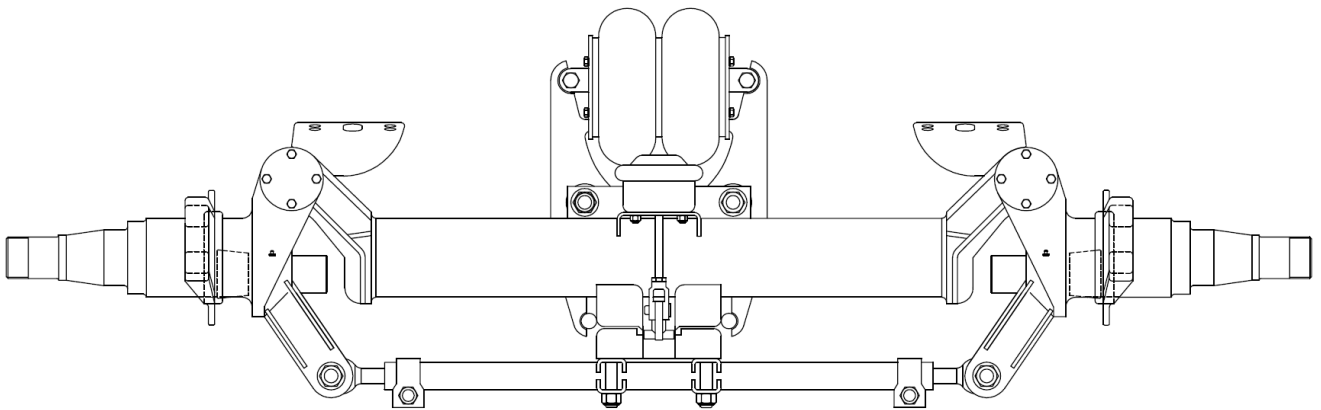




TMC STEER AXLE SERVICE MANUAL



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TMC Australia's policy is one of continuous development, we therefore reserve the right to change or modify the specifications without notification.

We Engineer Quality and Performance

RECOMMENDED SERVICE SCHEDULE

*see relevant TMC Brake/Wheel End Service Manual for brake/wheel end service information

*see relevant TMC Suspension Service Manual for suspensions service information

First Service 500 km or on Delivery:

Check for proper operation of steer axle

Check for tyre interference against chassis and mud guards, adjust if necessary.

Check torque settings for all fasteners

Every 25,000 km:

Lubricate King Pin, tie rod and lever arm.

Every 100,000 km:

Check for King Pin, Tie Rod and Thrust Bearing wear, replace if necessary

Check axle for wear or damage. Repair, adjust or replace as necessary.

Check axle alignment, adjust if necessary.

Check torque of draw keys.

Toe In Check:

After new vehicle installation.

When vehicle experiences unusual vibration or when the axle "shimmies".

When tyres experience unusual edge wear.

After new tyres are installed.

After the prime mover steering is aligned.

After repairs are done to the axle.

Note: TMC's range of Steer axles are generally designed for operating on clean paved roads. Although occasional use on graded or gravel roads is acceptable, for equipment that is regularly used "off-road" or "off-highway" TMC recommends that service intervals should be halved. In extremely severe operating conditions, weekly and in certain cases even daily inspections of the equipment may be required to ensure safe and correct operation of the steer axle.

WELDING TO TMC STEER AXLE BEAMS

Recommended welding procedures:

1. Before any welding is conducted on the axle tube, the axle tube must be pre heated to 150 – 200⁰C locally at the area to which the welding is to be done.
Caution: Do not apply excessive heat to the axle tube.
2. All welding is to be applied to the axle tube as near as possible to the axle's neutral axis.
Do not weld circumferentially around the axle tube.
3. All welds must be conducted using low hydrogen rods or an approved equivalent MIG process.

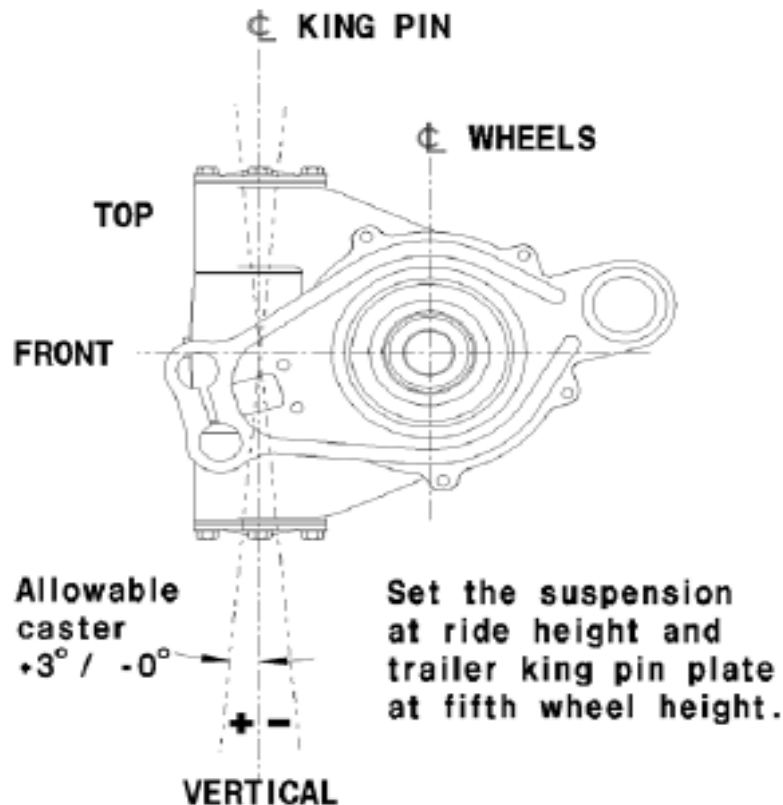


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TORQUE SETTINGS CHART

Tie Rod Clamp Bolts	¾-10 UNC	200 - Nm
King Pin Cap	3/8-16 UNC	27 - Nm
Draw Keys	7/16-20 UNF	68 - Nm
Tie Rod Nut *lock with cotter pin		200 - Nm
Lever Arm Torpress bolt – 5/8”-11		135/155 – Nm
Lever Arm Pivot bolt – 1”-8 *Lever arm must move freely after torquing		55/60 – Nm
Centralizer Positioning bolts – 5/8”-11		135/155 – Nm
Torpress bolt – 3/8”-16		25/30 – Nm
Lock Bracket bolt – 5/8”-11		135/155 – Nm
Reverse Lock booster		40/50 – Nm

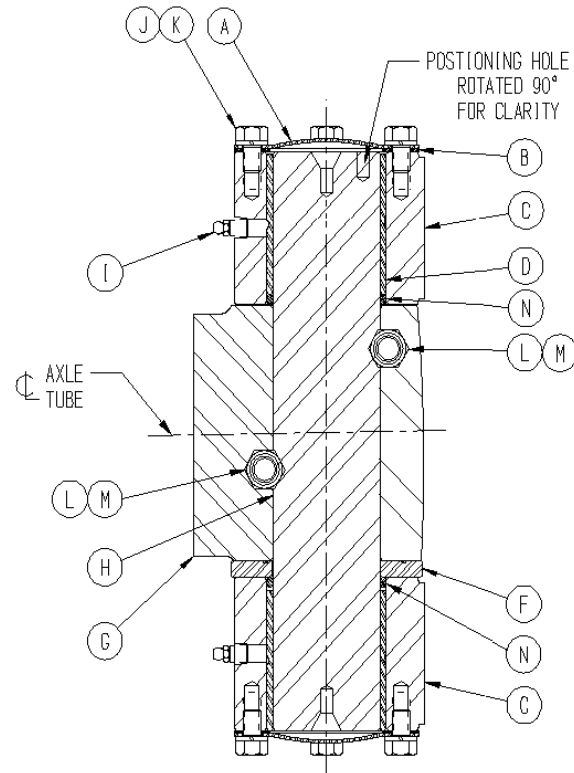
CASTOR SPECIFICATIONS FOR AXLE AT RIDE HEIGHT - LOADED**CAUTION**

1. Changing tyre diameters on the Self Steer Axle or the primary suspensions will affect the SSA castor position.
2. If the SSA castor measures more than 2 degrees negative when the prime mover and the trailer are properly coupled on level ground then contact TMC Engineering to develop a corrective action.

KNUCKLE SERVICE AND INSTALLATION

Disassembly

1. Support knuckle "C" to prevent injury when king pin is removed.
2. Remove king pin caps "A" and gaskets "B".
3. Remove nuts "M" and draw keys "L".
4. Drive king pin "H" out of the knuckle "C" and beam "G".
5. Remove knuckle "C".
6. Remove thrust bearing "F".



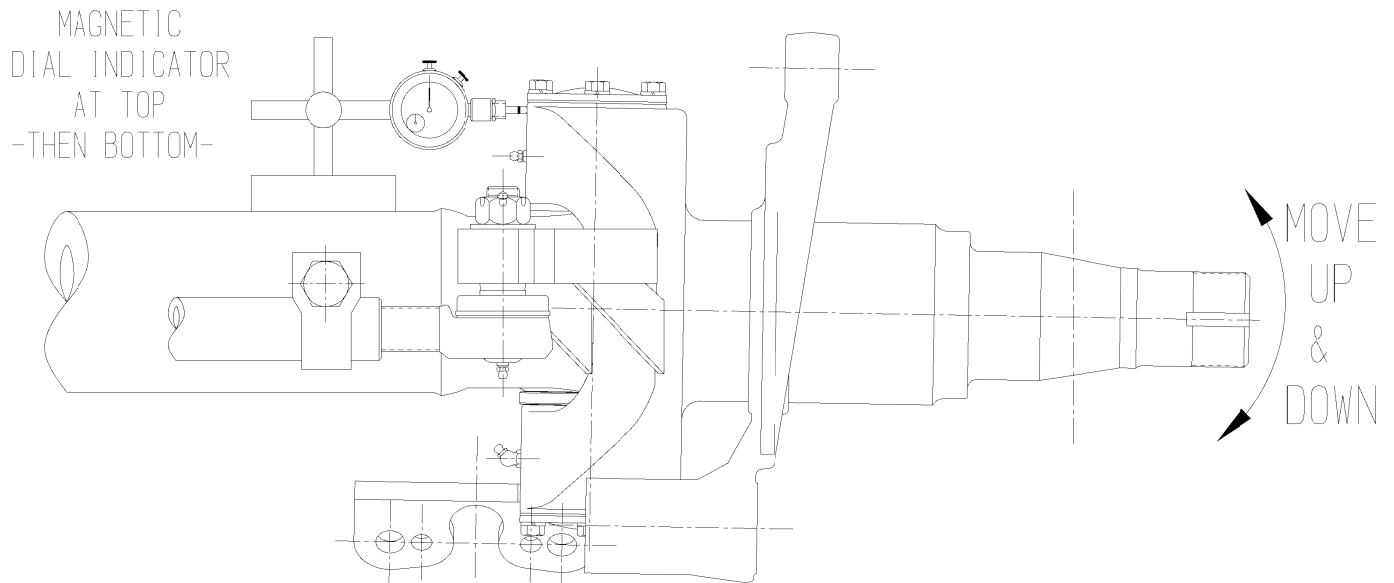
Assembly

1. Clean and inspect all parts. Insert new o-rings "N" in knuckle "C". Mount knuckle "C" on beam "G". Slide thrust washer "F" into place, as shown.
2. Select left king pin "H" for left side. Verify slot positions on king pin to match holes in the beam "G". Slide king pin "H" into place with positioning hole in front to align draw key slots correctly.
3. Insert draw keys "L" with threads towards the front of axle, and torque flange nut "M" to 65 Nm. Do opposite for right side.
4. Install top and bottom gaskets "B" and caps "A". Lubricate four grease nipples.
5. Re-torque two weeks after unit is put into service and at every major maintenance interval (27 Nm).

Recommendation

When significant wear is identified, you should replace both kingpins, the four bushings, four draw keys and nuts, and both thrust washers. Genuine replacement parts are available from TMC.

KING PIN BUSHING WEAR CHECK

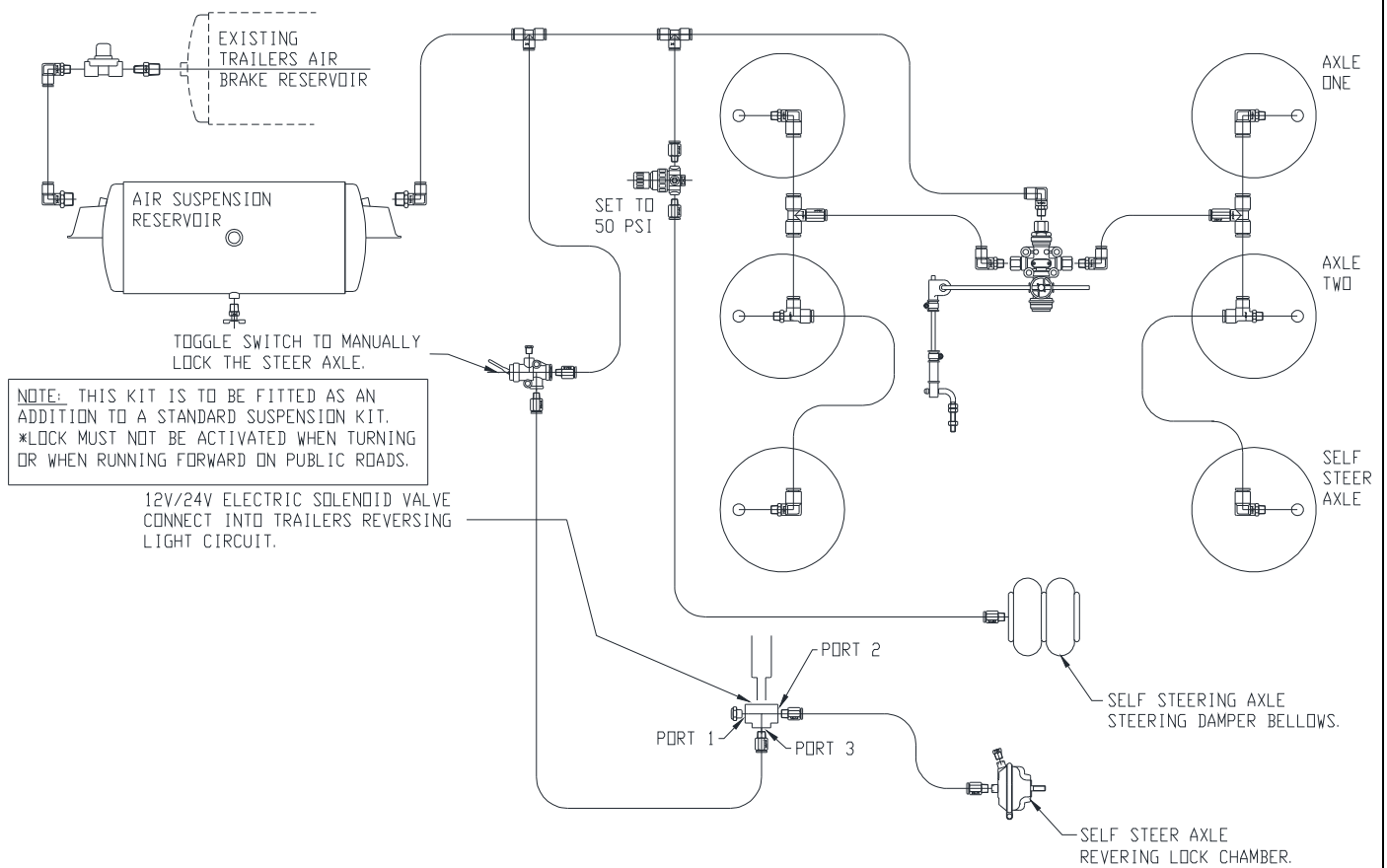


Total indicated movement of 2.8mm or more, Top or Bottom, indicates excessive wear or damage. Replace both bushings and check King Pin.

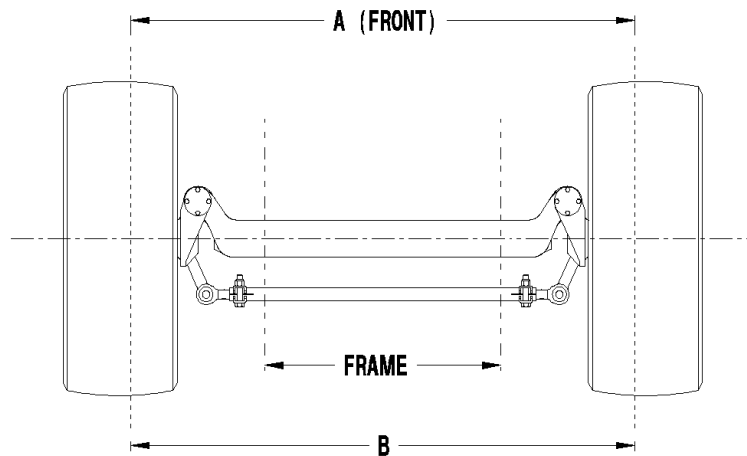
King Pin O.D. 57.125/57.099 mm

OPERATION WITH TORPRESS AND LOCKING CYLINDER

1. Observe operation of Self-Steering Axle at maximum axle load. Increase regulator pressure until the steer axle resists steering.
2. Now reduce pressure slightly in order to regain steering function. The objective is to obtain maximum centring force while retaining self-steering function at maximum axle load. Note: self steer function maybe limited when axle is unloaded and operating on gravel surfaces.
3. Regulator pressure can later be adjusted to suit different load conditions and road conditions.
4. For reverse operation the lock mechanism must be activated. See following pneumatic diagram for typical tri axle pneumatics with lock mechanism activated by a manual toggle switch or reverse light 12V/24V signal.



TOE-IN ADJUSTMENT



1. Tyre must be of the same size, pressure, and tread pattern. Hubs, drums, rotors and brakes must be identical. All suspension bushings and parts must be in good mechanical order and correctly adjusted.
2. Scribe a fine line on the tyre treads all around the tyre.
3. Measure between the scribed lines on tyre in front and on the back, on axle centre line. 22.5" Wheels "A" must be shorter than "B" by 1.6mm, 0.8 mm, when axle is a nominal load.
4. Adjust by rotating the tie-rod with axle un-loaded. Tie-rod ends must be square with stud, and guide plate must be centred in u-bracket before tightening the clamps. Tighten all the clamp bolts and the tie-rod end nuts to 200 Nm of torque.
5. Check toe-in after each adjustment until the axle is within specification.

AXLE ALIGNMENT

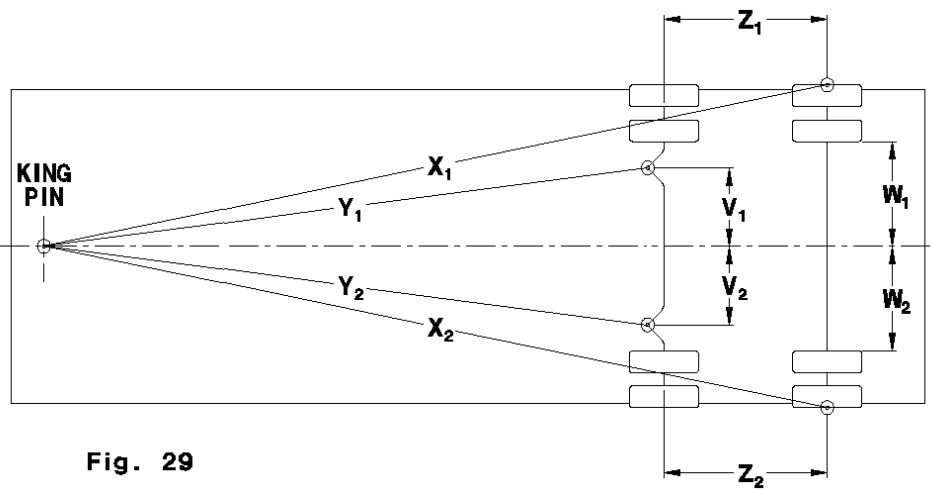
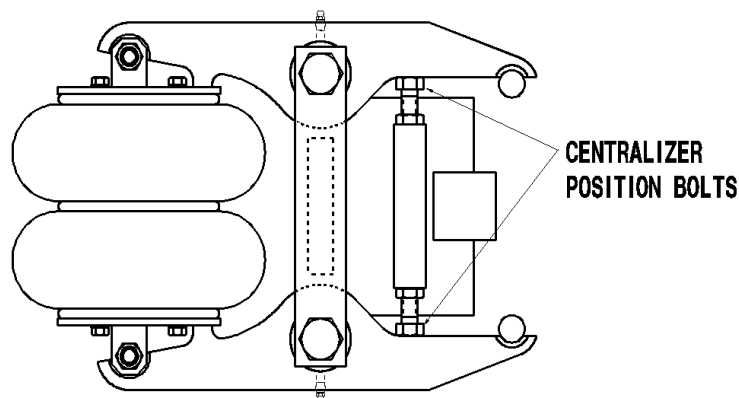


Fig. 29

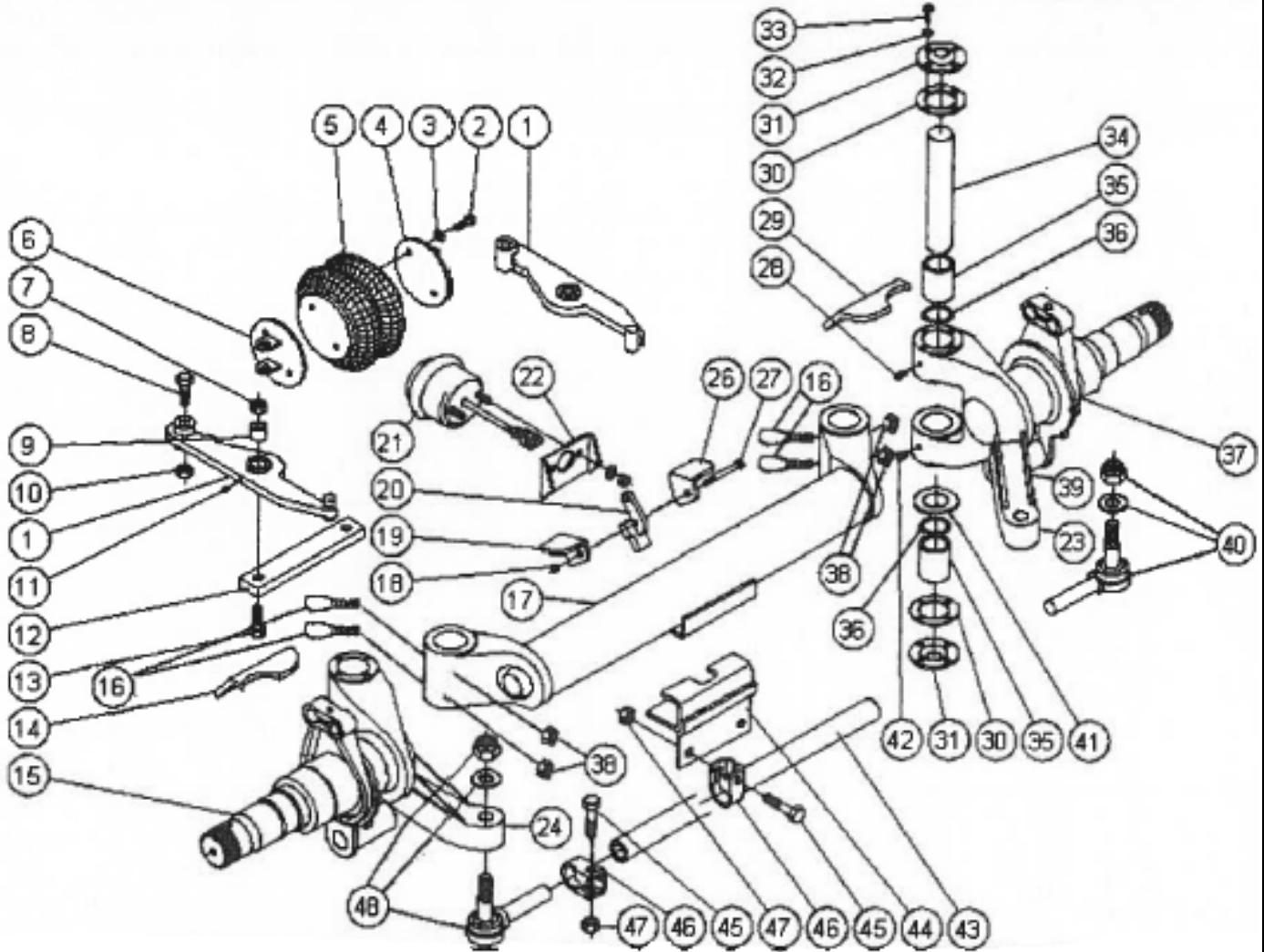
NOTE: VERIFY AND ADJUST TOE-IN BEFORE STARTING THIS ADJUSTMENT.

1. Inspect suspension and axle for mechanical wear, damage, or missing parts. Repair or replace parts as required before starting toe-in and alignment.
2. Verify and adjust Steer Axle king pin positions relative to trailer king pin, $Y_1=Y_2$. Use suspension adjustment mechanism to set this position.
3. Fixed Axle must be aligned first. Verify the Steer Axle end alignment with the trailer king pin, and adjust with the centralizer air bag position bolts per **Dwg. 700196**. Centralizer bag must be at approximately 35 psi. Set $Z_1=Z_2$
4. Lift Steer Axle to release any adjustment tension still in the steering mechanism. Lower and apply normal equalized load on the axle, and verify toe-in and alignment again. Adjust as required. Repeat until the axle measures correct toe-in and alignment.



DWG 700196

SPARE PARTS LIST – STEER AXLE



Item	Part #	Description	Item	Part #	Description
1-13		SEE TORPRESS ASSEMBLY	33		BOLT, 3/8-16 UNC-2Ax5/8, GR5
14	CONTACT TMC	BRAKE CHMBR BRKT	34	81700040L	KING PIN – LEFT HAND
15	CONTACT TMC	STEERING KNUCKLE	35	81700040R	KING PIN – RIGHT HAND
16	81700660	DRAW KEY	36	81700041	BUSHING (STRG KNUCKLE)
17	CONTACT TMC	AXLE BEAM	37	CONTACT TMC	SPIDER
18		NUT, 5/8-11 UNC	38	81700661	HEX NUT
19	81700191	LOCK BRACKET – L.H.	39	CONTACT TMC	REINFORCING GUSSET
20	81700212	TIE ROD LOCK	40	81700043	TIE ROD END – R.H.
21	217009-050	TYPE 9 AIR CHMBR 5" ROD	41	81700068	THRUST WASHER
22	81700192	TYPE 9 AIR CHMBR - BRKT	42		GREASE FITTING – 45 DEG
23	CONTACT TMC	STEERING ARM – R.H.	43	CONTACT TMC	TIE ROD, 40" LENGTH
24	CONTACT TMC	STEERING ARM – L.H.	44	CONTACT TMC	PUSH/LOCK PLATE
26	81700190	LOCK BRACKT – R.H.	45		BOLT, 3/4-10 UNC-2Ax3-3/4, GR5



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Item	Part #	Description	Item	Part #	Description
27		BOLT, 5/8-11 UNC-2Ax4", GR5	46	81700065	LOCKING CLAMP
28		GREASE FITTING, STRHT	47		NUT, 3/4-10 UNC-24, NYLOCK
29	CONTACT TMC	BRAKE CHMBR BRKT	48	81700042	TIE ROD END – L.H.
30	81700075	KING PIN GASKET			
31	81700076	KING PIN CAP			
32		WASHER, LOCK 3/8 NOM			

Camkits to suit 420x180 brake axle

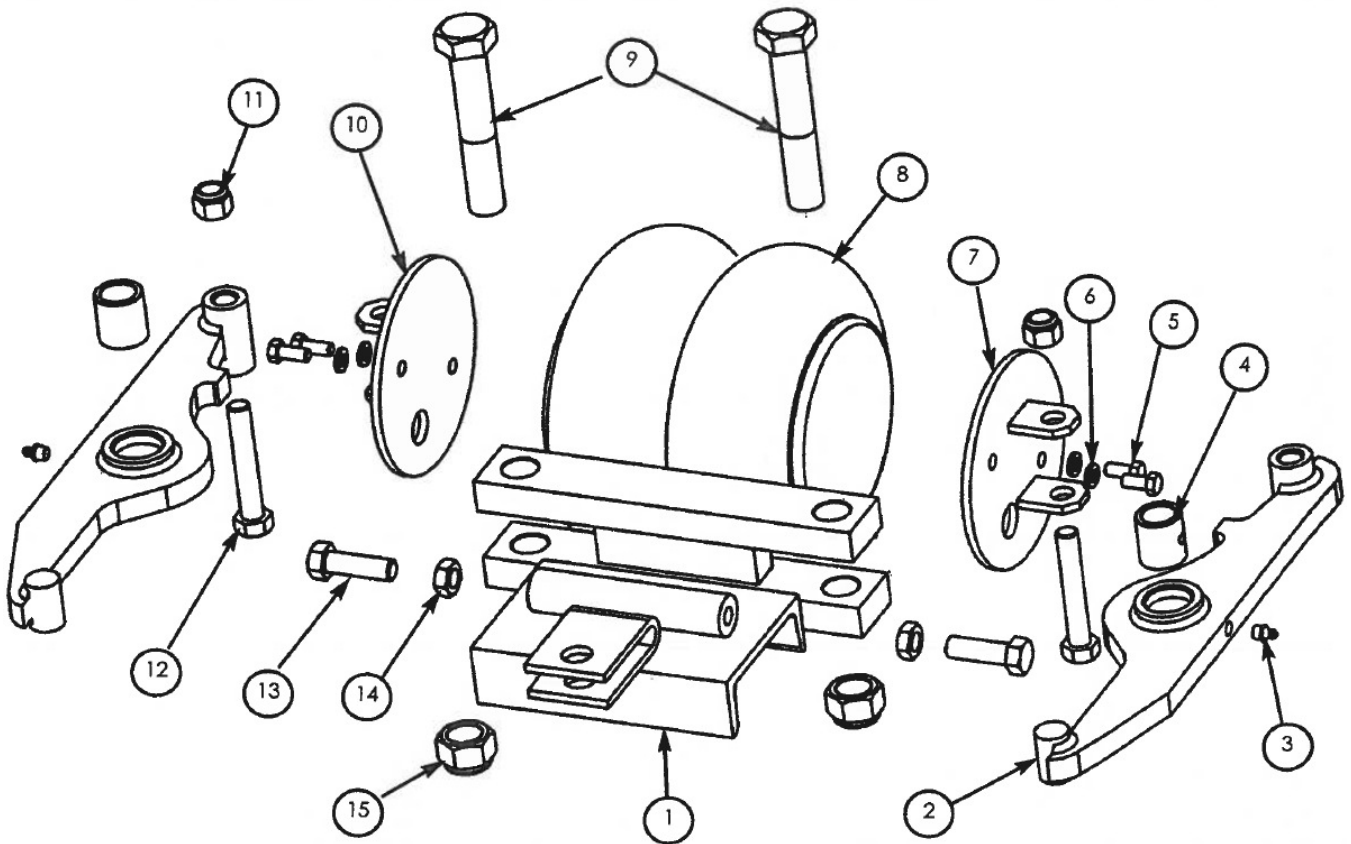
1. 817102 – camtube
2. 717198 – camtube gusset
3. 811006-244 – camshaft 244mm long
4. 810081 – camshaft seal (inner)

Camkits to suit 335x210 brake axle

1. 817130-157 – camtube
2. 717198 – camtube gusset
3. 817131-230 – camshaft 230mm long
4. 810081 – camshaft seal (inner)
5. 810082 – camshaft seal (outer)

- Refer to TMC Axle Service Manual Drum Brake for other wheel end kit parts

SPARE PARTS LIST – TORPRESS ASSEMBLY



Item	Part #	Description
1	81700232	TORPRESS MOUNTING ASSM
2	81700177	LEVER ARM - MACHINED
3		GREASE FITTING - STRHT
4	81700182	PIVOT BUSHING
5		BOLT, 3/8-16 UNC-2Ax7/8", GR5
6		WASHER, LOCK 3/8
7	81700179	ACTUATOR PAD WELDMENT – L.H.
8	81W01-358-6910	STYLE 20 AIRSTR ACTUATOR
9		BOLT, 1"-8 UNC x5-1/2", GR8
10	81700178	ACTUATOR PAD WELDMENT – R.H.
11		NUT, 5/8-11 UNC-2B, NYLOCK
12		BOLT, 5/8-11 UNC-2Ax4", GR5
13		BOLT, 5/8-11 UNC-2Ax2", GR5
14		NUT, 5/8-11 UNC-2B, JAM, GR5
15		NUT, 1"-8 UNC-2B, NYLOCK, GR8