Body/equipment mounting directives
Body/equipment mounting directives
FE, FG
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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 Introduction
## 1 Introduction

List of FMVSS and CMVSS applicable to MFTBC trucks with GVWR of more than 10,000 lbs. manufactured after Jan. 1, 2007 is shown below.

<table>
<thead>
<tr>
<th>FMVSS/CMVSS NO.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Controls and Displays</td>
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<tr>
<td>102</td>
<td>Transmission Shift Lever Sequence, Starter Interlock and Transmission Braking Effect</td>
</tr>
<tr>
<td>103</td>
<td>Windshield Defrosting and Defogging Systems</td>
</tr>
<tr>
<td>104</td>
<td>Windshield Wiping and Washing Systems</td>
</tr>
<tr>
<td>105</td>
<td>Hydraulic Brake Systems</td>
</tr>
<tr>
<td>106</td>
<td>Brake Hoses</td>
</tr>
<tr>
<td>108</td>
<td>Lamps, Reflective Devices and Associated Equipment</td>
</tr>
<tr>
<td>111</td>
<td>Rearview Mirrors</td>
</tr>
<tr>
<td>115</td>
<td>Vehicle Identification Number (CMVSS only)</td>
</tr>
<tr>
<td>116</td>
<td>Motor Vehicle Brake Fluids</td>
</tr>
<tr>
<td>119</td>
<td>New Pneumatic Tires for Vehicles other than Passenger Cars</td>
</tr>
<tr>
<td>120</td>
<td>Tire Selection and Rims for Motor Vehicles other than Passenger Cars</td>
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<td>124</td>
<td>Accelerator Control Systems</td>
</tr>
<tr>
<td>205</td>
<td>Glazing Materials</td>
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<td>206</td>
<td>Door Locks and Door Retention Components</td>
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<tr>
<td>207</td>
<td>Seating Systems</td>
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<td>208</td>
<td>Occupant Crash Protection</td>
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<td>Seat Belt Assembly Anchorages</td>
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<tr>
<td>302</td>
<td>Flammability of Interior Materials</td>
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<tr>
<td>1100</td>
<td>Vehicle Emissions (CMVSS only)</td>
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<tr>
<td>1106</td>
<td>Noise Emission (CMVSS only)</td>
</tr>
</tbody>
</table>

In addition to the Incomplete Vehicle Document, a Safety conformance Label as shown to the right is affixed to all vehicles when shipped from the factory. This label contains all the FMVSS numbers applicable not only to chassis-cabs but also to completed vehicles if they are completed in accordance with the Incomplete Vehicle Document.

This label is affixed to the door latch post of the left-hand side door.

**DO NOT COVER OVER WITH ANY OTHER LABEL.**
1 Introduction

NOISE REGULATIONS

The U.S. Environmental Protection Agency (EPA) has established noise emission standards applicable to medium and heavy trucks in excess of 10,000 lbs. GVWR manufactured after January 1, 1988 (40 CFR §205.52), requiring that they must conform to an 80 dB (A) maximum noise level when tested pursuant to EPA’s test procedures.

MFTBC trucks are built in conformance with EPA Noise Emission Standards. Modified or altered vehicles may increase in noise emissions; compliance with applicable noise standards are the responsibility of the subsequent stage manufacturer.

A sample of the Noise Emission Conformity Label is shown below. This label is affixed to all the vehicles when shipped from the factory.

DO NOT COVER OVER WITH ANY OTHER LABEL.

This label is affixed to the left-hand side door panel.
1 Introduction

1.1 The aim of these directives

These directives serve as instructions for the manufacture of attachments, bodies, equipment and for modification to other make bodies and major assemblies. These directives are divided into 9 interlinked chapters to help you find the information you require more quickly:

1. Introduction
2. General
3. Planning of bodies
4. Technical threshold values for planning
5. Damage prevention
6. Modifications to the basic vehicle
7. Construction of bodies
8. Calculations
9. Technical data

Appendix
Index
1 Introduction

1.1 The aim of these directives

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 Service Center

Your
MITSUBISHI FUSO TRUCK & BUS CORPORATION

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

Basic vehicle

Body
1 Introduction

1.2 Symbols

The following symbols are used in these directives:

- **Warning**
  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.

- **Note**
  A note draws your attention to possible hazards to your vehicle.

- **Tip**
  A tip contains advice or further information you may find useful.

➤ page
This symbol indicates the page on which you will find further information on the subject. These pages are cross-linked in the PDF file.
1 Introduction

1.3 Vehicle safety

<table>
<thead>
<tr>
<th>Risk of accident and injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>The use of parts, assemblies or conversion parts and accessories which have not been approved may jeopardize the safety of the vehicle.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>You could otherwise fail to recognize dangers, which could result in injury to yourself or others.</td>
</tr>
<tr>
<td>Official acceptance by public testing bodies or official approval does not rule out safety hazards.</td>
</tr>
</tbody>
</table>

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 safety exhaust emissions, or noise levels

Notes on vehicle safety

MITSUBISHI FUSO recommends

using appropriate parts only for each particular vehicle model.
1 Introduction

1.4 Operational reliability

⚠️ 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.
Introduction

1.5 Accident prevention

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 federal, state, and local regulations and codes 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.
2 General

2.1 Vehicle and model designations

2.1.1 Model coding system

- **Wheel base**: C: (2800mm / 110.2 inch) ~ K: (4750mm / 187 inch)
- **Steering position**: L: LHD
- **Transmission / Deck height**: 3: AMT / High deck
- **Cab style**: S: Single cab, W: Crew cab
- **Code Destination**: UH: U.S.A
- **Variation (e.g. engine power variants)**: D: 120kw (161HP)

- **Engine model / Emission**: 2: 4P10 / EPA
- **Front suspension system / GVW**: 5: Rigid / GVW6 - 8t, 7: Rigid / GVW6.05 - 7.5t, 9: Rigid / GVW 7.5t over
- **Development sequential number / Cab type / Frame width**: B: Wide cab / Frame width: 750mm, C: Wide cab / Frame width: 850mm
- **Vehicle category / Notification type / Drive system**: E: Standard category / Non-specification / 4x2, G: Standard category / Non-specification / 4x4
- **Vehicle style**: F: Cab-over
### 2.1 Vehicle and model designations

#### 2.1.2 Vehicle and model designation

<table>
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<th>FEC5</th>
<th>FEC7</th>
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<th>FEC9</th>
<th>FGB7</th>
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<td>Output</td>
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<td>161/3400</td>
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<td>295/1300</td>
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<td>Maximum torque</td>
<td>400/1300</td>
<td>161/3400</td>
<td>400/1300</td>
<td>295/1300</td>
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<tr>
<td>Cab</td>
<td>Single Crew</td>
<td>Wet dual clutch</td>
<td>Wet dual clutch</td>
<td>Wet dual clutch</td>
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<td>Wet dual clutch</td>
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<td>7255 / 15995</td>
<td>7255 / 15995</td>
<td>8160 / 17995</td>
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MITSUBISHI Fuso body/equipment mounting directives for FE, FG Issue date: 06.07.2012

Only print out complete sections from the current version
2 General

2.2 Technical advice and contact persons

2.2 Technical advice and contact persons

Please see the attached sheet. (Click button DOC file down load)
2 General

2.3 Required documents

In individual cases, the body drawings may be submitted to the department responsible before the start of work page 15. The drawings shall contain the following information:

- All deviations from MITSUBISHI FUSO body/equipment mounting directives.
- Complete data on dimensions, weights and center of gravity (weight certificates)
- Attachment of body to the chassis
- Vehicle operating conditions, e.g.
  - on poor roads
  - in very dusty conditions
  - at high altitude
  - at extremely high or low ambient temperatures
2.4 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, gearbox linkage, etc.) even in the case of diagonal torsion between the chassis and the bodies.
2 General

2.4 Product safety

2.4.1 Guarantee of traceability

Hazards in your body/equipment 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 federal or state vehicle registers 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 General

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 ➔ page 218

Overall appearance of the overall vehicle
If the vehicle fails to comply with the appearance, quality, specifications, and safety 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 Canter FE and FG 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 ➔ page 15.
2.6 Recycling of components

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

- It is preferable to use materials which permit recycling and closed material cycles.
- Materials and production processes are to be selected such that only low quantities of waste are generated during production and that this waste can be easily recycled.
- Plastics are to be used only where they provide advantages in terms of cost, function or weight.
- In the case of plastics, and composite materials in particular, only compatible substances within one material family are to be used.

- For components which are relevant to recycling, the number of different types of plastics used must be kept to a minimum.
- It must be assessed whether a component can be made from recycled material or with recycled elements.
- It must be ensured that components can be dismantled easily for recycling, e.g. by snap connections or predetermined breaking points. These components should generally be easily accessible and should permit the use of standard tools.
- Service products must be capable of being removed simply and in an environmentally responsible manner by means of drain plugs, etc.
- Wherever possible, components should not be painted or coated; colored plastic parts are to be used instead.
- Components in areas at risk from accidents must be designed in such a way that they are damage-tolerant, repairable and easy to replace.
2.7 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 described above, MITSUBISHI FUSO TRUCK & BUS CORPORATION urgently advises body and equipment 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 labeling materials/parts?
- Are quality assurance measures carried out at suppliers?
3 Planning of bodies

3.1 Selecting the chassis

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/gearbox
- Power take-offs
- Axle ratio
- Position of the center of gravity
- Legal registration requirements (e.g. underride guard)
- Permissible and technical gross vehicle and axle weights

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

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

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

3.2 Vehicle modifications

![Risk of accident](image)

**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 must still comply with federal, state, and local regulations and codes after modifications have been carried out.

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

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

3.3 Dimensions, weights, vehicle overall length, height, and width

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.

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, on the vehicle model plate.

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 an operator to lose control of the vehicle and cause an accident with possible injury or death.

Information on the permissible axle loads can be found in this manual and on the vehicle model plate.

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

Information about changes in weight is available from the department responsible > page 15.
3 Planning of bodies

3.4 About vehicle body incline

• When mounting the rear body onto the chassis, take care to evenly balance weight on the left and right sides. If there is a difference in weight between the left and right sides, adjust by adding counterweights or spacers on the sub-frame. Modification of axles suspension, including removal or replacement of individual spring leaves, is prohibited.

Also, use the chassis height adjustment shims (4.5mm (0.18in.) thickness) set on the front and rear springs.

Shim

<table>
<thead>
<tr>
<th>MFTBC Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
</tr>
<tr>
<td>Rear</td>
</tr>
</tbody>
</table>

Spaecer Specification

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness (mm/in.)</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS400(JIS G3101)</td>
<td>4.5 (0.18)</td>
<td>Painting for rust prevention</td>
</tr>
<tr>
<td>E275A(ISO 630)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S275JR/JO(EN10025)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUP9(JIS G4801)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55Cr3(ISO683-14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or equivalent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• The following are target reference values for tilting the body of an assembled vehicle.
  • Left-right weight difference
    \[ |H_{FL} - H_{FR}| \leq 10 \text{mm (0.39in.)} \]
    \[ |H_{RL} - H_{RR}| \leq 10 \text{mm (0.39in.)} \]
  • Front-back deviation
    \[ |(H_{FL} - H_{FR}) - (H_{RL} - H_{RR})| \leq 10 \text{mm (0.39in.)} \]

HFL: Center height of headlamp (left side)
HFR: Center height of headlamp (right side)
HRL: Lower height of rear end of body outer panel (left side)
HRR: Lower height of rear end of body outer panel (right side)
3 Planning of bodies

3.5 Tires

The body manufacturer must ensure that:

• the largest permissible factory-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).

Comply with federal, state, and local regulations and codes 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. NAFTA does not offer optional tire sizes for any model.

Risk of accident

Exceeding the specified tire load-bearing capacity or the permissible maximum tire speed can lead to tire damage or failure. The operator could lose control of the vehicle, and 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.

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.

<FG>

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

If tires of different sizes are fitted, the power train could be damaged.
3 Planning of bodies

3.6 Bolted and welded connections

3.6.1 Nuts and Bolts for Use on Frame

Pay attention to the following when removing nuts and bolts used on a standard vehicle.

- Target Locations
  Nuts and bolts used for tightening frame cross-members and side members (including nuts and bolts used for tightening the fuel tank and battery together)
  How to distinguish nuts and bolts
  Bolt (8T) .... Identifying letter "8"
  Nut (6T) .... Identification at diagonal corner

- Handling of nuts and bolts
  (a) Bolts that have been removed cannot be used again. Tighten again using new bolts having the same strength.
  (b) Nuts and bolts must be tightened to the following torques:
      M10: 60 to 80 Nm (44 to 59 ft.lbs, 6.1 to 8.2 kgf.m)
      M12: 98 to 120 Nm (72 to 89 ft.lbs, 10.0 to 12.0 kgf.m)

- In particular, cross-members must be tightened when bolts used for tightening cross-members together are removed for moving the fuel tank and battery.

Further information on bolted and welded connections can be found in Section 5 "Damage prevention" > page 65 and Section 6 "Modifications to the basic vehicle" > page 81.
3 Planning of bodies

3.6 Bolted and welded connections

3.6.2 Welded connections

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

- Parts which must not be welded:
  - Assemblies such as the engine, gearbox, axles, etc.
  - The chassis frame (except frame modifications).

Further information on bolted and welded connections can be found in Section 5 “Damage prevention” > page 65 and Section 6 “Modifications to the basic vehicle” > page 81.
3 Planning of bodies

3.7 Soundproofing

If modifications are carried out on any parts whose operation produces noise, e.g.

- engine
- exhaust system
- air intake system
- tires
- Noise absorbing cover, etc.

sound level measurements must be made.

To prevent modifications from changing the vehicle’s sound levels, it must be ensured that interior sound levels are reduced when planning bodies.

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

Comply with all federal, state, and local regulations and codes.
3.8 Duonic®

3.8.1 Cautions for vehicles with DUONIC® (mechanical automatic 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 contamination 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 harnesses maintain at least 25 mm (1 in.) of clear space to other parts. If this is impractical with parts installed on the same plane, clamp them at proper point(s) to hold them securely.

3.8.2 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.
Automatic transmission fluid level adjustment

Check of automatic transmission fluid level
Automatic transmission fluid is up to level plug.

Check of automatic transmission fluid level
Automatic transmission fluid is below level plug.

Supply additional automatic transmission fluid up to level plug.*

Fill automatic transmission fluid in hydraulic circuit as follows:
- Start engine.
- While depressing brake pedal, repeat [R] ⇔ [D] operation of change lever three times. (Hold lever in each range for 3 to 5 seconds.) Finally, place change lever into [P] position.
- Stop engine.

Check of automatic transmission fluid level
Automatic transmission fluid is up to level plug.

Check of automatic transmission fluid level
Automatic transmission fluid is below level plug.

End of adjustment
3 Planning of bodies

3.8 Duonic®

3.8.3 Initialization of DUONIC® system

Initializing the DUONIC® system stores the GSU (gear shift unit) gear position, road surface grade zero point correction value, clutch fill time learning value and clutch torque learning value in the memory of the TCU. It must be performed after ANY type of transmission-related service.

If any abnormality occurs during normal running, it may be cleared by initialization. Some kinds of body equipment work to the vehicle can cause an error in road surface grade recognition. To prevent this, be sure to initialize the DUONIC® system under the following conditions after body equipment work.

Conditions for initialization

Check the following before initialization.

(a) The engine electronic control unit and DUONIC® electronic control unit (TCU) are finished with flashing (programming) and coding (in case of a change in tire size or final ratio). For details, contact a MITSUBISHI FUSO service center.

(b) To compute the road grade zero point correction value, make sure that the vehicle is in the following state:

- Standing still, brake released, on a flat surface such that the vehicle remains stationary without drifting forward or backward
- Equipped with specified wheels with the tires filled to correct pressures.
- Cab tilt locked (a G sensor is provided in the cab.)

(c) For learning the clutch torque, units powered by the engine, such as the following, must be stopped:

- Air conditioner
- Load for equipment (compressor for refrigerator, etc.)

- Exhaust brake

Change lever pattern

P
R
D
N
-
### Initialization procedure

<table>
<thead>
<tr>
<th>Operation</th>
<th>Resultant status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hold vehicle on flat surface. (3.8.3 (b))</td>
<td>[Initialize mode standby status] is established and indicator shows [1] blinking.</td>
<td>[To clear initialize mode standby status to return to normal mode], release parking brake or turn key OFF and hold it OFF for 1 second.</td>
</tr>
<tr>
<td>• Turn key ON.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Stop engine.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Switch off air conditioner, equipment load and exhaust brake. (3.8.3 (c))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Accelerator ON (50% or more)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Foot brake ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Change lever D → (hold for approx. 1 second) → Hold A/M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Parking brake ON → (hold for approx. 1 second) → OFF → (hold for approx. 1 second) → ON (pull a little hard)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>From initialize mode standby status,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Turn accelerator OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Place change lever to [P].</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Then, start engine.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• With progress of initialization, indicator shows [2-3-4-5-N] blinking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• If initialization goes wrong, [R] is shown blinking.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Release parking brake or turn key OFF and hold it in that state for 1 second.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mode is returned to normal.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- (a) In case of failure of initialization
  - Repeat the initialization procedure from the start.
  - If initialization still goes wrong, there may be a problem with the hardware. Check the transmission (including gears, clutch, associated parts, valve body and GSU) and their connections.

- If the indicator shows from [2] to [R] blinking, move the vehicle once, then perform the initialization procedure. The problem may be resolved.
3 Planning of bodies

3.8 Duonic®

3.8.4 Resetting of initial DUONIC® settings

The DUONIC® system has a reset function for restoring the initially set GSU gear position, road grade zero point compensation value, clutch fill time learning value and clutch torque learning value to the pre-initialization status. (This is a back-up function used in case any initial settings are found to be abnormal and affect the vehicle operation; it is not normally used.)

Resetting procedure

<table>
<thead>
<tr>
<th>Operation</th>
<th>Status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn key ON.</td>
<td>[Initialize mode standby status] is established and indicator shows [1] blinking.</td>
<td>[To clear initialize mode standby status to return to normal mode], release parking brake or turn key OFF and hold it OFF for 1 second.</td>
</tr>
<tr>
<td>Accelerator ON (50% or more)</td>
<td>From initialize mode standby status, place change lever to [–].</td>
<td></td>
</tr>
<tr>
<td>Foot brake ON</td>
<td>Release parking brake, or hold key OFF for 1 second.</td>
<td></td>
</tr>
<tr>
<td>Change lever</td>
<td>Mode returns to normal.</td>
<td></td>
</tr>
<tr>
<td>D → (hold approx. 1 second) → Hold A/M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking brake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON → (hold approx. 1 second) → OFF → (hold approx. 1 second) → ON</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.8.5 Cautions during body equipment work on DUONIC® vehicle

The DUONIC® transmission and control system 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 with 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.
3  Planning of bodies

3.8 Duonic®

3.8.6 Power take-off for DUONIC® (mechanical automatic transmission)-equipped vehicle

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 \( \text{\textbullet} \) lights to indicate that the power take-off is in preparation.
- With the indicator lamp \( \text{\textbullet} \) 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 \( \text{\textbullet} \) goes off and the indicator lamp \( \text{\textbullet} \) goes on. The power take-off is being released.

The indicator lamp \( \text{\textbullet} \) 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 \( \text{\textbullet} \) lights.
- Connect the power take-off by means of the power take-off lever or damp lever.
- The indicator \( \text{\textbullet} \) 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 \( \text{\textbullet} \) goes off and the indicator lamp \( \text{\textbullet} \) 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 \( \text{\textbullet} \) goes off to indicate that the power take-off has been released.

Cautions

- The indicator lamp \( \text{\textbullet} \) may not show, depending on the sequence, operating speed or device response speed, which is not an abnormality.
- If the shift lever is in a position other than P or N, the power take-off is not connected even if the power take-off switch is turned ON. In the case where the shift lever is in a position other than P or N or the power take-off switch is turned to ON during running, the buzzer sounds and the warning indication of \( \text{\textbullet} \) appears on the meter. Turning the power take-off switch to OFF restores the state to normal.
- If the shift lever is placed into a position other than P or N or the power take-off switch is turned to ON when the power take-off is working, the buzzer sounds and the warning indication of \( \text{\textbullet} \) appears on the meter.
3 Planning of bodies

3.9 Exhaust system

The exhaust system must not be modified.

3.9.1 Clearance between exhaust system parts

- The exhaust pipe and exhaust gas purification devices (BlueTec® system) become so hot that if they are too close to or interfere 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 page 120. If this is impracticable, provide a heat shield plate to ensure safety.
- Do not install the tail pipe under the fuel pipe, fuel hose joint or fuel filter drain plug. Wooden and rubber body parts should be more than 100 mm (3.94 in.) apart from the diesel particulate filter (DPF) integrated muffler, SCR muffler and exhaust pipe. If this is impracticable, provide a heat shielding plate against to ensure safety.

3.9.2 Exhaust gas purification devices

- Exhaust gas purification devices (BlueTec® system) and sensors may be damaged by tool or equipment impact, or if dropped. 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 sensor, differential pressure sensor, lambda sensor or 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 tightly. Also, securely clip hose joints and confirm that there are no exhaust gas leaks.
- Exhaust gas purification devices and sensors are periodically removed for maintenance. Install any nearby equipment so that removal and reinstallation work can be carried out without any problems.

Risk of accident and injury

The tail pipe 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.
3 Planning of bodies

3.9 Exhaust system

3.9.3 BlueTec® exhaust gas aftertreatment

BlueTec® exhaust gas aftertreatment removes NOx in the exhaust gas.

Do not modify or relocate any of the following parts because the performance of the system may become compromised.

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

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 Planning of bodies

3.10 Maintenance and repairs

outside risk of accident and injury

Always have maintenance work for installed body or equipment 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 Service Center for all chassis-related service 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 specified service intervals. If this is not done, malfunctions or failures may occur in systems that could be relevant to safety. This could cause an operator to have an accident, which could result in injury or death.

- The Instruction Manual must be followed 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.

Any additional expenses arising from the body in connection with warranty, maintenance or repair will not be borne by NAFTA or its authorized dealer.

3.10.1 Maintenance instructions

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

- Due date of inspection
- The load sensing valve (LSV) must be set.
- Check the condition and capacity of batteries and service them in accordance with the manufacturer’s specifications.
- Check the headlamp setting or have this checked at a qualified specialist workshop.
- Retighten the wheel nuts to the specified torque.

Instruction Manual and directives for maintenance of attachments, bodies, installations or conversions, which have been installed by the body manufacturer, must be provided with the vehicle in the language of the country of use.

MITSUBISHI FUSO recommends adapting to each individual body the scope of maintenance work which has to be carried out on the body, coordinating it by means of the valid MITSUBISHI FUSO service systems. This applies both to the scope and type of service work, and for determining the service due dates for servicing intervals based on time elapsed and distance covered.

Maintenance and repair of the vehicle should not be made unnecessarily difficult by the body or other installed equipment.

Maintenance points and major assemblies must be easily accessible.
3 Planning of bodies

3.10 Maintenance and repairs

3.10.2 Preparation for storing the vehicle

Storage in an enclosed space:
• Clean the overall vehicle.
• Check the oil and coolant levels.
• Inflated the tires to 50 kPa (7.3 psi, 0.5 kgf/cm²) 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.

3.10.3 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 (32 °F) to 30 °C (86 °F).

Store the battery in an upright position.

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

If the battery voltage drops below 12.1 V, the battery may become damaged and 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 Planning of bodies

3.10 Maintenance and repairs

3.10.4 Work before handing over the modified vehicle

The manufacturer must confirm the work and modifications carried out by making an entry in the vehicle or job file.

Checking the overall vehicle

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

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. NAFTA recommends a MITSUBISHI FUSO Service Center for this work.

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

Further details are available from any MITSUBISHI FUSO Service Center.
3 Planning of bodies

3.11 Special equipment

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 dealer or from body manufacturer advisors page 15.

Optional equipment (e.g., auxiliary tanks, toolboxes, etc.) or retrofitted equipment increases the unladen weight of the vehicle.

When chassis are fitted with bodies or accessory equipment, 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 page 15.
- Some electrical parts to be mounted require that the SAM control unit parameters be changed. For the electrical parts to be mounted, see “5.1.1 Signal detection and actuation module-related parts” page 53.
  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.

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 Owner’s 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.
4 Technical threshold values for planning

4.1 Vehicle overhang and technical wheelbases

4.1 Vehicle overhang and technical wheelbases

⚠ Risk of accident

The body must be designed in such a way that placement 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 ▶ page 45.
- Take the weight of special equipment into consideration when making calculations.
4 Technical threshold values for planning

4.1 Vehicle overhang and technical wheelbases

4.1.1 Maximum vehicle overhangs

Van body: Body that fully encloses payload and does permit payload to protrude at the rear of vehicle

Example: Van body, lorry, etc.

All federal, state, and local regulations codes, and registration requirements must be complied with.
4  Technical threshold values for planning

4.2 Weight distribution, CoG height, anti-roll bars

4.2.1 Weight distribution
Avoid one-sided or laterally asymmetric 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 (11020 lb)
• Permissible wheel load distribution 2,600 kg to 2,400 kg (5730 lb to 5290 lb)

4.2.2 CoG height
Body/equipment manufacturer must calculate the vertical center of gravity, as measured from ground, for the completed and loaded vehicle. The provided maximum vertical center of gravity for the relevant chassis model cannot be exceeded under any operating condition.

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

4.2.1 Risk of accident
The body must be designed in such a way that placement 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.

4.2.2 Body/equipment manufacturer must calculate the vertical center of gravity, as measured from ground, for the completed and loaded vehicle. The provided maximum vertical center of gravity for the relevant chassis model cannot be exceeded under any operating condition.

MITSUBISHI FUSO cannot vouch for the handling, braking and steering characteristics of vehicles with attachments, installations or modifications for payloads with centers of gravity that violate prescribed limits (e.g. rear-mounted, overheight and side-mounted loads). The vehicle body/equipment manufacturer/retailer is responsible for the safety of the vehicle in the all cases.
4 Technical threshold values for planning

4.3 Steerability

Risk of accident

The body must be designed in such a way that a placement 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 page 15.

The permissible front axle load must not be exceeded.

Observe the notes on product liability page 17.
4 Technical threshold values for planning

4.4 Clearance for assemblies and cab

Certain clearances must be maintained in order to ensure the function and operational safety of assemblies. Dimensional data in the body builder’s drawings must be observed.

4.4.1 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 page 173.

Read and comply with the relevant sections of the Body Builder’s Manual.
4 Technical threshold values for planning

4.4 Clearance for assemblies and cab

4.4.2 Cab

- The distance between the cab and the body must be kept per layout drawings.

Reference body builder’s drawings and technical data. ▶ page 173.
4 Technical threshold values for planning

4.5 Air deflectors

4.5.1 Attaching the roof deck

**Roof**

- When attaching externally mounted parts such as an air deflector onto the roof, use only the threaded factory mounting holes provided on the roof.
- The total weight of externally mounted parts attached to the roof cannot exceed 50 kg (110 lb). (See Figs. 1, 2 and 4.)

**Cautions**

- 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 packing made of EPDM rubber to prevent ozone cracking.
- After attaching externally mounted parts, coat the entire periphery of the mounting bolts with sealer.
- A top coat of paint must be applied to externally mounted parts before attaching to the roof. (See Fig. 3.)
4 Technical threshold values for planning

4.5 Air deflectors

DETAIL C

Fig. 2

1. 16.5°
2. 31.0 mm (1.22 in.)
3. roof top
4. 1664 mm (65.5 in.)

5. 14.5°
6. 34.5 mm (1.36 in.)
7. roof top
8. 1694 mm (66.7 in.)
4 Technical threshold values for planning

4.5 Air deflectors

Fig. 3

1 Use washer and bolt with plain washer
2 Coat periphery with sealer
3 Air deflector mounting bracket
4 Rubber packing

Fig. 4

1 Bolt and washer: Left/right total 8 places
   (Air deflector)
4 Technical threshold values for planning

4.6 Coupling for direct-coupled power take-off

For installing the manufacturer’s genuine power take-off (general-purpose adaptor type), the vehicle is furnished with the coupling specified below.

Use the coupling if the shaft on the side of the pump for equipment is splined.

Note that the allowable torque for the genuine coupling is 195 N•m (145 ft.lbs, 20 kgf•m) / 1500 rpm.

(1) Detail of spline

(2) Spline specifications

<table>
<thead>
<tr>
<th>Involute spline specifications</th>
<th>Unit: mm (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool</td>
<td>Stub tooth</td>
</tr>
<tr>
<td>Type of tooth</td>
<td></td>
</tr>
<tr>
<td>Module</td>
<td>16/32</td>
</tr>
<tr>
<td>Pressure angle</td>
<td>30°</td>
</tr>
<tr>
<td>No. of teeth</td>
<td>10</td>
</tr>
<tr>
<td>Standard pitch circle diameter</td>
<td>15.875 (0.62)</td>
</tr>
<tr>
<td>Translocation</td>
<td>0</td>
</tr>
<tr>
<td>Centering</td>
<td>Side fit</td>
</tr>
<tr>
<td>Between-pin diameter</td>
<td>11.821 (0.466)</td>
</tr>
<tr>
<td>Pin diameter</td>
<td>2.743 (0.108)</td>
</tr>
<tr>
<td>Displacement over 2 teeth</td>
<td>7.245 (0.286)</td>
</tr>
</tbody>
</table>

## 4.7 Others

### 4.7.1 Non standard power take-off

When non standard power take-off is used, see the dimensions listed on page 206 for the lead-out port diameter and transmission-related dimensions.

### 4.7.2 PTO (power take-off) mode

In the case of a vehicle fitted with a transmission PTO, it is possible to select one of the PTO modes shown in the table below. The PTO mode is set to mode 2 (#1) before the vehicle leaves the factory. When installing a PTO on a standard truck subsequent to delivery, select the PTO mode of the two modes shown in the table below which best matches the conditions of use of the installed PTO.

#### Risk of accident

Do not press the brake pedal while the PTO is operating. If you do press the brake pedal while the PTO is operating, the BOS will operate and the engine speed will fall, which may result in an unforeseen accident. [When PTO mode 1 (#2) is selected]

<table>
<thead>
<tr>
<th>PTO (power take-off) mode</th>
<th>Unit: rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PTO mode (Control No.)</strong></td>
<td><strong>BOS</strong></td>
</tr>
<tr>
<td>2 (#1)</td>
<td>Non-operating</td>
</tr>
<tr>
<td>1 (#2)</td>
<td>Operating</td>
</tr>
</tbody>
</table>

**Note**

1. The engine speed when the PTO is operating can be set to the desired range by switching the PTO mode.
   For details, please contact nearest MITSUBISHI FUSO dealer or distributor.

2. The BOS (Brake override system) limits the engine torque when the brake pedal is pressed.
   The BOS will not function when PTO mode 2 (#1) has been selected. To make a setting that enables the PTO to operate when the engine speed is 1,600 rpm or higher (the upper limit is 2,000 rpm), change to PTO mode 1 (#2).
   When PTO mode 1 (#2) has been selected, if the brake pedal is pressed while the PTO is operating, the BOS will operate, and the engine speed will fall to the idling range.
   Caution the user not to press the brake pedal while the PTO is operating.

3. Only a transmission PTO can be used on a 4P10 model engine.
5.1 Electrical system

5.1.1 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 extreme 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.
5 Damage prevention

5.1 Electrical system

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

<table>
<thead>
<tr>
<th>Nut type</th>
<th>Torque</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6</td>
<td>4 to 6 (3 to 4.4, 0.4 to 0.6)</td>
<td>Nominal value: 5.4 (4, 0.55) To mount the control unit to the bracket</td>
</tr>
<tr>
<td>M8</td>
<td>10 to 15 (7.2 to 11.0, 1 to 1.5)</td>
<td>Nominal value: 12.7 (9.3, 1.3) To mount the power line 10C</td>
</tr>
</tbody>
</table>

Unit: N • m (ft.lbs, kgf • m)
5 Damage prevention

5.1 Electrical system

Cautions to be taken when handling signal detection and actuation module related parts

To protect the functions of the SAM, be sure NOT to:

(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 SAM control unit in any way.
(c) Remove or paint the cover of the SAM control unit.

Output terminals for additional wiring

The SAM 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.

<table>
<thead>
<tr>
<th>Circuit name</th>
<th>Allowable current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply (Batt)</td>
<td>7 A</td>
</tr>
<tr>
<td>Power supply (ACC)</td>
<td>7 A</td>
</tr>
<tr>
<td>Power supply (key-on)</td>
<td>7 A</td>
</tr>
<tr>
<td>ILL power supply*</td>
<td>2.5 A (chassis harness side)</td>
</tr>
<tr>
<td></td>
<td>2.5 A (body harness side)</td>
</tr>
<tr>
<td>Neutral signal*</td>
<td>0.2 A</td>
</tr>
<tr>
<td>Power take-off signal*</td>
<td>0.2 A</td>
</tr>
<tr>
<td>Parking brake signal*</td>
<td>0.2 A</td>
</tr>
<tr>
<td>Back alarm signal*</td>
<td>0.2 A</td>
</tr>
</tbody>
</table>

(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 SAM. For details, ask the contact person.
- 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 a noise-absorbing element-incorporated type.
- For necessary output lead-out connectors, see "Mounting Location of Optional Terminal Inside Cab" page 103.

Other precautions

(a) 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 Service Center or your contact person page 15.
- 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
    - 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

5.1.2 Starter switch

- The starter switch uses precision current contacts. Do not add any wiring to the line connected to the starter switch.
- Regarding the output terminals for additional wiring provided on the SAM control unit, see "5.1.1 Signal detection and actuation module-related parts" page 53.
5 Damage prevention

5.1 Electrical system

5.1.3 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 "Mounting Location of Optional Terminal Inside Cab" (page 103).

Fuses in the cab are provided on the signal detection and actuation module control SAM unit. When removing and reinstalling them, do so securely one by one. For other precautions on the SAM, see "5.1.1 Signal detection and actuation module-related parts" (page 53).

(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.

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

<Inside of SAM>
5 Damage prevention

5.1 Electrical system

<table>
<thead>
<tr>
<th>Fuse No.</th>
<th>Major load</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>F01</td>
<td>Starter</td>
<td>10A</td>
</tr>
<tr>
<td>F02</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>F03</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>F04</td>
<td>Optional power (IGN)</td>
<td>10A</td>
</tr>
<tr>
<td>F05</td>
<td>Power window (driver’s seat side)</td>
<td>30A</td>
</tr>
<tr>
<td>F06</td>
<td>Power window (passenger side)</td>
<td>30A</td>
</tr>
<tr>
<td>F07</td>
<td>ID lamp</td>
<td>20A</td>
</tr>
<tr>
<td>F09</td>
<td>Meter, diaphragm tachometer, diagnosis connector</td>
<td>10A</td>
</tr>
<tr>
<td>F10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>F11</td>
<td>Blower fan</td>
<td>30A</td>
</tr>
<tr>
<td>F12</td>
<td>Audio, interior lamp</td>
<td>15A</td>
</tr>
<tr>
<td>F13</td>
<td>Starter switch, ISS ECU</td>
<td>10A</td>
</tr>
<tr>
<td>F14</td>
<td>Horn</td>
<td>10A</td>
</tr>
<tr>
<td>F15</td>
<td>Audio</td>
<td>10A</td>
</tr>
<tr>
<td>F16</td>
<td>Power mirror, power socket (cigarette lighter)</td>
<td>20A</td>
</tr>
<tr>
<td>F17</td>
<td>Fuel heater</td>
<td>20A</td>
</tr>
<tr>
<td>F18</td>
<td>ABS ECU</td>
<td>10A</td>
</tr>
<tr>
<td>F19</td>
<td>Engine ECU</td>
<td>15A</td>
</tr>
<tr>
<td>F20</td>
<td>4WD M/V</td>
<td>10A</td>
</tr>
<tr>
<td>F21</td>
<td>-</td>
<td>10A</td>
</tr>
<tr>
<td>F22</td>
<td>Meters, A/C control</td>
<td>15A</td>
</tr>
<tr>
<td>F23</td>
<td>-</td>
<td>10A</td>
</tr>
<tr>
<td>F24</td>
<td>DUONIC®ECU</td>
<td>10A</td>
</tr>
<tr>
<td>F25</td>
<td>Optional power supply (ACC)</td>
<td>10A</td>
</tr>
<tr>
<td>F26</td>
<td>Optional power supply (B+)</td>
<td>10A</td>
</tr>
<tr>
<td>F27</td>
<td>Van body dome lamp</td>
<td>20A</td>
</tr>
<tr>
<td>F28</td>
<td>Engine ECU</td>
<td>15A</td>
</tr>
<tr>
<td>F29</td>
<td>BlueTec®system</td>
<td>20A</td>
</tr>
<tr>
<td>F30</td>
<td>BlueTec®system</td>
<td>20A</td>
</tr>
<tr>
<td>F31</td>
<td>Engine ECU</td>
<td>20A</td>
</tr>
<tr>
<td>F32</td>
<td>Air conditioner</td>
<td>10A</td>
</tr>
<tr>
<td>F33</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>F34</td>
<td>Fuel pump</td>
<td>15A</td>
</tr>
</tbody>
</table>

- 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 fuse holder and cause electrical failure or fire.

![Fuse puller](image1)

![Wall](image2)
5 Damage prevention

5.1 Electrical system

- Arrangement of relay in the instrument panel, sensors and ECU

![Diagram of electrical system and relay arrangement](image-url)
5.1.4 Connecting additional power wiring

- 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

- Taking power via the onboard battery terminal
  (a) Add a fuse of a correct type to any additional wire to thereby protect the circuit.
  (b) Use a wire of 5.0 mm² (0.2 in.²) or more for the additional wire (between battery terminal and fuse) of the next figure (page 60). 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" (page 60).
  (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.).
5 Damage prevention

5.1 Electrical system

Between battery terminal and fuse

(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

〇: Usable  ×: Not usable

<table>
<thead>
<tr>
<th>Fuse</th>
<th>Wire size [upper] and wire permissible current [lower]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Specifications</th>
<th>11</th>
<th>14</th>
<th>18</th>
<th>23</th>
<th>31</th>
<th>42</th>
<th>57</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blade and glass tube</td>
<td>5 A</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>7.5 A</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>10 A</td>
<td>×</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>15 A</td>
<td>×</td>
<td>×</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Note: Keep the continuous permissible current within 70% of the fuse specifications value.

(E.g.) If the fuse used is 10 A:

10 × 0.7 = 7 (A)

A load of up to 7 A can be used.

Notes:
1. ×: Not usable; –: 50 m (165 ft) max
2. AV/AVS wires: general wires; AVX wires: heat-resistant wires
5 Damage prevention

5.1 Electrical system

5.1.5 Batteries

• Never place any metal objects or tools on the batteries.
• There is a risk of short circuit if the positive terminal clamp on the connected battery comes into contact with vehicle parts. This could cause the highly explosive gas mixture to ignite. You and others could be seriously injured as a result.
• When disconnecting the batteries, always disconnect the negative terminal clamp first and then the positive terminal.
• When connecting the batteries, always connect the positive terminal clamp first and then the negative terminal.
• Incorrect polarity of the supply voltage can cause irreparable damage to the control units.
• Never start the engine without a connected battery (battery terminals tightened).
• Do not disconnect or remove the battery terminals while the engine is running.
• If the batteries are flat, the engine can be jump-started using jump leads connected to the batteries of another vehicle. Observe the Instruction Manual. Do not use a quick charger for jump-starting.
• Only tow-start the vehicle with the batteries connected.
• Quick-charge the batteries only after disconnecting them from the vehicle’s electrical system. Both the positive and negative terminals must be disconnected.

5.1.6 Lines, plug connections and control units

• A plug connection must not be unplugged from or plugged into the control unit(s) while the ignition is on.
• Lines must be protected from heat by means of insulation.
• Route cables in such a way that chafing cannot occur, particularly at crossover points and sharp edges. If necessary, use cable ducts, insulating loom, or guide pipes.
• Do not carry out tests at connector terminals using unsuitable tools (test probes, wire ends, etc.). This may lead to contact damage and subsequent problems. Use suitable test leads.
• The contact persons must be consulted if a battery isolating switch is to be retrofitted ▷ page 15.
5 Damage prevention

5.2 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.

- 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 discs.
- After installing fuel lines, hydraulic lines and brake hoses, the potentially affected 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 pressure loss.

Comply with all federal, state, and local regulations and codes.
5 Damage prevention

5.3 Mobile communications systems

United States Federal Communication Commission and Canadian National & Provincial communication regulations as well as the equipment manufacturer's information and installation specifications 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 meet FCC regulations for power, operating frequency, and interference.
- 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 terminal inside cab ► page 103.
- 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.

The notes on operating safety and vehicle safety in Section 1 "Introduction" ► page 10 and ► page 11 must be complied with.
5 Damage prevention

5.4 Electromagnetic compatibility (EMC)

The different electrical devices 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 FCC regulations.

The following standards provide information on this:

The notes on operating safety and vehicle safety in Section 1 “Introduction” page 10 and page 11 must be complied with.
5 Damage prevention

5.5 Welding work

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 springs 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 (0.59 in.).

Do not connect the arc welder ground clamp to assemblies such as the engine, gearbox or axles. Welding work is not permitted on assemblies such as the engine, gearbox, axles, etc.

• Avoid defects such as deposited metal cracking, toe crack, blow holes, slag inclusion, under cut, poor penetration, etc.
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 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.
5.6 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.

Optimum corrosion protection
5 Damage prevention

5.6 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 /L52932 page 15.

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 galvanizing, cataphoretic dip-priming and zinc-rich paint in sufficient coatings have proved satisfactory for this purpose.
5 Damage prevention

5.7 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.

**Example: Weld seams**

A – Suitable

B – Unsuitable

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.
5.8 Bolted connections

Finish-painted components
If painted parts are to be bolted together, the coats of paint must not cause settling in the bolted connections. In such cases, hard, high-density coatings such as cataphoretic immersion primers or powder coatings should be used. The coat thicknesses should be kept as small as possible (cataphoretic immersion primer approx. 20 µm (66 µft), powder coatings approx. 100 µm (330 µft)).

- If using bolts with serrations under the head, an additional top coat must be applied to touch up any paint damage.
- The use of hexagon socket or Torx socket bolts with the bolt heads in a horizontal position is to be avoided, as moisture can accumulate in the bolt head under certain conditions, leading to corrosion.

Fasteners
In areas susceptible to corrosion always use bolts, nuts, etc. with corrosion resistance (>480 h saline fog test according to ISO 9227) regardless of the required strength class. This standard is satisfied, e.g. by bolts with electroplating and additional thick-coat sealing and zinc platelet coatings with sealer (e.g. Dacromet or Deltaseal).

Information on identifying suitable coatings can be obtained from your local bolt supplier.

For details on bolted connections see Section 3 page 27.
5 Damage prevention

5.8 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.

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.
5.9 Painting work

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. Information on the primers used at the factory and on MITSUBISHI FUSO color numbers can be obtained from the relevant department page 15.

Mask the following areas before painting:
- Sealing surfaces
- Windows
- Contact areas between the wheels and wheel hubs
- Contact areas for wheel nuts
- Breathers on gearboxes, axles, etc.
- Disc brakes and disc rotors
- Door locks
- Door retainers in the rear door hinges
- Coupling flanges of drive shafts and power take-offs
- Spring mounting area
- Rubber hoses
- Electric control unit
- TCU (Transmission Control Unit)
- Lavel (Caution and name)
- Inner parts of drum brakes <FG>
- Inner surface of brake drums <FG>
- Contact areas between hubs and brake drums <FG>
5 Damage prevention

5.9 Painting work

5.9.1 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.

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

*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.

<table>
<thead>
<tr>
<th>Part name</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clip</td>
<td>MK676916 (MITSUBISHI FUSO part number)</td>
</tr>
</tbody>
</table>

*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.

<table>
<thead>
<tr>
<th>Part name</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clip</td>
<td>MK402586 (MITSUBISHI FUSO part number)</td>
</tr>
</tbody>
</table>
5 Damage prevention

5.9 Painting work

Parts to be removed or shielded from heat when repainting at temperatures exceeding 80°C (176°F)

- Do not leave any plastic parts mounted on the cab during the painting, baking and drying processes. They must be removed prior to painting.

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.

- Parts that must not be repainted
  The following parts are made of polypropylene (PP). Do not repaint them.
  - 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 glip fitting bases)
- Antenna

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 Damage prevention

5.9 Painting work

5.9.2 Laminated glass

- When a repainted cab body is heat-dried, the temperature should not exceed 100 °C (212 °F) and the process must be completed within 60 minutes. When using a temperature above 100 °C (212 °F), cover the glass surfaces with shields to prevent them from being heated beyond 100 °C (212 °F) or remove the glass.
- Laminated glass is marked by a double slash (//) in the lower left corner.
5.10 Leaf springs

- Only use original equipment spring leaves which have been tested and approved for the vehicle model in question. Reinforcement by installing heavier, stiffer, 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 Damage prevention

5.11 Tilting the cab

Risk of injury

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

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

5.12 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 Owner's Manual. You could otherwise fail to recognize dangers and cause an accident, which could result in injury or death.

Failure to observe the instructions in the Owner's Manual can result in damage to the vehicle.
5.13 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, gearbox, exhaust system, turbocharger, etc.

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

5.14 Storing and handing over the vehicle

5.14 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 > page 39.

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 > page 40.
6 Modifications to the basic vehicle

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 and qualified 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.

Further information on bolted and welded connections can be found in Section 3 "Planning of bodies" > page 27 and Section 5 "Damage prevention" > page 53.
6 Modifications to the basic vehicle

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.

See the respective body/equipment mounting directives for the longitudinal frame member dimensions.

Material: FEC . . . . . . . . . . . . . . . HTP540

FGB . . . . . . . . . . . . . . . MJSH440 or SAPH440 (JIS) (SAE J410950X or the equivalent)
6 Modifications to the basic vehicle

6.3 Drilling work on the vehicle frame

Drilling work on side rails

All factory holes in side rails are regularly spaced (50 mm (1.97 in.) in longitudinal pitch and 40 mm (1.57 in.) in vertical pitch). Use existing holes instead of drilling new holes. Never drill holes in any top flange areas. Also avoid enlarging existing holes in principle. If it is unavoidable to enlarge a hole, limit the hole diameter to 13 mm (0.51 in.).

No load may be applied to the center of the web of the longitudinal member (diaphragm effect). If this is unavoidable, make sure that there is a large area of support on both sides of the web.
**6 Modifications to the basic vehicle**

### 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.

<table>
<thead>
<tr>
<th>Crossmember type</th>
<th>Hole diameter</th>
<th>Center-to-center distance of holes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alligator type (see Fig. 1)</td>
<td>9 mm (0.35 in.) max.</td>
<td>30 mm (1.18 in.) min.</td>
</tr>
<tr>
<td>Channel type (see Fig. 2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note**: Maintain the dimensions of previously drilled holes.

- Holes should be more than 100 mm (3.94 in.) 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 (1.97 in.) min. from the end of the crossmember. (Refer to Fig. 2)
- Holes in the flange should be more than 25 mm (0.98 in.) from the end.
- Holes should be drilled more than 20 mm (0.79 in.) from the curved part of the flange.

**Fig. 1**

1. 100 mm (3.94 in.) min
2. DIA 9 mm (0.35 in.) max
3. 25 mm (0.98 in.) min

**Fig. 2**

4. 100 mm (3.94 in.) min
5. DIA 9 mm (0.35 in.) max
6. 25 mm (0.98 in.) min
7. 50 mm (1.97 in.) min (Web surface)
6 Modifications to the basic vehicle

6.4 Welding work on the vehicle frame

Welding anything onto chassis frame is prohibited in principle, as doing so increases the risk of cracks in the member. For detailed instructions about rear body mounting, see 7.2 “Mounting frame” ▶ page 112.

Further information on welded connections can be found in Section 5 "Damage prevention" ▶ page 65.
6.5 Reinforcements

Reinforcement for a cab-back-mounted crane

Adding a stiffener to the outside of a side rail generally has no reinforcing effect, as the stiffener (or a local reinforcement) will create a sudden change in rigidity in the frame, which is likely to cause cracks to develop in the frame. However, frame reinforcement is indispensable around the crane mounting area where stress concentrates during crane operation; follow the instructions below when performing such frame reinforcement work:

- Any of the ends of outer stiffeners should not be aligned with any of the ends of a sub side rail inside the side rail.
- Any of the ends of outer stiffeners should not be aligned with any stress concentration point such as the back of the cab, an area neighboring a spring hanger, and cross member ends. If it is unavoidable to locate a stiffener end close to a spring hanger, avoid aligning the ends of upper and lower stiffeners.
- Cut any end of an outer stiffener at an angle of more than 45 degrees, not squarely.
- Fasten outer stiffeners to side rails by riveting or bolting on the web surface.
- Use 10 mm (0.39 in.)-diameter rivets and M10 bolts for fastening. Use a riveting machine for riveting.

Tightening torque

<table>
<thead>
<tr>
<th>Name</th>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolt M10 Flange bolt 10T</td>
<td>88 to 105 (65 to 80, 9 to 11)</td>
</tr>
<tr>
<td>Nut M10 Flange nut 6T</td>
<td></td>
</tr>
</tbody>
</table>

Do not use ground bolts for fastening outer stiffeners. Mount the DEF tank bracket (plastic) with bolts tightened to a torque of 21 to 31 N·m (15 to 23 ft.lbs, 1 to 3.2 kgf·m).

- When re-riveting, do not use a rivet of the same diameter as the removed rivet in the same place. It is permitted to re-rivet with an 11 mm (0.43 in.) diameter rivet in place of a removed 10 mm (0.39 in.) diameter rivet after enlarging the hole correspondingly, provided the distance from the end of the outer stiffener is at least 25 mm (0.98 in.) from the edge of the rivet hole.
- Always fasten the front and rear ends of any outer stiffener.
- Stiffeners must be fastened especially securely around the No.2 cross member.
- The spacing between rivets or bolts should be no more than 200 mm (7.87 in.). The spacing must be closer near the ends of an outer stiffener.
- A channel-section stiffener, if inferior in dimensional accuracy, will create a gap at its flanges when installed on a side rail and may cause problems. Instead, use two L-section stiffeners on the top and bottom sides of the side rail.
- To ensure that the seating surfaces of bolts and nuts function properly, do not make outer stiffener mounting holes any larger than 11 mm (0.43 in.) in diameter. Slotting holes must not be used.
- If any chassis part has to be mounted astride an outer stiffener, create a gap in height with spacers (approx. 25 x 160 mm [0.98 x 6.3 in.]) equal to the outer stiffener added between them. Do not use existing plain washers for this purpose.
- Do not use bolts at the four corners outside the cross-member/transmission mount to fasten outer stiffeners.
6.5 Reinforcements

6.5.1 Others

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

1 Side rail
2 Crossmember gusset
3 Crossmember

Fig. 1
6 Modifications to the basic vehicle

6.6 Brake systems

<table>
<thead>
<tr>
<th>Risk of accident</th>
</tr>
</thead>
<tbody>
<tr>
<td>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 an operator to lose control of the vehicle and cause an accident with possible injury or death.</td>
</tr>
</tbody>
</table>

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

Comply with all federal, state, and local regulations and codes.

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” > page 62.

<table>
<thead>
<tr>
<th>Disc brake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not impede cooling by attaching spoilers below the bumper, additional hub caps or brake disc covers, etc.</td>
</tr>
</tbody>
</table>

Extreme caution is required in handling brake tubing because of the importance of the components due to brake safety. Tubing, joints, and brake components should be protected with covers during mounting work to prevent them from dents, damages, welding sparks, and heat and routing changes of tubing necessary for coupling with trailers, etc., should be performed in accordance with the following cautions.
6 Modifications to the basic vehicle

6.6 Brake systems

6.6.1 Chassis tubing form and dimension specifications

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

(Double Flare type) Unit: mm [in.]

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>A</th>
<th>B</th>
<th>t</th>
<th>C</th>
<th>S min.</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.75 (0.19)</td>
<td>6.6-7.1 (0.26-0.28)</td>
<td>3.0-3.7 (0.12-0.15)</td>
<td>0.7 (0.03)</td>
<td>1.4 (0.06)</td>
<td>1.0 (0.04)</td>
<td>SPCC (JIS) (ASTM A109 or A366) Double walled steel tubes</td>
</tr>
<tr>
<td>6.35 (0.25)</td>
<td>8.6-9.1 (0.34-0.36)</td>
<td>4.5-5.2 (0.18-0.20)</td>
<td>0.7 (0.03)</td>
<td>1.4 (0.06)</td>
<td>1.0 (0.04)</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4 min.</th>
<th>T</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.75 (0.19)</td>
<td>4.83-4.69 (0.190-0.185)</td>
<td>7.28-6.92 (0.286-0.273)</td>
<td>3.5-3.0 (0.137-0.119)</td>
<td>4.7 (0.19)</td>
<td>0.77-0.63 (0.030-0.025)</td>
<td>2.8-2.2 (0.110-0.087)</td>
</tr>
<tr>
<td>6.35 (0.25)</td>
<td>6.42-6.28 (0.252-0.248)</td>
<td>8.98-8.62 (0.353-0.340)</td>
<td>5.1-4.6 (0.201-0.182)</td>
<td>6.3 (0.25)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D4 is an outside diameter on the sealing surface. The surface-roughness is

Fig. 1
The tightening torques for the flare nuts which connect the brake lines are shown below.

<table>
<thead>
<tr>
<th>Nominal Diameter (mm [in.])</th>
<th>Tightening torque (N·m [ft.lbs, kgf.cm])</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.75</td>
<td>13 to 17 (9.4 to 12.3, 130 to 170)</td>
</tr>
<tr>
<td>4.76 (0.19)</td>
<td></td>
</tr>
<tr>
<td>6.35 (0.25)</td>
<td>19 to 25 (13.7 to 18.8, 190 to 260)</td>
</tr>
</tbody>
</table>

### 6.6.2 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.

<table>
<thead>
<tr>
<th>Nominal diameter of tube (mm [in.])</th>
<th>MFTBC Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.75 (0.19)</td>
<td>MF651001 (Double flare type)</td>
</tr>
<tr>
<td>4.76</td>
<td>MK678335 (ISO flare type)</td>
</tr>
<tr>
<td>6.35 (0.25)</td>
<td>MF651002 (Double flare type)</td>
</tr>
<tr>
<td></td>
<td>MK678336 (ISO flare type)</td>
</tr>
</tbody>
</table>

- 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.

<table>
<thead>
<tr>
<th>Nominal diameter (mm [in.])</th>
<th>Bend radius (mm [in.])</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.75</td>
<td>25 (0.98)</td>
</tr>
<tr>
<td>4.76 (0.19)</td>
<td></td>
</tr>
<tr>
<td>6.35 (0.25)</td>
<td>30 (1.18)</td>
</tr>
</tbody>
</table>
6 Modifications to the basic vehicle

6.6 Brake systems

- 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](image)

- 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.

6.6.3 Running additional lines

- Avoid crossing brake lines. If this is unavoidable, position each line so it clears the other by more than 15 mm (0.59 in.). (Fig. 4)

![Fig. 4](image)

- Position the brake lines so that they are not closer than 15 mm (0.59 in.) to sharp edges of the frame or other parts. (Fig. 5)
6 Modifications to the basic vehicle

6.6 Brake systems

- 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.

<table>
<thead>
<tr>
<th>Tube Dia</th>
<th>Clamp Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight tube</td>
<td>4.75-10 [0.19-0.39]</td>
</tr>
<tr>
<td>Curved tube</td>
<td>↑</td>
</tr>
</tbody>
</table>

- 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 [0.39 in.] 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 7 "Clearance between chassis parts and bodies" > page 119.

- The clearance between the brake lines and exhaust system components should conform to the specifications in Section 7 "Clearance between chassis parts and bodies" > page 119.

- Position the connection nut in a location where it can be completely tightened without difficulty.

- Tighten the flare nuts to torque specified in > page 90. 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

![Diagram](image)
6 Modifications to the basic vehicle

6.7 Modifications to the wheelbase

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

If this is unavoidable, contact the department responsible ➔ page 15.

6.7.1 Prohibition on modifying the propeller shaft

⚠️ Risk of accident

It is strictly prohibited to modify a 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 injury, or death.
6 Modifications to the basic vehicle

6.8 Frame modifications

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

6.8.1 Extension and shortening

Procedure for extending the frame's rear overhang

Extend the frame's rear overhang as follows.

- Materials

<table>
<thead>
<tr>
<th>Extension member</th>
<th>Reinforcement</th>
<th>Electrode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Thickness</td>
<td>Material</td>
</tr>
<tr>
<td>SAPH440</td>
<td>Same as side rail</td>
<td>SAPH440</td>
</tr>
</tbody>
</table>

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.
**6 Modifications to the basic vehicle**

### 6.8 Frame modifications

- **Extension/shortening procedure**
  
  Follow the reinforcement method described below.

  When bolts are used for fastening the reinforcement, fasten it at two or more points to each of the frame and extension member. Use M10 bolts (8T) and nuts (6T) and tighten them to a torque of 60 to 80 N·m (44 to 59 ft-lbs., 6.1 to 8.2 kgf-m).

  Finish flange ends at butt welds of the side rail with particular care using a grinder so that there is no undercut or build-up of weld metal. Also make sure that there is no difference in level between the side rail and extension member. If there is a step between them, finish the area for a smooth surface.

![Diagram of frame modifications](image-url)
6 Modifications to the basic vehicle

6.9 Mounting equipment on the side rail

6.9.1 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 (220 lb) 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.

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 Owner’s 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 or death.

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

All federal, state, and local regulations and codes and registration requirements must be complied with.
6 Modifications to the basic vehicle

6.9 Mounting equipment on the side rail

6.9.2 Wheel chocks

Mounting

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

6.9.3 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 body/equipment mounting directives must be observed.
- On chassis with standard bore holes for mudguard brackets, use these bore holes to secure the brackets.
6 Modifications to the basic vehicle

6.10 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 (page 15).

- The content relating to in Section 2.5 Mitsubishi three diamonds and Fuso emblem must be complied with (page 19).
6 Modifications to the basic vehicle

6.11 Seats and bench seat

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 seat or equipment installer.

Risk of injury

Modifications to or work incorrectly carried out on a restraint system (seat belt and seat belt anchorages), could cause the restraint systems to stop functioning correctly. For this reason, never carry out modifications to the restraint systems.

Comply with all federal, state, and local regulations and codes.
6 Modifications to the basic vehicle

6.12 Electrics/electronics

Electrical Wiring
The electrical circuits have been designed in particular with the emphasis on safety. In this respect, a high-current fuse box is provided at the side of the battery in order to prevent fires caused by shorting during accidents. Therefore, follow the procedures below when making changes to the electrical circuits.

- Additional Wiring
  (a) Use wires of the same gauge and color as the original wires when making wiring extensions. 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).

(b) Connect wires securely by soldering or crimping terminals and then insulate them completely with tape or other weatherproof material. Never attempt to connect wires by just twisting the stripped ends together.

(c) Do not use sulfuric acid for soldering.

(d) Do not extend or shorten the battery cables. If battery cable length must be adjusted due to the transfer of the battery, replace the cable(s) with one(s) of appropriate gauge and length.

(e) Be especially careful not to modify the type of clamps, location, or slack of wiring connected to movable components between the starter and the frame.

(f) Wiring should be made along the rear body parts, the frame, etc., fully supported, and never extended individually in midair.

(g) Clamp all wires securely in locations away from moving parts or sharp corners on the chassis and body. Use grommets where routing wires through metal plates in order to prevent electrical short circuits due to installation damage or chafing. (Fig. 1)

![Fig. 1](image)

1 Grommet
2 Wire
3 Metal plate

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 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 or death.

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.
(h) Wires should never pass along brake tubes or fuel lines. Observe the following clearances.

<table>
<thead>
<tr>
<th>Wiring</th>
<th>Clearance mm (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallel</td>
<td>10 (0.39) or more</td>
</tr>
<tr>
<td>Crossed</td>
<td>20 (0.79) or more</td>
</tr>
</tbody>
</table>

(i) Position wires more than 200 mm (7.87 in.) away from parts which become extremely hot such as the exhaust pipe or muffler. Install a heat insulator if heat protection is necessary.

(j) Road debris which is thrown up by the wheels can damage wiring. Install metal covers to protect the wiring.

(k) Tape wires together with the nearest chassis wiring harnesses if possible.

(l) Route wires along the chassis harnesses that are already installed. Wires should be clamped with vinyl tape, and wrapped up widely with thin metal sleeves (rubber or vinyl coated, or wiring loom). Do not use weak vinyl tape that could fall off soon due to engine heat.

(m) Wires connecting engine and transmission components should run along previously installed harnesses to allow them to absorb motion. Also allow adequate slack to prevent them from contacting other components.

(n) When connecting plugs, place the female end in the power source side to prevent a short circuit to the body even if the terminal comes off.

(o) Use coated or vinyl clamps when clamping wires.

(p) Bonding or temporary clamps should be used only for additional support.

(q) Use standard wiring clamp intervals as shown below:

<table>
<thead>
<tr>
<th>Harness diameter</th>
<th>Clamp intervals mm (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 (0.20) max</td>
<td>300 (11.81) max</td>
</tr>
<tr>
<td>5-10 (0.20-0.39)</td>
<td>approx. 400 (15.75)</td>
</tr>
<tr>
<td>10-20 (0.39-0.79)</td>
<td>approx. 500 (19.69)</td>
</tr>
</tbody>
</table>

(r) Wires may come in contact with edges of metal parts; increase the number of clamps and cover the edges with protectors to prevent damages due to vibrations.
(s) When passing electrical wiring through the cab floor, use the grommets in the area A and B shown in Fig. 4.

Fig. 4
Let harness pass through the grommet cut as shown in Fig. 5 and then tape them.

Fig. 5

Cut off

Unit: mm [in.]
Mounting Location of Optional Terminal Inside Cab

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Part Name</th>
<th>Connector No.</th>
<th>Circuit Description</th>
<th>Mating Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>OPTION CONNECTOR (Tachograph navigation)</td>
<td>MH056874 123456</td>
<td>MAIN (12V) SPEEDSIG(25P) SPEEDSIG(8P)</td>
<td>MH056807</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Circuit</th>
<th>Line color</th>
<th>Load</th>
<th>Mating Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
6 Modifications to the basic vehicle

6.12 Electrics/electronics

<table>
<thead>
<tr>
<th>No.</th>
<th>Part Name</th>
<th>Connector No.</th>
<th>Circuit Description</th>
<th>Line color</th>
<th>Load</th>
<th>Mating Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>OPTION CONNECTOR (Only When sub harness (MK649751) is arranged)</td>
<td>MH052847</td>
<td>PARKING ON NEUTRAL</td>
<td>R-G</td>
<td>*1</td>
<td>MH052805</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PTO</td>
<td>Lg-R</td>
<td>*1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ILL</td>
<td>O-B</td>
<td>*1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MAIN</td>
<td>L-R</td>
<td>*1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GND</td>
<td>B</td>
<td>*1</td>
<td>10A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BATT</td>
<td>G-R</td>
<td>*1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACC</td>
<td>W-R</td>
<td>*1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PARKING ON NEUTRAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IDLE UP (SWtoGND)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* 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.
6.12 Electrics/electronics

- Mounting Location of Optional Terminal Outside Cab
6 Modifications to the basic vehicle

6.12 Electrics/electronics

<table>
<thead>
<tr>
<th>No.</th>
<th>Part Name</th>
<th>Connector No.</th>
<th>Circuit Description</th>
<th>Circuit</th>
<th>Line Color</th>
<th>Load</th>
<th>Mating Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>OPTION CONNECTOR (van roomlamp &amp; ID lamp)</td>
<td>MH056453</td>
<td>01</td>
<td>VAN ID RAMP</td>
<td>G-W</td>
<td>5A</td>
<td>MH056403</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>02</td>
<td>GND</td>
<td>R</td>
<td>9A</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>03</td>
<td>VAN ROOM LAMP</td>
<td>B</td>
<td>5A</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>OPTION CONNECTOR (side turn)</td>
<td>MH056451</td>
<td>01</td>
<td>TURN LH</td>
<td>Gr-L</td>
<td>*1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>02</td>
<td>TURN RH</td>
<td>Gr-R</td>
<td>*1</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>OPTION CONNECTOR (chassis)</td>
<td>MH056457</td>
<td>01</td>
<td>BATT</td>
<td>G-R</td>
<td>*2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>02</td>
<td>ACC</td>
<td>W-R</td>
<td>*2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>03</td>
<td>MAIN</td>
<td>L-R</td>
<td>*2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>04</td>
<td>IDI LP</td>
<td>B</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>05</td>
<td>ILL</td>
<td>O</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>06</td>
<td>GND</td>
<td>R-B</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

* 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.
6 Modifications to the basic vehicle

6.12 Electrics/electronics

- Cautions when Grounding the Frame
  When moving the battery or when grounding a new rear body on the frame, remove masked or painted areas then reliably ground the connection terminal.

- About Charging/Discharging Balance
  The charging/discharging balance may become unequalized in the following operating conditions. For this reason, reduce the electrical load during work referring to the Engine Alternator Performance Curves on page 109.
  - When there is a lot of night work
  - When working for a long time with the engine idling
  - When many electrical load capacities are placed on installation items.
  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.
### 6.12 Electrics/electronics

#### Installation of switches and relays for equipment

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Mitsubishi Part No.</th>
<th>Allowable Current</th>
<th>Connector (Harness side)</th>
<th>Circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rocker switch</td>
<td>MK645424</td>
<td>3.0 A or less</td>
<td>MCP2.8 type connector Housing: A0145450026 Terminals: A0145451126KZ (wire diameter: 0.3 mm²) A0135457626KZ (wire diameter: 0.5 to 0.85 mm²)</td>
<td></td>
</tr>
<tr>
<td>Relay</td>
<td>MK420480 For 12 V</td>
<td></td>
<td>Connector type EQ5A (MH059820)</td>
<td></td>
</tr>
</tbody>
</table>

#### 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. 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

![Diagram of electrical connection](image-url)
6 Modifications to the basic vehicle

6.12 Electrics/electronics

- Engine Alternator Performance Curves

4P10 Engine Alternator Performance Curve
Nominal output: 12V-110A

4P10 Engine Alternator Performance Curve
Nominal output: 12V-140A
6 Modifications to the basic vehicle

6.13 Installation of propeller shafts

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 ($\beta_1 = \beta_2$). 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.

6.13.1 Types of angular offset

**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.

**Angle in one plane (two-dimensional offset)**

$\beta_1 = \beta_2$

*Upper = Z-type offset*

*Lower = W-type offset*

Failure to observe these instructions could result in damage to the major assemblies.
### 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 and qualified 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, gearbox, exhaust system, turbocharger, etc.

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

Bodies on which the gearbox 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 gearbox (gearbox guard) which will prevent abrupt cooling as well as water ingestion via the gearbox breather.

Further information on bolted and welded connections can be found in Section 3 "Planning of bodies" page 27 and Section 5 "Damage prevention" page 53.
7 Construction of bodies

7.2 Mounting frame

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

**Sub-frame**

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

---

**Fig. 1**

1. 525 mm (20.7 in.)
2. CAB BACK
3. Extend the front end of the sub-frame as far forward as possible; less than 300 mm (11.81 in.)
### 7 Construction of bodies

#### 7.2 Mounting frame

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

Fig. 2

1. 525 mm (20.7 in.)
2. CAB BACK
3. Extend the front end of the sub-frame as far forward as possible, less than 115 mm (4.53 in.)
4. "h" should be between a fourth and a fifth of "H"  
5. DRILLING
6. "r" must not be less than 2/3H (two thirds of "H")
7 Construction of bodies

7.2 Mounting frame

(b) The shape of the sub-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.

![Diagram of mounting frame](image)

**Fig. 3**

1. CAB BACK
2. Less than 300 mm [11.81 in.]
3. "h" should be between a fourth and a fifth of "H"
4. Left open
5. Less than 30°
6. Cut off Obliquely
7 Construction of bodies

7.2 Mounting frame

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

![Diagram of a truck showing mounting frame dimensions.]

1 CAB BACK
2 Less than 300 mm (11.81 in.)
3 "h" should be 2 to 3 mm (0.079 to 0.12 in.)
4 "I" should be 200 mm (7.874 in.)
5 This corner should be ground smoothly
7 Construction of bodies

7.2 Mounting frame

(d) When building a body to the frame of a 4 WD vehicle (FGB model), follow the instructions below.

- In the case of an ordinary body
  - Join the front end to the FR side rail (1). If this is not possible, join the body to the section where the RR side rail and kick-down rail overlap (2).

- In the case of a 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 below.
  - Use M10 bolts (8T) and nuts (6T) with a tightening torque of 60 to 80 N•m (43 to 58 ft.lbs, 6 to 8 kgf•m) to secure the member together with the existing battery, fuel tank, spare tire hanger, etc.
7 Construction of bodies

7.3 Mounting frame attachment

Attaching with U-bolts

- Allow sufficient clearance so that the U-bolts for tightening sub-frames or main bolsters do not come in contact with pipes, hoses, wires and harnesses.
- Do not install U-bolts at the taper-cut position of the sub-frames or main bolster.

![Diagram showing U-bolt attachment](image)

1 Do not install U-bolts in the shaded area.

- Place a wooden spacer inside the flange of the side rail to avoid bending when tightening the U-bolts.
- Use metal spacers in locations subject to heat, such as near the muffler, or other place where it is difficult to place wooden spacers.

![Diagram showing U-bolt attachment](image)

- Stress in the chassis frame tends to concentrate in the areas where the cross member, stiffener and gussets are fitted and near the side rail bends. Do not install U-bolts and opposed brackets in such areas.

![Diagram showing U-bolt attachment](image)

Installing U-bolts and brackets in the hatched areas is prohibited.
7 Construction of bodies

7.3 Mounting frame attachment

Mounting Bracket

When U-bolts cannot be used with a particular body, use mounting brackets in those positions to attach it to the sub-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 (7.87 in.) away from the end of these parts.

![Diagram of Mounting Bracket]

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

<Crew-Cab>

- Extend the sub-frame as far forward as possible.
- Locate the headmost fastener (U-bolt or bracket) as far forward of the sub-frame as possible.
### 7.4 Clearance between chassis parts and bodies

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

<table>
<thead>
<tr>
<th>Part</th>
<th>Minimum Clearance and Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Surrounding part of T/M</td>
<td>25 mm (0.98 in.) at surrounding part of transmission except rear part.</td>
</tr>
<tr>
<td>2. Clutch and Transmission Assembly</td>
<td>Do not install any rear body part in the area of 100 mm (3.94 in.) of the rear of the clutch and transmission ass’y, as the ass’y must be moved backward in the same inclination line of engine, to pull out the clutch spline shaft, when the transmission ass’y is removed from engine for service.</td>
</tr>
<tr>
<td>3. Upper part of Transmission</td>
<td>Keep more than 100 mm (3.94 in.) 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.</td>
</tr>
<tr>
<td>4. The surrounding part of the Propeller shaft and the Rear axle</td>
<td>Min. 25 mm (0.98 in.) of the surrounding part.</td>
</tr>
<tr>
<td>5. The brake hose (which connects to the front and rear wheel)</td>
<td>Maintain a minimum of 50 mm (1.97 in.) of clearance. This brake hose is considered to move when vehicle is driven.</td>
</tr>
<tr>
<td>6. The cab back and the surrounding part of the engine</td>
<td>No equipment must be mounted within 100 mm (3.94 in.) in the cab back, except the subframe and the side members. If any equipment inevitably comes within this range, install it in such a position which is more than 300 mm (11.8 in.) from both sides of engine rear part and not over the engine. Also take care that all equipment must not stand in the way of air flow which is discharged rearward, downward, or sideward from the engine compartment. If air flow is restricted, engine compartment temperature will excessively rise, resulting in poor engine performance, and fuel pipe and electric wiring overheating. Install a protector as shown below on the cab back or the front of the fixed rear body as high as possible with regard to exhaust so as to block foreign matter, which may come between cab and rear body, from high temperature areas of the engine. When a protector is installed on the cab back, use the specialized mounting holes provided.</td>
</tr>
</tbody>
</table>

![Diagram](image)

1. Rubber strip
2. Sheet metal
3. 675 mm (26.6 in.)
7. Construction of bodies

7.4 Clearance between chassis parts and bodies

The heat generated within and around the exhaust system can be very high, and the required clearance of components near it is an important factor in the safety of the vehicle. Keep the clearance between the rear body parts and these parts per the following figures on the table.

<table>
<thead>
<tr>
<th>Part</th>
<th>Minimum Clearance and Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. The Exhaust system</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The heat generated within</td>
</tr>
<tr>
<td></td>
<td>and around the exhaust</td>
</tr>
<tr>
<td></td>
<td>system can be very high,</td>
</tr>
<tr>
<td></td>
<td>and the required clearance</td>
</tr>
<tr>
<td></td>
<td>of components near it is</td>
</tr>
<tr>
<td></td>
<td>an important factor in</td>
</tr>
<tr>
<td></td>
<td>the safety of the vehicle.</td>
</tr>
<tr>
<td></td>
<td>Keep the clearance between</td>
</tr>
<tr>
<td></td>
<td>the rear body parts and</td>
</tr>
<tr>
<td></td>
<td>these parts per the following figures on the table.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parts</th>
<th>Minimum Clearance (mm (in.))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring harness</td>
<td>150 (*100) (5.91 (*3.94))</td>
</tr>
<tr>
<td>Fuel hose and pipe</td>
<td>200 (7.87)</td>
</tr>
<tr>
<td>Fuel tank</td>
<td>150 (5.91)</td>
</tr>
<tr>
<td>Rear body floor</td>
<td>100 (3.94)</td>
</tr>
<tr>
<td>Subframe, additional member etc.</td>
<td>20 (0.79)</td>
</tr>
<tr>
<td>Spring, axle</td>
<td>20 (0.79)</td>
</tr>
<tr>
<td>Shock absorber</td>
<td>30 (1.18)</td>
</tr>
<tr>
<td>Tire</td>
<td>100 (3.94)</td>
</tr>
<tr>
<td>Propeller shaft</td>
<td>50 (1.97)</td>
</tr>
<tr>
<td>Differential</td>
<td>50 (1.97)</td>
</tr>
<tr>
<td>Brake hose and pipe</td>
<td>100 (3.94)</td>
</tr>
<tr>
<td>Parking brake cable</td>
<td>50 (1.97)</td>
</tr>
<tr>
<td>Oil pan</td>
<td>100 (3.94)</td>
</tr>
<tr>
<td>Rear mud guard</td>
<td>50 (1.97)</td>
</tr>
<tr>
<td>Battery cable</td>
<td>150 (5.91)</td>
</tr>
<tr>
<td>Rubber parts</td>
<td>150 (5.91)</td>
</tr>
<tr>
<td>Plastic parts</td>
<td>150 (5.91)</td>
</tr>
<tr>
<td>Oil pipe</td>
<td>100 (3.94)</td>
</tr>
<tr>
<td>Brake booster</td>
<td>100 (3.94)</td>
</tr>
<tr>
<td>Vacuum tank</td>
<td>80 (3.15)</td>
</tr>
</tbody>
</table>

Note*: When wire harness is covered by heatproof conduit or protection.
7 Construction of bodies

7.4 Clearance between chassis parts and bodies

<table>
<thead>
<tr>
<th>Part</th>
<th>Minimum Clearance and Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOx sensor</td>
<td><img src="image" alt="NOx sensor Diagram" /></td>
</tr>
<tr>
<td></td>
<td><strong>&lt;FE&gt;</strong></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="NOx sensor Diagram" /></td>
</tr>
<tr>
<td></td>
<td><strong>&lt;FG&gt;</strong></td>
</tr>
<tr>
<td>8. Cab tilt area</td>
<td>Cabs other than double cabs can be tilted. Make sure that installation items do not enter the tilt path of the cab. For details on space requirements, refer to Chapter 9 &quot;Layout Drawings: Cab Side View (Cab Tilt Area)&quot; (page 173).</td>
</tr>
<tr>
<td>9. Attaching the rear fender</td>
<td>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 9.9 &quot;Differential and tire bound height&quot; (page 202).</td>
</tr>
</tbody>
</table>

![Part Diagram](image)
7 Construction of bodies

7.5 Fuel tank

7.5.1 Cautions relating to fuel tank

Be cautious while installing the rear fuel tank piping. Do not let it interfere with the body.

Do not allow foreign materials to enter the fuel tank and related parts.

Install all fuel hoses so that there is no slack, or broken parts and make sure that the hose is free to accept fuel. If a hose is too long, shortening may be required.

The temporary rubber cap on the fuel tank filler frame pass through must be removed. Clip part number MH021308 must be reused.

When inserting fuel filler hose MK517156, make sure that the hose is completely against the seat (spool) of the filler pipe. Install in accordance with the illustration printed below. Make sure there is no interference with the breather hose.

Remove the two tie wraps that temporarily hold the breather hose in the shipping position.

Insert more than 20 mm (0.79 in.) of the breather hose MK456266 to the filler end pipe and retain it using clamp MH021302.

Position the breather hose using clamps MH020945 to points indicated in the illustration below. Secure breather hose to the filler pipe using tie wraps ME292602 in two places. Refer to Fig. 1, Fig. 2 and indicated in Section 9.13 Fuel tank mounting layout.

The fuel filler end must be attached to the rear body structure. The rear body structure must be strong enough to support the weight of all components. The filler pipe must not be allowed to project beyond the side of the body.

The fuel filler pipe MUST be located at least 171.5 mm (6.75 in.) above the height of the upper truck frame flange. This will allow satisfactory fill speed.

Attach the fuel cap tether. See Section 9.13 Fuel tank mounting layout.

The air vent valve inclination must be approximately 25 degrees to vertical.

Attach caution label MK587871 where it will be readily seen.

Inspect the system and ensure that all attaching hardware is secure. Make sure there are no leaks or restrictions.
7 Construction of bodies

7.5 Fuel tank

Fig. 1
Upper View  Fuel pump, Cover & Brkt

MH026134
MH020945
MF140262
MF434105

MH026123
MH020945
MF140262
MF434105

Pass breather hose at through hole with a grommet
Installation of breather hose at shipping
### 7.5 Fuel tank

#### Fig. 2

**Rear View**

- **MH021302**: Rear body
- **MH021308**: Filler hose (MK517158) about 340 (13.39)
- **20 (0.79)**: Breather hose (MK456266)
- **40 (1.57)**: Fill to filler hose by tie-wrap (ME292602)
- **45°**
- **17.5 (0.7)**: Filler end
- **LH**: Insert until it bumps against a spool

#### Table: Tightening torque and Remarks

<table>
<thead>
<tr>
<th>Part</th>
<th>Tightening torque</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screw of Clamp</td>
<td>3.9 ± 1.0 [2.9 ± 0.7, 0.4 ± 0.1]</td>
<td>-</td>
</tr>
<tr>
<td>Filler end</td>
<td>8 to 12 [5.9 to 8.8, 0.8 to 1.2]</td>
<td>With tether of filler cap</td>
</tr>
</tbody>
</table>

Unit: mm (in.)

Unit: N·m (ft.lbs, kgf·m)
7 Construction of bodies

7.5 Fuel tank

7.5.2 Instructions for relocating the tank

- Avoid unnecessary moving of the fuel tank. If it is necessary to do so, follow the cautions listed below and obtain the advice from NAFTA.
- Use MITSUBISHI FUSO authorized fuel hose when replacing.
- Keep the distance from the filler end and the end of air vent hose to:
  - Over 300 mm (11.8 in.) to exhaust exit
  - Over 200 mm (7.87 in.) 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 loosening or other defect with consideration of the effect of vibration, layout, and other factors. Any custom mounting brackets must be designed for sufficient strength.

- 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 parts if you remove them through the relocating process.
- Prevent direct contact of any metal parts (as clamp to fix the fuel pump to brkt) to the fuel pump housing to avoid electro chemical corrosion: use plastic or rubber isolation between the fuel pump and brkt.
- Attach a cover to the fuel pump, and the fuel pump must be installed in the position that does not catch mud and spray.

<table>
<thead>
<tr>
<th>Model</th>
<th>Name</th>
<th>Size</th>
<th>Strength Grade</th>
<th>Grade</th>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE</td>
<td>BOLT, FLANGE</td>
<td>M10</td>
<td>8T or more</td>
<td>50 to 65 (37 to 48, 5.1 to 6.6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NUT, FLANGE</td>
<td>M10</td>
<td>6T</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOLT</td>
<td>M14</td>
<td>8.8 or more</td>
<td>130 to 170 (95 to 125, 13.3 to 17.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NUT, FLANGE</td>
<td>M14</td>
<td>6T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FG</td>
<td>BOLT, FLANGE</td>
<td>M10</td>
<td>10T</td>
<td>90 to 110 (66 to 81, 9.2 to 11.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NUT, FLANGE</td>
<td>M10</td>
<td>6T</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7 Construction of bodies

7.5 Fuel tank

7.5.3 Moving the fuel tank
Install a FHWA-approved fuel tank within the wheelbase. Consult NAFTA before installing it in other locations.

7.5.4 Fuel tubes
- Use rubber or metal tubes specified below when changing the fuel lines.
  - (a) Fuel hose
    Fuel hoses of poor quality may cause a fire.
    Always use the standard MFTBC products described below.
  - (b) Metal tube

<table>
<thead>
<tr>
<th>Inside dia. mm [in.]</th>
<th>MFTBC Part No.</th>
<th>Length mm [in.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply tube</td>
<td>11.5 [0.45]</td>
<td>MH030***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>120 to 20000 (4.72 to 787.4)</td>
</tr>
<tr>
<td>Return tube</td>
<td>9.5 [0.37]</td>
<td>MH030***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80 to 6500 (3.15 to 225.9)</td>
</tr>
<tr>
<td></td>
<td>6.2 [0.24]</td>
<td>MS602***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40 to 10000 (1.57 to 393.7)</td>
</tr>
</tbody>
</table>

Note: Check with NAFTA for corresponding details regarding the part numbers and length.

<table>
<thead>
<tr>
<th>Outside dia. mm [in.]</th>
<th>Thickness mm [in.]</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply tube</td>
<td>8 [0.31]</td>
<td>SPCC (JIS) (ASTM A109 or A366) Single rolled steel pipe</td>
</tr>
<tr>
<td>Return tube</td>
<td>10 [0.39]</td>
<td>0.7 [0.028]</td>
</tr>
</tbody>
</table>
7 Construction of bodies

7.5 Fuel tank

(c) Fuel Nylon tube

<table>
<thead>
<tr>
<th>Outside dia. mm [in.]</th>
<th>MFTBC Part No.</th>
<th>Length mm [in.]</th>
<th>Application Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 (0.31)</td>
<td>MK629953</td>
<td>1,000 (39.4)</td>
<td>Fuel Tank - Fuel Filter</td>
</tr>
<tr>
<td>8 (0.31)</td>
<td>MK629955</td>
<td>1,500 (59.1)</td>
<td>Fuel Tank - Fuel Filter</td>
</tr>
<tr>
<td>8 (0.31)</td>
<td>MK629957</td>
<td>2,000 (78.7)</td>
<td>Fuel Tank - Fuel Filter</td>
</tr>
<tr>
<td>8 (0.31)</td>
<td>MK629959</td>
<td>3,000 (118.1)</td>
<td>Fuel Tank - Fuel Filter</td>
</tr>
<tr>
<td>8 (0.31)</td>
<td>MK629961</td>
<td>1,000 (39.4)</td>
<td>Fuel Filter - Supply Pipe</td>
</tr>
<tr>
<td>8 (0.31)</td>
<td>MK629963</td>
<td>1,500 (59.1)</td>
<td>Fuel Filter - Supply Pipe</td>
</tr>
<tr>
<td>8 (0.31)</td>
<td>MK629965</td>
<td>2,000 (78.7)</td>
<td>Fuel Filter - Supply Pipe</td>
</tr>
<tr>
<td>8 (0.31)</td>
<td>MK629967</td>
<td>3,000 (118.1)</td>
<td>Fuel Filter - Supply Pipe</td>
</tr>
<tr>
<td>10 (0.39)</td>
<td>MK629969</td>
<td>1,000 (39.4)</td>
<td>Return Pipe - Fuel Tank</td>
</tr>
<tr>
<td>10 (0.39)</td>
<td>MK629971</td>
<td>1,500 (59.1)</td>
<td>Return Pipe - Fuel Tank</td>
</tr>
<tr>
<td>10 (0.39)</td>
<td>MK629973</td>
<td>2,000 (78.7)</td>
<td>Return Pipe - Fuel Tank</td>
</tr>
<tr>
<td>10 (0.39)</td>
<td>MK629975</td>
<td>3,000 (118.1)</td>
<td>Return Pipe - Fuel Tank</td>
</tr>
</tbody>
</table>

- Never extend the fuel lines.
- Use metal tubing for the fuel line inside the engine compartment.
- Never modify the clips or move the location of clamps for components in the engine compartment which can be moved.
- Never install tubes together with electrical wires.
- Follow the procedures described in Section 9 “EXHAUST SYSTEM” when modifying exhaust system components. Install a Heat insulation panel if the specified clearances cannot be maintained.
- Be sure to position the fuel lines so that if a fuel leak should somehow occur, the fuel will not drip onto the muffler or exhaust pipe. Never connect the fuel lines above the exhaust system.
- Use the nylon hose and the metal tube for connection with the fuel tank of the supply piping and the return piping. The end shape of the metal tube must be conformed by SAE J2044 standard. Otherwise it may cause fuel leakage. Please be sure to use the specified nylon hose and metal tube.
- Never use the rubber hose to the supply line (From the fuel pump to the engine)

7.5.5 Others

- Observe the procedures described in Section 6 “ELECTRICAL WIRING” when modifying the wires connected with the fuel tank.
- Place the filler port of the fuel tank to allow easy fueling.  page 122.
7 Construction of bodies

7.6 BlueTec® system

7.6.1 Installing a side guard and other parts around the DEF tank

- Care is required when installing a side guard around the DEF tank. Do not let the side guard and its mounting bracket(s) hide the filler cap of the tank and interfere with refilling the tank with DEF. Be sure to open up sufficient space around the cap to allow a filler nozzle of DEF to be inserted; typical dimensions of filler guns are shown in the figures below.
- Allow a clearance of at least 25 mm [0.98 in.] between the side guard, mud guard, etc. installed around the DEF tank and the following parts of the DEF tank: front end, rear end, and outer side.
- Avoid directly attaching parts to any of the DEF tank brackets.
- Maintain sufficient free space to insert DEF filler nozzle. (shaded area)

<FE>

<FG>

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

<FE>

<FG>
7 Construction of bodies

7.6 BlueTec® system

DEF filler nozzle - Examples

Fig. 3
7 Construction of bodies

7.6 BlueTec® system

7.6.2 DEF tank and connection piping

The DEF tank with a DEF 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.

There are DEF hose connecting ports near the points marked (2 places in total). After any operation including mounting the body or equipment near these areas, visually check that the clamps of the coupling connector are fully closed regardless of whether you touch the piping or not.

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

![Diagram of DEF tank and connection piping]
7 Construction of bodies

7.6 BlueTec® system

7.6.3 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 the after-running 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 welding, confirm that the starter switch is in the “OFF” position.

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.
8 Calculations

8.1 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:

\[
\Delta G_{HA} = \frac{G_{component} \cdot a}{R} \quad (kg \ {lb})
\]

\[
\Delta G_{VA} = G_{component} - G_{HA} \quad (kg \ {lb})
\]

\[
\Delta G_{VA} = \frac{G_{component} \cdot a}{R} \quad (kg \ {lb})
\]

\[
\Delta G_{VA} = G_{component} - G_{HA} \quad (kg \ {lb})
\]
# Calculations

## 8.1 Axle load calculation

### Axle and Tire Load Carrying Capacity

<table>
<thead>
<tr>
<th>Vehicle Model</th>
<th>Max. Output</th>
<th>Tire Size</th>
<th>Axle Capacity (kg {lb})</th>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LT215/85R16</td>
<td>LT215/85R16</td>
<td>215/75R17.5</td>
<td></td>
</tr>
<tr>
<td>FEC52CL3SUHD</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>2430 (5360)</td>
<td>4480 (9880)</td>
</tr>
<tr>
<td>FEC52FL3SUHD</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>2600 (5730)</td>
<td>4300 (9480)</td>
</tr>
<tr>
<td>FGB72EL3SUHD</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>2900 (6390)</td>
<td>5760 (12700)</td>
</tr>
</tbody>
</table>

### Tire Capacity (kg {lb})*1

- **Front**
  - LT215/85R16 LOAD RANGE E 1215x2=2430
  - LT215/85R16 LOAD RANGE E 1380x2=2760
  - LT215/85R16 LOAD RANGE E 1600x2=3200

- **Rear**
  - LT215/85R16 LOAD RANGE E 1120x4=4480
  - LT215/85R16 LOAD RANGE E 1260x4=5040
  - LT215/85R16 LOAD RANGE E 1550x4=6200

*1: At Maximum information pressure (kPa [psi, kgf/cm²] cold:Fr/Re)

- LT215/85R16 LOAD RANGE E 550 [80, 5.6]/550 [80, 5.6]
- LT215/85R16 LOAD RANGE E 550 [80, 5.6]/550 [80, 5.6]
- 215/75R17.5 LOAD RANGE F 690 [100, 7.0]/690 [100, 7.0]
## 9.1 Vehicle performance list

<table>
<thead>
<tr>
<th>Engine</th>
<th>Output kW (HP)/rpm</th>
<th>Torque Nm (lbs.ft)/rpm</th>
<th>Clutch</th>
<th>Model</th>
<th>GVW (kg/lbs)</th>
<th>Tire Radius (mm)</th>
<th>Final gear ratio (S:Std, P:Opt)</th>
<th>T/M</th>
<th>Position</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>4P 8T35</td>
<td>120 (161)/3400</td>
<td>400 (295)/1300</td>
<td>Wet Dual Clutch</td>
<td>M038S6</td>
<td>5.397/3.788</td>
<td>215/85R16</td>
<td>4.875</td>
<td>S</td>
<td>P</td>
<td>1</td>
</tr>
<tr>
<td>5.285</td>
<td>6.166</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.285</td>
<td>6.166</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>4.073</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.073</td>
<td>5.285</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>3.872</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.872</td>
<td>4.073</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>3.671</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.671</td>
<td>3.872</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>3.470</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.470</td>
<td>3.671</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>3.270</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.270</td>
<td>3.470</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>3.070</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.070</td>
<td>3.270</td>
<td>S</td>
<td>P</td>
</tr>
</tbody>
</table>

**Note:** Only print out complete sections from the current version.
9.2 Performance curve

9.2.1 Vehicle performance curve

FECS2 4P10-TS

ENGINE MODEL 4P10-TS

MAX. OUTPUT 120 kW (161 HP) / 3400 rpm

MAX. TORQUE 400 Nm (295 lb ft) / 1500 rpm

GROSS WEIGHT 5670 kg (12500 lb)

ROLL RESIST, Ch. 0.010
AIR RESIST, Ch. 0.200
FRONTAL AREA 3.80 m² (5590 in²)

TIRE SIZE 215/85R16

TIRE RADIUS 0.376 m (1.2 ft)

TRANSMISSION EFFICIENCY

1st 1.297 0.91
2nd 1.189 0.91
3rd 1.110 0.91
4th 1.074 0.91
5th 1.000 0.91
6th 0.973 0.91

FINAL G/ROLLO 4.875
9 Technical data

9.2 Performance curve

<table>
<thead>
<tr>
<th>FECS2</th>
<th>4P10-T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGINE MODEL</td>
<td>4P10-T5</td>
</tr>
<tr>
<td>MAX. OUTPUT</td>
<td>120 kW (161 HP) / 3400 rpm</td>
</tr>
<tr>
<td>MAX. TORQUE</td>
<td>400 Nm (295 ft-lb) / 1300 rpm</td>
</tr>
<tr>
<td>GROSS WEIGHT</td>
<td>5670 kg (12,500 lb)</td>
</tr>
<tr>
<td>ROLL RESISTANCE (G)</td>
<td>0.010</td>
</tr>
<tr>
<td>AIR RESISTANCE (C)</td>
<td>0.0035</td>
</tr>
<tr>
<td>FRONTAL AREA</td>
<td>3.80 m² (5990 in²)</td>
</tr>
<tr>
<td>TIRE SIZE</td>
<td>215/85R16</td>
</tr>
<tr>
<td>TIRE RADIUS</td>
<td>0.376 m (1.2 ft)</td>
</tr>
</tbody>
</table>

T/M & RATIO EFFICIENCY

1st | s = 0.97 | 0.91 |
2nd | s = 0.98 | 0.9 |
3rd | s = 0.90 | 0.9 |
4th | s = 0.9 | 0.9 |
5th | s = 0.84 | 0.93 |
6th | s = 0.70 | 0.91 |
Rev. | s = 0.97 | 0.90 |

FINAL G/RATIO | s = 2.85 |

- TAN | 30 |
- 25 |
- 20 |
- 15 |
- 10 |
- 5 |
- 0 |

- 25 | 7 |
- 20 | 6 |
- 15 | 5 |
- 10 | 4 |
- 5 | 3 |
- 0 | 2 |
- 0 | 1 |

TRACTION & ROAD LOAD (kg)

ENGINE REVOLUTION (rpm)

SPEED (km/h)

SPEED (mph)
9.2 Performance curve

**FEC72 4P10-T5**

<table>
<thead>
<tr>
<th>ENGINE MODEL</th>
<th>4P10-T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX. OUTPUT</td>
<td>120 kW (161 HP) / 3400 rpm</td>
</tr>
<tr>
<td>MAX. TORQUE</td>
<td>490 Nm (369 ft.lbf) / 1000 rpm</td>
</tr>
<tr>
<td>GROSS WEIGHT</td>
<td>7200 kg (15890 lb)</td>
</tr>
<tr>
<td>ROLL RESIST.</td>
<td>0.010</td>
</tr>
<tr>
<td>AIR RESIST.</td>
<td>0.0055</td>
</tr>
<tr>
<td>FRONTAL AREA</td>
<td>3.80 m² (50.90 ft²)</td>
</tr>
<tr>
<td>TIRE SIZE</td>
<td>215/75R17.5</td>
</tr>
<tr>
<td>TIRE RADIUS</td>
<td>0.373 m (12 in)</td>
</tr>
<tr>
<td>T/M (TG) RATIO</td>
<td>EFFICIENCY</td>
</tr>
<tr>
<td>1st</td>
<td>5.997</td>
</tr>
<tr>
<td>2nd</td>
<td>3.788</td>
</tr>
<tr>
<td>3rd</td>
<td>2.710</td>
</tr>
<tr>
<td>4th</td>
<td>1.774</td>
</tr>
<tr>
<td>5th</td>
<td>1.000</td>
</tr>
<tr>
<td>6th</td>
<td>0.700</td>
</tr>
<tr>
<td>R/A</td>
<td>3.699</td>
</tr>
<tr>
<td>FINAL G/R ATID</td>
<td>5.285</td>
</tr>
</tbody>
</table>

**ENGINE REVOLUTION (rpm)**

**SPEED (km/h)**

**TRACTION & LOAD (kg)**
9.2 Performance curve

**FEC72  4P10-T5**

<table>
<thead>
<tr>
<th>ENGINE MODEL</th>
<th>4P10-T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX. OUTPUT</td>
<td>120 kW (161 HP) / 3400 rpm</td>
</tr>
<tr>
<td>MAX. TORQUE</td>
<td>400 lbf-ft (343 Nm) / 2000 rpm</td>
</tr>
<tr>
<td>GROSS WEIGHT</td>
<td>7255 kg (15990 lb)</td>
</tr>
<tr>
<td>ROLL &amp; MP/ST.COH.</td>
<td>0.010</td>
</tr>
<tr>
<td>AIR RESIST. COEFF.</td>
<td>0.0035</td>
</tr>
<tr>
<td>FRONTAL AREA</td>
<td>3.80 m² (52.69 ft²)</td>
</tr>
<tr>
<td>TIRE SIZE</td>
<td>215/75R17.5</td>
</tr>
<tr>
<td>TIRE RADIUS</td>
<td>0.373 m (1.2 ft)</td>
</tr>
<tr>
<td>T/M Eff. (R/AID)</td>
<td>EFFICIENCY</td>
</tr>
<tr>
<td>1st</td>
<td>0.91</td>
</tr>
<tr>
<td>2nd</td>
<td>0.88</td>
</tr>
<tr>
<td>3rd</td>
<td>0.91</td>
</tr>
<tr>
<td>4th</td>
<td>0.91</td>
</tr>
<tr>
<td>5th</td>
<td>0.93</td>
</tr>
<tr>
<td>6th</td>
<td>0.70</td>
</tr>
<tr>
<td>REV</td>
<td>1.39</td>
</tr>
<tr>
<td>FINAL Eff. (R/AID)</td>
<td>0.90</td>
</tr>
</tbody>
</table>

![Performance Curve Diagram](image)
9.2 Performance curve
9 Technical data

9.2 Performance curve
9 Technical data

9.2 Performance curve

9.2.2 Engine performance curve

![Engine performance curve diagram]

Output

![Torque diagram]

Torque

Engine speed (rpm) vs. Output kW

Engine speed (rpm) vs. Torque Nm
### 9.3 Weight distribution table

**Model: FEC52CL3SUHD 120 (161) [kW(HP)]**

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight [Kg (lb)]</th>
<th>Distance *1 to center of gravity [m (ft)]</th>
<th>Front axle load [Kg (lb)]</th>
<th>Rear axle load [Kg (lb)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3)</td>
<td>15.0 (33)</td>
<td>-4 (-9)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2)</td>
<td>51.5 (115)</td>
<td>-10.5 (-21)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3)</td>
<td>29.9 (66)</td>
<td>-7.9 (-19)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>19.8 (44)</td>
<td>4.6 (10)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.8 (11)</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.4 (19)</td>
<td>0.6 (1.3)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>393.0 (865)</td>
<td>-38.0 (-81)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>31.2 (69)</td>
<td>-3.2 (-7)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>368.3 (810)</td>
<td>61.6 (135)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>47.5 (105)</td>
<td>-3.5 (-8)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>42.3 (93)</td>
<td>19.7 (43)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>3.230 (11)</td>
<td>-20.9 (-47)</td>
<td>157.0 (345)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>34.0 (75)</td>
<td>34.9 (77)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>12 (26)</td>
<td>1.896 (6.2)</td>
<td>3.9 (8.6)</td>
<td>8.1 (18)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>1.450 (4.8)</td>
<td>4.8 (11)</td>
<td>5.2 (11)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>262 (575)</td>
<td>1.470 (4.8)</td>
<td>124.5 (275)</td>
<td>137.6 (305)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.6)</td>
<td>0.401 (1.3)</td>
<td>2.3 (5.1)</td>
<td>0.4 (0.9)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-3)</td>
<td>34.5 (76)</td>
<td>-7.5 (-17)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-3)</td>
<td>49.8 (110)</td>
<td>-11.1 (-23)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-3)</td>
<td>5.3 (12)</td>
<td>-1.3 (-3)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>5.2 (11)</td>
<td>12.5 (28)</td>
</tr>
</tbody>
</table>

| Sprung weight                                    | 1611 (3550)      | 1255.6 (2770)                             | 355.3 (785)               | 355 (780)                |
| Unsprung weight                                  | 755 (1660)       | 277 (610)                                 | 478 (1050)                |                          |
| Chassis Cab weight *2                            | 2366 (5220)      | 1533 (3380)                               | 833 (1840)                |                          |
|                                                 | 2365 (5210)      | 1535 (3380)                               | 830 (1830)                |                          |

*1: From front axle center
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
### 9 Technical data

#### 9.3 Weight distribution table

**Model:** FEC52EL3SUHD 120 (161) [kW(HP)]

**Wheelbase [m (ft)]:** 3.400 (11)

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight [Kg (lb)]</th>
<th>Distance *1 to center of gravity [m (ft)]</th>
<th>Front axle load [Kg (lb)]</th>
<th>Rear axle load [Kg (lb)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3)</td>
<td>14.3 (32)</td>
<td>-3.3 (-7)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2)</td>
<td>49.7 (110)</td>
<td>-8.7 (-18)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3)</td>
<td>28.5 (63)</td>
<td>-6.5 (-13)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>20.6 (45)</td>
<td>3.8 (8.4)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.5 (19)</td>
<td>0.5 (1.1)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>386.3 (850)</td>
<td>-31.3 (-68)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>30.6 (67)</td>
<td>-2.6 (-6)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>379.2 (835)</td>
<td>50.7 (110)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>46.9 (105)</td>
<td>-2.9 (-6)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>45.8 (100)</td>
<td>16.2 (36)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>3.830 (13)</td>
<td>-17.2 (-39)</td>
<td>153.3 (335)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>40.1 (88)</td>
<td>28.8 (63)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>22 (49)</td>
<td>2.204 (7.2)</td>
<td>7.7 (17)</td>
<td>14.3 (32)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>1.700 (5.6)</td>
<td>5.0 (11)</td>
<td>5.0 (11)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>289 (635)</td>
<td>1.756 (5.8)</td>
<td>139.9 (310)</td>
<td>149.5 (330)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.4)</td>
<td>0.401 (1.3)</td>
<td>2.4 (5.3)</td>
<td>0.3 (0.7)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-3)</td>
<td>33.2 (73)</td>
<td>-6.2 (-11)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-3)</td>
<td>47.8 (105)</td>
<td>-9.1 (-20)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-3)</td>
<td>5.1 (11)</td>
<td>-1.1 (-2)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>7.4 (16)</td>
<td>10.3 (23)</td>
</tr>
</tbody>
</table>

| Sprung weight                     | 1648 (3630)      | 1287.2 (2840)                            | 361.0 (795)               | 361 (795)                |
| Unsprung weight                   | 755 (1660)       | 277 (610)                                | 478 (1050)                |                          |
| Chassis Cab weight *2             | 2403 (5300)      | 1564 (3450)                              | 839 (1850)                | 840 (1850)               |
|                                   | 2405 (5300)      |                                        |                          |                          |

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
### 9.3 Weight distribution table

**Model: FEC52GL3SUHD 120 (161) [kW(HP)]**

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg (lb))</th>
<th>Distance *1 to center of gravity (m (ft))</th>
<th>Front axle load (Kg (lb))</th>
<th>Rear axle load (Kg (lb))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3)</td>
<td>13.9 (31)</td>
<td>-2.9 (-6)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2)</td>
<td>48.7 (105)</td>
<td>-7.7 (-17)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3)</td>
<td>27.7 (61)</td>
<td>-5.7 (-14)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>21.1 (47)</td>
<td>3.3 (7.3)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.5 (19)</td>
<td>0.5 (1.1)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>382.7 (845)</td>
<td>-27.7 (-62)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>30.3 (67)</td>
<td>-2.3 (-5)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>385.2 (850)</td>
<td>44.8 (99)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>46.6 (100)</td>
<td>-2.6 (-6)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>47.7 (105)</td>
<td>14.3 (32)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>4.280 (14)</td>
<td>-15.2 (-31)</td>
<td>151.3 (335)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>43.5 (96)</td>
<td>25.4 (56)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>23 (51)</td>
<td>2.430 (8.0)</td>
<td>8.5 (19)</td>
<td>14.5 (32)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>1.950 (6.4)</td>
<td>4.9 (11)</td>
<td>5.1 (11)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>303 (665)</td>
<td>1.990 (6.5)</td>
<td>146.2 (320)</td>
<td>156.4 (345)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.4)</td>
<td>0.401 (1.3)</td>
<td>2.4 (5.3)</td>
<td>0.3 (0.7)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-3)</td>
<td>32.5 (72)</td>
<td>-5.5 (-14)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-3)</td>
<td>46.8 (105)</td>
<td>-8.0 (-19)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-3)</td>
<td>4.9 (11)</td>
<td>-0.9 (-2)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>8.6 (19)</td>
<td>9.1 (20)</td>
</tr>
</tbody>
</table>

| Sprung weight                   | 1663 (3670)      | 1300.9 (2870)                            | 361.7 (795)               |
|                                |                 | 1301 (2870)                              | 362 (800)                 |
| Unsprung weight                | 755 (1660)      | 277 (610)                                | 478 (1050)                |
| Chassis Cab weight             | 2418 (5330)     | 1578 (3480)                              | 840 (1850)                |
|                                | 2420 (5340)     | 1580 (3480)                              | 840 (1850)                |

*1: From front axle center
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
### 9.3 Weight distribution table

Model: FEC72CL3SUHD 120 (161) [kW(HP)]

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight [Kg (lb)]</th>
<th>Distance *1 to center of gravity [m (ft)]</th>
<th>Front axle load [Kg (lb)]</th>
<th>Rear axle load [Kg (lb)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3)</td>
<td>15.0 (33)</td>
<td>-4.0 (-9)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2)</td>
<td>51.5 (115)</td>
<td>-10.5 (-21)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3)</td>
<td>29.9 (66)</td>
<td>-7.9 (-19)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>19.9 (44)</td>
<td>4.6 (10)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.8 (11)</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.4 (19)</td>
<td>0.6 (1.3)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>393.1 (865)</td>
<td>-38.0 (-81)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>31.2 (69)</td>
<td>-3.2 (-7)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>368.4 (810)</td>
<td>61.6 (135)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>47.5 (105)</td>
<td>-3.5 (-8)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>42.3 (93)</td>
<td>19.7 (43)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>3.230 (11)</td>
<td>-20.9 (-47)</td>
<td>157.0 (345)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>34.0 (75)</td>
<td>35.0 (77)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>12 (26)</td>
<td>1.896 (6.2)</td>
<td>3.9 (8.6)</td>
<td>8.1 (18)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>1.450 (4.8)</td>
<td>4.8 (11)</td>
<td>5.2 (11)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>271 (595)</td>
<td>1.470 (4.8)</td>
<td>128.6 (285)</td>
<td>142.2 (315)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.4)</td>
<td>0.401 (1.3)</td>
<td>2.3 (5.1)</td>
<td>0.4 (0.9)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-3)</td>
<td>34.6 (76)</td>
<td>-7.5 (-17)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-3)</td>
<td>49.8 (110)</td>
<td>-11.1 (-23)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-3)</td>
<td>5.3 (12)</td>
<td>-1.3 (-3)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>5.2 (11)</td>
<td>12.5 (28)</td>
</tr>
</tbody>
</table>

| Sprung weight                           | 1620 (3570)      | 1260.1 (2780)                             | 360.0 (795)               | 360 (795)                |
| Unsprung weight                         | 872 (1920)       | 310 (685)                                 | 562 (1240)                |                          |
| Chassis Cab weight *2                   | 2492 (5490)      | 1570 (3460)                               | 922 (2030)                | 920 (2030)               |
| Chassis Cab weight *2                   | 2490 (5490)      | 1570 (3460)                               | 922 (2030)                | 920 (2030)               |

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
## 9.3 Weight distribution table

**Model: FEC72EL3SUHD 120 (161) [kW(HP)]**

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg [lb])</th>
<th>Distance *1 to center of gravity (m [ft])</th>
<th>Front axle load (Kg [lb])</th>
<th>Rear axle load (Kg [lb])</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3)</td>
<td>14.3 (32)</td>
<td>-3.3 (-7)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2)</td>
<td>49.7 (110)</td>
<td>-8.7 (-18)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3)</td>
<td>28.5 (63)</td>
<td>-6.5 (-13)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>20.6 (45)</td>
<td>3.8 (8.4)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.5 (19)</td>
<td>0.5 (1.1)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>386.3 (850)</td>
<td>-31.3 (-68)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>30.6 (67)</td>
<td>-2.6 (-6)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>379.2 (835)</td>
<td>50.7 (110)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>46.9 (105)</td>
<td>-2.9 (-6)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>45.8 (100)</td>
<td>16.2 (36)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>3.330 (13)</td>
<td>-17.2 (-39)</td>
<td>153.3 (335)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>40.1 (88)</td>
<td>28.8 (63)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>22 (49)</td>
<td>2.204 (7.2)</td>
<td>7.7 (17)</td>
<td>14.3 (32)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>1.700 (5.6)</td>
<td>5.0 (11)</td>
<td>5.0 (11)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>298 (655)</td>
<td>1.756 (5.8)</td>
<td>144.1 (315)</td>
<td>154.0 (340)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.6)</td>
<td>0.401 (1.3)</td>
<td>2.4 (5.3)</td>
<td>0.3 (0.7)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-3)</td>
<td>33.2 (73)</td>
<td>-6.2 (-11)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-3)</td>
<td>47.8 (105)</td>
<td>-9.1 (-20)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-3)</td>
<td>5.1 (11)</td>
<td>-1.1 (-2)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>7.4 (16)</td>
<td>10.3 (23)</td>
</tr>
</tbody>
</table>

Sprung weight: 1657 (3650)  
Unsprung weight: 872 (1920)  
Chassis Cab weight: 2529 (5580)  

*1: From front axle center  
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
### 9.3 Weight distribution table

**Model:** FEC72GL3SUHD 120 (161) [kW(HP)]

**Wheelbase** [m (ft)]: 3.850 (13)

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg (lb))</th>
<th>Distance *1 to center of gravity (m (ft))</th>
<th>Front axle load (Kg (lb))</th>
<th>Rear axle load (Kg (lb))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3)</td>
<td>13.9 (31)</td>
<td>-2.9 (-6)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2)</td>
<td>48.7 (105)</td>
<td>-7.7 (-17)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3)</td>
<td>27.7 (61)</td>
<td>-5.7 (-14)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>21.1 (47)</td>
<td>3.3 (7.3)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.5 (19)</td>
<td>0.5 (1.1)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>382.7 (845)</td>
<td>-27.7 (-62)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>30.3 (67)</td>
<td>-2.3 (-5)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>385.1 (850)</td>
<td>44.8 (99)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>46.5 (100)</td>
<td>-2.5 (-6)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>47.7 (105)</td>
<td>14.3 (32)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>4.280 (14)</td>
<td>-15.2 (-31)</td>
<td>151.3 (335)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>43.5 (96)</td>
<td>25.4 (56)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>23 (51)</td>
<td>2.430 (8.0)</td>
<td>8.5 (19)</td>
<td>14.5 (32)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>1.950 (6.4)</td>
<td>4.9 (11)</td>
<td>5.1 (11)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>311 (685)</td>
<td>1.990 (6.5)</td>
<td>150.4 (330)</td>
<td>160.9 (355)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.4)</td>
<td>0.401 (1.3)</td>
<td>2.4 (5.3)</td>
<td>0.3 (0.7)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-3)</td>
<td>32.5 (72)</td>
<td>-5.5 (-14)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-3)</td>
<td>46.7 (100)</td>
<td>-8.0 (-19)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-3)</td>
<td>4.9 (11)</td>
<td>-0.9 (-2)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>8.6 (19)</td>
<td>9.1 (20)</td>
</tr>
</tbody>
</table>

| Sprung weight                              | 1671 (3680)      | 1304.8 (2880)                             | 366.3 (805)               | 366 (805)                |
| Unsprung weight                            | 872 (1920)       | 310 (685)                                 | 562 (1240)                |                          |
| Chassis Cab weight                         | 2543 (5610)      | 1615 (3560)                               | 928 (2050)                | 930 (2050)               |

*1: From front axle center
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
# Technical data

## 9.3 Weight distribution table

**Model: FEC72HL3SUHD 120 (161) [kW(HP)]**

**Wheelbase (m [ft]): 4.300 (14)**

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg [lb])</th>
<th>Distance *1 to center of gravity (m [ft])</th>
<th>Front axle load (Kg [lb])</th>
<th>Rear axle load (Kg [lb])</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3)</td>
<td>13.6 (30)</td>
<td>-2.6 (-6)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2)</td>
<td>47.9 (105)</td>
<td>-6.9 (-15)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3)</td>
<td>27.1 (60)</td>
<td>-5.1 (-12)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>21.4 (47)</td>
<td>3.0 (6.6)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.6 (19)</td>
<td>0.4 (0.9)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>379.8 (835)</td>
<td>-24.8 (-53)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>30.1 (66)</td>
<td>-2.1 (-5)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>389.8 (860)</td>
<td>40.1 (88)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>46.3 (100)</td>
<td>-2.3 (-5)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>49.2 (110)</td>
<td>12.8 (28)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>4.730 (16)</td>
<td>-13.6 (-28)</td>
<td>149.7 (330)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>46.1 (100)</td>
<td>22.8 (50)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>30 (66)</td>
<td>2.653 (8.7)</td>
<td>11.5 (25)</td>
<td>18.5 (41)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>2.020 (6.6)</td>
<td>5.3 (12)</td>
<td>4.7 (10)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>334 (735)</td>
<td>2.205 (7.2)</td>
<td>162.7 (360)</td>
<td>171.3 (375)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.6)</td>
<td>0.401 (1.3)</td>
<td>2.4 (5.3)</td>
<td>0.3 (0.7)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-3)</td>
<td>31.9 (70)</td>
<td>-4.9 (-10)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-3)</td>
<td>45.9 (100)</td>
<td>-7.2 (-15)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-3)</td>
<td>4.8 (11)</td>
<td>-0.8 (-2)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>9.6 (21)</td>
<td>8.1 (18)</td>
</tr>
</tbody>
</table>

* Sprung weight: 1701 (3750)  
  Unsprung weight: 872 (1920)*2

*1: From front axle center  
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
## 9.3 Weight distribution table

**Model:** FEC72KL3SUHD 120 (161) [kW(HP)]

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight [(Kg (lb))]</th>
<th>Distance *1 to center of gravity (m [ft])</th>
<th>Front axle load [(Kg (lb))]</th>
<th>Rear axle load [(Kg (lb))]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3)</td>
<td>13.3 (29)</td>
<td>-2.3 (-5)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2)</td>
<td>47.2 (105)</td>
<td>-6.2 (-11)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3)</td>
<td>26.6 (59)</td>
<td>-4.6 (-10)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>21.7 (48)</td>
<td>2.7 (6.0)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.6 (19)</td>
<td>0.4 (0.9)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>377.5 (830)</td>
<td>-22.4 (-48)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>29.9 (66)</td>
<td>-1.9 (-4)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>393.6 (865)</td>
<td>36.3 (80)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>46.1 (100)</td>
<td>-2.1 (-5)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>50.4 (110)</td>
<td>11.6 (26)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>5.180 (17)</td>
<td>-12.3 (-29)</td>
<td>148.4 (325)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>48.3 (105)</td>
<td>20.6 (45)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>35 (77)</td>
<td>2.877 (9.4)</td>
<td>13.8 (30)</td>
<td>21.2 (47)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>2.000 (6.6)</td>
<td>5.8 (13)</td>
<td>4.2 (9.3)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>347 (765)</td>
<td>2.435 (8.0)</td>
<td>169.3 (375)</td>
<td>178.1 (390)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.4)</td>
<td>0.401 (1.3)</td>
<td>2.5 (5.5)</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-3)</td>
<td>31.5 (69)</td>
<td>-4.4 (-10)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-3)</td>
<td>45.3 (100)</td>
<td>-6.5 (-13)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-3)</td>
<td>4.8 (11)</td>
<td>-0.8 (-2)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>10.3 (23)</td>
<td>7.4 (16)</td>
</tr>
</tbody>
</table>

| Sprung weight                     | 1720 (3790)        | 1339.6 (2950)                             | 379.9 (835)                 | 380 (835)                 |
| Unsprung weight                   | 872 (1920)         | 310 (685)                                 | 562 (1240)                  |                           |
| Chassis Cab weight                | 2592 (5710)        | 1650 (3640)                               | 942 (2080)                  |                           |
|                                  | 2590 (5710)        | 1650 (3640)                               | 940 (2070)                  |                           |

*1: From front axle center
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.

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MITSUBISHI FUSO body/equipment mounting directives for FE, FG Issue date: 06. 07. 2012

Only print out complete sections from the current version
### 9.3 Weight distribution table

**Model:** FEC72HL3WUHD 120 (161) (kW(HP))

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg (lb))</th>
<th>Distance *1 to center of gravity (m (ft))</th>
<th>Front axle load (Kg (lb))</th>
<th>Rear axle load (Kg (lb))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3)</td>
<td>13.6 (30)</td>
<td>-2.6 (-6)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2)</td>
<td>47.9 (105)</td>
<td>-6.9 (-15)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3)</td>
<td>27.1 (60)</td>
<td>-5.1 (-12)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>27 (60)</td>
<td>0.524 (1.7)</td>
<td>24.1 (53)</td>
<td>3.3 (7.3)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.6 (19)</td>
<td>0.4 (0.9)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>565 (1250)</td>
<td>0.240 (0.8)</td>
<td>533.5 (1180)</td>
<td>31.5 (69)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>30.1 (66)</td>
<td>-2.1 (-5)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>389.8 (860)</td>
<td>40.1 (88)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>42 (93)</td>
<td>0.230 (0.8)</td>
<td>39.8 (88)</td>
<td>2.2 (4.9)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>49.2 (110)</td>
<td>12.8 (28)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>4.730 (16)</td>
<td>-13.6 (-28)</td>
<td>149.7 (330)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>68 (150)</td>
<td>1.420 (4.7)</td>
<td>45.3 (100)</td>
<td>22.3 (49)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>30 (66)</td>
<td>2.653 (8.7)</td>
<td>11.5 (25)</td>
<td>18.5 (41)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>2.020 (6.6)</td>
<td>5.3 (12)</td>
<td>4.7 (10)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>334 (735)</td>
<td>2.205 (7.2)</td>
<td>162.7 (360)</td>
<td>171.3 (375)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.4)</td>
<td>0.401 (1.3)</td>
<td>2.5 (5.5)</td>
<td>0.3 (0.7)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>36 (79)</td>
<td>-0.300 (-1)</td>
<td>38.5 (85)</td>
<td>-2.5 (-6)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-3)</td>
<td>45.9 (100)</td>
<td>-7.2 (-15)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-3)</td>
<td>4.8 (11)</td>
<td>-0.8 (-2)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>2.225 (7.3)</td>
<td>8.5 (19)</td>
<td>9.2 (20)</td>
</tr>
</tbody>
</table>

| Sprung weight                    | 1920 (4230)      | 1480.5 (3260)                             | 439.1 (970)               | 439 (965)                |
| Unsprung weight                  | 872 (1920)       | 310 (685)                                 | 562 (1240)                |                         |
| Chassis Cab weight               | 2792 (6160)      | 1791 (3950)                               | 1001 (2210)               | 1000 (2200)              |

*1: From front axle center

*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
### 9.3 Weight distribution table

**Model: FEC72KL3WUHD 120 (161) [kW(HP)]**

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg lb)</th>
<th>Distance *1 to center of gravity (m ft)</th>
<th>Front axle load (Kg lb)</th>
<th>Rear axle load (Kg lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3.3)</td>
<td>13.3 (29)</td>
<td>-2.3 (-5.1)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2.4)</td>
<td>47.2 (105)</td>
<td>-6.2 (-14)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3.3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3.3)</td>
<td>26.6 (59)</td>
<td>-4.6 (-10)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>27 (60)</td>
<td>0.524 (1.7)</td>
<td>24.4 (54)</td>
<td>3.0 (6.6)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.6 (19)</td>
<td>0.4 (0.9)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>565 (1250)</td>
<td>0.240 (0.8)</td>
<td>536.5 (1180)</td>
<td>28.5 (63)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (61.7288)</td>
<td>-0.320 (-1)</td>
<td>29.9 (66)</td>
<td>-1.9 (-4.2)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>393.6 (865)</td>
<td>36.3 (80)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>42 (93)</td>
<td>0.230 (0.8)</td>
<td>40.0 (88)</td>
<td>2.0 (4.4)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>50.4 (110)</td>
<td>11.6 (26)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>5.180 (17)</td>
<td>-12.3 (-27)</td>
<td>148.4 (325)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>68 (150)</td>
<td>1.420 (4.7)</td>
<td>47.4 (105)</td>
<td>20.2 (45)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>35 (77)</td>
<td>2.877 (9.4)</td>
<td>13.8 (30)</td>
<td>21.2 (47)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>2.000 (6.6)</td>
<td>5.8 (13)</td>
<td>4.2 (9.3)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>347 (765)</td>
<td>2.435 (8.0)</td>
<td>169.3 (375)</td>
<td>178.0 (390)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.4)</td>
<td>0.401 (1.3)</td>
<td>2.5 (5.5)</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>36 (79)</td>
<td>-0.300 (-1)</td>
<td>38.3 (84)</td>
<td>-2.3 (-5.1)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-2.6)</td>
<td>45.2 (100)</td>
<td>-6.5 (-14)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-2.9)</td>
<td>4.8 (11)</td>
<td>-0.8 (-1.8)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>2.225 (7.3)</td>
<td>9.4 (21)</td>
<td>8.3 (18)</td>
</tr>
</tbody>
</table>

| Sprung weight                     | 1938 (4270)    | 1500.1 (3310)                          | 437.7 (965)             |
| Unsprung weight                   | 872 (1920)     | 310 (685)                              | 562 (1240)              |

| Chassis Cab weight *2             | 2810 (6190)    | 1810 (3990)                            | 1000 (2200)             |

*1: From front axle center  
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
## 9 Technical data

### 9.3 Weight distribution table

*Model: FEC92CL3SUHD 120 (161) (kW(HP))*

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg (lb))</th>
<th>Distance *1 to center of gravity (m (ft))</th>
<th>Front axle load (Kg (lb))</th>
<th>Rear axle load (Kg (lb))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3.3)</td>
<td>15.0 (33)</td>
<td>-4.0 (-8.8)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2.4)</td>
<td>51.5 (115)</td>
<td>-10.5 (-23)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3.3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3.3)</td>
<td>29.9 (66)</td>
<td>-7.9 (-17)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>19.9 (44)</td>
<td>4.6 (10)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.8 (11)</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.4 (19)</td>
<td>0.6 (1.3)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-9.8)</td>
<td>393.1 (865)</td>
<td>-38.0 (-84)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>31.2 (69)</td>
<td>-3.2 (-7.1)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>368.4 (810)</td>
<td>61.6 (135)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>47.5 (105)</td>
<td>-3.5 (-7.7)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>42.3 (93)</td>
<td>19.7 (43)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>3.230 (11)</td>
<td>-20.9 (-46)</td>
<td>157.0 (345)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>34 (75)</td>
<td>35.0 (77)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>12 (26)</td>
<td>1.896 (6.2)</td>
<td>3.9 (8.6)</td>
<td>8.1 (18)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>1.450 (4.8)</td>
<td>4.8 (11)</td>
<td>5.2 (11)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>271 (595)</td>
<td>1.470 (4.8)</td>
<td>128.6 (285)</td>
<td>142.2 (315)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.6)</td>
<td>0.401 (1.3)</td>
<td>2.3 (5.1)</td>
<td>0.4 (0.9)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-2.6)</td>
<td>34.6 (76)</td>
<td>-7.5 (-17)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-2.6)</td>
<td>49.8 (110)</td>
<td>-11.1 (-24)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-2.9)</td>
<td>5.3 (12)</td>
<td>-1.3 (-2.9)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>5.2 (11)</td>
<td>12.5 (28)</td>
</tr>
</tbody>
</table>

| Sprung weight                             | 1620 (3570)      | 1260.1 (2780)                            | 360.0 (795)               | 360 (795)                |
| Unsprung weight                           | 872 (1920)       | 310 (685)                                | 562 (1240)                |                          |
| Chassis Cab weight *2                     | 2492 (5490)      | 1570 (3460)                              | 922 (2030)                | 920 (2030)               |

*1: From front axle center
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
### 9 Technical data

#### 9.3 Weight distribution table

**Model:** FEC92EL3SUHD 120 (161) [kW(HP)]

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg (lb))</th>
<th>Distance *1 to center of gravity (m (ft))</th>
<th>Front axle load (Kg (lb))</th>
<th>Rear axle load (Kg (lb))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3.3)</td>
<td>14.3 (32)</td>
<td>-3.3 (-7.3)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2.4)</td>
<td>49.7 (110)</td>
<td>-8.7 (-19)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3.3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3.3)</td>
<td>28.5 (63)</td>
<td>-6.5 (-14)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>20.6 (45)</td>
<td>3.8 (8.4)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.5 (19)</td>
<td>0.5 (1.1)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>386.3 (850)</td>
<td>-31.3 (-69)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>30.6 (67)</td>
<td>-2.6 (-5.7)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>379.2 (835)</td>
<td>50.7 (110)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>46.9 (105)</td>
<td>-2.9 (-6.4)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>45.8 (100)</td>
<td>16.2 (36)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>3.830 (13)</td>
<td>-17.2 (-38)</td>
<td>153.3 (335)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>40.1 (88)</td>
<td>28.8 (63)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>22 (49)</td>
<td>2.204 (7.2)</td>
<td>7.7 (17)</td>
<td>14.3 (32)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>1.700 (5.6)</td>
<td>5.0 (11)</td>
<td>5.0 (11)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>298 (655)</td>
<td>1.756 (5.8)</td>
<td>144.1 (315)</td>
<td>154.0 (340)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.6)</td>
<td>0.401 (1.3)</td>
<td>2.4 (5.3)</td>
<td>0.3 (0.7)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-2.6)</td>
<td>33.2 (73)</td>
<td>-6.2 (-14)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-2.6)</td>
<td>47.8 (105)</td>
<td>-9.1 (-20)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-2.9)</td>
<td>5.1 (11)</td>
<td>-1.1 (-2.4)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>7.4 (16)</td>
<td>10.3 (23)</td>
</tr>
</tbody>
</table>

| Sprung weight                           | 1657 (3650)      | 1291.4 (2850)                            | 365.5 (805)              |
|                                        |                 | 1291 (2850)                              | 366 (805)                |
| Unsprung weight                        | 872 (1920)       | 310 (685)                                | 562 (1240)               |
| Chassis Cab weight *2                   | 2529 (5580)      | 1601 (3530)                              | 928 (2050)               |
|                                        | 2530 (5580)      | 1600 (3530)                              | 930 (2050)               |

*1: From front axle center

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

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MITUBISHI FUSO body/equipment mounting directives for FE, FG Issue date: 06. 07. 2012

Only print out complete sections from the current version

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9 Technical data

### 9.3 Weight distribution table

Model: FEC92GL3SUHD 120 (161) [kW(HP)]

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg [lb])</th>
<th>Distance *1 to center of gravity (m [ft])</th>
<th>Front axle load (Kg [lb])</th>
<th>Rear axle load (Kg [lb])</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3.3)</td>
<td>13.9 (31)</td>
<td>-2.9 (-6.4)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2.4)</td>
<td>48.7 (105)</td>
<td>-7.7 (-17)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3.3)</td>
<td>13.0 (31)</td>
<td>-2.9 (-6.4)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3.3)</td>
<td>27.7 (61)</td>
<td>-5.7 (-13)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>21.1 (47)</td>
<td>3.3 (7.3)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.5 (19)</td>
<td>0.5 (1.1)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>382.7 (845)</td>
<td>-27.7 (-61)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>30.3 (67)</td>
<td>-2.3 (-5.1)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>385.1 (850)</td>
<td>44.8 (99)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>46.5 (100)</td>
<td>-2.5 (-5.5)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>47.7 (105)</td>
<td>14.3 (32)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>4.280 (14)</td>
<td>-15.2 (-34)</td>
<td>151.3 (335)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>43.5 (96)</td>
<td>25.4 (56)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>23 (51)</td>
<td>2.430 (8.0)</td>
<td>8.5 (19)</td>
<td>14.5 (32)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>1.950 (6.4)</td>
<td>4.9 (11)</td>
<td>5.1 (11)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>311 (685)</td>
<td>1.990 (6.6)</td>
<td>150.4 (330)</td>
<td>160.9 (355)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.6)</td>
<td>0.401 (1.3)</td>
<td>2.4 (5.3)</td>
<td>0.3 (0.7)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-2.6)</td>
<td>32.5 (72)</td>
<td>-5.5 (-12)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-2.6)</td>
<td>46.7 (100)</td>
<td>-8.0 (-18)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-2.9)</td>
<td>4.9 (11)</td>
<td>-0.9 (-2.0)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>8.6 (19)</td>
<td>9.1 (20)</td>
</tr>
</tbody>
</table>

**Sprung weight**

- 1671 (36810)
- 1304.8 (2880)
- 366.3 (805)
- 1305 (2880)
- 366 (805)

**Unsprung weight**

- 872 (1920)
- 310 (685)
- 562 (1240)

**Chassis Cab weight**

- 2543 (5610)
- 1615 (3560)
- 928 (2050)
- 2545 (5610)
- 1615 (3560)
- 930 (2050)

*1: From front axle center  
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
## 9.3 Weight distribution table

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg (lb))</th>
<th>Distance *1 to center of gravity (m (ft))</th>
<th>Front axle load (Kg (lb))</th>
<th>Rear axle load (Kg (lb))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3.3)</td>
<td>13.6 (30)</td>
<td>-2.6 (-5.7)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2.4)</td>
<td>47.9 (105)</td>
<td>-6.9 (-15)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3.3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3.3)</td>
<td>27.1 (60)</td>
<td>-5.1 (-11)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>21.4 (47)</td>
<td>3.0 (6.6)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.6 (19)</td>
<td>0.4 (0.9)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>379.8 (835)</td>
<td>-24.8 (-55)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>30.1 (66)</td>
<td>-2.1 (-4.6)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>389.8 (860)</td>
<td>40.1 (88)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>46.3 (100)</td>
<td>-2.3 (-5.1)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>49.2 (110)</td>
<td>12.8 (28)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>0.730 (16)</td>
<td>-13.6 (-30)</td>
<td>149.7 (330)</td>
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<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>46.1 (100)</td>
<td>22.8 (50)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>30 (66)</td>
<td>2.653 (8.7)</td>
<td>11.5 (25)</td>
<td>18.5 (41)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>2.020 (6.6)</td>
<td>5.3 (12)</td>
<td>4.7 (10)</td>
</tr>
<tr>
<td>Frame and others</td>
<td>334 (735)</td>
<td>2.205 (7.2)</td>
<td>162.7 (360)</td>
<td>171.3 (375)</td>
</tr>
<tr>
<td>Engine and T/M cover</td>
<td>3 (6.4)</td>
<td>0.401 (1.3)</td>
<td>2.4 (5.3)</td>
<td>0.3 (0.7)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-2.6)</td>
<td>31.9 (70)</td>
<td>-4.9 (-114)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-2.6)</td>
<td>45.9 (100)</td>
<td>-7.2 (-16)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-2.9)</td>
<td>4.8 (11)</td>
<td>-0.8 (-1.8)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>9.6 (21)</td>
<td>8.1 (18)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Sprung weight</th>
<th>Unsprung weight</th>
<th>Chassis Cab weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (Kg)</td>
<td>1701 (3750)</td>
<td>872 (1920)</td>
<td>2573 (5670)</td>
</tr>
<tr>
<td>Weight (lb)</td>
<td>3725.0 (825)</td>
<td>1830 (4040)</td>
<td>562 (1240)</td>
</tr>
</tbody>
</table>

*1: From front axle center
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
### 9.3 Weight distribution table

**Model:** FEC92KL3SUHD 120 (161) [kW(HP)]

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg (lb))</th>
<th>Distance *1 to center of gravity (m (ft))</th>
<th>Front axle load (Kg (lb))</th>
<th>Rear axle load (Kg (lb))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-1.012 (-3.3)</td>
<td>13.3 (29)</td>
<td>-2.3 (-5.1)</td>
</tr>
<tr>
<td>Steering system</td>
<td>41 (90)</td>
<td>-0.719 (-2.4)</td>
<td>47.2 (105)</td>
<td>-6.2 (-14)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3.3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-1.000 (-3.3)</td>
<td>26.6 (59)</td>
<td>-4.6 (-10)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.524 (1.7)</td>
<td>21.7 (48)</td>
<td>2.7 (6.0)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>0.085 (0.3)</td>
<td>4.9 (11)</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.196 (0.6)</td>
<td>8.6 (19)</td>
<td>0.4 (0.9)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>355 (780)</td>
<td>-0.300 (-1)</td>
<td>377.5 (830)</td>
<td>-22.4 (-49)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.320 (-1)</td>
<td>29.9 (66)</td>
<td>-1.9 (-4.2)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>430 (945)</td>
<td>0.401 (1.3)</td>
<td>393.6 (865)</td>
<td>36.3 (80)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.223 (-0.7)</td>
<td>46.1 (100)</td>
<td>-2.1 (-4.6)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.889 (2.9)</td>
<td>50.4 (110)</td>
<td>11.6 (26)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>136 (300)</td>
<td>5.180 (17)</td>
<td>-12.3 (-27)</td>
<td>148.4 (325)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>69 (150)</td>
<td>1.420 (4.7)</td>
<td>48.3 (105)</td>
<td>20.6 (45)</td>
</tr>
<tr>
<td>Propeller shaft assembly</td>
<td>35 (77)</td>
<td>2.877 (9.4)</td>
<td>13.8 (30)</td>
<td>21.2 (47)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>2.000 (6.6)</td>
<td>5.8 (13)</td>
<td>4.2 (9.3)</td>
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<td>Frame and others</td>
<td>347 (765)</td>
<td>2.435 (8.0)</td>
<td>169.3 (375)</td>
<td>178.1 (390)</td>
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<td>Engine and T/M cover</td>
<td>3 (6.4)</td>
<td>0.401 (1.3)</td>
<td>2.5 (5.5)</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.780 (-2.6)</td>
<td>31.5 (69)</td>
<td>-4.4 (-9.7)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.800 (-2.6)</td>
<td>45.3 (100)</td>
<td>-6.5 (-14)</td>
</tr>
<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.896 (-2.9)</td>
<td>4.8 (11)</td>
<td>-0.8 (-1.8)</td>
</tr>
<tr>
<td>SCR tank</td>
<td>18 (40)</td>
<td>1.975 (6.5)</td>
<td>10.3 (23)</td>
<td>7.4 (16)</td>
</tr>
</tbody>
</table>

### Sprung weight:

- 1720 (3790)
- 1339.6 (2950) 379.9 (835)
- 1340 (2950) 380 (835)

### Unsprung weight:

- 872 (1920)
- 310 (685) 562 (1240)

### Chassis Cab weight:

- 2592 (5710)
- 1650 (3640) 942 (2080)
- 2590 (5710) 1650 (3640) 940 (2070)

---

*1: From front axle center  
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
## 9.3 Weight distribution table

**Model:** FGB72EL3SUHD 120 (161) [kW(HP)]

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Weight (Kg (lb))</th>
<th>Distance *1 to center of gravity (m (ft))</th>
<th>Front axle load (Kg (lb))</th>
<th>Rear axle load (Kg (lb))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front bumper</td>
<td>11 (24)</td>
<td>-0.977 (-3)</td>
<td>14.1 (31)</td>
<td>-3.1 (-7)</td>
</tr>
<tr>
<td>Steering system</td>
<td>39 (86)</td>
<td>-0.704 (-2)</td>
<td>47.0 (105)</td>
<td>-8.0 (-19)</td>
</tr>
<tr>
<td>Engine control system</td>
<td>0 (0)</td>
<td>-1.000 (-3)</td>
<td>0.5 (1.1)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Brake, clutch control system</td>
<td>22 (49)</td>
<td>-0.985 (-3)</td>
<td>28.3 (62)</td>
<td>-6.3 (-11)</td>
</tr>
<tr>
<td>Air intake system</td>
<td>24 (53)</td>
<td>0.549 (1.8)</td>
<td>20.4 (45)</td>
<td>3.9 (8.6)</td>
</tr>
<tr>
<td>Parking brake system</td>
<td>5 (11)</td>
<td>-0.100 (-0.2)</td>
<td>5.1 (11)</td>
<td>-0.1 (-0.2)</td>
</tr>
<tr>
<td>Remote control system</td>
<td>9 (20)</td>
<td>0.211 (0.7)</td>
<td>8.4 (19)</td>
<td>0.6 (1.3)</td>
</tr>
<tr>
<td>Cab assembly, Front cab mounting</td>
<td>356 (785)</td>
<td>-0.285 (-0.9)</td>
<td>385.2 (850)</td>
<td>-29.7 (-65)</td>
</tr>
<tr>
<td>Cooling system</td>
<td>28 (62)</td>
<td>-0.305 (-1)</td>
<td>30.5 (67)</td>
<td>-2.5 (-6)</td>
</tr>
<tr>
<td>Engine, Transmission assembly</td>
<td>497 (1100)</td>
<td>0.530 (1.7)</td>
<td>419.4 (925)</td>
<td>77.1 (170)</td>
</tr>
<tr>
<td>Rear cab mounting</td>
<td>44 (97)</td>
<td>-0.208 (-0.7)</td>
<td>46.7 (100)</td>
<td>-2.7 (-6)</td>
</tr>
<tr>
<td>Battery</td>
<td>62 (135)</td>
<td>0.904 (3.0)</td>
<td>45.6 (100)</td>
<td>16.4 (36)</td>
</tr>
<tr>
<td>Fuel system</td>
<td>158 (350)</td>
<td>3.855 (13)</td>
<td>20.4 (-43)</td>
<td>178.8 (395)</td>
</tr>
<tr>
<td>Exhaust system</td>
<td>71 (155)</td>
<td>1.445 (4.7)</td>
<td>41.0 (90)</td>
<td>30.1 (66)</td>
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<tr>
<td>Propeller shaft assembly</td>
<td>32 (71)</td>
<td>2.275 (7.5)</td>
<td>10.7 (24)</td>
<td>21.3 (47)</td>
</tr>
<tr>
<td>Electric system</td>
<td>10 (22)</td>
<td>1.720 (5.6)</td>
<td>5.0 (11)</td>
<td>5.0 (11)</td>
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<tr>
<td>Frame and others</td>
<td>298 (655)</td>
<td>1.756 (5.8)</td>
<td>144.8 (320)</td>
<td>153.3 (335)</td>
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<tr>
<td>Engine and T/M cover</td>
<td>3 (6.4)</td>
<td>0.386 (1.3)</td>
<td>2.6 (5.7)</td>
<td>0.3 (0.7)</td>
</tr>
<tr>
<td>A/C unit</td>
<td>27 (60)</td>
<td>-0.765 (-3)</td>
<td>33.0 (73)</td>
<td>-6.0 (-11)</td>
</tr>
<tr>
<td>Electric others</td>
<td>39 (86)</td>
<td>-0.794 (-3)</td>
<td>47.7 (105)</td>
<td>-9.0 (-18)</td>
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<tr>
<td>ECU</td>
<td>4 (8.8)</td>
<td>-0.881 (-3)</td>
<td>5.0 (11)</td>
<td>-1.0 (-2)</td>
</tr>
<tr>
<td>Transfer</td>
<td>18 (40)</td>
<td>2.000 (6.6)</td>
<td>7.3 (16)</td>
<td>10.4 (23)</td>
</tr>
</tbody>
</table>

**Sprung weight** 1757 (3870)  
**Unsprung weight** 953 (2100)

**Chassis Cab weight**

<table>
<thead>
<tr>
<th>Weight (Kg (lb))</th>
<th>Distance *1 to center of gravity (m (ft))</th>
<th>Front axle load (Kg (lb))</th>
<th>Rear axle load (Kg (lb))</th>
</tr>
</thead>
<tbody>
<tr>
<td>2710 (5970)</td>
<td>1731 (3820)</td>
<td>979 (2160)</td>
<td>980 (2160)</td>
</tr>
<tr>
<td>2710 (5970)</td>
<td>1730 (3810)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1: From front axle center  
*2: Chassis cab weight oil, fuel and coolant but exclude tire & disc, tools and persons.
## Technical data

### 9.3 Weight distribution table

#### Optional equipment

The following additional weight must be taken into consideration when calculating vehicle weight.

<table>
<thead>
<tr>
<th>Group</th>
<th>Option</th>
<th>Mass Variation [kg (lb)]</th>
<th>Mass Center Position (distance from FrAxle center) [m (ft)]</th>
<th>Remark</th>
<th>Note.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chassis</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>T/M PTO (20kgfm, vacuum, separate connected pump, with flange)</td>
<td>+12kg</td>
<td>+0.401 (+1.30)</td>
<td>+0.401 (+1.30)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T/M PTO (40kgfm, vacuum, separate connected pump, with flange)</td>
<td>+13kg</td>
<td>+0.401 (+1.30)</td>
<td>+0.401 (+1.30)</td>
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</tr>
<tr>
<td></td>
<td>Chassis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>125L Side mount fuel tank</td>
<td>+139 (+306)</td>
<td>+1.835 (+6.0)</td>
<td>-</td>
<td>Wheel base: E 3400 (133.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-135 (-298)</td>
<td>+3.830 (+13.0)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>+139 (+306)</td>
<td>+1.835 (+6.0)</td>
<td>-</td>
<td>Wheel base: G 3850 (151.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-135 (-298)</td>
<td>+4.280 (+14.0)</td>
<td>-</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>+139 (+306)</td>
<td>+1.835 (+6.0)</td>
<td>+2.735 (+9.0)</td>
<td>Wheel base: H 4300 (169.3)</td>
</tr>
<tr>
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<td></td>
<td>-135 (-298)</td>
<td>+4.730 (+16.0)</td>
<td>+4.730 (+16.0)</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>+139 (+306)</td>
<td>+1.835 (+6.0)</td>
<td>+2.735 (+9.0)</td>
<td>Wheel base: K 4750 (187.0)</td>
</tr>
<tr>
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<td></td>
<td>-135 (-298)</td>
<td>+5.180 (+17.0)</td>
<td>+5.180 (+17.0)</td>
<td></td>
</tr>
</tbody>
</table>

Note. - "1 Distance from Fr. Axle Center; +: backward, -: forward
9.4 Chassis cab drawings

9.4.1 Chassis cab drawings

PDF files of Chassis cab drawings will be shown on clicking the Model name in left bookmark.

<table>
<thead>
<tr>
<th>Model</th>
<th>Page</th>
<th>Down Load</th>
</tr>
</thead>
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<td>161</td>
<td>.dxf</td>
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<tr>
<td>FEC72CL3SUHD</td>
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<td></td>
</tr>
<tr>
<td>FEC92CL3SUHD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FEC52EL3SUHD</td>
<td>162</td>
<td>.dxf</td>
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<td>FEC72EL3SUHD</td>
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</tr>
<tr>
<td>FEC92EL3SUHD</td>
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<td></td>
</tr>
<tr>
<td>FEC52GL3SUHD</td>
<td>163</td>
<td>.dxf</td>
</tr>
<tr>
<td>FEC72GL3SUHD</td>
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</tr>
<tr>
<td>FEC92GL3SUHD</td>
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<tr>
<td>FEC72HL3SUHD</td>
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</tr>
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<table>
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<tr>
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<th>Page</th>
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</thead>
<tbody>
<tr>
<td>FEC72HL3WUHD</td>
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<tr>
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<tr>
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<td>FGB72EL3SUHD</td>
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</table>
9.4 Chassis cab drawings
9.4 Chassis cab drawings

<table>
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<tr>
<th>TIRE SIZE</th>
<th>A</th>
<th>B</th>
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<tbody>
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<td>FEC52GL 3SUHD</td>
<td>1560</td>
<td>2143</td>
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<td>FEC92GL 3SUHD</td>
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<td>2143</td>
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</table>

UNIT: mm (n.)
SCALE: 1:1/50

215/75R17.5
9.4 Chassis cab drawings
9.4 Chassis cab drawings
9.4 Chassis cab drawings
9.4 Chassis cab drawings
9 Technical data

9.4 Chassis cab drawings

9.4.2 Cab front & Rear view

***PDF FILE – view file, unable to edit – ***

PDF files of Cab front & Rear view will be shown on clicking the Model name in left bookmark.

<table>
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<th>Page</th>
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<td>FEC72EL3SUHD</td>
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</tr>
<tr>
<td>FEC72GL3SUHD</td>
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</tr>
<tr>
<td>FEC72HL3SUHD</td>
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<td>FEC72KL3SUHD</td>
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</tr>
<tr>
<td>FEC92CL3SUHD</td>
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</tr>
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<td>FEC92KL3SUHD</td>
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<td>FEC72KL3WUHD</td>
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<tr>
<td>FGB72EL3SUHD</td>
<td>172</td>
</tr>
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</table>
9.4 Chassis cab drawings

Single cab
9 Technical data

9.4 Chassis cab drawings

FG single cab
9.4 Chassis cab drawings

9.4.3 Cab side view

Since the heat influence of a turbocharger is high, if body or equipment is mounted in the wheelarches, prevent the body or equipment from interfering with the brakes or engine coolant. If heat protection is installed, it is required.
9.4 Chassis cab drawings
9 Technical data

9.5 Frame layout

PDF files of Frame Layout & Frame Section Drawing, will be shown on clicking the Model name or Section name in left bookmark.

9.5.1 Frame section drawing

<table>
<thead>
<tr>
<th>Model</th>
<th>Section</th>
<th>Page</th>
<th>Download</th>
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<td>D-D</td>
<td>177</td>
<td>.dxf</td>
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<td>FG</td>
<td>A-A, D-D</td>
<td>178</td>
<td>.dxf</td>
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</tbody>
</table>
9.5 Frame layout
9.5 Frame layout

UNIT: mm (in.)
9.5 Frame layout

UNIT: mm (in.)
9.5 Frame layout

9.5.2 TCU installation drawing
## 9.5 Frame layout

### 9.5.3 Frame section module

<table>
<thead>
<tr>
<th>Model</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEC 2C</td>
<td>181</td>
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<tr>
<td>FEC 2E</td>
<td>182</td>
</tr>
<tr>
<td>FEC 2G</td>
<td>183</td>
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<tr>
<td>FEC 2H</td>
<td>184</td>
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<tr>
<td>FEC 2K</td>
<td>185</td>
</tr>
<tr>
<td>FGB 2E</td>
<td>186</td>
</tr>
</tbody>
</table>
9.5 Frame layout
9 Technical data

9.5 Frame layout

Model FEC2E Chassis frame section modulus

Distance from front axle center m (in.)

Section modulus Z cm$^3$ (in.$^3$)
9.5 Frame layout

Model FEG-103

Frame section modulus

Distance from front axle center [m]
9.5 Frame layout
9.5 Frame layout

Model FGB-E8E Chassis frame section modulus

- Section module (cm²)
- 0.36 (20.24)
- 0.23 (13.51)
- 0.11 (6.43)
- -0.33 (-21.46)
- -0.51 (-32.91)

Distance from front axle center (m
- 3.6 (143.70)
- 3.58 (141.30)
- 3.26 (130.16)
- 3.13 (125.17)
- 3.05 (120.00)
- 2.5 (98.43)
- 2.4 (96.49)
- 2.06 (79.40)
- 1.99 (75.54)
- 1.94 (72.57)
- 1.90 (69.37)
- 1.74 (62.54)
- 1.51 (58.15)
- 1.26 (51.67)
- 1.04 (45.77)
- 0.85 (40.36)
- 0.28 (10.24)
- 0.23 (8.45)
- -0.33 (-21.46)
- -0.51 (-32.91)
### 9 Technical data

#### 9.6 Spring diagram

##### 9.6.1 Distance from frame top surface to ground

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OBJECT ENGINE kW/HP</th>
<th>CAB CHASSIS WEIGHT kg (lb)</th>
<th>UNDER-SPRING WEIGHT kg (lb)</th>
<th>DISTANCE FROM FRAME TOP SURFACE TO GROUND mm (in.)</th>
<th>CoG. HEIGHT mm (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Front Wf</td>
<td>Rear Wr</td>
<td>Total W</td>
<td>Front</td>
<td>Rear</td>
</tr>
<tr>
<td>FEC52CL3SUHD</td>
<td>120 (161)</td>
<td>1535 (3385)</td>
<td>830 (1830)</td>
<td>2365 (5215)</td>
<td>277 (611)</td>
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<tr>
<td>FEC52EL3SUHD</td>
<td>120 (161)</td>
<td>1565 (3450)</td>
<td>840 (1850)</td>
<td>2405 (5300)</td>
<td>277 (611)</td>
</tr>
<tr>
<td>FEC52GL3SUHD</td>
<td>120 (161)</td>
<td>1580 (3485)</td>
<td>840 (1850)</td>
<td>2420 (5335)</td>
<td>277 (611)</td>
</tr>
<tr>
<td>FEC72CL3SUHD</td>
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<td>1570 (3540)</td>
<td>920 (2030)</td>
<td>2490 (5490)</td>
<td>310 (683)</td>
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<td>120 (161)</td>
<td>1600 (3580)</td>
<td>930 (2050)</td>
<td>2530 (5580)</td>
<td>310 (683)</td>
</tr>
<tr>
<td>FEC72GL3SUHD</td>
<td>120 (161)</td>
<td>1615 (3560)</td>
<td>930 (2050)</td>
<td>2545 (5610)</td>
<td>310 (683)</td>
</tr>
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<td>FEC72HL3SUHD</td>
<td>120 (161)</td>
<td>1635 (3605)</td>
<td>940 (2070)</td>
<td>2575 (5675)</td>
<td>310 (683)</td>
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<tr>
<td>FEC72KL3SUHD</td>
<td>120 (161)</td>
<td>1650 (3640)</td>
<td>940 (2070)</td>
<td>2590 (5710)</td>
<td>310 (683)</td>
</tr>
<tr>
<td>FEC72L3SUHD</td>
<td>120 (161)</td>
<td>1690 (3680)</td>
<td>950 (2090)</td>
<td>2620 (5750)</td>
<td>310 (683)</td>
</tr>
<tr>
<td>FEC72L3SUHD</td>
<td>120 (161)</td>
<td>1710 (3720)</td>
<td>950 (2090)</td>
<td>2625 (5790)</td>
<td>310 (683)</td>
</tr>
<tr>
<td>FEC92CL3SUHD</td>
<td>120 (161)</td>
<td>1570 (3460)</td>
<td>920 (2030)</td>
<td>2490 (5490)</td>
<td>310 (683)</td>
</tr>
<tr>
<td>FEC92EL3SUHD</td>
<td>120 (161)</td>
<td>1600 (3530)</td>
<td>930 (2050)</td>
<td>2530 (5580)</td>
<td>310 (683)</td>
</tr>
<tr>
<td>FEC92GL3SUHD</td>
<td>120 (161)</td>
<td>1615 (3490)</td>
<td>940 (2070)</td>
<td>2545 (5610)</td>
<td>310 (683)</td>
</tr>
<tr>
<td>FEC92HL3SUHD</td>
<td>120 (161)</td>
<td>1635 (3465)</td>
<td>940 (2070)</td>
<td>2575 (5675)</td>
<td>310 (683)</td>
</tr>
<tr>
<td>FEC92KL3SUHD</td>
<td>120 (161)</td>
<td>1650 (3450)</td>
<td>940 (2070)</td>
<td>2590 (5710)</td>
<td>310 (683)</td>
</tr>
<tr>
<td>FEC92L3SUHD</td>
<td>120 (161)</td>
<td>1730 (3815)</td>
<td>980 (2160)</td>
<td>2710 (5975)</td>
<td>403 (888)</td>
</tr>
</tbody>
</table>

Method of calculating Hf, Hr
Hf=hf+Rf : Frame height, Front See Chapter 9.4.1
Hr=hr+Rr : Frame height, Rear
hf : Distance from frame top to front wheel center (See drawings or following page 188.)
hr : Distance from frame top to rear wheel center (See drawings or following page 193.)
Rf, Rr : Tire radius (See drawings or following page 198.)
9.6 Spring diagram

9.6.2 Front spring diagram

MODEL FEC5 (FRONT)

<table>
<thead>
<tr>
<th>Load (N) (kg)</th>
<th>18345N (4124 lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (lb)</td>
<td>20000 (2059)</td>
</tr>
<tr>
<td>Load (lb)</td>
<td>30000 (3059)</td>
</tr>
<tr>
<td>Load (lb)</td>
<td>40000 (4079)</td>
</tr>
<tr>
<td>Load (lb)</td>
<td>50000 (5099)</td>
</tr>
</tbody>
</table>

DIMENSION
Span x Width x Thickness-No. of leaves
Main: 1150mm x 70mm x 17mm -2
(45.28in x 2.76in x 0.67in -2)

h f: Distance from front wheel center to upper surface of frame
MODEL FEC7 (FRONT) (EXCEPT FEC72 • L3W)

SPRING LOAD (ONE SIDE)

DIMENSION
Span x Width x Thickness-No of leaves
Main: 1150mm x 70mm x 17mm - 2
(45.28in x 2.76in x 0.67in - 2)

Wf (lb)  N (kg)
10000 [4521 lb]  20111N
9000 [4079]  11961N
8000 [3599]  8782N
7000 [3059]  50000 [5099]

hf mm

hf: Distance from front wheel center to upper surface of frame
9.6 Spring diagram

MODEL FEC72 * L3W (FRONT)

Sprung Load (One Side)

Dimension:
- Span x Width x Thickness / No. of leaves
- Main: 1150mm x 70mm x 17mm x 2
  (45.28in x 2.76in x 0.67in x 2)

22700N  (5103 lb)
177 N/mm  (18.0 kgf/mm)  (1011 lbs/in)

hf: Distance from front wheel center to upper surface of frame
9.6 Spring diagram

MODEL FEC9 (FRONT)

Wf N
(lb) (kg)

50000
(5099)

40000
(4079)

30000
(3059)

20000
(2039)

10000
(1020)

0

10000
(1020)

200

250

300

350

400

hf mm

hf: Distance from front wheel center to upper surface of frame

SPRING LOAD (ONE SIDE)

DIMENSION

Span x Width x Thickness-No. of leaves

Main : 1150mm x79mm x17mm -2
(45.28in x2.76in x0.67in -2)

177 N/mm
(18.0 kgf/mm)
(1011 lbs/in)

20111N
(4521 lb)
9.6 Spring diagram

MODEL FGB7 (FRONT)

- Springs:
  - Span x Width x Thickness x No. of leaves
  - Main: 1150mm x 70mm x 11mm x 5
    - (45.28in x 2.76in x 0.43in x 5)

- Load Capacity:
  - 50000N (5099lb)
  - 40000N (4079lb)
  - 30000N (3059lb)
  - 20000N (2039lb)
  - 10000N (1025lb)
  - 0N (0lb)

- Dimensions:
  - 650mm to 500mm (25.6in to 19.7in)

Hf: Distance from front wheel center to upper surface of frame
9.6.3 Rear spring diagram

MODEL FEC5 (REAR)

SPRING LOAD (ONE SIDE)

DIMENSION
Span x Width x Thickness-No. of leaves
Main : 1250 mm x 70 mm x 11 mm - 2
13 mm - 2
25 mm - 1
(49.21 in x 2.76 in x 0.43 in - 2)
0.47 in - 2
0.98 in - 1

Wr N (lb) (kg)
80000 (8158)
60000 (6118)
40000 (4079)
20000 (2036)
10000 (1018)
0
4000
8000
12000
16000
2000
450
17
16
15
14
13
300 hr mm (in)

hr: Distance from rear wheel center to upper surface of frame

432 N/mm (44.1 kgf/mm) (2470 lbs/in)
22074N (4962 lb)
10800N (2428 lb)
191 N/mm (19.5 kgf/mm) (1091 lbs/in)
9.6 Spring diagram

MODEL FEC7 (REAR)
(EXCEPT FEC72 • L3W)

SPRING LOAD (ONE SIDE)

DIMENSION
Span x Width x Thickness-No. of leaves
Main : 1250mm x 70mm x 12mm - 1
11mm - 2
10mm - 3
(4.92 in x 2.76 in x 0.47 in - 1)
0.43 in ( - 2)
0.39 in ( - 3)

Helper : 850mm x 70mm x 15mm - 3
(34.25 in x 2.76 in x 0.59 in - 3)

556 N/mm
(56.7 kgf/mm)
(3175 lbs/in)

29813N
(6702 lb)

10787N
(2425 lb)

193 N/mm
(19.7 kgf/mm)
(1102 lbs/in)

hr mm

hr: Distance from rear wheel center to upper surface of frame
9 Technical data

9.6 Spring diagram

MODEL FEC72 L3W (REAR)

**SPRING LOAD (ONE SIDE)**

**DIMENSION**

Span x Width x Thickness No of leaves
- Main: 1250mm x70mm x 12mm -1
- 11mm - 2
- 10mm - 3
- (49.21in x2.76in x 0.47in -1)
- 0.43in -2
- 0.39in -3

- Helper: 880mm x70mm x 15mm -3
- (34.65in x2.76in x 0.59in -3)

- 29859N
  - 556 N/mm
  - (6701 lb)
  - (56.7 kgf/mm)
  - (3175 lbs/in)

- 10787N
  - 193 N/mm
  - (2425 lb)
  - (19.7 kgf/mm)
  - (1102 lbs/in)

hr: Distance from rear wheel center to upper surface of frame

Only print out complete sections from the current version
9.6 Spring diagram

MODEL FEC9 (REAR)

SPRING LOAD (ONE SIDE)

DIMENSION
Span x Width x Thickness-No of leaves
Main : 1250mm x 79mm x 12mm -1
11mm -2
16mm -3
(49.21in x 3.11in x 0.47in -1)
0.43in -2
0.58in -3)
Helper : 880mm x 79mm x 16mm -3
(34.65in x 3.11in x 0.63in -3)

Wr (lb)
N (kg)
80000 [8158]
60000 [6118]
40000 [4079]
20000 [2039]
0
31148N (7002 lb)
10787N (2425 lb)
193 N/mm (19.7 kgf/mm)
595 N/mm (60.7 kgf/mm)
1102 lbs/in (3399 lbs/in)

hr mm
17 16 15 14 13

hr: Distance from rear wheel center to upper surface of frame
9.6 Spring diagram

MODEL FGB7 (REAR)

SPRING LOAD (ONE SIDE)

DIMENSIONS
Span x Width x Thickness-No. of leaves
Main: 1200mm x 70mm x 12mm - 1
11mm - 2
10mm - 3
(49.21in x 2.76in x 0.47in - 1)
0.43in - 2
0.39in - 3
Helper: 880mm x 70mm x 15mm - 3
(34.65in x 2.76in x 0.59in - 3)

28099N
(6315 lb)
10767N
(2425 lb)
193 N/mm
(19.7 kgf/mm)
(1102 lbs/in)

hr mm

hr: Distance from rear wheel center to upper surface of frame
9.6 Spring diagram

9.6.4 Tire radius calculating diagram

Single tire: Front-tire distributed load/2
Double tire: Rear-tire distributed load/4
9 Technical data

9.7 Lamp layout drawings

9.7.1 Rear combination lamp

Use the rear combination lamps and license plate lamps which have been installed as standard MFTBC equipment, but don’t use the original bracket which holds the lamps.
9.7 Lamp layout drawings

9.7.2 License plate lamp
## Technical data

### 9.8 Power train

#### 9.8.1 Powertrain list

<table>
<thead>
<tr>
<th>Model</th>
<th>GVW (kg/lbs)</th>
<th>Engine Model</th>
<th>Clutch</th>
<th>T/M Model</th>
<th>Position</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>FEC52CL3SUHD</td>
<td>5670/12500</td>
<td>4P10T5</td>
<td>Wet dual clutch</td>
<td>M038S6</td>
<td>1</td>
<td>5.397</td>
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<tr>
<td>FEC52EL3SUHD</td>
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<td></td>
<td>2</td>
<td>3.788</td>
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<td>3</td>
<td>2.310</td>
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<td>4</td>
<td>1.474</td>
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<td></td>
<td>R</td>
<td>5.397</td>
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<tr>
<td>FEC72HL3WUHD</td>
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<tr>
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<tr>
<td>FEC92KL3SUHD</td>
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</table>
### 9.9 Differential and tire bound height

<table>
<thead>
<tr>
<th>Model</th>
<th>Tire size</th>
<th>A (mm in)</th>
<th>B (mm in)</th>
<th>C (mm in)</th>
<th>D (mm in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEC52CL3SUHD</td>
<td>215/85R16</td>
<td>130 (5.1)</td>
<td>139 (5.5)</td>
<td>644.5 (25.4)</td>
<td>144 (5.7)</td>
</tr>
<tr>
<td>FEC52EL3SUHD</td>
<td>215/85R16</td>
<td>130 (5.1)</td>
<td>140 (5.5)</td>
<td>644.5 (25.4)</td>
<td>144 (5.7)</td>
</tr>
<tr>
<td>FEC52GL3SUHD</td>
<td>215/85R16</td>
<td>130 (5.1)</td>
<td>139 (5.5)</td>
<td>644.5 (25.4)</td>
<td>144 (5.7)</td>
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<tr>
<td>FEC72CL3SUHD</td>
<td>215/75R17.5</td>
<td>125 (4.9)</td>
<td>142 (5.6)</td>
<td>647 (25.5)</td>
<td>151 (5.9)</td>
</tr>
<tr>
<td>FEC72EL3SUHD</td>
<td>215/75R17.5</td>
<td>125 (4.9)</td>
<td>141 (5.6)</td>
<td>647 (25.5)</td>
<td>151 (5.9)</td>
</tr>
<tr>
<td>FEC72GL3SUHD</td>
<td>215/75R17.5</td>
<td>125 (4.9)</td>
<td>140 (5.5)</td>
<td>647 (25.5)</td>
<td>152 (6.0)</td>
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<tr>
<td>FEC72HL3SUHD</td>
<td>215/75R17.5</td>
<td>125 (4.9)</td>
<td>137 (5.4)</td>
<td>647 (25.5)</td>
<td>153 (6.0)</td>
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<tr>
<td>FEC72KL3SUHD</td>
<td>215/75R17.5</td>
<td>125 (4.9)</td>
<td>137 (5.4)</td>
<td>647 (25.5)</td>
<td>153 (6.0)</td>
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<tr>
<td>FEC72HL3WUHD</td>
<td>215/75R17.5</td>
<td>175 (6.9)</td>
<td>89 (3.5)</td>
<td>647 (25.5)</td>
<td>153 (6.0)</td>
</tr>
<tr>
<td>FEC72KL3WUHD</td>
<td>215/75R17.5</td>
<td>175 (6.9)</td>
<td>90 (3.5)</td>
<td>647 (25.5)</td>
<td>152 (6.0)</td>
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<tr>
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<td>215/75R17.5</td>
<td>125 (4.9)</td>
<td>142 (5.6)</td>
<td>647 (25.5)</td>
<td>151 (5.9)</td>
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<td>125 (4.9)</td>
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<td>152 (6.0)</td>
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<td>138 (5.4)</td>
<td>647 (25.5)</td>
<td>154 (6.1)</td>
</tr>
<tr>
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<td>102 (4.0)</td>
<td>653 (25.7)</td>
<td>139 (5.5)</td>
</tr>
</tbody>
</table>
9.9 Differential and tire bound height

FEC5

FEC7

FEC9

FGB7
9.10 Engine transmission assembly

9.10 Engine transmission assembly

• ENG CENTER

<table>
<thead>
<tr>
<th>Model</th>
<th>T/M</th>
<th>X</th>
<th>Y</th>
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</thead>
<tbody>
<tr>
<td>4P10</td>
<td>147 N·m</td>
<td>110 lbs·ft, 15 kgf·m</td>
<td>-10 (0.4) (TO THE LEFT SIDE)</td>
</tr>
<tr>
<td>196 N·m</td>
<td>145 lbs·ft, 20 kgf·m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>392 N·m</td>
<td>290 lbs·ft, 40 kgf·m</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• TAKING OUT CENTER OF PTO *1

<table>
<thead>
<tr>
<th>Model</th>
<th>T/M</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>6AMT</td>
<td>M03856</td>
<td>985.6 (38.8)</td>
<td>302.5 (11.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>870.7 (34.3)</td>
<td>313.7 (12.4)</td>
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</tbody>
</table>

Unit: mm (in.)
9.10 Engine transmission assembly

<table>
<thead>
<tr>
<th>ENG CENTER</th>
<th>CENTER OF CHASSIS TO CENTER OF ENG OFFSET</th>
</tr>
</thead>
<tbody>
<tr>
<td>4P10</td>
<td>-10 (0.4) (TO THE LEFT SIDE)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TM &amp; PTO</th>
<th>T/M</th>
<th>PTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>6AMT</td>
<td>M038S6</td>
<td>196 N•m [145 ft.lbs, 20 kgf•m]</td>
</tr>
</tbody>
</table>
9.11 Transmission power-take-off layout

9.11 Transmission power-take-off layout

PTO take-off gear tabular

<table>
<thead>
<tr>
<th>Module</th>
<th>Helix angle</th>
<th>Number of teeth</th>
<th>Reference pitch diameter</th>
<th>Base circle diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear Involute</td>
<td>Transmission model</td>
<td>Tool</td>
<td>Tooth depth</td>
<td>Amount of addendum modification</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Displacement over a given number of teeth</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Number of teeth</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Over pin diameter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pin diameter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Finishing method</td>
</tr>
<tr>
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<td></td>
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<td>Crowning</td>
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<td>Shaping</td>
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<td></td>
<td>Pressure angle</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transmission model name affixing position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lubrication port (oil level plug)</td>
</tr>
<tr>
<td>Lubrication port (oil drain plug)</td>
</tr>
<tr>
<td>Error in dimension between center of PTO window and center of each hole within 0.1</td>
</tr>
<tr>
<td>Transmission rear end surface</td>
</tr>
<tr>
<td>PTO take-off gear (reverse idler gear)</td>
</tr>
<tr>
<td>Center of transmission</td>
</tr>
<tr>
<td>Center of reverse idler shaft</td>
</tr>
<tr>
<td>Center of counter shaft</td>
</tr>
<tr>
<td>Clutch housing + transmission case overall length</td>
</tr>
</tbody>
</table>

(1) Permissible output shaft torque/speed
- 196 N.m/1500 rpm at PTO output shaft (PTO for general-purpose vehicles)
- 147 N.m/2000 rpm at PTO output shaft (PTO for dump trucks)

(2) Gear backlash
- Reverse idler gear to PTO input gear: Ensure a backlash of 0.10 to 0.23.

(3) Be careful about the seal on the PTO mounting surface.

(4) Be careful about the seal on the PTO mounting surface.

(5) Transmission gear train
- See below.

(3) PTO take-off gear
- Reverse idler gear, see the tabular on the left.

(4) Gear ratio
- Precautions for mounting PTO

(1) Permissible output shaft torque/speed
- 196 N.m/1500 rpm at PTO output shaft (PTO for general-purpose vehicles)
- 147 N.m/2000 rpm at PTO output shaft (PTO for dump trucks)

(2) Gear backlash
- Reverse idler gear to PTO input gear: Ensure a backlash of 0.10 to 0.23.

(3) Be careful about the seal on the PTO mounting surface.
9.11 Transmission power-take-off layout

- Precautions for mounting PTO
  1. Permissible output shaft torque/speed: 392 N.m/1500 rpm at PTO output shaft
  2. Gear backlash: Ensure a backlash of 0.08 to 0.26 for PTO idler gear to counter shaft.
  3. Be careful about the seal on the PTO mounting surface.
  4. PTO take-off gear: Counter shaft 3rd gear, refer to the tabular on the left.

- Gear ratio
  - See below.
  - Transmission gear train (5)
  - Gear backlash (2)
  - PTO idler gear to counter shaft: Ensure a backlash of 0.08 to 0.26.

- Error in dimension between center of PTO window and center of each hole within 0.1.

- Transmission rear end surface
  - Center of counter shaft
  - PTO mounting surface
  - Center of PTO window
  - Center of transmission

- Large capacity transmission PTO take-off port relation diagram

- Transmission rear end surface
  - Center of counter shaft
  - PTO mounting surface
  - Center of PTO window
  - Center of transmission

- Input (Main shaft) (Counter shaft) (PTO idler shaft)
9 Technical data

9.12 Battery mounting layout

9.12 Battery mounting layout

<FE>

<FG>
9.13 Fuel tank mounting layout

9.13.1 Fuel tank

<FE>
9.13 Fuel tank mounting layout

![Diagram of fuel tank mounting layout]
9.13 Fuel tank mounting layout

- **Option 125L Fuel tank**
  - SINGLE CAB WB: E,G,H,K
  - CREW CAB WB: H,K
  - CREW CAB WB: K ONLY

Unit: mm (in)

- 53 (2.09)
- 240 (9.45)
- 80 (3.15)
- 400 (15.7)
- 272 (10.7)
- 544 (21.4)
- 1130 (44.5)

Fuel pump, Cover & Brkt
9.13 Fuel tank mounting layout

9.13.2 Fuel tank bracket (option)
9 Technical data

9.13 Fuel tank mounting layout

<Option 125L Fuel tank>
SINGLE CAB  WB : E,G,H,K

![Diagram of fuel tank mounting layout]

- FRONT OF VEHICLE
- Unit : mm (in)

Dimensions:
- 110 (4.33)
- 46 (1.81)
9.13 Fuel tank mounting layout

<Option 125L Fuel tank>
CREW CAB  WB: H,K

Unit: mm (in)

110 (4.33)
46 (1.81) T6

544 (21.4)

110 (4.33)
46 (1.81) T6

544 (21.4)

102 (4.02)

F/A CTR ~ H05 (8.5)

FRONT OF VEHICLE
9.14 BlueTec® exhaust gas aftertreatment

- FEC C, E, G, H, K
9.14 BlueTec® exhaust gas aftertreatment
9 Technical data

9.14 BlueTec® exhaust gas aftertreatment

A · FGB

![Diagram of BlueTec exhaust gas aftertreatment system]

MITSUBISHI FUSO body/equipment mounting directives for FE, FG Issue date: 06. 07. 2012

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## 9 Technical data

### 9.15 Labels and marks

- 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.

#### 9.15.1 List of the attaching locations of labels and emblems

<table>
<thead>
<tr>
<th>Description</th>
<th>Front face of cab</th>
<th>RH and LH doors</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUSO</td>
<td>○</td>
<td>–</td>
</tr>
<tr>
<td>DUONIC</td>
<td>–</td>
<td>○</td>
</tr>
<tr>
<td>BlueTec</td>
<td>–</td>
<td>○</td>
</tr>
</tbody>
</table>

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

Clean the indicated areas where the CUSTOM mark, BLUETEC mark, and DUONIC mark are to be stuck, peel off the backing paper from each sticker, and affix it in position according to the illustration.
9 Technical data

9.15 Labels and marks

A

DOOR OUTER LINE

BLUETEC
MK675502

DLINE D2

B

DOOR OUTER LINE

LINE D1

APPLICATION TAPE

DUONIC
MK676977 (LH)
MK676976 (RH)
9.15 Labels and marks

Attaching procedure of the labels and emblems

<table>
<thead>
<tr>
<th>Cab width</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>115</td>
<td>78</td>
<td>60</td>
<td>390</td>
<td>285</td>
</tr>
<tr>
<td></td>
<td>(4.53)</td>
<td>(3.07)</td>
<td>(2.36)</td>
<td>(15.4)</td>
<td>(11.2)</td>
</tr>
<tr>
<td>Wide</td>
<td>115</td>
<td>103</td>
<td>85</td>
<td>465</td>
<td>360</td>
</tr>
<tr>
<td></td>
<td>(4.53)</td>
<td>(4.06)</td>
<td>(3.35)</td>
<td>(18.3)</td>
<td>(14.2)</td>
</tr>
</tbody>
</table>

Unit: mm (in.)
9.16 Electrical wiring diagram

HOW TO READ CIRCUITS

- **Index number**
- **Key number**
- **Code number**
- **Part name**
- **Connector type**
- **Connector terminal number**
- **Harness connection**
- **Grounding point**
- **Circuit number, wire diameter, wire color**
- **Water temperature gauge circuit**
- **Major harness division**
- **Wiring variation between different specifications**
9 Technical data

9.16 Electrical wiring diagram

(1) Index number: (000) - (999)
• Index numbers are used as reference numbers for electrical circuits. Each electrical circuit has been assigned its own index number.

(2) Key number: A01 - Z99
• Key numbers indicate parts installation locations. The installation location of a part can be easily found using its key number shown in a circuit diagram.

(3) Code number: #001 - #999
• Code numbers are reference numbers to find individual parts inspection procedures. The inspection procedure for a part can be found using its code number shown in a circuit diagram.

(4) Part name

(5) Connector type (type indication)

(6) Connector terminal number

(7) Major harness division
• Major harness divisions are shown

(8) Wiring variations between different specifications
• Variations in wiring/circuit between different vehicle specifications are clearly indicated as shown.

(9) Circuit number, wire diameter, wire color

(10) Grounding point: [1] - [99]
• Locations where wires are grounded to the vehicle. All of the grounding points are listed in (130).

(11) Harness connection
• The arrow in the wiring diagram indicates where harnesses are connected, and NOT the flow of electricity.
## Technical data

### 9.16 Electrical wiring diagram

#### Wire color

<table>
<thead>
<tr>
<th>Wire color</th>
<th>Insulation color + tracer</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Black</td>
<td>BW black/white</td>
</tr>
<tr>
<td></td>
<td>BY black/yellow</td>
</tr>
<tr>
<td></td>
<td>BR black/red</td>
</tr>
<tr>
<td></td>
<td>BG black/green</td>
</tr>
<tr>
<td></td>
<td>BL black/blue</td>
</tr>
<tr>
<td>Br Brown</td>
<td>BrW brown/white</td>
</tr>
<tr>
<td></td>
<td>BrB brown/black</td>
</tr>
<tr>
<td></td>
<td>BrY brown/yellow</td>
</tr>
<tr>
<td></td>
<td>BrR brown/red</td>
</tr>
<tr>
<td></td>
<td>BrG brown/green</td>
</tr>
<tr>
<td>G Green</td>
<td>GW green/white</td>
</tr>
<tr>
<td></td>
<td>GR green/red</td>
</tr>
<tr>
<td></td>
<td>GY green/yellow</td>
</tr>
<tr>
<td></td>
<td>GB green/black</td>
</tr>
<tr>
<td></td>
<td>GL green/blue</td>
</tr>
<tr>
<td></td>
<td>GO green/orange</td>
</tr>
<tr>
<td>Gr Gray</td>
<td>GrL gray/blue</td>
</tr>
<tr>
<td></td>
<td>GrR gray/red</td>
</tr>
<tr>
<td>L Blue</td>
<td>LW blue/white</td>
</tr>
<tr>
<td></td>
<td>LR blue/red</td>
</tr>
<tr>
<td></td>
<td>LY blue/yellow</td>
</tr>
<tr>
<td></td>
<td>LB blue/black</td>
</tr>
<tr>
<td></td>
<td>LO blue/orange</td>
</tr>
<tr>
<td></td>
<td>LG blue/green</td>
</tr>
<tr>
<td>Lg Light green</td>
<td>LgR light green/red</td>
</tr>
<tr>
<td></td>
<td>LgY light green/yellow</td>
</tr>
<tr>
<td></td>
<td>LgB light green/black</td>
</tr>
<tr>
<td></td>
<td>LgW light green/white</td>
</tr>
<tr>
<td>O Orange</td>
<td>OL orange/blue</td>
</tr>
<tr>
<td></td>
<td>OB orange/black</td>
</tr>
<tr>
<td></td>
<td>OG orange/green</td>
</tr>
<tr>
<td>P Pink</td>
<td>PB pink/black</td>
</tr>
<tr>
<td></td>
<td>PG pink/green</td>
</tr>
<tr>
<td></td>
<td>PL pink/blue</td>
</tr>
<tr>
<td></td>
<td>PW pink/white</td>
</tr>
<tr>
<td>Pu Purple</td>
<td></td>
</tr>
<tr>
<td>R Red</td>
<td>RW red/white</td>
</tr>
<tr>
<td></td>
<td>RB red/black</td>
</tr>
<tr>
<td></td>
<td>RY red/yellow</td>
</tr>
<tr>
<td></td>
<td>RG red/green</td>
</tr>
<tr>
<td></td>
<td>RL red/blue</td>
</tr>
<tr>
<td></td>
<td>RO red/orange</td>
</tr>
<tr>
<td>Sb Sky blue</td>
<td></td>
</tr>
<tr>
<td>V Violet</td>
<td>VY violet/yellow</td>
</tr>
<tr>
<td></td>
<td>VW violet/white</td>
</tr>
<tr>
<td></td>
<td>VR violet/red</td>
</tr>
<tr>
<td></td>
<td>VG violet/green</td>
</tr>
<tr>
<td>W White</td>
<td>WR white/red</td>
</tr>
<tr>
<td></td>
<td>WB white/black</td>
</tr>
<tr>
<td></td>
<td>WL white/blue</td>
</tr>
<tr>
<td></td>
<td>WG white/green</td>
</tr>
<tr>
<td></td>
<td>WO white/orange</td>
</tr>
<tr>
<td>Y Yellow</td>
<td>YR yellow/red</td>
</tr>
<tr>
<td></td>
<td>YB yellow/black</td>
</tr>
<tr>
<td></td>
<td>YG yellow/green</td>
</tr>
<tr>
<td></td>
<td>YL yellow/blue</td>
</tr>
<tr>
<td></td>
<td>YW yellow/white</td>
</tr>
<tr>
<td></td>
<td>YO yellow/orange</td>
</tr>
</tbody>
</table>
9. Technical data

9.16 Electrical wiring diagram

SAM INTERNAL CIRCUIT

A part of this circuit is omitted.

Connector classification

<table>
<thead>
<tr>
<th>Connector</th>
<th>Number of terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>B11-16</td>
<td></td>
</tr>
</tbody>
</table>

B40 SAM

SAM: Signal detect and actuation modules

To SAM internal circuit (2/2)

SAM connector (harness side)

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Only print out complete sections from the current version
9. Technical data

9.16 Electrical wiring diagram

SAM INTERNAL CIRCUIT

A part of this circuit is omitted.

B40 SAM

SAM: Signal detect and actuation modules

Connector classification

Number of terminal

[Diagram of electrical wiring]

SAM connector (harness side)

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9 Technical data

9.16 Electrical wiring diagram

POWER CIRCUIT (1)

Battery → high-current fuse → SAM (1/2)

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

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9 Technical data

9.16 Electrical wiring diagram

POWER CIRCUIT (2)

Battery → high-current fuse → SAM (2/2)
9 Technical data

9.16 Electrical wiring diagram

POWER CIRCUIT (3)

SAM
(ENG BAT)

To high-current fuse (HF03)

SAM

To headlamp, RH (low)

105

B40

120-1

310

SL01-L, G

325

To rear combination lamp, LH (stop)

120-3

TL01R, R

320

To rear combination lamp, RH (tail)

120-4

TR01R, YL

330

To rear combination lamp, LH (turn)

SAM connector (harness side)

BC 12C 16B

HG2A HQ10B HQ8BC

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9.16 Electrical wiring diagram

POWER CIRCUIT (4)

SAM
(Fuse F01 to F09)

B40

SAM

F01 0° 18-5 FMI1 ST RB 210 To starter relay (for drive)
F04 0° 6X-5 FMI4C LR 115 To optional connector
F05 0° 18-7 FBD 2=0 622 To power window switch, LH
F07 0° 2R-3 FB7A 2=OB 622 To power window switch, RH
F08 0° 2R-3 FBED 0,65-VR 349 To identification lamp relay
F09 0° 2R-3 FBXLT PL 401 To meter cluster

SAM connector (harness side)

110=D07346F01

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9 Technical data

9.16 Electrical wiring diagram

POWER CIRCUIT (5)

SAM
(Fuse F11 to F14)

A/C: Air-conditioner
ECU: Electronic control unit

SAM connector (harness side)

20 20 7C

110-007348F11
9 Technical data

9.16 Electrical wiring diagram

POWER CIRCUIT (6)

SAM
(Fuse F15 to F17)
9 Technical data

9.16 Electrical wiring diagram

POWER CIRCUIT (7)

SAM
(Fuse F18 to F20)

ABS: Anti-lock brake system
EDU: Electronic control unit

SAM connector (harness side)

110-C07346F18

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9 Technical data

9.16 Electrical wiring diagram

POWER CIRCUIT (8)

SAM
(Fuse F22 to F24)

A/C: Air-conditioner
ECU: Electronic control unit

B40

SAM

POWER CIRCUIT (8)

SAM
(Fuse F22 to F24)

A/C: Air-conditioner
ECU: Electronic control unit

B40

SAM

POWER CIRCUIT (8)

SAM
(Fuse F22 to F24)

A/C: Air-conditioner
ECU: Electronic control unit
9 Technical data

9.16 Electrical wiring diagram

POWER CIRCUIT (9)

SAM
(Fuse F25 to F27)
9.16 Electrical wiring diagram

POWER CIRCUIT (10)

SAM
(Fuse F28 to F31)

ECU: Electronic control unit
DEF: Diesel exhaust fluid

![Electrical wiring diagram]

SAM connector (harness side)
9.16 Electrical wiring diagram

POWER CIRCUIT (11)

SAM
(Fuse F32 to F34)

SAM connector (harness side)
9 Technical data

9.16 Electrical wiring diagram

POWER CIRCUIT (12)

SAM
(OPTIONAL BAT)

To high-current fuse (HF22)

SAM

B40

105

SC-1

EX-4

OP03L

OB

115 To optional connector

SAM connector (harness side)

EX

BG

PRX

HQA

110-03734808
POWER CIRCUIT (13)

SAM (VEHICLE BAT) 1/3

To high-current fuse (HP01)

S-R = F01

B40

10S

SAM

105

15R-10 LCB01 BR 320 To headlamp, LH (parking)

15R-11 LCB01 FL 320 To headlamp, RH (parking)

15B-4 YRL01 YL 330 To front and side turn signal lamp, LH

15B-4 YRL01 YR 330 To front and side turn signal lamp, RH

15B-12 S06A V 345 To step lamp, RH

15B-13 S06D VR 345 To step lamp, LH

15B-14 M01A 0,65,<R 629 To mirror heater, RH

15B-15 M01D 0,65=IL 629 To mirror heater, LH

15B-21 M03 0,3-RW 629 To mirror heater switch

11C-0 B041 BP 340 To back buzzer

12C-7 YRL01 RL 340 115 To optional connector

13C-4 YRL01 Q

Chassis Rear chassis

13C-4 B041 BO 340 To rear combination lamp, LH

15C-4 B041 B0 340 To rear combination lamp, RH

13C-7 S06R GR 325 To rear combination lamp, RH

13C-8 T041 L 320 To rear combination lamp, LH

SAM connector (harness side)

11C 12C 13C 14G 15B 16B

HG10A HG10B HG20A HG20B HG80A HG80B

110-007348VB-1

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9 Technical data

9.16 Electrical wiring diagram

POWER CIRCUIT (14)

SAM

(VEHICLE BAT) 2/3

To high-current
fuse (HF01)

SAM

B40

105

To rear combination lamp, RH
(Lamp)

To fog lamp, RH

To license plate lamp

To fog lamp, LH

To wiper motor

To windshield wiper motor

To key interlock solenoid

To headlamp, LH
(high)

To headlamp, LH
(low)

To headlamp, RH
(high)

SAM connector (harness side)
9.16 Electrical wiring diagram

POWER CIRCUIT (15)

SAM
(VEHICLE BAT)3/3

To high-current fuse (HF01)

15-0 HF01

B40

105

SAM

To cigarette lighter

610

B.0101 O

To DPF cleaning switch

Gr13E

B.0101F 0.3-O

To identification lamp relay

349

R.01B3 0.3-O

To mirror heater switch

629

R.01MH 0.3-O

To van body dome light switch

352

R.01VR 0.2-O

J14

AX22X

Cab

Instrument panel

Joint

(JL01)

B.01H2 O

330

To hazard switch

B.01RA O

612

To radio

B.01D0 O

415

To tachograph

B.01AA 0.3-O

Gr55E

To air-conditioner ECU and control panel

B.01HC O

620

To heater control panel

B.01AM O

Gr22E

To ECO mode switch

B.01PT 0.3-O

850

To T/M PTO switch

B.01FL 0.3-O

315

To fog lamp switch

B.01DC 0.3-O

Gr13E

To cruise control main switch

B.01DB 0.3-O

622

To door lock switch

B.01TW 0.3-O

610

To front drive switch

SAM connector (harness side)

ECU : Electronic control unit
T/M : Transmission
PTO : Power take-off
DPF : Diesel particulate filter

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241
9 Technical data

9.16 Electrical wiring diagram

RESERVE POWER CIRCUIT

[Diagram of electrical wiring circuit with annotations and labels for connections and components such as "To van body dome light relay", "To identification lamp relay", "Optional connector", "VAN BODY DOME LIGHT IDENTIFICATION LAMP GND", "0.3-HB OPE1UP", etc.]

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242
### 9.16 Electrical wiring diagram

**GROUND (1)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Circuit No.</th>
<th>Wire diameter - wire color</th>
<th>Destination</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1]</td>
<td>EAB2</td>
<td>1.25-B</td>
<td>JOINT (EAB2)</td>
<td></td>
</tr>
<tr>
<td>[2]</td>
<td>EAB3</td>
<td>1.25-B</td>
<td>Frame ground ([12])</td>
<td></td>
</tr>
</tbody>
</table>
9 Technical data

9.16 Electrical wiring diagram

GROUND (2)


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

### 9.16 Electrical wiring diagram

**GROUND (3)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Circuit No.</th>
<th>Wire diameter - wire color</th>
<th>Destination</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[11]</td>
<td>HNE1</td>
<td>1.25-B</td>
<td>Frame ground ([12])</td>
<td>Horn</td>
</tr>
<tr>
<td>[12]</td>
<td>CFE1</td>
<td>1.25-B</td>
<td>Condenser fan motor</td>
<td>FE</td>
</tr>
<tr>
<td></td>
<td>EAB3</td>
<td>1.25-B</td>
<td>Cab ground ([2])</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EAC1</td>
<td>1.25-B</td>
<td>JOINT (EAC1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FHE1</td>
<td>1.25-B</td>
<td>Fuel filter</td>
<td>FG</td>
</tr>
<tr>
<td></td>
<td>FHE1S</td>
<td>1.25-B</td>
<td></td>
<td>FG</td>
</tr>
<tr>
<td></td>
<td>FLE1</td>
<td>B</td>
<td>Fog lamp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HNE1</td>
<td>1.25-B</td>
<td>Horn ground</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HSE1</td>
<td>2-B</td>
<td>DEF tank</td>
<td>BlueTec® exhaust gas aftertreatment</td>
</tr>
<tr>
<td></td>
<td>HSE2</td>
<td>2-B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[13]</td>
<td>EA81</td>
<td>8-B</td>
<td>SAM</td>
<td></td>
</tr>
<tr>
<td>[14]</td>
<td>ABE1</td>
<td>3-B</td>
<td>Hydraulic unit</td>
<td>ABS</td>
</tr>
<tr>
<td></td>
<td>ABE2</td>
<td>3-B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AME1</td>
<td>1.25-B</td>
<td>DUONIC® ECU</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AME2</td>
<td>1.25-B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EDE1</td>
<td>2.5-B</td>
<td>Engine ECU</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EDE2</td>
<td>2.5-B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EDE3</td>
<td>2.5-B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXE1</td>
<td>1.25-B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[15]</td>
<td>CFE1</td>
<td>1.25-B</td>
<td>Condenser fan motor</td>
<td>FG</td>
</tr>
<tr>
<td></td>
<td>EAR1</td>
<td>1.25-B</td>
<td>JOINT (EAR1)</td>
<td>FG</td>
</tr>
<tr>
<td></td>
<td>FHE1</td>
<td>-</td>
<td>Fuel filter</td>
<td>FE</td>
</tr>
<tr>
<td>[16]</td>
<td>-</td>
<td>15-B</td>
<td>Battery</td>
<td>FG</td>
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<td></td>
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<td>30-BY</td>
<td>Battery</td>
<td>FE</td>
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<tr>
<td>[17]</td>
<td>EAR1</td>
<td>1.25-B</td>
<td>JOINT (EAR1)</td>
<td>FE</td>
</tr>
<tr>
<td></td>
<td>FPE1X</td>
<td>0.85-B</td>
<td>Fuel pump</td>
<td>FE</td>
</tr>
</tbody>
</table>

SAM : Signal detect and actuation modules  
ABS : Anti-lock brake system  
ECU : Electronic control unit  
DEF : Diesel exhaust fluid
9.16 Electrical wiring diagram

GROUND (4)

* This diagram indicates grounding points.
* See the following pages for branching of grounding (wiring for “”).

ECU: Electronic control unit

[13] EAB1 8-B Star 105 To SAM (GND)
[1] EAB2 125-B Star To JOINT (EAB2)
[2] EAB3 125-B

FLE1 B Star 315 To fag lamp. LH

EAC1 125-B Star To JOINT (EAC1)


[12] CFE1 125-B <FE> 620 To condenser fan motor

Gr13E To fuel filter

FHE1 125-B <FG> 1210 FHE1S 125-B <FG>

FHE1S 125-B <FG>

HSE1 2-B Star

HSE2 2-B Star To JOINT (HSE1)

[15] FHE1 125-B <FE> Gr13E To fuel filter

CFE1 125-B <FG> 620 To condenser fan motor

Gr13E To JOINT (EAI1)

[14] ABE1 2-B

AME1 125-B Gr22E To DUONIC ECU

AME2 125-B Gr35E To hydraulic unit

ABE2 2-B

[17] EDE1 2-B

EDE2 2-B Gr13E To engine ECU

EDE3 2-B

EXE1 125-B Gr13E To exhaust brake valve

[16] EAR1 125-B <FE> To JOINT (EAR1)

FPE1X 0-B <FE> Gr13E To fuel pump

15-B or RTE3 30-BY + Battery

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9. Technical data

9.16 Electrical wiring diagram

GROUND (5)

Circuit No. EAB1 ground (1/6)

- B40
- SAM

[Diagram of electrical wiring diagram]

- To rear cab lamp
- To cab lamp
- To windshield washer motor
- Key interlock solenoid
- To heater control panel
- To power MOS-FET (transistor)
- To power window switch, LH
- To door lock actuator, LH
- To step lamp, LH
- To mirror heater, LH connector
- To power window switch, RH
- To step lamp, RH
- To mirror heater, RH connector
- To headlamp, RH (low)
- To headlamp, LH (low)
- To diagnosis connector
- To fuse level sensor

SAM connector (bottom side)

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9 Technical data

9.16 Electrical wiring diagram

GROUND (6)

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

ECU: Electronic control unit
9 Technical data

9.16 Electrical wiring diagram

GROUND (7)

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

![Electrical wiring diagram]

SAM connector (harness side)

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9 Technical data

9.16 Electrical wiring diagram

GROUND (8)

Circuit No. EAB1 ground (4/6)
<JONT(EAB1PL)>

--- Diagram Image ---

**Notes:**
- Only print out complete sections from the current version.
9 Technical data

9.16 Electrical wiring diagram

GROUND (9)

Circuit No. EAB1 ground (5/6)

\(<\text{JOINT(EAB1PR), JOINT(EA1)}>\)

\(\text{JOINT (EA1)}\)

To hazard switch 330
To cruise control main switch Gr13E
To fog lamp switch 315
To T/M PTO switch 850
To EOG mode switch Gr22E
To heater control panel 620
To A/C ECU and control panel Gr55E

\(\text{JOINT (EAB1PR)}\)

\(\text{Instrumenc panel}\)

B40 105
SAM

SAM connector (harness side)

EQU : Electronic control unit
DPF : Diesel particulate filter
A/C : Air-conditioner
T/M : Transmission
PTO : Power take-off

MITSUBISHI FUSO body/equipment mounting directives for FE, FG Issue date: 06. 07. 2012

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252
9 Technical data

9.16 Electrical wiring diagram

GROUND (10)

Circuit No. EAB11 ground (6/6)
<JOUTE(EAB1S)>

DPF : Diesel particulate filter
9 Technical data

9.16 Electrical wiring diagram

GROUND (11)

Circuit No. EAB2 ground
9.16 Electrical wiring diagram

GROUND (12)

Circuit No. EAC1 ground

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

100 CO7348EAC1
9 Technical data

9.16 Electrical wiring diagram

GROUND (13)

Circuit No. EARI ground

<FE>

JOINT (EARI)

TLEIR 0.85-B

320 325 To rear combination lamp, RH

330 340

TLEIL 0.85-B

320 325 To rear combination lamp, LH

330 340

LLEI B

320 To license plate lamp

BZEI B

340 To back buzzer

EARI 1.25-B

[17]

<FG>

T/F : Transfer
M/V : Magnetic valve

JOINT (EARI)

TLEIR 0.85-B

320 325 To rear combination lamp, RH

330 340

TLEIL 0.85-B

320 325 To rear combination lamp, LH

330 340

LLEI B

320 To license plate lamp

BZEI B

340 To back buzzer

EARI 1.25-B

12 B FWE2Y 810 To diode

FWE1 B

11 To T/F four-wheel drive

3-way M/V

W03

B FWE2X 810 To diode

Chassis

810 To T/F two-wheel drive

3-way M/V

W21

B FWE1Y 810 To T/F four-wheel drive switch

FWE3 B

[15]

130-C07346EARI

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Only print out complete sections from the current version
9 Technical data

9.16 Electrical wiring diagram

GROUND (14)

Circuit No. FLE1 ground

[Diagram of electrical wiring with labels and connections]
**9 Technical data**

**9.16 Electrical wiring diagram**

GROUND (15)

Circuit No. HSE1, HSE2 ground

DEF: Diesel exhaust fluid
ENGINE STARTING CIRCUIT (1)

(1/2)
ENGINE STARTING CIRCUIT (2)

(2/2)

A part of immobilizer circuit is omitted.
9 Technical data

9.16 Electrical wiring diagram

ENGINE ELECTRIC CIRCUIT (1/6)
9 Technical data

9.16 Electrical wiring diagram

ENGINE ELECTRIC CIRCUIT (2/6)
9 Technical data

9.16 Electrical wiring diagram

ENGINE ELECTRIC CIRCUIT (3/6)
ENGINE ELECTRIC CIRCUIT (5/6)

13F-007349-5
DAYTIME RUNNING LIGHT CIRCUIT

9.16 Electrical wiring diagram
9.16 Electrical wiring diagram

FOG LAMP CIRCUIT
9.16 Electrical wiring diagram

TAIL, POSITION AND LICENSE PLATE LAMPS CIRCUIT

Rear combination lamp, RH
Rear combination lamp, LH

To high-current fuse (HF01)

110 B40

SAM

120-3 TL01R

130-6 TL01L

130-8 LL01 OL

130-4 TL01 R

130-5 TL01 L

Chassis

Rear chassis

To high-current fuse (HF01)

110

STARTER

SW(M)

120-3 LS01M Y

210 To starter switch

License plate lamp

License plate lamp

Headlamp, LH
Headlamp, RH

J01

905

J/G (EA01LG)

SAB1LG B

120-23

9C

COMB. SW LN SG
FOR 0

130

SAB1LG B

120-23

110 C5

COMB. SW LN SG
FOR 0

130

C5

120-23

COMB. SW LN SG
FOR 0

130

C5

120-23

130

C5
9 Technical data

9.16 Electrical wiring diagram

TURN SIGNAL AND HAZARD LAMP CIRCUIT
9 Technical data

9.16 Electrical wiring diagram

CAB LAMP CIRCUIT

<Except crew cab>
9 Technical data

9.16 Electrical wiring diagram

CAB LAMP CIRCUIT

MITSUBISHI FUSO body/equipment mounting directives for FE, FG Issue date: 06. 07. 2012

Only print out complete sections from the current version
9 Technical data

9.16 Electrical wiring diagram

ILLUSTRATION LAMP CIRCUIT

Meter cluster connector (harness side)

Instrument panel

105 B40

90S J20

J20

C01

Meter cluster

120

G-55E

To air-conditioner ECU and control panel

To heater control panel

90S J01

A17 #001 Combination switch

Combination switch connector (harness side)

In this document:
- Only print out complete sections from the current version.
END-OUTLINE MARKER LAMP CIRCUIT

#201 B20
Identification lamp relay

Clearance and side marker lamp

F04a LH

F01a RH

To high-current fuse (F201) 110

ZAM

To combination switch 310

ID01 0.85-OM

To optional connector 115

JOINT (ID01)

JOINT (EAB1PR)

JOINT (EAB2)

Identification lamp F02a

SAM connector (harness side)

MITSUBISHI FUSO body/equipment mounting directives for FE, FG
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Only print out complete sections from the current version

277
9 Technical data

9.16 Electrical wiring diagram

METER CLUSTER INTERNAL CIRCUIT

(1/2)
9 Technical data

9.16 Electrical wiring diagram

TACHOMETER CIRCUIT

[Diagram of Tachometer Circuit]

ECU: Electronic control unit

410-C073A8
9 Technical data

9.16 Electrical wiring diagram

SPEEDOMETER CIRCUIT

[Diagram of electrical wiring circuit with labels and connections]

- **Motor cluster connector (harness side)**
- **DUONIC ECU**
- **˙ELO : Electronic control unit**
- **Vehicle speed sensor #265**
- **Harness side connector (harness side)**

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281
FUEL GAUGE CIRCUIT

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9.16 Electrical wiring diagram

WATER TEMPERATURE GAUGE CIRCUIT
PARKING BRAKE INDICATOR CIRCUIT

9.16 Electrical wiring diagram

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9.16 Electrical wiring diagram

BRAKE WARNING CIRCUIT

- 106  B40  SAM
- F09  CAB  09  YG  10-9  095
- F22  CAN(A)  10-11  Y  CAN(H)  1-11  CAN(L)  1-11
- CAN(O)  1-11  J20  905  CAN(H)  1-11
- 10-3  J20  905  J14
- 10-1  J14
- 10-3  B40  905
- BRAKE FLUID LEVEL SW
- STARTER SW(M)
- VAC, SW
- PARKING BRAKE SW
- SAM connector (front side)

- 130  130
- A22 #041  Brake fluid level switch
- Brake fluid decrease - Off
- 210  To starter switch
- 210  V201  WB
- T01 #023  Vacuum switch
- Brake fluid decrease - On
- A36 #038  Parking brake switch

- 401  Meter cluster
- CPU
- 130  Meter cluster connector (front side)
- 10-3  CAB  09  B40  SAM

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9.16 Electrical wiring diagram

ENGINE OIL PRESSURE WARNING CIRCUIT

ECU : Electronic control unit

SAM connector (harness side)

ECU : Electronic control unit

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**9. Technical data**

**9.16 Electrical wiring diagram**

CAB TILT WARNING CIRCUIT
CIGARETTE LIGHTER CIRCUIT

9 Technical data

9.16 Electrical wiring diagram

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1 Only print out complete sections from the current version
9.16 Electrical wiring diagram

WIPER AND WASHER CIRCUIT

To high-current fuse (HF1)

WIPER PARKED SW

STATER SW(M)

SAM

CO3 #422
Wiper motor

#428 CO2
Windshield washer motor

A17 #001
Combination switch

J/C (EAB1LG)
Combination switch connector (harness side)

905
J01

SAM connector (harness side)

292
9. Technical data

9.16 Electrical wiring diagram

AIR-CONDITIONER CIRCUIT (1)

<Rear heater>

D21 #034
Rear heater switch

D25 #750
Rear blower motor

B48 #201
Rear Blower motor relay

To blower motor
<See manual air-conditioner circuit>
9 Technical data

9.16 Electrical wiring diagram

AIR-CONDITIONER CIRCUIT (2)

<Manual air-conditioner>
9 Technical data

9.16 Electrical wiring diagram

AIR-CONDITIONER CIRCUIT (3)

<Rear air-conditioner>
9 Technical data

9.16 Electrical wiring diagram

POWER WINDOW AND CENTRAL DOOR LOCK CIRCUIT
9 Technical data

9.16 Electrical wiring diagram

MIRROR HEATER CIRCUIT

![MIRROR HEATER CIRCUIT Diagram]

[19]

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Only print out complete sections from the current version
9.16 Electrical wiring diagram

**JOINT CONNECTOR**

(1/2)

**Ground (EABILG)**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
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<tr>
<td>EABILG</td>
<td>OSEILG</td>
<td>CHEILG</td>
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**Rear door switch (DS0)**

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<tr>
<td>DS0R</td>
<td>DS0RL</td>
<td>DS0RR</td>
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**Meter cluster (CAN-Hi)**

<table>
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<tr>
<td>ON1HOM</td>
<td>CN2H</td>
<td>CM01H</td>
<td>-</td>
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</table>

**Meter cluster (CAN-Li)**

<table>
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<th>4</th>
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<tbody>
<tr>
<td>ON1LOM</td>
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<td>CM01L</td>
<td>-</td>
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</tbody>
</table>

**Immobilizer (CAN-Hi)**

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</thead>
<tbody>
<tr>
<td>CB1HM</td>
<td>CB2H</td>
<td>CM01H</td>
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</table>

**Immobilizer (CAN-Li)**

<table>
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<tbody>
<tr>
<td>CB1LM</td>
<td>CB2L</td>
<td>CM01L</td>
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</table>

CAN : Controller Area Network

905-07348-1
9.16 Electrical wiring diagram

JOINT CONNECTOR

(2/2)

Engine control (CAN)

Connection

DUONO (CAN)

Connection

ABS (CAN)

Connection

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9.16 Electrical wiring diagram

SAM CIRCUIT

SAM connector (harness side)

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9.16 Electrical wiring diagram

SAM CIRCUIT

(3/8)
9 Technical data

9.16 Electrical wiring diagram

SAM CIRCUIT

(5/8)
9 Technical data

9.16 Electrical wiring diagram

SAM CIRCUIT

(6/8)

---

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---

SAM connector (frame side)

964-C017448-8
9 Technical data

9.16 Electrical wiring diagram

SAM CIRCUIT

(7/8)
9.16 Electrical wiring diagram

SAM CIRCUIT

(8/8)
ANTI-LOCK BRAKE SYSTEM CIRCUIT (1)

SAM: Signal detect and actuation modules
CAN: Controller area network
ECU: Electronic control unit

Hydraulic unit ECU harness side connector

[Diagram of electrical wiring for anti-lock brake system]

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<td>13MY revised</td>
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<tr>
<td>F</td>
<td>18. Jun. 2012</td>
<td>Added notices for operation when the PTO is engaged</td>
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Engine Alternator Performance Curves revised |
Vehicle performance curve revised |
| A         | 16. May. 2011 | FG Model added |

Body/equipment mounting directives