

# CHASSIS ENGINEERING GUIDELINES

(ISSUE B, AUGUST 2019)

## DESIGN GUIDELINES FOR:

**FUSO SHOGUN 6x4**

**FUSO HD 6x4**

## MODELS:

**FV70HK, FV74HK, FV74HT**

**FV51SK, FV54SK, FV54ST**

## APPLICATIONS - FLAT DECK, CURTAINSIDER, TIPPER, TRACTOR

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.

### 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 taillifts.
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.

#### TRACTOR

POINT LOAD	Consider as a concentrated load applied through the fifth wheel position ahead of rear axis.
SIDE LIFTER	Side lifter operation is a heavy duty application and may require additional frame engineering.

### CHASSIS FRAME MATERIAL

Hot Rolled Steel, 540 MPa tensile, 380 MPa yield.

### MAXIMUM DESIGN STRESS

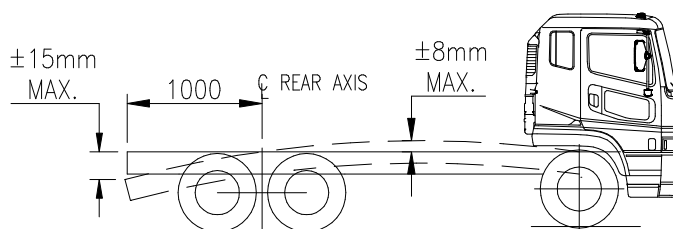
Recommended maximum design stress = 35%\* of chassis yield stress (133 MPa) for sections of frame that are unmodified or do not contain stress raisers. Appropriate allowance should be made for details in the frame that have been modified or contain stress raisers. Refer to the body builders manual for 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

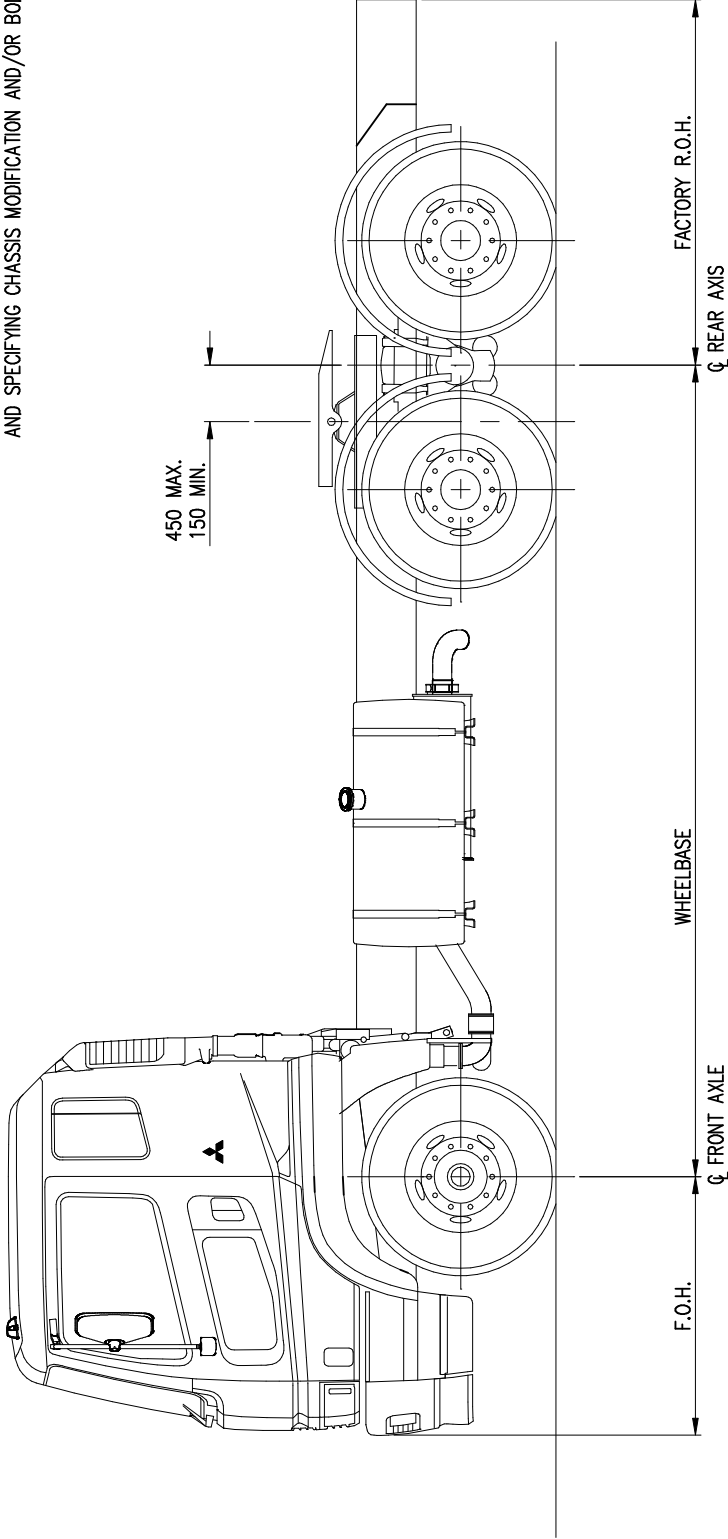
CASE 1	Between front and rear axis. Maximum permissible deflection: $\pm 8\text{mm}$ .
CASE 2	Maximum permissible deflection: 15mm at 1000mm or greater, rear of rear axis.



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NOTES:

- 01) THE FITTING OF A FIFTH WHEEL 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 FIFTH WHEEL APPLICATIONS, A SUBFRAME, ATTACHMENT ANGLES, OR CHASSIS REINFORCEMENT IS REQUIRED, AND THIS REQUIREMENT SHOULD BE DETERMINED BY ENGINEERING CALCULATION AND ASSESSMENT USING NZS5450 AND 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.



MODEL	WHEELBASE	F.O.H.	FACTORY R.O.H.
FV51SK/FV54SK/FV70HK/FV74HK	4300mm	1370mm	1935mm

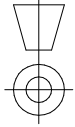
B	20/8/2019	REISSUE WITH EURO 6 MODEL CODES	K.H.
A	1/8/2018	FIRST ISSUE	K.H.
ISSUE DATE	CHANGES MADE	BY	



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FV51SK/FV54SK/FV70HK/FV74HK 6 X 4

SAMPLE TRACTOR UNIT LAYOUT



3 - 560819

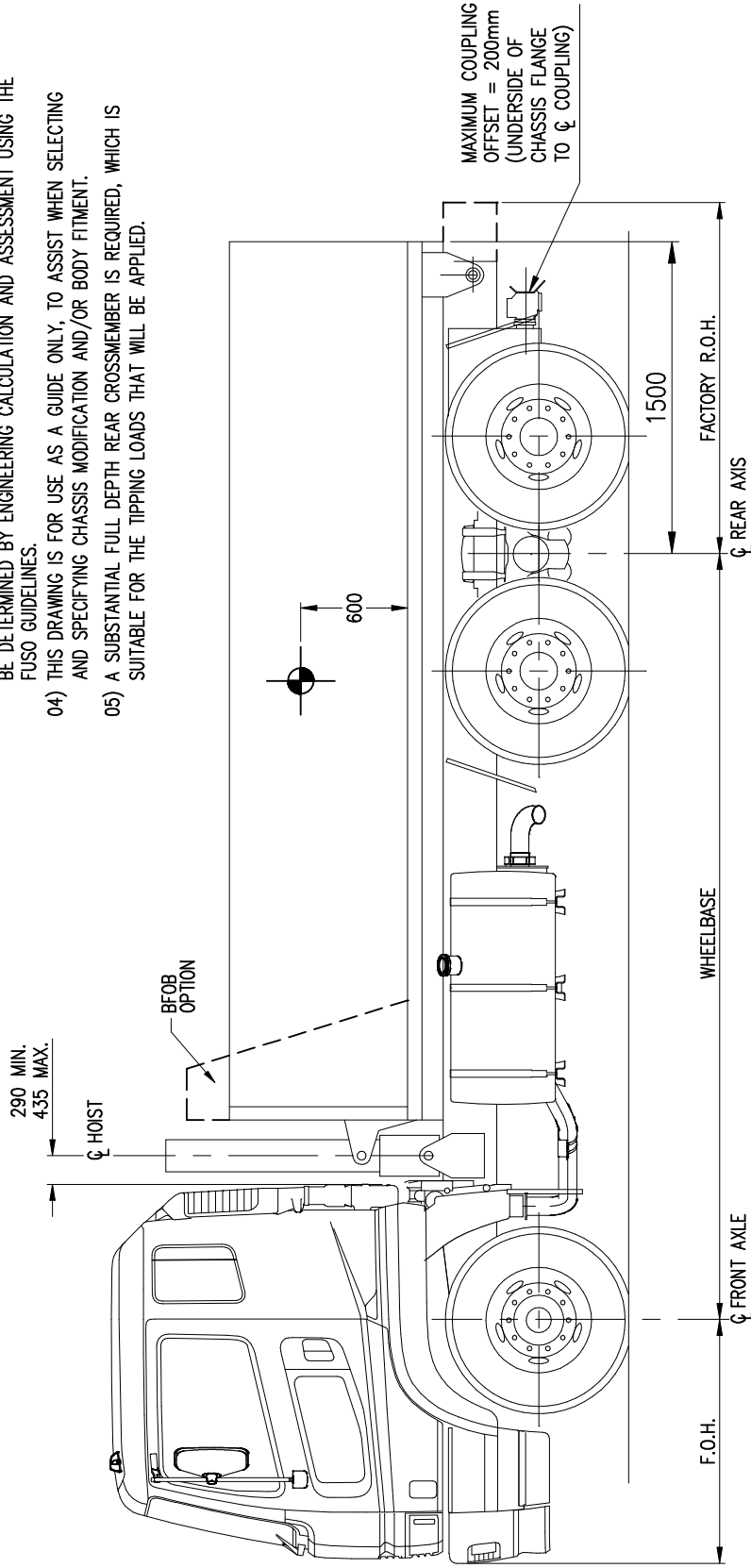
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NOTES:

- 01) THIS CHASSIS (WITHOUT A SUBFRAME) IS SUITABLE FOR FITTING AN F.O.B. (OR B.F.O.B.) HOIST AND BODY, AND LOADS UP TO THE MANUFACTURERS G.V.M. PROVIDING THE BODY OR HINGE PIVOT DO NOT EXCEED THE RELEVANT BODY R.O.H. 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 REAR OVERHANG OR THE HINGE PIVOT EXCEEDS 1500mm, 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.



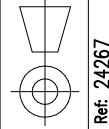
MODEL	WHEELBASE	F.O.H.	FACTORY R.O.H.
FV51SK/FV54SK/FV70HK/FV74HK	4300mm	1370mm	1970mm

ISSUE DATE	CHANGES MADE	BY
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FV51SK/FV54SK/FV70HK/FV74HK 6 X 4  
SAMPLE F.O.B./B.F.O.B. TIPPING LAYOUT

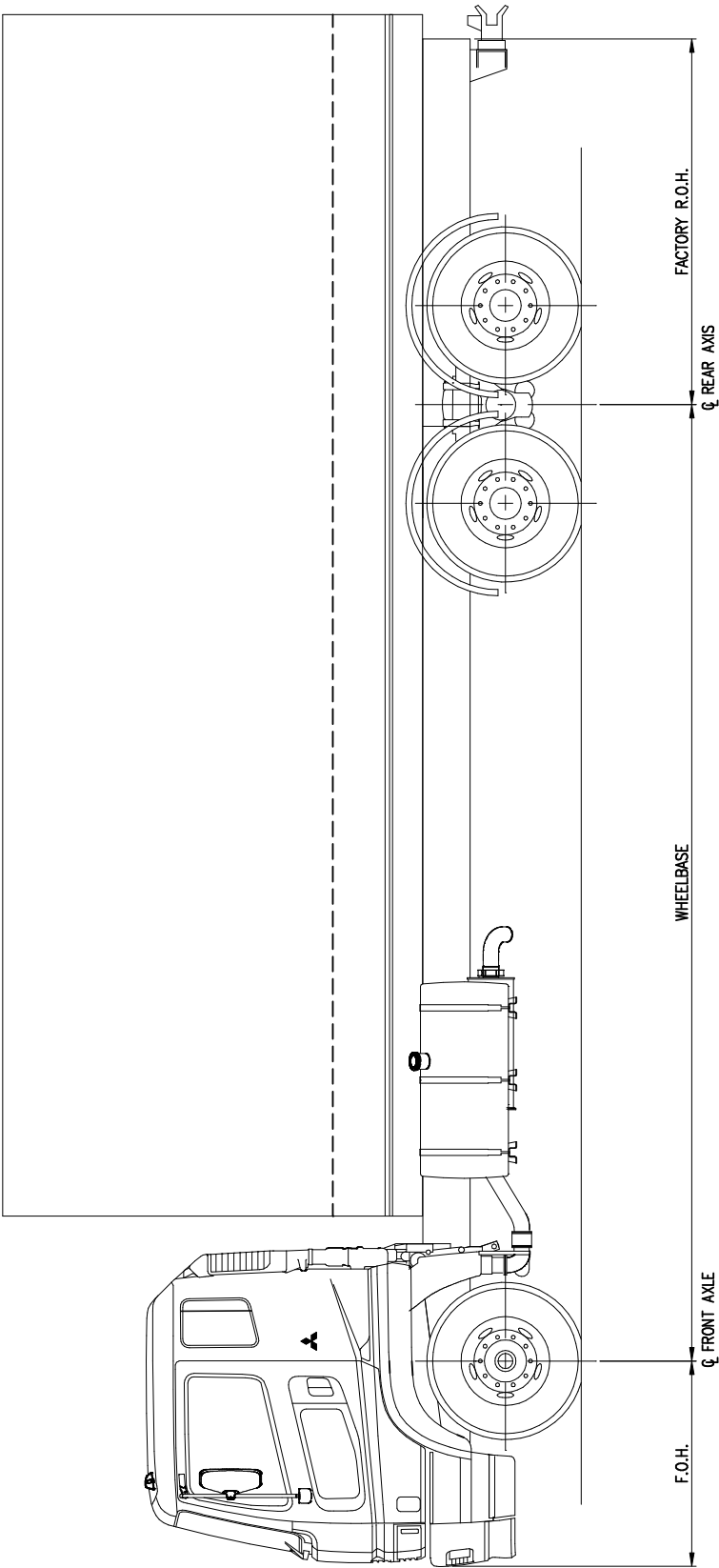


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NOTES:

- 01) THIS DRAWING IS FOR USE AS A GUIDE ONLY, TO ASSIST WHEN SELECTING AND SPECIFYING CHASSIS MODICATION AND/OR BODY FITMENT.
- 02) THE FITTING OF A BODY AND ANY WORK ON THE CHGASSIS FRAME MUST BE CARRIED OUT IN ACCORDANCE WITH THE FUSO GUIDELINES FOR THIS MODEL.

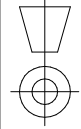


MODEL	WHEELBASE	F.O.H.	FACTORY R.O.H.
FV54ST3/FV74HT2	6380mm	1370mm	3570mm

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FV54ST3/FV74HT2 (6 X 4) SAMPLE  
CURTAINSIDER UNIT LAYOUT

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