These recommendations have been prepared for design engineers and body builders as a guide to assist when selecting and specifying chassis modification and/or body fitment. These guidelines should be read in conjunction with the Mitsubishi Fuso Truck & Bus Body Equipment Mounting Directives available on the FUSO Body Builder Portal. Use these guidelines to determine any reinforcement details required for each application.

**APPLICATIONS - FLAT DECK, CURTAINSIDER, TIPPER, LOGGER**

Frame reinforcements should be balanced in terms of frame strength. Bolster mounts of an appropriate size and shape could contribute to the total frame strength.

**LOAD CONSIDERATIONS**

**FLAT DECK**
- **U.D.L.** Consider as a uniformly distributed load over whole or part of deck length.
- **CURTAINSIDER** Consider as a uniformly distributed load over whole or part of deck length in conjunction with point loads imposed by body and tailifts.
- **LOAD CENTRE** Determined as water level load 600mm above chassis.

**TIPPER**
- **AT LIFT OFF** Point when body raised just clear of the chassis thus imposing two point loads on the chassis rails at hinge and hoist mount.
- **AT MAX TIP** Point when the body is raised to tip angle of 48°, (tail door closed) so loads act at the hoist mounting and hinge pivot points.
- **LOAD CENTRE** Determined as water level load 600mm above chassis.
- **SPREADING** Spreader work imposes higher frame loads and may require chassis reinforcement.

**LOGGER**
- **LONGS/SHORTS** Consider as a point load applied through bolster mounting positions. Use Bolster attachment code.

**CHASSIS FRAME MATERIAL**
Hot Rolled Steel, 540 MPa tensile, 380 MPa yield.

**MAXIMUM DESIGN STRESS**
Recommended maximum design stress = 35%* of chassis yield stress (133 MPa) for sections of frame that are unmodified or do not contain stress raisers. Appropriate allowance should be made for details in the frame that have been modified or contain stress raisers. Refer to the body builders manual for stress levels using static load applications.
For heavy duty, more arduous applications, eg., sidelifter, the stress levels should be reduced a further 33% to enhance frame durability.
Recommended heavy duty design stress = 2/3. Recommended max design stress = 90 MPa.

**MAXIMUM CHASSIS DEFLECTION**

<table>
<thead>
<tr>
<th>CASE 1</th>
<th>Between front and rear axis. Maximum permissible deflection: ±8mm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASE 2</td>
<td>Rear overhang. Maximum permissible deflection: 15mm at 1000mm or greater, rear of rear axis.</td>
</tr>
</tbody>
</table>

Frame reinforcements should be balanced in terms of frame strength. Bolster mounts of an appropriate size and shape could contribute to the total frame strength.
REINFORCEMENT EXAMPLES FOR FRAME REINFORCEMENT TYPES

FS52SS/FS54SS

NOTE:
THESE FRAME REINFORCEMENTS ARE BASED ON GRADE 350 MATERIAL.

A 1/8/2018 FIRST ISSUE
ISSUE DATE CHANGES MADE

STANDARD FACTORY CHASSIS

T-RAIL ONLY

ADD T-RAIL & LOWER FLUTCH

ADD FULL DEPTH T-RAIL

ADD J-RAIL

NOTE: THESE FRAME REINFORCEMENTS ARE BASED ON GRADE 350 MATERIAL.
REINFORCEMENT EXAMPLES FOR FRAME REINFORCEMENT TYPES

FS52SS/FS54SS

1. REFER TO MANZ BODYBUILDERS MANUAL FOR CROSSMEMBER SPECIFICATION/DETAILS.

2. * MODS MAY BE REQUIRED TO CROSSMEMBER.
NOTES:
01) THIS CHASSIS (WITHOUT A SUBFRAME) IS SUITABLE FOR FITTING A CURTAINSIDER BODY AND LOADS UP TO THE MANUFACTURERS DIM PROVIDING THE BODY/CHASSIS R.O.H. DOES NOT EXCEED THE RELEVANT BODY R.O.H. FIGURE STATED.
02) THE FITTING OF A BODY AND ANY WORK ON THE CHASSIS FRAME MUST BE CARRIED OUT IN ACCORDANCE WITH THE FUSO GUIDELINES FOR THIS MODEL AND GOOD INDUSTRY PRACTICE.
03) IF THE BODY/CHASSIS REAR OVERHANG EXCEEDS 3750mm, A SUBFRAME OR CHASSIS REINFORCEMENT IS RECOMMENDED, AND THIS REQUIREMENT SHOULD BE DETERMINED BY ENGINEERING CALCULATION AND ASSESSMENT USING THE FUSO GUIDELINES.
04) THIS DRAWING IS FOR USE AS A GUIDE ONLY, TO ASSIST WHEN SELECTING AND SPECIFYING CHASSIS MODIFICATION AND/OR BODY FITMENT.
05) REGARDLESS OF THE BODY/CHASSIS REAR OVER HANG, FITMENT OF A TAIL LIFT MAY REQUIRE A SUBFRAME OR ADDITIONAL CHASSIS REINFORCEMENT, AND THIS REQUIREMENT SHOULD BE DETERMINED BY ENGINEERING CALCULATION AND ASSESSMENT USING THE FUSO GUIDELINES.

FUSO NEW ZEALAND LTD
8 Landing Drive, Auckland Airport, 2022
P.O Box 107 166, Auckland Airport, 2105

FS52SS/FS54SS RIGID 8 x 4
SAMPLE CURTAINSIDER LAYOUT

MAXIMUM COUPLING OFFSET = 200mm
UNDERSIDE OF CHASSIS FLANGE TO CONNECTION

MODEL | WHEELBASE | F.O.H. | FACTORY R.O.H. |
----- | --------- | ----- | -------------- |
FS52SS | 5870mm | 1370mm | 2900mm |
FS54SS | 6000mm | 1370mm | 2970mm |

Datum: 1/8/2018
NOTES:
01. THIS CHASSIS FRAME IS SUITABLE FOR FITTING AN F.O.B. (OR B.F.O.B.) HOIST AND BODY WITHOUT A SUBFRAME, PROVIDING THE BODY OR HINGE PIVOT DO NOT EXCEED A R.O.H. OF 1450 mm.
02. THE FITTING OF A BODY AND ANY WORK ON THE CHASSIS FRAME MUST BE CARRIED OUT IN ACCORDANCE WITH THE FUSO GUIDELINES FOR THIS MODEL AND GOOD INDUSTRY PRACTICE.
03. IF THE REAR OVERHANG OR THE HINGE PIVOT EXCEEDS 1450 mm, A SUBFRAME OR CHASSIS REINFORCEMENT IS RECOMMENDED, AND THIS REQUIREMENT SHOULD BE DETERMINED BY ENGINEERING CALCULATION AND ASSESSMENT USING THE FUSO GUIDELINES.
04. THIS DRAWING IS FOR USE AS A GUIDE ONLY, TO ASSIST WHEN SELECTING AND SPECIFYING CHASSIS MODIFICATION AND/OR BODY FITMENT.
05. A SUBSTANTIAL FULL DEPTH REAR CROSSMEMBER IS REQUIRED, WHICH IS SUITABLE FOR THE TIPPING LOADS THAT WILL BE APPLIED.

FUSO NEW ZEALAND LTD
8 Landing Drive, Auckland Airport, 2022
P.O. Box 107 146, Auckland Airport, 2120

FS52SS/FS54SS RIGID 8 x 4
SAMPLE FOB TIPPER LAYOUT

<table>
<thead>
<tr>
<th>MODEL</th>
<th>WHEEL BASE</th>
<th>F.O.H.</th>
<th>FACTORY R.O.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS52SS</td>
<td>5870mm</td>
<td>1370mm</td>
<td>2900mm</td>
</tr>
<tr>
<td>FS54SS</td>
<td>5900mm</td>
<td>1370mm</td>
<td>2870mm</td>
</tr>
</tbody>
</table>

GVM=30800 Kg
GCM=53000 Kg
NOTES:

01) THE FITTING OF A BODY AND ANY WORK ON THE CHASSIS FRAME MUST BE CARRIED OUT IN ACCORDANCE WITH THE FUSO GUIDELINES FOR THIS MODEL AND GOOD INDUSTRY PRACTICE.
02) FOR BOLSTERS/LOGGING APPLICATIONS, A SUBFRAME OR CHASSIS REINFORCEMENT IS REQUIRED, AND THIS REQUIREMENT SHOULD BE DETERMINED BY ENGINEERING CALCUATION AND ASSESSMENT USING THE FUSO GUIDELINES.
03) THIS DRAWING IS FOR USE AS A GUIDE ONLY, TO ASSIST WHEN SELECTING AND SPECIFYING CHASSIS MODIFICATION AND/OR BODY FITMENT.

BOLSTER MOUNTING DETAILS:

01) RECOMMENDED POSITIONS FOR LOGGING BOLSTERS ARE SHOWN
02) BOLSTER MOUNTINGS AND ATTACHMENTS TO BE SPREAD OVER DISTANCES INDICATED. MIN. BOLSTER LENGTH = 600mm
03) MOUNTING ANGLE/SUBFRAMES TO BE FABRICATED FROM STEEL WITH A MINIMUM YIELD STRESS OF 350 MPa. ENSURE PROGRESSIVE(OR MINIMAL) CHANGE OF SECTION AT TERMINATIONS(ENDS). ALL BOLSTERS.
04) DO NOT BOLT TO TOP FLANGE, OR WELD TO CHASSIS.
05) ENSURE BOLSTER ATTACHMENT METHOD MEETS THE REQUIREMENTS OF NZS 5444, AND BOLSTER ATTACHMENT CODE -- (ISSUE 2 NOVEMBER 2010)
06) REINFORCEMENT IS REQUIRED FOR THE CHASSIS; REFER TO REINFORCEMENTS EXAMPLES AS DETAILED IN DRAWINGS 3-560221/01/02 TO ENSURE THAT MAX DESIGN STRESS LEVELS ARE NOT EXCEEDED.

MODEL | WHEELBASE | F.O.H. | FACTORY P.O.H.
FS52SS | 5800mm | 1370mm | 2900mm
FS54SS | 5900mm | 1370mm | 2870mm

ESTIMATED POSITIONS CONFIRM FOR EACH CHASSIS

MAXIMUM COUPLING OFFSET = 200mm
(UNDERSIDE OF CHASSIS FLANGE TO COUPLING)