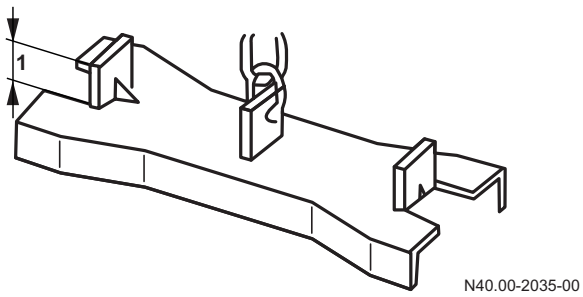
- In a suitable bracket so that they cannot rattle.
- Secured to prevent loss.
- Ensure good accessibility.

6.7.3 Spare tire carrier

- Install under the frame, on the side of the frame or on the body in accordance with the chassis drawing.
- It must be easily accessible and easy to handle.
- The Spare tire - carrier
  When remodelling the tire carrier, followings must be paid attention:
  (a) A single worker can easily remove or attach the tire.
  (b) Interference is not caused with parts other than the intended stopper when tightening the tire on the tire carrier.
  (c) The worker can attach even burst tires.
  (d) The tightening section is prevented from becoming loose.
  Example 1: Clamped tire-carrier
  - The tightening bolt must be 30 mm or longer.
  - Double nuts must be used for tightening.
  - The structure having a height difference for preventing falling on the bracket.
  - The structure having a stopper for preventing tightening nuts and bolts from falling.

  Example 2: Hoisted tire-carrier
  - The structure must have a spring inserted below the hoisting plate.
  - The structure must prevent reverse rotation of the hoisting shaft.
  - The structure must have a lock for preventing the tire from falling

  (e) The tightening bolt must be M10, 7 T strength or an equivalent product. (clamped tire-carriers)
  (f) The tire shape must limit movement in the forward, backward, left and right directions. (clamped tire-carriers)
  (g) Take care to prevent injury when hoisting tires. (hoisted tire-carriers)
  (h) Tightening bolts must be tightened to a torque of at least 49 Nm and by a force at least 290 N at handles. The tire-carrier must be designed to have enough contact area to support the tire securely. (hoisted tire-carriers)
  (i) The height difference on the lifter must be at least 10 mm, or the lifter must be of a shape that enables the same effect. (hoisted tire-carriers)



1 More than 10 mm

  (j) When manufacturing the carrier, apply a tensile load of 4900 N or more on the lifter. (hoisted tire-carriers)
  (k) Affix a Caution Plate indicating the recommended tightening torque 49 Nm at a position that can be easily seen during operation.

6.7 Mounting of implements and auxiliary components

- Carry out the following tests with the carrier attached to the body or in a similar state.
  (a) Tensile strength test
  (clamped tire-carrier)
  Apply the following load face down at the center of the disc wheel with a tire attached to the carrier.

  $P = W \times \alpha \times \beta$

  P : Test load
  W : tire of maximum set weight
  α : Load multiple of 2.5
  β : Required safety ratio of 1.3

  (hoisted tire-carrier)
  Apply the following load face down via the hoisting plate.

  $P = (Po \times \gamma \pm W \times \alpha) \times \beta$

  P : Test load
  Po : Load applied on chain by tightening torque during standard tightening
  W : tire of maximum set weight
  α : Load multiple of 2.5
  β : Required safety ratio of 1.3
  γ : Load multiple of 1.5

  As a result of this test, carrier components must be free from detrimental deformation.

(b) Hoisting strength test
(hoisted tire carrier)
Fix the hoisting plate, and apply the following torques on the carrier.

$T = To \times \gamma \times \beta$

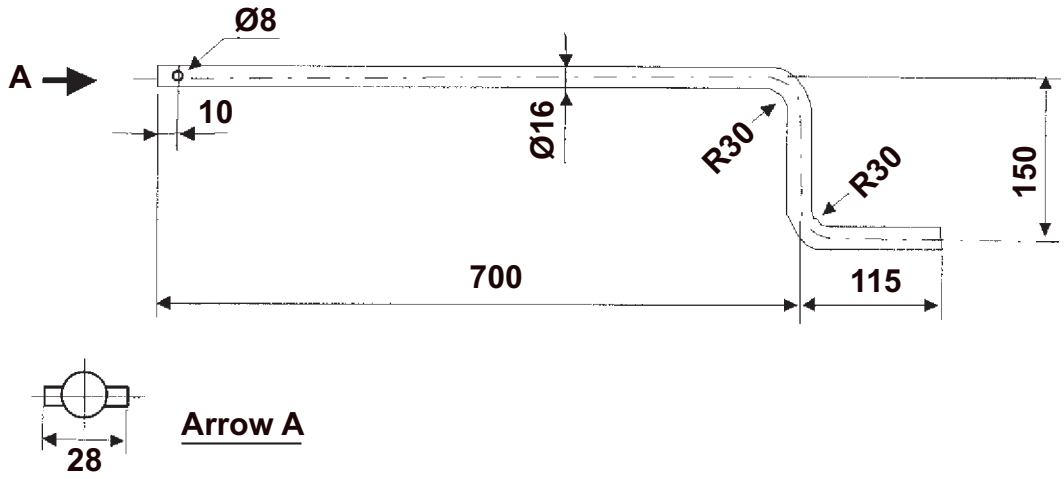
T : Test torque
To : Standard tightening torque
β : Required safety ratio of 1.3
γ : Load multiple of 1.5

As a result of this test, carrier components must be free from detrimental deformation.

(c) Operating durability
Hoist a tire of maximum allowable weight, tighten to a torque of 49 Nm, and then winch down. Repeat this series of operations 200 times. (This test needs be carried out continuously.) As a result of this test, operation must remain uninterrupted and carrier components must be free from detrimental deformation.

(d) Looseness resistance
Increase and decrease vibrations of 1 g (9.8 m/sec2) (need not be 1 g during resonance vibrations) and 8.3 Hz to 50 Hz (500 to 3,000 times per minute) on the supporting device in the vertical direction of the carrier mount continuously for one hour taking at least 5 minutes for each reciprocal movement.
As a result of this test, the carrier device must be free from detrimental looseness.

Crank handle (reference)



6.7.4 Mudguards and wheel arches

- The distance from the tire to the mudguard or wheel arch must be sufficient, even when snow chains or anti-skid chains are fitted and at full spring compression (including under torsion). The dimensional data in the tender drawings must be observed.
- On chassis with standard bore holes for mudguard brackets, use these bore holes to secure the brackets.

6.7.5 Rear underrun protection <Vehicle with rear underrun protection for R58-02>

Rear underrun protection should be installed in compliance with UN regulation R58 and in accordance with the drilling work instructions.

- the distance between the rear of the vehicle and the final rear axle is more than 1,000 mm
- the ground clearance of the chassis as well as the main body parts exceeds 700 mm for the unladen vehicle across the entire width.

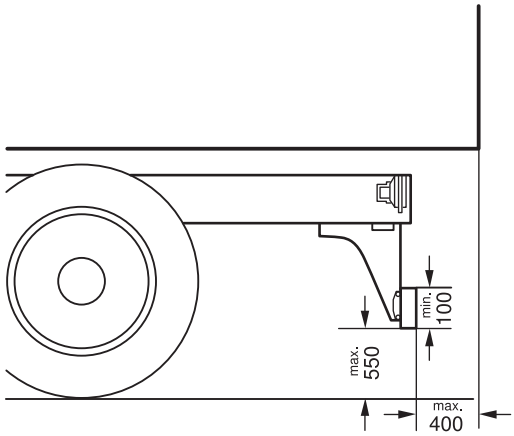
Exceptions to this regulation are semitrailer tractor vehicles, machines and vehicles whose purpose cannot be fulfilled if an underrun protection is fitted.

If an underrun protection is required, it must comply with UN Regulation R58.

The underrun protection must be mounted as far back as possible.

Installation dimensions:

- maximum height of underrun protection (unladen vehicle) above road surface: 550 mm.
- maximum width = width of rear axle (outer tire edge).
- minimum width: = Width of rear axle – 100 mm on each side (widest axle is authoritative)
- crossmember section height at least 100 mm.
- edge radius at least 2.5 mm.



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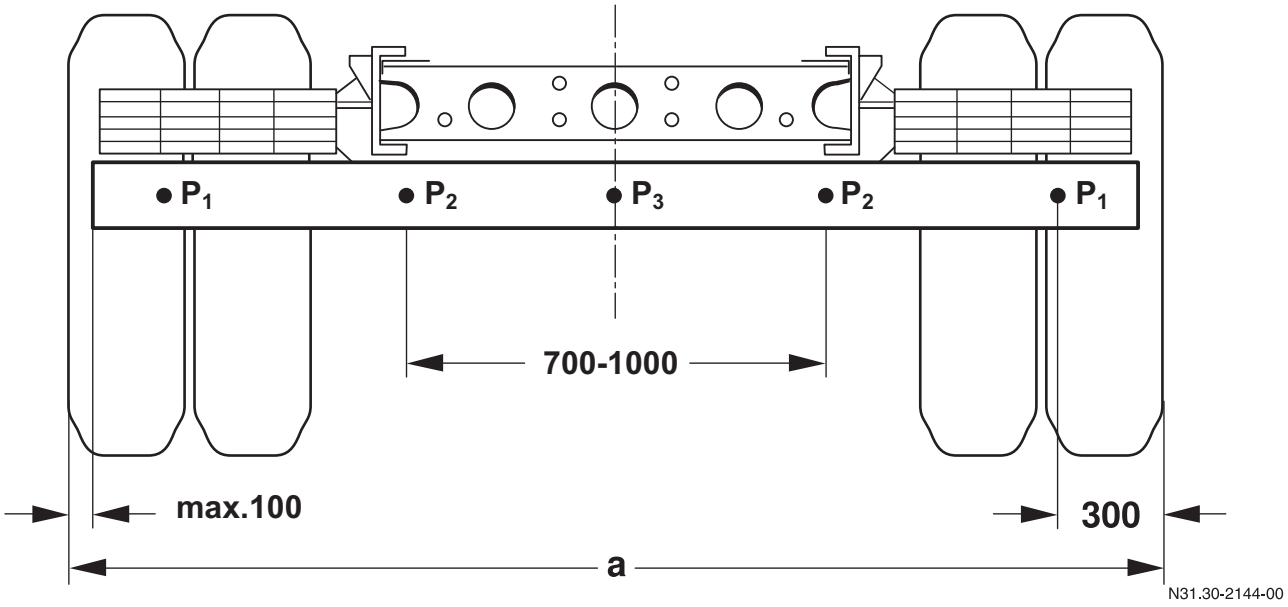
The rear underrun protection fitted at the factory complies with UN Regulation R58. No modifications may be made. If modifications are unavoidable, they must be clarified in advance with the vehicle licensing agency responsible.

6.7 Mounting of implements and auxiliary components

Check strength of underrun protection and its mounting in accordance with UN Regulation R58.

At maximum deformation, the distance from the end of the body to the end of the underrun protection at the load points may not exceed 400 mm.



a = Rear axle width
P_1, P_2, P_3 = Load application points

6.7.6 Side underrun protections

Mount components in accordance with local regulations.

6.7.7 Front-mounted implements

Additional information

Airbags are not permissible if the vehicle is fitted with front-mounted implements.

If the vehicle has airbags, they must be properly removed.

The installation of front-mounted implements must be co-ordinated with the department responsible (▷ 2.2).

6.8 Cab

Modifications to the cab must not have a negative effect on the operation or strength of assemblies or control elements or on the strength of load-bearing parts.

The tilting cab must not be fixed rigidly to the bodywork. If any interventions to the cab are planned they must be co-ordinated with the department responsible ▷ 2.2.

- The content relating to Mitsubishi three diamonds and Fuso emblem must be complied with ▷ 2.5.

Attaching the roof deck

Roof

- When attaching externally mounted parts such as roof deck or drag foiler onto the roof, use the exclusive mounting holes provided on the roof. (See Figs. 1 and 2.)
- Prevent the weight of externally mounted parts attached to the roof from exceeding 50 kg. (See Figs. 1, 2 and 4.)
- Use nickel-chrome plated stainless steel bolts and washers.
- Take special care to prevent the body from becoming scratched when attaching externally mounted parts.
- Insert packing between externally mounted parts and the body to prevent rusting. Use RC710CP (EPDM) rubber or equivalent with a thickness of 2 mm or less and a hole diameter of 8 mm (for ozone crack prevention).
- After attaching externally mounted parts, coat the entire periphery of the mounting bolts with sealer.
- The top coat of paint must be applied to externally mounted parts before attaching to the roof. (See Fig. 3.)

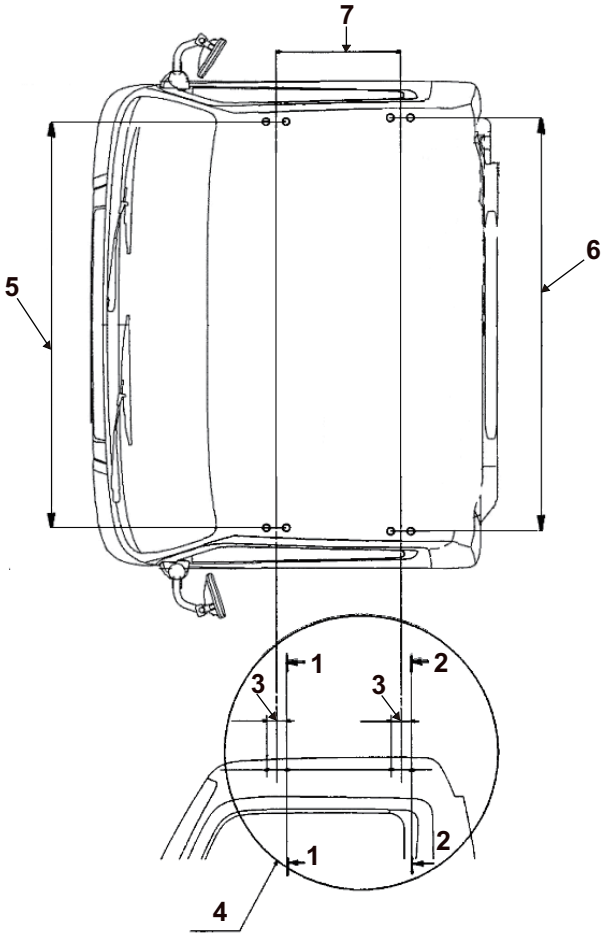


Fig. 1

1 Section A-A
2 Section B-B
3 80
4 Detail C
5 1664 (Wide cab)
1364 (Standard cab)
6 1694 (Wide cab)
1394 (Standard cab)
7 500

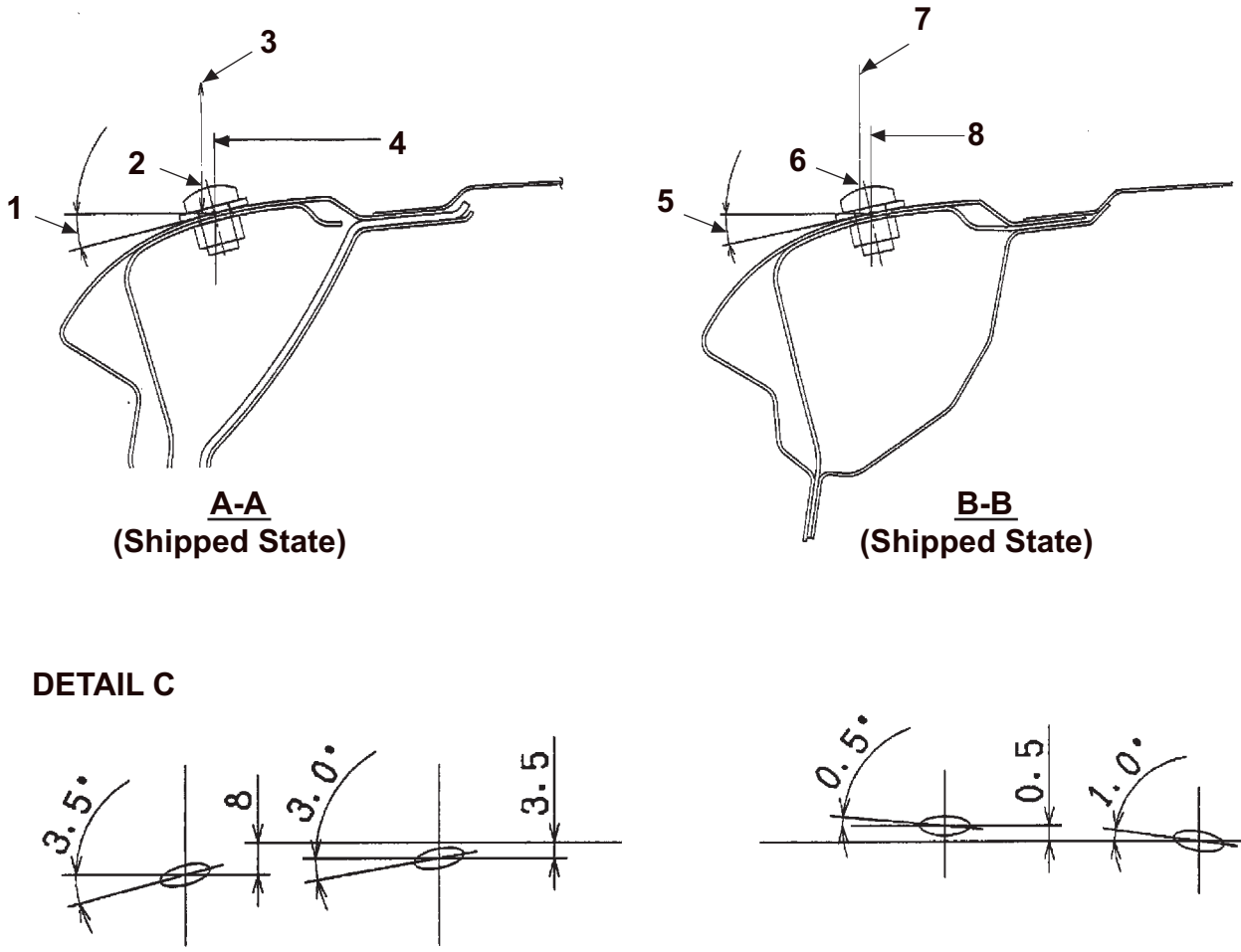


Fig. 2

1 *16.5° (Wide cab, Standard cab)*
2 *31.0 (Wide cab)*
29.0 (Standard cab)
3 *roof top*
4 *1664 (Wide cab)*
1364 (Standard cab)
5 *14.5° (Wide cab, Standard cab)*
6 *34.5 (Wide cab)*
32.5 (Standard cab)
7 *roof top*
8 *1694 (Wide cab)*
1394 (Standard cab)

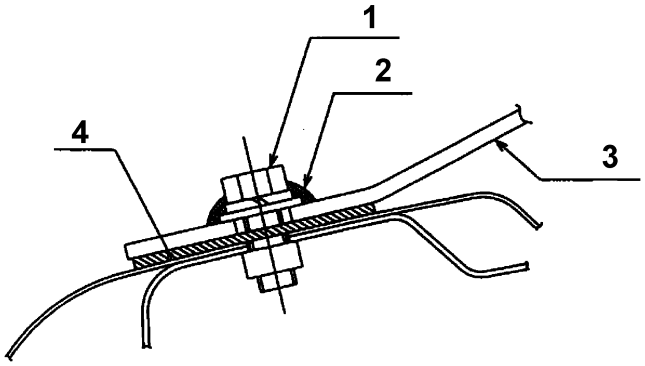


Fig. 3

1 Use washer and bolt with plain washer
2 Coat periphery with sealer
3 Roof deck or drag foiler
4 Rubber packing

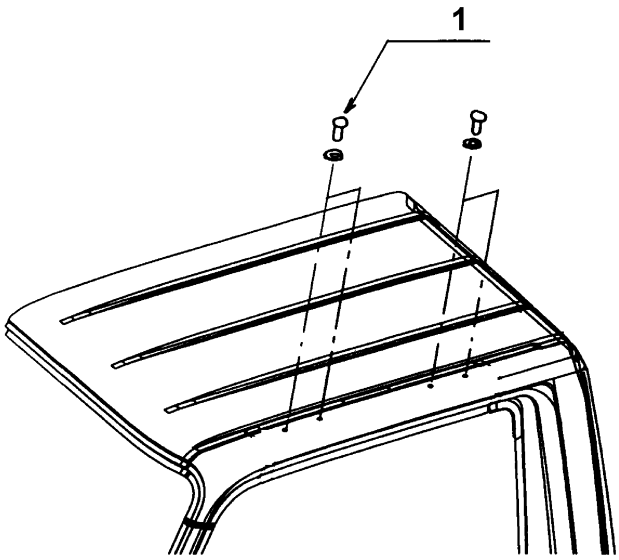


Fig. 4

1 Bolt and washer: Left/right total 8 places
(For roof deck or drag foiler)

6.9 Seats and bench seat

⚠ Risk of injury

Modifications to or work incorrectly carried out on a restraint system (seat belt and seat belt anchorages, belt tensioner or airbag) or its wiring, could cause the restraint systems to stop functioning correctly, e.g. the airbags or belt tensioners could be triggered inadvertently or could fail in accidents in which the deceleration force is sufficient to trigger the airbag. For this reason, never carry out modifications to the restraint systems.

Comply with all national regulations and directives.

The retrofitting of original seats and/or bench seats is only permitted and possible if the necessary preinstallations exist in the vehicle, such as suitable floor assembly, reinforced cab/cab suspension. For all other seat retrofittings, corresponding evidence (belt checks, tensile tests) is required as part of an endorsement check carried out by the department responsible ▷ 2.2.

6.10 ePTO and control

6.10.1 ePTO function default condition

A

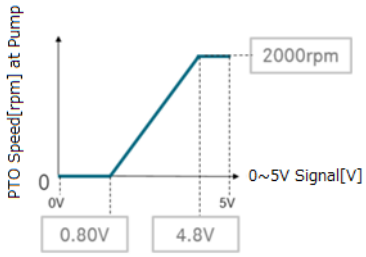
As initial setting of ePTO function, following condition will be set. (see Table 1).

This ePTO functions can be configured with VCU coding settings.

Consult an authorized MITSUBISHI FUSO distributer for VCU coding settings and changes.

Table 1

Name of parameter set	ePTO speed control method	PTO Available Shift Position	ePTO usage while driving	Pump/ Compressor	Gear Ratio/ Pulley Ratio	Pump/Compressor speed setup	Speed control Diag	Expected application
ePTO_2 General_Garbage_Tipper_0-5V	Case3) 0~5V signal input	P/N	No	Pump	3.500	0~0.8V 0rpm / 4.8~5.0V 2000rpm	Disable	General (Garbage)



0~5V signal input

6.10.2 ePTO initial settings and motor characteristics acquisition

- Initial settings (i.e., motor characteristics acquisition and motor acquisition) will be required to store the motor characteristics in the inverter if any of the following items is done for the ePTO.
  (a) Inverter replacement
  (b) Inverter initialization
  (c) Motor replacement

1 Motor characteristics acquisition procedure
  (a) Remove all motor loads and enable the motor to rotate free of loads.
    - If a transmission and pump are connected, remove the pump.
    - If a pulley and compressor are connected, remove the drive belt.
  (b) Check that the shift position is set to P position and activate the EV system.
  (c) Execute an Acquisition Request for the ePTO inverter using the FD.
  (d) The motor will rotate in both directions for approximately 30 seconds, and initial settings will be made.
  (e) When the motor stops rotating with a state of Acquisition Done confirmed on the FD, the initial settings will be completed.
  (f) Turn off the key and shut down the EV system.

6.10.3 ePTO operation procedure

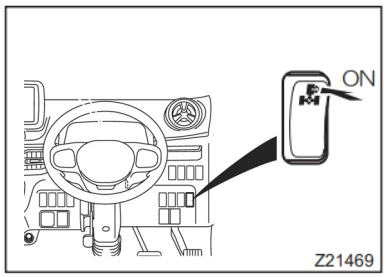
The ePTO uses the vehicle's high-voltage output to drive the ePTO motor, which drives the pump and compressor to power the mount.

1 Starting PTO

(a) Check that the shift position is set to P position, and activate the EV system.

(b) After starting the EV system, press the PTO switch to turn the PTO ON.

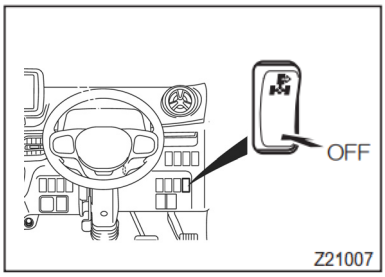
(c) ePTO will appear on the meter, and the PTO will be activated.



2 Stopping PTO

(a) Press the PTO switch to turn the PTO OFF.

(b) Check that ePTO on the meter has disappeared.



3 Advice

PTO usage conditions (e.g., shift position and traveling availability) vary depending on the mount type.

4 ePTO warning display <Misoperation>

ePTO will appear on the meter, and a buzzer will sound if the PTO switch is turned on while the ePTO usage conditions, such as the shift position and vehicle speed, are not met.

Stop the vehicle in a safe place, set the shift position to P position, and turn the PTO switch OFF in that case.

5 ePTO warning display <ePTO output limit>.

If the ePTO is used continuously with a heavy load, the ePTO output may be limited due to a rise in ePTO system temperature, and the meter may display ePTO.

The ePTO may be continuously used if there are no problems with the operation of the mount. However, it is recommended to discontinue using it until the temperature of the ePTO system cools down.

6 ePTO warning display <ePTO system error>.

There is a problem with the PTO system, and it should be promptly checked at an authorized MITSUBISHI FUSO service factory if the ePTO display on the meter does not disappear.

	English meter display
When PTO is activated ePTO	PTO system active
PTO abnormality warning ePTO	PTO system caution

6.10.4 ePTO control

The ePTO is controlled by the VCU, and ePTO functions can be configured with VCU coding settings.
Consult an authorized MITSUBISHI FUSO authorized Distributer for VCU coding settings and changes.

6.10.5 VCU parameter setup for ePTO

This section describes ePTO parameter settings. Consult with your authorized MITSUBISHI FUSO authorized Distributer regarding the parameter settings.

- VCU parameter set

Coding parameter	"T" Refer	Remarks
PTO Type	18421	Refer
Target Speed	0	No fixed speed usage
PTO Rotate Dir	1	CCW
PTO Ratio	0.91	0.9154=119/130
PTO Speed Limit	65535	No speed limit
Volume Signal X0	0	PTO speed down in Low vehicle speed
Volume Signal X1	0	PTO speed down in Low vehicle speed
Volume Signal X2	0	PTO speed down in Low vehicle speed
Volume Speed Y1	1228	PTO speed down in Low vehicle speed
Volume Speed Y2	2193	PTO speed down in Low vehicle speed
Concept/Remarks		- PTO available with all vehicle speed - 0V stop / 5V drive ; relay control - PTO speed down in Low vehicle speed

PTO_Type defines
- Interface of speed request
- PTO usage shift position
- PTO usage vehicle speed
- other preference

PTO_Rotate_Dir defines
- Rotation direction of ePTO motor

PTO_Ratio defines
- Pulley/Transmission ratio

PTO Speed Limit defines
- Vehicle speed limit for PTO

Target Speed/Volume Signal/Volume Speed defines
- PTO speed

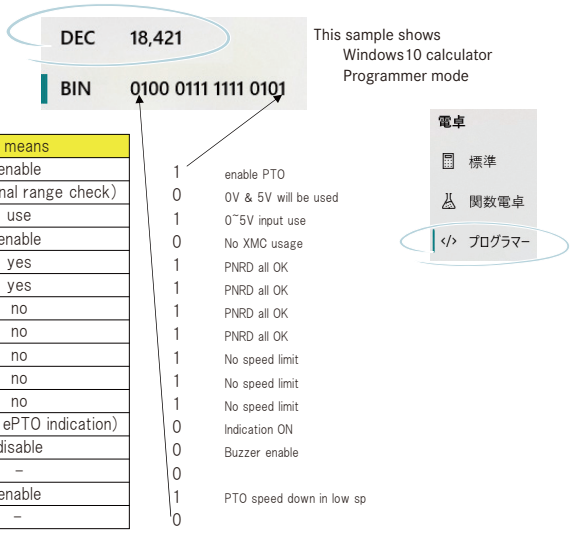
- PTO Type setup

Please choose functionality with 0 or 1 according to following table.

bit	Item	0 means	1 means	Note
0	ePTO enable disable	disable	enable	With PTO equipped vehicle, always 1;enable
1	Accel volume diagnosis enable	disable	enable (signal range check)	In case of 1;enable, accel volume signal range check will work. In case of 1;enable, less than 0.5V or more than 4.5V signal will be detected as error. Please set as 0;disable in case, 0~5V full range signal usage, or no accel volume usage.
2	Accel volume signal usage	not used	use	If 0~5V signal input, or accel volume will be used, please set 1;use. Otherwise, please set as 0;not used
3	CAN XMC speed request enable	disable	enable	For domestic market ; please set as 0;disable. For export market ; if speed request via CAN will be used, please set as 1;enable. Otherwise, please set as 0;disable.
4	ePTO start with N position	no	yes	1;yes makes PTO start available with shift position N <Advise ; If 1;yes is chosen for bit4 (ePTO start with N position), bit7 (ePTO stop with N position) must be 1;no>
5	ePTO start with D,R position	no	yes	1;yes makes PTO start available with shift position D or R <Advise ; If 1;yes is chosen for bit5 (ePTO start with D,R position), bit6 (ePTO stop with D,R position) must be 1;no>
6	ePTO stop with D,R position	yes	no	0;yes makes PTO stops with shift position D or R
7	ePTO stop with N position	yes	no	0;yes makes PTO stops with shift position N
8	ePTO start with vehicle stand still check	yes	no	In case of 0;yes, PTO start will be limited while vehicle stops <Advise ; If 1;no is chosen for bit8 (ePTO start with vehicle stand still check), bit10 (ePTO stop with vehicle move) must be 1;no>
9	ePTO with vehicle speed limitation	yes	no	In case of 0;yes, PTO usage will be limited within vehicle speed limitation defined with coding parameter "PTO Speed Limit"
10	ePTO stop with vehicle move	yes	no	In case of 0;yes, PTO will stop when vehicle move.
11	ePTO indication on ICUC	enable	disable (no ePTO indication)	"ePTO" indication on meter cluster will be disabled with 1;disable.
12	Give caution with buzzer	enable	disable	ePTO warning buzzer will be disabled with 1;disable
13	(reserved)	-	-	Please set as 0
14	ePTO speed down in Low vehicle speed	disable	enable	In case of 1;enable, ePTO speed will be changed with vehicle speed. Please refer page for "ePTO speed down in Low vehicle speed"
15	(reserved)	-	-	Please set as 0

6.10 ePTO and control

After functionality defined with 0/1. With calculator on your PC, input the binary number, and calculate decimal number.
The decimal number will be coding parameter for "PTO Type".

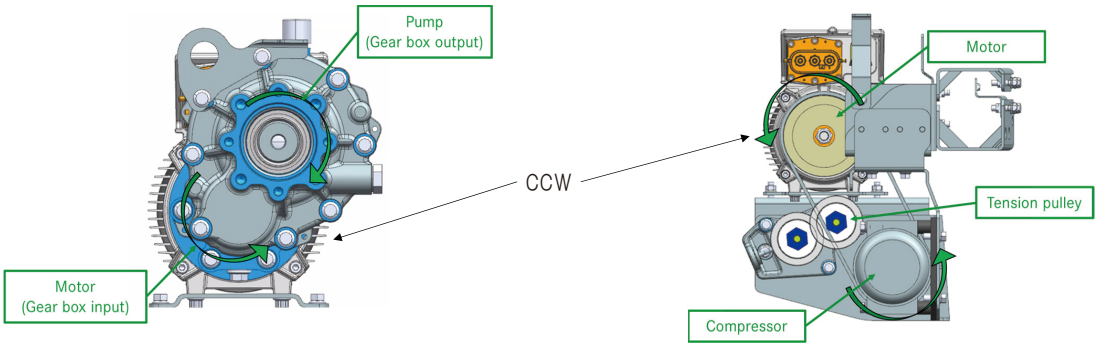


bit	Item	0 means	1 means
0	ePTO enable disable	disable	enable
1	Accel volume diagnosis enable	disable	enable (signal range check)
2	Accel volume signal usage	not used	use
3	CAN XMC speed request enable	disable	enable
4	ePTO start with N position	no	yes
5	ePTO start with D,R position	no	yes
6	ePTO stop with D,R position	yes	no
7	ePTO stop with N position	yes	no
8	ePTO start with vehicle stand still check	yes	no
9	ePTO with vehicle speed limitation	yes	no
10	ePTO stop with vehicle move	yes	no
11	ePTO indication on ICUC	enable	disable (no ePTO indication)
12	Give caution with buzzer	enable	disable
13	(reserved)	–	–
14	ePTO speed down in Low vehicle speed	disable	enable
15	(reserved)	–	–

- PTO Rotate Dir setup

0 ; CW makes ePTO motor rotate with CW (ClockWise) direction
1 ; CCW makes ePTO motor rotate with CCW (CounterClockWise) direction

As shown in following figures, both application will be 1 ; CCW setup.



Gear box (Pump) application
View from vehicle rear side

Pulley (Compressor) application
View from vehicle rear side

- PTO Ratio setup

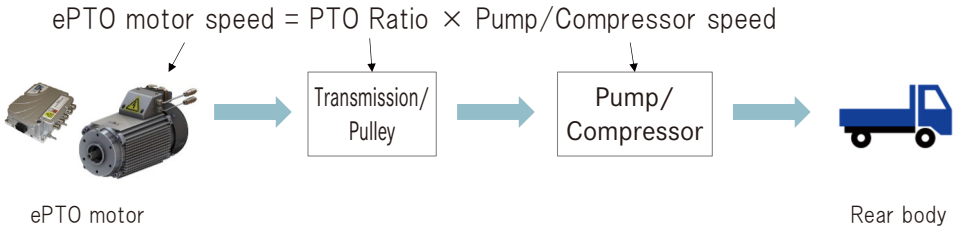
For gear box (Pump) application

Please set "3.50" as PTO Ratio

For pulley (Compressor) application

Please calculate PTO ratio with following
PTO Ratio = compressor pulley diameter (mm) / 130 (mm)

Relation of ePTO motor speed, PTO Ratio, Pump/Compressor speed



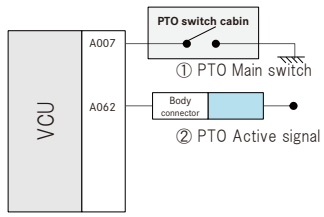
- PTO Speed Limit setup

If "PTO Type" bit no.9 "ePTO with vehicle speed limitation" is 0;yes, this "PTO Speed Limit" will be referenced as limitation.
When vehicle speed goes over the "PTO Speed Limit", ePTO will be stopped.
Please setup "PTO Speed Limit" with unit km/h.

- PTO speed setup

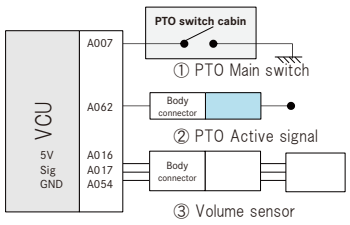
To setup PTO speed, PTO speed control interface need to be chosen.
Common info ; With ① PTO Main switch ON, PTO system will be activated. And ② PTO active signal will be Ground when active (If not active ; Open).

<Constant speed control>



After activation, PTO speed will be controlled with defined speed “Target Speed”.

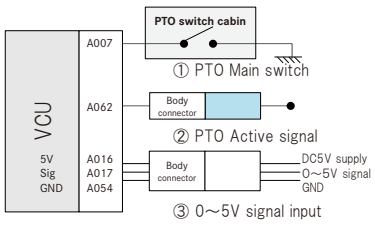
<Volume control>



After activation, PTO speed follows volume signal.
Volume signal and PTO speed shall be setup with following parameters

Target Speed
Volume Signal X0
Volume Signal X1
Volume Signal X2
Volume Speed Y1
Volume Speed Y2

<0～5V signal input>



After activation, PTO speed follows 0~5V signal.
0~5V signal and PTO speed shall be setup with following parameters

Target Speed
Volume Signal X0
Volume Signal X1
Volume Signal X2
Volume Speed Y1
Volume Speed Y2

<Constant speed control>

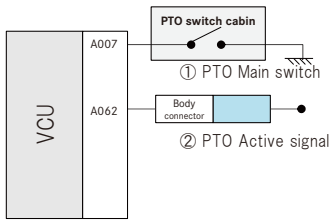
PTO Type setup will be follows.

bit	Item	Setup
1	Accel volume diagnosis enable	0;disable
2	Accel volume signal usage	0;not used
3	CAN XMC speed request enable	0;disable
14	ePTO speed down in Low vehicle speed	0;disable

Please input designated pump/compressor speed in XXXX, unit is [rpm].
Please note that PTO motor maximum speed is 7000rpm, this means
[Target Speed] × [PTO Ratio] must be 7000rpm or less.

Coding parameter	Value
Target Speed	XXXX
PTO Ratio	YYYY
Volume Signal X0	0
Volume Signal X1	0
Volume Signal X2	0
Volume Speed Y1	0
Volume Speed Y2	0

Constant speed control



<Volume control>

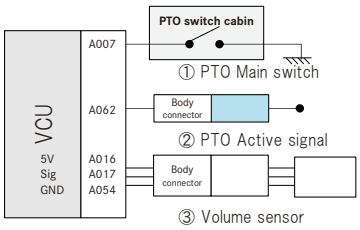
PTO Type setup will be follows.

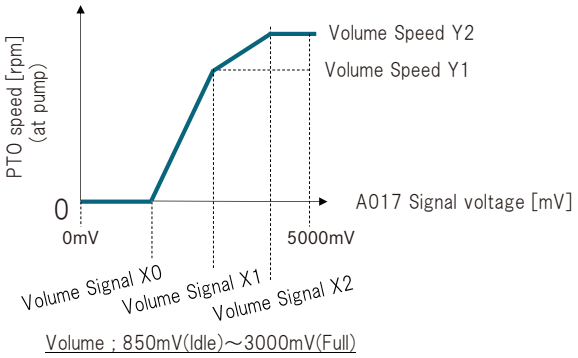
bit	Item	Setup
1	Accel volume diagnosis enable	1;enable (signal range check)
2	Accel volume signal usage	1;use
3	CAN XMC speed request enable	0;disable
14	ePTO speed down in Low vehicle speed	0;disable

Please input designated pump/compressor speed in Y1,Y2, unit is [rpm].
And also input volume signal value X0,X1,X2, unit is [mV]
Please note that PTO motor maximum speed is 7000rpm, this means
[Speed Y1,Y2] × [PTO Ratio] must be 7000rpm or less.
Volume range is ; 850mV(Idle)～3000mV(Full)

Coding parameter	Value
Target Speed	0
PTO Ratio	YYYY
Volume Signal X0	X0 [mV]
Volume Signal X1	X1 [mV]
Volume Signal X2	X2 [mV]
Volume Speed Y1	Y1 [rpm]
Volume Speed Y2	Y2 [rpm]

Volume control



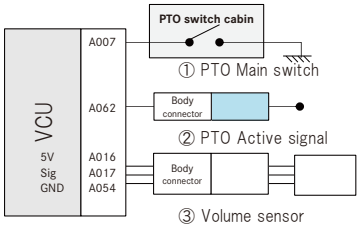


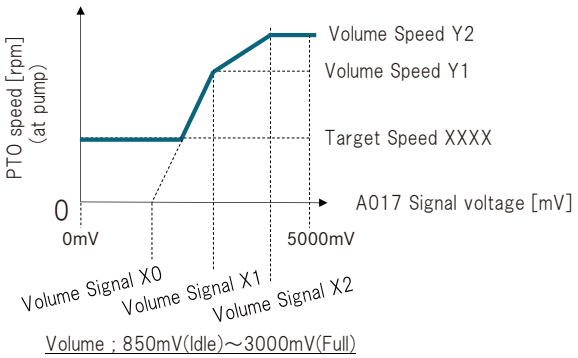
Volume ; 850mV(Idle)～3000mV(Full)

If Target Speed XXXX[rpm] is not “0”, volume speed control will be changed as shown in figure.

Coding parameter	Value
Target Speed	XXXX [rpm]
PTO Ratio	YYYY
Volume Signal X0	X0 [mV]
Volume Signal X1	X1 [mV]
Volume Signal X2	X2 [mV]
Volume Speed Y1	Y1 [rpm]
Volume Speed Y2	Y2 [rpm]

Volume control





Volume ; 850mV(Idle)～3000mV(Full)

<0~5V signal input control>

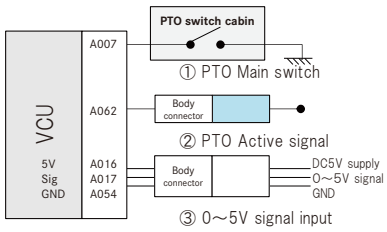
PTO Type setup will be follows.

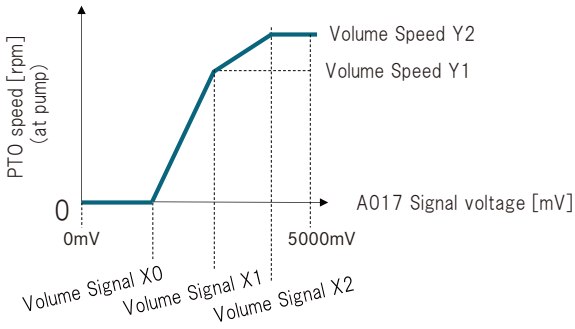
bit	Item	Setup
1	Accel volume diagnosis enable	0;disable
2	Accel volume signal usage	1;use
3	CAN XMC speed request enable	0;disable
14	ePTO speed down in Low vehicle speed	0;disable

Please input designated pump/compressor speed in Y1,Y2, unit is [rpm].
And also input volume signal value X0,X1,X2, unit is [mV]
Please note that PTO motor maximum speed is 7000rpm, this means
[Speed Y1,Y2] × [PTO Ratio] must be 7000rpm or less.

Coding parameter	Value
Target Speed	0
PTO Ratio	YYYY
Volume Signal X0	X0 [mV]
Volume Signal X1	X1 [mV]
Volume Signal X2	X2 [mV]
Volume Speed Y1	Y1 [rpm]
Volume Speed Y2	Y2 [rpm]

0～5V signal input

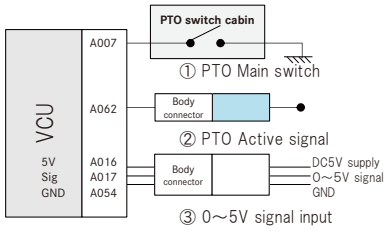


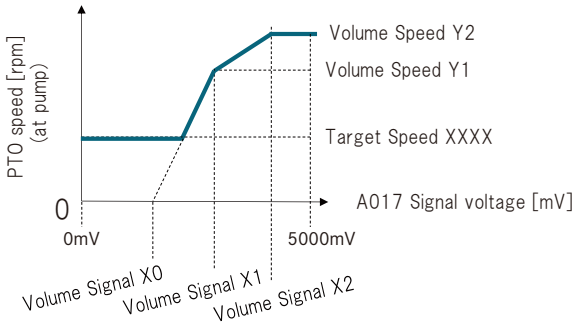


If Target Speed XXXX[rpm] is not “0”, volume speed control will be changed as shown in figure.

Coding parameter	Value
Target Speed	XXXX [rpm]
PTO Ratio	YYYY
Volume Signal X0	X0 [mV]
Volume Signal X1	X1 [mV]
Volume Signal X2	X2 [mV]
Volume Speed Y1	Y1 [rpm]
Volume Speed Y2	Y2 [rpm]

0～5V signal input



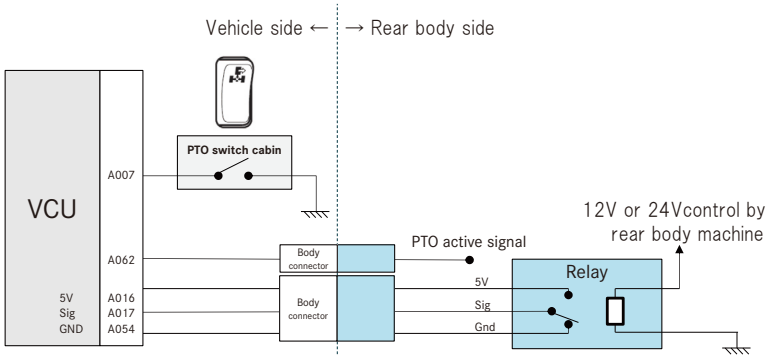


speed down in Low vehicle speed. (0~5V signal input control)

With following setup (PTO Type bit14 1;enable) special setup “ePTO speed down in Low vehicle speed” is available.

bit	Item	Setup
1	Accel volume diagnosis enable	0;disable
2	Accel volume signal usage	1;use
3	CAN XMC speed request enable	0;disable
14	ePTO speed down in Low vehicle speed	1;enable

This function is prepared for refrigerator rear body, to reduce PTO speed in Low vehicle speed.
(Noise reduction while vehicle speed is low.)
The ePTO motor stop/rotate is controlled by relay (Sig-Gnd short ; Stop/Sig-5V short ; Rotate).
And the rotate speed will follow Y1 in low vehicle speed (less than 30km/h), and Y2 in high vehicle speed (more than 40km/h).



Coding parameter	Value
Target Speed	0
PTO Ratio	YYYY
Volume Signal X0	0
Volume Signal X1	0
Volume Signal X2	0
Volume Speed Y1	Y1 [rpm]
Volume Speed Y2	Y2 [rpm]

Y1 will be reduced compressor speed
Y2 will be normal compressor speed

6.10.6 Cab back control (accelerator sensor for body building)

- The movement of the cable from the mount is converted into an electrical signal to control the ePTO rotation speed.
- If cab back control is retrofitted, the vehicle control unit data must be modified, and the ePTO will not work unless the data is modified. For details, consult an MITSUBISHI FUSO authorized Distributer.
- To retrofit the cab back control, data must be modified of the Vehicle control unit and SAM control unit. The power take-off is enabled only after the data has been modified. Consult an authorized MITSUBISHI FUSO authorized Distributer.
- Detail of Accelerator Sensor

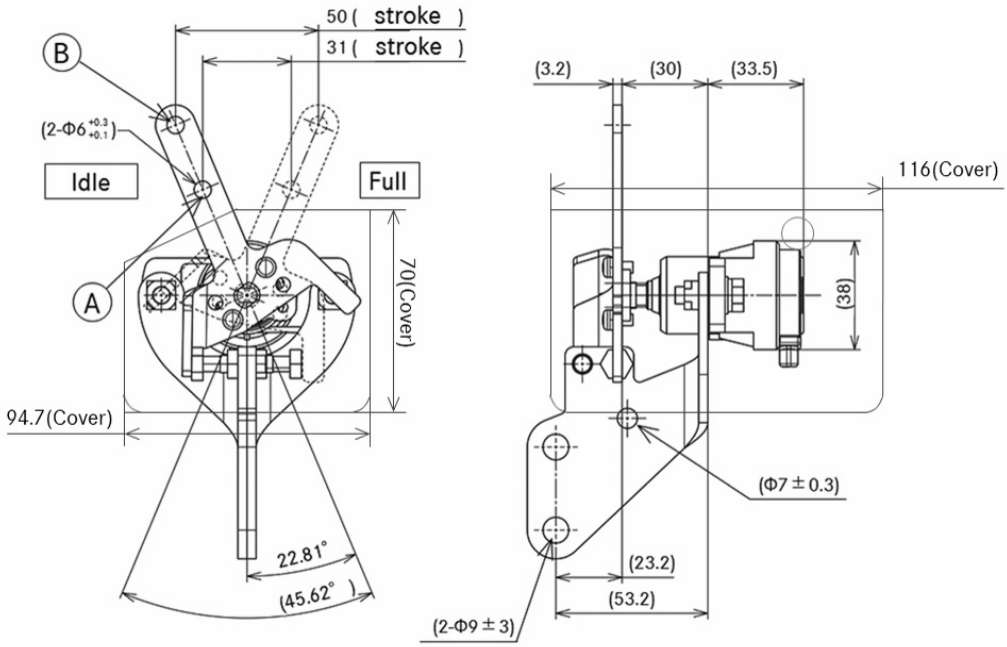


Fig. 1

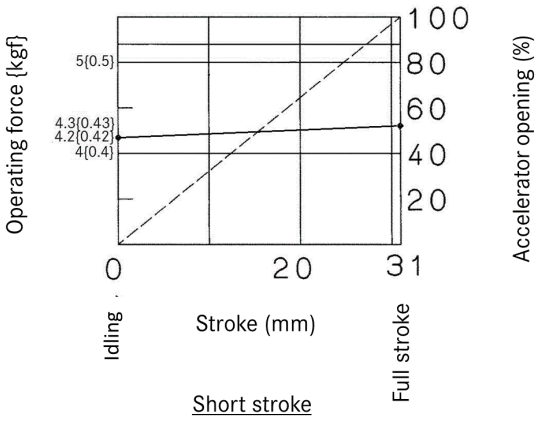
- Lever Stroke

It's able to choose 2 kinds of lever stroke by choosing a clevis hole of the accelerator sensor lever Table 3.

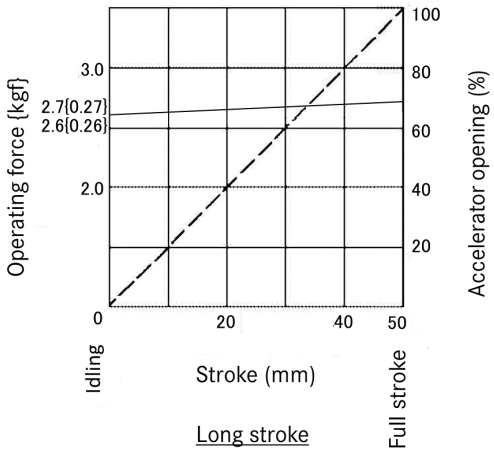
Unit: mm

Table 3 (Accelerator Sensor Specification)

	LEVER HOLE	LEVER STROKE	LEVER OPERATING EFFORT N {kgf}		LEVER LENGTH
			AT IDLE	AT FULL STROKE	
SHORT STROKE TYPE	(A)	31	4.2 {0.42}	4.3 {0.43}	40.0
LONG STROKE TYPE	(B)	50	2.6 {0.26}	2.7 {0.27}	64.5



Short stroke



Long stroke

- Installation of the accelerator sensor

Connecting the harness

The connector of the accelerator sensor on the chassis side is set at a rearward portion on the left of the cab as illustrated below. Connect it to the accelerator sensor by using a sub-harness.

Installing the accelerator sensor

Install the accelerator sensor by using the bracket attached to it. Install the sensor together with the cover.

Precautions:

(a) Use the genuine cab back control (accelerator sensor for the mount). Using a non-genuine cab back control (accelerator sensor for the mount) may result in a malfunction or failure of the vehicle control unit or other components, which will not be covered under warranty.

(b) Install the accelerator sensor at a location free from water splashed from a high pressure vehicle washing system or gravel or mud water flown from a tire. Be also careful about dust, high temperature, vibration, and interference with other parts and fit a cover.

(c) Ensure that the accelerator sensor lever is pulled in the direction in parallel with the lever stroke direction and that the lever is free of bend or twist.

(d) Do not adjust the stopper bolt of the accelerator sensor.

(e) Adjust the control on the built body side so as to reach its full stroke before the accelerator sensor.

(f) Fix the connector and harness in place with a band clip or similar device to prevent them from being loose.

(g) Do not drop or give strong impact to the sensor. Do not disassemble the sensor, as an erratic operation or failure could result.

(h) Do not use the return spring force of the Position the accelerator sensor when returning the body part/equipment side control.

Portion in which the accelerator sensor connector is set on the chassis side

Fig. 2

List of set parts

Unit: mm

Part Number	Description	Sub-harness length
ML343597	SENSOR ASSY,CAB BACK CONTROL	-
MK648545	HARNESS,CAB BACK CONTROL	2500
ML235685	SUB HARNESS ACCEL SENSOR	180

6.11 Brake systems

Risk of accident

Work carried out incorrectly on the brake system may impair its function. This may lead to the failure of components or parts relevant to safety. This could cause you to lose control of the vehicle and cause an accident with possible injury to yourself and others.

All accident prevention regulations must be complied with when working on the vehicle.

Comply with all national regulations and laws.

Additional information

After any modifications the brake system must be tested for proper operation and approved by a technical inspection authority otherwise the operating permit will be invalidated.

Further information can be found in Section 5 "Damage prevention" ▷ 5.1.

ESP® (Electronic Stability Program)

<Vehicle with ESP®>

- Be sure not to change the motor generator power, transmission, final ratio (except option), tire size, suspension system or wheelbase.
- Be sure not to alter ESP®-associated devices, sensors, harnesses or connectors in any way.

Disc brake

Property damage

Do not impede cooling by attaching spoilers below the bumper, additional hub caps or brake disc covers, etc.

6.11.1 Chassis tubing form and dimension specifications

The chassis uses steel brake lines which conform to the following specifications.

(Double Flare type) Unit: mm

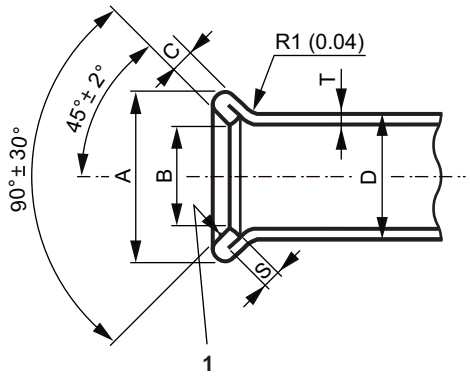
Nominal diameter	A	B	t	C	S min.	Material
4.75 4.76	6.6-7.1	3.0-3.7	0.7	1.4	1.0	SPCC (JIS) (ASTM A109 or A366) Double walled steel tubes
6.35	8.6-9.1	4.5-5.2	0.7	1.4	1.0	

(ISO flare type) Material is the same as Double Flare types. Unit: mm

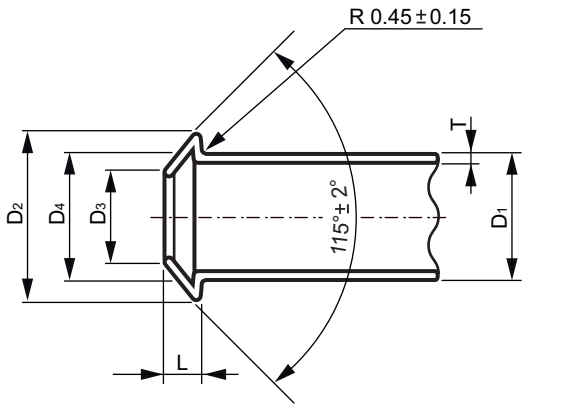
Nominal diameter	D1	D2	D3	D4 min.	T	L
4.75 4.76	4.83-4.69	7.28-6.92	3.5-3.0	4.7	0.77-0.63	2.8-2.2
6.35	6.42-6.28	8.98-8.62	5.1-4.6	6.3		

D4 is an outside diameter on the sealing surface. The surface-roughness is $\sqrt[3.2]{\lambda\tau 0.8}$

Double flare type Unit: mm



ISO flare type Unit: mm



1 This surface must be smooth

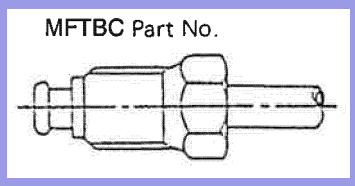
Fig. 1

The tightening torques for the flare nuts which connect the brake lines are shown below.

Nominal Diameter mm	Tightening torque N·m {kgf.cm}
4.75 4.76	13 to 17 {130 to 170}
6.35	19 to 26 {190 to 260}

6.11.2 Making additional tubes

- Only use brake tubes of the same material as the tubes connected to the chassis when extending the brake tubes.
- Only use steel tubes to extend the brake fluid tubes. Never use copper tubes.
- Only use metric pipe tools to form the flared end of brake lines as shown in the "Flared end shape figure" in Fig. 1. Be careful to not scratch the tubes, or damage the mating surfaces when flaring the ends.
- A brass nut used with steel tubes could cause uneven fitting between the flared surface of the tubes and the connecting surface joint, resulting in fluid leakage.
- Use the flare nuts specified in the table below.

Nominal diameter of tube mm	 Fig. 2
4.75 4.76	MF651001 (Double flare type) MK678335 (ISO flare type)
6.35	MF651002 (Double flare type) MK678336 (ISO flare type)

- Use a tubing bending tool to bend the brake lines correctly. Do not use heat to bend the brake lines.
- The bend curvature R should strictly conform to the minimum allowable bend radius R shown in the table below.

Unit: mm

Nominal diameter	Bend radius
4.75 4.76	25
6.35	30

- The required length of the straight portion of the line end and the bent portion must conform to the dimensions specified in Fig. 3.

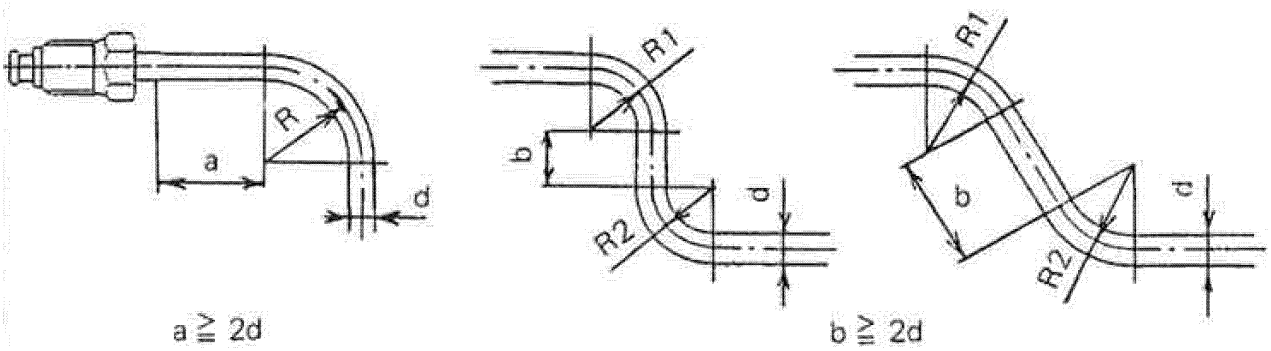
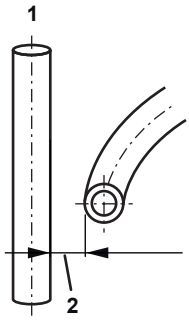


Fig. 3

- Use high pressure air nozzle to clean and remove foreign matter from inside the brake lines before use. Use compressed air for cleaning. Cleaning oil is not recommended, but completely remove any residue if it is used.

6.11.3 Running additional lines

- Avoid crossing brake lines. If this is unavoidable, position each line so it clears the other by more than 15 mm. (Fig. 4)

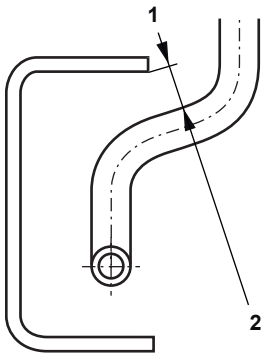


N42.50-2022-00

Fig. 4

1 Crossed brake lines
2 15 mm min.

- Position the brake lines so that they are not closer than 15 mm to sharp edges of the frame or other parts. (Fig. 5)



N42.50-2023-00

Fig. 5

1 Sharp edges
2 15 mm min.

- Securely clamp brake lines with PVC coated clamps or grommets to prevent vibrations when the vehicle is running.
- The standard brake line clearances are shown in the table below.

Unit: mm

	Tube dia	Clamp intervals
Straight tube	4.75-8	550 max.
Curved tube	↑	400 max.

- Brake lines should be laid along the inside web of the side rail whenever possible. When they cross over to the opposite side rail, they should be positioned along the cross members.
  Install the lines more than 10 mm away from bolts and rivets.
- Make sure the brake fluid lines can be bled easily.
- Never clamp or tape electrical wires to the brake lines, as this can cause corrosion of the line.
  Maintain the clearances described in Section 4 "Clearance for the basic vehicle and bodies" ▷ 4.4.
- The clearance between the brake lines components should conform to the specifications in Section 4 "Clearance for the basic vehicle and bodies" ▷ 4.4.
- Position the connection nut in a location where it can be completely tightened without difficulty.
- Tighten the flare nuts to torque specified in ▷ 6.11.2. Do not tighten the flare nut any further if oil leaks. Loosen the flare nut completely, adjust the mating surfaces, re-thread the nut and then tighten it completely.
- Never force or tighten any part with a wrench or other tool if problems occur while installing brake lines. Realign the brake lines so the mating surfaces are correctly positioned, and then tighten the flare nut. If possible, first gently thread the nuts by hand, and then tighten them with the designated flare nut wrench.
- Never install brake lines near the drive shaft or other moving parts.
- Never change the installation location of the brake hoses.
- When replacing the brake lines, do not use the fluid which was drained.
  Drain the fluid completely and replace with new fluid.
- Install the brake lines so that they are protected from damages caused by flying objects thrown up by the tires.
- When it is necessary to protect brake lines against possible damage as described above, install a protective panel as shown below.
  (a) Fabricate a protective panel which will not be deformed by flying objects and come in contact with the brake lines.
  (b) Position and shape the protective panel properly (for drain holes, etc.) so water will drain freely.

Example

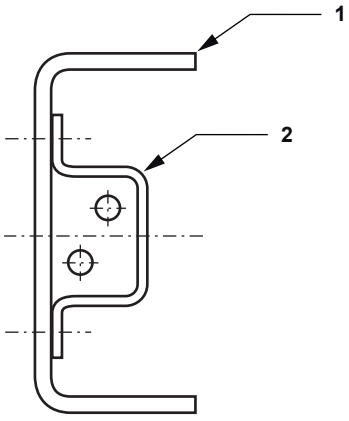


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Fig. 6

1 Side rail
2 Protector

6.12 Handling of EV system

⚠ Risk of accident

For EV system, high-voltage of 348V may be generated in the high-voltage circuit consisting of high-voltage equipment and components such as inverter, electric engine, high-voltage lithium-ion batteries,high-voltage cables (orange color), etc. Hazards and risks must be understood, and the correct action during routine situations, as well as dangerous situations must be trained. You must ensure that all country-specific legal requirements are met. If both FUSO and legal requirements exist for one aspect, the more stringent requirement is used. This does not apply if a FUSO requirement is more stringent, but its enforcement would violate legal requirements. Under any circumstances, legal requirements have to be complied with.

Never use the high-voltage battery for any other application.

You cannot carry out body building for the purpose of transporting dangerous items.

! Property damage

Do not wash the high-voltage battery or any other high-voltage components, including the charging inlet, using high-pressure washing. This may result in water getting inside the components, causing it to become damaged.

Do not drive the vehicle on a road that is submerged with water to a depth of 30 cm or more. This may result in water getting inside the high-voltage battery, components or the charging inlet, causing it to become damaged.

Characteristics of EV system
The system is equipped with a high-voltage battery (348V) exclusive for the EV system apart from a 12 V battery.
The high-voltage system is interrupted when the starter switch is turned off, the emergency button is pushed or the 12V battery is disconnected.
High-voltage is generated in the high-voltage circuit when the starter switch is turned ON.
High-voltage may be generated in the high-voltage circuit regardless of the vehicle condition when the EV system is abnormal (illumination of the EV warning lamp).

The G sensor is mounted on the frame side of the emergency stop button that shuts off the high-voltage system in the event of a collision. Make sure that the G sensor is free from any impact when working.

6.12.1 General precautions

B

⚠ Risk of accident

The eCanter has high-voltage (approx. 348V). Be careful that mishandling high-voltage equipment may lead to an electric shock, burns, death, leakage and breakage.

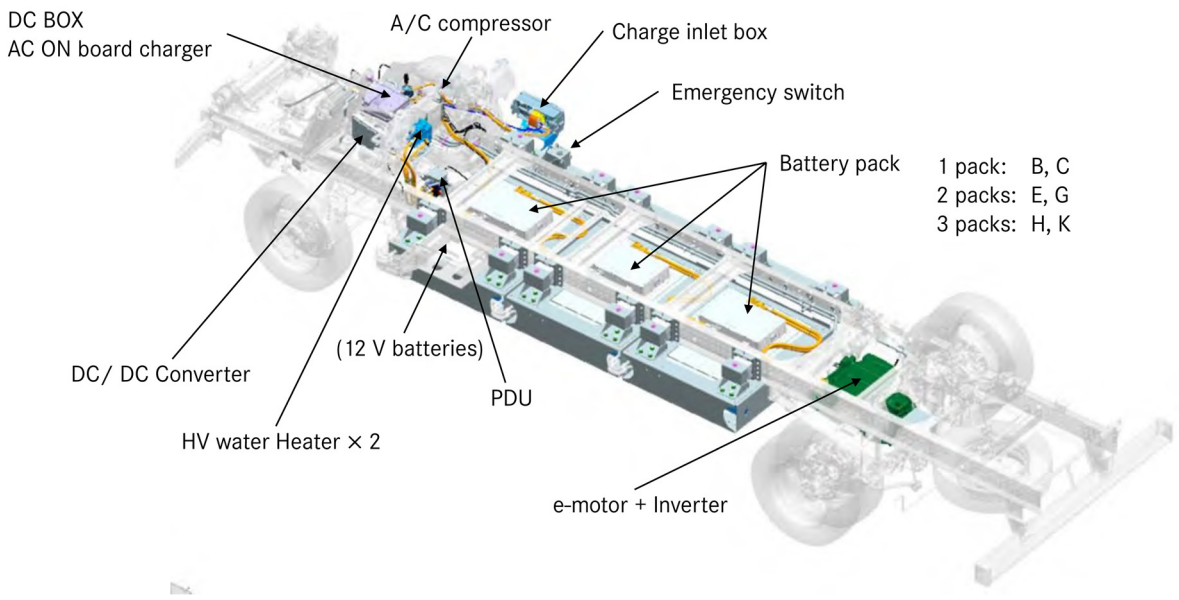
To prevent accidents, work on the vehicle should only be carried out when the ignition is switched off.

The vehicle key should be kept safely at a distance of at least 5m from the vehicle.

Please avoid unnecessary activation of the drive system while work is being carried out on the vehicle.

Do not change the cooling water piping route in the high-voltage cooling system, as this may impair cooling performance.

(a) The eCANTER has high voltage equipment (approx. 348V).
Handle it with care otherwise, an electric shock, burns, death, leakage and breakage. The high voltage Components and cables includes the following:



DCB: DC interface box
ePS: Electric power steering pump
e-A/C: Electric air conditioner
OBC: AC onboard charger

(b) An operator who removes and installs high-voltage equipment must be careful of an electric shock. In addition, qualifications may be required Observe the laws and regulations of the applicable country when performing the work.

(c) The pieces of the high-voltage equipment should not be disassembled.
(excluding high-voltage cable joint, and safety plug and air filter of the high-voltage battery box)
Never disassemble the high-voltage Components and cables, because doing so may cause the risk of an electric shock and failure.
Besides, never modify sensors, harnesses and connectors.

(d) Even if it is simple work such as installing the radio, the high-voltage equipment might be damaged. Be sure to implement the following items.
- Turn OFF the starter switch.
- Remove the negative (-) terminal of the 12 V battery cable and put a cover on the terminal.
- Check that the EV system is normally activated ("READY indicator" illuminates on the instrument panel when the starter switch is turned ON.) before and after body mounting work.

(e) Before carrying out a vehicle wash, including a high-pressure wash, Starter switch off.
Do not apply high pressure cleaning to the EV system equipment, charge inlet box, or ECU. Do not expose the area surrounding the high voltage battery bent pipe directly to water or steam. If water or steam enters into the high voltage battery, the lithium battery may be broken.

(f) Do not bind the high voltage cable together with wires or pipes.

6.12.2 High voltage shutoff and reset

(a) Safety precautions for bodywork
Bodywork requires safety measures such as decommissioning of the high-voltage system. Performing work without decommissioning the high-voltage system may cause an electric accident such as electric shock, burns, or damage to the vehicle itself and its components.
The decommissioning of the HV system depends on the following conditions:

Area	Field of Work	Activity / component affected	Decommissioning YES / NO
- Interior - Doors - Body	There are no HV components in this area		NO
- Cabin - Rear Body - Frame - Cargo Space - Under Cabin - Drive Train - Underbody - Wheel Arch - Exterieur	Assembly	Body or Trim Parts inclusive bolting	NO
	Work on low voltage system	NO HV components affected. 12V / 24V battery must be disconnected due to the activity.	NO
	Work on high voltage system	—	YES
	Work without tools	No HV components affected	NO
	Work with tools	Not in the area of HV components or HV cable with a distance of more than 20 cm or mechanically separated (sheet metal or plastic wall, large components). There is no risk of damage by the tool to insulation/HV cables/ components (by slipping off, crushing, etc.).	NO
		In the area of HV components with a distance of less than 20 cm or not mechanically separated (no covering by sheet metal, plastic wall, or large components is present). There is a risk of damage by the tool to insulation/HV cables/ components (by slipping off, crushing, etc.).	YES

Area	Field of Work	Activity / component affected	Decommissioning YES / NO
- Various	Welding	Chassi Frame	YES
	Drilling	Chassi Frame	YES
	Cutting	Chassi Frame	YES
	HV System Error	Independent of the activity even if actually no decommissioning would be required	YES
	Painting	No HV component affected	NO
		HV components affected/ disassembled, e.g. ground connection PE (black cable).	YES
		Drying procedure at low temperatures: < 50°C - no time restriction < 60°C - max. 3 hours* < 65°C - max. 1.5 hours* < 80°C - max. 60 minutes* *ambient temperature before drying must be less than 40°C. The time described and the temperature of 80°C may not be exceeded.	NO
		HV components nearby but can be are covered.	NO

Exception:

In this case, a rear body gets mounted at a distance of less than 200mm to HV components, and it is possible to mount the rear body with tools that do not pose a risk to HV components, nothing has to be welded, drilled, or cut, mounting the rear body is possible without the decommissioning of the HV system. However, special care must be taken not to damage or pinch any cables. Rerouting of HV cables or exchanging PE connections is not allowed. If a PE connection has to be disconnected from the HV component or the frame, an HV decommissioning of the HV system is necessary, as well as a potential equalization measurement at the affected location.

If an activity on an HV vehicle cannot be classified in this matrix, the responsible electrical specialist of the bodybuilder management department must be consulted and informed.

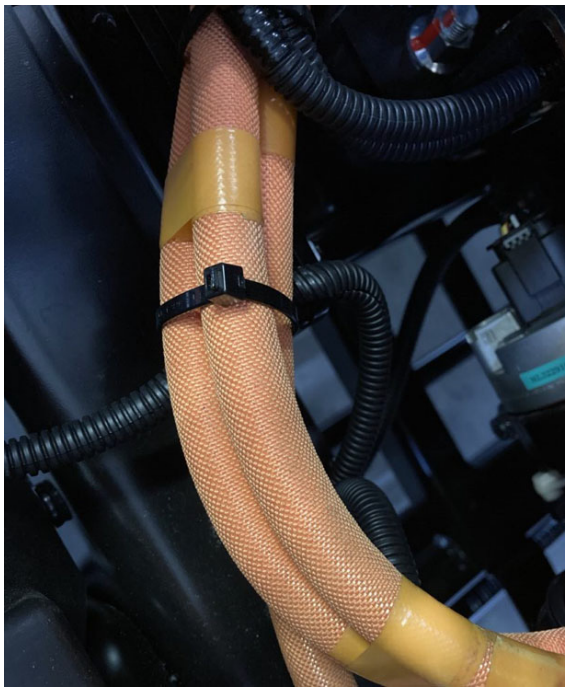
Decommissioning is necessary when:

- Bodywork that needs welding, cutting, or drilling on the frame.
- Installation of any rear body with a connection to the ePTO.
- Installation of a 12V tailgate lifter.
- Disconnection of PE connections (ground strap).
- Disassembly/assembly of suspension and brake parts or work under the cab with a distance less than 200mm to HV components.
- Vehicle demonstrations at exhibitions or events.
- Always when an HV system (EV SYS - red) failure occurs.

Under cabin:

Space where HV components are located (under cabin)

HV Cables and Insulation:



HV cable with protection

HV cable with basic insulation and protection

HV Components:

HV battery and connection

HV components (PDU)

6.12 Handling of EV system

Work permitted without decommissioning of the HV system:

- Service like tire change.
- Work inside or outside the cab.
- Changing of mechanical parts, e.g., headlamp, bulb replacement, etc.
- Exchange or charging of 12V / 24V battery.
- Refilling or replacing coolant.
- Visual inspection of HV components -parts and harness (no touching).
- Painting and drying at ambient temperature.

Towing of the vehicle:

For towing purposes, the HV system does not need to be decommissioned. However, special care needs to be taken. When towing the vehicle, the HV system needs to be activated (ignition active + READY in instrument cluster visible), and the gearshift lever needs to be on N. If it is not possible to start the HV system (e.g., HV system error, flat HV battery, etc.) the drive axle needs to be disengaged to tow or push the vehicle. Any vehicle movement without an active HV system (no active cooling of the inverter) is prohibited, including pushing the vehicle.

Special tool

Symbol	Name	Shape	Part number	Purpose
	High voltage break out box		MH065029	Voltage shutoff work/ restart work

Other items to be prepared

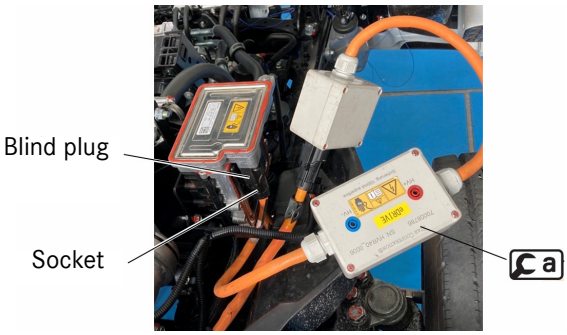
Symbol	Name	Shape		Purpose
–	Voltmeter	 601977	Use a voltmeter designed to withstand high voltage rather than a normal voltmeter.	Voltage shutoff work/ restart work
–	Insulation resistance tester	 601978	Use an equipment able to measure the resistance value of a load to which a voltage of 500 V is applied.	
–	High voltage protectors	High voltage insulation gloves  601979	Use gloves that withstand up to 600V and are long enough to cover the arms	
–		Protective goggles  601980	Wear goggles if necessary.	

(b) HV system decommissioning procedure overview:

- Always make sure to use the latest version of the decommissioning report.
- Store the report digitally for a minimum of 10 years.
- Please proceed as mentioned in the decommissioning report, step by step (all checkmarks must be filled correctly).
- When the absence of voltage is not verified, always light PPE must be worn (safety glasses, short insulation/rubber gloves, ESD shoes).
- Work on the vehicle is only permitted when the absence of voltage has been verified. Verified means when all steps in the decommissioning protocol have been completed step by step and the voltage is below 10V on all poles.
- Once the HV system has been decommissioned, secured against reconnection, and the absence of voltage has been verified, PPE need not be worn except when working on or near the HV battery (<200mm).
- Always make sure to follow the three safety steps:
  1 Decommissioning of the vehicle:
    - Turn off the ignition.
    - Disconnect the minus pole of the 12V/ 24V supply (LV battery).
    - Press the emergency stop button.
  2 Secure against reconnection
    - Keep the vehicle key outside of the cabin.
    - Secure the cover flap of the emergency stop button after pressing with a padlock so the cover can't be opened.
  3 Verify the absence of voltage

(c) HV system decommissioning procedure detailed:

- Ensure no external voltage source such as charging cables are connected to the vehicle (walk-around required).
- Prevent the vehicle from rolling away.
- Place the red sign "Vehicle Commissioned" on the vehicle (must be visible from the front, right, and left sides of the vehicle).
- Switch off the ignition and store the vehicle key outside of the vehicle cabin.
- Disconnect the minus pole of the 12V/24V battery.
- Press the emergency stop button and secure the cover of the emergency stop button with a padlock or plastic strap against opening/ reconnection.
- Wait for 5min until all capacitors are discharged.
- Check the measurement breakout box adapter for damage (cables, connectors, housing) and a vailed test seal.
- Disconnect the HV connector on the PTC-heater (Rosenberger HVR40).
- Connect the breakout box through the connector of the HV connector (PDU side) and the PTC heater.
- Check the measurement tool for damages and a vailed test seal (calibration date).
- Test the voltage tester for function (e.g., by testing a reference voltage).
- Use the voltage tester to determine the absence of voltage at all poles (HV+ > HV-
- | HV+ > ground/PE | HV- > ground/PE) with the breakout box.
- All measured voltages need to be less than 10V.
- If the voltage exceeds 10V, you need to contact your ES immediately and stop working.
- Replace the "red" sign with the "green" one and the "DO NOT switch on" sign.
- After you complete the decommissioning report, the decommissioning procedure is successfully finished.



High-Voltage Disconnection Work Report

Full name:		Date/Time:	
Phone:		Traveling distance:	km
Model name/Vehicle identification number (VIN):			

This report is only valid in conjunction with the current Vehicle-specific Handling Manual.
You must follow the specific measures described here.
Performing other work is prohibited during the following shutdown work.

- ☐ It was confirmed that no external power sources, such as a charging cable, were connected. (A workaround is required)
- ☐ The parking brake is engaged to prevent the vehicle from moving, and wheel chocks are in place.
- ☐ A red high-voltage warning sign is posted on the vehicle.
- ☐ The EV system is turned off.
- ☐ The negative terminal of the low-voltage battery was disconnected.
- ☐ Press the high-voltage cutoff switch, close the cover, and secure it with a padlock.
- ☐ Wait for 5 minutes until all capacitors are discharged.

- ☐ The high-voltage breakout box is undamaged.
- ☐ The calibration of the high-voltage measurement breakout box was confirmed to be within its validity period.
- ☐ A high-voltage breakout box was connected between the PDU and the PTC heater.

- ☐ The calibration of the high-voltage measuring instrument was confirmed to be within its validity period.
- ☐ The function of the high-voltage measuring instrument was checked. (E.g., the reference voltage was measured.)

Measure high voltages using a high-voltage breakout box and a high-voltage measuring instrument.

HV+〜HV-		V	Reference value: -10 V min. to 10 V max.
Between HV+ and body ground		V	Reference value: -10 V min. to 10 V max.
Between HV- and body ground		V	Reference value: -10 V min. to 10 V max.

☐ All measurement readings are less than 60 V.

! Warning: If more than 60 V, stop work immediately and contact ES for remedial action.
If there is no protection against contact (e.g., after removing the service cover), recheck for the absence of voltage.

- ☐ Replace the red high-voltage warning signs with green high-voltage and “do not turn on” signs.
- ☐ The high-voltage system is disconnected and secured to prevent reconnection.

☐ Text: All items were checked off.

➡ Work can be performed on the vehicle.

Signature of the person responsible

(d) HV system recommissioning procedure overview:
- Always make sure to use the latest version of the recommissioning report.
- Store the report digitally for a minimum of 10 years.
- Please proceed as mentioned in the recommissioning report, step by step (all checkmarks must be filled correctly).
- If the vehicle is in an unverified decommissioned state, the car must first be properly decommissioned. Furthermore, light PPE must be worn.

(e) HV system recommissioning procedure detailed:
- Ensure no external voltage source such as charging cables are connected to the vehicle (walk-around required).
- Replace the "DO NOT switch on" and the "green" HV sign with the "red" one.
- Check the HV components and cables (marking are not covered, no damage, connectors are plugged in) and that the ground straps / PE cables are connected.

If any ground strap was disassembled/ disconnected during the work before, please proceed with the following steps; otherwise, skip this section:

- Check the measurement tool for damages and a vailed test seal (calibration date).
- Light PPE must be worn.
- The 4-wire milliohm measurement needs to be done with 1 Ampere.
- Perform an equipotential bonding measurement (4-wire Kelvin milliohm measurement) at four different housing points (e.g., 2 x cover, 2 x base housing) of the HV component from which the ground wire has been disconnected. Also, perform a tight fit (torque check) of the connection (frame and component).
- The result of the 4-wire milliohm measurement needs to be less than 20 mΩ.

If any HV connection has been opened or an HV component has been replaced or relocated, please proceed as follows; otherwise, skip this section:

If no breakout box adapter is installed yet:

- Check the measurement breakout box adapter for damage (cables, connectors, housing) and a vailed test seal.
- Disconnect the HV connector on the PTC-heater (Rosenberger HVR40).
- Connect the breakout box through the connector of the HV connector (PDU side) and the PTC-Heater.

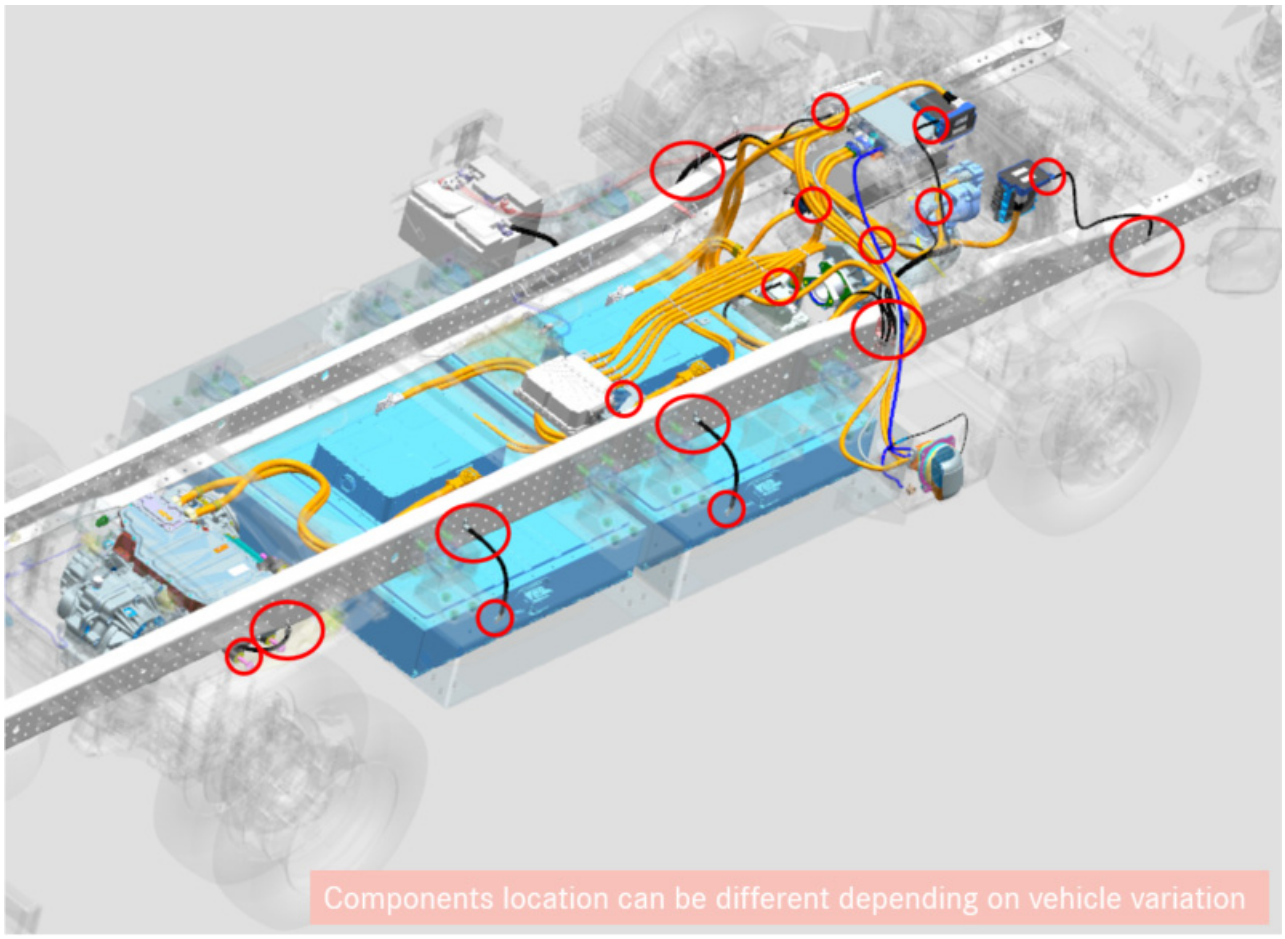
If a breakout box adapter is already installed:

- Check the measurement tool for damages and a vailed test seal (calibration date).
- Light PPE must be worn.
- The isolation resistance measurement needs to be done with 500V.
- Measure the isolation resistance between HV+ and ground/PE.
- Measure the isolation resistance between HV- and ground/PE.
- The result of the isolation resistance measurement must be higher than 1 MΩ.
- Remove the breakout box adapter
- Reconnect the connector on the PTC-heater

Follow-up normal recommissioning procedure:

- Remove the "red" warning sign.
- Open/unlock the emergency stop button.
- Deactivate the emergency stop button (turn and pull).
- Reconnect the 12V/24V battery.
- Switch on the ignition (terminal 15) and wait for the system check "READY" to be displayed in the instrument cluster.
- If an "EV SYS - red" error is displayed, try to confirm it to clear it. If clearing is impossible and there is no exact procedure for troubleshooting, please get in touch with the responsible ES and stop any work on the vehicle.
- Read out the fault memory and delete any DTCs if necessary.
- After you fill out the recommissioning report, the procedure is successfully finished.
- Perform a test drive (functional check) and record the mileage before and after the test drive.

Ground connections (PE connections):



Restart Operation Report

Full name:		Date/Time:	
Phone:		Traveling distance:	km
	Model name/Vehicle identification number (VIN):		

This report is only valid in conjunction with the current Vehicle-specific Handling Manual.
You must follow the specific measures described here.

Performing other work is prohibited during the restart!
Detail below the work performed and any replaced high-voltage equipment, including all part numbers or serial numbers.

☐ It was confirmed that no external power sources, such as a charging cable, were connected. (A workaround is required)
☐ Replace the green high-voltage signs and “do not turn on” signs with red high-voltage warning signs.
☐ Visual inspection confirmed no installation problems or damages to the high-voltage components and cables.
(This includes checking the markings, cover, and connectors to ensure they are properly attached or plugged in)
☐ Visual inspection was performed on the equipotential ground cable connections, including those to the body and frame.

Equipotential ground cable protective grounding test for replaced high-voltage equipment
☐ Fill in the test sheet for equipotential ground cable measurement.

Part name		1	2	
Torque	Frame or PE rail	N・m	N・m	
	High-voltage equipment part	N・m	N・m	
Resistance measurement High-voltage and low-voltage connectors must be disconnected.		mΩ	mΩ	Reference value: 20 mΩ or less Four-wire measurement: More than 200 mA
Remarks:				

☐ The high-voltage breakout box was removed, and the startup status of the high-voltage equipment was checked. (If not done yet.)
☐ The red warning sign was removed.
☐ The high-voltage cutoff switch was disengaged. (Turned and pulled)
☐ The negative terminal of the low-voltage battery was connected.
☐ The EV system was turned on, and the READY light was displayed on the ICUC metre.
☐ Conduct a functional test. (Read error memory and delete as necessary)
☐ Text: All items were checked off.

➡ Work can be performed on the vehicle.

Signature of the person responsible

6.12.3 Precautions during electric welding

Property damage

Do not leave the connection of the PTC heater open. The HV cable/connector must be connected. Keep the breakout box adapter installed or close the connection. Otherwise, water or foreign objects may enter the connector, which could cause an EV system failure. Decommission the vehicle fully by following the decommissioning procedure.

(a) Cover the surrounding area to prevent welding sparks from damaging the vehicle or any HV components/cables.

(b) Connect the welding machine minus cable to the vicinity of the part you would like to weld. Do not connect the cab and the frame.

(c) Set the welder current to the value suitable for the metal and perform the welding.

(d) Perform welding, referring to "8.6. Precautions during electric welding" (▷ 8.6.).

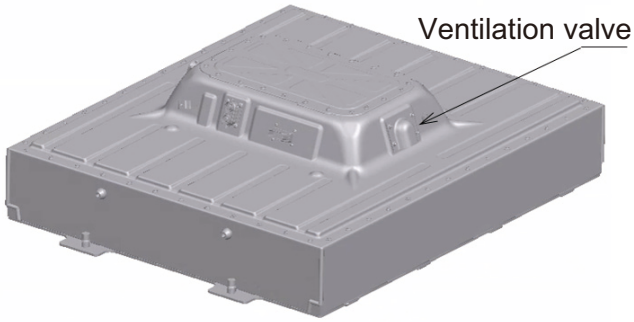
6.12.4 Precautions for the lithium-ion high-voltage battery

The high voltage battery is a lithium-ion high-voltage battery. Observe the following precautions to secure the safety of the battery and make full use of the performance. For any questions regarding handling, etc., contact your Mitsubishi Fuso authorized Distributer.

(a) If a fault or other problem occurs during the use of the high voltage battery, immediately contact your Mitsubishi Fuso authorized Distributer for receiving appropriate support.

(b) The high voltage battery shall not be used for any other purposes than intended.

(c) Do not expose the ventilation valve (the internal release valve) of the high voltage battery to water, sea water, juice, or other liquid because doing so may result in damages to the internal parts of the high voltage battery, explosion, iring, heating, or expansion of the battery module.
Also, do not apply high pressure cleaning to the said valve.



(d) Do not damage the high voltage battery with any foreign object, strike it with a hammer, or step on it because doing so could damage the battery and may cause explosion, firing, heating, or expansion of the battery.

(e) If the battery is externally corroded, emits odour, or gets heated, immediately stop using it and contact your Mitsubishi Fuso authorized Distributer. as well as the nearest fire department.

(f) At all the instructions in the guideline "Handling of Lithium-Ion High-Volatge Batteries" must be followed at all times.

6.12.5 Attaching a side guard

When installing a side guard around the high voltage battery housing, take care to prevent interference with the high voltage battery side cover when it is attached or removed.

The service cover of the high-voltage battery should stay accessible. Or the side guard should be easy removable to access the service cover and the MSD.

6.12.6 Installing the side underrun protection

(a) When installing the side underrun protection in the vicinity of the high-voltage battery box, take care that it does not interfere with the replenishment of water in the inverter cooling water tank, the inspection of the filling port and the high-voltage battery box side cover, or the operation of the high-voltage shutoff switch.

(b) Ensure that the side underrun protection and mounting stay do not hide the access hole for the emergency stop button in the side cover or the caution labels.

6.12.7 Precautions during painting

(a) High-voltage cables and connectors are in exclusive orange color so that they can be identified as high-voltage. When reapplying painting, be careful not to paint these cables so that they can be surely distinguished.

(b) Surface specifications of the high-voltage battery box that minimizes the rise in battery temperature. Do not paint the battery box.

6.12.8 Attaching caution label for emergency stop button

Additional information

For attaching of the caution label, see ▷ 10.11.3.

6.12.9 Installing custom-built truck body

When adding a wire or pipe for installing custom-built body, do not clamp it together with a high-voltage cable.

6.13 Others

6.13.1 SRS air bag

⚠ Risk of injury

Observe the following precautions when carrying out body/modification work on vehicles equipped with SRS airbags and seat belts with emergency tensioning retractors.

Otherwise, the airbag may not operate properly or it may be triggered unexpectedly during the work. (SRS: Abbreviation for Supplemental Restraint System, a restraint system which supplements the seat belts)

- Precautions for body building and modifications
  (a) Modification of a front portion of the vehicle or mounting of a built body on the front surface of the cab may result in the SRS air bag not working properly. If such a modification is made or body building is performed, explain the precaution to the purchaser of the vehicle and alter the SRS air bag so as to demount.
  For queries about the alteration procedure to demount the air bag and any special types of body building other than those given below, contact the department responsible. ▷ 2.2
  - Modification of the front bumper, frame or cab at the front portion of the vehicle
  - Mounting of a grille guard or winch
  - Mounting of a snowplow
  - Body building of a front-stowing, and not hook-stowing, cab back crane (type of crane traveling with a hook suspended at the front of the cab)

  (b) Never disassemble or modify the steering wheel (including the pad), airbag modules (driver's seat and front passenger seat), airbag ECU, sub-G sensor, ELR of the seatbelts fitted with pretensioners (driver's seat and front passenger seat) or the airbag harnesses.
  (c) Do not install electrical parts or equipment related to body-building at a location that is on and higher than the steering wheel.
  (d) The airbag ECU is installed on a bracket alongside the brake pedal on the cabin floor (in the case where a front passenger seat airbag is provided, a sub-sensor is also installed on the floor at the rear of the washer tank on the front passenger seat side), so do not modify or reinforce the airbag ECU mounting bracket. Also, do not apply a strong impact to the bracket by kicking or striking it, for example.

- Precautions during electric welding
  (a) Turn OFF the starter switch and disconnect the negative battery cable. Then, leave the vehicle to stand for 1 minute or more.
  This step is performed to let electricity stored in the backup capacitor disposed inside the ECU of the SRS air bag discharged.
  Wrap tape around the negative battery cable terminal for proper insulation. (Be sure to perform this step particularly for work related to electrical systems and cab.)
  (b) Make an ground connection of the welding machine near the welding portion.
  (c) After the welding operation, restore the battery cable to the original position and turn ON the starter switch. At this time, make sure that AIR BAG does not appear on the multi-display.
  If the multi-display shows AIR BAG, never fail to contact an authorized MITSUBISHI FUSO authorized Distributer.

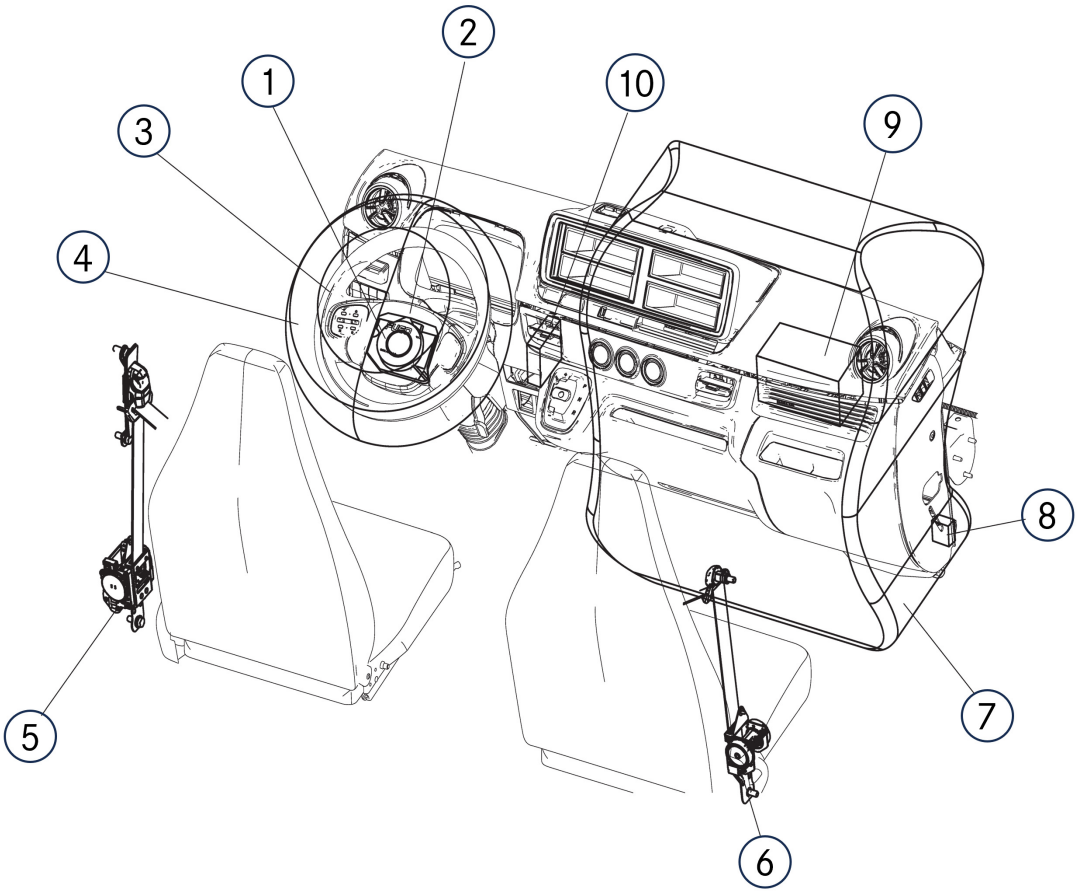
If you carry out welding work in the vicinity of the airbag, you are likely to cause this restraint system to become defective. Never carry out welding in the vicinity of the airbag.

If you ignore this warning, the airbag is likely to deploy or fail to function correctly.

- Precautions during body building work
  (a) The SRS air bag system parts are mounted around the steering wheel and seat belt retractor. Do not tap the areas around the SRS air bag system parts or otherwise apply impact to them.
  (b) Do not remove any SRS air bag system parts.

(c) Do not modify harnesses and connectors of the SRS air bag system. Do not fix other harnesses to the air bag or pretensioner harness.
(d) Do not check the SRS air bag circuit using a multimeter or similar device.
(e) When performing work involving heating to the cab (e.g. painting), if the temperature becomes 93°C or higher, remove the air bag ECU, sub-G sensor, air bag module, clock spring, and the ELR of the seat belt with pretensioner in advance.
If these parts are to be removed, contact the department responsible in advance. ▷ 2.2
(f) If the air bag module is removed, place it with the horn pad upper surface facing up on a flat site. Do not place any other object on the air bag module.
(g) Use utmost care when handling the air bag module, air bag ECU and sub-G sensor. Do not drop it or subject it to water or oil.
Never apply impact to the air bag ECU and sub-G sensor, in particular.
Should it be dropped, replace it with a new one even if it looks all right on the outside.
(h) Do not modify the electrical circuit of the SRS air bag.
Never use a general-purpose multimeter.
(i) Never source power from the SRS air bag fuse.
(j) Do not turn the clock spring three turns or more from the neutral position (straight-ahead position), as a damaged internal harness could result.
(k) Whenever removing the steering wheel or steering shaft joint, be sure to place the front tires in the straight-ahead position, remove the starter key, and lock the steering wheel.
(l) During reinstallation of the steering wheel, make sure that the front tires are placed in the straight-ahead position and the clock spring in the neutral position.
To bring the clock spring into its neutral position, follow these steps: turn the clock spring fully clockwise; turn it counterclockwise the number of turns specified on the label; and turn it until the alignment marks are aligned with each other.
(m) After the work has been completed, use the SRS air bag warning to check that the system functions properly.
Turn ON the starter switch and then check that the SRS air bag warning AIR BAG does not appear on the meter cluster multi-display.
If the SRS air bag warning AIR BAG appears, consult an authorized MITSUBISHI FUSO authorized Distributer.

- Miscellaneous
  (a) Be sure to consult an authorized MITSUBISHI FUSO authorized Distributer. whenever performing any work other than those noted above, replacing or disposing of the SRS air bag, or discarding a vehicle equipped with the SRS air bag.



1 *Clock spring*
2 *Driver's seat side airbag module*
3 *Steering wheel*
4 *Driver's seat side airbag*
5 *Driver's seat side seat belt with pretensioner*
6 *Passenger's seat side seat belt with pretensioner*
7 *Passenger's seat side airbag*
8 *Sub-G sensor*
9 *Passenger's seat side airbag module*
10 *Airbag ECU*

6.13.2 Active Brake Assist 5 (ABA5) <Vehicle with ABA5>

Active Brake Assist 5 automatically applies the brakes to either prevent a collision, or reduce the speed at which impact occurs and thereby reduce the damage caused by a collision when a collision with the vehicle ahead cannot be avoided.

Preparation

Before doing any electrical welding work related to body mounting work, turn off the starter switch and disconnect the battery cable from the negative terminal.
Put the ground for the welder close to the position you are welding.

When painting work

- Mask the radar unit and radar cover so no paint gets on them.
- Remove the radar unit from the vehicle before forced drying the area around the radar unit.

If you remove the radar unit

After you have removed the radar unit from the vehicle, have the radar adjusted at MITSUBISHI FUSO TRUCK&BUS CORPORATION.

If you drop the radar unit

The radar unit is a precision component. You must replace it if it is subjected to physical shock, such as being dropped.

Built body components

Do not install built body components in front of the radar. Doing so could cause false alarms or malfunctions.
Do not install a license plate frame (number plate frame).

7.1 General

Risk of accident and injury

Do not modify any bolted connections that are relevant to safety, e.g. that are required for wheel alignment, steering or braking functions.

When unfastening bolted connections make sure that, when work is complete, the connection again corresponds with the original condition.

Welding work on the chassis/body may only be carried out by trained personnel.

The body, attached or installed equipment and any modifications must comply with the applicable laws and directives as well as workplace safety or accident prevention regulations, safety rules and accident insurer requirements.

With all bodies make sure that neither flammable objects nor flammable liquids can come into contact with hot assemblies (including through leakages in the hydraulic system) such as the transmission, etc.

Appropriate caps, seals and covers must be installed on the body in order to avoid the risk of fire.

Property damage

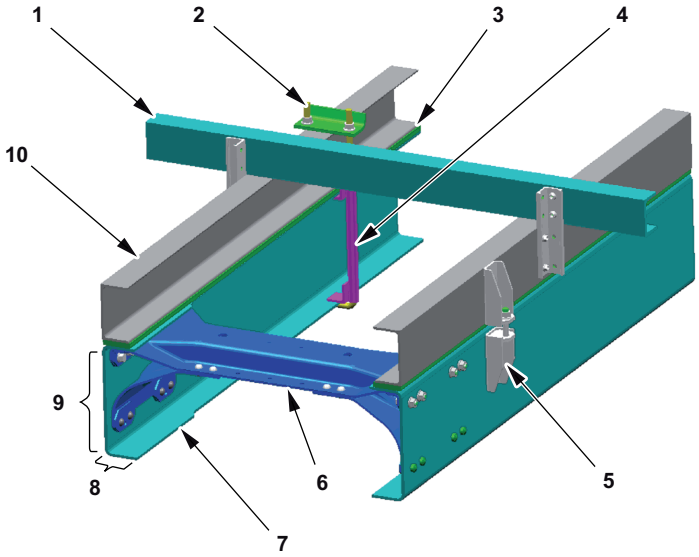
Bodies on which the transmission can be expected to be exposed to high levels of water, e.g. cleaning water (flushing, overflowing or similar), require an effective cover over the transmission (transmission guard) which will prevent abrupt cooling as well as water ingestion via the transmission breather.

Additional information

Further information on bolted and welded connections can be found in Section 3 "Planning of bodies" ▷ 3.6 and Section 5 "Damage prevention" ▷ 5.1.

7.1.1 Body mounting methods

General



N31.00-2218-00

1 *Cross sill*
2 *U-bolt*
3 *Spacer (liner)*
4 *Spacer (for preventing deformation)*
5 *Mounting bracket*
6 *Cross member*
7 *Chassis frame*
8 *Flange*
9 *Web*
10 *Mounting frame*

Correct calculation of load on the chassis frame

- If a mounting frame is used, the stress calculation of the chassis frame must be conducted for beams combined with the body to be mounted.
- The mounting frame must be fastened to the chassis frame so firmly that the rear body weight may be borne evenly by the combined chassis frame and mounting frame.

Additional information

- For the strength calculation of the chassis frame and mounting frame, refer to "10.4 Weight distribution table" ▷ 10.4 and "10.6.2 Frame section modulus" ▷ 10.6.2.
- The frame stress should be less than the values shown in the table below.

Table of frame stresses (when loaded to rating)

Unit: MPa {kgf/mm^2}

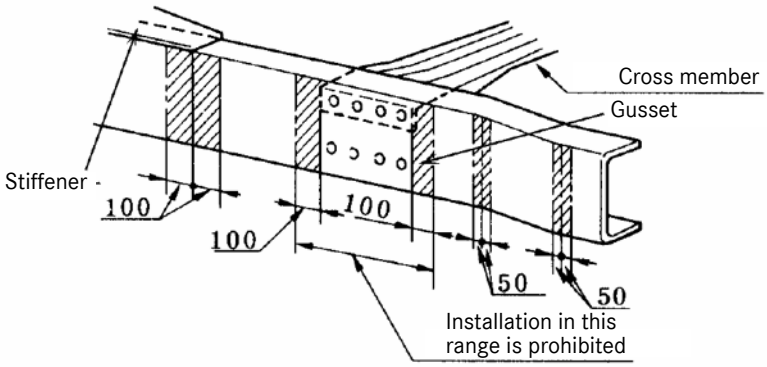
Material / Condition	High tensile steel plate with tensile strength	
	SAPH440 440 {45}	HTP540 540 {55}
Vehicles mainly driven on paved roads	74 {7.5} or less	88 {9.0} or less
Vehicles mainly driven on rough roads	54 {5.5} or less	64 {6.5} or less

Mounting fastening area

The stress of the chassis frame is likely to be concentrated near the cross member, stiffener, gusset attachment points, and side rail bends. Therefore, do not install U-bolts and opposed brackets in these positions (see the figure below).

However, refer to "10.5.4 Rear body tightening bracket mounting position diagram" for fastening the front-most part. ▷ 10.5.4

Do not install U-bolts or brackets in the shaded area



7.2 Mounting frame

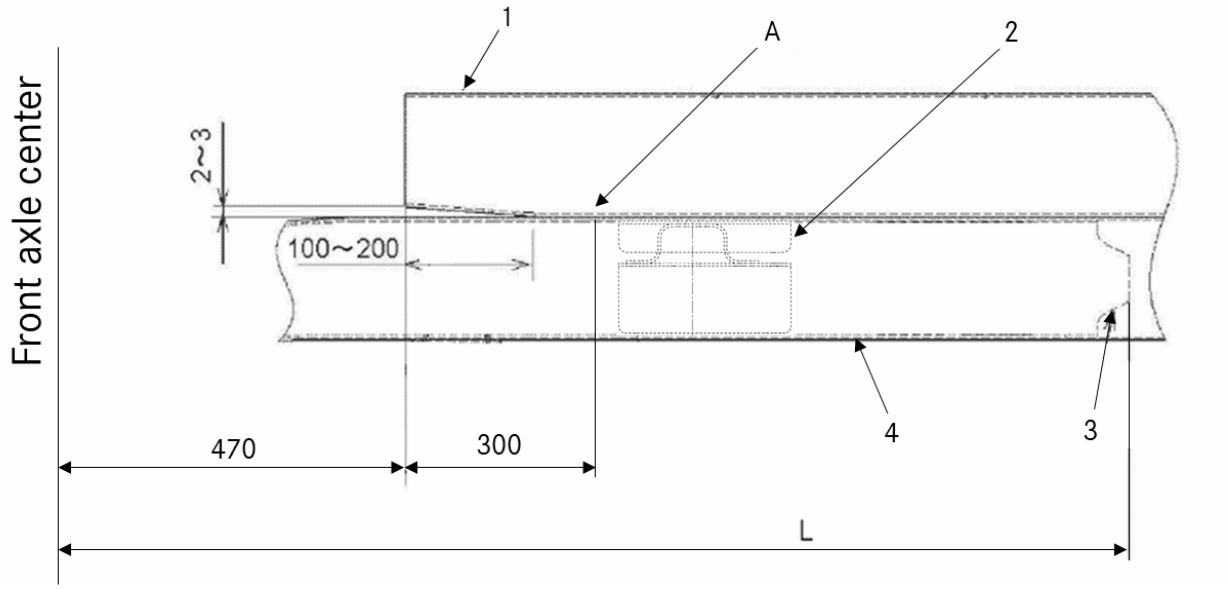
All bodies require a mounting frame or a substructure that assumes the function of a mounting frame to ensure a reliable connection between the chassis and the body.

Property damage

If more than one body is mounted on the same chassis (e.g. platform and loading tailgate), the larger of the specified moments of resistance must be taken to determine the mounting frame.

7.2.1 Mounting frame

- Be sure to install a mounting frame to ensure that a concentrated load is not applied to the chassis frame.



A Part of the frame assembly that has been enlarged
standard cab: 700 mm assembly width
wide cab: 750 mm assembly width
1 Mounting frame
2 No. 2 cross member
3 Sub-side rail
Wide cab: excludes an assembly width of 850 mm
4 Side rail

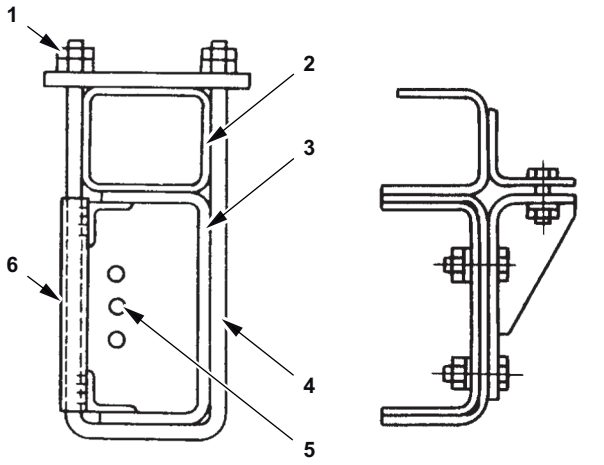
Unit: mm

Model	L
Standard cab	1700
Wide cab	1800

Additional information

(A) indicates the part of the frame assembly that has been enlarged (standard cab: 700 mm assembly width; wide cab: 750 mm assembly width).

- Carry out the following in order to prevent stress concentrating at the front end of the mounting frame. Make the length of the tapered part of the bottom end of the mounting frame between 100 and 200 mm, and end the taper at a point that is not past (A). If a taper cannot be secured, form the end to a radius of at least 10, and extend the end part to the front (vicinity of the shackle).
- To connect the mounting frame to the chassis frame, either use U-bolts, or in the case of a heavy body building part fix the mounting frame with opposing brackets and ensure that the load imposed by the body building part plus the freight is borne by both the mounting frame and the chassis frame.
  Ensure that the front end connecting part is frontward of the No.2 cross member (transmission suspension part). A large number of hoses and wires pass through this area, so take care not to damage them when installing the U-bolts.



N31.20-2118-00

1 Use double nuts
2 Mounting frame
3 Chassis frame
4 U-bolt
5 Pipings
6 Misalignment stopper

7.2 Mounting frame

Cargo

Position of mounting frame

- Install the mounting frame as shown in Fig. 1 to gradually reduce the stress concentrations in the front end. The front end of the mounting frame should be installed as close to the rear of the cab as possible. Extend the mounting frame as far toward the cab as possible when the rear body is installed far from the cab.

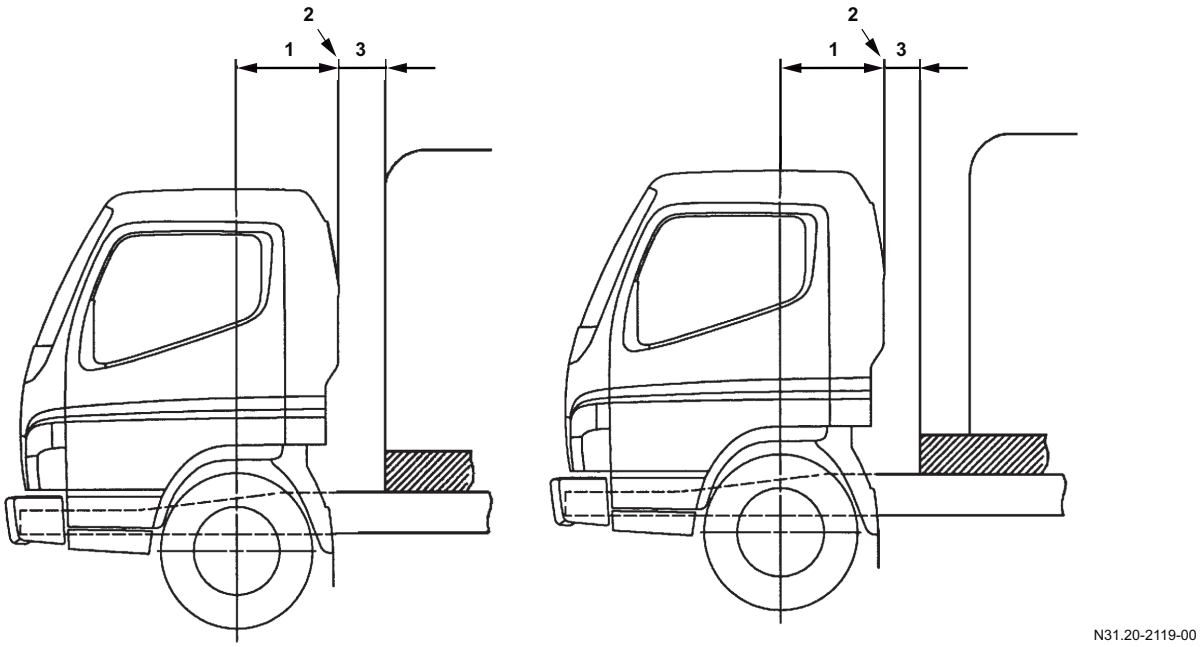


Fig. 1

1 525 mm
2 CAB BACK
3 Extend the front end of the mounting frame as far forward as possible; less than 300 mm

Mounting Bracket

When U-bolts cannot be used with a particular body, use mounting brackets in those positions to attach it to the mounting frame. Use the following bracket locations and installation procedures.

- Attach the mounting brackets to the chassis frame with bolts whenever possible. Be especially careful not to damage any pipes, hoses, and wiring harnesses attached to or around the frame.
- Do not attach brackets close to the ends of cross members, gussets or stiffeners. Brackets should be installed at least 200 mm away from the end of these parts.

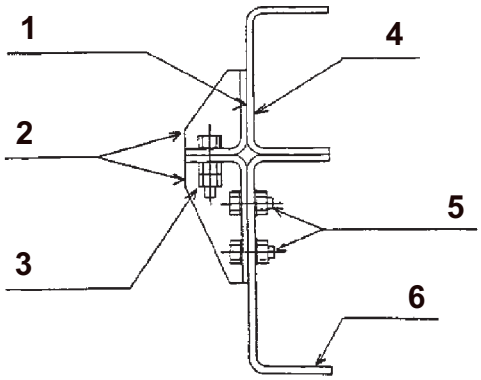


Fig. 1

1 Attached by welding
2 Mounting bracket
3 Use double nuts
4 Mounting frame
5 Tighten the bolts and nuts in more than two locations.
6 Chassis frame

- As a maker option, the genuine rear body brackets are available as shown below.

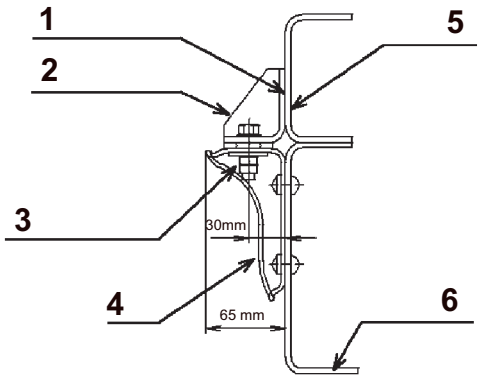


Fig. 2

1 Attached by welding
2 Mounting bracket
3 Use double nuts With washer (more than Ø32 mm)
4 Genuine mounting bracket
5 Mounting frame
6 Chassis frame

- Examples of front-end shape of mounting frames
  (a) Install the mounting frame having the shape as shown in Fig. 1 to gradually reduce the stress concentrations in the front end.

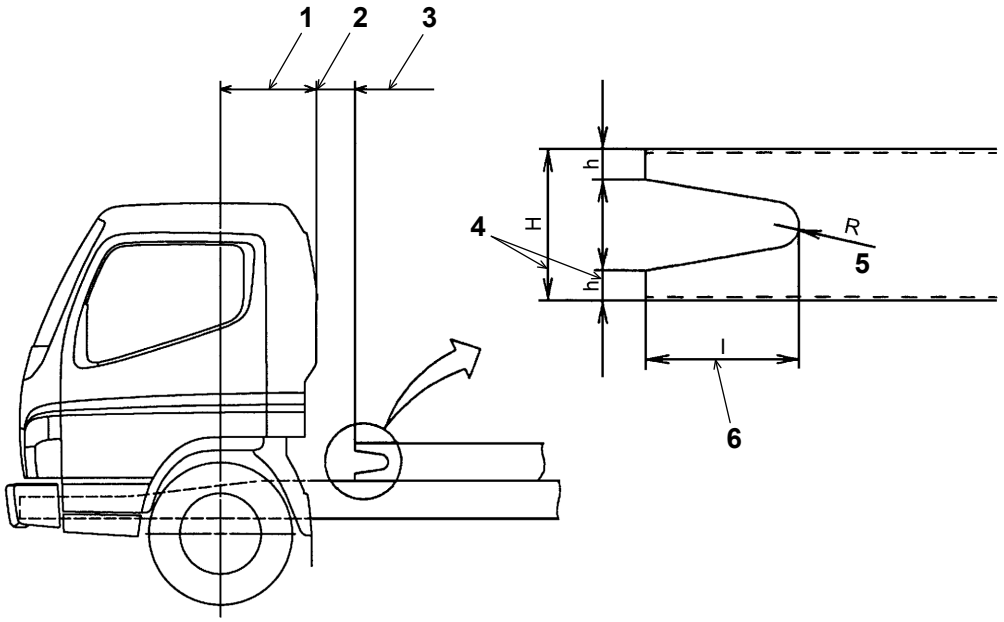


Fig. 1

1 525 mm
2 CAB BACK
3 Extend the front end of the mounting frame as far forward as possible; less than 115 mm
4 "h" should be between a fourth and a fifth of "H"
5 DRILLING
6 "l" must not be less than 2/3H(two thirds of "H")

(b) The shape of the mounting frame front end as shown in Fig. 1 is highly desirable. However, if there is enough room behind the cab, the shape as shown in Fig. 2 is also acceptable.

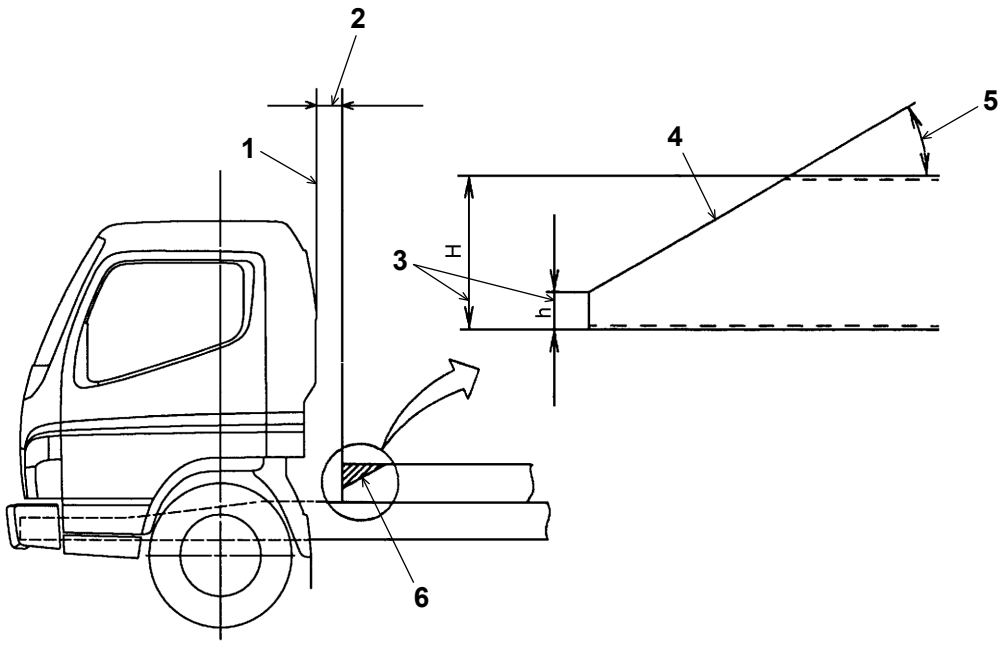


Fig. 2

1 CAB BACK
2 Less than 300 mm
3 "h" should be between a fourth and a fifth of "H"
4 Left open
5 Less than 30°
6 Cut off Obliquely

(c) If it is difficult to shape the front end of the mounting frame as described in Fig. 1 and Fig. 2, cut it to the shape as shown in Fig. 3 before installation.

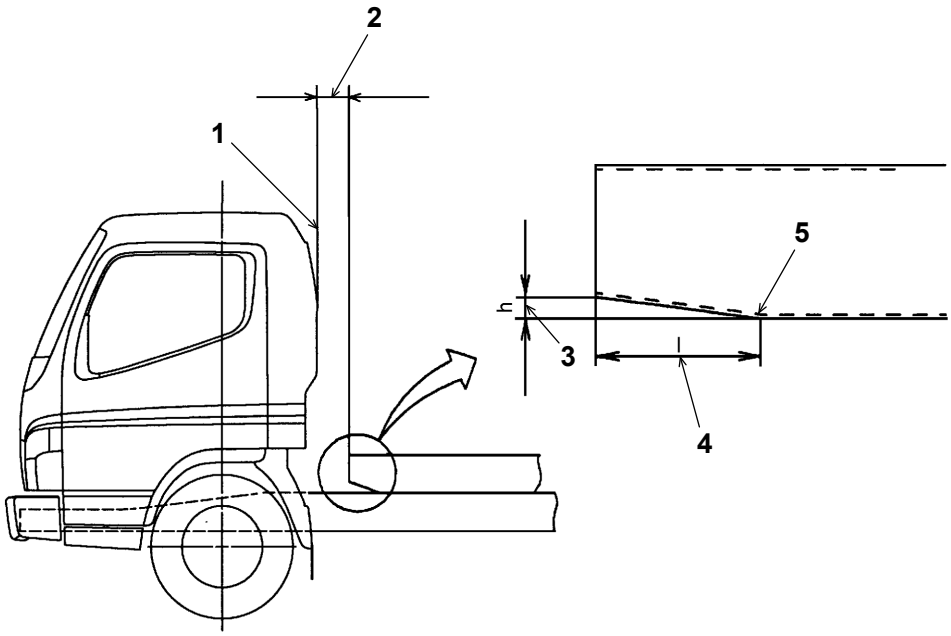


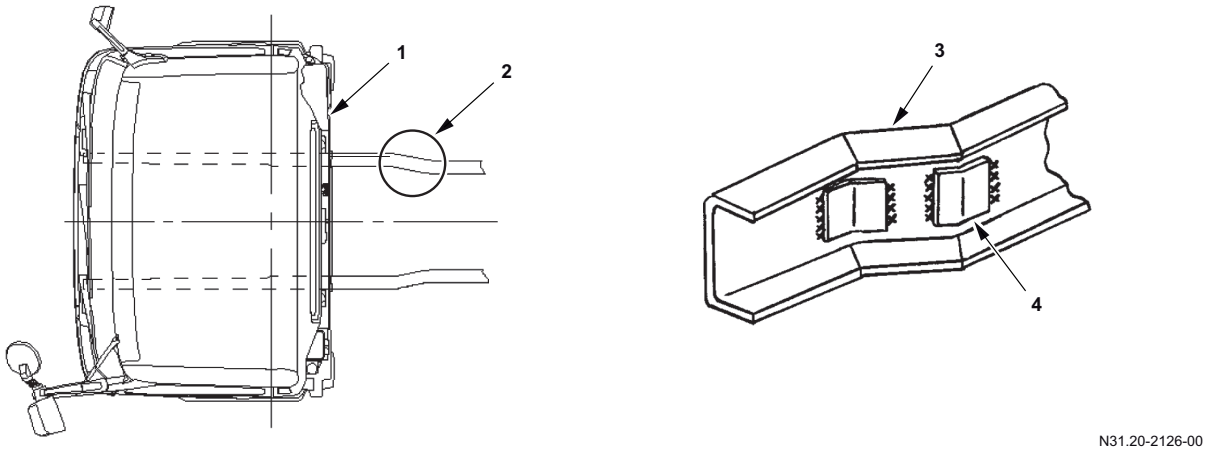
Fig. 3

1 CAB BACK
2 Less than 300 mm
3 "h" should be 2 to 3 mm
4 "l" should be 50 to 70 mm
5 This corner should be ground smoothly

7.2 Mounting frame

Cargo

- If the chassis frame changes its width behind the cab back as shown in the picture below and the mounting frame should extend forward beyond the width-changed portion, the mounting frame must also change its width along the chassis frame. The portion of the mounting frame where the width changed must have the internal surface reinforced with stiffeners as shown in the figure.

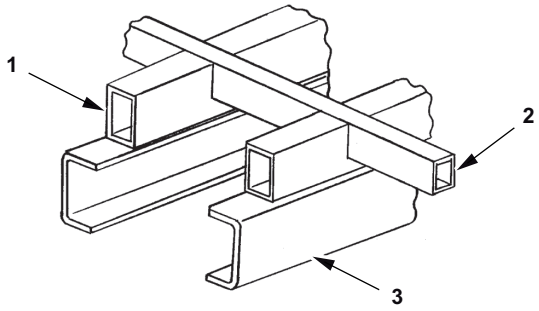


N31.20-2126-00

1 Cab back
2 Width-changed portion
3 Mounting frame
4 Stiffener

Other notes

- If, for the sake of a low deck design, the mounting frame and the cross sill must be arranged on the same plane, pass the cross sill member through the mounting frame.



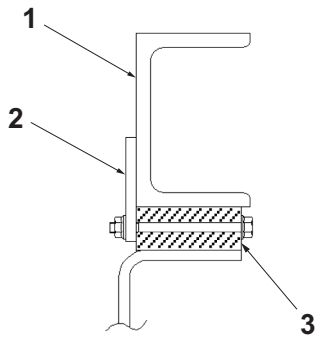
N31.20-2128-00

1 Mounting frame
2 Cross sill
3 Chassis frame

7.3 Mounting frame attachment

7.3.1 Spacer (liner)

- Placing a spacer (liner) between the chassis frame and the mounting frame is not recommended because the combining force between both frames may be lowered.
- In an unavoidable case, hold the spacer (liner) in position with an additional retainer.



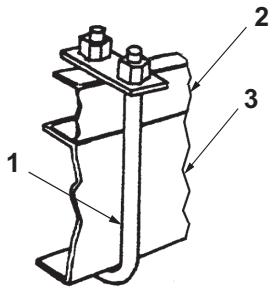
Installation of out-of-position preventive retainer

1 Mounting frame
2 Retainer
3 Spacer (liner)

7.3.2 Fastening mounting frame to chassis frame (securing mounted body)

Frame fasteners and their features

- U-bolt
  The U-bolt is a fastener widely used for combining two or more members. This offers a considerable fastening force and is effective for preventing lateral movement of members. However, it is not so effective for suppressing the longitudinal movement. Therefore, it is required that a retainer be used together for that purpose.

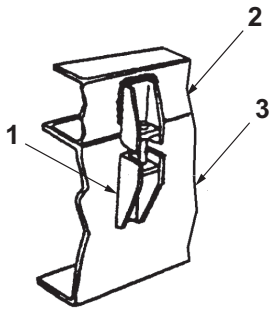


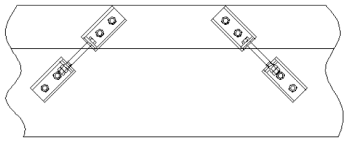
1 U-bolt
2 Mounting frame
3 Chassis frame

7.3 Mounting frame attachment

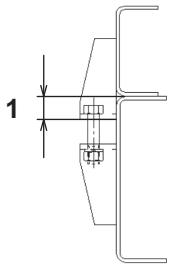
Cargo

- Opposed bracket
  This is a fastener composed of two brackets opposed to each other (one on chassis frame, one on mounting frame) and one bolt connecting these brackets. This offers a larger fastening force in a vertical direction as compared to a U-bolt. However, it is inferior in the longitudinal and lateral holding forces. To increase the longitudinal holding force of this fastener, arrange two pairs of brackets diagonally as shown below. To increase the lateral holding force, overhang the bracket on the mounting frame side toward the chassis frame side.





For increasing longitudinal holding force

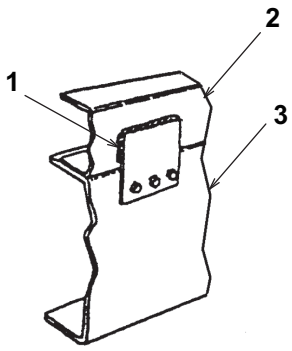


For increasing lateral holding force

1 Opposed bracket
2 Mounting frame
3 Chassis frame

1 Overhang

- Mounting flange
  This is a retainer composed of a set plate fastening the chassis frame and mounting frame to each other. This offers a strong holding force in the longitudinal direction but is inferior to a U-bolt or opposed bracket in vertical and lateral holding forces.



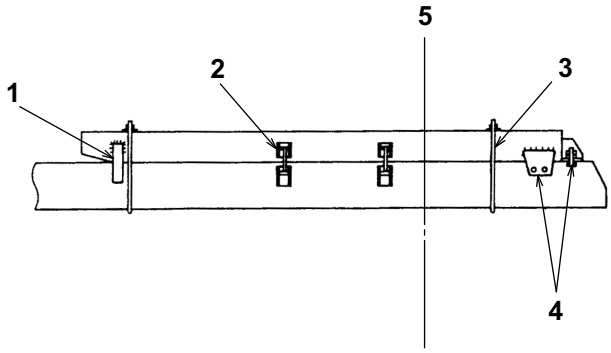
1 Set plate
2 Mounting frame
3 Chassis frame

7.3 Mounting frame attachment

Cargo

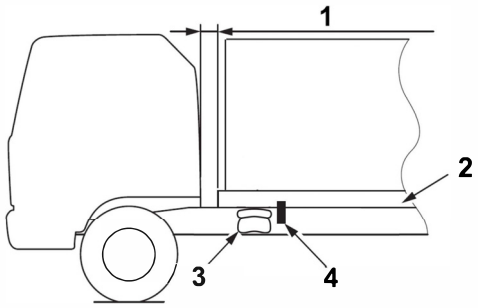
Precautions for fastening frames

- When fastening the mounting frame to the chassis frame using U-bolts and opposed brackets, use retainers for preventing longitudinal and lateral movements together.



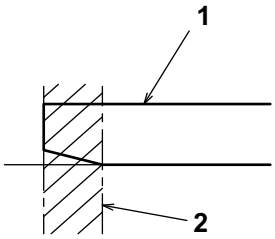
1 Retainer for suppressing lateral movements
2 Opposed bracket
3 U-bolt
4 Retainer for suppressing longitudinal movements (web or flange surface)
5 Trunnion center

- Even if the distance between the cab back and body front end is larger, extend the mounting frame to near the cab back and use the frontmost fastening member above the No.1 HV battery and right after the No.2 cross member. ▷ 10.5.4



1 Within 300 mm
2 Mounting frame
3 No.2 cross member
4 Fastener

- When fastening with a U-bolt, ensure that ample spaces are left for running pipes, hoses, wires and harnesses.
- Do not attach any fastener in the mounting frame front end section where the sectional shape is different from the remaining part.

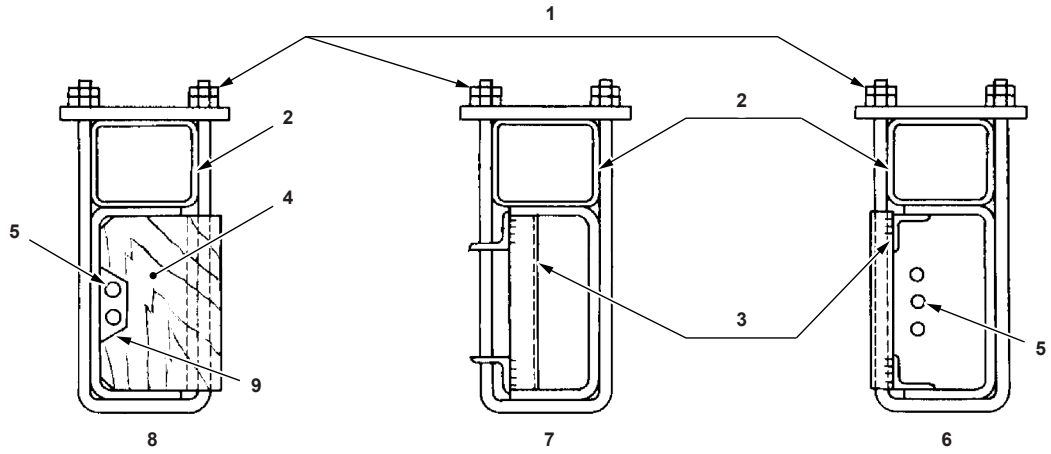


1 Mounting frame
2 Do not attach a fastener in this section.

7.3 Mounting frame attachment

Cargo

- When the mounting frame and chassis frame are combined with a U-bolt, insert a spacer in the chassis frame at the combined position to prevent the side rail flanges from deforming. When attaching the U-bolt near a hot component such as a muffler, use a metallic spacer, not a wooden spacer which can catch fire. Avoid welding a metallic spacer to the chassis frame to hold it in position.



N31.20-2138-00

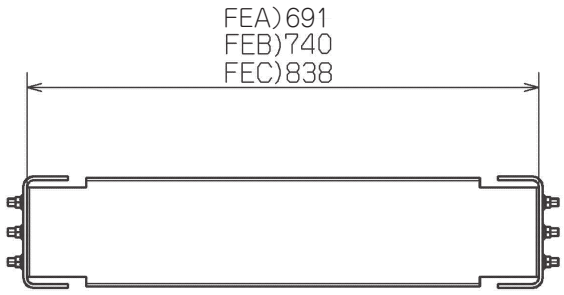
1 Use double nuts
2 Mounting frames
3 Spacer (metallic channel or pipe)
4 Spacer (wood)
5 Pipings
6 In case that pipings run near a flange end
7 When a metallic spacer is used
8 When a wooden spacer is used
9 Provide a notch for running pipings

- Attaching opposed brackets to a chassis frame should be done with bolts. For the procedure, refer to "6. Modifications to the basic vehicle" ▷ 6.1.

7.4 Others

7.4.1 Rear end of chassis frame

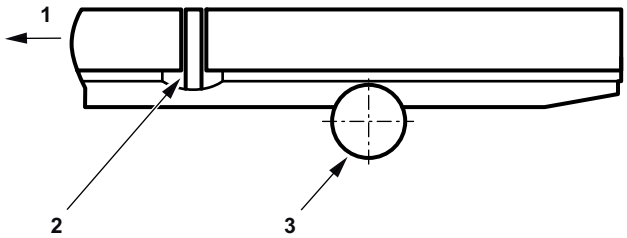
As a result of Product Tolerance for vehicles without RUP, the width dimension of the assembly at the Rear End of the Chassis Frame, may sometimes differ greatly from the dimension indicated in "10.5 Chassis cab drawings". Refer to ▷ 10.5.
If this constitutes an obstacle to body building, devise countermeasures to facilitate body building, such as the installation of a cross member at the rear end of the chassis frame.
An example of a cross member is shown in the figure below.



View seen from the rear of the vehicle

7.4.2 Intermediate post

- On chassis mounted with a 5-way openable rear body, heavy object container or low rigidity body, install an intermediate post at a position just before the rear front axle to prevent the body from drooping rearward or to facilitate sideway swinging of a gate to open or close it during loading.



N31.20-2147-00

1 Vehicle forward
2 Intermediate post
3 Rear axle

- When installing an intermediate post on a truck with a long wheelbase, taking the chassis frame deflection during loading into consideration, provide an ample space between the post and the side gate so that trouble-free side gate opening/closing operations may be assured.

8.1 Electrical system

Risk of fire

Work carried out incorrectly on the electrical system may impair its function. This may lead to the failure of components or parts relevant to safety.

Work on live electrical lines carries a risk of short circuit.

Before starting work on the electrical system, disconnect the onboard electrical system from the power source, e.g. battery.

All accident prevention regulations must be complied with when working on the vehicle.

Comply with all national regulations and laws.

Additional information

Observe the notes on operating safety and vehicle safety in Section 1 "Introduction" ▷ 1.3 and ▷ 1.4.

8.1.1 Specification Check Prior to Building the Body

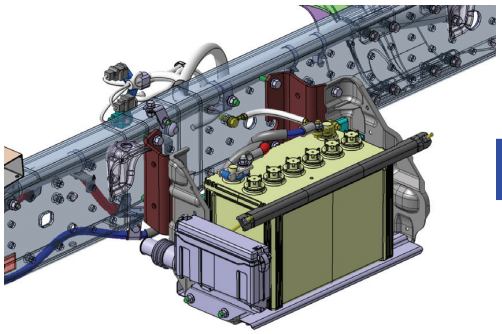
Power supply voltage

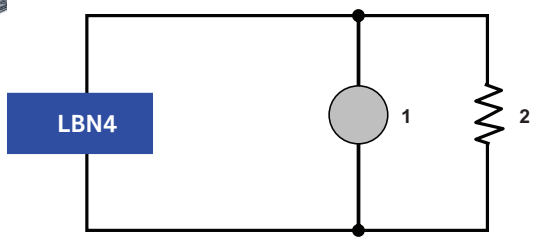
The configuration of the power supply voltage differs according to the particular vehicle.
Check the specifications of the battery mounted on the vehicle. When installing parts related to the power supply voltage, be sure to observe the following precautions.

(1) Configuration of the vehicle power supply

(a) When there is one battery (LBN4)

The vehicle uses 12 V power supply system. You cannot install 24 V electrical components for building body.



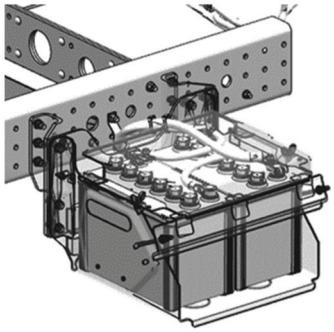


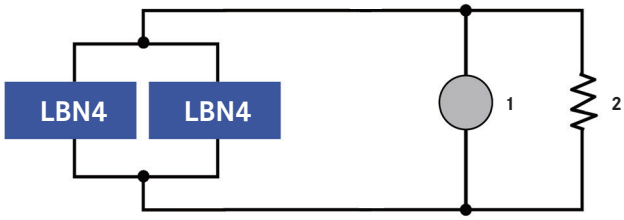
N54.10-2332-00

1 DC-DC converter (HV) *2 12 V load (s)*

(b) When there are two battery (LBN4)

The vehicle uses 12 V power supply system. You cannot install 24 V electrical components for building body.





N54.10-2332-00

1 DC-DC converter (HV) *2 12 V load (s)*

Additional information

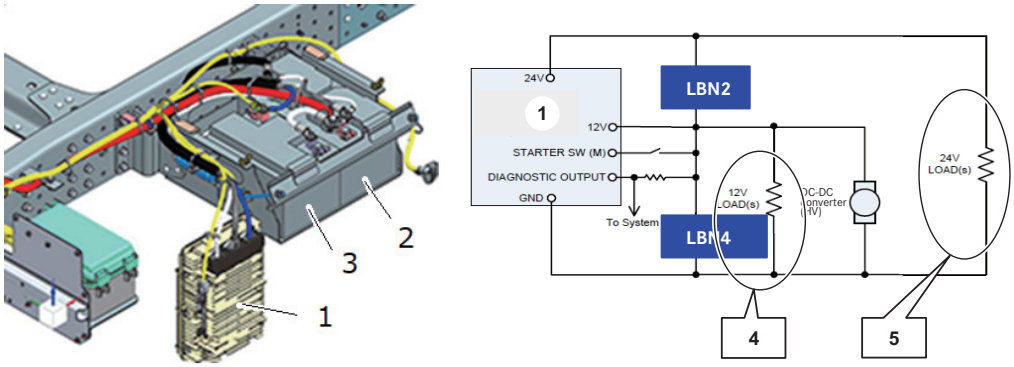
Some vehicles optionally use two 100AH-760A batteries without equalizer.

(c) When there are two batteries (LBN4+LBN2)

In this case 12 V and 24 V power supply systems coexist in the one vehicle, so be very careful.

All of the existing electrical components use 12 V system, but the take-off power supply for the option connectors uses 24 V system. Refer to ▷ 8.4.1 and ▷ 8.4.2.

You cannot use 12 V electrical components for building body.



N54.10-2333-00

1 Battery equalizer
2 Battery 12 V
3 Battery 24 V
4 Vehicle electrical system
5 Option output

Additional information

Some vehicles optionally use two 100AH-760A batteries without equalizer.

(2) Precautions concerning a 12 V/24 V mixed power supply voltage vehicle

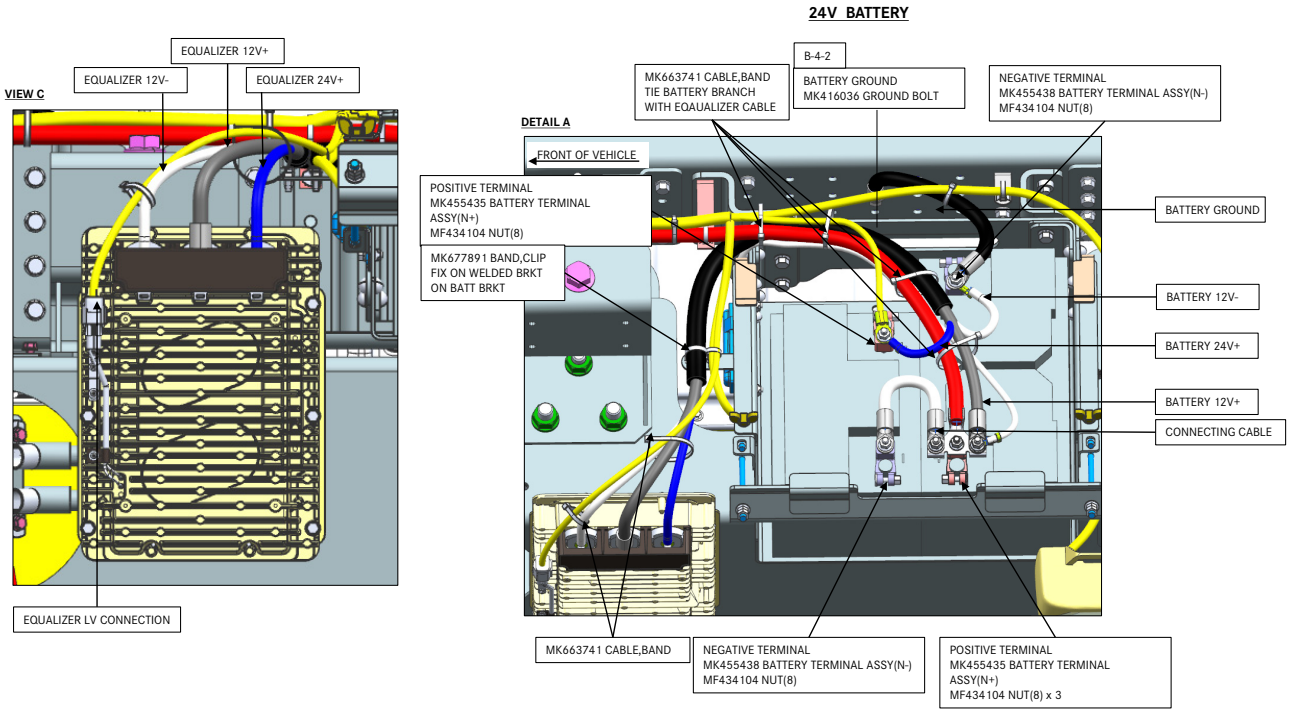
An error in the connected power supply or a wiring error such as a battery connected in the reverse polarity will have an adverse effect on the vehicle electrical components, and may lead to a vehicle fire. For this reason, be very careful of the following points.

<Before building the body>

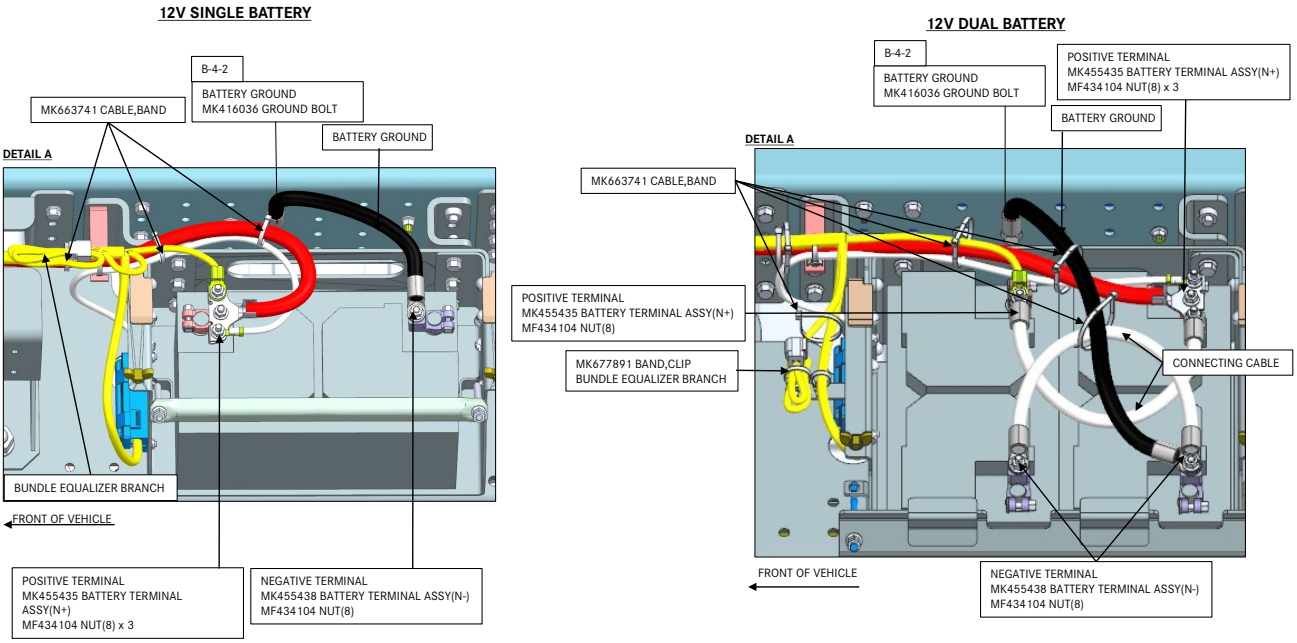
- Turn OFF the starter switch, Also, disconnect all testers and external communication devices.
- After carrying out the above work, close the doors and wait for at least 30 seconds before carrying out body-building work.

<When building the body>

- Disconnect the battery cables from the negative terminals of both 12 V and 24 V batteries.

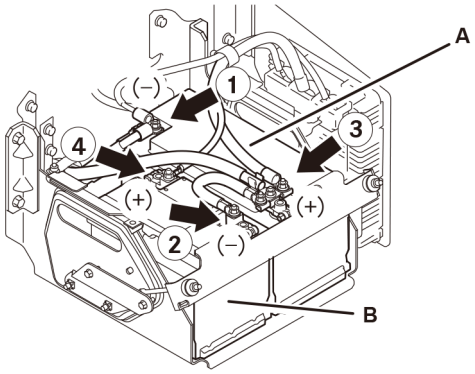


8.1 Electrical system

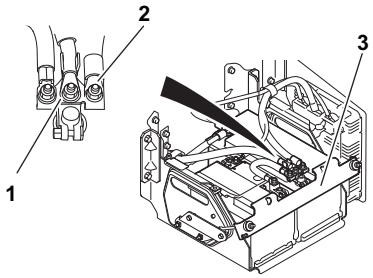


- Even after you have disconnected the cable from the negative terminal of the 12 V battery, be careful not to accidentally short-circuit the negative terminal of the 24 V battery to the frame or the battery box with a spanner or other similar tools.
- When taking off power, use the body-building connector (24 V). It is forbidden to directly take off power from both batteries as a general rule. If this is unavoidable, check ▷ 8.4.1 and ▷ 8.4.2.
- It is forbidden to cut, strip or splice wires or modify connectors or fuses in the existing harness instead of using the connectors intended for building the body. Refer to ▷ 8.4.1 and ▷ 8.4.2.

- Procedure for disconnecting the harness cables
  ① Disconnect the cable from the negative terminal of the 12 V battery.
  ② Disconnect the cable from the negative terminal of the 24 V battery.
  ③ Disconnect the cable from the positive terminal of the 12 V battery.
  ④ Disconnect the cable from the positive terminal of the 24 V battery.

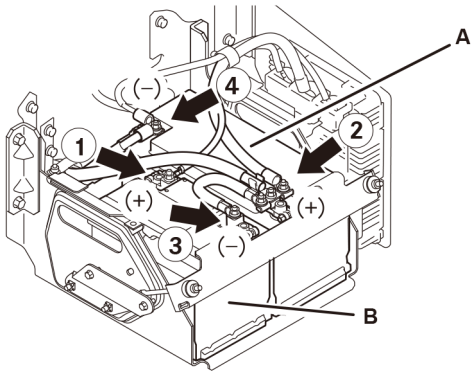


(A) Battery 12 V
(B) Battery 24 V



1 Connector
2 Cable
3 Battery

- Procedure for connecting the harness cables
  ① Connect the cable to the positive terminal of the 24 V battery.
  ② Connect the cable to the positive terminal of the 12 V battery.
  ③ Connect the cable to the negative terminal of the 24 V battery.
  ④ Connect the cable to the negative terminal of the 12 V battery.



(A) Battery 12 V
(B) Battery 24 V

(3) Relocating the batteries and battery equalizer

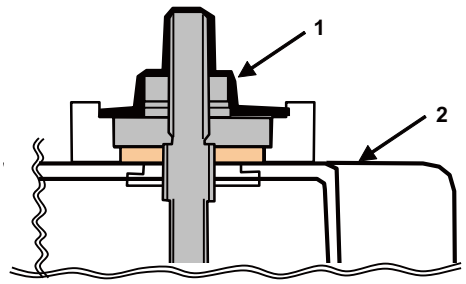
- Do not relocate the battery or battery equalizer.

(4) Precautions concerning the battery equalizer

- Do not disconnect the cables from the 12 V and 24 V terminals of the battery equalizer unless it is absolutely necessary. If the cables must be disconnected from the terminals for some reason, note the following precautions.
- After disconnecting the battery cables, wait for 10 minutes, and then disconnect the battery equalizer cables.
- When reinstalling the battery equalizer, ensure that the terminal side is uppermost, and also that the height of the terminals of the battery equalizer is the same as the height of the battery terminals.
- When connecting the cables to the battery equalizer terminals, apply silicone sealant as described below to ensure that the terminals are fully waterproofed with sealant. If the sealing is inadequate, the terminals will corrode, which may lead to an electric fire, fusing of terminals, or other serious accident and damage.
- How to apply silicone sealant
  ① Place the battery equalizer in a horizontal position with the terminals facing upwards.
  ② Connect the 12 V, 24 V, and negative battery cables to the battery equalizer after disconnecting the cables from the 12 V, 24 V and negative terminals of the battery.

③ Apply silicone sealant to the illustrated areas of the 12 V and 24 V terminals on the battery equalizer and battery so that the metal parts are completely covered. Remove any air bubbles in the sealant, since they will adversely affect the waterproofing effect.

④ After completing the application, leave it in the horizontal position to dry (approx. 8 hours at 10°C and 50% humidity).



1 Silicon sealant
2 Battery equalizer

Name	Part No.	Remarks
SEALANT	MS996198	Bond type

8.1.2 Signal detection and actuation module-related parts

SAM related parts

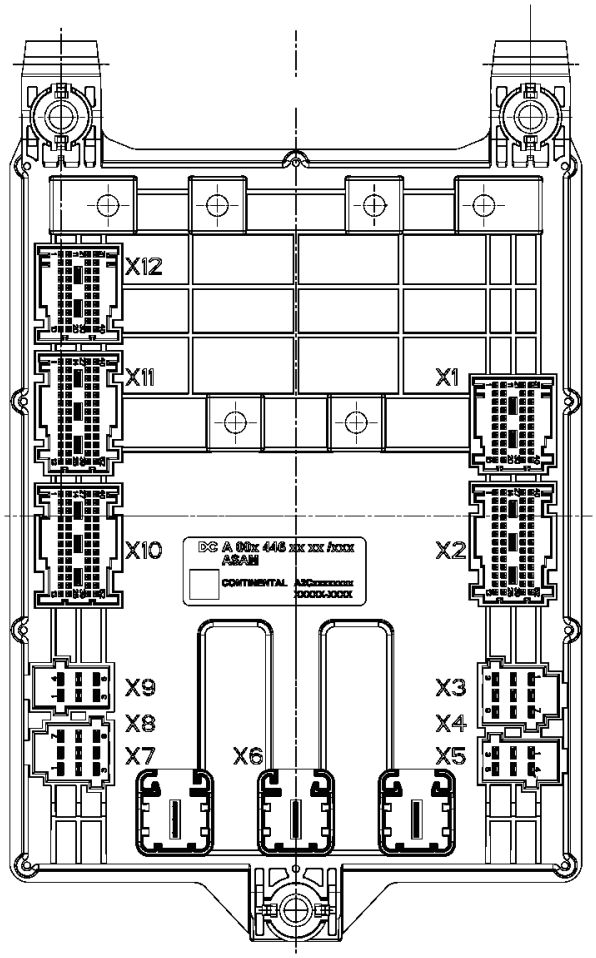
Precautions for SAM (control unit for electric body equipment)
The SAM is a module that distributes power to and controls electronic equipment in the cab and body.

(a) Turn off the vehicle's starter switch before disconnecting the cables and connectors connected to the SAM control unit.

(b) When cleaning the interior, be very careful that water does not get on the SAM control unit (including connectors).

(c) Before removing the SAM control unit from a vehicle, turn off the vehicle's starter switch, and remove the harness from the battery terminal, and then remove connectors and screws according to the following procedure. For installation, do the procedure in reverse.
Remove the SAM bracket assembly from the vehicle.

- Remove the power line.
- Remove each connector.
- Remove the GND line.
- Remove the screws (MX000032(N000000001146): 3 screws), and then remove the SAM from the bracket.



Cautions to be taken when handling signal detection and actuation module related parts

To protect the functions of the signal detection and actuation module, DO NOT:

(a) Alter electrical routing by extending or cutting a power cable or connector to/from other parts than the connector used for body equipment or other similar methods.
(b) Alter the signal detection and actuation module control unit in any way.
(c) Remove or paint the cover of the signal detection and actuation module control unit.

Output terminals for additional wiring

Take out the power supply and signals through the mounting connectors. Refer to "8.4 Power supply" for details. ▷ 8.4

(a) Cautions when using output terminals for additional wiring

- Allowable current values are specified for the output terminals. Make sure that the rated current for any additional electric part to be used is lower than the specified allowable current.
- When any diagnostic function of the output terminals marked* is used, it is necessary to change data for the signal detection and actuation module. For details, ask the department responsible. ▷ 2.2
- When a signal output terminal is used to operate any body equipment-side apparatus, use it as the activating side for operation relay. The relay used must be the noise-absorbing element-incorporated type.
- The output voltage differs according to the vehicle. Refer to "Power supply voltage" ▷ 8.1.1.
- For necessary output lead-out connectors, see "8.4.3 Mounting location of optional terminal" ▷ 8.4.3.
- When trailer is connected with coupling device, it is necessary to change data for the signal detection and actuation module to activate diagnosis function for the lamps. For details, ask the department responsible. ▷ 2.2

(b) Precautions for body building and modifying electrical parts

SAM control unit will detect an error if an electrical part is added or replaced improperly. A warning lamp then goes on and remains on or the power is shut down, resulting in vehicle failure.

- If an electrical part is to be added or a lamp is to be replaced with an LED lamp, the current value of the electrical part should be ensured to fall within a specified range. This is, however, does not guarantee that the electrical part to be mounted will be fully operational when its current value falls within the specified range.
- For the specified current value, consult an authorized MITSUBISHI FUSO authorized Distributer or the department responsible ▷ 2.2.
- Body building or modification of any of the following electrical parts requires that the SAM control unit parameters be changed. Consult an authorized MITSUBISHI FUSO authorized Distributer. Some parts to be mounted may not be fully operational depending on their specifications or the vehicle specifications.

  Major body building and modification examples:
  - Mounting a heated mirror
  - Mounting fog lamps
  - Mounting the step lamp
  - Modifying the rear combination lamp [incorporating LED]
  - Adding a turn signal
  - Modifying the license plate lamp

8.1.3 Starter switch

- The starter switch uses weak current contacts. Do not add any wiring to the line connected to the starter switch.
- In case the use of a power source linked to the starter switch is unavoidable, be sure to connect to the appropriate output terminal for additional wiring provided on the signal detection and actuation module control unit via the connector for body equipment.
  Regarding the output terminals for additional wiring provided on the signal detection and actuation module control unit, see "8.1.2 Signal detection and actuation module-related parts" ▷ 8.1.2.

8.2 Electric wiring

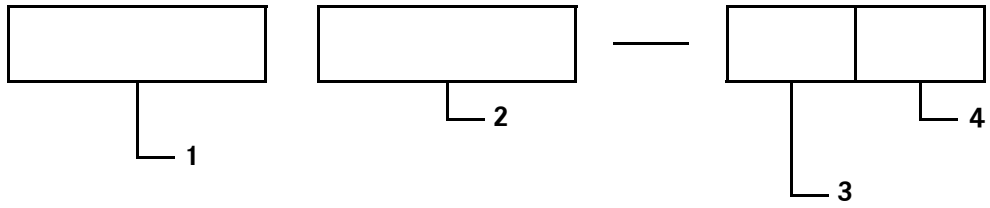
8.2.1 General precautions

The vehicle is delivered after electric wiring and fuses on the chassis side are checked with respect to load capacity, frequency of use, etc. to make sure of fire prevention and running safety. Do not alter the wiring unless it is absolutely necessary. Should it become unavoidable to extend or modify the wiring, be sure to follow the instructions given in "8.2 Electric Wiring".

8.2.2 Cable Identification

Cable size and cable color

Coding system



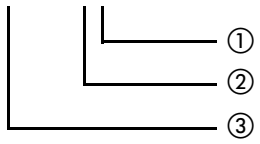
1 Type of cable
(this may not be omitted in case of AV line)
2 Cable size (nominal sectional area)
3 Cable color (base color)
4 Cable color (stripe color)

Alphabetical symbols of cable colors

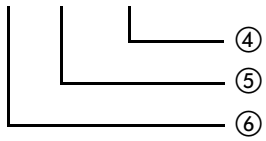
Symbol	Color	Symbol	Color
W	WHITE	L	BLUE
B	BLACK	Br	BROWN
R	RED	Lg	LIGHT GREEN
Y	YELLOW	O	ORANGE
G	GREEN		

Typical examples of cable identification codes

- 0.85 – GW



- AVX1.25 – L



① Stripe color: White
② Base color: Green
③ Cable size: 0.85 mm²
④ Base color: Blue (no stripe color)
⑤ Cable size: 1.25 mm²
⑥ Type of cable: AVX line

Select types of cables

Related standards
(JIS C 3406: Low voltage cables for automotive use)
(JASO D 608: Heat-resistive low voltage cables for automotive use)
(JASO D 609: Current capacity of low voltage cables for automotive use)

Type of cable

Select necessary types of cables from the list below.

Type of cable	Location of use
AV line Vinyl-insulated low voltage cable for automotive use	Used for ordinary wiring
AVX line Cross-linked vinyl heat-resistive low voltage cable for automotive use	Used for wiring in areas where ambient temperature is high, such as around motor generator and EV battery
AEX line Cross-linked polyethylene heat-resistive low voltage cable for automotive use	

Cable size

Select necessary cable sizes from the list below.

Nominal sectional area	Number of strands /Strand diameter (mm)	Allowable current (A)		
		AV line	AVX line	AEX line
0.5f	20/0.18	8	7	7
0.5	7/0.32	9	8	8
0.75f	30/0.18	10	9	9
0.85	11/0.32	11	10	10
1.25f	50/0.18	14	13	13
1.25	16/0.32	14	14	13
2	26/0.32	20	18	18
3	41/0.32	27	25	25
5	65/0.32	36	34	33
8	50/0.45	47	44	43

"f" suffixed to nominal sectional area stands for "flexible."

Use flexible cables in vibrating and crooked areas, such as at the cab to chassis and transmission.

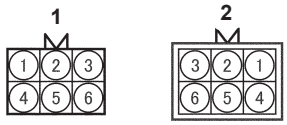
8.2.3 Connector code

Connector pin numbers

Numbering of terminals

Female terminals: Numbering started from upper left

Male terminal: Numbering started from upper right



N54.10-2338-00

1 Female connector
2 Male connector

8.2.4 Existing wiring and custom-built truck body on chassis side

- Make sure that wiring is not caught in by custom-built truck body.
- Make sure that wiring clear of sharp edges.
- When handling, do not pull wiring with excessive force.
- Remove harness connector by the connector body. Do not pull the harness.
- Make sure that wiring has a sufficient distance from heating parts.
- After installing custom-built truck body, make sure that associated wiring and parts can be inspected and serviced without hindrance.
- When a buzzer is provided for custom-built truck body, avoid shared use of chassis-side buzzer or use of a buzzer that is the same in tone as the chassis-side one.

8.2.5 Change and extension of wiring

Cables to be used

Use cables conforming to JIS C 3406 (low voltage cables for automotive use), JASO D 608 (heat-resistive low voltage cables for automotive use) or equivalent. As to vinyl tape, use products conforming to JIS C 2336 (vinyl adhesive tapes for electric insulation) or equivalent. See "Type of cable" in "8.2.2 Cable Identification" ▷ 8.2.2.

- When selecting a cable size, make sure that its allowable current conforms to the system rating. Especially in a system where a motor, etc. is used as a load, allow for the current in case the motor locks (restricted). See "Cable size" in "8.2.2 Cable Identification" ▷ 8.2.2.

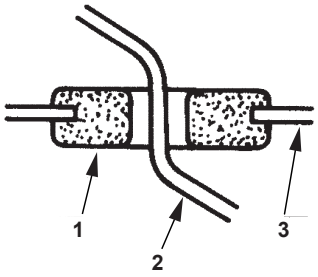
Wiring procedure

- When custom-built truck body-side wiring is extended, do not relocate existing cables and wires installed at the time of delivery from the manufacturer. If relocation is unavoidable, make sure that there is sufficient space from neighbouring parts and there is no interference with them.
- For wiring, install cables along rear body members, frame, etc. Do not stretch them in the air.
- Install cables clear of chassis and custom-built truck body rotary parts, vibrating parts and sharp edged parts. Firmly clamp cables.
  Secure the following clearances.

Unit: mm

Location	Minimum clearance
Between moving part and wiring	10
Between sharp edge and wiring	10

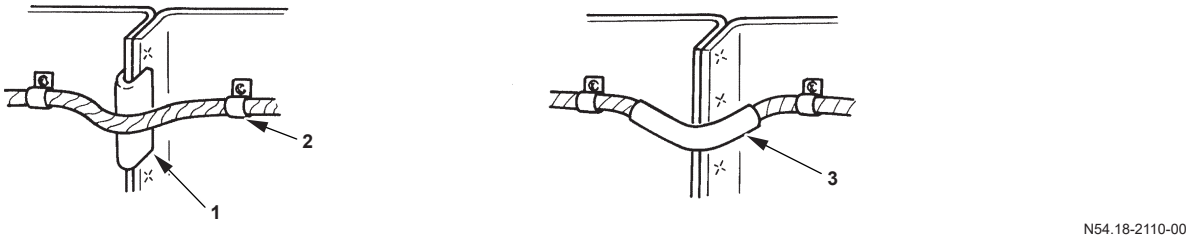
- Be sure to use a grommet in every cable through hole in the steel plate to prevent the cable from being damaged in the sheathing and short-circuited.



N54.18-2109-00

1 Grommet
2 Cable
3 Steel plate

- Use additional clips as required where the cable may contact the edges of metal parts to prevent damage to sheathing due to vibration-induced contact. Alternatively, cover the metal edges with a protector or wrap corrugate tube around the part of the cable that contacts the metal edges.



N54.18-2110-00

1 Protector
2 Fasten cable with clip
3 Corrugated tube

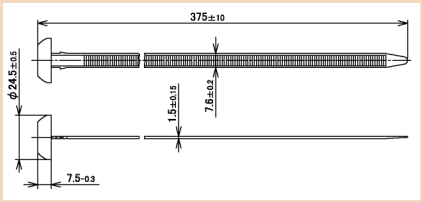
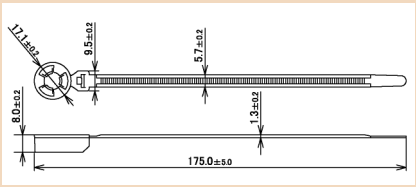
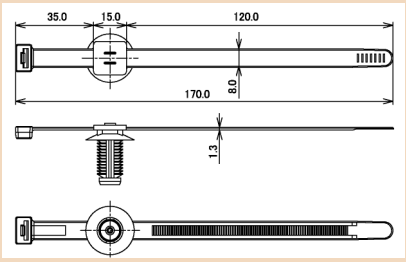
- If a harness exists nearby, tape the cable along to the harness. It is positively prohibitive to lay cables along the brake piping (including brake hose). Maintain clearances between cable and existing harness.

Unit: mm

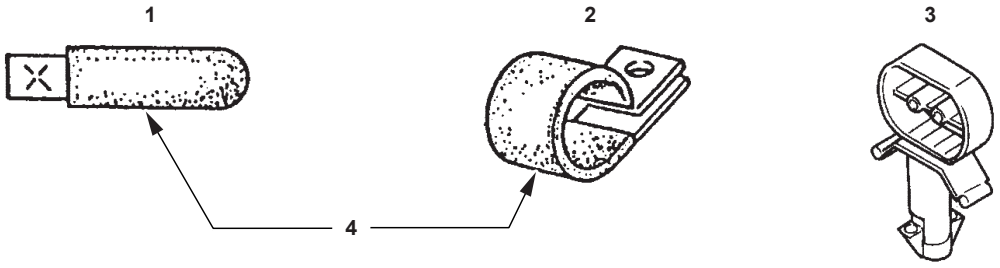
Wiring method	Minimum clearance
Parallel	10
Crossover	20

- For clearance between cable and chassies part, see "4.4 Clearance for the basic vehicle and bodies" ▷ 4.4.
- Install harnesses or battery cables where they will not be covered with accumulated dirt, snow, etc., iced nor damaged by flying stones. In an unavoidable case, provide a metal shield to protect the harness or cable.
- Do not connect cables with sheathing broken and wires drawn out.
- When equipment is wired, water may run down the cable into the equipment. Seal the through hole firmly with a grommet or the like and install the cable with its terminal upward.
- Route cables through places where they are not splashed with water or covered with dust.
- Do not install cables onto the top and outer sides of the frame. They may be damaged by feet put on the frame or stones flying to the frame during running.
- Install cables to motor generator and transmission-mounted parts routing along existing harnesses so that their relative movements can be absorbed. Also, give cables a proper amount of slack so that they do not contact with other parts.
- Relocation of batteries is prohibited.
- When cables are shortened, do not cut them short but bind excess length of cable to existing harness or the like bundled with vinyl type.
- Hold MWP water-proof connectors for rear combination lamp, license lamp, side turn lamp, etc. in place by fastening the connector body with hook type plastic clips (MH056347 to MH056350) or band clips.

- When cable bands are cut off for convenience of work, obtain necessary parts in accordance with the list below and restore the cable bands to their original state.

Part name	Part No.	Geometry	Remarks
BAND, CLIP	MK665242		Fixing tie: Hellermann Tyton, BHT375M or equivalent
BAND, CLIP	MK665243		Stud bolt tie: Hellermann Tyton, T50SOSSBD-M10-HSW or equivalent
BAND, CLIP	MK665244		Fir tree mounting tie: Hellermann Tyton, CM170-FT11J or equivalent

- For clipping, use coating tape, protective rubber or plastic clip. Limit sticking and clasping clips to auxiliary use.



N54.18-2111-00

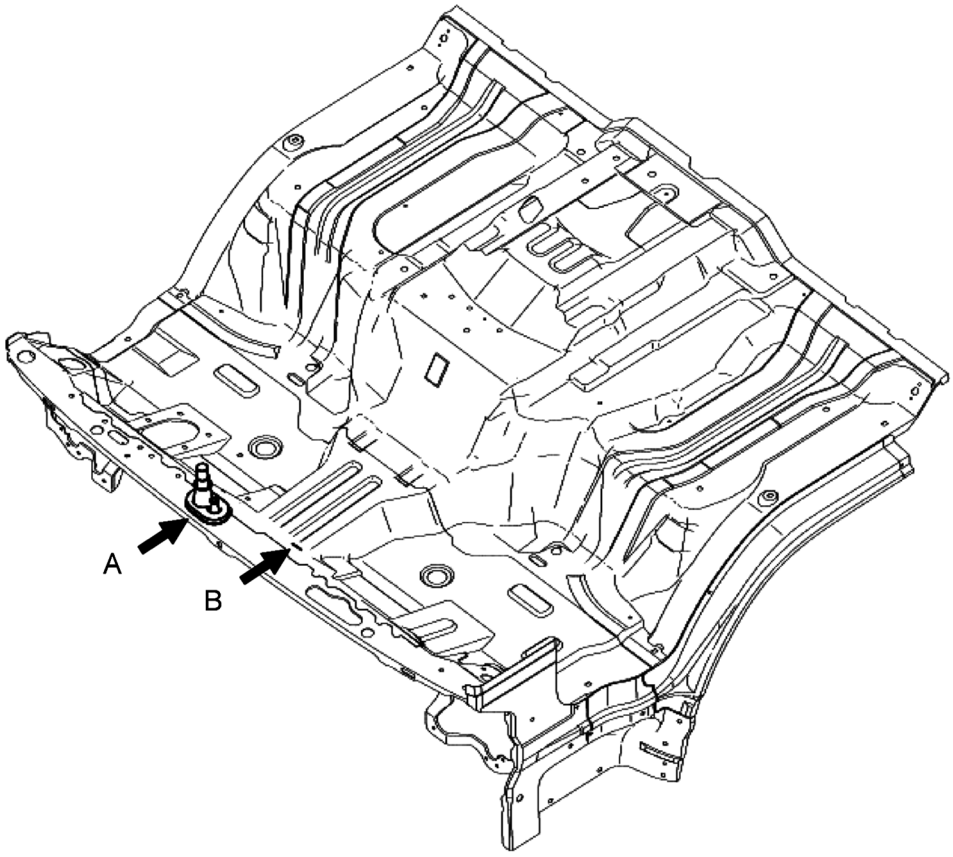
1 Flat clip
2 Roll clip
3 Plastic clip
4 Vinyl tube or vinyl coating

Given below are the standard limits of spacing for cable clamps.

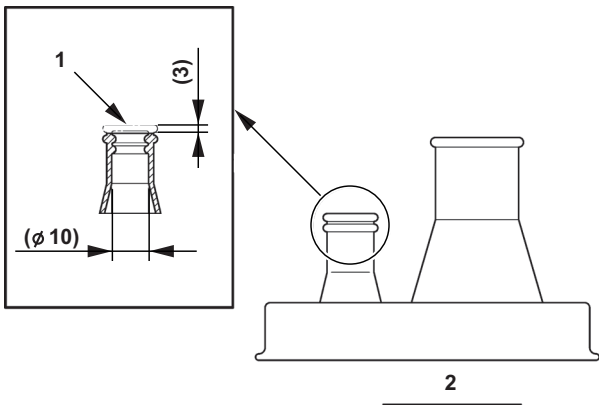
Unit: mm

Harness diameter	Limit of spacing
Up to 5	Up to 300
5 to 10	400
10 to 20	500

- When passing electrical wiring through the cab floor, use the grommets in the area A and B shown below.



Let harness pass through the grommet cut as shown below and then tape them.



N54.18-2114-00

1 Cut off
2 Grommet

Procedure for wire connection

- In the case of wire connection using plug and plug receptacle, use the plug receptacle on the power supply side, so that if the plug and plug receptacle should be separated, the disconnected wire is not short-circuited even if it touches the vehicle body.
- When cable is extended, the extension cable should be identical in sectional area and hue. Connect the cable ends firmly by soldering or using crimp type terminal and provide the joint with solid insulating covering. Be sure not to connect cables by twisting together. When soldering, do not use hydrochloric acid.
  Especially, when wires of chassis harnesses (all harnesses outside of the cab) are extended, properly protect joints against water and insulate them.

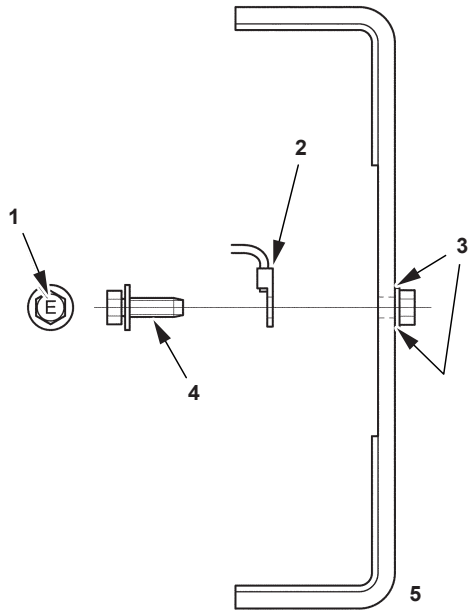
8.2.6 Grounding

Ground extended power cable to the circuit connecting to the minus (–) terminal of battery. In the case of grounding to the frame, establish the grounding point on unmasked or uncoated surface.

Use eyelet terminal for grounding.

Dedicated bolt for grounding is used for tightening ground terminal. In the case where dedicated grounding bolt is removed during custom-built truck body installation, do the following.

- If grounding point is not relocated
  Reinstall the removed dedicated grounding bolt by tightening to the specified torque.
- If grounding point is relocated
  Use designated dedicated grounding bolt shown below. Spot weld nut to the frame and tighten bolt to the specified torque. Provide the weld with touch-up coating.



N54.10-2339-00

1 Identification mark
2 Ground terminal
3 Weld nut MF434105
4 Dedicated grounding bolt
Part no.: MK416036 (M10x30 P1.25)
Part no.: MK560984 (M10x35 P1.25)
Tightening torque: 39 - 40 Nm
5 Chassis frame

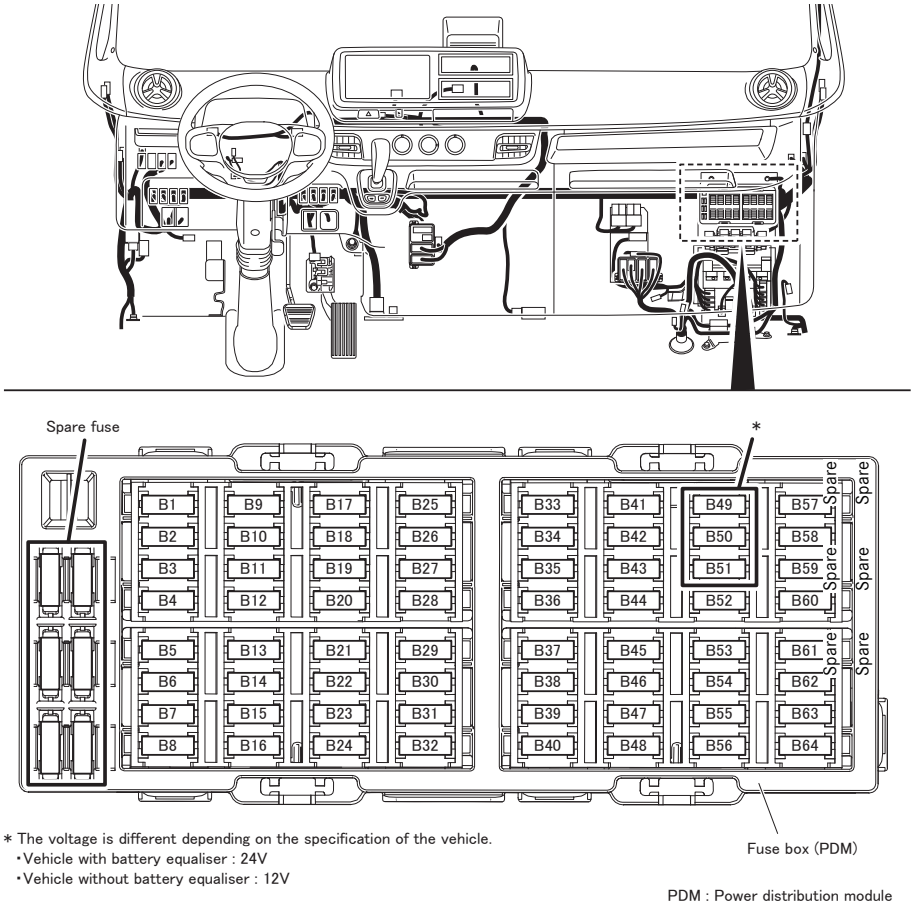
When wiring from the custom-built truck body side is earthed to the frame, do the same as described in [If grounding point is relocated] above.

8.2.7 Fuse

(a) Do not route power wiring from any fuse for unintended use. The existing fuse on the chassis side is of the optimum capacity for the service load, frequency of use, etc. When installing an additional electrical device associated with body equipment, do not connect parts or harnesses which may provide an error signal to the chassis power line or ground line.
Be sure to lead out power for body equipment-related apparatus and lamps via designated appropriate connectors. For further details, see "8.4.3 Mounting location of optional terminal" ▷ 8.4.3.
When removing and reinstalling them, do so securely one by one. For other precautions on the signal detection and actuation module, see "8.1.2 Signal detection and actuation module-related parts" (▷ 8.1.2).

(b) Mid-point extension of existing wiring or the use of a larger capacity fuse could cause an excessive current to flow in the power fuse box, resulting in a fire.
The power supply voltage may differ depending upon the fuse. Verify the power supply voltage by referring to "Power supply voltage" ▷ 8.1.1.

(c) Arrangement of power fuses, relay in the instrument panel, sensors and ECU



* The voltage is different depending on the specification of the vehicle.
・Vehicle with battery equaliser : 24V
・Vehicle without battery equaliser : 12V

PDM : Power distribution module

Note: Drawings for LHD vehicles should be considered as symmetrical position to those for RHD vehicle to obtain.data for RHD vehicles.

Fuse No.	Main load	Capacity
B1	ESP sensor, Hydraulic unit ＜ABS＞, ESP / ASR cutoff switch, Steering angle sensor	10A
B2	Airbag ECU	10A
B3	Hill start assist ECU, Hill start assist system cutoff switch, Mirror heater switch FUSO easy access system ECU, VRDU2, EPB ECU	10A
B4	Air-conditioner ECU and control panel, Blower motor relay, Fresh/recirculation changeover motor	10A
B5	VCU main relay, Fuse box (PDM) B33～B36	30A
B6	Air-conditioner ECU and control panel, Cab lamp	15A
B7	FMS connector	20A
B8	FUSO easy access system ECU, Tachograph	10A
B9	–	–
B10	Steering wheel heater switch, Seat heater switch, Window defogger switch, ICUC (Meter cluster), Tachograph, Optional connector, FMS connector, FMS, Telematics, IGN relay (12V/24V), Battery equaliser, Headlamp leveling switch, Headlamp leveling actuator	15A
B11	–	–
B12	PTC heater cut switch, AVAS ECU, Vacuum pump relay 1, Vacuum pump relay 2, VCU, EHPS (Electric power steering oil pump, motor, ECU)	10A
B13	–	–
B14	ASAM	20A
B15	–	–
B16	Steering wheel heater	20A
B17	–	–
B18	–	–
B19	–	–
B20	–	–
B21	–	–
B22	–	–
B23	Horn relay, Electric horn	10A
B24	Condenser fan main relay, VCU	10A
B25	Cigarette lighter, USB power socket	20A
B26	Back eye monitor, FUSO easy access system ECU, ACC relay (12V/24V), Radio	10A
B27	–	–
B28	–	–
B29	–	–
B30	–	–
B31	–	–
B32	–	–
B33	VCU	20A
B34	Chiller S/OFF valve relay, Chiller (Evaporator), Electric parking lock (EPL) relay A/C S/OFF valve relay, Air-conditioner S/O valve, 3/2-WAY valve relay (HVB), 3/2 WAY valve (HVB), Shift lever unit	15A
B35	Water pump (HVB)	20A
B36	Water pump (HVAC)	20A
B37	–	–
B38	IGN relay (12V), Fuse box (PDM) B1～B4, B10, B12	30A
B39	ICUC (Meter cluster), MSF-SIU	10A
B40	CGW(CAN), Telematics, Back eye monitor, Steering wheel switch	10A

Fuse No.	Main load	Capacity
B41	–	–
B42	–	–
B43	–	–
B44	–	–
B45	–	–
B46	–	–
B47	–	–
B48	Mirror heater	20A
B49 *	Optional connector, XMC, FMS connector	10A
B50 *	Optional connector	10A
B51 *	Optional connector, High voltage battery cutoff connector	10A
B52	–	–
B53	–	–
B54	ACC relay (12V), Fuse box (PDM) B25, B26	30A
B55	Blower motor	30A
B56	Power window switch, Dr	30A
B57	–	–
B58	–	–
B59	–	–
B60	–	–
B61	–	–
B62	Hill start assist ECU, VRDU2, Radio, Lateral milli wave radar unit (SRR), Milli wave radar unit (RDF), Lane recognition camera (MPC)	15A
B63	Diagnosis connector	10A
B64	Power window switch, As	30A

* The voltage is different depending on the specification of the vehicle.
- Vehicle with battery equaliser : 24V
- Vehicle without battery equaliser : 12V

*: The power supply voltage differs depending upon the vehicle power supply specifications. Refer to "Power supply voltage" ▷ 8.1.1.

- Removal of spare fuse
  To remove the spare fuse, insert a fuse puller from outside the wall holding the spare fuse.

Do not insert the puller from inside the wall, as doing so could damage the apparatus and cause erroneous operation or a fire.

N54.15-2222-00

1 Fuse puller
2 Fuse
3 Wall

8.3 Handling of electric/electronic equipment

8.3.1 Handling of electronic parts

In the electronic control systems-equipped vehicle, multi-way connectors suited for weak current of such electronic parts and circuits as sensors, control units and actuators are used. When handling these connectors, use particular care in the following respects.

- Do not disjoin and rejoin connectors unless necessary. Connector pins could be deformed or damaged, resulting in poor contact.
- Disjoin connectors holding their housings. Pulling by cable or by force may deform connector pins.
- When disjoining connectors, do not let water, oil or dust adhere to their pin, or poor contact or unsteady continuity could result.
- Join connectors firmly after completion of work. When a harness is removed for servicing, restore it firmly to the original place after work.
- Use of electronic equipment, such as relays, solenoid valves and motors, for installation on the vehicle body is limited to those incorporating diode or varister noise absorbing elements.

8.3.2 Handling of battery

To prevent damage or fire of battery-related parts, observe the following precautions when handling the battery.

- When performing a quick charge of the battery, be sure first to disconnect the battery cables from (+) and (–) terminals.

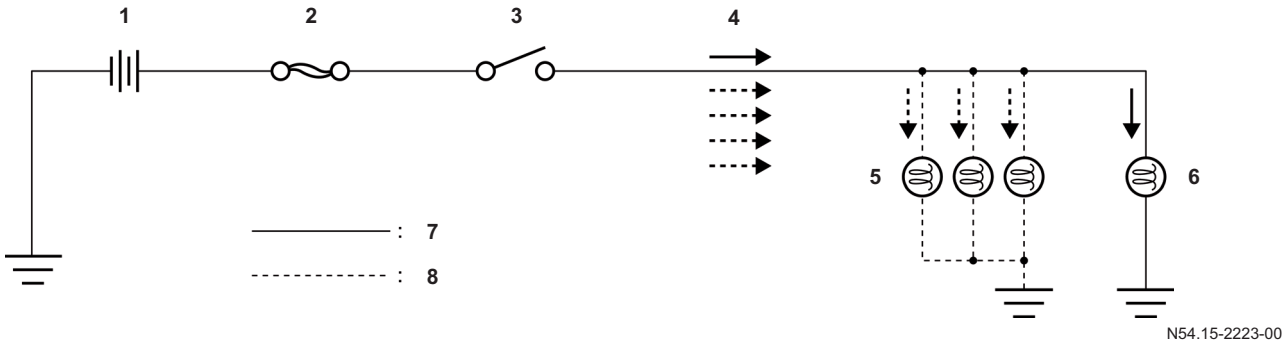
8.4 Power supply

8.4.1 Taking power from the existing wiring

(a) Source the power for the lamps and devices of the built body from the specified connector. If an electrical device related to the built body is to be added, do not install a part or route a harness that can give a false signal to the power line and ground line of the electrical devices on the vehicle side.

Adding a wire to a midway point of the existing wire or increasing capacity by changing the fuse causes an excessive current to flow through the power supply and fuse box, leading to a fire. Never change or add electrical wires except for those contained in this manual. Increase the number of lamps according to the table given below (load, power source, etc.).

(b) Typical faulty wiring



1 Battery
2 High-current fuse
3 Switch
4 The amount of current is increased by the additional lamps, which applies load on the switch, fuse, and wires, resulting in a fire.
5 Additional lamps
6 Existing lamp
7 Existing wire
8 Additional wires

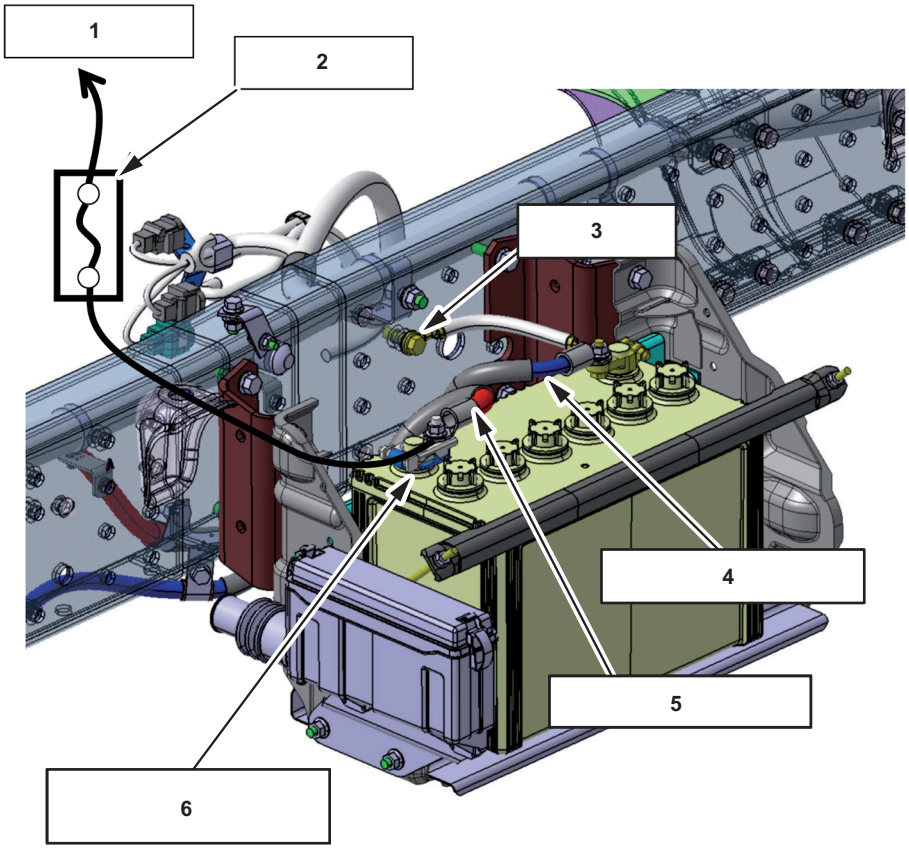
8.4.2 Taking power via the onboard battery terminal

Take power by way of the onboard battery terminal only when doing that is absolutely necessary to achieve body building. If it is done unavoidably, observe the following precautions.

(a) Add a fuse of a correct type to any additional wire to thereby protect the circuit.
(b) Use a wire of 5.0 mm^2 or more for the additional wire ("between battery terminal and fuse" of the next figure (▷ 8.4.2). Set the wire as short as possible and make sure that its jacket is not damaged to result in a short.
(c) For the combination of the capacity of the additional fuse and the wire size between the fuse and the additional load, study those marked with ○ in "List of recommended combinations of fuse capacity and wire size" (▷ 8.4.2).
(d) Install the additional fuse in a waterproof cover (e.g. electric cover) or take an equivalent waterproofing measure for the additional fuse. Do not add wires or fuses to the existing high-current fuse box.
(e) Use of a directly connected power supply causes the onboard battery to tend to run down quickly. Make sure that the customer understands and observes the following handling precautions:
- Do not use the onboard battery as a service power supply (for the clock, memory, etc.).

Between battery terminal and fuse

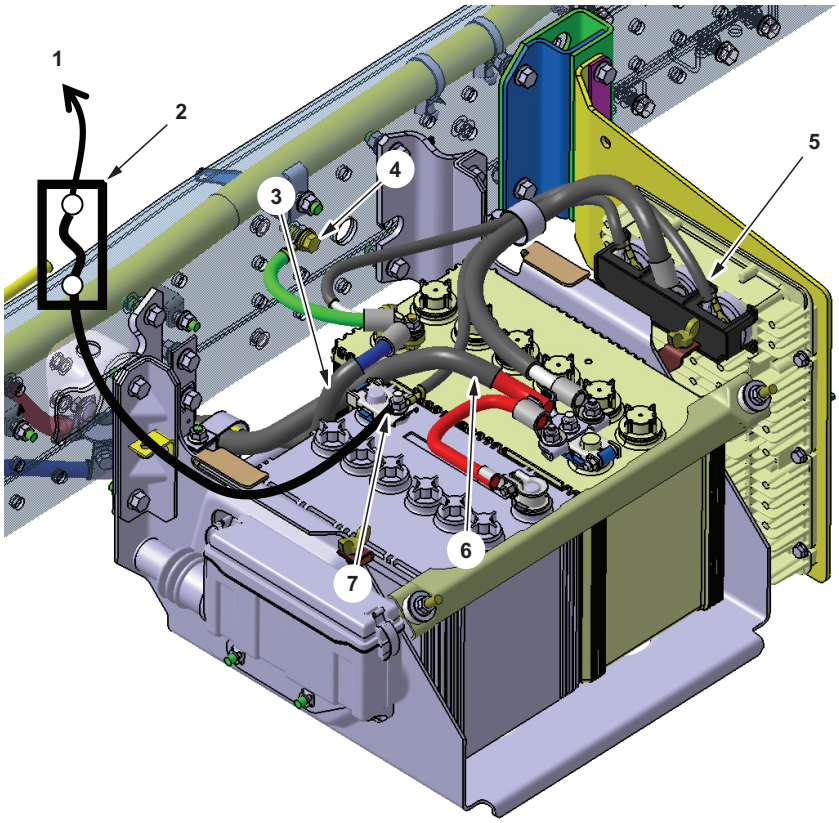
12 V



N54.15-2225-00

1 *Addition on the built body*
2 *Additional fuse etc.*
3 *Ground point*
4 *Battery cable (-)*
5 *Battery cable (+)*
6 *Terminal for taking power on built body side, M8 screw*

24 V



N54.15-2224-00

1 *Addition on the built body*
2 *Additional fuse etc.*
3 *Battery cable (–)*
4 *Ground point*
5 *Battery equalizer*
6 *Battery cable (+)*
7 *Terminal for taking power on built body side, M8 screw*

(f) Use a round flat terminal for the power supply terminal and jointly fasten it by using the fixing nut for attaching the battery cable terminal.
Only one power supply terminal may be used.
Two or more additional terminals can be loosened, resulting in heat being generated or a short.

List of recommended combinations of fuse capacity and wire size

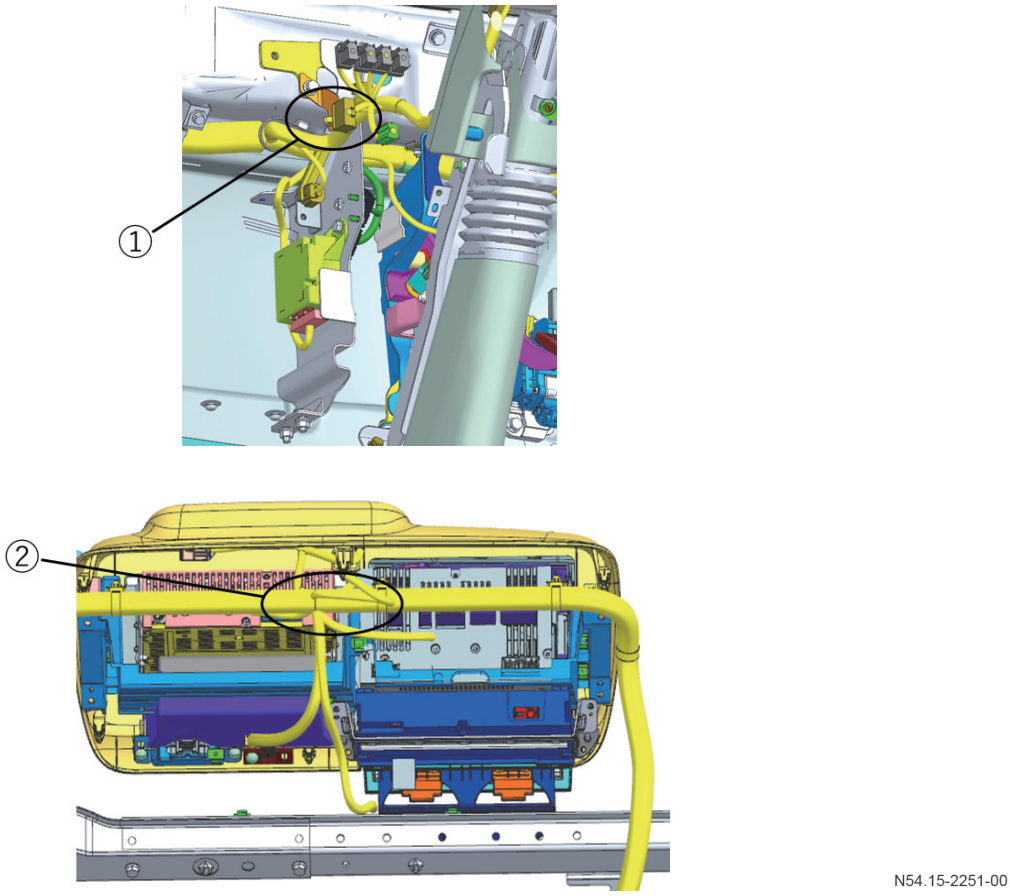
○ : Usable × : Not usable

Fuse		Wire size (mm^2) [upper] and wire permissible current (A) [lower]							
Type	Specifications	0.3	0.5	0.85	1.25	2.0	3.0	5.0	(mm^2)
		11	14	18	23	31	42	57	(A)
Blade and glass tube	5 A	○	○	○	○	○	○	○	
	7.5 A	○	○	○	○	○	○	○	
	10 A	×	○	○	○	○	○	○	
	15 A	×	×	○	○	○	○	○	

Note: Keep the continuous permissible current within 70 % of the fuse specifications value.
(E.g.) If the fuse used is 10 A:
10 × 0.7 = 7 (A)
→ A load of up to 7 A can be used.

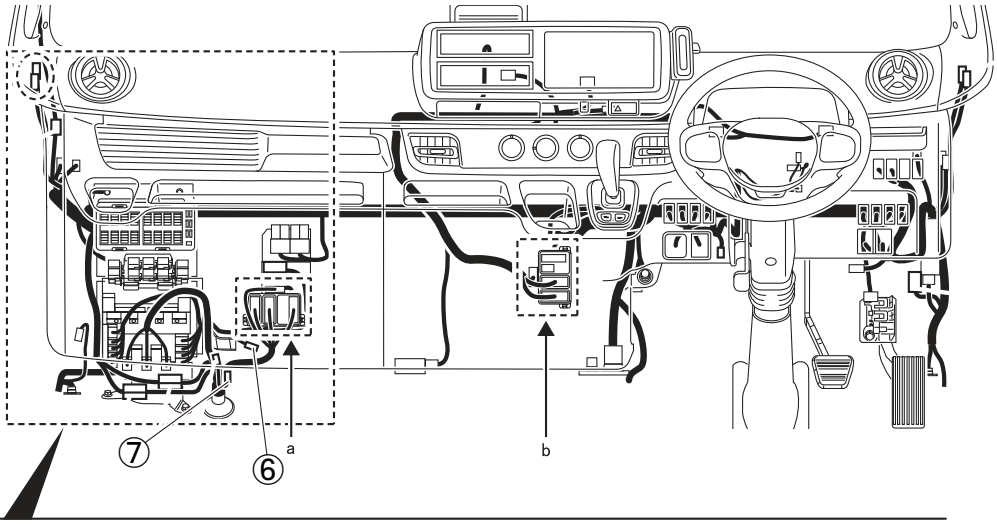
8.4.3 Mounting location of optional terminal

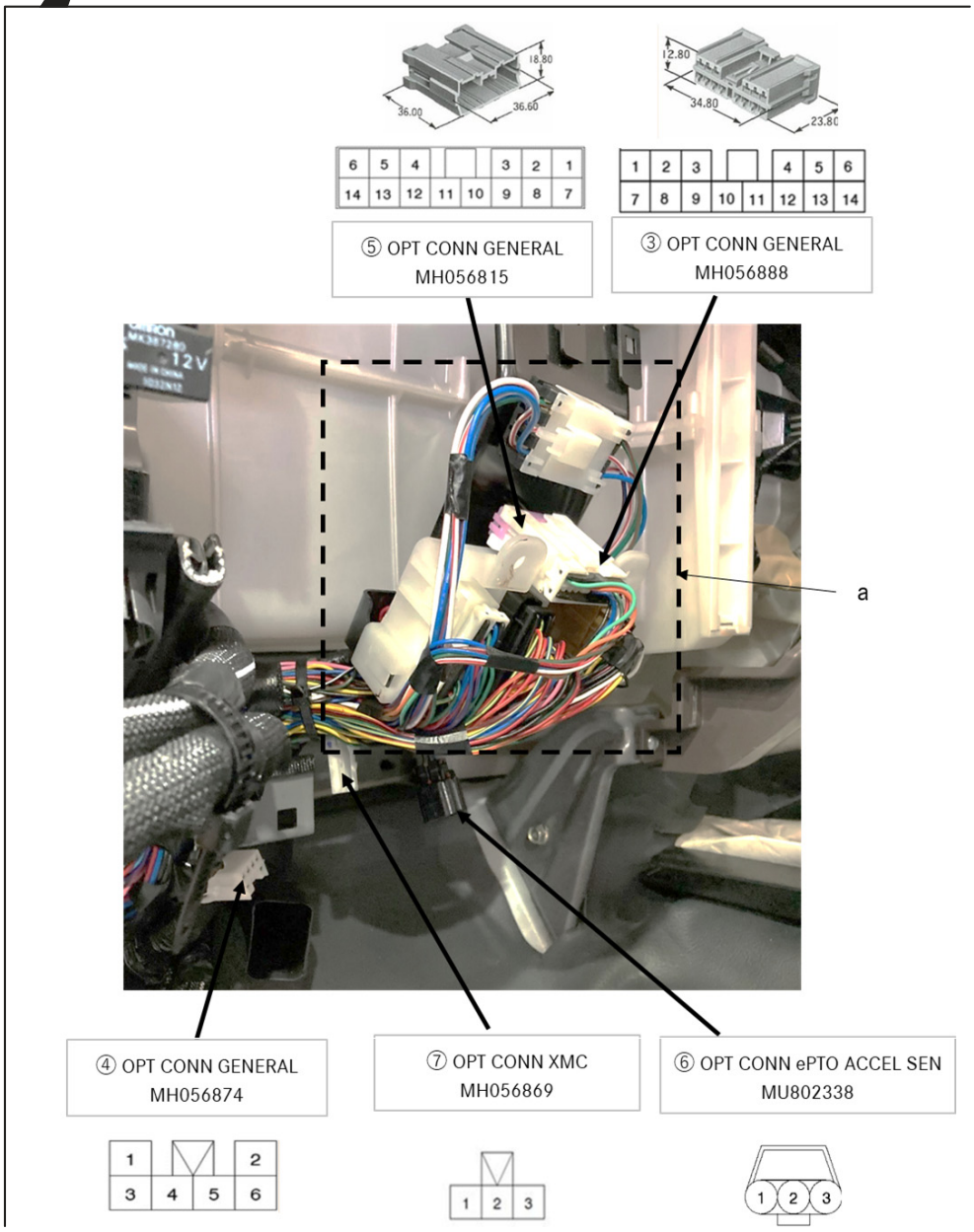
- Inside Cab



N54.15-2251-00

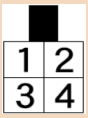
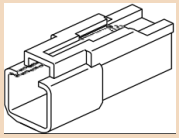
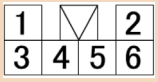
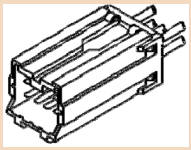
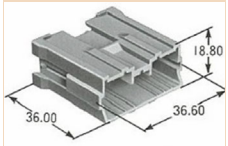
- Inside Cab



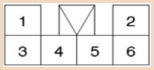
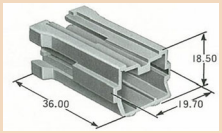
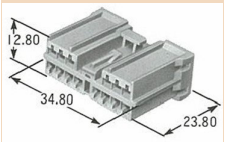
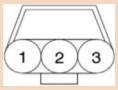
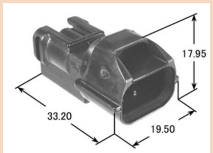
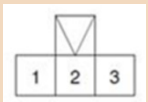
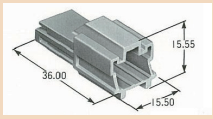


⑤ is already connected to ③

D

No.	Part Name	Connector No.	Circuit Description						Mating Connector
			No.	Circuit	Line colour	Load			
						With-out XMC/ FMS	With XMC	With FMS	
①	ETC connector	MH058658 	01	ACC (12V)	R-G		1A		MH058487 
			02	ILL (12V)	O		0.1A		
			03	GND	B				
			04	BATT (12V)	R-G		1A		
②	Option connector (tachograph and navigation)	MH056874 	01	MAIN (12V)	P		-		MH056807 
			02	STOP LAMP (12V)	G		-		
			03						
			04	REVERSE SIG (12V)	R		-		
			05	SPEED SIG (25P)	Lg		-		
			06	SPEED SIG (8P)	O-L		-		
③	Option connector (general mounting circuits) *1	MH056888 	01	ACC (12/24V)	W-R	7A	7A	7A	MH056815 
			02	BATT (12/24V)	G-R	7A	6A*3	2A*4	
			03	MAIN (12/24V)	L-R	7A	7A	7A	
			04	ILL (12/24V)	O	7A	6A*3	2A*4	
			05	NEUTRAL SIG(12/24V)	R-G	7A	6A*3	2A*4	
			06	PARKING ON SIG(12/24V)	Lg	7A	6A*3	2A*4	
			07						
			08	HORN (SW to GND)	B				
			09						
			10	DC-DC CONVERTER (12V)	L				
			11						
			12						
			13						
			14						

D

No.	Part Name	Connector No.	Circuit Description						Mating Connector
			No.	Circuit	Line colour	Load			
						Without XMC/FMS	With XMC	With FMS	
④	Option connector (To chassis connector ③)	MH056874 	01 02 03 04 05 06	BODYBUILDER USE BODYBUILDER USE BODYBUILDER USE BODYBUILDER USE BODYBUILDER USE BODYBUILDER USE	R O Y G L W				MH056807 
⑤	Option connector (general mounting circuits) *1	MH056815 	01 02 03 04 05 06 07 08 09 10 11 12 13 14	ACC (12/24V) BATT (12/24V) MAIN (12/24V) ILL (12/24V) NEUTRAL SIG(12/24V) PARKING ON SIG(12/24V) HORN (SW to GND) DC-DC CONVERTER (12V)	W-R G-R L-R O R-G Lg B L	7A 7A 7A 7A 7A 7A	7A 6A*3 7A 6A*3 6A*3 6A*3	7A 2A*4 7A 2A*4 2A*4 2A*4	MH056888 
⑥	Option connector (ePTO ACCEL SEN)	MU802338 	01 02 03	V SIG GND	L G-R B-W				MU802337 
⑦	Option connector (XMC)	MH056869 	01 02 03	CAN L CAN H	W B				MH056802 

-: The connector marked with - is used for signal cabling only, not used to connect the loads.

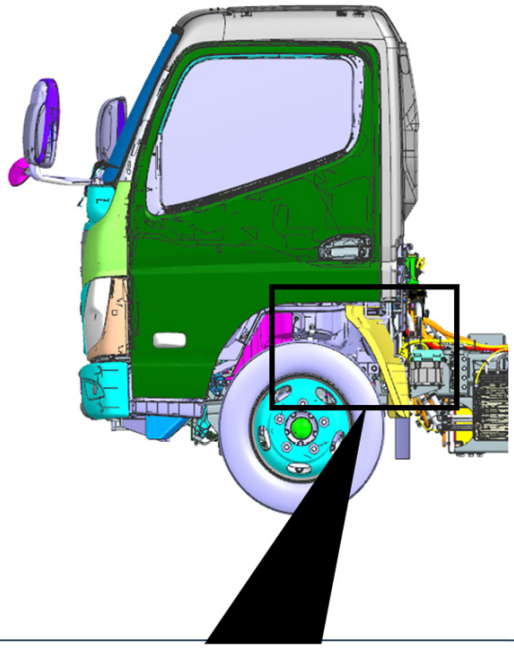
*1: Loads to be connected to the connector marked with *1 should be arranged so that the total value of the connector output in each of the cab and chassis side shall not exceed the permissible current.

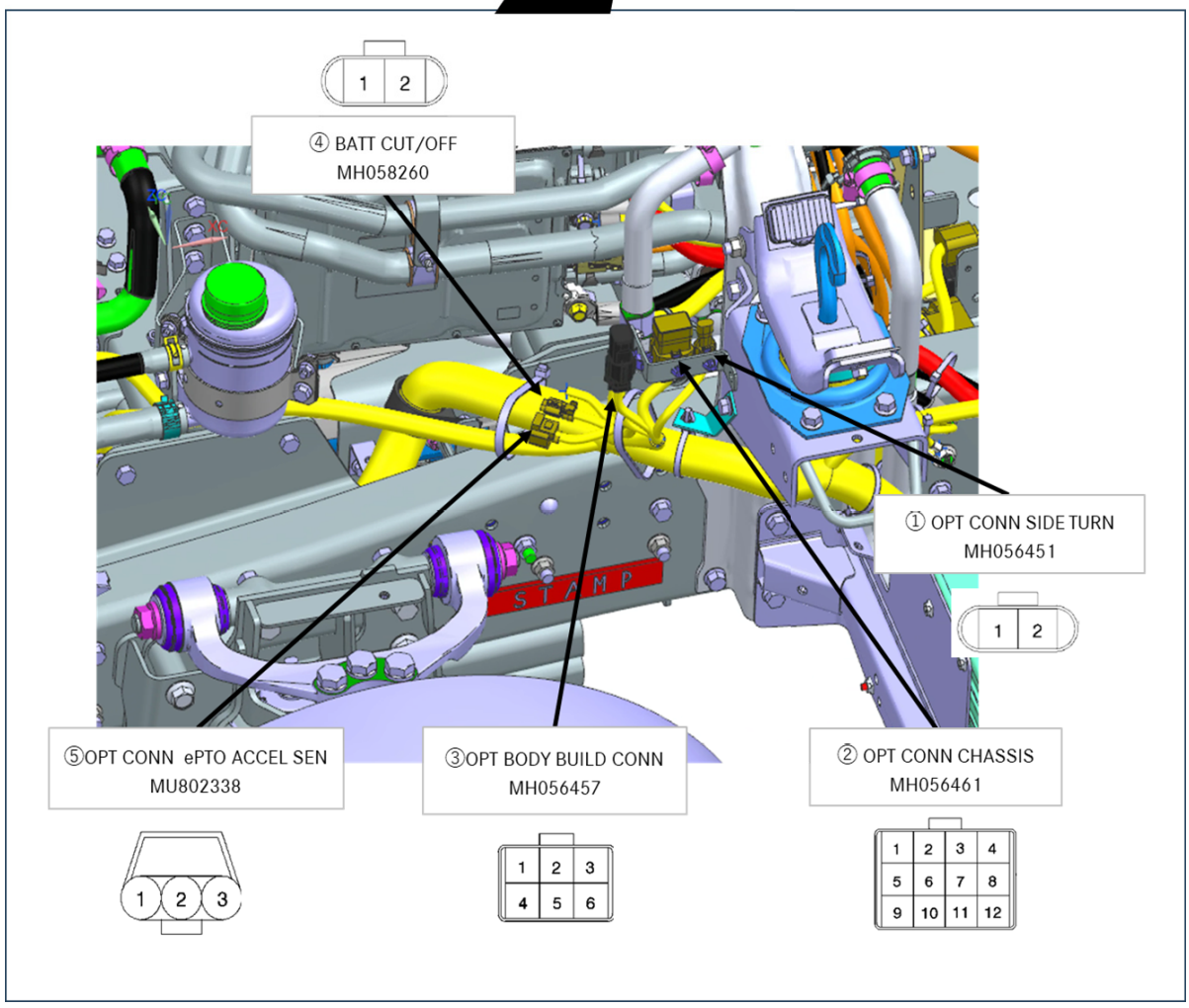
*2: Voltage of (12/24V) is depend on vehicle voltage system.

*3: 02, 04, 05, 06 terminals total up to 6A

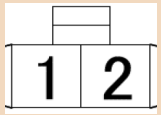
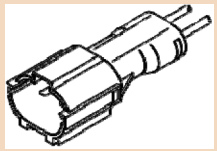
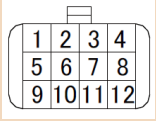
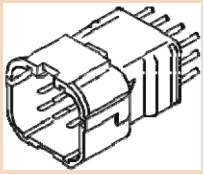
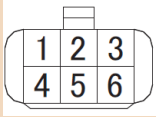
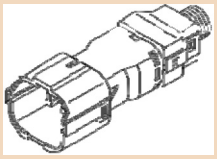
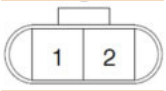
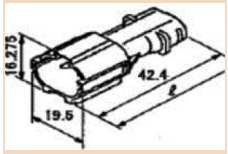
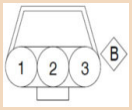
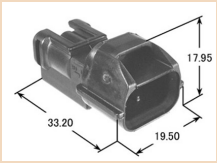
*4: 02, 04, 05, 06 terminals total up to 2A

- Outside Cab




1 2
④ BATT CUT/OFF
MH058260
① OPT CONN SIDE TURN
MH056451
1 2
⑤OPT CONN ePTO ACCEL SEN
MU802338
③OPT BODY BUILD CONN
MH056457
② OPT CONN CHASSIS
MH056461
1 2 3
1 2 3
4 5 6
1 2 3 4
5 6 7 8
9 10 11 12

D

No.	Part Name	Connector No.	Circuit Description				Load			Mating Connector
			No.	Circuit	Line color	Load	With-out XMC/ FMS	With XMC	With FMS	
①	Option connector (side turn)	MH056451 	01 02	TURN LH (12V) TURN RH (12V)	Gr-Y Gr-B	*1 *1				MH056401 
②	Option connector (chassis) *2	MH056461 	01 02 03 04 05 06 07 08 09 10 11 12	ACC (12/24V) BATT (12/24V) MAIN (12/24V) ILL (12/24V) NEUTRAL SIG (12/24V) PARKING ON SIG (12/24V) PTO ACTIVE (GND signal) HORN (SW to GND) DC-DC CONVERTER (12V) GND	W-R G-R L-R O R-G Lg L B L B		7A 7A 7A 7A 7A 7A	7A 6A*4 7A 6A*4 6A*4 6A*4	7A 2A*5 7A 2A*5 2A*5 2A*5	MH050093 
③	Option connector (From Cab connector ④)	MH056457 	01 02 03 04 05 06	BODYBUILDER USE BODYBUILDER USE BODYBUILDER USE BODYBUILDER USE BODYBUILDER USE BODYBUILDER USE	R O Y G L W					MH058407 
④	Option connector (BATT CUT/OFF)	MH058260 	01 02	IGN (12/24V) GND	B-Y L-R					MH050085 
⑤	Option connector (ePTO ACCEL SEN)	MU802338 	01 02 03	V SIG GND	L G-R B-W					MU802337 

-: The connector marked with - is used for signal cabling only, not used to connect the loads.

*1: In a vehicle with a connector marked with *1, one lamp as shown in the following can be additionally mounted for one side of the vehicle at manufacturer's option: voltage:12 V, lamp type: 21 W.

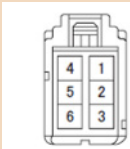
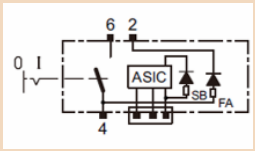
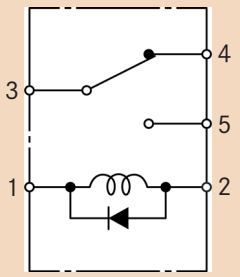
*2: Loads to be connected to the connector marked with *2 should be arranged so that the total value of the connector output in each of the cab and chassis side shall not exceed the permissible current.

*3 : Voltage of (12/24V) is depend on vehicle voltage system.

*4 : 02, 04, 05, 06 terminals total up to 6A

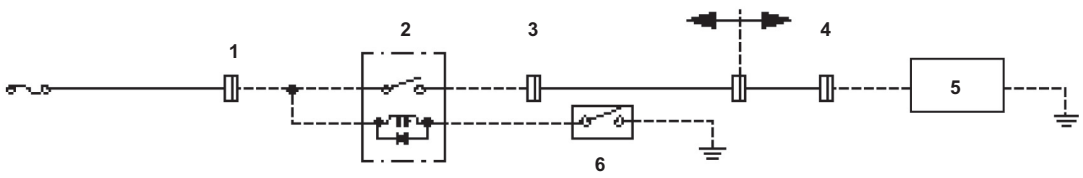
*5 : 02, 04, 05, 06 terminals total up to 2A

8.4.4 Installation of switches and relays for equipment

Part Name	Mitsubishi Part No.	Allowable Current	Connector (Harness side)	Circuit
Rocker switch	MX929999 (A0195450707)	5.0 A or less	 TYCO-AMP MCP 2.8 MX937840 (A0135456026)	
Relay	MK420479 24 V type	Between ③ & ⑤ (normally open side): 10 A max Between ③ & ④ (normally closed side): 5 A max	 Connector type EQ5A (MH059820)	 1: Power supply side 2: Ground side
	MK420480 12 V type	Between ③ & ⑤ (normally open side): 20 A max Between ③ & ④ (normally closed side): 10 A maxs		

Notes:

1. If the total load current to the equipment connected to the switch for equipment exceeds 5.0 A, a relay must be added to prevent the flow of any load current exceeding 5.0 A through the switch.
   Night lighting and ON lighting are available for the switch for equipment. Use them as required.
2. For the vehicle voltage, refer to "Power supply voltage" ▷ 8.1.2.
   There are two relays: One intended exclusively for 24 V and the other exclusively for 12 V.
   The allowable current for the output line for equipment is specified separately from that for the relay above.
   Select the connected load that will not exceed either allowable current.
3. Typical example of use



N54.15-2229-00

1 Lead-out point provided on vehicle
2 Genuine relay (20 A or less)
3 Cab harness
4 Chassis harness
5 Load
6 Genuine switch (3 A or less)
--- Additional wiring

8.4.5 Electrical power for rear body

D

The approximate amperages available when the vehicle operating is as shown below.

Note that these are the rough values and may vary depending on the environment conditions, vehicle model, condition of vehicle, etc.

Unit: A

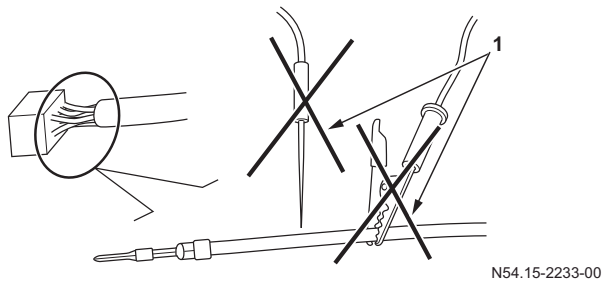
Alternator type	Available amperage
All type	< 5 (@1 hr)
	< 300 (@30 s)

8.5 Electric circuit continuity check

Property damage

Needling check is prohibitive.

Damage to cable insulation by test bar or electric circuit check lamp needle can result in premature corrosion of chassis harness.



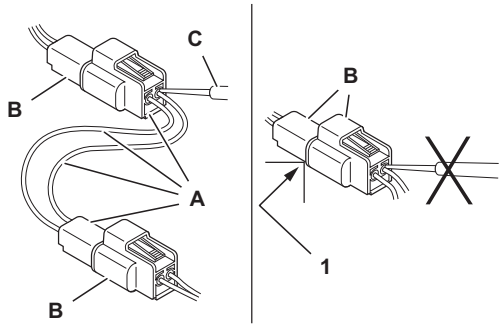
1 Sticking of test bar or electric circuit check lamp needle into cable insulation is prohibitive.

8.5.1 Check procedures

Continuity check with mating connectors joined (with continuity established in circuit)

Waterproof connector

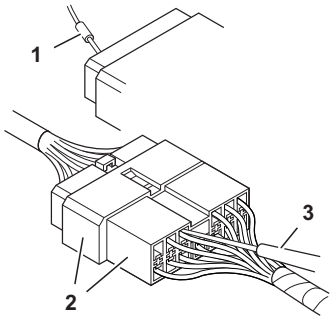
- Connect check harness A between joined circuit connectors B.
- Perform the check with the test bar applied to the check harness A connector
- Do not put in the test bar from connector B-side harness. The connector would lose waterproofing performance to result in harness corrosion.



1 Connect A between B here.

Non-waterproof connector

- Insert the test bar from the harness side.
- If joined connectors are so small that test bar cannot be inserted, such as control unit connectors, do not push in the test bar by force but use a superfine pointed test bar.

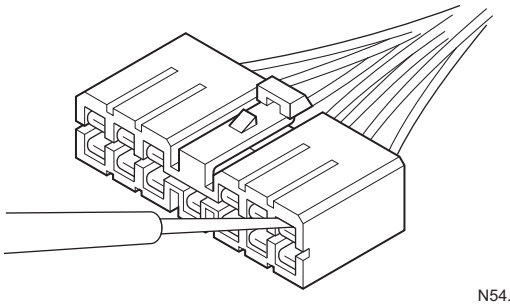


1 Test bar
2 Connector
3 Test bar

Continuity check with connectors disjoined

Check with female connector pins

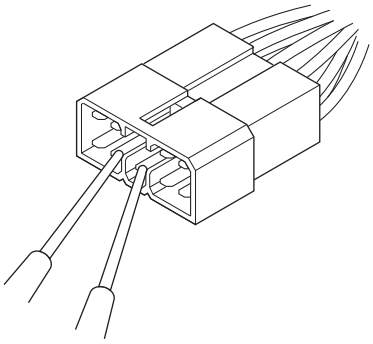
- Perform the check with the test bar inserted in the pins.
- Forced bar insertion could result in poor contact.



N54.15-2236-00

Check with male connector pins

- Perform the check applying the test bar directly to connector pins.
- Take care that the test bar does not short-circuit between connector pins. In the case of electronic control units, short-circuiting could break down their internal circuit.

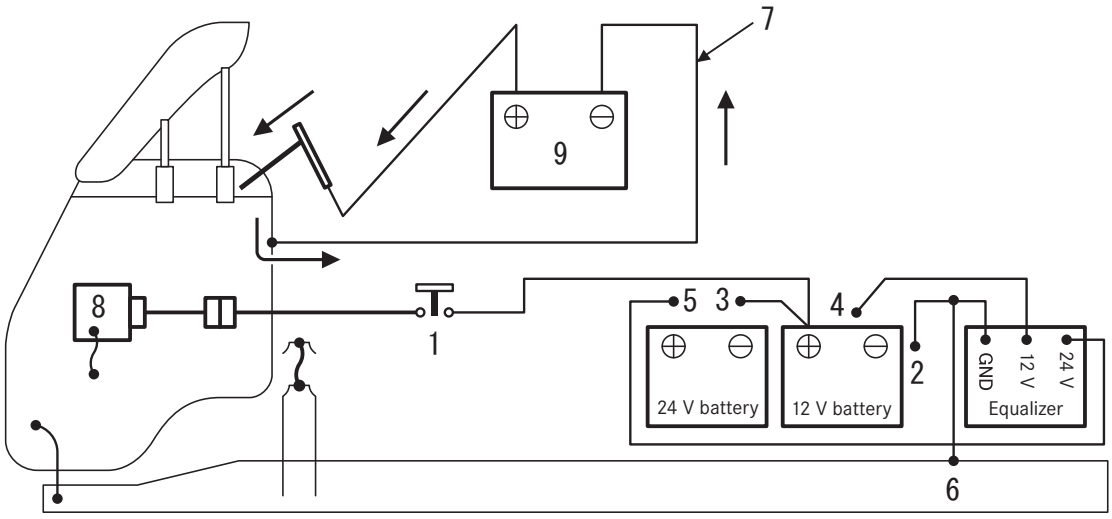


N54.15-2237-00

8.6 Precautions for electric welding

When a worker carries out arc welding, the electrical harness of the vehicle and also the electronic devices sometimes become damaged. To prevent this, observe the following precautions.

- Preparations for arc welding
  On the vehicle are mounted electronic devices and an electronic control unit (ECU) which are connected directly to the battery. If you carry out arc welding with these devices connected, current from the welding machine may flow in the reverse direction through the ground circuit and damage the devices.
  If you do not observe the precautions for welding, welding current will flow through the following circuit: ▷ 8.6
  Before carrying out welding, carry out the following work.
  (a) Turn OFF the starter switch
  (b) Disconnect the battery cables from negative terminals of the batteries, and cover the ends of the cables.
  Disconnect the harness connectors connected to the 12 V and 24 V terminals of the battery equalizer from the positive terminals of the batteries, and cover the ends of the cables.
  (c) Wait for at least one minute. (because SRS airbags are installed)
  (d) Be sure to ground the welding machine at a point near the welding area.
  - When welding to the cabin
    Ground the cabin using a nearby plated bolt or a metallic part of the cabin.
    When grounding the cabin itself, remove the paint from the grounding point.
  - When welding to the frame
    Ground the frame using a nearby plated bolt or the frame.
    When grounding the frame itself, remove the paint from the grounding point.
    Do not obtain an ground using a chassis spring because this may result in damage to the spring.



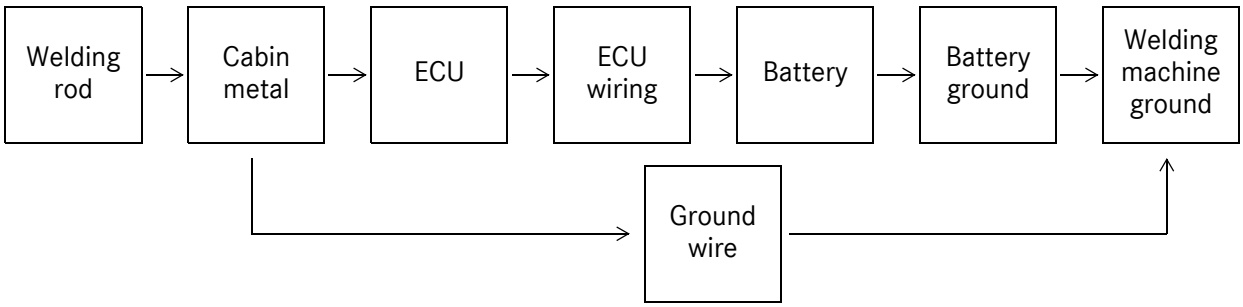
N54.10-2340-00

1 *Turn OFF the starter switch.*
2 *Disconnect the cable from the negative terminal of the 12 V battery, and cover the end of the cable.*
3 *Disconnect this cable from the negative terminal of the 24 V battery, and cover the end of the cable.*
4 *Disconnect the cable from the positive terminal of the 12 V battery, and cover the end of the cable.*
5 *Disconnect the cable from the positive terminal of the 24 V battery, and cover the end of the cable.*
6 *Frame*
7 *Ground the welding machine at a point near the wel-ding area.*
8 *ECU*
9 *Welding machine*

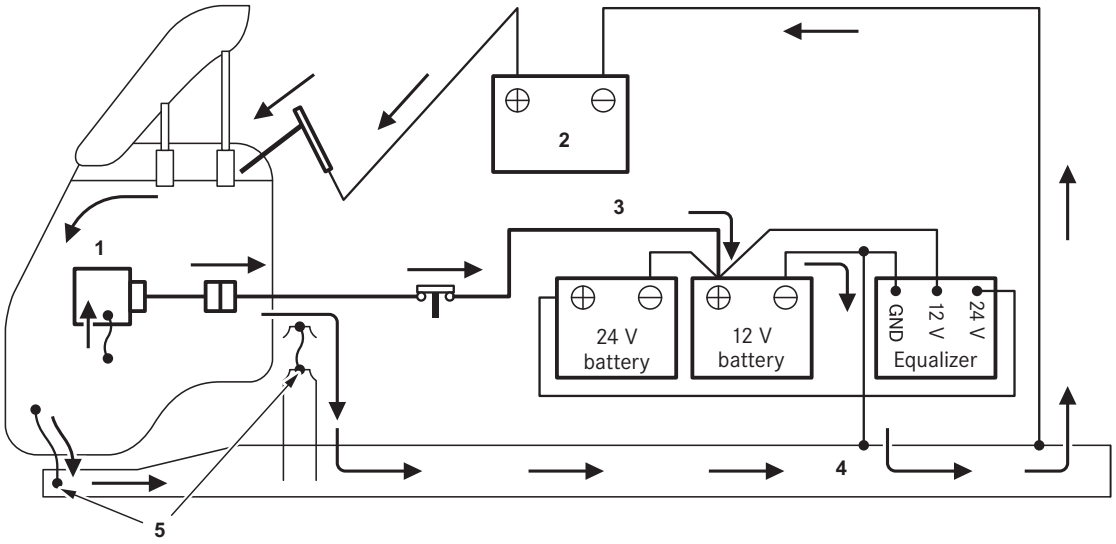
- Other precautions
  (a) Before carrying out welding, place a cover over electronic devices, rubber hoses, wire harnesses, pipes, tubes, chassis spring, tires and other items in the vicinity of the welding area in order to protect them from sparks (spatter) generated during welding.
  Please note that you cannot protect the ECU from damage caused by a short circuit if you accidentally touch the ECU case with the welding rod.
  (b) Carry out welding under appropriate conditions, take steps to minimize the effect of heat on the vicinity, and also strive to secure high welding quality.
- Checks to be performed after the end of welding work
  (a) Reconnect the battery cables that you disconnected from the positive and negative terminals, so as to restore the power.
  If you removed the paint from the frame or the cabin, apply rustproofing paint of the same color.
  (b) Confirm that the starter switch is OFF.
  (c) If you wait for at least 30 seconds before reconnecting the battery cables that you disconnected from the positive and negative terminals in step (a), the needle of each meter in the meter cluster will move. Note, however, that this is due to the operation the self-diagnostic function, and is not indicative of a fault.
  (d) After restoring the power, check the electronic devices to see if they function correctly.
  For the checking method, consult an authorized MITSUBISHI FUSO authorized Distributer.
  (e) For the precautions to observe concerning the SRS airbag when carrying out welding work, refer to ▷ 6.13.1.

8.6 Precautions for electric welding

- If you do not observe the precautions for welding, welding current will flow through the following circuit:



As a result, other wiring including the ECU and the ground wire will be damaged.



N54.10-2341-00

1 Damaged ECU
2 Welding machine
3 To starter switch
4 Frame
5 Damaged earth wire

8.7 Lighting

8.7.1 Installation of Additional lamps and equipment

- Turn signal lamps
  One lamp (*1) may be added on one side (*1: voltage 12 V, lamp specifications 21 W).
  The addition of the lamp may result in the open circuit detection function being inoperative. Use the specified additional lamp.
  After modification, be sure to perform the functional check.
  When you install additional turn lamp, ask an authorized MITSUBISHI FUSO authorized Distributer to change the parameters of the SAM control unit.

Additional information

Failure to change the parameters will result in the turn signal not operating properly.

- Installing rear lamps
  (1) The vehicle is shipped with the rear combination lamp, backup lamp, and license plate lamp temporarily mounted on the chassis. Use those parts.
  (2) Be sure to install the lamps on each side of the vehicle symmetrically. Fix lamp wires aesthetically nicely along the rear surfaces of the frame, cross member, and rear body by using adequate clamps.

- Rear combination lamp
  (1) Installation
  On the chassis with a cab, the rear combination lamp has been temporarily mounted upside down and the water drain hole in the lamp has been taped. Be sure to peel off the tape after the lamp is installed in the correct position.
  Do not array the lamp vertically.

- License plate holder
  (1) For the license plate lamp, use the lamp provided with the chassis as far as possible.
  (2) The law stipulates that the license plate bracket must be of a construction such that it cannot be easily removed from the rear body. For this reason, install the bracket with rivets, or bolt the bracket by tightening the nuts and then be sure to either crimp the threaded part of each bolt or weld the nut to the bolt.
  (3) When installing the license plate brackets to the wooden part of the rear body, use bolts that are of sufficient length to pass completely through the wood, and after tightening the nuts be sure to crimp the threaded part of each bolt.
  (4) Select the mounting position of the license plate in such a way that the license plate is not in the shadow of the rear bumper or any of the lamps.

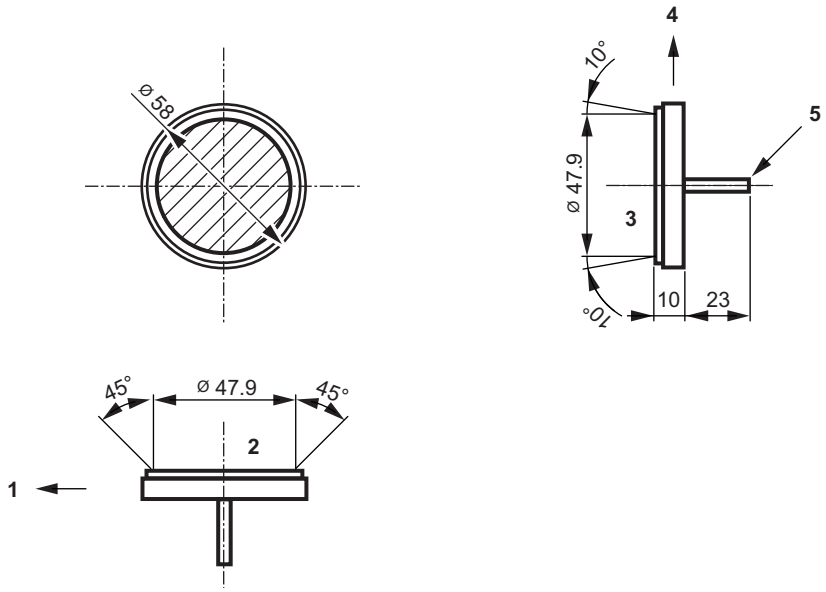
- Installation of side reflectors
  Remove side reflectors from the frame during body building for later use. For additional requirements, use MITSUBISHI FUSO genuine parts.
  The front side reflector, removed from the frame, can no longer be reused. Use a new part if replacement is necessary for a damage one.

8.7.2 Side reflector

The side reflectors must be removed before starting the body mounting work.

If any additional side reflectors are to be installed, be sure to use MITSUBISHI FUSO genuine reflectors.

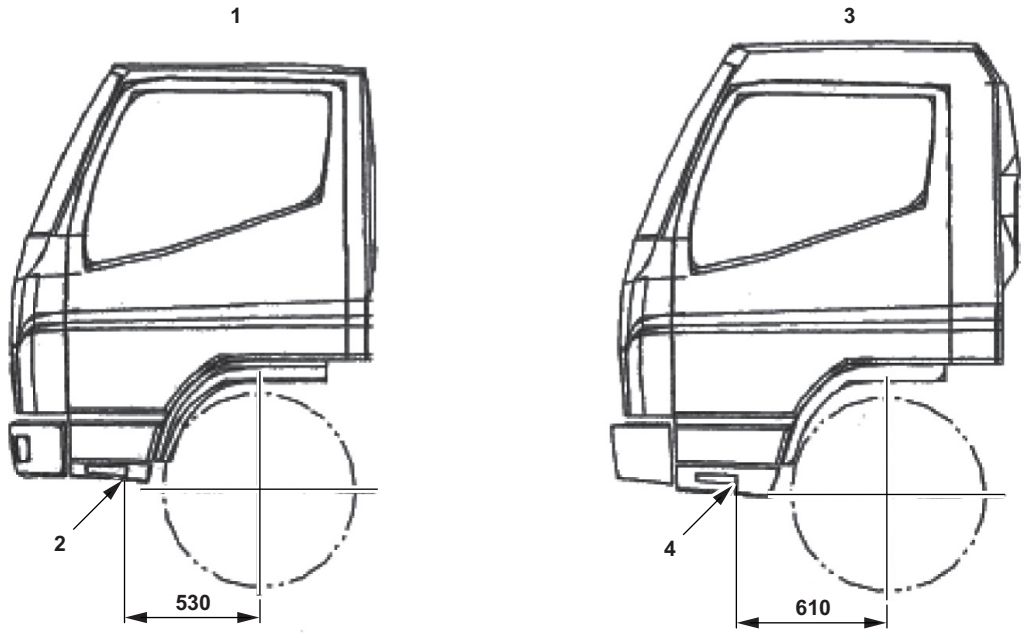
Side reflector



N82.10-2821-00

1 Front
2 Reflecting section
3 Reflecting section
4 Upward
5 Bolt M5 × 0.8
Tightening torque: 2 - 3 Nm
(0.2 to 0.3 kgf·cm)

Front side reflector



N82.10-2822-00

1 Cab with standard width
2 Trailing edge of reflective section of reflector
3 Wide cab
4 Trailing edge of reflective section of reflector

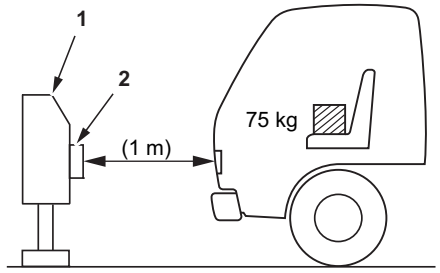
8.7.3 Headlamp aiming

Preparation before Adjustment

- Park the vehicle on a level place.
- Be sure to put tire chocks securely in place.
- Unload the vehicle and make sure no one is in it.
- Inflate the tires to the specified pressure.
- Seat one person of an equivalent mass (75 kg) in the vehicle.
- Start the vehicle system and check that the battery is being charged.
- Place convergent lamp tester and the vehicle facing each other as shown in the drawing.
- Align the center of headlamp bulb and the center of convergent lens of convergent lamp tester. (The drawing shows the left-hand headlamp.)
- When adjusting one headlamp, mask the other to avoid light leakage.

Adjustment

- Do not mask a lit headlamp for more than 2 minutes or the heat generated might cause a fire.

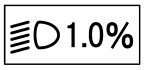


N82.10-2818-00

1 Lamp tester
2 Convergence lens

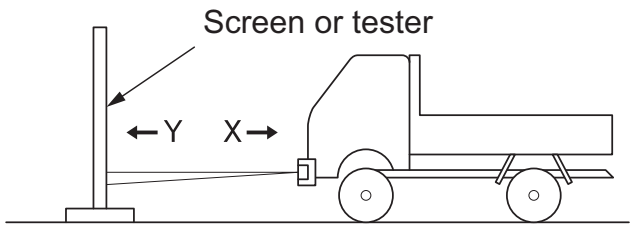
Headlamp

- Adjust the right- and left-hand headlamps to the specified optical axes using the 2 aiming adjustment screws.
- Adjust the dipped (low) beam optical axis angle to the value on the initial optical axis label attached to the rear side of the passenger seat side door opening.
  Ex. Initial optical axis label [when 1.0%]

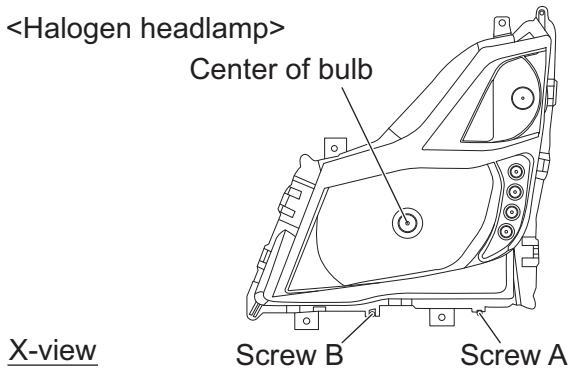


Adjustment of dipped beam

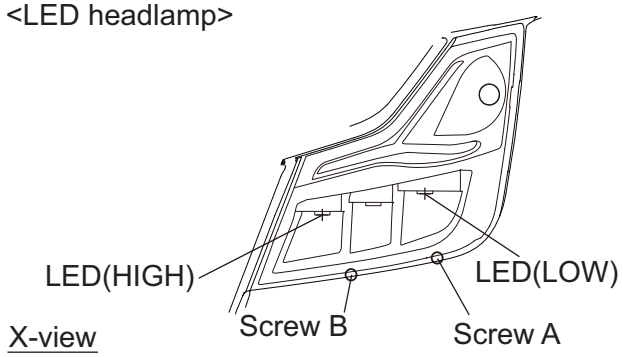
(a) Turn on the dipped beam.
(b) Adjust according to the following procedures so that the elbow point of the dipped beam cut-off line is in the position as illustrated.

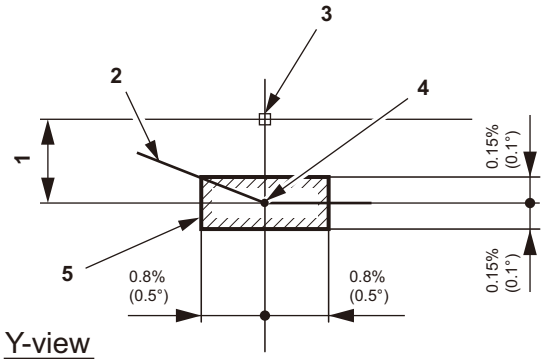


<Halogen headlamp>



<LED headlamp>





Initial optical axis label	Optical axis adjustment angle
1.0%	0.57°(1%)
1.5%	0.86°(1.5%)

1 Cut-off line position
2 Cut-off line
3 Center of lamp
4 Elbow point of cut-off line
5 Tolerance of adjustment

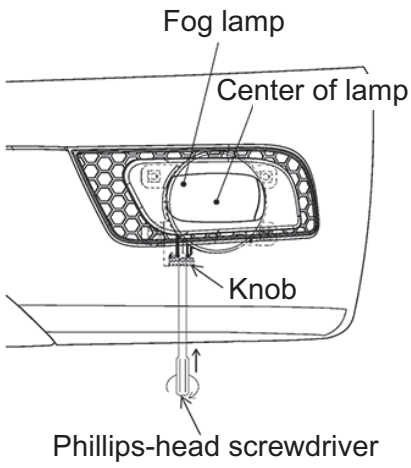
(c) Vertical adjustment: Turn Screw B to adjust.
(d) Horizontal adjustment: Turn Screw A to adjust.

	Optical axis adjustment direction							
	Right headlamp				Left headlamp			
	Up	Down	Left	Right	Up	Down	Left	Right
Screw A	-	-	Counter-clockwise	Clock-wise	-	-	Clock-wise	Counter-clockwise
Screw B	Counter-clockwise	Clock-wise	-	-	Counter-clockwise	Clock-wise	-	-

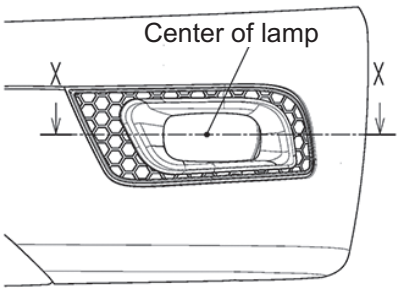
Note:
- The same adjustment procedures are applied to both halogen and LED lamps.
- For vertical adjustment, turn the screw and the optical axis will move in a diagonal direction.

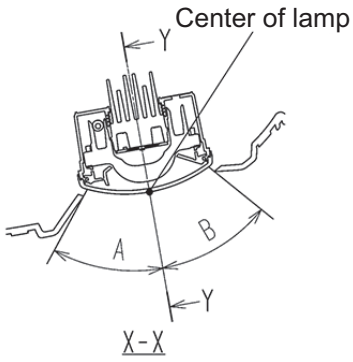
8.7.4 Fog lamp

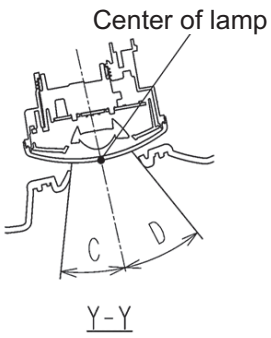
- After carrying out body-building, perform re-adjustment of aiming.
- Turn the knob at the lower side of the fog lamp using a Phillips-head screwdriver, so that the cut-off line is within the adjustment value.



(a) How to align the center of the fog lamp



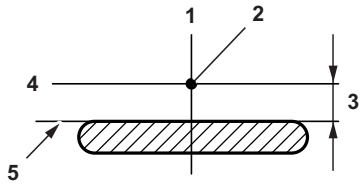




Unit: mm

	A	B	C	D
Standard	38.5	41.2	18.3	26.5
Wide	38.2	41.2	18.4	24.5
Wide + FUP	40.8	36.6	18.7	25

A, B, C and D show the distance (reference) between the bezel edge and the lamp center.



	Optical axis adjustment direction	
	Up	Down
Rotation direction	Clockwise	Counter-clockwise

1 Vertical
2 Lamp center
3 Cut-off line position
4 Horizontal
5 Cut-off line

Cut-off line position	Adjustment value
	1.0 (0.57°) % or less

9.1 Axle load calculation

An axle load calculation is required to optimize the overall vehicle (vehicle and body). It is only possible to match the body to the truck if the vehicle is weighed before any work on the body is carried out. The weights measured by weighing form the basis of the axle load calculation.

The moment theorem is used to distribute the weight of the equipment on the front and rear axles. All distances relate to the center front axle (theoretical center). Mark the weight with mathematically correct signs and enter them in the table. The result will assist you in choosing the optimum positioning of the body.

It has proved useful to make the following calculations:

Weight

+ (plus) is everything when the vehicle is laden
– (minus) is everything that the vehicle can unload (weights)

Axle distance

+ (plus) is everything behind the center of the front axle
– (minus) is everything in front of the center of the front axle

Calculate the weight distribution on the front and rear axle using the formula:

$$\triangle G_{HA} = \frac{G_{component} \cdot a}{R} \text{ [kg]}$$

$\triangle G_{HA}$	=	Change in weight on rear axle in [kg]
$G_{component}$	=	Component weight in [kg]
a	=	Axle distance to theoretical center of front axle in [mm]
R	=	Theoretical wheelbase [mm]

$$\triangle G_{VA} = G_{component} - G_{HA} \text{ [kg]}$$

$\triangle G_{VA}$	=	Change in weight on front axle in [kg]
$G_{component}$	=	Component weight in [kg]
$\triangle G_{HA}$	=	Change in weight on rear axle in [kg]

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Revision record <Common section (Chapter 1-9)>

D	10. October. 2024	Correction
C	19. April. 2024	Correction
B	29. February. 2024	Correction
A	25. August. 2023	Correction
–	09. June. 2023	Newly issued
Rev. code	Date issued	Remarks

Body/equipment mounting directives <Common section>

FUSO eCANTER

MITSUBISHI FUSO TRUCK & BUS CORPORATION

October. 2024 TL301_F

Body/equipment mounting directives
Technical data section
Australia

MITSUBISHI FUSO TRUCK & BUS CORPORATION
February. 2024 TL3FA

Contents

10 Technical data

10.1 Model line-up

Model	Type	Drive system	Crew	Motor			G.V.W. (kg)	G.C.W. (kg)	Tire
				Model	output (kW)	torque (Nm)			
FEAVKBRCSFAD	Forward control tilt cab	4 × 2	3	S40	110	430	4500	-	205/75R17.5
FEAVKCRCSFAD									
FEAVKERCSFAD									
FEAVKERDSFAB							6000		
FEB7KERDSFAC					129		7500		215/75R17.5
FEB7KGRDSFAC									
FEBVKERCSFAD					110		4500		205/75R17.5
FEBVKERDSFAB							6000		
FEBVKGRDSFAB									
FECXKGRDSFAC					129		8550		225/70R19.5
FECXKHRDSFAC									
FECXKHRESFAC									
FECXKKRDSFAC									
FECXKKRESFAC									

B

10.2 Specifications

10.2.1 Specifications

Model		FEAVKBRCSFAD	FEAVKCRCSFAD	FEAVKERCSFAD
Wheelbase (mm)		2500	2800	3400
Tread (mm)	Front	1390	1390	1390
	Rear	1435	1435	1435
Curb weight (kg)		2575	2585	2610
	Front	1425	1515	1475
	Rear	1150	1070	1135
Minimum mass (kg)		-	-	-
Max. GVW (kg)		4500	4500	4500
	Front	2600	2600	2600
	Rear	4500	4500	4500
Motor model		S40	S40	S40
Max. output		110 kW	110 kW	110 kW
Max. torque		430 Nm	430 Nm	430 Nm
Rated output		85kW	85kW	85kW
Front axle		Rigit type	Rigit type	Rigit type
Rear axle		eAxle type	eAxle type	eAxle type
Tire		205/75R17.5	205/75R17.5	205/75R17.5
Wheel		17.5X5.25-115-8	17.5X6.00-127-9	17.5X6.00-127-9
Steering angle (in/out)		39° /34°	39° /34°	39° /34°
Service brake		hydraulic vacuum assisted 2 circuit split system	hydraulic vacuum assisted 2 circuit split system	hydraulic vacuum assisted 2 circuit split system
Parking brake		Electromechanical, part of disc brake function operated by motor mounted on the brake caliper	Electromechanical, part of disc brake function operated by motor mounted on the brake caliper	Electromechanical, part of disc brake function operated by motor mounted on the brake caliper
Front suspension		Coil spring with shock absorbers	Coil spring with shock absorbers	Coil spring with shock absorbers
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers
PTO		OPT	OPT	OPT
Electrical	HV battery	S-size	S-size	S-size
	LV Batteries	12 Volts (80AH)	12 Volts (80AH)	12 Volts (80AH)
Cab		Narrow, Single	Narrow, Single	Narrow, Single
Crew		3	3	3

10.2 Specifications

B

Model		FEAVKERDSFAB	FEB7KERDSFAC	FEB7KGRDSFAC
Wheelbase (mm)		3400	3400	3850
Tread (mm)	Front	1390	1665	1665
	Rear	1435	1560	1560
Curb weight (kg)		3070	3235	3250
	Front	1655	1760	1805
	Rear	1415	1475	1445
Minimum mass (kg)		-	-	-
Max. GVW (kg)		6000	7500	7500
	Front	2600	3100	3100
	Rear	4500	6000	6000
Motor model		S40	S40	S40
Max. output		110 kW	129 kW	129 kW
Max. torque		430 Nm	430 Nm	430 Nm
Rated output		85kW	110kW	110kW
Front axle		Rigit type	Rigit type	Rigit type
Rear axle		eAxle type	eAxle type	eAxle type
Tire		205/75R17.5	215/75R17.5	215/75R17.5
Wheel		17.5X5.25-115-8	17.5X6.00-127-9	17.5X6.00-127-9
Steering angle (in/out)		39° /34°	45° /34°	45° /34°
Service brake		hydraulic vacuum assisted 2 circuit split system	hydraulic vacuum assisted 2 circuit split system	hydraulic vacuum assisted 2 circuit split system
Parking brake		Electromechanical, part of disc brake function operated by motor mounted on the brake caliper	Electromechanical, part of disc brake function operated by motor mounted on the brake caliper	Electromechanical, part of disc brake function operated by motor mounted on the brake caliper
Front suspension		Coil spring with shock absorbers	Semi-elliptic laminated leaf spring with shock absobers and stabiliser	Semi-elliptic laminated leaf spring with shock absobers and stabiliser
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers
PTO		OPT	OPT	OPT
Electrical	HV battery	M-size	M-size	M-size
	LV Batteries	12 Volts (80AH)	12 Volts (80AH)	12 Volts (80AH)
Cab		Narrow, Single	Wide, Single	Wide, Single
Crew		3	3	3

10.2 Specifications

B

Model		FEBVKERCSFAD	FEBVKERDSFAB	FEBVKGRDSFAB
Wheelbase (mm)		3400	3400	3850
Tread (mm)	Front	1655	1655	1655
	Rear	1490	1490	1490
Curb weight (kg)		2745	3195	3205
	Front	1615	1770	1815
	Rear	1130	1425	1390
Minimum mass (kg)		-	-	-
Max. GVW (kg)		4500	6000	6000
	Front	2600	2600	2600
	Rear	4500	4500	4500
Motor model		S40	S40	S40
Max. output		110 kW	110 kW	129 kW
Max. torque		430 Nm	430 Nm	430 Nm
Rated output		85kW	85kW	110kW
Front axle		Rigit type	Rigit type	Rigit type
Rear axle		eAxle type	eAxle type	eAxle type
Tire		205/75R17.5	205/75R17.5	205/75R17.5
Wheel		17.5X5.25-115-8	17.5X5.25-115-8	17.5X5.25-115-8
Steering angle (in/out)		44° /37°	44° /37°	44° /37°
Service brake		hydraulic vacuum assisted 2 circuit split system	hydraulic vacuum assisted 2 circuit split system	hydraulic vacuum assisted 2 circuit split system
Parking brake		Electromechanical, part of disc brake function operated by motor mounted on the brake caliper	Electromechanical, part of disc brake function operated by motor mounted on the brake caliper	Electromechanical, part of disc brake function operated by motor mounted on the brake caliper
Front suspension		Coil spring with shock absorbers	Coil spring with shock absorbers	Coil spring with shock absorbers
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers
PTO		OPT	OPT	OPT
Electrical	HV battery	S-size	M-size	M-size
	LV Batteries	12 Volts (80AH)	12 Volts (80AH)	12 Volts (80AH)
Cab		Wide, Single	Wide, Single	Wide, Single
Crew		3	3	3

10.2 Specifications

B

Model		FECXKGRDSFAC	FECXKHRDSFAC	FECXKHRESFAC
Wheelbase (mm)		3850	4450	4450
Tread (mm)	Front	1665	1665	1665
	Rear	1660	1660	1660
Curb weight (kg)		3465	3495	3960
	Front	1870	1945	2080
	Rear	1595	1550	1880
Minimum mass (kg)		-	-	-
Max. GVW (kg)		8550	8550	8550
	Front	3400	3400	3400
	Rear	6000	6000	6000
Motor model		S40	S40	S40
Max. output		129 kW	129 kW	129 kW
Max. torque		430 Nm	430 Nm	430 Nm
Rated output		110kW	110kW	110kW
Front axle		Rigit type	Rigit type	Rigit type
Rear axle		eAxle type	eAxle type	eAxle type
Tire		225/70R19.5	225/70R19.5	225/70R19.5
Wheel		19.5X6.75-129-11	19.5X6.75-129-11	19.5X6.75-129-11
Steering angle (in/out)		41° /32°	41° /32°	41° /32°
Service brake		hydraulic vacuum assisted 2 circuit split system	hydraulic vacuum assisted 2 circuit split system	hydraulic vacuum assisted 2 circuit split system
Parking brake		Electromechanical, part of disc brake function operated by motor mounted on the brake caliper	Electromechanical, part of disc brake function operated by motor mounted on the brake caliper	Electromechanical, part of disc brake function operated by motor mounted on the brake caliper
Front suspension		Semi-elliptic laminated leaf spring with shock absobers and stabiliser	Semi-elliptic laminated leaf spring with shock absobers and stabiliser	Semi-elliptic laminated leaf spring with shock absobers and stabiliser
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers
PTO		OPT	OPT	OPT
Electrical	HV battery	M-size	M-size	L-size
	LV Batteries	12 Volts (80AH)	12 Volts (80AH)	12 Volts (80AH)
Cab		Wide, Single	Wide, Single	Wide, Single
Crew		3	3	3

10.2 Specifications

B

Model		FECXKKRDSFAC	FECXKKRESFAC
Wheelbase (mm)		4750	4750
Tread (mm)	Front	1665	1665
	Rear	1660	1660
Curb weight (kg)		3510	3975
	Front	1960	2115
	Rear	1550	1860
Minimum mass (kg)		-	-
Max. GVW (kg)		8550	8550
	Front	3400	3400
	Rear	6000	6000
Motor model		S40	S40
Max. output		129 kW	129 kW
Max. torque		430 Nm	430 Nm
Rated output		110kW	110kW
Front axle		Rigit type	Rigit type
Rear axle		eAxle type	eAxle type
Tire		225/70R19.5	225/70R19.5
Wheel		19.5X6.75-129-11	19.5X6.75-129-11
Steering angle (in/out)		41° /32°	41° /32°
Service brake		hydraulic vacuum assisted 2 circuit split system	hydraulic vacuum assisted 2 circuit split system
Parking brake		Electromechanical, part of disc brake function operated by motor mounted on the brake caliper	Electromechanical, part of disc brake function operated by motor mounted on the brake caliper
Front suspension		Semi-elliptic laminated leaf spring with shock absobers and stabiliser	Semi-elliptic laminated leaf spring with shock absobers and stabiliser
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers
PTO		OPT	OPT
Electrical	HV battery	M-size	L-size
	LV Batteries	12 Volts (80AH)	12 Volts (80AH)
Cab		Wide, Single	Wide, Single
Crew		3	3

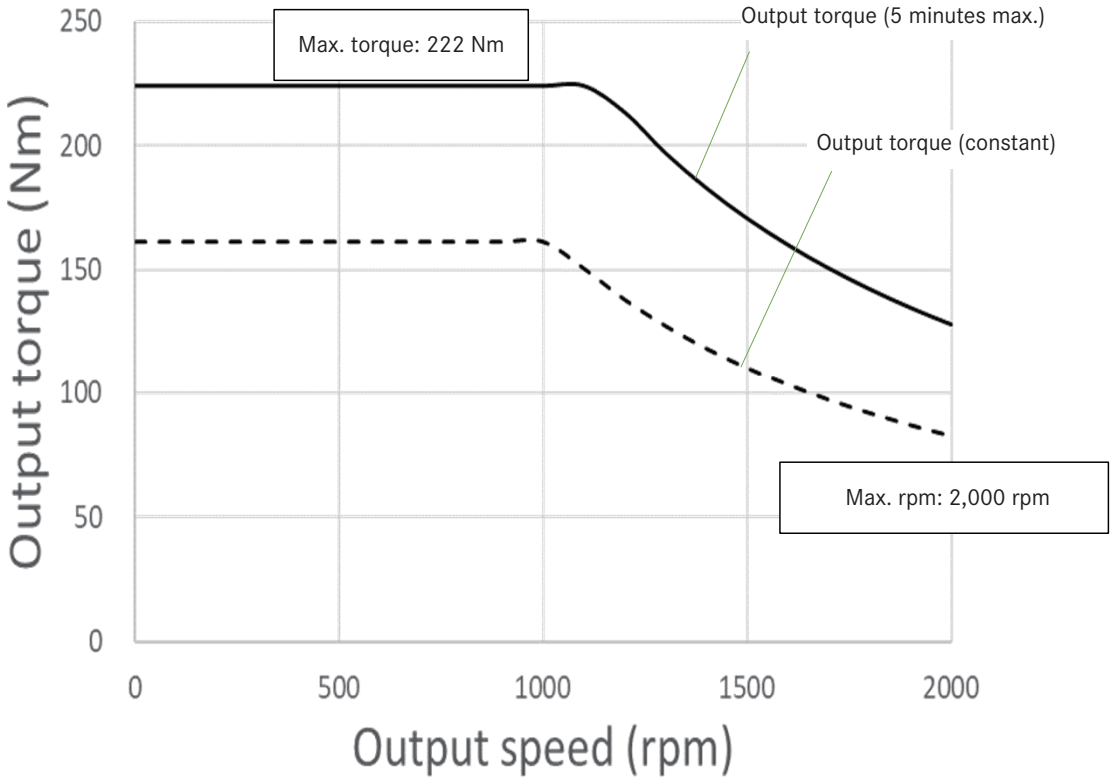
10.2.2 Axle and tire load carrying capacity

G.V.W. (kg)	Model	Max. Output (kw)	Tire Size			Axle Capacity (kg)	
			205/75R17.5 124/122M	215/75R17.5 124/123L	225/70R19.5 128/126N	Front	Rear
4500	FEAVKBRCSFAD	110	X			2600	4500
	FEAVKCRCSFAD		X				
	FEAVKERCSFAD		X				
	FEBVKERCSFAD		X				
6000	FEAVKERDSFAB		X				
	FEBVKERDSFAB		X				
	FEBVKGRDSFAB		X				
7500	FEB7KERDSFAC	129		X		3100	6000
	FEB7KGRDSFAC			X			
8550	FECXKGRDSFAC				X	3400	
	FECXKHRDSFAC				X		
	FECXKHRESFAC				X		
	FECXKKRDSFAC				X		
	FECXKKRESFAC				X		
Tire Capacity (kg)*1		Front	1600x2=3200	1600x2=3200	1800x2=3600		
		Rear	1500x4=6000	1550x4=6200	1700x4=6800		

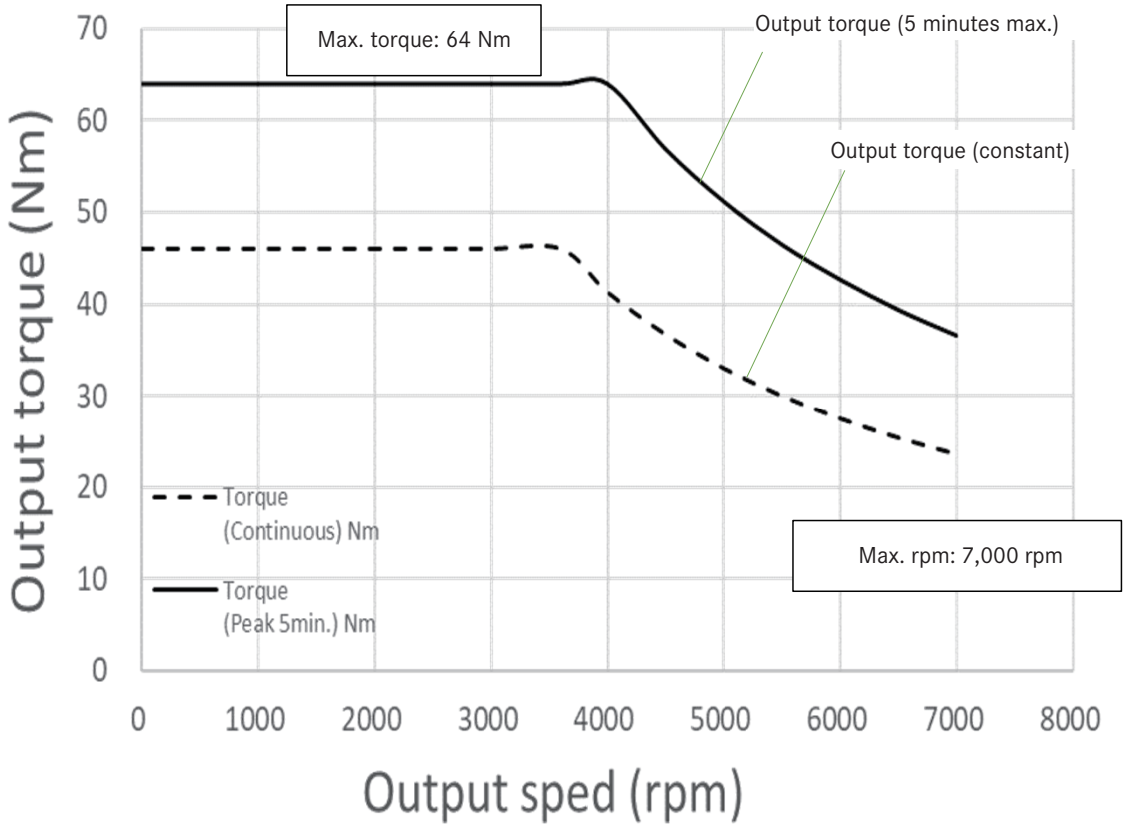
*1: At Maximum information pressure (kPa, cold: Fr/Re)
205/75R17.5 124/122...750/750
215/75R17.5 124/123...675/675
225/70R19.5 128/126...750/750

10.3 ePTO performance curve

- Performance curve diagram of ePTO with reduction gear



- Performance curve diagram of ePTO with pulley



B

10.4 Weight distribution table

10.4.1 Weight distribution table

Model: FEAVKBRCSFAD (110kW)

Wheelbase (m) : 2.500

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	43	0.018	42.7	0.3
Accelerator (Engine)	1	-0.855	1.3	-0.3
Gearshift	1	-0.816	1.3	-0.3
Brake, Clutch	27	-0.246	29.7	-2.7
Parking	1	0.018	1.0	0.0
Steering	44	-0.233	48.1	-4.1
Front bumper	9	-0.880	12.2	-3.2
Cab	314	-0.250	345.4	-31.4
HVAC	24	-0.085	24.8	-0.8
Cab Electric	40	-0.711	51.4	-11.4
Cab mounting	41	-0.238	44.9	-3.9
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.214	15.4	14.6
Chassis electronic	32	1.275	15.7	16.3
Spare tire carrier	2	3.378	-0.7	2.7
Frame	239	1.468	98.7	140.3
other (sprung weight)-IFS	128	-0.033	129.7	-1.7
eAxle	200	2.393	8.6	191.4
BSA	3	1.530	1.2	1.8
Charger,DC/DC converter-EV	65	0.147	61.2	3.8
Charger inlet	6	0.830	4.0	2.0
Motor assy mounting	29	2.276	2.6	26.4
PDU, Earth Cable-EV, AVAS, VCU	10	0.339	8.6	1.4
HV battery bracket	486	1.154	261.6	224.4
HV harness	14	1.050	8.1	5.9
HVAC	11	-0.206	11.9	-0.9
other (sprung weight)	15	0.000	15.0	0.0
Sprung weight *2	1815		1255	560
Unsprung weight	720		185	535
Chassis Cab weight	2535		1440	1095

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FEAVKCRCSFAD (110kW)

Wheelbase (m) : 2.800

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	43	0.015	42.7	0.3
Accelerator (Engine)	1	-0.855	1.3	-0.3
Gearshift	1	-0.816	1.3	-0.3
Brake, Clutch	27	-0.303	30.3	-3.3
Parking	1	0.000	1.0	0.0
Steering	44	-0.246	48.3	-4.3
Front bumper	9	-0.880	12.2	-3.2
Cab	314	-0.250	345.4	-31.4
HVAC	24	-0.085	24.8	-0.8
Cab Electric	40	-0.711	51.4	-11.4
Cab mounting	41	-0.236	44.9	-3.9
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.214	15.4	14.6
Chassis electronic	33	0.933	20.7	12.3
Spare tire carrier	2	3.679	-0.9	2.9
Frame	248	1.546	94.6	153.4
other (sprung weight)-IFS	128	-0.030	129.5	-1.5
eAxle	200	2.693	-15.4	215.4
BSA	3	1.590	1.1	1.9
Charger,DC/DC converter-EV	65	0.147	61.2	3.8
Charger inlet	6	0.839	4.0	2.0
Motor assy mounting	29	2.602	-1.2	30.2
PDU, Earth Cable-EV, AVAS, VCU	10	0.413	8.3	1.7
HV battery bracket	486	1.154	261.6	224.4
HV harness	14	1.050	8.1	5.9
HVAC	11	-0.204	11.9	-0.9
other (sprung weight)	15	0.000	15.0	0.0
Sprung weight *2	1825		1340	485
Unsprung weight	720		185	535
Chassis Cab weight	2545		1525	1020

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FEAVKERCSFAD (110kW)

B

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	43	0.120	40.9	2.1
Accelerator (Engine)	1	-0.855	1.3	-0.3
Gearshift	1	-0.816	1.3	-0.3
Brake, Clutch	27	-0.309	30.3	-3.3
Parking	1	0.000	1.0	0.0
Steering	45	-0.276	50.0	-5.0
Front bumper	9	-1.085	12.9	-3.9
Cab	314	-0.300	351.7	-37.7
HVAC	24	-0.075	24.7	-0.7
Cab Electric	40	-0.809	52.9	-12.9
Cab mounting	41	-0.300	45.9	-4.9
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.204	15.6	14.4
Chassis electronic	32	1.362	14.6	17.4
Spare tire carrier	2	0.000	2.0	0.0
Frame	270	2.012	52.7	217.3
other (sprung weight)-IFS	128	-0.006	128.3	-0.3
eAxle	200	3.293	-63.4	263.4
BSA	3	1.330	1.4	1.6
Charger,DC/DC converter-EV	69	0.147	64.9	4.1
Charger inlet	8	0.774	5.5	2.5
Motor assy mounting	29	3.205	-8.2	37.2
PDU, Earth Cable-EV, AVAS, VCU	8	0.413	6.7	1.3
HV battery bracket	486	1.154	261.6	224.4
HV harness	15	1.034	8.8	6.2
HVAC	11	-0.235	12.0	-1.0
other (sprung weight)	15	0.000	15.0	0.0
Sprung weight *2	1850		1300	550
Unsprung weight	720		185	535
Chassis Cab weight	2570		1485	1085

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FEAVKERDSFAB (110kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	45	0.132	43.3	1.7
Accelerator (Engine)	1	-0.855	1.3	-0.3
Gearshift	1	-0.816	1.2	-0.2
Brake, Clutch	27	-0.298	29.4	-2.4
Parking	1	0.000	1.0	0.0
Steering	45	-0.232	48.1	-3.1
Front bumper	9	-0.946	11.5	-2.5
Cab	314	-0.250	337.1	-23.1
HVAC	24	-0.098	24.7	-0.7
Cab Electric	40	-0.711	48.4	-8.4
Cab mounting	41	-0.236	43.8	-2.8
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.178	19.6	10.4
Chassis electronic	32	0.890	23.6	8.4
Spare tire carrier	2	4.256	-0.5	2.5
Frame	268	2.046	106.8	161.2
other (sprung weight)-IFS	128	-0.020	128.7	-0.7
eAxle	200	3.293	6.3	193.7
BSA	3	1.590	1.6	1.4
Charger,DC/DC converter-EV	77	0.167	73.2	3.8
Charger inlet	10	0.916	7.3	2.7
Motor assy mounting	29	3.205	1.7	27.3
PDU, Earth Cable-EV, AVAS, VCU	8	0.495	7.1	1.2
HV battery bracket	946	1.537	518.5	427.5
HV harness	18	0.871	13.4	4.6
HVAC	11	-0.204	11.7	-0.7
other (sprung weight)	0	0.000	0.0	0.0
Sprung weight *2	2310		1479	829
Unsprung weight	720		186	536
Chassis Cab weight	3030		1665	1365

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FEB7KERDSFAC (129kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	51	0.148	48.8	2.2
Accelerator (Engine)	1	-0.855	1.3	-0.3
Gearshift	1	-0.816	1.2	-0.2
Brake, Clutch	28	-0.219	29.8	-1.8
Parking	1	0.000	1.0	0.0
Steering	49	-0.522	56.5	-7.5
Front bumper	14	-1.085	18.5	-4.5
Cab	353	-0.300	384.1	-31.1
HVAC	26	-0.107	26.8	-0.8
Cab Electric	45	-0.809	55.7	-10.7
Cab mounting	44	-0.299	47.9	-3.9
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.178	19.6	10.4
Chassis electronic	34	1.448	19.5	14.5
Spare tire carrier	2	4.271	-0.5	2.5
Frame	332	2.027	134.1	197.9
other (sprung weight)-IFS	0	0.000	0.0	0.0
eAxle	200	3.293	6.3	193.7
BSA	5	0.954	3.6	1.4
Charger,DC/DC converter-EV	77	0.155	73.5	3.5
Charger inlet	12	0.369	10.7	1.3
Motor assy mounting	29	3.205	1.7	27.3
PDU, Earth Cable-EV, AVAS, VCU	8	0.495	7.1	1.2
HV battery bracket	946	1.654	485.8	460.2
HV harness	20	1.509	11.1	8.9
HVAC	19	-0.270	20.5	-1.5
other (sprung weight)	0	0.000	0.0	0.0
Sprung weight *2	2325		1468	857
Unsprung weight	875		305	570
Chassis Cab weight	3195		1770	1425

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FEB7KGRDSFAC (129kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	51	0.151	49.0	2.0
Accelerator (Engine)	1	-0.855	1.2	-0.2
Gearshift	1	-0.816	1.2	-0.2
Brake, Clutch	28	-0.210	29.5	-1.5
Parking	1	0.000	1.0	0.0
Steering	49	-0.522	55.6	-6.6
Front bumper	14	-1.085	17.9	-3.9
Cab	353	-0.300	380.5	-27.5
HVAC	26	-0.107	26.7	-0.7
Cab Electric	45	-0.809	54.5	-9.5
Cab mounting	44	-0.299	47.4	-3.4
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.178	20.8	9.2
Chassis electronic	34	1.363	22.0	12.0
Spare tire carrier	2	4.711	-0.4	2.4
Frame	347	2.345	135.6	211.4
other (sprung weight)-IFS	0	0.000	0.0	0.0
eAxle	200	3.743	5.6	194.4
BSA	5	0.954	3.8	1.2
Charger,DC/DC converter-EV	77	0.155	73.9	3.1
Charger inlet	12	0.369	10.8	1.2
Motor assy mounting	29	3.656	1.5	27.5
PDU, Earth Cable-EV, AVAS, VCU	8	0.495	7.3	1.1
HV battery bracket	946	1.654	539.6	406.4
HV harness	20	1.668	11.3	8.7
HVAC	19	-0.235	20.2	-1.2
other (sprung weight)	0	0.000	0.0	0.0
Sprung weight *2	2340		1513	827
Unsprung weight	875		305	570
Chassis Cab weight	3210		1815	1395

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FEBVKERCSFAD (110kW)

B

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	47	0.120	45.3	1.7
Accelerator (Engine)	1	-0.855	1.3	-0.3
Gearshift	1	-0.816	1.2	-0.2
Brake, Clutch	28	-0.309	30.5	-2.5
Parking	1	0.000	1.0	0.0
Steering	48	-0.276	51.9	-3.9
Front bumper	14	-1.085	18.5	-4.5
Cab	353	-0.300	384.1	-31.1
HVAC	26	-0.075	26.6	-0.6
Cab Electric	45	-0.809	55.7	-10.7
Cab mounting	44	-0.300	47.9	-3.9
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.204	19.4	10.6
Chassis electronic	34	1.362	20.4	13.6
Spare tire carrier	2	0.000	2.0	0.0
Frame	304	2.012	124.1	179.9
other (sprung weight)-IFS	148	-0.006	148.2	-0.2
eAxle	200	3.293	6.3	193.7
BSA	5	1.330	3.0	2.0
Charger,DC/DC converter-EV	69	0.147	66.0	3.0
Charger inlet	7	0.774	5.4	1.6
Motor assy mounting	29	3.205	1.7	27.3
PDU, Earth Cable-EV, AVAS, VCU	8	0.413	7.0	1.0
HV battery bracket	486	1.154	321.0	165.0
HV harness	15	1.034	10.4	4.6
HVAC	18	-0.235	19.2	-1.2
other (sprung weight)	15	0.000	15.0	0.0
Sprung weight *2	1980		1440	540
Unsprung weight	725		185	540
Chassis Cab weight	2705		1625	1080

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FEBVKERDSFAB (110kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	49	0.167	46.6	2.4
Accelerator (Engine)	1	-0.855	1.3	-0.3
Gearshift	1	-0.816	1.2	-0.2
Brake, Clutch	28	-0.219	29.8	-1.8
Parking	1	0.000	1.0	0.0
Steering	48	-0.263	51.7	-3.7
Front bumper	14	-0.853	17.5	-3.5
Cab	353	-0.300	384.1	-31.1
HVAC	26	-0.107	26.8	-0.8
Cab Electric	45	-0.809	55.7	-10.7
Cab mounting	44	-0.299	47.9	-3.9
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.178	19.6	10.4
Chassis electronic	34	1.363	20.4	13.6
Spare tire carrier	2	4.271	-0.5	2.5
Frame	300	1.984	124.9	175.1
other (sprung weight)-IFS	148	-0.006	148.2	-0.2
eAxle	200	3.293	6.3	193.7
BSA	5	0.954	3.6	1.4
Charger,DC/DC converter-EV	77	0.155	73.5	3.5
Charger inlet	7	0.633	5.7	1.3
Motor assy mounting	29	3.205	1.7	27.3
PDU, Earth Cable-EV, AVAS, VCU	8	0.495	7.1	1.2
HV battery bracket	946	1.654	485.8	460.2
HV harness	18	1.509	10.0	8.0
HVAC	18	-0.235	19.2	-1.2
other (sprung weight)	0	0.000	0.0	0.0
Sprung weight *2	2430		1594	835
Unsprung weight	725		186	540
Chassis Cab weight	3155		1780	1375

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FEBVKGRDSFAB (110kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	49	0.167	46.9	2.1
Accelerator (Engine)	1	-0.855	1.2	-0.2
Gearshift	1	-0.816	1.2	-0.2
Brake, Clutch	28	-0.217	29.6	-1.6
Parking	1	0.000	1.0	0.0
Steering	48	-0.238	51.0	-3.0
Front bumper	14	-1.085	17.9	-3.9
Cab	353	-0.300	380.5	-27.5
HVAC	26	-0.107	26.7	-0.7
Cab Electric	45	-0.809	54.5	-9.5
Cab mounting	44	-0.299	47.4	-3.4
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.178	20.8	9.2
Chassis electronic	34	1.363	22.0	12.0
Spare tire carrier	2	4.711	-0.4	2.4
Frame	313	2.252	129.9	183.1
other (sprung weight)-IFS	145	-0.006	145.2	-0.2
eAxle	200	3.743	5.6	194.4
BSA	5	0.954	3.8	1.2
Charger,DC/DC converter-EV	77	0.156	73.9	3.1
Charger inlet	7	0.369	6.3	0.7
Motor assy mounting	29	3.656	1.5	27.5
PDU, Earth Cable-EV, AVAS, VCU	8	0.495	7.3	1.1
HV battery bracket	946	1.654	539.6	406.4
HV harness	18	1.668	10.2	7.8
HVAC	18	-0.235	19.1	-1.1
other (sprung weight)	0	0.000	0.0	0.0
Sprung weight *2	2440		1639	800
Unsprung weight	725		186	540
Chassis Cab weight	3165		1825	1340

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FECXKGRDSFAC (129kW)

B

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	53	0.171	50.6	2.4
Accelerator (Engine)	1	-0.855	1.2	-0.2
Gearshift	1	-0.816	1.2	-0.2
Brake, Clutch	28	-0.109	28.8	-0.8
Parking	1	0.000	1.0	0.0
Steering	51	-0.506	57.7	-6.7
Front bumper	14	-1.085	17.9	-3.9
Cab	363	-0.300	391.3	-28.3
HVAC	26	0.044	25.7	0.3
Cab Electric	45	-0.809	54.5	-9.5
Cab mounting	45	-0.294	48.4	-3.4
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.198	20.7	9.3
Chassis electronic	36	1.288	24.0	12.0
Spare tire carrier	2	4.928	-0.6	2.6
Frame	354	2.603	114.7	239.3
other (sprung weight)-IFS	0	0.000	0.0	0.0
eAxle	200	3.743	5.6	194.4
BSA	5	1.331	3.3	1.7
Charger,DC/DC converter-EV	77	0.156	74.1	3.1
Charger inlet	12	0.553	10.3	1.7
Motor assy mounting	30	3.706	1.1	28.9
PDU, Earth Cable-EV, AVAS, VCU	10	0.583	8.5	1.5
HV battery bracket	946	1.654	539.6	406.4
HV harness	22	1.441	13.8	8.2
HVAC	19	-0.250	20.2	-1.2
other (sprung weight)	0	0.000	0.0	0.0
Sprung weight *2	2370		1512	858
Unsprung weight	1040		373	667
Chassis Cab weight	3410		1885	1525

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FECXKHRDSFAC (129kW)

B

Wheelbase (m) : 4.450

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	53	0.200	50.6	2.4
Accelerator (Engine)	1	-0.855	1.2	-0.2
Gearshift	1	-0.816	1.2	-0.2
Brake, Clutch	28	-0.124	28.8	-0.8
Parking	1	0.000	1.0	0.0
Steering	51	-0.496	56.7	-5.7
Front bumper	14	-1.085	17.4	-3.4
Cab	363	-0.300	387.5	-24.5
HVAC	26	0.044	25.7	0.3
Cab Electric	45	-0.809	53.2	-8.2
Cab mounting	45	-0.289	47.9	-2.9
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.198	21.9	8.1
Chassis electronic	36	1.454	24.2	11.8
Spare tire carrier	2	5.387	-0.4	2.4
Frame	383	2.930	130.8	252.2
other (sprung weight)-IFS	0	0.000	0.0	0.0
eAxle	200	4.343	4.8	195.2
BSA	5	1.324	3.5	1.5
Charger,DC/DC converter-EV	77	0.156	74.5	2.7
Charger inlet	12	0.544	10.5	1.5
Motor assy mounting	30	4.315	0.9	29.1
PDU, Earth Cable-EV, AVAS, VCU	10	0.582	8.7	1.3
HV battery bracket	946	1.662	592.8	353.2
HV harness	22	1.951	12.4	9.6
HVAC	19	-0.324	20.4	-1.4
other (sprung weight)	0	0.000	0.0	0.0
Sprung weight *2	2400		1582	818
Unsprung weight	1040		373	667
Chassis Cab weight	3440		1955	1485

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FECXKHRESFAC (129kW)

B

Wheelbase (m) : 4.450

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	55	0.299	51.3	3.7
Accelerator (Engine)	1	-0.855	1.2	-0.2
Gearshift	1	-0.816	1.2	-0.2
Brake, Clutch	28	-0.132	28.8	-0.8
Parking	1	0.000	1.0	0.0
Steering	51	-0.475	56.4	-5.4
Front bumper	14	-1.085	17.4	-3.4
Cab	363	-0.300	387.5	-24.5
HVAC	26	0.032	25.8	0.2
Cab Electric	45	-0.809	53.2	-8.2
Cab mounting	45	-0.289	47.9	-2.9
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.198	21.9	8.1
Chassis electronic	38	1.293	27.0	11.0
Spare tire carrier	2	5.387	-0.4	2.4
Frame	381	2.938	129.5	251.5
other (sprung weight)-IFS	0	0.000	0.0	0.0
eAxle	200	4.343	4.8	195.2
BSA	5	1.324	3.5	1.5
Charger,DC/DC converter-EV	77	0.156	74.5	2.7
Charger inlet	12	0.544	10.5	1.5
Motor assy mounting	30	4.315	0.9	29.1
PDU, Earth Cable-EV, AVAS, VCU	10	0.582	8.7	1.3
HV battery bracket	1408	2.162	723.9	684.1
HV harness	24	2.266	11.8	12.2
HVAC	19	-0.324	20.4	-1.4
other (sprung weight)	0	0.000	0.0	0.0
Sprung weight *2	2865		1717	1148
Unsprung weight	1040		373	667
Chassis Cab weight	3905		2090	1815

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FECXKKRDSFAC (129kW)

B

Wheelbase (m) : 4.750

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	53	0.287	49.8	3.2
Accelerator (Engine)	1	-0.855	1.2	-0.2
Gearshift	1	-0.816	1.2	-0.2
Brake, Clutch	28	-0.099	28.6	-0.6
Parking	1	0.000	1.0	0.0
Steering	51	-0.496	56.3	-5.3
Front bumper	14	-1.085	17.2	-3.2
Cab	363	-0.300	385.9	-22.9
HVAC	26	0.044	25.8	0.2
Cab Electric	45	-0.809	52.7	-7.7
Cab mounting	45	-0.289	47.7	-2.7
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.198	22.4	7.6
Chassis electronic	36	1.422	25.2	10.8
Spare tire carrier	2	5.837	-0.5	2.5
Frame	399	3.176	132.2	266.8
other (sprung weight)-IFS	0	0.000	0.0	0.0
eAxle	200	4.643	4.5	195.5
BSA	5	1.324	3.6	1.4
Charger,DC/DC converter-EV	77	0.156	74.6	2.5
Charger inlet	12	0.544	10.6	1.4
Motor assy mounting	30	4.619	0.8	29.2
PDU, Earth Cable-EV, AVAS, VCU	10	0.582	8.8	1.2
HV battery bracket	946	1.662	615.1	330.9
HV harness	22	2.285	11.4	10.6
HVAC	19	-0.324	20.3	-1.3
other (sprung weight)	0	0.000	0.0	0.0
Sprung weight *2	2415		1602	813
Unsprung weight	1040		373	667
Chassis Cab weight	3455		1975	1480

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4 Weight distribution table

Model: FECXKKRESFAC (129kW)

B

Wheelbase (m) : 4.750

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Cooling	55	0.383	50.6	4.4
Accelerator (Engine)	1	-0.855	1.2	-0.2
Gearshift	1	-0.816	1.2	-0.2
Brake, Clutch	28	-0.099	28.6	-0.6
Parking	1	0.000	1.0	0.0
Steering	51	-0.476	56.1	-5.1
Front bumper	14	-1.085	17.2	-3.2
Cab	363	-0.300	385.9	-22.9
HVAC	26	0.043	25.8	0.2
Cab Electric	45	-0.809	52.7	-7.7
Cab mounting	45	-0.289	47.7	-2.7
Rear bumper	0	0.000	0.0	0.0
LV battery	30	1.198	22.4	7.6
Chassis electronic	38	1.338	27.3	10.7
Spare tire carrier	2	5.837	-0.5	2.5
Frame	396	3.180	130.9	265.1
other (sprung weight)-IFS	0	0.000	0.0	0.0
eAxle	200	4.643	4.5	195.5
BSA	5	1.324	3.6	1.4
Charger,DC/DC converter-EV	77	0.156	74.6	2.5
Charger inlet	12	0.544	10.6	1.4
Motor assy mounting	30	4.619	0.8	29.2
PDU, Earth Cable-EV, AVAS, VCU	10	0.582	8.8	1.2
HV battery bracket	1408	2.162	767.2	640.8
HV harness	24	2.285	12.5	11.5
HVAC	19	-0.324	20.3	-1.3
other (sprung weight)	0	0.000	0.0	0.0
Sprung weight *2	2880		1757	1123
Unsprung weight	1040		373	667
Chassis Cab weight	3920		2130	1790

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude spare tire& disk, tool and person

10.4.2 Option equipment

Group	Option	Mass Variation	Mass Center Position (distance from FrAxle Center)[m]*1			Remark
			4x2			
			Standard cab	Wide cab		
			Single	Single (110kW)	Single (129kW)	
Chassis	ePTO(general)	+66 kg	0.339	0.339	0.339	
	ePTO(Reefer)	+77 kg	0.31	0.357	0.357	
	Front Stabilizer	+5 Kg	0.124	0.124	-	
	Rear stabilizer	+16 kg	2.85	3.14	3.74	
	24V(Equalizer)	+27 kg	0.873	0.873	0.889	
	12V (HD) 80AHx2	+24 kg	1.226	1.226	1.226	

Note
- *1 Distance from Fr. Axle Center ; +: backward, -: forward
- Some items are applied as standard or inapplicable

10.5 Chassis cab drawings

10.5.1 Chassis cab drawings

Main model	Applicable model		Page
	LHD	RHD	
FEAVKBRCSFAD	-	-	26
FEAVKCRCSFAD	-	-	27
FEAVKERCSFAD	-	-	28
FEAVKERDSFAB	-	-	29
FEBVKERCSFAD	-	-	30
FEBVKERDSFAB	-	-	31
FEBVKGRDSFAB	-	-	32
FEB7KERDSFAC	-	-	33
FEB7KGRDSFAC	-	-	34
FECXKGRDSFAC	-	-	35
FECXKHRDSFAC	-	-	36
FECXKHRESFAC	-	-	37
FECXKKRDSFAC	-	-	38
FECXKKRESFAC	-	-	39

10.5 Chassis cab drawings

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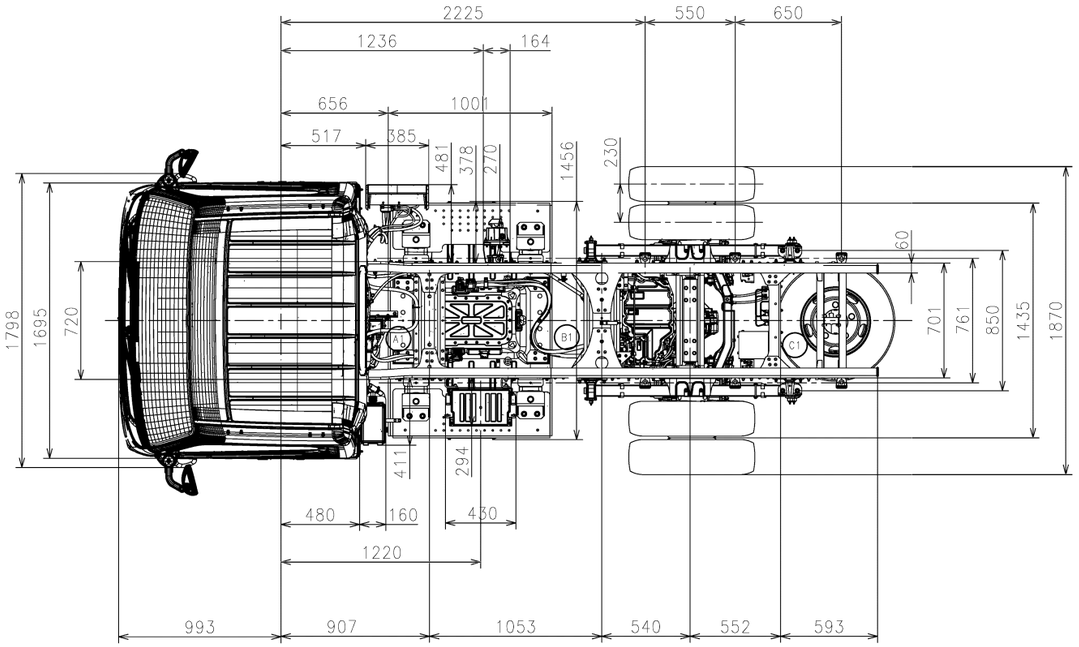

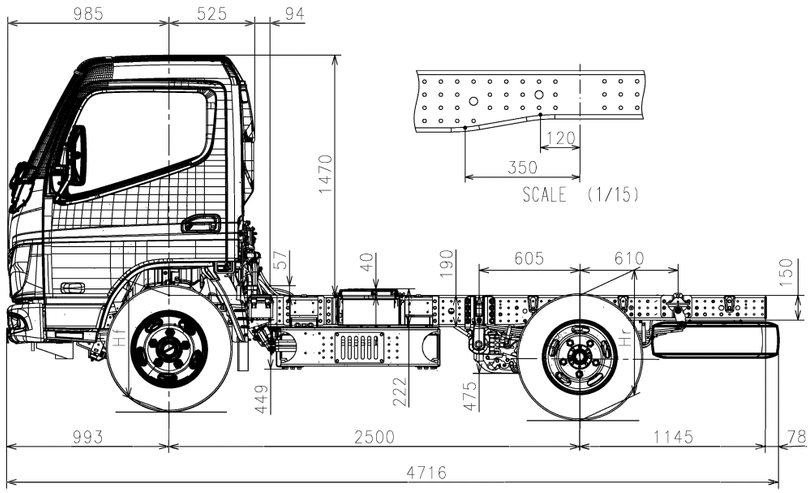

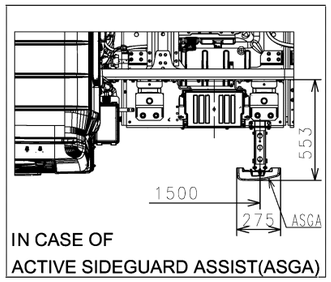

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TIRE SIZE	205/75R17.5

10.5 Chassis cab drawings

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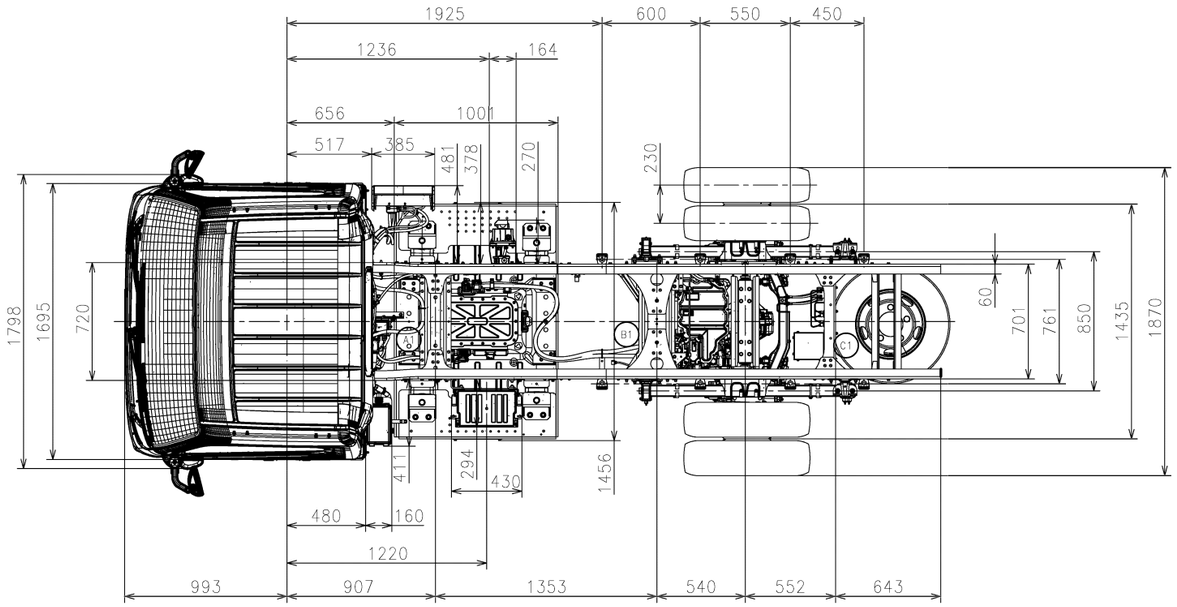

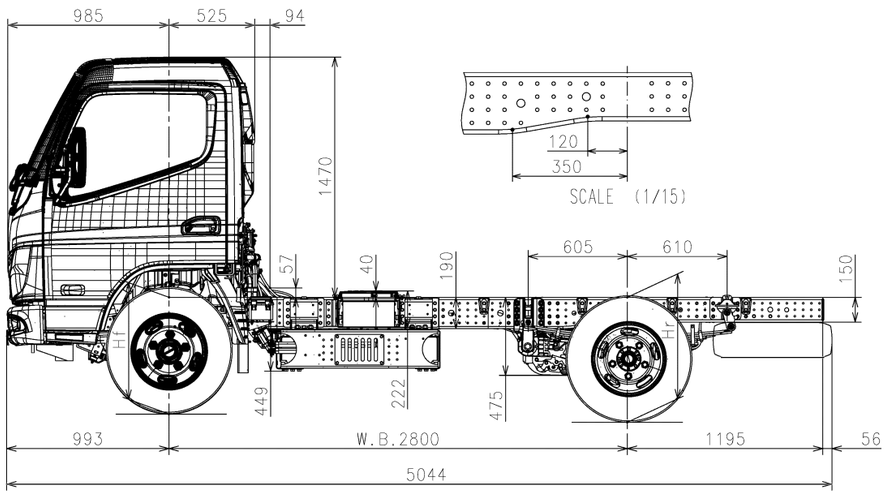

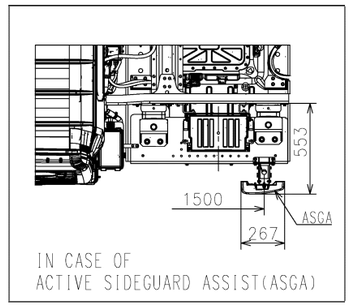

	FEAVKCRCS
TIRE SIZE	205/75R17.5

10.5 Chassis cab drawings

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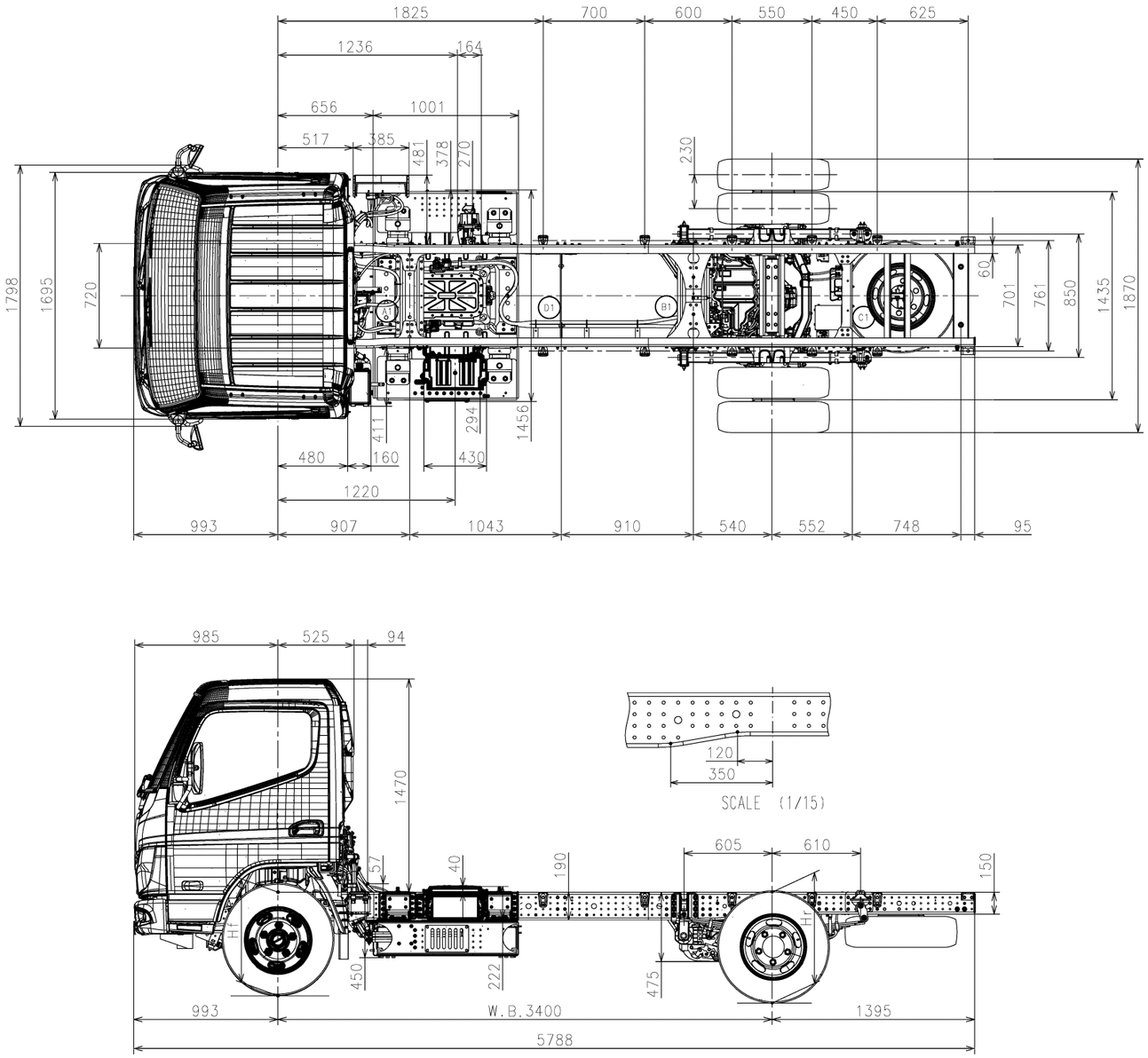

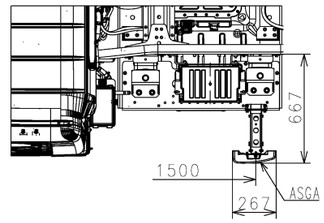

In case of Active Side Guard Assist (ASGA) option

	FEAVKERCS
TIRE SIZE	205/75R17.5

10.5 Chassis cab drawings

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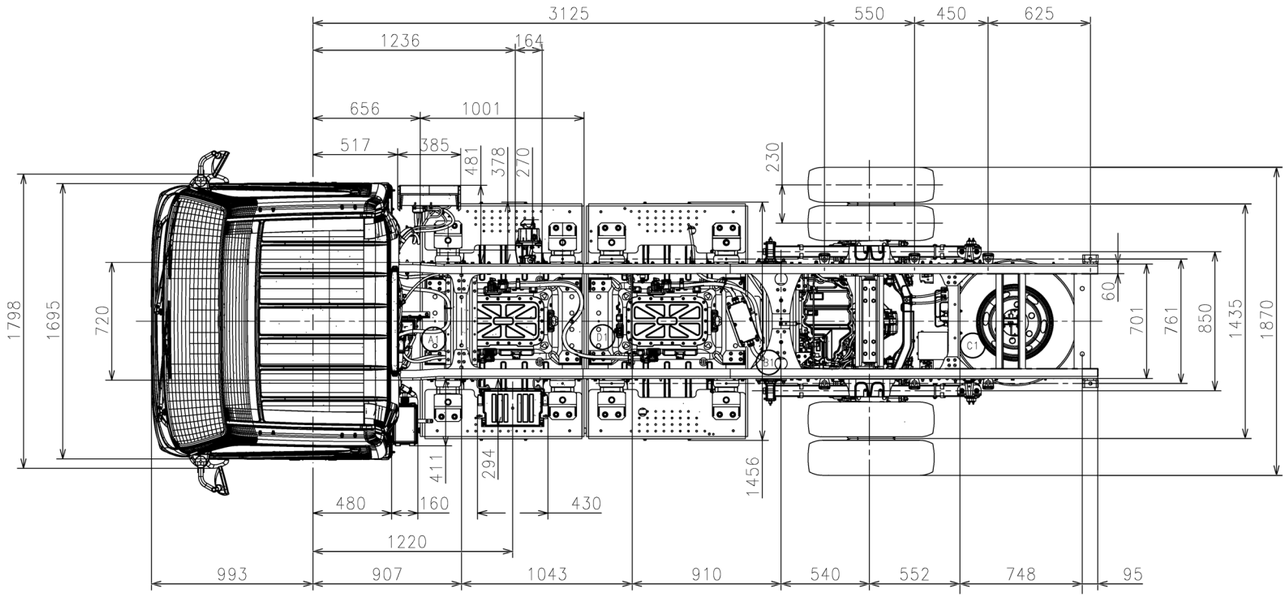

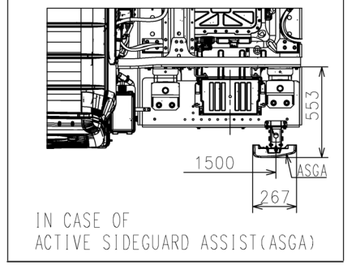

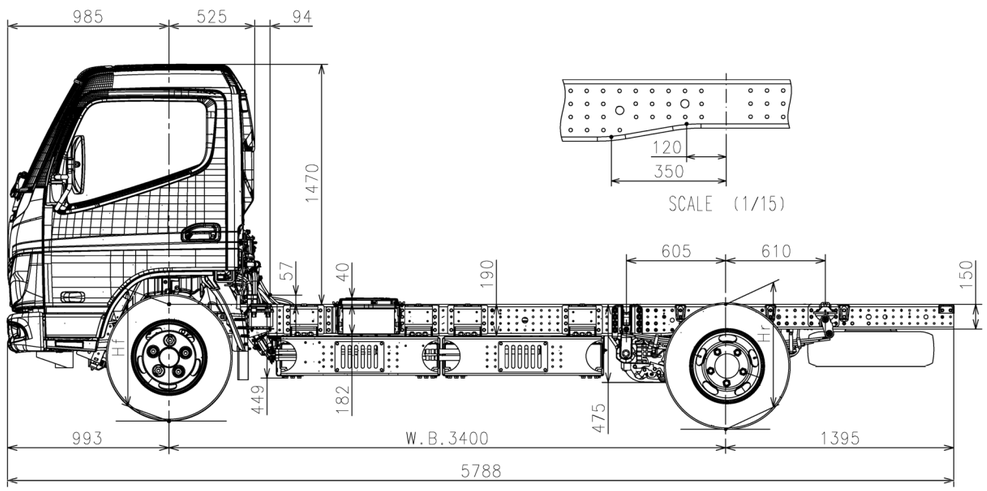

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TIRE SIZE	205/75R17.5

10.5 Chassis cab drawings

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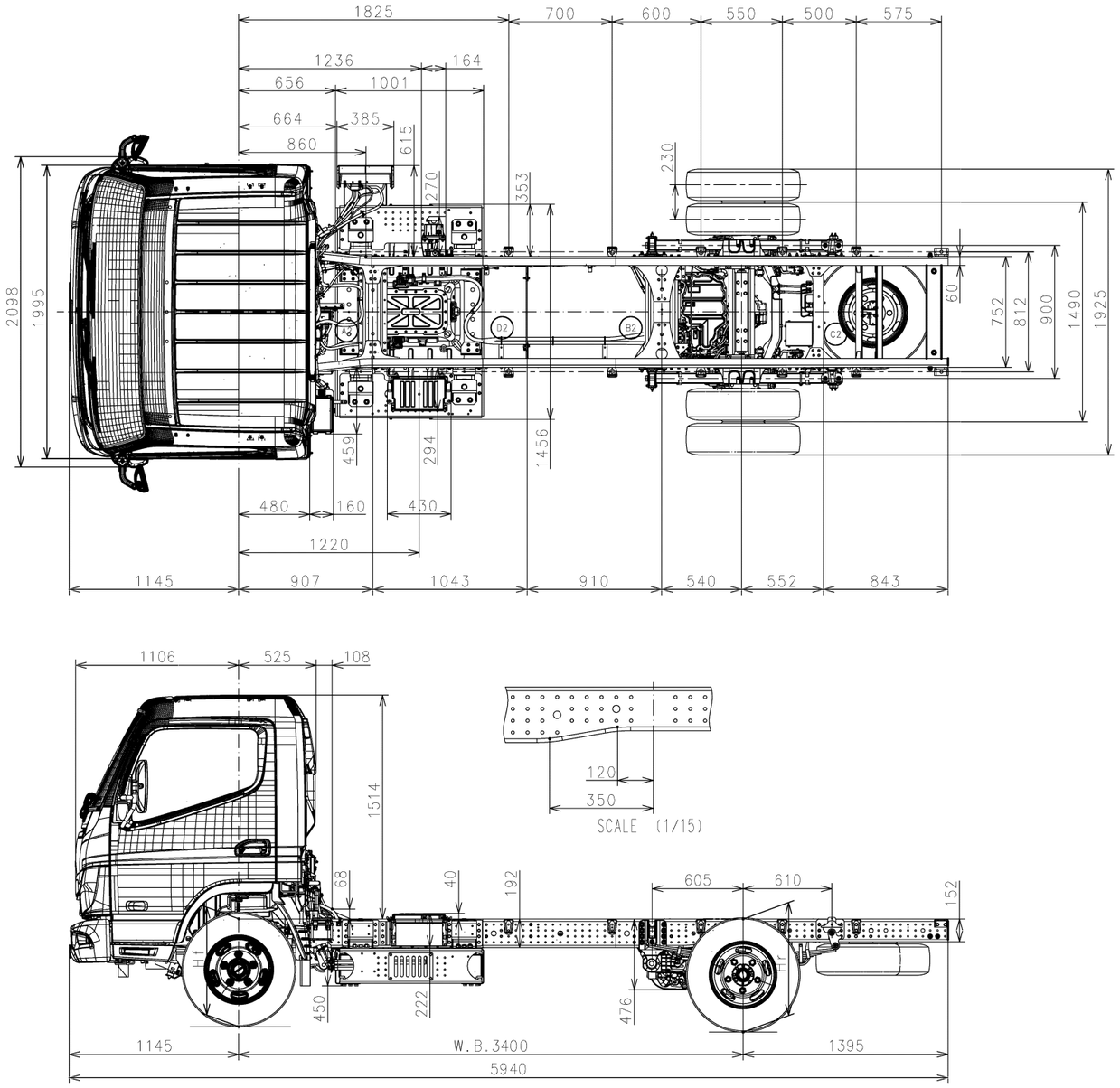

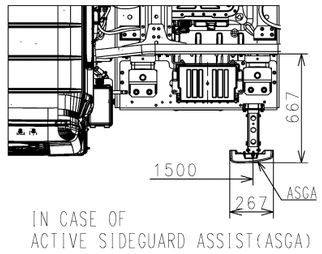

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TIRE SIZE	205/75R17.5

10.5 Chassis cab drawings

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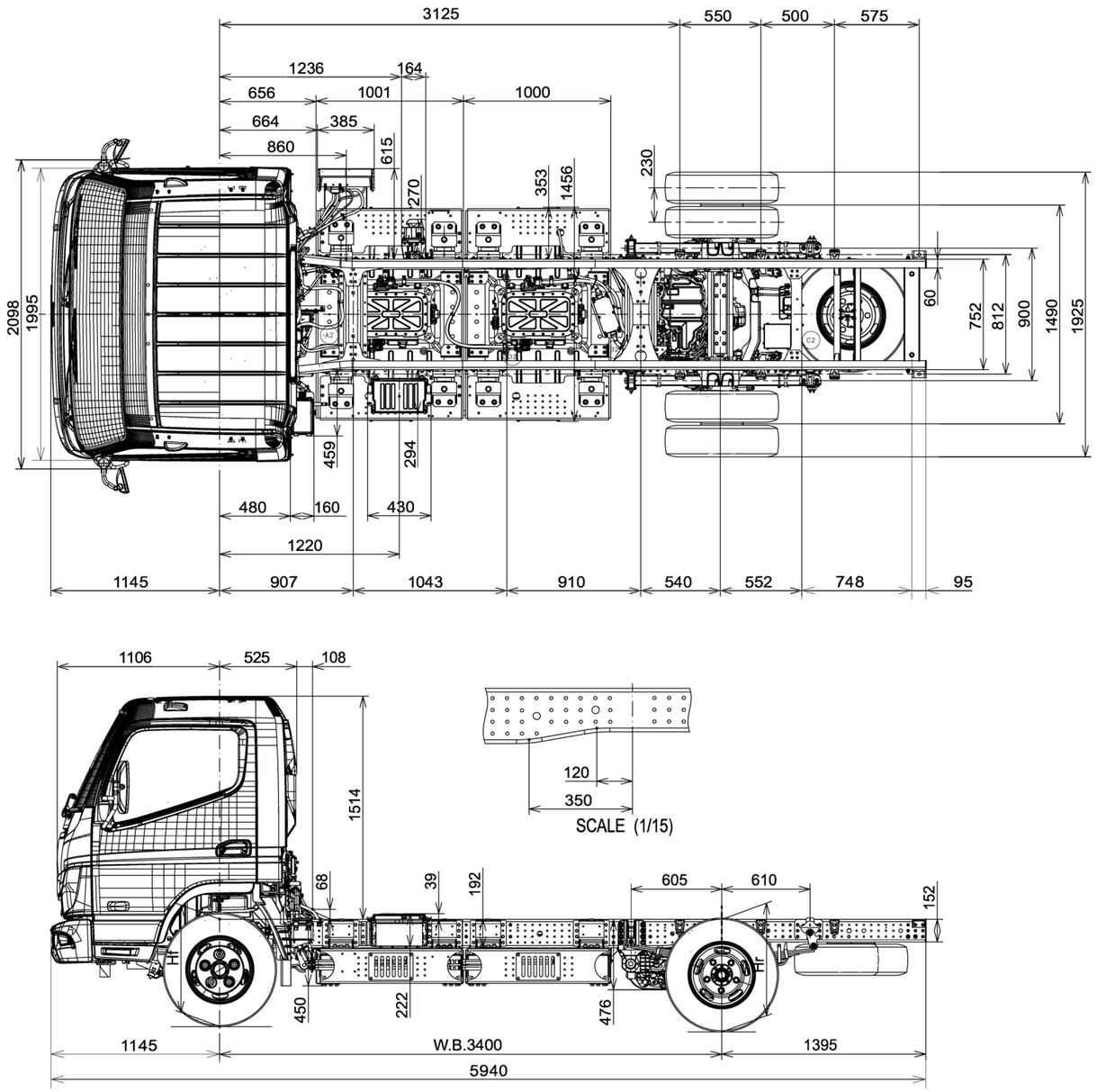
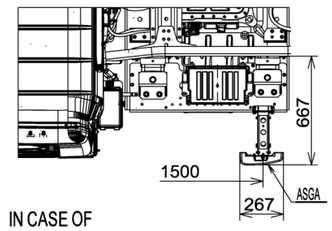


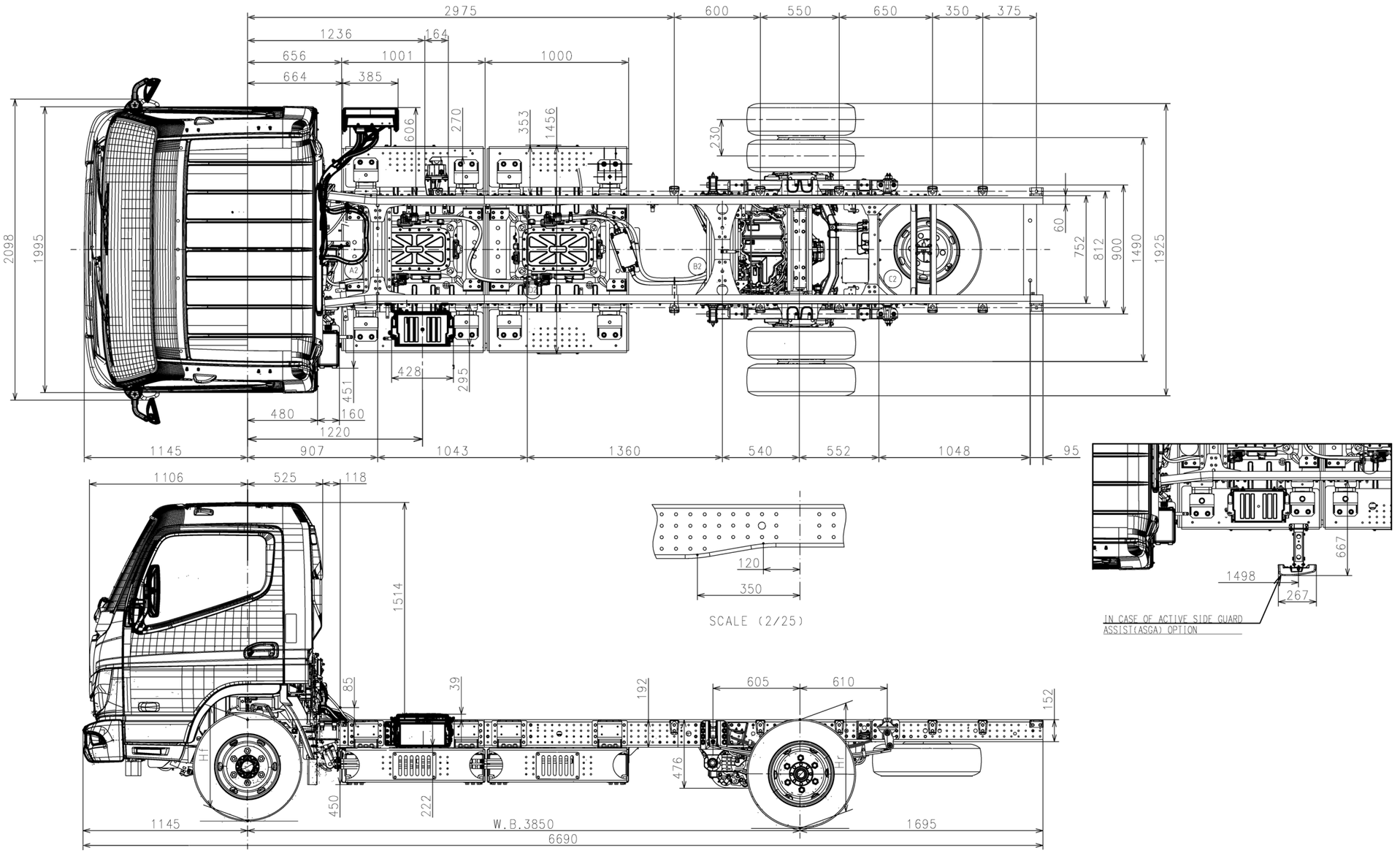


IN CASE OF
ACTIVE SIDEGUARD ASSIST(ASGA)

	FEBVKERD
TIRE SIZE	205/75R17.5

10.5 Chassis cab drawings

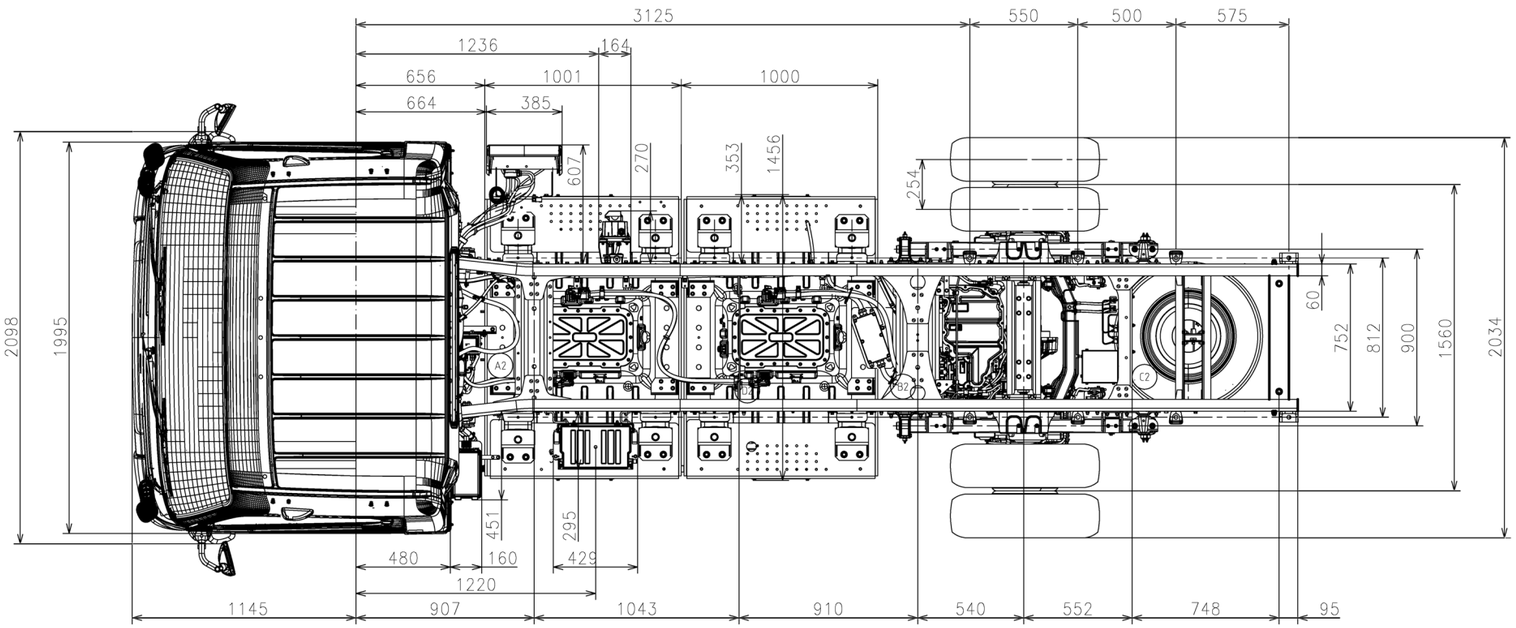
<FEBVKGRDSFAB>

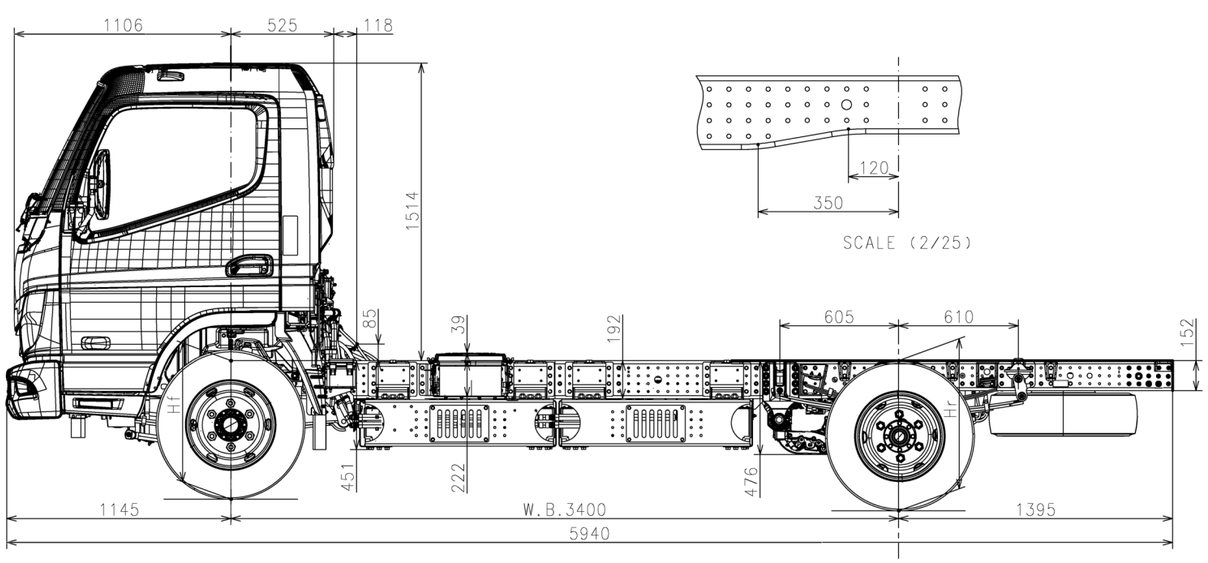


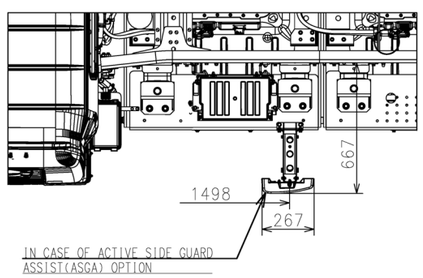
	FEBVKGRD
TIRE SIZE	205/75R17.5

10.5 Chassis cab drawings

<FEB7KERDSFAC>







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TIRE SIZE	215/75R17.5

10.5 Chassis cab drawings

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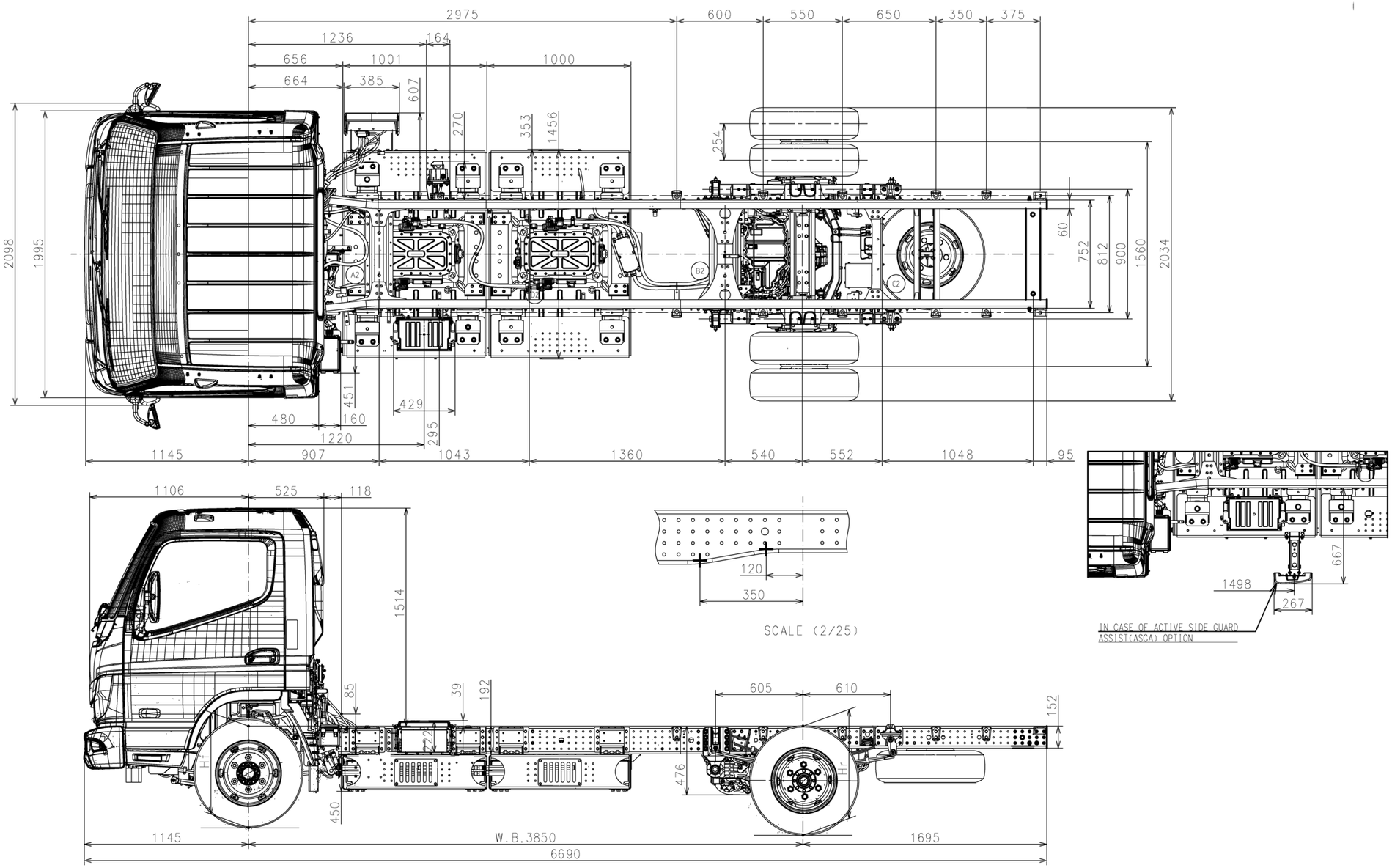

	FEB7KGRD
TIRE SIZE	215/75R17.5

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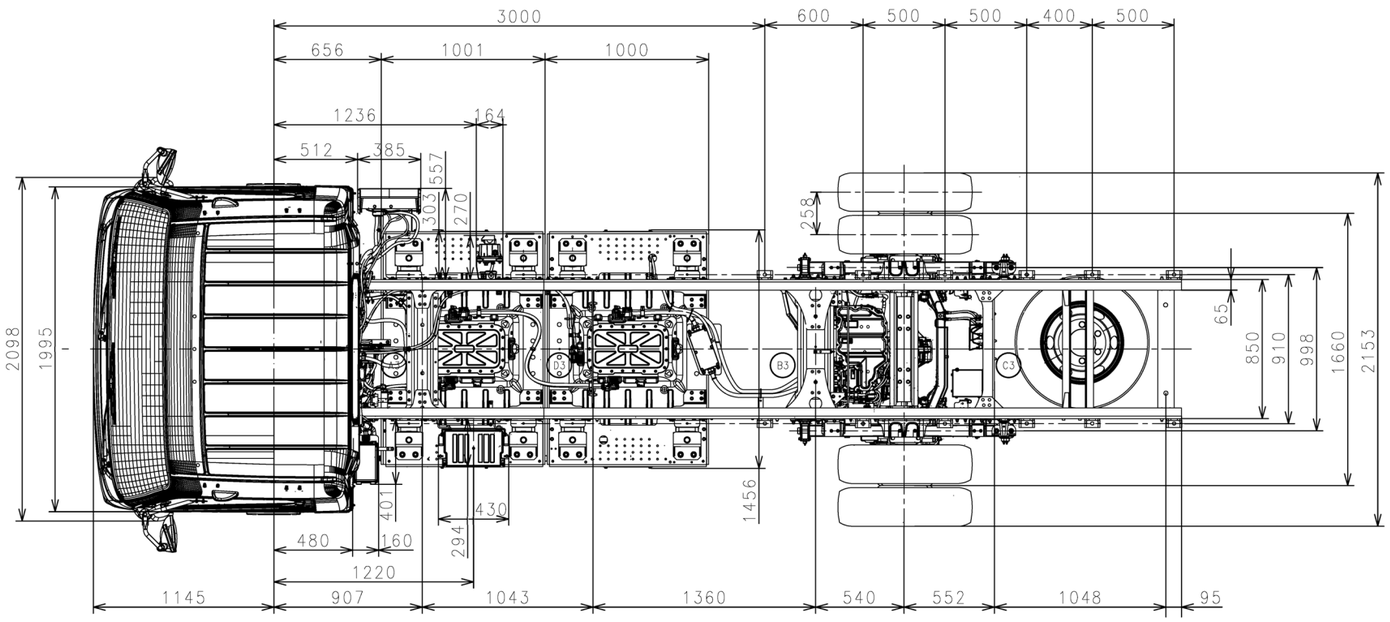

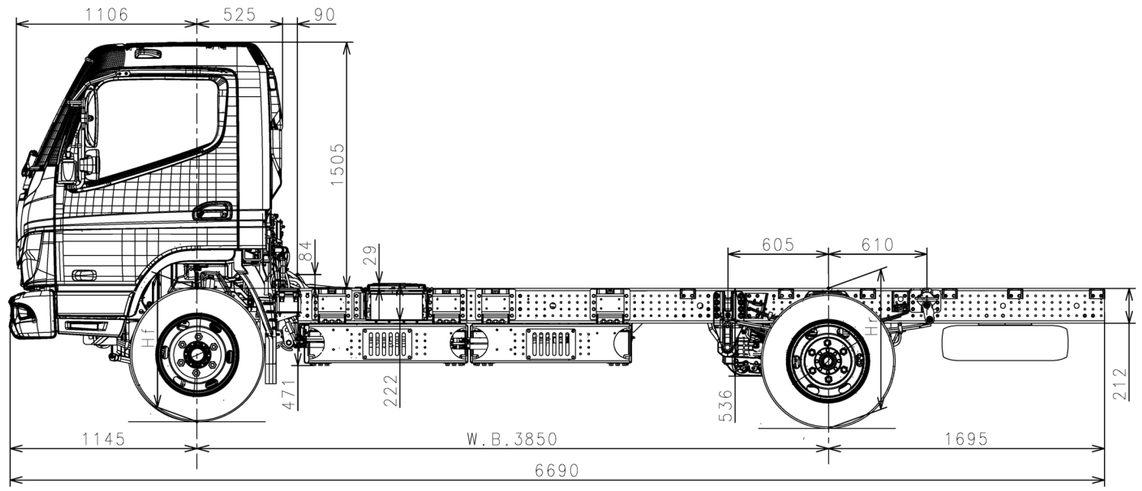

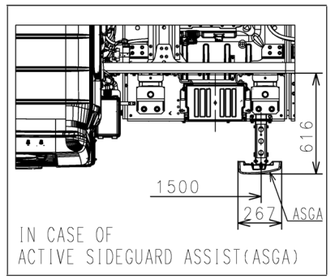

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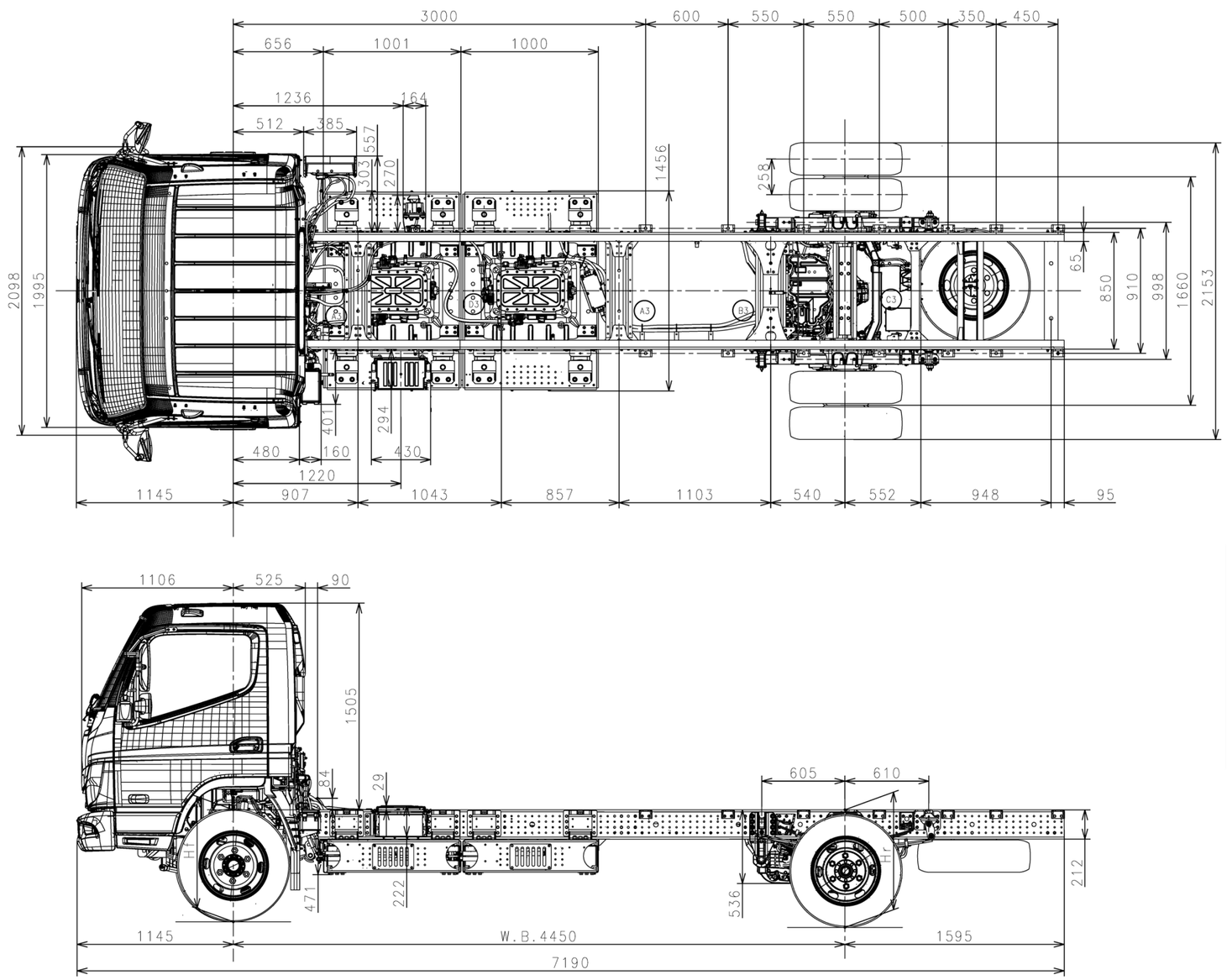
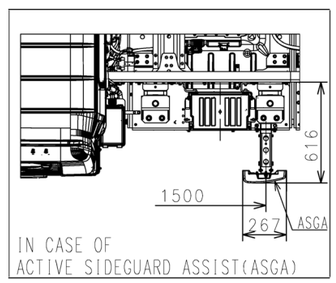
TIRE SIZE	225/70R19.5

<FECXKHRDSFAC>





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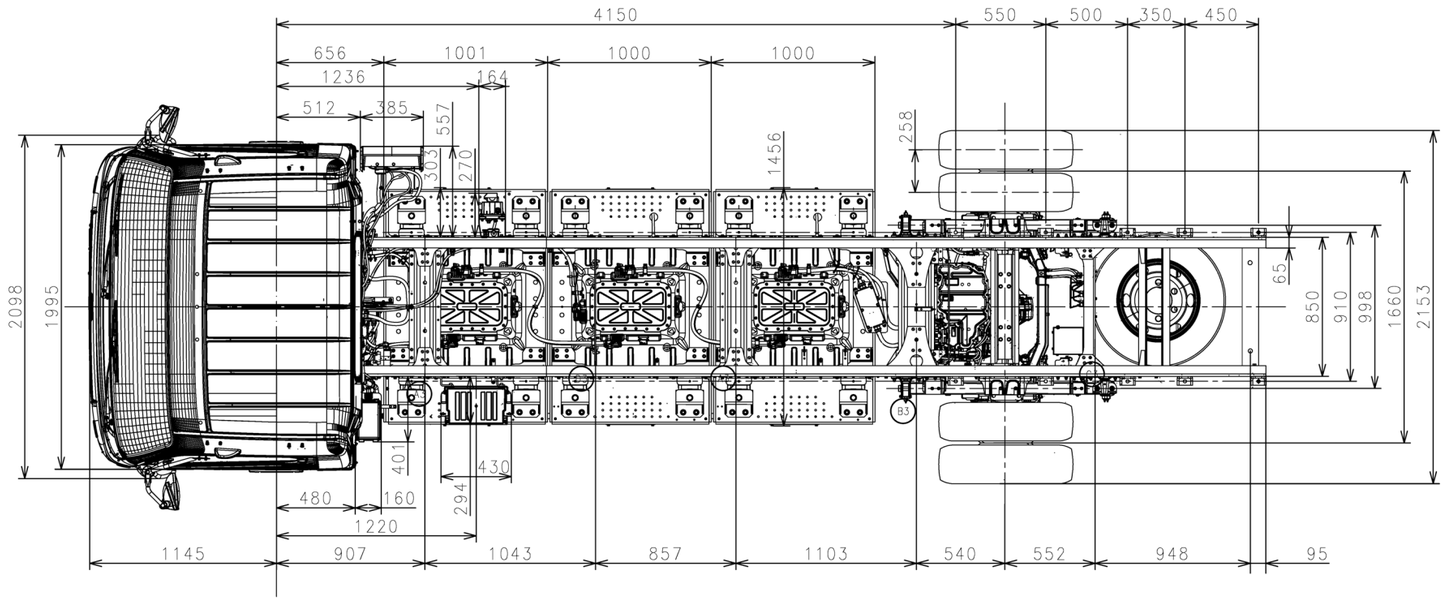
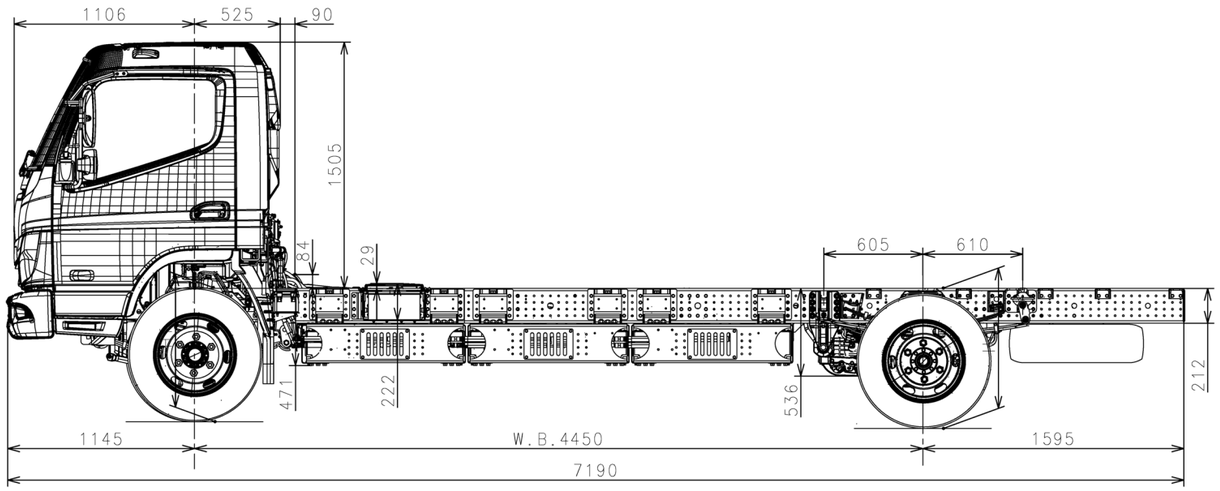
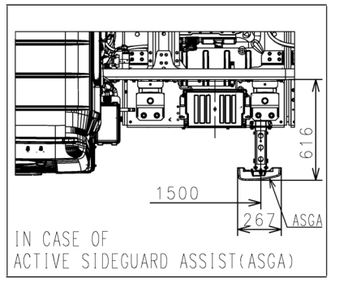
TIRE SIZE	225/70R19.5

<FECXKHRESFAC>







	FECXKHRE
TIRE SIZE	225/70R19.5

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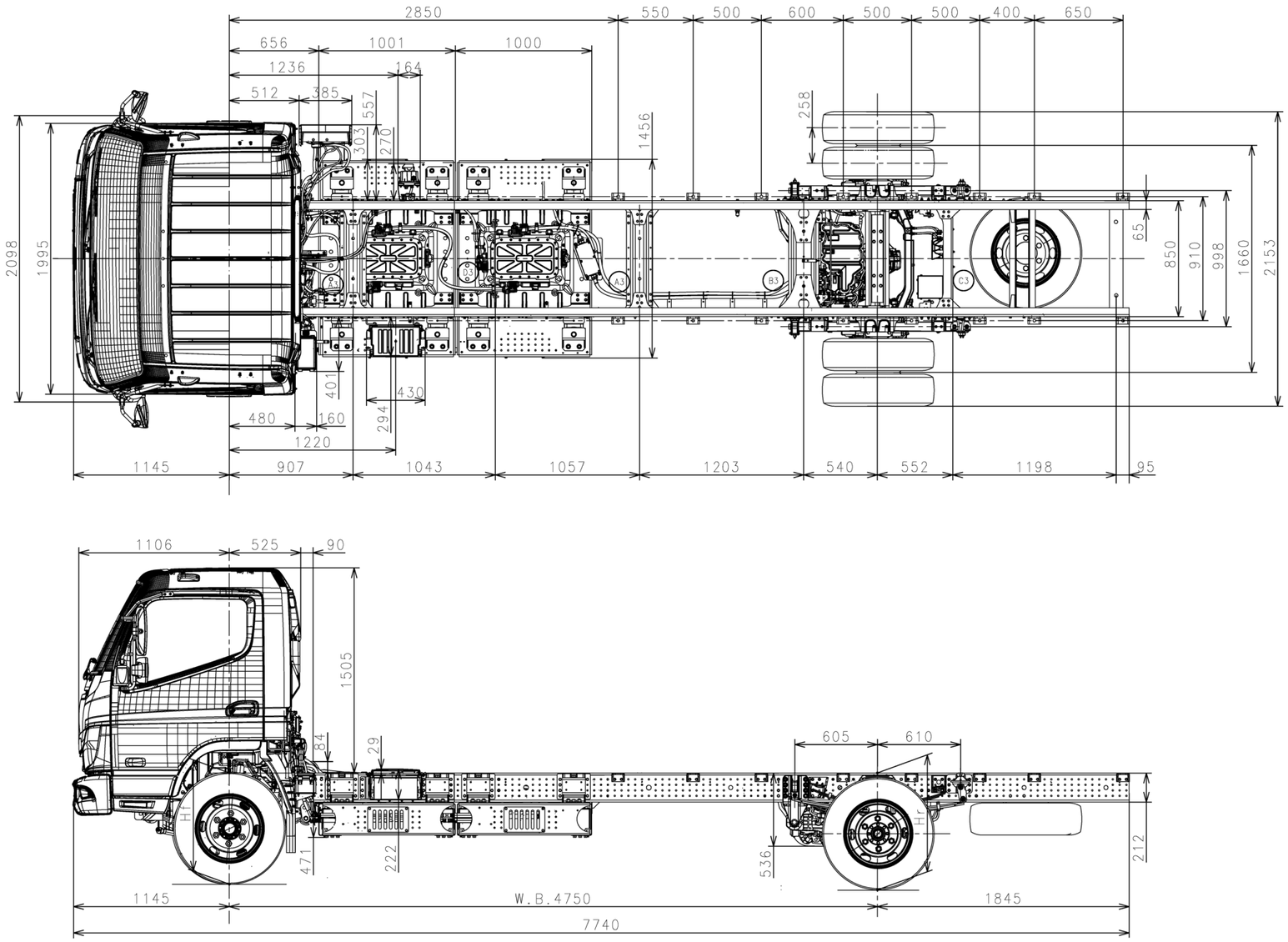

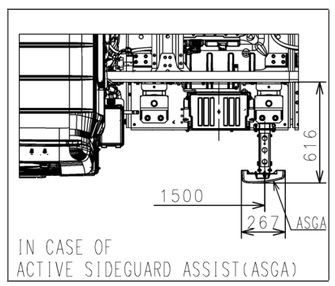

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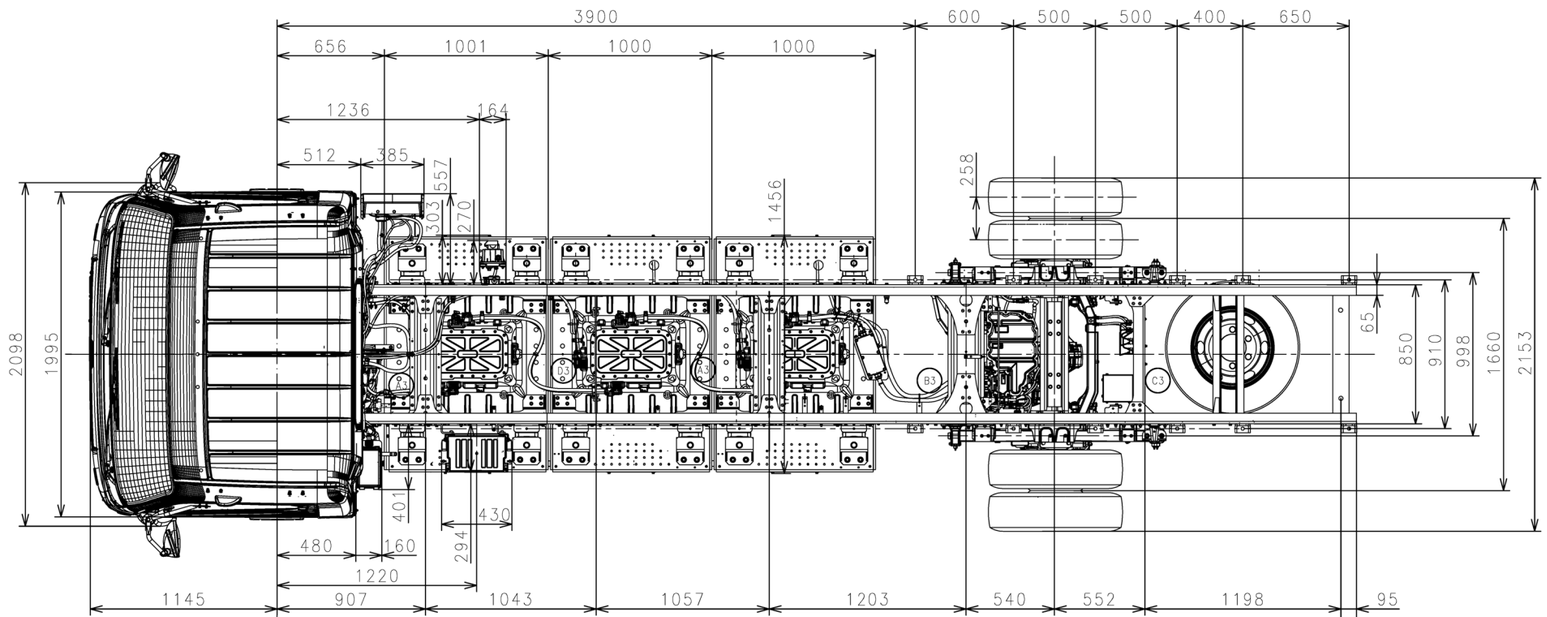
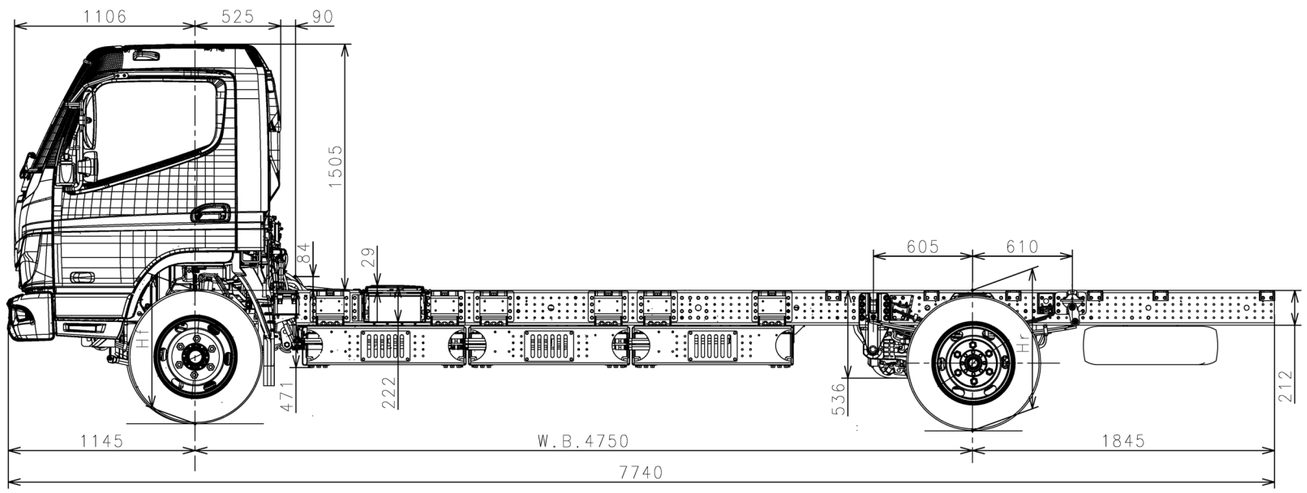
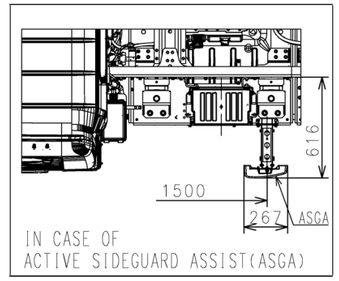
TIRE SIZE	225/70R19.5

<FECXKKRESFAC>





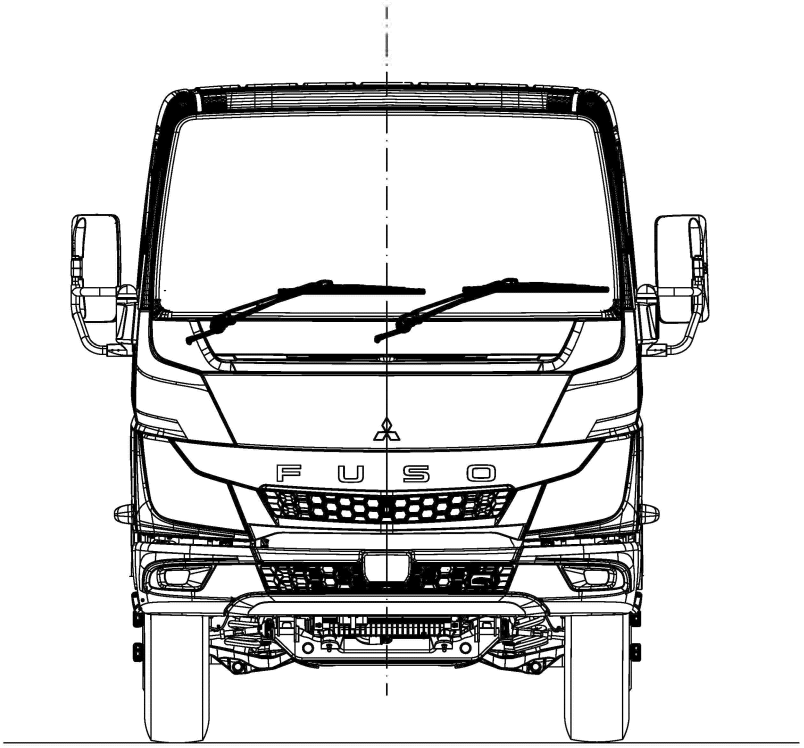


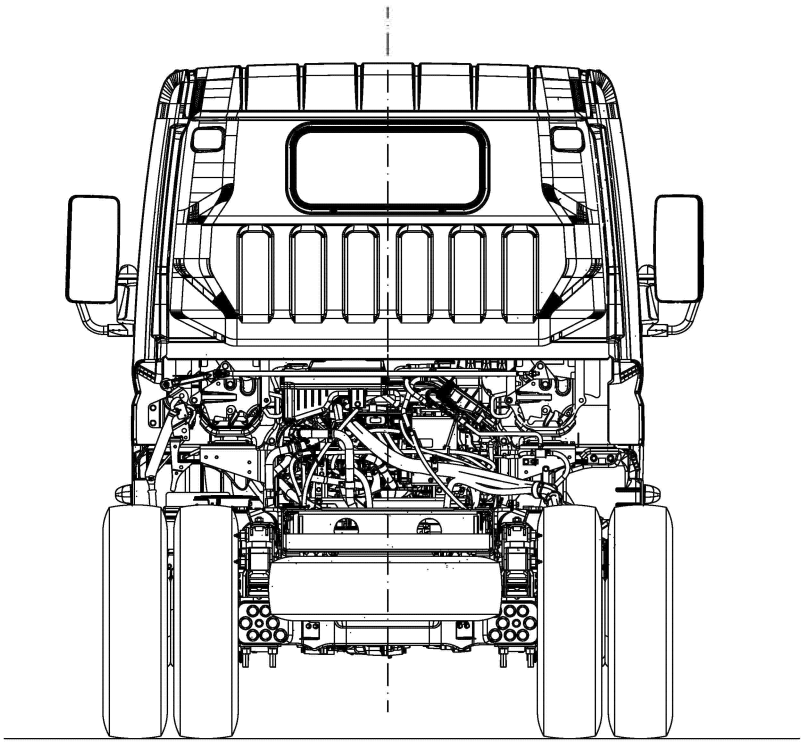
	FECXKKRE
TIRE SIZE	225/70R19.5

10.5.2 Cab drawings

Main model	Applicable model		Page
	LHD	RHD	
FEAVKERDSFAB	-	FEAVKBRCSFAD	41
	-	FEAVKCRCSFAD	
	-	FEAVKERCSFAD	
FEBVKERDSFAB	-	FEBVKERCSFAD	42
	-	FEBVKGRDSFAB	
FEB7KERDSFAC	-	FEB7KGRDSFAC	43
FECXKGRDSFAC	-	FECXKHRDSFAC	44
	-	FECXKHRESFAC	
	-	FECXKKRDSFAC	
	-	FECXKKRESFAC	

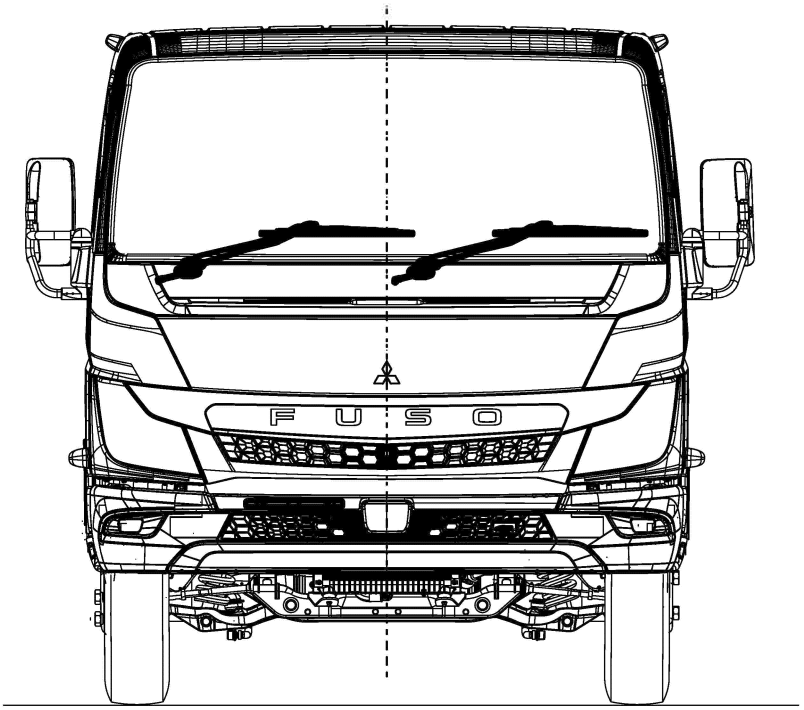
10.5 Chassis cab drawings

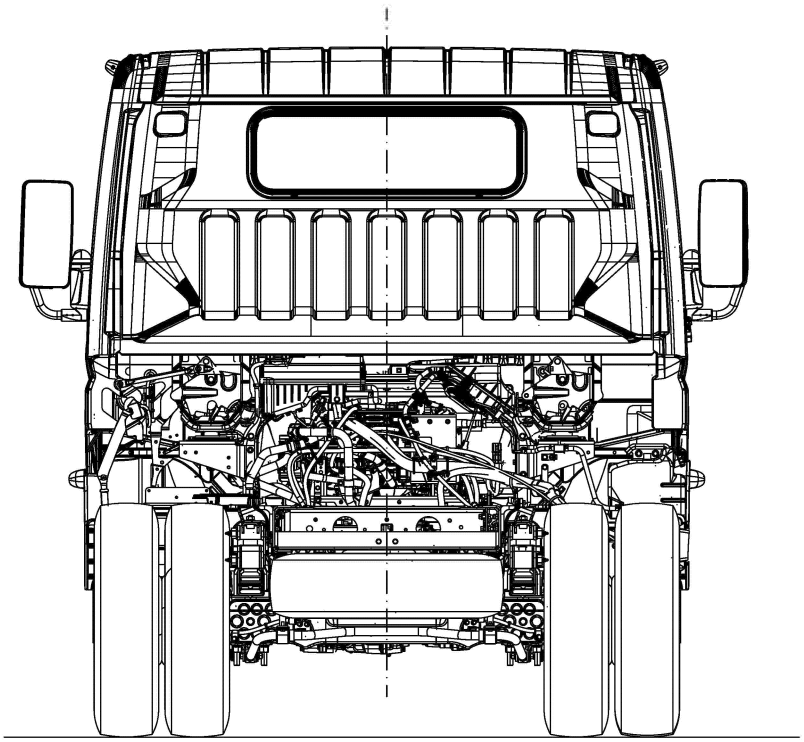




FEAVKERDSFAB FEAVKCRCSFAD
FEAVKBRCSFAD FEAVKERCSFAD

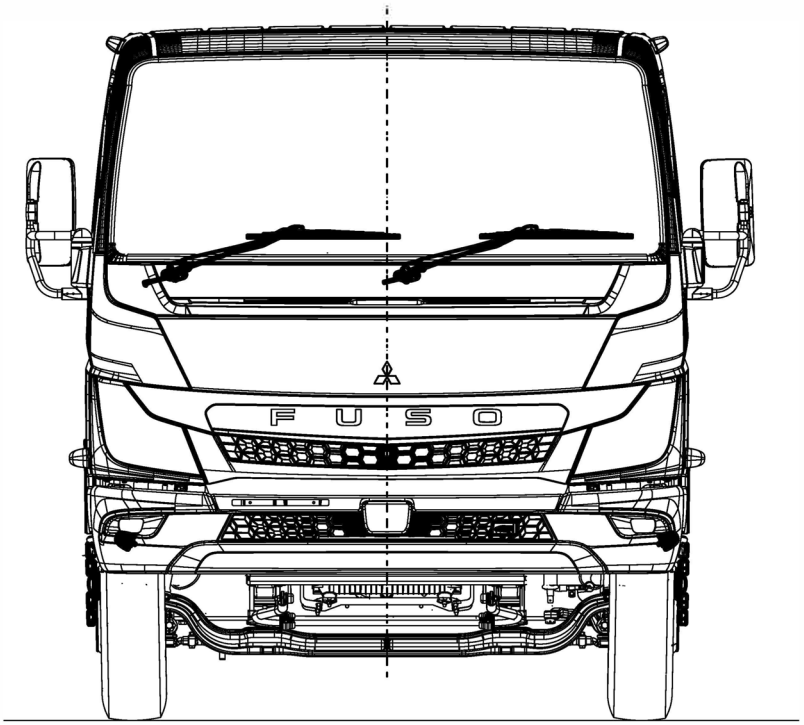
10.5 Chassis cab drawings

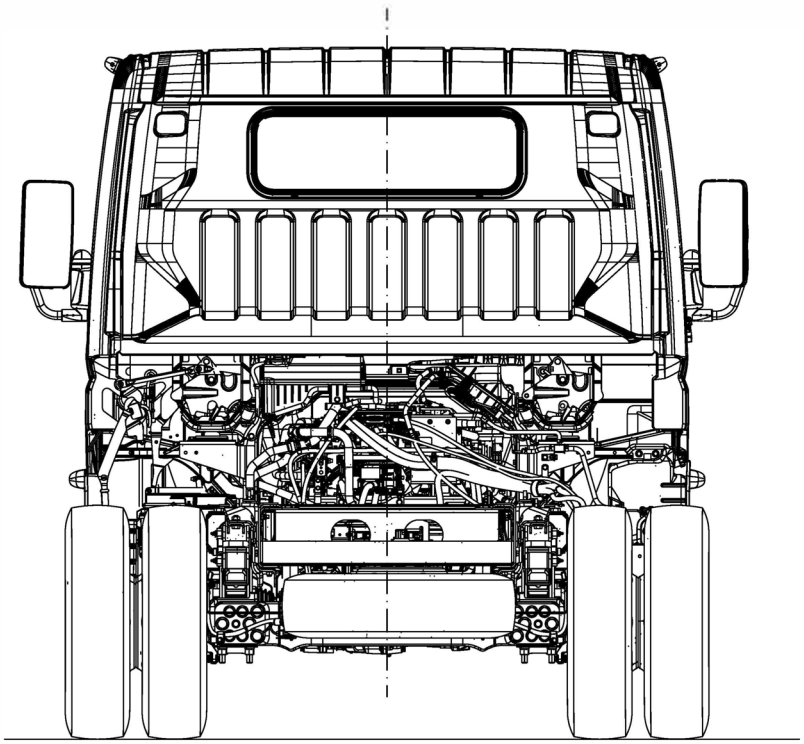




FEBVKERDSFAB FEBVKERCSFAD
FEBVKGRDSFAB

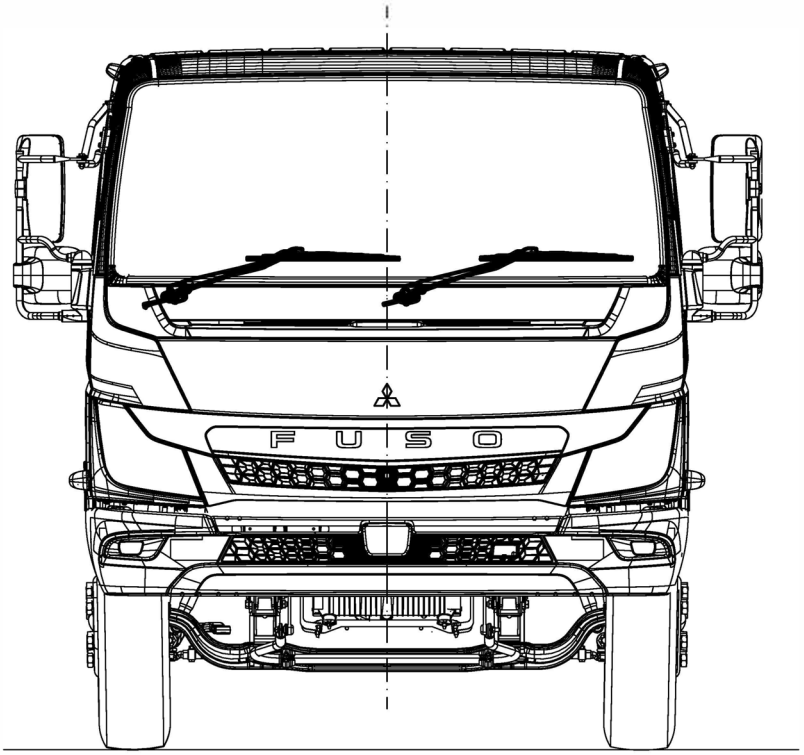
10.5 Chassis cab drawings

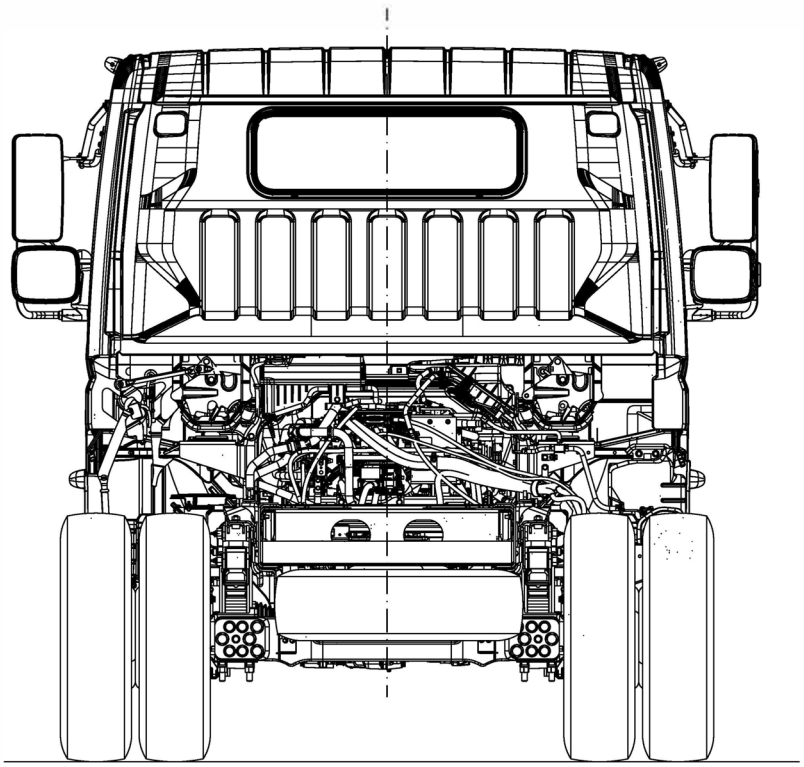




FEB7KERDSFAC
FEB7KGRDSFAC

10.5 Chassis cab drawings

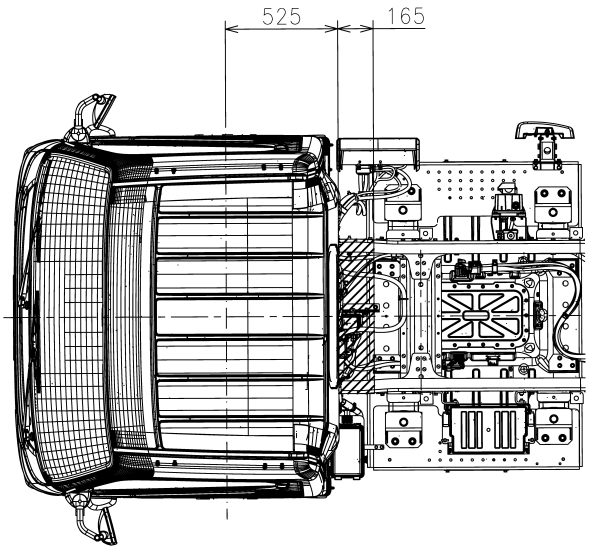


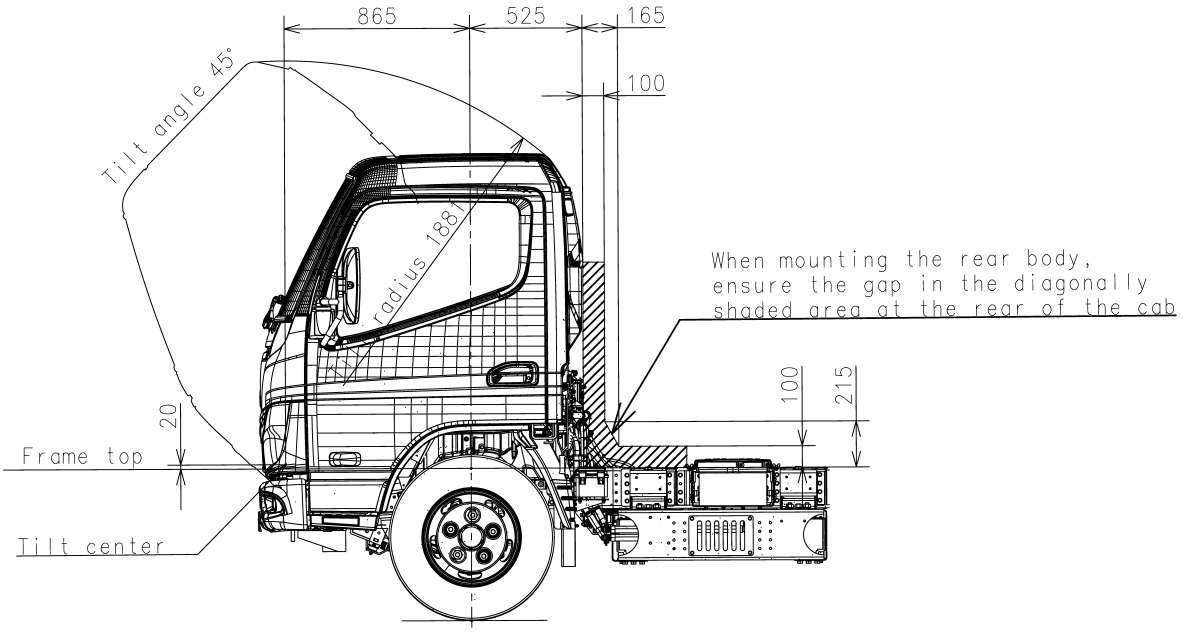


FECXKHRD/ESFAC
FECXKGRDSFAC FECXKKRD/ESFAC

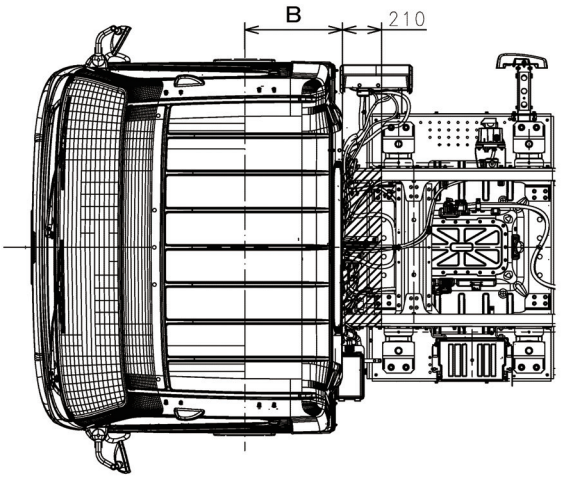
10.5.3 Cab side view

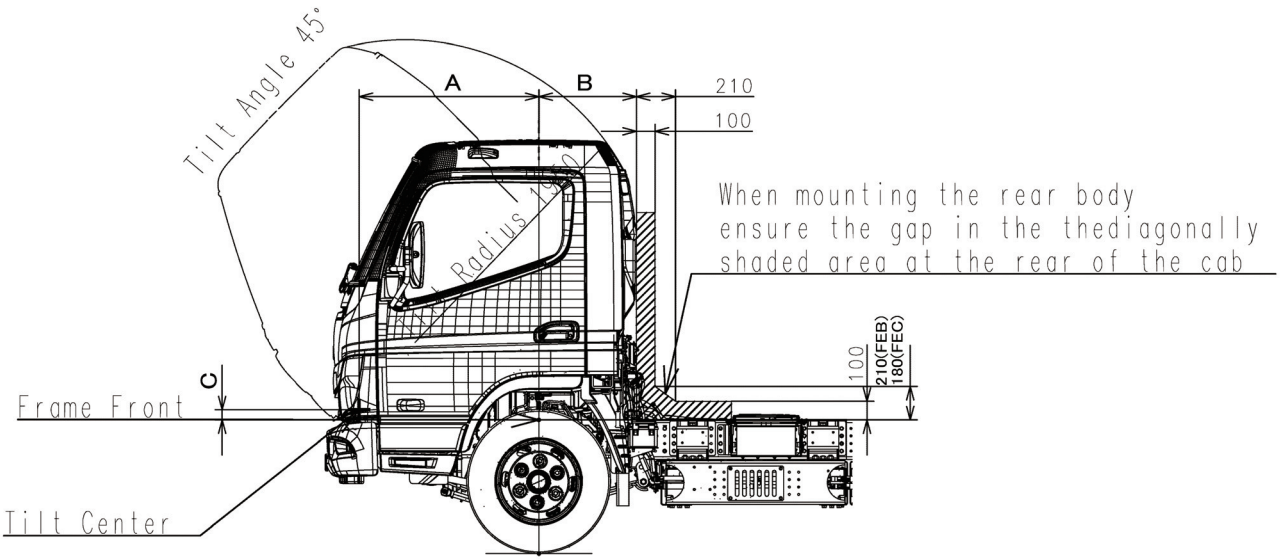
<Standard single cab>





<Wide single cab>





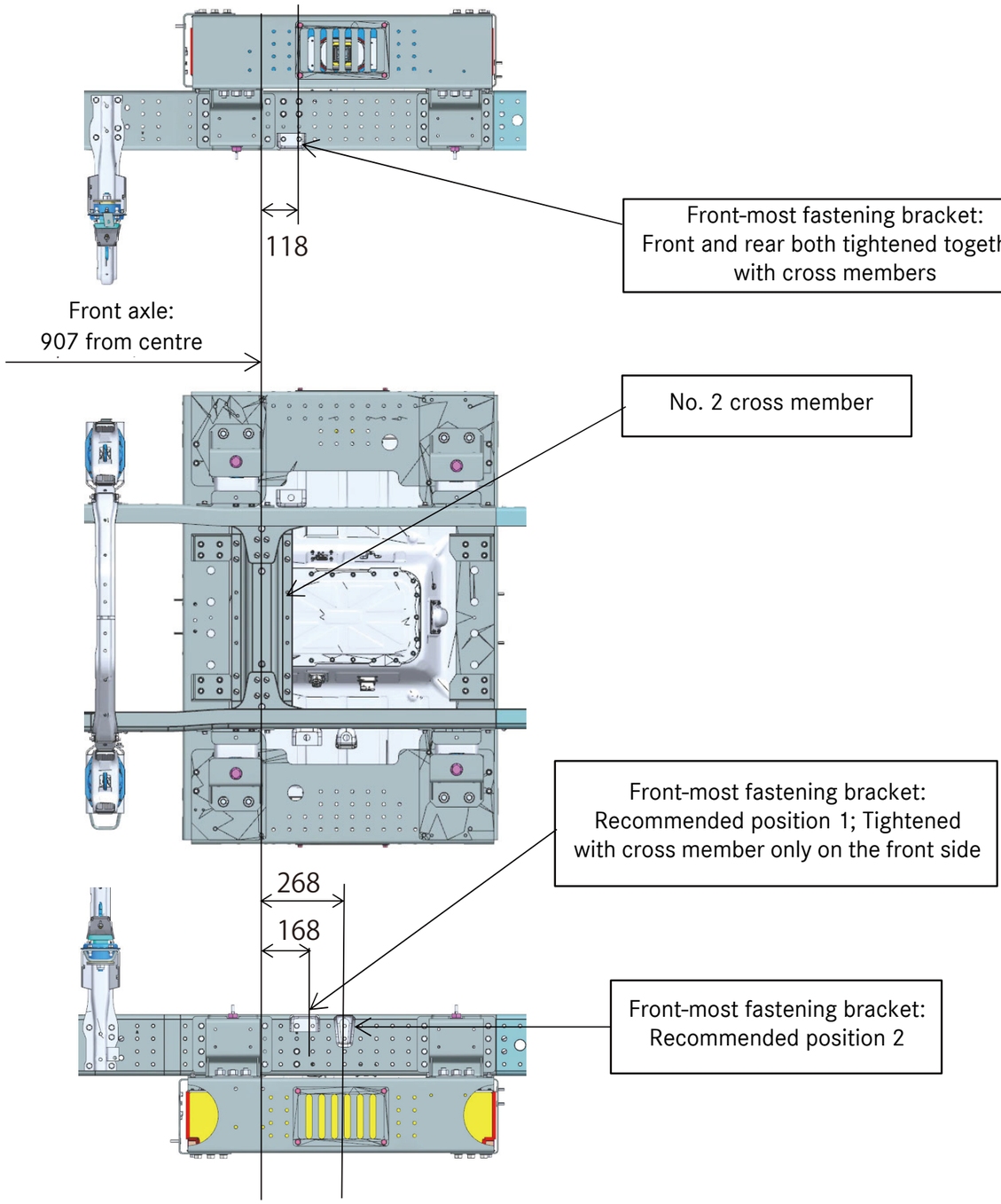
unit(mm)

	A :Front axle centre to cab tilt centre	B :Front axle centre to cab end	C :Top surface of frame to cab tilt centre
FEB	965	525	65
FEC	965	525	55

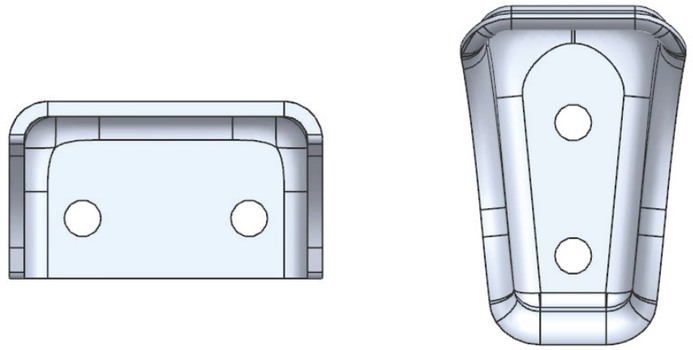
10.5 Chassis cab drawings

10.5.4 Rear body tightening bracket mounting position diagram

<FEA>



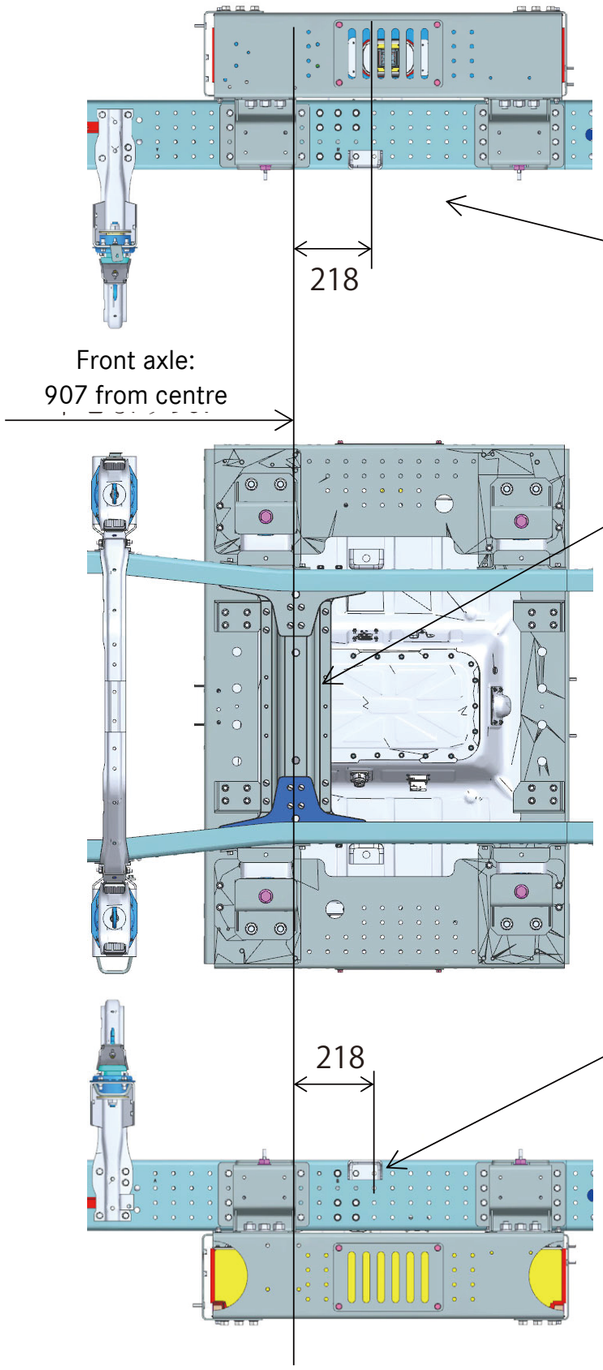
Bracket reference shape



FEA series:
Detailed view around No. 2 cross-section

10.5 Chassis cab drawings

<FEB>

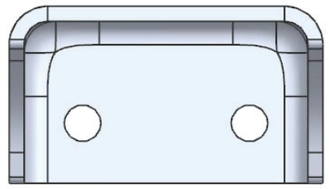


Front-most fastening bracket:
Front and rear both tightened together with cross members

No. 2 cross member

Front-most fastening bracket:
Tightened with cross member only on the front side

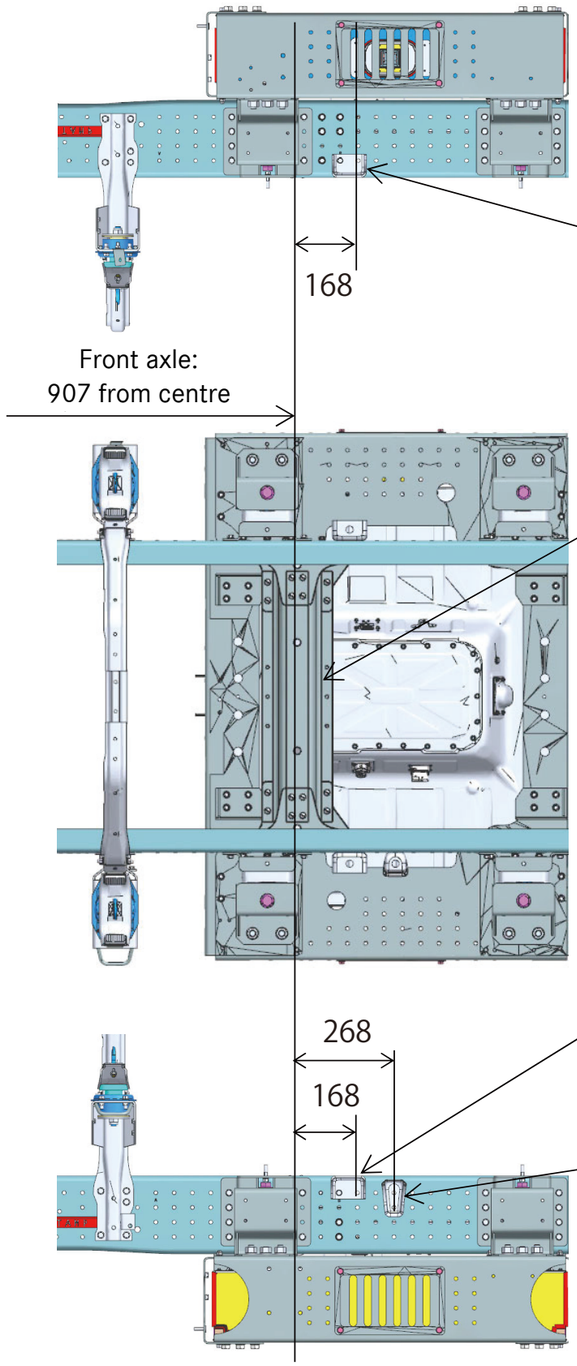
Bracket reference shape



FEB series:
Detailed view around No. 2 cross-section

10.5 Chassis cab drawings

<FEC>



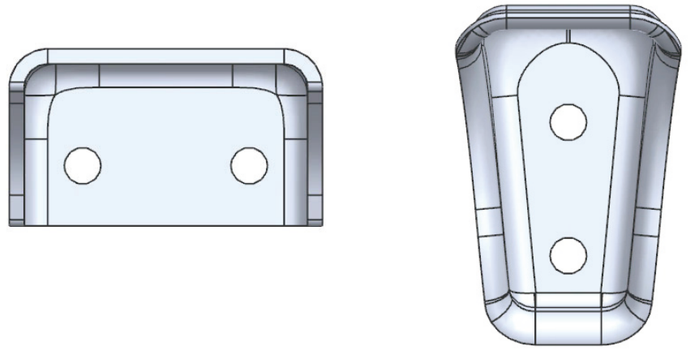
Front-most fastening bracket:
Tightened with cross member only on the front side

No. 2 cross member

Front-most fastening bracket:
Recommended position 1; Tightened with cross member only on the front side

Front-most fastening bracket:
Recommended position 2

Bracket reference shape



FEC series:
Detailed view around No. 2 cross-section

10.5.5 Precautions for cross-member co-tightening

When tightening a cross member and mounting fastening bracket together, use the parts and tightening torques shown in the table below.

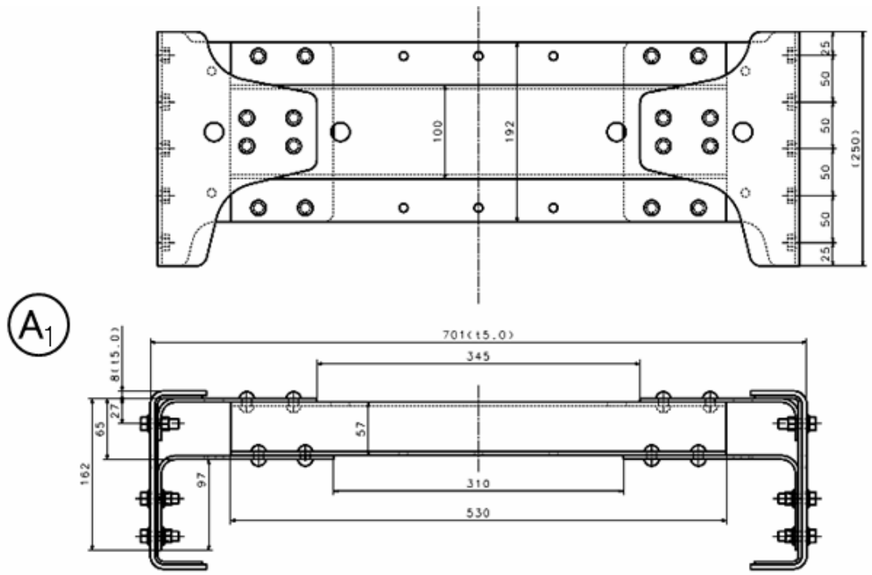
Unit: N·m {kgf·m}

	Flange bolt	Flange nut
Size	M10	
Strength classification	8T	6T
Tightening torque	60~80 {6~8 }	

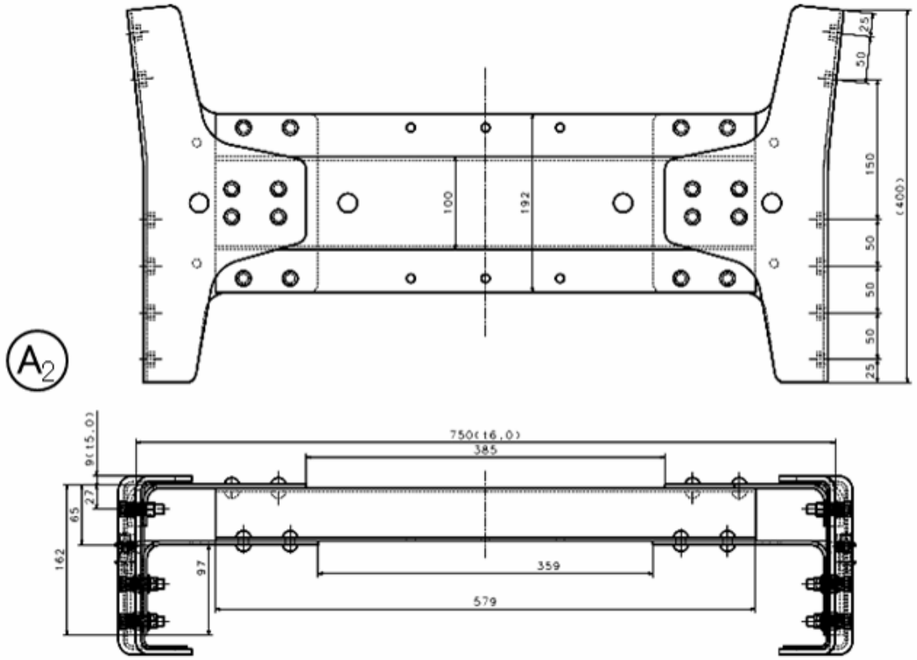
10.6 Frame structure

10.6.1 Details of cross member

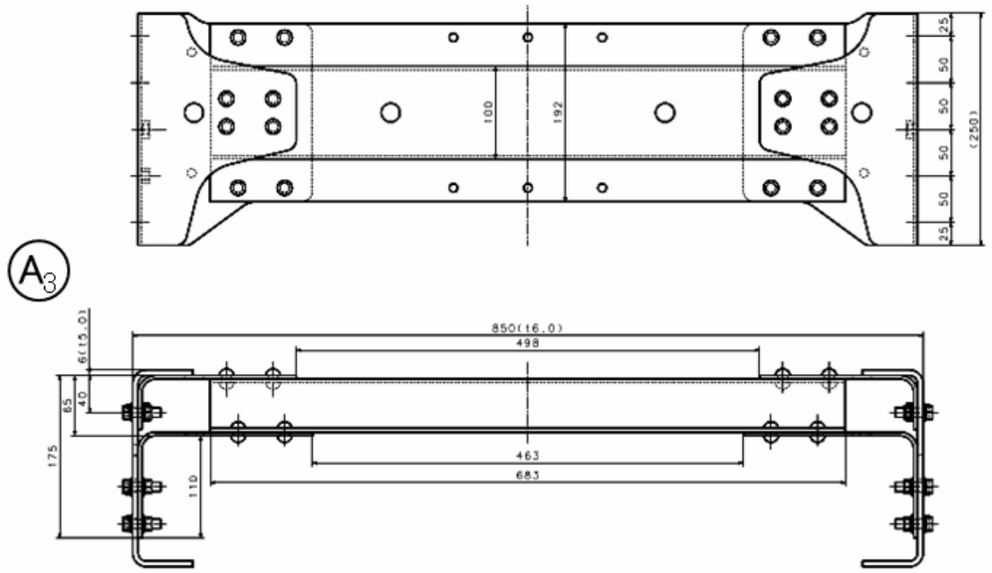
A1


100
192
25
50
50
50
50
25
(250)
701(15.0)
8(15.0)
345
27
65
57
162
97
310
530

A2

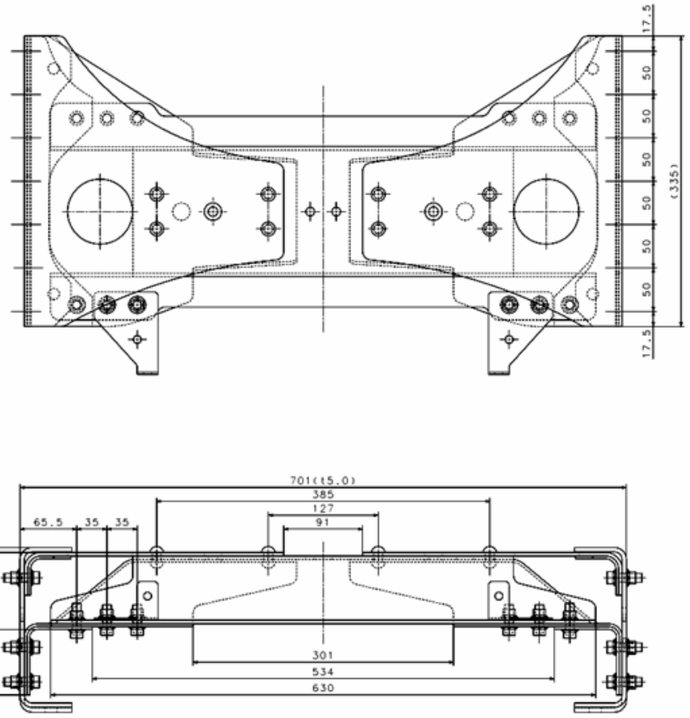

100
192
25
50
150
(400)
50
50
50
25
750(16.0)
8(15.0)
385
27
65
162
97
359
579

A3

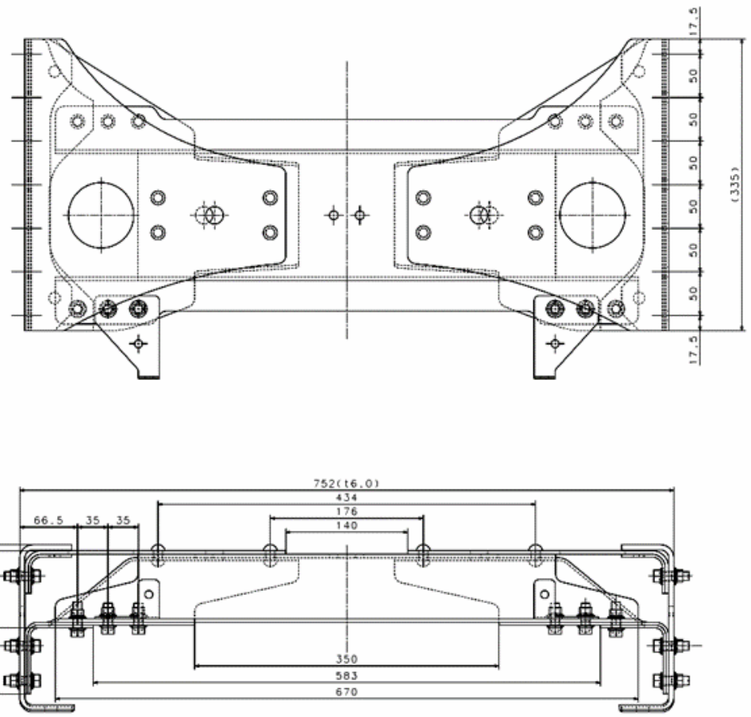

100
192
25
50
50
50
50
25
(250)
850(16.0)
6(15.0)
498
65
40
175
110
463
683

10.6 Frame structure

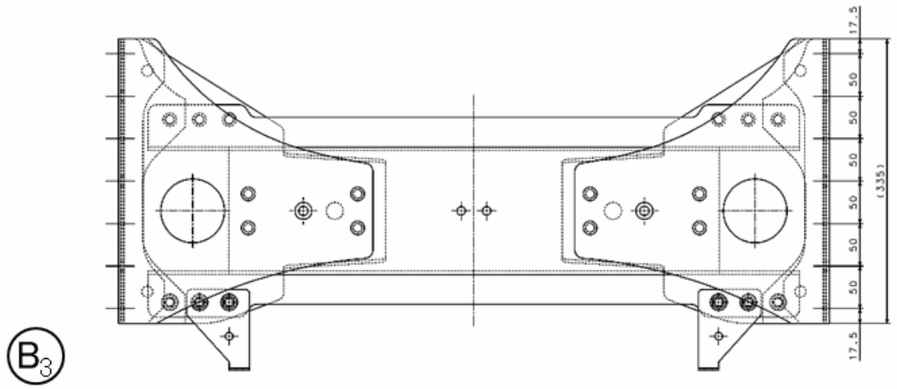
B1



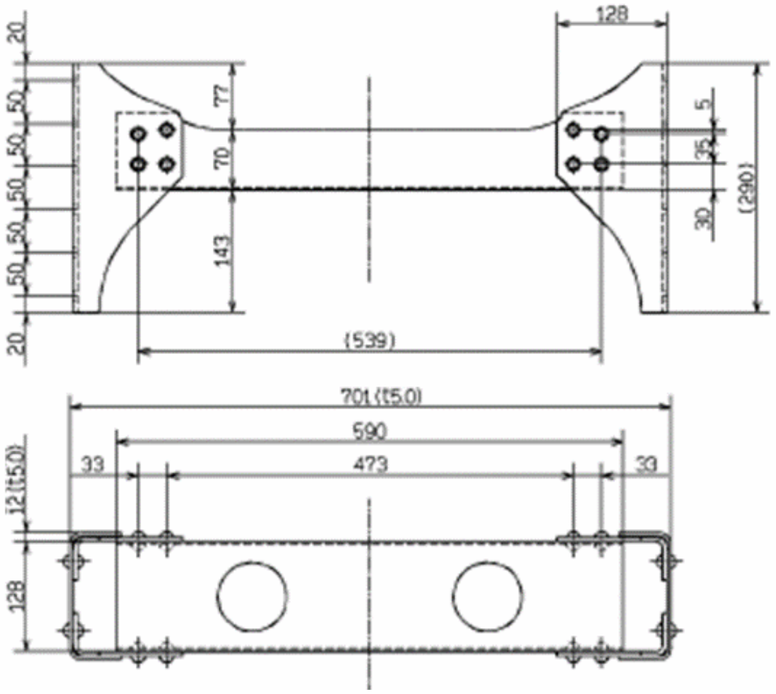
B2



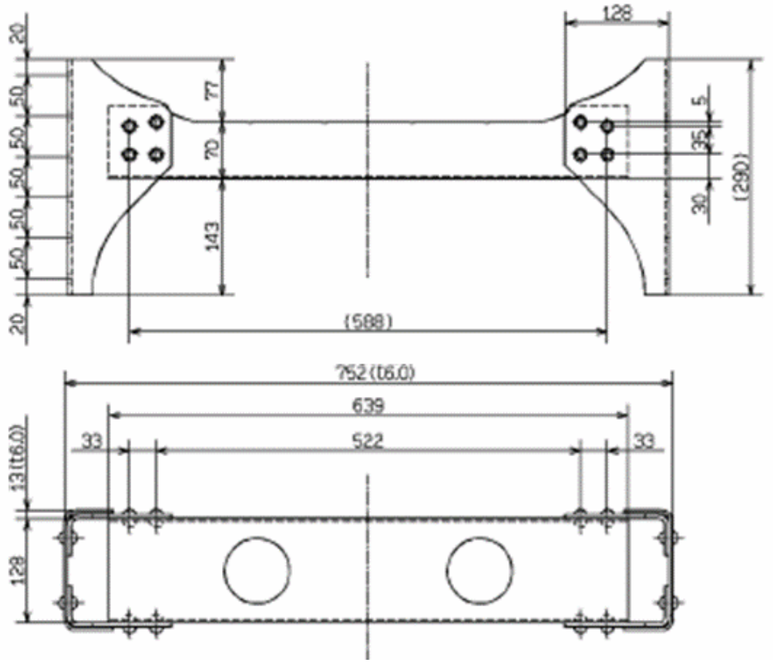
B3



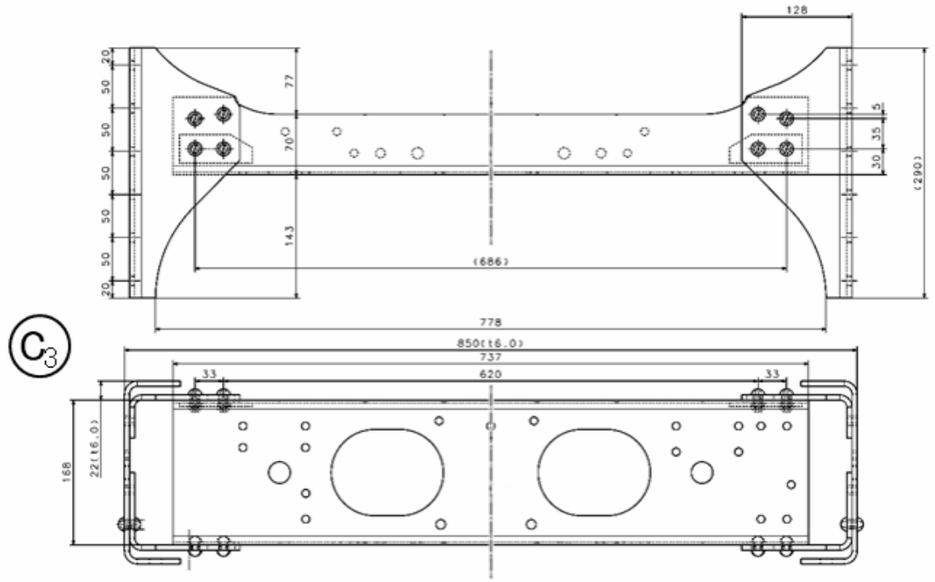
C1


20
50
50
50
50
50
20
77
70
143
128
5
35
30
(290)
(539)
701 (t5.0)
590
473
33
33
12 (t5.0)
128

C2

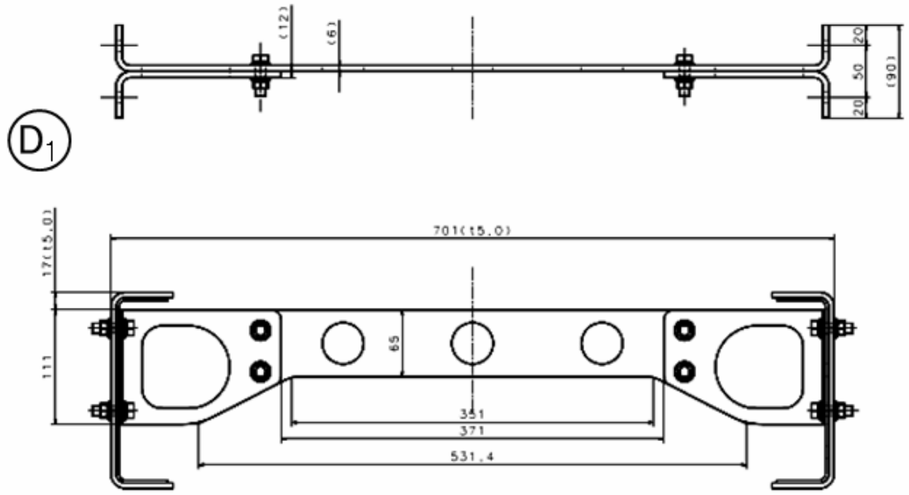

20
50
50
50
50
50
20
77
70
143
128
5
35
30
(290)
(588)
752 (t6.0)
639
522
33
33
13 (t6.0)
128

C3

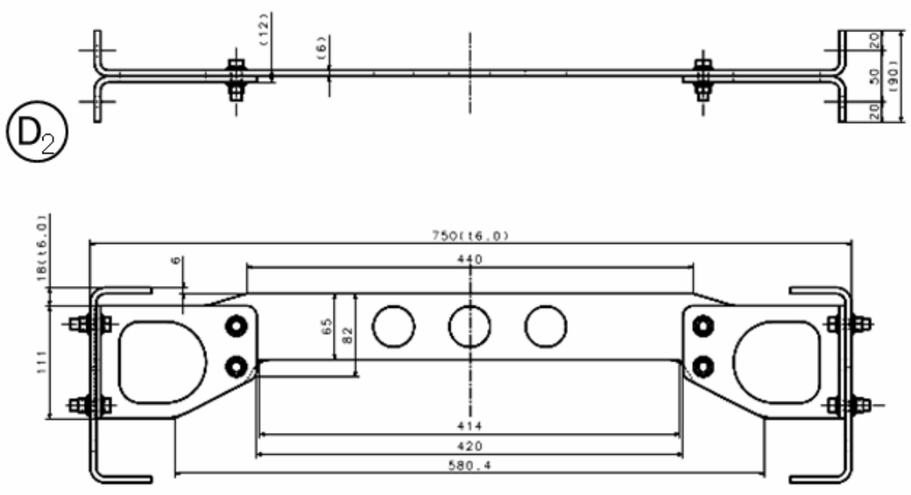

20
50
50
50
50
50
20
77
70
143
128
5
35
30
(290)
(686)
778
850 (t6.0)
737
620
33
33
22 (t6.0)
168

10.6 Frame structure

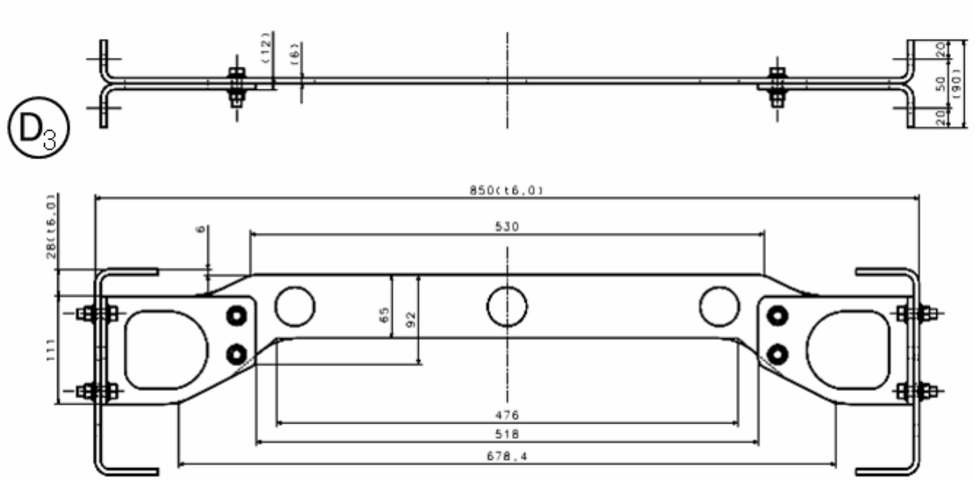
D1



D2

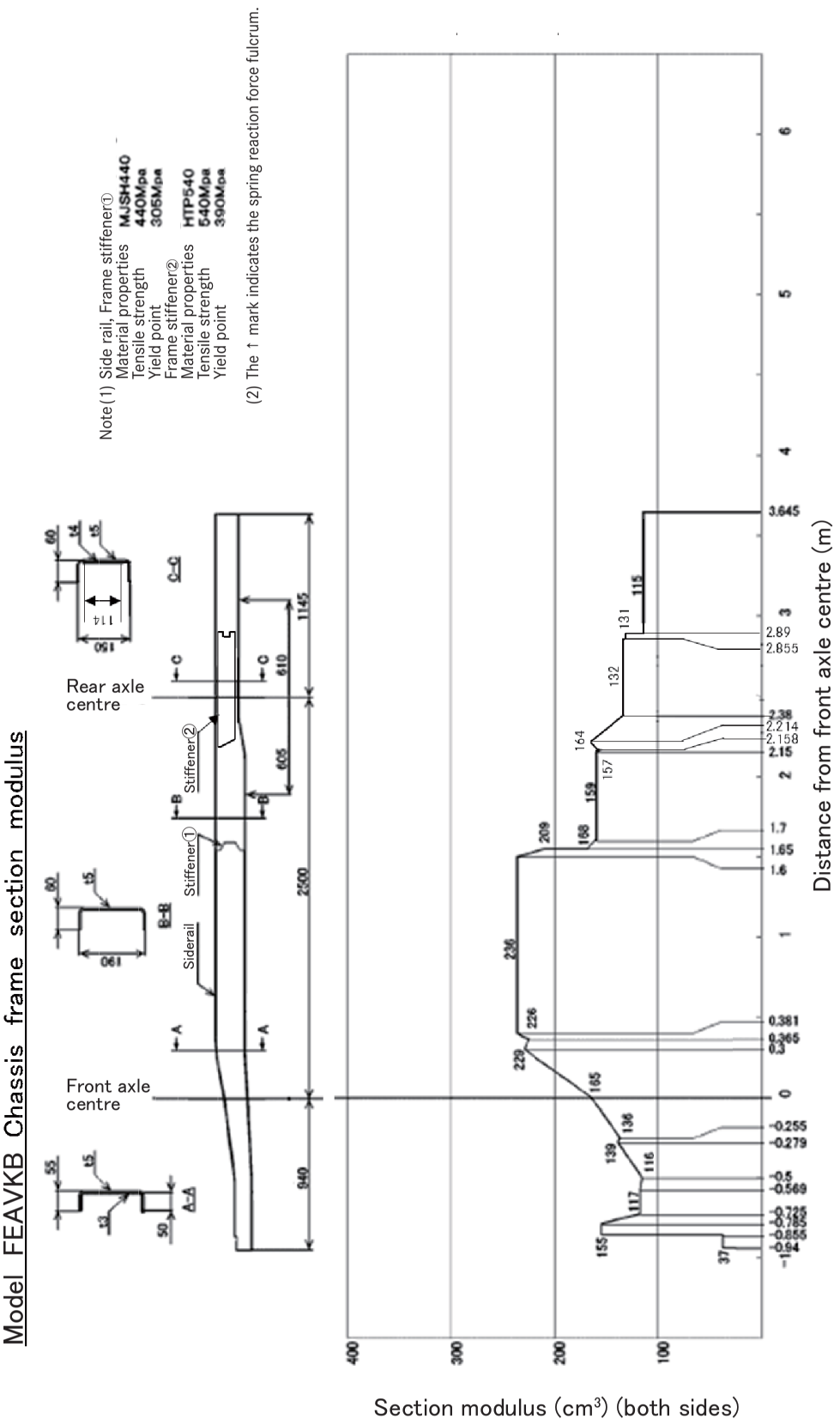


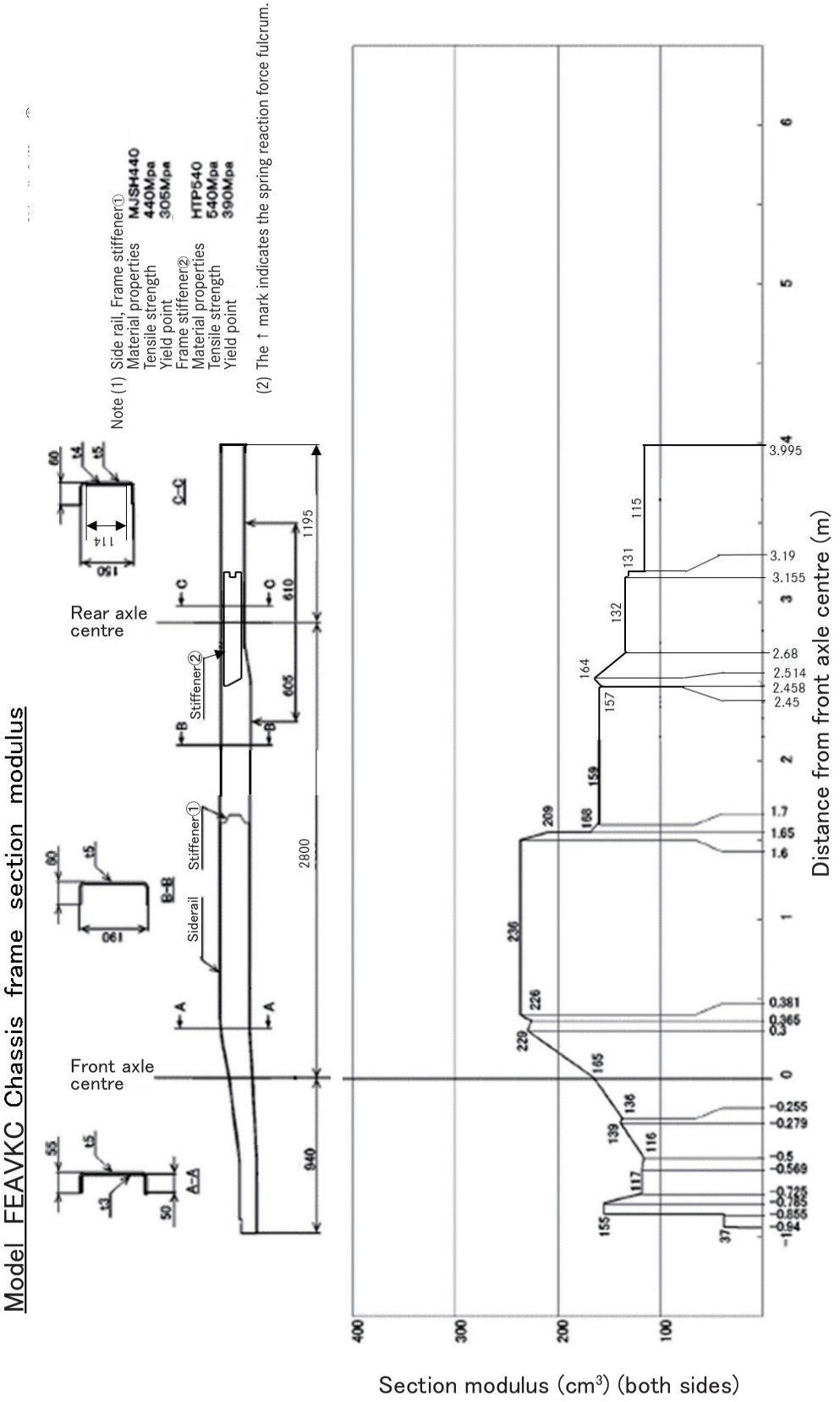
D3

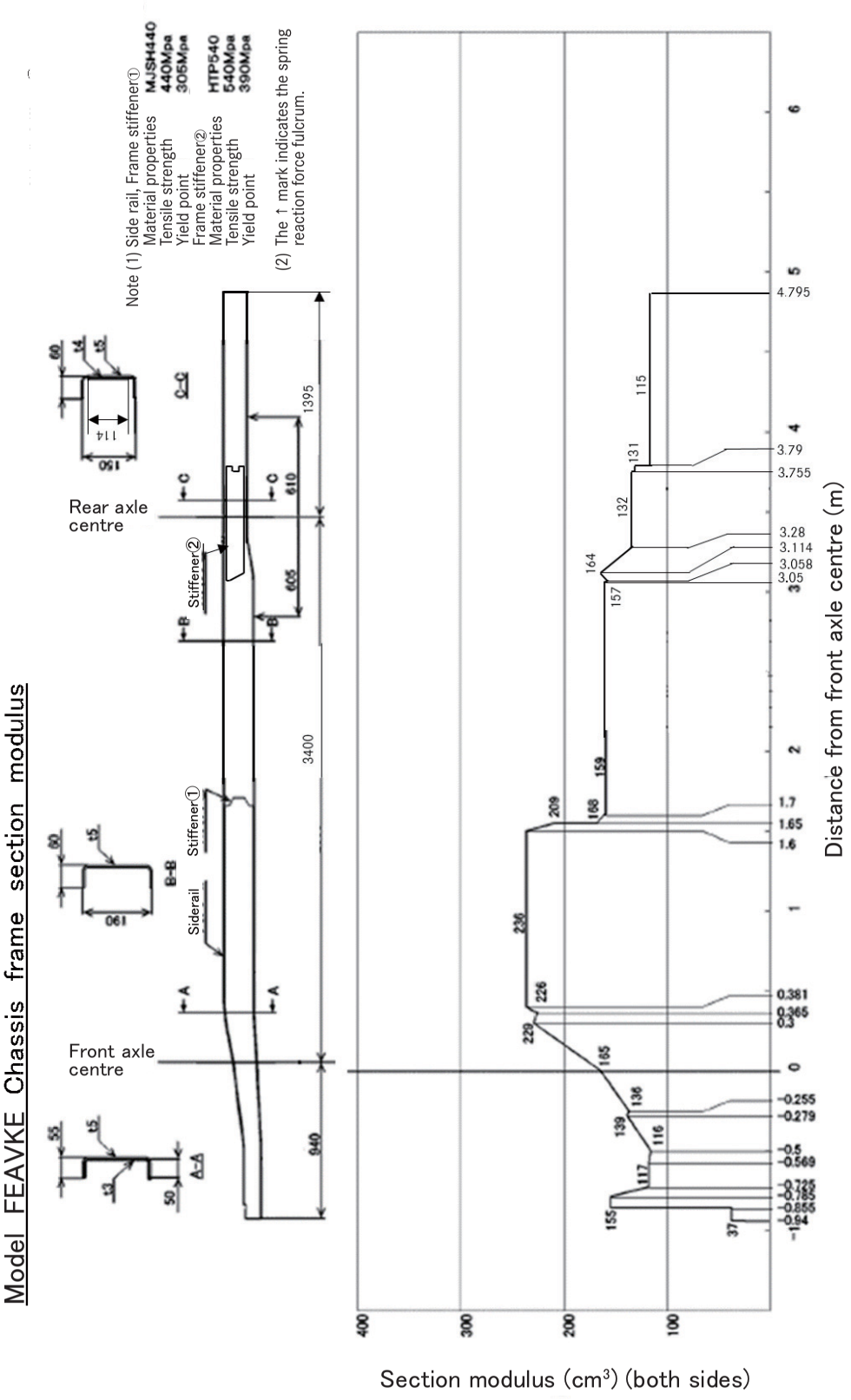


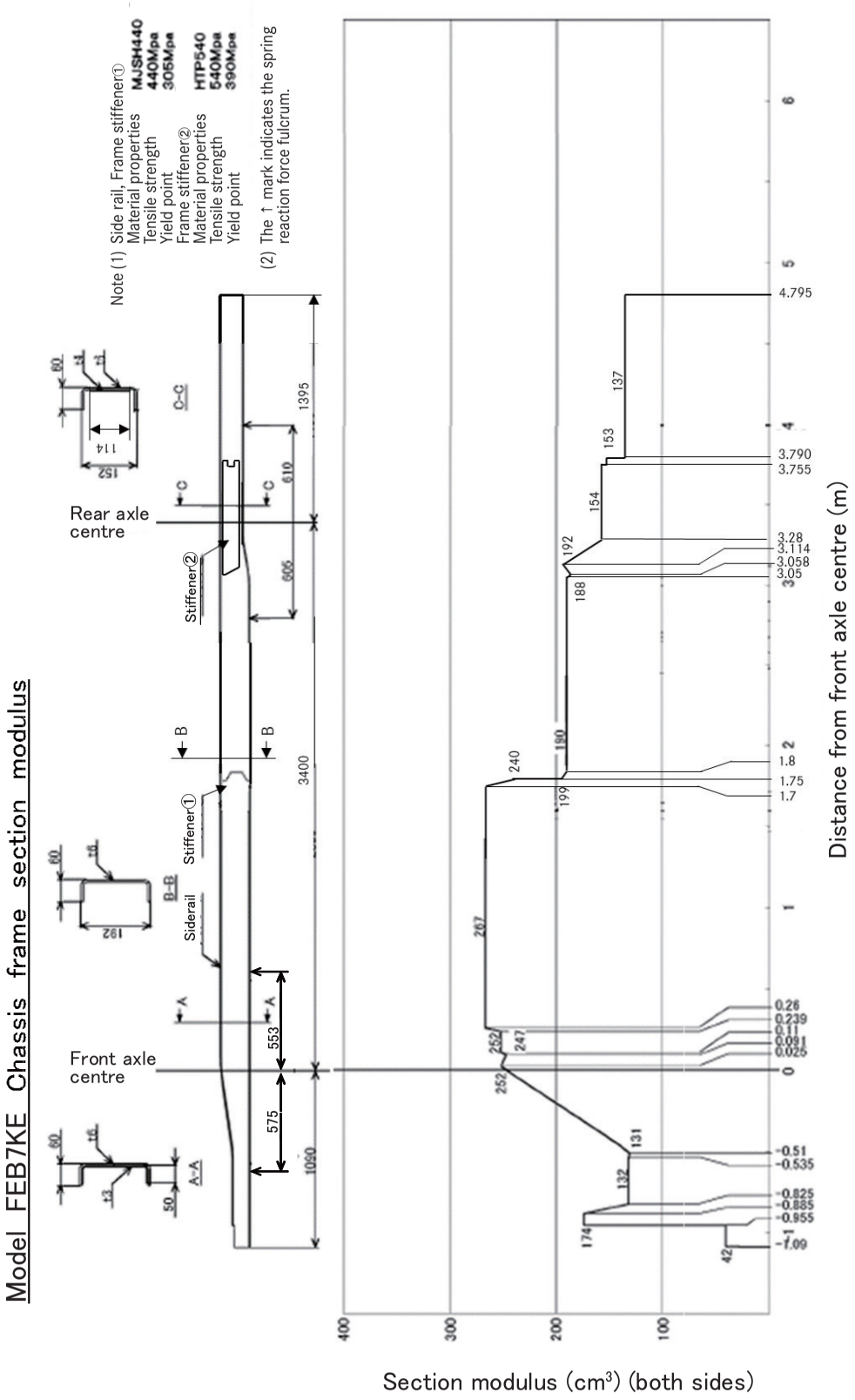
10.6.2 Frame section modulus

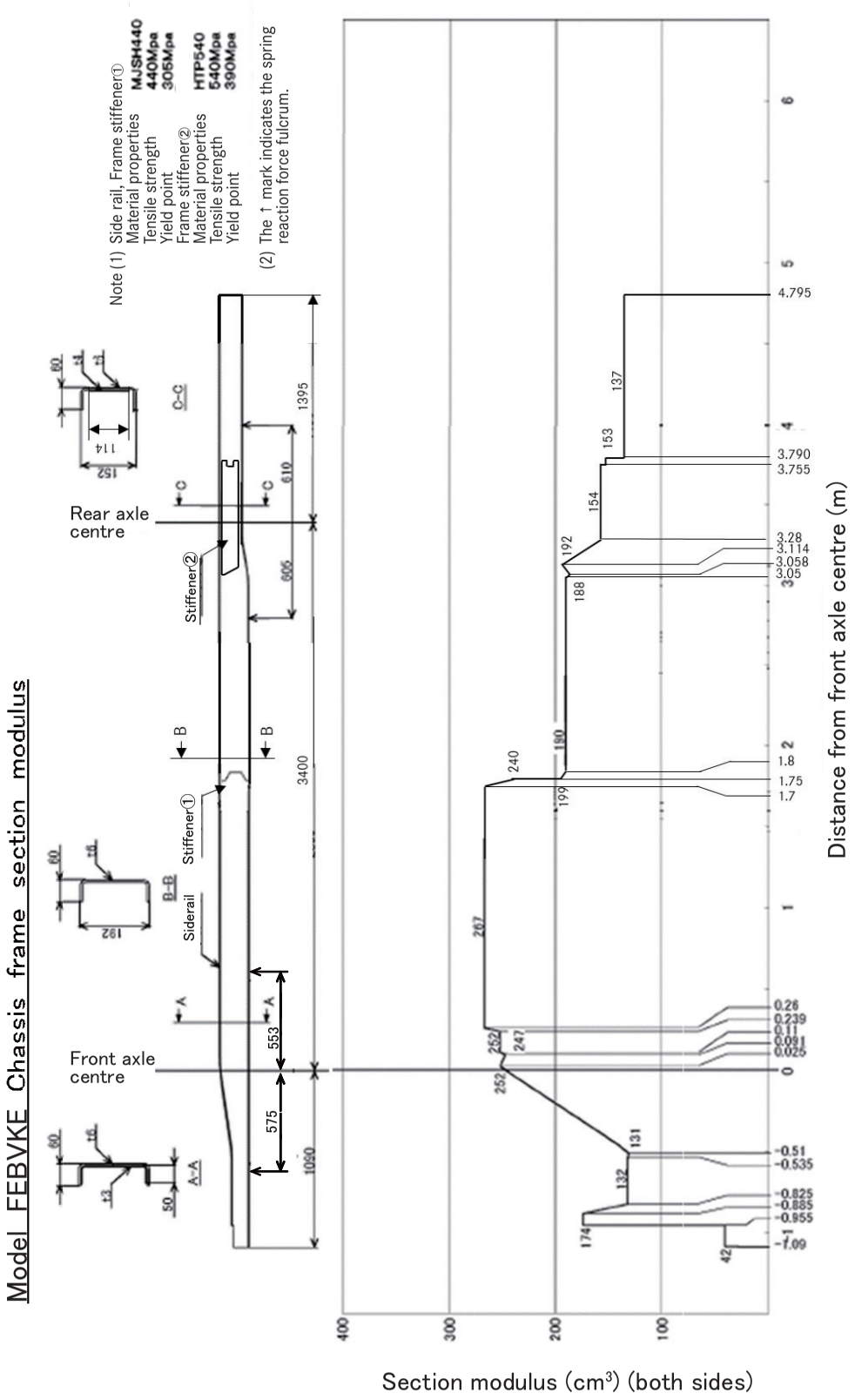
A


Note (1) Side rail, Frame stiffener①
Material properties MJSH440
Tensile strength 440Mpa
Yield point 305Mpa
Frame stiffener②
Material properties HTP540
Tensile strength 540Mpa
Yield point 390Mpa
(2) The ↑ mark indicates the spring reaction force fulcrum.
Model FEAVKB Chassis frame section modulus
Rear axle centre
Front axle centre
Stiffener②
Stiffener①
Siderail
C–C
B–B
A–A
Distance from front axle centre (m)
Section modulus (cm³) (both sides)

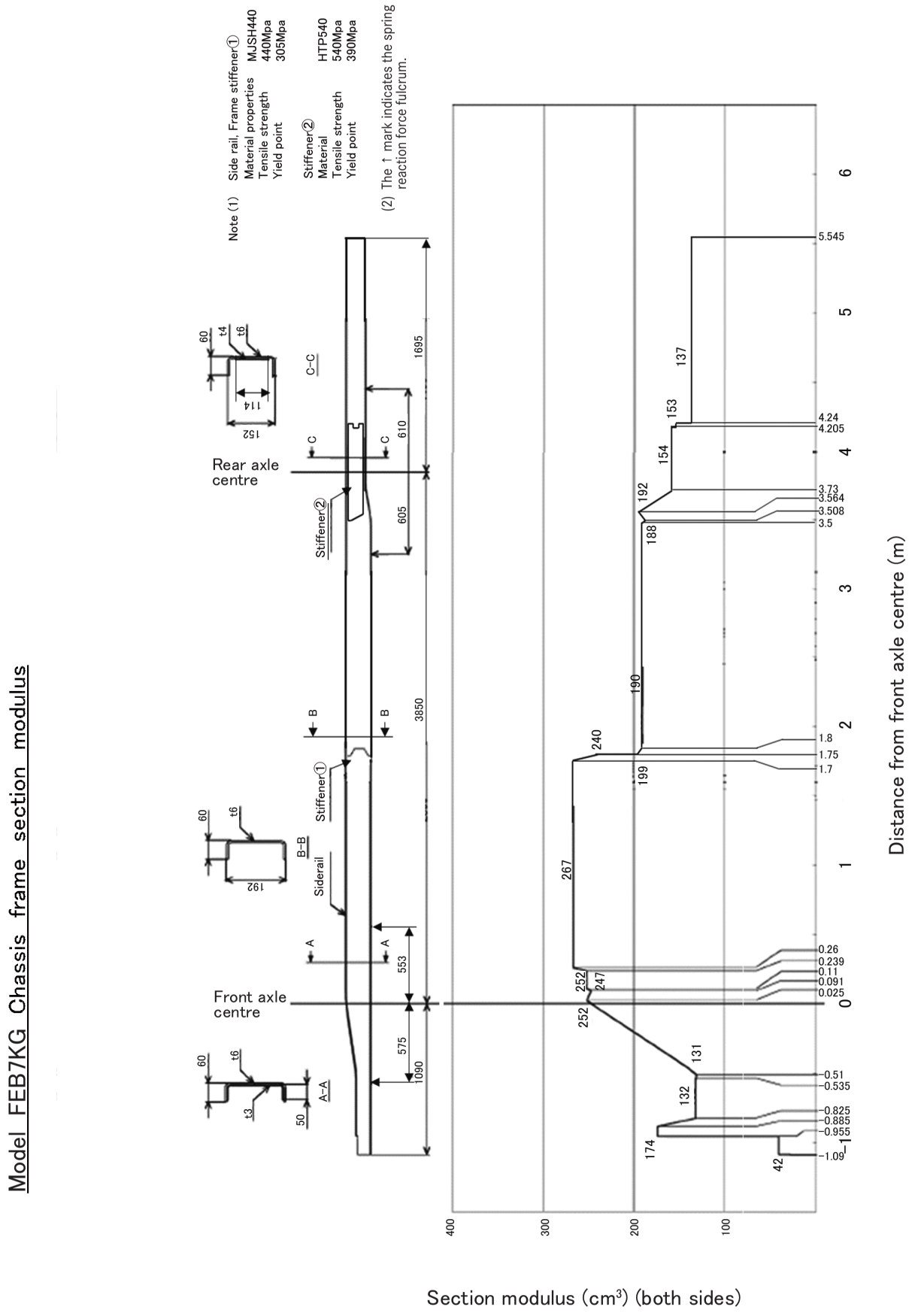

Note (1) Side rail, Frame stiffener①
Material properties MJSH440
Tensile strength 440Mpa
Yield point 305Mpa
Frame stiffener②
Material properties HTP540
Tensile strength 540Mpa
Yield point 390Mpa
(2) The ↑ mark indicates the spring reaction force fulcrum.
Model FEAVKC Chassis frame section modulus
Rear axle centre
Front axle centre
Stiffener①
Stiffener②
Siderail
Distance from front axle centre (m)
Section modulus (cm³) (both sides)


Model FEAVKE Chassis frame section modulus
Note (1) Side rail, Frame stiffener①
Material properties MJSH440
Tensile strength 440Mpa
Yield point 305Mpa
Frame stiffener②
Material properties HTP540
Tensile strength 540Mpa
Yield point 390Mpa
(2) The ↑ mark indicates the spring reaction force fulcrum.
Rear axle centre
Front axle centre
Stiffener①
Stiffener②
Siderail
3400
1395
610
605
940
Distance from front axle centre (m)
Section modulus (cm³) (both sides)

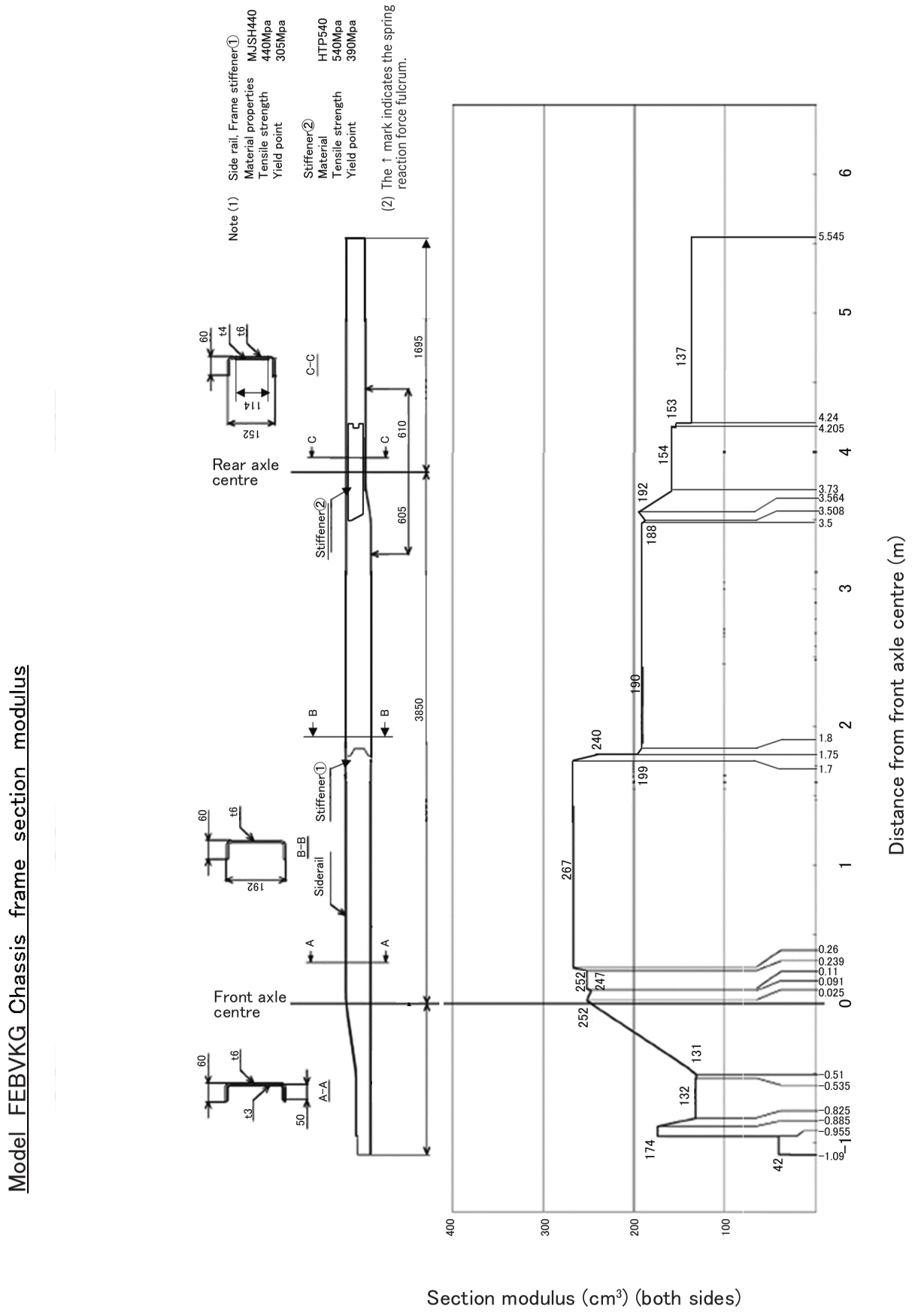

Model FEB7KE Chassis frame section modulus
Note (1) Side rail, Frame stiffener①
Material properties MJSH440
Tensile strength 440Mpa
Yield point 305Mpa
Frame stiffener②
Material properties HTP540
Tensile strength 540Mpa
Yield point 390Mpa
(2) The ↑ mark indicates the spring reaction force fulcrum.
Rear axle centre
Front axle centre
Stiffener①
Stiffener②
Siderail
C–C
B–B
A–A
1395
610
605
3400
553
575
1060
Distance from front axle centre (m)
Section modulus (cm³) (both sides)

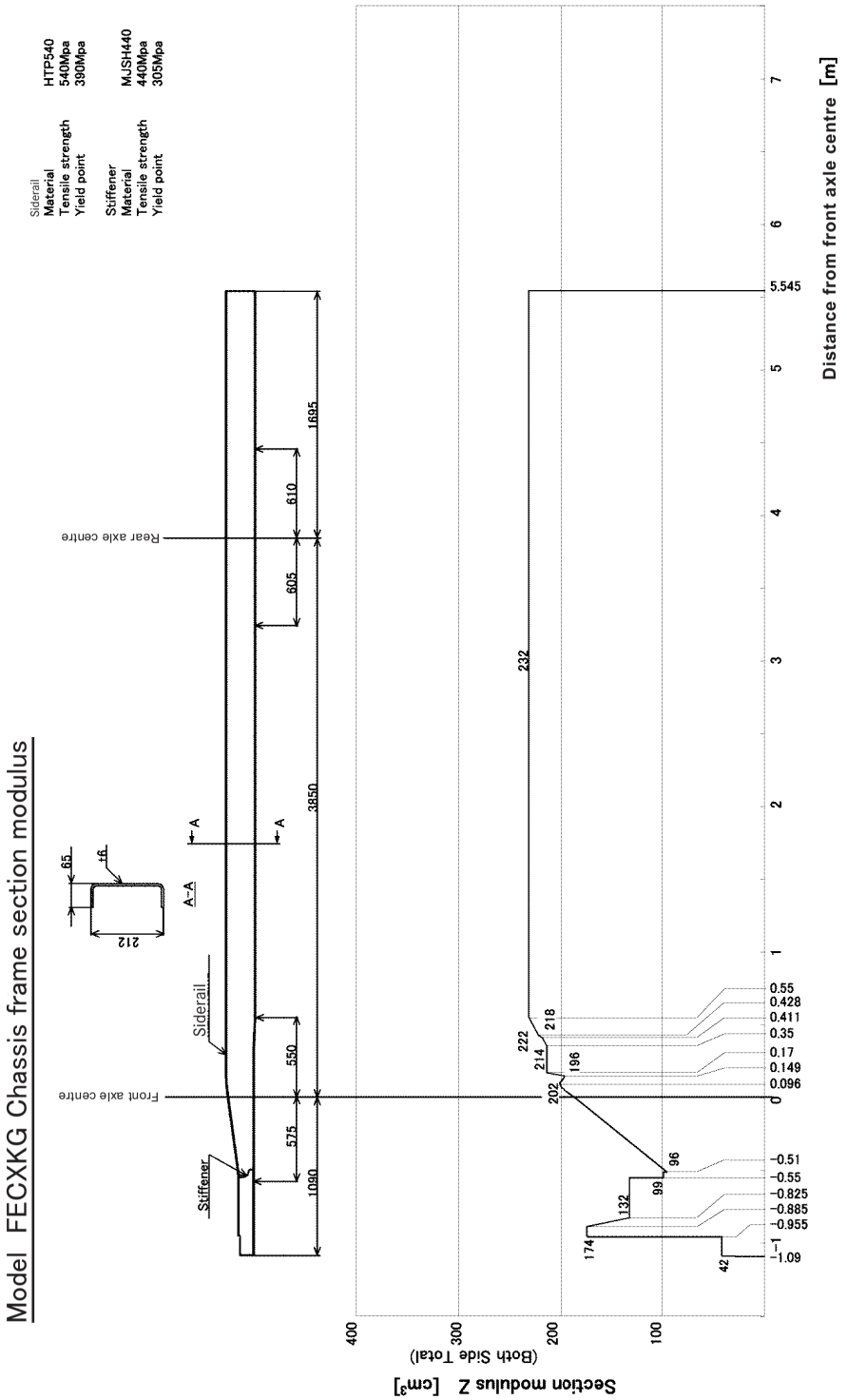

Model FEBVKE Chassis frame section modulus
Note (1) Side rail, Frame stiffener①
Material properties MJSH440
Tensile strength 440Mpa
Yield point 305Mpa
Frame stiffener②
Material properties HTP540
Tensile strength 540Mpa
Yield point 390Mpa
(2) The ↑ mark indicates the spring reaction force fulcrum.
Rear axle centre
Front axle centre
Stiffener②
Stiffener①
Siderail
C–C
B–B
A–A
1395
610
606
3400
553
575
1060
Distance from front axle centre (m)
Section modulus (cm³) (both sides)

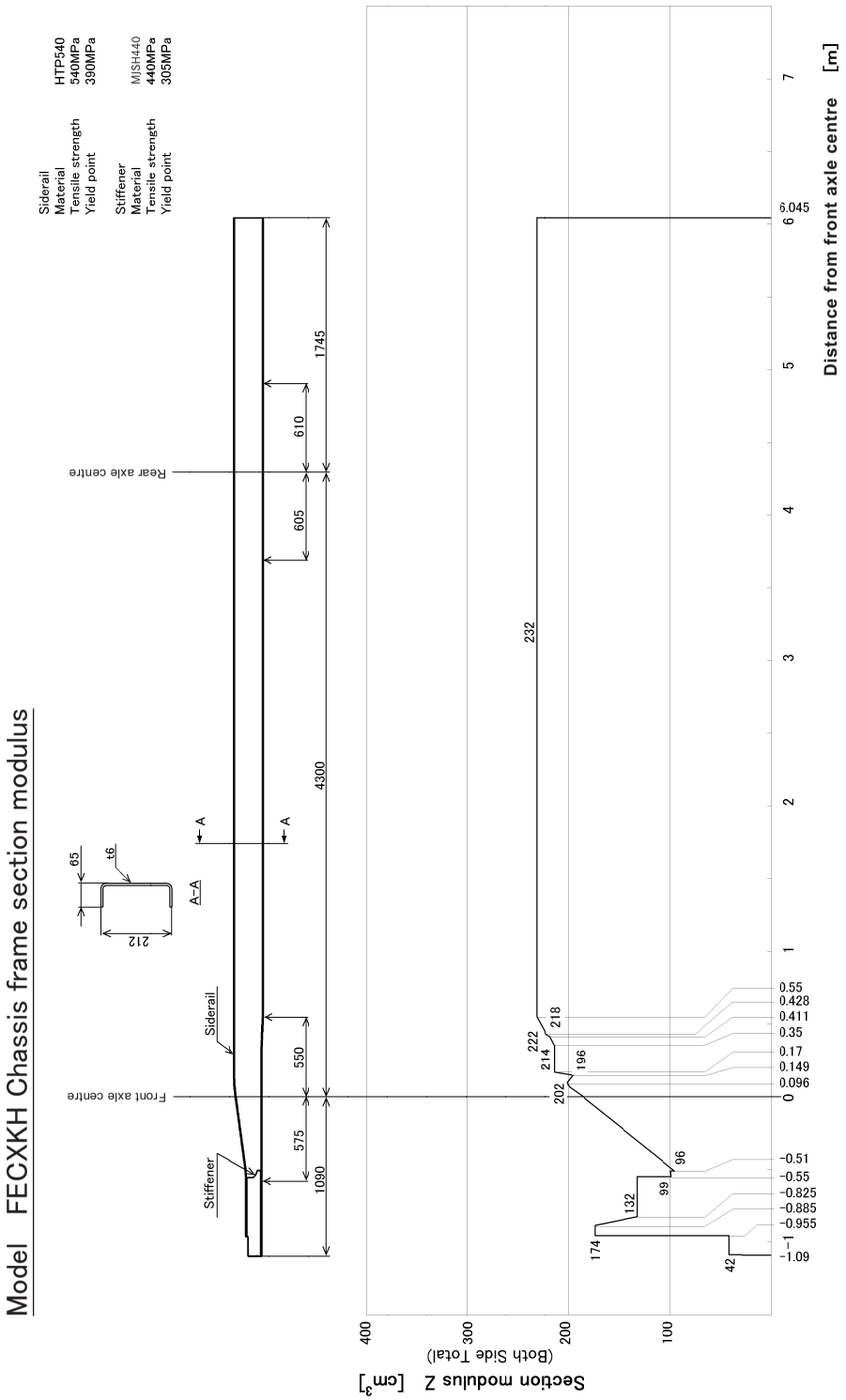
Model FEB7KG Chassis frame section modulus



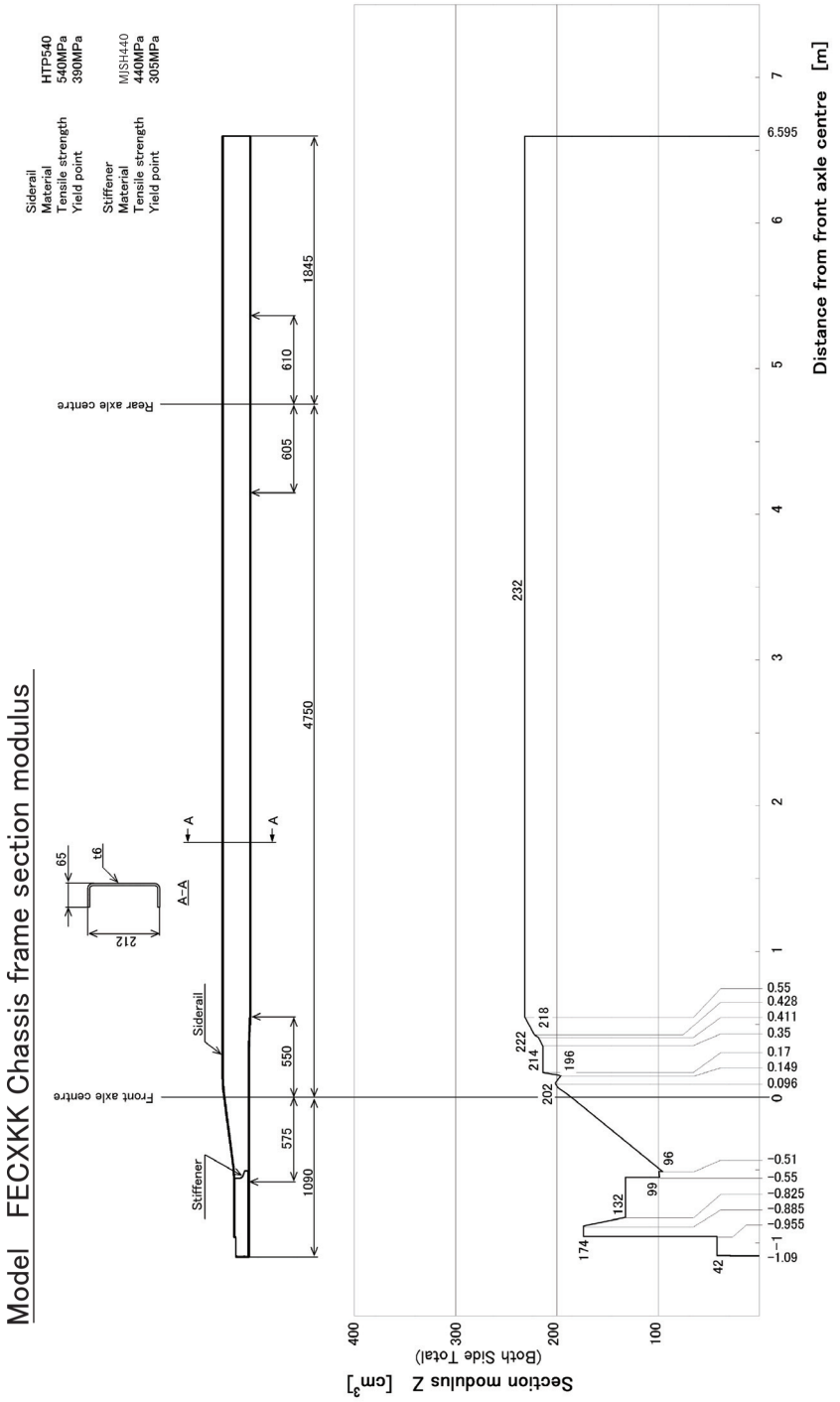
Model FEBVKG Chassis frame section modulus




Model FECXKG Chassis frame section modulus
Siderail
Material HTP540
Tensile strength 540Mpa
Yield point 390Mpa
Stiffener
Material MJSH440
Tensile strength 440Mpa
Yield point 305Mpa
Rear axle centre
Front axle centre
Siderail
Stiffener
A–A
85
9
212
1695
610
605
3850
550
575
1090
5.545
232
222
218
214
202
196
0.55
0.428
0.411
0.35
0.17
0.149
0.096
96
99
132
174
42
−0.51
−0.55
−0.825
−0.885
−0.955
−1.09
Distance from front axle centre [m]
Section modulus Z [cm³]
(Both Side Total)


Model FECXKH Chassis frame section modulus
Siderail
Material HTP540
Tensile strength 540MPa
Yield point 390MPa
Stiffener
Material MJSH440
Tensile strength 440MPa
Yield point 305MPa
Rear axle centre
Front axle centre
Siderail
Stiffener
A
A
A–A
65
t6
212
1745
610
605
4300
550
575
1090
Section modulus Z [cm³]
(Both Side Total)
400
300
200
100
Distance from front axle centre [m]
0
1
2
3
4
5
6
7
6.045
232
222
218
214
196
202
174
132
99
96
42
0.55
0.428
0.411
0.35
0.17
0.149
0.096
-0.51
-0.55
-0.825
-0.885
-0.955
-1
-1.09

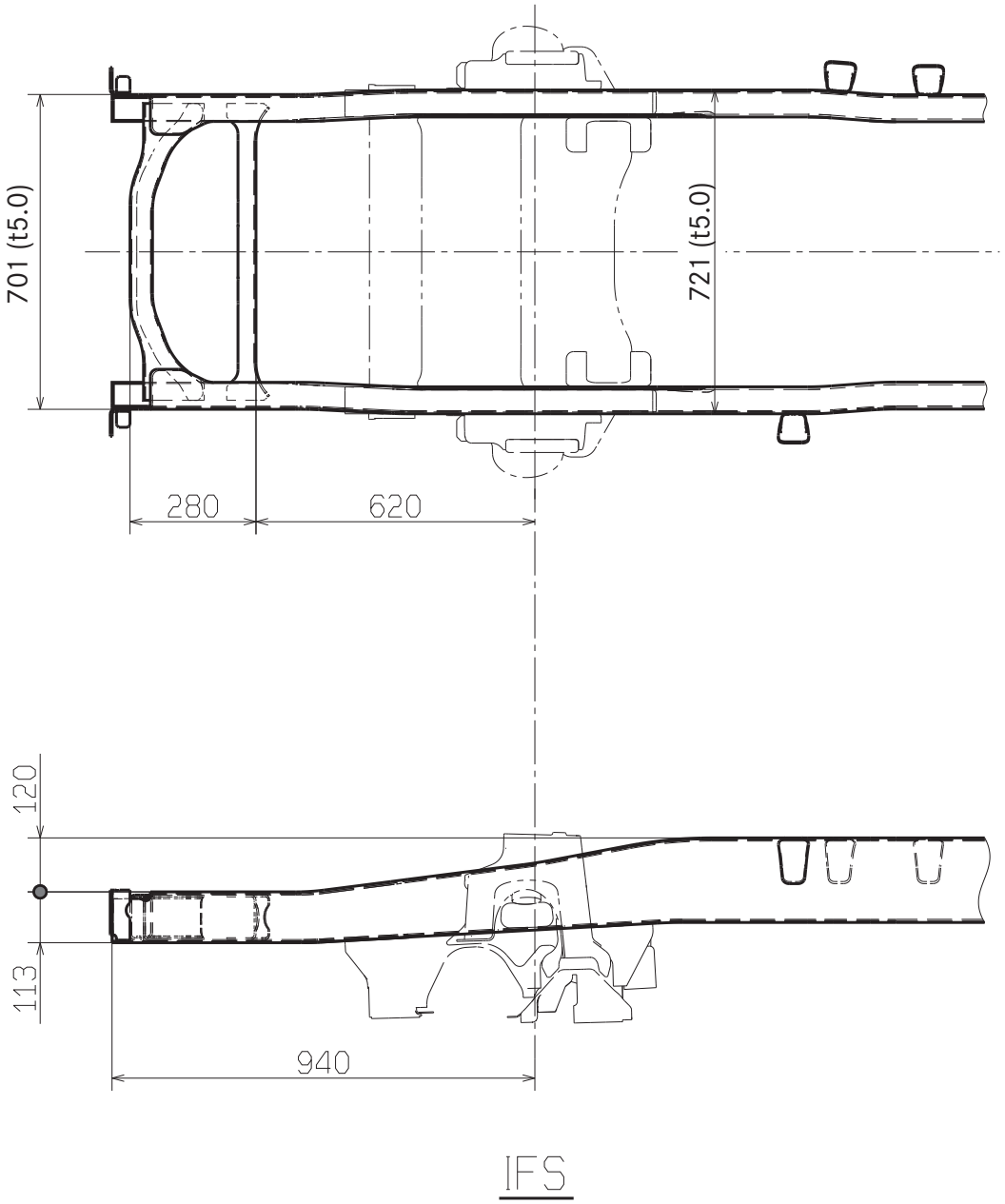
10.6 Frame structure



10.6.3 Frame front drawings

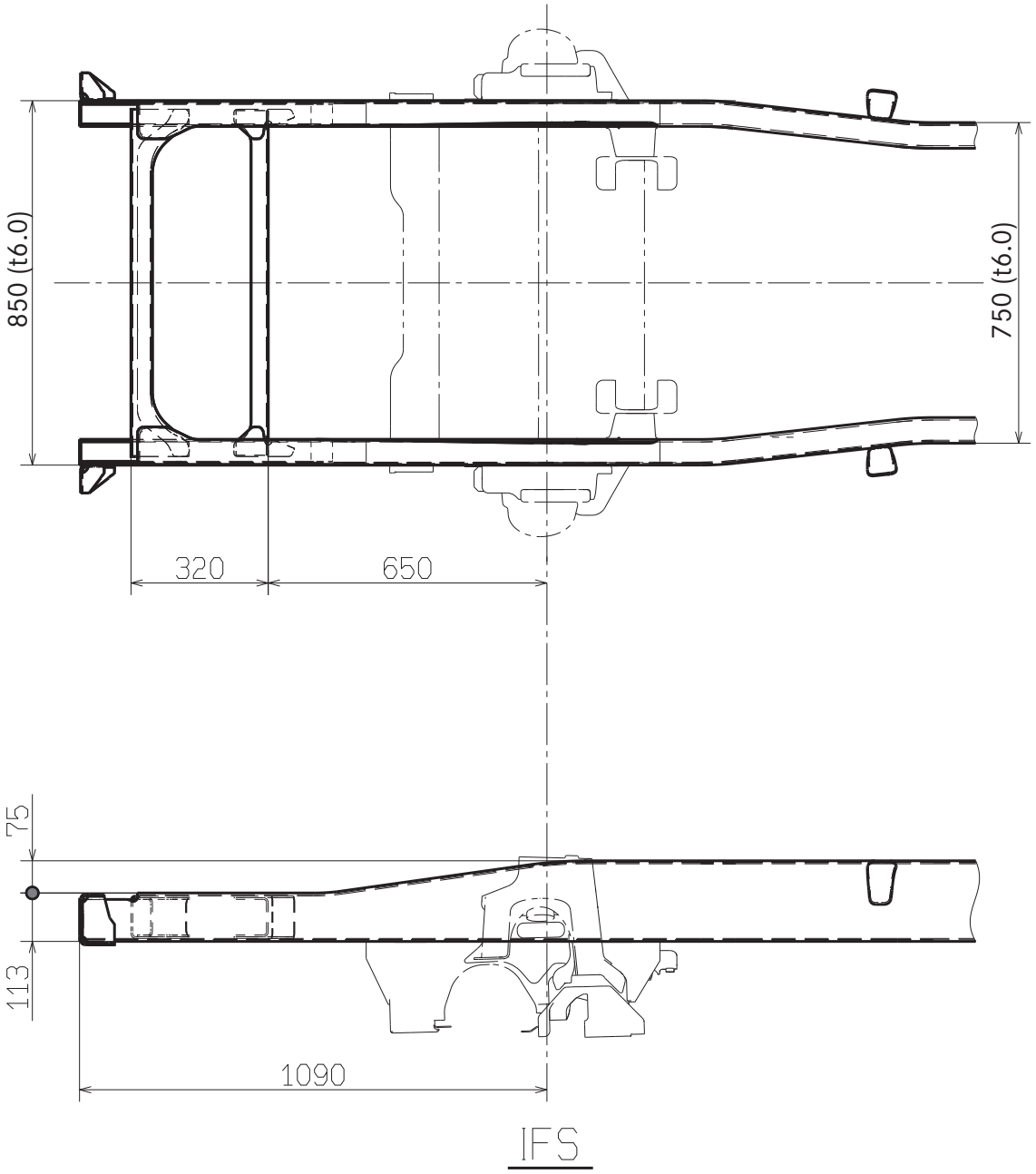
Front suspension type	Model	Frame width (Nominal value)	Page
Independent	FEAV	700	68
	FEBV	750	69
Rigid	FEB7	750	70
	FECX	850	

10.6 Frame structure

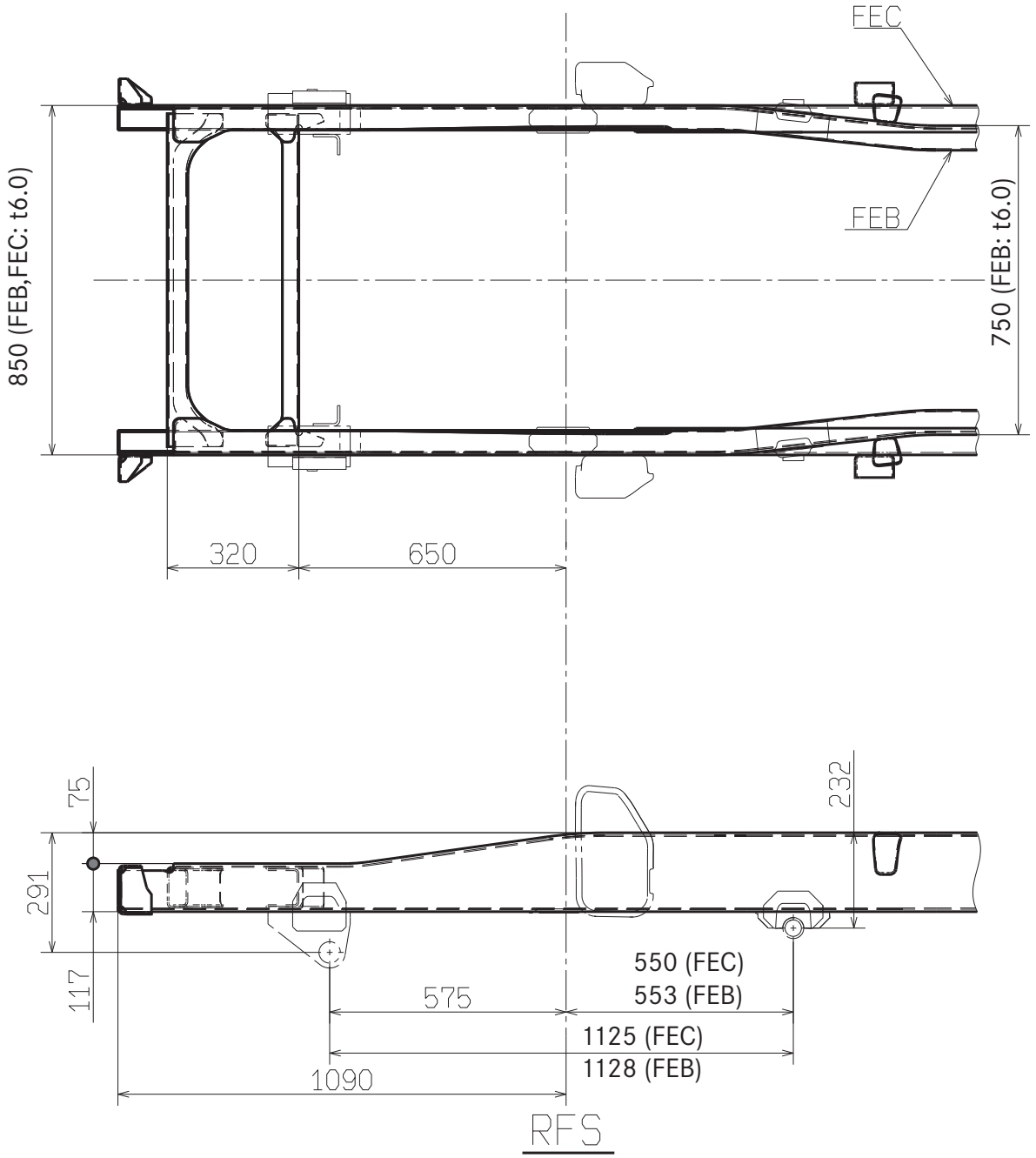


IFS

10.6 Frame structure



10.6 Frame structure



10.7 Spring characteristic

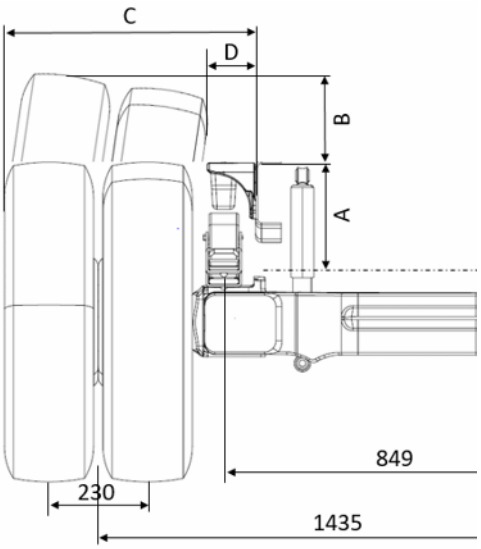
10.7.1 Distance from frame top surface to ground

B

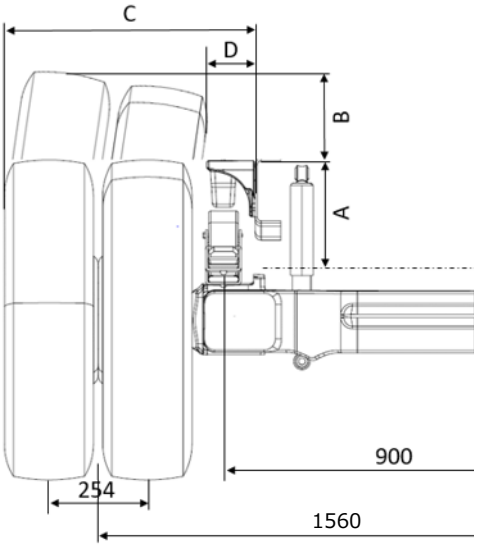
MODEL	OBJECT ENGINE kW	CAB CHASSIS WEIGHT Kg			UNDER-SPRING WEIGHT Kg		DISTANCE FROM FRAME TOP SURGACE TO GROUND mm		CoG Height mm
		Front	Rear	Total	Front	Rear	Front	Rear	
		Wf	Wr	W			±10 Hf	±25 Hr	
FEAVKBRCSFAD	110	1440	1095	2535	185	535	701	755	555
FEAVKCRCSFAD		1525	1020	2545	185	535	697	756	550
FEAVKERCSFAD		1485	1085	2570	185	535	699	755	550
FEAVKERDSFAB		1665	1365	3030	185	535	692	750	515
FEB7KERDSFAC	129	1770	1425	3195	305	570	720	776	550
FEB7KGRDSFAC		1815	1395	3210	305	570	718	776	550
FEBVKERCSFAD	110	1625	1080	2705	185	540	717	755	595
FEBVKERDSFAB		1780	1375	3155	185	540	709	750	555
FEBVKGRDSFAB		1825	1340	3165	185	540	707	751	550
FECXKGRDSFAC	129	1885	1525	3410	365	660	790	849	620
FECXKHRDSFAC		1955	1485	3440	365	660	788	849	620
FECXKHRESFAC		2090	1815	3905	365	660	783	846	595
FECXKKRDSFAC		1975	1480	3455	365	660	787	850	620
FECXKKRESFAC		2130	1790	3920	365	660	782	846	595

10.7.2 Differential and tire bound height

MODEL	Tire Size	A mm	B mm	C mm	D mm
FEAVKBRCSFAD	205/75R17.5	222	142	589	125
FEAVKCRCSFAD	205/75R17.5	222	143	589	124
FEAVKERCSFAD	205/75R17.5	222	142	589	125
FEAVKERDSFAB	205/75R17.5	222	138	589	127
FEB7KERDSFAC	215/75R17.5	226	151	641	141
FEB7KGRDSFAC	215/75R17.5	226	152	641	141
FEBVKERCSFAD	205/75R17.5	223	139	591	128
FEBVKERDSFAB	205/75R17.5	223	134	591	130
FEBVKGRDSFAB	205/75R17.5	223	135	591	130
FECXKGRDSFAC	225/70R19.5	286	104	653	139
FECXKHRDSFAC	225/70R19.5	286	104	653	138
FECXKHRESFAC	225/70R19.5	286	100	653	140
FECXKKRDSFAC	225/70R19.5	286	104	653	138
FECXKKRESFAC	225/70R19.5	286	100	653	140

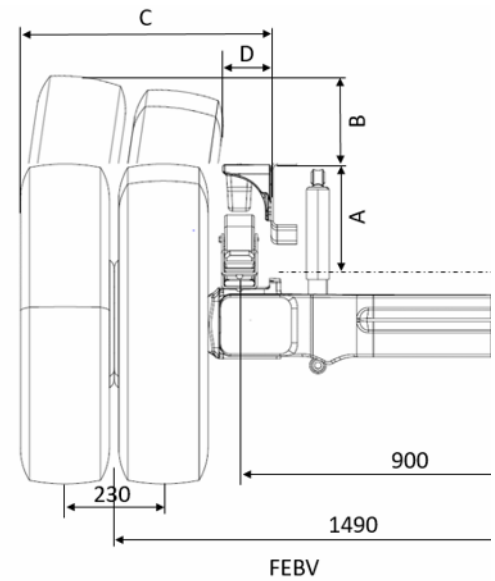


FEAV

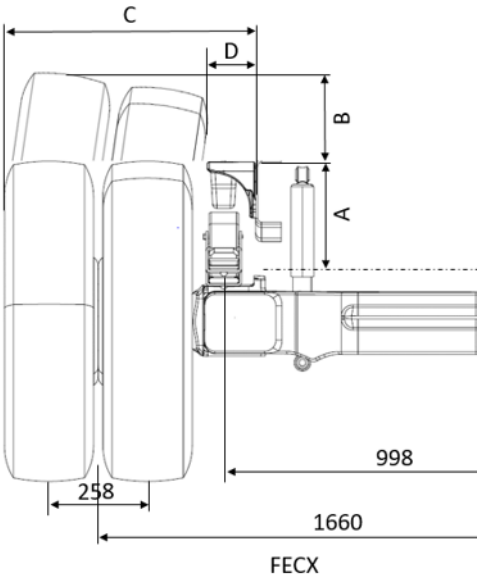


FEB7

10.7 Spring characteristic

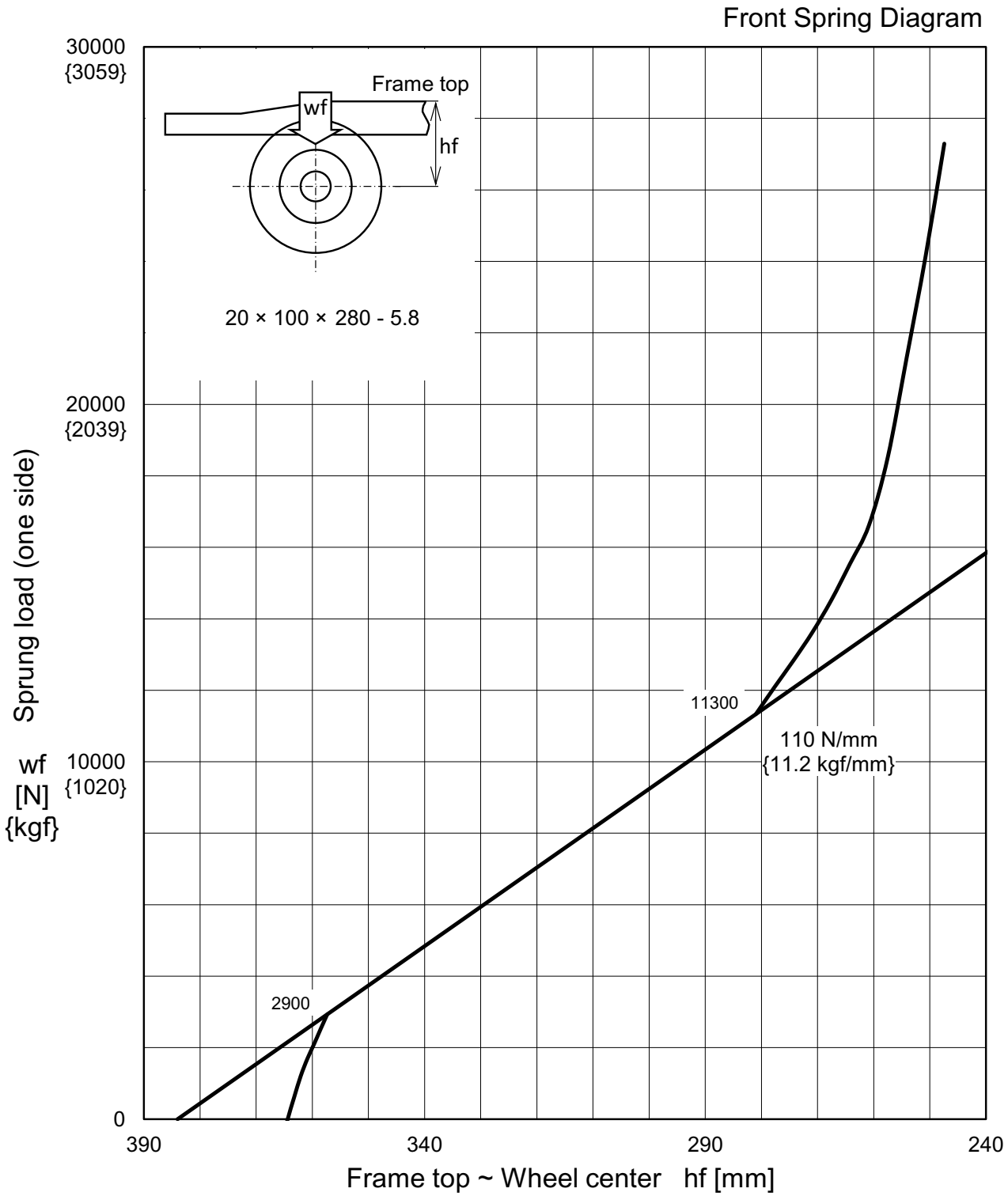


FEBV

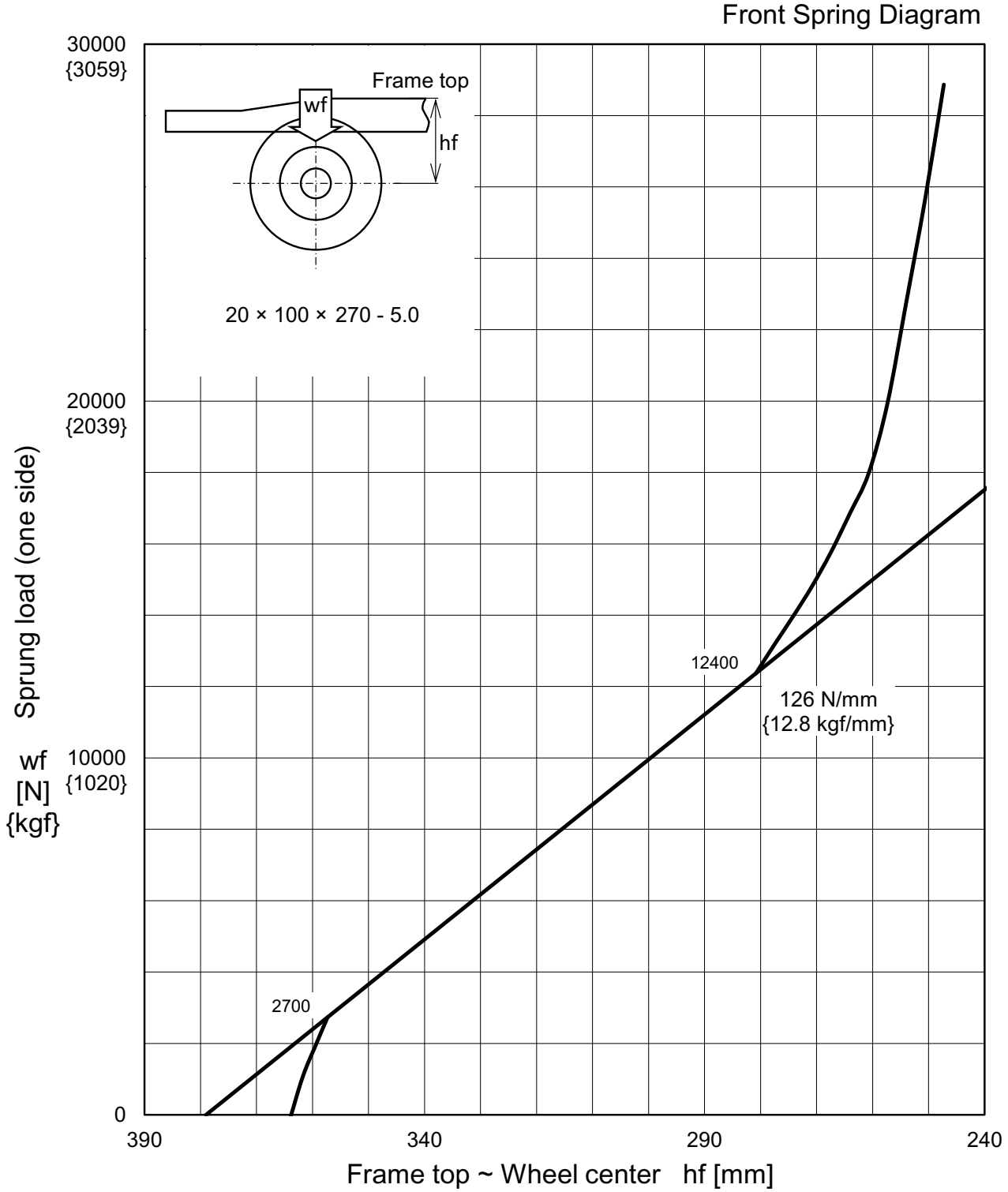


FECX

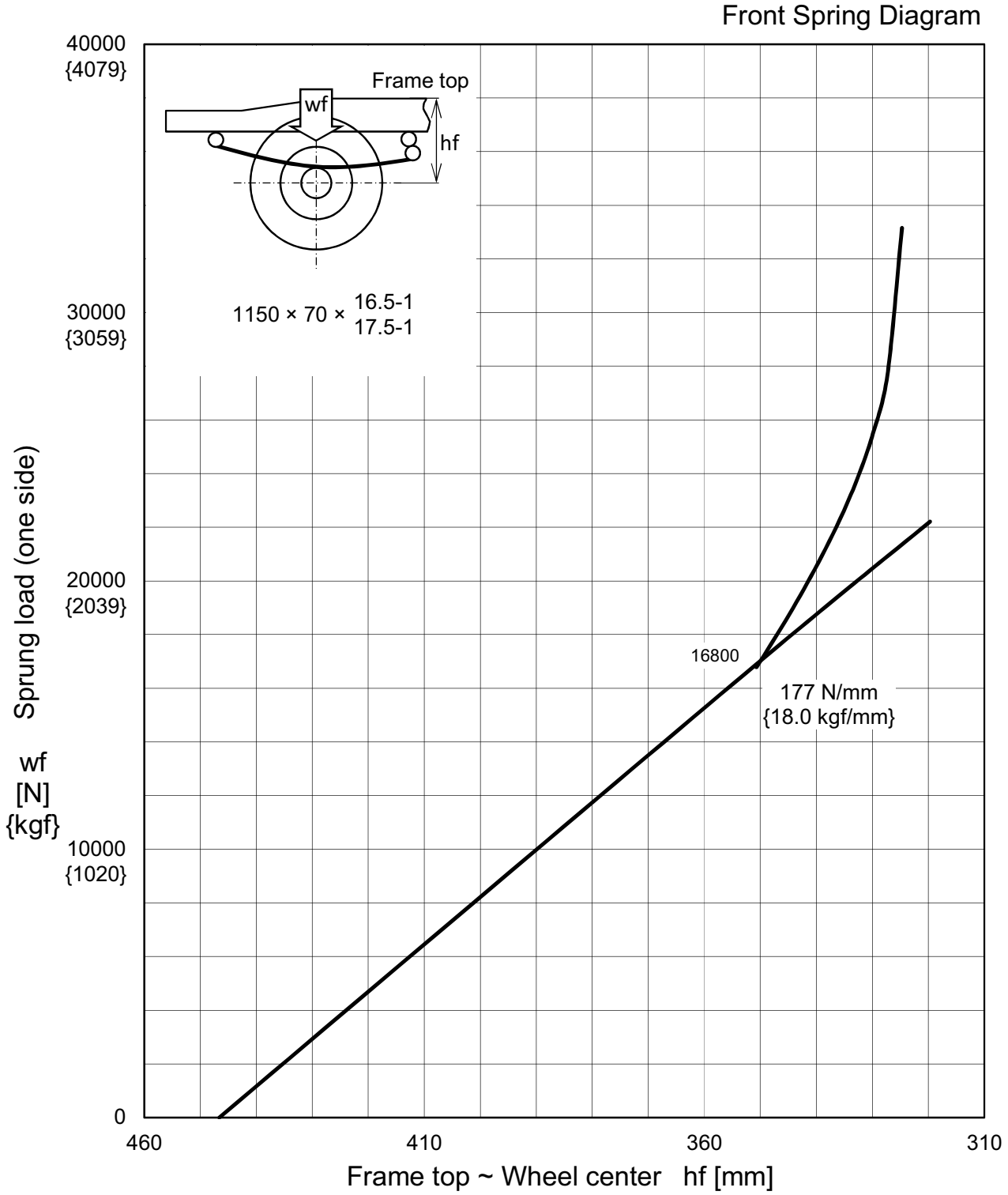
10.7.3 Front spring diagram



MODEL: FEAV GVW 6t

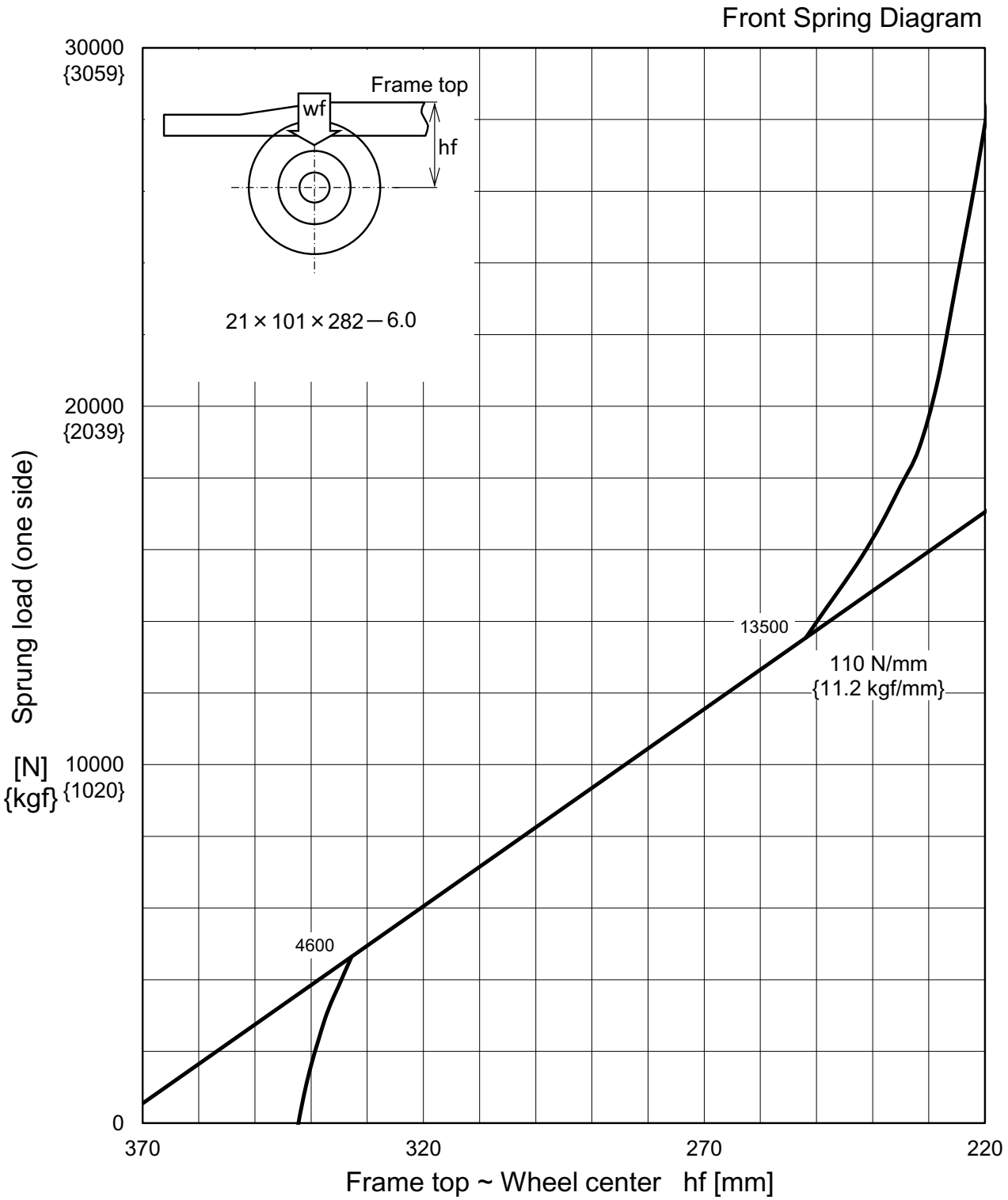


MODEL: FEB7

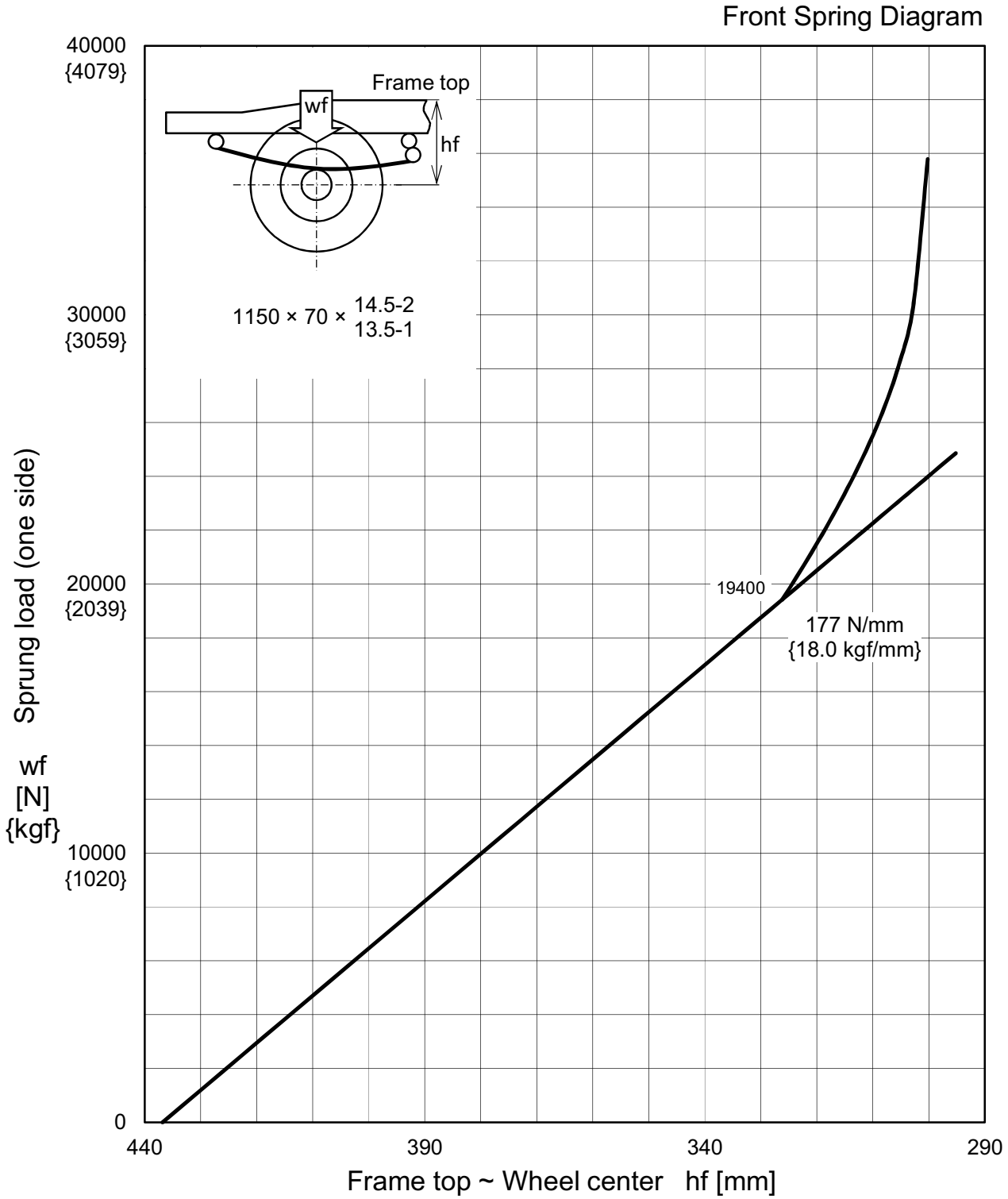

Front Spring Diagram
40000
{4079}
30000
{3059}
20000
{2039}
10000
{1020}
0
Sprung load (one side)
wf
[N]
{kgf}
Frame top
wf
hf
1150 × 70 × 16.5-1
17.5-1
16800
177 N/mm
{18.0 kgf/mm}
460
410
360
310
Frame top ~ Wheel center hf [mm]

10.7 Spring characteristic

MODEL: FEBV

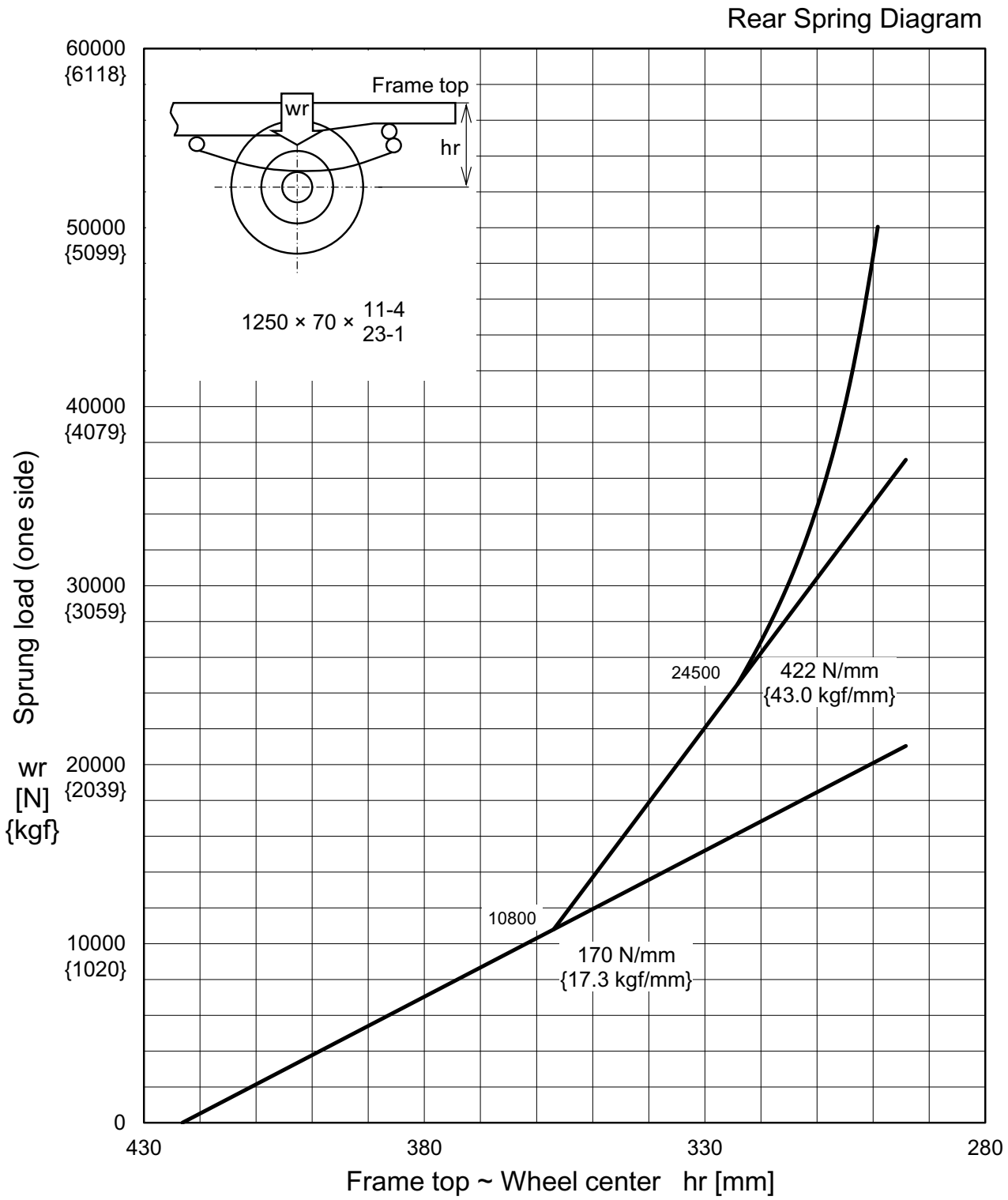


MODEL: FECX

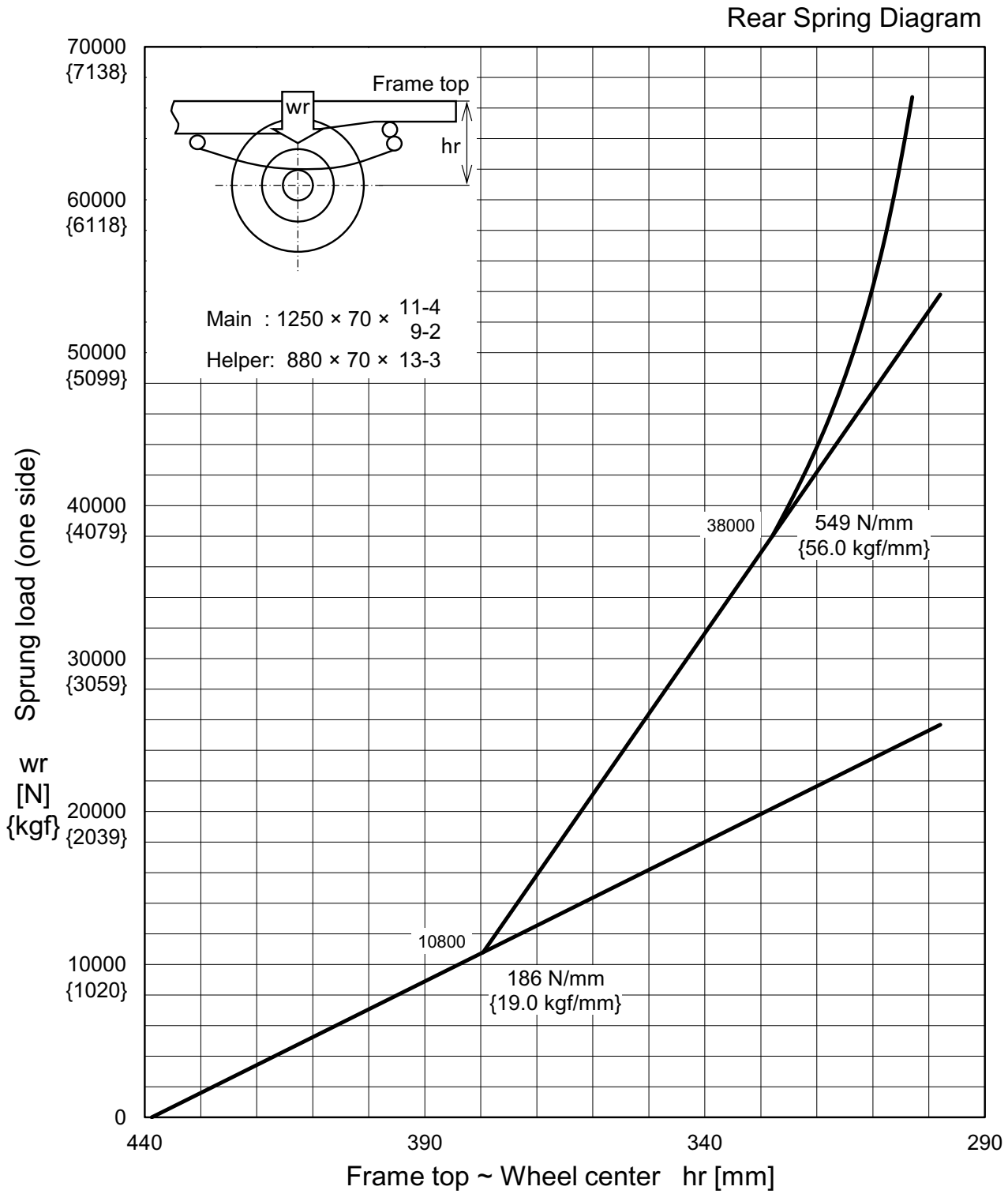

Front Spring Diagram
40000
{4079}
30000
{3059}
20000
{2039}
10000
{1020}
0
Sprung load (one side)
wf
[N]
{kgf}
Frame top
wf
hf
1150 × 70 × 14.5-2
13.5-1
19400
177 N/mm
{18.0 kgf/mm}
440
390
340
290
Frame top ~ Wheel center hf [mm]

10.7.4 Rear spring diagram

MODEL: FEAV, FEBV

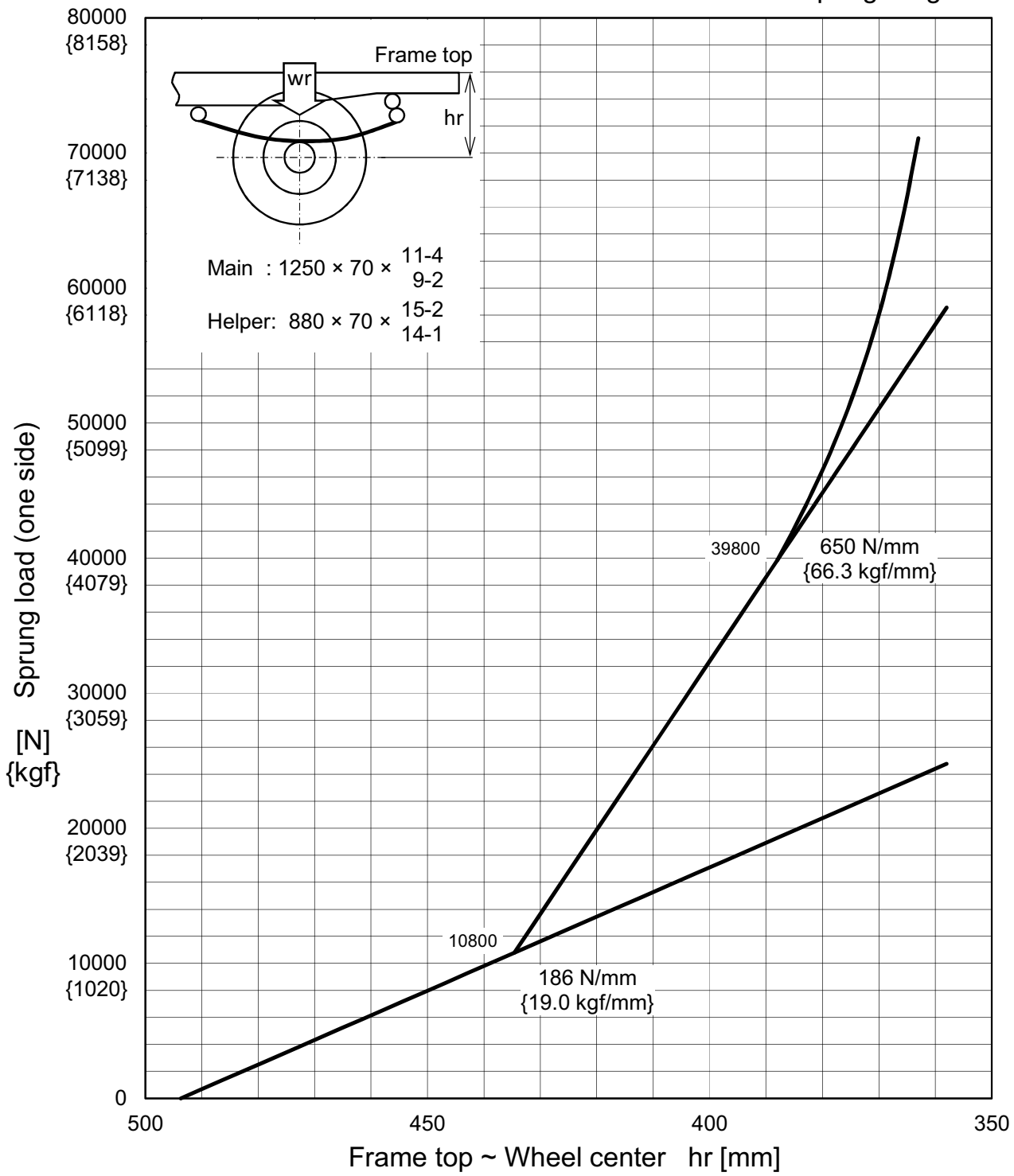


MODEL: FEB7

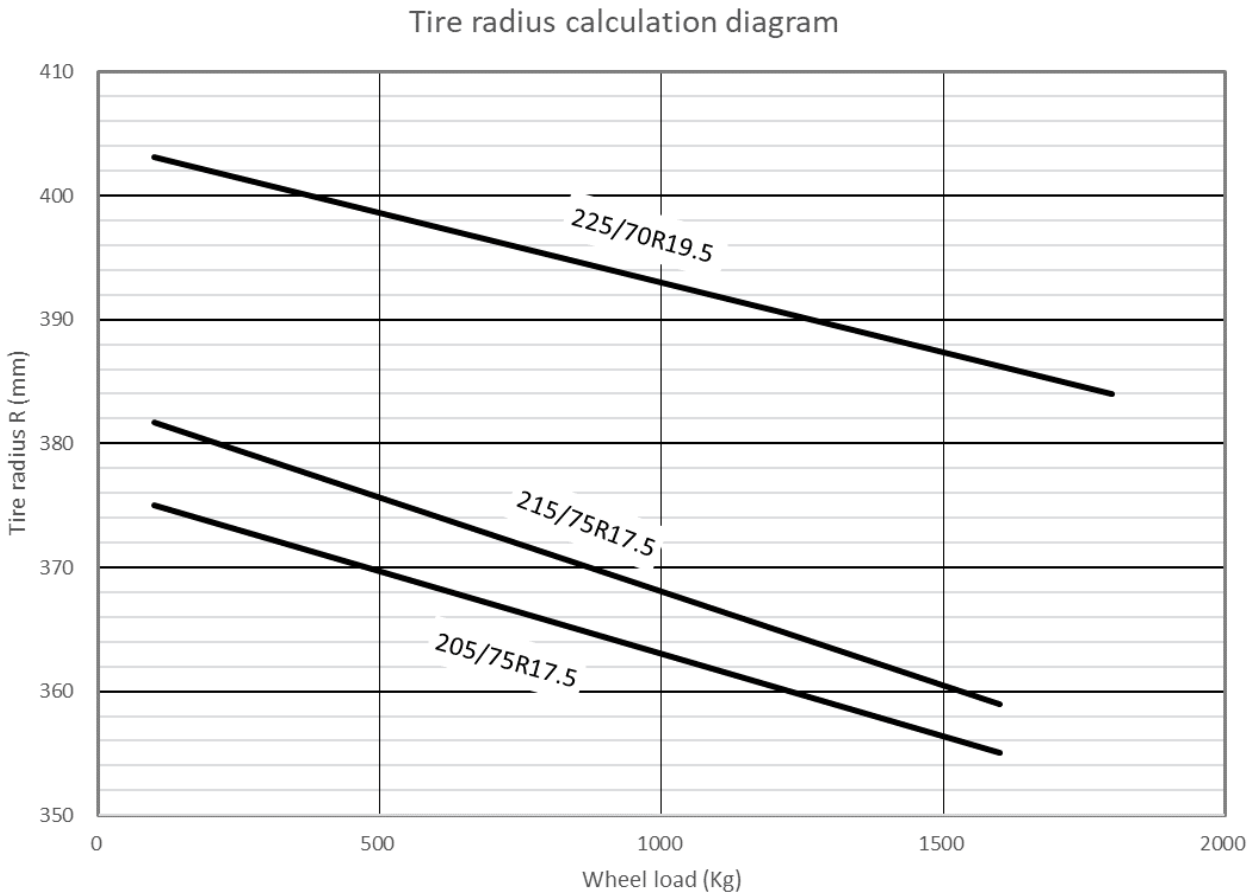

Rear Spring Diagram
Frame top
wr
hr
Main : 1250 × 70 × 11-4 9-2
Helper: 880 × 70 × 13-3
70000 {7138}
60000 {6118}
50000 {5099}
40000 {4079}
30000 {3059}
20000 {2039}
10000 {1020}
0
Sprung load (one side)
wr
[N]
{kgf}
38000
549 N/mm
{56.0 kgf/mm}
10800
186 N/mm
{19.0 kgf/mm}
440
390
340
290
Frame top ~ Wheel center hr [mm]

MODEL: FECX

Rear Spring Diagram



10.7.5 Tire radius calculating diagram



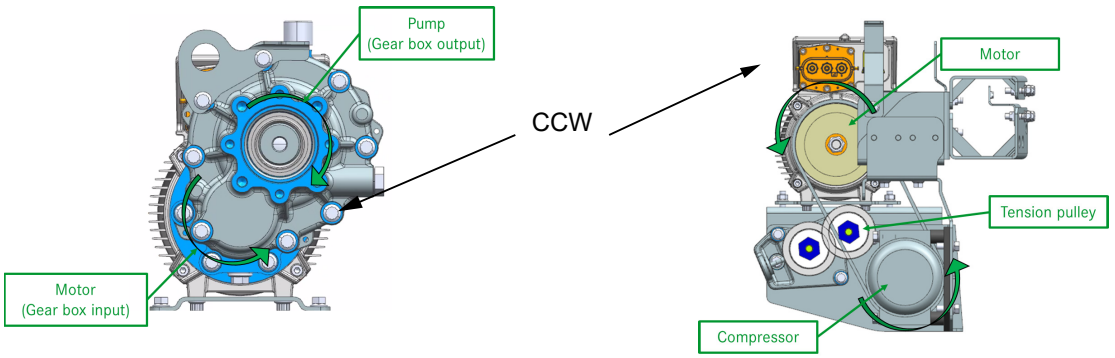
10.8 ePTO

10.8.1 ePTO data list

ePTO type	Use	ePTO rotation ratio (relative to motor rotation)	Allowable output shaft torque (Nm)	Part No.		Remarks
				Motor	Reduction gear	
With reduction gear	For hydraulic pump drive	0.286 (reduction ratio: 3.5)	Reduction gear output shaft 222 (5 minutes max.) 161 (constant)	ME540369	ME540803	Pump directly connected
With pulley	For compressor drive	Depends on the compressor pulley diameter (Motor side pulley diameter: 130 mm)	Motor output shaft 64 (5 minutes max.) 46 (constant)	ME540663	-	Belt-driven For refrigerated vehicles

NOTE:

1 The rotation direction of the PTO output shaft is set by default, as shown in the figure below.
To change the rotation direction, use the maintenance tool FUSO Diag.



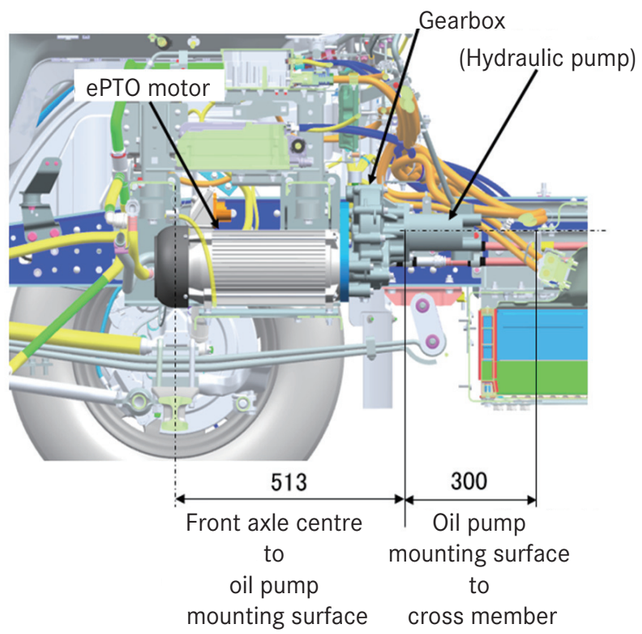
Gear box (Pump) application
View from vehicle rear side

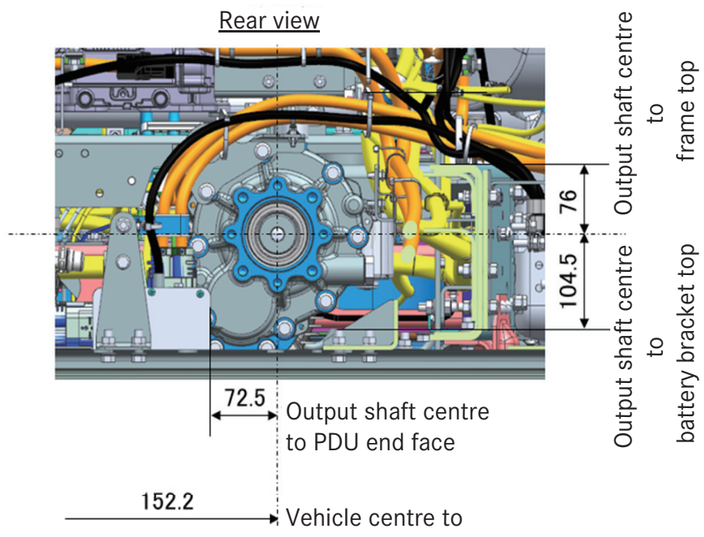
Pulley (Compressor) application
View from vehicle rear side

2 Refer to "10.8.2 ePTO ASSY" for details in the case of power extraction.

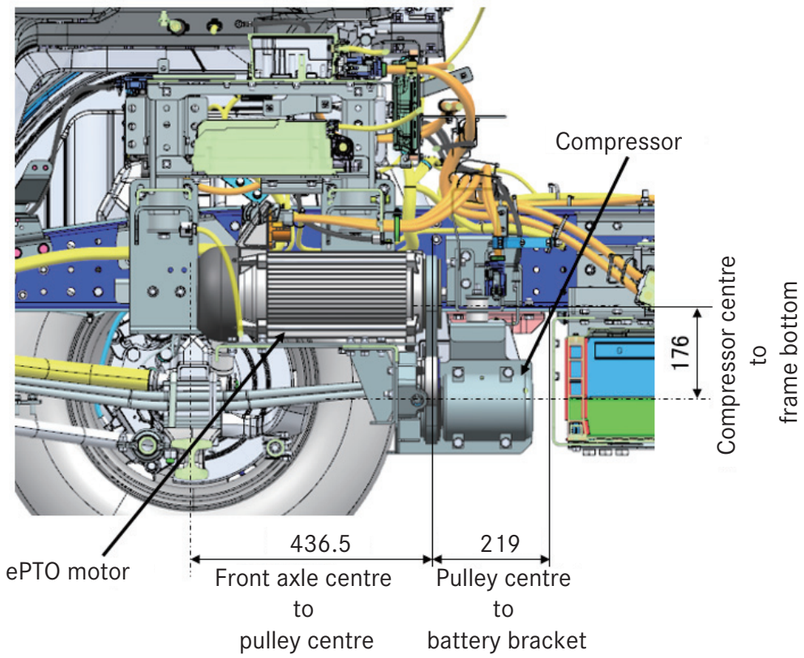
10.8.2 ePTO ASSY

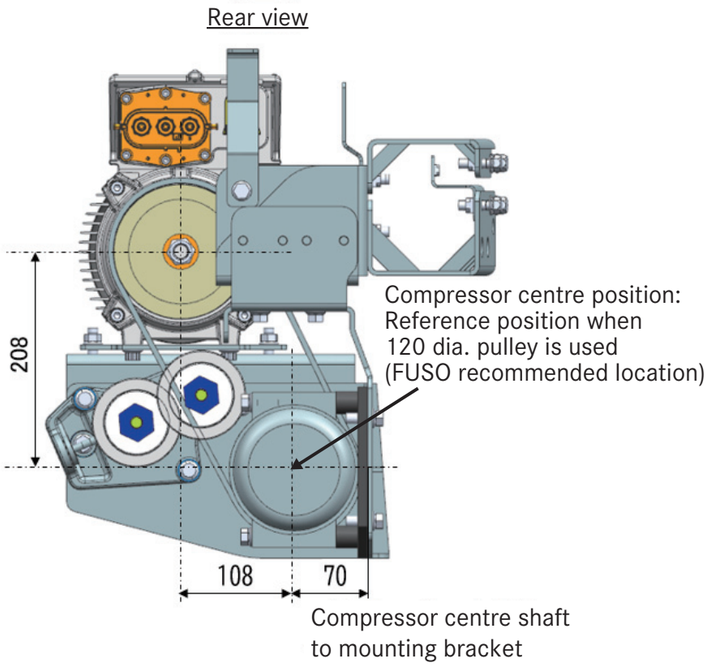
Gear box (Pump)





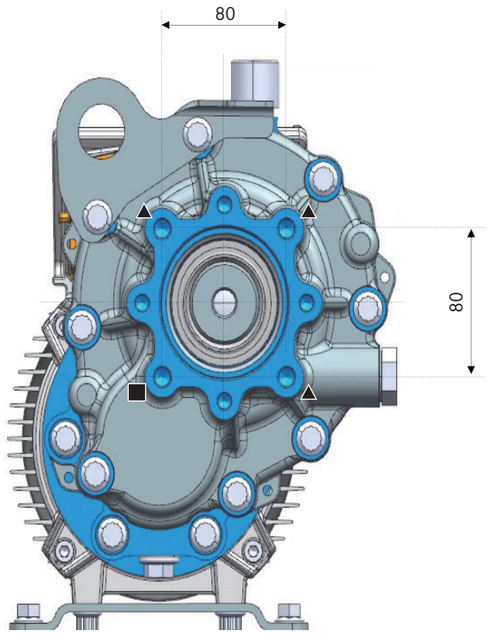
Pulley (Compressor)



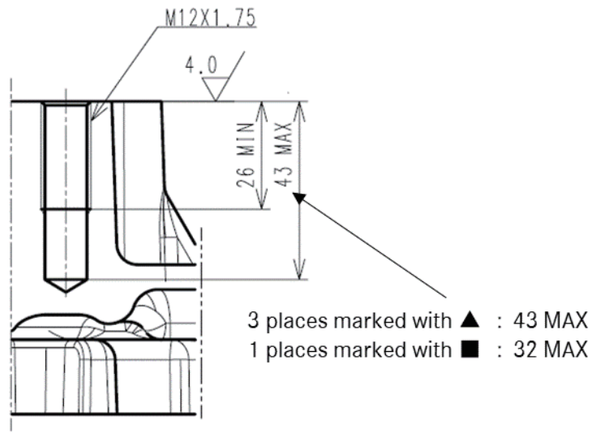


10.8.3 ePTO outlet

Gear box (Pump)

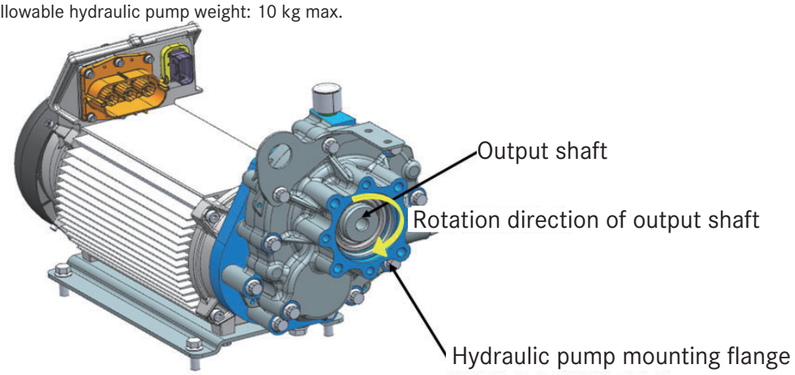


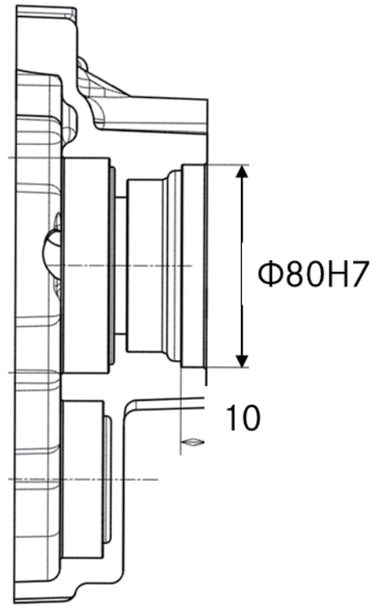
Specifications of hydraulic pump mounting flange



Pump mounting hole dimensions

Connection method: Directly connected to reduction gear
(same specifications as some TM PTOs for diesel vehicles)
Rotation direction: Clockwise when viewed from hydraulic pump side
Output shaft: Spline fitting type (internal spline)
Spline specifications: A8×32×36, DIN 5462
Allowable hydraulic pump weight: 10 kg max.



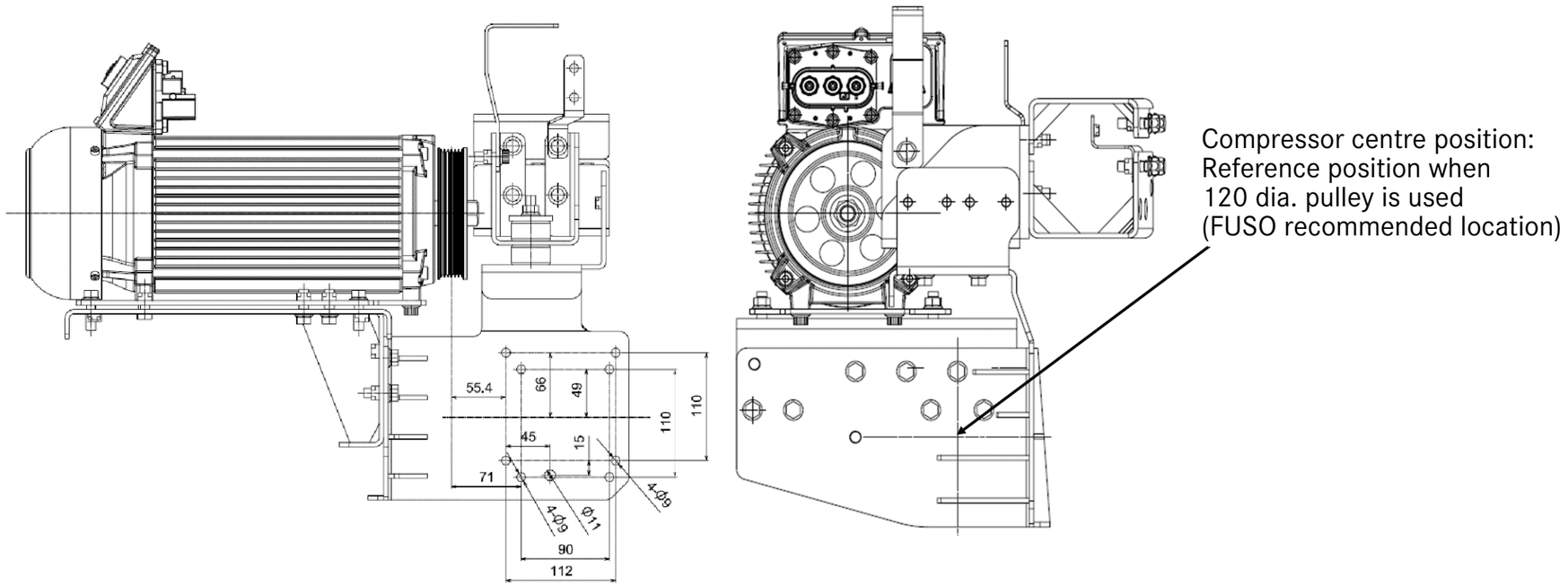


Pump mounting spigot dimensions

10.8 ePTO

B

Pulley (Compressor)

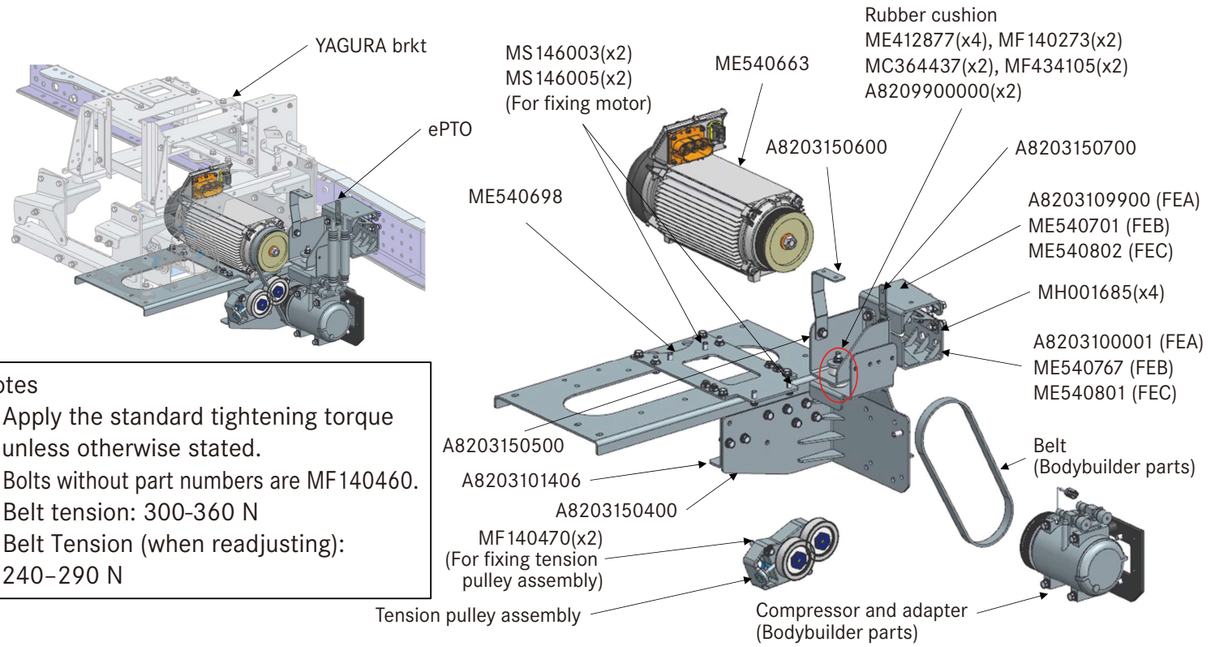


10.8 ePTO

10.8.4 Installation of ePTO parts (for FEB) on refrigerated vehicles

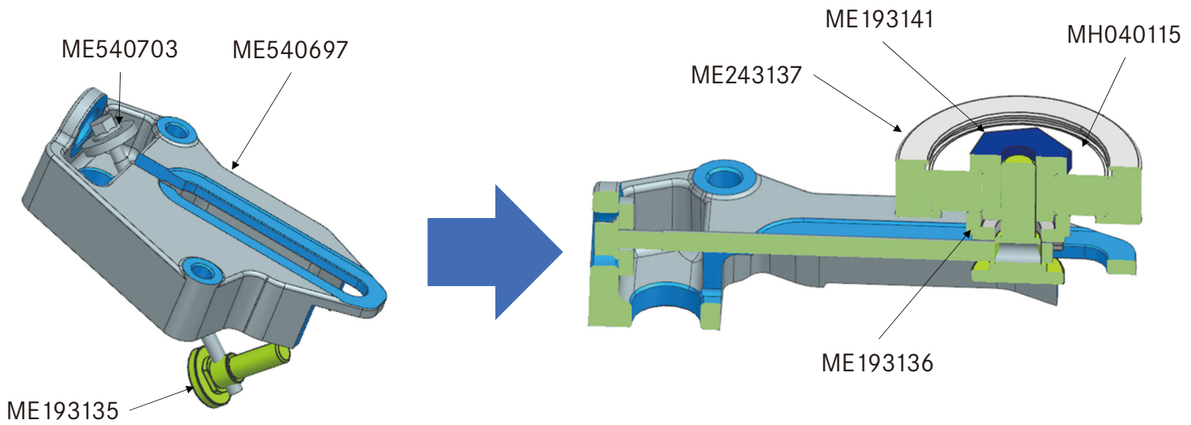
B

Whole



Notes
1. Apply the standard tightening torque unless otherwise stated.
2. Bolts without part numbers are MF140460.
3. Belt tension: 300-360 N
4. Belt Tension (when readjusting): 240–290 N

Tension pulley assembly

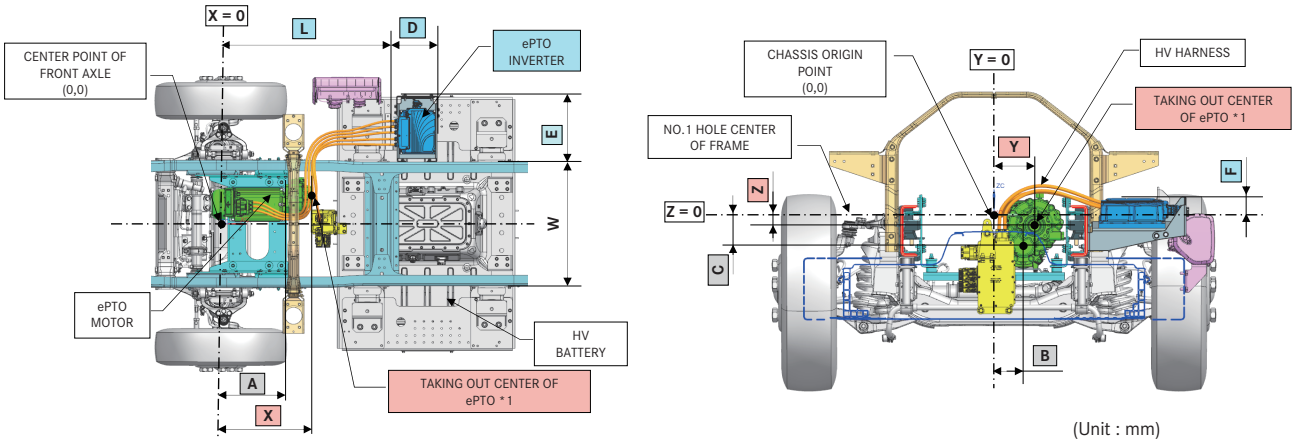


Pass ME540703 through the slit part of ME540697 and temporarily fix ME 193135.

Install each part as described above.
Tightening torque for ME193141
During preliminary assembly: 9.8 Nm (8–12 Nm)
After belt tension adjustment: 42.2 Nm (34–50 Nm)

10.8.5 ePTO Motor and inverter assembly

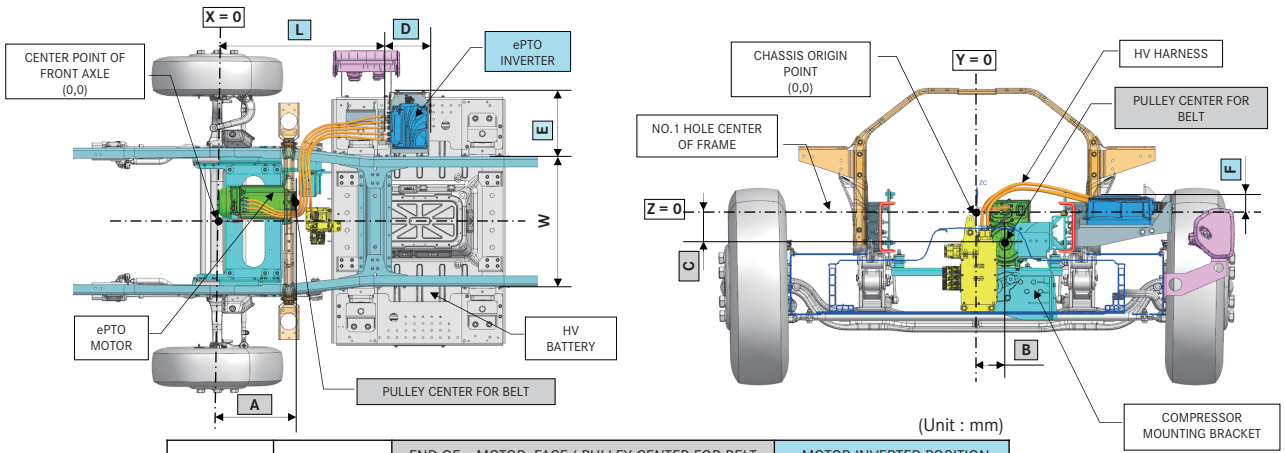
ePTO Reduction Gear box and inverter drawing : Pump type – direct drive



(Unit : mm)

MODEL	W FRAME WIDTH	END OF eMOTOR FACE			eMOTOR INVERTER POSITION				TAKING OUT CENTER OF ePTO *1		
		A	B	C	L	D	E	F	X	Y	Z
FEA	700	366.5	110	113.5	927	304	383	67	510	152	40
FEB	750										
FEC	850										

ePTO Motor and inverter drawing : Compressor type – Belt drive



(Unit : mm)

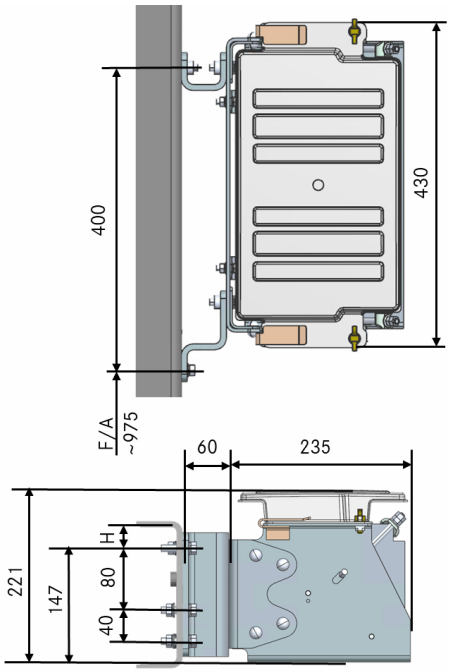
MODEL	W FRAME WIDTH	END OF eMOTOR FACE/ PULLEY CENTER FOR BELT			eMOTOR INVERTER POSITION			
		A	B	C	L	D	E	F
FEA	700	452	110	124	927	304	383	67
FEB	750							
FEC	850							

10.9 Electrical systems

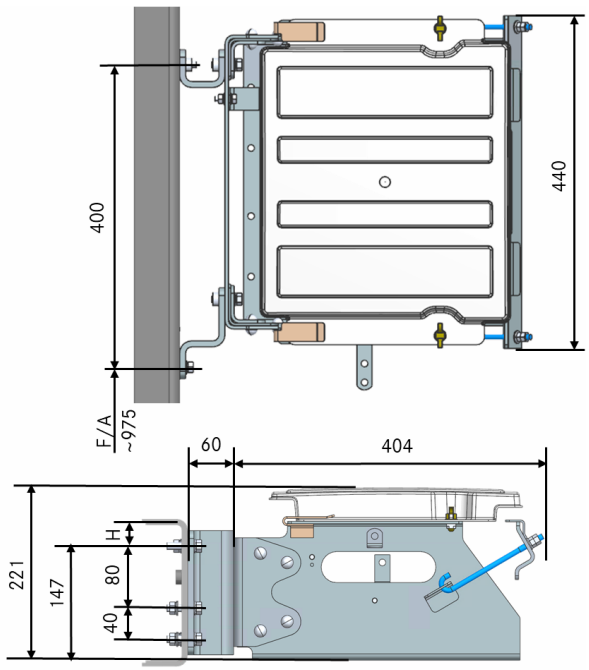
See the electrical systems section.

10.10 Battery mounting layout

12V Single Battery Box



24V/12V Dual Battery Box

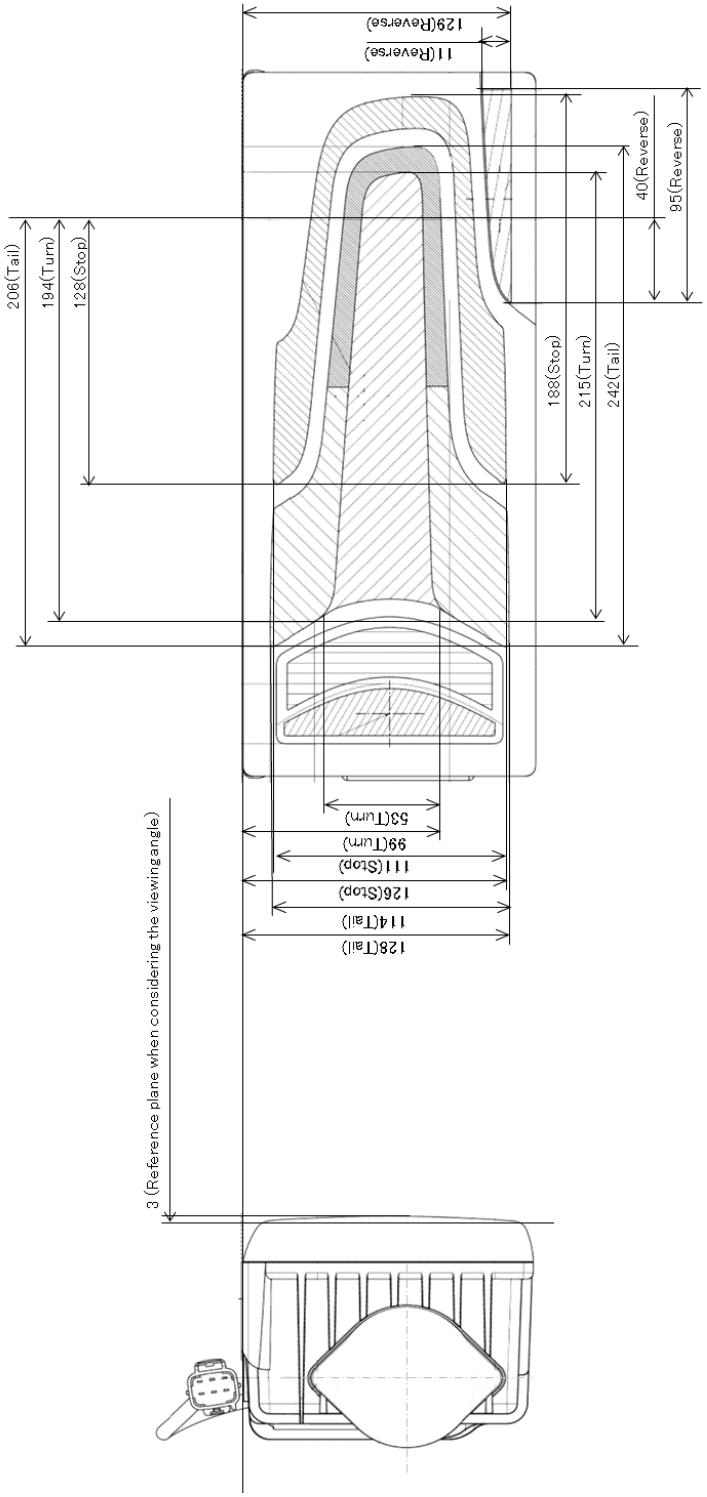


Model	H
FEA FEB	30
FEC	40

10.11 Other equipment

10.11.1 Installing rear lamps

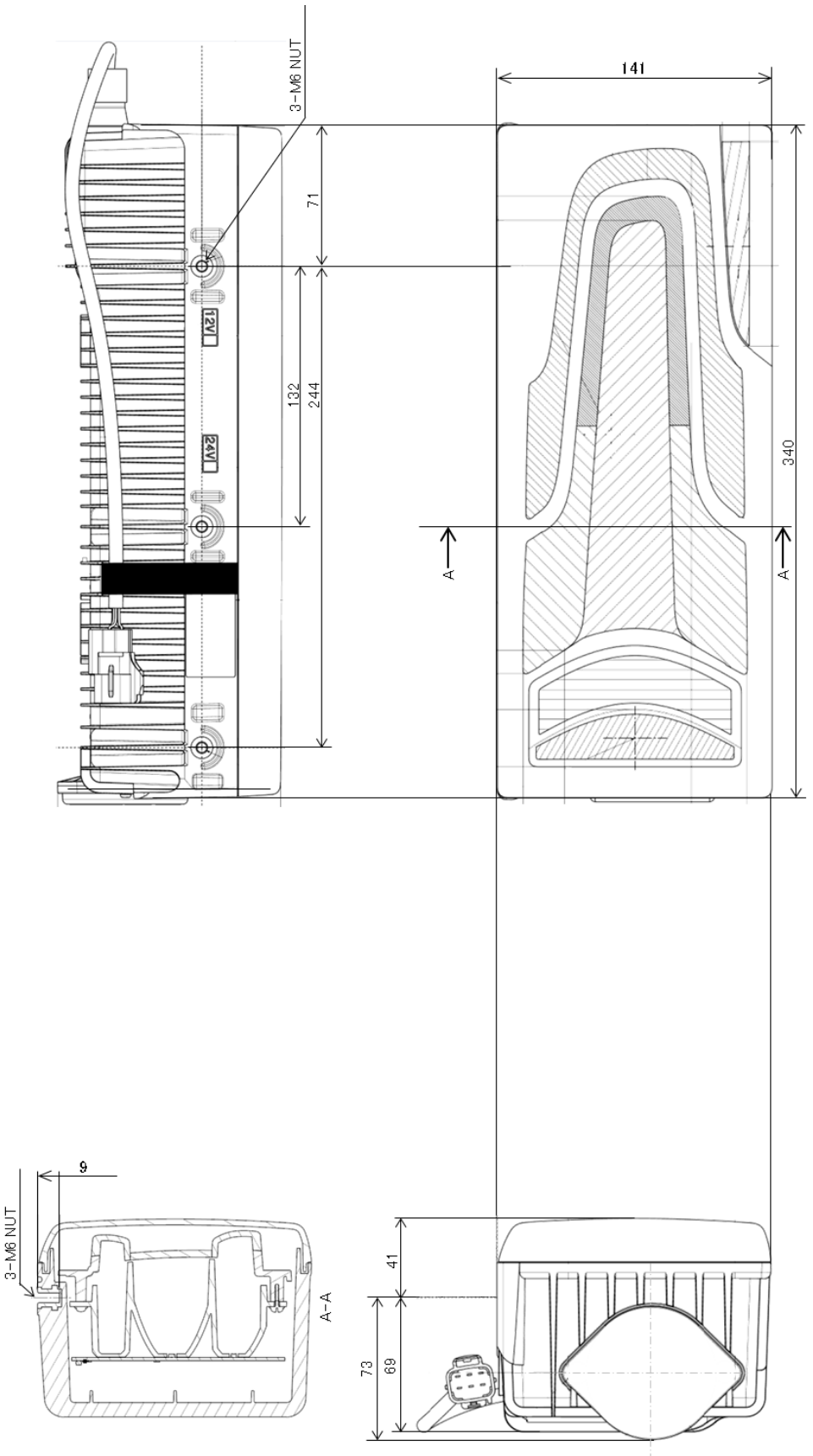
(1) Rear combination lamp



- This figure shows the left-side installation. The right-side installation is symmetrical to the left-side installation.
- The following description provides information on mounting the rear combination lamps onto the chassis. In the case of a chassis provided with a cab, they have been temporarily mounted upside down.

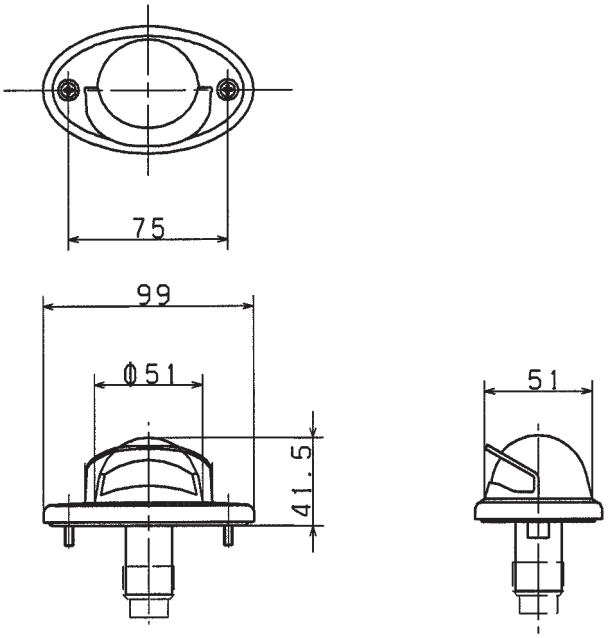
(a) Use the mounting holes on the top surface.

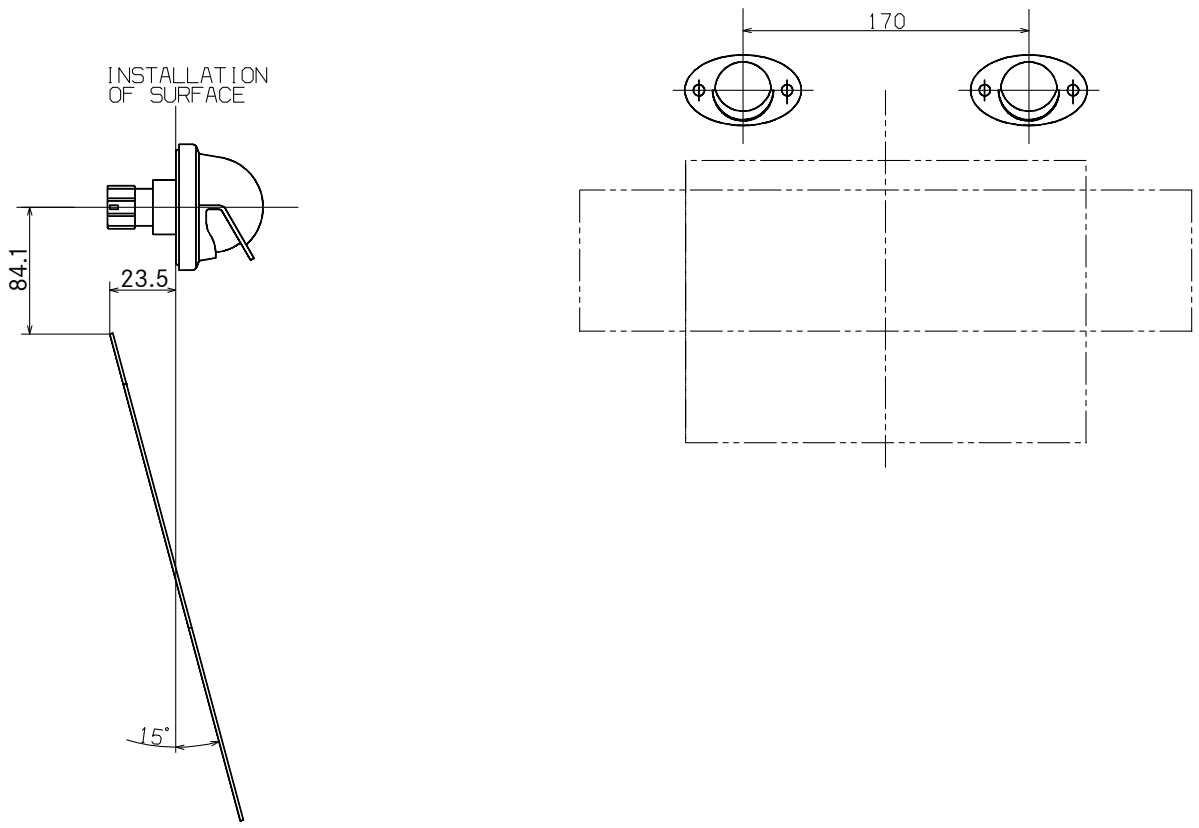
(b) Select the appropriate bolt length considering the thickness of the bracket.



- Installing the rear combination lamp, attach it to the combination lamp mounting hole. Keep the bolt fitting part 9 mm or less.

(2) Rear registration plate lamp





10.11.2 Labels and markings

- When peeling off a label or emblem, order the part number from the responsible division and attach the label or emblem while referring to ▷ 95.

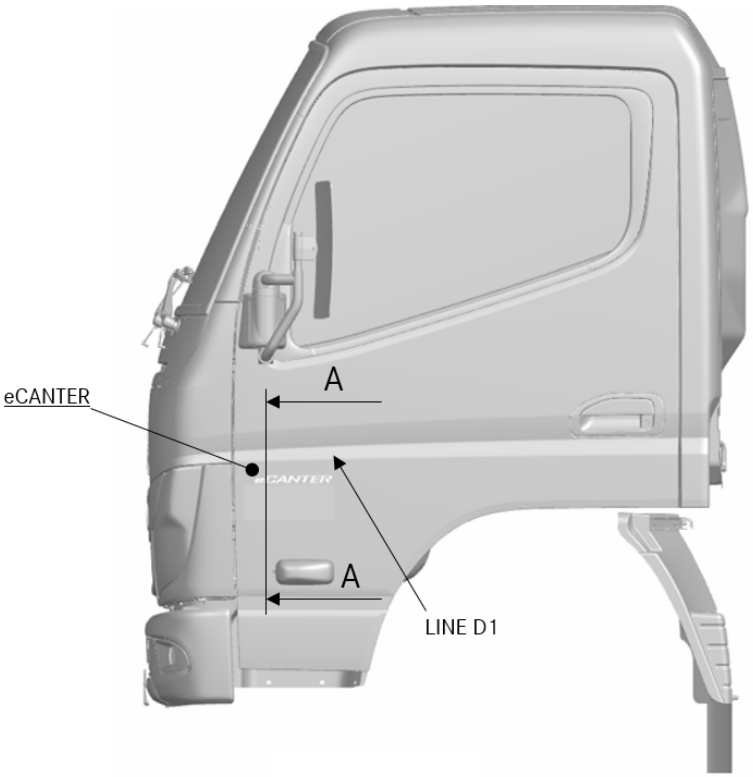
(1) List of the attaching locations of labels and emblems

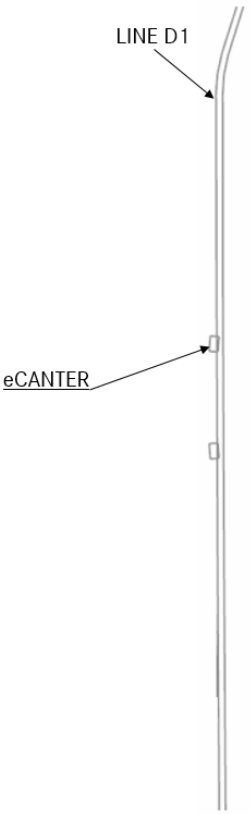
Locations / Description	Front face of cab	RH and LH doors	Emergency stop button
3-DIA	○	–	–
eCANTER	–	○	–
Emergency stop button	–	–	○

NOTE: Types of the label and emblem attaching on a vehicle differ depending on the vehicle types.

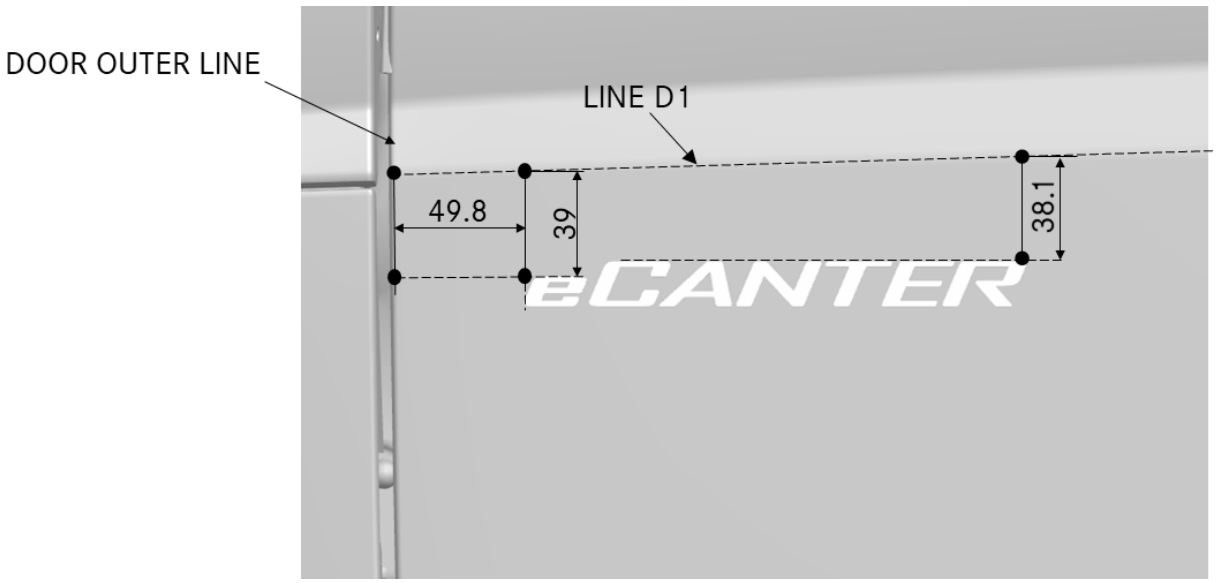
(2) Installation of marks

Clean the indicated areas where the eCANTER mark, and Emergency stop button caution label are to be stuck, peel off the backing paper from each sticker, and affix it in position according to the illustration.

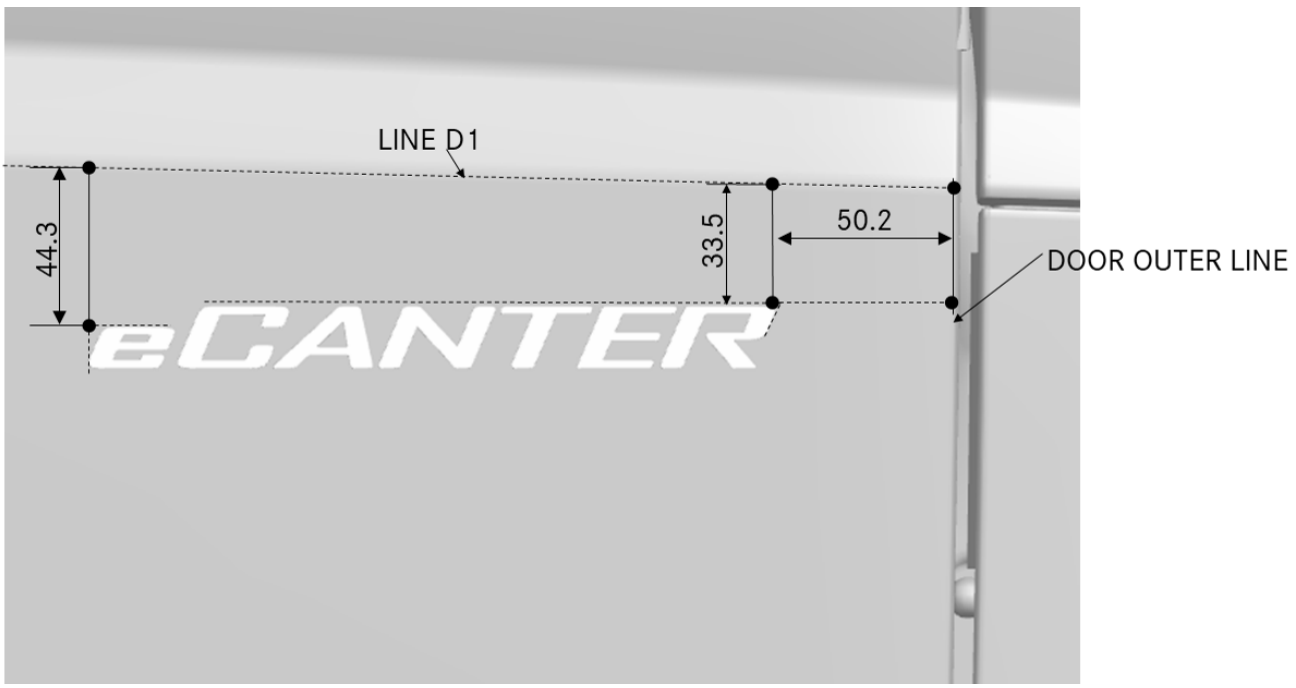




LH

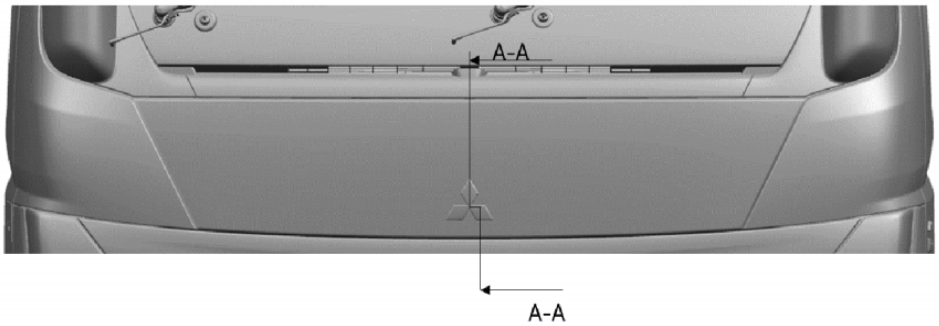

DOOR OUTER LINE
LINE D1
49.8
39
38.1
eCANTER

RH


LINE D1
44.3
33.5
50.2
DOOR OUTER LINE
eCANTER

10.11 Other equipment

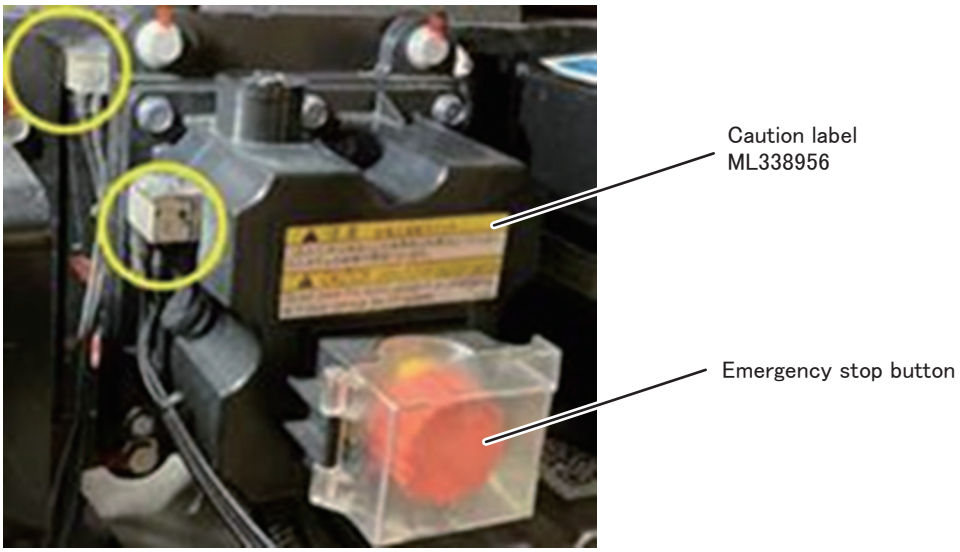
Attaching procedure of the labels and emblems

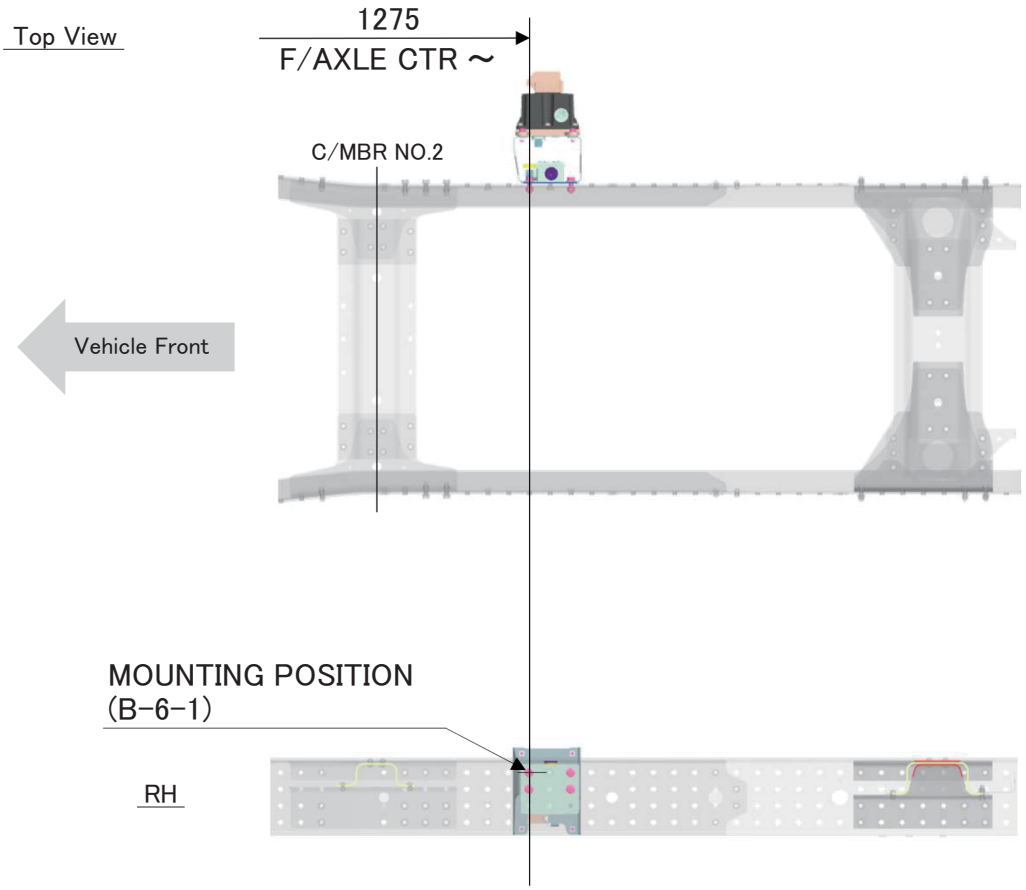


(Unit: mm)

Cab width	A
Standard	27
Wide	33

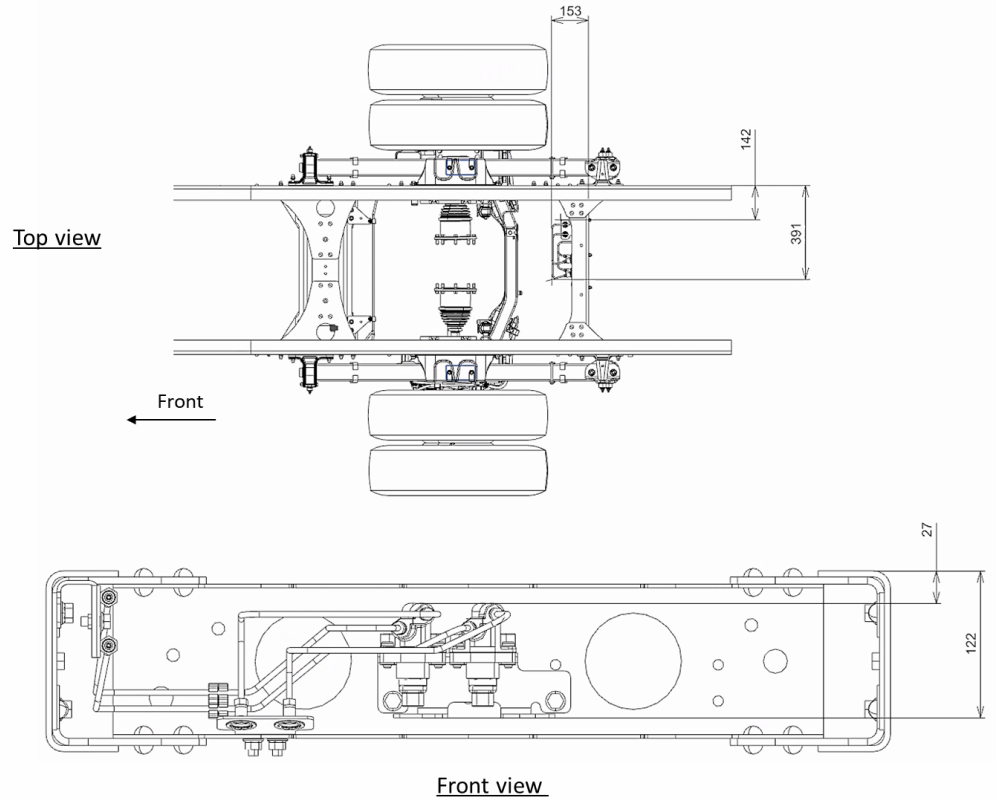
10.11.3 Instructions on caution label installation for emergency stop button



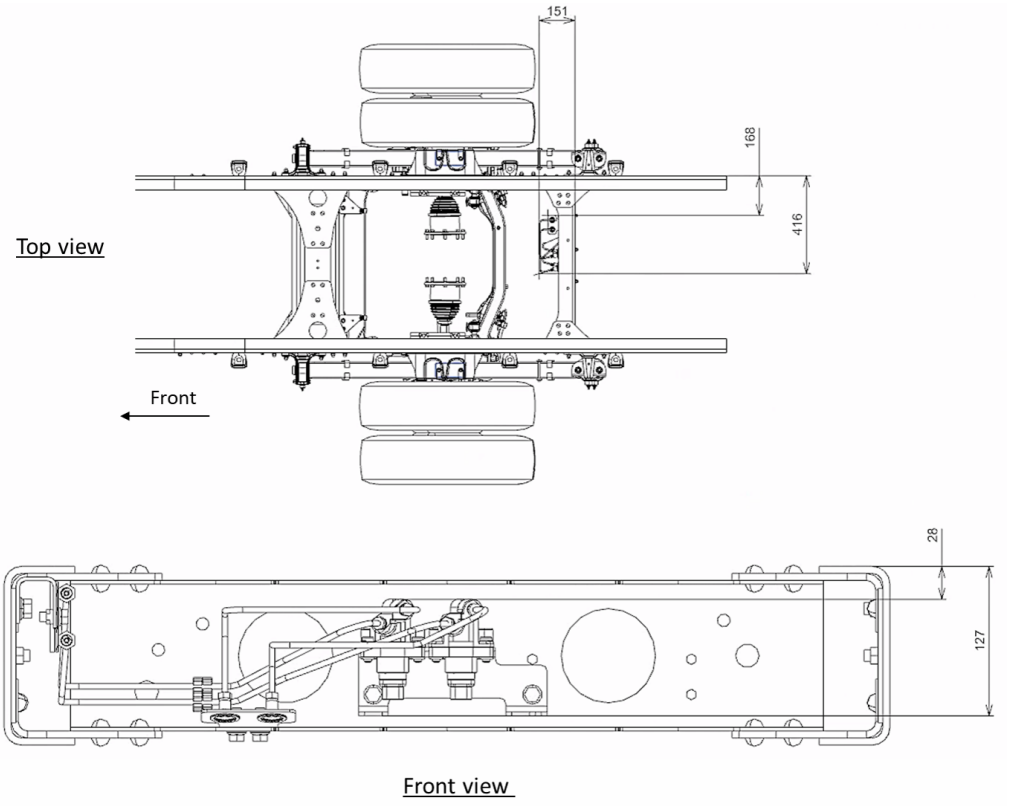


10.11.4 AUS valve

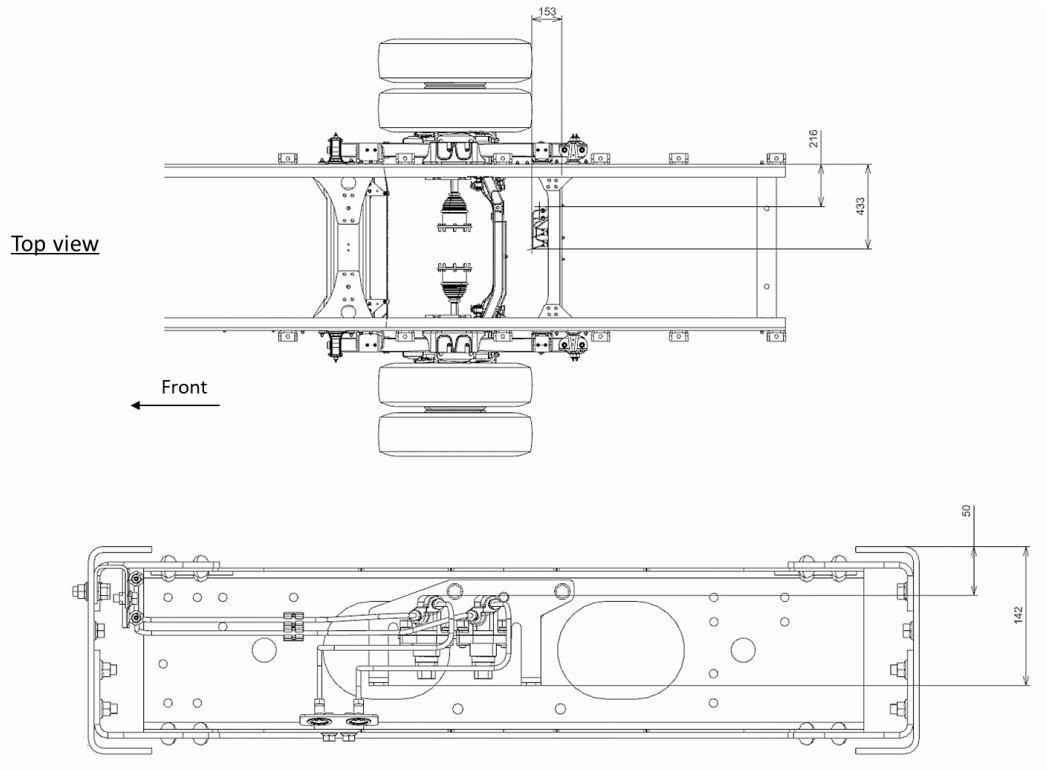
<FEA>



<FEB>



<FEC>



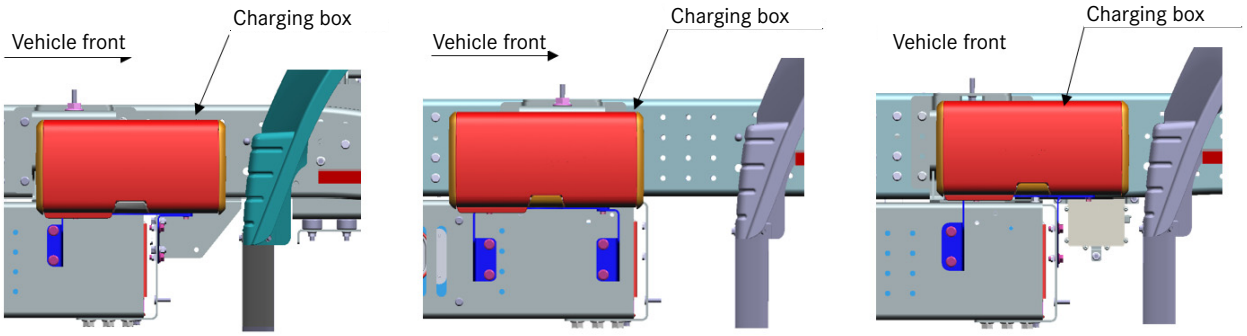
Top view

Front view

10.11.5 Detail drawing of the battery charging socket

Precautions around the charging box

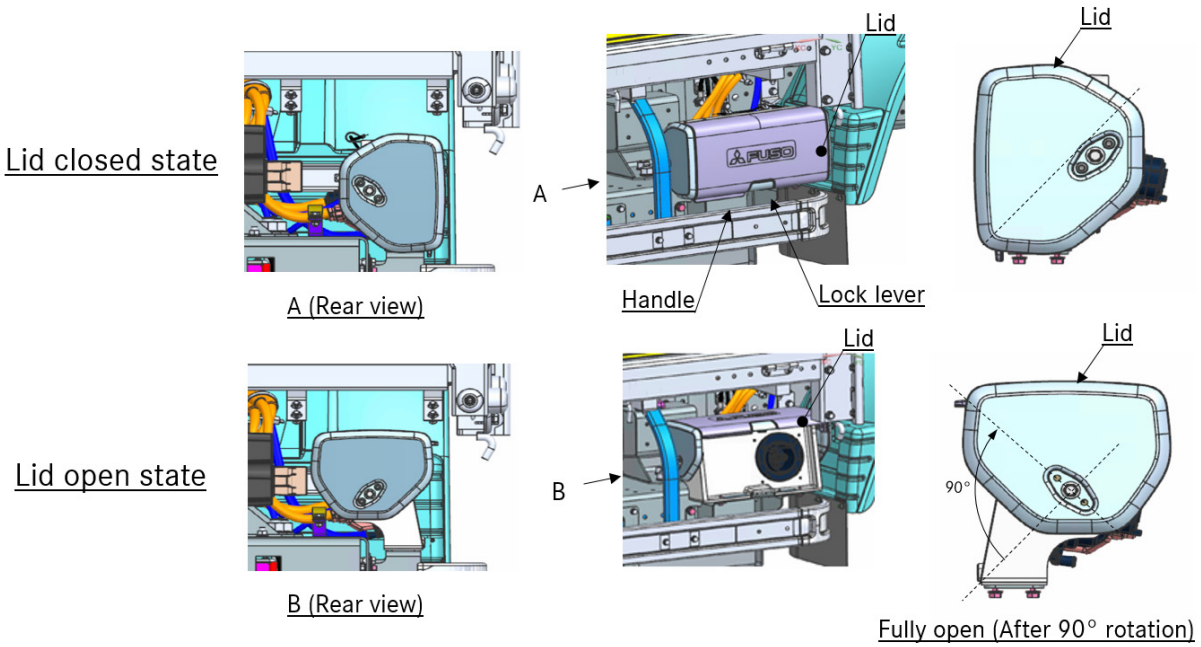
The charging box is mounted behind the cab on the right side of the side rail. Although the vehicle mounting position differs depending on the model, the same parts are used (see the figure below).



Standard width | Wide width (Frame width 750mm) | Wide width (Frame width 850mm)

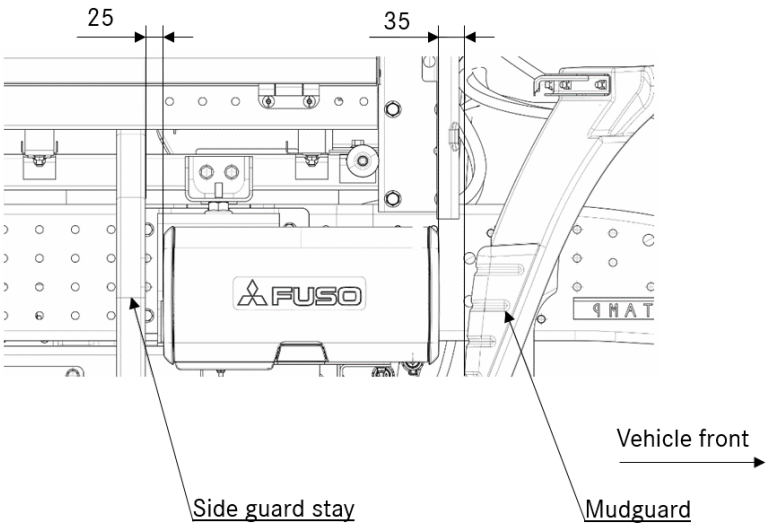
Opening and closing the charging box lid

- Pull the lock lever toward you to unlock.
- Hook your finger on the handle and pull it upward.
- After pulling the lid up to the top, grasp the lid and lift it upward until it locks.
- When closing the lid, push in the upper side of the lid lock lever until it clicks into place and make sure the lid is completely closed.

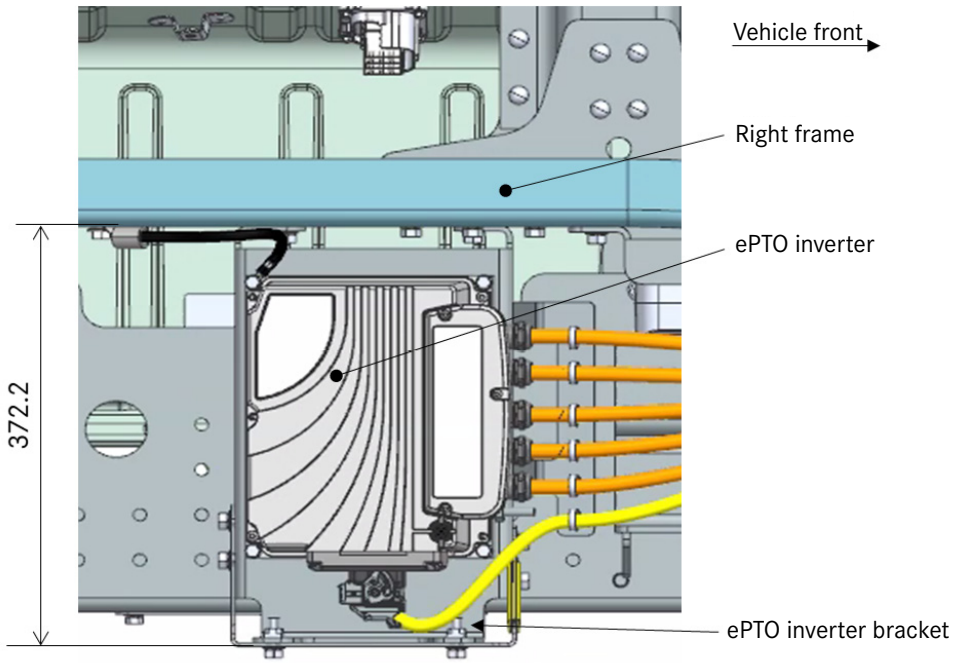


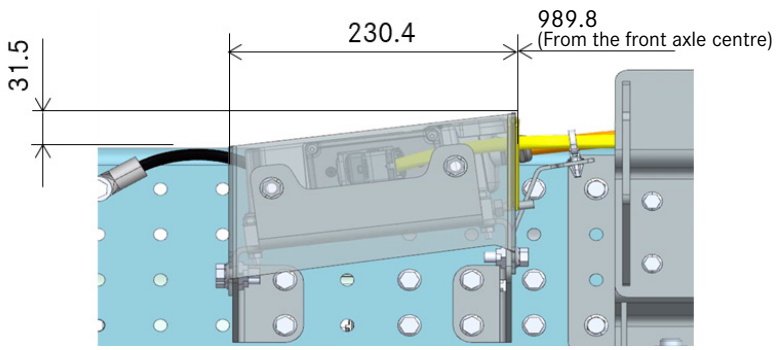
Clearance with peripheral parts

- Ensure a clearance of 25mm or more between the charging box and peripheral parts.
- Consider the possibility of interference with mounting objects when opening and closing the lid.



10.11.6 ePTO inverter

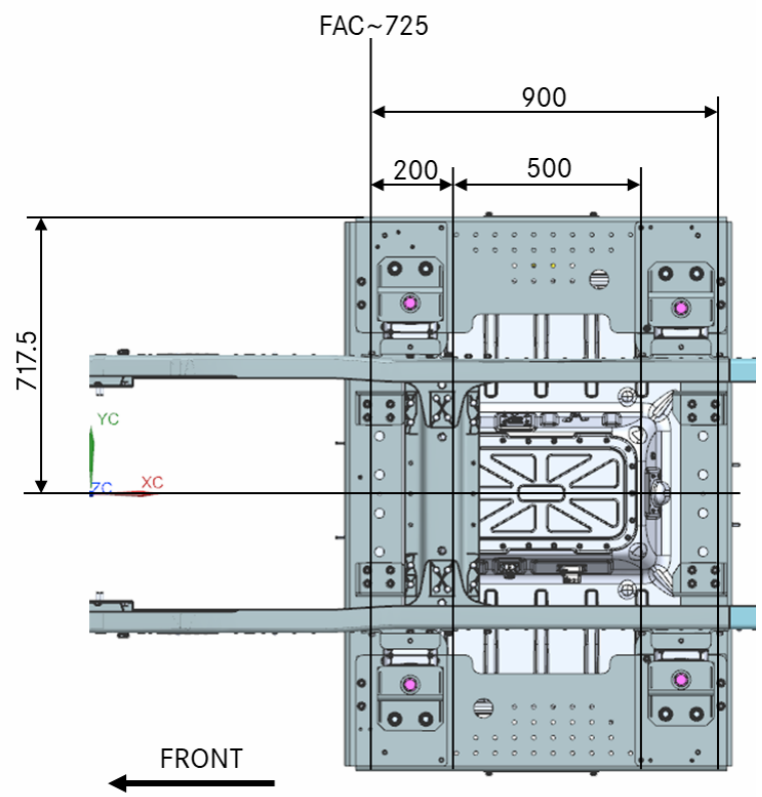




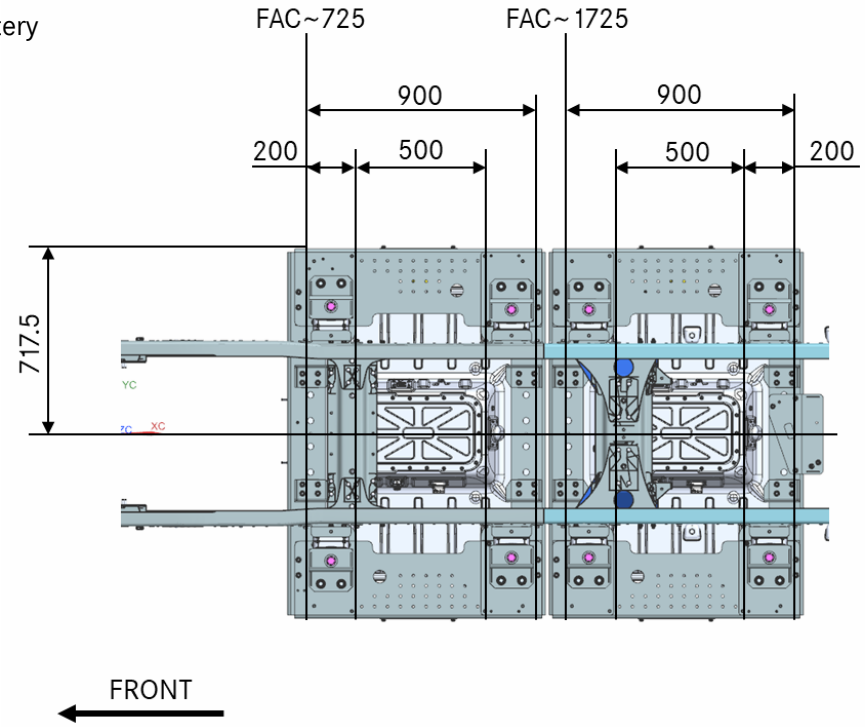
10.11.7 High-voltage battery bracket

A

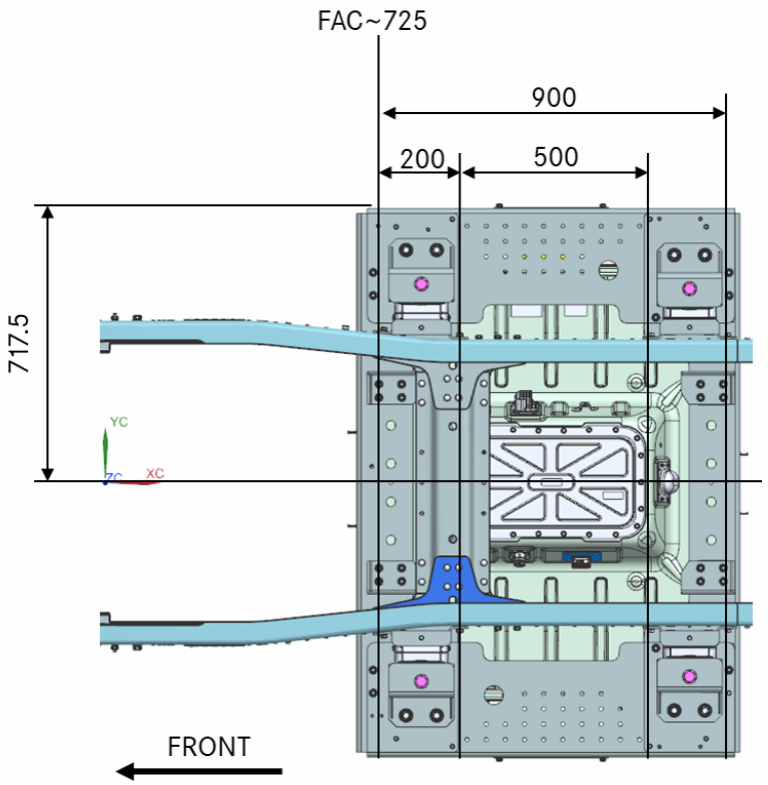
FEA S-size battery



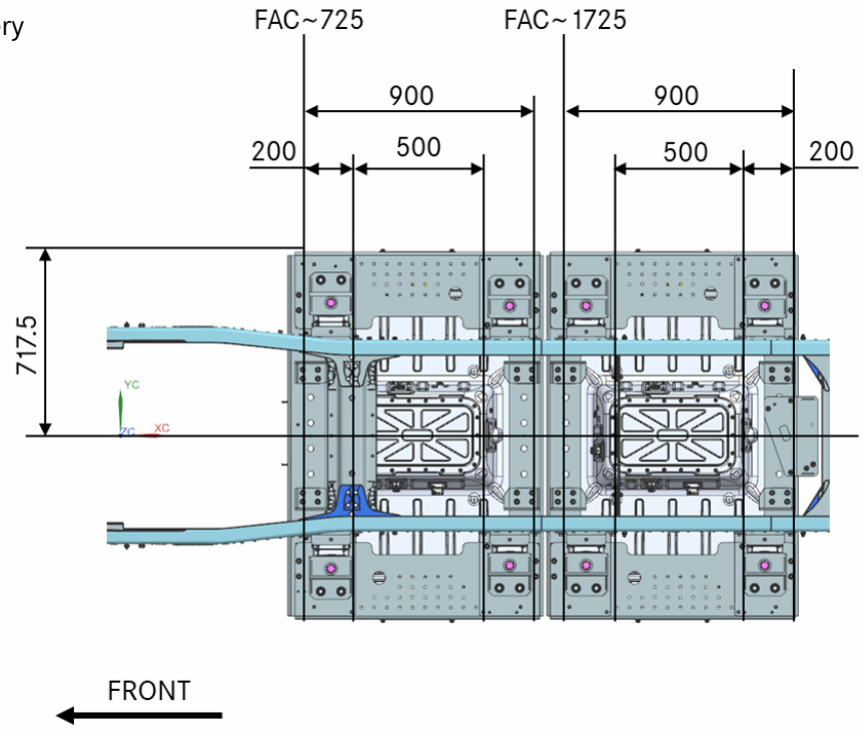
FEA M-size battery



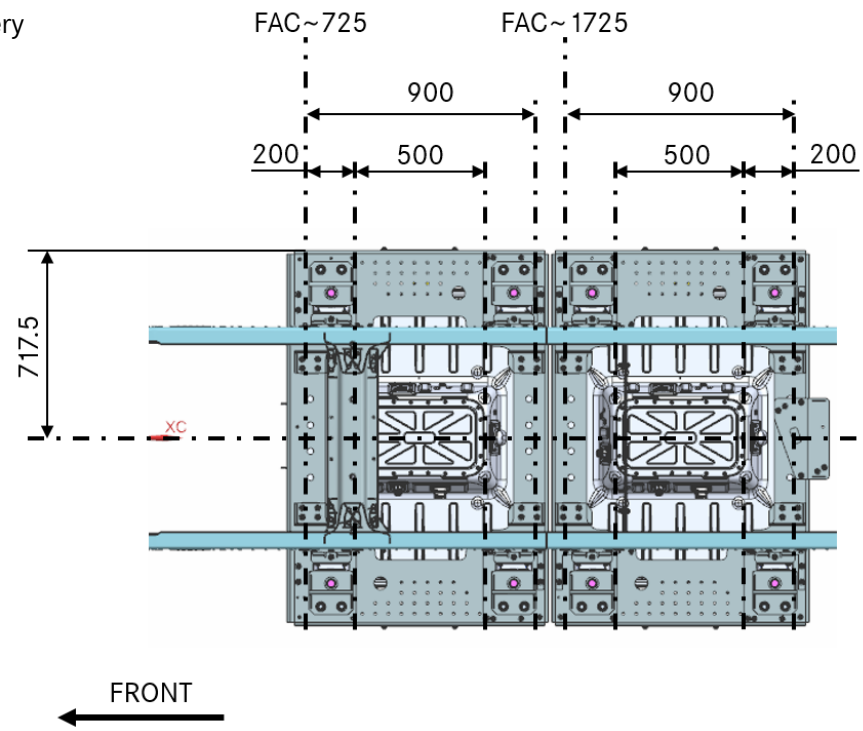
A FEB S-size battery



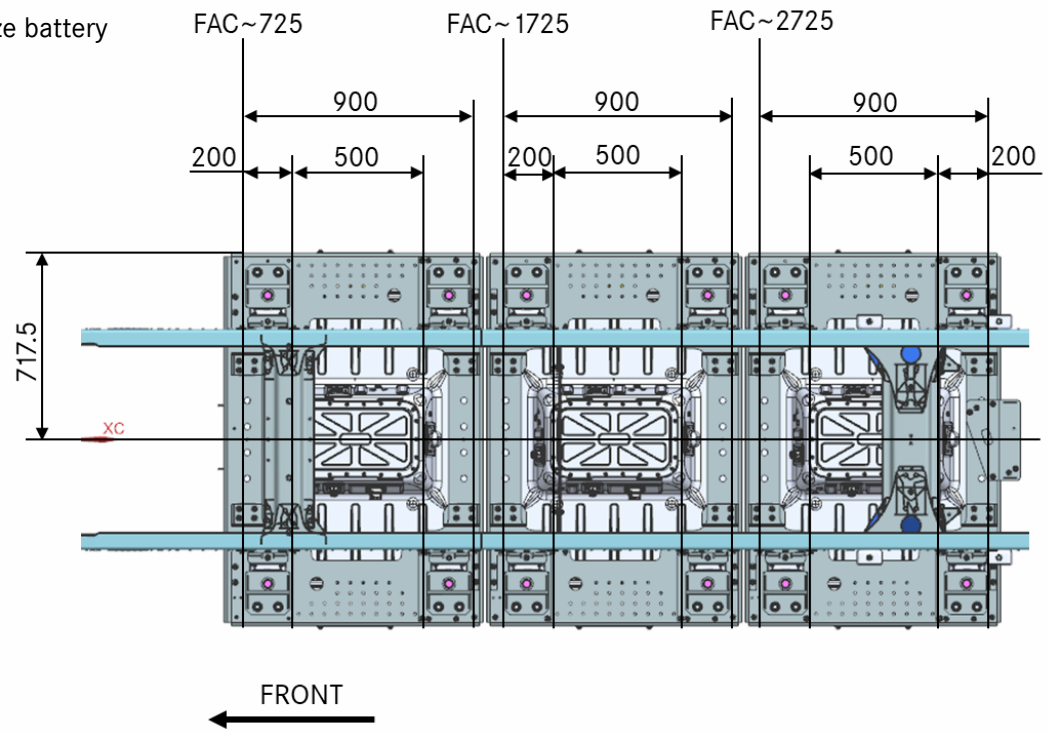
FEB M-size battery



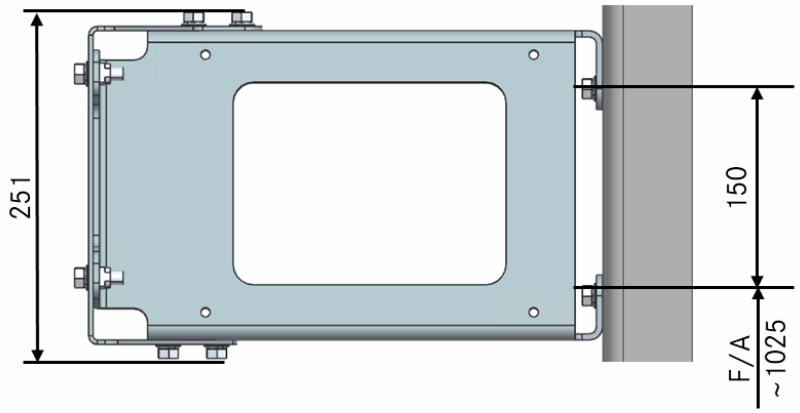
FEC M-size battery

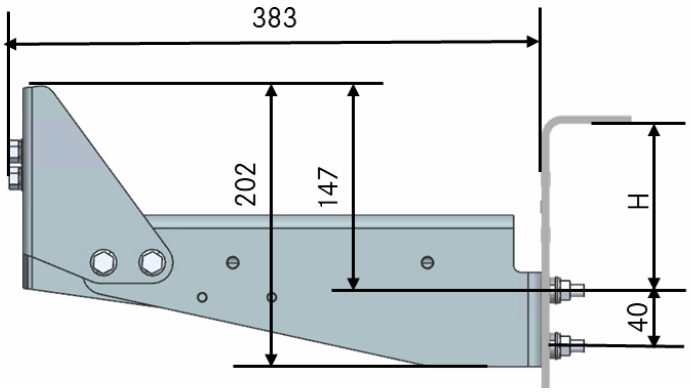


FEC L-size battery



10.11.8 ePTO inverter bracket





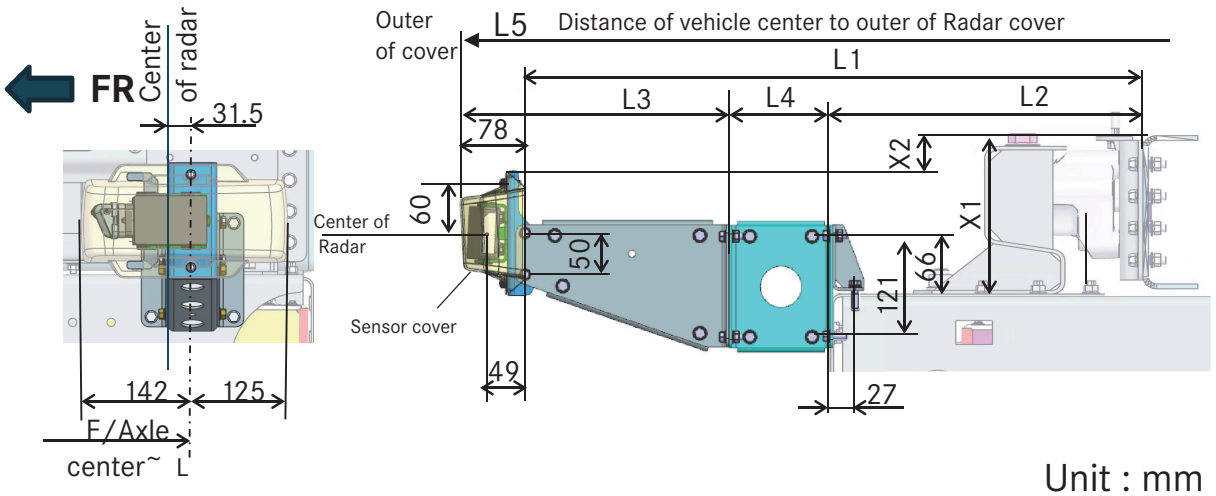
Model	H
FEA FEB	110
FEC	120

10.11.9 Active Sideguard Assist®

B

The radar positions setting at the factory

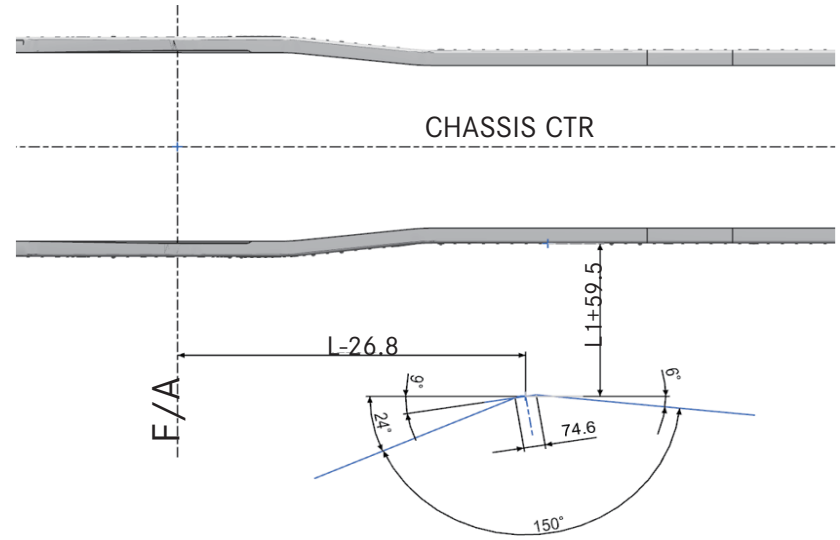
(1) Radar unit installation status



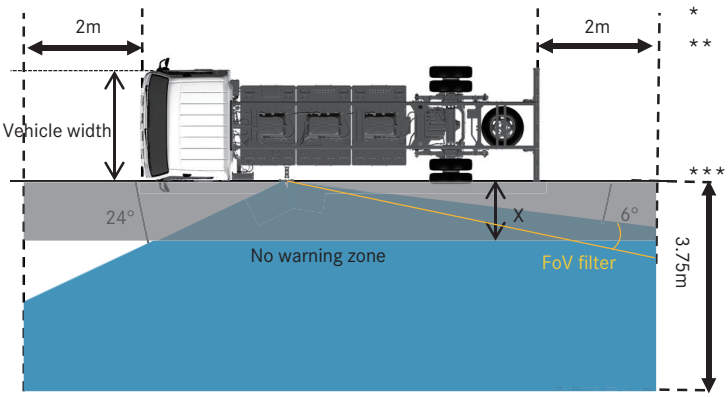
Unit : mm

MODEL	Body Width	L	L1	L2	L3	Extension bracket L4	L5	X1	X2
FEA	2080～2215	1500	476	367	187	125	1029	197.5	53.5
FEBV	2275～2330	1500	507.5	341.5	244	125	1086.4	197.5	53.5
FEB7	2435～2500	1500	587.5	341.5	324	125	1166.6	197.5	53.5
FEC	2435～2500	1500	538.5	292.5	324	125	1166.6	218.5	74.5

(2) Radar sensing area (setting at the factory)



MODEL	Body Width (mm)	Extension Bracket (mm)	L (mm)	L1 (mm)	Radar mounting position (mm)*	No warning zone X** (m)*	FoV Filter*** (°)*
FEA	2,080 to 2,155	125	1500	601	-1020	0	2
FEBV	2,275 to 2,330	125	1500	632.5	-1020	0.6	4
FEB7	2,435 to 2,500	125	1500	712.5	-1140	0.6	4
FEC	2,435 to 2,500	125	1500	663.5	-1140	0.6	4



* ECU parameter value
** No warning zone from outer line of vehicle width
vehicle width is set as below:
1700mm for FEA
2000mm for FEB,FEC
*** Filtering of the radar sensing area

10.11.10 Relocation of radar unit

Radar unit relocation instructions

The radar positions set at the factory can be changed in compliance with the following conditions.

Moving in width direction – Refer the next pages.

The radar installed at the side may not protrude beyond the legally permissible vehicle width.

The radar sensor holders, radar sensors and sensor cover must not be separated. Always reposition the unit as a whole.

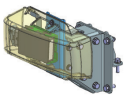
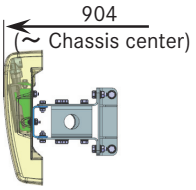
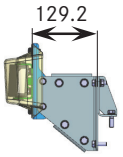
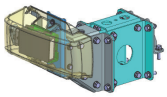
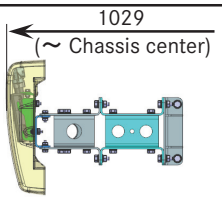
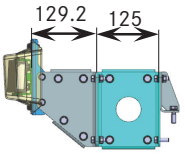
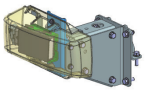
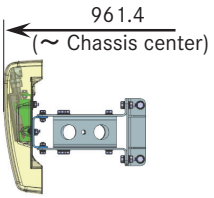
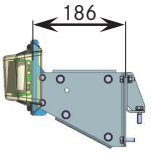
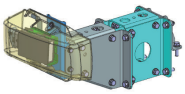
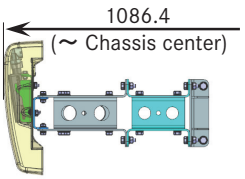
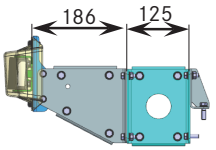
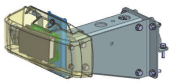
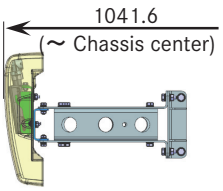
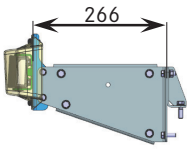
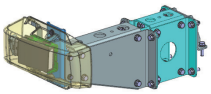
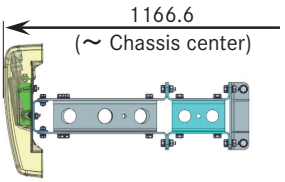
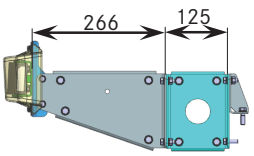
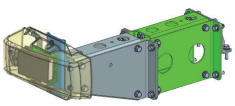
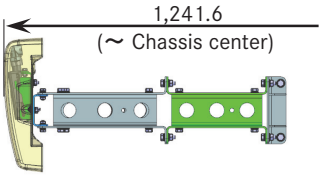
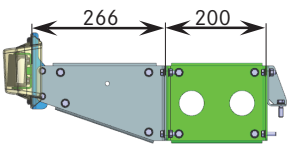
The distance from the center of the radar sensor to the center of the front axle must keep original value.

Parameterization of control units

Adapt parameter accordingly in SRR short-range radar control unit and in VRDU2 control unit. For details, contact your nearest MITSUBISHI FUSO dealer.

B

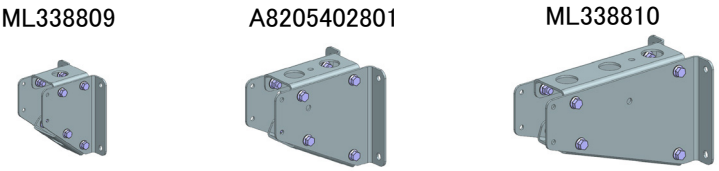
Radar bracket and extension bracket for moving

Model	Bracket part No.	Isometric view	Top view	Rear view
FEA	Radar bracket ML338809			
FEA	Radar bracket ML338809 Extension bracket A8205401120	FEA standard 		
FEA/ FEB	Radar backet A8205402801			
FEA/ FEB/ FEC	Radar backet A8205402801 Extension bracket A8205401120	FEBV standard 		
FEB/ FEC	Radar bracket ML338810			
FEB/ FEC	Radar bracket ML338810 Extension bracket A8205401120	FEB7/FEC standard 		
FEB/ FEC	Radar bracket ML338810 Extension bracket A8205405719			

B Confirm part number of radar bracket and extension bracket in the table of necessary parameter setting.

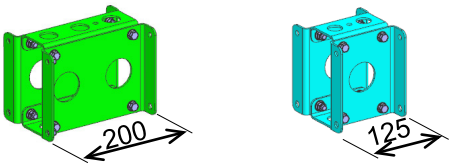
Radar bracket

ML338809 A8205402801 ML338810



Extension bracket (ZB BRACKET)

A8205405719 A8205401120



< Necessary parts for extension bracket>

Part name	Part number	200mm extension	125mm extension
		Quantity	
ZB BRACKET	A820 540 57 19	1	-
ZB BRACKET	A820 540 11 20	-	1
FLANGE BOLT(8x20)	MF140225	4	4
FLANGE NUT(8)	MF434104	4	4

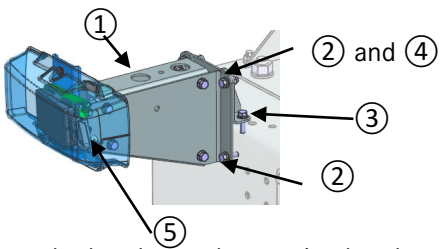
Installation of radar bracket and extension bracket

Disconnect connectors of both side of harness, SRR and remove along with clips.

Disassemble radar bracket

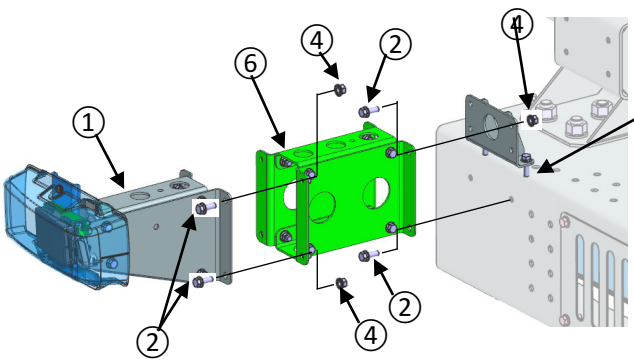
Remove ② and ④

Remove ⑤ if change radar bracket①



①Rada and radar bracket
②Flange bolt (8x20)
③Flange bolt (8x25)
④ Flange nut (8)
⑤ Flange bolt (6X16)
⑥ Extension bracket

Assemble radar bracket and extension bracket



Unless otherwise specified, tightening torque is 19～28Nm

③ Re-tightening with wet condition
Tightening torque : 24～29Nm

Property damage

Tighten ③ with wet condition to prevent bolt looseness

Connect connectors of both side of harness, SRR and assemble with clips.

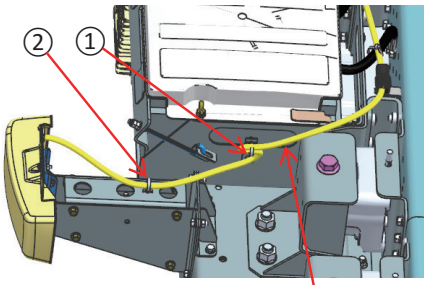
Radar harness arrangement

If the radar is relocated, replace the radar (SRR) harness.
Check the part number of your existing subharness SRR and obtain it according to the table below.

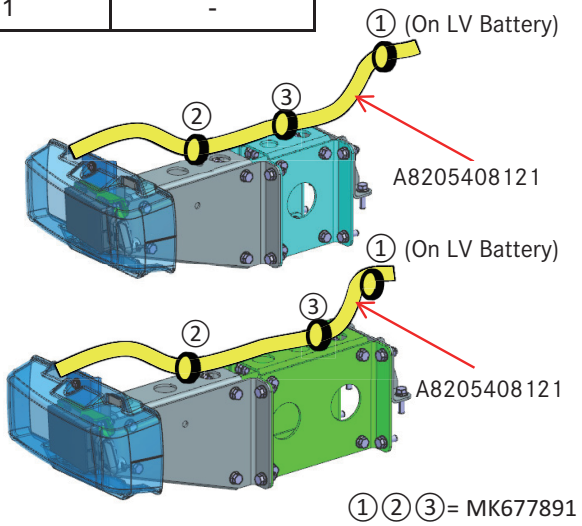
< Necessary parts>

Part name	Part number	Existing Harness	
		ML341716	A8205408121
		Quantity	
Band Clip	MK677891	3	3
Harness, SRR	A8205408121	1	-

< Current Layout>



ML341716 or
A8205409019



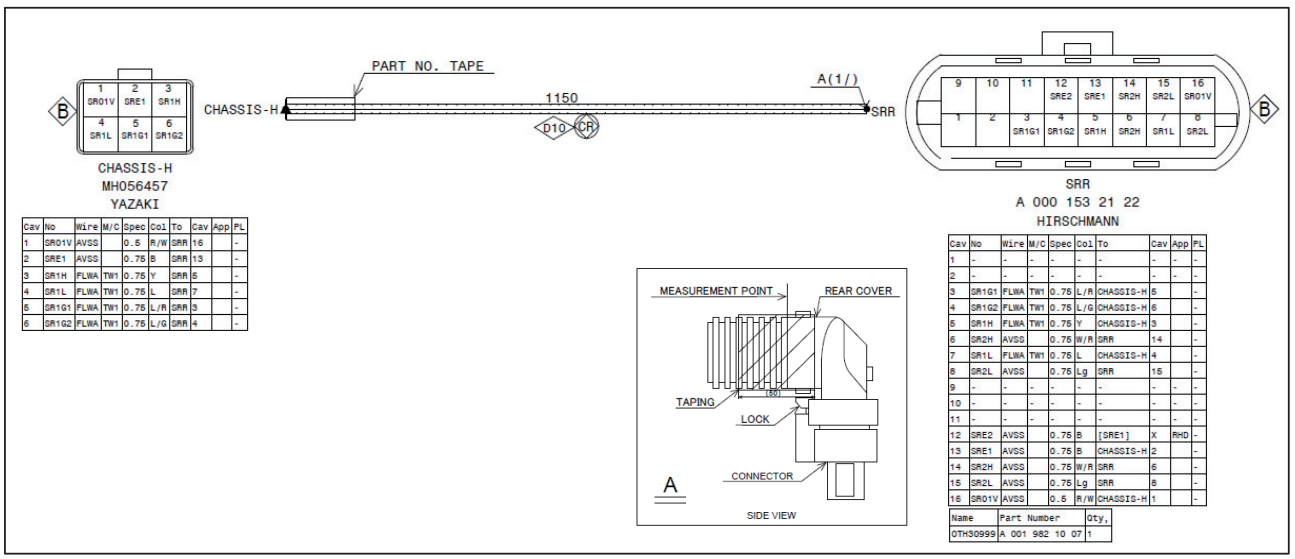
STEP-1

1. Disconnect Harness and remove along with clips ①and ②

STEP-2

1. Connect A8205408121 to both side connectors
2. Fix Band clip ② and ③ then arrange excess length inside clip ① and fix

Drawing: A8205408121



B

Necessary parameter setting

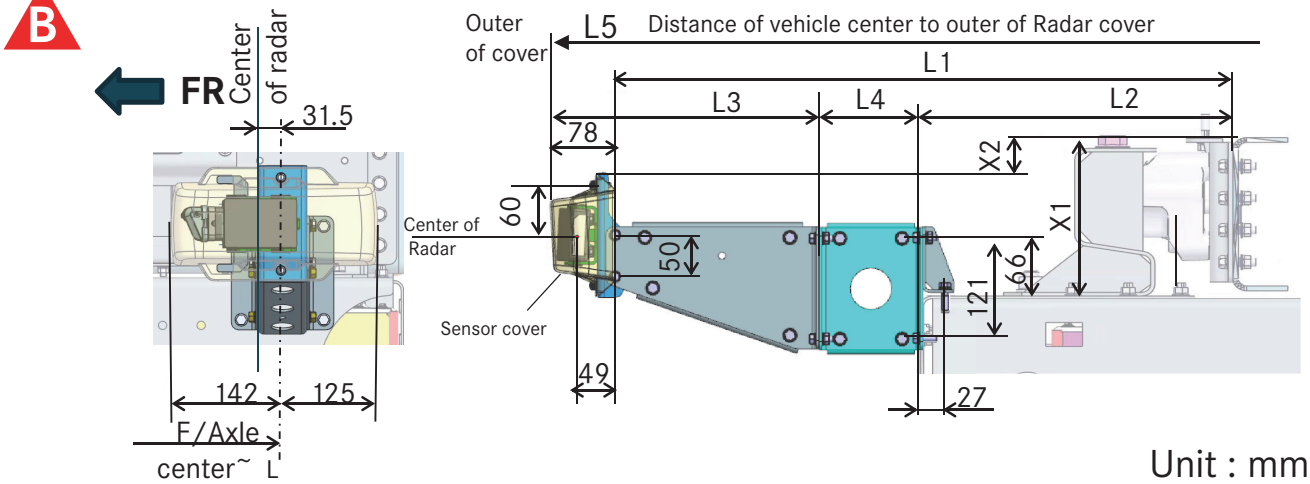
Set as below if necessary for position change

: setting at the factory.

Boxes without bold text: Non factory set, when extension brackets are installed, parameter changes are required for ASGA to operate properly. Please contact your dealer.

MODEL	Rear body Width (mm)	Radar Bracket	Extension Bracket		Radar mounting position & parameter		FoV Filter & parameter		No warning zone X & parameter	
		Part number	(mm)	Part number	SRR (mm)	Part number	SRR (°)	Part Number	VRDU (m)	Part number
FEA	1,875 to 1,905	ML338809	-	-	-880	A0024476092, A0024476192	2	A0024472592	0	A0014475051
	1,910 to 1960	ML338809	-	-	-880	A0024476692, A0024476792	4	A0074479392	0.6	A0074472651
	1,965 to 2,020	A8205402801	-	-	-950	A0024476092, A0024476192	2	A0024472592	0	A0014475051
	2,025 to 2,075	A8205402801	-	-	-950	A0024476692, A0024476792	4	A0074479392	0.6	A0074472651
	2,080 to 2,155	ML338809	125	A8205401120	-1020	A0024476092, A0024476192	2	A0024472592	0	A0014475051
	2,160 to 2,215	ML338809	125	A8205401120	-1020	A0024476692, A0024476792	4	A0074479392	0.6	A0074472651
	2,195 to 2,270	A8205402801	125	A8205401120	-1020	A0024476092, A0024476192	2	A0024472592	0	A0014475051
	2,275 to 2,330	A8205402801	125	A8205401120	-1020	A0024476692, A0024476792	4	A0074479392	0.6	A0074472651
FEBV /FEB7 /FEC	1,995 to 2,020	A8205402801	-	-	-950	A0024476292, A0024476392	2	A0024472592	0	A0014475051
	2,025 to 2,080	A8205402801	-	-	-950	A0024476292, A0024476392	4	A0074479392	0.6	A0074472651
	2,105 to 2,180	ML338809	-	-	-1020	A0024476692, A0024476792	2	A0024472592	0	A0014475051
	2,185 to 2,240	ML338809	-	-	-1020	A0024476692, A0024476792	4	A0074479392	0.6	A0074472651
	2,195 to 2,270	A8205402801	125	A8205401120	-1020	A0024476692, A0024476792	2	A0024472592	0	A0014475051
	2,275 to 2,330	A8205402801	125	A8205401120	-1020	A0024476692, A0024476792	4	A0074479392	0.6	A0074472651
	2,355 to 2,430	ML338809	125	A8205401120	-1140	A0084472592, A0084472692	2	A0024472592	0	A0014475051
	2,435 to 2,500	ML338809	125	A8205401120	-1140	A0024476692, A0024476792	4	A0074479392	0.6	A0074472651
	2,505 to 2,550	ML338809	200	A8205405719	-1220	A0084471992, A0084472092	2	A0024472592	0	A0014475051

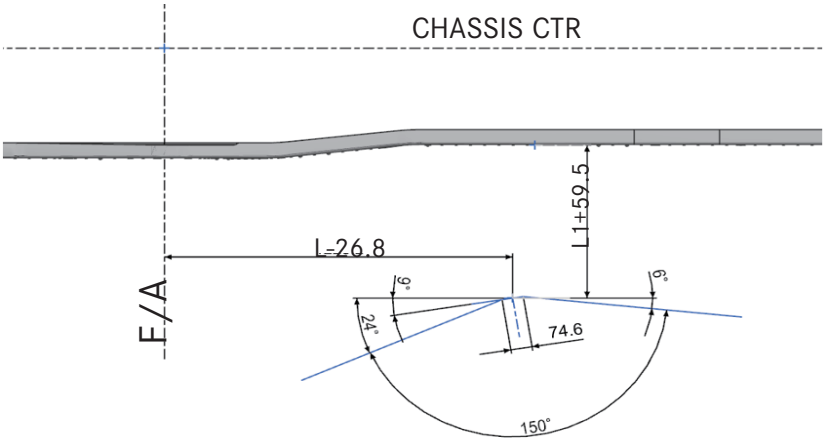
The radar positions setting with extension bracket



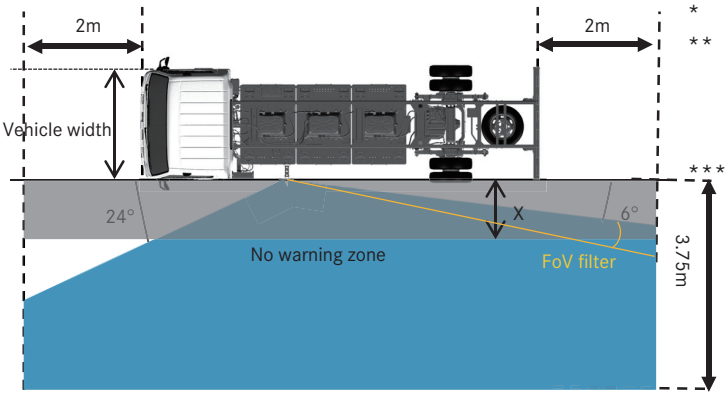
Unit : mm

MODEL	Body Width	L	L1	L2	L3	Extension bracket L4	L5	X1	X2
FEA	2080～2215	1500	476	367	187	125	1029	197.5	53.5
	2195～2330	1500	533	367	244	125	1086.4	197.5	53.5
FEB	2195～2330	1500	507.5	341.5	244	125	1086.4	197.5	53.5
	2355～2500	1500	587.5	341.5	324	125	1166.6	197.5	53.5
	2505～2550	1500	587.5	341.5	324	200	1241.6	197.5	53.5
FEC	2195～2330	1500	458.5	292.5	244	125	1086.4	218.5	74.5
	2355～2500	1500	538.5	292.5	324	125	1166.6	218.5	74.5
	2505～2550	1500	538.5	292.5	324	200	1241.6	218.5	74.5

Radar sensing area for moving of radar



MODEL	Body Width (mm)	Extension Bracket (mm)	L (mm)	L1 (FEB/FEC) (mm)	Radar mounting position (mm)*	No warning zone X** (m)*	FoV Filter*** (°)*
FEA	1,875 to 1,905	-	1500	476	-880	0	2
	1,910 to 1965	-	1500	476	-880	0.6	4
	1,945 to 2,020	-	1500	533	-950	0	2
	2,025 to 2,075	-	1500	533	-950	0.6	4
	2,080 to 2,155	125	1500	601	-1020	0	2
	2,160 to 2,215	125	1500	601	-1020	0.6	4
	2,195 to 2,270	125	1500	658	-1020	0	2
	2,275 to 2,330	125	1500	658	-1020	0.6	4
FEB/FEC	1,995 to 2,020	-	1500	507.5/458.5	-950	0	2
	2,025 to 2,080	-	1500	507.5/458.5	-950	0.6	4
	2,105 to 2,180	-	1500	587.5/538.5	-1020	0	2
	2,185 to 2,240	-	1500	587.5/538.5	-1020	0.6	4
	2,195 to 2,270	125	1500	632.5/583.5	-1020	0	2
	2,275 to 2,330	125	1500	632.5/583.5	-1020	0.6	4
	2,355 to 2,430	125	1500	712.5/663.5	-1140	0	2
	2,435 to 2,500	125	1500	712.5/663.5	-1140	0.6	4
	2,505 to 2,550	200	1500	787.5/738.5	-1220	0	2

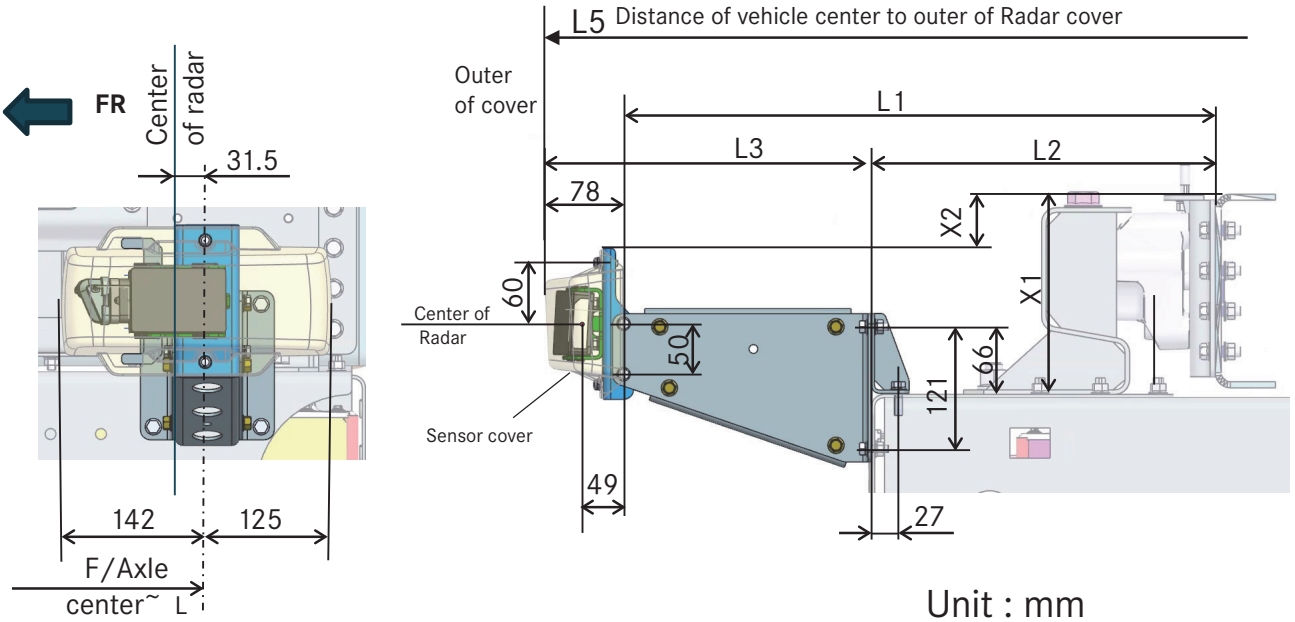


* ECU parameter value

** No warning zone from outer line of vehicle width
vehicle width is set as below:
1700mm for FEA
2000mm for FEB,FEC

*** Filtering of the radar sensing area

The radar positions setting for extension bracket less



Unit : mm

MODEL	Body Width	L	L1	L2	L3	L5	X1	X2
FEA	1875～1965	1500	476	367	187	904	197.5	53.5
	1945～2075	1500	533	367	244	961.4	197.5	53.5
FEB	1955～2080	1500	507.5	341.5	244	961.4	197.5	53.5
	2105～2240	1500	587.5	341.5	324	1041.6	197.5	53.5
FEC	1955～2080	1500	458.5	292.5	244	961.4	218.5	74.5
	2105～2240	1500	538.5	292.5	324	1041.6	218.5	74.5

10.11.11 Outside mirror

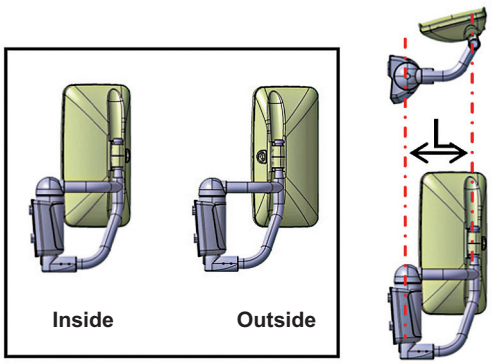
B

There is a limitation on rear body width for outside Mirror and Lamps.

Outside mirror

The vehicle is shipped from the factory with the exterior mirrors installed in the "Inside set" position. Before delivery, relocate the mirrors in the necessary positions shown in Figure 1, 2 and Table 1 depending on the rear body width.

Dimensions for Fig. 1

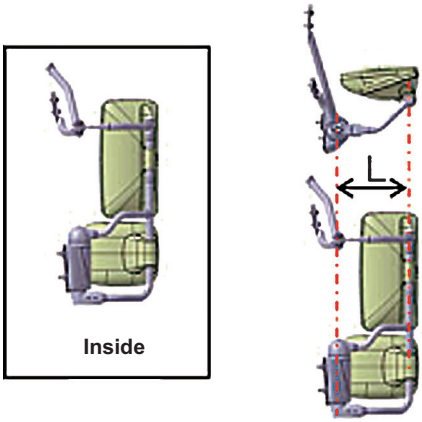


N88.70-2047-00

Unit: mm

STAY LENGTH	L
Short	170
Long	290

Dimensions for Fig. 2



N88.70-2050-00

Unit: mm

STAY LENGTH	L
Short	205
Middle	297.5
Long	390

Table 1: Mirror setting positions corresponding to stay length and rear body width

Unit: mm

Model	Cab type	STAY LENGTH	Mirror set position	Rear body width	Type
F*A	Standard	Short	Inside Set	1710 to 1870	Fig. 1
			Outside Set	1870 to 2000	
		Long	Inside Set	2000 to 2100	
			Outside Set	2100 to 2200	
FEB (2WD[GVW ≤ 7.5t])	Wide	Short	Inside Set	2000 to 2150	
			Outside Set	2150 to 2280	
		Long	Inside Set	2280 to 2400	
			Outside Set	2400 to 2550	
FECX (2WD[GVW > 7.5t])	Wide	Short	Inside Set	2000 to 2185	Fig. 2
		Middle	Inside Set	2185 to 2370	
		Long	Inside Set	2370 to 2550	

* Consult an authorised MITSUBISHI FUSO dealer if the body width is not within the ranges shown above.

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Revision record <Technical data section>

B	29. February. 2024	Correction
A	22. August. 2023	Other models added
–	23. June. 2023	Newly issued
Rev. code	Date issued	Remarks

NOTE:

1, Chapter 1-9 is Common Section for all markets and to be revised without any special notification. Therefore, please note that this version is not necessarily the latest one.

2, Chapter 10 is for specific market(s). MFTBC will distribute the latest version whenever it will be revised.

Body/equipment mounting directives <Technical data section>

FUSO eCANTER

Australia

MITSUBISHI FUSO TRUCK & BUS CORPORATION

February. 2024 TL3FA_F

Body/equipment mounting directives
Electrical systems section
Australia

MITSUBISHI FUSO TRUCK & BUS CORPORATION
March. 2024 TL3FA

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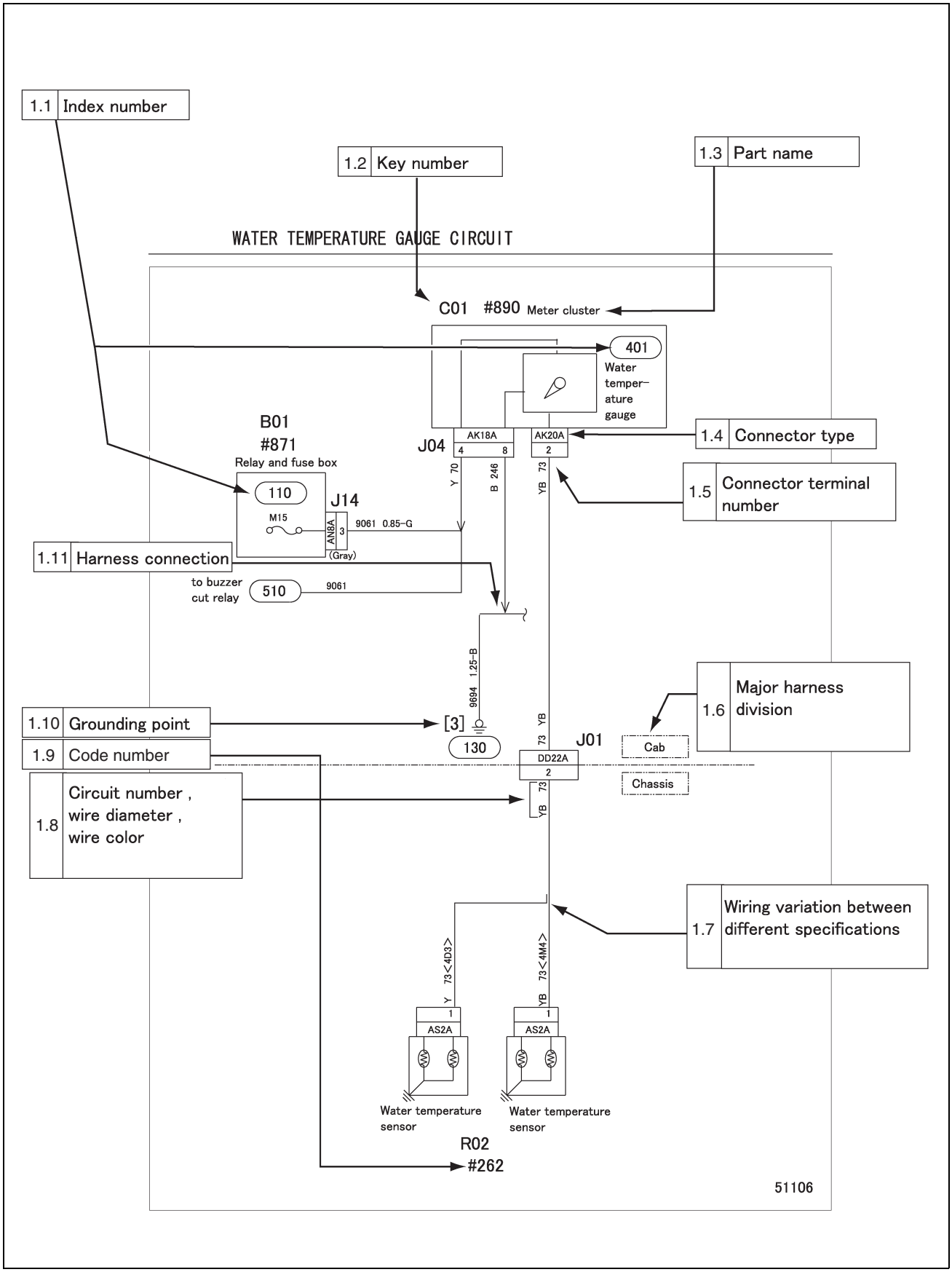
10.9 Electrical systems

HOW TO READ CIRCUITS



1.1 Index number: (100) - (999)

- Index numbers are used as reference numbers for electrical circuits. Each electrical circuit has been assigned its own index number.

1.2 Key number: A01 - Z99

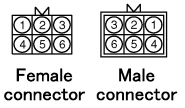
- Key numbers indicate parts installation locations. The installation location of an electrical equipment can be easily found using its key number shown in a circuit diagram.
  All of the electrical equipment installation locations are listed in Gr54-10. (Group Number Service Manual)

1.3 Part name

1.4 Connector type (type indication)

- A list of the connectors used is included in Gr54-10. (Group Number Service Manual)

1.5 Connector terminal number



Connector terminal numbering starts with the upper left corner for female connectors and with the upper right corner for male connectors.

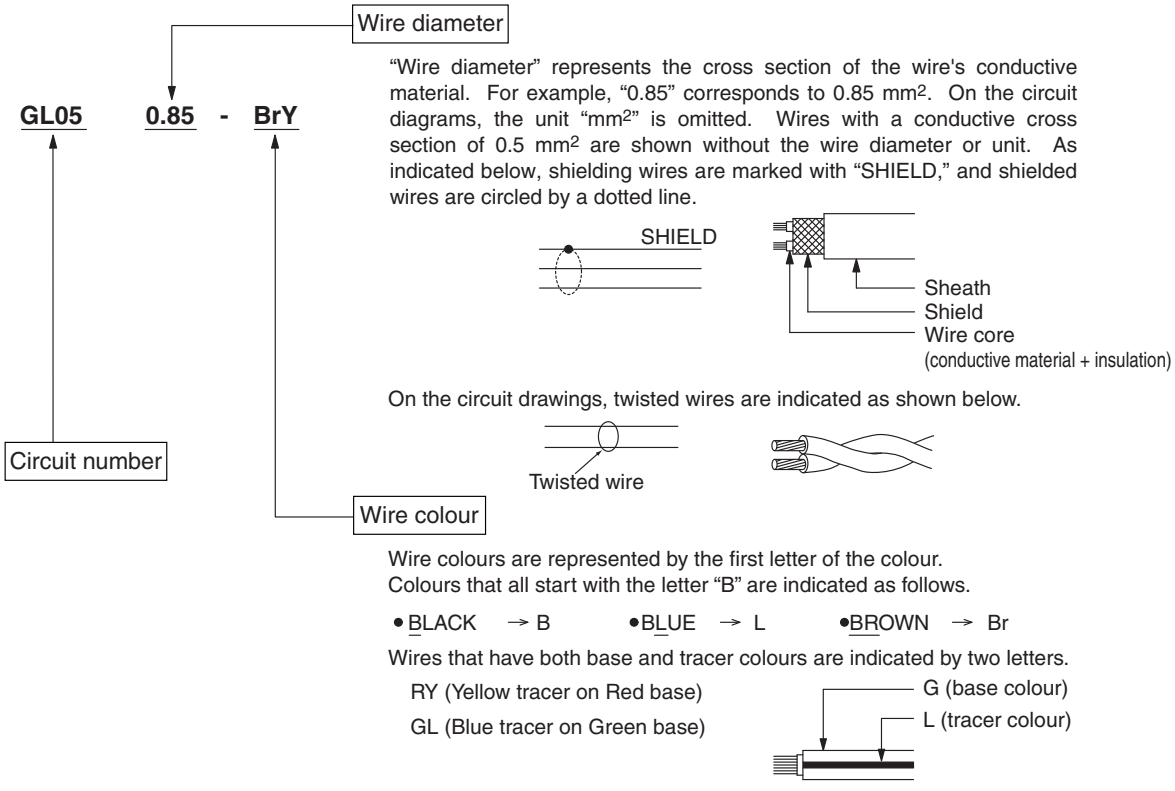
1.6 Major harness division

- Major harness divisions are shown

1.7 Wiring variations between different specifications

- Variations in wiring/circuit between different vehicle specifications are clearly indicated as shown.

1.8 Circuit number, wire diameter, wire colour



1.9 Code number: #001 - #999

- Code numbers are reference numbers to find individual electrical equipment inspection procedures. The inspection procedure for an electrical equipment can be found using its code number shown in a circuit diagram.

1.10 Earthing point: [1] - [99]

- Locations where wires are earthed to the vehicle. All of the earthing points are listed in (130). (Index number Service Manual)

1.11 Harness connection

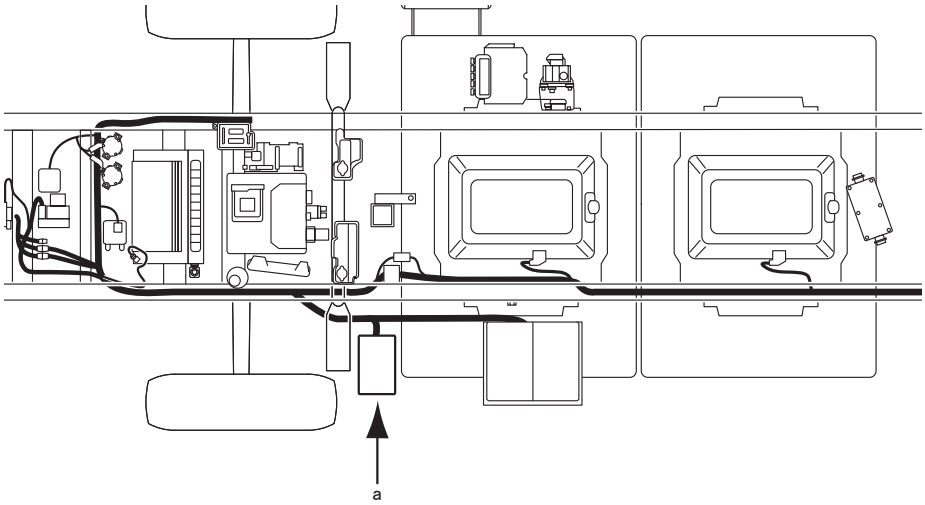
- The arrow in the wiring diagram indicates where harnesses are connected, and NOT the flow of electricity.

Wire colour

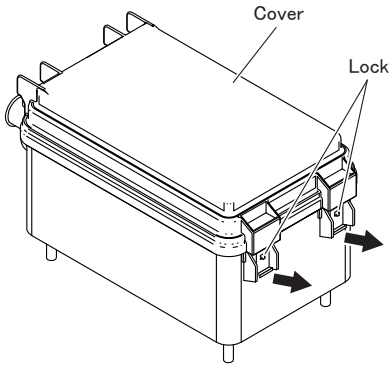
Wire colour		Base colour + tracer									
B	Black	BW	Black/ white	BY	Black/ yellow	BR	Black/ red	BG	Black/ green	BL	Black/ blue	BO	Black/ orange
		BP	Black/ pink	BV	Black/ violet	B Br	Black/ brown						
Br	Brown	BrW	Brown/ white	BrB	Brown/ black	BrY	Brown/ yellow	BrR	Brown/ red	BrG	Brown/ green	BrL	Brown/ blue
		BrGr	Brown/ grey	BrV	Brown/ Violet								
G	Green	GW	Green/ white	GR	Green/ red	GY	Green/ yellow	GB	Green/ black	GL	Green/ blue	GO	Green/ orange
		GGr	Green/ grey	GBr	Green/ brown	GV	Green/ violet						
Gr, Gy	Grey	GrL, GyL	Grey/ blue	GrR, GyR	Grey/ red	GrB, GyB	Grey/ black	GrG, GyG	Grey/ green	GrW, GyW	Grey/ white	GrY	Grey/ yellow
		GrG	Grey/ green	GrBr	Grey/ brown								
L	Blue	LW	Blue/ white	LR	Blue/ red	LY	Blue/ yellow	LB	Blue/ black	LO	Blue/ orange	LG	Blue/ green
		LGr	Blue/ grey	LBr	Blue/ brown								
Lg	Light green	LgR	Light green/ red	LgY	Light green/ yellow	LgB	Light green/ black	LgW	Light green/ white				
O	Orange	OL	Orange /blue	OB	Orange /black	OG	Orange /green						
P	Pink	PB	Pink/ black	PG	Pink/ green	PL	Pink/ blue	PW	Pink/ white	PGr	Pink/ grey	PV	Pink/ violet
Pu	Purple												
R	Red	RW	Red/ white	RB	Red/ black	RY	Red/ yellow	RG	Red/ green	RL	Red/ blue	RO	Red/ orange
		RBr	Red/ brown	Rgr	Red/ Grey								
Sb	Sky blue												
V	Violet	VY	Violet/ yellow	VW	Violet/ white	VR	Violet/ red	VG	Violet/ green	VGr	Violet/ grey	VB	Violet/ black
W	White	WR	White/ red	WB	White/ black	WL	White/ blue	WG	White/ green	WO	White/ orange	WV	White/ violet
		WBr	White/ brown	WY	White/ yellow								
Y	Yellow	YR	Yellow/ red	YB	Yellow/ black	YG	Yellow/ green	YL	Yellow/ blue	YW	Yellow/ white	YO	Yellow/ orange
		YP	Yellow/ pink	YV	Yellow/ violet	YGr	Yellow/ grey	YBr	Yellow/ brown				

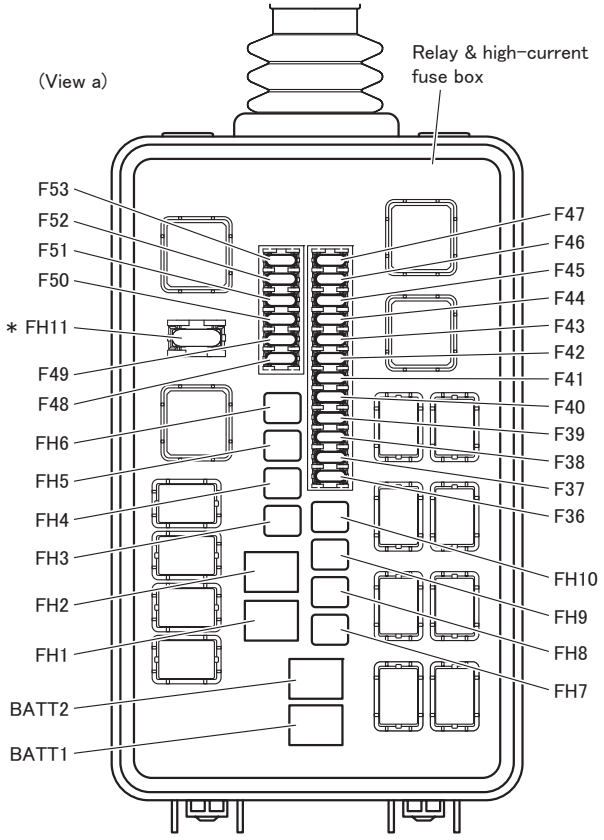
10.9.1 Electrical wiring diagram

RELAY & HIGH CURRENT FUSE BOX (1)



* The voltage is different depending on the specification of the vehicle.
  ·Vehicle with battery equaliser : 24V
  ·Vehicle without battery equaliser : 12V





⚠CAUTION

- If a fuse blows out, identify and remedy the cause, then replace the fuse.
- Be sure to use the fuse with the specified ampere.

54-303014HF-1

RELAY & HIGH CURRENT FUSE BOX (2)

Relay & high current fuse box

Fuse No.	Main load	Capacity
BATT1	ASAM	140A
BATT2	ASAM	100A
FH1	Fuse box (PDM) B5 to B8	80A
FH2	Cooling fan	80A
FH3	Fuse box (PDM) B38 to B40, B48	60A
FH4	Fuse box (PDM) B14, B16, B23, B24	60A
FH5	Fuse box (PDM) B54 to B56, B62 to B64	60A
FH6	EPB ECU	50A
FH7	EPB ECU	50A
FH8	Hydraulic unit <ABS>	50A
FH9	Electric vacuum pump 1	50A
FH10	Electric vacuum pump 2	50A
FH11 *	Fuse box (PDM) B49 to B51	40A
F36	VCU, KL15 VTL relay, JOINT(KL15V)	20A
F37	eDM	10A
F38	AVAS ECU, DC/DC converter	10A
F39	PTC heater (HVB), PTC heater (HVAC)	20A
F40	Condenser fan motor	20A
F41	Hydraulic unit <ABS>	30A
F42	Electric parking lock (EPL) actuator	30A
F43		–
F44	Water pump (Motor)	20A
F45		–
F46	–	–
F47	–	–
F48	Window heater	20A
F49	Window heater	20A
F50	Window heater	20A
F51	Seat heater	10A
F52 **	High voltage battery, DCB, OBC, DC/DC converter, VCU	15A
F53	High voltage battery, DCB, OBC	10A

- Since the main load is described here, connection of other loads is described in (110) .

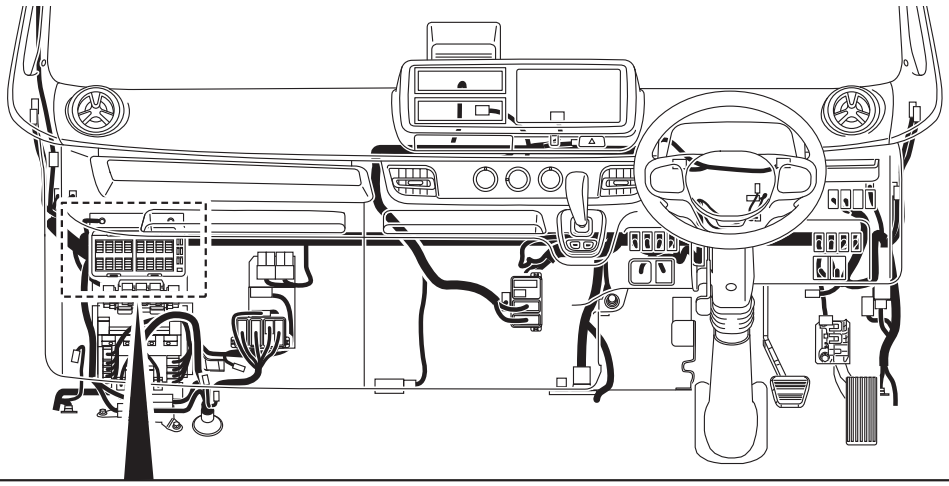
* The voltage is different depending on the specification of the vehicle.
  ・Vehicle with battery equaliser : 24V
  ・Vehicle without battery equaliser : 12V

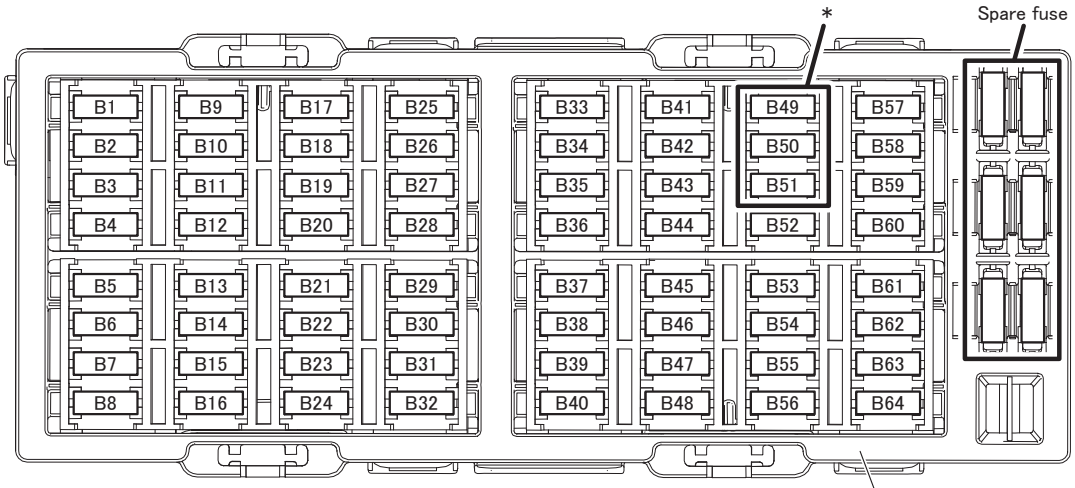
** Circuit cutoff mechanisms are provided by a crash sensor and a high voltage cutoff switch. Refer (110) .

ASAM : Advanced signal detect and actuation module
ABS : Anti-lock brake system
AVAS : Acoustic Vehicle Alert System
DCB : DC interface box
ECU : Electronic control unit
eDM : Electric drive module
EPB : Electric parking brake
EPL : Electric parking lock
HVAC : Heating, Ventilation, and Air Conditioning
HVB : High voltage battery
OBC : On Board Charger
PDM : Power distribution module
VCU : Vehicle control unit

54-616323HF-2

FUSE BOX (PDM), FUSE (1)

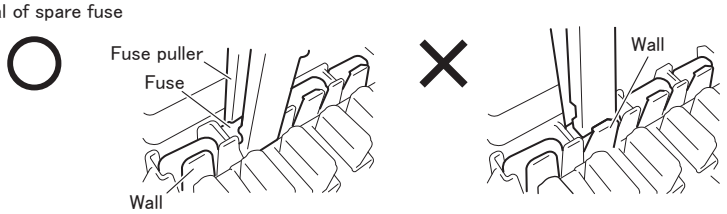




* The voltage is different depending on the specification of the vehicle.
  ·Vehicle with battery equaliser : 24V
  ·Vehicle without battery equaliser : 12V

PDM : Power distribution module

Removal of spare fuse



⚠CAUTION

- To prevent possible injury, be sure to disconnect the negative (−) cable of the battery and insulate it with tape before removing fuses. (See Gr00-240.)
- If a fuse blows out, identify and remedy the cause, then replace the fuse.
- Be sure to use the fuse with the specified ampere.
- Insert the fuse puller into the gap on the outer side of the fuse holder wall to remove the spare fuse. Do not force the puller into the gap on the inner side of the fuse holder wall.

54-616323FUSE-1R

FUSE BOX (PDM), FUSE (2)

Fuse box (PDM) (1/2)

Fuse No.	Main load	Capacity
B1	ESP sensor, Hydraulic unit <ABS>, ESP / ASR cutoff switch, Steering angle sensor	10A
B2	Airbag ECU	10A
B3	Hill start assist ECU, Hill start assist system cutoff switch, Mirror heater switch FUSO easy access system ECU, VRDU2, EPB ECU	10A
B4	Air-conditioner ECU and control panel, Blower motor relay, Fresh/recirculation changeover motor	10A
B5	VCU main relay, Fuse box (PDM) B33 to B36	30A
B6	Air-conditioner ECU and control panel, Cab lamp	15A
B7	FMS connector	20A
B8	FUSO easy access system ECU	10A
B9	–	–
B10	Steering wheel heater switch, Seat heater switch, Window defogger switch, ICUC (Meter cluster), Optional connector, FMS connector, FMS, Telematics, IGN relay (12V/24V), Battery equaliser, Headlamp leveling switch, Headlamp leveling actuator	15A
B11	–	–
B12	PTC heater cut switch, AVAS ECU, Vacuum pump relay 1, Vacuum pump relay 2, VCU, EHPS (Electric power steering oil pump, motor, ECU)	10A
B13	–	–
B14	ASAM	20A
B15	–	–
B16	Steering wheel heater	20A
B17	–	–
B18	–	–
B19	–	–
B20	–	–
B21	–	–
B22	–	–
B23	Horn relay, Electric horn	10A
B24	Condenser fan main relay, VCU	10A
B25	Cigarette lighter, USB power socket	20A
B26	Back eye monitor, FUSO easy access system ECU, ACC relay (12V/24V), Radio	10A
B27	–	–
B28	–	–
B29	–	–
B30	–	–
B31	–	–
B32	–	–
B33	VCU	20A
B34	Chiller S/OFF valve relay, Chiller (Evaporator), Electric parking lock (EPL) relay A/C S/OFF valve relay, Air-conditioner S/O valve, 3/2-WAY valve relay (HVB), 3/2 WAY valve (HVB), Shift lever unit	15A
B35	Water pump (HVB)	20A
B36	Water pump (HVAC)	20A
B37	–	–
B38	IGN relay (12V), Fuse box (PDM) B1 to B4, B10, B12	30A
B39	ICUC (Meter cluster), MSF-SIU	10A
B40	CGW(CAN), Telematics, Back eye monitor, Steering wheel switch	10A

- Since the main load is described here, connection of other loads is described in (110) .

54-616323FUSE-2

FUSE BOX (PDM), FUSE(3)

Fuse box (PDM) (2/2)

Fuse No.	Main load	Capacity
B41	–	–
B42	–	–
B43	–	–
B44	–	–
B45	–	–
B46	–	–
B47	–	–
B48	Mirror heater	20A
B49 *	Optional connector, XMC, FMS connector	10A
B50 *	Optional connector	10A
B51 *	Optional connector, High voltage battery cutoff connector	10A
B52	–	–
B53	–	–
B54	ACC relay (12V), Fuse box (PDM) B25, B26	30A
B55	Blower motor	30A
B56	Power window switch, Dr	30A
B57	–	–
B58	–	–
B59	–	–
B60	–	–
B61	–	–
B62	Hill start assist ECU, VRDU2, Radio, Lateral milli wave radar unit (SRR), Milli wave radar unit (RDF), Lane recognition camera (MPC)	15A
B63	Diagnosis connector	10A
B64	Power window switch, As	30A

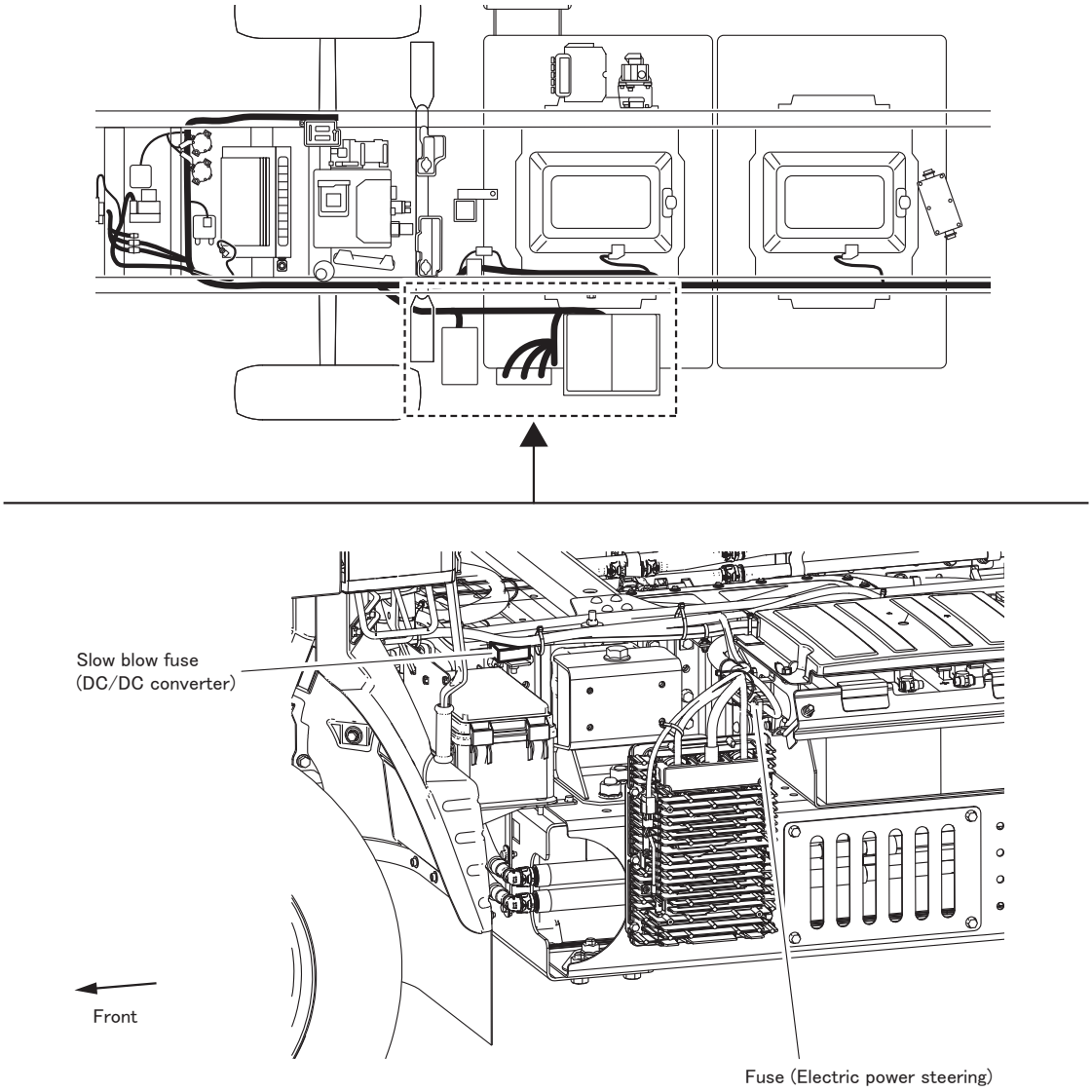
- Since the main load is described here, connection of other loads is described in (110) .

* The voltage is different depending on the specification of the vehicle.
  ・Vehicle with battery equaliser : 24V
  ・Vehicle without battery equaliser : 12V

ASAM : Advanced signal detect and actuation module
ABS : Anti-lock brake system
As : Assistant driver's seat side
ASR : Anti spin regulator
AVAS : Acoustic Vehicle Alert System
CGW : Can gate way
Dr : Driver's seat side
ECU : Electronic control unit
EHPS : Electric hydraulic power steering
EPB : Electric parking brake
EPL : Electric parking lock
ESP : Electronic stability program
FMS : Fleet management system
HVAC : Heating, Ventilation, and Air Conditioning
HVB : High voltage battery
MPC : Multi purpose camera
PDM : Power distribution module
PTC : Positive Temperature Coefficient
RDF : Radar front end
SRR : Short range radar
USB : Universal serial bus
VCU : Vehicle control unit
VRDU : Video radar decision unit
XMC : Expansion module cabin

54-303014FUSE-3

FUSE BOX (PDM), FUSE(4)



Fuse No.	Capacity	Remarks
Slow blow fuse (DC/DC converter)	400A	Fuse between DC/DC converter and low voltage battery
Fuse (Electric power steering)	120A	Fuse between electric power steering oil pump and low voltage battery

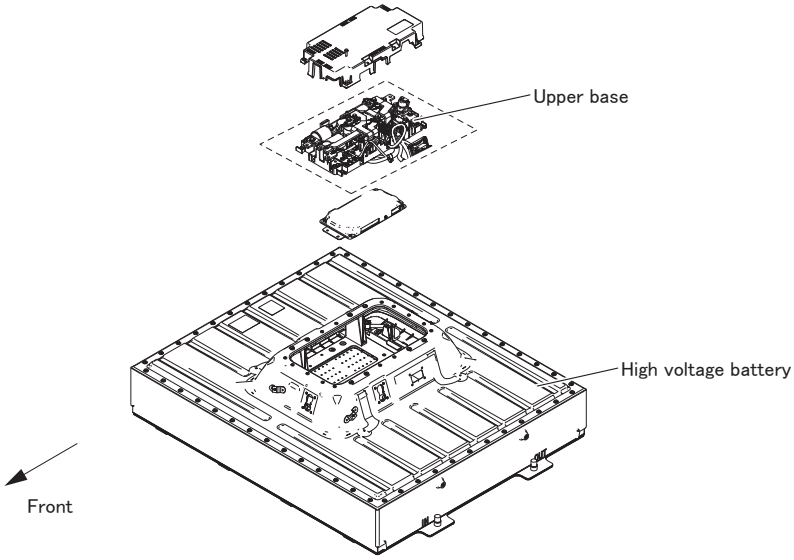
⚠CAUTION

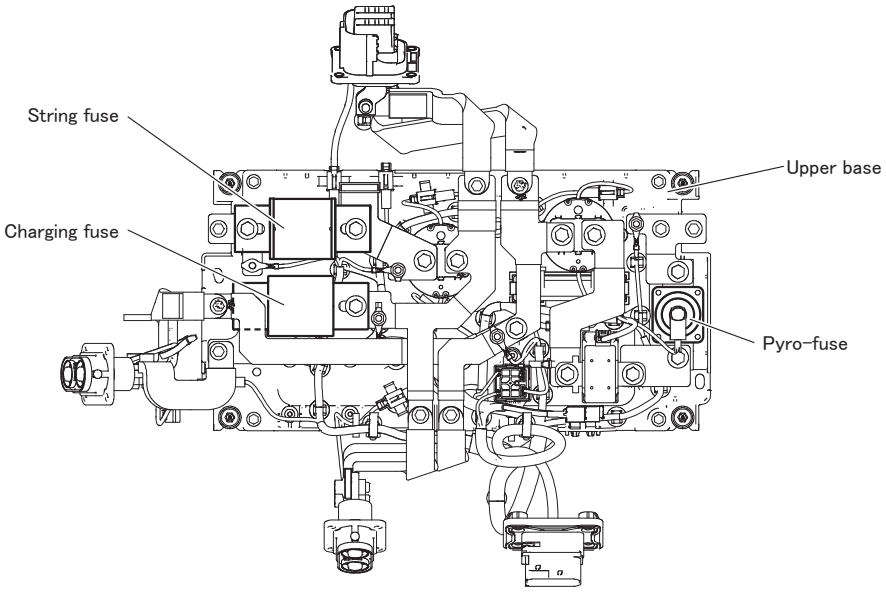
- To prevent possible injury, be sure to disconnect the negative (−) cable of the battery and insulate it with tape before removing fuses. (See Gr00-240.)
- If a fuse blows out, identify and remedy the cause, then replace the fuse.
- Be sure to use the fuse with the specified ampere.

54-616323LVF

FUSE BOX (PDM), FUSE(5)

High voltage battery internal fuse





Fuse No.	Capacity	Remarks
Pyro-fuse	–	Built-in ignition device for current interruption, activated by external signal
Charging fuse	500A	
String fuse	600A	

⚠CAUTION

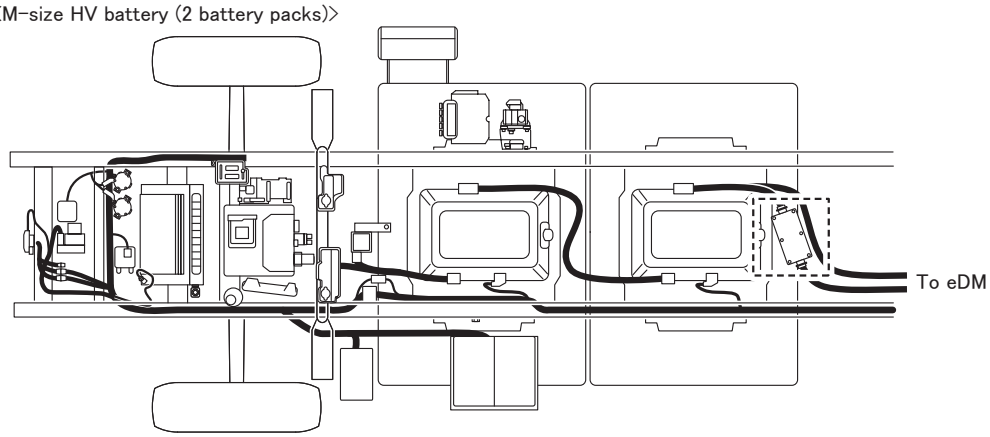
- When handling high-voltage equipment, check the work prior to removal before proceeding. (See Gr19-310)
- If a fuse blows out, identify and remedy the cause, then replace the fuse.
- Be sure to use the specified fuse.
- Never touch the connector of the pyro-fuse with the tester. If the tester touches it, the tester's micro current could flow into the ignition circuit.

54-616323HVF-1

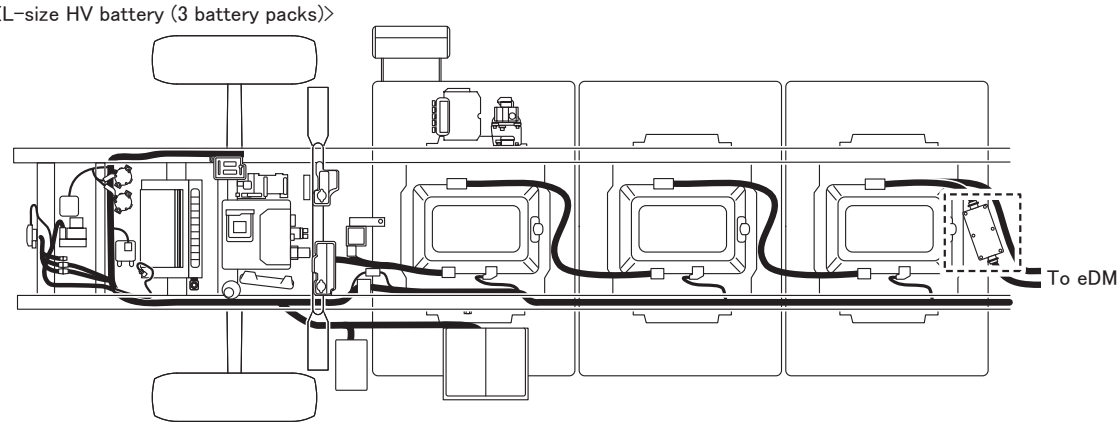
FUSE BOX (PDM), FUSE(6)

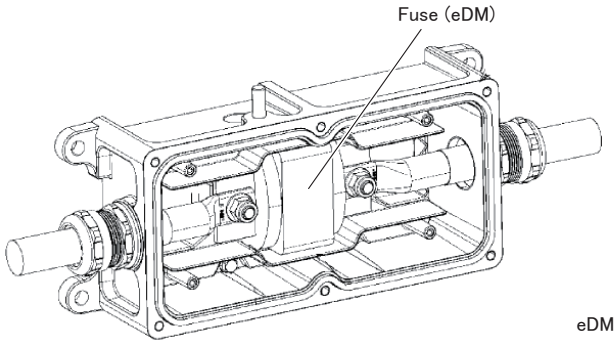
eDM fuse

<M-size HV battery (2 battery packs)>



<L-size HV battery (3 battery packs)>





eDM : Electric drive module

Fuse No.	Main load	Capacity	Remarks
Fuse (eDM)	eDM	600A	Fuse between high voltage battery and eDM <Except S-size HV battery (1 battery pack)>

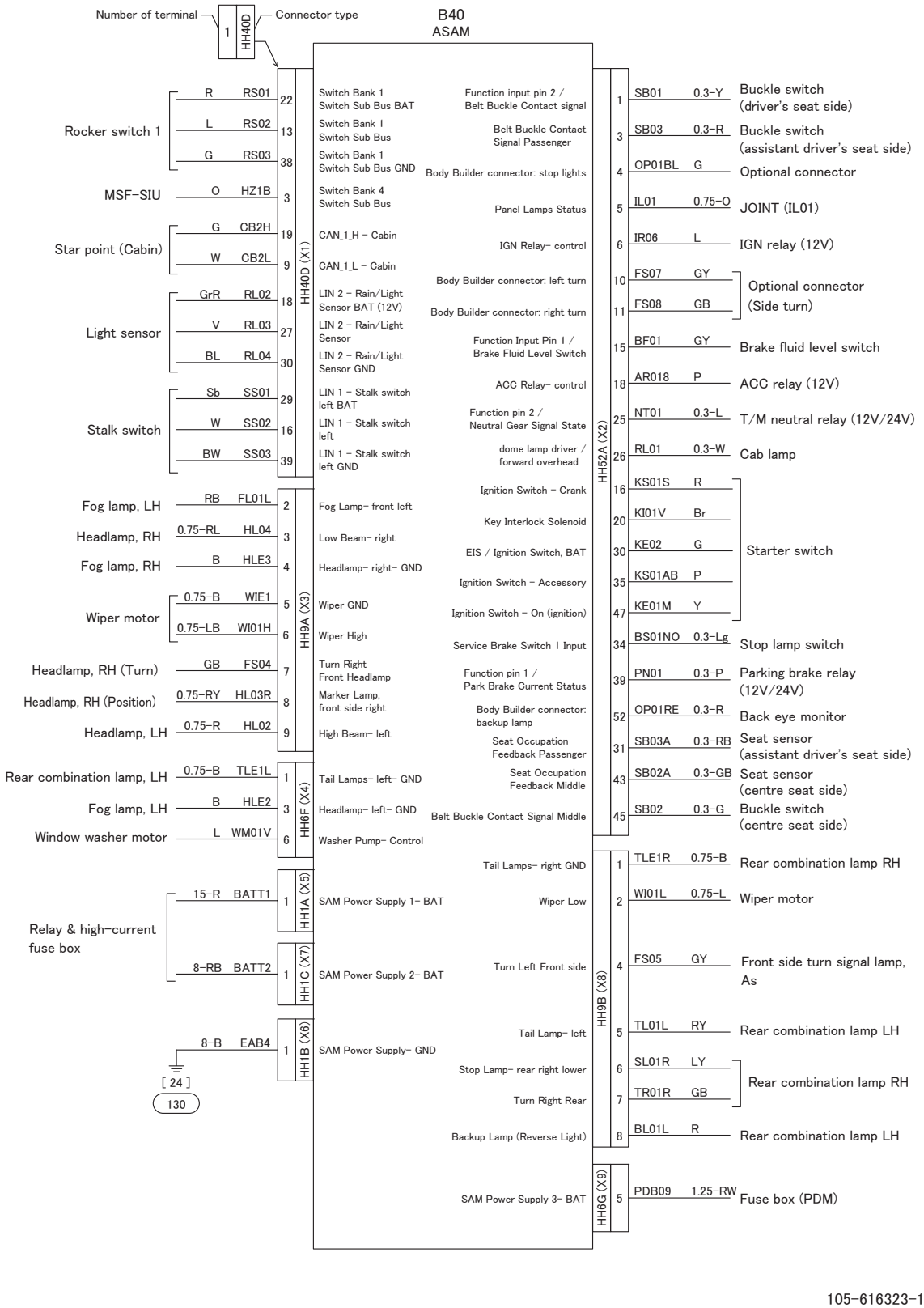
⚠CAUTION

- When handling high-voltage equipment, check the work prior to removal before proceeding. (See Gr19-310)
- If a fuse blows out, identify and remedy the cause, then replace the high voltage cable. It is not possible to replace just the fuse.

54-616323HVF-2

SAM INTERNAL CIRCUIT (1)

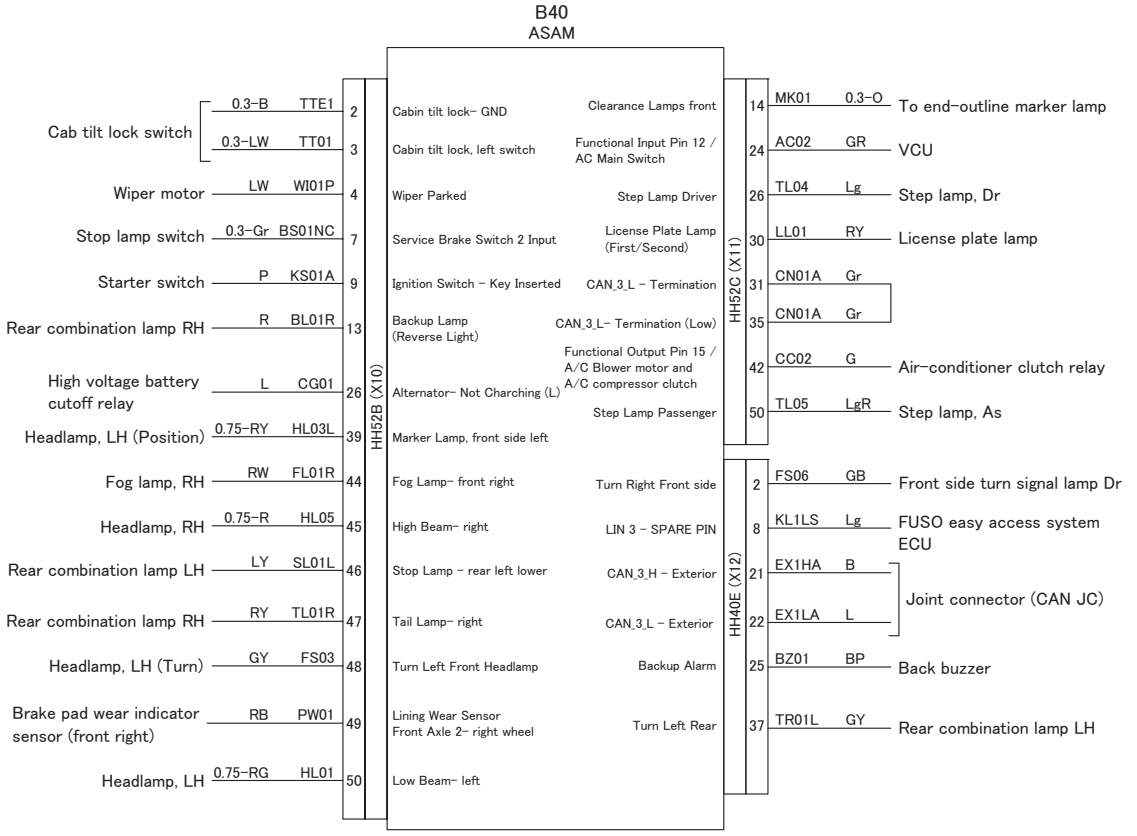
(1/2)



105-616323-1

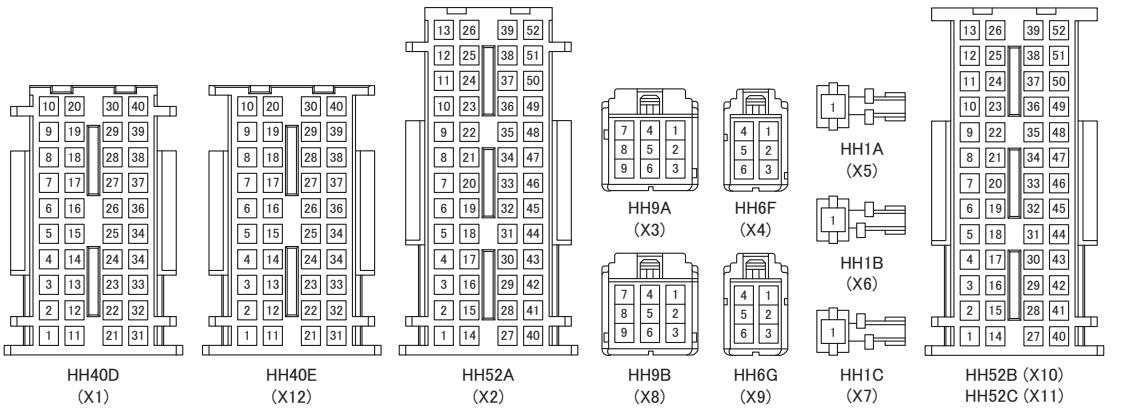
SAM INTERNAL CIRCUIT (2)

(2/2)



ASAM : Advanced signal detect and actuation module
As : Assistant driver's seat side
CAN : Controller area network
Dr : Driver's seat side
ECU : Electronic control unit
PDM : Power distribution module
T/M : Transmission
VCU : Vehicle control unit

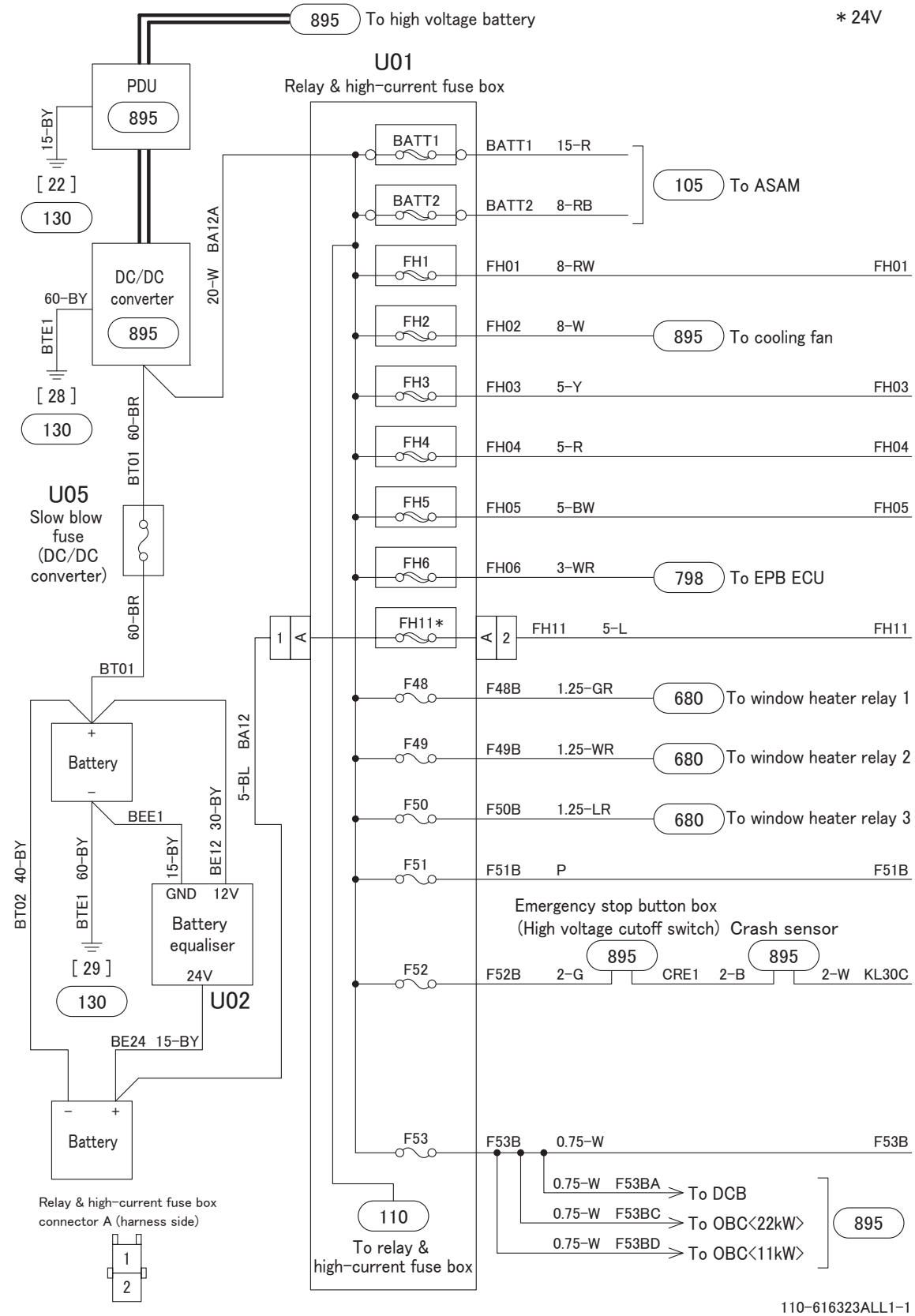
ASAM connector (harness side)



105-616323-2

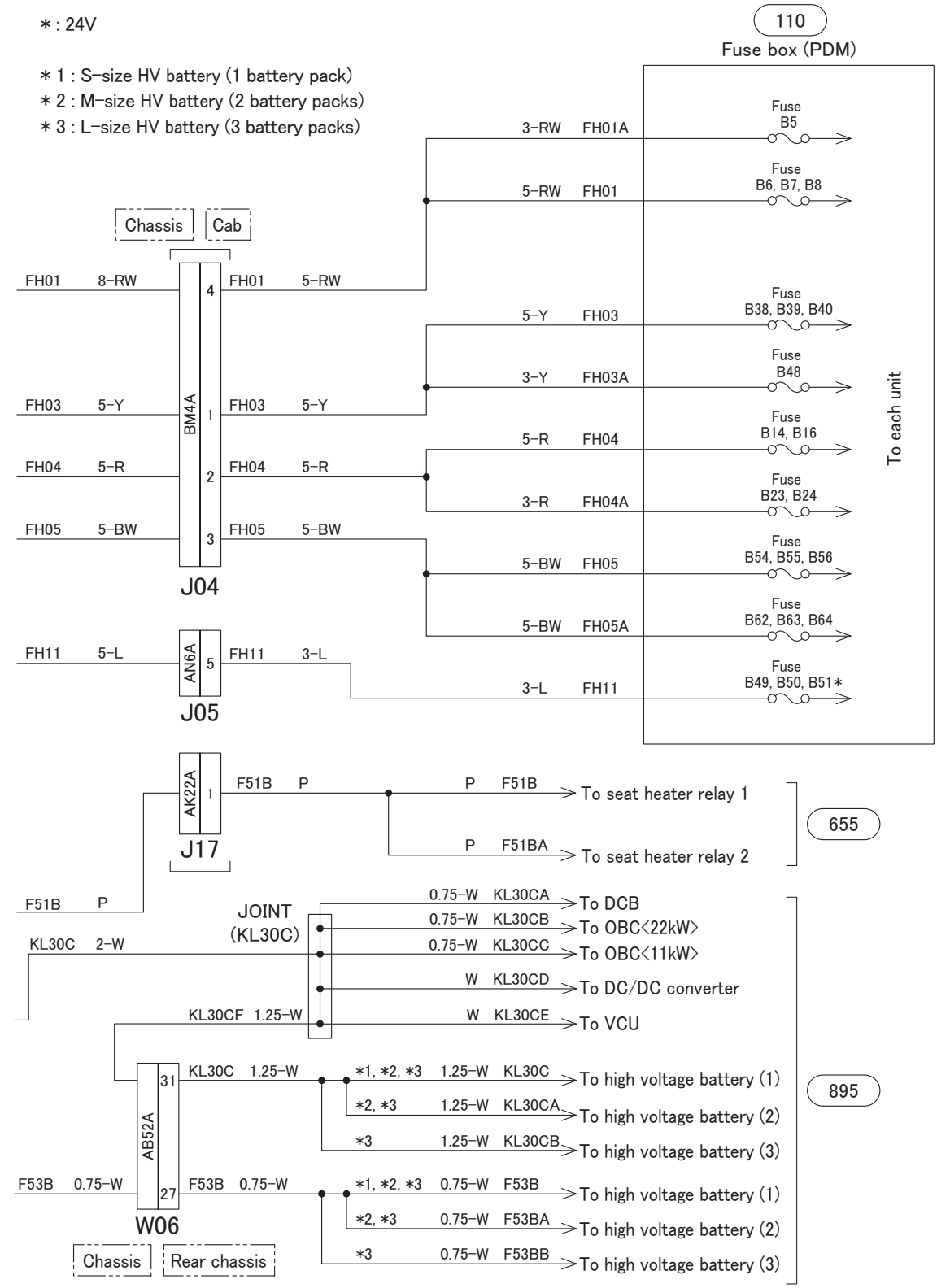
POWER CIRCUIT (1)

Battery-Relay & high-current fuse box-Fuse box(PDM) <Vehicle with battery equaliser> (1/2)



POWER CIRCUIT (2)

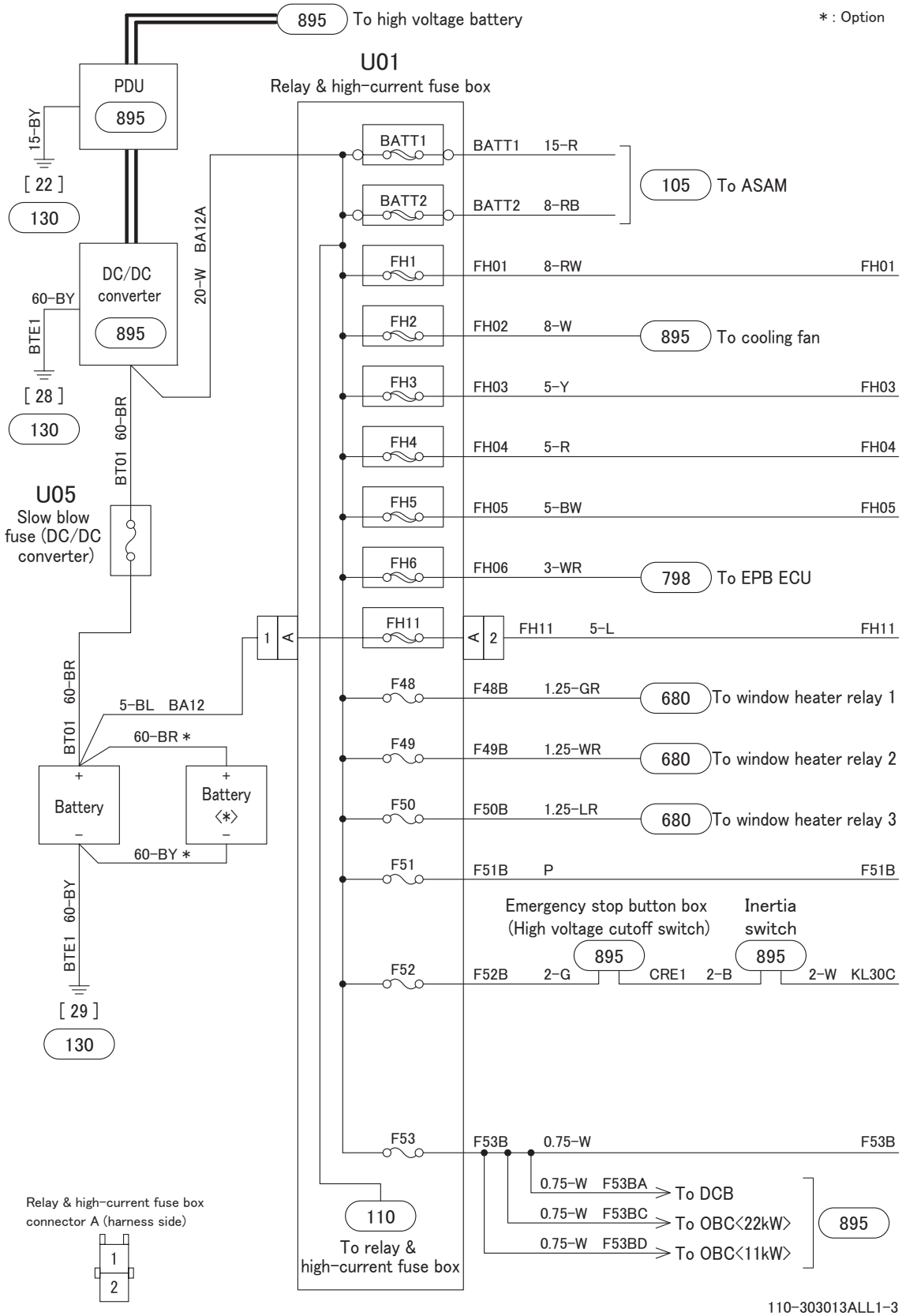
Battery-Relay & high-current fuse box-Fuse box(PDM) <Vehicle with battery equaliser> (2/2)



110-303013ALL1-2

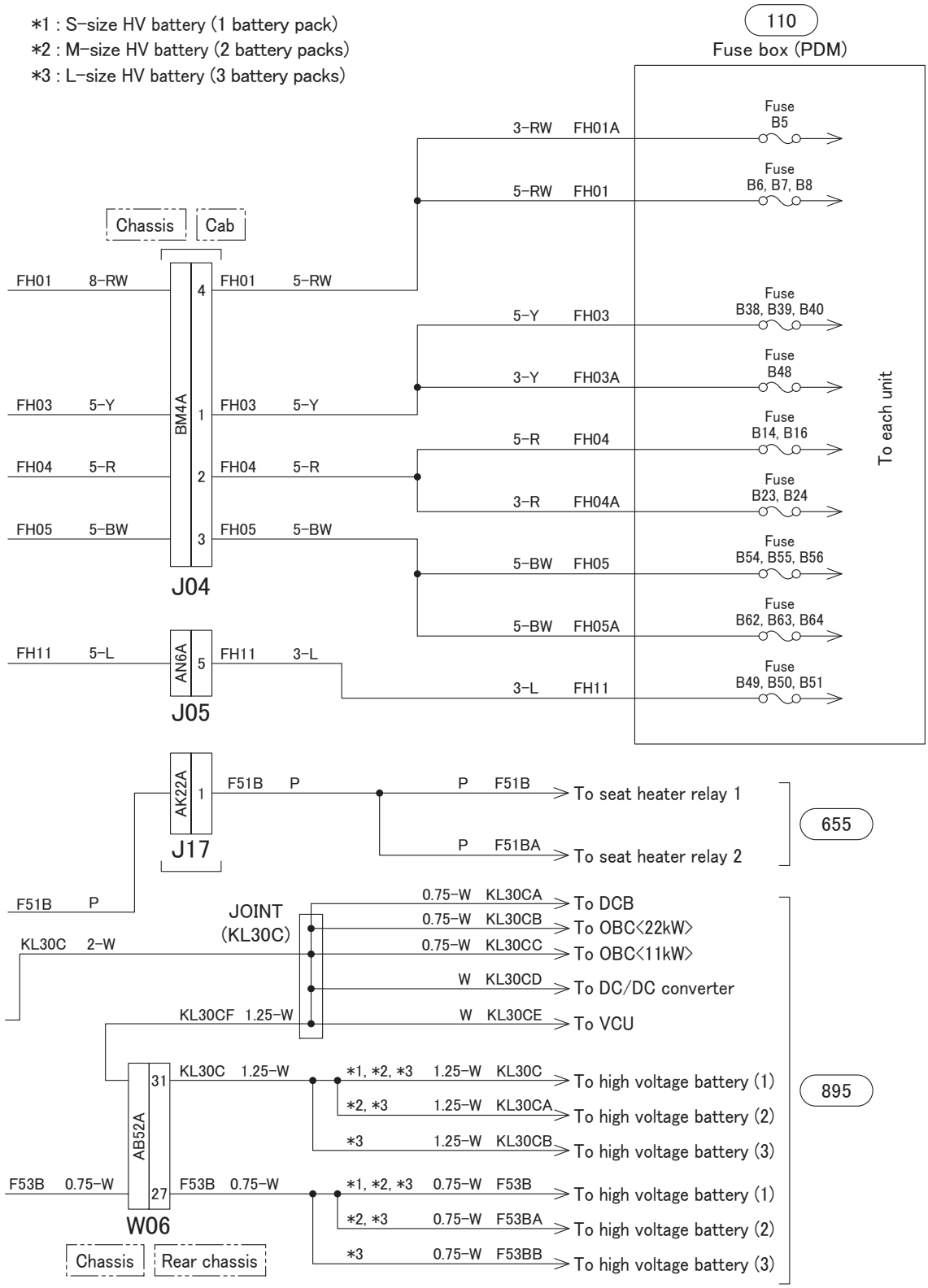
POWER CIRCUIT (3)

Battery-Relay & high-current fuse box-Fuse box(PDM) <Vehicle without battery equaliser> (1/2)



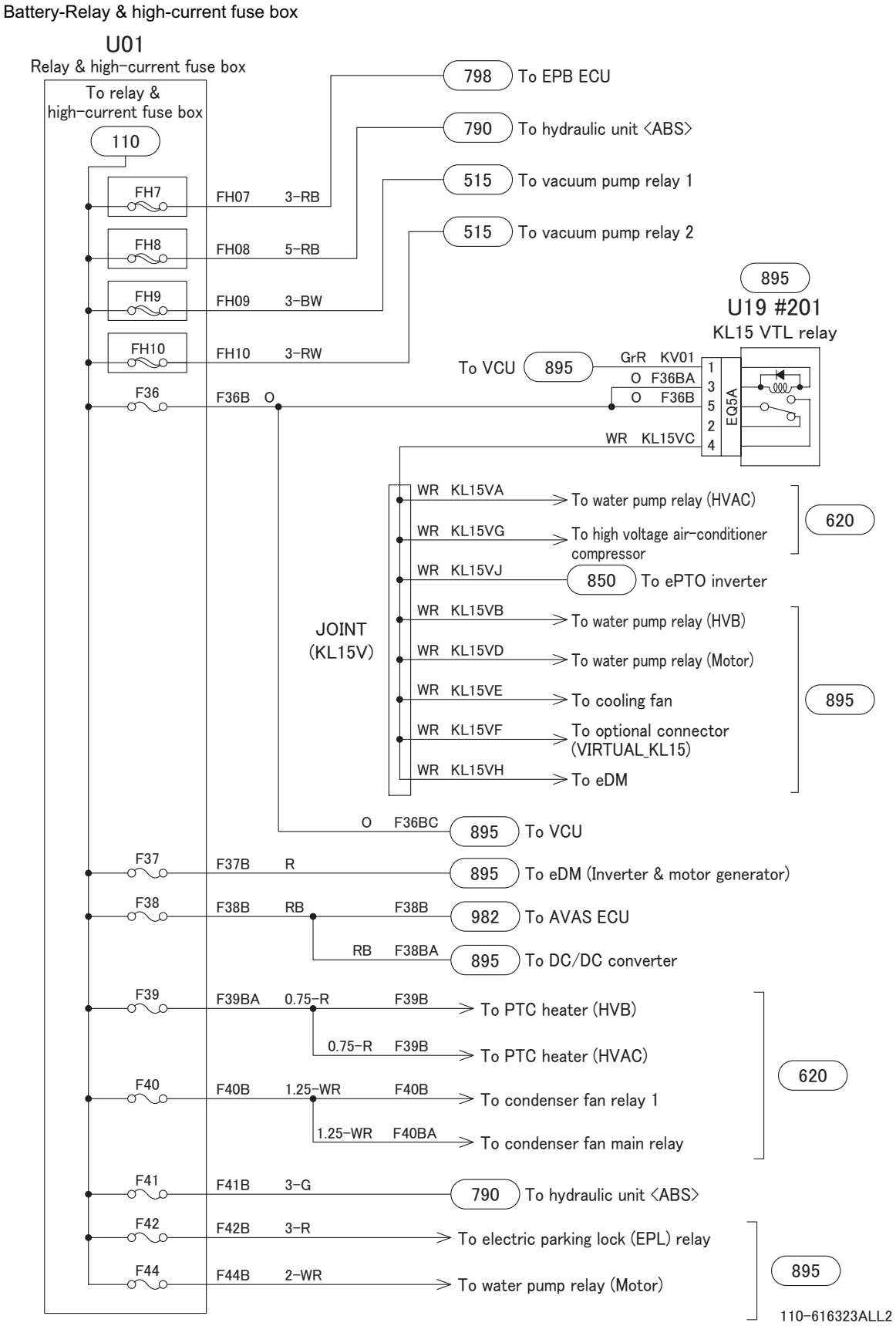
POWER CIRCUIT (4)

Battery-Relay & high-current fuse box-Fuse box(PDM) <Vehicle without battery equaliser> (2/2)

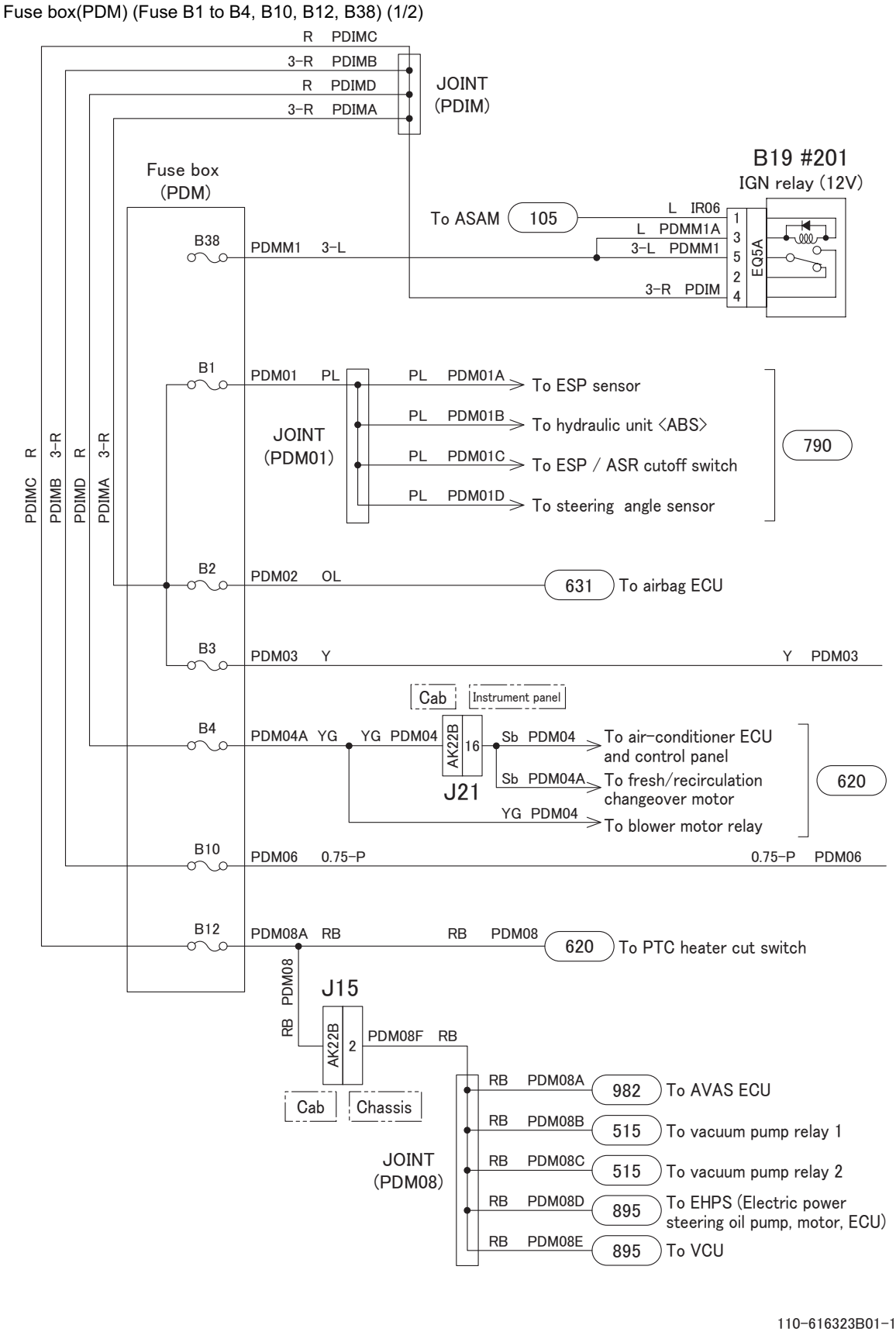


110-616323ALL1-4

POWER CIRCUIT (5)

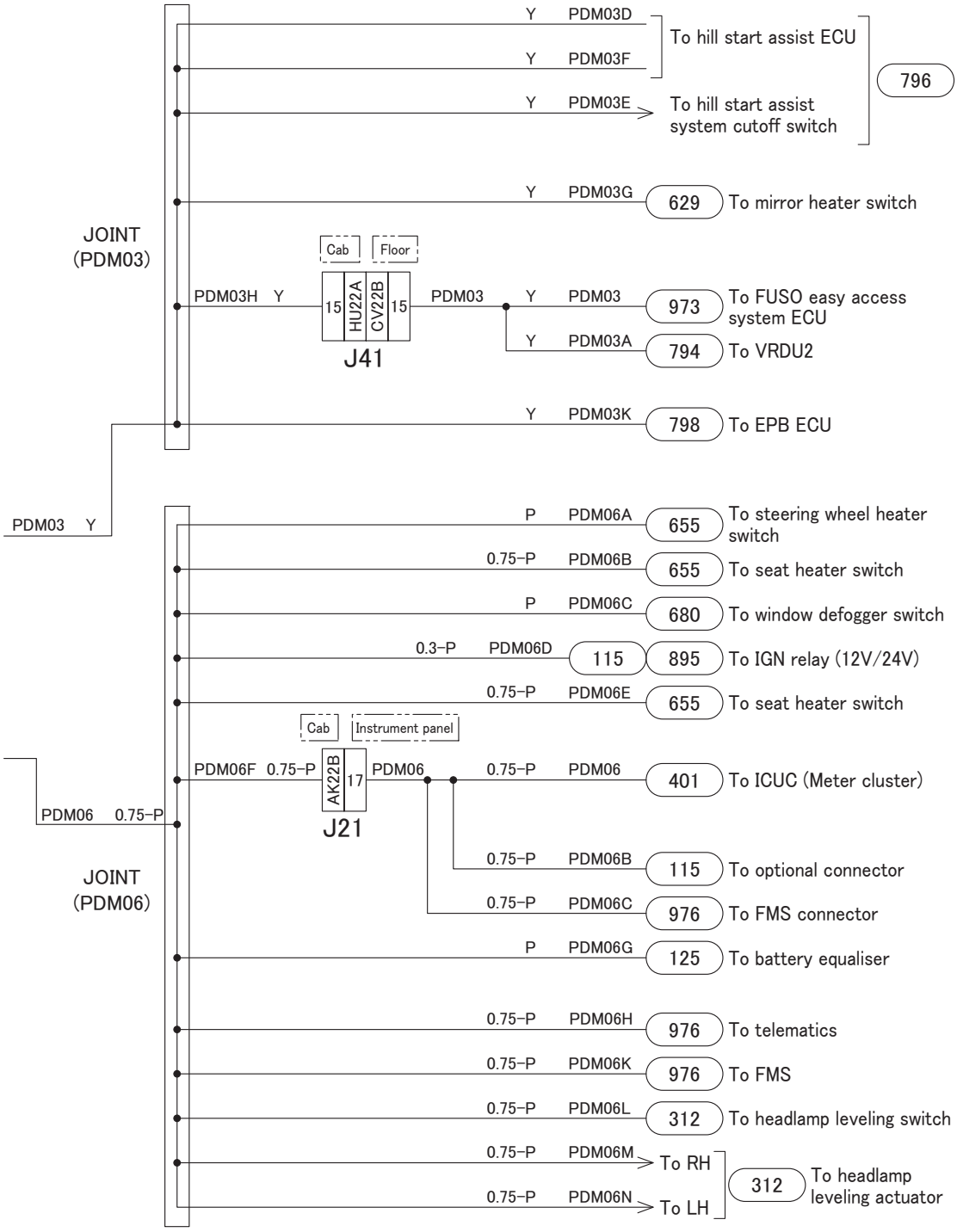


POWER CIRCUIT (6)



POWER CIRCUIT (7)

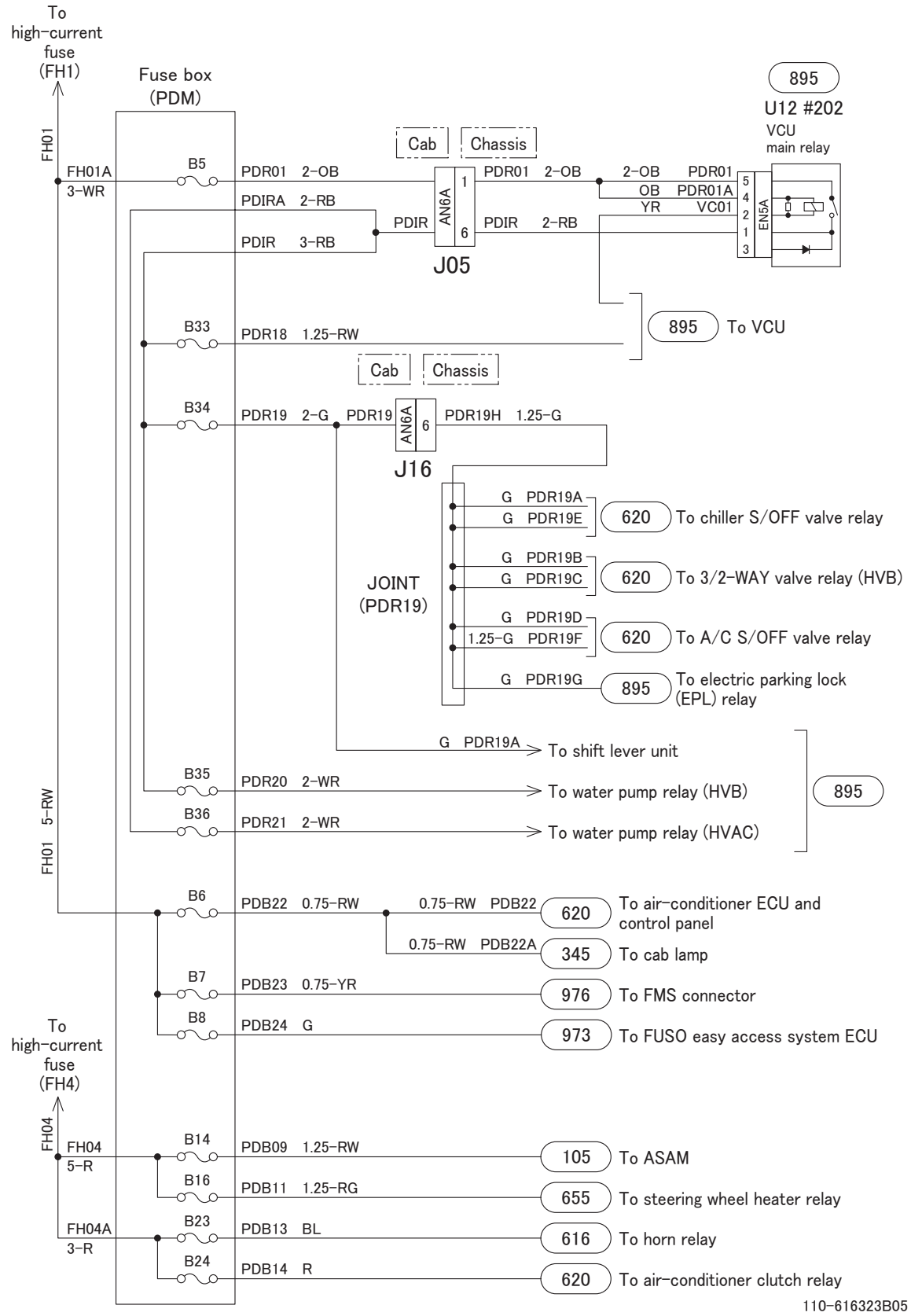
Fuse box(PDM) (Fuse B1 to B4, B10, B12, B38) (2/2)



110-616323B01-2

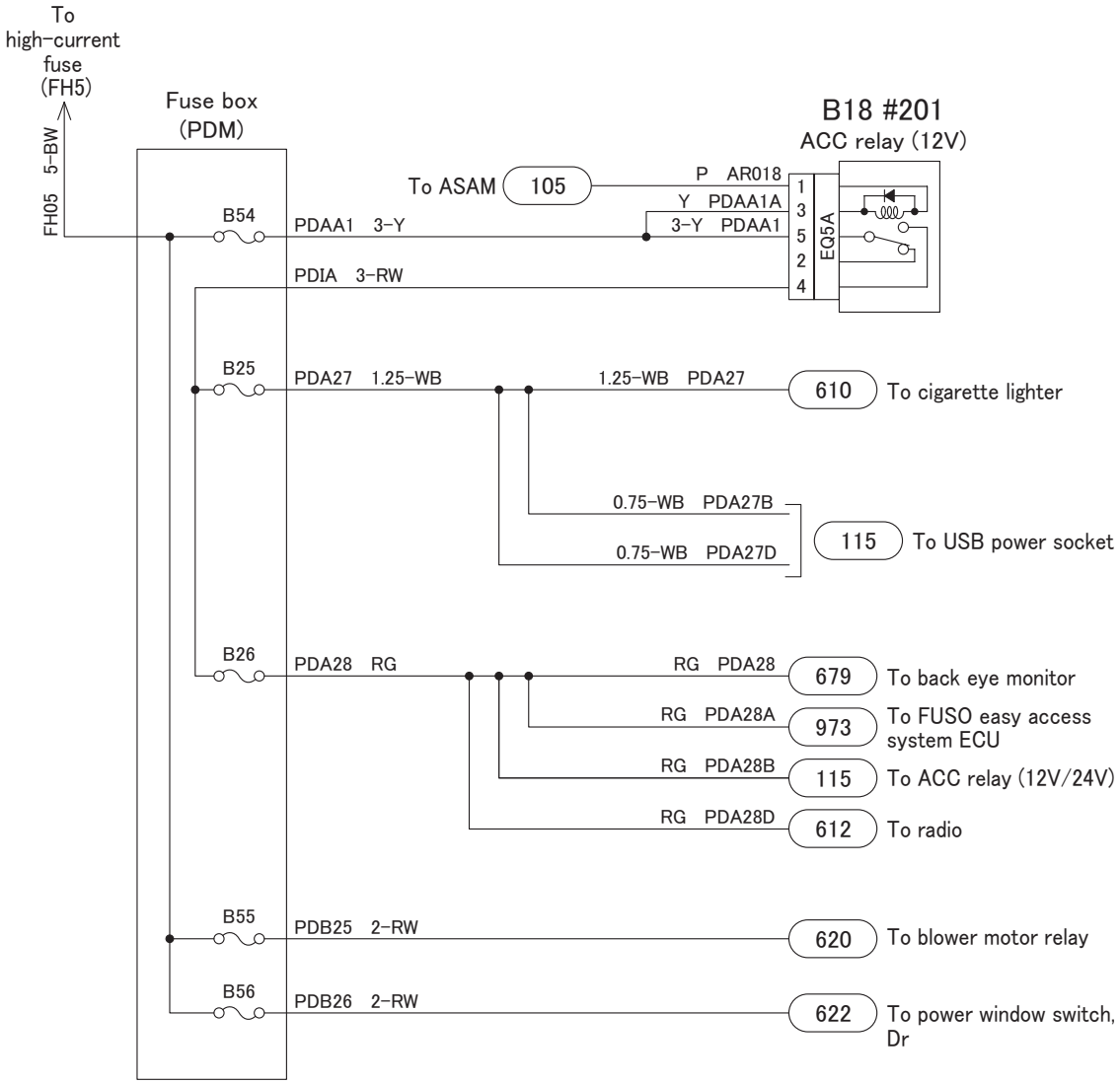
POWER CIRCUIT (8)

Fuse box(PDM) (Fuse B5 to B8, B14, B16, B23, B24, B33 to B36)



POWER CIRCUIT (9)

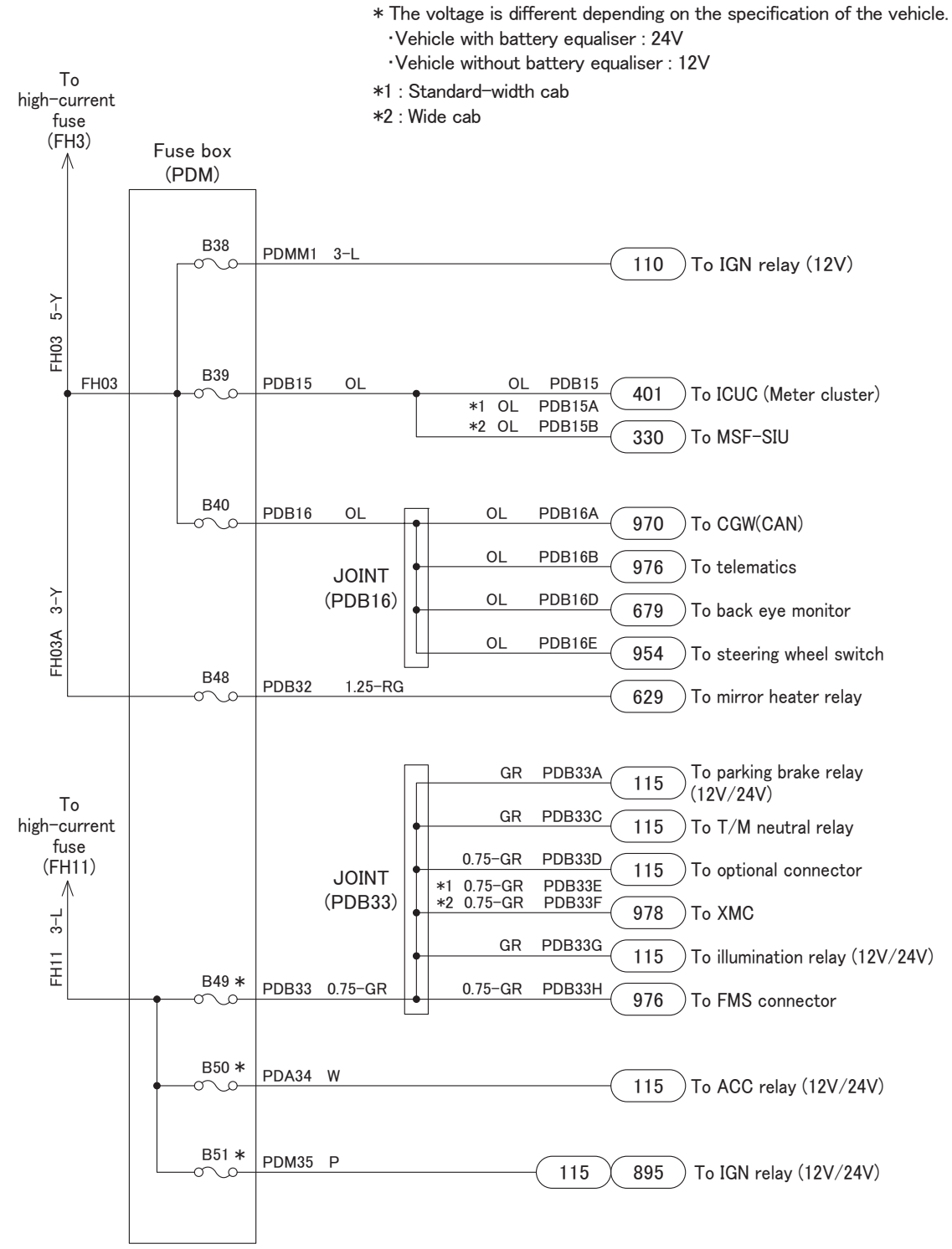
Fuse box(PDM) (Fuse B25 to B26, B54 to B56)



110-616323B25

POWER CIRCUIT (10)

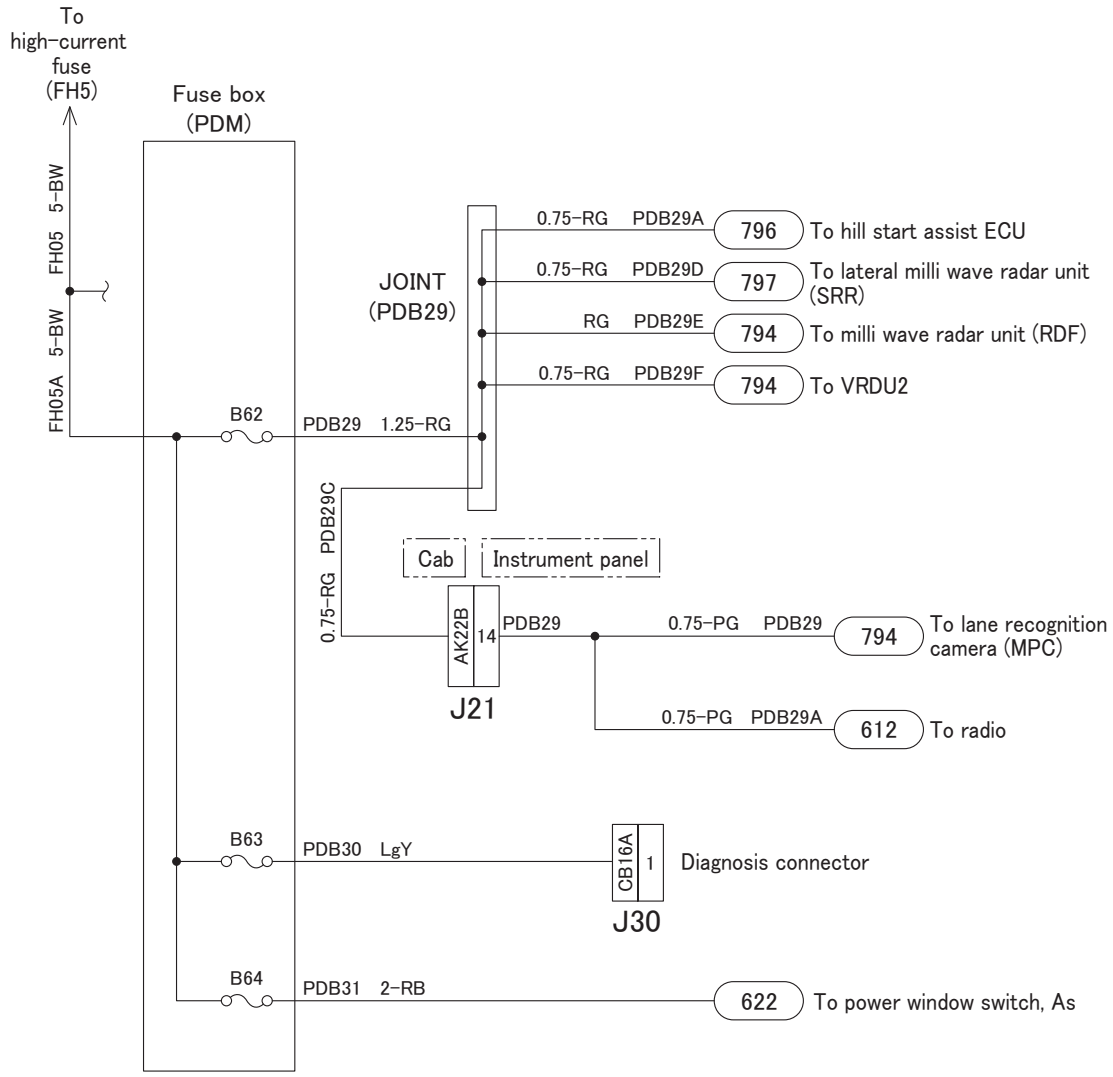
Fuse box(PDM) (Fuse B38 to B40, B48 to B51)



110-303013B38

POWER CIRCUIT (11)

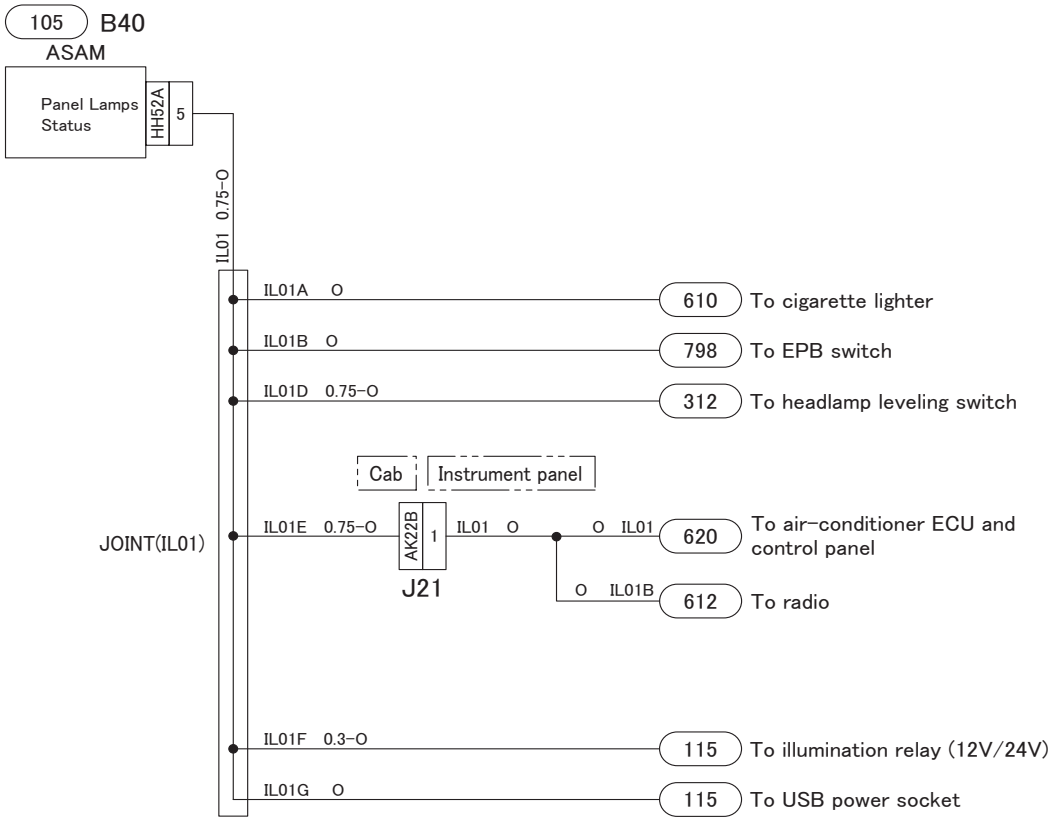
Fuse box(PDM) (Fuse B62 to B64)



110-303013B62

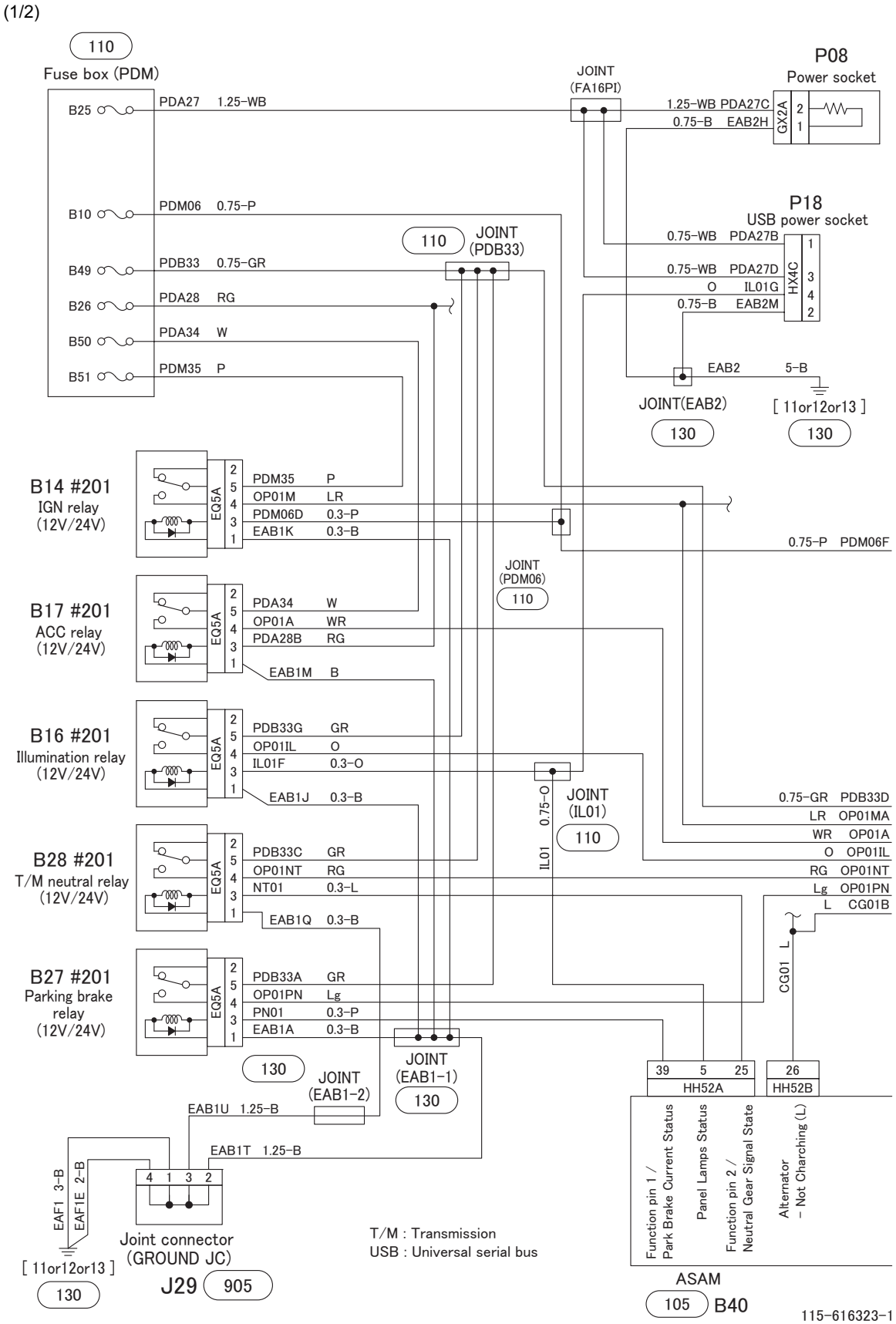
POWER CIRCUIT (12)

ASAM <JOINT (IL01)>



110-616323IL01

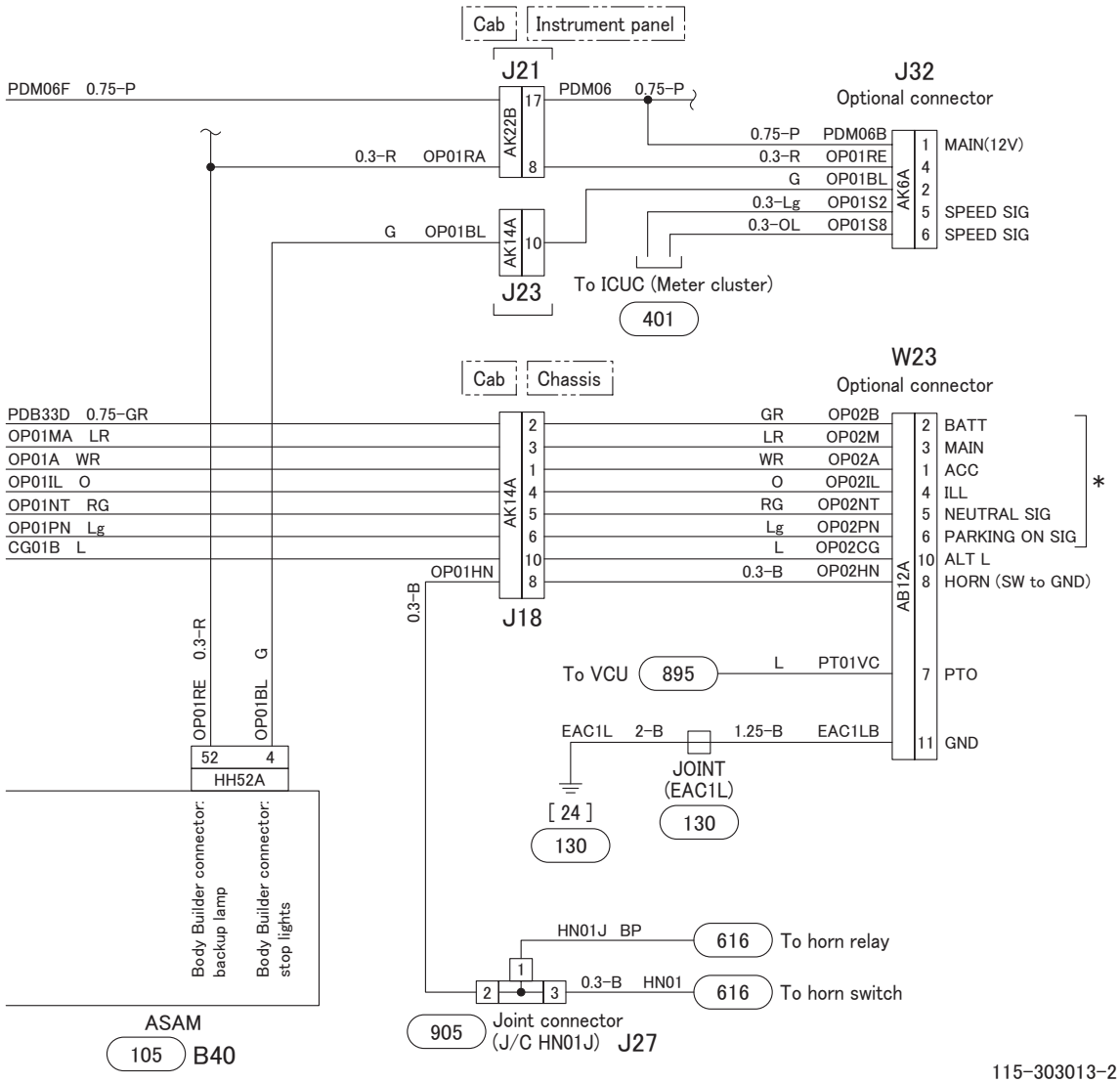
RESERVE POWER CIRCUIT (1)



RESERVE POWER CIRCUIT (2)

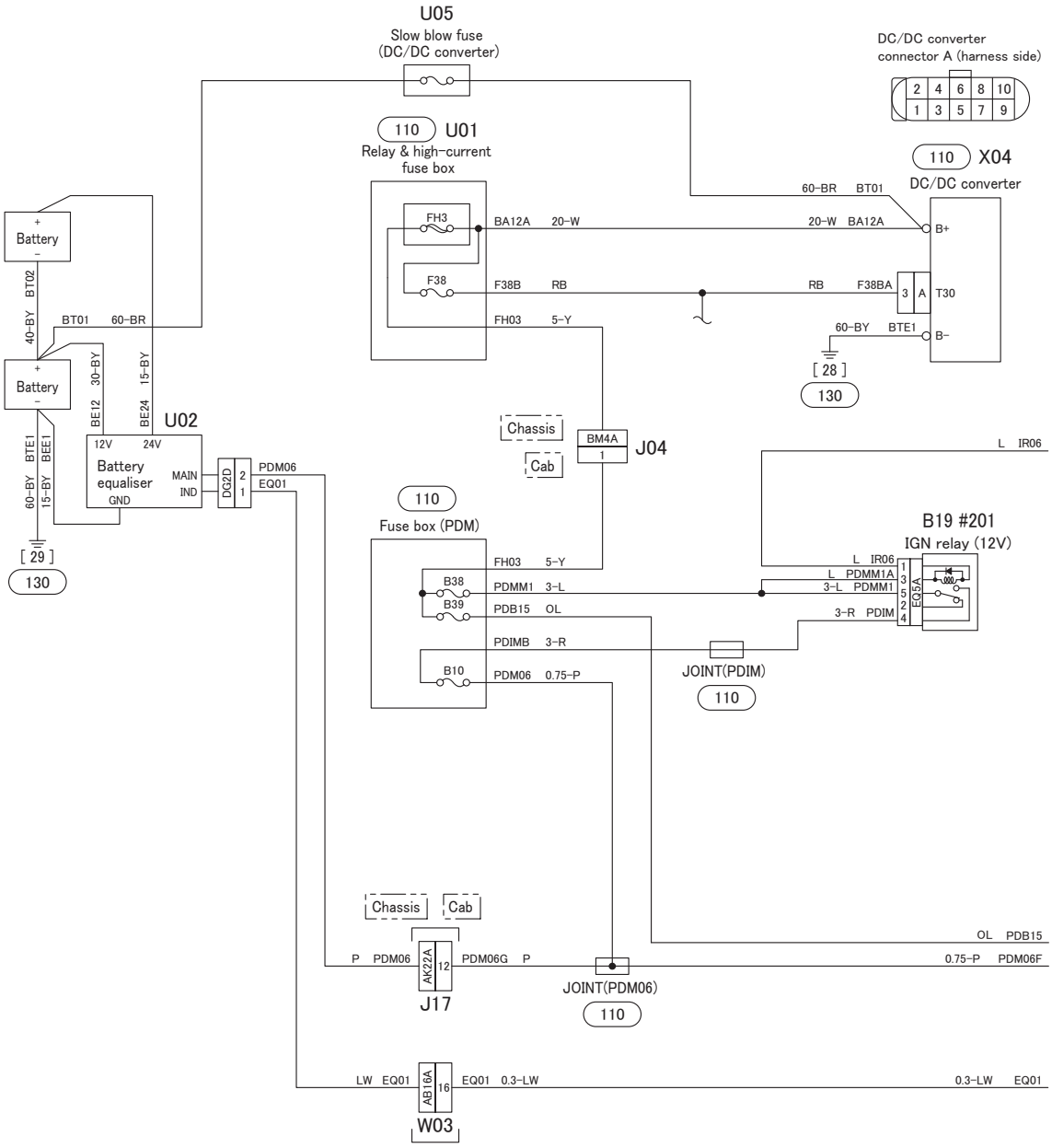
(2/2)

＊The voltage is different depending on the specification of the vehicle.
・Vehicle with battery equaliser : 24V
・Vehicle without battery equaliser : 12V



BATTERY CHARGING CIRCUIT(1)

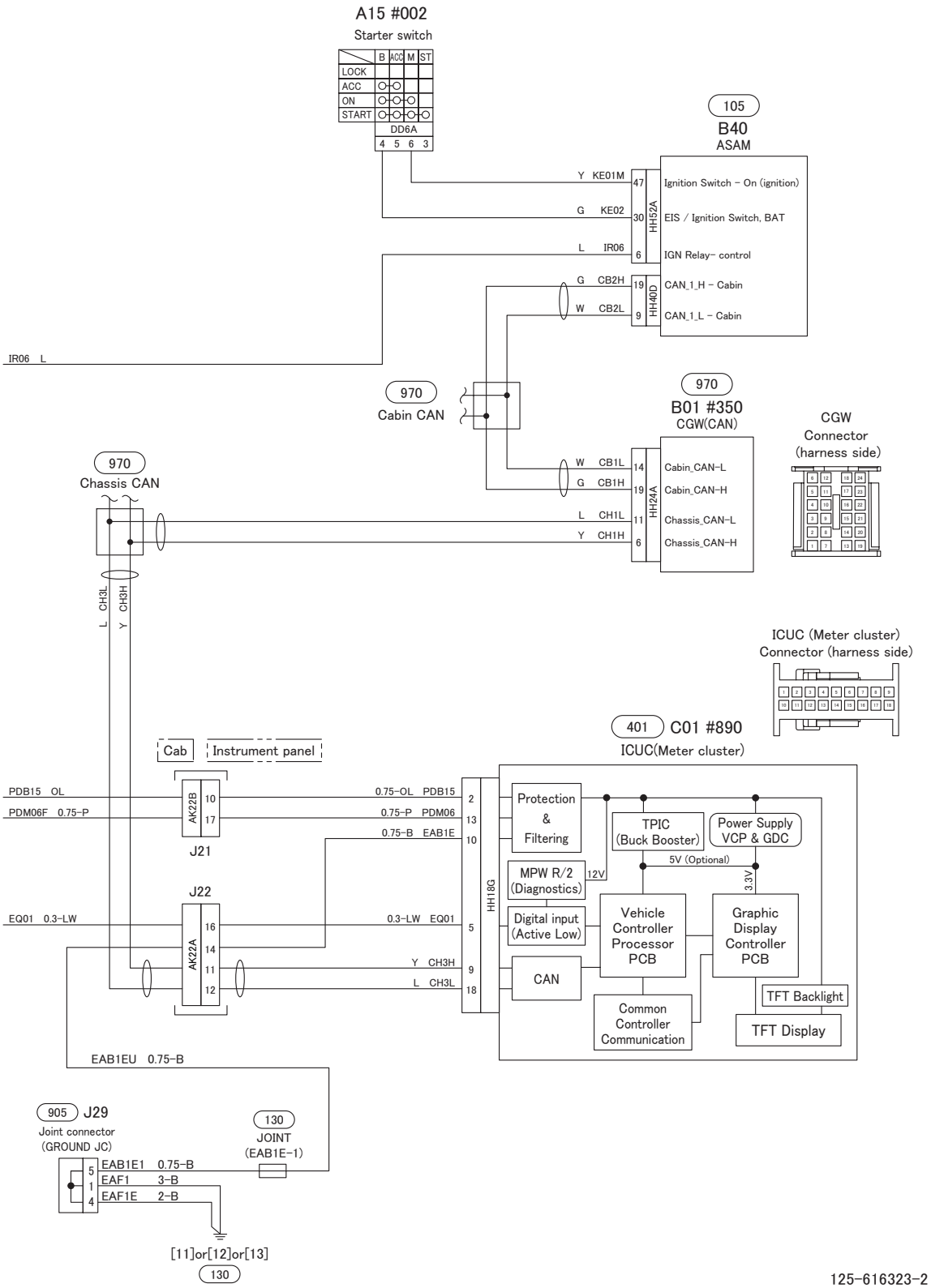
<Vehicle with battery equaliser> (1/2)



125-616323-1

BATTERY CHARGING CIRCUIT(2)

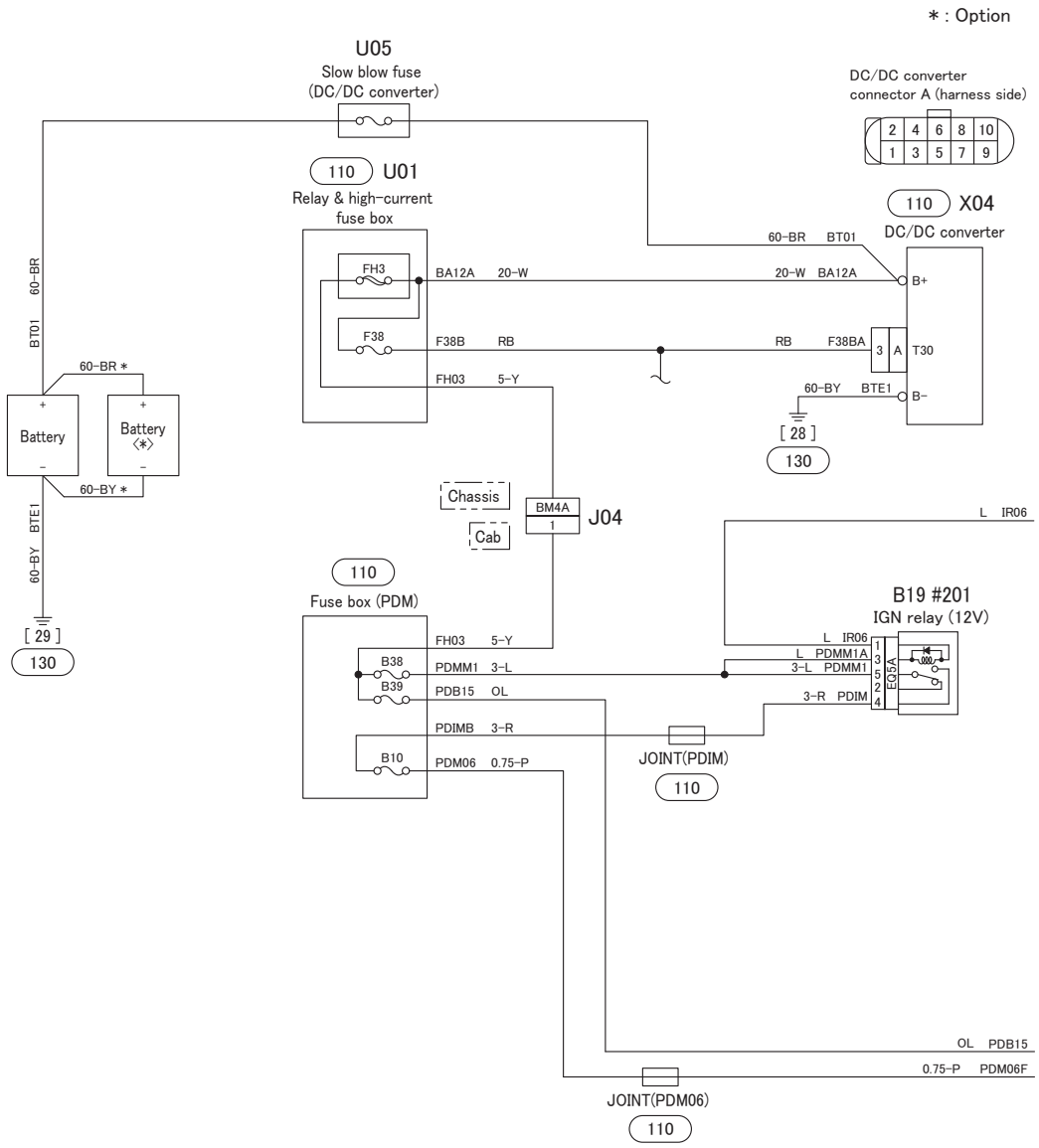
<Vehicle with battery equaliser> (2/2)



125–616323–2

BATTERY CHARGING CIRCUIT(3)

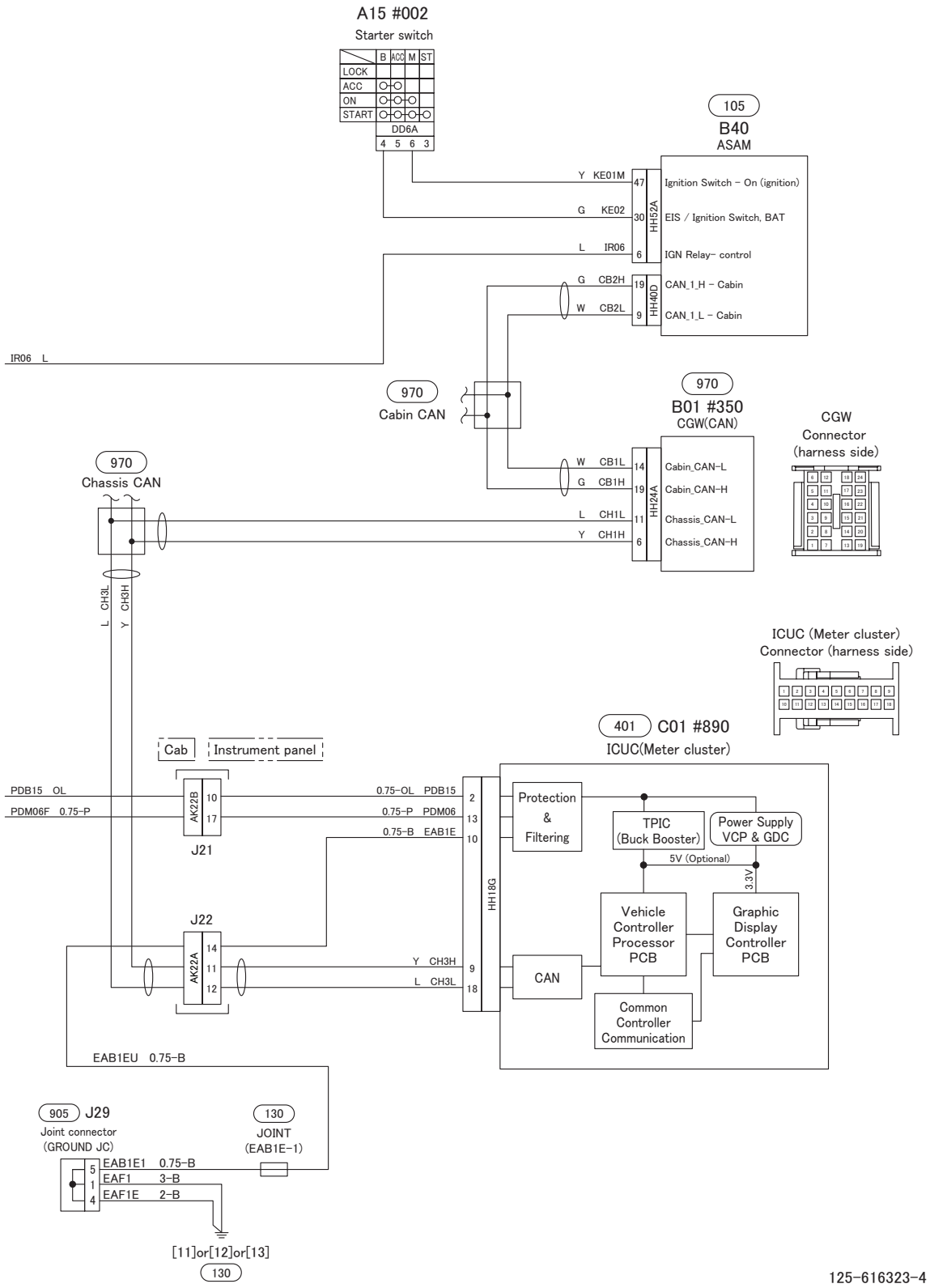
<Vehicle without battery equaliser> (1/2)



125-303013-3

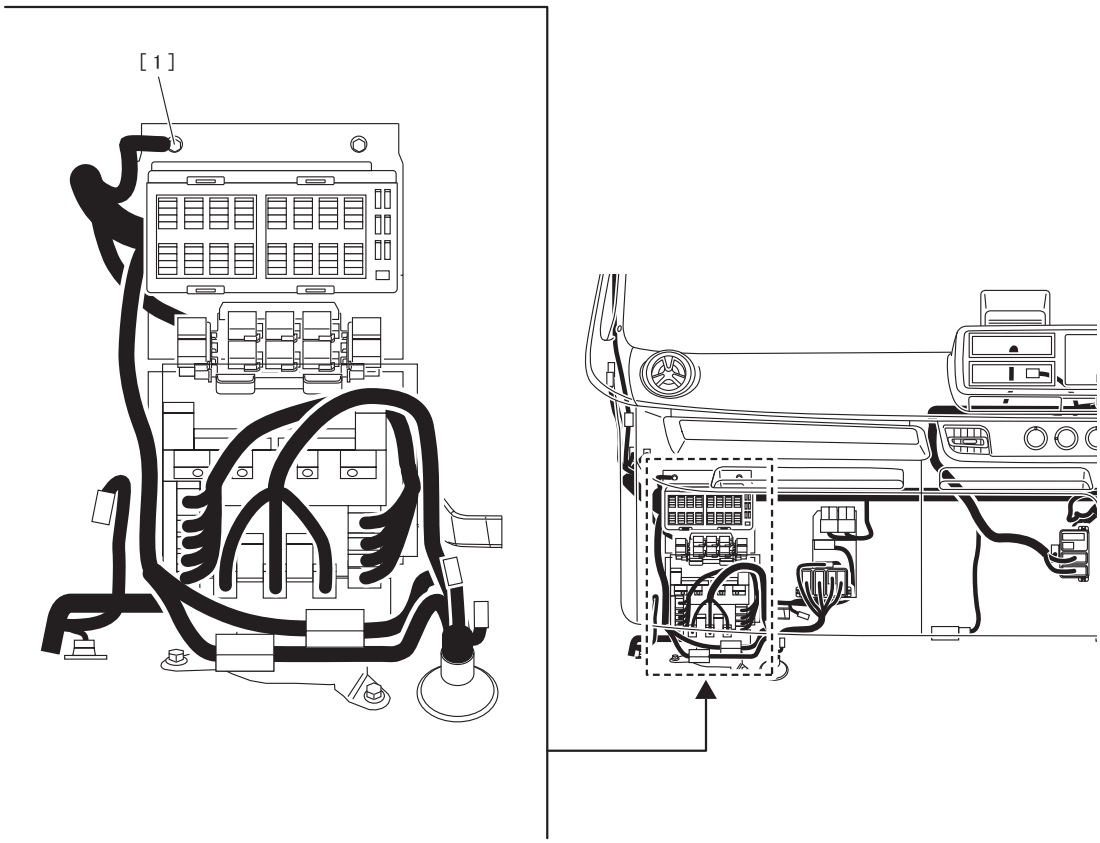
BATTERY CHARGING CIRCUIT(4)

<Vehicle without battery equaliser> (2/2)



EARTH (1)

[1] Cab ground

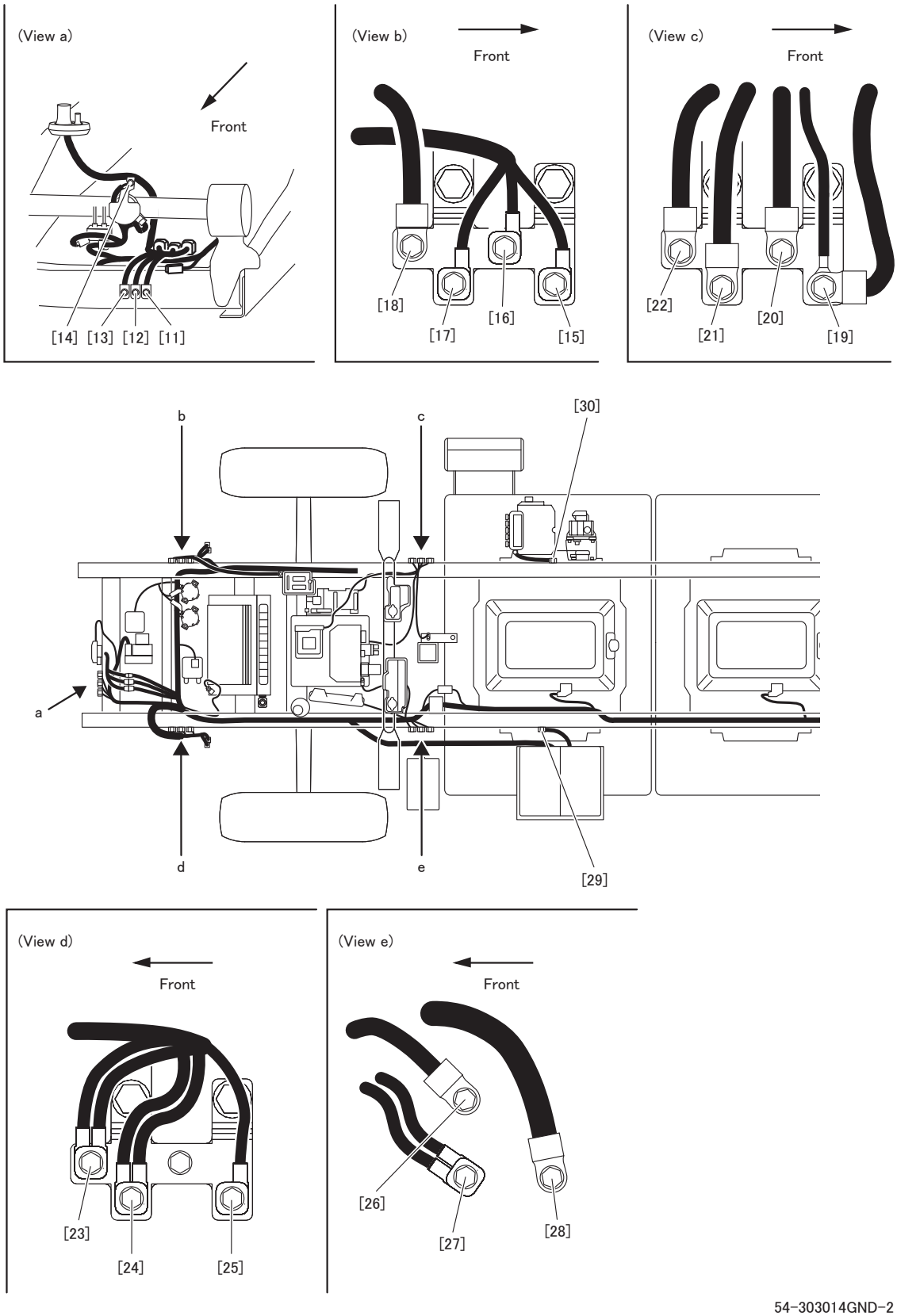


Location	Circuit No.	Wire diameter – wire colour	Destination	Remarks
[1]	EAB3	5-B	Frame ground ([11or12or13])	

54-616323GND-1

EARTH (2)

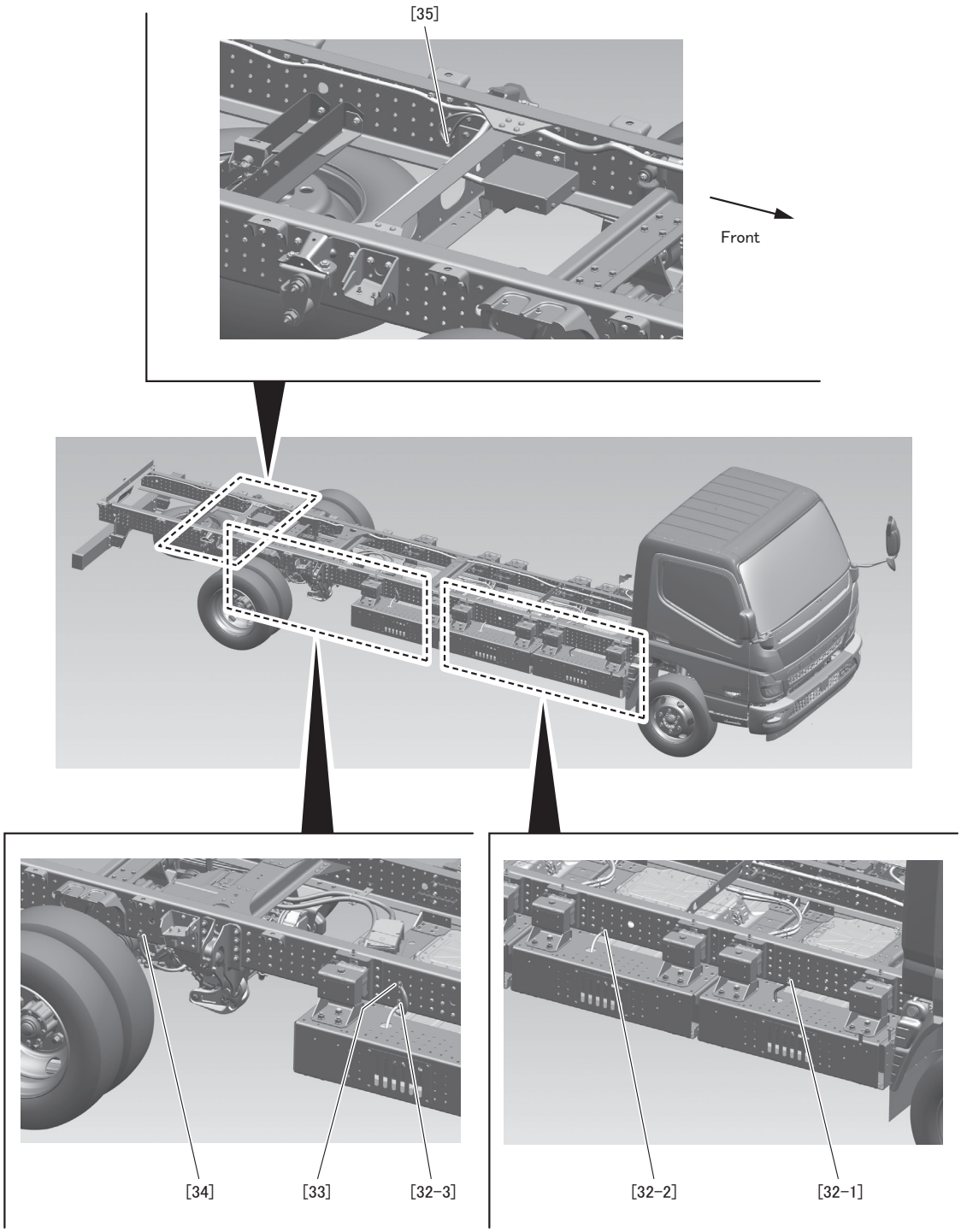
[11]-[30] Chassis ground



54-303014GND-2

EARTH (3)

[32]-[35] Chassis ground



54-616323GND-3

EARTH (4)

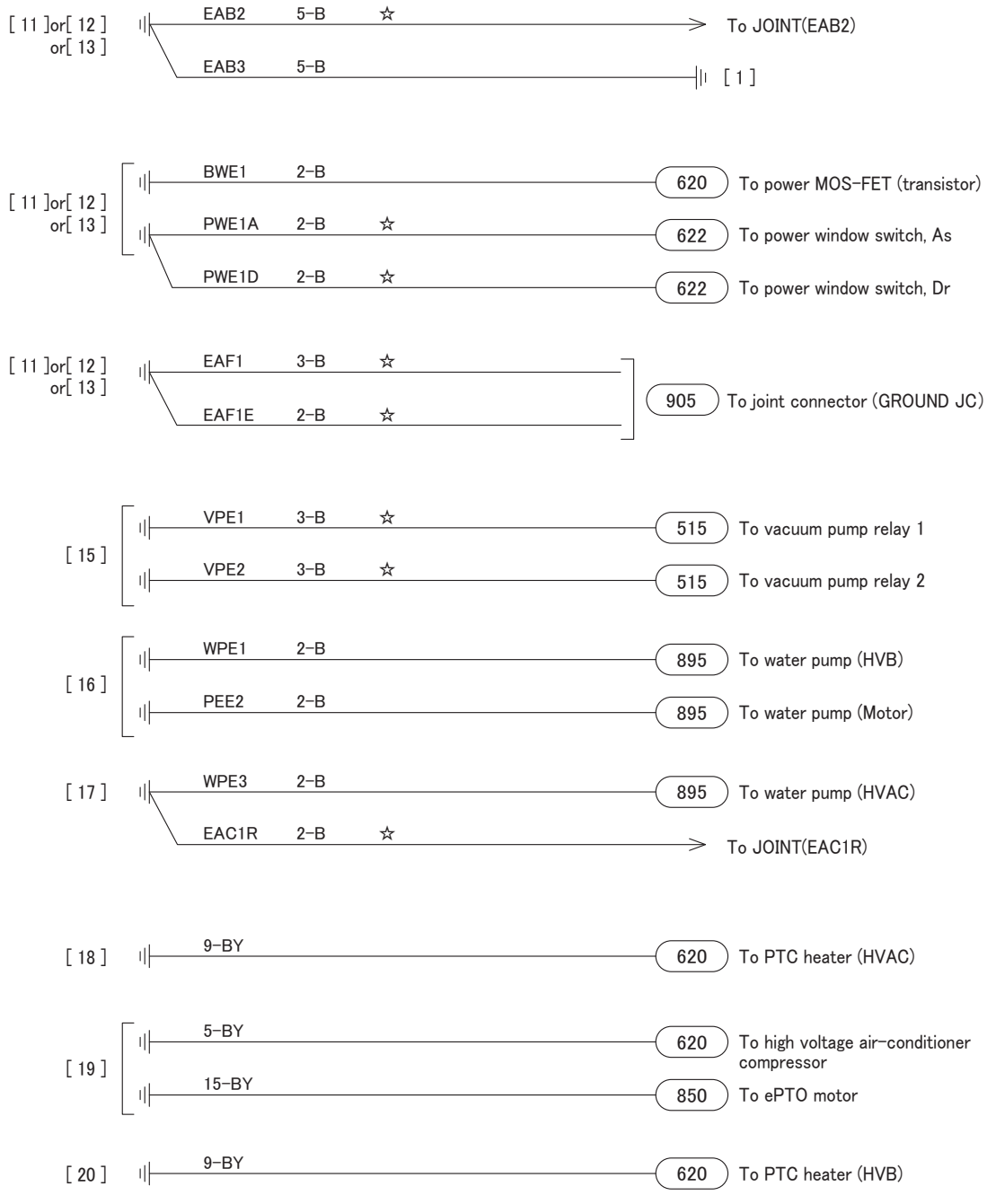
Location	Circuit No.	Wire diameter – wire colour	Destination	Remarks
[11or12or13]	EAB2	5-B	JOINT (EAB2)	
	EAB3	5-B	Cab ground ([1])	
[11or12or13]	BWE1	2-B	Power MOS-FET (transistor)	
	PWE1A	2-B	Power window switch, As	
	PWE1D	2-B	Power window switch, Dr	
[11or12or13]	EAF1	3-B	Joint connector (Ground JC)	
	EAF1E	2-B	Joint connector (Ground JC)	
[14]	HNE1	1.25-B	Frame ground ([23])	Horn
[15]	VPE1	3-B	Vacuum pump relay 1	
	VPE2B	3-B	Vacuum pump relay 2	
[16]	PEE2	2-B	Water pump (Motor)	
	WPE1	2-B	Water pump (HVB)	
[17]	EAC1R	2-B	JOINT (EAC1R)	
	WPE3	2-B	Water pump (HVAC)	
[18]	–	9-BY	PTC heater (HVAC)	
[19]	–	5-BY	High voltage air-conditioner compressor	
	–	15-BY	ePTO motor	
[20]	–	9-BY	PTC heater (HVB)	
[21]	–	15-BY	OBC	
[22]	–	15-BY	PDU	
[23]	VCE1	1.25-B	VCU	
	VCE2	1.25-B		
	VCE3	1.25-B		
	VCE4	1.25-B		
	CFE1	1.25-B	Condenser fan relay 2	
	HNE1	1.25-B	[14] Horn	
[24]	EAB4	8-B	ASAM	
	EAC1L	2-B	JOINT (EAC1L)	
	EAC2L	2-B	JOINT (EAC2L)	
[25]	ABE1	3-B	Hydraulic unit	ABS
	ABE2	3-B		
[26]	–	15-BY	DCB	
[27]	EPE1	15-B	EHPS	Electric power steering oil pump, motor, ECU
	FNE1	8-B	Cooling fan	
[28]	BTE1	60-BY	DC/DC converter	
[29]	BTE1	60-BY	Battery	Low voltage
[30]	–	15-BY	ePTO inverter	
[32-1]	–	40-BY	High voltage battery (1)	
[32-2]	–	40-BY	High voltage battery (2)	
[32-3]	–	40-BY	High voltage battery (3)	
[33]	–	50-BY	Fuse (eDM)	Except S-size HV battery (1 battery pack)
[34]	–	50-BY	eDM	
[35]	EPBE1	3-B	EPB ECU	
	EPBE2	3-B		
	EPL2	3-B	Electric parking lock (EPL) actuator	

54-616323GND-4

EARTH (5)

Entire ground(1/3)

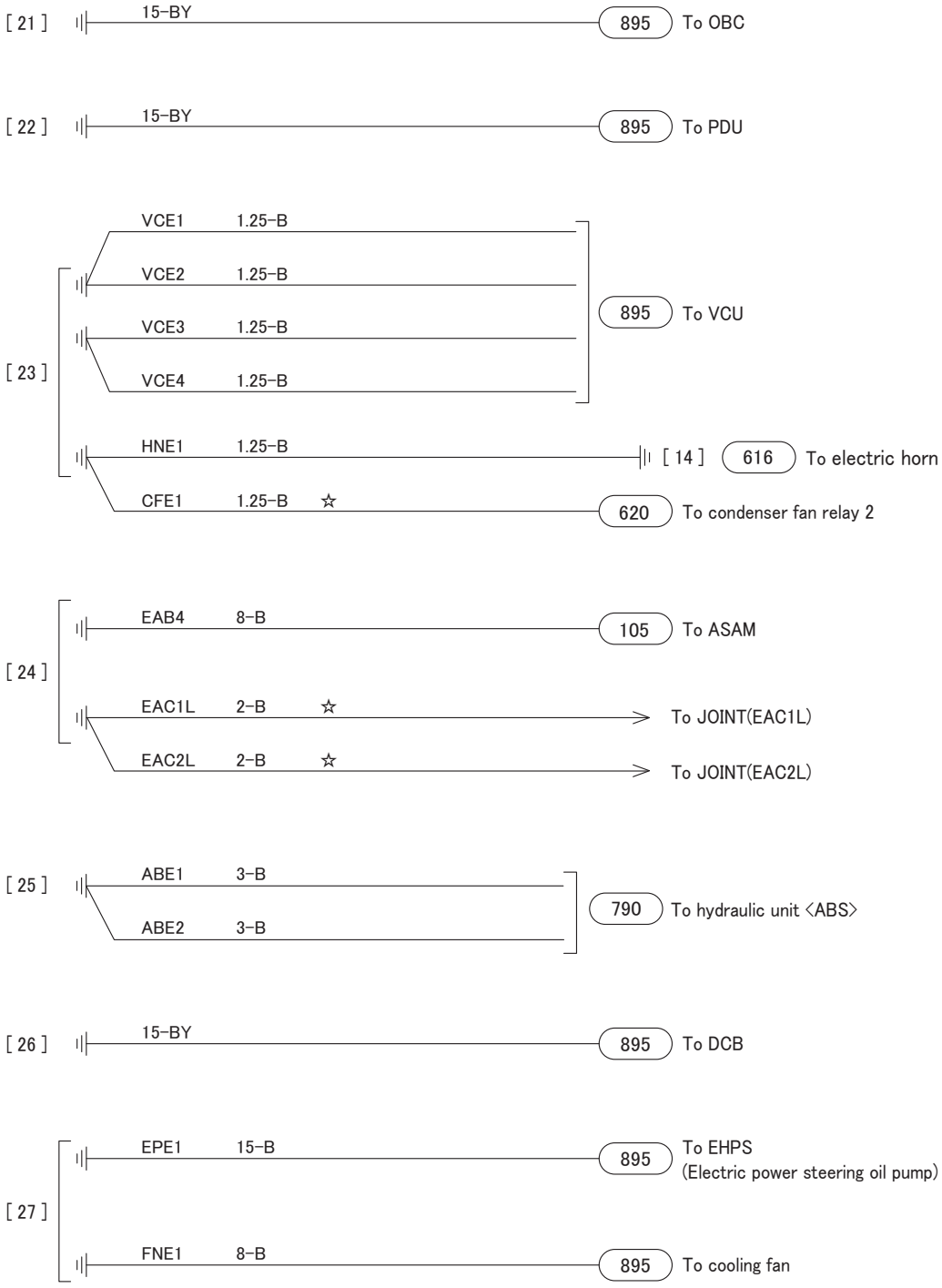
・This diagram indicates earthing points.
・See the following pages for branching of earthing (wiring for ☆).
(in circuit No. order)



130-616323ALL-1

EARTH (6)

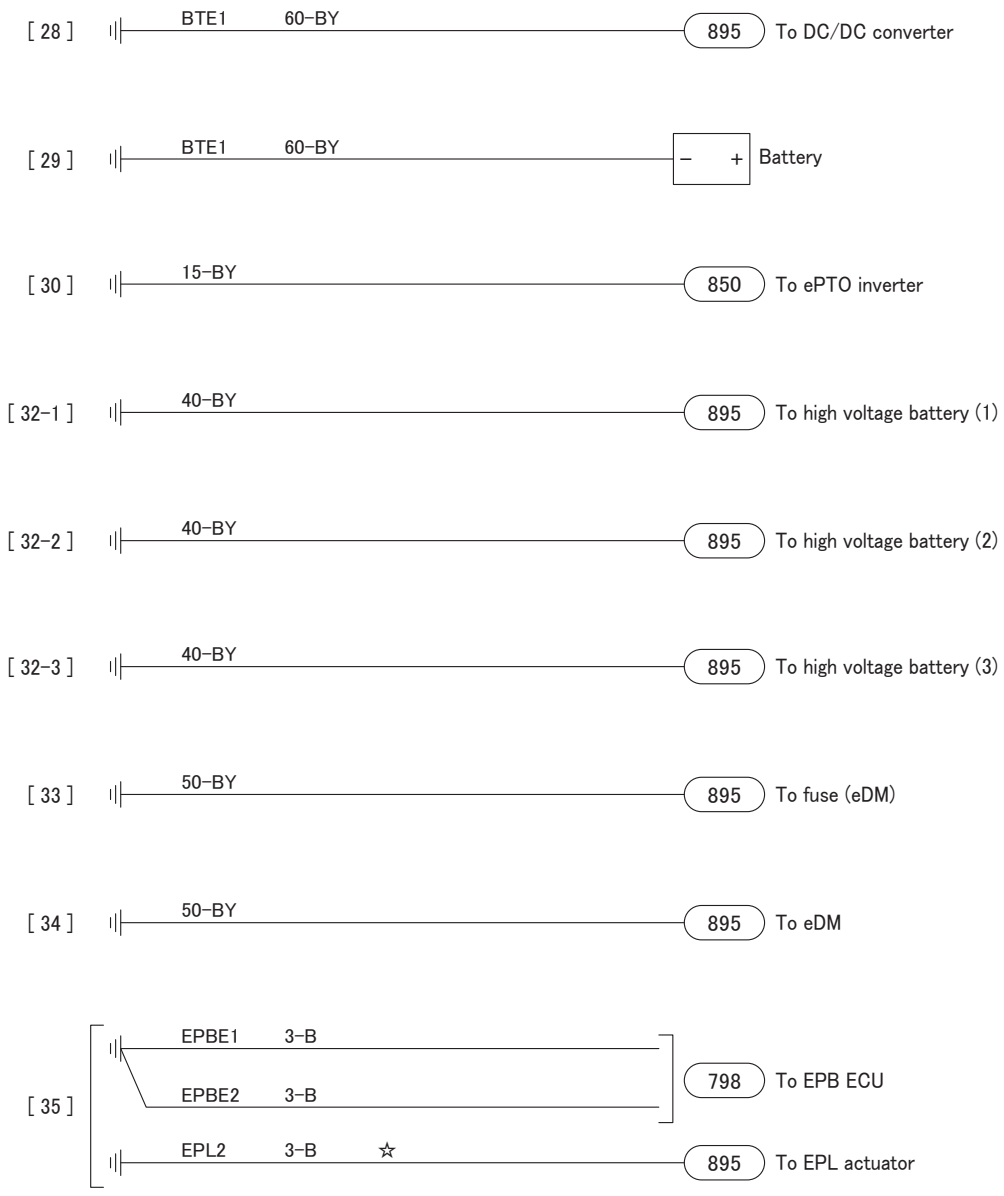
Entire ground(2/3)



130-303013ALL-2

EARTH (7)

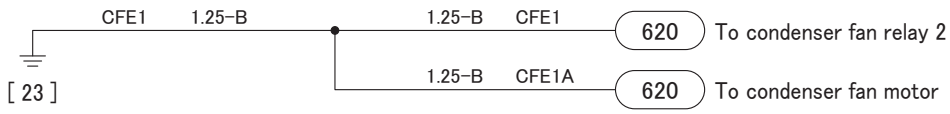
Entire ground(3/3)



130-616323ALL-3

EARTH (8)

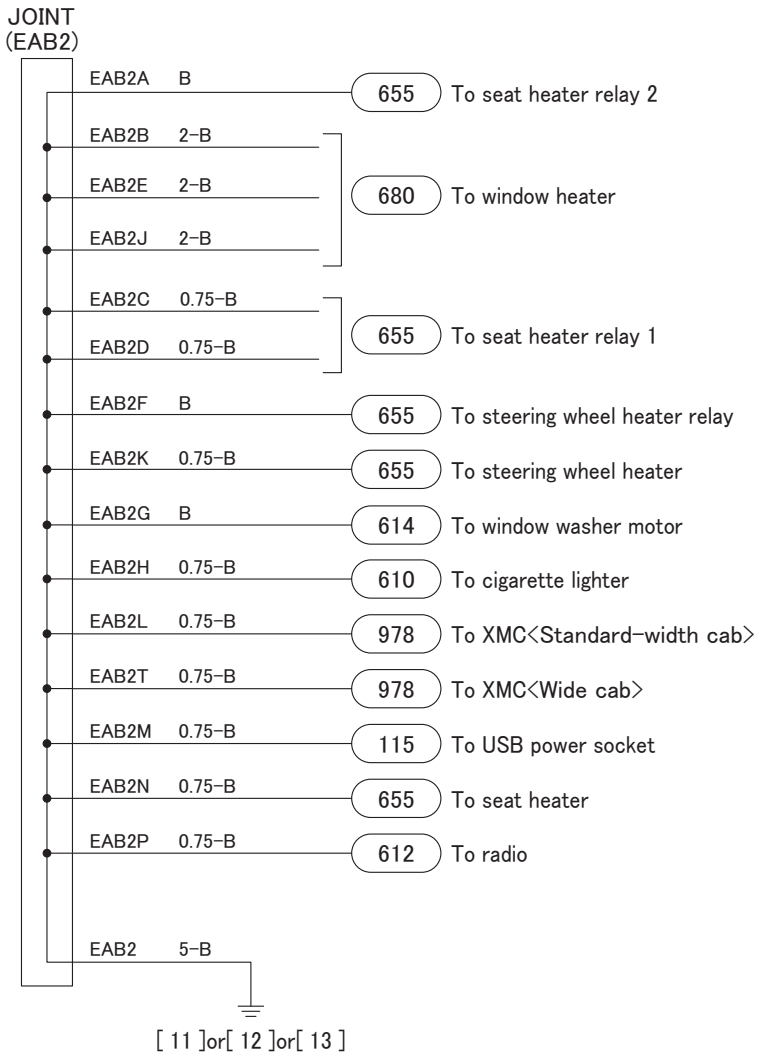
Circuit No. CFE1 ground



130-303013CFE1

EARTH (9)

Circuit No. EAB2 ground

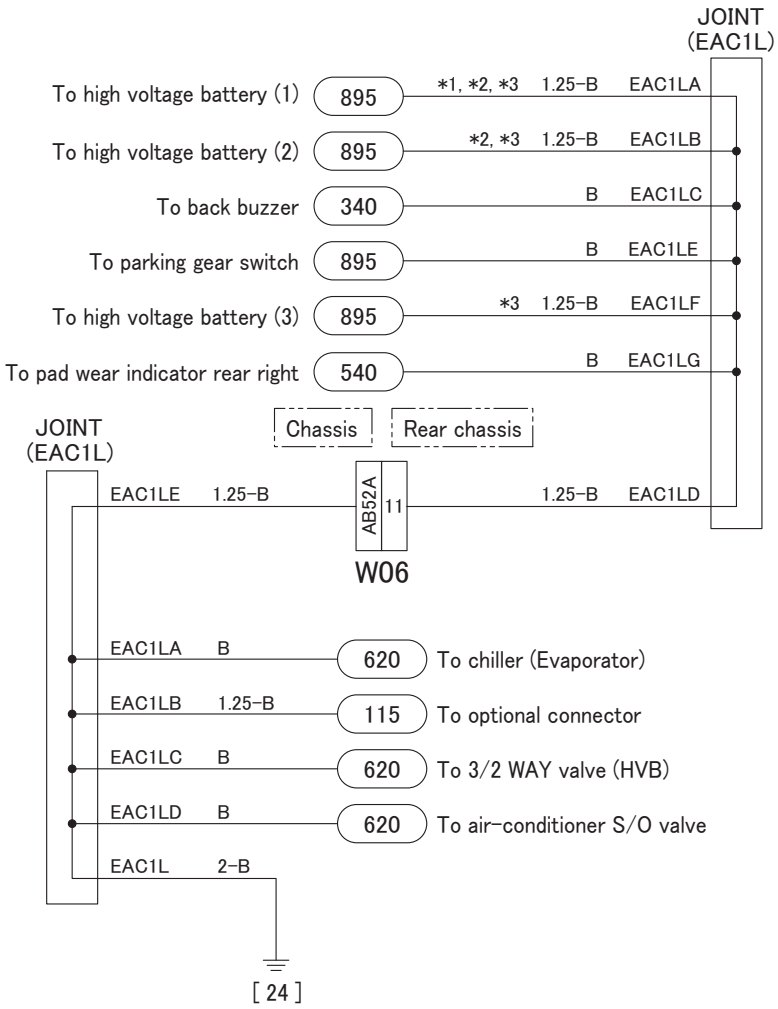


130-616323EAB2

EARTH (10)

Circuit No. EAC1L ground

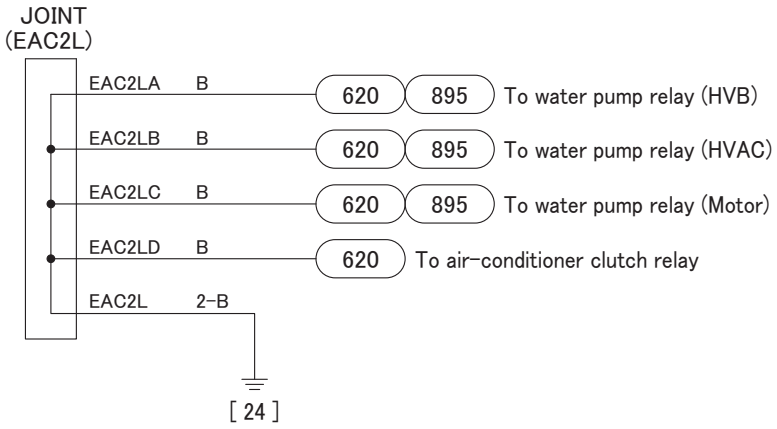
*1 : S-size HV battery (1 battery pack)
*2 : M-size HV battery (2 battery packs)
*3 : L-size HV battery (3 battery packs)



130-616316EAC1L

EARTH (11)

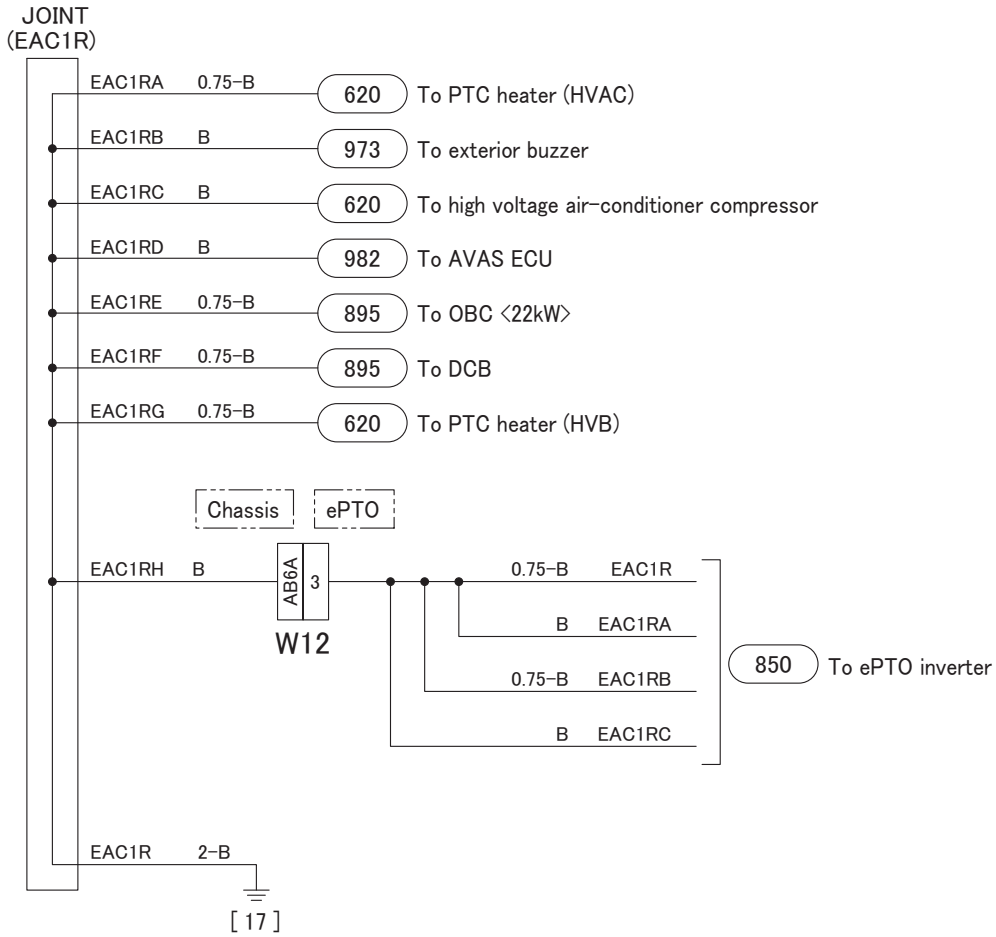
Circuit No. EAC2L ground



130-303013EAC2L

EARTH (12)

Circuit No. EAC1R ground

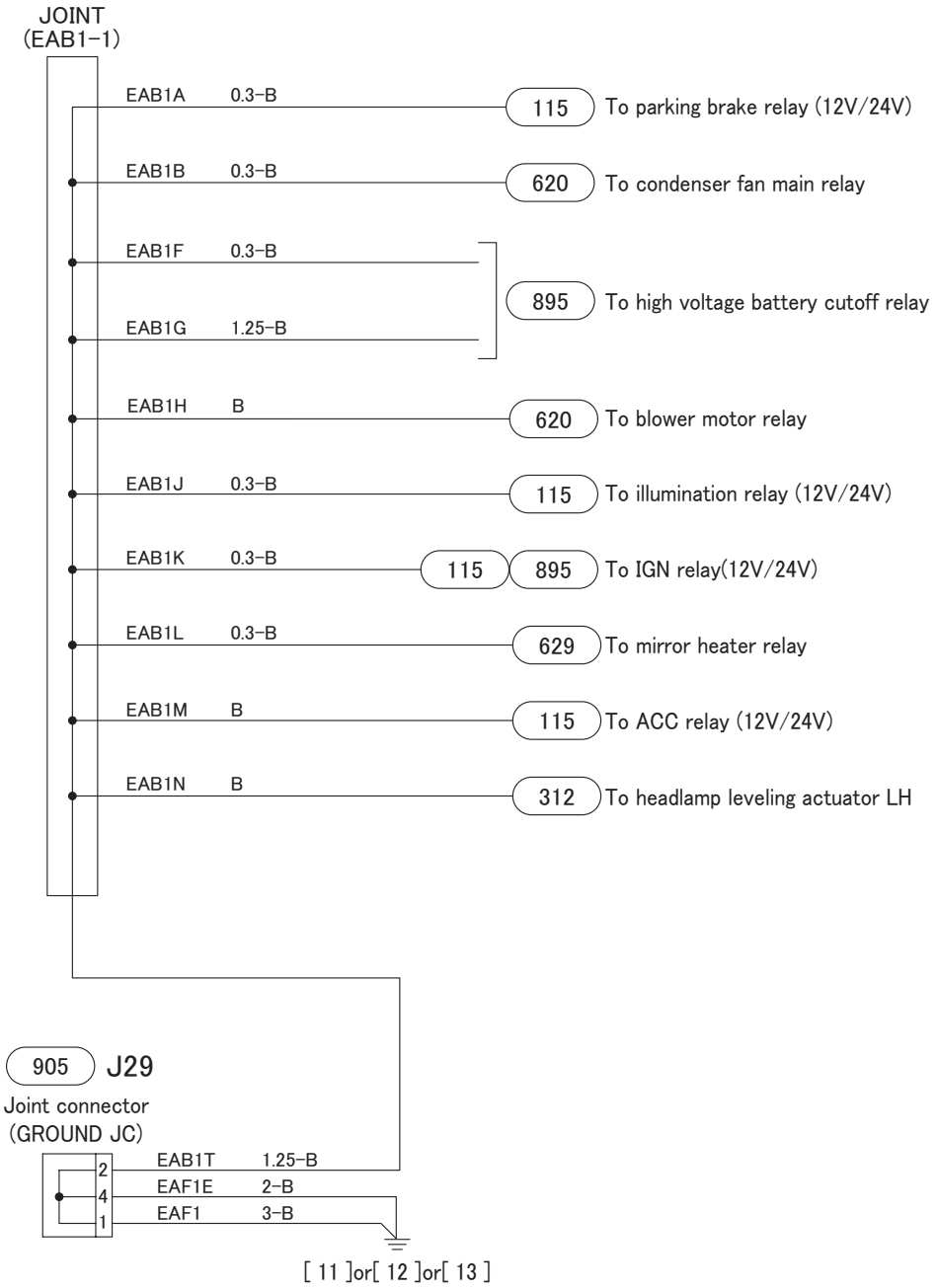


130-616323EAC1R

EARTH (13)

Circuit No. EAF1, EAF1E ground <JOINT(EAB1-1)>

(1/5)

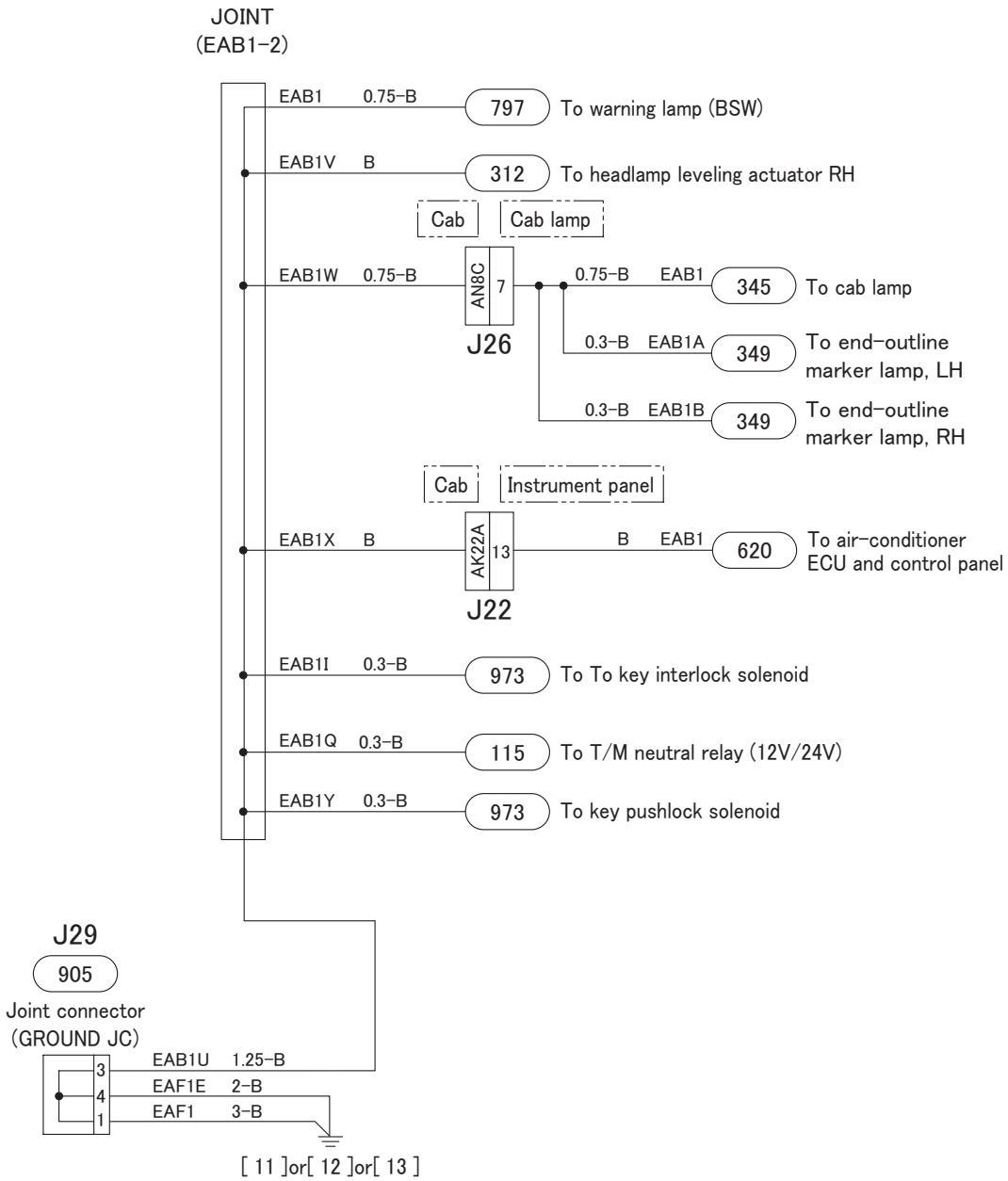


130-616323EAF1-1

EARTH (14)

Circuit No. EAF1, EAF1E ground <JOINT(EAB1-2)>

(2/5)

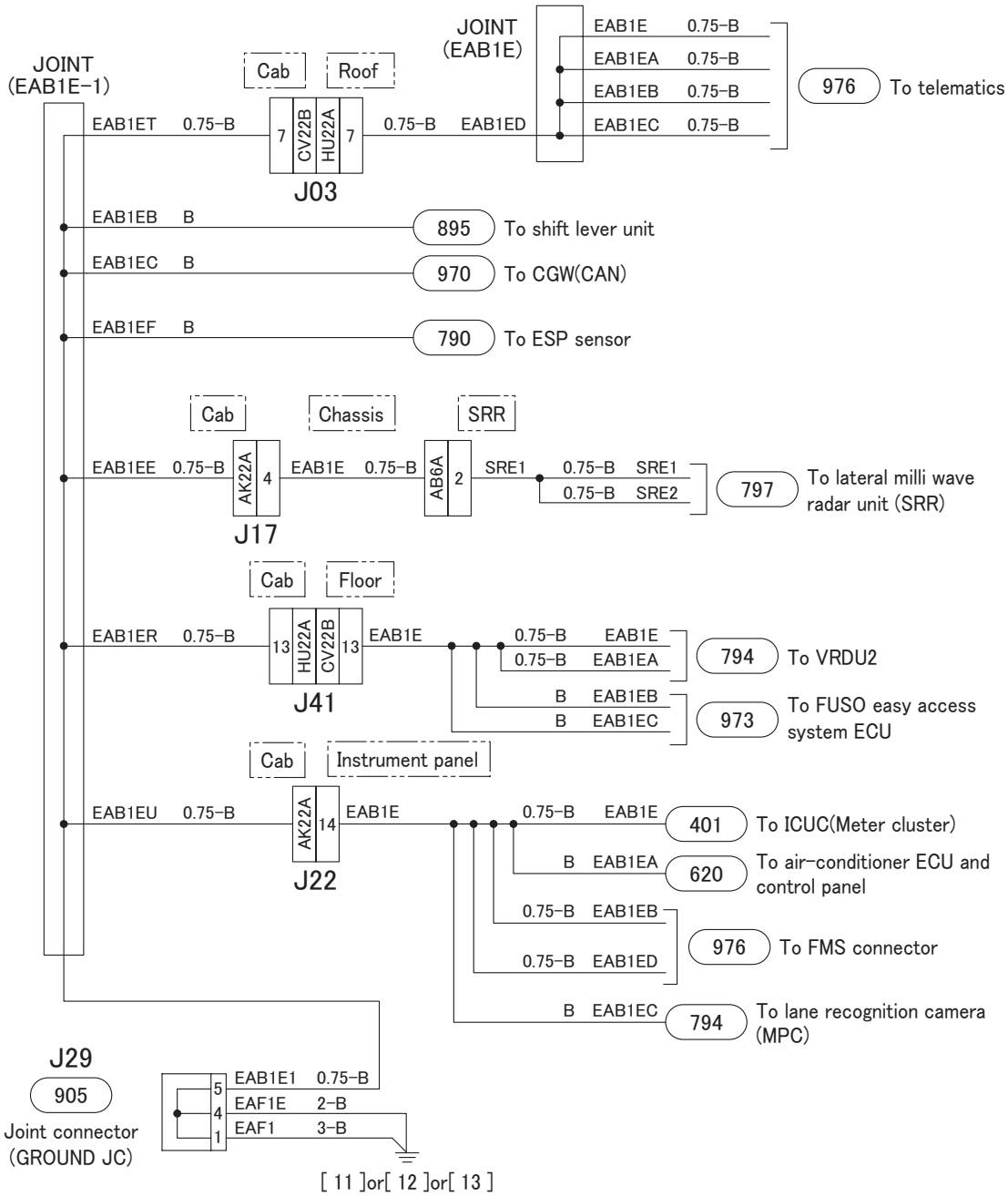


130-616323EAF1-2

EARTH (15)

Circuit No. EAF1, EAF1E ground <JOINT(EAB1E-1), JOINT(EAB1E)>

(3/5)

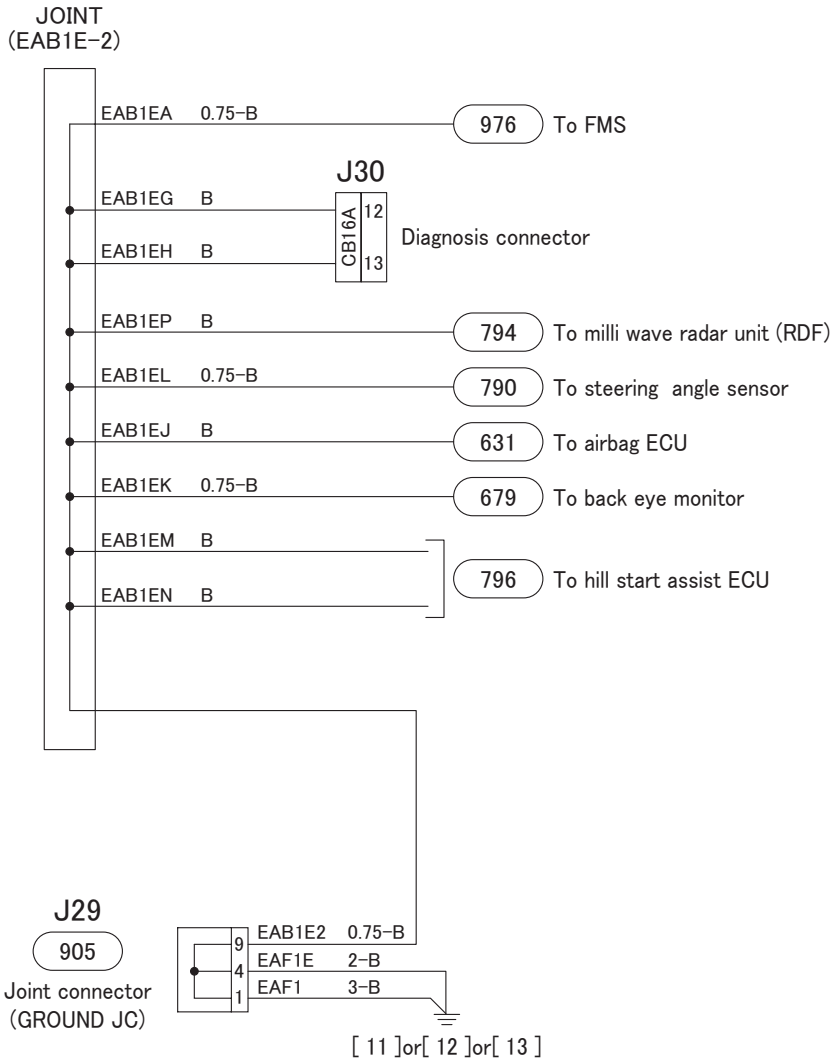


130-616323EAF1-3

EARTH (16)

Circuit No. EAF1, EAF1E ground <JOINT(EAB1E-2), JOINT(EAB1E)>

(4/5)

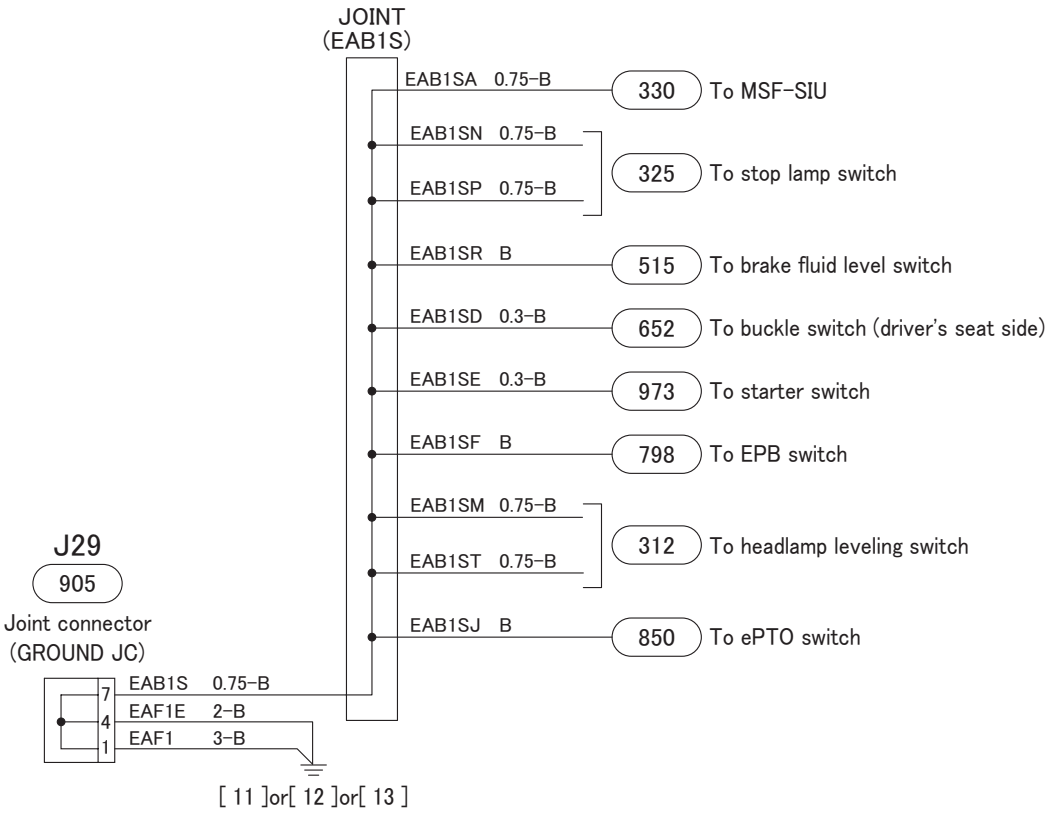


130-616323EAF1-4

EARTH (17)

Circuit No. EAF1, EAF1E ground <JOINT(EAB1S)>

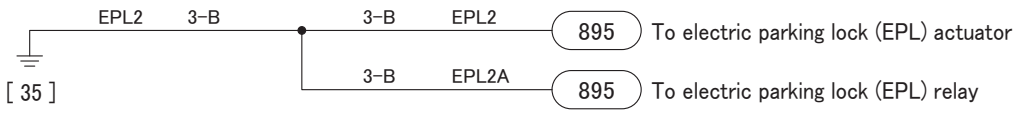
(5/5)



130-616323EAF1-5

EARTH (18)

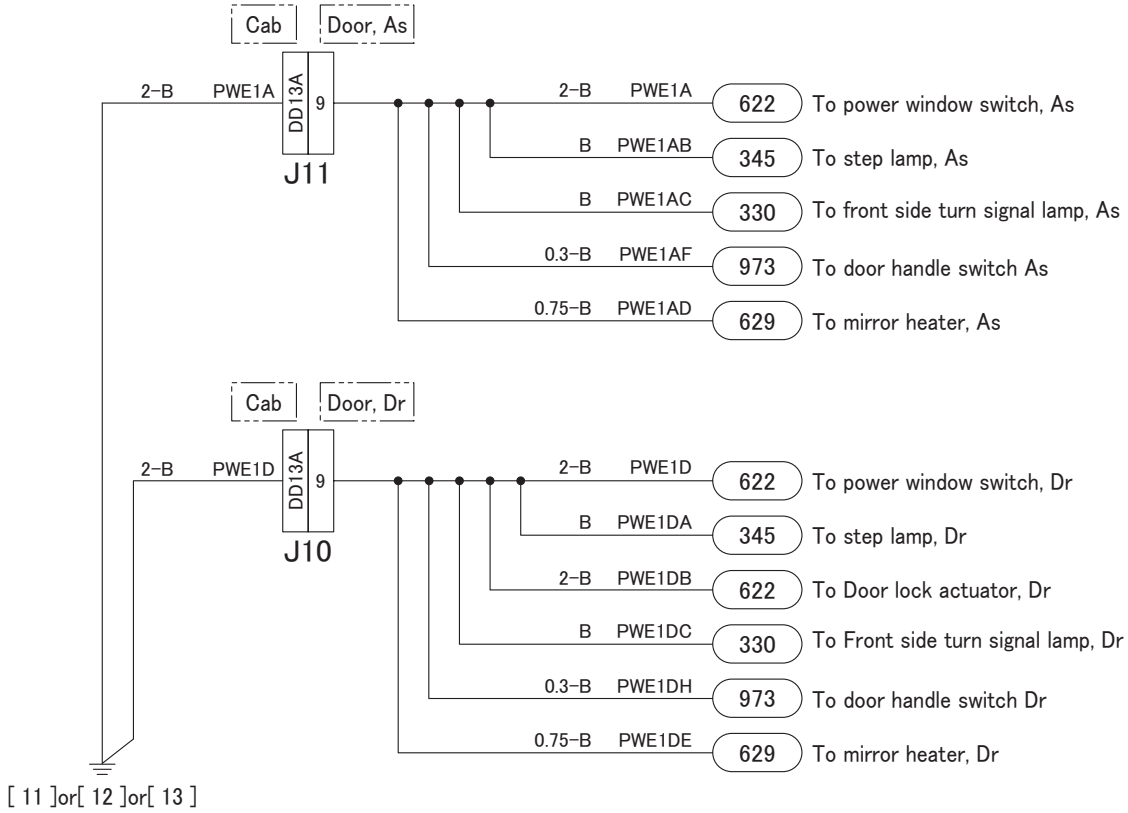
Circuit No. EPL2 ground



130-303013EPL2

EARTH (19)

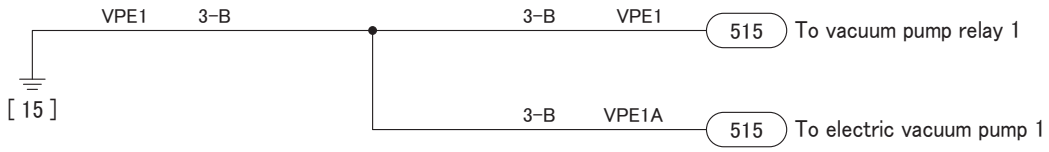
Circuit No. PWE1A, PWE1D ground



130-616323PWE1

EARTH (20)

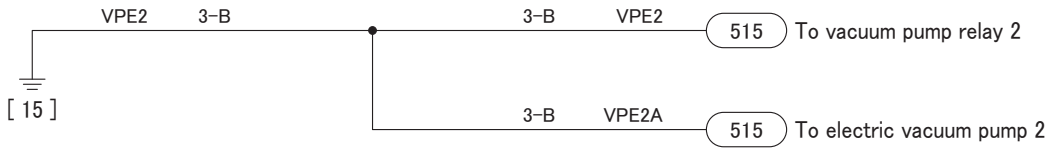
Circuit No. VPE1 ground



130-303013VPE1

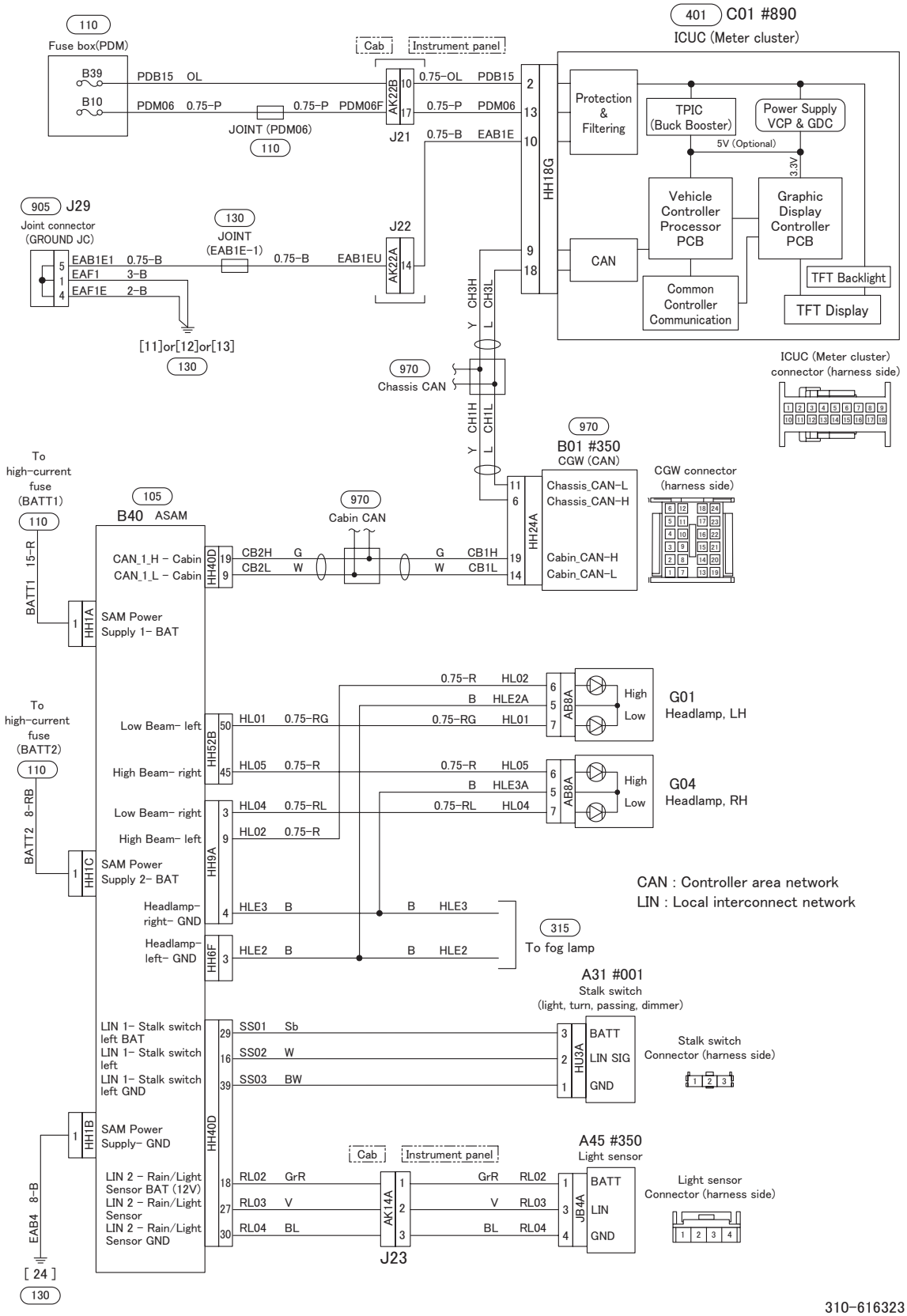
EARTH (21)

Circuit No. VPE2 ground

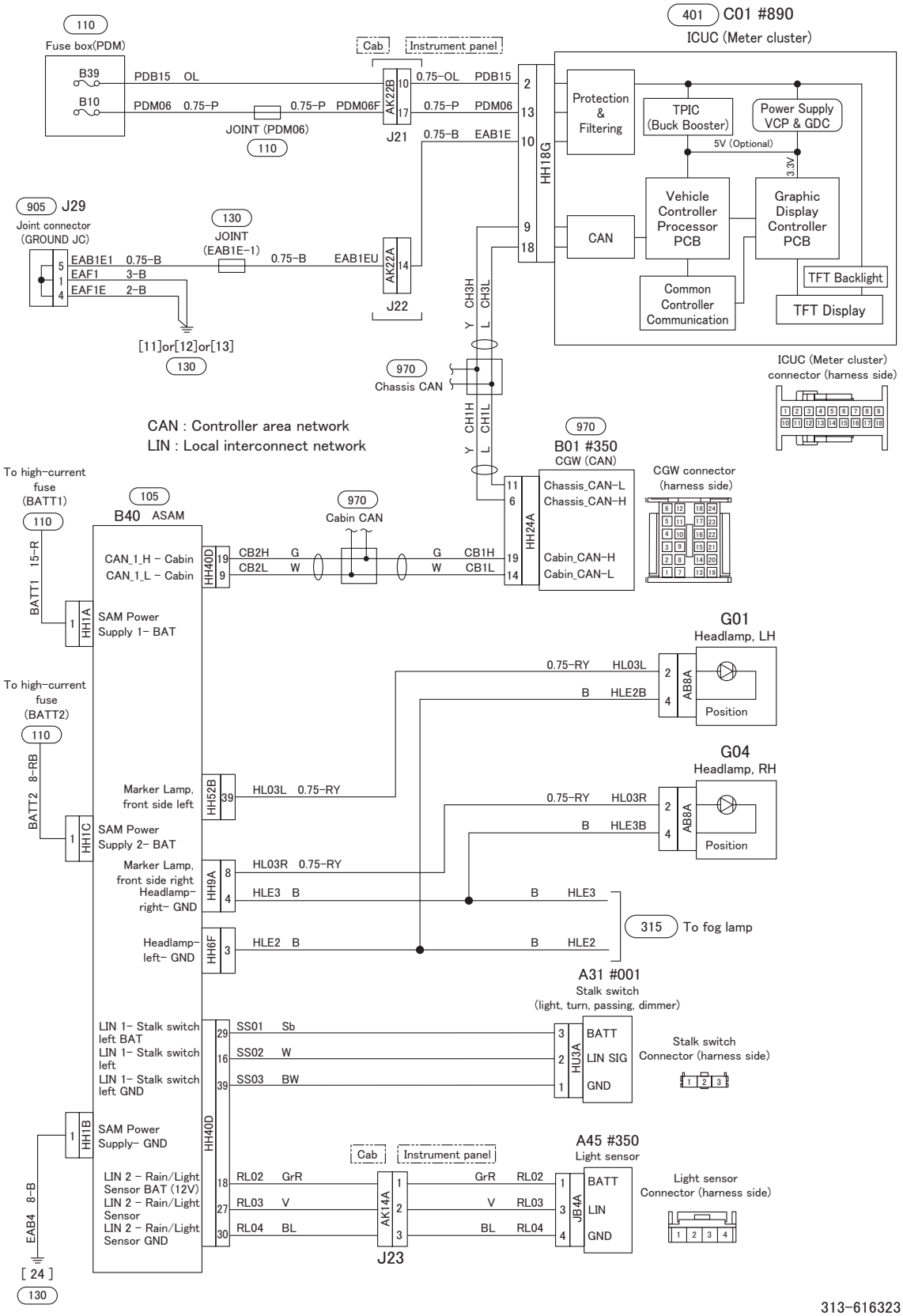


130-303013VPE2

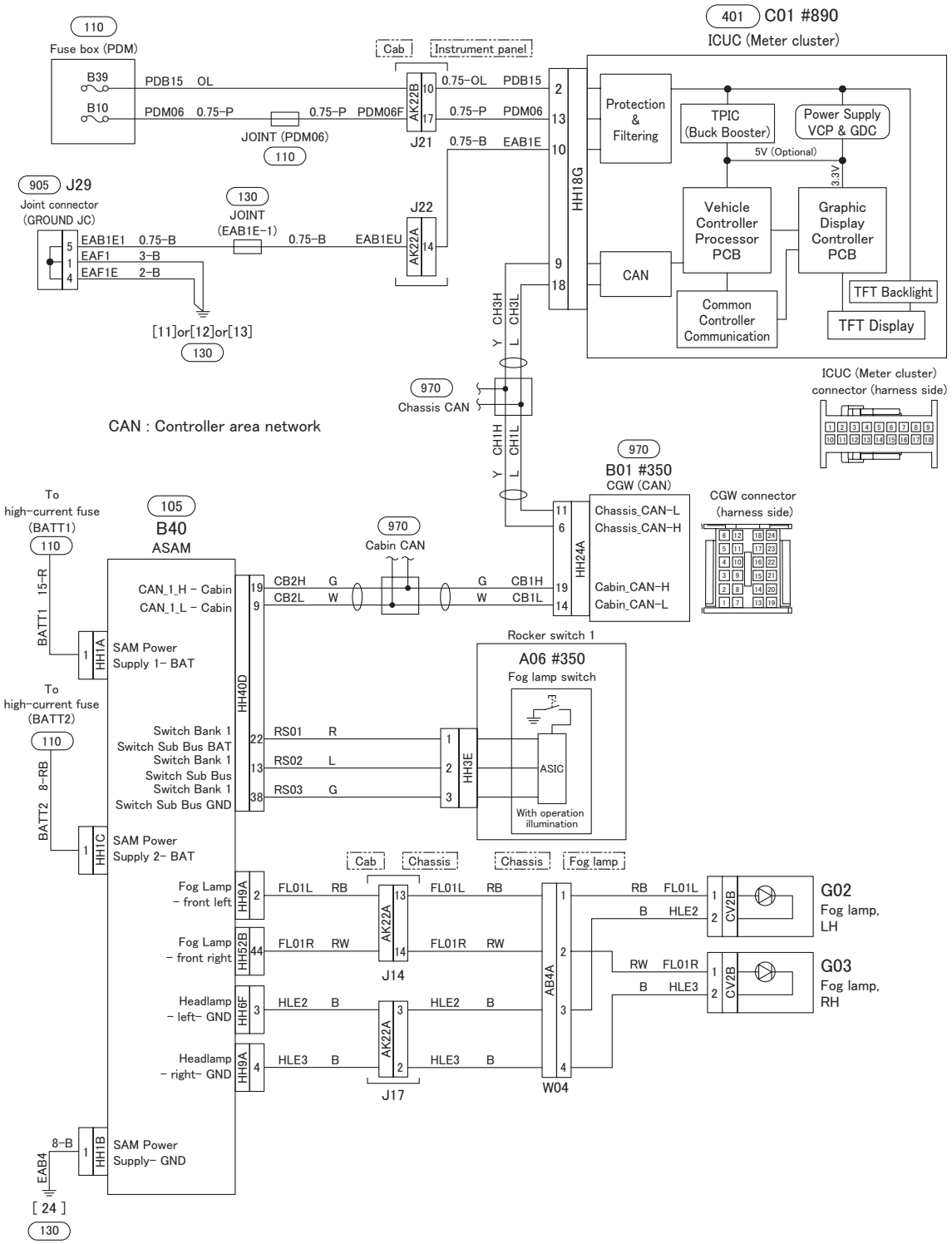
HEADLAMP CIRCUIT



DAYTIME RUNNING LAMP CIRCUIT



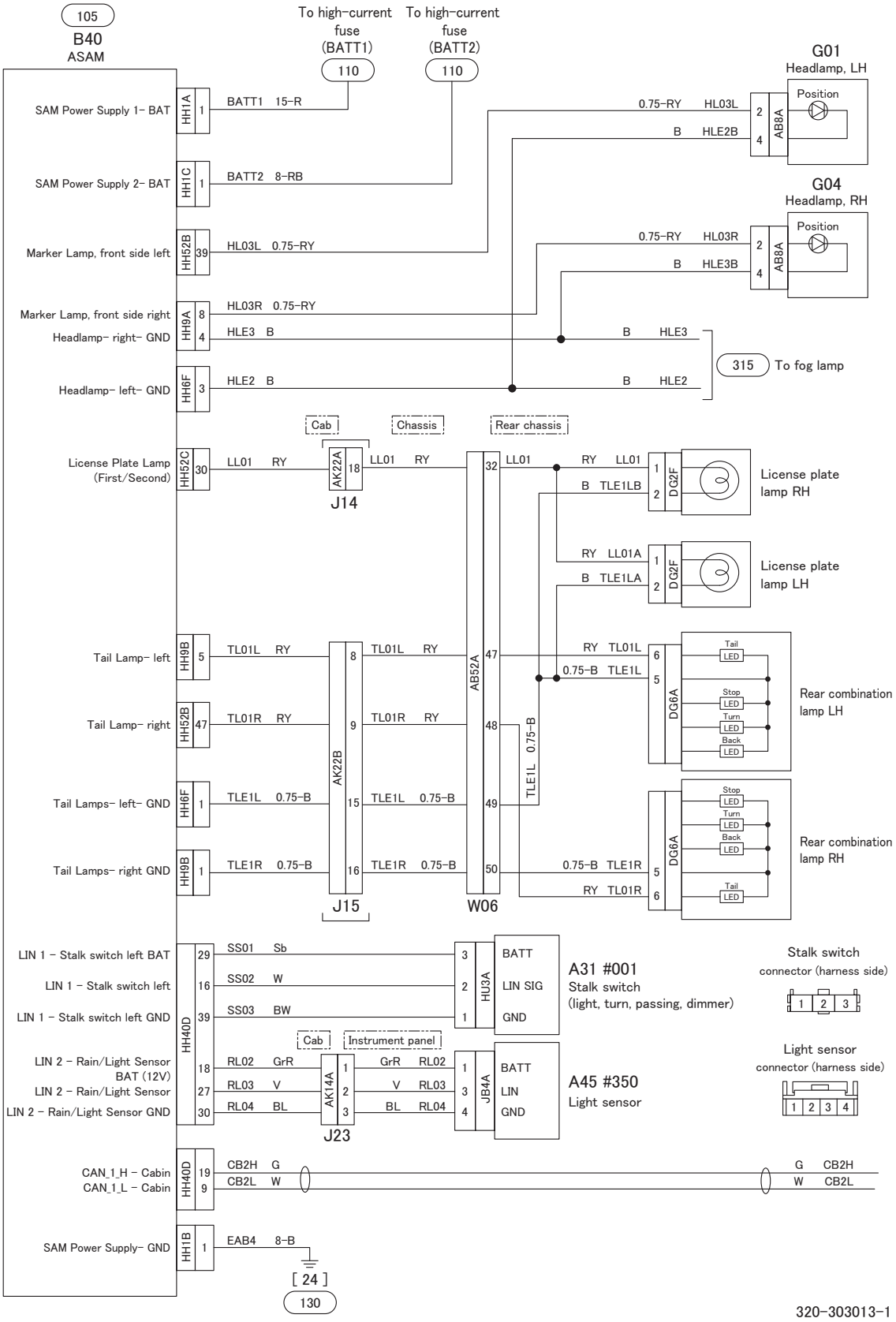
FOG LAMP CIRCUIT



315-616323

TAIL, POSITION AND LICENSE PLATE LAMPS CIRCUIT (1)

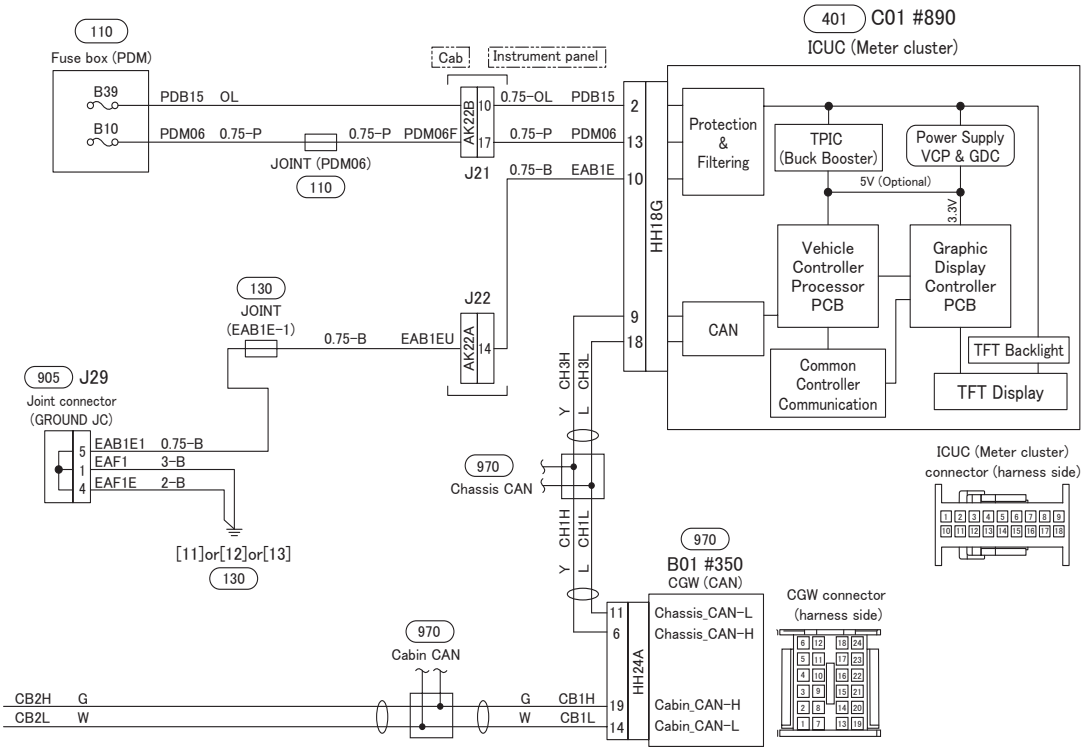
(1/2)



TAIL, POSITION AND LICENSE PLATE LAMPS CIRCUIT (2)

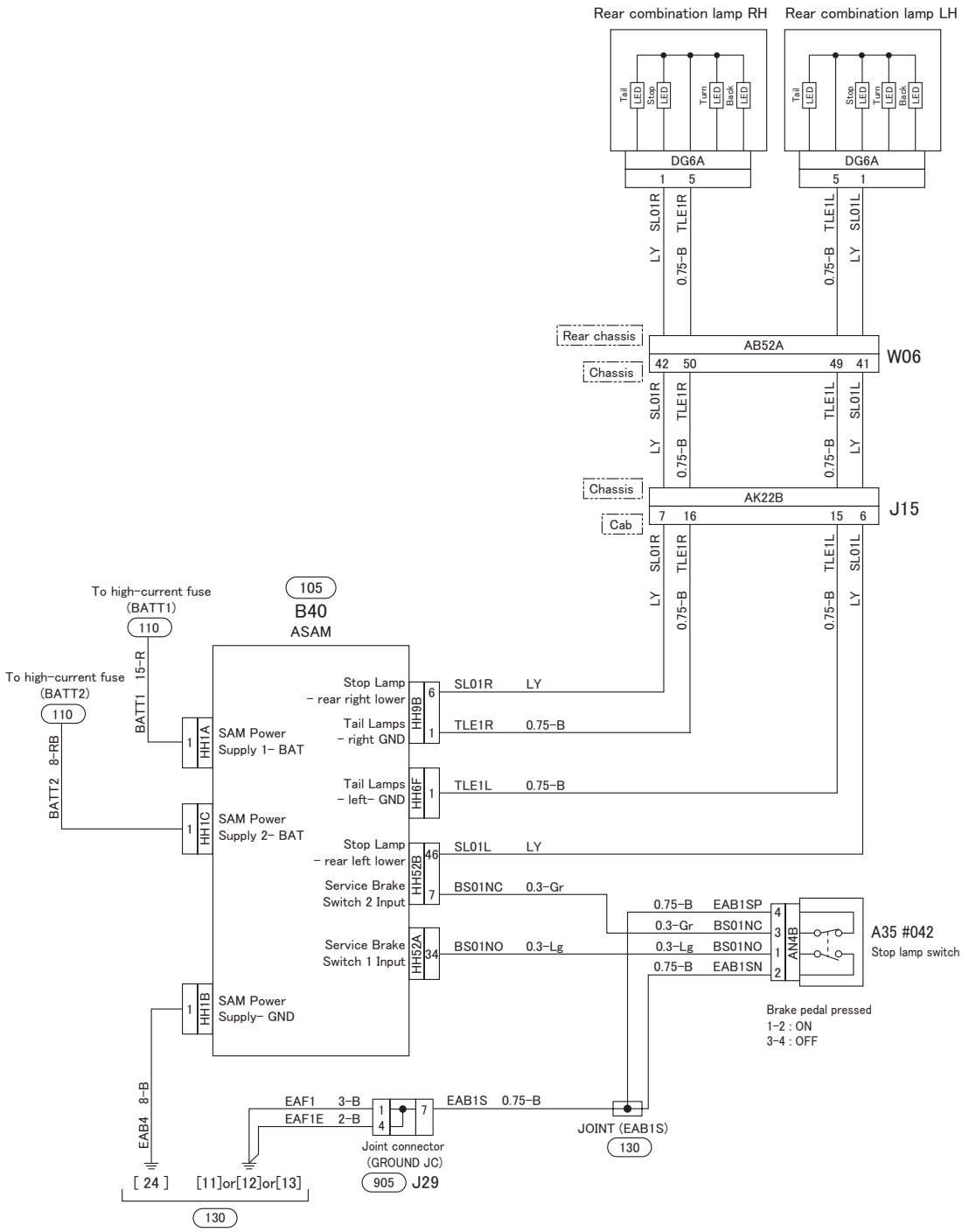
(2/2)

CAN : Controller area network
LIN : Local interconnect network



320-616323-2

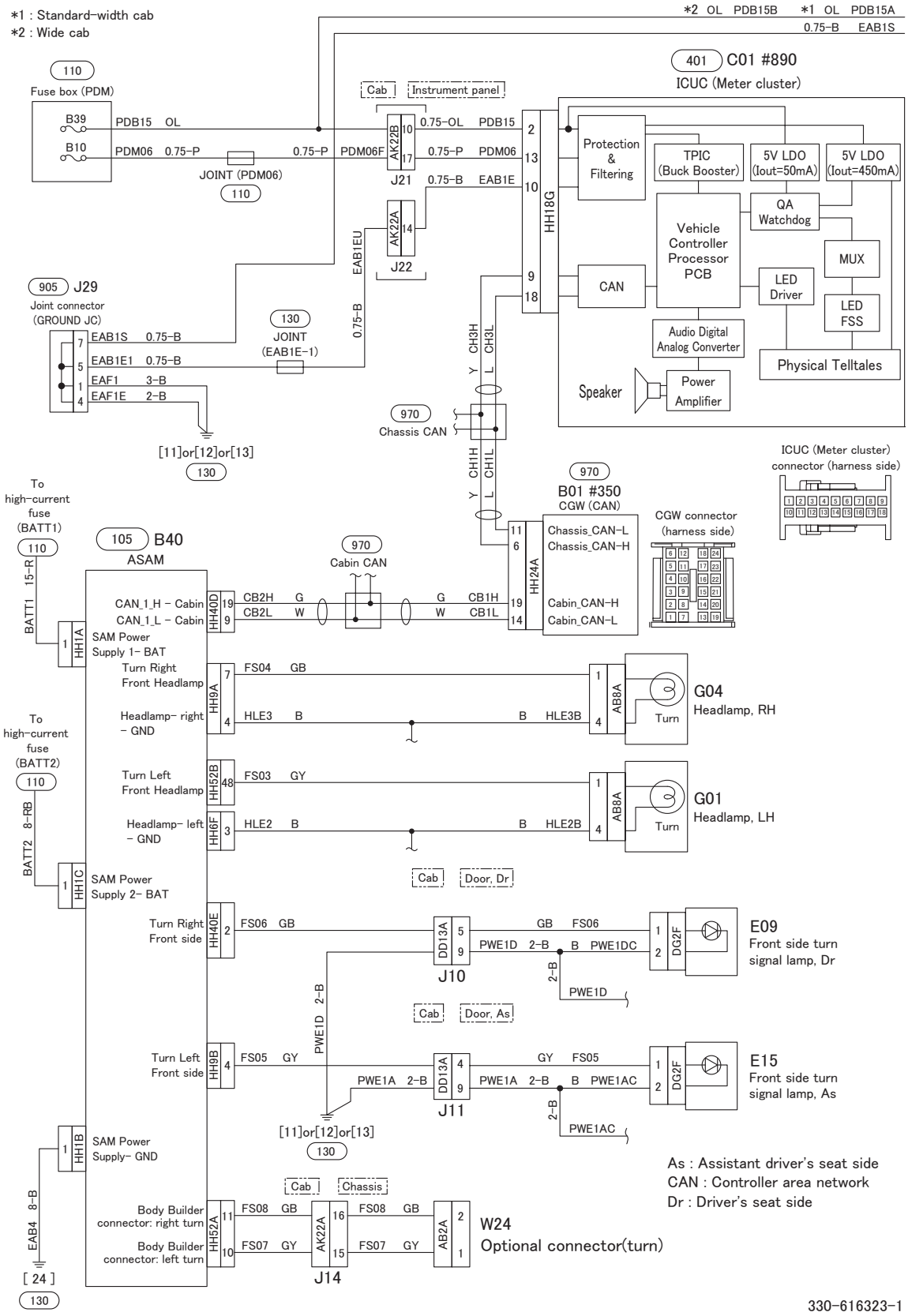
STOP LAMP CIRCUIT



325-303013

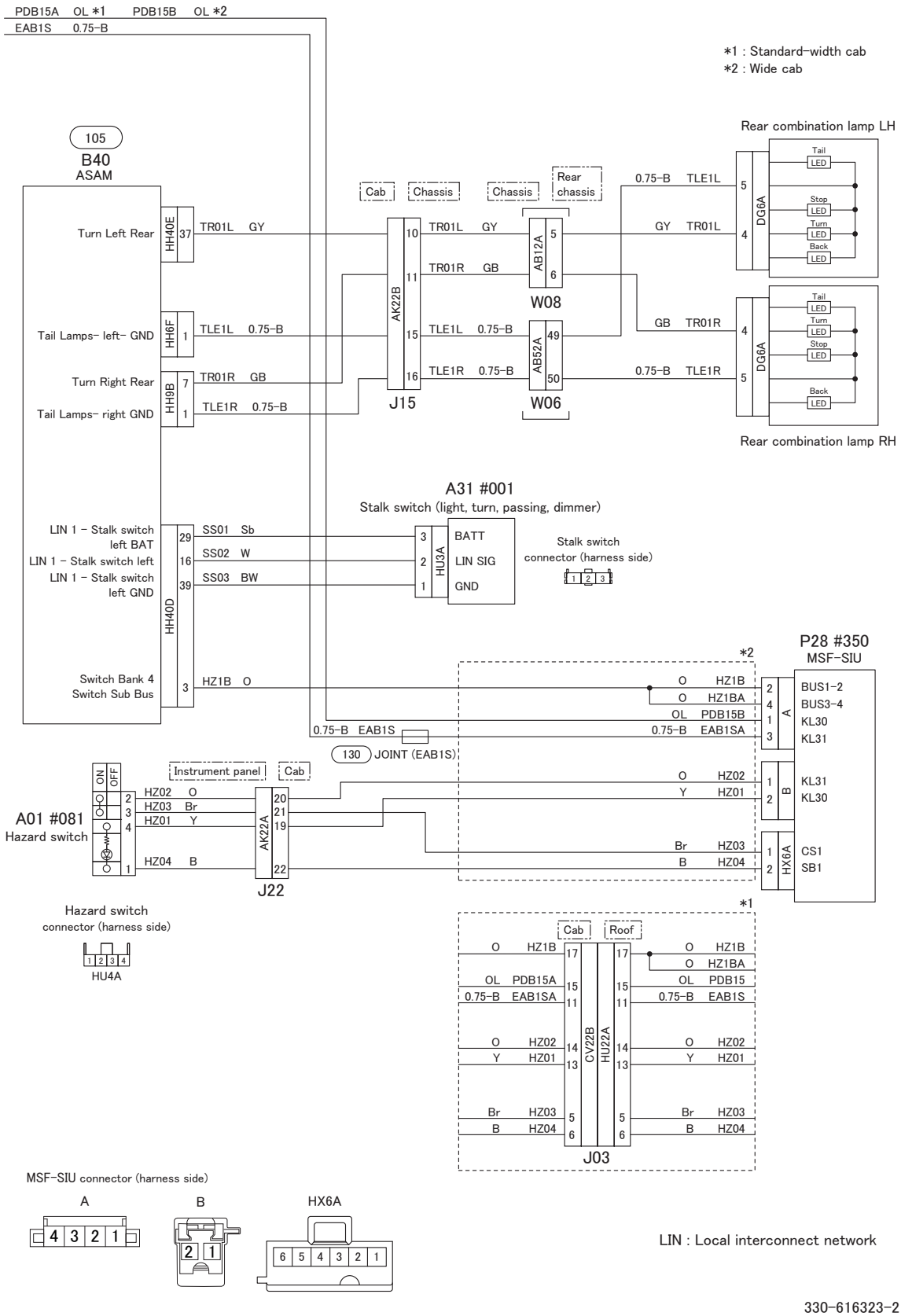
TURN SIGNAL AND HAZARD WARNING LAMP CIRCUIT (1)

(1/2)

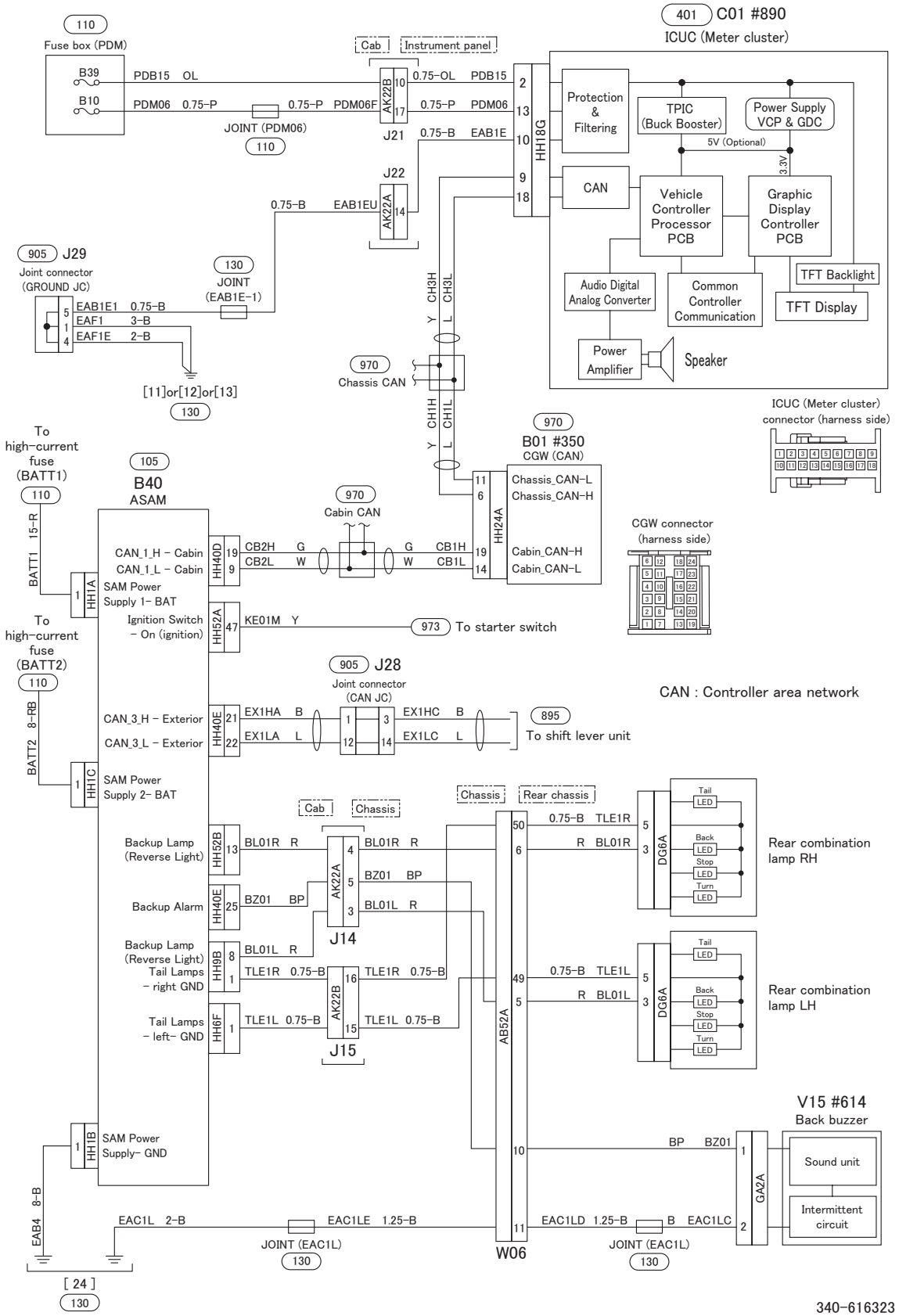


TURN SIGNAL AND HAZARD WARNING LAMP CIRCUIT (2)

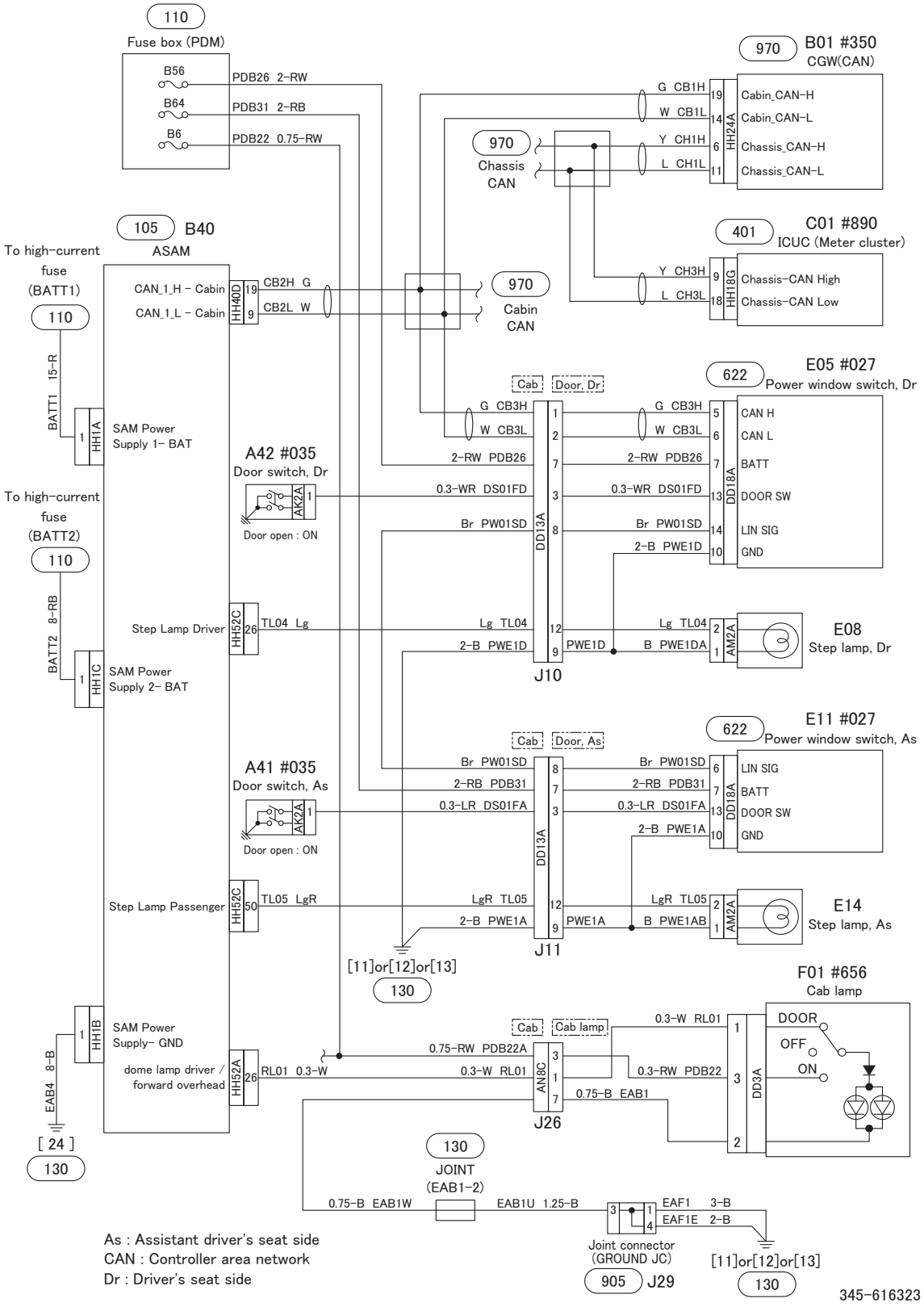
(2/2)



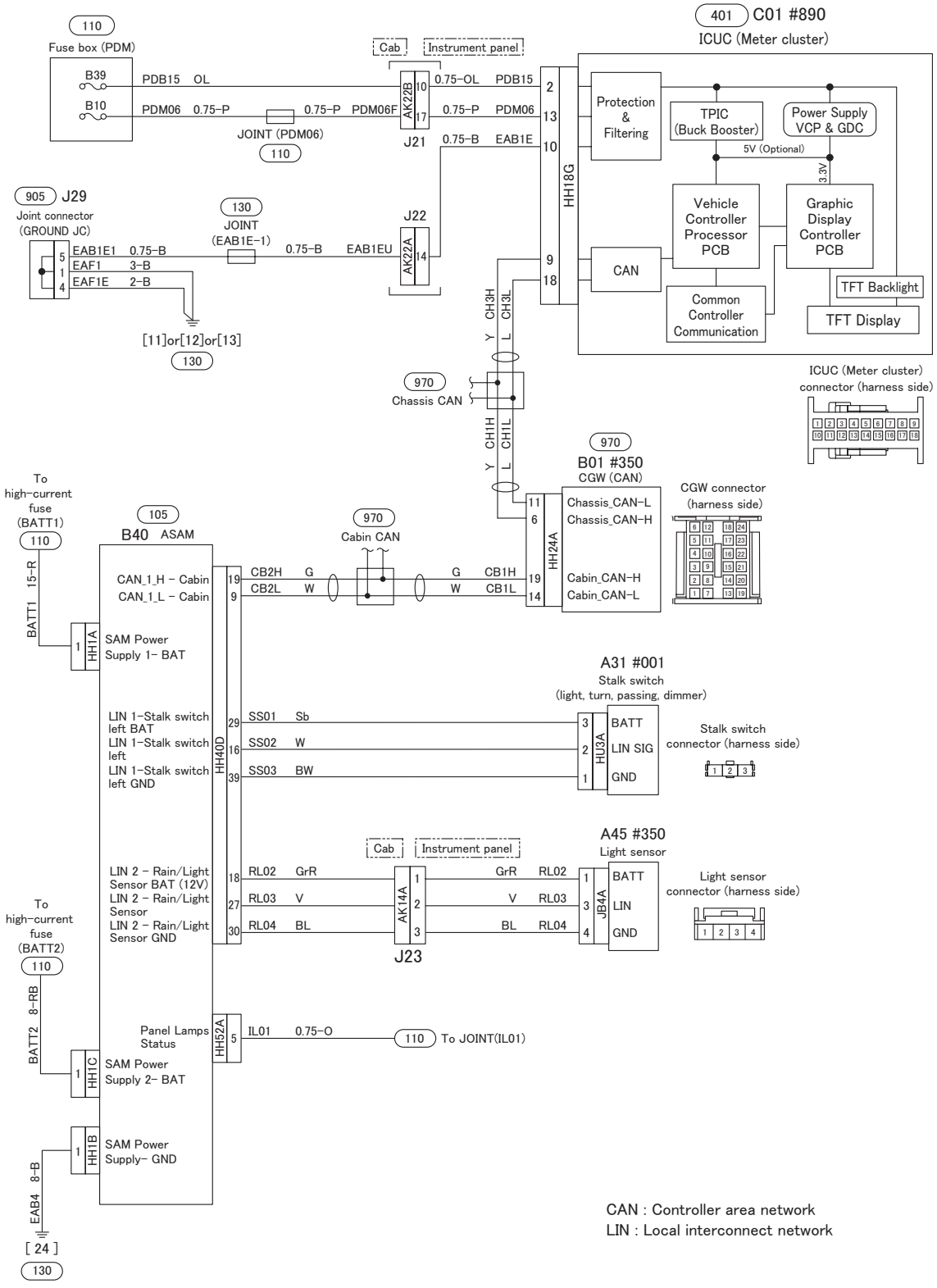
BACKUP LAMP CIRCUIT



CAB LAMP CIRCUIT

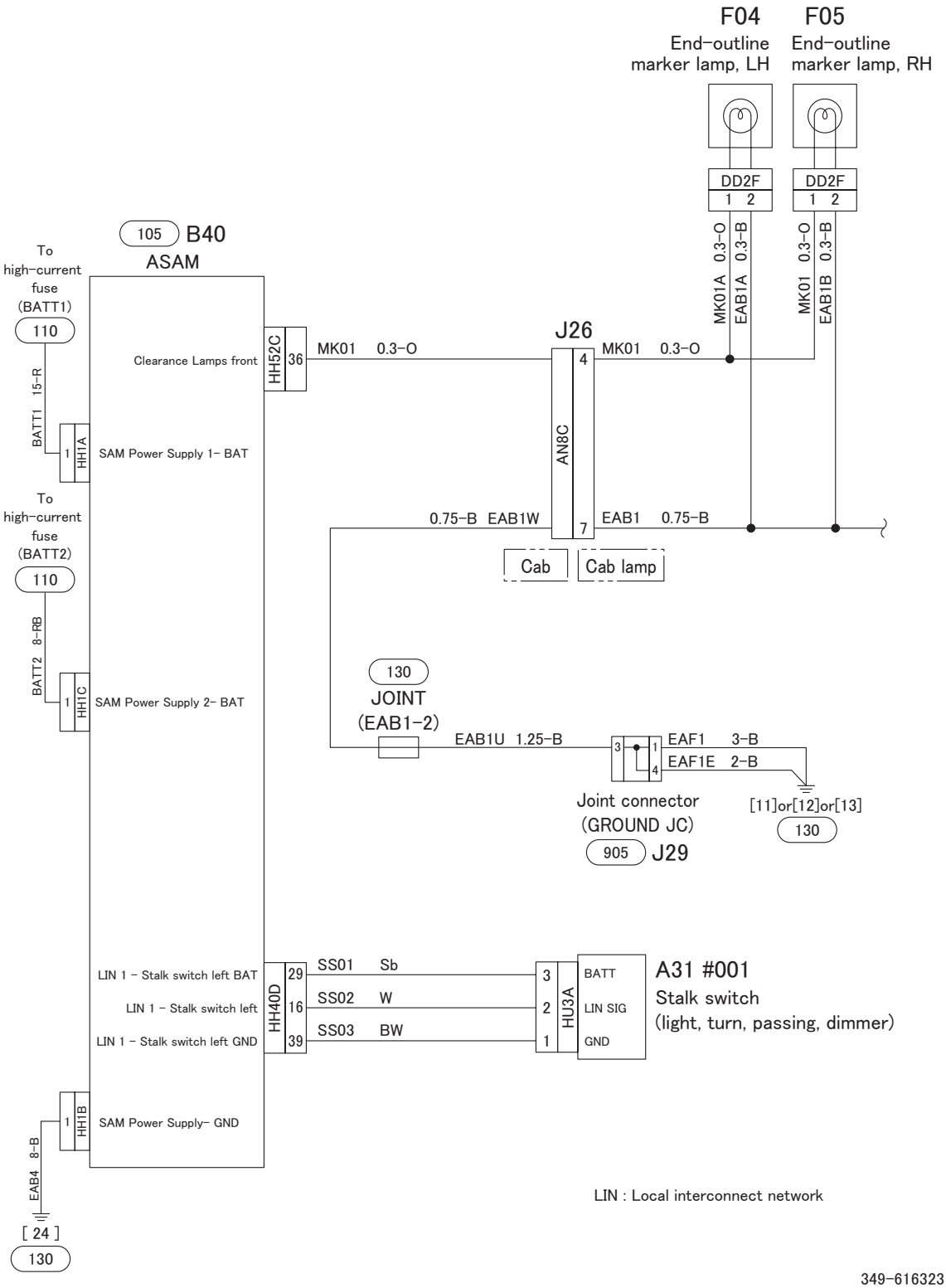


ILLUMINATION LAMP CIRCUIT

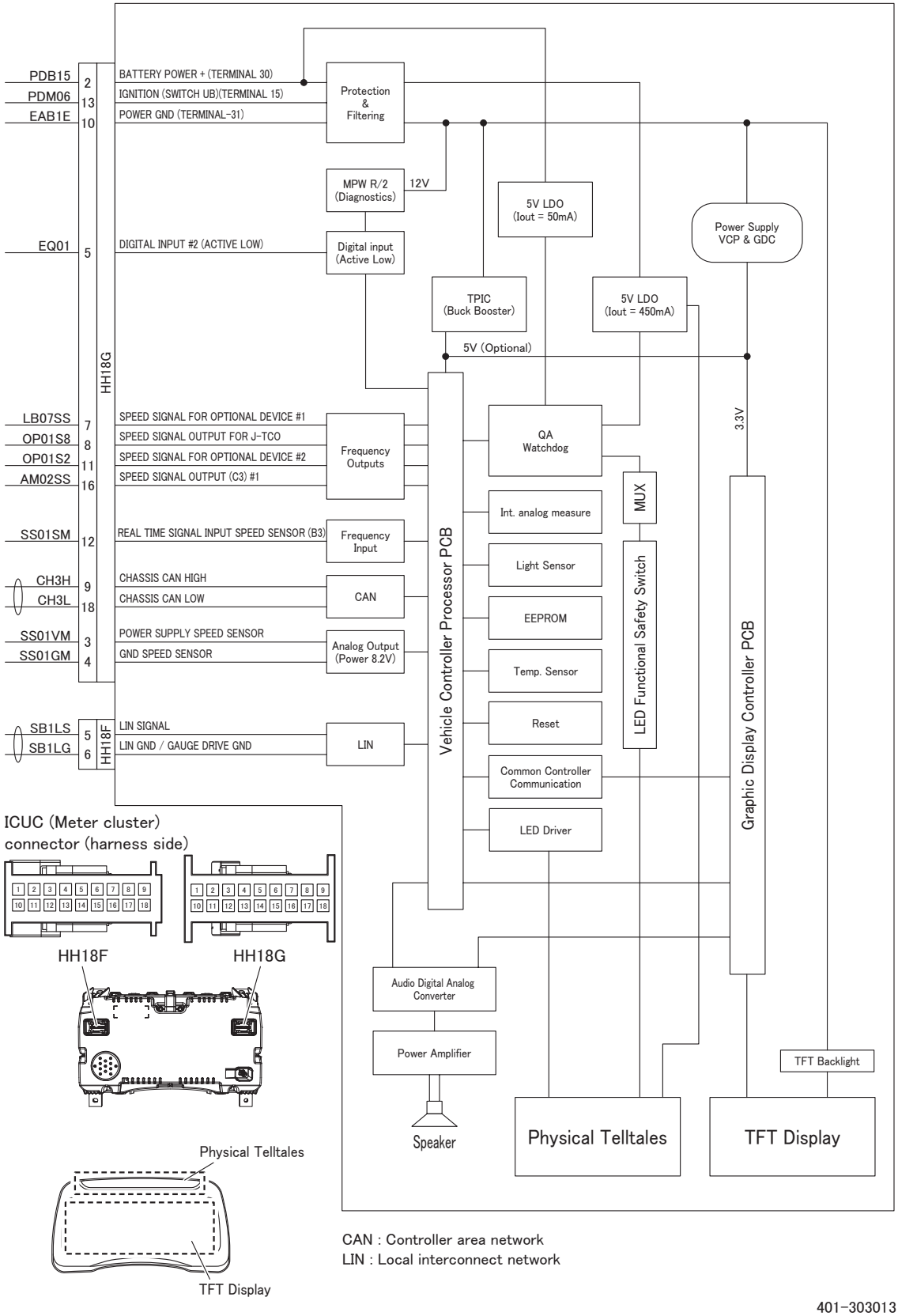


348-616323

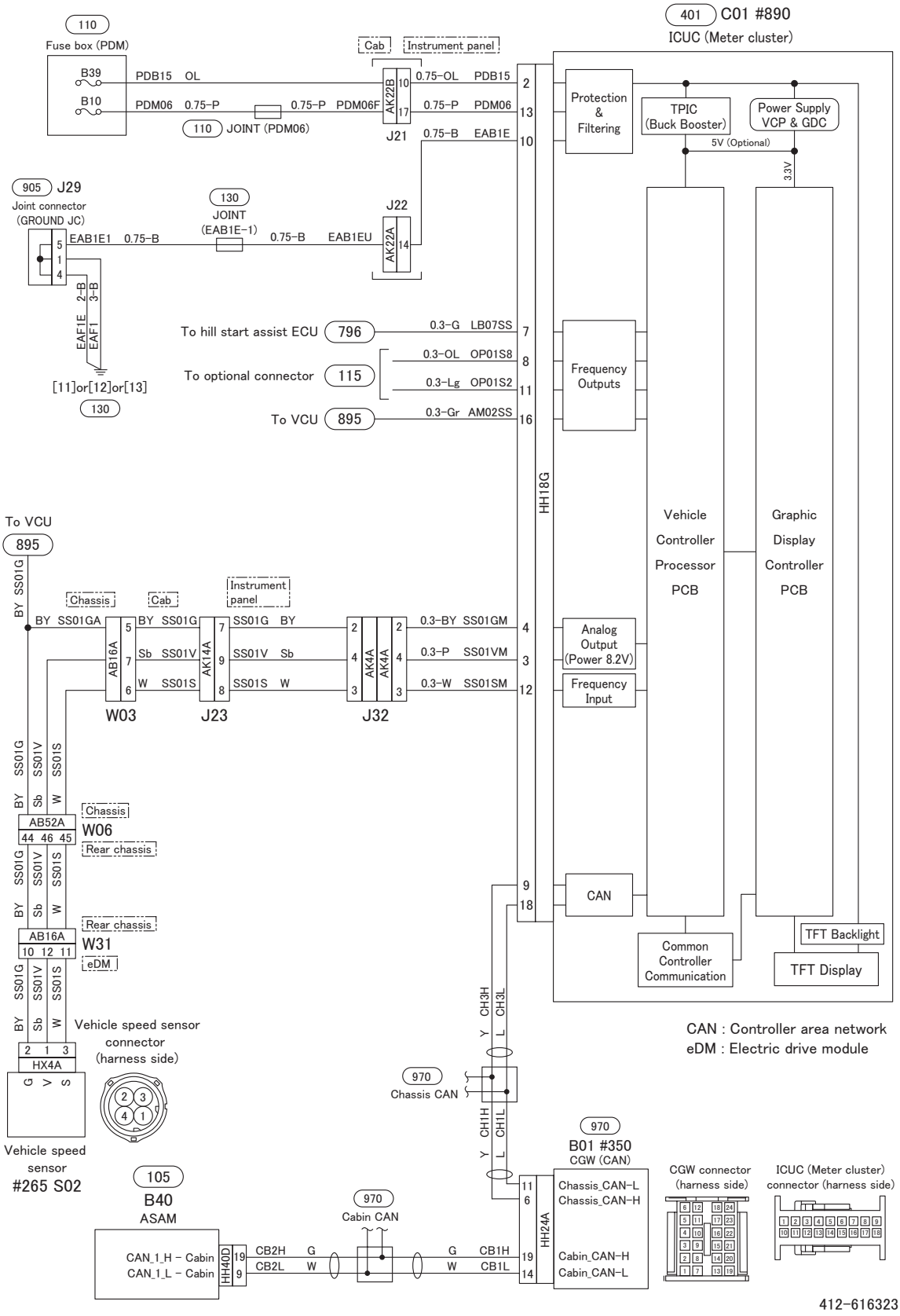
END-OUTLINE MARKER LAMP CIRCUIT LAMP CIRCUIT



METER CLUSTER INTERNAL CIRCUIT

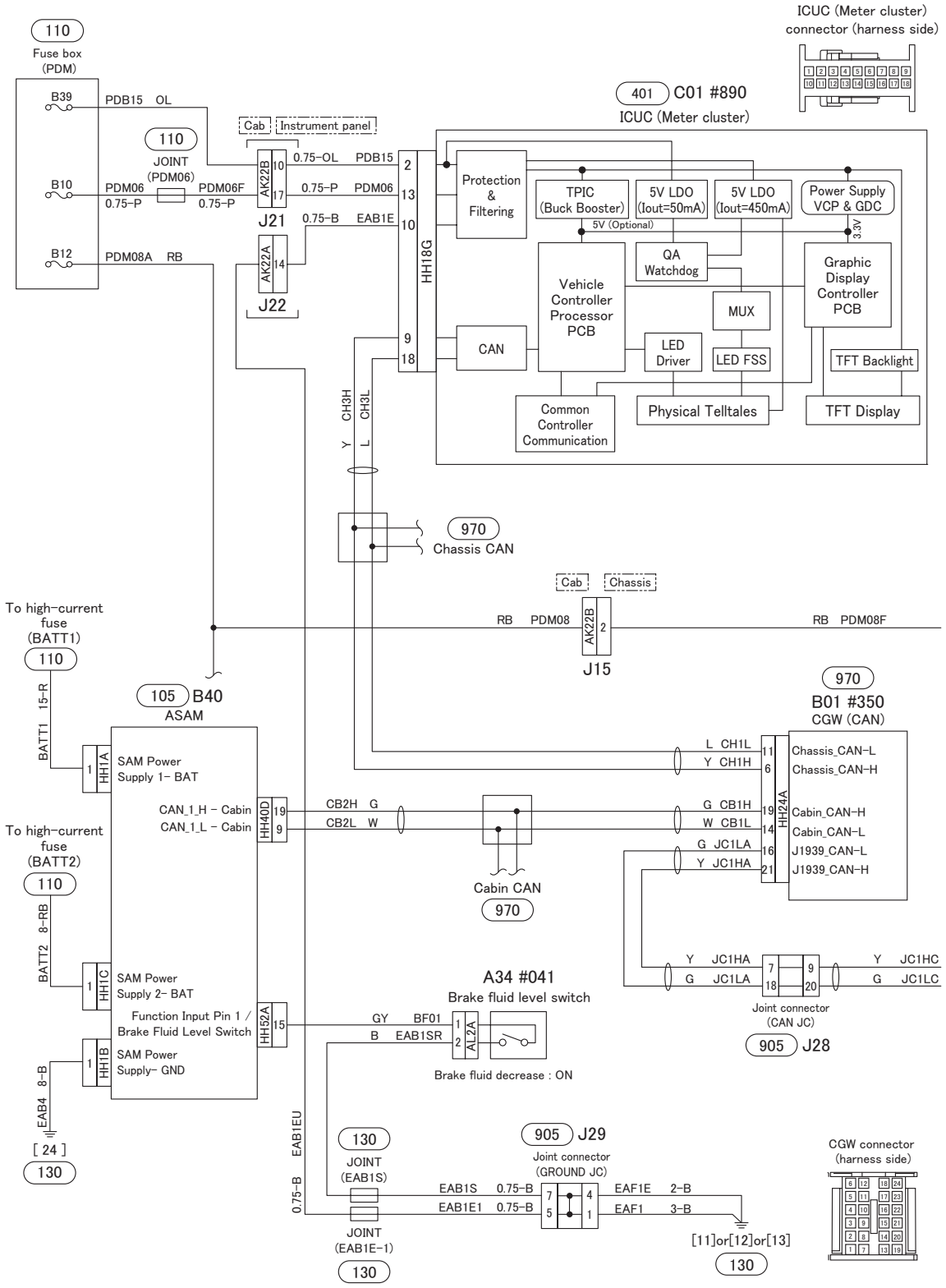


SPEEDOMETER CIRCUIT



BRAKE WARNING CIRCUIT (1)

(1/2)

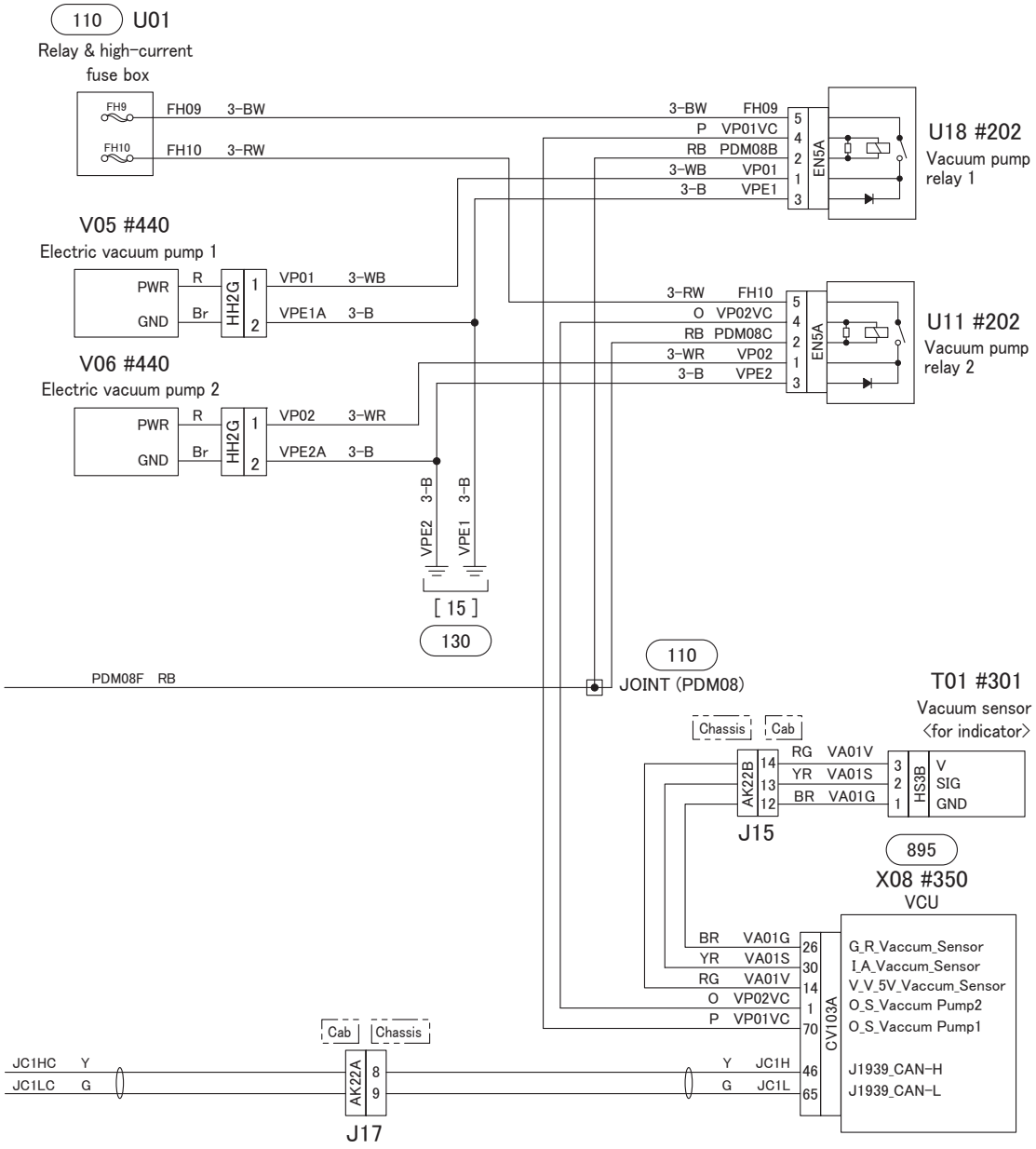


CAN : Controller area network

515-616323-1

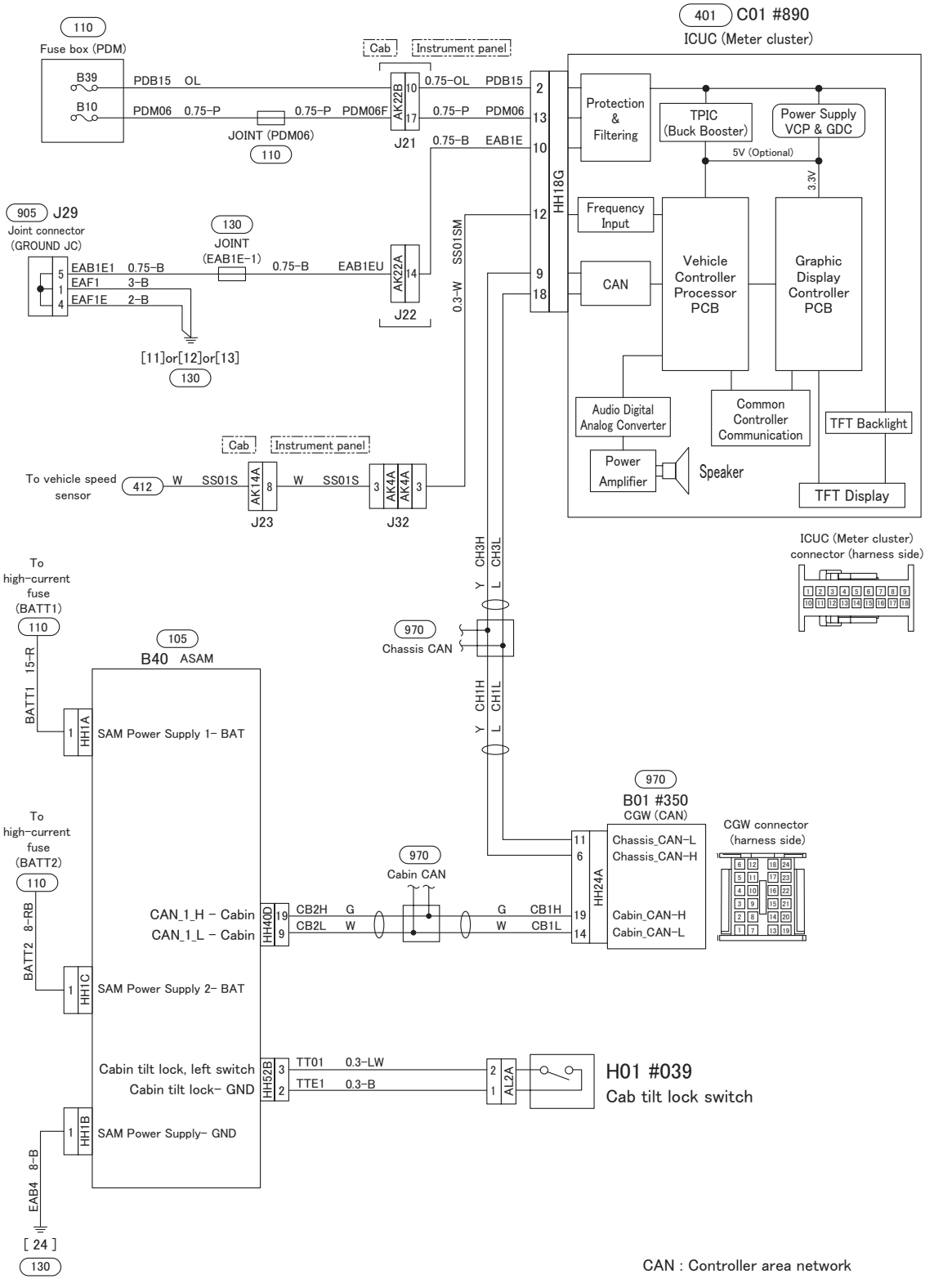
BRAKE WARNING CIRCUIT (2)

(2/2)

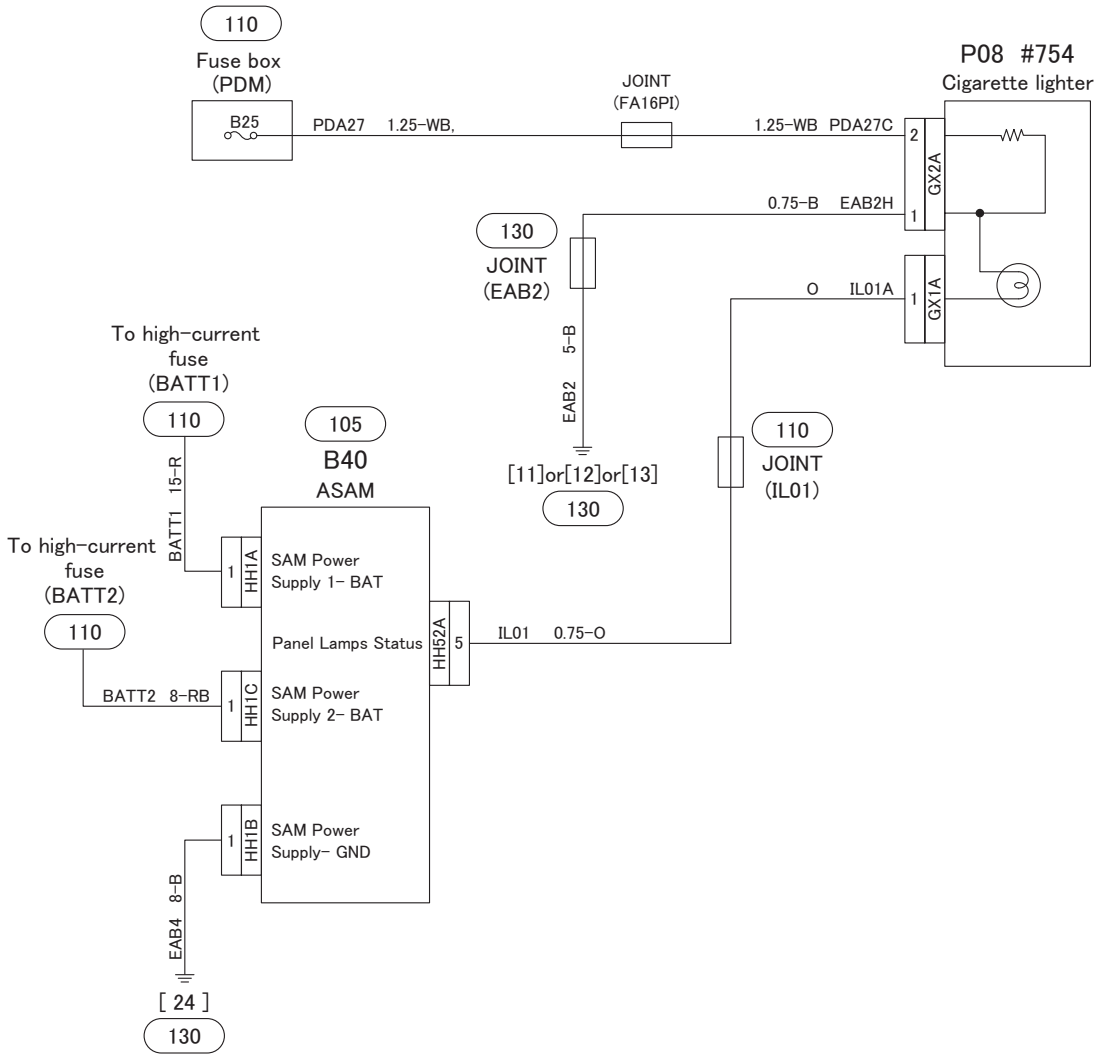


515-616323-2

CAB TILT WARNING CIRCUIT



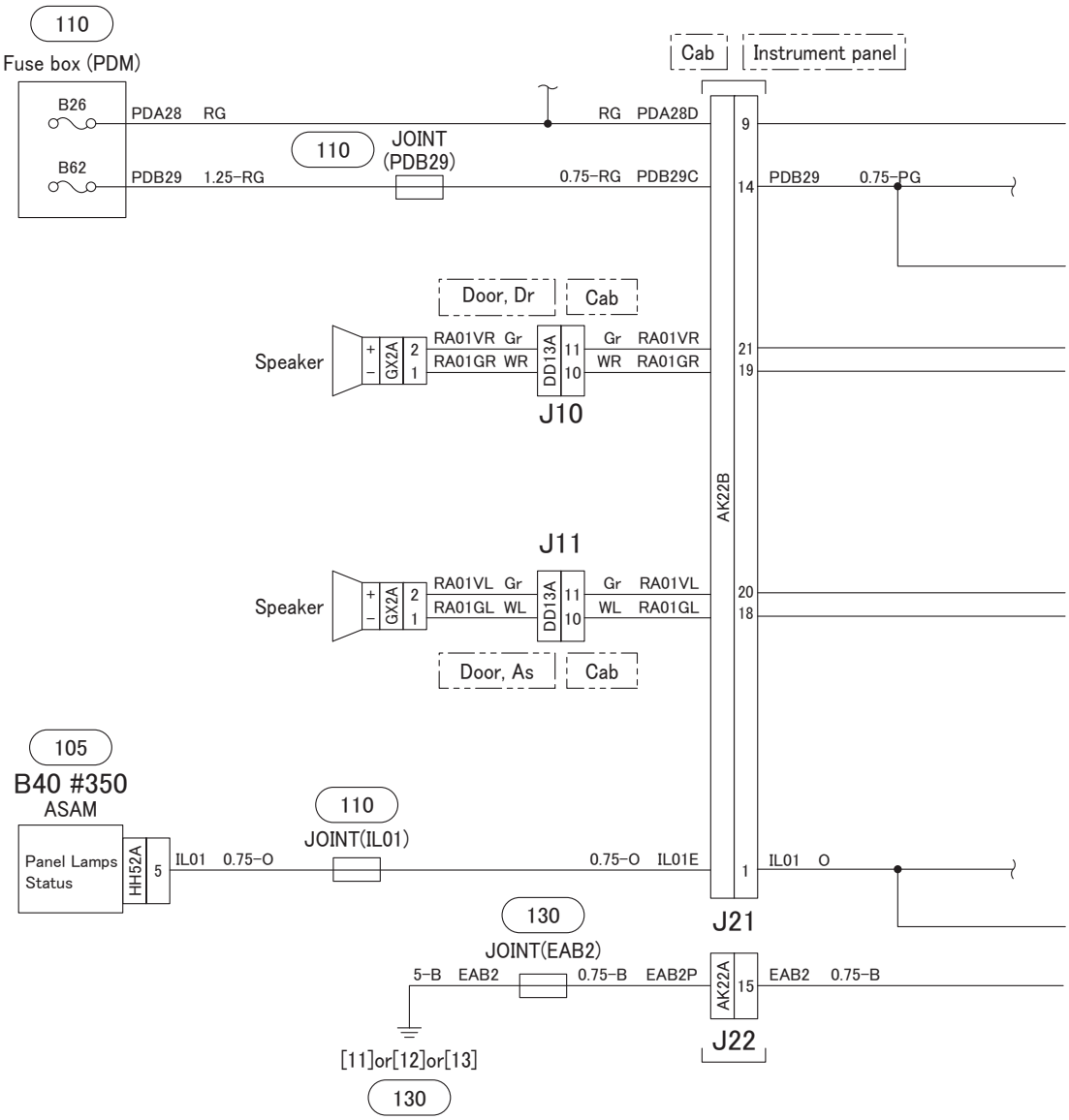
CIGARETTE LIGHTER CIRCUIT



610-616323

AUDIO CIRCUIT (1)

<Opt> (1/2)

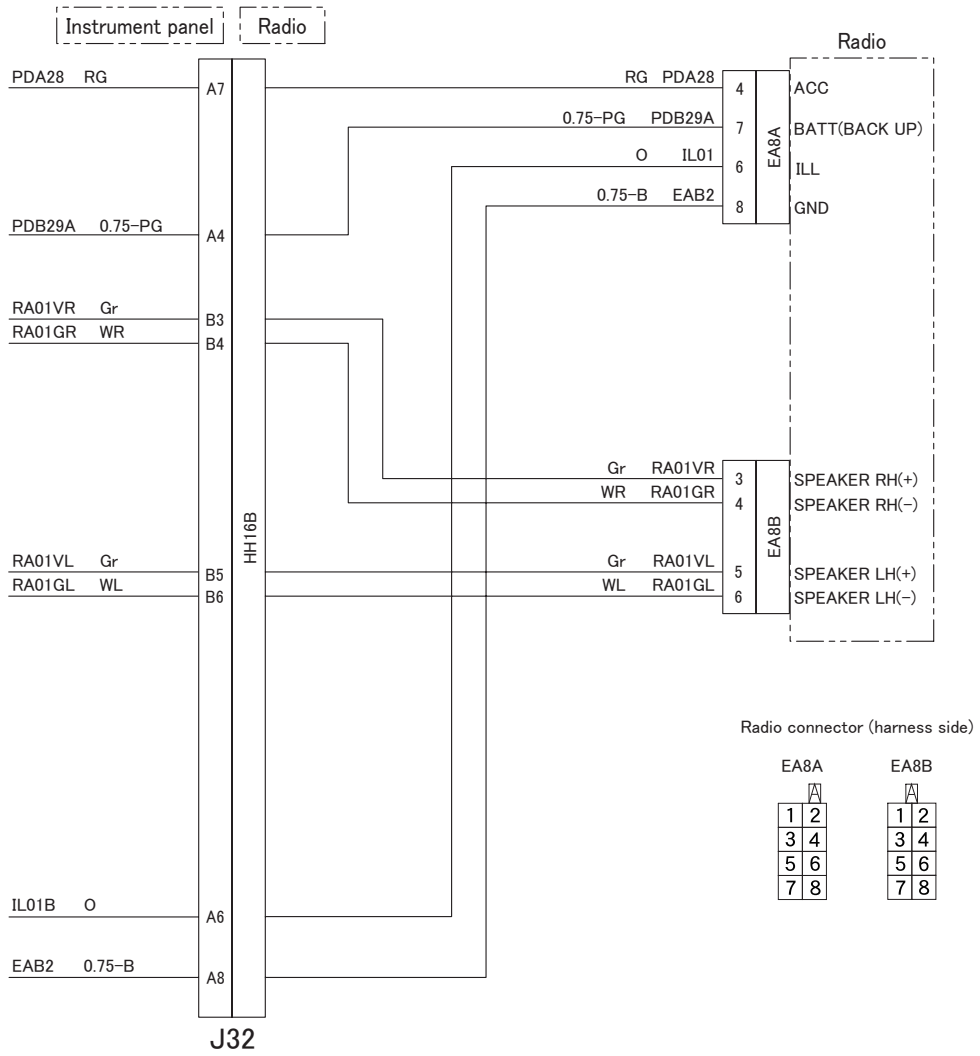


As : Assistant driver's seat side
Dr : Driver's seat side

612-616323R-1

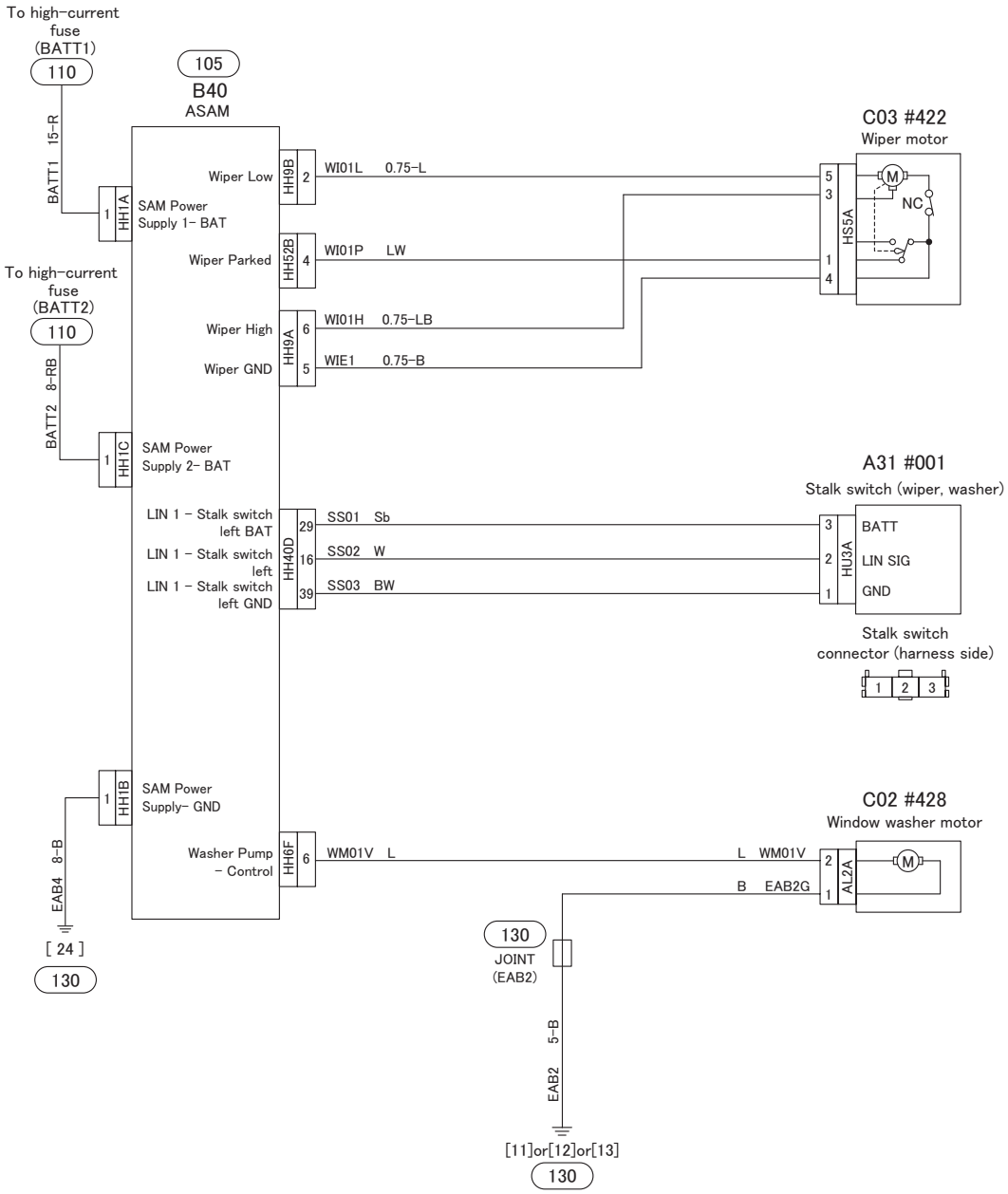
AUDIO CIRCUIT (2)

(2/2)



612-616323R-2

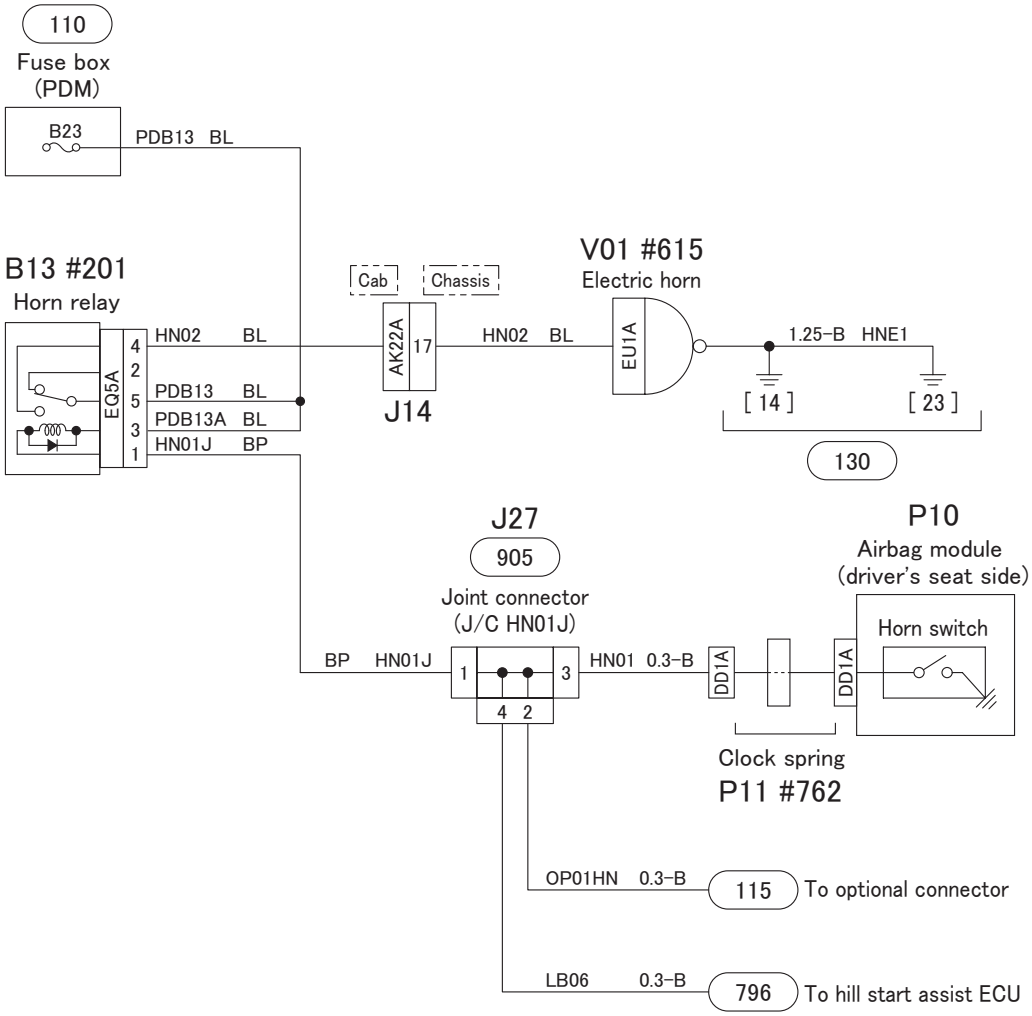
WIPER AND WASHER CIRCUIT



LIN : Local interconnect network

614-616323

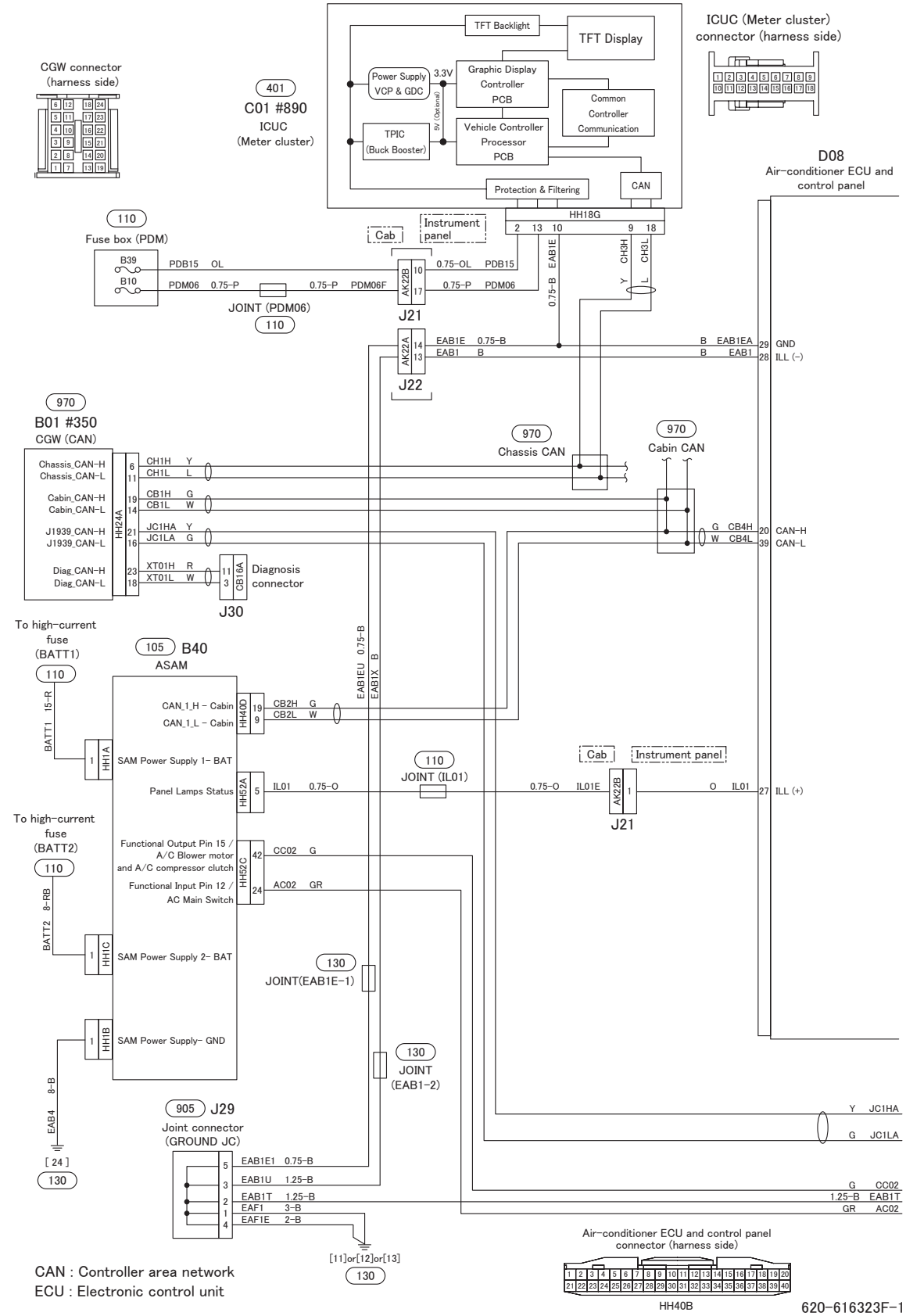
HORN CIRCUIT



616-303013

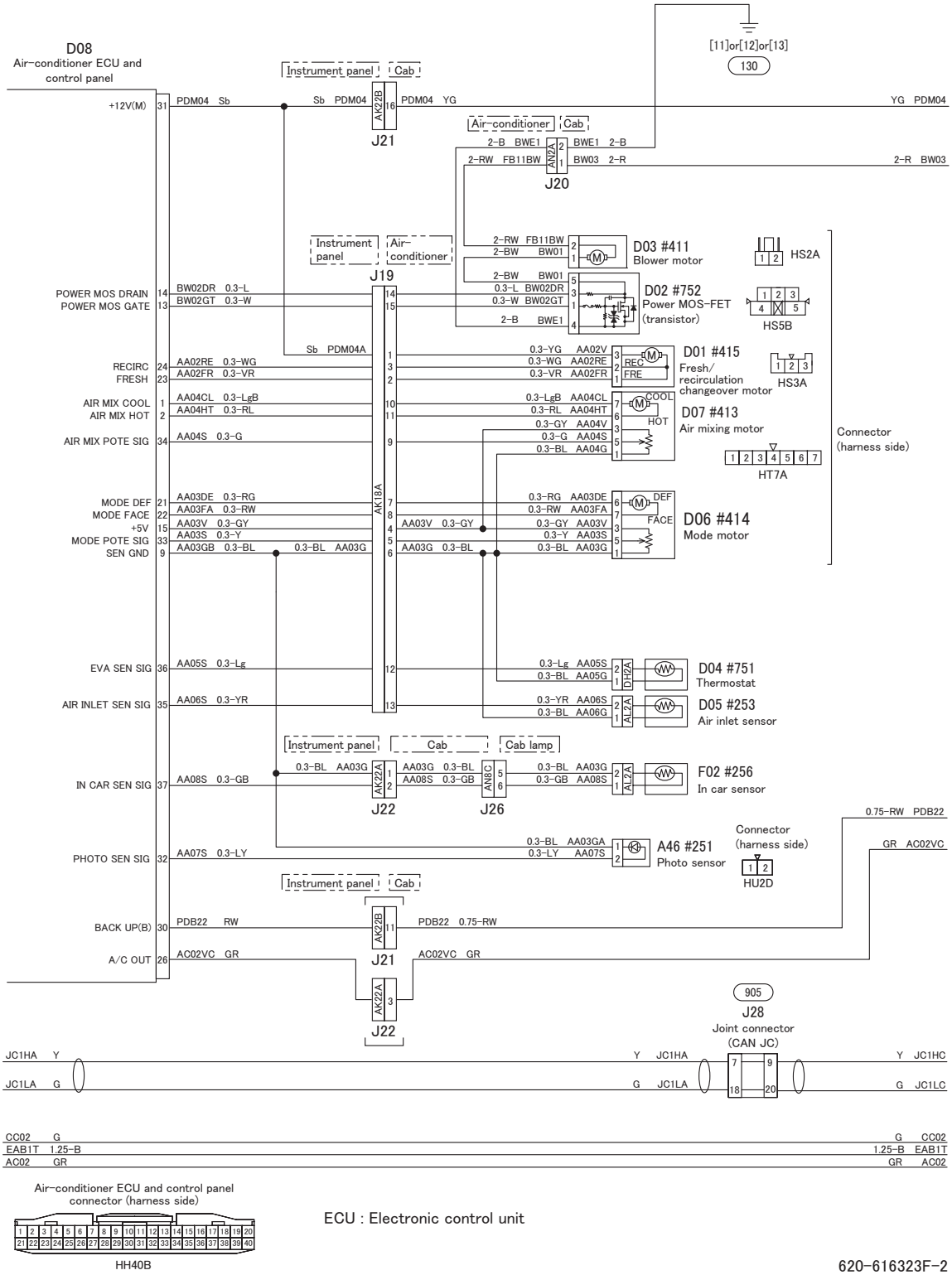
AIR-CONDITIONER CIRCUIT (1)

(1/8)



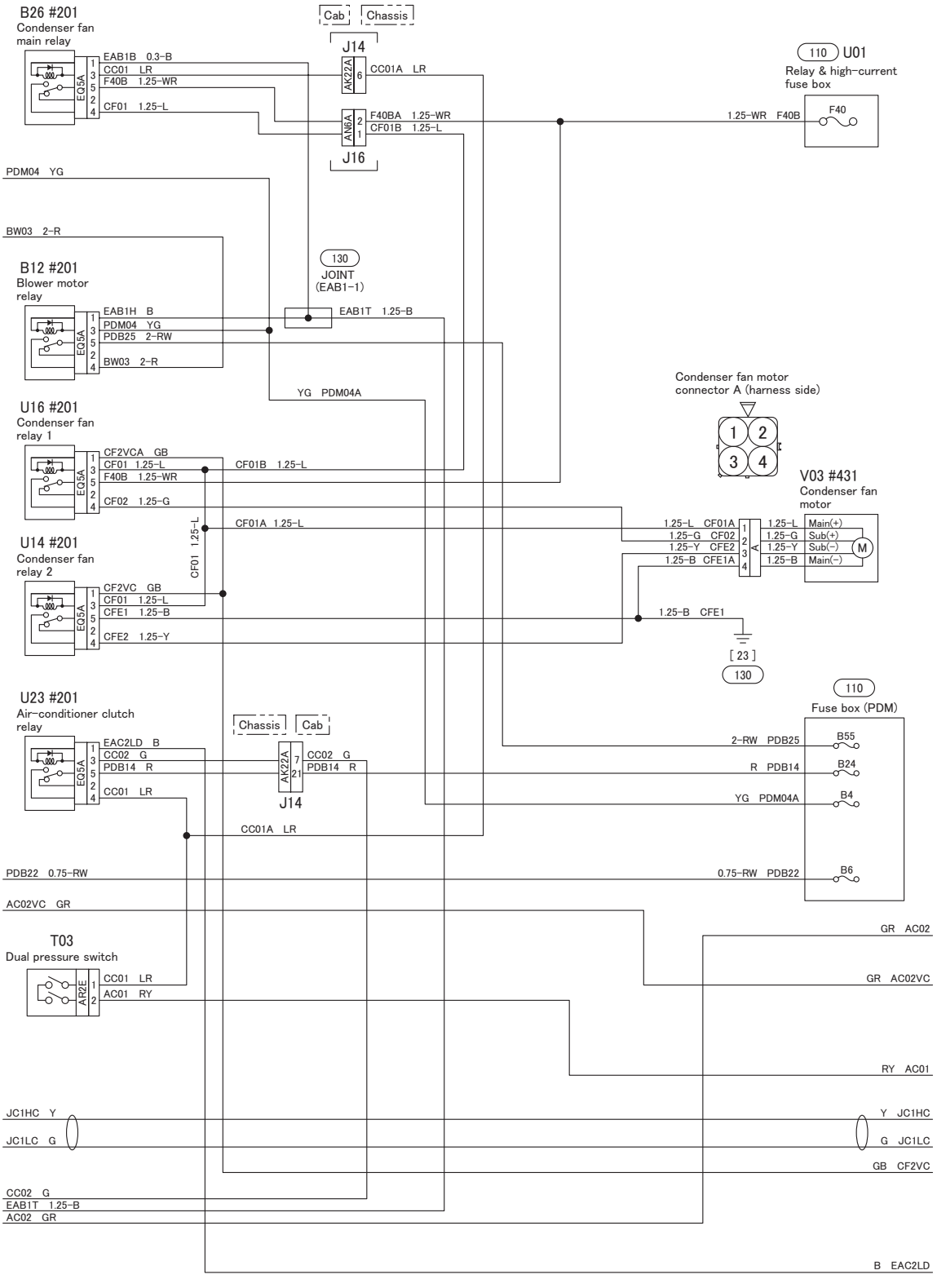
AIR-CONDITIONER CIRCUIT (2)

(2/8)



AIR-CONDITIONER CIRCUIT (3)

(3/8)

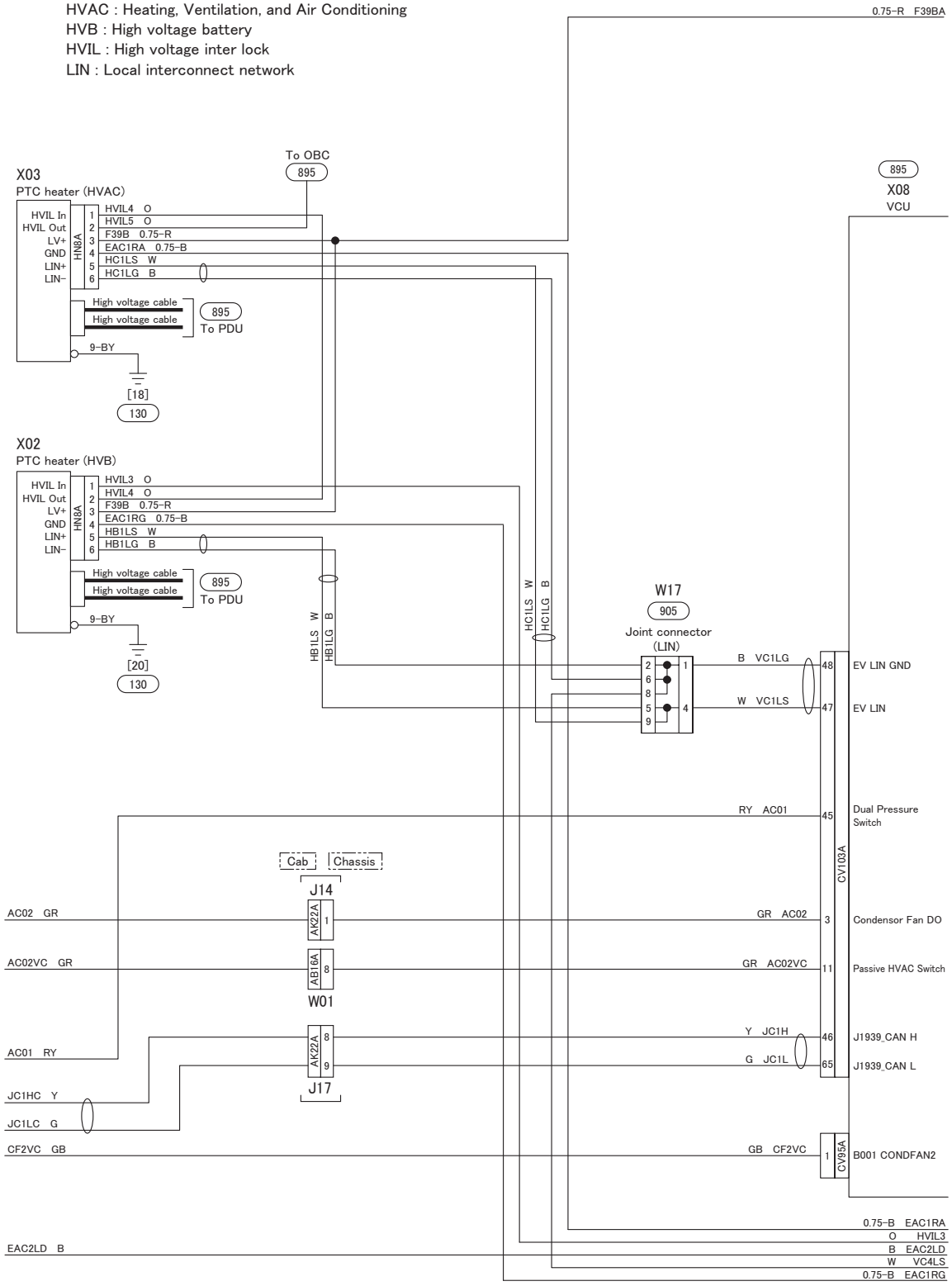


620-616323F-3

AIR-CONDITIONER CIRCUIT (4)

(4/8)

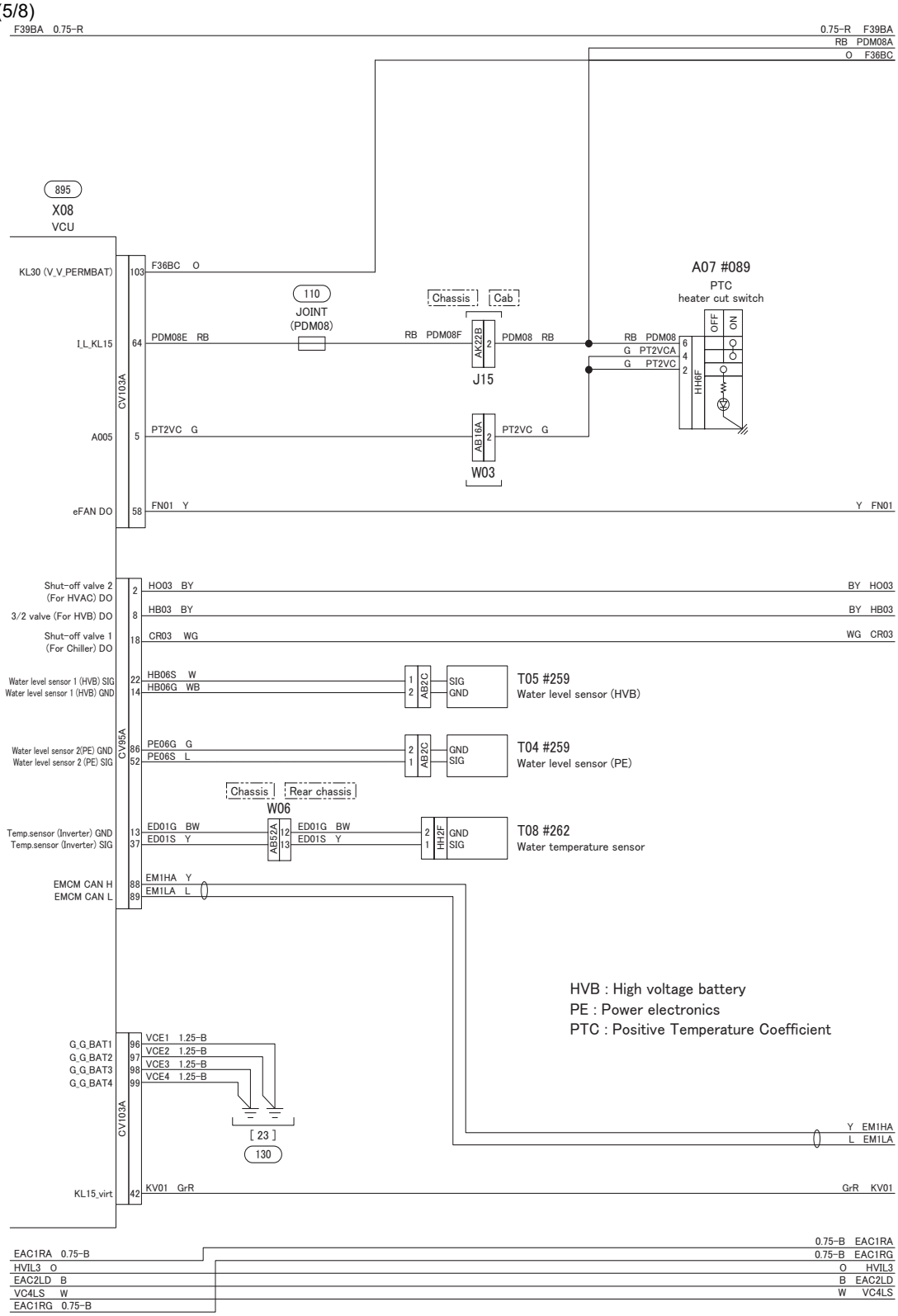
HVAC : Heating, Ventilation, and Air Conditioning
HVB : High voltage battery
HVIL : High voltage inter lock
LIN : Local interconnect network



620-616323F-4

AIR-CONDITIONER CIRCUIT (5)

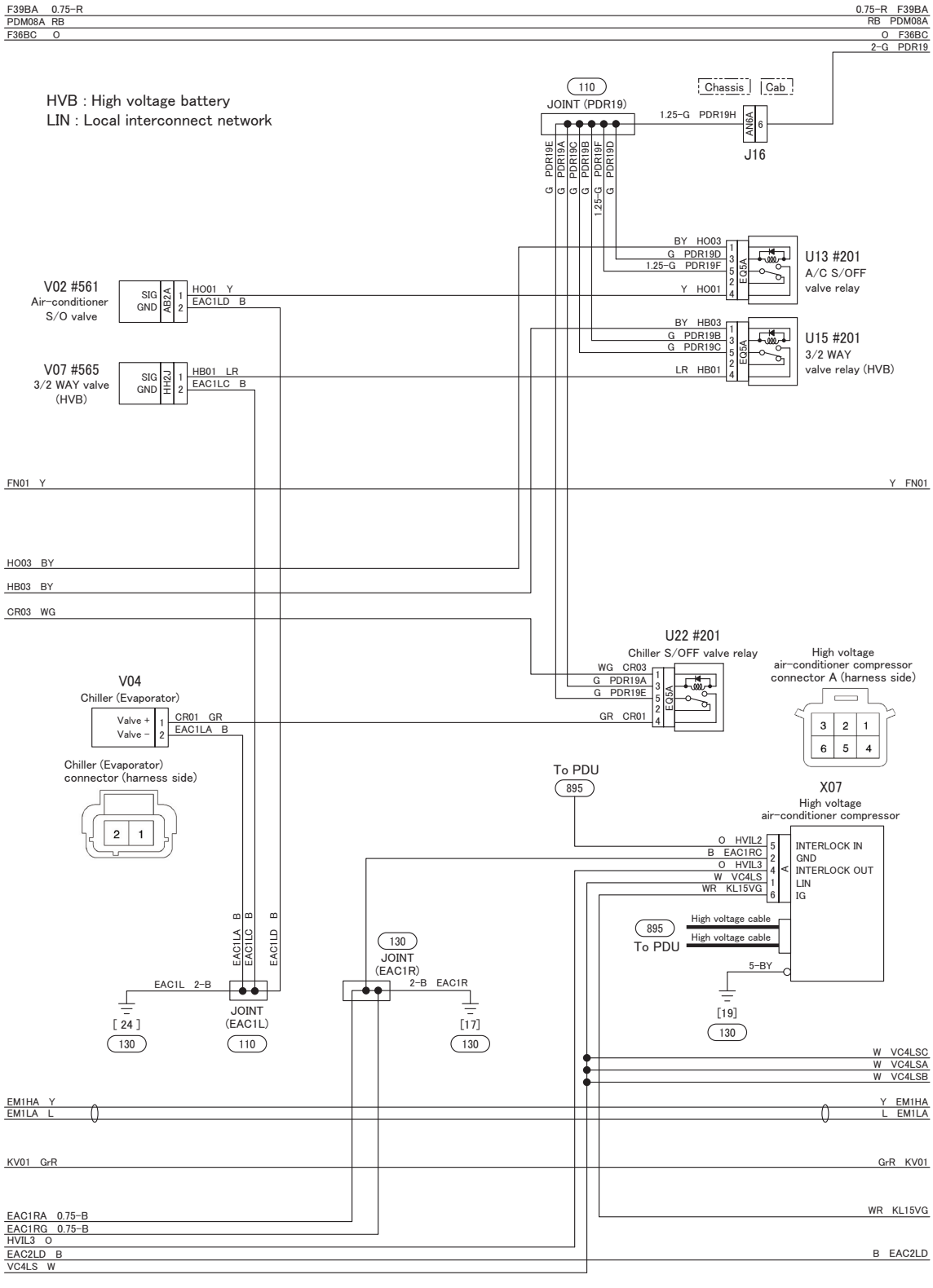
(5/8)



620-616323F-5

AIR-CONDITIONER CIRCUIT (6)

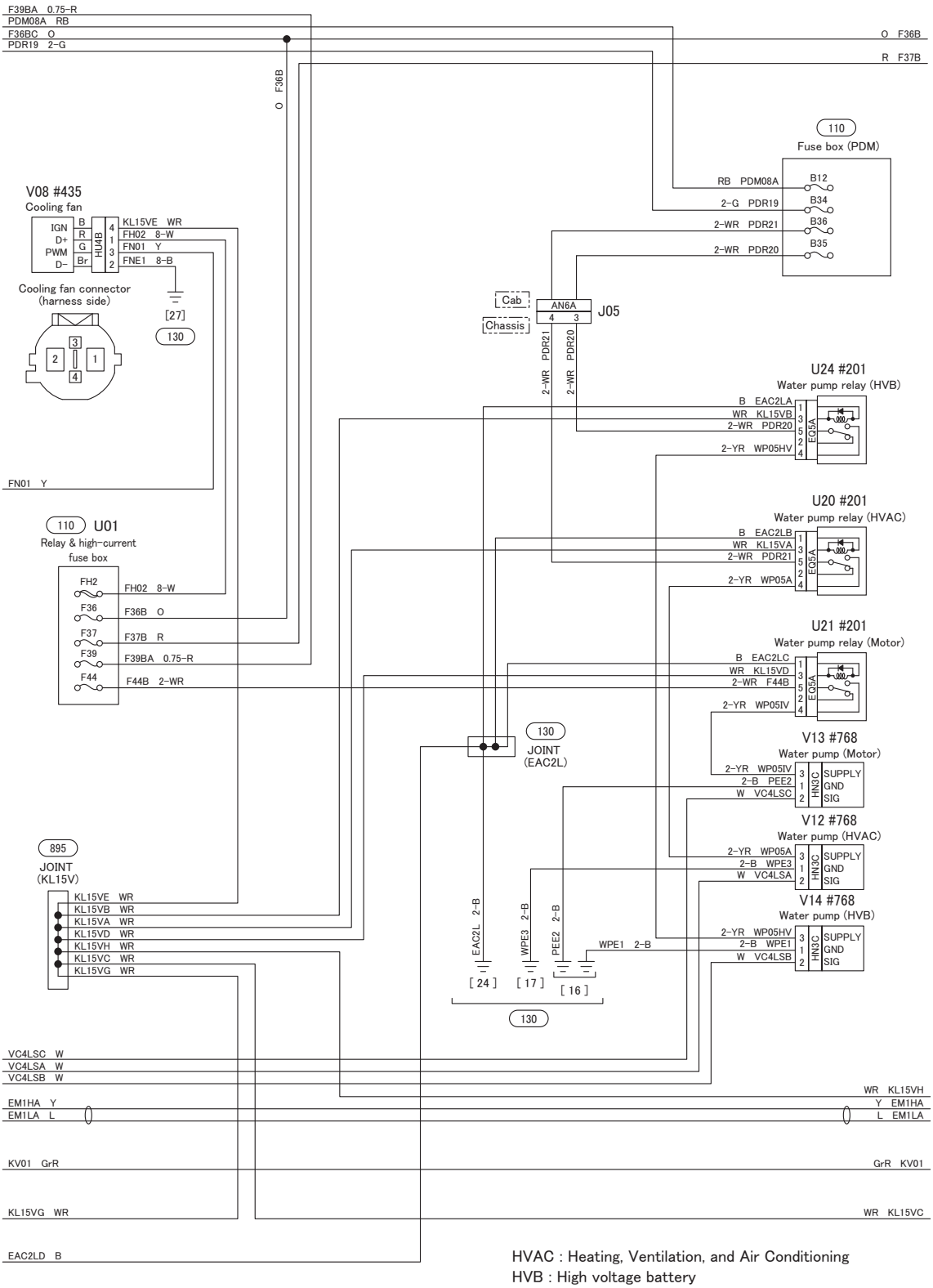
(6/8)



620-616323F-6

AIR-CONDITIONER CIRCUIT (7)

(7/8)

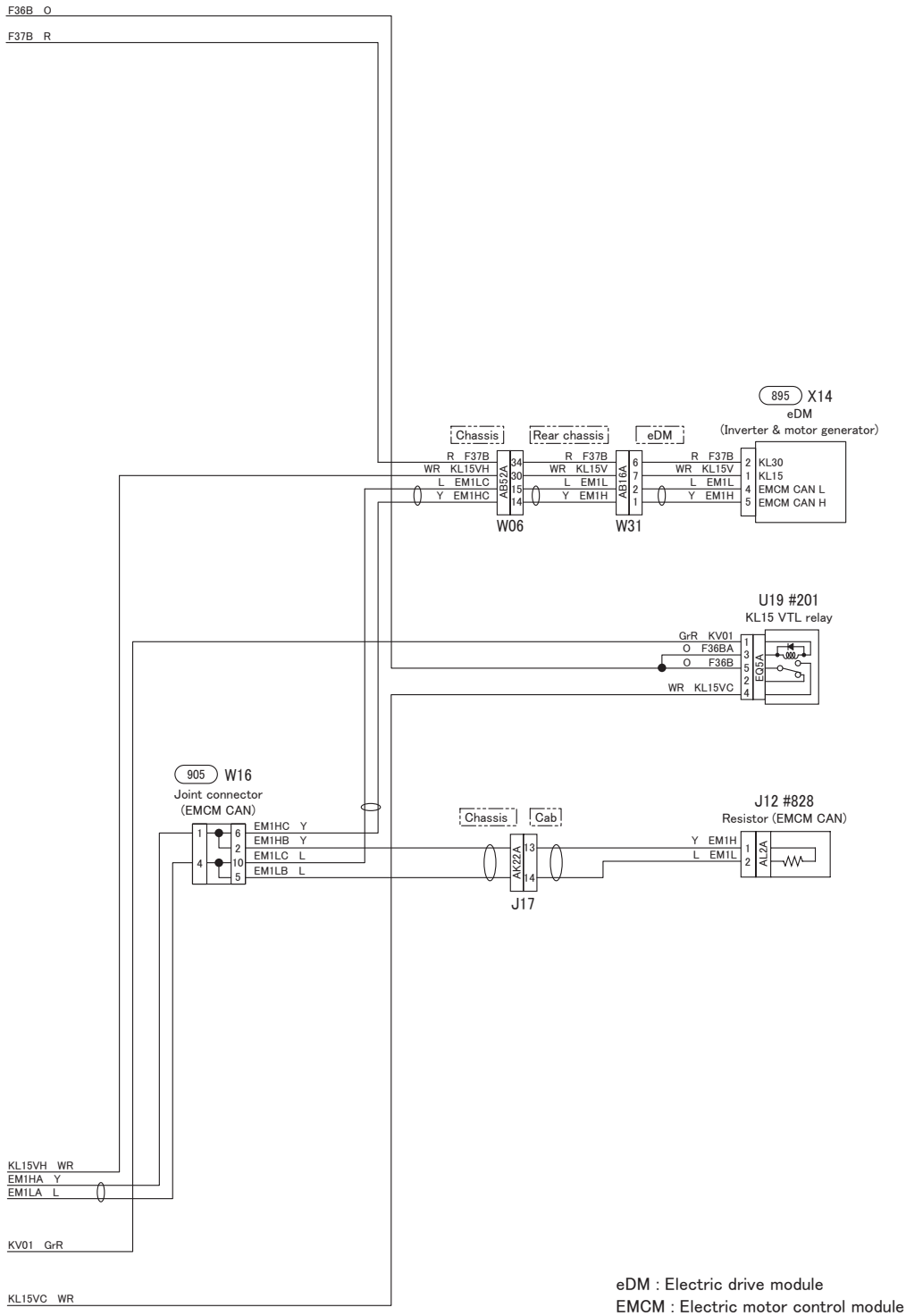


HVAC : Heating, Ventilation, and Air Conditioning
HVB : High voltage battery

620-303013F-7

AIR-CONDITIONER CIRCUIT (8)

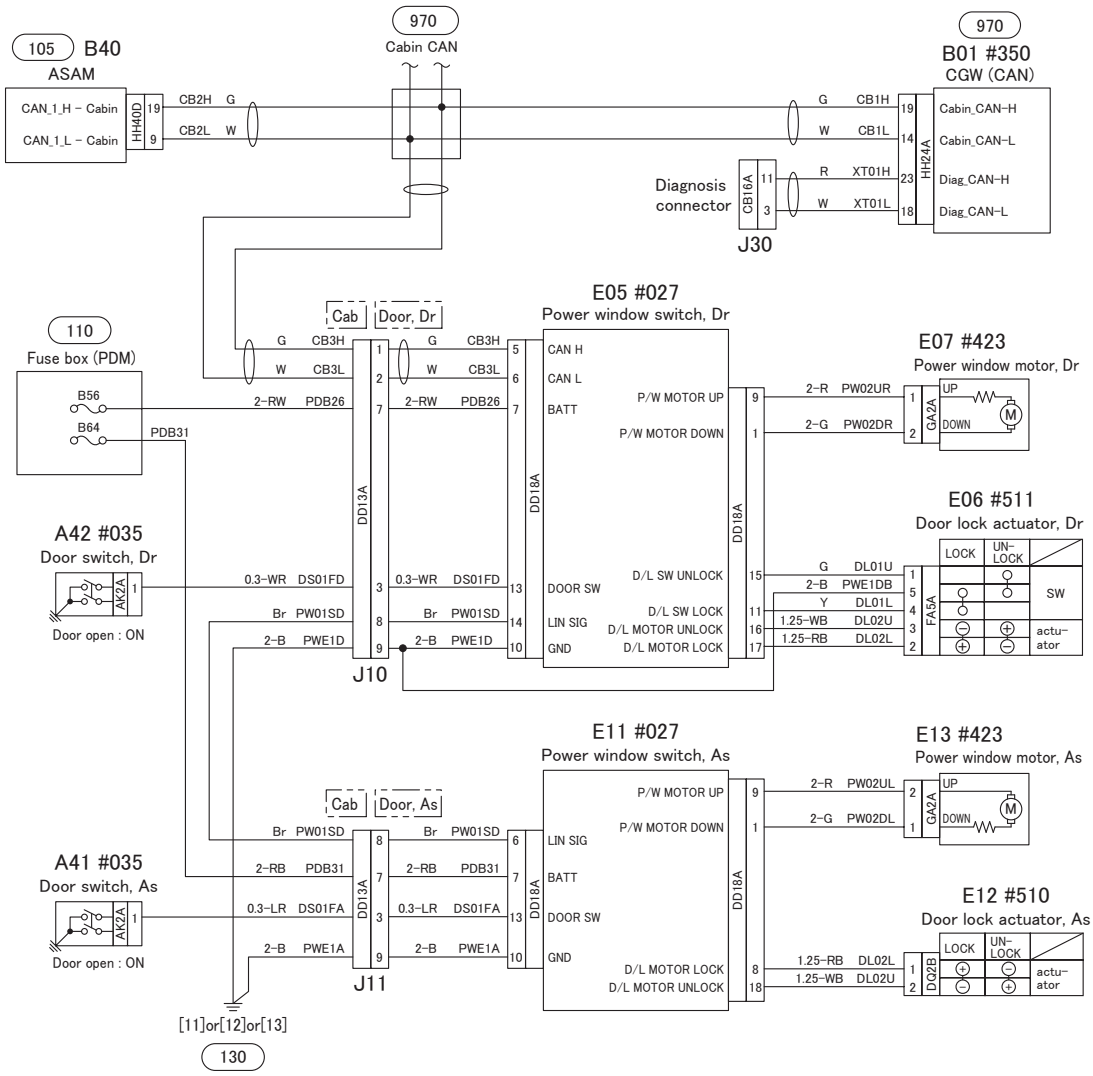
(8/8)



eDM : Electric drive module
EMCM : Electric motor control module

620-303013F-8

POWER WINDOW AND CENTRAL DOOR LOCK CIRCUIT

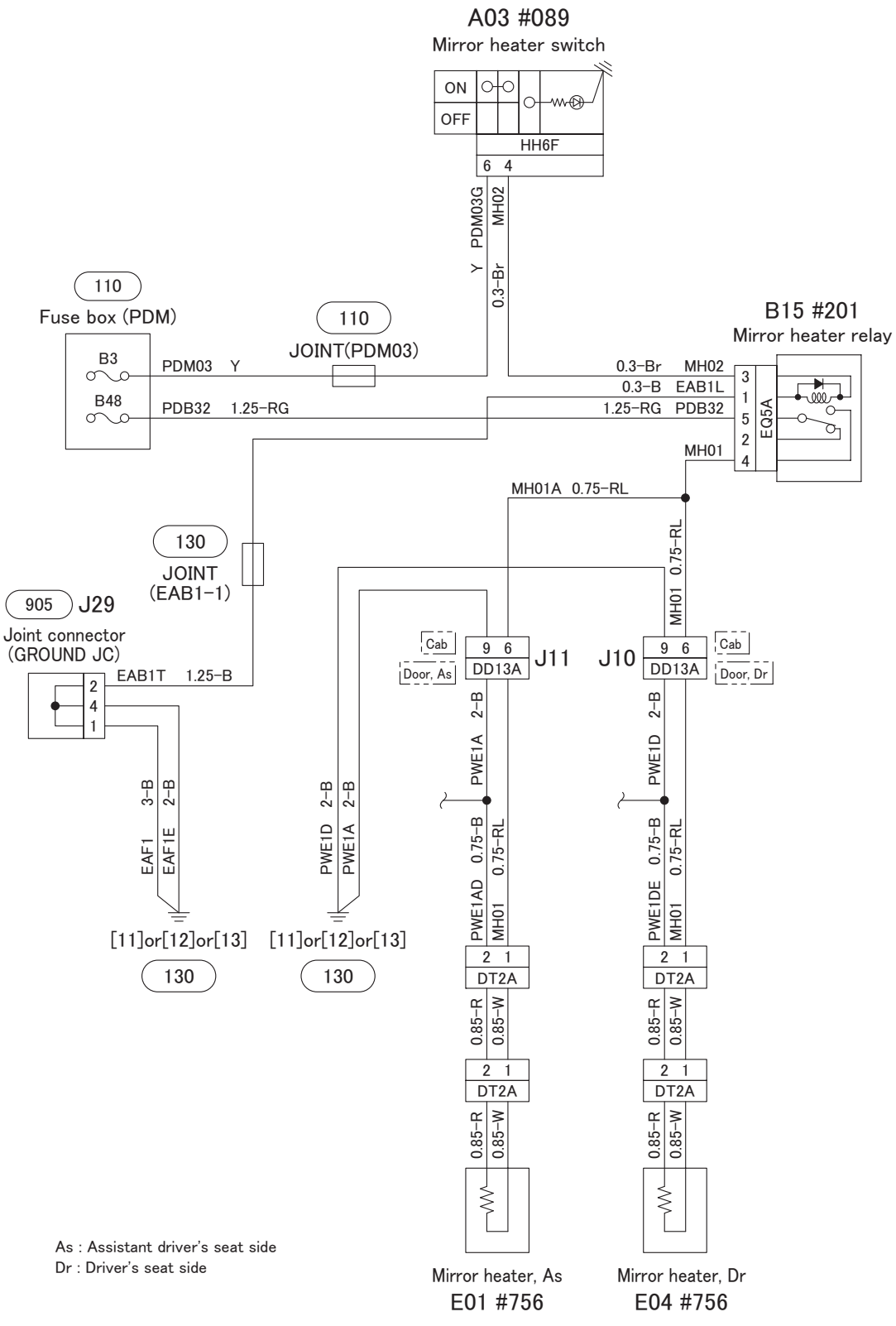


As : Assistant driver's seat side
CAN : Controller area network
Dr : Driver's seat side
LIN : Local interconnect network

622-616323

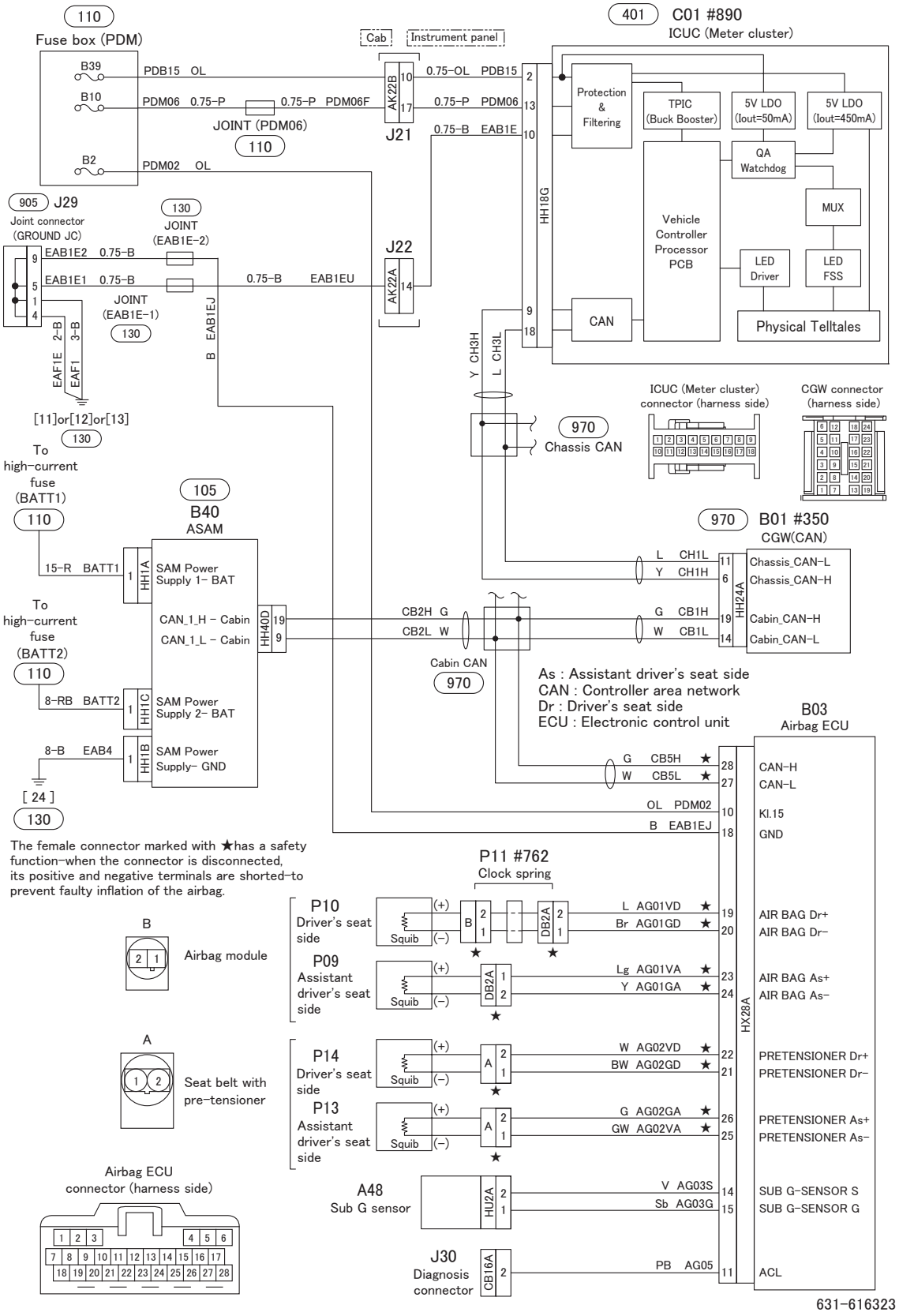
MIRROR HEATER CIRCUIT

<Opt>



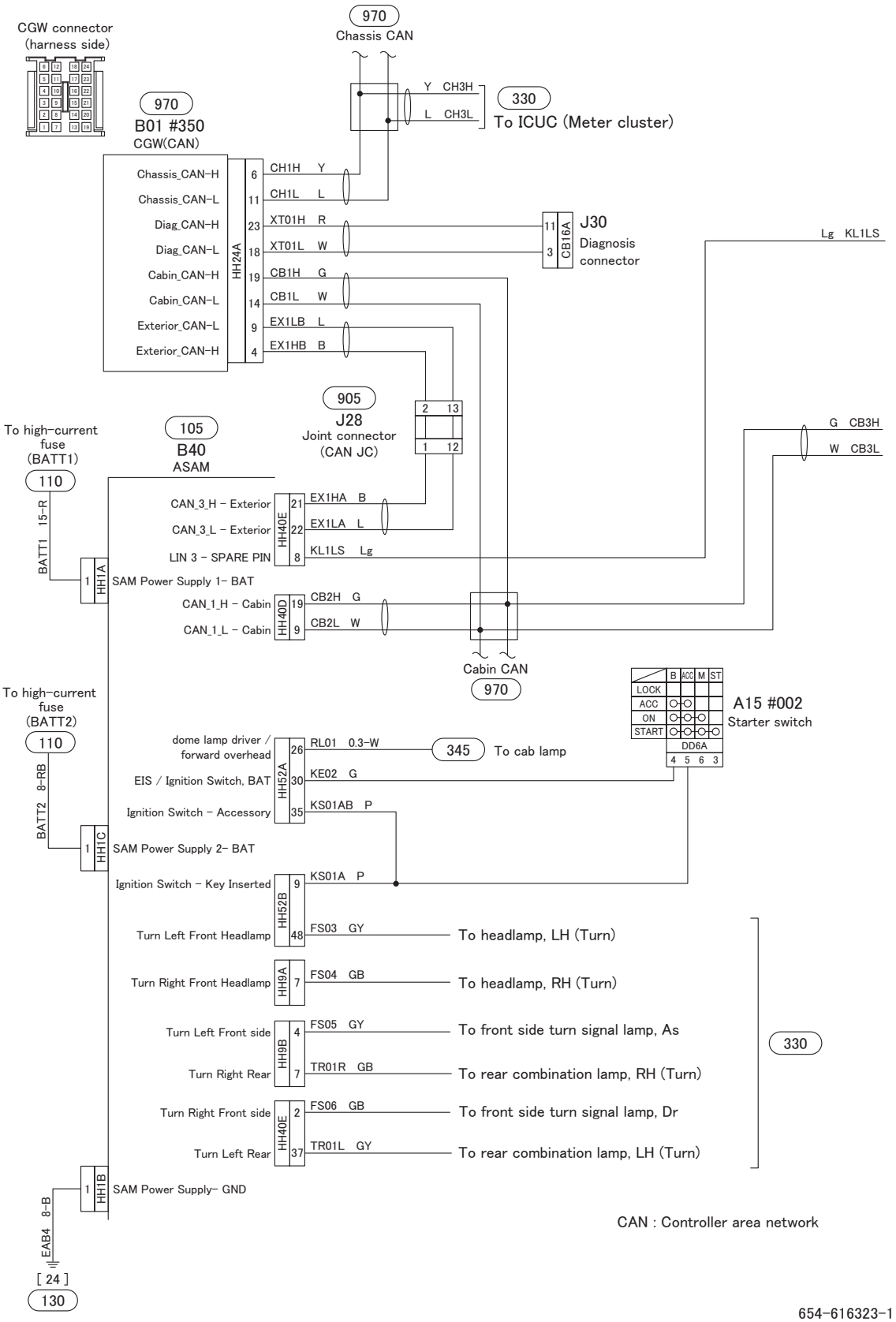
629-616323

SUPPLEMENTAL RESTRAINT SYSTEM AIRBAG CIRCUIT



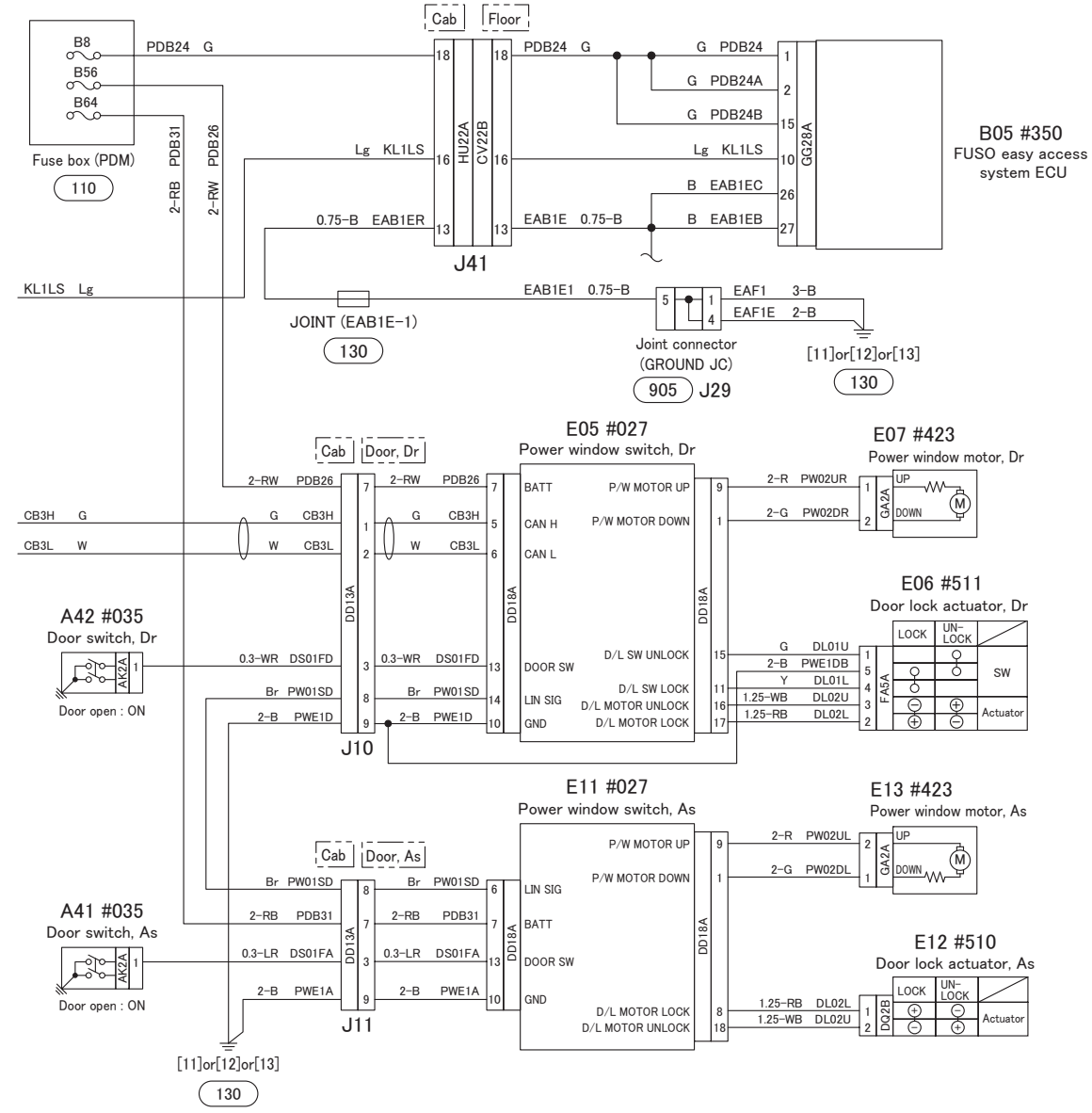
KEYLESS ENTRY CIRCUIT (1)

(1/2)



KEYLESS ENTRY CIRCUIT (2)

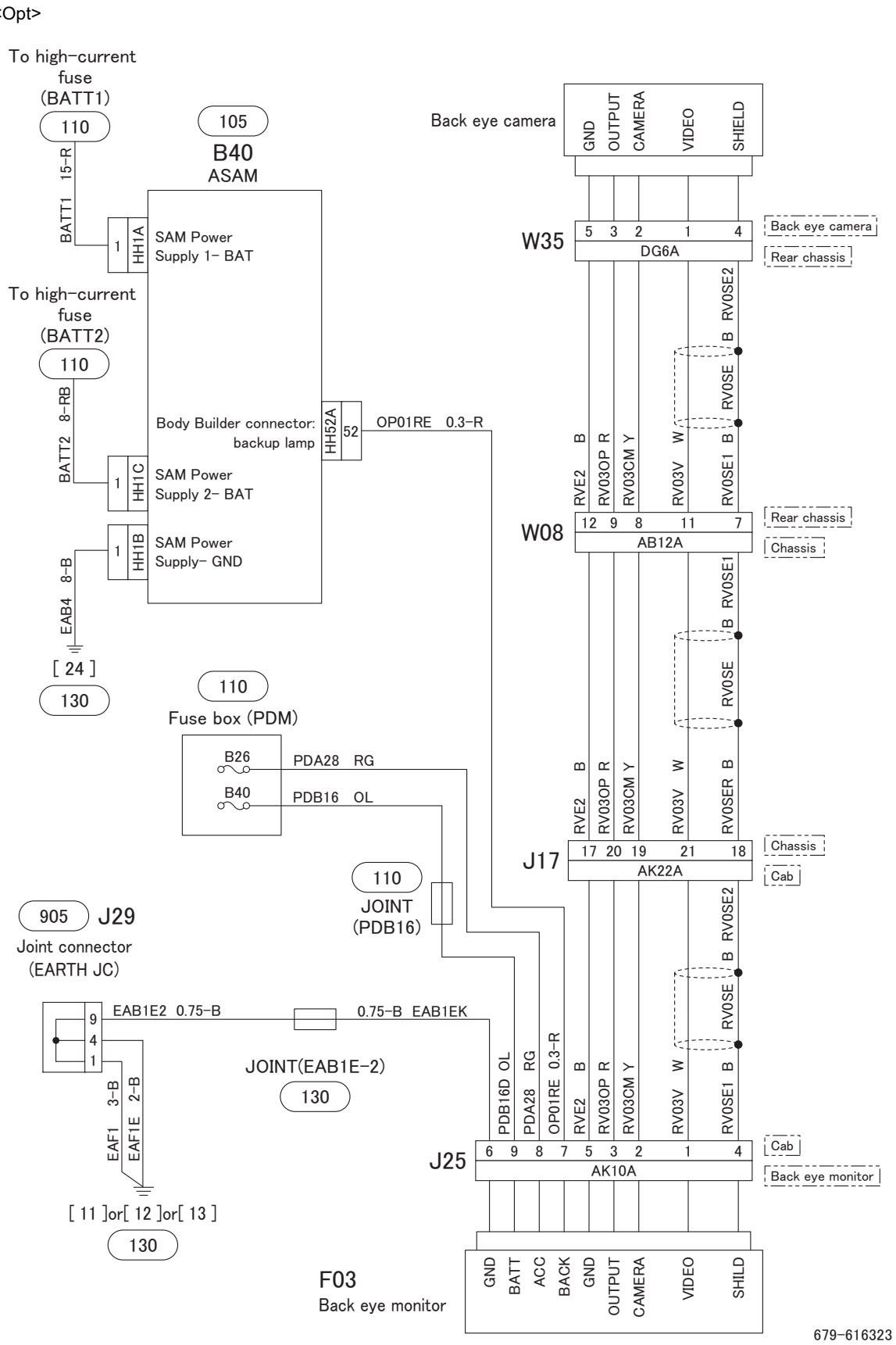
(2/2)



As : Assistant driver's seat side
CAN : Controller area network
Dr : Driver's seat side
ECU : Electronic control unit
LIN : Local interconnect network

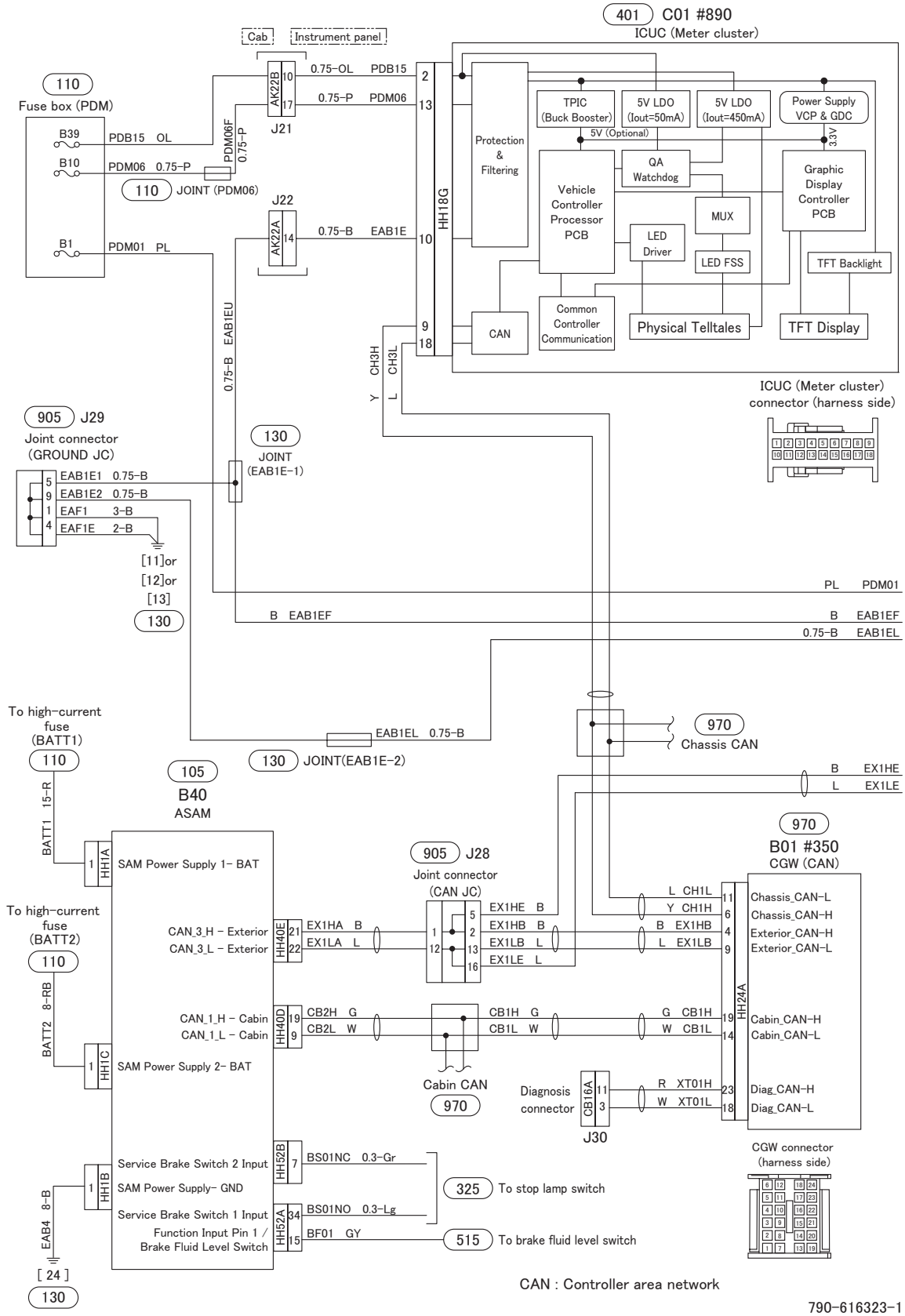
654-616323-2

REAR VIEW CAMERA SYSTEM CIRCUIT



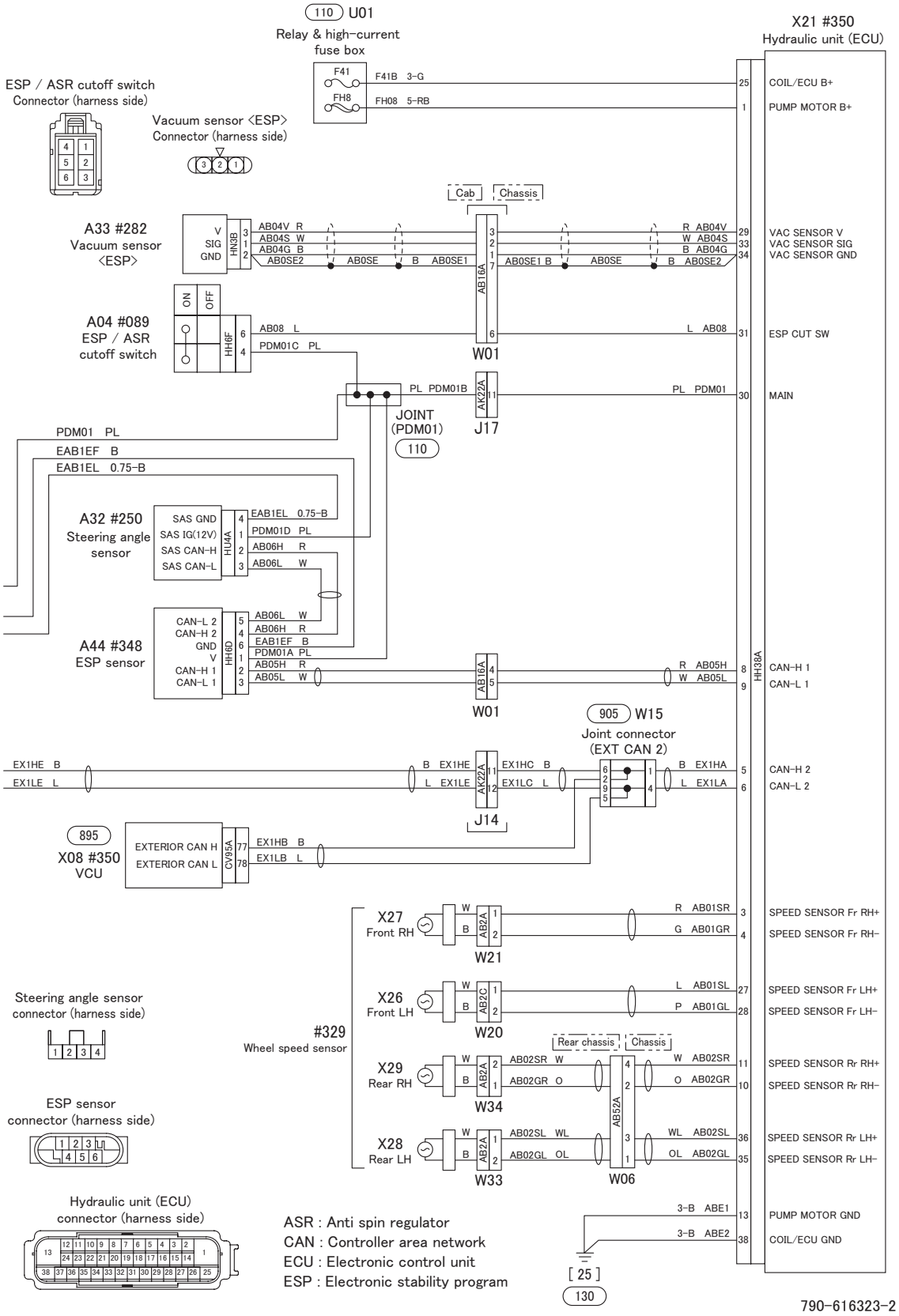
ANTI-LOCK BRAKE SYSTEM CIRCUIT (1)

(1/2)



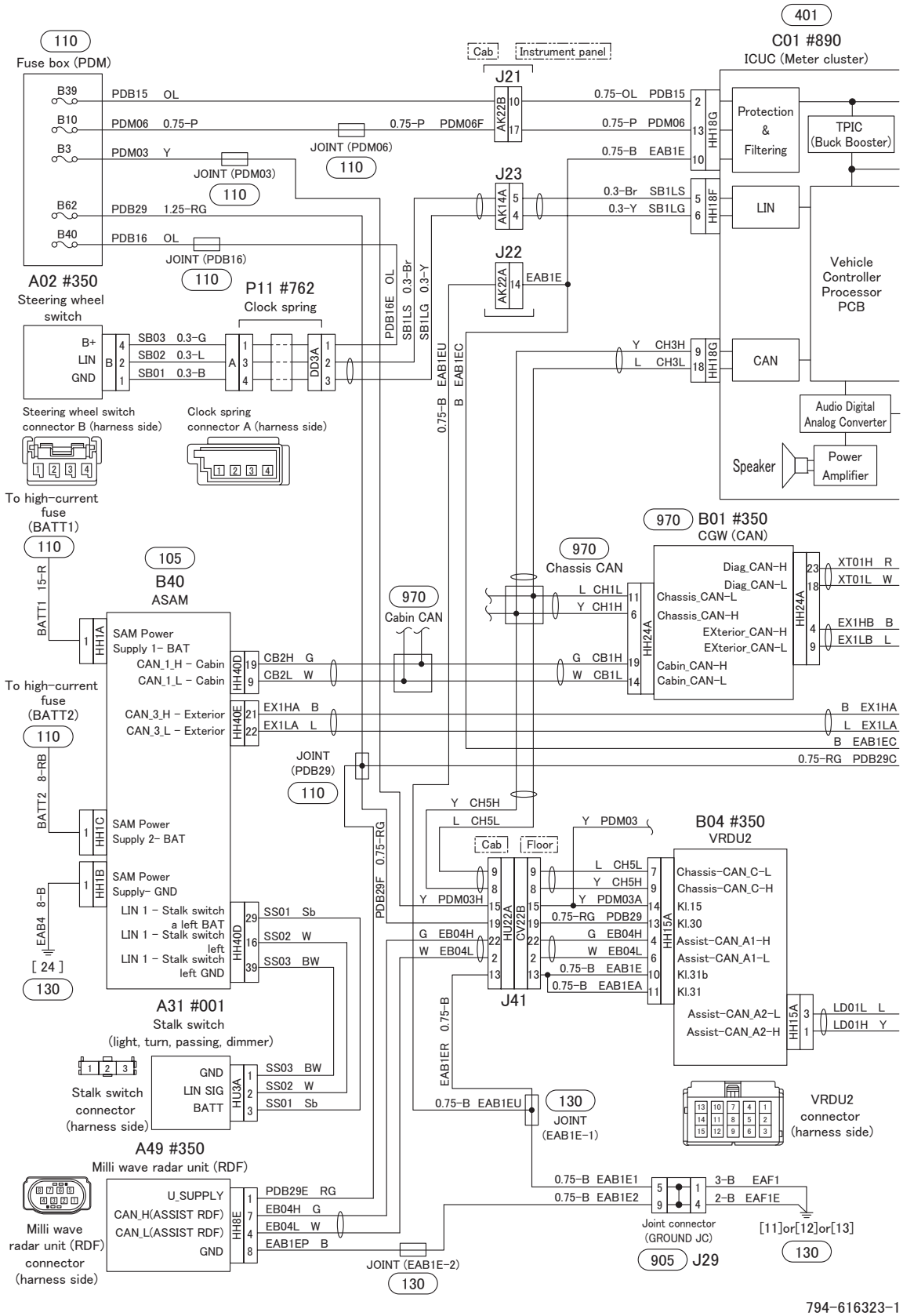
ANTI-LOCK BRAKE SYSTEM CIRCUIT (2)

(2/2)



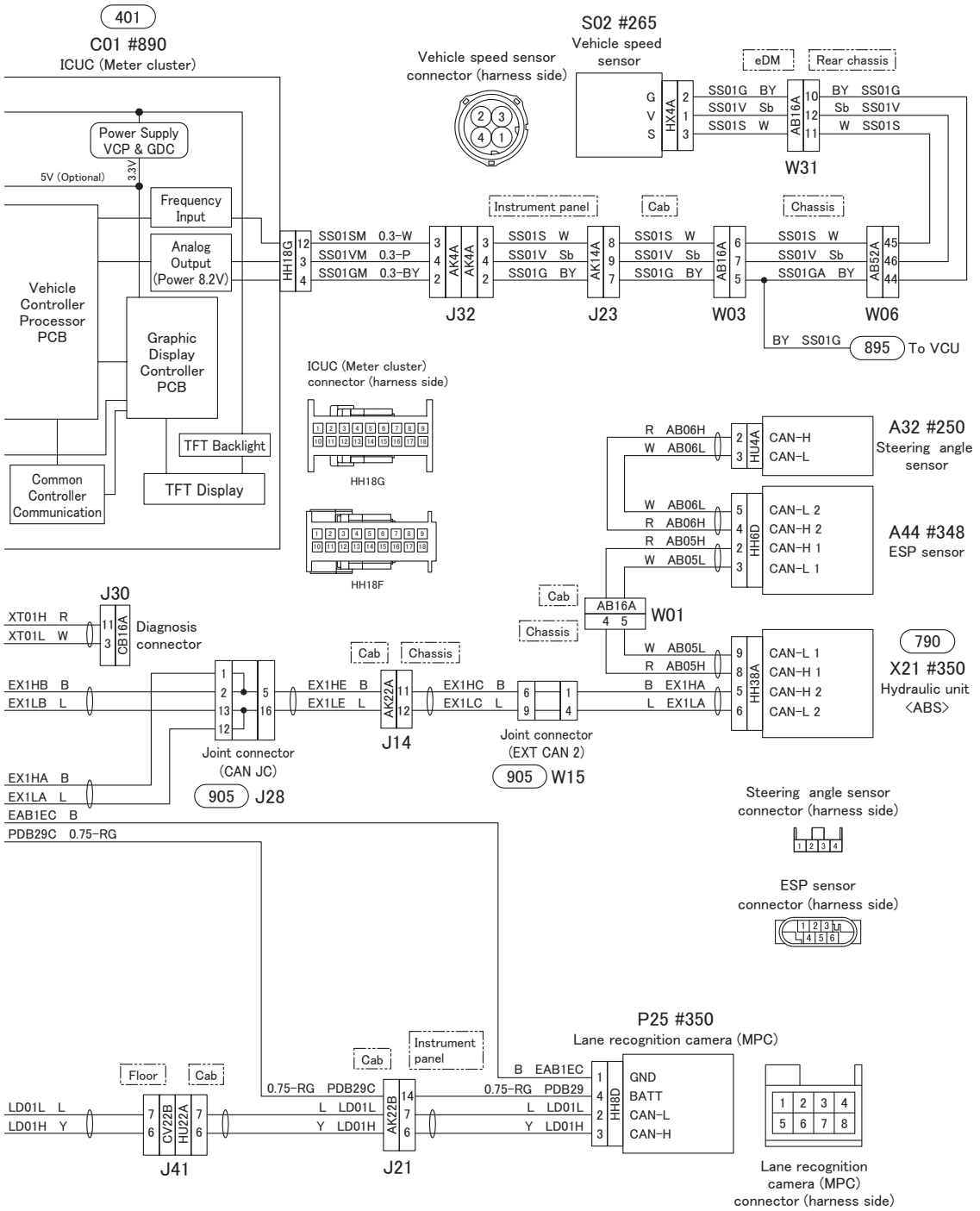
ABA (ACTIVE BRAKE ASSIST) CIRCUIT (1)

(1/2)



ABA (ACTIVE BRAKE ASSIST) CIRCUIT (2)

(2/2)

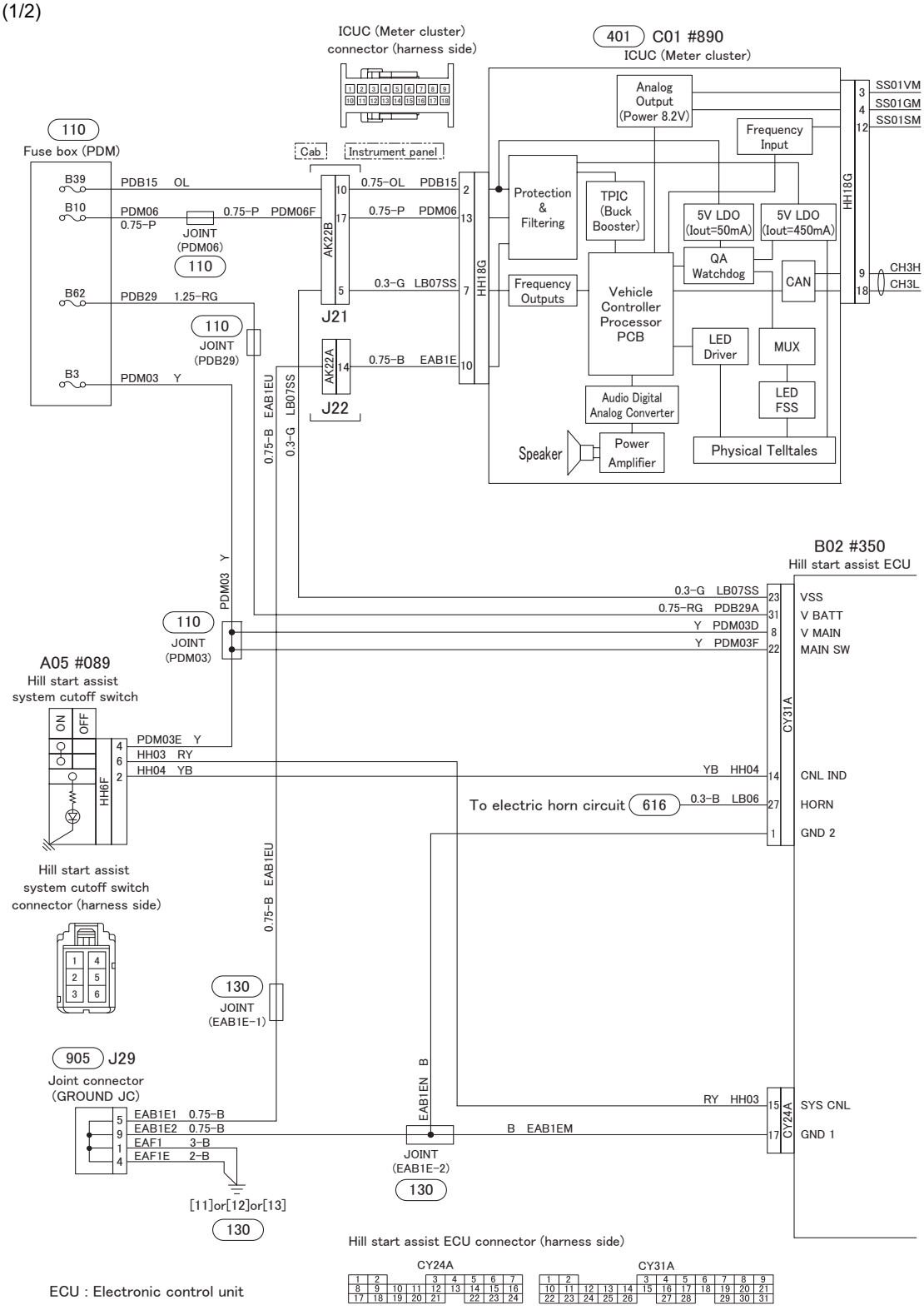


ABS : Anti-lock brake system
CAN : Controller area network
eDM : Electric drive module
ESP : Electronic stability program
LIN : Local interconnect network
MPC : Multi purpose camera
RDF : Radar front end
VRDU : Video radar decision unit

794-303013-2

HILL START ASSIST SYSTEM CIRCUIT (1)

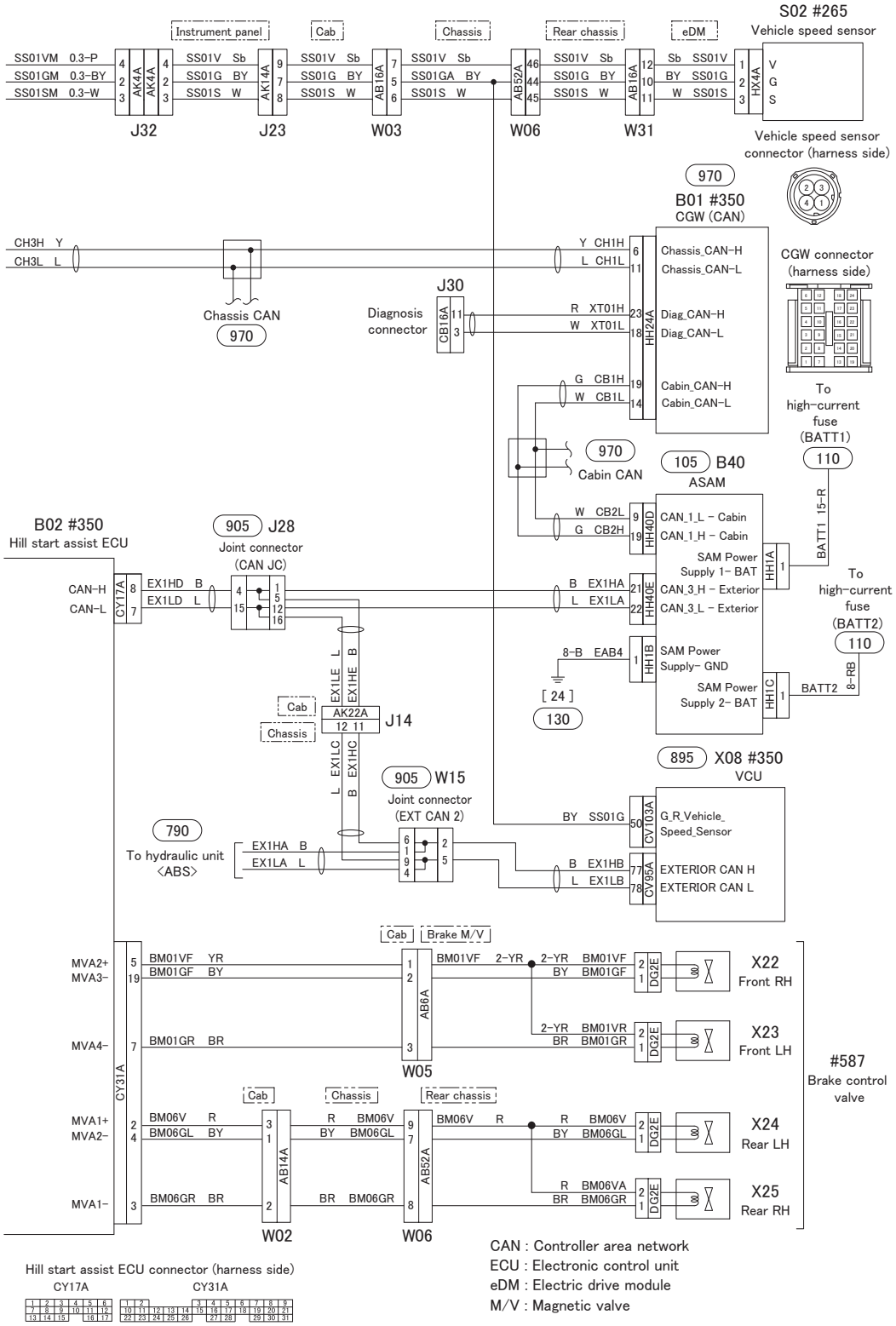
(1/2)



796-616323-1

HILL START ASSIST SYSTEM CIRCUIT (2)

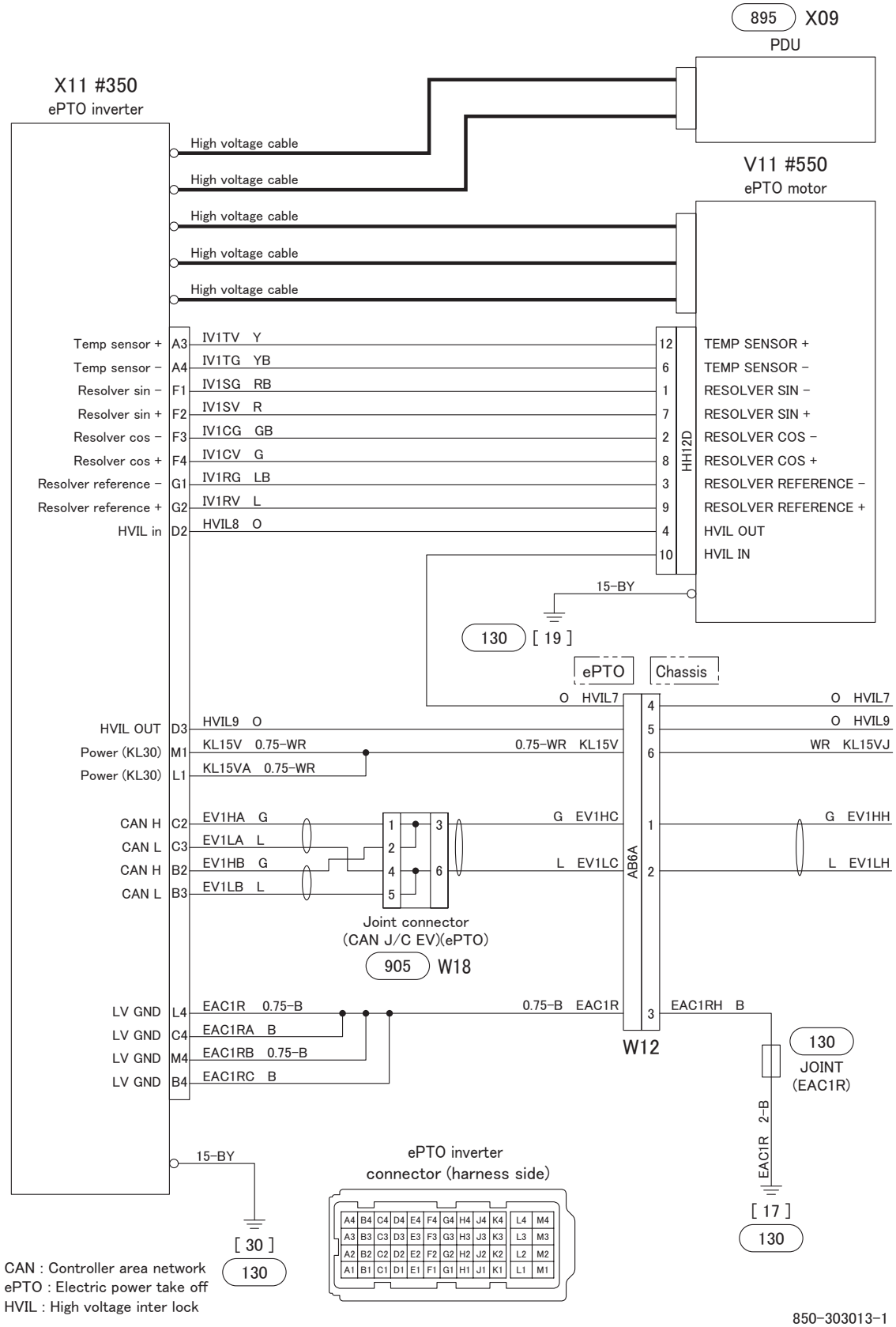
(2/2)



796-303013-2

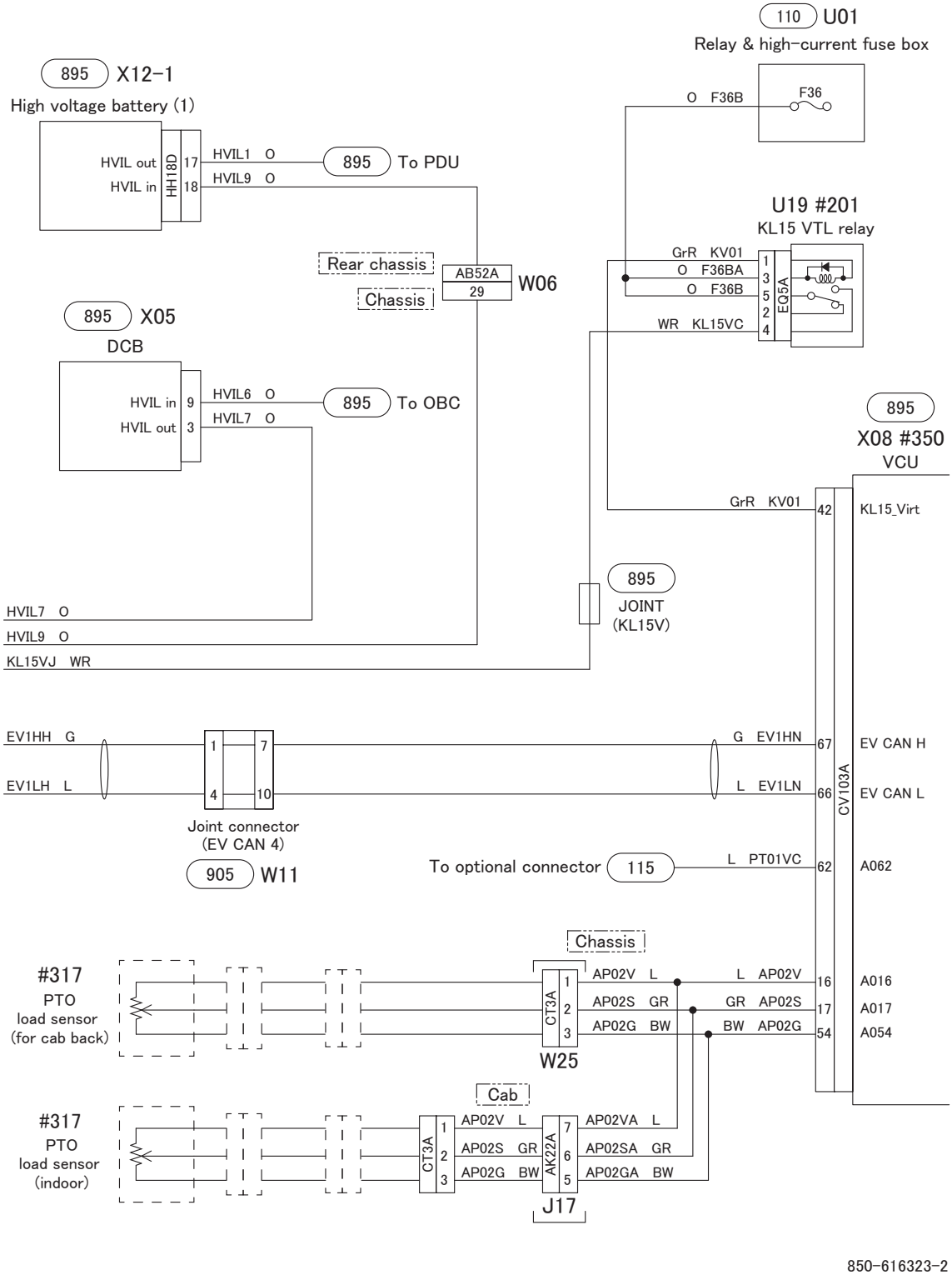
ePTO CIRCUIT (1)

<Opt> (1/4)



ePTO CIRCUIT (2)

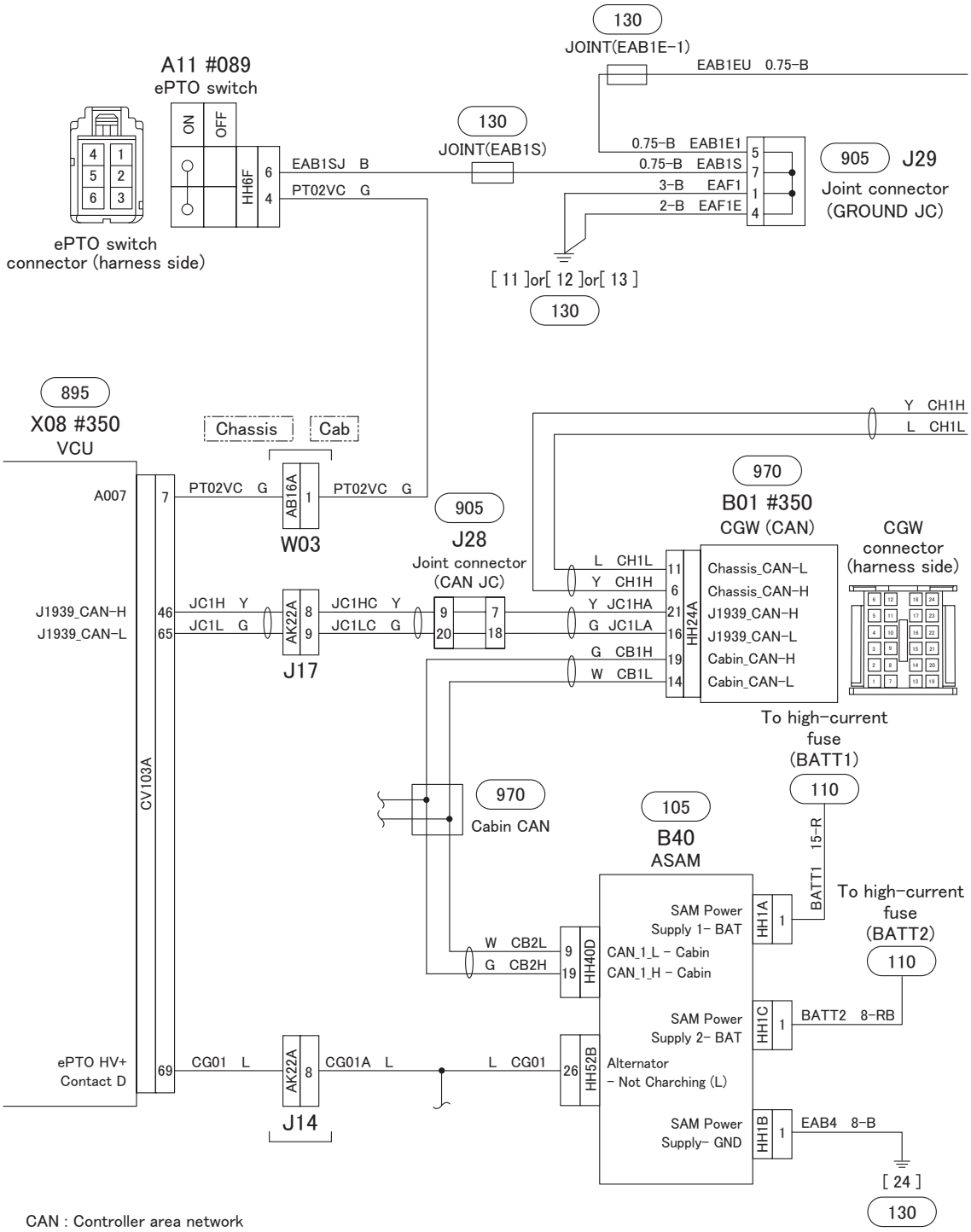
(2/4)



850-616323-2

ePTO CIRCUIT (3)

(3/4)

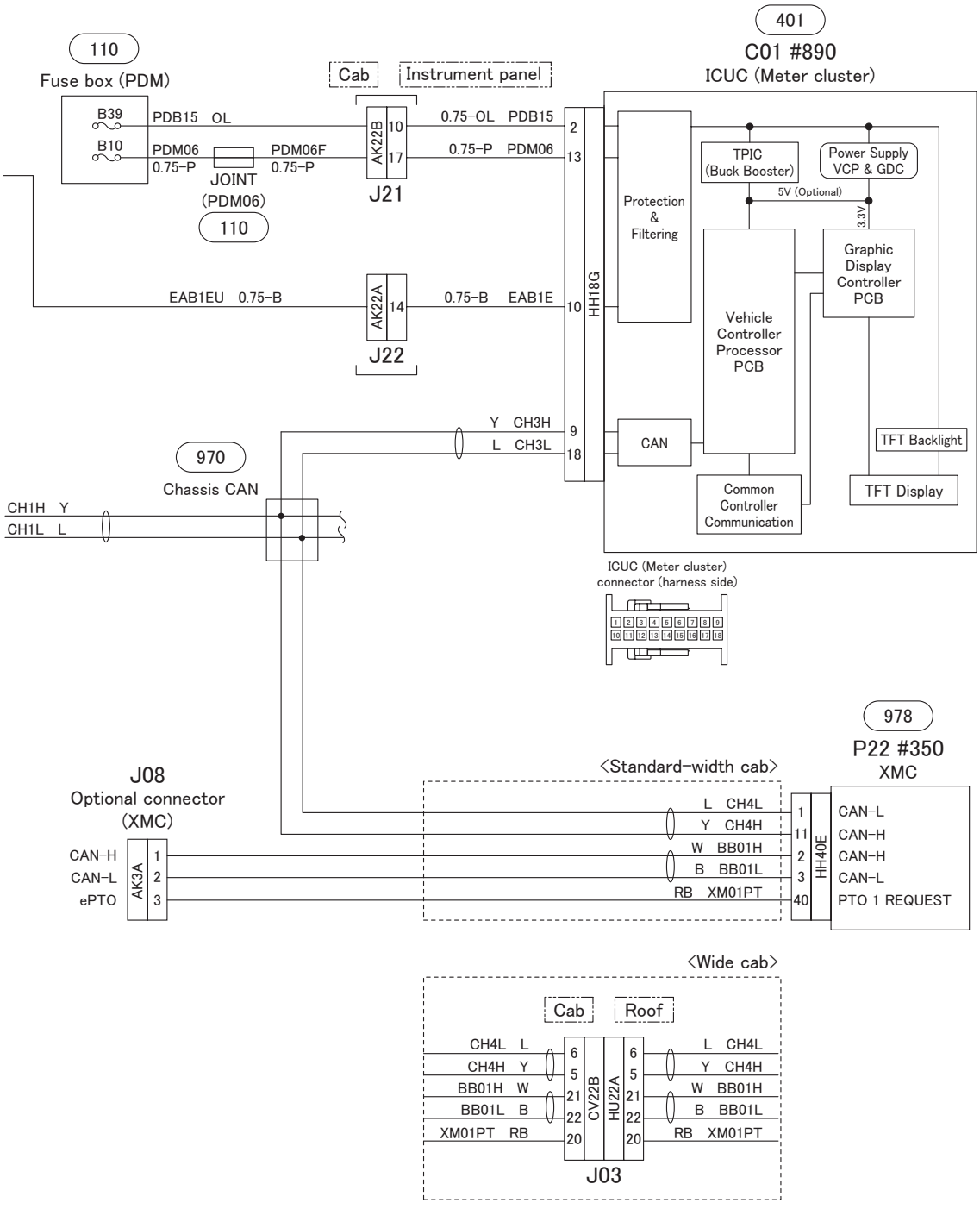


CAN : Controller area network
ePTO : Electric power take off

850-616323-3

ePTO CIRCUIT (4)

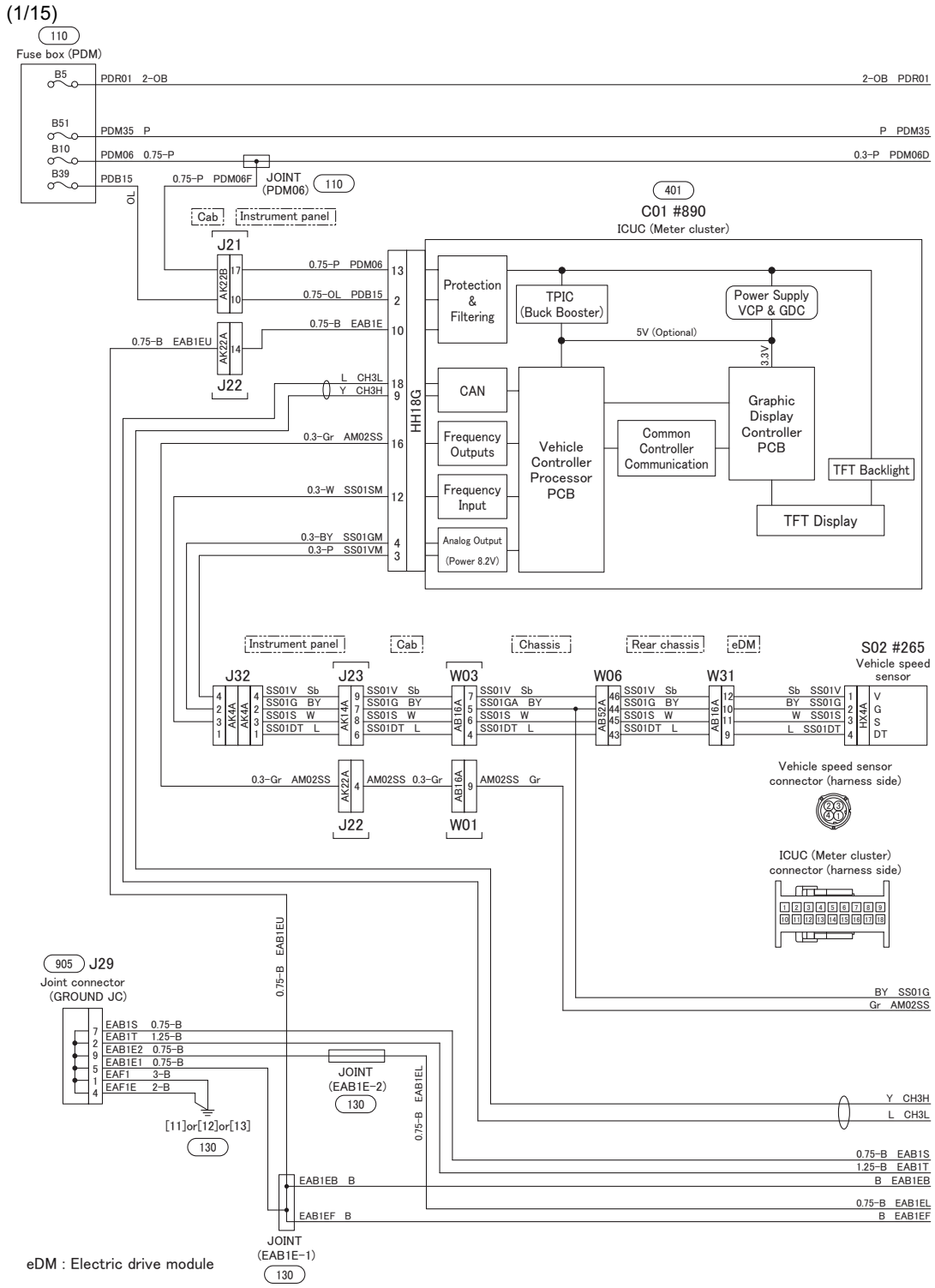
(4/4)



CAN : Controller area network
ePTO : Electric power take off
XMC : Expansion module cabin

850-616323-4

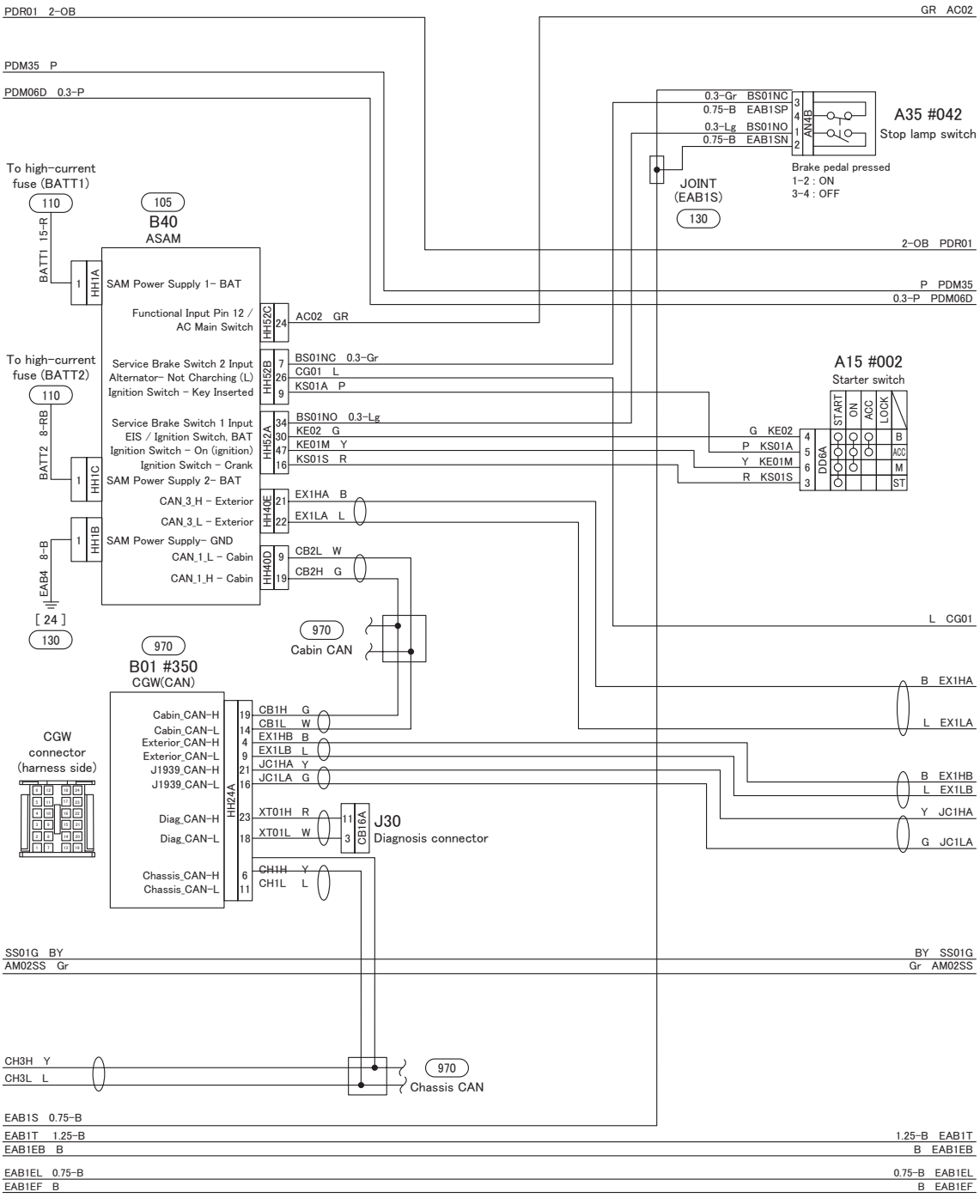
EV SYSTEM CIRCUIT (1)



895-616323-1

EV SYSTEM CIRCUIT (2)

(2/15)

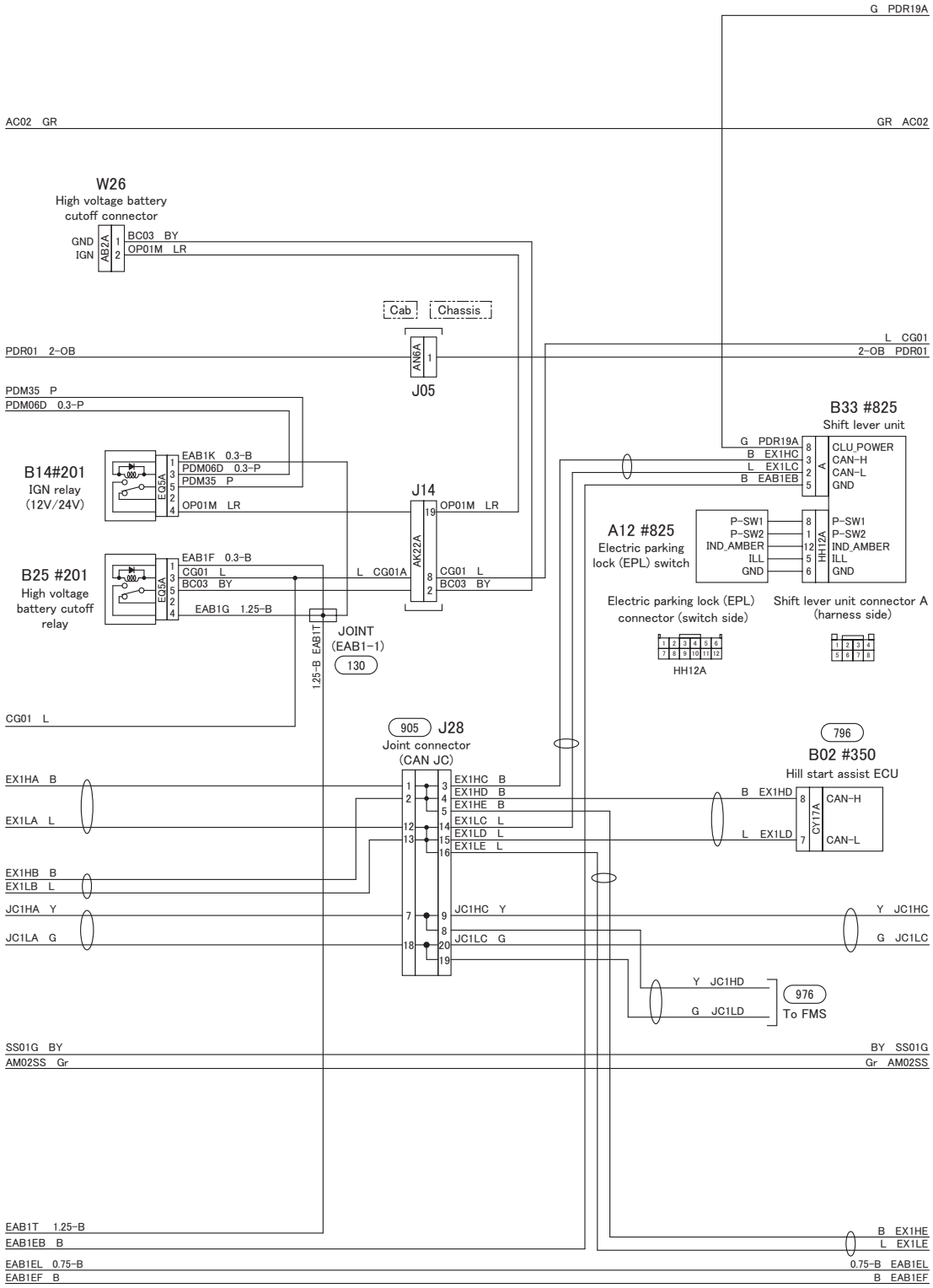


CAN : Controller area network

895-616323-2

EV SYSTEM CIRCUIT (3)

(3/15)

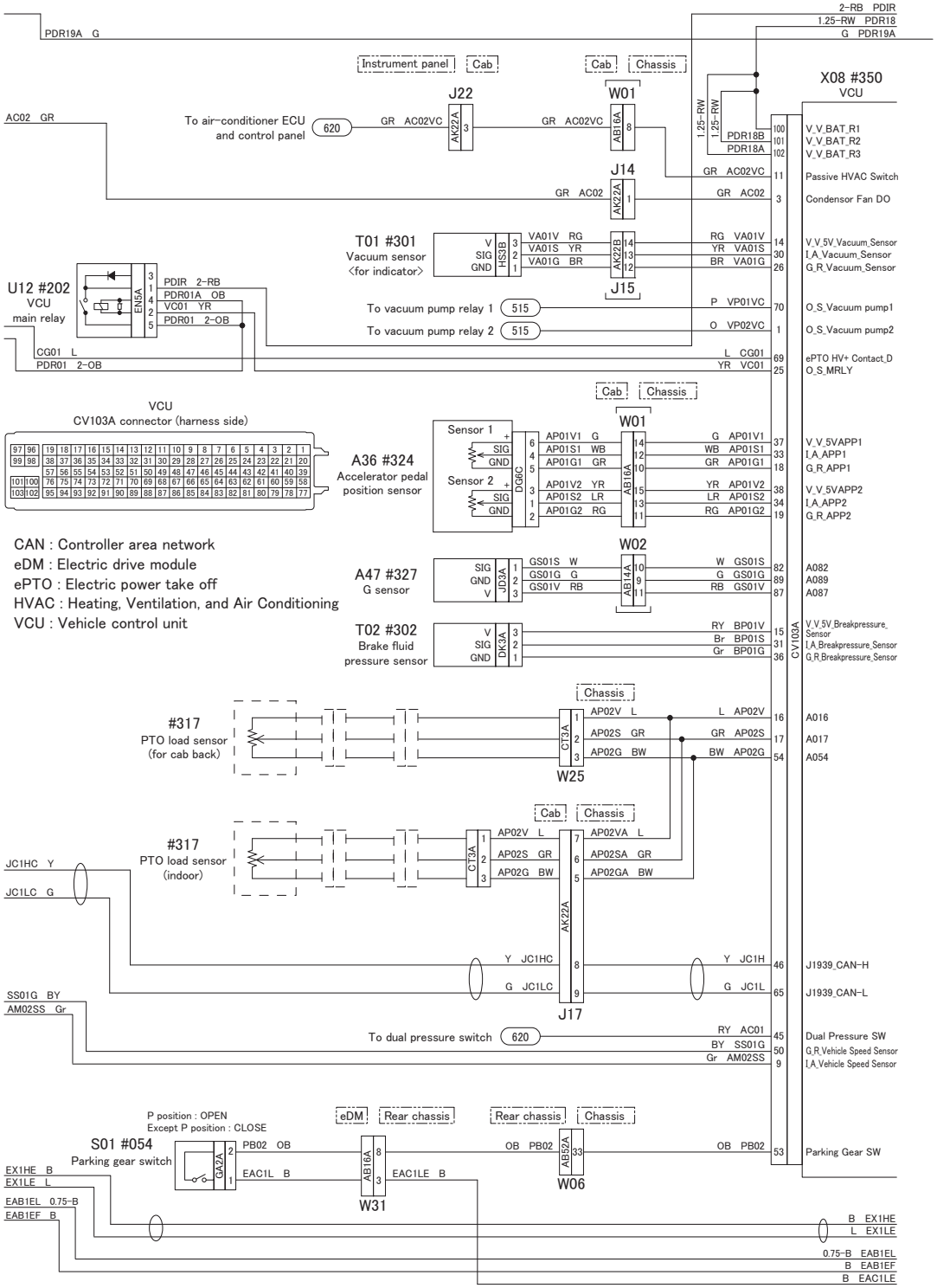


CAN : Controller area network
EPL : Electric parking lock

895-616323-3

EV SYSTEM CIRCUIT (4)

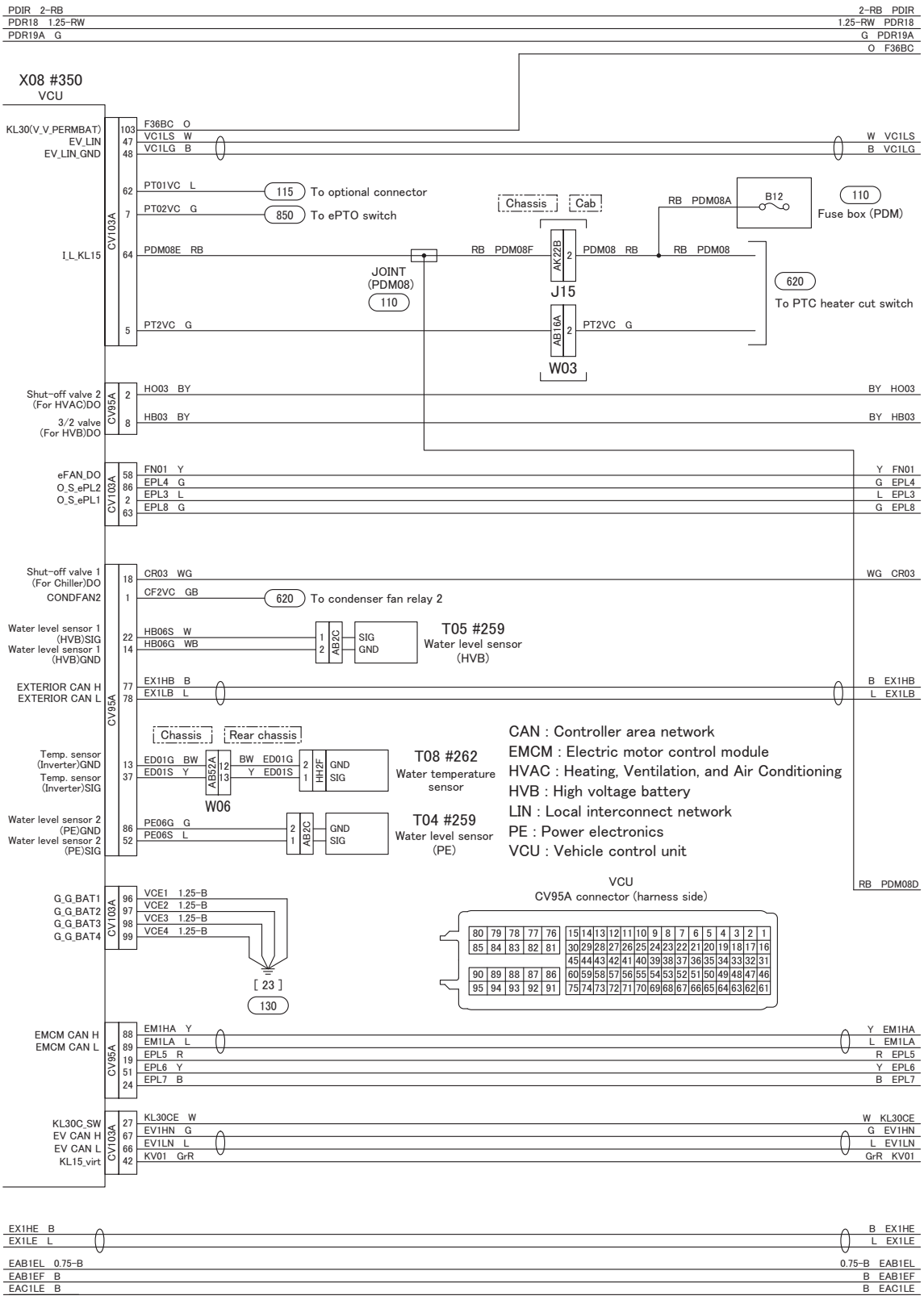
(4/15)



895-616323-4

EV SYSTEM CIRCUIT (5)

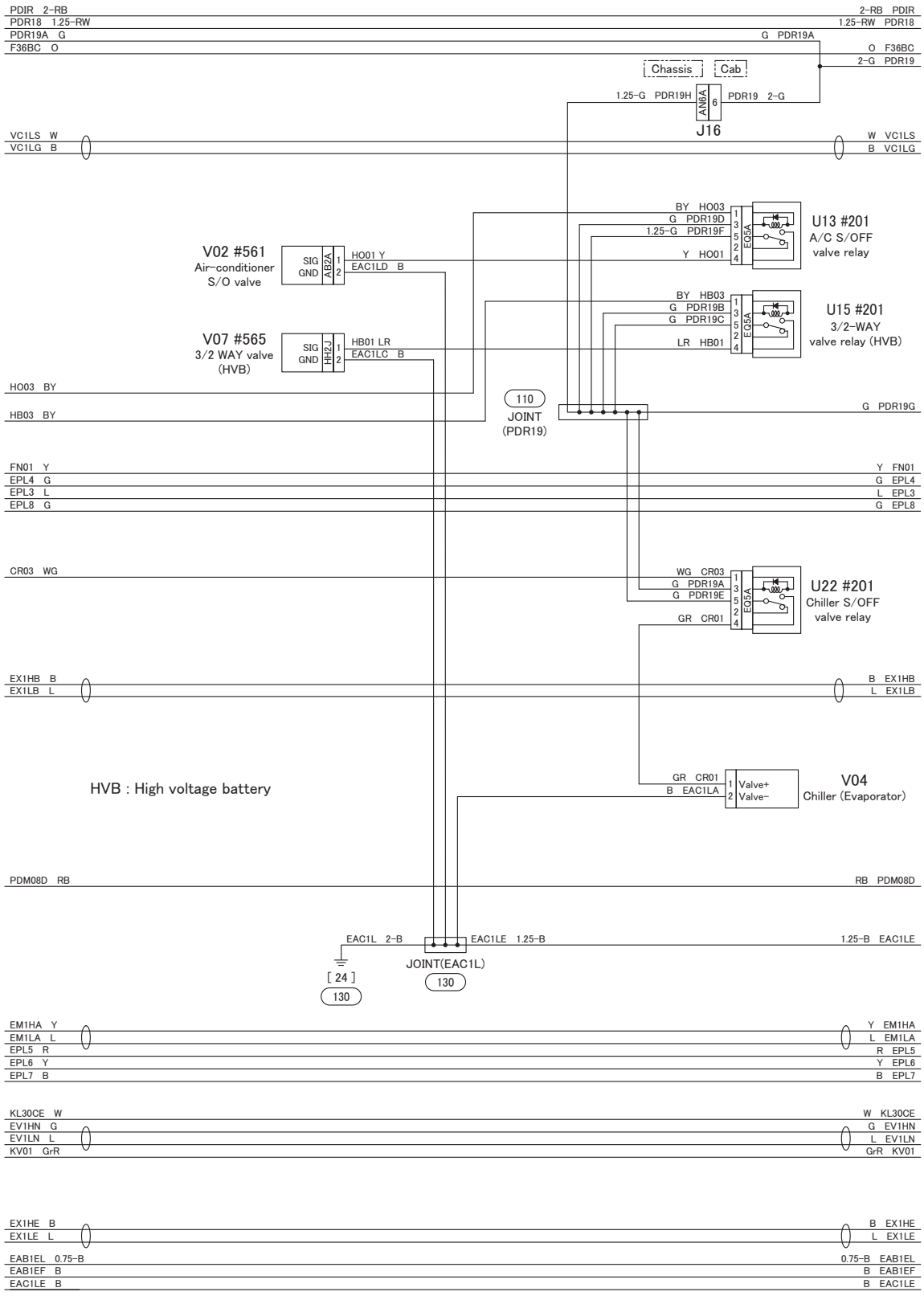
(5/15)



895-616323-5

EV SYSTEM CIRCUIT (6)

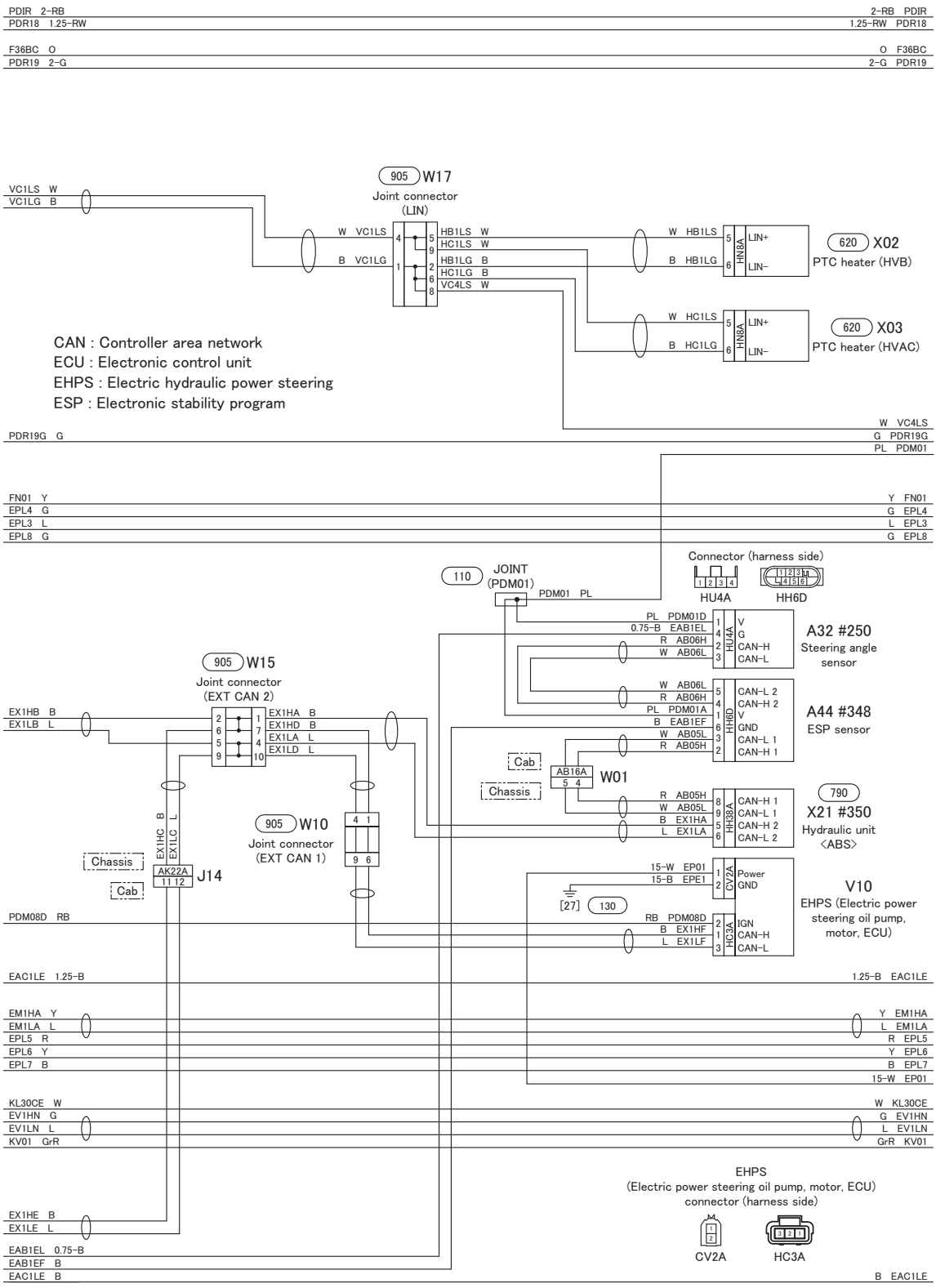
(6/15)



895-616323-6

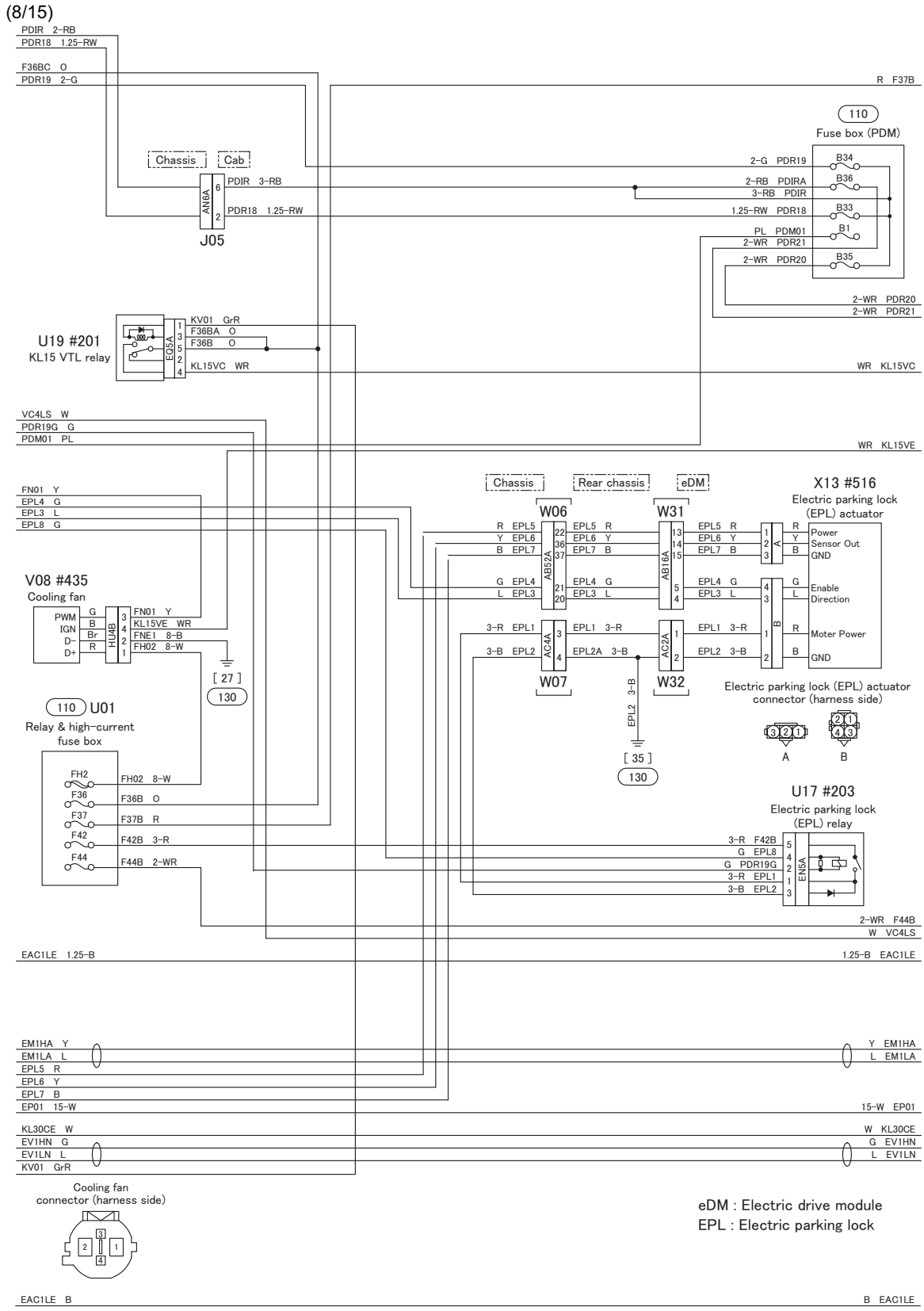
EV SYSTEM CIRCUIT (7)

(7/15)



895-616323-7

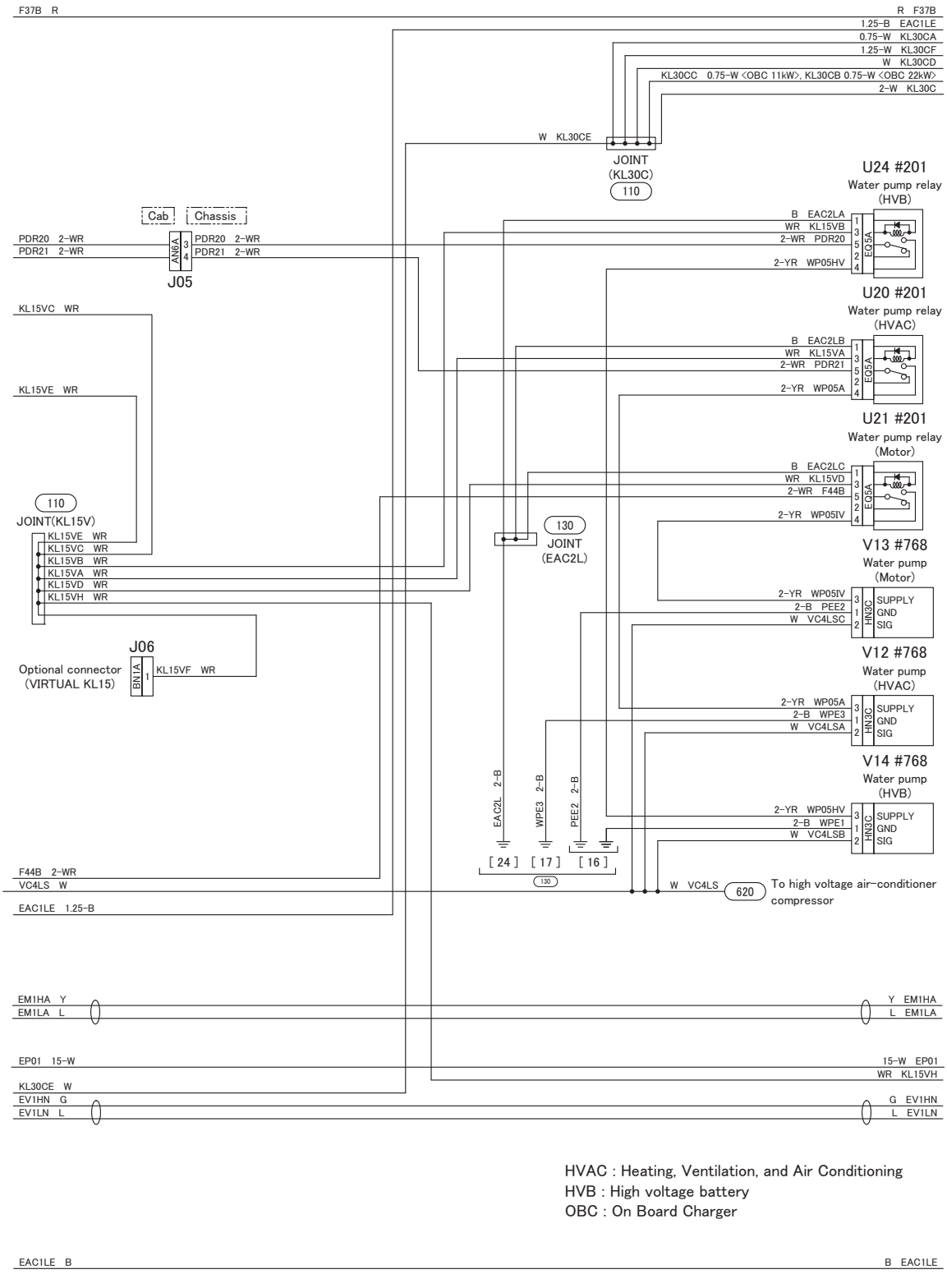
EV SYSTEM CIRCUIT (8)



895-616323-8

EV SYSTEM CIRCUIT (9)

(9/15)

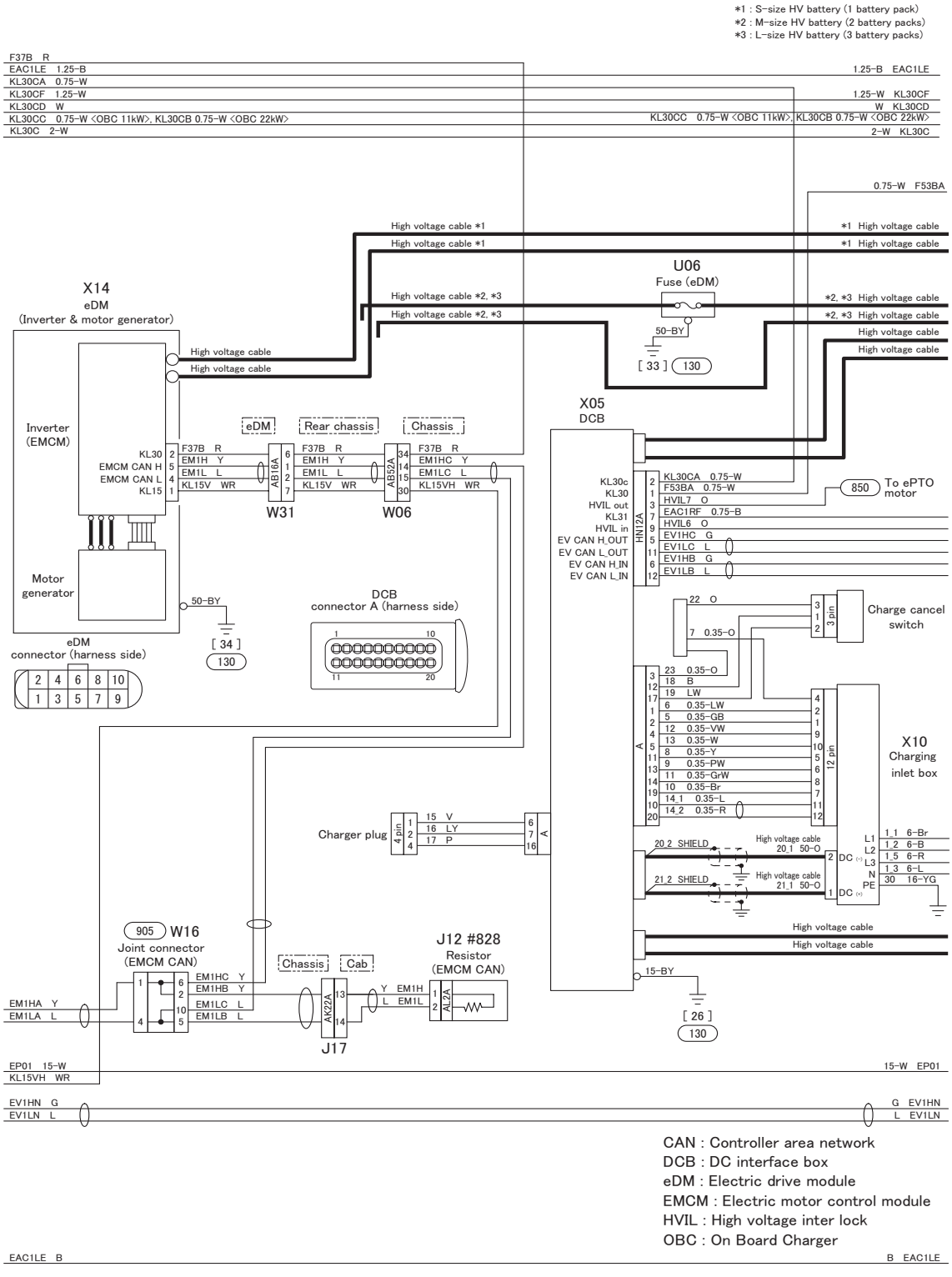


HVAC : Heating, Ventilation, and Air Conditioning
HVB : High voltage battery
OBC : On Board Charger

895-616323-9

EV SYSTEM CIRCUIT (10)

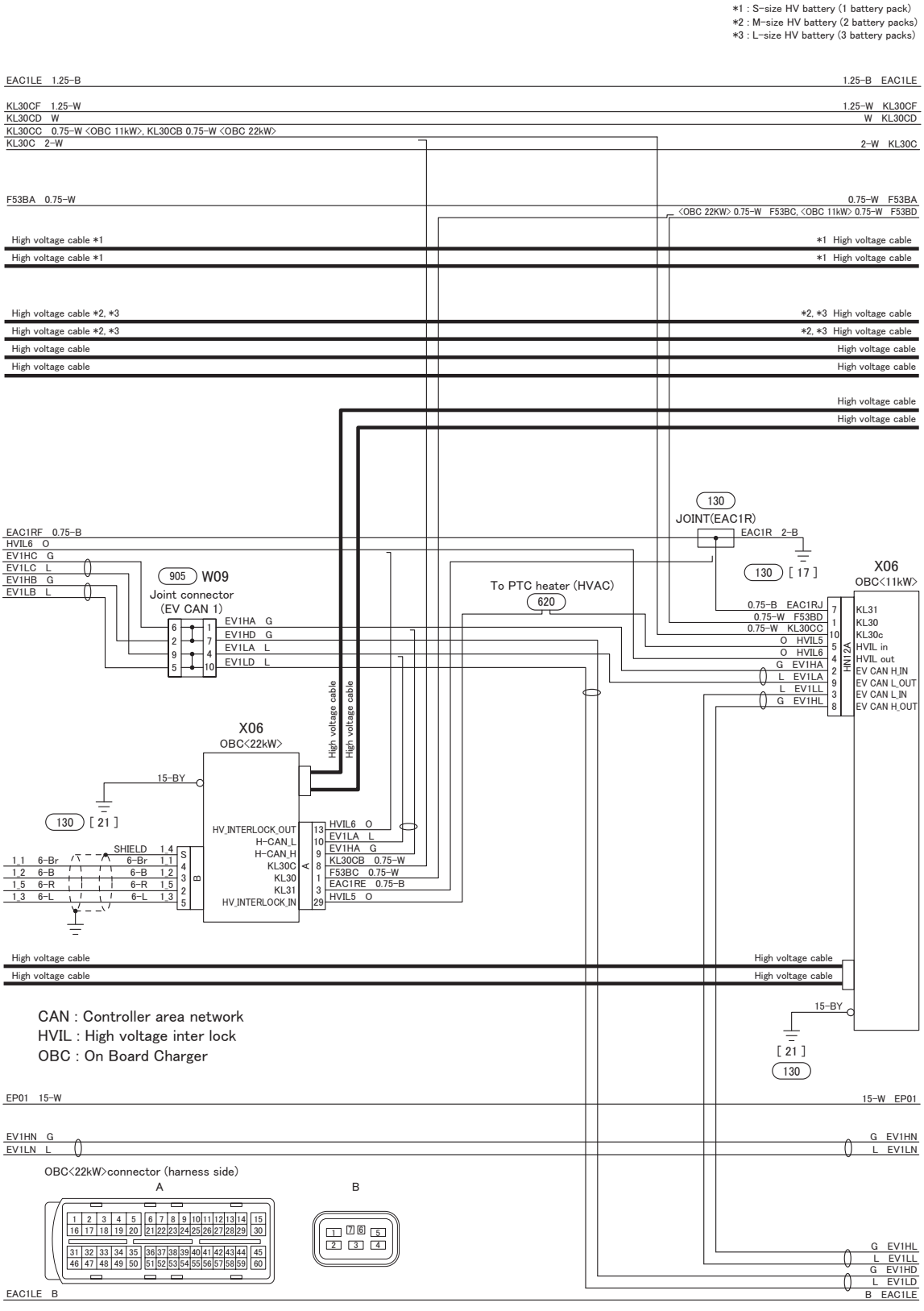
(10/15)



895-616323-10

EV SYSTEM CIRCUIT (11)

(11/15)



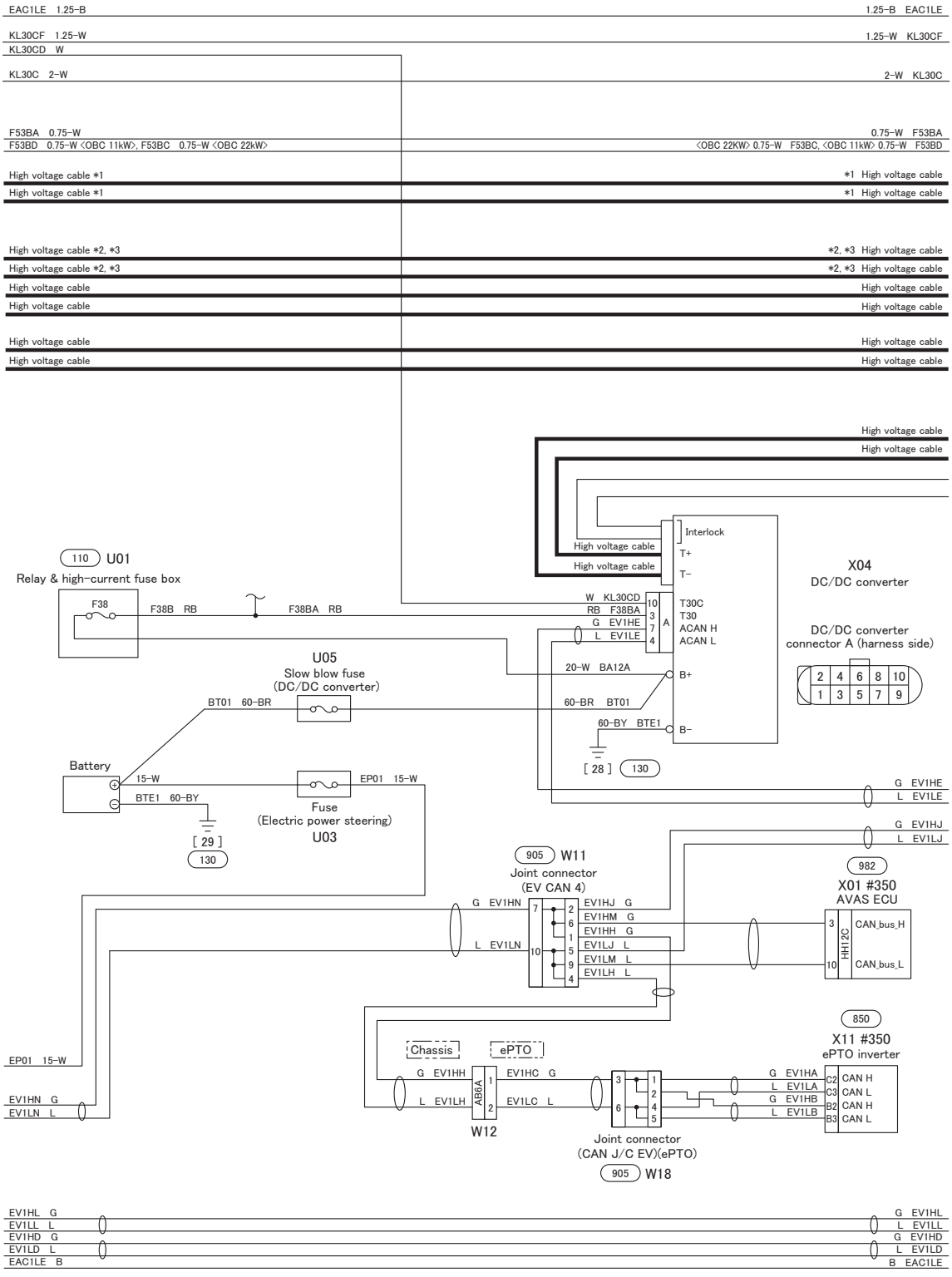
895-616323-11

EV SYSTEM CIRCUIT (12)

(12/15)

ePTO : Electric power take off
OBC : On Board Charger

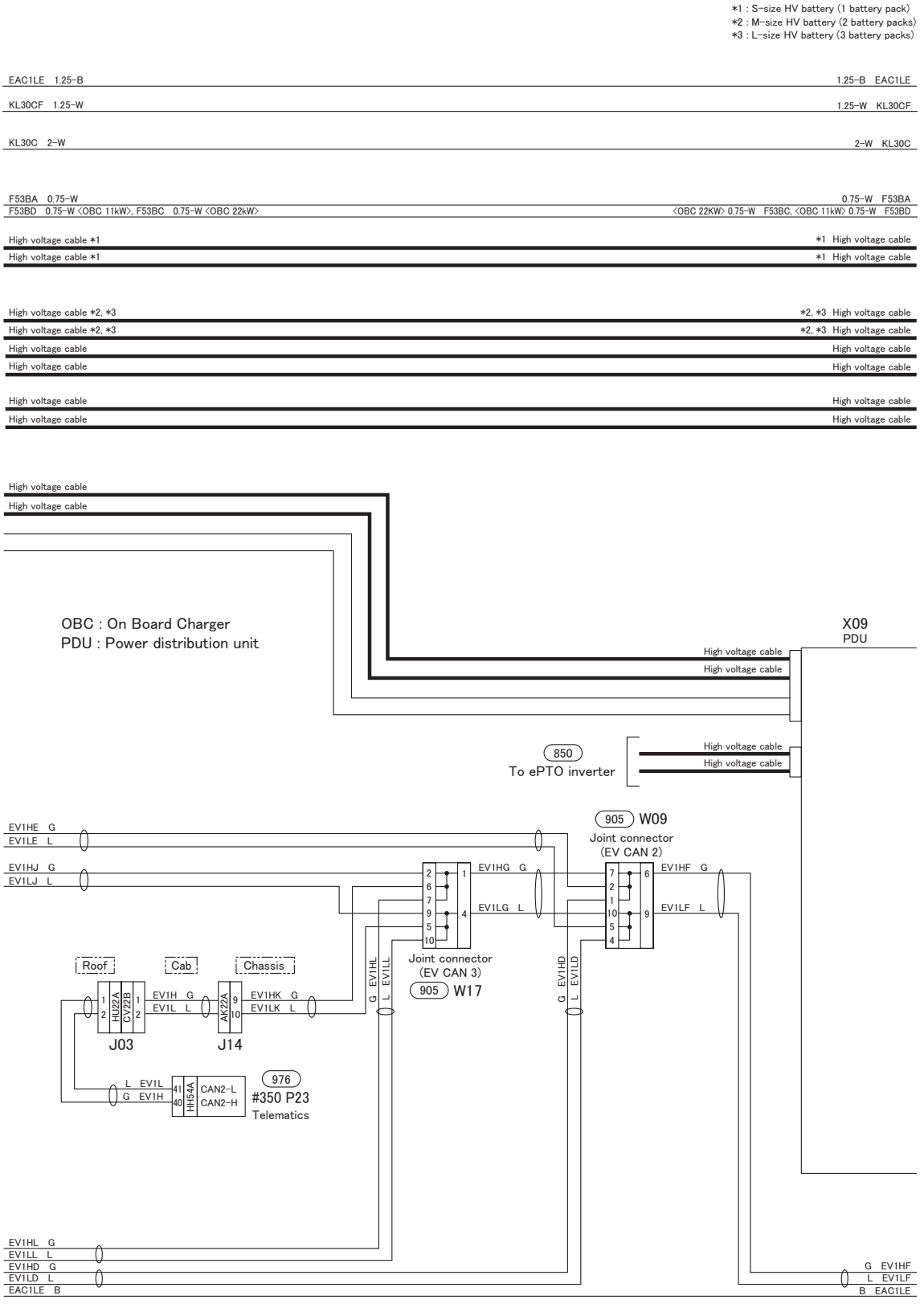
*1 : S-size HV battery (1 battery pack)
*2 : M-size HV battery (2 battery packs)
*3 : L-size HV battery (3 battery packs)



895-616323-12

EV SYSTEM CIRCUIT (13)

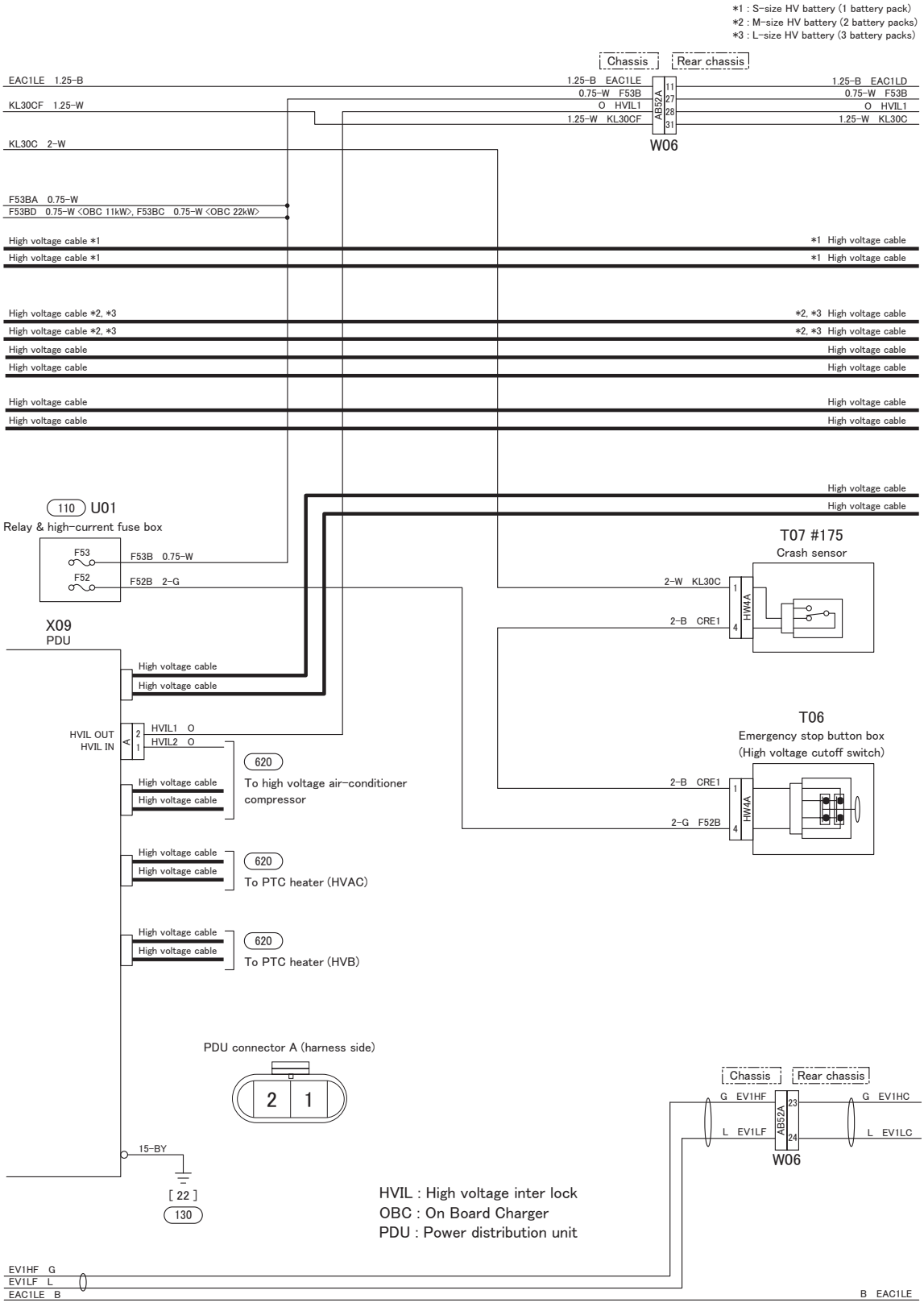
(13/15)



895-616323-13

EV SYSTEM CIRCUIT (14)

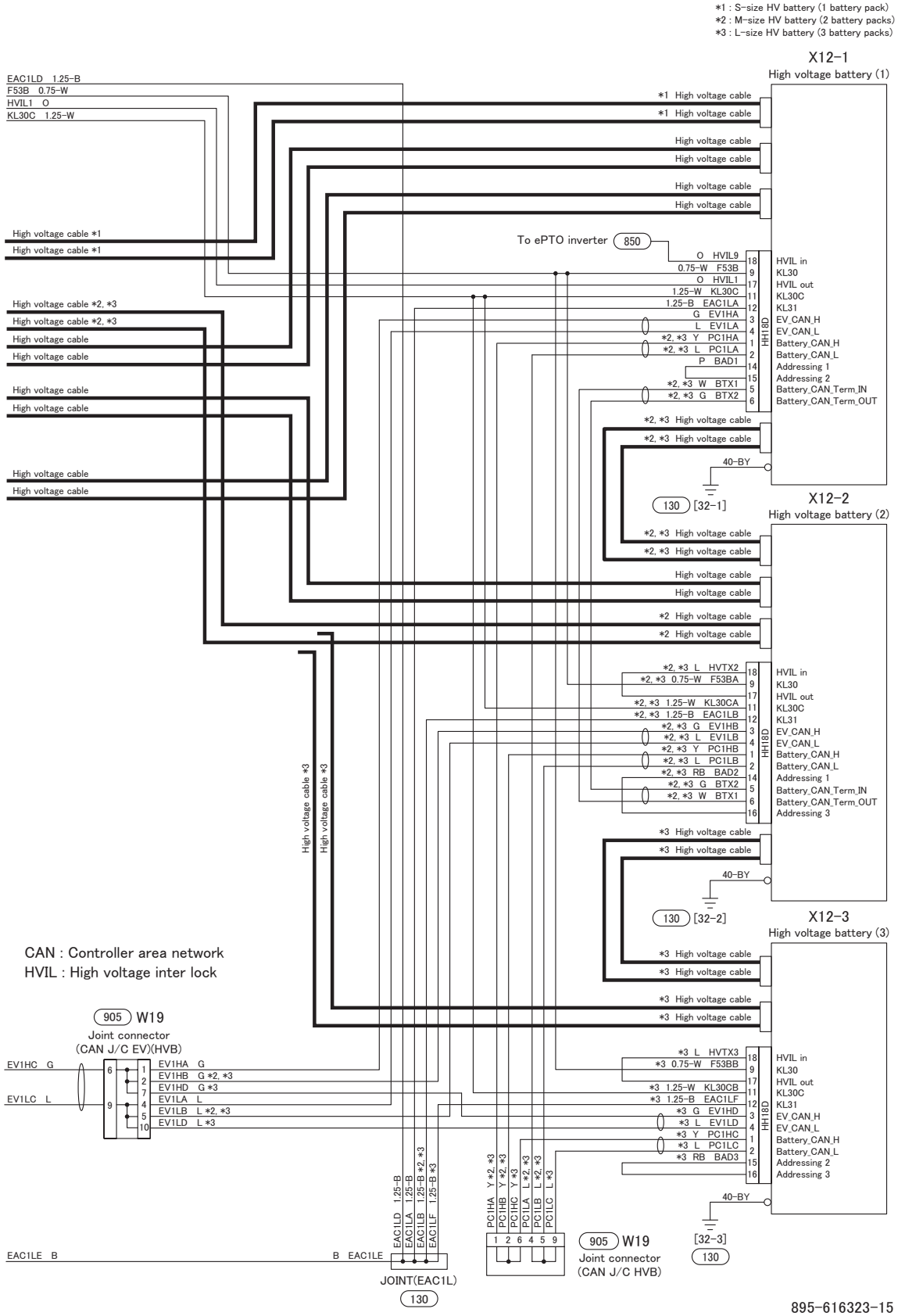
(14/15)



895-616323-14

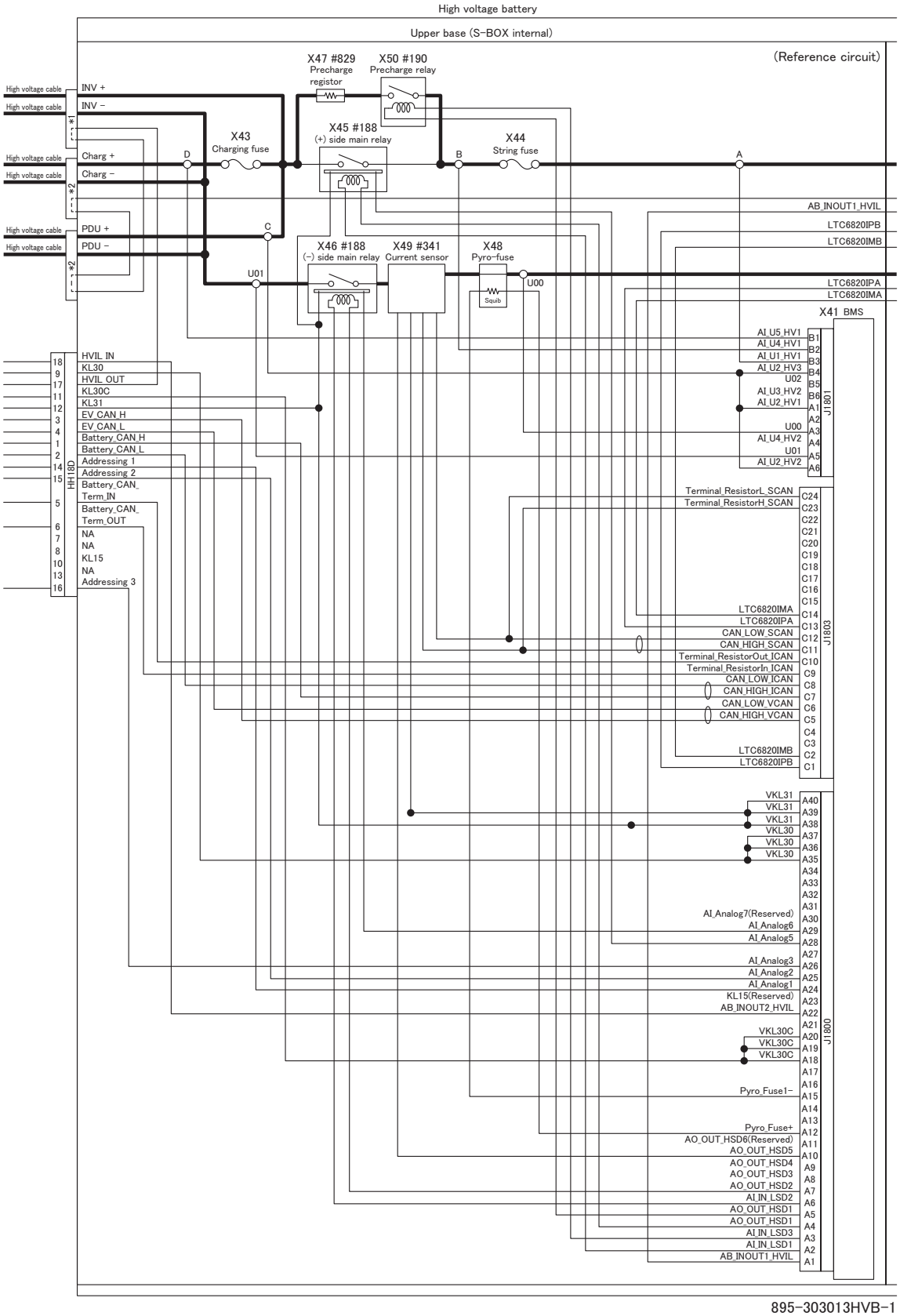
EV SYSTEM CIRCUIT (15)

(15/15)



EV SYSTEM CIRCUIT (16)

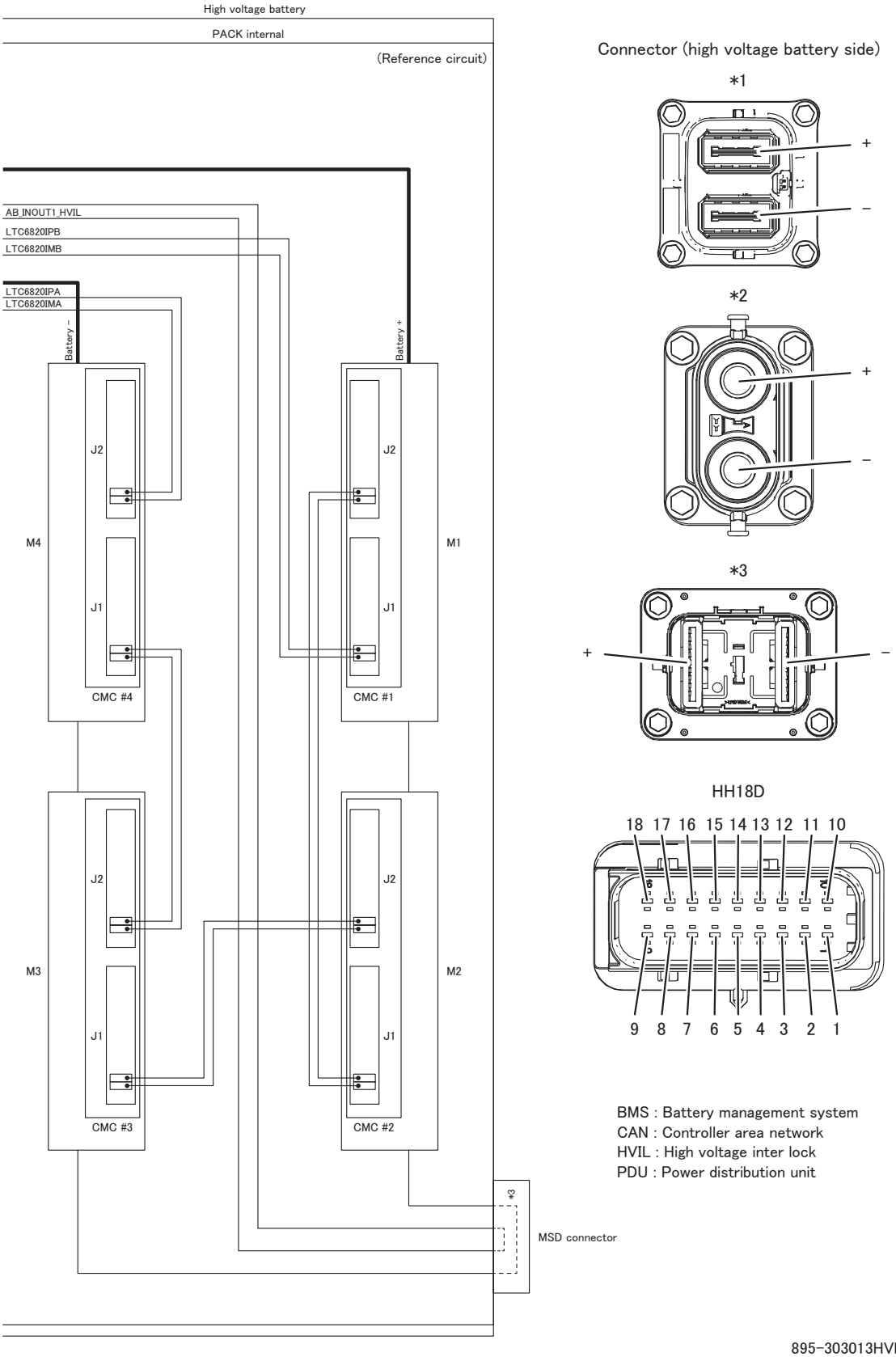
High voltage battery internal circuit(1/2)



895-303013HVB-1

EV SYSTEM CIRCUIT (17)

High voltage battery internal circuit(2/2)



Connector (high voltage battery side)

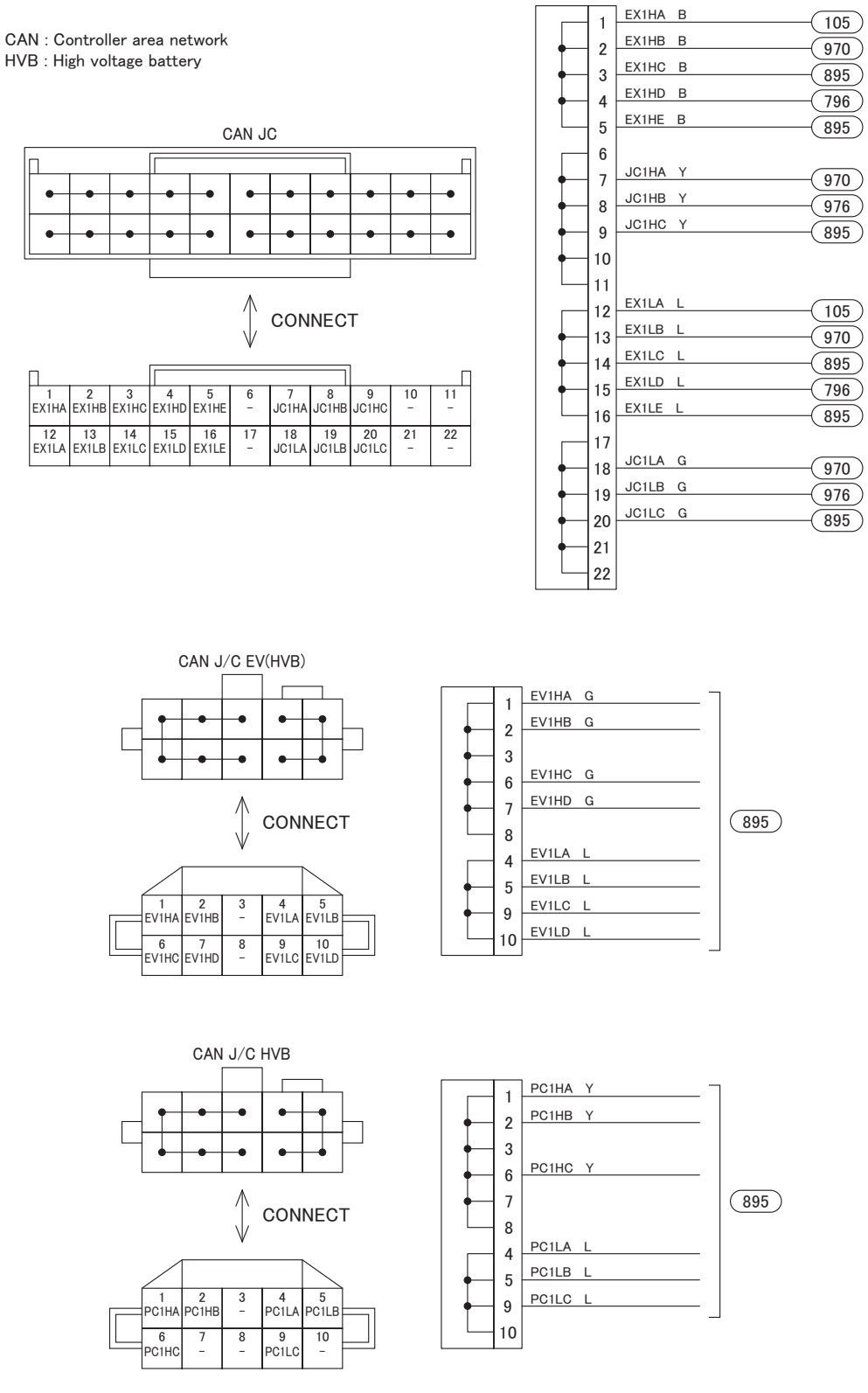
HH18D

BMS : Battery management system
CAN : Controller area network
HVIL : High voltage inter lock
PDU : Power distribution unit

895-303013HVB-2

JOINT CONNECTOR (J/C) (1)

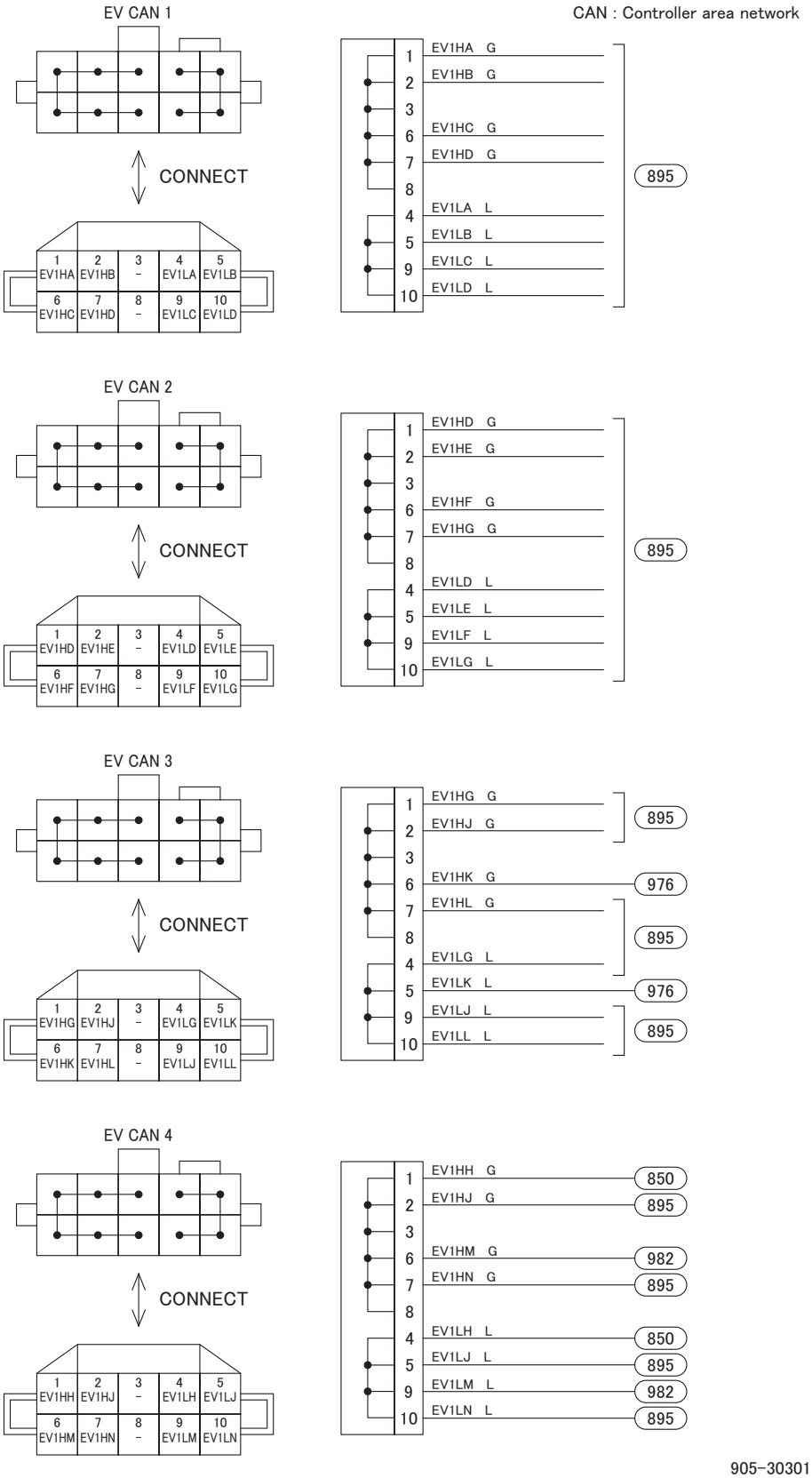
(1/4)



905-303013-1

JOINT CONNECTOR (J/C) (2)

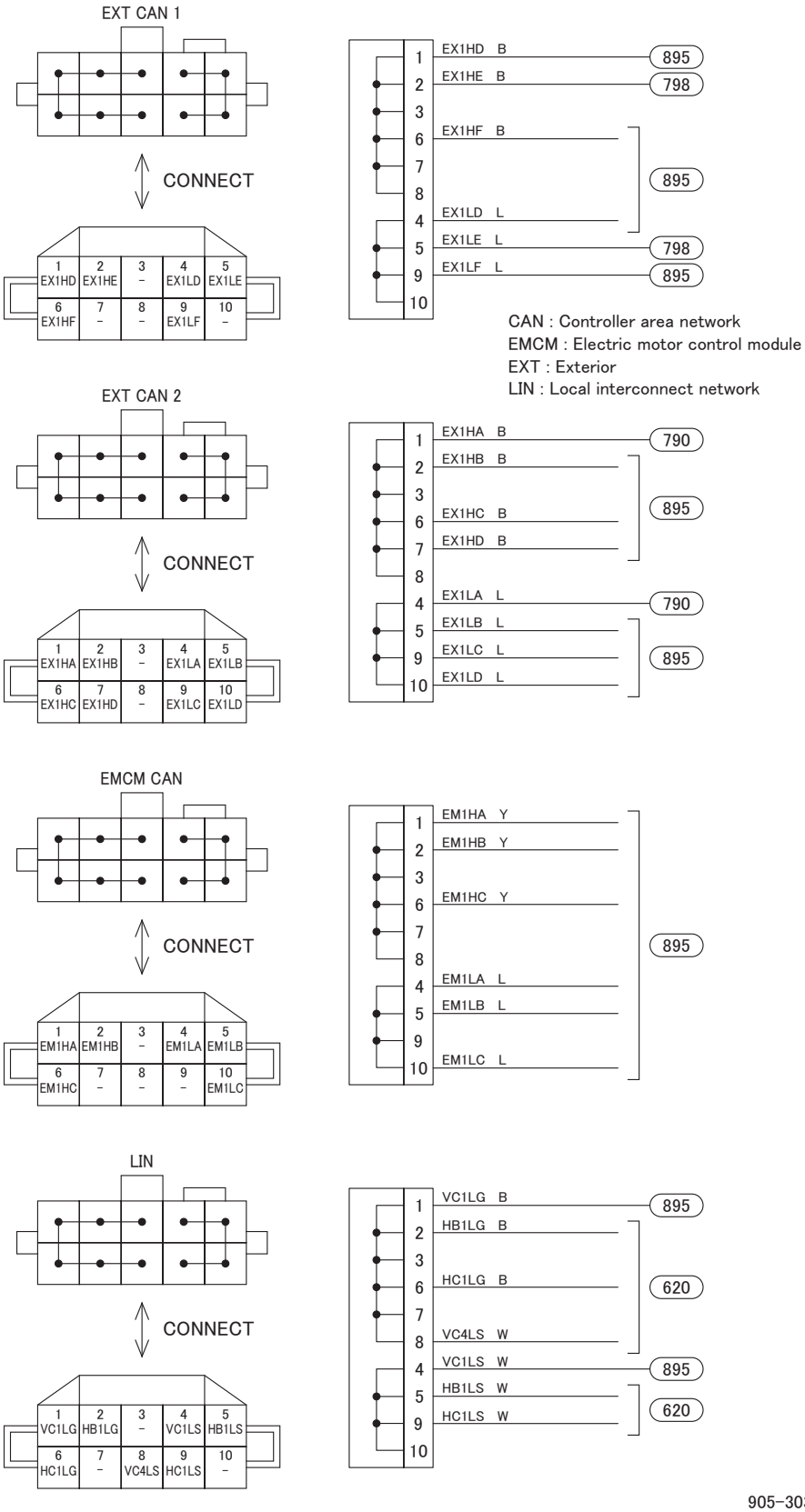
(2/4)



905-303013-2

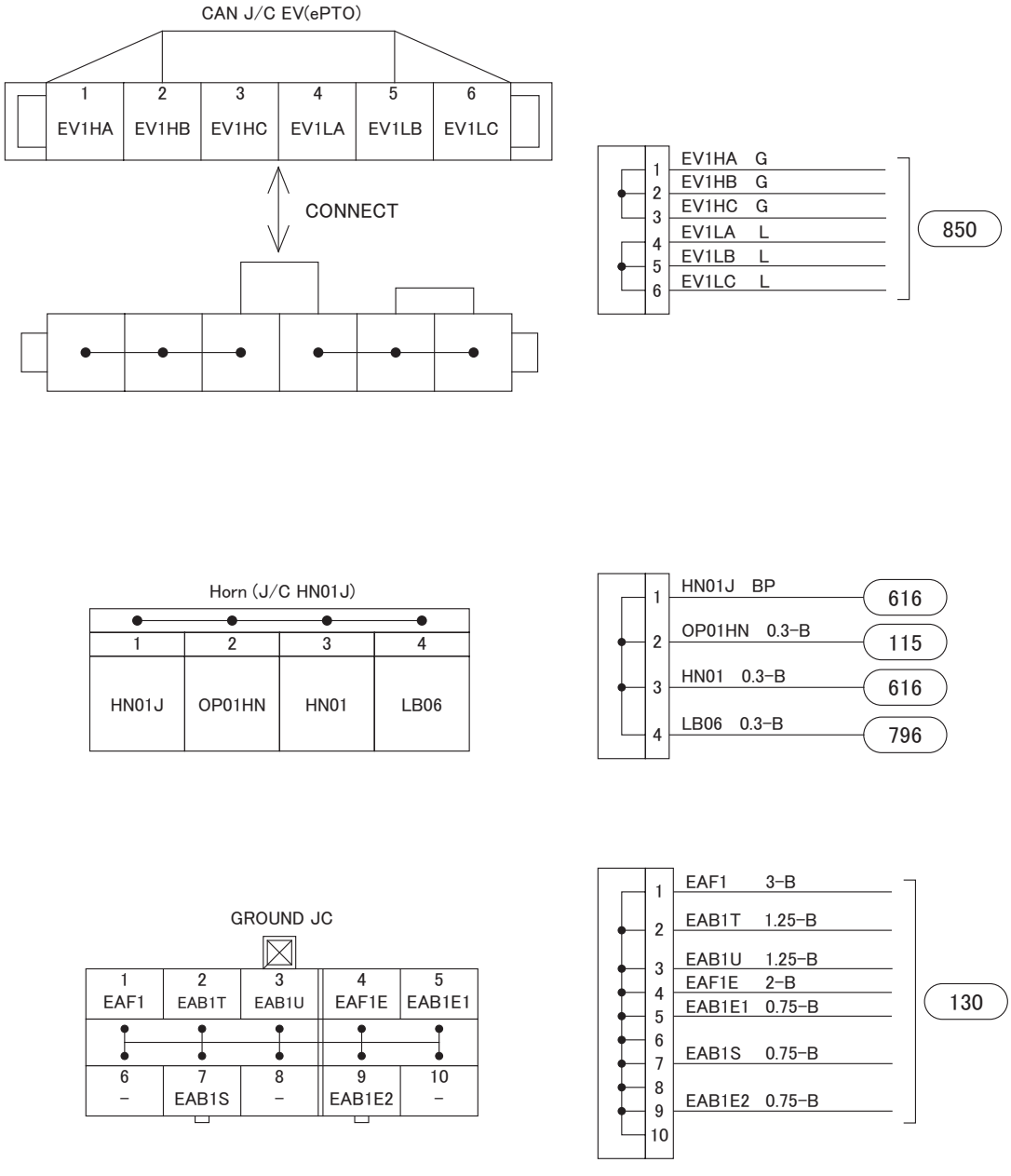
JOINT CONNECTOR (J/C) (3)

(3/4)



JOINT CONNECTOR (J/C) (4)

(4/4)

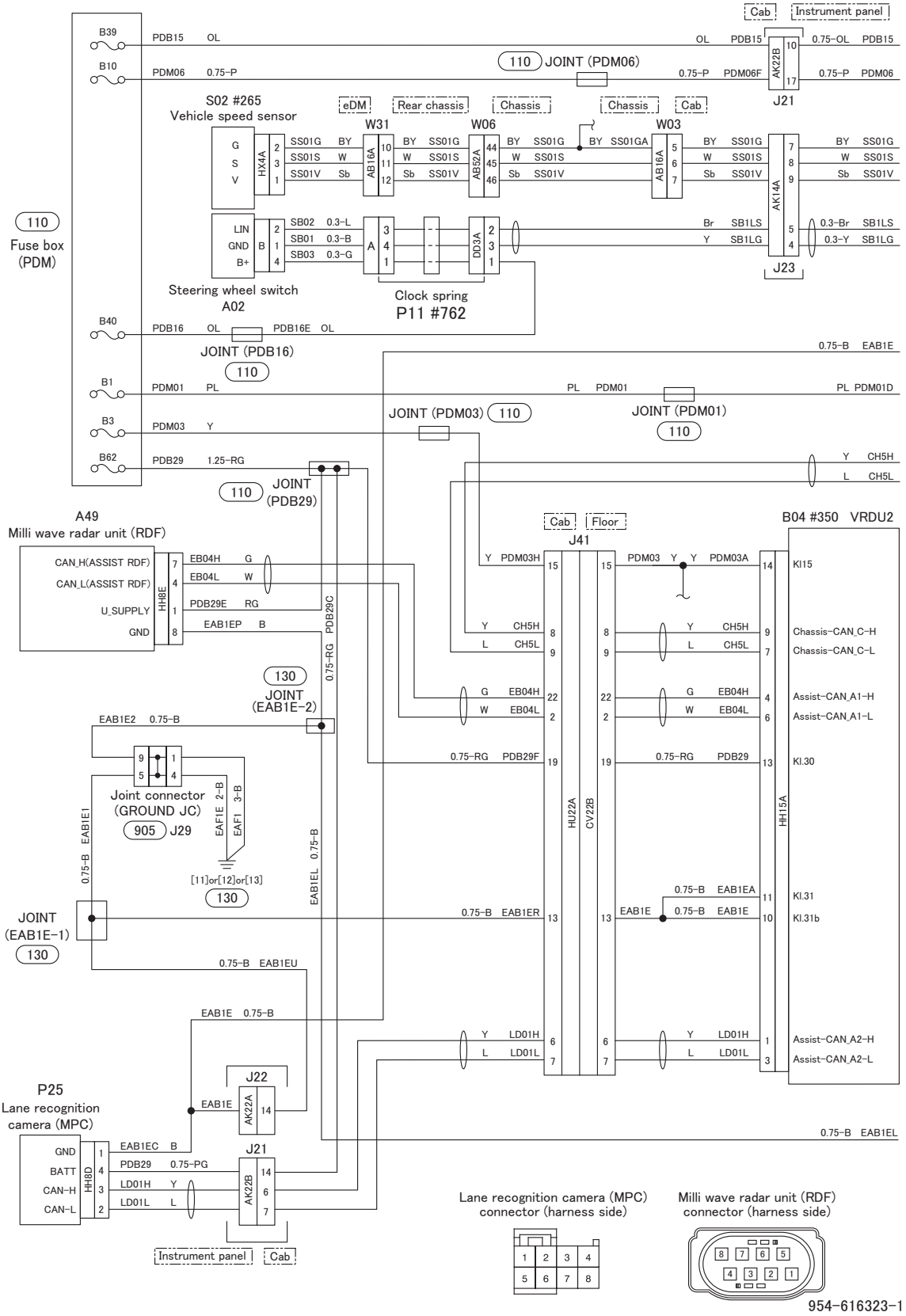


ePTO : Electric power take off

905-616323-4

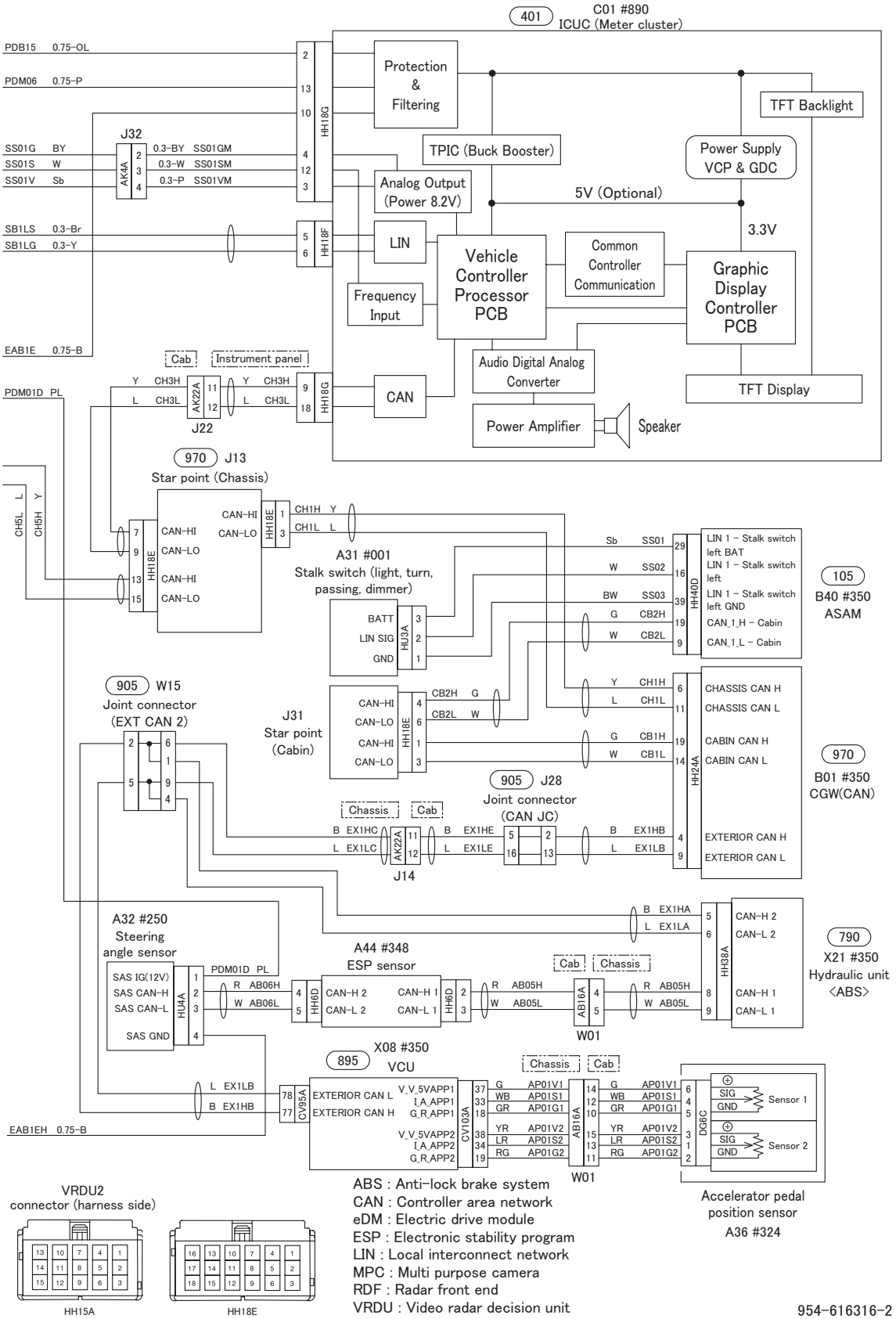
LDWS/IHC CIRCUIT (1)

(1/2)



LDWS/IHC CIRCUIT (2)

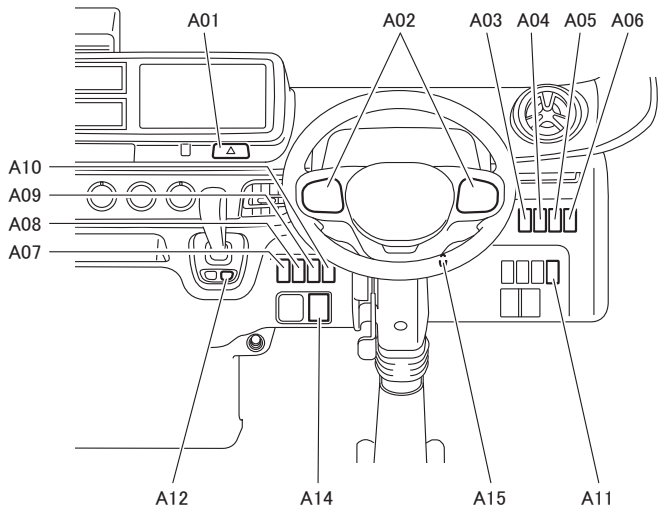
(2/2)



INSIDE CAB LAYOUT

SWITCH AND SENSOR (1)

A01-15 (Switch)



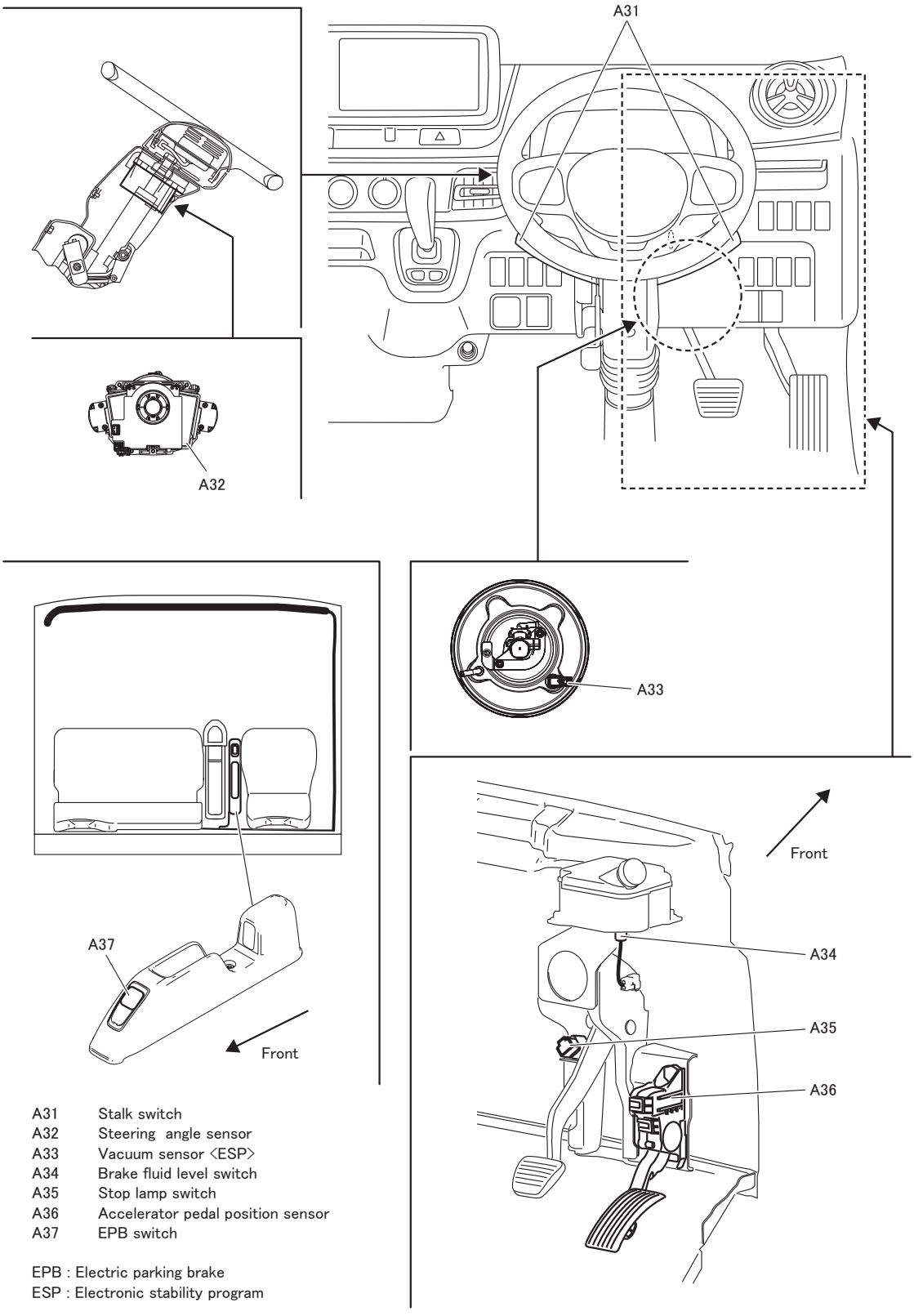
A01	Hazard switch
A02	Steering wheel switch
A03	Mirror heater switch
A04	ESP/ASR cutoff switch
A05	Hill start assist system cutoff switch
A06	Fog lamp switch
A07	PTC heater cut switch
A08	Steering wheel heater switch
A09	Seat heater switch
A10	Window defogger switch
A11	ePTO switch
A12	Electric parking lock (EPL) switch
A14	Headlamp leveling switch
A15	Starter switch

ASR : Anti spin regulator
ePTO : Electric power take off
ESP : Electronic stability program
PTC : Positive Temperature Coefficient

54-616323A-1

SWITCH AND SENSOR (2)

A31-37 (Switch, Sensor)



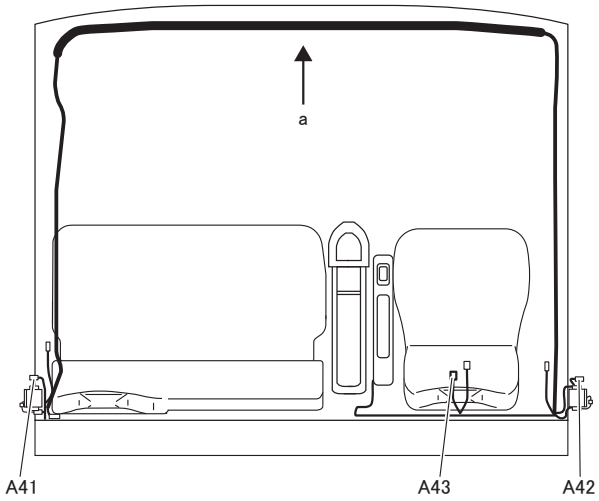
A31 Stalk switch
A32 Steering angle sensor
A33 Vacuum sensor <ESP>
A34 Brake fluid level switch
A35 Stop lamp switch
A36 Accelerator pedal position sensor
A37 EPB switch

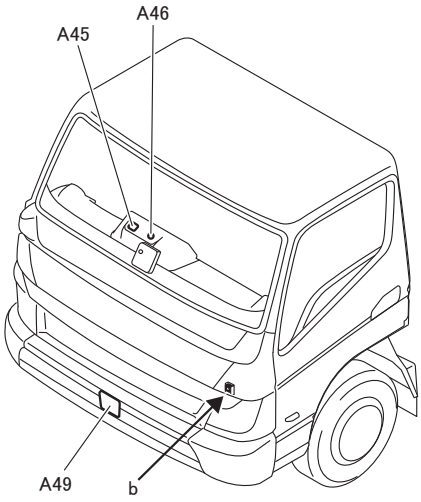
EPB : Electric parking brake
ESP : Electronic stability program

54-616323A-2R

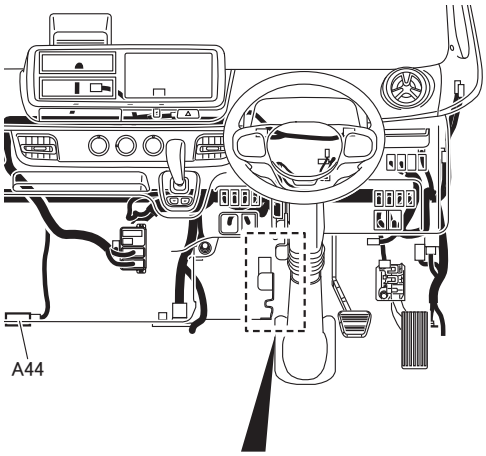
SWITCH AND SENSOR (3)

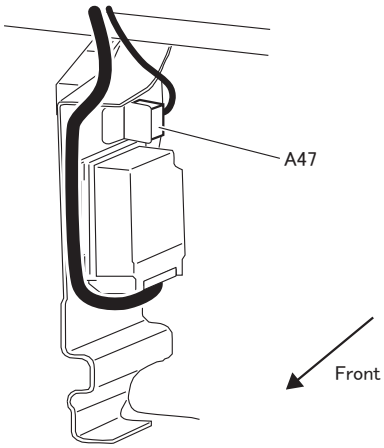
A41-49 (Switch, Sensor)



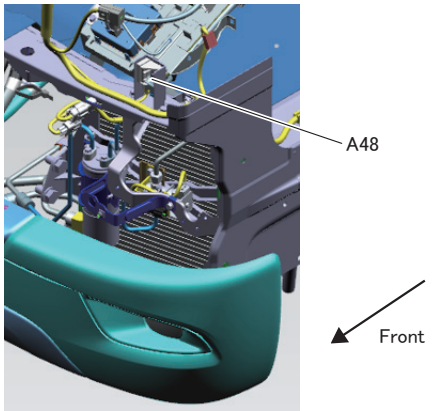


(View a)





(View b)



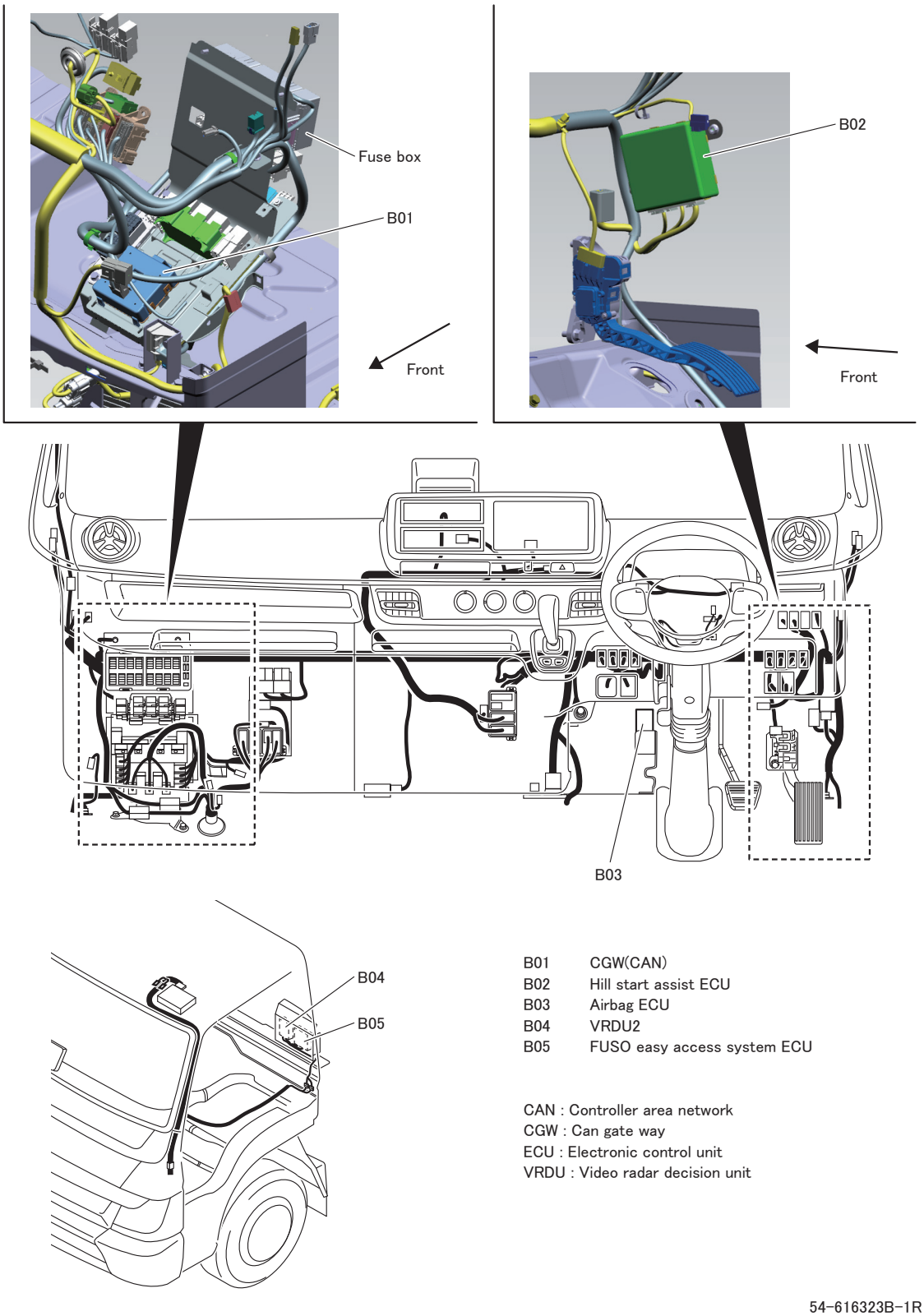
A41	Door switch, As
A42	Door switch, Dr
A43	Buckle switch (driver's seat side)
A44	ESP sensor
A45	Light sensor<Auto light>
A46	Photo sensor<Fully automatic air-conditioner>
A47	G sensor<VCU>
A48	Sub G sensor<SRS airbag>
A49	Milli wave radar unit (RDF)

As : Assistant driver's seat side
Dr : Driver's seat side
ESP : Electronic stability program
RDF : Radar front end
SRS : Supplemental restraint system
VCU : Vehicle control unit

54-616323A-3R

RELAY AND ELECTRONIC CONTROL UNIT (1)

B01-05



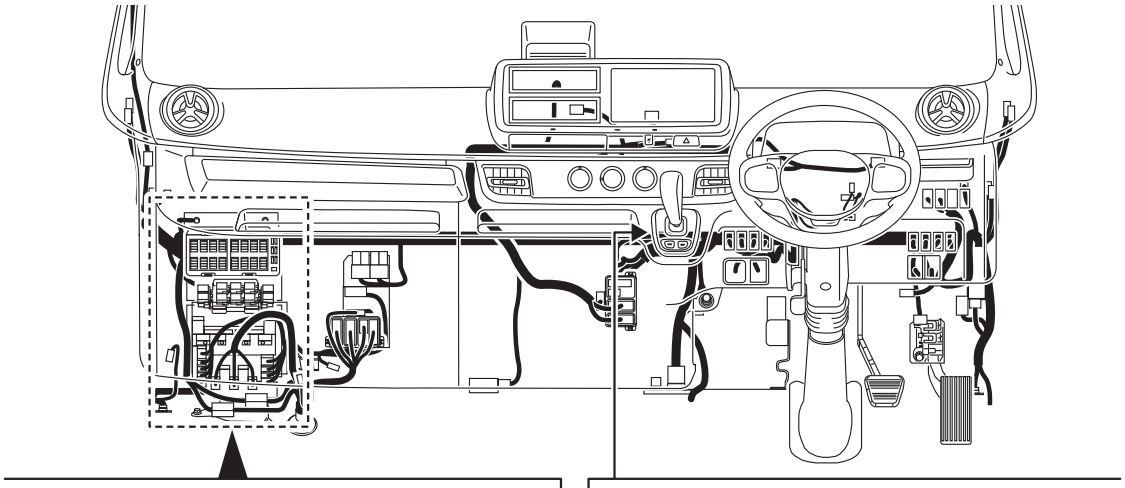
B01	CGW(CAN)
B02	Hill start assist ECU
B03	Airbag ECU
B04	VRDU2
B05	FUSO easy access system ECU

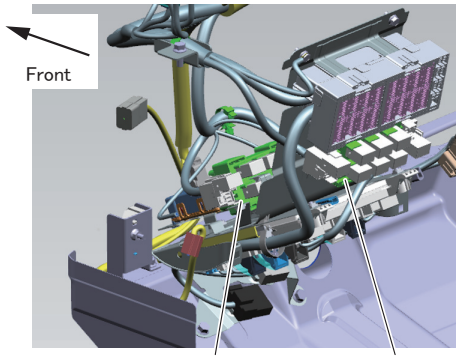
CAN : Controller area network
CGW : Can gate way
ECU : Electronic control unit
VRDU : Video radar decision unit

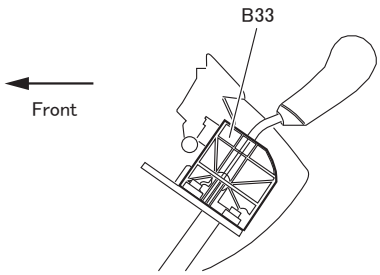
54-616323B-1R

RELAY AND ELECTRONIC CONTROL UNIT (2)

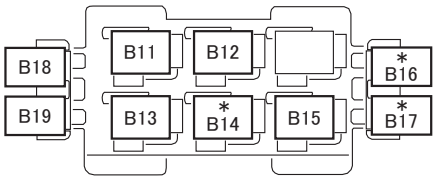
B11-33



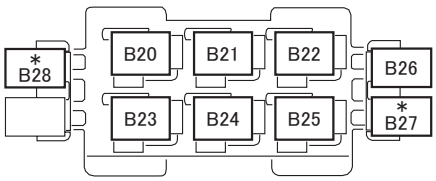




Relay block 1



Relay block 2



	B11	Steering wheel heater relay
	B12	Blower motor relay
	B13	Horn relay
*	B14	IGN relay (12V/24V)
	B15	Mirror heater relay
*	B16	Illumination relay (12V/24V)
*	B17	ACC relay (12V/24V)
	B18	ACC relay (12V)
	B19	IGN relay (12V)
	B20	Seat heater relay 1
	B21	Seat heater relay 2
	B22	Window heater relay 1
	B23	Window heater relay 2
	B24	Window heater relay 3
	B25	High voltage battery cutoff relay
	B26	Condenser fan main relay
*	B27	Parking brake relay (12V/24V)
*	B28	T/M neutral relay (12V/24V)
	B33	Shift lever unit

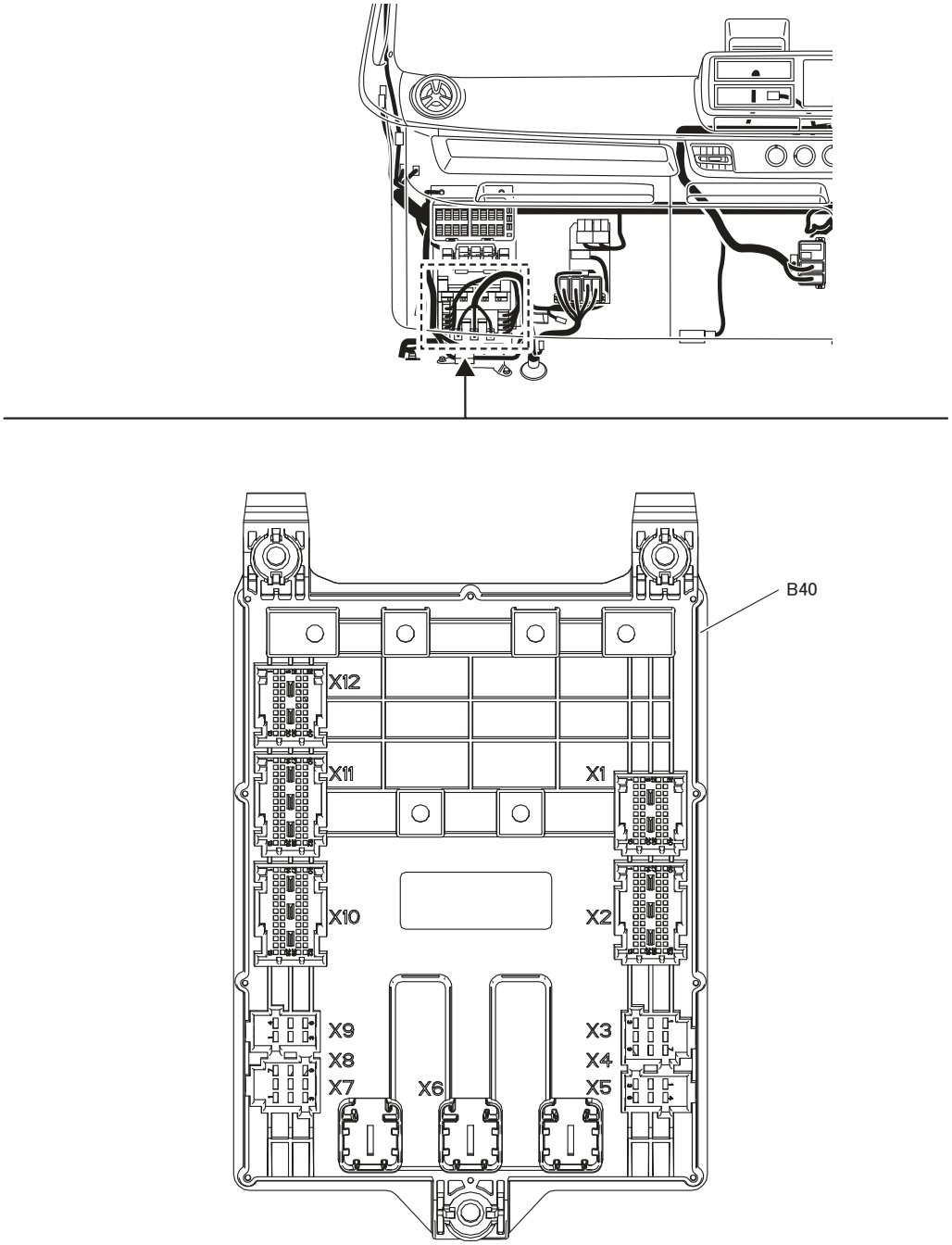
T/M : Transmission

* The voltage is different depending on the specification of the vehicle.
  ·Vehicle with battery equaliser : 24V
  ·Vehicle without battery equaliser : 12V

54-616323B-2R

RELAY AND ELECTRONIC CONTROL UNIT (3)

B40 (ASAM)



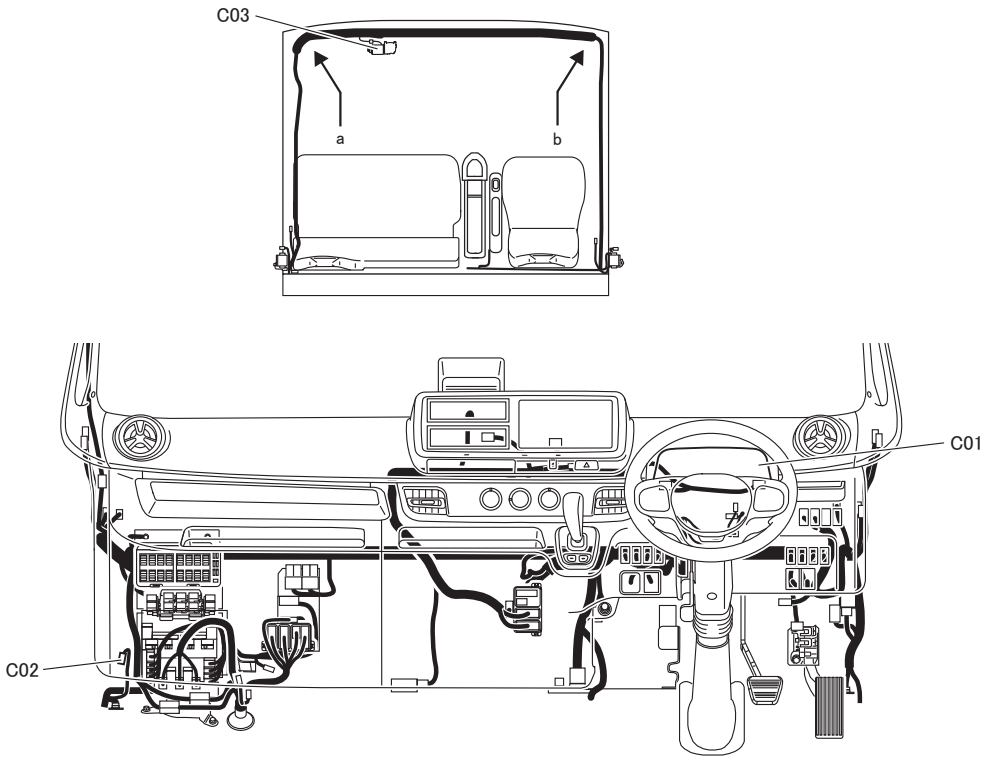
B40 ASAM

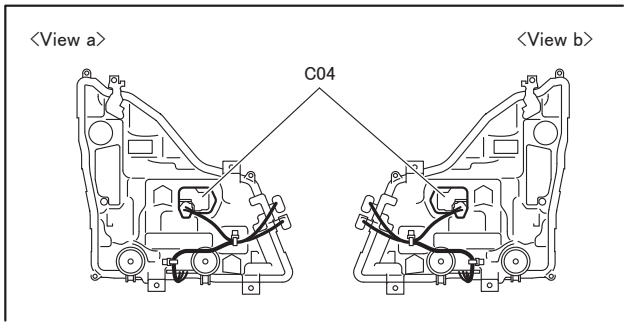
ASAM : Advanced signal detect and actuation module

54-616323B-3

METER AND MOTOR

C01-04



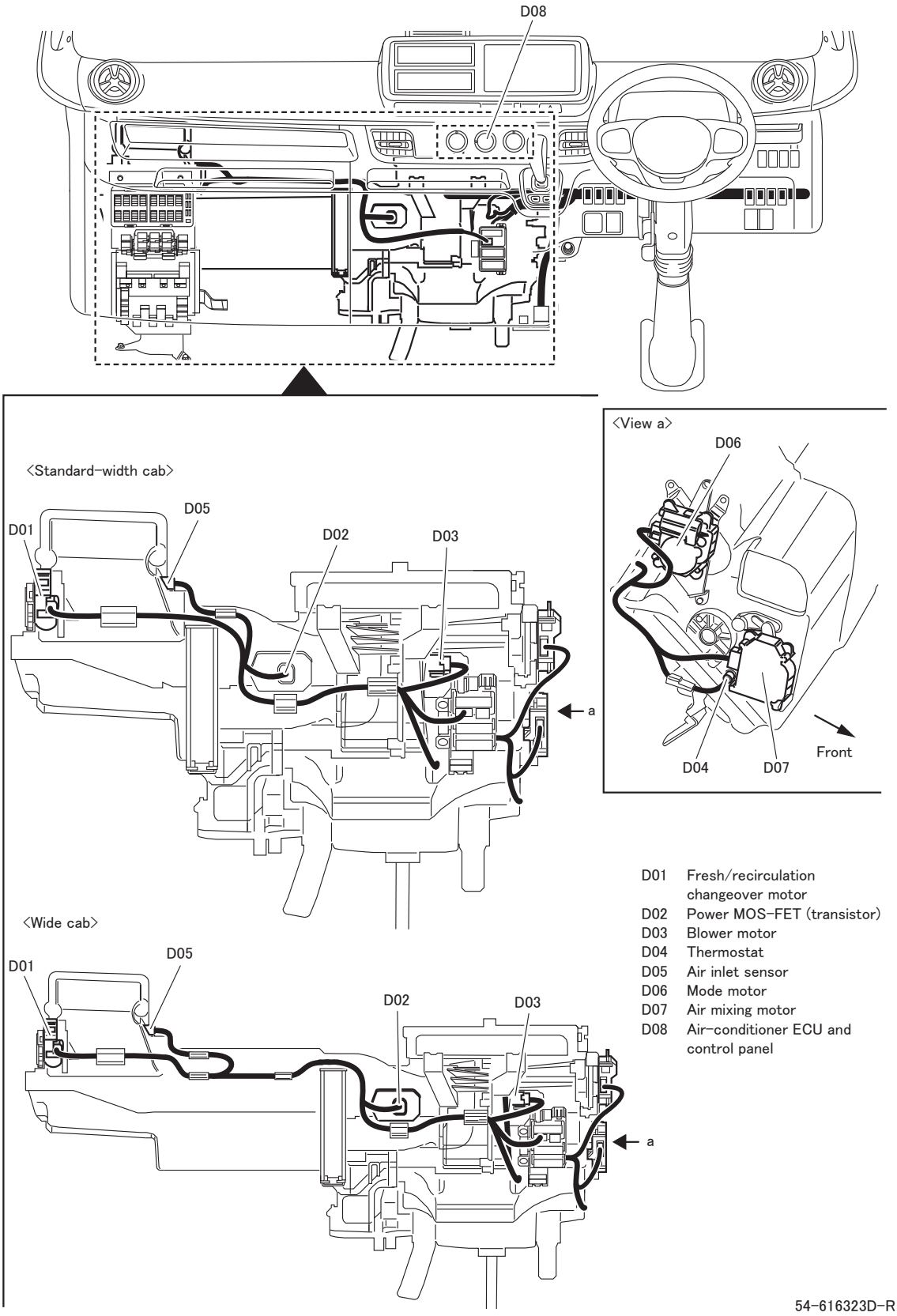


C01	ICUC (Meter cluster)
C02	Window washer motor
C03	Wiper motor
C04	Headlamp leveling actuator

54-616323C

HEATER AND AIR-CONDITIONER

D01-08

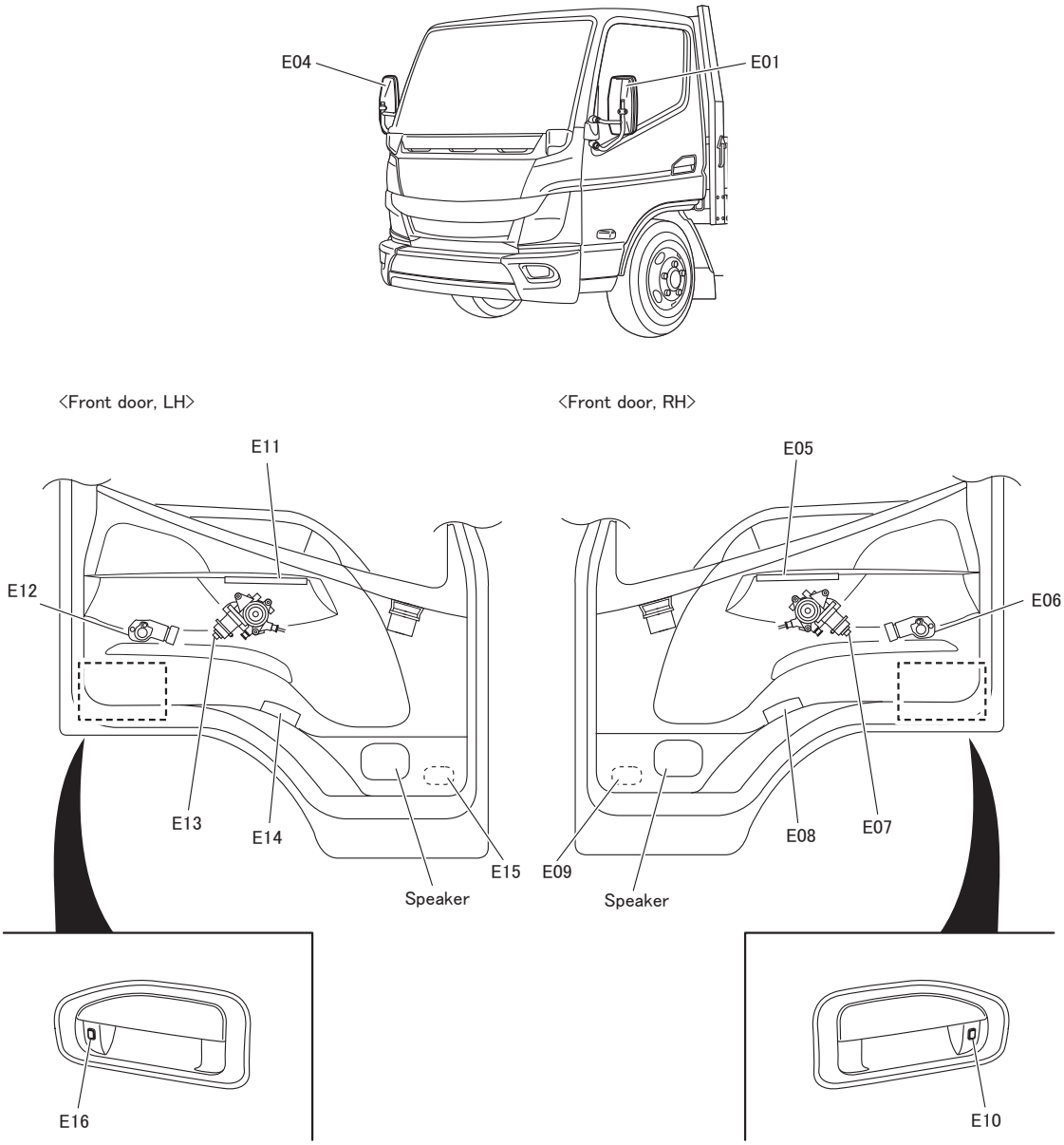


D01 Fresh/recirculation changeover motor
D02 Power MOS-FET (transistor)
D03 Blower motor
D04 Thermostat
D05 Air inlet sensor
D06 Mode motor
D07 Air mixing motor
D08 Air-conditioner ECU and control panel

54-616323D-R

DOOR AND MIRROR

E01-16



E01 Mirror heater, As
E04 Mirror heater, Dr
E05 Power window switch, Dr
E06 Door lock actuator, Dr
E07 Power window motor, Dr
E08 Step lamp, Dr
E09 Front side turn signal lamp, Dr
E10 Door handle switch, Dr

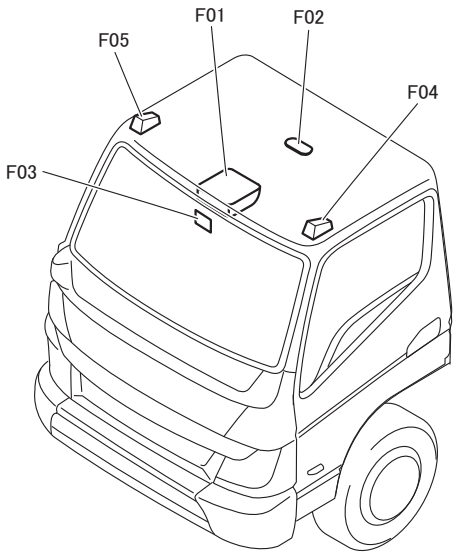
E11 Power window switch, As
E12 Door lock actuator, As
E13 Power window motor, As
E14 Step lamp, As
E15 Front side turn signal lamp, As
E16 Door handle switch, As

Dr : Driver's seat side
As : Assistant driver's seat side

54-616323E-R

ROOF

F01-05

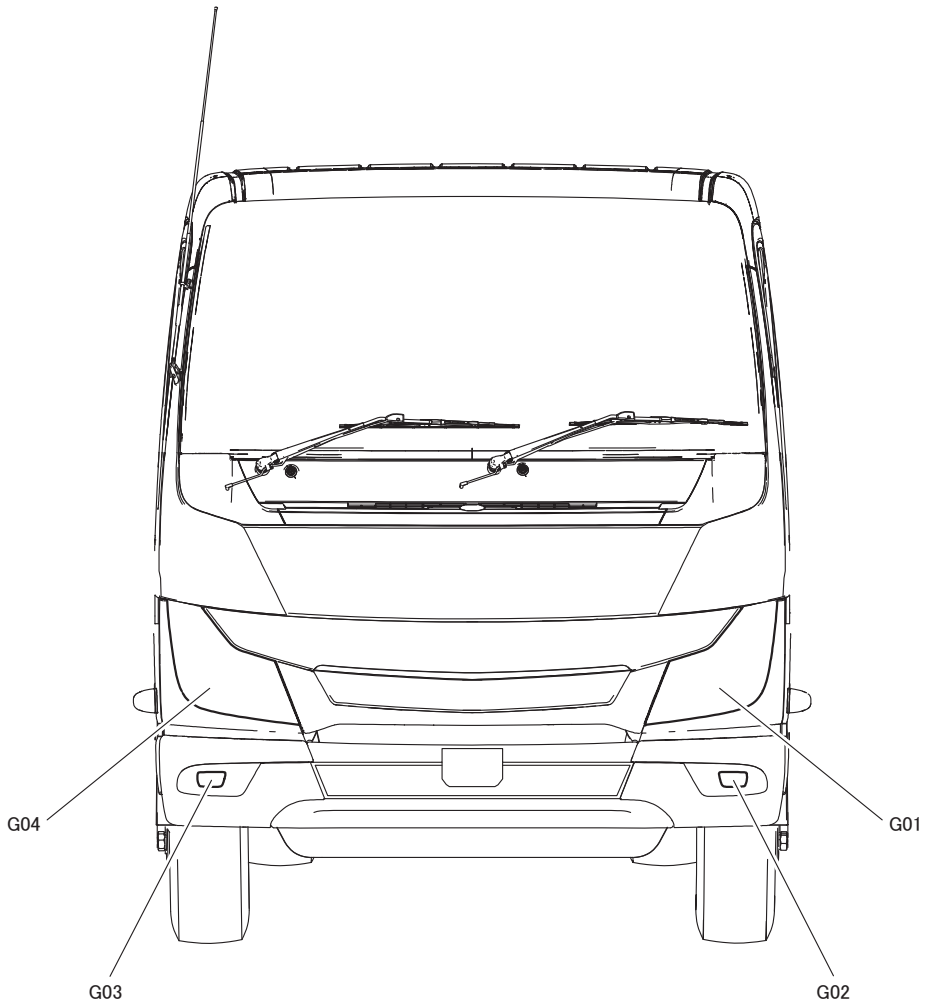


F01 Cab lamp
F02 In car sensor
F03 Back eye monitor
F04 End-outline marker lamp, LH <Wide cab>
F05 End-outline marker lamp, RH <Wide cab>

54-303014F

CAB

G01-04

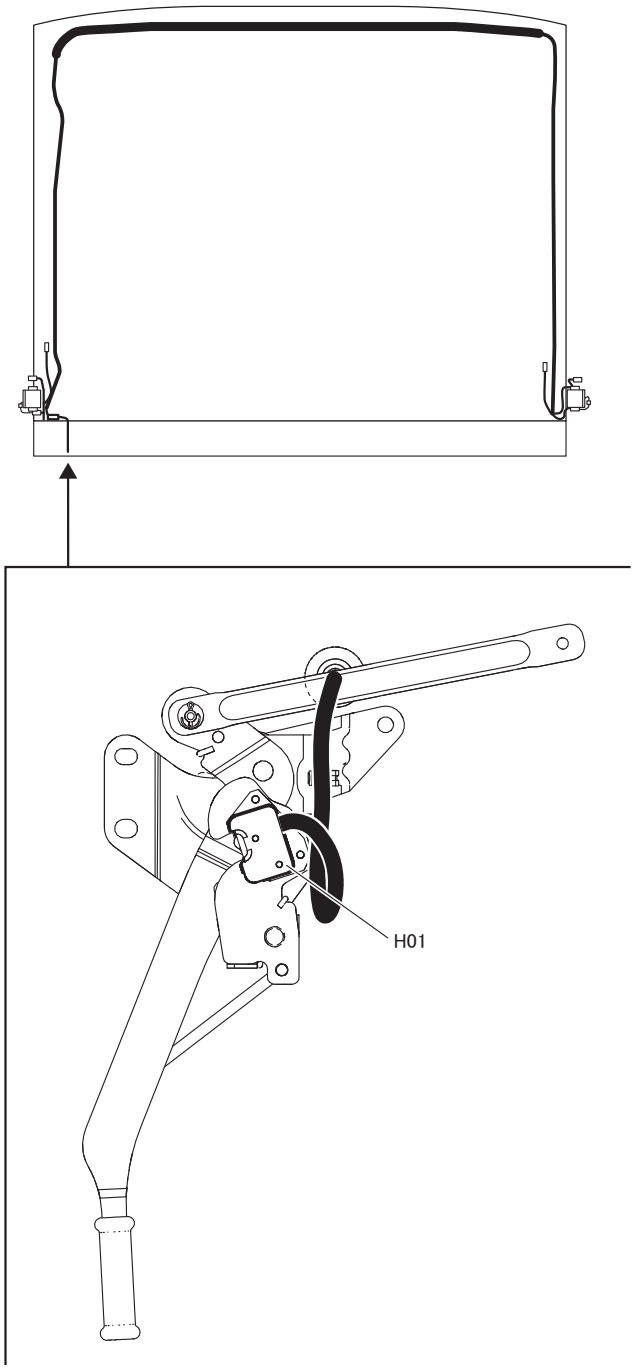


G01 Headlamp, LH
G02 Fog lamp, LH
G03 Fog lamp, RH
G04 Headlamp, RH

54-303014G

TILT

H01

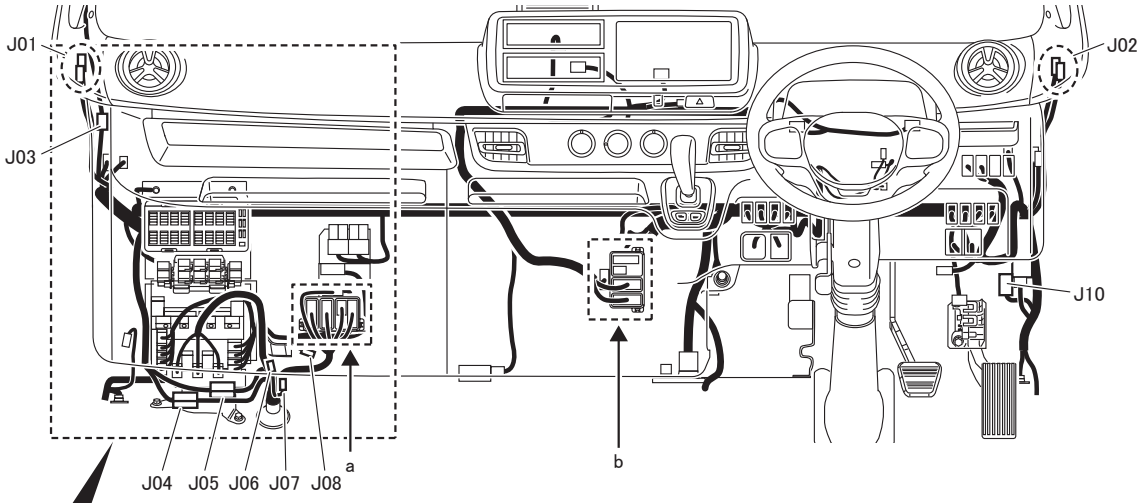


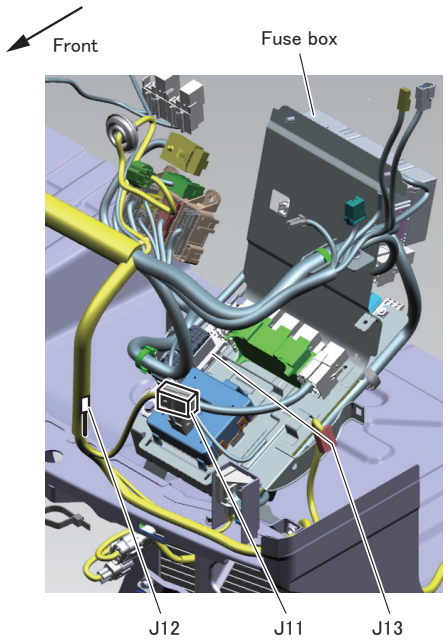
H01 Cab tilt lock switch

54-303014H

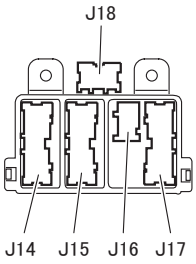
JOINTS OF MAIN HARNESS CONNECTORS (1)

J01-J23

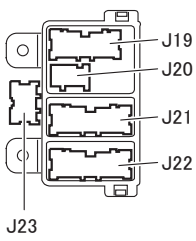




(View a)



(View b)



J01	Connection of cab harness and windscreen heater harness LH : [AL2A], [AL1A]
J02	Connection of cab harness and windscreen heater harness RH : [AL2A], [AL1A]
J03	Connection of cab harness and roof harness : [CV22B], [HU22A]
J04	Connection of cab harness and chassis harness : [BM4A]
J05	Connection of cab harness and chassis harness : [AN6A]
J06	Optional connector (VIRTUAL KL15) : [BN1A]
J07	Optional connector (Bodybuilder) : [AK6A]
J08	Optional connector (XMC) : [AK3A]
J10	Connection of cab harness and door harness, Dr : [DD13A]
J11	Connection of cab harness and door harness, As : [DD13A]
J12	Resistor (EMCM CAN)
J13	Star point (Chassis)
J14	Connection of cab harness and chassis harness : [AK22A]
J15	Connection of cab harness and chassis harness : [AK22B]
J16	Connection of cab harness and chassis harness : [AN6A]
J17	Connection of cab harness and chassis harness : [AK22A]
J18	Connection of cab harness and chassis harness : [AK14A]
J19	Connection of instrument panel harness and air-conditioner harness : [AK18A]
J20	Connection of cab harness and air-conditioner harness : [AN2A]
J21	Connection of cab harness and instrument panel harness : [AK22B]
J22	Connection of cab harness and instrument panel harness : [AK22A]
J23	Connection of cab harness and instrument panel harness : [AK14A]

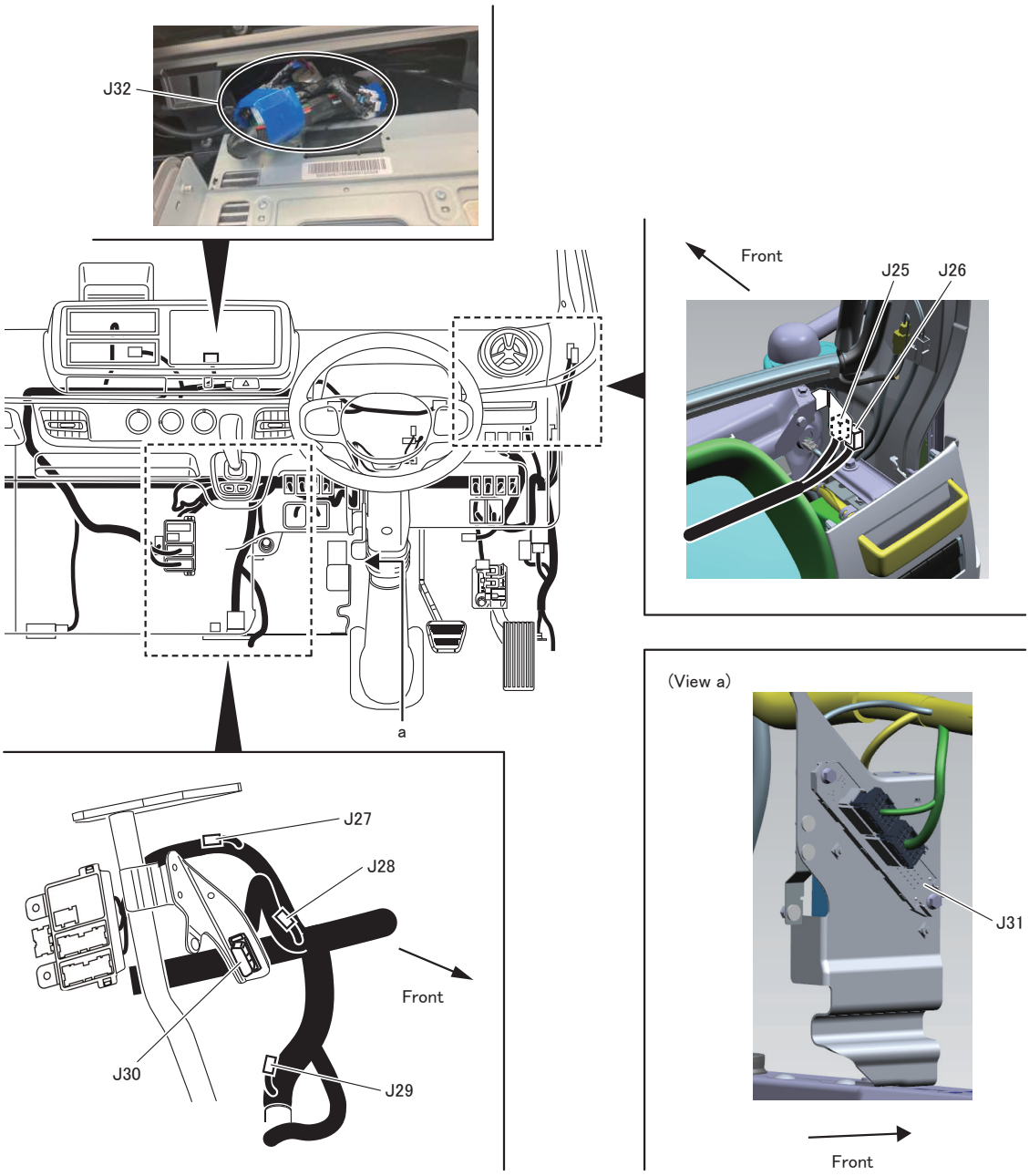
EMCM : Electric motor control module
XMC : Expansion module cabin

Indicate by connector type [ ].

54-616323J-1R

JOINTS OF MAIN HARNESS CONNECTORS (2)

J25-J32



J25	Connection of cab harness and back eye monitor harness : [AK10A]
J26	Connection of cab harness and cab lamp harness : [AN8C]
J27	Joint connector (J/C HN01J)
J28	Joint connector (CAN JC)
J29	Joint connector (GROUND JC)
J30	Diagnosis connector
J31	Star point (Cabin)
J32	FMS connector : [HX12A], Optional connector : [AK6A], Connector (for vehicle speed sensor) : [AK4A], Connection of instrument panel harness and radio harness : [HH16B]

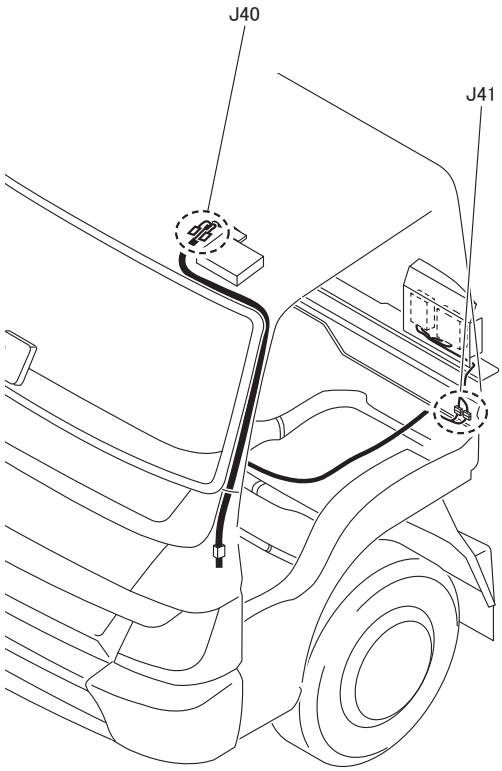
CAN : Controller area network
FMS : Fleet management system

Indicate by connector type [ ].

54-616323J-2R

JOINTS OF MAIN HARNESS CONNECTORS (3)

J40-41

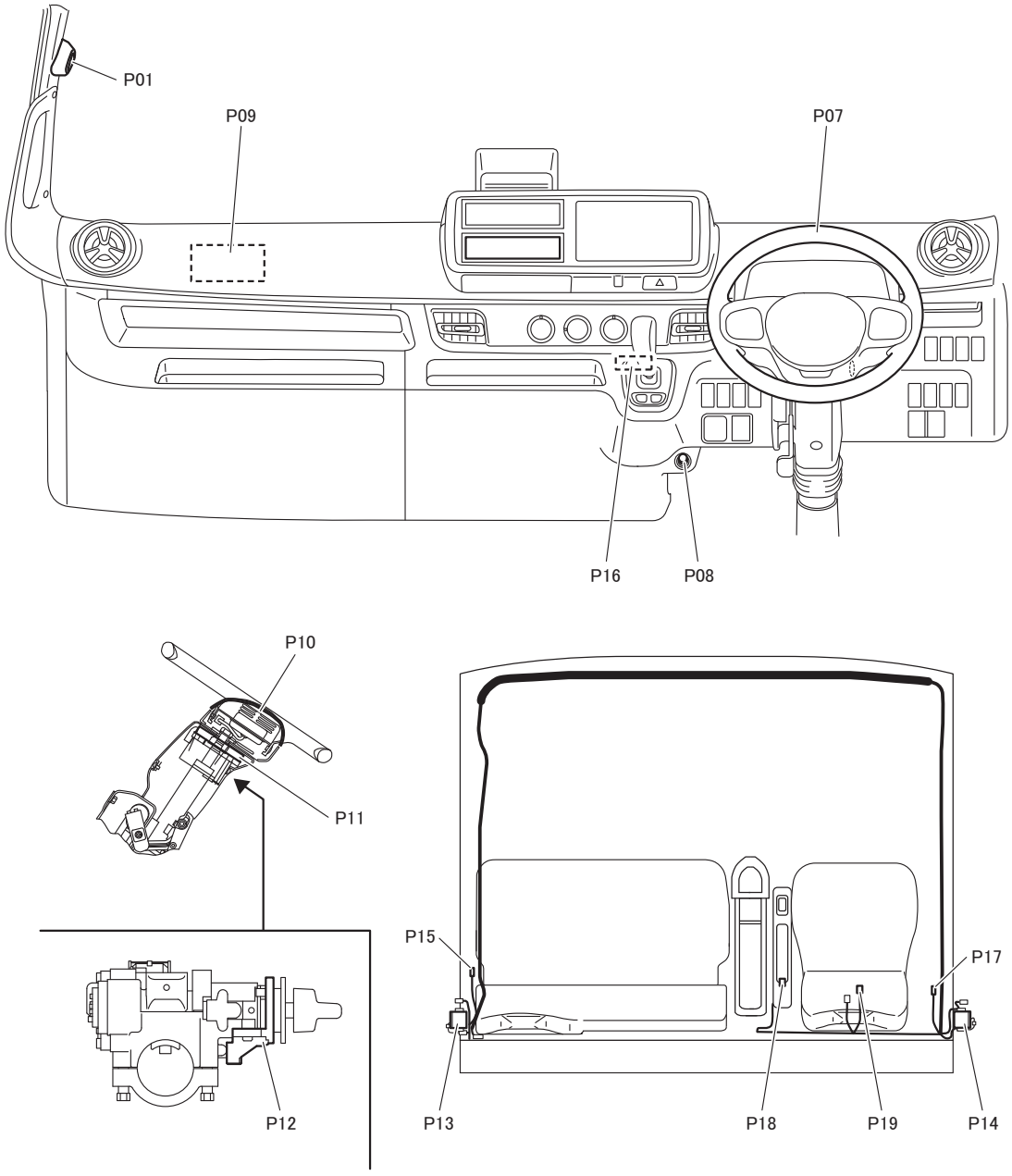


J40 RS232-1 connector, RS232-3 connector
J41 Connection of cab harness and floor harness : [HU22A], [CV22B]
Connection of cab harness and floor harness : [PH14A]

54-616323J-3

OTHERS (1)

P01-19

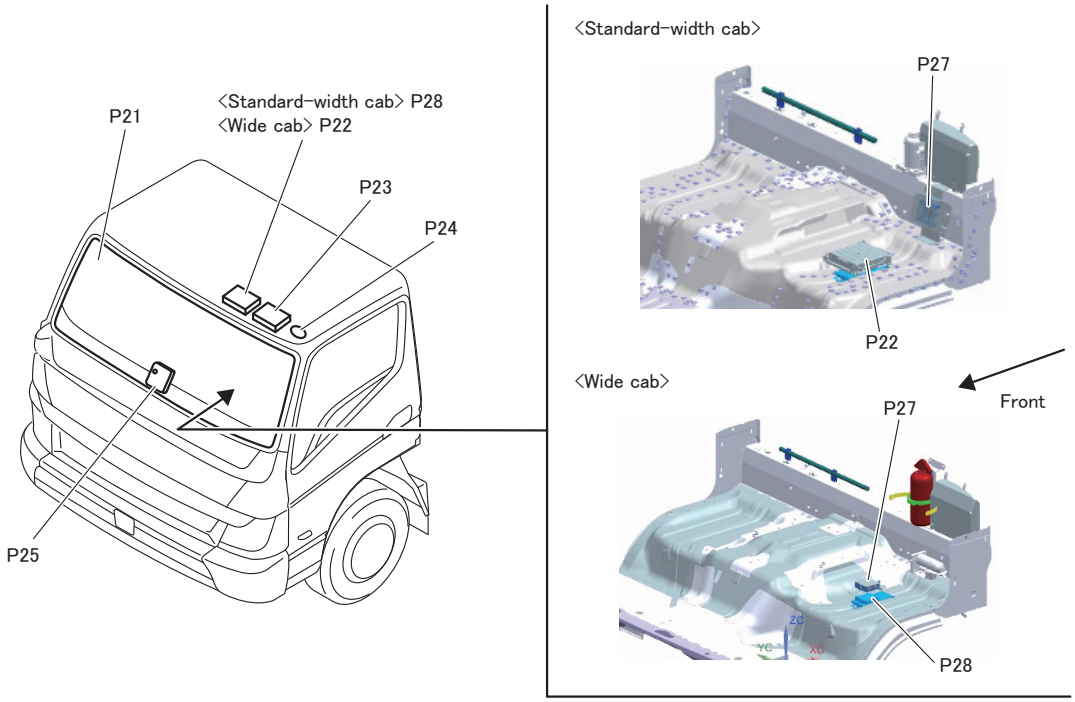


P01	Warning lamp (BSW)
P07	Steering wheel heater
P08	Cigarette lighter
P09	Airbag module (assistant driver's seat side)
P10	Airbag module (driver's seat side)
P11	Clock spring
P12	Immobiliser antenna
P13	Seat belt with pre-tensioner (assistant driver's seat side)
P14	Seat belt with pre-tensioner (driver's seat side)
P15	Antenna LH
P16	Antenna centre
P17	Antenna RH
P18	USB power socket
P19	Seat heater

54-616323P-1R

OTHERS (2)

P21-28



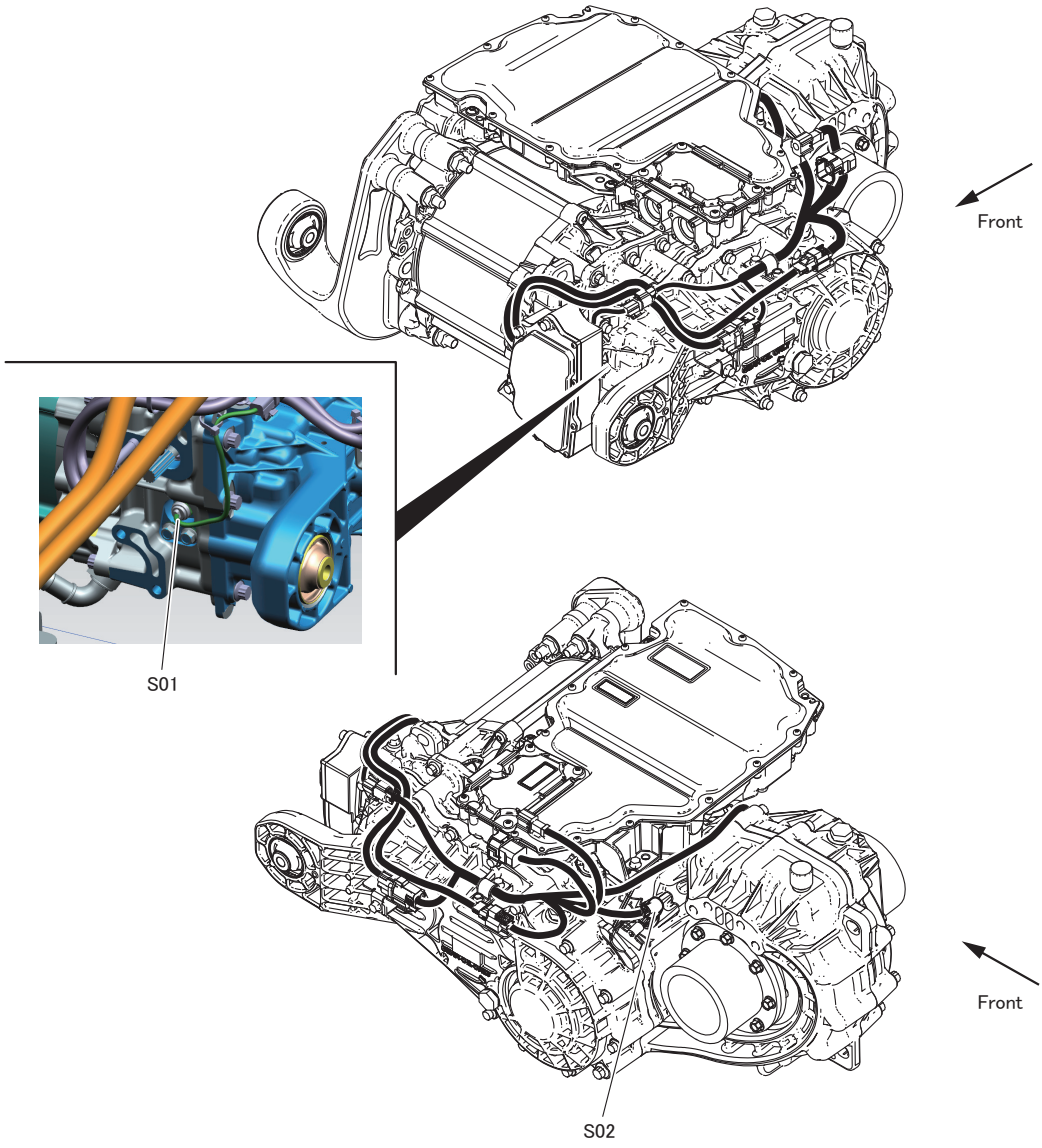
P21	Window heater
P22	XMC
P23	Telematics
P24	GPS antenna<Telematics>
P25	Lane recognition camera (MPC)
P27	FMS
P28	MSF-SIU

FMS : Fleet management system
MPC : Multi purpose camera
XMC : Expansion module cabin

54-616323-2

GEARBOX

S01-02



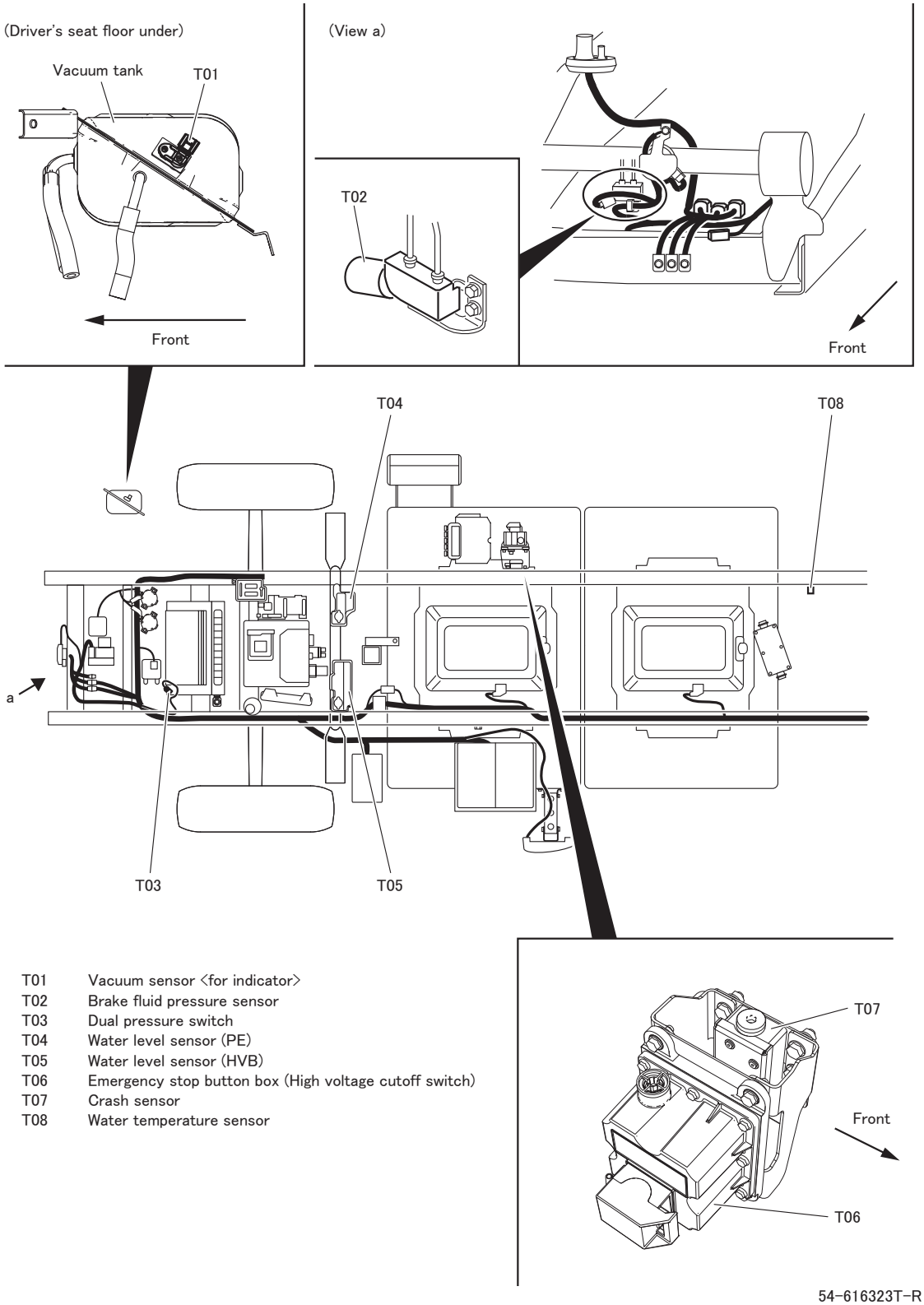
S01 Parking gear switch
S02 Vehicle speed sensor

54-303014S

CHASSIS SIDE

SWITCH AND SENSOR

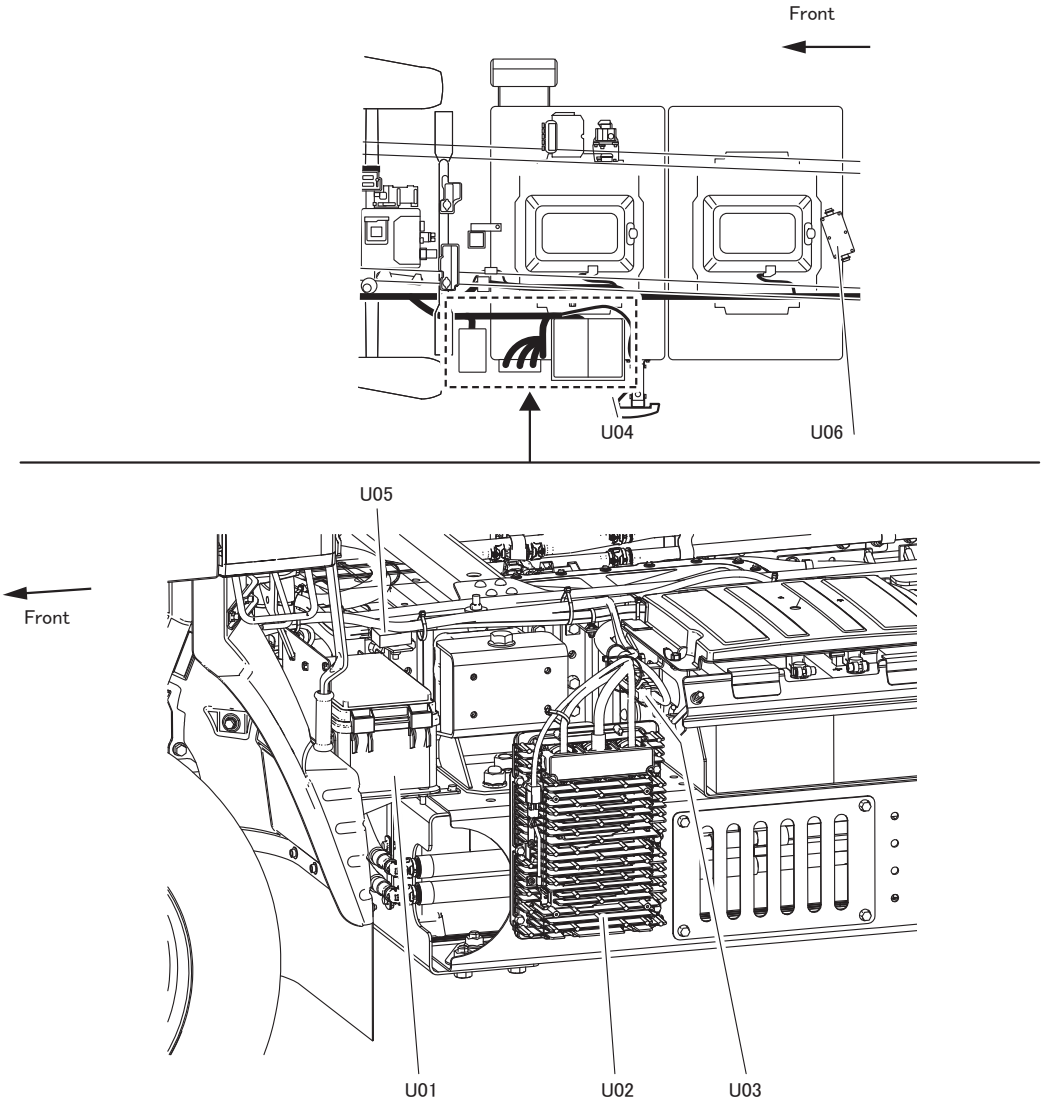
T01-08



T01	Vacuum sensor <for indicator>
T02	Brake fluid pressure sensor
T03	Dual pressure switch
T04	Water level sensor (PE)
T05	Water level sensor (HVB)
T06	Emergency stop button box (High voltage cutoff switch)
T07	Crash sensor
T08	Water temperature sensor

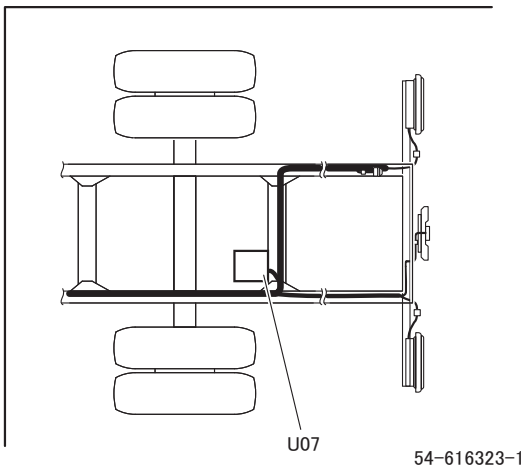
FUSE, RELAY AND ELECTRONIC CONTROL UNIT (1)

U01-07



U01 Relay & high-current fuse box
U02 Battery equaliser
U03 Fuse (Electric power steering)
U04 Lateral milli wave radar unit (SRR)
U05 Slow blow fuse (DC/DC converter)
U06 Fuse (eDM) <Except S-size HV battery (1 battery pack)>
U07 EPB ECU

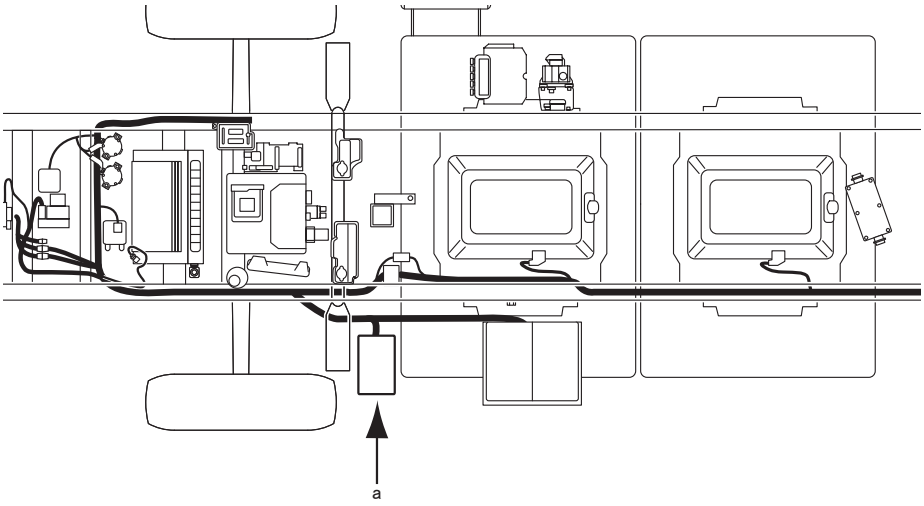
eDM : Electric drive module
ECU : Electronic control unit
EPB : Electric parking brake
SRR : Short range radar



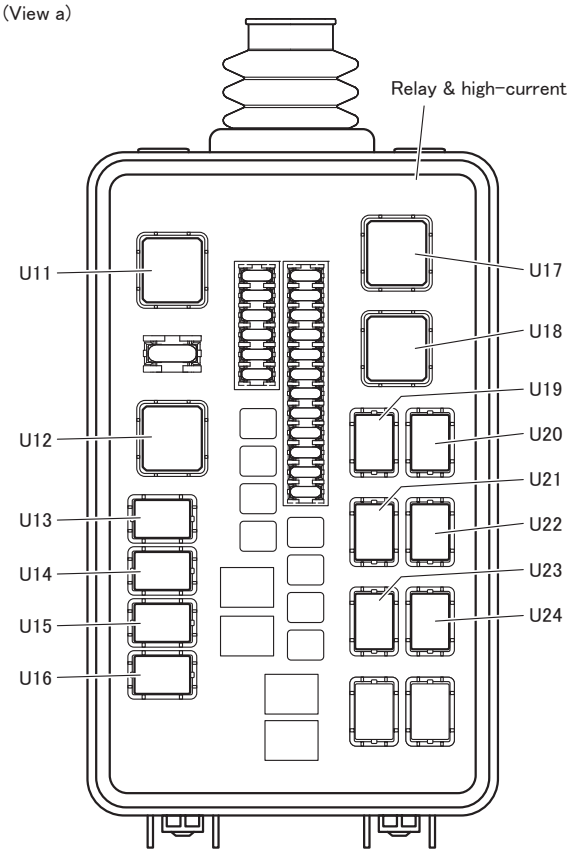
54-616323-1

FUSE, RELAY AND ELECTRONIC CONTROL UNIT (2)

U11-24 (Relay & high current fuse box)



(View a)



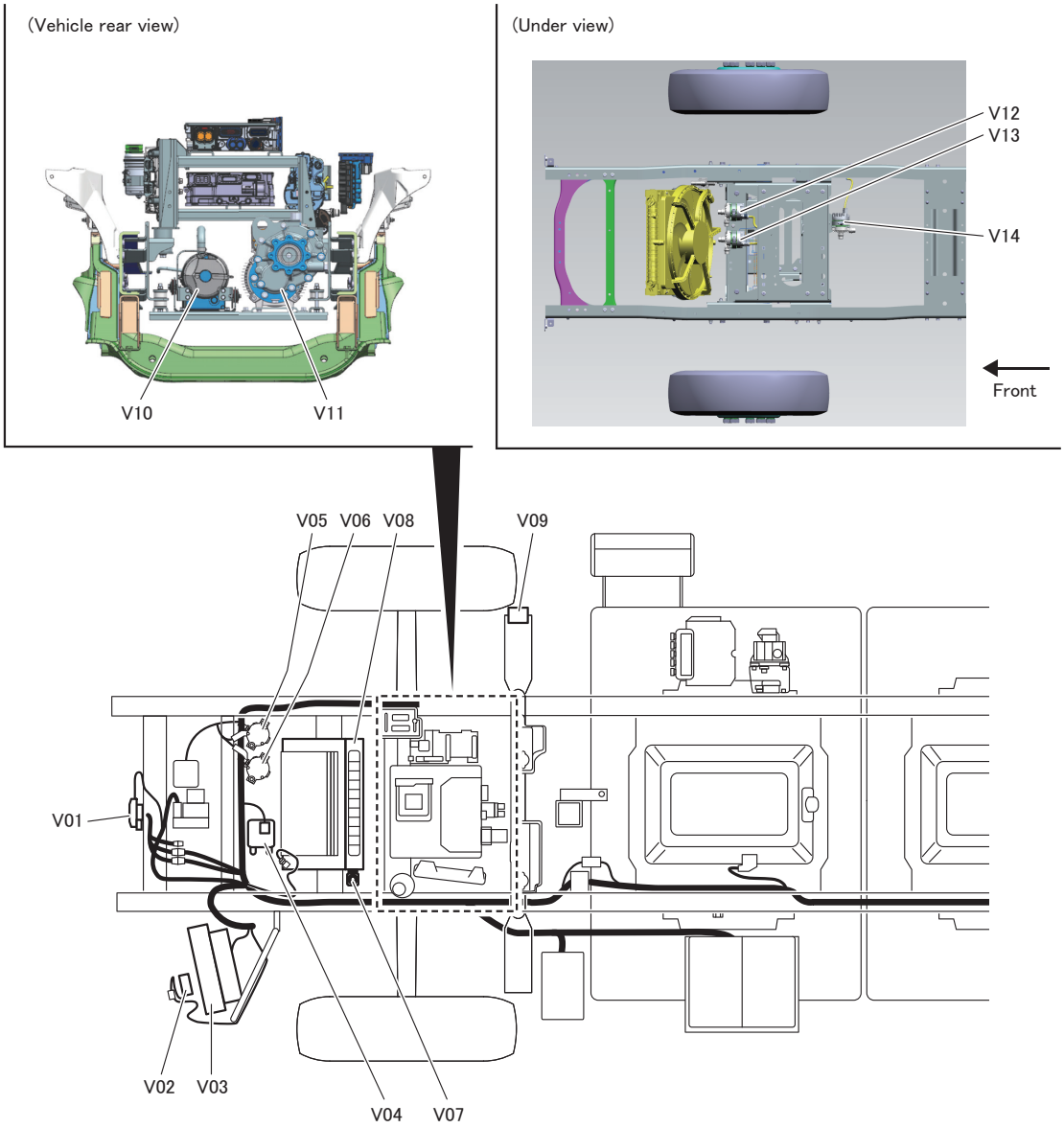
U11	Vacuum pump relay 2
U12	VCU main relay
U13	A/C S/OFF valve relay
U14	Condenser fan relay 2
U15	3/2-WAY valve relay (HVB)
U16	Condenser fan relay 1
U17	Electric parking lock (EPL) relay
U18	Vacuum pump relay 1
U19	KL15 VTL relay
U20	Water pump relay (HVAC)
U21	Water pump relay (Motor)
U22	Chiller S/OFF valve relay
U23	Air-conditioner clutch relay
U24	Water pump relay (HVB)

HVAC : Heating, Ventilation, and Air Conditioning
VCU : Vehicle control unit

54-303014U-2

MAGNET VALVE, MOTOR AND BUZZER

V01-15



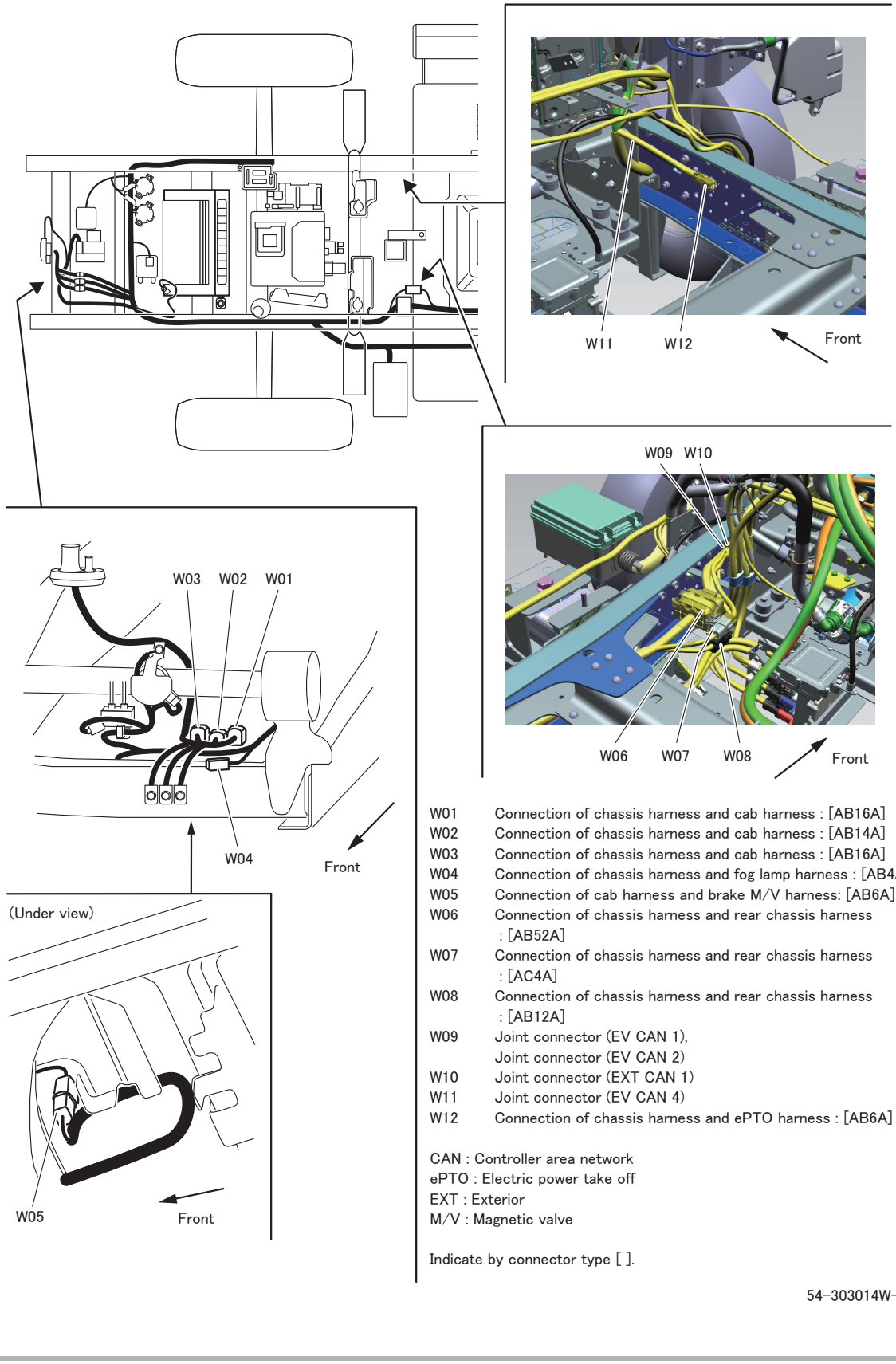
V01	Electric horn
V02	Air-conditioner S/O valve
V03	Condenser fan motor
V04	Chiller (Evaporator)
V05	Electric vacuum pump 1
V06	Electric vacuum pump 2
V07	3/2 WAY valve (HVB)
V08	Cooling fan
V09	Exterior buzzer
V10	EHPS (Electric power steering oil pump, motor, ECU)
V11	ePTO motor
V12	Water pump (HVAC)
V13	Water pump (Motor)
V14	Water pump (HVB)
V15	Back buzzer

ECU : Electronic control unit
EHPS : Electric hydraulic power steering
ePTO : Electric power take off
HVAC : Heating, Ventilation, and Air Conditioning

54-616323V

JOINTS OF MAIN HARNESS CONNECTORS (1)

W01-12



W01	Connection of chassis harness and cab harness : [AB16A]
W02	Connection of chassis harness and cab harness : [AB14A]
W03	Connection of chassis harness and cab harness : [AB16A]
W04	Connection of chassis harness and fog lamp harness : [AB4A]
W05	Connection of cab harness and brake M/V harness: [AB6A]
W06	Connection of chassis harness and rear chassis harness : [AB52A]
W07	Connection of chassis harness and rear chassis harness : [AC4A]
W08	Connection of chassis harness and rear chassis harness : [AB12A]
W09	Joint connector (EV CAN 1), Joint connector (EV CAN 2)
W10	Joint connector (EXT CAN 1)
W11	Joint connector (EV CAN 4)
W12	Connection of chassis harness and ePTO harness : [AB6A]

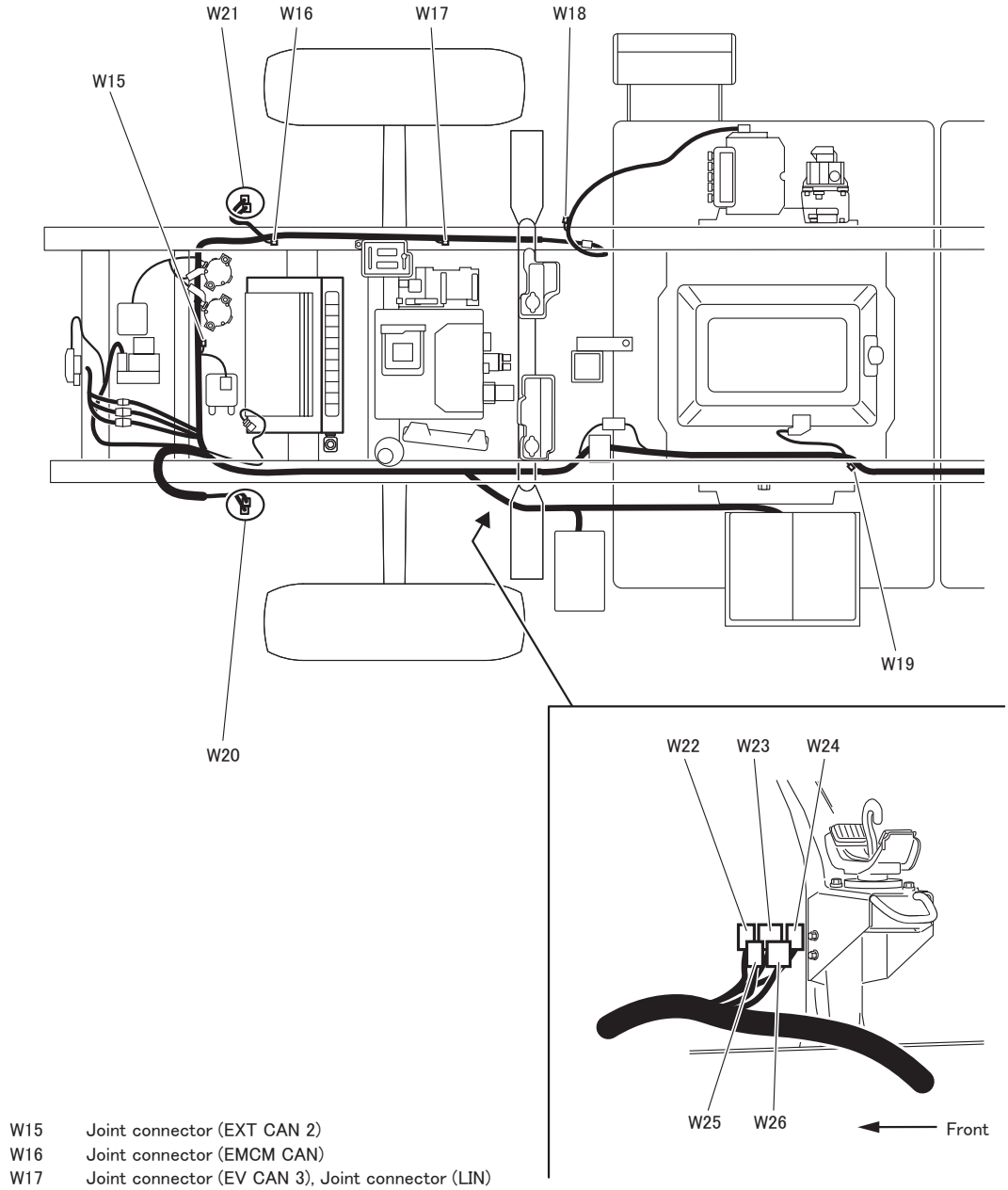
CAN : Controller area network
ePTO : Electric power take off
EXT : Exterior
M/V : Magnetic valve

Indicate by connector type [ ].

54-303014W-1

JOINTS OF MAIN HARNESS CONNECTORS (2)

W15-26



W15	Joint connector (EXT CAN 2)
W16	Joint connector (EMCM CAN)
W17	Joint connector (EV CAN 3), Joint connector (LIN)
W18	Joint connector (CAN J/C EV)(ePTO)
W19	Joint connector (CAN J/C EV)(HVB), Joint connector (CAN J/C HVB)
W20	Connection of chassis harness and front LH vehicle speed sensor harness : [AB2A] Connection of chassis harness and front LH brake pad wear indicator harness : [GA2A]
W21	Connection of chassis harness and front RH vehicle speed sensor harness : [AB2A] Connection of chassis harness and front RH brake pad wear indicator harness : [GA2A]
W22	Optional connector (Bodybuilder) : [AB6A]
W23	Optional connector : [AB12A]
W24	Optional connector (Side turn) : [AB2A]
W25	Connection of chassis harness and ePTO accelerator sensor harness : [CT3A]
W26	High voltage battery cutoff connector : [AB2A]

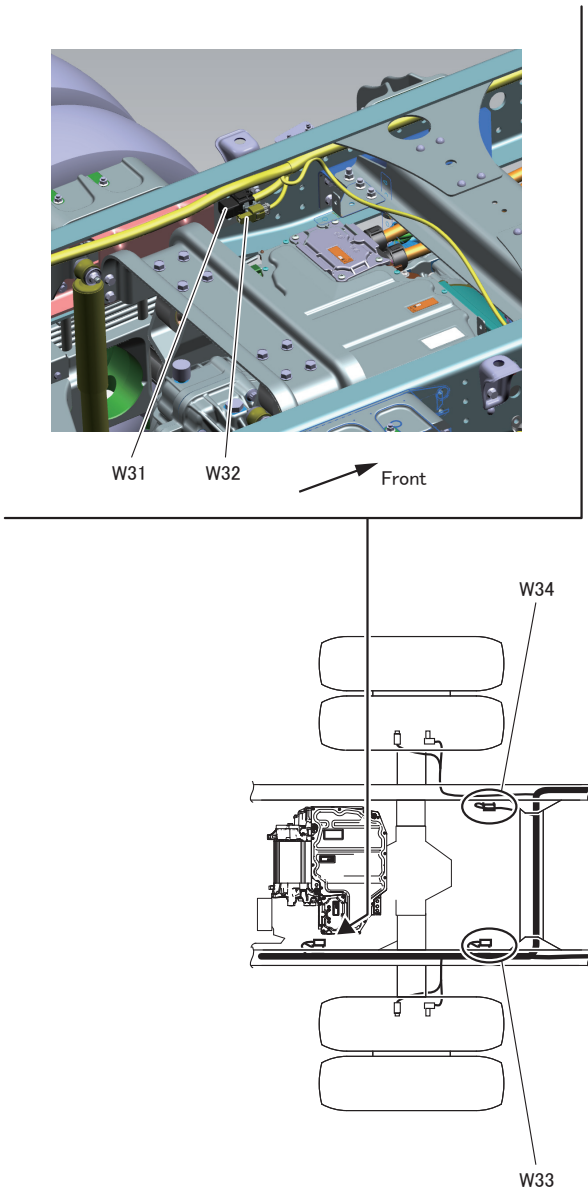
CAN : Controller area network
EMCM : Electric motor control module
ePTO : Electric power take off
EXT : Exterior
LIN : Local interconnect network

Indicate by connector type [ ].

54-303014W-2

JOINTS OF MAIN HARNESS CONNECTORS (3)

W31-35



W31	Connection of rear chassis harness and eDM harness : [AB16A]
W32	Connection of rear chassis harness and eDM harness : [AC2A]
W33	Connection of rear chassis harness and rear LH vehicle speed sensor harness : [AB2A]
	Connection of rear chassis harness and rear LH EPB actuator harness : [AC2A]
	Connection of rear chassis harness and rear LH brake pad wear indicator harness : [GA2A]
W34	Connection of rear chassis harness and rear RH vehicle speed sensor harness : [AB2A]
	Connection of rear chassis harness and rear RH EPB actuator harness : [AC2A]
	Connection of rear chassis harness and rear RH brake pad wear indicator harness : [GA2A]
W35	Connection of rear chassis harness and back eye camera : [DG6A]

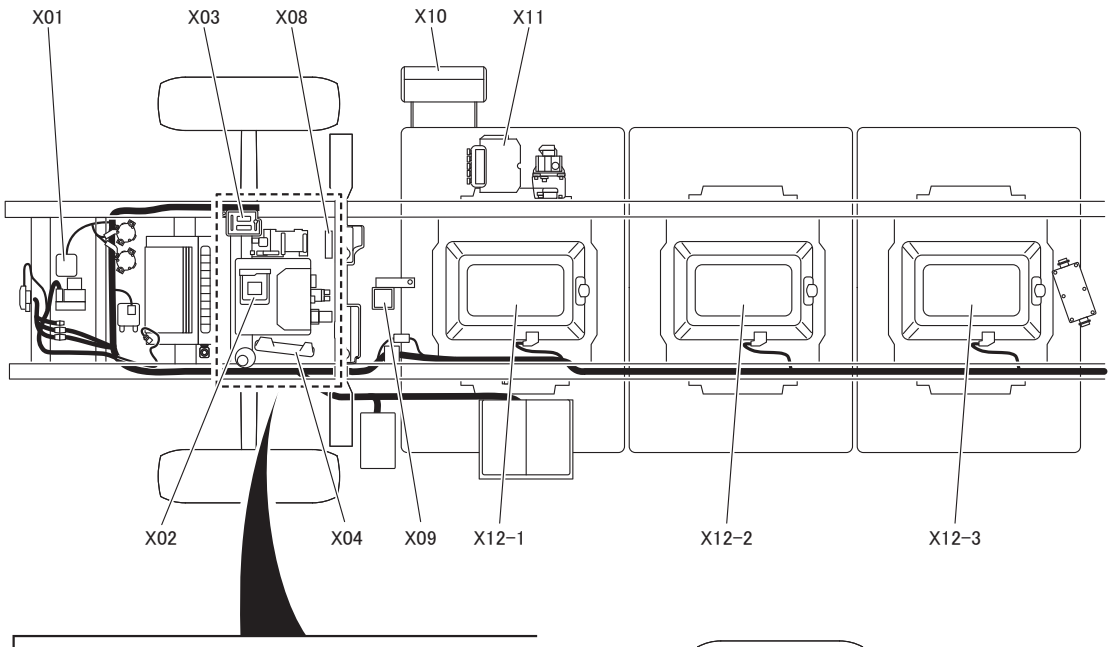
Indicate by connector type [ ].

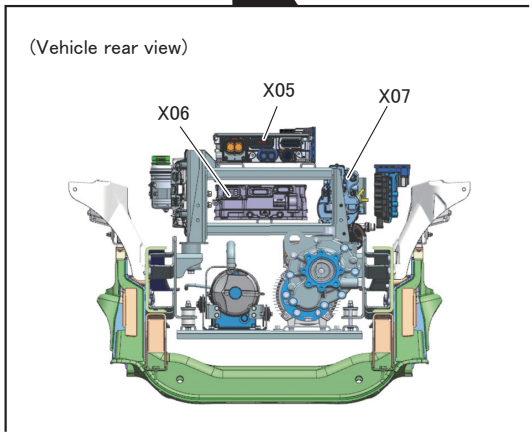
eDM : Electric drive module
EPB : Electric parking brake

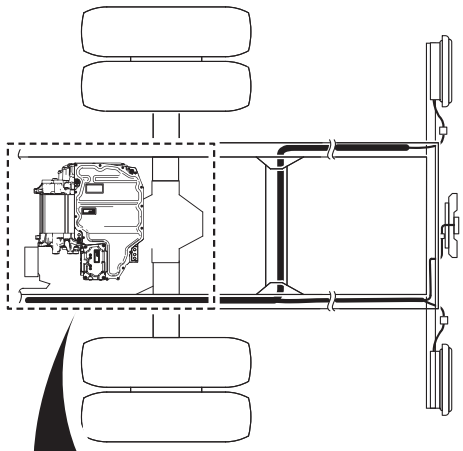
54-303014W-3

OTHERS (1)

X01-14

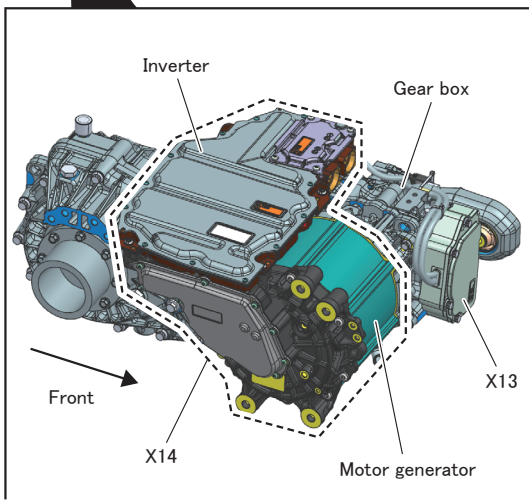






X01	AVAS ECU
X02	PTC heater (HVB)
X03	PTC heater (HVAC)
X04	DC/DC converter
X05	DCB (DC interface box)
X06	OBC (On Board Charger)
X07	High voltage air-conditioner compressor
X08	VCU (Vehicle control unit)
X09	PDU (Power distribution unit)
X10	Charging inlet box
X11	ePTO inverter
X12-1	High voltage battery (1)
X12-2	High voltage battery (2)
X12-3	High voltage battery (3)
X13	Electric parking lock (EPL) actuator
X14	eDM (Inverter & motor generator)

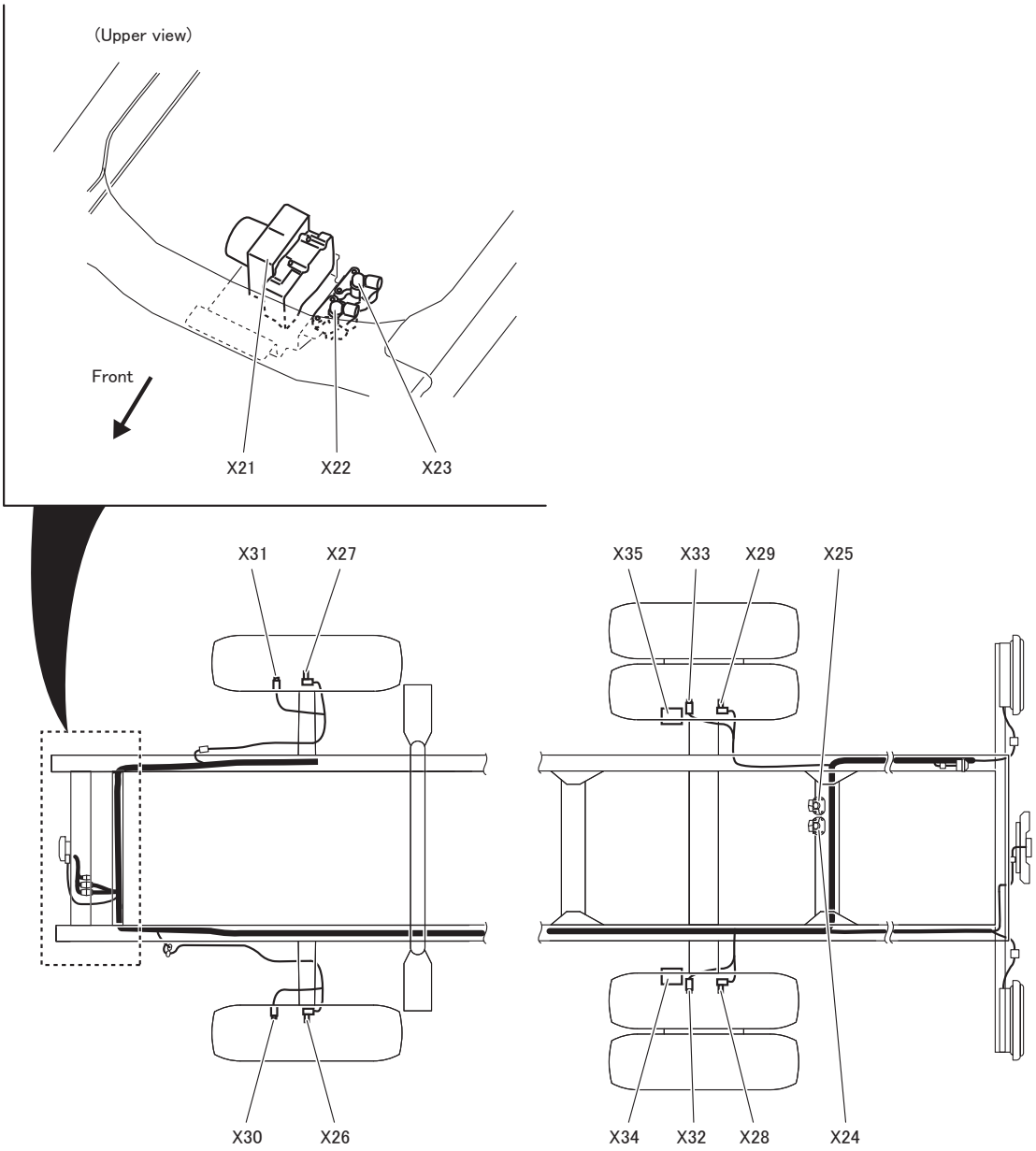
AVAS : Acoustic Vehicle Alert System
ECU : Electronic control unit
eDM : Electric drive module
ePTO : Electric power take off
HVAC : Heating, Ventilation, and Air Conditioning



54-616323X-1

OTHERS (2)

X21-35



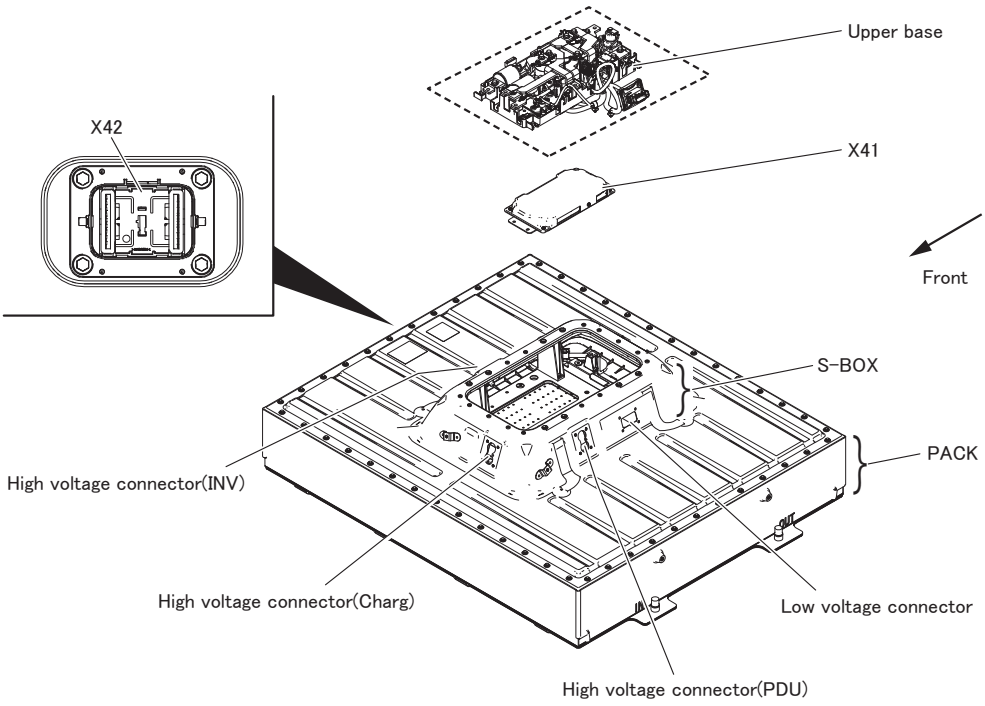
X21	Hydraulic unit <ABS>
X22	Brake control valve, RH (front)
X23	Brake control valve, LH (front)
X24	Brake control valve, LH (rear)
X25	Brake control valve, RH (rear)
X26	Wheel speed sensor, LH (front)
X27	Wheel speed sensor, RH (front)
X28	Wheel speed sensor, LH (rear)
X29	Wheel speed sensor, RH (rear)
X30	Brake pad wear indicator sensor, LH (front)
X31	Brake pad wear indicator sensor, RH (front)
X32	Brake pad wear indicator sensor, LH (rear)
X33	Brake pad wear indicator sensor, RH (rear)
X34	EPB actuator, LH
X35	EPB actuator, RH

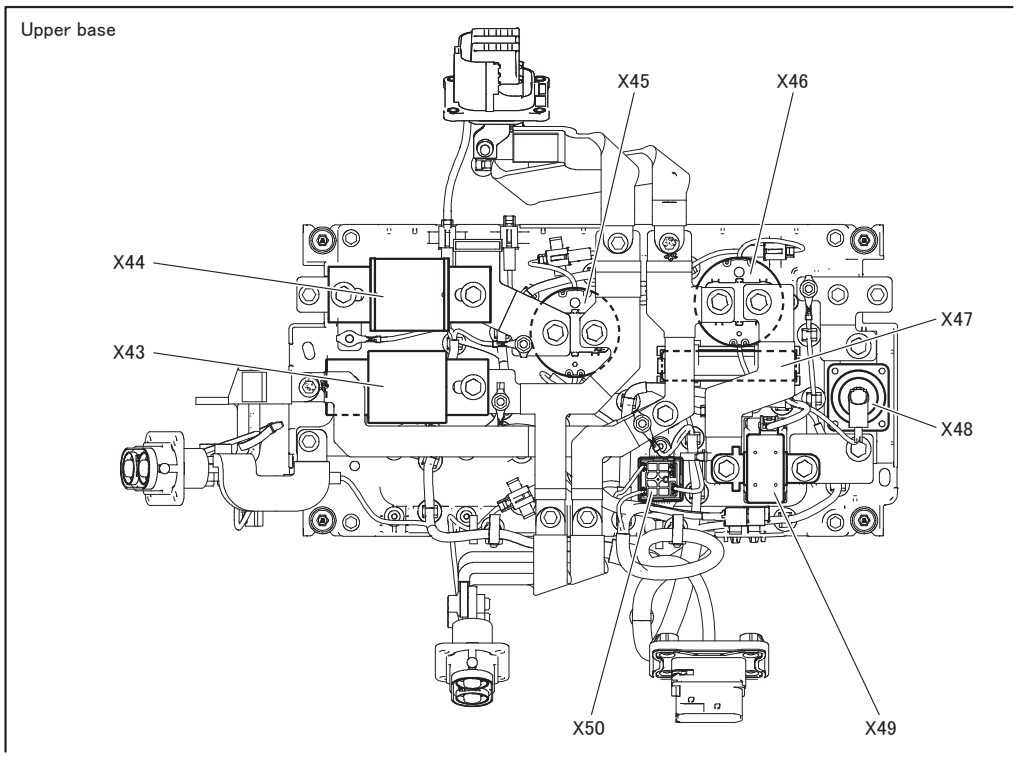
ABS : Anti-lock brake system
EPB : Electric parking brake

54-303014X-2

OTHERS (3)

X41-50 (Inside high voltage battery)





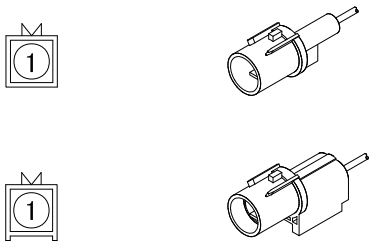
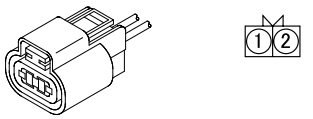
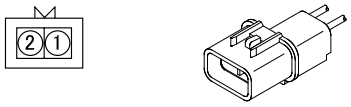
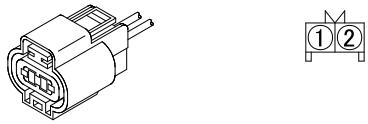
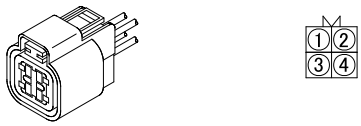
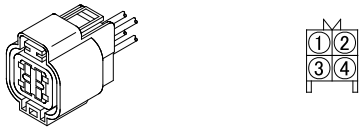
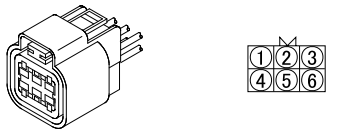
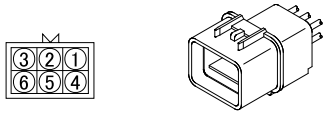
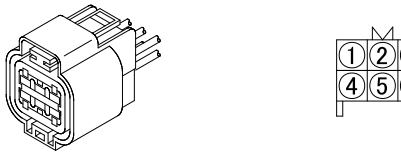
X41	BMS	X47	Precharge registor
X42	MSD connector	X48	Pyro-fuse
X43	Charging fuse	X49	Current sensor
X44	String fuse	X50	Precharge relay
X45	(+) side main relay		
X46	(−) side main relay		

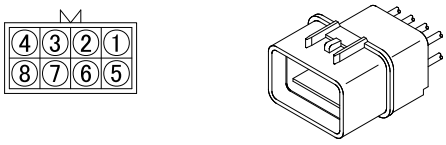
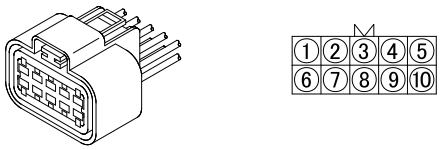
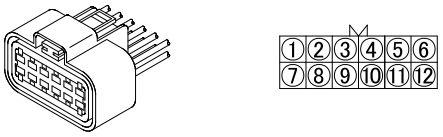
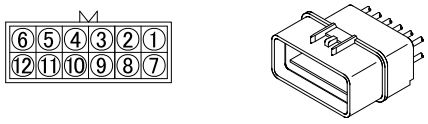
54-303014X-3

10.9.2 Connector configuration chart

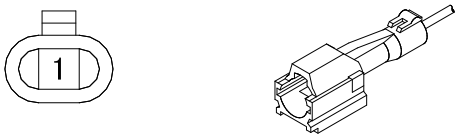
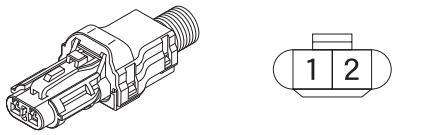
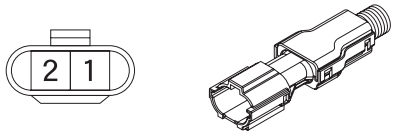
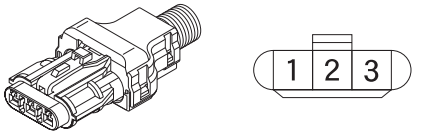
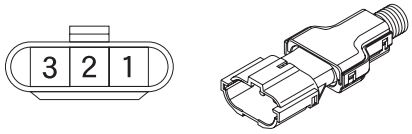
Connector configuration chart

AA type

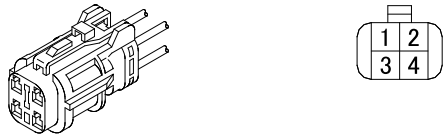
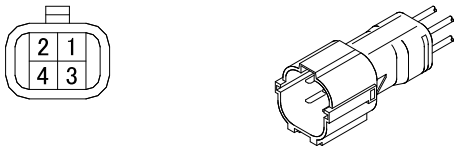
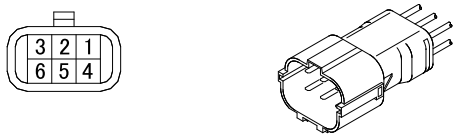
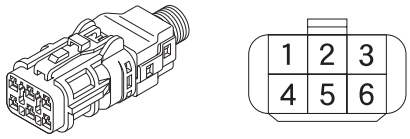
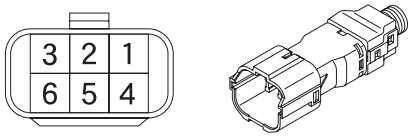
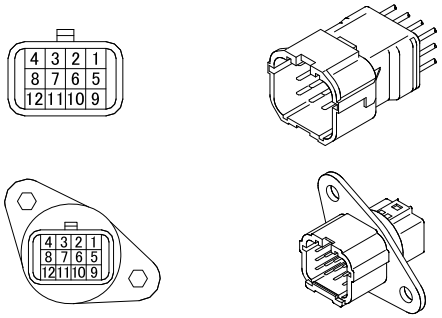
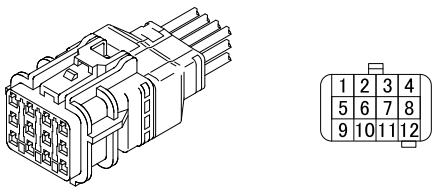
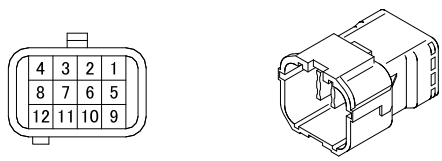
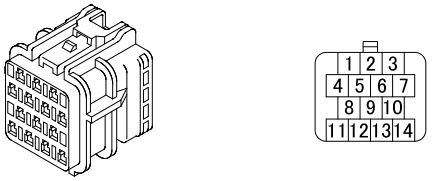
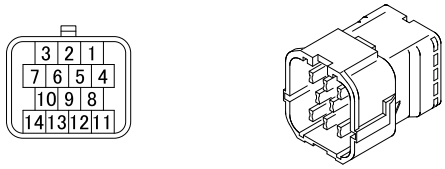
Number shows number of pins	Female connector	Male connector
AA1A		
AA2A		
AA2B		
AA3A		
AA3B		
AA4A		
AA4B		
AA6A		
AA6B		

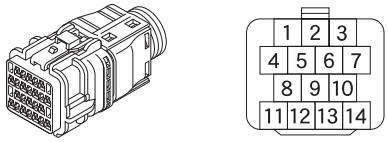
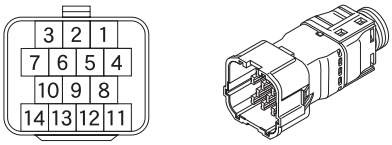
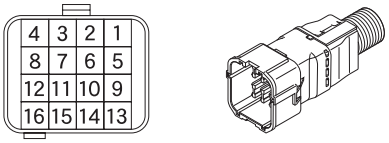
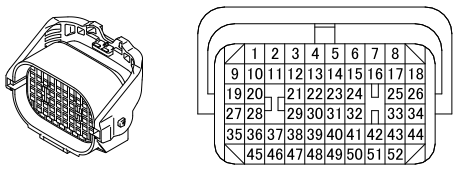
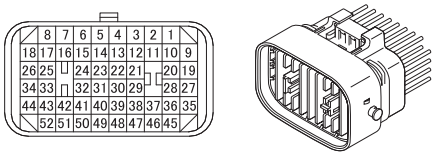
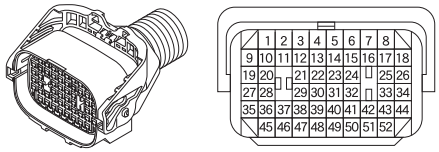
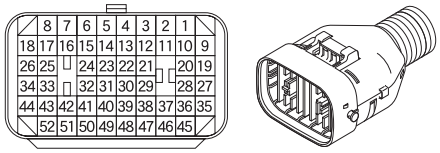
Number shows number of pins	Female connector	Male connector
AA8A		
AA10A		
AA12A		

AB type

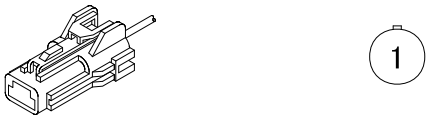
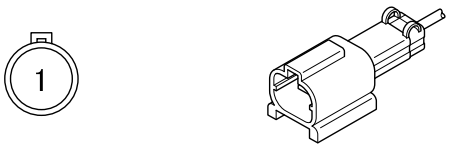
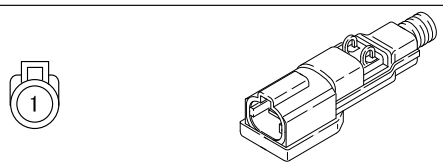
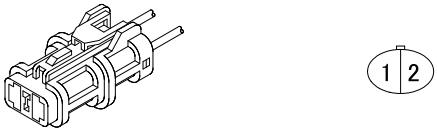
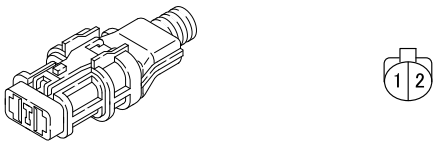
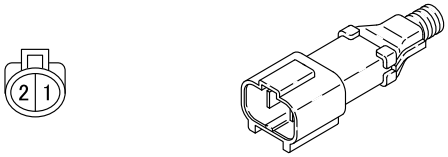
Number shows number of pins	Female connector	Male connector
AB1A		
AB2A		
AB2B		
AB2C		
AB3A		
AB3B		

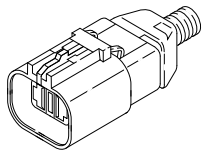
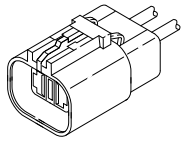
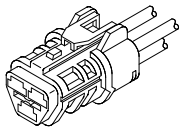
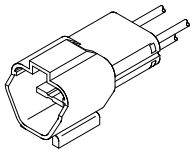
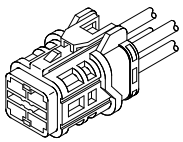
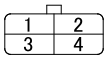
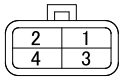
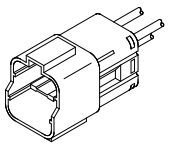
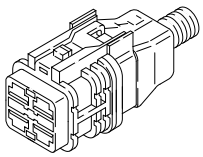
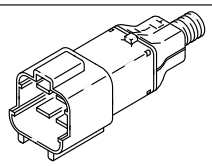
A

Number shows number of pins	Female connector	Male connector
AB4A		
AB6A		
AB6B		
AB8A		
AB8B		
AB12A		
AB12B		
AB14A		

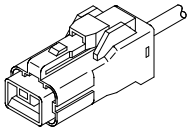
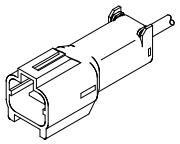
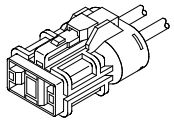
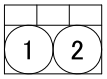
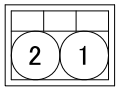
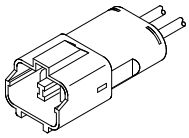
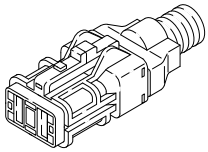
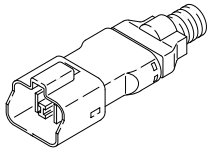
Number shows number of pins	Female connector	Male connector
AB14B		
AB16A		
AB16B		
AB52A		
AB52B		

AC type

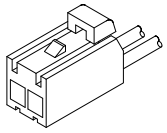
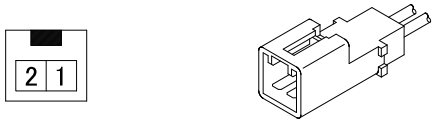
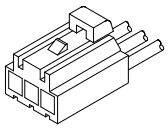
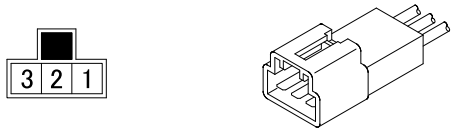
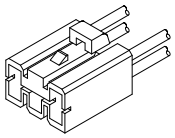
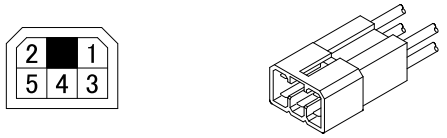
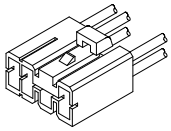
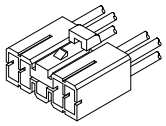
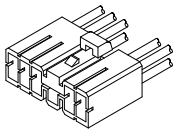
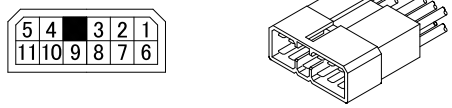
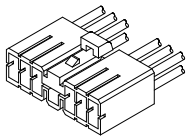
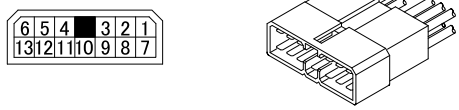
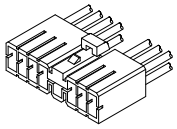
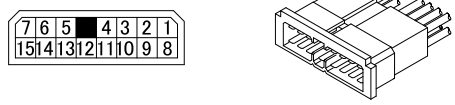
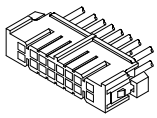
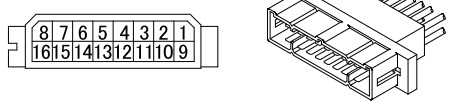
Number shows number of pins	Female connector	Male connector
AC1A		
AC1B		
AC2A		
AC2B		

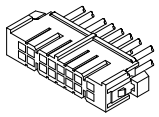
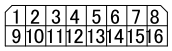
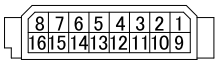
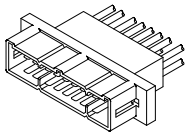
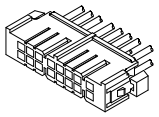
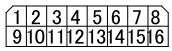
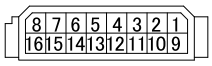
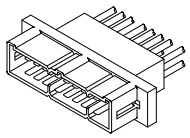
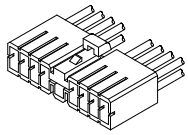
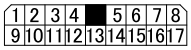
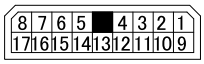
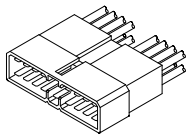
Number shows number of pins	Female connector	Male connector
AC2C	 	
AC2D	 	
AC3A	 	 
AC4A	 	 
AC4B	 	 

AD type

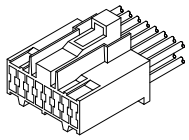
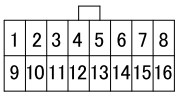
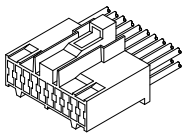
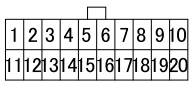
Number shows number of pins	Female connector	Male connector
AD1A	 	 
AD2A	 	 
AD2B	 	 

AE type

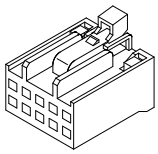
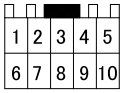
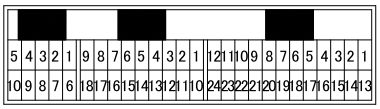
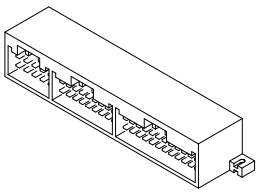
Number shows number of pins	Female connector	Male connector
AE2A		
AE3A		
AE5A		
AE7A		
AE9A		
AE11A		
AE13A		
AE15A		
AE16A		

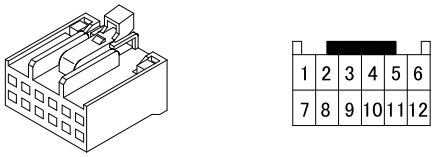
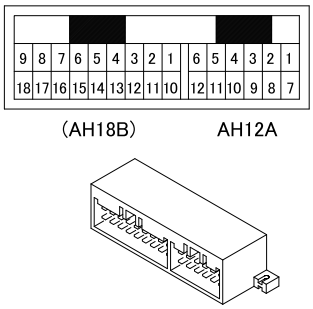
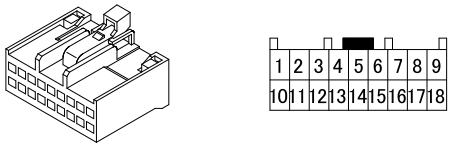
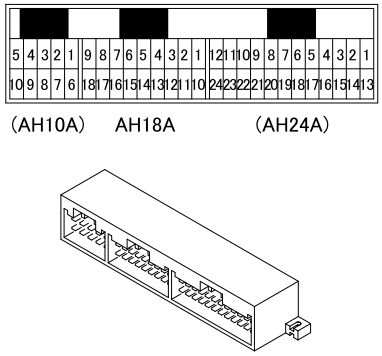
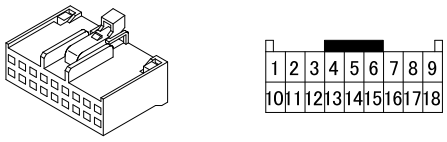
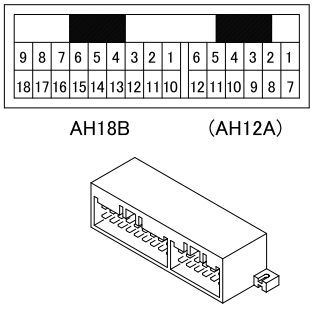
Number shows number of pins	Female connector	Male connector
AE16B	 	 
AE16C	 	 
AE17A	 	 

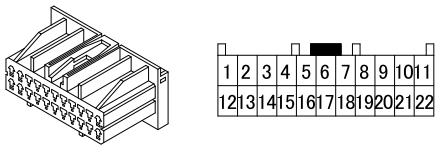
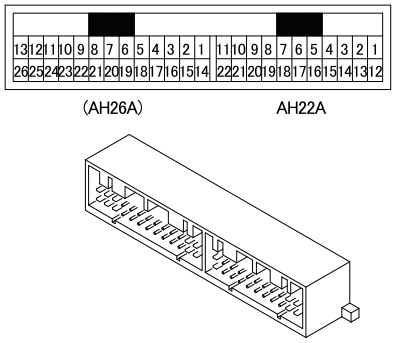
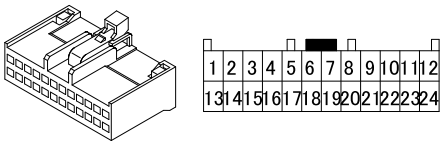
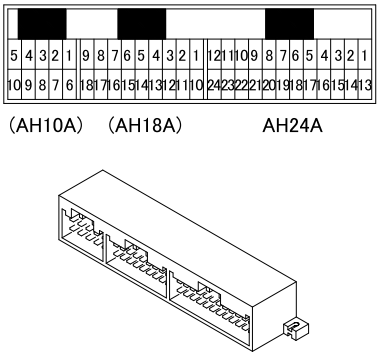
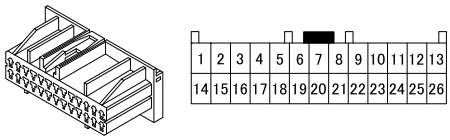
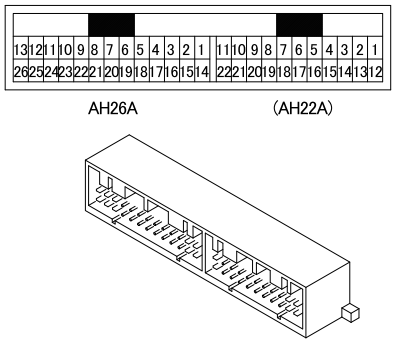
AG type

Number shows number of pins	Female connector	Male connector
AG16A	 	
AG20A	 	

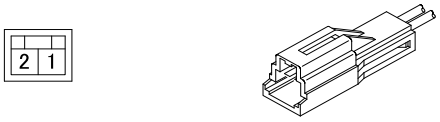
AH type

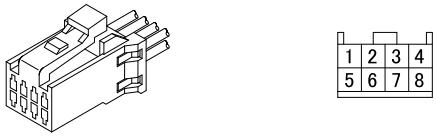
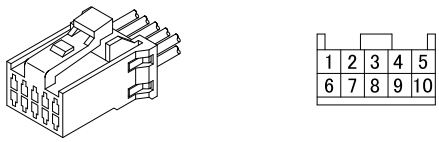
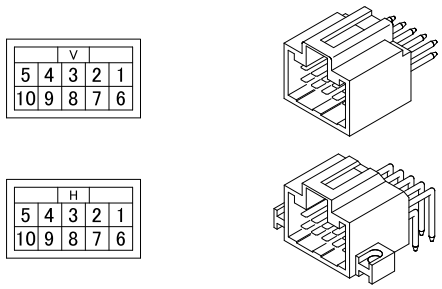
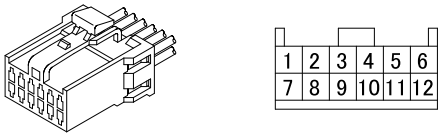
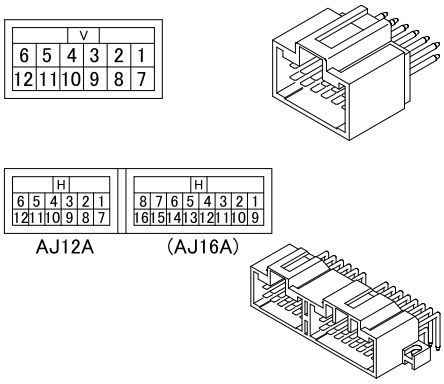
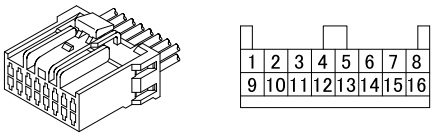
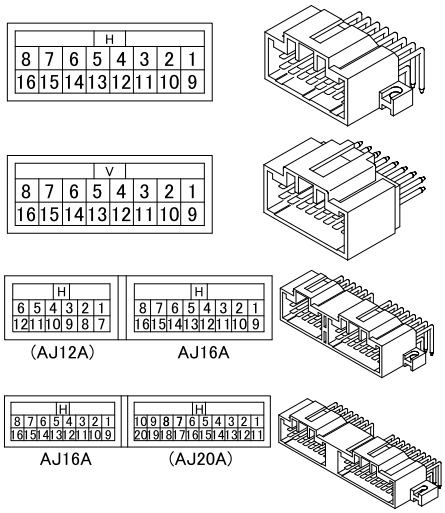
Number shows number of pins	Female connector	Male connector
AH10A	 	 AH10A (AH18A) (AH24A) 

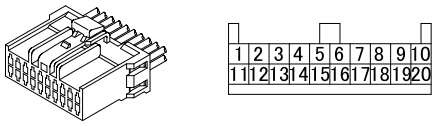
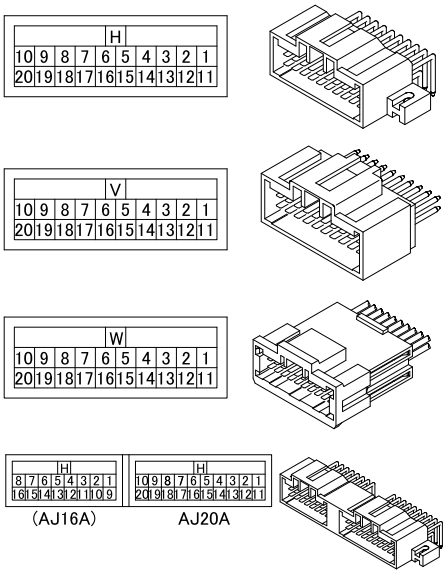
Number shows number of pins	Female connector	Male connector
AH12A		
AH12B		
AH16A		
AH18A		
AH18B		

Number shows number of pins	Female connector	Male connector
AH22A		 (AH26A) AH22A
AH24A		 (AH10A) (AH18A) AH24A
AH26A		 AH26A (AH22A)

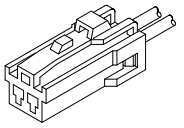
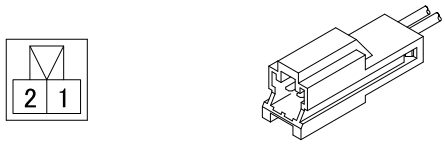
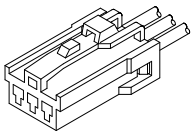
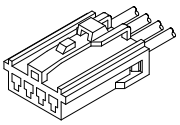
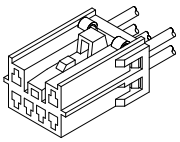
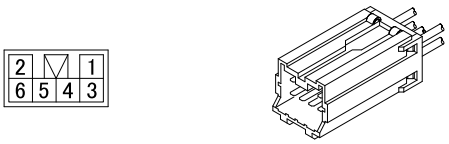
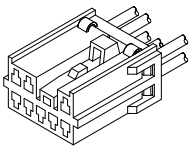
AJ type

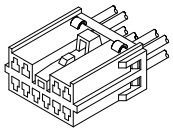
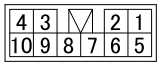
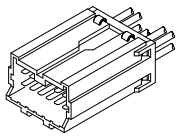
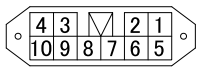
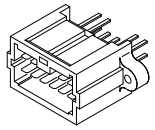
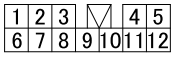
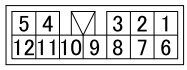
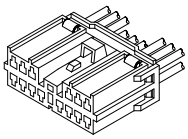
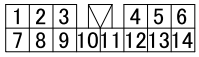
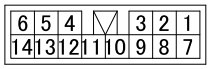
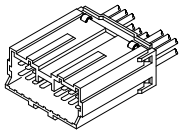
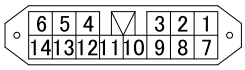
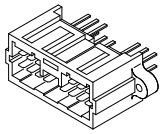
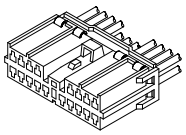
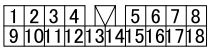
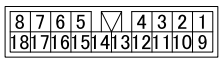
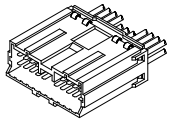
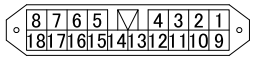
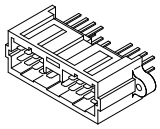
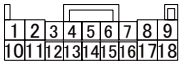
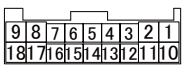
Number shows number of pins	Female connector	Male connector
AJ2A		
AJ4A		

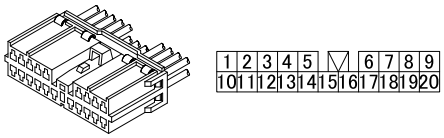
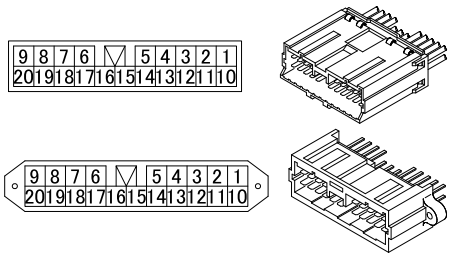
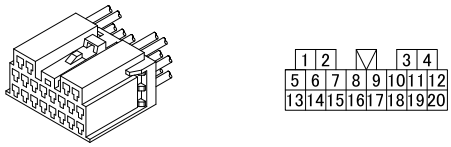
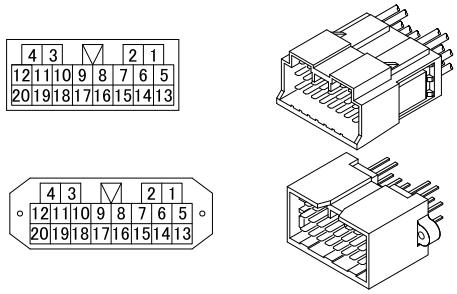
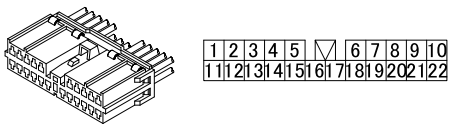
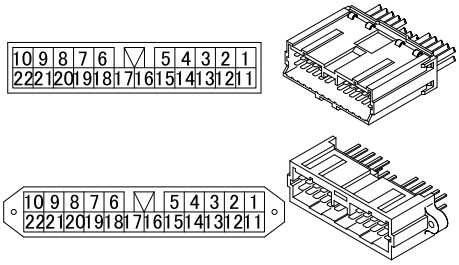
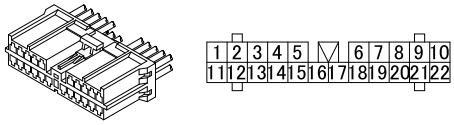
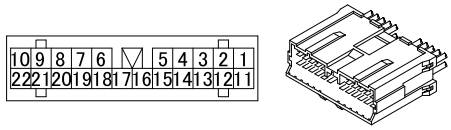
Number shows number of pins	Female connector	Male connector
AJ8A		
AJ10A		
AJ12A		
AJ16A		

Number shows number of pins	Female connector	Male connector
AJ20A		

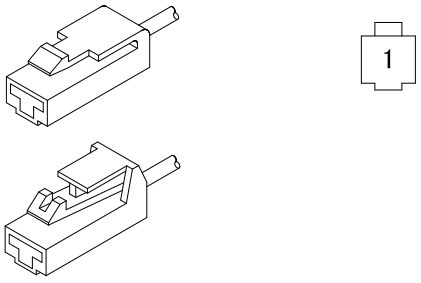
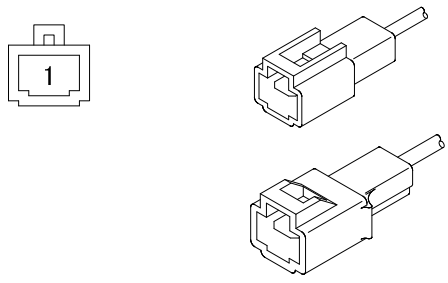
AK type

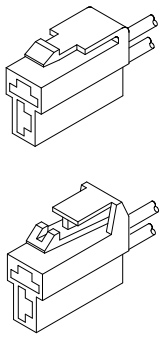
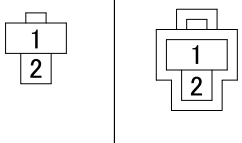
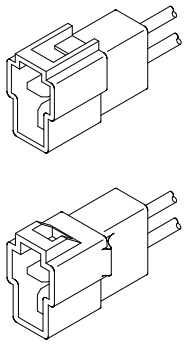
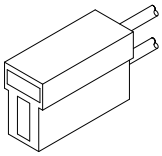
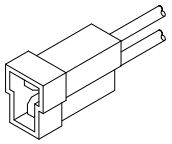
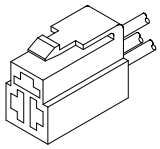
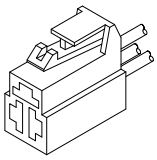
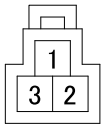
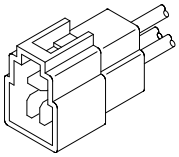
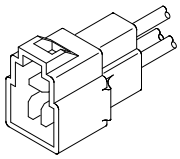
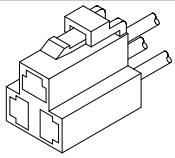
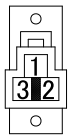
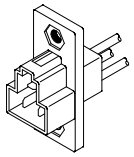
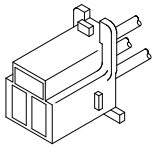
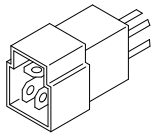
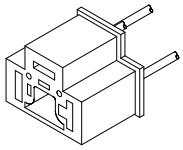
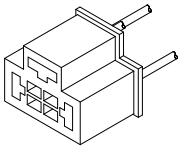
Number shows number of pins	Female connector	Male connector
AK2A		
AK3A		
AK4A		
AK6A		
AK8A		

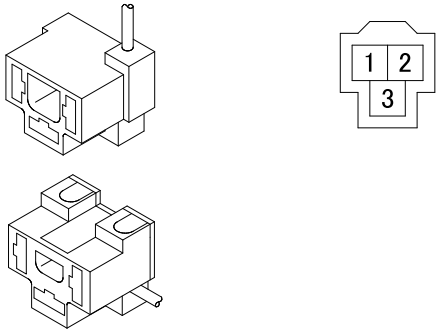
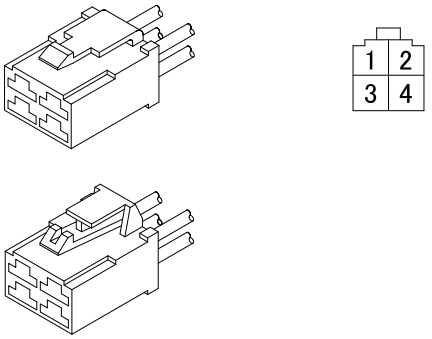
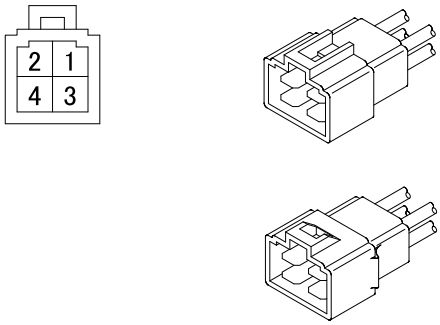
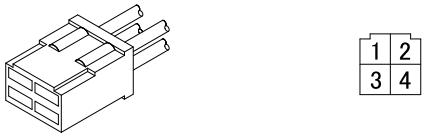
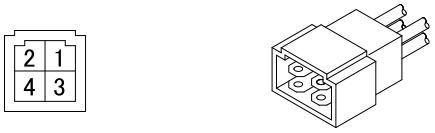
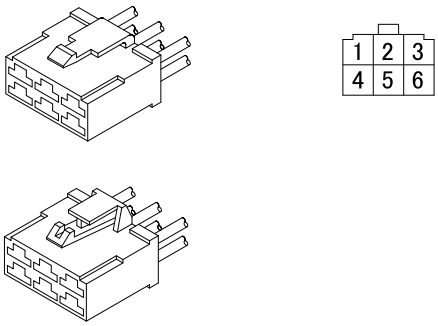
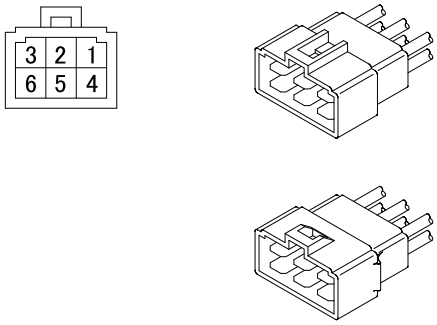
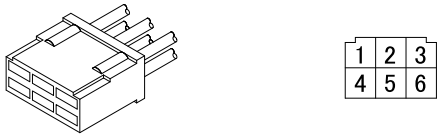
Number shows number of pins	Female connector	Male connector
AK10A	 	   
AK12A		
AK14A	 	   
AK18A	 	   
AK18B		
AK18C		

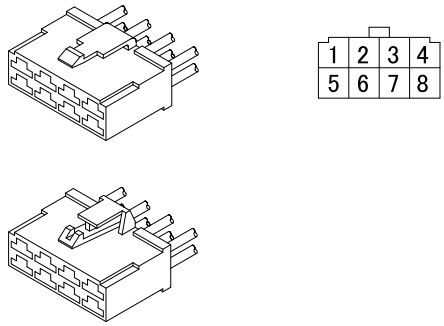
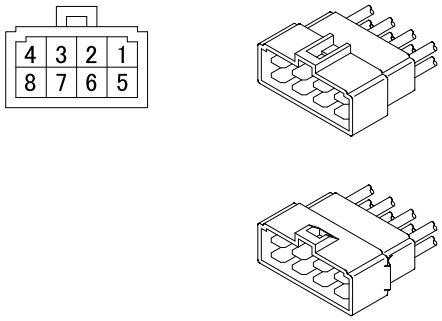
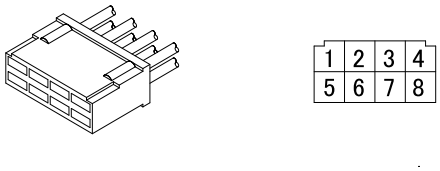
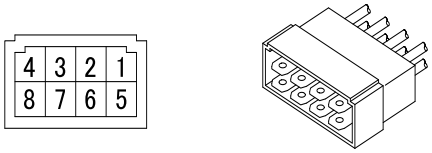
Number shows number of pins	Female connector	Male connector
AK20A		
AK20B		
AK22A		
AK22B		

AL type

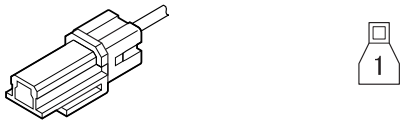
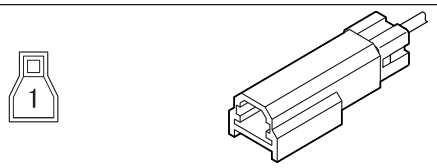
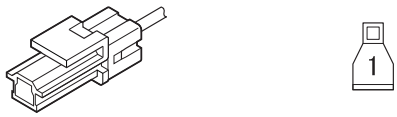
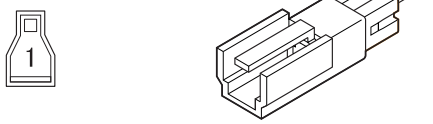
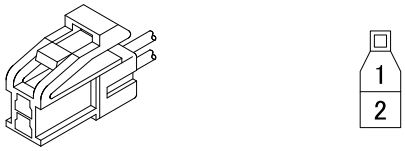
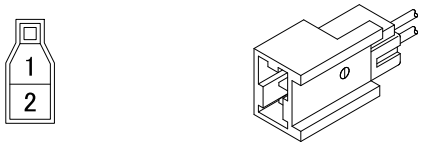
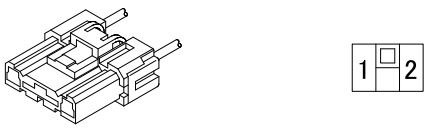
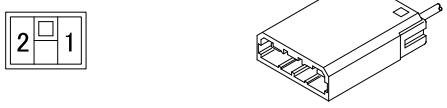
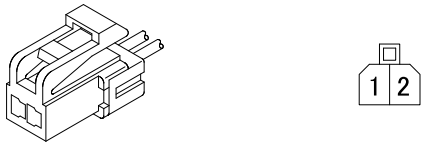
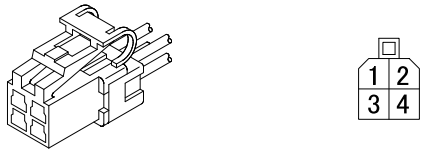
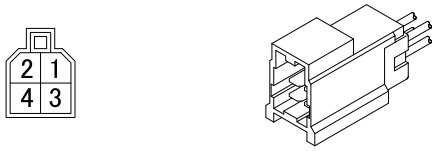
Number shows number of pins	Female connector	Male connector
AL1A		

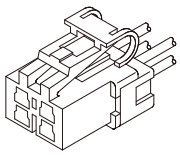
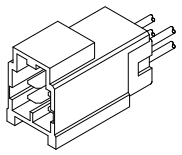
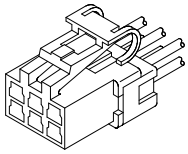
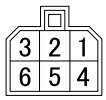
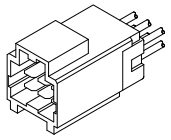
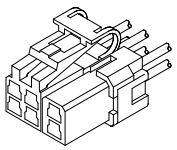
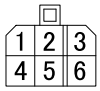
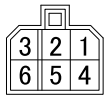
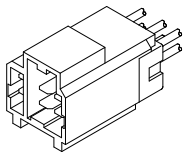
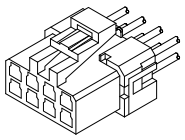
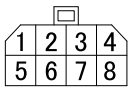
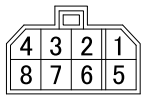
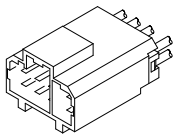
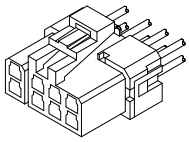
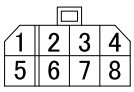
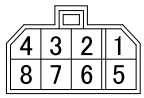
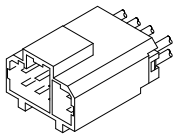
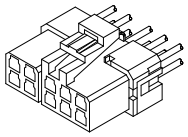
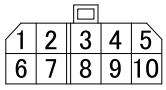
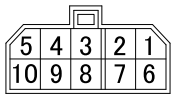
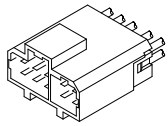
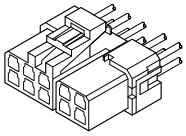
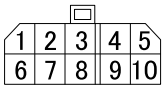
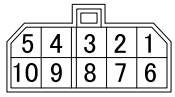
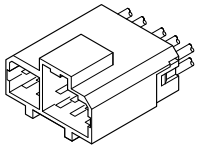
Number shows number of pins	Female connector	Male connector
AL2A	  	
AL2B	 	 
AL3A	  	  
AL3B	 	 
AL3C	 	 
AL3D	  	

Number shows number of pins	Female connector	Male connector
AL3E		
AL4A		
AL4B		
AL6A		
AL6B		

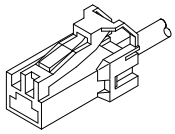
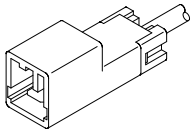
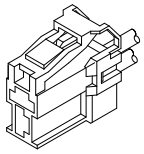
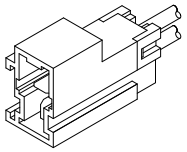
Number shows number of pins	Female connector	Male connector
AL8A		
AL8B		

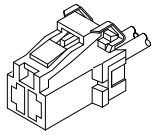
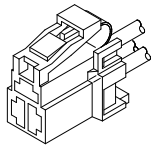
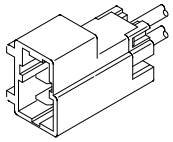
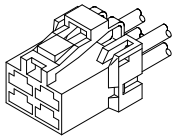
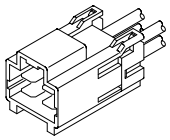
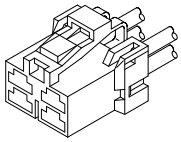
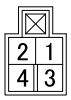
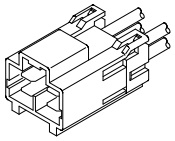
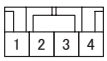
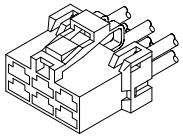
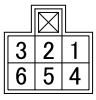
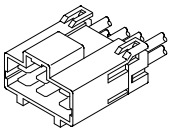
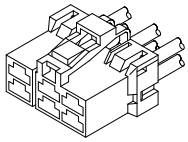
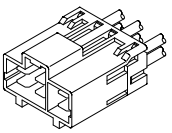
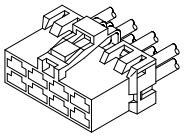
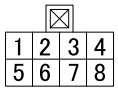
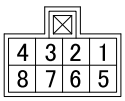
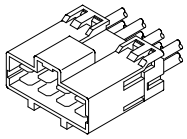
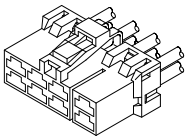
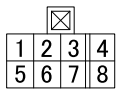
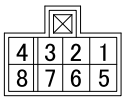
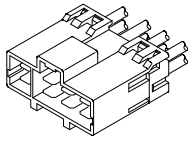
AM type

Number shows number of pins	Female connector	Male connector
AM1A		
AM1B		
AM2A		
AM2B		
AM2C		
AM4A		

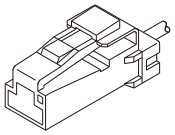
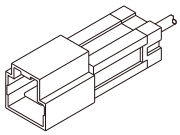
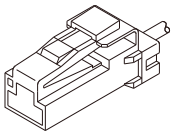
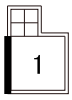
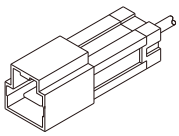
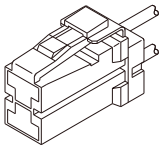
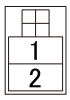
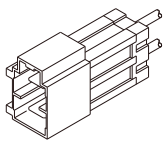
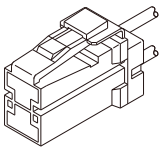
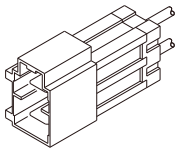
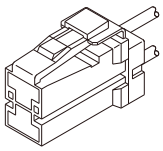
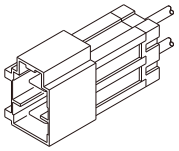
Number shows number of pins	Female connector	Male connector
AM4B	 	 
AM6A	 	 
AM6B	 	 
AM8A	 	 
AM8B	 	 
AM10A	 	 
AM10B	 	 

AN type

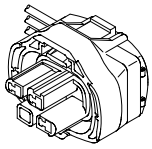
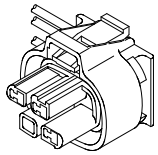
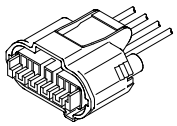
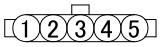
Number shows number of pins	Female connector	Male connector
AN1A	 	 
AN2A	 	 

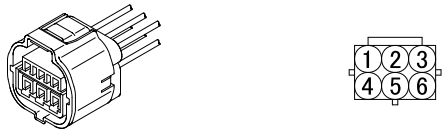
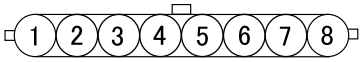
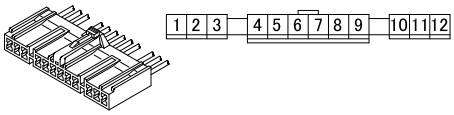
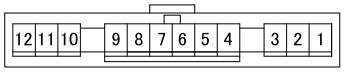
Number shows number of pins	Female connector	Male connector
AN2B	 	
AN3A	 	 
AN4A	 	 
AN4B	 	 
AN4C		
AN6A	 	 
AN6B	 	 
AN8A	 	 
AN8B	 	 

AP type

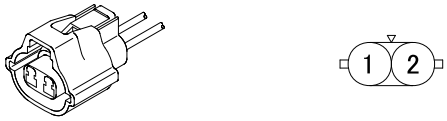
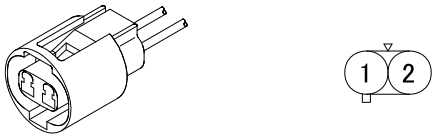
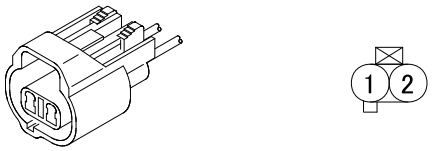
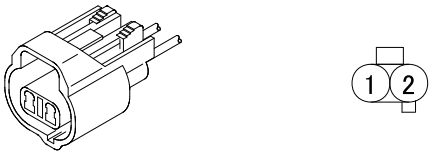
Number shows number of pins	Female connector	Male connector
AP1A	 	 
AP1B	 	 
AP2A	 	 
AP2B	 	 
AP2C	 	 

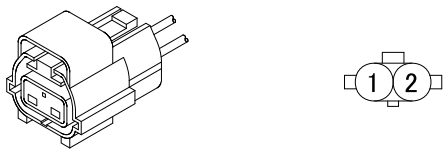
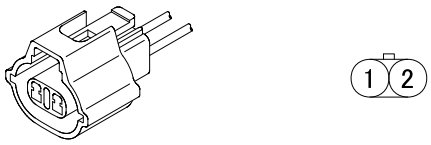
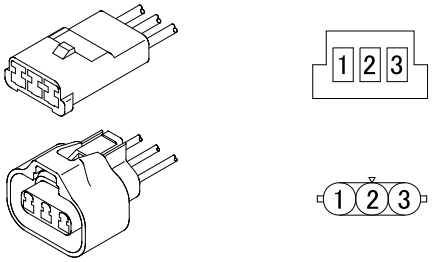
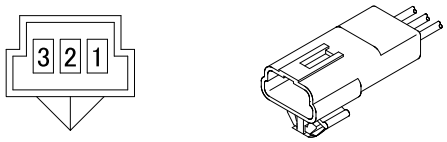
AQ type

Number shows number of pins	Female connector	Male connector
AQ1A		
AQ3A	 	
AQ3B	 	
AQ5A	 	

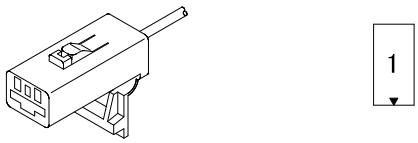
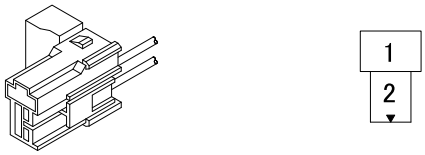
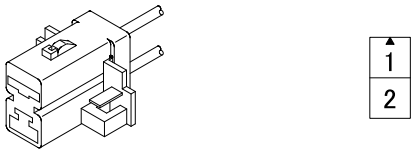
Number shows number of pins	Female connector	Male connector
AQ6A		
AQ8A		
AQ12A		

AR type

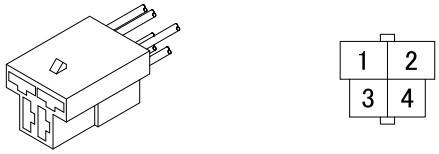
Number shows number of pins	Female connector	Male connector
AR2A		
AR2B		
AR2C		
AR2D		
AR2E		
AR2F		

Number shows number of pins	Female connector	Male connector
AR2G		
AR2H		
AR3A		

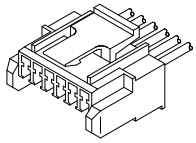
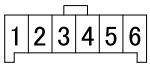
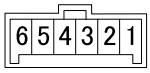
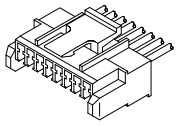
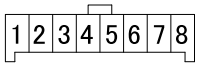
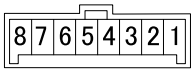
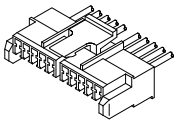
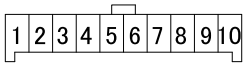
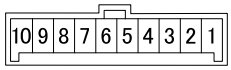
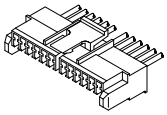
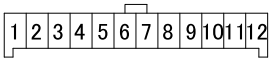
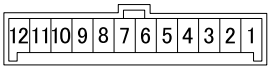
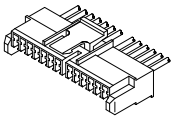
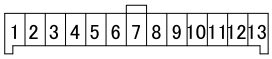
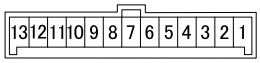
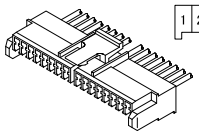
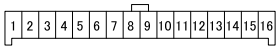
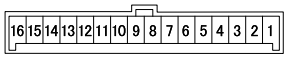
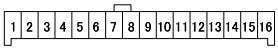
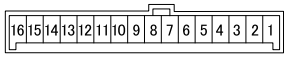
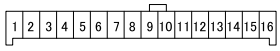
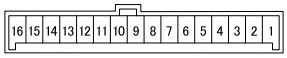
AS type

Number shows number of pins	Female connector	Male connector
AS1A		
AS2A		
AS2B		

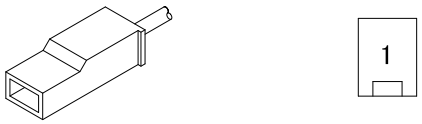
AT type

Number shows number of pins	Female connector	Male connector
AT4A		

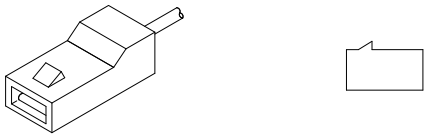
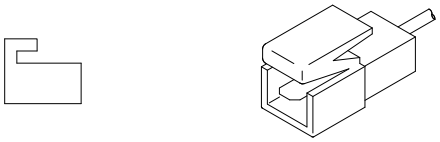
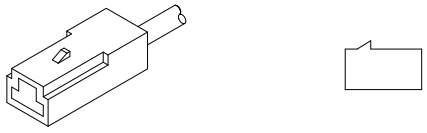
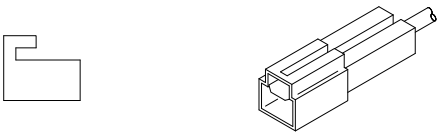
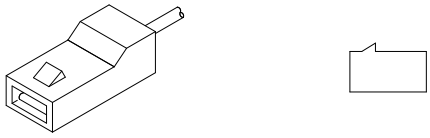
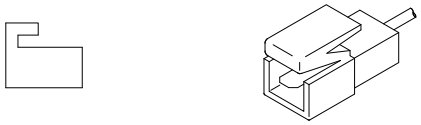
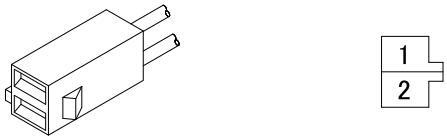
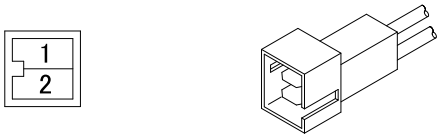
AU type

Number shows number of pins	Female connector	Male connector
AU2A		
AU6A	 	
AU8A	 	
AU10A	 	
AU12A	 	
AU13A	 	
AU16A	 	
AU16B		
AU16C		

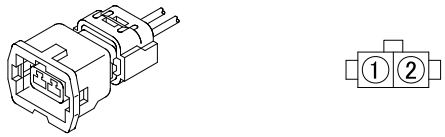
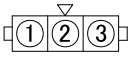
AV type

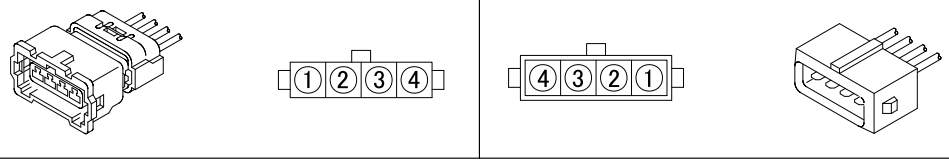
Number shows number of pins	Female connector	Male connector
AV1A		
AV2A		

AW type

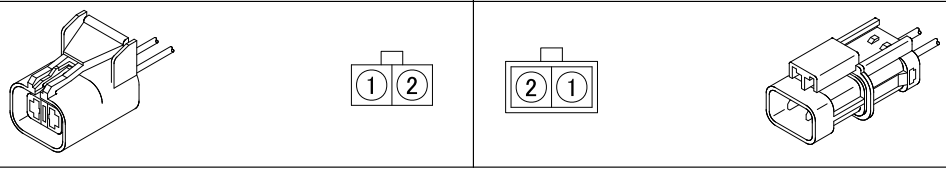
Number shows number of pins	Female connector	Male connector
AW1A		
AW1B		
AW1C		
AW2A		

AX type

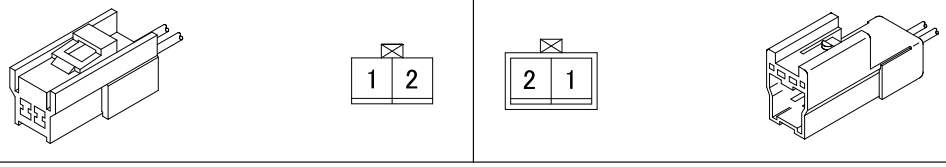
Number shows number of pins	Female connector	Male connector
AX2A		
AX3A		

Number shows number of pins	Female connector	Male connector
AX4A		

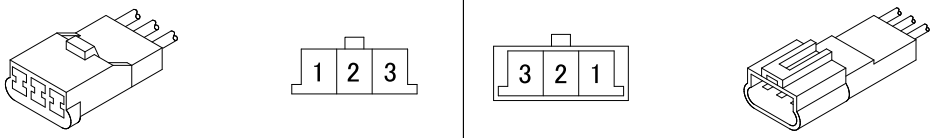
AY type

Number shows number of pins	Female connector	Male connector
AY2A		

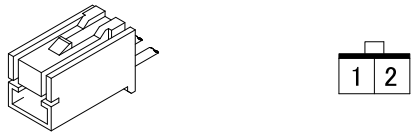
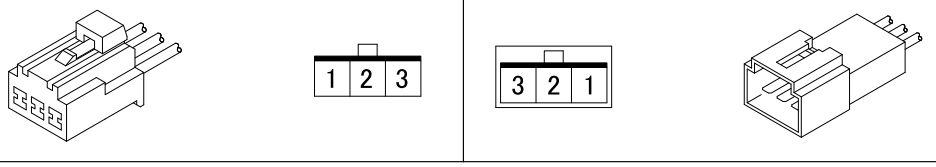
AZ type

Number shows number of pins	Female connector	Male connector
AZ2A		

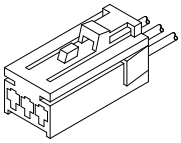
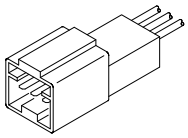
BA type

Number shows number of pins	Female connector	Male connector
BA3A		

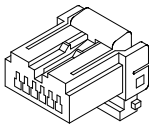
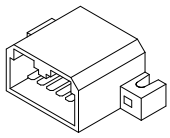
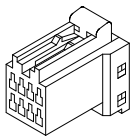
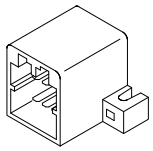
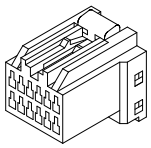
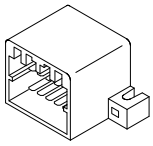
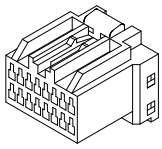
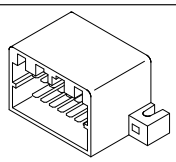
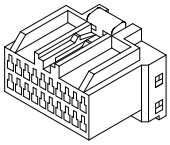
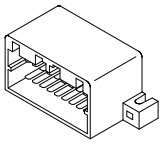
BB type

Number shows number of pins	Female connector	Male connector
BB2A		
BB3A		

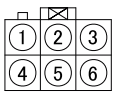
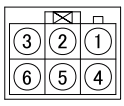
BC type

Number shows number of pins	Female connector	Male connector
BC3A		

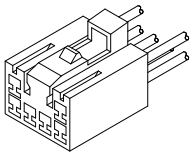
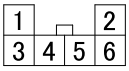
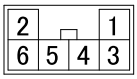
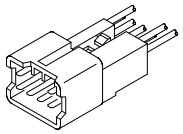
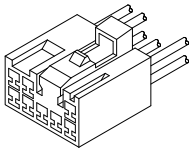
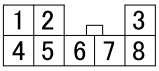
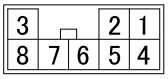
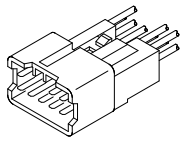
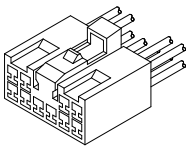
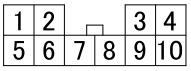
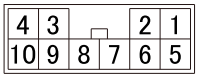
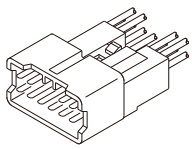
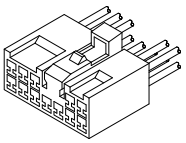
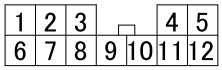
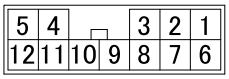
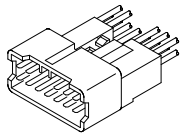
BD type

Number shows number of pins	Female connector	Male connector
BD6A		
BD8A		
BD12A		
BD16A		
BD20A		

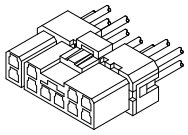
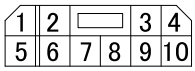
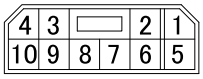
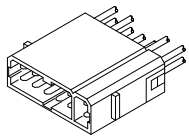
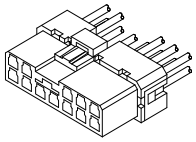
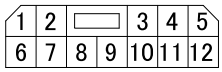
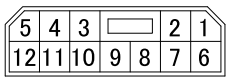
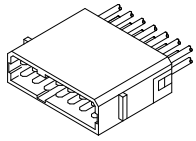
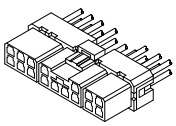
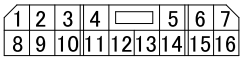
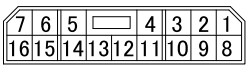
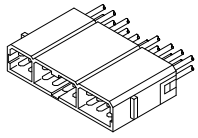
BE type

Number shows number of pins	Female connector	Male connector
BE6A		

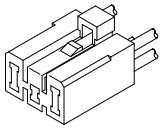
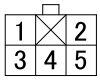
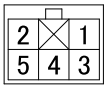
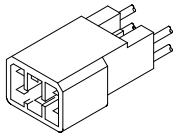
BF type

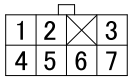
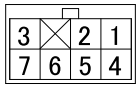
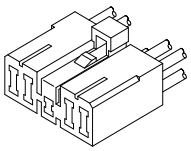
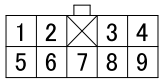
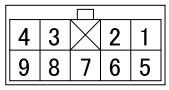
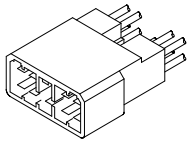
Number shows number of pins	Female connector	Male connector
BF6A	 	 
BF8A	 	 
BF10A	 	 
BF12A	 	 

BG type

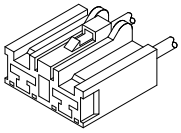
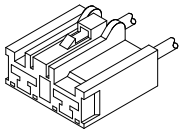
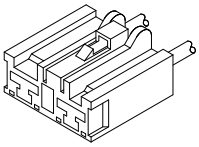
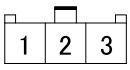
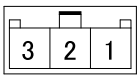
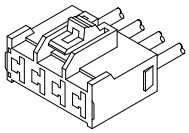
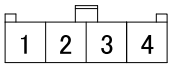
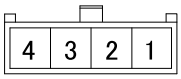
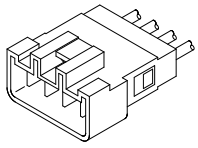
Number shows number of pins	Female connector	Male connector
BG10A	 	 
BG12A	 	 
BG16A	 	 

BJ type

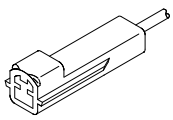
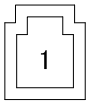
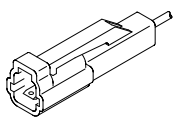
Number shows number of pins	Female connector	Male connector
BJ5A	 	 

Number shows number of pins	Female connector	Male connector
BJ7A		
BJ9A	 	 

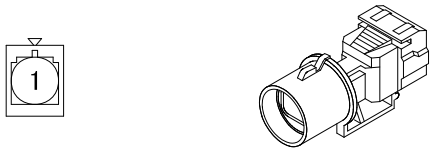
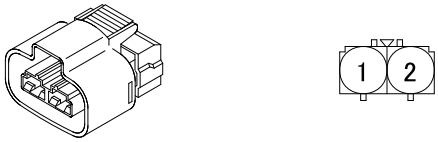
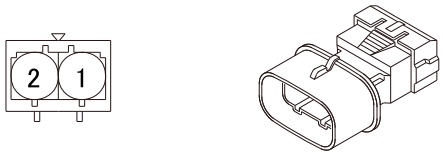
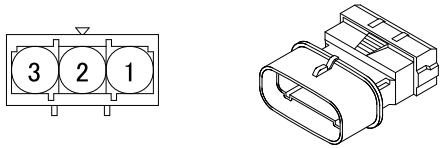
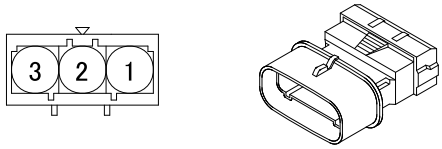
BM type

Number shows number of pins	Female connector	Male connector
BM2A	 	
BM2B	 	
BM2C	 	
BM3A		
BM4A	 	 

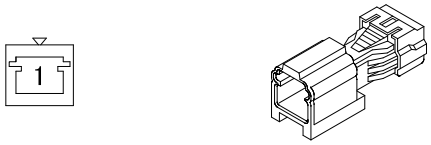
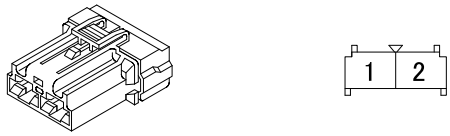
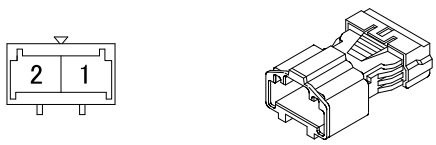
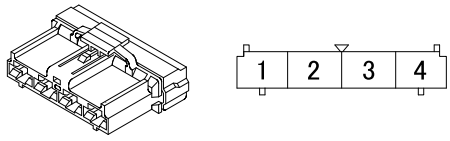
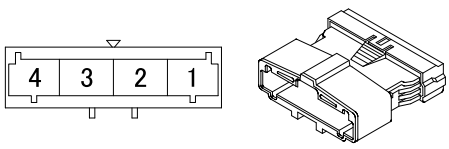
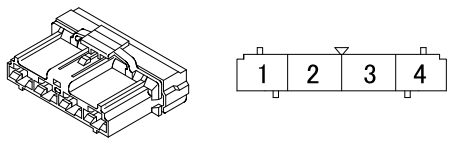
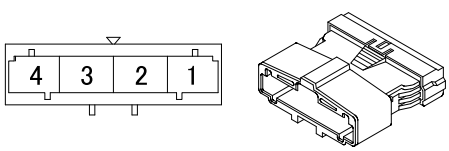
BN type

Number shows number of pins	Female connector	Male connector
BN1A	 	 

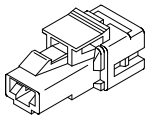
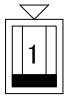
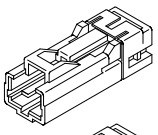
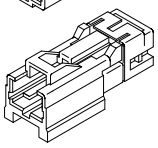
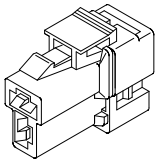
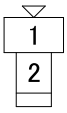
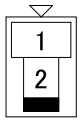
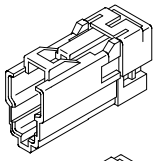
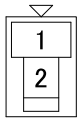
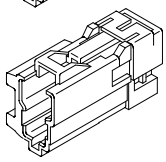
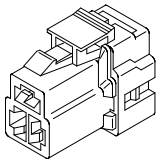
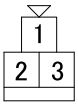
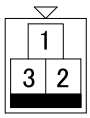
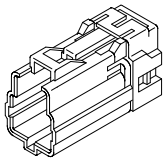
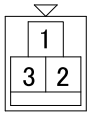
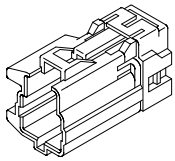
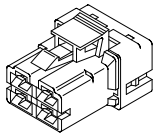
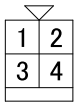
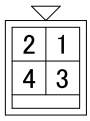
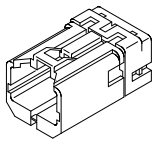
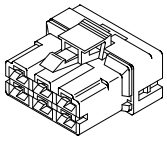
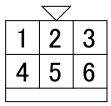
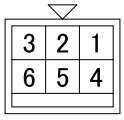
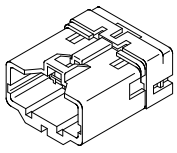
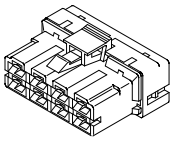
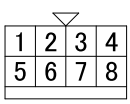
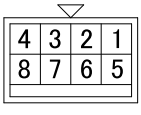
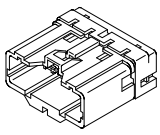
BQ type

Number shows number of pins	Female connector	Male connector
BQ1A		
BQ2A		
BQ3A		
BQ3B		

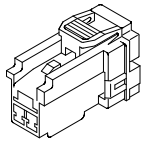
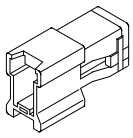
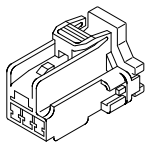
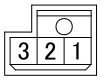
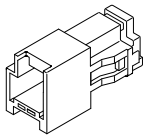
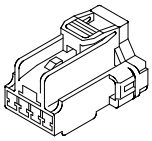
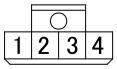
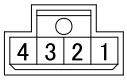
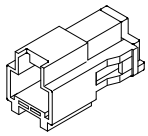
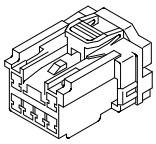
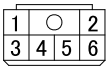
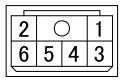
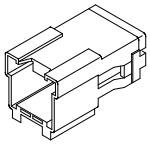
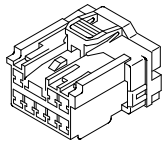
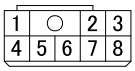
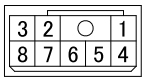
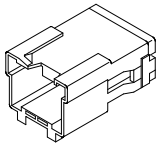
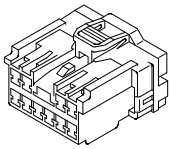
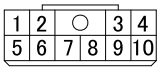
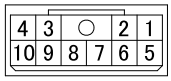
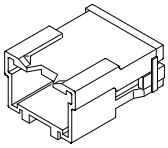
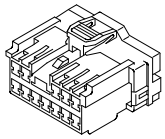
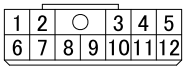
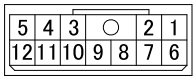
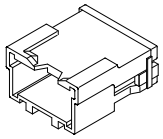
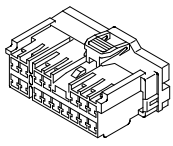
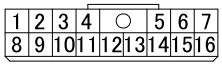
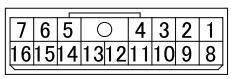
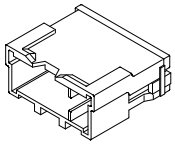
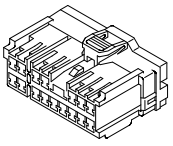
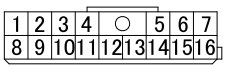
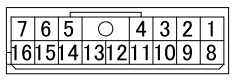
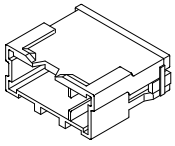
BR type

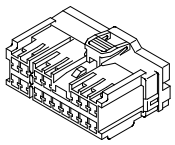
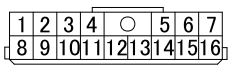
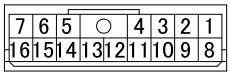
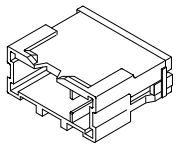
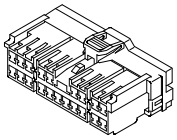
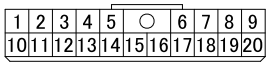
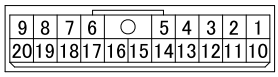
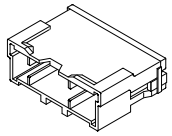
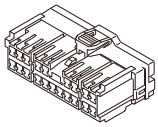
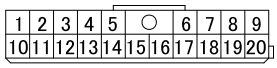
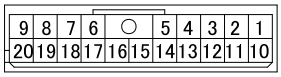
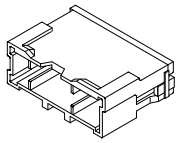
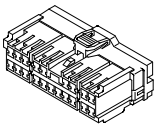
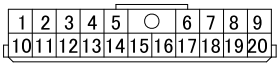
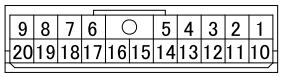
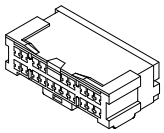
Number shows number of pins	Female connector	Male connector
BR1A		
BR2A		
BR4A		
BR4B		

BS type

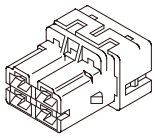
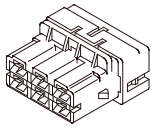
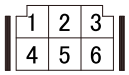
Number shows number of pins	Female connector	Male connector
BS1A	 	   
BS2A	 	   
BS3A	 	   
BS4A	 	 
BS6A	 	 
BS8A	 	 

BT type

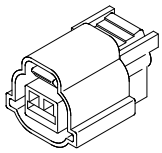
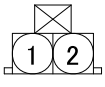
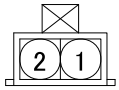
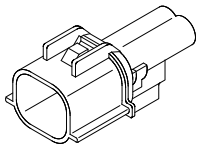
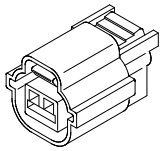
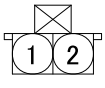
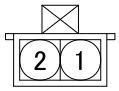
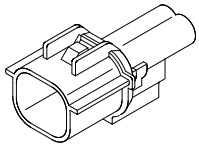
Number shows number of pins	Female connector	Male connector
BT2A	 	 
BT3A	 	 
BT4A	 	 
BT6A	 	 
BT8A	 	 
BT10A	 	 
BT12A	 	 
BT16A	 	 
BT16B	 	 

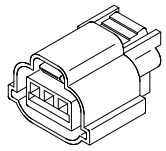
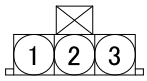
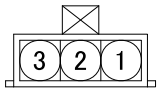
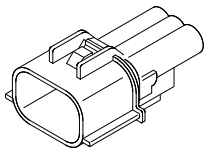
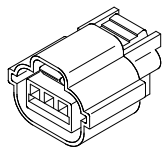
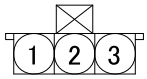
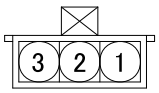
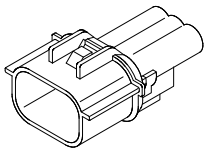
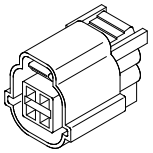
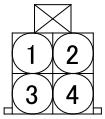
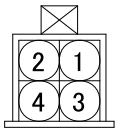
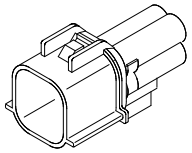
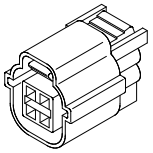
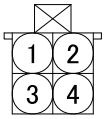
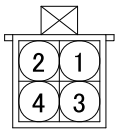
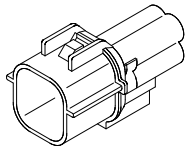
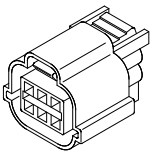
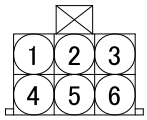
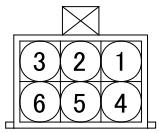
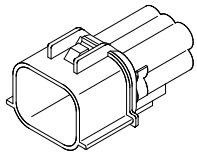
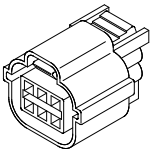
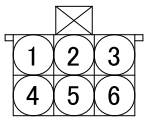
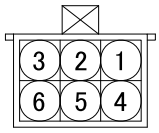
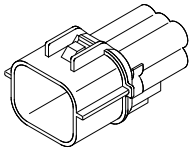
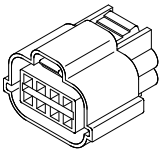
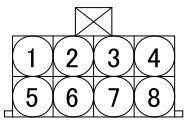
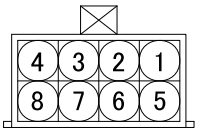
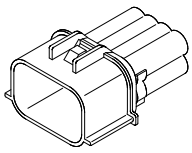
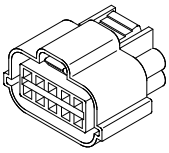
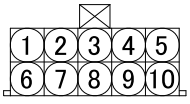
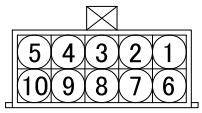
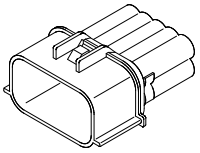
Number shows number of pins	Female connector	Male connector
BT16C	 	 
BT20A	 	 
BT20B	 	 
BT20C	 	 

BU type

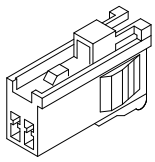
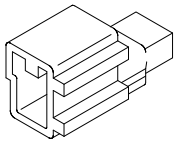
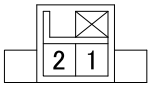
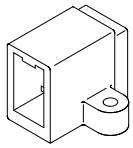
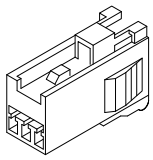
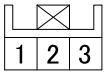
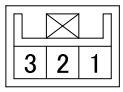
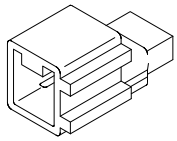
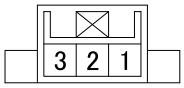
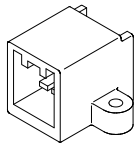
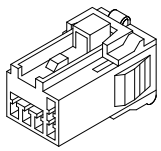
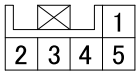
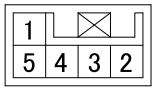
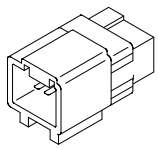
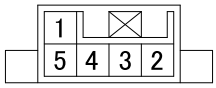
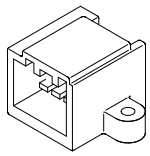
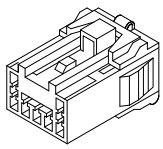
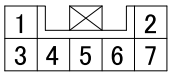
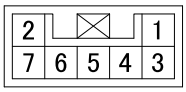
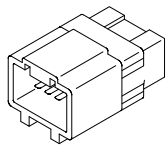
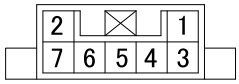
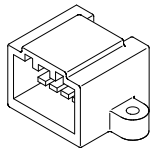
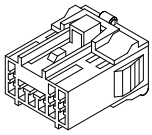
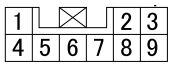
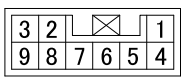
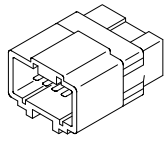
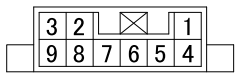
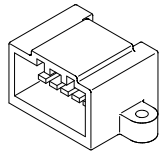
Number shows number of pins	Female connector	Male connector
BU4A	 	
BU6A	 	

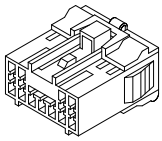
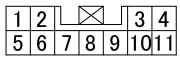
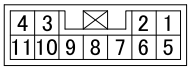
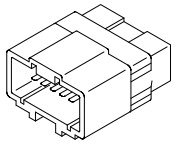
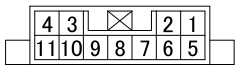
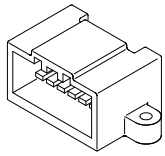
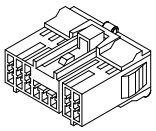
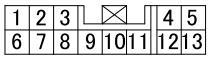
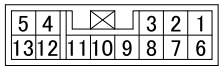
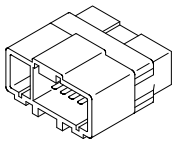
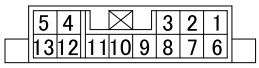
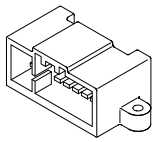
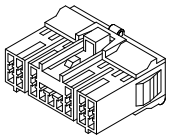
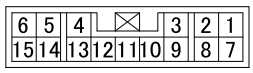
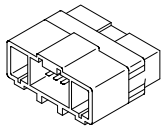
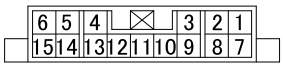
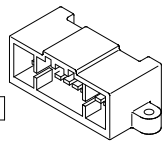
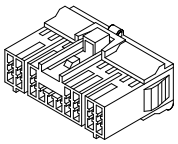
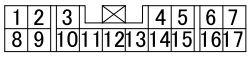
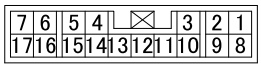
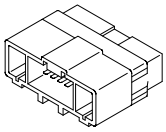
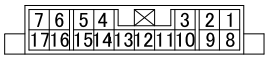
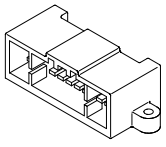
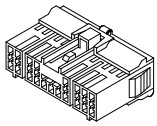
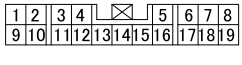
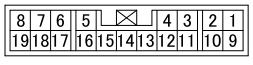
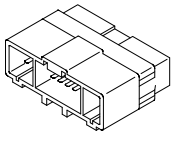
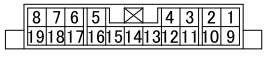
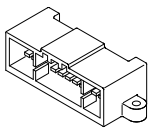
BW type

Number shows number of pins	Female connector	Male connector
BW2A	 	 
BW2B	 	 

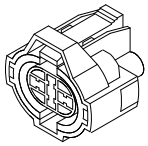
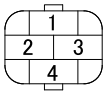
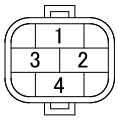
Number shows number of pins	Female connector	Male connector
BW3A	 	 
BW3B	 	 
BW4A	 	 
BW4B	 	 
BW6A	 	 
BW6B	 	 
BW8A	 	 
BW10A	 	 

BX type

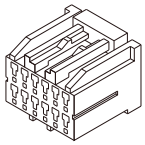
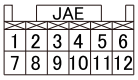
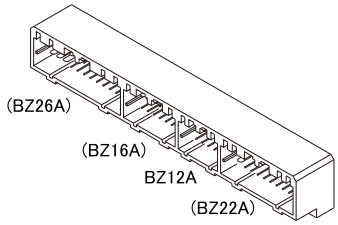
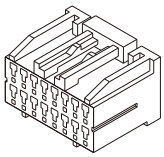
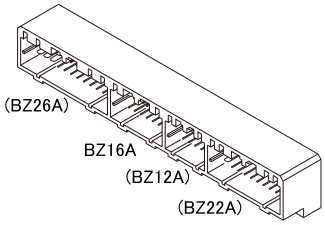
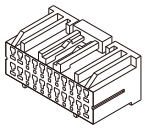
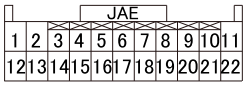
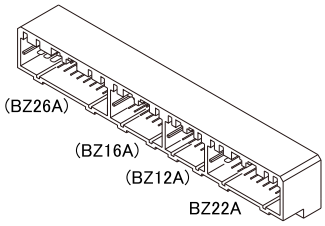
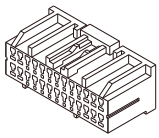
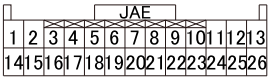
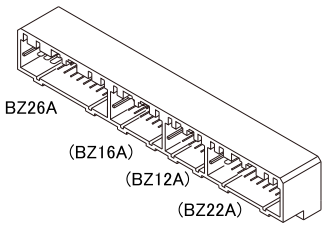
Number shows number of pins	Female connector	Male connector
BX2A	 	   
BX3A	 	   
BX5A	 	   
BX7A	 	   
BX9A	 	   

Number shows number of pins	Female connector	Male connector
BX11A	 	   
BX13A	 	   
BX15A	 	   
BX17A	 	   
BX19A	 	   

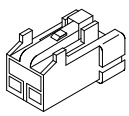
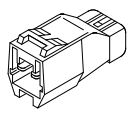
BY type

Number shows number of pins	Female connector	Male connector
BY4A	 	

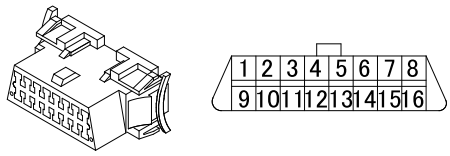
BZ type

Number shows number of pins	Female connector	Male connector
BZ12A	 	
BZ16A	 	
BZ22A	 	
BZ26A	 	

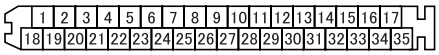
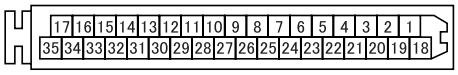
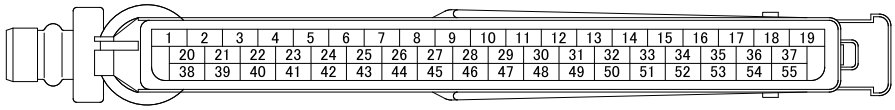
CA type

Number shows number of pins	Female connector	Male connector
CA2A	 	 

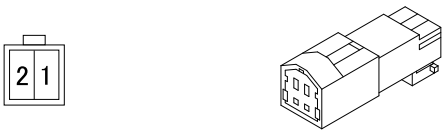
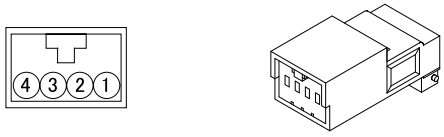
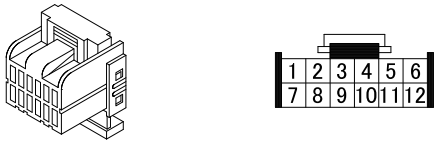
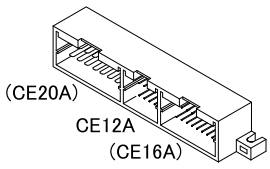
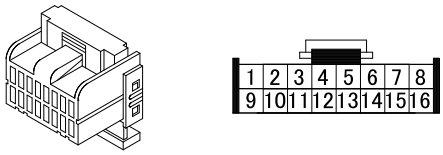
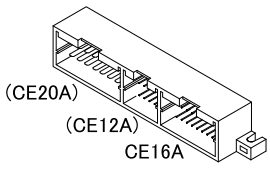
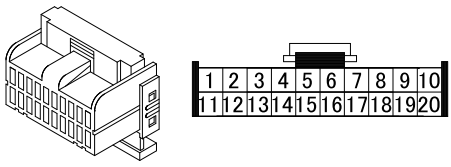
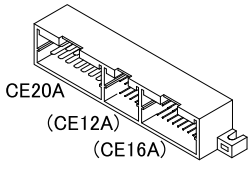
CB type

Number shows number of pins	Female connector	Male connector
CB16A		

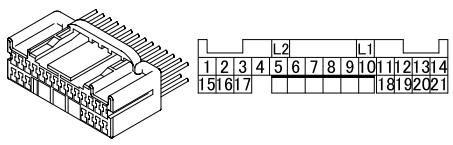
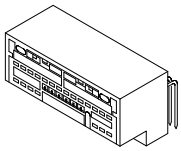
CD type

Number shows number of pins	Female connector	Male connector
CD35A		
CD55A		

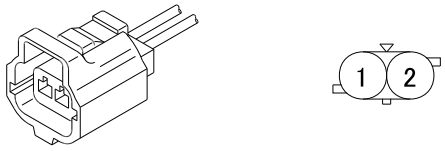
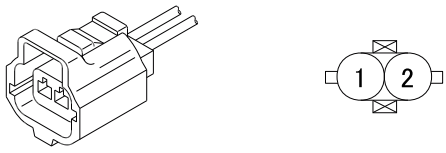
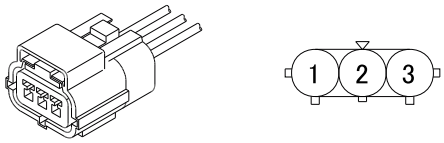
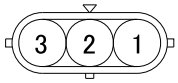
CE type

Number shows number of pins	Female connector	Male connector
CE2A		
CE4A		
CE12A		
CE16A		
CE20A		

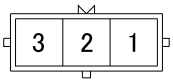
CF type

Number shows number of pins	Female connector	Male connector
CF21A		

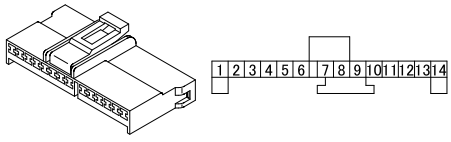
CH type

Number shows number of pins	Female connector	Male connector
CH2A		
CH2B		
CH3A		

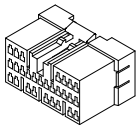
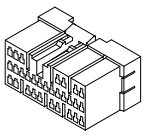
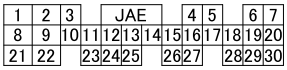
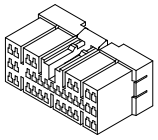
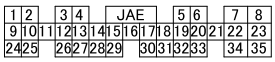
CK type

Number shows number of pins	Female connector	Male connector
CK3A		

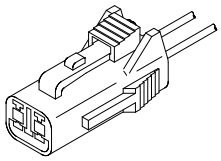
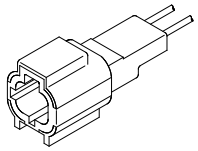
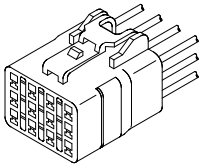
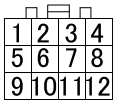
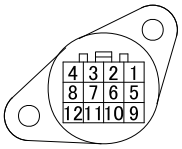
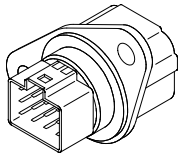
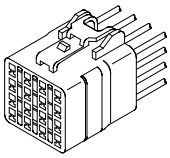
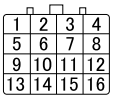
CL type

Number shows number of pins	Female connector	Male connector
CL14A		

CM type

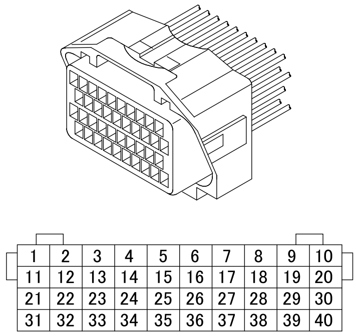
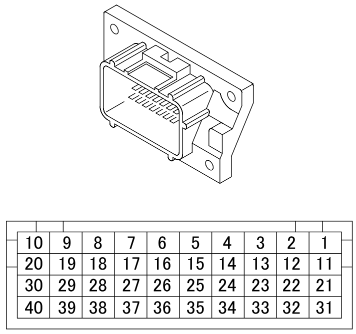
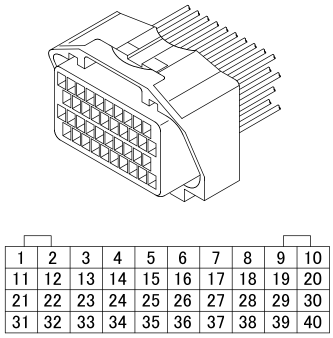
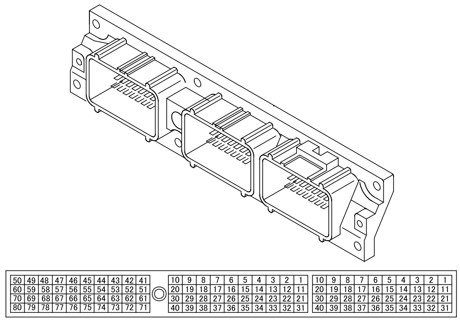
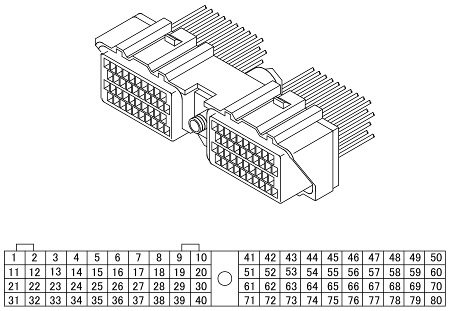
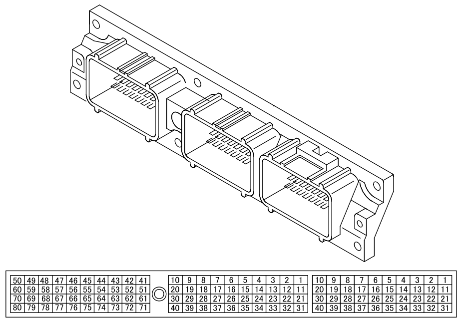
Number shows number of pins	Female connector	Male connector
CM28A	 	
CM30A	 	
CM35A	 	

CN type

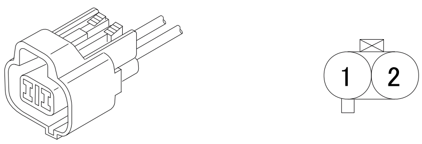
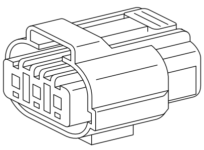
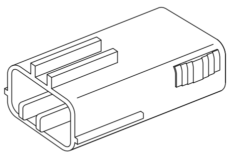
Number shows number of pins	Female connector	Male connector
CN2A	 	 
CN12A	 	 
CN16A	 	

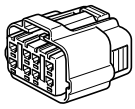
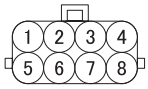
A

CP type

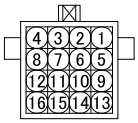
Number shows number of pins	Female connector	Male connector
CP40A		
CP40B		
CP80A		

CQ type

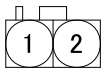
Number shows number of pins	Female connector	Male connector
CQ2B		
CQ3A		

Number shows number of pins	Female connector	Male connector
CQ8A	 	

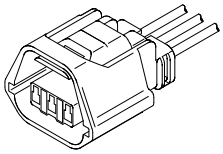
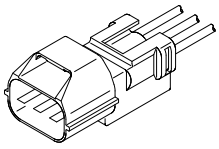
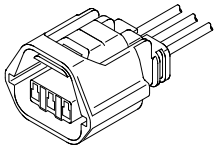
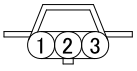
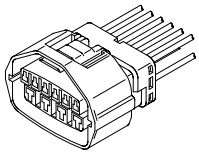
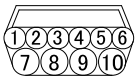
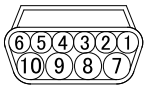
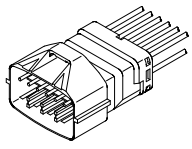
CR type

Number shows number of pins	Female connector	Male connector
CR16A		

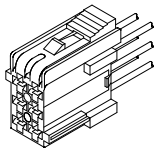
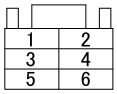
CS type

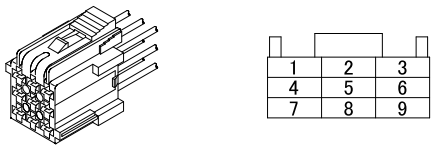
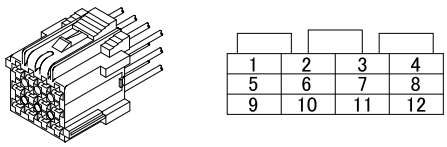
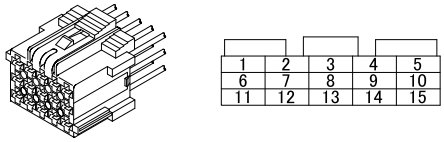
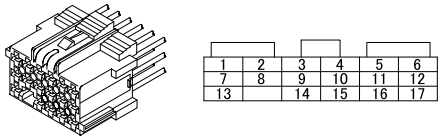
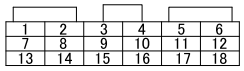
Number shows number of pins	Female connector	Male connector
CS2A		

CT type

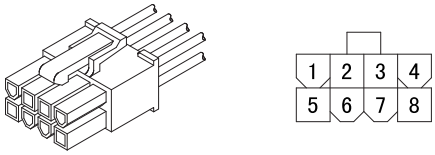
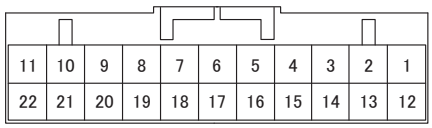
Number shows number of pins	Female connector	Male connector
CT3A	 	 
CT3B	 	
CT10A	 	 

CU type

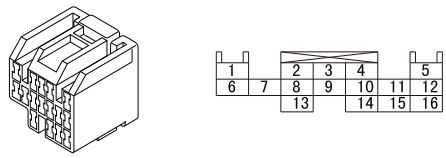
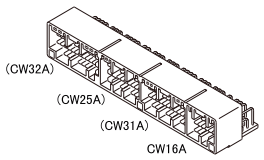
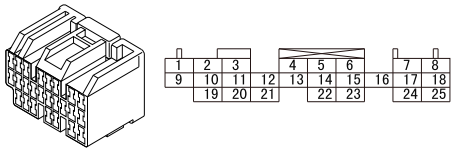
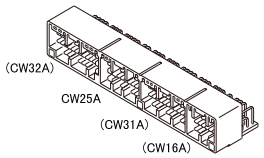
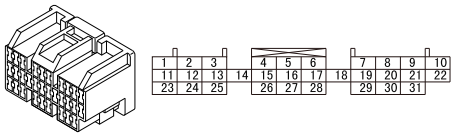
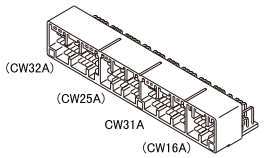
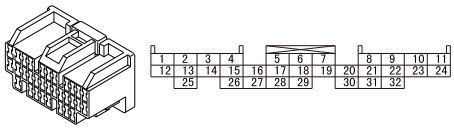
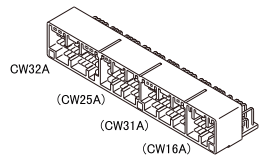
Number shows number of pins	Female connector	Male connector
CU6A	 	

Number shows number of pins	Female connector	Male connector
CU9A		
CU12A		
CU15A		
CU17A		
CU18A		

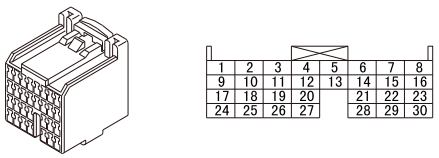
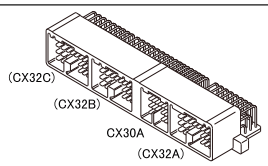
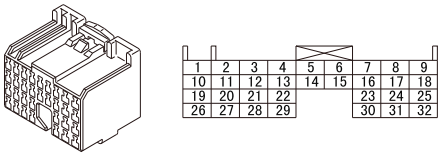
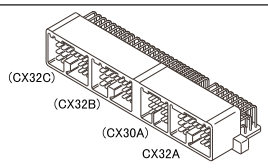
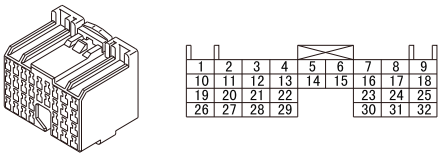
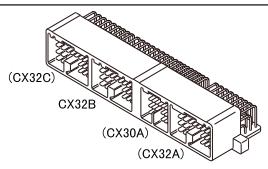
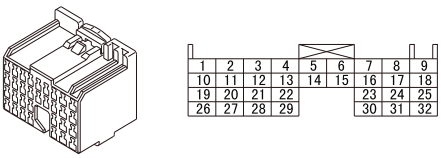
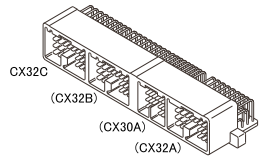
CV type

Number shows number of pins	Female connector	Male connector
CV2B		
CV8A		
CV22B		

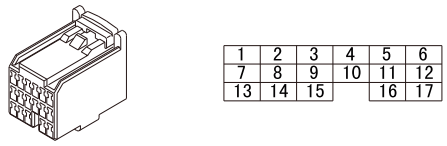
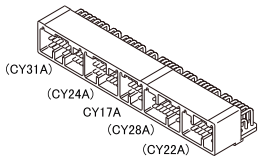
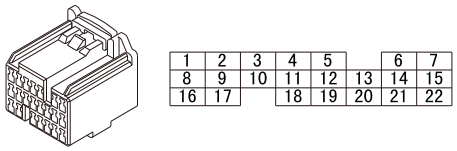
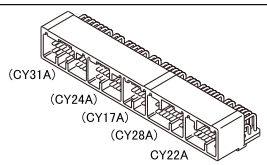
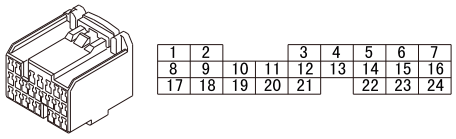
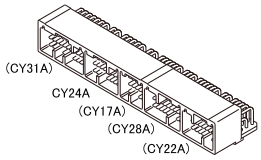
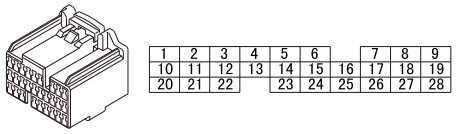
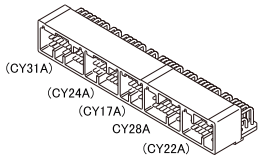
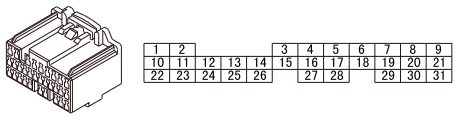
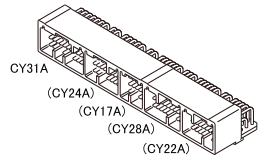
CW type

Number shows number of pins	Female connector	Male connector
CW16A		
CW25A		
CW31A		
CW32A		

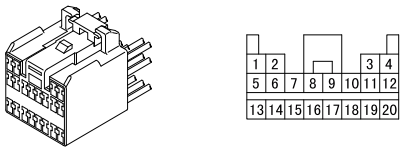
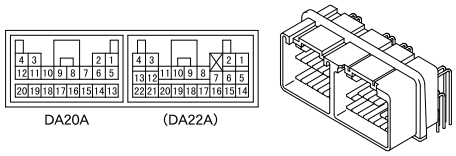
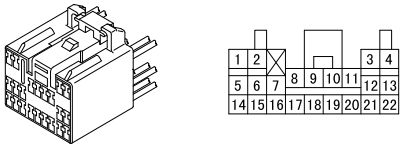
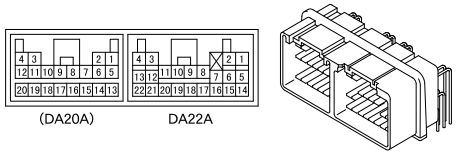
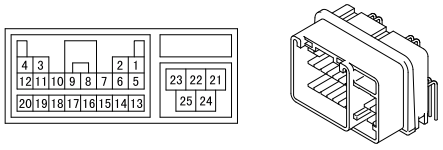
CX type

Number shows number of pins	Female connector	Male connector
CX30A		
CX32A		
CX32B		
CX32C		

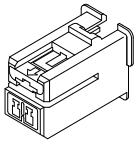
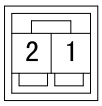
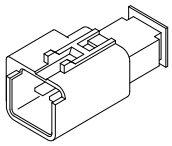
CY type

Number shows number of pins	Female connector	Male connector
CY17A		
CY22A		
CY24A		
CY28A		
CY31A		

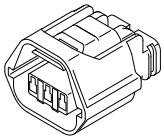
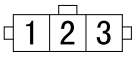
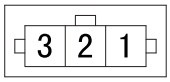
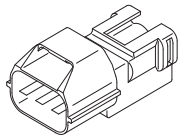
DA type

Number shows number of pins	Female connector	Male connector
DA20A		
DA22A		
DA25A		

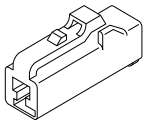
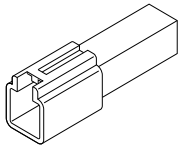
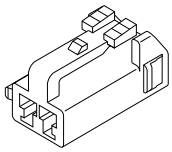
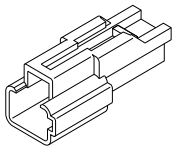
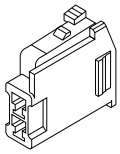
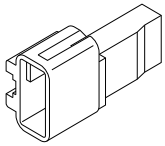
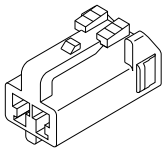
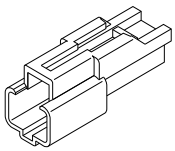
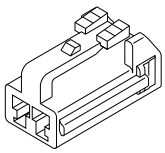
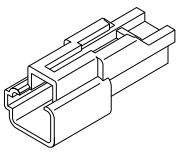
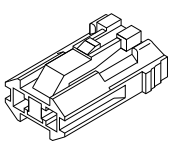
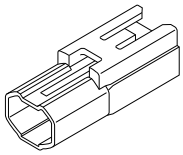
DB type

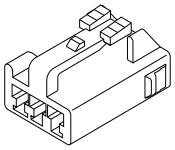
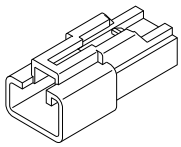
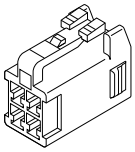
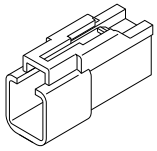
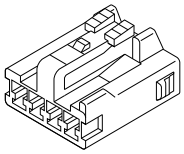
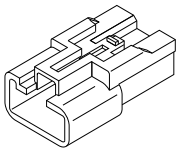
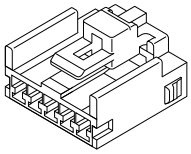
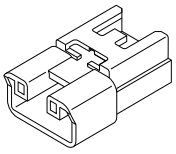
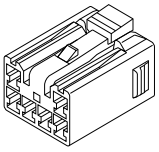
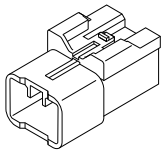
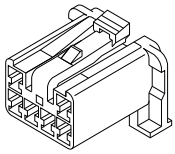
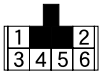
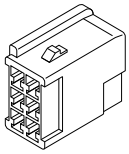
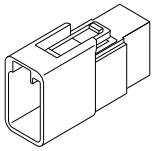
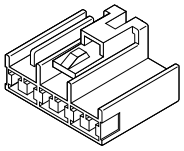
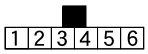
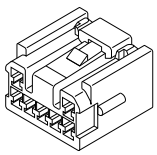
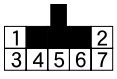
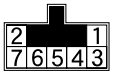
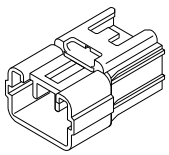
Number shows number of pins	Female connector	Male connector
DB2A	 	 

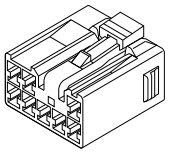
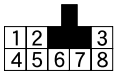
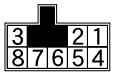
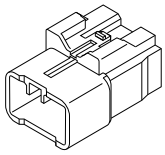
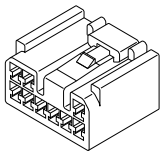
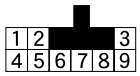
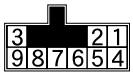
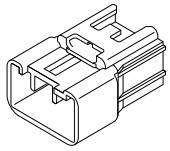
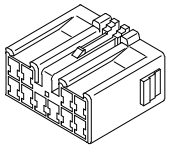
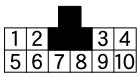
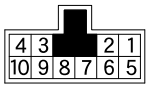
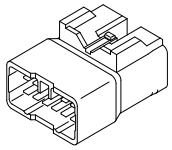
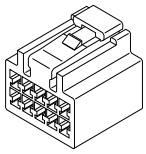
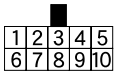
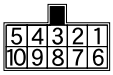
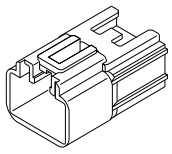
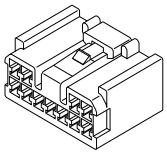
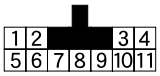
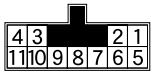
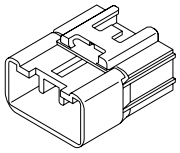
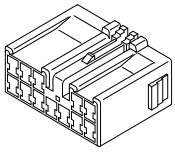
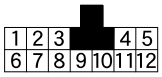
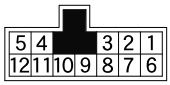
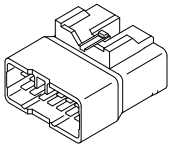
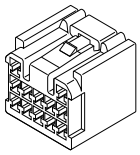
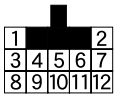
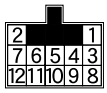
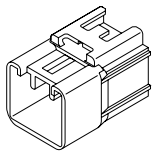
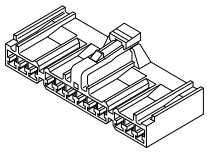
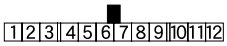
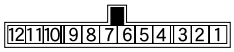
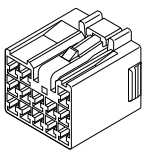
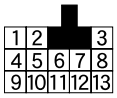
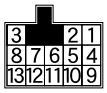
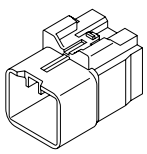
DC type

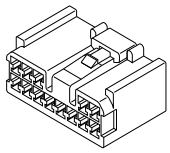
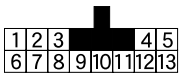
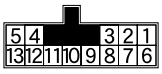
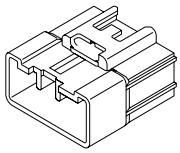
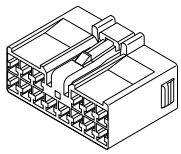
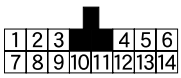
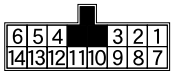
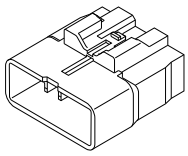
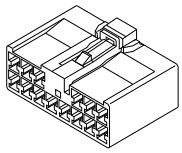
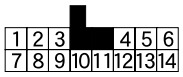
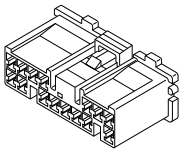
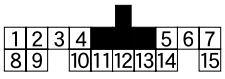
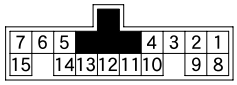
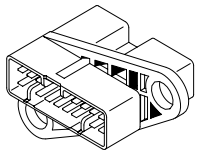
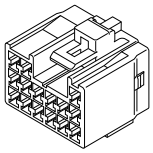
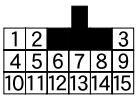
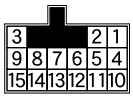
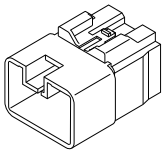
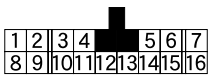
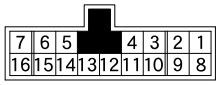
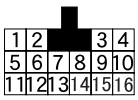
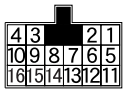
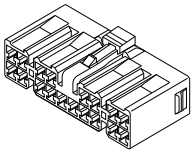
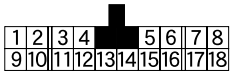
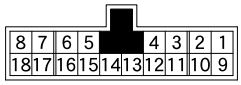
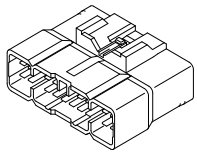
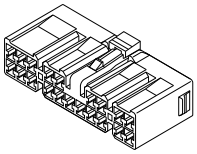
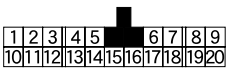
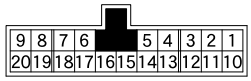
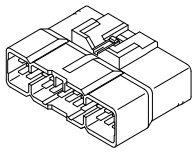
Number shows number of pins	Female connector	Male connector
DC3A	 	 

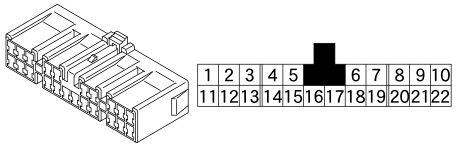
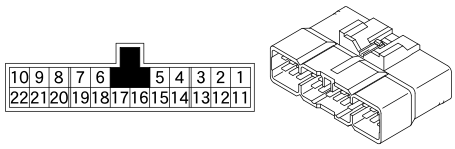
DD type

Number shows number of pins	Female connector	Male connector
DD1A	 	 
DD2A	 	 
DD2B	 	 
DD2C	 	 
DD2E	 	 
DD2F	 	 

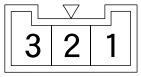
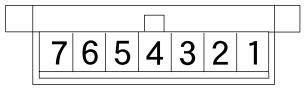
Number shows number of pins	Female connector	Male connector
DD3A	 	 
DD4A	 	 
DD4C	 	 
DD5A	 	 
DD6A	 	 
DD6B	 	
DD6C	 	 
DD6E	 	
DD7A	 	 

Number shows number of pins	Female connector	Male connector
DD8A	 	 
DD9A	 	 
DD10A	 	 
DD10B	 	 
DD11A	 	 
DD12A	 	 
DD12B	 	 
DD12C	 	
DD13A	 	 

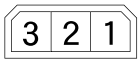
Number shows number of pins	Female connector	Male connector
DD13B	 	 
DD14A	 	 
DD14B	 	
DD15A	 	 
DD15B	 	 
DD16A		
DD16B		
DD18A	 	 
DD20A	 	 

Number shows number of pins	Female connector	Male connector
DD22A		

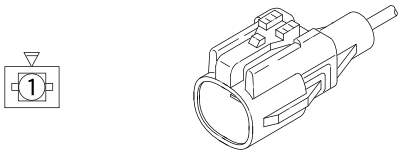
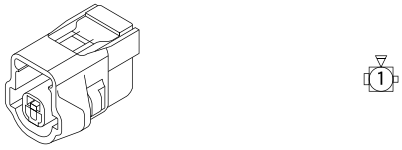
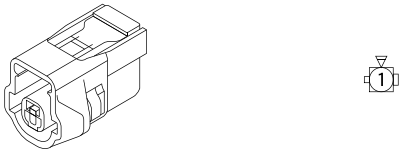
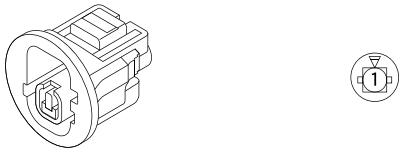
DE type

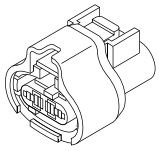
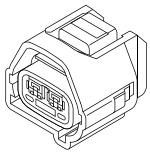
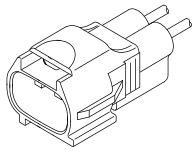
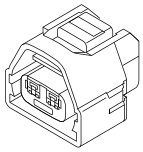
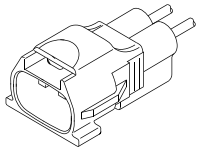
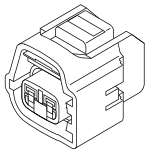
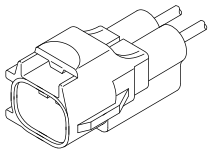
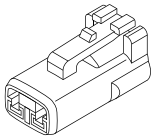
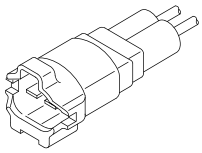
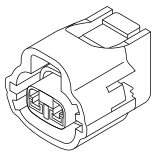
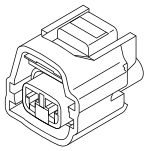
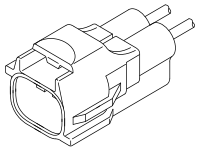
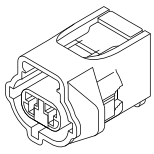
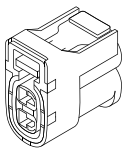
Number shows number of pins	Female connector	Male connector
DE3A		
DE7A		

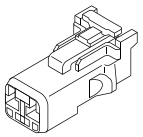
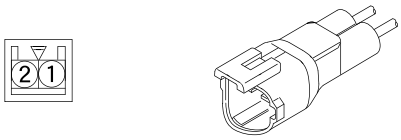
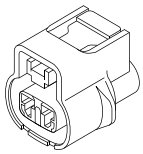
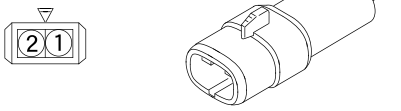
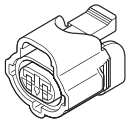
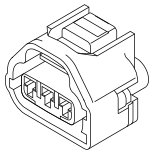
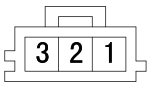
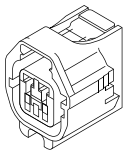
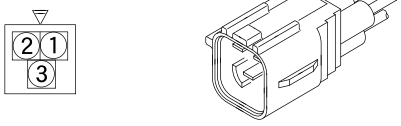
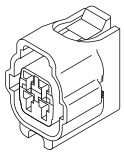
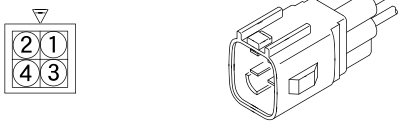
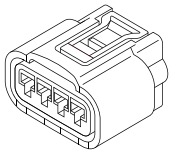
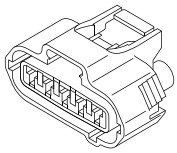
DF type

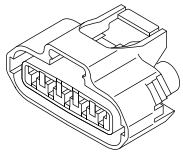
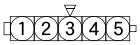
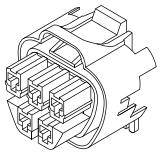
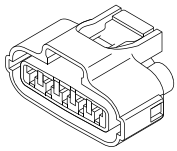
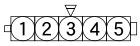
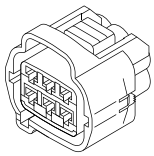
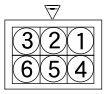
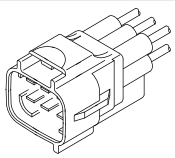
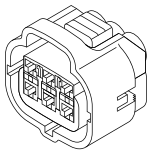
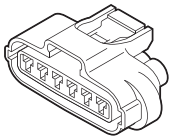
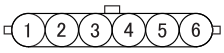
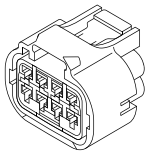
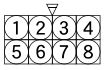
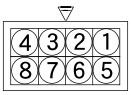
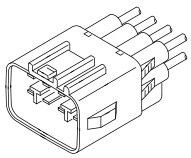
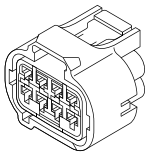
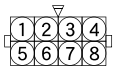
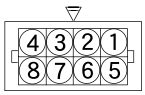
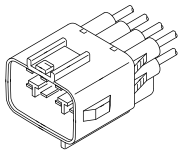
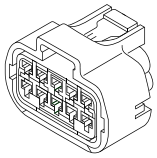
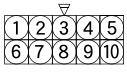
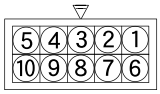
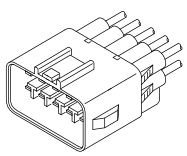
Number shows number of pins	Female connector	Male connector
DF3A		

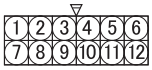
DG type

Number shows number of pins	Female connector	Male connector
DG1A		
DG1B		
DG1C		
DG1D		

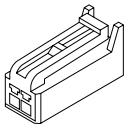
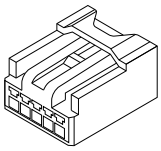
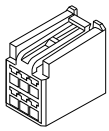
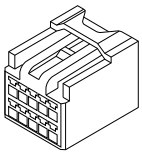
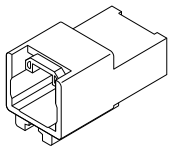
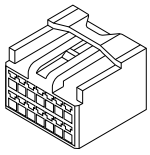
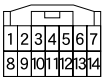
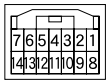
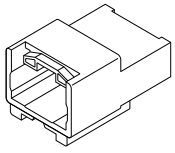
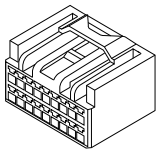
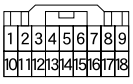
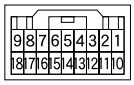
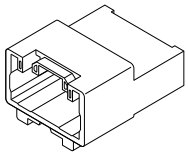
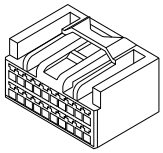
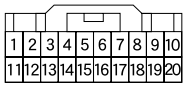
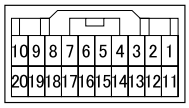
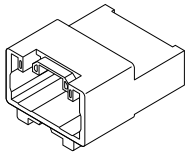
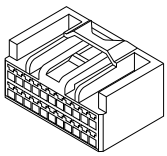
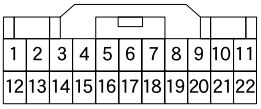
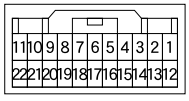
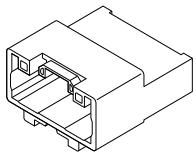
Number shows number of pins	Female connector	Male connector
DG2A	 	
DG2B	 	 
DG2C	 	 
DG2D	 	 
DG2E	 	 
DG2F	 	
DG2G	 	 
DG2H	 	
DG2J	 	

Number shows number of pins	Female connector	Male connector
DG2K		
DG2L		
DG2M		
DG3A		
DG3B		
DG4A		
DG4B		
DG4C		
DG5A		

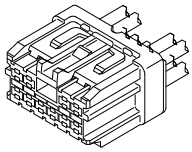
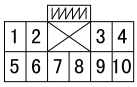
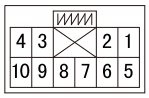
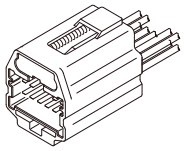
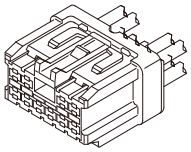
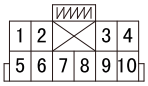
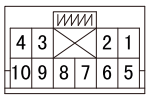
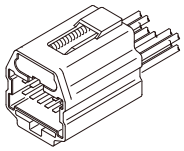
Number shows number of pins	Female connector	Male connector
DG5B	 	
DG5C	 	
DG5D	 	
DG6A	 	 
DG6B	 	
DG6C	 	
DG8A	 	 
DG8B	 	 
DG10A	 	 

Number shows number of pins	Female connector	Male connector
DG12A		

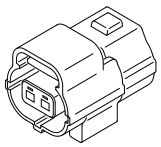
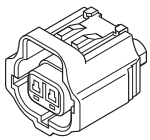
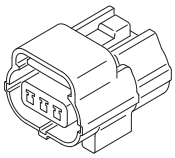
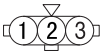
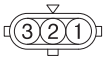
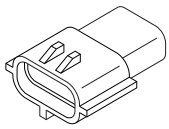
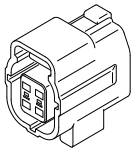
DH type

Number shows number of pins	Female connector	Male connector
DH2A	 	
DH5A	 	
DH6A	 	
DH10A	 	 
DH14A	 	 
DH18A	 	 
DH20A	 	 
DH22A	 	 

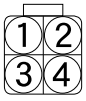
DJ type

Number shows number of pins	Female connector	Male connector
DJ10A	 	 
DJ10B	 	 

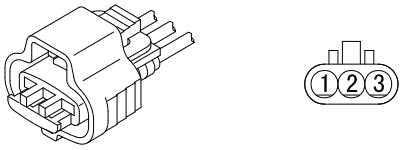
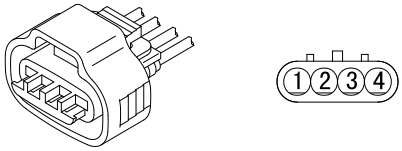
DK type

Number shows number of pins	Female connector	Male connector
DK2A	 	
DK2B	 	
DK3A	 	 
DK4A	 	

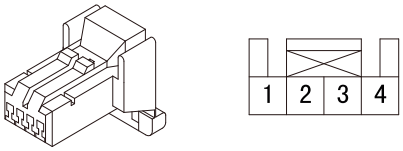
DL type

Number shows number of pins	Female connector	Male connector
DL4A		

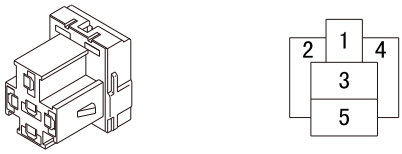
DM type

Number shows number of pins	Female connector	Male connector
DM3A		
DM4A		

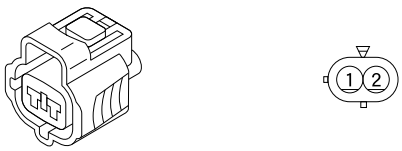
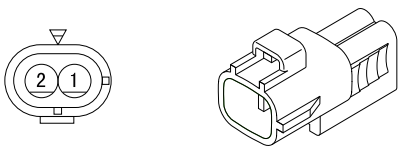
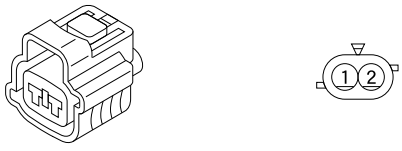
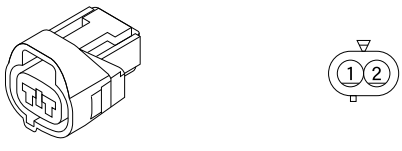
DN type

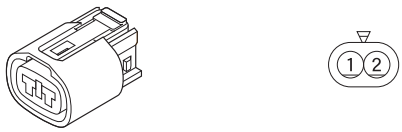
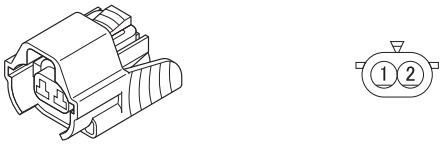
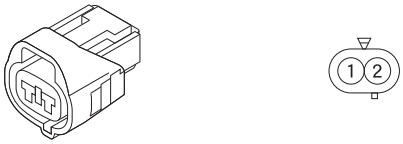
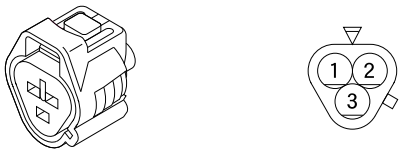
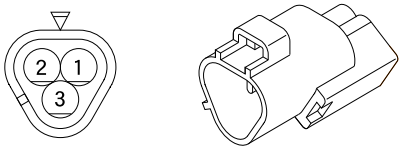
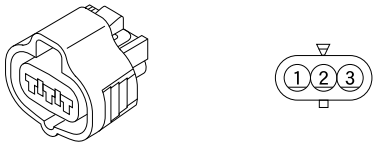
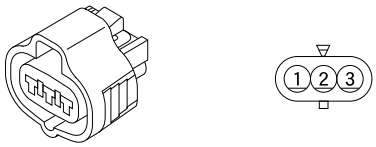
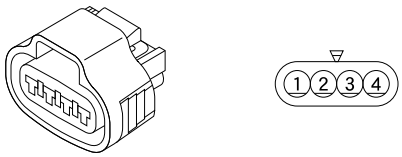
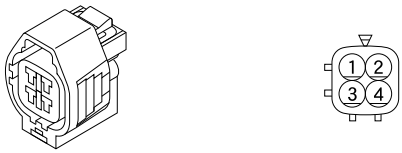
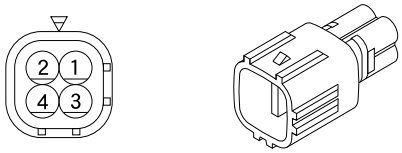
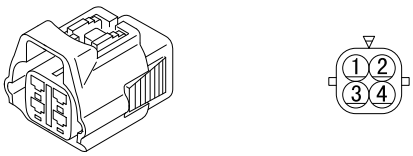
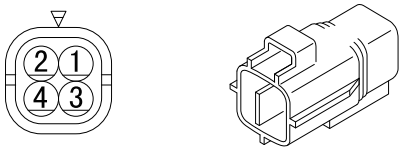
Number shows number of pins	Female connector	Male connector
DN4A		

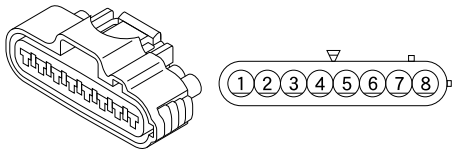
DP type

Number shows number of pins	Female connector	Male connector
DP5A		

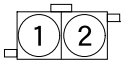
DQ type

Number shows number of pins	Female connector	Male connector
DQ2A		
DQ2B		
DQ2C		

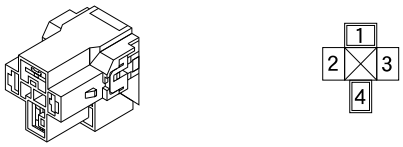
Number shows number of pins	Female connector	Male connector
DQ2D		
DQ2E		
DQ2F		
DQ3A		
DQ3B		
DQ3D		
DQ4A		
DQ4B		
DQ4C		

Number shows number of pins	Female connector	Male connector
DQ8A		

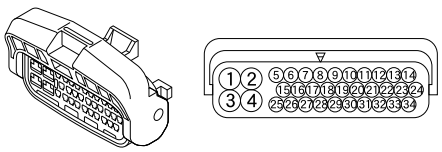
EC type

Number shows number of pins	Female connector	Male connector
EC2A		

EN type

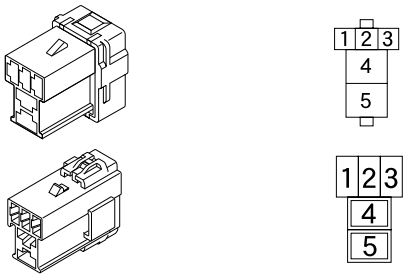
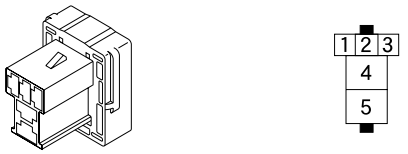
Number shows number of pins	Female connector	Male connector
EN4A		
EN5A		

EP type

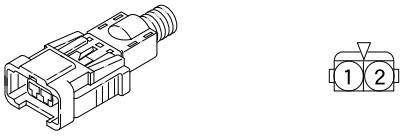
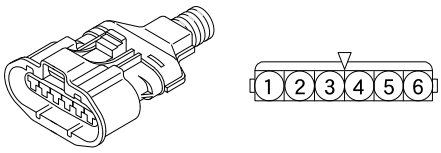
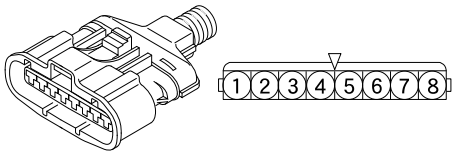
Number shows number of pins	Female connector	Male connector
EP34A		

EQ type

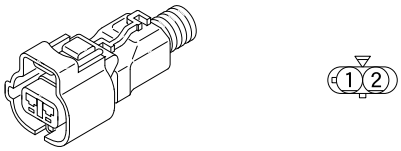
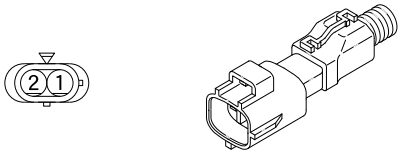
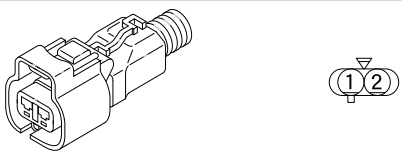
Number shows number of pins	Female connector	Male connector
EQ4A		
EQ4B		

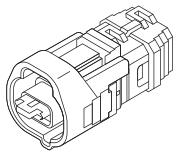
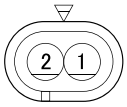
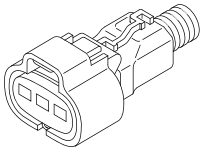
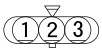
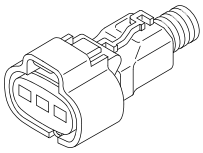
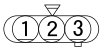
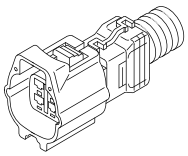
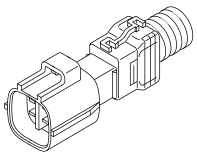
Number shows number of pins	Female connector	Male connector
EQ5A		
EQ5B		

ER type

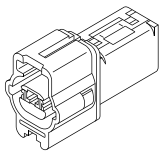
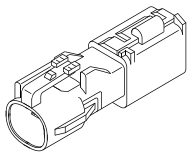
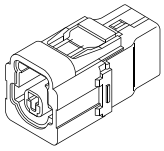
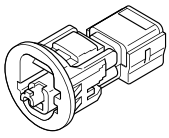
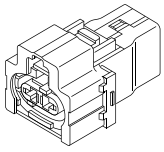
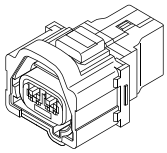
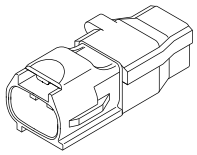
Number shows number of pins	Female connector	Male connector
ER2A		
ER6A		
ER8A		

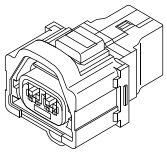
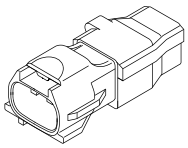
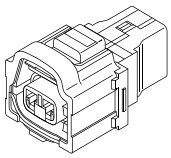
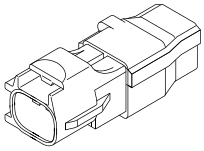
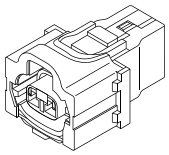
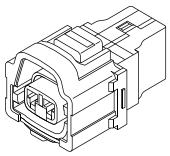
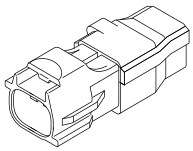
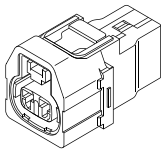
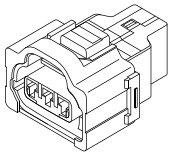
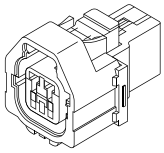
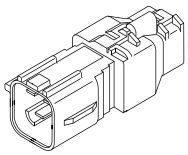
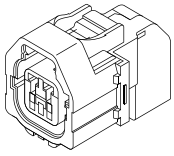
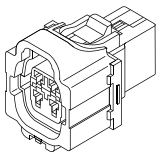
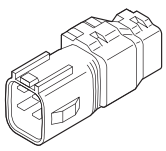
ES type

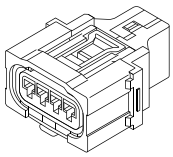
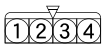
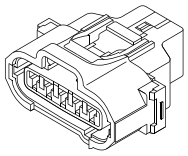
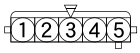
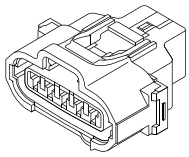
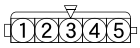
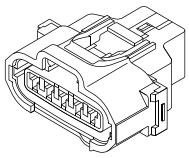
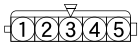
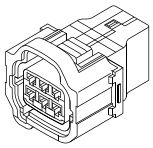
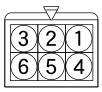
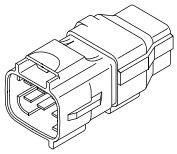
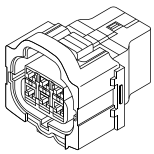
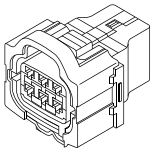
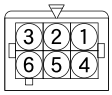
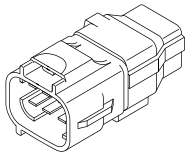
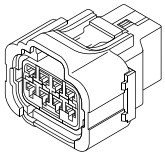
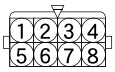
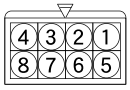
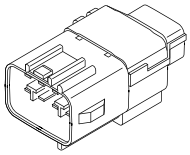
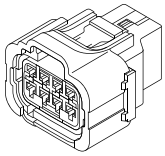
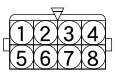
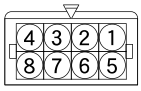
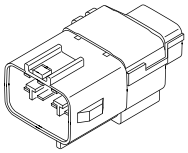
Number shows number of pins	Female connector	Male connector
ES2A		
ES2B		

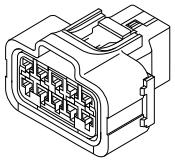
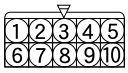
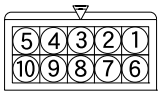
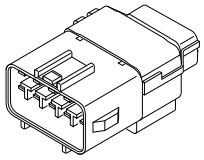
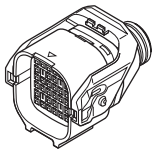
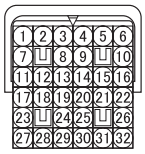
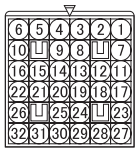
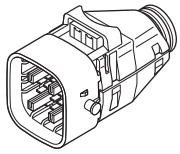
Number shows number of pins	Female connector	Male connector
ES2C	 	
ES3A	 	
ES3B	 	
ES4A	 	 

ET type

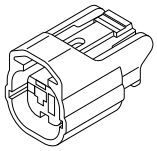
Number shows number of pins	Female connector	Male connector
ET1A	 	 
ET1B	 	
ET1D	 	
ET2A	 	
ET2B	 	 

Number shows number of pins	Female connector	Male connector
ET2C	 	 
ET2D	 	 
ET2F	 	
ET2G	 	 
ET2L	 	
ET3A	 	
ET3B	 	 
ET3C	 	
ET4A	 	 

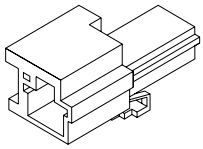
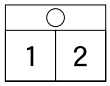
Number shows number of pins	Female connector	Male connector
ET4B	 	
ET5A	 	
ET5B	 	
ET5D	 	
ET6A	 	 
ET6B	 	
ET6C	 	 
ET8A	 	 
ET8B	 	 

Number shows number of pins	Female connector	Male connector
ET10A	 	 
ET32A	 	 

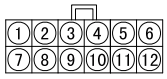
EU type

Number shows number of pins	Female connector	Male connector
EU1A	 	

EV type

Number shows number of pins	Female connector	Male connector
EV2A	 	

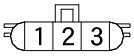
EW type

Number shows number of pins	Female connector	Male connector
EW12A		

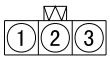
EX type

Number shows number of pins	Female connector	Male connector
EX5A		

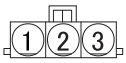
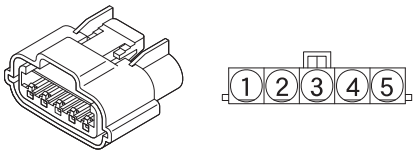
EY type

Number shows number of pins	Female connector	Male connector
EY3A		

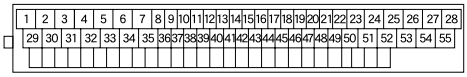
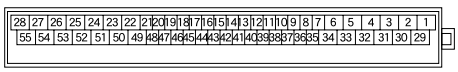
EZ type

Number shows number of pins	Female connector	Male connector
EZ3A		

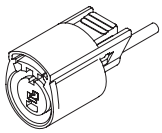
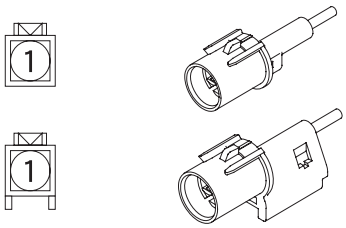
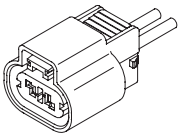
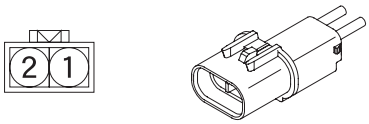
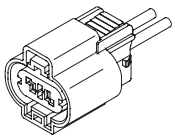
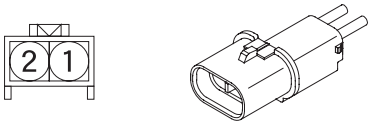
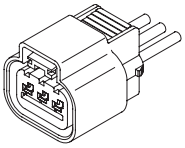
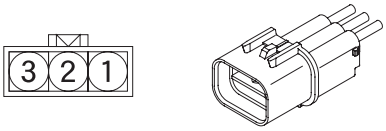
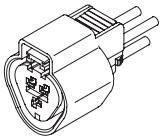
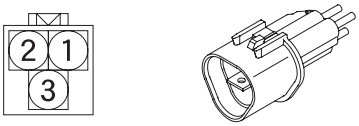
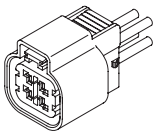
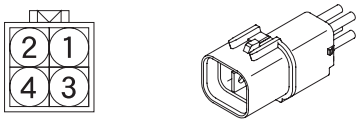
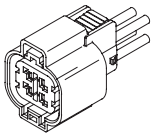
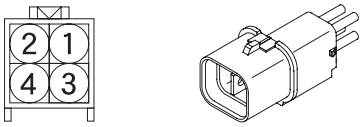
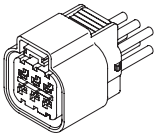
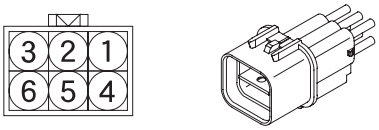
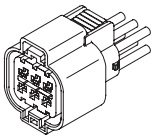
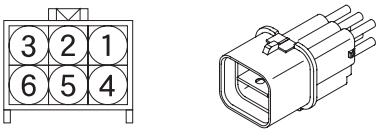
FA type

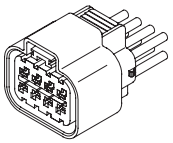
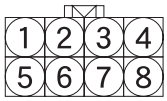
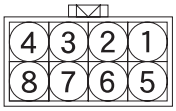
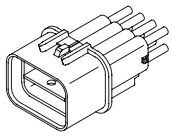
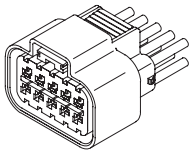
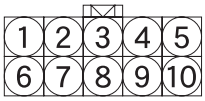
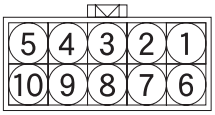
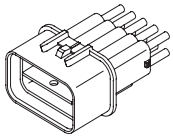
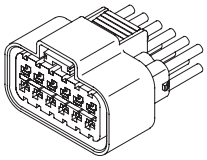
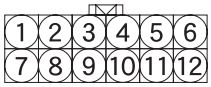
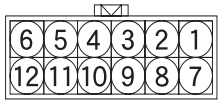
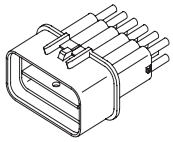
Number shows number of pins	Female connector	Male connector
FA2B		
FA3A		
FA5A		

FB type

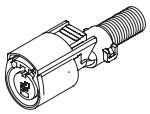
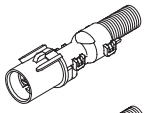
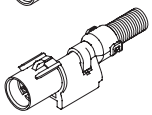
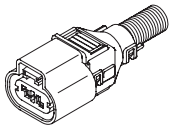
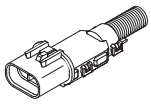
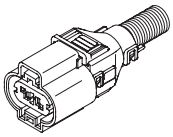
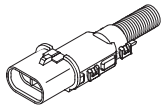
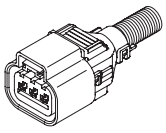
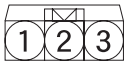
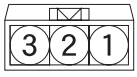
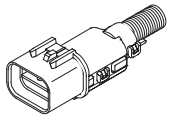
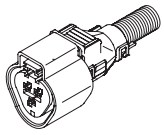
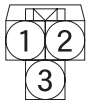
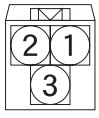
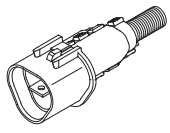
Number shows number of pins	Female connector	Male connector
FB55A		

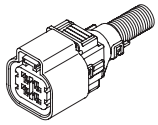
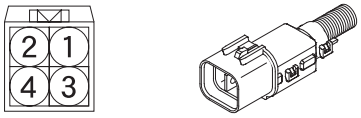
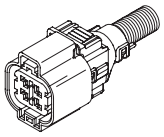
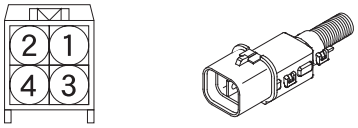
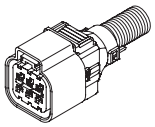
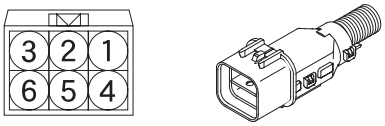
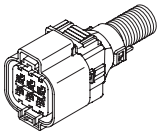
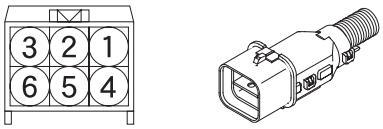
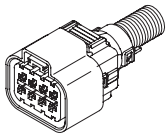
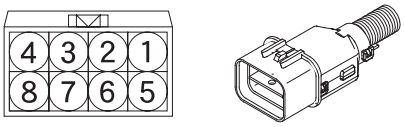
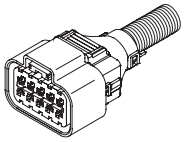
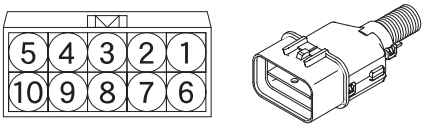
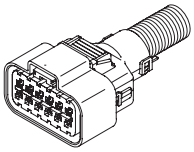
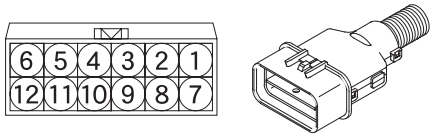
GA type

Number shows number of pins	Female connector	Male connector
GA1A		
GA2A		
GA2B		
GA3A		
GA3B		
GA4A		
GA4B		
GA6A		
GA6B		

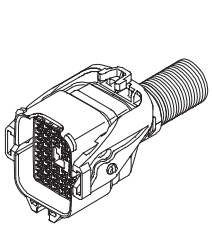
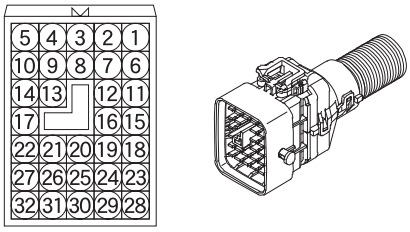
Number shows number of pins	Female connector	Male connector
GA8A	 	 
GA10A	 	 
GA12A	 	 

GB type

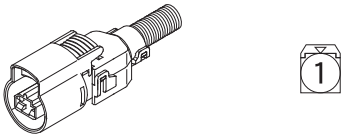
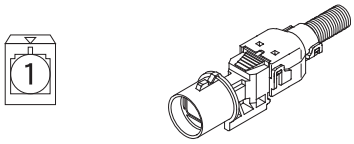
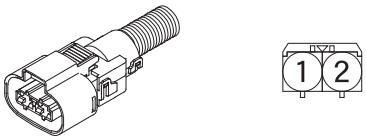
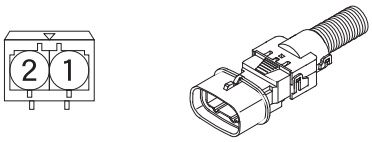
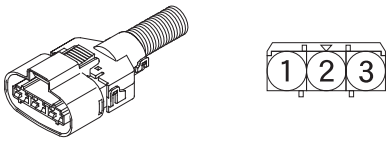
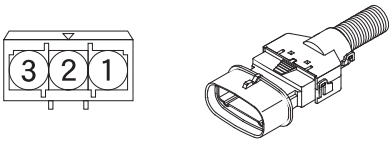
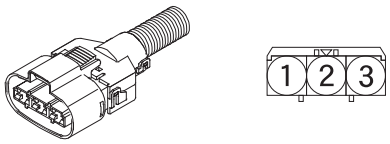
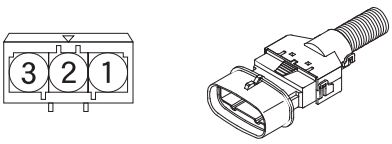
Number shows number of pins	Female connector	Male connector
GB1A	 	   
GB2A	 	 
GB2B	 	 
GB3A	 	 
GB3B	 	 

Number shows number of pins	Female connector	Male connector
GB4A		
GB4B		
GB6A		
GB6B		
GB8A		
GB10A		
GB12A		

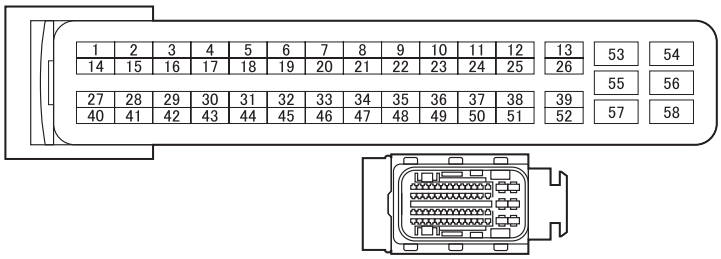
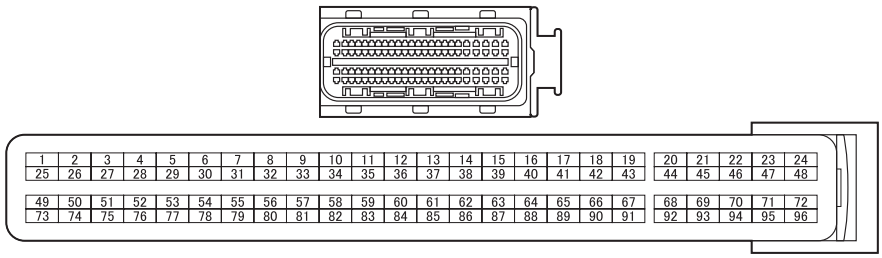
GC type

Number shows number of pins	Female connector	Male connector
GC32A		

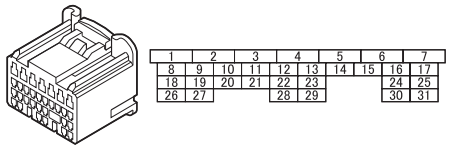
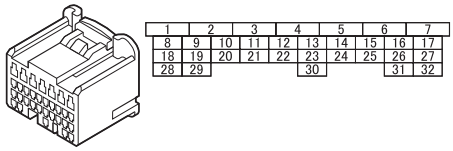
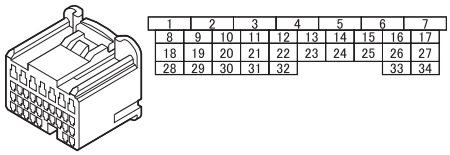
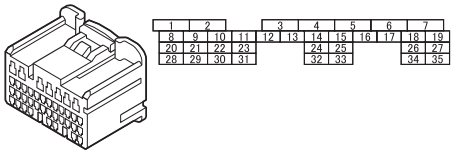
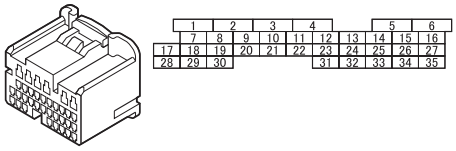
GD type

Number shows number of pins	Female connector	Male connector
GD1A		
GD2A		
GD3A		
GD3B		

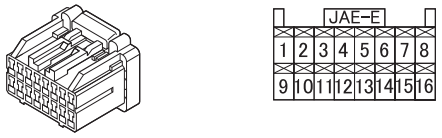
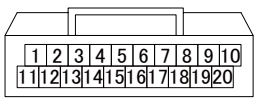
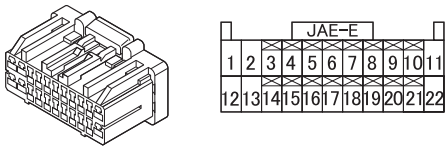
GE type

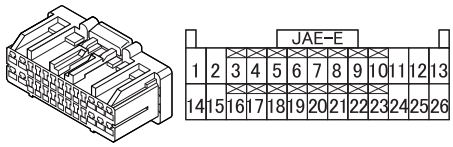
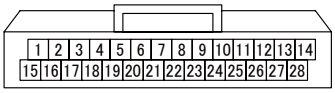
Number shows number of pins	Female connector
GE58A	
GE96A	

GF type

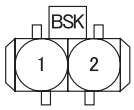
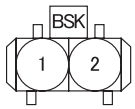
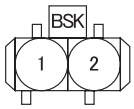
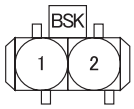
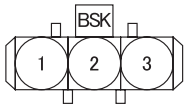
Number shows number of pins	Female connector	Male connector
GF31A		
GF32A		
GF34A		
GF35A		
GF35B		

GG type

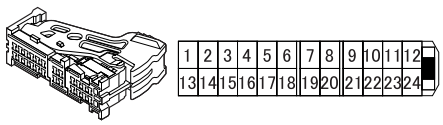
Number shows number of pins	Female connector	Male connector
GG12A		
GG16A		
GG20A		
GG22A		

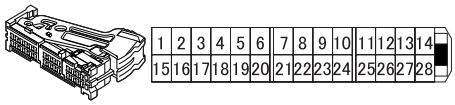
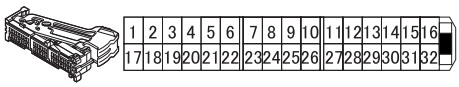
Number shows number of pins	Female connector	Male connector
GG26A		
GG28A		

GS type

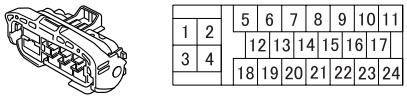
Number shows number of pins	Female connector	Male connector
GS2A		
GS2B		
GS2C		
GS2D		
GS3A		

GT type

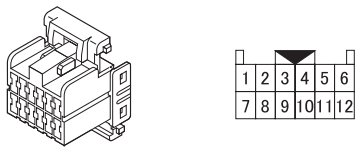
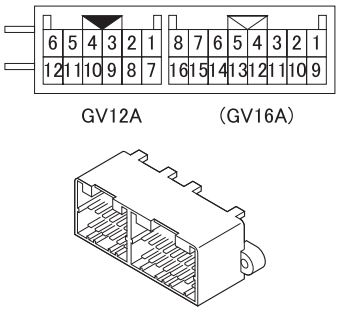
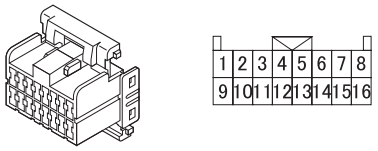
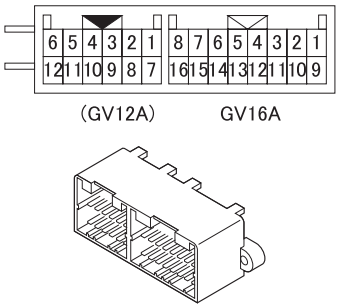
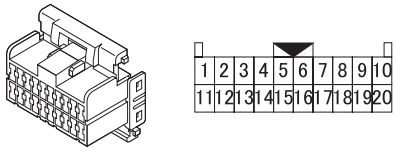
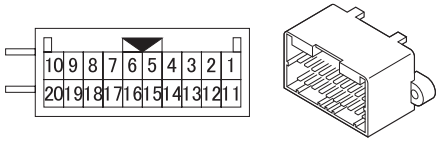
Number shows number of pins	Female connector	Male connector
GT24A		

Number shows number of pins	Female connector	Male connector
GT28A		
GT32A		

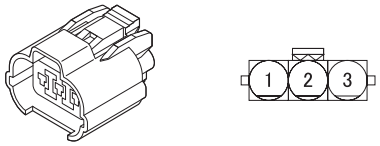
GU type

Number shows number of pins	Female connector	Male connector
GU24A		

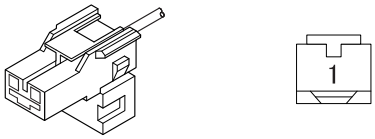
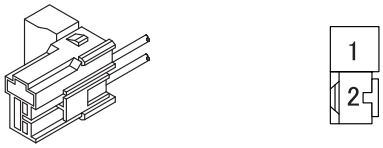
GV type

Number shows number of pins	Female connector	Male connector
GV12A		 GV12A (GV16A)
GV16A		 (GV12A) GV16A
GV20A		

GW type

Number shows number of pins	Female connector	Male connector
GW3A		
GW3B		
GW4A		

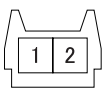
GX type

Number shows number of pins	Female connector	Male connector
GX1A		
GX2A		

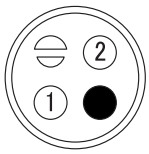
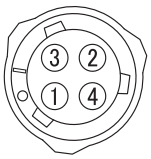
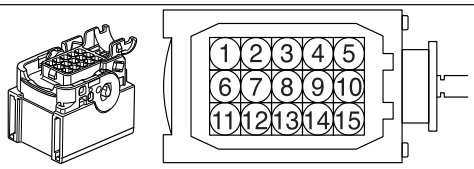
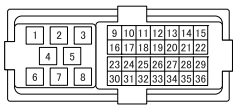
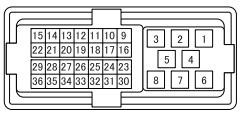
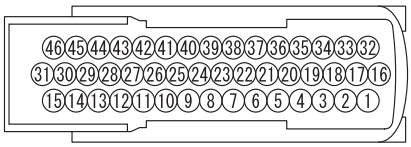
GY type

Number shows number of pins	Female connector	Male connector
GY4A		

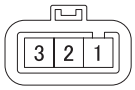
GZ type

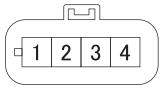
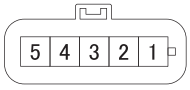
Number shows number of pins	Female connector	Male connector
GZ2A		

HA type

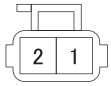
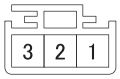
Number shows number of pins	Female connector	Male connector
HA2A		
HA4A		
HA7A		
HA15A		
HA36A		
HA46A		

HD type

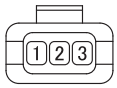
Number shows number of pins	Female connector	Male connector
HD2A		
HD2B		
HD3A		

Number shows number of pins	Female connector	Male connector
HD4A		
HD4B		
HD5A		

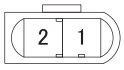
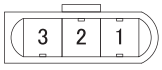
HE type

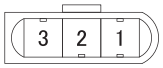
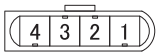
Number shows number of pins	Female connector	Male connector
HE2A		
HE3A		

HF type

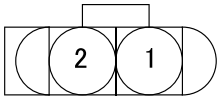
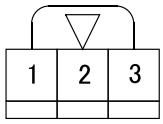
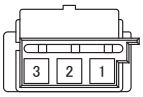
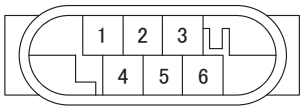
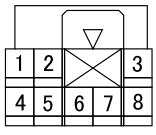
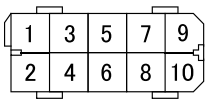
Number shows number of pins	Female connector	Male connector
HF3A		

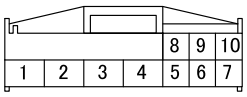
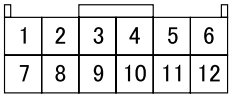
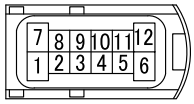
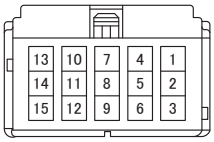
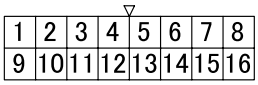
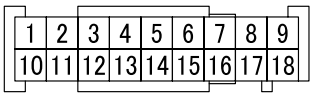
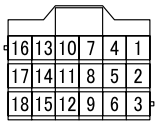
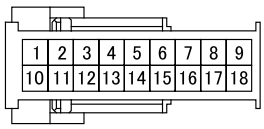
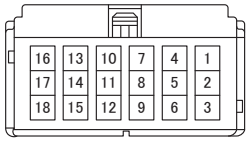
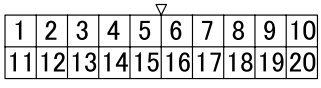
HG type

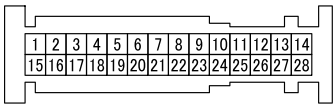
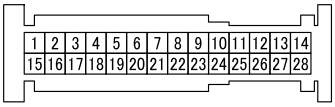
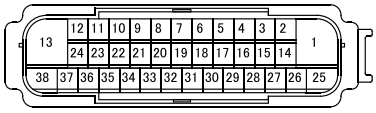
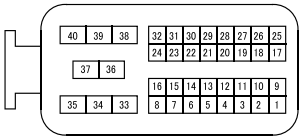
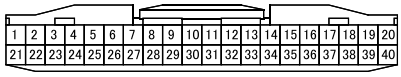
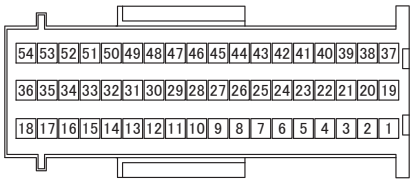
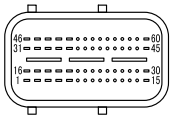
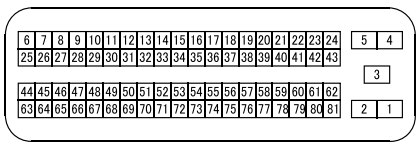
Number shows number of pins	Female connector	Male connector
HG2A		
HG3A		

Number shows number of pins	Female connector	Male connector
HG3B		
HG4A		

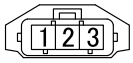
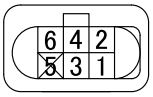
HH type

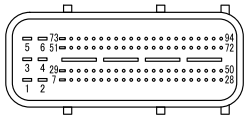
Number shows number of pins	Female connector	Male connector
HH2A		
HH3A		
HH3D		
HH6A		
HH8A		
HH8E		
HH10A		

Number shows number of pins	Female connector	Male connector
HH10B		
HH12A		
HH12B		
HH15A		
HH16A		
HH18A		
HH18B		
HH18C		
HH18E		
HH20A		

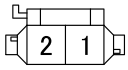
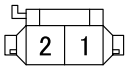
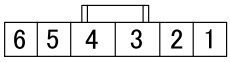
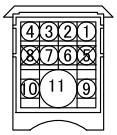
Number shows number of pins	Female connector	Male connector
HH28A		
HH28B		
HH38A		
HH40A		
HH40B		
HH54A		
HH60A		
HH81A		

HJ type

Number shows number of pins	Female connector	Male connector
HJ2A		
HJ2B		
HJ2C	(Viewed form back side) 	
HJ3A		
HJ3B	(Viewed form back side) 	
HJ3C	(Viewed form back side) 	
HJ4A		
HJ4B	 or (Viewed form back side) 	
HJ6A		

Number shows number of pins	Female connector	Male connector
HJ94A		

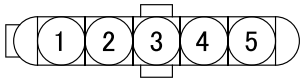
HK type

Number shows number of pins	Female connector	Male connector
HK2A		
HK2B		
HK6A		
HK11A		

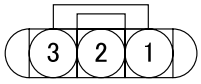
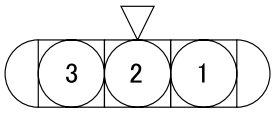
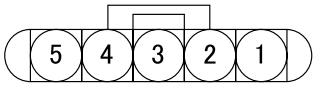
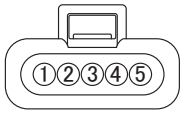
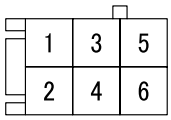
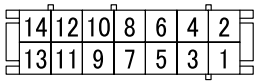
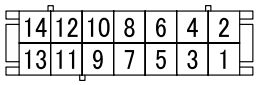
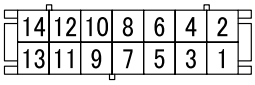
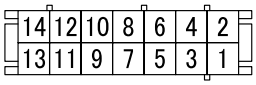
HL type

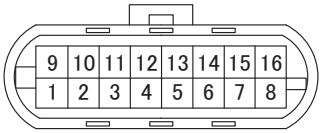
Number shows number of pins	Female connector	Male connector
HL3A		

HM type

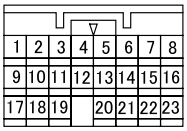
Number shows number of pins	Female connector	Male connector
HM5A		

HN type

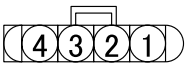
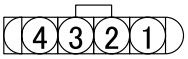
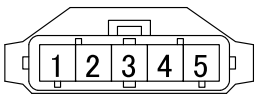
Number shows number of pins	Female connector	Male connector
HN3A		
HN3B		
HN5A		
HN5B	(Viewed form back side) 	
HN6A		
HN14A		
HN14B		
HN14C		
HN14D		

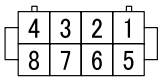
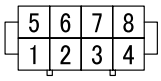
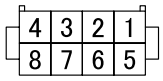
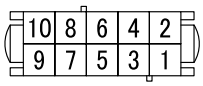
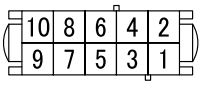
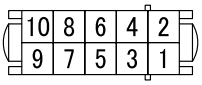
Number shows number of pins	Female connector	Male connector
HN16A		

HP type

Number shows number of pins	Female connector	Male connector
HP23A		

HQ type

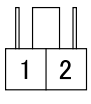
Number shows number of pins	Female connector	Male connector
HQ1A		
HQ2A		
HQ4A		
HQ4B		
HQ5A		
HQ5B		

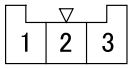
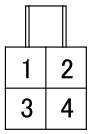
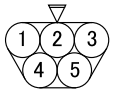
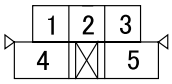
Number shows number of pins	Female connector	Male connector
HQ8A		
HQ8B		
HQ8C		
HQ10A		
HQ10B		
HQ10C		

HR type

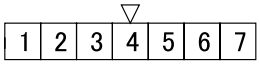
Number shows number of pins	Female connector	Male connector
HR3A	(Viewed form back side) 	

HS type

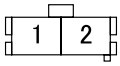
Number shows number of pins	Female connector	Male connector
HS2A		

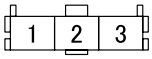
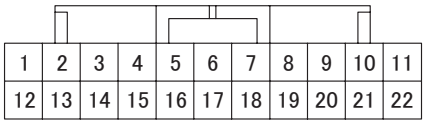
Number shows number of pins	Female connector	Male connector
HS3A		
HS4A		
HS5A		
HS5B		

HT type

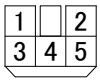
Number shows number of pins	Female connector	Male connector
HT7A		

HU type

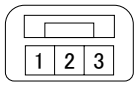
Number shows number of pins	Female connector	Male connector
HU2A		
HU2B		
HU2C		

Number shows number of pins	Female connector	Male connector
HU2D		
HU2F		
HU2G		
HU3A		
HU22A		

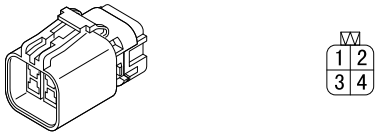
JF type

Number shows number of pins	Female connector	Male connector
JF5A		

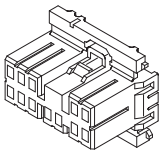
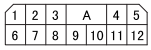
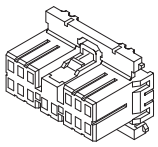
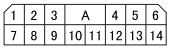
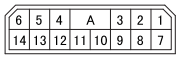
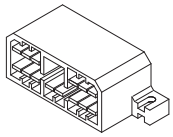
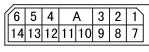
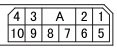
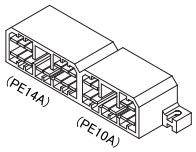
JG type

Number shows number of pins	Female connector	Male connector
JG3A		

PC type

Number shows number of pins	Female connector	Male connector
PC4A		

PE type

Number shows number of pins	Female connector	Male connector
PE12A	 	
PE14A	 	   (PE14A)  (PE10A) 

Revision record <Electrical systems section>

A	06. March. 2024	Additional specifications included
–	28. August. 2023	Newly issued
Rev. code	Date issued	Remarks

NOTE:

1, Chapter 1-9 is Common Section for all markets and to be revised without any special notification. Therefore, please note that this version is not necessarily the latest one.

2, Chapter 10 is for specific market(s). MFTBC will distribute the latest version whenever it will be revised.

Body/equipment mounting directives <Electrical systems section>

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