Tecair Duratrac FB Air Suspension

Installation Manual

YORK
SIMPLY MILES AHEAD

YTE Leading Trailer Parts

TÜV SÜD ISO 9001
CERT NO.: 93-2-0135
ISO 9001 : 2000

MGMT.SYS.
RvA C 223

www.yorktransport.com

1. INTRODUCTION

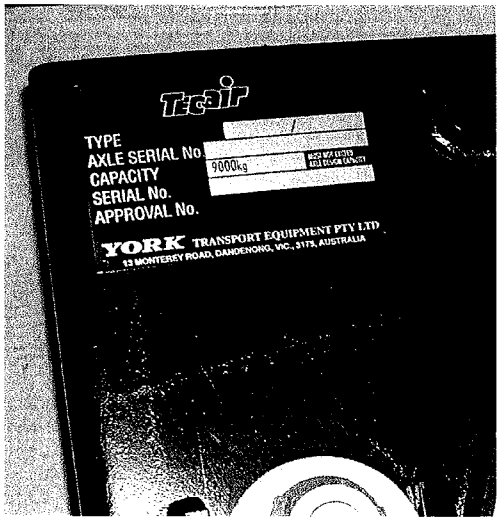
The **Tecair Duratrac** suspension has been produced through ongoing evolution at **YORK** to provide a 'Fixed Beam' suspension that exceeds the requirements of current and future transport needs. Using 'state of the art' Finite Element Analysis, meeting the requirements of 'Road Friendly Suspension and with provision for the now wide spread acceptance of Disc Brakes, **Duratrac** has become lighter and stronger. With integral shock absorber mounts, internal bump stops and a new axle alignment procedure, removing the need for welding after alignment the suspension installation has been simplified and accelerated.

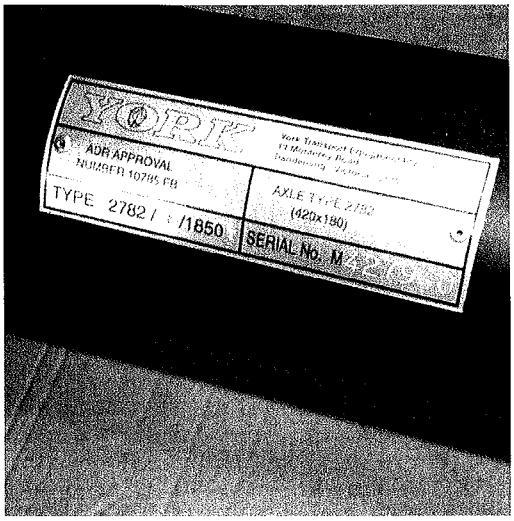
Ride heights are from 260mm to 460mm in 40mm increments as standard with other heights available on request.

2. INSTALLATION

2.1 - Receival

On receipt of the **Duratrac** suspension ensure that the correct unit has been received by checking the identification plate as attached to the suspension hanger. This will have the suspension type and ride height marked on it. Check also that the axle, if obtained with the suspension is the type and axle track as ordered. This is shown by the identification plate attached to the centre of the axle.





CAUTION

It is the trailer builders responsibility to ensure that the correct suspension has been chosen to suit the expected requirements and working conditions.

INSTALLING AN INCORRECT SUSPENSION MAY VOID THE WARRANTY

The suspension will be delivered with the suspension hangers and shock-absorbers assembled to the suspension arms. The pivot bolts and shock-absorber bolts will be installed but not tightened. The air bags and air bag top plate will be supplied loose along with the other associated components.

'IMPORTANT'

Use only 'YORK' supplied or approved components. Failure to do so could cause a dangerous condition and may void the 'Warranty'

2.2 - Equipment

The installation of **Duratrac** suspension does not require any specialized equipment other than normal workshop tools. All welding must be performed in a competent manner (following **YORK** standard welding procedures) using welding equipment suitable to the requirements of the work. As components of the axle/suspension assembly are far in excess of manual lifting capacity, mechanical lifting equipment will be necessary to position and move the components during installation. Associated chains, slings and hooks must be in a **safe** and **workable** condition and of suitable capacity. It is the responsibility of the individuals working on the vehicle to ensure that it is performed in a safe and clean environment, using only approved and suitable lifting and blocking equipment.

'CAUTION'

Always use the appropriate lifting equipment and safety precautions. Safety goggles, ear protection and gloves will be necessary where required.

3. - SUSPENSION ATTACHMENT

This manual have been formulated for when the suspension is supplied with the axle attached. If this is not the case the axle must be now attached to the suspension in its correct position and orientation. Refer to section 8 for **'Attaching Suspension Arm to Axle Beam'** before continuing with this procedure.

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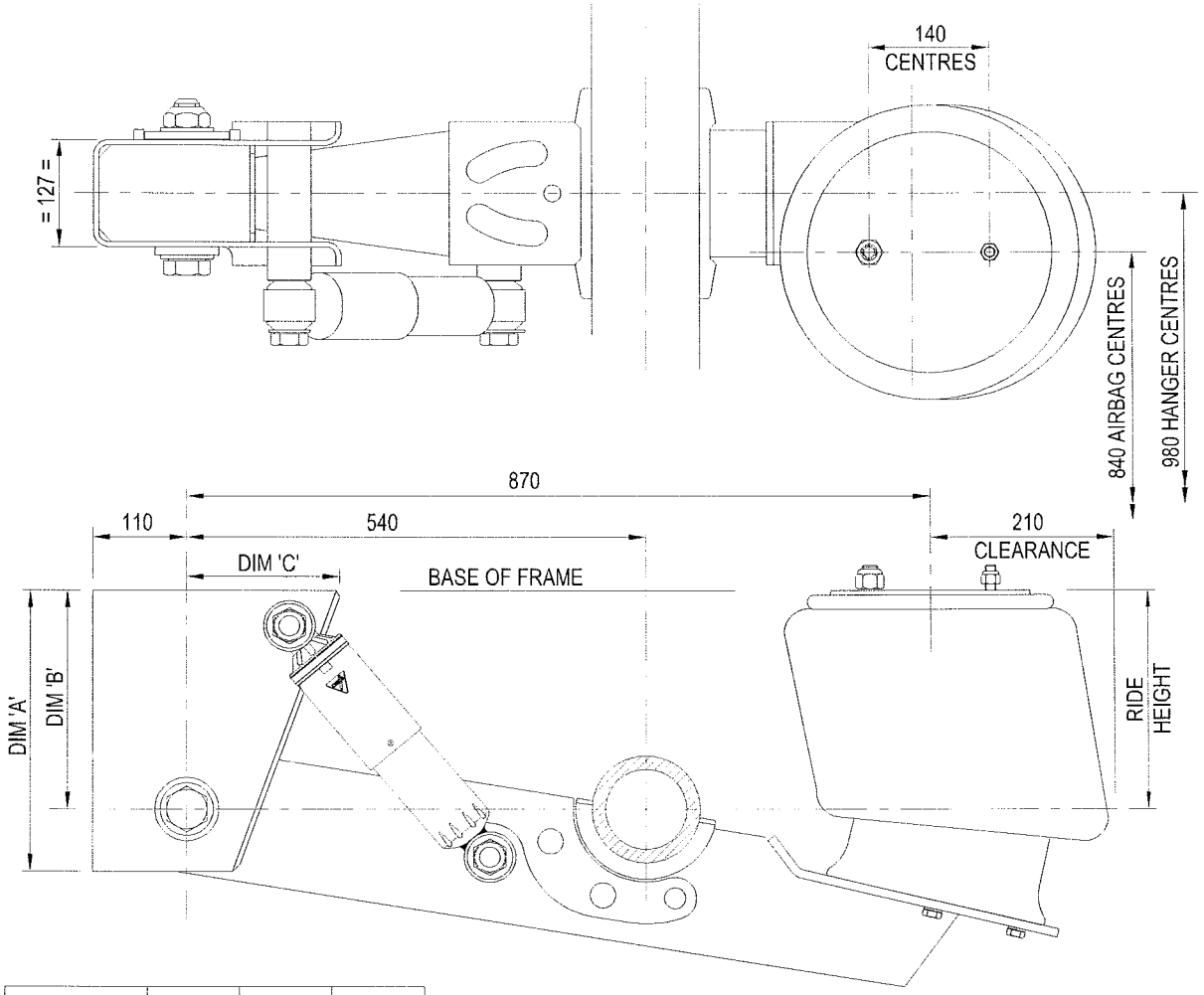
3.1 - General Arrangement:

3.1.1 - Underslung Suspension - Ride Height 260 - Drum Brakes
Ride Height 300 - Drum & 2980 Disc Brakes
Ride Height 340 - Drum & Disc Brakes



Ride Height	Dim 'A'	Dim 'B'	Dim 'C'
260 **	335	260	178
300	375	300	193
340	415	340	208

Axle Travel - From Nominal Ride Height
= 100 UP
= 80 DOWN
Ride Height Variation = ±10

Suspension variant marked **
suits drum brake axles only

ADR APPROVAL NUMBERS
SINGLE AXLE - 8219SS
TANDEM AXLE - 8220SS
TRI AXLE - 8221SS

Torque Settings:
M30 Pivot Pins Bolt - 1300 Nm
M24 Shock-absorber Bolt - 900 Nm
M24 Shock-absorber Stud and Nyloc Nut - 320 Nm
1/2" UNC Airbag Mounting Bolt - 70 Nm
1/2" UNC Airbag Top Plate Stud - 35 Nm
3/4" UNF Airbag Top Plate Stud - 70 Nm

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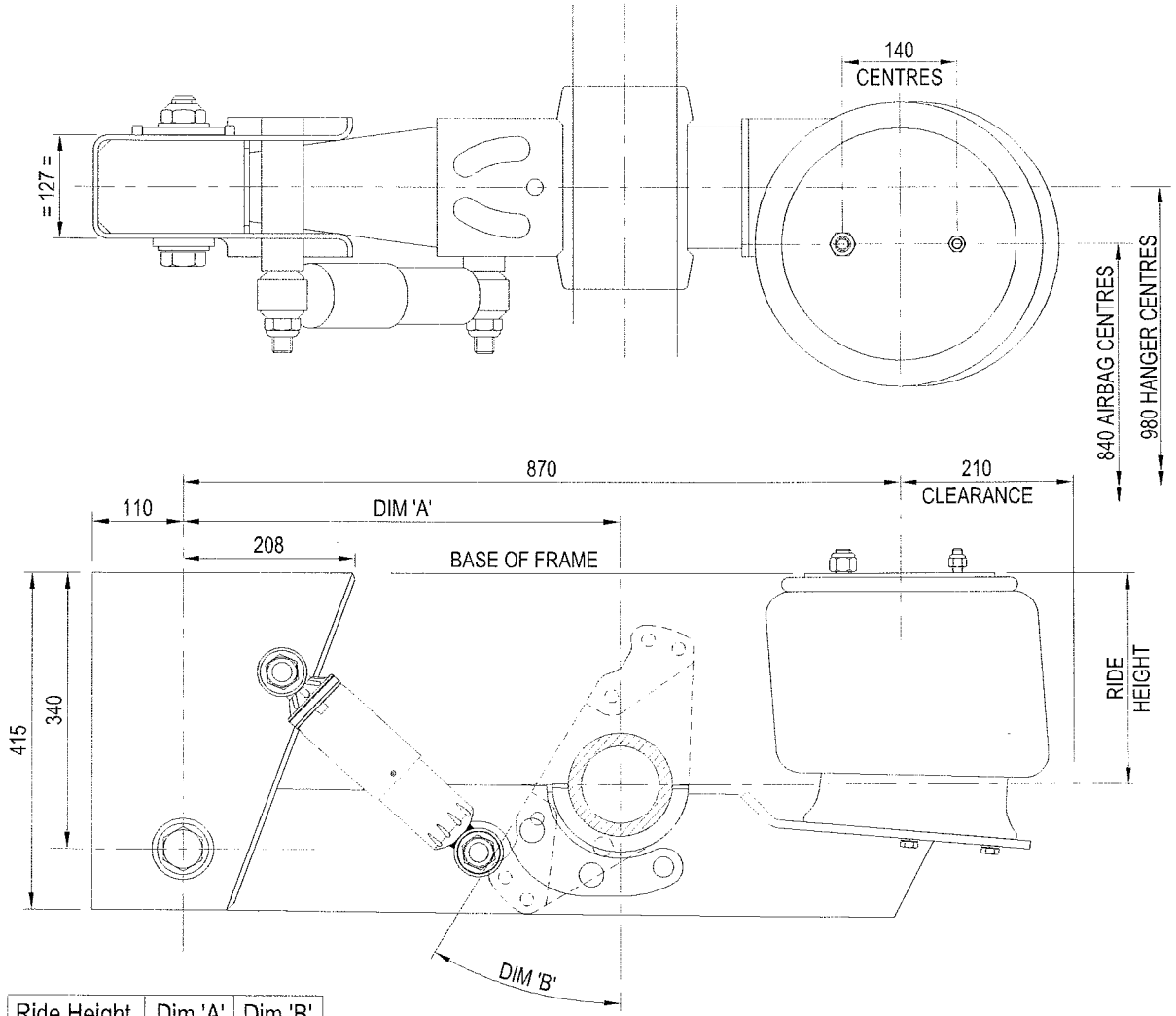
3.1.2 - Underslung Suspension - Ride Height 260 - 2980/2970 Disc Brakes
Ride Height 300 - 2970 Disc Brakes



Ride Height	Dim 'A'	Dim 'B'
260	531	31°
300	535	36°

Axle Travel - From Nominal Ride Height
= 70 UP (260 Ride Height)
= 85 UP (300 Ride Height)
= 120 DOWN
Ride Height Variation = ±10

ADR APPROVAL NUMBERS
SINGLE AXLE - 8219SS
TANDEM AXLE - 8220SS
TRI AXLE - 8221SS

Torque Settings:
M30 Pivot Pins Bolt - 1300 Nm
M24 Shock-absorber Bolt - 900 Nm
M24 Shock-absorber Stud and Nyloc Nut - 320 Nm
1/2" UNC Airbag Mounting Bolt - 70 Nm
1/2" UNC Airbag Top Plate Stud - 35 Nm
3/4" UNF Airbag Top Plate Stud - 70 Nm

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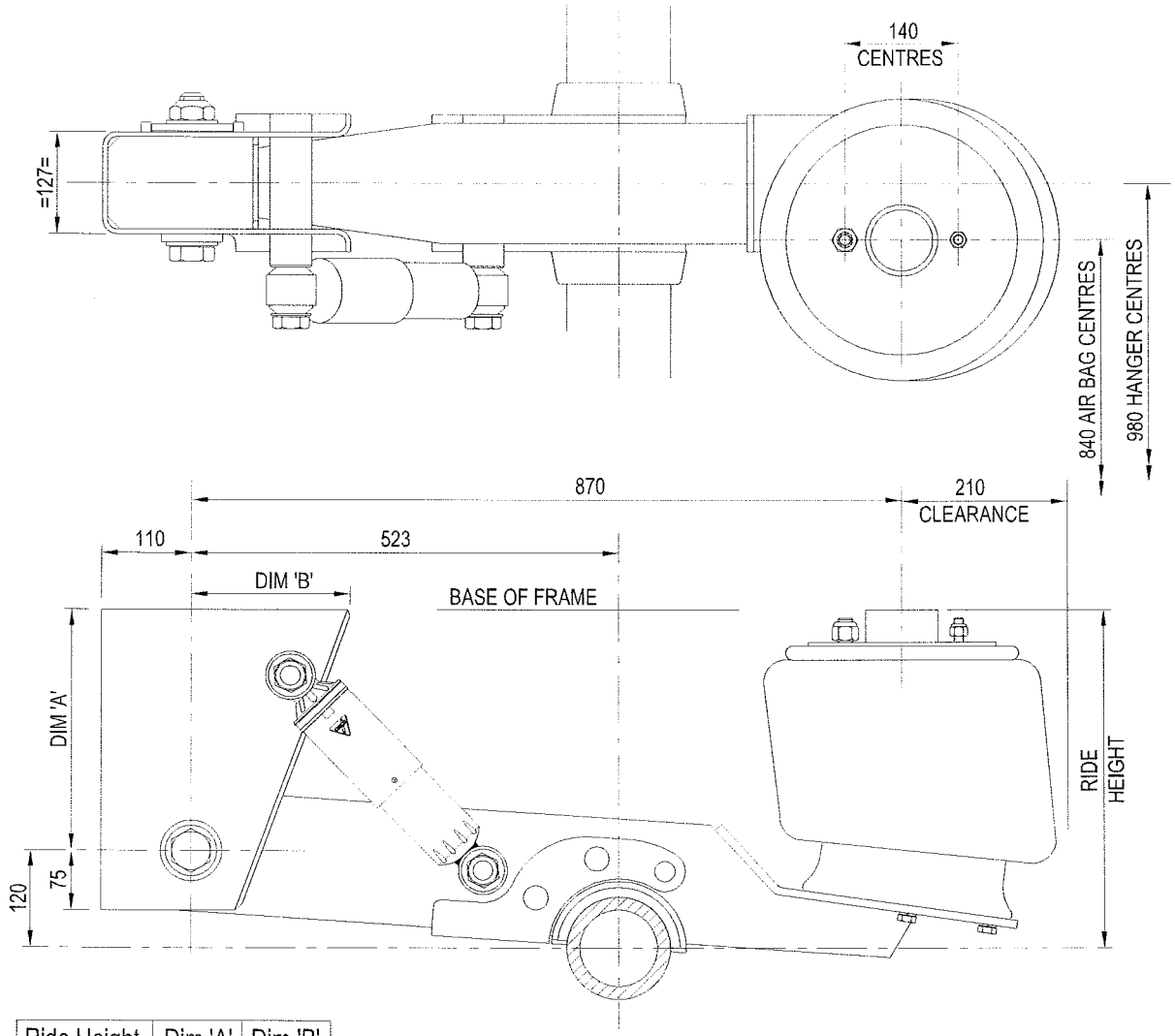
3.1.3 - Overslung Suspension - Ride Height 380 - Drum & Disc Brakes
Ride Height 420 - Drum & Disc Brakes
Ride Height 460 - Drum & Disc Brakes



Ride Height	Dim 'A'	Dim 'B'
380	260	178
420	300	193
460	340	208

Axle Travel - From Nominal Ride Height
= 80 UP
= 100 DOWN
Ride Height Variation = ±10

ADR APPROVAL NUMBERS
SINGLE AXLE - 8219SS
TANDEM AXLE - 8220SS
TRI AXLE - 8221SS

Torque Settings:
M30 Pivot Pins Bolt - 1300 Nm
M24 Shock-absorber Bolt - 900 Nm
M24 Shock-absorber Stud and Nyloc Nut - 320 Nm
1/2" UNC Airbag Mounting Bolt - 70 Nm
1/2" UNC Airbag Top Plate Stud - 35 Nm
3/4" UNF Airbag Top Plate Stud - 70 Nm

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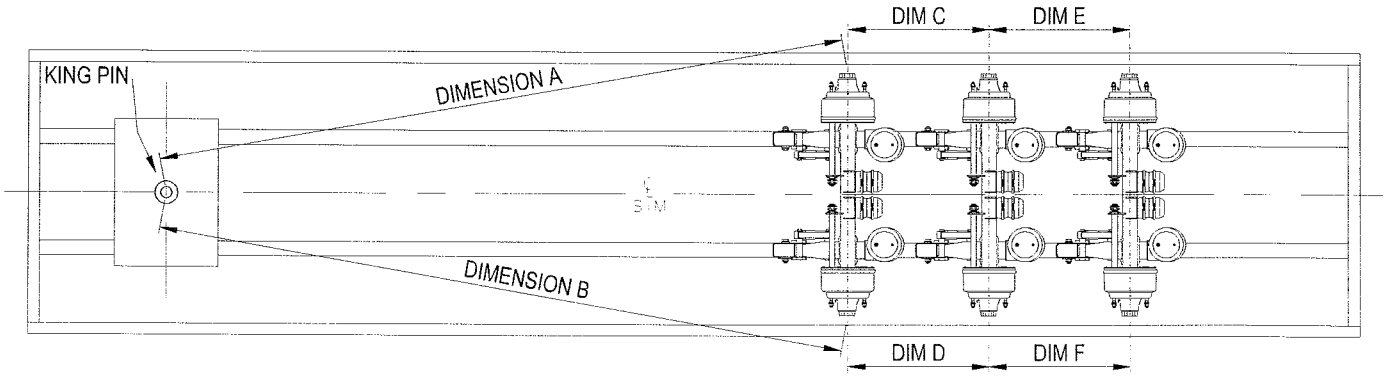
It is generally found easier to install the suspension with the trailer chassis inverted. This is not essential but will be more convenient for laying out and checking the measurements. It is the installers responsibility to ensure that the chassis is square and parallel to the centre line of the trailer. If not, variations in the thickness of the doubler plates may be required. The installer must also check that there is sufficient clearance for the suspension movement around existing attachments to the trailer, such as cross members, air tanks, tromboning sections and locking devices etc. Placement and attachment of tyre guards need to be considered.

3.2 - Alignment of Suspension Assembly

From measurements as shown on the supplied drawings, place the suspension hanger in its appropriate position with the axle at its required location and at ride height. Check that the axle alignment adjusters are set at the middle of their adjustment and the pivot bolts tightened sufficiently to stop their movement. The hangers are to be square to each other.



It is vital that the dimensions as measured on the chassis layout of the suspension be as close to optimum as possible. The difference between dimension A and B must be no more than 2mm and between C and D, and E and F, 1mm. Although the tracking can be adjusted at a later date it will be expedient if these accuracies can be obtained initially. Straight tracking and hence tyre wear are dependent on this symmetry.

'IMPORTANT'

Check equal dimensions from KING PIN to HANGER centres.
Ensure suspension is square to centre line.

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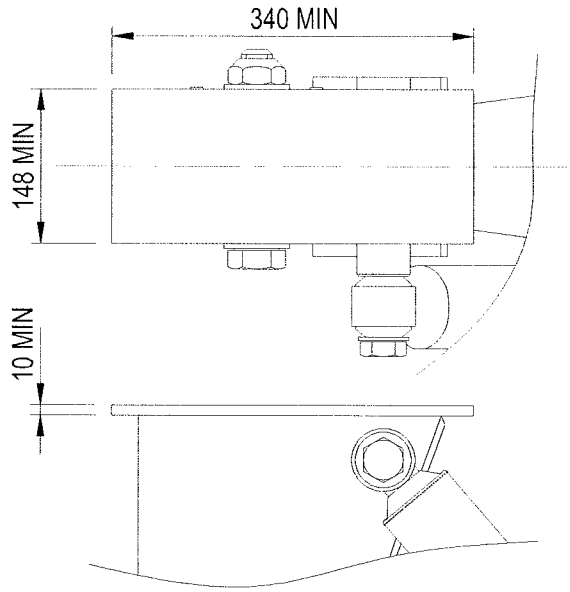
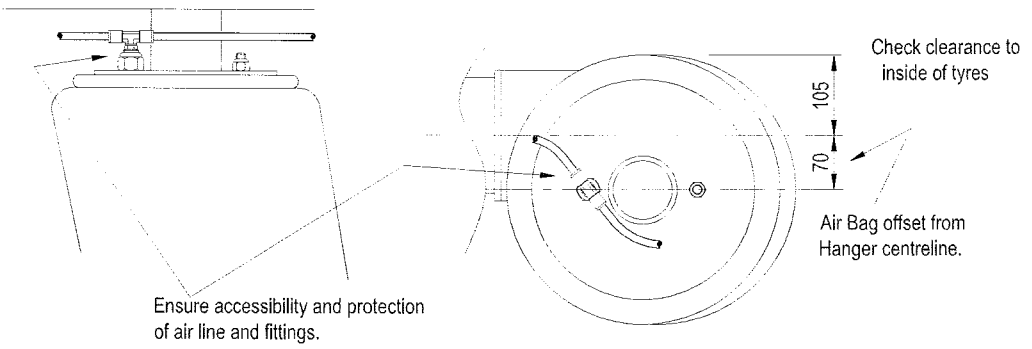
3.3 - Doubler Plates

If doubler plates are to be fitted above the hangers they must also be used above the air bag top mount. They have a recommended minimum thickness of 10mm and must extend 25mm beyond each end and 10mm on each side of the hangers. Observe their welding procedure



Position the remaining axles. Check the diagonal and parallel measurements between hangers and axles. Ensure they are parallel and square to the king pin centre line.

Install the air bag top plate in accordance with the drawings, not forgetting the 70mm offset from the hanger centres. Make sure the top air bag bolts are accessible and the air line attachment convenient.



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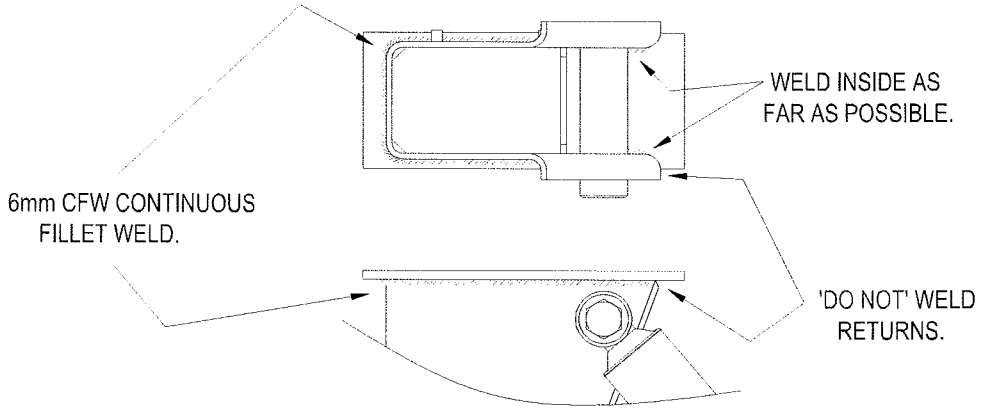
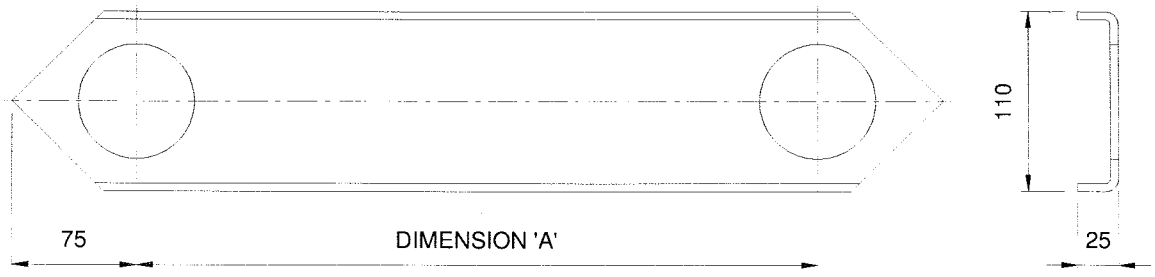
3.4 - Welding

It is recommended that the suspension hangers are welded to the doubler plates or trailer frame by welding all round the top of the hangers with a continuous fillet weld of not less than 6mm c.f.w., except for the hanger returns on the trailing edge, which are not to be welded. It is the installers responsibility to ensure that this is done correctly. The air bag top mounts are to be attached in a similar manner. The doubler plates must be welded adequately to the trailer frame.

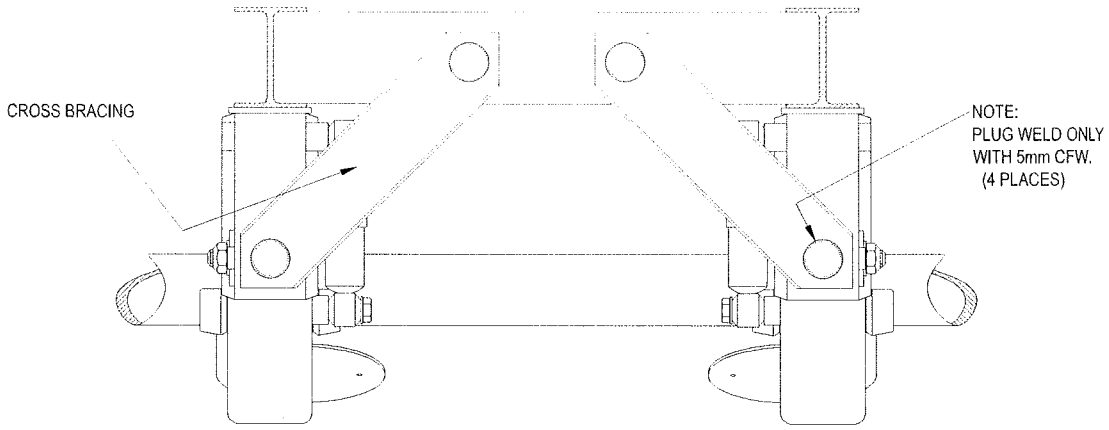


3.5 - Cross Bracing

Suspension hangers should all have some form of cross bracing. If the suspension is to be subject to high side loads or has long hangers, cross bracing has to be fitted. Bracing shall extend from one hanger to the other or if the centre of the trailer needs to remain unobstructed, diagonal cross bracing to the trailer cross member can be used. Cross bracing sections can be obtained from **YORK** on request. Check clearance to other components.

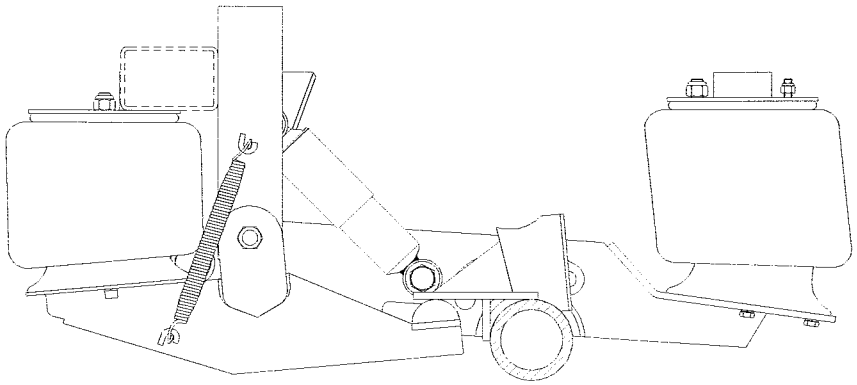


PART NUMBER	DIMENSION 'A'
61.506301/01	400
61.506301/02	450
61.506301/03	500
61.506301/04	600



3.6 - Axle Lift

Where an axle lift is to be installed along with the suspension it should be attached at this stage. Install this as to instructions supplied with the components. Make sure that the lifting arm contacts the lifting bracket on the axle of a centre lift at the correct position. If a hanger mounted axle lift is to be installed check that the lifting arm contacts the suspension arm at the correct position and is free to move, with the springs returning the arm to the relaxed position.



4. - COMPONENT INSTALLATION

4.1 - Air Bags

Install the air bag between the suspension arm and the top air bag mount.. If the base of the air bag needs to be rotated to align with the holes in the tail plate, loosen the large nut inside the air bag aluminium piston and rotate the piston the required amount. Re-torque the nut at 35 to 40 Nm. Torque the lower air bag bolts and upper bolts or nuts to the amount specified in the assembly drawing.

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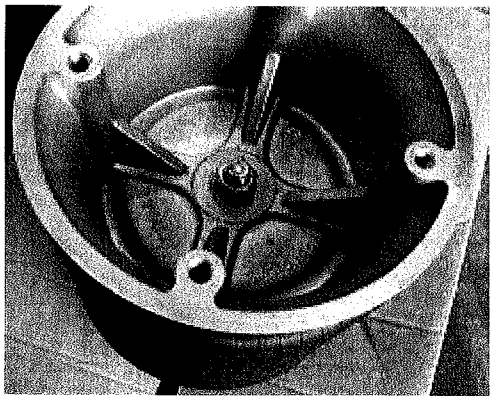
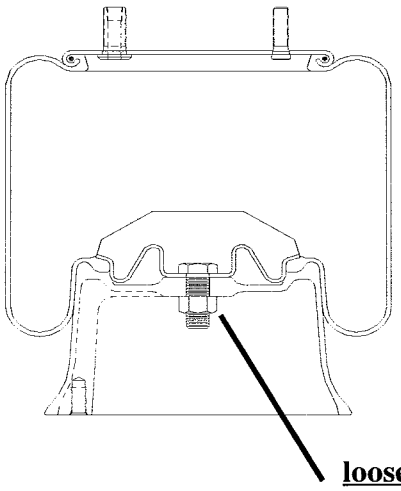
'WARNING'

'DO NOT' pressurise the air bags unless contained by and correctly attached to the suspension, and the shock-absorber installed.
'DO NOT' exceed 700 kpa pressure.

'WARNING'

Never allow the air bag to operate with a twisted rubber diaphram.
Check clearances when inflated.



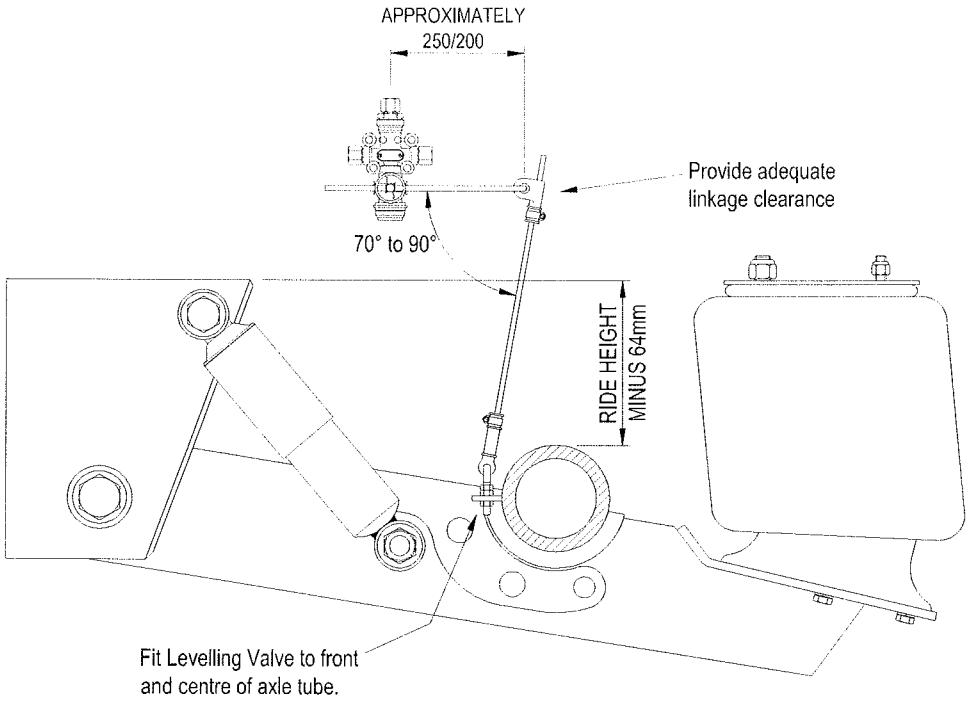


4.2 - Ride Height Control Valve

The Ride Height Control Valve is normally connected to the centre axle of a triaxle axle suspension or the rear axle of a tandem axle. The valve is mounted to a suitable bracket attached to a cross member, such that it is in the appropriate position to be actuated from the linkage. The linkage will be attached to the front of the axle close to the horizontal and vertical centre line.

'CHECK'

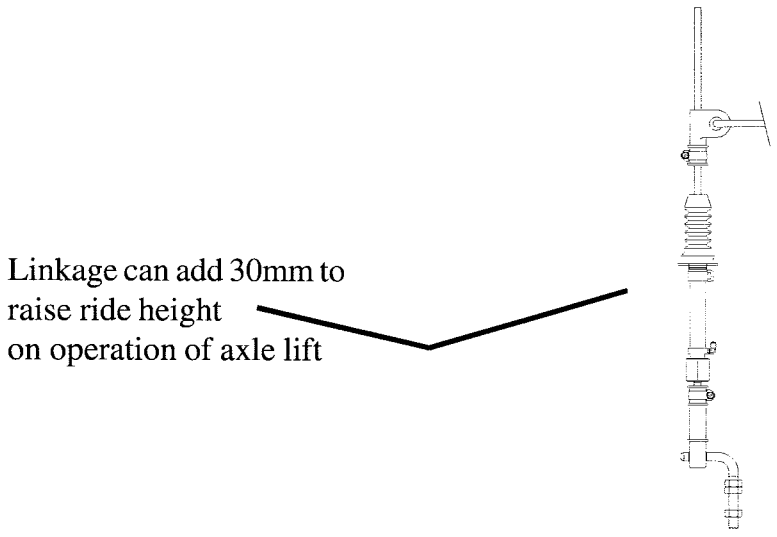
Clearance of linkage and angle of linkage joints.



4.3 - Setting Ride Height Control Valve

The ride height control valve cannot be set to the required ride height until the trailer is sitting on its suspension and the pneumatic system pressurized and functional. Refer to the **Service and Maintenance Manual,** to obtain the correct procedure

If the trailer is fitted with an axle lift and it has been found that there is insufficient clearance between the lifted axle and the pavement, **YORK** can supply a modified height control valve linkage that will increase this ground clearance by an extra 30mm on operation of the axle lift.



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5. - PNEUMATIC INSTALLATION

'WARNING'

Compressed air can be dangerous.
Assembly and handling of pneumatic systems should only be performed by trained and experienced personnel.

The trailer can now be turned the correct way up and the Pneumatic System installed. This is usually done in conjunction with the air brake system

Check components as supplied with the pick list. As there are fine control ports in the ride height control valves and working surfaces in the air bags it must be assured that the air supply from the prime mover is free from condensate or contaminates and of the correct pressure.

Installation of the air receiver must be clear of other movable components and be easily accessed. Bracketry must be strong enough to carry the weight and not damaged by vibration. The drain tap must be at the bottom of the tank and accessible for operation. Air supply, from the brake system receiver **must** be through a 'pressure retention valve' fitted directly to the air brake receiver, protecting the brake system from loss of pressure in the suspension system.

5.1 - Before Piping

Before connecting tubes make sure that all debris, condensate or dust, etc. is removed. When installing fitting into ports ensure sealant material does not enter any piping or ports. When using sealant tape, leave the first 1 1/2 to 2 thread turns exposed at the end of the fittings. It is sometimes found convenient to install a length of 10mm steel rod on either side of the inner chassis to attach the tube. If more welding is to be performed around the suspension area this should be performed before installation of the plastic tube as weld spatter can easily melt through the tube and cause difficult to find pin holes.

5.2 - Piping

Lay the plastic tube in an neat and orderly arrangement. Do not cut the tube too short, leave sufficient length to allow the tubing to be inserted or remove easily from the fittings To avoid the possibility of kinking or collapsing, do not allow the tubing to be bent tighter than the approved minimum radius. Place tubing well away from any possibility of rubbing against other components.

On completion of the installation apply shop air pressure, check all fittings for leaks and that components are working correctly. Possible leaks can be checked with a well diluted mixture of dish washing liquid and water applied with a spray bottle.

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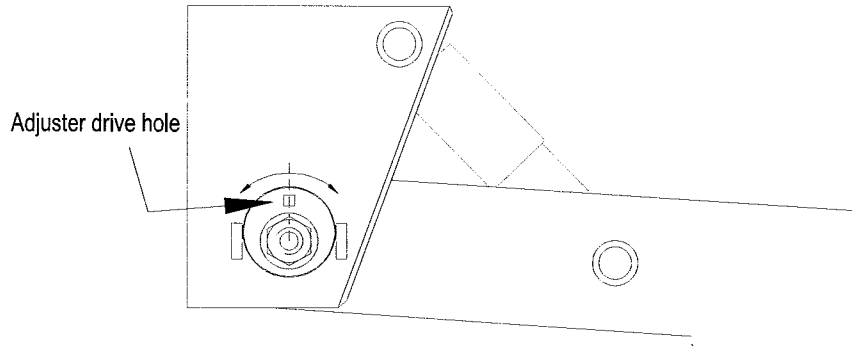
6. - AXLE ALIGNMENT

It is the installers responsibility to correctly align the suspension using the axle alignment adjuster on the suspension hangers. These are to be used for either forward or reverse adjustment by releasing but not removing the main M30 pivot bolt and inserting a 1/2" drive bar into the square hole of the cam ring and rotating in the direction required. It may be necessary to give the outer washer in the inner side of the hanger a light tap with a hammer to help with the adjustment.

Adjustment must be made equally on both sides of the suspension. If one side is moved forward the other side is to be moved a corresponding amount to the rear. Tracking adjustment is +/-10mm.



With the adjustment complete the main pivot bolt (M30) must be torqued up to 1300 Nm.
The shock absorber mounting arrangement must be tightened as specified.

'CAUTION'

Tighten the main pivot bolt to 1300 Nm, after suspension alignment.
The shock absorber mountings must be tightened as specified
FAILURE TO DO SO MAY CAUSE AN ACCIDENT.

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8. - ATTACHING SUSPENSION ARMS TO AXLE BEAM

'EXTREME CAUTION'

The attachment of the suspension arm to the axle requires a high level of expertise. This is to be performed only by a qualified and competent welder.

FAILURE OF THE WELD MAY CAUSE A SERIOUS ACCIDENT

8.1 - Positioning

Position the suspension arms on a flat surface with the mounting seats facing upwards and the shock absorbers to the inside of the arms.

Check that the suspension arms are parallel to each other and square to the axle tube. The arms must be equidistant from the centre line of the axle and the correct distance apart, corresponding to the separation of the suspension hangers. Usually the hangers are at 980mm centres but there are variations.

Place the axle into the axle seat and rotate the axle to obtain the correct clearance between the drum brake cam shaft tube or the disc brake actuator. It may be necessary to grind the top edge of the axle seat to allow the axle tube to sit down fully into the seat. The axle must sit completely and firmly down into the axle seat. A jacking or clamping arrangement may be necessary. If installing a **YORK** axle into the suspension ensure that the top of the axle as shown by the centre drill mark is aligned to the top of the suspension as it is installed in the vehicle.

Tack weld the arm to the axle seat and re-check all squares, clearances and dimensions.

8.2 - Welding

'IMPORTANT'

Adhere to the YORK axle welding procedure.
Ignoring these may result in a failure and could cause a serious accident.

Before welding the suspension to the axle ensure that the welding equipment is in good condition and suitable for the required work. The welder **must** observe the procedure as set out in the 'Axle Welding Procedure (8.3) and perform the work in a timely and competent manner. This procedure is shown in the accompanying drawings.

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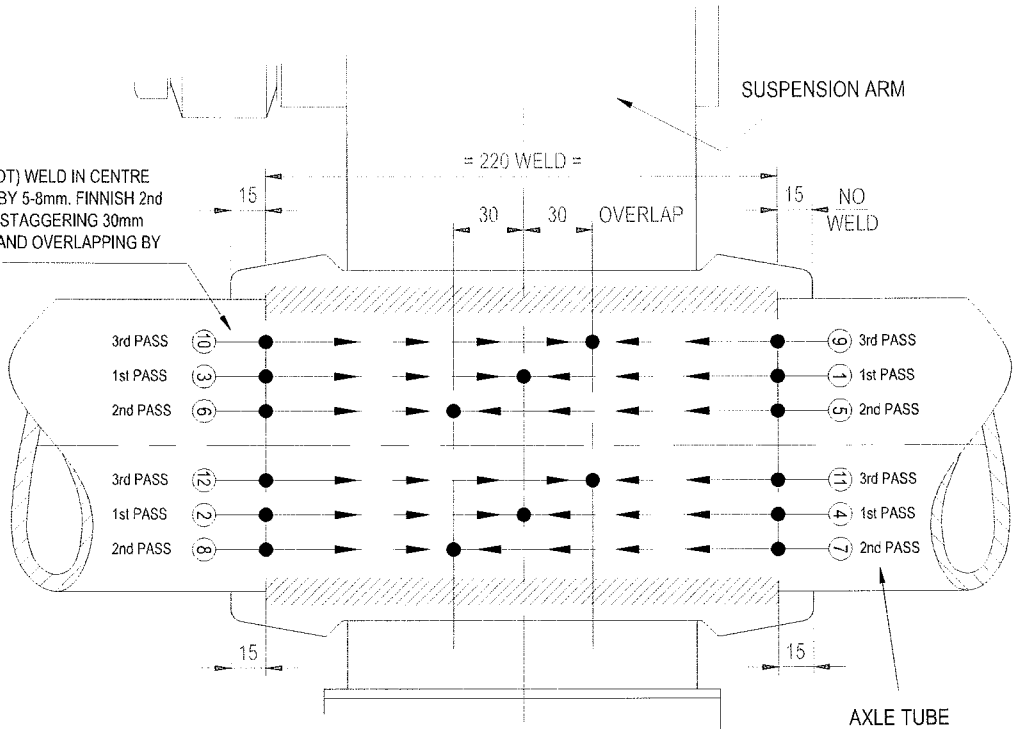
8.3 - Axle Welding Procedure

NOTE:
FINNISH FIRST PASS (ROOT) WELD IN CENTRE SECTION AND OVERLAP BY 5-8mm. FINNISH 2nd AND 3rd PASS WELDS BY STAGGERING 30mm FROM CENTRE SECTION AND OVERLAPPING BY 5-8mm.



WELDING PROCEDURE:

1. REFER TO TECAIR FB3 WORK INSTRUCTIONS AND INSTALLATION MANUAL FOR THE LOCATION AND ASSEMBLY OF THE SUSPENSION ARMS TO THE AXLE BEAM USING THE TECAIR FB3 TACKING JIG
2. TACK THE TRAILING ARMS TO THE AXLE BEAM AND RECHECK RELEVANT DIMENSIONS . ENSURE SHOCK-ABSORBER MOUNTS ON INSIDE OF ARM.
3. PRIOR TO WELDING, PREHEAT THE AXLE WELD AREA TO 225°C TO 250°C AND MAINTAIN THIS TEMPERATURE DURING ALL WELDING PROCEDURES.
4. ALL WELD MUST BE 12mm CONTINUOS FILLET. ALL WELDS MUST BE FULL PENETRATION AND USING ONLY YORK APPROVED LOW HYDROGEN WELDING PROCESSES. WELD PARALLEL TO THE AXLE ONLY IN THE DIRECTION AS SHOWN ON THE DIAGRAM. USE A WELD GAUGE TO CHECK THE SIZE OF THE WELD.
5. DO NOT APPLY ALL THE WELDING IN ONE AREA. THREE PASS FILLET WELDS ARE TO BE APPLIED WITH SUCCESSIVE WELD RUNS AT THE ALTERNATING POINTS, GRADUALLY BUILDING UP TO THE FULL SIZE OF WELD. START 1st PASS (ROOT), 2nd AND 3rd PASS WELDS 15mm FROM THE EDGE OF THE PLATES.
   APPLYING WELD RUNS:
   A/ FINNISH FIRST PASS (ROOT) WELDS IN THE CENTRE OF THE BEAM WITH AN OVERLAP OF 5-8mm.
   B/ FINNISH 2nd AND 3rd PASS WELDS SO THAT THEY ARE STAGGERED 30mm ON EACH SIDE OF THE CENTRE LINE OF THE BEAM. OVERLAP BY 30mm.
   THE WELDING SEQUENCE AND STAGER DETAILS ARE SHOWN ON THE DRAWING. THE NUMBERS 1 - 12 ARE TO BE FOLLOWED IN APPLYING THE WELD PASSES.
6. DO NOT:
   * WELD AROUND THE AXLE TUBE
   * ALLOW WELD UNDERCUT/UNDERFILL.
   * ALLOW WELD COLD LAP
   * ALLOW CRATER CRACKING.
7. REMOVE ALL WELD SPATTER, BURRS, SLAG AND GREASE.