

TEC Air 2 Air Suspension

Installation - Manual.



TECAIR 2 AIR SUSPENSION MANUAL

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SECTION 1.1

INSTALLATION RECOMMENDATIONS

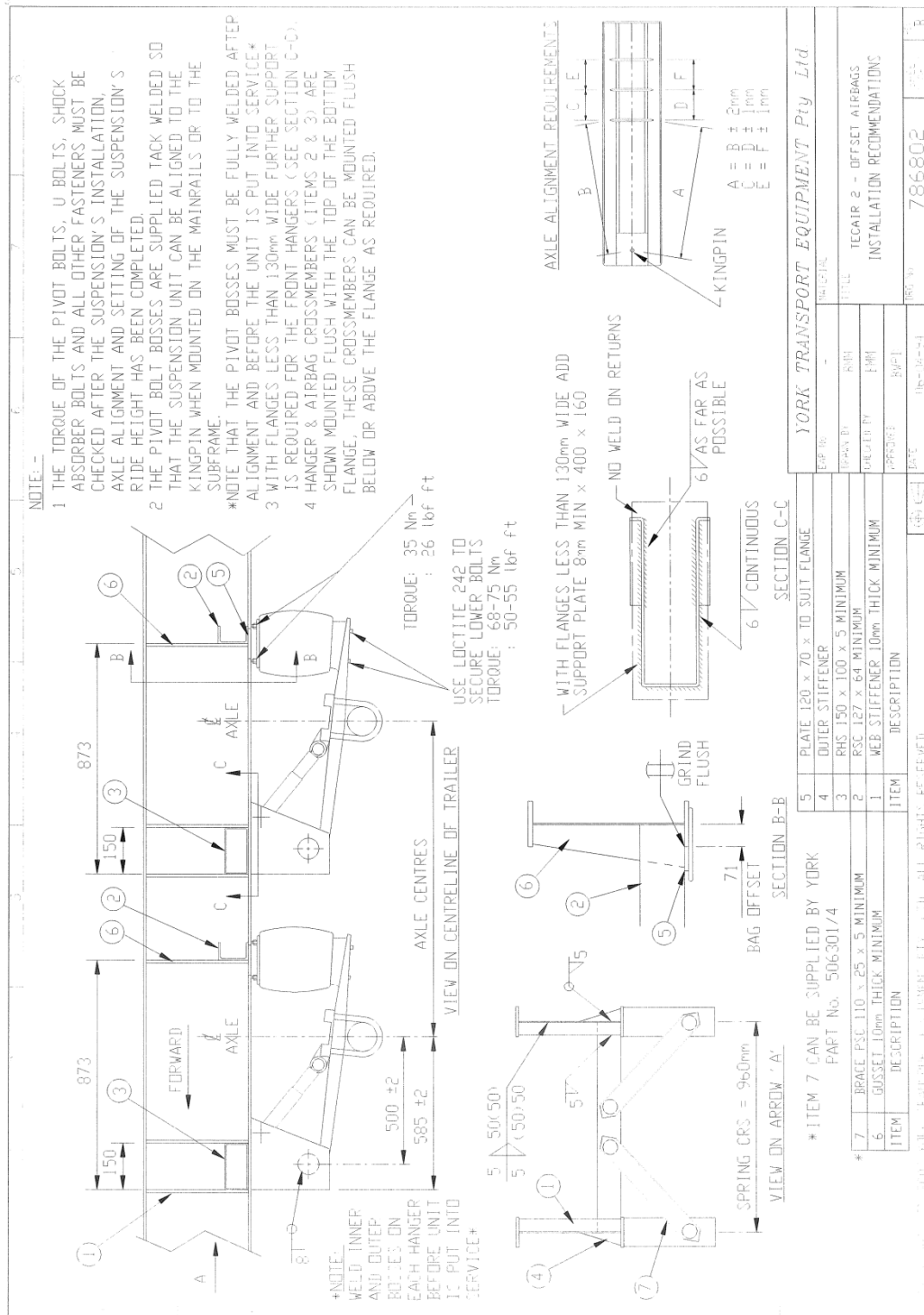
General Procedure

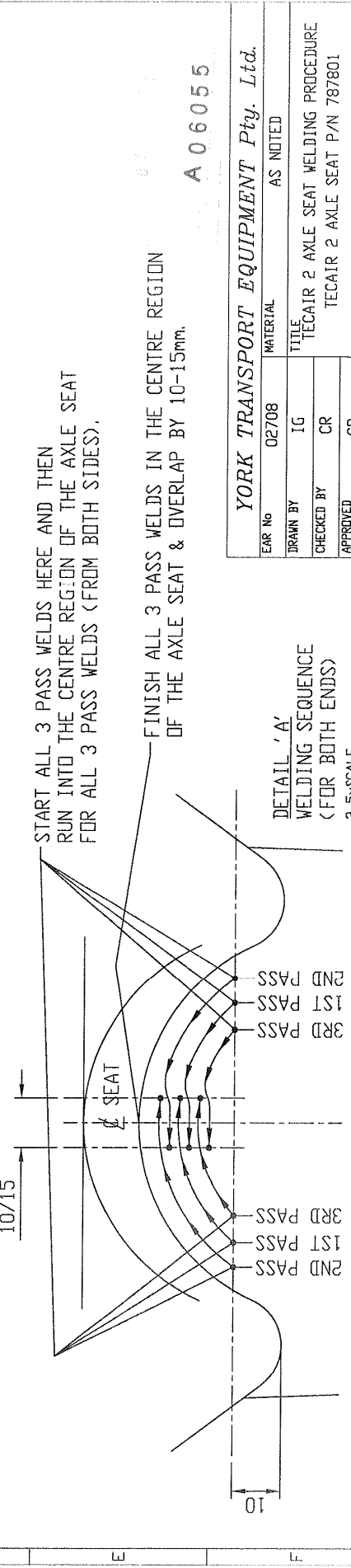
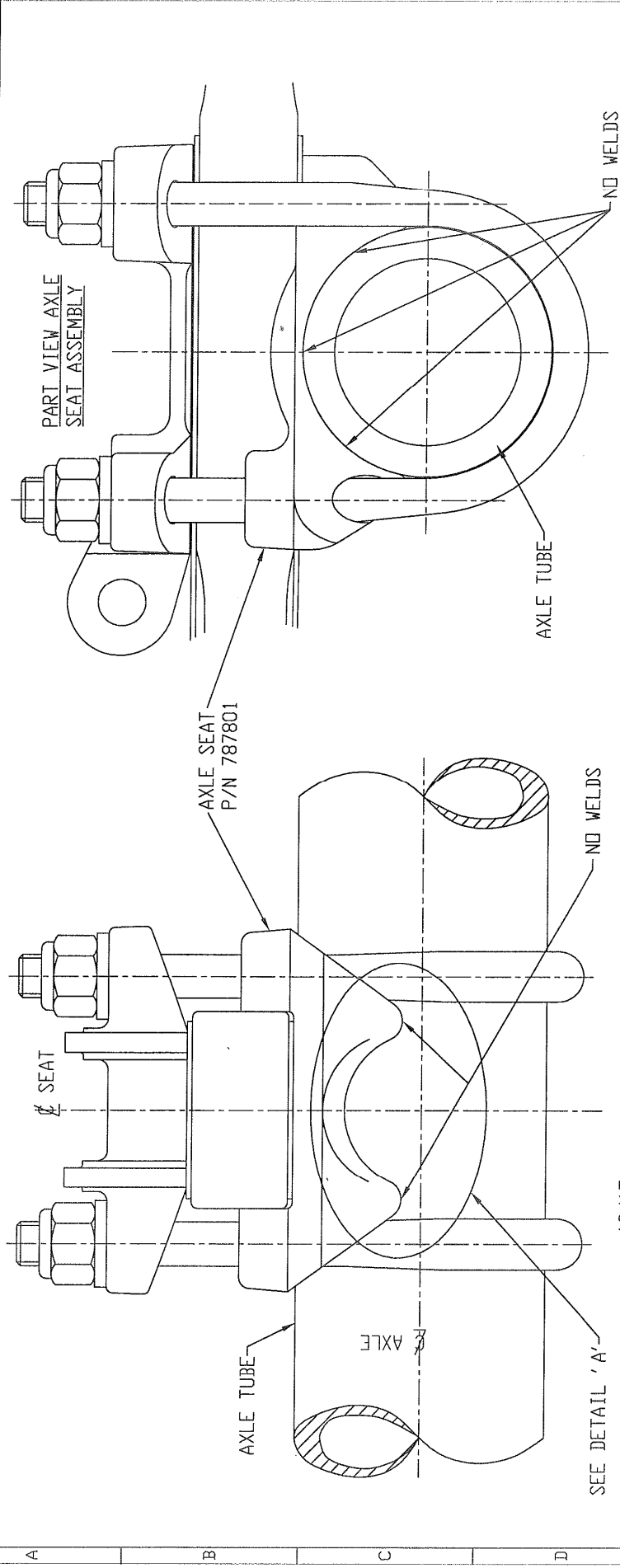
For trailers under construction the suspension installation is ideally carried out with the trailer upside down.

1. Weld the airspring pedestals in place and put the airsprings in place on the chassis.
2. Put the centre axle of a tri axle suspension or the front axle of a tandem suspension in position on the chassis using the bump stops inside the airsprings to take the weight of the axle.
3. Move the axle around until it is central on the chassis and aligned to the kingpin within the tolerance shown on the appropriate drawing. Weld in position: weld details are on the installation drawing.
4. Assemble the other axles to the chassis and align these to the front or centre axle already fitted.
5. If, after the suspension has been welded on it is discovered that it is out of alignment, adjustment is possible as follows:-
For Tecair 2 alignment instructions refer to page 7.
6. Fit the bolts securing the airspring and bottom plates to the spring using Loctite 242 on the threads and torque to 70 Nm (50 lbf ft).
7. Fit the height control (levelling) valve and suspension pneumatics as described in Section 3.

NOTE:- ALL TORQUE SETTINGS IN THIS MANUAL ARE SUBJECT TO A TOLERANCE OF +/- 3% FROM THOSE SPECIFIED.

SECTION 1.2 INSTALLATION DRAWING





START ALL 3 PASS WELDS HERE AND THEN RUN INTO THE CENTRE REGION OF THE AXLE SEAT FOR ALL 3 PASS WELDS (FROM BOTH SIDES).

FINISH ALL 3 PASS WELDS IN THE CENTRE REGION OF THE AXLE SEAT & OVERLAP BY 10-15mm.

A 06055

YORK TRANSPORT EQUIPMENT Pty. Ltd.			
EAR No	02708	MATERIAL	AS NOTED
DRAWN BY	IG	TITLE	TECAIR 2 AXLE SEAT WELDING PROCEDURE
CHECKED BY	CR		TECAIR 2 AXLE SEAT P/N 787801
APPROVED	CR		
DATE	05-03-02	IRG No	792110
		SHEET	2 OF 2
		REV	A

ORIGINAL

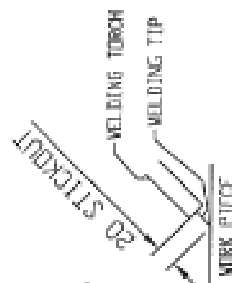
REV	MODIFICATION	DATE	DRN/CHKD	EAR
A	First Issue	05.03.02	TDOR	00708

WELDING PROCEDURE:-

1. REFER TO TECAIR 2 WORK INSTRUCTIONS FOR THE LOCATION AND ASSEMBLY OF THE TECAIR 2 AXLE SEATS P/N 787801 TO THE AXLE TUBES USING THE TECAIR 2 TACKING JIG. THE TWO AXLE SEATS MUST BE FITTED TO THE AXLE AT THE REQUIRED SPRING/HANGER CENTRES (NORMALLY 960mm). ENSURE THAT THE AXLE SEATS ARE PARALLEL TO EACH OTHER IN BOTH PLANES AND THAT THEY ARE AT RIGHT ANGLES TO THE AXLES CENTRE LINE. IT IS MOST IMPORTANT THAT THIS IS CAREFULLY CHECKED BEFORE ANY WELDING IS COMMENCED. THE TECAIR 2 SUSPENSION MUST BE ASSEMBLED PRIOR TO WELDING THE AXLE SEATS TO THE AXLE TUBE.
2. TACK THE AXLE SEATS TO THE AXLE TUBE AND RE-CHECK RELEVANT DIMENSIONS AND LOCATION OF SEATS.
3. PRIOR TO WELDING PREHEAT THE AXLE WELD AREA TO 100°C. MAINTAIN THIS PREHEAT TEMPERATURE DURING ALL WELDING.
4. ALL WELDS SHOULD BE 12mm CONTINUOUS FILLET WELDS. ALL WELDS MUST BE FULL PENETRATION. USE ONLY APPROVED LOW HYDROGEN WELDING PROCESSES. WELD PARALLEL TO THE AXLE ONLY, AND ONLY AS SHOWN ON THE DIAGRAMS.
USE WELD SIZE GAUGE TO CHECK FINAL SIZE OF WELDS.
5. REFER TO SHEET 2 FOR DETAIL OF WELDING THE AXLE SEATS TO THE AXLE TUBE. 3 PASS FILLET WELDS ARE TO BE APPLIED. DO NOT DO ALL THE WELDING AT ANY ONE POINT, DO SUCCESSIVE WELD RUNS AT ALTERNATIVE POINTS GRADUALLY BUILDING UP TO THE FINAL FULL SIZE OF WELD. APPLY WELD RUNS TO BOTH ENDS OF THE AXLE SEAT AND TUBE. START 1ST PASS (ROOT RUN), 2ND AND 3RD PASS WELDS 10mm FROM THE BOTTOM SURFACE OF THE AXLE SEATS AS SHOWN. FINISH ALL 3 PASS WELDS IN THE CENTRE REGION OF THE AXLE SEAT AND OVERLAP EACH PASS BY 10-15mm. THE WELDING SEQUENCE IS INDICATED BY THE DETAIL 'A' DIAGRAM.
6. DO NOT:
 - * WELD AROUND AXLE TUBE
 - * ALLOW WELD UNDERCUT/UNDERFILL/OVERLAP
 - * ALLOW WELD COLD LAP
 - * ALLOW CRATER CRACKS
 - * GRIND AXLE SEAT ENDS/AXLE TUBE
 - * ALLOW POROSITY
7. REMOVE WELD SPATTER, SLAG, BURRS AND GREASE.

EQUIPMENT:-

- A. FCAW EQUIPMENT, TECAIR 2 AXLE SEAT, AXLE TUBE, TECAIR 2 TACKING JIG, MIG WELDING SET, PROTECTIVE EQUIPMENT.
- B. WELDING PROCESS: FLUX CORED GAS METAL-ARC WELDING (FCAW).
SHIELDING GAS - ARGONSHIELD 51.
WELDING WIRE: 1.2mm DIAMETER FLUX CORE WIRE - FLUXOFL 41,
WELDING CURRENT: 300+ AMPS.
ARC VOLTAGE: 24+ VOLTS.
TYP. STICKOUT: 20mm (SEE DIAGRAM).



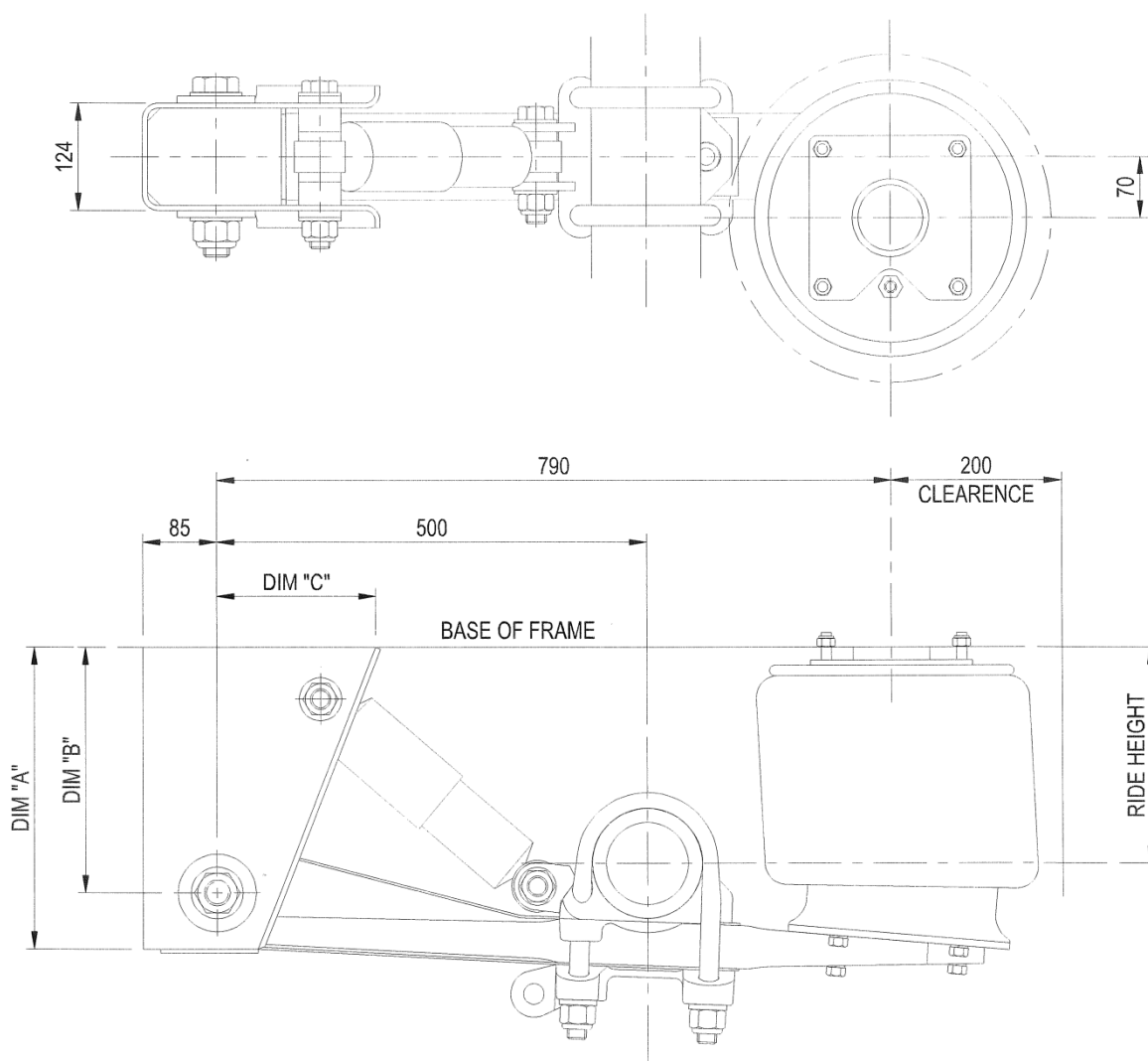
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YORK TRANSPORT EQUIPMENT Pty. Ltd.

EAR No	02/208	MATERIAL	AS NOTED
DRAWN BY	TG	TITLE	TECAIR 2 AXLE SEAT WELDING PROCEDURE
CHECKED BY	CR		TECAIR 2 AXLE SEAT 787801
APPROVED	CR		
DATE	05-03-02	DWG No	792110
		SHEET	1 OF 2
		REV	A

TECAIR 2

SECTION 1.3.1 GENERAL LAYOUT - UNDERSLUNG SUSPENSION



Ride Height	Dim 'A'	Dim 'B'	Dim 'C'
235	325	260	175
260	350	285	185
285	375	310	195
310	400	335	205
335	425	360	215
360	450	385	225

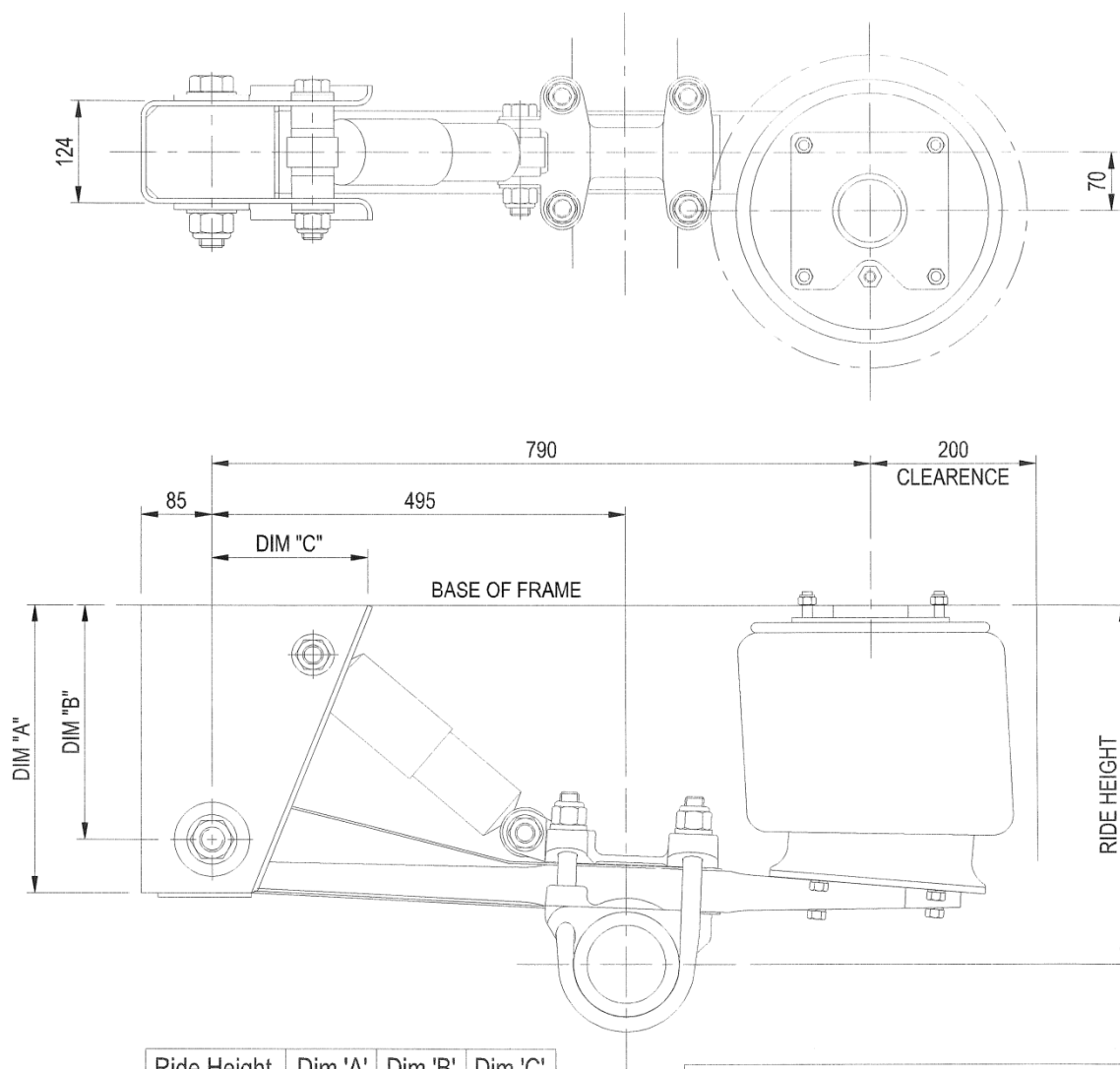
Axle Travel - From Nominal Ride Height
= 75 UP (Allow 25 Extra Bump Clearance)
= 100 DOWN
Ride Height Variation = ± 10

ADR APPROVAL NUMBERS
SINGLE AXLE - 8163SS
TANDEM AXLE - 8164SS
TRI AXLE - 8162SS



TECAIR 2

SECTION 1.3.2 GENERAL LAYOUT - OVERSLUNG SUSPENSION



Ride Height	Dim 'A'	Dim 'B'	Dim 'C'
420	325	260	175
445	350	285	185
470	375	310	195
495	400	335	205
520	425	360	215
3545	450	385	225

Axle Travel - From Nominal Ride Height
 = 75 UP (Allow 25 Extra Bump Clearance)
 = 100 DOWN
 Ride Height Variation = ± 10

ADR APPROVAL NUMBERS

SINGLE AXLE - 8163SS

TANDEM AXLE - 8164SS

TRI AXLE - 8162SS



TECAIR 2

SECTION 1.4

INSTALLATION RECOMMENDATIONS

TECAIR 2 ALIGNMENT PROCEDURE

1. Loosen the main pivot bolts (M30) until the the bolt is just clear of the two collars in the front suspension hanger.
2. Cut the tack welds holding the collars in place on the front hangers (it is necessary to cut the tack welds on both the outer and inner collar on both front hangers) and ensure the collars and pivot bolt assembly is free to move.
3. Use a hide mallet or porta power to move the axle backwards or forwards until it is aligned. Re-torque the main pivot bolts to 1230 Nm (800 lbf ft) and recheck the alignment. Re-adjust the alignment as necessary.
4. Weld the collars to the hangers using a 6mm continuous fillet weld. Ensure both the inner and outer on both hangers are fully welded. **NOTE: It is recommended that this weld is applied to a minimum of 75% of the circumference of each collar.**
5. It is most important that the weld between the front suspension hanger and the pivot bolt collar is checked irrespective of whether re-alignment is necessary or not. **This weld must be put in place before the suspension enters service.**

AXLE ALIGNMENT PROCEDURE

1. Measure from Kingpin to end of front axle
2. Adjust the adjustable torque arm until:
 $A = B \pm 2\text{mm}$
3. Measure the distance between the end of the front and second axle (both side)
4. Adjust the adjustable torque arm until:
 $C = D \pm 1\text{mm}$
5. Repeat step 3 & 4 for second & third axle until
 $E = F \pm 1\text{mm}$
6. Tighten the clamp bolts alternately (min 4 times) With torque wrench until torque of 90/100 Nm is reached

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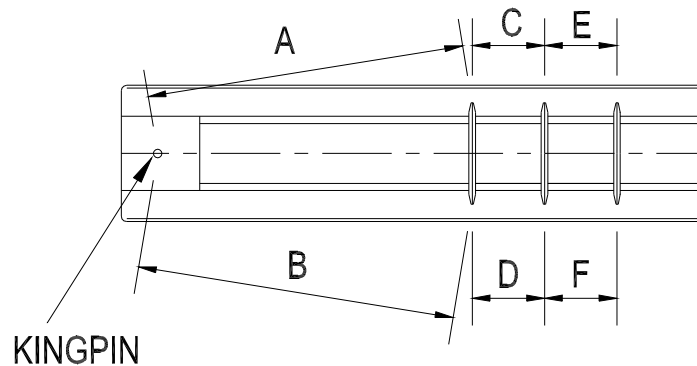
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AXLE ALIGNMENT PROCEDURE

$$A = B \pm 2\text{mm}$$

$$C = D \pm 1\text{mm}$$

$$E = F \pm 1\text{mm}$$



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SECTION 2.1

PROCEDURE FOR SETTING HEIGHT CONTROL (LEVELLING) VALVES

There are two methods for setting height control (levelling) valves

1. If the valve is being set by the trailer manufacturer then this is best achieved without use of air in the system, preferably with the trailer inverted with the axle resting on the airspring bump stops.
 - a) Adjust the height control (levelling) valve arm to a 225mm radius ensuring that the arm enters through the side of the boss marked with a 'V', and lock the quadrant in the neutral position by inserting a 4mm drill shank through one of the holes provided.
 - b) Lift the axle to ride height and connect the height control (levelling) valve link to a bracket attached to the axle.
Remove drill shanks before releasing axle.
On no account must spacers be welded to axle beam to maintain axle ride height while the height control (levelling) valve is being set.

- 2 If for any reason the height control (levelling) valve is being set at a later stage then the following procedure may be used.
 - a) Have the trailer on even ground (level), preferably with the vehicle laden and with a primemover under the front. All air reservoirs to be fully pressurised and the park brakes and the hand brake if fitted must be released. It is advisable to place wheel chocks at one wheel minimum to prevent the unit moving for safety reasons.
 - b) Exhaust the air bags by turning the height control (levelling) valve arm downwards to deflate the airsprings.
 - c) Open the height control (levelling) valve and raise the suspension to ride height by turning the lever upwards, insert a 4mm drill shanks or dowels into holes provided to lock arm in neutral position.
 - d) Attach rod of required length to axle bracket with the lever radius operating on an approximately 225mm radius.

Once set the ride height may be finely adjusted using the rod adjustment nuts on the lower rod linkage.

TECAIR 2

SECTION 2.2

HEIGHT CONTROL (LEVELLING) VALVE ADJUSTMENT

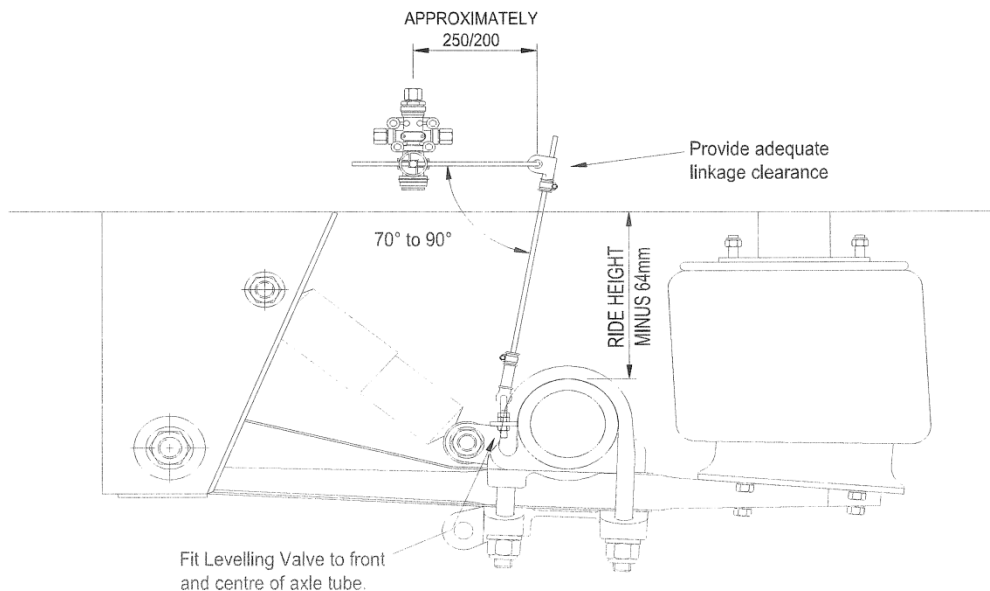
The levelling valve must be fitted to the middle axle on a tri axle trailer and usually to the rear axle on a tandem trailer.

Ensure the levelling valve arms are set to be similar to the drawings below.

To establish the correct ride height check the TECAIR SERIAL NUMBER PLATE which is riveted to one of the front suspension hanger brackets. e.g. TA2 420, in this case the ride height is 420mm.

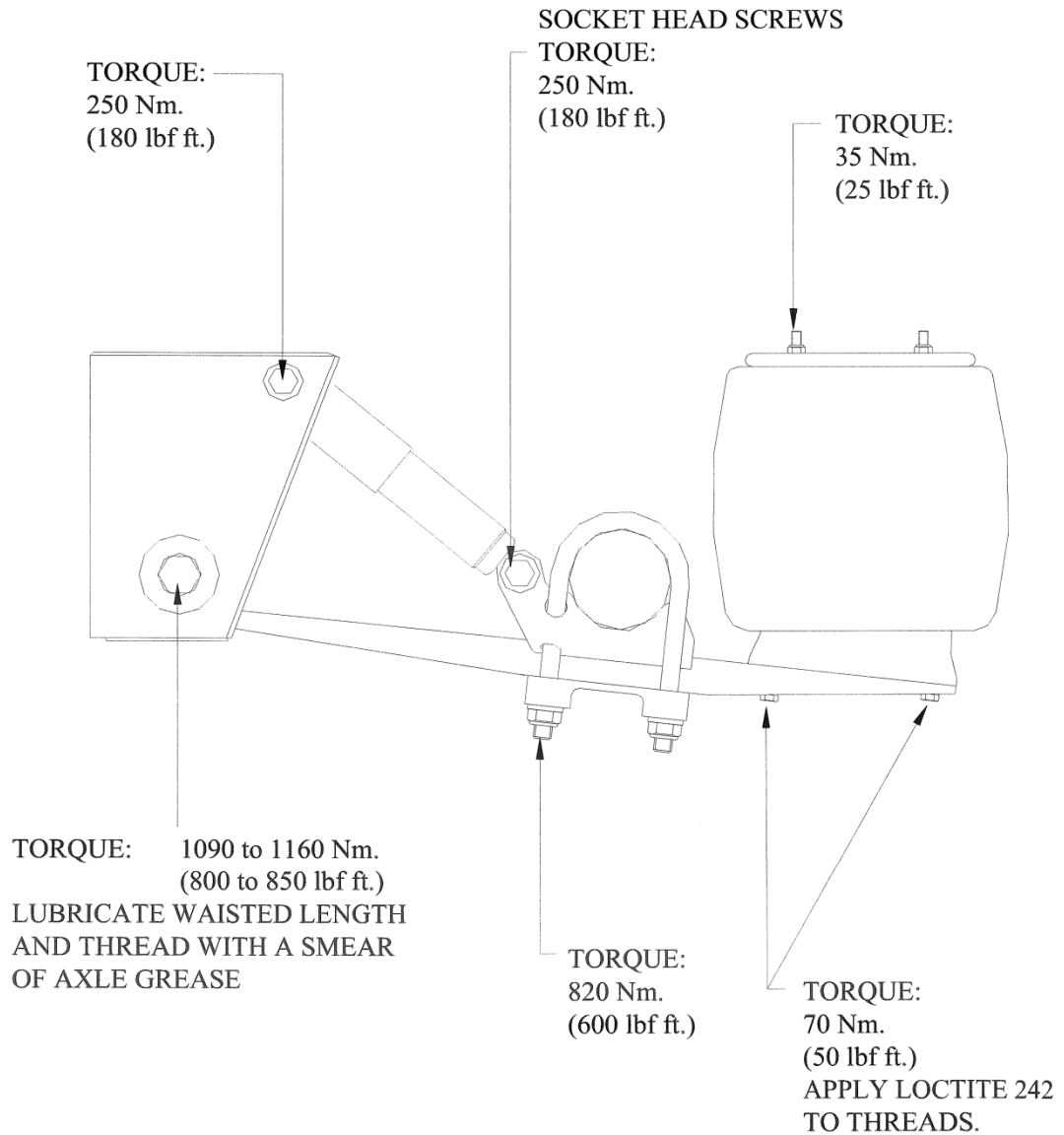
- Have the trailer on level ground preferably loaded and with the prime mover attached.
- Air reservoirs should all be fully charged and tests should be preformed with the engine running ensuring adequate air supply.
- **Brakes must be off.**
- Loosen the clamps on the vertical adjusting rod. Alter the length of the rod until the correct ride height is obtained.
Shorten to Lower - Lengthen to raise.
Re clamp the adjusting rod.

On completion of this adjustment ensure that the arms are similar to the drawings below in dimension and angles. This will then give correct operation and with the axle travel arms will not go over centre creating reverse operation of the levelling



SECTION 4.1

TORQUE SETTINGS





TECAIR 2

SECTION 3.1

MAINTENANCE

Tecair is a very robust air suspension. Misuse or neglect should not result in rapid breakdown or failure. Equally by observing the servicing and operating requirements laid down below, it should be possible to extend the trouble free operation of the suspension by years.

Operation

Before moving the trailer ensure that the suspension is inflated. The quick check for inflation is that some piston is showing beneath the rubber diaphragm of the airspring. If this is not the case, couple the prime mover air lines and run the engine for a few minutes and then re-check. If the suspension still will not inflate, refer to the section headed 'Fault Finding'. In the event of the suspension deflating while the vehicle is travelling, the bump stops inside the airsprings will carry the load. However, because of the slope of the trailer the rear axle will carry nearly all the load. Therefore, although it is possible to continue to a point where repairs can be effected the journey must be at a very much reduced speed if damage to the rear tyres, air suspension and axles is to be avoided.

Servicing Intervals

Task

After 500 km.

Tighten 'U' Bolts and pivot bolts to torque settings shown on page 14.

After 5000 km.

Tighten all suspension bolts to torque settings shown on page 14.

Quarterly or Every 25,000 km

- a) Tighten all suspension bolts to torque settings shown on page 14.
Inspect shock absorbers for oil leakage:
replace if necessary.
- b) Inspect shock absorber bushes:
replace if necessary.
- c) Drain air tanks and jack up trailer until airspring is at full stretch.
- d) Check the airbag rubber for signs of perishing, remove any debris which has collected between the diaphragm and the piston.

Annually or Every 100,000 km

- a) Remove pivot bolts and lower front of trailing arm spring from the hanger bracket to permit inspection of pivot bushes and wear pads. It is best to replace pivot the bushes without disturbing the 'U' bolts.
- b) Leak test all piping joints and the airspring top plate to diaphragm joint by using 'soapy water'.
- c) Inspect spring leaves for cracks, it is recommended that single leaf suspension springs are crack tested annually after 5 years of service.
- d) Repeat quarterly checks.