Body/equipment mounting directives

CANTER

Australia

FUSO

Body/equipment mounting directives
FEA, FEB, FEC, FGB

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:

1 Introduction ▷ 1.1
2 General ▷ 2.1
3 Planning of bodies ▷ 3.1
4 Technical threshold values for planning ▷ 4.1
5 Damage prevention ▷ 5.1
6 Modifications to the basic vehicle ▷ 6.1
7 Construction of bodies ▷ 7.1
8 Electrics/electronics ▷ 8.1
9 Calculations ▷ 9.1
10 Technical data ▷ 10.1

Appendix
Index

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.

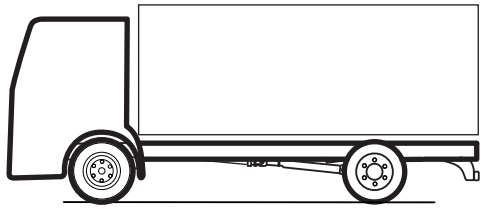
References to regulations, standards, directives etc. are given in keywords and serve for information only.

Additional information is available from any

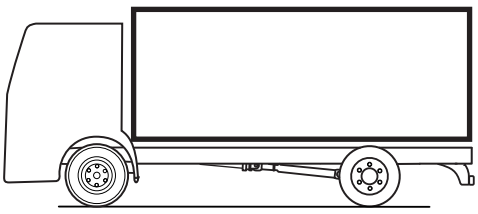
MITSUBISHI FUSO authorized Distributer

Your
MITSUBISHI FUSO TRUCK & BUS CORPORATION

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



Basic vehicle



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 exhaust emissions or 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.

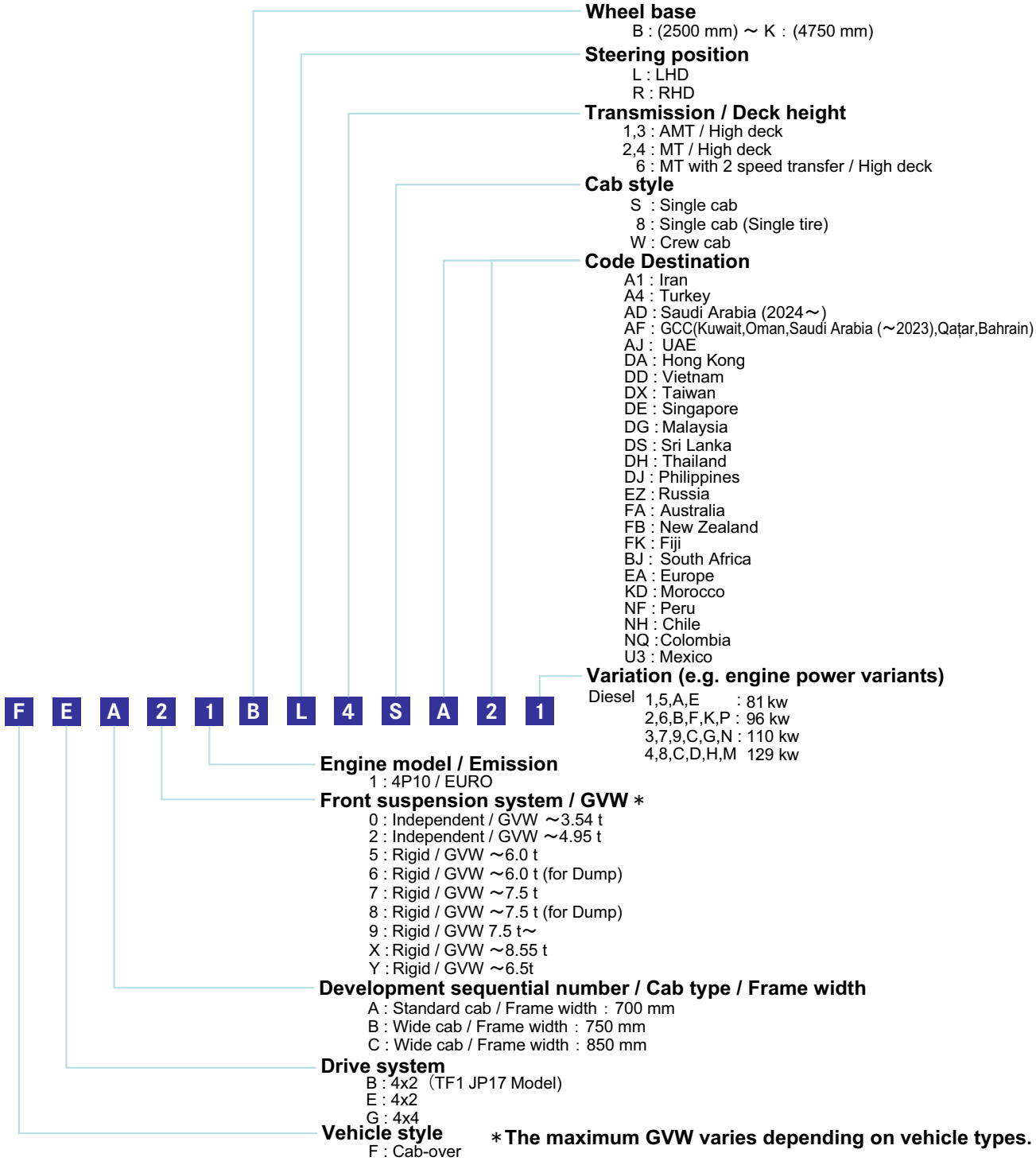
1.6 Note on copyright

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

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

2.1 Vehicle and model designations

2.1.1 Model coding system



Before mounting necessary body parts/equipment, check the model designation and specifications of your vehicle ▷ 10.2.1.

2.2 Technical advice and contact persons

Please log in from the following BODYBUILDER PORTAL URL and contact us.

It is correspondence of only English.

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, propeller 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

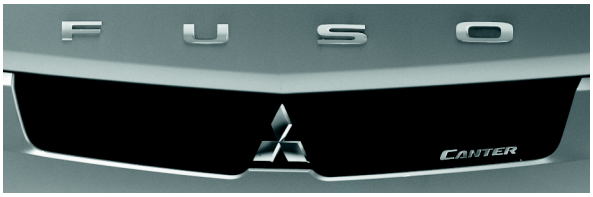
- may not be affixed next to MITSUBISHI FUSO trademarks

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.

<Except EuroV Australia / New Zealand(2024~)>



<For EuroV Australia / New Zealand(2024~)>

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 "10.14.2 Labels and markings" ▷ 10.14.2.

2.7 Recycling of components

Environmental note

When planning attachments, bodies, equipment and modifications, and with regard to the legal requirements according to EU Directive 2000/53/EC, and 1907/2006/EC (REACH: Registration, Evaluation, Authorisation (and Restriction) of Chemicals), 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 addi-tives, 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".
- EU Directive 2000/53/EC must be complied with.

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 organizational 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

- Wheelbase
- Engine/Transmission
- Power take-offs
- 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>
LDWS may be disabled in the following cases:

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

LDWS: Lane Departure Warning System

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 vehicles are shipped after adequate consideration has been given to safety, reliability and mantainability. 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 or noise reduction 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.

Do not mount any objects in such a way as to block the front grille opening.

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 countries (and if the vehicle is operated on international services), comply with all the relevant national regulations.

Unit: m

	The permissible vehicle height is limited to max
EU*	4
Hong Kong	3.5
Australia	4.3
New Zealand	4.25
Taiwan	3.8

*: Countries conforming to EC regulations
* For countries not listed above, Vehicle height need to adapt in accordance with each countries local 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".

	Weight tolerances
EU*	1230/2012/EC
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

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

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.

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.

B

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

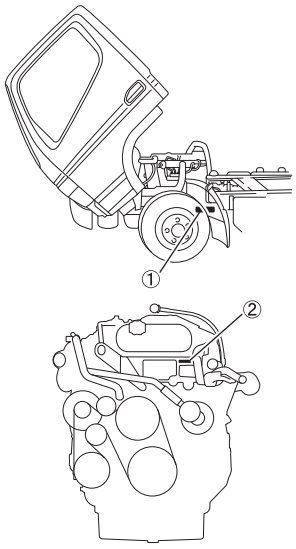
MODEL	Maximum total width of vehicle
F*A	2250
F*B / F*C	2550

3.4 Vehicle type identification data

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

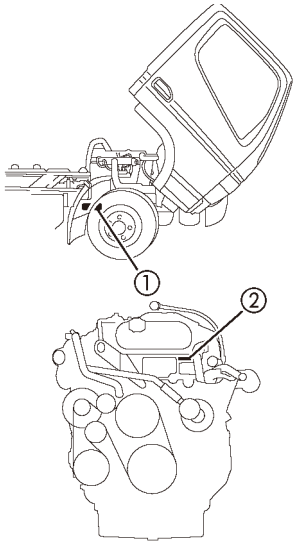
3.4.1 Chassis number

The indicated information varies depending on the country.



Z21444

<Morroco>



Z22117

<Type1>
The chassis number is indicated on the left frame ①, near the left front wheel.

Example: FEC91E – □□□□□□
Chassis number
Vehicle model

<Type2>
The vehicle identification number (V.I.N.) is indicated on the left frame ①, near the front wheel.

Example: JLAFEC91G0K □□□□□□
Chassis number
Vehicle model

3.4.2 Engine number

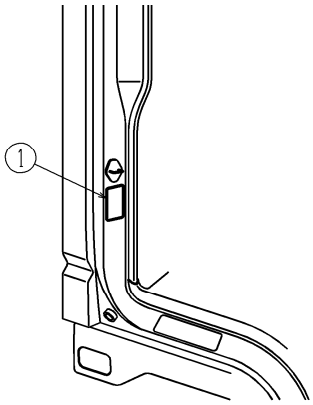
The engine number ② is indicated on the front side of the cylinder head.

Example: 4P10 - □□□□□□
Engine number
Engine model

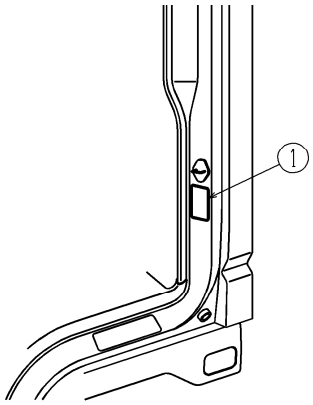
3.4.3 Nameplate

- A nameplate ① is located inside the cab.
  (Except for models for Australia and New Zealand, South Africa)

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

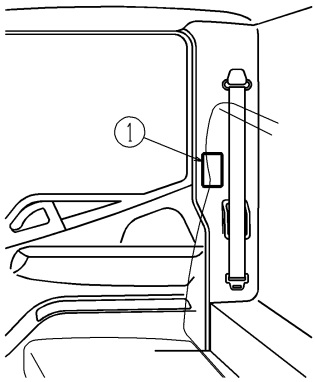


LHD vehicles



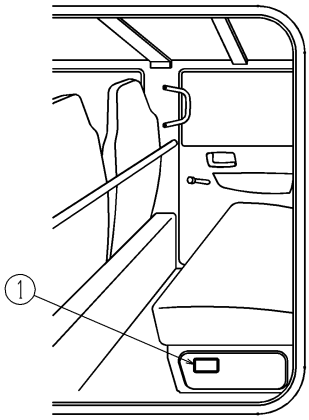
RHD vehicles

<Single cab models - 2>
The door pillar of assistant driver's side

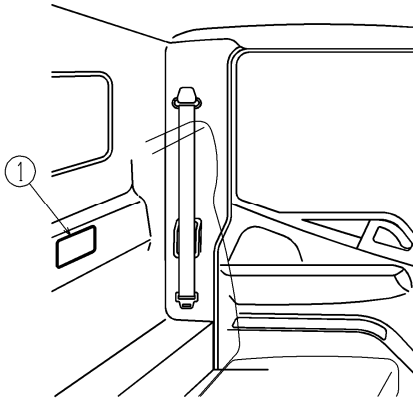


LHD vehicles

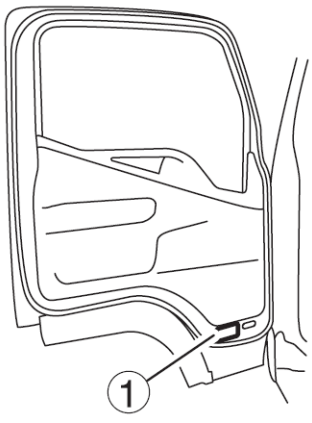
<Crew cab models>
Under the rear seat of left side



<Single cab models - 3>
Under the rear window

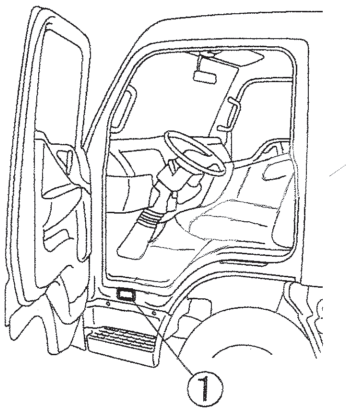


<Single cab model - 4>
Under the door of driver's side



3.4 Vehicle type identification data

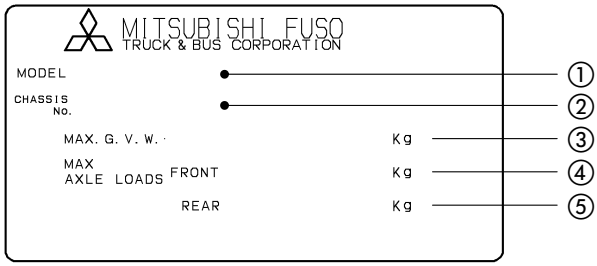
<Single cab model - 5>
The door opening portion of driver's side



Location of name plate	Application
Single cab models - 1	General export, Hong Kong, Singapore, Taiwan, Malaysia, Egypt, Kenya
Single cab models - 2	Peru, Colombia, Algeria
Single cab models - 3	Indonesia, Venezuela, Turkey, Morocco, Iran, Russia
Single cab models - 4	Chile, Sri Lanka, UAE, Thailand, Philippine, Vietnam, Fiji, GCC, Saudi Arabia
Single cab models - 5	Mexico
Crew cab models	General export, Hong Kong, Singapore

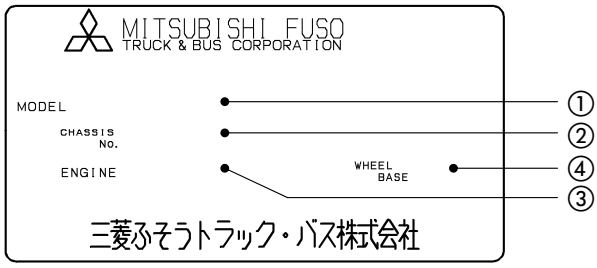
- The nameplate shows the following.
  (Except for models for Australia and New Zealand)

<Type 1>



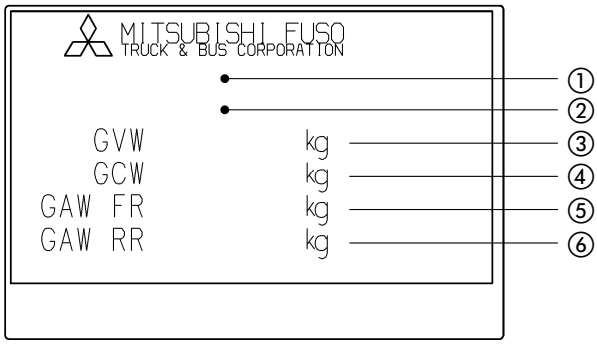
① *Model*
② *Chassis number*
③ *Maximum permitted laden mass of the vehicle*
④ *Maximum permitted load mass for front axle*
⑤ *Maximum permitted load mass for rear axle*

<Type 2>



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

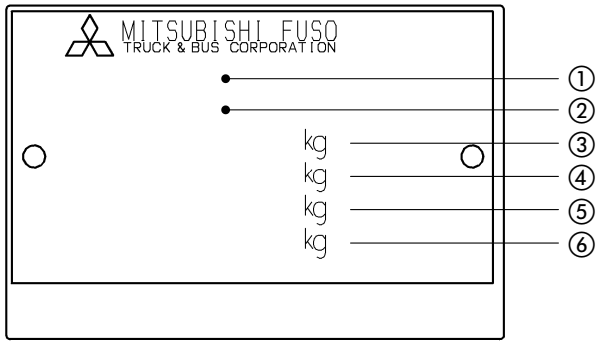
<Type 3>



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*

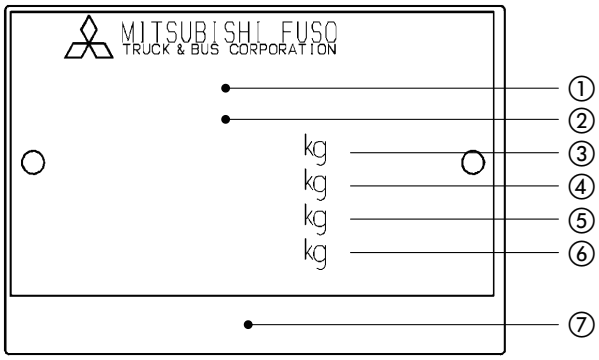
3.4 Vehicle type identification data

<Type 4>



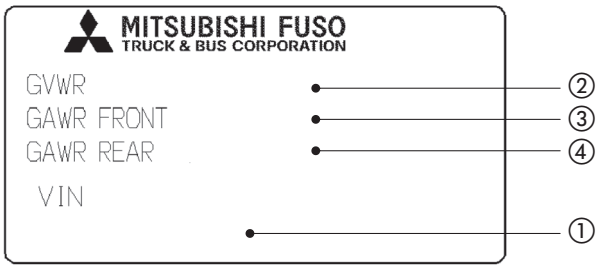
① *Whole vehicle type-approval number*
② *Vehicle identification number*
③ *Maximum permitted laden mass of the vehicle*
④ *Maximum permitted laden mass of the combination*
⑤ *Maximum permitted load mass for front axle*
⑥ *Maximum permitted load mass for rear axle*

<Type 5>



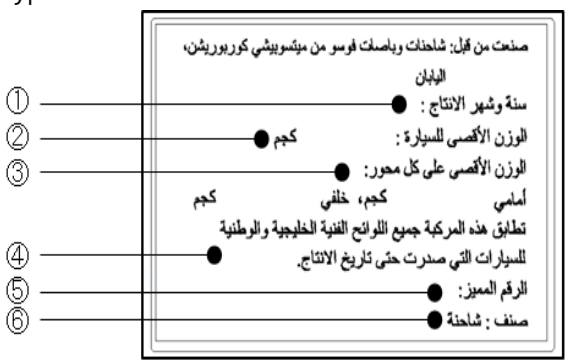
① *Whole vehicle type-approval number*
② *Vehicle identification number*
③ *Maximum permitted laden mass of the vehicle*
④ *Maximum permitted laden mass of the combination*
⑤ *Maximum permitted load mass for front axle*
⑥ *Maximum permitted load mass for rear axle*
⑦ *Model code*

<Type 6>



① *Vehicle identification number*
② *Maximum permitted laden mass of the vehicle*
③ *Maximum permitted load mass for front axle*
④ *Maximum permitted load mass for rear axle*

<Type 7>



①YEAR AND MONTH OF MANUFACTURE
②GROSS EHICLE WEIGHT
③MAXIMUM WEIGHT ON EACH AXLE
④STATEMENT
⑤VIN
⑥TYPE:TRUCK

Type of name plate	Application
Type 1	General export, Singapore, Taiwan, Indonesia, Malaysia, Egypt, Kenya
Type 2	Hong Kong
Type 3	Venezuela, Peru, Colombia, Algeria, Chile, Sri Lanka, Thailand, Philippine, Vietnam, Fiji
Type 4	Turkey, Morocco, Russia
Type 5	Iran
Type 6	Mexico
Type 7	UAE, GCC, Saudi Arabia

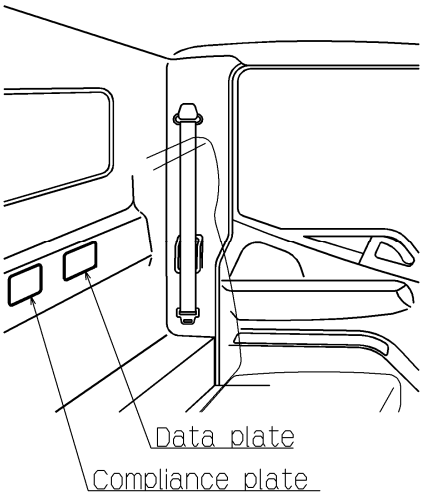
3.4 Vehicle type identification data

- In case of models for Australia and New Zealand

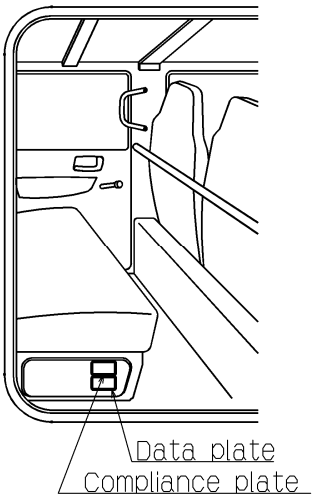
The data plate and the compliance plate are locatedinside the cab.

For accurate information about the plate locations, contact the department responsible since they might be subject to change ▷ 2.2.

<Single cab models>
Under the rear window



<Crew cab models>
Under the rear seat of right side



The data plate shows the following.

① *Model*
② *Vehicle identification number*
③ *Option code*
④ *Paint code*
⑤ *Trim code*

The compliance plate certifies that your vehicle complied with Australian Design Rules at the time of manufacture.

The compliance plate shows the following.

① *Approval number*
② *Category*
③ *Vehicle identification number*
④ *Maximum permitted laden mass of the vehicle*
⑤ *Number of seats*

- In case of models for South Africa, The name plate which contains vehicle model number and the like is attached to the driver's side door opening.

D

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.

For FG models:

Be sure to fit tires of the same size and type on all wheels.

B

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 engine, propeller shaft, 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 engine model
- Change of reduction gear
- Change of transmission gear
- Replacement of tires with non-registered ones
- Change of exhaust pipe diameter, clamping position or muffler size
- Change of radiator cooling fan size, pitch, number of blades or rotational speed
- Change of air intake duct diameter, shape or length
- Modifications of shielding cover around the engine which can lead to reduced shielding performance or increased ambient temperature inside the shielding cover

Do not modify the vehicle except for those indicated in the body/equipment mounting directives.
Shielding covers around the engine and transmission, muffler with combined exhaust emission control device, and exhaust pipe between exhaust manifold and muffler with combined exhaust emission control device are components to be noise-proofed.
Therefore, never attempt to modify them.
Take utmost care not to damage these components if they are to be removed once and then reinstalled for facilitating mounting works.

- 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.

D

	Noise regulation	Detail
EU*	70/157/EEC	Article 49.3 of the German licensing regulations (low-noise vehicles) must be observed.
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

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

3.8 Exhaust system

The exhaust system must not be modified.
If modification is unavoidable, consult with the department in charge of the measures ▷ 2.2.

Property damage

The original exhaust system mounting, by this we mean the bracket components including frame-mounted castings, may not be modified. Modifications can lead to damage to the exhaust system.

Additional information

Further information on exhaust system can be found in Section 6 "Exhaust system" ▷ 6.14.

3.8 Exhaust system

3.8.1 Euro VI, Euro V, Euro III

Environmental note

Modifications carried out incorrectly to the routing of the exhaust system upstream of the catalytic converter can result in the leakage of untreated exhaust gas into the environment.

<For Euro VI and Euro V>
To satisfy the Euro V emissions legislation, the BlueTec®, exhaust aftertreatment system is used, which is based on Selective Catalytic Reduction (SCR). BlueTec® diesel technology reduces the nitrogen oxide content of the exhaust gas by the injection AdBlue® (urea dissolved in water). The water-based AdBlue® solution is injected into the hot exhaust gas via a metering valve. The exhaust gas is transformed in the rear silencer with catalytic converter (SCR catalytic converter). This technology requires components for which installation space is needed in the vehicle.

3.8.2 BlueTec® exhaust gas aftertreatment

BlueTec® exhaust gas aftertreatment removes NOx in the exhaust gas.
Do not modify and transfer the following parts because the performance of the system is deteriorated.

- SCR muffler
- Urea tank unit
- Dosing module
- Urea hose

Property damage

Don't take out the power supply for other electric components from the existing fuse.

Especially the function of BlueTec® exhaust gas after treatment can not work when the fuse of system is blowout.

BlueTec® exhaust gas after treatment requires a lot of electric power to work the heating device for freeze proofing in winter or cold region.

3.9 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 a 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 ▷ 3.9.2 and ▷ 3.9.3.

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

3.9.1 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, co-ordinating 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.

3.9.2 Preparation for storing the vehicle

Property damage

For vehicle deliveries in winter when roads may be gritted, please clean the vehicle as soon as possible to avoid surface damage, particularly the transmission housing and light-alloy wheels.

The battery may run down if the vehicle is stored for a long time with the key left in the key cylinder, so remove the key before storing the vehicle.

Storage in an enclosed space:

- Clean the overall vehicle.
- Check the oil and coolant 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.

3.9.3 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.

3.9.4 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 a 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 any MITSUBISHI FUSO authorized Distributer.

3.10 Advanced Emergency Braking System (AEBS)

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).

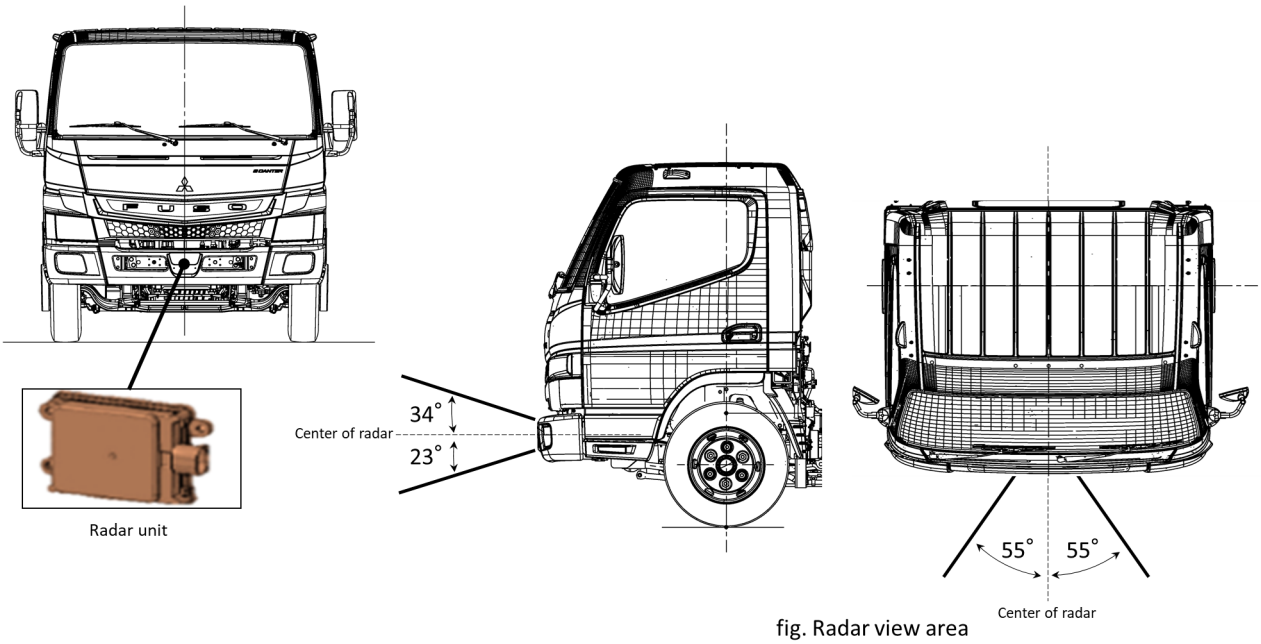


fig. Radar view area

3.11 Lane Departure Warning System (LDWS)

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

- 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).

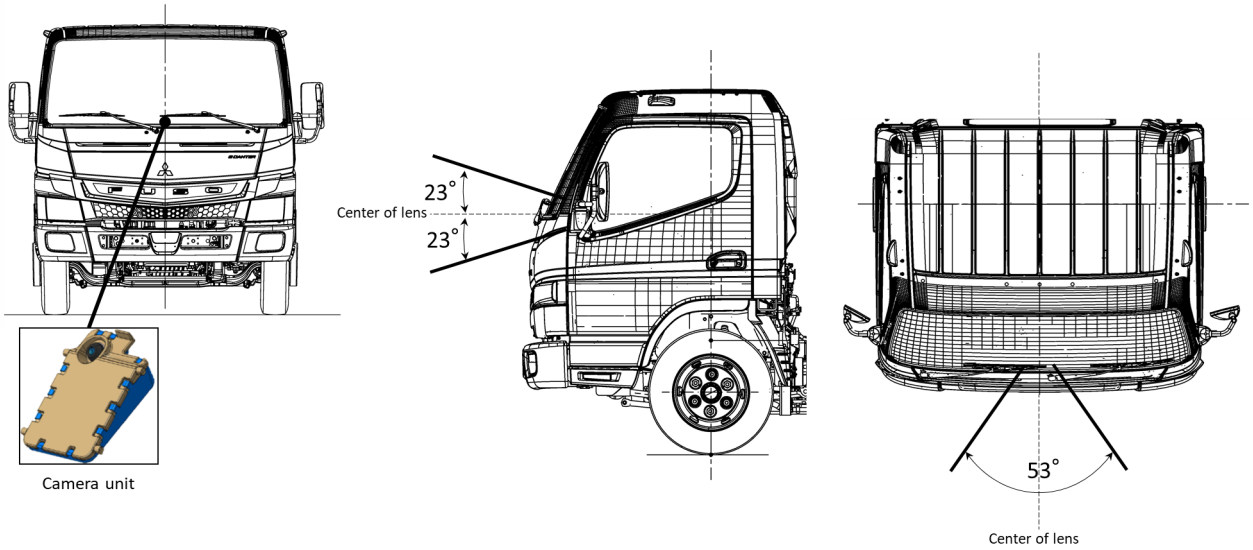


fig. camera view area

3.12 Active Sideguard Assist (BSA)

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 left or changing lanes.

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

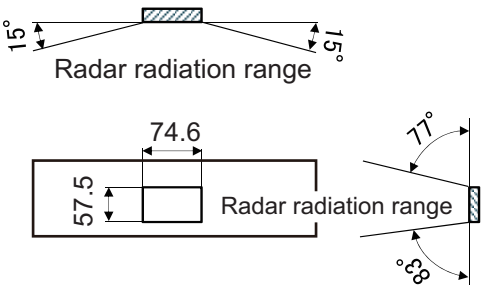
Do not remove the radar unit.
If the radar unit is removed, be sure to consult an authorized MITSUBISHI FUSO distributor or dealer to have the calibration of radar.

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 radiation range toward surface

3.13 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 your MITSUBISHI FUSO authorized Distributer or from body manufacturer advisors ▷ 2.2.

Optional equipment (e.g. , auxiliary tanks, 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 your MITSUBISHI FUSO Service Center or body manufacturer advisors ▷ 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 SAM-related parts ▷ 8.1.2. Ask your MITSUBISHI FUSO Service Center.
- 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.

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)
Van body	65% of wheelbase
Except Van body	50% of wheelbase

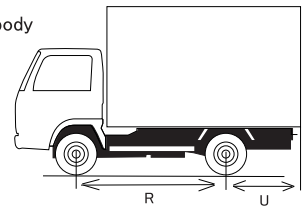
Van body: Body that does not accept load jutting out in the rear of vehicle

Example: Van body, lorry, etc.

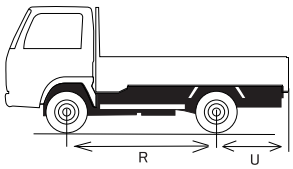
Additional information

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

Van body



Except Van body



R=Wheel base
U=Rear over hang

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

AG

For approval of the vehicle with body/implements mounted, a calculation of the height of the center of gravity of the laden vehicle must be submitted in accordance with EC Brakes Directive 71/320/EEC. 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.

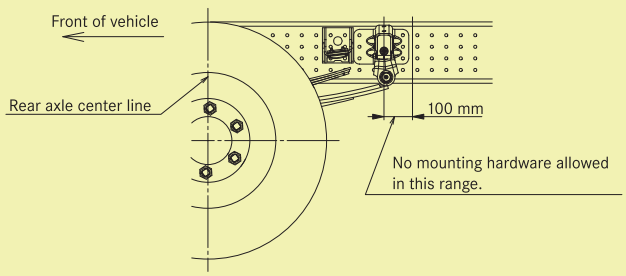
4.4 Clearance for the basic vehicle and bodies

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

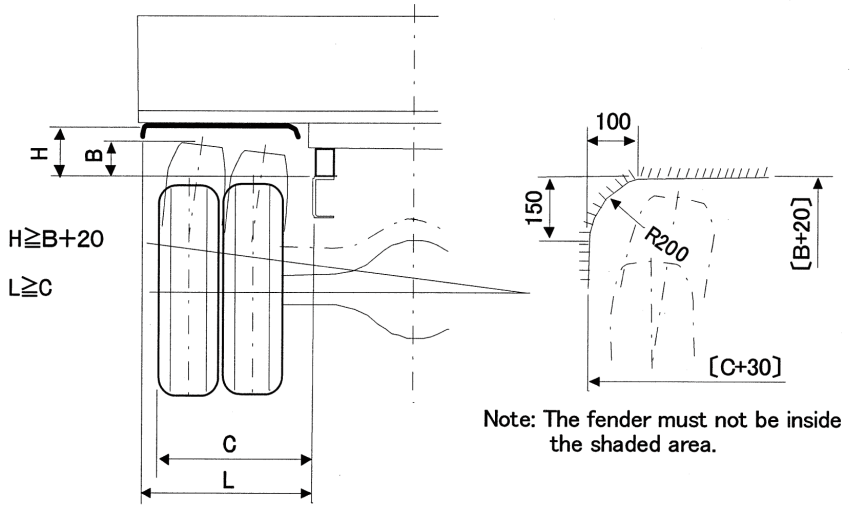
Dimensional data in the body/equipment mounting directives must be observed.

4.4.1 Minimum clearance and notes

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

Part	Minimum Clearance and Notes
1. Section behind cab	In the section behind the cab, there are a cab tilt locking unit, power steering oil tank, coolant reservoir tank or expansion tank, 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.
2. Areas around engine	Vertical direction 40 mm Lateral direction 30 mm Longitudinal direction 25 mm
3. Clutch and Transmission Assembly	Do not install any rear body part in the area of 100 mm of rear part, because clutch and transmission ass'y is moved backward in the same inclination line of engine, to pull out the clutch spline shaft, when clutch and transmission ass'y is removed from engine.
4. The Surrounding part of Transmission	25 mm at surrounding part of transmission except rear part.
5. Upper part of Transmission	Keep more than 100 mm of clearance between the upper surface of upper cover and the rear body part if possible, because this clearance is used when the transmission upper cover is removed.
6. The surrounding part of the Propeller shaft and the Rear axle	Min. 25 mm of the surrounding part.
7. The 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.
8. Other hoses	40 mm
9. Rear springs	The link at the rear end of the main spring may move during traveling. Do not fit any mounting hardware within the range indicated in the figure. 

4.4 Clearance for the basic vehicle and bodies

Part	Minimum Clearance and Notes
10.Space above rear axle	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.
11.Attaching the rear fender	The clearance between the rear fender and tire must be designed to be optimum assuming that the vehicle is traveling 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. 

4.4 Clearance for the basic vehicle and bodies

<table>
<tr><th>Part</th><th>Minimum Clearance and Notes</th></tr>
<tr><td>12.The exhaust system</td><td>The heat affection and the interference of the exhaust system is a quite important factor in the safety of the vehicle. Keep the clearance between the rear body parts and these parts at least following figures on the table.
Unit: mm
<table>
<tr><th>Parts name</th><th>Minimum Clearance</th></tr>
<tr><td>Fuel hose and pipe</td><td>200</td></tr>
<tr><td>Wiring harness</td><td>150 (*100)</td></tr>
<tr><td>Fuel tank</td><td rowspan="4">150</td></tr>
<tr><td>Battery cable</td></tr>
<tr><td>Rubber parts</td></tr>
<tr><td>Plastic parts</td></tr>
<tr><td>Rear body floor</td><td rowspan="6">100</td></tr>
<tr><td>Brake booster</td></tr>
<tr><td>Brake hose and pipe</td></tr>
<tr><td>Oil pan</td></tr>
<tr><td>Oil pipe</td></tr>
<tr><td>Tire</td></tr>
<tr><td>Vacuum tank</td><td>80</td></tr>
<tr><td>Propeller shaft</td><td rowspan="6">50</td></tr>
<tr><td>Rear axle, Differential</td></tr>
<tr><td>Parking brake cable</td></tr>
<tr><td>Shock absorber bush</td></tr>
<tr><td>Shackle bush</td></tr>
<tr><td>Rear mud guard</td></tr>
<tr><td>Shock absorber</td><td>30</td></tr>
<tr><td>Mounting frame, Additional member etc.</td><td rowspan="2">20</td></tr>
<tr><td>Spring, Axle</td></tr>
</table></td></tr>
</table>

4.4 Clearance for the basic vehicle and bodies

Part	Minimum Clearance and Notes
	For FG models, ensure the clearance around the ATS unit as shown in Fig. 1 and 2.

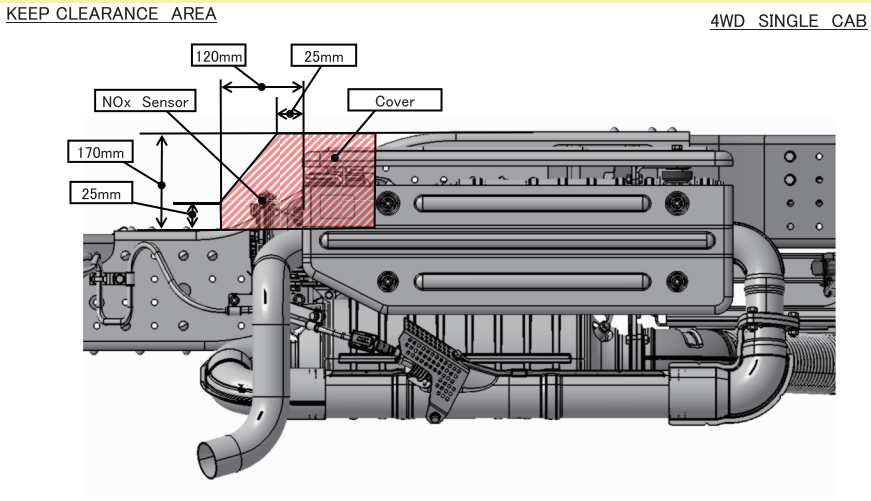


Fig. 1 (Single Cab)

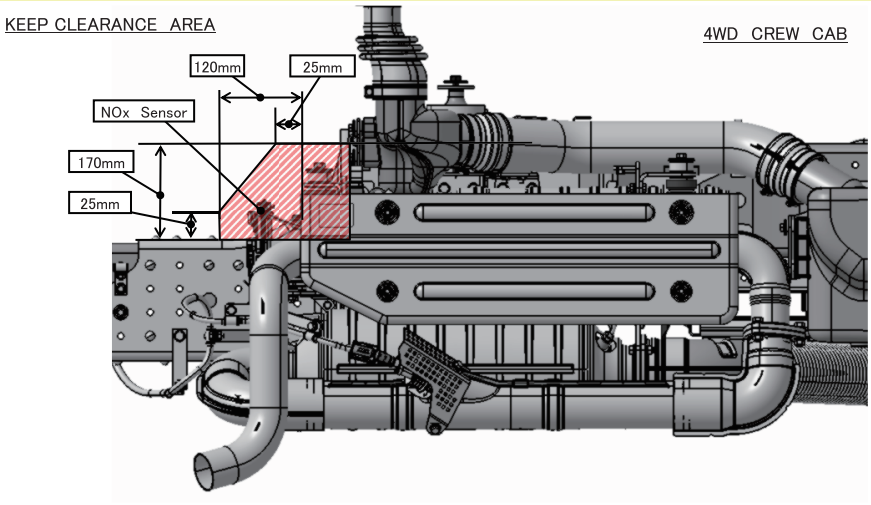


Fig. 2 (Crew Cab)

Note*: When wireharness is covered by heatproof conduit or protection

Do not install a tailpipe under the fuel pipe, hose connection and fuel filter drain tube.

Keep body mounting such as wood and rubber parts away from the muffler built in the emission control system and exhaust pipe by at least 100 mm. If this is impossible, install a heat shield plate to avoid a heat effect and check that there is no safety problem.

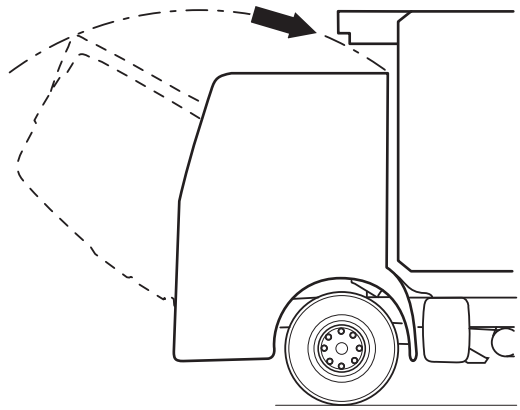
13.Fuel tank	The fuel tank must be mounted so that refilling operations such as opening/closing the filler cap and pouring fuel are not obstructed.
14.Battery	Mounting hardware must be located so that battery removal/installation and inspection as well as battery cover detaching/attaching can be done easily.

Additional information

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

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 "10.5.1 Chassis cab drawings" ▷ 10.5.1.



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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.

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 "Fig. 1 Front view"
  ΔHf = H1 – H2
  Target: | ΔHf | ≤ 10 mm
- Rear tilt: ΔHr
  Left-right difference at the stop lamp center height "Fig. 2 Rear view"
  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

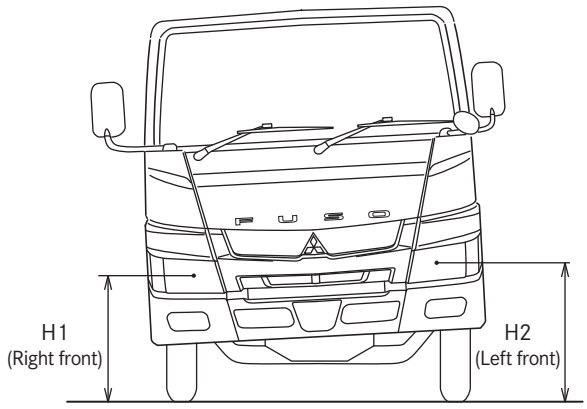


Fig. 1 Front view

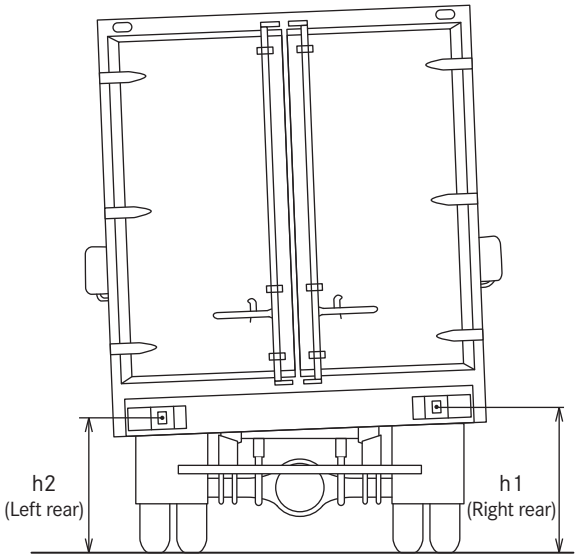


Fig. 2 Rear view

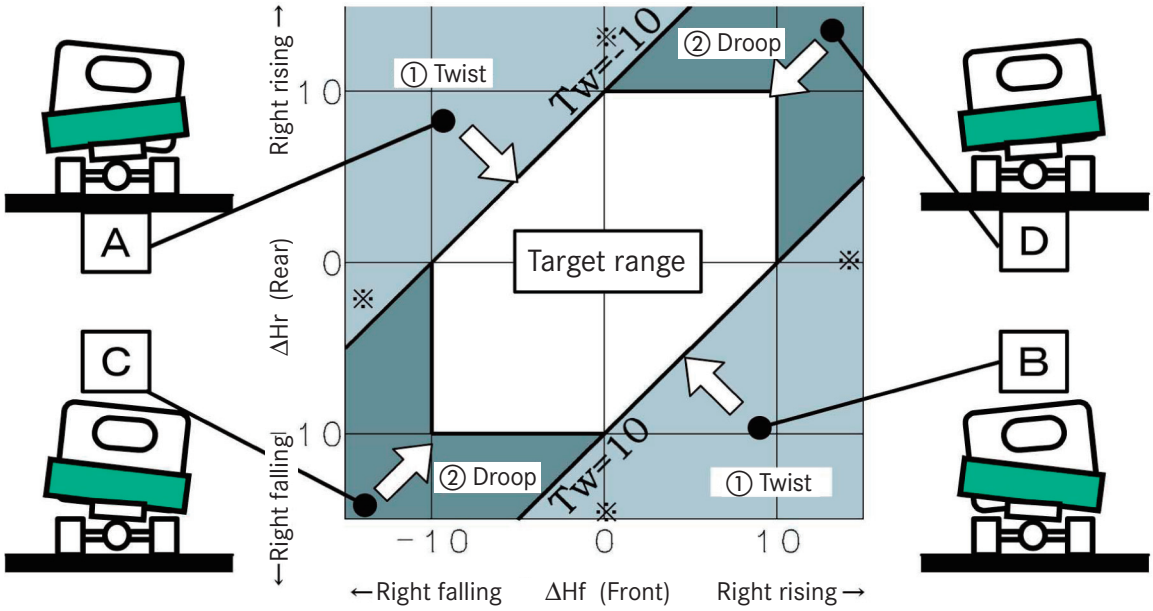
4.6.2 Correction method

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.)

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

Body posture and applicable correction method



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

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

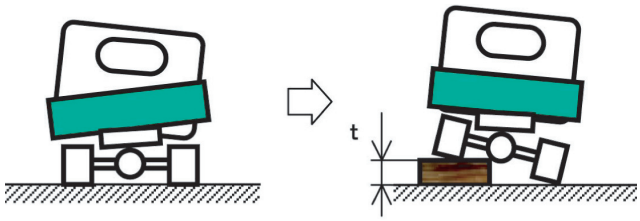
- Place chocks firmly beneath the front wheels.
- In the case of A (Tw < –10), place the left rear wheel on a plate of thickness t corresponding to the amount of twist. In the case of B (Tw > 10), place the right rear wheel on the plate.

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.

Note: In the case of a vehicle whose initial posture corresponds to the vicinity of one of the ※ marks indicated in the diagram "Body posture and applicable correction method" on ▷ 4.6.2 (body is both tilted and twisted), the posture after this correction has been carried out sometimes becomes condition C or D. In such a case, proceed with tilt correction.

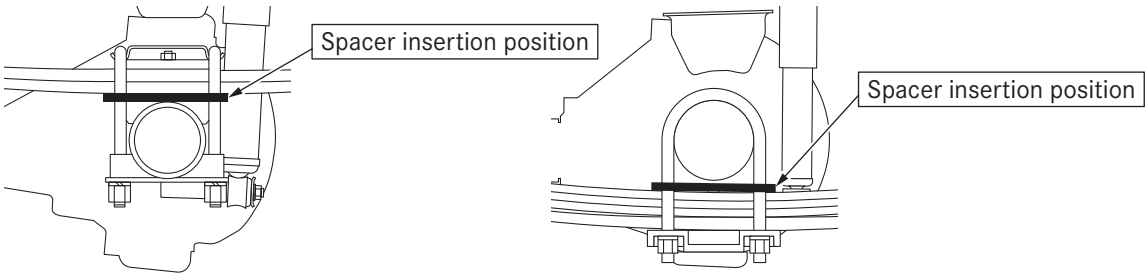
Tilt correction (C and D: | ΔHf | > 10 mm, or | ΔHr | > 10 mm)

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.

Note: Regarding the implementation of the following work, please consult with your local MITSUBISHI FUSO dealer.

- 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).



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.

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

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

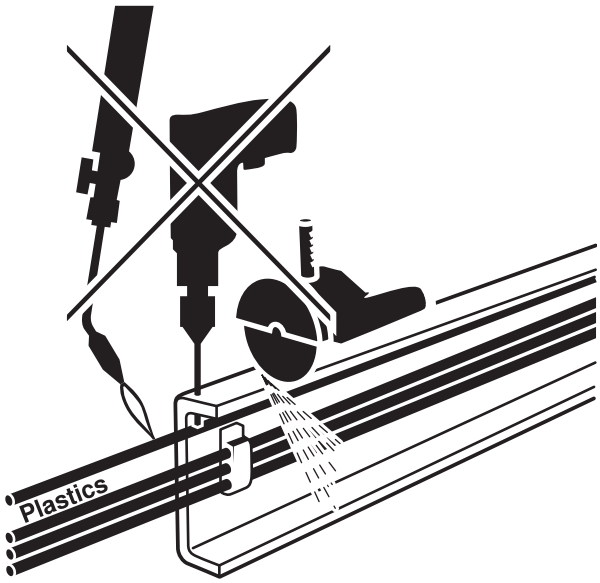
4.7.1 Maximum rear body width <Exclude to Mexico>

The maximum limits on the rear body width is prescribed in the local laws and regulations.
There is a limitation on rear body width for outside Mirror and Lamps.

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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- Fuel and 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 disks.
- After installing, fuel lines, 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

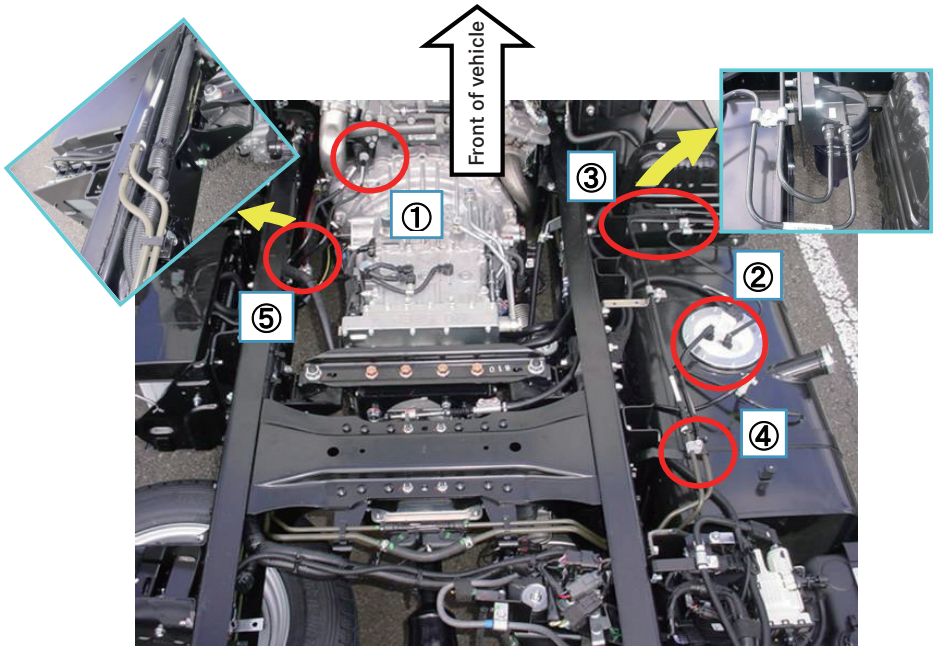
Further information on brake hoses can be found in 6.13 "Brake systems" ▷ 6.13.

5.1 Brake hoses/cables and lines

Precautions for carrying out body building and modification work

Before carrying out work near the parts indicated below, secure a place to stand on other than the vehicle itself. During the work, take care not to pull on the fuel hose or place it where it is likely to be pulled, otherwise fuel will leak from those parts.
In the event that you inadvertently place your foot on, or pull, any of the parts indicated below, start the engine of the vehicle before shipping it from the factory, and then confirm that there is no leakage.

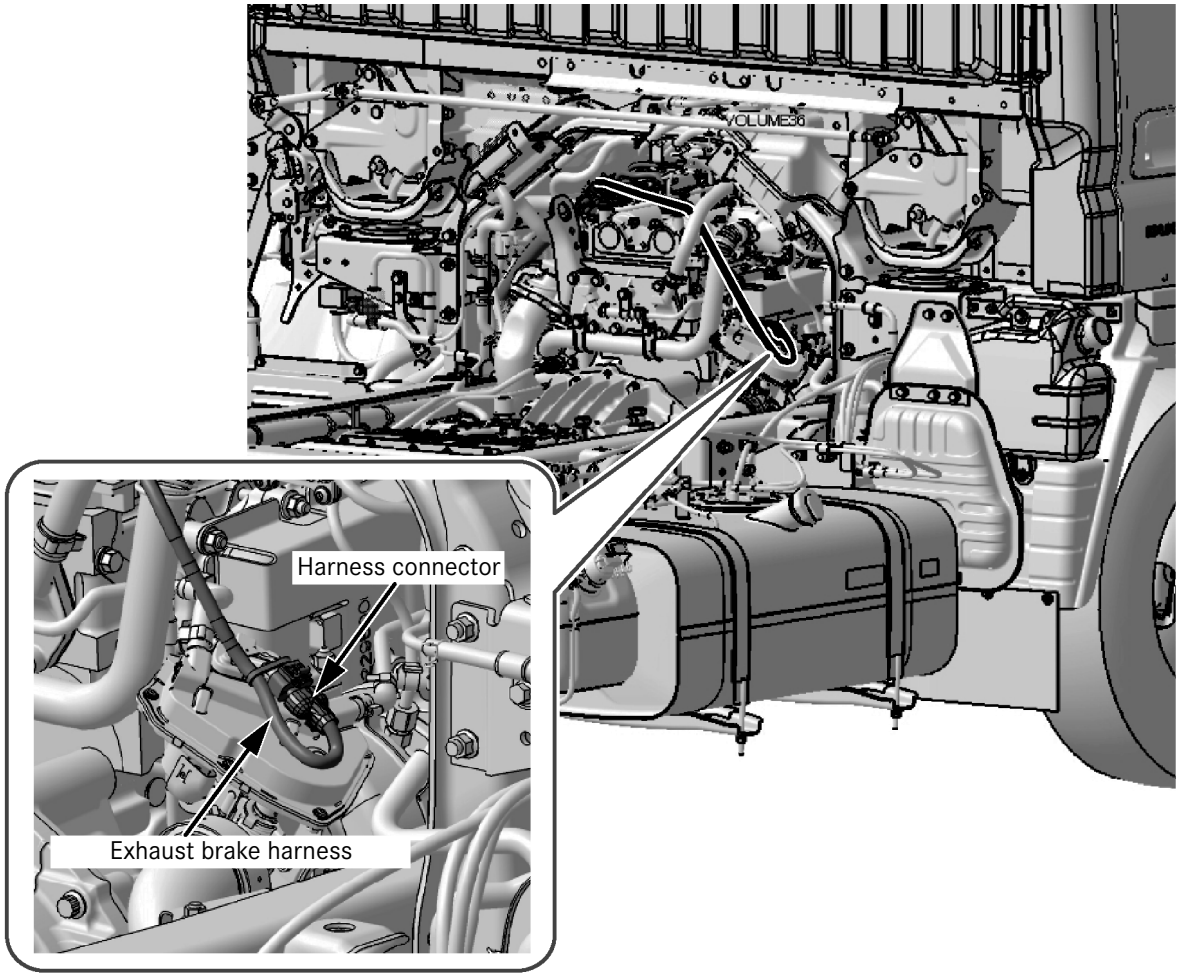
Examples of fuel leakage and parts where leakage occurred



	Part	Precaution
①	Fuel connector at left rear of the engine	• Do not place your foot on the top of the engine. • Do not pull the fuel hose.
②	Top of the fuel tank	• Do not place your foot on the fuel tank.
③	Fuel filter connection part	• Do not place your foot on the fuel hose.
④	Vicinity of the fuel tank and the fuel filter	• Do not place your foot on the fuel hose.
⑤	Intermediate connector of the fuel system on the left side face of the transmission	• Do not place your foot on the fuel hose. • Do not pull the fuel hose.

5.1 Brake hoses/cables and lines

When body-building a single cab vehicle, do not pull on the exhaust brake harness, or place your foot on or stand on the connection part of a connector. This may damage the exhaust brake harness connector or cause the connector to drop out.



5.2 Welding work

⚠ 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.

! Property damage

Do not connect the arc welder ground clamp to assemblies such as the engine, transmission or axles.

Welding work is not permitted on assemblies such as the engine, transmission, axles, etc.

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.
- Cover the fuel tank and fuel system (lines, etc.) before carrying out welding work.
- 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.
- Avoid defects such as deposited metal cracking, toe crack, blow holes, slag inclusion, under cut, poor penetration, etc.

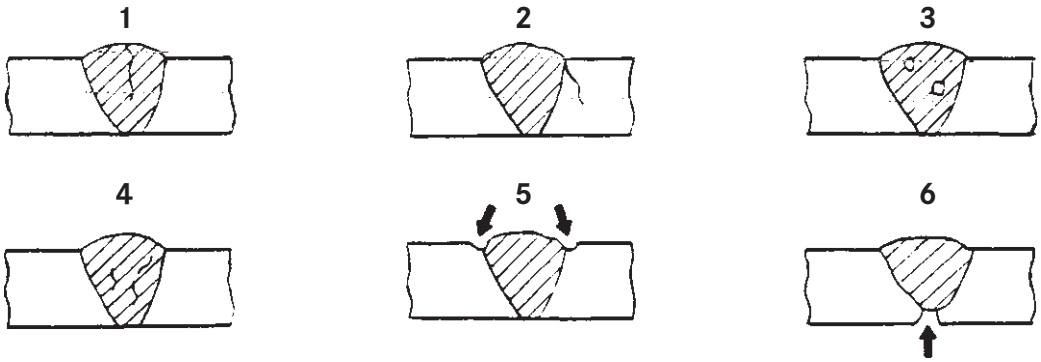


Fig. 1

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 engine, transmission, propeller shaft, 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.

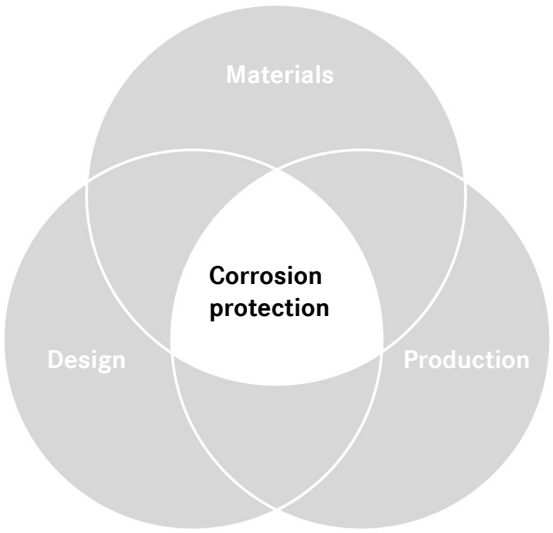
5.3 Corrosion protection measures

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.



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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 responsible department ▷ 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

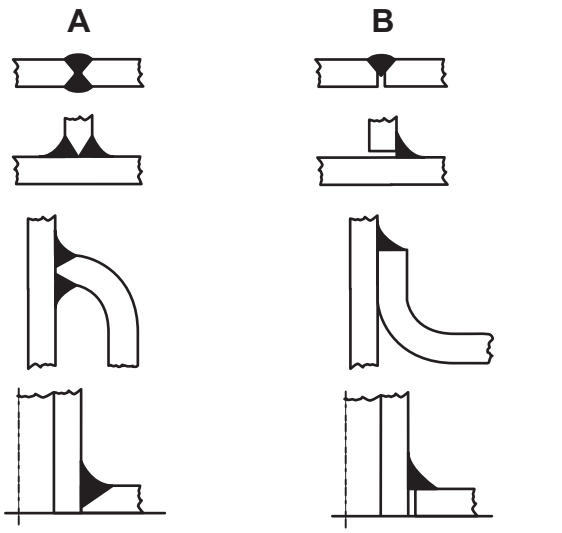
In order to avoid crevice corrosion at weld seams, the welds should be made in accordance with the examples shown.

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

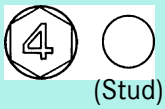
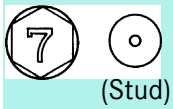
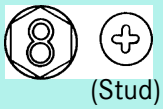
Use the specified bolts and nuts. Unless otherwise specified, tighten to the torques shown in the table below.

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.

- Hexagon 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}

- Hexagon 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}

- Hexagon 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}

- Hexagon 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

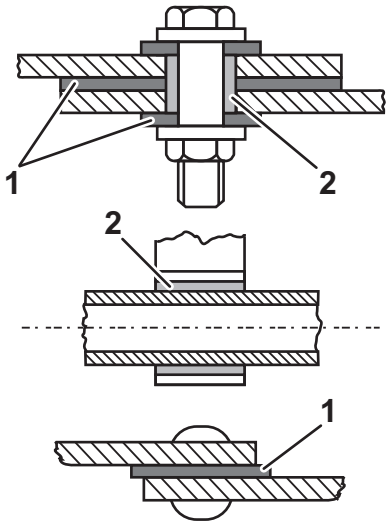
Insulation by coating

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 minimized by selecting suitable materials.

5.5 Painting work

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 re-install 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 the MITSUBISHI FUSO authorized Distributer to confirm which colors or parts are available for the vehicle.

5.5.1 Areas which must not be repainted

S

<Except EuroV Australia / New Zealand(2024~)>

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

If you removed parts, be sure to re-install 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 disk wheels of the double tires
- Contact areas for wheel nuts
- Brake hose and brake associated parts
- Various vinyl tubes and identification tape
- Breathers on transmission, axles, etc.
- Disk brakes and disk rotors <Vehicle with disk brakes>

L

B

- Inner parts of drum brakes <Vehicle with drum brakes>
- Inner surface of brake drums <Vehicle with drum brakes>
- Contact areas between hubs and brake drums <Vehicle with drum brakes>
- Door locks
- Door retainers in the rear door hinges
- Spring mounting area
- Rubber hoses
- Cab suspension, engine, chassis suspension and steering system rubber or plastic parts
- Electric control unit
  TCU (Transmission Control Unit)
  SAM (Body electronics control unit with integrated relay and fuse)
- Electrical wiring and connectors

B

- Drive shaft connecting flange (propeller shaft, PTO output shaft)
- Piston rods for the hydraulic and pneumatic cylinders
- Control valves for the air lines
- Various caution plates and nameplates
- Rubber or polypropylene parts for cab
  - Weatherstrips
  - Outside 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
  - Radar cover

R

- The following parts should not be repainted for appearance reasons.
  - Emblems (such as FUSO)
  - Outside mirror stays
  - Fenders
  - Wiper arms and blades
  - Antenna and its bracket

AH

<For EuroV Australia / New Zealand(2024~)>

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

If you removed parts, be sure to re-install 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.

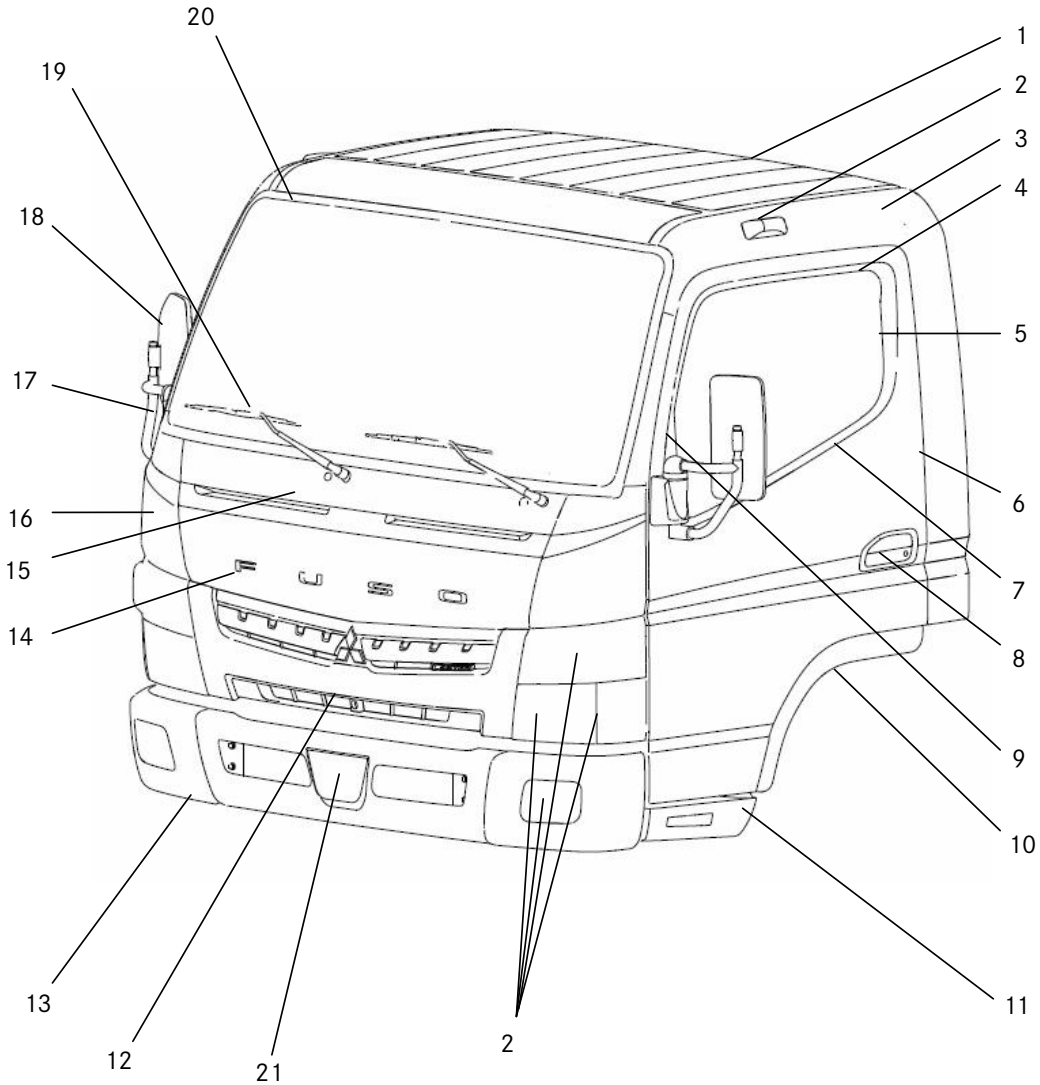
- Sealing surfaces
- Windows
- Cotact areas between the wheels and wheel hubs, contact areas between the disk wheels of the double tires
- Contact areas for wheel nuts
- Brake hose and brake associated parts
- Various vinyl tubes and identification tape
- Breathers on transmission, axles, etc.
- Disk brakes and disk rotors
- Inner parts of drum brakes <Vehicle with disk brakes>
- Inner surface of brake drums <Vehicle with disk brakes>
- Contact areas between hubs and brake drums <Vehicle with disk brakes>
- Door locks
- Door retainers in the rear door hinges
- Spring mounting area
- Rubber hoses
- Cab suspension, engine, chassis suspension and steering system rubber or plastic parts
- Electric control unit
  TCU (Transmission Control Unit)
  SAM (Body electronics control unit with integrated relay and fuse)
- Electrical wiring and connectors
- Drive shaft connecting flange (propeller shaft, PTO output shaft)
- Piston rods for the hydraulic and pneumatic cylinders
- Control valves for the air lines
- 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
  - Radar 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

5.5.2 Precautions to be observed when drying the paint

<Except EuroV Australia / New Zealand(2024~)>

- 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



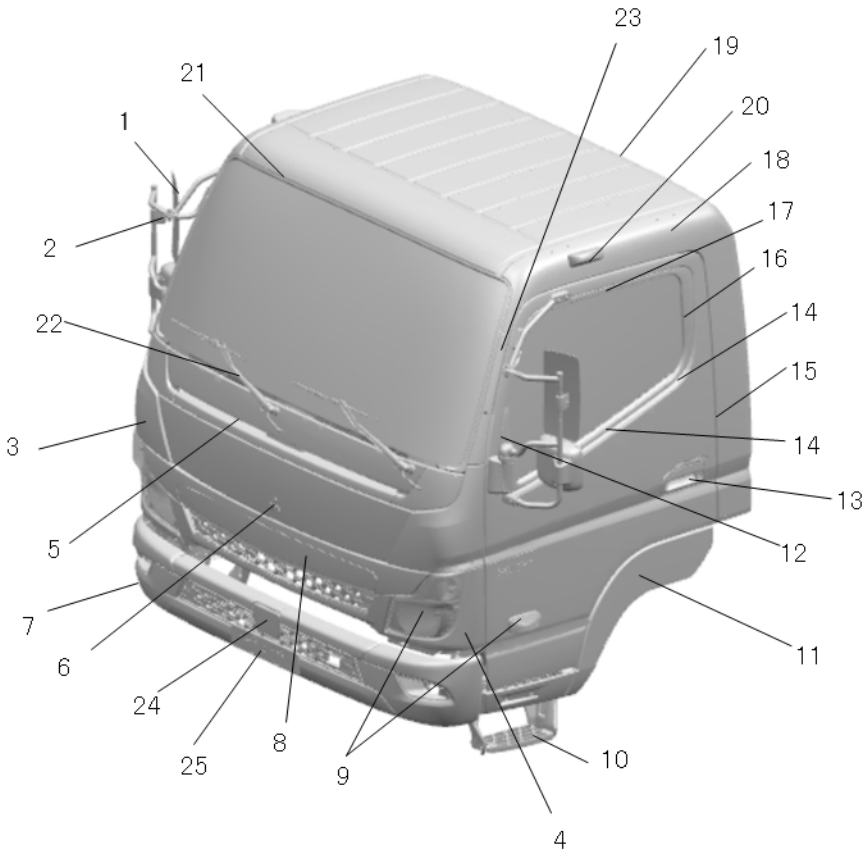
1 Rear window weatherstrip (cab)
2 Lamp, etc
3 Screw seal Washer
4 Door runchannel
5 Door sash garnish
6 Door weatherstrip
7 Door beltline molding
8 Door outer handle
9 Door delta garnish
10 Fender
11 Step
12 Front grille (Including caps screws for fitting hole in cab)
13 Bumper corner cover
14 Emblem
15 Front cover
16 Corner panel including caps for mounting
17 Door stay
18 Outside mirror
19 Wiper
20 Windshied weatherstrip
21 Radar cover

<For EuroV Australia / New Zealand(2024~)>

- 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. *Radar 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.

- Natural drying
  There is no need to remove resin or rubber parts from the vehicle.

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.

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

- 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
Propeller shaft	RM chassis super black	Dai Nippon Toryo
Spring	Spring black No. 1000	Dai Nippon Toryo
Fuel tank	Acrose No. 6000	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 • Outside mirrors, mirror stays <Except EuroV Australia / New Zealand(2024~)> • Exterior mirrors, mirror stays <For EuroV Australia / New Zealand(2024~)> • Bumper corner covers • Heat protector (at back of cab) • Sealing washers for screws • Radar 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

Manufacturer	Name of paint
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.

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.

Process	Description of work
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)
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

Process	Description of work
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 MITSUBISHI FUSO's 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

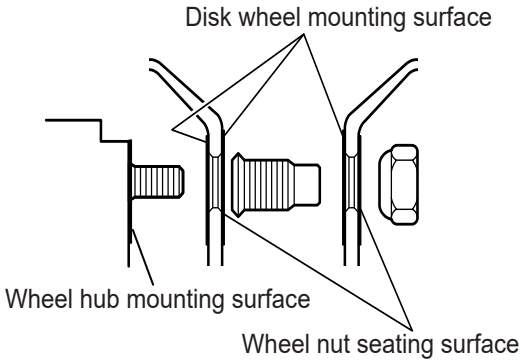
- When a repainted cab body is forced-dried, the temperature should not exceed 100 °C and the process must be completed within 60 minutes. When using a temperature above 100 °C, cover the glass surfaces with shields to prevent them from being heated beyond 100 °C or remove the glass.
- Laminated glass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

5.5.7 Painting the disk wheels

Disk 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 disk 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.



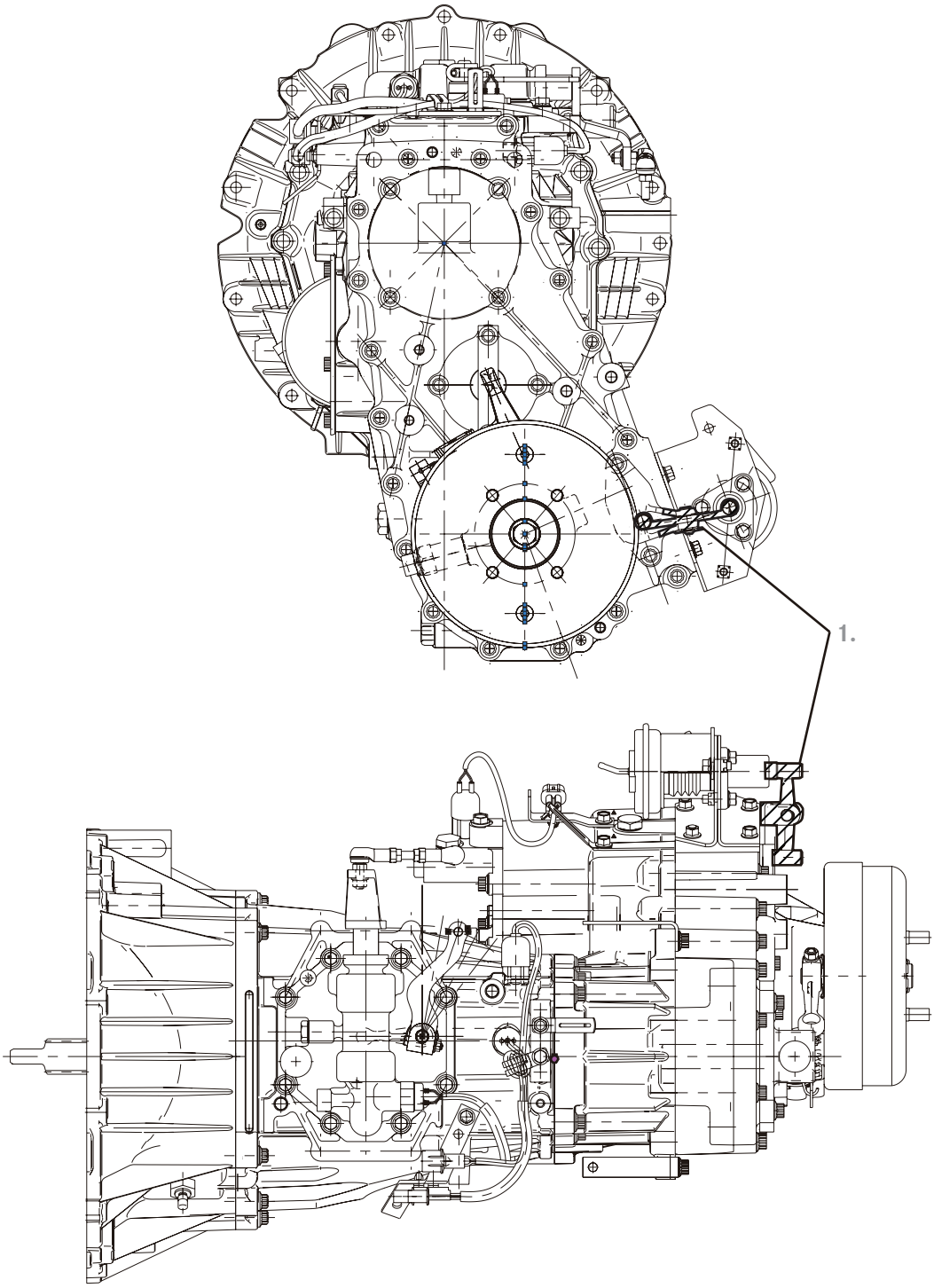
- If you removed parts, securely re-install them in their original positions. If you peeled off labels, obtain new labels and stick them in their original locations.

Tire rotation

- If additional paint on a disk 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 disk wheel. If it is installed without removing the paint, the thick paint coating could lead to loose wheel nuts.

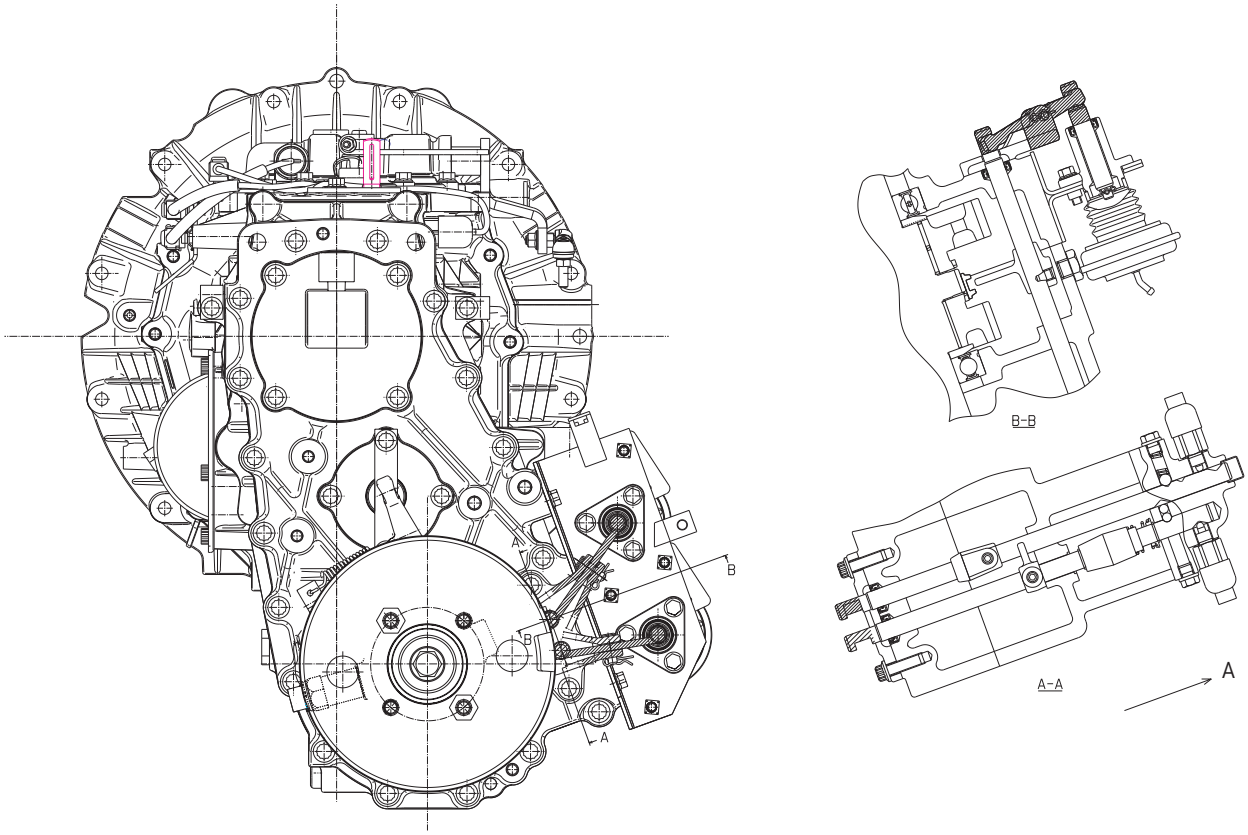
5.5.8 Painting the Transmission with transfer <FG>

- Before painting the transmission, be sure to mask the hatched sections shown in the illustration below to prevent the adhesion of paint, otherwise there will be problems in shifting between 2WD and 4WD.



1. Prohibit area

<FG High-Low Transfer>



A. Prohibit area

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 tow-starting

⚠ Risk of accident and injury

Before towing or tow-starting, please make sure that you read the "Towing" section in the detailed Instruction Manual. You could otherwise fail to recognize dangers and cause an accident, which could result in injury to yourself or others.

Property damage

Failure to observe the instructions in the Instruction Manual can result in damage to the vehicle.

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 engine, transmission, exhaust system, turbocharger, 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. At MITSUBISHI FUSO, electronic components installed at the factory are checked for their electromagnetic compatibility in the vehicle.

When retrofitting electric or electronic systems, they must be tested for electromagnetic compatibility and this must be documented.

The equipment must have been granted type approval in accordance with EC Directive 2009/19/EC and must bear the "e" mark.

The following standards provide information on this:

- DIN50498
- DC11224 (EMC component requirements)
- DC10613 (EMC vehicle requirements)
- EU Directive 2009/19/EC

Additional information

The notes on operating safety and vehicle safety in Section 1 "Introduction" ▷ 1.3 and ▷ 1.4 must be complied with.

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 ▷ 3.9.2 and ▷ 3.9.3.

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 ▷ 3.9.4.

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, propeller shaft. If you study the movement of critical safety parts owing to unavoidable circumstances, be sure to consult with contact personnel for body mounting and modification. "2.2 Technical advice and contact persons" ▷ 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
- Air tank, vacuum tank
- Wheel bolt
- Wheel nut
- Spring bracket
- Spring U-bolt
- Propeller shaft

Observe the following precautions during body building work.

Failure to observe any of them could damage an engine or intake system part.

- Do not run the engine with the air cleaner removed.
- Do not allow paint or organic solvent (including evaporated gas) to be drawn into the engine intake system.
- Do not heat the engine intake system from the outside.

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.

Some models shown in the table below may not be released in your market.

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)
FEA01, 21	×	–	×	×	–	–
FEA51	×	–	×	×	–	–
FEA61	×	–	×	×	–	–
FEA91,FEAY1	×	–	×	×	×	–
FEB21	–	×	×	×	–	–
FEB51	×	–	×	×	–	–
FEB71,FEBY1	×	–	×	×	–	–
FEB74	×	–	×	×	–	–
FEB91	×	–	×	×	–	–
FEC71	–	×	–	–	–	×
FEC81	–	×	–	–	–	×
FEC91	–	×	–	–	–	×
FECX1	–	×	–	–	–	×
FGB71	×	–	×	×	–	–

Note: For the member dimensions and the position of stiffener ① or stiffener ②, 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" ▷ 7.1.1.

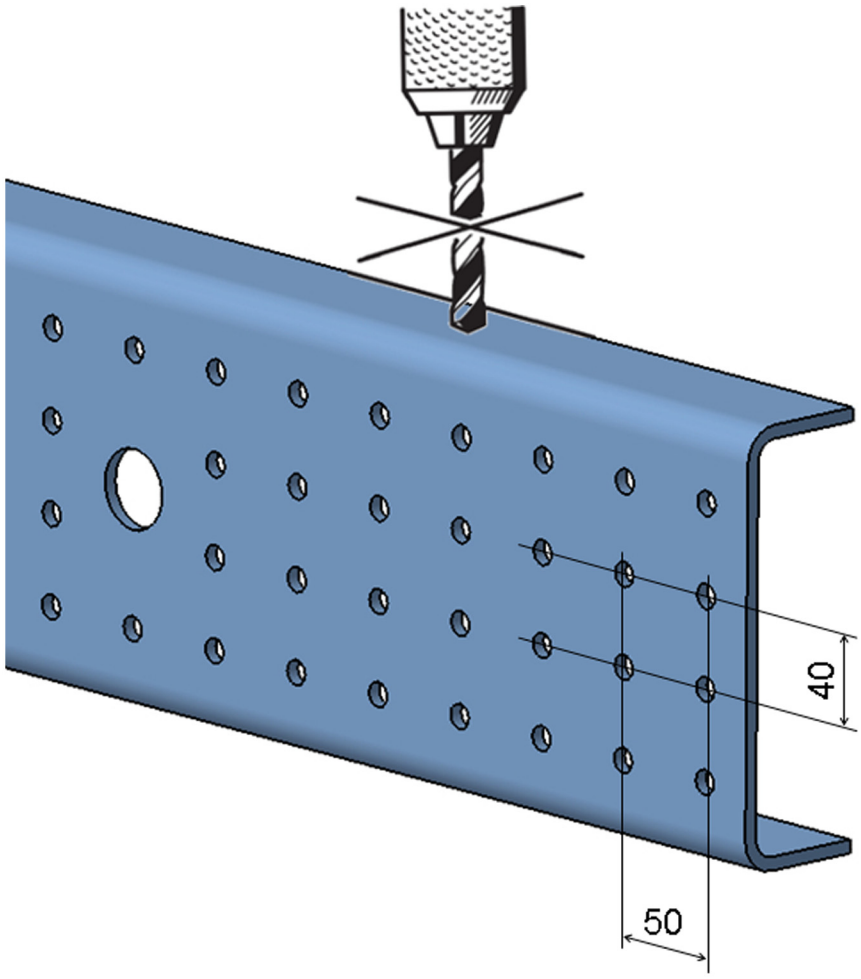
6.3 Drilling work on the vehicle frame

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. 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 ϕ13.

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.



6.3 Drilling work on the vehicle frame

Drilling work on the crossmembers

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

Crossmember type	Hole diameter	Center-to-center distance of holes
• Alligator type (see Fig. 1) • Channel type (see Fig. 2)	9 mm max.	30 mm* 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 crossmember should be 50 mm min. from the end of the crossmember. (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

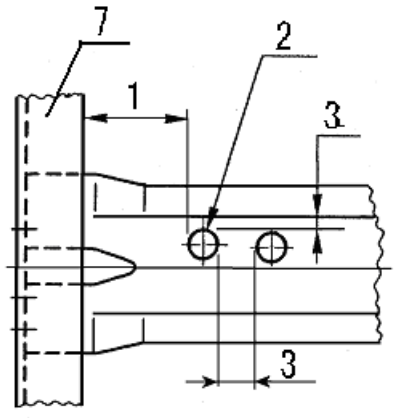


Fig. 1

Channel type

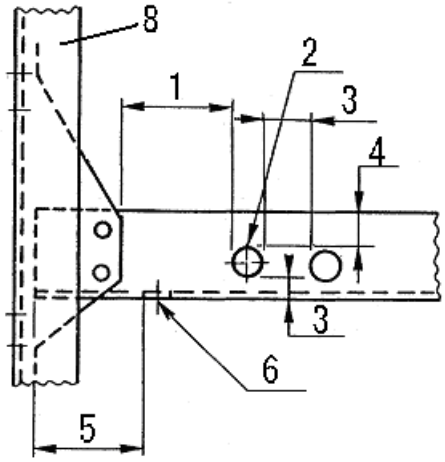


Fig. 2

1 100 mm min
2 DIA 9 mm max
3 25 mm min
4 20 mm min
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" ▷ 7.1.2.

Additional information

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

6.5 Reinforcement

• Cab back crane reinforcement procedure

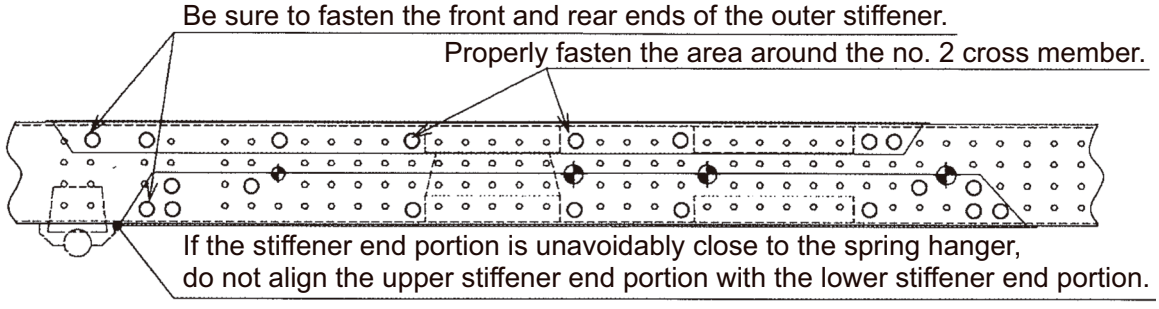
Adding an outer stiffener to the side rail causes the reinforcement end portion of the locally reinforced frame to undergo a sudden change in rigidity, making cracking more likely to occur. Reinforcement is thus not necessary for ordinary applications. Be sure, however, to reinforce the frame in areas near the crane mounting on which stress is locally concentrated during crane operations. The following show examples of reinforcement:

- Do not position the end portion of the outer stiffer on the end portion of the sub-side rail located inside the side rail.
- Do not position the stiffener end portion on the cab rear surface, near the spring hanger, on the cross member end portion, or any other load concentrating portions. If it is unavoidably close to the spring hanger, do not align the upper stiffener end portion with the lower stiffener end portion.
- Do not cut the outer stiffener end portion vertically. Cut it obliquely at an angle of 45° or more.
- Connect the outer stiffener and side rail through riveting or bolting on the web surface.
  Bolt M10: Flange bolt 10T
  Nut M10: Flange nut 6T
  Tightening torque: 90–110 N·m {9–11 kgf·m}

Additional information

Do not clamp the outer stiffener using the grounding bolt. Clamp the urea tank bracket (plastic) using a tightening torque of between 21 and 31 N·m.

- Use ϕ10 rivets or M10 bolts. Use a riveting machine for driving rivets in place.
- Do not set a rivet of the same diameter a second time in the same position. An ϕ11 rivet may be driven a second time in a position, in which a ϕ10 rivet was set, only if the dimension between an end portion and the rivet hole edge measures 25 mm or more.
- Be sure to fasten the front and rear ends of the outer stiffener.
- Properly fasten the area around the no. 2 cross member.
- Set rivets and bolts at a pitch of 200 mm or less. A smaller pitch should be used in areas near the outer stiffener end portion.
- A poorly machined, substantially U-shaped stiffener, when fitted in the side rail, can produce a clearance in the flange portion, adversely affecting the installation. Use L-shaped stiffeners both at the upper and lower portions.
- To obtain an adequate seating area for the nuts and bolts, use a diameter of ϕ11 for the holes in the outer stiffener, and do not make the holes oblong.
- If a chassis part straddles the outer stiffener, do not use a plain washer to adjust the level difference, but instead add a spacer (25×160 approx.) which has the same thickness as that of the outer stiffener.
- Do not clamp the outer stiffener using the bolts at the four corners of the outer side of the cross member and the transmission mount.



6.6 Modifications to the wheelbase

The wheelbase should not be extended or shortened because considerations for the propeller shaft length, balance, position of center bearings, brake piping and harness length are required.

If this is unavoidable, contact the department responsible ▷ 2.2.

6.6.1 Prohibition on modifying the propeller shaft

⚠ Risk of accident

It is strictly prohibited to modify the propeller shaft by welding or other means to change its length.

An improperly modified propeller shaft may cause vibration during operation, which in turn may cause cracks and fractures in the clutch housing, separation of the propeller shaft, and other dangerous conditions, possibly resulting in a serious accident.

6.7 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.

6.7.1 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.

6.7.2 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**
SAPH440 (S355MC), HTP540 (S500MC)	Same as the side rail	SAPH440 (S355MC)	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 (SAPH440), follow the instructions below.

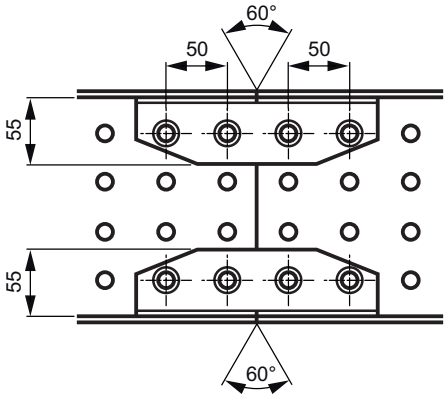
    (a) Be sure to use a low-hydrogen type electrode. Especially, where the weld must have the same strength level as the base metal, use a low hydrogen, high tensile strength type electrode.
    (b) Short weld beads are more likely to crack due to low hardening rate, so in areas requiring many short weld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



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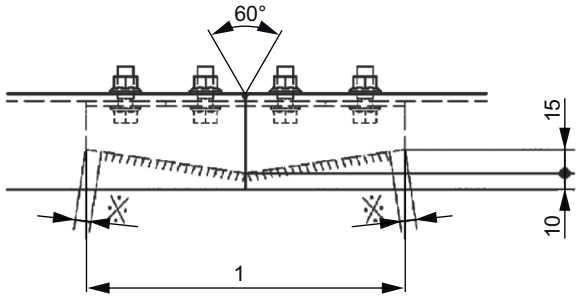

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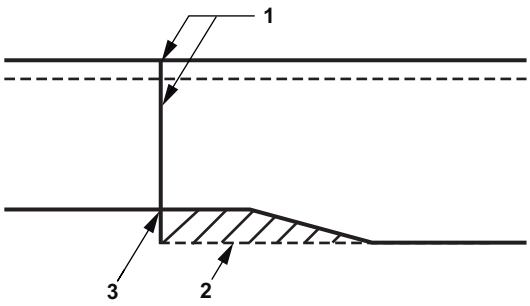
1 More than 200 mm

Additional information

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



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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

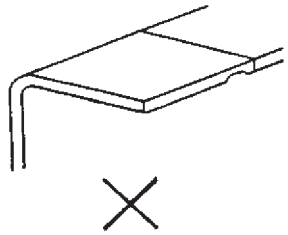


Fig. 3

Pile up

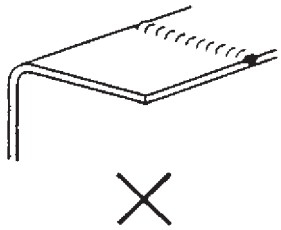


Fig. 4

6.7.3 Others

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

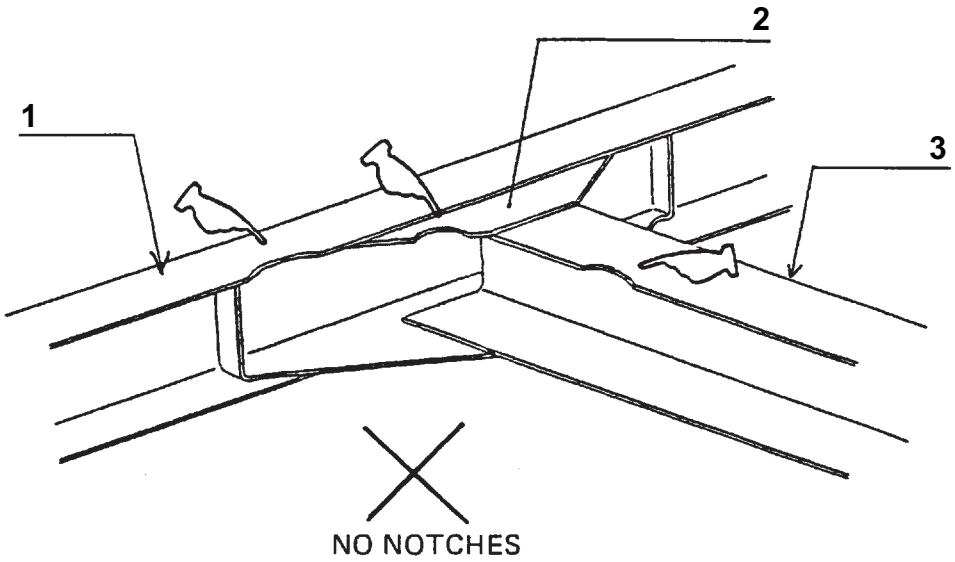


Fig. 1

1 Side rail
2 Crossmember gusset
3 Crossmember

6.8 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.

6.8.1 Mounting equipment on the side rail

- Attach a stiffener to the inside of the side rail as shown in Fig. 1 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 (fuel tank, 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.

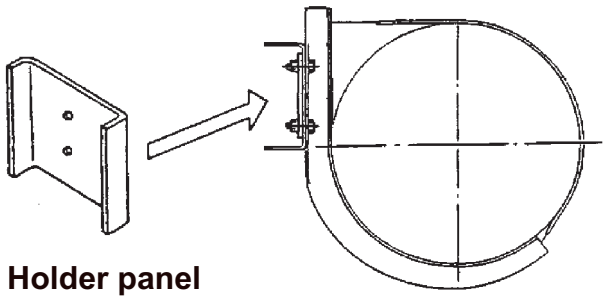


Fig. 1

6.8.2 Wheel chocks

Mounting

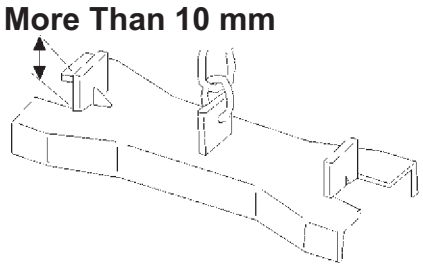
- In a suitable bracket so that they cannot rattle.
- Secured to prevent loss.
- Ensure good accessibility.

6.8.3 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)



  (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.

6.8 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 disk 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)

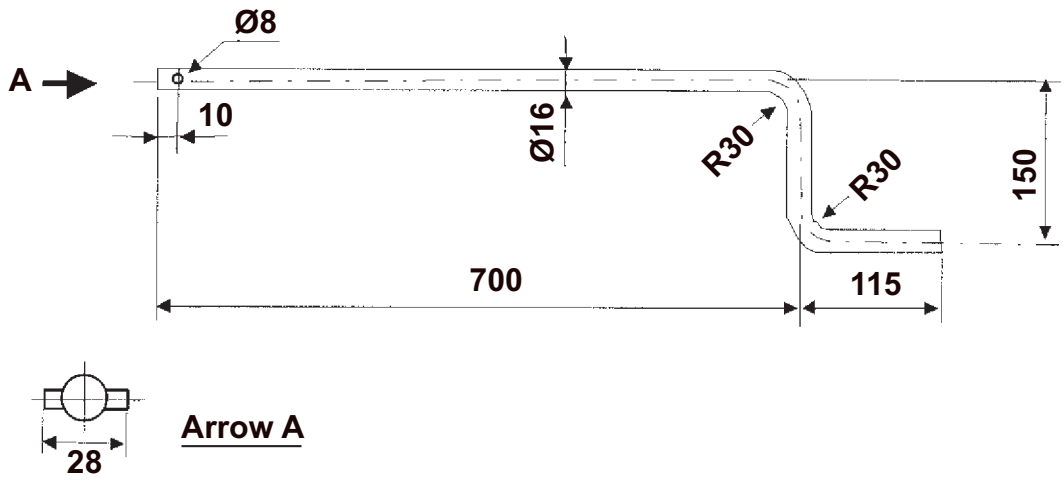


Fig. 2

6.8.4 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.

6.8.5 Front underrun protection <Vehicle with front underrun protection>

All class N2 vehicles put into circulation must comply with UN Regulation R93 (front underrun protection) in order to conform with Directive 2007/46/EC, Annex II. The intended operation of a vehicle is to a great extent determined by the bodywork, so that the structure, design and equipment of the chassis must be carefully considered both with and without the front underrun protection. It is not possible to retrofit a front underrun protection on Canter. MITSUBISHI FUSO recommends that the approval and intended use be clarified with the authorities responsible beforehand.

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

AD

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.

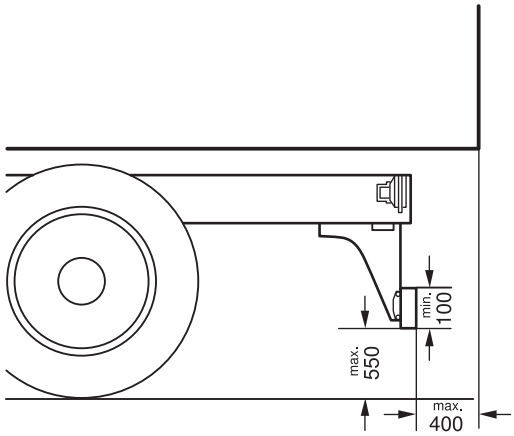
Exceptions to this regulation are semitrailer tractor vehicles, machines and vehicles whose purpose cannot be fulfilled if an underrun protection is fitted.

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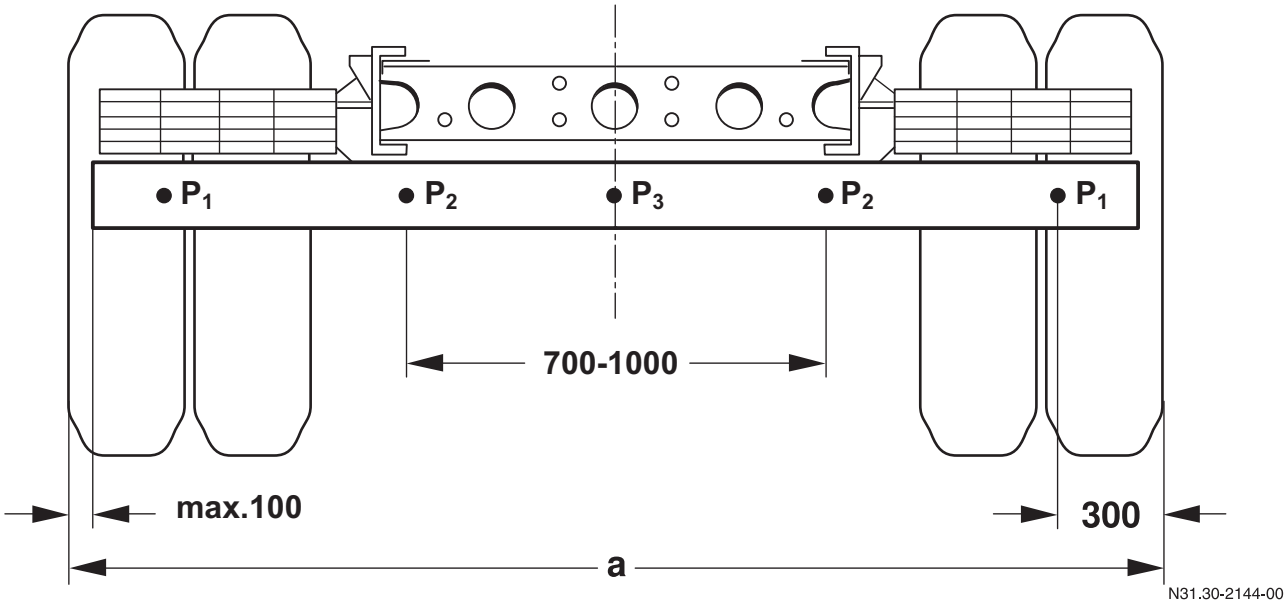
The rear underrun protection fitted at the factory complies with UN Regulation R58. No modifications may be made. If modifications are unavoidable, they must be clarified in advance with the vehicle licensing agency responsible.

6.8 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

6.8 Mounting of implements and auxiliary components

AD

<Vehicle with rear underrun protection for R58-03>

In Germany, Article § 32b of the German vehicle licensing regulations requires an underrun protection when

- 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 550 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.

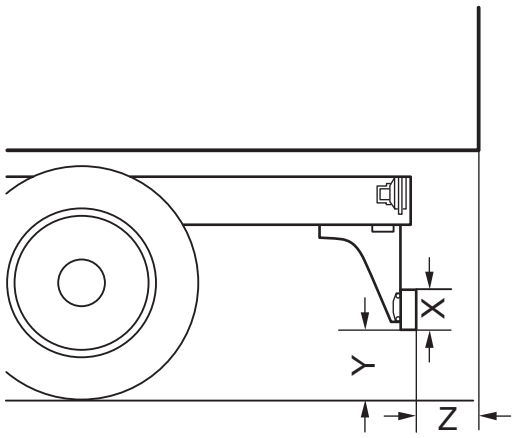
If an underrun protection is required, it must comply with UN regulation R58.

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

Installation dimensions:

			GVW ≤ 8ton	GVW > 8ton
Cross member section height	**X**		Min.100	Min.120
Maximum height of the underrun protection(unladen vehicle) above the road surface	**Y**		Max.550	Max.450 (Air suspension) Max.500 (Steel suspension)
Maximum Distance from the end of the body to end of the underrun protection	**Z**	**At installed condition**	Max.350	Max.300
		During application of test forces at P1, P2, P3	Max.400	

- Maximum width: = width of the rear axle (outer tyre edge).
- Minimum width: = Width of the rear axle-100mm on each side (widest axle is authoritative)
- Edge radius at least 2.5mm



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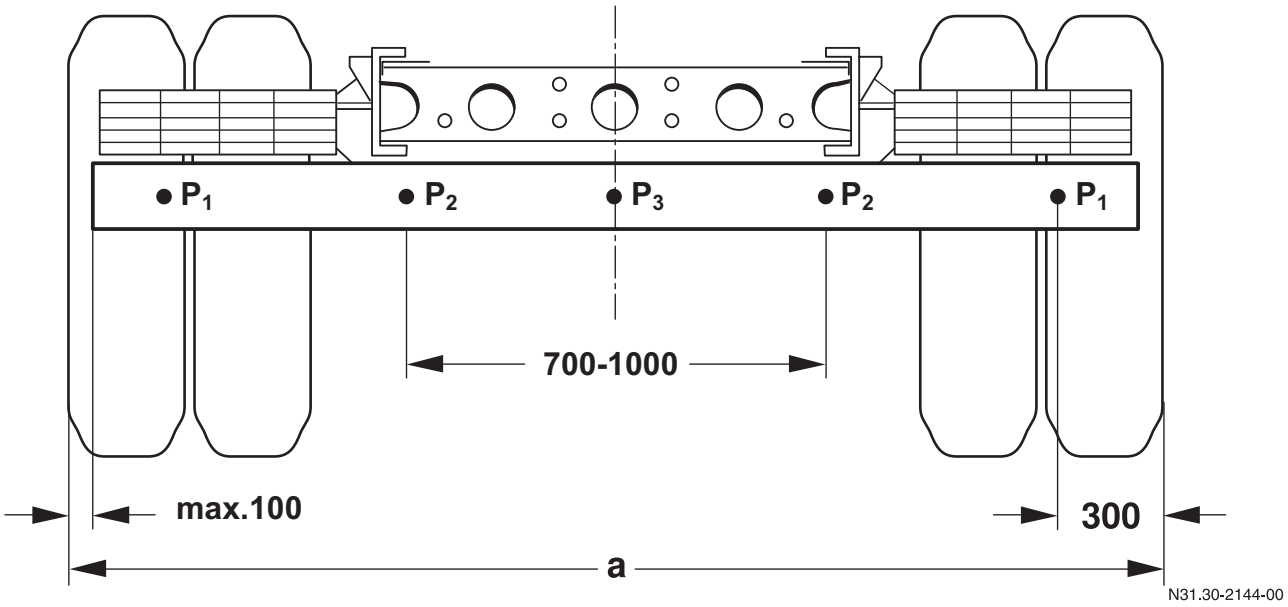
The rear underrun protection fitted at the factory complies with UN regulation R58. No modifications may be made. If modifications are unavoidable, they must be clarified in advance with the vehicle licensing agency responsible.

6.8 Mounting of implements and auxiliary components

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



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

6.8.7 Side underrun protections

Mount components in accordance with local regulations.

6.9 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 in Section 2.5 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.)

<Except EuroV Australia / New Zealand(2024~)>

B

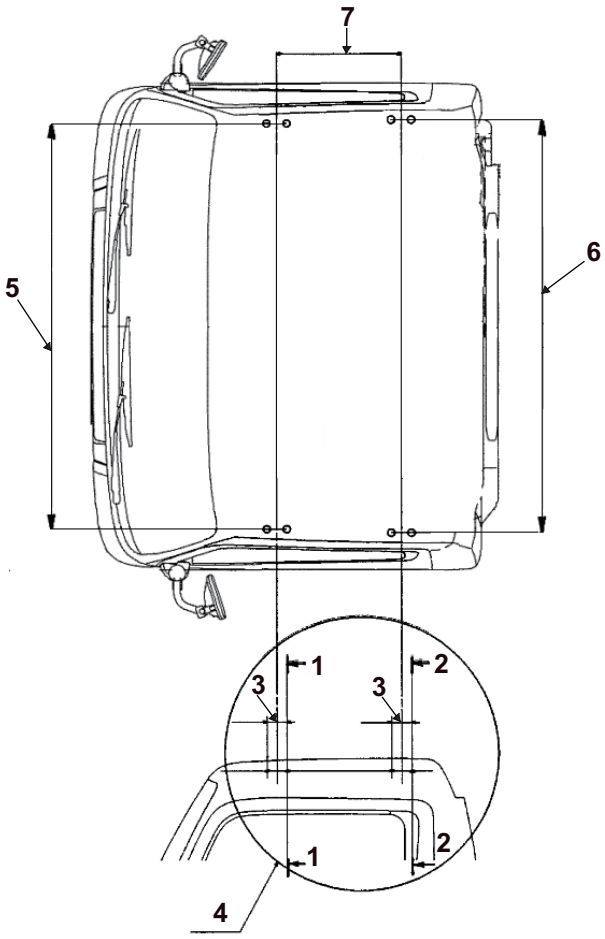


Fig. 1

1 Section A-A
2 Section B-B
3 80
4 Detail C
5 1408 (Standard cab)
1664 (Wide cab)
1364 (Standard and high roof cab)
6 1436 (Standard cab)
1694 (Wide cab)
1394 (Standard and high roof cab)
7 500

6.9 Cab

<For EuroV Australia / New Zealand(2024~)>

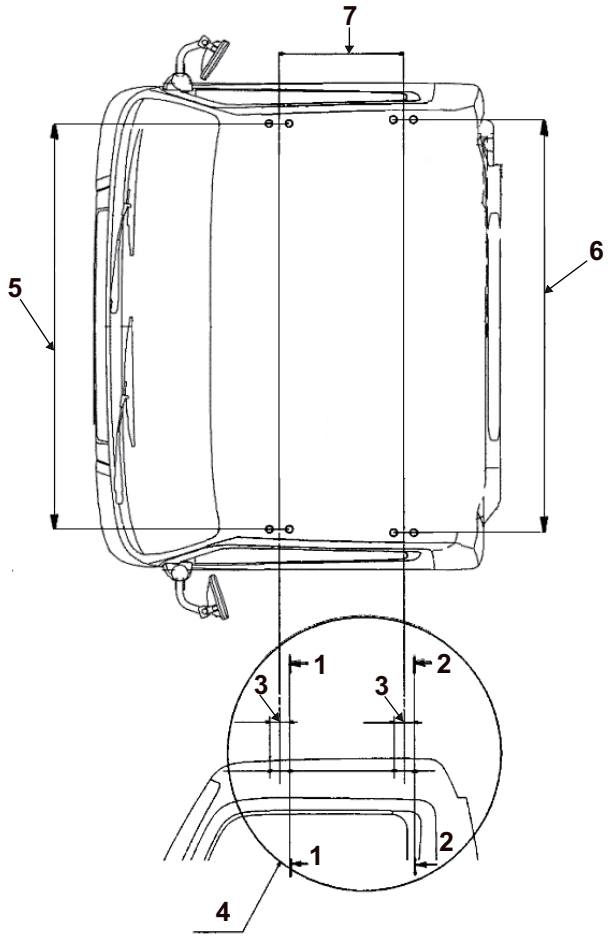
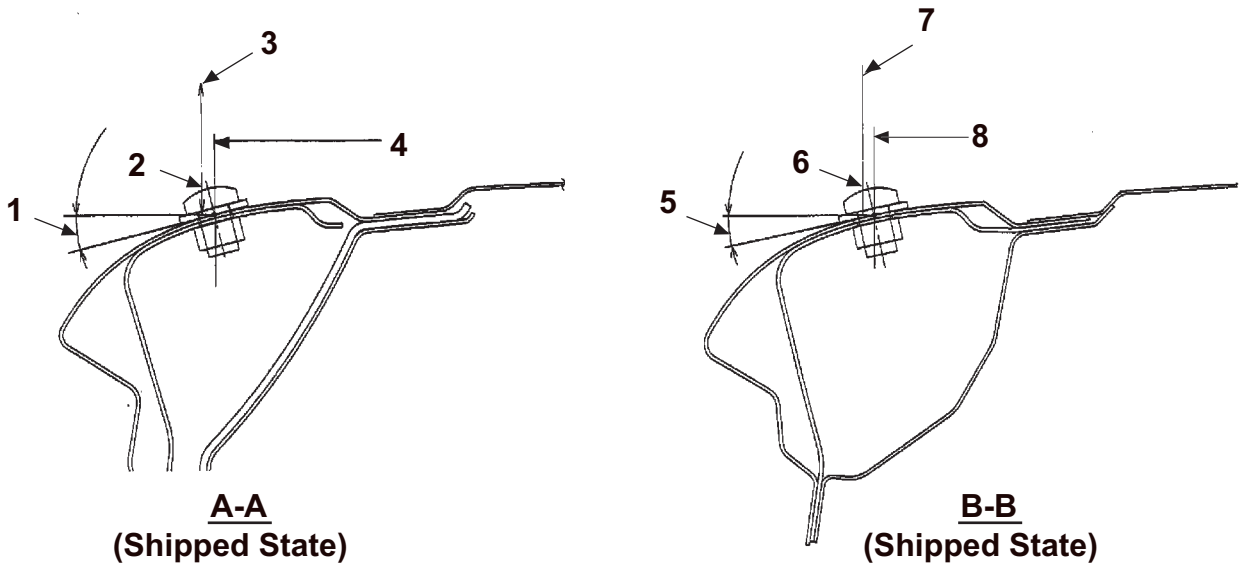


Fig. 1

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

B

<Except EuroV Australia / New Zealand(2024~)>



DETAIL C (1) <Standard cab>

DETAIL C (2) <Wide cab, Standard and high roof cab>

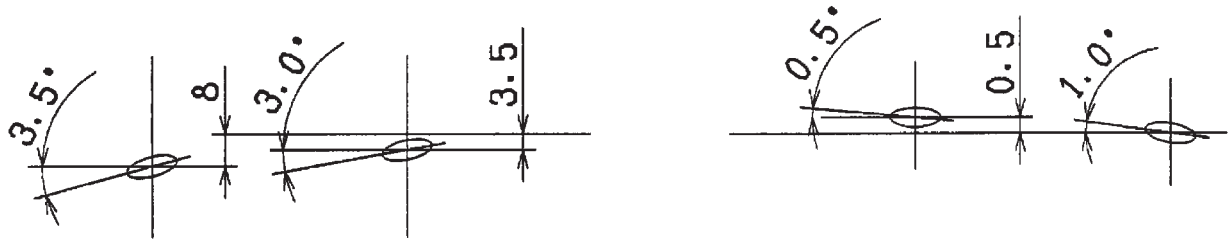
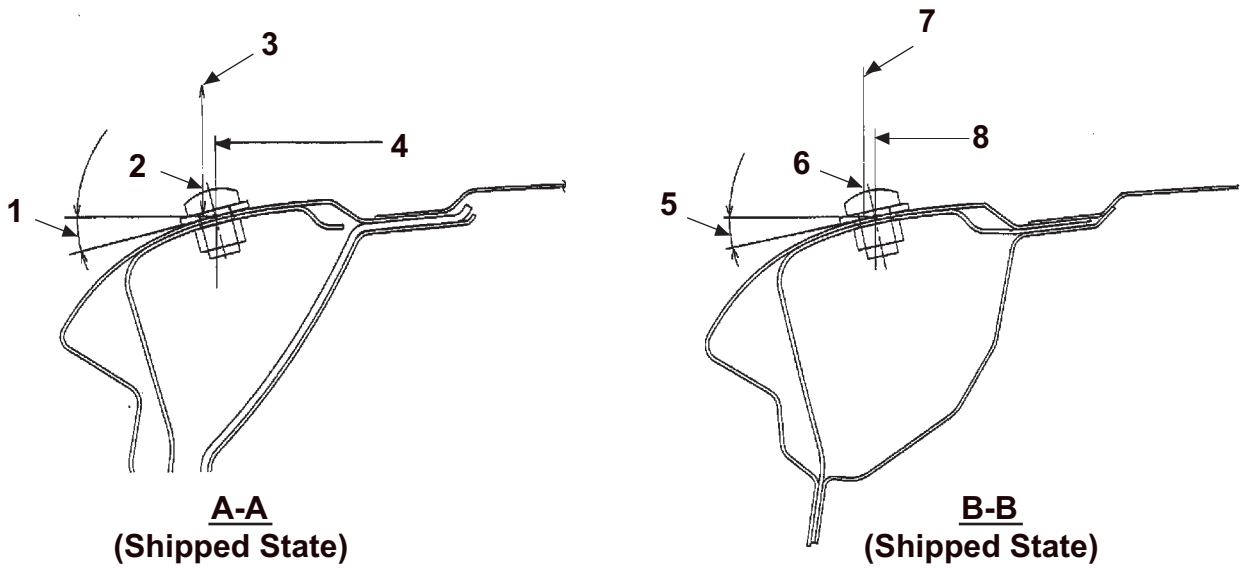


Fig. 2

1 *14.5° (Standard cab)*
16.5° (Wide cab, Standard and high roof cab)
2 *32.5 (Standard cab)*
31.0 (Wide cab)
29.0 (Standard and high roof cab)
3 *Roof top*
4 *1408 (Standard cab)*
1664 (Wide cab)
1364 (Standard and high roof cab)
5 *12.0° (Standard cab)*
14.5° (Wide cab, Standard and high roof cab)
6 *21.5 (Standard cab)*
34.5 (Wide cab)
32.5 (Standard and high roof cab)
7 *Roof top*
8 *1436 (Standard cab)*
1694 (Wide cab)
1394 (Standard and high roof cab)

<For EuroV Australia / New Zealand(2024~)>



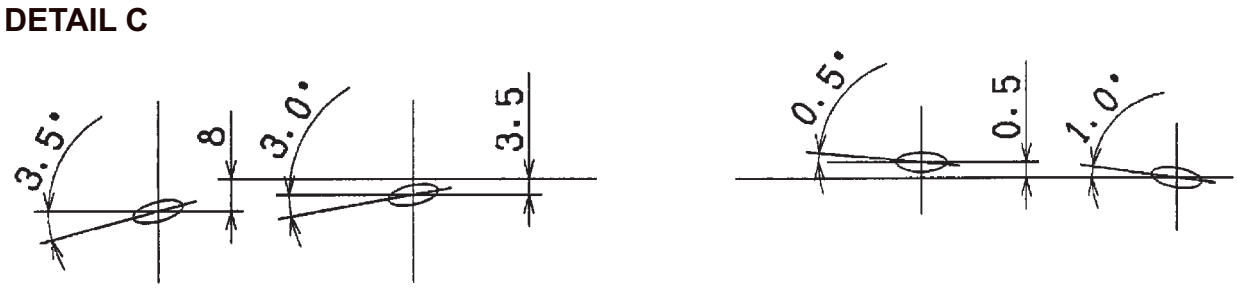


Fig. 2

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)

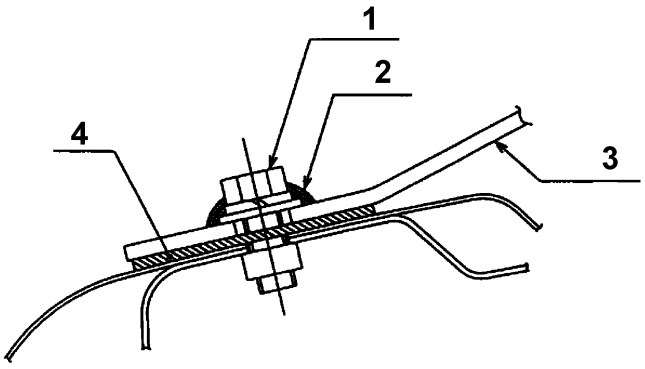


Fig. 3

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

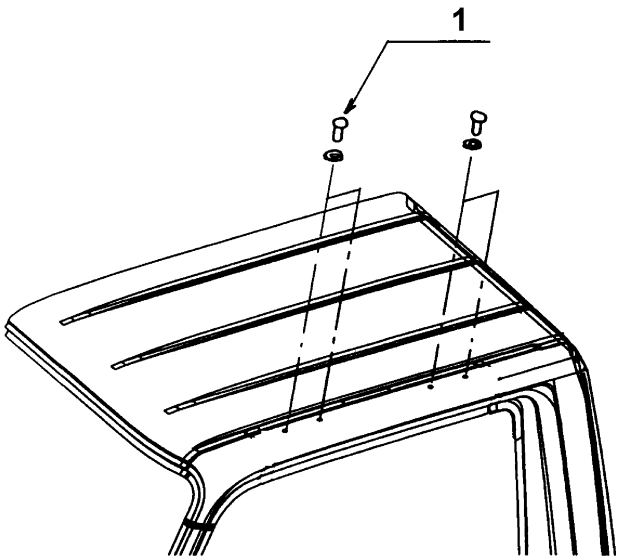


Fig. 4

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

6.10 Seats and seat belt

⚠ 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.

Unit: mm

6.11 Power take-offs

6.11.1 Transmission driven power take-off

AF

- The PTO output shaft turns backward relative to the engine revolution.
- The durable life time under rated operation is 500 hours.
- For details of power take-off, see ▷ 10.9.

Using a non-genuine power take-off may damage the transmission and other drive systems. In that case the warranty will not apply.

W

<Except Morocco>

Engine	Transmission model	PTO revolution ratio (relative to engine revolution)	Permissible output shaft torque/speed N·m/rpm [kgf·m/rpm]	PTO control	Part number		Remarks
					Output	PTO assembly	
4P10	M038S5 (MT) M038S6 (AMT)	0.644 (MT) 0.655 (AMT)	147/2000 [15/2000]	Wire type (for dump trucks)	Directly coupled to pump	ME530972	Dump truck
			196/1500 [20/1500]	Vacuum type	Flange type	ME536138	MT
						ME530661	AMT
					Adapter type	ME536139	MT
						ME530666	AMT
		0.638 (MT) 0.651 (AMT)	196/1500 [20/1500]	Vacuum type	Direct connection type	ME536976	*
		0.723 (MT) 0.727 (AMT)	392/1500 [40/1500]	Vacuum type	Flange type	ME536881	MT
						ME536882	AMT

*: The PTO output shaft rotate in the same direction with the engine revolution, others are rotate in the opposite direction.

AG

<For Morocco>

Engine	Gearbox model	PTO revolution ratio (relative to engine speed)	Permissible torque/ rpm of output shaft [Nm/rpm]	PTO governor	Part number		Remarks
					Output type	PTO assembly	
4P10	M038S5 (MT) M038S6 (AMT)	0.644 (MT) 0.655 (AMT)	196/1500	Vacuum type	Flange type	ME536138	MT
						ME530661	AMT
		0.723 (MT) 0.727 (AMT)	392/1500	Vacuum type	Flange type	ME536881	MT
						ME536882	AMT
		0.638 (MT) 0.651 (AMT)	196/1500	Vacuum type	Directly coupled to pump	ME537270	Manufac-tured by Bezares S.A.*

* Information on ordering parts can be obtained from the department responsible (see ▷ 2.2).

Cab back engine control (accelerator sensor for body building)

- The movement of the cable from the built body is converted to a corresponding electrical signal to thereby control the engine speed.
- To retrofit the cab back control, data must be modified of the engine ECU and SAM control unit. The power take-off is enabled only after the data has been modified. Consult the MITSUBISHI FUSO authorized Distributer.

- Detail of Accelerator Sensor

<OLD: ~June 2021>

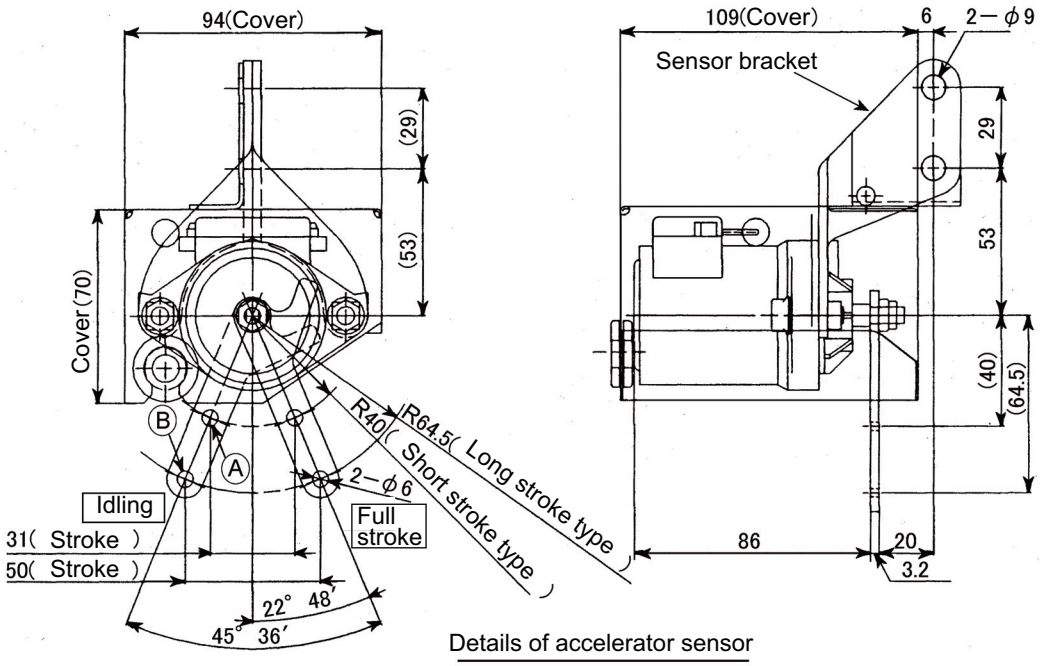


Fig. 1

- Lever Stroke

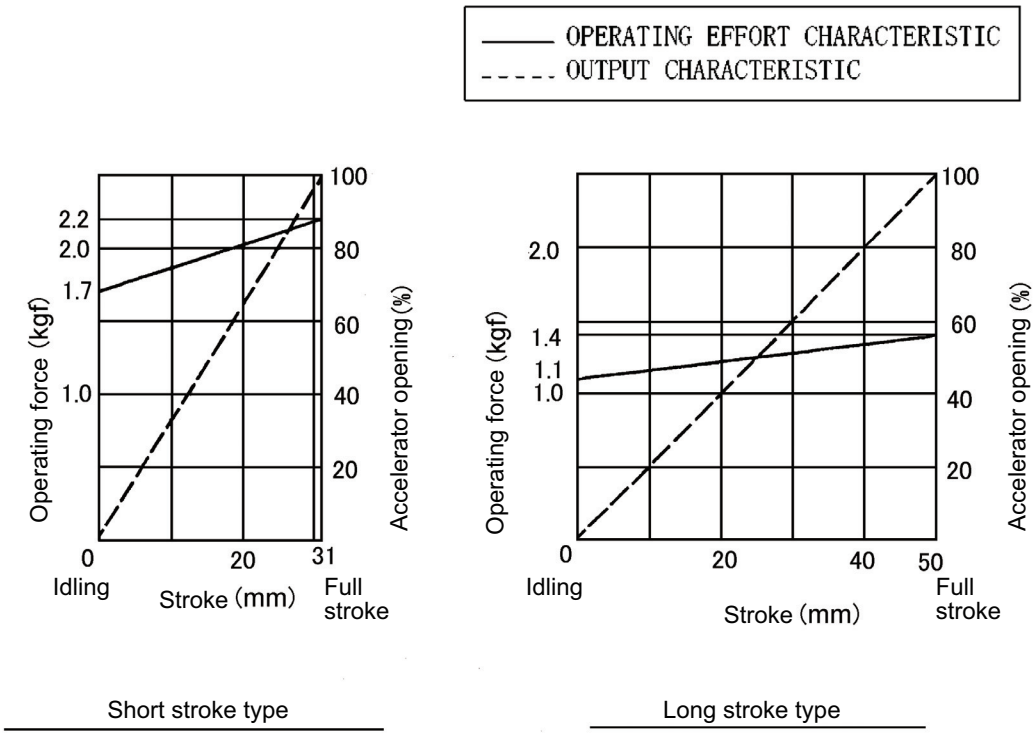
It's able to choose 2 kinds of lever stroke by choosing a clevis hole of the accelerator sensor lever Table 3.

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	17 N {1.7 kgf}	22 N {2.2 kgf}	40.0
LONG STROKE TYPE	(B)	50	11 N {1.1 kgf}	14 N {1.4 kgf}	64.5

- Sensor Output Characteristic

Output characteristic and operating effort are as following figure.



- Detail of Accelerator Sensor

<NEW: July 2021~>

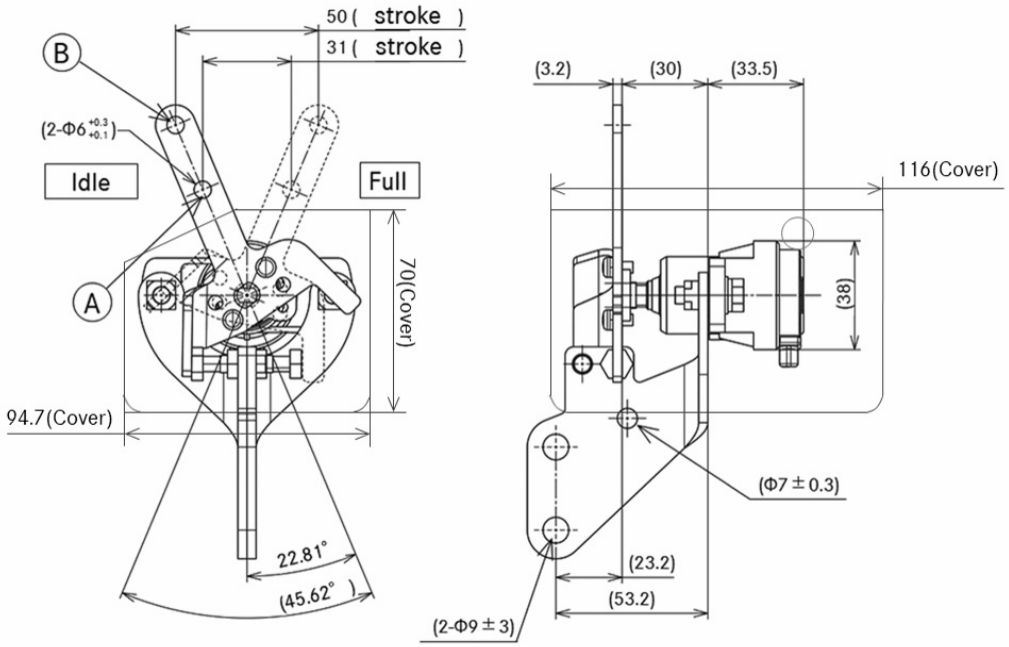


Fig. 1

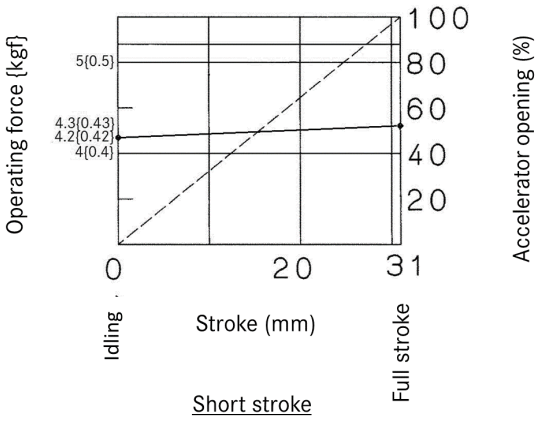
- Lever Stroke

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

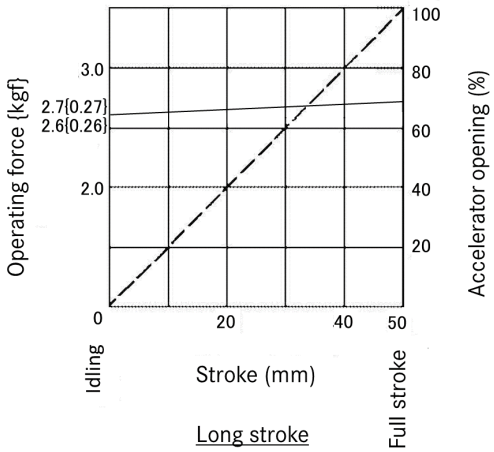
Unit: mm

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) 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.

(b) 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.

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

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

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

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

(g) 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

AC

List of set parts

Unit: mm

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

6.11.2 Governor

(1) Electronically controlled governor

The electronically controlled governor (electronic governor) automatically switches to a special equipment governor during PTO operation.

The vehicle can be mounted with a cab back engine control (sensor-based) for engine control during PTO operation.

For the cab back engine control, see ▷ 6.11.1.

For governor performance, see ▷ 10.3.3.

Engine model	Governor model	Governor characteristics	Engine control	Operation	Applicable vehicle model (Note 4)		Remarks
4P10T2, 4, 6	Electronically controlled	Normal engine governor	–	–	Standard vehicle	Vehicles not equipped with PTO	[Note 1]
		Special equipment governor	Sensor-based	PTO-ON	Special equipment vehicle	Vehicles with transmission PTO	[Notes 2 and 3]

Notes:
1. Retrofitting a standard vehicle with a PTO requires a change of SAM parameters including the engine ECU. Consult the contact person ▷ 2.2.
2. Retrofitting the cab back control requires a change of engine ECU parameters. Consult the contact person.
3. In the case of retrofitting a vacuum controlled PTO, it is also necessary to change the parameters in the DUONIC ECU.
4. On a vehicle equipped with the cab back control, the accelerator pedal is inoperative while the PTO is ON. (This can, however, be changed by selecting a new control number.)
5. Only the transmission PTO is set for the model 4P10 engine.

(2) Governor characteristics

For the special equipment governor, governor characteristics during PTO operation can be selected by selecting the control number (Additional information 1). Only with the vehicle with PTO, #1 has been factory-selected for models not equipped with the cab back control. To change the governor characteristics according to body building, use the table shown below to find the control number appropriate for the need.

If the PTO is retrofitted on the standard vehicle, select the control number according to body building from among those shown in the table below (Additional information 1).

<Special equipment governor characteristics and engine control systems relative to the control numbers>

Control number	Special equipment governor characteristics		Engine control system	
	Governor type	Max. speed	Accelerator pedal	Cab back control
#1	Soft	①	○	×
#2	Hard	Ⓐ	○	○
#3	Soft	①	×	○
#4	Hard	Ⓐ	×	○
#5	Soft	②	○	○
#6	Hard	Ⓑ	×	○
#7	Soft	③	×	○
#8	Soft	④	×	○

Additional information

- The control number can be selected by changing the engine ECU parameters. Consult the department responsible ▷ 2.2.
- In any case, characteristics are the normal engine one and the cab back sensor is inoperative when the PTO is OFF.
- If both the cab back sensor and accelerator pedal are operated at the same time, the engine is controlled by whichever has a greater input.
- For max. speed codes shown in the table above, see ▷ 10.3.3.

6.12 Installation of propeller shafts

The modification of extending or shortening the wheelbase or additional installation of a gear box to the drive line requires the modification of the propeller shaft. If the propeller shaft is improperly modified such as a change in the pipe length by welding to the main unit of the propeller shaft, vibration caused by the propeller shaft can lead to a serious trouble or accident such as cracks and rupture of the clutch housing and falling-off of the propeller shaft. Therefore, the modification of the propeller shaft is strictly prohibited.

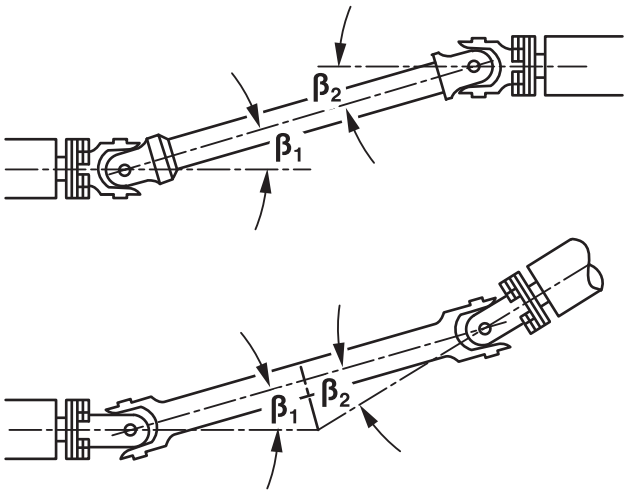
If the modification of the propeller shaft is necessary due to a customer's request or body mounting layout, be sure to consult with contact personnel for body mounting and modification. (▷ 2.2)

Observe the following when installing propeller shafts:

- Installation guidelines of the propeller shaft manufacturer.
- If necessary, fit several propeller shafts with intermediate bearings.
- The flanging surfaces must be completely flat.
- The angular offsets must be identical at both universal joints ($ß_1 = ß_2$). They must not be greater than 6° or less than 1°.
- Balancing plates must not be removed.
- Make sure that the marks are aligned on the propeller shafts during installation.
- Eliminate any vibrations, e.g. by optimising the propeller shaft angles.

6.12 Installation of propeller shafts

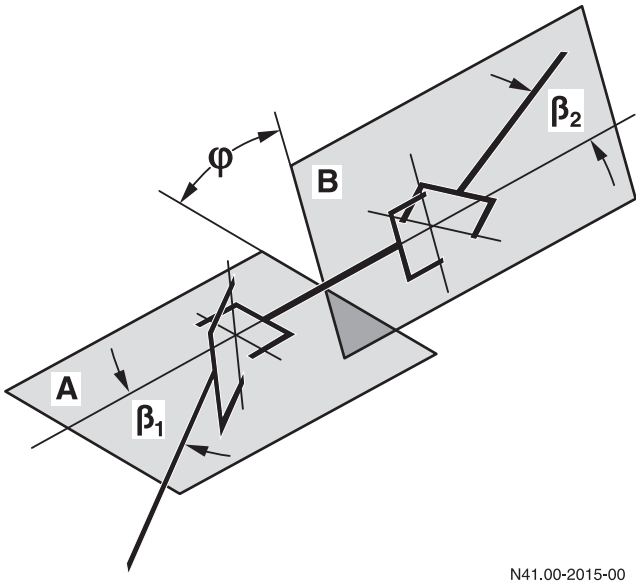
6.12.1 Types of angular offset



N41.00-2014-00

Angle in one plane (two-dimensional offset)

$\beta_1 = \beta_2$
Upper = Z-type offset
Lower = W-type offset



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Angles in two planes (three-dimensional offset)

$\beta_1 = \beta_2$

With three-dimensional offset, the input and output shafts intersect in different planes (combined W- and Z-offset).

In order to compensate for any irregularities, the inner joint fork must be offset.

Property damage

Failure to observe these instructions could result in damage to the major assemblies.

6.13 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.

Disk brake

Property damage

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

ESP (Electronic Stability Program)

<Vehicle with ESP>

- Be sure not to change the engine 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.

6.13.1 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 D	A	B	t	C	S min.	Material	Tightening torque * N·m {kgf.cm}
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	13-17 {1.3-1.7}
6.35	8.6-9.1	4.5-5.2	0.7	1.4	1.0		19-26 {1.9-2.6}
8	10.5-11.0	6.2-6.9	0.7	1.4	1.6		29-39 {3.0-4.0}
10	13.0-13.5	8.2-8.9	0.7	1.4	1.6		39-50 {4.0-5.1}
12	15.0-15.7	9.8-10.5	0.9	1.8	1.6		77-90 {7.5-8.9}
15	18.1-18.8	12.7-13.4	1.0	2.0	1.6		85-100 {8.3-9.8}

* The tightening torques for the flare nuts which connect the brake lines.

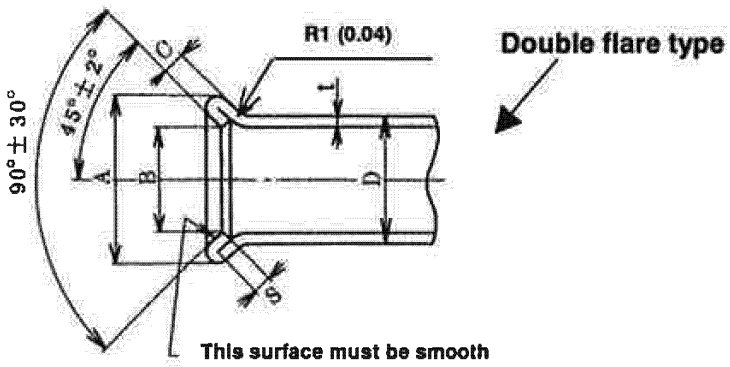


Fig. 1 (1/2)

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

Nominal diameter	D_1 ±0.07	D_2 ±0.18	D_3 +0.3 -0.2	D_4 min.	T ±0.07	l ±0.3
4.75	4.75	7.1	3.2	4.7	0.7	2.5
4.76	4.76					
6.35	6.35	8.8	4.8	6.3		

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

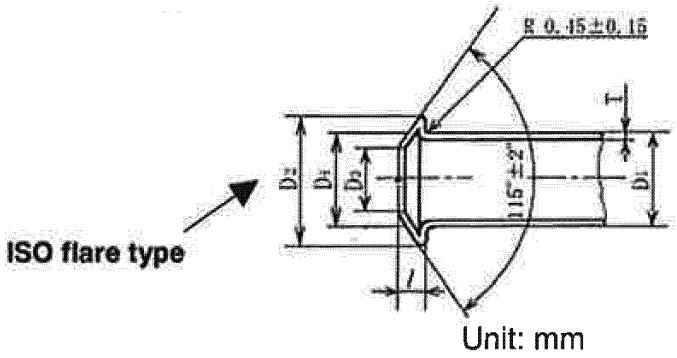
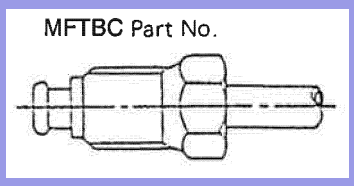


Fig. 2 (2/2)

6.13.2 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.

Nominal diameter mm	Bend radius mm
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.

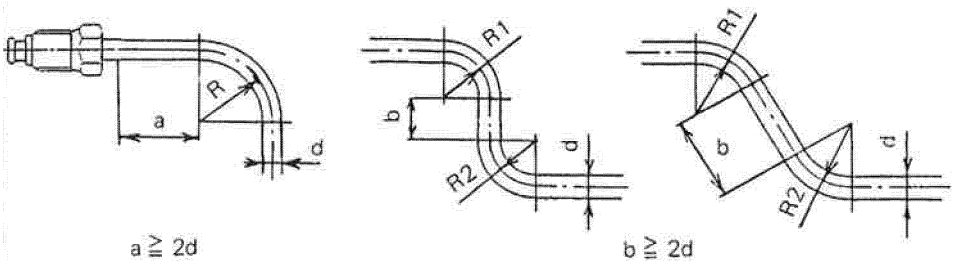


Fig. 3

- 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.

6.13.3 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)

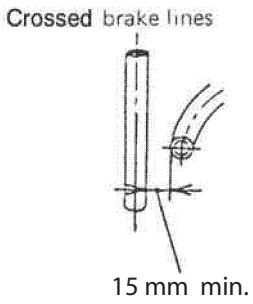


Fig. 4

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

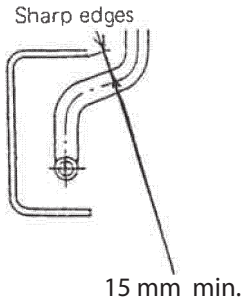


Fig. 5

- 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	Curved tube
4.75, 4.76	550	400
6.35	550	400
8	550	400
10	750	550
12	750	750
15	750	750

- 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 crossmembers.
  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 and exhaust system 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 ▷ 6.13.2. 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

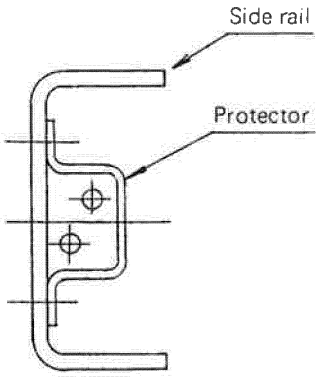


Fig. 6

6.14 Exhaust system

The modification of the exhaust system is prohibited because it has an adverse effect on the noise regulation, fire prevention, emission control system and engine.

<Vehicles with SCR and DPF systems>

6.14.1 Exhaust gas purification devices (BlueTec® system) and sensors

- Exhaust gas purification devices (BlueTec® system) may be damaged by heavy impact against their body or fall. When mounting, handle them with sufficient care.
- To prevent the exhaust gas purification devices (BlueTec® system) and engine proper from being adversely affected, do not relocate the exhaust gas purification devices (BlueTec® system), exhaust temperature senor, differential pressure sensor, lambda sensor and NOx sensor.
  If temporary removal of these parts becomes inevitable during mounting, be sure to reinstall these parts in the original places. Connect the pressure sensor hose properly, not in reverse, too loose nor too tense. Also, securely clip hose joints and make sure of gas-tightness.
- Exhaust gas purification devices and sensors are periodically removed for maintenance. Install them so that removal and reinstallation work can be carried out without any problems.

6.14.2 BlueTec® system

BlueTec® exhaust gas aftertreatment

BlueTec® exhaust gas aftertreatment removes NOx in the exhaust gas.
Do not modify and transfer the following parts because the performance of the system is deteriorated.

- SCR muffler
- Urea tank unit
- Dosing module
- Urea hose

Property damage

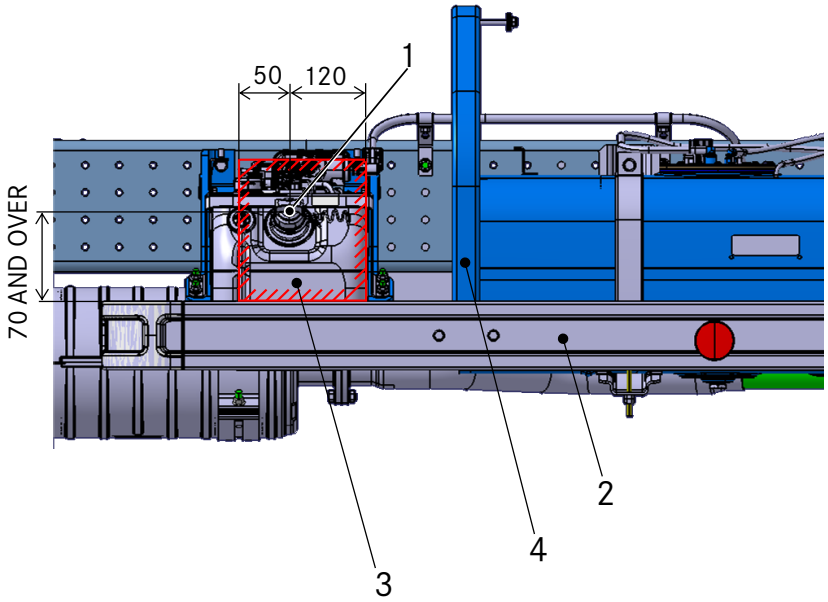
Do not take out the power supply for other electric components from the existing fuse.

Especially the function of BlueTec® exhaust gas after treatment can not work when the fuse of system is blowout.

BlueTec® exhaust gas after treatment requires a lot of electric power to work the heating device for freeze proofing in winter or cold region.

Installing a side guard and other parts around the urea tank

- Care is required when installing a side guard around the urea tank. Do not let the side guard and its mounting stay hide the filler cap of the tank and interfere with refilling the tank with AdBlue®. Be sure to open up sufficient space around the cap to allow a filler gun of AdBlue® to be inserted; typical dimensions of filler guns are shown in the figures below.
- Allow a clearance of at least 25 mm between the side guard, mud guard, etc. installed around the urea tank and the following parts of the urea tank: front end, rear end, and outer side.
- Avoid directly attaching parts to any of the urea tank brackets.
- Maintain sufficient free space to insert AdBlue® filler nozzle. (shaded area)



1 Cap
2 Side guard
3 Urea tank
4 Side guard mounting stay

AdBlue® filler gun - Examples

Filler gun for dispensers

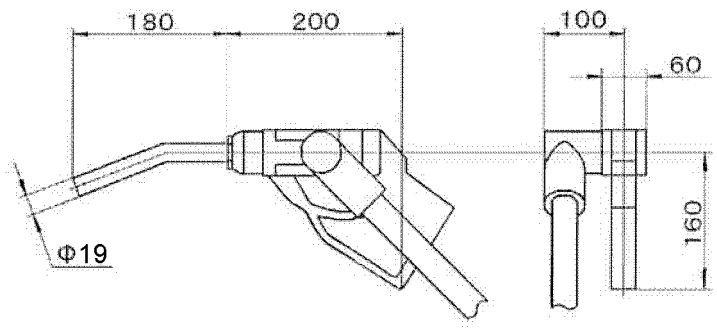
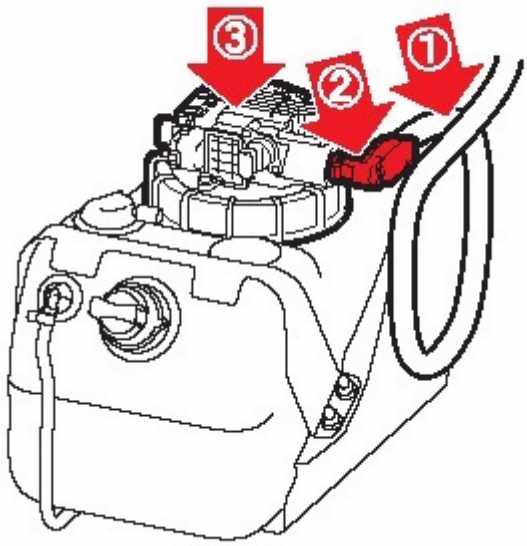


Fig. 2

6.14 Exhaust system

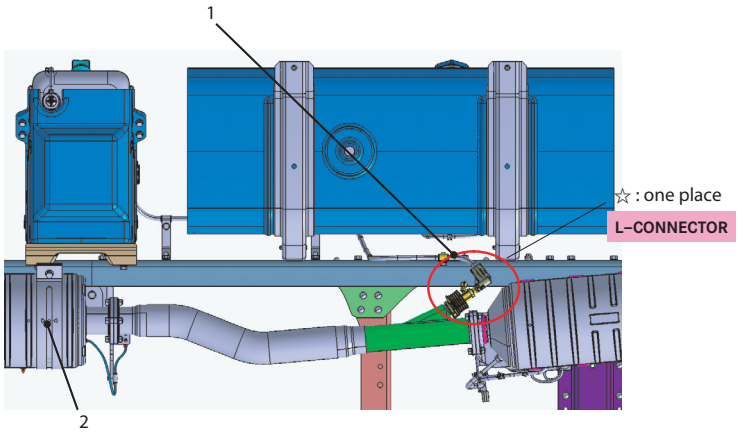
Urea tank and connection piping

- The urea tank with a urea pump module inside, the dosing module, and their connection piping are all installed conforming to the relevant exhaust gas control requirements. It is prohibited to relocate these components and change their piping when mounting the body or equipment.
- If an excessive force is applied to the urea tank and/or hose ①, the hose connector ② or the hose ① may break.
  (a) Do not pull the hose ① when servicing.
  (b) Do not step on the area around the hose connector ② or top of the urea tank ③. Do not apply heavy impact and do not scrub hard with a car wash brush.
- Do not use a broken hose connector or hose as it may cause leakage of urea water.

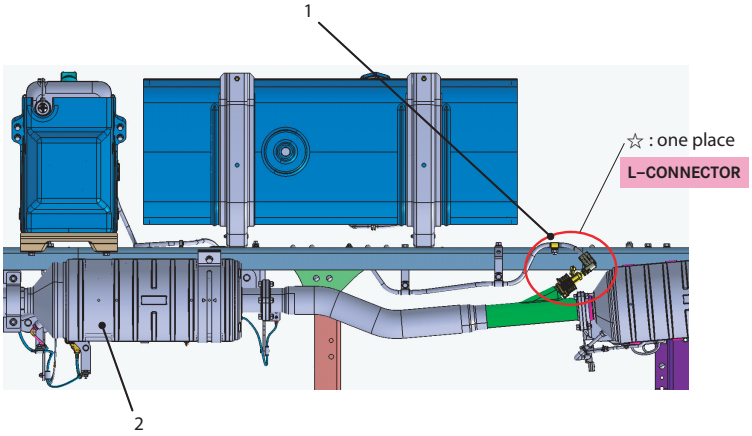


<EuroV Type>

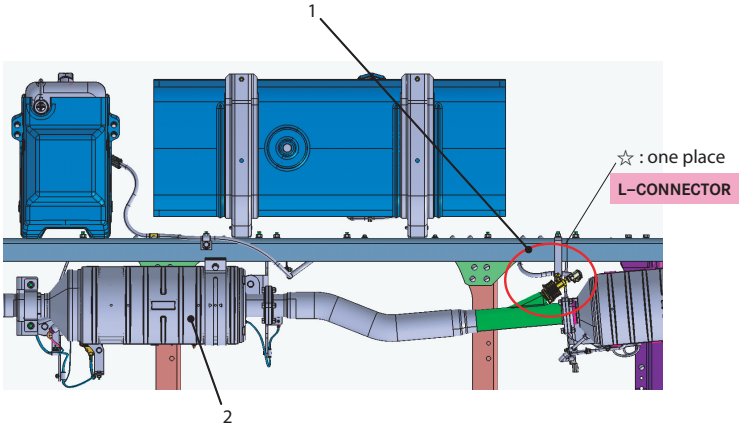
Wheel base: E



Wheel base: G



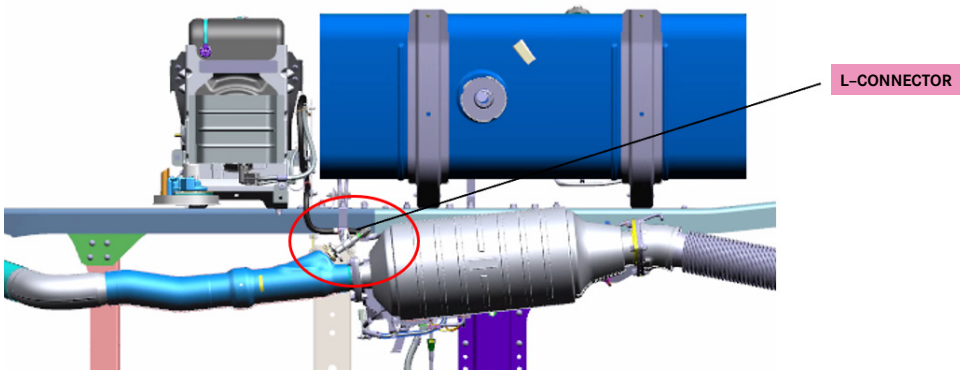
Wheel base: H, K



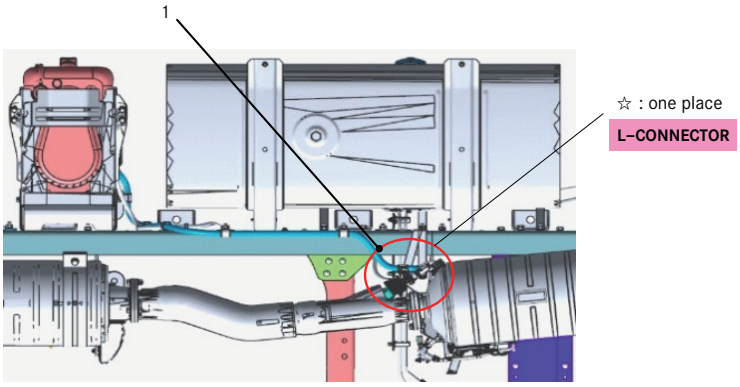
1 Dosing module
2 SCR muffler with internal catalyzer

<Euro VI Type>

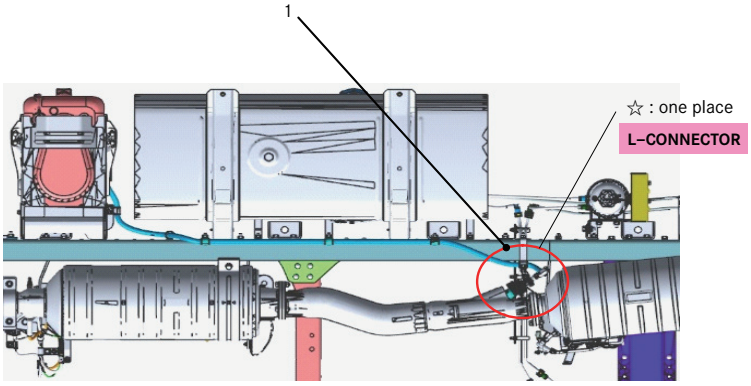
Wheel base: C



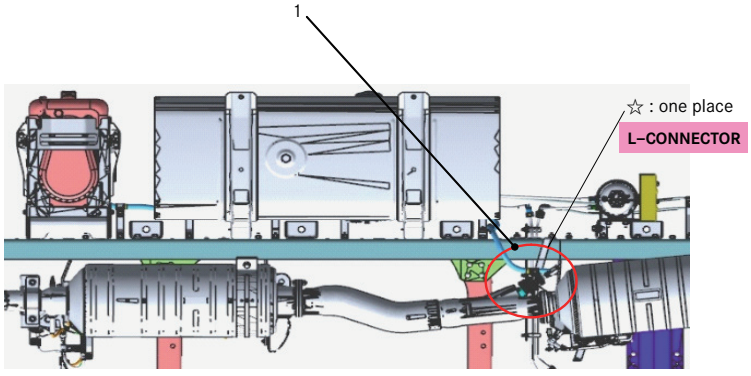
Wheel base: E



Wheel base: G

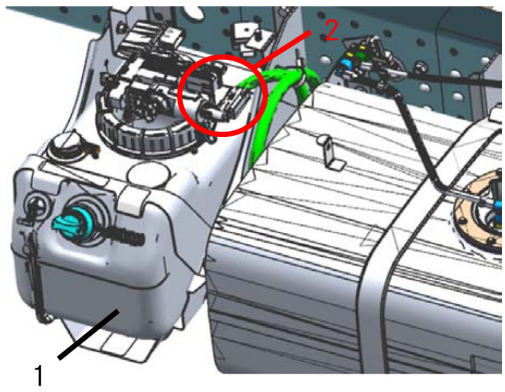


Wheel base: H, K



1 Dosing module

6.14 Exhaust system



1 Urea tank
2 L-connector

There are urea hose connecting ports near the L-connector. After any operation including mounting the body or equipment near these areas, visually check that the clamps of the coupling connector is fully closed regardless of whether you touch the piping or not.

Property damage

Applying undue force to hoses may damage their connections. Do not pull on hoses or step on their connections.

Precautions for electric welding

If electric welding is performed while the electric wiring for the pump module of the BlueTec® system is still connected, the internal electric circuits on the module could be damaged. Be sure to disconnect the module's electric wiring connector as follows before starting electric welding:

- Turn the starter switch to "OFF".
- Leave the starter switch in the "OFF" position for at least 1 minute. (This is necessary for after-run processing.)
- Disconnect the wiring connector on the pump module side.
- Be sure to ground the welder close to the welding area.

When reconnecting the connector after completing the electric welding, confirm that the starter switch is in the "OFF" position.

Property damage

Do not divide any power supply from an existing fuse.

Especially the BlueTec® system will not work if its fuse has blown. In winter and cold areas, the system consumes more electric power for its heater to prevent freezing. Never branch power for another electric device from the fuse.

<Vehicles with DPF system>

6.14.3 Clearance between exhaust system parts and other parts

- The exhaust pipe and exhaust gas purification devices (DPF, Rear Oxidation catalyst) become so hot that if they are too close to or in-terfere with other chassis parts, a serious accident like fire or damage by melting could occur. Malfunction is also a possible consequence. Secure sufficient clearance in accordance with the standards ▷ 4.4. If this is impracticable, provide a shield plate against heat to ensure safety.
- Do not install the tail pipe under fuel pipe, fuel hose joint or fuel filter drain tube.
  Wooden and rubber body parts should be more than 100 mm apart from the diesel particulate filter (DPF) integrated muffler and exhaust pipe. If this is impracticable, provide a shielding plate against heat to ensure safety.

Risk of accident and injury

The tail pipe (including Rear Oxidation catalyst) of a DPF-equipped vehicle can become considerably hotter than that of a conventional vehicle during automatic regeneration. Provide sufficient clearance between the tail pipe and other parts.

6.14.4 Exhaust gas purification devices (DPF, Rear Oxidation catalyst) and sensors

- The muffler integrated with diesel particulate filter (DPF) may be damaged by heavy impact against its body or fall. When mounting, handle it with sufficient care.
- To prevent the exhaust gas purification devices (DPF, Rear Oxidation catalyst) and engine proper from being adversely affected, do not relocate the exhaust gas purification devices (DPF, Rear Oxidation catalyst), exhaust temperature sensor or pressure sensor.
  If temporary removal of these parts becomes inevitable during mounting, be sure to reinstall these parts in the original places. Connect the pressure sensor hose properly, not in reverse, too loose nor too tense. Also, securely clip hose joints.
- The DPF-integrated muffler is periodically removed for maintenance. Install it so that removal and reinstallation work can be carried out without any problems.

6.15 Fuel system

6.15.1 Fuel tank

Do not connect the chassis-mounted fuel tank and the mounting bracketsto the body-building part, because this may adversely affect the mounting strength of the fuel tank.

Precautions for relocating the fuel tank

When changing the fuel pipes, use the specified steel pipes, nylon tubes indicated below. If you use poor quality parts, a fire may occur, so be sure to purchase genuine parts from your local MITSUBISHI FUSO parts dealer.

Nylon tube

Unit: mm

Nominal diameter	Applicable location	Part number	Length	Connector type
8	Fuel tank – Fuel filter	MK629953	1,000	Fuel tank side : Elbow Fuel filter side : Elbow
		MK629955	1,500	
		MK629957	2,000	
		MK629959	3,000	
	Fuel filter - Pipe	MK629961	1,000	Fuel filter side : Elbow Pipe side : Elbow
		MK629963	1,500	
		MK629965	2,000	
		MK629967	3,000	
		MK620244	2,000	Fuel filter side : Elbow Pipe side : Straight
		MK620246	3,500	
	Pipe - Fuel filter	A8204700704	1,000	Pipe side : Elbow Fuel filter side : Elbow
		A8204700804	1,500	
		A8204700904	2,000	
		A8204701004	1,000	Pipe side : Straight Fuel filter side : Elbow
		A8204701104	1,500	
		A8204701204	2,000	

Nominal diameter	Applicable location	Part number	Length	Connector type
10	Pipe - Fuel tank	MK629969	1,000	Pipe side : Elbow Fuel tank side : Elbow
		MK629971	1,500	
		MK629973	2,000	
		MK629975	3,000	
		MK620248	2,000	Pipe side : Straight Fuel tank side : Elbow
		MK620250	3,500	
12	Fuel tank - Fuel filter	A8204701304	1,000	Fuel tank side : Elbow Fuel filter side : Elbow
		A8204701404	1,500	
		A8204701504	2,000	
	Fuel filter - Pipe	A8204701604	1,000	Fuel filter side : Elbow Pipe side : Elbow
		A8204701704	1,500	
		A8204701804	2,000	
		A8204701904	1,000	Fuel filter side : Elbow Pipe side : Straight
		A8204702004	1,500	
		A8204702104	2,000	
	Pipe - Fuel filter	A8204702204	1,000	Pipe side : Elbow Fuel filter side : Elbow
		A8204702304	1,500	
		A8204702404	2,000	
		A8204702504	1,000	Pipe side : Straight Fuel filter side : Elbow
		A8204702604	1,500	
		A8204702704	2,000	

Steel pipes

Use steel pipes that have been rustproofed on both the inside and outside surfaces, and ensure that the shape of the ends of the pipes conforms to the figure below.

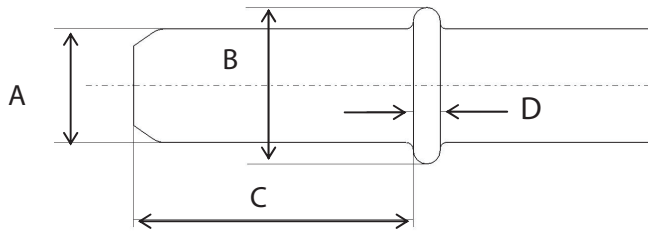
Rustproofing

Inside surface : Copper plating
(Plating thickness: 3 μ or more)

Inside surface (biodiesel B10 fuel applicable)
: Nickel plating
(Plating thickness: 3 μ or more)

Outside surface: Zinc plating
(Plating thickness: 13 μ or more)

SAE J2044 standard type



Unit: mm

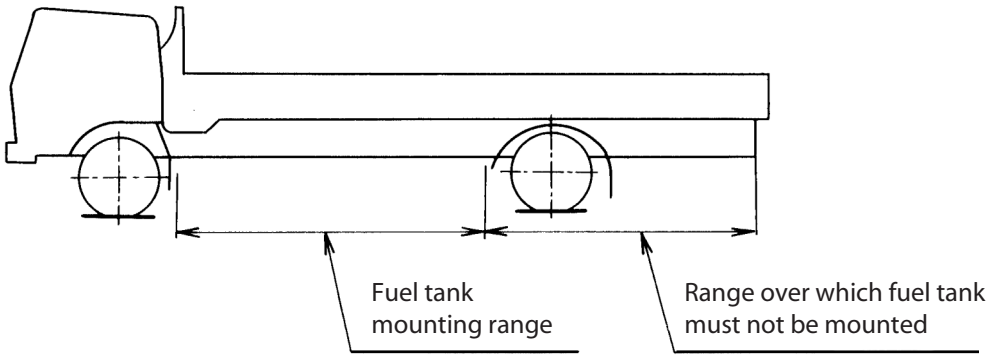
Nominal diameter D	A	B	C	D	
8	7.89 ± 0.06	10.98 ± 0.15	19.52 ± 0.25	1.6 ± 0.33	* 8 mm (5/16″)
10	9.49 ± 0.06	12.94 ± 0.21	19.52 ± 0.25	1.6 ± 0.33	* 9.5 mm (3/8″)
12	11.8 ± 0.1	16.51 ± 0.25	24.12 ± 0.50	2.5 ± 0.33	* 12 mm

* For details of the shape, refer to SAE J2044.

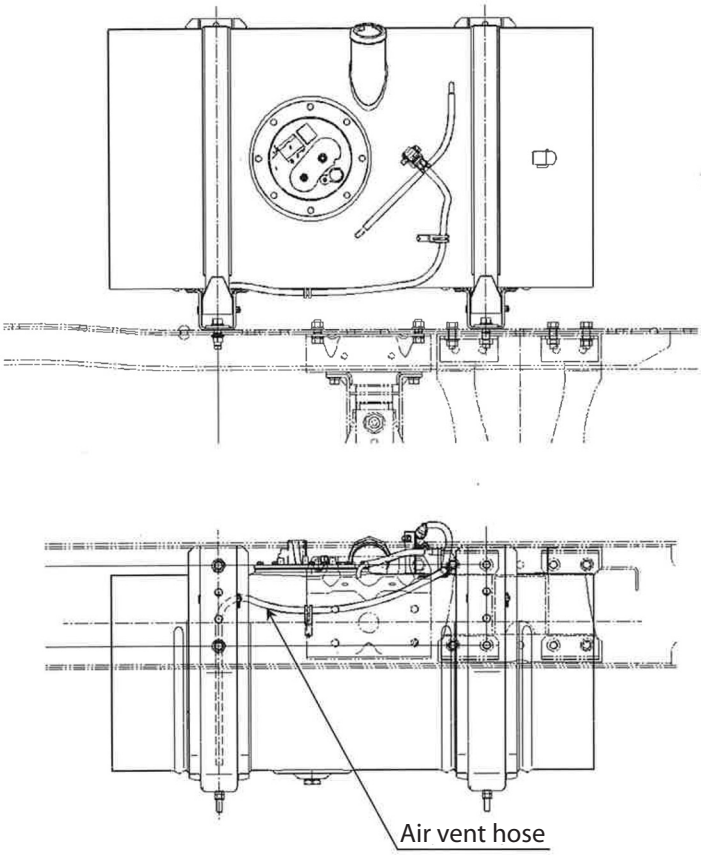
- Do not connect fuel hoses directly to each other. When you wish to extend the length of the fuel hose, connect it to the extension fuel hose via a nylon tube.
- Use steel pipes inside the engine compartment.
- Do not change the clips or the positions of clamps on parts of the engine and the frame which move relative to each other.
- Run fuel hoses and nylon tubes in such a way that they do not touch each other or touch metal pipes, electric wires etc., and then clamp them. If a fuel hose or a nylon tube is in contact with another tube or pipe, for example, it will wear and eventually become damaged, resulting in fuel spurting out or a fire occurring.
- Take care that the side guard and the fuel tank parts do not interfere with each other. Also, take steps to ensure that lubrication work is not impeded.
- Clamp the fuel hose at intervals of between 400 and 500 mm to ensure that its buckling does not occur. Use a sheet metal clip with rubber (MH020418), for example, to clamp the nylon tube. (The recommended bending radius is 80 mm or more for D = 8, and 120 mm or more for D = 10.)
- Maintain the steel pipe at least 15 mm from the corners of other parts, at least 25 mm from parts which move relative to each other, and fix it securely with clamps.
- In order to connect the feed side pipe and the return side pipe to the fuel tank, use nylon tubes and steel pipes whose end shape is stipulated in SAE J2044.
- If you use parts other than the above, fuel leakage is likely to occur, so be sure to use nylon tubes and prescribed steel pipes.
- Never use a rubber hose for the feed side piping.

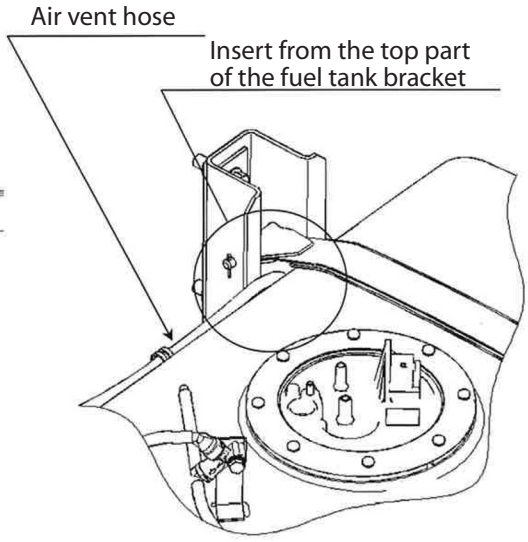
Relocating the fuel tank

- When you wish to relocate the fuel tank, follow the procedure of "Precautions for relocating the fuel tank" ▷ 6.15.1.



- After removing the fuel tank, firmly insert the air vent hose of the fuel tank into the bracket from the top, with the end face downward. When doing this, take care not to crush the air vent hose or allow it to become clogged.

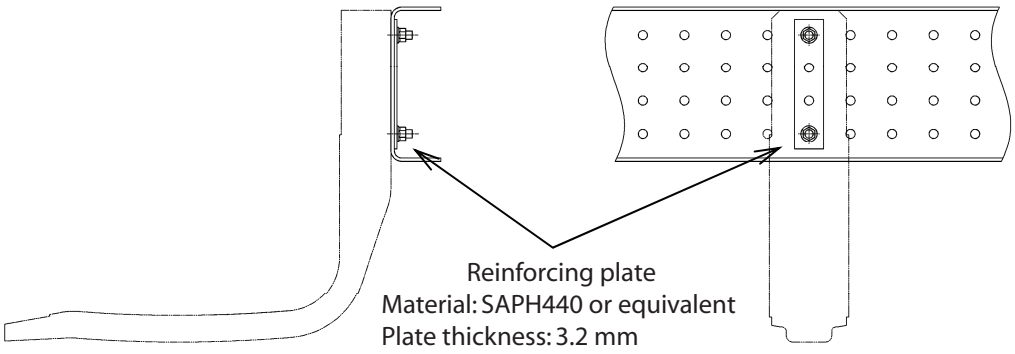




Re-installing the fuel tank

- When re-installing the fuel tank, take adequate account of vibration, the mounting position, and mounting conditions, and ensure that there is no looseness or other problem. When using new brackets, ensure that they have adequate strength to support the fuel tank.

<Fuel tank fixing points – Reinforcement example>



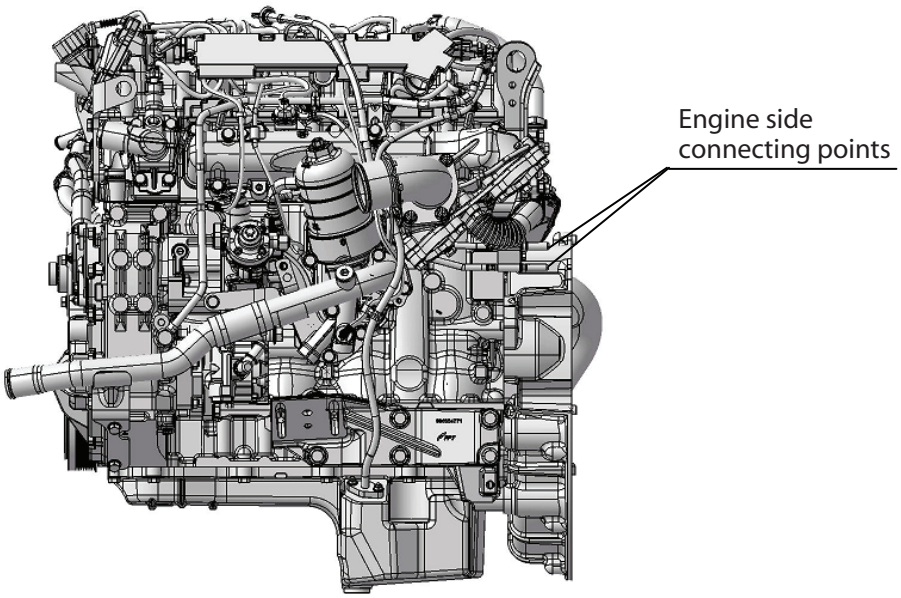
- To connect the fuel tank to the frame, be sure to use flange nuts and flange bolts of the strength classification shown below, and tighten the bolts to the specified torque.

	Size	Strength classification	Tightening torque
Flange bolts	M10	10T or more	90 – 110 N·m {9.2 – 11.2 kgf·m}
Flange nuts	M10	6T or more	

6.15.2 Fuel filter

Relocating the fuel filter

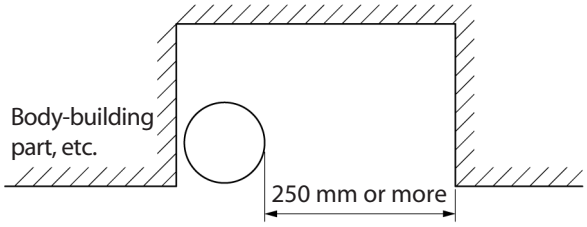
- Relocation position
  - Move the fuel filter to a point within the wheel bases. (It is also possible to mount the fuel tank and the fuel filter separately on the left and right sides of the vehicle.)
  - When relocating the fuel filter to a point near the exhaust pipe, maintain it at a distance of at least 150 mm from the heat source. If it is difficult to secure this distance, be sure to install a heat shield. Do not relocate the fuel filter to a point that is almost directly above the exhaust pipe.
  - Ensure that the water drainage outlet of the fuel filter does not protrude below the bottom surface of the fuel tank.
  - Fix the fuel filter independently to the frame. (This also applies to the case where the fuel filter mounted on the fuel tank brackets is to be relocated.)
- The size of each relocating pipe must be ϕ8 on the main side, and ϕ10 on the return side. For details, refer to "6.15.1 Fuel Tank" ▷ 6.15.1.
- Ensure that the length of each pipe between the engine side connecting point (see figure below) and the fuel tank is within 8.5 m.



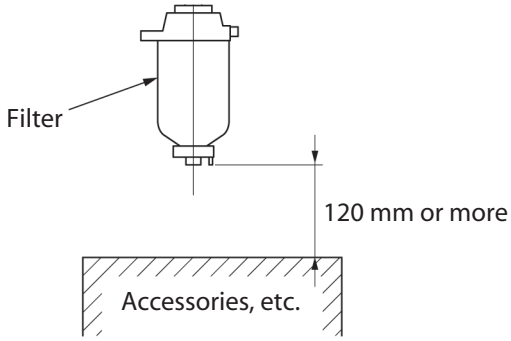
- Never connect fuel hoses directly to each other.
- Take care that dirt or other foreign matter does not enter the removed fuel pipe. (Particularly, be very careful of the part of the fuel pipe between the fuel filter and the engine.) Before installing a new pipe and fuel hose, confirm that there is no dirt or other foreign matter inside.
  If dirt or other foreign matter gets into the fuel filter, the parts of the fuel injection system are liable to break.
- Be careful that the fuel hose and nylon tube do not buckle and impede the supply of fuel.
  Fuel hose: Secure a bending radius of at least 50 mm inside the hose.
  Nylon tube: Recommended bending radius is at least 80 mm for D = 8, or 120 mm for D = 10.
- Secure the clearance indicated below between the fuel hose and the peripheral parts.
  Electrical wires: 20 mm or more
  When there is relative motion: 25 mm or more
  When there is no relative motion: 15 mm or more
- Securely fix the pipes and wires in the vicinity of the fuel filter with clips to prevent them from moving. Install the clips at intervals of no more than 300 mm.
- If there is a possibility of the fuel filter becoming damaged due to flying stones or fallen objects, for example, install a protective cover, or the like.

- Secure a clearance around the fuel filter to enable work such as draining off the water in the fuel filter, bleeding off air or replacing the element. A clearance value is shown below for reference.

  <Upward view>
  - Secure a space of at least 250 mm in at least one direction in the vicinity of the filter (to enable the filter wrench to be applied).



  <Side view>
  Secure the following space.
  - The space at the bottom end of the filter must be at least 120 mm (to enable the filter wrench to be applied).



- Do not modify the fuel filter or the mounting bracket.
- When newly fabricating a fuel filter bracket, ensure that it has adequate strength in consideration of body vibration.
- When refurbishing the electrical wiring going to the fuel filter, refer to "8.2 Electric wiring" ▷ 8.2.
- If there is anything concerning the relocation work that you are not sure of, please consult with the department in charge of body-building and modification.
  "2.2 Technical advice and contact persons" ▷ 2.2.

6.16 Others

6.16.1 SRS air bag

⚠ Risk of injuary

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 make it inactive. For queries about the alteration procedure to make the air bag inactive and any special types of body building other than those given below, contact the responsible section. ▷ 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 a 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  does not appear on the meter claster.
  If the multi-display shows  , never fail to contact the MITSUBISHI FUSO authorized Distributer. ▷ 2.2

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.

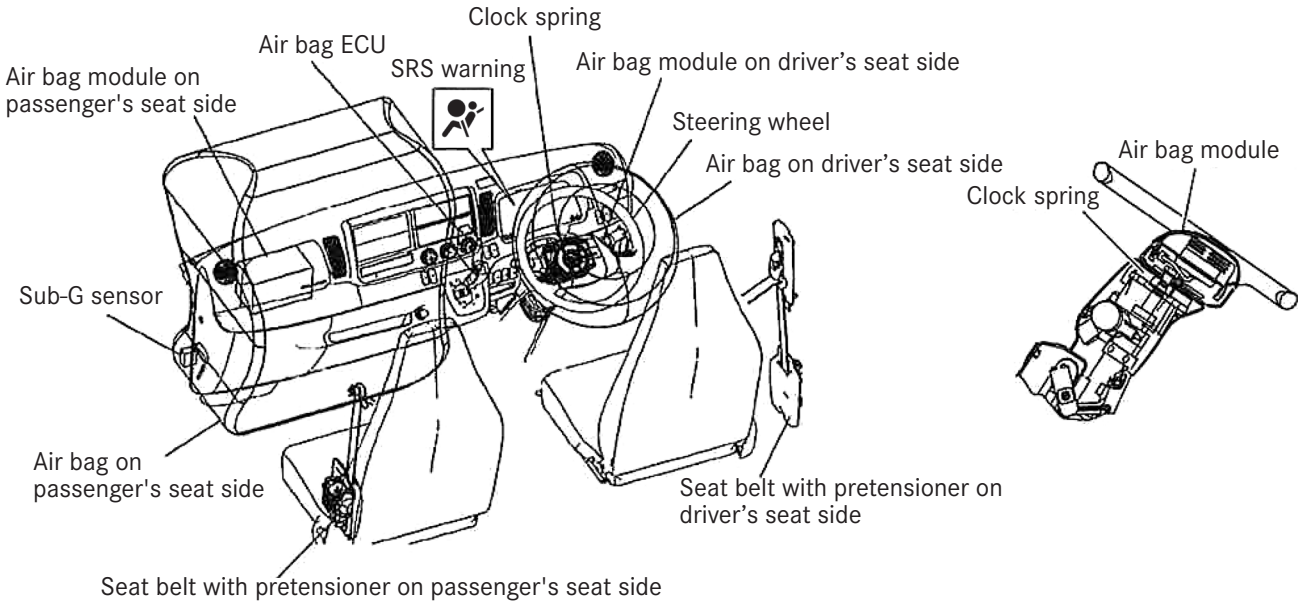
- Precautions during body building work
  (a) The SRS air bag system parts are mounted around the steering wheel and seat belt retractor. Do not tap the areas around the SRS air bag system parts or otherwise apply impact to them.
  (b) Do not remove any SRS air bag system parts.

(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 responsible section 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  does not appear on the meter cluster.
If the SRS air bag warning  appears, consult the MITSUBISHI FUSO authorized Distributer ▷ 2.2.

L

O

- Miscellaneous
  (a) Be sure to consult the 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. ▷ 2.2



6.16.2 DUONIC®

Cautions for vehicles with DUONIC® (Automated Manual Transmission)

When removing the DUONIC® components and associated parts (piping and wiring included) or performing other works for body mounting, pay particular attention to the following.

Oil cooler piping

- When reinstalling removed oil cooler piping, etc., make sure that the pipe and the DUONIC® system components do not contain any foreign matter. The presence of dirt or the like may cause the system, etc. to malfunction.
- After reinstalling, be sure to adjust the automatic transmission fluid level and initialize the DUONIC® system.

Clearance

- Make sure that the piping and harness are at least 25 mm apart from other parts. If this is impractical with parts installed on the same plane, clamp them at proper point(s) to hold them securely.

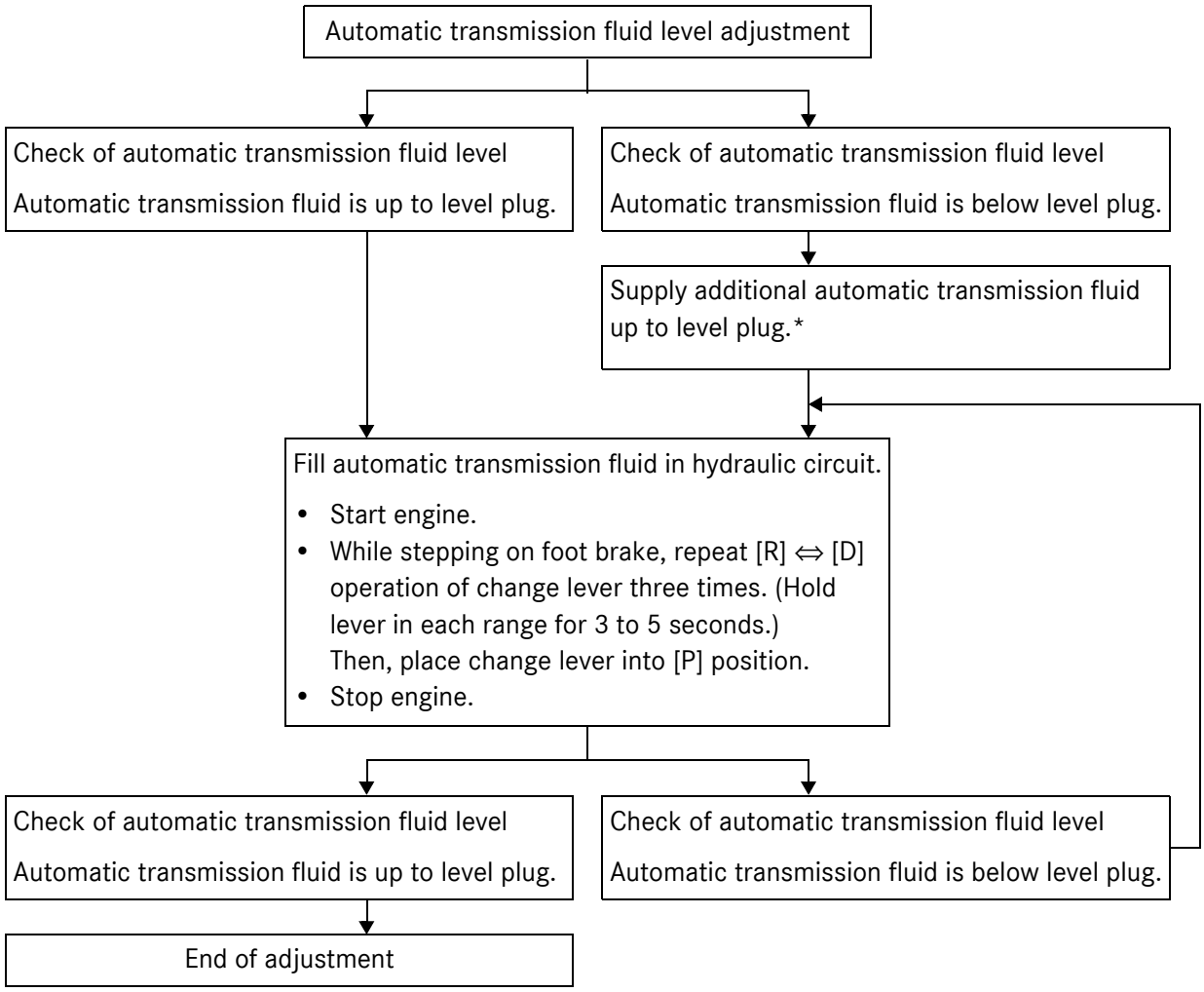
Automatic transmission fluid level adjustment

After reinstalling removed oil cooler piping, adjust the automatic transmission fluid level as follows.

Automatic transmission fluid level adjustment procedure

Perform the adjustment in the following sequence. The position of the automatic transmission fluid level plug is the normal fluid level. If the automatic transmission fluid is up to the normal level after the hydraulic circuit is filled up, the adjustment has been properly made.

<FE, FG>



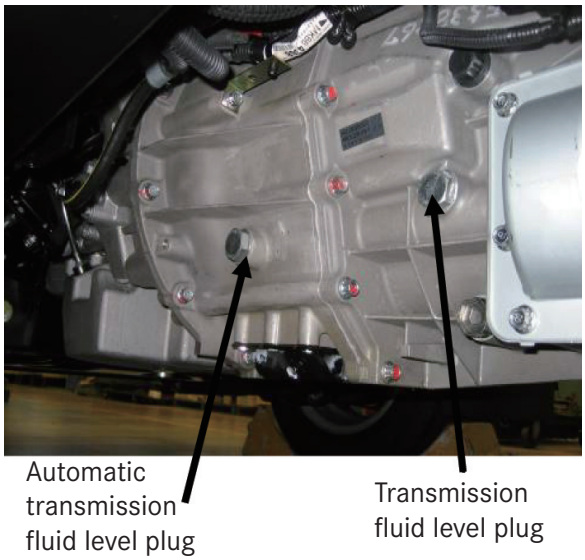


Fig. 1 Left view of transmission (FE, FG)

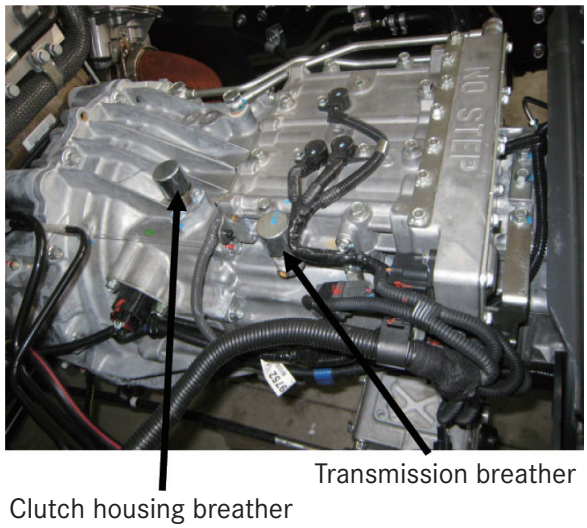


Fig. 2 Top view of transmission (FE, FG)

B

Initialization of DUONIC® System

- In the initialization of the DUONIC® system, the following initial settings are memorized by the DUONIC® electronic control unit: gear shift unit's gear position, clutch fill time, learned clutch torque value, and G sensor signal voltage on flat road. All of these settings are initialized with a single initialization operation, which must be performed every time the vehicle is serviced.
- Initialization of the DUONIC® system may help improve degradation of roll-off, creep or gear shift quality if that is experienced.
- The vehicle must be warmed up before performing initialization. With a cold engine or transmission, initialization may not be successfully completed when attempted.
- If any of the following service is performed, initialization must be performed following the procedure described.

Service	Initialization procedure
Inspection of automatic transmission fluid level and replacement of fluid	After inspection of automatic transmission fluid level and replacement of fluid, start the engine and cycle the shift lever to D and R several times to sufficiently circulate automatic transmission fluid before performing initialization. After initialization, test drive the vehicle.
Replacement of gear oil	After replacement of gear oil, perform initialization followed by test drive.
Work on engine or transmission	After any service on the engine or transmission, the DUONIC® system must be initialized as follows to prevent any possible degradation of driving quality due to possible change in the engine or transmission characteristics.

- While the engine or transmission is cold, initialization may be left uncompleted or learning values may be set inappropriate. To avoid such case, perform initialization after finishing transmission oil temperature adjustment by the procedure below.

Preparation before initialization of DUONIC® system

- Measure the oil temperature in the transmission using the FUSO Diagnostics.
- Adjust the transmission oil temperature to approximately 50°C by the method recommended below.
  - Repeat initialization several times. (With each time of initialization, the temperature rises by 10 to 12°C.)
  - Actually drive the vehicle to increase the transmission oil temperature up to the required level.
- When initialization is performed to eliminate feeling-related symptom, record initial setting reference values shown below. Comparison pre- and post-initialization values with these referent values can lead to the identification of the causes of symptoms.
- If feeling is not improved despite initialization of the DUONIC® system, check automatic transmission fluid level and repeat the initialization of DUONIC® system. Chances are that feeling will be improved this way.
- If driving quality or feeling is not improved despite initialization of the DUONIC® system, check automatic transmission fluid level, then repeat the initialization of the DUONIC® system. It can sometimes improve the feeling.

Property damage

DUONIC® system may make driving feeling bad if automatic transmission fluid level is not right.

Additional information

Every vehicle is different from each other. Thus, all vehicles do not necessarily show actual values within the reference values shown below.

AH

Initial setting reference values

No.	Actual values	Description	FE and FG
1	Temperatures	Temperature of Transmission Oil	45 to 55°C
2	Transmission	Position of cylinder 1 front	87.2 to 88.3%
3	Transmission	Position of cylinder 1 rear	11.6 to 12.7%
4	Transmission	Position of cylinder 2 front	11.3 to 12.8%
5	Transmission	Position of cylinder 2 rear	87.0 to 88.7%
6	Transmission	Position of cylinder 3 front	10.7 to 12.6%
7	Transmission	Position of cylinder 3 rear	87.8 to 89.8%
8	Clutch	Time for Filling Learning Value Inner Clutch	0.15 to 0.27 sec
9	Clutch	Time for Filling Learning Value Outer Clutch	0.08 to 0.22 sec
10	Clutch	Inner Clutch Current at 25 kgfm Clutch Torque	570 to 663 mA
11	Clutch	Inner Clutch Current at 5 kgfm Clutch Torque	341 to 412 mA
12	Clutch	Outer Clutch Current at 25 kgfm Clutch Torque	552 to 659 mA
13	Clutch	Outer Clutch Current at 5 kgfm Clutch Torque	369 to 435 mA
14	Clutch	Inner Clutch Current at Kiss Point	301 to 376 mA
15	Clutch	Outer Clutch Current at Kiss Point	296 to 366 mA

Initialization standby mode

- Prior to starting initialization, the vehicle must be placed in the initialization standby mode.

Ensure that the vehicle meets all of the following conditions.

- Software installation and coding have been completed on the engine and DUONIC® electronic control units.
- Transmission oil temperature has been adjusted to approximately 50°C (45 to 55°C).
- Automatic transmission fluid level has been checked.
- The engine is stopped.
- The vehicle is stationary (with the brakes released) on a flat road and unloaded.
- The tire pressure has been set to specification.
- The cab tilt is locked.
- The starter key is in the ON position.
- The accelerator pedal is in the ON (50% or above) position.
- The foot brake is applied.
- The systems that are powered by the engine such as the air conditioner, the compressor for the freezer and the exhaust brake are stopped.
- The change lever is moved to D for one second and then set to A/M.
- The parking brake is applied for one second, then released for one second and then applied (pulled rather hard) again.

↓

"1" flashes on the gear shift indicator, which means that the vehicle is now in the initialization standby mode.

Initialization (Initialization)

↓

The vehicle goes back to the normal mode if the parking brake is released or the starter key is turned to the OFF position.

Initialization

Operator action	Vehicle action

With the vehicle in the initialization standby mode, set the accelerator pedal to OFF and the change lever to P before starting the engine.	• The progress of initialization process is indicated on the gear shift indicator as a flashing "2", "3", "4", "5" and "N".
	• Initialization progress indicated on the gear shift indicator is as follows:
	  • "2": The gear shift unit's gear position is being detected.
	  • "3": Clutch is being warmed up. G sensor voltage value is being corrected.
	  • "4": Clutch fill time is being learned.
	  • "5": Clutch torque is being learned.
	  • "N": Initialization is completed.

-	• Gearshift indicator "R" flashes on and off. → Initialization unsatisfactory. → Return to normal mode with parking brake off or key off, then repeat initialization. • If gearshift indicator changes flashing from "2" to "R", gear shifting by gearshift unit may be difficult, in which case the vehicle is moved once, then initialization is performed. Chances are that problem will be solved this way. • If gearshift indicator changes flashing from "3" to "R", G sensor may be installed out of place or G sensor signal may be abnormal. • If gearshift indicator changes flashing from "4" to "R", clutch may be out of order. • If gearshift indicator changes flashing from "5" to "R", engine may not be warm enough or clutch may be out of order. • If initialization ends in failure again, check clutch and transmission.

Initial setting reference values

No.	Description	Value	Remarks
1	Intermediate of Position of cylinder 1 front and rear	49.4 to 50.5%	(Position of cylinder 1 front + Position of cylinder 1 rear)/2
2	Intermediate of Position of cylinder 2 front and rear	49.2 to 50.8%	(Position of cylinder 2 front + Position of cylinder 2 rear)/2
3	Intermediate of Position of cylinder 3 front and rear	49.3 to 51.2%	(Position of cylinder 3 front + Position of cylinder 3 rear)/2

- After initialization is completed, check the above values (not indicated in the FUSO Diagnostics). If any post-initialization values largely deviate from above values (3% or more), repeat the initialization.
- If pre- and post-re-initialization values are the same, nothing is abnormal.
- Test run after initialization is completed and check that there is no feeling problem during driving and at speed change. If there is a shock or an abnormal sound at speed change, perform initialization of the DUONIC® system again.

⚠ Risk of accident

For safety, keep the foot brake applied after the engine is started.

B

Resetting the initialization

- The DUONIC® system offers the possibility to reset the initialization values of gear shift unit's gear position, clutch fill time, learned clutch torque, and G sensor voltage on flat road so that these values are defaulted to those before the initialization. (This feature is designed to be used such as when driving quality has deteriorated after initialization.)

Operator action	Vehicle action
With the vehicle in the initialization standby mode, set the change lever to "-".	"6" flashes on the gear shift indicator, meaning that the reset process has been completed.

Cautions during body equipment work on DUONIC® vehicle

The DUONIC® of the vehicle is a computerized and electronically controlled system; mishandling could cause system errors and in the worst case, breakdown of the computer itself. Therefore, body equipment work on the vehicle should be carried out while following the precautions given below.

General handling precautions

- Be sure not to change the tire size, final ratio, and speedometer gear ratio of a DUONIC® vehicle.
- Be sure not to alter DUONIC®-associated devices, sensors, harnesses and connectors in any way.
- Before disconnecting DUONIC®-associated connectors, set the starter switch of the vehicle to OFF. Before turning the starter switch ON, reconnect the disconnected connectors.
  If DUONIC®-associated device connectors are disconnected while power is supplied to the TCU, a warning lamp will light or the system may lose functionality.
- Before painting the transmission body, mask electric parts, harnesses, connectors, breathers, oil cooler pipe joints and other parts which should be covered.
  Furthermore, mask wrong fluid/oil supply preventive labels (ATF ONLY, GEAR OIL ONLY) attached near to appropriate fluid/oil plugs so that they are not covered with paint.
- After completing the body equipment work on the vehicle, make sure that the vehicle runs without any problem.

D

Power take-off for DUONIC® (Automated Manual Transmission)-equipped vehicle

The following procedures apply to the manufacturer-designated power take-off only.

The vehicle cannot be run while the power take-off is in operation.

Vacuum-type power take-off operation procedure

- With the engine running, place the shift lever into the P position (or N position).
- Set the power take-off main switch in the cab to ON.
- The indicator lamp PTO READY lights to indicate that the power take-off is in preparation.
- With the indicator lamp PTO on, the power take-off can be used.
- To clear this status, set the power take-off main switch in the cab to OFF. The indicator lamp PTO goes off and the indicator lamp PTO READY goes on. The power take-off is being released.
  The indicator lamp PTO READY goes off to indicate that the power take-off has been released.

Cable type power take-off operation procedure

- With the engine running, place the shift lever to the P position (or N position).
- Set the power take-off main switch in the cab to ON.
- The indicator lamp PTO READY lights.
- Connect the power take-off by means of the power take-off lever or damp lever.
- The indicator PTO goes on to indicate that the power take-off is operational.
- To release the power take-off, set the power take-off main switch in the cab to OFF. The indicator lamp PTO goes off and the indicator lamp PTO READY goes on to indicate that the power take-off is ready to be released.
  Release the power take-off by means of the power take-off lever or damp lever. The indicator lamp PTO READY goes off to indicate that the power take-off has been released.

AH

Additional information

- The indicator lamp PTO READY may not show depending on the sequence, operating speed or device response speed, but it is normal.
- When the shift lever is in other than P or N position, the power take-off will not be connected if the power take-off switch is turned ON.
- On diesel-powered vehicle, if the shift lever is moved to other than P or N position or if the power take-off switch is turned ON again while operating the power take-off, a buzzer will sound, and the warning indication of PTO appears on the meter.
- On diesel-powered vehicle, a warning appears if the main switch of the power take-off is turned ON during driving.

6.16.3 Addition of a compressor and other accessories

Mounting procedure

- Ensure that electrical harnesses and hoses accompanying the installation of the various parts of the exhaust system and the accessories are separated from each other by at least 200 mm. If this separation cannot be realized, install heat insulation tubes or heat insulation plates to create a structure that prevents the harnesses from being affected by heat.

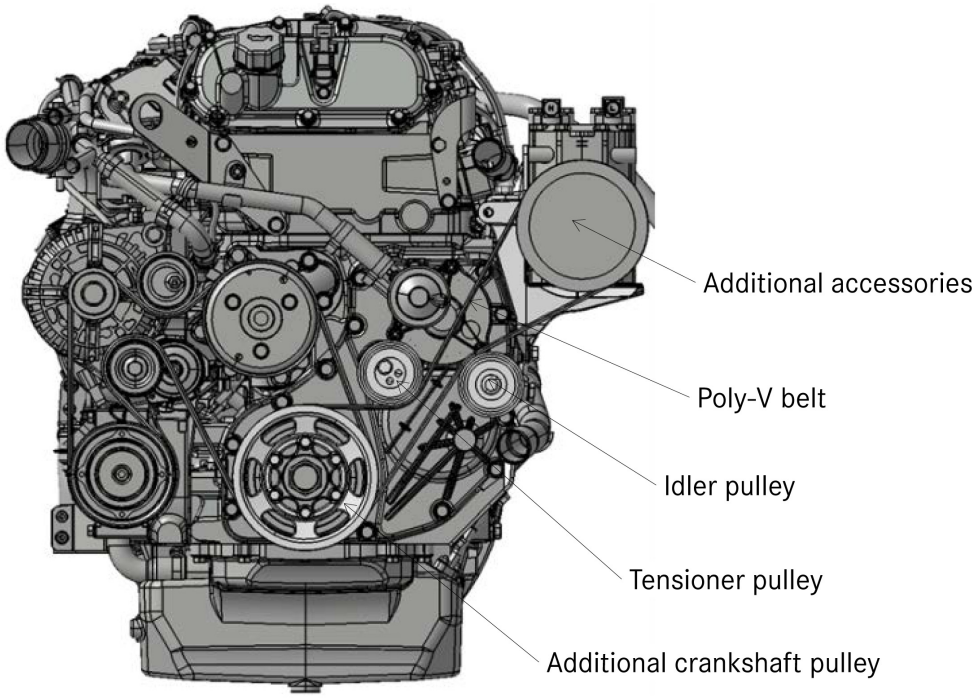
Conditions for installing the accessories

Refer to the following concerning the conditions for mounting the accessories on the brackets.

1 Weight of accessories: 14.2 kg max
2 Allowable accessory drive torque: 36 N·m max
3 Additional accessories must be driven by poly-V belt with idler and tensioner. (Refer to below figure)

Procedure drawings for installing accessary brackets and relavant parts

When installing the end bolts of the tension pulley and the idler pulley, be sure to use a box spanner or a socket wrench.



Example for additional accessories

6.16.4 Advanced emergency braking system (AEBS)

Advanced emergency braking system 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.

Risk of fire

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 engine, transmission, exhaust system, turbocharger, etc.

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

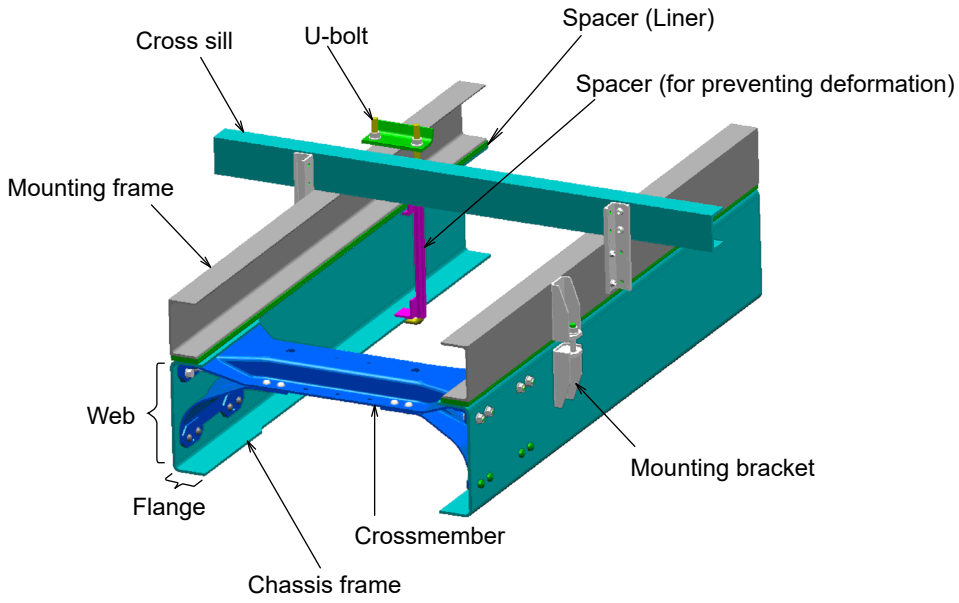
Property damage

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



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" ▷ 10.4.1 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)

Material / Condition	High tensile steel plate with tensile strength	
	SAPH440 (S355MC) 440 MPa {45 kgf/mm^2}	HTP540 (S500MC) 540 MPa {55 kgf/mm^2}
Vehicles mainly driven on paved roads	74 MPa {7.5 kgf/mm^2} or less	88 MPa {9.0 kgf/mm^2} or less
Vehicles mainly driven on rough roads	54 MPa {5.5 kgf/mm^2} or less	64 MPa {6.5 kgf/mm^2} or less

7.1.2 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.

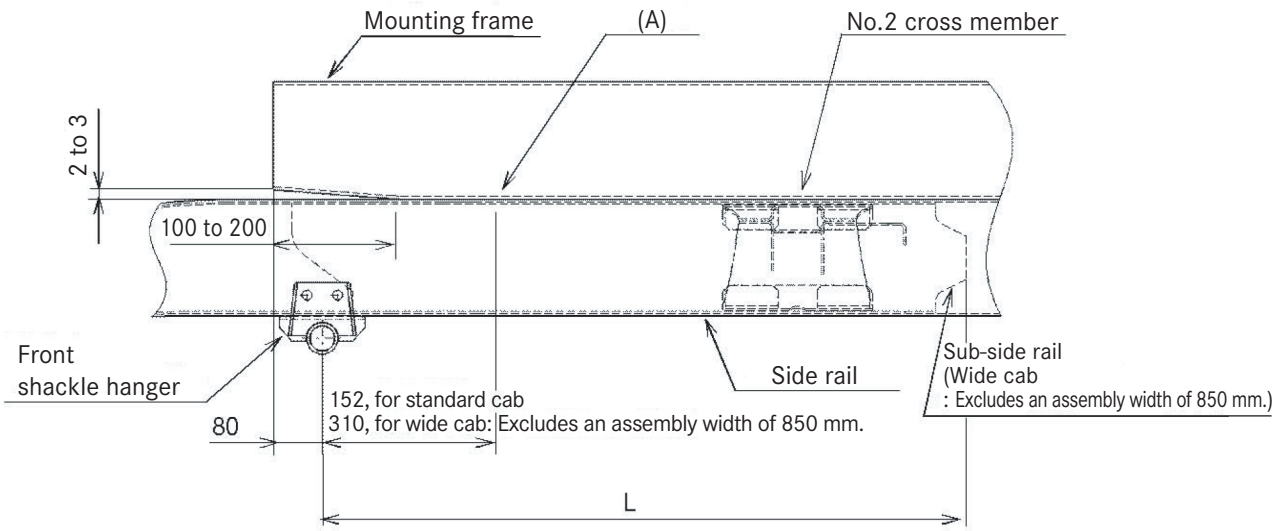
Property damage

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 Fastening mounting frame to chassis frame

7.2.1 Cargo trucks

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



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Unit: mm

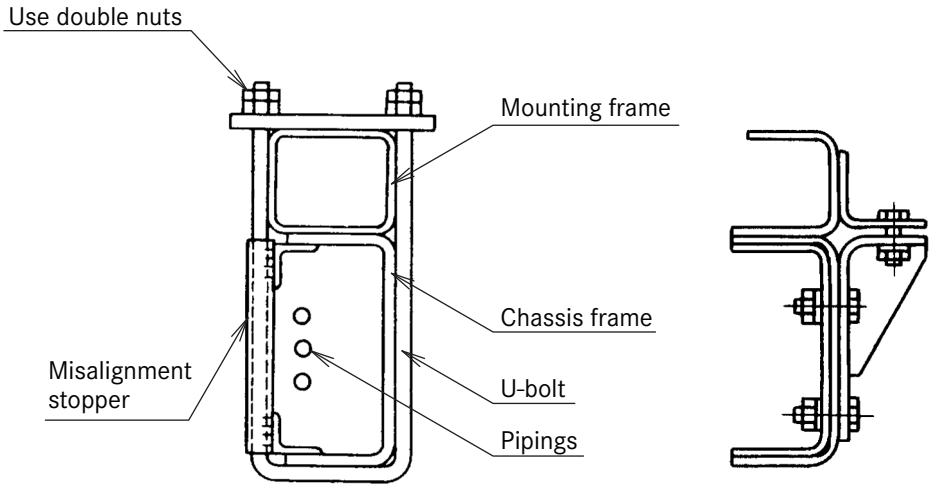
Vehicle mode	L
Standard cab	1050
Wide cab (FE, FG)	1100

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

7.2 Fastening mounting frame to chassis frame

Cargo

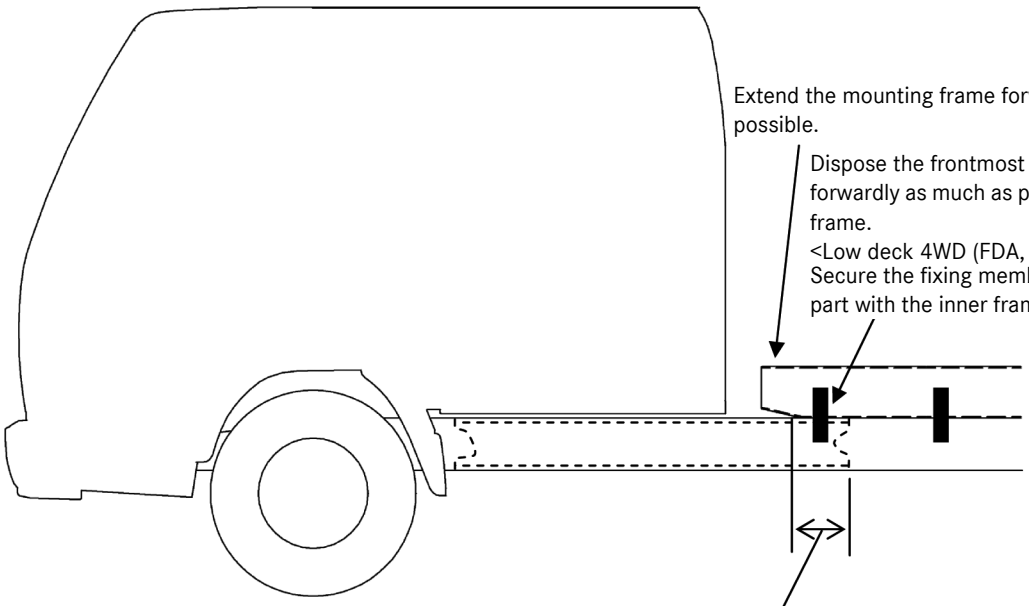
- Carry out the following in order to prevent stress concentrating at the front end of the mounting frame. Make the length of the tapered part of the bottom end of the mounting frame between 100 and 200 mm, and end the taper at a point that is not past (A). If a taper cannot be secured, form the end 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 holes and wires pass through this area, so take care not to damage them when installing the U-bolts.



7.2 Fastening mounting frame to chassis frame

Cargo

<Crew cab>



<Low deck 4WD (FDA, FGA model)>

The contact surface between the mounting frame and the side rail should overlap 100 mm or more with the inner frame.

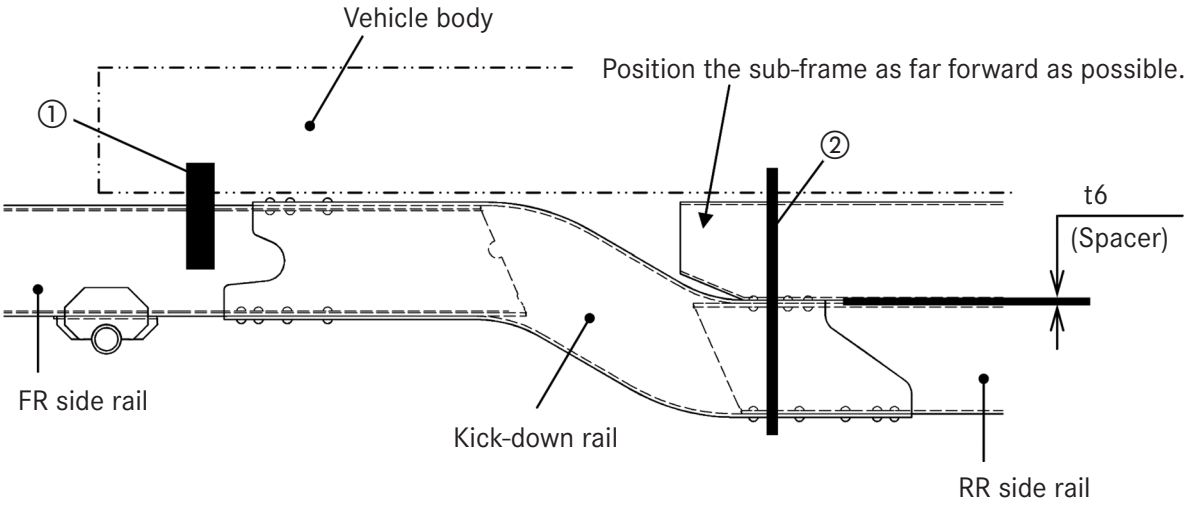
7.2 Fastening mounting frame to chassis frame

Cargo

<4WD(FGB Moel)>

B

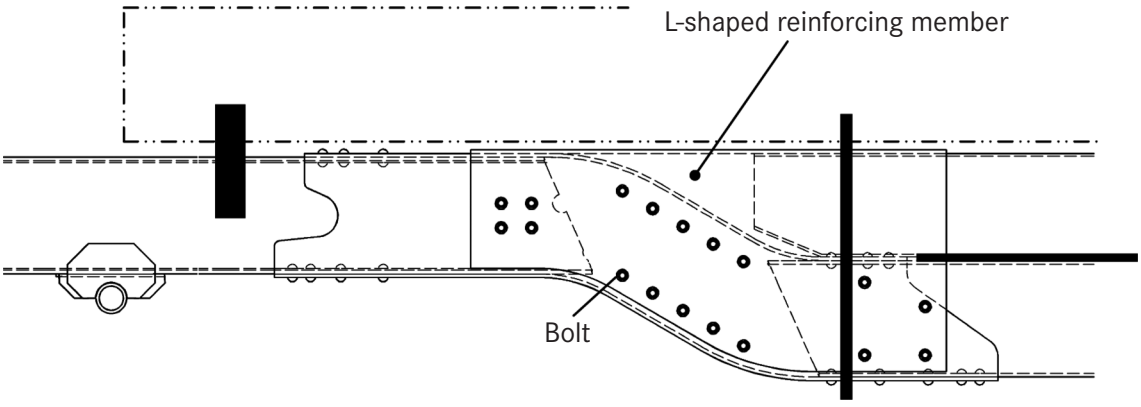
- When building a vehicle body to the frame of a 4WD vehicle (FGB model), follow the instructions below.
  (a) In the case of an ordinary vehicle body:
  Join the front end to the FR side rail (①). For securing the vehicle body to the RR side rail, join the vehicle body to the section where the RR side rail and kick-down rail overlap (②).



(b) In the case of a vehicle body that applies concentrated load or excessive force to the frame, or if an excessive twisting force may be applied to the frame on rough roads or muddy ground, add an L-shaped reinforcing member as shown in the figure below.
Use M10 bolts (8T) and nuts (6T) with a tightening torque of 60 to 80 N·m {6 to 8 kgf·m} to secure the vehicle body to the frame. Note that it is necessary to tighten together with the existing fuel tank, fuel filter and ATS module, so observe the following points:

① Specifications of bolt strength and tightening torque:
- For fuel tank and ATS module: 10T, 90 to 110 N·m {9 to 11 kgf·m}
- For fuel filter (No. 2 cross member): 8T, 60 to 80 N·m {6 to 8 kgf·m}

② On a vehicle equipped with the ATS module, there will be a difference in height of the vehicle body between the sections before and after the module due to the reinforcing member. Adjust the brackets to compensate for this height difference.



7.2 Fastening mounting frame to chassis frame

Cargo

(1) 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.

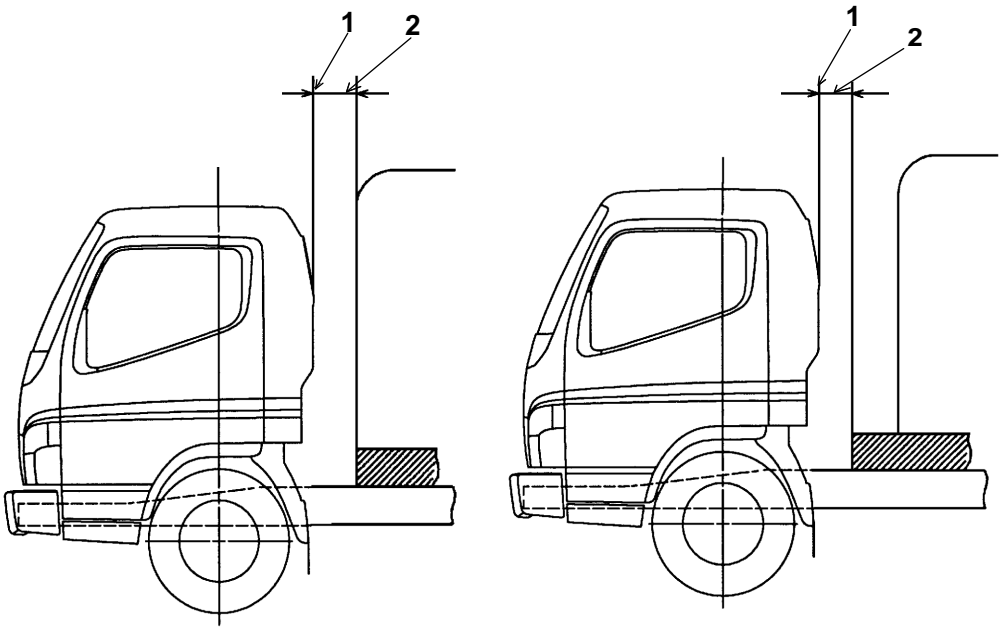


Fig. 1

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

7.2 Fastening mounting frame to chassis frame

Cargo

- Examples of front-end shape of mounting frames
  (a) Install the mounting frame having the shape as shown in Fig. 2 to gradually reduce the stress concentrations in the front end.

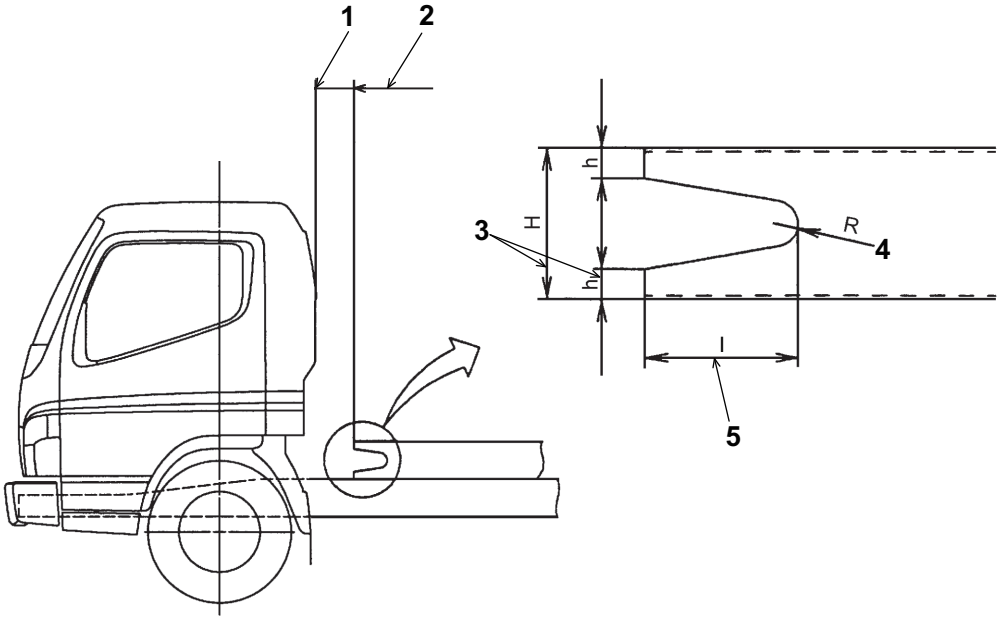


Fig. 2

1 CAB BACK
2 Extend the front end of the mounting frame as far forward as possible; less than 115 mm
3 "h" should be between a fourth and a fifth of "H"
4 DRILLING
5 "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. 2 is highly desirable. However, if there is enough room behind the cab, the shape as shown in Fig. 3 is also acceptable.

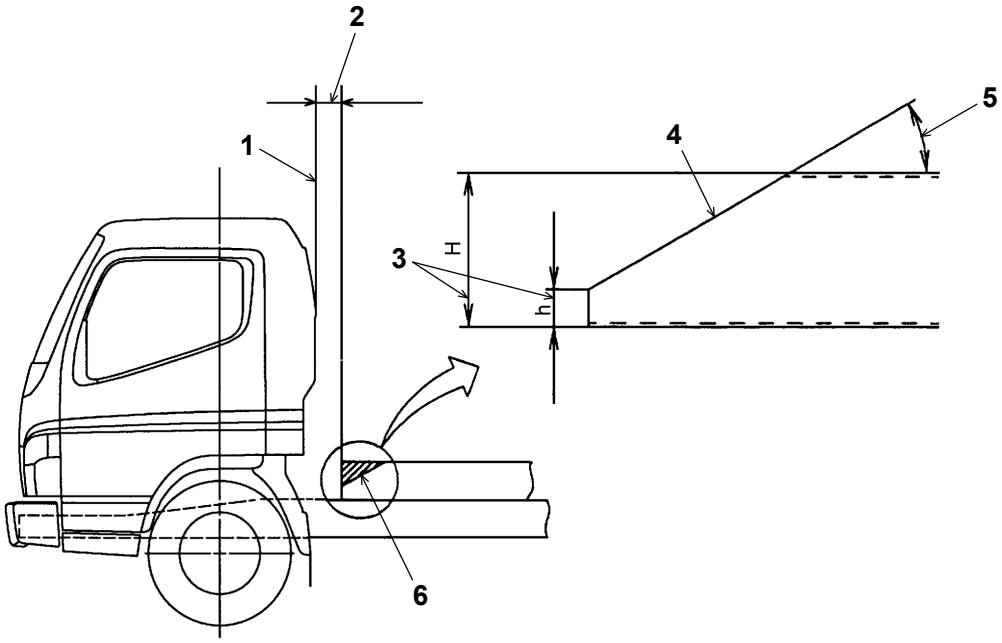


Fig. 3

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. 2 and Fig. 3, cut it to the shape as shown in Fig. 4 before installation.

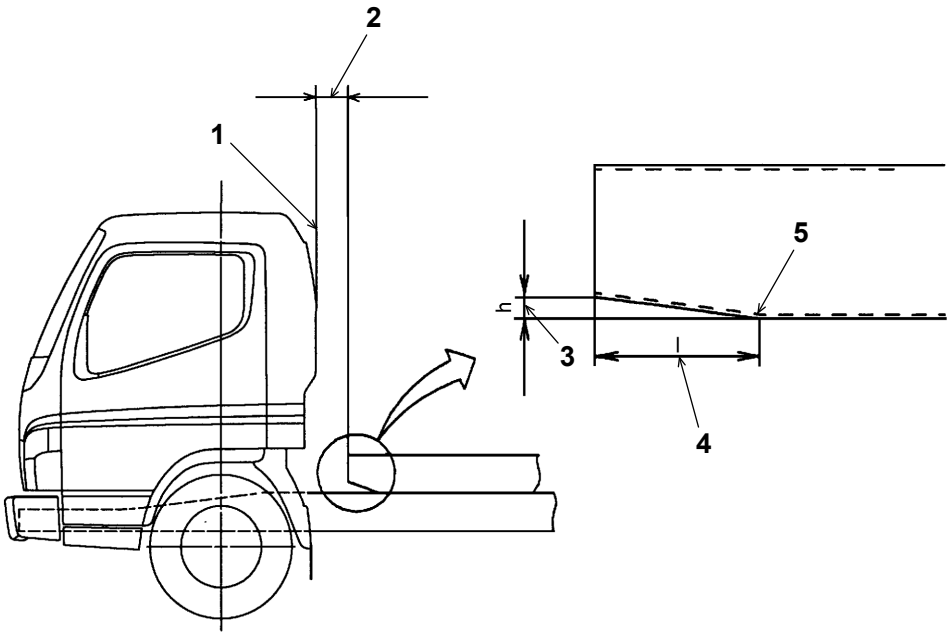


Fig. 4

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 Fastening mounting frame to chassis frame

Cargo

- If the chassis frame changes its width behind the cab back as shown in Fig. 7 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.

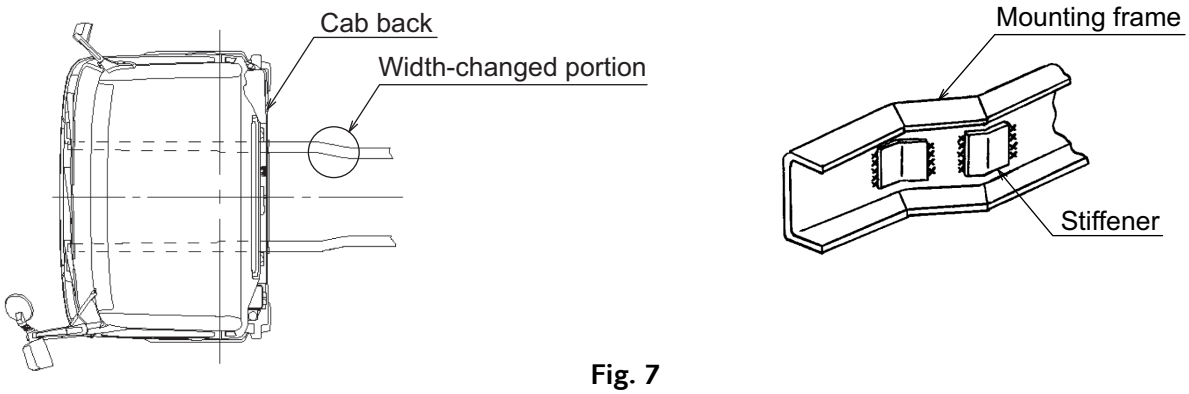
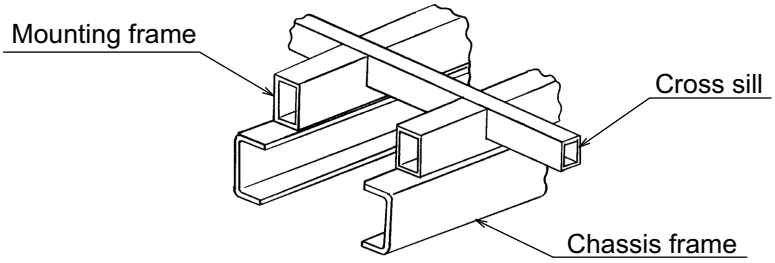


Fig. 7

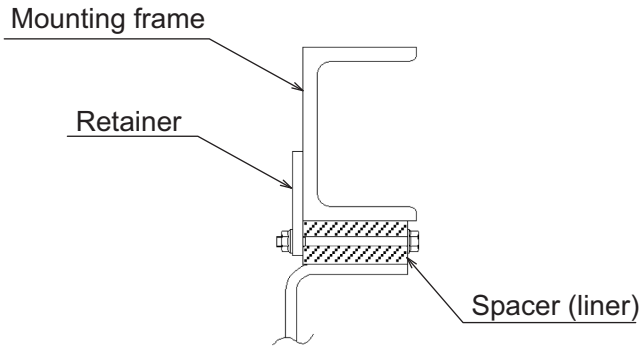
Other notes

- 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.



(2) Spacer (Liner)

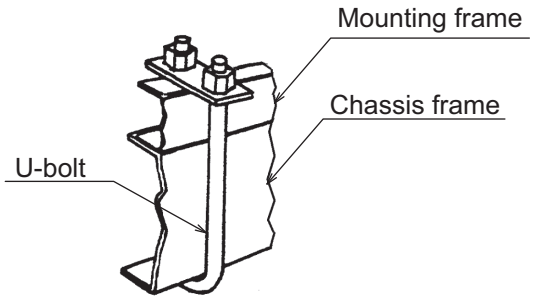
- Placing a spacer (liner) between the chassis frame and the mounting frame is not recommended because the combining force between both frames may be lowered.
- In an unavoidable case, hold the spacer (liner) in position with an additional retainer.



Installation of out-of-position preventive retainer

(3) 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.



7.2 Fastening mounting frame to chassis frame

Cargo

- **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 crossmembers, gussets or stiffeners. Brackets should be installed at least 200 mm away from the end of these parts.

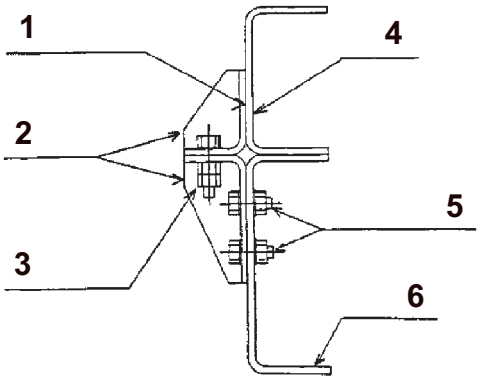


Fig. 8

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.

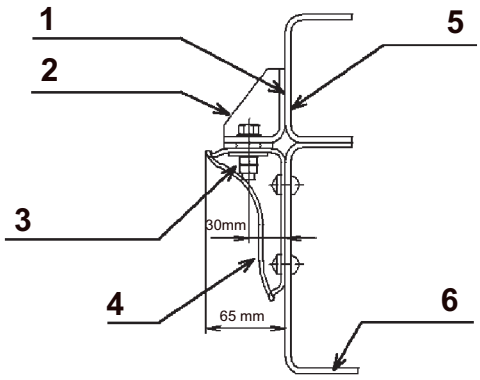


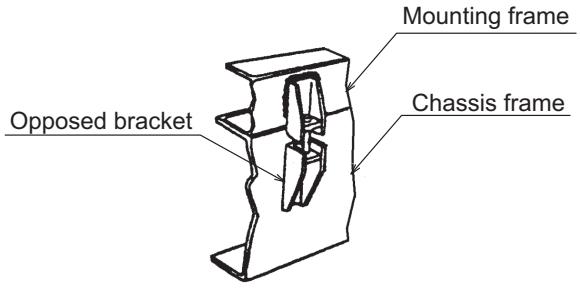
Fig. 9

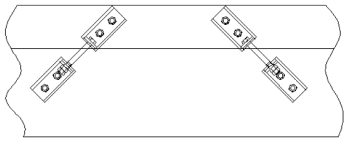
1 Attached by welding
2 Mounting bracket
3 Use double nuts With washer (more than Ø32 mm)
4 Genuine mounting bracket
5 Mounting frame
6 Chassis frame

7.2 Fastening mounting frame to chassis frame

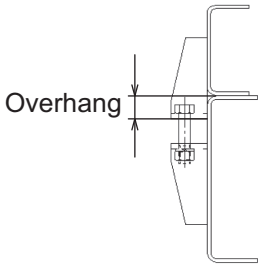
Cargo

- 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.



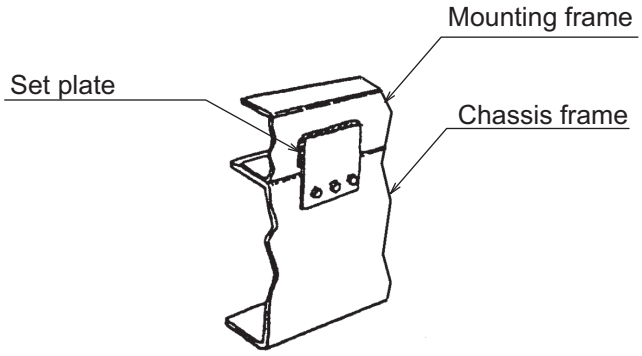


For increasing longitudinal holding force



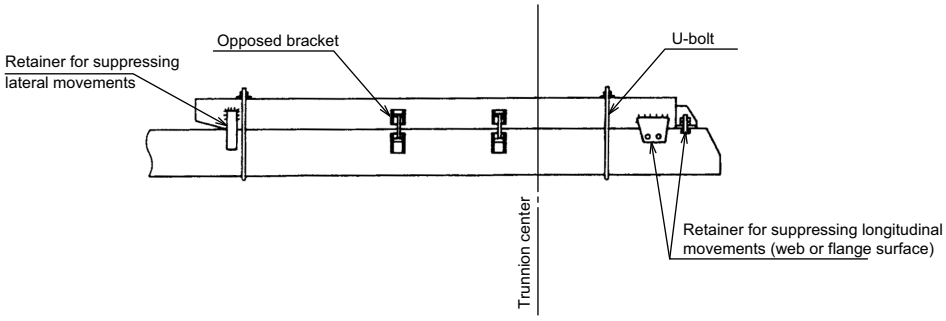
For increasing lateral holding force

- 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.



Precautions for fastening frames

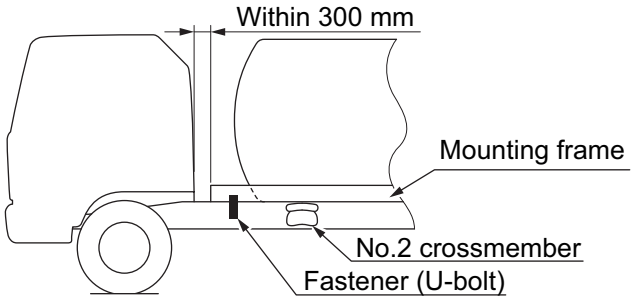
- When fastening the mounting frame to the chassis frame using U-bolts and opposed brackets, use retainers for preventing longitudinal and lateral movements together.



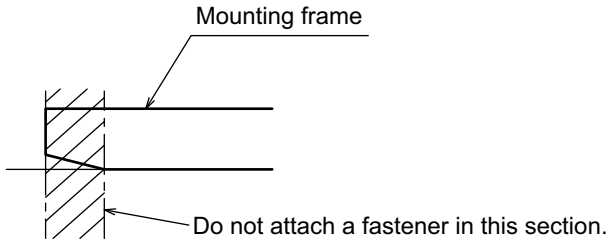
7.2 Fastening mounting frame to chassis frame

Cargo

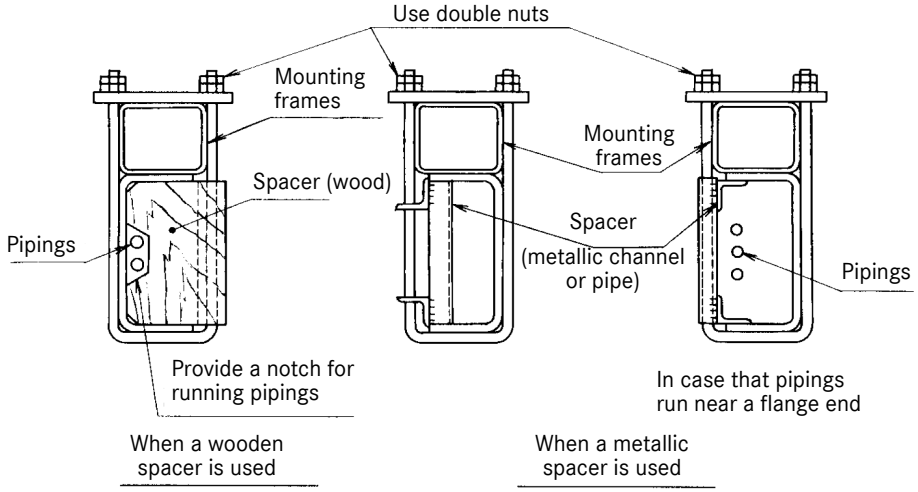
- Even if the distance between the cab back and body front end is larger, extend the mounting frame to near the cab back and secure it at a position before a No.2 crossmember with a fastener.



- 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.



- 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.

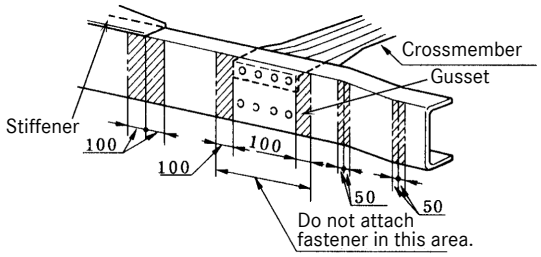


- Attaching opposed brackets to a chassis frame should be done with bolts. For the procedure, refer to "6. Modifications to the basic vehicle" ▷ 6.1.

7.2 Fastening mounting frame to chassis frame

Cargo

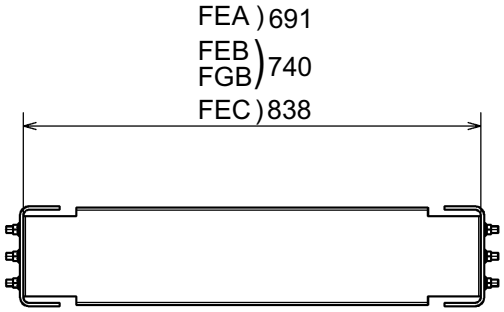
- Do not use U-bolts or opposed brackets for crossmember, stiffener and gusset attaching sections or near the curved section of the chassis frame because these sections are likely to be subjected to stress concentration.



B

(4) Rear end of chassis frame

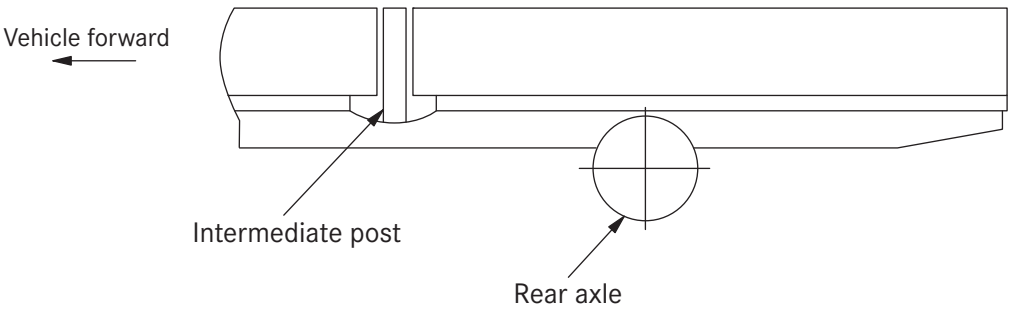
As a result of Product Tolerance for vehicles without RUP, the width dimension of the assembly at the Rear End of the Chassis Frame, may sometimes differ greatly from the dimension indicated in "10.5 Chassis cab drawings". Refer to ▷ 10.5.
If this constitutes an obstacle to body building, devise countermeasures 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

(5) 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.



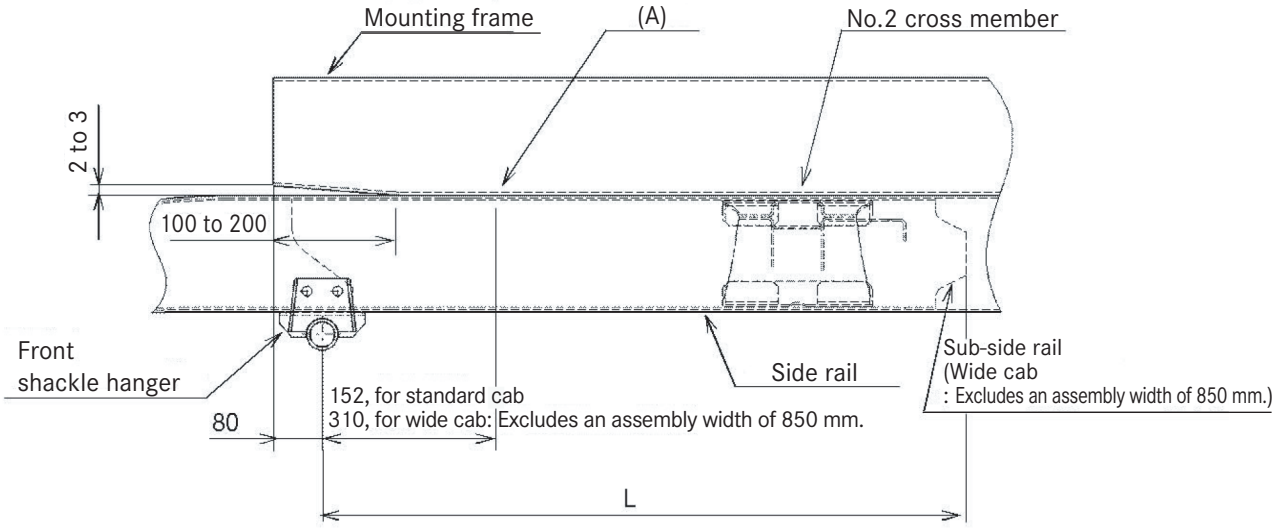
- When installing an intermediate post on a truck with a long wheelbase, taking the chassis frame deflection during loading into consideration, provide an ample space between the post and the side gate so that trouble-free side gate opening/closing operations may be assured.

7.2 Fastening mounting frame to chassis frame

Tank truck

7.2.2 Tank truck, Powder carrying vehicle

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



B

Unit: mm

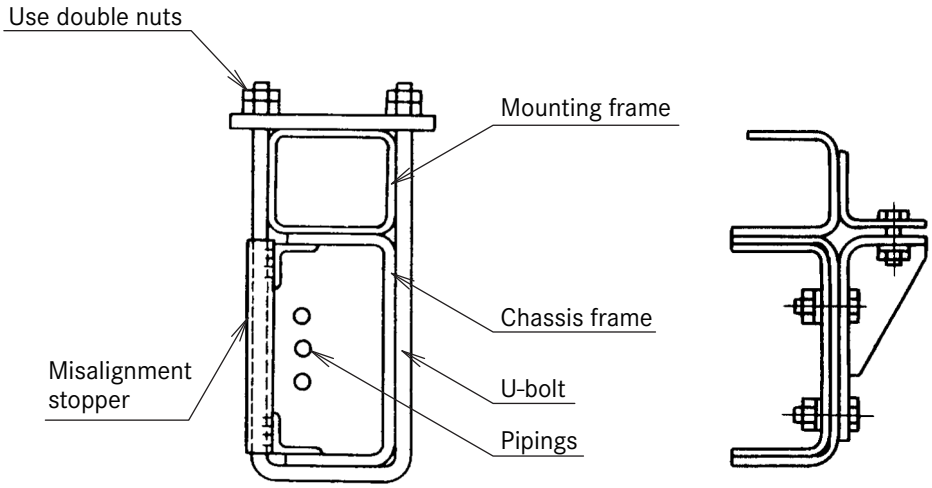
Vehicle mode	L
Standard cab	1050
Wide cab (FE, FG)	1100
Wide cab (HEV)	1250

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

7.2 Fastening mounting frame to chassis frame

Tank truck

- 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 holes and wires pass through this area, so take care not to damage them when installing the U-bolts.



7.2 Fastening mounting frame to chassis frame

Tank truck

(1) 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.

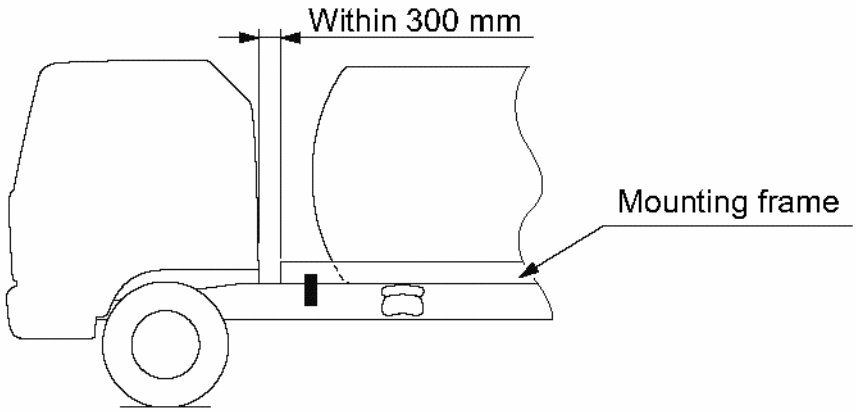


Fig. 1

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

- Examples of front-end shape of mounting frames
  (a) Install the mounting frame having the shape as shown in Fig. 2 to gradually reduce the stress concentrations in the front end.

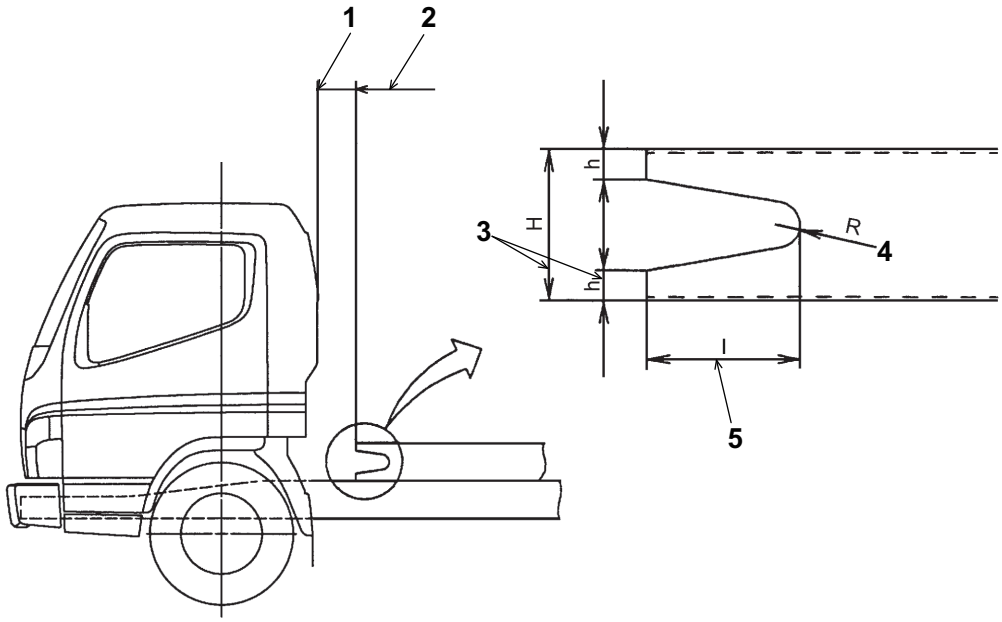


Fig. 2

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

7.2 Fastening mounting frame to chassis frame

Tank truck

(b) The shape of the mounting frame front end as shown in Fig. 2 is highly desirable. However, if there is enough room behind the cab, the shape as shown in Fig. 3 is also acceptable.

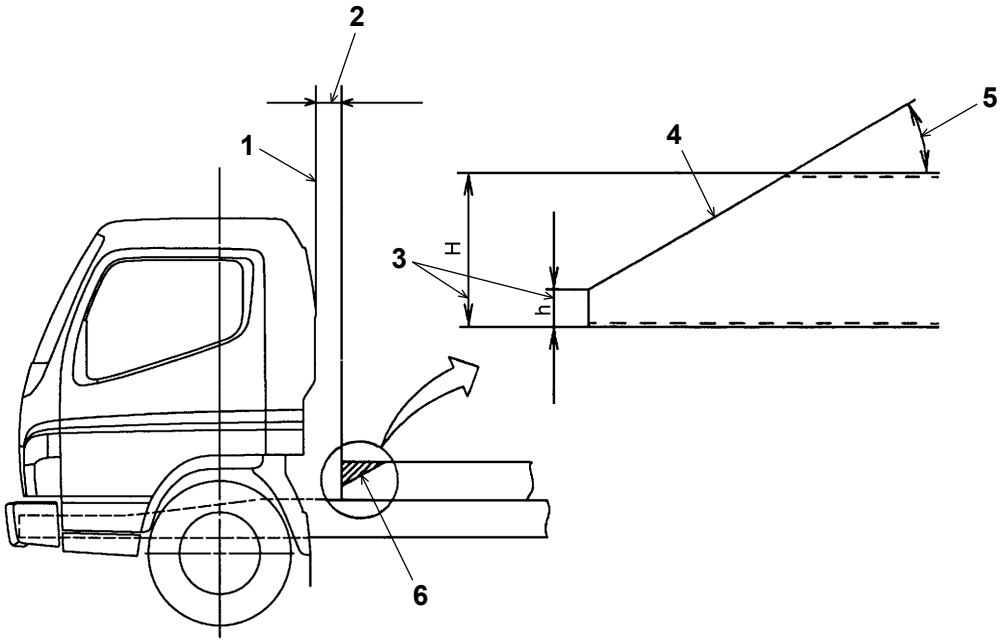


Fig. 3

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

7.2 Fastening mounting frame to chassis frame

Tank truck

(c) If it is difficult to shape the front end of the mounting frame as described in Fig. 2 and Fig. 3, cut it to the shape as shown in Fig. 4 before installation.

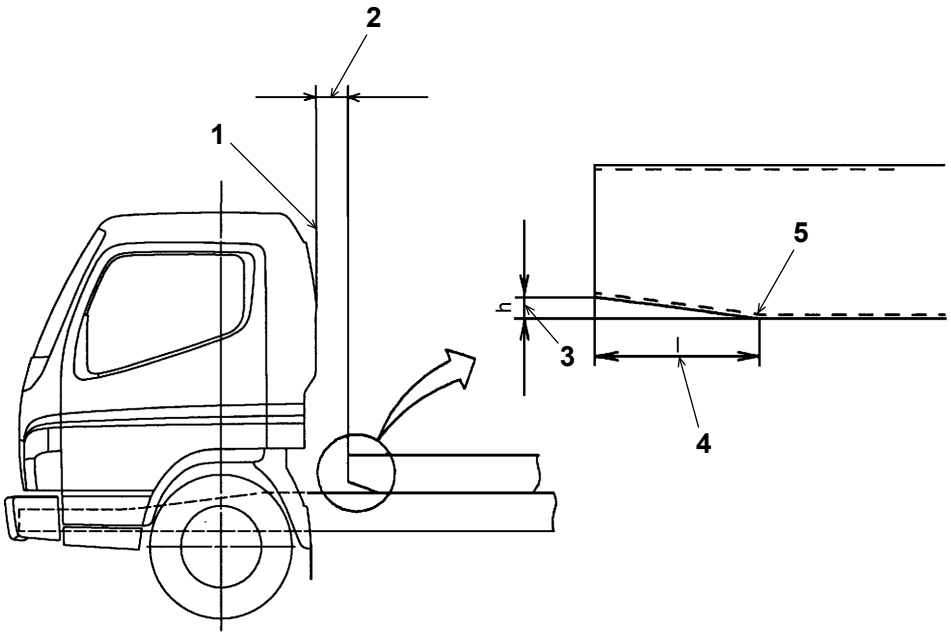


Fig. 4

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 Fastening mounting frame to chassis frame

Tank truck

- If the chassis frame changes its width behind the cab back as shown in Fig. 7 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.

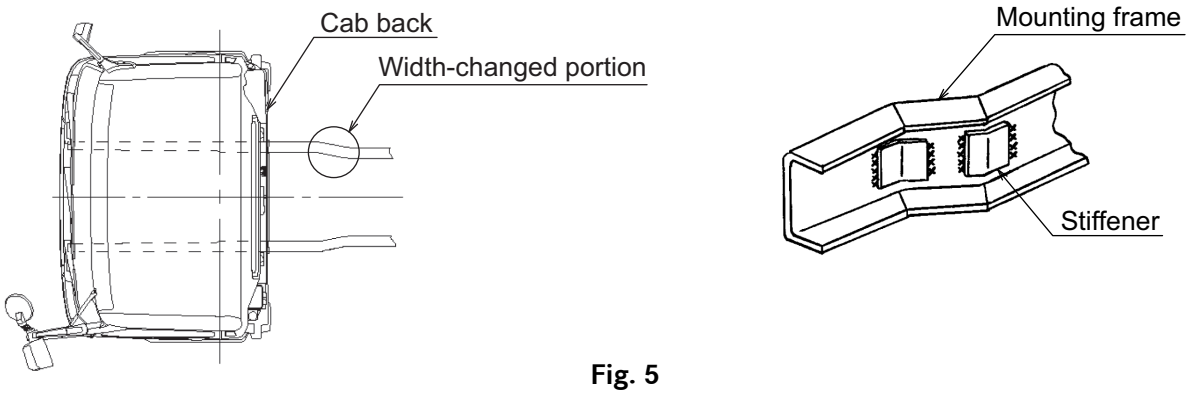
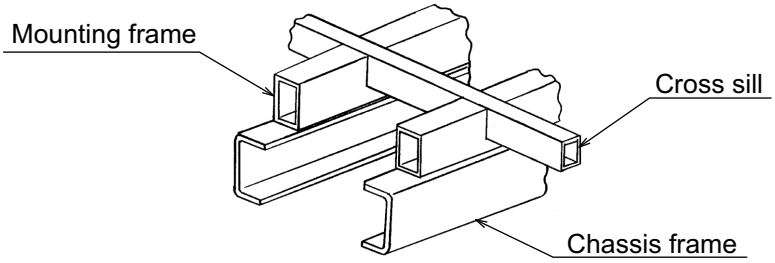


Fig. 5

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.



7.2 Fastening mounting frame to chassis frame

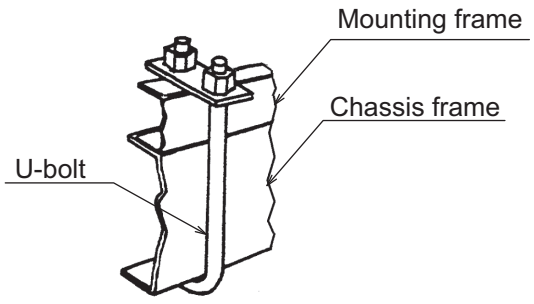
Tank truck

(2) Spacer (liner)

The spacer (liner) reduces the fastening force between the chassis frame and the mounting frame.

(3) 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.



7.2 Fastening mounting frame to chassis frame

Tank truck

- **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 crossmembers, gussets or stiffeners. Brackets should be installed at least 200 mm away from the end of these parts.

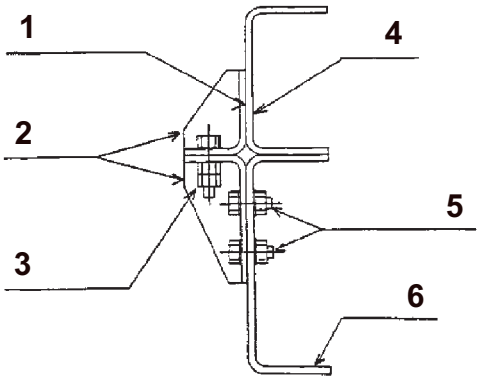


Fig. 6

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.

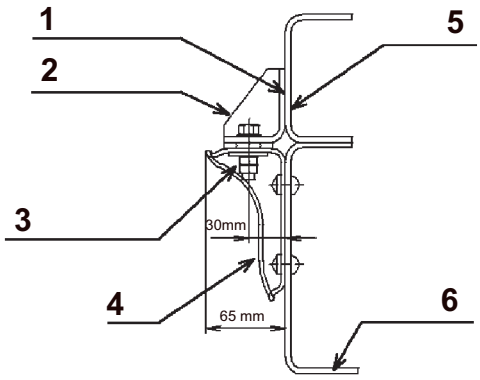


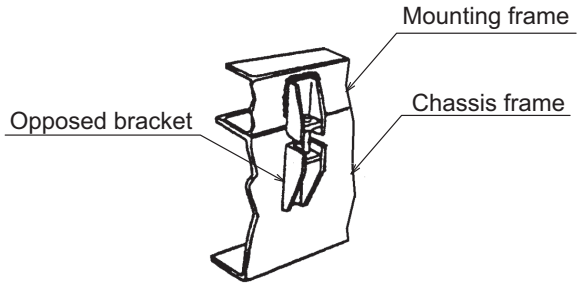
Fig. 7

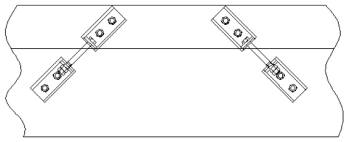
1 Attached by welding
2 Mounting bracket
3 Use double nuts With washer (more than Ø32 mm)
4 Genuine mounting bracket
5 Mounting frame
6 Chassis frame

7.2 Fastening mounting frame to chassis frame

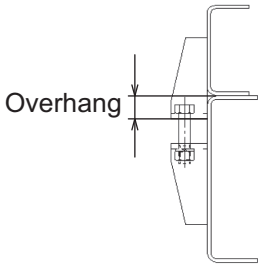
Tank truck

- 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.



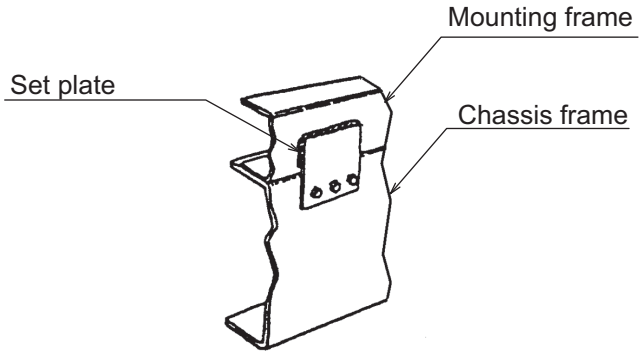


For increasing longitudinal holding force



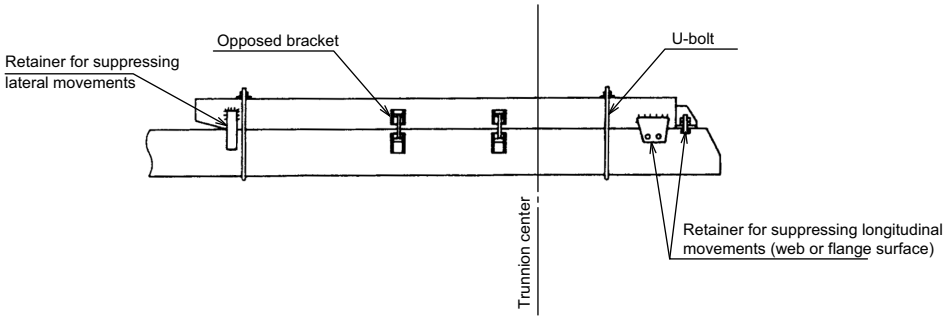
For increasing lateral holding force

- 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.



Precautions for fastening frames

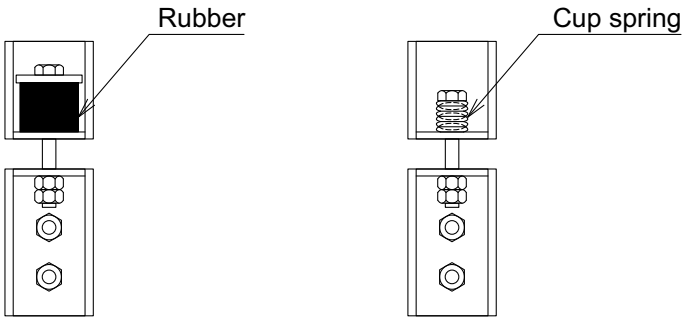
- When fastening the mounting frame to the chassis frame using U-bolts and opposed brackets, use retainers for preventing longitudinal and lateral movements together.



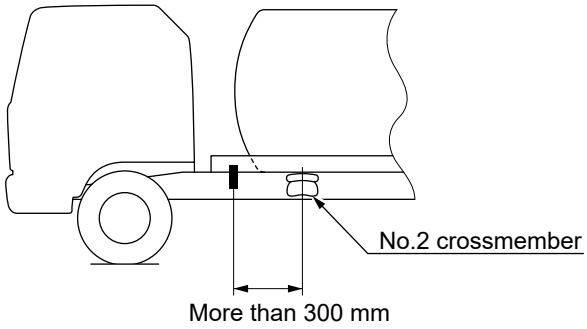
7.2 Fastening mounting frame to chassis frame

Tank truck

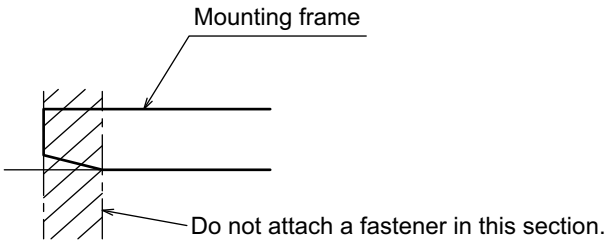
- For fastening at the forefront, use a flexible joint such as shown in the figure below to absorb the relative displacement between the mounting frame and chassis frame.



- Locate the forefront fastener at least 300 mm ahead from the No.2 crossmember to reduce the load input on the chassis frame.



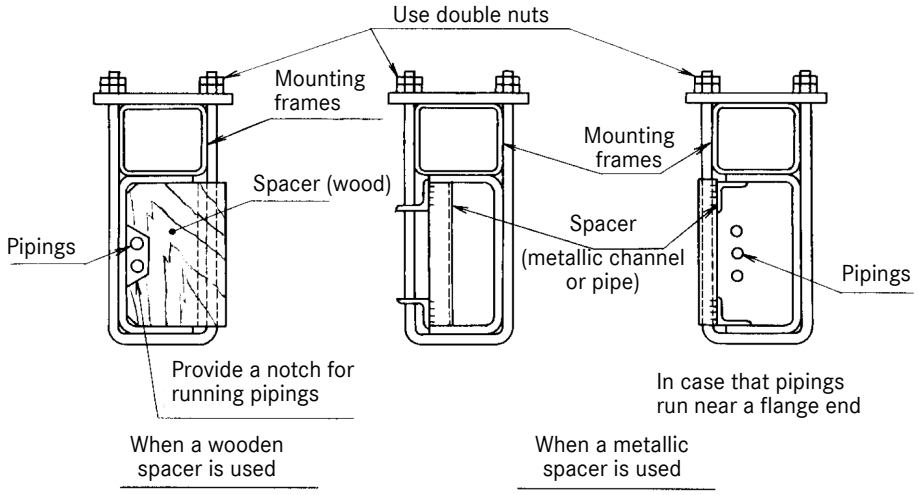
- When fastening with a U-bolt, ensure that ample spaces are left for running pipes, hoses, wires and harnesses.
- Do not attach any fastener in the mounting frame front end section where the sectional shape is different from the remaining part.



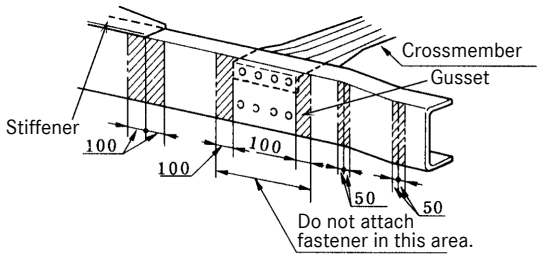
7.2 Fastening mounting frame to chassis frame

Tank truck

- 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.

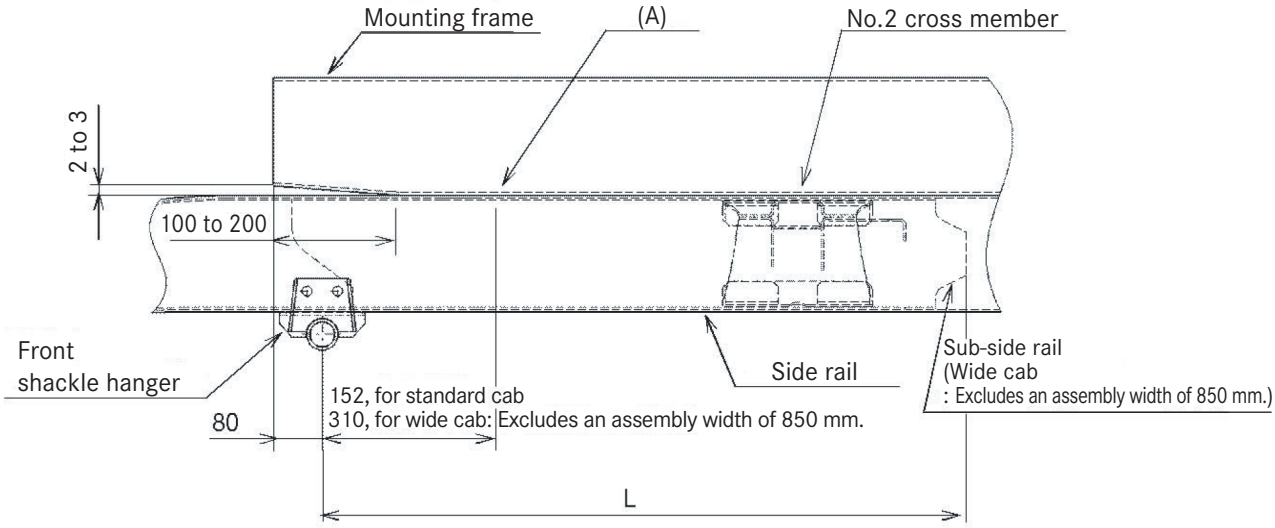


- Attaching opposed brackets to a chassis frame should be done with bolts. For the procedure, refer to "6. Modifications to the basic vehicle" ▷ 6.1.
- Do not use U-bolts or opposed brackets for crossmember, stiffener and gusset attaching sections or near the curved section of the chassis frame because these sections are likely to be subjected to stress concentration.



7.2.3 Loading crane

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



B

Unit: mm

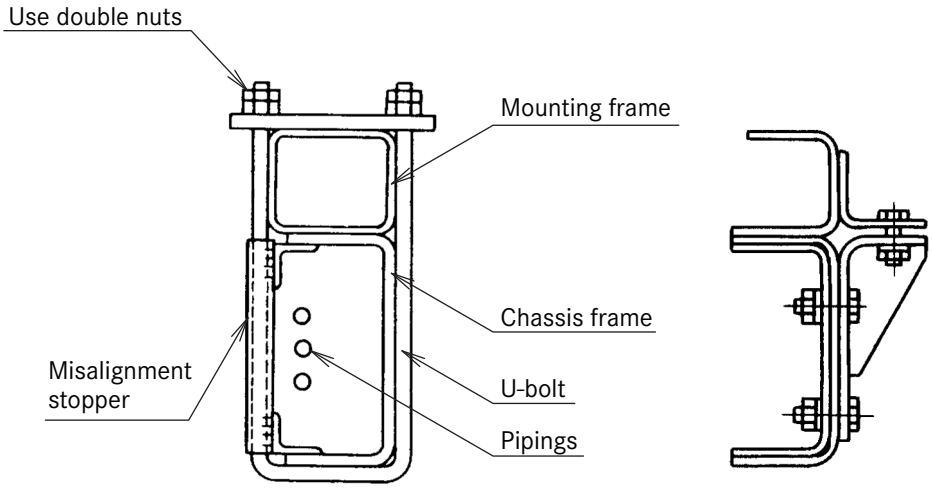
Vehicle mode	L
Standard cab	1050
Wide cab (FE, FG)	1100
Wide cab (HEV)	1250

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

7.2 Fastening mounting frame to chassis frame

Loading crane

- 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 holes and wires pass through this area, so take care not to damage them when installing the U-bolts.



7.2 Fastening mounting frame to chassis frame

Loading crane

(1) Position of mounting frame

- Be sure to use a mounting frame of box construction for ensuring higher rigidity.
- For reducing cab vibrations and protecting a chassis frame, mount the crane at a position as close to the cab back as possible.

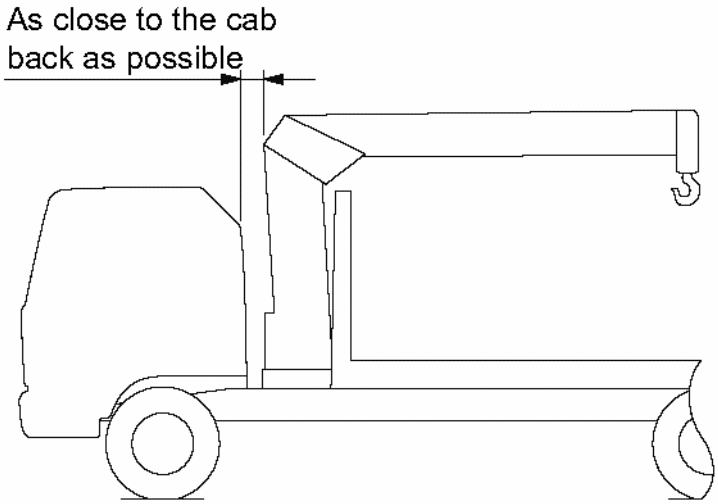


Fig. 1

- Examples of front-end shape of mounting frames
  (a) Install the mounting frame having the shape as shown in Fig. 2 to gradually reduce the stress concentrations in the front end.

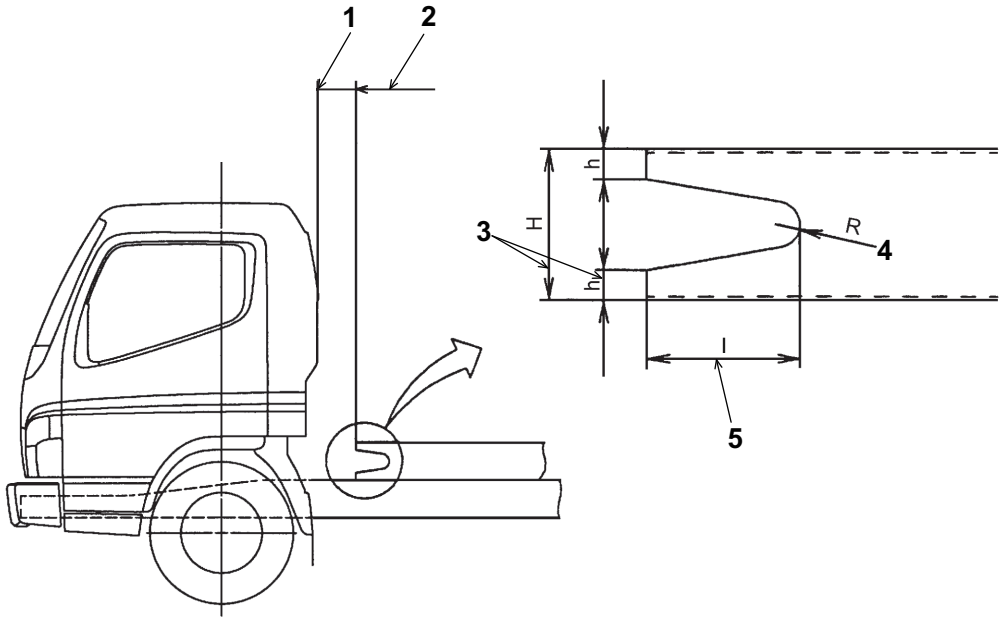


Fig. 2

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

7.2 Fastening mounting frame to chassis frame

Loading crane

(b) The shape of the mounting frame front end as shown in Fig. 2 is highly desirable. However, if there is enough room behind the cab, the shape as shown in Fig. 3 is also acceptable.

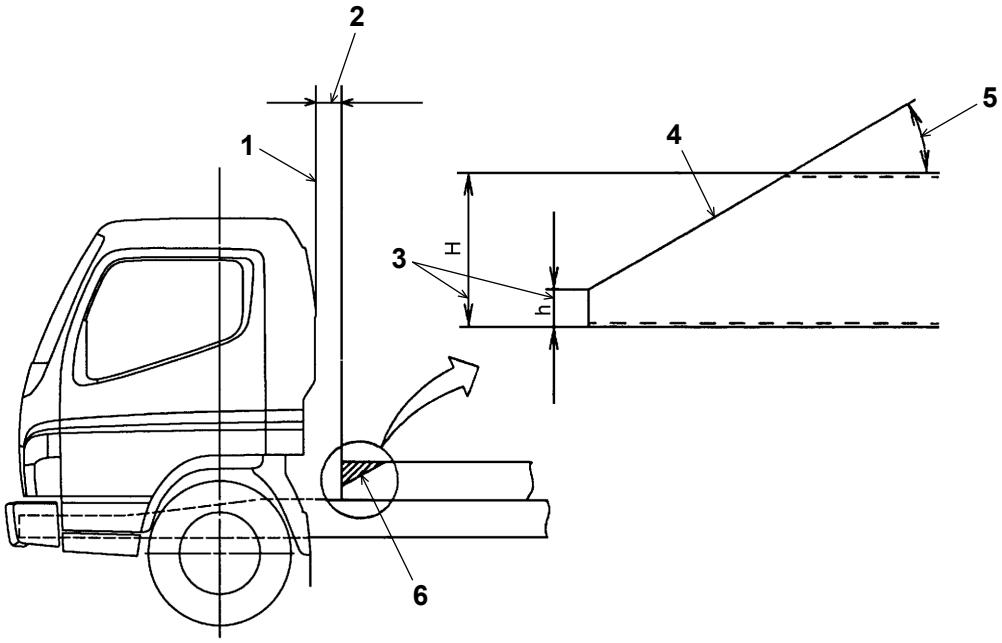


Fig. 3

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. 2 and Fig. 3, cut it to the shape as shown in Fig. 4 before installation.

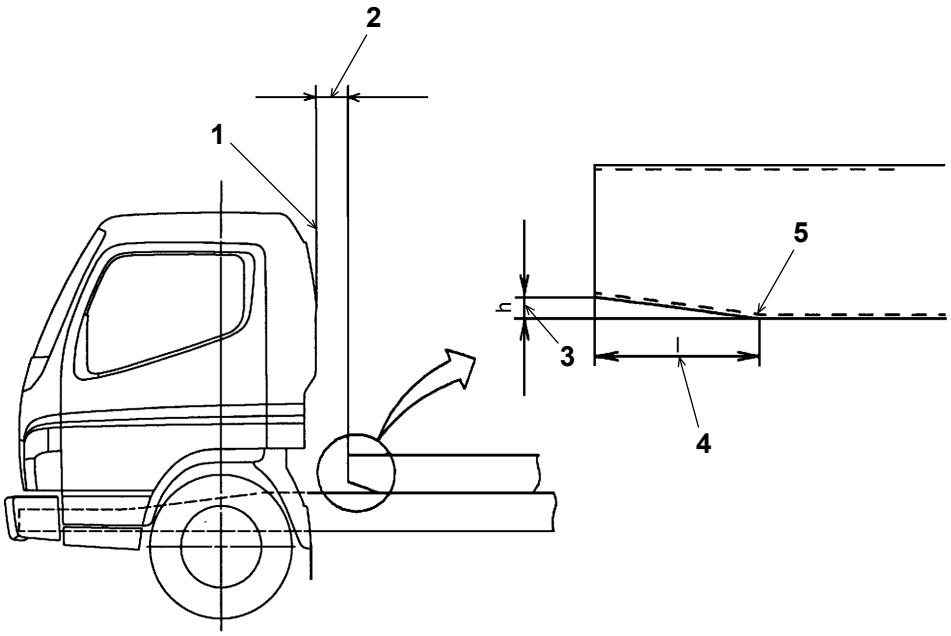


Fig. 4

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 Fastening mounting frame to chassis frame

Loading crane

- If the chassis frame changes its width behind the cab back as shown in Fig. 7 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.

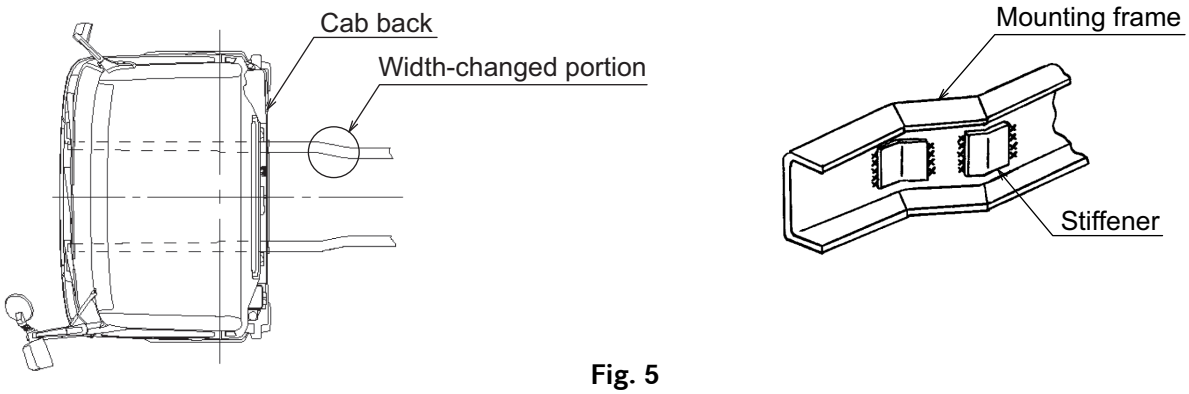
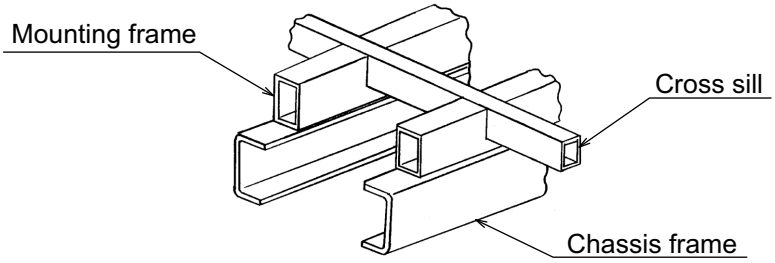


Fig. 5

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.



(2) Spacer (liner)

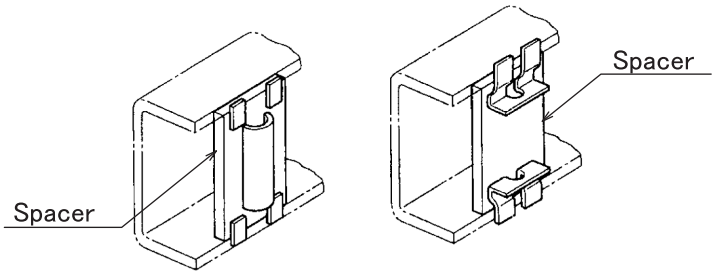
The spacer (liner) reduces the fastening force between the chassis frame and the mounting frame.

7.2 Fastening mounting frame to chassis frame

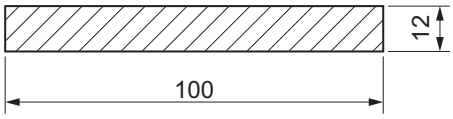
Loading crane

(3) Frame reinforcement

- In order to prevent the chassis frame flanges from deforming, provide the chassis frame with spacers for supporting the flanges. Avoid welding a metallic spacer to the chassis frame to hold it in position.



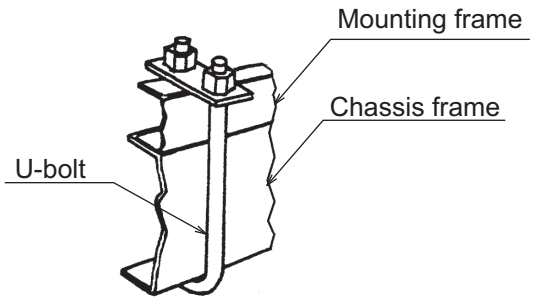
- Spacers for preventing deformation of the chassis frame must be fabricated from a steel plate having a sectional area of minimum 1200 mm^2.



- The frame section near the crane mounting position can be locally subjected to stress concentration during crane operation. Do not forget to reinforce this section with stiffeners. For the frame reinforcement procedure, refer to "6.5 Reinforcement" ▷ 6.5.

(4) 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.



7.2 Fastening mounting frame to chassis frame

Loading crane

- **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 crossmembers, gussets or stiffeners. Brackets should be installed at least 200 mm away from the end of these parts.

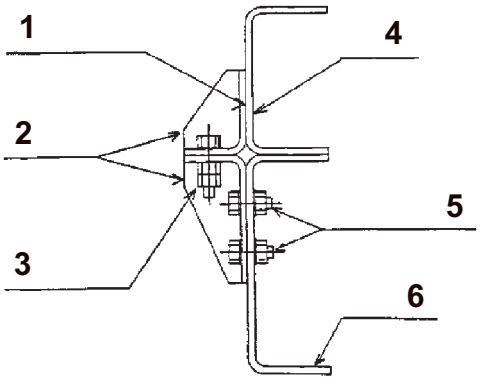


Fig. 6

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.

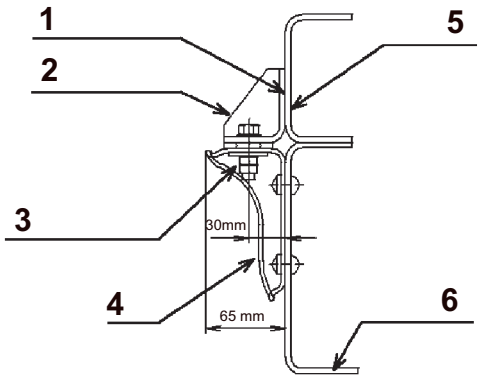


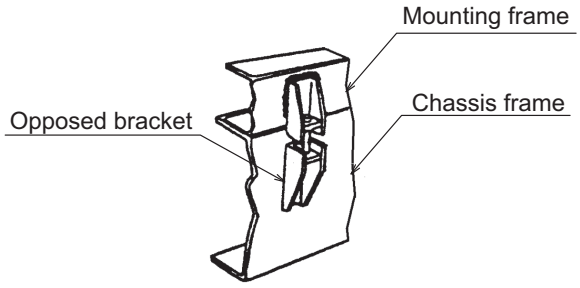
Fig. 7

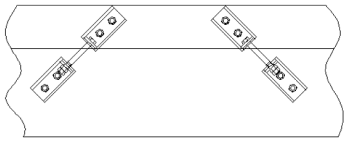
1 Attached by welding
2 Mounting bracket
3 Use double nuts With washer (more than Ø32 mm)
4 Genuine mounting bracket
5 Mounting frame
6 Chassis frame

7.2 Fastening mounting frame to chassis frame

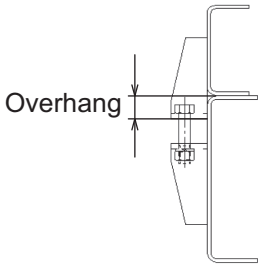
Loading crane

- 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.



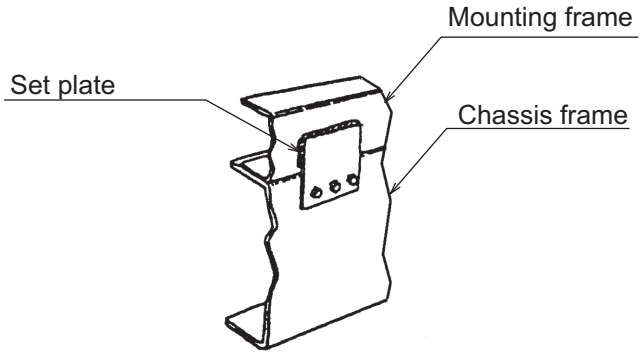


For increasing longitudinal holding force



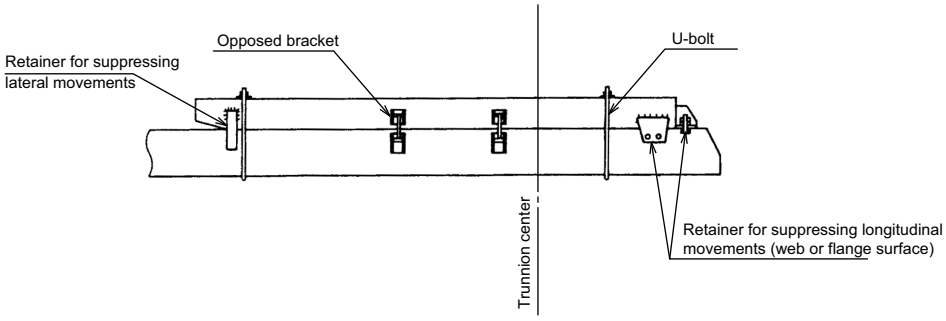
For increasing lateral holding force

- 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.



Precautions for fastening frames

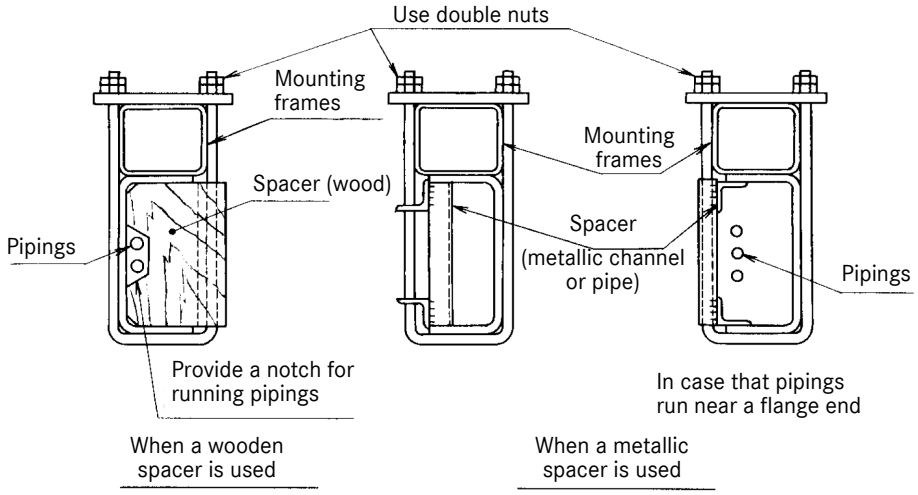
- When fastening the mounting frame to the chassis frame using U-bolts and opposed brackets, use retainers for preventing longitudinal and lateral movements together.



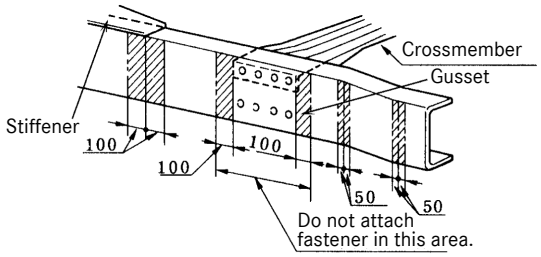
7.2 Fastening mounting frame to chassis frame

Loading crane

- 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.



- 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.
- Do not use U-bolts or opposed brackets for crossmember, stiffener and gusset attaching sections or near the curved section of the chassis frame because these sections are likely to be subjected to stress concentration.



7.3 Others

7.3.1 Fuel tank

⚠ Risk of fire

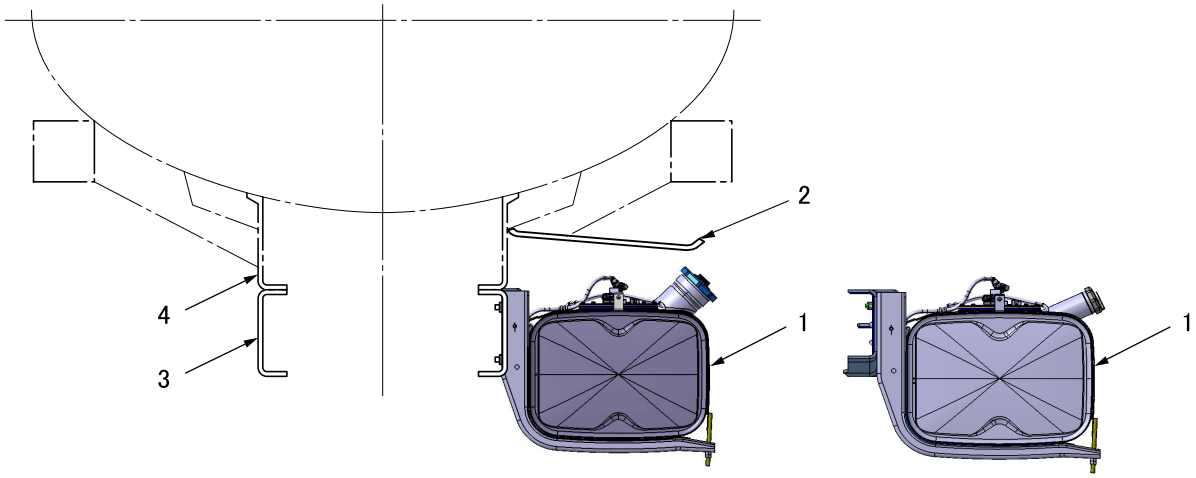
Firmly attach the airvent hose to the Fuel Tank Bracket if it comes away when relocating the fuel tank. ▷ 6.15.1

Attaching the splash guard protective cover

To protect the fuel hoses, a protection cover must be attached over the fuel hoses for the vehicle which has a large space between the tank and the body. (e.g. concrete mixer, tankbody)

Fig. 1 shows an example of a cover installed on a vehicle equipped as a lorry.

Fig. 1



1 Fuel tank
2 Cover bracket
3 Chassis frame
4 Mounting frame

Instructions for relocating the tank, adding on the auxiliary tank, and increasing its capacity

- A letter of no objection is required from the department responsible when relocating the tank, adding on the auxiliary tank, or increasing its capacity and following must be considered.
- Use MITSUBISHI FUSO authorized fuel hose when replace it.
- Keep the distance from the filler end and the end of air vent hose to;
  - Over 300 mm to exhaust exit
  - Over 200 mm to exposed electric terminal
- Don't connect the fuel piping over the exhaust pipes. Set the connection point where the fuel will not splash on the exhaust system even if it will leak.
- Install the tank securely to be free from loosen or other defect with consideration the effect of vibration, layout, and others. New bracket must be designed to have sufficient strength.
- Use legally conformed auxiliary tank for your local regulations.
- Don't open the plug for auxiliary tank except the mounting process of the auxiliary tank.
- Don't modify the MITSUBISHI FUSO genuine tank.
- Use following flange bolt and nut for mounting the tank, and tighten them with following torque. Some of the bolts that fix the tank on the frame are tightened with frame component such as C/MBR. These bolts and nuts must be tightened securely again with new bolts and nuts if you remove them through the relocating process.

	Size	Strength Grade	Tightening torque
BOLT, FLANGE	M10	10T or more	90 – 110 N·m
NUT, FLANGE	M10	6T	

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 on-board 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.

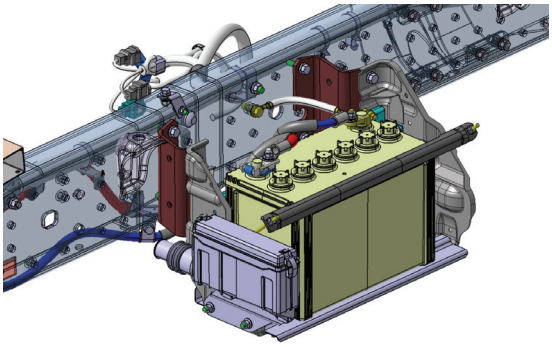
8.1.1 Specification Check Prior to Building the Body

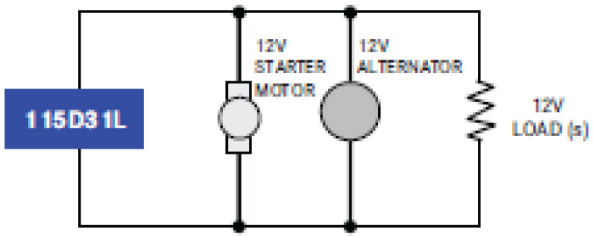
Power supply voltage

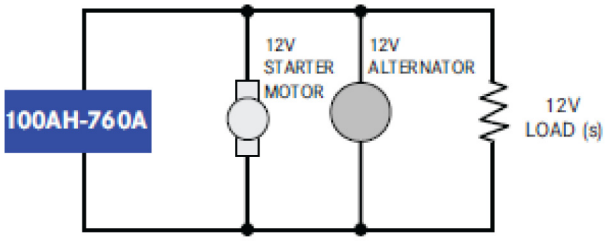
The configuration of the power supply voltage differs according to the particular vehicle.
Check the specifications of the battery mounted on the vehicle. When installing parts related to the power supply voltage, be sure to observe the following precautions.

(1) Configuration of the vehicle power supply

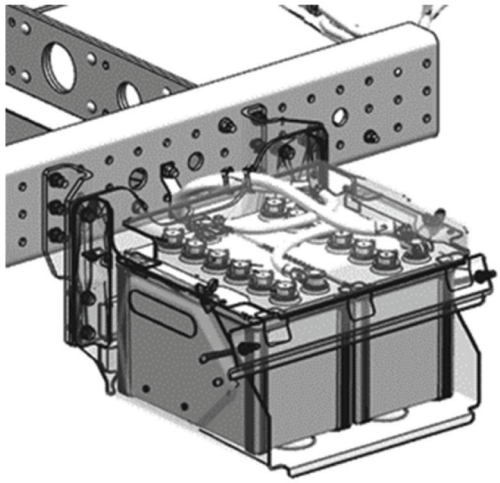
(a) When there is one battery
(115D31L/100AH-760A)
The vehicle uses 12 V power supply system.
You cannot install 24 V electrical components for building body.

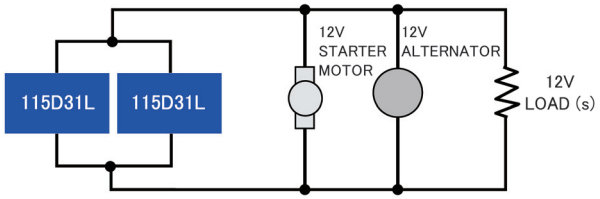


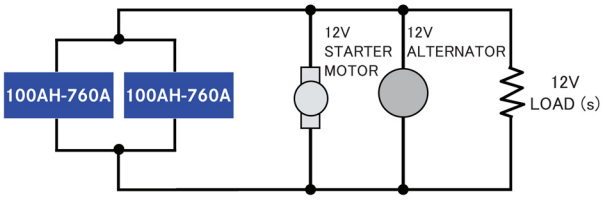


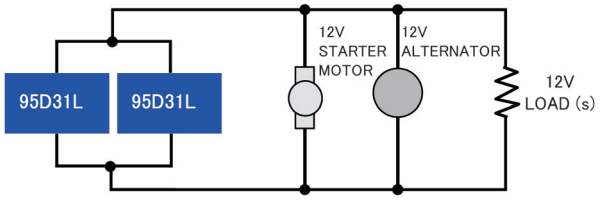


(b) When there are two batteries
(115D31LX2/100AH-760AX2/95D31LX2)
The vehicle uses 12 V power supply system.
You cannot install 24 V electrical components for building body.

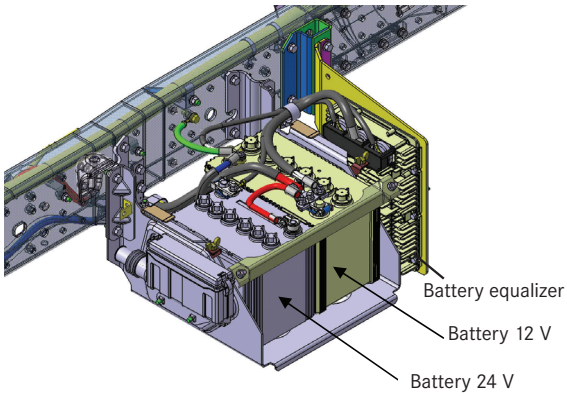


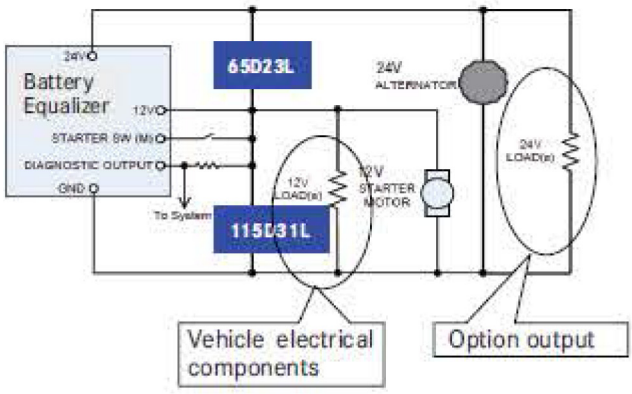


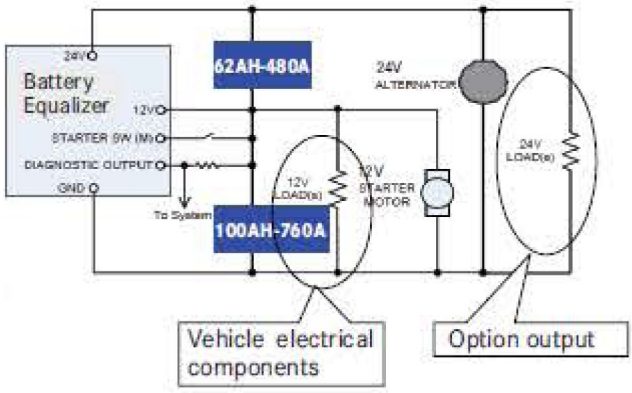




(c) When there are two batteries (115D31L65D23L/100AH-760A/62AH-480A)
In this case 12 V and 24 V power supply systems coexist in the one vehicle, so be very careful.
All of the existing electrical components use 12 V system, but the take-off power supply for the option connectors uses 24 V system.
Refer to ▷ 8.4.1 and ▷ 8.4.2.
You cannot use 12 V electrical components for building body.







Note: Some vehicles optionally use two 115D31L batteries without equalizer.

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

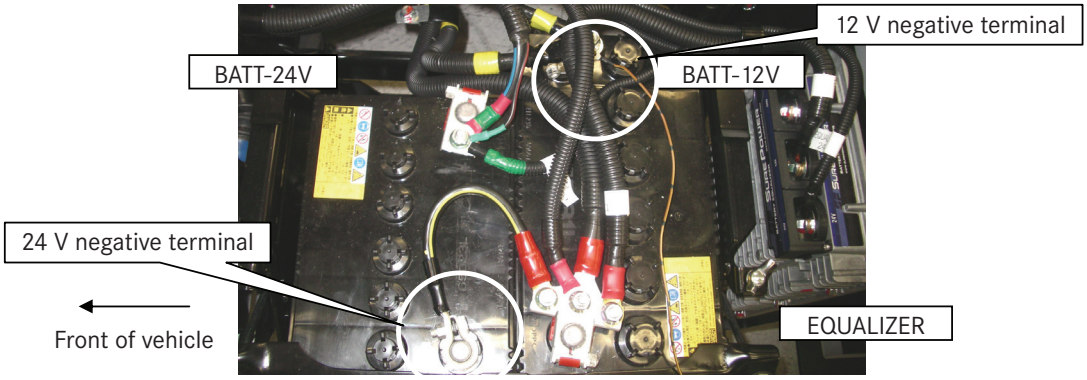
An error in the connected power supply or a wiring error such as a battery connected in the reverse polarity will have an adverse effect on the vehicle electrical components, and may lead to a vehicle fire. For this reason, be very careful of the following points.

<Before building the body>

- Turn OFF the starter switch, and pull out the starter key. 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.

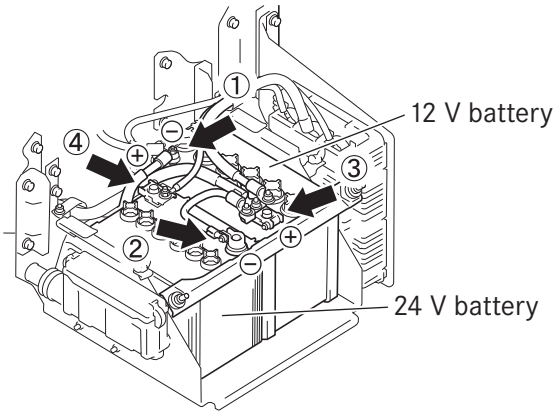
<When building the body>

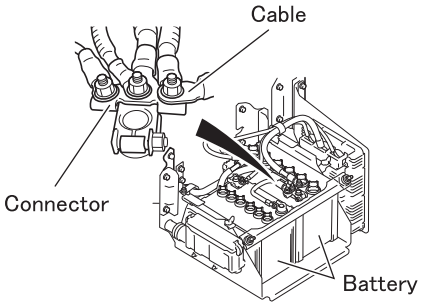
- Disconnect the battery cables from the negative terminals of both 12 V and 24 V batteries.



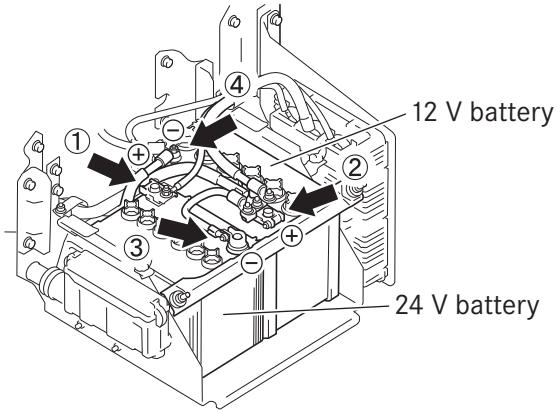
- Even after you have disconnected the cable from the negative terminal of the 12 V battery, be careful not to accidentally short-circuit the negative terminal of the 24 V battery to the frame or the battery box with a spanner or other similar tools.
- When taking off power, use the body-building connector (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 before carrying out power take-off work.

- 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.





- 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.



(3) Relocating the batteries and battery equalizer

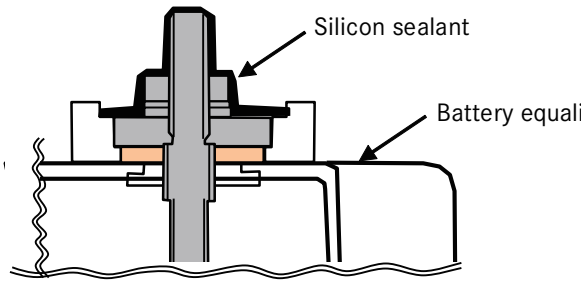
- Be sure to relocate the batteries and the battery equalizer as a set.

(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).



Name	Part No.	Remarks
SEALANT	MS996198	Bond type

8.1.2 Signal detection and actuation module-related parts

Cautions on Signal detection and Actuation Module (SAM) (relay and fuse-integrated control unit for body equipment)

The signal detection and actuation module is an integrated unit with the control and power distribution functions for electric parts of the cab and body equipment.

(a) Before disconnecting the connected cables of the signal detection and actuation module control unit, set the starter switch of the vehicle to OFF.

(b) Before performing welding to the chassis and body, be sure to disconnect the signal detection and actuation module control unit cables and connectors. Use exteme care of spattering (sparks, etc.) thrown on the harnesses during the welding work.
Ground the welder near the weld.

(c) When cleaning inside the cab, take utmost care not to splash the signal detection and actuation module control unit (including relays, fuses and connectors) with water.

(d) When removing the signal detection and actuation module control unit from the vehicle, set the starter switch of the vehicle to OFF, then disconnect the harness from the battery terminals and remove the connectors/nuts in the following order. (To reinstall, reverse the sequence of removal.)

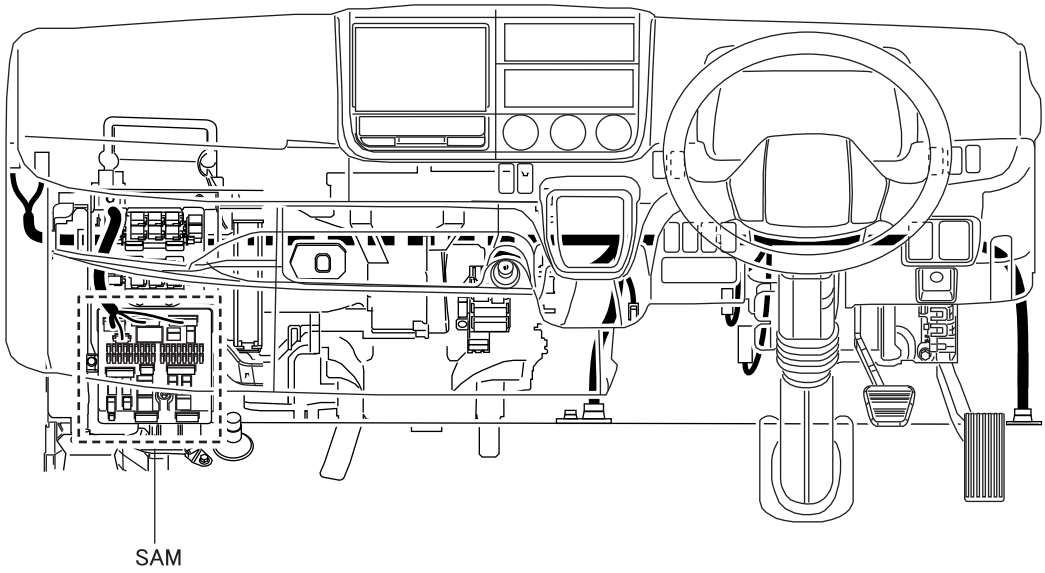
- Disconnect the power line (connector No. 9C, nut No. 10C) first.
- Disconnect the control unit connectors.
- Disconnect the ground line (connector No. 8C) last.
- Bracket nuts (back of signal detection and actuation module, M6 x 4)]

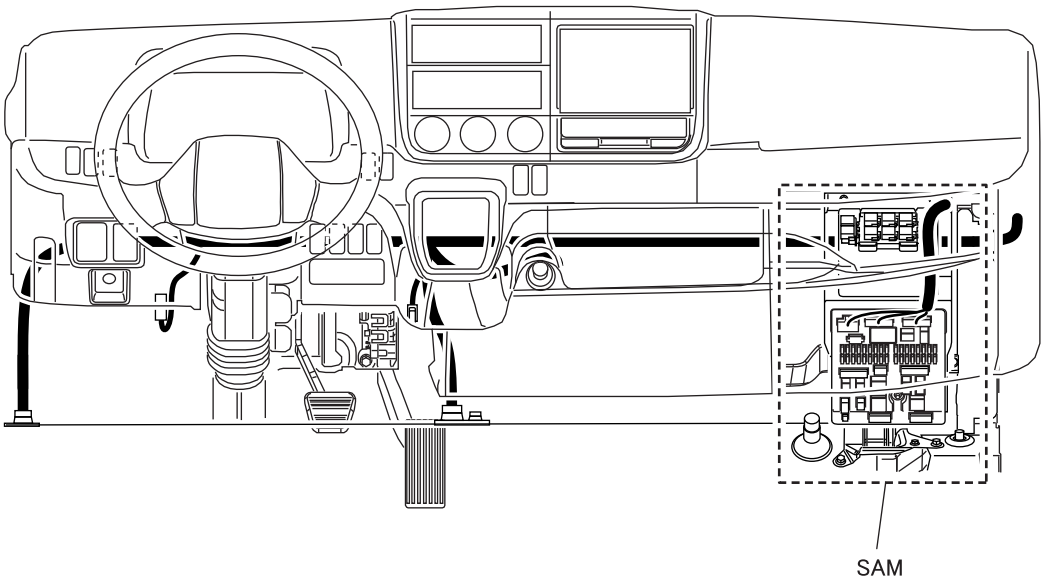
When installing the signal detection and actuation module control unit to the vehicle, tighten its nuts to the torques specified below.

Unit: N·m

Nut type	Torque	Use
M6	4 to 6 (nominal value: 5.45)	To mount the control unit to be bracket
M8	10 to 15 (nominal value: 12.7)	To mount the power line 10C

(e) Relays and fuses should be carefully installed or removed in/from the signal detection and actuation module control unit one by one.





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

The signal detection and actuation module control unit has circuit output terminals for additional wiring as listed below. Connect power or signal cables to the connectors used for body equipment to add the wiring as required.

Circuit name	Allowable current
Power supply (Batt)	7 A
Power supply (ACC)	7 A
Power supply (key-on)	7 A
ILL power supply*	2.5 A (chassis harness side) 2.5 A (body harness side)
Neutral signal*	0.2 A
Power take-off signal*	0.2 A
Parking brake signal*	0.2 A
Back alarm signal*	0.2 A

(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 contact person ▷ 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 contact person ▷ 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 a MITSUBISHI FUSO authorized Distributer or your contact person ▷ 2.2.
- Body building or modification of any of the following electrical parts requires that the SAM control unit parameters be changed. Consult a MITSUBISHI FUSO Service Center. 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 transmission Power take-off
  - Mounting a dump control lever [Power take-off ON/OFF]
  - Mounting a centralized door lock and keyless entry system <Vehicle with keyless entry system>
  - 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

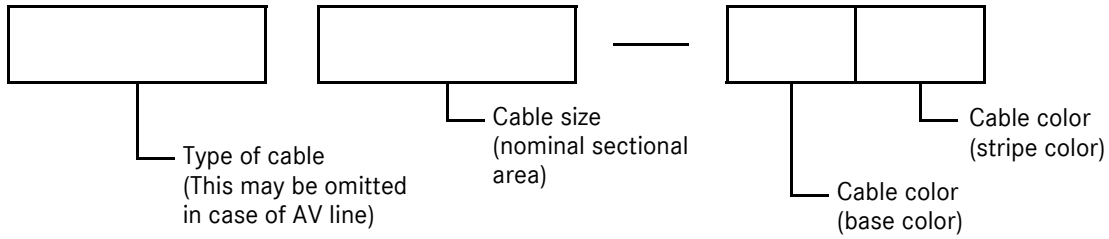
8.2.1 General precautions

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



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
  - Stripe color: White
  - Base color: Green
  - Cable size: 0.85 mm^2
- AVX1.25 – L
  - Base color: Blue (no stripe color)
  - Cable size: 1.25 mm^2
  - 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 engine
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, engine, transmission and dump hinge.

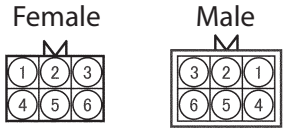
8.2.3 Connector code

Connector pin numbers

Numbering of terminals

Female terminals: Numbering started from upper left

Male terminal: Numbering started from upper right



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.

A

- 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.

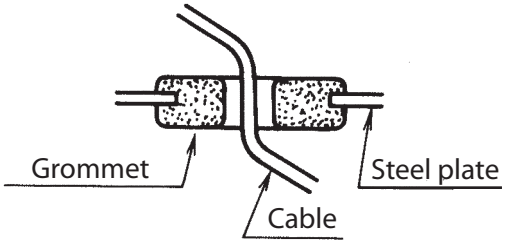
Wiring procedure

- 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.

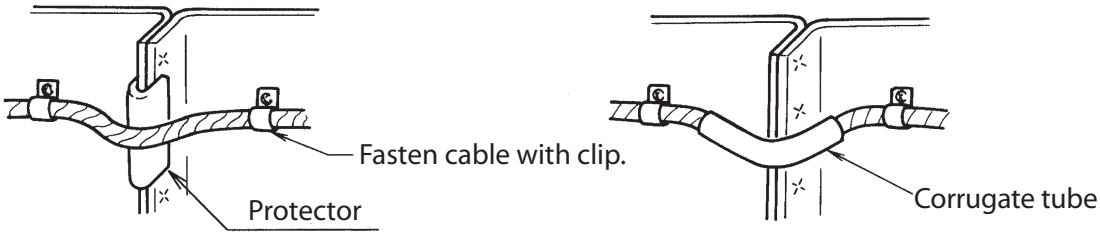
Unit: mm

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.



- 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.



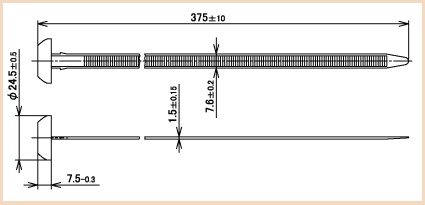
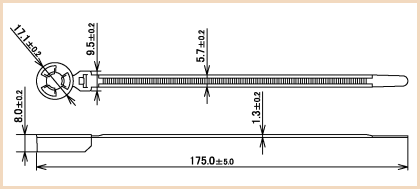
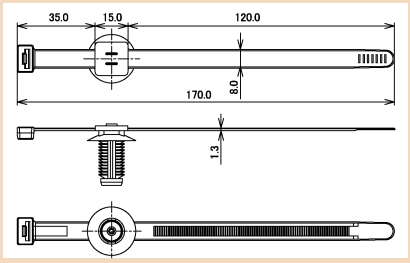
- If a harness exists nearby, tape the cable along to the harness. It is positively prohibitive to lay cables along the brake piping (including brake hose and brake pipe), fuel piping (including all metal and rubber hoses) and grease piping. Maintain clearances between cable and existing harness.

Unit: mm

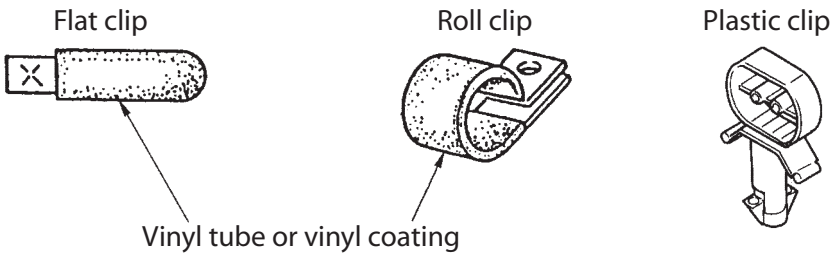
Wiring method	Minimum clearance
Parallel	10
Crossover	20

- For clearance between cable and exhaust system 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 in the engine compartment apart enough from heat sources and along existing harness. Bind cables extensively with heat-resistive vinyl tape or fasten with metal sheet clamps (rubber- or vinyl-coated). Do not use non-heat-resistive vinyl tape because it is degraded to separate by heat.
- Install cables to engine- 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.
- When the routing of battery cables is changed for relocation of battery or other reason, do not extend or shorten battery cables and/or charging circuits of alternator, etc. Especially, do not change clamping method, clamping position, slack, etc. in areas of relative movement between starter and frame.
- When battery is relocated, locate it at least 200 mm apart from the exhaust system (muffler with emission gas purifier and tail pipe). If less than 200 mm apart, provide a heat insulator.
- 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.



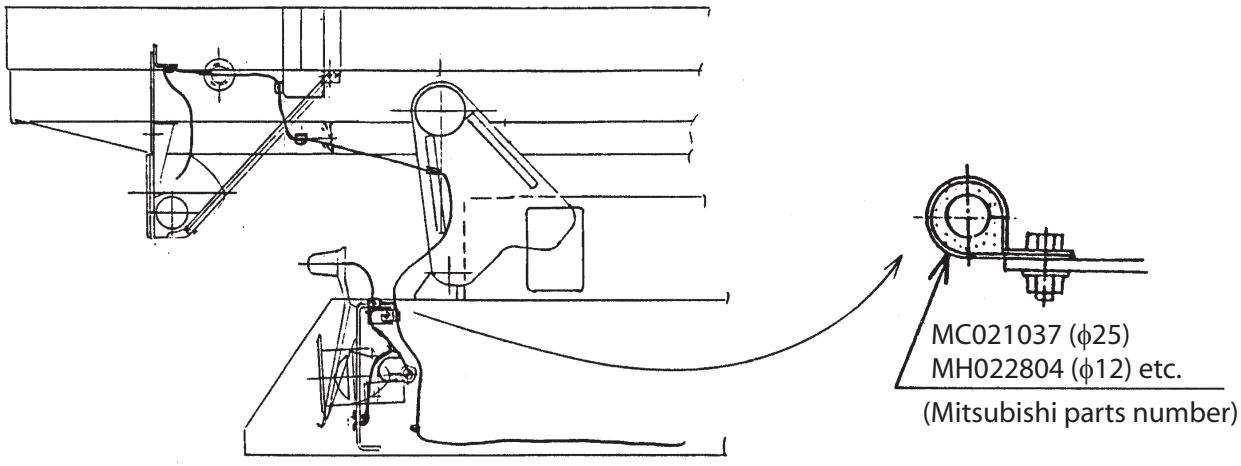
Given below are the standard limits of spacing for cable clamps.

Unit: mm

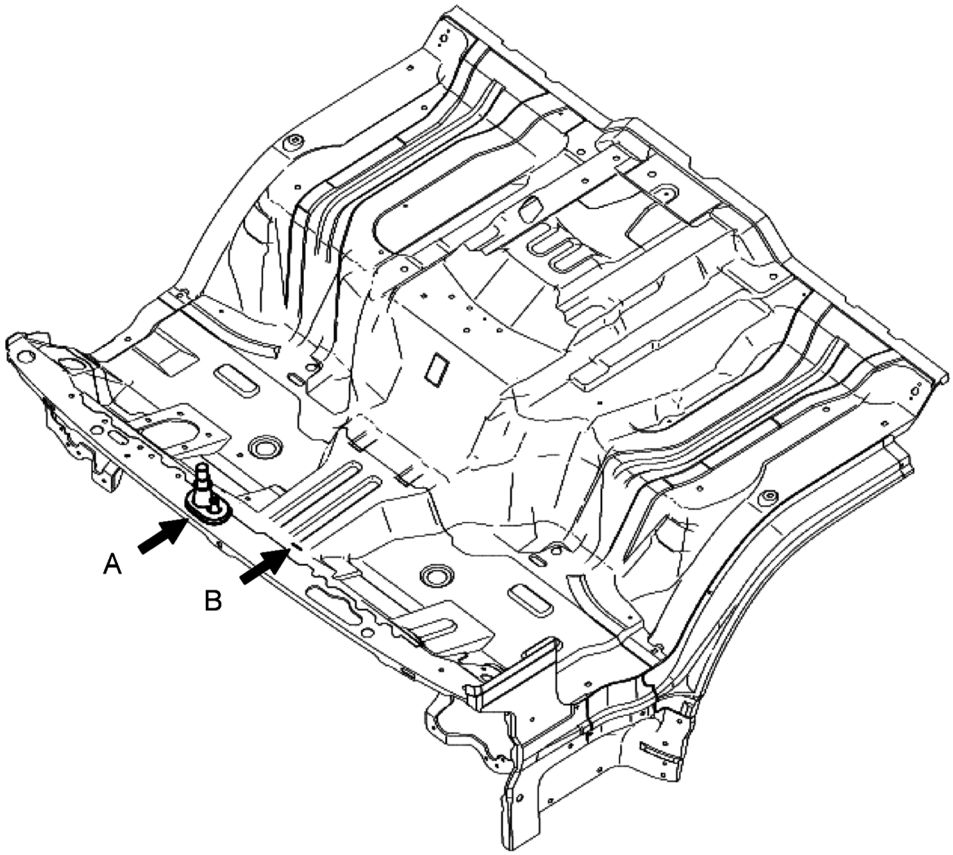
Harness diameter	Limit of spacing
Up to 5	Up to 300
5 to 10	400
10 to 20	500

8.2 Electric wiring

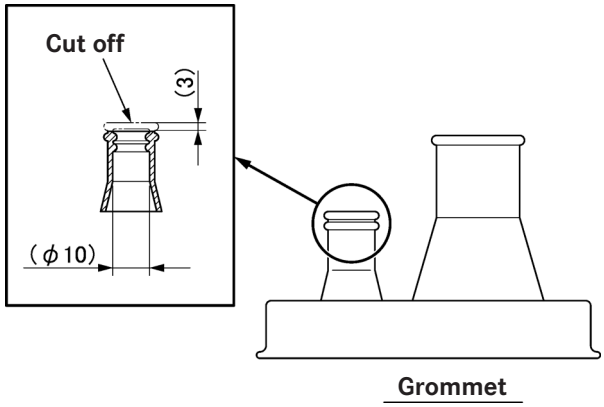
For cables to rotary portions of dump hinge and other custom-built truck body parts and vibrating bodies of engine, transmission, etc., use solid rubber clips.



- 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.



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.

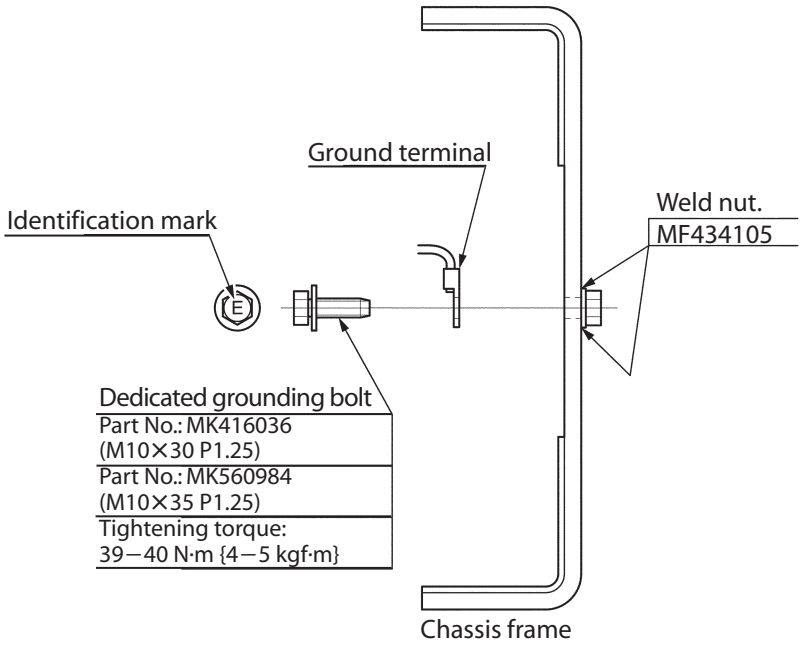
8.2.6 Grounding

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.



When wiring from the custom-built truck body side is grounded to the frame, do the same as described in [If grounding point is relocated] above.

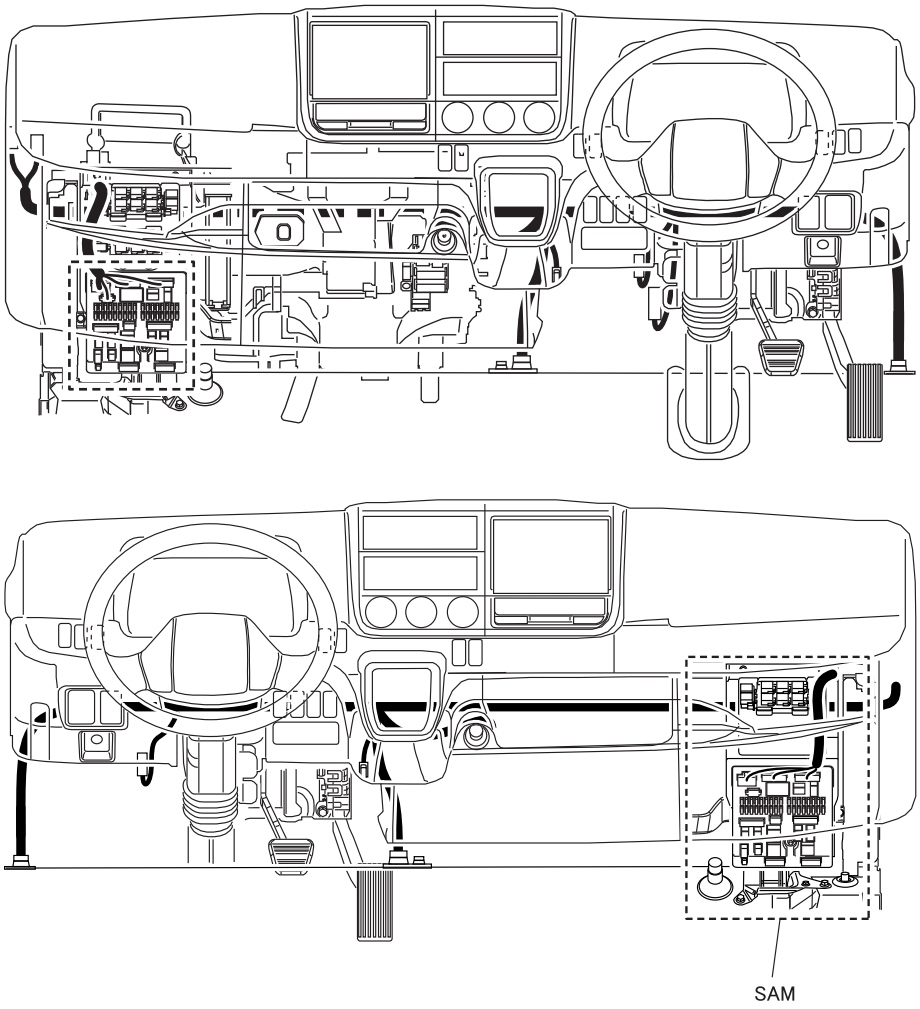
8.2.7 Fuse

(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.
Fuses in the cab are provided on the signal detection and actuation module control unit. 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).

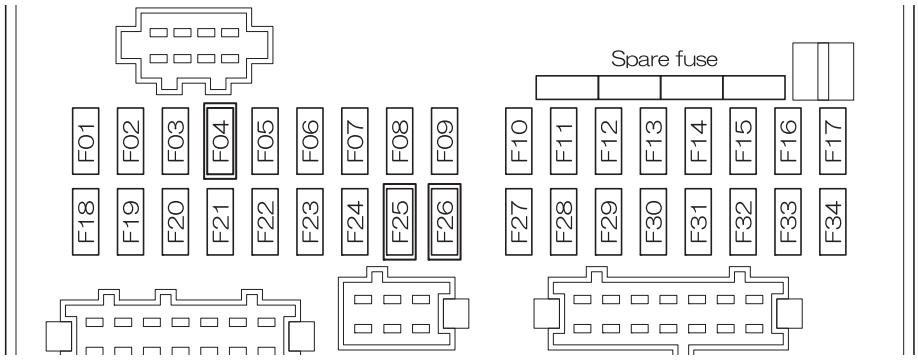
(b) Mid-point extension of existing wiring or the use of a larger capacity fuse could cause an excessive current to flow in the power fuse box, resulting in a fire.
The power supply voltage may differ depending upon the fuse. Verify the power supply voltage by referring to "Power supply voltage" ▷ 8.1.1.

(c) Arrangement of power fuses, relay in the instrument panel, sensors and ECU

- Fuse layout drawing



〈Inside of SAM〉



: 12 V power supply fuse

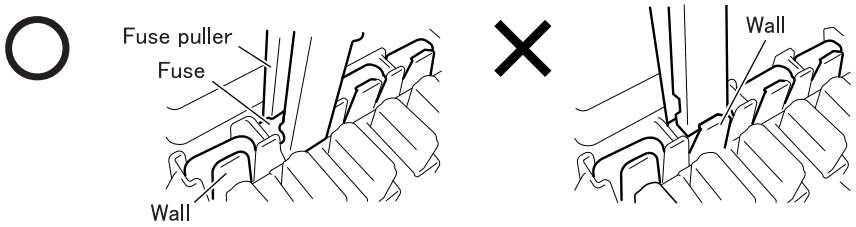
: When the vehicle uses two batteries, a 24 V power supply fuse is installed.
When the vehicle uses one battery, a 12 V power supply fuse is installed.

Fuse No.	Major load	Capacity
F01	Starter	10 A
F02	4WD M/V	10 A
F03	Air bag	10 A
F04*	Optional power (IGN)	10 A
F05	Power window (driver's seat side)	30 A
F06	Hillstart ECU	10 A
F07	Power window (passenger's seat side)	30 A
F08	-	-
F09	Meter, diaphragm tachometer, diagnosis connecter	10 A
F10	ISS	30 A
F11	Blower fan	30 A
F12	Audio, interior lamp	15 A
F13	Starter switch, ISS ECU	10 A
F14	Horn	10 A
F15	Audio	10 A
F16	Power mirror, power socket (cigarette lighter)	20 A
F17	Fuel heater	20 A
F18	ABS ECU	10 A
F19	Engine ECU	15 A
F20	ISS, 4WD M/V, Hillstart ECU	10 A
F21	Battery control unit, motor control unit	10 A
F22	Meters, air conditioner control	15 A
F23	-	-
F24	DUONIC® ECU, 4WD ECU	10 A
F25*	Optional power supply (ACC)	10 A
F26*	Optional power supply (B+)	10 A
F27	-	-
F28	Engine ECU	15 A
F29	BlueTec® system	20 A
F30	BlueTec® system	20 A
F31	Engine ECU	20 A
F32	Air conditioner	10 A
F33	-	-
F34	Fuel pump	15 A

*: 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.



8.3 Handling of electric/electronic equipment

8.3.1 Available types of electronic control systems (typical examples)

Some systems may not be fitted depending on the specifications of the vehicle.

- Engine electronic control unit
- Transmission electronic control unit (TCU)
- Anti-lock brake system (ABS)
- Automated Manual Transmission
- Idling stop & start system (ISS)
- SRS air bag
- Signal detection and Actuation Module (SAM)
- Emergency locking retractor (ELR)
- Keyless entry
- Immobilizer

8.3.2 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.

8.3.3 Handling of battery

To prevent damage or fire of battery-related parts, observe the following precautions when handling the battery.

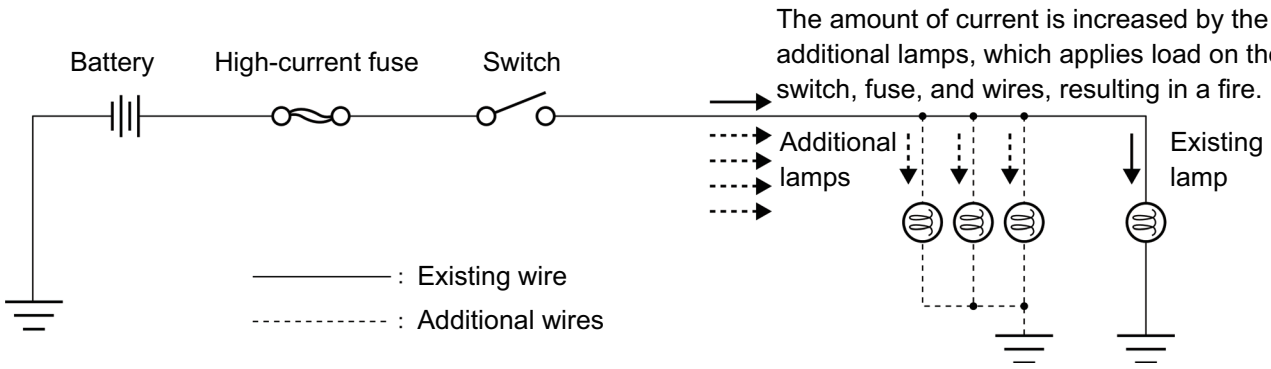
- Do not loosen or disconnect the battery cable while the engine is running.
- Be sure to connect the battery when starting the engine through towing.
- When performing a quick charge of the battery, be sure first to disconnect the battery cables from (+) and (–) terminals.
- Protect the cable to be routed near the exhaust system with a heat-resistant outer jacket.
- Route cables so that none rub together.

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



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).

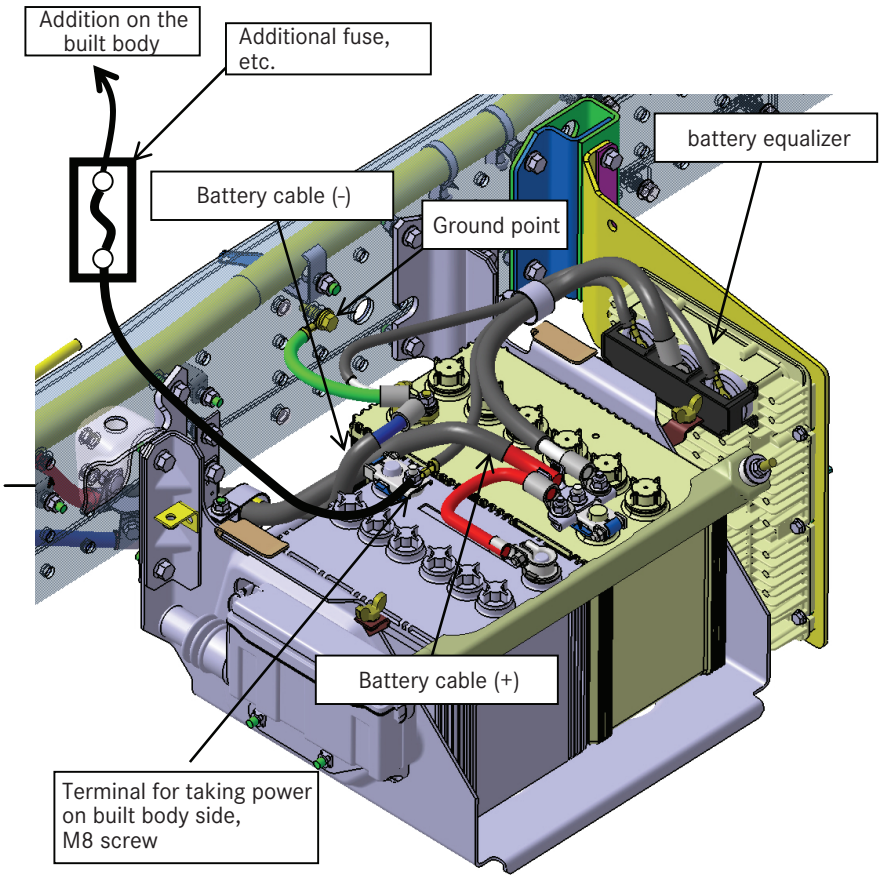
(d) Install the additional fuse in a waterproof cover (e.g. electric cover) or take an equivalent waterproofing measure for the additional fuse. Do not add wires or fuses to the existing high-current fuse box.

(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:

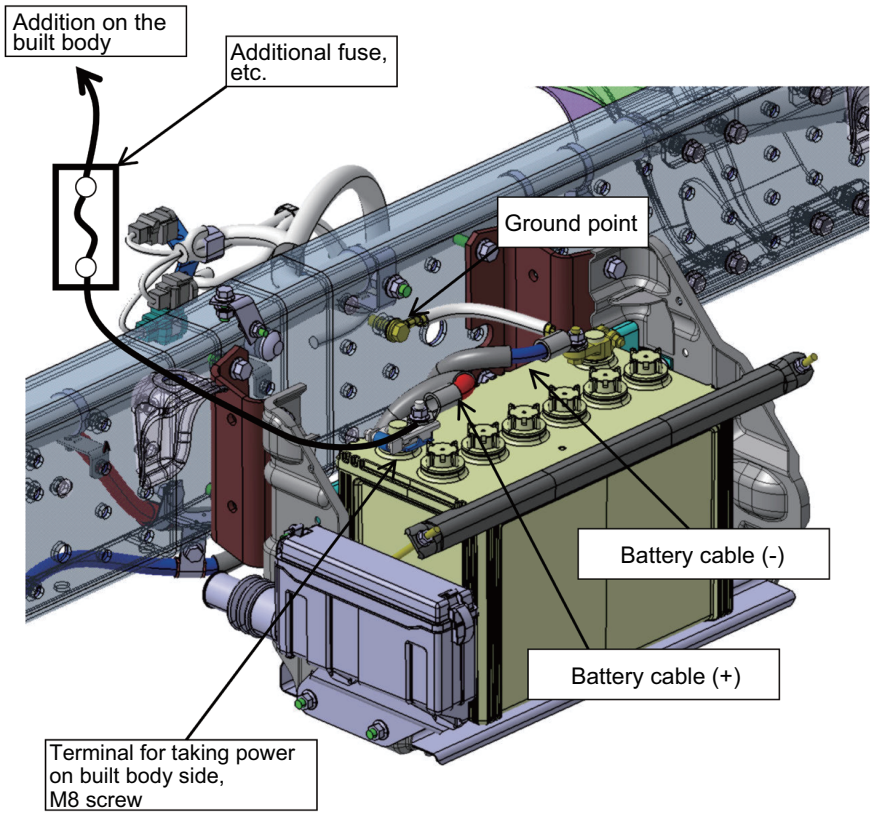
- It is prohibited to use the onboard battery for a long time with the engine stationary.
  Do not use the onboard battery as a service power supply (for the clock, memory, etc.).

Between battery terminal and fuse

24 V (vehicles with 24 V power supply system)



12 V (vehicles with 12 V power supply system)



(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

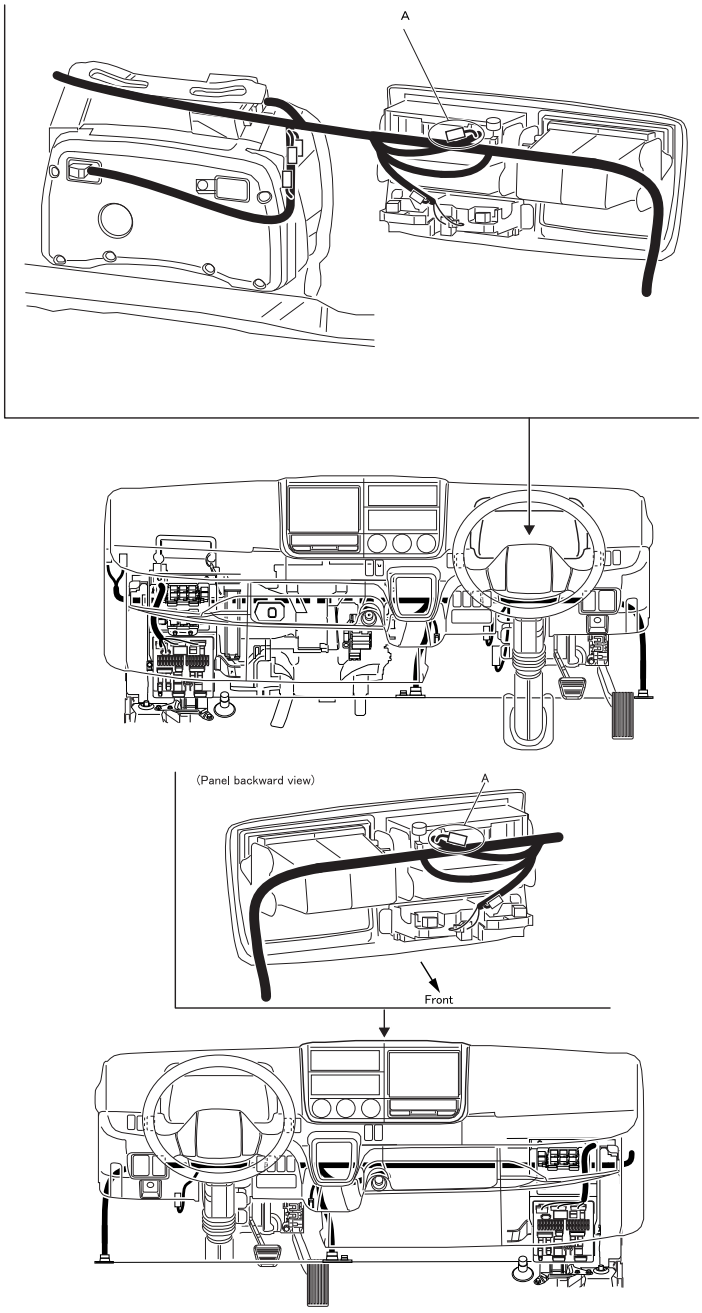
○ : Usable × : Not usable

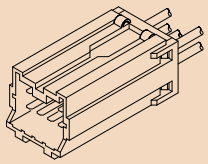
Fuse	Wire size (mm^2) [upper] and wire permissible current (A) [lower]								
Type	Specifications	0.3	0.5	0.85	1.25	2.0	3.0	5.0	(mm^2)
		11	14	18	23	31	42	57	(A)
Blade and glass tube	5 A	○	○	○	○	○	○	○	
	7.5 A	○	○	○	○	○	○	○	
	10 A	×	○	○	○	○	○	○	
	15 A	×	×	○	○	○	○	○	

Note: Keep the continuous permissible current within 70 % of the fuse specifications value.
(E.g.) If the fuse used is 10 A:
$10 \times 0.7 = 7$ (A)
→ A load of up to 7 A can be used.

8.4.3 Mounting location of optional terminal

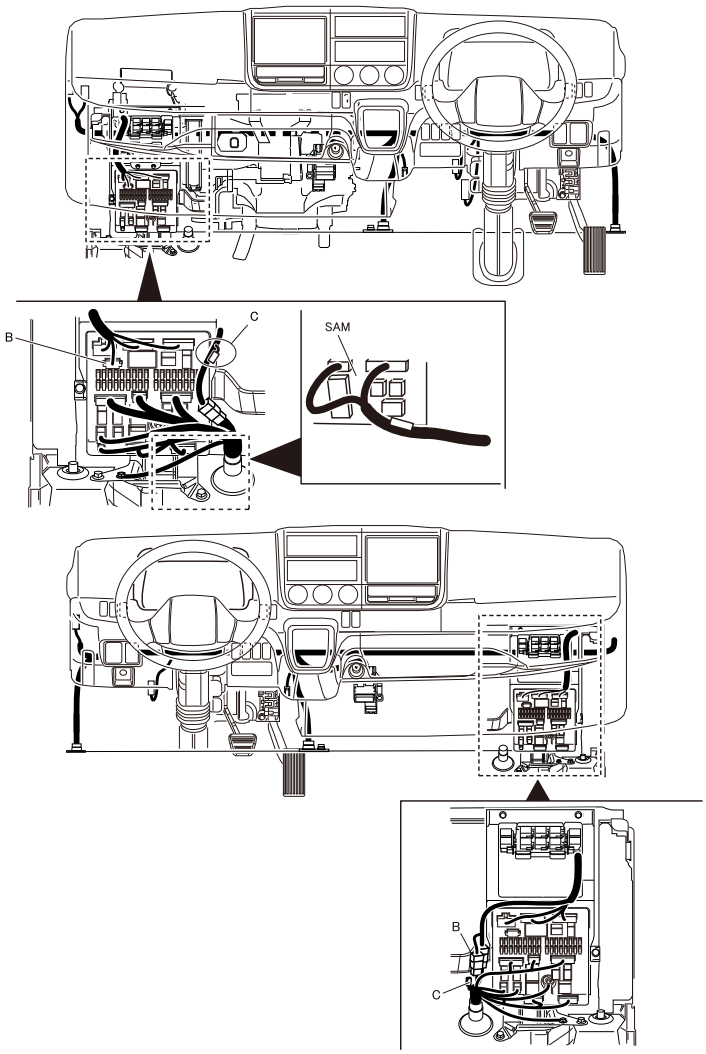
- Inside Cab



No.	Part Name	Connector No.	Circuit Description				Mating Connector
			No.	Circuit	Line color	Load	
A	OPTION CONNECTOR (Tachograph navigation)	MH056874 1 2 3 4 5 6	01 02 03 04 05 06	MAIN (12V) SPEEDSIG(25P) SPEEDSIG(8P)	Y-G Lg O-L	- - -	MH056807 

-: The connector marked with - is used for signal cabling only, not used to connect the loads.

AB



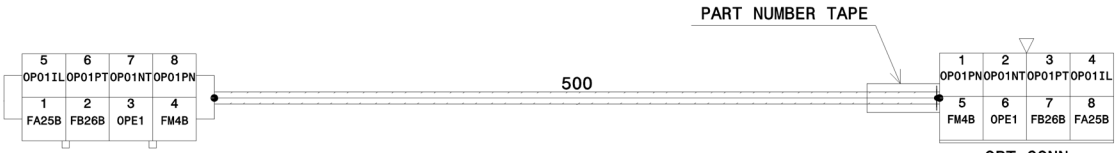
No.	Part Name	Connector No.	Circuit Description				Mating Connector
			No.	Circuit	Line color	Load	
B	OPTION CONNECTOR (Only When sub harness (MK649751) is arranged)	MH052847 1 2 3 4 5 6 7 8	01 02 03 04 05 06 07 08	PARKING ON (24 V/12 V) NEUTRAL (24 V/12 V) PTO (24 V/12 V) ILL (24 V/12 V) MAIN (24 V/12 V) GND BATT (24 V/12 V) ACC (24 V/12 V)	Br R-G Lg-R O-B L-R B G-R W-R	*1 *1 *1 *1 *1 10A *1 *1	MH052805
C	OPTION CONNECTOR	MH056867 1 2	01 02	IDLE UP (SWtoGND)	R-B	-	MH056800

-: 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.

AB

Sub-harness(MK649751) details



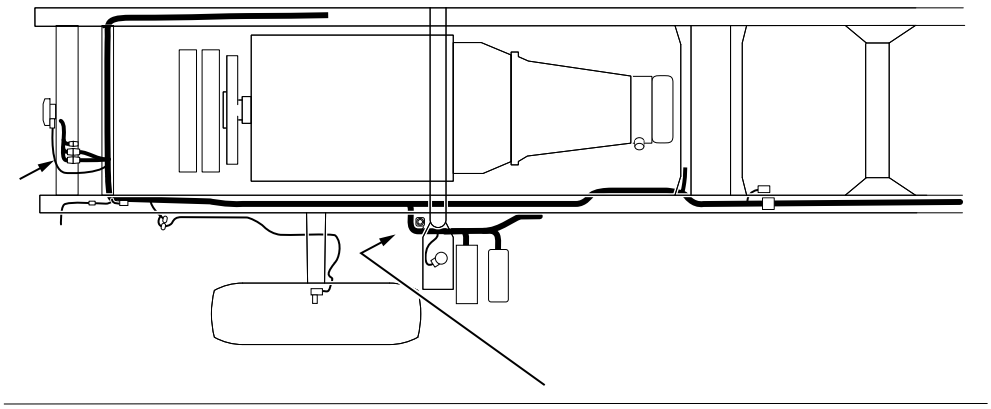
SAM 4X
1 04 00 56142 3
KOSTAL

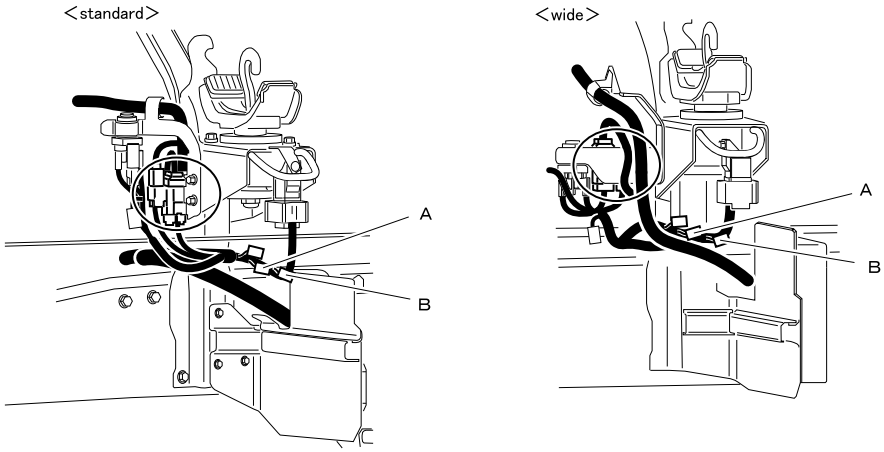
Cav	No	Wire	M/C	Spec	Col	To	Cav
1	FA25B	CAVS		0.5	W/R	OPT CONN	8
2	FB26B	CAVS		0.5	G/R	OPT CONN	7
3	OPE1	CAVS		0.85	B	OPT CONN	6
4	FM4B	CAVS		0.5	L/R	OPT CONN	5
5	OP01IL	CAVS		0.5	O/B	OPT CONN	4
6	OP01PT	CAVS		0.5	Lg/R	OPT CONN	3
7	OP01NT	CAVS		0.5	R/G	OPT CONN	2
8	OP01PN	CAVS		0.5	Br	OPT CONN	1

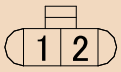
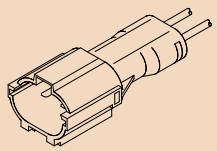
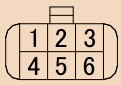
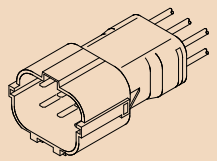
OPT CONN
MH052847
MITSUBISHI

Cav	No	Wire	M/C	Spec	Col	To	Cav
1	OP01PN	CAVS		0.5	Br	SAM 4X	8
2	OP01NT	CAVS		0.5	R/G	SAM 4X	7
3	OP01PT	CAVS		0.5	Lg/R	SAM 4X	6
4	OP01IL	CAVS		0.5	O/B	SAM 4X	5
5	FM4B	CAVS		0.5	L/R	SAM 4X	4
6	OPE1	CAVS		0.85	B	SAM 4X	3
7	FB26B	CAVS		0.5	G/R	SAM 4X	2
8	FA25B	CAVS		0.5	W/R	SAM 4X	1

- Outside Cab





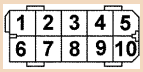
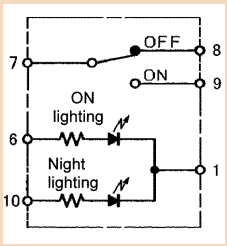
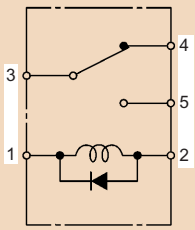
No.	Part Name	Connector No.	Circuit Description				Mating Connector
			No.	Circuit	Line color	Load	
A	OPTION CONNECTOR (side turn)	MH056451 	01 02	TURN LH (12 V) TURN RH (12 V)	Gr-L Gr-R	*1 *1	MH056401 
B	OPTION CONNECTOR (chassis)	MH056457 	01 02 03 04 05 06	BATT (24 V/12 V) ACC (24 V/12 V) MAIN (24 V/12 V) IDLE UP (SW to GND) ILL (24 V/12 V) GND	G-R W-R L-R R-B O-B B	*2 *2 *2 - - -	MH050090 

-: 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.

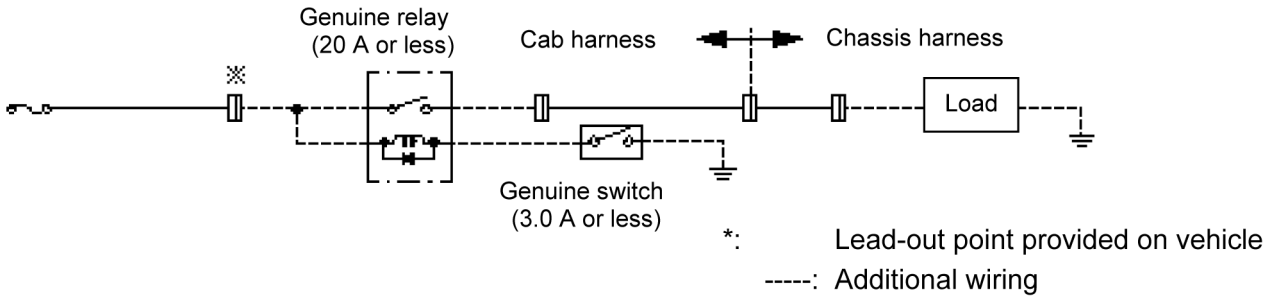
*2: Loads to be connected to the connector marked with *2 should be arranged so that the total value of the connector output in each of the cab and chassis side shall not exceed the permissible current.

8.4.4 Installation of switches and relays for equipment

Part Name	Mitsubishi Part No.	Allowable Current	Connector (Harness side)	Circuit
Rocker switch	MK645424	3.0 A or less	 MCP2.8 type connector Housing: A0145450026 Terminal: A0145451126KZ (wire diameter: 0.3 mm^2) A0135457626KZ (wire diameter: 0.5 to 0.85 mm^2)	
Relay	MK420479 24 V type	Between ⑤ & ④ (normally open side): 10 A max Between ⑤ & ② (normally closed side): 5 A max	 Connector type EQ5A (MH059820)	 1: Power supply side 2: Ground side
	MK420480 12 V type	Between ⑤ & ④ (normally open side): 20 A max Between ⑤ & ② (normally closed side): 10 A maxs		

Notes:

1. If the total load current to the equipment connected to the switch for equipment exceeds 3.0 A, a relay must be added to prevent the flow of any load current exceeding 3.0 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" ▷ 8.1.1.
   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



8.5 Charging/discharging balance

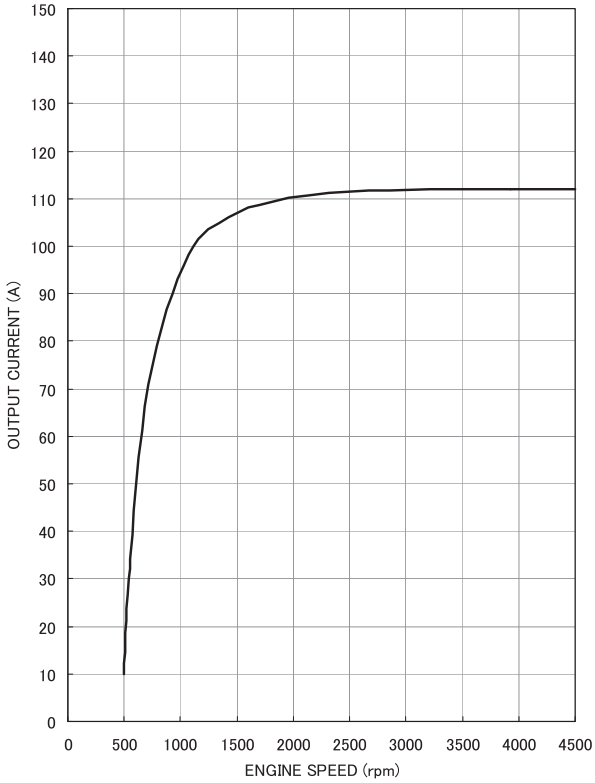
The charging/discharging balance may become worse in the following operating conditions. For this reason, reduce the electrical load during work referring to the Engine Alternator Performance Curves.

- When there is a lot of night work
- When working for a long time with the engine idling
- When many large load electrical auxiliary equipments are connected

In particular, when mainly idling the engine during night work, make sure that the electrical load is lower than the output current of the alternator.

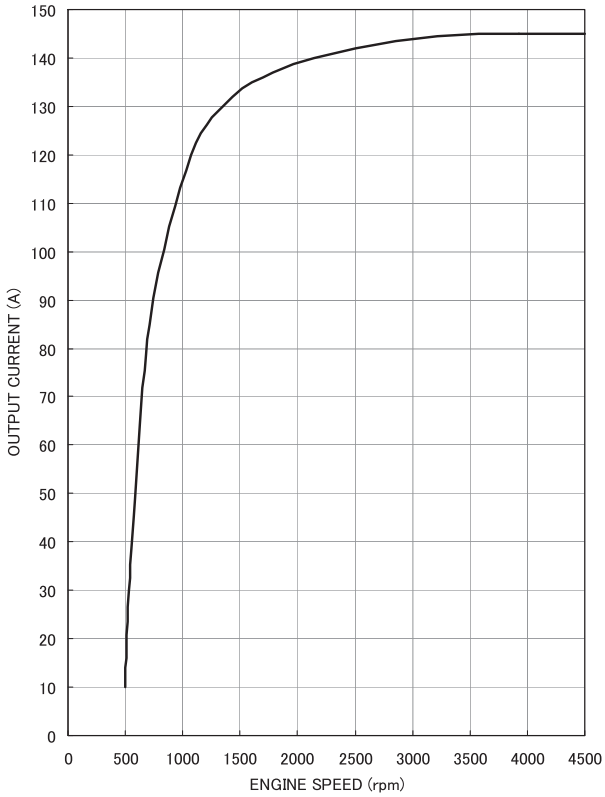
- Engine Alternator Performance Curves

Alternator 12V-110A

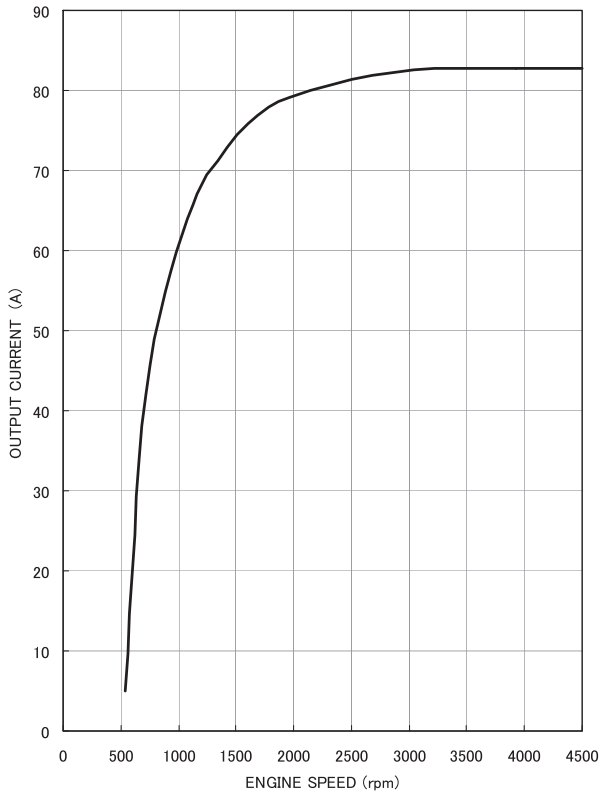


8.5 Charging/discharging balance

Alternator 12V-140A

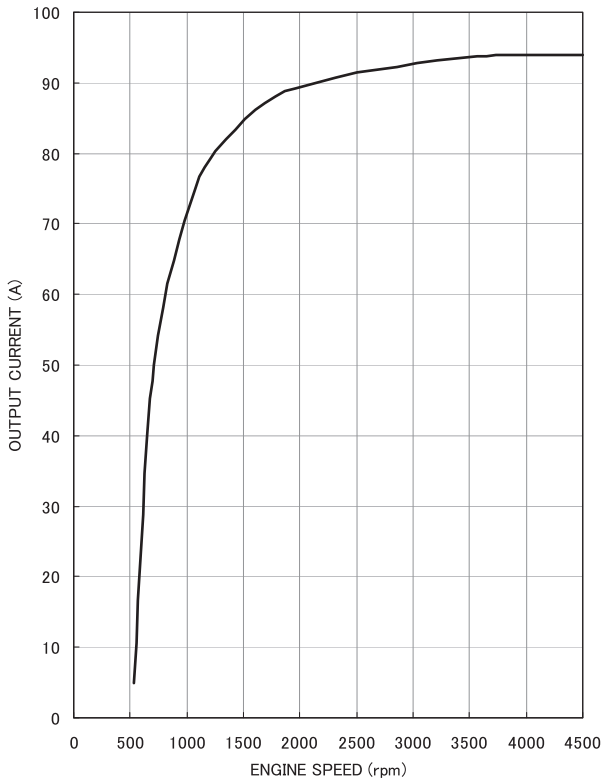


Alternator 24V-80A



B

Alternator 24V-90A (option)

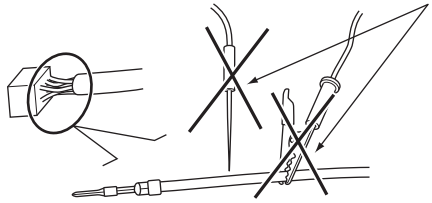


8.6 Electric circuit continuity check

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.

Sticking of test bar or electric circuit check lamp needle into cable insulation is prohibitive.

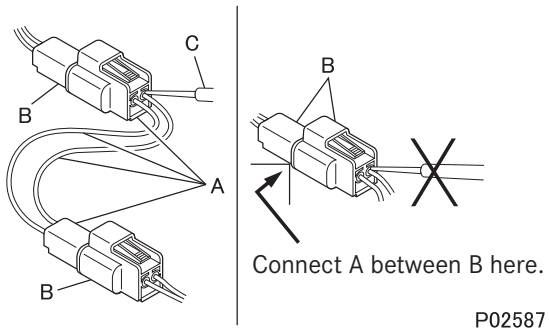


8.6.1 Check procedures

Continuity check with mating connectors joined (with continuity established in circuit)

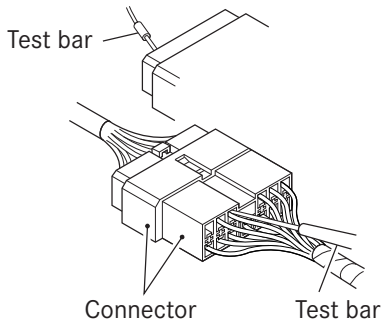
Waterproof connector

- 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.



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.

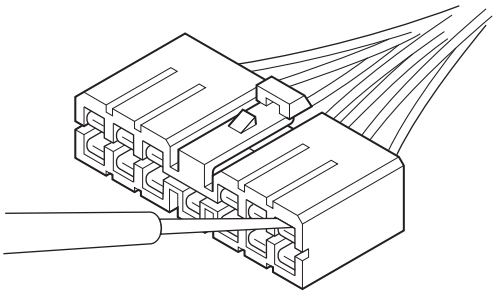


8.6 Electric circuit continuity check

Continuity check with connectors disjoined

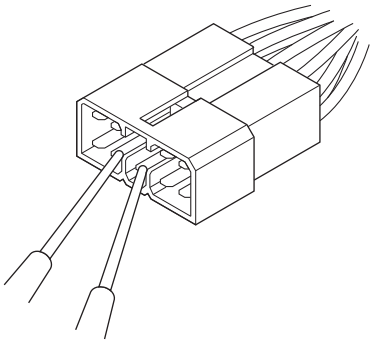
Check with female connector pins

- Perform the check with the test bar inserted in the pins.
- Forced bar insertion could result in poor contact.



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.

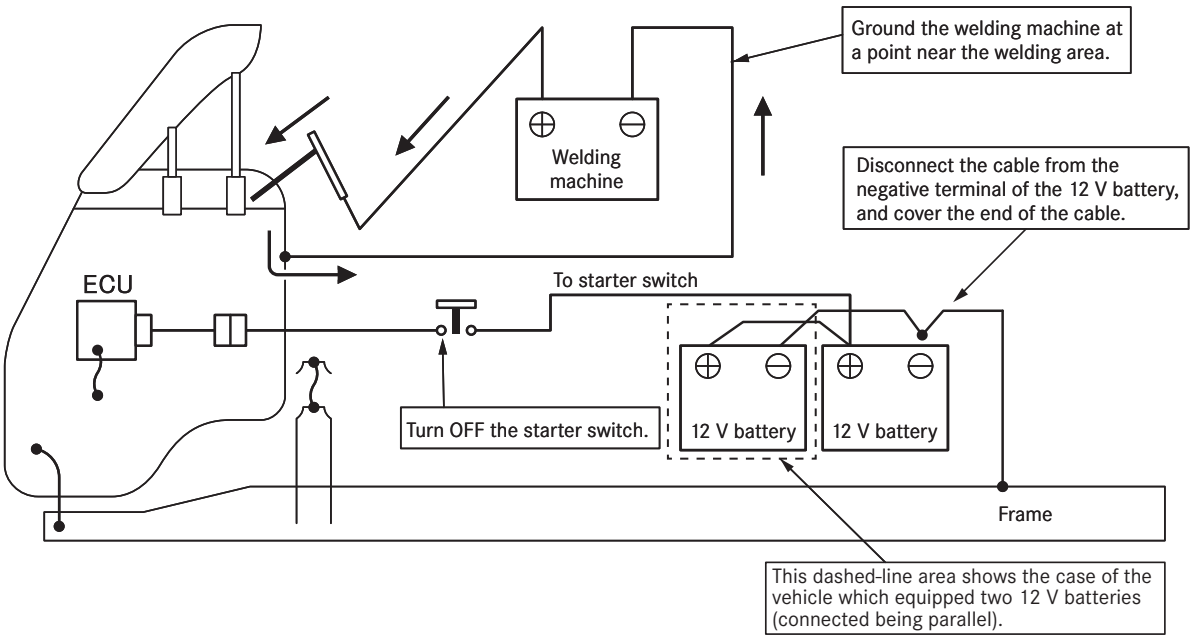


8.7 Precautions for electric welding

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.

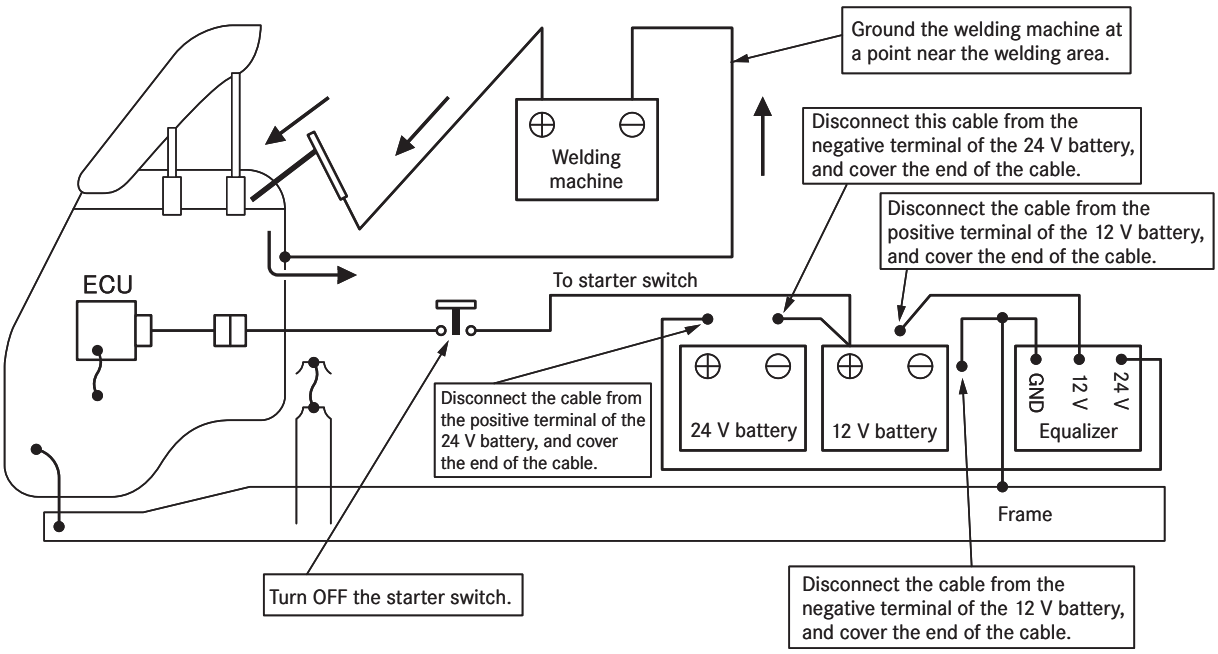
- Preparations for arc welding
  On the vehicle are mounted electronic devices and an electronic control unit (ECU) which are connected directly to the battery. If you carry out arc welding with these devices connected, current from the welding machine may flow in the reverse direction through the ground circuit and damage the devices.
  If you do not observe the precautions for welding, welding current will flow through the following circuit: ▷ 8.7
  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 a ground using a chassis spring because this may result in damage to the spring.

G (Vehicles with 12 V power supply system)



8.7 Precautions for electric welding

(Vehicles with 24 V power supply system)



- 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 with your local MITSUBISHI FUSO dealer.
  (e) For the precautions to observe concerning the SRS airbag when carrying out welding work, refer to ▷ 6.16.1.
  (f) For the precautions to observe concerning the BlueTec® exhaust gas aftertreatment when carrying out welding work, refer to ▷ 6.14.

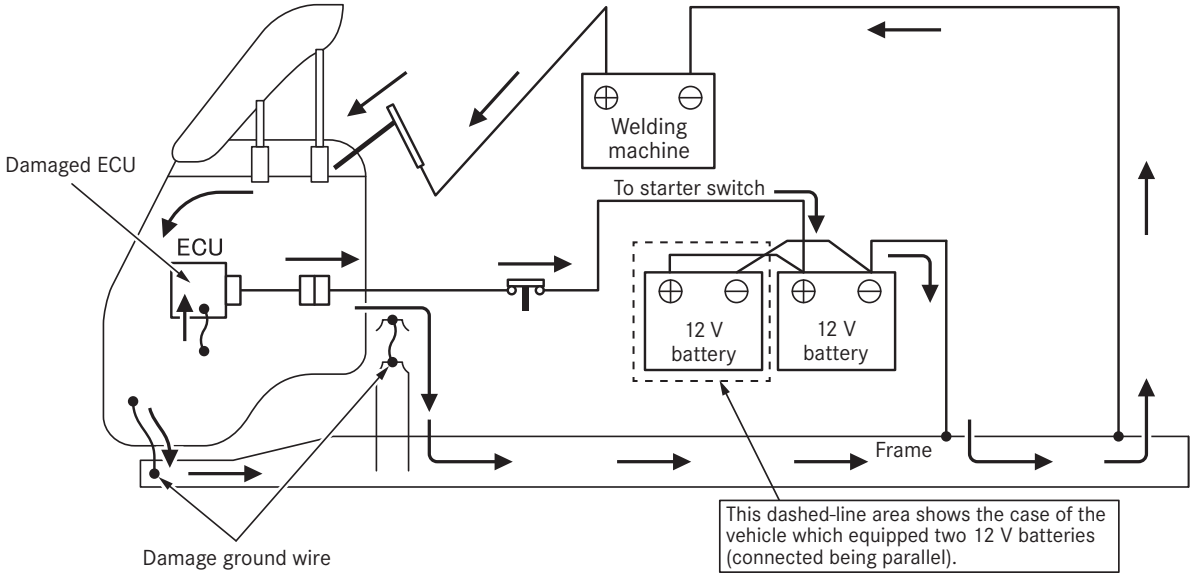
8.7 Precautions for electric welding

- If you do not observe the precautions for welding, welding current will flow through the following circuit:

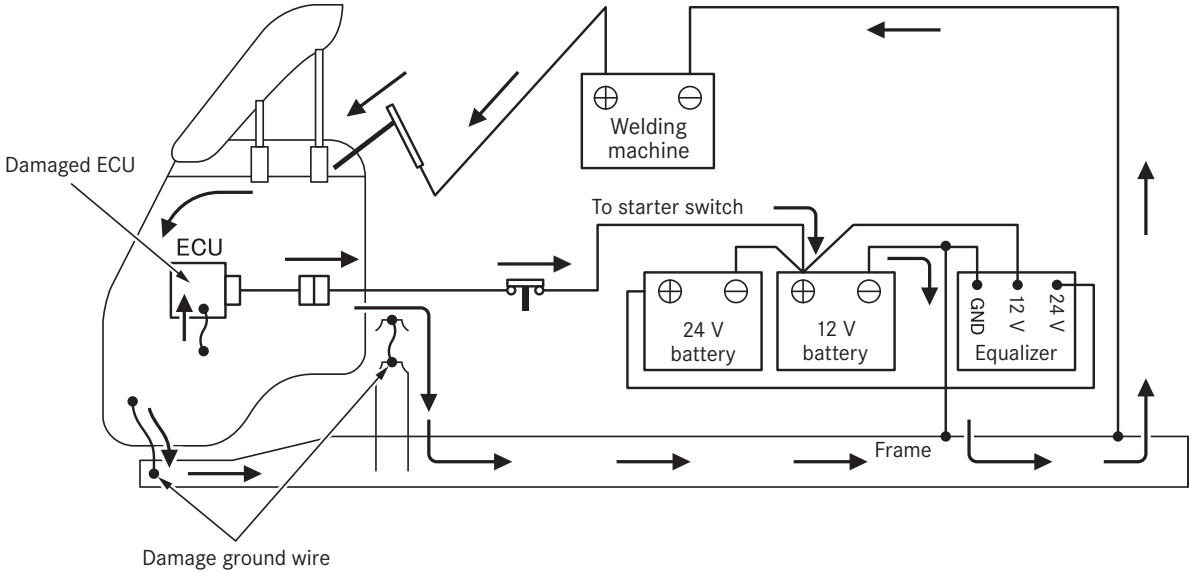
Welding rod→Cabin meta→ECU→ECU wiring→Battery→Battery ground→Welding machine ground
Ground wire

As a result, other wiring including the ECU and the ground wire will be damaged.

(Vehicles with 12 V power supply system)



(Vehicles with 24 V power supply system)



8.8 Lighting

8.8.1 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 the nearest MITSUBISHI FUSO authorized Distributer to change the parameters of the SAM control unit. 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.
  (2) Harness extension
  The extension harness for the rear combination lamp is available now. please use it.

Unit: mm

Application	Length	Part No.
Extension harness for rear combination lamp	400	MC115366
	900	MC115367

- 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.

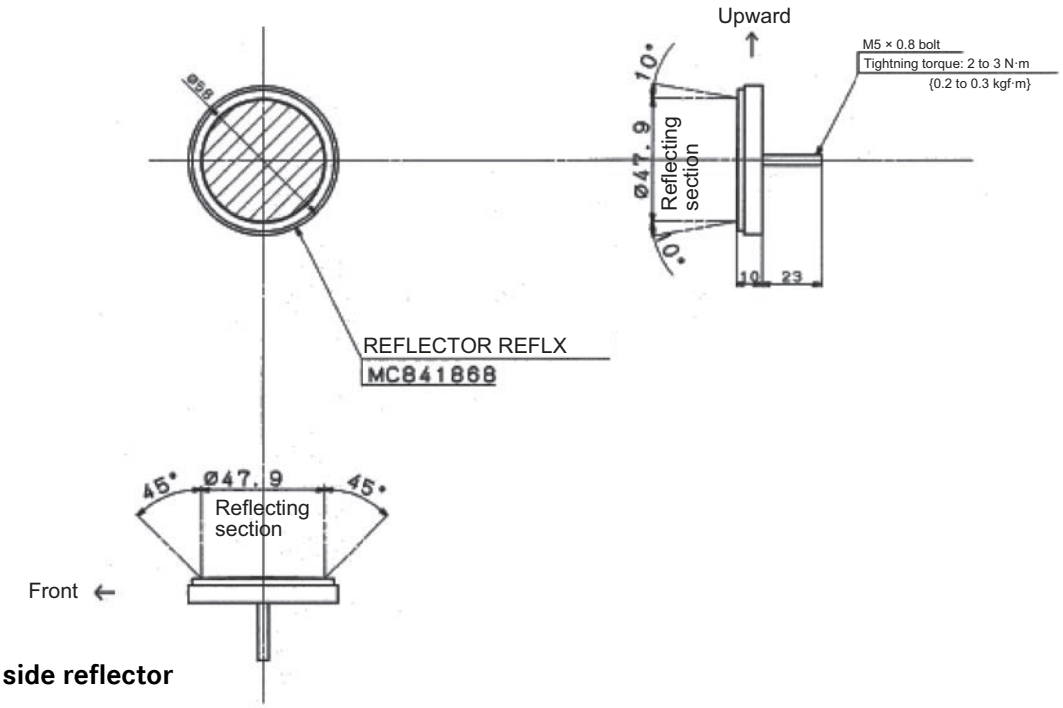
- Installation of side reflectors
  Remove side reflectors from the frame during body building for later use. For additional requirements, use MITSUBISHI FUSO genuine parts.
  The front side reflector, removed from the frame, can no longer be reused. Use a new part if replacement is necessary for a damage one.

8.8.2 Side reflector

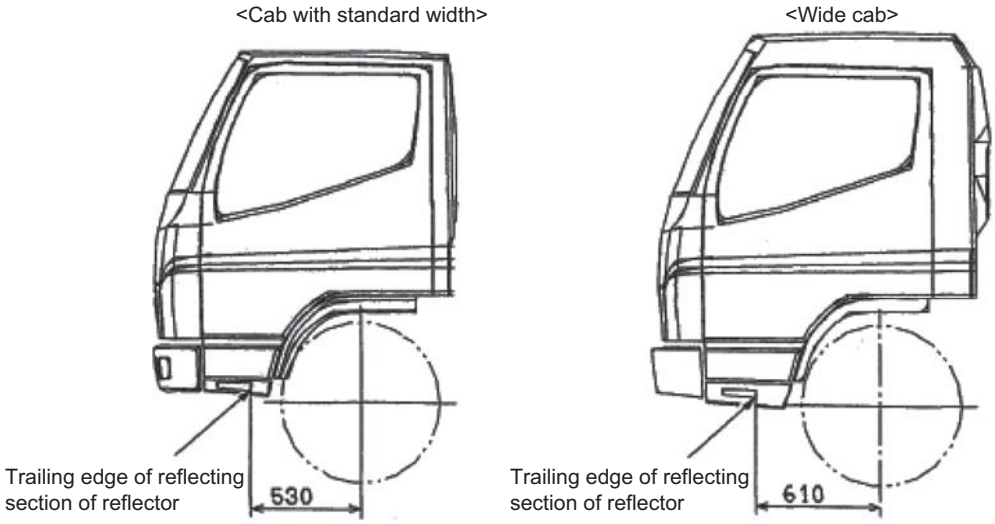
The side reflectors must be removed before starting the body mounting work.

If any additional side reflectors are to be installed, be sure to use MITSUBISHI FUSO genuine reflectors.

Side reflector



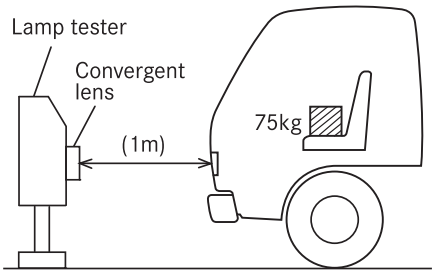
Front side reflector

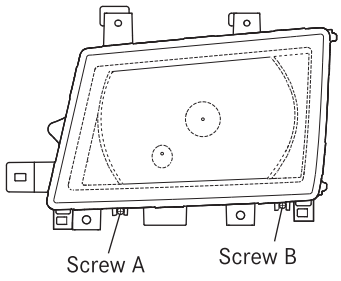


8.8.3 Headlamp aiming

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 engine 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.



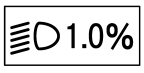


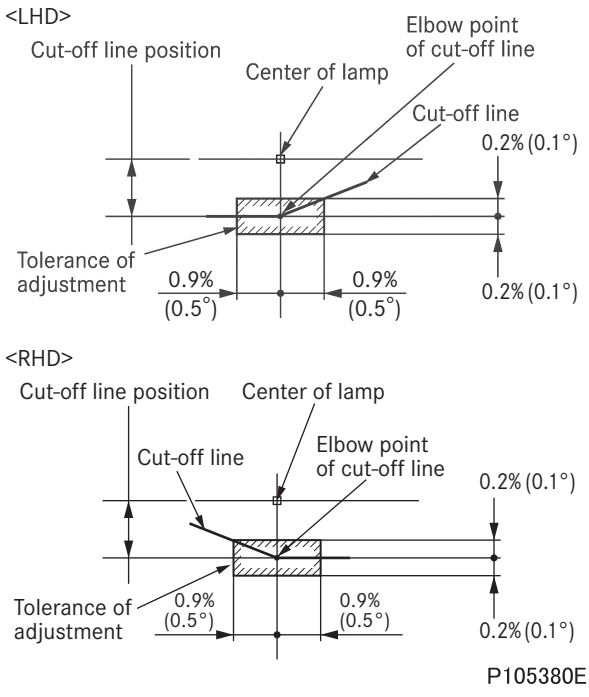
Adjustment

- Do not mask a lit headlamp for more than 2 minutes or the heat generated might cause a fire.

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

<Except EuroV Australia / New Zealand(2024~)>

- Turn on dipped beam.
- Make adjustment by the following procedure so that the elbow point of dipped beam cut-off line is in the illustrated position.
- Vertical adjustment: Adjust by turning screws A and B in this order by the same amount.
- Horizontal adjustment: Turn screw B.
- Adjust the optical axes of the dipped beams so that the cut-off line position can conform to the standard value.

B

Model	Initial optical axis label	Optical axis adjustment angle
Except FG High Floor	1.0%	1.0% (0.57°)
FG High Floor	1.5%	1.5% (0.86°)

Vertical adjustment: Turn screws A and B in that sequence by equal amounts at a time.

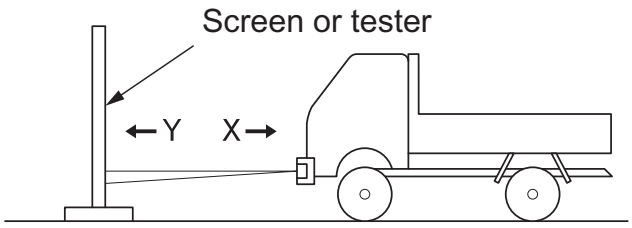
Horizontal adjustment: Perform adjustment by turning screw B.

	Optical axis adjustment direction							
	Right headlamp				Left headlamp			
	Up	Down	Left	Right	Up	Down	Left	Right
Screw A	Counter-clockwise	Clockwise			Counter-clockwise	Clockwise		
Screw B	Counter-clockwise	Clockwise	Counter-clockwise	Clockwise	Counter-clockwise	Clockwise	Clockwise	Counter-clockwise

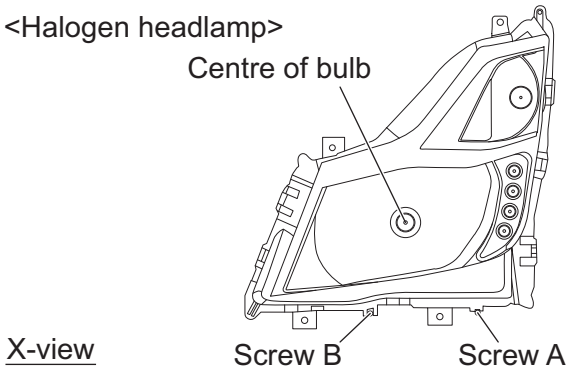
AH

<For EuroV Australia / New Zealand(2024~)>

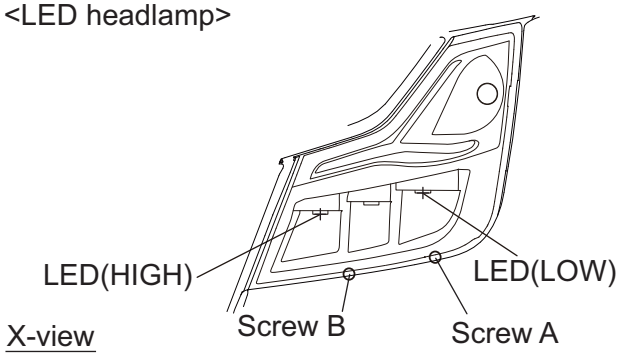
- Turn on the dipped beam.
- Adjust according to the following procedures so that the elbow point of the dipped beam cut-off line is in the position as illustrated.

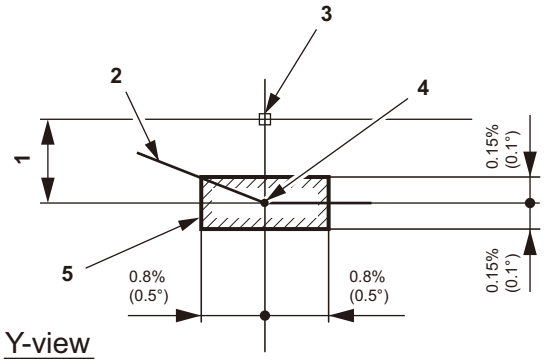


<Halogen headlamp>



<LED headlamp>





Y-view

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 Centre of lamp
4 Elbow point of cut-off line
5 Tolerance of adjustment

- Vertical adjustment: Turn Screw B to adjust.
- 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.

8.8.4 Fog lamp

<Except EuroV Australia / New Zealand(2024~)>

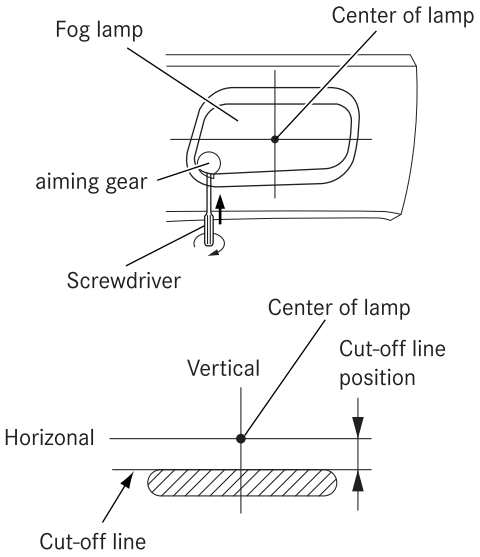
After carrying out body-building, perform re-adjustment of aiming.

Using the aiming adjustment gear, adjust the left and right fog lamps to the correct optical axis.

Adjust the angle of the optical axis of the fog lamp so that the light-dark boundary line is in the location shown in the figure below.

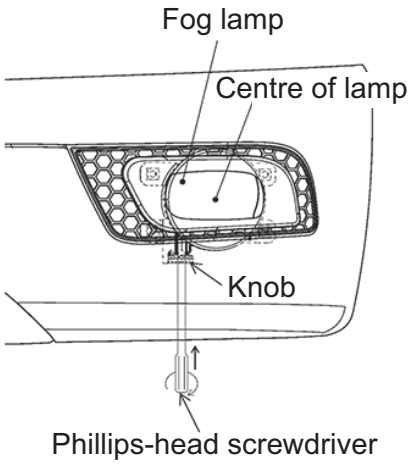
Location of light-dark boundary line	Adjustment value
	1.5%(0.86°) or less

	Optical axis adjustment direction	
	Up	Down
Driver rotation direction	Clockwise	Counter-clockwise

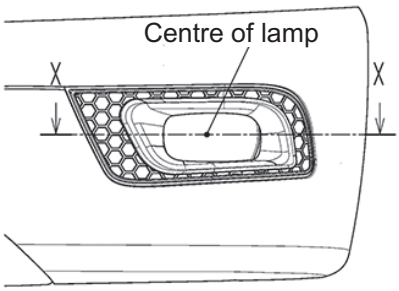


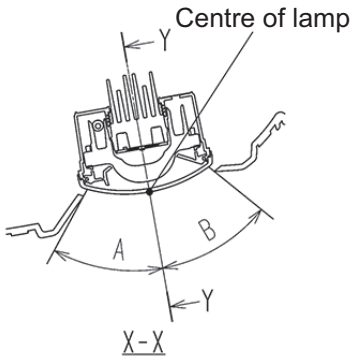
<For EuroV Australia / New Zealand(2024~)>

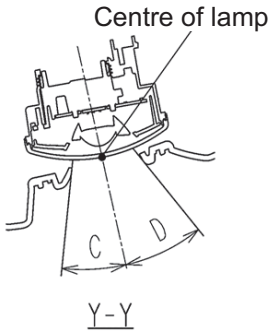
- After carrying out body-building, perform re-adjustment of aiming.
- Turn the knob at the lower side of the fog lamp using a Phillips-head screwdriver, so that the cut-off line is within the adjustment value.



(a) How to align the centre of the fog lamp



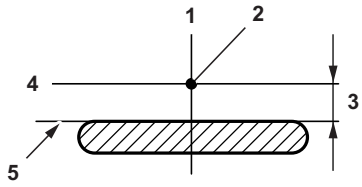




Unit: mm

	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 centre.



	Optical axis adjustment direction	
	Up	Down
Rotation direction	Clockwise	Counter-clockwise

1 Vertical
2 Lamp centre
3 Cut-off line position
4 Horizontal
5 Cut-off line

Cut-off line position	Adjustment value
	1.0 (0.57°) % or less

8.9 Mobile communications systems

The ADR/GGVS regulations (Hazardous Materials Road Transport Regulations and European Agreement concerning the International Carriage of Dangerous Goods by Road) and the manufacturer's information and installation specification must be observed.

If mobile communication systems (e.g. telephone, CB radio) are retrofitted, the following requirements must be fulfilled in order to avoid malfunctions developing on the vehicle at a later stage.

Equipment

- The equipment must have official approval and correspond to DIN 50498.
- The equipment must be permanently installed.
- Operation of portable or mobile equipment inside the cab is only permitted if this equipment is connected to a permanently installed external aerial.
- The transmitter must be installed separately from all other vehicle electronics.
- Protect equipment from moisture.
- Observe the permissible operating temperature.
- Protect the equipment against severe mechanical vibrations.

Aerial (for two-way radio sets)

- The aerial must be officially licensed.

Connection and wiring

- The connection should be made directly to teriminal inside cab ▷ 8.4.3.
- Disconnect the unit from the electrical system before jump-starting.
- Cables should be wired via the shortest possible route (not looped) and twisted.
- Ensure that the system has a good ground connection to the body (aerial and equipment).
- The aerial and connecting cables between the transmitter, receiver and control panel must be routed separately from the vehicle wiring harness in the vicinity of the body ground.
- Make sure that the aerial cable is not kinked or crushed.

Additional information

The notes on operating safety and vehicle safety in Section 1 "Introduction" ▷ 1.3 and ▷ 1.4 must be complied with.

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)>

AI	20. June. 2025	Additional specifications included
AH	21. June. 2024	Additional specifications included
AG	05. April. 2024	Additional specifications included
AF	25. August. 2023	Additional specifications included
AE	11. November. 2022	Additional specifications included
AD	15. September. 2022	Additional specifications included
AC	13. April. 2022	Additional specifications included
AB	14. January. 2022	Correction
AA	30. August. 2021	Additional specifications included
Z	07. June. 2021	Additional specifications included
Y	30. April. 2021	Additional specifications included
X	30. September. 2020	Additional specifications included
W	17. July. 2020	Additional specifications included
V	13. March. 2020	Additional specifications included
U	31. January. 2020	Additional specifications included
T	18. December. 2019	Additional specifications included
S	30. September	Additional specifications included
R	29. March. 2019	Additional specifications included
Q	29. June. 2018	Additional specifications included
P	08. March. 2018	Correction
O	31. October. 2017	Additional specifications included
N	30. June. 2017	Additional specifications included
M	04. September. 2015	Additional specifications included
L	29. MAY. 2015	Additional specifications included
K	06. March. 2015	Additional specifications included
J	26. December. 2014	Additional specifications included
I	07. November. 2014	Other models added
H	29. August. 2014	Additional specifications included
G	18. June. 2014	Other models added
F	28. January. 2014	Added notices for wiring
–	29. November. 2013	–
E	31. October. 2013	Other models added
D	20. September. 2013	Other models added
–	31. July. 2013	–
C	28. September. 2012	Additional specifications included
B	28. June. 2012	Other models added
A	25. January. 2012	Added notices for wiring
–	24. October. 2011	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 <Common section>

CANTER

MITSUBISHI FUSO TRUCK & BUS CORPORATION

June. 2025 TL201_F

Body/equipment mounting directives
Technical data section
Australia

MITSUBISHI FUSO TRUCK & BUS CORPORATION
July. 2025 TL2FA

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10.1 Model line-up

Model	Type	Drive system	Crew	Engine			G.V.W. (kg)	G.C.W. (kg)	Tire
				Model	Output (kw)	Torque (Nm)			
FEA61BR4SFBM	Forward control tilt cab	4×2	3	4P10	110	400	4500	8000	205/85R16
FEB21CR4SFBM									185/85R16
FEB21ER4SFBM									
FEB51ER4SFBM							6000	9500	205/85R16
FEB51GR4SFBM									
FEB71GR4SFBM							7500	11000	215/75R17.5
FEB71GR4WFBM	Forward control fixed cab		7						
FEB91GR4WFBP					129	430	8200	11700	
FEC71ER4SFBM	Forward control tilt cab		3		110	400	7500	11000	
FEC71HR4SFBM									
FEC81CR4SFBM									
FECX1GR4SFBP					129	430	8550	12050	
FECX1GR4WFBP	Forward control fixed cab		7						
FECX1HR4SFBP	Forward control tilt cab		3						
FECX1KR4SFBP									
FEA21CR3SFBM					110	400	4500	8000	185/85R16
FEA21ER3SFBM									
FEA21ER3SFBR									
FEA21ER3WFBM	Forward control fixed cab		6						195/85R15
FEA61BR3SFBM	Forward control tilt cab		3						205/85R16
FEB21CR3SFBM									185/85R16
FEB21ER3SFBM									
FEB51ER3SFBM							6000	9500	205/85R16
FEB51GR3SFBM									
FEB71ER3WFBM	Forward control fixed cab		7				7500	11000	215/75R17.5
FEB71GR3SFBM	Forward control tilt cab		3						
FEB71GR3WFBM	Forward control fixed cab		7						
FEB91ER3WFBP					129	430	8200	11700	
FEB91GR3WFBP									
FEC71ER3SFBM	Forward control tilt cab		3		110	400	7500	11000	
FEC71HR3SFBM									
FEC81CR3SFBM									
FECX1GR3SFBP					129	430	8550	12050	
FECX1GR3WFBP	Forward control fixed cab		7						
FECX1HR3SFBP	Forward control tilt cab		3						
FECX1KR3SFBP									
FGB71ER6SFBM		4×4			110	400	6500	10000	
FGB71ER6WFBM	Forward control fixed cab		7						

10.2 Specifications

10.2.1 Specifications

(1) FE

Model		FEA61BR4SFBM	FEB21CR4SFBM	FEB21ER4SFBM
Emission		EuroVI	EuroVI	EuroVI
Wheelbase (mm)		2500	2800	3400
Tread (mm)	Front	1390	1655	1655
	Rear	1235	1495	1495
Curb weight (kg) *		2100	2050	2075
	Front*	1405	1470	1470
	Rear*	695	580	605
Max. G.V.W. (kg)		4500	4500	4500
Max. G.C.W. (kg)		8000	8000	8000
Model		4P10-VAT4	4P10-VAT4	4P10-VAT4
Max. Output (EEC)		110 kW /2626 rpm	110 kW /2626 rpm	110 kW /2626 rpm
Max. Torque (EEC)		400 Nm/1600 rpm	400 Nm/1600 rpm	400 Nm/1600 rpm
Clutch		C3W28-modi	C3W28-modi	C3W28-modi
Transmission		M038S5	M038S5	M038S5
	Gear ratio	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494
Propeller shaft		P3	P3	P3
Transfer		-	-	-
Rear axle		R033T	R030T	R030T
Final reduction gear		D033H	D3H	D3H
	Ratio	STD: 4.875 OPT: 5.285	STD: 4.444 OPT: 4.875	STD: 4.444 OPT: 4.875
Front axle		F200T	F200T	F200T
Tires		205/85R16	185/85R16	185/85R16
Wheels		16x5 1/2K-115-8t-5studs	16x5 1/2K-115-8t-5studs	16x5 1/2K-115-8t-5studs
Steering angle (in/out)		39° / 30°	48°/ 41°	48°/ 41°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
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		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers	Double wishbone independent suspension with shock absorbers (Coil spring)	Double wishbone independent suspension with shock absorbers (Coil spring)
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
P.T.O		T/M PTO (tipper, 15kgfm, wire, direct connected pump)	-	-
Fuel system	Injection pump	Unit pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor	Electronic control governor
Fuel tank		70 L	100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR	DPF+SCR
Electrical	Voltage	-	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2
Cab		Standard, Single	Wide, Single	Wide, Single
Crew		3	3	3

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2 Specifications

Model		FEB51ER4SFBM	FEB51GR4SFBM	FEB71GR4SFBM
Emission		EuroVI	EuroVI	EuroVI
Wheelbase (mm)		3400	3850	3850
Tread (mm)	Front	1670	1670	1675
	Rear	1495	1495	1560
Curb weight (kg) *		2260	2280	2455
	Front*	1555	1555	1600
	Rear*	705	725	855
Max. G.V.W. (kg)		6000	6000	7500
Max. G.C.W. (kg)		9500	9500	11000
Model		4P10-VAT4	4P10-VAT4	4P10-VAT4
Max. Output (EEC)		110 kW /2626 rpm	110 kW /2626 rpm	110 kW /2626 rpm
Max. Torque (EEC)		400 Nm/1600 rpm	400 Nm/1600 rpm	400 Nm/1600 rpm
Clutch		C3W28-modi	C3W28-modi	C4W30
Transmission		M038S5	M038S5	M038S5
	Gear ratio	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494
Propeller shaft		P3	P3	P3
Transfer		-	-	-
Rear axle		R030T	R030T	R035T
Final reduction gear		D3H	D3H	D035H
	Ratio	STD: 4.875 OPT: 5.285	STD: 4.875 OPT: 5.285	5.285
Front axle		F200T	F200T	F350T
Tires		205/85R16	205/85R16	215/75R17.5
Wheels		16x5 1/2K-115-8t-5studs	16x5 1/2K-115-8t-5studs	17.5x6.00-127-9t-6studs
Steering angle (in/out)		49°/ 36°	49°/ 36°	45°/ 34°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
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		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
P.T.O		-	-	-
Fuel system	Injection pump	Unit pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor	Electronic control governor
Fuel tank		100 L	100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR	DPF+SCR
Electrical	Voltage	-	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2
Cab		Wide, Single	Wide, Single	Wide, Single
Crew		3	3	3

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2 Specifications

Model		FEB71GR4WFBM	FEB91GR4WFBP	FEC71ER4SFBM
Emission		EuroVI	EuroVI	EuroVI
Wheelbase (mm)		3850	3850	3400
Tread (mm)	Front	1675	1675	1675
	Rear	1560	1560	1670
Curb weight (kg) *		2655	2690	2430
	Front*	1740	1760	1575
	Rear*	915	930	855
Max. G.V.W. (kg)		7500	8200	7500
Max. G.C.W. (kg)		11000	11700	11000
Model		4P10-VAT4	4P10-VAT6	4P10-VAT4
Max. Output (EEC)		110 kW /2626 rpm	129 kW / 2865 rpm	110 kW /2626 rpm
Max. Torque (EEC)		400 Nm/1600 rpm	430 Nm / 1600 rpm	400 Nm/1600 rpm
Clutch		C4W30	C4W30	C4W30
Transmission		M038S5	M038S5	M038S5
	Gear ratio	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494
Propeller shaft		P3	P3	P3
Transfer		–	-	-
Rear axle		R035T	R035T	R035T
Final reduction gear		D035H	D035H	D035H
	Ratio	5.285	5.285	5.285
Front axle		F350T	F350T	F350T
Tires		215/75R17.5	215/75R17.5	215/75R17.5
Wheels		17.5x6.00-127-9t, 6studs	17.5x6.00-127-9t-6studs	17.5x6.00-127-9t-6studs
Steering angle (in/out)		45°/ 34°	45°/ 34°	45°/ 34°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
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		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
P.T.O		–	-	-
Fuel system	Injection pump	Unit pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor	Electronic control governor
Fuel tank		100 L	100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR	DPF+SCR
Electrical	Voltage	-	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD:115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2
Cab		Wide, Crew	Wide, Crew	Wide, Single
Crew		7 (3+4)	7 (3+4)	3

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2 Specifications

Model		FEC71HR4SFBM	FEC81CR4SFBM	FECX1GR4SFBP
Emission		EuroVI	EuroVI	EuroVI
Wheelbase (mm)		4300	2800	3850
Tread (mm)	Front	1675	1675	1675
	Rear	1670	1670	1670
Curb weight (kg) *		2505	2405	2485
	Front*	1610	1590	1590
	Rear*	895	815	895
Max. G.V.W. (kg)		7500	7500	8550
Max. G.C.W. (kg)		11000	11000	12050
Model		4P10-VAT4	4P10-VAT4	4P10-VAT6
Max. Output (EEC)		110 kW /2626 rpm	110 kW /2626 rpm	129 kW / 2865 rpm
Max. Torque (EEC)		400 Nm/1600 rpm	400 Nm/1600 rpm	430 Nm / 1600 rpm
Clutch		C4W30	C4W30	C4W30
Transmission		M038S5	M038S5	M038S5
	Gear ratio	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494
Propeller shaft		P3	P3	P3
Transfer		-	-	–
Rear axle		R035T	R035T	R035T
Final reduction gear		D035H	D035H	D035H
	Ratio	5.285	5.285	5.285
Front axle		F350T	F350T	F350T
Tires		215/75R17.5	215/75R17.5	215/75R17.5
Wheels		17.5x6.00-127-9t-6studs	17.5x6.00-127-9t-6studs	17.5x6.00-127-9t-6studs
Steering angle (in/out)		45°/ 34°	45°/ 34°	45°/ 34°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
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		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
P.T.O		-	-	–
Fuel system	Injection pump	Unit pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor	Electronic control governor
Fuel tank		100 L	100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR	DPF+SCR
Electrical	Voltage	-	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2
Cab		Wide, Single	Wide, Single	Wide, Single
Crew		3	3	3

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2 Specifications

Model		FECX1GR4WFBP	FECX1HR4SFBP	FECX1KR4SFBP
Emission		EuroVI	EuroVI	EuroVI
Wheelbase (mm)		3850	4300	4750
Tread (mm)	Front	1675	1675	1675
	Rear	1670	1670	1670
Curb weight (kg) *		2700	2520	2540
	Front*	1765	1615	1625
	Rear*	935	905	915
Max. G.V.W. (kg)		8550	8550	8550
Max. G.C.W. (kg)		12050	12050	12050
Model		4P10-VAT6	4P10-VAT6	4P10-VAT6
Max. Output (EEC)		129 kW / 2865 rpm	129 kW / 2865 rpm	129 kW / 2865 rpm
Max. Torque (EEC)		430 Nm / 1600 rpm	430 Nm / 1600 rpm	430 Nm / 1600 rpm
Clutch		C4W30	C4W30	C4W30
Transmission		M038S5	M038S5	M038S5
	Gear ratio	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494
Propeller shaft		P3	P3	P3
Transfer		–	–	–
Rear axle		R035T	R035T	R035T
Final reduction gear		D035H	D035H	D035H
	Ratio	5.285	5.285	5.285
Front axle		F350T	F350T	F350T
Tires		215/75R17.5	215/75R17.5	215/75R17.5
Wheels		17.5x6.00-127-9t-6studs	17.5x6.00-127-9t-6studs	17.5x6.00-127-9t-6studs
Steering angle (in/out)		45°/ 34°	45°/ 34°	45°/ 34°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
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		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
P.T.O		–	–	–
Fuel system	Injection pump	Unit pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor	Electronic control governor
Fuel tank		100 L	100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR	DPF+SCR
Electrical	Voltage	-	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2
Cab		Wide, Crew	Wide, Single	Wide, Single
Crew		7 (3+4)	3	3

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2 Specifications

Model		FEA21CR3SFBM	FEA21ER3SFBM FEA21ER3SFBR	FEA21ER3WFBM
Emission		EuroVI	EuroVI	EuroVI
Wheelbase (mm)		2800	3400	3400
Tread (mm)	Front	1390	1390	1390
	Rear	1435	1435	1435
Curb weight (kg) *		1945	1975	2175
	Front*	1365	1390	1505
	Rear*	580	585	670
Max. G.V.W. (kg)		4500	4500	4500
Max. G.C.W. (kg)		8000	8000	8000
Model		4P10-VAT4	4P10-VAT4	4P10-VAT4
Max. Output (EEC)		110 kW /2626 rpm	110 kW /2626 rpm	110 kW /2626 rpm
Max. Torque (EEC)		400 Nm/1600 rpm	400 Nm/1600 rpm	400 Nm/1600 rpm
Clutch		-	-	-
Transmission		M038S6	M038S6	M038S6
	Gear ratio	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397
Propeller shaft		P3	P3	P3
Transfer		-	-	-
Rear axle		R030T	R030T	R030T
Final reduction gear		D3H	D3H	D3H
	Ratio	STD: 4.444 OPT: 4.875	STD: 4.444 OPT: 4.875	STD: 4.444 OPT: 4.875
Front axle		F200T	F200T	F200T
Tires		185/85R16	185/85R16	195/85R15
Wheels		16x5 1/2K-115-8t-5studs	16x5 1/2K-115-8t-5studs	15x5.00-115-8t-5studs
Steering angle (in/out)		43°/ 37°	43°/ 37°	43°/ 37°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
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		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Double wishbone independent suspension with shock absorbers (Coil spring)	Double wishbone independent suspension with shock absorbers (Coil spring)	Double wishbone independent suspension with shock absorbers (Coil spring)
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
P.T.O		-	-	-
Fuel system	Injection pump	Unit pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor	Electronic control governor
Fuel tank		70 L	100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR	DPF+SCR
Electrical	Voltage	-	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	115D31Lx1
Cab		Standard, Single	Standard, Single	Standard, Crew
Crew		3	3	6 (3+3)

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2 Specifications

Model		FEA61BR3SFBM	FEB21CR3SFBM	FEB21ER3SFBM
Emission		EuroVI	EuroVI	EuroVI
Wheelbase (mm)		2500	2800	3400
Tread (mm)	Front	1390	1655	1655
	Rear	1235	1495	1495
Curb weight (kg) *		2125	2065	2090
	Front*	1425	1480	1485
	Rear*	700	585	605
Max. G.V.W. (kg)		4500	4500	4500
Max. G.C.W. (kg)		8000	8000	8000
Model		4P10-VAT4	4P10-VAT4	4P10-VAT4
Max. Output (EEC)		110 kW /2626 rpm	110 kW /2626 rpm	110 kW /2626 rpm
Max. Torque (EEC)		400 Nm/1600 rpm	400 Nm/1600 rpm	400 Nm/1600 rpm
Clutch		-	-	-
Transmission		M038S6	M038S6	M038S6
	Gear ratio	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397
Propeller shaft		P3	P3	P3
Transfer		-	-	-
Rear axle		R033T	R030T	R030T
Final reduction gear		D033H	D3H	D3H
	Ratio	STD: 4.875 OPT: 5.285	4.444	4.444
Front axle		F200T	F200T	F200T
Tires		205/85R16	185/85R16	185/85R16
Wheels		16x5 1/2K-115-8t-5studs	16x5 1/2K-115-8t-5studs	16x5 1/2K-115-8t-5studs
Steering angle (in/out)		39° / 30°	48°/ 41°	48°/ 41°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side	Driver side
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		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers	Double wishbone independent suspension with shock absorbers (Coil spring)	Double wishbone independent suspension with shock absorbers (Coil spring)
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
P.T.O		T/M PTO (tipper, 15kgfm, wire, direct connected pump)	-	-
Fuel system	Injection pump	Unit pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor	Electronic control governor
Fuel tank		70 L	100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR	DPF+SCR
Electrical	Voltage	-	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2
Cab		Standard, Single	Wide, Single	Wide, Single
Crew		3	3	3

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2 Specifications

Model		FEB51ER3SFBM	FEB51GR3SFBM	FEB71ER3WFBM
Emission		EuroVI	EuroVI	EuroVI
Wheelbase (mm)		3400	3850	3400
Tread (mm)	Front	1670	1670	1675
	Rear	1495	1495	1560
Curb weight (kg) *		2275	2295	2675
	Front*	1560	1560	1750
	Rear*	715	735	925
Max. G.V.W. (kg)		6000	6000	7500
Max. G.C.W. (kg)		9500	9500	11000
Model		4P10-VAT4	4P10-VAT4	4P10-VAT4
Max. Output (EEC)		110 kW /2626 rpm	110 kW /2626 rpm	110 kW /2626 rpm
Max. Torque (EEC)		400 Nm/1600 rpm	400 Nm/1600 rpm	400 Nm/1600 rpm
Clutch		-	-	-
Transmission		M038S6	M038S6	M038S6
	Gear ratio	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397
Propeller shaft		P3	P3	P3
Transfer		-	-	-
Rear axle		R033T	R033T	R035T
Final reduction gear		D033H	D033H	D035H
	Ratio	STD: 4.875 OPT: 5.285	STD: 4.875 OPT: 5.285	5.714
Front axle		F200T	F200T	F350T
Tires		205/85R16	205/85R16	215/75R17.5
Wheels		16x5 1/2K-115-8t-5studs	16x5 1/2K-115-8t-5studs	17.5x6.00-127-9t-6studs
Steering angle (in/out)		49°/ 36°	49°/ 36°	45°/ 34°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
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		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
P.T.O		-	-	-
Fuel system	Injection pump	Unit pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor	Electronic control governor
Fuel tank		100 L	100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR	DPF+SCR
Electrical	Voltage	-	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2
Cab		Wide, Single	Wide, Single	Wide, Crew
Crew		3	3	7 (3+4)

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2 Specifications

Model		FEB71GR3SFBM	FEB71GR3WFBM	FEB91ER3WFBP
Emission		EuroVI	EuroVI	EuroVI
Wheelbase (mm)		3850	3850	3400
Tread (mm)	Front	1675	1675	1675
	Rear	1560	1560	1560
Curb weight (kg) *		2465	2685	2690
	Front*	1610	1765	1750
	Rear*	855	920	940
Max. G.V.W. (kg)		7500	7500	8200
Max. G.C.W. (kg)		11000	11000	11700
Model		4P10-VAT4	4P10-VAT4	4P10-VAT6
Max. Output (EEC)		110 kW /2626 rpm	110 kW /2626 rpm	129 kW / 2865 rpm
Max. Torque (EEC)		400 Nm/1600 rpm	400 Nm/1600 rpm	430 Nm / 1600 rpm
Clutch		-	–	-
Transmission		M038S6	M038S6	M038S6
	Gear ratio	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397
Propeller shaft		P3	P3	P3
Transfer		-	–	-
Rear axle		R035T	R035T	R035T
Final reduction gear		D035H	D035H	D035H
	Ratio	5.714	5.714	6.166
Front axle		F350T	F350T	F350T
Tires		215/75R17.5	215/75R17.5	215/75R17.5
Wheels		17.5x6.00-127-9t-6studs	17.5x6.00-127-9t, 6studs	17.5x6.00-127-9t-6studs
Steering angle (in/out)		45°/ 34°	45°/ 34°	45°/ 34°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
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		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
P.T.O		-	–	-
Fuel system	Injection pump	Unit pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor	Electronic control governor
Fuel tank		100 L	100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR	DPF+SCR
Electrical	Voltage	-	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2
Cab		Wide, Single	Wide, Crew	Wide, Crew
Crew		3	7 (3+4)	7 (3+4)

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2 Specifications

Model		FEB91GR3WFBP	FEC71ER3SFBM	FEC71HR3SFBM
Emission		EuroVI	EuroVI	EuroVI
Wheelbase (mm)		3850	3400	4300
Tread (mm)	Front	1675	1675	1675
	Rear	1560	1670	1670
Curb weight (kg) *		2705	2445	2510
	Front*	1775	1590	1615
	Rear*	930	855	895
Max. G.V.W. (kg)		8200	7500	7500
Max. G.C.W. (kg)		11700	11000	11000
Model		4P10-VAT6	4P10-VAT4	4P10-VAT4
Max. Output (EEC)		129 kW / 2865 rpm	110 kW /2626 rpm	110 kW /2626 rpm
Max. Torque (EEC)		430 Nm / 1600 rpm	400 Nm/1600 rpm	400 Nm/1600 rpm
Clutch		-	-	-
Transmission		M038S6	M038S6	M038S6
	Gear ratio	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397
Propeller shaft		P3	P3	P3
Transfer		-	-	-
Rear axle		R035T	R035T	R035T
Final reduction gear		D035H	D035H	D035H
	Ratio	6.166	5.714	5.714
Front axle		F350T	F350T	F350T
Tires		215/75R17.5	215/75R17.5	215/75R17.5
Wheels		17.5x6.00-127-9t-6studs	17.5x6.00-127-9t-6studs	17.5x6.00-127-9t-6studs
Steering angle (in/out)		45°/ 34°	45°/ 34°	45°/ 34°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
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		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
P.T.O		-	-	-
Fuel system	Injection pump	Unit pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor	Electronic control governor
Fuel tank		100 L	100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR	DPF+SCR
Electrical	Voltage	-	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2
Cab		Wide, Crew	Wide, Single	Wide, Single
Crew		7 (3+4)	3	3

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2 Specifications

Model		FEC81CR3SFBM	FECX1GR3SFBP	FECX1GR3WFBP
Emission		EuroVI	EuroVI	EuroVI
Wheelbase (mm)		2800	3850	3850
Tread (mm)	Front	1675	1675	1675
	Rear	1670	1670	1670
Curb weight (kg) *		2405	2495	2705
	Front*	1590	1600	1775
	Rear*	815	895	930
Max. G.V.W. (kg)		7500	8550	8550
Max. G.C.W. (kg)		11000	12050	12050
Model		4P10-VAT4	4P10-VAT6	4P10-VAT6
Max. Output (EEC)		110 kW /2626 rpm	129 kW / 2865 rpm	129 kW / 2865 rpm
Max. Torque (EEC)		400 Nm/1600 rpm	430 Nm / 1600 rpm	430 Nm / 1600 rpm
Clutch		-	–	–
Transmission		M038S6	M038S6	M038S6
	Gear ratio	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397
Propeller shaft		P3	P3	P3
Transfer		-	–	–
Rear axle		R035T	R035T	R035T
Final reduction gear		D035H	D035H	D035H
	Ratio	5.714	6.166	6.166
Front axle		F350T	F350T	F350T
Tires		215/75R17.5	215/75R17.5	215/75R17.5
Wheels		17.5x6.00-127-9t-6studs	17.5x6.00-127-9t-6studs	17.5x6.00-127-9t-6studs
Steering angle (in/out)		45°/ 34°	45°/ 34°	45°/ 34°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
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		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
P.T.O		-	–	–
Fuel system	Injection pump	Unit pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor	Electronic control governor
Fuel tank		100 L	100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR	DPF+SCR
Electrical	Voltage	-	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2
Cab		Wide, Single	Wide, Single	Wide, Crew
Crew		3	3	7 (3+4)

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2 Specifications

Model		FECX1HR3SFBP	FECX1KR3SFBP
Emission		EuroVI	EuroVI
Wheelbase (mm)		4300	4750
Tread (mm)	Front	1675	1675
	Rear	1670	1670
Curb weight (kg) *		2530	2550
	Front*	1620	1630
	Rear*	910	920
Max. G.V.W. (kg)		8550	8550
Max. G.C.W. (kg)		12050	12050
Model		4P10-VAT6	4P10-VAT6
Max. Output (EEC)		129 kW / 2865 rpm	129 kW / 2865 rpm
Max. Torque (EEC)		430 Nm / 1600 rpm	430 Nm / 1600 rpm
Clutch		–	–
Transmission		M038S6	M038S6
	Gear ratio	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397	5.397 - 3.788 - 2.310 - 1.474 - 1.000 - 0.701 Rev. 5.397
Propeller shaft		P3	P3
Transfer		–	–
Rear axle		R035T	R035T
Final reduction gear		D035H	D035H
	Ratio	6.166	6.166
Front axle		F350T	F350T
Tires		215/75R17.5	215/75R17.5
Wheels		17.5x6.00-127-9t-6studs	17.5x6.00-127-9t-6studs
Steering angle (in/out)		45° / 34°	45° / 34°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
Service brake		hydraulic vacuum assisted 2 circuit split system	hydraulic vacuum assisted 2 circuit split system
Parking brake		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers and stabilizer	Semi-elliptic laminated leaf spring with shock absobers and stabilizer
P.T.O		–	–
Fuel system	Injection pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor
Fuel tank		100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR
Electrical	Voltage	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2	STD: 115D31Lx1 OPT: 115D31Lx2, 95D31Lx2
Cab		Wide, Single	Wide, Single
Crew		3	3

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

(2) FG

Model		FGB71ER6SFBM	FGB71ER6WFBM
Emission		EuroVI	EuroVI
Wheelbase (mm)		3415	3415
Tread (mm)	Front	1665	1665
	Rear	1560	1560
Curb weight (kg) *		2665	2890
	Front*	1765	1905
	Rear*	900	985
Max. G.V.W. (kg)		6500	6500
Max. G.C.W. (kg)		10000	10000
Model		4P10-VAT4	4P10-VAT4
Max. Output (EEC)		110 kW /2626 rpm	110 kW /2626 rpm
Max. Torque (EEC)		400 Nm/1600 rpm	400 Nm/1600 rpm
Clutch		C4W30	C4W30
Transmission		M038S5	M038S5
	Gear ratio	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494	5.494 - 3.038 - 1.592 - 1.000 - 0.723 Rev. 5.494
Propeller shaft		P3	P3
Transfer		Transmission with transfer (Part time with Hi-Low mode)	Transmission with transfer (Part time with Hi-Low mode)
Rear axle		R035T	R035T
Final reduction gear		D035H	D035H
	Ratio	5.285	5.285
Front axle		F200TW	F200TW
Tires		215/75R17.5	215/75R17.5
Wheels		17.5x6.00-127-9t-6studs	17.5x6.00-127-9t-6studs
Steering angle (in/out)		35°/ 34°	35°/ 34°
SRS air bag		STD: Driver side OPT: Assist side	STD: Driver side OPT: Assist side
Service brake		hydraulic vacuum assisted 2 circuit split system	hydraulic vacuum assisted 2 circuit split system
Parking brake		Mechanical, internal expanding type mounted on the rear end of the transmission case	Mechanical, internal expanding type mounted on the rear end of the transmission case
Front suspension		Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers
Rear suspension		Semi-elliptic laminated leaf spring with shock absobers	Semi-elliptic laminated leaf spring with shock absobers
P.T.O		–	–
Fuel system	Injection pump	Unit pump	Unit pump
	Governor	Electronic control governor	Electronic control governor
Fuel tank		100 L	100 L
Exhaust system		DPF+SCR	DPF+SCR
Electrical	Voltage	-	-
	Alternator	A.C. 12 Volt, 110 Amp	A.C. 12 Volt, 110 Amp
	Batteries	STD:115D31Lx1 OPT:115D31Lx2, 95D31Lx2	STD:115D31Lx1 OPT:115D31Lx2, 95D31Lx2
Cab		Wide, Single	Wide, Crew
Crew		3	7 (3+4)

* Including coolant, oils, 90% fuel, spare wheel, tools and 75 kg driver

** Calculated maximum value. Should be checked based on installed body and application.

10.2.2 Axle and tire load carrying capacity

G.V.W. (kg)	Model	Max. Output (kw)	Tire Size					Axle Capacity (kg)	
			185/85 R16 111/109 N	195/85 R15 113/111 L	205/85 R16 117/115 L	215/75 R17.5 124/123 L 126/124 M	215/75 R17.5 124/123 L	Front	Rear
4500	FEA61BR4SFBM	110			X			2570	4500
	FEB21CR4SFBM		X					2180	3800
	FEB21ER4SFBM		X						
6000	FEB51ER4SFBM				X			2570	4500
	FEB51GR4SFBM				X				
7500	FEB71GR4SFBM					X		3100	6000
	FEB71GR4WFBM					X			
8200	FEB91GR4WFBP	129				X			
7500	FEC71ER4SFBM	110				X			
	FEC71HR4SFBM					X			
	FEC81CR4SFBM						X		
8550	FECX1GR4SFBP	129				X			
	FECX1GR4WFBP					X			
	FECX1HR4SFBP					X			
	FECX1KR4SFBP					X			
6500	FGB71ER6SFBM	110					X	2800	5760
	FGB71ER6WFBM						X		
4500	FEA21CR3SFBM		X					2180	3800
	FEA21ER3SFBM		X						
	FEA21ER3SFBR		X						
	FEA21ER3WFBM			X				2300	
	FEA61BR3SFBM				X			2570	4500
	FEB21CR3SFBM		X					2180	3800
	FEB21ER3SFBM		X						
6000	FEB51ER3SFBM				X			2570	4500
	FEB51GR3SFBM				X				
7500	FEB71ER3WFBM					X		3100	6000
	FEB71GR3SFBM					X			
	FEB71GR3WFBM					X			
8200	FEB91ER3WFBP	129				X			
	FEB91GR3WFBP					X			
Tire Capacity (kg)*1		Front	1090X2=2180	1150X2=2300	1285X2=2570	1600X2=3200 1700X2=3400	1600X2=3200		
		Rear	1030X4=4120	1090X4=4360	1215X4=4860	1550X4=6200 1600X4=6400	1550X4=6200		

*1 At Maximum information pressure (kPa, cold: Fr/Re)
185/85 R16 111/109 ... 600/525
195/85R15 113/111 ... 600/500
205/85 R16 117/115 ... 600/600
215/75R17.5 124/123 ... 675/675
215/75R17.5 126/124 ... 700/700

10.2 Specifications

G.V.W. (kg)	Model	Max. Output (kw)			Axle Capacity (kg)	
			215/75 R17.5 124/123 L 126/124 M	215/75 R17.5 124/123 L	Front	Rear
7500	FEC71ER3SFBM	110	X		3100	6000
	FEC71HR3SFBM		X			
	FEC81CR3SFBM			X		
8550	FECX1GR3SFBP	129	X			
	FECX1GR3WFBP		X			
	FECX1HR3SFBP		X			
	FECX1KR3SFBP		X			
Tire Capacity (kg)*1		Front	1600X2=3200 1700X2=3400	1600X2=3200		
		Rear	1550X4=6200 1600X4=6400	1550X4=6200		

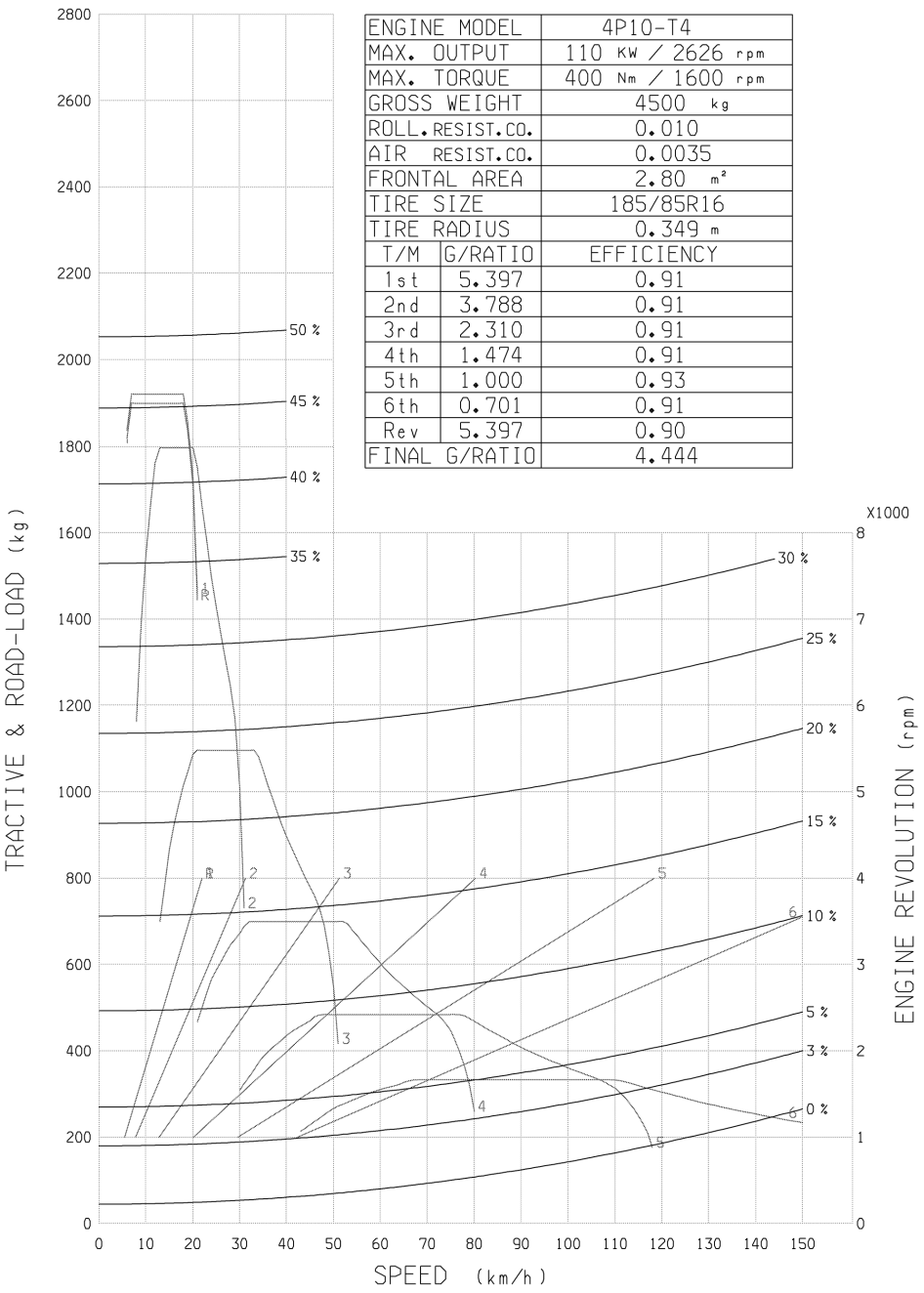
*1 At Maximum information pressure (kPa, cold: Fr/Re)
215/75R17.5 124/123 ... 675/675
215/75R17.5 126/124 ... 700/700

10.3 Performance curve

10.3.1 Vehicle performance curve

FEA21×R3 4P10-T4

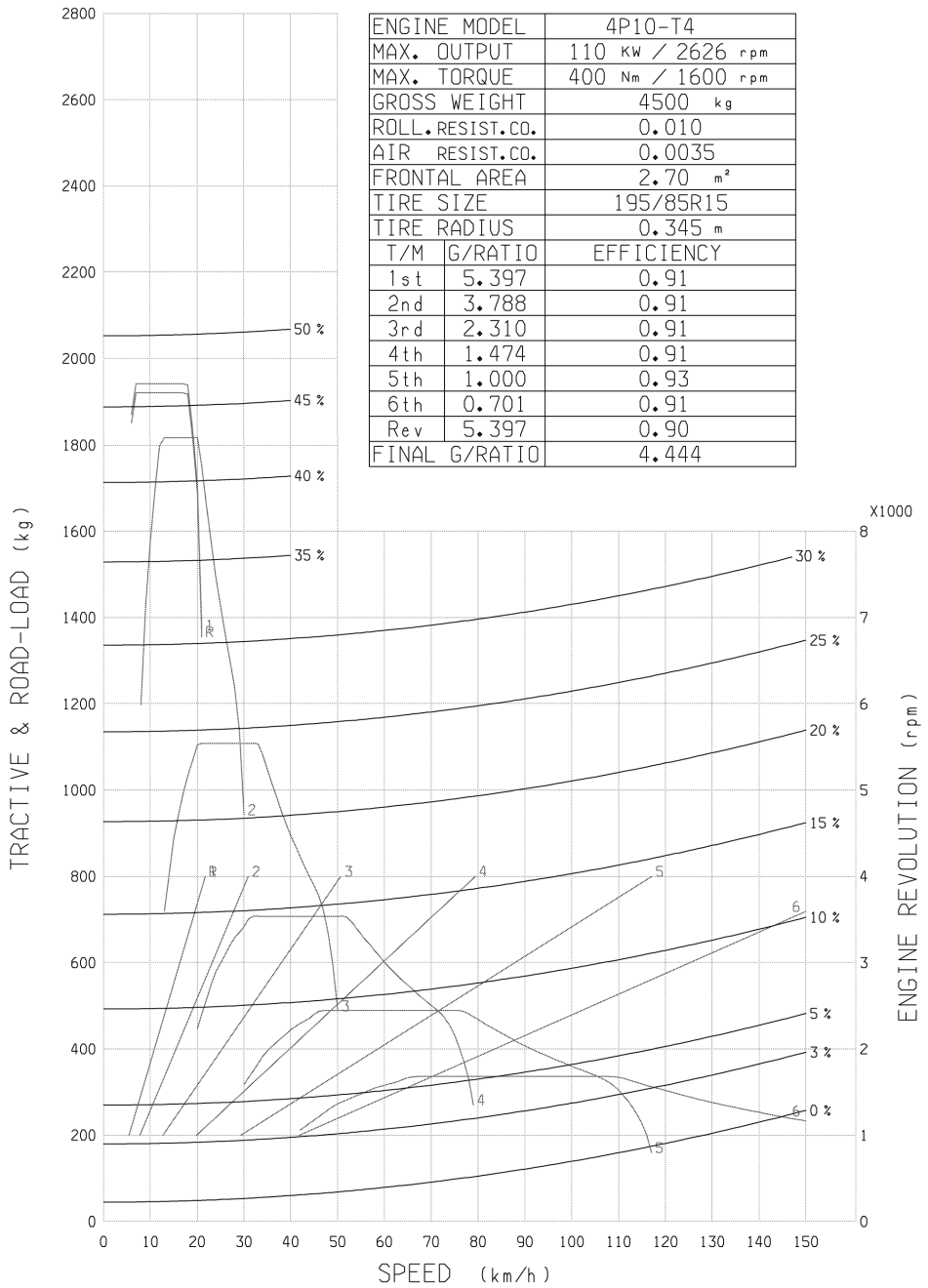
ENGINE MODEL		4P10-T4
MAX. OUTPUT		110 KW / 2626 rpm
MAX. TORQUE		400 Nm / 1600 rpm
GROSS WEIGHT		4500 kg
ROLL.RESIST.CO.		0.010
AIR RESIST.CO.		0.0035
FRONTAL AREA		2.80 m²
TIRE SIZE		185/85R16
TIRE RADIUS		0.349 m
T/M	G/RATIO	EFFICIENCY
1st	5.397	0.91
2nd	3.788	0.91
3rd	2.310	0.91
4th	1.474	0.91
5th	1.000	0.93
6th	0.701	0.91
Rev	5.397	0.90
FINAL G/RATIO		4.444



10.3 Performance curve

FEA21*R3 4P10-T4

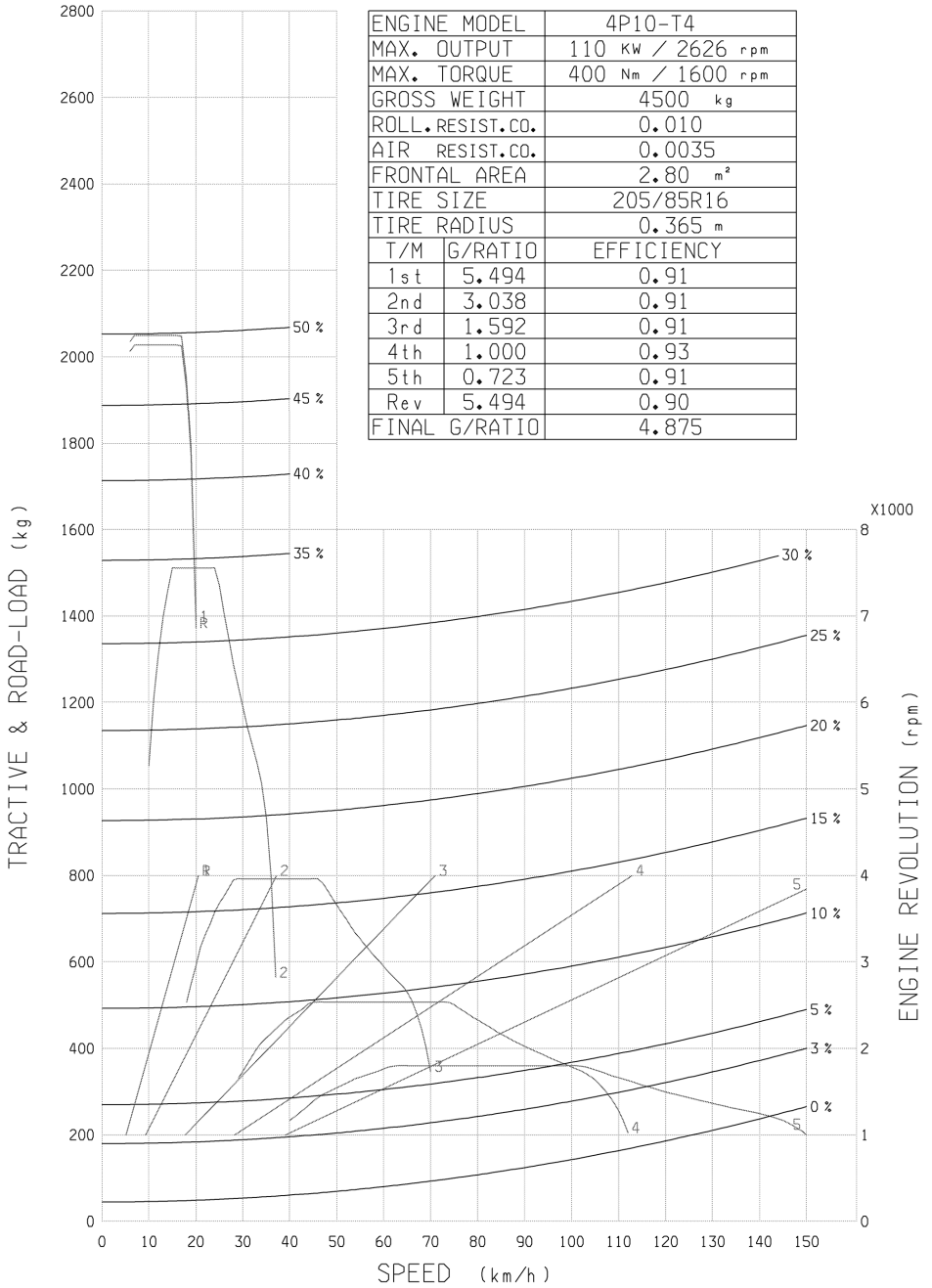
ENGINE MODEL		4P10-T4
MAX. OUTPUT		110 KW / 2626 rpm
MAX. TORQUE		400 Nm / 1600 rpm
GROSS WEIGHT		4500 kg
ROLL. RESIST. CO.		0.010
AIR RESIST. CO.		0.0035
FRONTAL AREA		2.70 m²
TIRE SIZE		195/85R15
TIRE RADIUS		0.345 m
T/M	G/RATIO	EFFICIENCY
1st	5.397	0.91
2nd	3.788	0.91
3rd	2.310	0.91
4th	1.474	0.91
5th	1.000	0.93
6th	0.701	0.91
Rev	5.397	0.90
FINAL G/RATIO		4.444



10.3 Performance curve

FEA61*R4 4P10-T4

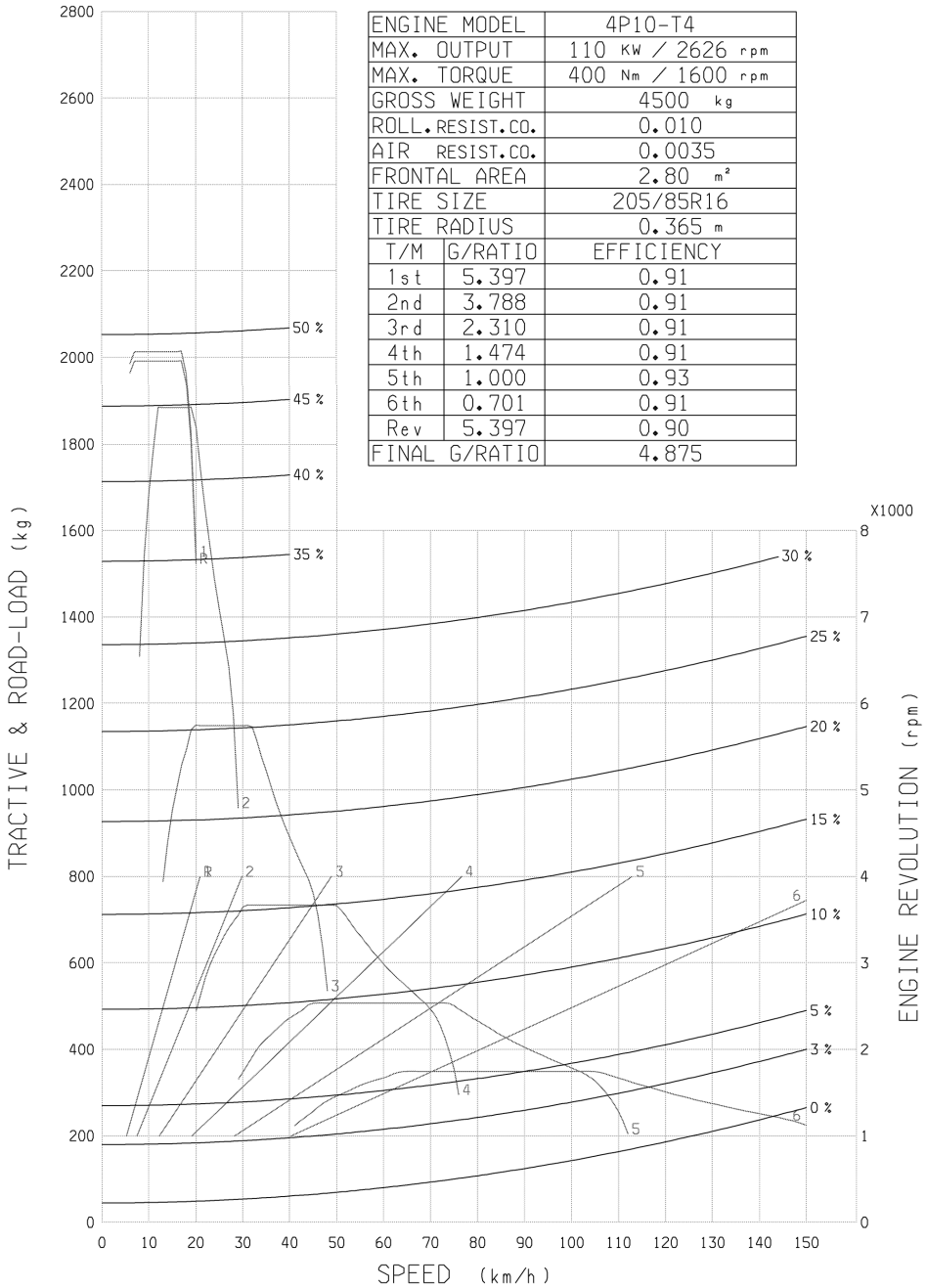
ENGINE MODEL	4P10-T4
MAX. OUTPUT	110 KW / 2626 rpm
MAX. TORQUE	400 Nm / 1600 rpm
GROSS WEIGHT	4500 kg
ROLL. RESIST. CO.	0.010
AIR RESIST. CO.	0.0035
FRONTAL AREA	2.80 m²
TIRE SIZE	205/85R16
TIRE RADIUS	0.365 m
T/M	G/RATIO	EFFICIENCY
1st	5.494	0.91
2nd	3.038	0.91
3rd	1.592	0.91
4th	1.000	0.93
5th	0.723	0.91
Rev	5.494	0.90
FINAL G/RATIO	4.875	



10.3 Performance curve

FEA61*R3 4P10-T4

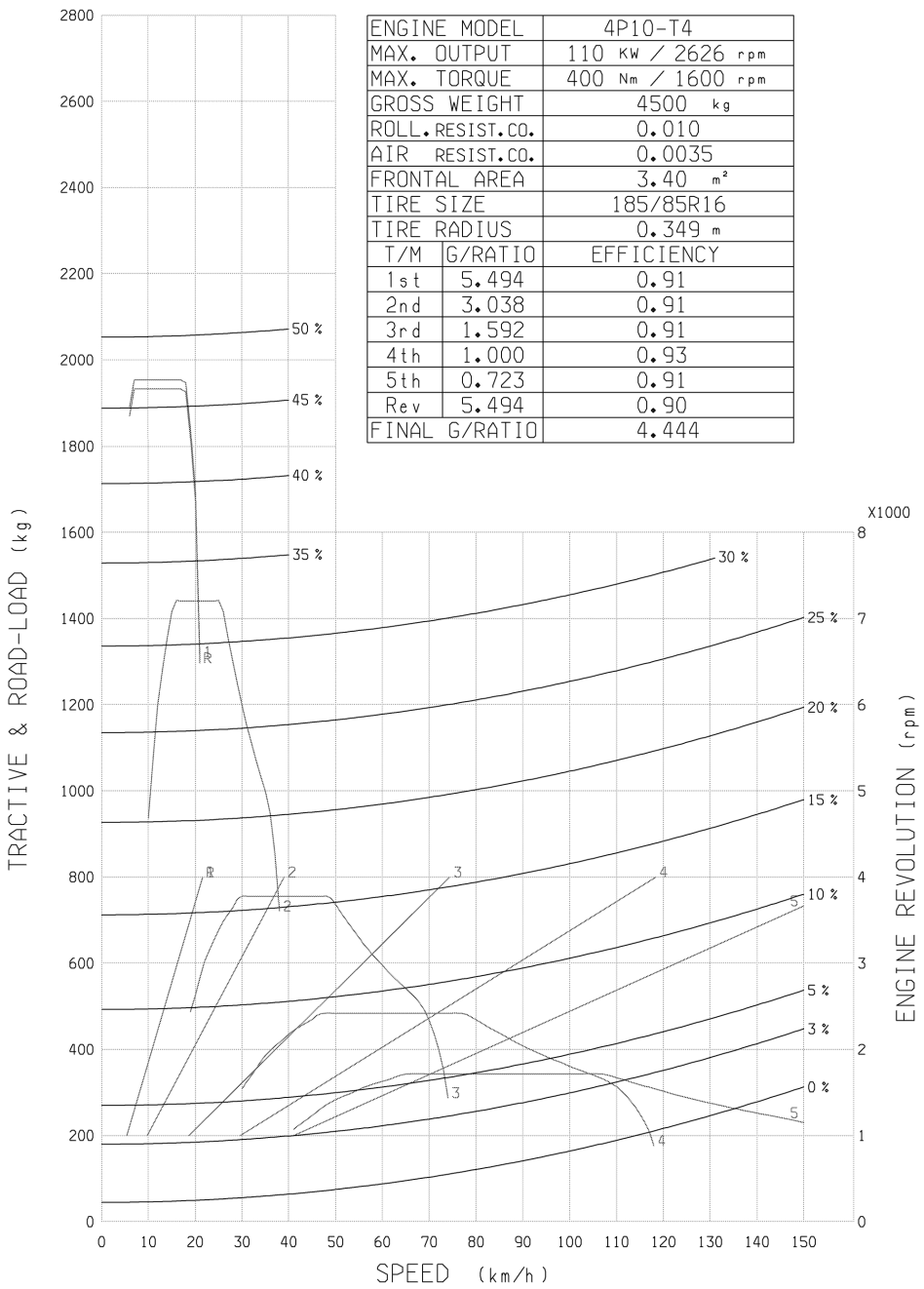
ENGINE MODEL	4P10-T4
MAX. OUTPUT	110 KW / 2626 rpm
MAX. TORQUE	400 Nm / 1600 rpm
GROSS WEIGHT	4500 kg
ROLL. RESIST. CO.	0.010
AIR RESIST. CO.	0.0035
FRONTAL AREA	2.80 m²
TIRE SIZE	205/85R16
TIRE RADIUS	0.365 m
T/M G/RATIO	EFFICIENCY
1st 5.397	0.91
2nd 3.788	0.91
3rd 2.310	0.91
4th 1.474	0.91
5th 1.000	0.93
6th 0.701	0.91
Rev 5.397	0.90
FINAL G/RATIO	4.875



10.3 Performance curve

FEB21*R4 4P10-T4

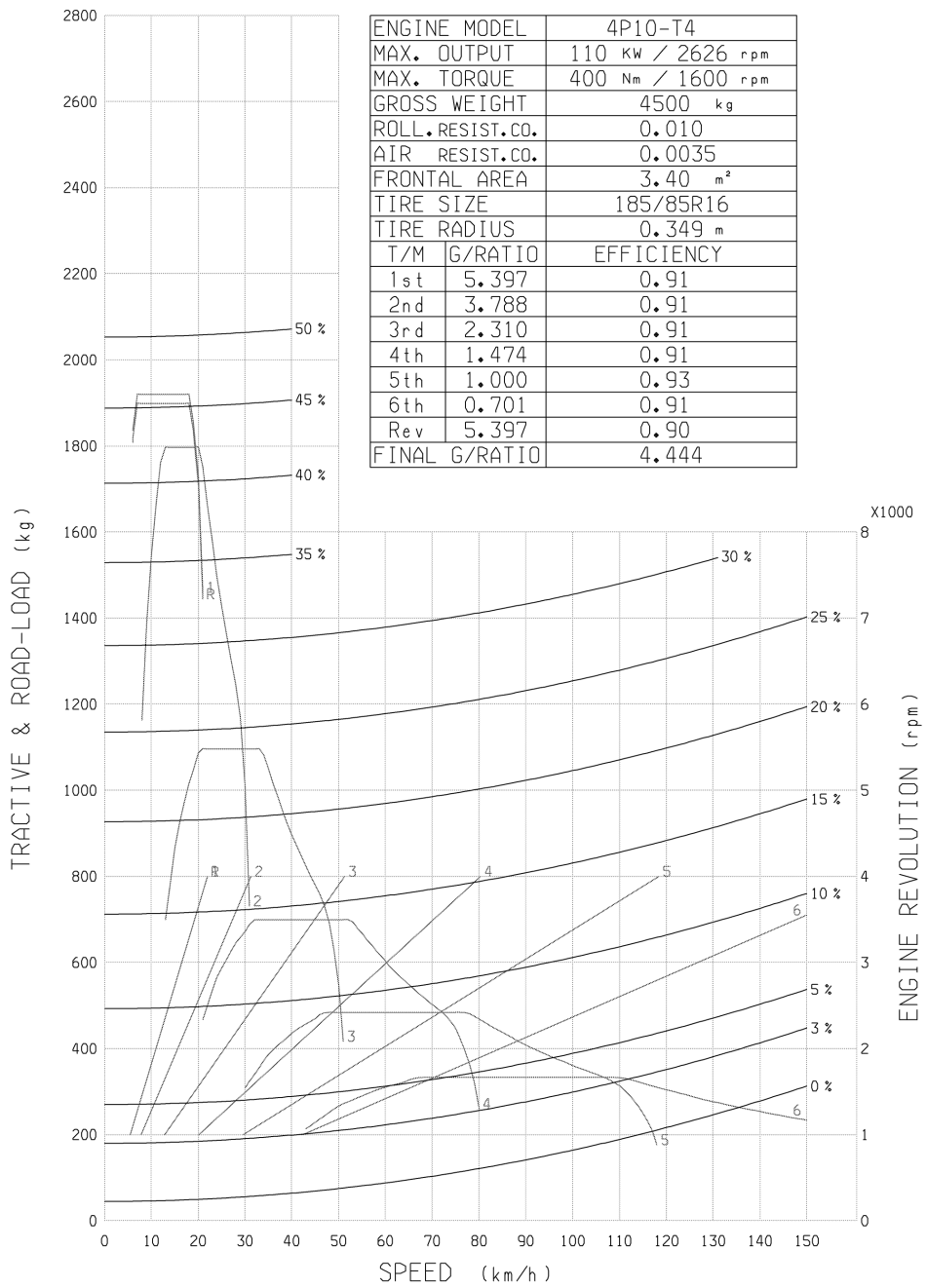
ENGINE MODEL	4P10-T4
MAX. OUTPUT	110 KW / 2626 rpm
MAX. TORQUE	400 Nm / 1600 rpm
GROSS WEIGHT	4500 kg
ROLL. RESIST. CO.	0.010
AIR RESIST. CO.	0.0035
FRONTAL AREA	3.40 m²
TIRE SIZE	185/85R16
TIRE RADIUS	0.349 m
T/M G/RATIO	EFFICIENCY
1st 5.494	0.91
2nd 3.038	0.91
3rd 1.592	0.91
4th 1.000	0.93
5th 0.723	0.91
Rev 5.494	0.90
FINAL G/RATIO	4.444



10.3 Performance curve

FEB21*R3 4P10-T4

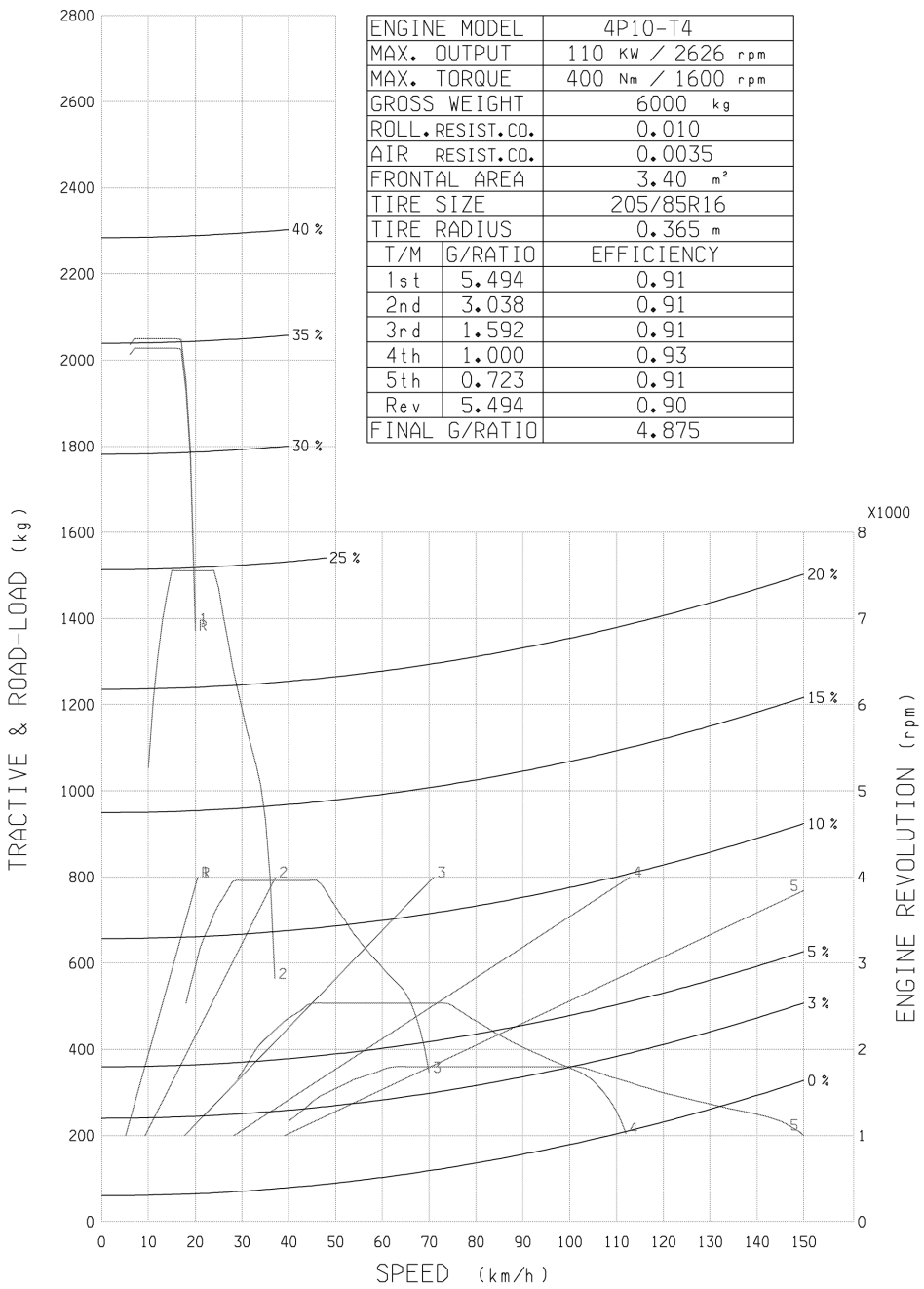
ENGINE MODEL		4P10-T4
MAX. OUTPUT		110 KW / 2626 rpm
MAX. TORQUE		400 Nm / 1600 rpm
GROSS WEIGHT		4500 kg
ROLL. RESIST. CO.		0.010
AIR RESIST. CO.		0.0035
FRONTAL AREA		3.40 m²
TIRE SIZE		185/85R16
TIRE RADIUS		0.349 m
T/M	G/RATIO	EFFICIENCY
1st	5.397	0.91
2nd	3.788	0.91
3rd	2.310	0.91
4th	1.474	0.91
5th	1.000	0.93
6th	0.701	0.91
Rev	5.397	0.90
FINAL G/RATIO		4.444



10.3 Performance curve

FEB51*R4 4P10-T4

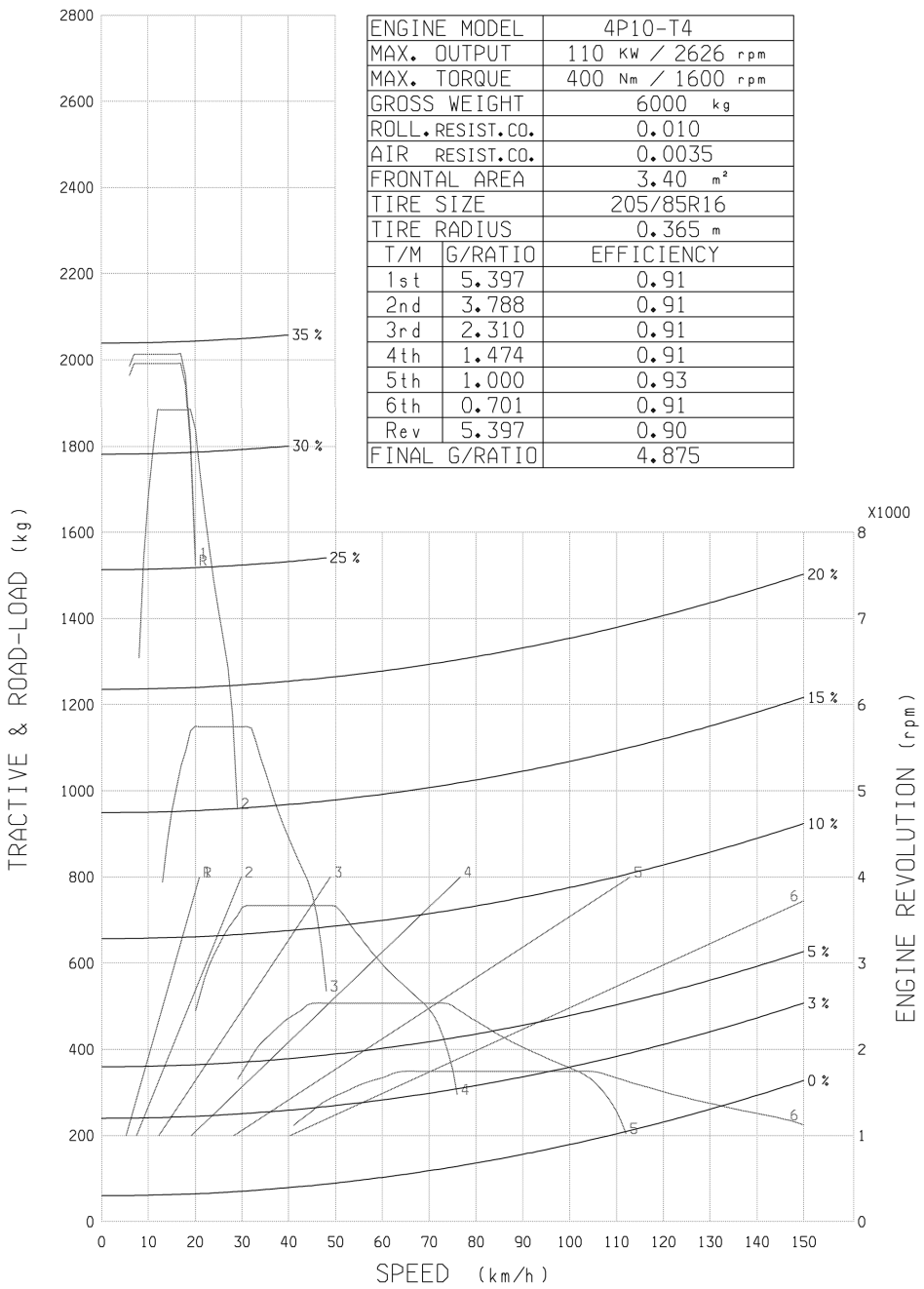
ENGINE MODEL		4P10-T4
MAX. OUTPUT		110 KW / 2626 rpm
MAX. TORQUE		400 Nm / 1600 rpm
GROSS WEIGHT		6000 kg
ROLL. RESIST. CO.		0.010
AIR RESIST. CO.		0.0035
FRONTAL AREA		3.40 m²
TIRE SIZE		205/85R16
TIRE RADIUS		0.365 m
T/M	G/RATIO	EFFICIENCY
1st	5.494	0.91
2nd	3.038	0.91
3rd	1.592	0.91
4th	1.000	0.93
5th	0.723	0.91
Rev	5.494	0.90
FINAL G/RATIO		4.875



10.3 Performance curve

FEB51*R3 4P10-T4

ENGINE MODEL		4P10-T4
MAX. OUTPUT		110 KW / 2626 rpm
MAX. TORQUE		400 Nm / 1600 rpm
GROSS WEIGHT		6000 kg
ROLL. RESIST. CO.		0.010
AIR RESIST. CO.		0.0035
FRONTAL AREA		3.40 m²
TIRE SIZE		205/85R16
TIRE RADIUS		0.365 m
T/M	G/RATIO	EFFICIENCY
1st	5.397	0.91
2nd	3.788	0.91
3rd	2.310	0.91
4th	1.474	0.91
5th	1.000	0.93
6th	0.701	0.91
Rev	5.397	0.90
FINAL G/RATIO		4.875

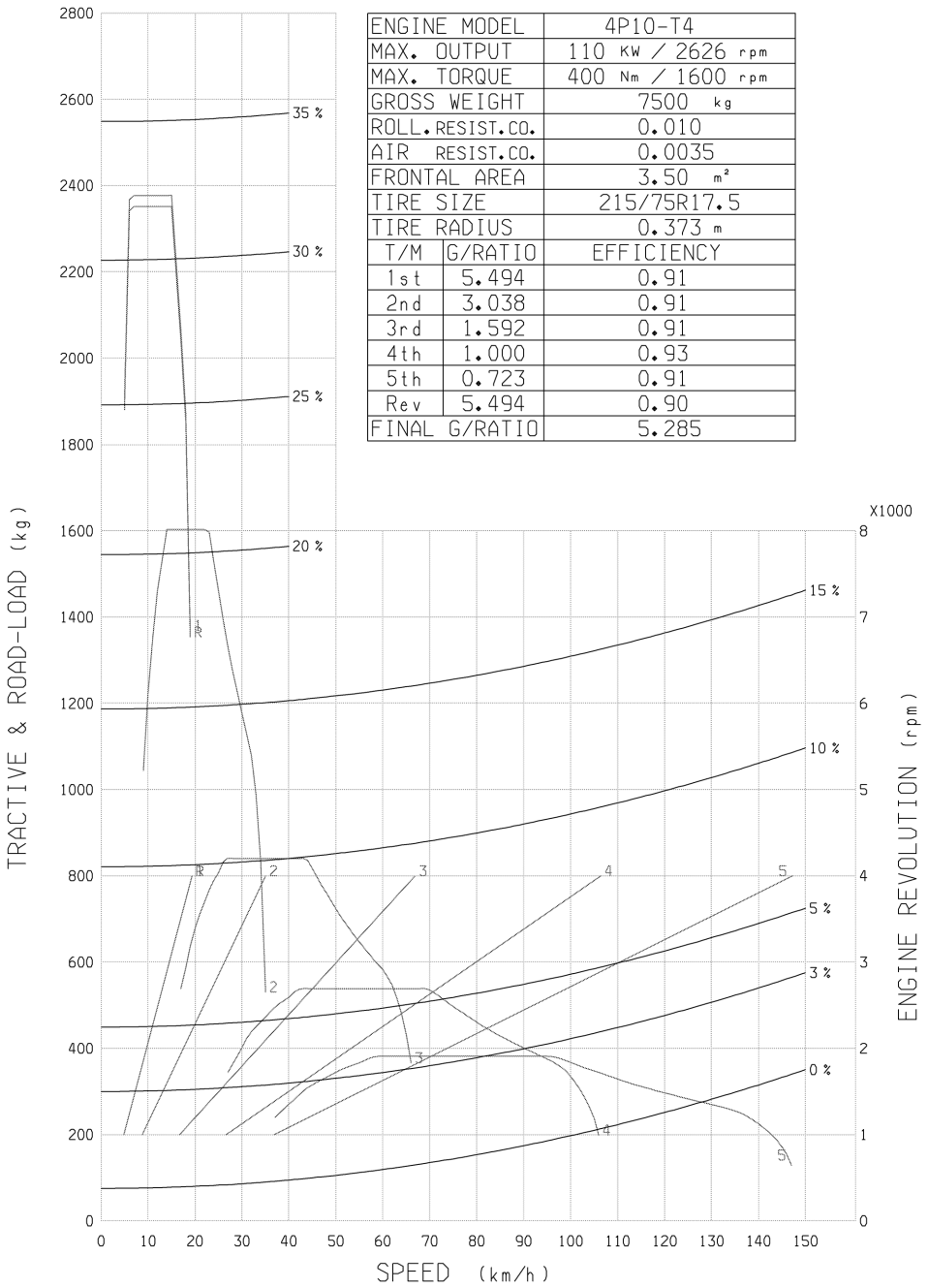


10.3 Performance curve

FEB71*R4 4P10-T4

ENGINE MODEL	4P10-T4
MAX. OUTPUT	110 KW / 2626 rpm
MAX. TORQUE	400 Nm / 1600 rpm
GROSS WEIGHT	7500 kg
ROLL. RESIST. CO.	0.010
AIR RESIST. CO.	0.0035
FRONTAL AREA	3.50 m²
TIRE SIZE	215/75R17.5
TIRE RADIUS	0.373 m

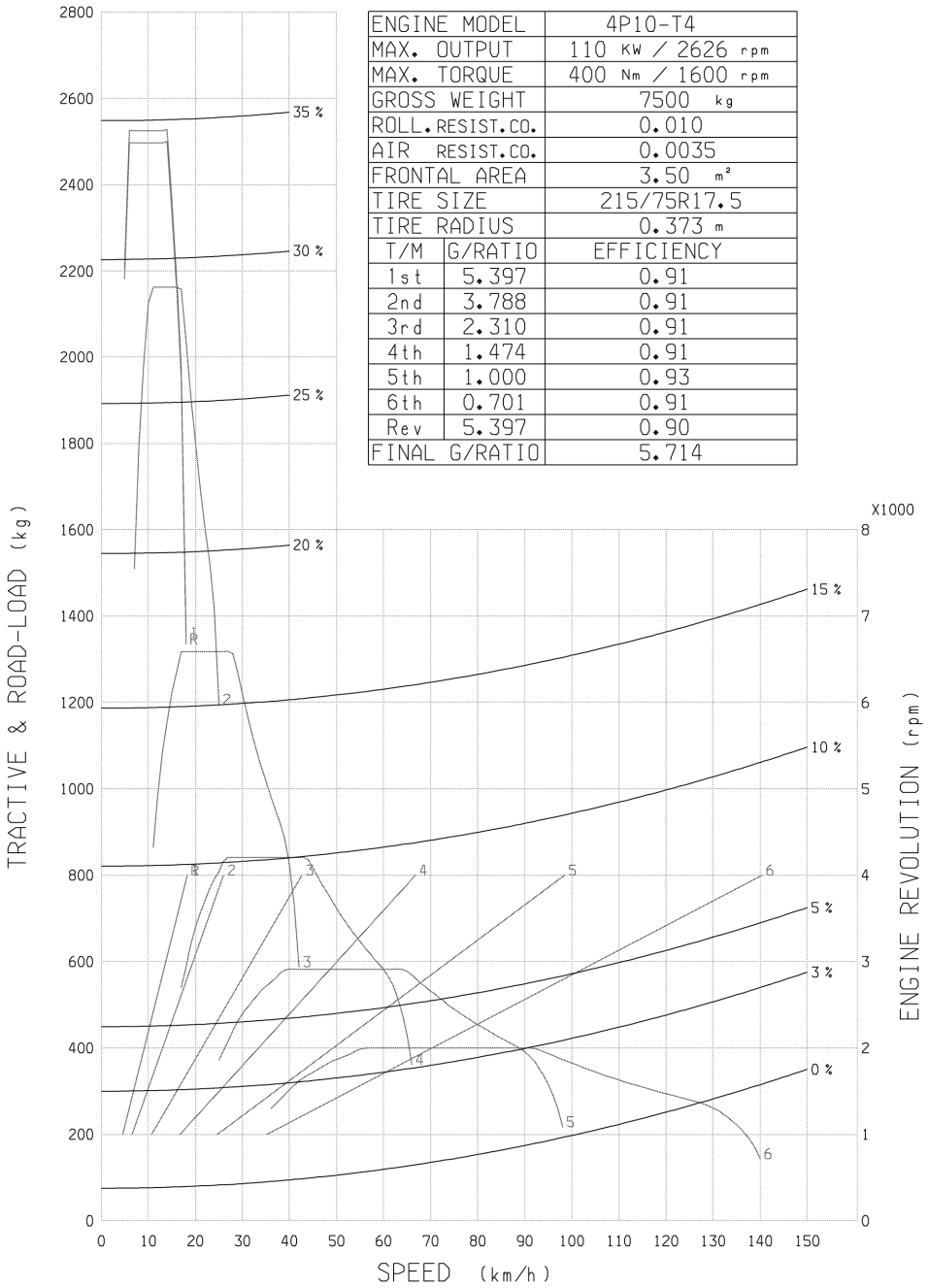
T/M	G/RATIO	EFFICIENCY
1st	5.494	0.91
2nd	3.038	0.91
3rd	1.592	0.91
4th	1.000	0.93
5th	0.723	0.91
Rev	5.494	0.90
FINAL G/RATIO		5.285



10.3 Performance curve

FEB71*R3 4P10-T4

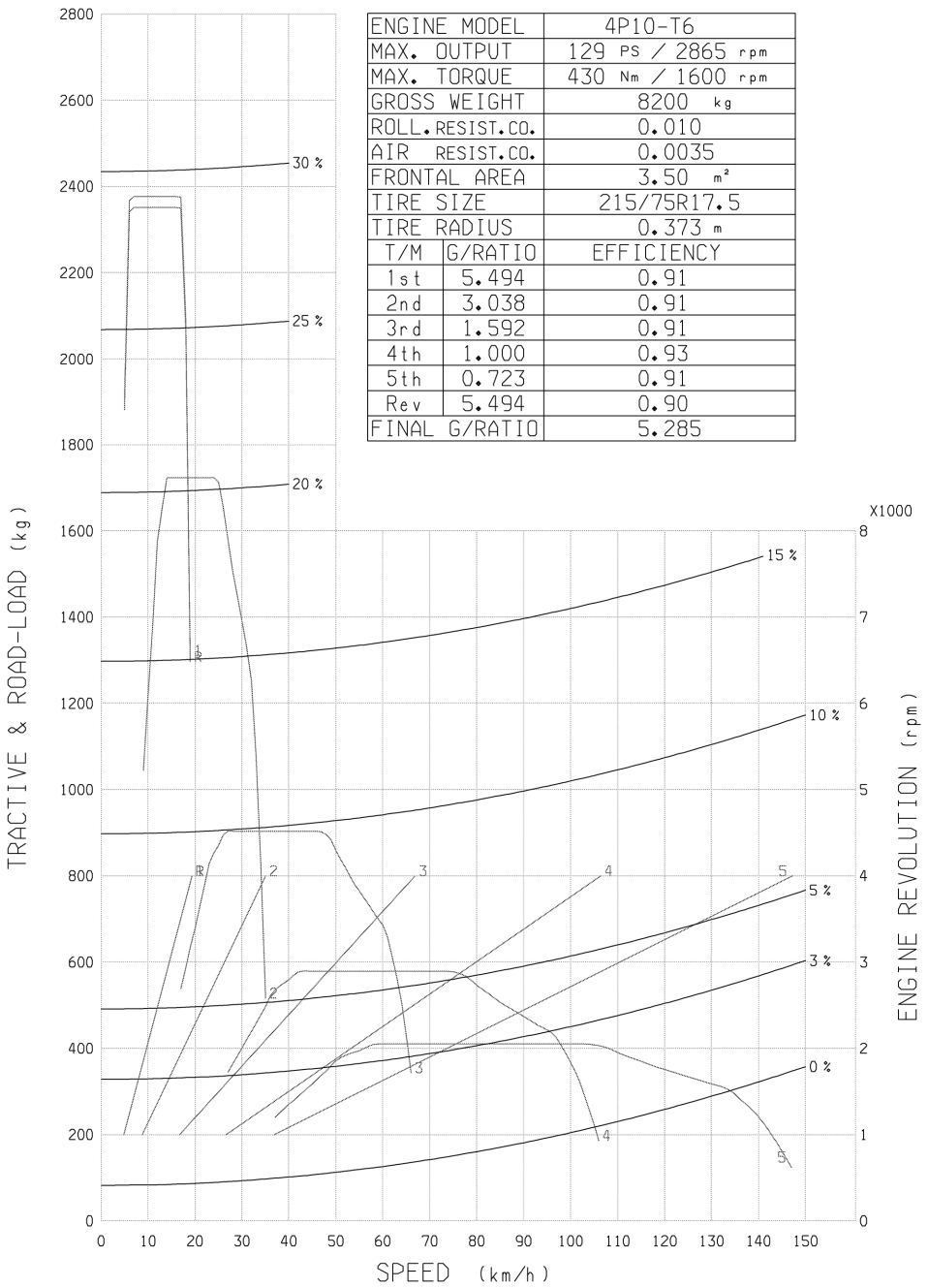
ENGINE MODEL		4P10-T4
MAX. OUTPUT		110 KW / 2626 rpm
MAX. TORQUE		400 Nm / 1600 rpm
GROSS WEIGHT		7500 kg
ROLL. RESIST. CO.		0.010
AIR RESIST. CO.		0.0035
FRONTAL AREA		3.50 m²
TIRE SIZE		215/75R17.5
TIRE RADIUS		0.373 m
T/M	G/RATIO	EFFICIENCY
1st	5.397	0.91
2nd	3.788	0.91
3rd	2.310	0.91
4th	1.474	0.91
5th	1.000	0.93
6th	0.701	0.91
Rev	5.397	0.90
FINAL G/RATIO		5.714



10.3 Performance curve

FEB91*R4 4P10-T6

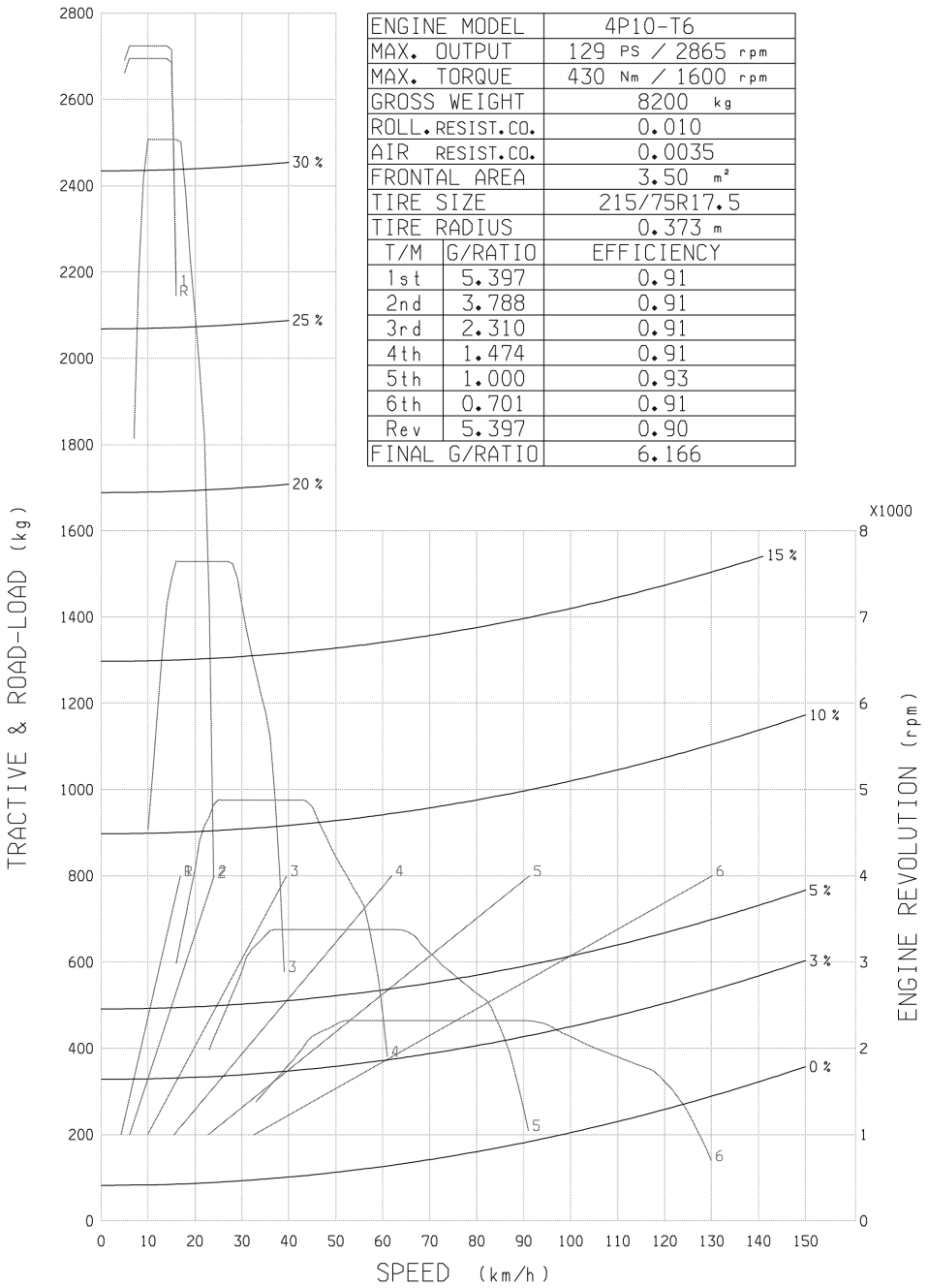
ENGINE MODEL		4P10-T6
MAX. OUTPUT		129 PS / 2865 rpm
MAX. TORQUE		430 Nm / 1600 rpm
GROSS WEIGHT		8200 kg
ROLL. RESIST. CO.		0.010
AIR RESIST. CO.		0.0035
FRONTAL AREA		3.50 m²
TIRE SIZE		215/75R17.5
TIRE RADIUS		0.373 m
T/M	G/RATIO	EFFICIENCY
1st	5.494	0.91
2nd	3.038	0.91
3rd	1.592	0.91
4th	1.000	0.93
5th	0.723	0.91
Rev	5.494	0.90
FINAL G/RATIO		5.285



10.3 Performance curve

FEB91*R3 4P10-T6

ENGINE MODEL		4P10-T6
MAX. OUTPUT		129 PS / 2865 rpm
MAX. TORQUE		430 Nm / 1600 rpm
GROSS WEIGHT		8200 kg
ROLL. RESIST. CO.		0.010
AIR RESIST. CO.		0.0035
FRONTAL AREA		3.50 m²
TIRE SIZE		215/75R17.5
TIRE RADIUS		0.373 m
T/M	G/RATIO	EFFICIENCY
1st	5.397	0.91
2nd	3.788	0.91
3rd	2.310	0.91
4th	1.474	0.91
5th	1.000	0.93
6th	0.701	0.91
Rev	5.397	0.90
FINAL G/RATIO		6.166

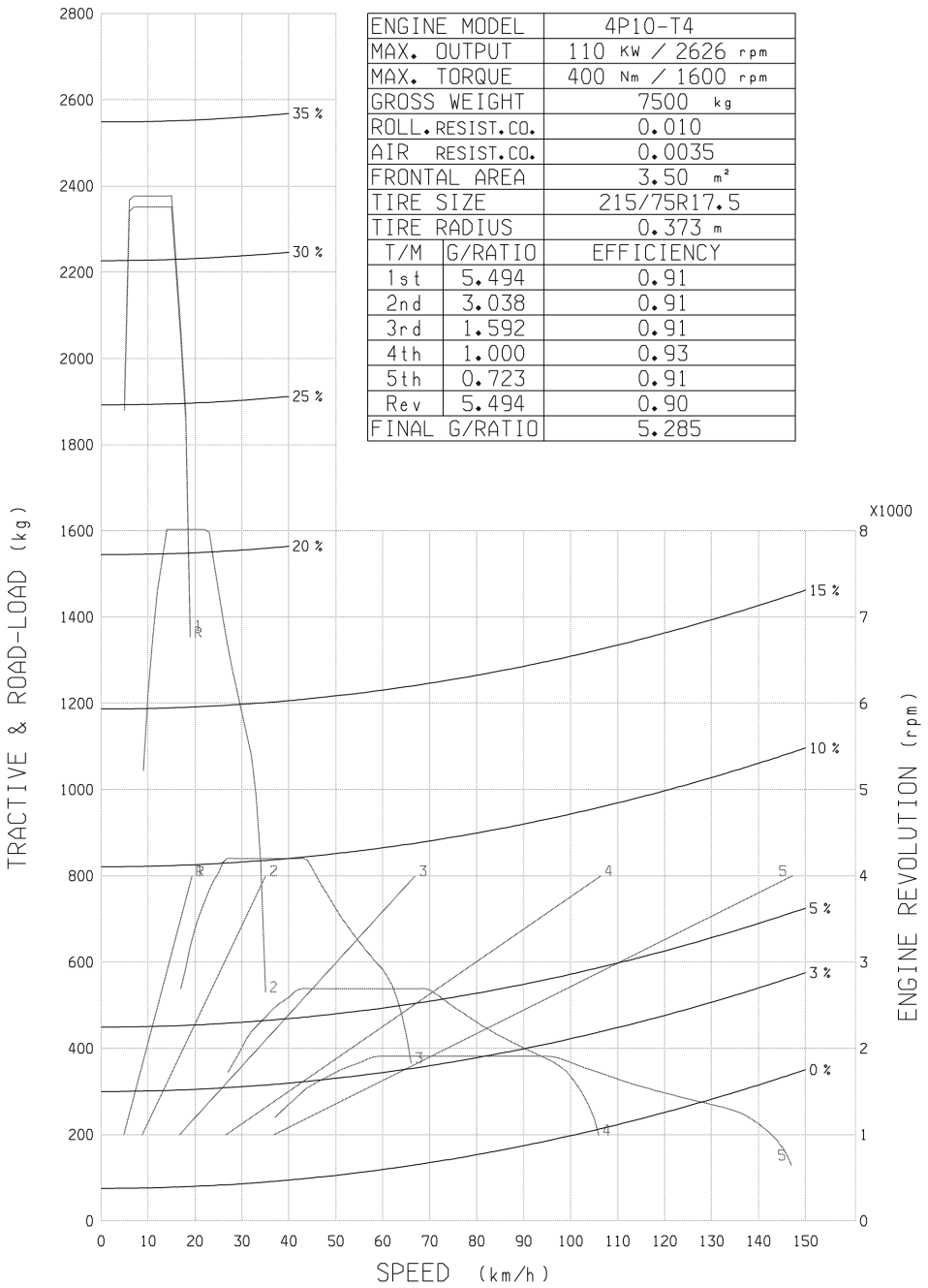


10.3 Performance curve

FEC71*R4 4P10-T4

ENGINE MODEL	4P10-T4
MAX. OUTPUT	110 KW / 2626 rpm
MAX. TORQUE	400 Nm / 1600 rpm
GROSS WEIGHT	7500 kg
ROLL. RESIST. CO.	0.010
AIR RESIST. CO.	0.0035
FRONTAL AREA	3.50 m²
TIRE SIZE	215/75R17.5
TIRE RADIUS	0.373 m

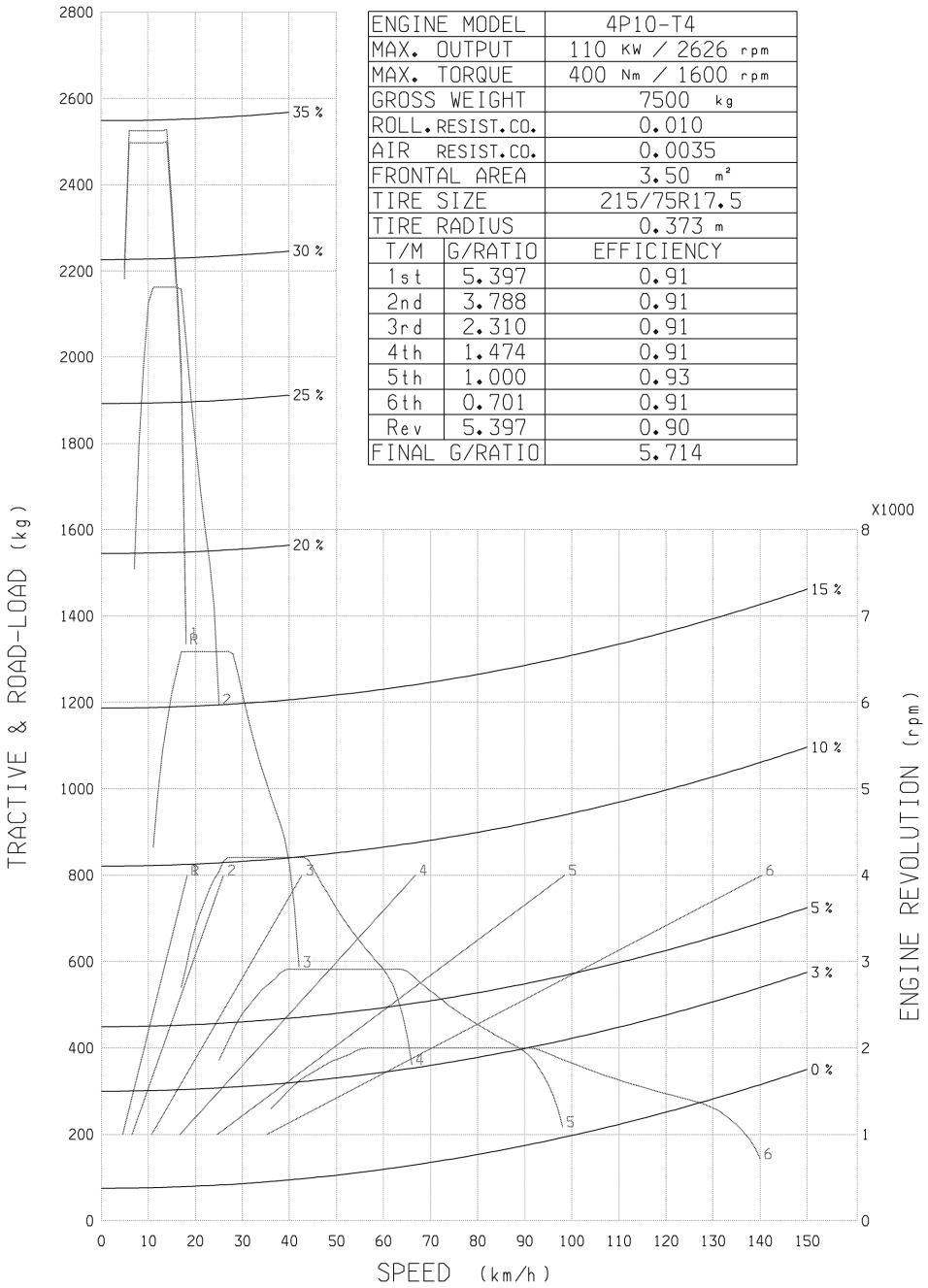
T/M	G/RATIO	EFFICIENCY
1st	5.494	0.91
2nd	3.038	0.91
3rd	1.592	0.91
4th	1.000	0.93
5th	0.723	0.91
Rev	5.494	0.90
FINAL G/RATIO		5.285



10.3 Performance curve

FEC71*R3 4P10-T4

ENGINE MODEL		4P10-T4
MAX. OUTPUT		110 KW / 2626 rpm
MAX. TORQUE		400 Nm / 1600 rpm
GROSS WEIGHT		7500 kg
ROLL. RESIST. CO.		0.010
AIR RESIST. CO.		0.0035
FRONTAL AREA		3.50 m²
TIRE SIZE		215/75R17.5
TIRE RADIUS		0.373 m
T/M	G/RATIO	EFFICIENCY
1st	5.397	0.91
2nd	3.788	0.91
3rd	2.310	0.91
4th	1.474	0.91
5th	1.000	0.93
6th	0.701	0.91
Rev	5.397	0.90
FINAL G/RATIO		5.714

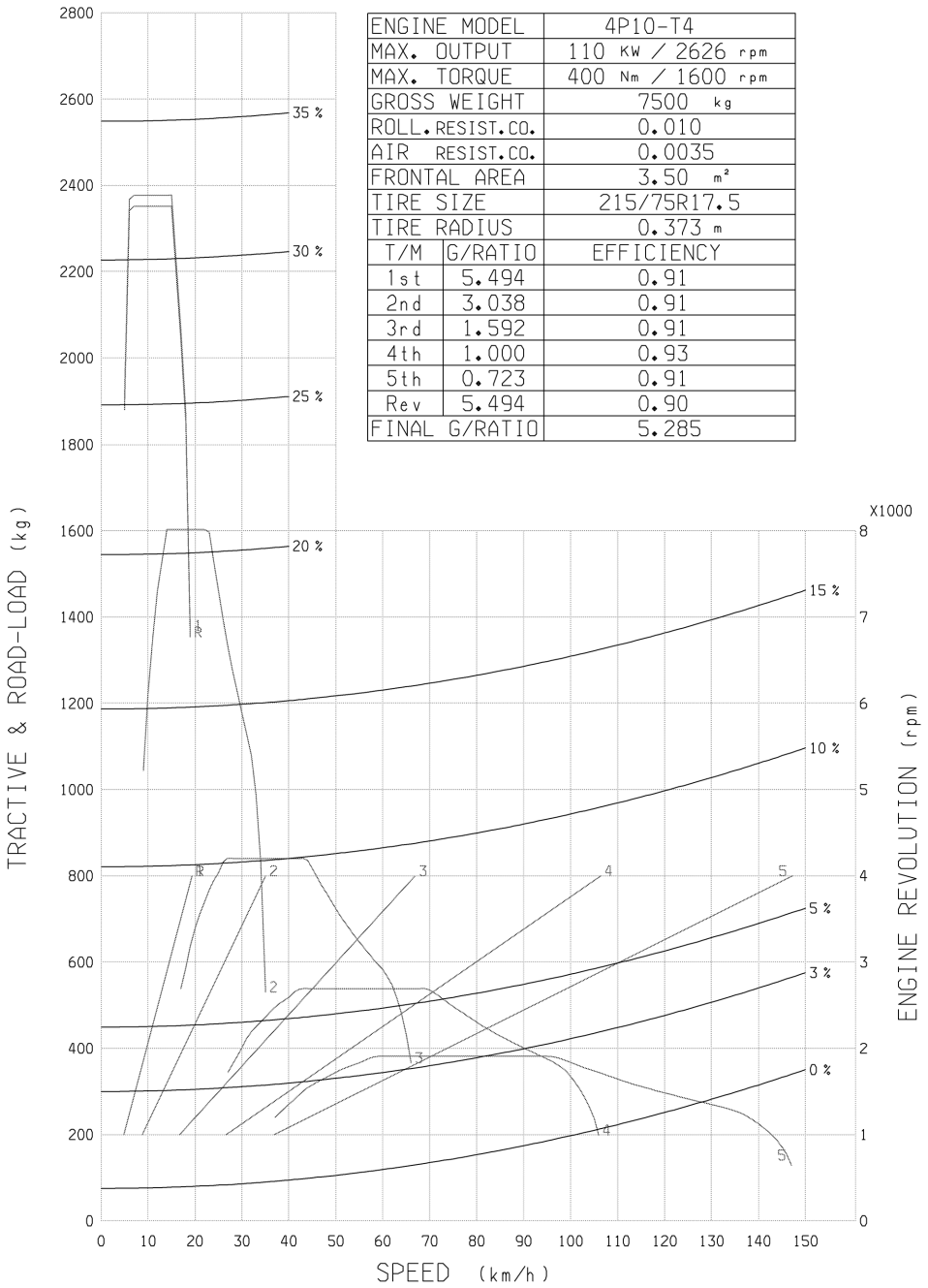


10.3 Performance curve

FEC81*R4 4P10-T4

ENGINE MODEL	4P10-T4
MAX. OUTPUT	110 KW / 2626 rpm
MAX. TORQUE	400 Nm / 1600 rpm
GROSS WEIGHT	7500 kg
ROLL. RESIST. CO.	0.010
AIR RESIST. CO.	0.0035
FRONTAL AREA	3.50 m²
TIRE SIZE	215/75R17.5
TIRE RADIUS	0.373 m

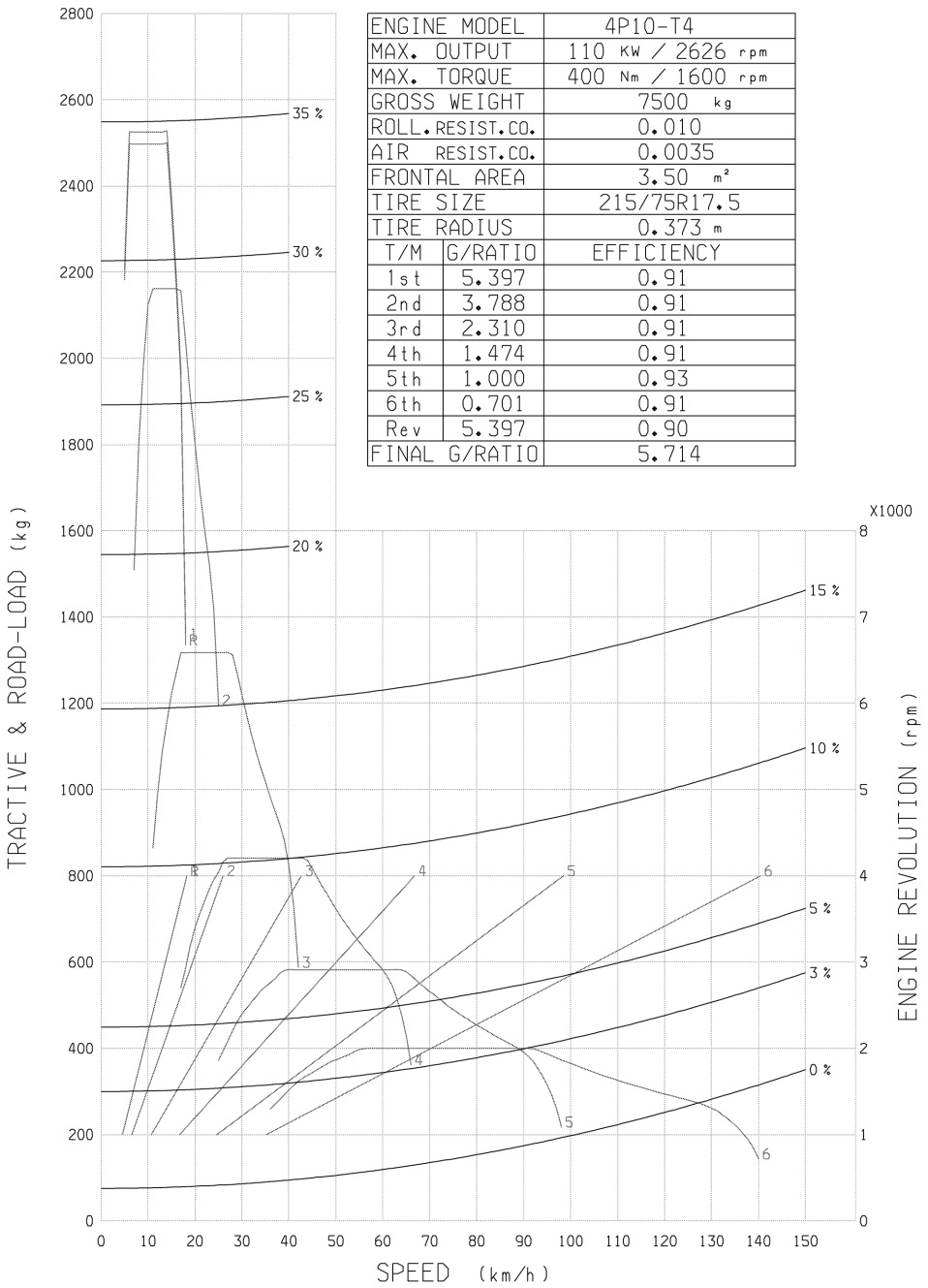
T/M	G/RATIO	EFFICIENCY
1st	5.494	0.91
2nd	3.038	0.91
3rd	1.592	0.91
4th	1.000	0.93
5th	0.723	0.91
Rev	5.494	0.90
FINAL G/RATIO		5.285



10.3 Performance curve

FEC81*R3 4P10-T4

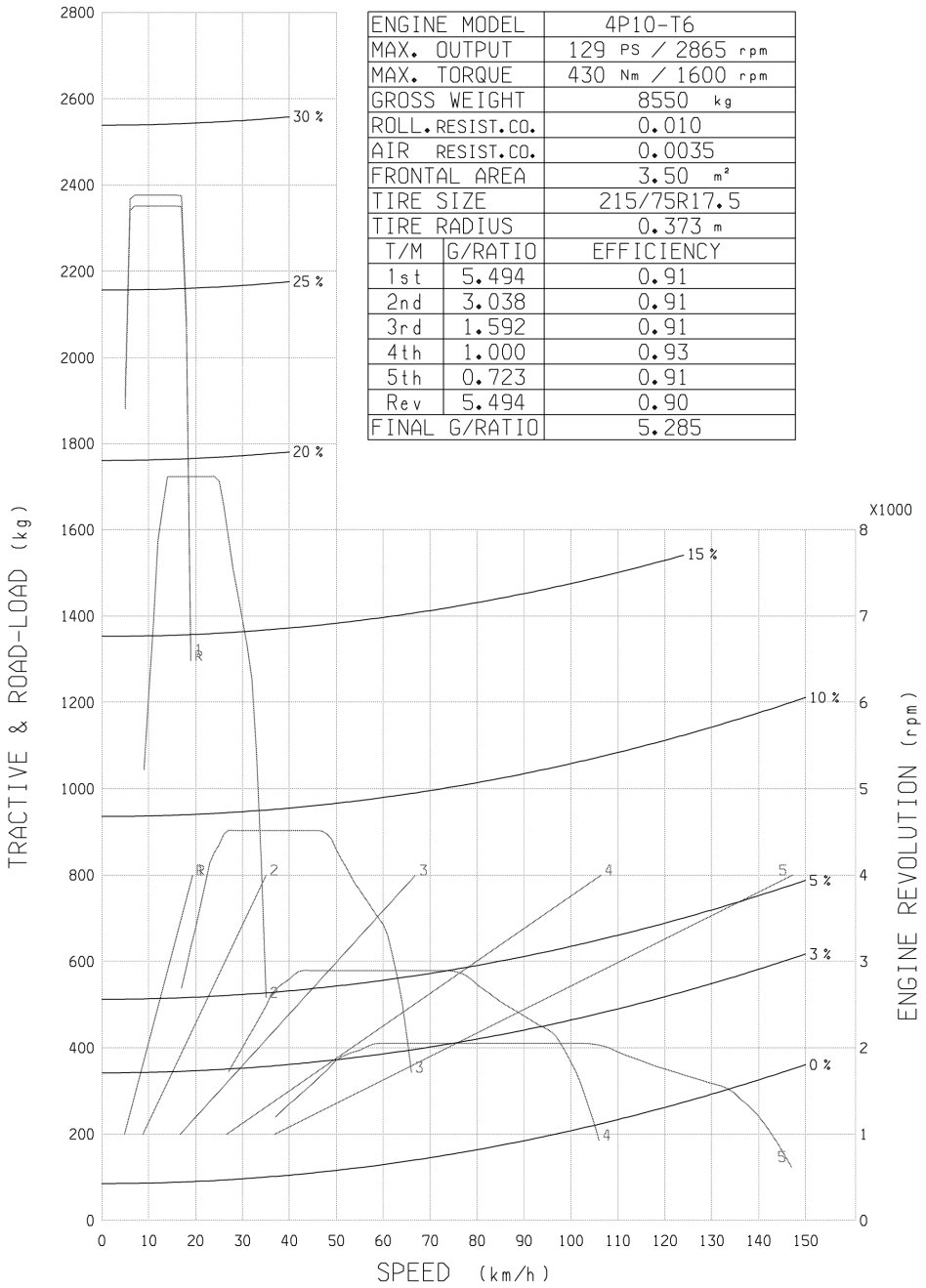
ENGINE MODEL		4P10-T4
MAX. OUTPUT		110 KW / 2626 rpm
MAX. TORQUE		400 Nm / 1600 rpm
GROSS WEIGHT		7500 kg
ROLL. RESIST. CO.		0.010
AIR RESIST. CO.		0.0035
FRONTAL AREA		3.50 m²
TIRE SIZE		215/75R17.5
TIRE RADIUS		0.373 m
T/M	G/RATIO	EFFICIENCY
1st	5.397	0.91
2nd	3.788	0.91
3rd	2.310	0.91
4th	1.474	0.91
5th	1.000	0.93
6th	0.701	0.91
Rev	5.397	0.90
FINAL G/RATIO		5.714



10.3 Performance curve

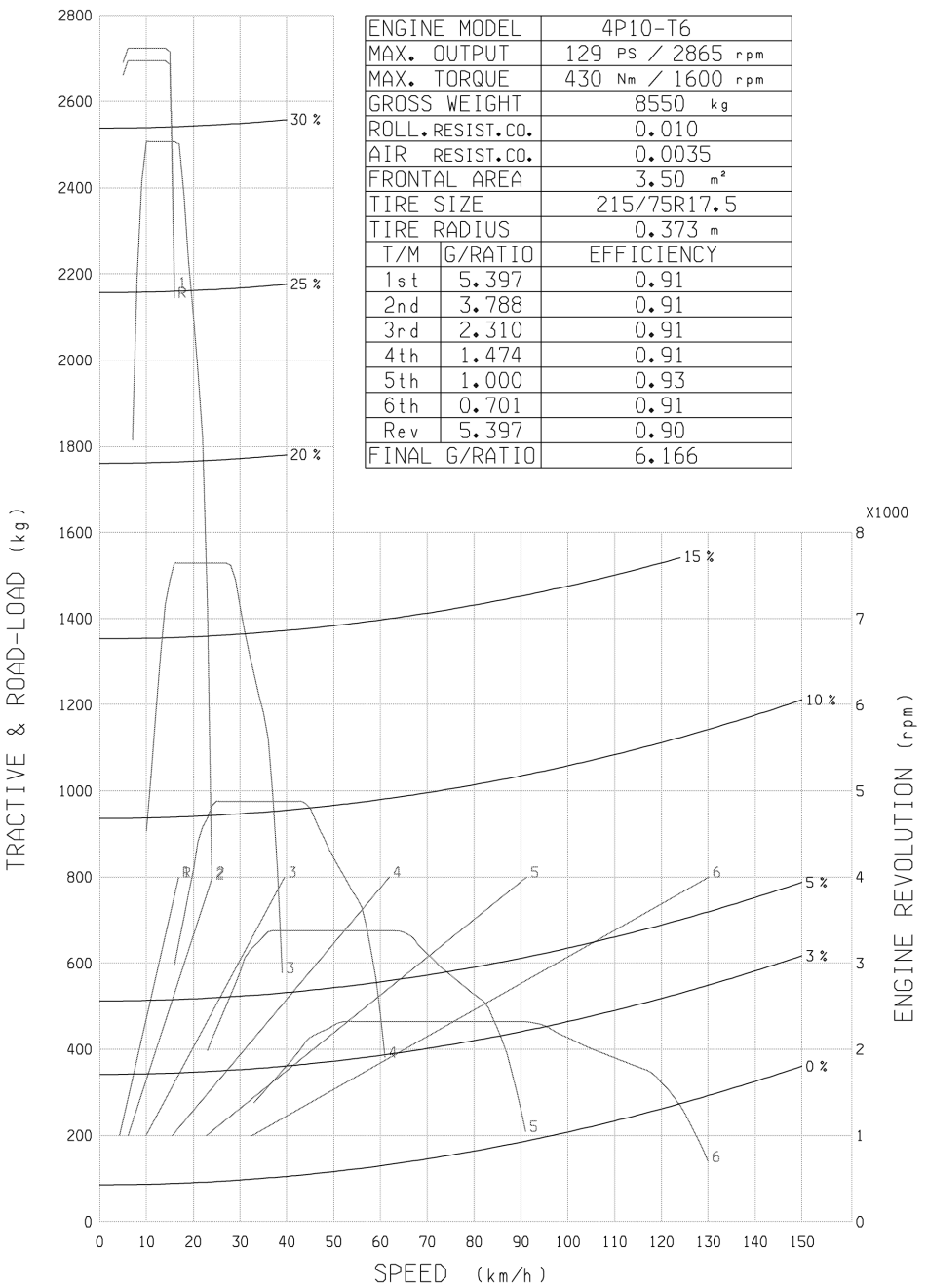
FECX1*R4 4P10-T6

ENGINE MODEL	4P10-T6
MAX. OUTPUT	129 PS / 2865 rpm
MAX. TORQUE	430 Nm / 1600 rpm
GROSS WEIGHT	8550 kg
ROLL. RESIST. CO.	0.010
AIR RESIST. CO.	0.0035
FRONTAL AREA	3.50 m²
TIRE SIZE	215/75R17.5
TIRE RADIUS	0.373 m
T/M	G/RATIO / EFFICIENCY
1st	5.494 / 0.91
2nd	3.038 / 0.91
3rd	1.592 / 0.91
4th	1.000 / 0.93
5th	0.723 / 0.91
Rev	5.494 / 0.90
FINAL G/RATIO	5.285



10.3 Performance curve

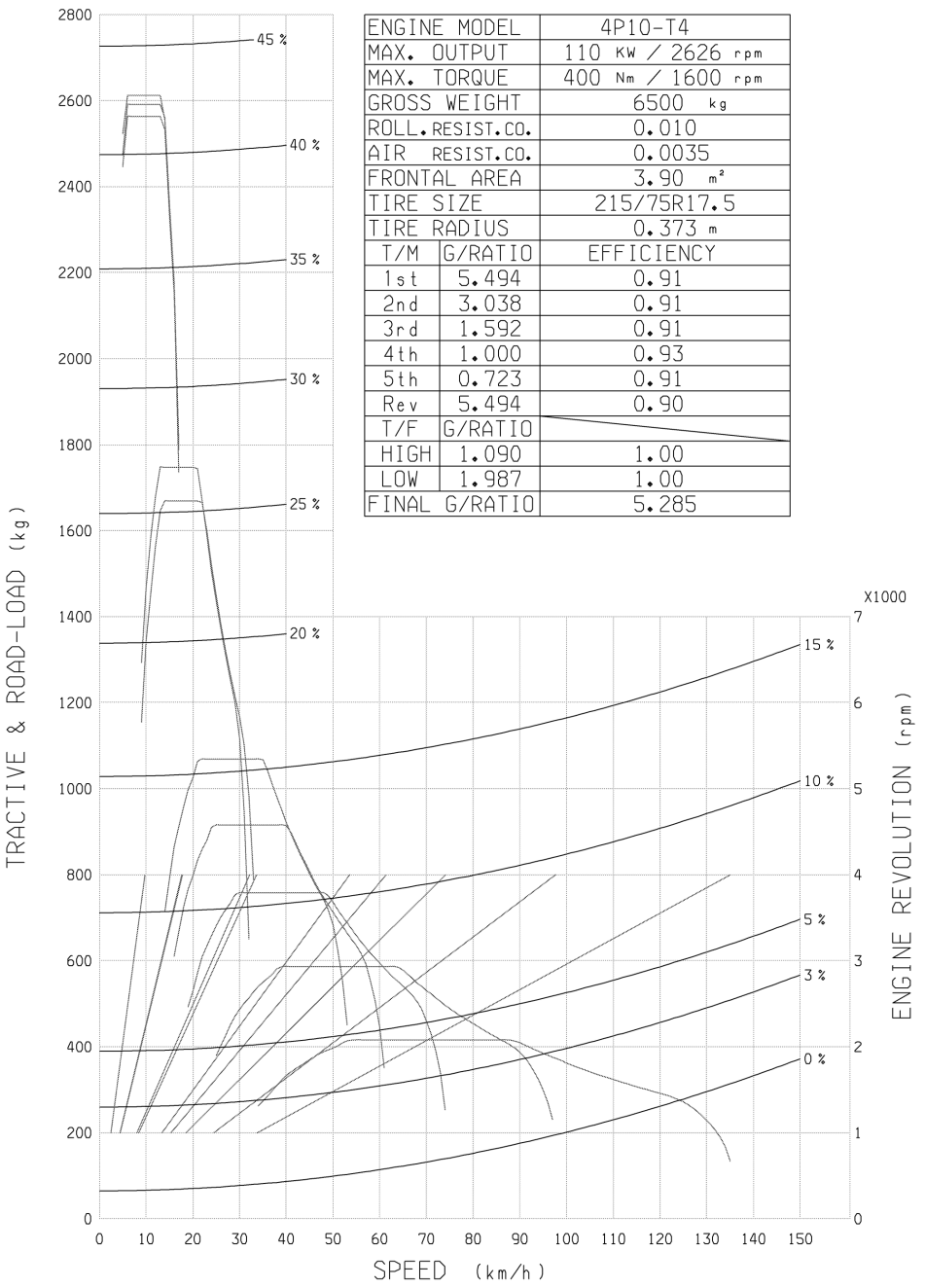
FECX1*R3 4P10-T6



ENGINE MODEL		4P10-T6
MAX. OUTPUT		129 PS / 2865 rpm
MAX. TORQUE		430 Nm / 1600 rpm
GROSS WEIGHT		8550 kg
ROLL. RESIST. CO.		0.010
AIR RESIST. CO.		0.0035
FRONTAL AREA		3.50 m²
TIRE SIZE		215/75R17.5
TIRE RADIUS		0.373 m
T/M	G/RATIO	EFFICIENCY
1st	5.397	0.91
2nd	3.788	0.91
3rd	2.310	0.91
4th	1.474	0.91
5th	1.000	0.93
6th	0.701	0.91
Rev	5.397	0.90
FINAL G/RATIO		6.166

10.3 Performance curve

FGB71*R6 4P10-T4



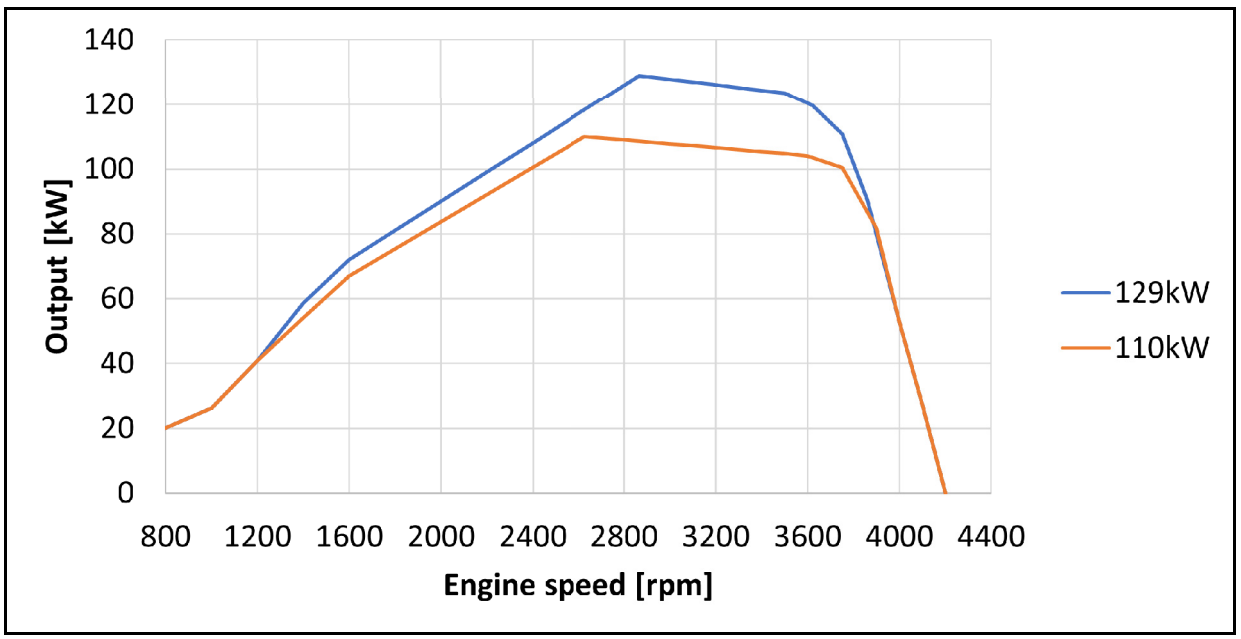
ENGINE MODEL	4P10-T4
MAX. OUTPUT	110 KW / 2626 rpm
MAX. TORQUE	400 Nm / 1600 rpm
GROSS WEIGHT	6500 kg
ROLL. RESIST. CO.	0.010
AIR RESIST. CO.	0.0035
FRONTAL AREA	3.90 m²
TIRE SIZE	215/75R17.5
TIRE RADIUS	0.373 m

T/M	G/RATIO	EFFICIENCY
1st	5.494	0.91
2nd	3.038	0.91
3rd	1.592	0.91
4th	1.000	0.93
5th	0.723	0.91
Rev	5.494	0.90

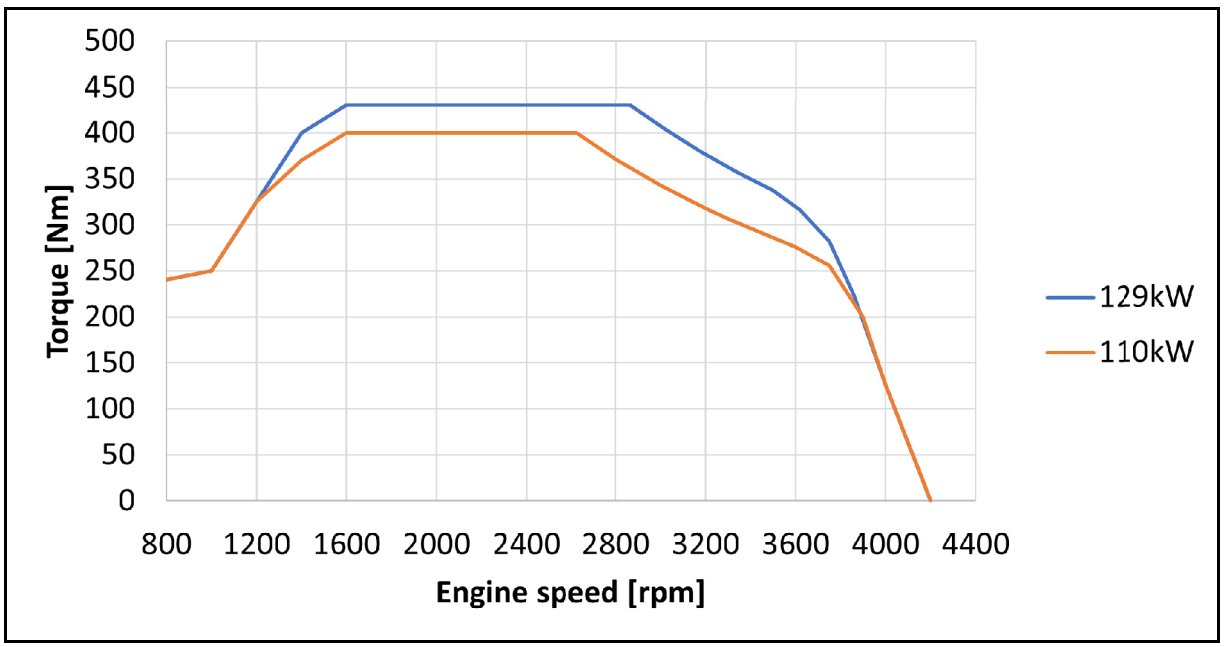
T/F	G/RATIO	
HIGH	1.090	1.00
LOW	1.987	1.00
FINAL G/RATIO		5.285

10.3.2 Engine performance curve

- Output



- Torque



10.3.3 Governor and torque characteristics

- 4P10 (110kW)

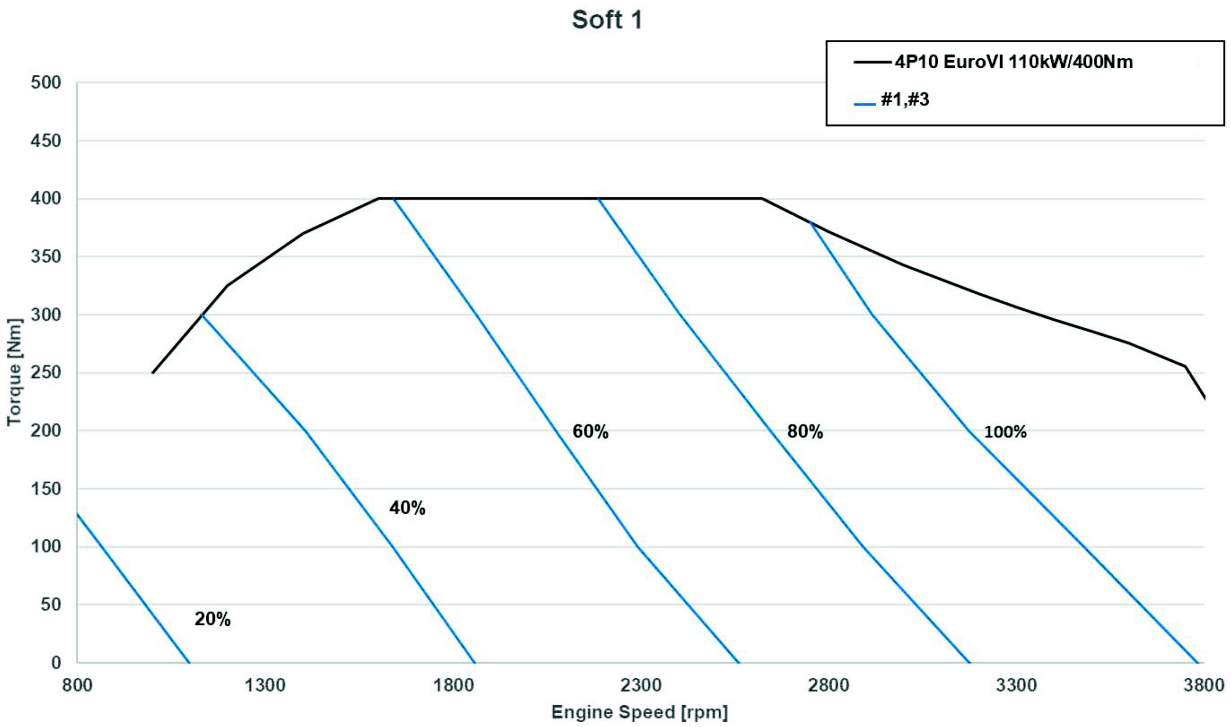


Fig. 1

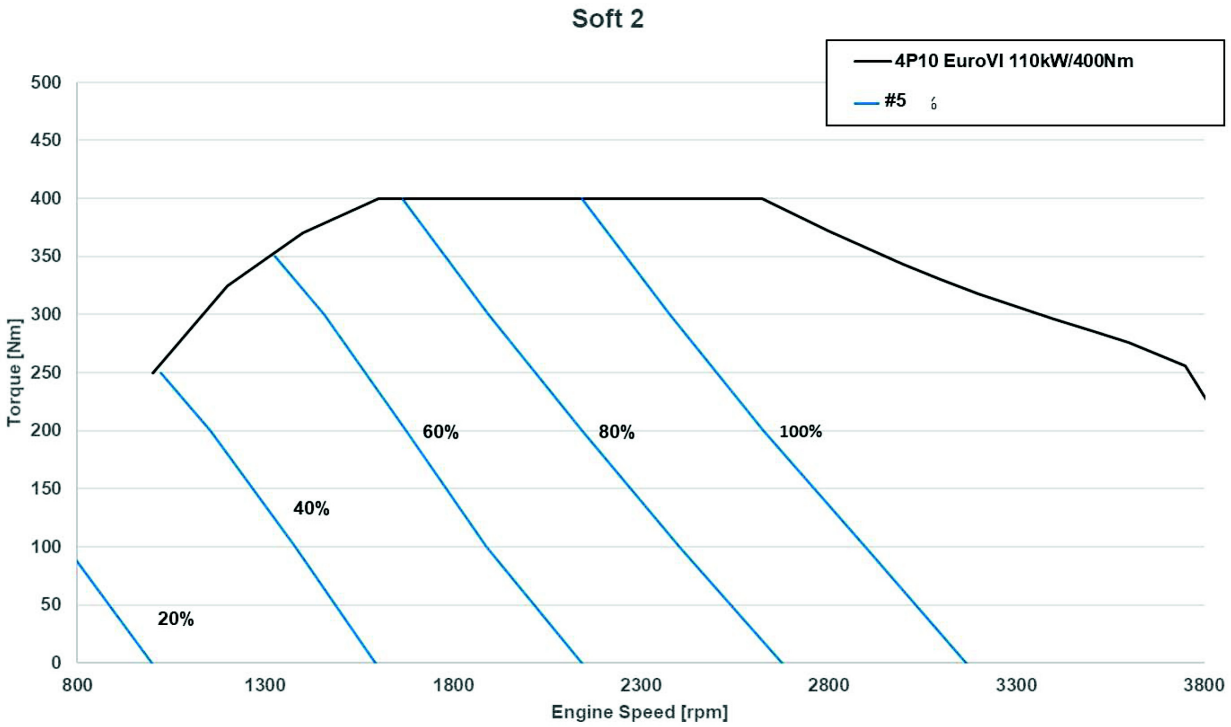


Fig. 2

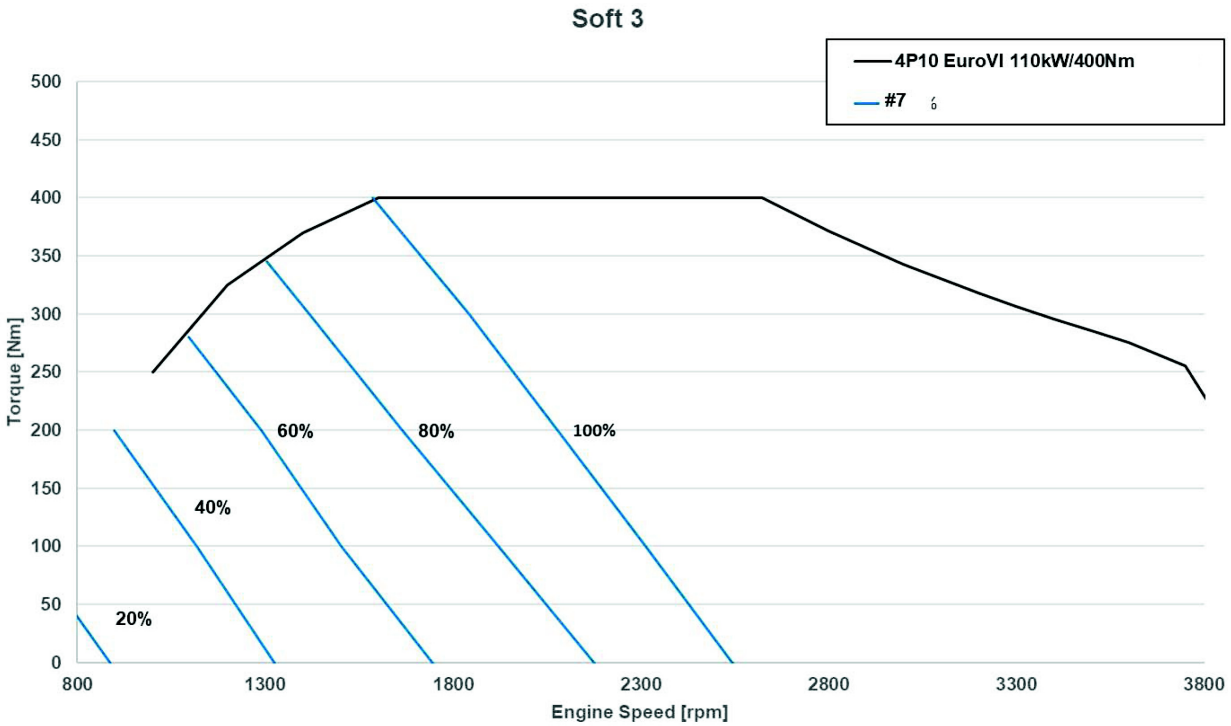

Soft 3
4P10 EuroVI 110kW/400Nm
#7
Torque [Nm]
Engine Speed [rpm]
20%
40%
60%
80%
100%

Fig. 3

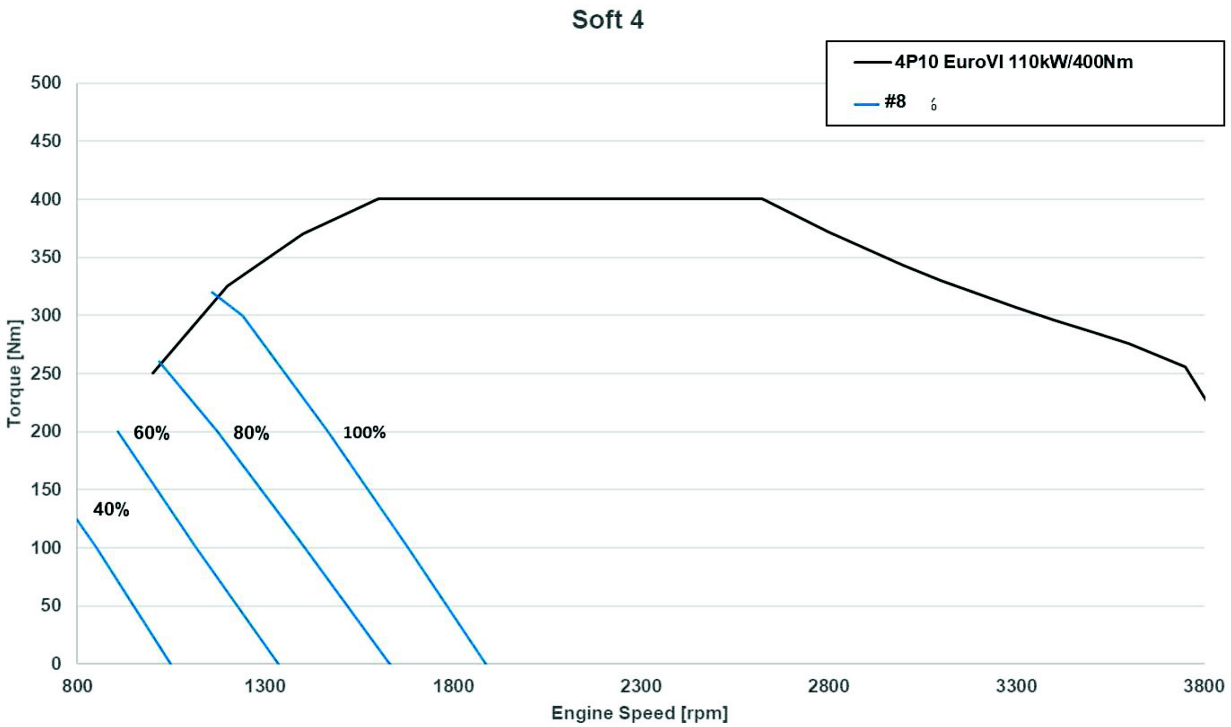

Soft 4
4P10 EuroVI 110kW/400Nm
#8
Torque [Nm]
Engine Speed [rpm]
40%
60%
80%
100%

Fig. 4

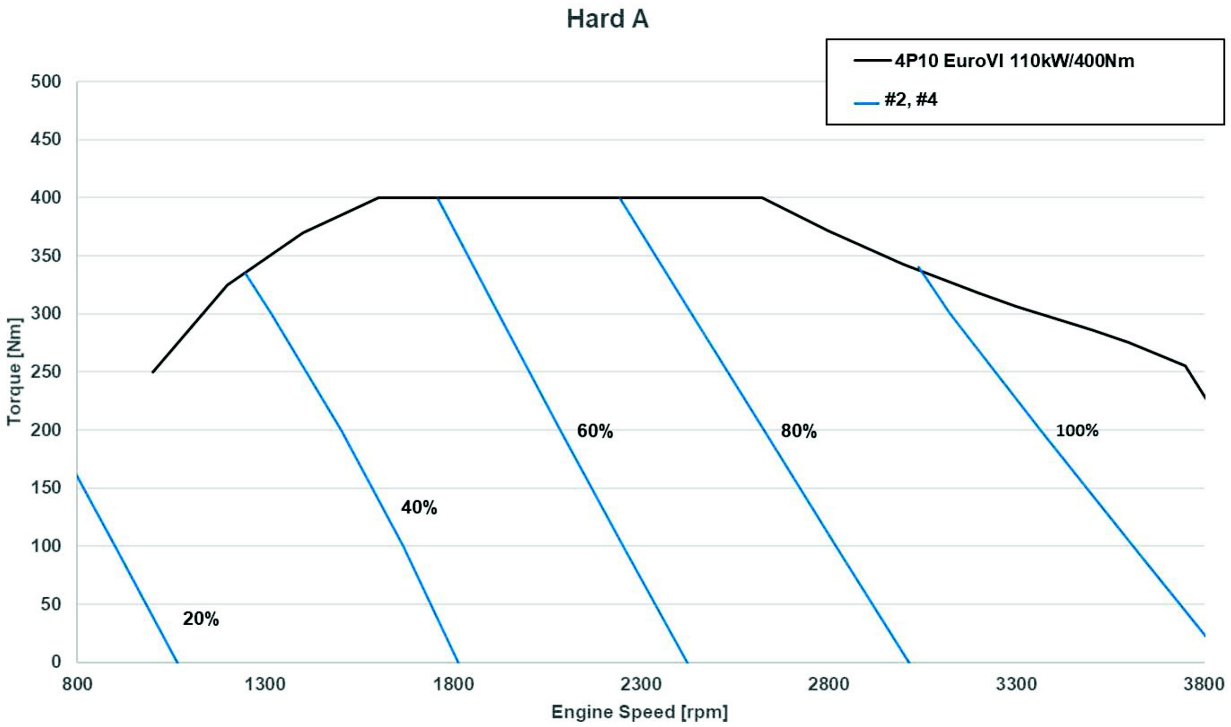

Hard A
4P10 EuroVI 110kW/400Nm
#2, #4
Torque [Nm]
Engine Speed [rpm]
20%
40%
60%
80%
100%

Fig. 5

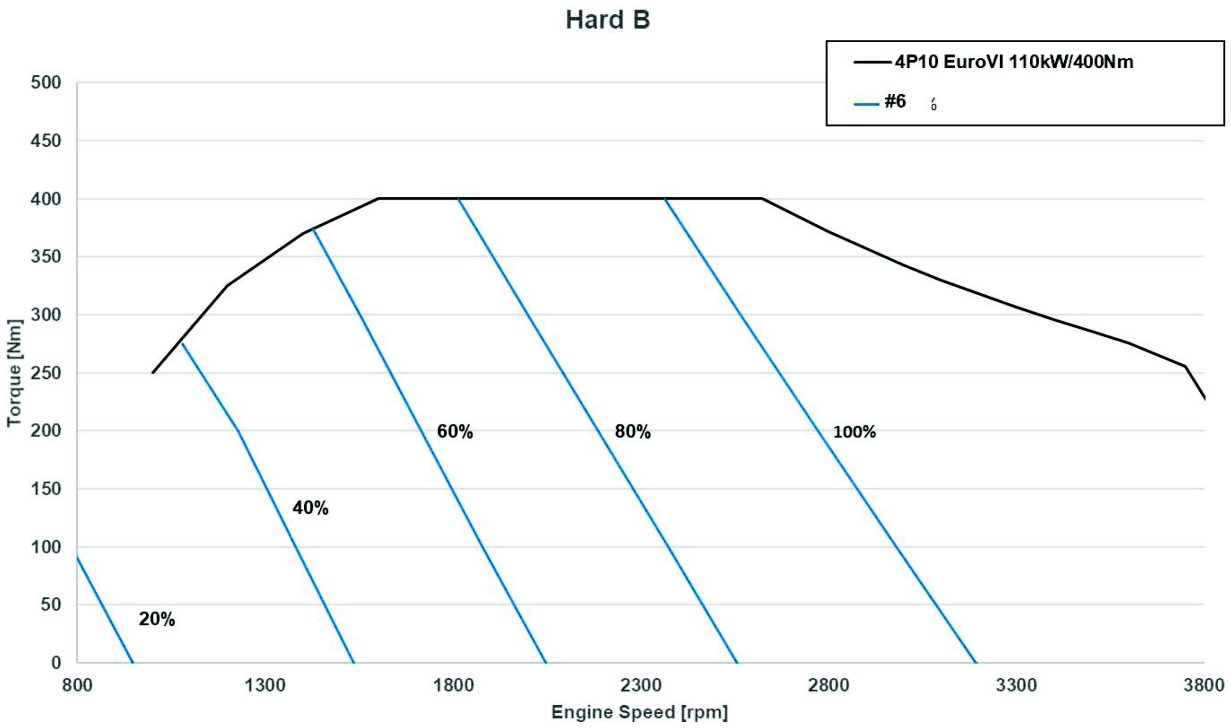

Hard B
4P10 EuroVI 110kW/400Nm
#6
Torque [Nm]
Engine Speed [rpm]
20%
40%
60%
80%
100%

Fig. 6

- 4P10 (129kW)

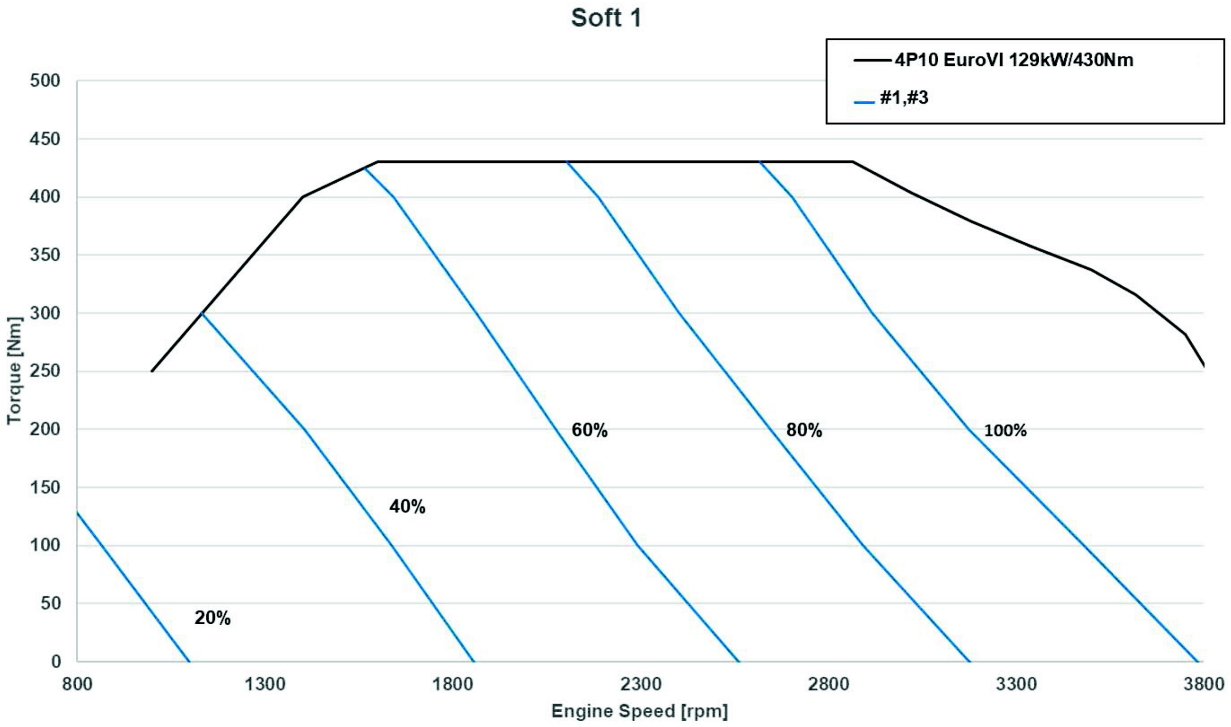


Fig. 7

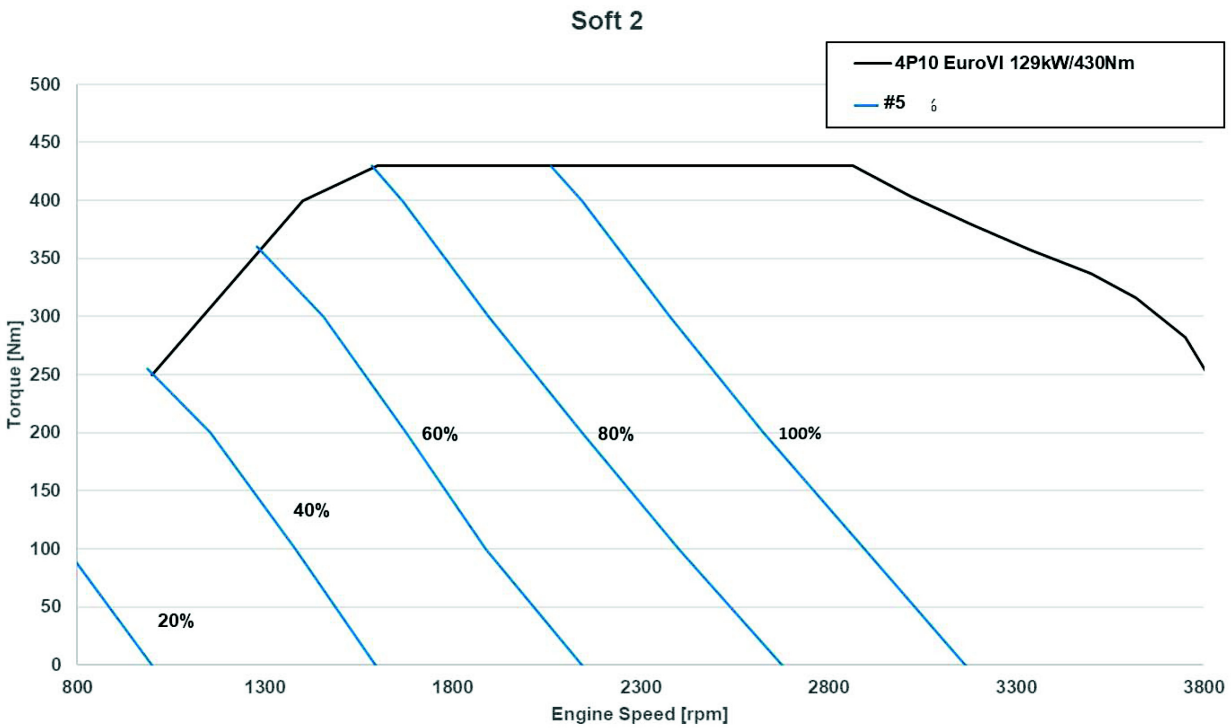


Fig. 8

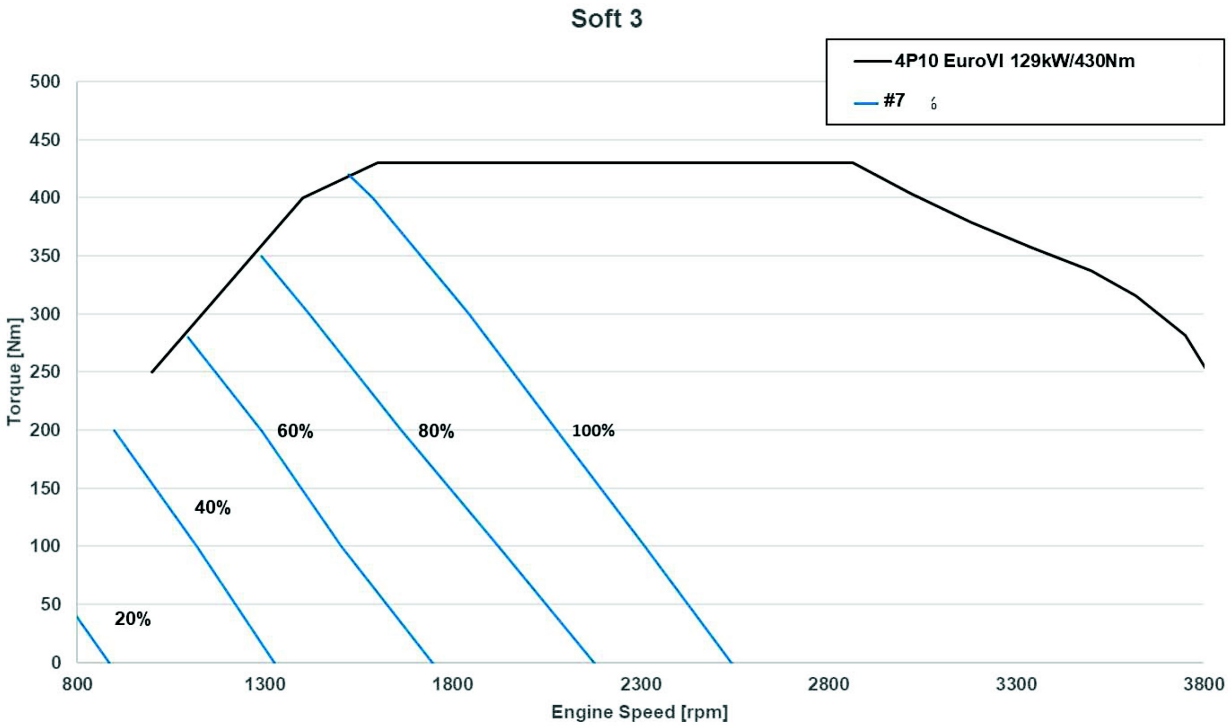

Soft 3
4P10 EuroVI 129kW/430Nm
#7
Torque [Nm]
Engine Speed [rpm]
20%
40%
60%
80%
100%

Fig. 9

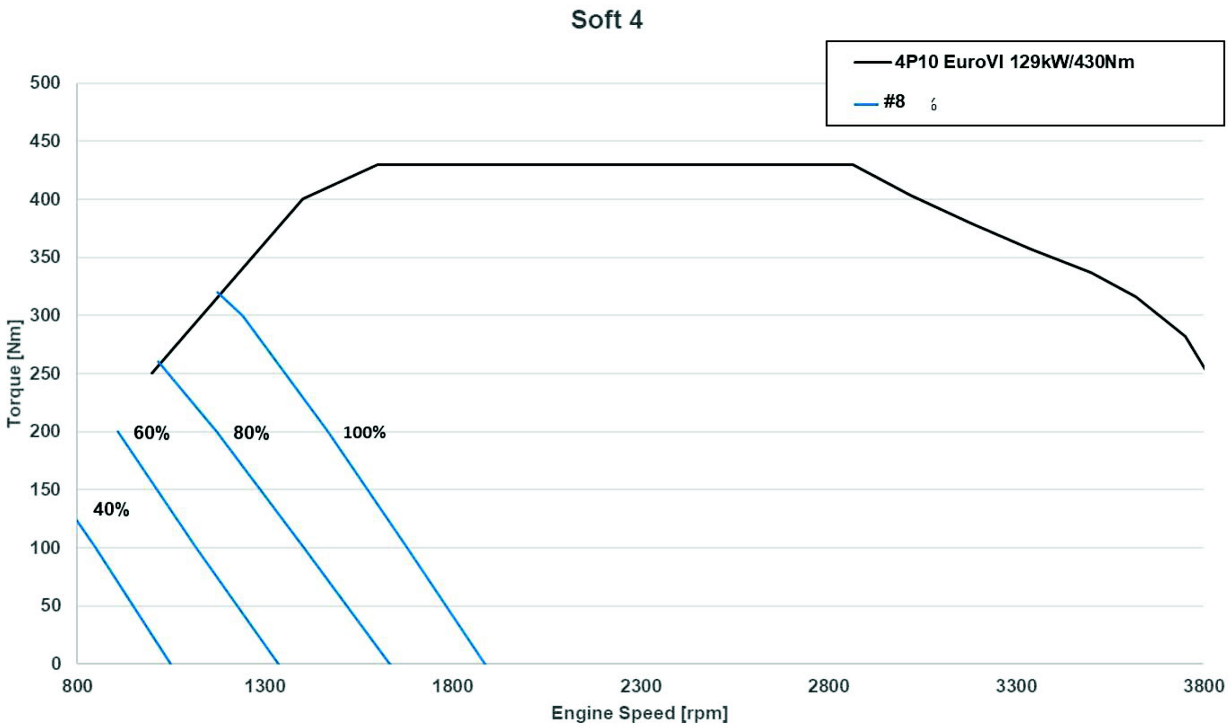

Soft 4
4P10 EuroVI 129kW/430Nm
#8
Torque [Nm]
Engine Speed [rpm]
40%
60%
80%
100%

Fig. 10

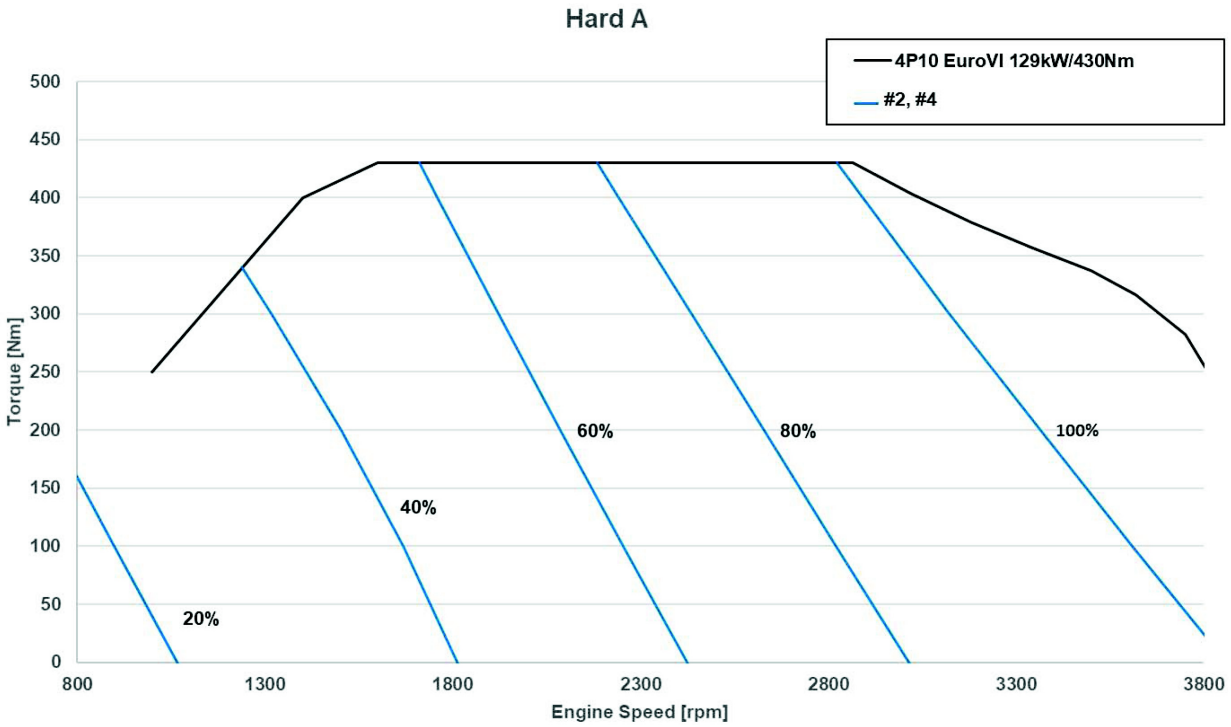

Hard A
4P10 EuroVI 129kW/430Nm
#2, #4
Torque [Nm]
Engine Speed [rpm]
20%
40%
60%
80%
100%

Fig. 11

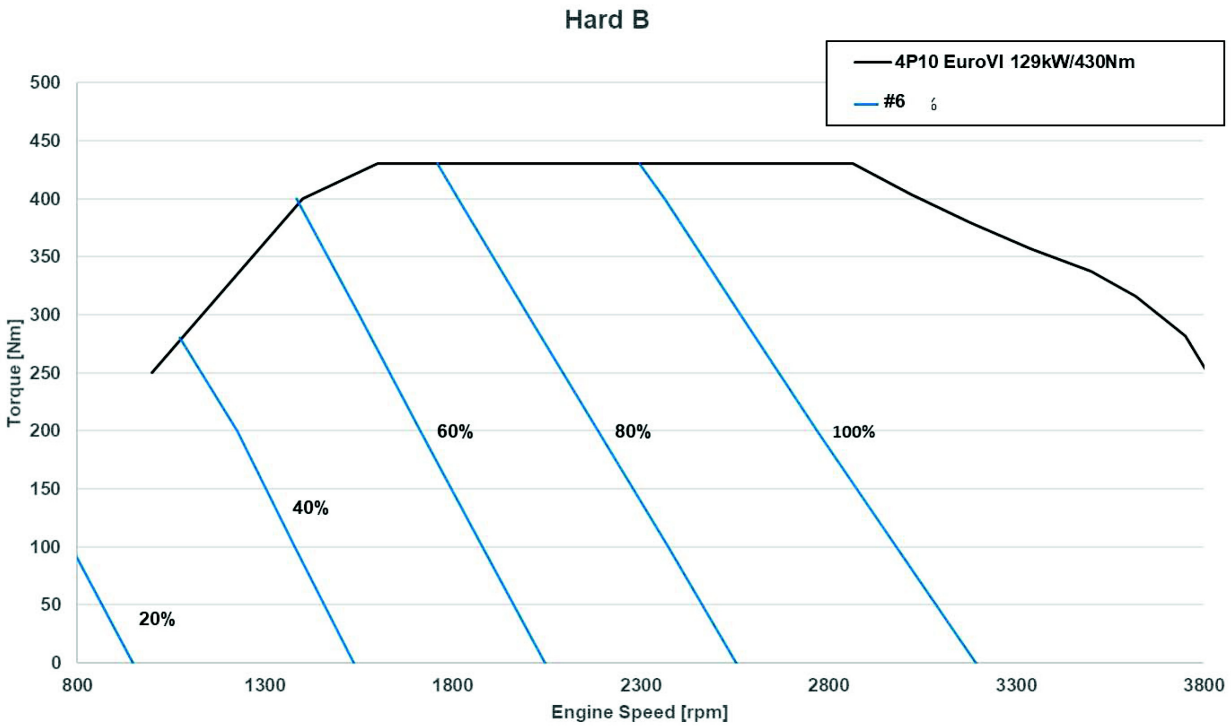

Hard B
4P10 EuroVI 129kW/430Nm
#6
Torque [Nm]
Engine Speed [rpm]
20%
40%
60%
80%
100%

Fig. 12

10.4 Weight distribution table

10.4.1 Weight distribution table

Model: FEA61BR4SFBM (110 kW)

Wheelbase (m) : 2.500

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	7	-0.946	9.5	-2.6
Steering system	37	-0.714	47.2	-10.5
Engine control system	1	-0.900	0.5	-0.1
Brake, clutch control system	21	-0.900	28.6	-7.6
Air intake system	20	-0.515	24.1	-4.1
Parking brake system	5	0.826	3.5	1.7
Remote control system	15	0.793	10.0	4.7
Cab assembly, Front cab mounting	294	-0.250	323.5	-29.4
Cooling system	20	-0.315	22.1	-2.5
Engine, Transmission assembly	389	0.356	333.9	55.5
Rear cab mounting	41	-0.160	43.6	-2.6
Battery	28	0.889	18.0	10.0
Fuel system	114	1.375	51.3	62.7
Exhaust system	37	2.137	5.4	31.9
Propeller shaft assembly	12	1.839	3.0	8.5
Electric system	38	-0.700	48.3	-10.6
Frame and others	229	1.317	108.2	120.4
Engine and T/M cover	10	0.356	8.2	1.4
A/C unit	20	-0.690	24.9	-5.4
Electric others	10	1.450	4.2	5.8
ECU	4	-0.805	5.3	-1.3
SCR tank	20	3.625	-8.9	28.6
IFS	0	0.024	0.0	0.0
Spare tire carrier	6.0	1.300	2.9	3.1
Transmission PTO	13	0.000	12.5	0.0
Sprung weight	1387		1129.8 1130	257.6 258
Unsprung weight	715		275	440
Chassis Cab weight *2	2102 2100		1405 1405	698 695

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB21CR4SFBM (110 kW)

Wheelbase (m) : 2.800

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	14.3	-3.8
Steering system	19	-0.719	24.1	-4.9
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	31.9	-8.4
Air intake system	24	0.524	19.3	4.4
Parking brake system	5	0.826	3.7	1.5
Remote control system	15	0.793	10.8	4.2
Cab assembly, Front cab mounting	345	-0.300	382.3	-37.0
Cooling system	24	-0.315	26.1	-2.6
Engine, Transmission assembly	389	0.401	333.6	55.8
Rear cab mounting	44	-0.223	47.5	-3.5
Battery	28	0.889	19.1	8.9
Fuel system	114	1.275	62.1	51.9
Exhaust system	36	2.137	8.5	27.5
Propeller shaft assembly	12	1.882	3.8	7.7
Electric system	39	-0.800	49.8	-11.1
Frame and others	206	1.317	109.2	97.0
Engine and T/M cover	11	0.401	9.0	1.5
A/C unit	21	-0.780	26.2	-5.7
Electric others	10	1.600	4.3	5.7
ECU	4	-0.896	5.3	-1.3
SCR tank	20	1.975	5.8	13.9
IFS	95	0.005	94.4	0.2
Spare tire carrier	2	1.500	0.9	1.1
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1495		1292.5 1293	202.9 203
Unsprung weight	555		175	380
Chassis Cab weight *2	2050 2050		1468 1470	583 580

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB21ER4SFBM (110 kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.6	-3.1
Steering system	19	-0.719	23.3	-4.1
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	30.4	-6.9
Air intake system	24	0.524	20.0	3.7
Parking brake system	5	0.826	3.9	1.3
Remote control system	15	0.471	12.9	2.1
Cab assembly, Front cab mounting	345	-0.300	375.8	-30.5
Cooling system	24	-0.315	25.7	-2.2
Engine, Transmission assembly	389	0.401	343.5	45.9
Rear cab mounting	44	-0.223	46.9	-2.9
Battery	28	0.889	20.7	7.3
Fuel system	114	1.825	52.8	61.2
Exhaust system	31	2.168	11.3	20.0
Propeller shaft assembly	22	2.190	7.9	14.2
Electric system	39	-0.800	47.8	-9.1
Frame and others	227	1.639	117.4	109.2
Engine and T/M cover	10	0.401	9.2	1.2
A/C unit	21	-0.780	25.2	-4.7
Electric others	10	1.700	5.0	5.0
ECU	4	-0.896	5.1	-1.1
SCR tank	20	2.575	4.8	14.9
IFS	95	0.005	94.5	0.1
Spare tire carrier	2	4.363	-0.6	2.6
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1522		1297.6 1298	224.0 224
Unsprung weight	555		175	380
Chassis Cab weight *2	2077 2075		1473 1470	604 605

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB51ER4SFBM (110 kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.6	-3.1
Steering system	41	-0.719	49.1	-8.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	30.4	-6.9
Air intake system	24	0.524	20.0	3.7
Parking brake system	5	0.826	3.9	1.3
Remote control system	15	0.471	12.9	2.1
Cab assembly, Front cab mounting	345	-0.300	375.8	-30.5
Cooling system	25	-0.315	27.2	-2.3
Engine, Transmission assembly	389	0.401	343.5	45.9
Rear cab mounting	44	-0.223	46.9	-2.9
Battery	28	0.889	20.7	7.3
Fuel system	114	1.825	52.8	61.2
Exhaust system	31	2.168	11.3	20.0
Propeller shaft assembly	22	2.190	7.9	14.2
Electric system	39	-0.800	47.8	-9.1
Frame and others	297	1.639	153.8	143.1
Engine and T/M cover	12	0.401	10.5	1.4
A/C unit	21	-0.780	25.2	-4.7
Electric others	10	1.700	5.0	5.0
ECU	4	-0.896	5.1	-1.1
SCR tank	20	2.575	4.8	14.9
IFS	0	0.005	0.0	0.0
Spare tire carrier	2	4.363	-0.6	2.6
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1522		1268.1 1268	253.4 253
Unsprung weight	740		285	455
Chassis Cab weight *2	2262 2260		1553 1555	708 705

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB51GR4SFBM (110 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-8.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	29.6	-6.1
Air intake system	24	0.524	20.5	3.2
Parking brake system	5	0.826	4.1	1.1
Remote control system	15	0.435	13.3	1.7
Cab assembly, Front cab mounting	345	-0.300	372.2	-26.9
Cooling system	25	-0.315	26.9	-2.0
Engine, Transmission assembly	389	0.401	348.8	40.6
Rear cab mounting	44	-0.223	46.5	-2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.333	44.9	69.1
Exhaust system	32	1.420	20.2	11.8
Propeller shaft assembly	23	2.416	8.5	14.3
Electric system	39	-0.800	46.7	-8.0
Frame and others	316	1.925	158.0	158.0
Engine and T/M cover	12	0.401	10.7	1.2
A/C unit	21	-0.780	24.7	-4.2
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	4.9	-0.9
SCR tank	20	3.025	4.2	15.5
IFS	0	0.005	0.0	0.0
Spare tire carrier	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1542		1272.6 1273	269.4 269
Unsprung weight	740		285	455
Chassis Cab weight *2	2282 2280		1558 1555	724 725

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB71GR4SFBM (110 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-7.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	29.6	-6.1
Air intake system	24	0.524	20.5	3.2
Parking brake system	5	0.826	4.1	1.1
Remote control system	15	0.435	13.3	1.7
Cab assembly, Front cab mounting	345	-0.300	372.2	-26.9
Cooling system	25	-0.315	26.9	-2.0
Engine, Transmission assembly	389	0.401	348.8	40.6
Rear cab mounting	44	-0.223	46.5	-2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.333	44.9	69.1
Exhaust system	31	2.022	14.9	16.4
Propeller shaft assembly	23	2.416	8.5	14.3
Electric system	39	-0.800	46.7	-8.0
Frame and others	325	1.925	162.3	162.3
Engine and T/M cover	12	0.401	10.7	1.2
A/C unit	21	-0.780	24.7	-4.2
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	4.9	-0.9
SCR tank	20	3.025	4.2	15.5
IFS	0	0.005	0.0	0.0
Spare tire carrier	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1550		1271.6 1272	278.3 278
Unsprung weight	905		330	575
Chassis Cab weight *2	2455 2455		1602 1600	853 855

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB71GR4WFBM (110 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-7.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	26.5	-5.5
Air intake system	25	0.524	21.6	3.4
Parking brake system	5	0.826	4.1	1.1
Remote control system	9	0.471	7.6	1.1
Cab assembly, Front cab mounting	564	0.240	529.1	35.2
Cooling system	25	-0.315	26.9	-2.0
Engine, Transmission assembly	389	0.401	348.8	40.6
Rear cab mounting	42	0.230	39.0	2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.325	45.2	68.8
Exhaust system	31	2.168	13.7	17.6
Propeller shaft assembly	22	2.240	9.2	12.9
Electric system	39	-0.800	46.7	-8.0
Frame and others	325	1.925	162.6	162.6
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	30	-0.300	32.3	-2.3
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	4.9	-0.9
SCR tank	20	3.025	4.2	15.5
IFS	0	0.000	0.0	0.0
Spare tire career	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1759		1412.7 1413	346.4 346
Unsprung weight	895		325	570
Chassis Cab weight *2	2654 2655		1738 1740	916 915

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB91GR4WFBP (129 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-7.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	29.6	-6.1
Air intake system	25	0.524	21.6	3.4
Parking brake system	5	0.826	4.1	1.1
Remote control system	15	0.435	13.3	1.7
Cab assembly, Front cab mounting	570	0.240	534.7	35.6
Cooling system	21	-0.315	23.0	-1.7
Engine, Transmission assembly	389	0.401	348.8	40.6
Rear cab mounting	42	0.230	39.0	2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.325	45.2	68.8
Exhaust system	53	2.022	25.4	28.0
Propeller shaft assembly	23	2.430	8.4	14.4
Electric system	39	-0.800	46.7	-8.0
Frame and others	325	1.925	162.5	162.5
Engine and T/M cover	6	0.401	5.2	0.6
A/C unit	30	-0.300	32.3	-2.3
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	4.9	-0.9
SCR tank	20	3.025	4.2	15.5
IFS	0	0.000	0.0	0.0
Spare tire carrier	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1796		1436.8 1437	359.2 359
Unsprung weight	895		325	570
Chassis Cab weight *2	2691 2690		1762 1760	929 930

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEC71ER4SFBM (110 kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.6	-3.1
Steering system	41	-0.719	49.1	-8.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	30.4	-6.9
Air intake system	24	0.524	20.0	3.7
Parking brake system	5	0.826	3.9	1.3
Remote control system	15	0.471	12.9	2.1
Cab assembly, Front cab mounting	345	-0.300	375.8	-30.5
Cooling system	25	-0.315	27.2	-2.3
Engine, Transmission assembly	389	0.401	343.5	45.9
Rear cab mounting	44	-0.223	46.9	-2.9
Battery	28	0.889	20.7	7.3
Fuel system	114	1.825	52.8	61.2
Exhaust system	33	2.168	11.9	20.9
Propeller shaft assembly	22	2.190	7.9	14.2
Electric system	39	-0.800	47.8	-9.1
Frame and others	304	1.860	137.6	166.2
Engine and T/M cover	10	0.401	9.2	1.2
A/C unit	21	-0.780	25.2	-4.7
Electric others	10	1.700	5.0	5.0
ECU	4	-0.896	5.1	-1.1
SCR tank	20	2.575	4.8	14.9
IFS	0	0.005	0.0	0.0
Spare tire carrier	2	4.363	-0.6	2.6
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1528		1251.2 1251	277.2 277
Unsprung weight	900		325	575
Chassis Cab weight *2	2428 2430		1576 1575	852 855

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEC71HR4SFBM (110 kW)

Wheelbase (m) : 4.300

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.0	-2.5
Steering system	41	-0.719	47.3	-6.8
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	29.0	-5.5
Air intake system	24	0.524	20.8	2.9
Parking brake system	5	0.826	4.2	1.0
Remote control system	15	0.276	14.0	1.0
Cab assembly, Front cab mounting	345	-0.300	369.4	-24.1
Cooling system	25	-0.315	26.7	-1.8
Engine, Transmission assembly	389	0.401	353.1	36.3
Rear cab mounting	44	-0.223	46.3	-2.3
Battery	28	0.889	22.2	5.8
Fuel system	114	2.700	42.4	71.6
Exhaust system	33	2.016	17.4	15.4
Propeller shaft assembly	35	2.653	13.3	21.3
Electric system	39	-0.800	45.9	-7.2
Frame and others	352	2.361	158.6	193.2
Engine and T/M cover	15	0.401	13.7	1.4
A/C unit	21	-0.780	24.2	-3.7
Electric others	10	2.020	5.3	4.7
ECU	4	-0.896	5.1	-0.9
SCR tank	20	3.075	5.6	14.1
IFS	0	0.000	0.0	0.0
Spare tire carrier	2	5.363	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1594		1277.5 1278	316.3 316
Unsprung weight	910		330	580
Chassis Cab weight *2	2504 2505		1608 1610	896 895

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEC81CR4SFBM (110 kW)

Wheelbase (m) : 2.800

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	14.3	-3.8
Steering system	41	-0.719	50.9	-10.4
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	31.9	-8.4
Air intake system	24	0.524	19.3	4.4
Parking brake system	5	0.826	3.7	1.5
Remote control system	15	0.793	10.8	4.2
Cab assembly, Front cab mounting	345	-0.300	382.3	-37.0
Cooling system	25	-0.315	27.7	-2.8
Engine, Transmission assembly	389	0.401	333.6	55.8
Rear cab mounting	44	-0.223	47.5	-3.5
Battery	28	0.889	19.1	8.9
Fuel system	114	1.275	62.1	51.9
Exhaust system	38	2.137	9.0	29.1
Propeller shaft assembly	12	1.882	3.8	7.7
Electric system	39	-0.800	49.8	-11.1
Frame and others	270	1.465	128.5	141.0
Engine and T/M cover	15	0.401	12.9	2.2
A/C unit	21	-0.780	26.2	-5.7
Electric others	10	1.600	4.3	5.7
ECU	4	-0.896	5.3	-1.3
SCR tank	20	1.975	5.8	13.9
IFS	0	0.005	0.0	0.0
Spare tire carrier	0	3.663	0.0	0.0
Transmission PTO	13	0.000	12.5	0.0
Sprung weight	1504		1261.8 1262	242.2 242
Unsprung weight	900		325	575
Chassis Cab weight *2	2404 2405		1587 1590	817 815

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FECX1GR4SFBP (129 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-7.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	29.6	-6.1
Air intake system	24	0.524	20.5	3.2
Parking brake system	5	0.826	4.1	1.1
Remote control system	15	0.435	13.3	1.7
Cab assembly, Front cab mounting	345	-0.300	372.2	-26.9
Cooling system	21	-0.315	23.0	-1.7
Engine, Transmission assembly	389	0.401	348.8	40.6
Rear cab mounting	44	-0.223	46.5	-2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.333	44.9	69.1
Exhaust system	55	2.022	26.0	28.7
Propeller shaft assembly	23	2.416	8.5	14.3
Electric system	39	-0.800	46.7	-8.0
Frame and others	328	2.200	140.4	187.1
Engine and T/M cover	15	0.401	13.5	1.6
A/C unit	21	-0.780	24.7	-4.2
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	5.2	-1.0
SCR tank	20	3.025	4.2	15.5
IFS	0	0.005	0.0	0.0
Spare tire career	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1576		1260.0 1260	316.0 316
Unsprung weight	910		330	580
Chassis Cab weight *2	2486 2485		1590 1590	896 895

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FECX1GR4WFBP (129 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-7.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	29.6	-6.1
Air intake system	25	0.524	21.6	3.4
Parking brake system	5	0.826	4.1	1.1
Remote control system	15	0.435	13.3	1.7
Cab assembly, Front cab mounting	570	0.240	534.7	35.6
Cooling system	21	-0.315	23.0	-1.7
Engine, Transmission assembly	389	0.401	348.8	40.6
Rear cab mounting	42	0.230	39.0	2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.325	45.2	68.8
Exhaust system	63	2.022	29.7	32.9
Propeller shaft assembly	23	2.430	8.4	14.4
Electric system	39	-0.800	46.7	-8.0
Frame and others	325	1.925	162.5	162.5
Engine and T/M cover	6	0.401	5.2	0.6
A/C unit	30	-0.300	32.3	-2.3
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	4.9	-0.9
SCR tank	20	3.025	4.2	15.5
IFS	0	0.000	0.0	0.0
Spare tire career	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1805		1441.1 1441	364.1 364
Unsprung weight	895		325	570
Chassis Cab weight *2	2700 2700		1766 1765	934 935

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FECX1HR4SFBP (129 kW)

Wheelbase (m) : 4.300

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.0	-2.5
Steering system	41	-0.719	47.3	-6.8
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	29.0	-5.5
Air intake system	24	0.524	20.8	2.9
Parking brake system	5	0.826	4.2	1.0
Remote control system	15	0.276	14.0	1.0
Cab assembly, Front cab mounting	345	-0.300	369.4	-24.1
Cooling system	21	-0.315	22.9	-1.6
Engine, Transmission assembly	389	0.401	353.1	36.3
Rear cab mounting	44	-0.223	46.3	-2.3
Battery	28	0.889	22.2	5.8
Fuel system	114	2.700	42.4	71.6
Exhaust system	55	2.016	29.1	25.6
Propeller shaft assembly	35	2.653	13.3	21.3
Electric system	39	-0.800	45.9	-7.2
Frame and others	352	2.361	158.6	193.2
Engine and T/M cover	15	0.401	13.7	1.4
A/C unit	21	-0.780	24.2	-3.7
Electric others	10	2.020	5.3	4.7
ECU	4	-0.896	5.1	-0.9
SCR tank	20	3.075	5.6	14.1
IFS	0	0.000	0.0	0.0
Spare tire career	2	5.363	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1612		1285.4 1285	326.7 327
Unsprung weight	910		330	580
Chassis Cab weight *2	2522 2520		1615 1615	907 905

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FECX1KR4SFBP (129 kW)

Wheelbase (m) : 4.750

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	12.7	-2.2
Steering system	41	-0.719	46.6	-6.1
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	24	-1.000	28.4	-4.9
Air intake system	24	0.524	21.1	2.6
Parking brake system	5	0.826	4.3	0.9
Remote control system	15	0.259	14.2	0.8
Cab assembly, Front cab mounting	345	-0.300	367.1	-21.8
Cooling system	21	-0.315	22.7	-1.4
Engine, Transmission assembly	389	0.401	356.5	32.9
Rear cab mounting	44	-0.223	46.1	-2.1
Battery	28	0.889	22.8	5.2
Fuel system	114	3.083	40.0	74.0
Exhaust system	55	2.016	31.5	23.2
Propeller shaft assembly	37	2.877	14.7	22.6
Electric system	39	-0.800	45.2	-6.5
Frame and others	368	2.630	164.2	203.8
Engine and T/M cover	15	0.401	13.8	1.3
A/C unit	21	-0.780	23.9	-3.4
Electric others	10	2.110	5.6	4.4
ECU	4	-0.896	5.0	-0.8
SCR tank	20	3.075	6.9	12.8
IFS	0	0.000	0.0	0.0
Spare tire career	2	5.813	-0.4	2.4
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1631		1293.4 1293	337.6 338
Unsprung weight	910		330	580
Chassis Cab weight *2	2541 2540		1623 1625	918 915

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEA21CR3SFBM (110 kW)

Wheelbase (m) : 2.800

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	7	-0.946	9.2	-2.3
Steering system	17	-0.714	21.6	-4.4
Engine control system	1	-0.900	0.5	-0.1
Brake, clutch control system	21	-0.900	27.8	-6.8
Air intake system	20	-0.515	23.7	-3.7
Parking brake system	5	0.826	3.7	1.5
Remote control system	9	0.793	6.2	2.5
Cab assembly, Front cab mounting	294	-0.250	320.4	-26.3
Cooling system	19	-0.315	20.7	-2.1
Engine, Transmission assembly	419	0.356	365.7	53.3
Rear cab mounting	41	-0.160	43.3	-2.3
Battery	28	0.889	19.1	8.9
Fuel system	114	1.375	58.0	56.0
Exhaust system	36	2.137	8.4	27.2
Propeller shaft assembly	12	1.839	3.9	7.6
Electric system	38	-0.700	47.1	-9.4
Frame and others	190	1.317	100.4	89.2
Engine and T/M cover	3	0.356	3.0	0.4
A/C unit	20	-0.690	24.3	-4.8
Electric others	10	1.450	4.8	5.2
ECU	4	-0.805	5.2	-1.2
SCR tank	20	3.625	-5.8	25.5
IFS	85	0.024	84.3	0.7
Spare tire carrier	2	1.500	0.9	1.1
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1412		1196.4 1196	215.7 216
Unsprung weight	535		170	365
Chassis Cab weight *2	1947 1945		1366 1365	581 580

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEA21ER3SFBM (110 kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	7	-0.946	8.8	-1.9
Steering system	17	-0.714	20.8	-3.6
Engine control system	1	-0.900	0.5	-0.1
Brake, clutch control system	21	-0.900	26.6	-5.6
Air intake system	20	-0.515	23.0	-3.0
Parking brake system	5	0.826	3.9	1.3
Remote control system	9	0.799	6.7	2.0
Cab assembly, Front cab mounting	294	-0.250	315.7	-21.6
Cooling system	19	-0.315	20.3	-1.7
Engine, Transmission assembly	419	0.356	375.1	43.9
Rear cab mounting	41	-0.161	42.9	-1.9
Battery	28	0.889	20.7	7.3
Fuel system	114	1.775	54.5	59.5
Exhaust system	30	2.168	11.0	19.3
Propeller shaft assembly	22	2.171	8.0	14.1
Electric system	38	-0.700	45.5	-7.8
Frame and others	214	1.639	110.7	103.1
Engine and T/M cover	3	0.356	3.0	0.4
A/C unit	20	-0.690	23.5	-4.0
Electric others	10	1.500	5.6	4.4
ECU	4	-0.805	4.9	-0.9
SCR tank	20	2.575	4.8	14.9
IFS	85	0.024	84.4	0.6
Spare tire carrier	2	4.363	-0.6	2.6
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1442		1220.3 1220	221.3 221
Unsprung weight	535		170	365
Chassis Cab weight *2	1977 1975		1390 1390	586 585

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEA21ER3SFBR (110 kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	7	-0.946	8.8	-1.9
Steering system	17	-0.714	20.8	-3.6
Engine control system	1	-0.900	0.5	-0.1
Brake, clutch control system	21	-0.900	26.6	-5.6
Air intake system	20	-0.515	23.0	-3.0
Parking brake system	5	0.826	3.9	1.3
Remote control system	9	0.799	6.7	2.0
Cab assembly, Front cab mounting	294	-0.250	315.7	-21.6
Cooling system	19	-0.315	20.3	-1.7
Engine, Transmission assembly	419	0.356	375.1	43.9
Rear cab mounting	41	-0.161	42.9	-1.9
Battery	28	0.889	20.7	7.3
Fuel system	114	1.775	54.5	59.5
Exhaust system	30	2.168	11.0	19.3
Propeller shaft assembly	22	2.171	8.0	14.1
Electric system	38	-0.700	45.5	-7.8
Frame and others	214	1.639	110.7	103.1
Engine and T/M cover	3	0.356	3.0	0.4
A/C unit	20	-0.690	23.5	-4.0
Electric others	10	1.500	5.6	4.4
ECU	4	-0.805	4.9	-0.9
SCR tank	20	2.575	4.8	14.9
IFS	85	0.024	84.4	0.6
Spare tire carrier	2	4.363	-0.6	2.6
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1442		1220.3 1220	221.3 221
Unsprung weight	535		170	365
Chassis Cab weight *2	1977 1975		1390 1390	586 585

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEA21ER3WFBM (110 kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	7	-0.946	8.8	-1.9
Steering system	17	-0.714	20.8	-3.6
Engine control system	1	-0.900	0.5	-0.1
Brake, clutch control system	21	-0.900	26.6	-5.6
Air intake system	23	-0.515	25.9	-3.4
Parking brake system	5	0.826	3.9	1.3
Remote control system	9	0.799	6.7	2.0
Cab assembly, Front cab mounting	483	0.290	441.9	41.2
Cooling system	19	-0.315	20.3	-1.7
Engine, Transmission assembly	419	0.356	375.1	43.9
Rear cab mounting	37	0.300	33.6	3.3
Battery	28	0.889	20.7	7.3
Fuel system	114	2.125	42.8	71.3
Exhaust system	30	2.168	11.0	19.3
Propeller shaft assembly	22	2.162	8.0	14.1
Electric system	38	-0.700	45.5	-7.8
Frame and others	214	1.639	110.7	103.1
Engine and T/M cover	3	0.356	3.0	0.4
A/C unit	29	-0.200	30.4	-1.7
Electric others	10	1.500	5.6	4.4
ECU	4	-0.805	4.9	-0.9
SCR tank	20	2.525	5.1	14.6
IFS	85	0.024	84.4	0.6
Spare tire carrier	2	4.363	-0.6	2.6
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1638		1335.6 1336	302.7 303
Unsprung weight	535		170	365
Chassis Cab weight *2	2173 2175		1506 1505	668 670

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEA61BR3SFBM (110 kW)

Wheelbase (m) : 2.500

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	7	-0.946	9.5	-2.6
Steering system	36	-0.719	46.9	-10.5
Engine control system	1	-0.900	0.5	-0.1
Brake, clutch control system	24	-0.900	32.0	-8.5
Air intake system	20	-0.515	24.1	-4.1
Parking brake system	5	0.826	3.5	1.7
Remote control system	15	0.793	10.0	4.7
Cab assembly, Front cab mounting	294	-0.250	323.5	-29.4
Cooling system	20	-0.315	22.1	-2.5
Engine, Transmission assembly	419	0.356	359.3	59.7
Rear cab mounting	41	-0.160	43.6	-2.6
Battery	28	0.889	18.0	10.0
Fuel system	114	1.375	51.3	62.7
Exhaust system	37	2.137	5.4	31.9
Propeller shaft assembly	12	1.839	3.0	8.5
Electric system	38	-0.700	48.3	-10.6
Frame and others	224	1.317	105.9	117.9
Engine and T/M cover	4	0.356	3.3	0.5
A/C unit	20	-0.690	24.9	-5.4
Electric others	10	1.450	4.2	5.8
ECU	4	-0.805	5.3	-1.3
SCR tank	20	3.625	-8.9	28.6
IFS	0	0.024	0.0	0.0
Spare tire carrier	6	1.300	2.9	3.1
Transmission PTO	13	0.000	12.5	0.0
Sprung weight	1409		1151.1 1151	257.5 258
Unsprung weight	715		275	440
Chassis Cab weight *2	2124 2125		1426 1425	698 700

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB21CR3SFBM (110 kW)

Wheelbase (m) : 2.800

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	14.3	-3.8
Steering system	19	-0.719	24.1	-4.9
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	28.5	-7.5
Air intake system	24	0.524	19.3	4.4
Parking brake system	5	0.826	3.7	1.5
Remote control system	9	0.793	6.2	2.5
Cab assembly, Front cab mounting	345	-0.300	382.3	-37.0
Cooling system	24	-0.315	26.5	-2.7
Engine, Transmission assembly	419	0.401	359.0	60.0
Rear cab mounting	44	-0.223	47.5	-3.5
Battery	28	0.889	19.1	8.9
Fuel system	114	1.275	62.1	51.9
Exhaust system	36	2.137	8.4	27.2
Propeller shaft assembly	12	1.882	3.8	7.7
Electric system	39	-0.800	49.8	-11.1
Frame and others	202	1.317	106.8	94.9
Engine and T/M cover	2	0.401	2.1	0.3
A/C unit	21	-0.780	26.2	-5.7
Electric others	10	1.600	4.3	5.7
ECU	4	-0.896	5.3	-1.3
SCR tank	20	1.975	5.8	13.9
IFS	95	0.005	94.4	0.2
Spare tire carrier	6	1.500	2.8	3.2
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1508		1302.8 1303	204.7 205
Unsprung weight	555		175	380
Chassis Cab weight *2	2063 2065		1478 1480	585 585

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB21ER3SFBM (110 kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.6	-3.1
Steering system	19	-0.719	23.3	-4.1
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	27.2	-6.2
Air intake system	24	0.524	20.0	3.7
Parking brake system	5	0.826	3.9	1.3
Remote control system	9	0.471	7.5	1.2
Cab assembly, Front cab mounting	345	-0.300	375.8	-30.5
Cooling system	24	-0.315	26.0	-2.2
Engine, Transmission assembly	419	0.401	369.6	49.4
Rear cab mounting	44	-0.223	46.9	-2.9
Battery	28	0.889	20.7	7.3
Fuel system	114	1.825	52.8	61.2
Exhaust system	30	2.168	10.9	19.2
Propeller shaft assembly	22	2.190	7.9	14.2
Electric system	39	-0.800	47.8	-9.1
Frame and others	227	1.639	117.4	109.2
Engine and T/M cover	2	0.401	2.1	0.3
A/C unit	21	-0.780	25.2	-4.7
Electric others	10	1.700	5.0	5.0
ECU	4	-0.896	5.1	-1.1
SCR tank	20	2.575	4.8	14.9
IFS	95	0.005	94.5	0.1
Spare tire carrier	2	4.363	-0.6	2.6
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1534		1307.9 1308	225.6 226
Unsprung weight	555		175	380
Chassis Cab weight *2	2089 2090		1483 1485	606 605

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB51ER3SFBM (110 kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.6	-3.1
Steering system	41	-0.719	49.1	-8.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	27.2	-6.2
Air intake system	24	0.524	20.0	3.7
Parking brake system	5	0.826	3.9	1.3
Remote control system	9	0.471	7.5	1.2
Cab assembly, Front cab mounting	345	-0.300	375.8	-30.5
Cooling system	25	-0.315	27.5	-2.3
Engine, Transmission assembly	419	0.401	369.6	49.4
Rear cab mounting	44	-0.223	46.9	-2.9
Battery	28	0.889	20.7	7.3
Fuel system	114	1.825	52.8	61.2
Exhaust system	30	2.168	10.9	19.2
Propeller shaft assembly	22	2.190	7.9	14.2
Electric system	39	-0.800	47.8	-9.1
Frame and others	297	1.639	153.8	143.1
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	21	-0.780	25.2	-4.7
Electric others	10	1.700	5.0	5.0
ECU	4	-0.896	5.1	-1.1
SCR tank	20	2.575	4.8	14.9
IFS	0	0.005	0.0	0.0
Spare tire carrier	2	4.363	-0.6	2.6
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1532		1277.4 1277	254.8 255
Unsprung weight	745		285	460
Chassis Cab weight *2	2277 2275		1562 1560	715 715

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB51GR3SFBM (110 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-7.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	26.5	-5.5
Air intake system	24	0.524	20.5	3.2
Parking brake system	5	0.826	4.1	1.1
Remote control system	9	0.435	7.7	1.0
Cab assembly, Front cab mounting	345	-0.300	372.2	-26.9
Cooling system	25	-0.315	27.3	-2.1
Engine, Transmission assembly	419	0.401	375.4	43.6
Rear cab mounting	44	-0.223	46.5	-2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.333	44.9	69.1
Exhaust system	30	2.022	14.3	15.8
Propeller shaft assembly	23	2.416	8.5	14.3
Electric system	39	-0.800	46.7	-8.0
Frame and others	316	1.925	158.0	158.0
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	21	-0.780	24.7	-4.2
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	4.9	-0.9
SCR tank	20	3.025	4.2	15.5
IFS	0	0.005	0.0	0.0
Spare tire carrier	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1552		1276.7 1277	275.3 275
Unsprung weight	745		285	460
Chassis Cab weight *2	2297 2295		1562 1560	735 735

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB71ER3WFBM (110 kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.6	-3.1
Steering system	41	-0.719	49.1	-8.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	27.2	-6.2
Air intake system	25	0.524	21.1	3.9
Parking brake system	5	0.826	3.9	1.3
Remote control system	9	0.471	7.5	1.2
Cab assembly, Front cab mounting	564	0.240	524.5	39.8
Cooling system	25	-0.315	27.5	-2.3
Engine, Transmission assembly	419	0.401	369.6	49.4
Rear cab mounting	42	0.230	38.7	2.8
Battery	28	0.889	20.7	7.3
Fuel system	114	2.175	41.1	72.9
Exhaust system	30	2.168	10.9	19.2
Propeller shaft assembly	22	2.204	7.8	14.3
Electric system	39	-0.800	47.8	-9.1
Frame and others	306	1.639	158.5	147.6
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	30	-0.300	32.6	-2.6
Electric others	10	1.700	5.0	5.0
ECU	4	-0.896	5.1	-1.1
SCR tank	20	2.525	5.1	14.6
IFS	0	0.024	0.0	0.0
Spare tire carrier	2	4.363	-0.6	2.6
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1769		1419.6 1420	349.1 349
Unsprung weight	905		330	575
Chassis Cab weight *2	2674 2675		1750 1750	924 925

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB71GR3SFBM (110 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-7.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	26.5	-5.5
Air intake system	24	0.524	20.5	3.2
Parking brake system	5	0.826	4.1	1.1
Remote control system	9	0.435	7.7	1.0
Cab assembly, Front cab mounting	345	-0.300	372.2	-26.9
Cooling system	25	-0.315	27.3	-2.1
Engine, Transmission assembly	419	0.401	375.4	43.6
Rear cab mounting	44	-0.223	46.5	-2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.333	44.9	69.1
Exhaust system	30	2.022	14.3	15.8
Propeller shaft assembly	23	2.416	8.5	14.3
Electric system	39	-0.800	46.7	-8.0
Frame and others	325	1.925	162.3	162.3
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	21	-0.780	24.7	-4.2
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	4.9	-0.9
SCR tank	20	3.025	4.2	15.5
IFS	0	0.005	0.0	0.0
Spare tire carrier	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1561		1281.0 1281	279.6 280
Unsprung weight	905		330	575
Chassis Cab weight *2	2466 2465		1611 1610	855 855

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB71GR3WFBM (110 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-7.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	26.5	-5.5
Air intake system	25	0.524	21.6	3.4
Parking brake system	5	0.826	4.1	1.1
Remote control system	9	0.435	7.7	1.0
Cab assembly, Front cab mounting	564	0.240	529.1	35.2
Cooling system	25	-0.315	27.3	-2.1
Engine, Transmission assembly	419	0.401	375.4	43.6
Rear cab mounting	42	0.230	39.0	2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.325	45.2	68.8
Exhaust system	30	2.022	14.3	15.8
Propeller shaft assembly	23	2.430	8.4	14.4
Electric system	39	-0.800	46.7	-8.0
Frame and others	325	1.925	162.6	162.6
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	30	-0.300	32.3	-2.3
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	4.9	-0.9
SCR tank	20	3.025	4.2	15.5
IFS	0	0.000	0.0	0.0
Spare tire career	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1788		1439.6 1440	348.9 349
Unsprung weight	895		325	570
Chassis Cab weight *2	2683 2685		1765 1765	919 920

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB91ER3WFBP (129 kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.6	-3.1
Steering system	41	-0.719	49.1	-8.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	27.2	-6.2
Air intake system	25	0.524	21.1	3.9
Parking brake system	5	0.826	3.9	1.3
Remote control system	9	0.471	7.5	1.2
Cab assembly, Front cab mounting	564	0.240	524.5	39.8
Cooling system	22	-0.315	23.6	-2.0
Engine, Transmission assembly	419	0.401	369.6	49.4
Rear cab mounting	42	0.230	38.7	2.8
Battery	28	0.889	20.7	7.3
Fuel system	114	2.175	41.1	72.9
Exhaust system	58	2.168	21.0	37.0
Propeller shaft assembly	22	2.204	7.8	14.3
Electric system	39	-0.800	47.8	-9.1
Frame and others	306	1.639	158.6	147.5
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	30	-0.300	32.6	-2.6
Electric others	10	1.700	5.0	5.0
ECU	4	-0.896	5.1	-1.1
SCR tank	20	2.525	5.1	14.6
IFS	0	0.024	0.0	0.0
Spare tire carrier	2	4.363	-0.6	2.6
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1793		1425.8 1426	367.2 367
Unsprung weight	895		325	570
Chassis Cab weight *2	2688 2690		1751 1750	937 940

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEB91GR3WFBP (129 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-7.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	26.5	-5.5
Air intake system	25	0.524	21.6	3.4
Parking brake system	5	0.826	4.1	1.1
Remote control system	9	0.435	7.7	1.0
Cab assembly, Front cab mounting	564	0.240	529.1	35.2
Cooling system	22	-0.315	23.4	-1.8
Engine, Transmission assembly	419	0.401	375.4	43.6
Rear cab mounting	42	0.230	39.0	2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.325	45.2	68.8
Exhaust system	53	2.022	25.1	27.8
Propeller shaft assembly	23	2.430	8.4	14.4
Electric system	39	-0.800	46.7	-8.0
Frame and others	325	1.925	162.6	162.6
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	30	-0.300	32.3	-2.3
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	4.9	-0.9
SCR tank	20	3.075	4.0	15.7
IFS	0	0.000	0.0	0.0
Spare tire carrier	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1808		1446.3 1446	361.4 361
Unsprung weight	895		325	570
Chassis Cab weight *2	2703 2705		1771 1775	931 930

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEC71ER3SFBM (110 kW)

Wheelbase (m) : 3.400

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.6	-3.1
Steering system	41	-0.719	49.1	-8.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	27.2	-6.2
Air intake system	24	0.524	20.0	3.7
Parking brake system	5	0.826	3.9	1.3
Remote control system	9	0.471	7.5	1.2
Cab assembly, Front cab mounting	345	-0.300	375.8	-30.5
Cooling system	25	-0.315	27.5	-2.3
Engine, Transmission assembly	419	0.401	369.6	49.4
Rear cab mounting	44	-0.223	46.9	-2.9
Battery	28	0.889	20.7	7.3
Fuel system	114	1.825	52.8	61.2
Exhaust system	32	2.168	11.5	20.1
Propeller shaft assembly	22	2.190	7.9	14.2
Electric system	39	-0.800	47.8	-9.1
Frame and others	306	1.860	138.5	167.3
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	21	-0.780	25.2	-4.7
Electric others	10	1.700	5.0	5.0
ECU	4	-0.896	5.1	-1.1
SCR tank	20	2.527	5.1	14.6
IFS	0	0.005	0.0	0.0
Spare tire carrier	2	4.363	-0.6	2.6
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1543		1263.0 1263	279.6 280
Unsprung weight	900		325	575
Chassis Cab weight *2	2443 2445		1588 1590	855 855

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEC71HR3SFBM (110 kW)

Wheelbase (m) : 4.300

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.0	-2.5
Steering system	41	-0.719	47.3	-6.8
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	25.9	-4.9
Air intake system	24	0.524	20.8	2.9
Parking brake system	5	0.826	4.2	1.0
Remote control system	9	0.276	8.1	0.6
Cab assembly, Front cab mounting	345	-0.300	369.4	-24.1
Cooling system	25	-0.315	27.0	-1.8
Engine, Transmission assembly	419	0.401	379.9	39.1
Rear cab mounting	44	-0.223	46.3	-2.3
Battery	28	0.889	22.2	5.8
Fuel system	114	2.700	42.4	71.6
Exhaust system	32	2.016	16.8	14.8
Propeller shaft assembly	35	2.653	13.3	21.3
Electric system	39	-0.800	45.9	-7.2
Frame and others	352	2.361	158.8	193.3
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	21	-0.780	24.2	-3.7
Electric others	10	2.020	5.3	4.7
ECU	4	-0.896	5.1	-0.9
SCR tank	20	3.075	5.6	14.1
IFS	0	0.000	0.0	0.0
Spare tire carrier	2	5.363	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1602		1283.9 1284	317.7 318
Unsprung weight	910		330	580
Chassis Cab weight *2	2512 2510		1614 1615	898 895

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FEC81CR3SFBM (110 kW)

Wheelbase (m) : 2.800

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	14.3	-3.8
Steering system	41	-0.719	50.9	-10.4
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	28.5	-7.5
Air intake system	24	0.524	19.3	4.4
Parking brake system	5	0.826	3.7	1.5
Remote control system	9	0.793	6.2	2.5
Cab assembly, Front cab mounting	345	-0.300	382.3	-37.0
Cooling system	25	-0.315	28.0	-2.8
Engine, Transmission assembly	419	0.401	359.0	60.0
Rear cab mounting	44	-0.223	47.5	-3.5
Battery	28	0.889	19.1	8.9
Fuel system	114	1.275	62.1	51.9
Exhaust system	37	2.137	8.8	28.4
Propeller shaft assembly	12	1.882	3.8	7.7
Electric system	39	-0.800	49.8	-11.1
Frame and others	265	1.465	126.2	138.5
Engine and T/M cover	3	0.401	2.3	0.4
A/C unit	21	-0.780	26.2	-5.7
Electric others	10	1.600	4.3	5.7
ECU	4	-0.896	5.3	-1.3
SCR tank	20	1.975	5.8	13.9
IFS	0	0.005	0.0	0.0
Spare tire carrier	0	3.663	0.0	0.0
Transmission PTO	13	0.000	12.5	0.0
Sprung weight	1507		1266.4 1266	240.6 241
Unsprung weight	900		325	575
Chassis Cab weight *2	2407 2405		1591 1590	816 815

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FECX1GR3SFBP (129 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-7.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	26.5	-5.5
Air intake system	24	0.524	20.5	3.2
Parking brake system	5	0.826	4.1	1.1
Remote control system	9	0.435	7.7	1.0
Cab assembly, Front cab mounting	345	-0.300	372.2	-26.9
Cooling system	22	-0.315	23.4	-1.8
Engine, Transmission assembly	419	0.401	375.4	43.6
Rear cab mounting	44	-0.223	46.5	-2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.333	44.9	69.1
Exhaust system	54	2.022	25.5	28.3
Propeller shaft assembly	23	2.416	8.5	14.3
Electric system	39	-0.800	46.7	-8.0
Frame and others	328	2.200	140.4	187.1
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	21	-0.780	24.7	-4.2
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	5.2	-1.0
SCR tank	20	3.025	4.2	15.5
IFS	0	0.005	0.0	0.0
Spare tire career	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1584		1266.7 1267	317.1 317
Unsprung weight	910		330	580
Chassis Cab weight *2	2494 2495		1597 1600	897 895

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FECX1GR3WFBP (129 kW)

Wheelbase (m) : 3.850

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.3	-2.8
Steering system	41	-0.719	48.1	-7.6
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	26.5	-5.5
Air intake system	25	0.524	21.6	3.4
Parking brake system	5	0.826	4.1	1.1
Remote control system	9	0.435	7.7	1.0
Cab assembly, Front cab mounting	564	0.240	529.1	35.2
Cooling system	22	-0.315	23.4	-1.8
Engine, Transmission assembly	419	0.401	375.4	43.6
Rear cab mounting	42	0.230	39.0	2.5
Battery	28	0.889	21.5	6.5
Fuel system	114	2.325	45.2	68.8
Exhaust system	54	2.022	25.6	28.4
Propeller shaft assembly	23	2.430	8.4	14.4
Electric system	39	-0.800	46.7	-8.0
Frame and others	325	1.925	162.6	162.6
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	30	-0.300	32.3	-2.3
Electric others	10	1.920	5.0	5.0
ECU	4	-0.896	4.9	-0.9
SCR tank	20	3.025	4.2	15.5
IFS	0	0.000	0.0	0.0
Spare tire career	2	4.813	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1809		1447.0 1447	361.8 362
Unsprung weight	895		325	570
Chassis Cab weight *2	2704 2705		1772 1775	932 930

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FECX1HR3SFBP (129 kW)

Wheelbase (m) : 4.300

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	13.0	-2.5
Steering system	41	-0.719	47.3	-6.8
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	25.9	-4.9
Air intake system	24	0.524	20.8	2.9
Parking brake system	5	0.826	4.2	1.0
Remote control system	9	0.276	8.1	0.6
Cab assembly, Front cab mounting	345	-0.300	369.4	-24.1
Cooling system	22	-0.315	23.2	-1.6
Engine, Transmission assembly	419	0.401	379.9	39.1
Rear cab mounting	44	-0.223	46.3	-2.3
Battery	28	0.889	22.2	5.8
Fuel system	114	2.700	42.4	71.6
Exhaust system	54	2.016	28.6	25.2
Propeller shaft assembly	35	2.653	13.3	21.3
Electric system	39	-0.800	45.9	-7.2
Frame and others	325	2.361	158.8	193.3
Engine and T/M cover	3	0.401	2.4	0.3
A/C unit	21	-0.780	24.2	-3.7
Electric others	10	2.020	5.3	4.7
ECU	4	-0.896	5.1	-0.9
SCR tank	20	3.075	5.6	14.1
IFS	0	0.000	0.0	0.0
Spare tire career	2	5.363	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1620		1291.9 1292	328.3 328
Unsprung weight	910		330	580
Chassis Cab weight *2	2530 2530		1622 1620	908 910

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FECX1KR3SFBP (129 kW)

Wheelbase (m) : 4.750

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-1.012	12.7	-2.2
Steering system	41	-0.719	46.6	-6.1
Engine control system	1	-1.000	0.5	-0.1
Brake, clutch control system	21	-1.000	25.4	-4.4
Air intake system	24	0.524	21.1	2.6
Parking brake system	5	0.826	4.3	0.9
Remote control system	9	0.259	8.2	0.5
Cab assembly, Front cab mounting	345	-0.300	367.1	-21.8
Cooling system	22	-0.315	23.0	-1.4
Engine, Transmission assembly	419	0.401	383.6	35.4
Rear cab mounting	44	-0.223	46.1	-2.1
Battery	28	0.889	22.8	5.2
Fuel system	114	3.083	40.0	74.0
Exhaust system	54	2.037	30.7	23.1
Propeller shaft assembly	37	2.877	14.7	22.6
Electric system	39	-0.800	45.2	-6.5
Frame and others	368	2.630	164.4	203.9
Engine and T/M cover	3	0.401	2.5	0.2
A/C unit	21	-0.780	23.9	-3.4
Electric others	10	2.110	5.6	4.4
ECU	4	-0.896	5.0	-0.8
SCR tank	20	3.075	6.9	12.8
IFS	0	0.000	0.0	0.0
Spare tire career	2	5.813	-0.4	2.4
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1639		1299.9 1300	339.2 339
Unsprung weight	910		330	580
Chassis Cab weight *2	2549 2550		1630 1630	919 920

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FGB71ER6SFBM (110 kW)

Wheelbase (m) : 3.415

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-0.997	14.2	-3.2
Steering system	39	-0.704	47.0	-8.0
Engine control system	1	-0.985	0.5	-0.1
Brake, clutch control system	22	-0.985	28.3	-6.3
Air intake system	24	0.539	20.0	3.7
Parking brake system	5	0.100	4.9	0.1
Remote control system	15	0.211	14.1	0.9
Cab assembly, Front cab mounting	345	-0.285	374.1	-28.8
Cooling system	25	-0.305	27.1	-2.2
Engine, Transmission assembly	482	0.530	407.5	74.9
Rear cab mounting	44	-0.208	46.7	-2.7
Battery	28	0.904	20.6	7.4
Fuel system	114	1.890	50.9	63.1
Exhaust system	58	1.347	35.4	23.0
Propeller shaft assembly	32	2.275	10.7	21.3
Electric system	39	-0.794	47.7	-9.0
Frame and others	322	1.882	144.5	177.5
Engine and T/M cover	4	0.530	3.2	0.6
A/C unit	27	-0.765	33.0	-6.0
Electric others	10	1.715	5.0	5.0
ECU	4	-0.896	5.0	-1.0
SCR tank	20	2.190	7.2	13.0
IFS	0	0.005	0.0	0.0
Spare tire career	2	4.253	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1673		1347.1 1347	325.7 326
Unsprung weight	990		415	575
Chassis Cab weight *2	2663 2665		1762 1765	901 900

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4 Weight distribution table

Model: FGB71ER6WFBM (110 kW)

Wheelbase (m) : 3.415

Parts name	Weight (Kg)	Distance *1 to center of gravity (m)	Front axle load (Kg)	Rear axle load (Kg)
Front bumper	11	-0.997	14.2	-3.2
Steering system	39	-0.704	47.0	-8.0
Engine control system	1	-0.985	0.5	-0.1
Brake, clutch control system	22	-0.985	28.3	-6.3
Air intake system	25	0.716	19.8	5.2
Parking brake system	5	0.100	4.9	0.1
Remote control system	15	0.211	14.1	0.9
Cab assembly, Front cab mounting	565	0.255	523.1	42.2
Cooling system	24	-0.305	25.6	-2.1
Engine, Transmission assembly	482	0.530	407.5	74.9
Rear cab mounting	42	0.245	39.0	3.0
Battery	28	0.904	20.6	7.4
Fuel system	114	1.890	50.9	63.1
Exhaust system	58	1.347	35.1	22.8
Propeller shaft assembly	32	2.275	10.7	21.3
Electric system	39	-0.338	42.5	-3.8
Frame and others	322	1.882	144.5	177.5
Engine and T/M cover	4	0.530	3.2	0.6
A/C unit	36	-0.285	39.0	-3.0
Electric others	10	1.715	5.0	5.0
ECU	4	-0.896	5.0	-1.0
SCR tank	20	2.190	7.2	13.0
IFS	0	0.005	0.0	0.0
Spare tire career	2	4.253	-0.5	2.5
Transmission PTO	0	0.000	0.0	0.0
Sprung weight	1899		1487.2 1487	412.0 412
Unsprung weight	990		415	575
Chassis Cab weight *2	2889 2890		1902 1905	987 985

*1: From front axle center

*2: Chassis cab weight: Include oil, fuel and coolant but exclude tire & disk, tools and persons.

10.4.2 Option equipment

Group	Option	Mass Variation [kg]	Mass Center Position (distance from Fr. Axle center) [m] *1						Remark
			Standard Cab		Wide Cab				
			2WD Single	2WD Double	2WD Single	2WD Double	4WD Single	4WD Double	
Interior	Air Bag Assist seat	+5 kg	-0.250	0.240	-0.300	0.240	-0.285	0.255	
	Floor mat & Carpet (Vinyl)	+3.6 kg	-	0.240	-	-	-	-	
		+4.6 kg	-	-	-	0.240	-	0.255	
	AM/FM + CD 1DIN Radio	+2 kg	-0.620	-0.620	-0.670	-0.670	-0.655	-0.655	
	Full auto A/C	+0.4 kg	-0.250	-	-0.300	-	-0.285	-	
	Dual A/C	+33 kg	-	0.240	-	0.240	-	-	Except for FECX1
Chassis	Light duty spring (rear)	-3.8 kg	Same as W.B. length *2			-	-	-	FEA21 high deck FEB21 high deck
	LSD (Multi plate type)	+3 kg	Same as W.B. length *2						
	T/M PTO (20kgm, vacuum, separate connected pump, with flange)	+1 kg	-	-	0.401	-	-	-	FEC81CR only
Electric	Heavy duty battery (115D31LX2) 12V tandem	+28 kg	0.889	-	0.889	0.889	0.904	0.904	
	Heavy duty battery (95D31LX2) 12V tandem	+25 kg	0.889	-	0.889	0.889	0.904	0.904	

Note. - *1 Distance from Fr. Axle Center ; +: backward, -: forward
- *2 2WD W.B. length [mm] B: 2500 / C: 2800 / E: 3400 / G: 3850 / H: 4300 / K: 4750
4WD W.B. length [mm] C: 2815 / E: 3415

10.5 Chassis cab drawings

10.5.1 Chassis cab drawings

Model			Page
ModelName	Applicable model		
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FEB21ER3SFBM	-	FEB21ER4SFBM	89
FEB51ER3SFBM	-	FEB51ER4SFBM	90
FEB51GR3SFBM	-	FEB51GR4SFBM	91
FEB71ER3WFBM	-	-	92
FEB71GR3SFBM	-	FEB71GR4SFBM	93
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FECX1HR3SFBP	-	FECX1HR4SFBP	102
FECX1KR3SFBP	-	FECX1KR4SFBP	103
FGB71ER6SFBM	-	-	104
FGB71ER6WFBM	-	-	105

10.5 Chassis cab drawings

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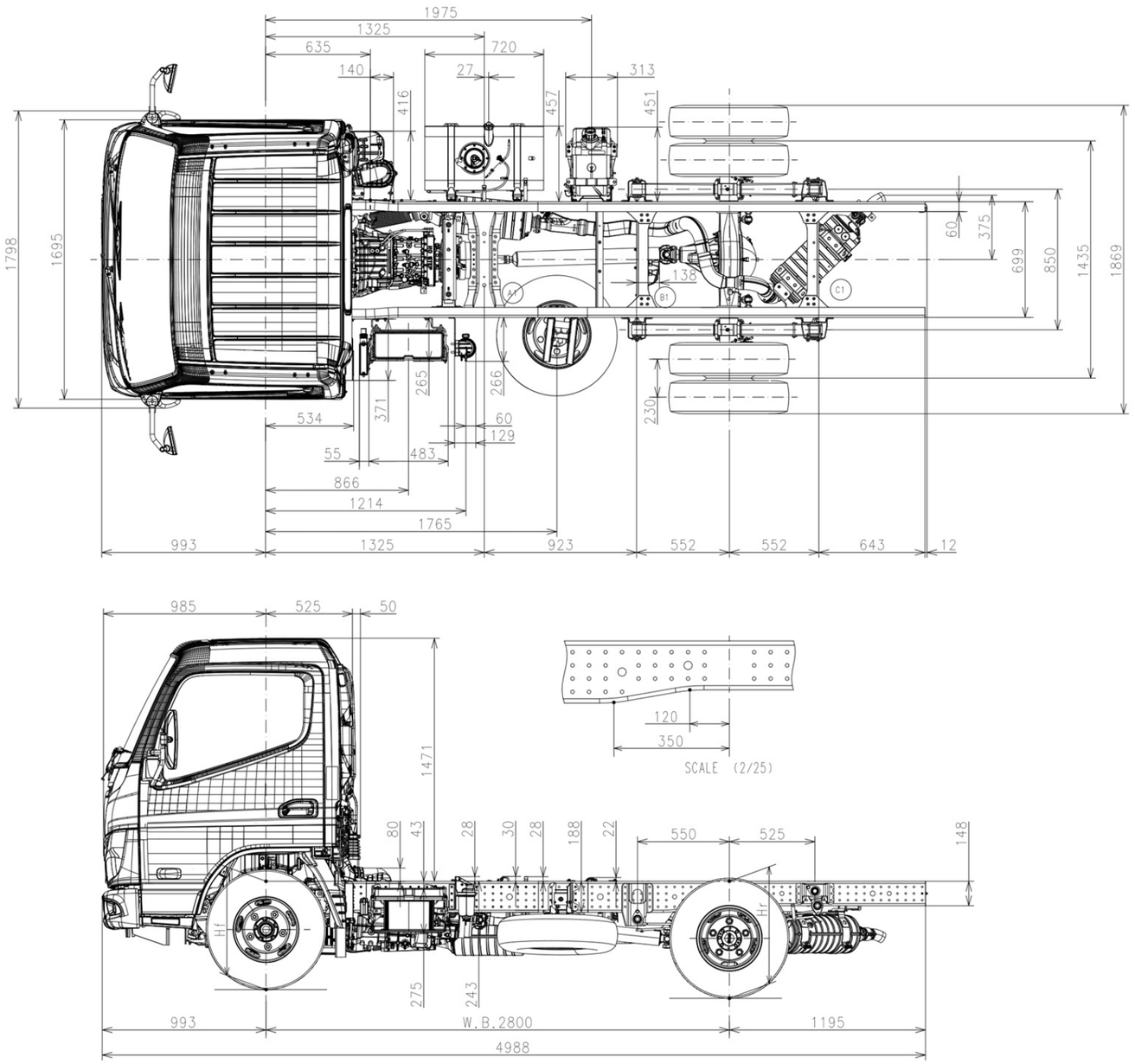

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TIRE SIZE	185/85R16

CHASSIS CAB
DRAWINGS

FEA21CR3SFBM
UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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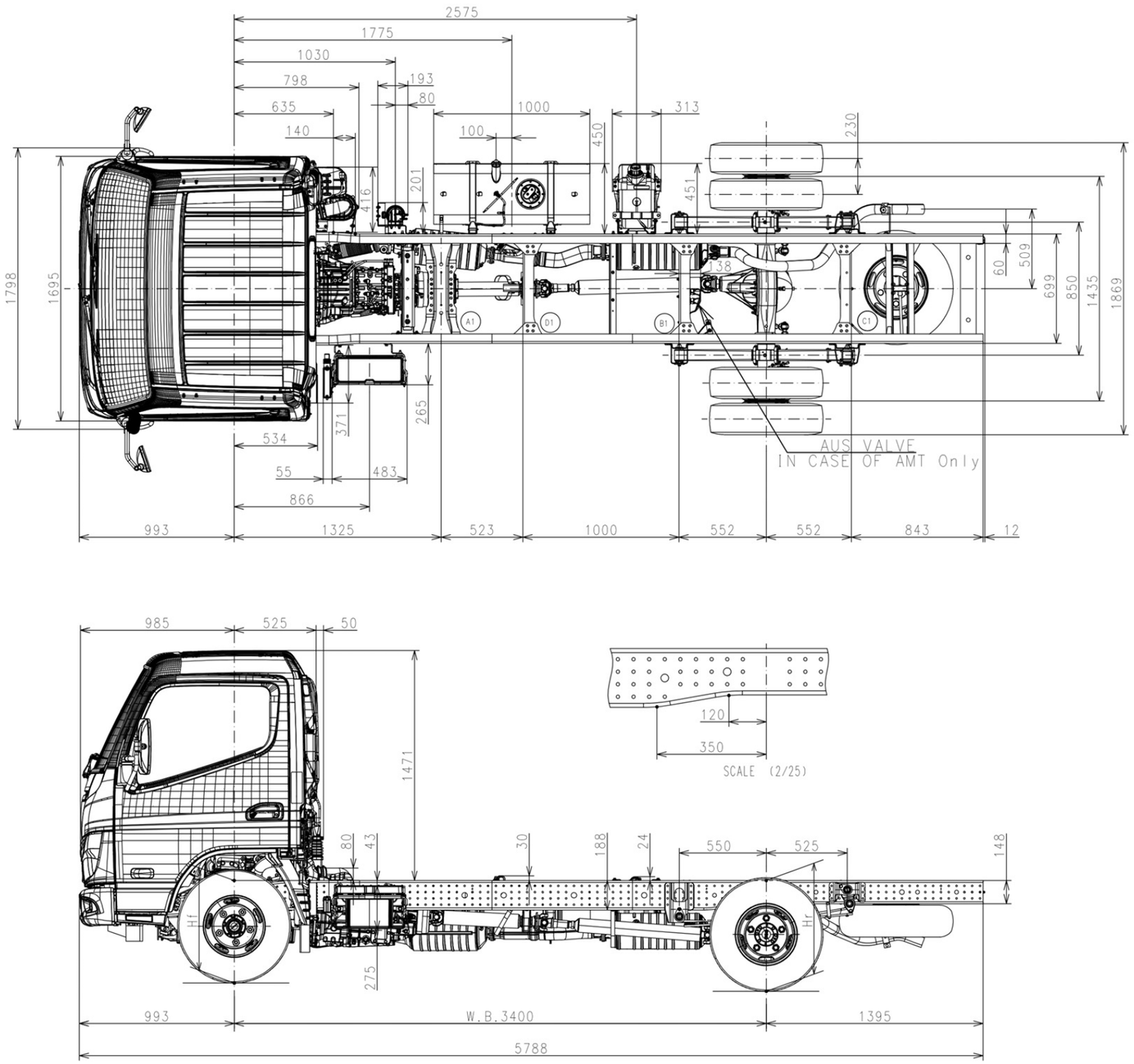

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TIRE SIZE	185/85R16

CHASSIS CAB
DRAWINGS

FEA21ER3SFBM
UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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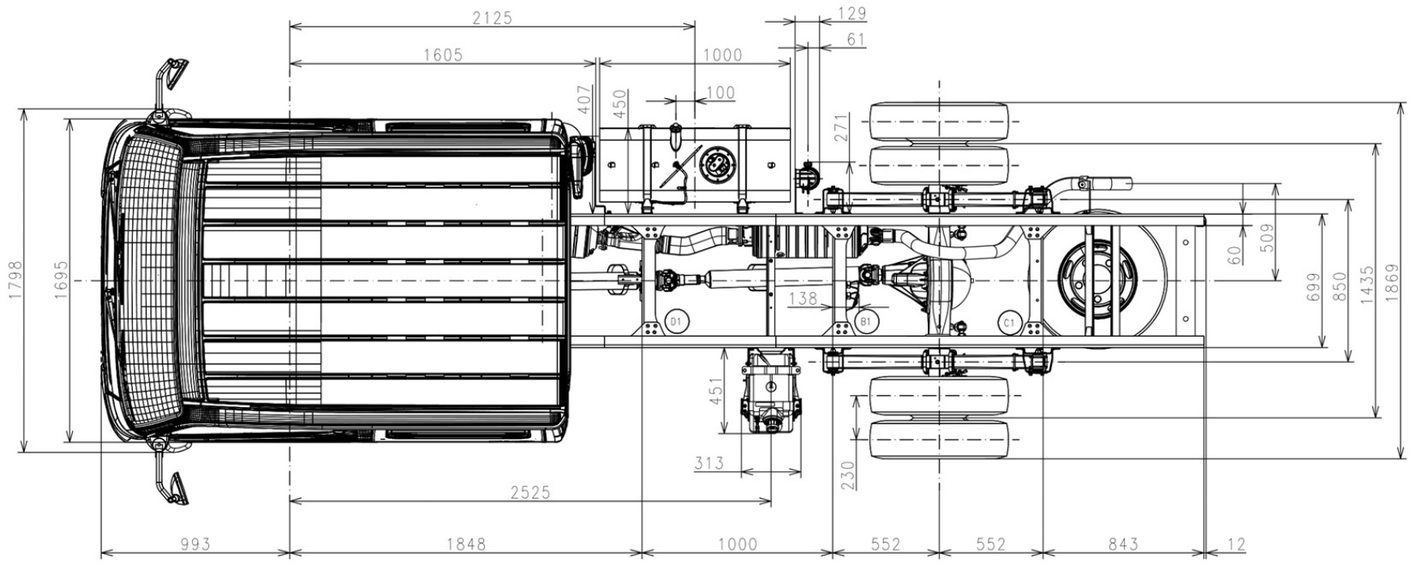

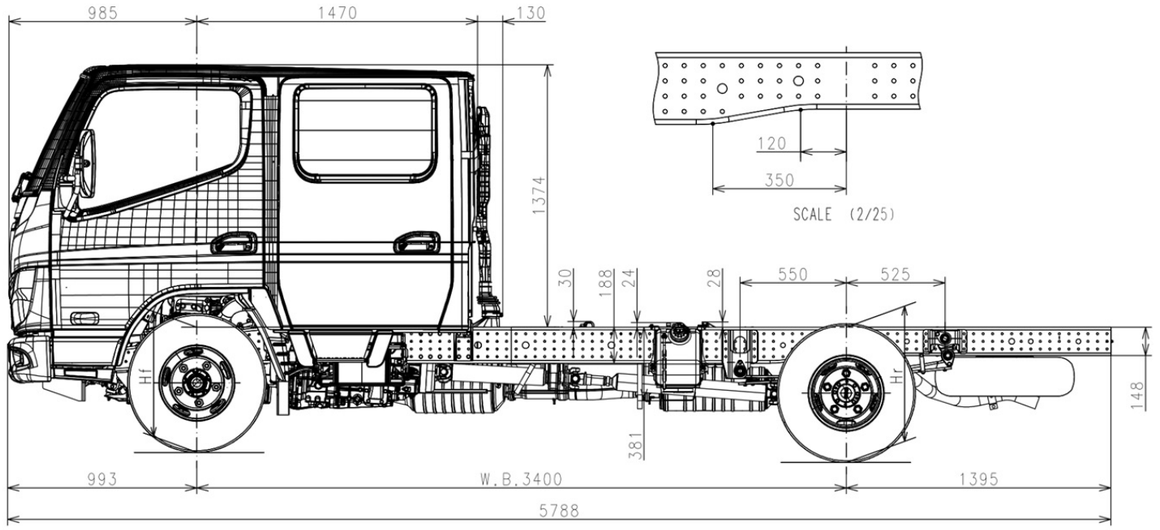

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TIRE SIZE	195/85R15

CHASSIS CAB
DRAWINGS

FEA21ER3WFBM
UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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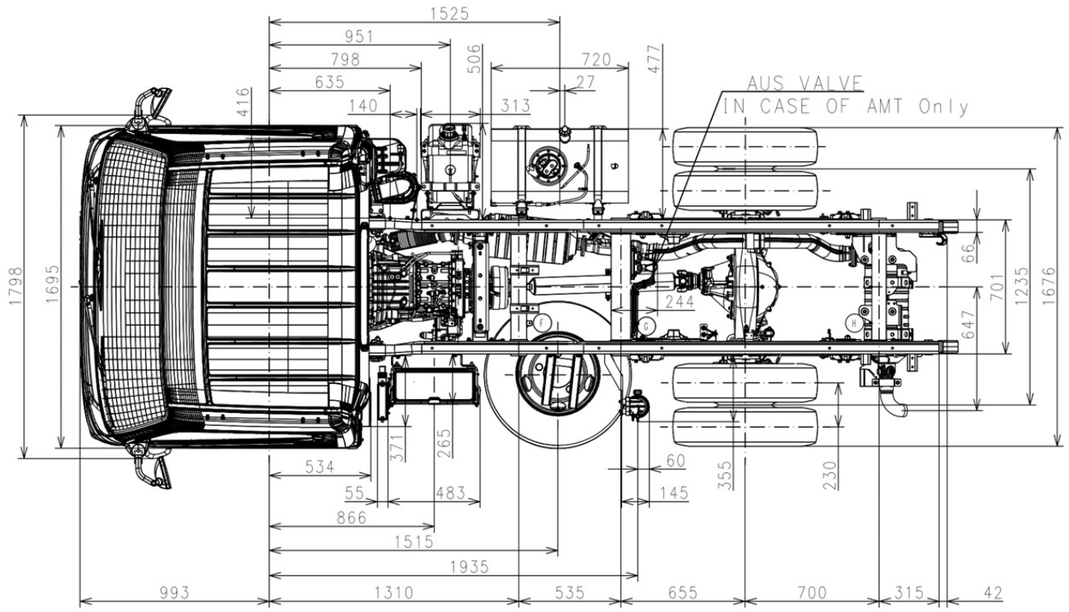

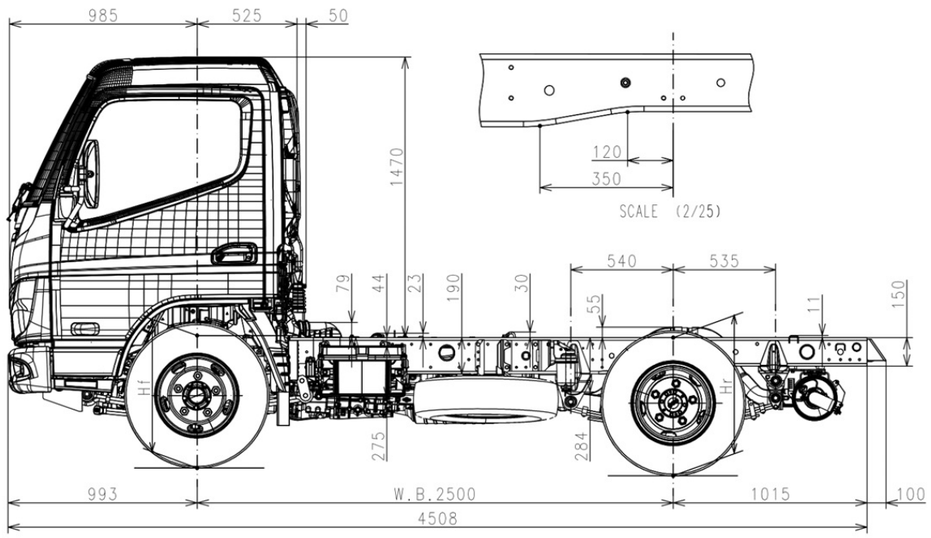

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CHASSIS CAB
DRAWINGS

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UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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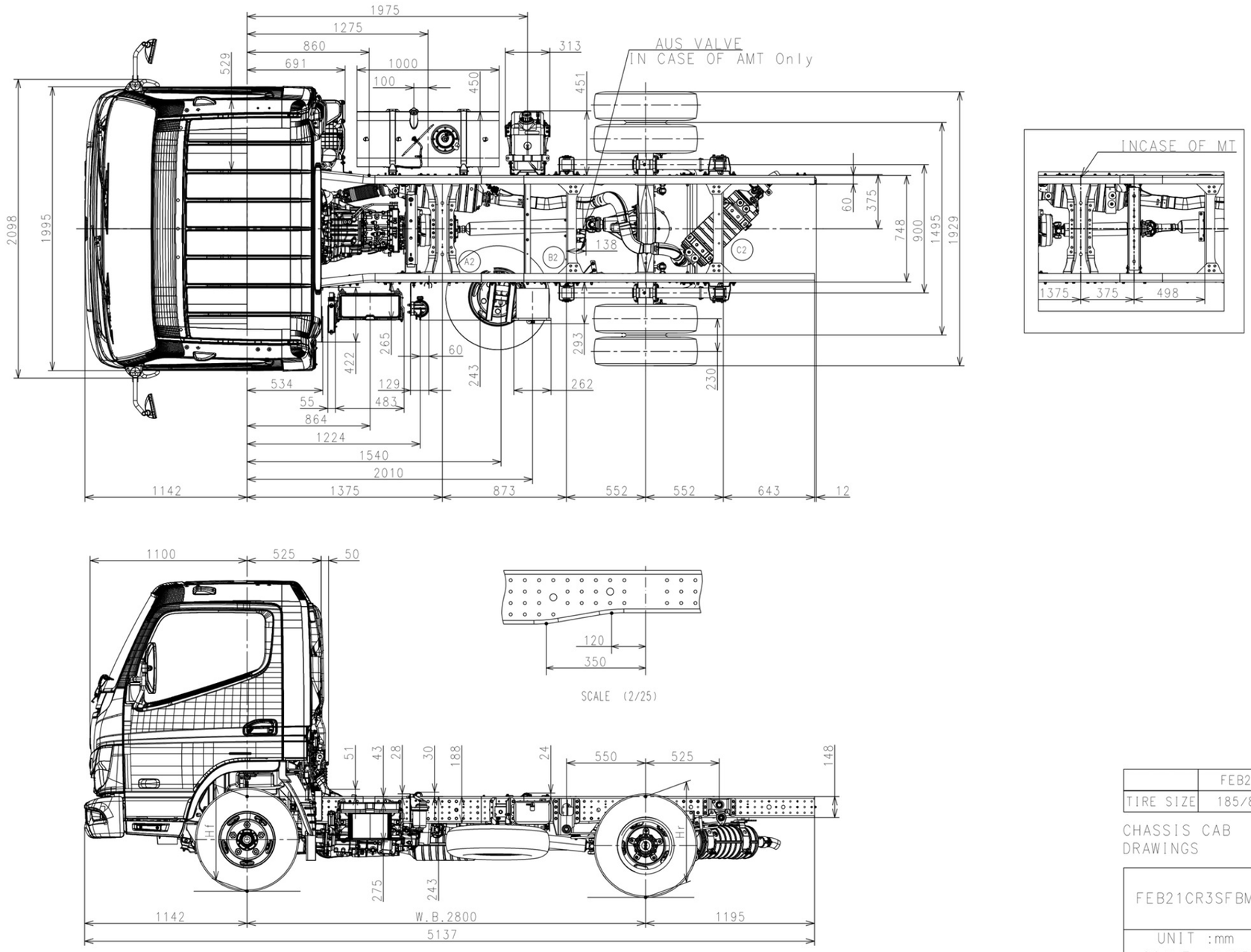

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TIRE SIZE	185/85R16

CHASSIS CAB
DRAWINGS

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UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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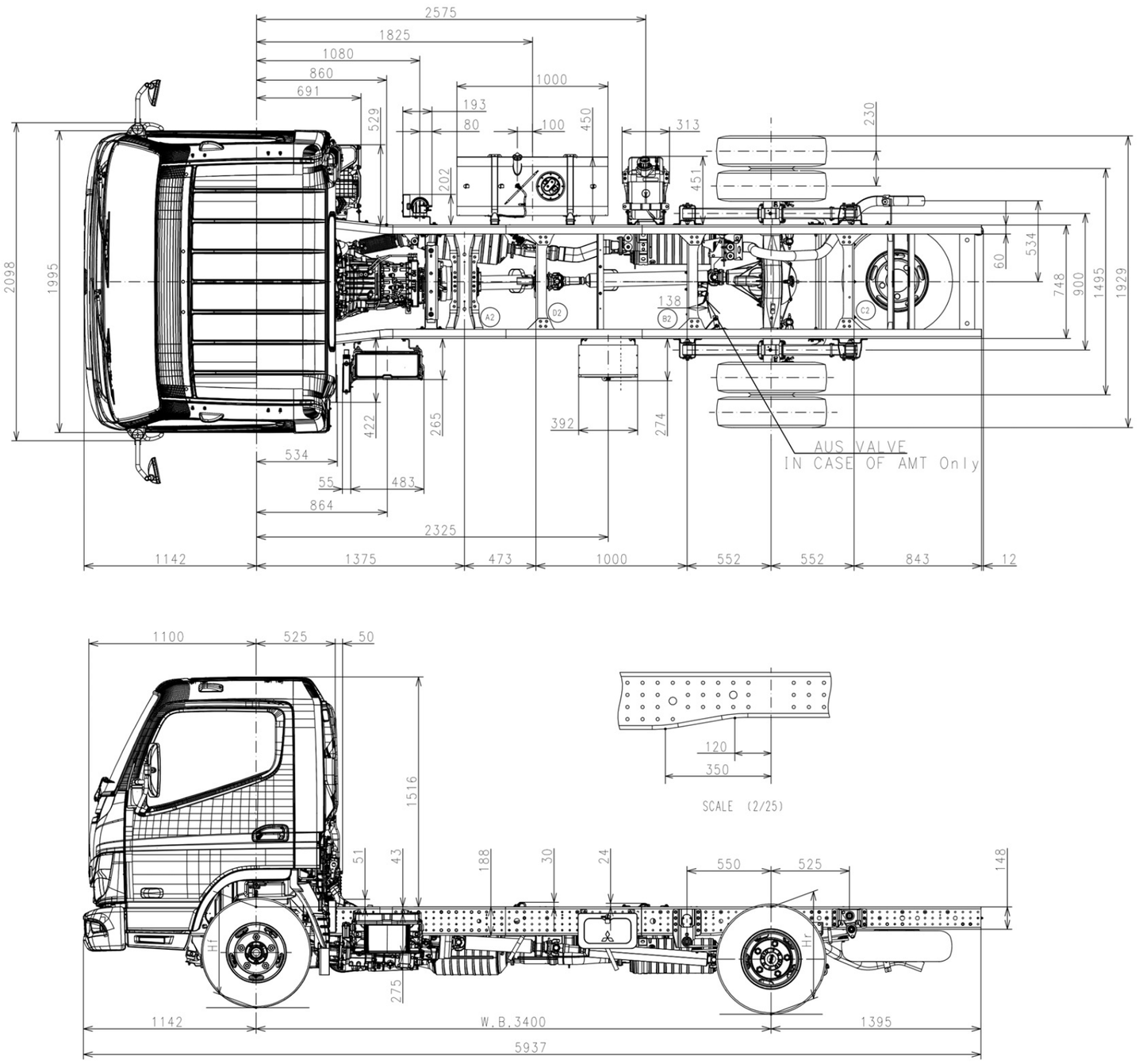

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CHASSIS CAB DRAWINGS

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UNIT :mm
SCALE :1/25

10.5 Chassis cab drawings

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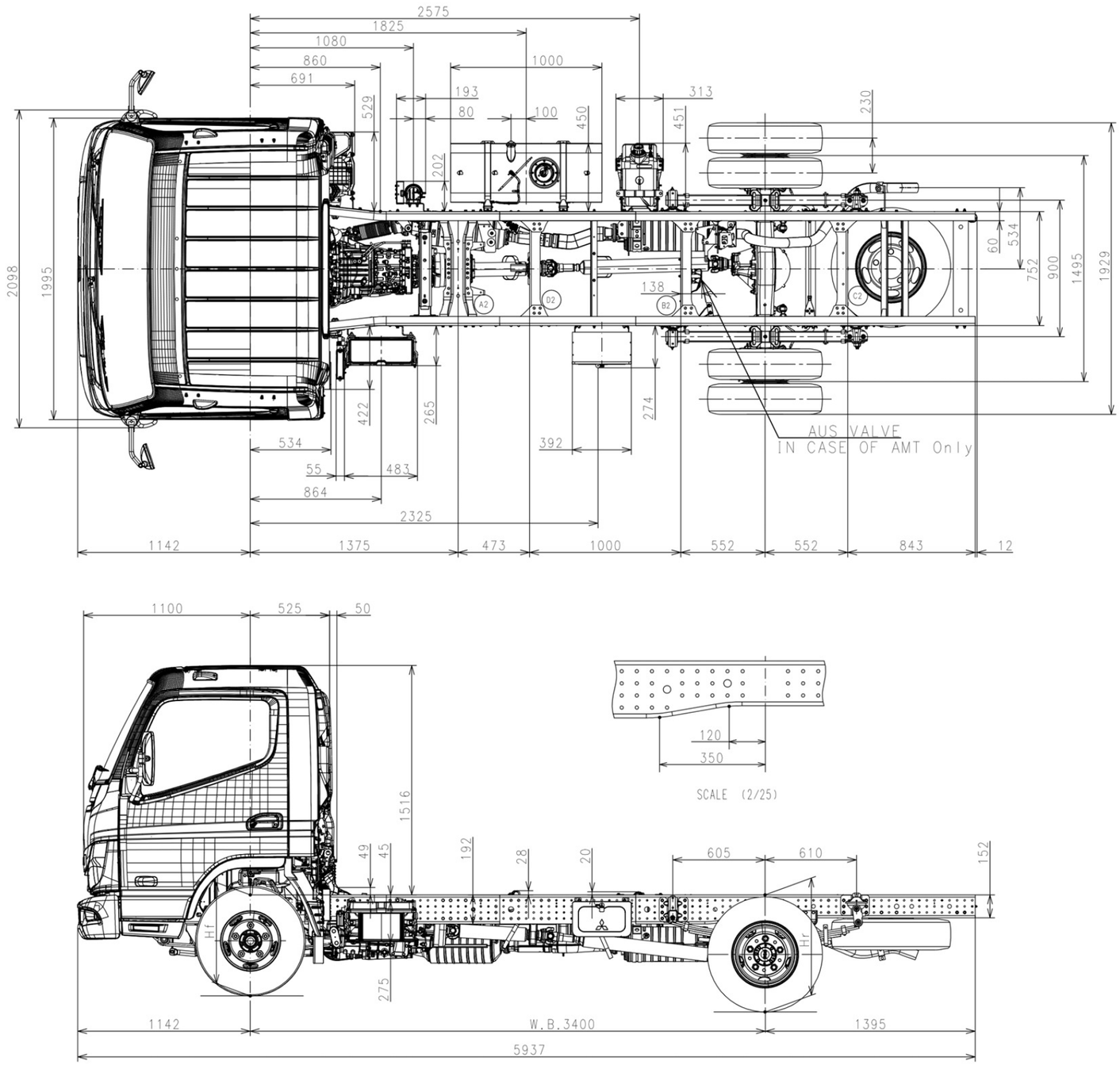

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CHASSIS CAB
DRAWINGS

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UNIT :mm
SCALE :1/25

10.5 Chassis cab drawings

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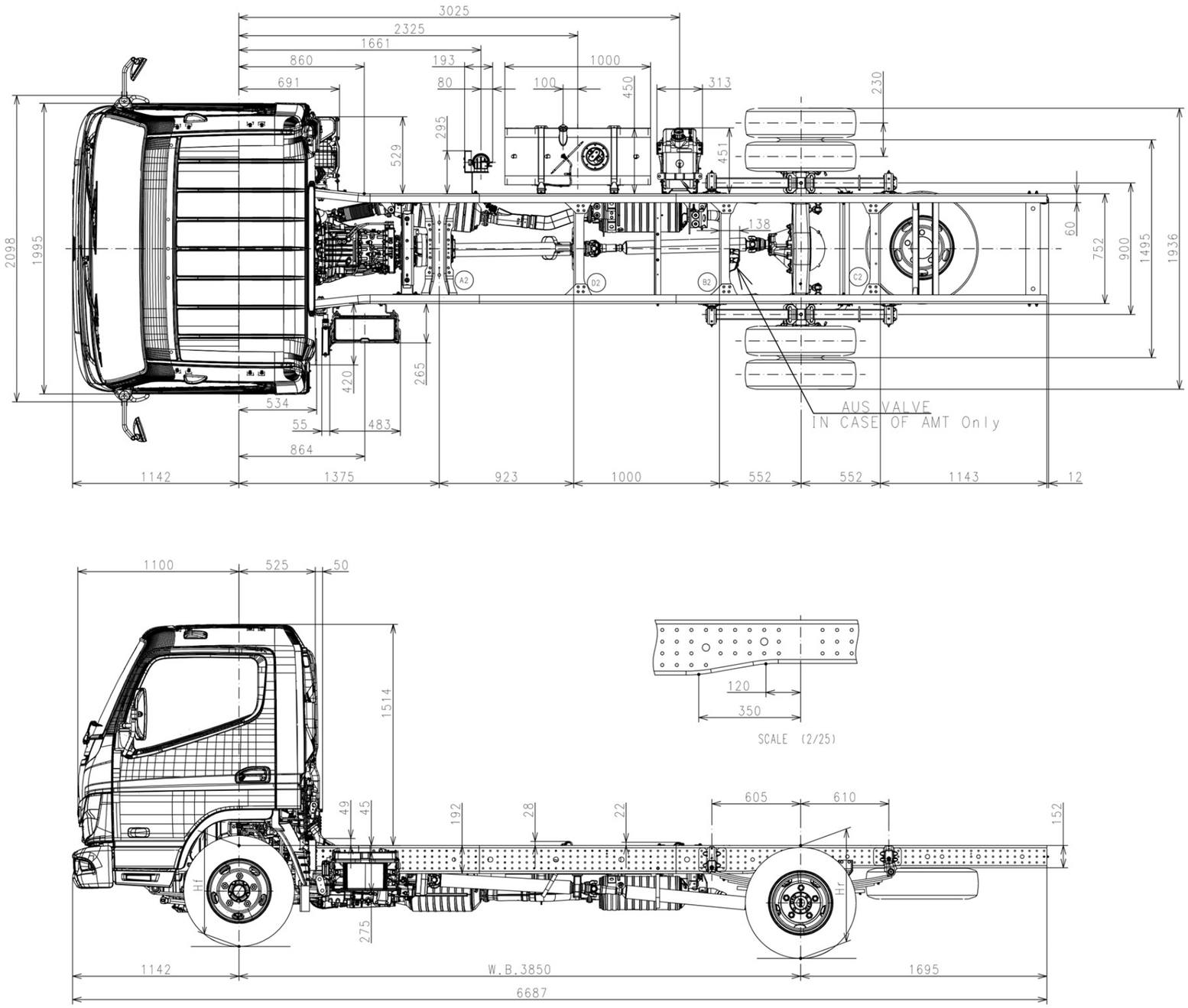

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CHASSIS CAB
DRAWINGS

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10.5 Chassis cab drawings

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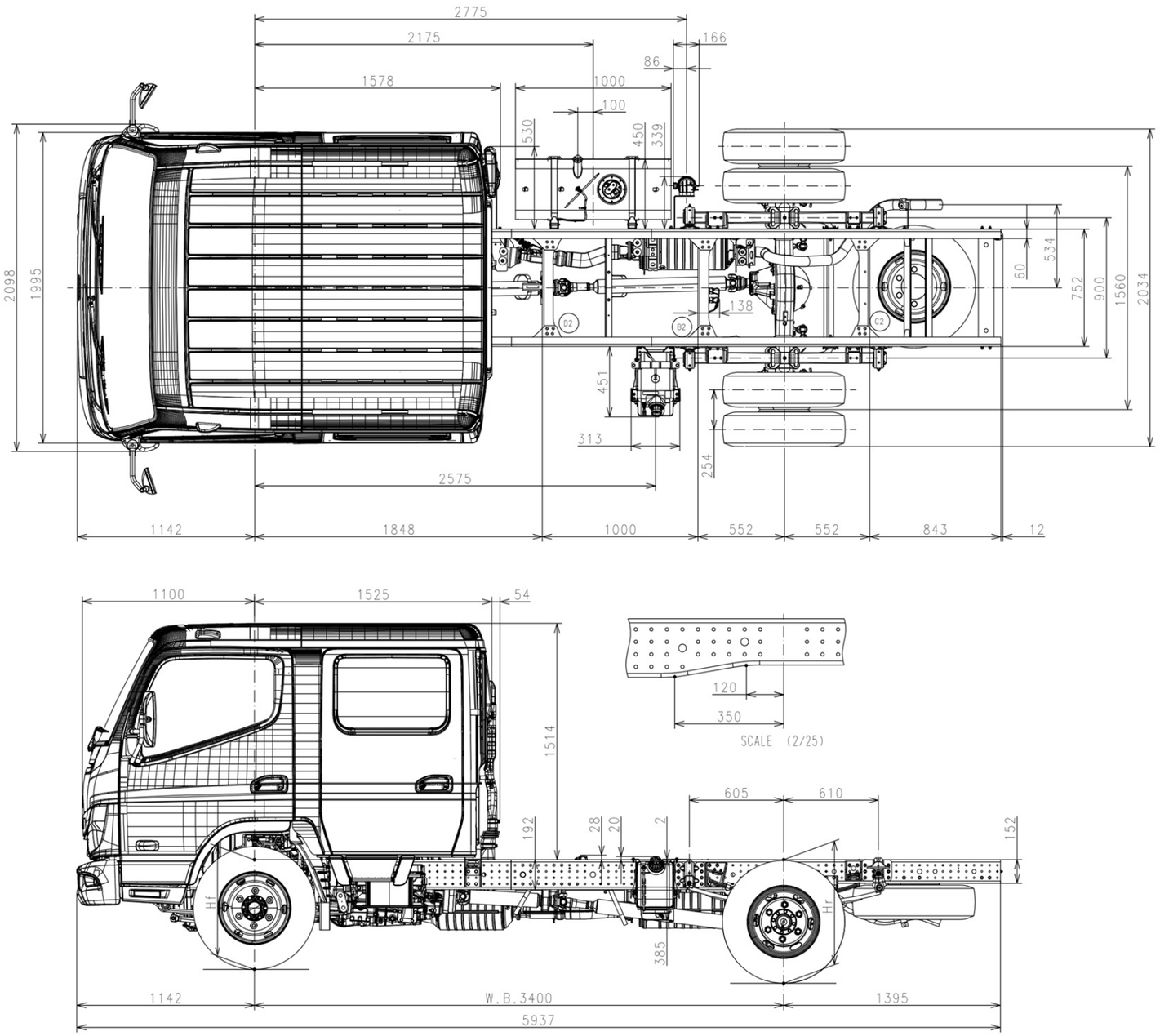

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CHASSIS CAB
DRAWINGS

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UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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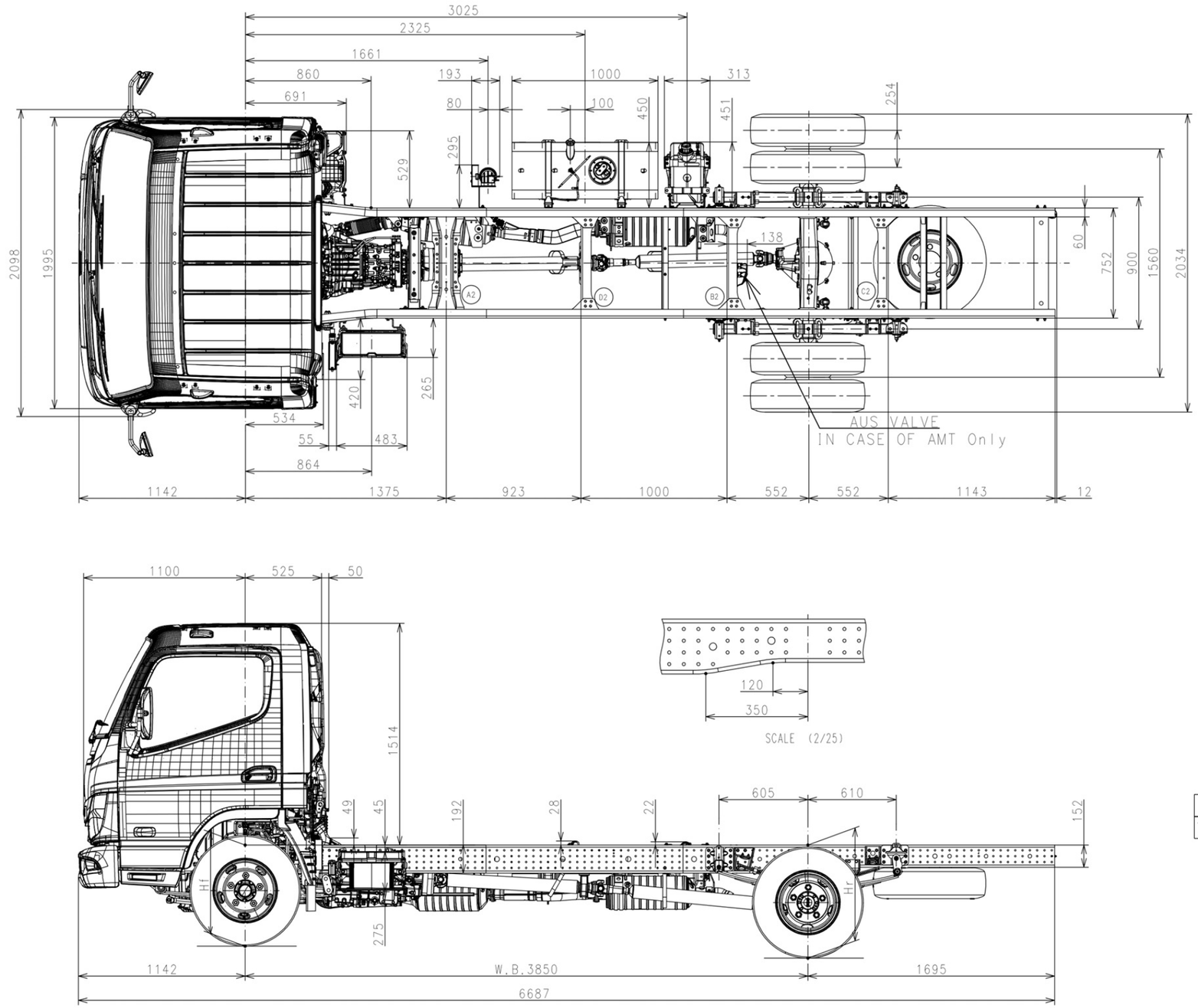

	FEB71GR3
TIRE SIZE	215/75R17.5

CHASSIS CAB
DRAWINGS

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UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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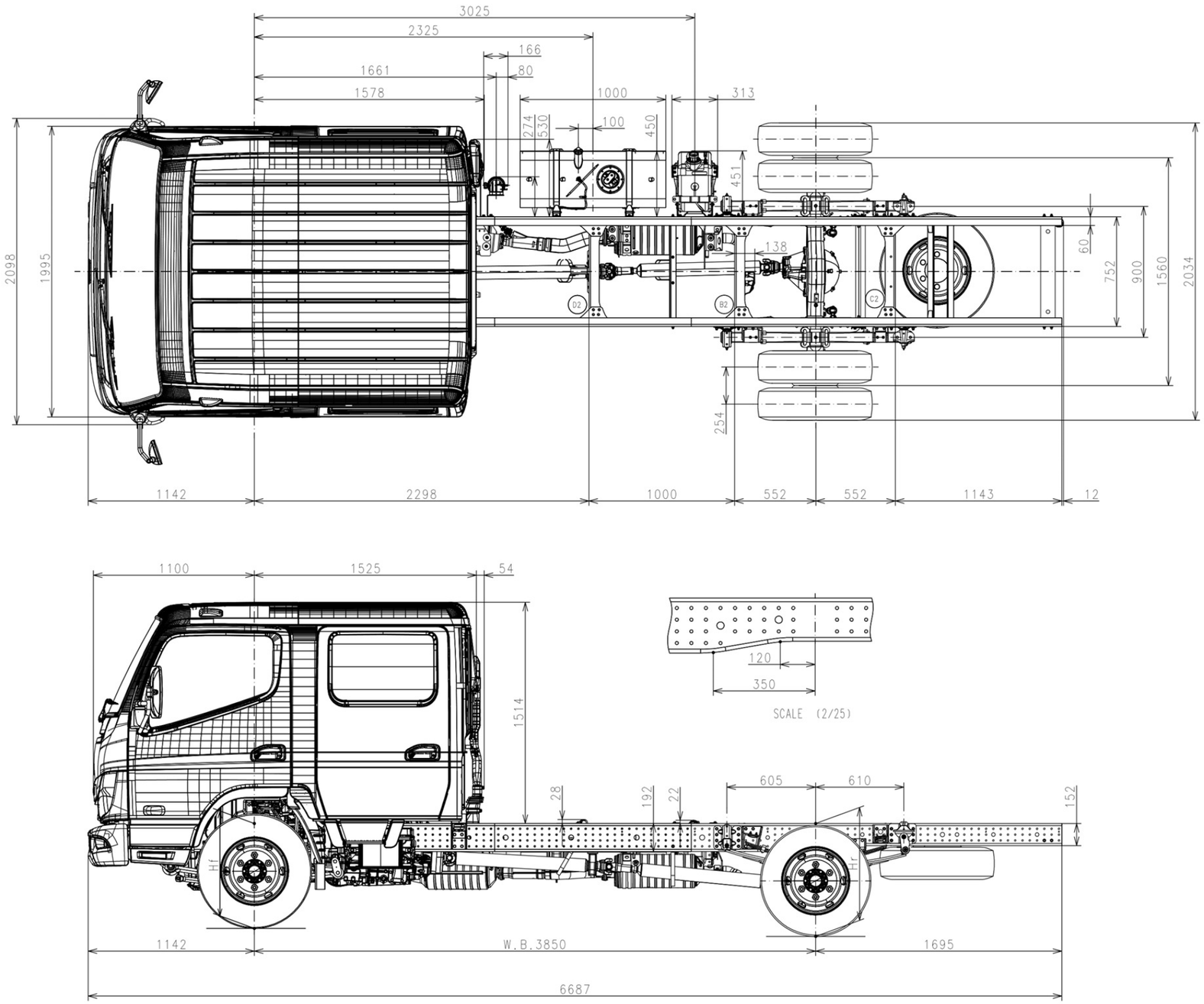

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TIRE SIZE	215/75R17.5

CHASSIS CAB
DRAWINGS

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UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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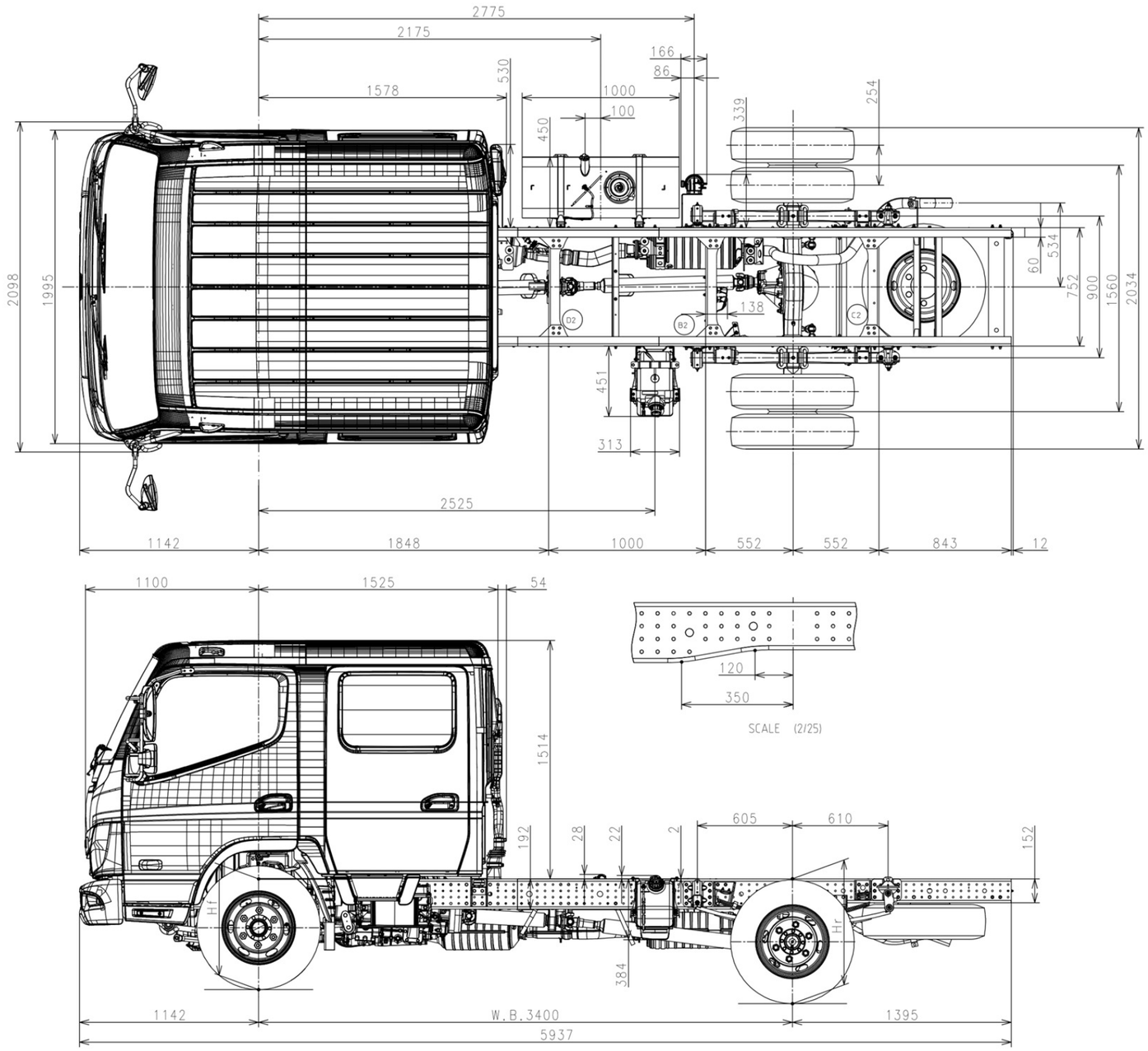

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TIRE SIZE	215/75R17.5

CHASSIS CAB
DRAWINGS

FEB91ER3WFBP
UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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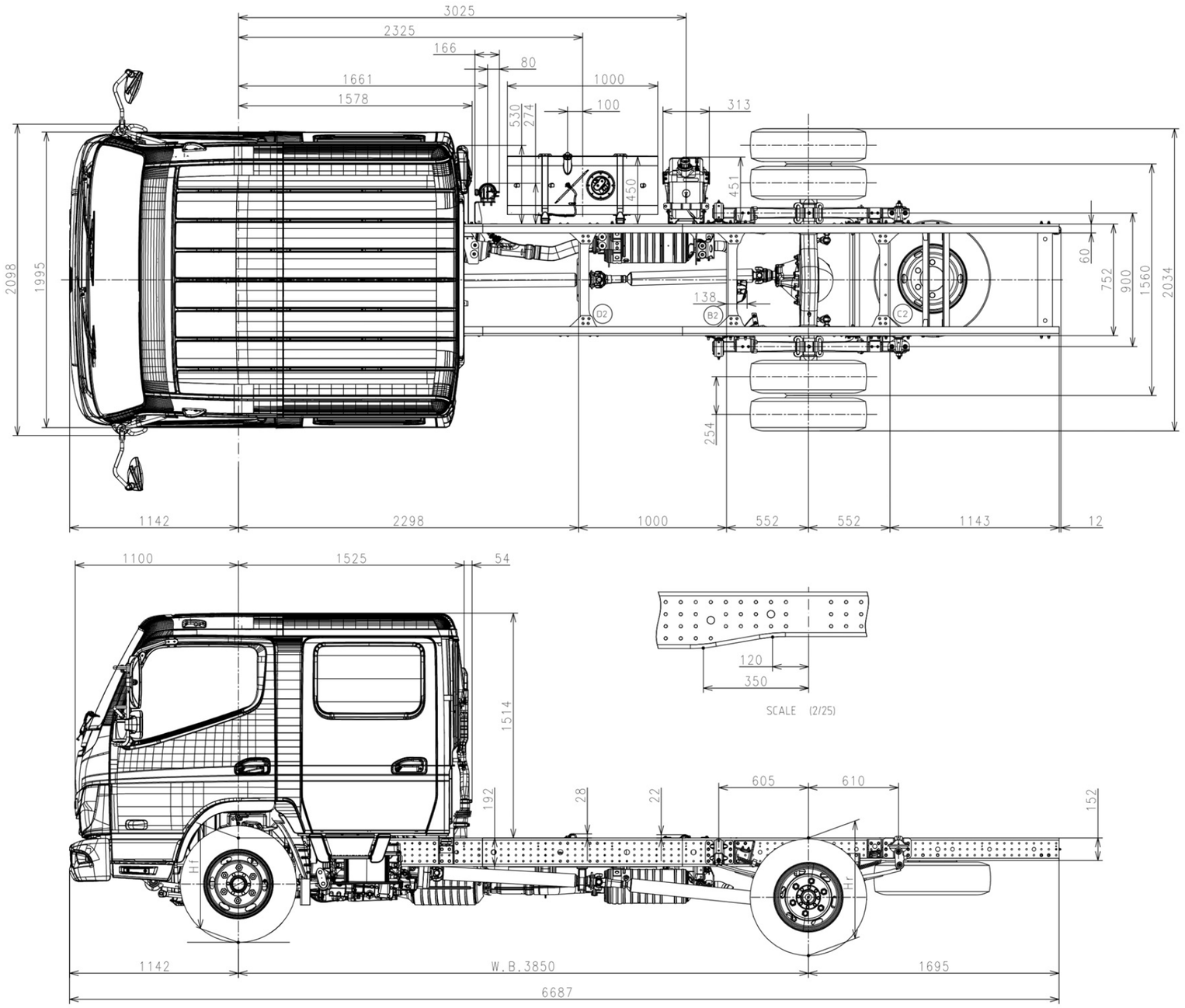

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TIRE SIZE	215/75R17.5

CHASSIS CAB
DRAWINGS

FEB91GR3WFBP
UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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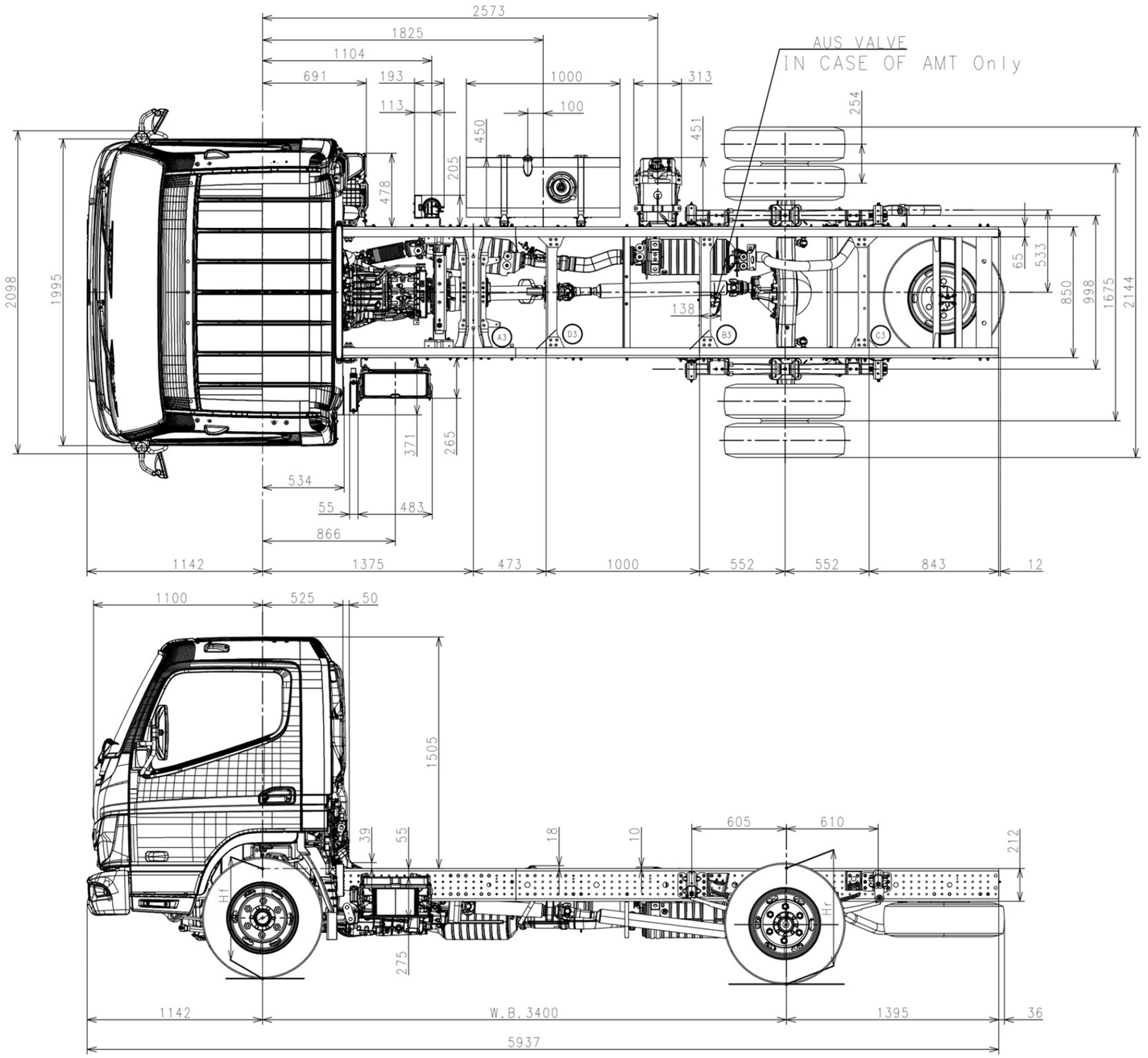

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TIRE SIZE	215/75R17.5

CHASSIS CAB
DRAWINGS

FEC71ER3SFBM
UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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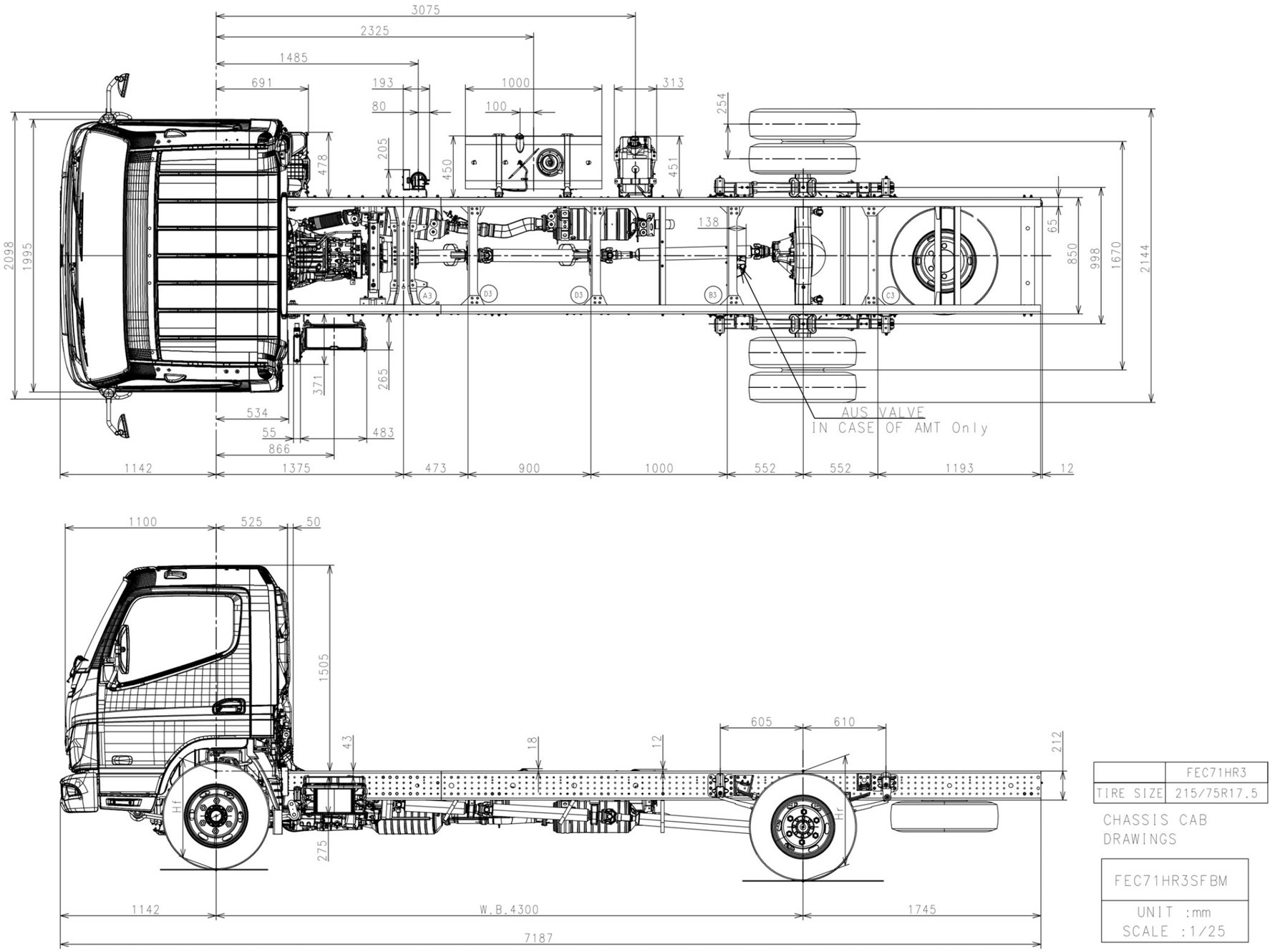

10.5 Chassis cab drawings

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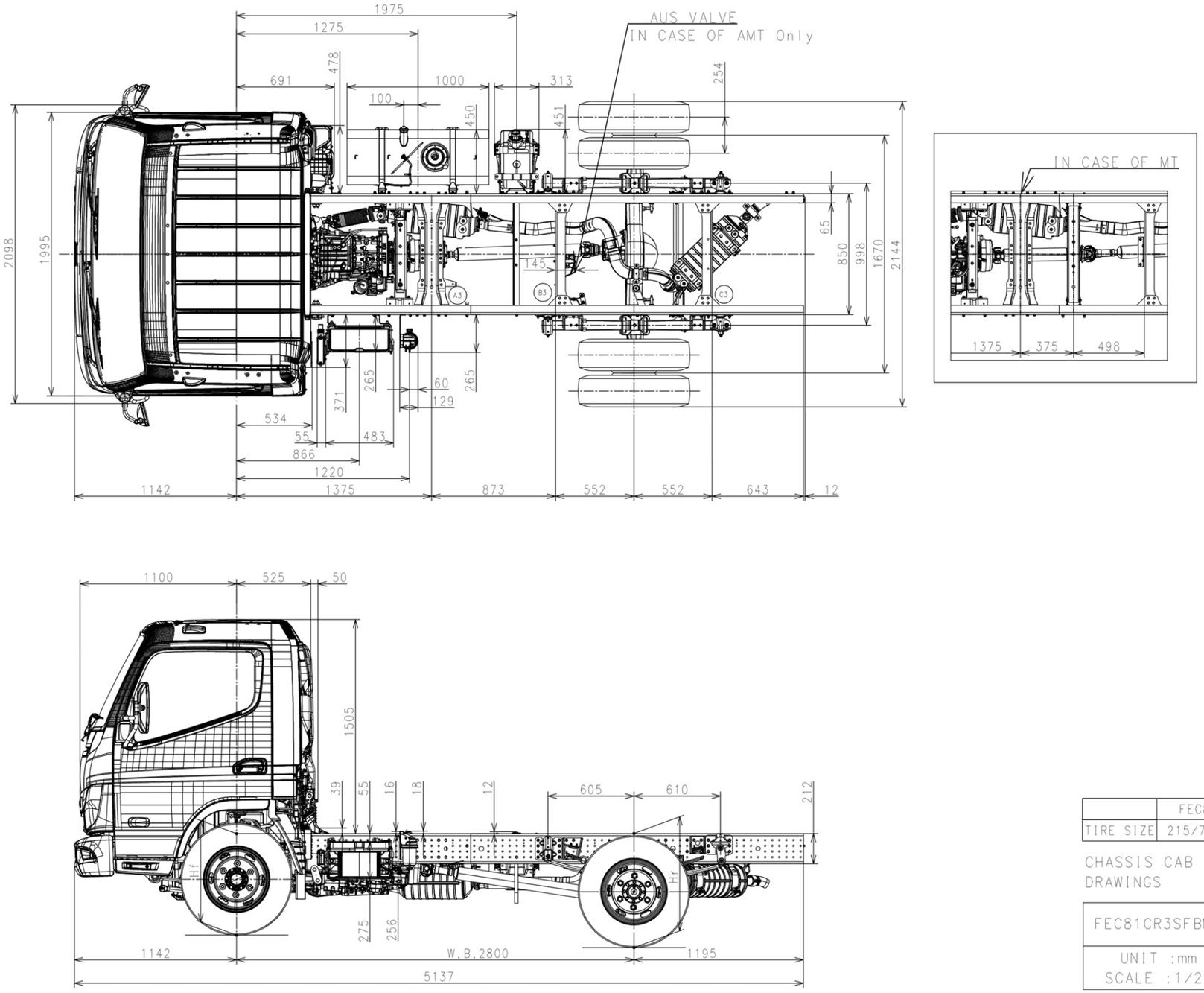

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TIRE SIZE	215/75R17.5

CHASSIS CAB
DRAWINGS

FEC81CR3SFBM
UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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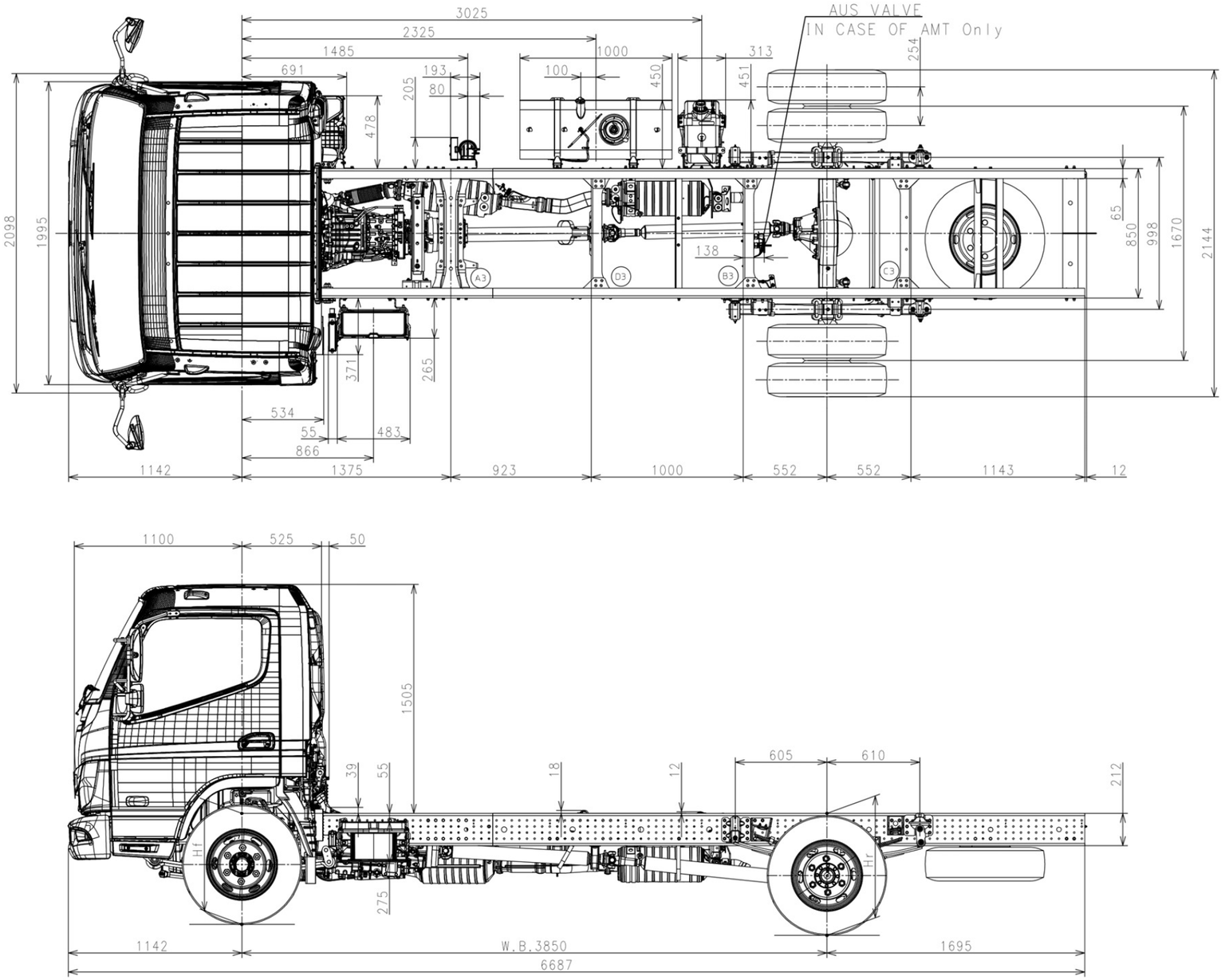

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TIRE SIZE	215/75R17.5

CHASSIS CAB
DRAWINGS

FECX1GR3SFBP
UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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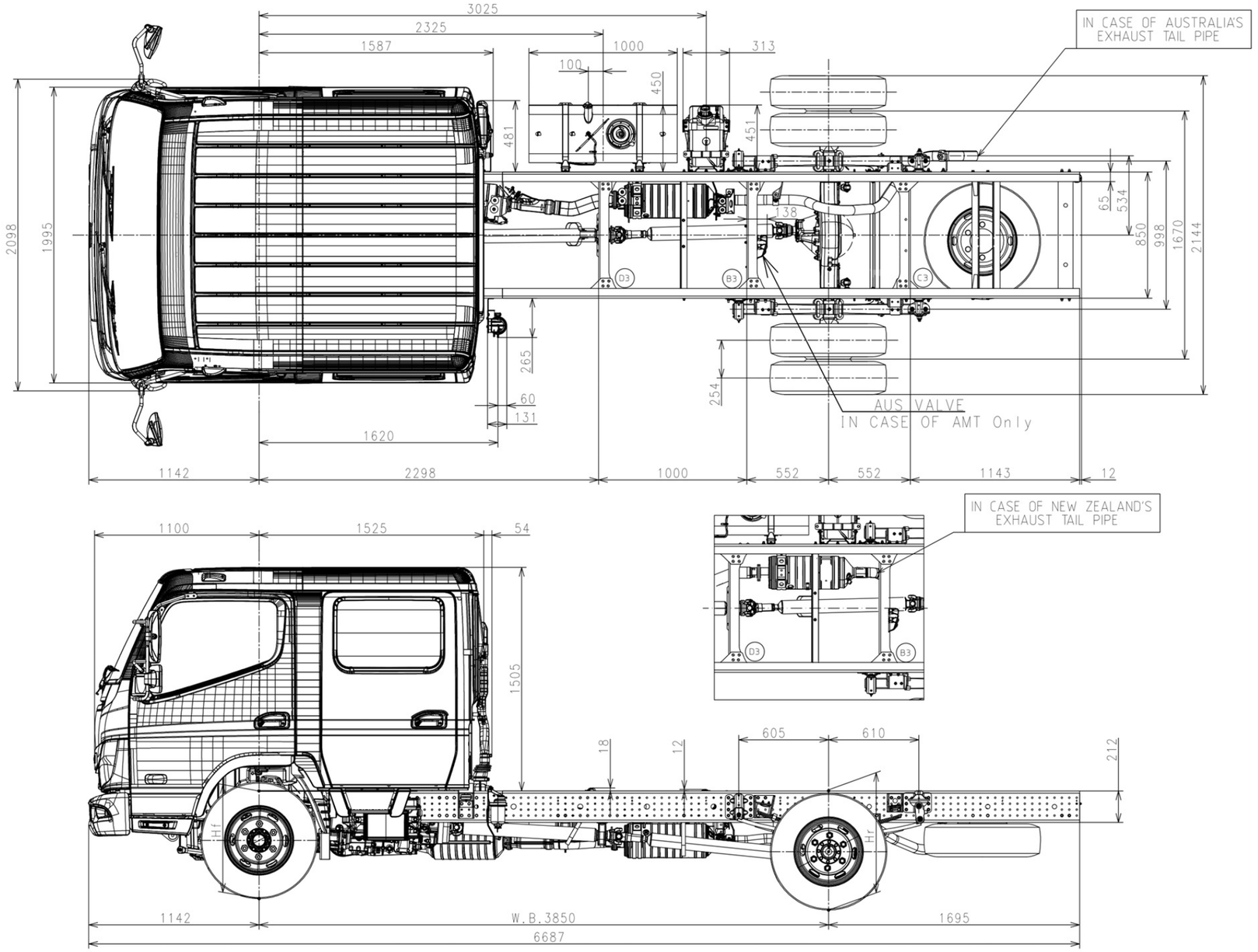

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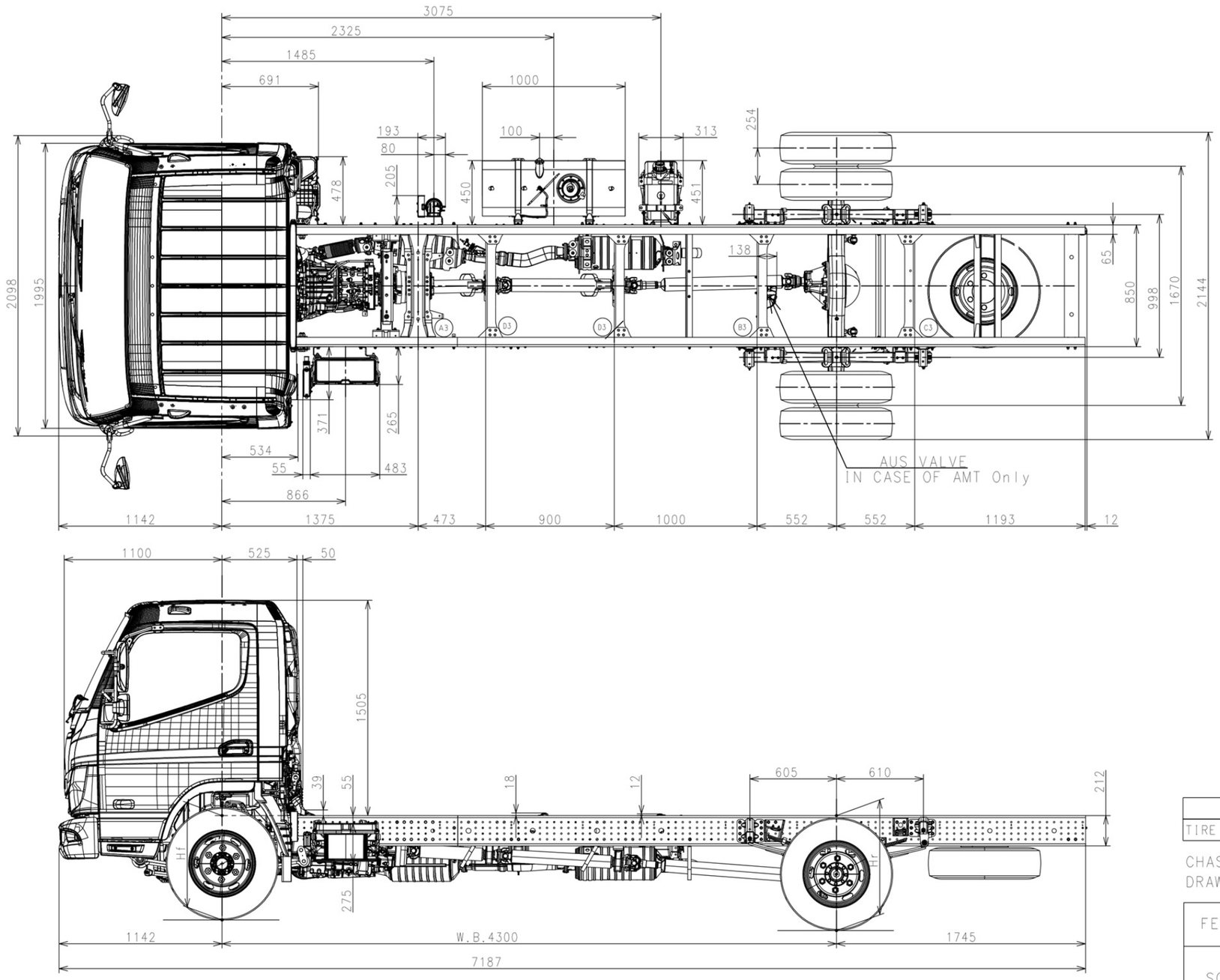
TIRE SIZE	215/75R17.5

CHASSIS CAB
DRAWINGS

FECX1GR3WFBP
UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

<FECX1HR3SFBP,FECX1HR4SFBP>



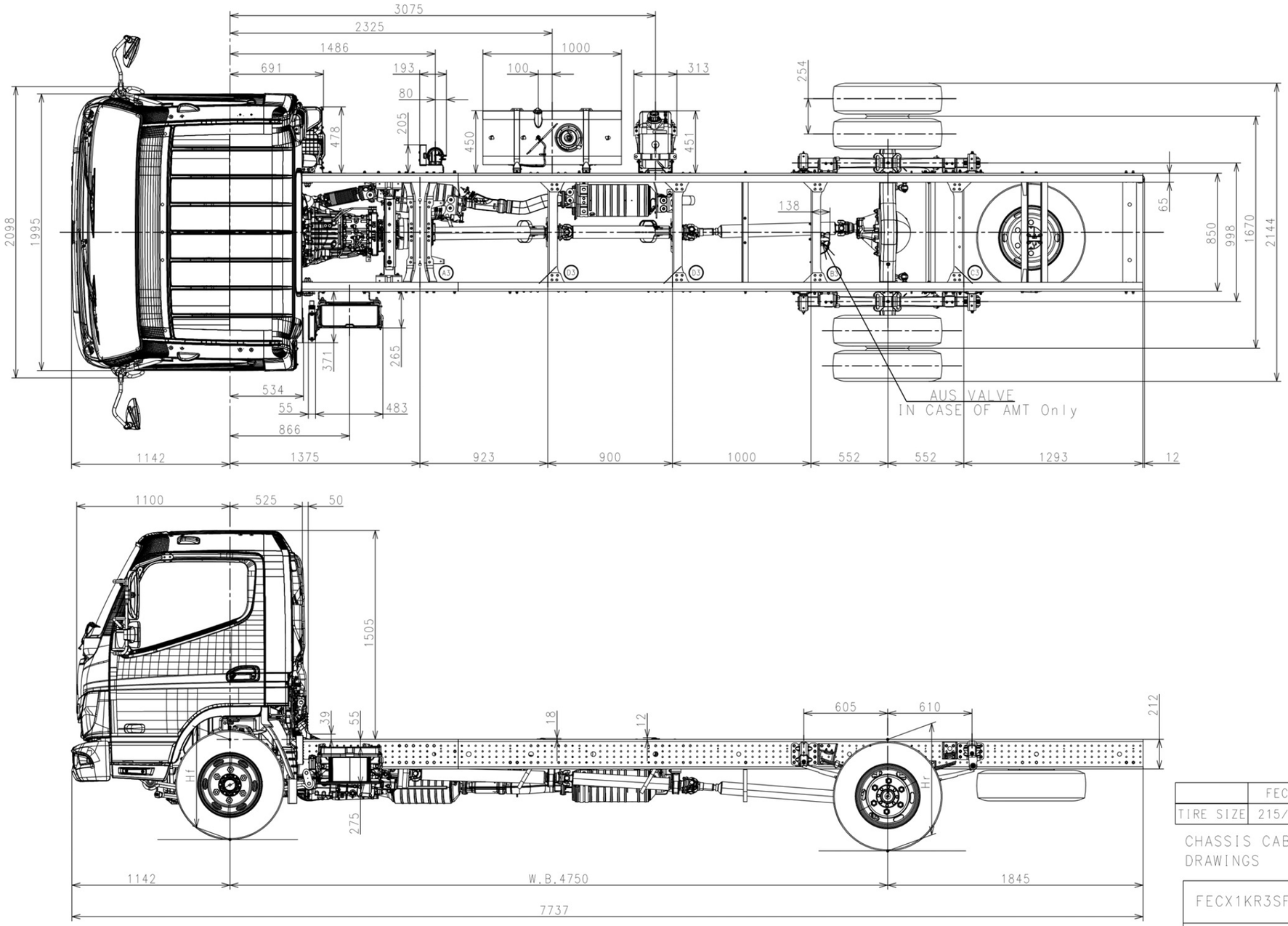
	FECX1HR3
TIRE SIZE	215/75R17.5

CHASSIS CAB
DRAWINGS

FECX1HR3SFBP
UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

<FECX1KR3SFBP,FECX1KR4SFBP>



10.5 Chassis cab drawings

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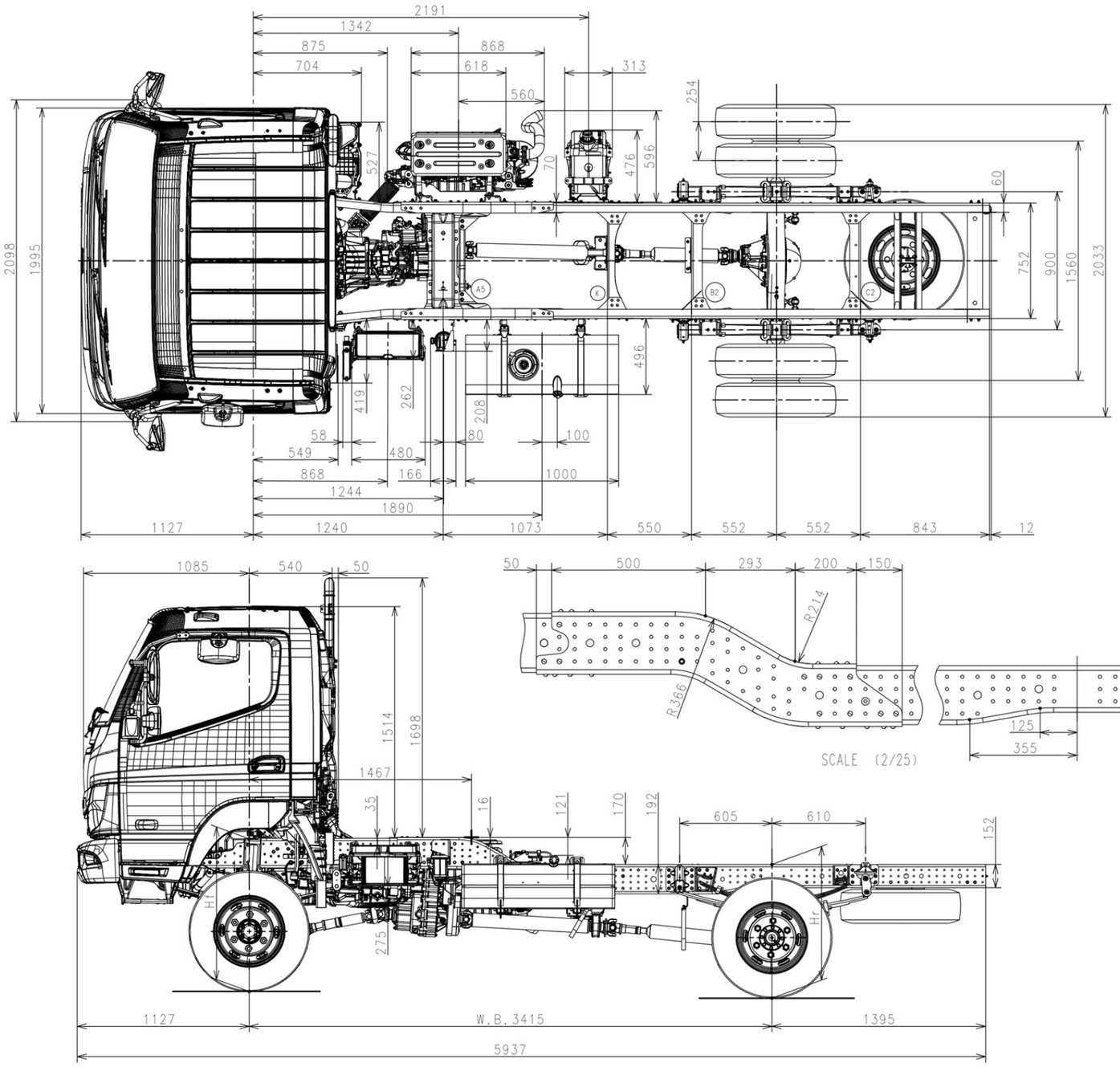

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TIRE SIZE	215/75R17.5

CHASSIS CAB
DRAWINGS

FGB71ER6SFBM
UNIT :mm SCALE :1/25

10.5 Chassis cab drawings

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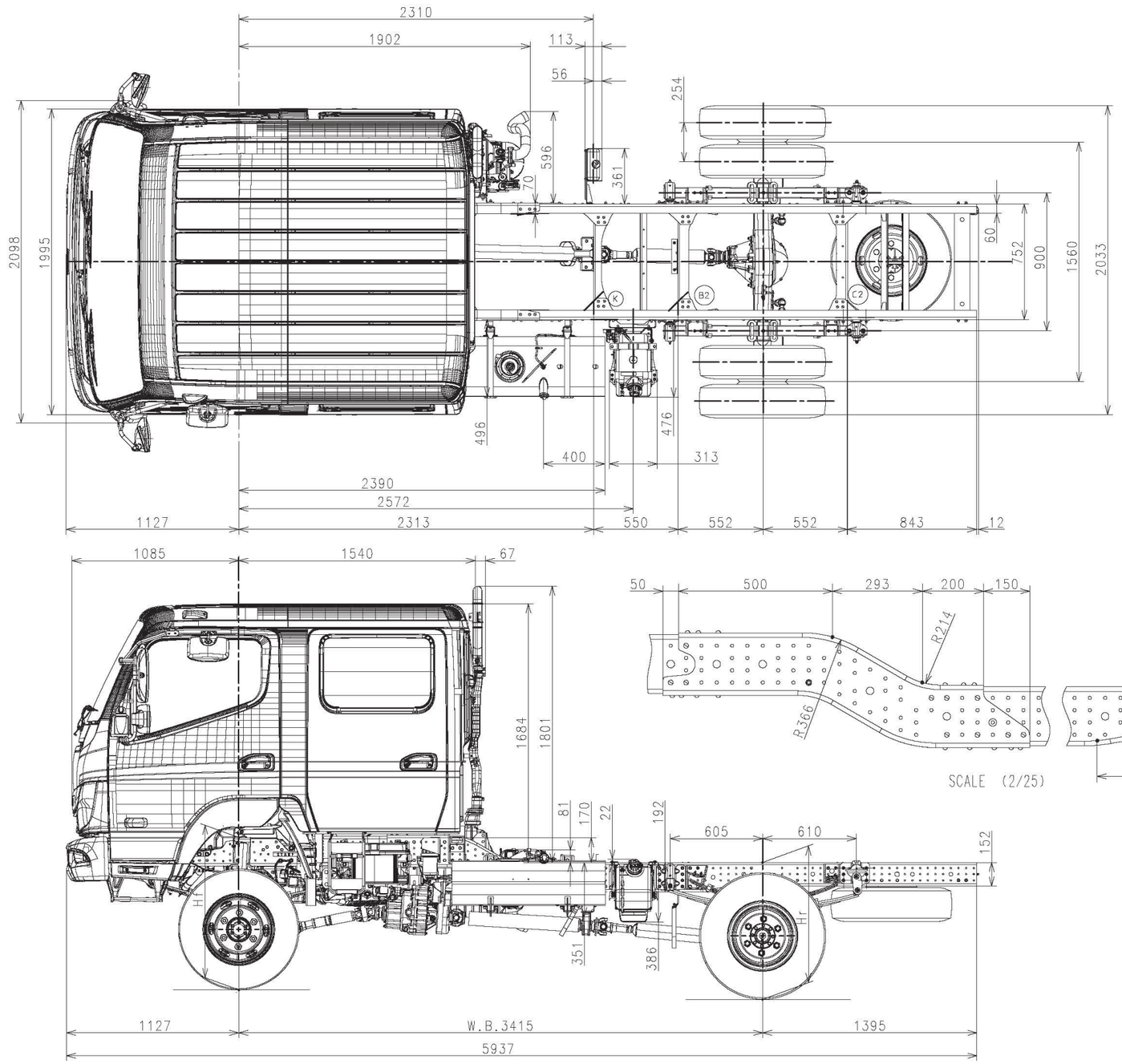

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TIRE SIZE	215/75R17.5

CHASSIS CAB
DRAWINGS

FGB71ER6WFBM
UNIT :mm SCALE :1/25

10.5.2 Cab drawings

Model			Page
ModelName	Applicable model		
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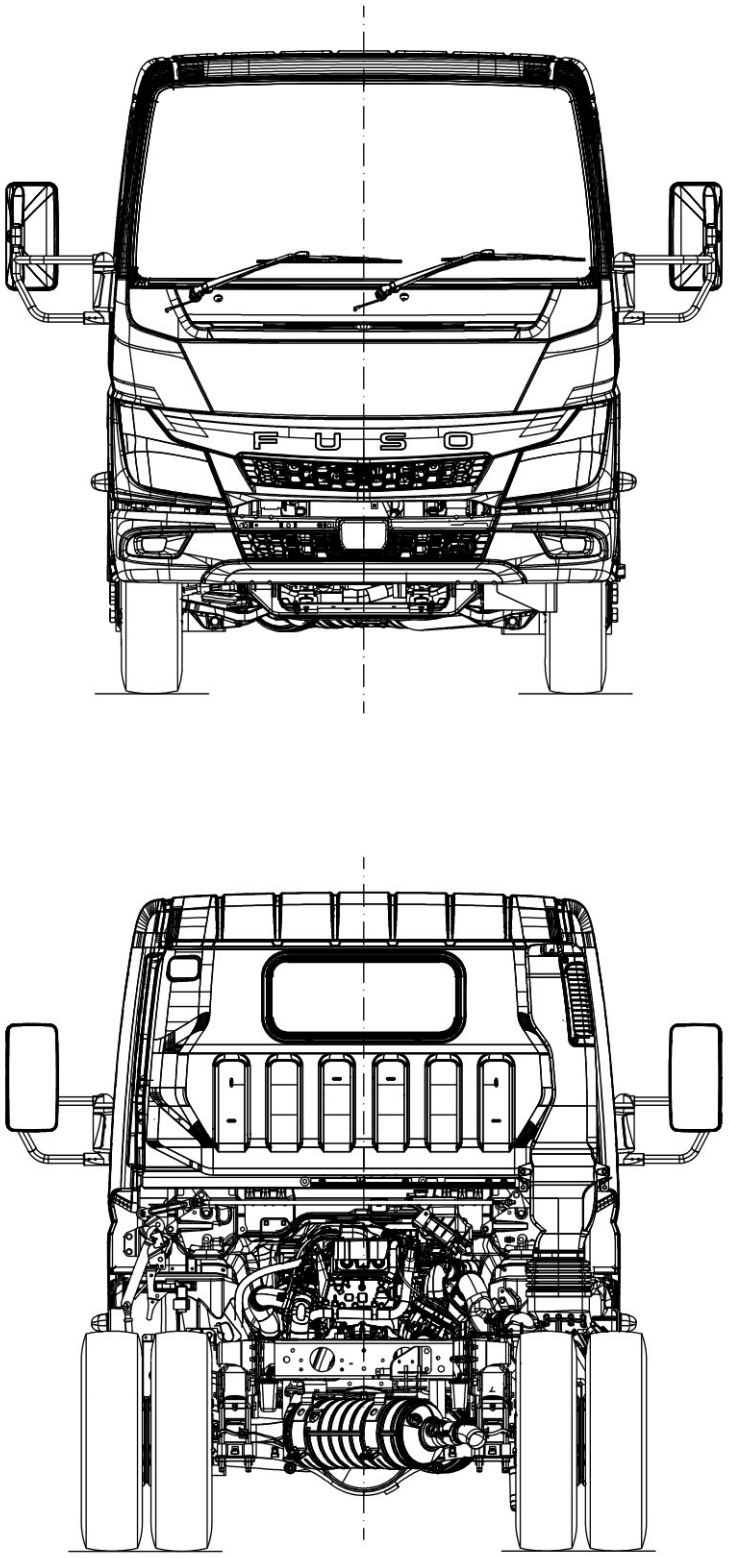
FEA21ER3WFBM	-	-	109
FEA61BR3SFBM	-	FEA61BR4SFBM	110
FEB21CR3SFBM	-	FEB21CR4SFBM	111
FEB21ER3SFBM	-	FEB21ER4SFBM	112
FEB51ER3SFBM	FEB51GR3SFBM	FEB51ER4SFBM	113
	FEB71GR3SFBM	FEB51GR4SFBM	
	-	FEB71GR4SFBM	
FEB71ER3WFBM	FEB71GR3WFBM	FEB71GR4WFBM	114
FEB91ER3WFBP	FEB91GR3WFBP	FEB91GR4WFBP	115
FEC71ER3SFBM	-	FEC71ER4SFBM	116
FEC71HR3SFBM	-	FEC71HR4SFBM	117
FEC81CR3SFBM	-	FEC81CR4SFBM	118
FECX1GR3SFBP	FECX1HR3SFBP	FECX1GR4SFBP	119
	FECX1KR3SFBP	FECX1HR4SFBP	
	-	FECX1KR4SFBP	
FECX1GR3WFBP	-	FECX1GR4WFBP	120
FGB71ER6SFBM	-	-	121
FGB71ER6WFBM	-	-	122

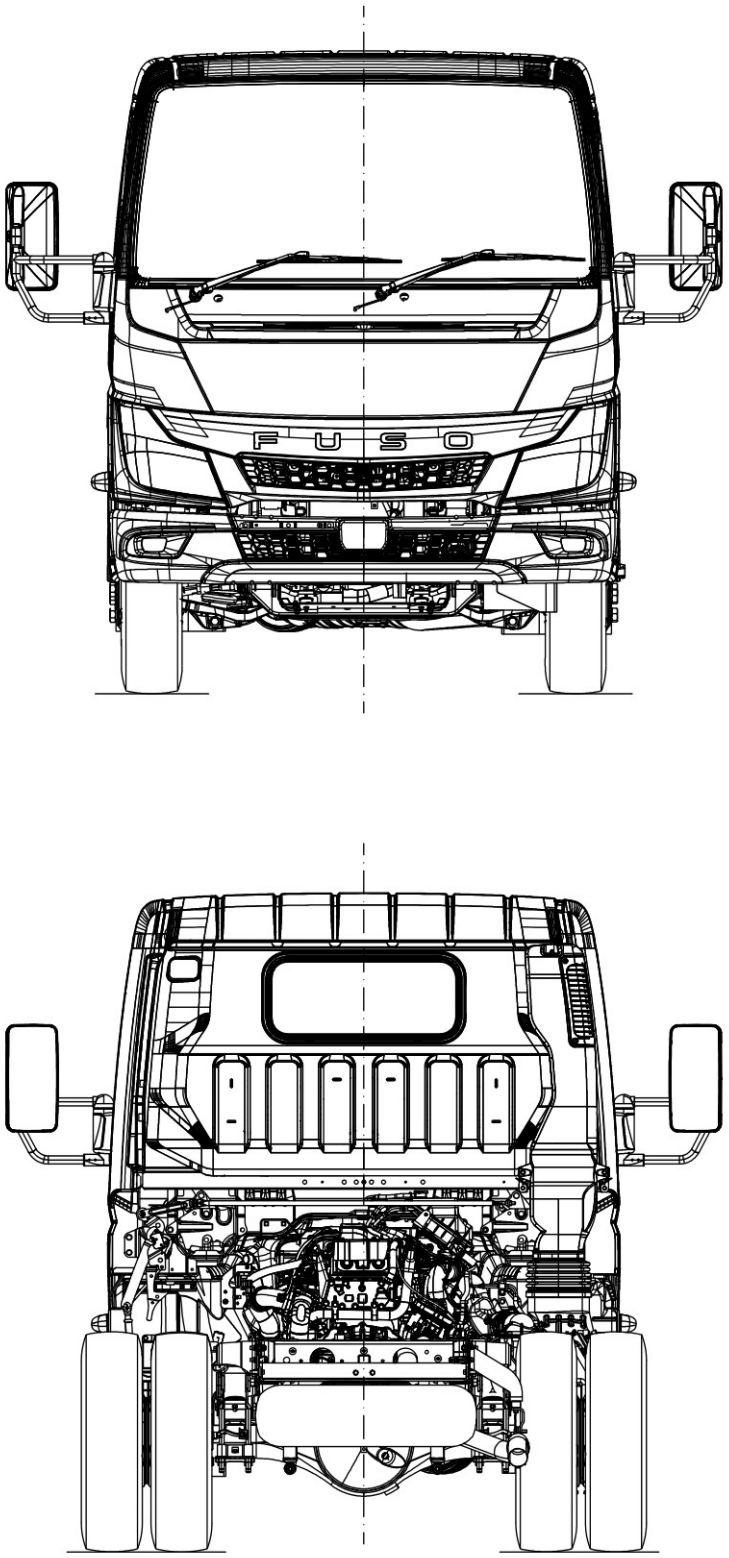
10.5 Chassis cab drawings



TF EuroVI FEA21C S/CAB

FEA21C SINGLE CAB AMT

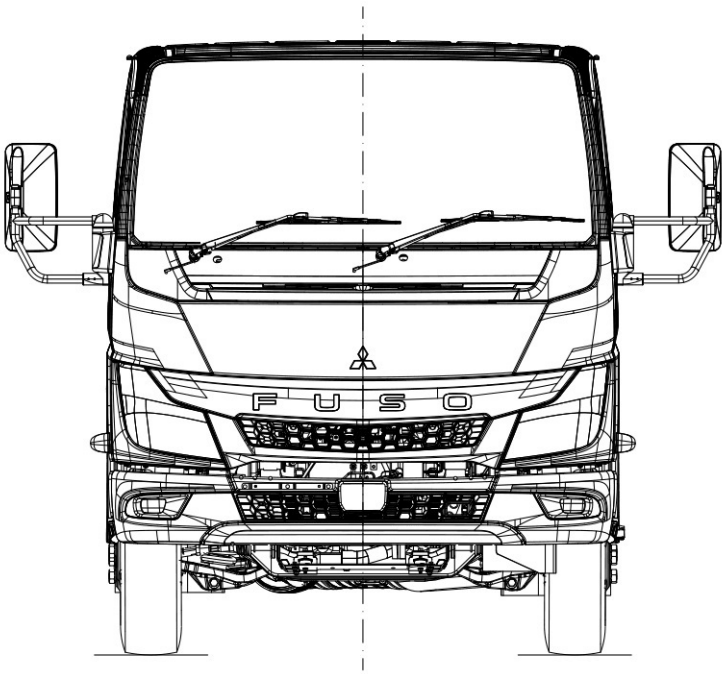
10.5 Chassis cab drawings

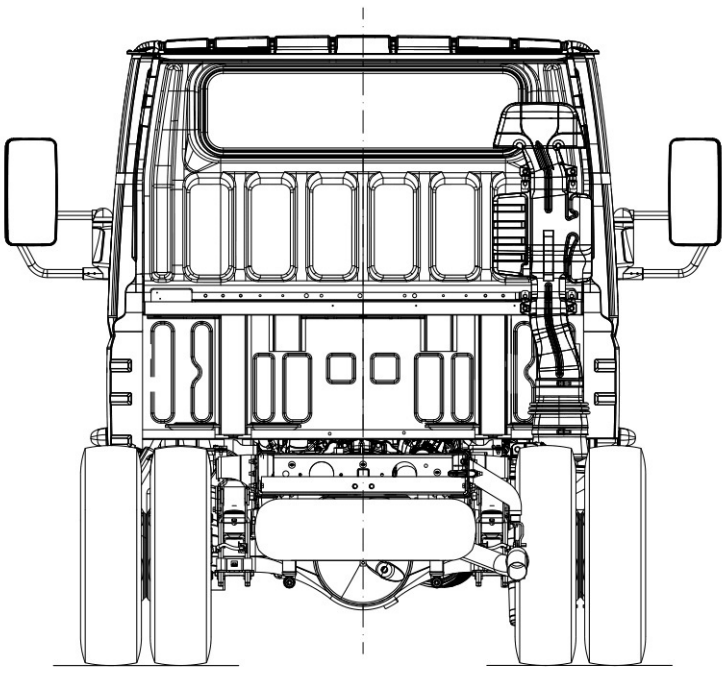


TF EuroVI FEA21E S/CAB

FEA21E SINGLE CAB AMT

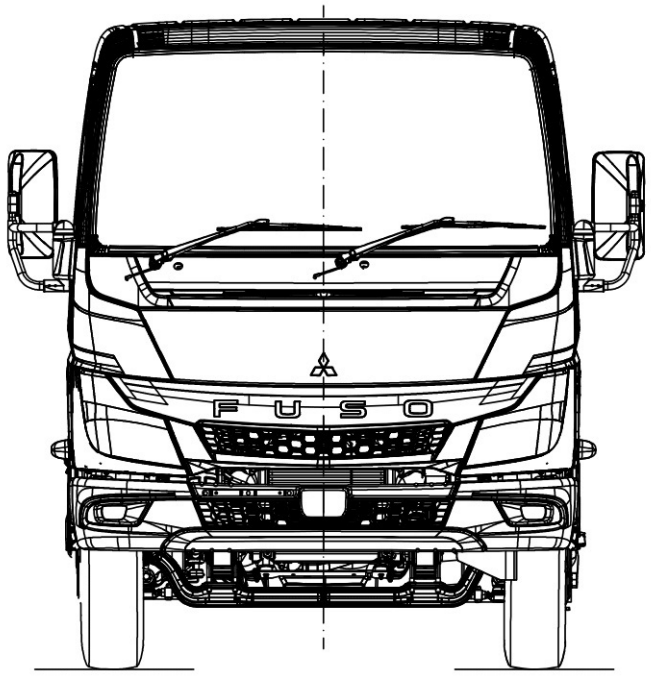
10.5 Chassis cab drawings

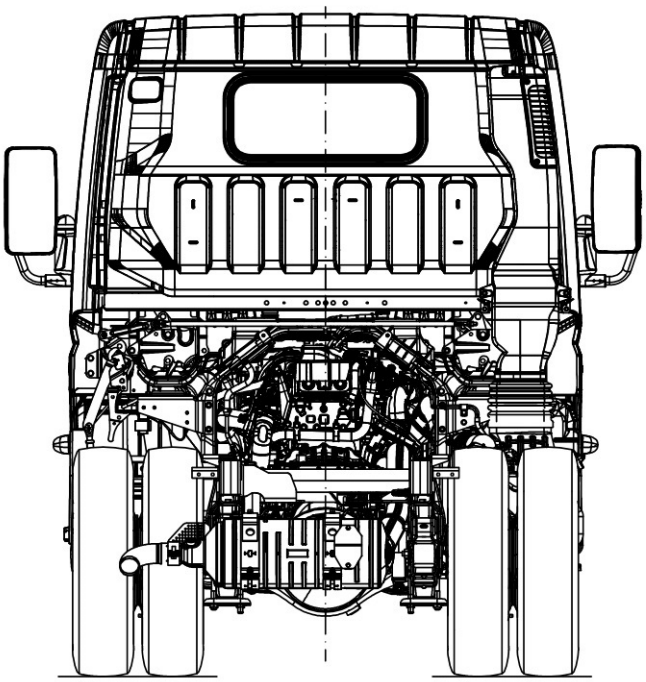




TF EuroVI FEA21E W/CAB

FEA21E CREW CAB AMT

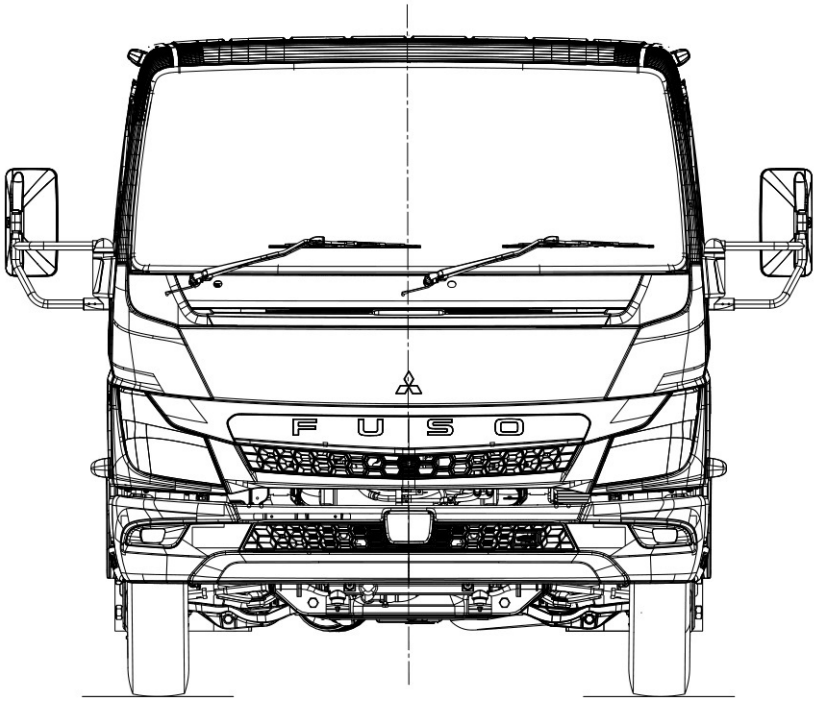


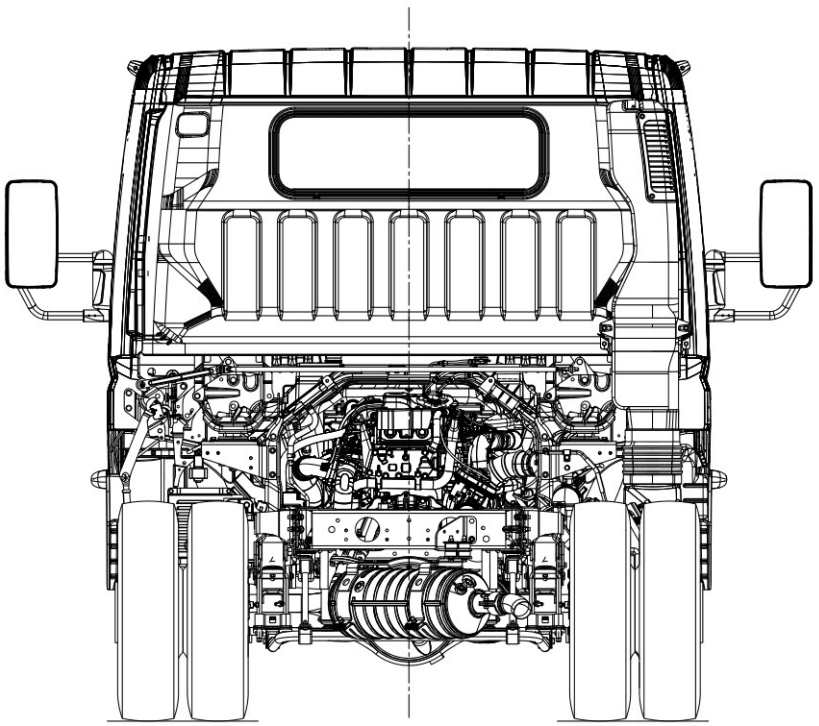


TF EuroVI FEA61B S/CAB

FEA61B SINGLE CAB AMT/MT

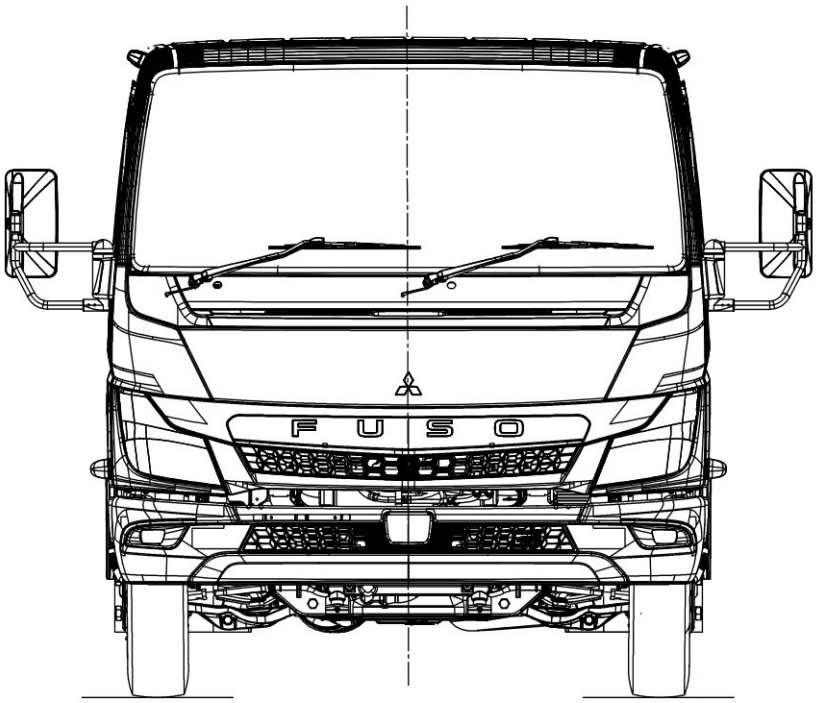
10.5 Chassis cab drawings

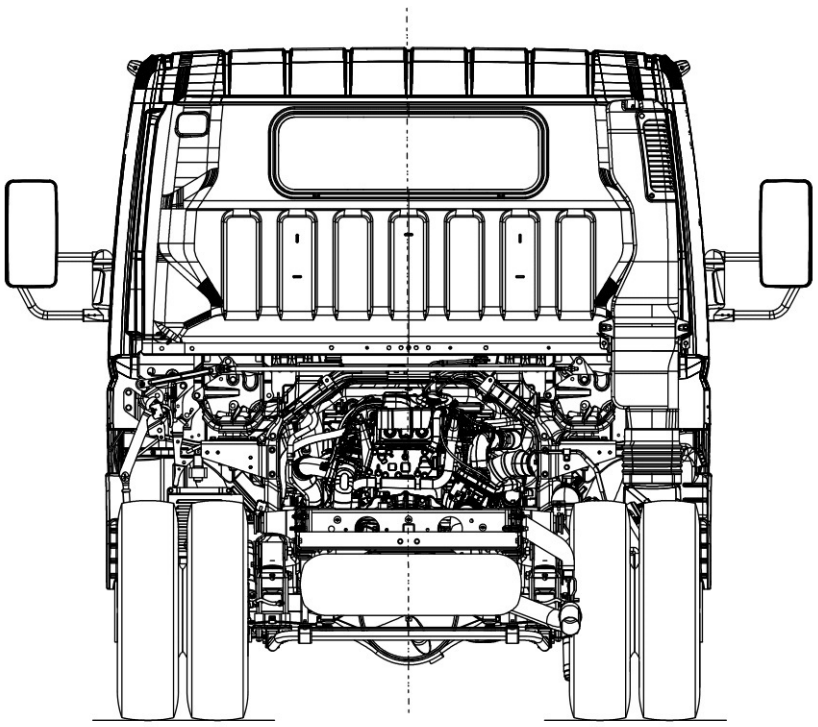




TF EuroVI FEB21C S/CAB

FEB21C SINGLE CAB AMT/MT

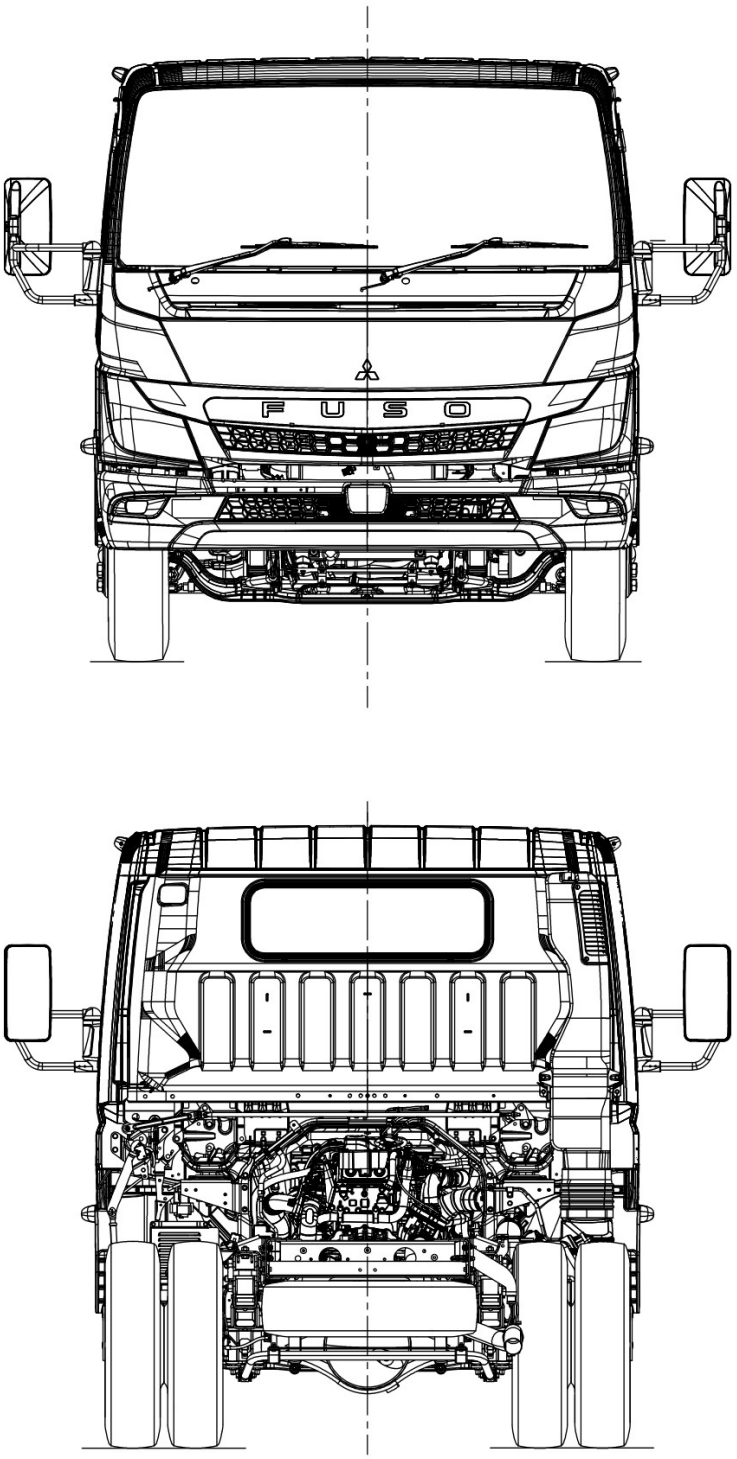




TF EuroVI FEB21E S/CAB

FEB21E SINGLE CAB AMT/MT

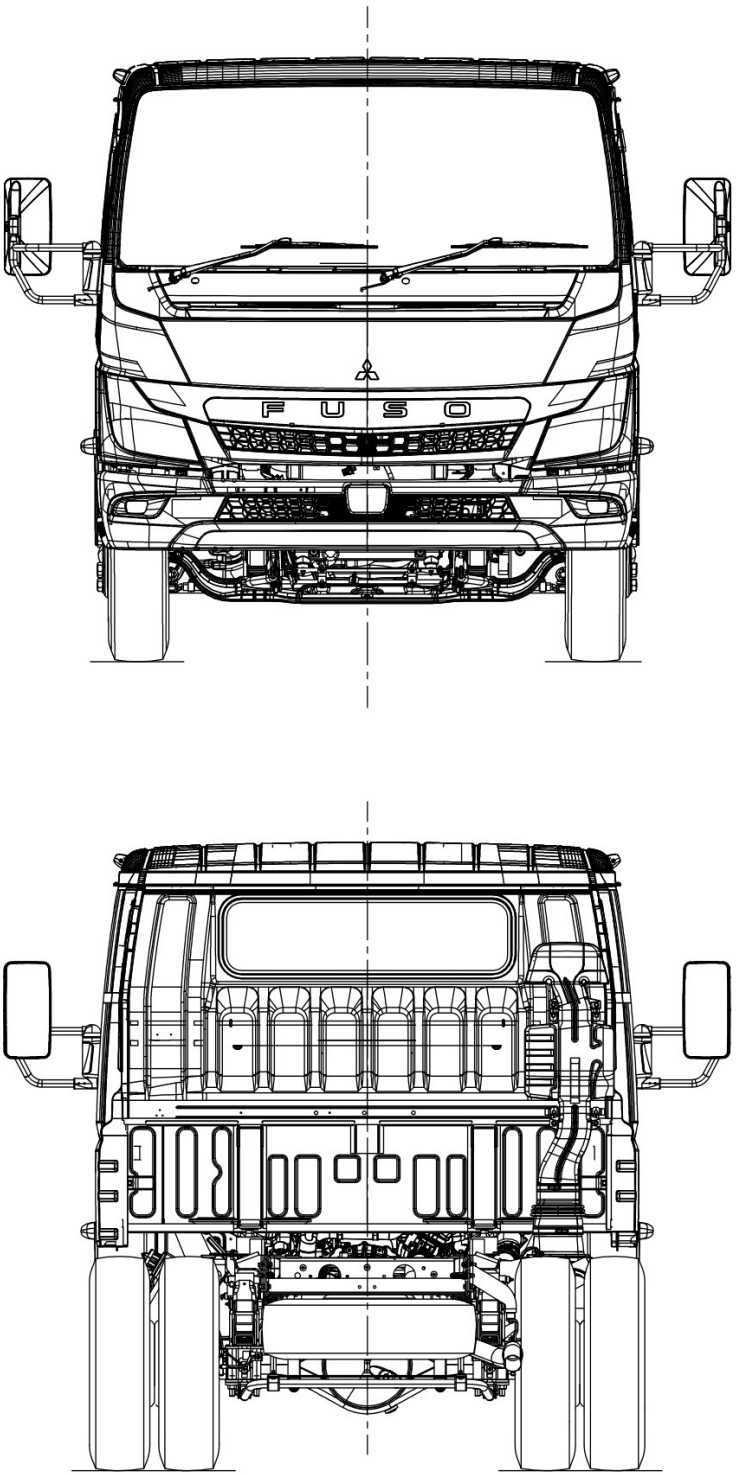
10.5 Chassis cab drawings



TF EuroVI FEB51E,FEB51G,FEB71G S/CAB

FEB51E,FEB51G,FEB71G SINGLE CAB AMT/MT

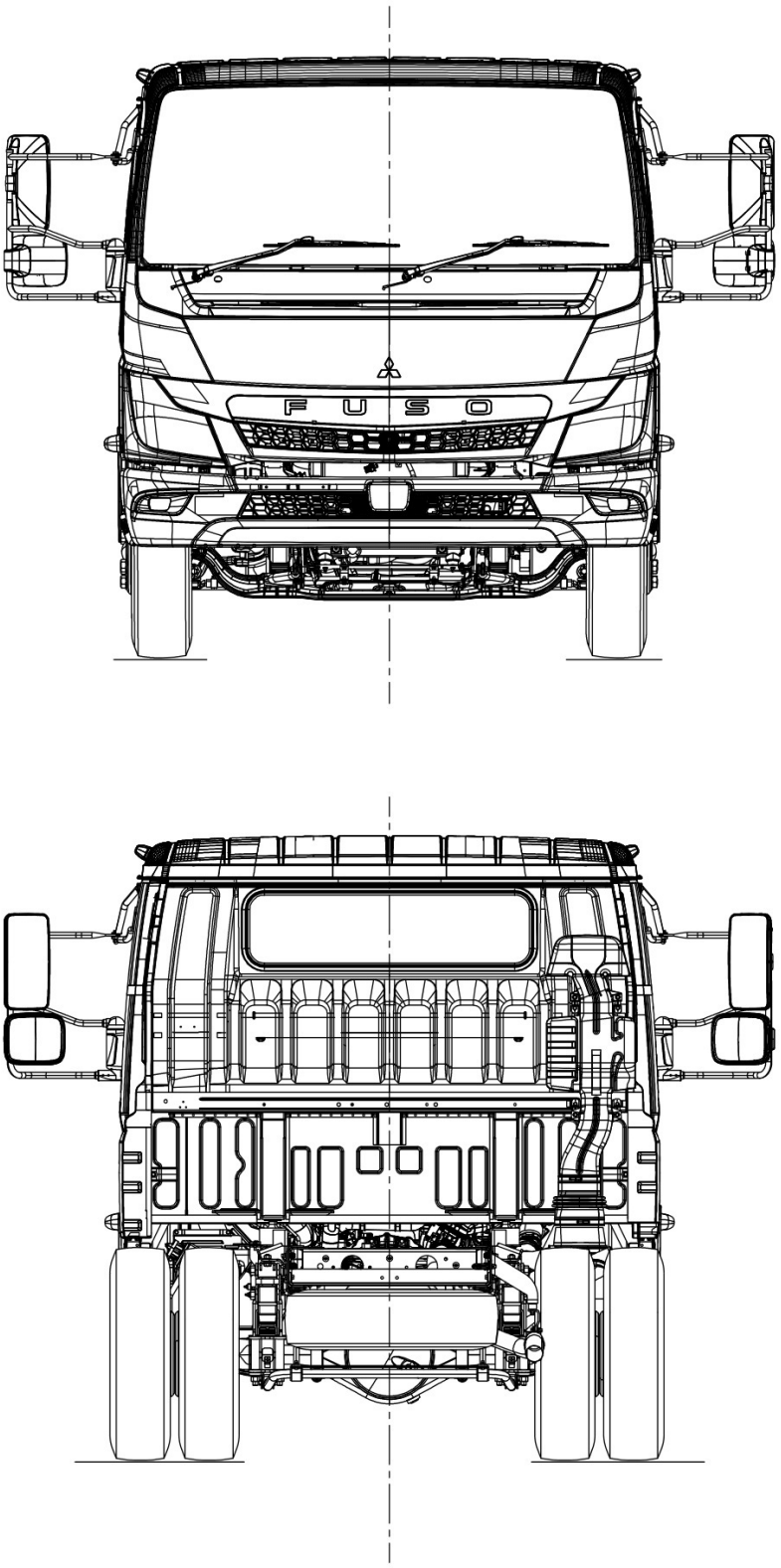
10.5 Chassis cab drawings



TF EuroVI FEB71E,FEB71G W/CAB

FEB71E,FEB71G CREW CAB AMT/MT

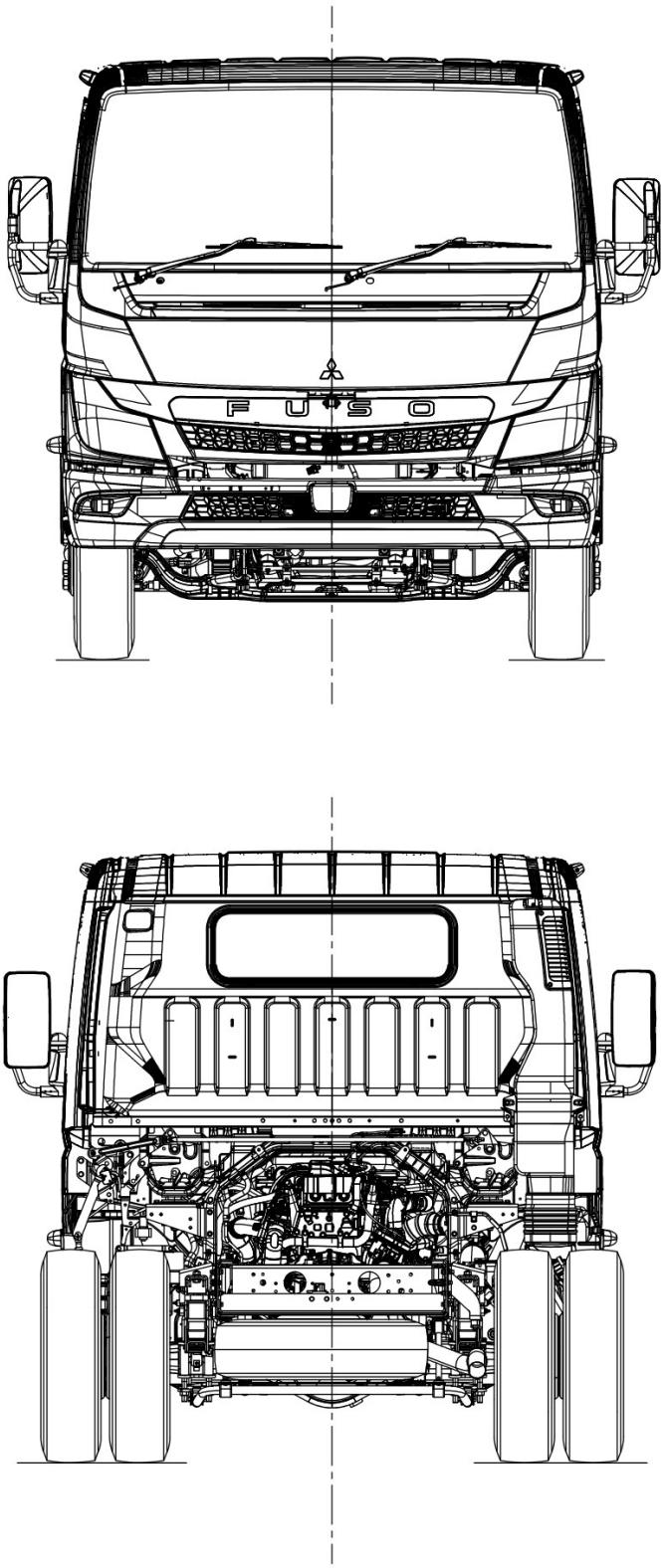
10.5 Chassis cab drawings



TF EuroVI FEB91E,FEB91G W/CAB

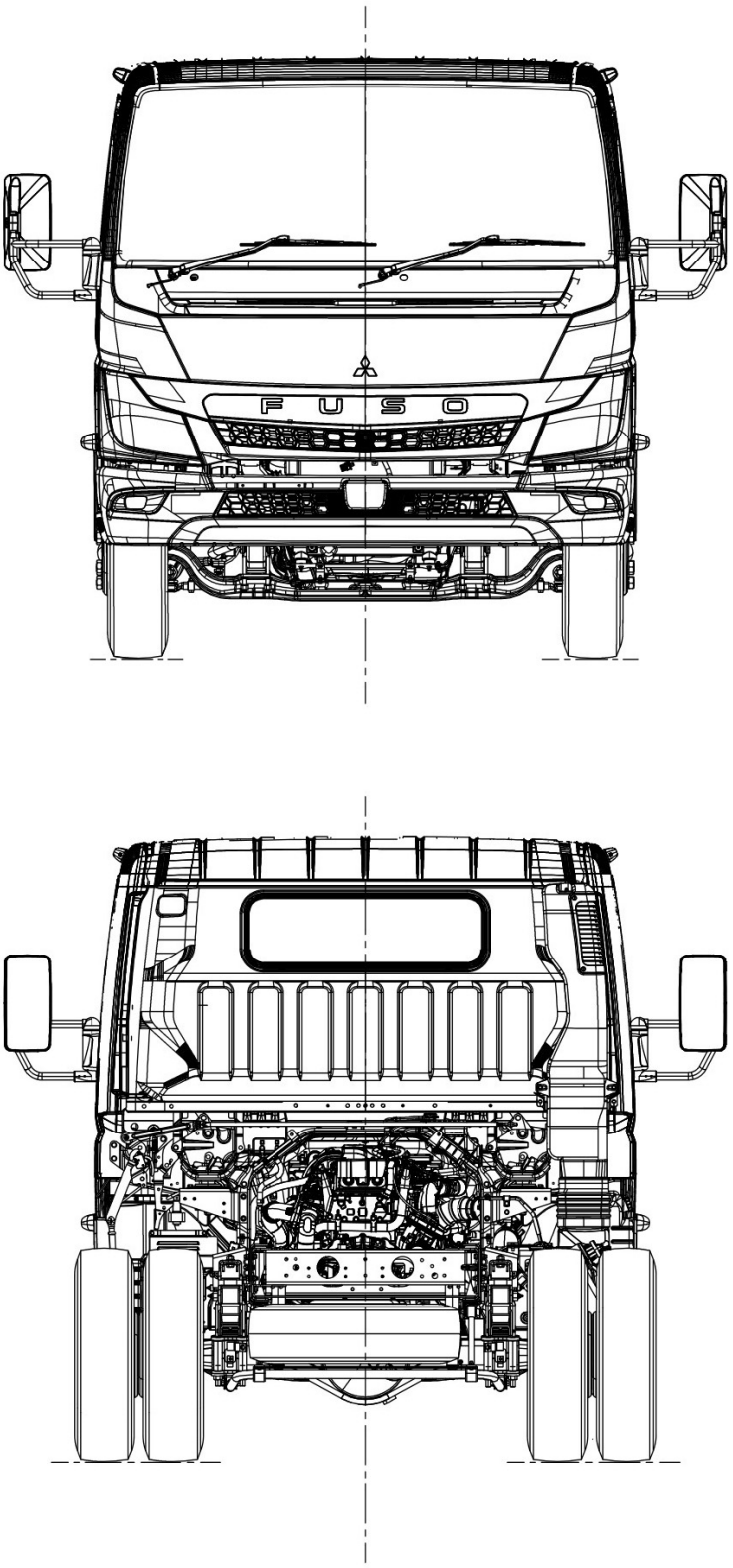
FEB91E,FEB91G CREW CAB AMT/MT

10.5 Chassis cab drawings



TF EuroVI FEC71E S/CAB

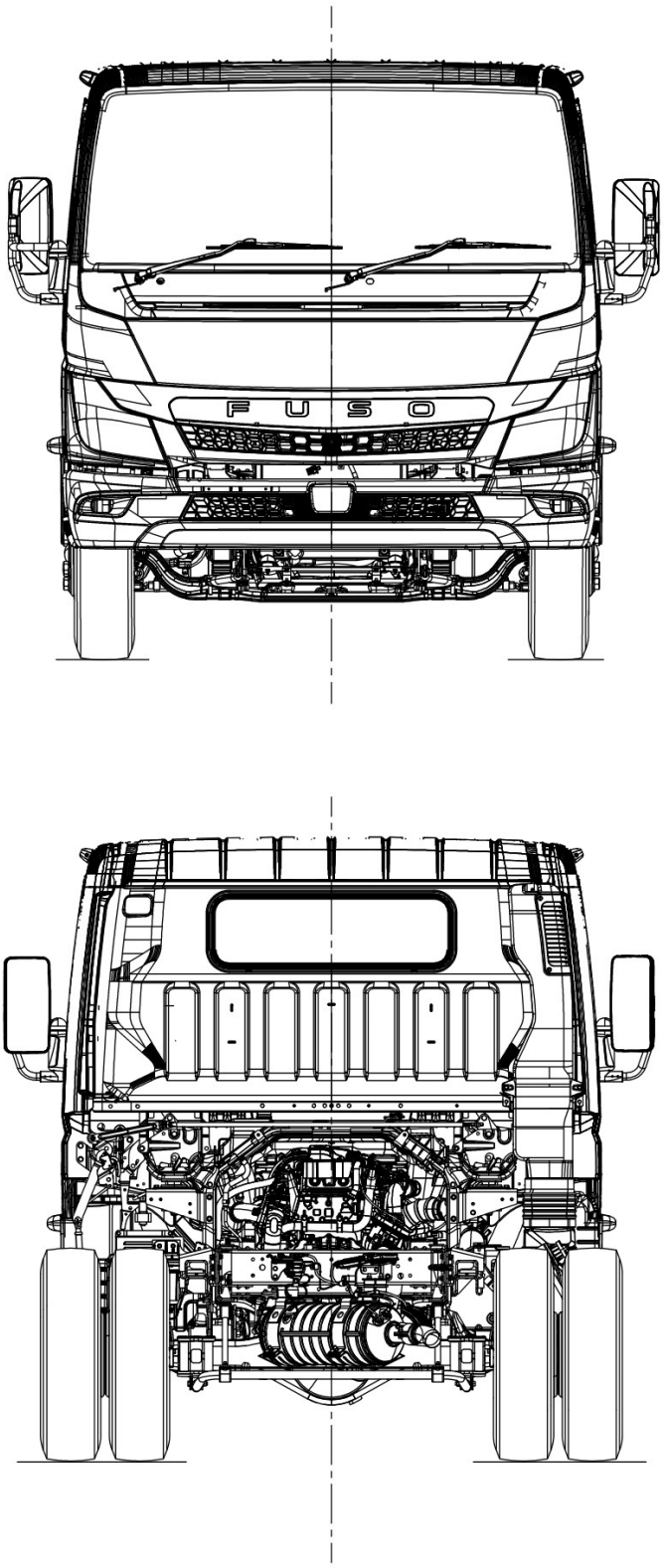
FEC71E SINGLE CAB AMT/MT



TF EuroVI FEC71H S/CAB

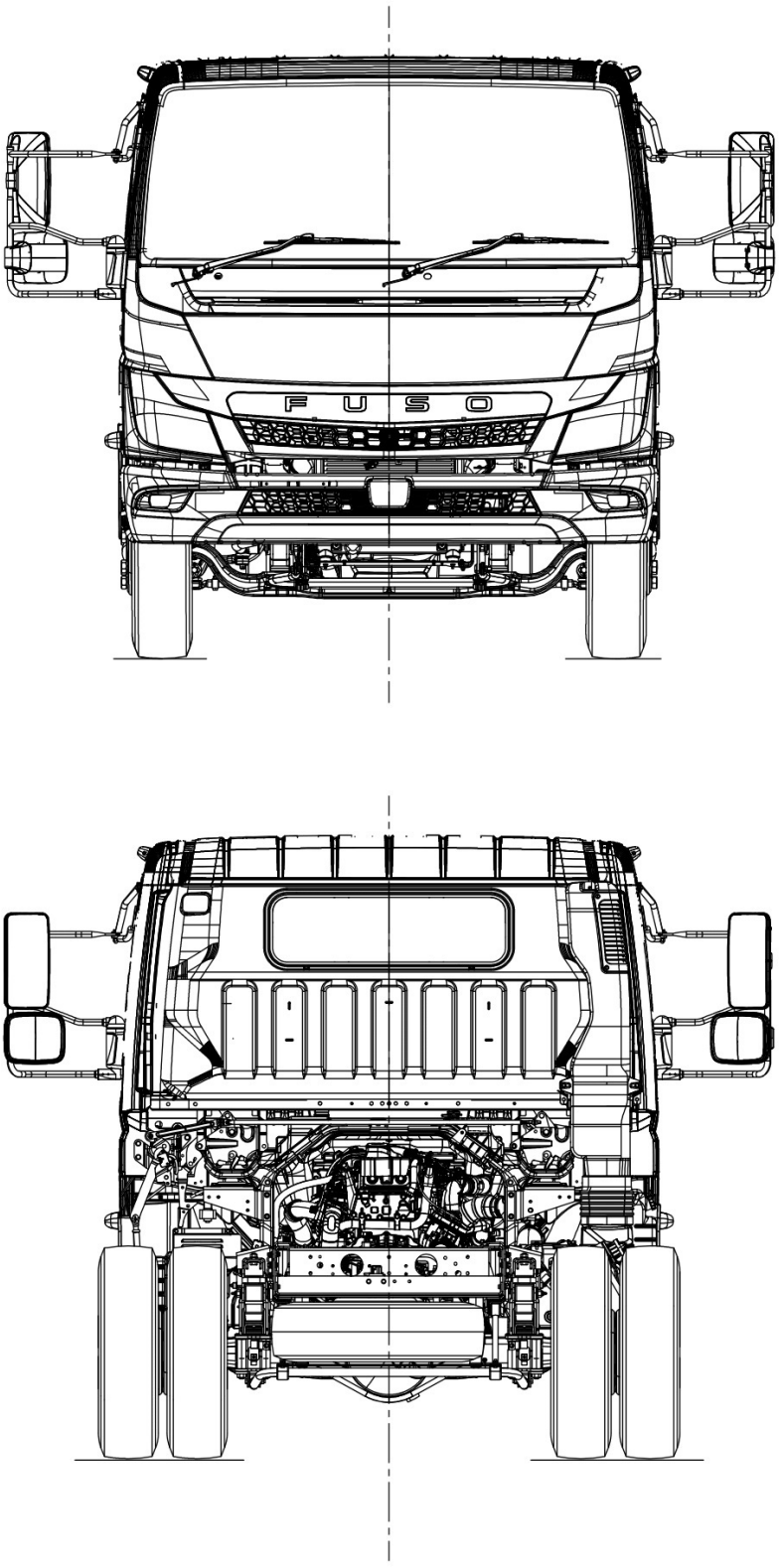
FEC71H SINGLE CAB AMT/MT

10.5 Chassis cab drawings



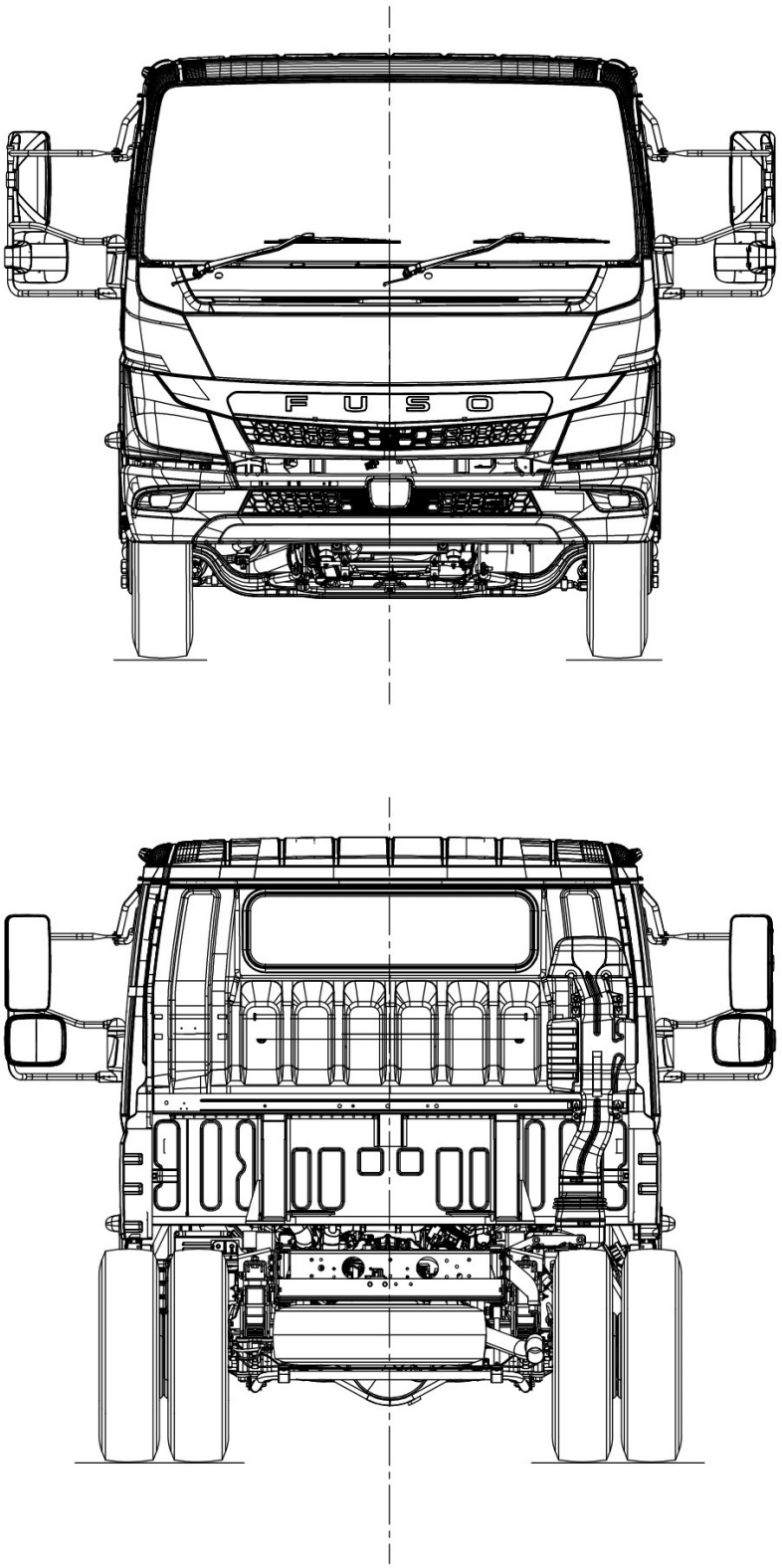
TF EuroVI FEC81C S/CAB

FEC81C SINGLE CAB AMT/MT



TF EuroVI FECX1G, FECX1H,FECX1K S/CAB

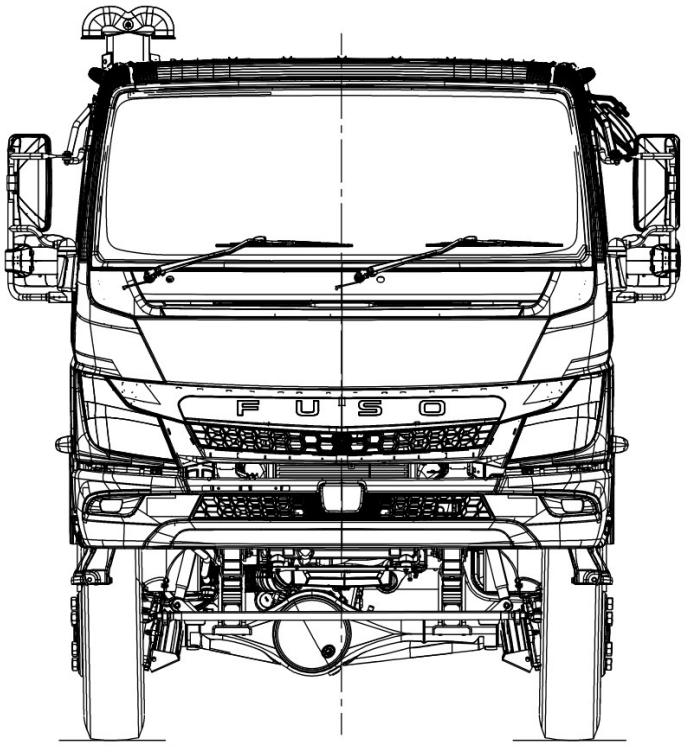
FECX1G,FECX1H,FECX1K SINGLE CAB AMT/MT

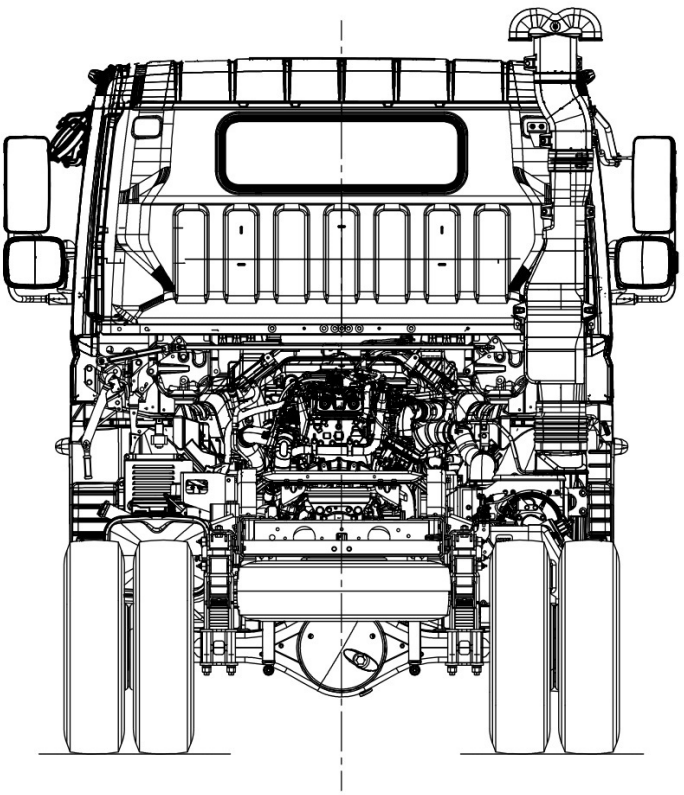


TF EuroVI FECX1G W/CAB

FECX1G CREW CAB AMT/MT

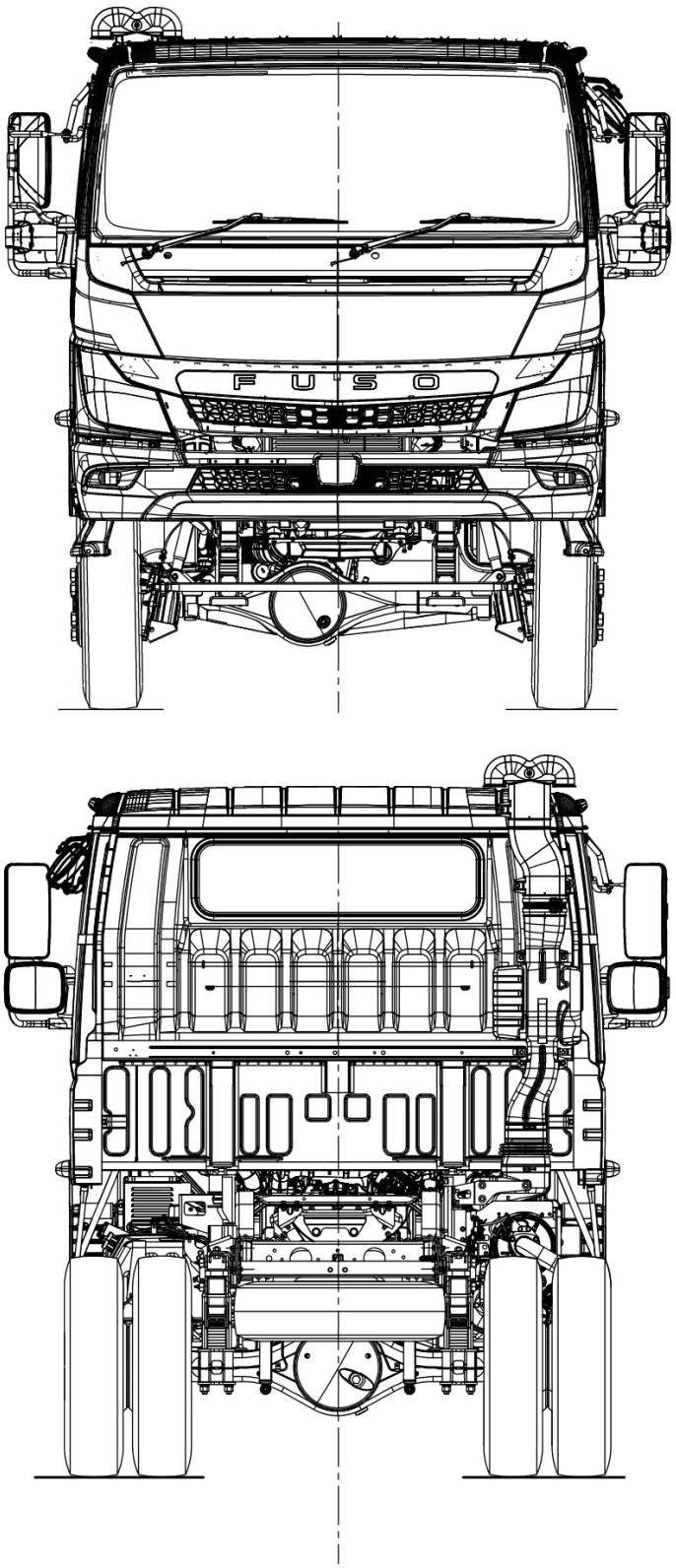
10.5 Chassis cab drawings





TF EuroVI FGB71E S/CAB

FGB71E SINGLE CAB MT

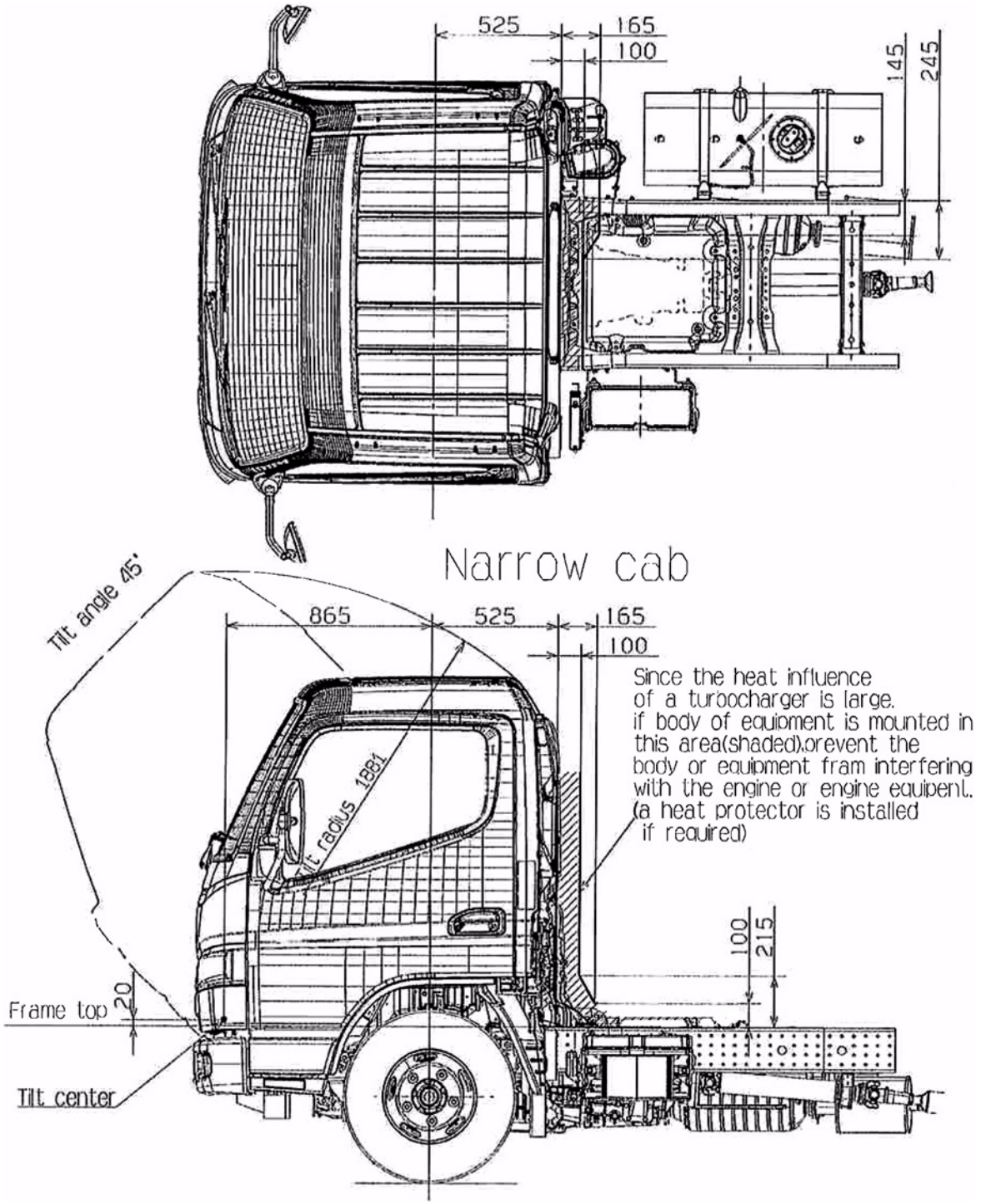


TF EuroVI FGB71E W/CAB

FGB71E CREW CAB MT

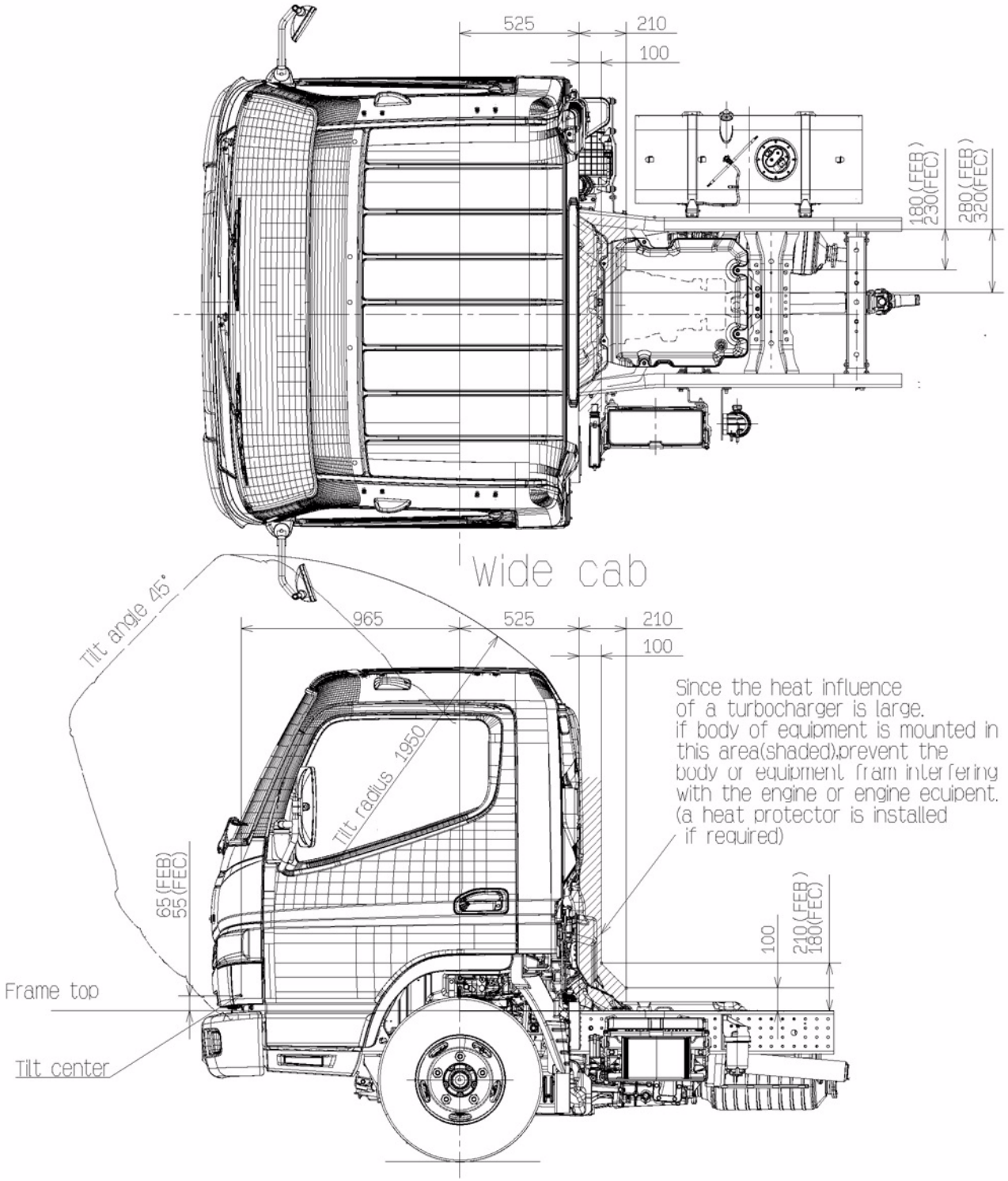
10.5.3 Cab side view

<Standard single cab>



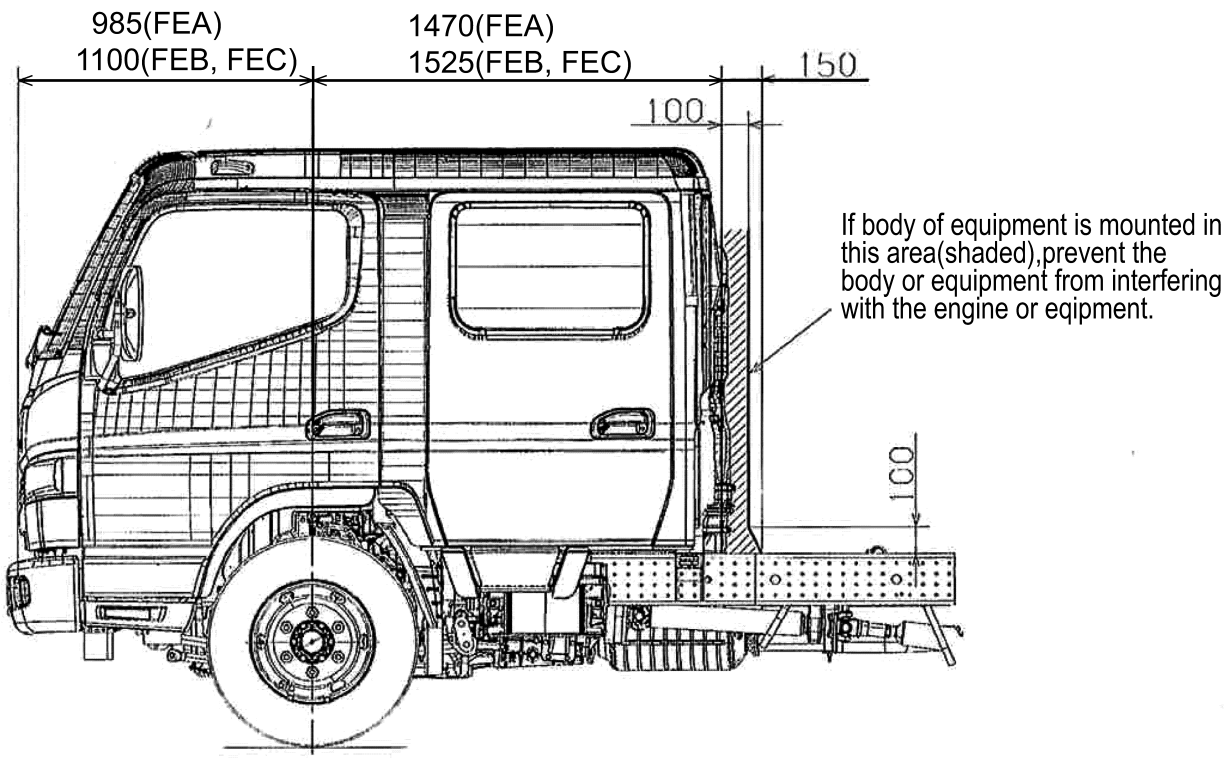
10.5 Chassis cab drawings

<Wide single cab>



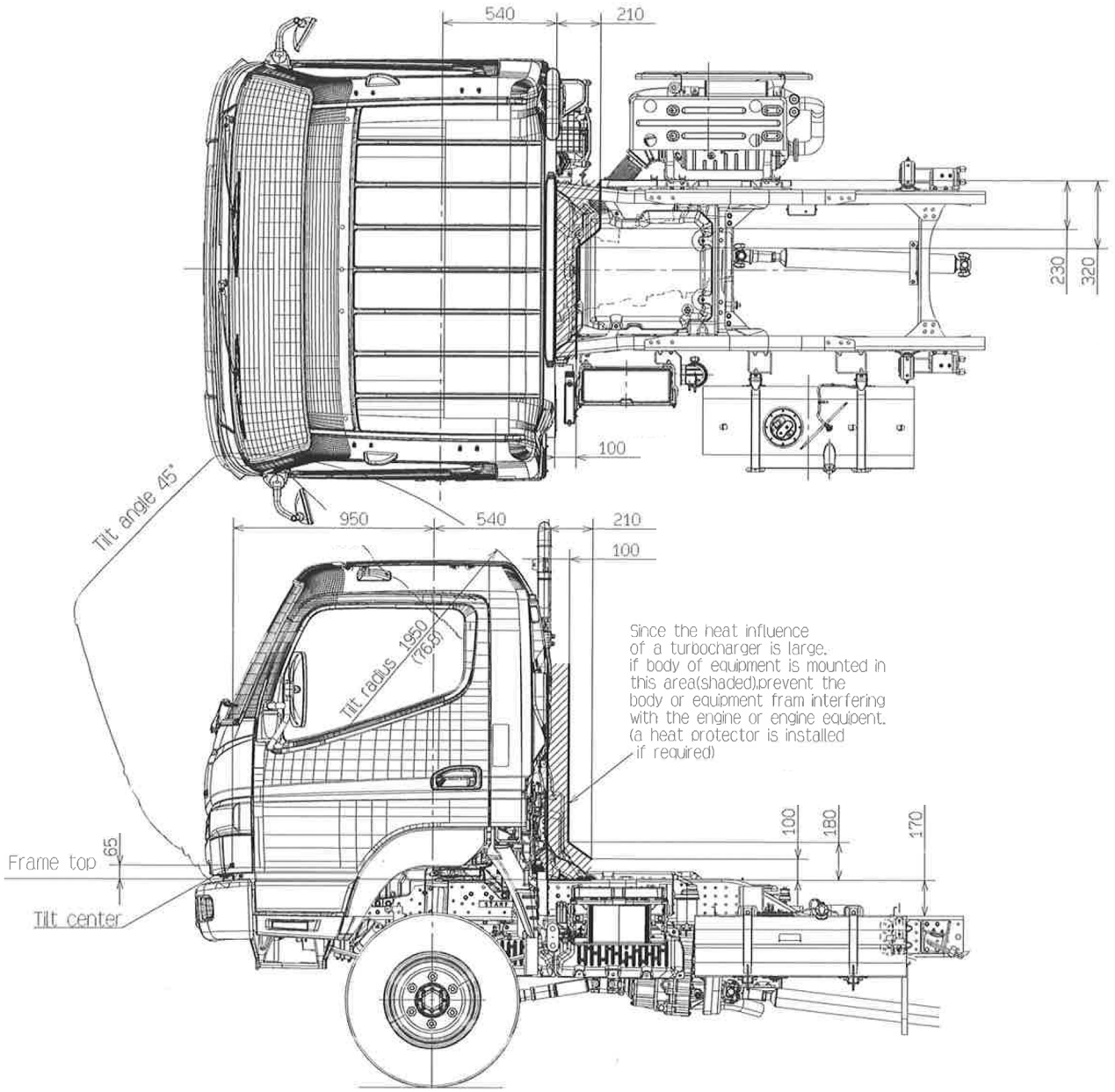
<Standard double (crew) cab>
<Wide double (crew) cab>

Double cab

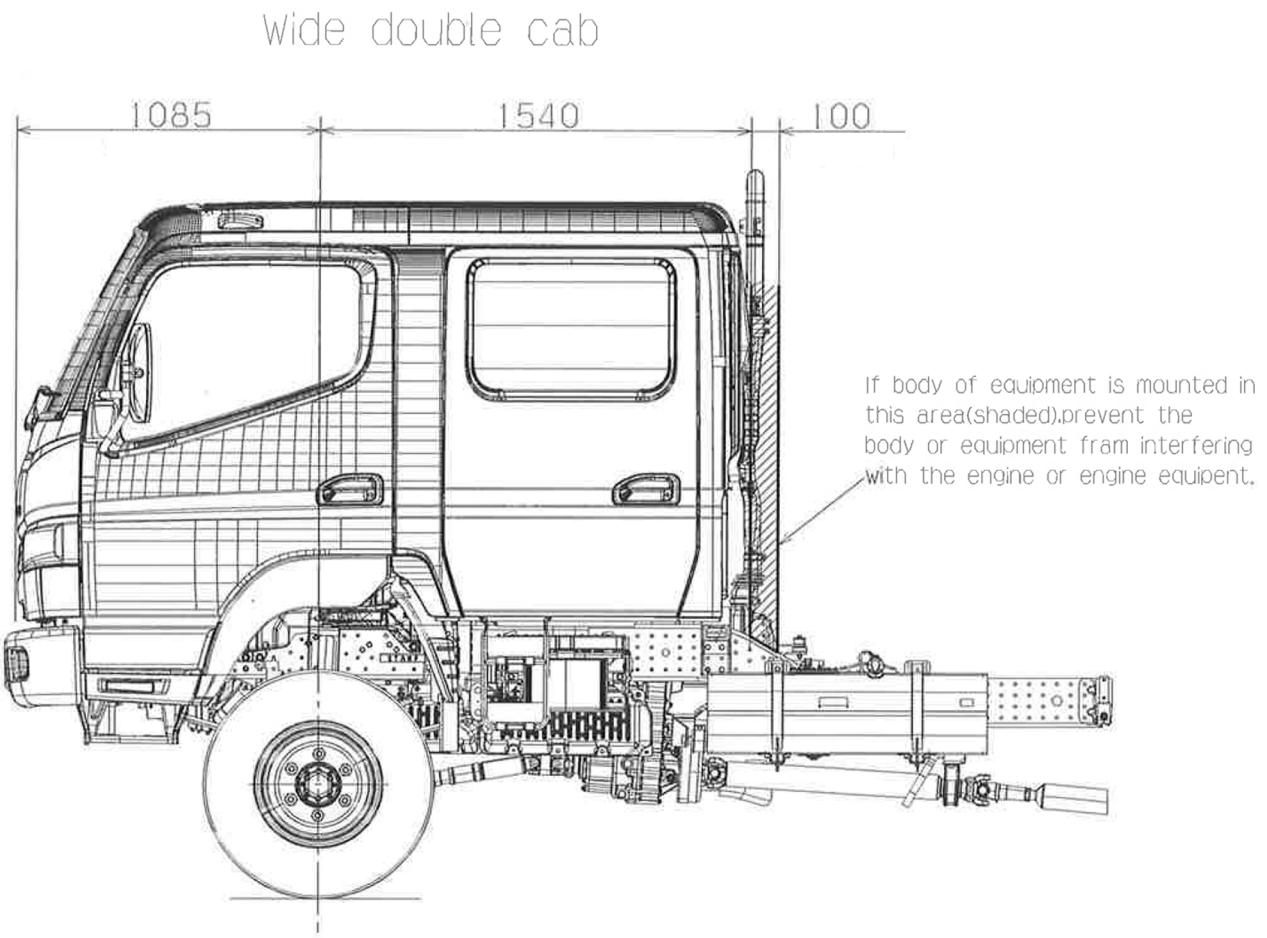


10.5 Chassis cab drawings

<Wide single(4x4) cab>



<Wide double (4x4 crew) cab>

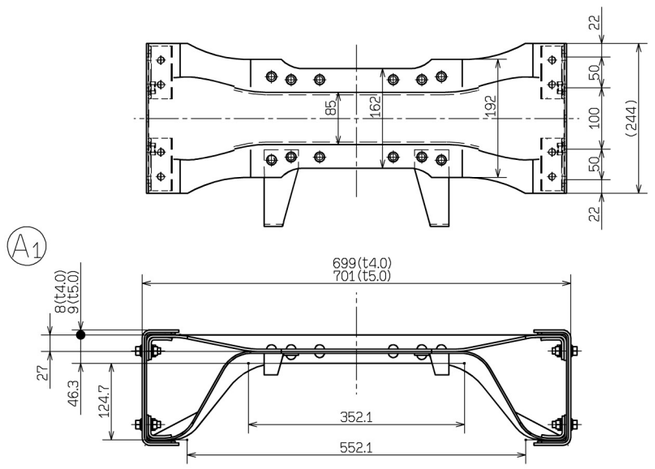


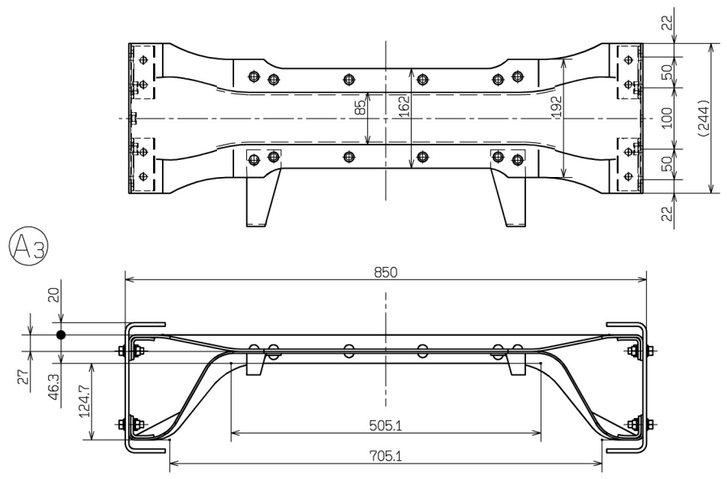
10.6 Frame structure

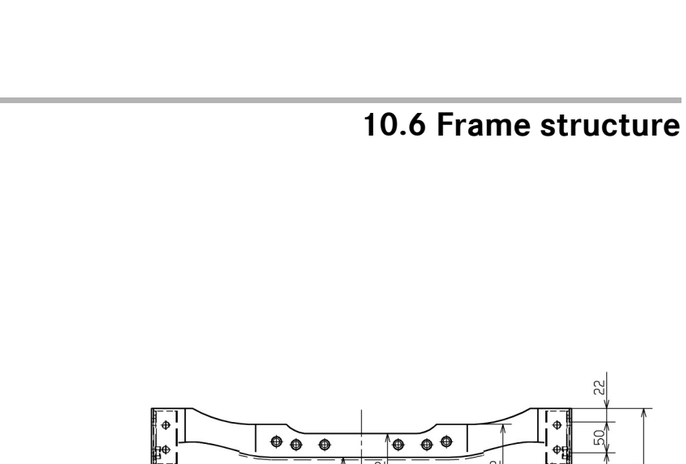
10.6.1 Details of crossmembers

Model	Section	Page
FEA, FEB, FEC	A1, A2, A3	129
	B1, B2, B3	130
	C1, C2, C3	131
	D1, D2, D3	132
	F, G, H	133
FGB	A5, C2, K	134
	B2	135

10.6 Frame structure



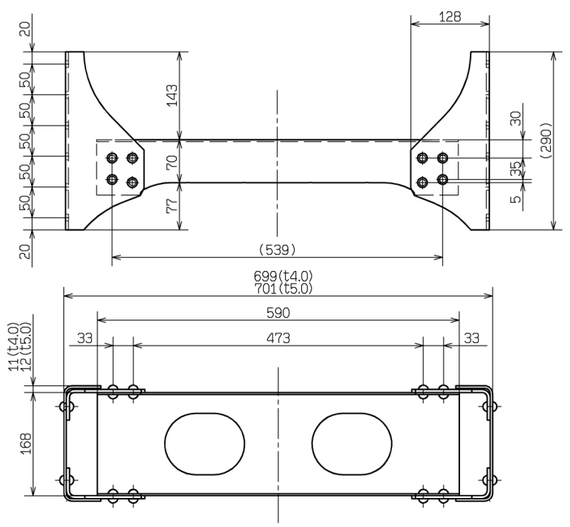




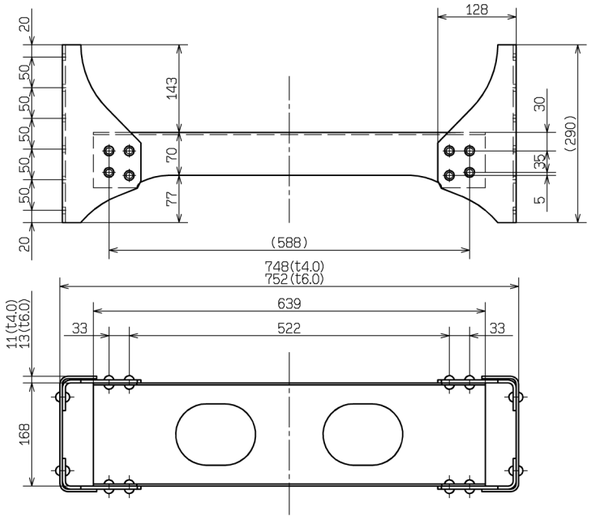
UNIT : mm

10.6 Frame structure

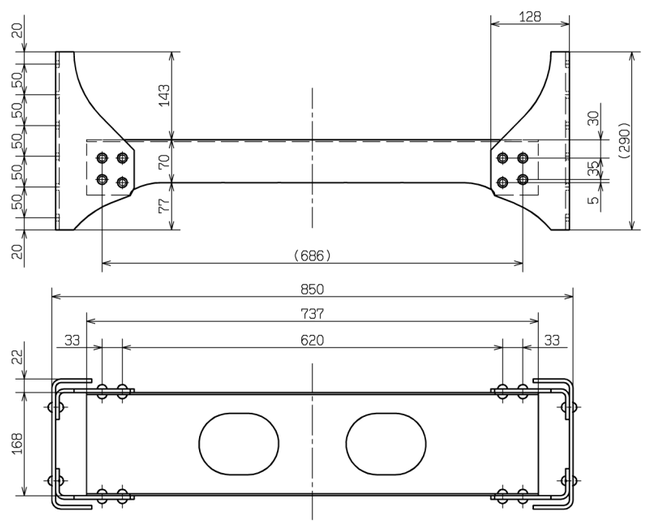
B1



B2



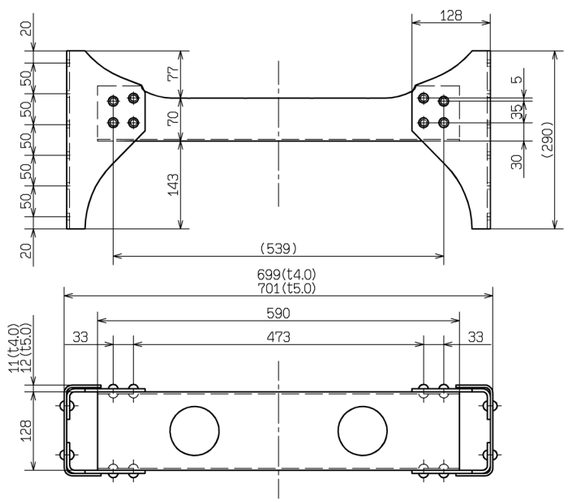
B3



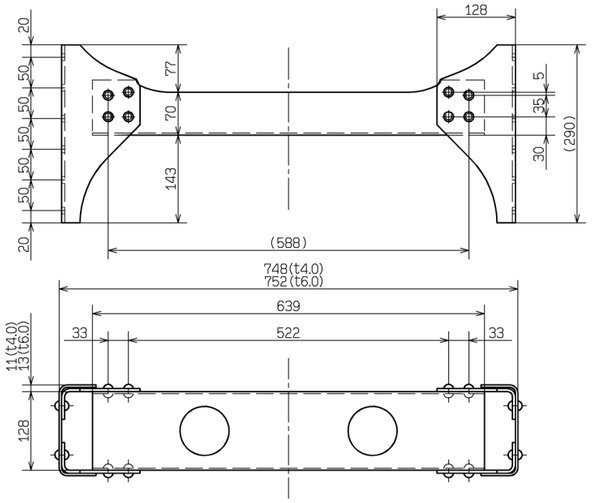
UNIT : mm

10.6 Frame structure

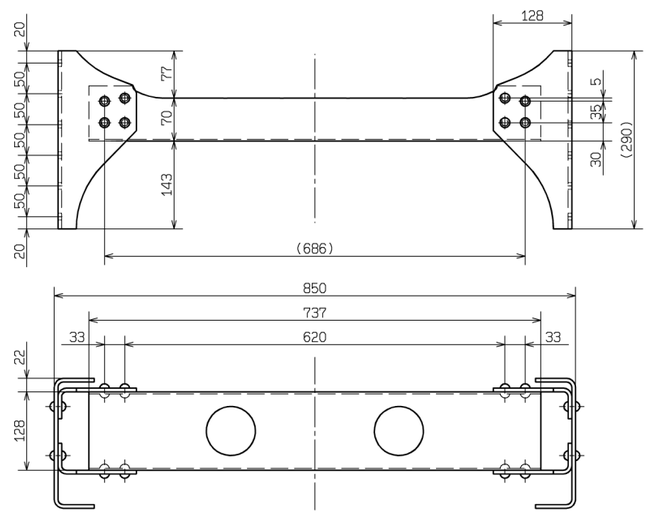
C1



C2



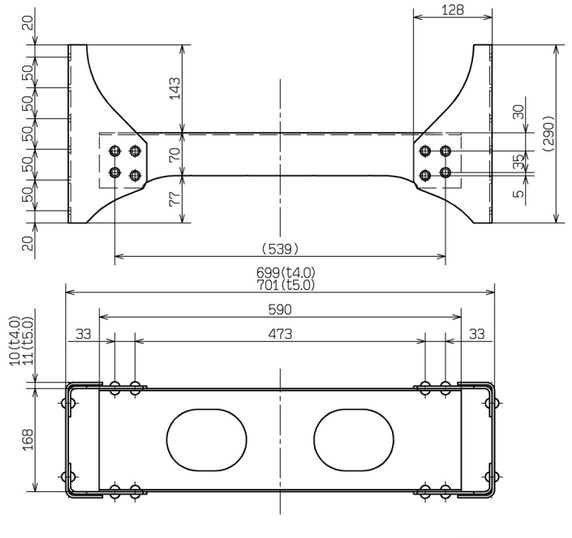
C3



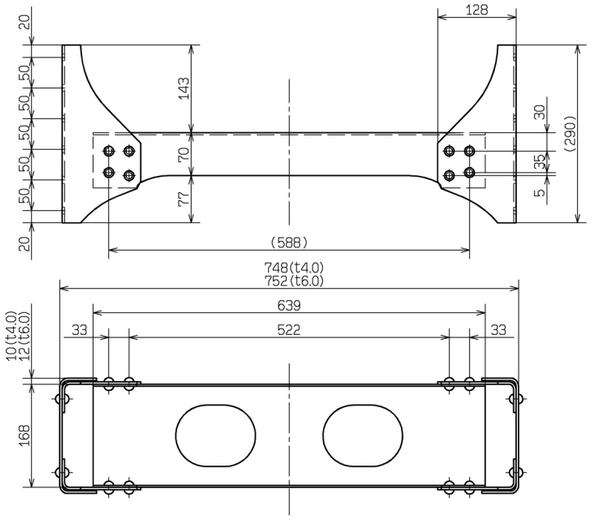
UNIT : mm

10.6 Frame structure

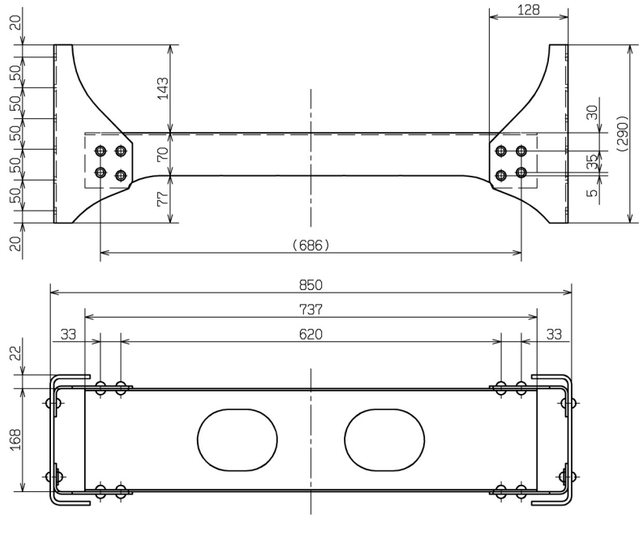
D1



D2



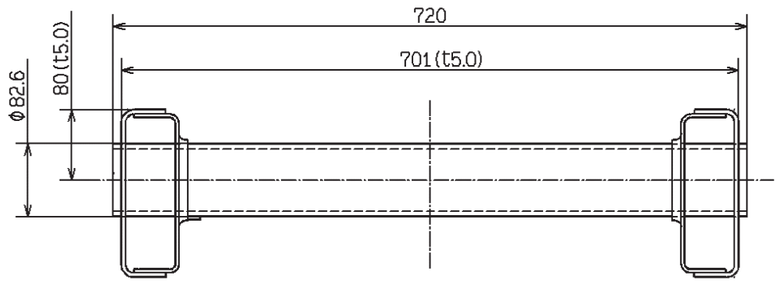
D3



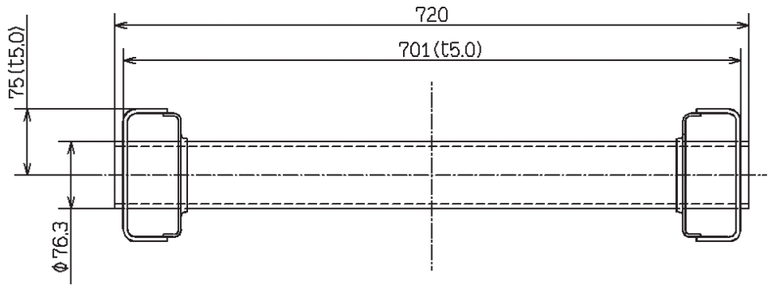
UNIT : mm

10.6 Frame structure

Ⓕ



Ⓗ



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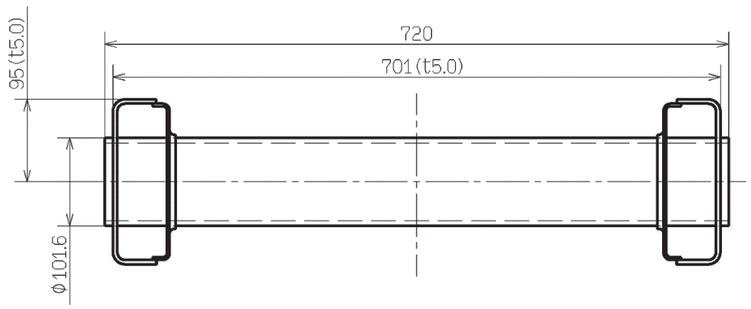
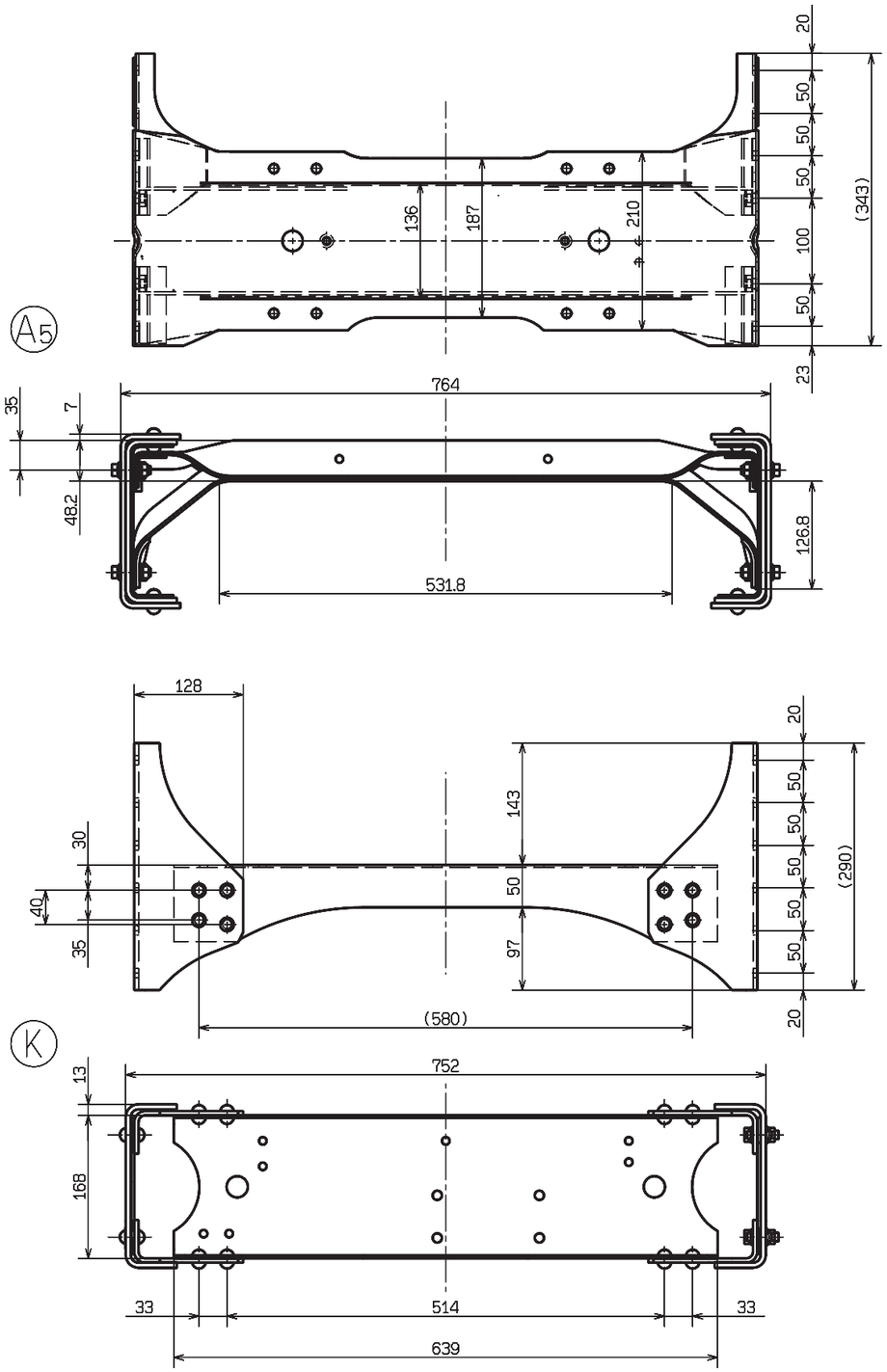


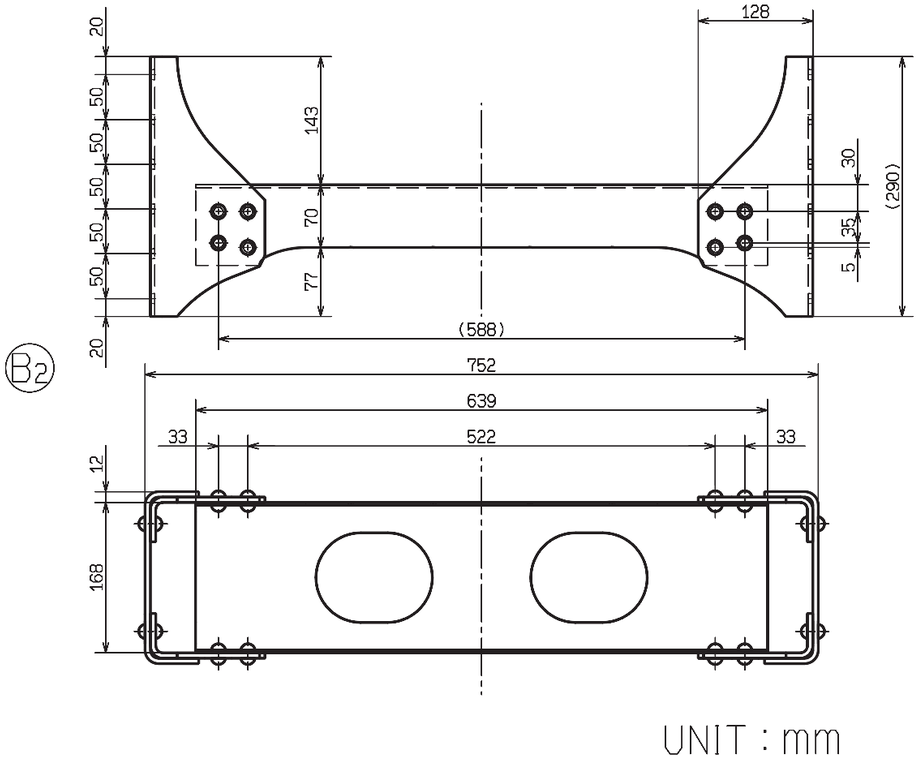
UNIT : mm

10.6 Frame structure



UNIT : mm

10.6 Frame structure

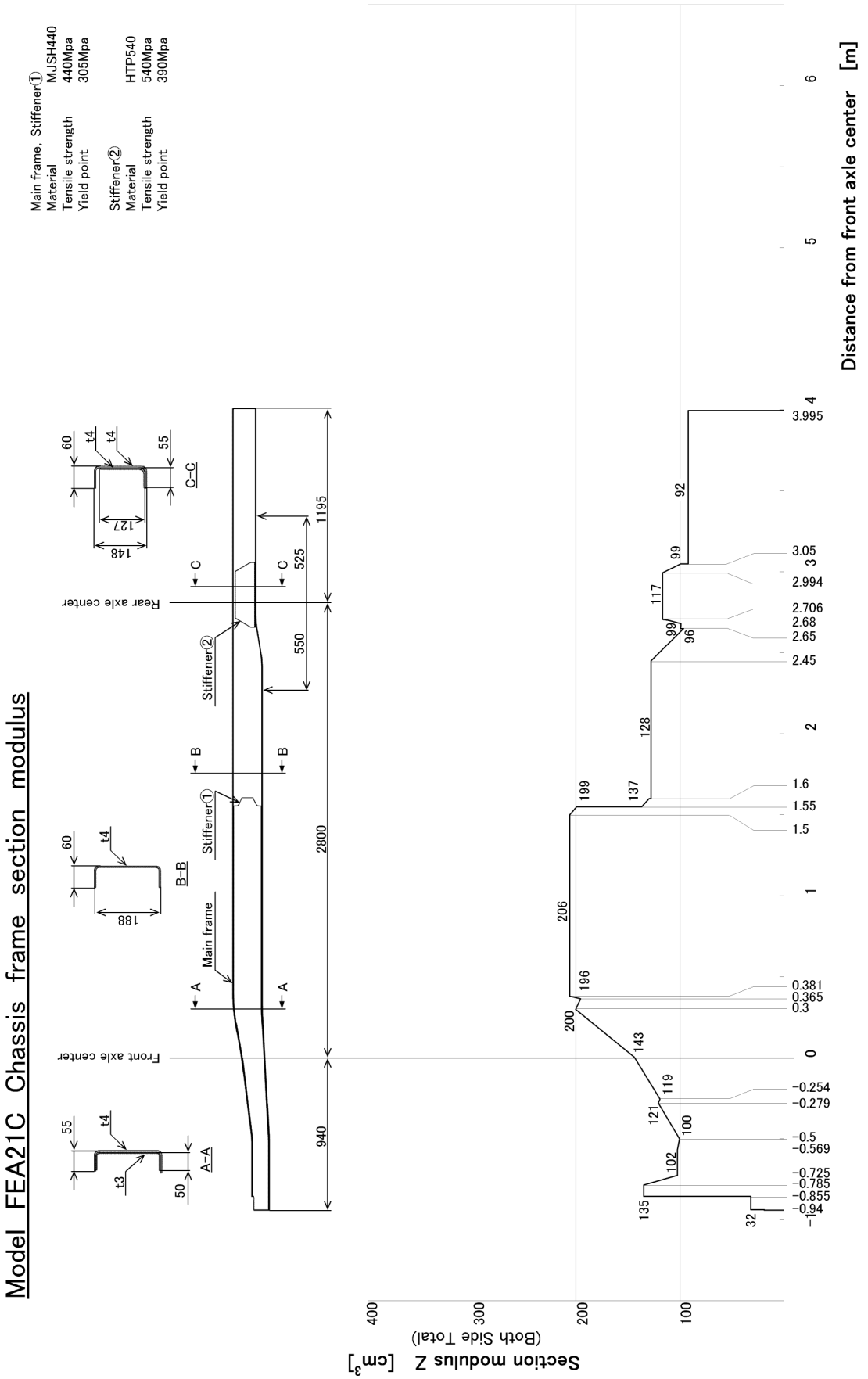


UNIT : mm

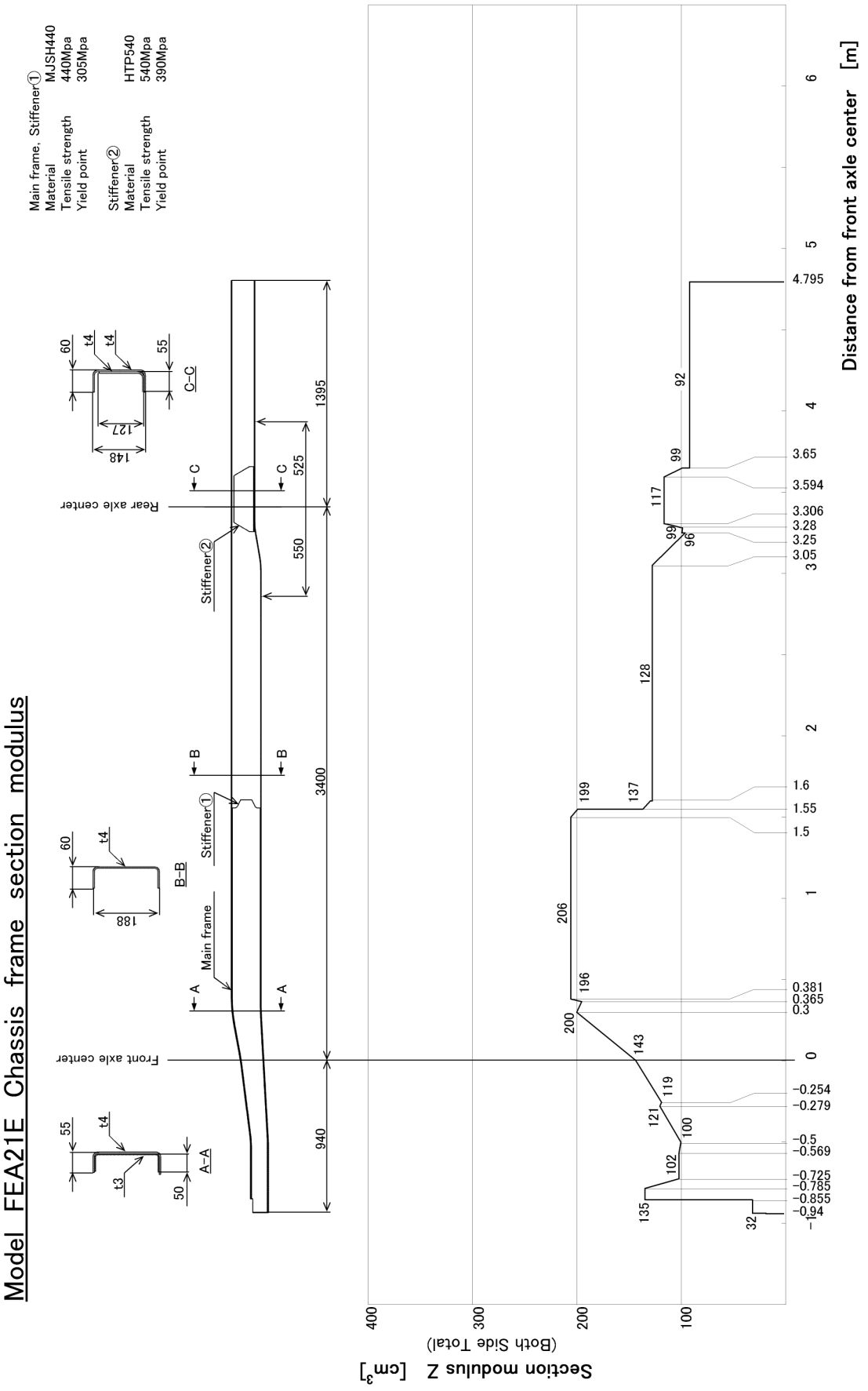
10.6.2 Frame section modulus

Model	Page
FEA21C	137
FEA21E	138
FEA61B	139
FEB21C	140
FEB21E	141
FEB51E	142
FEB71E	
FEB91E	
FEB51G	143
FEB71G	
FEB91G	
FEC71E	144
FEC81C	145
FECX1G	146
FEC71H	147
FECX1H	
FECX1K	148
FGB71E	149

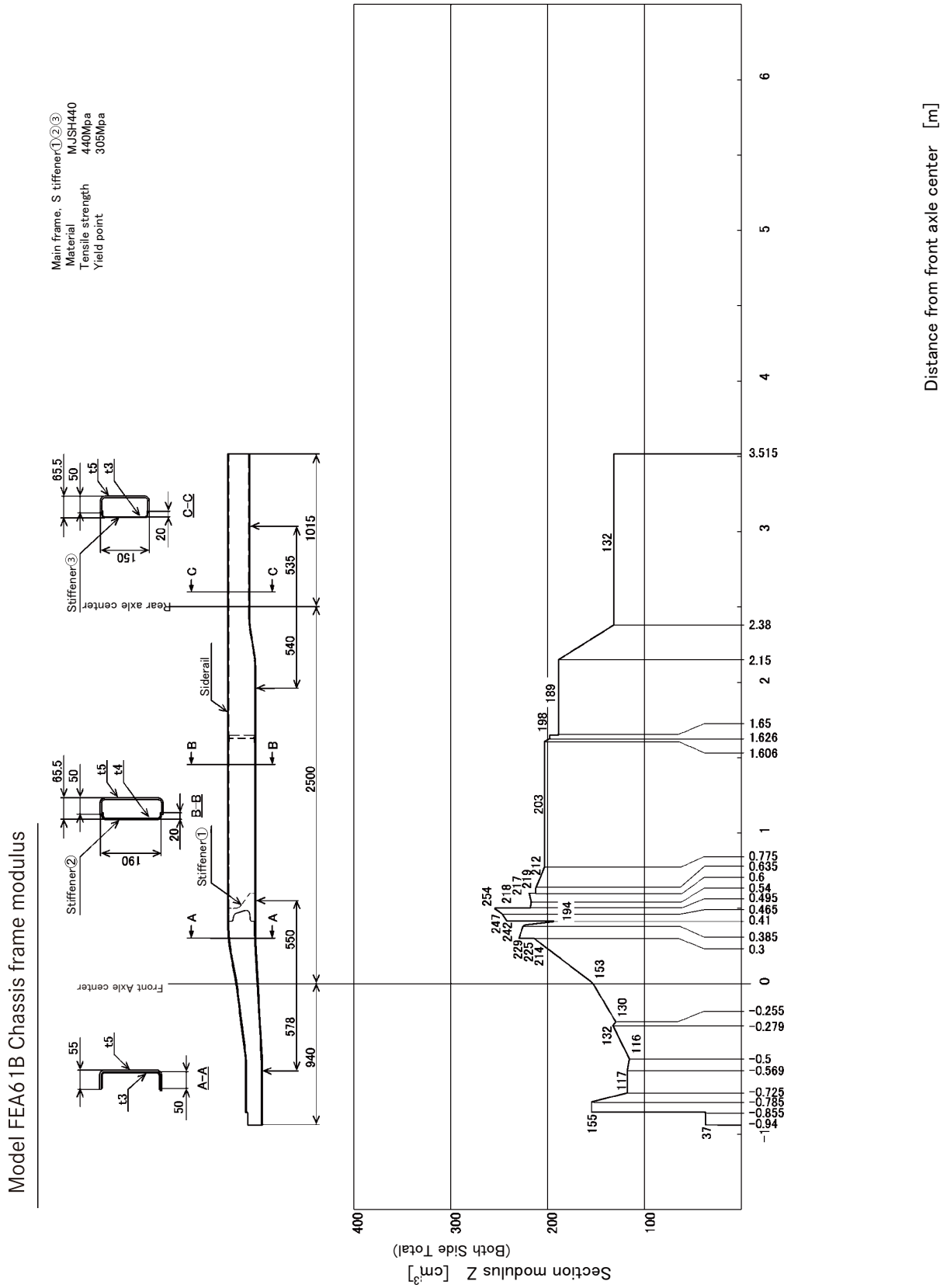
10.6 Frame structure



10.6 Frame structure



10.6 Frame structure



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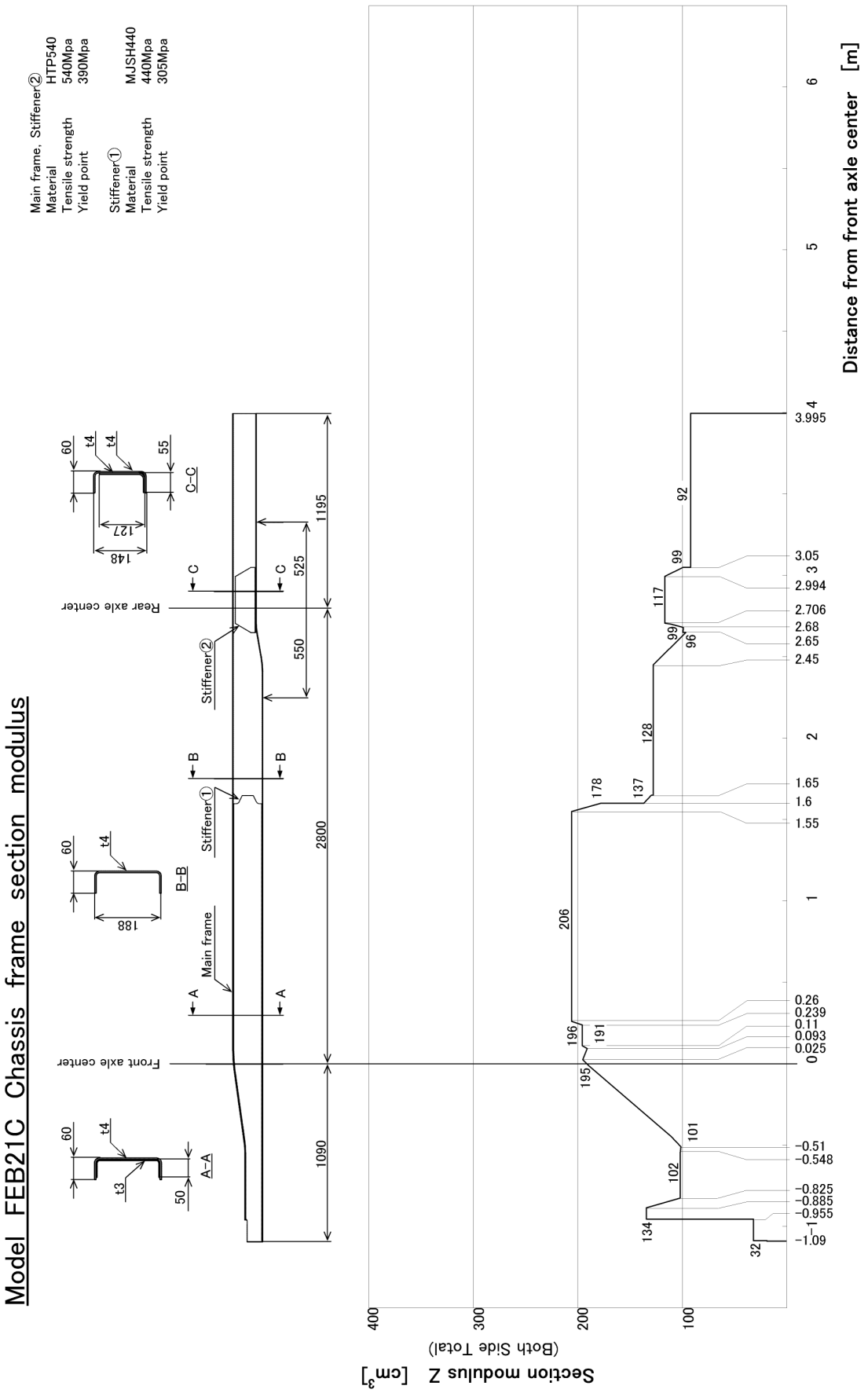
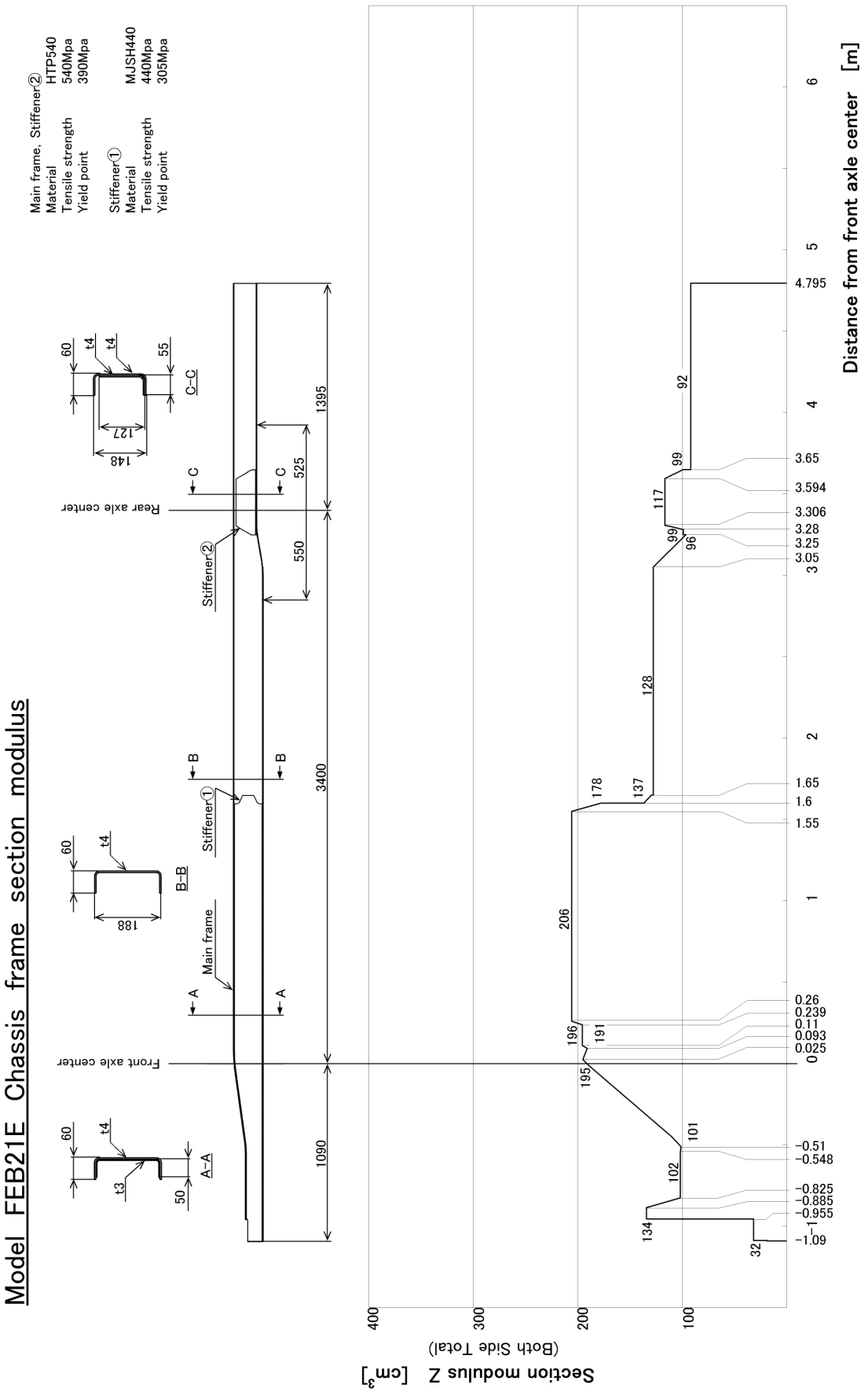


10.6 Frame structure



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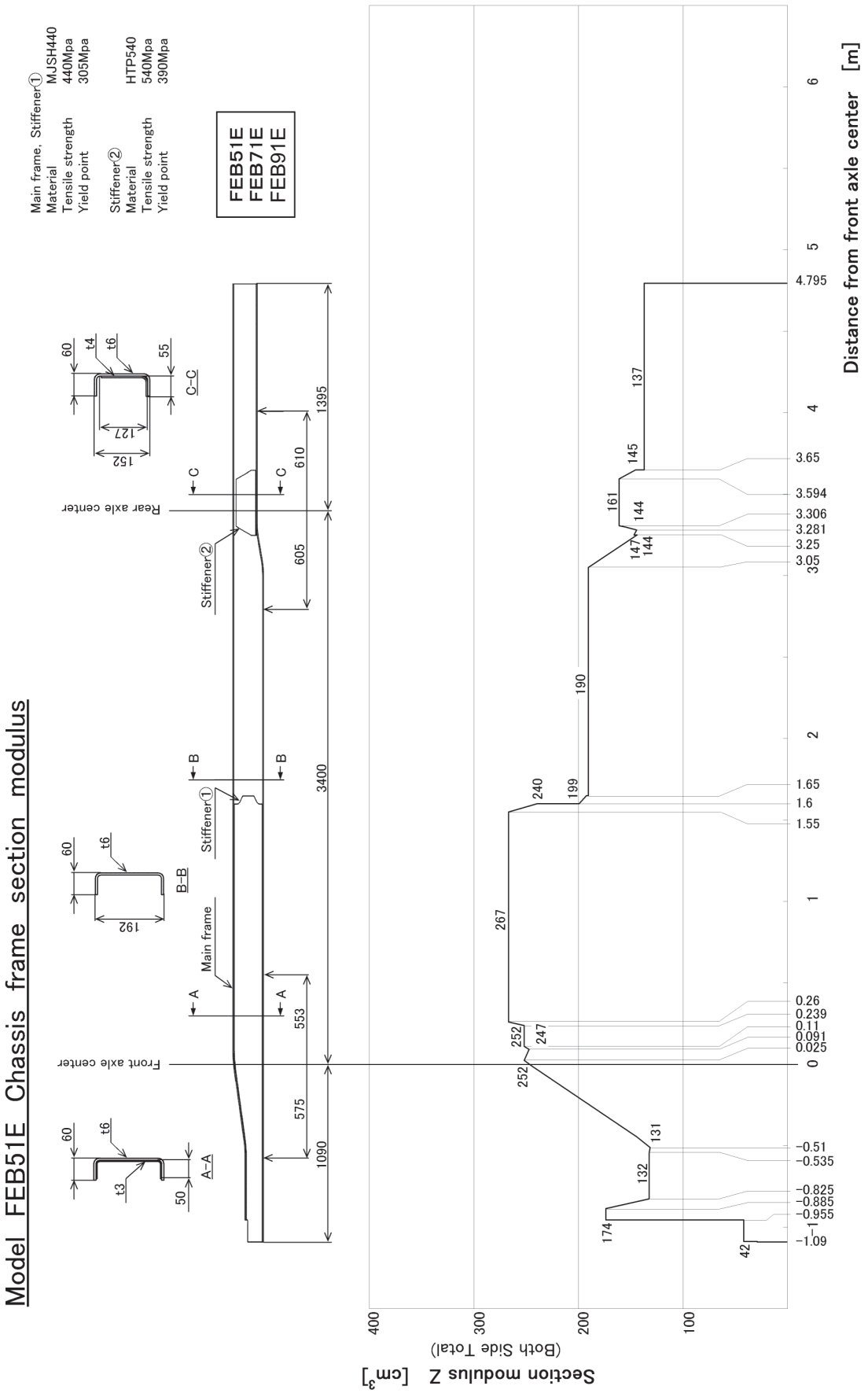

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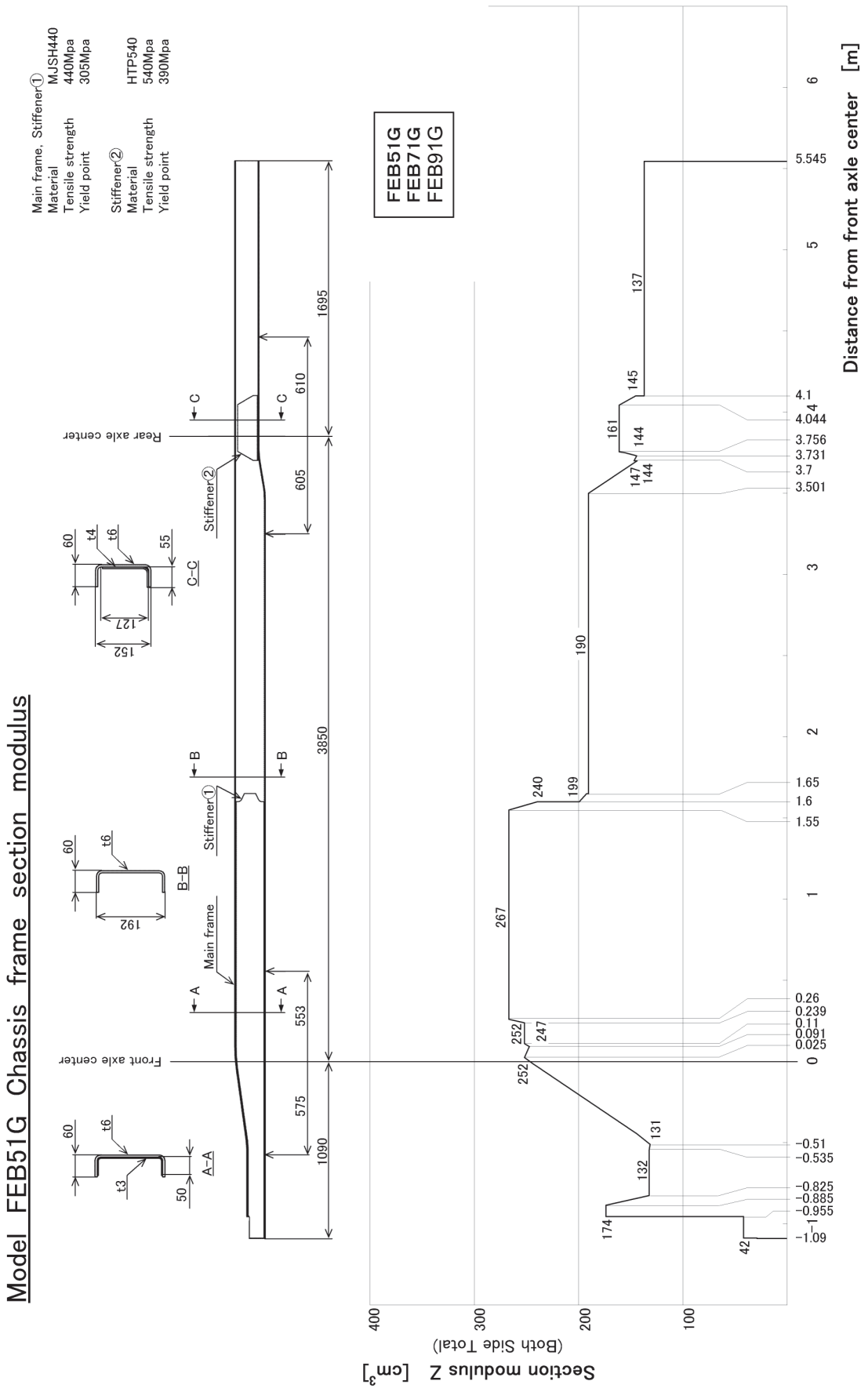
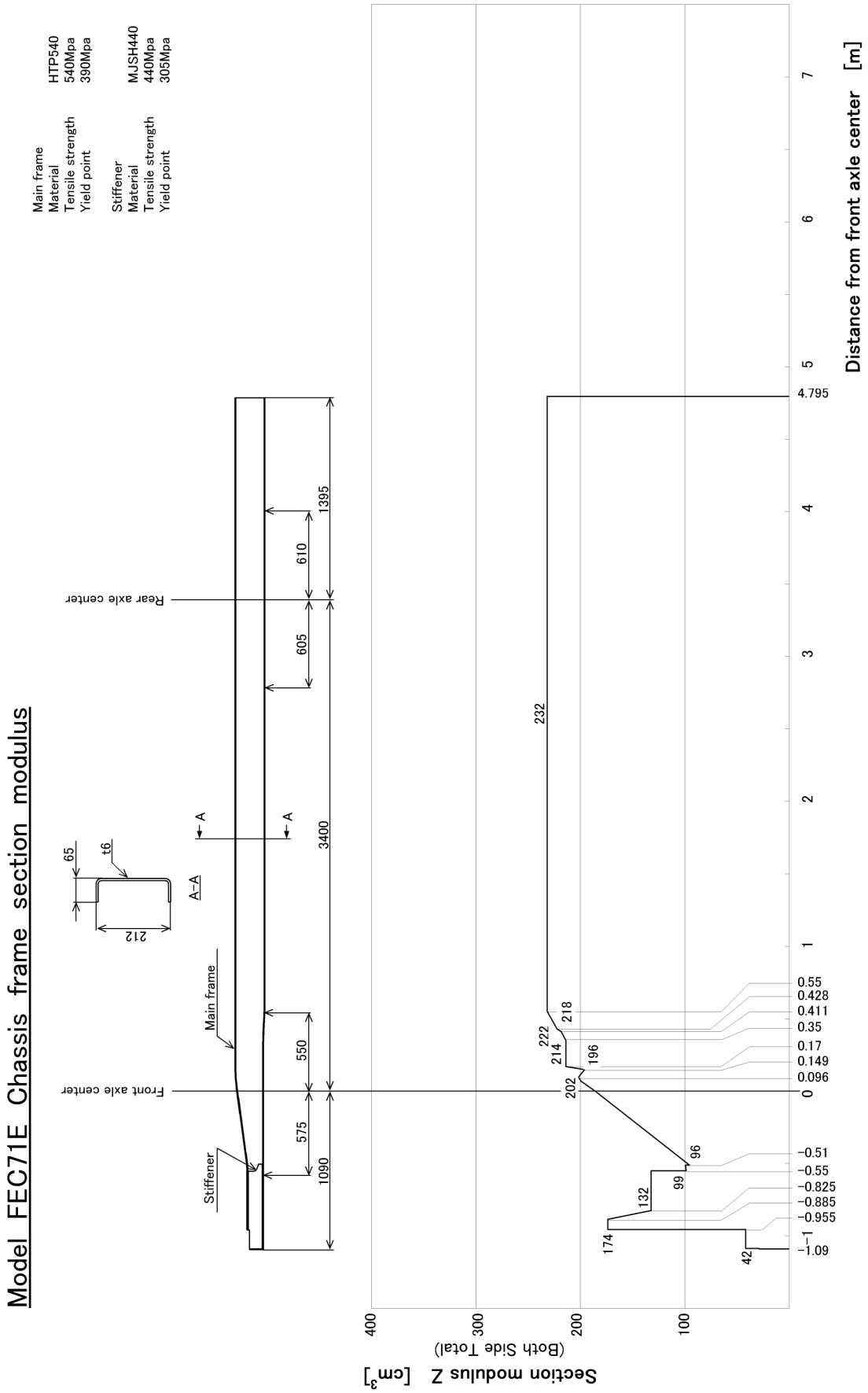
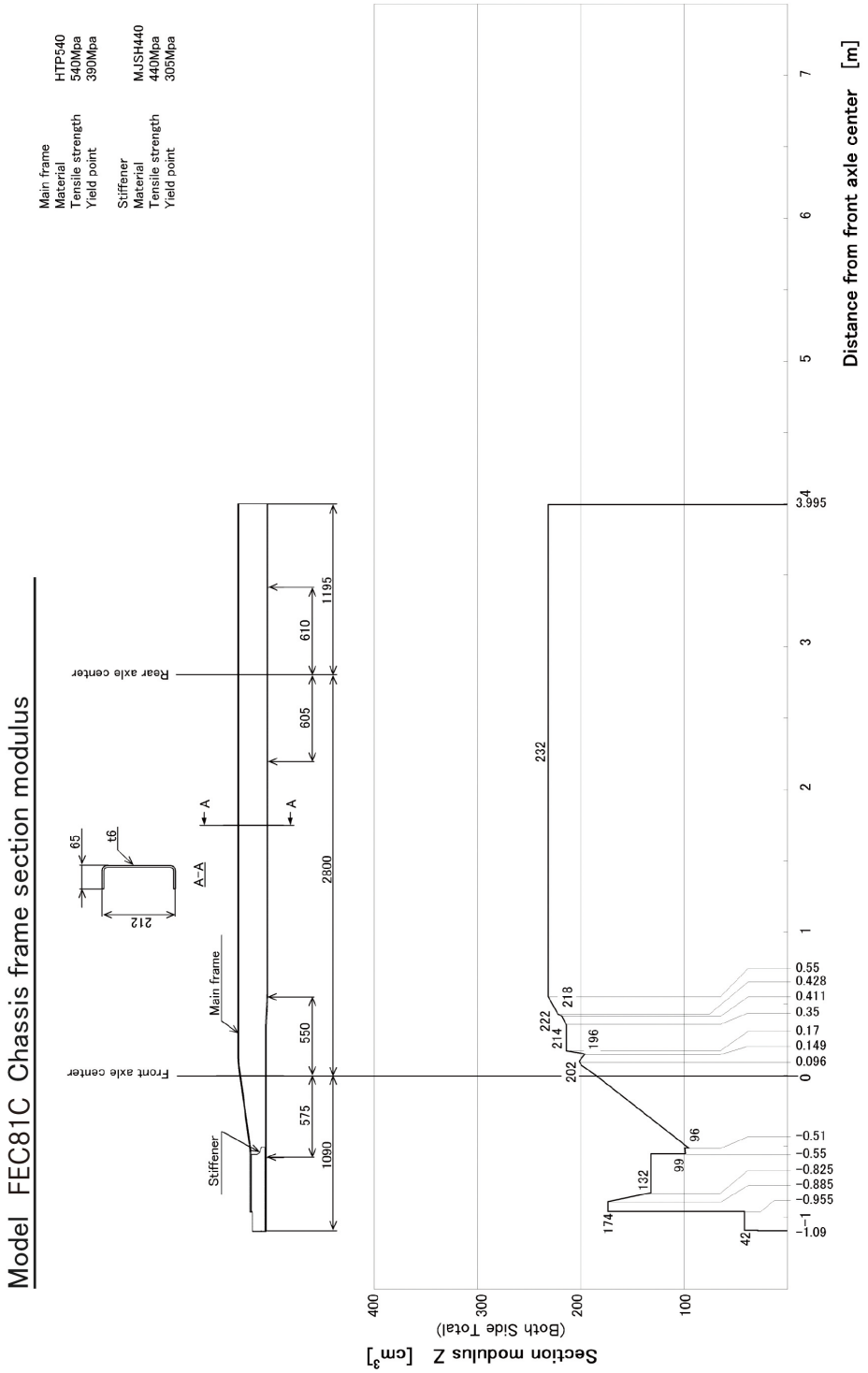
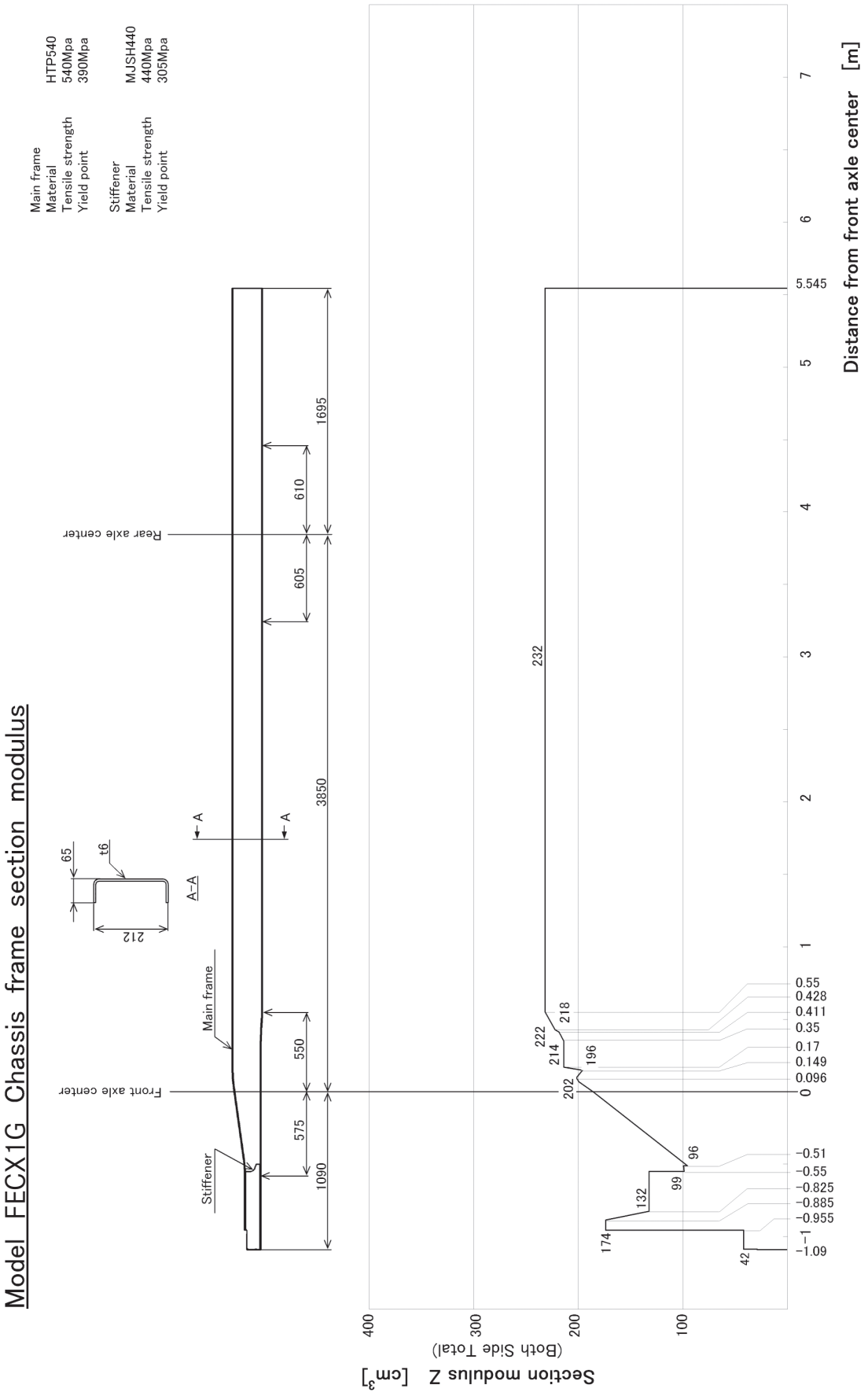


10.6 Frame structure

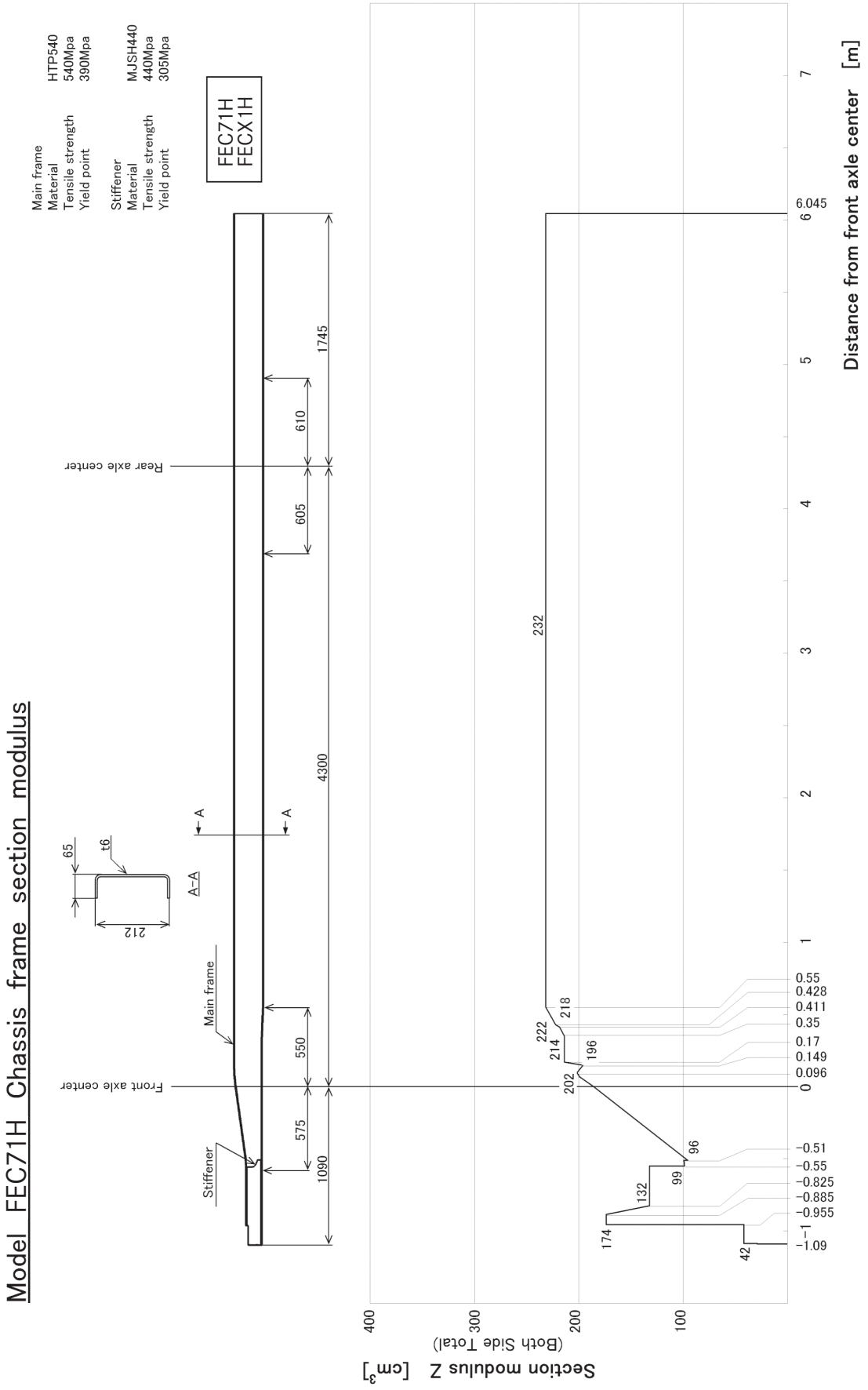



Model FEC81C Chassis frame section modulus
Main frame
Material HTP540
Tensile strength 540Mpa
Yield point 390Mpa
Stiffener
Material MJSH440
Tensile strength 440Mpa
Yield point 305Mpa
Rear axle center
Front axle center
Main frame
Stiffener
A
A
A–A
65
t6
212
1195
610
605
2800
550
575
1090
Section modulus Z [cm³]
(Both Side Total)
400
300
200
100
232
222
214
218
196
202
96
99
132
174
42
3.995
0.55
0.428
0.411
0.35
0.17
0.149
0.096
0
−0.51
−0.55
−0.825
−0.885
−0.955
−1
−1.09
Distance from front axle center [m]
1
2
3
4
5
6
7

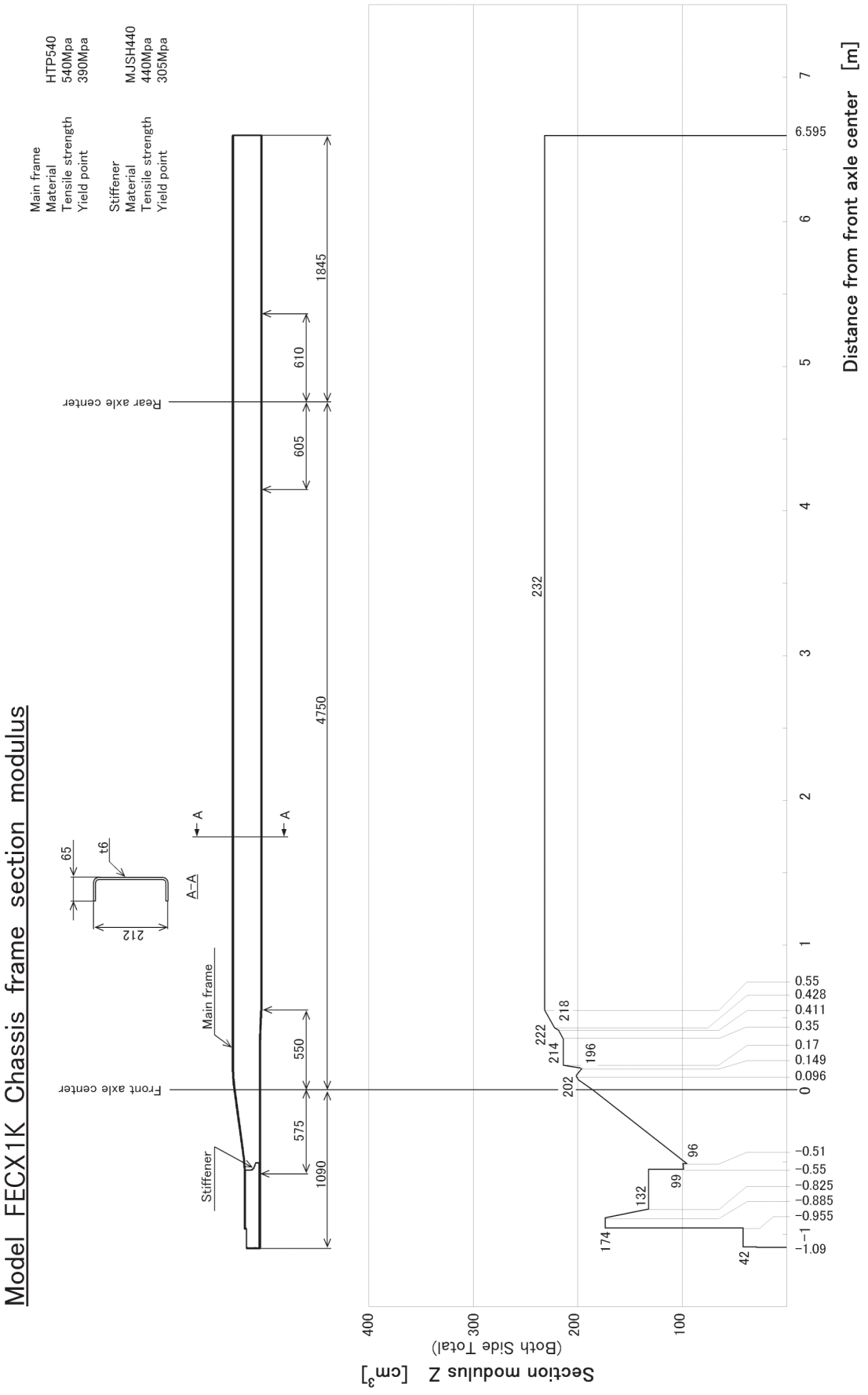
10.6 Frame structure



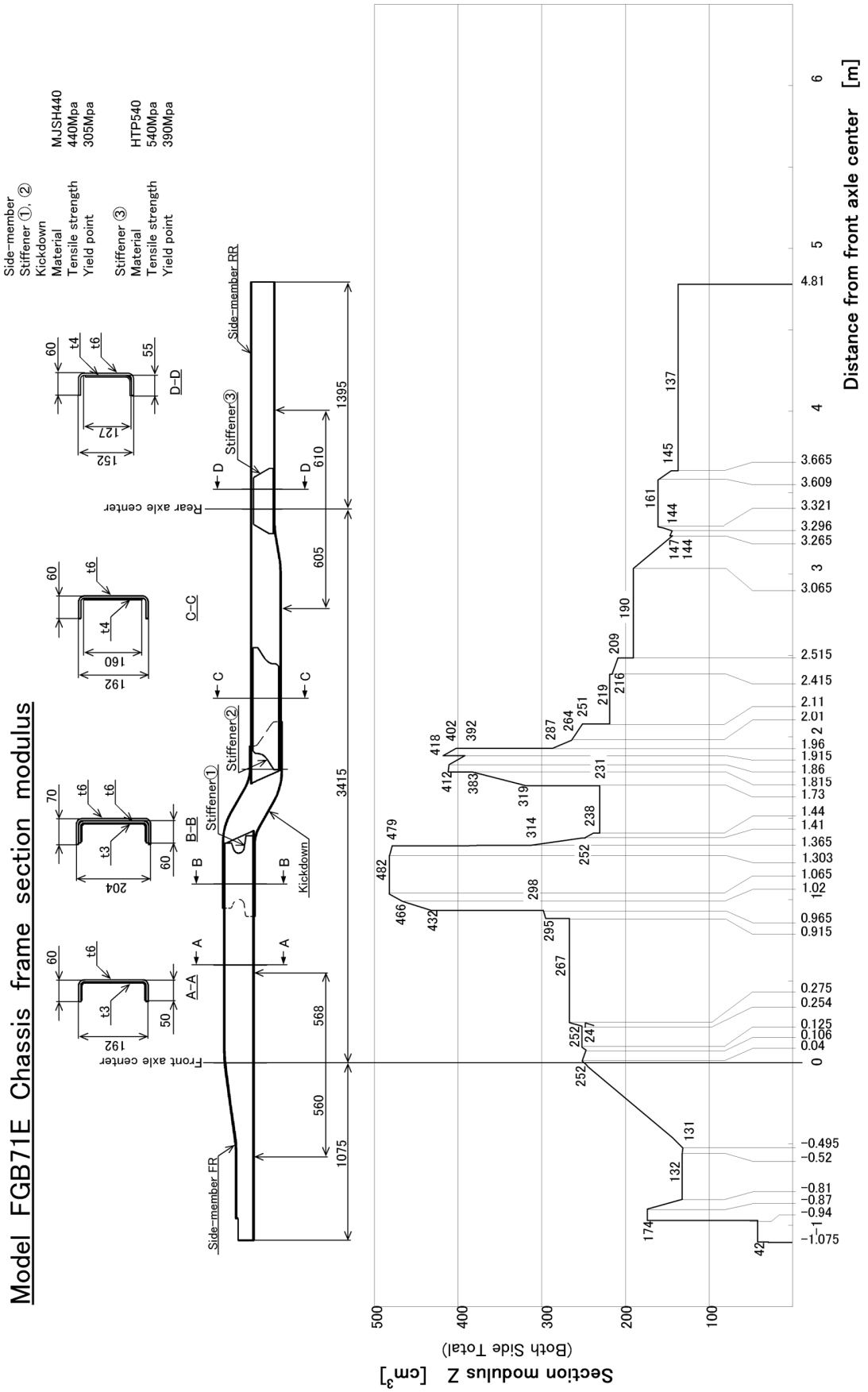
10.6 Frame structure



10.6 Frame structure



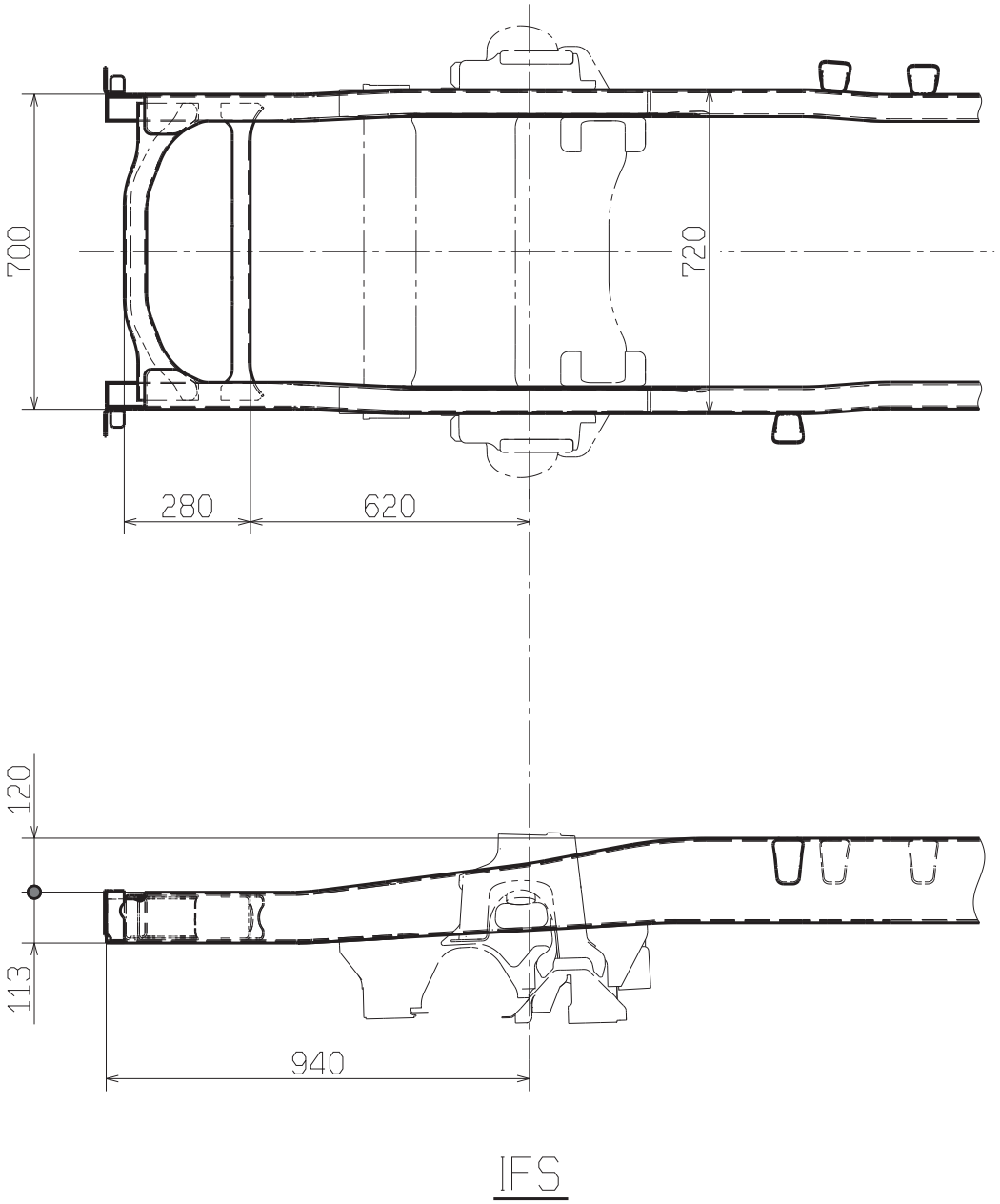
10.6 Frame structure



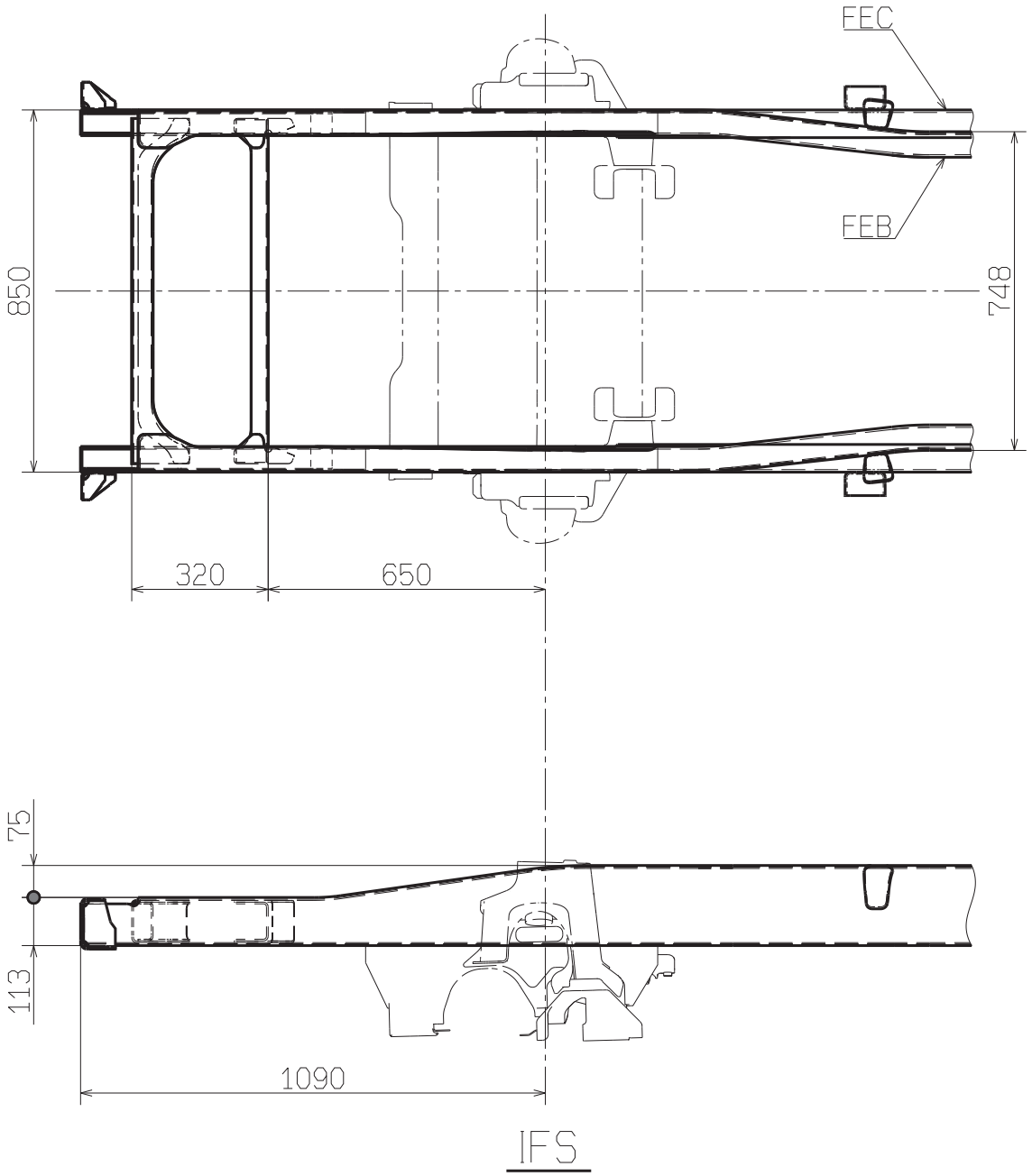
10.6.3 Frame front drawings

Front suspension type	Model	Frame width	Page
Independent	FEA2	700	151
	FEB2	750	152
Rigid	FEA6	700	153
	FEB5 FEB7 FEB9	750	154
	FEC7 FEC8 FECX	850	
	FGB7	750	

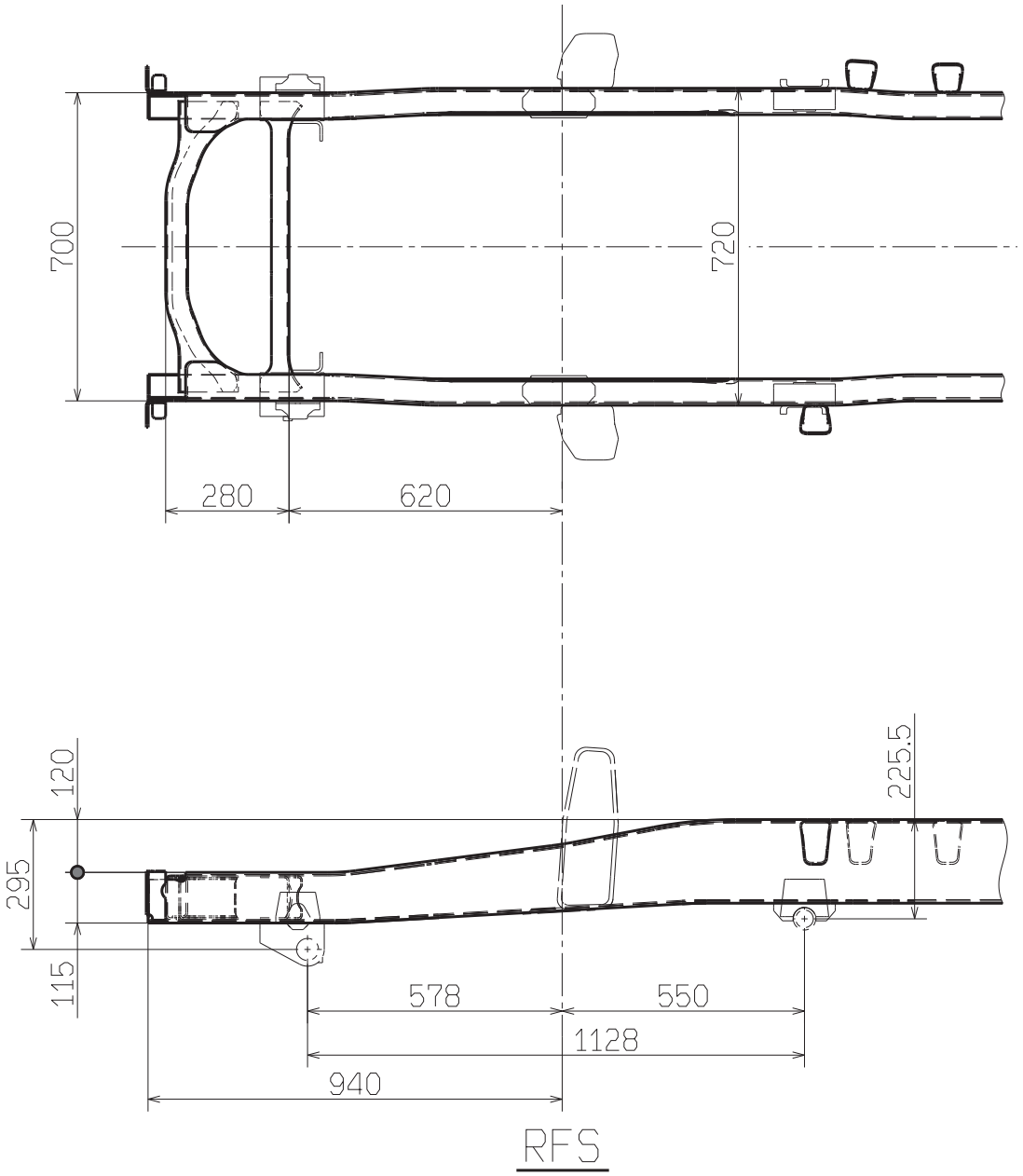
<FEA2>



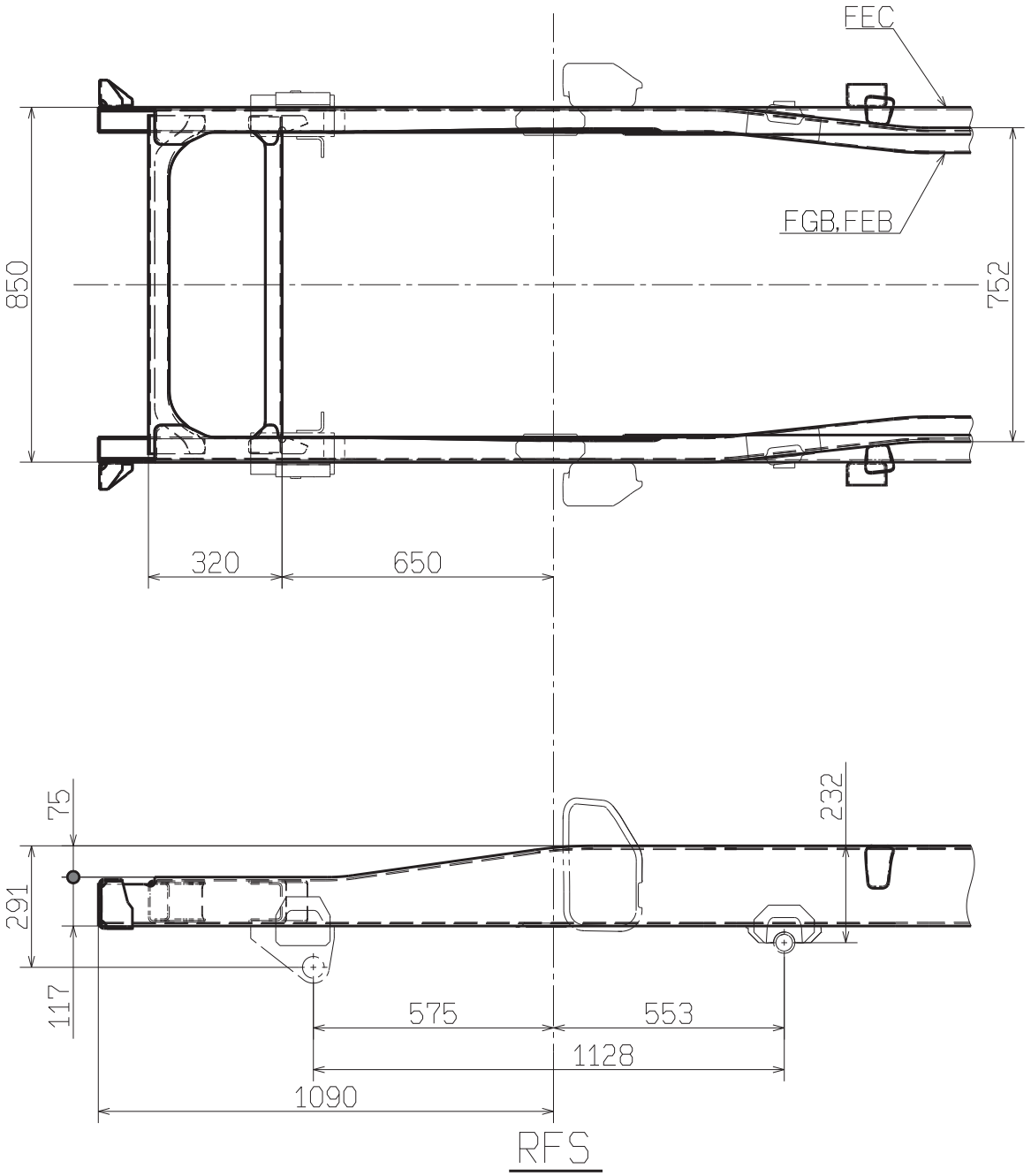
<FEB2>



<FEA6>



<FEB5, 7, 9>
<FEC7, 8, X>
<FGB7>



10.7 Spring characteristic

10.7.1 Distance from frame top surface to ground

MODEL	OBJECT ENGINE kW	CAB CHASSIS WEIGHT Kg			UNDER-SPRING WEIGHT Kg		DISTANCE FROM FRAME TOP SURGACE TO GROUND mm		CoG Height mm
		Front Wf	Rear Wr	Total W	Front	Rear	Front ±10 Hf	Rear ±25 Hr	
FEA61BR4SFBM	110	1613	895	2508	274	439	652	712	660
FEA61BR4SFBM (GVW OPT)		1407	694	2101	274	439	645	721	660
FEB21CR4SFBM		1473	580	2053	175	379	652	694	615
FEB21ER4SFBM		1475	604	2079	175	379	652	704	615
FEB51ER4SFBM		1556	704	2260	285	454	671	750	615
FEB51GR4SFBM		1560	721	2281	285	454	671	750	615
FEB71GR4SFBM		1602	850	2452	328	574	679	764	615
FEB71GR4WFBM		1751	921	2672	328	574	674	764	615
FEB91GR4WFBP	129	1764	926	2690	325	570	683	761	615
FEC71ER4SFBM	110	1580	848	2428	325	574	694	774	605
FEC71HR4SFBM		1607	894	2501	328	579	693	774	605
FEC81CR4SFBM		1578	812	2390	325	574	694	774	605
FECX1GR4SFBP	129	1590	893	2483	328	579	722	771	605
FECX1GR4WFBP		1769	931	2700	325	570	715	771	605
FECX1HR4SFBP		1615	905	2520	328	579	721	771	605
FECX1KR4SFBP		1623	916	2539	328	579	720	771	605
FEA21CR3SFBM	110	1369	580	1949	171	366	639	704	575
FEA21ER3SFBM		1393	586	1979	171	366	638	704	575
FEA21ER3SFBR		1629	917	2546	171	366	625	702	575
FEA21ER3WFBM		1508	667	2175	171	366	628	700	625
FEA61BR3SFBM		1428	694	2122	274	439	660	713	660
FEA61BR3SFBM (GVW OPT)		1428	694	2122	274	439	645	721	660
FEB21CR3SFBM		1483	582	2065	175	379	651	704	615
FEB21ER3SFBM		1485	605	2090	175	379	651	704	615
FEB51ER3SFBM		1565	713	2278	285	461	670	750	615
FEB51GR3SFBM		1564	735	2299	285	461	670	750	615
FEB71ER3WFBM		1751	920	2671	328	574	674	764	615
FEB71GR3SFBM		1611	852	2463	328	574	679	764	615
FEB71GR3WFBM		1767	916	2683	325	570	673	764	615
FEB91ER3WFBP	129	1754	934	2688	325	570	683	761	615
FEB91GR3WFBP		1774	929	2703	325	570	683	761	615
FEC71ER3SFBM	110	1591	851	2442	325	575	693	774	605
FEC71HR3SFBM		1393	586	1979	328	579	700	815	605
FEC81CR3SFBM		1598	810	2408	325	574	693	774	605

Method of calculating Hf, Hr
hf : Distance from frame top to front wheel center (See Chapter 10.7.3.)
hr : Distance from frame top to rear wheel center (See Chapter 10.7.4.)
Rf, Rr : Tire radius (See Chapter 10.7.5.)

10.7 Spring characteristic

MODEL	OBJECT ENGINE kW	CAB CHASSIS WEIGHT Kg			UNDER-SPRING WEIGHT Kg		DISTANCE FROM FRAME TOP SURGACE TO GROUND mm		CoG Height mm
		Front Wf	Rear Wr	Total W	Front	Rear	Front ±10 Hf	Rear ±25 Hr	
FECX1GR3SFBP	129	1596	810	2406	328	579	721	771	605
FECX1GR3WFBP		1597	894	2491	325	570	721	771	605
FECX1HR3SFBP		1775	929	2704	328	579	715	771	605
FECX1KR3SFBP		1621	906	2527	328	579	720	771	605
FGB71ER6SFBM	110	1764	900	2664	417	575	973	841	740
FGB71ER6WFBM		1976	915	2891	417	575	966	841	815

Method of calculating Hf, Hr
hf : Distance from frame top to front wheel center (See Chapter 10.7.3.)
hr : Distance from frame top to rear wheel center (See Chapter 10.7.4.)
Rf, Rr : Tire radius (See Chapter 10.7.5.)

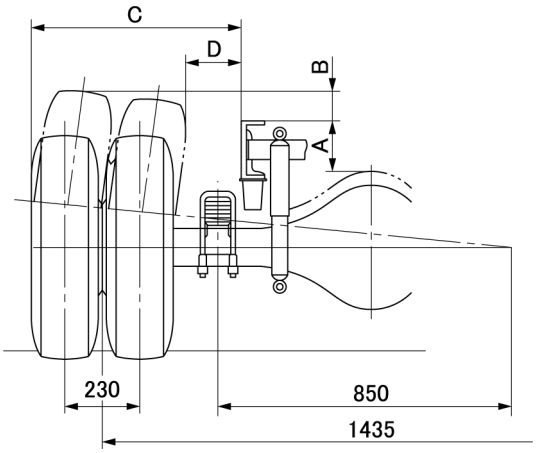
10.7.2 Differential and tire bound height

Model	Tire size	A mm	B mm	C mm	D mm
FEA61BR4SFBM	205/85R16	91	165	488	21
FEA61BR4SFBM (GVW OPT)		91	165	488	19
FEB21CR4SFBM	185/85R16	75	161	583	137
FEB21ER4SFBM		85	150	583	138
FEB51ER4SFBM	205/85R16	109	149	593	127
FEB51GR4SFBM		109	148	593	128
FEB71GR4SFBM	215/75R17.5	104	165	642	138
FEB71GR4WFBM		104	164	642	139
FEB91GR4WFBP		104	160	642	141
FEC71ER4SFBM		124	135	647	149
FEC71HR4SFBM		124	134	647	149
FEC81CR4SFBM		124	136	647	148
FECX1GR4SFBP		124	134	647	149
FECX1GR4WFBP		124	134	647	149
FECX1HR4SFBP		124	134	647	149
FECX1KR4SFBP		124	134	647	149
FEA21CR3SFBM	185/85R16	85	153	578	131
FEA21ER3SFBM		85	153	578	131
FEA21ER3SFBR		117	123	578	130
FEA21ER3WFBM	195/85R15	85	149	585	127
FEA61BR3SFBM	205/85R16	91	165	488	21
FEA61BR3SFBM (GVW OPT)		91	168	488	19
FEB21CR3SFBM	185/85R16	85	151	583	137
FEB21ER3SFBM		85	150	583	138
FEB51ER3SFBM	205/85R16	109	149	593	127
FEB51GR3SFBM		109	148	593	127

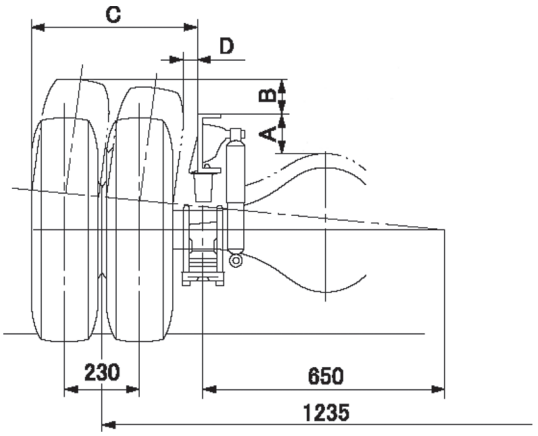
10.7 Spring characteristic

Model	Tire size	A mm	B mm	C mm	D mm
FEB71ER3WFBM	215/75R17.5	104	164	642	139
FEB71GR3SFBM		104	165	642	138
FEB71GR3WFBM		104	164	642	139
FEB91ER3WFBP		104	164	642	139
FEB91GR3WFBP		104	164	642	139
FEC71ER3SFBM		124	135	647	149
FEC71HR3SFBM		124	134	647	149
FEC81CR3SFBM		124	130	647	152
FECX1GR3SFBP		92	164	647	150
FECX1GR3WFBP		124	134	647	149
FECX1HR3SFBP		124	134	647	149
FECX1KR3SFBP		124	134	647	149
FGB71ER6SFBM	215/75R17.5	181	87	642	139
FGB71ER6WFBM		181	87	642	139

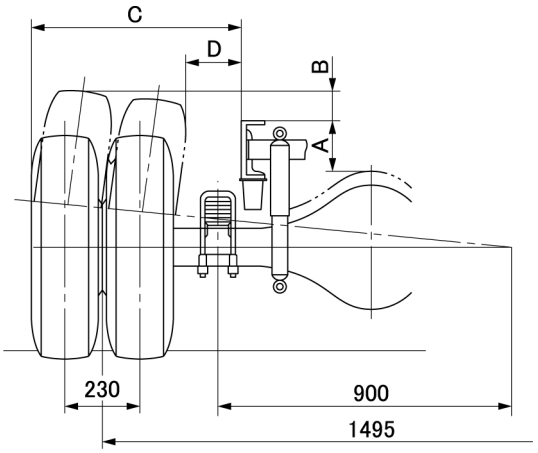
10.7 Spring characteristic



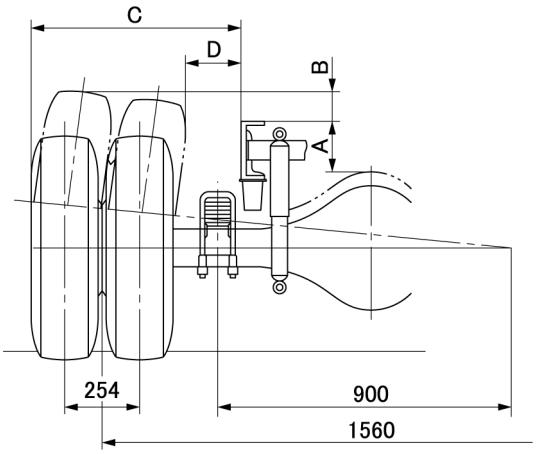
FEA2



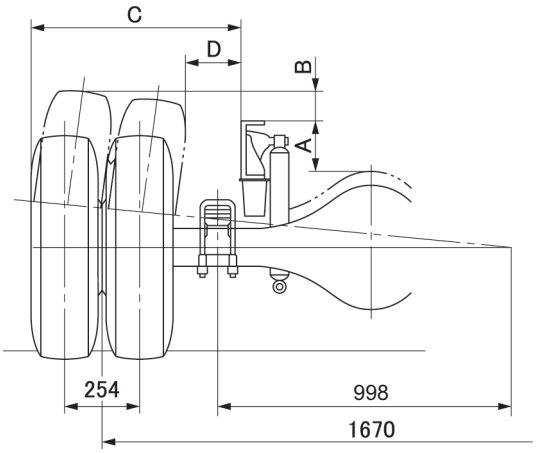
FEA6



FEB2
FEB5



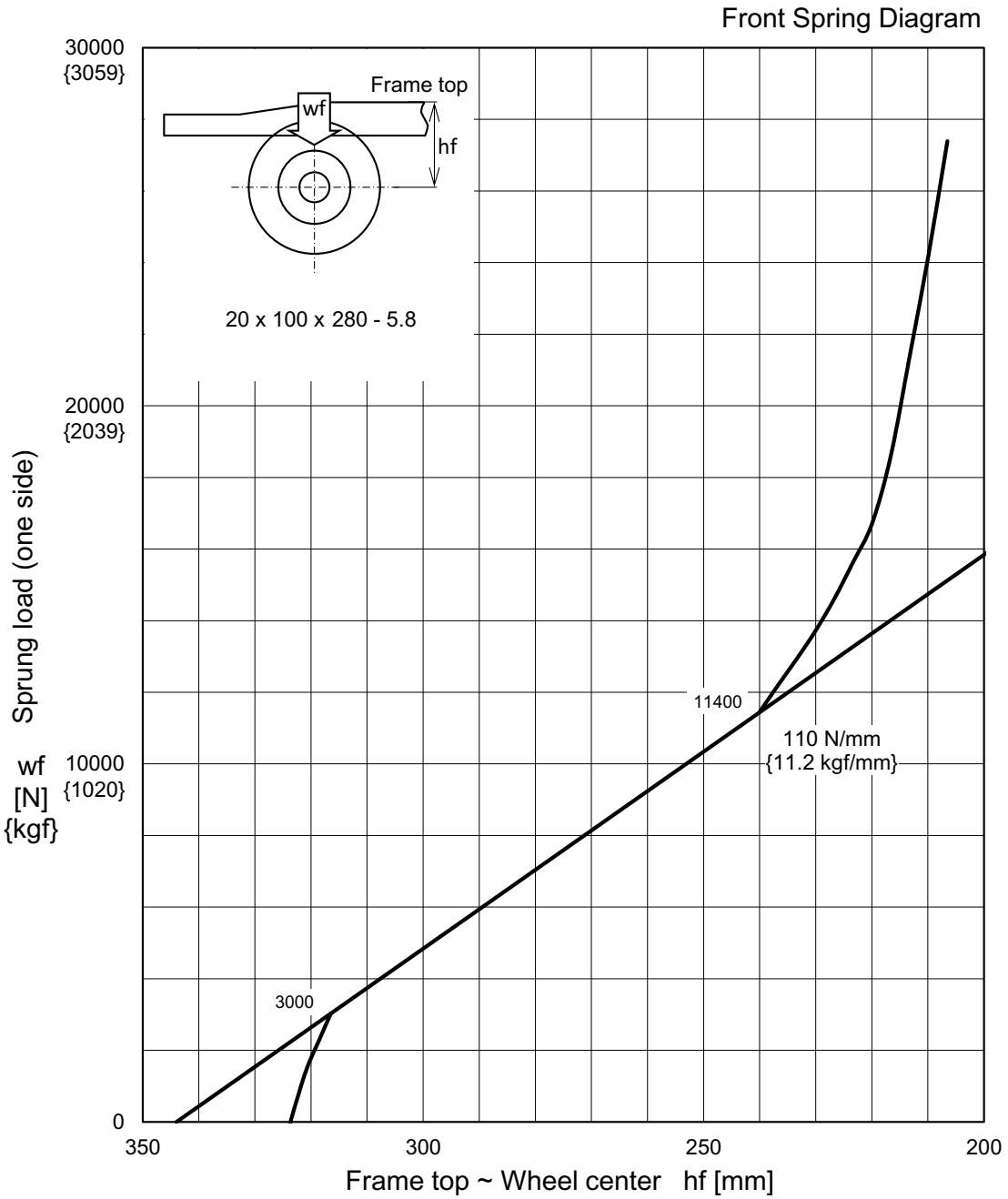
FEB7
FEB9
FGB7



FEC7
FEC8
FECX

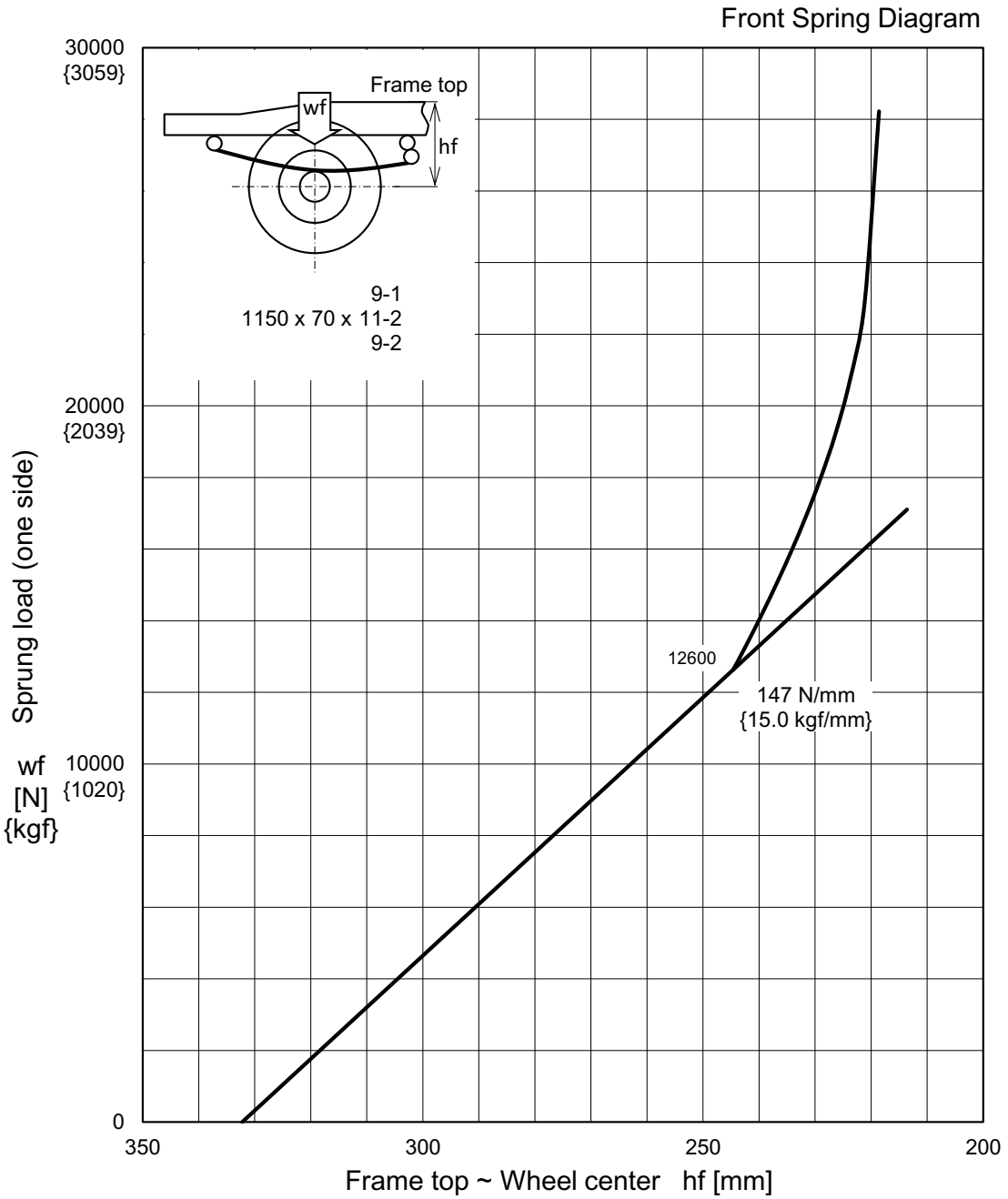
10.7.3 Front spring diagram

MODEL: FEA2



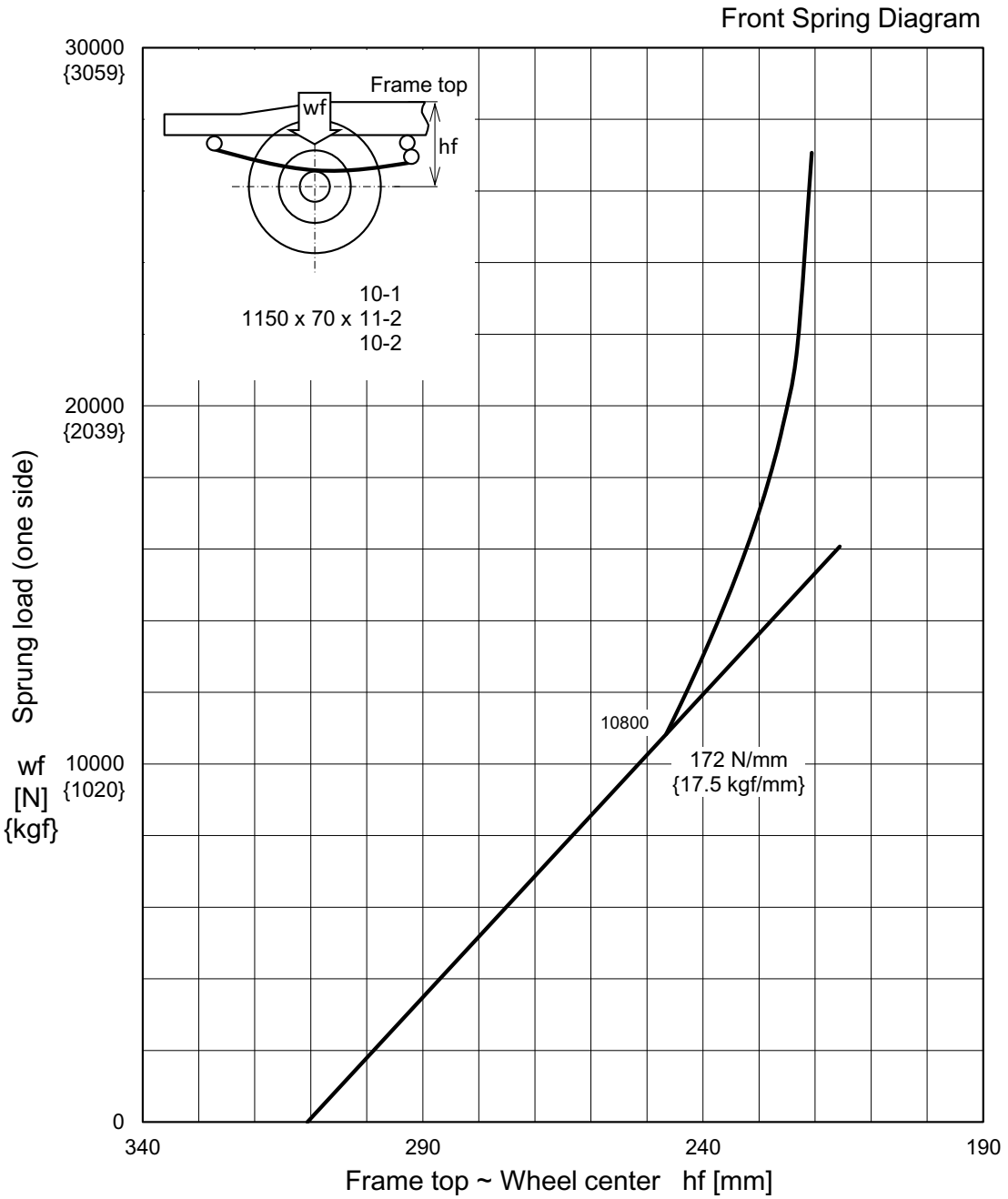
10.7 Spring characteristic

MODEL: FEA6

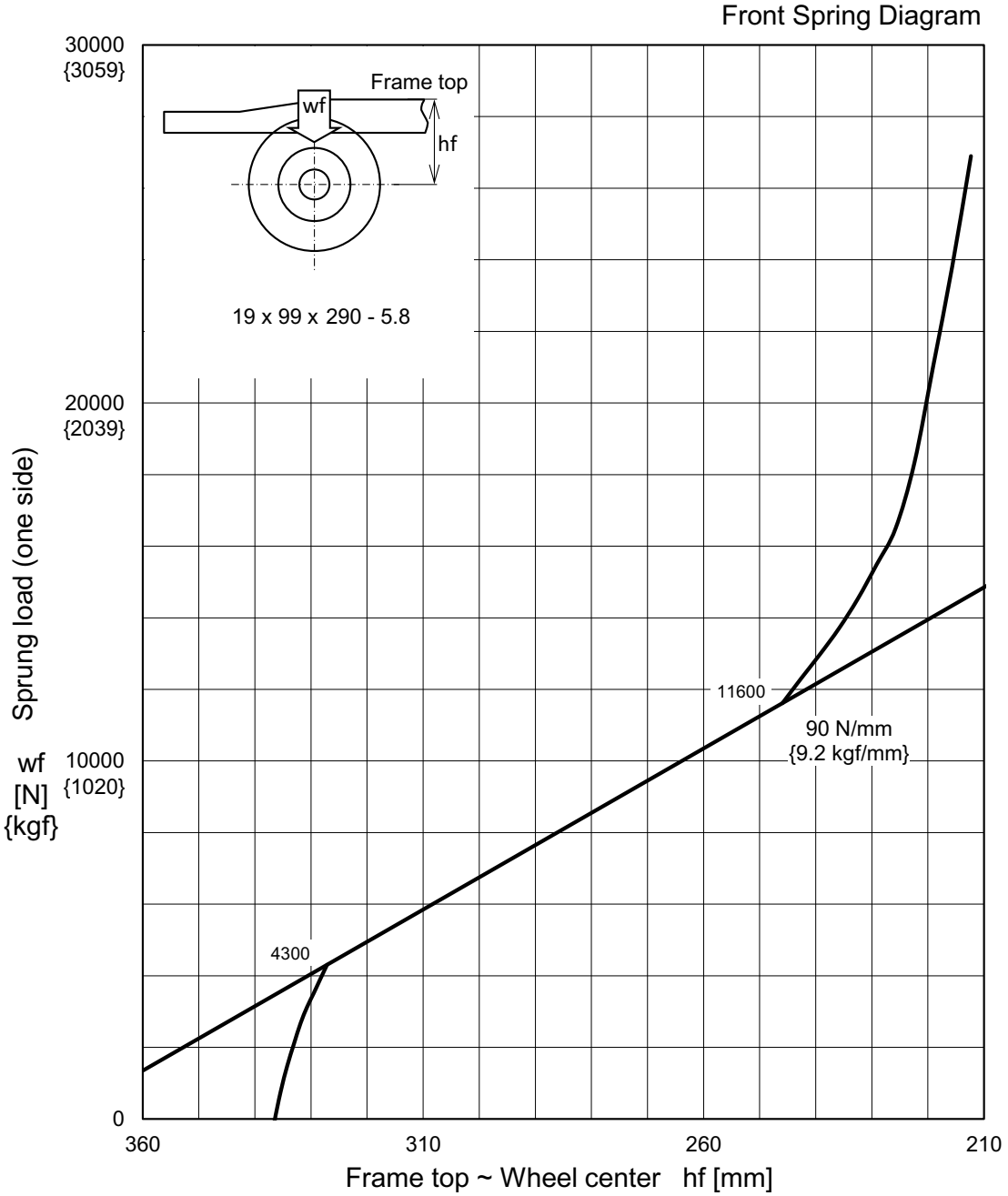


10.7 Spring characteristic

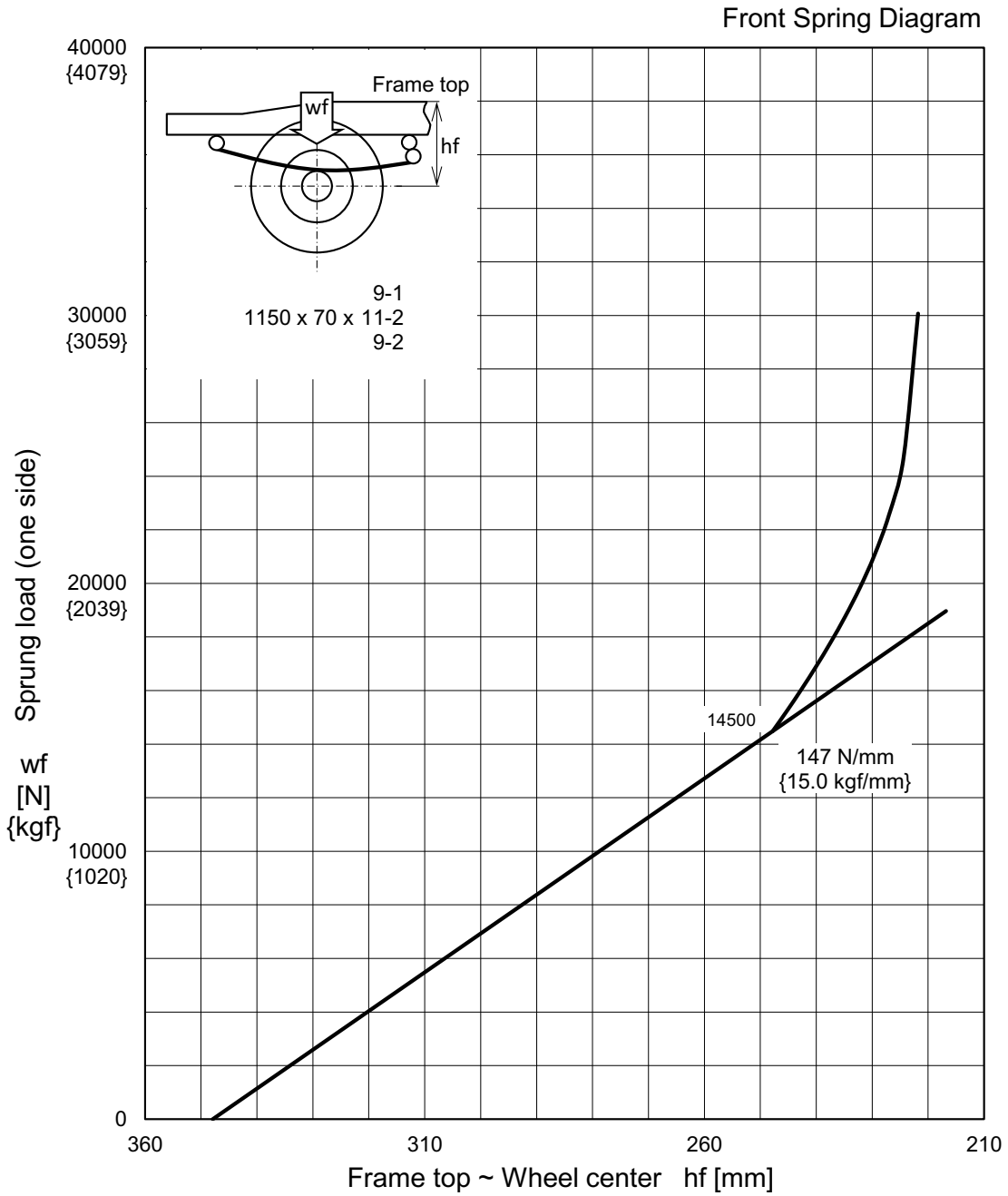
MODEL: FEA6 (GVW OPT)



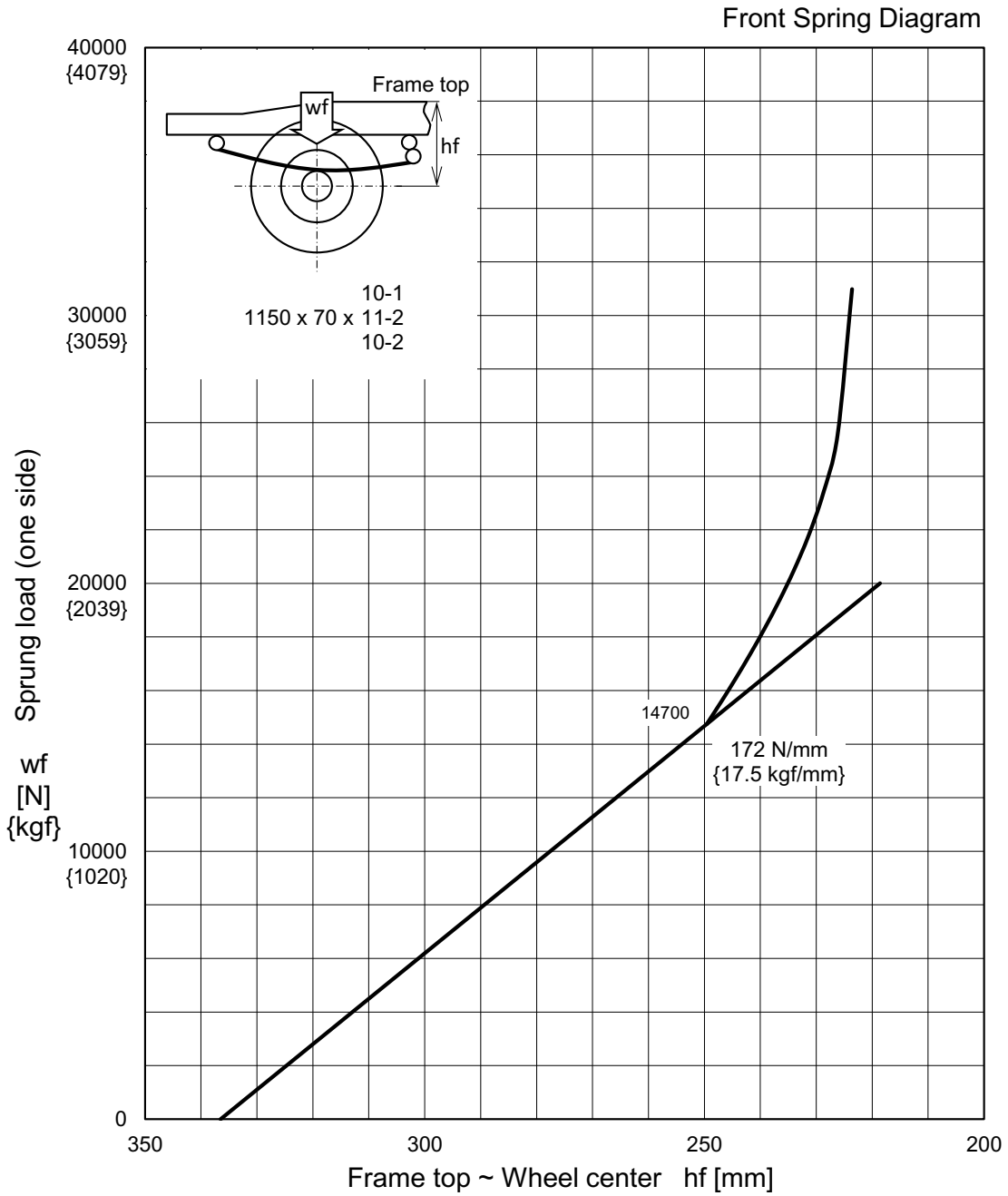
MODEL: FEB2


Front Spring Diagram
30000
{3059}
20000
{2039}
10000
{1020}
0
Sprung load (one side)
wf
[N]
{kgf}
Frame top
wf
hf
19 x 99 x 290 - 5.8
11600
90 N/mm
{9.2 kgf/mm}
4300
360
310
260
210
Frame top ~ Wheel center hf [mm]

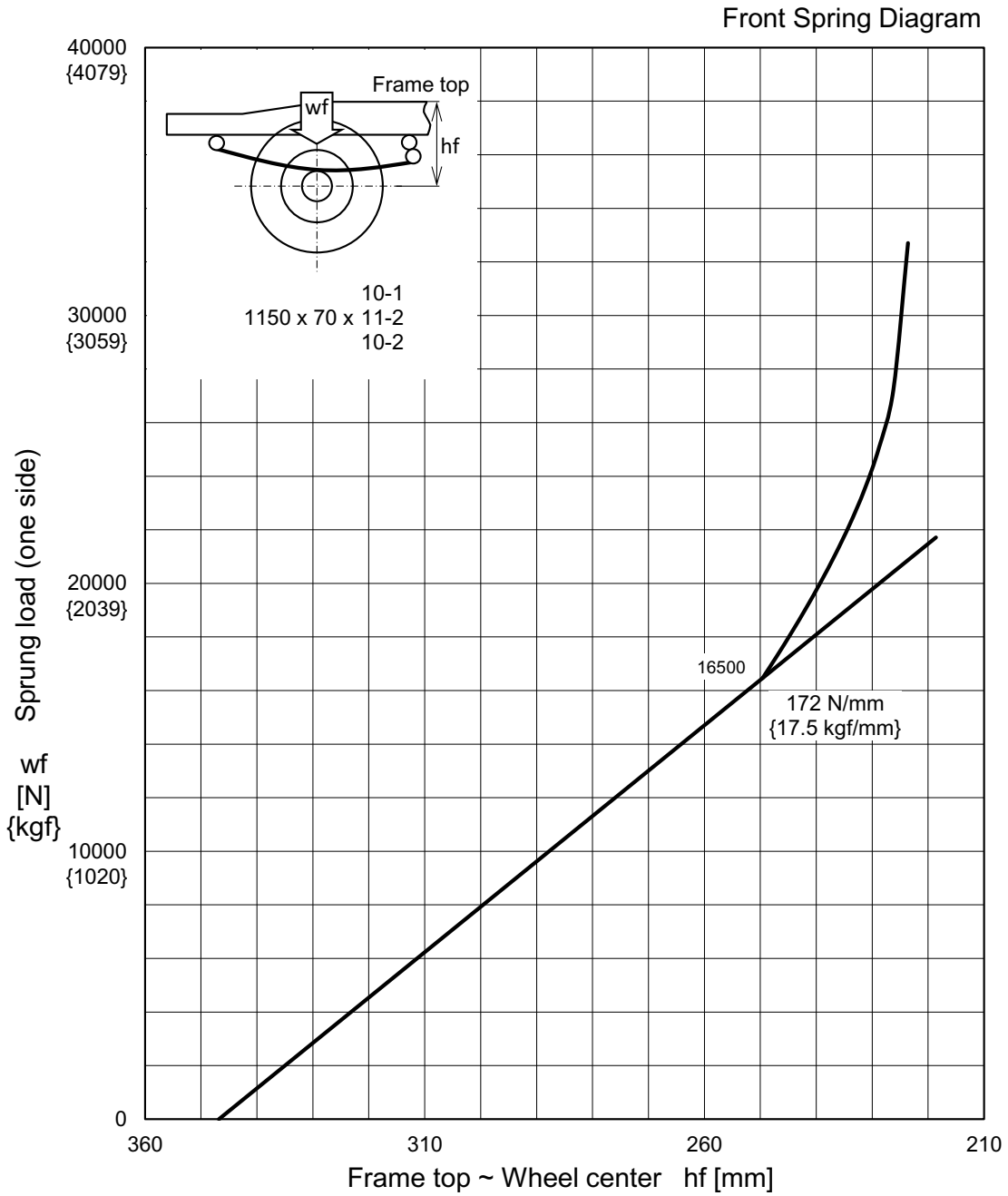
MODEL: FEB5


Front Spring Diagram
40000
{4079}
30000
{3059}
20000
{2039}
10000
{1020}
0
Sprung load (one side)
wf
[N]
{kgf}
Frame top
wf
hf
9-1
1150 x 70 x 11-2
9-2
14500
147 N/mm
{15.0 kgf/mm}
360
310
260
210
Frame top ~ Wheel center hf [mm]

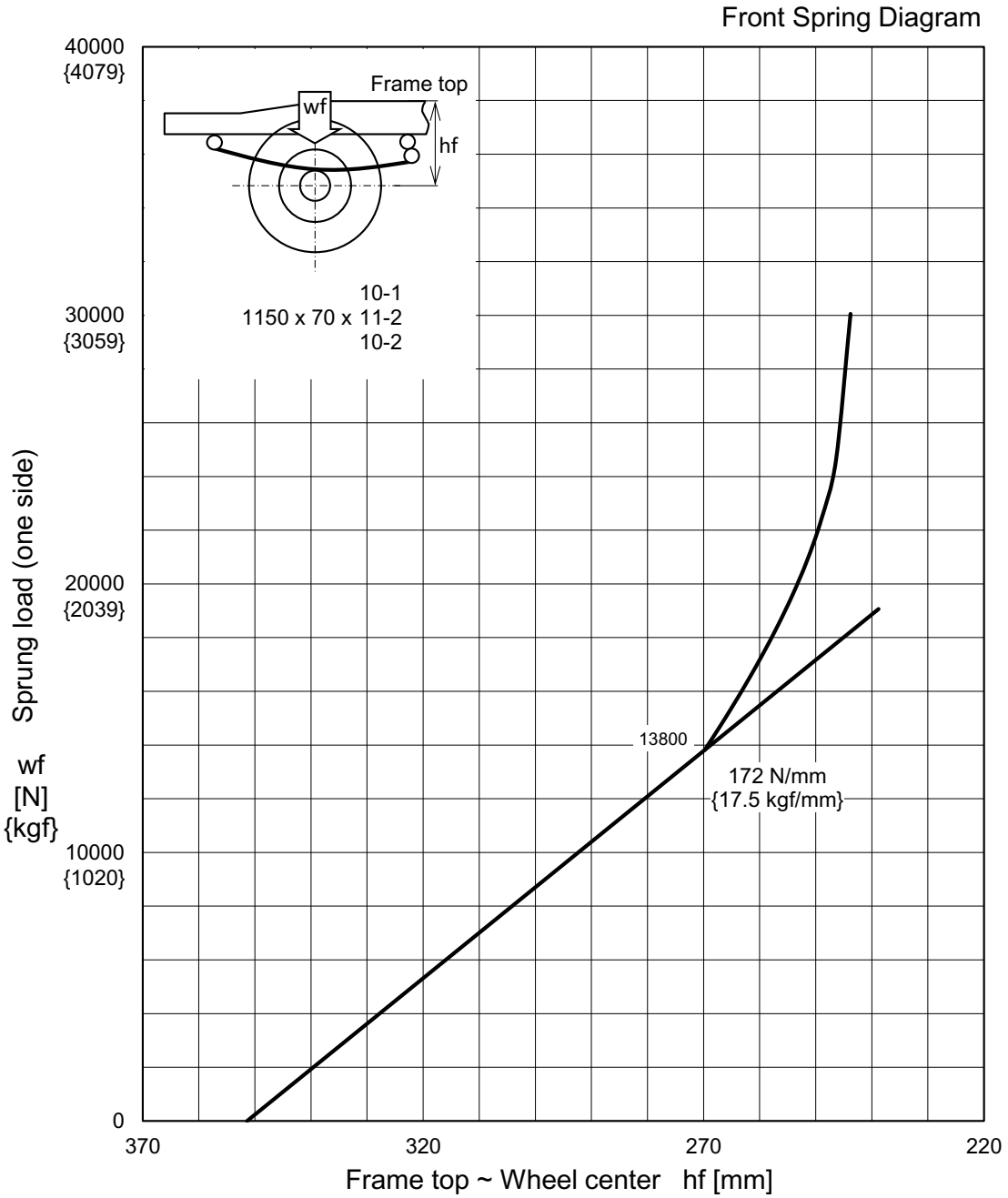
MODEL: FEB7


Front Spring Diagram
40000
{4079}
30000
{3059}
20000
{2039}
10000
{1020}
0
Sprung load (one side)
wf
[N]
{kgf}
Frame top
wf
hf
10-1
1150 x 70 x 11-2
10-2
14700
172 N/mm
{17.5 kgf/mm}
350
300
250
200
Frame top ~ Wheel center hf [mm]

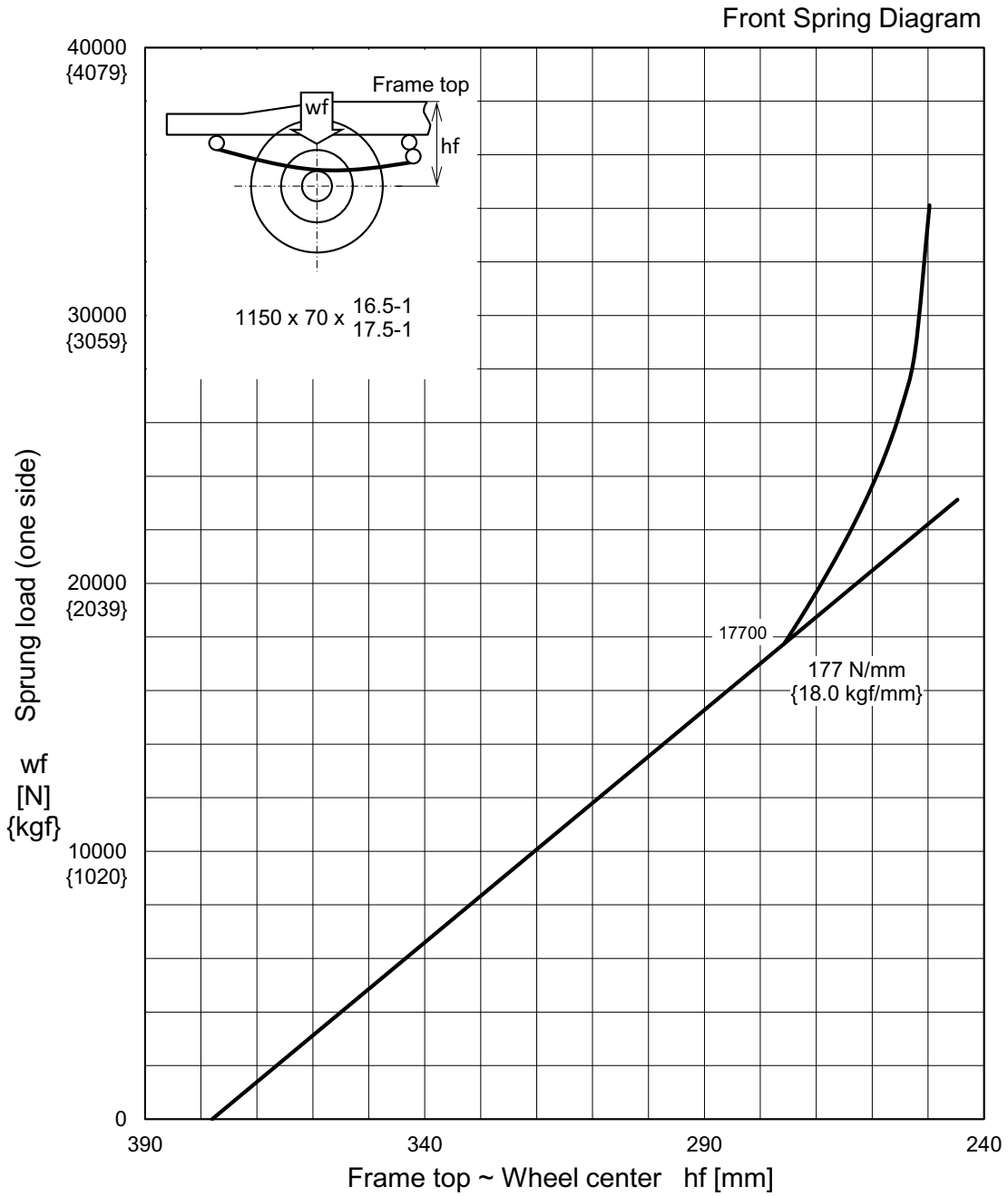
MODEL: FEB9


Front Spring Diagram
40000
{4079}
30000
{3059}
20000
{2039}
10000
{1020}
0
Sprung load (one side)
wf
[N]
{kgf}
Frame top
wf
hf
10-1
1150 x 70 x 11-2
10-2
16500
172 N/mm
{17.5 kgf/mm}
360
310
260
210
Frame top ~ Wheel center hf [mm]

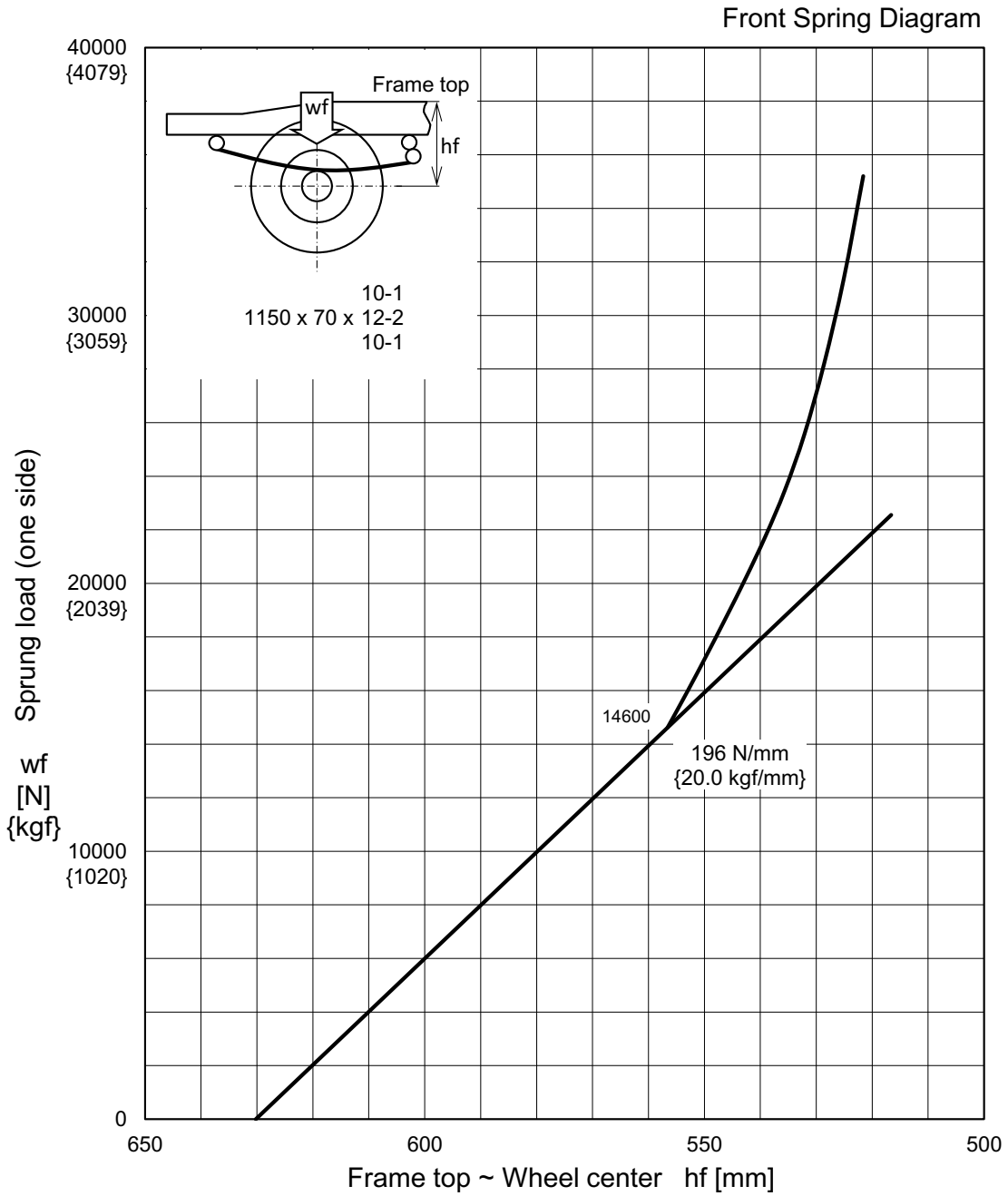
MODEL: FEC7,FEC8



MODEL: FECX

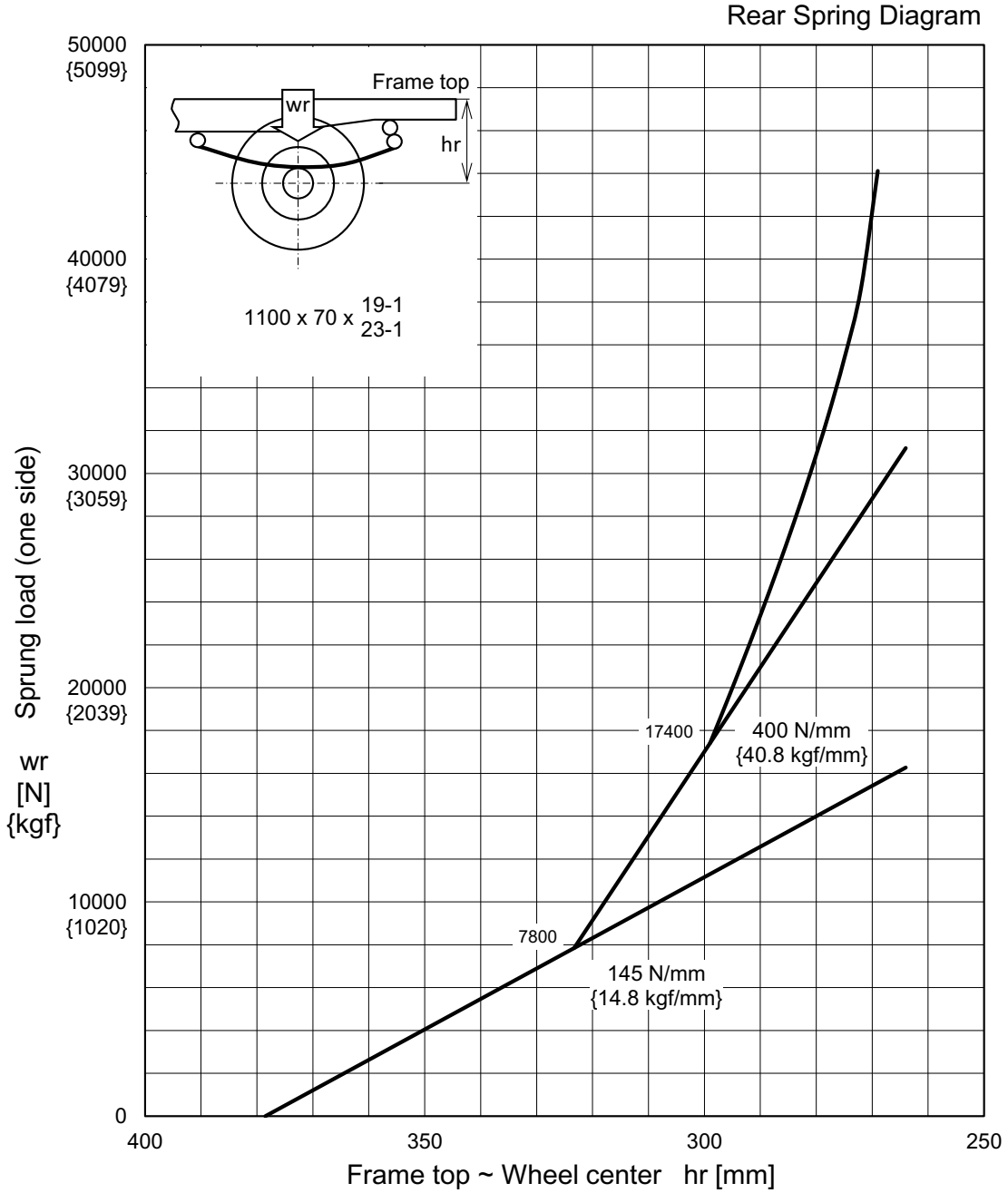

Front Spring Diagram
40000
{4079}
30000
{3059}
20000
{2039}
10000
{1020}
0
Sprung load (one side)
wf
[N]
{kgf}
Frame top
wf
hf
1150 x 70 x 16.5-1
17.5-1
17700
177 N/mm
{18.0 kgf/mm}
390
340
290
240
Frame top ~ Wheel center hf [mm]

MODEL: FGB7


Front Spring Diagram
40000
{4079}
30000
{3059}
20000
{2039}
10000
{1020}
0
Sprung load (one side)
wf
[N]
{kgf}
Frame top
wf
hf
10-1
1150 x 70 x 12-2
10-1
14600
196 N/mm
{20.0 kgf/mm}
650
600
550
500
Frame top ~ Wheel center hf [mm]

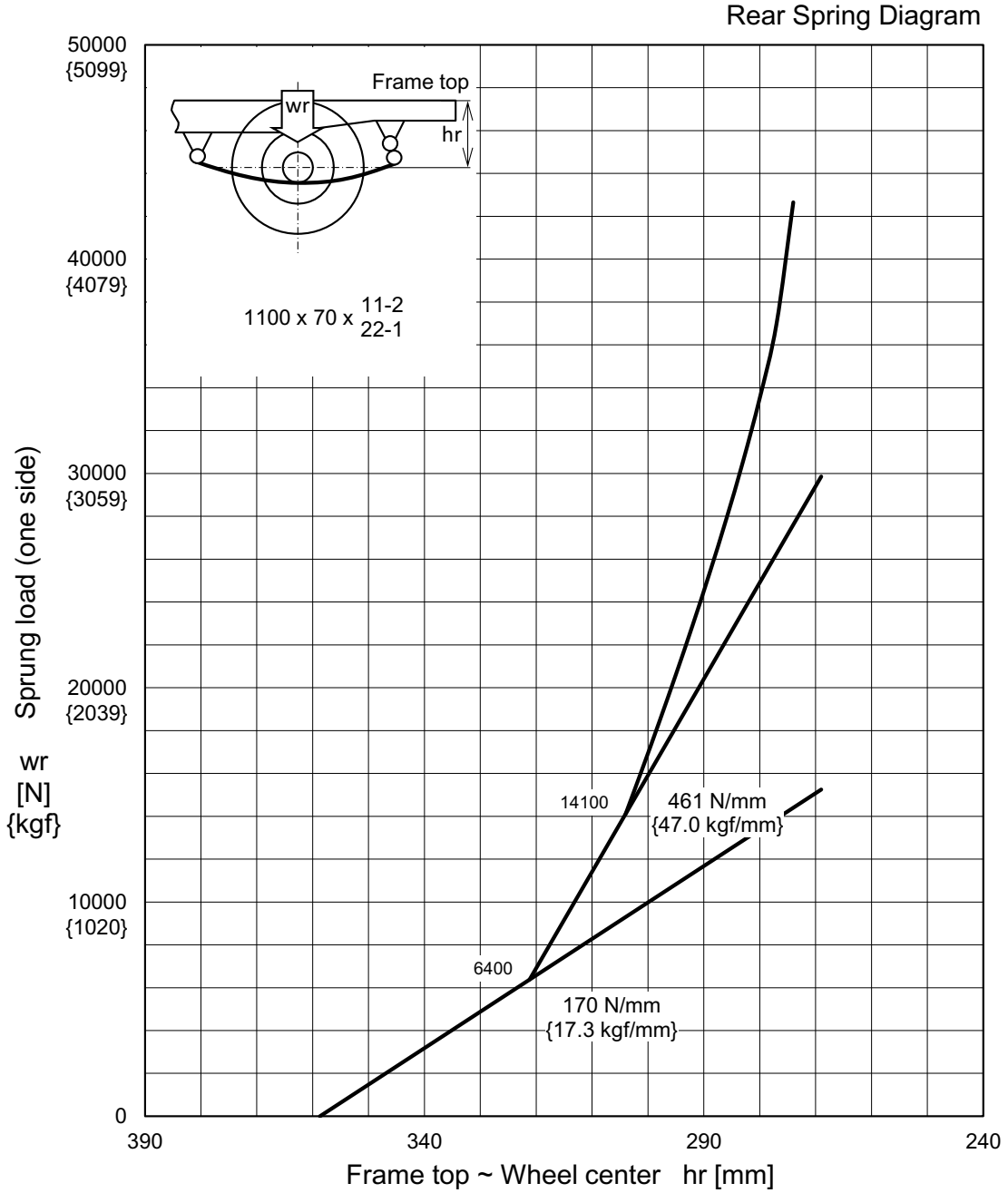
10.7.4 Rear spring diagram

MODEL: FEA2**1, FEB2 (EXCEPT FEB2*C*4)

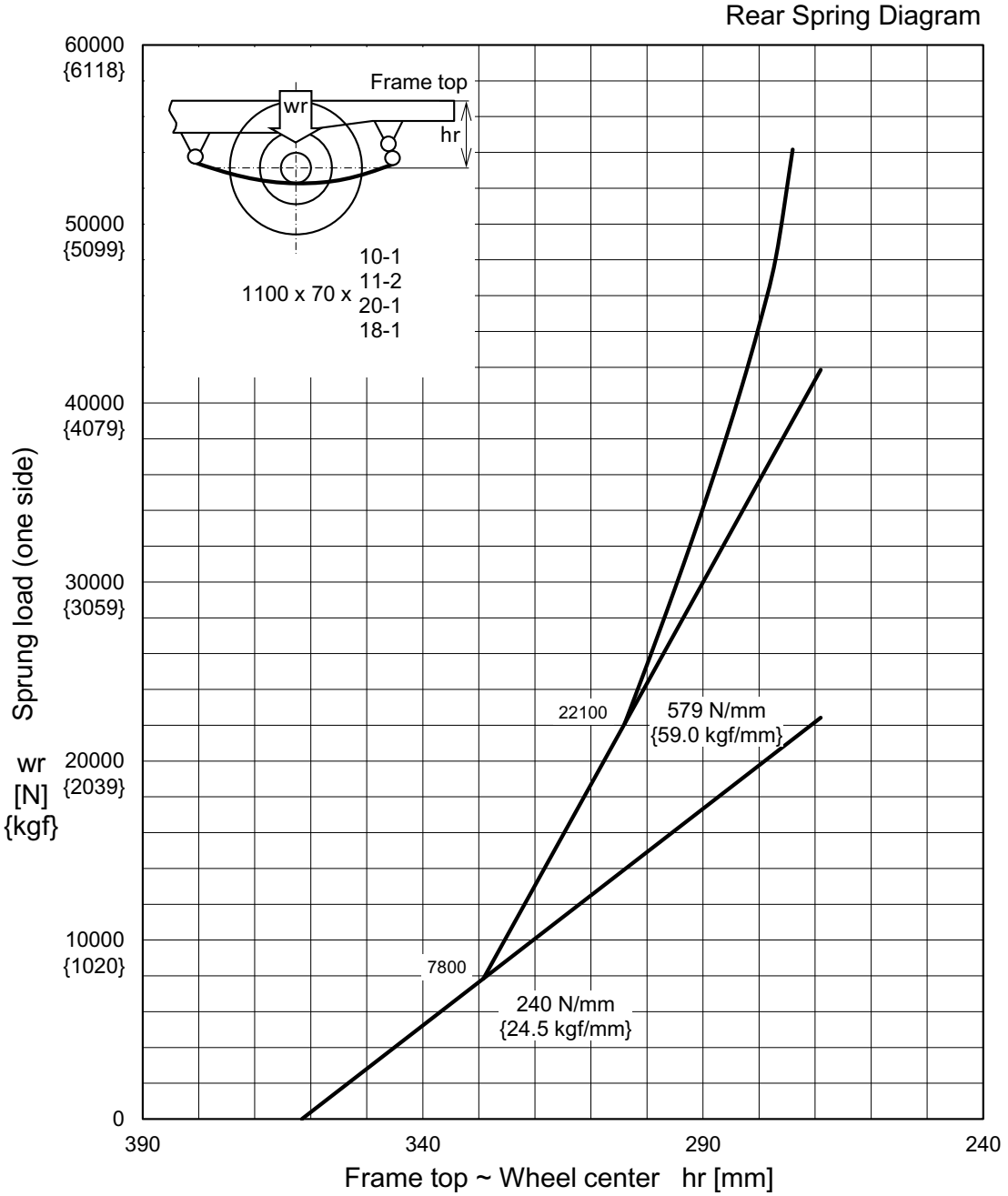


10.7 Spring characteristic

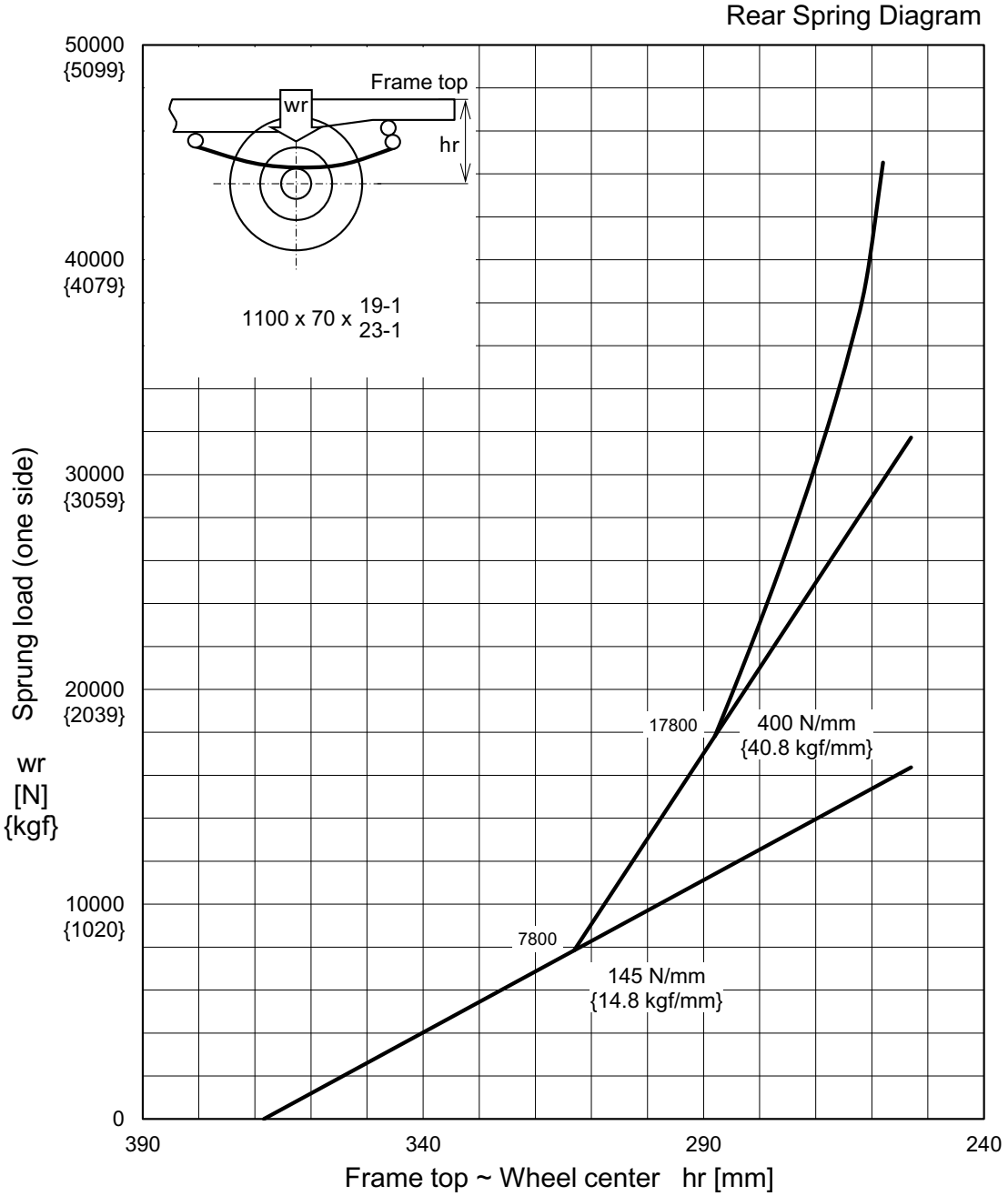
MODEL: FEA6



MODEL: FEA6 (GVW OPT)

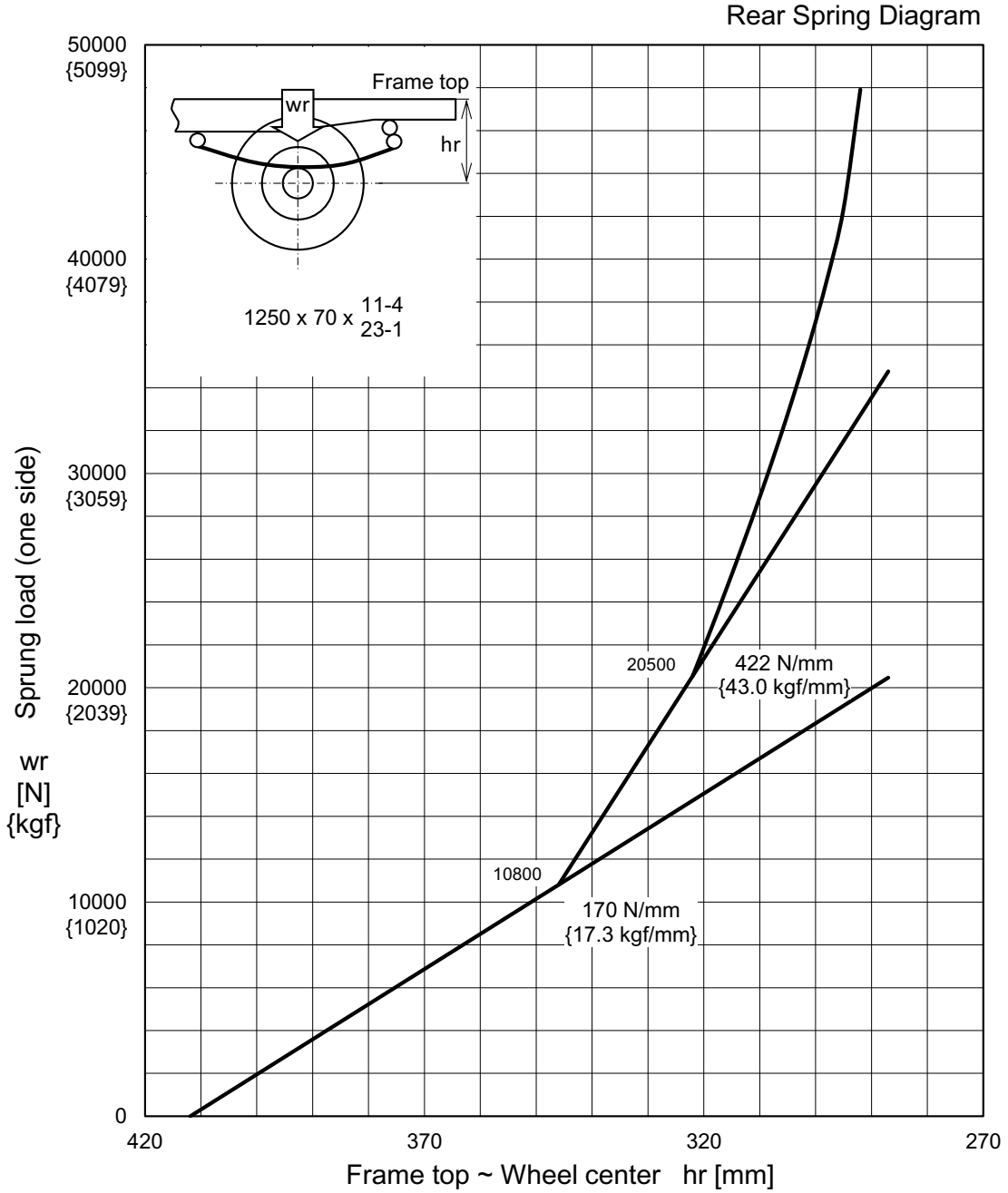


MODEL: FEB2*C*4

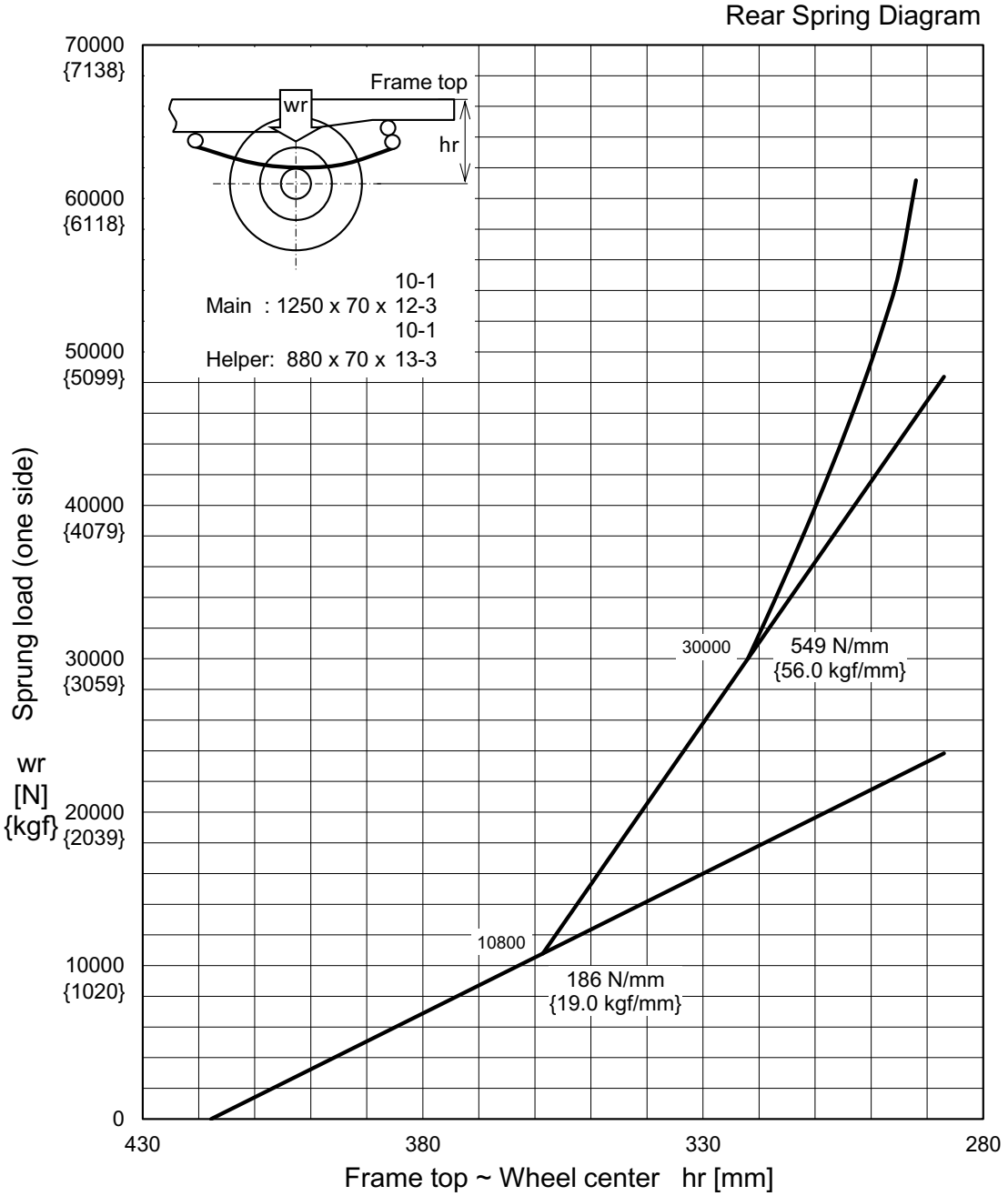


10.7 Spring characteristic

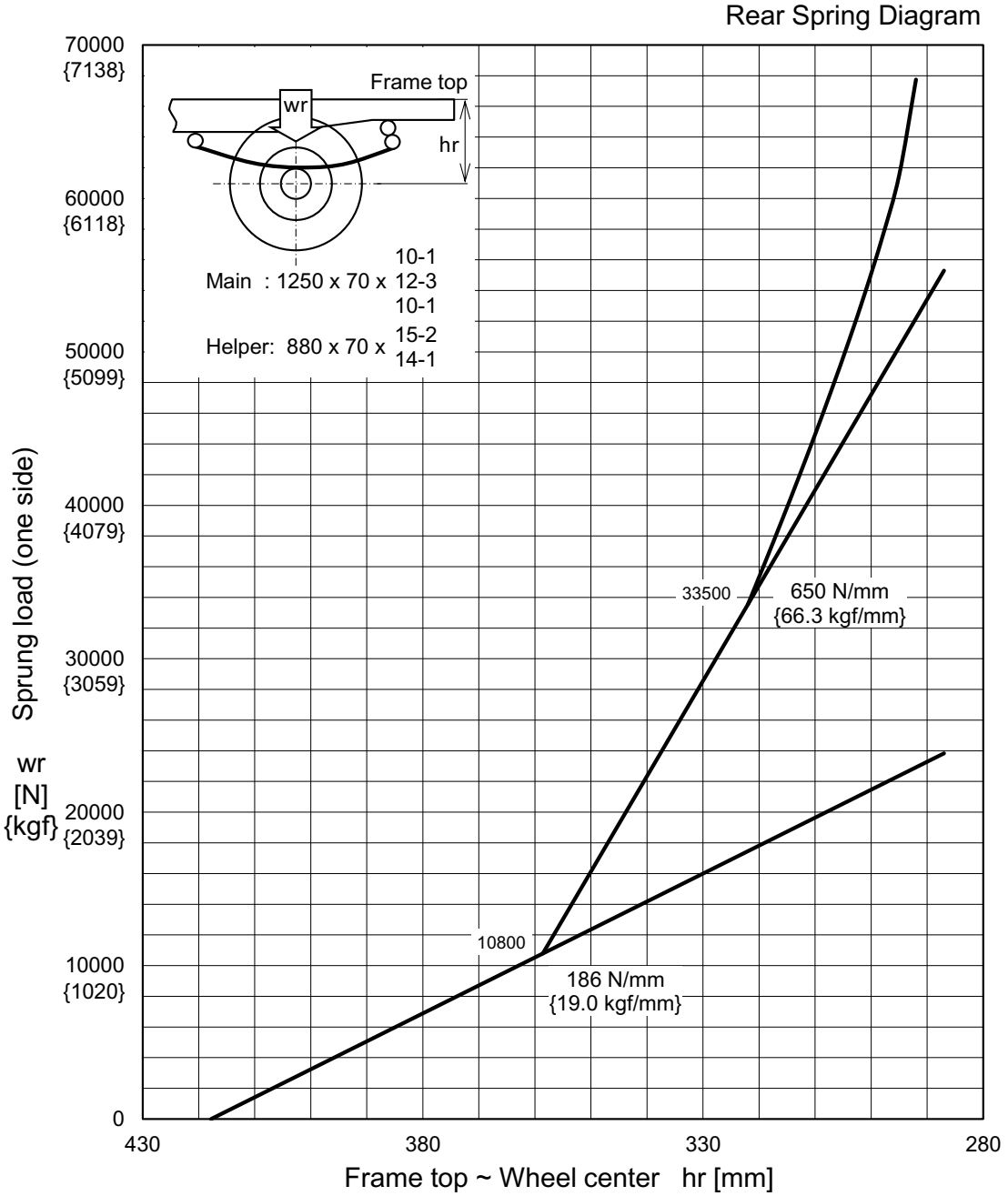
MODEL: FEB5



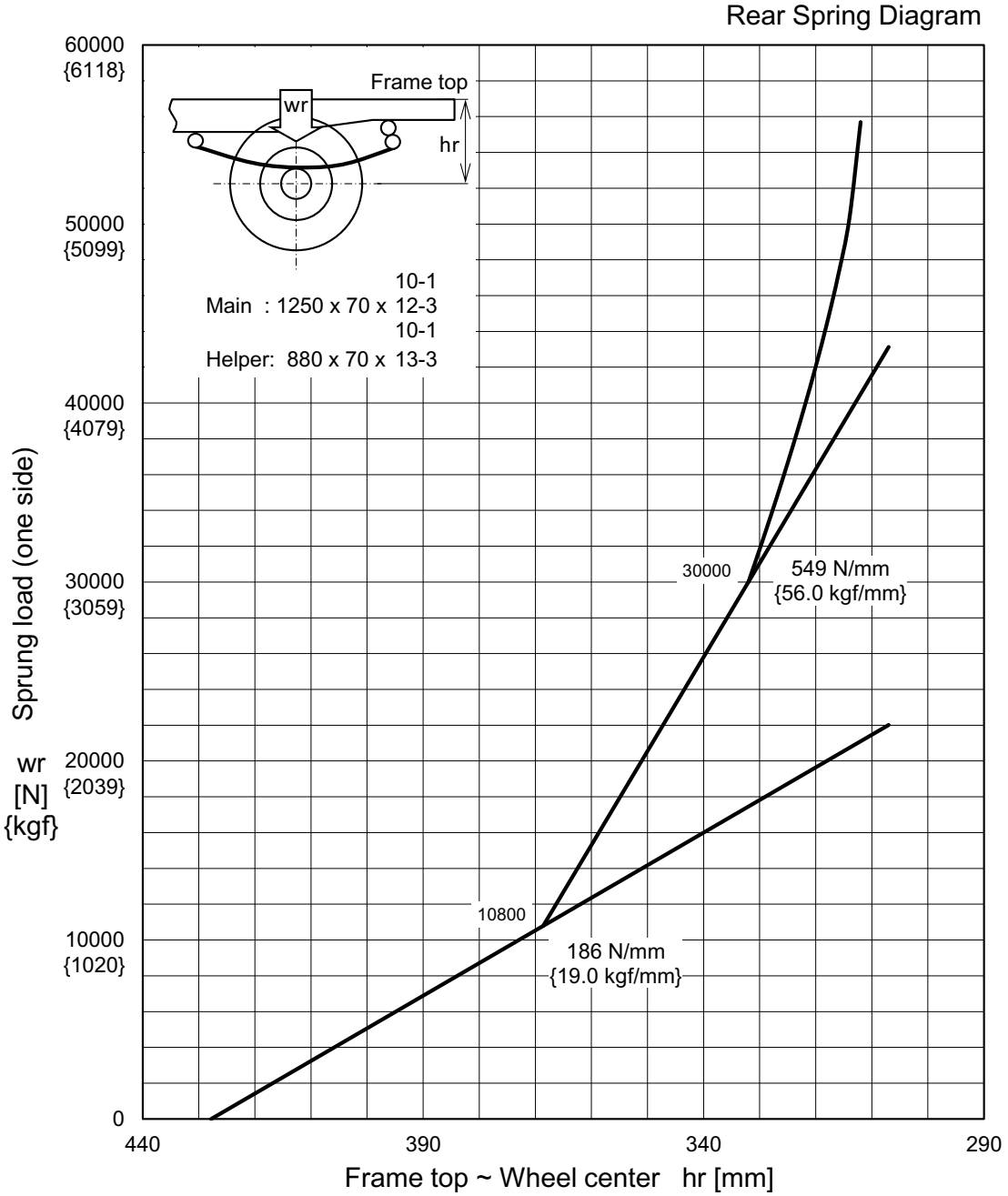
MODEL: FEB7


Rear Spring Diagram
70000
{7138}
60000
{6118}
50000
{5099}
40000
{4079}
30000
{3059}
20000
{2039}
10000
{1020}
0
Sprung load (one side)
wr
[N]
{kgf}
Frame top
wr
hr
10-1
Main : 1250 x 70 x 12-3
10-1
Helper: 880 x 70 x 13-3
30000
549 N/mm
{56.0 kgf/mm}
10800
186 N/mm
{19.0 kgf/mm}
430
380
330
280
Frame top ~ Wheel center hr [mm]

MODEL: FEB9

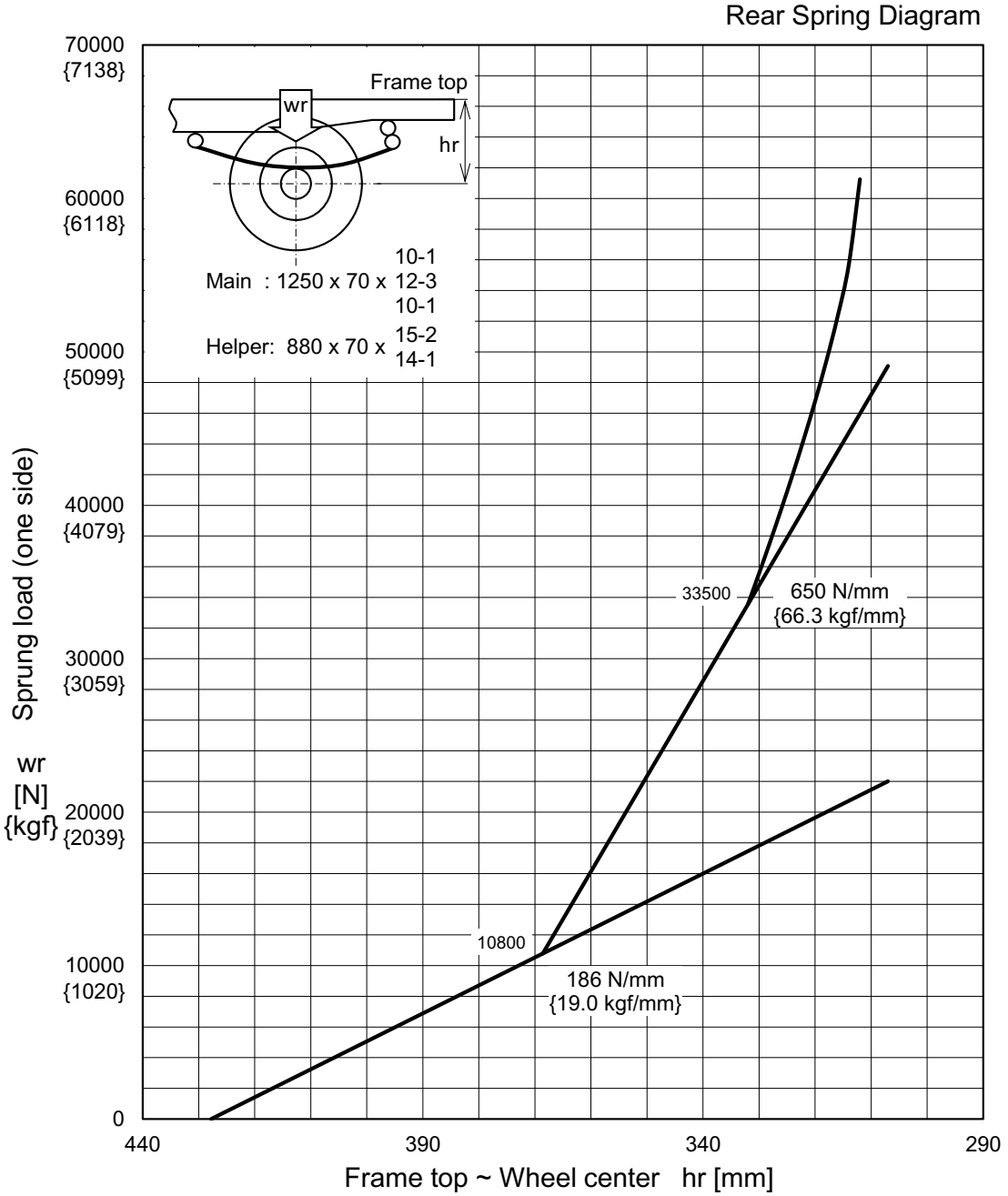

Rear Spring Diagram
Frame top
wr
hr
Main : 1250 x 70 x 10-1 12-3 10-1
Helper: 880 x 70 x 15-2 14-1
33500
650 N/mm
{66.3 kgf/mm}
10800
186 N/mm
{19.0 kgf/mm}
Sprung load (one side)
wr
[N]
{kgf}
70000 {7138}
60000 {6118}
50000 {5099}
40000 {4079}
30000 {3059}
20000 {2039}
10000 {1020}
0
430
380
330
280
Frame top ~ Wheel center hr [mm]

MODEL: FEC7,FEC8

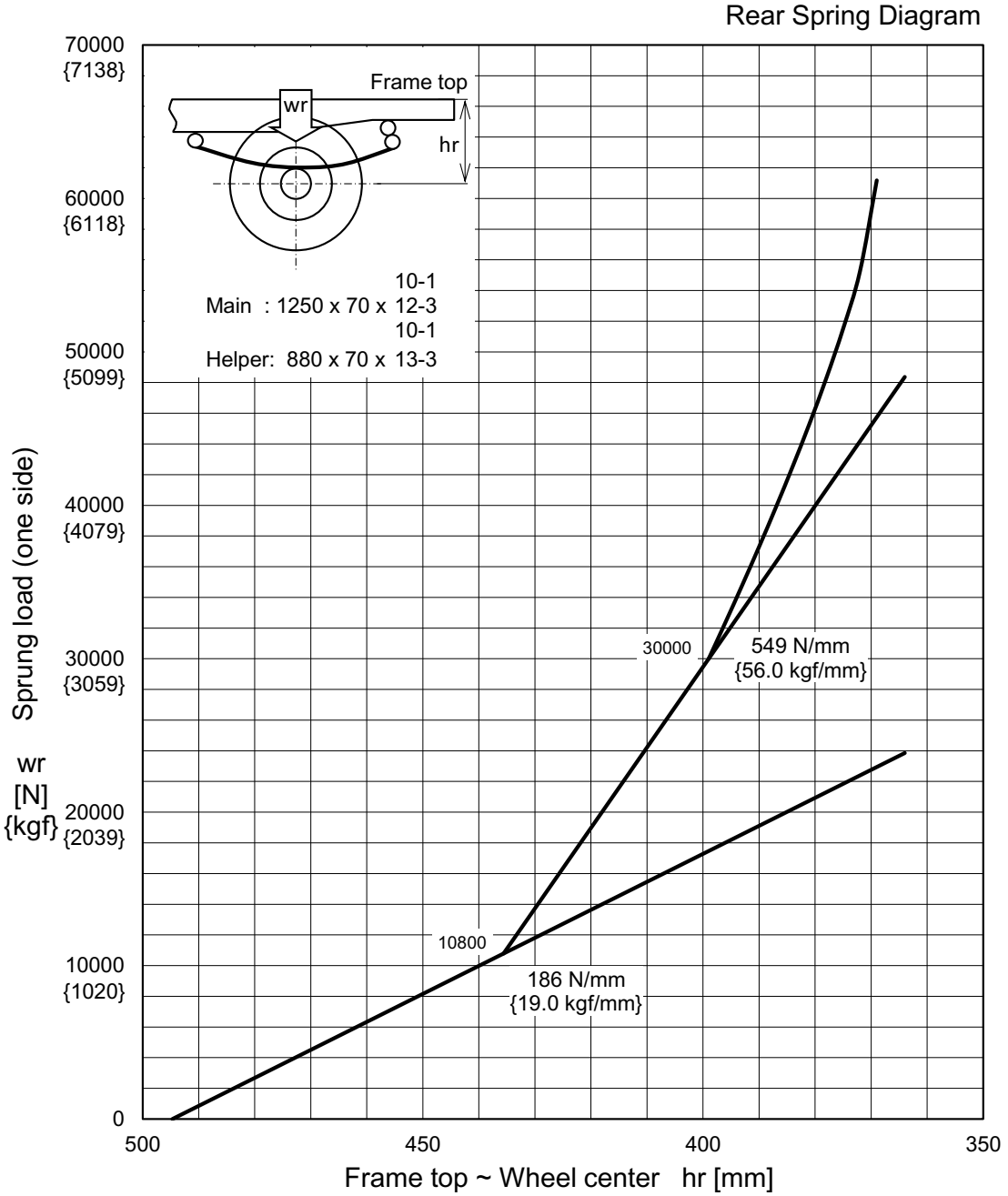


10.7 Spring characteristic

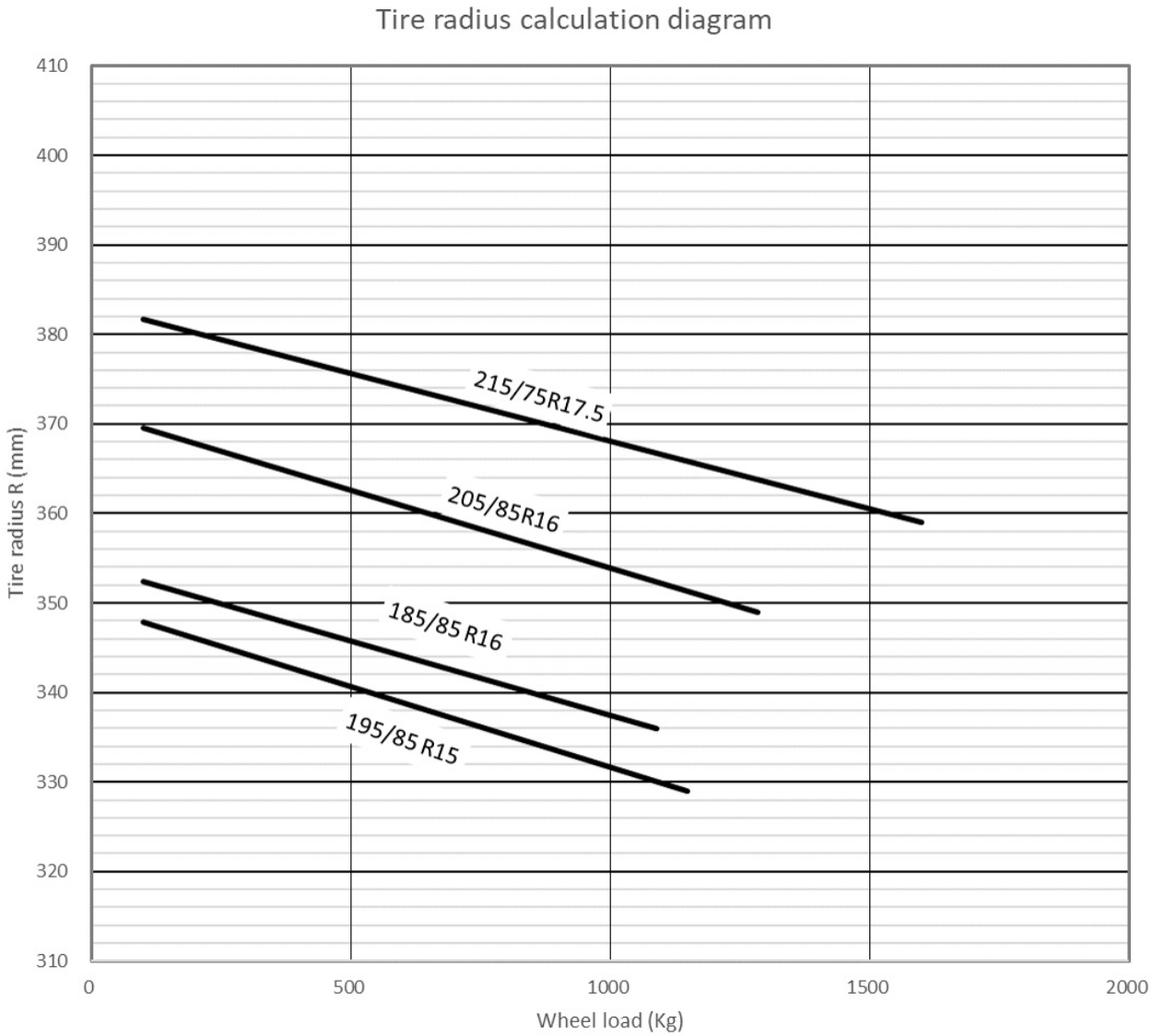
MODEL: FECX



MODEL: FGB7

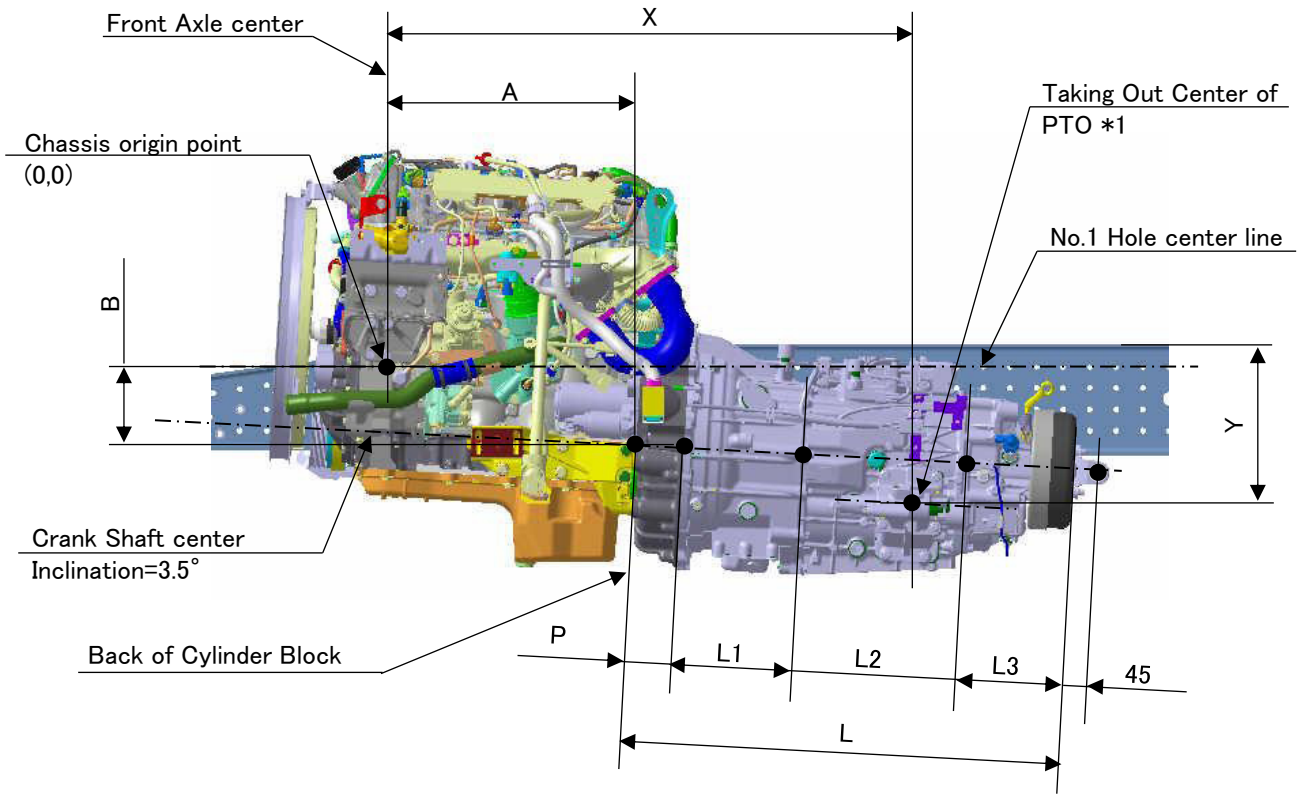

Rear Spring Diagram
70000
{7138}
60000
{6118}
50000
{5099}
40000
{4079}
30000
{3059}
20000
{2039}
10000
{1020}
0
Sprung load (one side)
wr
[N]
{kgf}
Frame top
wr
hr
10-1
Main : 1250 x 70 x 12-3
10-1
Helper: 880 x 70 x 13-3
30000
549 N/mm
{56.0 kgf/mm}
10800
186 N/mm
{19.0 kgf/mm}
500
450
400
350
Frame top ~ Wheel center hr [mm]

10.7.5 Tire radius calculating diagram



10.8 Engine transmission assembly

<FEA, FEB, FEC>



- Back of Cylinder Block (Unit : mm)

Model	A	B	Offset of Engines center from Chassis center line
FEA	425	146	-5 (Left side)
FEB, FEC	470	146	-10 (Left side)

- Dimensions of Transmission (Unit : mm)

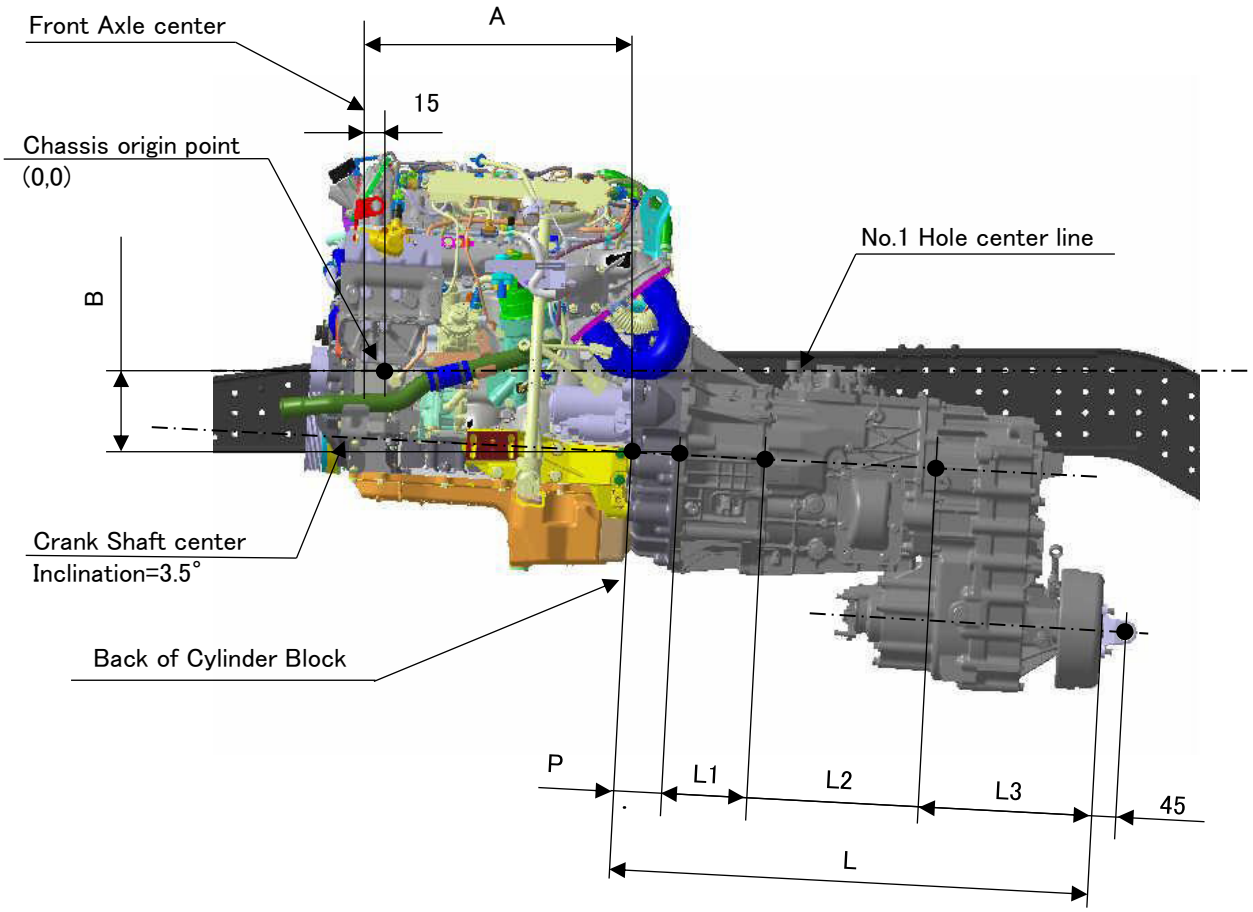
T/M	Clutch	P	L1	L2	L3	L
M038S6	–	90	215	317	204.5	826.5
M038S5	C3W28-modi	1.5	236.5	317	146.5	701.5
M038S5	C4W30	90	148	317	146.5	701.5

- Taking out center of PTO *1 (Unit : mm)

Model	T/M	Frame thickness	147N·m [15kgf·m]	
			X	Y
FEA	M038S6	(5t)	940.6	292.5
	M038S5	(5t)	873.7	288.4
FEC	M038S6	(6t)	985.6	302.5
	M038S5	(6t)	918.7	298.4

10.8 Engine transmission assembly

<FGB>



- Back of Cylinder Block

Unit : mm

Model	A	B	Offset of Engines center from Chassis center line
FGB	485	146	-10 (Left side)

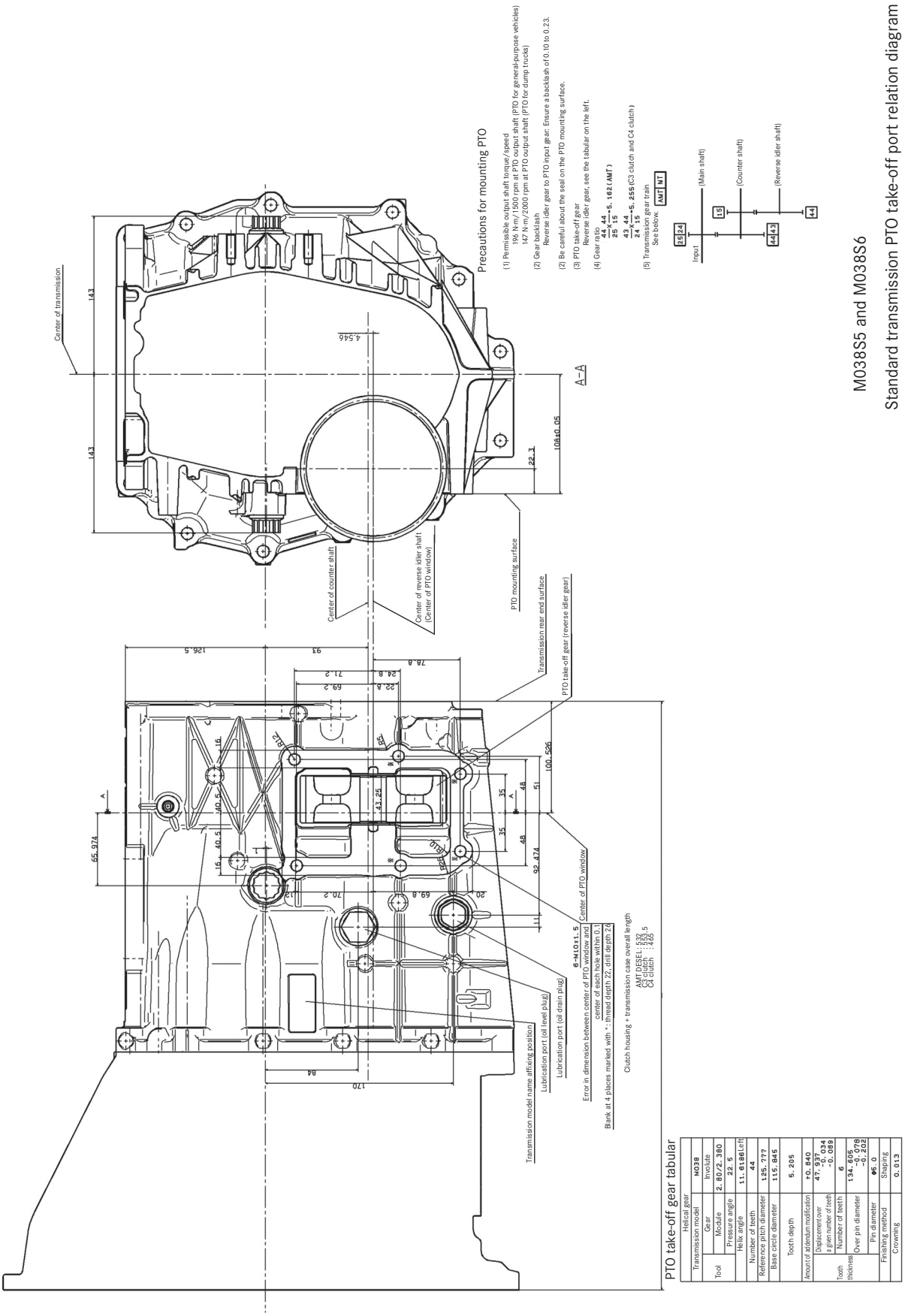
- Dimensions of Transmission

(Unit : mm)

T/M	Clutch	P	L1	L2	L3	L
M038S5	C4W30	90	148	317	349.5	904.5

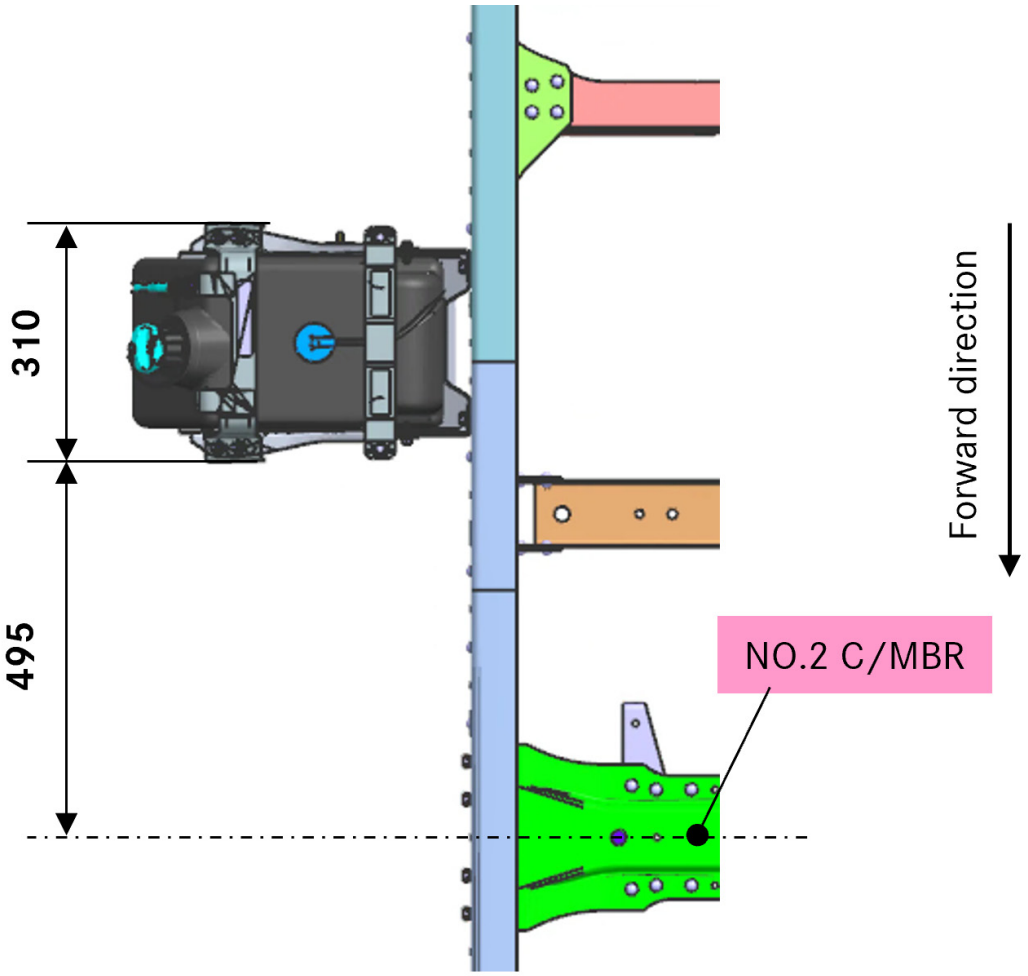
10.9 Power take-offs

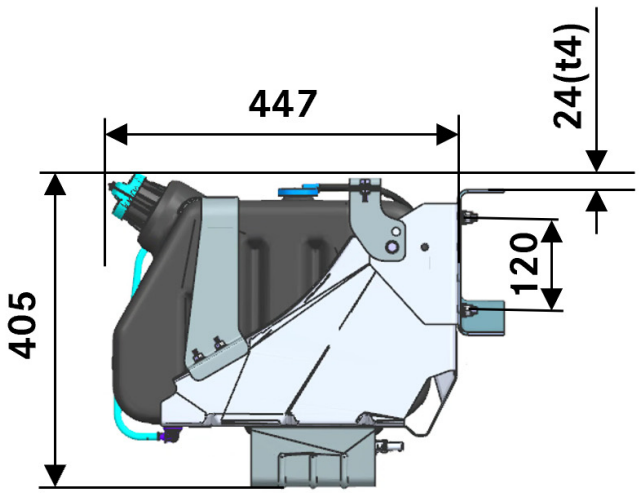
10.9.1 Transmission power take-off layout



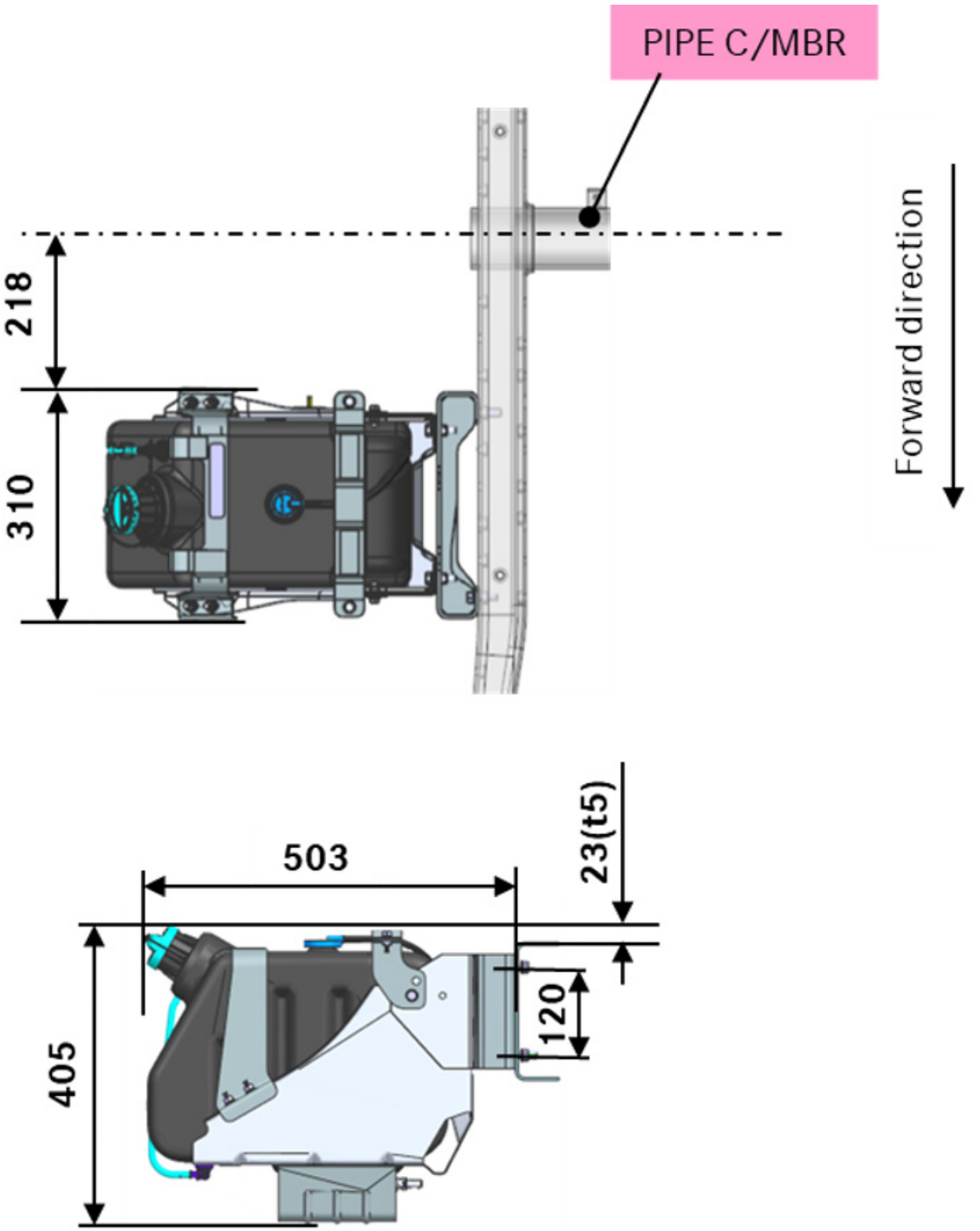
10.10 Exhaust system layout

FEA21C

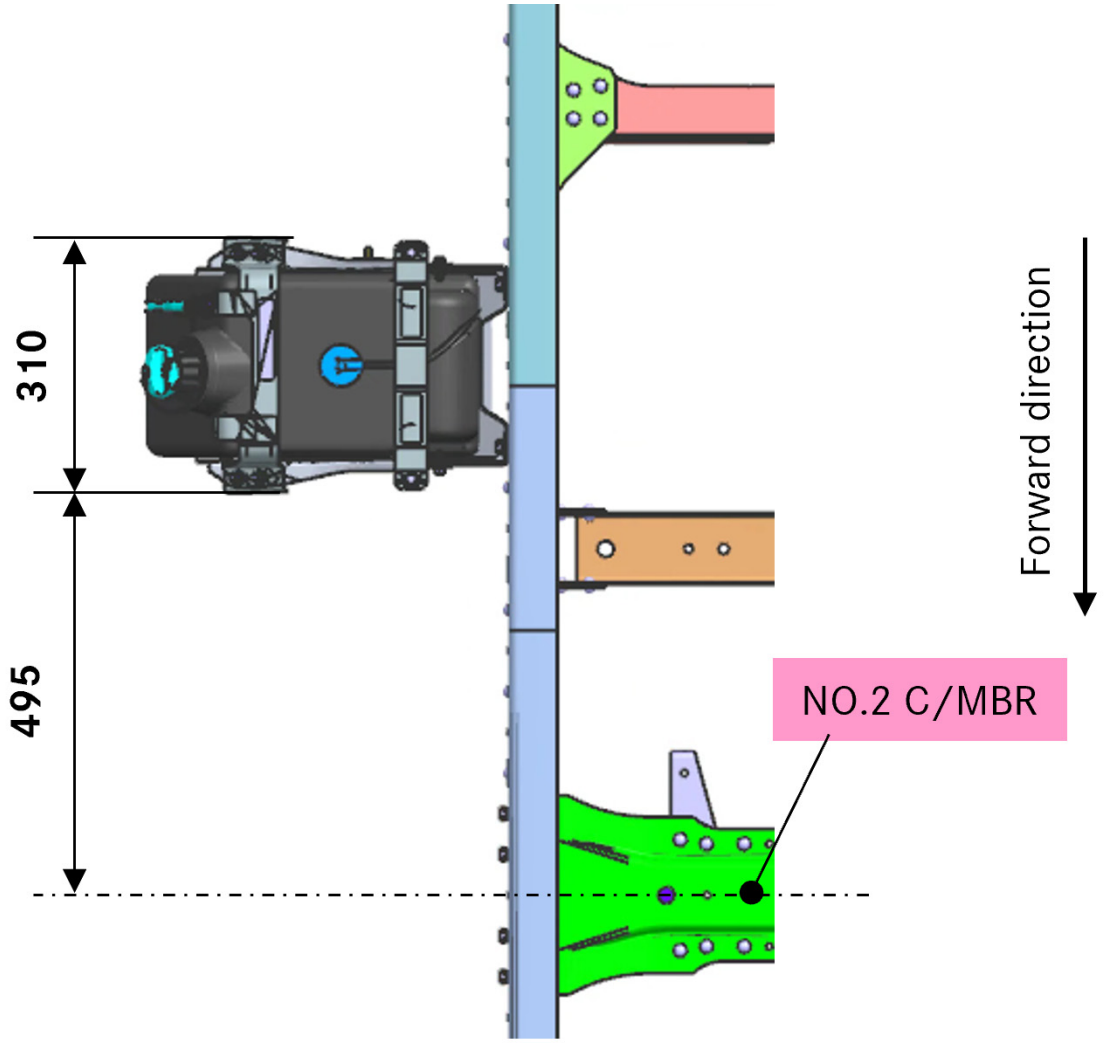


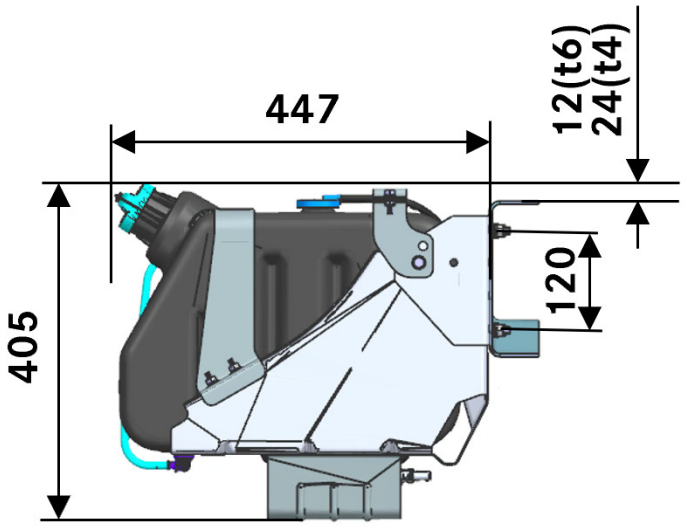


FEA61B

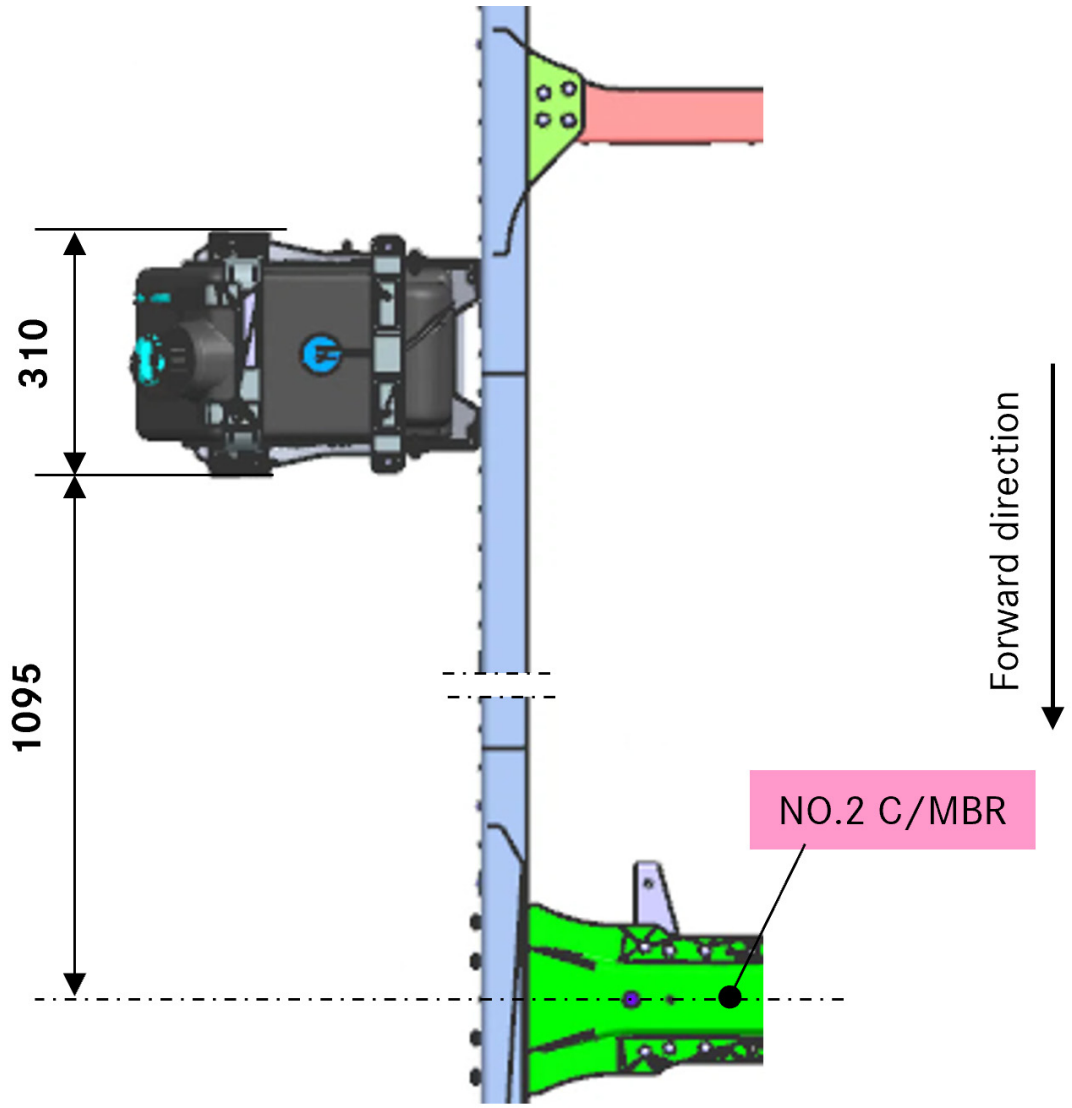


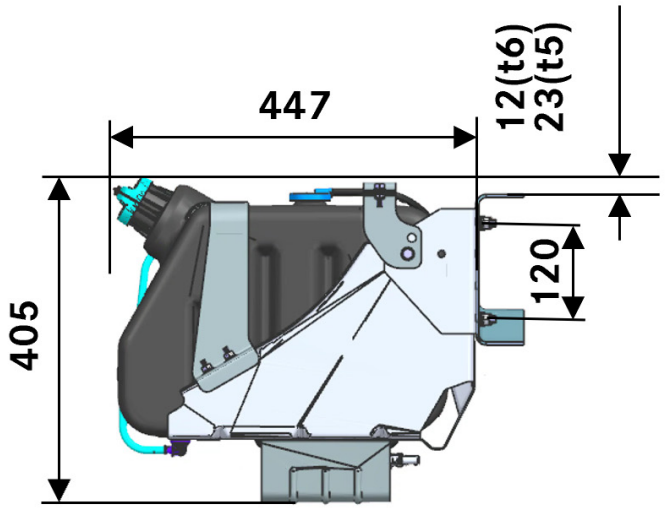
FEB21C
FEC81C



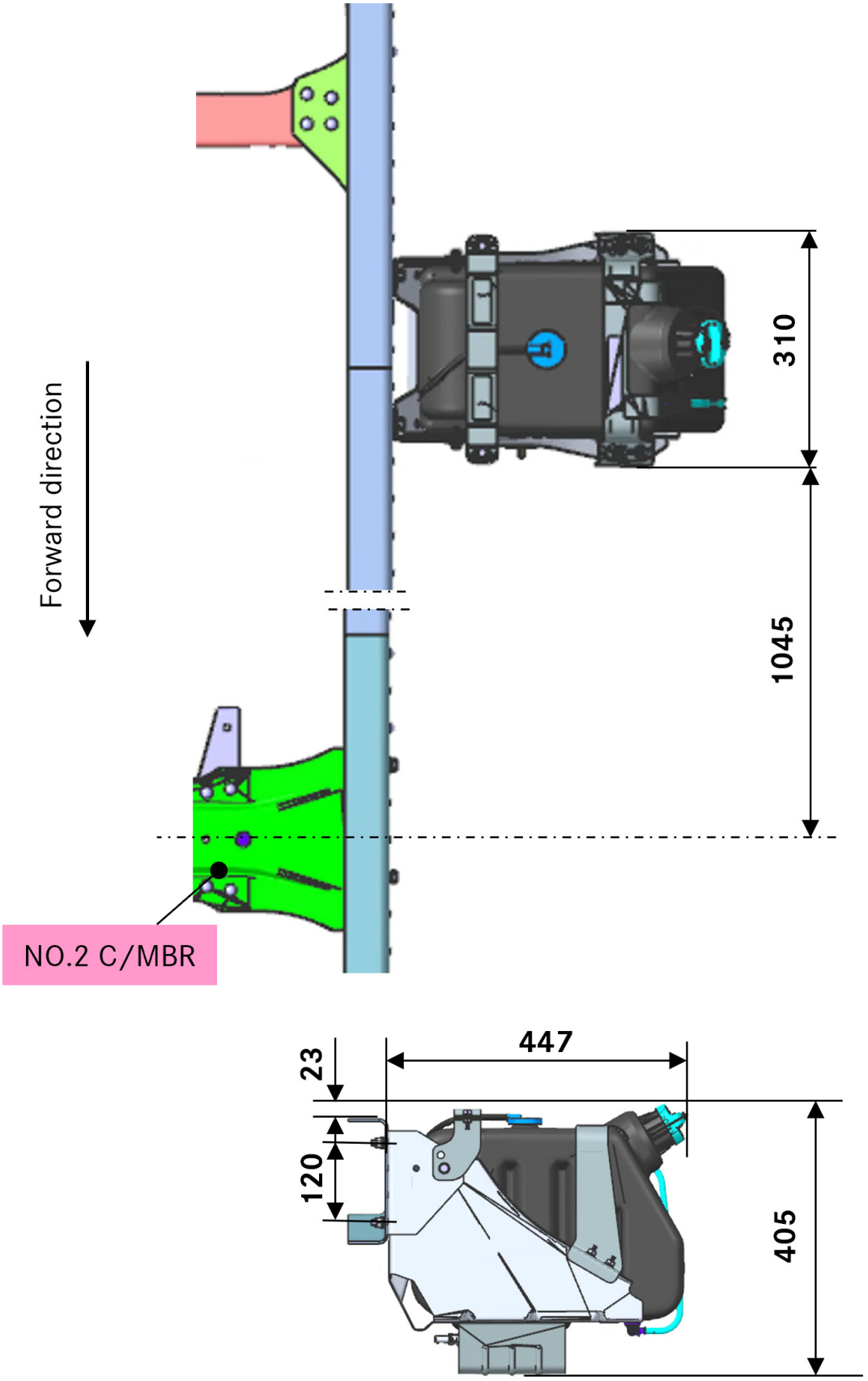


FEA21E SINGLE CAB
FEB21E, FEB51E
FEC71E

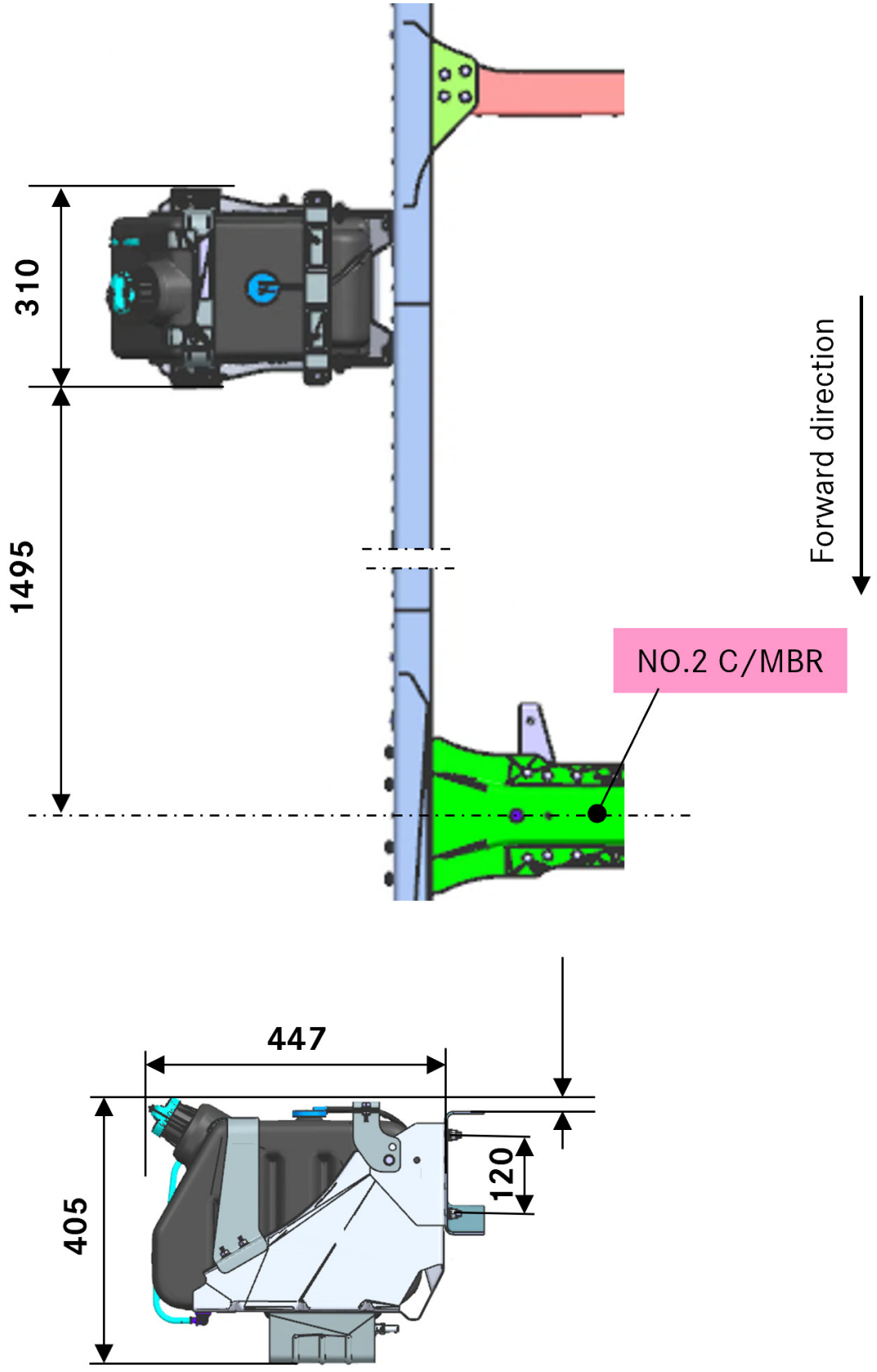




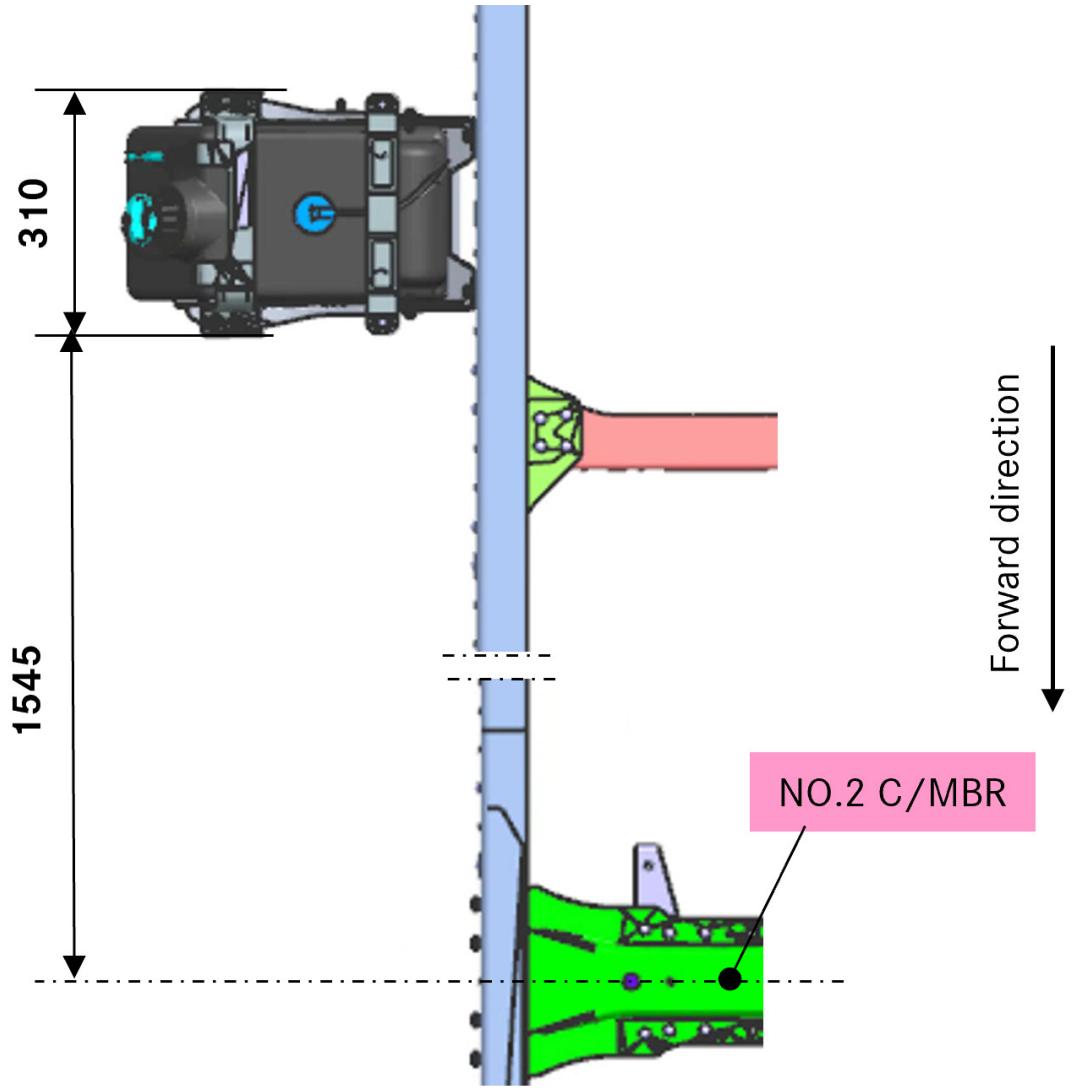
FEA21E CREW CAB
FEB71E, FEB91E

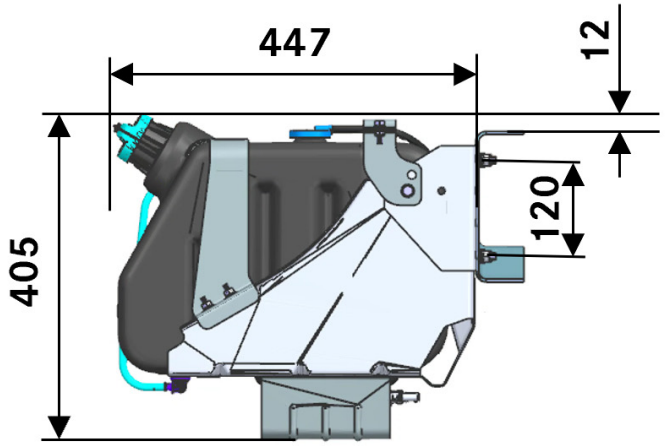


FEB51G, FEB71G, FEB91G
FECX1G

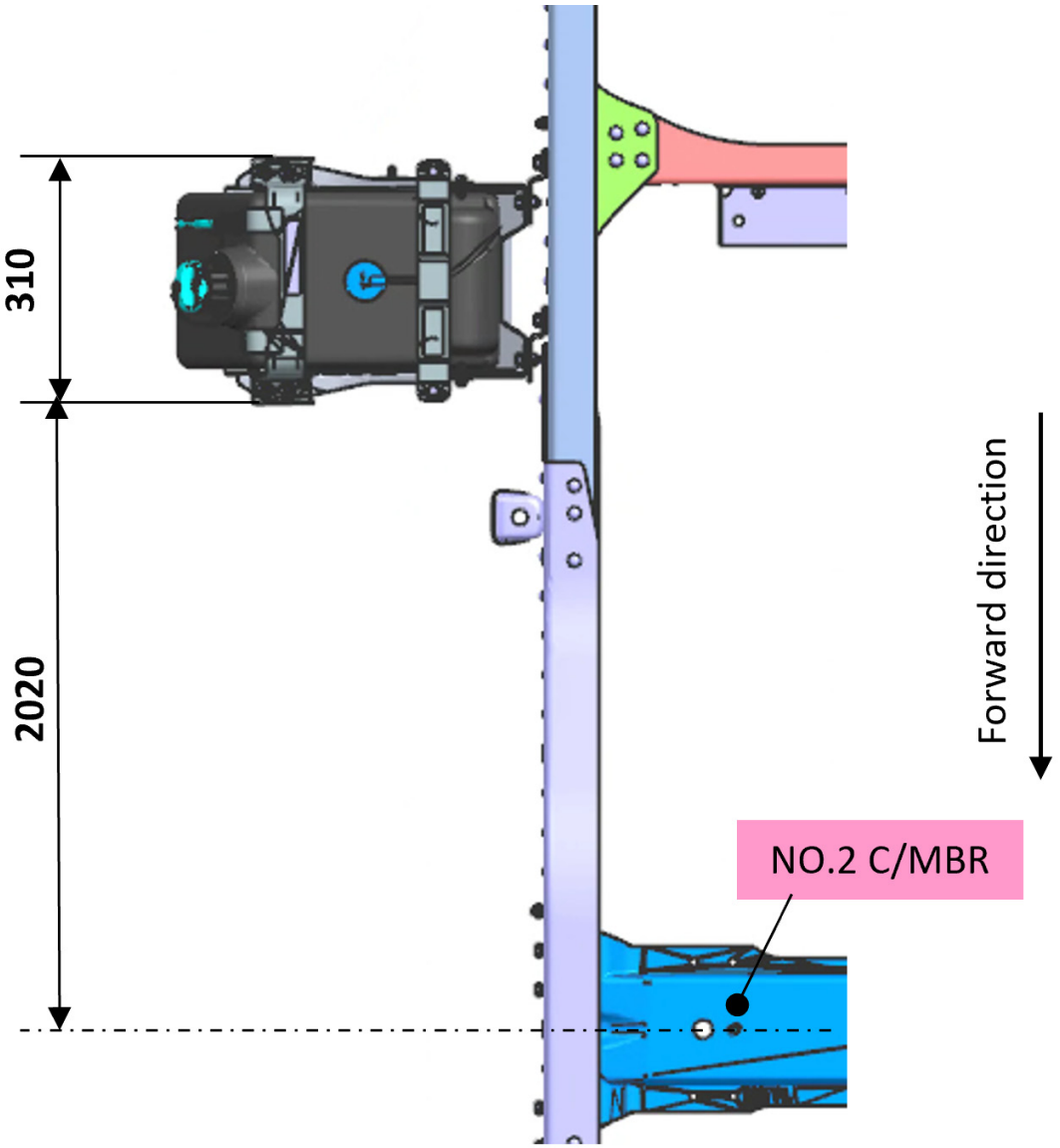


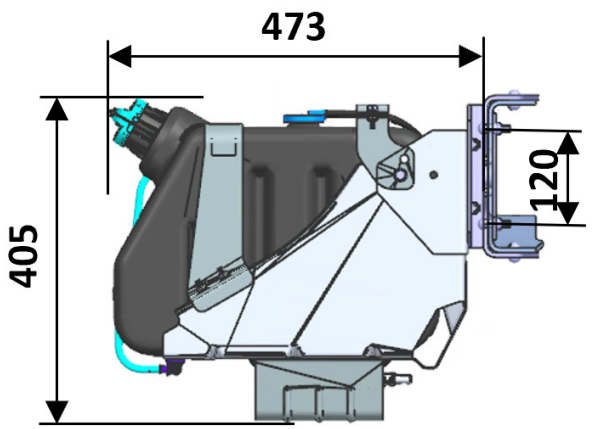
FEC71H,FECX1H, K



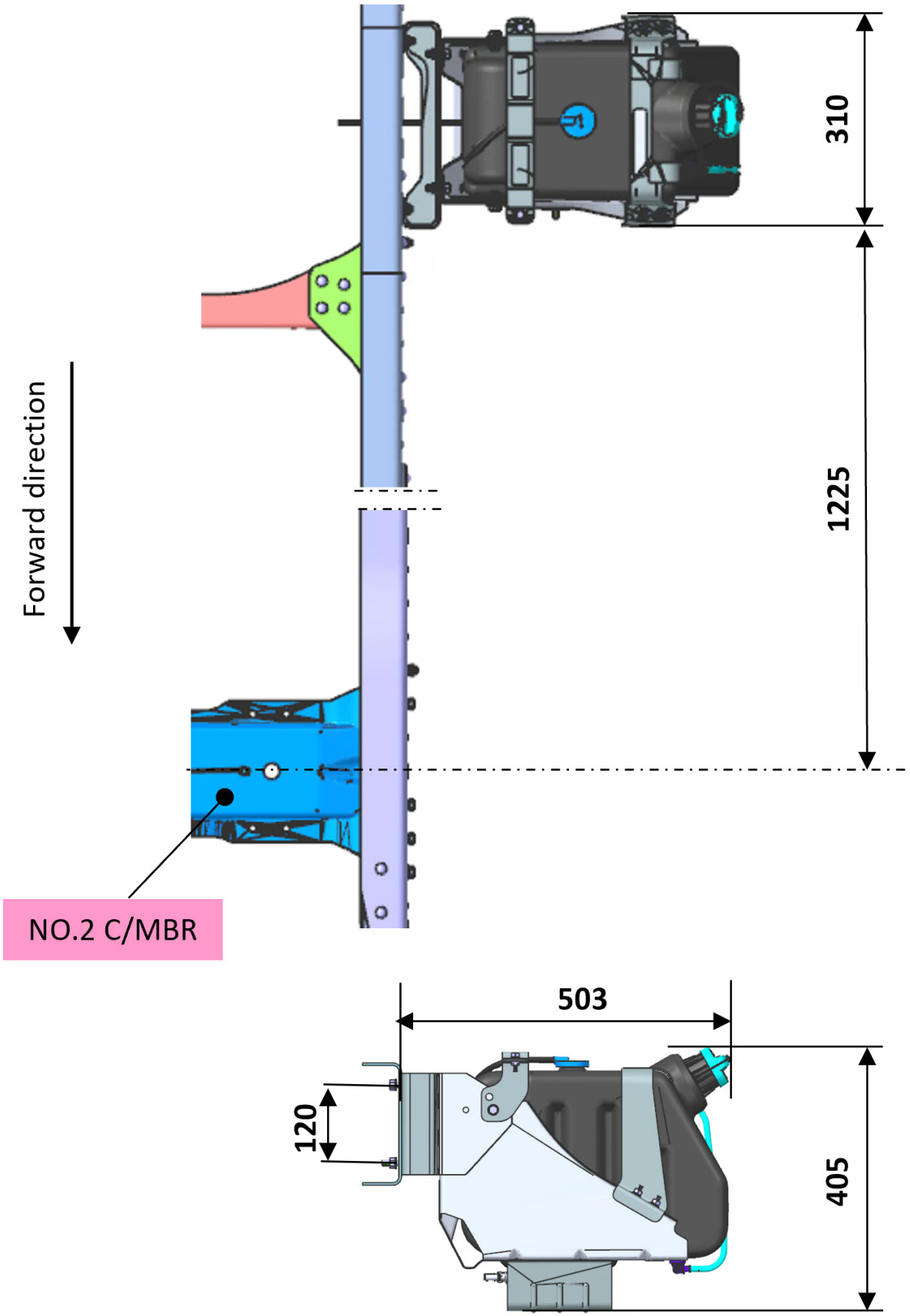


FGB71E SINGLE CAB





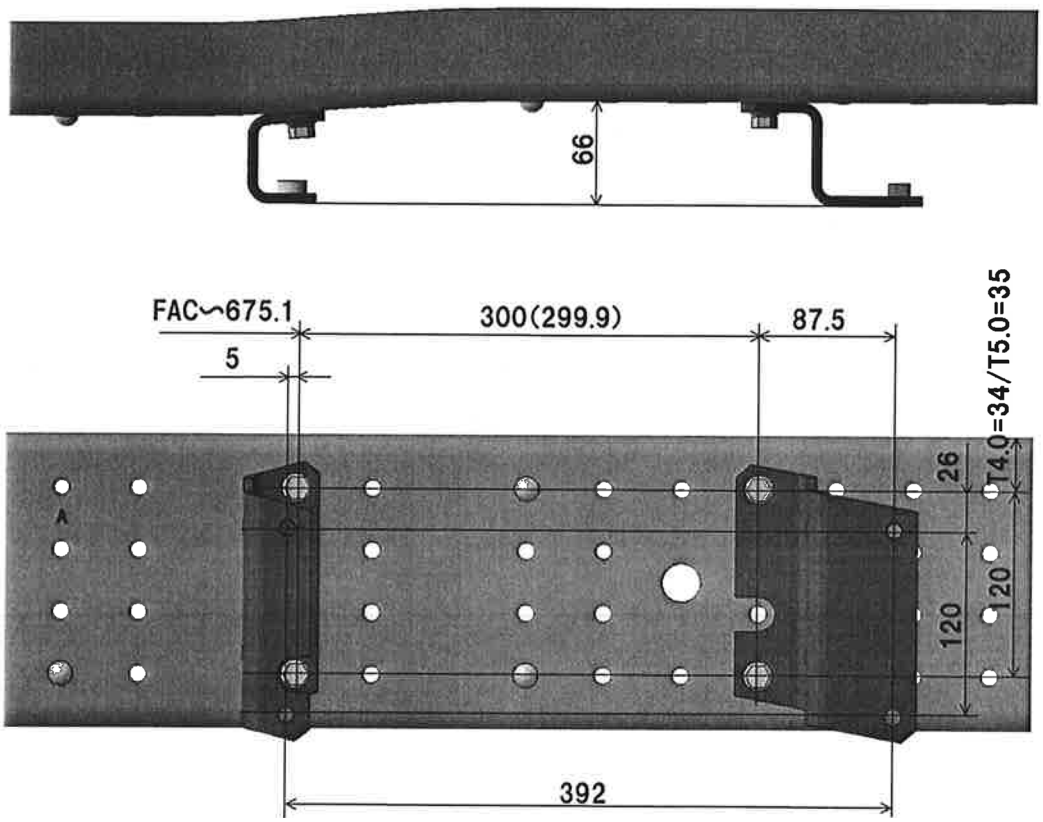
FGB71E CREW CAB



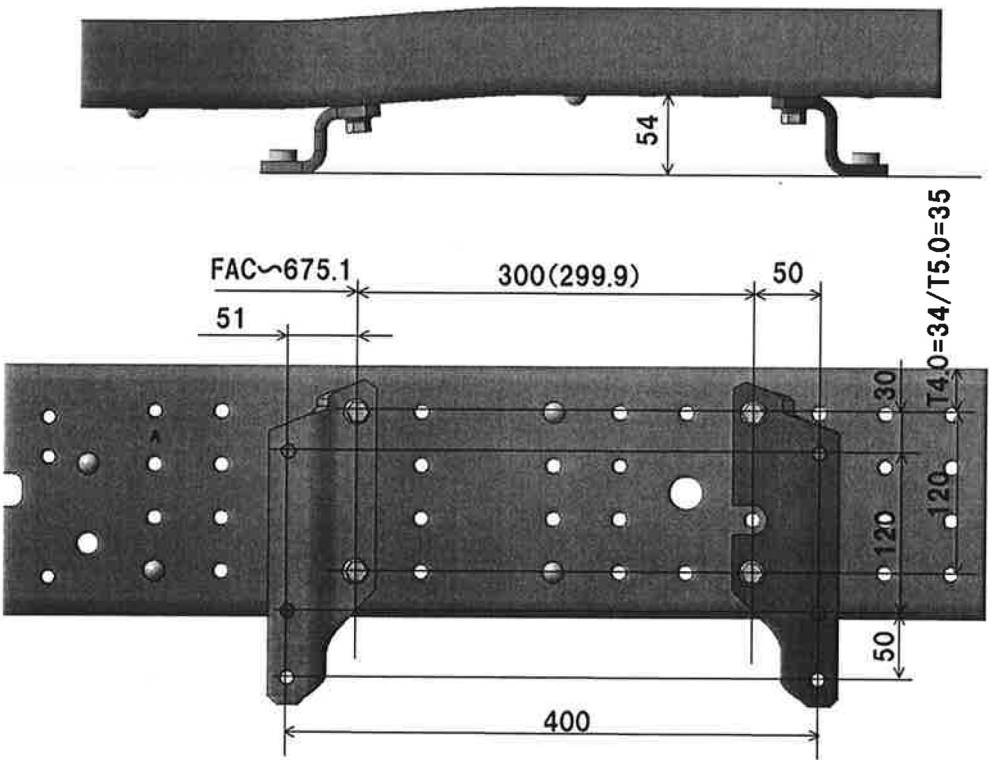
10.11 Battery mounting layout

10.11.1 Battery mounting layout

FEA

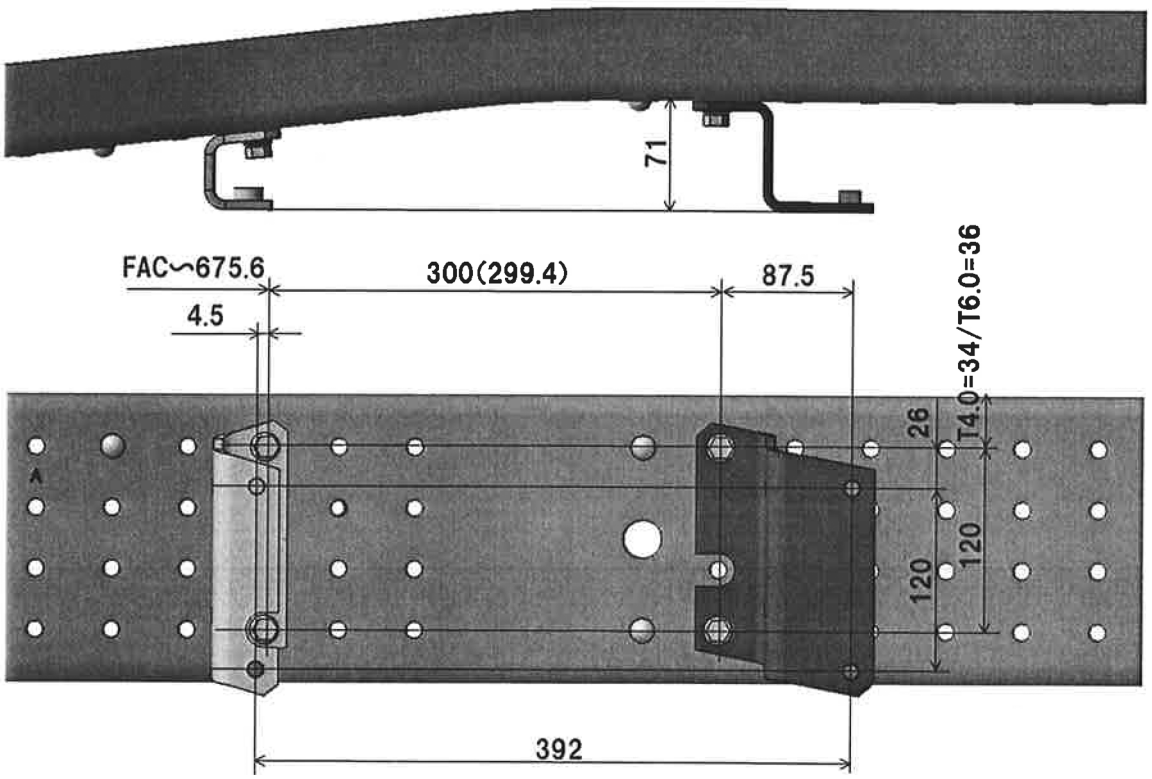


FEA(Alarge Capacity type)

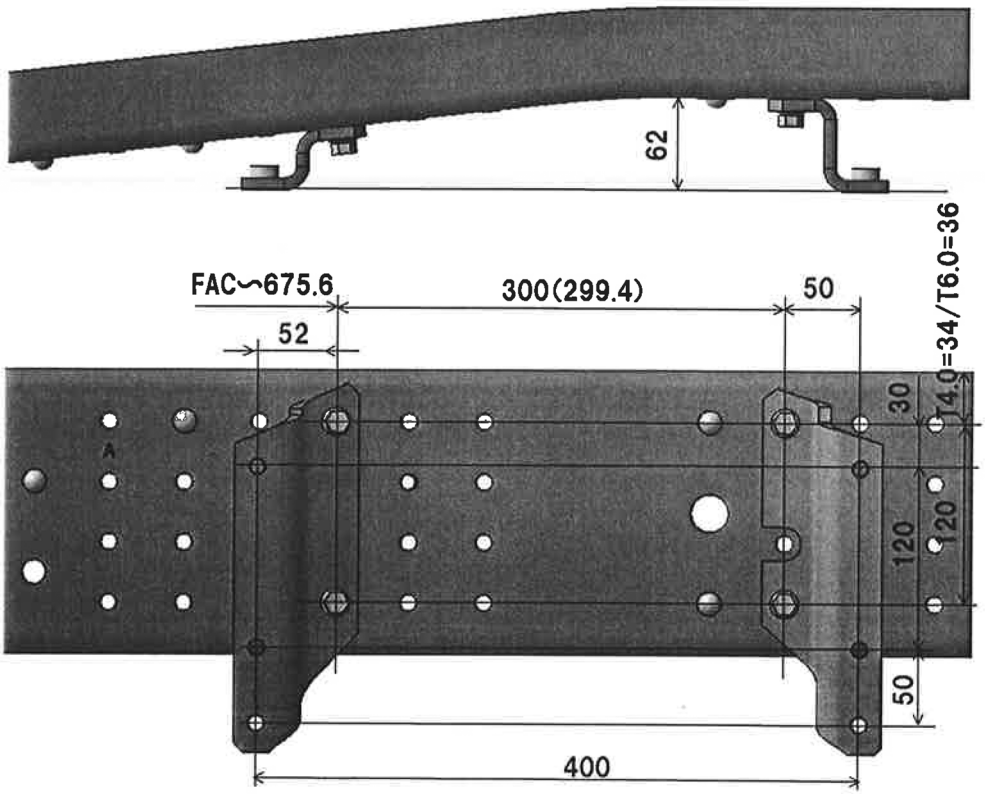


10.11 Battery mounting layout

FEB

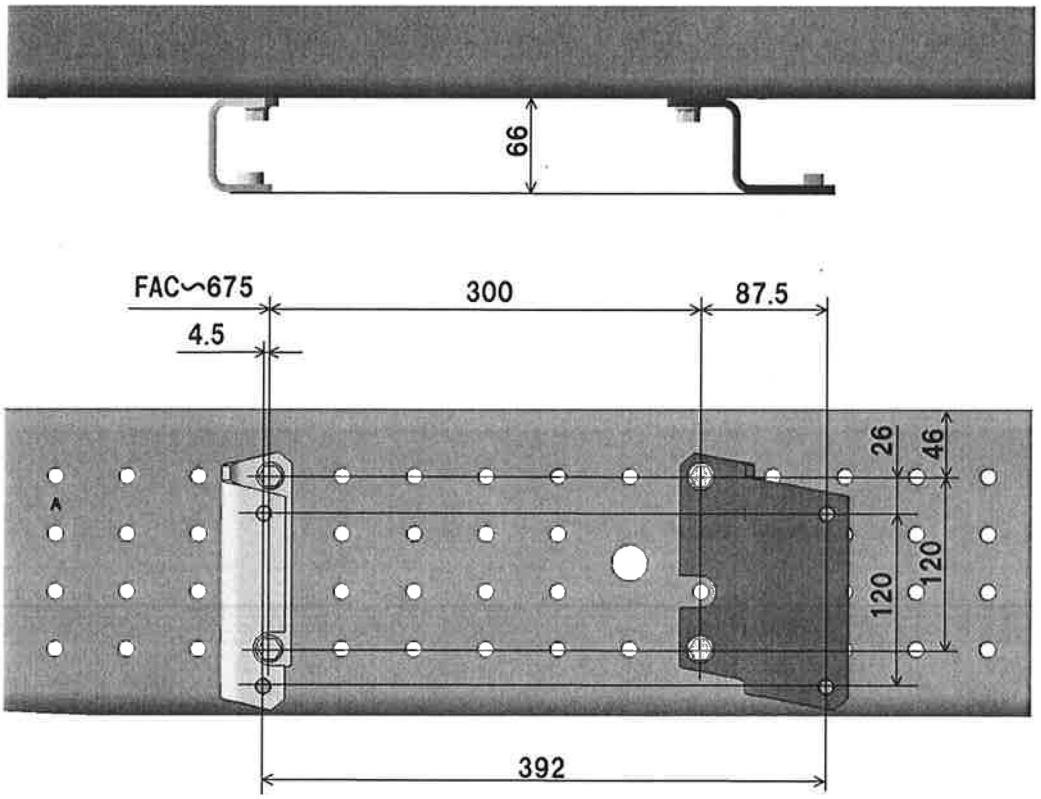


FEB (Alarge capacity type)

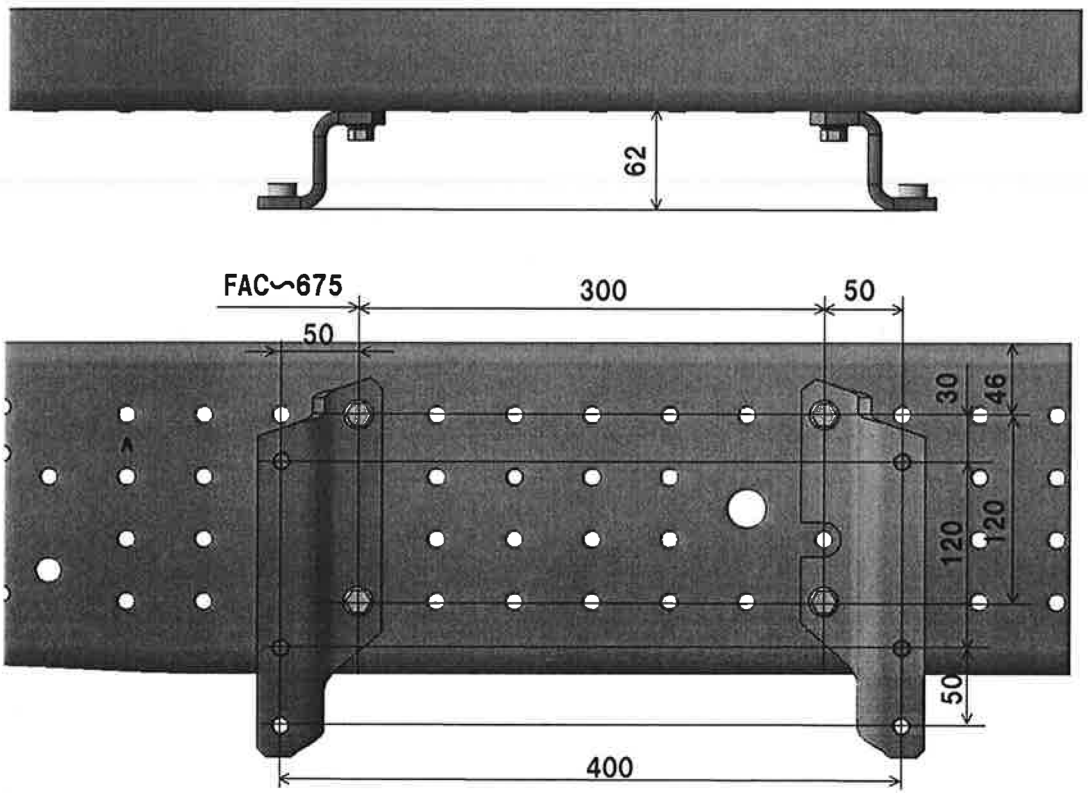


10.11 Battery mounting layout

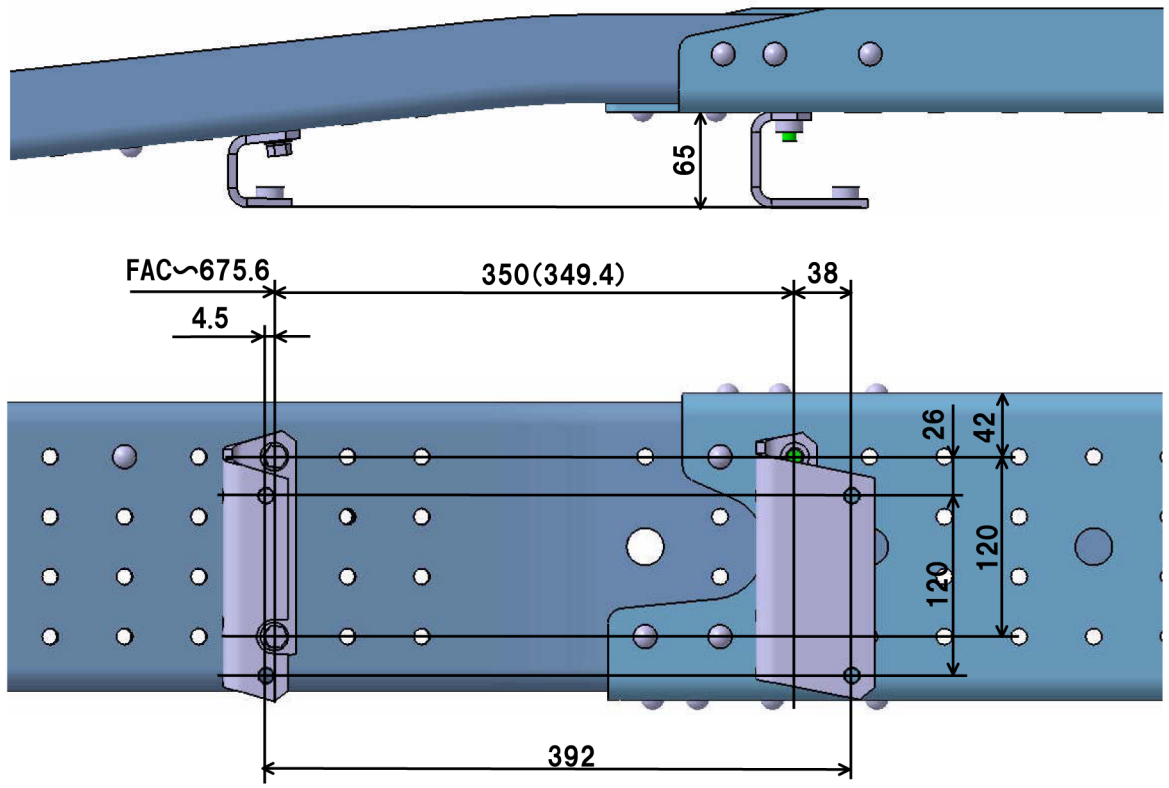
FEC



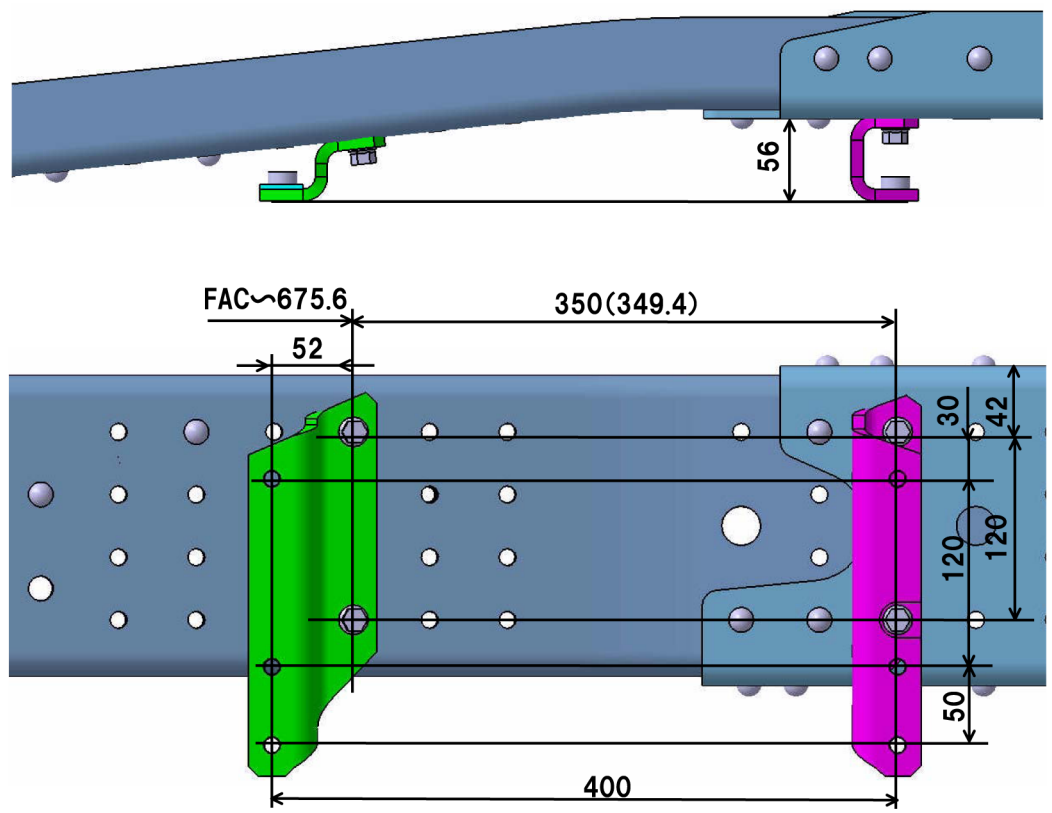
FEC(A Large Capacity type)



FGB



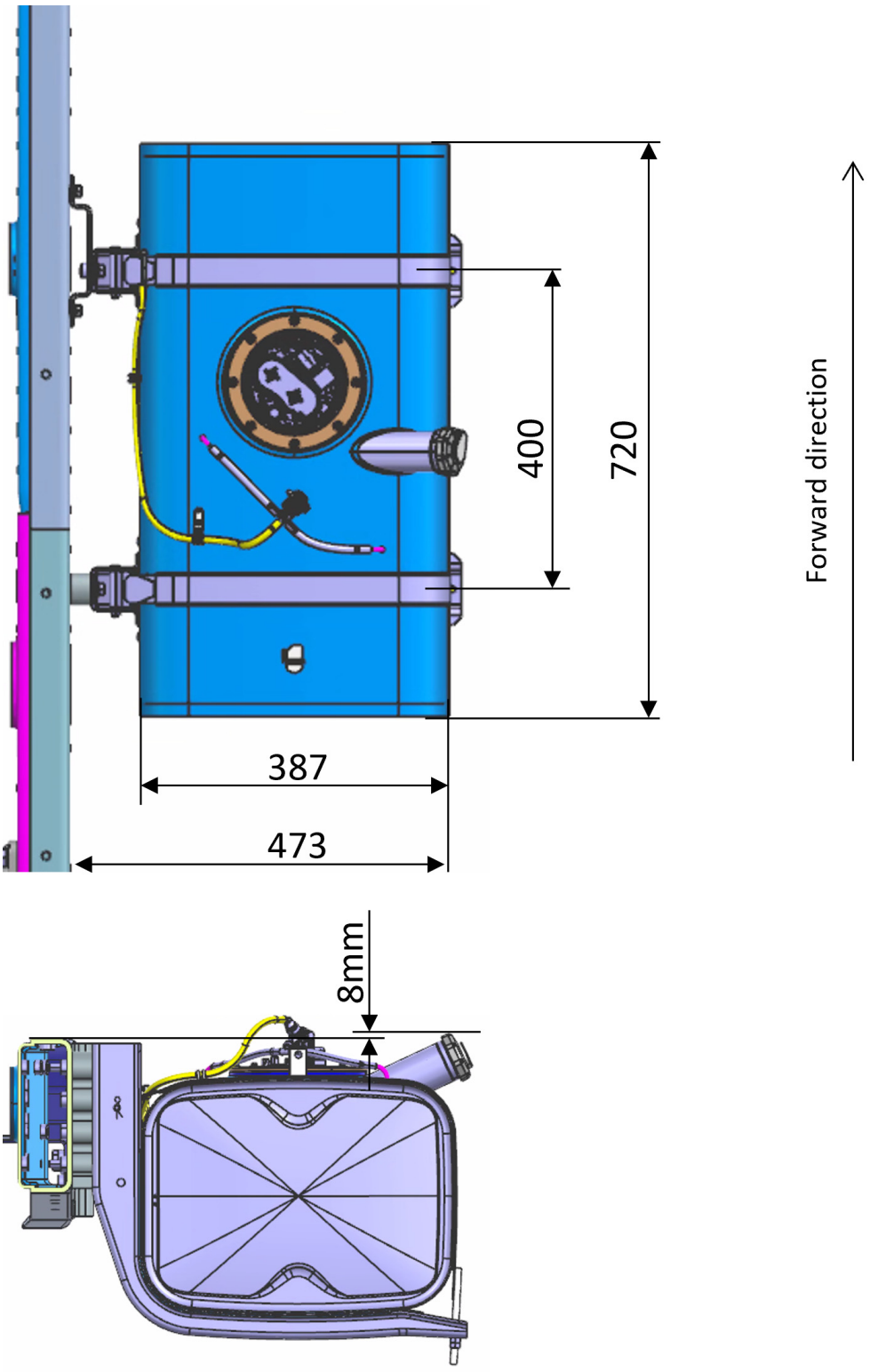
FGB (A Large Capacity type)



10.12 Fuel tank mounting layout

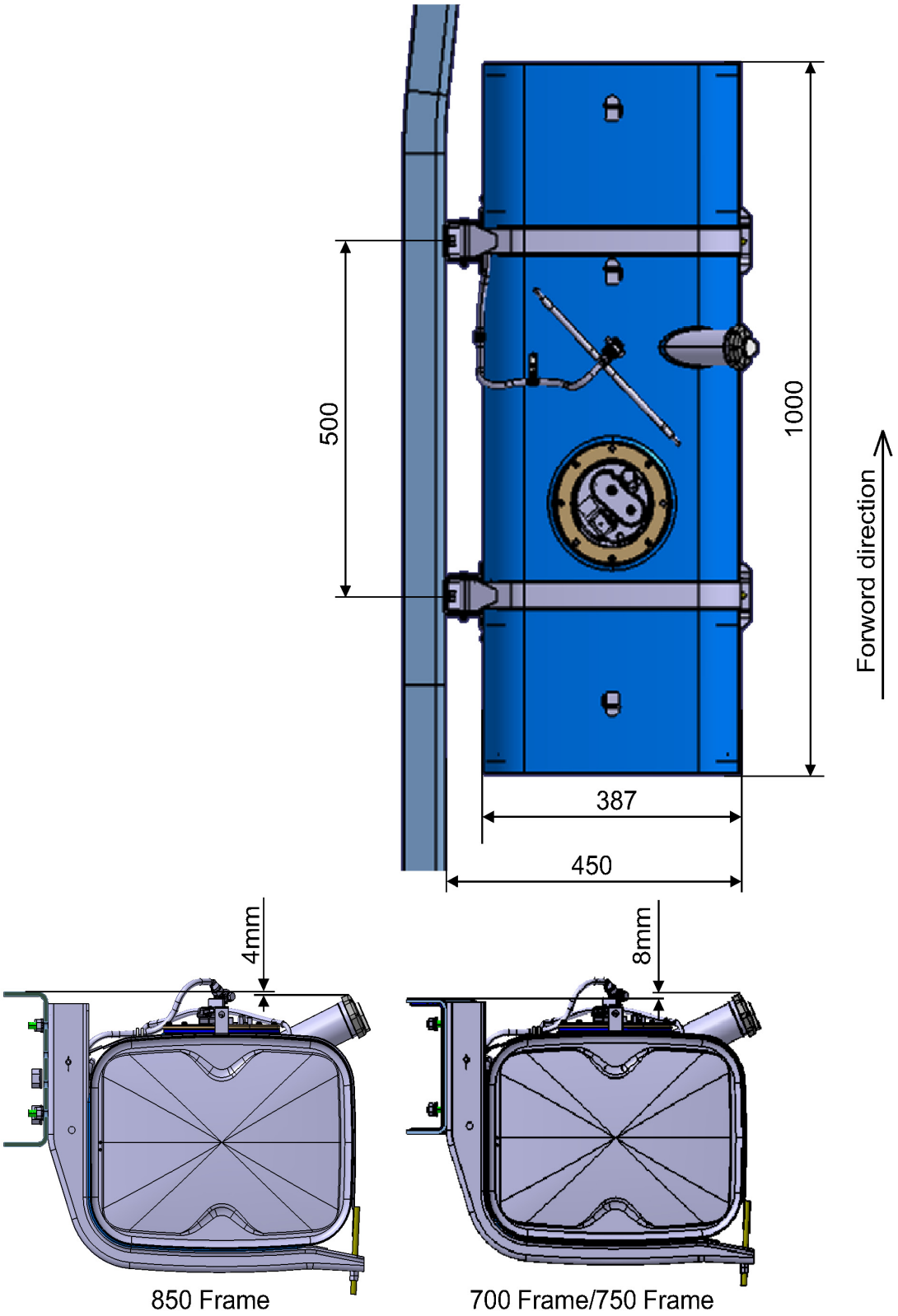
10.12.1 Fuel tank

70-liter tank



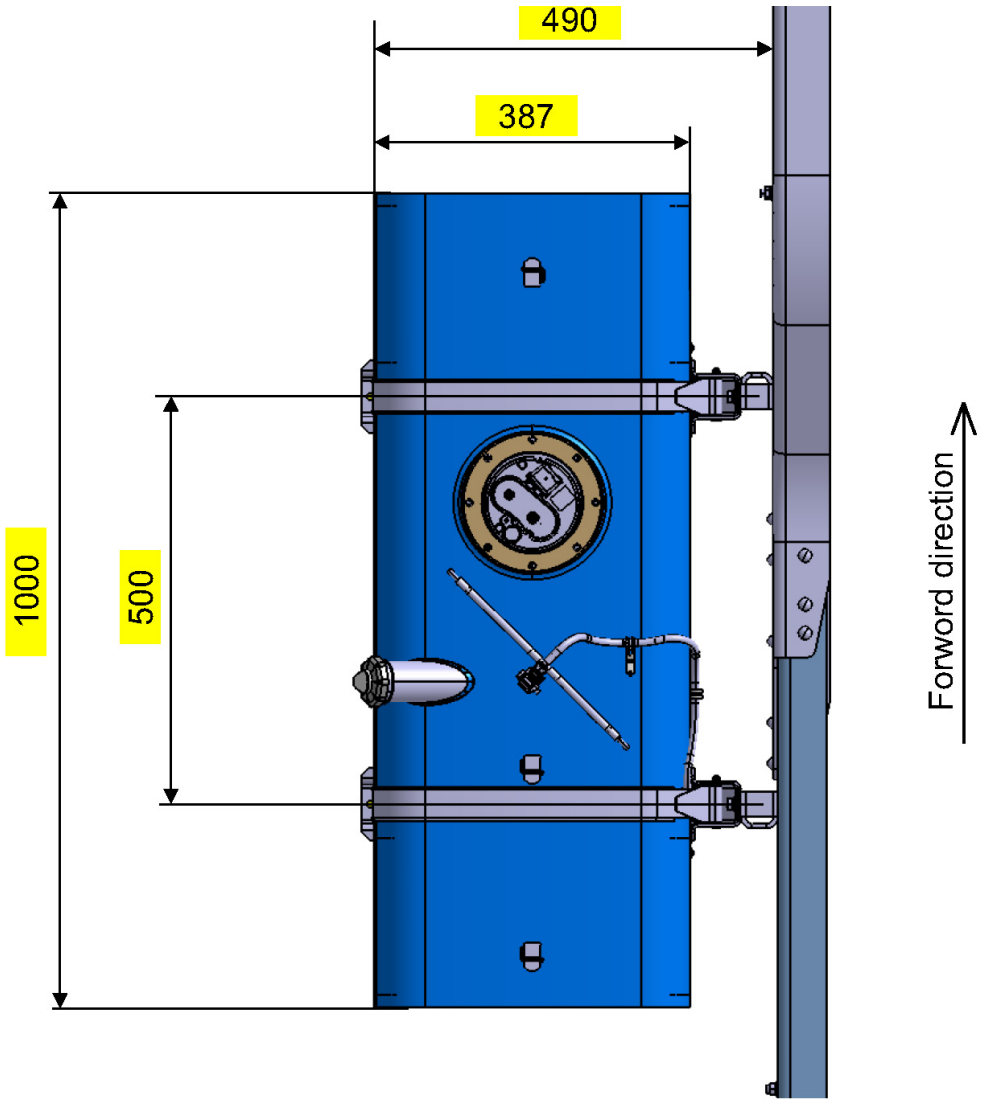
10.12 Fuel tank mounting layout

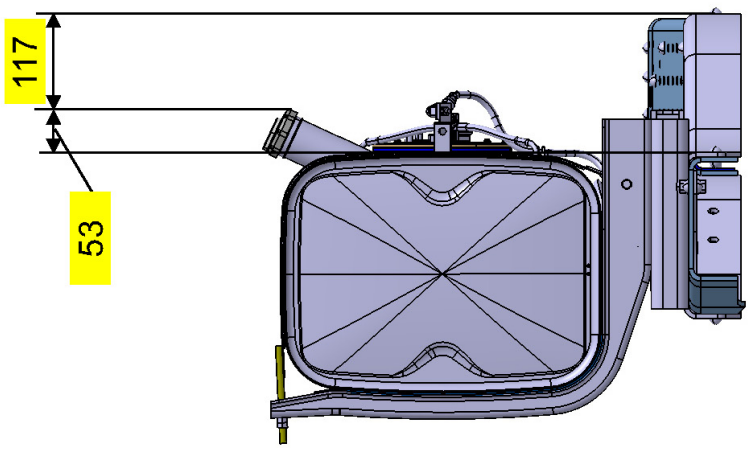
100-liter tank <FE>



10.12 Fuel tank mounting layout

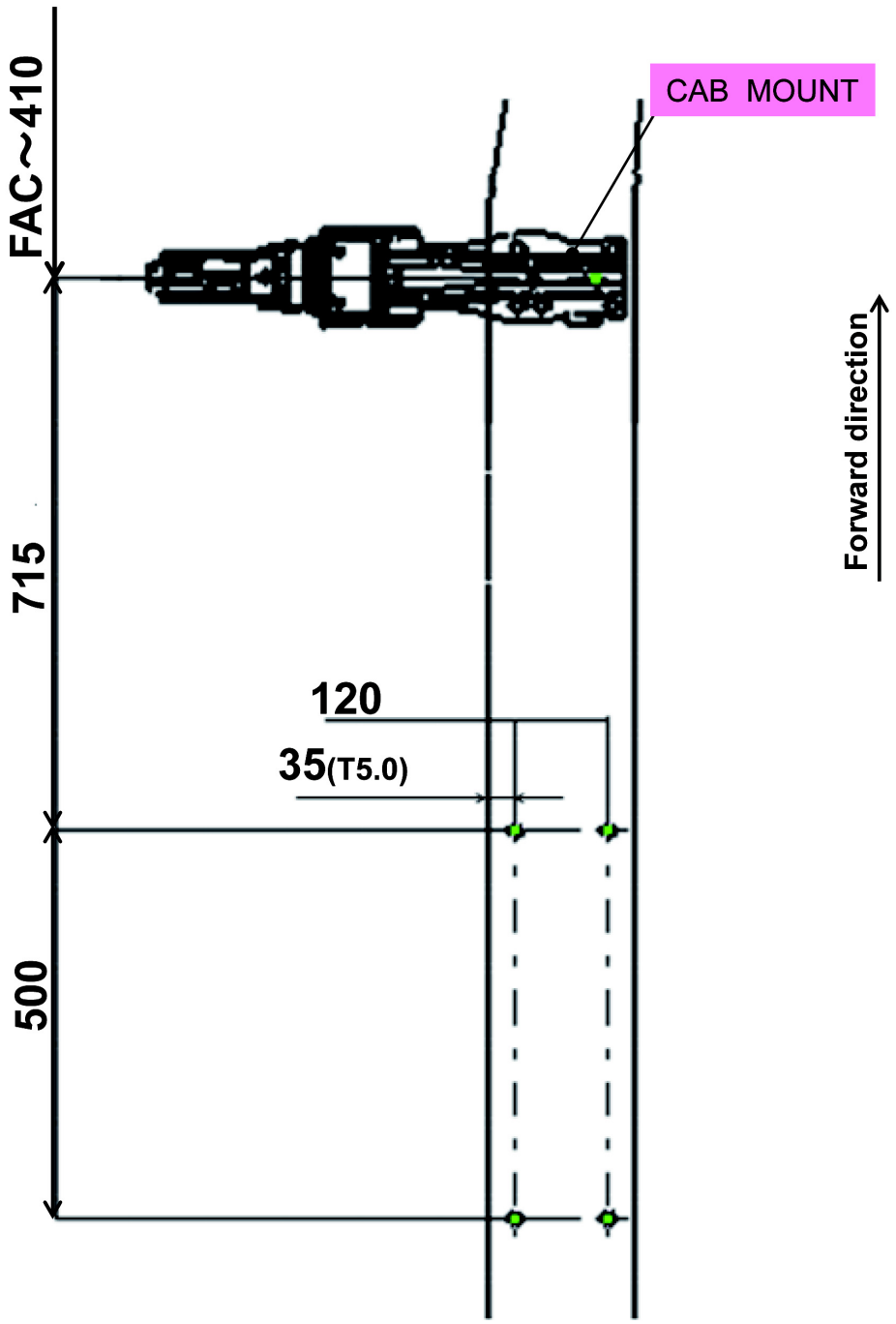
100-liter tank <FGB71E>





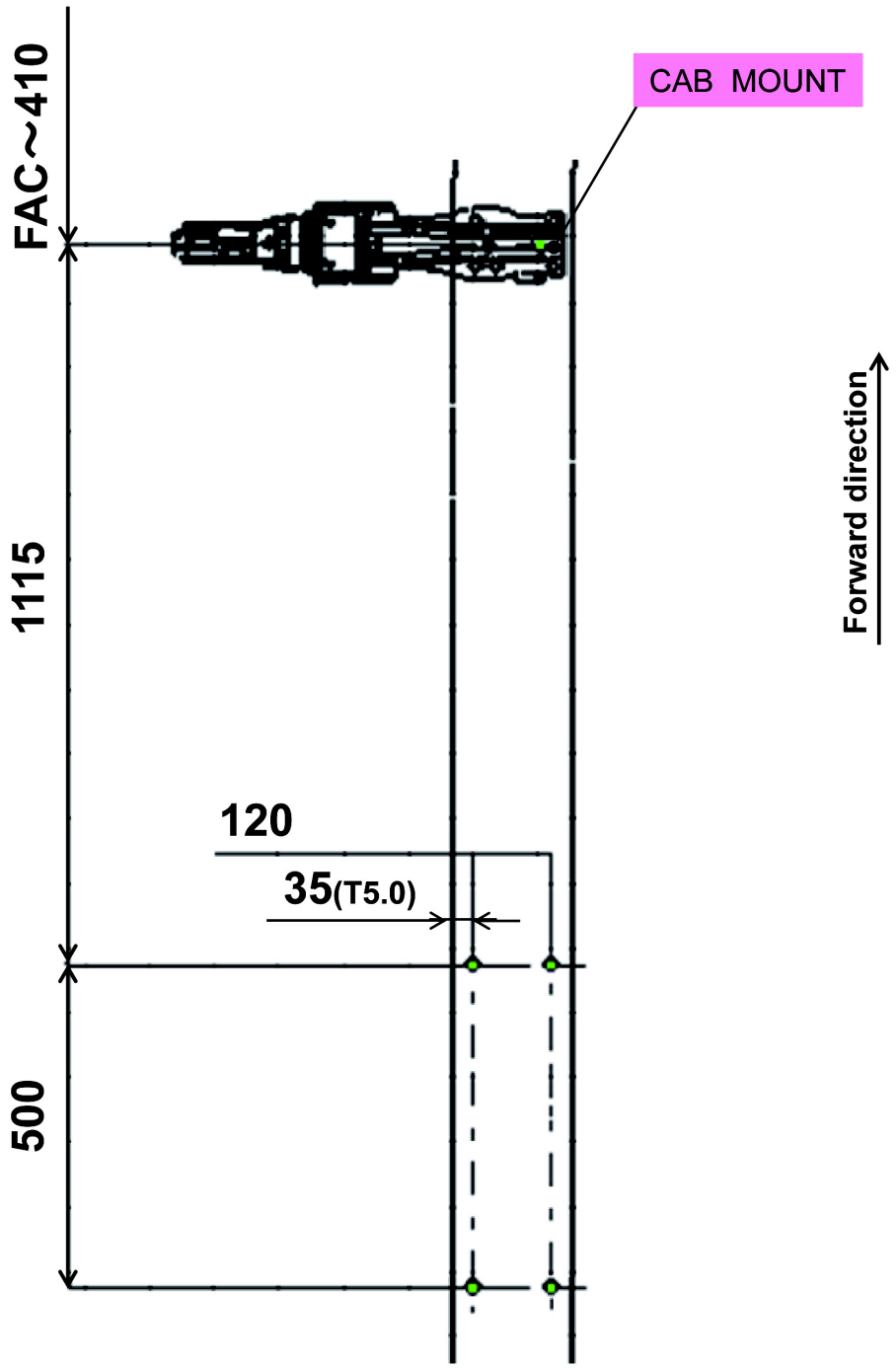
10.12.2 Fuel tank bracket

FEA21C

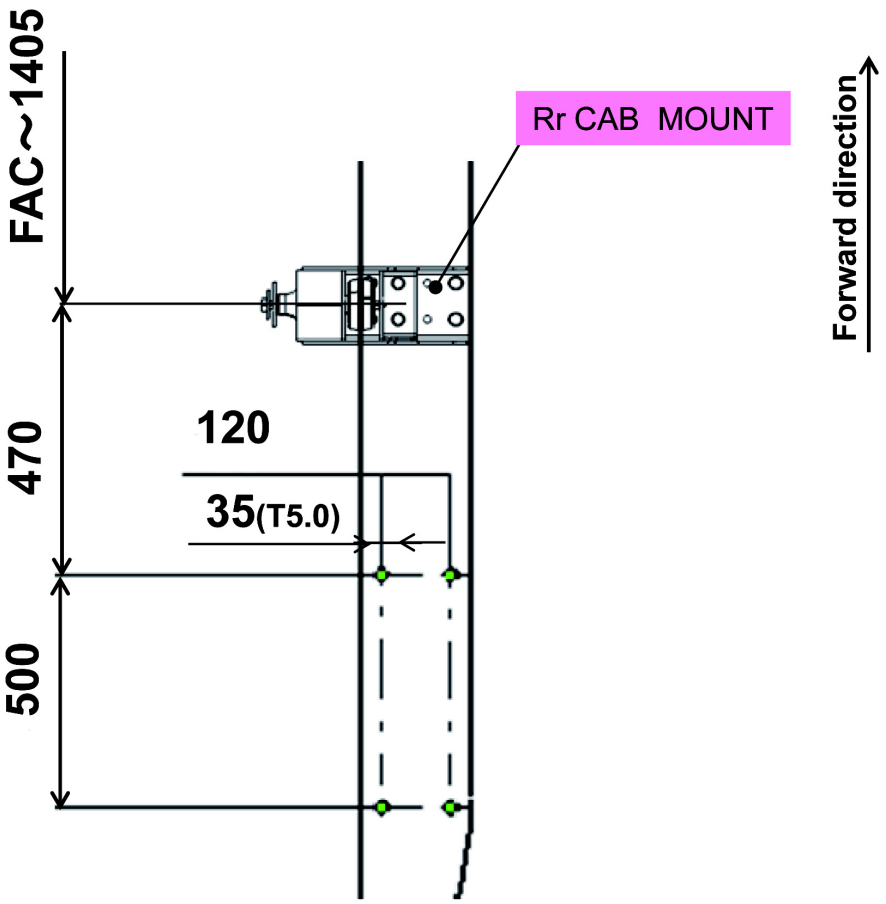


10.12 Fuel tank mounting layout

FEA21E SINGLE CAB

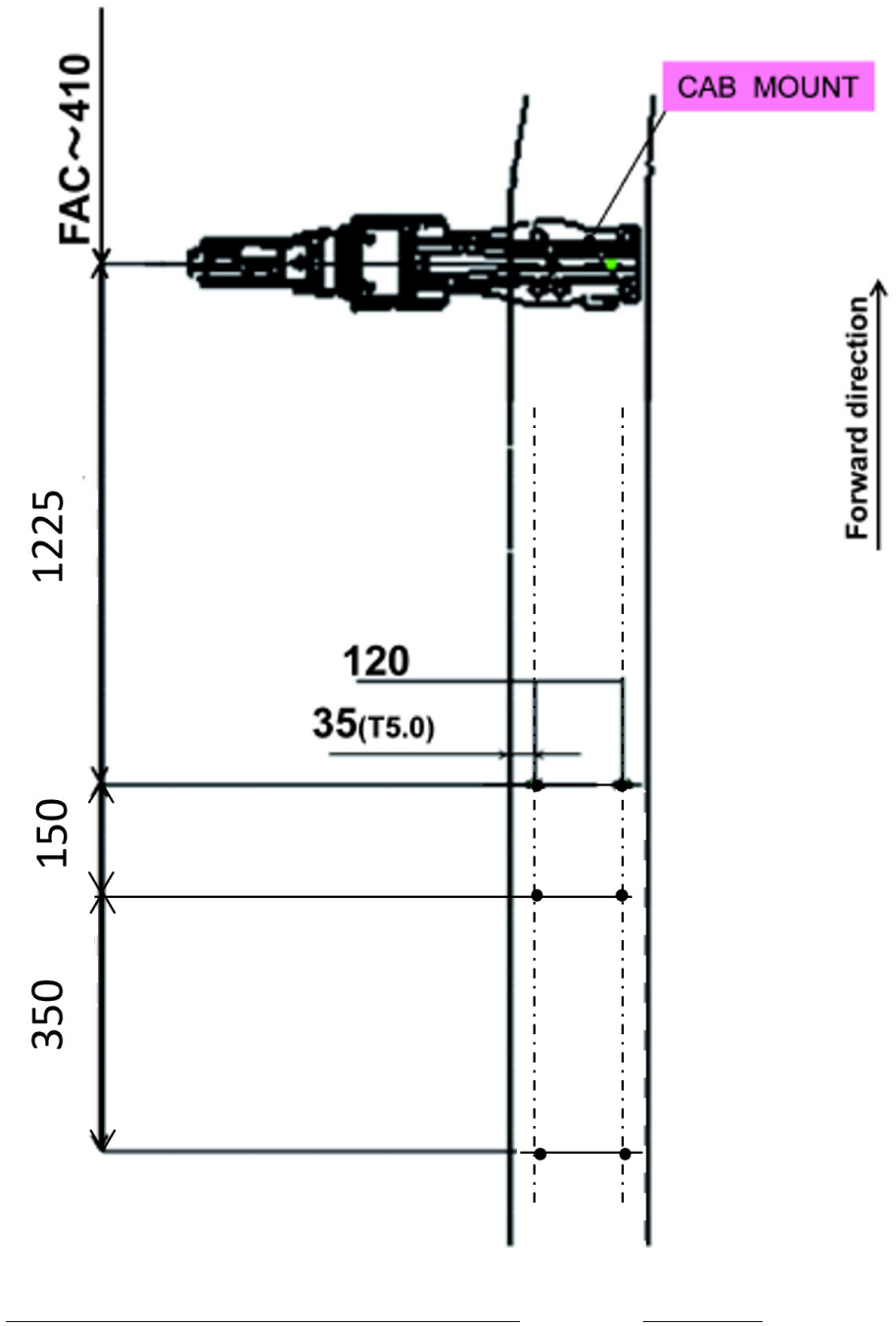


FEA21E CREW CAB



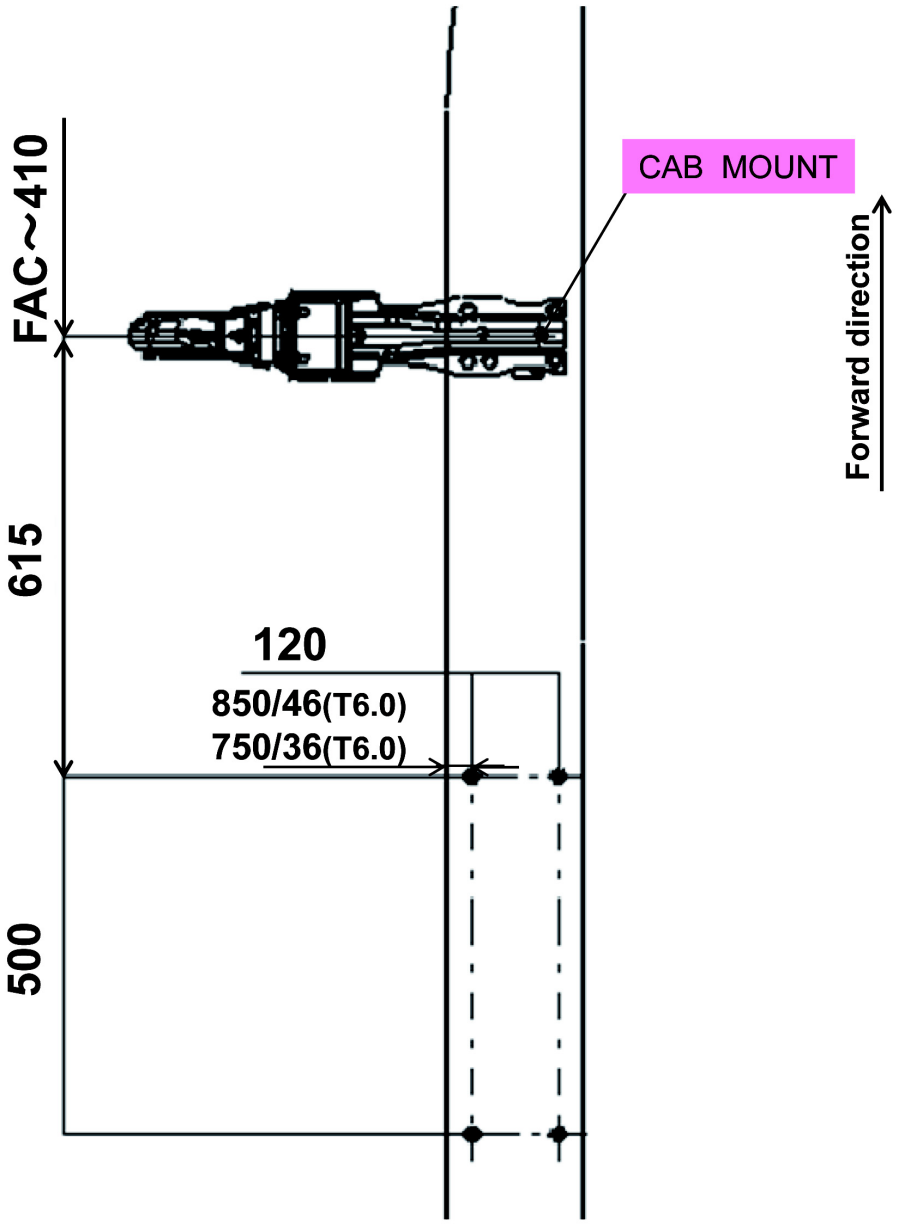
10.12 Fuel tank mounting layout

FEA61B



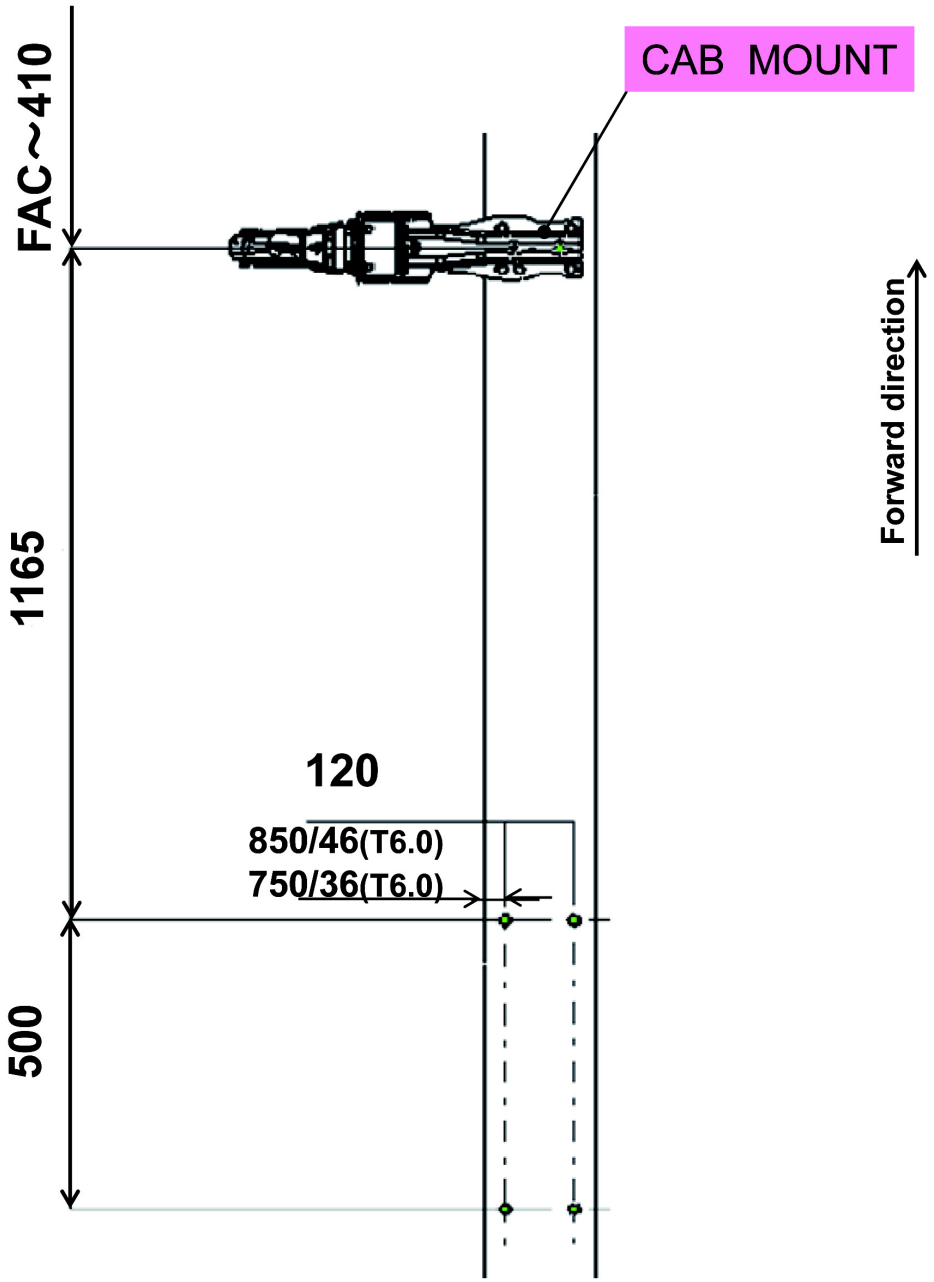
10.12 Fuel tank mounting layout

FEB21C, FEC81C



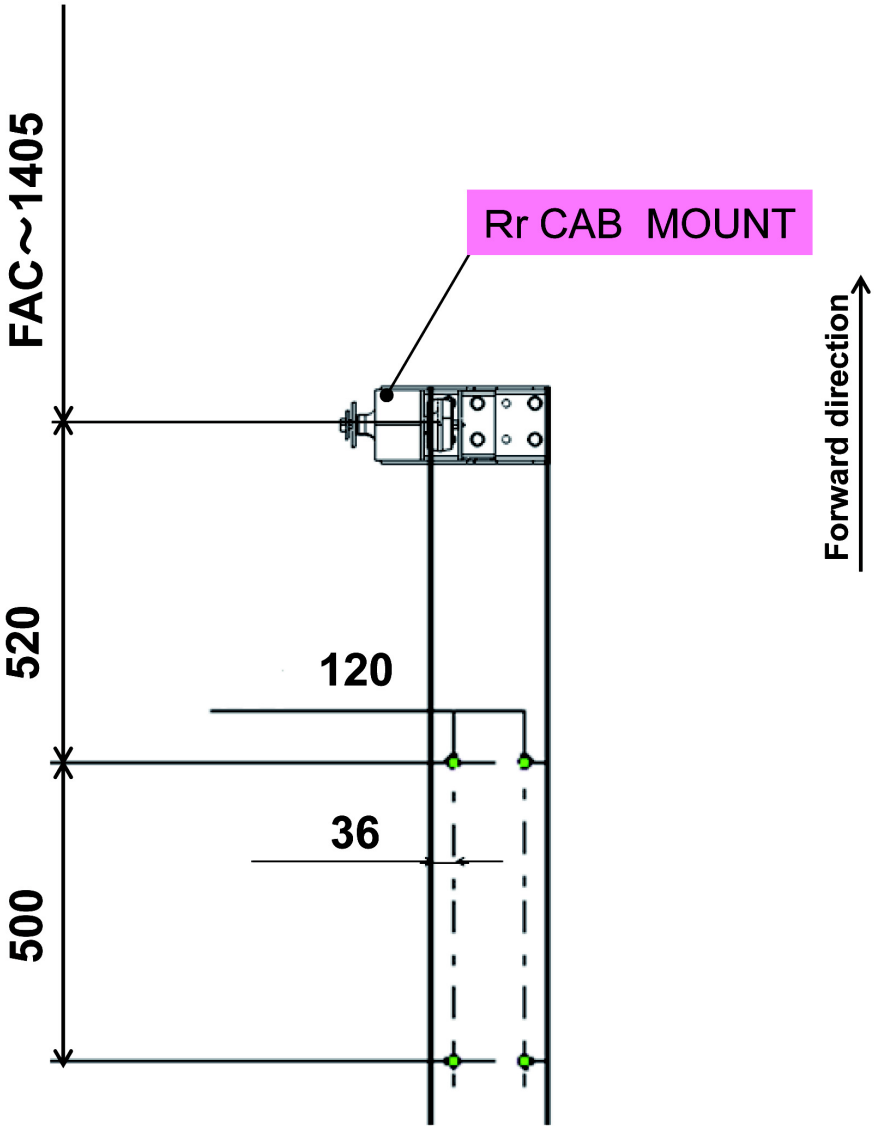
10.12 Fuel tank mounting layout

FEB21E, FEB51E
FEC71E



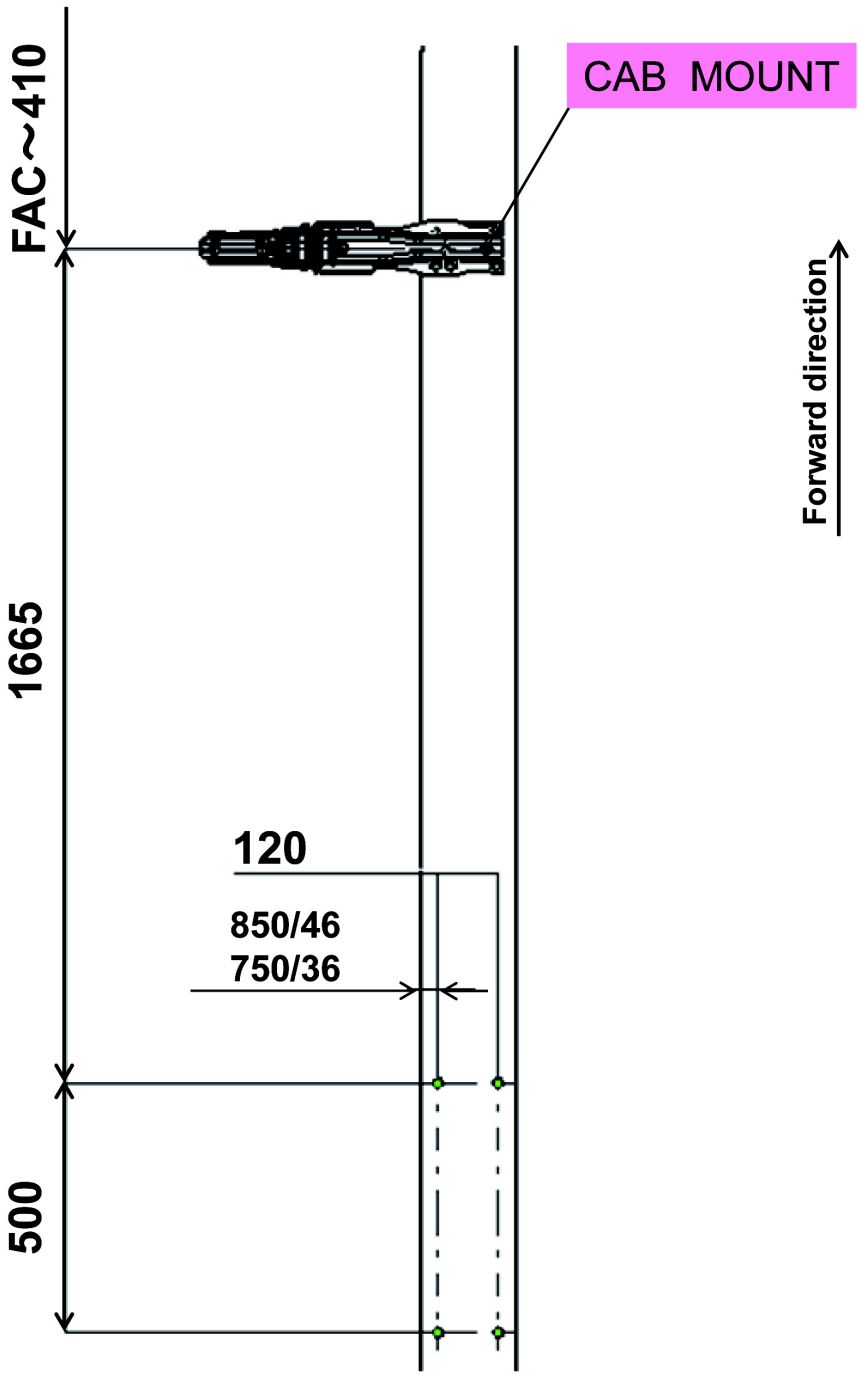
10.12 Fuel tank mounting layout

FEB71E
FEB91E

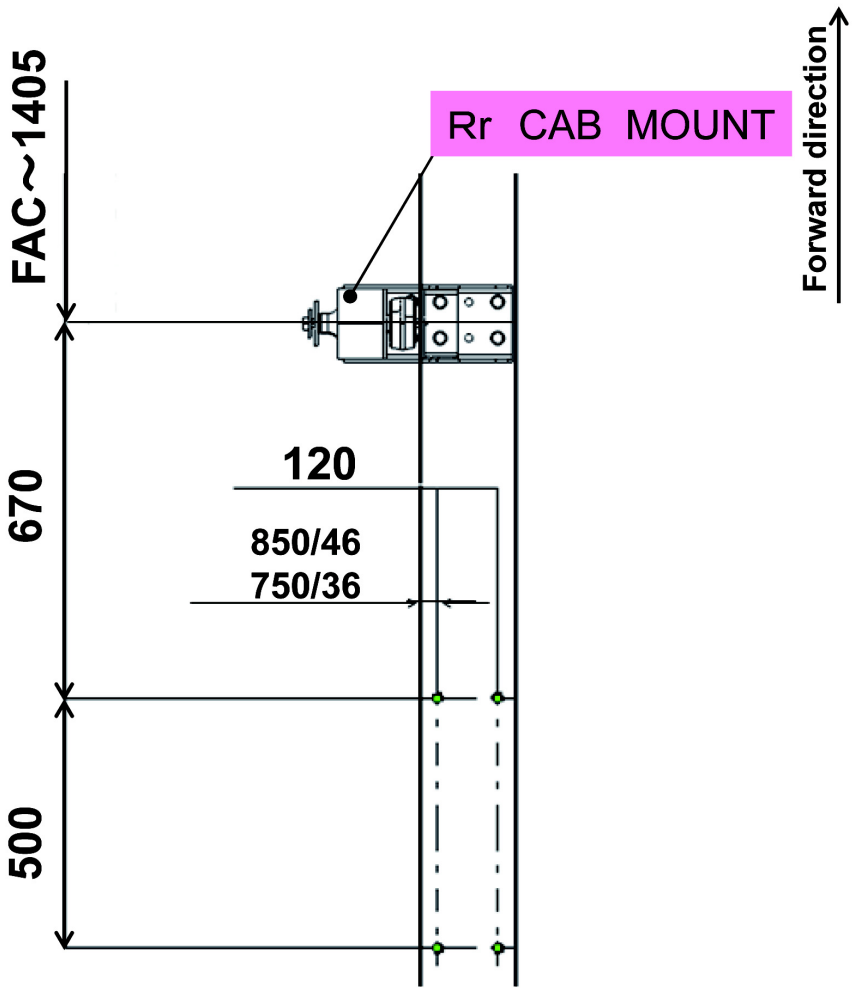


10.12 Fuel tank mounting layout

FEB51G, FEB71G
FECX1G, H,K

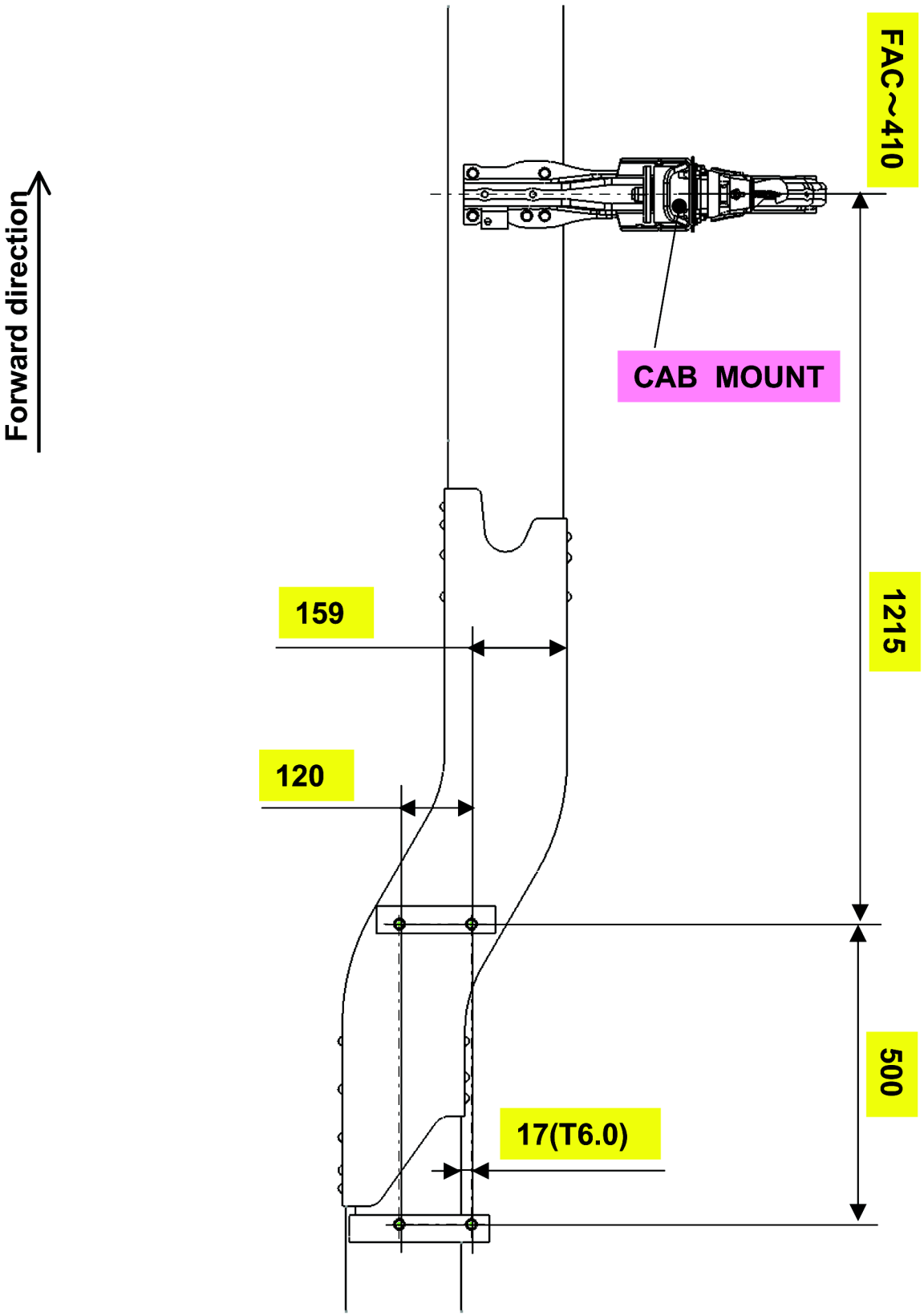


FEB91G


Rr CAB MOUNT
Forward direction
FAC~1405
670
120
850/46
750/36
500

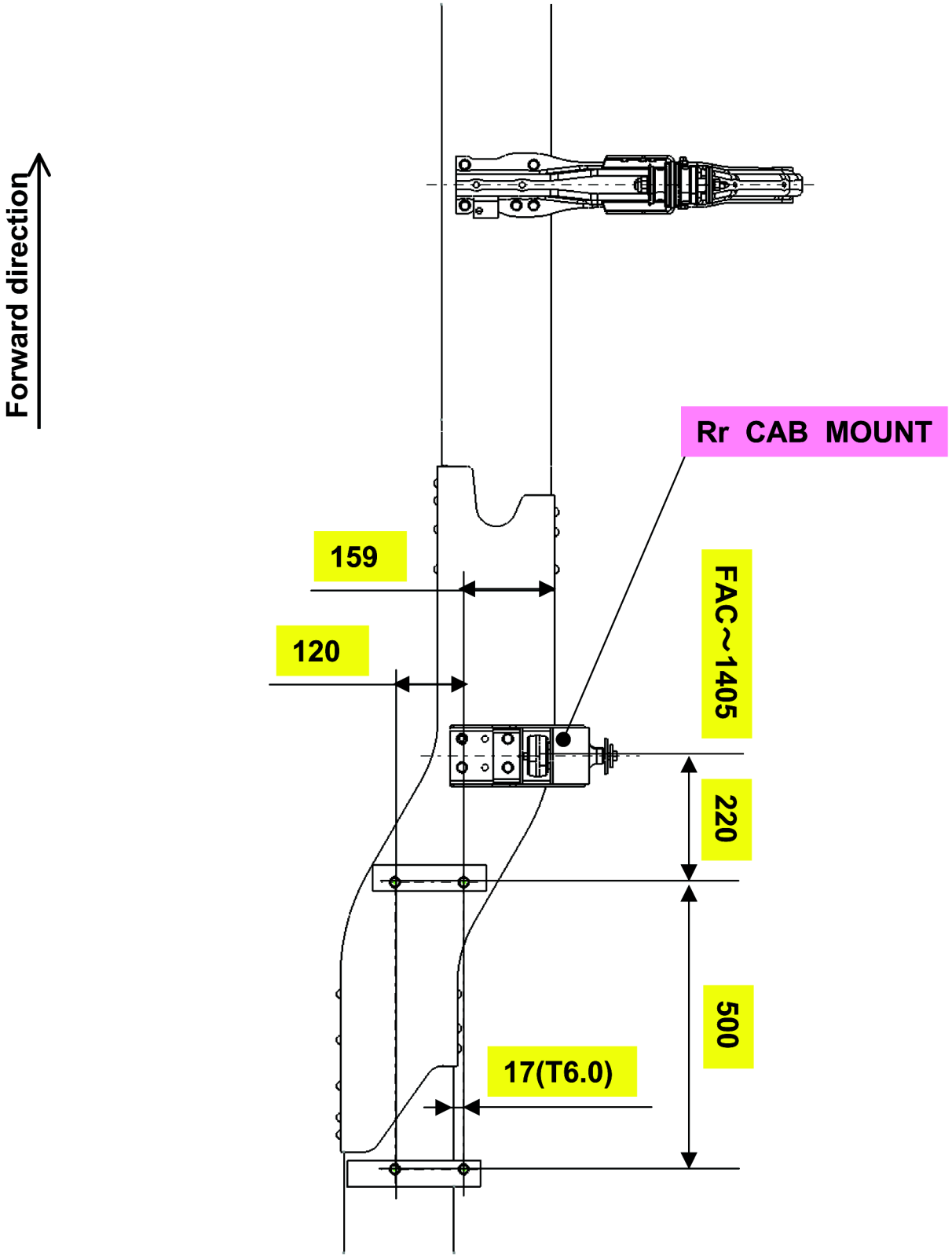
10.12 Fuel tank mounting layout

FGB71E SINGLE CAB



10.12 Fuel tank mounting layout

FGB71E CREW CAB



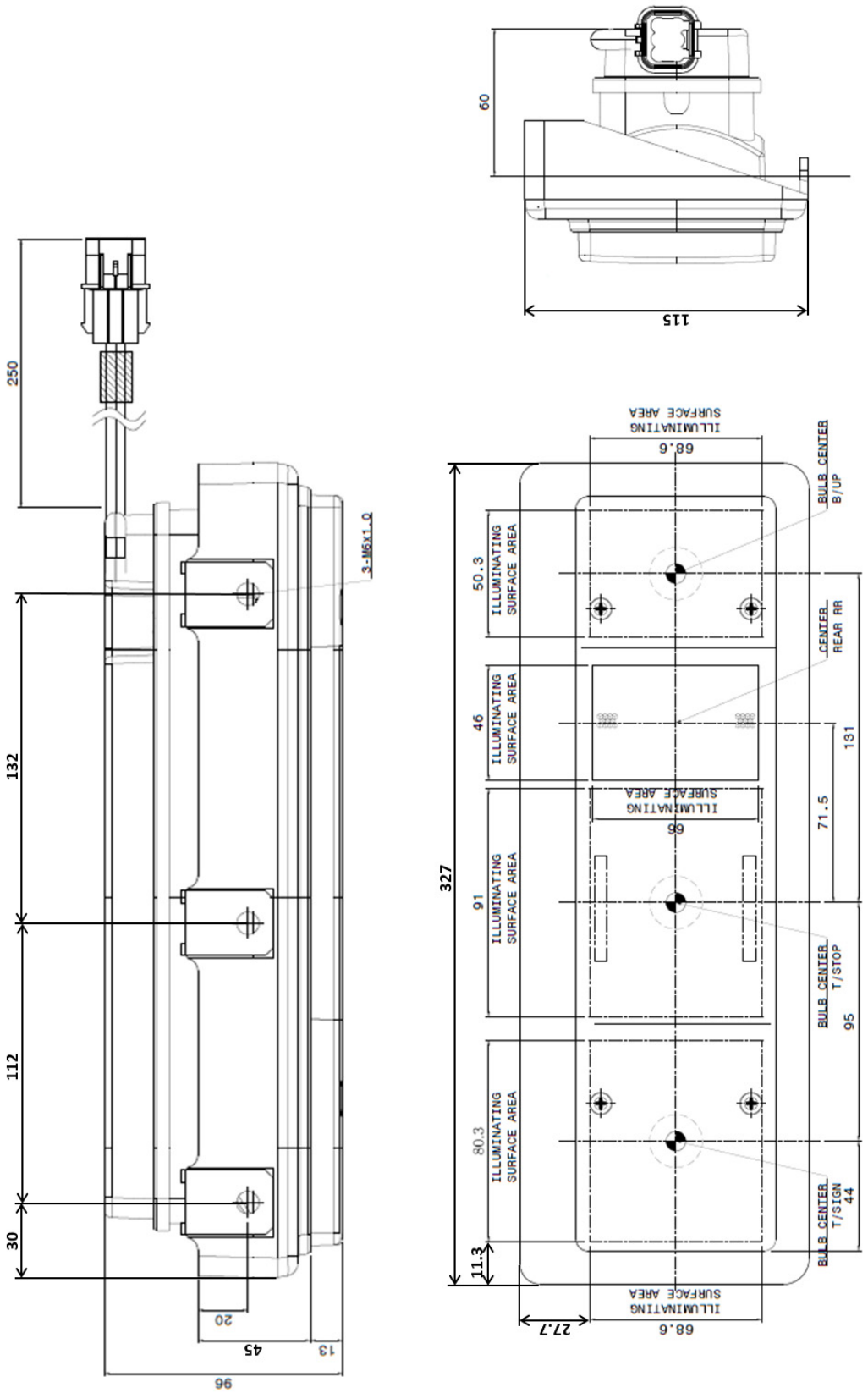
10.13 Electrical systems

See the electrical systems section.

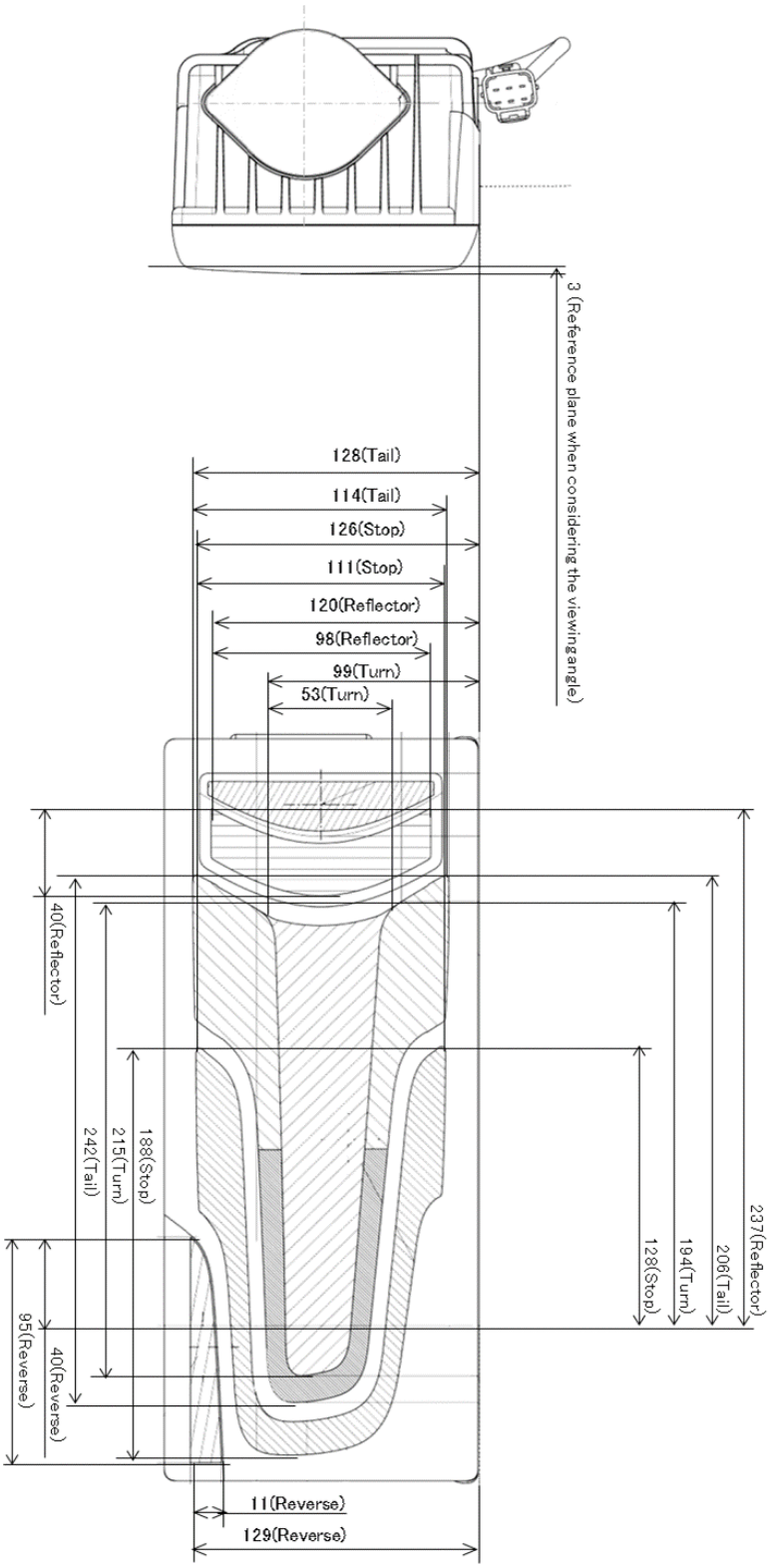
10.14 Other equipment

10.14.1 Installing rear lamps

(1) Rear combination lamp



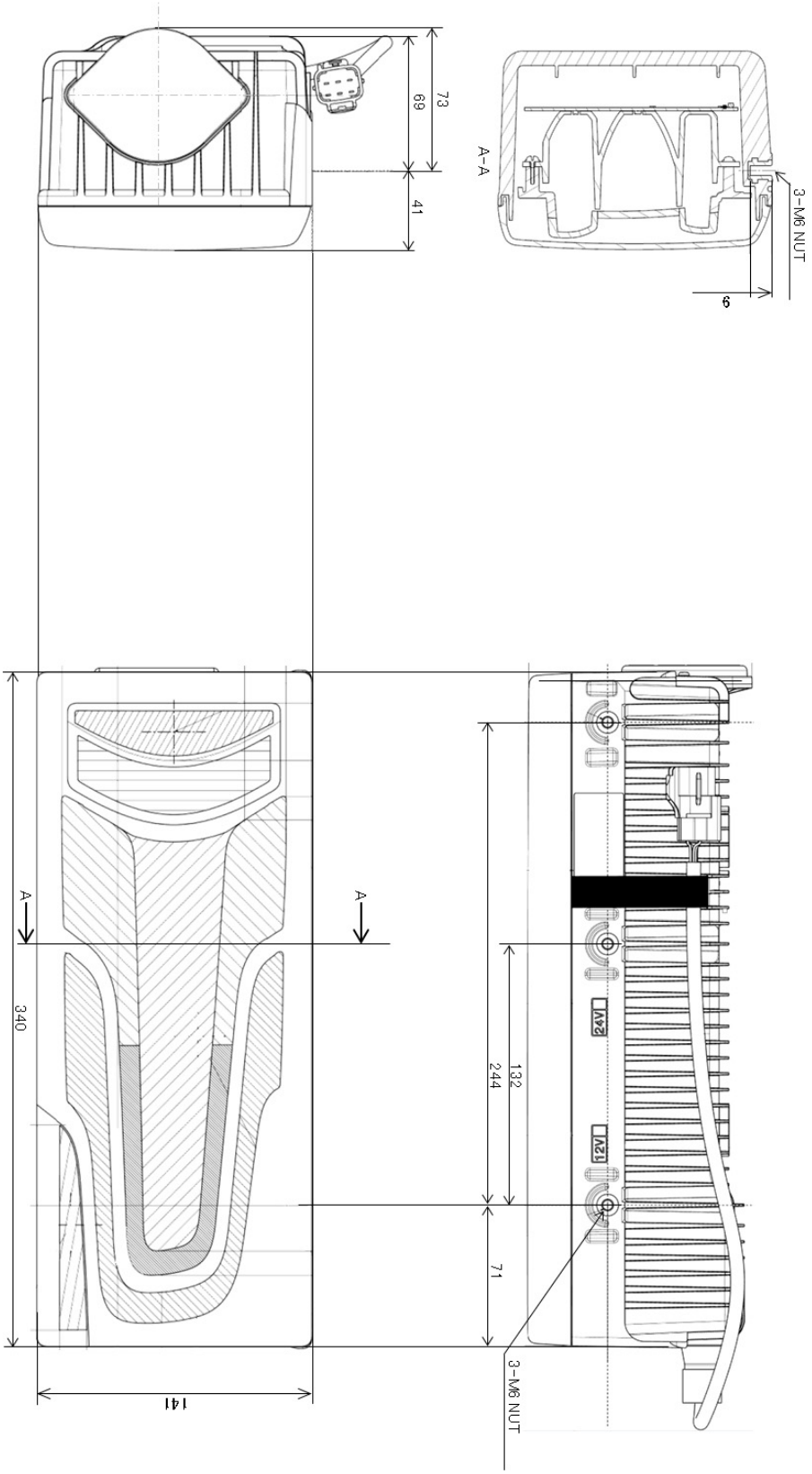
Rear combination lamp (LED type)



This diagram shows installation on the left side, installation on the right side is symmetric to this drawing.
The rear combination lamp is installed to the vehicle as shown below. They are temporarily installed upside down on chassis cab vehicles.

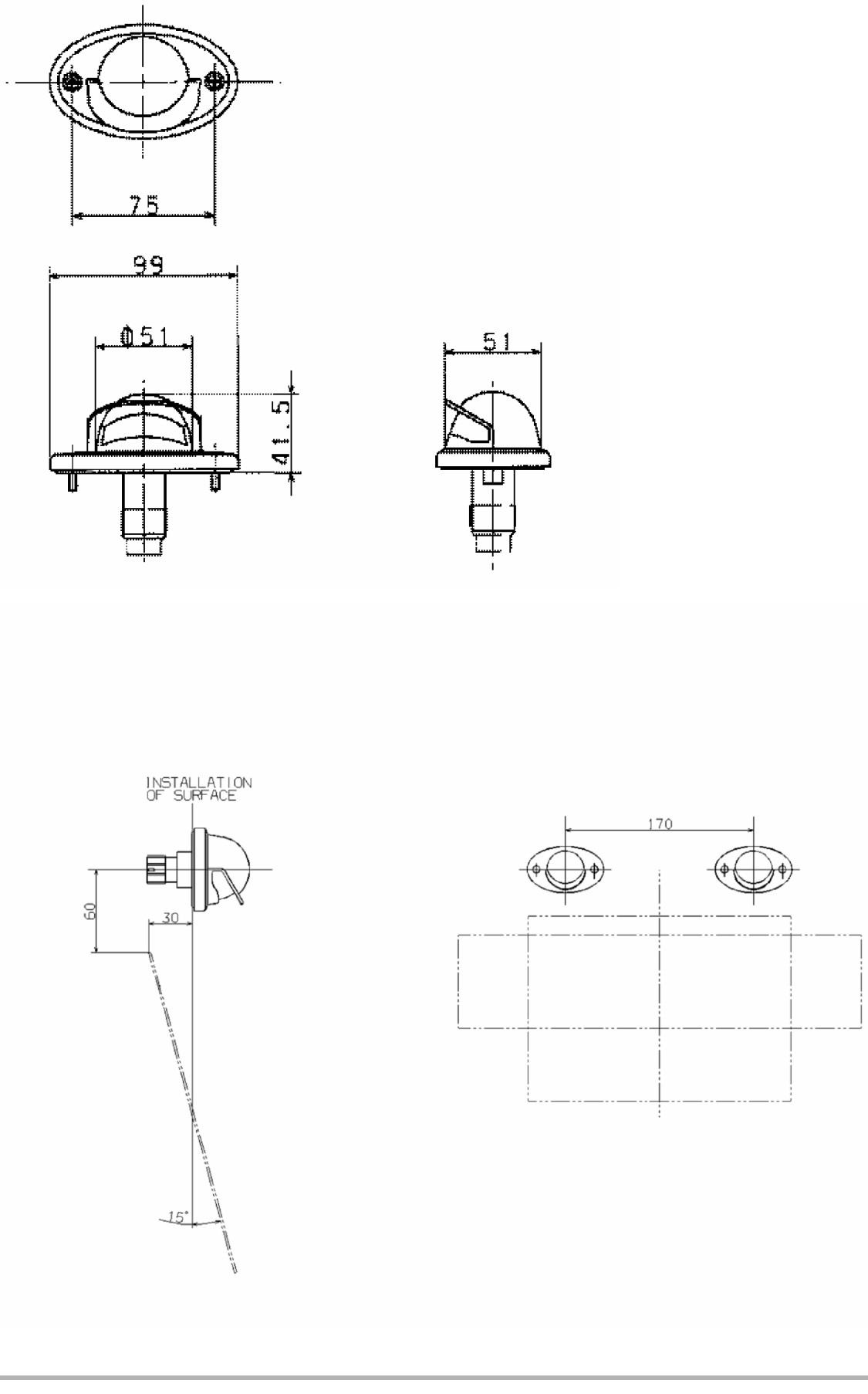
- Use top side installation holes
- Select bolt length suitable for thickness of bracket.

Rear combination lamp (LED type)



- 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



10.14.2 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 ▷ page 219.

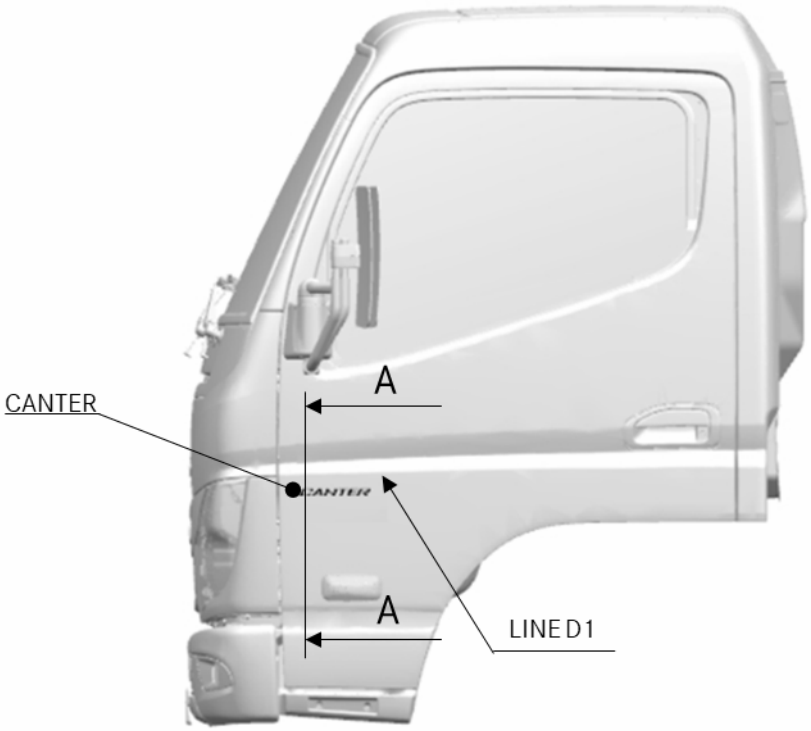
(1) List of the attaching locations of labels and emblems

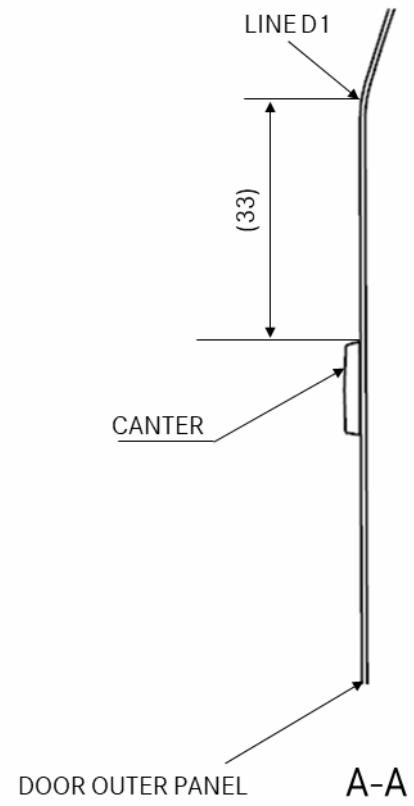
Locations / Description	Front face of cab	RH and LH doors
FUSO	○	–
3-DIA	○	–
CANTER	–	○

NOTE: Types of the label and emblem attaching on a vehicle differ depending on the vehicle types.

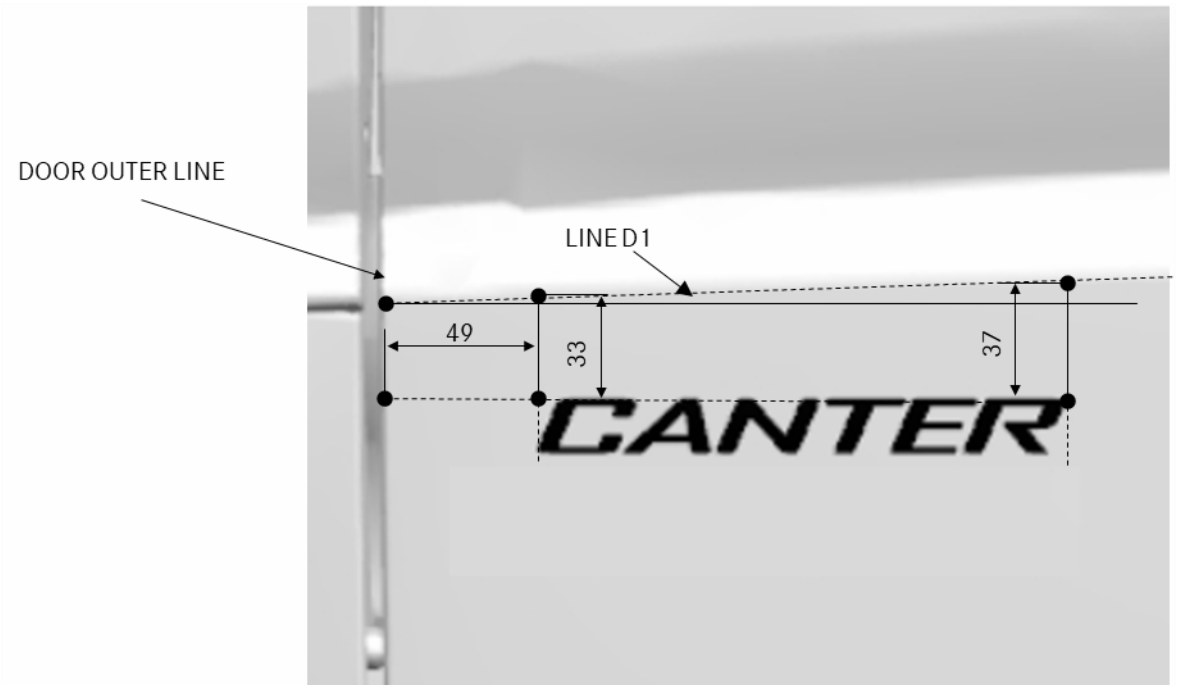
(2) Installation of marks

Clean the indicated areas where the emblems are to be stuck, peel off the backing paper from each sticker, and affix it in position according to the illustration.

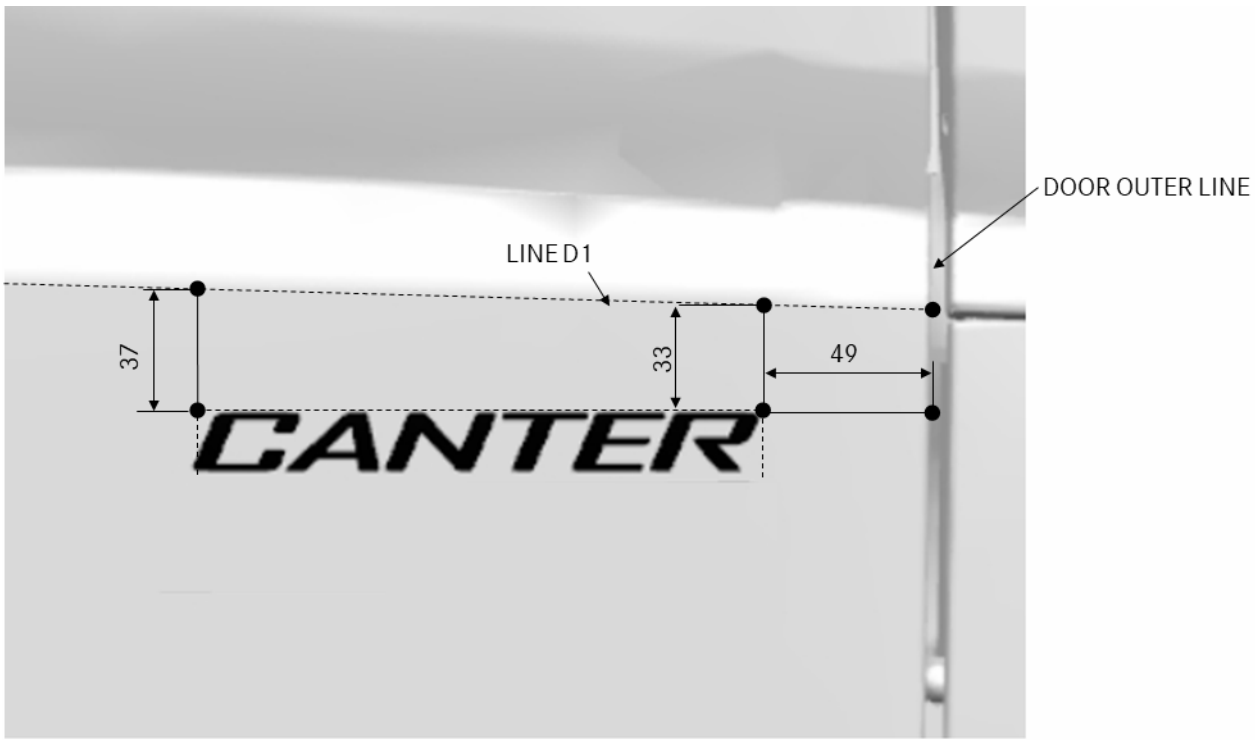




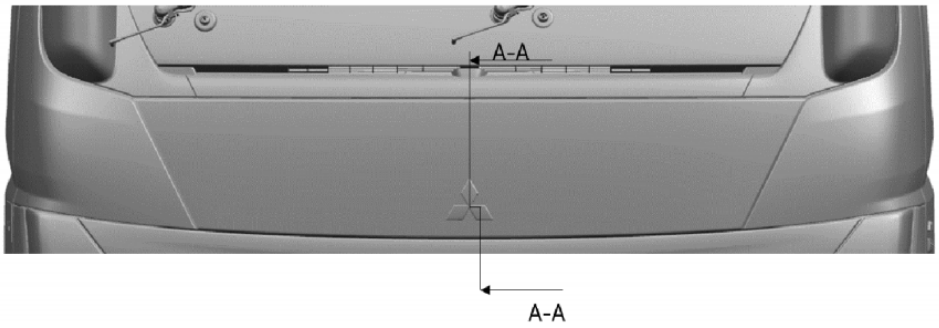
LH


DOOR OUTER LINE
LINE D1
49
33
37
CANTER

RH


DOOR OUTER LINE
LINE D1
37
33
49
CANTER

Attaching procedure of the labels and emblems



(Unit: mm)

Cab width	A
Standard	27
Wide	33

10.14.3 Outside mirror

There is a limitation on rear body width for outside Mirror and Lamps.

Outside mirror

The vehicle is shipped from the factory with the outside 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.

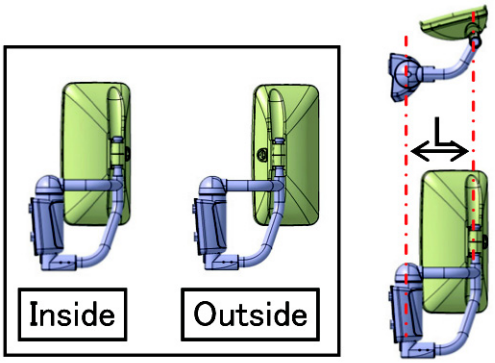


Fig. 1

STAY LENGTH	L(mm)
Short	170
Long	290

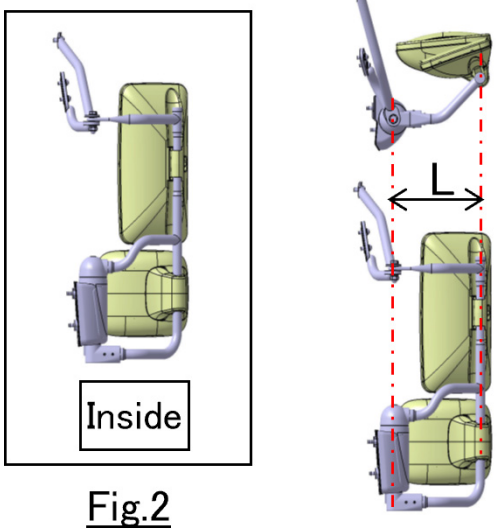


Fig.2

STAY LENGTH	L(mm)
Short	205
Middle	297.5
Long	390

Table 1: Mirror setting positions corresponding to stay length and rear body width

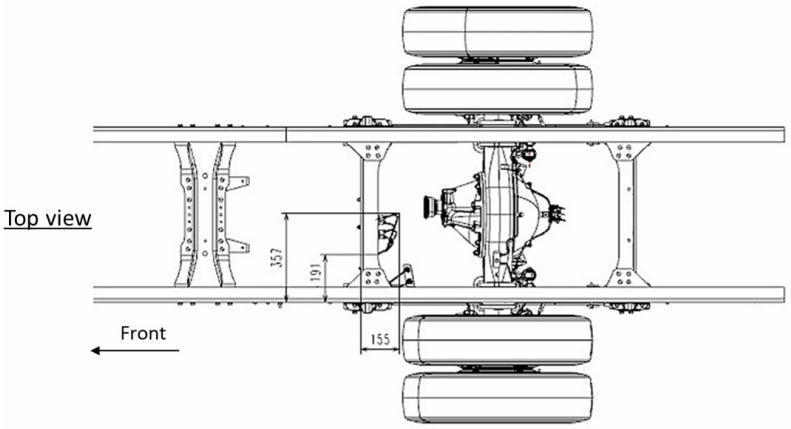
MODEL	CAB TYPE	STAY LENGTH	MIRROR SET	REAR BODY WIDTH (mm)	Type
FEA	Standard	Short	Inside Set	1710 to 1870	Fig.1
			Outside Set	1870 to 2000	
		Long	Inside Set	2000 to 2100	
			Outside Set	2100 to 2200	
FEB, FEC (2WD[GVW≤7.5t])	Wide	Short	Inside Set	2000 to 2150	
			Outside Set	2150 to 2280	
		Long	Inside Set	2280 to 2400	
			Outside Set	2400 to 2550	
FGB (4WD[GVW≤7.5t]) FEB9, 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	

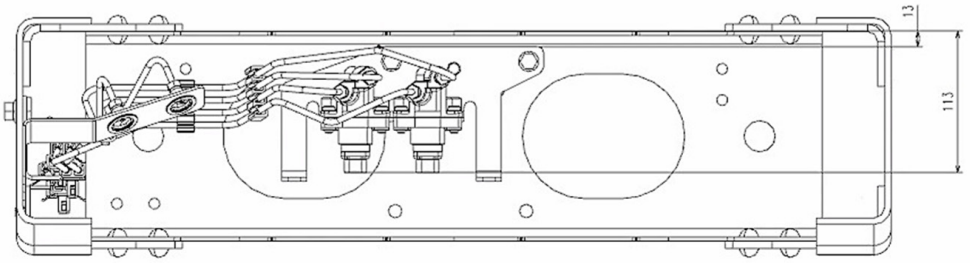
* Consult an authorised dealer if the rear body width is not within the ranges shown above.

10.14.4 AUS valve

<With Hill Holder>

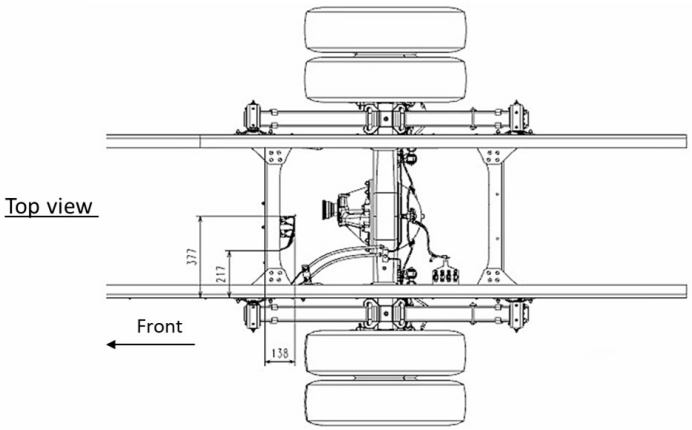
FEA

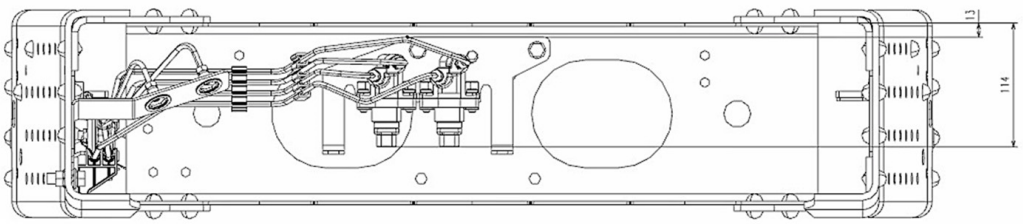




Rear view

FEB

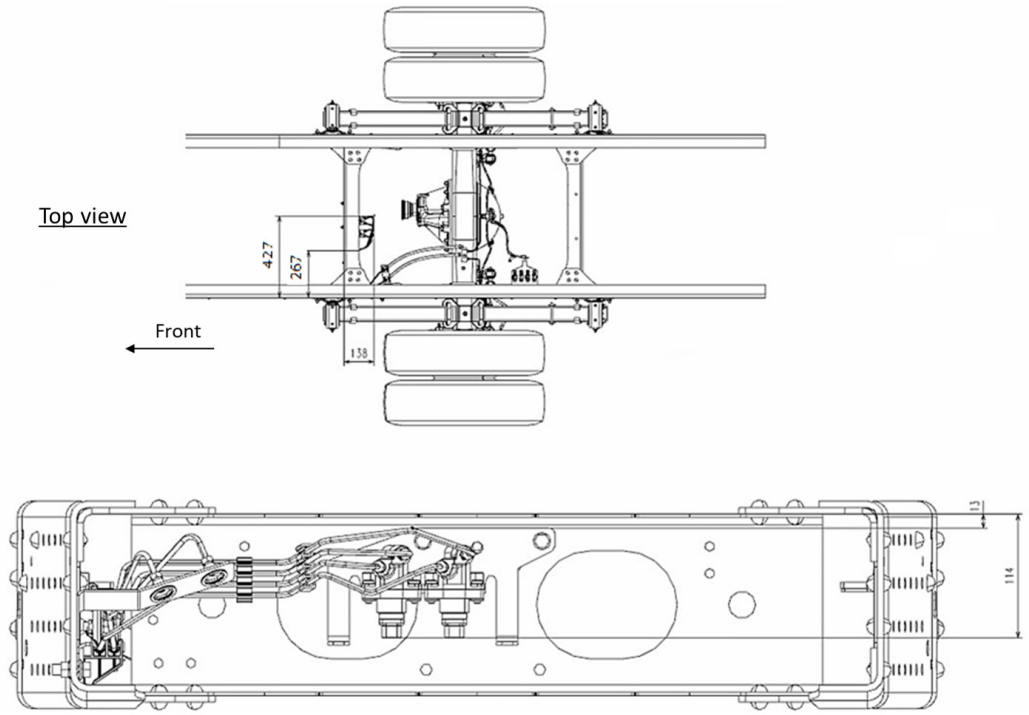




Rear view

10.14 Other equipment

FEC



Rear view

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Revision record <Technical data section>

–	04. July. 2025	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>

CANTER

Australia

MITSUBISHI FUSO TRUCK & BUS CORPORATION

July. 2025 TL2FA_F

Body/equipment mounting directives
Electrical systems section
Australia

MITSUBISHI FUSO TRUCK & BUS CORPORATION
September. 2025 TL2FA

10.13 Electrical systems

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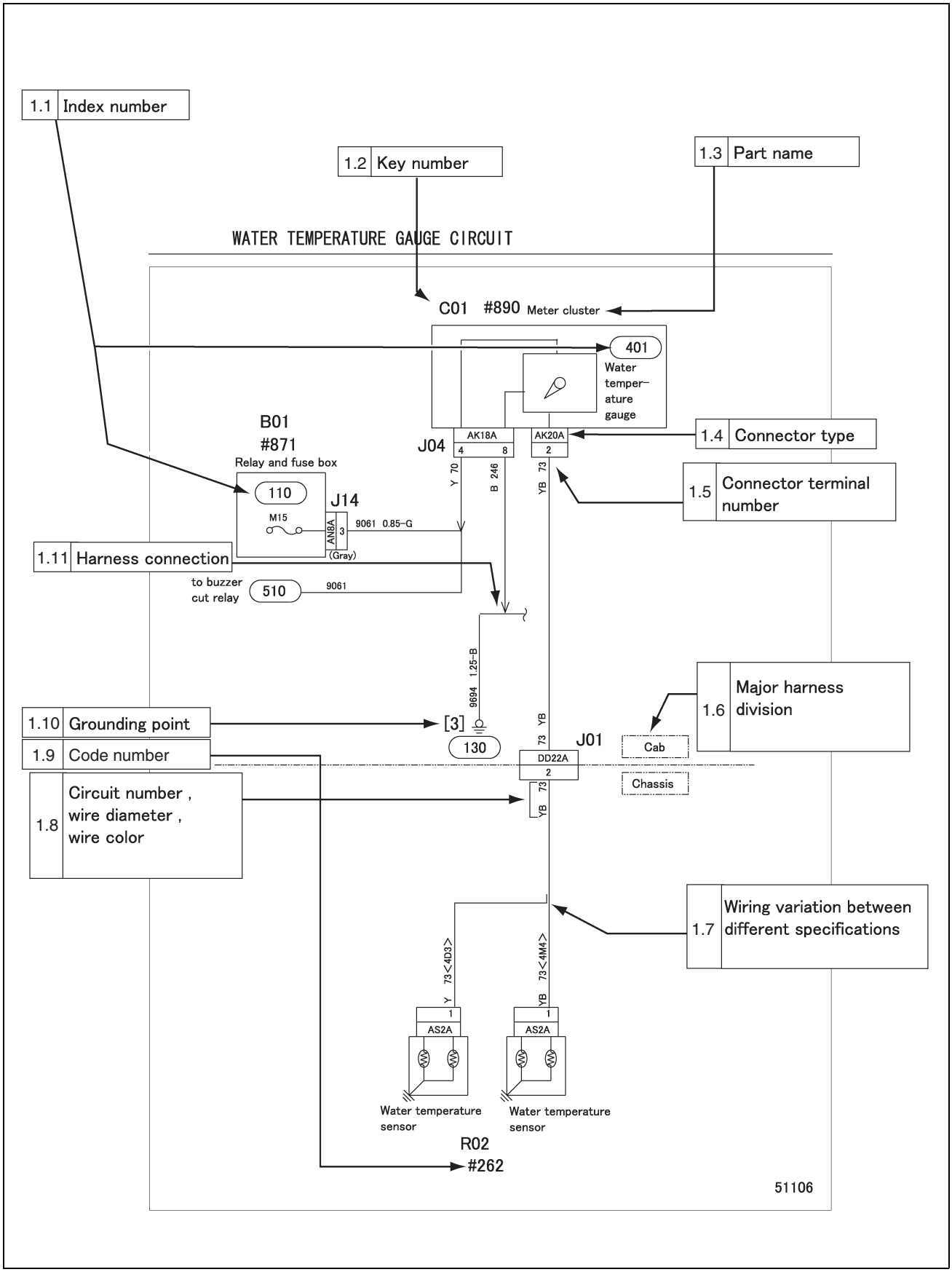
10.13 Electrical systems

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

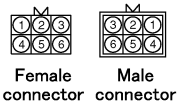
- Key numbers indicate parts installation locations. The installation location of an electrical equipment can be easily found using its key number shown in a circuit diagram.
  All of the electrical equipment installation locations are listed in Gr54-10. (Group Number Service Manual)

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.

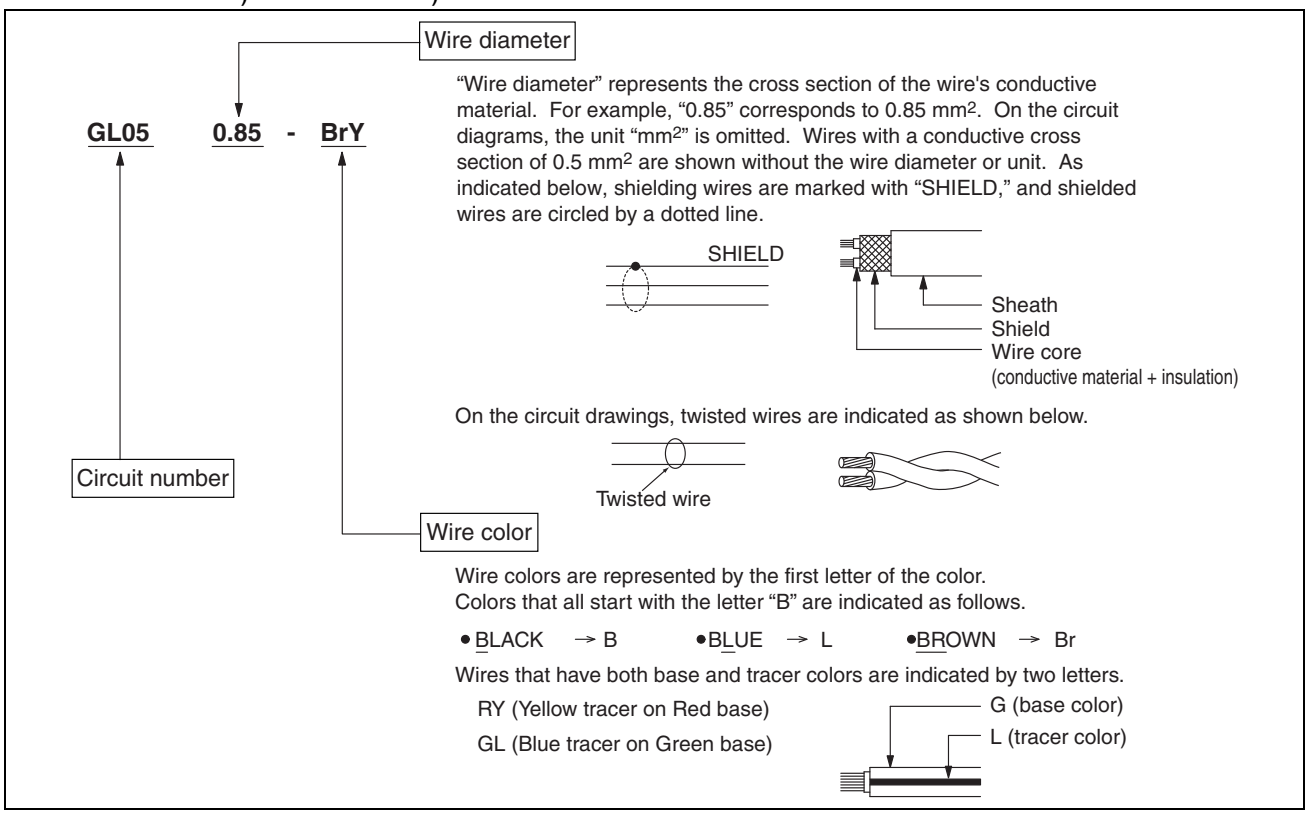
1.6 Major harness division

- 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 color



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 Grounding point: [1] - [99]

- Locations where wires are grounded to the vehicle. All of the grounding points are listed in (130). (Index number Service Manual)

1.11 Harness connection

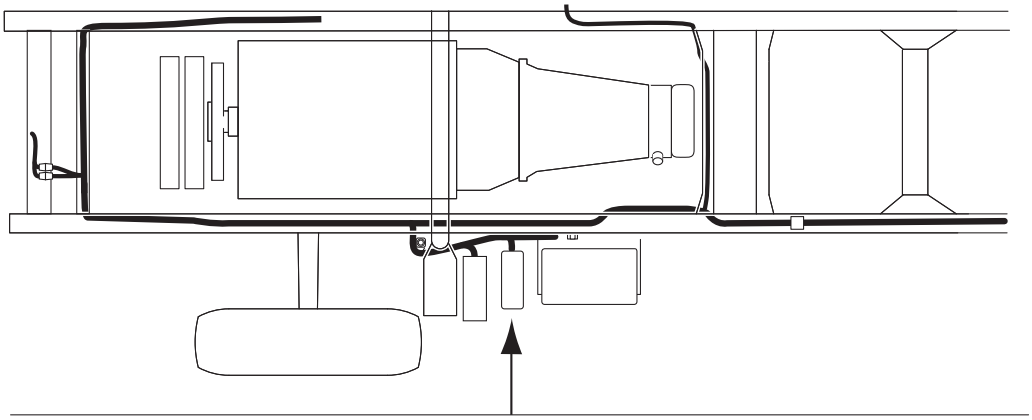
- The arrow in the wiring diagram indicates where harnesses are connected, and NOT the flow of electricity.

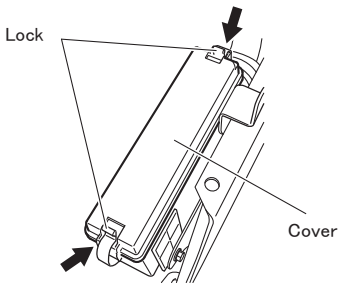
Wire color

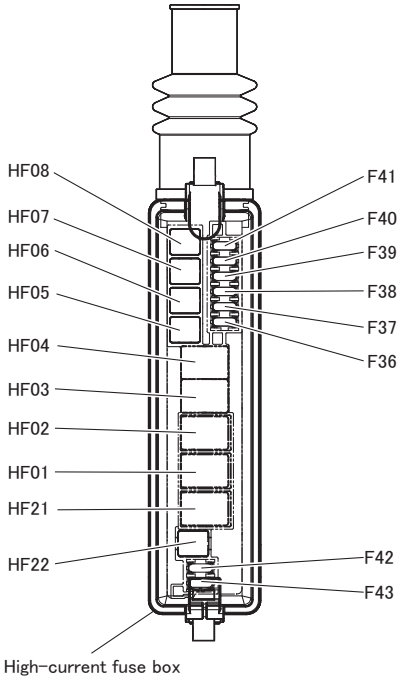
Wire color		Insulation color + tracer											
B	Black	BW	Black/ white	BY	Black/ yellow	BR	Black/red	BG	Black/ green	BL	Black/ blue		
Br	Brown	BrW	Brown/ white	BrB	Brown/ black	BrY	Brown/ yellow	BrR	Brown/ red	BrG	Brown/ green		
G	Green	GW	Green/ white	GR	Green/ red	GY	Green/ yellow	GB	Green/ black	GL	Green/ blue	GO	Green/ orange
Gr Gy	Gray	GrL GyL	Gray/ blue	GrR GyR	Gray/ red								
L	Blue	LW	Blue/ white	LR	Blue/red	LY	Blue/ yellow	LB	Blue/ black	LO	Blue/ orange	LG	Blue/ green
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				
Pu	Purple												
R	Red	RW	Red/ white	RB	Red/ black	RY	Red/ yellow	RG	Red/ green	RL	Red/blue	RO	Red/ orange
Sb	Sky blue												
V	Violet	VY	Violet/ yellow	VW	Violet/ white	VR	Violet/red	VG	Violet/ green				
W	White	WR	White/ red	WB	White/ black	WL	White/ blue	WG	White/ green	WO	White/ orange		
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								

10.13.1 Electrical wiring diagram

HIGH-CURRENT FUSE BOX (1)







WARNING ⚠

- To prevent possible injury, be sure to disconnect the negative (–) cable of the battery and insulate it with tape before removing high-current fuses. (See Gr00E.)

CAUTION ⚠

- With the negative (–) cable of the battery connected, some high-current fuses are always under battery voltage. An arc will be generated when any of these high-current fuses is replaced without disconnecting the battery negative cable, and this could cause the related electric devices to be damaged.
- If replace the fuse, remove the high-current fuse box from the vehicle.
- If a fuse blows out, identify and remedy the cause, then replace the fuse.
- Be sure to use the fuse with the specified ampere.

54-618048HF-1

HIGH-CURRENT FUSE BOX (2)

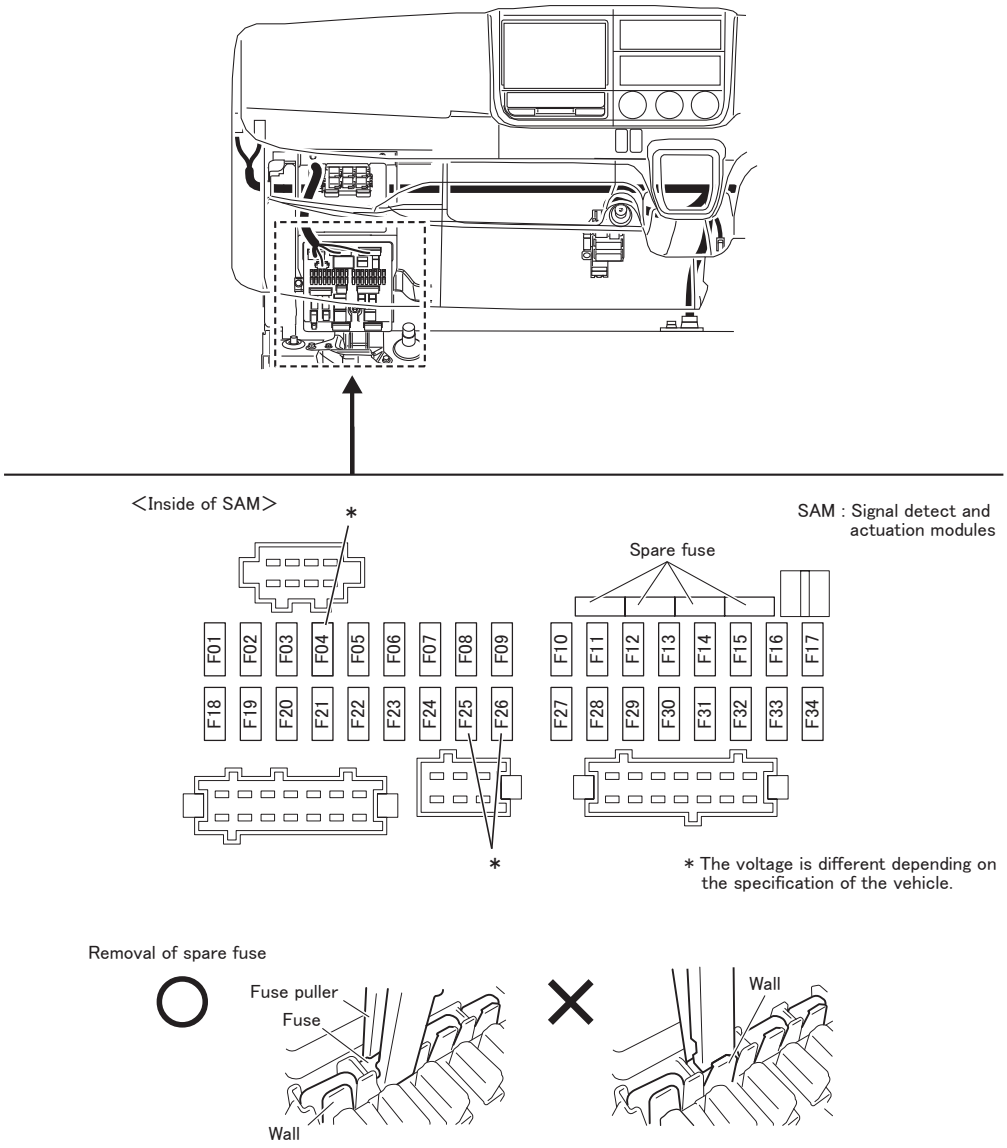
High-current fuse box

Fuse No.	Main load	Capacity
HF01	SAM	140A
HF02	—	—
HF03	SAM	80A
HF04	Heater control unit (HCU)	50A
HF05	Glow ECU	60A
HF06	Starter relay	40A
HF07	Condenser fan relay	20A
HF08	Hydraulic unit	50A
HF21	—	—
HF22	SAM	40A
F01	BATT 12V	140A
F03	—	—
F36	DUONIC ECU	20A
F37	Rear blower fan <Crew cab>	10A
F38	Rear condensor fan <Crew cab>	15A
F39	Main relay (NOx sensor)	30A
F40	—	—
F41	Hydraulic unit	30A
F42	—	—
F43	—	—

SAM : Signal detect and actuation module
ECU : Electronic control unit

54-619522HF-2

FUSE BOX (1)



WARNING ⚠

- To prevent possible injury, be sure to disconnect the negative (−) cable of the battery and insulate it with tape before removing fuses. (See Gr00E.)

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.
- 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. Doing so will break the SAM and cause malfunctions or a fire.

54-618048FUSE-1

FUSE BOX (2)

Fuse box

Fuse No.	Main load	Capacity
F01	Starter	10A
F02	—	—
F03	SRS airbag	10A
F04	Optional body builder connector	10A
F05	Power window (driver's seat side)	30A
F06	Hill start assist system	10A
F07	Power window (assistant driver's seat side)	30A
F08	—	—
F09	Meter cluster, diagnosis connector, combination switch	10A
F10	—	—
F11	Blower fan	30A
F12	Audio, cab lamp	15A
F13	Starter switch	10A
F14	Horn	10A
F15	Audio, DUONIC ECU	10A
F16	Cigarette lighter	20A
F17	Fuel filter (heater)	20A
F18	ABS ECU	10A
F19	Engine ECU	15A
F20	Four-wheel drive magnetic valve, hill start assist system, AEBS ECU (VRDU2)	10A
F21	—	—
F22	Meter cluster, air-conditioner control	15A
F23	—	—
F24	DUONIC ECU	10A
F25	Opt (ACC)	10A
F26	Opt (B)	10A
F27	—	—
F28	Engine ECU	15A
F29	—	—
F30	—	—
F31	Engine ECU	20A
F32	Air-conditioner	10A
F33	—	—
F34	Fuel pump	15A

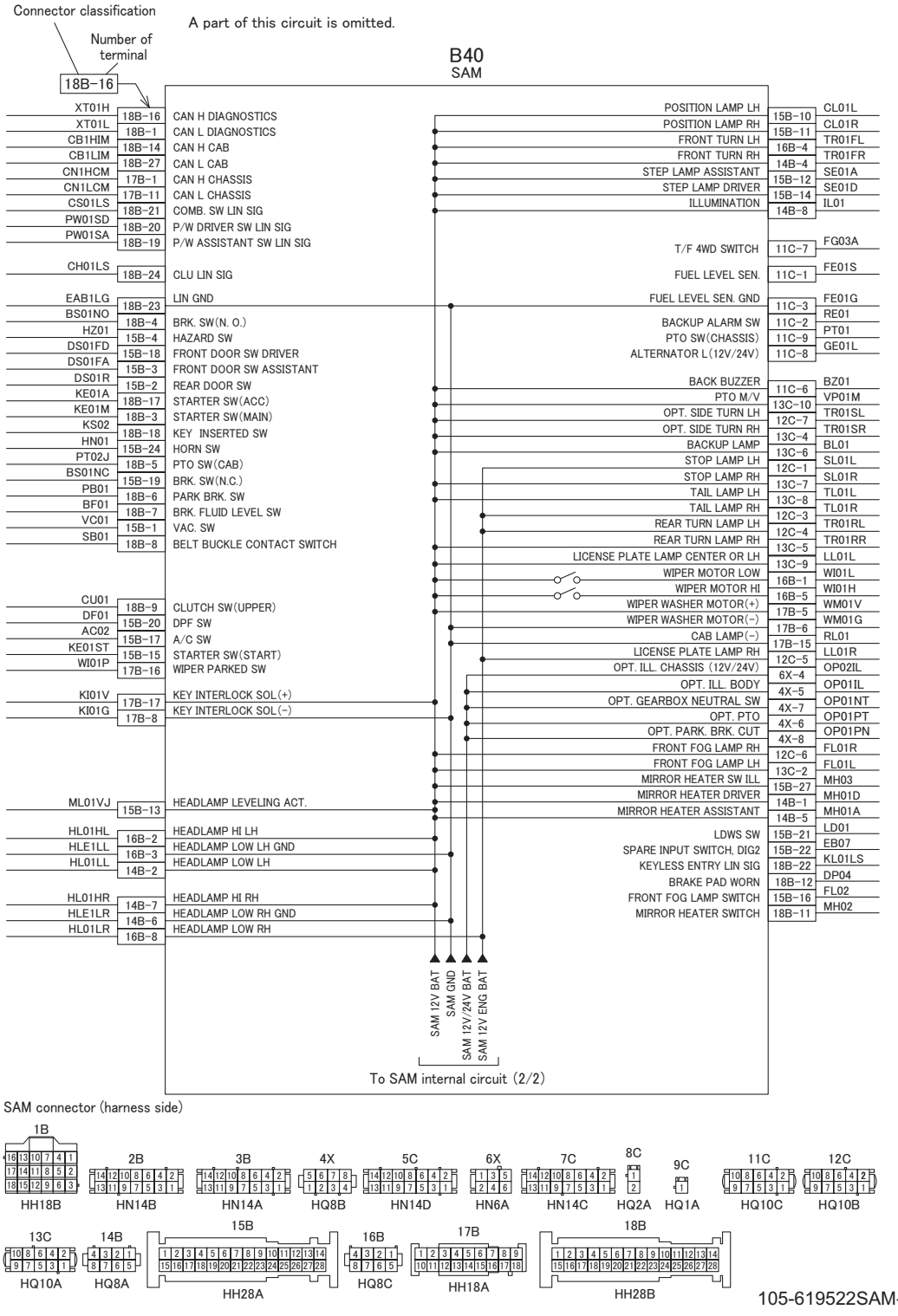
ABS : Anti-lock brake system
ECU : Electronic control unit
SAM : Signal detect and actuation module
SRS : Supplemental restraint system

54-619522FUSE-2

SAM INTERNAL CIRCUIT (1)

(1/2)

SAM : Signal detect and actuation module

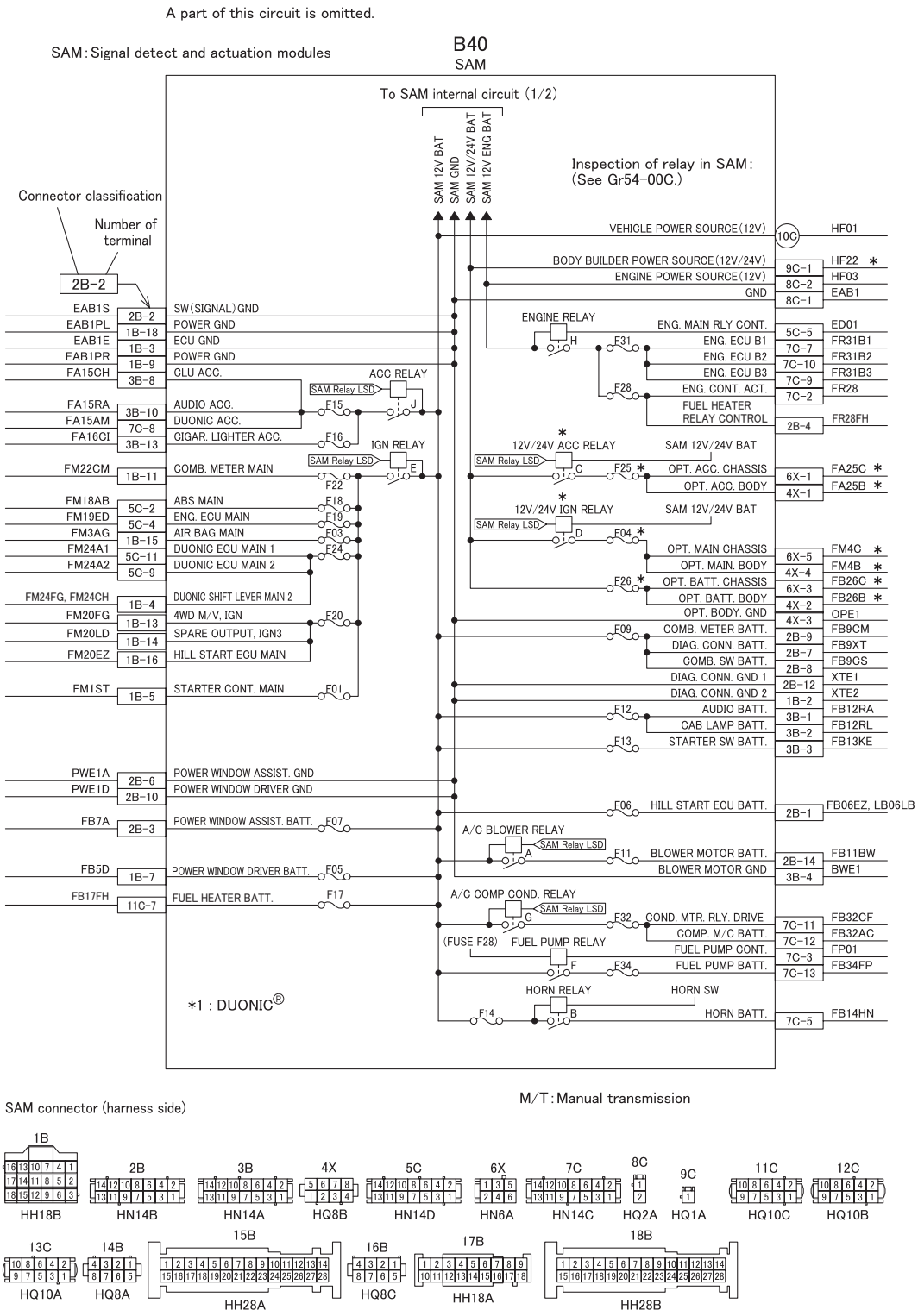


SAM connector (harness side)

105-619522SAM-1

SAM INTERNAL CIRCUIT (2)

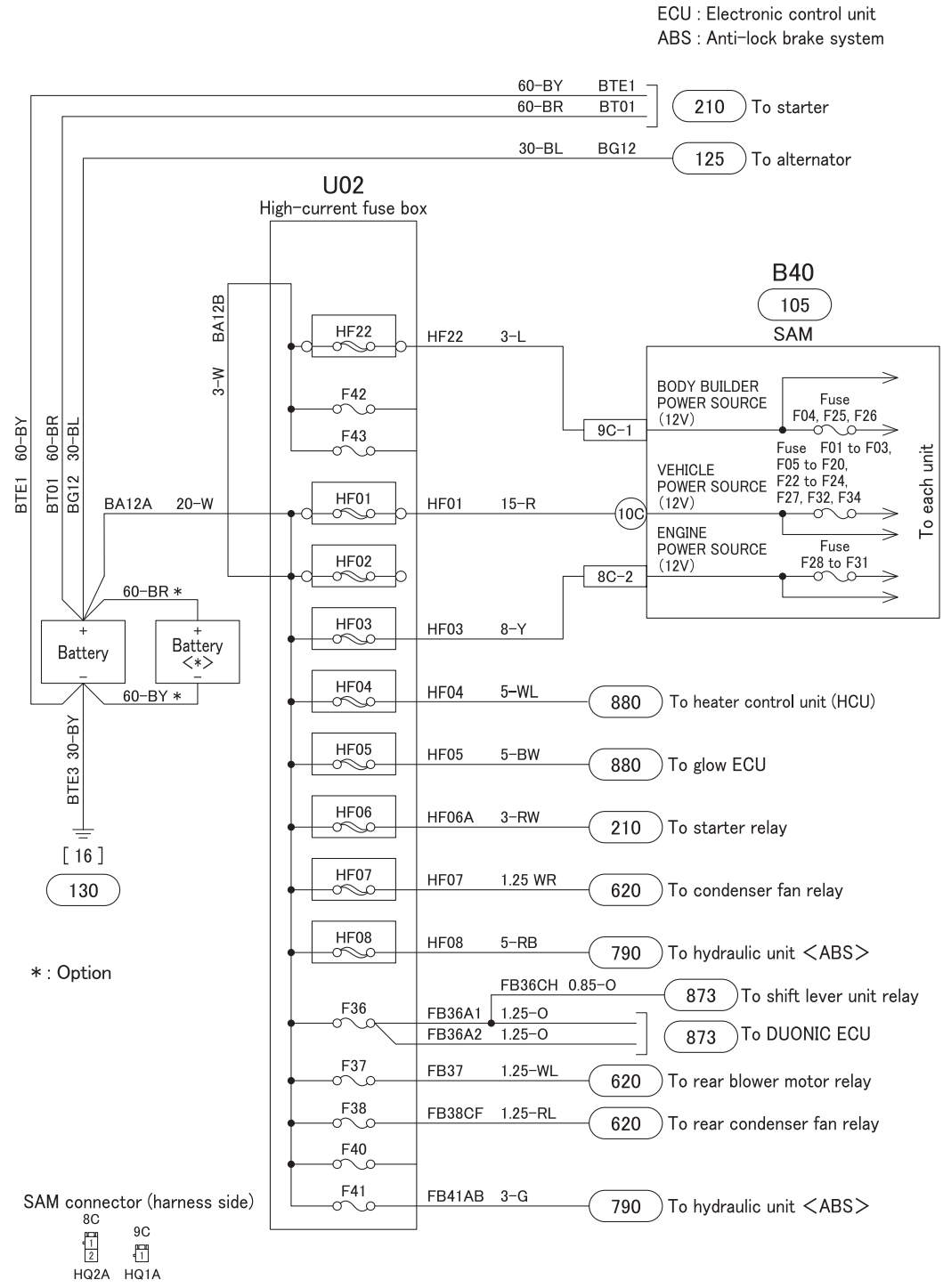
(2/2)



105-619522SAM-2

POWER CIRCUIT (1)

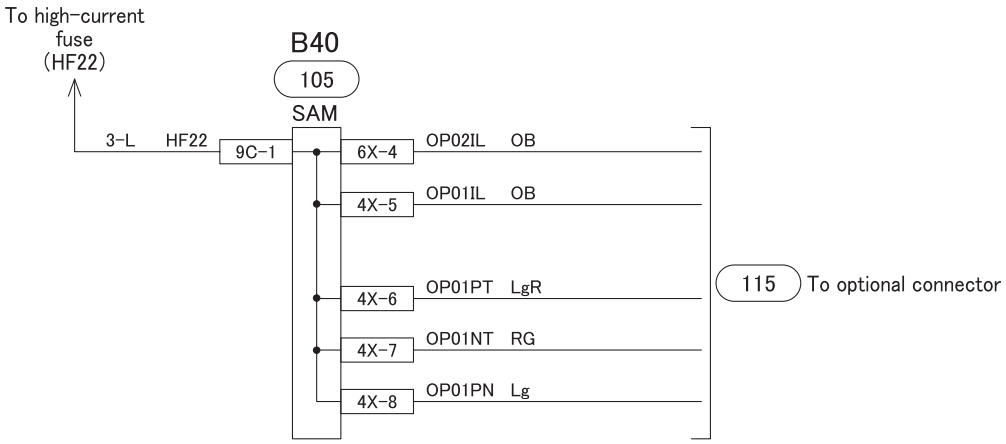
Battery → high-current fuse → SAM



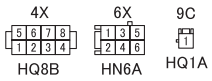
110-619522ALL

POWER CIRCUIT (2)

SAM
(12V)



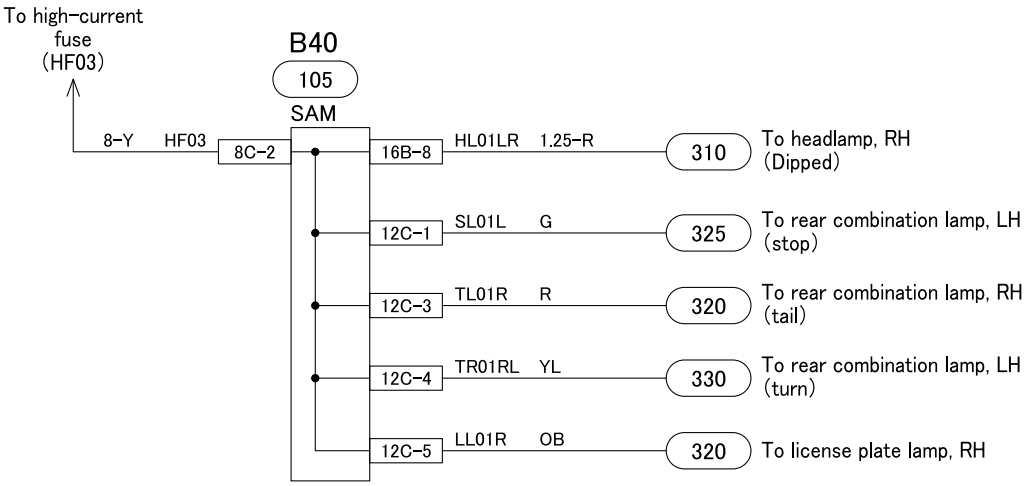
SAM connector (harness side)



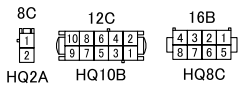
110-618048-2412

POWER CIRCUIT (3)

SAM
(12V ENG BAT)

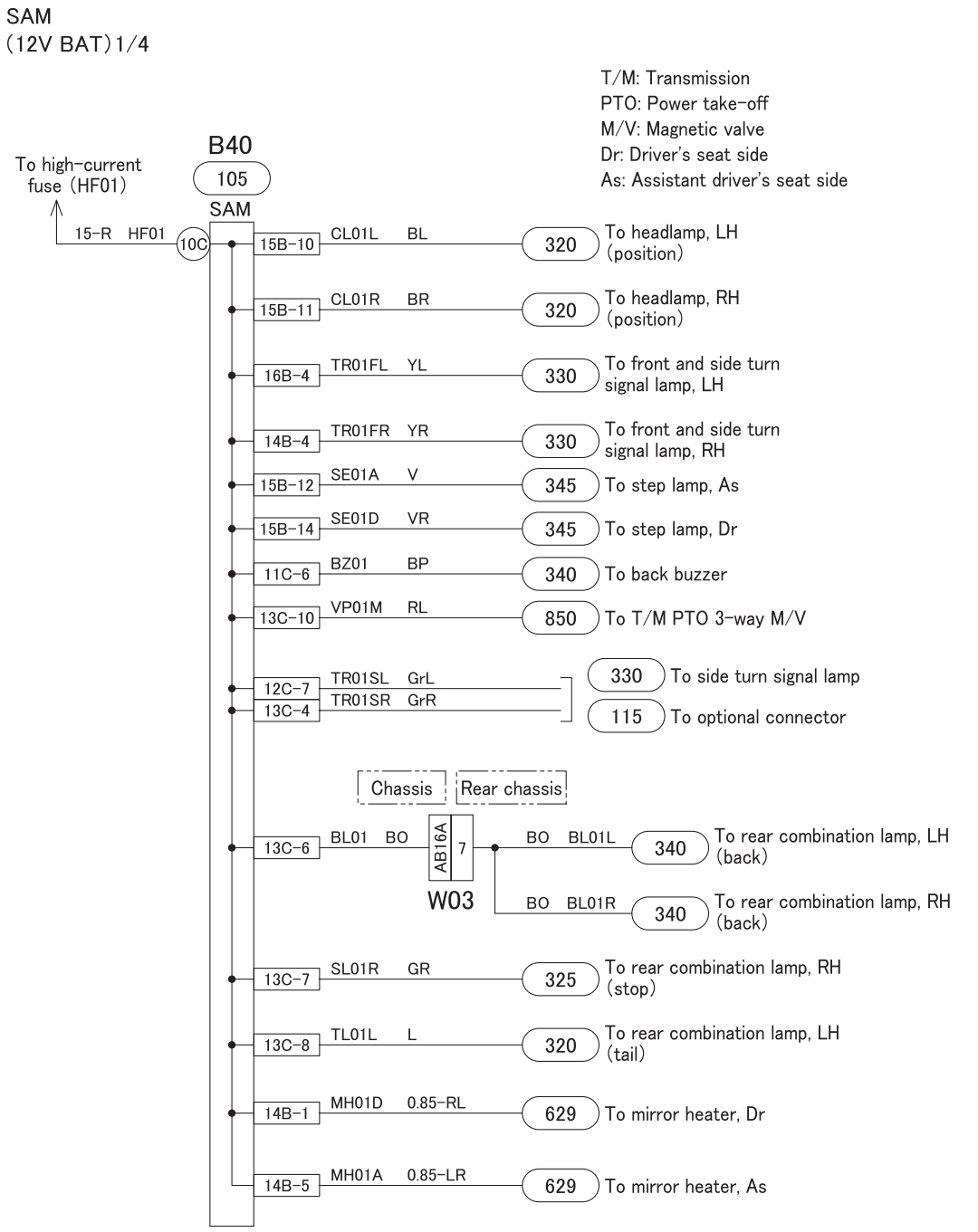


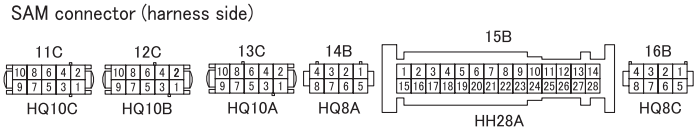
SAM connector (harness side)



110-C07432-12E

POWER CIRCUIT (4)

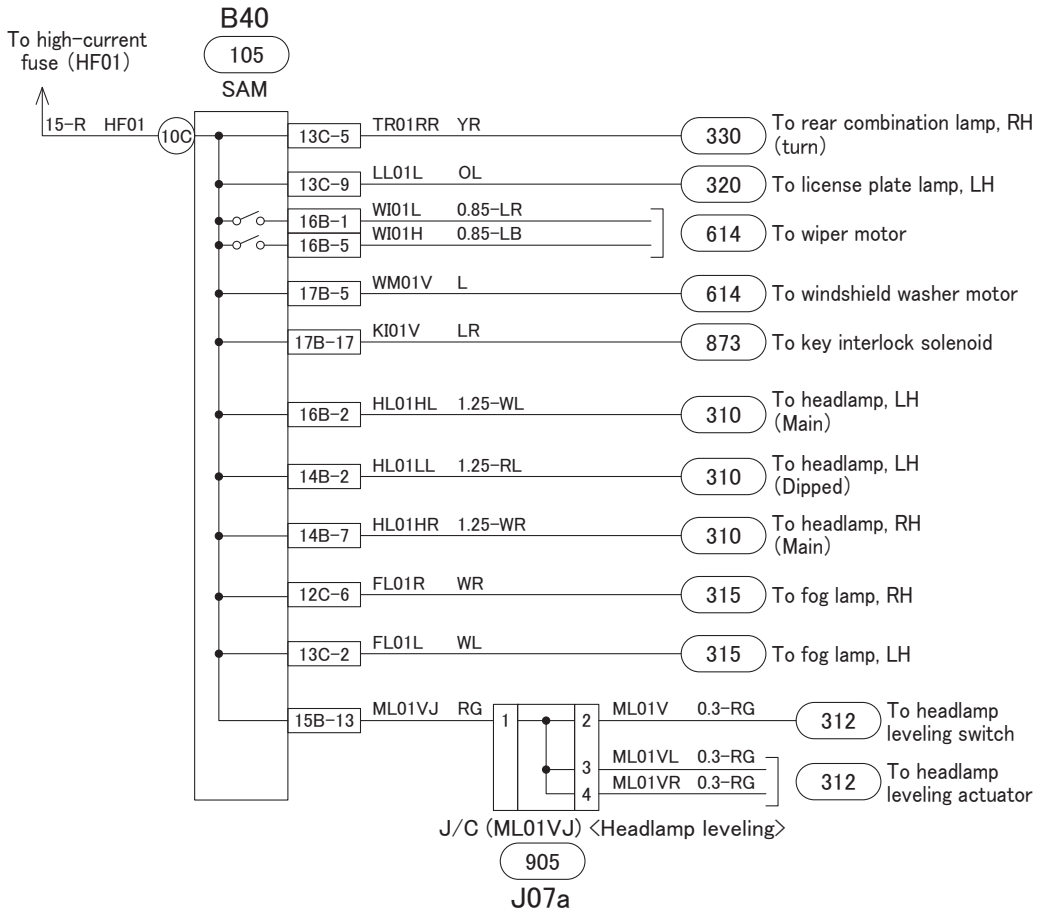




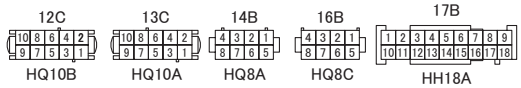
110-618048-12-1

POWER CIRCUIT (5)

SAM
(12V BAT)2/4



SAM connector (harness side)

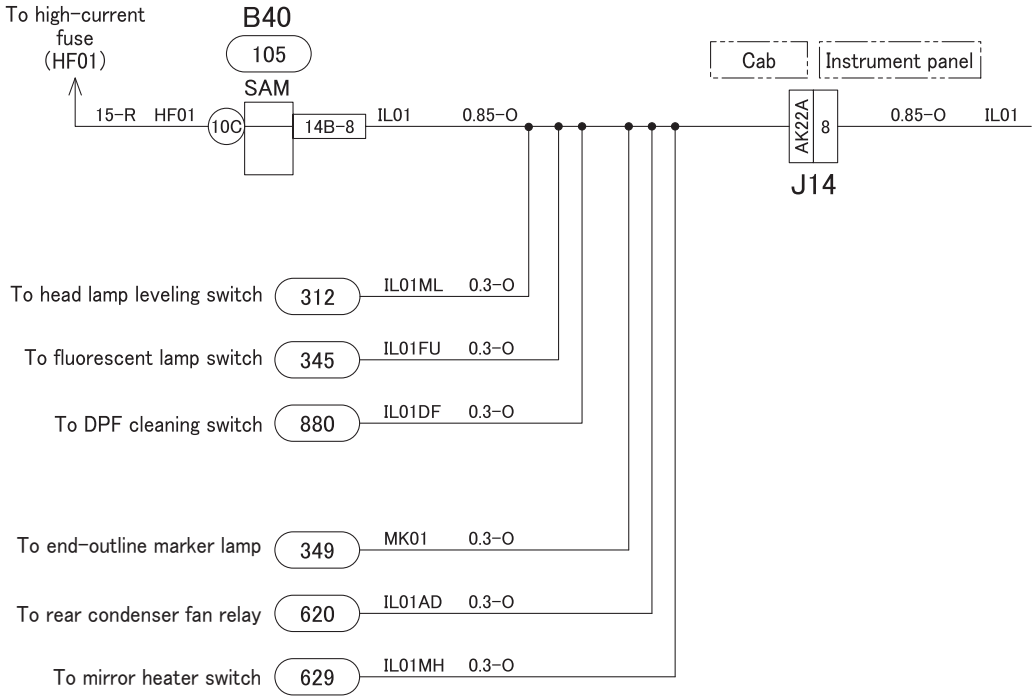


110-619522-12-2

POWER CIRCUIT (6)

SAM
(12V BAT)3/4

DPF : Diesel particulate filter
LDWS : Lane departure warning system



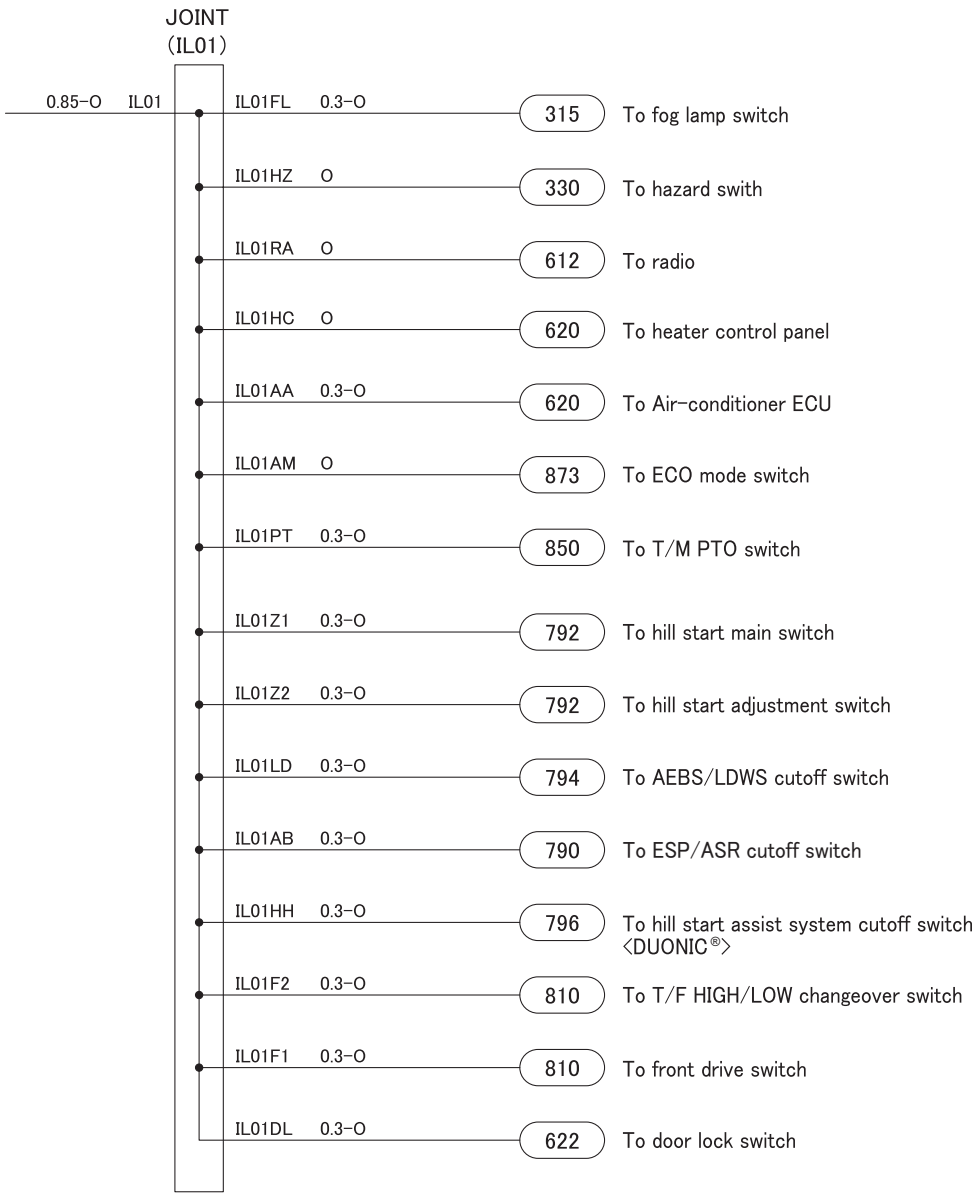
SAM connector (harness side)

110-619522-12-3

POWER CIRCUIT (7)

SAM
(12V BAT)4/4

ESP : Electronic stability program
ASR : Anti spin regulator
T/F : Transfer
T/M : Transmission
PTO : Power take-off

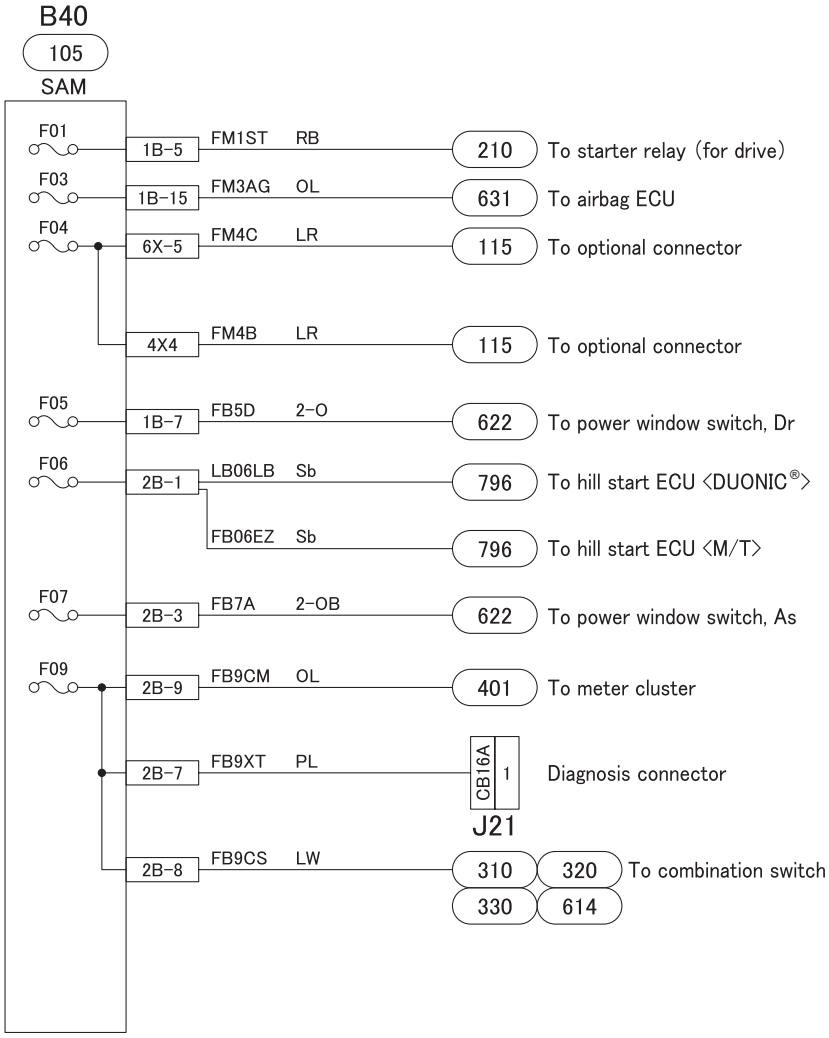


110-619522-12-4

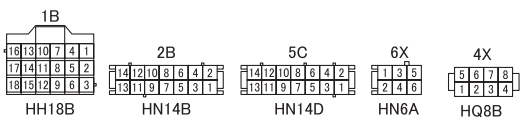
POWER CIRCUIT (8)

SAM
(Fuse F01 to F09)

ECU : Electronic control unit
Dr : Driver's seat side
As : Assistant driver's seat side

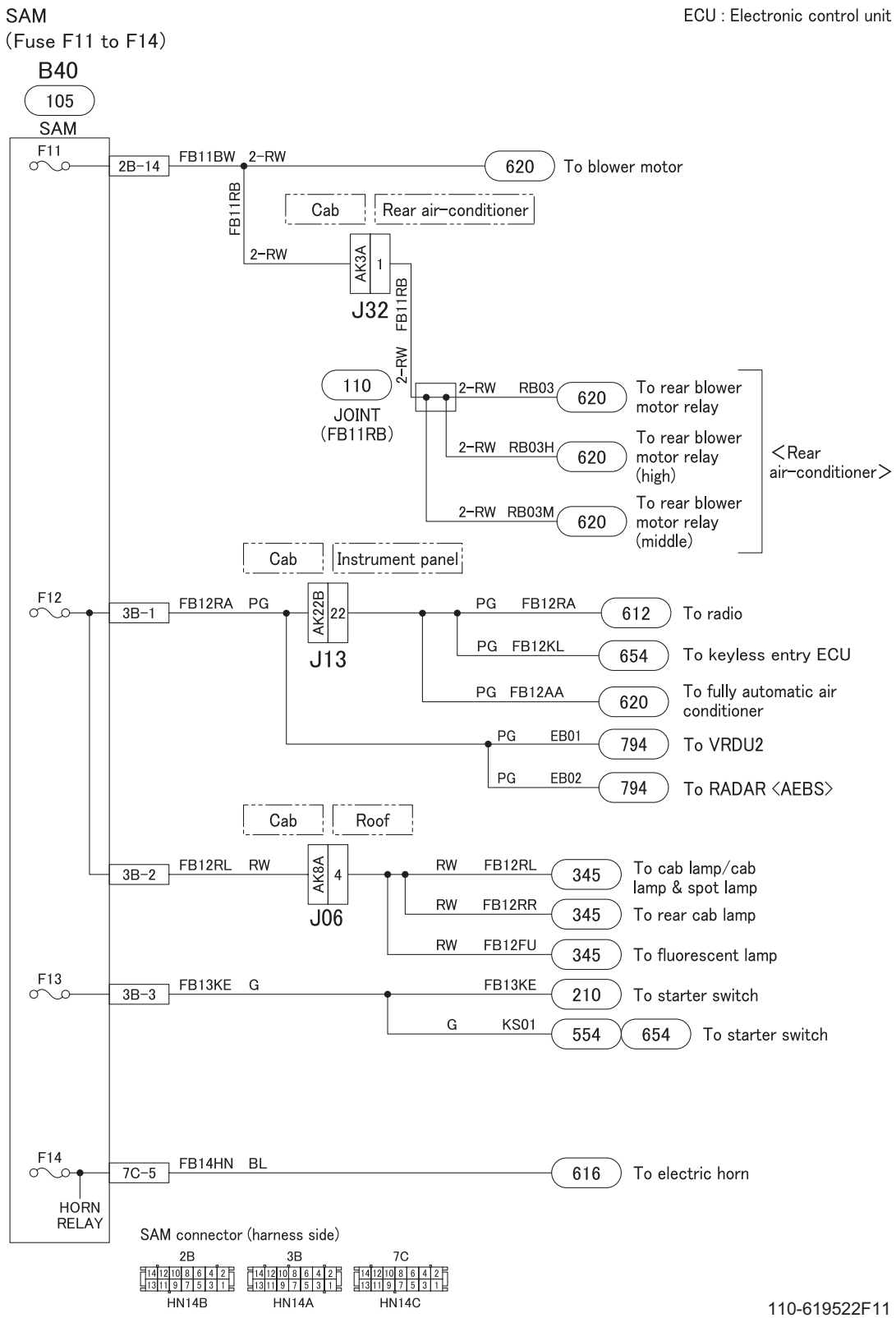


SAM connector (harness side)



110-619522F01

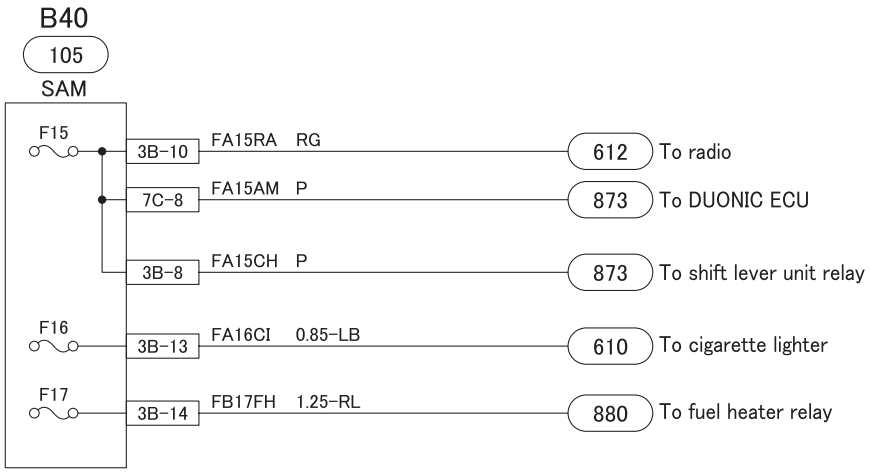
POWER CIRCUIT (9)



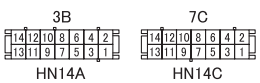
POWER CIRCUIT (10)

SAM
(Fuse F15 to F17)

ECU : Electronic control unit

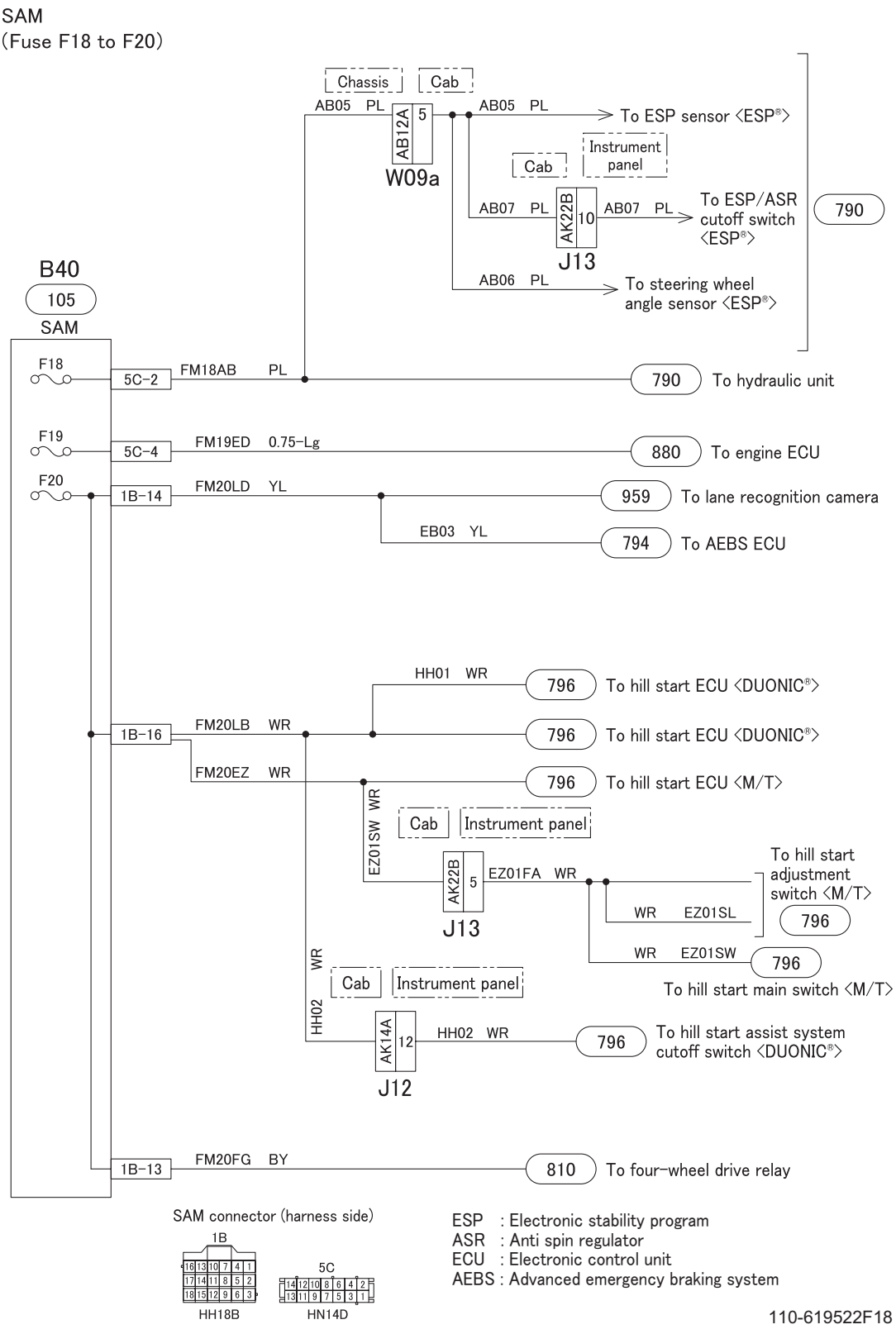


SAM connector (harness side)



110-619522F15

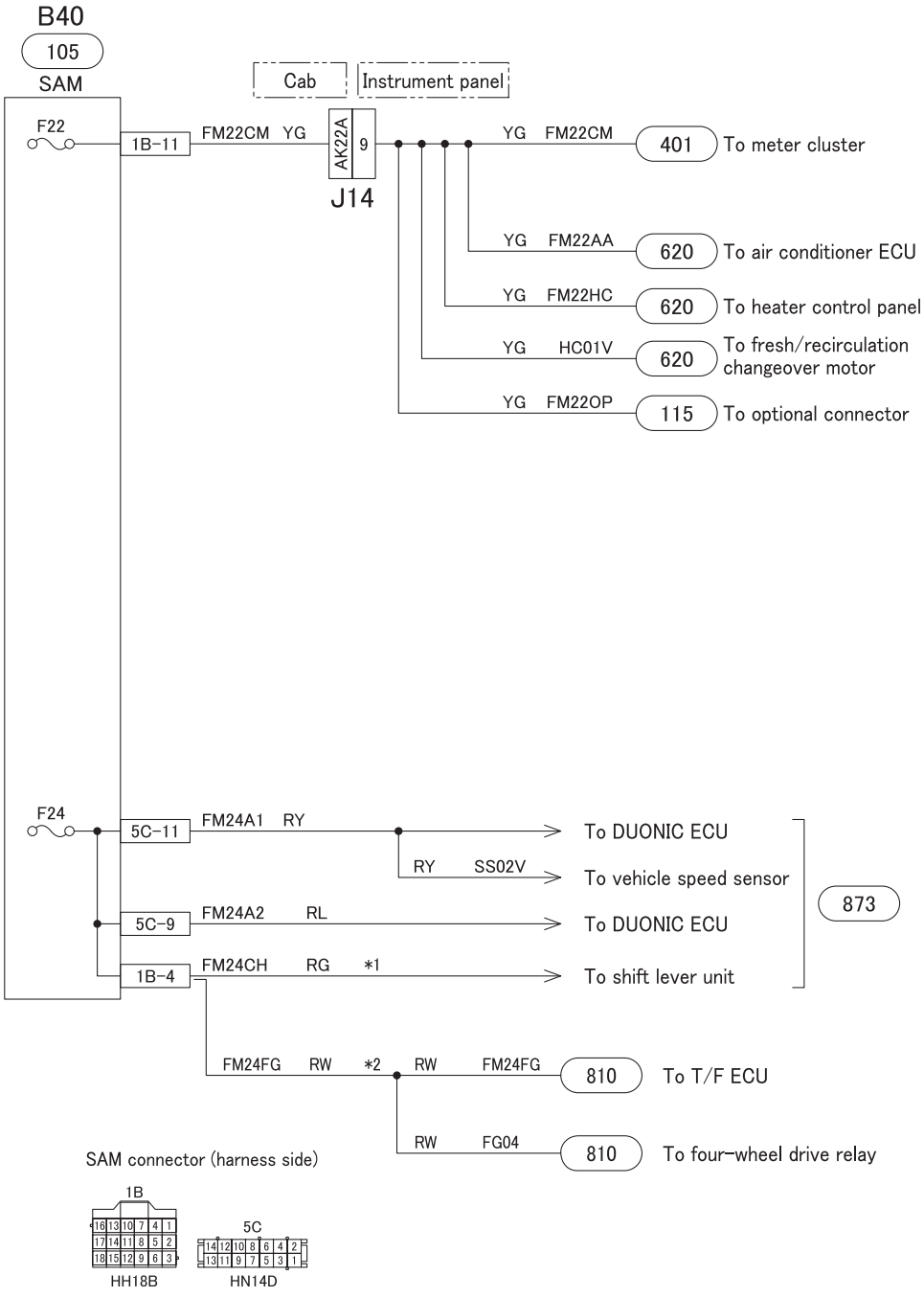
POWER CIRCUIT (11)



POWER CIRCUIT (12)

SAM
(Fuse F22 to F24)

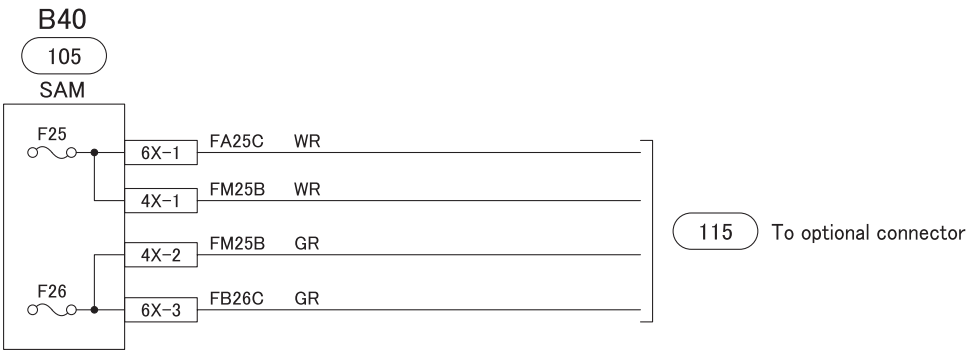
ECU : Electronic control unit
*1 : DUONIC
*2 : FG



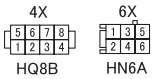
110-619522F22

POWER CIRCUIT (13)

SAM
(Fuse F25 to F26)



SAM connector (harness side)

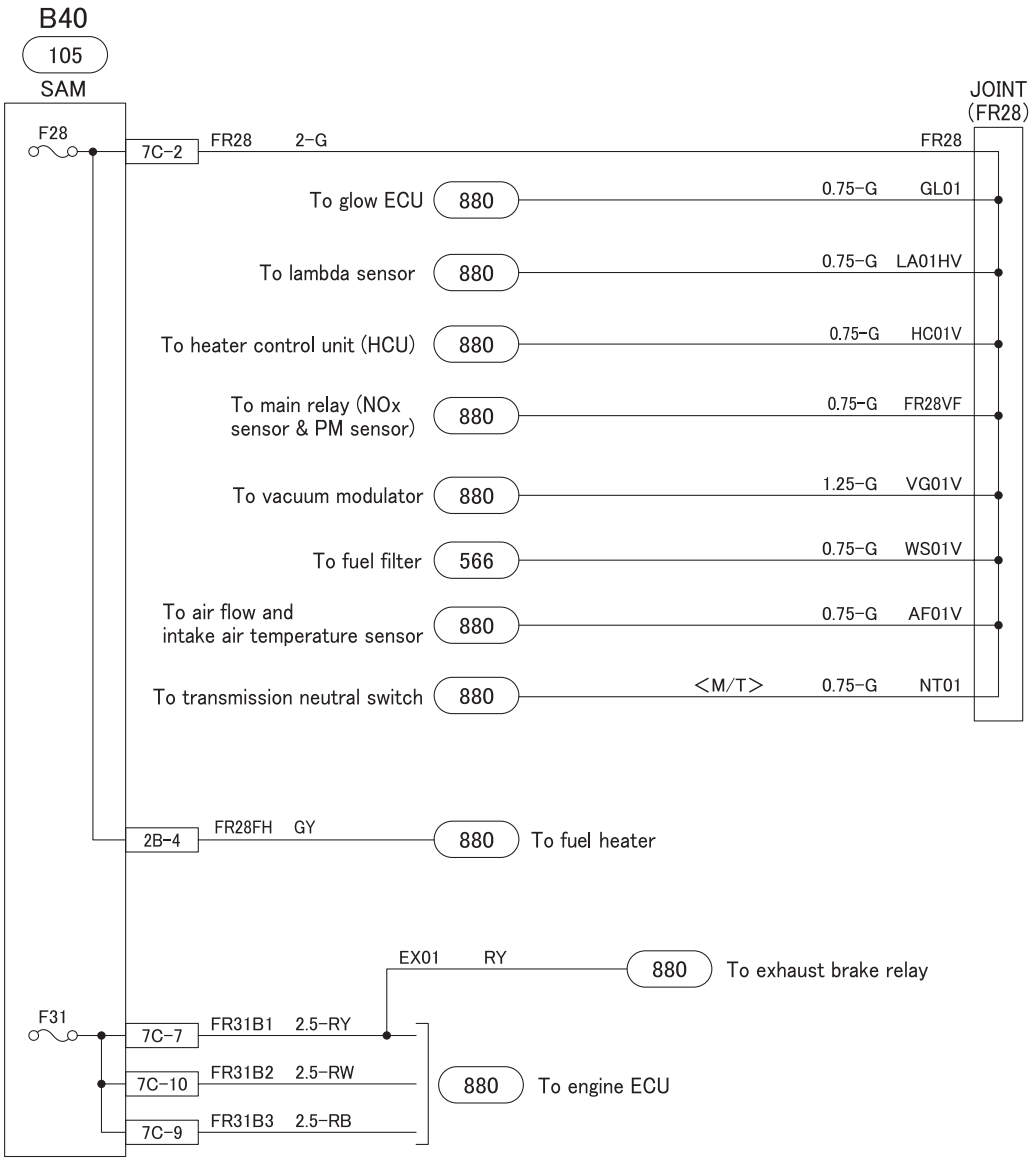


110-619522F25

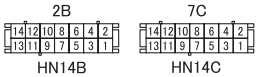
POWER CIRCUIT (14)

SAM
(Fuse F28 to F31)

ECU : Electronic control unit
M/T : Manual transmission



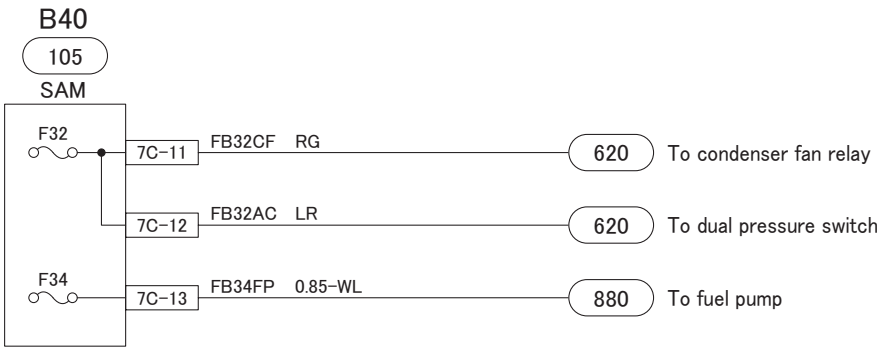
SAM connector (harness side)



110-619522F28

POWER CIRCUIT (15)

SAM
(Fuse F32 to F34)

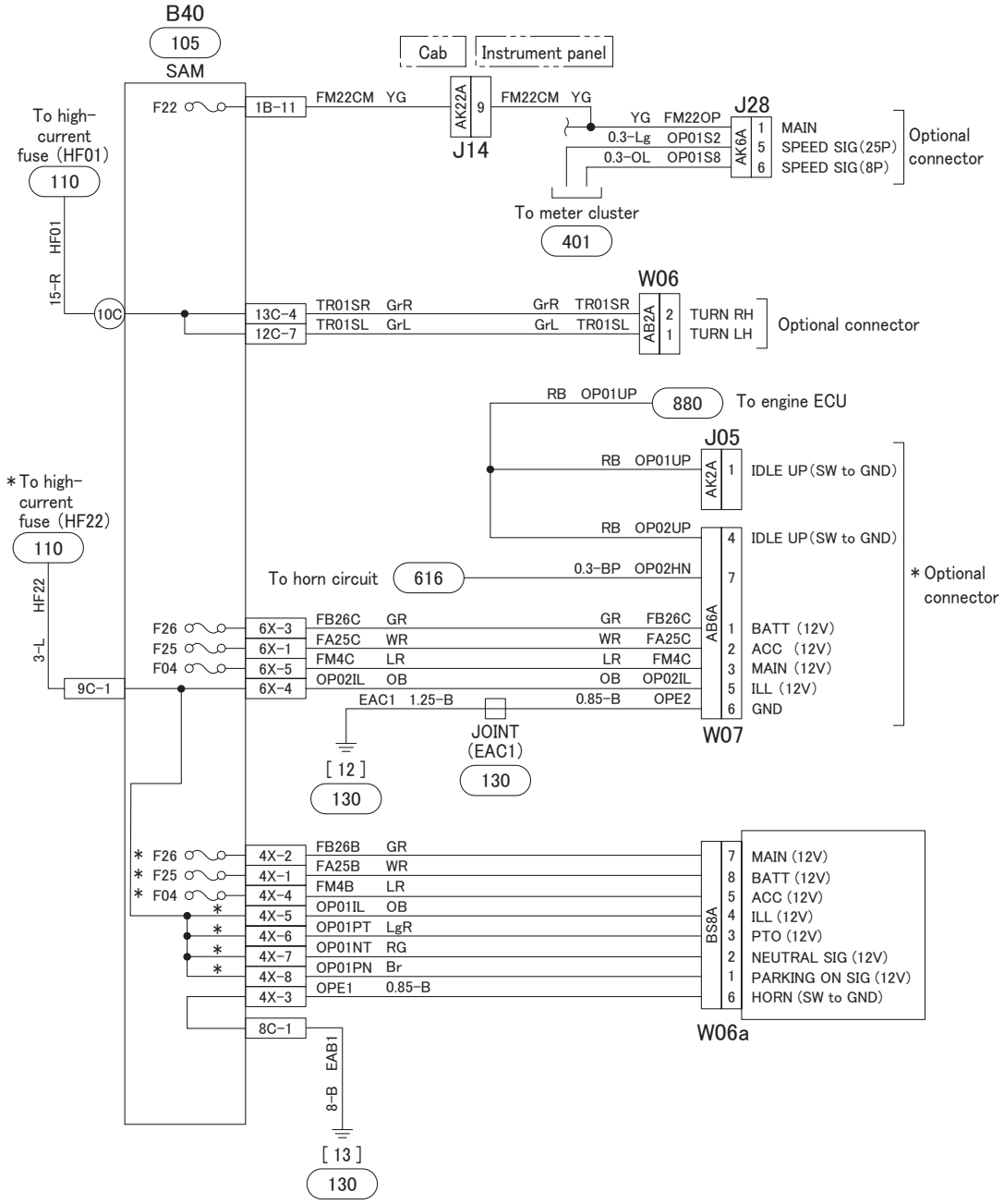


SAM connector (harness side)

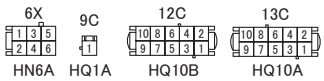
W003349

RESERVE POWER CIRCUIT

ECU : Electronic control unit

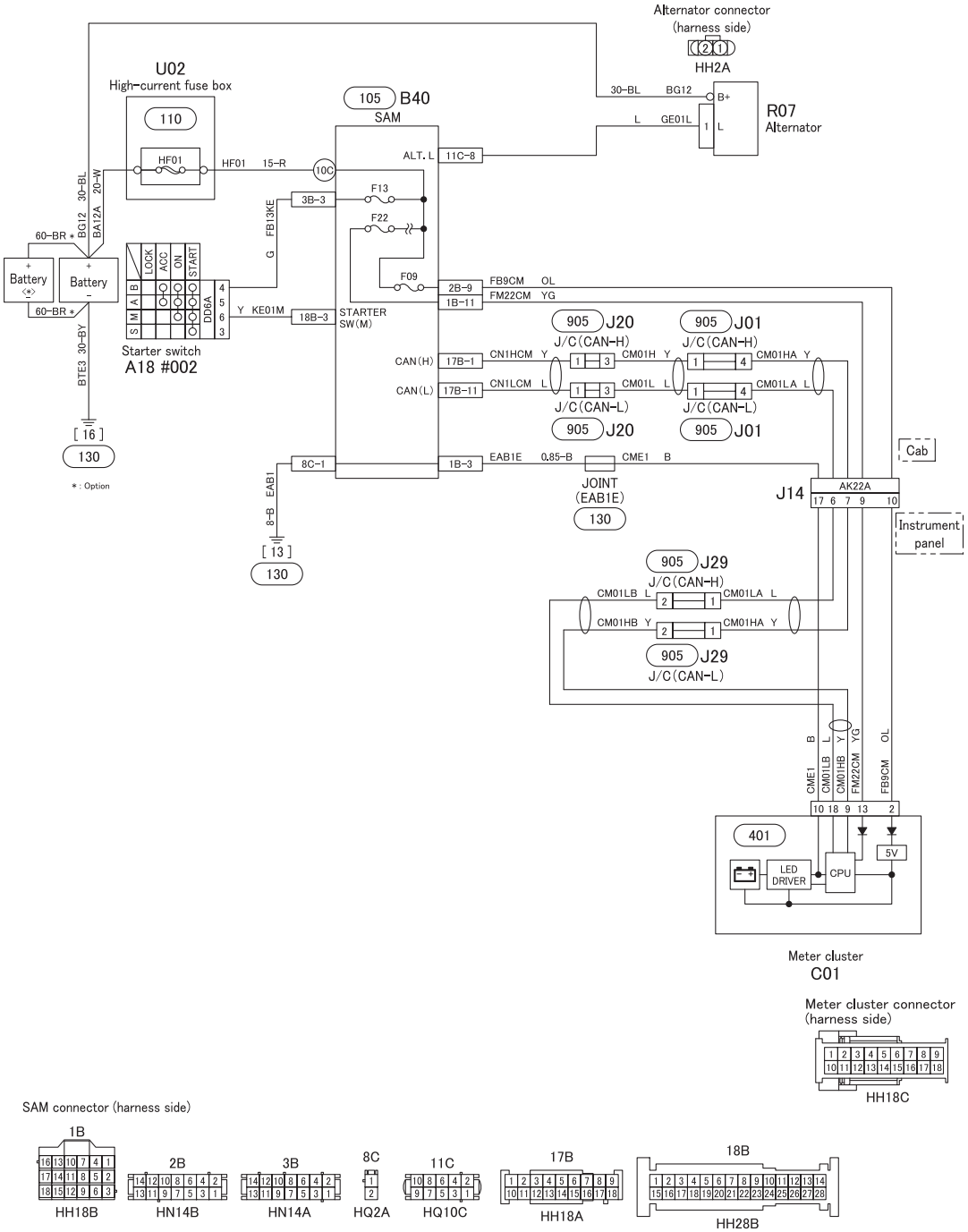


SAM connector (harness side)



115-619522

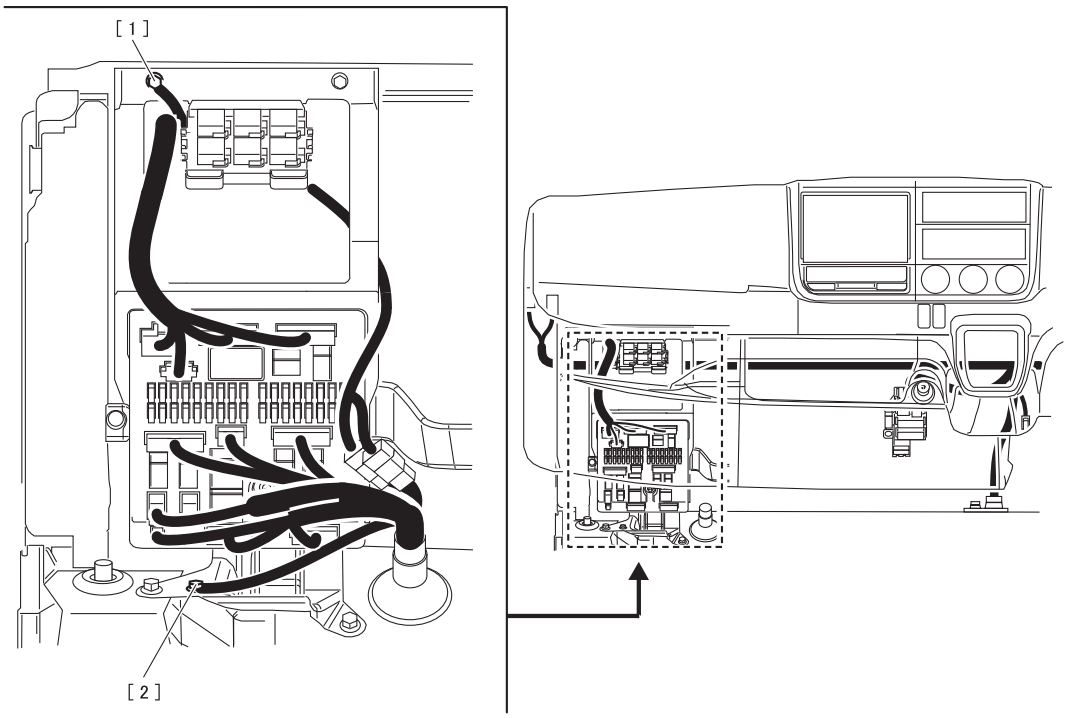
BATTERY CHARGING CIRCUIT



125-618048

GROUND (1)

[1] – [2] Cab ground

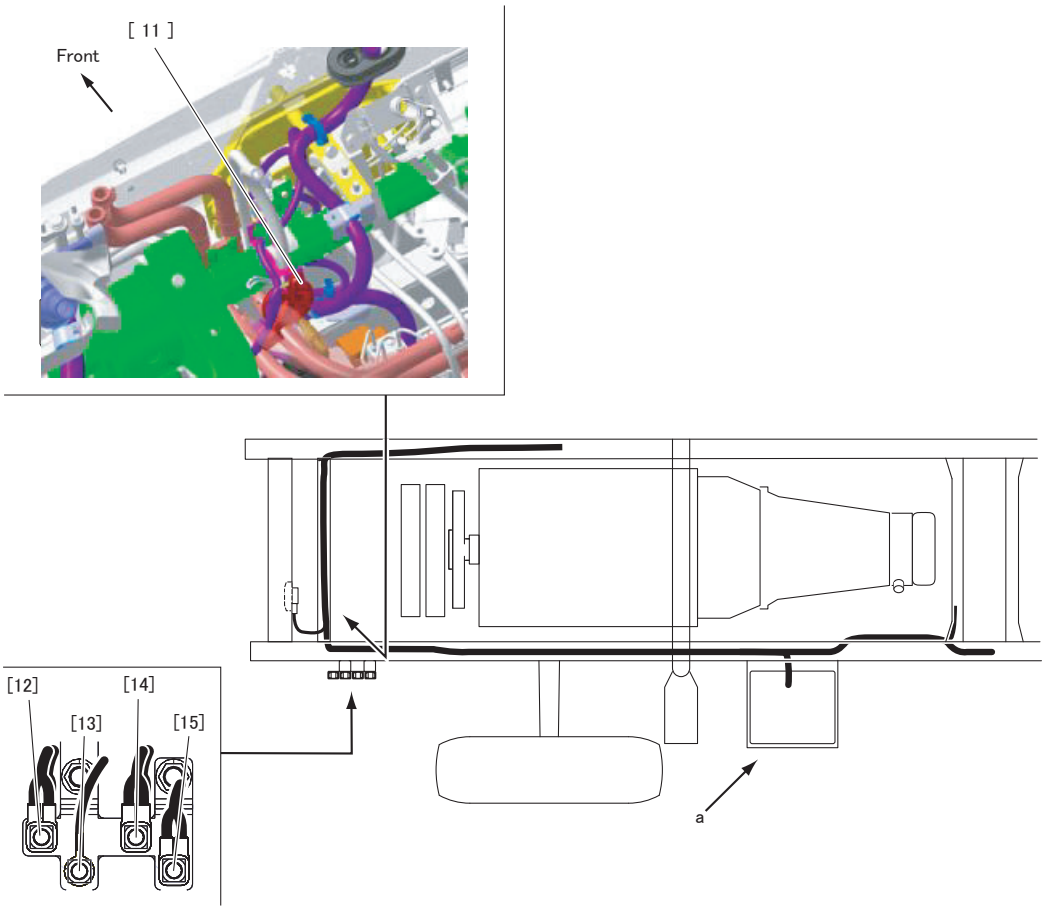


Location	Circuit No.	Wire diameter – wire color	Destination	Remarks
[1]	EAB2	1.25–B	JOINT (EAB2)	
[2]	EAB3	1.25–B	Frame ground ([12])	

54–L05316GND–1

GROUND (2)

[11] – [16] Chassis ground



＊: The installation position is different depending on the specification.

54-602211GND-2

GROUND (3)

Location	Circuit No.	Wire diameter – wire color	Destination	Remarks
[11]	HNE1	1.25-B	Frame ground ([12])	Horn
[12]	EAB3	1.25-B	Cab ground ([2])	
	EAC1	1.25-B	JOINT (EAC1)	
	FHE1	0.85-B	Fuel filter	
	FPE1	0.85-B	Fuel filter	
	HNE1	1.25-B	Horn ground	
	HSE1	0.85-B	To urea hose heater	BlueTec exhaust gas aftertreatment
	HSE2			
[13]	EAB1	8-B	SAM	
	NXE1	3-B	JOINT (NXE1)	BlueTec exhaust gas aftertreatment
[14]	ABE1	3-B	Hydraulic unit	ABS
	ABE2	3-B		
	AME1	1.25-B	DUONIC ECU	
	AME2	1.25-B		
	EDE1	2.5-B	Engine ECU	
	EDE2	2.5-B		
	EDE3	2.5-B		
[15]	CFE1	1.25-B	Condenser fan motor	
	CFE3			Rear air-conditioner
	EAR1		JOINT (EAR1)	
	FCE1		Fan clutch coupling	
	FLE1	B	Fog lamp	
[16]	BTE1	60-BY	Starter	
	BTE3	30-BY	Battery	

ABS : Anti-lock brake system
ECU : Electronic control unit
SAM : Signal detect and actuation module

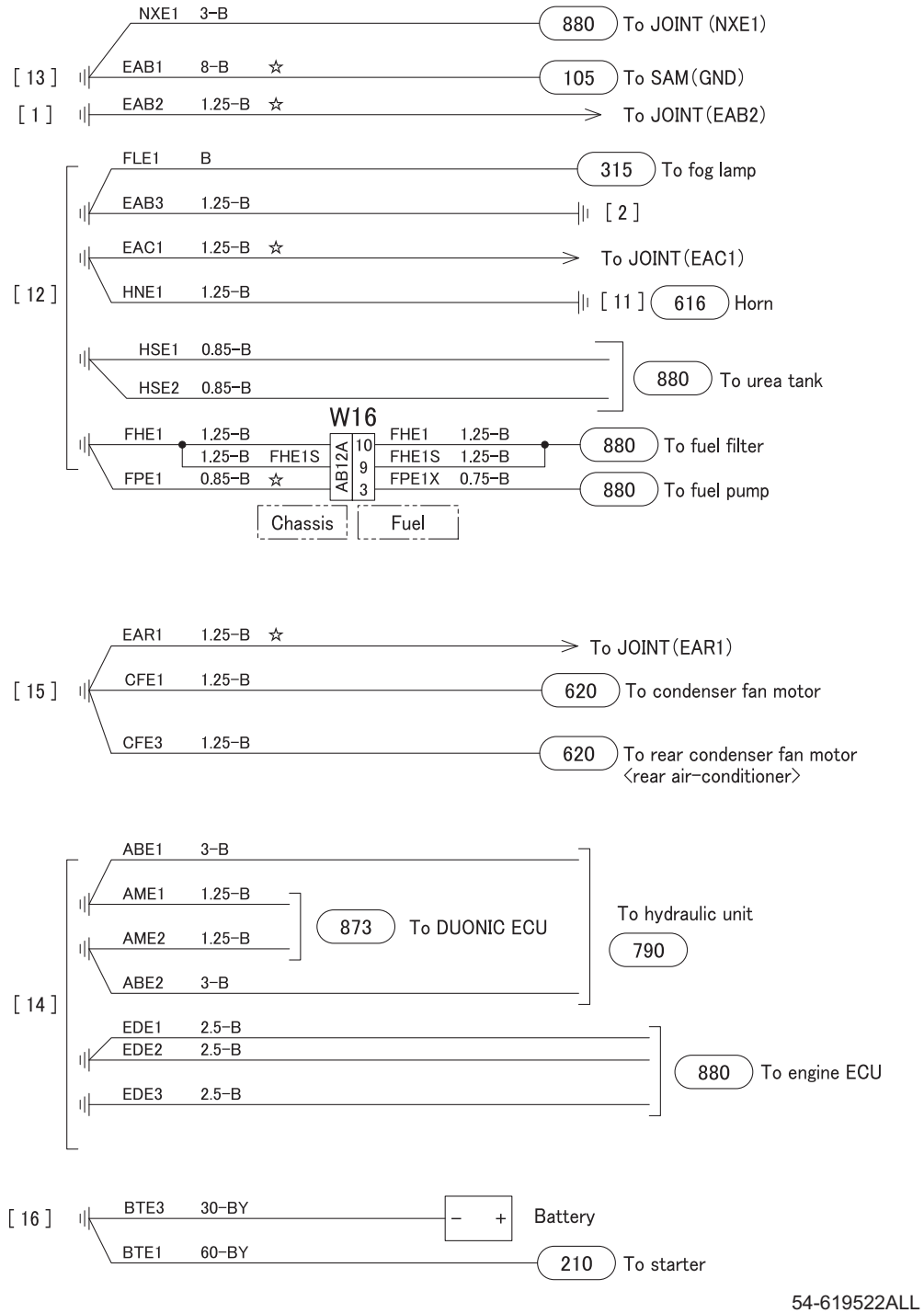
54-619522GND-3

GROUND (4)

ECU : Electronic control unit

Entire ground

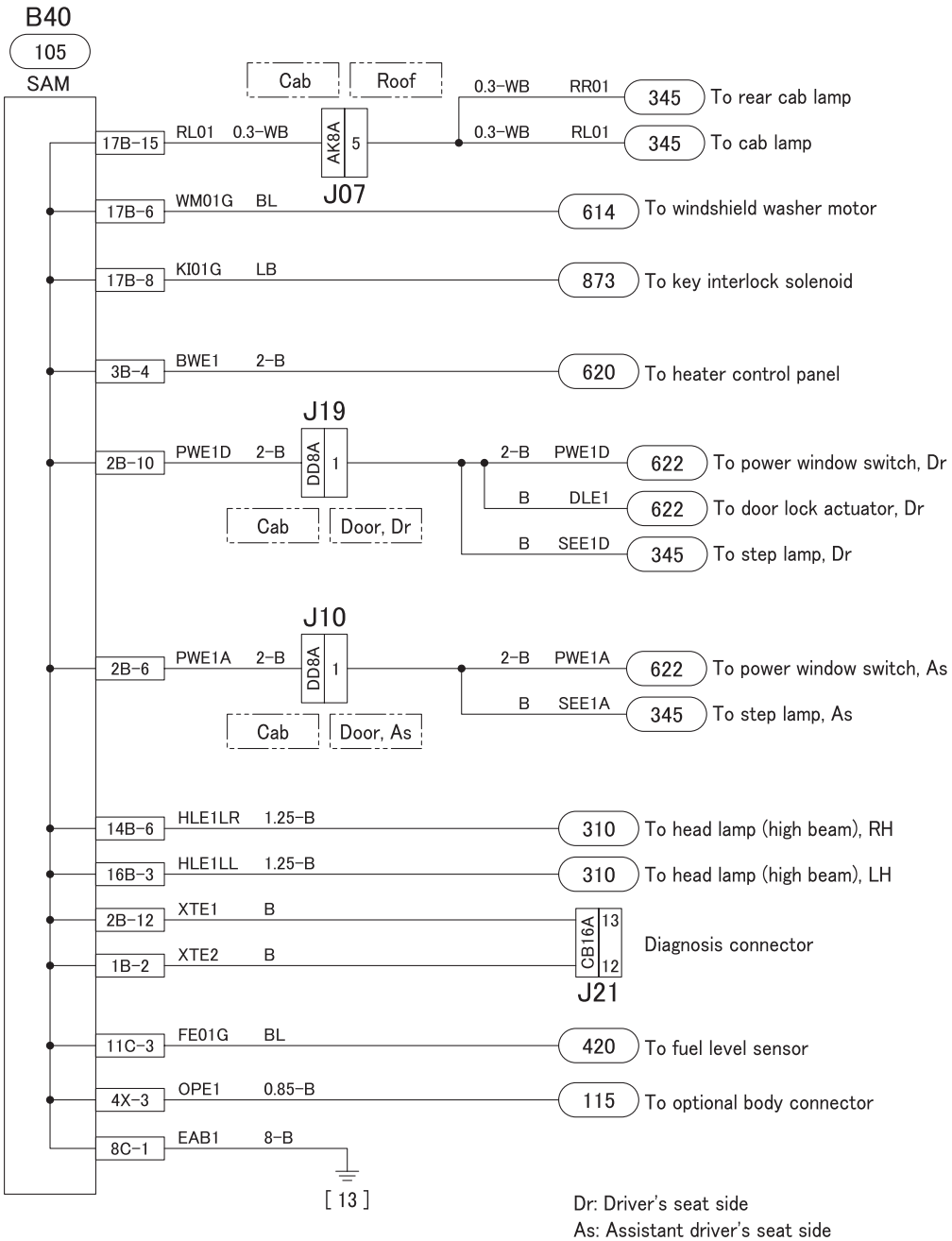
- This diagram indicates grounding points.
- See the following pages for branching of grounding (wiring for ☆). (in circuit No. order)



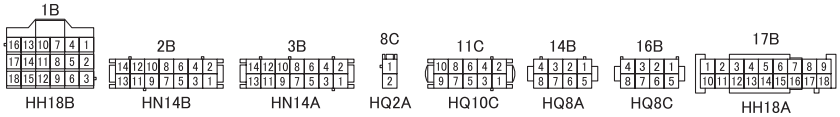
54-619522ALL

GROUND (5)

Circuit No. EAB1 ground (1/6)



SAM connector (harness side)

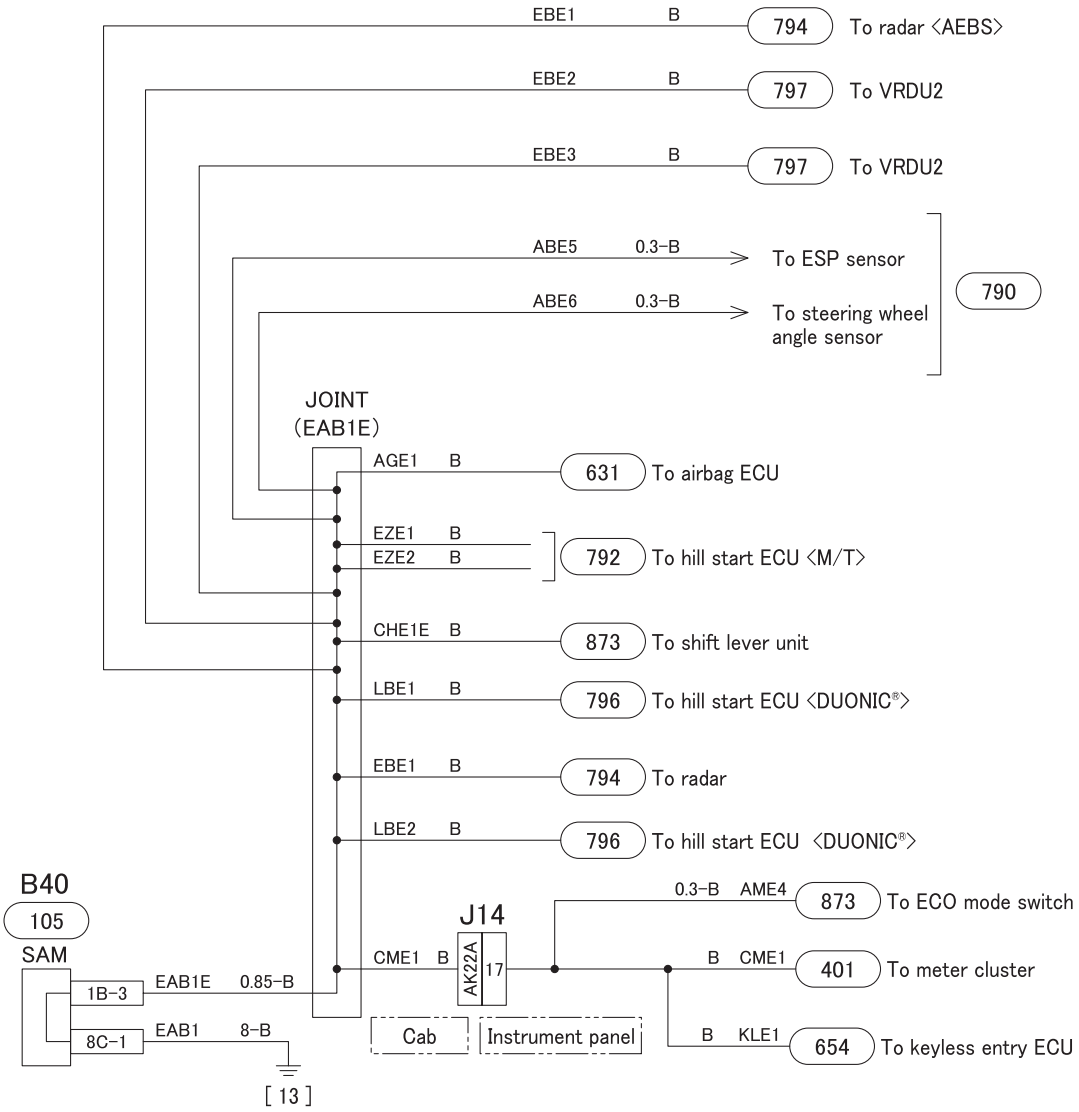


130-619522EAB1-1

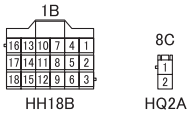
GROUND (6)

Circuit No. EAB1 ground (2/6)
＜JOINT(EAB1E)＞

ECU : Electronic control unit
ISS : Idling stop and start system



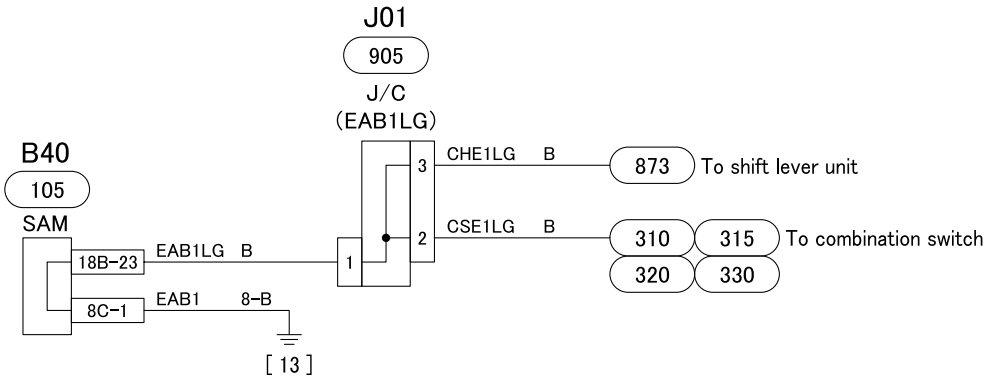
SAM connector (harness side)



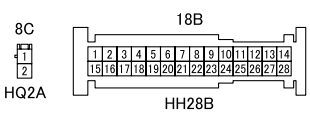
130-619522EAB1-2

GROUND (7)

Circuit No. EAB1 ground (3/6)
＜J/C(EAB1LG)＞



SAM connector (harness side)

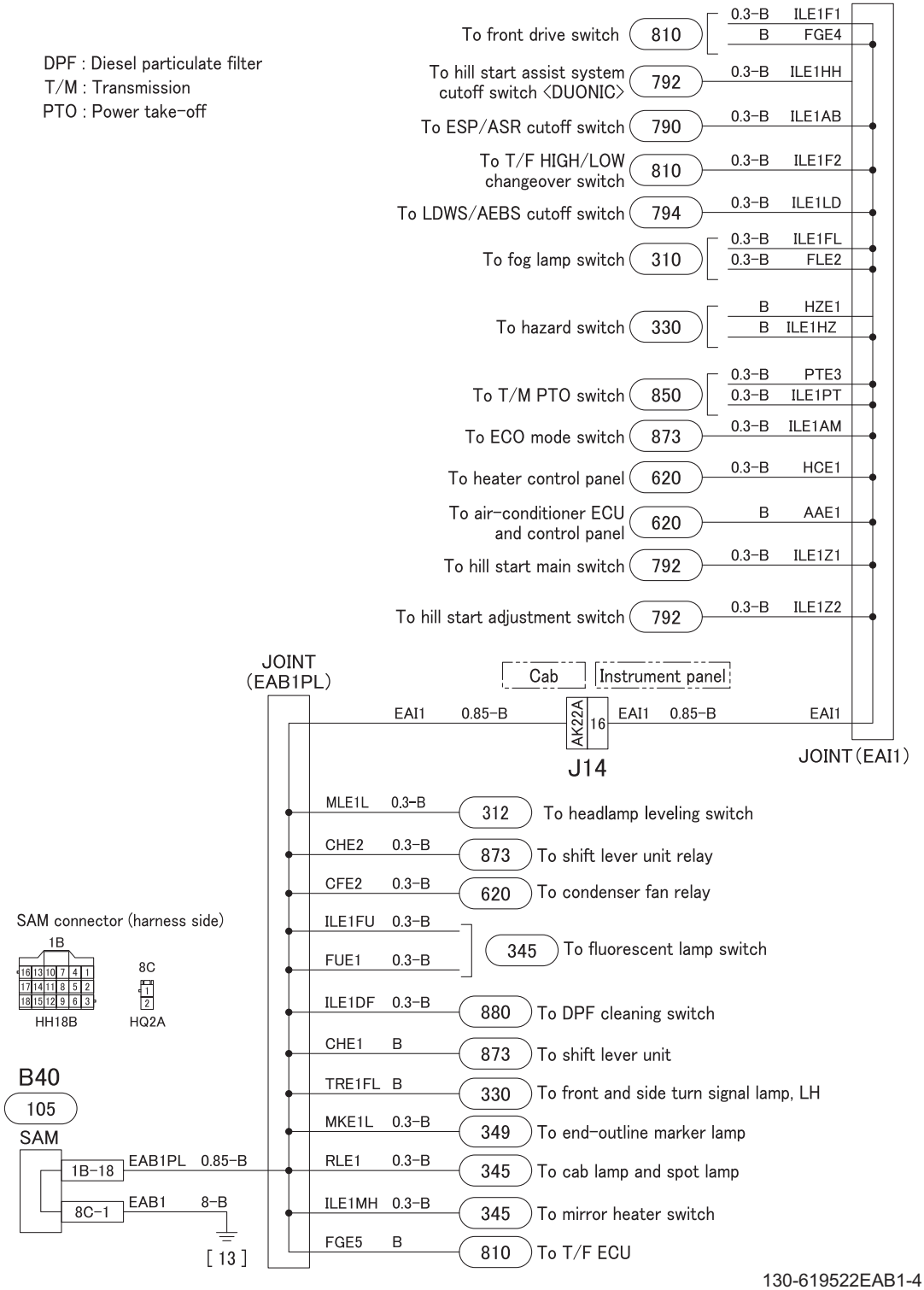


130-C07432EAB1-3

GROUND (8)

Circuit No. EAB1 ground (4/6)
＜JOINT(EAB1PL), JOINT(EAI1)＞

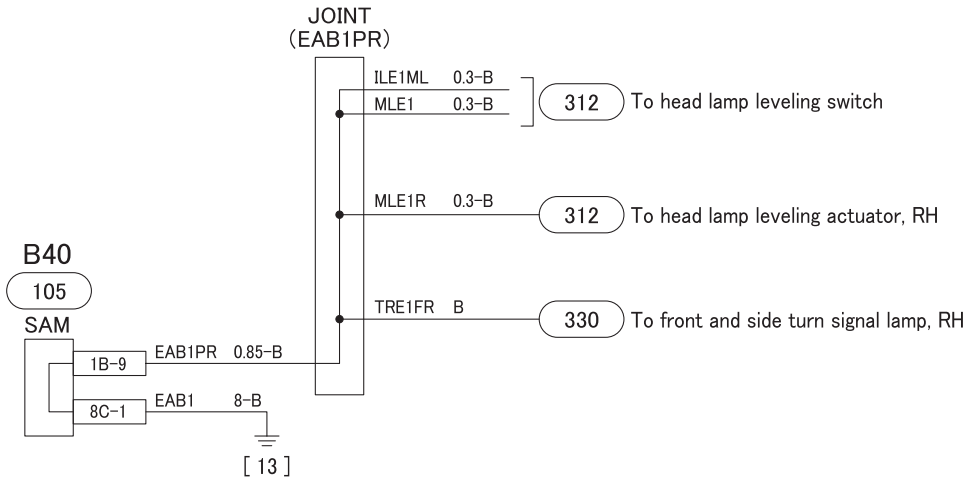
DPF : Diesel particulate filter
T/M : Transmission
PTO : Power take-off



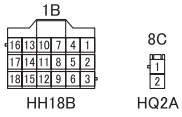
130-619522EAB1-4

GROUND (9)

Circuit No. EAB1 ground (5/6)
＜JOINT(EAB1PR)＞



SAM connector (harness side)

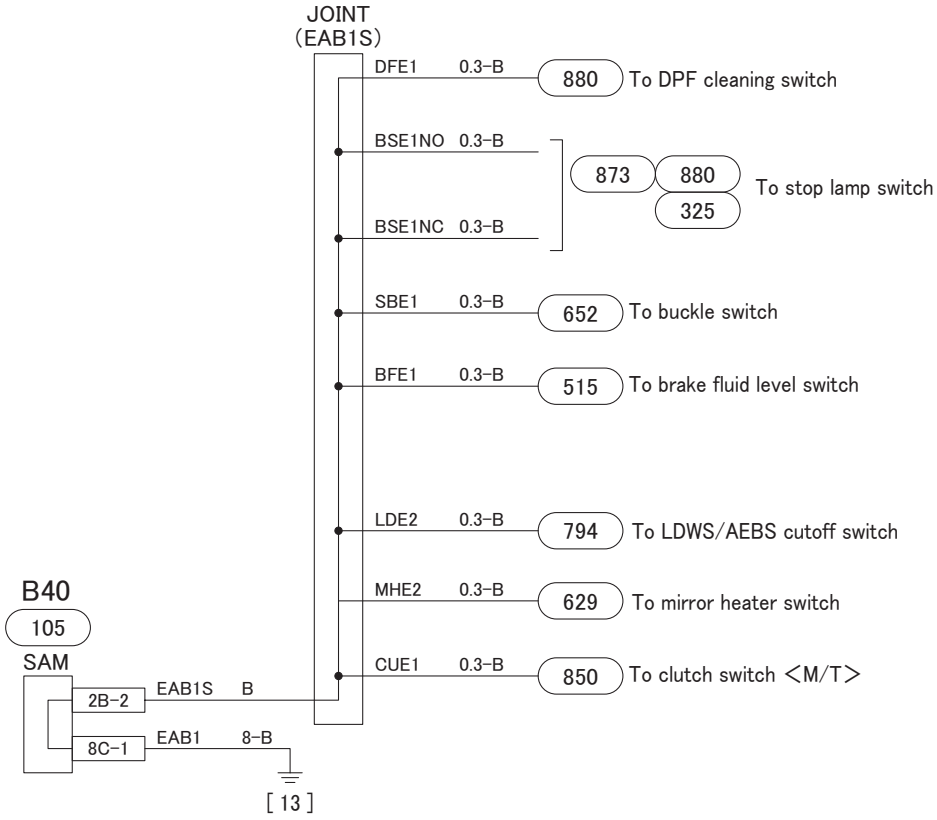


130-618048EAB1-5

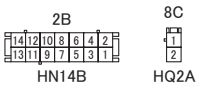
GROUND (10)

Circuit No. EAB1 ground (6/6)
＜JOINT(EAB1S)＞

M/T : Manual transmission
DPF : Diesel particulate filter



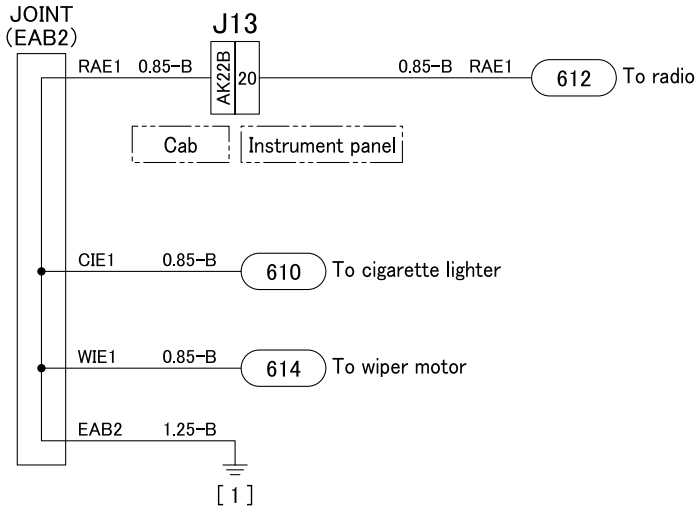
SAM connector (harness side)



130-619522EAB1-6_1

GROUND (11)

Circuit No. EAB2 ground

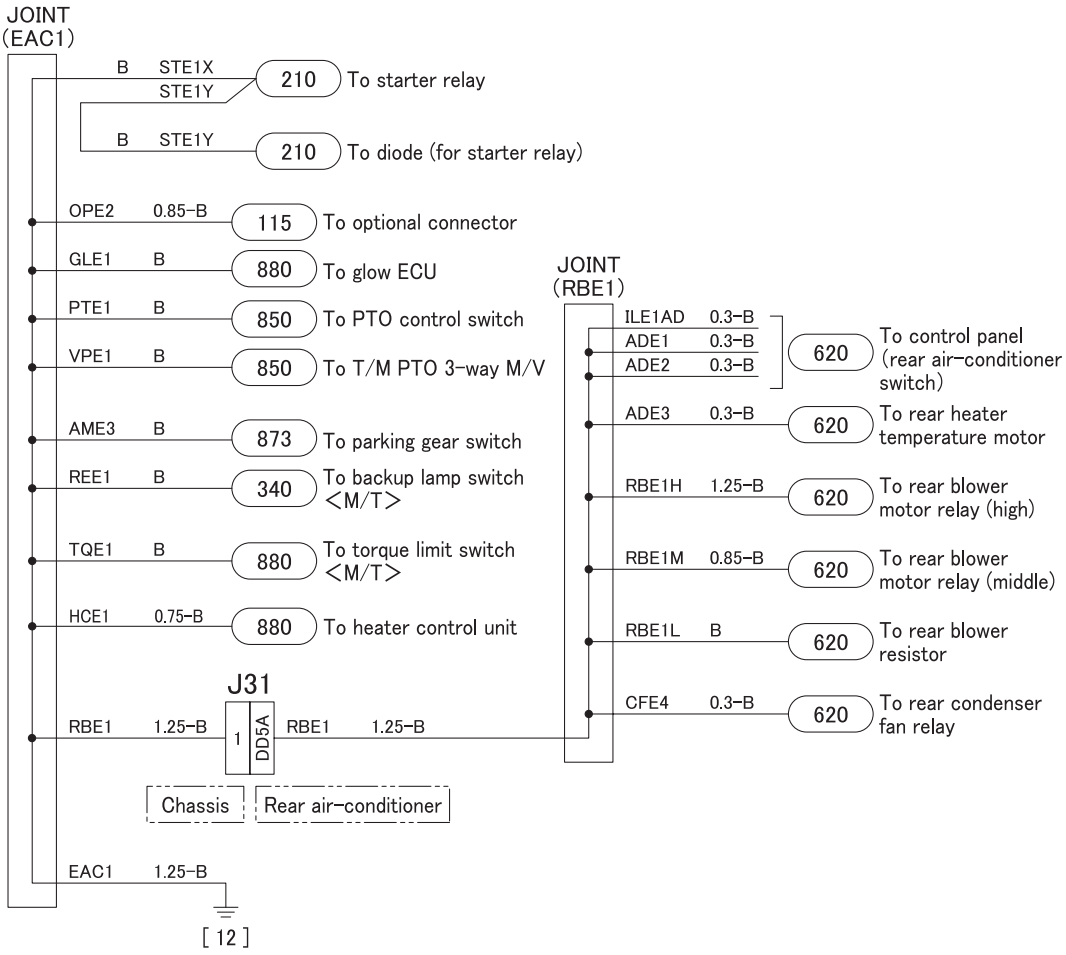


130-C07432EAB2

GROUND (12)

Circuit No. EAC1 ground

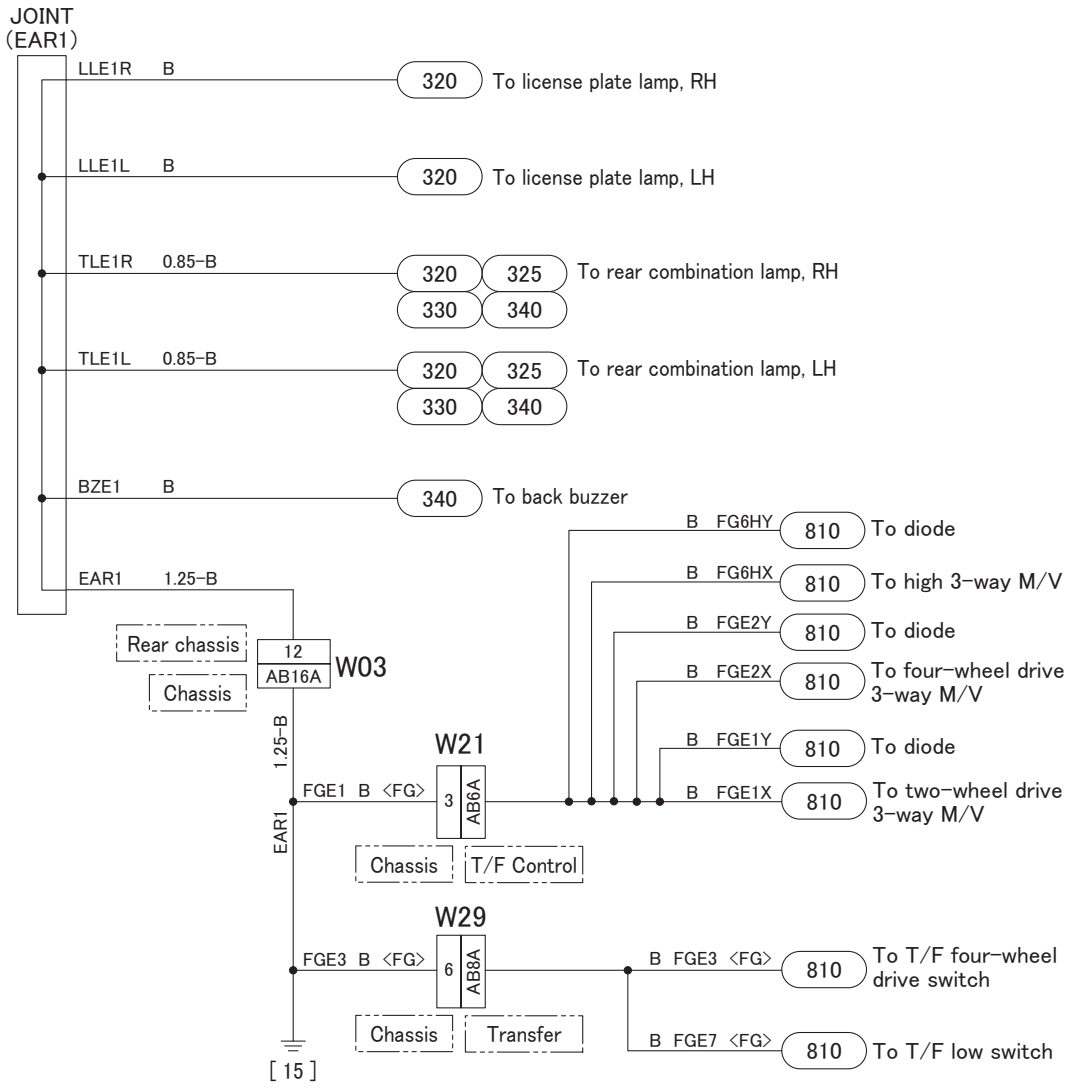
ECU : Electronic control unit
T/M : Transmission
PTO : Power take-off
M/V : Magnetic valve
M/T : Manual transmission



130-619522EAC1

GROUND (13)

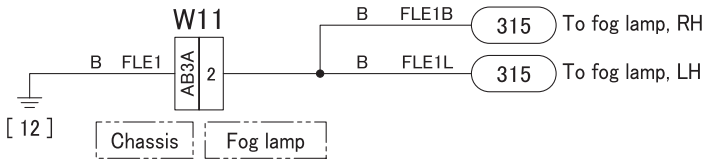
Circuit No. EAR1 ground



130-619522EAR1

GROUND (14)

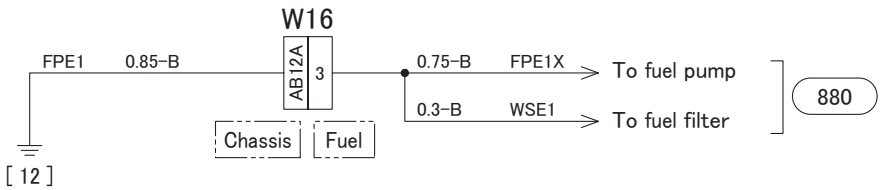
Circuit No. FLE1 ground



130-618048FLE1

GROUND (15)

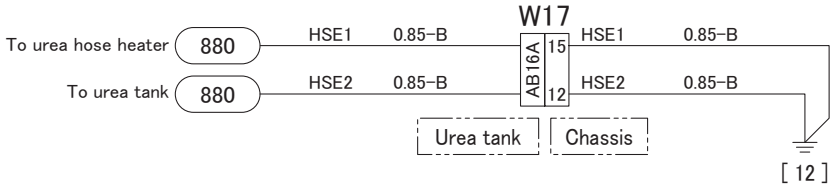
Circuit No. FPE1 ground



130-619522FPE1

GROUND (16)

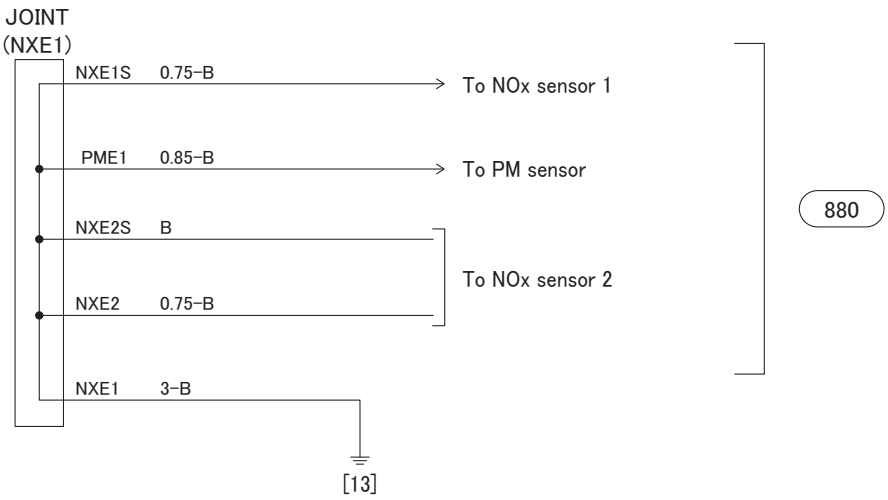
Circuit No. HSE1, HSE2 ground



130-619522HSE1

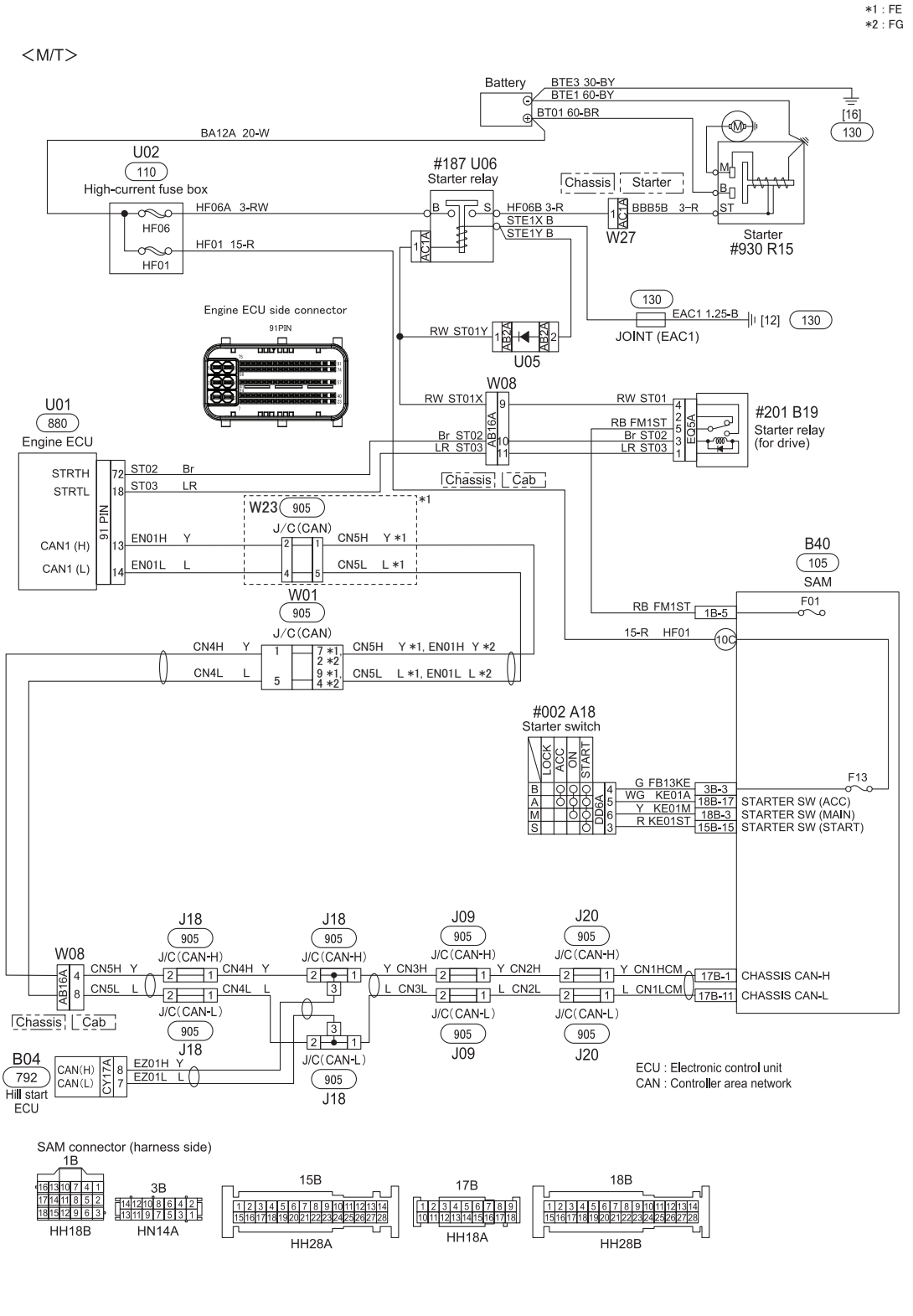
GROUND (17)

Circuit No. NXE1 ground



130-619522NXE1

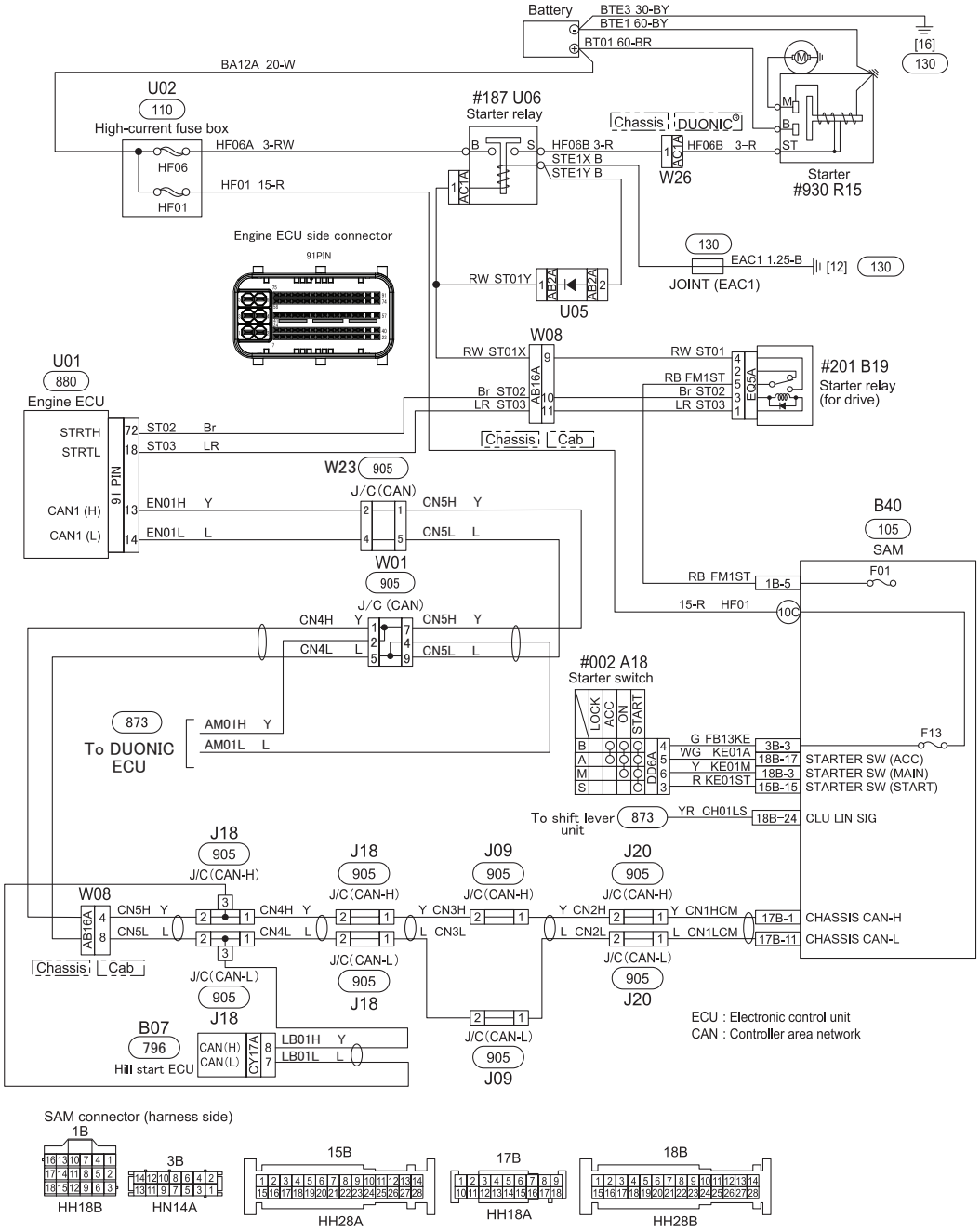
ENGINE STARTING CIRCUIT (1)



210-618048M

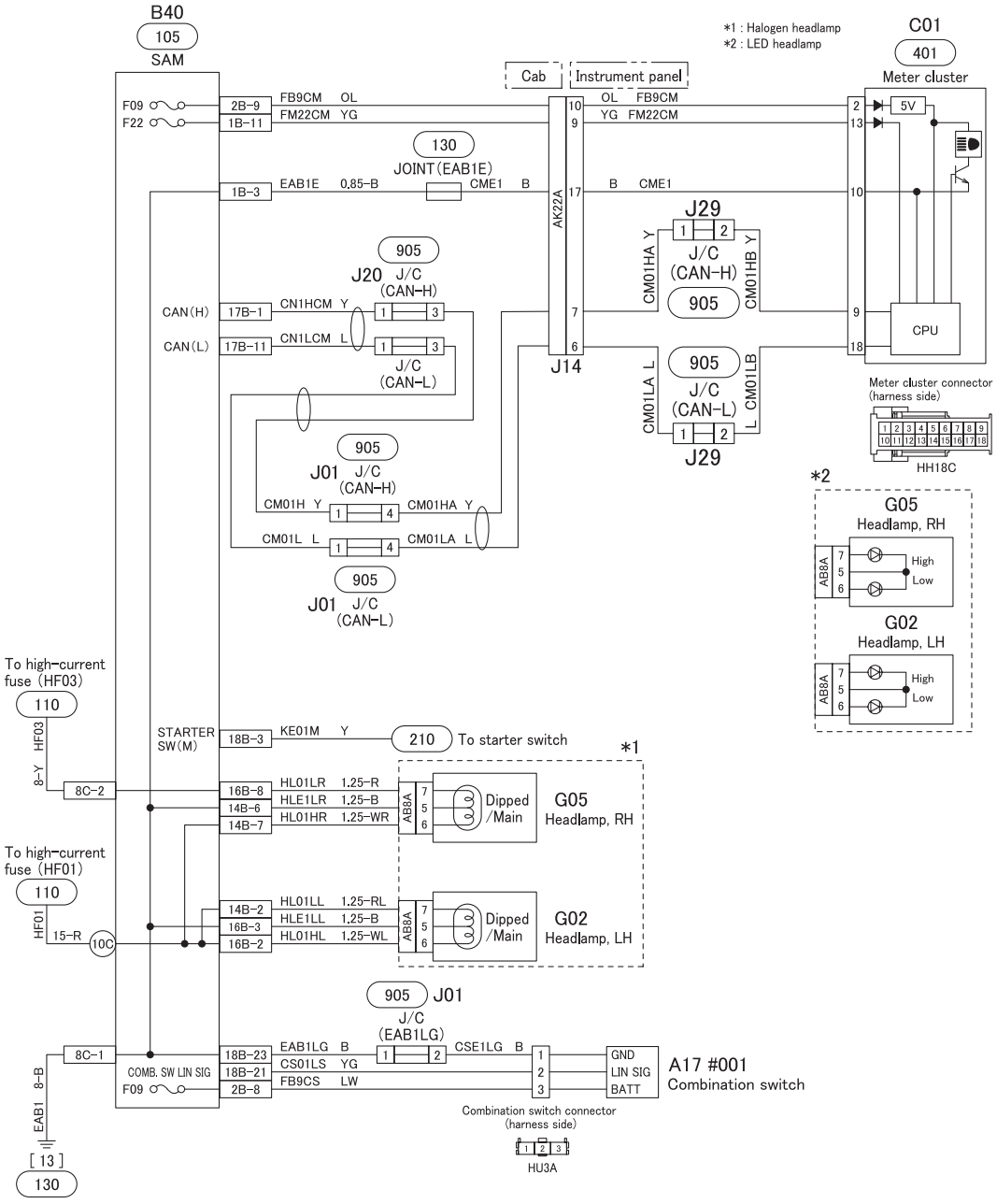
ENGINE STARTING CIRCUIT (2)

<DUONIC®>

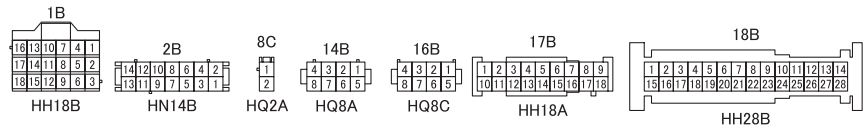


210-619522D

HEADLAMP CIRCUIT

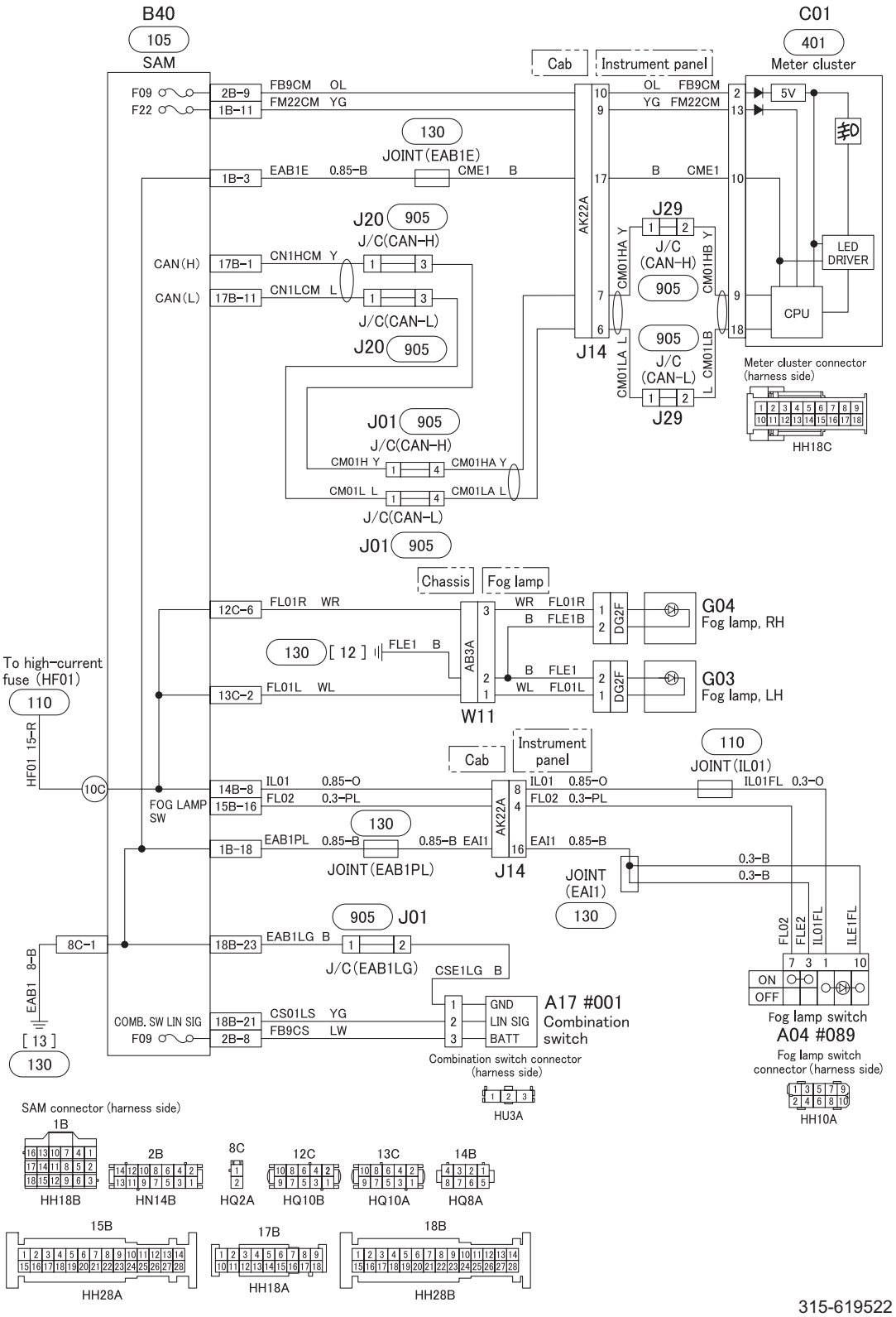


SAM connector (harness side)

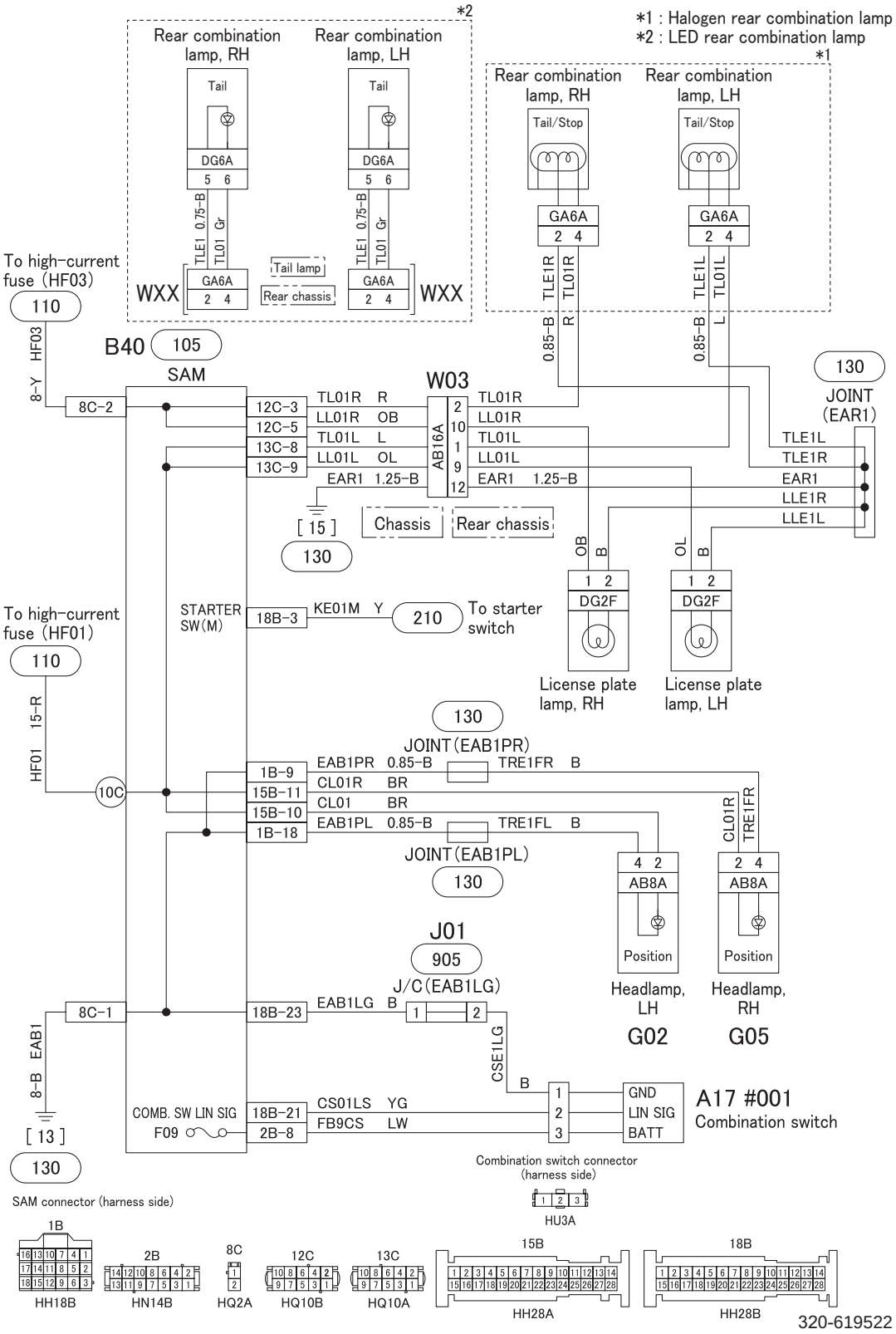


310-619522

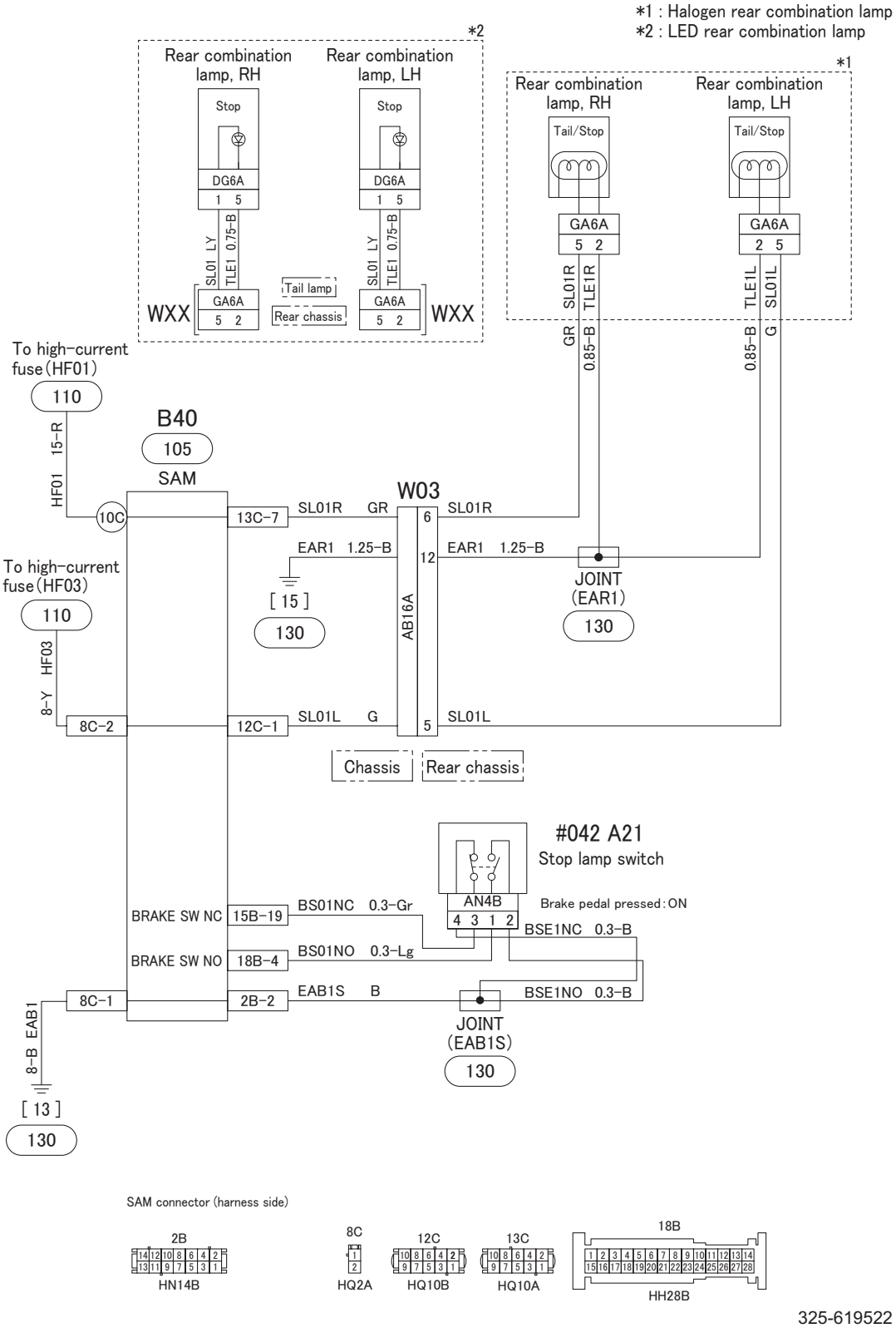
FOG LAMP CIRCUIT



TAIL, POSITION AND LICENSE PLATE LAMPS CIRCUIT

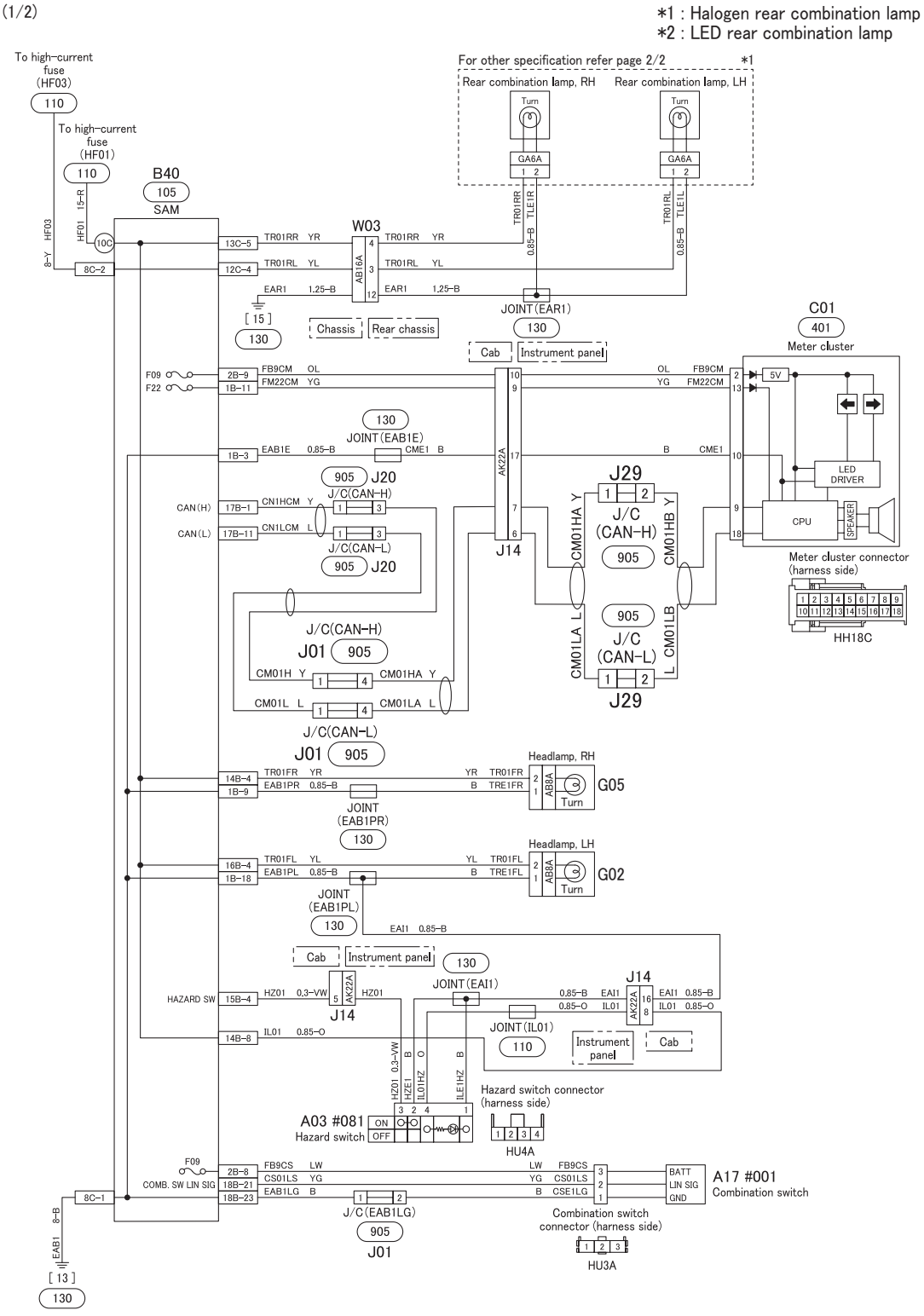


STOP LAMP CIRCUIT



325-619522

TURN SIGNAL AND HAZARD LAMP CIRCUIT (1)

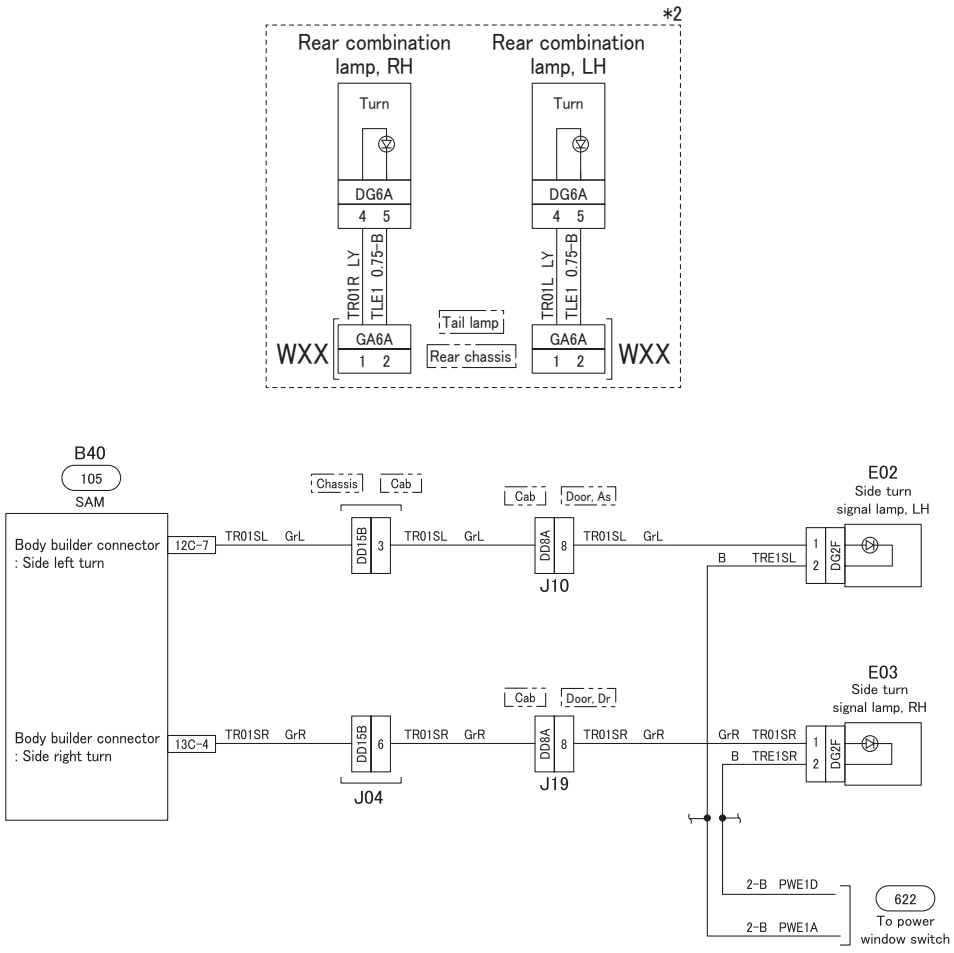


330-619522-1

TURN SIGNAL AND HAZARD LAMP CIRCUIT (2)

(2/2)

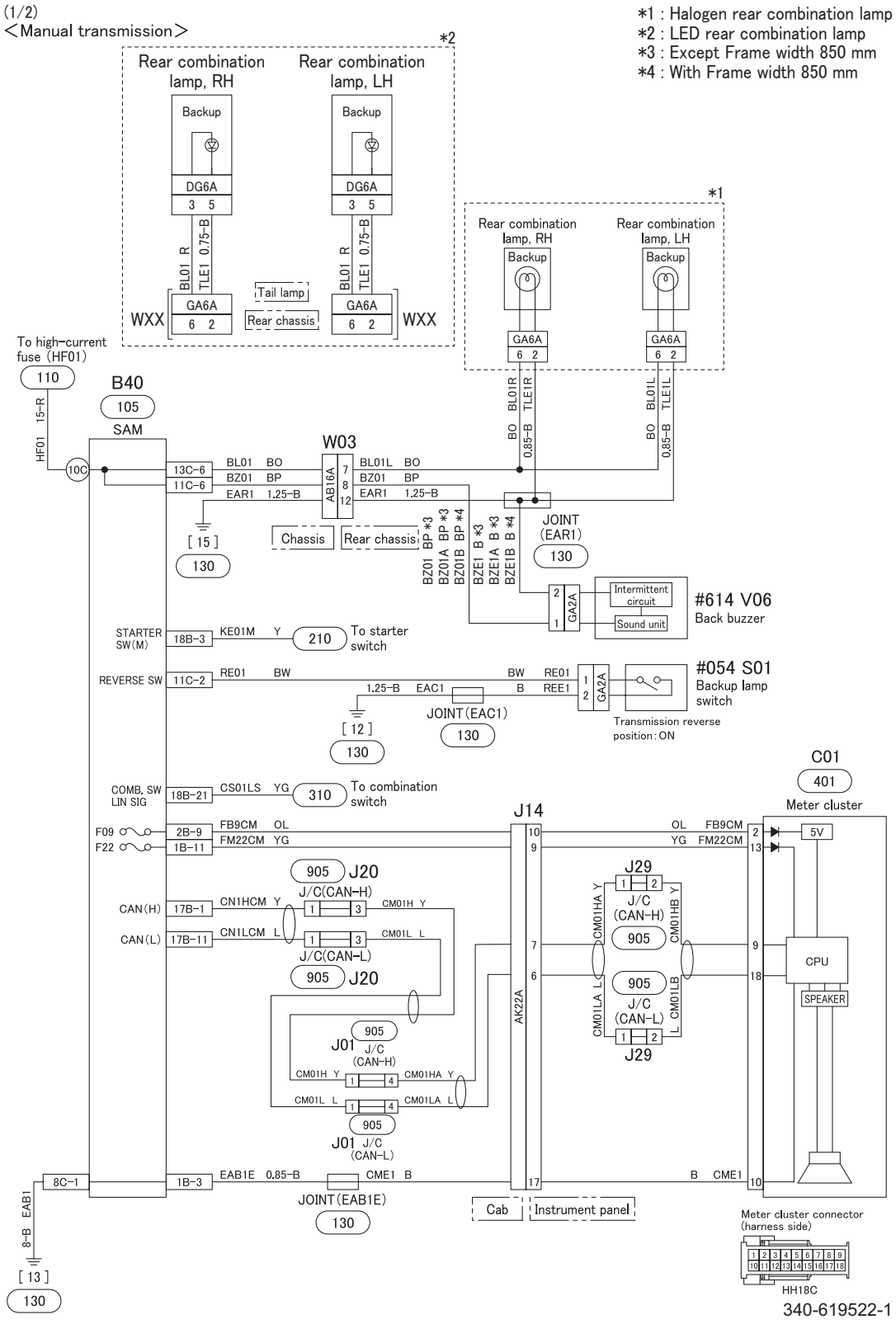
*1 : Halogen rear combination lamp
*2 : LED rear combination lamp



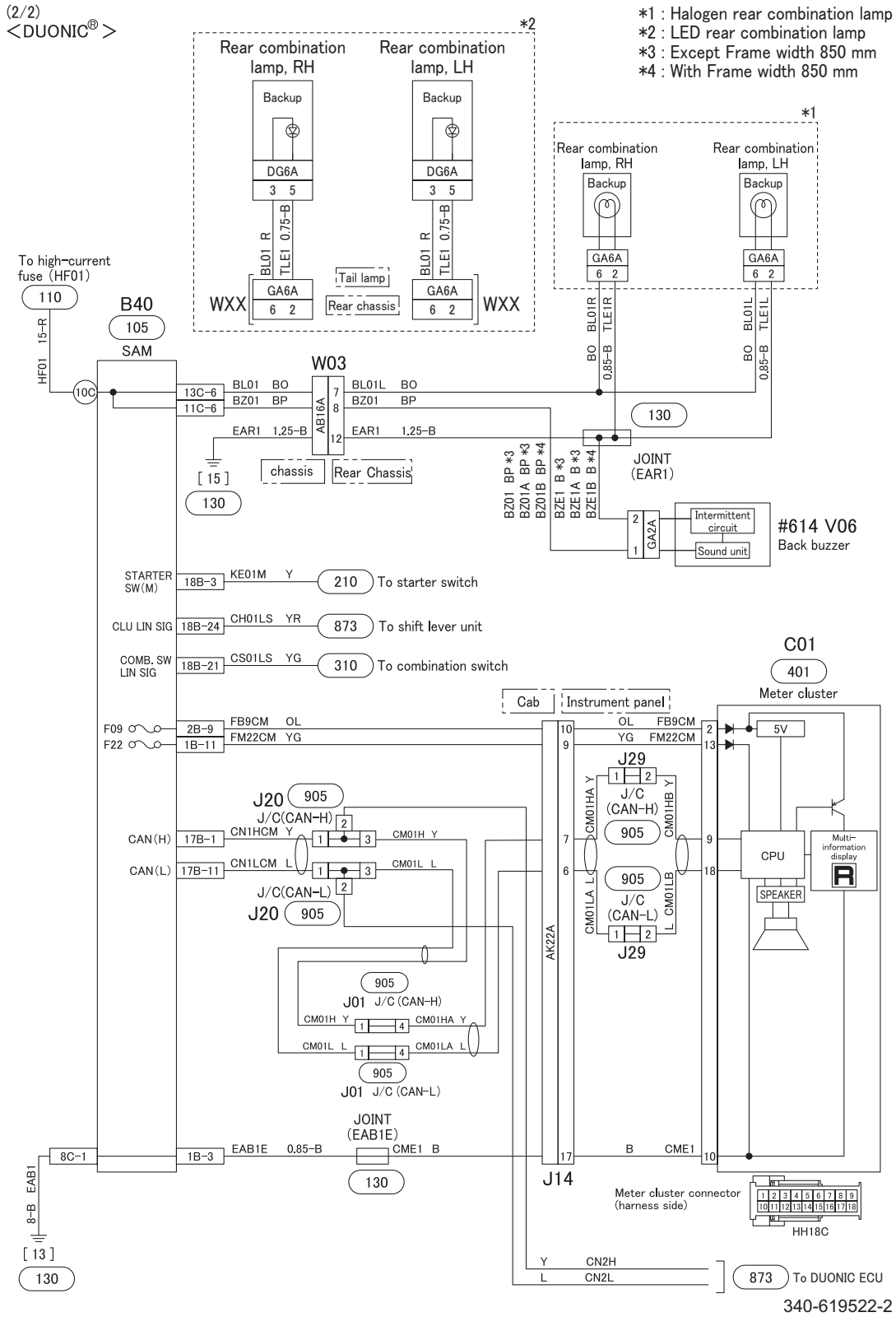
Dr : Driver's seat side
As : Assistant driver's seat side

330-619522-2

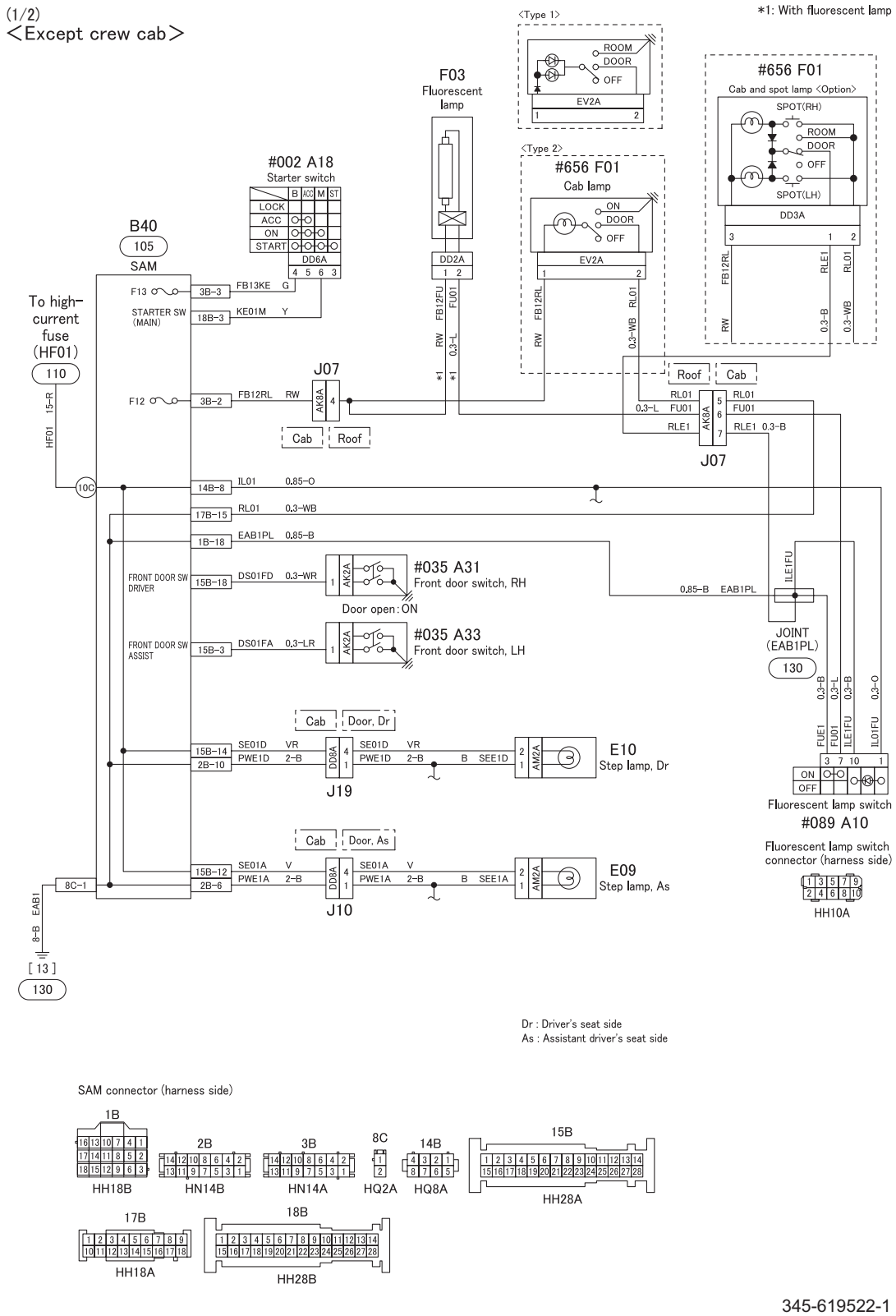
BACKUP LAMP CIRCUIT (1)



BACKUP LAMP CIRCUIT (2)



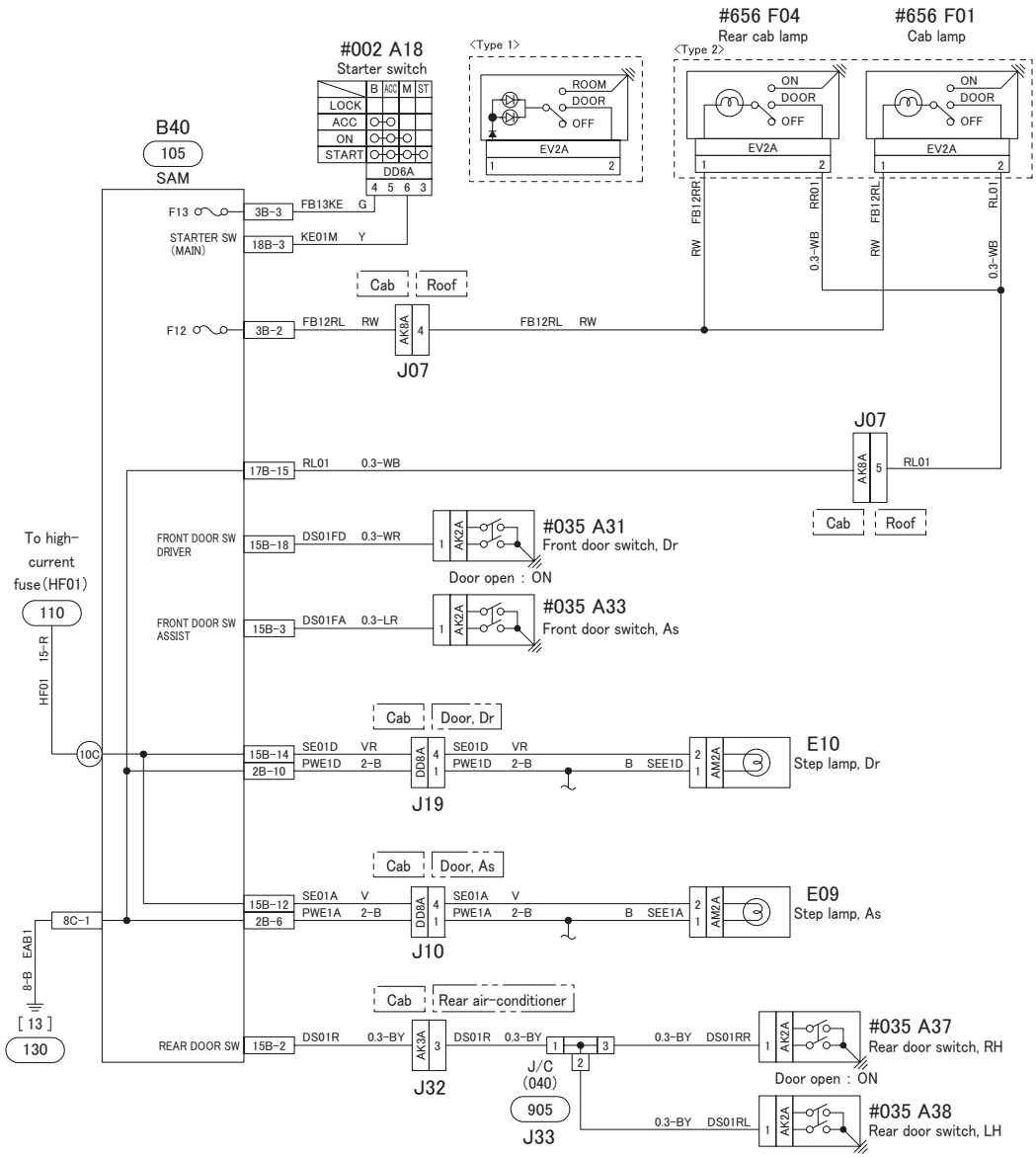
CAB LAMP AND STEP LAMP CIRCUIT (1)



345-619522-1

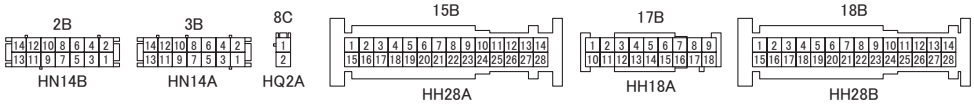
CAB LAMP AND STEP LAMP CIRCUIT (2)

(2/2)
＜Crew cab＞



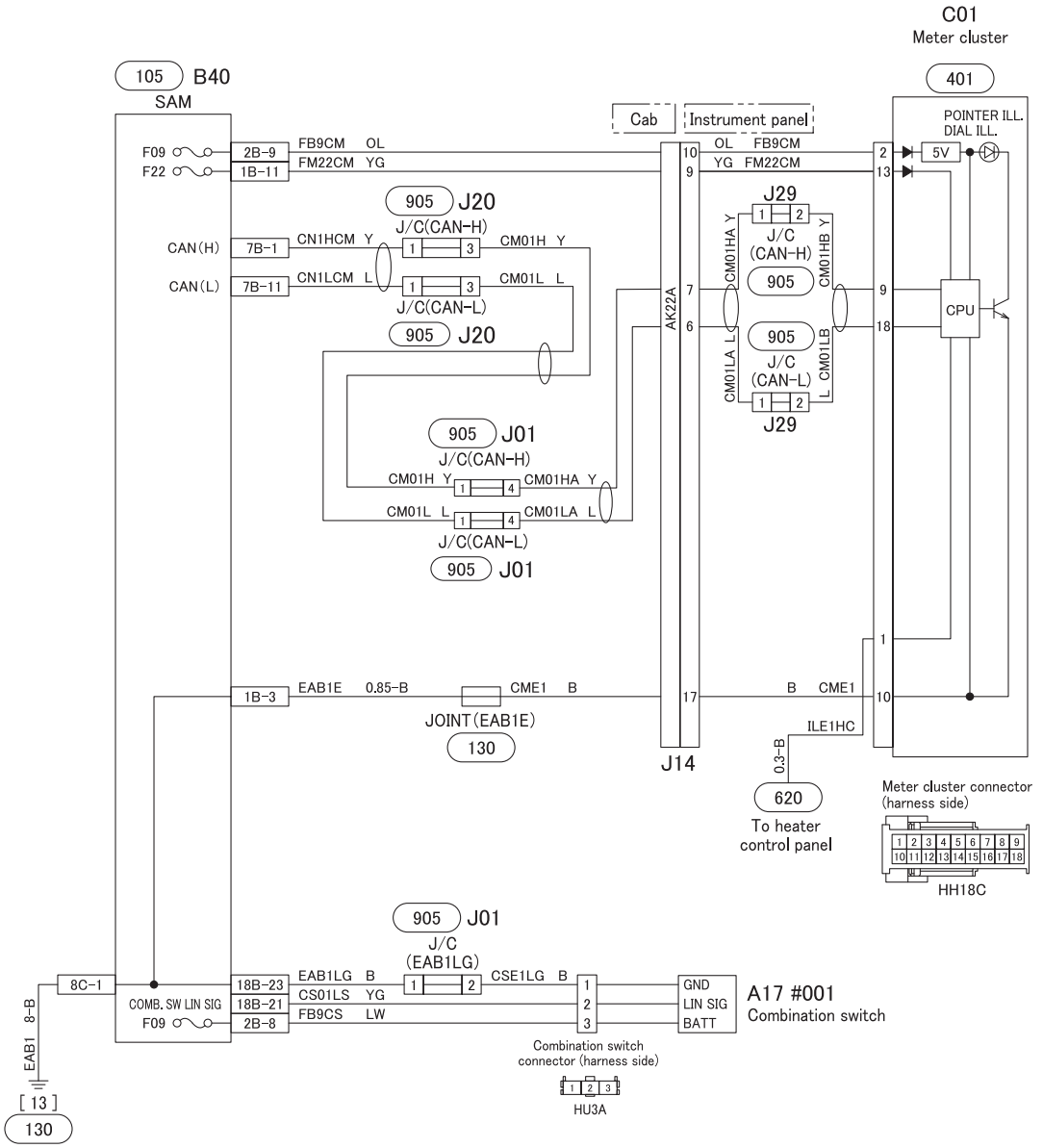
Dr : Driver's seat side
As : Assistant driver's seat side

SAM connector (harness side)

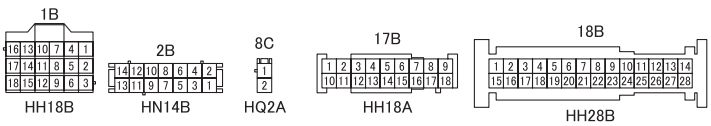


345-619522-2

ILLUMINATION LAMP CIRCUIT

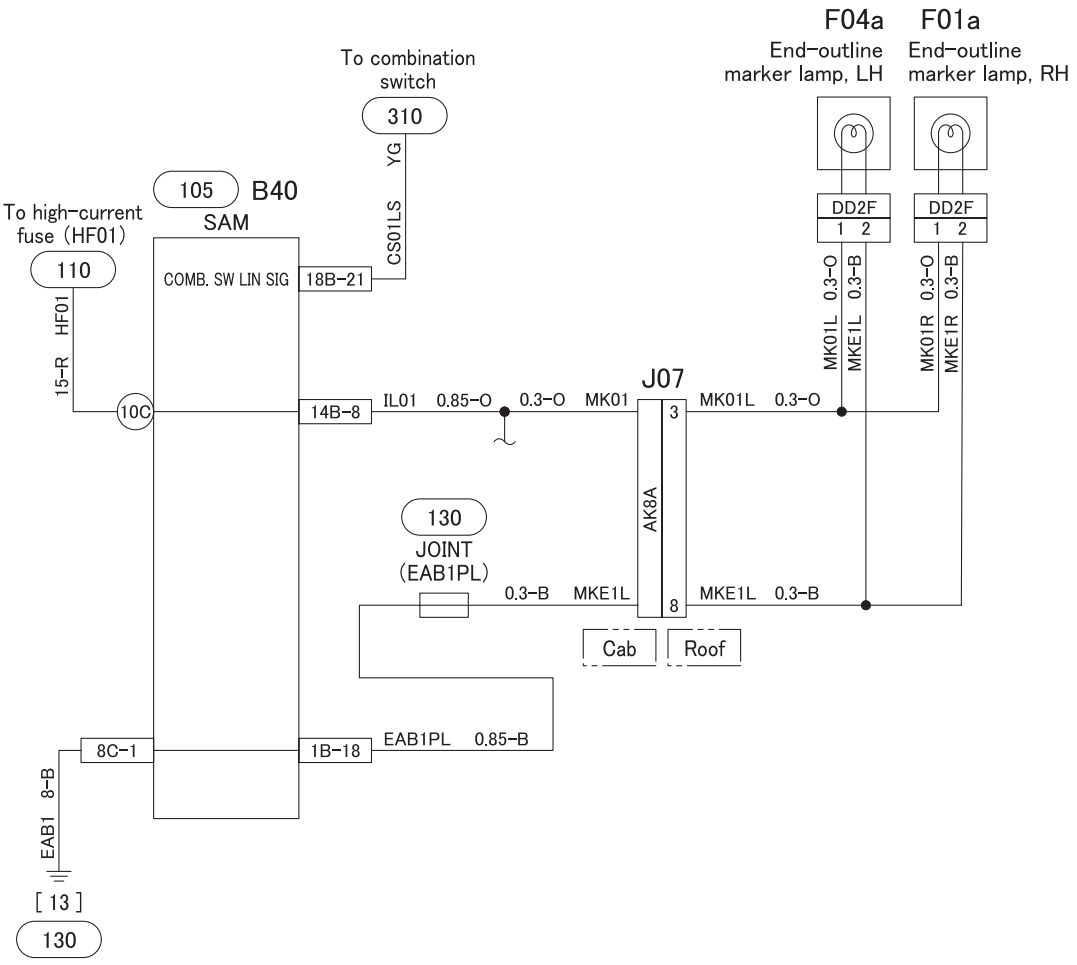


SAM connector (harness side)

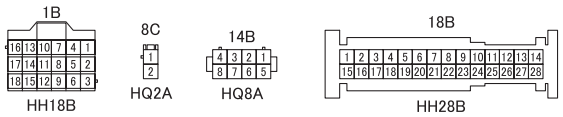


348-602211

END-OUTLINE MARKER LAMP CIRCUIT

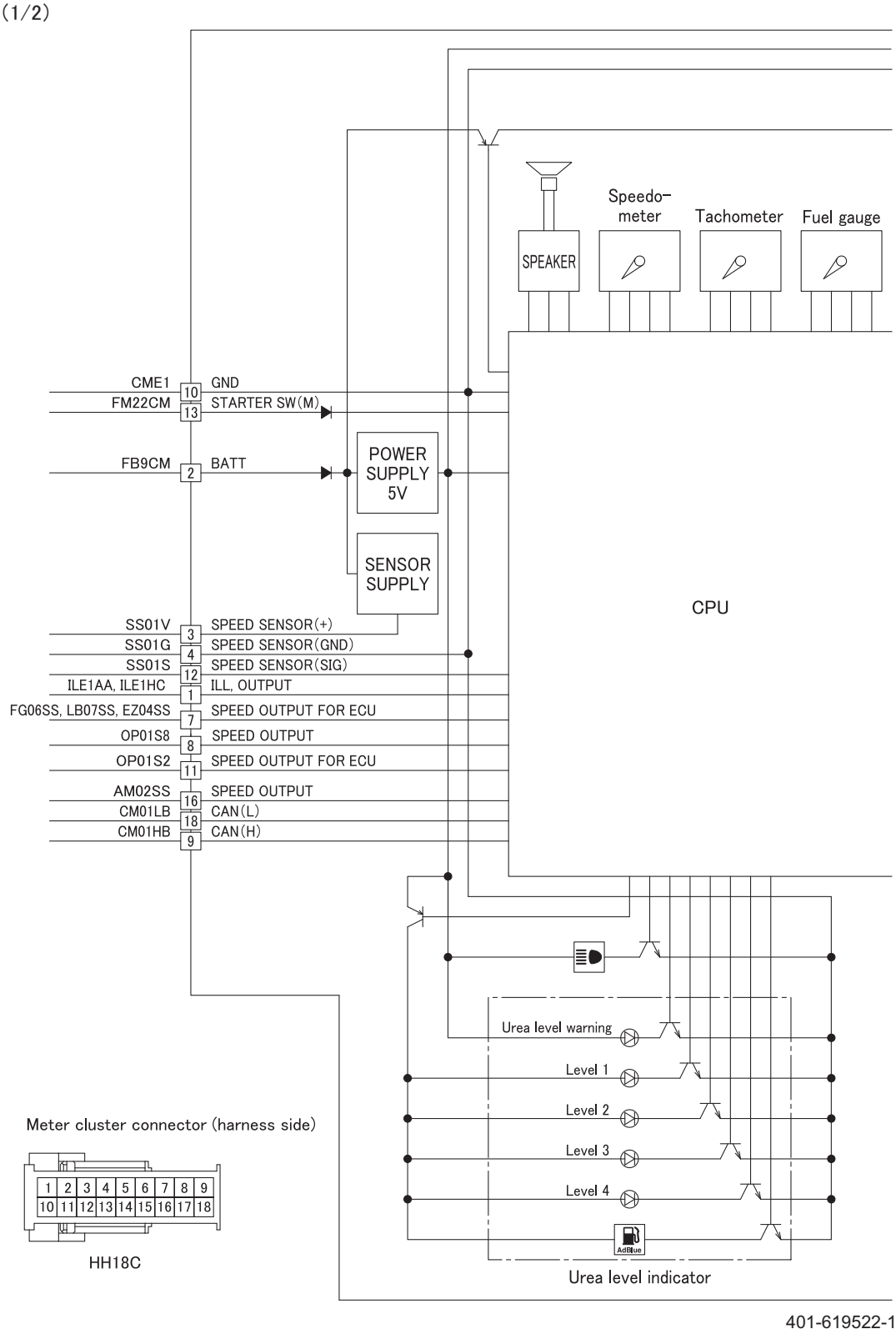


SAM connector (harness side)

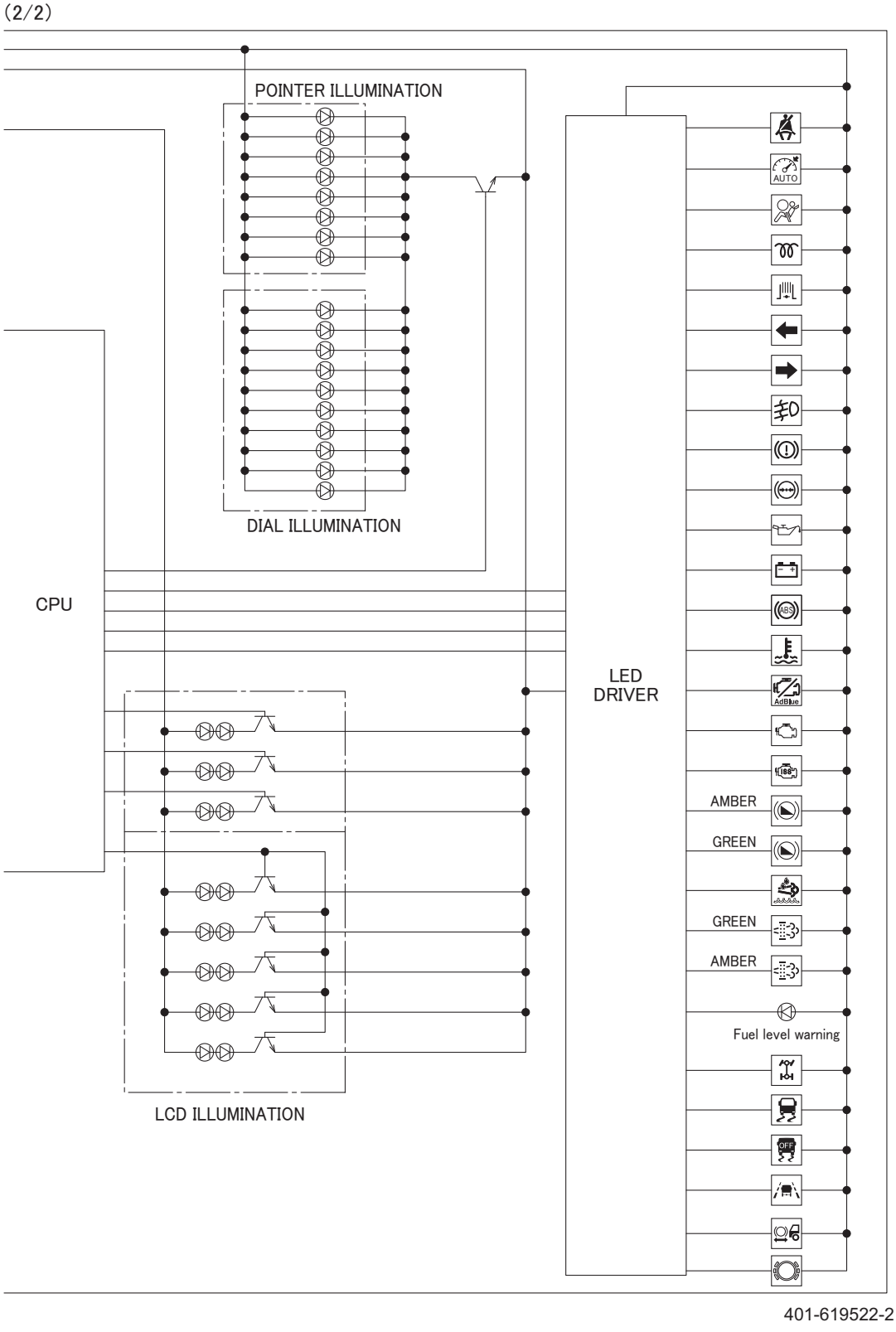


349-602211

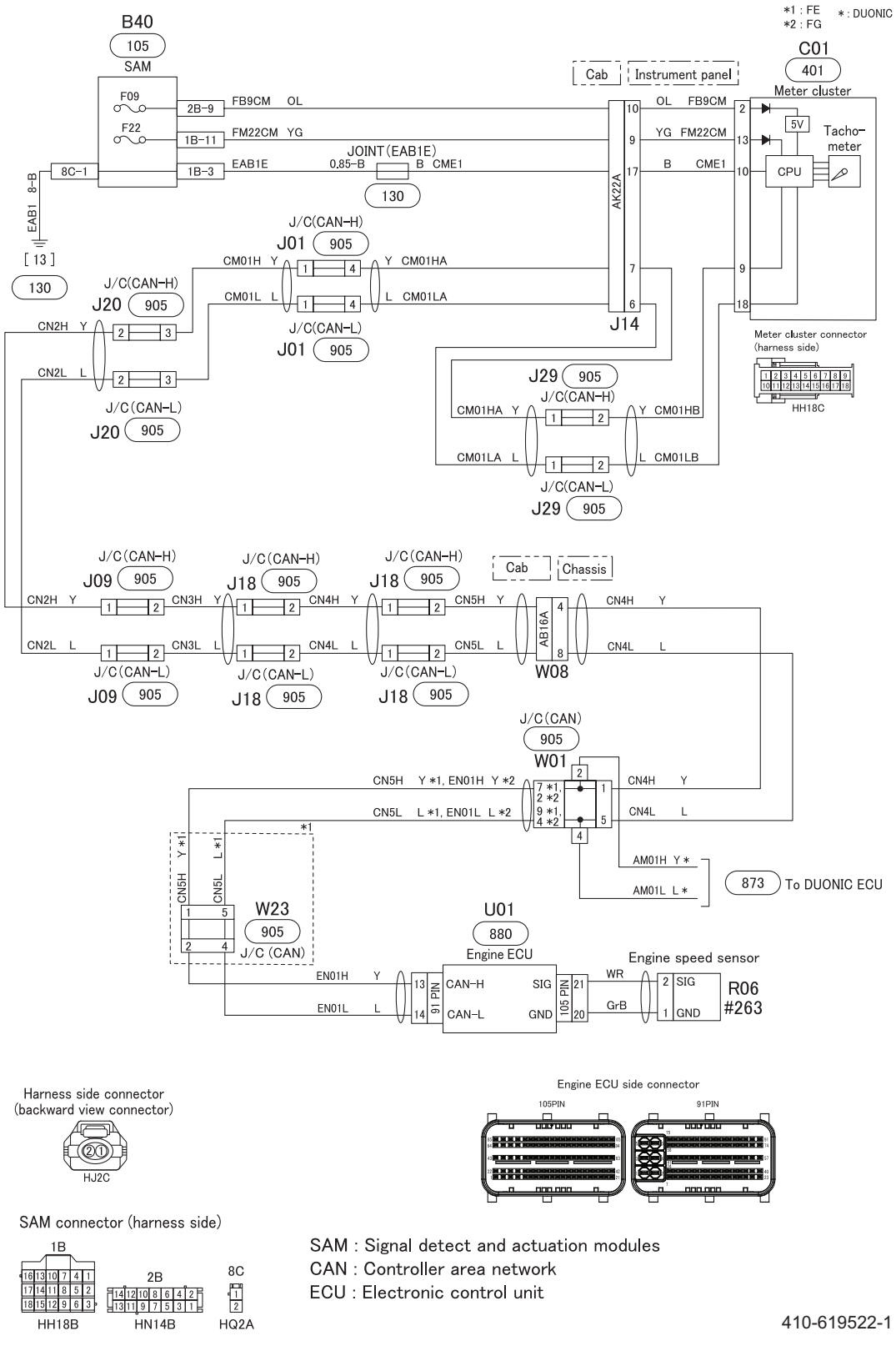
METER CLUSTER INTERNAL CIRCUIT (1)



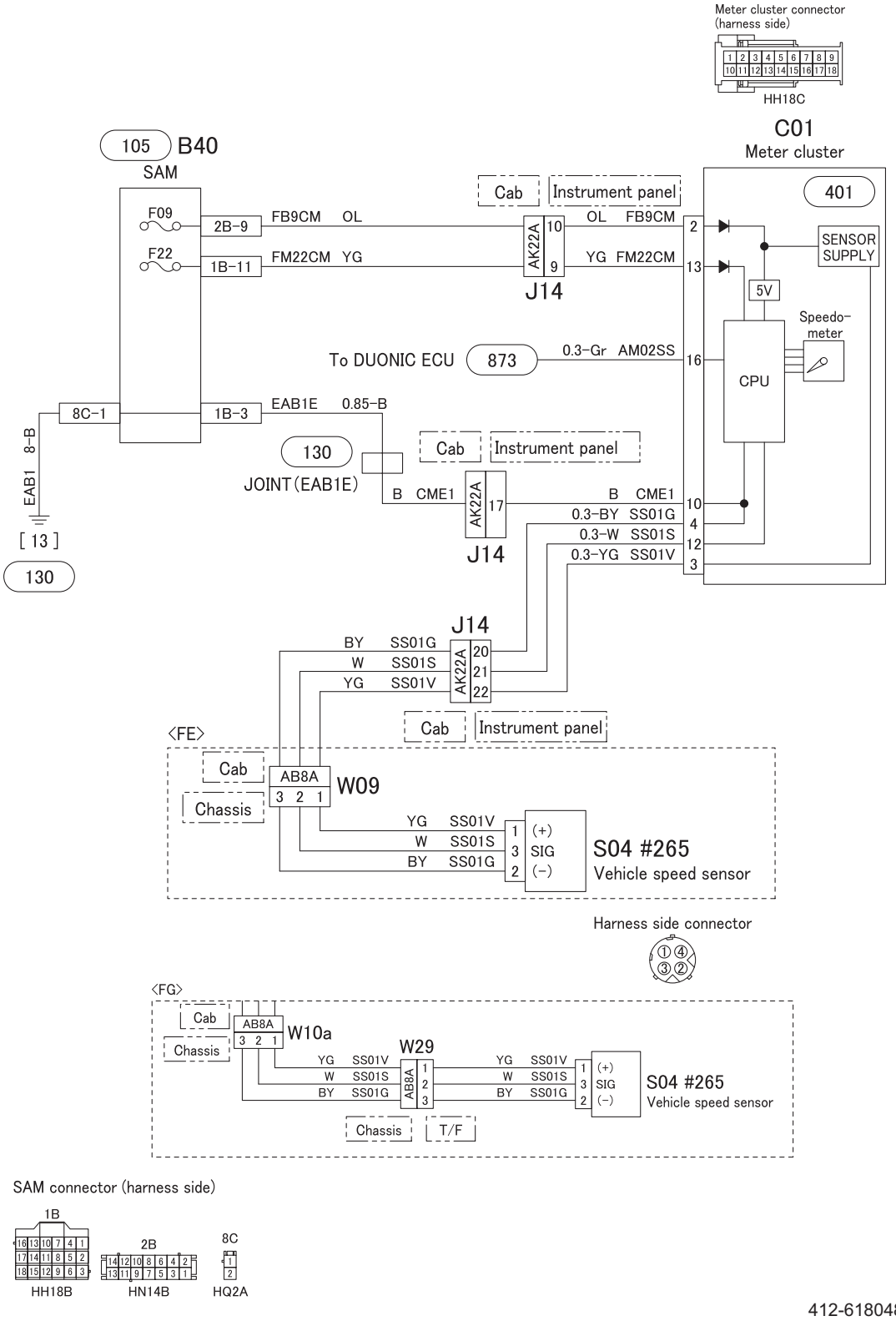
METER CLUSTER INTERNAL CIRCUIT (2)



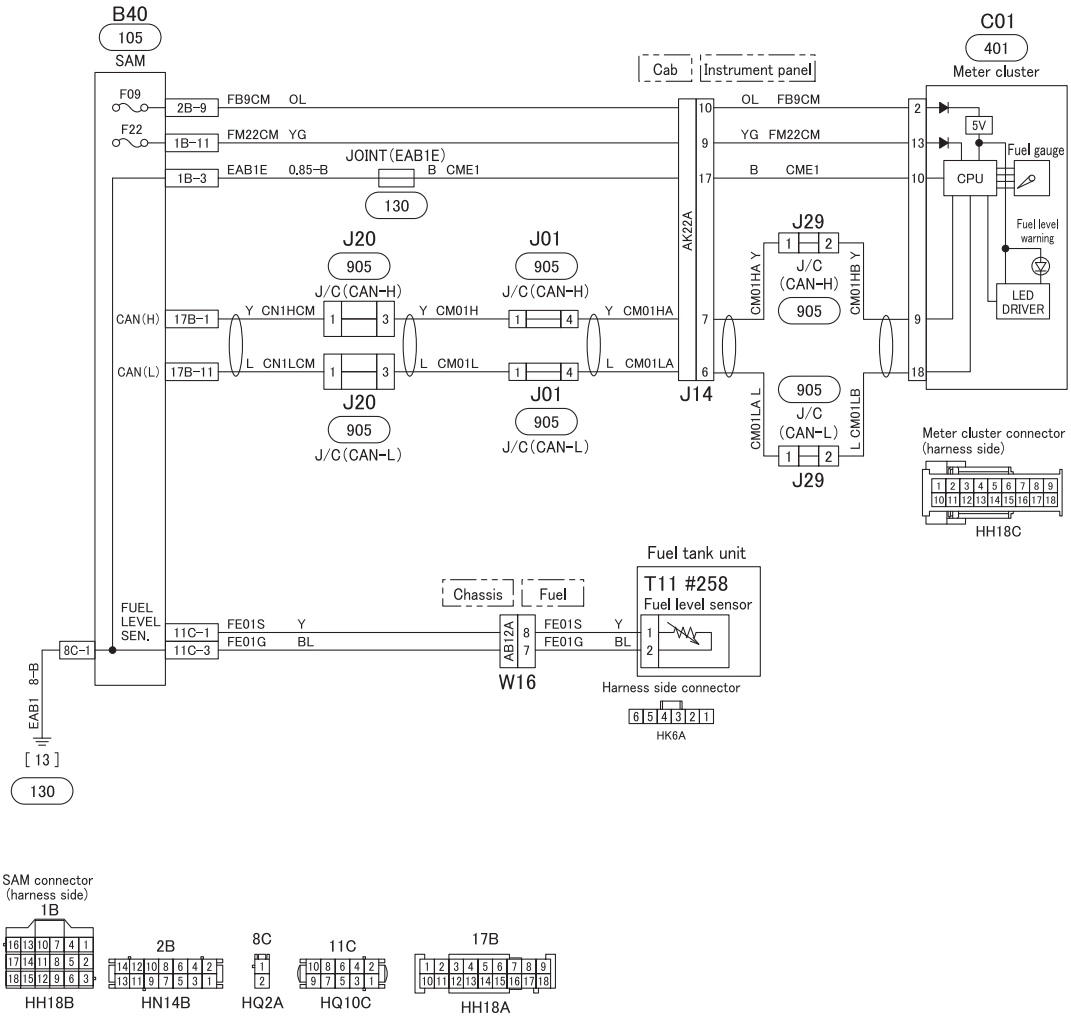
TACHOMETER CIRCUIT



SPEEDOMETER CIRCUIT

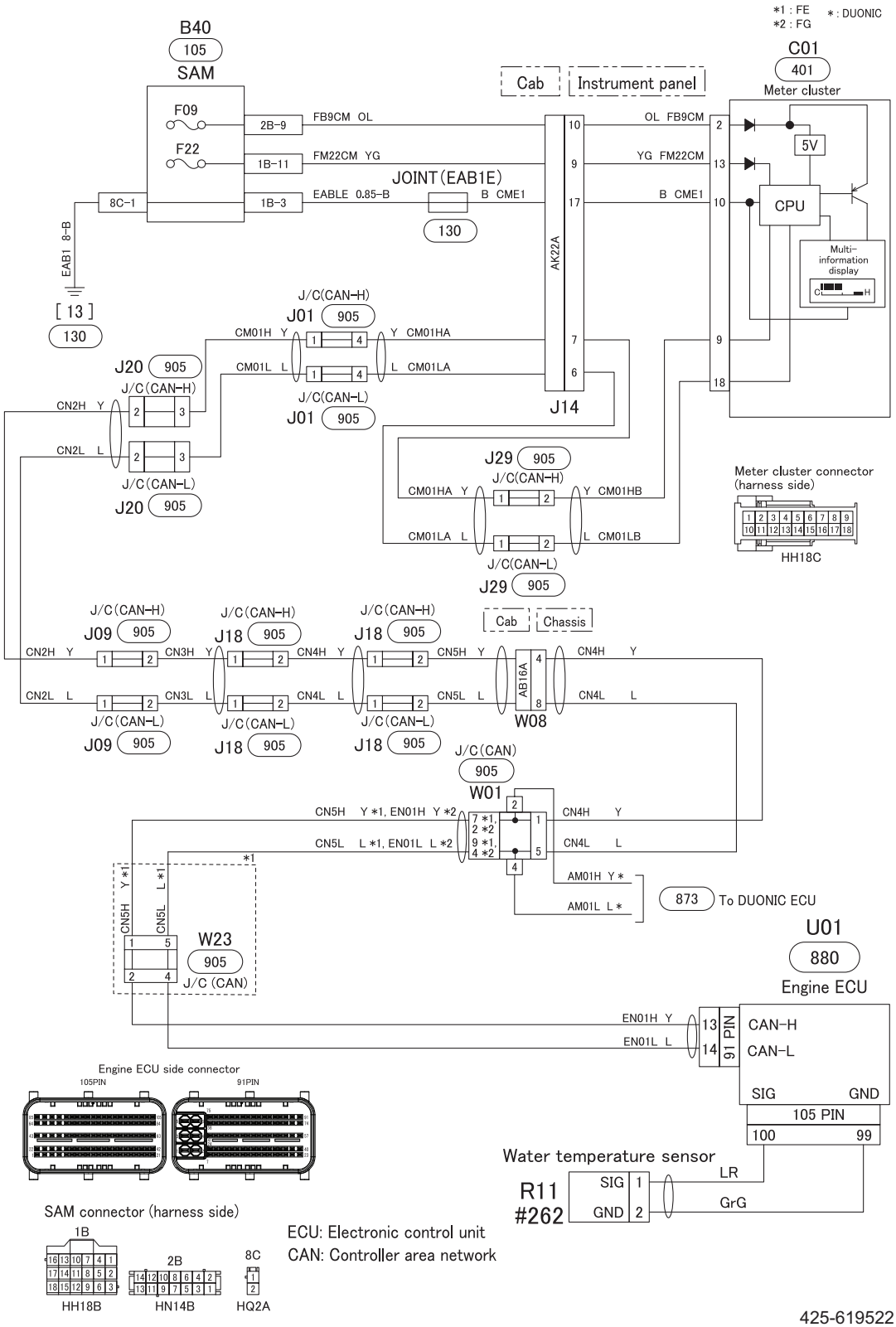


FUEL GAUGE CIRCUIT



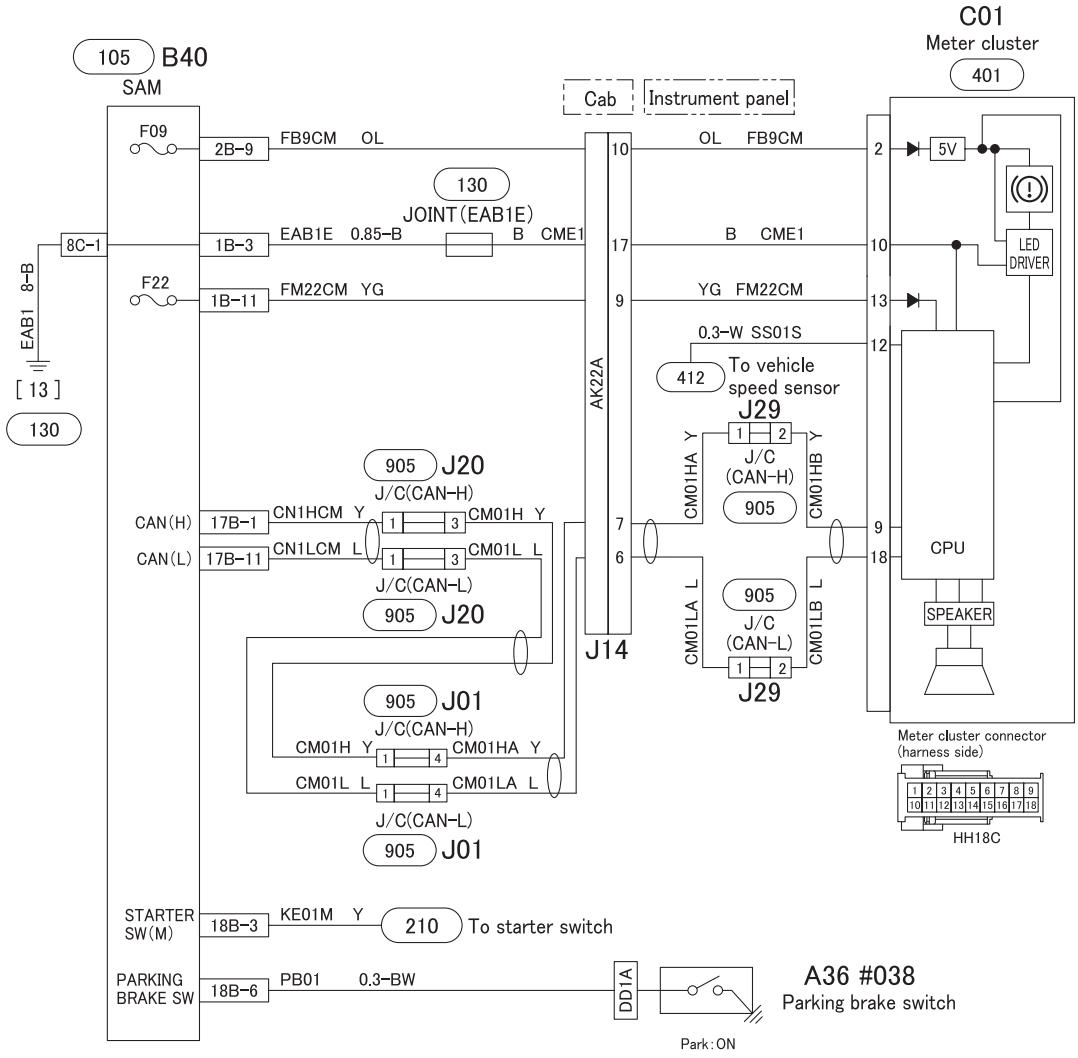
420-619522

WATER TEMPERATURE GAUGE CIRCUIT

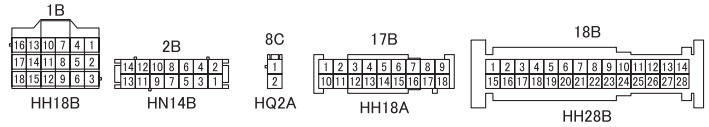


425-619522

PARKING BRAKE INDICATOR CIRCUIT

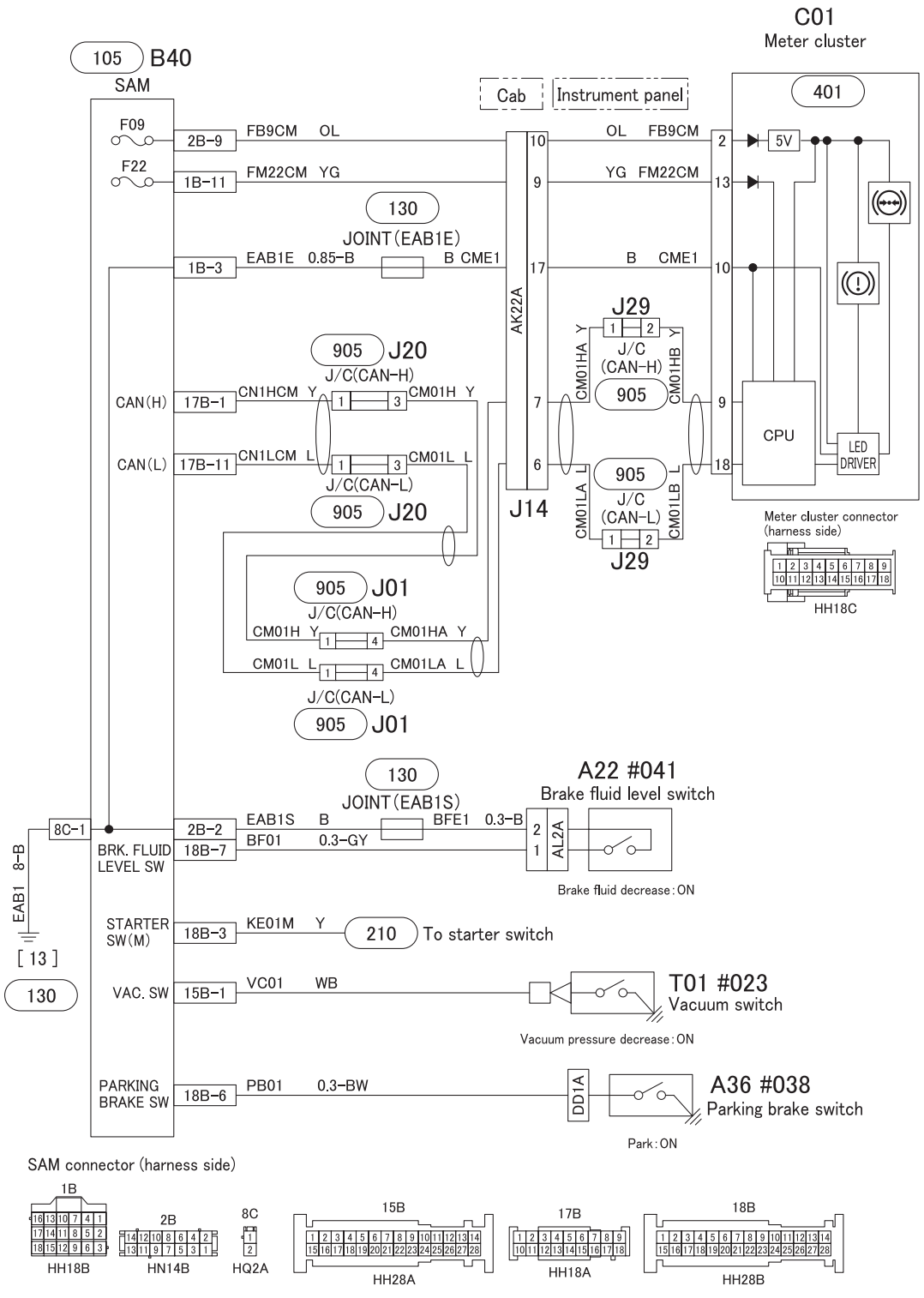


SAM connector (harness side)



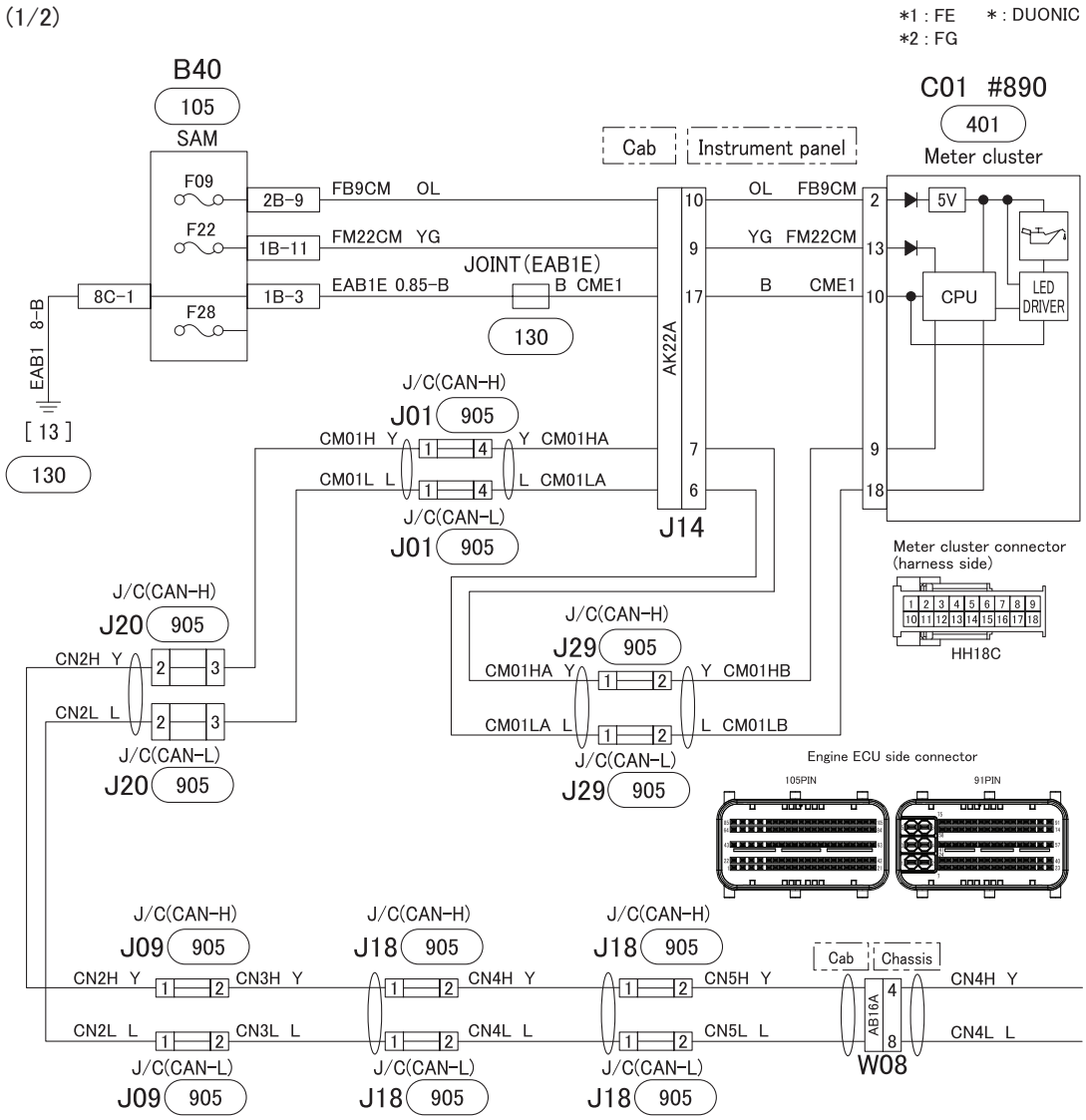
510-602211

BRAKE WARNING CIRCUIT

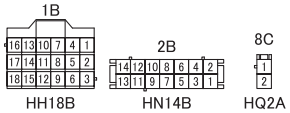


515-618048

ENGINE OIL LEVEL WARNING CIRCUIT



SAM connector (harness side)

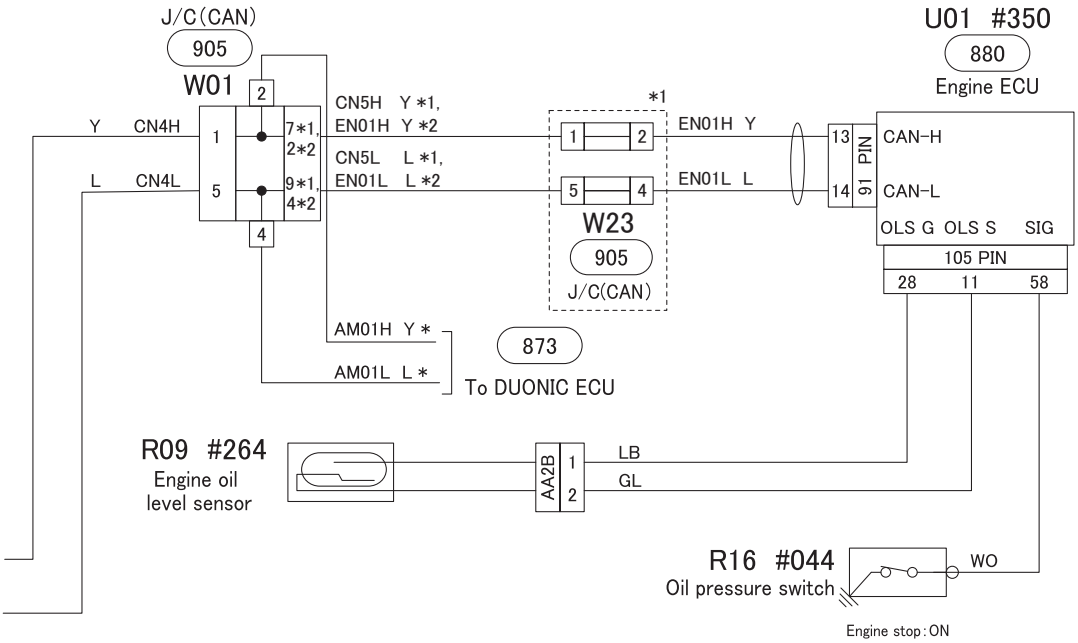


ECU : Electronic control unit

535-619522-1

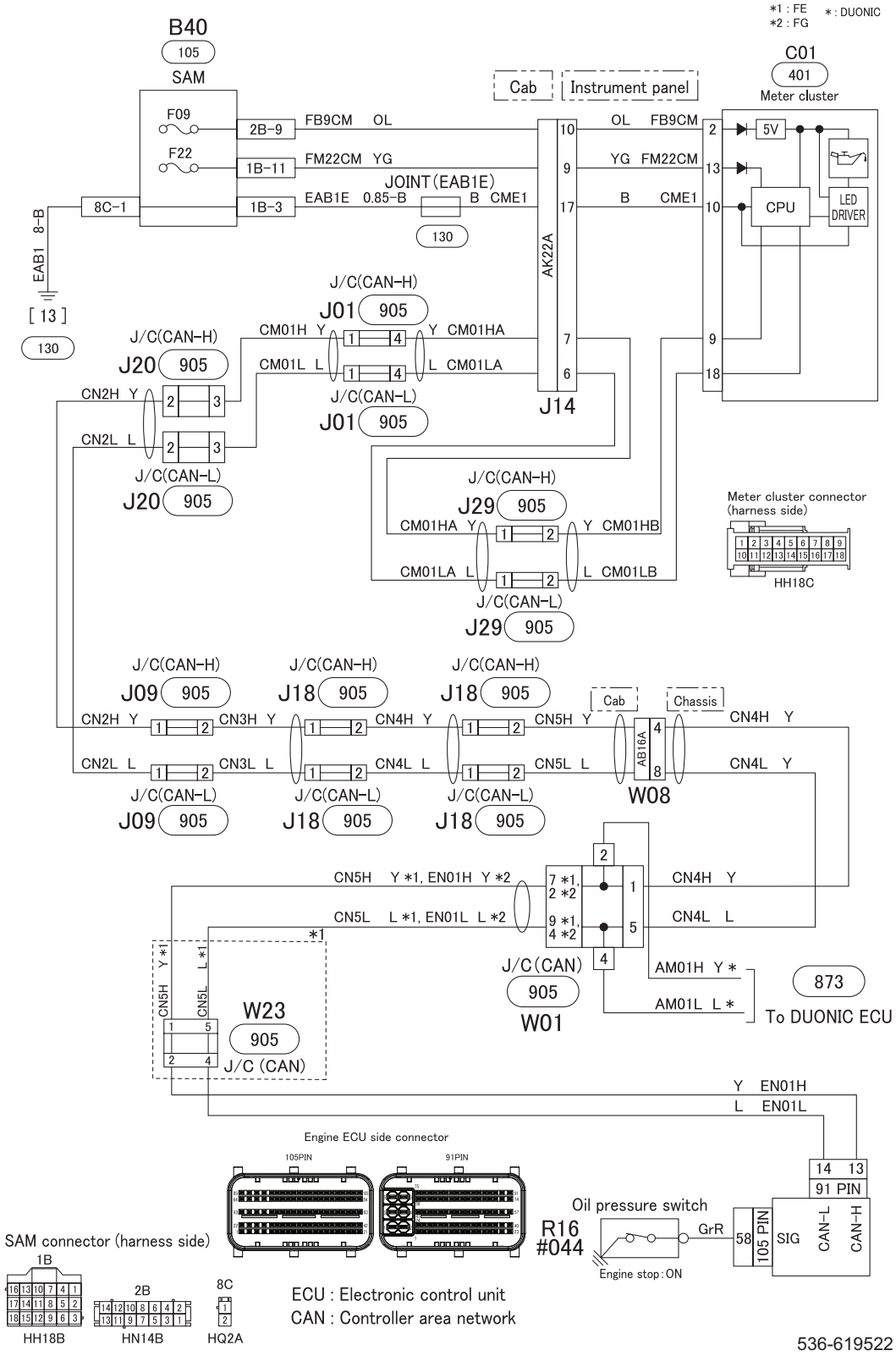
ENGINE OIL LEVEL WARNING CIRCUIT

(2/2)

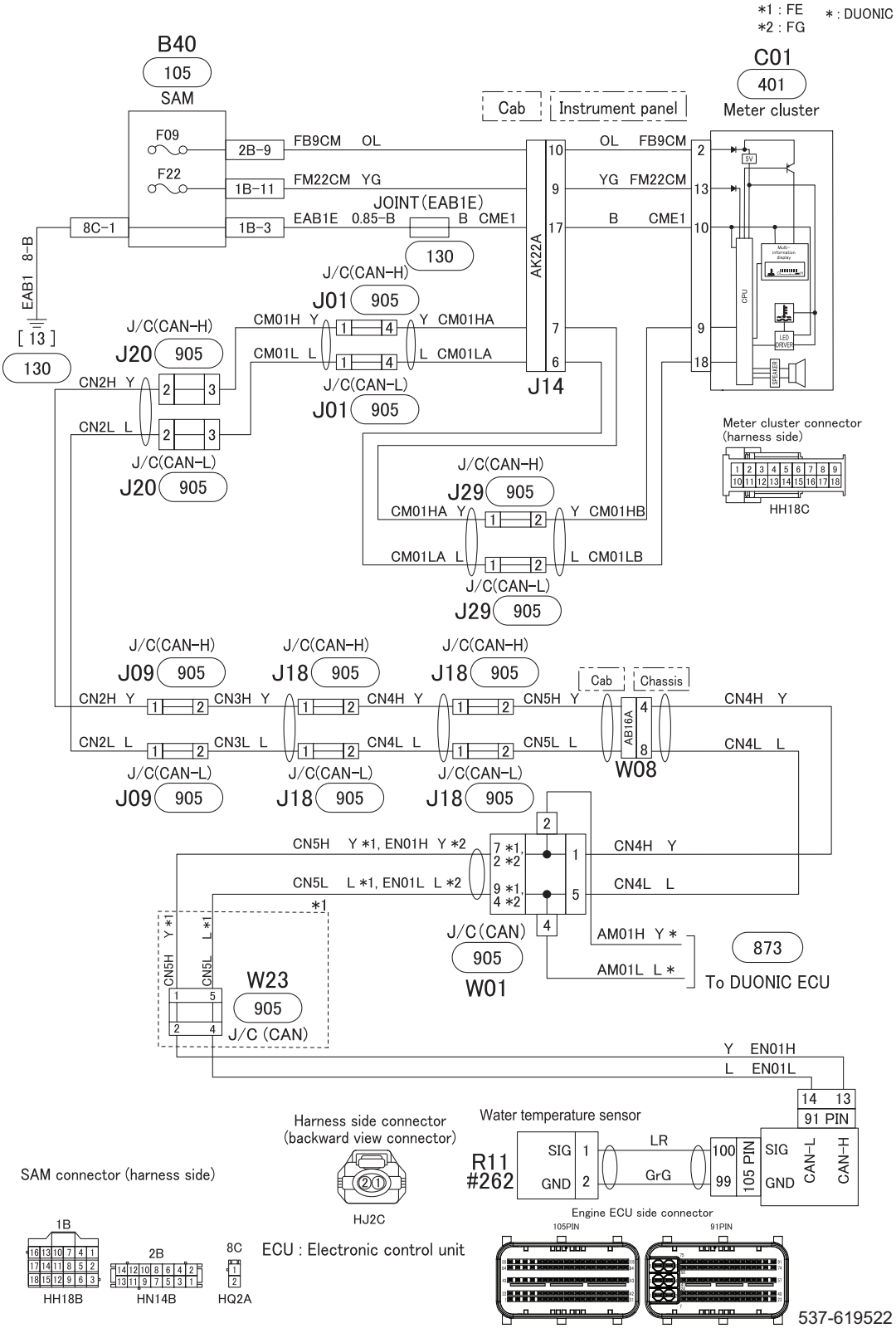


535-619522-2

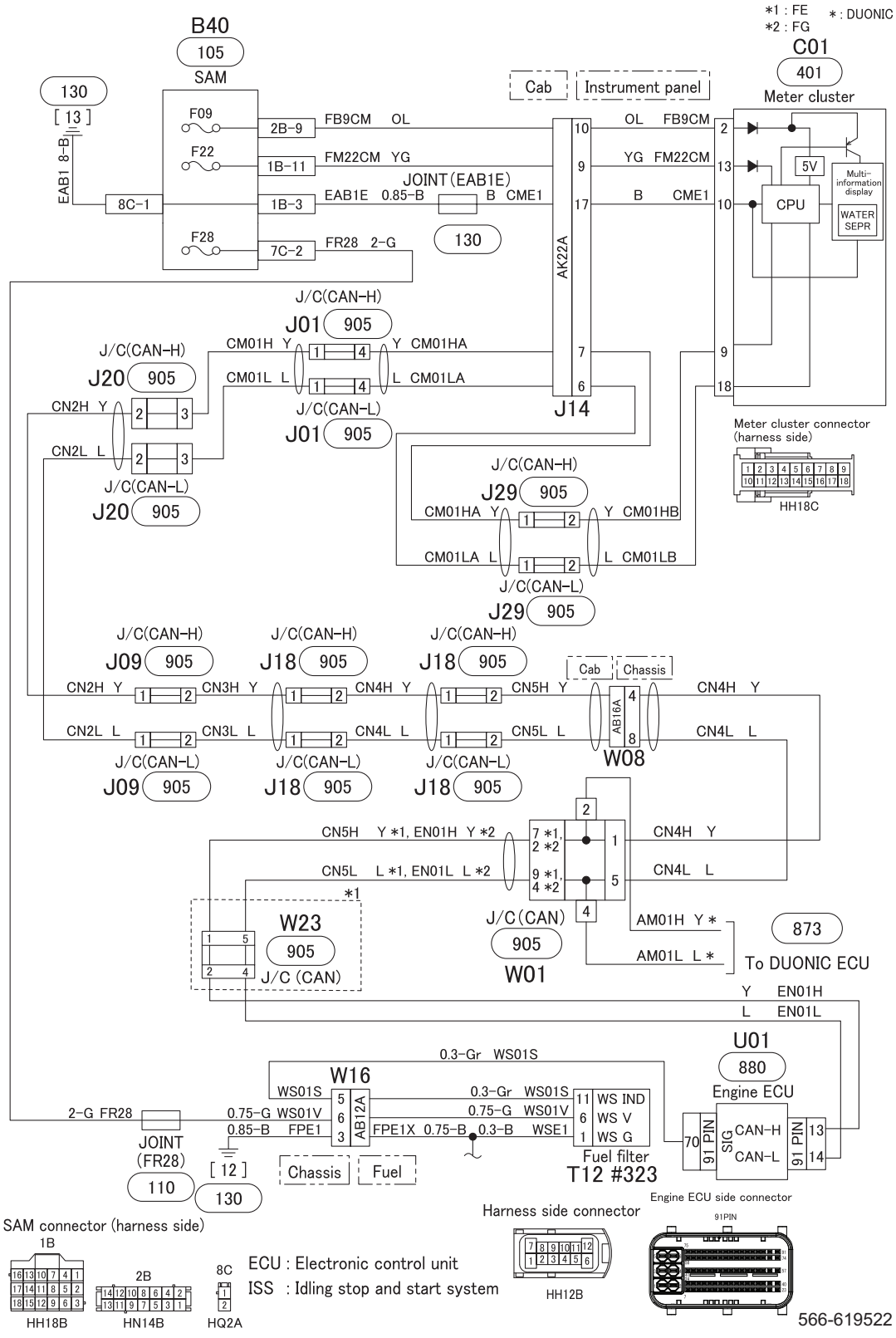
ENGINE OIL PRESSURE WARNING CIRCUIT



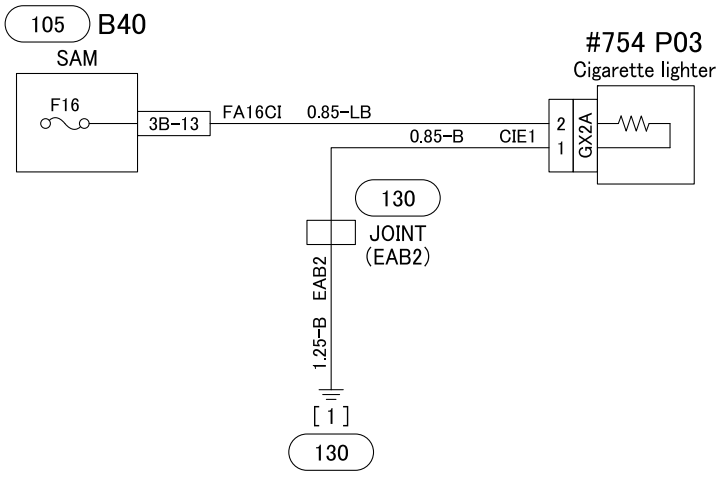
OVERHEATING WARNING CIRCUIT



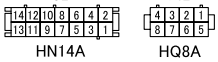
FUEL FILTER CIRCUIT



CIGARETTE LIGHTER CIRCUIT



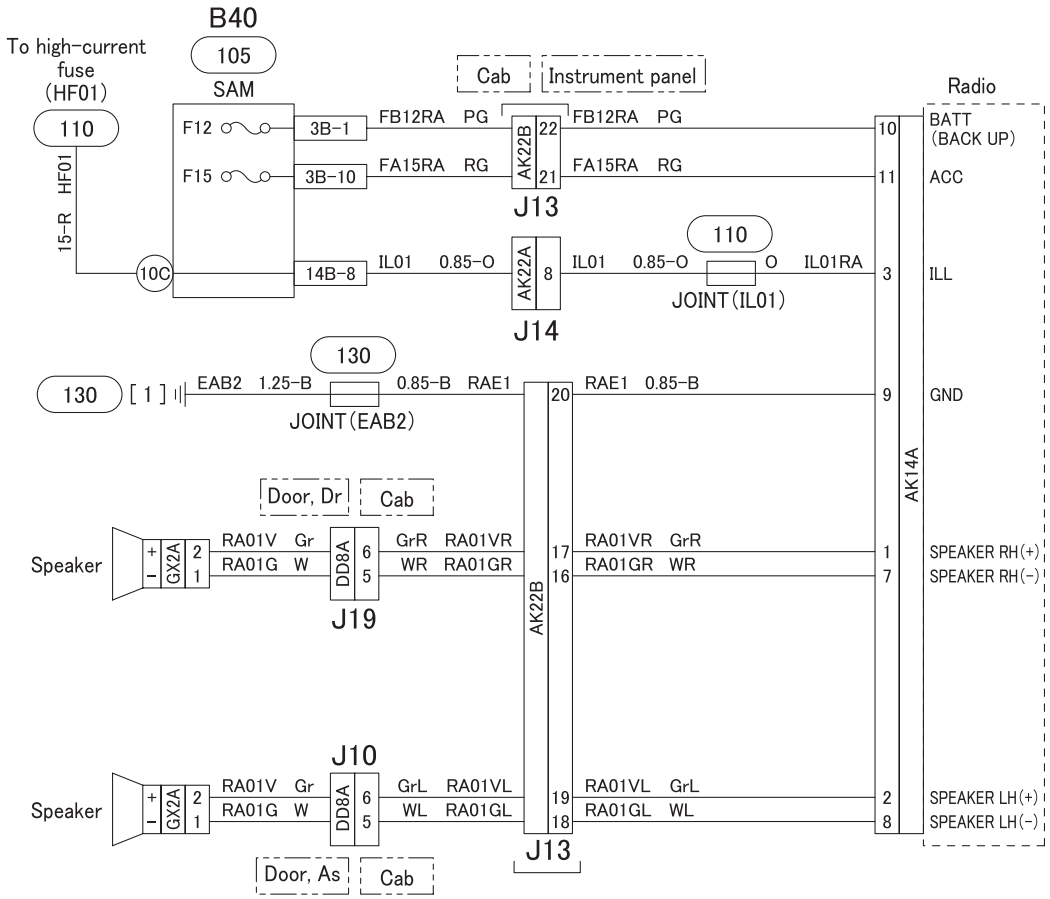
SAM connector (harness side)



610-C07432

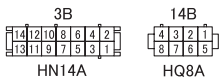
AUDIO CIRCUIT (1)

<Audio harness>



Dr : Driver's seat side
As : Assistant driver's seat side

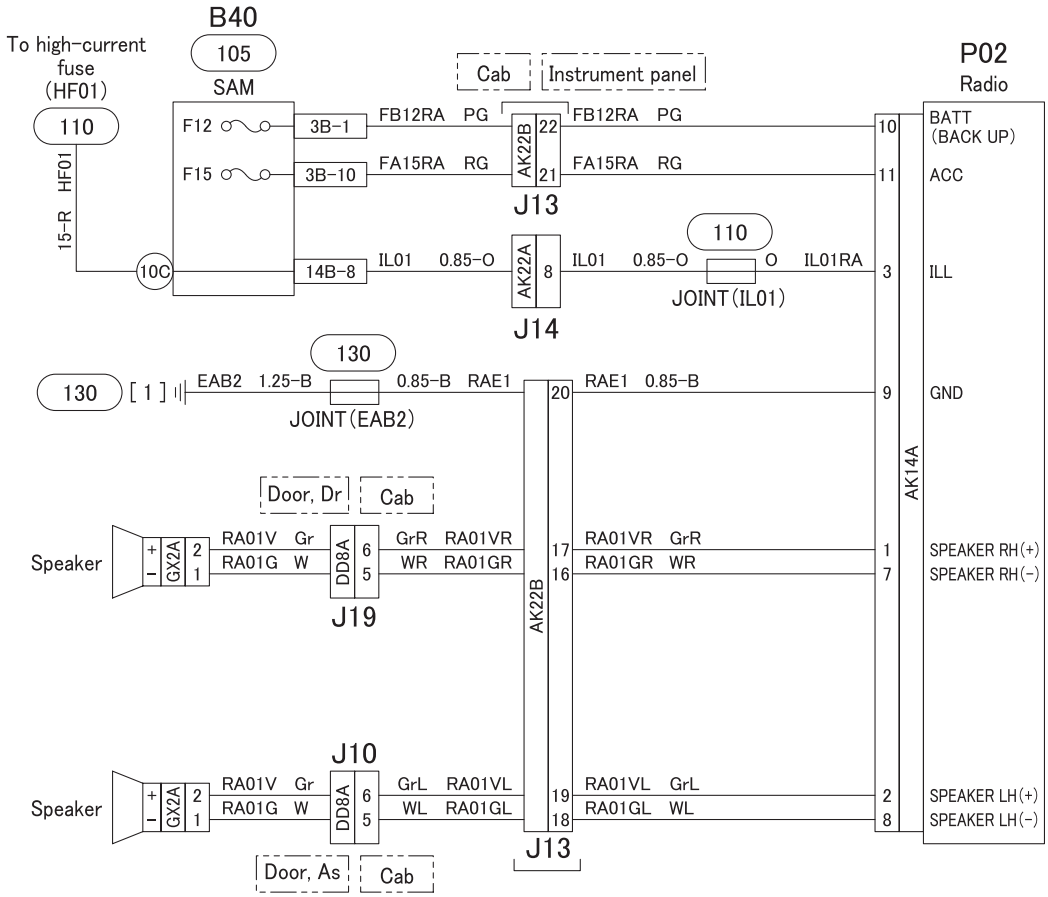
SAM connector (harness side)



612-619522-1

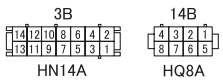
AUDIO CIRCUIT (2)

<Audio (CD & AUX)>



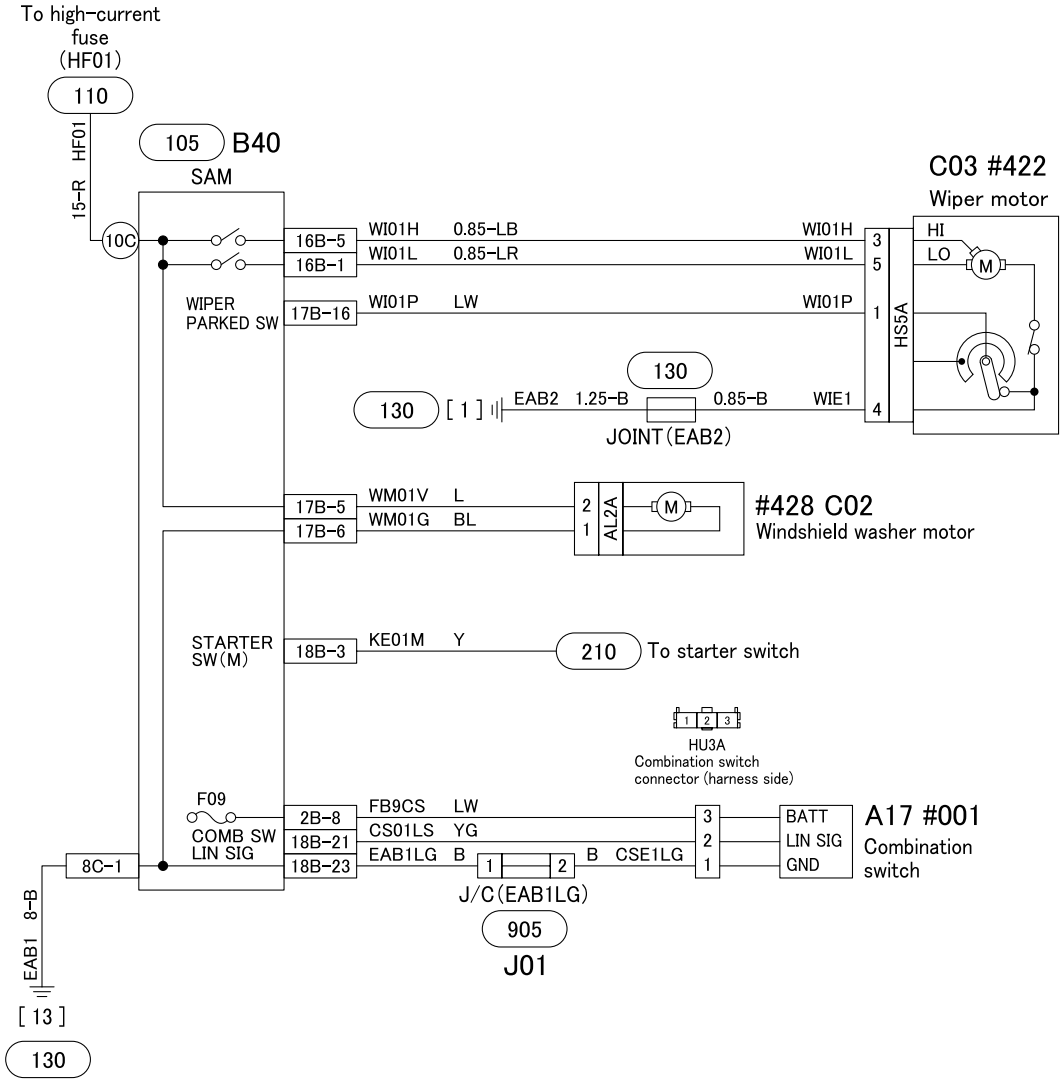
Dr : Driver's seat side
As : Assistant driver's seat side

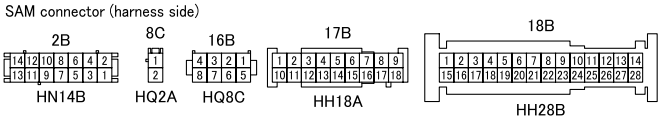
SAM connector (harness side)



612-619522-2

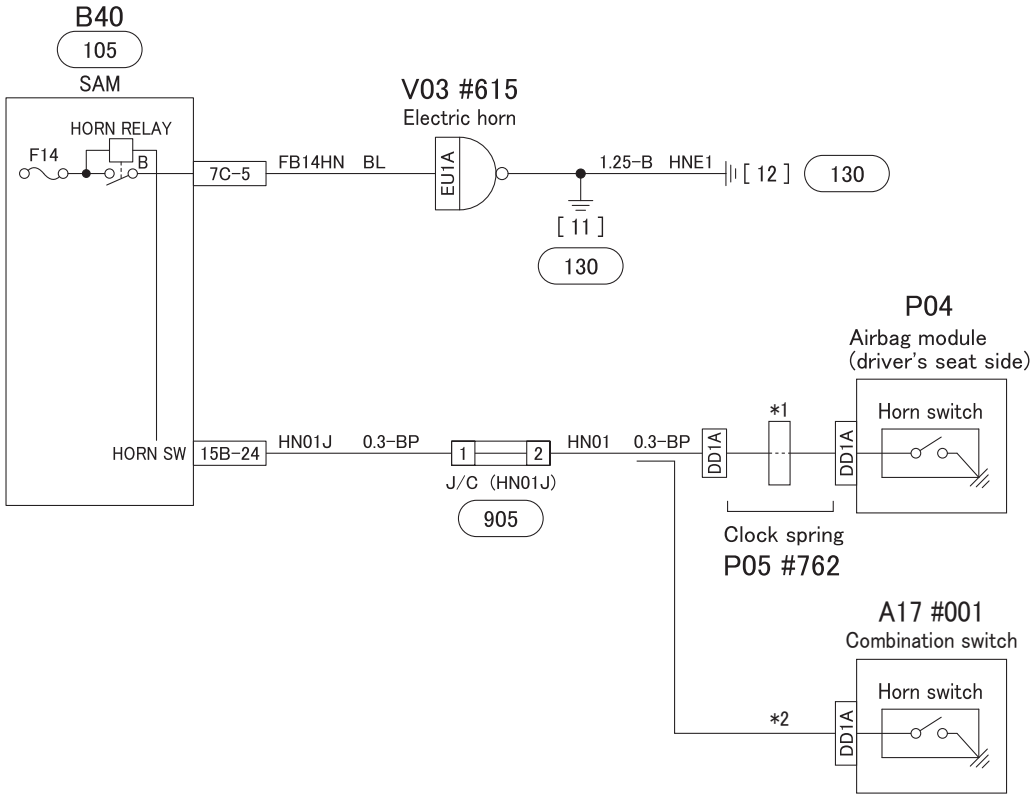
WIPER AND WASHER CIRCUIT



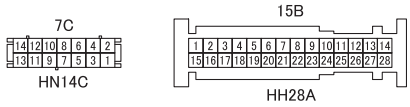


614-C07432

HORN CIRCUIT



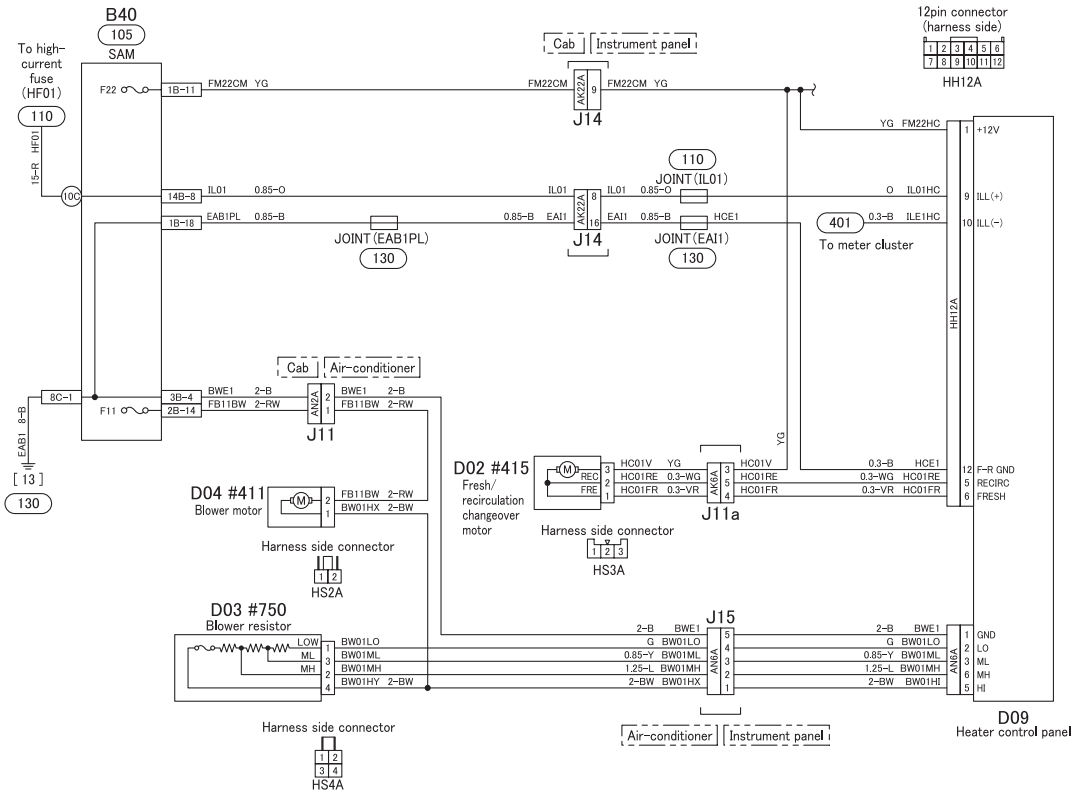
SAM connector (harness side)

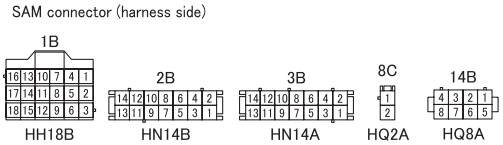


616-619522

HEATER AND AIR-CONDITIONER CIRCUIT (1)

<Heater> <Opt>



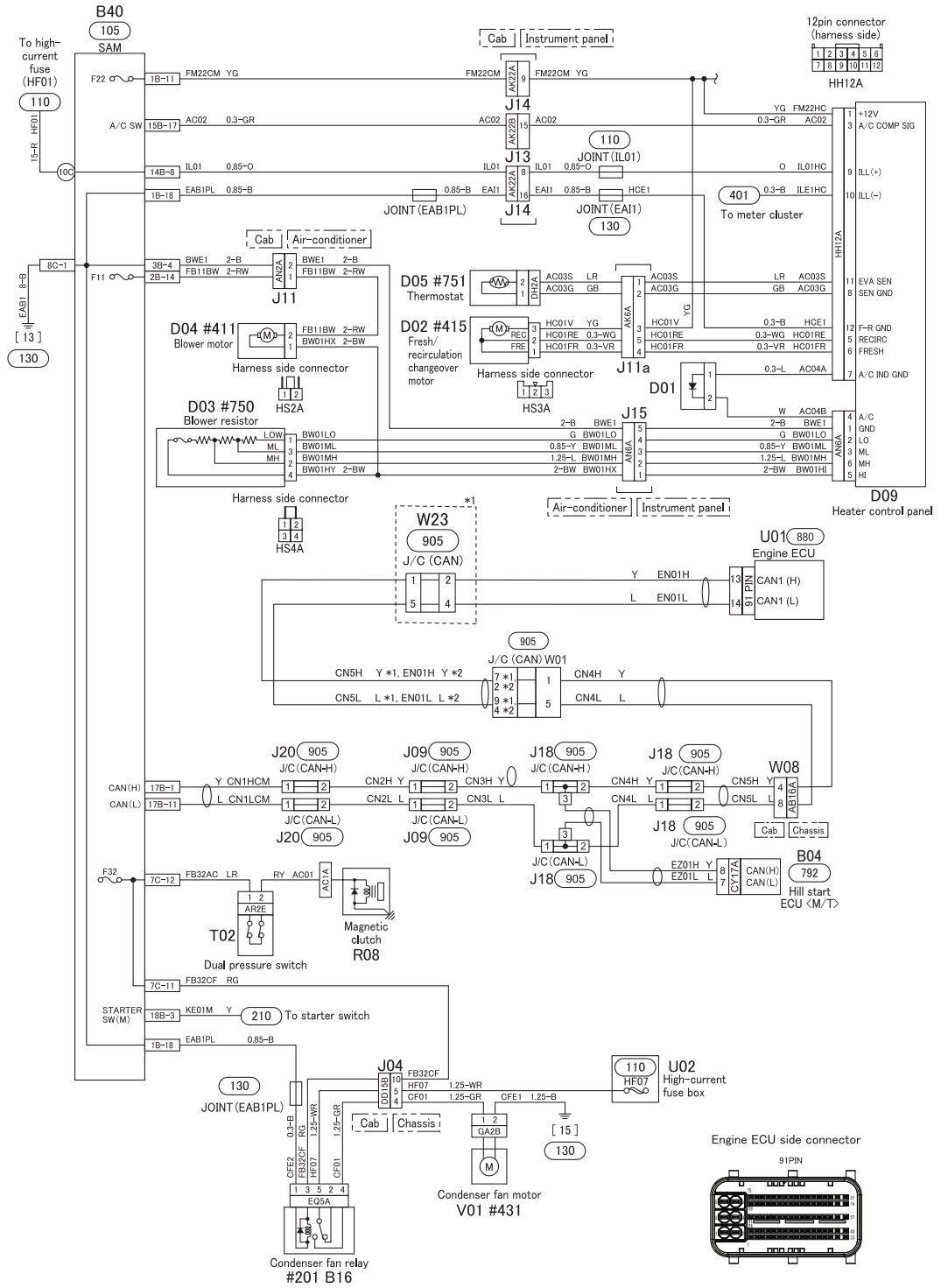


620-619522-1

HEATER AND AIR-CONDITIONER CIRCUIT (2)

<Manual air-conditioner> <Opt>

*1 : FE
*2 : FG



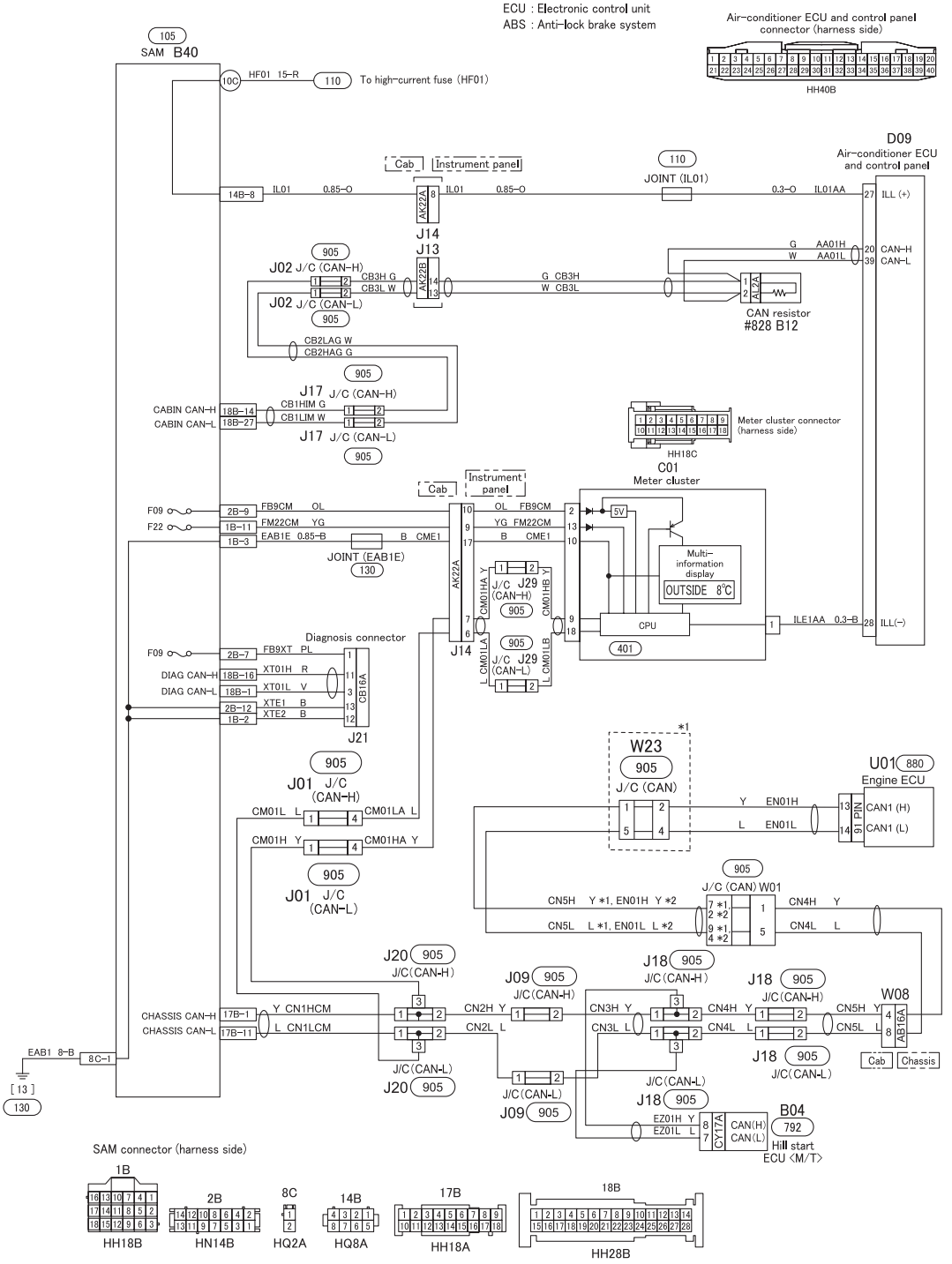
620-619522-2

HEATER AND AIR-CONDITIONER CIRCUIT (3)

(1/2)

*1 : FE
*2 : FG

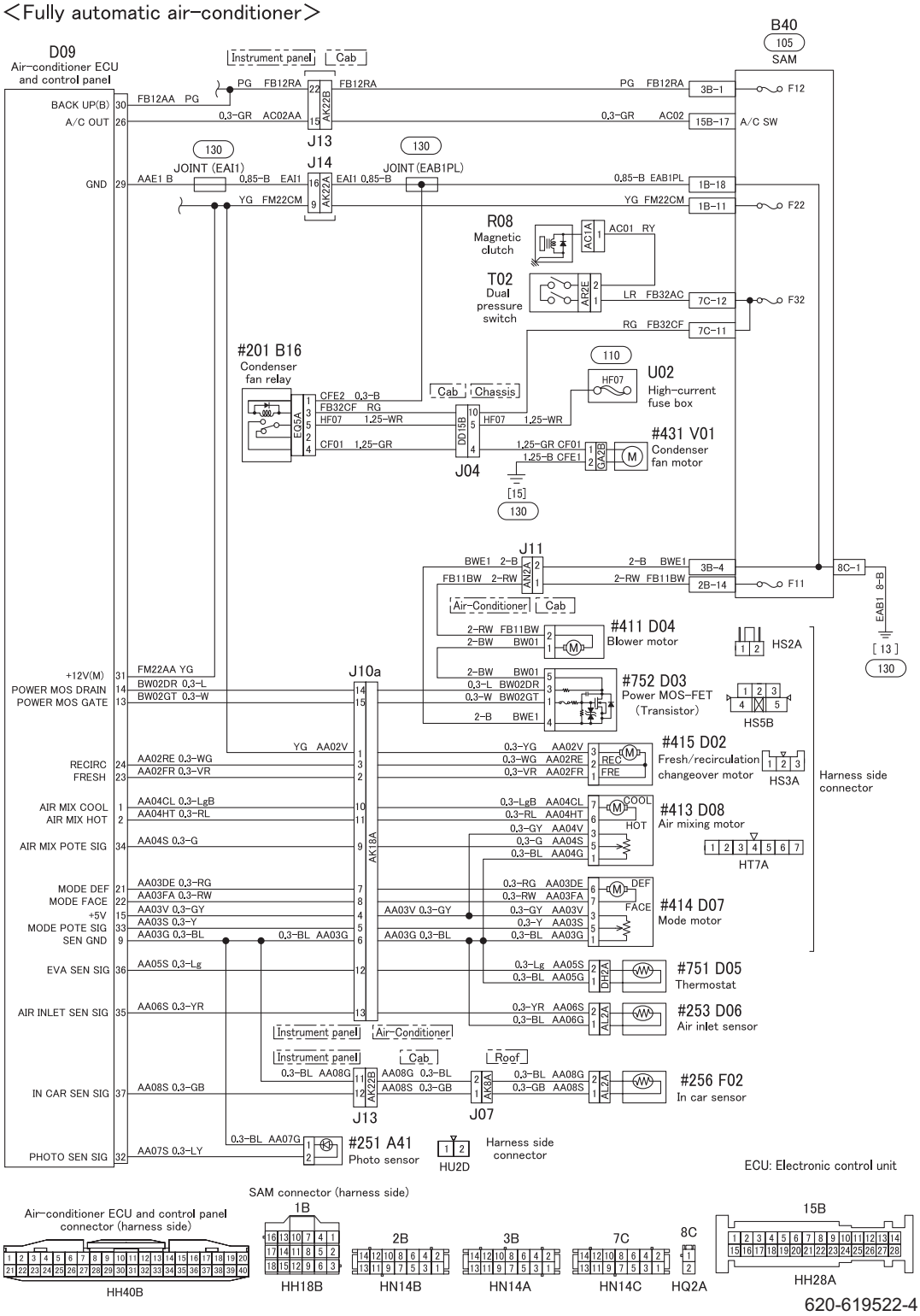
<Fully automatic air-conditioner> <Opt>



620-619522-3

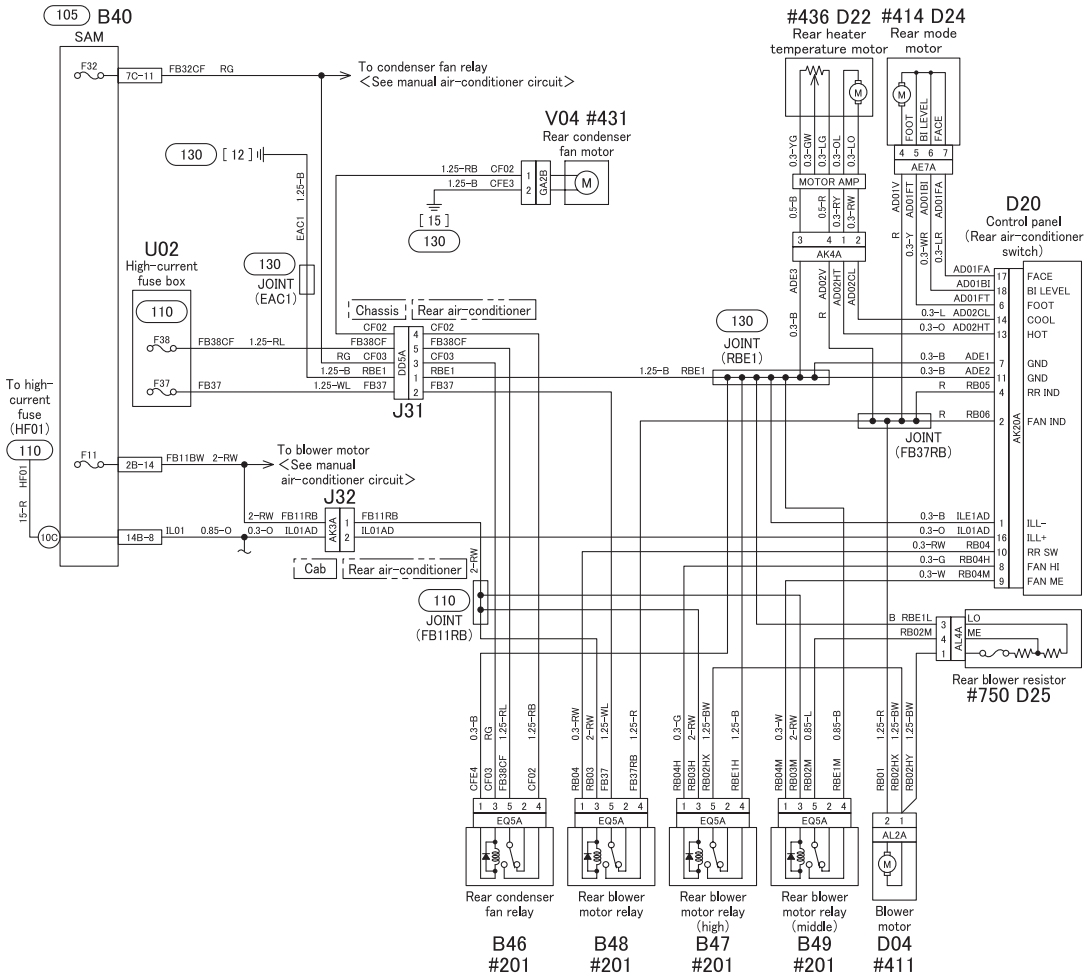
HEATER AND AIR-CONDITIONER CIRCUIT (4)

(2/2)

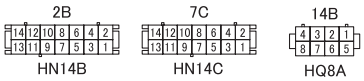


HEATER AND AIR-CONDITIONER CIRCUIT (5)

＜Rear air-conditioner＞

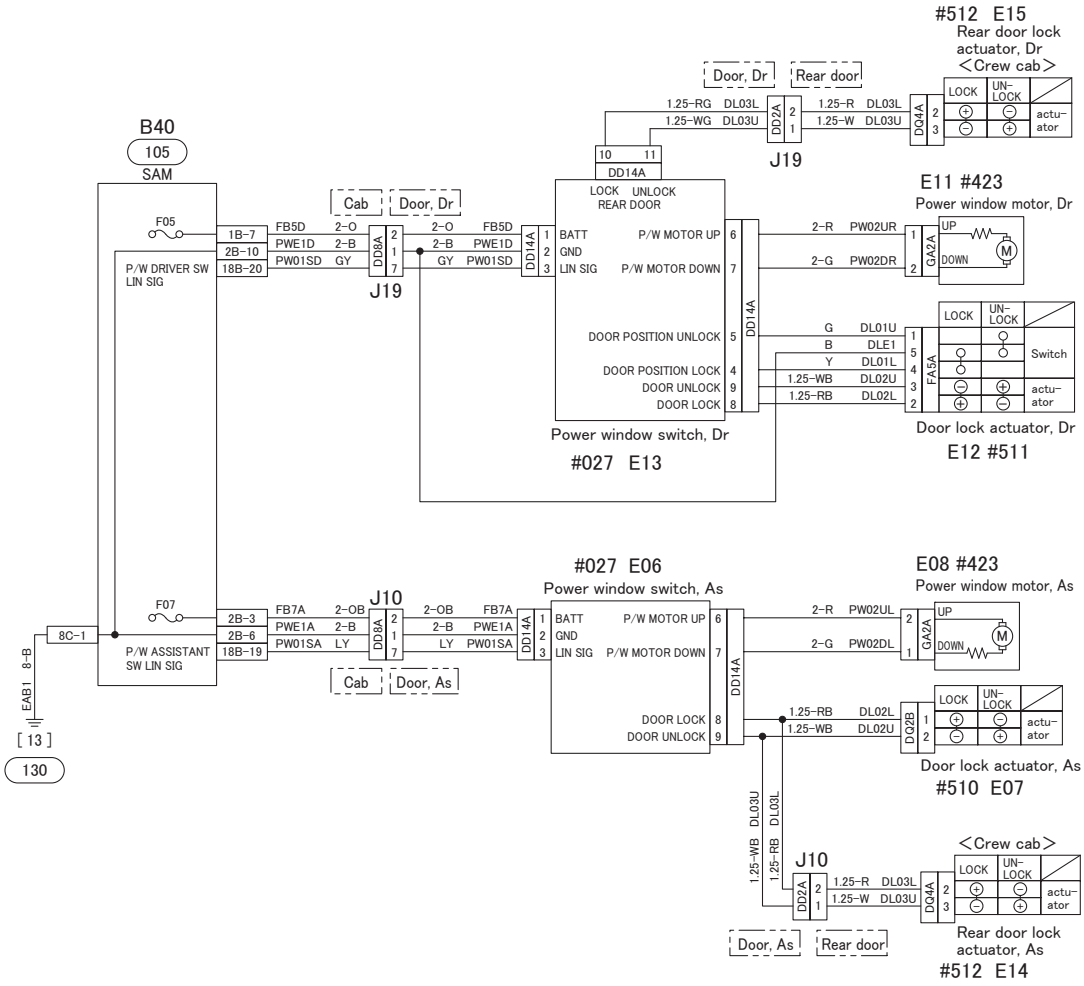


SAM connector (harness side)



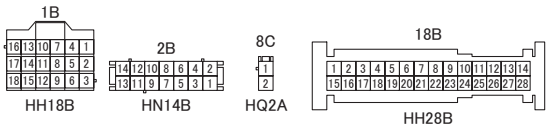
620-602211-5

POWER WINDOW AND CENTRAL DOOR LOCK CIRCUIT



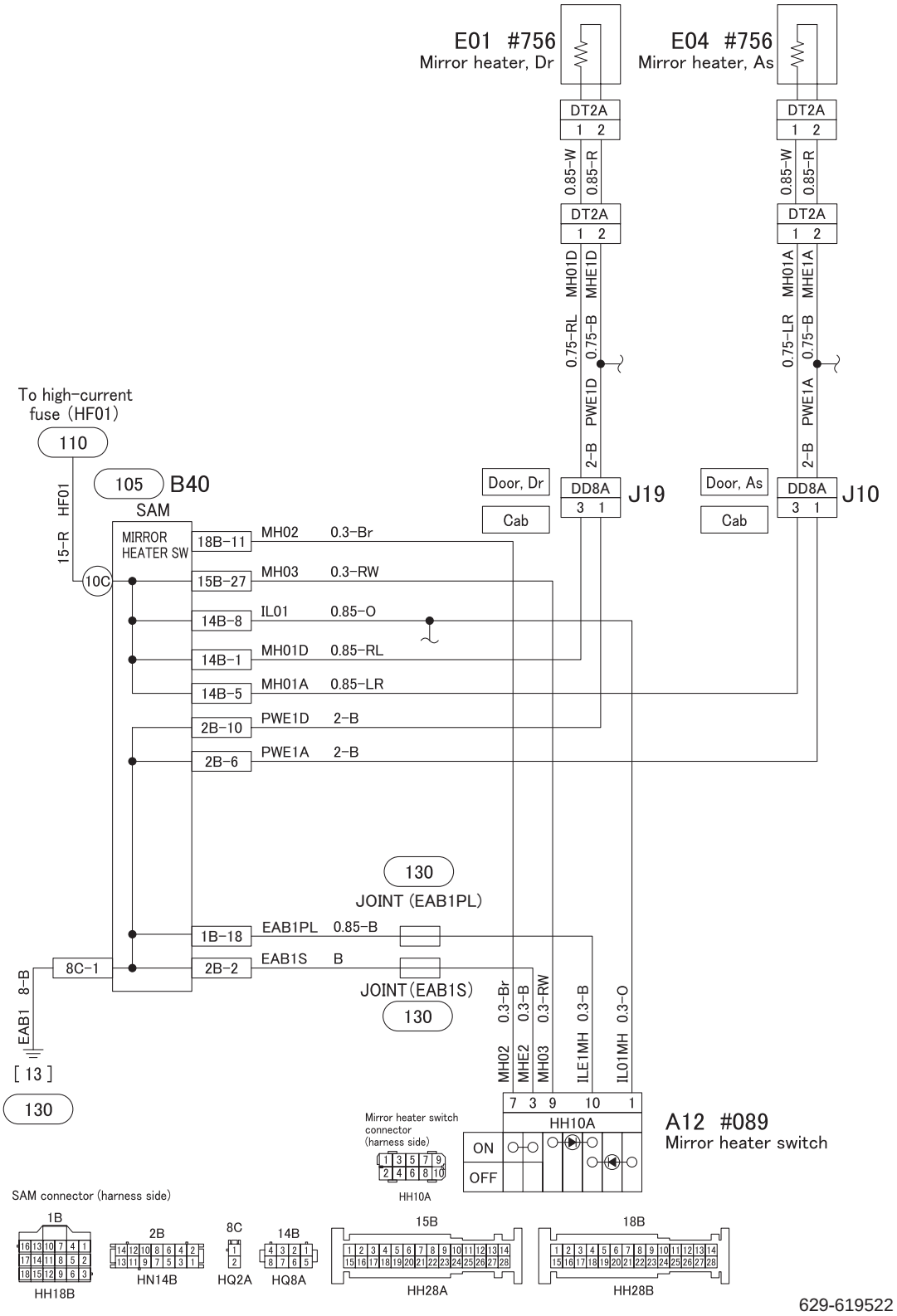
Dr : Driver's seat side
As : Assistant driver's seat side

SAM connector (harness side)



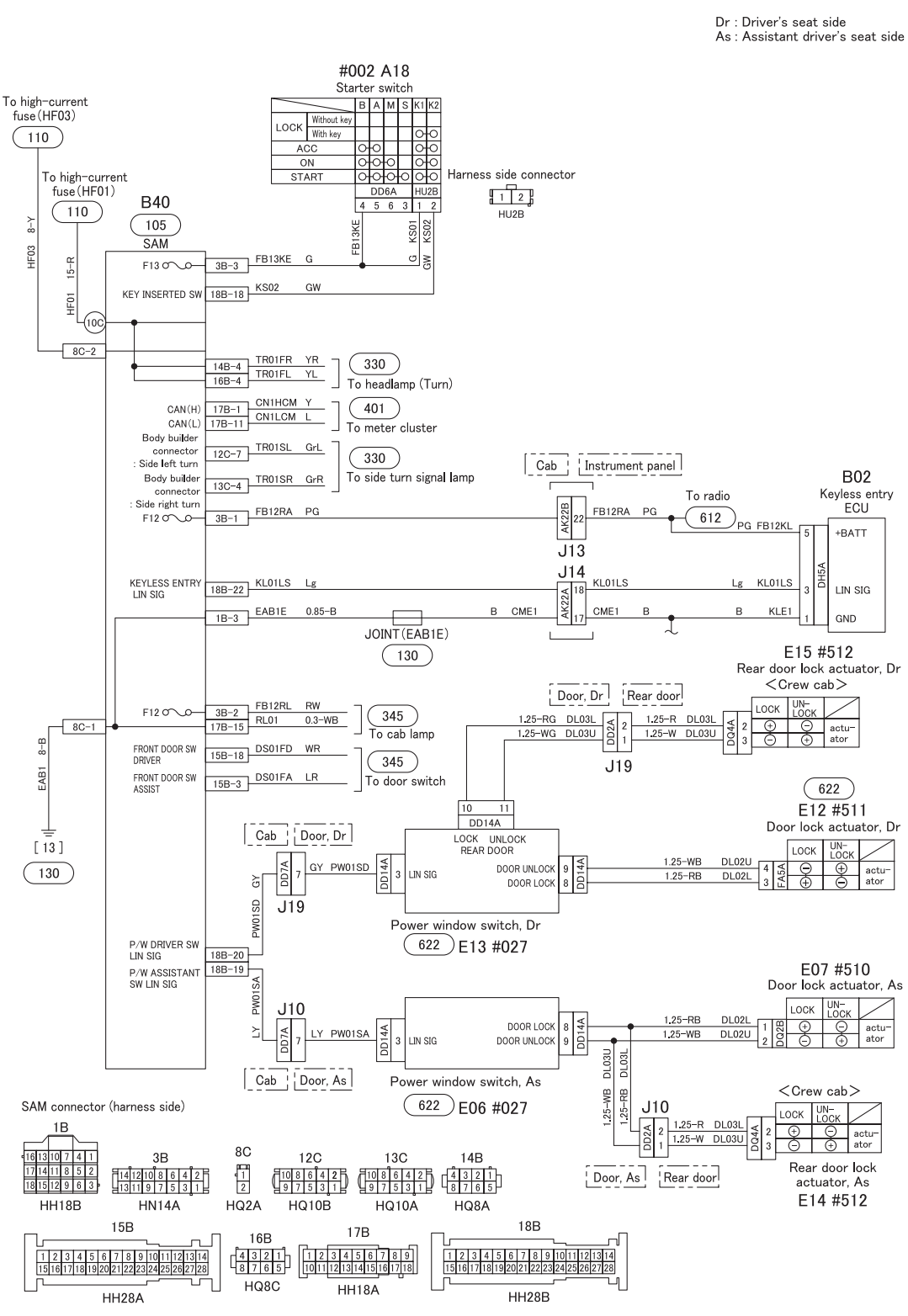
622-619522

MIRROR HEATER CIRCUIT



629-619522

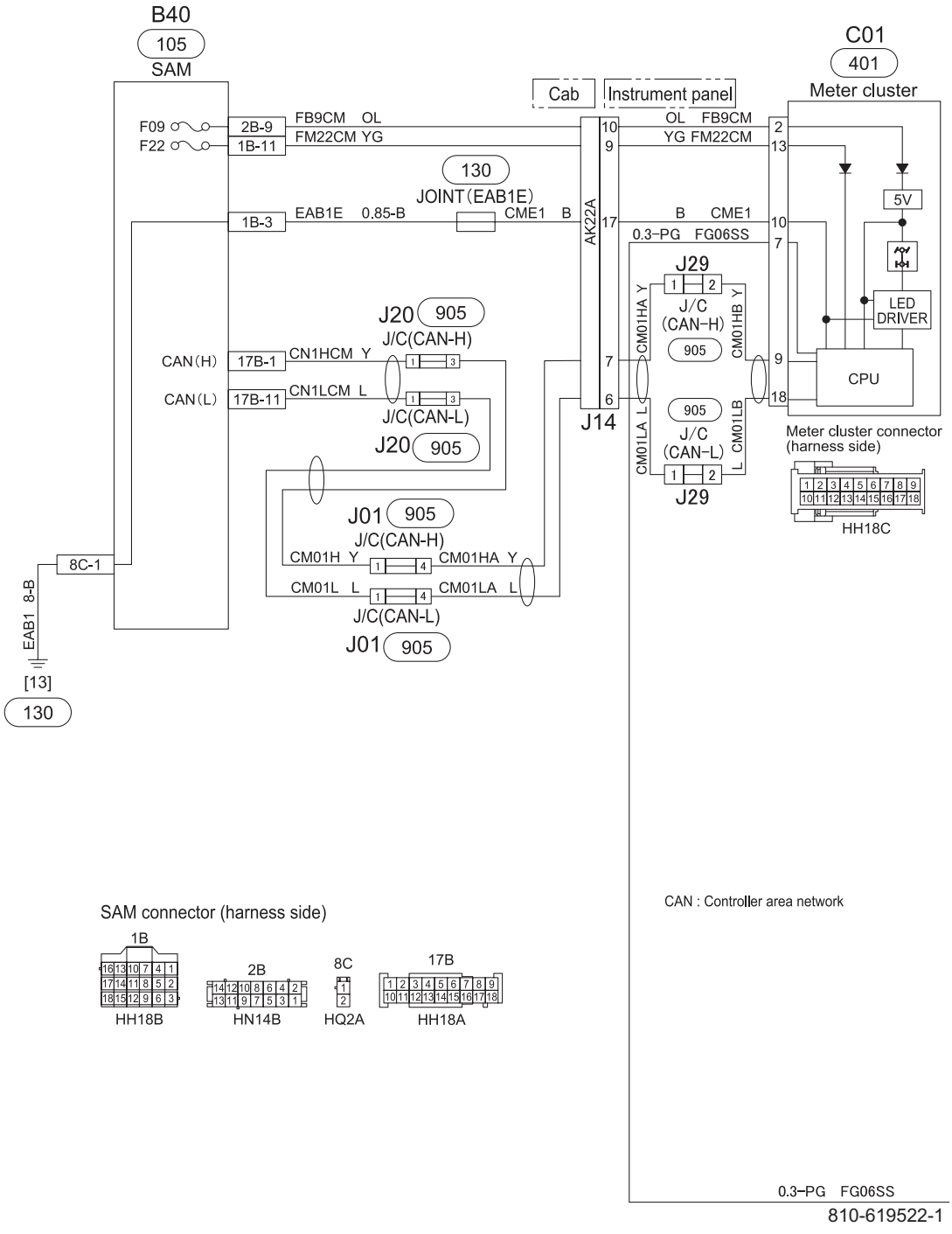
KEYLESS ENTRY CIRCUIT



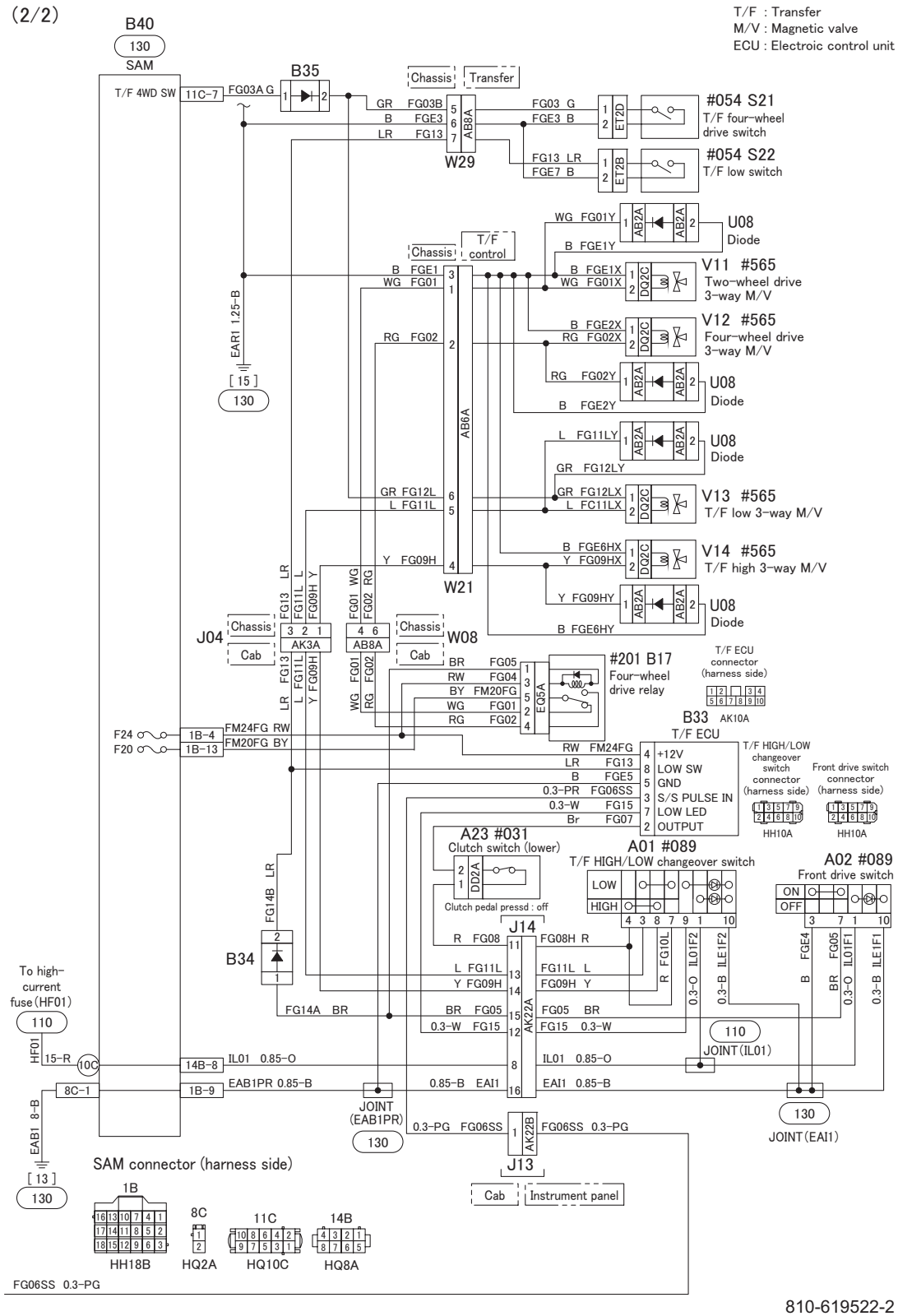
654-619522

FOUR-WHEEL DRIVE CIRCUIT (1)

(1/2)



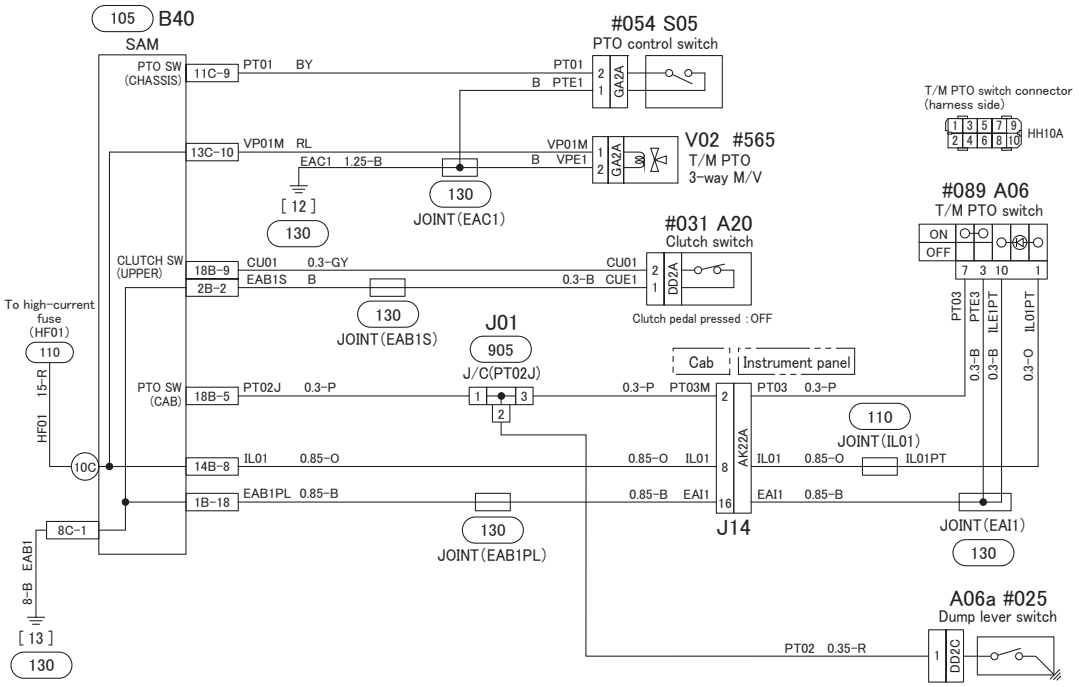
FOUR-WHEEL DRIVE CIRCUIT (2)

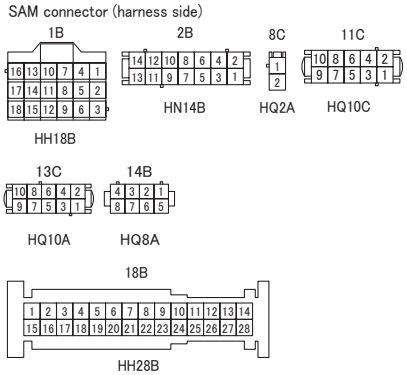


810-619522-2

TRANSMISSION POWER TAKE-OFF CIRCUIT (1)

<M/T>(1/2)

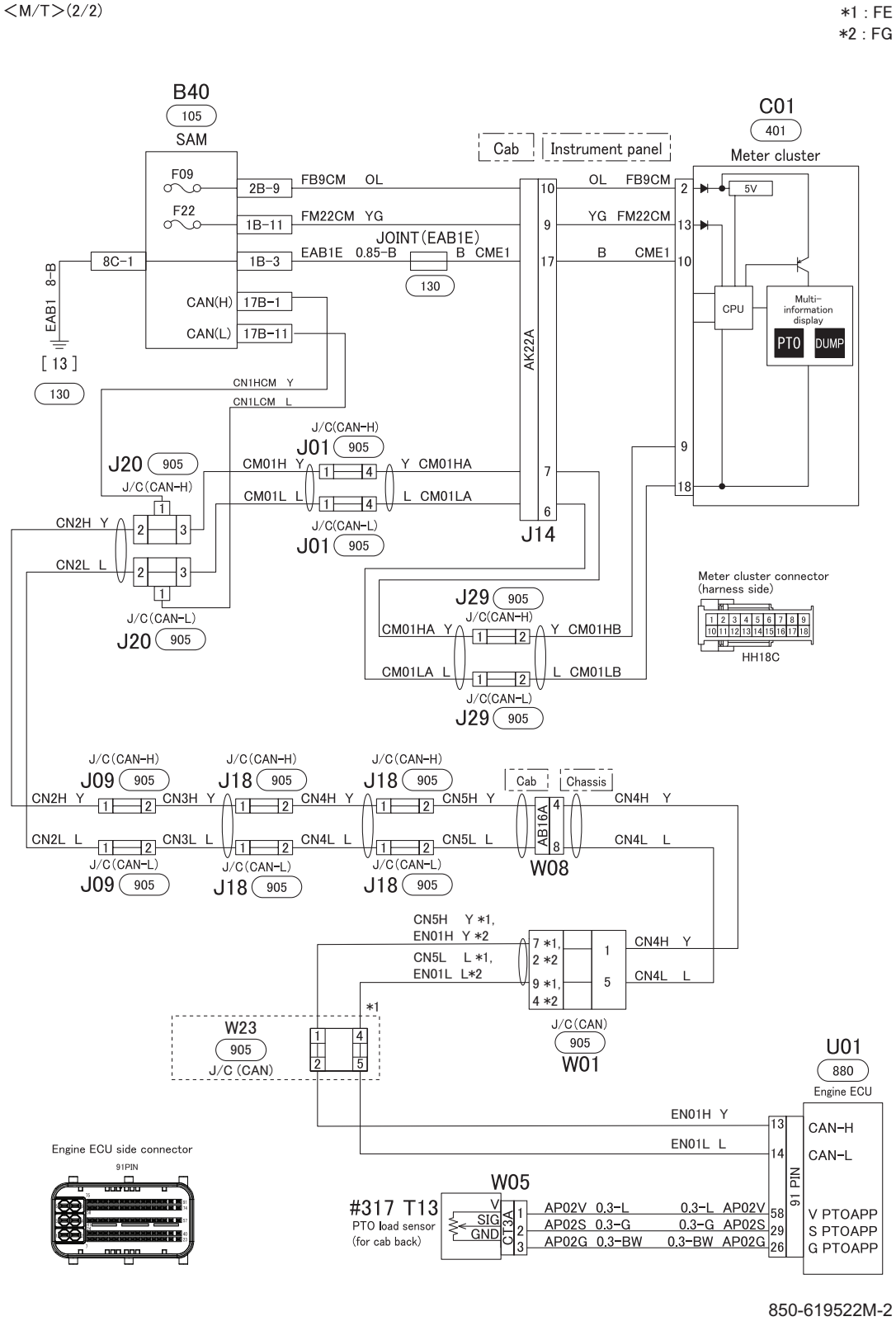




M/T: Manual transmission
PTO: Power take-off
T/M: Transmission
M/V: Magnetic valve

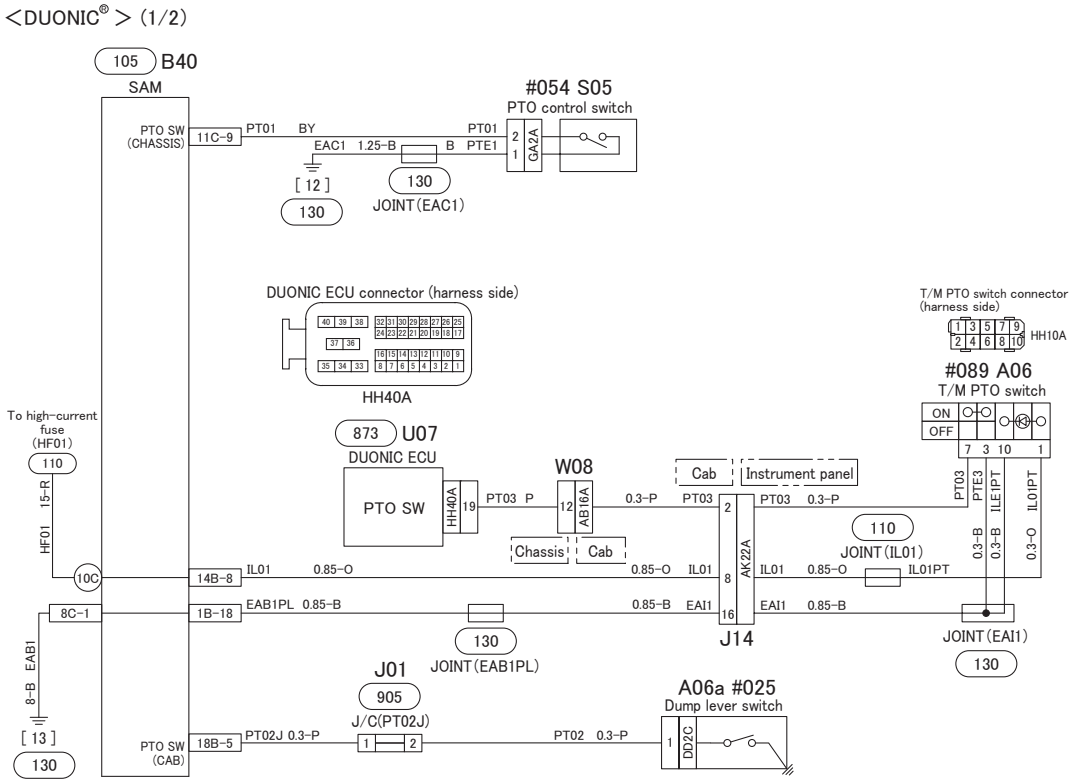
850-619522M-1

TRANSMISSION POWER TAKE-OFF CIRCUIT (2)

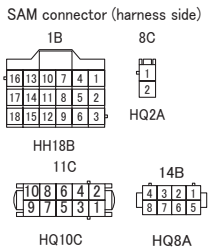


850-619522M-2

TRANSMISSION POWER TAKE-OFF CIRCUIT (3)

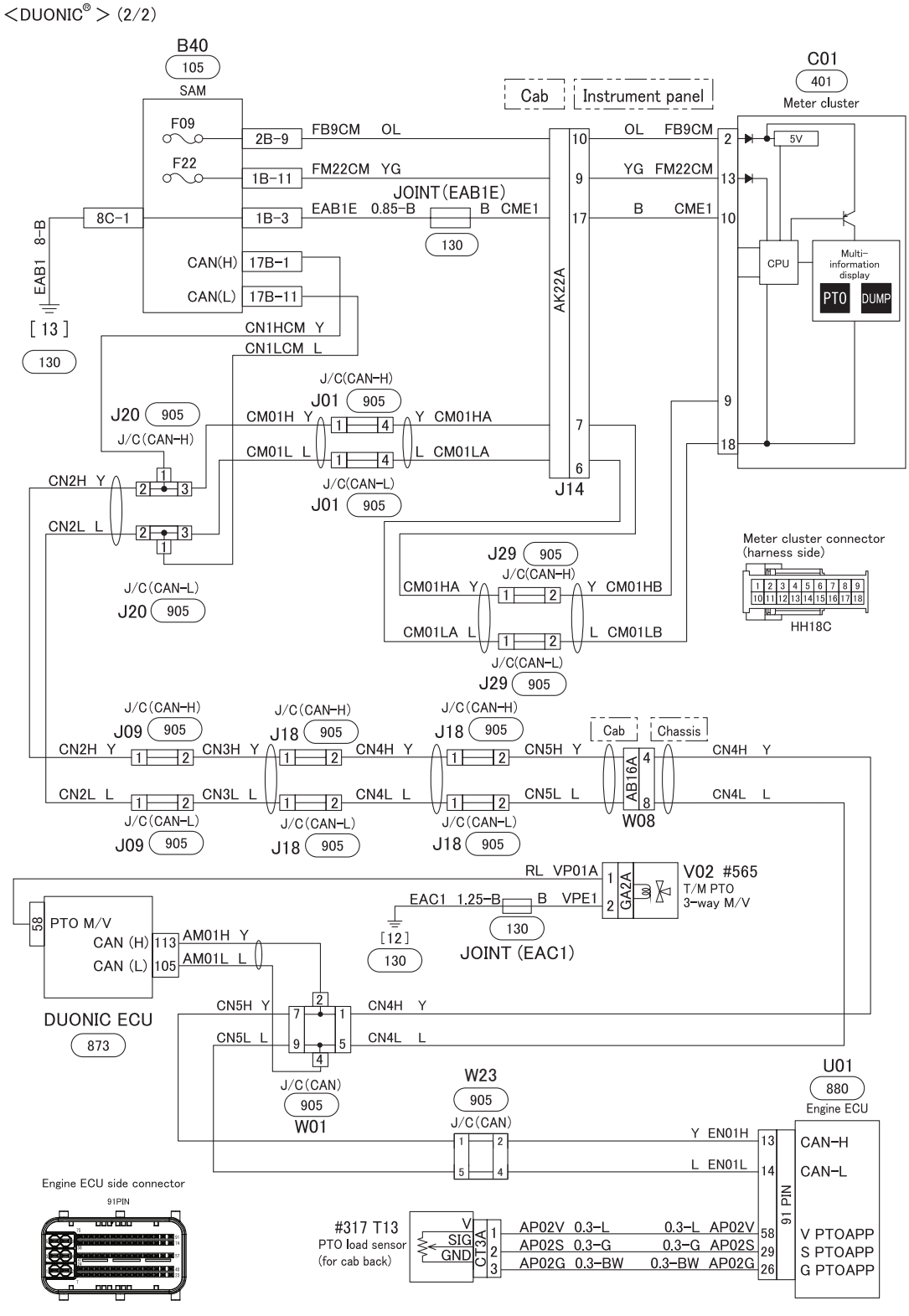


T/M: Transmission
PTO: Power take-off



850-619522D-1

TRANSMISSION POWER TAKE-OFF CIRCUIT (4)



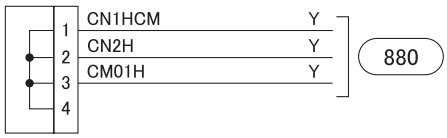
850-619522D-2

JOINT CONNECTOR (1)

(1/7)

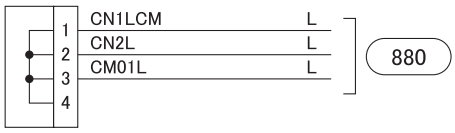
Meter cluster(CAN-H)

1	2	3	4
CN1HCM	CN2H	CM01H	–



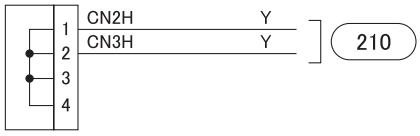
Meter cluster(CAN-L)

1	2	3	4
CN1LCM	CN2L	CM01L	–



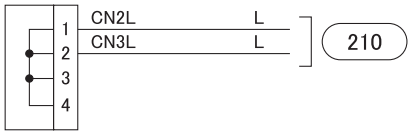
ISS(CAN-H)

1	2	3	4
CN2H	CN3H	–	–



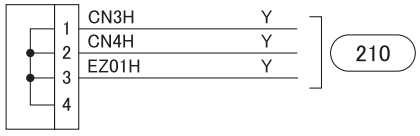
ISS(CAN-L)

1	2	3	4
CN2L	CN3L	–	–



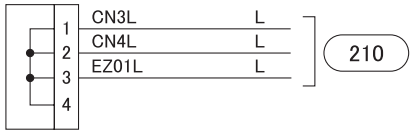
Hill start assist system (CAN-H) <M/T>

1	2	3	4
CN3H	CN4H	EZ01H	–



Hill start assist system (CAN-L) <M/T>

1	2	3	4
CN3L	CN4L	EZ01L	–

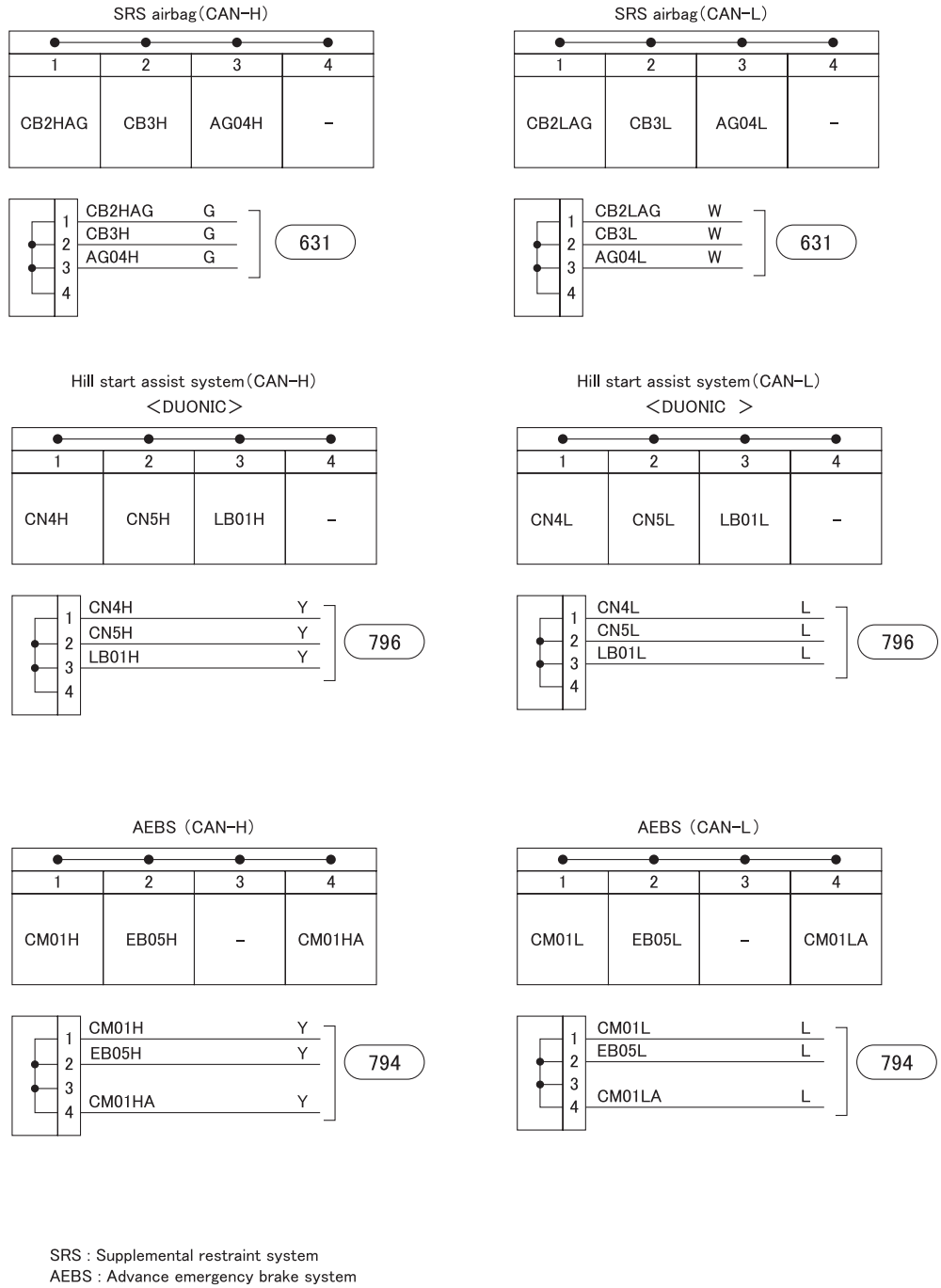


ISS: Idling stop and start system

905-619522-1

JOINT CONNECTOR (2)

(2/7)

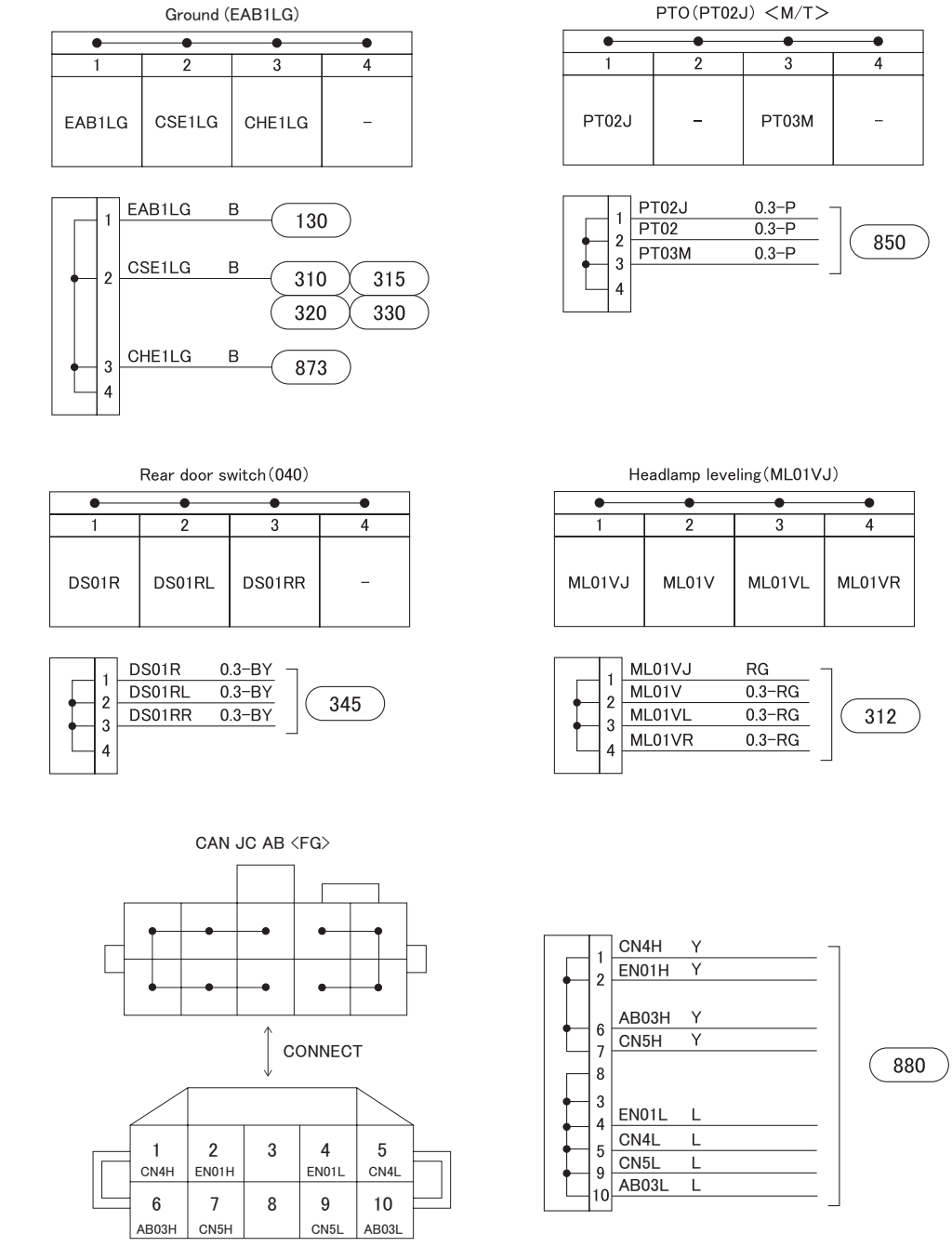


SRS : Supplemental restraint system
AEBS : Advance emergency brake system

905-619522-2

JOINT CONNECTOR (3)

(3/7)

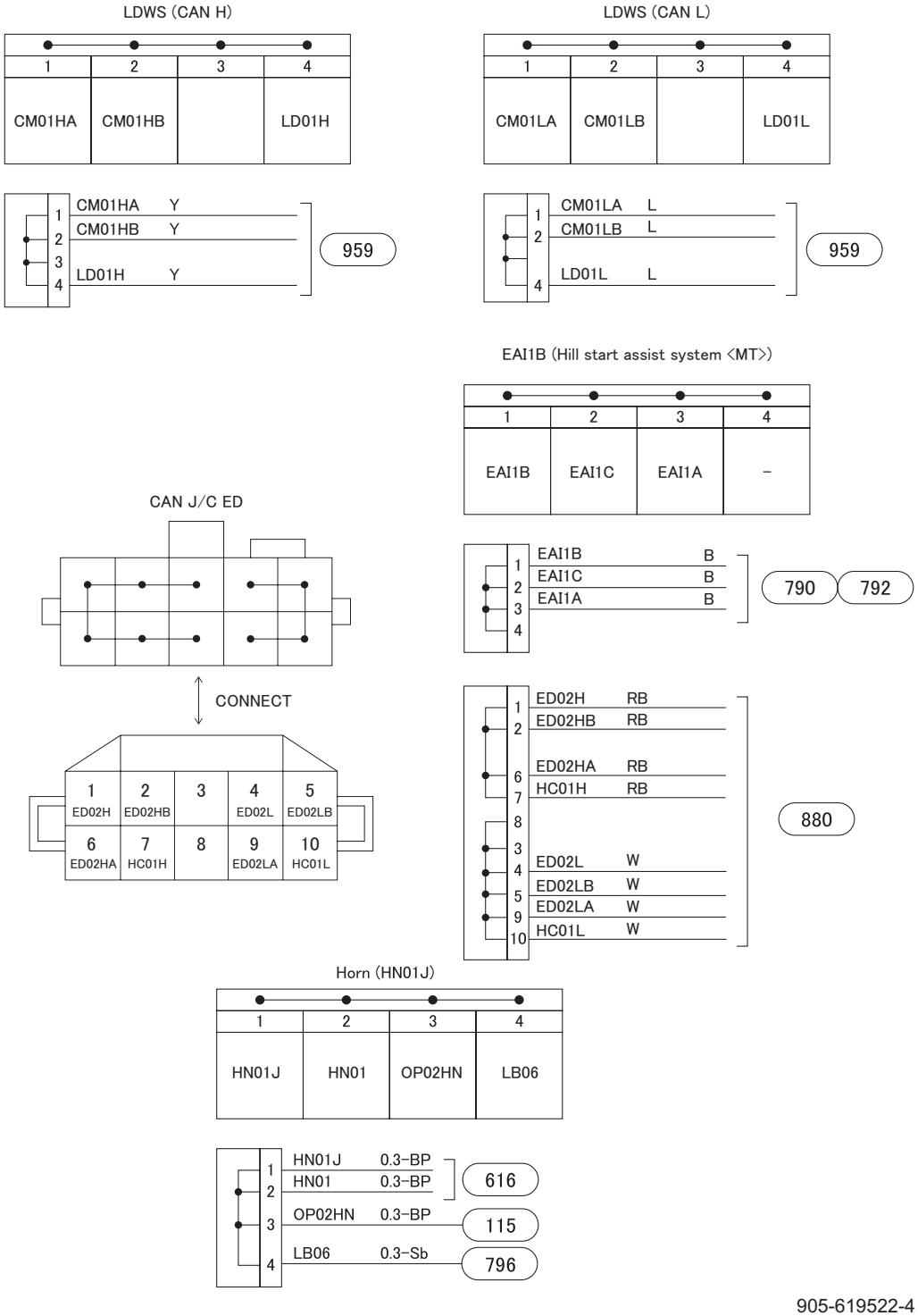


PTO: Power take-off
M/T: Manual transmission

905-619522-3

JOINT CONNECTOR (4)

(4/7)



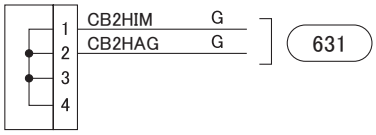
905-619522-4

JOINT CONNECTOR (5)

(5/7)

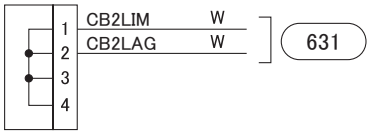
Immobilizer (CAN-H)

1	2	3	4
CB2HIM	CB2HAG	–	–



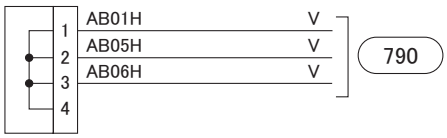
Immobilizer (CAN-L)

1	2	3	4
CB2LIM	CB2LAG	–	–



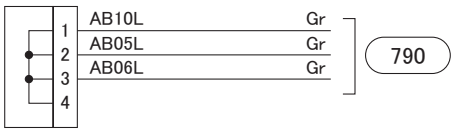
ESP (CAN-H)

1	2	3	4
AB01H	AB05H	AB06H	–

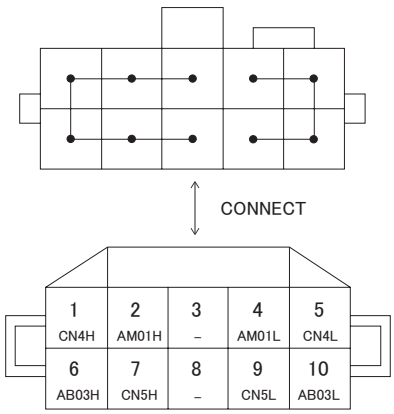


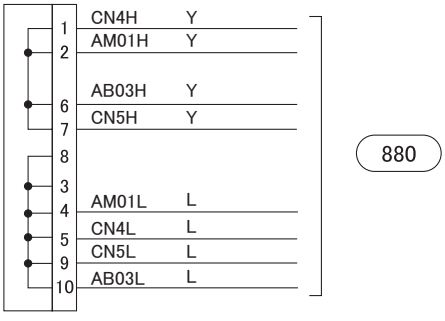
ESP (CAN-L)

1	2	3	4
AB10L	AB05L	AB06L	–



CAN J/C ED <FE>

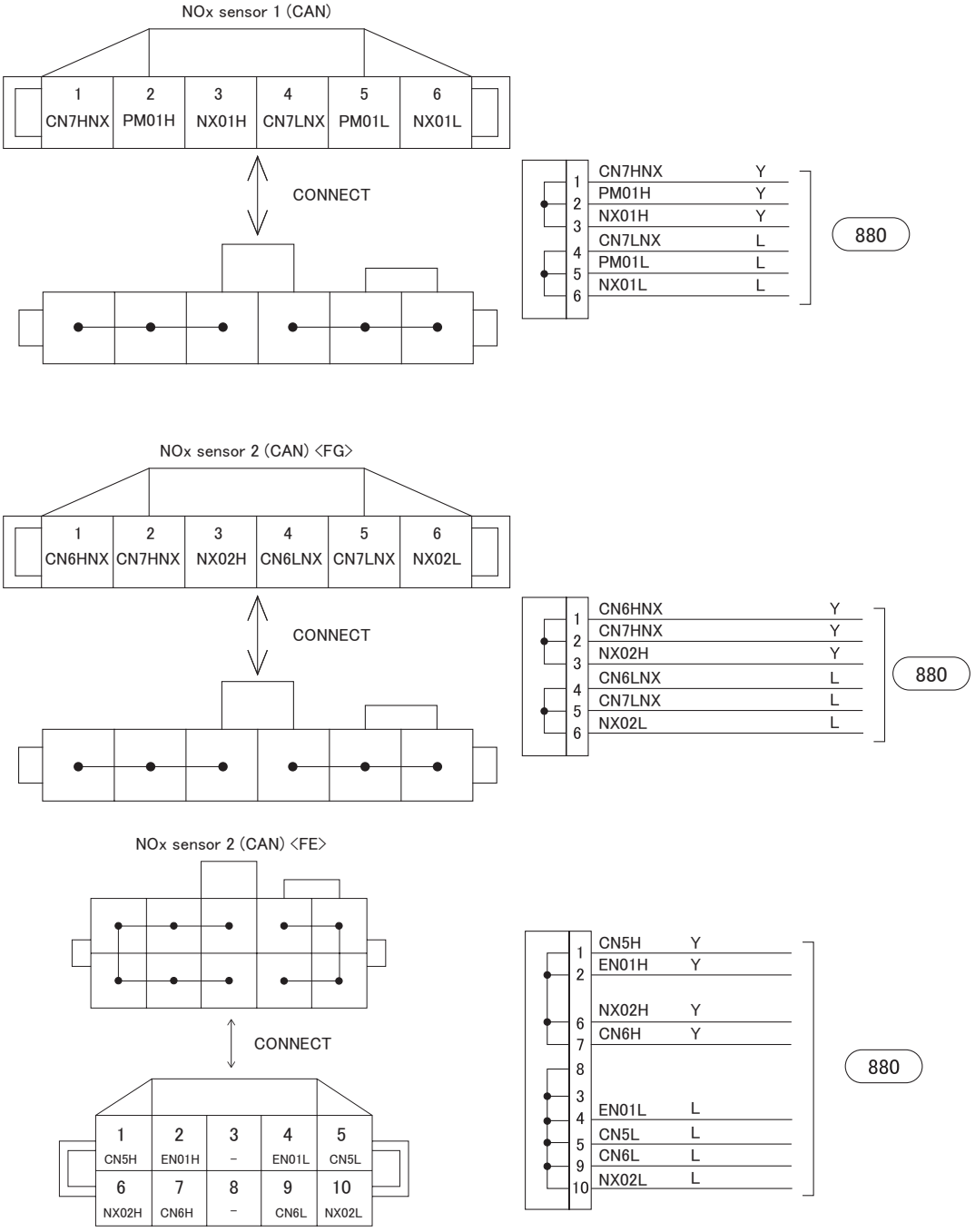




905-619522-5

JOINT CONNECTOR (6)

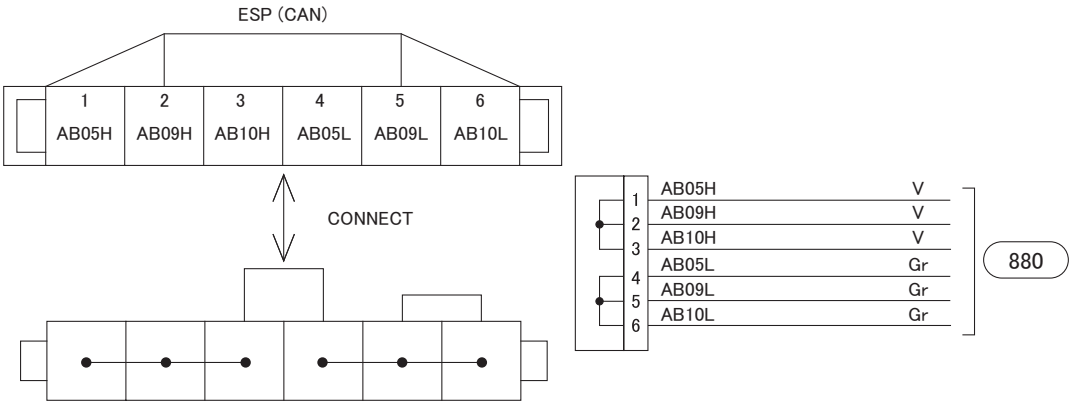
(6/7)



905-619522-6

JOINT CONNECTOR (7)

(7/7)



905-619522-7

Revision record <Electrical systems section>

–	19. September. 2025	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>

CANTER

Australia

MITSUBISHI FUSO TRUCK & BUS CORPORATION

September. 2025 TL2FA_F