BODY BUILDER'S DRAWINGS AND SUPPORTING DATA

FE.FG

LIT. No. LTE07001-A

SEP. 2007

INTRODUCTION

This book has been designed to provide information for body and equipment manufacturers who mount their products on MITSUBISHI-FUSO FE chassis.
We believe that all the detailed information which is essential for that purpose is contained in this book, but if you require any additional data or information, please contact:

MITSUBISHI FUSO TRUCK OF AMERICA, INC.
2015 Center Square Road,
Logan Township, NJ 08085
(Phone : (856) 467-4500)

The specifications and descriptions contined in this book are based on the latest product information at the time of publication, but since the design of MITSUBISHI-FUSO truck is continuously being improved, we must reserve the right to discontinue or change at any time without prior notice.

COMPLIANCE WITH FEDERAL MOTOR VEHICLE SAFETY STANDARDS

The federal government has established Federal Motor Vehicle Safety Standards (FMVSS) for various categories of motor vehicles and motor vehicle equipment under the provisions of the National Traffic and Motor Vehicle Safety Act of 1966. The Act imposes important legal responsibilities on manufacturers, dealers, body builders and others engaged in the marketing of motor vehicles and motor vehicle equipment.

Vehicles manufactured by Mitsubishi FUSO Truck & Bus Corporation (MFTBC) for the subsequent installation of commercial bodies are classified as incomplete vehicles. These vehicles fully comply with certain applicable Motor Vehicle Safety Standards, and partially (or do not) comply with others. They cannot be certified fully because certain components which are required for certification are not furnished. Under present federal regulations, vehicles completed from these units are required to meet all applicable standards in effect on the date of manufacture of the incomplete vehicle, the date of final completion, or date between those two dates, as determined by their final configuration.

MFTBC incomplete vehicles carry in the glove box a document, as shown on the next page, that provides the vehicle types (truck) into which they may appropriately be completed, and the degree to which the incomplete vehicles comply with each of the standards in effect on the date of its manufacture. The completing manufacturer must certify compliance with all applicable standards, but may rely on MFTBC certification for those standards so indicated in the instructions for completing the vehicle document, provided that the instructions for completing the vehicle are followed. Questions may be directed to the Engineering or Service Department of MFTBC.

Alterations, modifications, or additions to the vehicle which affect compliance with FMVSS are not covered by MFTBC certification and are the responsibility of the completing manufacturer. Likewise the completing manufacturer must assume responsibility for compliance with changes in federal requirements that occur after the manufacture of the incomplete vehicle by MFTBC, if he elects to certify compliance as of a later date.

INCOMPLETE VEHICLE DOCUMENT

DO NOT REMOVE

THIS DOCUMENT MUST REMAIN WITH THIS VEHICLE

UNTIL IT IS CERTIFIED AS A COMPLETE VEHICLE

THIS INCOMPLETE VEHICLE MANUFACTURED BY

MITSUBISHI FUSO TRUCK & BUS CORPORATION
890-12, Kashimada. Saiwai-ku, Kawasaki-shi,
Kanagawa, Japan

DATE OF MANUFACTURE :

VIN :

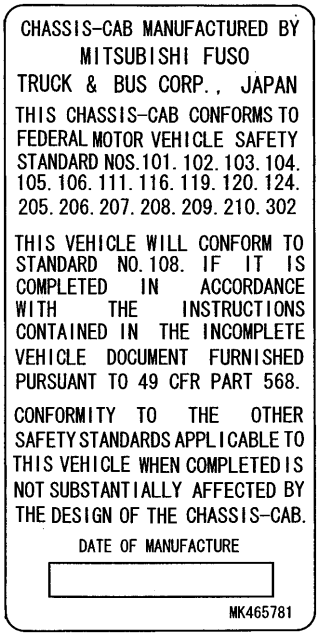
List of FMVSS and CMVSS applicable to MFTBC trucks with GVWR of more than 10,000 lbs. manufactured after Jan. 1, 2007 is shown below.

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

In addition to the Incomplete Vehicle Document, a Safety conformance Label as shown to the right is affixed to all the 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.



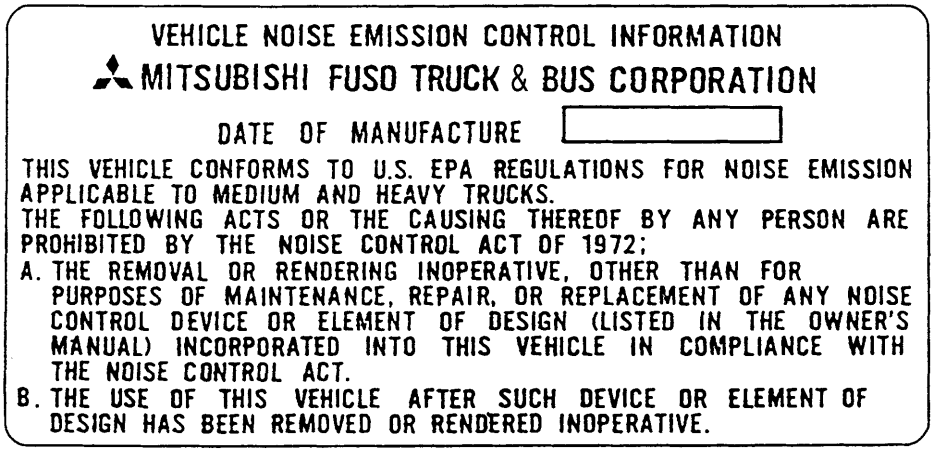
NOISE REGULATIONS

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 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.


VEHICLE NOISE EMISSION CONTROL INFORMATION

MITSUBISHI FUSO TRUCK & BUS CORPORATION

DATE OF MANUFACTURE

THIS VEHICLE CONFORMS TO U.S. EPA REGULATIONS FOR NOISE EMISSION APPLICABLE TO MEDIUM AND HEAVY TRUCKS.
THE FOLLOWING ACTS OR THE CAUSING THEREOF BY ANY PERSON ARE PROHIBITED BY THE NOISE CONTROL ACT OF 1972;

A. THE REMOVAL OR RENDERING INOPERATIVE, OTHER THAN FOR PURPOSES OF MAINTENANCE, REPAIR, OR REPLACEMENT OF ANY NOISE CONTROL DEVICE OR ELEMENT OF DESIGN (LISTED IN THE OWNER'S MANUAL) INCORPORATED INTO THIS VEHICLE IN COMPLIANCE WITH THE NOISE CONTROL ACT.
B. THE USE OF THIS VEHICLE AFTER SUCH DEVICE OR ELEMENT OF DESIGN HAS BEEN REMOVED OR RENDERED INOPERATIVE.

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

PART I

GENERAL PRINCIPLES OF BODY AND EQUIPMENT MOUNTING

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1. CLEARANCE BETWEEN THE MOUNTED BODY AND CHASSIS COMPONENTS

The clearance between the mounted body and chassis components should be greater than the values shown below. Pay attention to the position of the mounted body to facilitate the installation and removal of chassis components.

Location	Minimum Clearance and Related Cautions
1.1 Cab back	(1) Be sure to allow a minimum clearance of 50 mm (1.97 in.) from any point of the tilt path of the cab when tilting to avoid interference with any body over the cab.

UNIT: mm (in.)

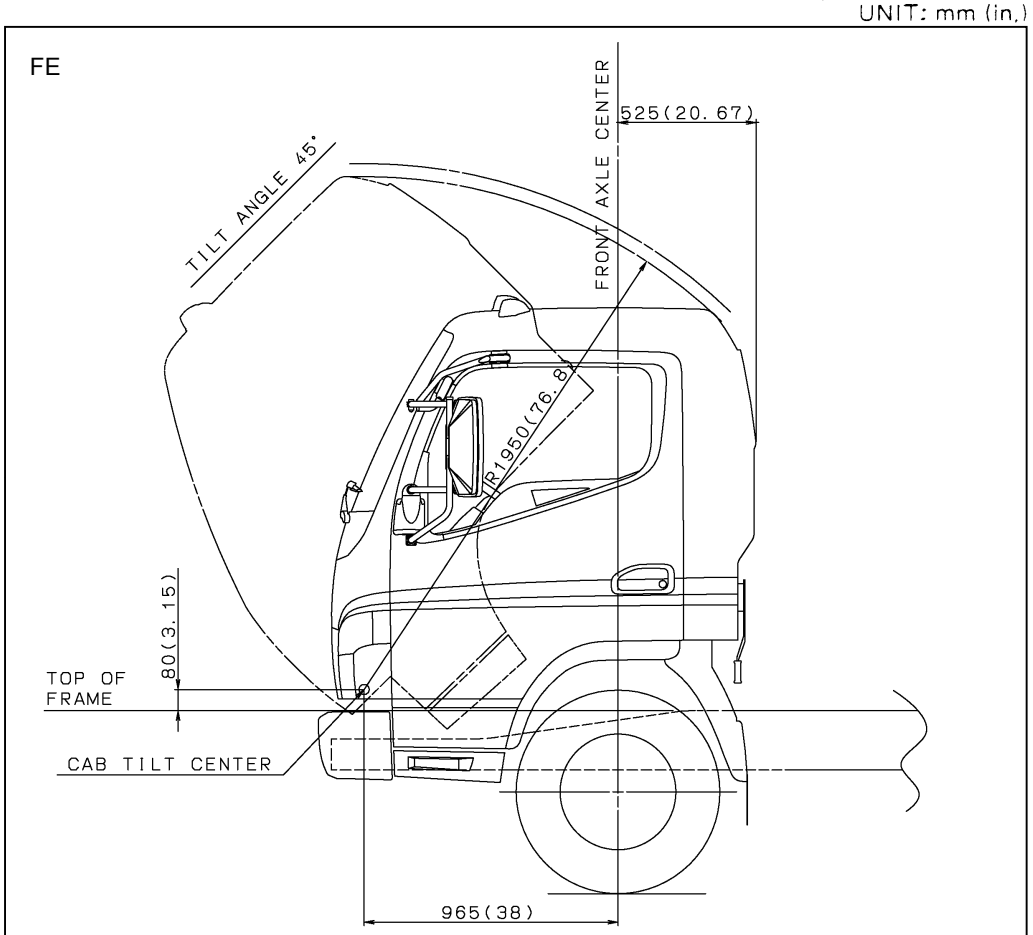

Fig. 1.1

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Location	Minimum Clearance and Related Cautions (Continued)
1.1 Cab back (Continued)	UNIT: mm (in.)

FG

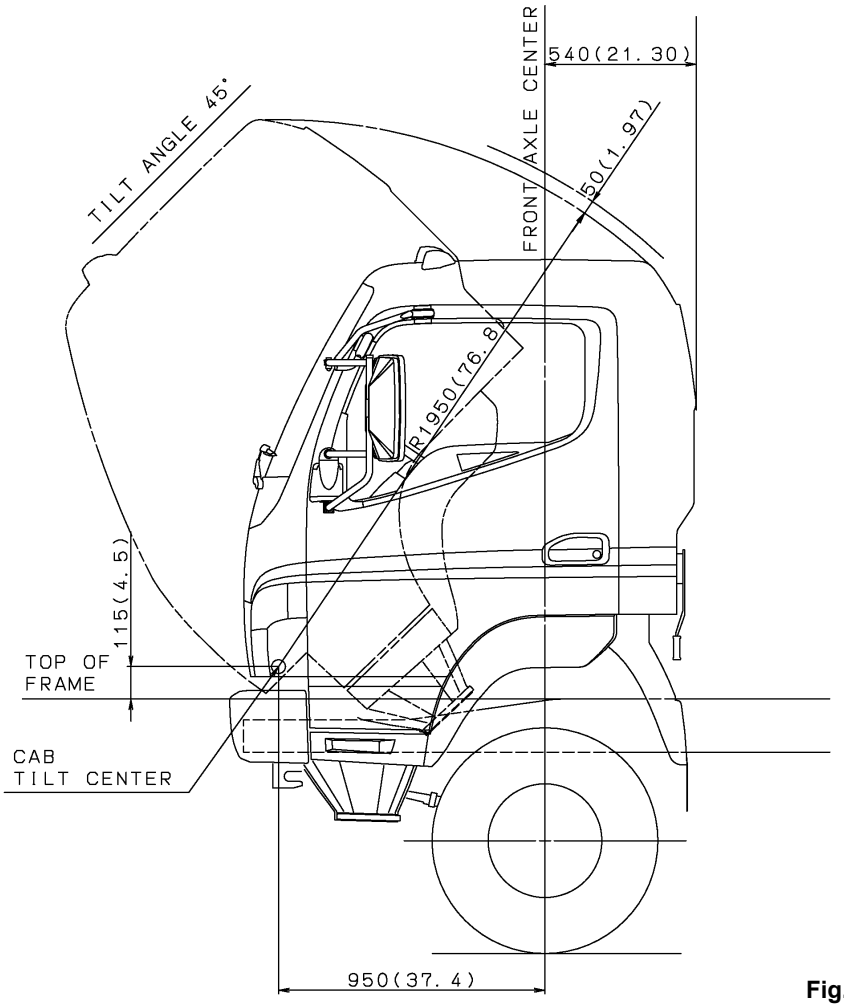


Fig. 1.2

(2) Maintain a clearance of 100mm (3.94 in.) or more between the cab rear surface (rear window panel) and the rear body.
Maintain adequate clearance around high heat producing components such as the turbocharger and related hardware.
Take appropriate measures such as installation of heat insulation panels, if necessary.

(3) When installing the body or equipment near the cab tilt lever (including the release lever), make sure the levers are not interfered with.

Location	Minimum Clearance and Related Cautions (Continued)
1.2 Around engine	Vertical direction: 40 mm (1.57 in.) Horizontal direction: 30 mm (1.18 in.)
1.3 Around transmission	An area of 25 mm (0.98 in.) in circumference should be clear around the transmission to facilitate inspection, removal and installation, except where noted.

MANUAL TRANSMISSION

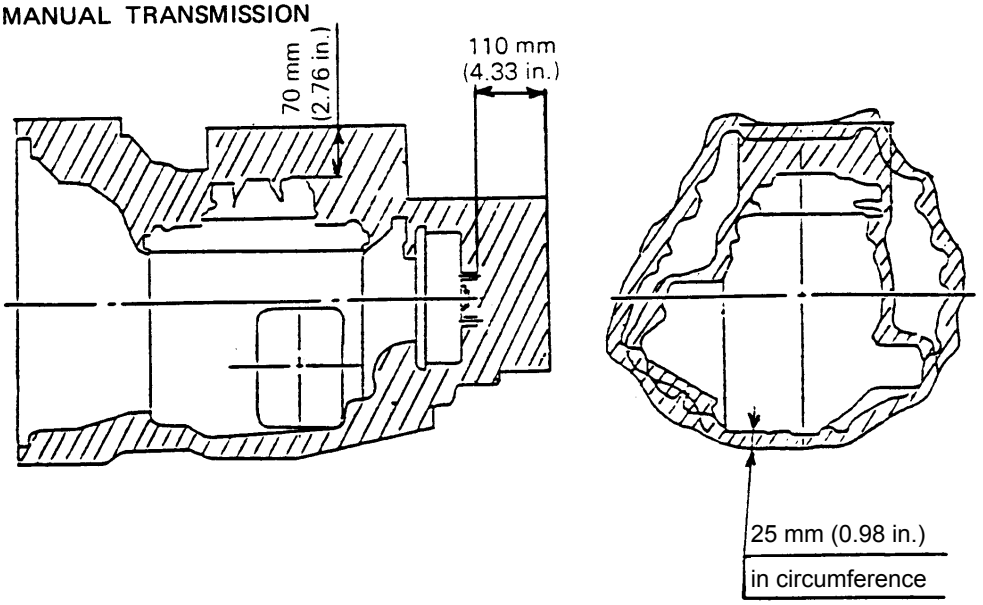


Fig. 1.3

AUTOMATIC TRANSMISSION

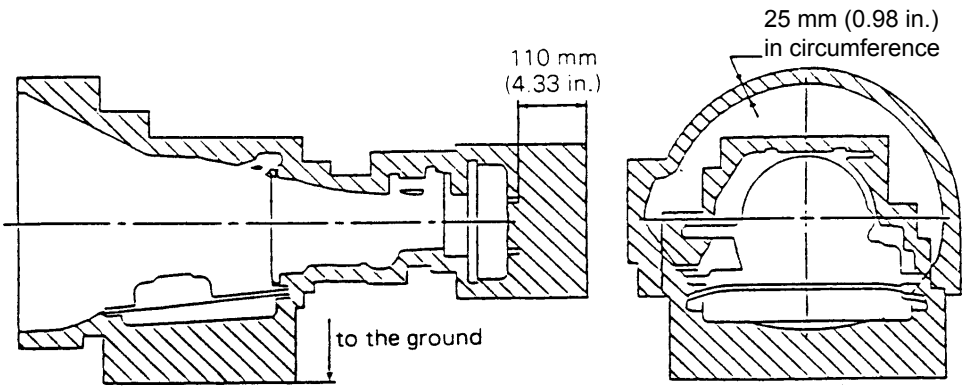
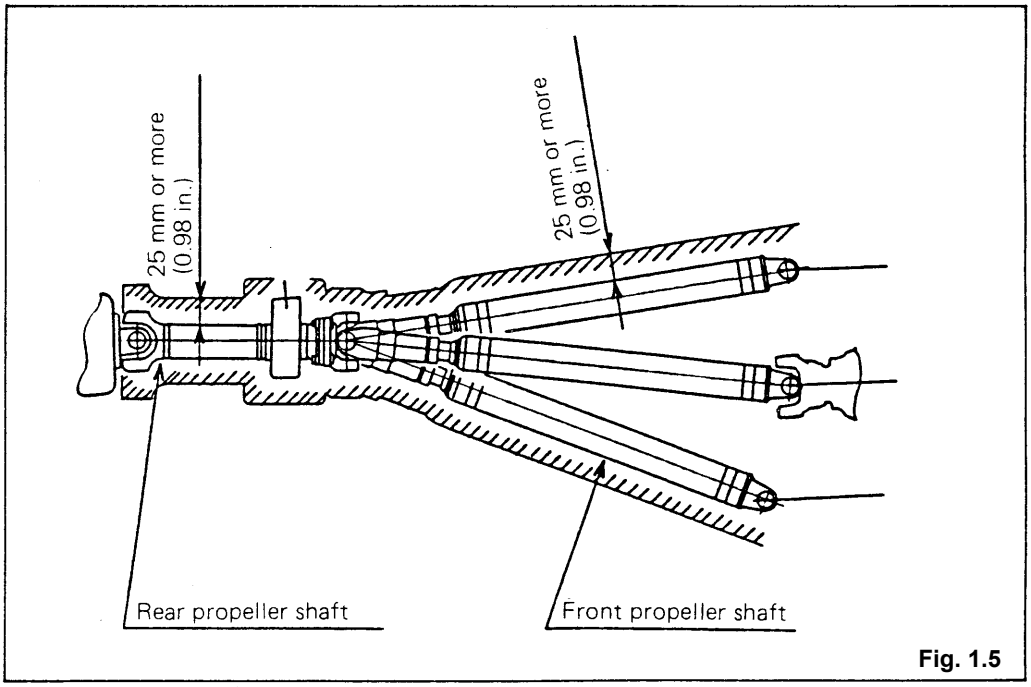


Fig. 1.4

Location	Minimum Clearance and Related Cautions (Continued)
1.4 Above transmission	Maintain a clearance of more than 70 mm (2.76 in.) above the transmission cover to allow removal of the cover. (M/T. Refer to Fig. 1.3)
1.5 Below transmission	Do not install anything below the transmission so the oil pan can be removed when the transmission oil is changed. (A/T only. Refer to Fig. 1.4)
1.6 Behind transmission	To facilitate transmission removal, allow a minimum clearance of 110 mm (4.33 in.) behind the transmission brake drum. (Refer to Fig. 1.3. and Fig. 1.4)
1.7 Front propeller shaft	Maintain a clearance of 25 mm (0.98 in.) around the front portion of the propeller shaft. (Refer to Fig. 1.5)  **Fig. 1.5**
1.8 Rear propeller shaft	Maintain a clearance of 25 mm (0.98 in.) around the propeller shaft at the rear axle location. (Refer to Fig. 1.5)
1.9 Front axle, Rear axle, Steering linkage	Maintain a clearance greater than 25 mm (0.98 in.), the moving limits of these parts, from other parts or components.

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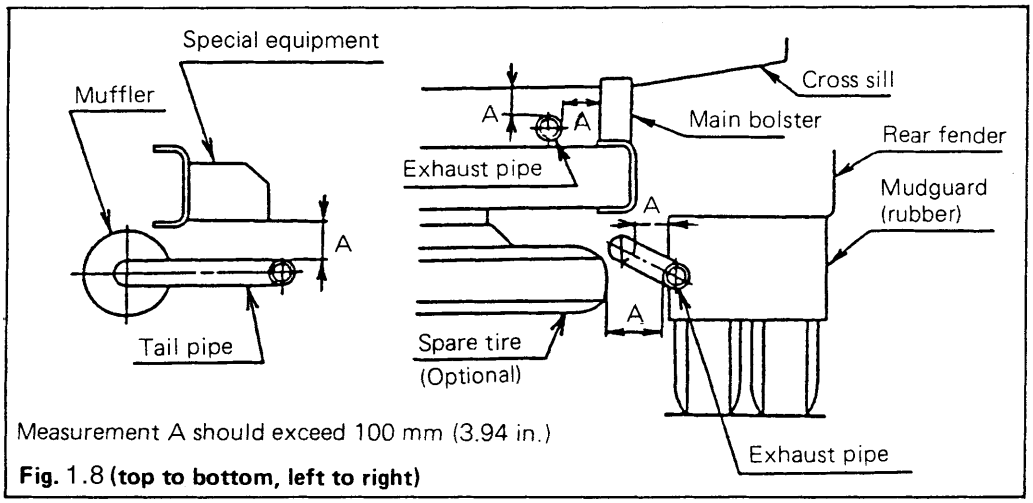
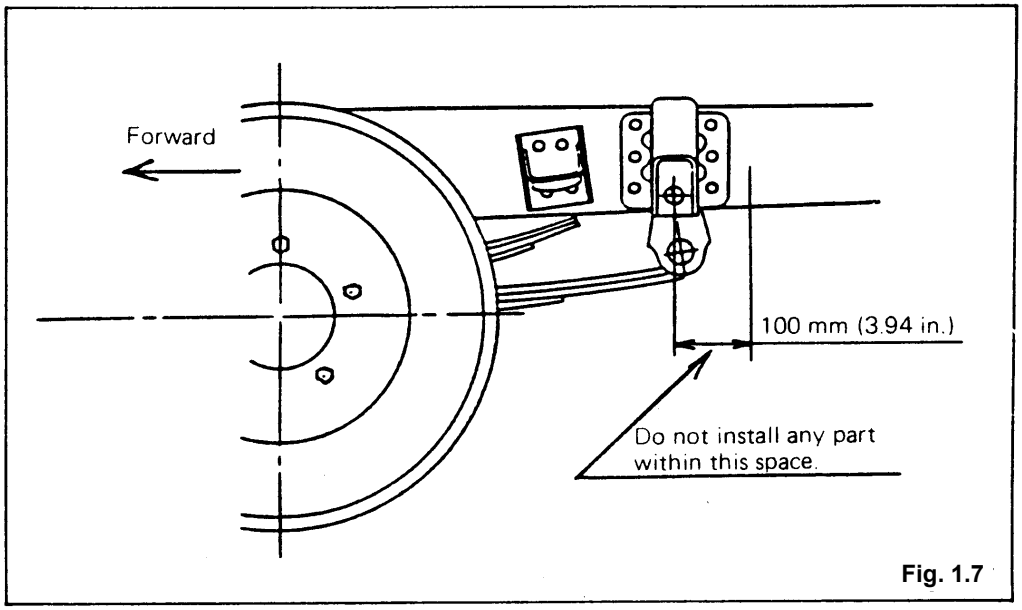
Location	Minimum Clearance and Related Cautions (Continued)
1.10 Brake hose (connected to the front and rear wheels)	Allow 50 mm (1.97 in.) more than the maximum possible extension of the hose during vehicle operation.
1.11 Fuel hose and other hoses	Maintain clearance of 40 mm (1.57 in.) from other parts or components.
1.12 Exhaust system	(1) To avoid damage by heat from the exhaust pipe or the muffler, keep flammable parts of the mounted body away from such heat sources by 100 mm (3.94 in.) or more. (See 5.2 regarding mudguard rubber.) If impossible, adopt heat insulation measures such as installation of an insulation panel.



Measurement A should exceed 100 mm (3.94 in.)

Fig. 1.8 **(top to bottom, left to right)**

(2) Do not mount any component near the exhausty pipe outlet.

Location	Minimum Clearance and Related Cautions (Continued)
1.13 **Rear spring**	Do not install any parts within 100 mm (3.94 in.) of the rear spring shackle.  **Fig. 1.7**

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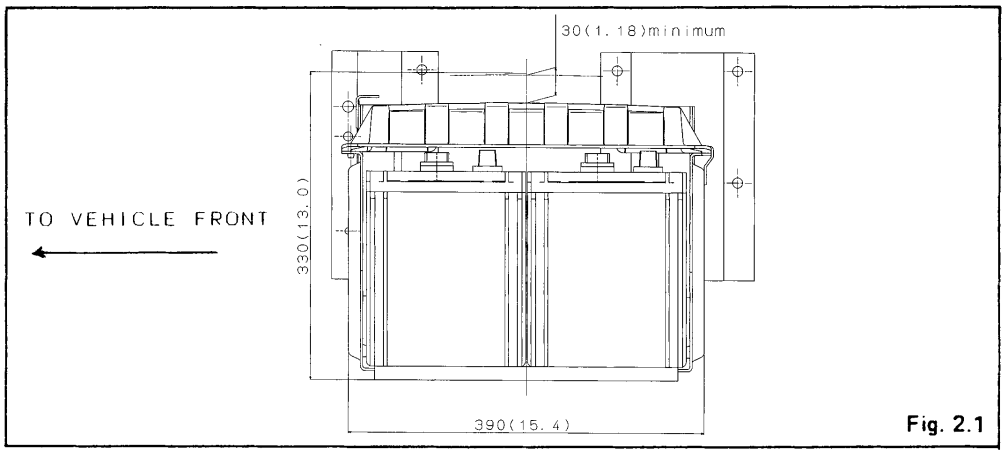
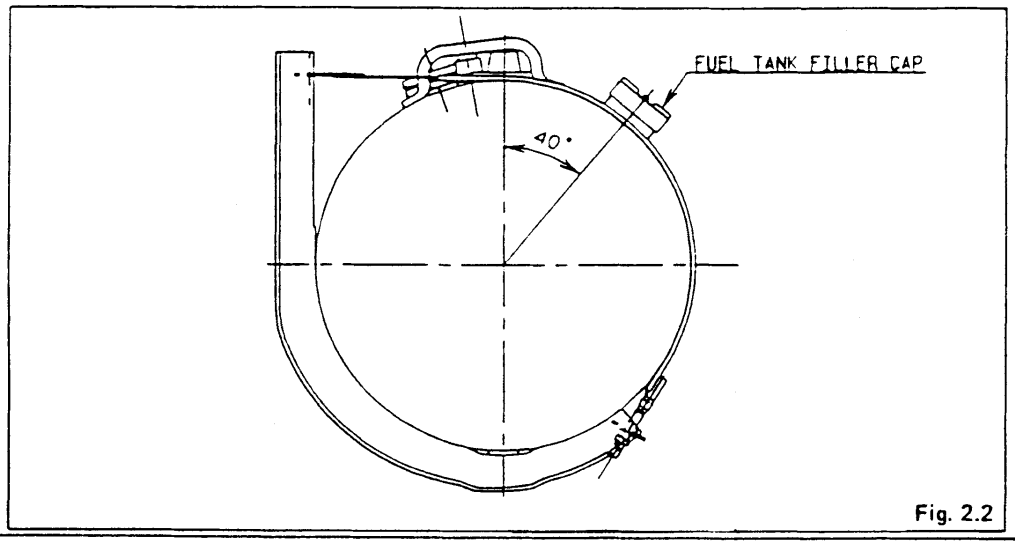
2. MOUNTING THE BODY FOR EASY INSPECTION, REMOVAL AND INSTALLATION OF CHASSIS COMPONENTS

Following the notes below will allow serviceability of chassis mounted components.

Location	Cautions
2.1 Battery	Position the rear body so the battery and cover can be inspected, removed and installed without difficulty. UNIT. mm (in.)  Fig. 2.1
2.2 Fuel tank	Do not hinder the fuel filler and related parts. Make sure that the cap is positioned correctly when installed. Special attention must be paid to the arrangement of cross members of the rear body. UNIT. mm (in.)  Fig. 2.2

Location	Cautions (Continued)
2.3 **Rear 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 hose is too long, may be required to be shortened. 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 MK517155 to the filler end pipe and retain it suing clamp # MH021302. Position the breather hose using clamps MH020946 to points indicated in the illustration below. Secure breather hose to the filler pipe using tie wraps #ME292602 in two places. Refer to Fig. 2.3, Fig. 2.4 and indicated in PART II Section 12.2 “FE Series (Rear fuel tank)”. 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 169 mm (6.65 in.) above the height of the upper truck frame flange. This will allow satisfactory fill speed. Attach the fuel cap tether. See PART II Section 12.2 “FE Series (Rear fuel tank)”. The air vent valve inclination must be approximately 25 degrees to vertical. Attach caution label MK518283 where it will be easy to see. Inspect the system and insure that all attaching hardware is secure. Make sure there are no leaks or restrictions.

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Location	Cautions (Continued)
2.3 Rear fuel tank (Continued)	

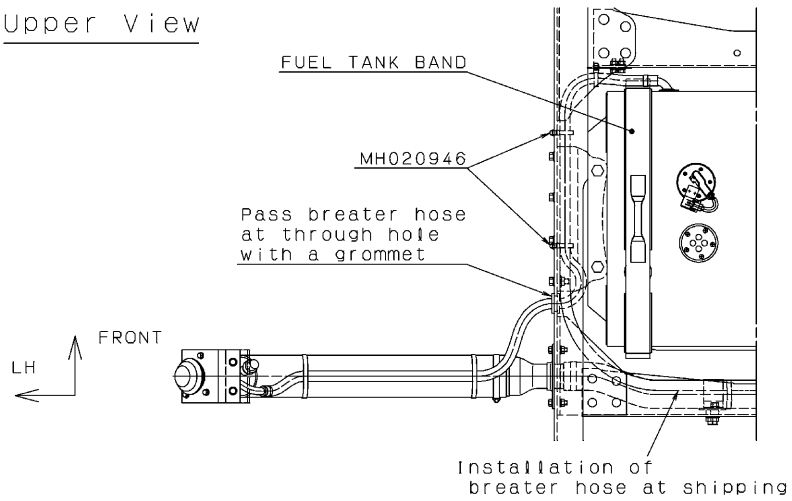

Fig. 2.3

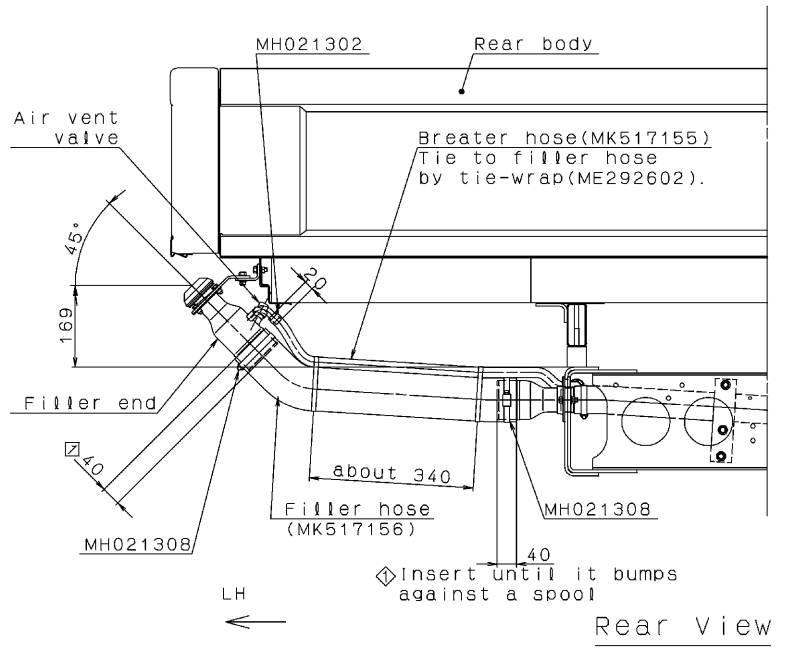

Fig. 2.4

Part	Tightening torque	Remarks
Screw of Clip	3.9 ± 1.0 {2.9 ± 0.7} [N·m {ft.lbs}]	-
Filler end	8 - 12 {5.9 - 8.8} [N·m {ft.lbs}]	With tether of filler cap

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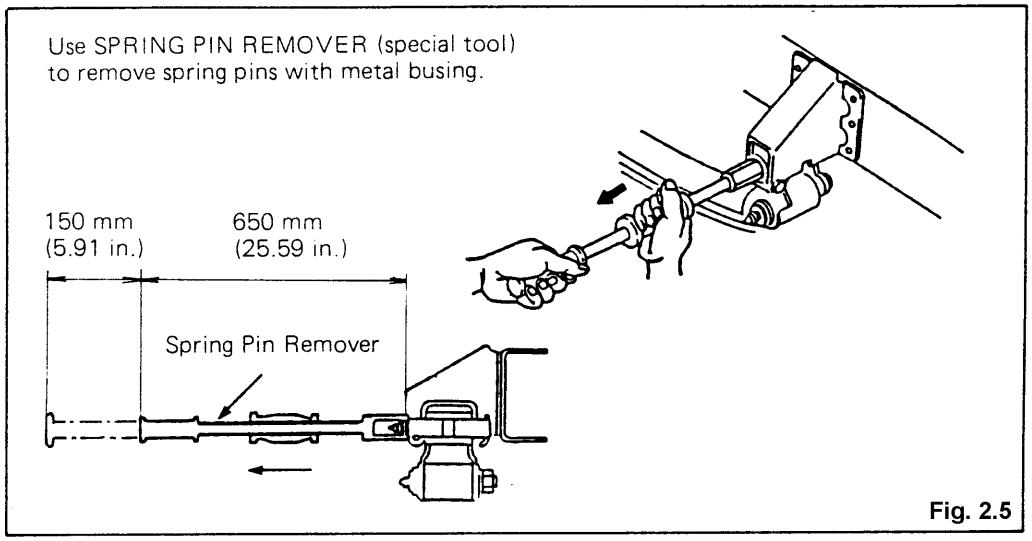
Location	Cautions (Continued)
2.4 **Rear spring**	Allow adequate clearance around the rear spring pin area.  **Fig. 2.5**

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3. CAUTION IN MODIFYING CHASSIS FRAMES

Modify the chassis frame according to the procedures described below.

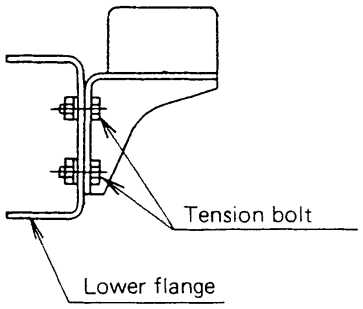
<table>
<tr><th>Modification</th><th>Cautions</th></tr>
<tr><td>3.1
Drilling frames
(General)</td><td>(1) Use proper drills. Do not use tools such as a blow torch to drill holes.
(2) Always chamfer the edges after drilling.</td></tr>
<tr><td>3.2
Drilling side rails</td><td>(1) The hole diameters and center-to-center distance of holes should be as follows.
<table>
<tr><th></th><th>Hole diameter</th><th>Center-to-center distance of holes</th></tr>
<tr><td>Holes for tension bolt or shear bolt</td><td>11 mm (0.43 in.) max.</td><td>30 mm (1.18 in.)* min.</td></tr>
</table>
Note*: Maintain the dimensions of previously drilled holes.
<table>
<tr>
<td>Tension bolt
(Bolts subject to tension)
 

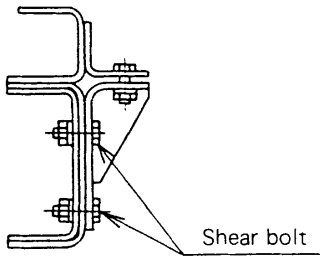
Fig. 3.1</td>
<td>Shear bolt
(Bolts subject to shearing force)
 

Fig. 3.2</td>
</tr>
</table>
(2) Do not drill holes in the upper flange.
(3) Do not drill holes in the lower flange within the wheelbase.
(4) Holes in the lower flange should be separated at least 200 mm (7.87 in.) from the crossmember, gusset end, and the spring hanger. (Refer to Fig. 3.4.)
(5) The number of holes to be drilled in the lower flange must be one in the lateral direction of the flange, and it must be more than 25 mm (0.98 in.) from the free edge of the flange.</td></tr>
</table>

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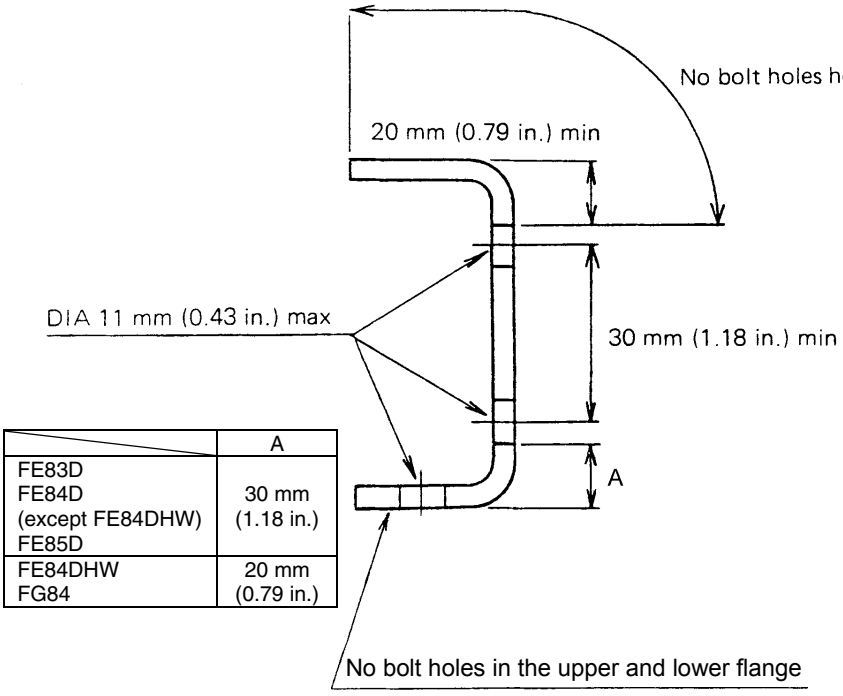
Modification	Cautions (Continued)
3.2 Drilling side rails (Continued)	(6) Do not drill holes within 20 mm (0.79 in.) from the curved part of the side rail, otherwise the bolt head may be within the radius of the curved surface of the channel.

UNIT: mm (in.)



	A
FE83D FE84D (except FE84DHW) FE85D	30 mm (1.18 in.)
FE84DHW FG84	20 mm (0.79 in.)

Fig. 3.3

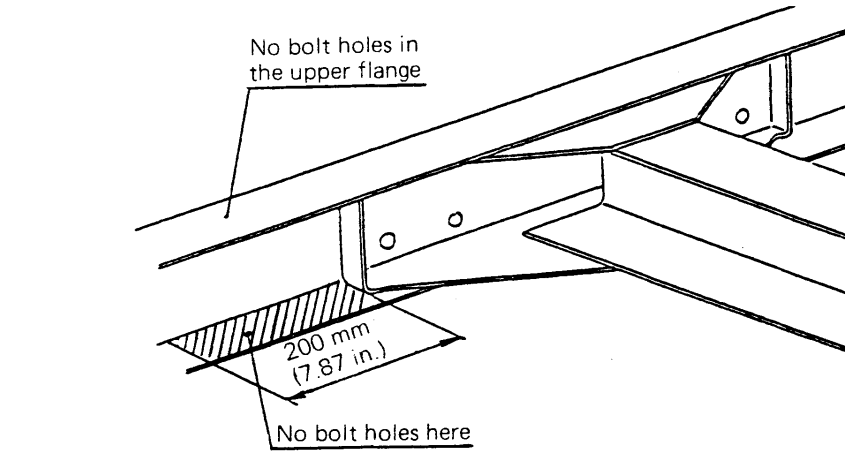


Fig. 3.4

Modification	Cautions (Continued)
3.3 Drilling crossmembers	(1) The holes and distances between the holes should conform to the values specified in the chart below.

Crossmember type	Hole diameter	Center-to-center distance of holes
○ Alligator type (see Fig. 3.5) ○ Channel type (see Fig. 3.6)	9 mm (0.35 in.) max.	30 mm (1.18 in.)* min.

Note*: Maintain the dimensions of previously drilled holes.

(2) 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.

(3) 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. 3.6)

(4) Holes in the flange should be more than 25 mm (0.98 in.) from the end.

(5) Holes should be drilled more than 20 mm (0.79 in.) from the curved part of the flange.

Alligator type

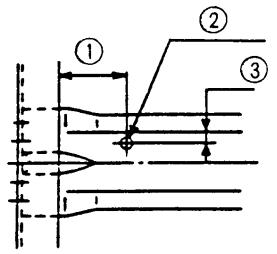


Fig. 3.5

Channel type

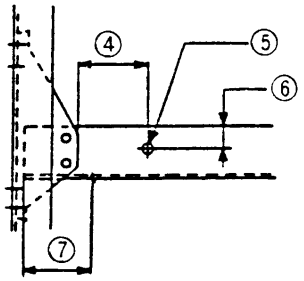


Fig. 3.6

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

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Modification	Cautions (Continued)
3.4 Welding to frame	(1) Do not weld any part on to the flange of the side rails. Welding on the lower flange within the wheelbase is strictly prohibited. (2) Do not weld anything within 20 mm (0.79 in.) of the curve of the side rail.

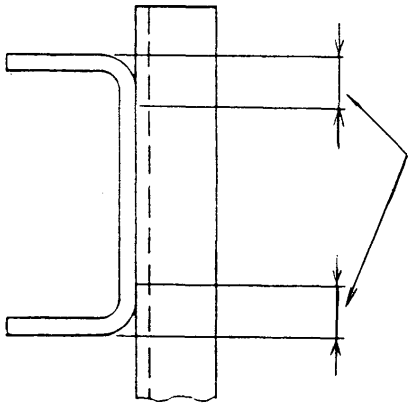


Fig. 3.7

(3) Do not weld any item to the frame for temporarily adhesion.

(4) Clean parts thoroughly with a wire brush and dry them off before welding.

(5) Make sure the paint is completely removed, before welding a painted part.

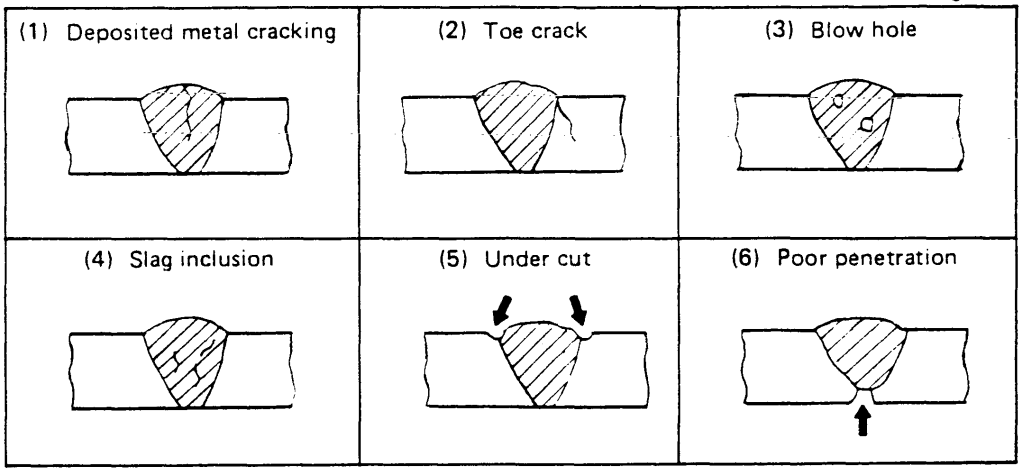
(6) Use a low hydrogen type welding electrode. The welding electrode absorbs moisture when it is used, so it is necessary to dry it thoroughly before use.

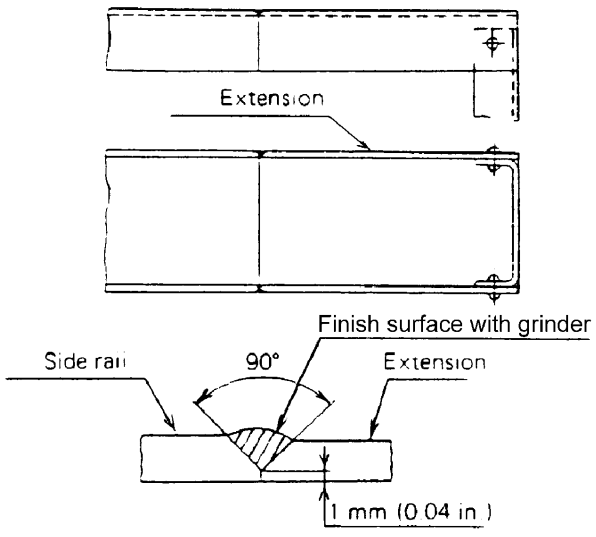
(7) When welding, maintain the optimum welding speed and conditions for the preservation of the welding electrode.

(8) Maintain the welding current at the optimum value for safety.

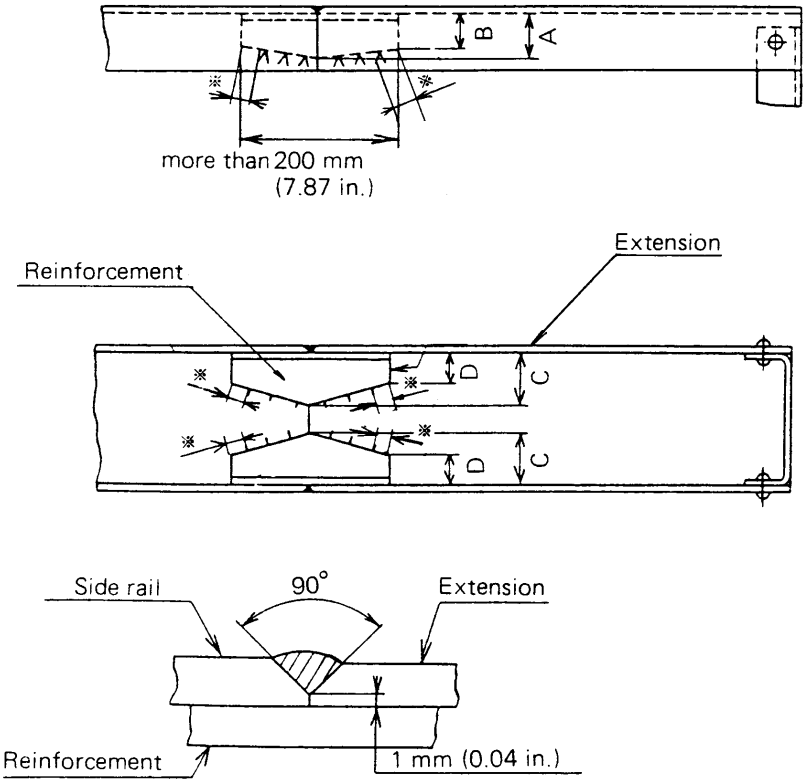
(9) Avoid defects such as deposited metal cracking, toe crack, blow holes, slag inclusion, under cut, poor penetration, etc.

Fig. 3.8



Modification	Cautions (Continued)
3.4 Welding to frame (Continued)	(10) 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. (11) When performing welding work on the chassis, take proper measures to prevent the tubes, harnesses, rubber parts, springs, etc. from heat or spatter. (12) Do not cool parts off with water after welding. **CAUTION ⚠** Before performing electric or arc welding as part of vehicle repair operation, disconnect the negative (–) cable from the battery and the connector from the ECU. The earth cable of the welding machine should be connected to a point as close to the welding area as possible.
3.5 Extension of rear overhang	Extension of the rear overhang may be required. Extension procedures are listed below. (1) Added material as an extension member. Use steel plates of SAPH440 (JIS) (SAE J410 950X or the equivalent) for the frame. The cross section form should be the same as that of the side rail rear end. The plate thickness should be 4.5 mm (0.18 in.) (2) Reinforcement material. Use the same SAPH440 (JIS) (SAE J410 950X or equivalent) for the frame. The plate thickness should be 3.2 mm (0.13 in.)–4.5 mm (0.18 in.). (3) Rear overhang extension (a) Added material length less than 300 mm (11.8 in.) Butt weld continuously from the outside as shown in Fig. 3.9, and finish the welded surface by grinding. No reinforcement is required for normal usage, but reinforcement should be added as shown in (3)-(b) in order to support heavy weights on the overhang extension.  **Fig. 3.9**

Modification	Cautions (Continued)
3.5 Extension of rear overhang (Continued)	(b) Added material length of 300 mm (11.8 in.) or more Attach reinforcement on the inside of the side rail as shown in Fig. 3.10. Butt-weld the additional material and the side rail continuously, and then finish the welded surface by grinding.



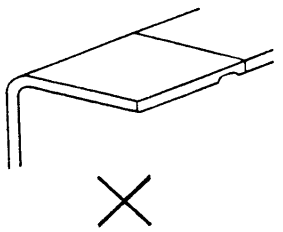
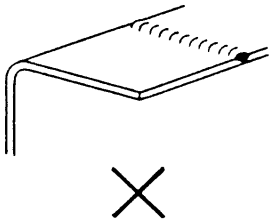
Note: There should be no contact within 10 mm (0.39 in.) of the asterisk ※ mark.

UNIT: mm (in.)

A	B	C	D
50 (1.97)	35 (1.38)	50 (1.97)	35 (1.38)

Fig. 3.10

(4) Exercise great care while welding the reinforcement to the lower face of the rear side rail where it is tapered.

Modification	Cautions (Continued)
3.5 Extension of rear overhang (Continued)	(5) Cautions for finishing the side rails Be especially careful when finishing the flange end of the butt-welded side rails. Ensure a clean finish by grinding the weld so it is free of undercut, pileup or convexed bead. Under cut  Fig. 3.11 Pile up  Fig. 3.12
3.6 Shortening or extending the frame within the wheelbase	Frames should not be extended or shortened within the wheelbase because considerations for the propeller shaft length, balancing, position of center bearings, brake piping and harness length are required. If this is unavoidable, contact MFTA for advice.
3.7 Reinforcement on side rail	Avoid adding outside reinforcement to the side rail, as this can actually produce stress concentrations which cause cracks in the frame. If additional reinforcement is absolutely necessary, perform the procedures described below. (1) An L-shaped stiffener is recommended. The channel type stiffener should not be used because it produces a gap with the side rail flange. (2) Position the L-shaped stiffeners so the flange will be on the side of the side rail stress that receives the tension (the lower surface within the wheelbase and the upper side for the overhang). (3) Do not align the stiffener ends with the ends of the sub side rail that have already been installed. (Refer to Fig. 3.13) (4) Do not position the ends of the stiffener near stress concentration locations such as the rear surface of the cab, spring hangers, crossmember ends, etc. (5) Do not cut the outer stiffener ends vertically. They should be cut at an angle of less than 45°. (Refer to Fig. 3.13) (6) Attach the stiffeners and the side rail by riveting or plug welding on the web. (7) When drilling rivet holes, the outer stiffeners and side rails should be processed together. The difference between the rivet and hole diameters should be less than 0.7 mm (0.03 in.). The rivet holes should be separated from the side rail corners by 20 mm (0.79 in.).

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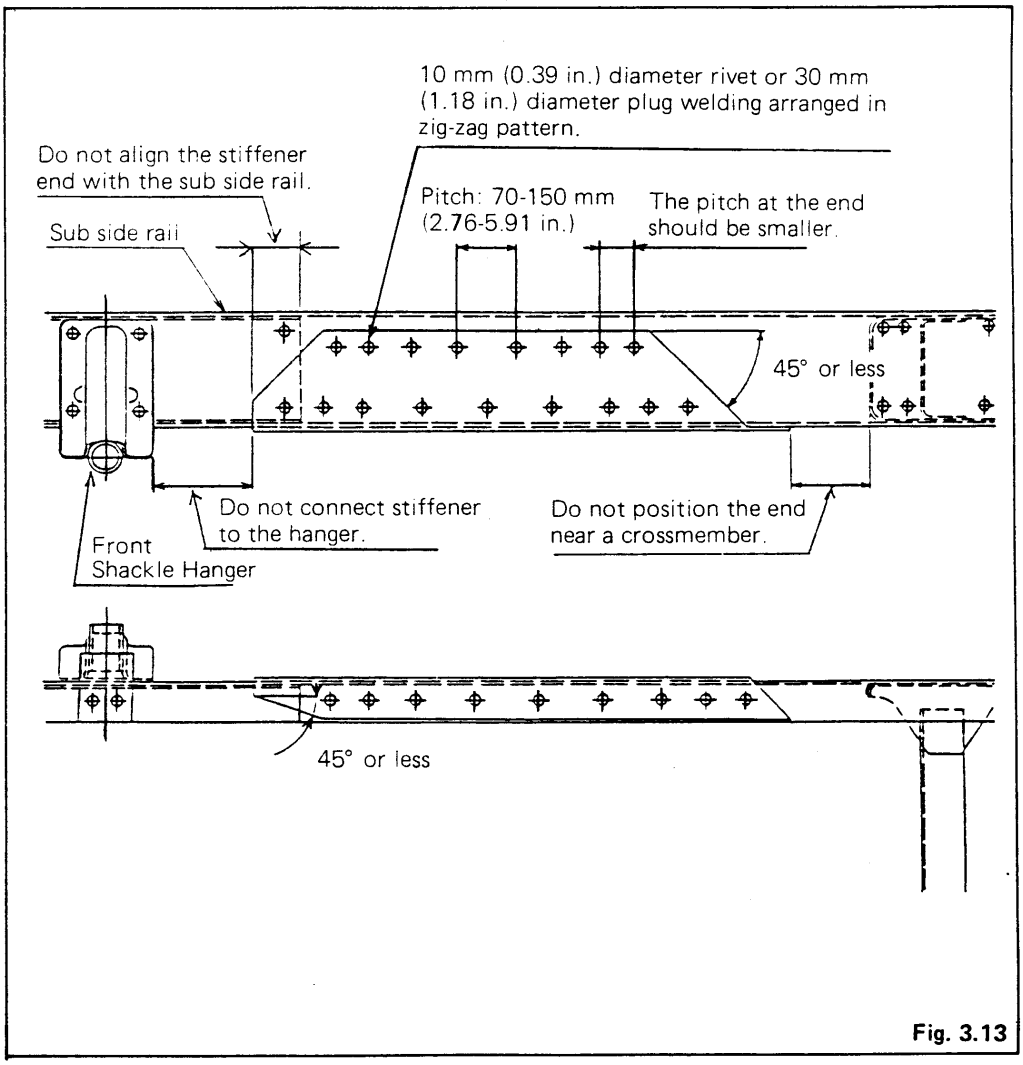
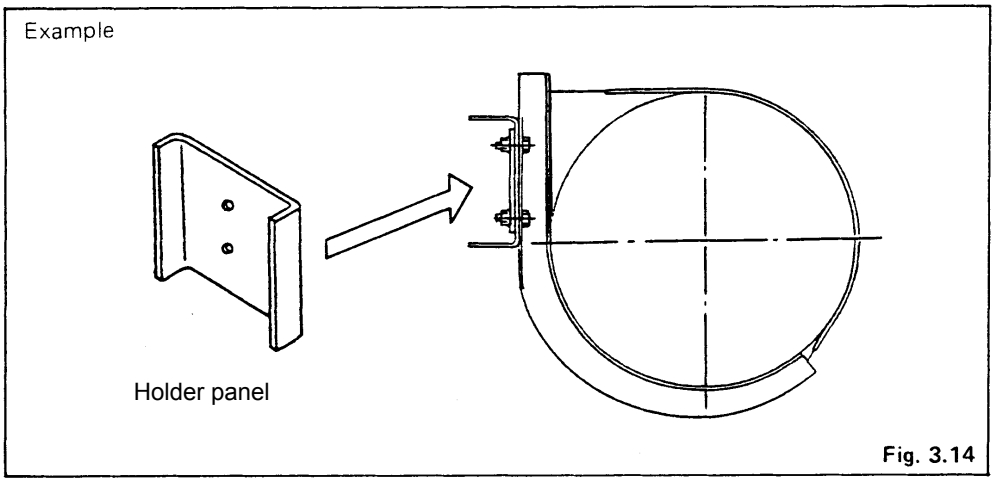
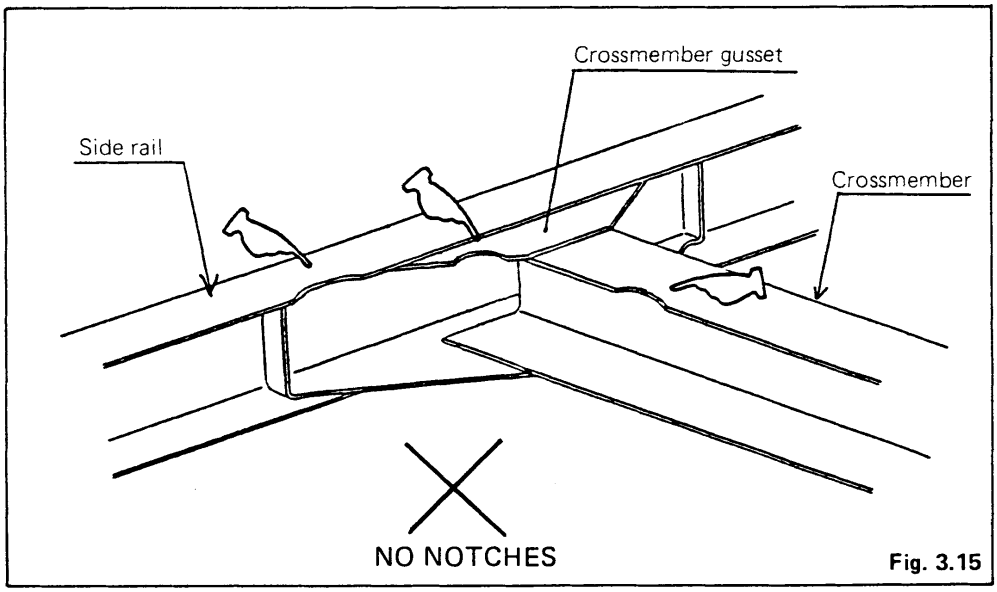
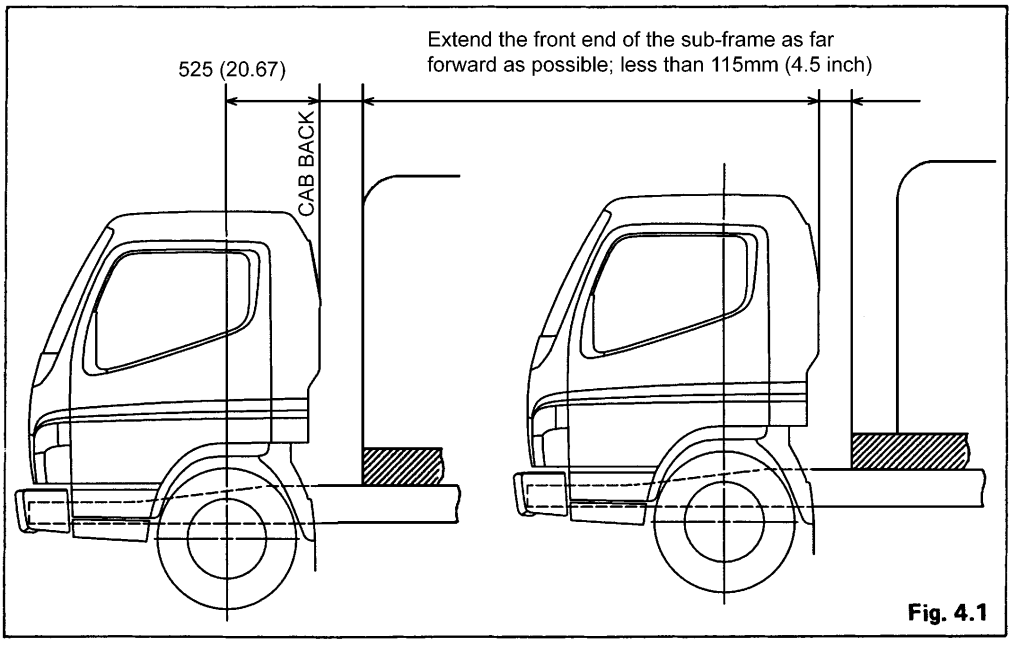
Modification	Cautions (Continued)
3.7 Reinforcement on side rail (Continued)	(8) Use rivets which have a 10 mm (0.39 in.) diameter. Arrange them in a zig-zag pattern. (9) Separate rivets and bolts at least 70 mm (2.76 in.) to prevent heat damage or distortion when they are plug welded. (10) Holes for plug welding should be at least 30 mm (1.18 in.) dia and arranged in a zig-zag pattern. (11) Position the end of the stiffeners 25 mm – 30 mm (0.98 in. – 1.18 in.) from the holes for rivets or plug welds. (12) The pitch for rivets and plug welds should be 70 mm – 150 mm (2.76 in. – 5.91 in.). Keep the pitch small near the edge of the stiffener. (13) Do not drill any additional holes in the side rail flange. Only use the holes which have been already drilled in the flange.  Fig. 3.13

Modification	Cautions (Continued)
3.8 Mounting equipment on the side rail	(1) Attach a stiffener to the inside of the side rail as shown in Fig. 3.14 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. (220.5 lbs.) of force for each bolt.  Fig. 3.14 (2) 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.
3.9 Others	Never drill or grind any notches in the side rail, crossmember flange, or crossmember gusset.  Fig. 3.15

4. CAUTIONS IN MOUNTING A REAR BODY

Location	Cautions
4.1 General cautions	(1) To ensure vehicle safety, reliability and maintenance, do not perform any of the following modifications or alterations to the chassis. (a) Cutting any part of the cab or welding anything to the cab. (b) Modifying any part related to the axle, steering, brake or propeller shaft. (c) Modifying brake hoses or vacuum lines. (Use MFTBC replacement parts only.) (d) Making any modification to the chassis other than those described in this manual. (2) Make an effort to minimize the weight of the body mounting so that it will not jeopadize the strength or rigidity of the frame. (3) Be sure to install a sub-frame securely on the chassis frame so as to evenly distribute the load on the vehicle. (4) Do not modify the engine cooling system components, such as blocking the air intakes in the front bumper, or removing the radiator seal rubber, as it may result in decreased performance or engine damage. (5) Always observe any applicable law when modifying parts related to noise suppression, such as the muffler and exhaust pipes.
4.2 Sub-frame	(1) Install the sub-frame as shown in Fig.4.1 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. UNIT: mm (in.)  Fig. 4.1

Location	Cautions (Continued)
4.2 Sub-frame (Continued)	(2) Examples of front-end shape of sub-frames (a) Install the sub-frame having the shape as shown in Fig. 4.2 to gradually reduce the stress concentrations in the front end.

UNIT: mm (in.)

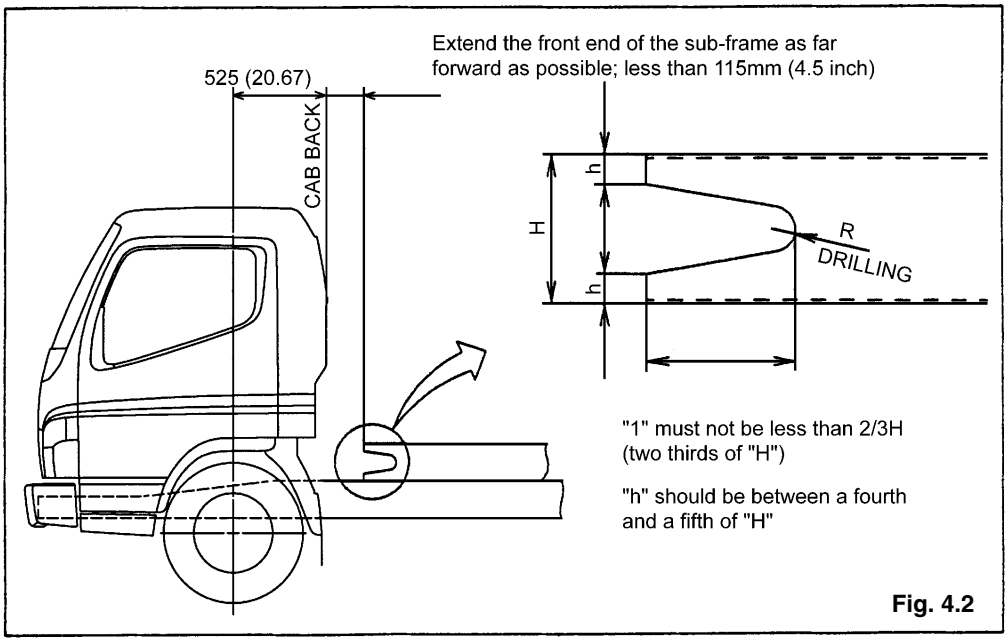


Fig. 4.2

(b) The shape of the sub-frame front end as shown in Fig. 4.2 is highly desirable. However, if there is enough room behind the cab, the shape as shown in Fig. 4.3 is also acceptable.

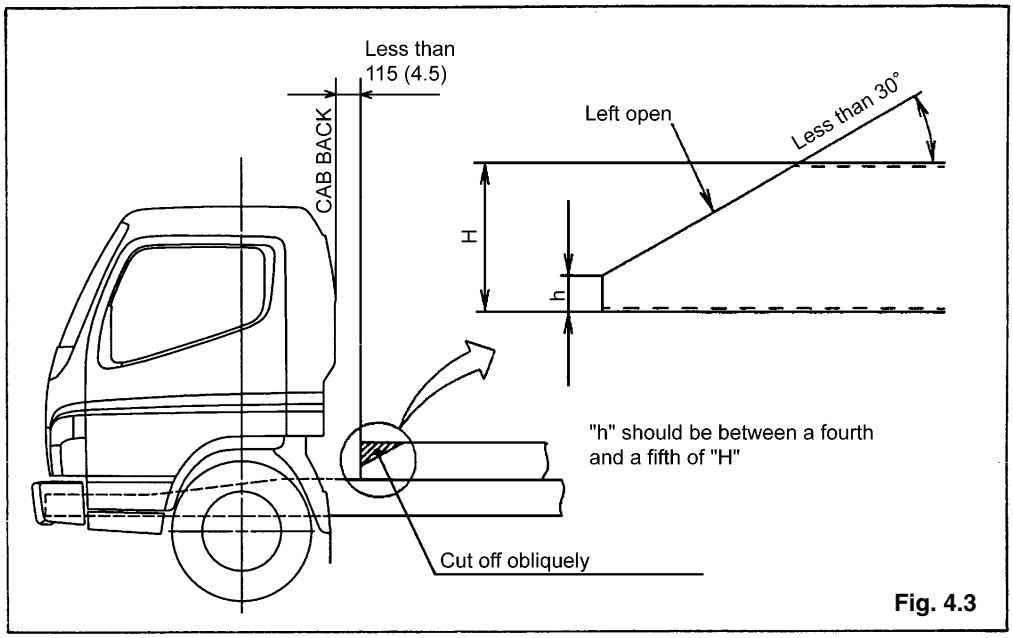


Fig. 4.3

Location	Cautions (Continued)
4.2 Sub-frame (Continued)	(c) If it is difficult to shape the front end of the sub-frame as described in Fig. 4.2 and Fig. 4.3, cut it to the shape as shown in Fig. 4.4 before installation.

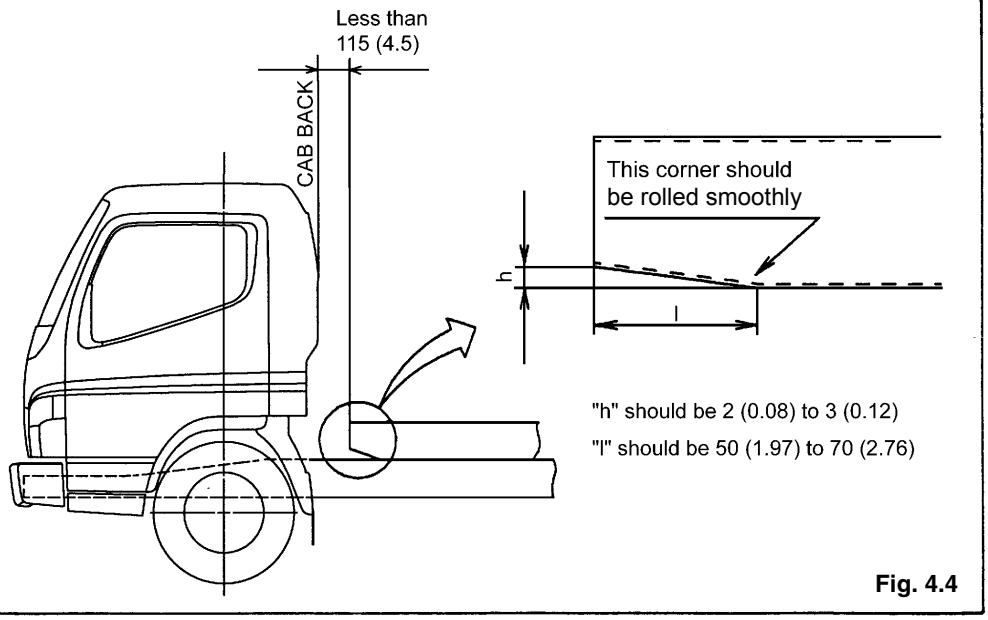


Fig. 4.4

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Location	Cautions (Continued)
4.3 Attaching with U-bolts	(1) Allow sufficient clearance for the U-bolts to be tightened to the sub-frames or main bolsters. Don't contact the pipes, hoses, wires and harness. (2) Do not install U-bolts at the taper-cut position of the sub-frame or main bolster.

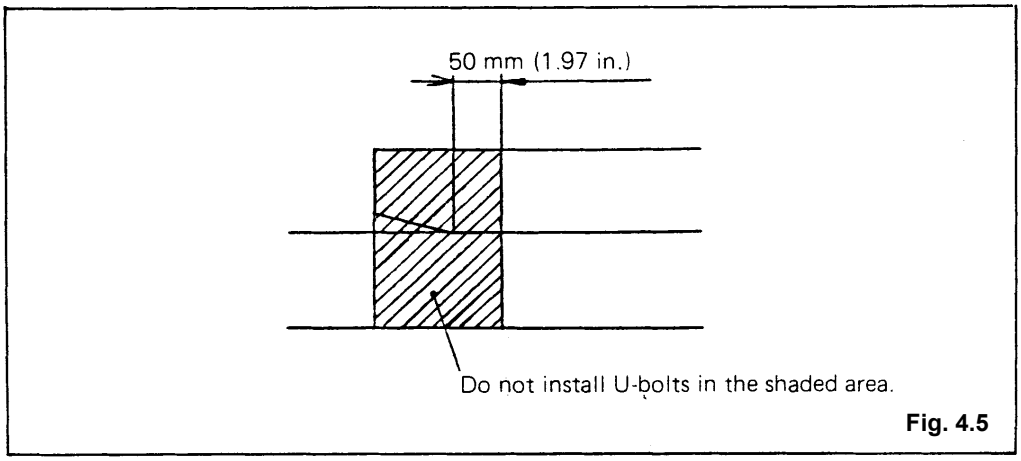


Fig. 4.5

(3) Place a wooden spacer inside the flange of the side rail to avoid bending when tightening the U-bolts.

(4) Use metal spacers in locations subject to heat, such as near the muffler, or other places where it is difficult to place wooden spacers.

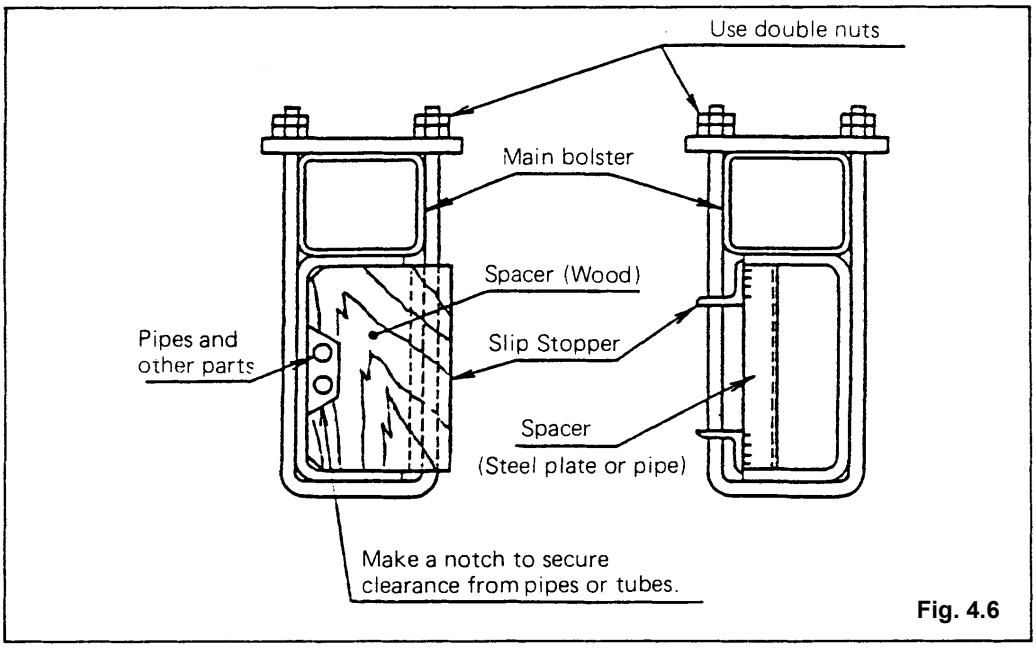
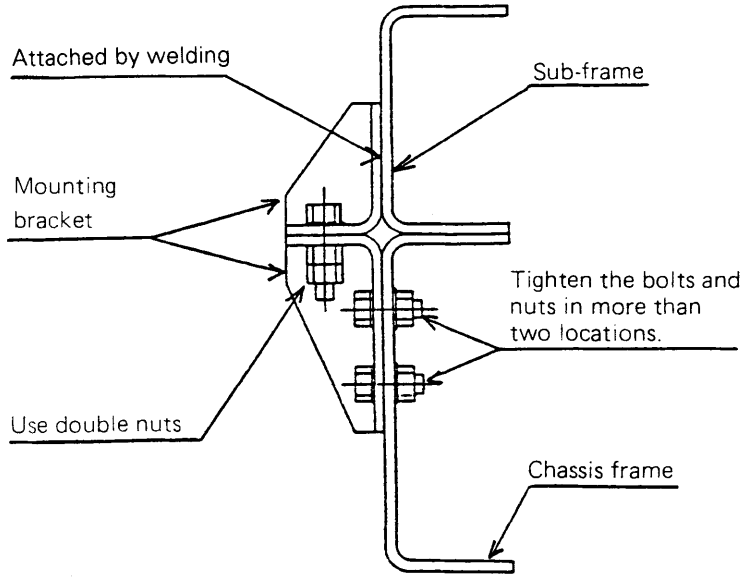
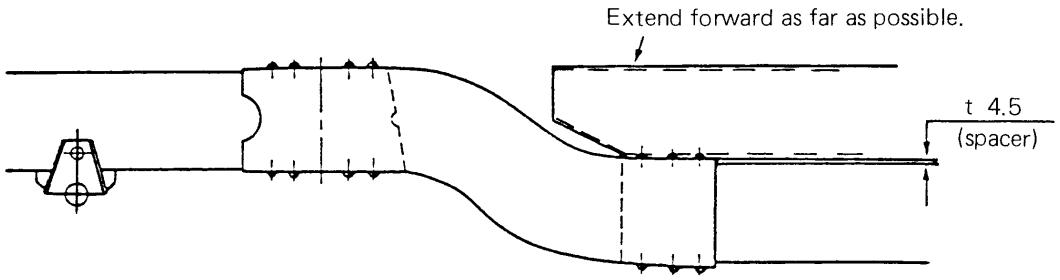
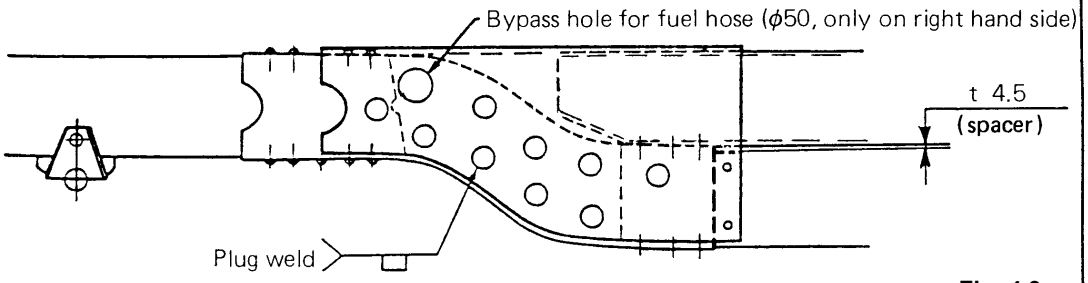


Fig. 4.6

Location	Cautions (Continued)
4.4 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. (a) Attach the mounting brackets to the chassis frame with bolts whenever possible, and follow the procedures described in Section 3, "CAUTION IN MODIFYING CHASSIS FRAMES". Be especially careful not to damage any pipes, hoses, and wiring harnesses attached to or around the frame. (b) 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.  **Fig. 4.7**

Location	Caution (Continued)
4.5 Mounting of rear body (FG only)	(1) When mounting a subframe on the 4WD frame, follow the instructions below. (a) For general use:  **Fig. 4.8** (b) For cases where there may be concentrated stress on the chassis frame or excessive input. Reinforce the frame using an L-shaped stiffener as shown in the figure below. Be sure to tighten the plug weld (ϕ30), existing battery, fuel tank, spare-tire hanger, etc. at the same time.  **Fig. 4.9** (2) For installing a dump body, install a float control valve in the hydraulic system to avoid an abrupt dump action with heavy cargo loaded.

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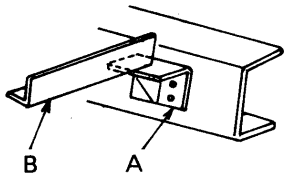
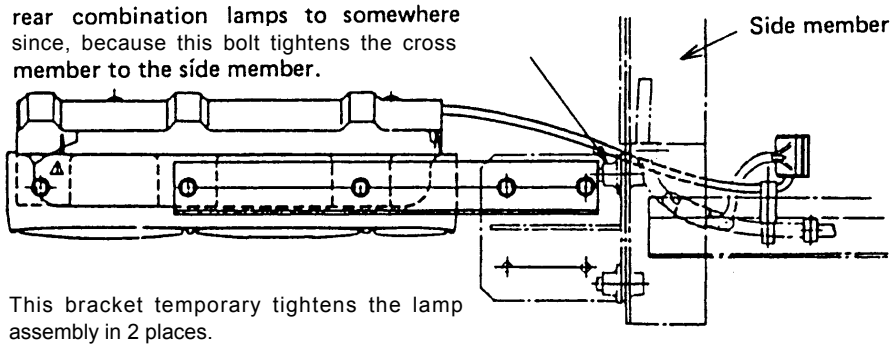
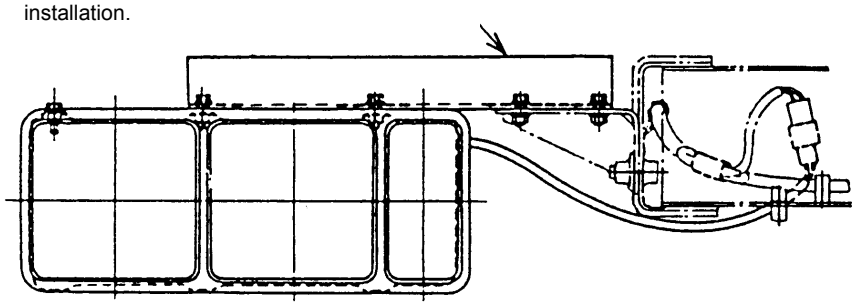
Location	Cautions (Continued)
4.6 Attaching of the rear combination lamps	Don't remove bracket A. Don't keep the rear comb. lamps on the bracket B. Please install them securely.  **Fig. 4.10** Never remove this bolt when moving the rear combination lamps to somewhere since, because this bolt tightens the cross member to the side member.  This bracket temporary tightens the lamp assembly in 2 places. Use a more sophisticated one for permanent installation.  **Fig. 4.11**

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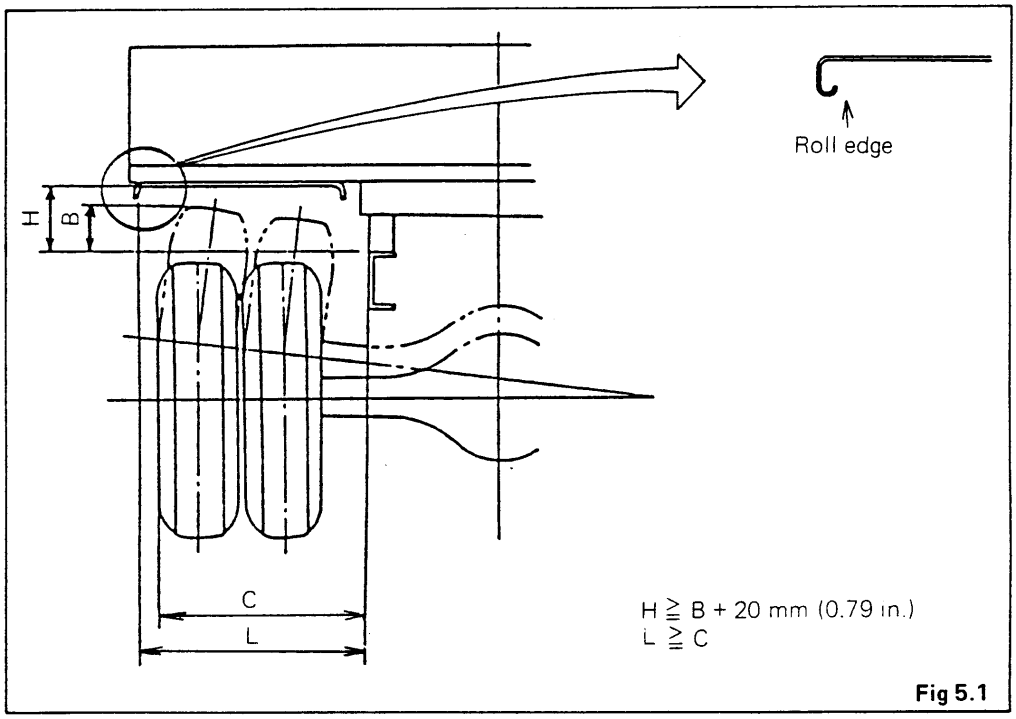
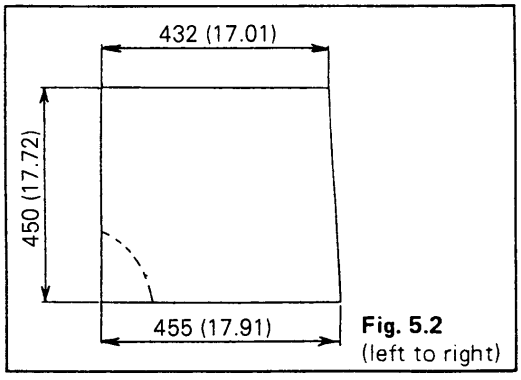
5. INSTALLING REAR FENDER AND MUD GUARD

Location	Cautions
5.1 Installing rear fender	(1) Install the rear fender so the clearance between the tire and the fender is as open as possible to compensate for bad operating conditions. The standard clearances "H" and "L", between the fender and the upper and side surfaces of the frame, are determined by the values "B" and "C" of the rear axle upper rebound limit indicated in PART II Section 11. "REAR AXLE BOUNCE HEIGHT".  Fig 5.1 (2) Roll over the rear fender edge on the outside to inside of the rear fender as shown in Fig. 5.1 to prevent cracks and maintain safety. (3) The outer edge of the fender should extend beyond outside of the tire.
5.2 Rear fender mud flap	(1) Standard dimensions of a mud flap are shown in Fig. 5.2. Notes: 1. This figure is for use on the right side, but the left side is symmetrical. 2. Please cut off the left bottom corner of the mudflap or add a bar to the mudflap to suppress fore-and-aft movement of the mudflap when the vehicle is in motion (see 1.12). UNIT: mm (in.)  Fig. 5.2 (left to right)

Location	Cautions (Continued)
5.2 Rear fender mud flap (Continued)	(2) The standard installation dimensions are shown in Fig. 5.3, but they may be increased or decreased to improve splash protection or prevent entanglement in the wheels. Install a mud flap retaining board as shown in Fig. 5.4 to prevent the flaps from being caught in the wheels, especially for mud flaps which are longer than the specified standard.

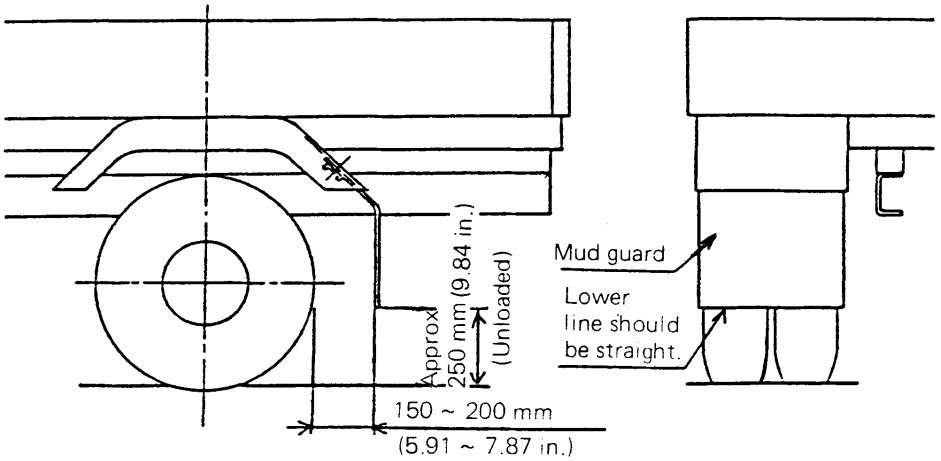


Fig. 5.3

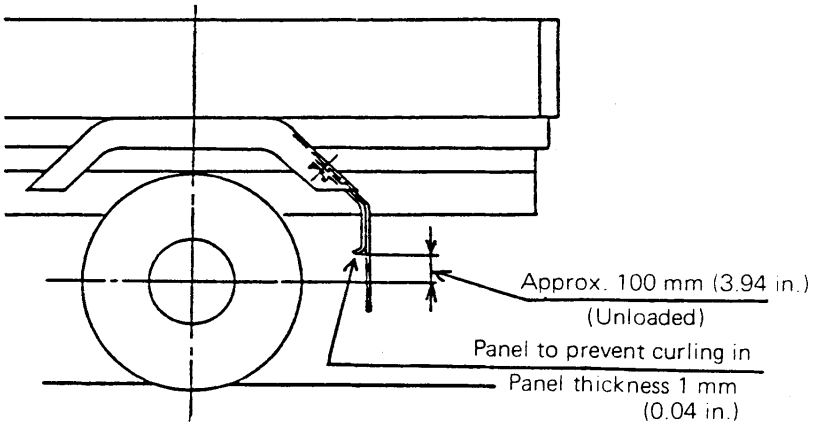


Fig. 5.4

6. ELECTRICAL WIRING

Follow the procedures described below when making additions or modifications to the electrical wiring to prevent fires and maintain safety of the brake systems.

Location	Cautions
6.1 Additional wiring	(1) Use wires of the same gauge and color as the original wires when making wiring extensions. (2) Connect wires securely by soldering or crimping terminals and then insulate them completely with tape or other material. Never attempt to connect wires by just twisting the stripped ends together. (3) Do not use sulfuric acid for soldering. (4) Do not extend or shorten the battery cables. In case of change of battery cable wiring due to the transfer of the battery, be sure not to make any extension or shortening of the battery cables. Replace the cables with the ones with specified length. (5) 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. (6) Wiring should be made along the rear body parts, the frame, etc., and never extend it individually in midair. (7) Clamp all wires securely in locations away from moving parts or sharp corners on the chassis and body. Use grommets whenever routing wires through metal plates in order to prevent electrical short circuits due to installation damage. (Fig. 6.1)

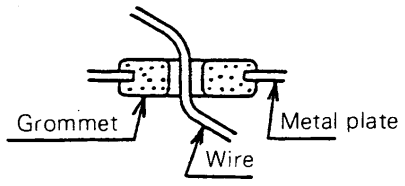


Fig. 6.1

Location	Cautions (Continued)
6.1 Additional wiring (Continued)	(8) Wires should never pass along brake tubes or fuel lines. Observe the following clearances.

Wiring	Clearance mm (in.)
Parallel	10 (0.39) or more
Crossed	20 (0.79) or more

(9) 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.

(10) Gravel which is thrown up by the wheels can damage lamp wiring. Install metal covers to protect the wiring.

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

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

(13) 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.

(14) 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.

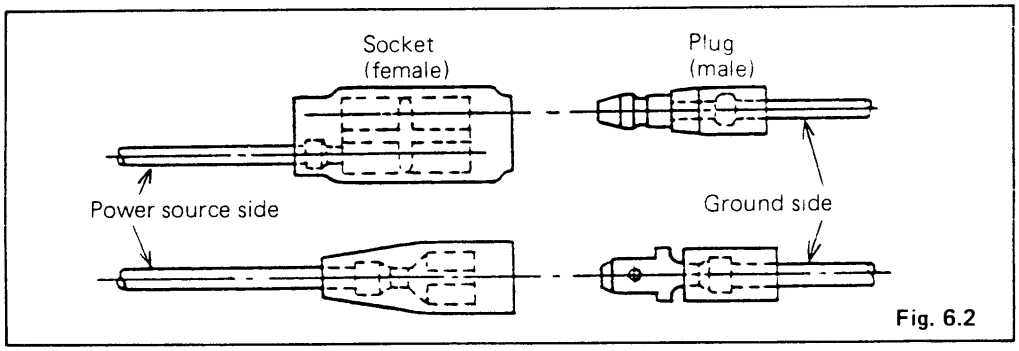


Fig. 6.2

(15) Use coated or protected tape when clamping wires.

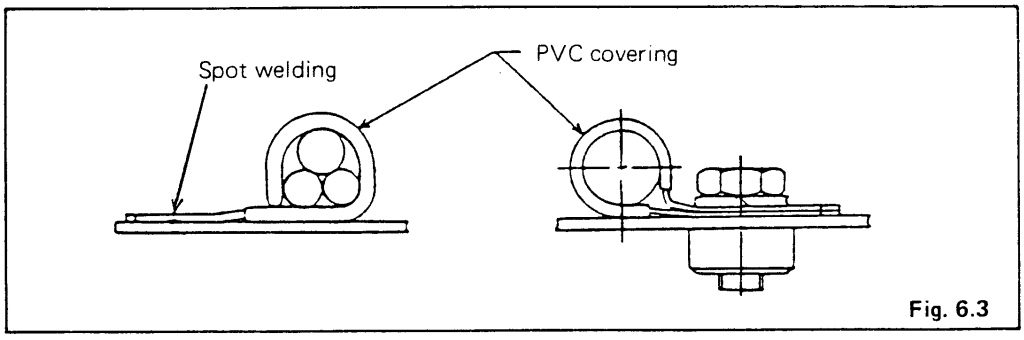


Fig. 6.3

<table>
<tr><th>Location</th><th>Cautions (Continued)</th></tr>
<tr><td>6.1
Additional wiring (Continued)</td><td>
(16) Bonding or clamps should only be used for extra support.

(17) Use standard wiring clamp intervals as shown below:
<table>
<tr><th>Harness diameter</th><th>Clamp intervals mm (in.)</th></tr>
<tr><td>5 (0.20) max</td><td>300 (11.81) max</td></tr>
<tr><td>5-10 (0.20-39)</td><td>approx. 400 (15.75)</td></tr>
<tr><td>10-20 (0.39-0.79)</td><td>approx. 500 (19.69)</td></tr>
</table>
(18) 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.
</td></tr>
<tr><td>6.2
Power source for electrical equipment of the body</td><td>
Use only specified terminals as a power supply for lights and other electrical equipment. Do not add wires to previously installed wiring. Never increase the fuse capacity as this may cause fires due to excessive current flow.

(1) Use the terminals described below for the power supply of additional lighting.

(a) Connector locations

CLEARANCE, IDENTIFICATION and SIDE MARKER LAMPS.
– Chassis left side, back of the rear cab mount (Fig. 6.5) for front side ramps
– Chassis rear crossmember (Fig. 6.5) for rear side ramps

ii. OPTION (L) (used for an additional tail lamp)
– Back side of the interior panel on the combination meter side. (Fig. 6.6)

(b) The lighting switch inside the cab can be used to control any additional lighting.

(c) The total permissible current of additional lighting is 7.6 amps.
Refer to the "Fuse Capacity Chart" for further details. (See page I-6-7 and I-6-8)
</td></tr>
</table>

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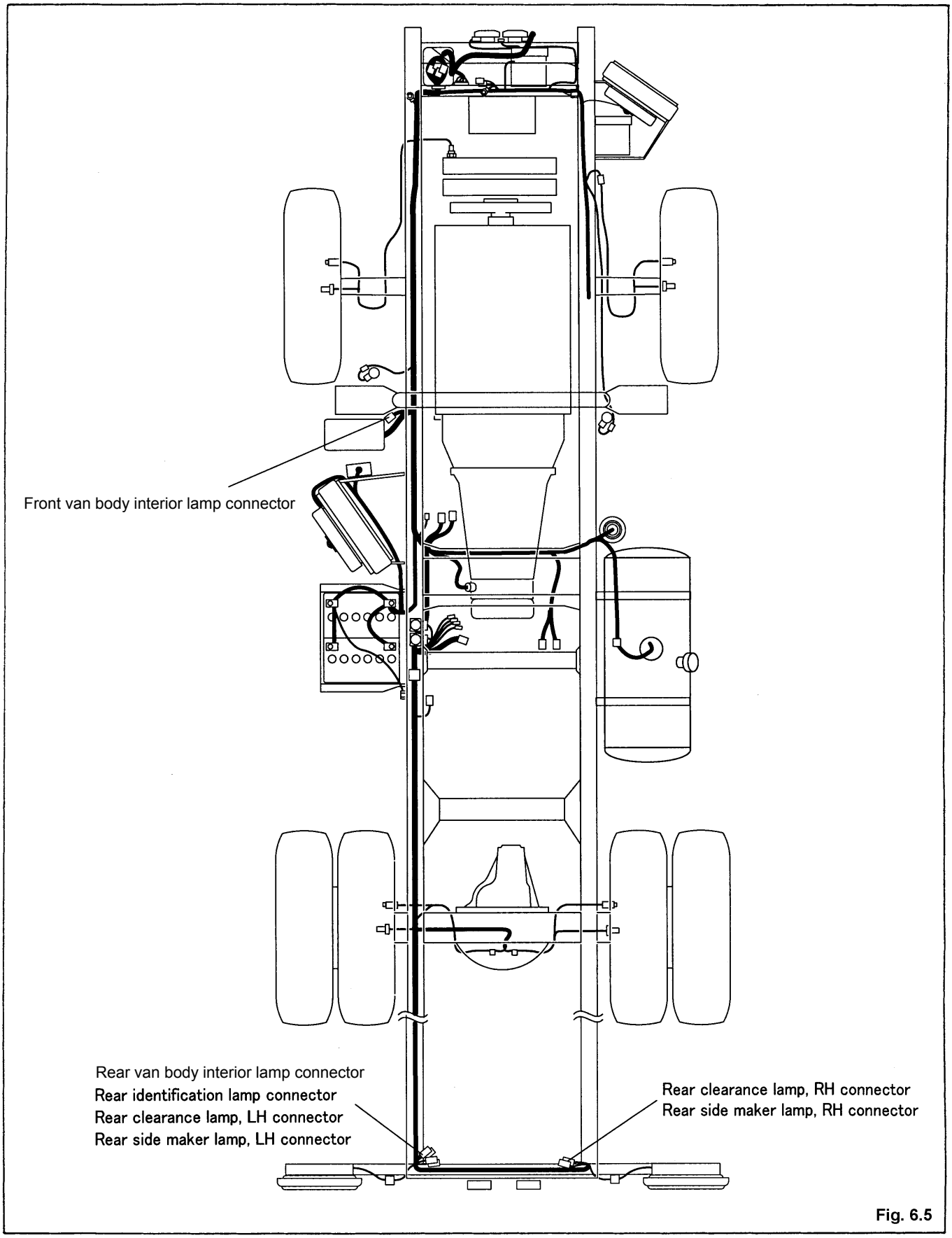
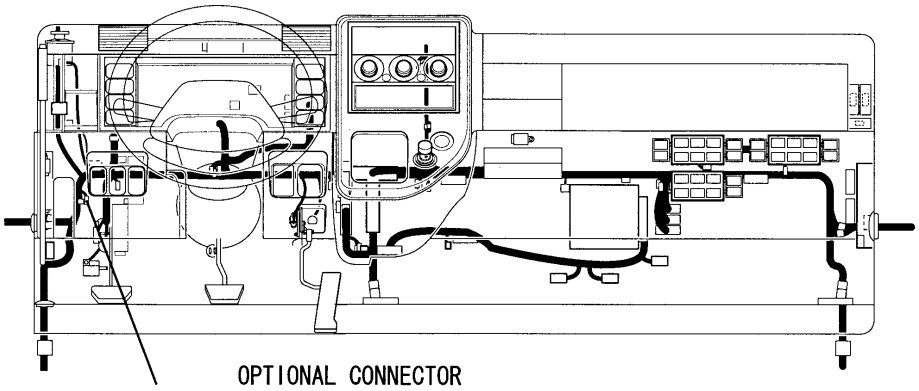


Fig. 6.5

Location	Cautions (Continued)
6.2 Power source for electrical equipment of the Body (Continued)	(2) Use the terminals described below as a spare power supply for other types of electrical devices. (a) Connector locations i. OPTION (ACC) — Back side of the interior panel on the heater side. (Fig. 6.6) ii. FRONT VAN BODY INTERIOR LAMP — Chassis left side, back of the rear cab mount (Fig. 6.5) iii. REAR VAN BODY INTERIOR LAMP — Chassis rear crossmember (Fig. 6.5) (b) The OPTION (ACC) terminal is connected to the starter switch. The FRONT and REAR VAN BODY INTERIOR LAMP terminals are not connected to the starter switch. (c) The total permissible current is 3.95A for the VAN BODY INTERIOR LAMP terminal, and 4.97A for the OPTION (ACC).



1	2			3
4	5	6	7	8

No.	Circuit	Color	Fuse
1	BATT	G-R	10A
2	ACC	W-R	10A
3	GROUND	B	
4	MAIN	L-R	10A
5	ILL	G-W	15A
6	—	—	
7	—	—	
8	IDLE UP	R-B	

Fig. 6.6

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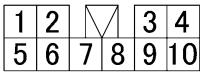
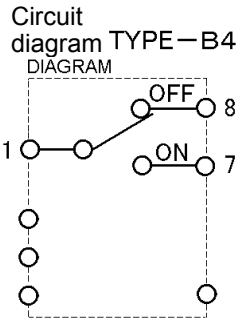
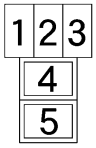
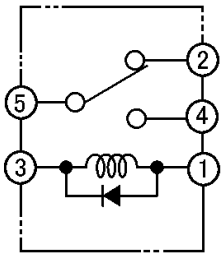
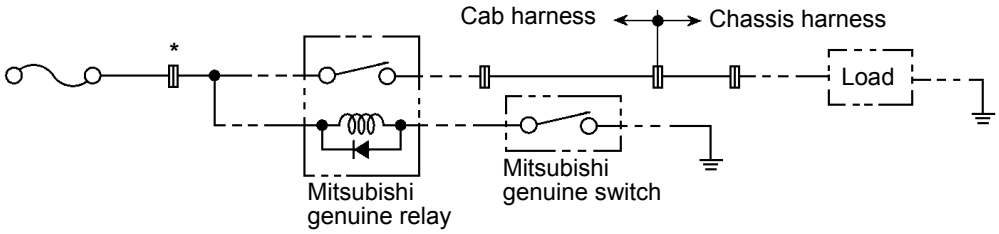
Location	Cautions (Continued)

6.3 Installing switch and relay for specially equipped body

Description	Mitsubishi P/N	Permissible current	Connector (Harness side)	Circuit diagram
Toggle switch	MK541358, laterally arranged switch (without lighting circuit)	2.0A or less	 Connector type AK10A (MH056885)	
	MK541359, longitudinally arranged switch (without lighting circuit)	2.0A or less		
Relay	MK420480	Terminals ⑤ – ④ (Normally open end): 20A or less Terminals ⑤ – ② (Normally closed end): 10A or less	 Connector type EQ5A (MH059820)	 Terminal ③: Power supply Terminal ①: Ground

Notes:

1. Be sure to add the relay to the circuit before the switch for specially equipped body and avoid applying the load current to the switch since the switch can carry less permissible current (2.0A).
2. The permissible current for the relay is as shown in the above table. Do not connect any loads which exceed the standard value.
3. Typical connection diagram



Marked with * : Points from which the current is taken off.
- - - - : Added wiring

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Fuse Capacity Chart

High-current fuse (1P)

Main load	Capacity
Alternator (terminal B)	120A

High-current fuse box

Fuse No.	Main load	Capacity
FH1	Fuse box (S1, A1 to A5, M1 to M12)	60A
FH2	Fuse box (B1 to B12)	60A
FH3	Fuse box (B13 to B16)	40A
FH7	ABS motor	40A
FH8	ABS solenoid	40A
FH12	Hydraulic booster	60A
B25	Tail lamp	15A
B27	Horn	10A
B28	Air-conditioner	10A
B29	Condenser fan	25A
B30	Blower fan	30A
B33	Van body dome light	10A
B34	ATF cooler fan	20A
B36	Engine electronic drive unit	20A
BATT1	Alternator	120A
BATT2	Glow	60A

ABS: Anti-lock brake system
ATF: Automatic transmission fluid

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Fuse box

Fuse No.	Main load	Capacity
A1	Cigar lighter	15A
A2	Audio	10A
A4	Opt (ACC)	10A
B1	Stop lamp	15A
B2	Meter	10A
B3	Turn signal lamp	15A
B4	Opt (B)	10A
B5	Audio	10A
B6	Cab lamp	10A
B7	Power window (driver)	30A
B8	Power window (assistant)	30A
B9	Engine electronic control unit	20A
B10	MVCU	10A
B11	Mirror heater	20A
B12	Automatic transmission	10A
B13	Tester	15A
B14	Headlamp (HI)	20A
B15	Headlamp (LH/LO)	20A
B16	Headlamp (RH/LO)	20A
M1	Backup lamp	10A
M2	Meter	10A
M3	Wiper	15A
M4	Opt (M)	10A
M5	Relay control	10A
M6	Automatic transmission	10A
M8	Exhaust brake	10A
M9	Engine electronic control unit	5A
M10	MVCU	10A
M11	ABS	10A
S1	Starter	10A

Diagnosis fuse

Fuse No.	Main load	Capacity
A/T	Diagnosis	5A
ABS	Diagnosis	5A
ABS	Memory clear	10A
MVCU	Diagnosis	5A
MVCU	Memory clear	10A
Engine ECU	Diagnosis	5A

ABS: Anti-lock brake system
A/T: Automatic transmission
ECU: Electronic control unit
MVCU: Multifunction vehicle control unit

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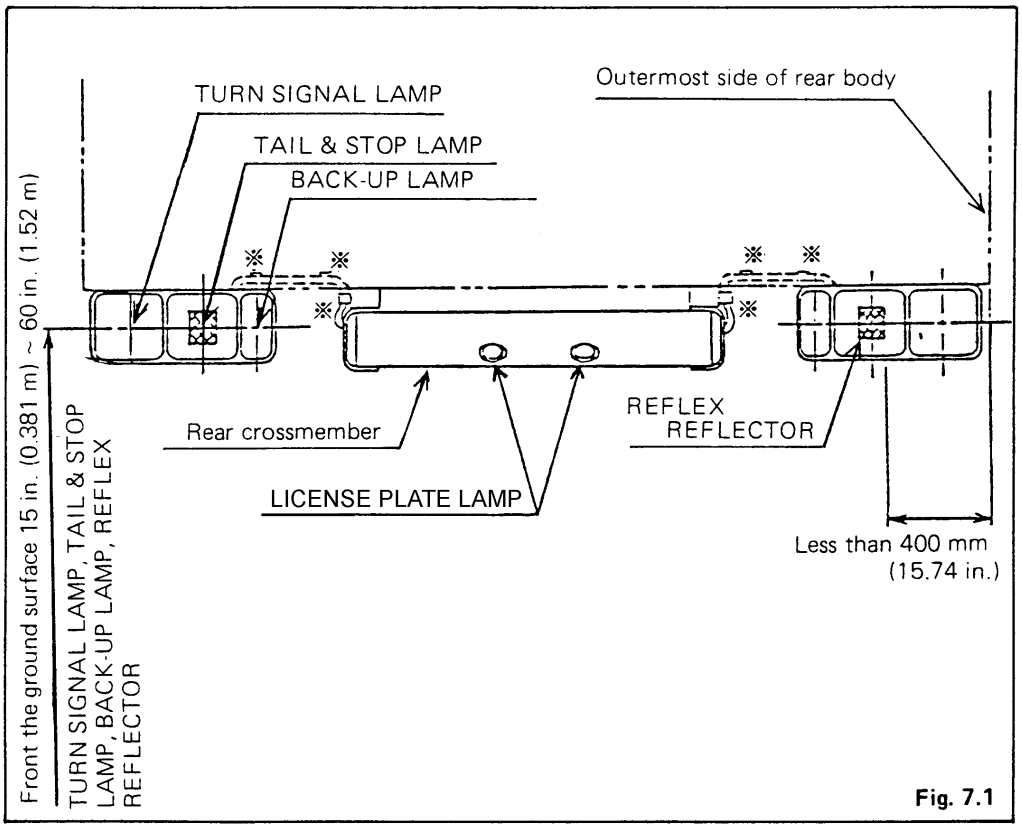
7. REAR COMBINATION AND LICENSE PLATE LAMPS

Location	Cautions
7.1 Rear combination lamps	(1) 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. (2) Installation dimensions for the rear combination lamps are shown in Fig.7.1.  **Fig. 7.1** (3) Clamp the harness of the rear combination lamps securely to the rear body and the main bolster by clips. (※ Fig. 7.1) (4) Refer to PART II section 15 for more detailed specifications for the rear combination lamp.
7.2 License plate lamp	Refer to PART II section 14 for detailed installation specifications of the license plate lamp and license plate, and then perform the installation.

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8. BRAKE LINES

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.

Location	Cautions
8.1 Chassis tubing form and dimension specifications	The chassis uses steel brake lines which conforms to the following specifications.

Unit: mm (in.)

Nominal Diameter	A	B	t	C	S min.	Material
4.76 (0.19)	6.6-7.1 (0.26-0.28)	3.0-3.7 (0.12-0.15)	0.7 (0.03)	1.4 (0.06)	1.0 (0.04)	SPCC (JIS) (ASTM A109 or A366) Double walled steel tube
6.35 (0.25)	8.6-9.1 (0.34-0.36)	4.5-5.2 (0.18-0.20)	0.7 (0.03)	1.4 (0.06)	1.0 (0.04)	

UNIT: mm (in.)

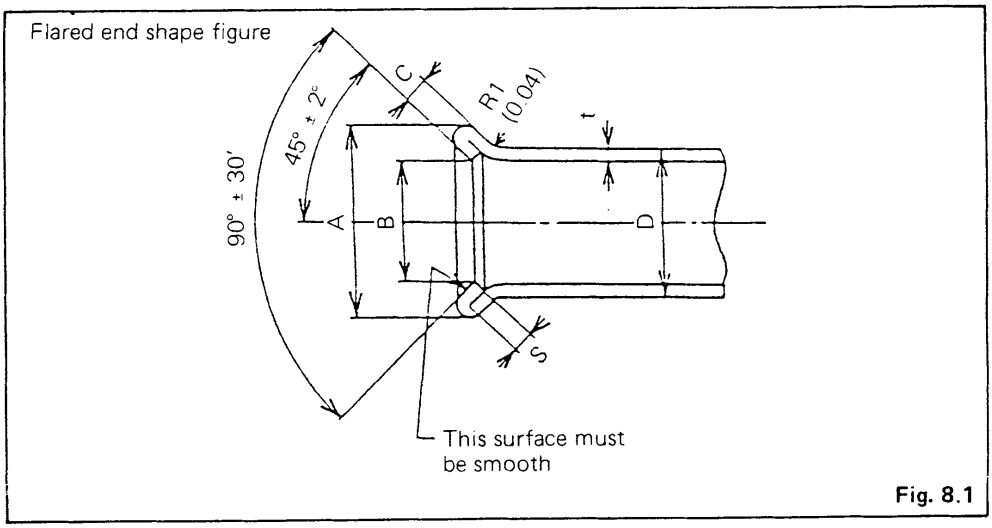
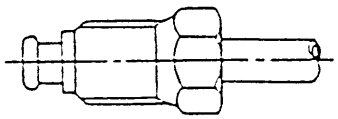


Fig. 8.1

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

Nominal diameter mm (in.)	Tightening torque kgf·cm (lbs.·ft)
4.76 (0.19)	130-170 (9.4-12.3)
6.35 (0.25)	190-260 (13.7-18.8)

Location	Cautions (Continued)
8.2 Making additional tubes	(1) Using brake tubes of the same material as the tubes connected to the chassis when extending the brake tubes. (2) Only use steel tubes to extend the brake fluid tubes. Never use copper tubes. (3) Use only metric pipe tools, to form the flared end of brake lines as shown in the "Flared end shape figure" in Fig. 8.1. Be careful not to scratch the tubes, or not to damage the mating surfaces when flaring the ends. (4) 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. (5) Use the flare nuts specified in the table below.

Nominal diameter of tube mm (in.)	MFTBC Part No.  Fig. 8.2
4.76 (0.19)	MF651001
6.35 (0.25)	MF651002

(6) Use a tubing bending tool to bend the brake lines correctly. Do not use heat to bend the brake lines.

(7) The bend curvature R should strictly conform to the minimum allowable bend radius R shown in the table below.

Nominal diameter mm (in.)	Bend radius mm (in.)
4.76 (0.19)	25 (0.98)
6.35 (0.25)	30 (1.18)

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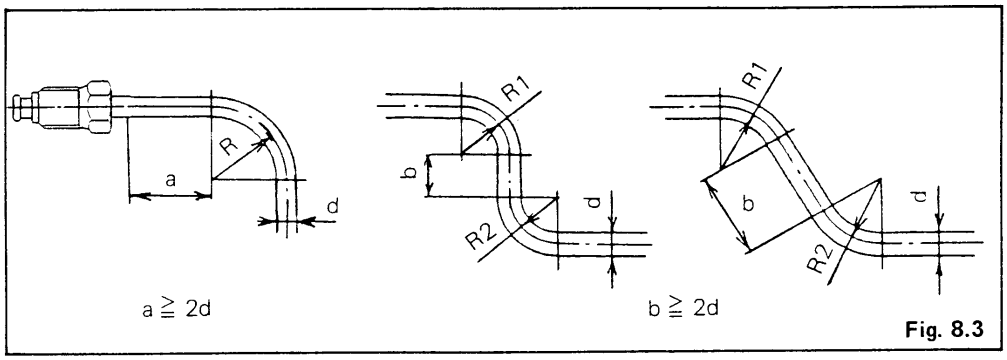
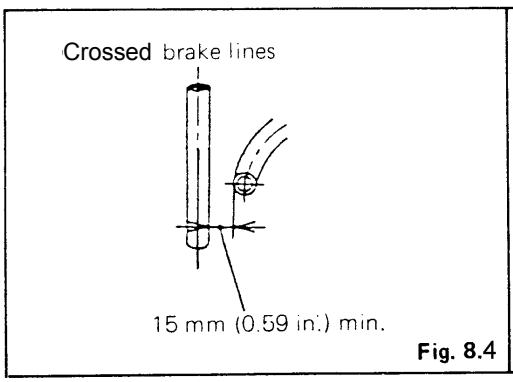
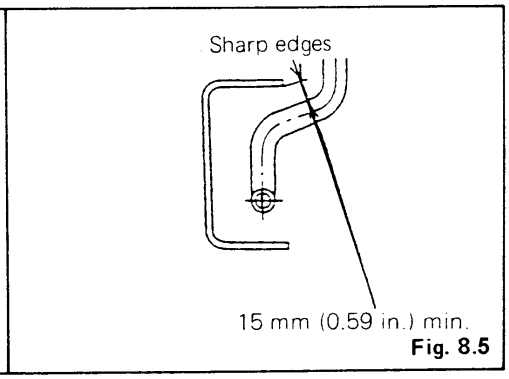
Location	Cautions (Continued)
8.2 Making additional tubes (Continued)	(8) The required length of the straight portion of the line end and the bent portion must conform to the dimensions specified in Fig. 8.3.  **Fig. 8.3** (9) Use high pressure air nozzle to clean and remove foreign matter from inside the brake lines before use. Use compressed air for cleaning. Cleaning oil is not recommended, but completely remove any residue if it is used.
8.3 Running additional lines	(1) 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. 8.4)  **Fig. 8.4**  **Fig. 8.5** (2) 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. 8.5)

Location	Cautions (Continued)
8.3 Running additional lines (Continued)	(3) Securely clamp brake lines with PVC coated clamps or grommets to prevent vibrations when the vehicle is running. (4) The standard brake line clearances are shown in the table below. Unit: mm (in.) (5) 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) away from bolts and rivets. (6) Make sure the brake fluid lines can be bled easily. (7) Never clamp or tape electrical wires to the brake lines, as this can cause corrosion of the line. Maintain the clearances described in Section 6 "ELECTRICAL WIRING". (8) The clearance between the brake lines and exhaust system components should conform to the specifications in Section 9 "EXHAUST SYSTEM". (9) Position the connection nut in a location where it can be completely tightened without difficulty. (10) Tighten the flare nuts to the torque specified in Section 8.1. 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. (11) 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. (12) Never install brake lines near the drive shaft or other moving parts. (13) Never change the installation location of the brake hoses. (14) When replacing the brake lines, do not use the fluid which was drained. Drain the fluid completely and replace with new fluid. (15) Install the brake lines so that they are protected from damages caused by flying objects thrown up by the tires.

	Tube dia	Clamp intervals
Straight tube	4.76-10 (0.19-0.39)	550 (21.65) max.
Curved tube	↑	400 (15.75) max.

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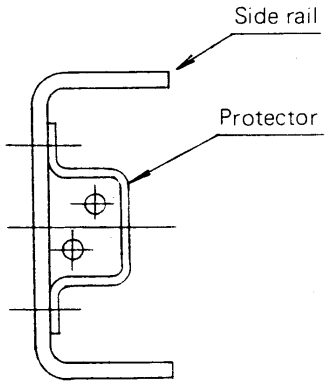
Location	Cautions (Continued)
8.3 Running additional lines (Continued)	(16) When it is necessary to protect brake lines against possible damage as described above, install a protective panel as shown below. (a) Fabricate a protective panel in which will not be deformed by flying objects and come in contact with the brake lines. (b) Position and shape the protective panel properly (for drain holes, etc.) so water will run freely. Example  **Fig. 8.6**

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9. EXHAUST SYSTEM

<table>
<tr><th>Location</th><th>Procedure</th></tr>
<tr><td>9.1
Modifying the exhaust system</td><td>Do not make any adjustments or modifications to the exhaust system at all costs. Making any adjustments or modifications to the exhaust system may cause malfunctions to the OBD/EMD system.</td></tr>
<tr><td>9.2
Clearance between exhaust system and other components</td><td>Mount the rear body so that it conforms with the following requirements to ensure fire prevention and vehicle safety.

(1) Maintain the clearances shown below when mounting the rear body. Install heat insulators if it is impossible to maintain these clearances.

<table>
<tr><th>Components</th><th>Minimum clearance mm (in.)</th></tr>
<tr><td>Air pipe</td><td>80 (3.15)</td></tr>
<tr><td>Air tank</td><td>80 (3.15)</td></tr>
<tr><td>Battery</td><td>150 (5.91)</td></tr>
<tr><td>Brake booster</td><td>100 (3.94)</td></tr>
<tr><td>Brake tube</td><td>100 (3.94)</td></tr>
<tr><td>Cable</td><td>150 (5.91)</td></tr>
<tr><td>Electric harness</td><td>150 (5.91)</td></tr>
<tr><td>Fuel tank</td><td>150 (5.91)</td></tr>
<tr><td>Fuel tube</td><td>200 (7.87)</td></tr>
<tr><td>Mud guard</td><td>50 (1.97)</td></tr>
<tr><td>Oil pan</td><td>100 (3.94)</td></tr>
<tr><td>Oil pipe</td><td>100 (3.94)</td></tr>
<tr><td>Propeller shaft, Differential</td><td>50 (1.97)</td></tr>
<tr><td>Rear body floor</td><td>100 (3.94)</td></tr>
<tr><td>Shock absorber</td><td>30 (1.18)</td></tr>
<tr><td>Spring, Axle</td><td>20 (0.79)</td></tr>
<tr><td>Sub frame, Crossmember</td><td>20 (0.79)</td></tr>
<tr><td>Tire</td><td>100 (3.94)</td></tr>
<tr><td>Vacuum tank</td><td>80 (3.15)</td></tr>
<tr><td>Plastic materials</td><td>150 (5.91)</td></tr>
<tr><td>Rubber materials</td><td>150 (5.91)</td></tr>
</table>

(2) The clearances between the muffler and or exhaust pipes and the rear body should correspond to the specifications described in Section 1 “CLEARANCE BETWEEN THE MOUNTED BODY AND CHASSIS COMPONENTS”.</td></tr>
</table>

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10. FUEL 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 MFTA.

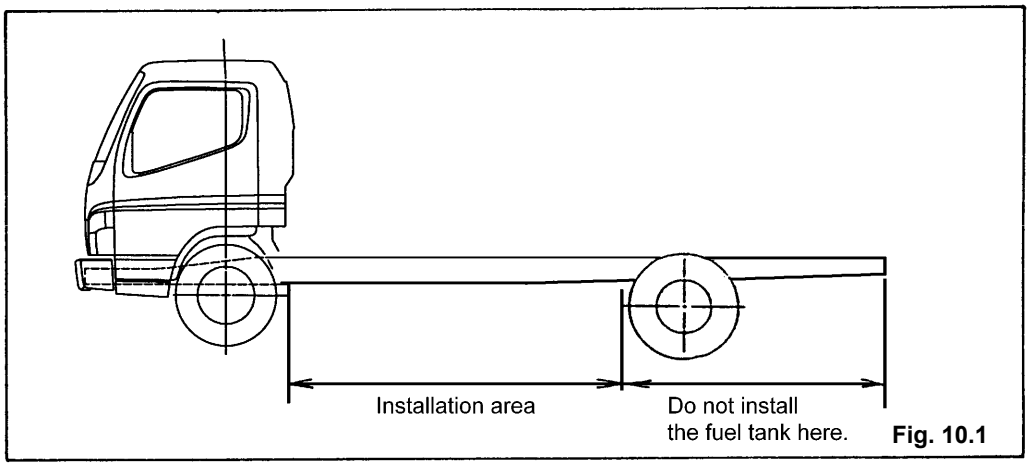
<table>
<tr><th>Location</th><th>Cautions</th></tr>
<tr><td>10.1
Moving the fuel tank</td><td>Install the fuel tank within the wheelbase. Consult MFTA before installing it in other locations.
 

Fig. 10.1</td></tr>
<tr><td>10.2
Fuel tubes</td><td>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.
<table>
<tr><th></th><th>Inside dia. mm (in.)</th><th>MFTBC Part No.</th><th>Length mm (in.)</th></tr>
<tr><td>Supply tube</td><td>11.5 (0.45)</td><td>MH030※※※</td><td>120-20000 (4.72-787.4)</td></tr>
<tr><td>Return tube</td><td>9.5 (0.37)</td><td>MH030※※※</td><td>80-6500 (3.15-225.9)</td></tr>
</table>
Note: Check with MFTA for corresponding details regarding the part numbers and length.</td></tr>
</table>

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<table>
<tr><th>Location</th><th>Cautions (Continued)</th></tr>
<tr><td>10.2
Fuel tubes
(Continued)</td><td>
(b) Metal tube
<table>
<tr><th></th><th>Outside dia. mm (in.)</th><th>Thick-ness mm (in.)</th><th>Material</th></tr>
<tr><td>Supply tube</td><td>12
(0.47)</td><td>0.9
(0.035)</td><td rowspan="2">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
(0.03)</td></tr>
</table>
(2) Never extend the fuel lines.
(3) Use metal tubing for the fuel line inside the engine compartment.
(4) Never modify the clips or move the location of clamps for components in the engine compartment which can be moved.
(5) Never install tubes together with electrical wires.
(6) 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.
(7) 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.
</td></tr>
<tr><td>10.3
Others</td><td>
(1) Observe the procedures described in Section 6 "ELECTRICAL WIRING" when modifying the wires connected with the fuel tank.
(2) Place the filler port of the fuel tank to allow easy fueling. Refer to Section 4 "CAUTIONS IN MOUNTING A REAR BODY".
</td></tr>
</table>

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11. PAINTING

Location	Cautions
11.1 Parts not to be painted	(1) Do not paint the following parts. (a) Caution plates .... VIN plate, Chassis-Cab label, Noise emission conformity label, Engine identification plate, etc. (b) Rubber parts .... Weather stripping, Packing rubber, Rubber hoses, etc. (c) Plastic parts .... Front grill, Front cover, Front cover, side, Washer nozzle, Step, Fender, Head lamp lens, Battery cover, Air intake ducts, etc. (d) Wiper arm and blade, Antenna, Outside mirror and Mirror stay, Mud guards, etc. (e) Emblems .... "  " mark, etc. (f) Cable wires .... Electrical harnesses, Battery cables, Handbrake cable, Speedometer cable, etc. (g) Inside the engine compartment (h) Inside the cab (2) Be careful not to accidentally get paint on the following items. (a) Brake system components (b) Steering system components (c) Axle air vent hole
11.2 Paint spot remover	It is important to use proper solvent to wipe off paint on plastic components such as lamps. Because plastics have poor resistance to organic solvents, an improper solvent may crack in plastic components. (1) Organic solvents to be used: kerosene, light oil, antifreeze (2) Organic solvents not to be used: thinner, turpentine, gasoline, commercial wax, acetone, alcohol, ketone, ester, chloric hydrocarbon
11.3 Cautions on drying after painting	(1) Remove plastic and rubber parts before painting because they easily deform when being heated. After painting is completed, reassemble these parts. Or perform heat insulation treatment to reduce ambient temperature to 80°C (176°F) or below. (2) Do not remove parts from the steering and brake systems (such as brake hoses, etc.), because mistakes in tighting torques and installation direction during reassembly may cause serious accidents. Set up some device to maintain an ambient temperature of less than 80°C. (176°F)

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Location	Cautions (Continued)
11.4 Main external rubber and plastic parts	

NO.	Part name	Material
1	Front grill	ASA
2	Head lamp lens	Polycarbonate
3	Front & side turn signal lamp lens	PMMA
4	Dummy lamp lens	PMMA
6	Front cover	ABS
7	Front cover,side	ABS
8	Marker lamp	PMMA
9	Step	PP+GF35
10	Weather strip (front window)	Rubber
11	Weather strip (rear window:single cab)	Rubber
12	Door outer weather strip	Rubber
13	Outside mirror stay packing	Rubber
14	Fender(FE)	Polypropylene
15	Fender(FG)	PDCPD
16	Delta garnish	Polypropylene
17	Door outside handle(front door)	PC+PET
18	Sash garnish	Polypropylene
19	Glass runchannel(single cab)	TPO
20	Front Door beltline molding	PVC
21	Snorkle duct	Polypropylene
22	Air intake silencer(single cab)	Polypropylene
23	Air hose(single cab)	Rubber
24	Battery cover	Polypropylene
25	Weather strip (rear window:crew cab)	Rubber
26	Center Pillar Garnish(crew cab)	Polypropylene
27	Door outside handle(rear door)	PC+PET
28	Glass runchannel(crew cab)	Rubber
29	Rear Door beltline molding	PVC
30	Air intake silencer(crew cab)	Polypropylene
31	Air hose(crew cab)	Rubber

Refer to Fig. 11.1 to 11.3 (see page I-11-3 to I-11-5)

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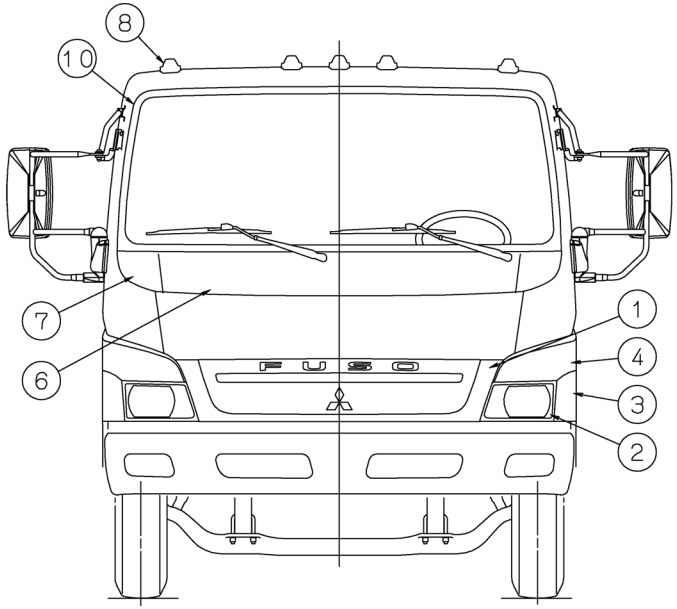
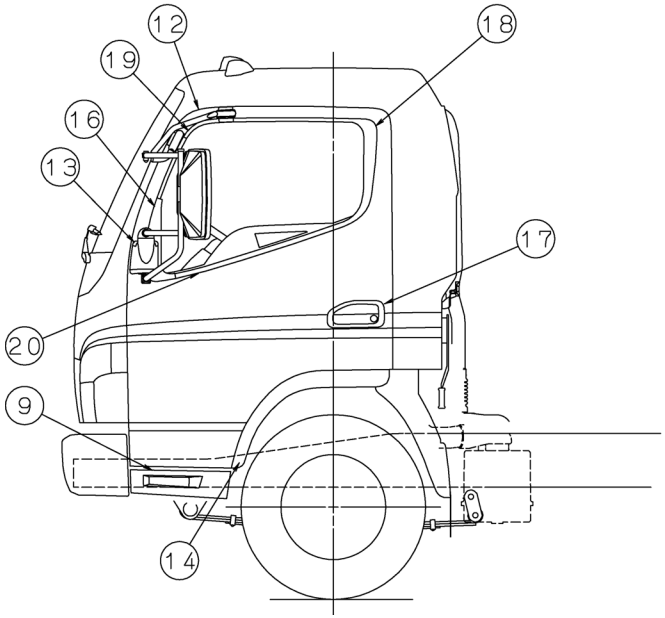
MAIN EXTERNAL RUBBER AND PLASTIC PARTS <FE>





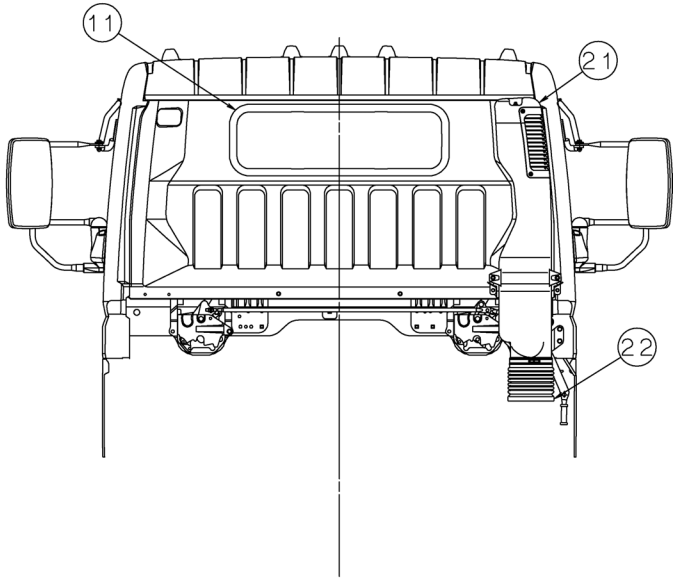


Fig. 11.1

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MAIN EXTERNAL RUBBER AND PLASTIC PARTS (CREW CAB) <FE>

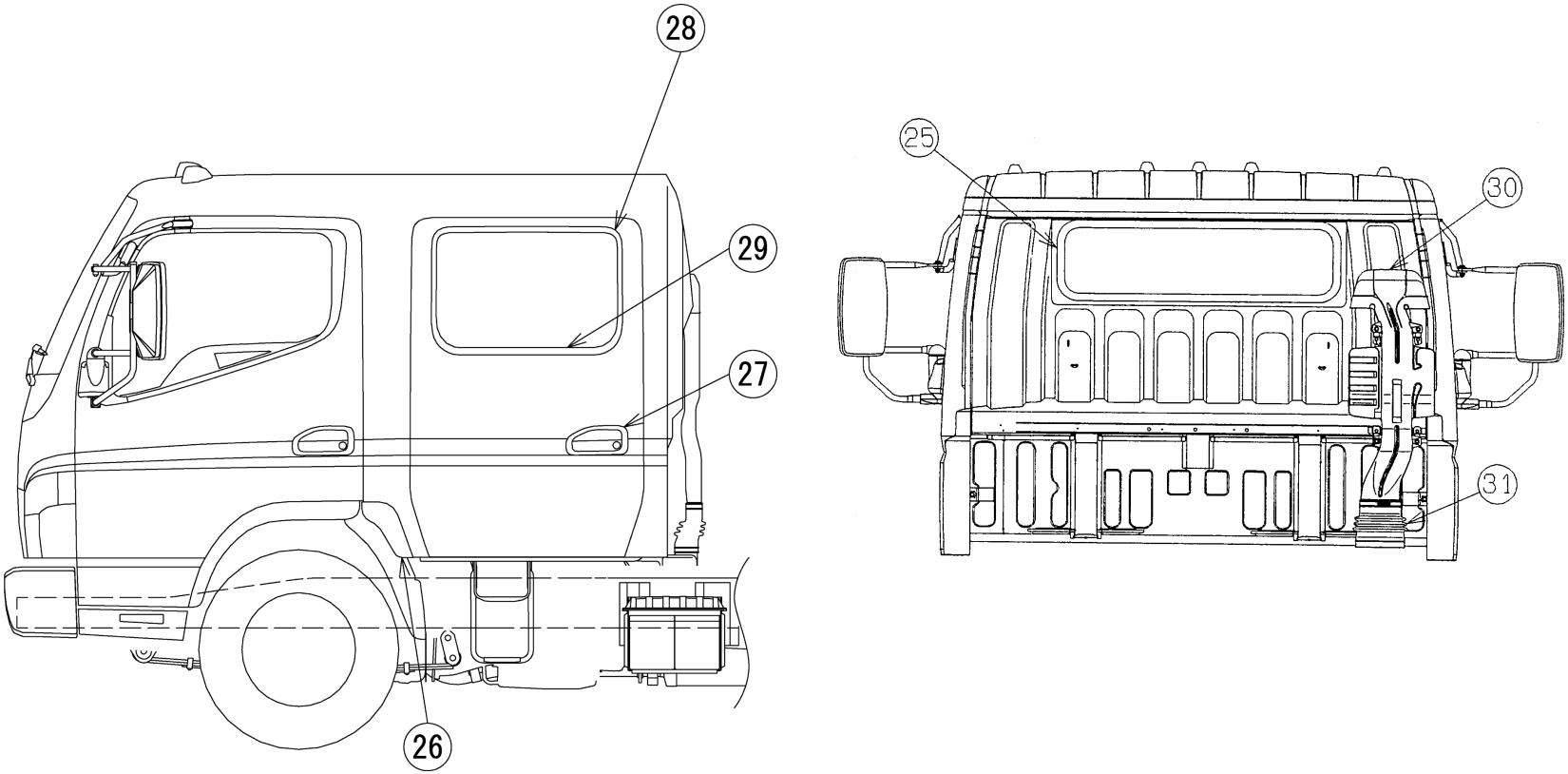

Fig. 11.2

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MAIN EXTERNAL RUBBER AND PLASTIC PARTS <FG>

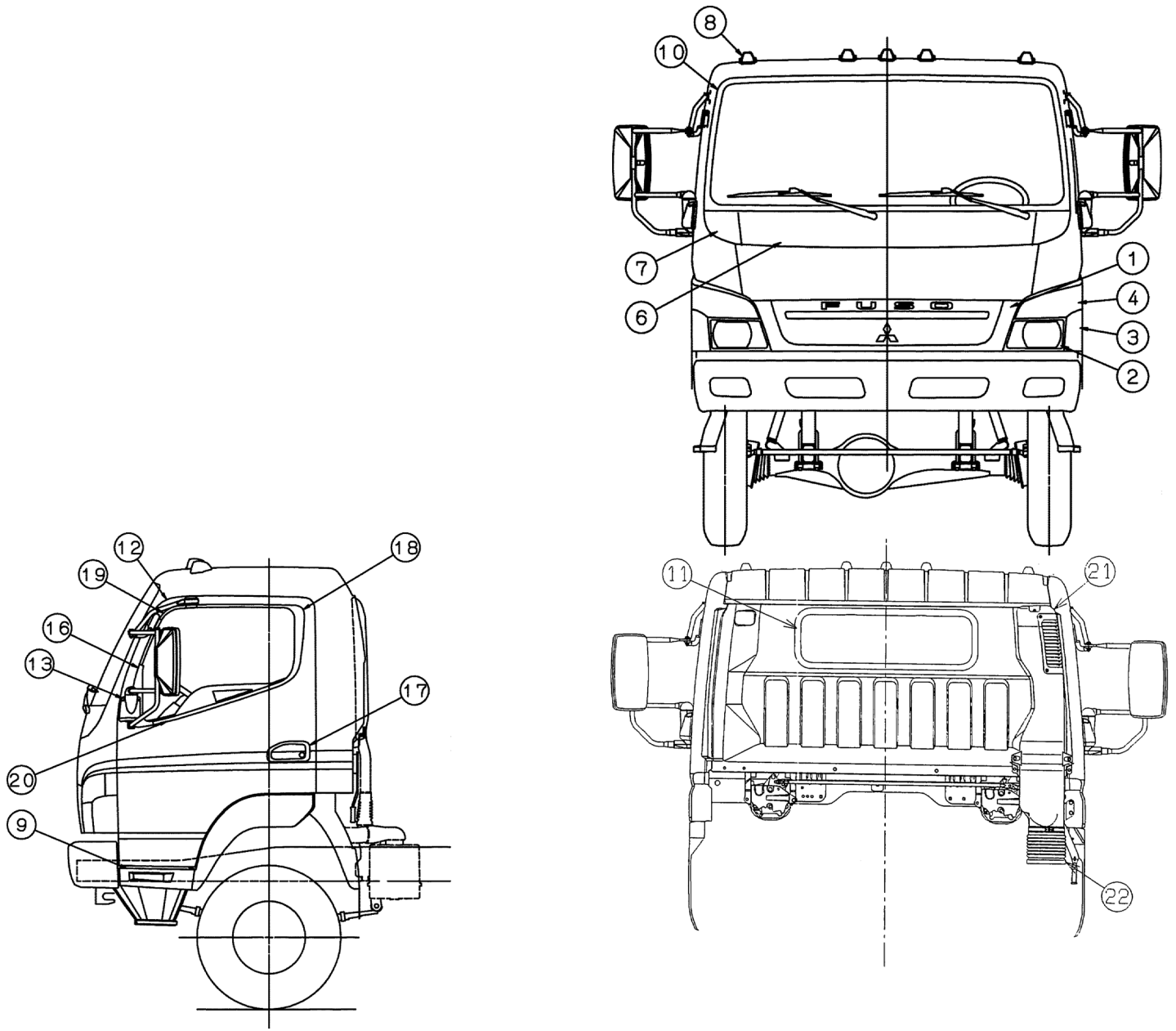

Fig. 11.3

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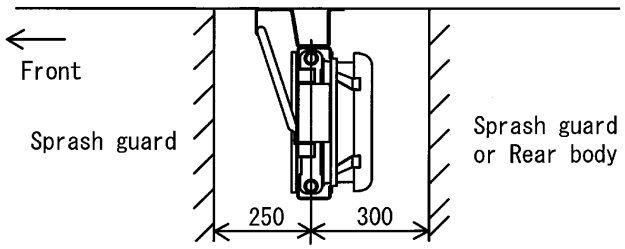
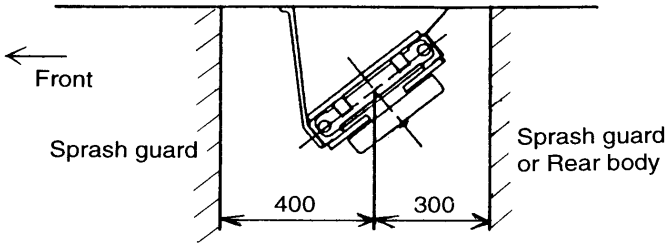
12. A/T OIL COOLER

Not to move A/T oil cooler principally.
If necessary, keep the cautions as shown bellow.

Location	Cautions
12.1 Moving the A/T oil cooler	(1) Make sure of protecting from against. (2) Maintain a clearance around the A/T oil cooler as the drawing shown below. FE83D FE84D (except FE84DHW) FE85D  FE84DHW  **Fig. 12.1** (3) Never extend the A/T oil cooler lines. (4) After the body mounted, check the cooling operation.

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