



## Chain Kit / Articulated Trailer Installation Instructions



## **Chain Kit / Articulated Trailer Installation Instructions**

The details in this manual were correct at the time of printing. Bennett Engineering Ltd. reserves the right to enhance and modify specifications or designs without prior notice or obligation. For the latest updates or revisions, please contact Bennett Engineering Ltd.

**Bennett Engineering Ltd.**

**Horton Road**

**Horton**

**Chipping Sodbury**

**South Gloucestershire**

**England**

**BS37 6QH**

**01454 321707**

# Contents

---

Introduction .....	3
1 Trailer Chassis .....	4
2 Preparation .....	5
3 Wheel Rest Assembly .....	7
3.1.1 Standard Wheel Rest .....	8
3.1.2 Extended Wheel Rest .....	9
3.2 Mounting Plate Spacing .....	10
4 Assembly.....	11
4.1 Machine Dependant Dimensions.....	11
4.2 Structural Frame Assembly .....	12
4.2.1 Base Frame Assembly.....	15
4.2.2 Gussets .....	16
4.2.3 Fork Slipper Spacers .....	17
4.2.4 Chassis Spacers.....	18
4.3 Underrun Bar .....	19
4.4 Wheel Stops.....	20
4.4.1 Straight Wheel Stop .....	20
4.4.2 Angled Wheel Stop .....	20
4.5 Fitting .....	21
5 Mounting the Forklift.....	22
6 Lighting Socket Wiring .....	23
7 Pre 2005 Moffett Dimensions .....	24

## Introduction

---

The truck-mounted forklift is designed to be transported on the rear of a truck or trailer. You must read and understand this manual before fitting this mounting kit.

The purpose of this manual is to provide you with details on proper installation procedures for the Moffett mounting kit. The correct and most efficient installation procedure is explained and illustrated in this manual.

Before installing this mounting kit on your trailer, ensure that doing so will not void the manufacturer's warranty.

With the forklift on the back of your truck/trailer, the load distribution will have been altered. To ensure that the loading on the fifth wheel coupling (front axle on rigid vehicles) rear axles and the maximum vehicle dimensions are within the legal requirement for the country of use. Bennett Engineering Ltd. is available to address any queries and can perform these calculations.

All welders and fabricators of mounting kits should be certified to meet BSEN 283 and BSEN 288.

Unless specified otherwise, all welds should be 8 mm fillet welds.

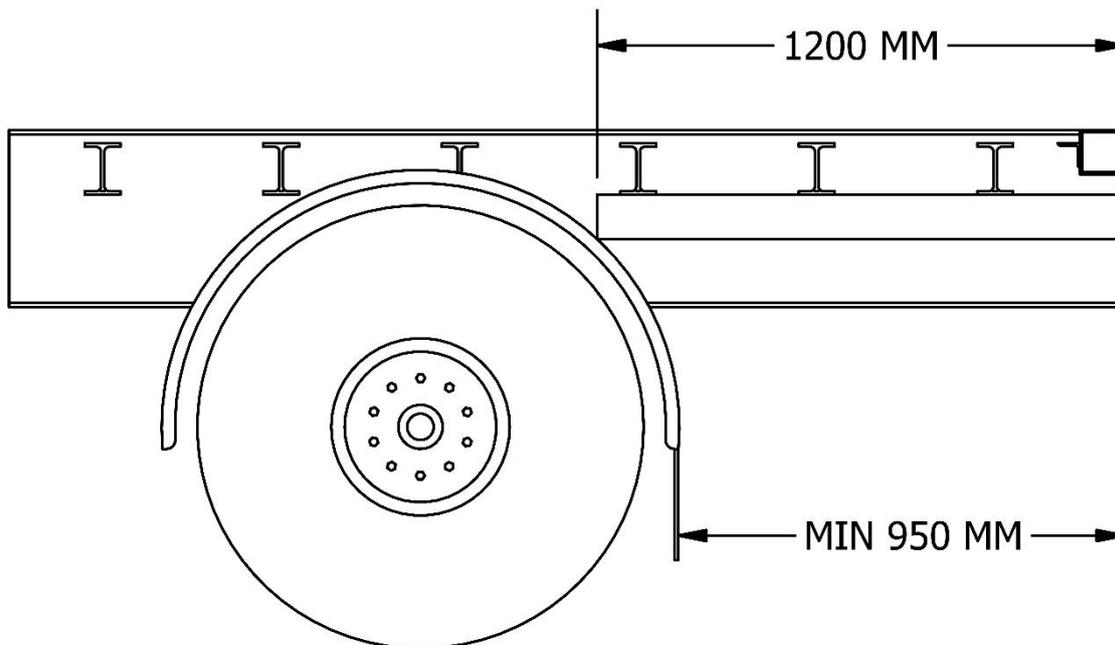
The chassis of most articulated trailers is made from mild steel, which allows the Bennett mounting kit to be welded without any adverse effects. However, the chassis of rigid trucks are made from high-tensile steel; in this case, it is advisable to use the bolt-on method to attach the mounting kit.

Existing holes in the chassis should be used whenever possible. If drilling is required, consult the truck or trailer manufacturer's documentation to ensure the warranty is not affected.

# 1 Trailer Chassis

Before starting any of the following procedures, ensure that the following conditions are met:

1. The distance between the rear of the chassis and the nearest point of the rear wheel mudguards is at least 950 mm (Figure 1)
2. There is 1200 mm of space available for the fork slippers (Figure 1)
3. The rear cross member is in good condition
4. Manufacturers supply information to bodybuilders for body strength, construction etc. for rear-mounted cranes; this can also be used for truck-mounted forklifts
5. The forks do not interfere with any components around the rear axle, such as springs, airbags, anti-roll bars, air reservoirs, etc.
6. You are aware of your customer's preferred fork centre spacing
7. The curtain tensioners will not obstruct the mounting of the forklift
8. The trailer coupling on rigid trucks will not obstruct the fitting of the mounting kit
9. For special trailer or truck applications, it is important to contact Bennett Engineering Ltd.



*Figure 1 (Chassis Check Dimensions)*

## 2 Preparation

1. To protect all electrical cables and light fittings during the assembly and welding of the mounting kit, remove them from the rear of the truck/trailer, extending as far back as the rear axle
2. Clean the chassis thoroughly and remove the existing crash bar
3. Before welding uncouple the tractor unit or disconnect the battery

**Table 1 (Parts List)**

<b>Parts List</b>			
<b>Item</b>	<b>QTY</b>	<b>Part Number</b>	<b>Description</b>
1	1	TMF010.02C	Underrun Bar LH
2	1	TMF010.03C	Underrun Bar RH
3	1	TMF010.01C	Centre Underrun Bar Assembly
4	1	CTMK30.01C	Bent Plate LH
5	1	CTMK30.02C	Bent Plate RH
6	1	CTMK50.01C	Rear Wheel Support
7	2	CTFM20.03C	Wheel Support 20 mm
8	1	CTMK20.01C	Wheel Support RHS 1430
9	2	CTMK20.04C	Outer Sleeve
10	2	CTMK40.01C	Fork Slipper Pressing
11	1	CTMK80.07C	Bent Gusset LH
12	1	CTMK80.08C	Bent Gusset RH
13	2	CTMK80.09C	Reinforcing Plate
14	2	CTMK20.02C	Bent Wheel Rest
15	2	XHCTM14.04C	Straight Wheel Clamp Assembly
16	2	CTMK80.05C	Slipper Spacer 120 X 80
17	2	CTMK10.04C	Underrun Bar Pin
18	2	CTMK60.01C	Chain Pin
19	2	6 MM	Linch Pin
20	6	CTMK80.04C	120 X 80 Spacer
21	4	M16 X 50	Hex Bolt
22	1	KASB010.08C	Light Socket Plate
23	1	KASOCK	Trailer Light Socket
24	1	M8 X 20	Hex Bolt 8.8
25	2	CTMK80.06C	Gusset
26	2	CTMK90.01C	Gusset
27	2	HCTMK80.01C	Chain Bracket Assembly
28	4	M16 X150	Hex Bolt
29	8	M16	M16 Nylock Nut
30	2	ROTD15.OOC	100 X 100 Plastic Insert
31	2	M10 X 25	Hex Bolt
32	2	M10	Nylock
33	2	HCTFM14.02C	Straight Wheel Stop Assembly
34	2	S12 X 4 R CLIP	S12 X 4 mm R Clip
35	2	ROTD15.O2C	80 X 120 Plastic Insert

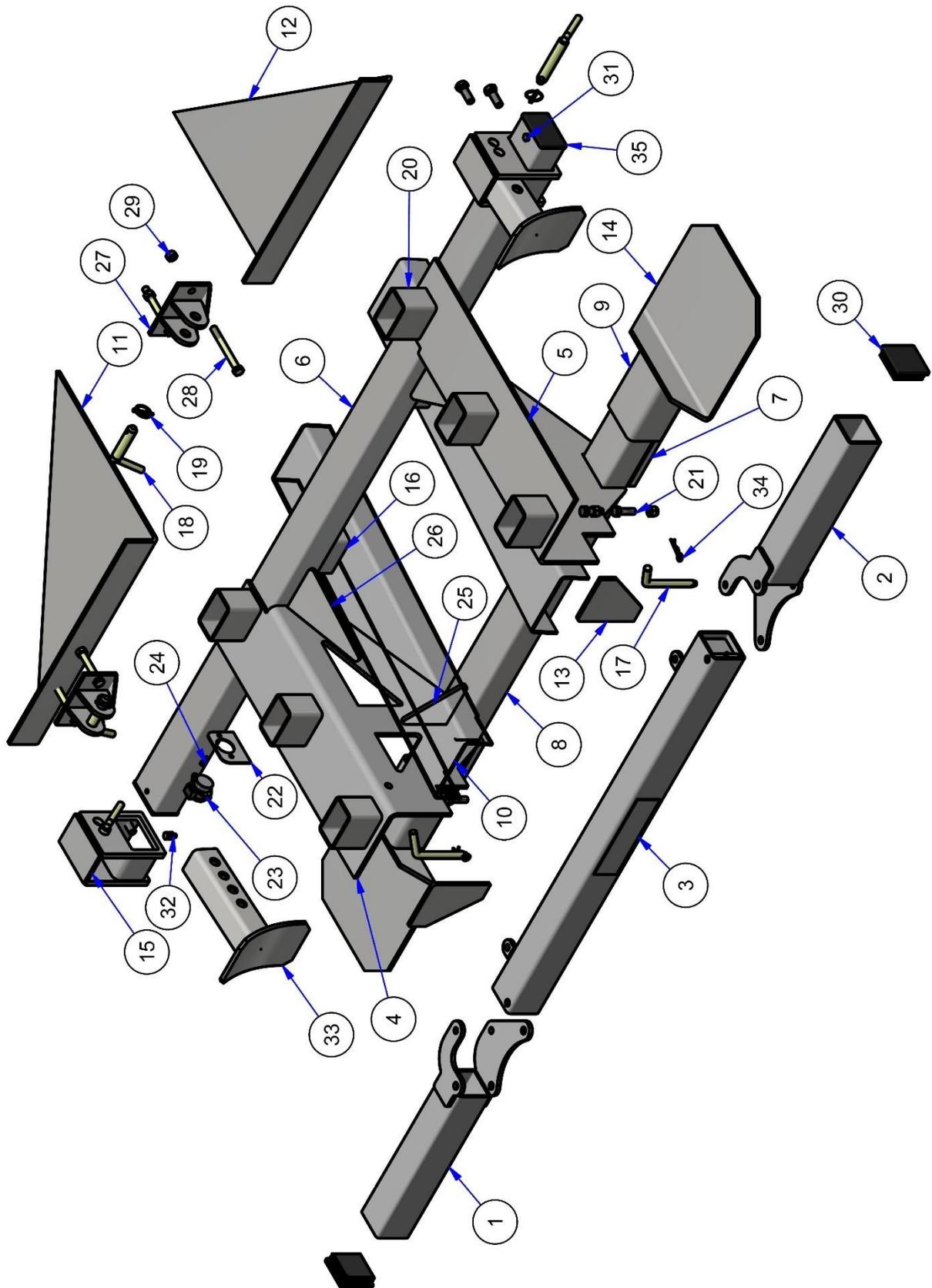


Figure 2 (Exploded Parts Diagram)

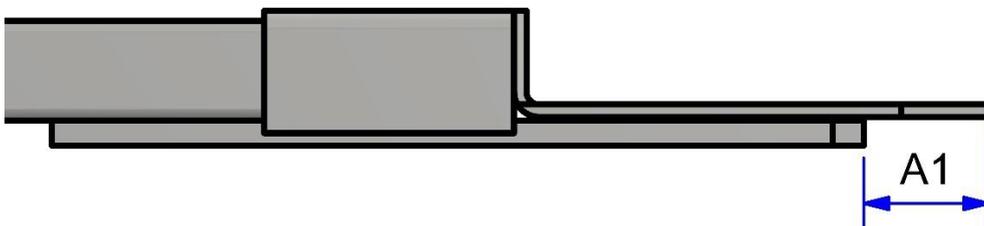
### 3 Wheel Rest Assembly

1. Fit the wheel rest plate (Item 14) in the mounting kit to the wheel rest outer sleeve (Item 9)
2. Weld the strengthener plate (Item 7) to the wheel rest box (Item 8) as shown in Figures 5 and 6, or Figures 7 and 8 if the extended wheel rest has been selected
3. Position assembly I (Items 9 and 14) on the assembly II (Items 7 and 8)
4. Ensure dimension A, Figure 3 is achieved to give the exact wheel rest width for the machine to be fitted

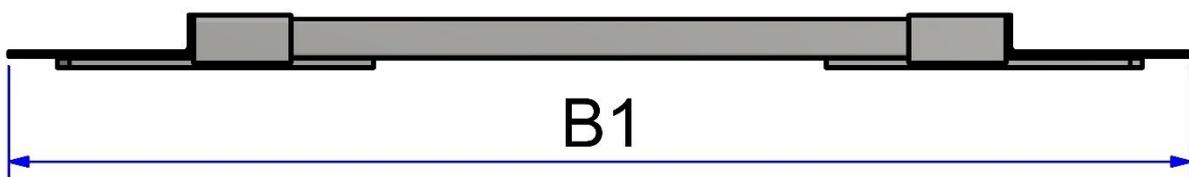
**Table 2 (Machine Type A and B Dimensions)**

Wheel Rest Dimensions		
Palfinger		
Model	A1 (mm)	B1 (mm)
CR203 26"	80	2390
CR203 27"	30	2290
CR253 26"	100	2430
CR253 27"	30	2290
CR253 4 Way 27"	115	2460
CR253 HD 32"	115	2460
Moffett		
Model	A1 (mm)	B1 (mm)
M5 Range (06 Onwards)	115	2460
M8 W (05 Onwards)	115	2460
M8 N (05 Onwards)	40	2310
M9 N (Not M9 23.3)	28	2240
M9 W (Not M9 23.3)	78	2346

5. Check dimensions A and B before fully welding

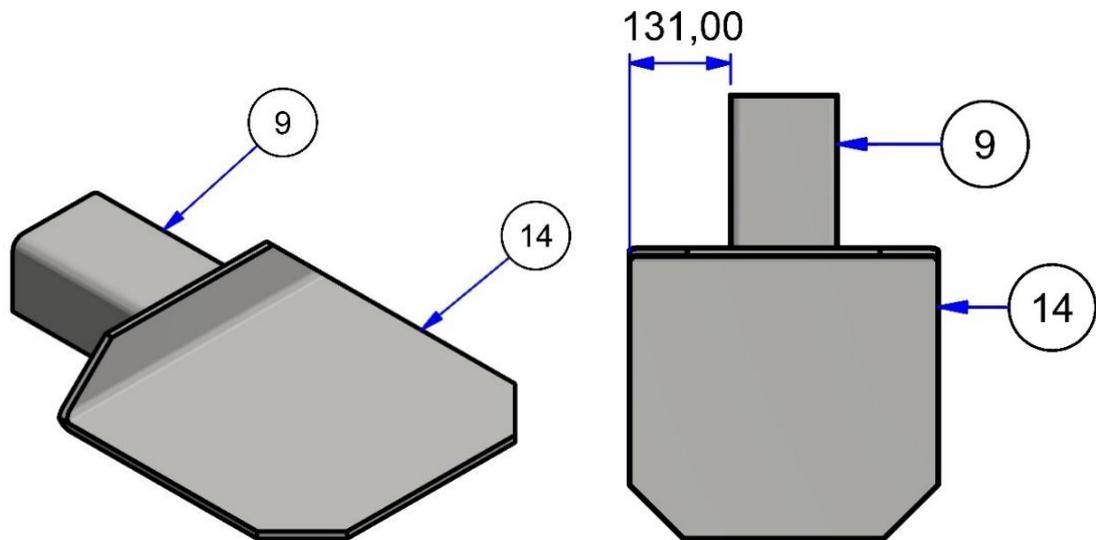


**Figure 3 (Check Dimension "A")**

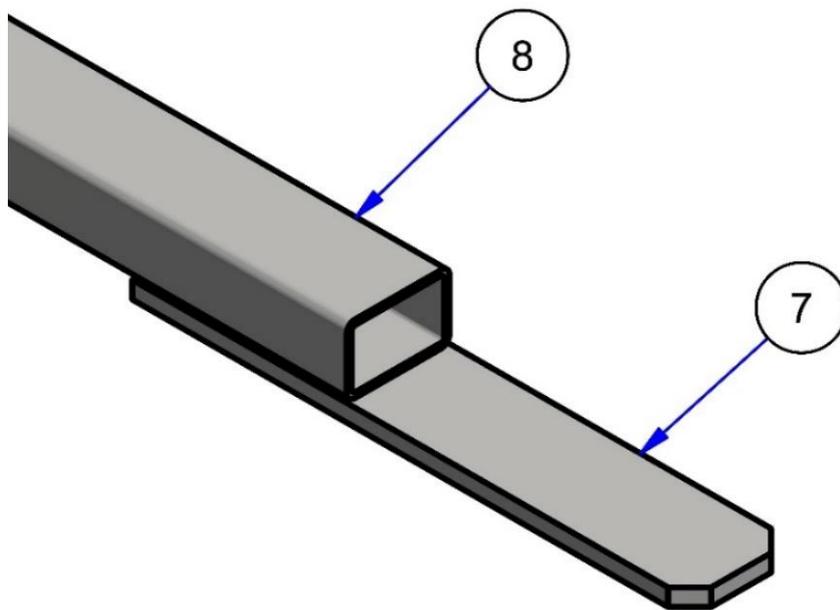


**Figure 4 (Check Dimension "B")**

### 3.1.1 Standard Wheel Rest

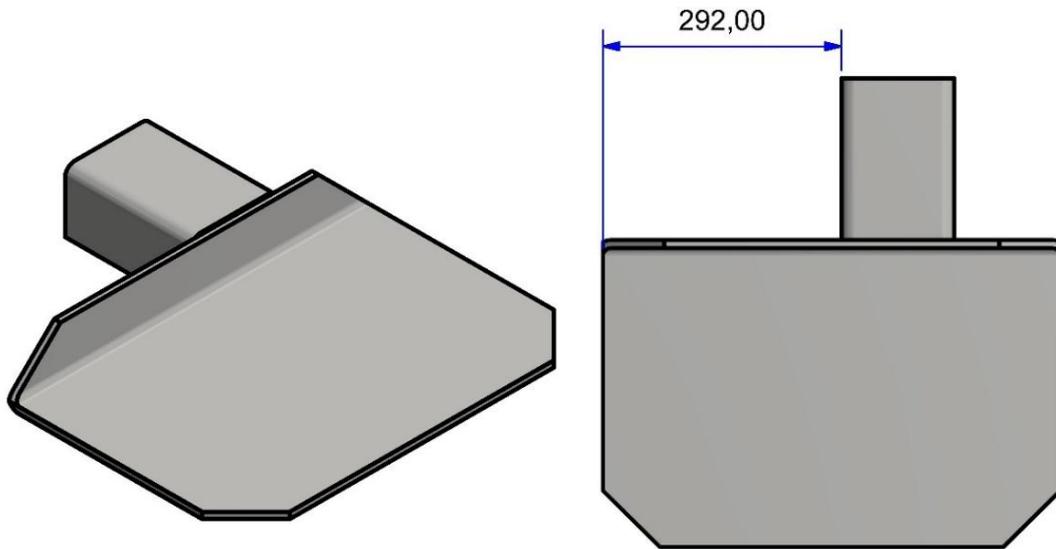


*Figure 5 (Assembly 1 – Standard Wheel Rest Plate and Outer Sleeve)*

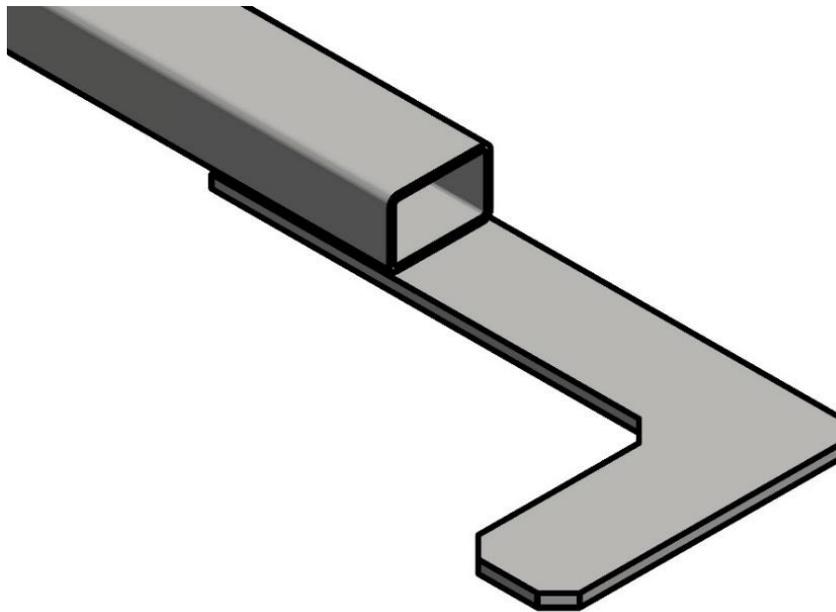


*Figure 6 (Assembly 2: Standard Strengthenener Plate and Wheel Rest Box)*

### 3.1.2 Extended Wheel Rest



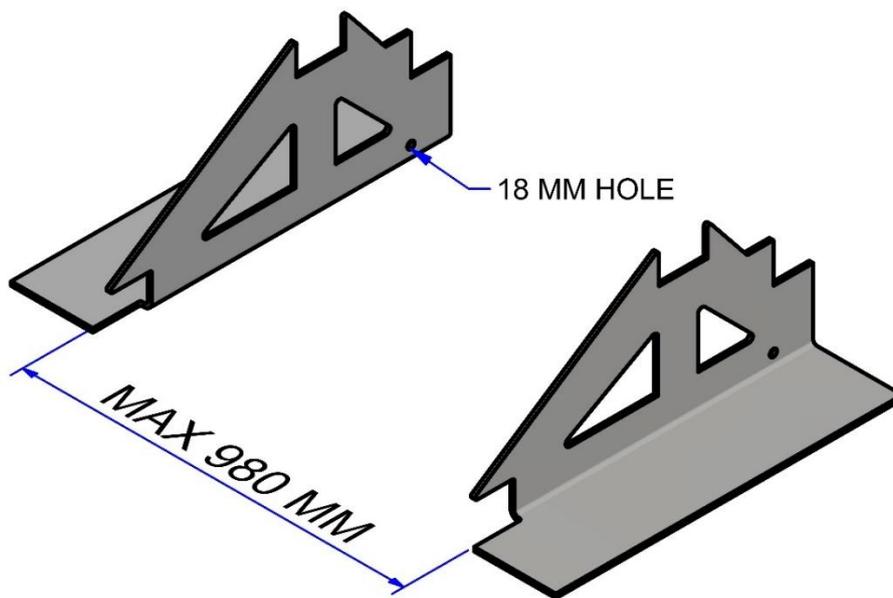
*Figure 7 (Assembly 3 – Standard Wheel Rest Plate and Outer Sleeve)*



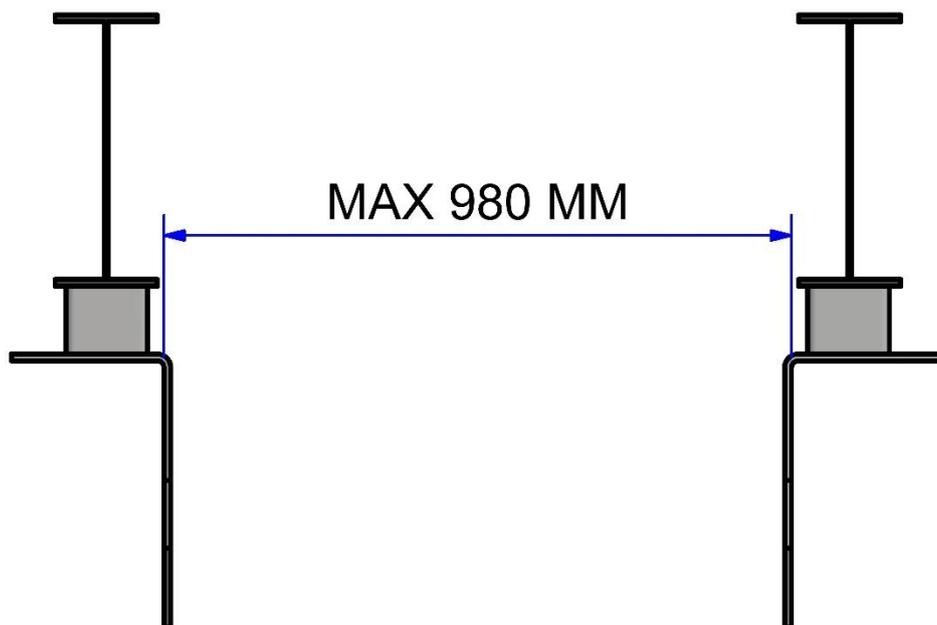
*Figure 8 (Assembly 4: Standard Strengthener Plate and Wheel Rest Box)*

### 3.2 Mounting Plate Spacing

1. Adjust the width of the mounting kit side plates (Items 4 and 5) to match the width of the trailer chassis
2. Ensure the width stays within the specified maximum dimension
  - a. 980 MM on the outer face of the side plates
3. This task can be made easier by inverting the mounting plates (Figure 9)
4. Use a threaded bar and nuts in the two 18mm holes in the side plates to prevent distortion when welding



*Figure 9 (Isometric View - Mounting Kit Width)*



*Figure 10 (End View - Mounting Kit Width)*

## 4 Assembly

### 4.1 Machine Dependant Dimensions

The kit's dimensions will need to be adjusted based on the specific TMF machine to be mounted. Refer to Figure 11 below for the dimensions, and consult Tables 3 and 4 for their corresponding values

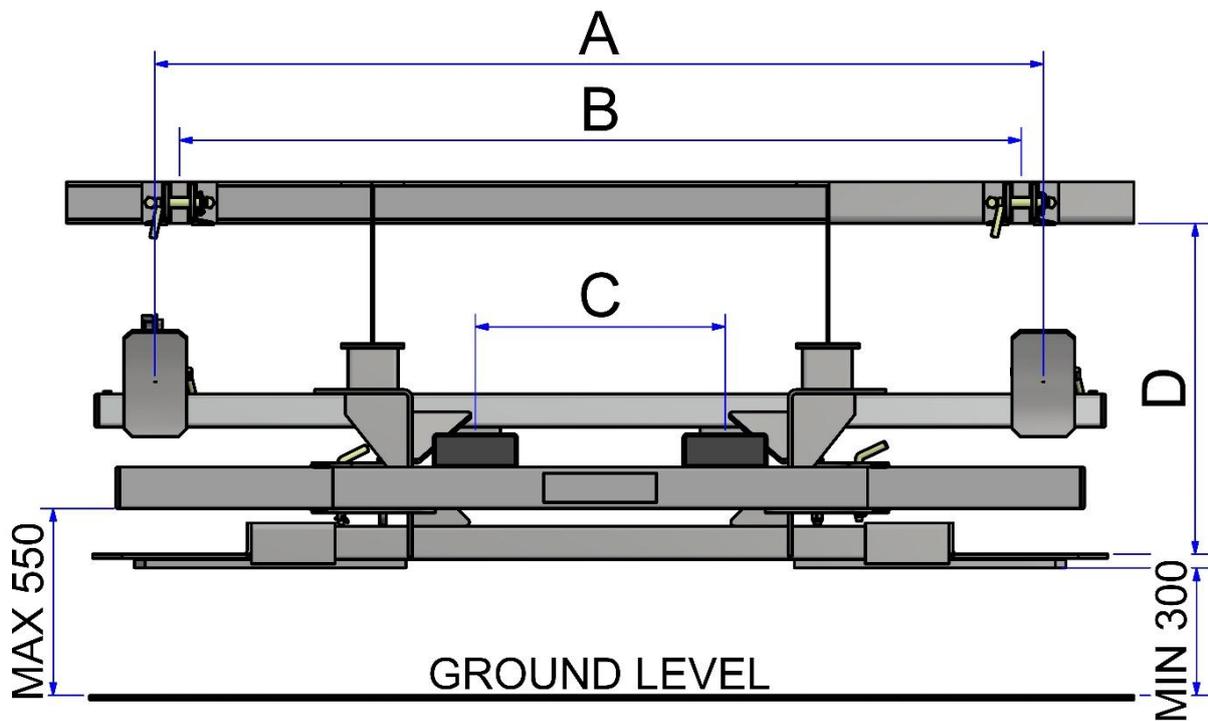


Figure 11 (Front View with Dimensions)

Table 3 (Kit Mounting Height Guide for Palfinger)

Variable Dimensions for Palfinger TMF					
Palfinger					
Model	Tyre Size	A (mm)	B (mm)	C (mm)	D (mm)
CR203	26"	2080	2000	640	700
	27"	2020	2000	640	725
CR253	26"	2100	2000	640	700
	27"	2040	2000	640	725
CR253 4 Way	27"	2240	2000	640	750
CR253 HD	32"	2110	2000	640	800

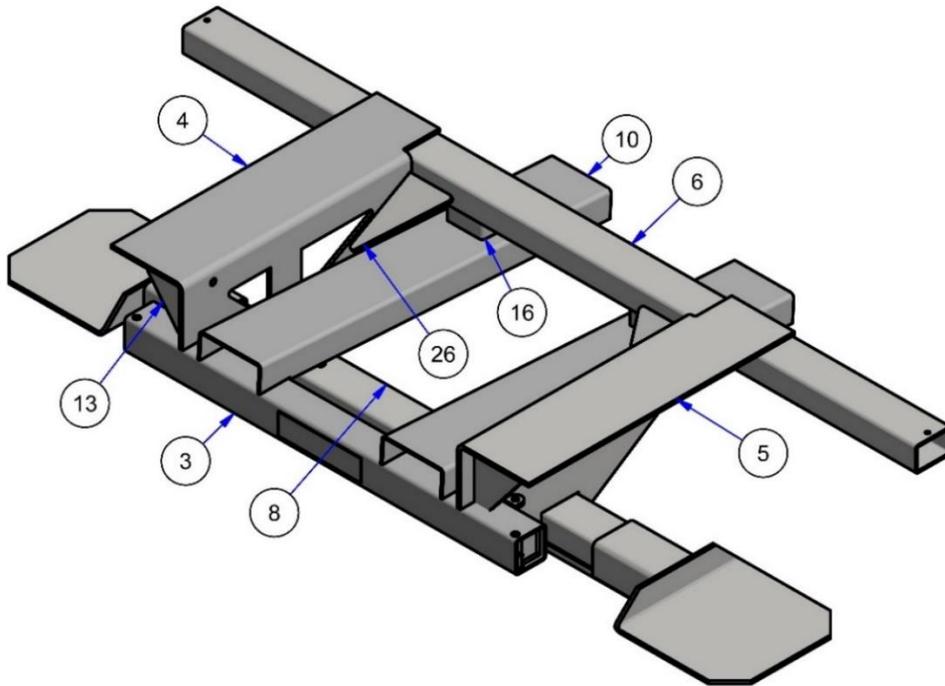
**Table 4 (Kit Mounting Height Guide for Moffett)**

<b>Variable Dimensions for Moffett TMF</b>					
<b>Moffett</b>					
<b>Model</b>	<b>Tyre Size</b>	<b>A (mm)</b>	<b>B (mm)</b>	<b>C (mm)</b>	<b>D (mm)</b>
<b>M5</b>	31 x 15.5 – 15	2180	2200	640	850
	10 x 16.5	2170	2200	640	820
	280/60-15.5	2170	2200	640	790
	29 X12.5-15	2180	2200	640	790
	27 x 10 – 12	2170	2200	640	750
	700 x 12 - 12	2170	2200	640	750
	26 X12-12	2180	2200	640	720
<b>M8 N (Narrow)</b>	31 x 15.5 – 15	2100	2200	640	850
	10 x 16.5	2070	2200	640	820
	280/60-15.5	2070	2200	640	790
	29 X12.5-15	2070	2200	640	790
	27 x 10 – 12	2070	2200	640	750
	700 x 12 - 12	2070	2200	640	750
<b>M8 W (Wide)</b>	31 x 15.5 – 15	2180	2200	640	850
	10 x 16.5	2170	2200	640	820
	280/60-15.5	2170	2200	640	790
	29 X12.5-15	2180	2200	640	790
	27 x 10 – 12	2170	2200	640	750
	700 x 12 - 12	2170	2200	640	750
<b>M9 N (Narrow)</b>	10 x 16.5	2020	2200	640	820
	280/60-15.5	2020	2200	640	790
	29 X12.5-15	2020	2200	640	790
	27 x 10 – 12	2020	2200	640	750
	700 x 12 - 12	2020	2200	640	750
<b>M9 W (Wide)</b>	10 x 16.5	2120	2200	640	820
	280/60-15.5	2120	2200	640	790
	29 X12.5-15	2120	2200	640	790
	27 x 10 – 12	2120	2200	640	750
	700 x 12 - 12	2120	2200	640	750

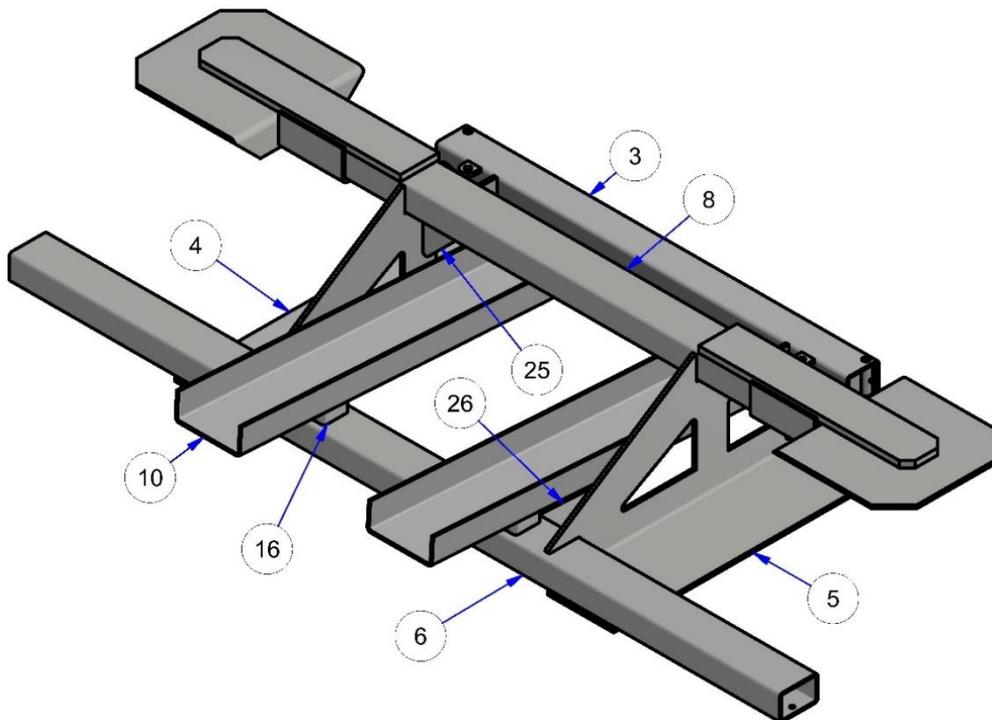
**NOTE:** When building a mounting kit to suit machines fitted with **lift assist arms or load rests**, an additional 50 mm should be added to dimension D.

## 4.2 Structural Frame Assembly

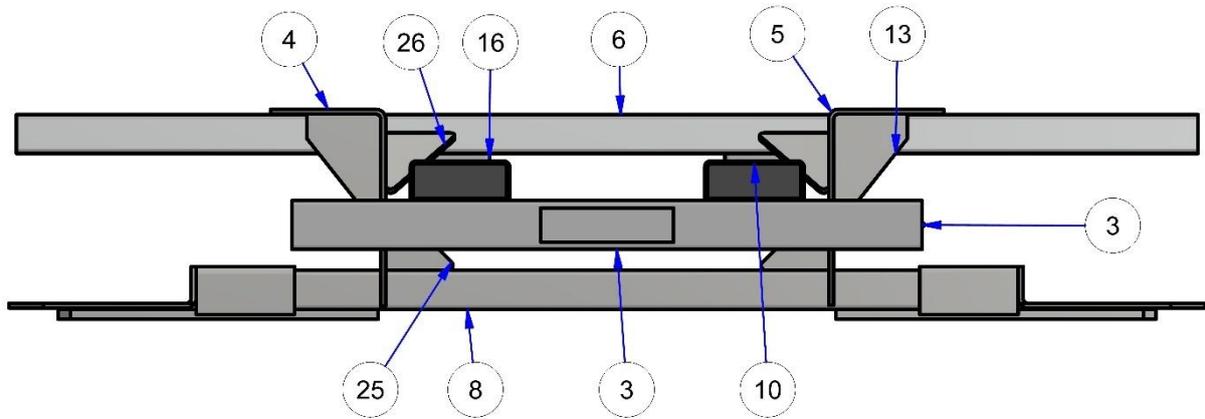
- The weldment shown in Figures 12 to 15 forms the structural frame to which all ancillaries will attach
- It is important to refer to Figure 11 and Table 3 or 4 (above), depending on the brand of forklift you intend to mount when welding this section



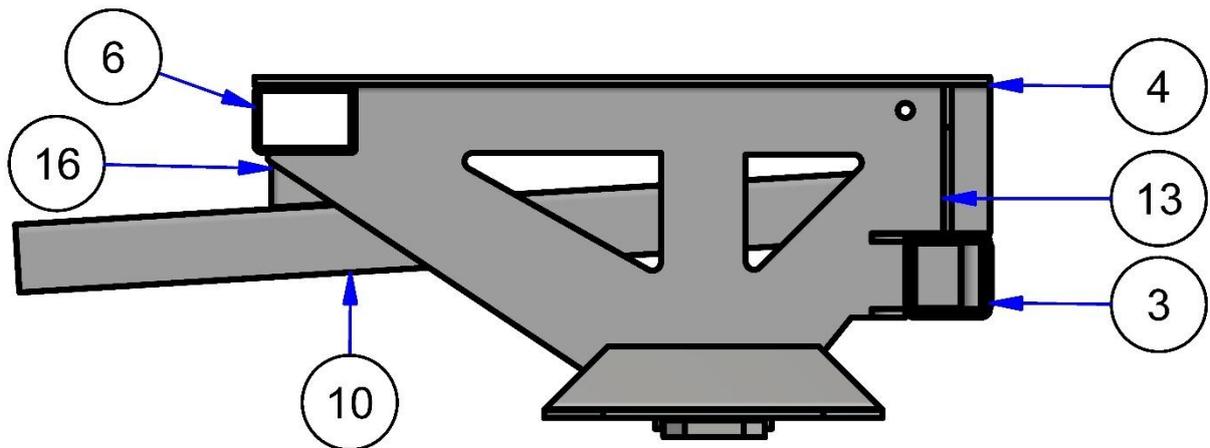
*Figure 12 (Completed Frame Assembly Diagram)*



*Figure 13 (Completed Frame Assembly Diagram Upside Down)*



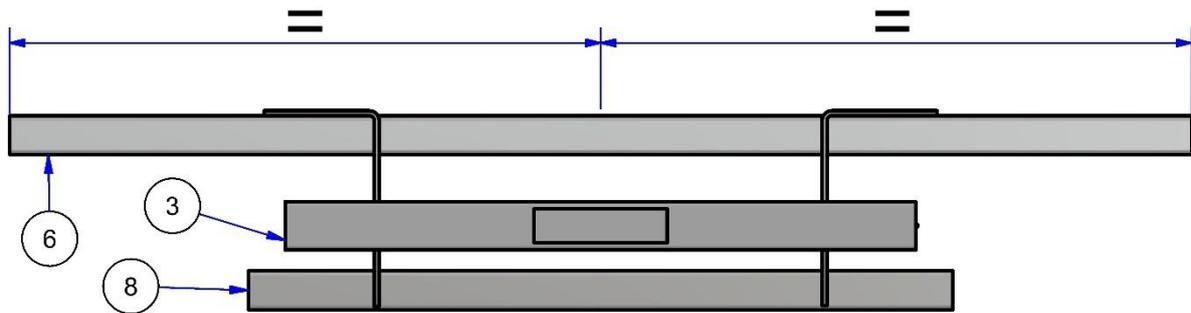
**Figure 14 (Completed Frame Assembly Diagram Front View)**



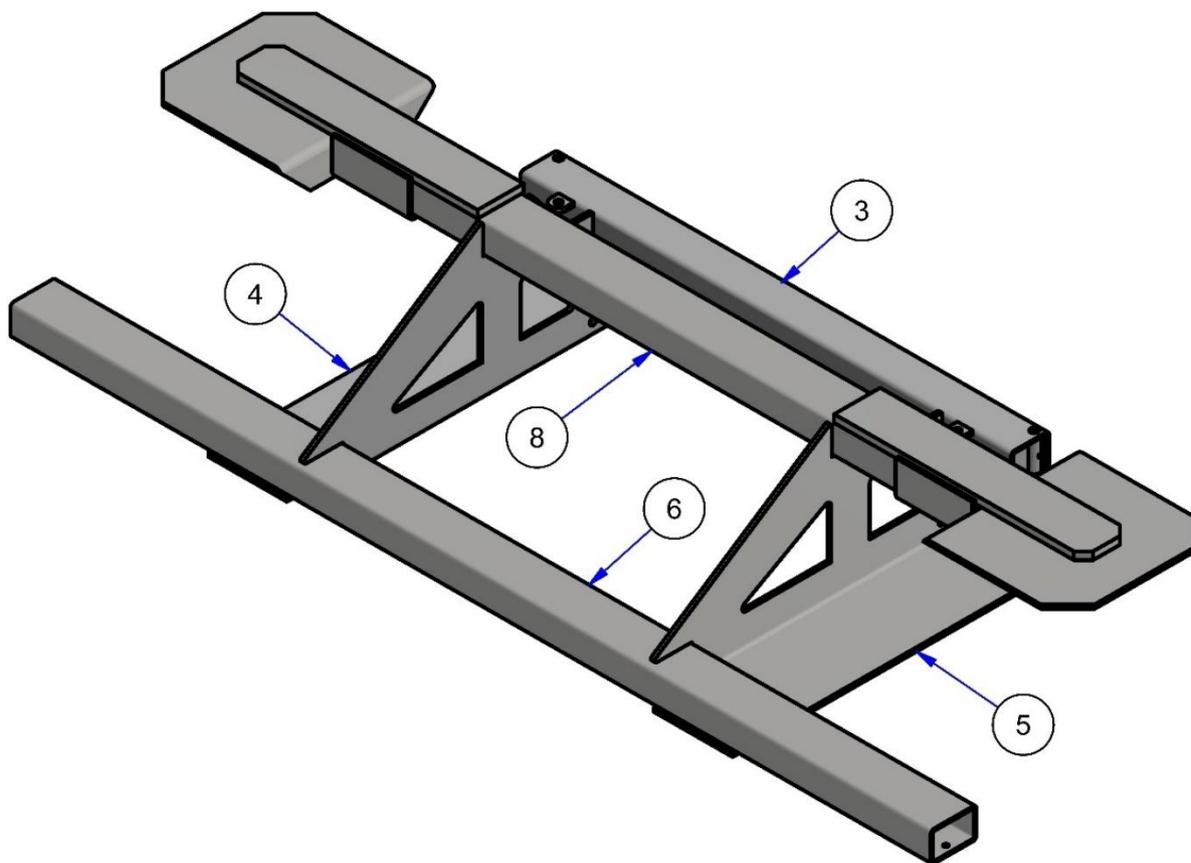
**Figure 15 (Completed Frame Assembly Diagram Side View)**

### 4.2.1 Base Frame Assembly

1. Fit the completed wheel rest assembly from Section 4 into the designated slot in the main plate ensuring it is centred
2. Position the centre underrun bar (Item 3) and the rear wheel support (Item 6) into the remaining two slots and centralise them as shown in Figures 16 and 17
3. This part of the assembly can be made easier by constructing it upside down



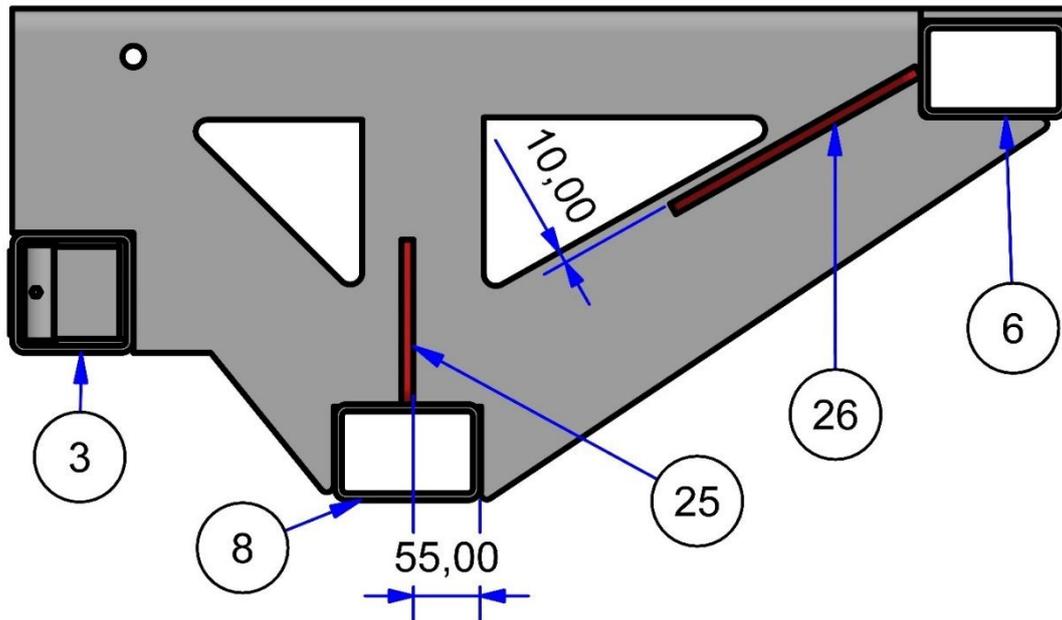
*Figure 16 (Front View - Frame Assembly)*



*Figure 17 (Upside Down Isometric View - Frame Assembly)*

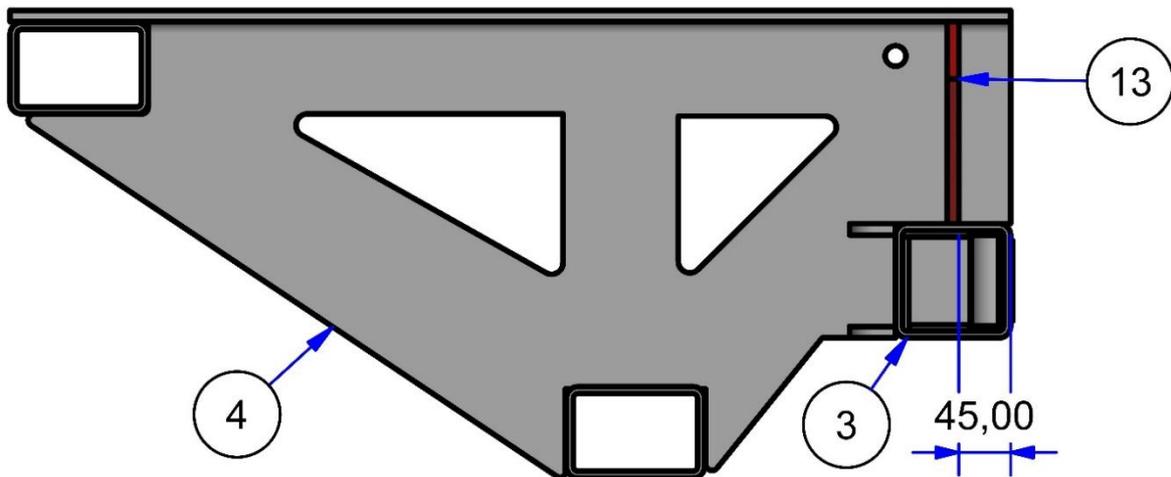
## 4.2.2 Gussets

1. Fit the gussets (Items 25 and 26) as shown to the bent plate (Item 4), rear-wheel support (Item 6) and wheel support RHS 1430 (Item 8)



*Figure 18 (Item 25 and 26 Positioning)*

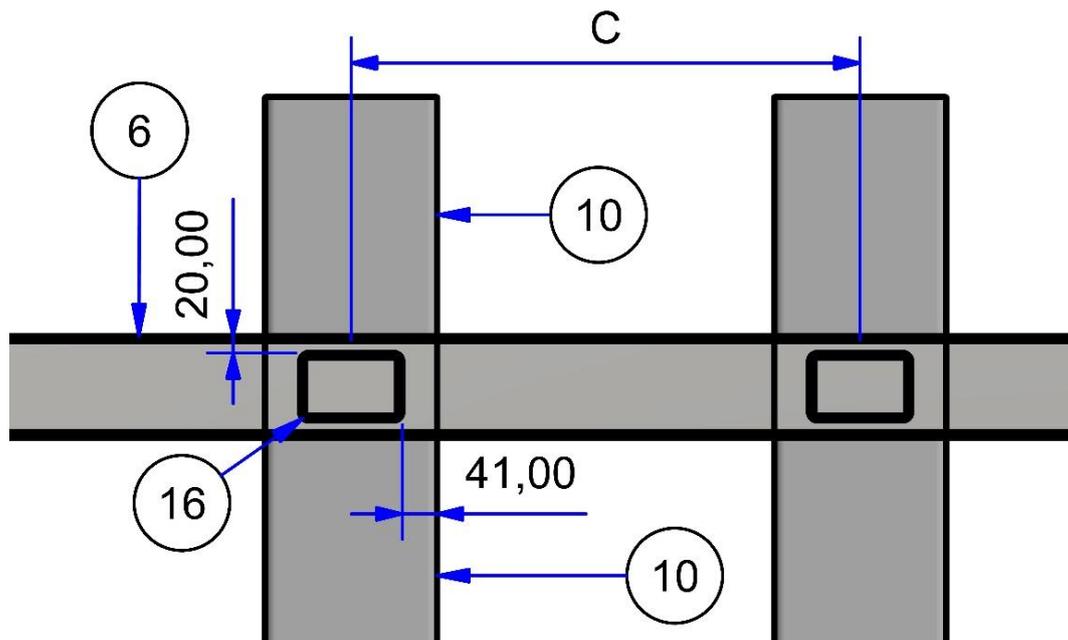
2. Weld the reinforcing plates (Item 13) into the fold of the bent plate (Item 4) as shown in Figure 19



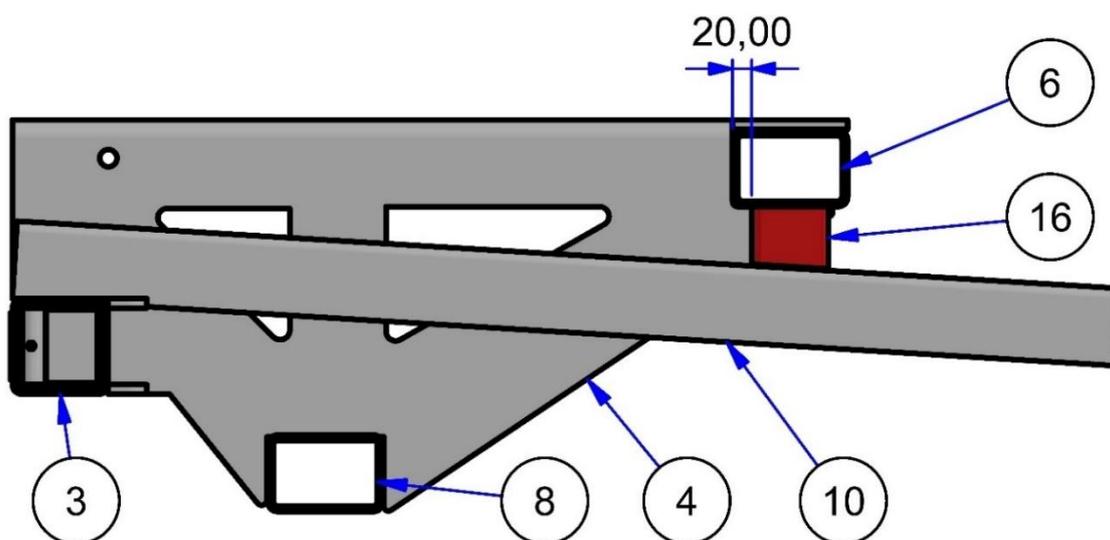
*Figure 19 (Item 13 Position)*

### 4.2.3 Fork Slipper Spacers

4. Fit the fork slipper guides (Item 10) centrally between the main kit plates
5. Set the fork guides at the recommended centres listed in Table 3 or as required by the customer
6. Check for any interference of the forks with airbags, suspension springs, axle beams, air reservoirs, etc.
7. Fit the fork slipper spacers (Item 16)
8. When using telescopic forks, reduce the height of the slipper spacers by an additional 15 mm



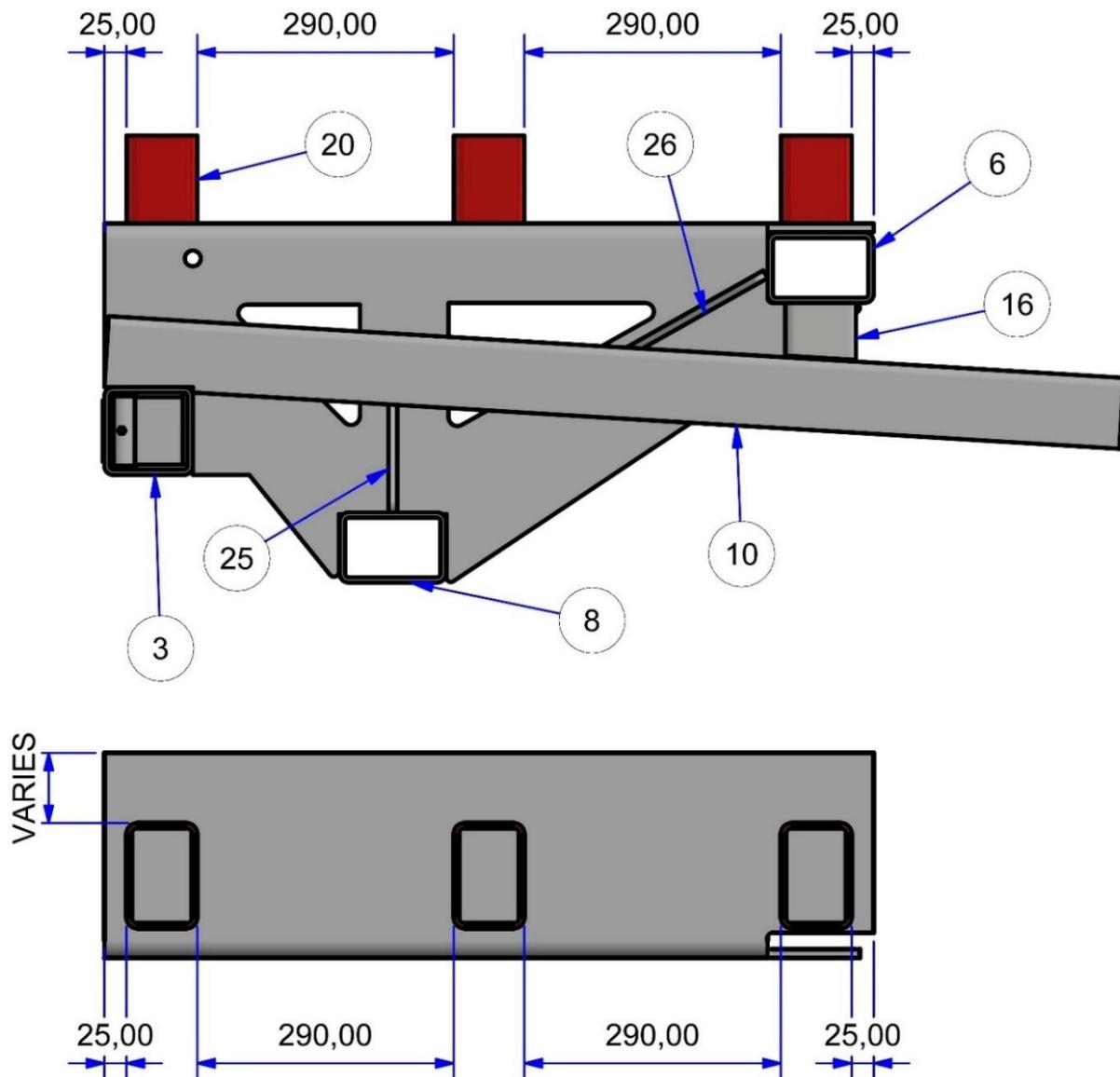
*Figure 20 (Top View - Slipper Spacer)*



*Figure 21 (Side View - Slipper Spacer)*

#### 4.2.4 Chassis Spacers

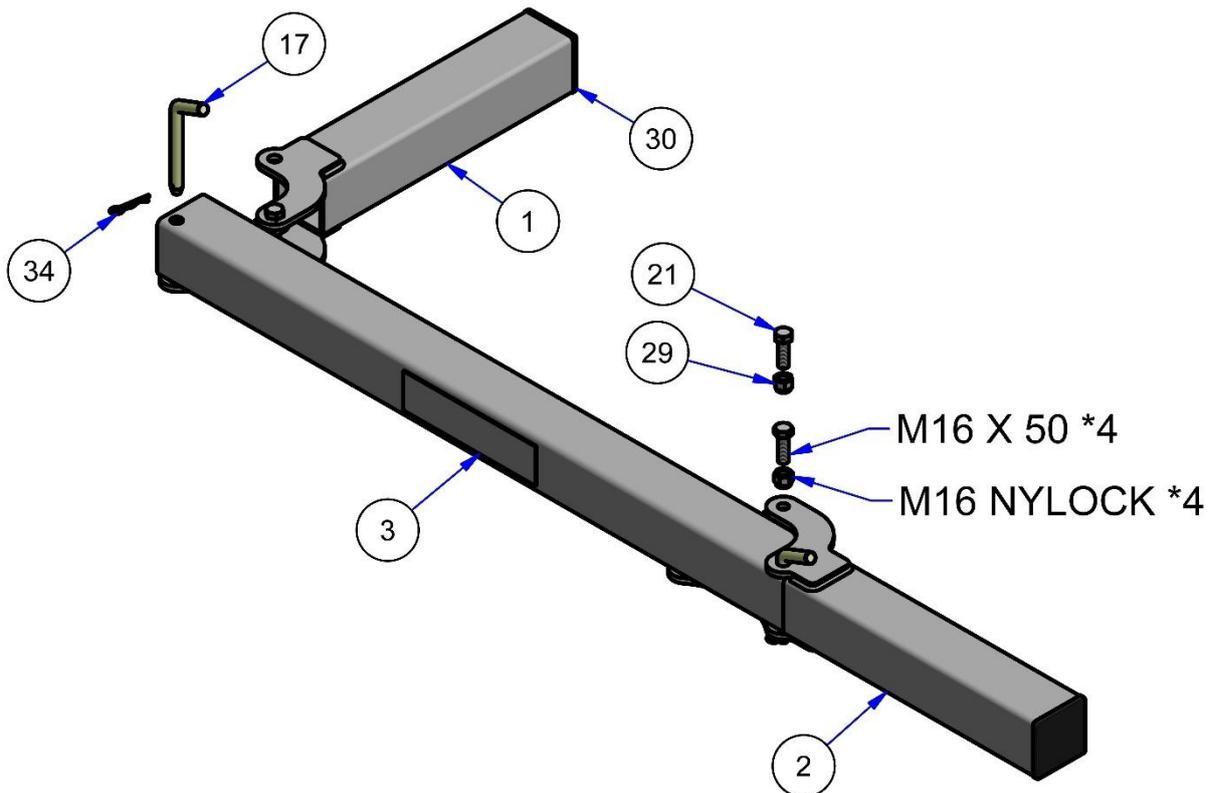
1. When cutting the chassis spacers to size, refer to Figure 22 and Table 3 to ensure Dimension D and the distance to ground level remain within the acceptable range
2. Weld the chassis spacers onto the bent plates, spaced as shown in Figure 22
3. Adjust the positioning of the chassis spacers on the bent plate according to the width of the trailer chassis
4. Ensure the spacers sit centrally on the I-beam of the trailer



**Figure 22 (Side and Top View - Chassis Spacer Placement)**

### 4.3 Underrun Bar

1. Attach the taillight clusters onto the folding underrun bars
2. Bolt Items 1 and 2 onto the underrun bar centre (Item 3) using the four M16 nuts and bolts as shown in Figure 23
3. Ensure Items 1 and 2 can pivot freely
4. Insert the underrun pins (Items 17) and the R-clips (Items 34) to lock the underrun bar in the desired position

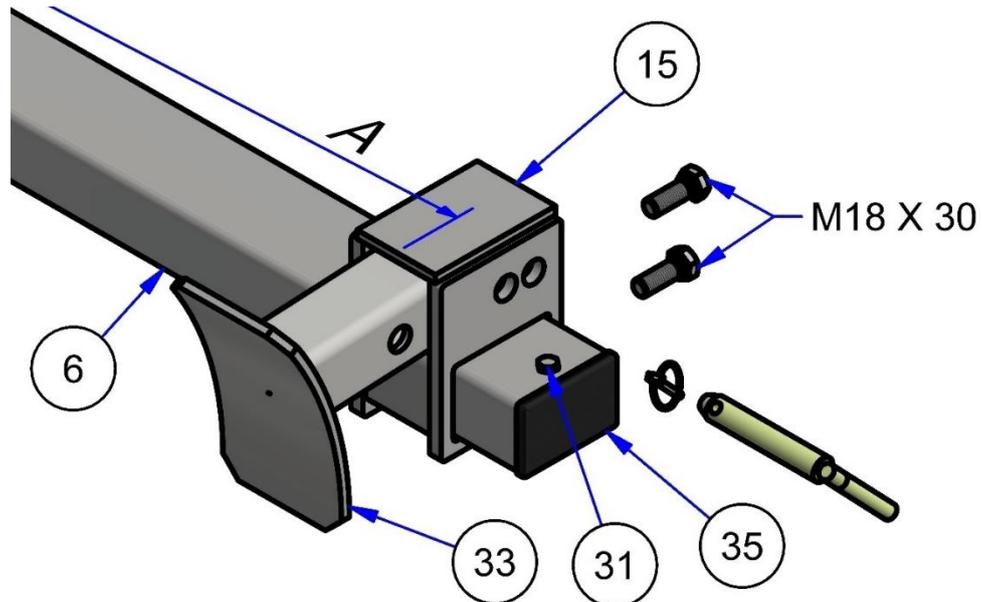


*Figure 23 (Underrun Bar Assembly)*

## 4.4 Wheel Stops

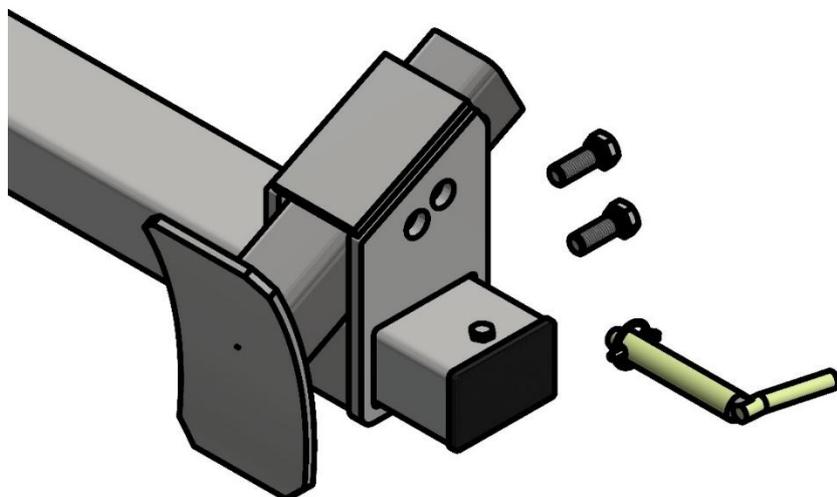
1. Assemble both wheel stops (Left and Right)
2. Secure them in position using the M18 bolts, torqued to 275 Nm
3. Check the bolt torque after one hundred miles and periodically after that

### 4.4.1 Straight Wheel Stop



*Figure 24 (Straight Wheel Stop Assembly)*

### 4.4.2 Angled Wheel Stop

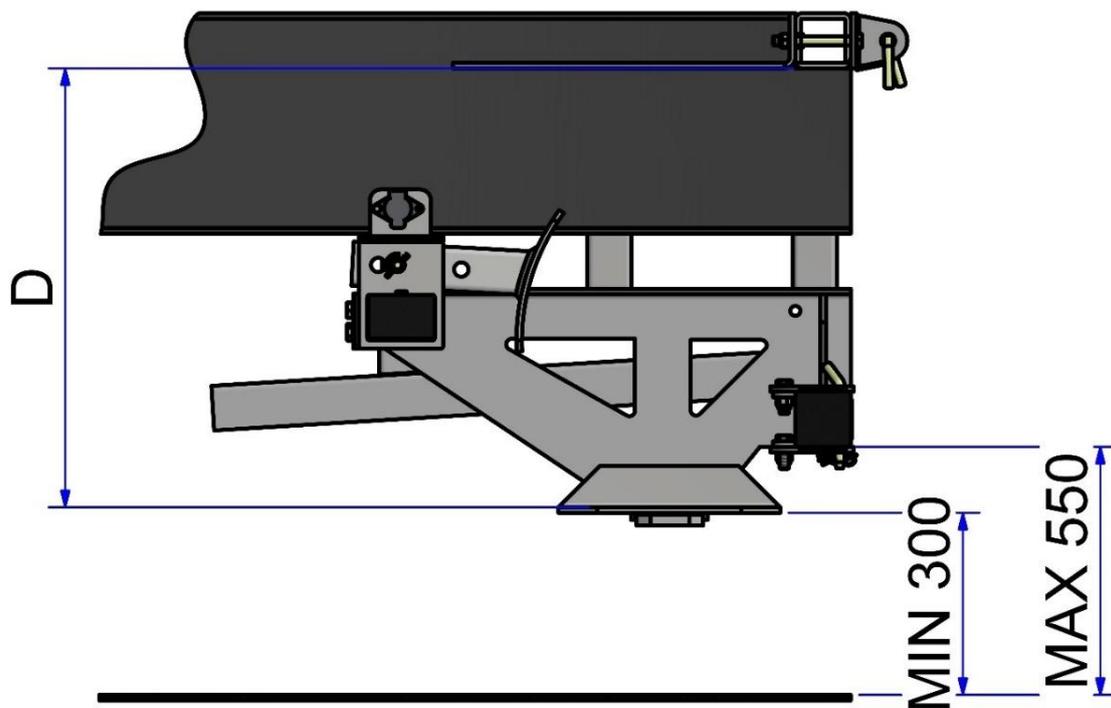


*Figure 25 (Bent Wheel Stop Assembly)*

## 4.5 Fitting

Using the forklift, if available, or a jacking system, position the assembled kit under the trailer chassis. Set the height of the kit as follows:

1. While keeping the mounting kit as high as possible, ensure that the height from the ground to the underside of the crash bar does not exceed 550 mm
2. Then check to see if the wheel clearance (D) is correct for the specific model and tyre size to be mounted
3. If there is insufficient wheel clearance, lower the kit
4. Ensure that the ground clearance does not fall below 300 mm from the underside of the wheel rest strengthener plate to the ground
5. Once the height of the kit is established, spacers (Item 20) may be required between the bottom flange of the chassis and the top fold of the assembled kit
6. Cut spacers (Item 20) to fit
7. Ensure the rear face of the mounting kit is flush with the furthest point of the trailer
8. If the doors protrude beyond the rear cross member, align the mounting kit flush with the rear doors
9. Fully weld the chassis spacers to the chassis I-beam and the mounting kit



*Figure 26 (Side View with Dimensions)*

## 5 Mounting the Forklift

---

Once the mounting frame is fully welded, follow these steps to mount the forklift onto the trailer:

1. Approach the rear of the trailer slowly with the mast extended and forks positioned to suit the mounting kit
2. Drive slowly forward until the forks are tight with the back of the trailer
3. Tilt the mast rearward to raise the rear wheel
4. Lower the forks using the lift lever until the bottom of the front wheels of the machine is slightly higher than the wheel rests
5. Retract the carriage fully, this will bring the wheels of the forklift under the trailer
6. Move the carriage so that approximately 40 mm (1.5 inches) of chrome rod is visible from the end of the cylinder
7. Ensure that the wheel stop assemblies snugly fit around the forklift wheels
  - a. If the machine is not present during the fitting of the kit, establish the wheel stop centres
  - b. Refer to Tables 3 and 4 for details on both scenarios
8. Fully retract the mast carriage towards the driver
  - a. Note: The gap between the forks and the trailer, created when the wheels press against the wheel stops, is crucial to absorb shock loads during transit
9. Weld on all other components shown in Figure 2 to their designated positions
  - a. This includes stabilizing chain brackets and light brackets
  - b. For the larger folded gussets (Items 11 and 12), it may be necessary to remove the folded section to ensure proper fit
10. Weld the Suzie socket bracket (Item 22) in an appropriate location
  - a. Ensure it does not obstruct anything when the forklift is mounted
  - b. Wire the Suzie cable according to the instructions provided in Section 7

## 6 Lighting Socket Wiring

Most modern trucks are now equipped with an onboard computer, known as the CAM or telemetric system, which controls the extensive array of electronics, from the windows to the brakes and suspension.

When installing the connection plug (Suzie socket) for the 7-pin socket to rigid trucks for the auxiliary lights of the truck-mounted forklift, it is crucial to avoid damaging the truck's telemetric/CAM system.

**To prevent such damage, the person wiring the mounting kit auxiliary socket must contact the truck manufacturer before cutting into the truck's wiring system, as improper handling can cause extensive and costly damage.**

Some trucks are equipped with special sockets within the chassis specifically for this purpose. For others, it may be necessary to wire the auxiliary lights back to the fuse box, this varies by manufacturer and model. Details on connecting to the wiring system can be found in the bodybuilder's manual or CD provided by most manufacturers. If this information is not available, please contact the manufacturer directly.

Below (Table 4) are the two most common methods to wire the 24V 7-pin 24N socket, with and without a reversing light

*Table 5 (Wiring Colours)*

Type: 24N, ISO:1185 24V Socket			
POS	Wire Colour	With Rev Light	Without Rev Light
1	White	Ground	Ground
2	Black	Reverse	LH side lights
3	Yellow	LH indicator	LH indicator
4	Red	LH/RH stoplights	LH/RH stoplights
5	Green	RH indicator	RH indicator
6	Brown	LH/RH side lights	RH side lights
7	Blue	Fog light	Fog light

## 7 Pre 2005 Moffett Dimensions

*Table 6 (Pre 2005 Dimensions A and B)*

<b>Old Pre 2005</b>		
<b>Moffett Types</b>	<b>A1 (mm)</b>	<b>B1 (mm)</b>
M2003 (Pre 1997)	28	2168
M2003E/M5 20.3 (97-06')	40	2310
M2503E & 4way /M5 25.4 (97-06')	115	2460
M7/M2403/M2703 N	40	2310
M7/M2403/M2703 W & 4-Way	115	2460
M2275 N /M9 N	28	2186
M2275 W /M9 W	78	2386

*Table 7 (Pre 2005 (Kit Mounting Height Guide))*

<b>Variable Dimensions for Older Moffett TMF</b>					
<b>Model</b>	<b>Tyre Size</b>	<b>A (mm)</b>	<b>B (mm)</b>	<b>C (mm)</b>	<b>D (mm)</b>
<b>M2003/ M5 20.3 (Up to 1997')</b>	700 x12 -12	1965	1800	640	720
	26 x 12 - 12	1965	1800	640	720
	27 x 10 - 12	1965	1800	640	740
<b>M2003E/ M5 20.3 (1997 -2006)</b>	700 x12 -12	2065	2050	640	740
	26 x 12 - 12	2075	2050	640	740
	27 x 10 - 12	2065	2050	640	740
<b>M2003E 4-Way / M5 20.4 (1997 -2006)</b>	700 x12 -12	2080	2050	640	770
	26 x 12 - 12	2090	2050	640	770
	27 x 10 - 12	2080	2050	640	770
<b>M2403N / M7 24.3 N</b>	31 x 15.5 - 15	2070	2000	640	850
	280/60 - 15.5	2070	2000	640	790
	27 x 10-12	2070	2000	640	740
	700 x 12 - 12	2070	2000	640	720
<b>M2403W / M7 24.3 W</b>	31 x 15.5 - 15	2180	2000	640	850
	280/60 - 15.5	2180	2000	640	790
	27 x 10-12	2180	2000	640	740
	700 x 12 - 12	2180	2000	640	720
<b>M2403W 4-Way / M7 24.4 W</b>	31 x 15.5 - 15	2180	2200	640	850
	280/60 - 15.5	2180	2200	640	790
	27 x 10-12	2180	2200	640	740

	700 x 12 - 12	2180	2200	640	720
<b>M2703 W / M7 27.3 W</b>	31 x 15.5 - 15	2180	2200	640	850
	280/60 - 15.5	2180	2200	640	790
	27 x 10-12	2180	2200	640	740
	700 x 12 - 12	2180	2200	640	720
<b>M2703N / M7 27.3N</b>	31 x 15.5 - 15	2030	2200	640	850
	280/60 - 15.5	2030	2200	640	790
	27 x 10-12	2030	2200	640	740
	700 x 12 - 12	2030	2200	640	720
<b>M2703 N 4-Way</b>	31 x 15.5 -15	2030	2200	640	850
	280/60 - 15.5	2030	2200	640	790
	27 x 10 -12	2030	2200	640	740
<b>M2703W4-Way/ M7 27.4 W</b>	31 x 15.5 - 15	2180	2200	640	850
	280/60 - 15.5	2180	2200	640	790
	27 x 10-12	2180	2200	640	740
	700 x 12 - 12	2180	2200	640	720
<b>M2275 / M9 (Up to 2007)</b>	280/60 - 15.5	2000	2050	640	790
	27 x 10 -12	2000	2050	640	760
	26 x 10 - 12	2000	2050	640	760
<b>M2503 E / M5 25.3 / 25.4 (1997 -2006)</b>	700 x 12-12	2170	2200	640	770
	26 x 12-12	2180	2200	640	770
	27 x 10-12	2170	2200	640	770
	280/60 - 15.5	2180	2200	640	820
<b>M9 24.3 W (Up to 2007)</b>	10x16.5	2120	2150	640	810
	280/60 - 15.5	2120	2150	640	790
	27 x 10 -12	2120	2150	640	760
	700 x 12 -12	2120	2150	640	760