

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

1: Introduction	Page 1
Driver Maintenance Information	
2: Basic information	Page 2 - Page 8
Repairs	
3: The hydraulic system	Page 9
4: Rams - remove and replacement	Page 19
5: Bellcrank bolt remove and replace	Page 21
6: Bellcrank centre bush - remove and replace	Page 22
7: Cam follower	Page 22
A: Test	Page 22
B: Remove and refit	Page 23
8: Rear turntable remove and replace	Page 25
9: Front slew ring	Page 25
A: Test for wear	Page 25
B: Remove and replace	Page 26
10: The wedge	Page 26
11: Steering alignment	Page 26
A: Manual alignment	Page 26
B: Automatic alignment	Page 27
C: Rear bogey stoppers	Page 27
D: Adjustment stoppers after replacing bogey	Page 29
E: Rear Ram Adjustment	Page 29
12: Parts list	Page 30
A: Complete Assembly (drawing)	Page 31
B: Compact Module - Standard Module (drawing)	Page 32
C: Hydraulic Rams Assembly - Piping Assembly (drawing)	Page 33
D: Back Bogey - Wedge Parts - Accumulator (drawing)	Page 34

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

1)

Introduction

The steer system works through a low pressure, four line, self contained hydraulic circuit, with a back up reserve accumulator. As the tractor unit turns left or right the front steer rams are activated which in turn move the rear rams, which steer the rear axle.

2)

Basic Information

- A: The wedge
- B: The hydraulic system indicators
- C: Steering alignment
- D: Advice and warning
- E: Steering maintenance

A: The Wedge

Always make sure the wedge is fully adjusted up into the slot in the 5th wheel plate.

To adjust Using a 24 mm (15/16") spanner, slack the 2 bolts under the wedge plus the lock nut on the adjusting screw.

(See fig 1).

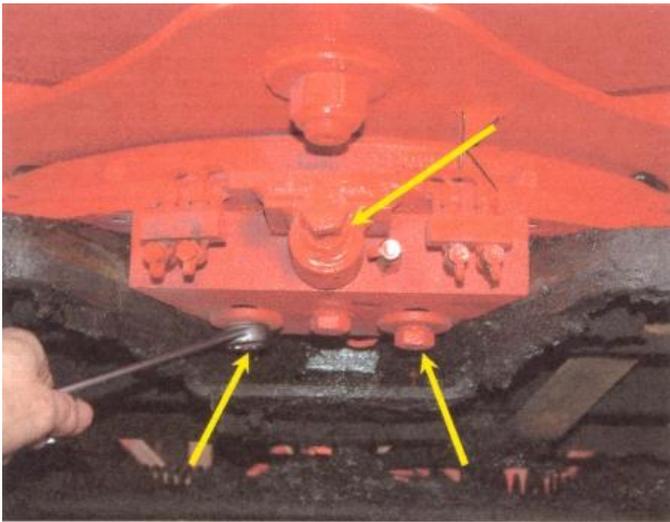


FIG 1

Screw in the adjusting screw until the wedge is **just fully engaged** in the slot with no clearance at either side. (see FIG 2)



FIG 2

Do not **over tighten** as it is very difficult, if not impossible; to couple or uncouple the trailer. When adjustment is correctly completed, tighten lock nut and the 2 bolts under wedge. (see FIG 1)

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

B: THE HYDRAULIC SYSTEM INDICATORS

The hydraulic system has three separate indicators as to pressure and quantity of oil in the system

- 1 : THE PRESSURE GAUGE,
- 2: THE ACCUMULATOR
- 3: THE WARNING LIGHT

1: THE PRESSURE GAUGE

The pressure gauge mounted on top of the accumulator indicates system pressure (see fig 3)



FIG 3

The normal pressure in the system is approximately 6 bar (85psi)

2: THE ACCUMULATOR

The accumulator holds a reserve quantity of hydraulic oil, of approx 1.5 Litres. There is a quantity indicator on the front of the accumulator. When the indicator is fully IN the accumulator is **FULL**

(fig 4a)

When the indicator is fully **OUT** (approx 3" (75mm) the accumulator is empty (see fig 4b, and the pressure is at zero.

(See fig 4c).

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

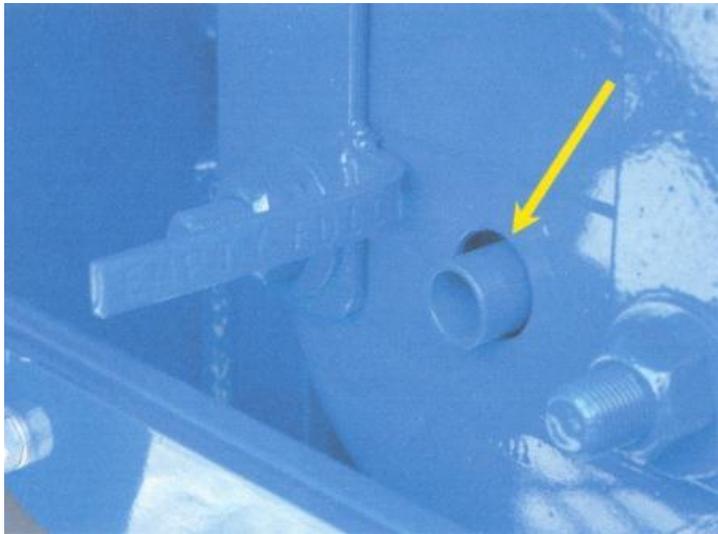


FIG 4a

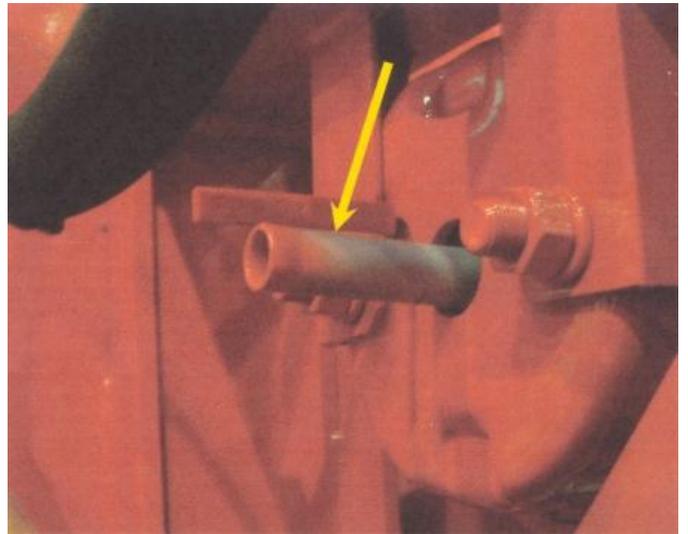


FIG 4b

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)



FIG 4c

3: THE WARNING LIGHT

If for any reason the system develops an oil leak, then the pressure will drop and the accumulator indicator will start to protrude.

If left undetected, the warning light will eventually come on; when the system pressure has dropped to approximately 1.5 bar (20 PSI).

At this stage the steer system is still in a safe and useable condition, however it is highly advisable that any oil leak be detected and repaired and the system primed to 6 bar (85 PSI) as soon as possible. Refer to the hydraulic system (in the workshop manual).

C: STEERING ALIGNMENT

Models produced prior to September 2000 require the steering to be aligned manually; Models produced after this date have an automatic alignment system.

MANUAL ALIGNMENT

WARNING: MANUAL ALIGNMENT SHOULD ONLY BE ATTEMPTED BY COMPETENT PERSONNEL AFTER HAVING FIRST CONSULTED THE WORKSHOP MANUAL.

SERIOUS DAMAGE CAN OCCUR IF **ALL** INSTRUCTIONS ARE NOT FULLY ADHERED TO.

AUTOMATIC ALIGNMENT

Automatic alignment takes place when the tractor unit is turned to 90 degrees to the trailer in both left and right directions. It will be necessary to carry out the above operation **every time** the tractor unit is uncoupled and re-coupled, or if steering axle misalignment occurs

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

D: ADVICE TO DRIVERS

ALWAYS un-couple and re-couple with trailer and tractor unit in a straight line. If this is not possible, then driver needs to take account of the angle the unit was uncoupled, and later attempt to re couple at the same angle. This is **most important** on trailers with non self-alignment.

CAUTION REGARDING TIPPING TRAILERS

STEERING AXLE TRAILERS MUST NOT BE TIPPED UNLESS UNIT AND TRAILER ARE IN A STRAIGHT LINE, AS BLOWING EQUIPMENT ETC WILL FOUL REAR AXLE.

WARNING

NEVER ATTEMPT TO TIP A LOADED BODY WHILE ON UNEVEN TERRAIN WITH AIR BAGS DUMPED. THIS CAN CAUSE MAJOR CHASSIS DAMAGE.
DO NOT MOVE TRAILER UNLESS BODY IS COMPLETELY LOWERED.

E: STEERING MAINTENANCE

The front and rear turntables should be greased monthly. Use good quality water proof grease (see following list of recommended greases)

SUITABLE EQUIVALENT GREASES:

SHELL - RETINAX HD2 OR HDX2
DUCKHAMS-LB 10
BP ENER GREASE - ISEP-2
FUCHS- RENOUT EP-2
CASTROL SPHEEROL LEP-2 (OR HIGHER SPEC) PYROPLEX BLUE
OMEGA - 77
MOBII-GREASE - XHP 222
ESSO - UNIREX EP-2

Grease nipples are situated on the front offside corner of the rear bogey (see fig 5) and at the back of the wedge on the front turntable (see fig 6)

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

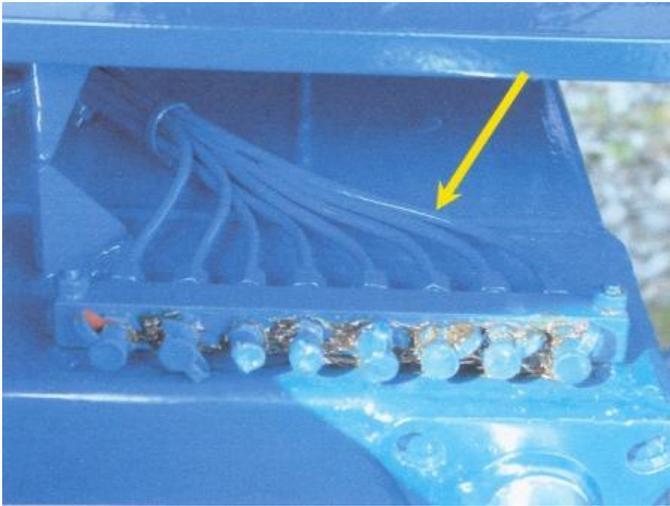


FIG 5

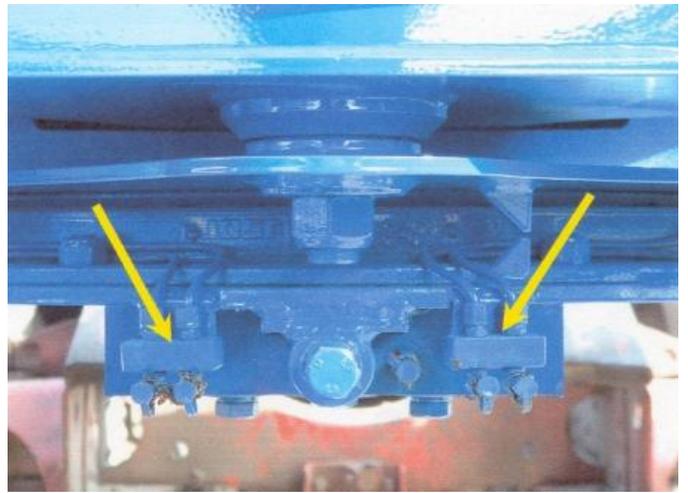


FIG 6

On earlier trailers the cam follower bearing grease nipple is situated just in front of the wedge under the rubbing plate (see FIG 7)

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

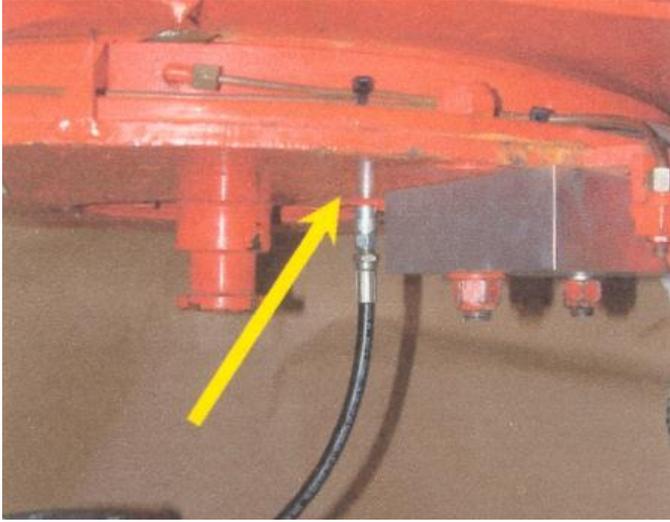


FIG 7

(The tractor unit needs to be uncoupled for this operation)
On later trailers the nipple is situated under the wedge adjusting screw boss, or on the wedge itself.



FIG 8

Apply only two or three pumps of grease to cam follower, and also later type bellcrank centre bolt (see FIG 9)

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)



FIG 9

3: THE HYDRAULIC SYSTEM

- A: Warning
- B: Dismantling
- C: Warning light
- D: Priming
- E: Priming empty valve manifold
- F: Priming empty relief valves

A: WARNING All the following operations should only be attempted by competent personnel

The MAXIMUM pressure in the hydraulic system should never exceed 100 PSI (7 Bar). The normal working pressure in the system is 85 PSI (6 Bar): - The only safe way to achieve this is by using a hand operated priming pump.

B: DISMANTLING

Caution. Before attempting to remove a ram or any hydraulic part of the steer system, always release the pressure in the system; this is done by fitting the diaphragm pulling bolt, (which is located on the side of the accumulator). (See fig 10).

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

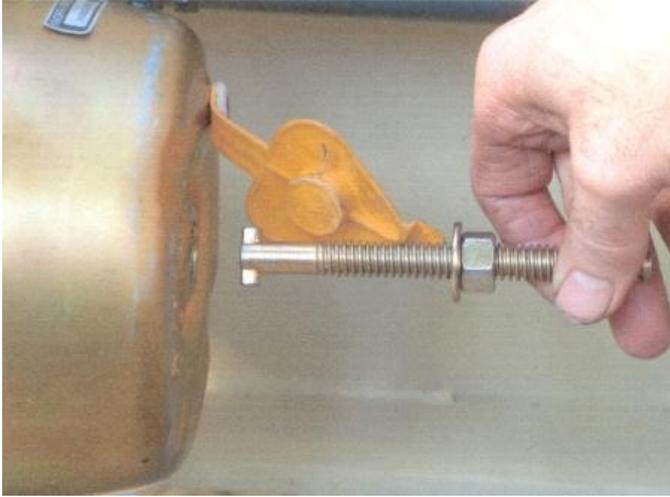


FIG 10

Tighten this bolt (see FIG 11) while observing the pressure gauge.
Keep tightening until the pressure gauge reads zero.
(see FIG 4c)
(Remember to release and remove the bolt after repairs are completed).



FIG 11

If it is desired to drain the oil from the accumulator, then proceed as follows.
First place a container under the valve **manifold** capable of holding at least 2 litres of oil. Then slacken the bleed screw at the top of the manifold, and press down on one side (see FIG 12).

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

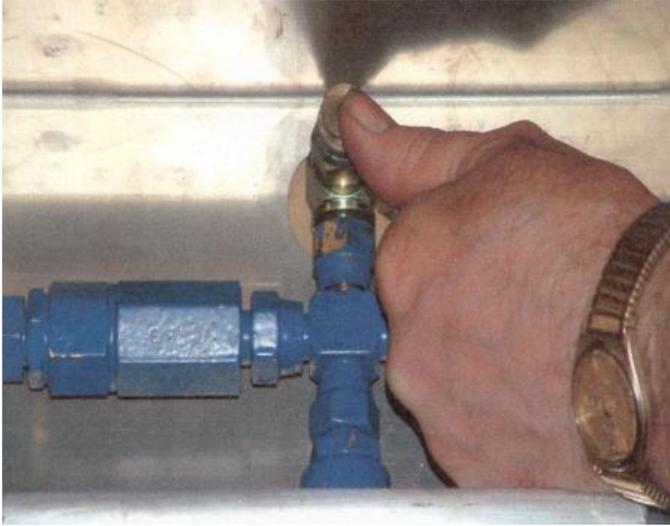


FIG 12

On later type, first remove plug while holding down locking ring with an 8mm spanner as shown in (FIG 13)

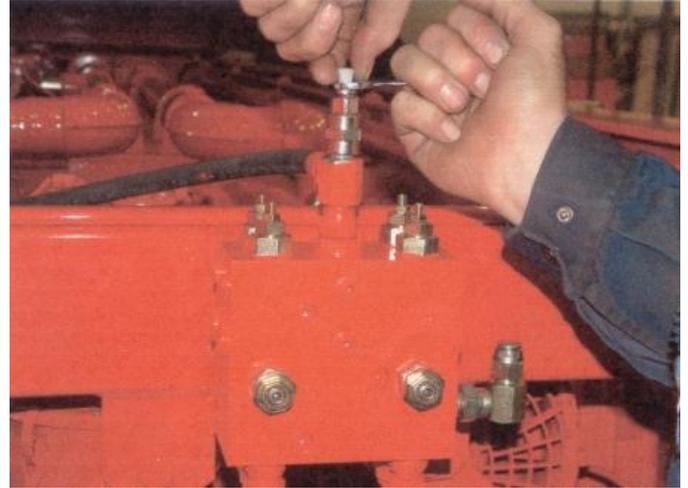


FIG 13

Then push in a length of 8mm tubing and put the other end in the container, and slacken the bleeder (see FIG 14)

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

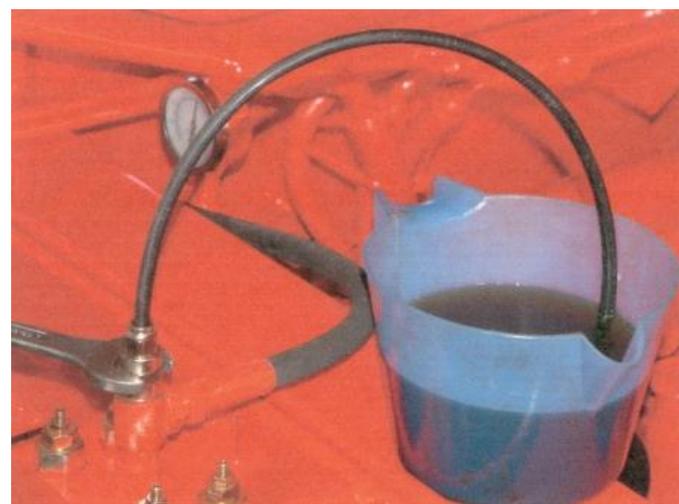


FIG 14

C: WARNING LIGHT

At this zero pressure stage (FIGS 4b and 4c). switch on the ignition, (or side lights as applicable) and check if warning light comes on. If not, then check:

- 1 : The bulb
- 2 : The wiring
- 3: The pressure switch

It is most important to repair any faults at this stage

D: PRIMING

NOTE: Before starting to prime and bleed the system, **ALWAYS** make sure the trailer is level; this is to ensure all air is expelled from both ends of the rams.

If the valve **manifold** or the valve **block** have been drained completely; then first refer to the section **E** or **F**.

To prime or bleed the system, a hand operated pump will need to be connected to the priming port, (see FIG 15 early type). (FIG 16 later type).

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)



FIG 15

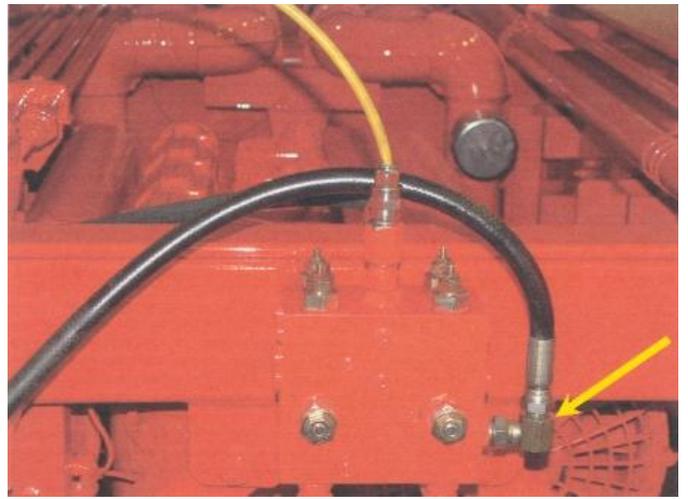


FIG 16

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

Remember to have sufficient hydraulic oil in the priming pump to be able to prime the complete system without introducing air.

The bleeder at the top of the valve assembly, or valve block, will need to be loosed to expel the initial air from the priming hose and pump after the first several strokes. (FIG 12 and 14)

After all the air is expelled, then continue to operate the priming pump while observing accumulator capacity indicator as it retracts see (FIG 4a and 4b).

Also observe pressure gauge. **Do not exceed 100 PSI (1 bar) (FIG 3)**

WARNING: One more pump stroke could over- pressurise the system and cause damage to the accumulator and pressure gauge. **BE VERY CAREFUL!**

Now proceed to bleed rams, (remember to have the accumulator pumped up to full before attempting to bleed each ram) (FIG 3).

Early type bleeders (plus those fitted on aluminium chassis) will need to be slacked off, and one side of the cap held down; a container should be placed under each end of the ram while bleeding.

On later type bleeders the plugs need to be removed see (FIG 17).

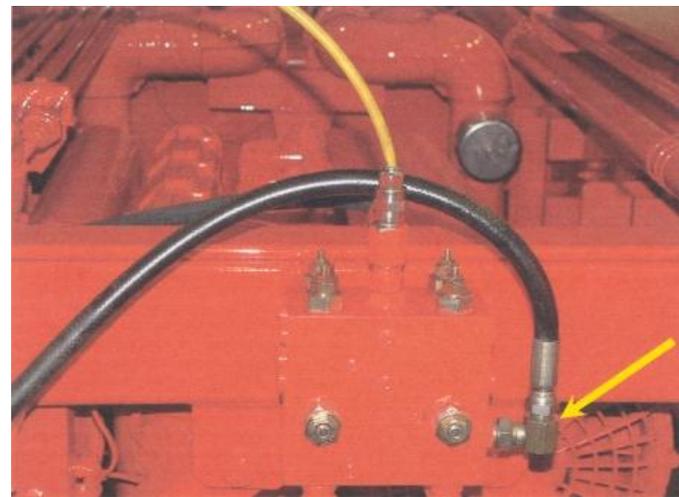


FIG 17

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

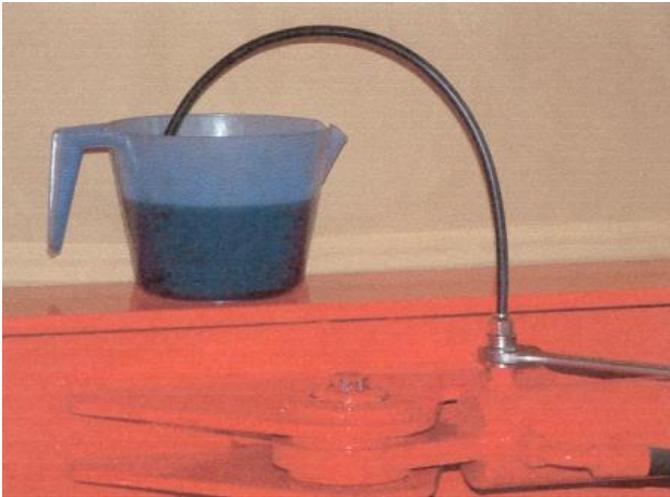


FIG 18

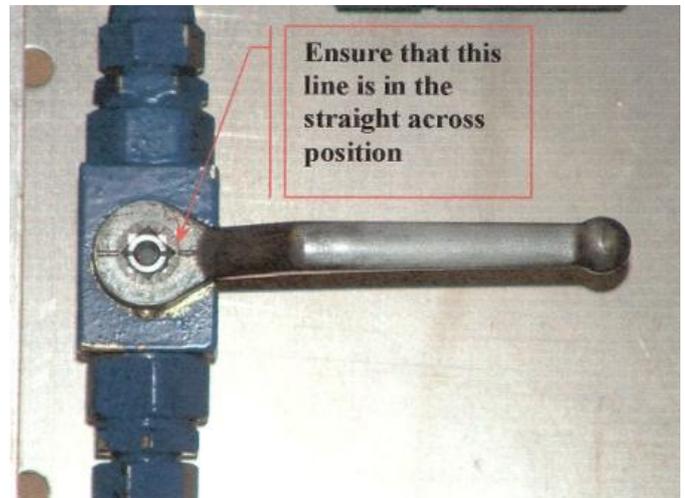


FIG 19

Repeat procedure on all rams that have been disconnected.

To be **absolutely sure** that **all** air is expelled from the system, proceed as follows:

Raise the front of the trailer several inches and slack each bleeder in turn; lower the front several inches below level and slack each bleeder in turn. refit all bleeder plugs; finally, pump the system pressure to 85 PSI (6 bar); remove priming pump and refit priming port cap.

E: PRIMING EMPTY VALVE MANIFOLD

If the valve manifold (early type) has been **drained completely**, then the following procedure needs to be carried out: first remove both handles with an 8mm spanner. Check and make **absolutely sure** the slots in **both** square spindles are in the straight across position (see FIG 19)

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

If not turn them to this position. Refit both handles in line, without the locking pipe fitted (see FIG 20)

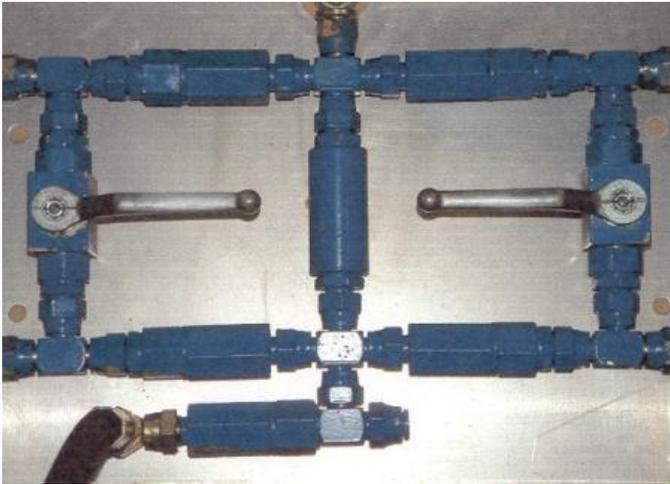


FIG 20

Turn both handles to 90 degrees from this position (FIG 21)

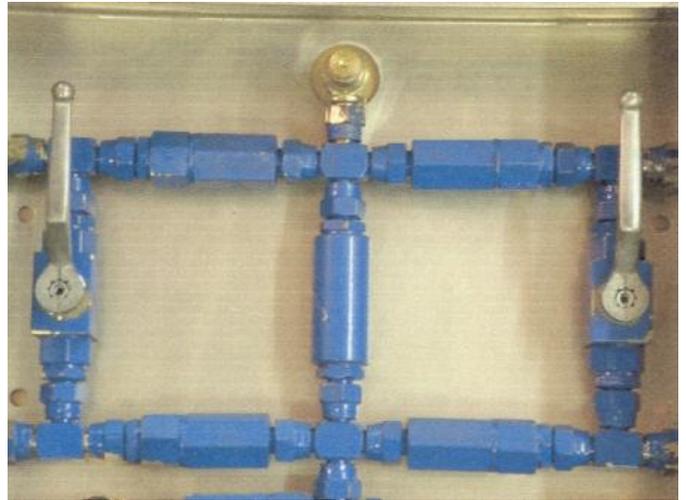


FIG 21

(This action allows the oil to flow through the valve assembly and expel any trapped air). Proceed to prime and bleed the system as described in (D : PRIMING). Finish operation by lining up front and rear pointers (FIG 5 and 6). Then turn both handles back in line and fit locking pipe (see FIG 22).

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

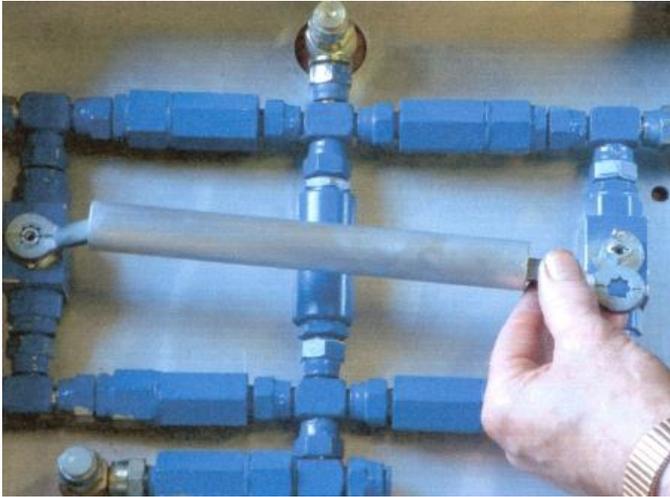


FIG 22

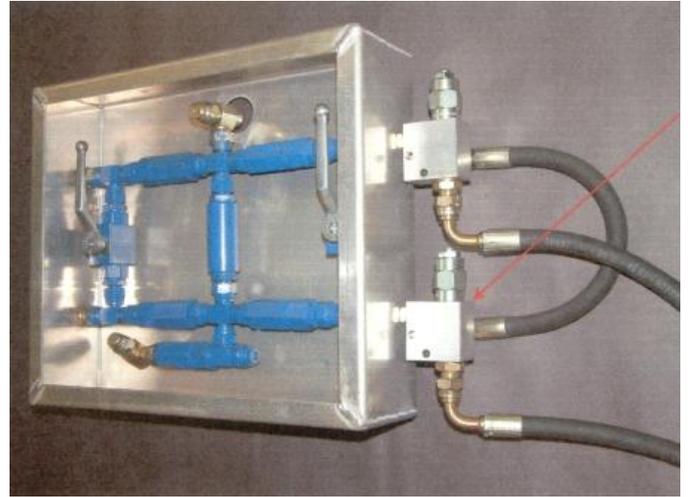


FIG 23

F: PRIMING EMPTY RELIEF VALVE

The following only applies to self aligning systems (fitted as standard since mid 2000). There are 4 relief valves in the system. These are fitted outside of each end of the earlier type control box (FIG 23)

They are fitted on the top of the later valve block (see FIG 24).

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

Before starting to prime this type of system, **(only necessary after being drained empty)**: first clean off all dirt from around valves.

WARNING NEVER slack a relief valve if there is **any pressure** in the system. The "O" rings on the valves will be damaged. To release pressure refer to section B **(Dismantling hydraulic system)** Screw the valves out but leave them sitting in the cavities (FIG 23 and 24). Then gently operate the priming pump, gently to expel all air out of the cavities; Only screw the valves back in when there is **zero** pressure in the system. (to avoid damaging the O rings). Tighten valves and proceed to prime and bleed the system as described at **D: PRIMING**.

NOTE If it is required to disconnect the action between the front and rear rams on the later type valve block then proceed as follows: two flow restrictors are fitted in the front surface of the valve block: slack the lock nuts and unscrew centre part of restrict or a few turns using a 5mm Allen key (see fig 25)



FIG 24

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

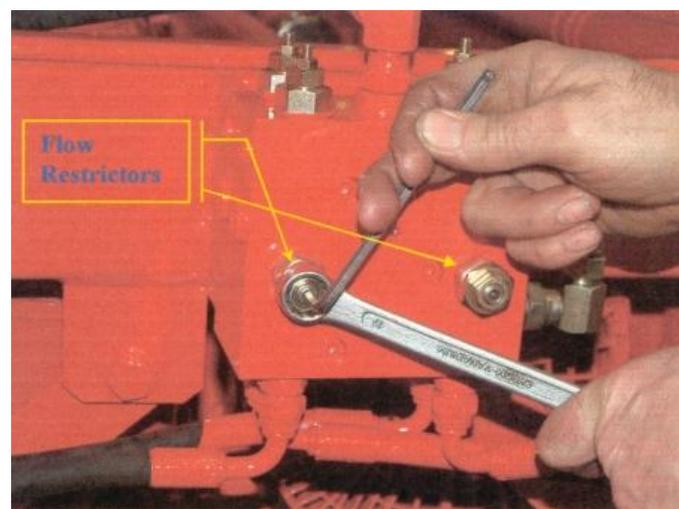


FIG 25

Before closing restrictors **always** make sure to line up pointers on both front and rear turntables (FIG 5 and 6). This is **VERY IMPORTANT** due to the **very high loading** involved in bringing a badly out of line axle back into alignment automatically. **Serious damage** to the cam follower etc can occur if above warning is not strictly adhered to.

4: RAMS
A: Remove and replace
All ram pins (except both front ones) are secured by a bolt and a large washer top and bottom: this means the pin can be removed either up or down ways.
The front pins are secured with countersunk head (10 mm hex socket) bolts, with lock tight on the threads. The best way to remove the pins is by using the special puller, (FIG 26) which can be supplied by Muldoon Transport Systems (**tool number RPP-I**).

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34



FIG 26



FIG 27

Before fitting ram pins, always remove any rust that may have gathered on the pins, bushes and bearings. Always apply anti seize compound to above parts before fitting pins. Always fit a 5/8" or M16 bolt into head of the pin before attempting to drift or hammer pin back into position (FIG 27)

Index | [Previous Page](#) | Next Page

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

NEVER HAMMER DIRECTLY ON THE END OF THE PIN: this will flare the end, leaving it unable to fit completely into the bush causing great difficulty while attempting to remove later.

(B) RAM BEARINGS

If ram bearings need to be replaced, always use **correct type of bearing**. Always remove both circlips and **press** on outer ring only, **never** on the centre part.

5: BELLCRANK BOLT REMOVE AND REPLACE

To remove centre bolt, use the special puller (FIG 28), which can be supplied by Muldoon Transport Systems (**Tool no BC EO-I**).

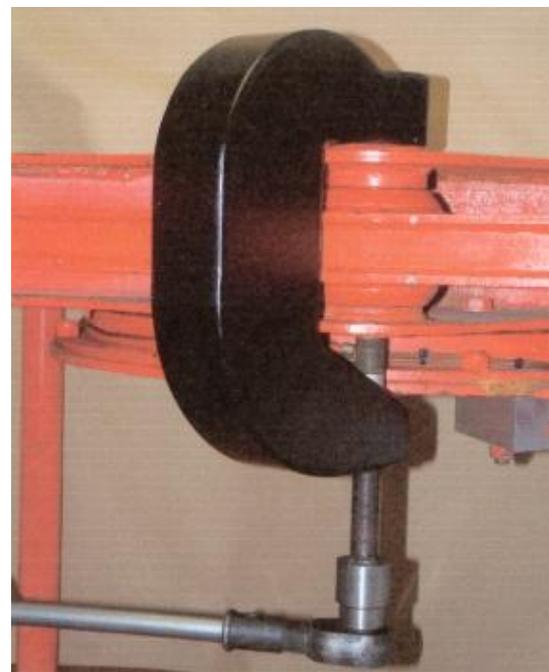


FIG 28

Remove all rust from the bolt and bushes, and apply anti seize compound before replacing bolt. Torque nut to 520 NM

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

6: BELLCRANK CENTRE BUSH REMOVE AND REPLACE

Early type bushes are one piece; later - type comprise three pieces. The best way to remove and replace the bush is by using special puller supplied by Muldoon Transport Systems (**tool number BC BU-1-3**) The use of this puller means the bush can be changed without removing the Bellcrank (FIG 29a and 29b).



FIG 29a



FIG 29

The puller is made to fit the end of the bush, which stops the bush being distorted during the process of removing or replacing it; also, this tool ensures the bush is easily centralized. The later - type bronze bushes should easily lift out: one from the top, and one from the bottom.

NOTE (early and later type bushes are not the same diameter)

Puller is supplied with all necessary parts to remove and replace both types.

NOTE It is highly recommended that the "O" rings are discarded when replacing bronze bushes; this will allow grease to penetrate better.

7:CAM FOLLOWER

A: TEST

With tractor unit removed, hold wedge adjusting screw, and pull from side to side, while holding fingers between cam follower nut and housing (see FIG 30).

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)



FIG 30

There should be no play, and nut should be tight

Also check for play in bearing itself (FIG 31).



FIG 31

B: REMOVE AND REFIT

Before attempting to remove the cam follower nut, **first** slack off both locking grub screws in the head of the nut (see FIG 32)

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)



FIG 32



FIG 33

The cam follower is fitted using Lock Tight. The best way to remove it is by using a press: fit appropriate packers as close to the cam follower boss as possible. This will avoid causing distortion in the rubbing plate. (see FIG 33)

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

When refitting the cam follower, first ensure the bearing shaft and cam follower boss and threads are degreased (using thinners etc); also ensure the dowel pin in the bearing shaft is in good condition. (if in any doubt, it will need to be renewed); apply lock - tight to the shaft and boss bore. Accurately line up the head of the dowel with the keyway, and press the shaft into the boss (see FIG 34).



FIG 34

Keep the press as near to the centre of the head of the shaft as possible, to avoid any misalignment problems. When fully seated, the nut can be fitted, (after insuring that the two locking grub screws are well screwed out). It is advisable to degrease threads, and apply some lock - tight Torque the nut to 680NM and tighten the two locking grub screws.

8: REAR TURNTABLE REMOVE AND REPLACE

First remove rear pins from rear rams (as described in section 4); disconnect brake and suspension air pipes; renew turntable by fitting same type unit (with rubber seals).

NOTE It is much easier to tap out grease pipe adaptor threads BEFORE fitting turntable. (use m8x 1 mm tap). (apply anti - seize compound when refitting ram pins) Torque all 5/8 bolts to 270NM.

9: FRONT SLEW RING

A: TEST FOR WEAR with tractor unit removed, hold wedge adjusting screw and pull from side to side, and up and down; look for any excessive play.

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

B: REMOVE AND REPLACE

First disengage steering action between front and rear by opening ball valves (in early- type control boxes), or flow restrictors in later type valve blocks. (see FIGS 21 or 25) remove all grease pipes: carefully grind off all locating welds around edge of slew ring/rubbing plate; remove all 8 countersunk head - bolts; it will now be possible to remove the rubbing plate;

next remove all 8 bolts; securing the slew- ring to the cross members. Renew slew ring by fitting same type unit (with rubber seals); unlike the rear turntable, the front slew ring comes un-drilled. **NOTE** The holes cannot be accurately drilled by clamping the old and new slew rings face- to -face, or back to back; they should only be purchased from Muldoon Transport systems, where they are accurately drilled on special jigs.

NOTE It is much easier to tap out grease pipe adaptor threads before fitting slew ring. (use m8 x 1mm tap). Torque all 5/8" M16 bolts to 270NM.

VERY IMPORTANT Remember to fit the earth clamp to the **rubbing plate only**. **BEFORE** putting on the locating welds. (this is to stop the current passing through the bearings, and causing premature damage to the slew ring).

10: THE WEDGE

If the wedge has been removed, then all rust and corrosion needs to be removed from sliding surfaces. Remove any worn tape from face of the wedge and replace with new tape. (This is to stop corrosion between both metals). Apply plenty of anti - seize compound in groove etc before refitting wedge.

11: STEERING ALIGNMENT

Models produced prior to September 2000 require the steering aligned manually.

Models produced after this date have an automatic alignment system.

A: MANUAL ALIGNMENT

WARNING - MANUAL ALIGNMENT SHOULD ONLY BE ATTEMPTED BY COMPETENT PERSONNELL AFTER HAVING READ THE FOLLOWING INSTRUCTIONS.

SERIOUS DAMAGE CAN OCCUR IF ALL THE INSTRUCTIONS GIVEN ARE NOT FULLY ADHERED TO.

To manually align steering, open the door on the early type control box (FIG 15). Inside will be two handles locked by a length of pipe. Using an 8mm spanner remove both handles. Check and make absolutely sure the slots in both square spindles are in the straight across position (FIG 19)

If not, then turn them to this position. Refit both handles in line without the locking pipe fitted (FIG 20) Turn both handles to 90 degrees from this position (FIG 21) This action allows the oil to flow through the valve assembly and disconnects the movement of the front rams from the rear rams.

Line up the pointers on the front slew ring and rear turntable (FIGS 5 & 6). Then turn both handles back in line with each other. Remove one handle and fit the locking pipe on both handles and replace the handle (FIG 22) then tighten both handles.

WARNING - FRONT AND REAR POINTERS MUST BE LINED UP BEFORE CLOSING BALL VALVES. IF STEERING IS OPERATED WITH POINTERS OUT OF LINE THEN SERIOUS DAMAGE WILL OCCUR AS THE RAMS BOTTOM OUT.

(THERE ARE NO RELIEF VALVES IN THIS SYSTEM)

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

NOTE automatic alignment is fitted on the last of the early type valve manifolds (fig 23) Also on all later type valve blocks (see FIG 24).

B: AUTOMATIC ALIGNMENT

Automatic alignment occurs when the tractor unit is turned 90 degrees to the trailer in both left and right directions; it will be necessary to carry out the above operation **EVERY TIME** the tractor unit and trailer are uncoupled and re-coupled, or if steering axle misalignment occurs.

After turning the tractor unit 90 degrees in both directions, line up the front pointers; if the rear Bogey pointers do not line up and they are more than a couple of millimetres out, then check the following for wear etc:

- 1: **All** Ram Bearings
- 2: **All** Ram Pins
- 3: Cam Follower Bearing
- 4: Front Slew Ring
- 5: Bell Crank Centre Bush
- 6: Rear Bogey has been changed (see section II-D)
- 7: Air in the Hydraulic System (see section 3)

C: REAR BOGEY STOPPERS

FIRST. repair and resolve any of the above faults that may be present; if **ALL** the above are in good order, then the pointers **should line up**. If not, then proceed as follows:

If for example the pointers show the bogey is toed out toward the NS (near side), then turn the tractor unit to 90 degrees towards the as, (offside); then line up the front pointers and check the rear pointers again; if they line up ok then the as stopper is screwed out to far (FIG 35); if they still show the Bogey as toed out to the NS then the NS stopper will need to be screwed out see (FIG 36).

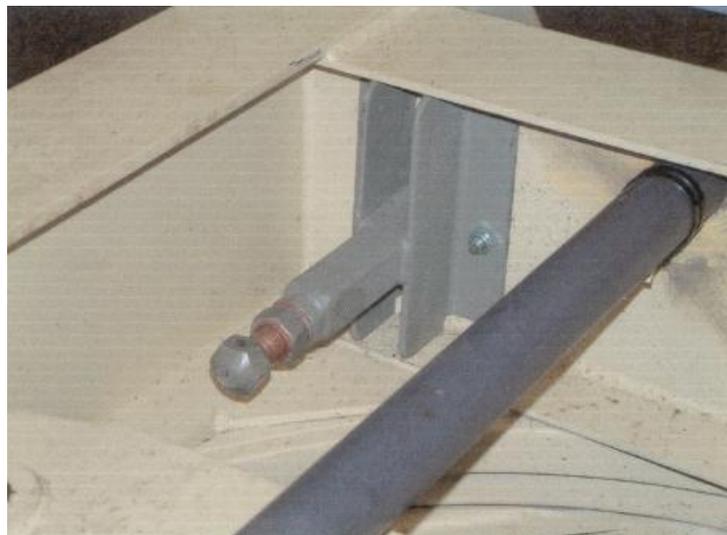


FIG 35 (OS)

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

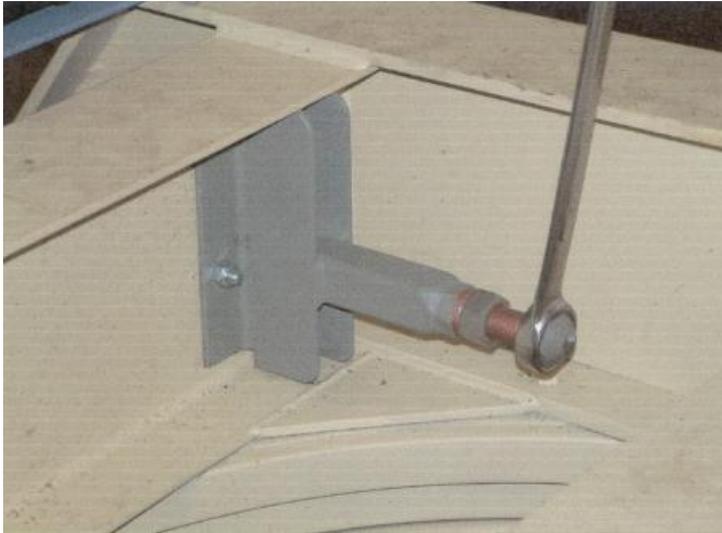


FIG 36

(NS)

(As an approximate reference, 1½ turns will adjust the Bogey pointers approximately 8mm); after screwing the NS stopper out the appropriate amount, the tractor unit should be turned toward the OS 90 degrees to the trailer; then straighten and line up the front pointers, and then check the rear pointers again.; if the pointers have come short of being in line, then the NS stopper should be screwed out a little further and the tractor unit turned again to the OS 90 degrees to the trailer; then line up the front pointers again and check the rear pointers; the above procedure should be repeated until the pointers are in line; now turn the tractor unit 90 degrees to the trailer in the NS direction; straighten and line up front pointers and check the rear pointers again. If the bogey is not in line but is toed out toward the NS, then the as stopper is screwed out too far: screw the as stopper in (using the general guide of 1½ turns to 8mm at the pointers):- with the front pointers in line, slack the lock nuts on both flow restrictors (on the front of the valve block (see FIG 25) and screw the centre part out a few turns; place a chock in front of the rear as wheel and move the trailer forward **VERY SLOWLY** until the bogey is slightly toed out of line towards the as; (the pointers should only be several (mm) past the straight ahead position).

WARNING Putting the bogey out of line more than this can cause **SERIOUS DAMAGE** (as explained at the end of section F in Hydraulic system).

SCREW IN BOTH FLOW RESTRICTORS; now turn the tractor unit 90 degrees to the NS, and then straighten and check front and rear pointers; continue to adjust and check until the pointers line up. Finally; **thoroughly tighten** lock nuts on stoppers (using extension on spanner); Also make sure both flow restrictors and their lock nuts are tight.

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

D: ADJUSTING THE STOPPERS AFTER REPLACING BOGEY.

If a new rear bogey has been fitted, then the **first** thing that needs to be done is to line up the rear axel as **accurately as possible**. Then weld a new pointer unto the new Bogey correctly in line with the one on the chassis. Remember to open both ball valves in the control box early type (see FIG 21) or screw out the flow restrictors a few turns later type (see FIG 25) to allow the rear axel to freely move.

Then line up **front and rear** pointers and close **both** valves, or flow restrictors.

A new Bogey may not have the stopper blocks in the same position as the originals, therefore the stoppers should be screwed in a few turns. Now turn the tractor unit to 90 degrees to the trailer and park in this position.

Screw the stopper out until it is **tight** against the stopper block (won't screw out any further).

Repeat the above operation in the opposite direction, and screw the stopper out **tight** against the stopper block. Then bring front pointers back into line. Screw **both** stoppers out 1½ turns. Then proceed to adjust as described in section C (Rear bogey stoppers)

E: REAR RAM ADJUSTMENT

From mid 2003 the stoppers are replaced by adjustment in the ram itself. The Ram bottoms in the fully closed position. The adjustment is achieved by turning the rod itself, using a 30mm spanner; after slacking the lock nut.

The steering is adjusted in the same way as with the stoppers section "C" Rear bogey stoppers except that the NS ram is adjusted when the tractor unit is turned to the NS.

The OS ram is adjusted when the tractor unit is turned to the OS. Always remember to tighten the lock nut thoroughly when adjustment is complete

[Index](#) | [Previous Page](#) | [Next Page](#)

Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System - Parts Index

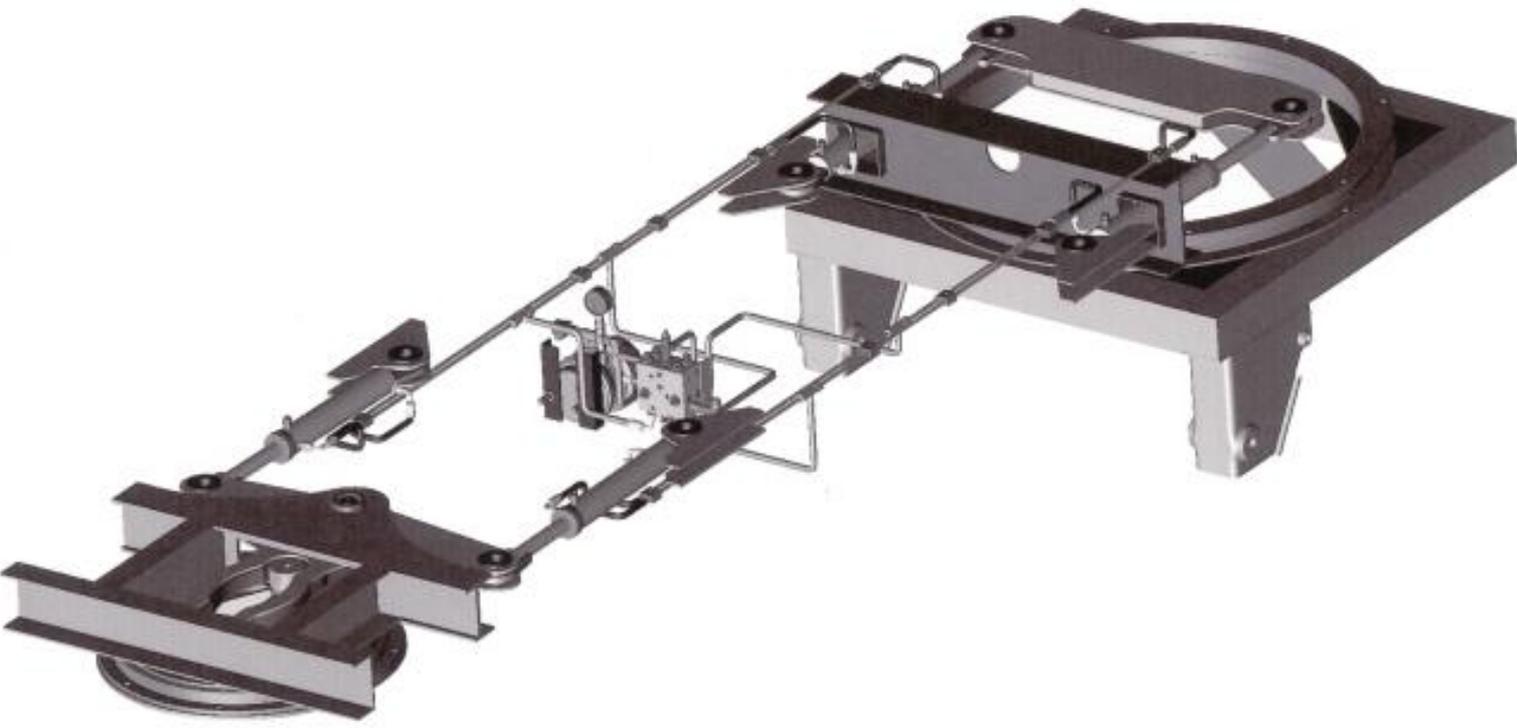
Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

No.	Code	Description
1	GM-KIT-MOD-STL-FA	Front Steer Module Frame Type A
2	GM-KIT-MOD-STL-FB	Front Steer Module Frame Type B
3	GM-KIT-MOD-BELLC	Front Steer Module Bellcrank Assembly
4	GM-KIT-MOD-RUBPL	Front Steer Module Rubbing Plate Assembly
5	FH-JOST-KOLW9003	Jost Front 903 Turntable
6	BEAR-HR-3-1/2-XB	3 1/2" Cam Follower Bearing
7	BEAR-CF-DOWEL	Dowel for Cam Follower
8	BLT-SCW-10	M16 Spring Washer
9	BLT-HX-N-M16	M16 Hex Nut
10	BLT-HX-M16-M100	M16 x 100mm Hex Bolt
11	AF-5813	1/8 Bsp Male x 3/16" Tube Coupling
12	GM-AP-2PORT	1/8 Bsp Anchor Point 2-Port
13	GF-3090	1/8 Bsp 90d Grease Nipple
14	BLT-CS-CP-M16-M40	M16 x 40mm C/Sunk Caphead Bolt
15	GM-MOD-1010	Cam Roller Nut
16	GF-0344	1/8 Bsp Straight Grease Nipple
17	BLT-GS-05-BSW-08	5/16 x 1/2 Long Grubscrew
18	GF-0344	1/8 Bsp Straight Grease Nipple
19	AF-7540	1/8 Bsp M x F Ext 1" Long
20	GM-MOD-1013-M	Turntable Wedge Machined
21	GM-MOD-1004-1	Cylinder Pin Washer
22	BLT-NY-M16-M85	M16 x 85mm Hex Bolt
23	BLT-SCW-10	M16 Spring Washer
24	AF-TUBE-03-PLA	3/16 Plastic Grease Pipe Per Metre
25	AF-TUBE-03-CPR	3/16" Copper Brake Tube Per Metre

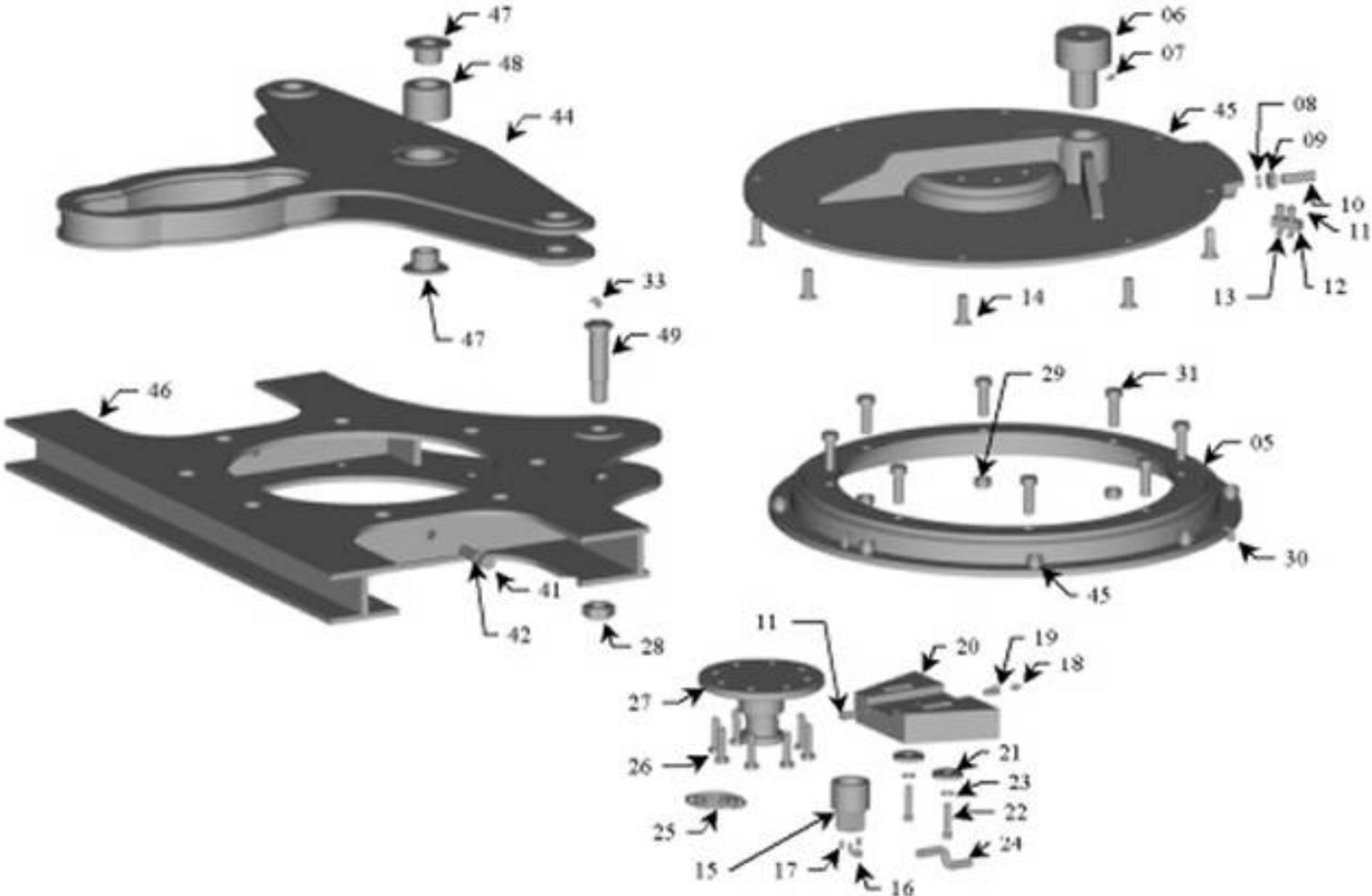
26	FH-JOST-KP-ONLY	Bolt-on King Pin Only (without base)
27	FH-JOST-KP-BOLT	Bolts for Bolt-on King Pin
28	BLT-NY-N-M27	M27 x 2P Nyloc Nut
29	BLT-NY-N-10-UNF	5/8" Unf Lock Nut
30	AF-4100	M8 x 1P x 3/16 Tube Brass Elbow
31	BLT-HX-10-UNF-32	5/8 x 2" Unf Bolt
32	GM-MOD-1020	Bellcrank Main Pin
33	GF-3090	1/8 Bsp 90d Grease Nipple
34	GM-MOD-1004	Bellcrank Cylinder Pin Washer
35	GM-NM-1248	Bellcrank Centre Bush
36	GM-MOD-1027	Steer Module Brass Bush
37	GM-MOD-1000	Cylinder Pin Bellcrank
38	BEAR-CR-3-1/2-XB	CR 3 1/2 XB Cam Follower Bearing
39	BEAR-CF-DOWEL	Dowel for Cam Follower
40	GM-MOD-1010	Cam Roller Nut
41	BLT-HX-M16-M80	M16 x 80mm Hex Bolt
42	BLT-SCW-10	M16 Spring Washer
43	GM-KIT-MOD-RUBPL-SL	Slim Line Rubbing Plate Assembly
44	GM-KIT-MOD-BELLC-SL	Front Steer Slim line Mod Bellcrank Assembly
45	FH-JOST-KOLW9003	Jost Front 903 Turntable
46	GM-KIT-MOD-STL-FSM	Slime line Frame for Front Steer Module
47	GM-MOD-1027-SL	Brass Bush (Slim Line Mod)
48	GM-NM-1248-SL	Bellcrank Centre Bush (Slim Line Mod)
49	GM-NM-1020-SL	Bellcrank Main Pin (Slim Line Mod)
50	GM-HYD-STR-RAM	Front Hydraulic Steer Ram Complete
51	GM-HYD-STR-RAM-A	Rear Hydraulic Steer Ram Adjustable
52	BLT-HX-M16-M100	M16 x 100mm Hex Bolt
53	GM-MOD-1017	Cylinder Pins for Steer Rams
54	BEAR-C-CLIP-M681	68mm Internal Circlip
55	BEAR-GEHO-FW-2PS	68mm x 25mm x 40mm S/Align Bearing
56	GM-HYD-SR-BKT	Steer Ram Brackets Complete
57	GM-HYD-SR-BKT	Steer Ram Brackets Complete

58	HYD-110040800	5/16 OD Plug
59	GM-HYD-RAM-BLD	Bleeder Adopter for Hydraulic Steer Ram
60	BEAR-BALL-M10	10mm Ball Bearing
61	FU-3515880	24/30 Brake Chamber
62	HYD-MANIFOLD	Manifold Block for Steering System
63	GM-HYD-SR-HOSE1	No1 Hydraulic Hose for Steer System
64	GM-HYD-SR-HOSE2	No2 Hydraulic Hose for Steer System
65	GM-HYD-SR-HOSE3	No3 Hydraulic Hose for Steer System
66	GM-HYD-SR-HOSE4	No4 Hydraulic Hose for Steer System
67	HYD-PC-M12-D	M12 Double Pipe Clamp
68	HYD-PC-M12-S	M12 Single Pipe Clamp
69	HYD-1130	M12 Equal Tee Pipe Adaptor
70	HYD-1109	M12 x 3/8 BSP Coupling
71	HYD-PG-7211-63-0	0-10 PSI Stem Mounted Pressure Gauge
72	HYD-1173	1/4 Seal Ring
73	HYD-PG-20800ZP	1/4 BSP Gauge Connector
74	HYD-05-04	1/4 BSP Dowty Seal
75	HYD-1172	3/8 x 1/4 F Reducer
76	HYD-1160	3/8 BSP Female Cross
77	HYD-2231	M16 x 3/8 BSP Male to Male Adopter
78	HYD-SIM-A-1	Pressure Switch
79	HYD-1180	3/8 BSP Male to Male Adopter
80	HYD-1150	3/8 BSP Male to Female to Male Adopter
81	HYD-DS-06	3/8 BSP Dowty Seal
82	FH-JOST-HE1200	Rear Bogie Turntable
83	GM-KIT-MOD-BOGIE-F	Back Bogie Frame for Steer System
84	BLT-HX-M16-M160	M16 x 160mm Hex Bolt
85	GM-AP-8PORT	1/8 BSP Anchor Point 8-Port

Complete Assembly



Compact Module



Standard Module

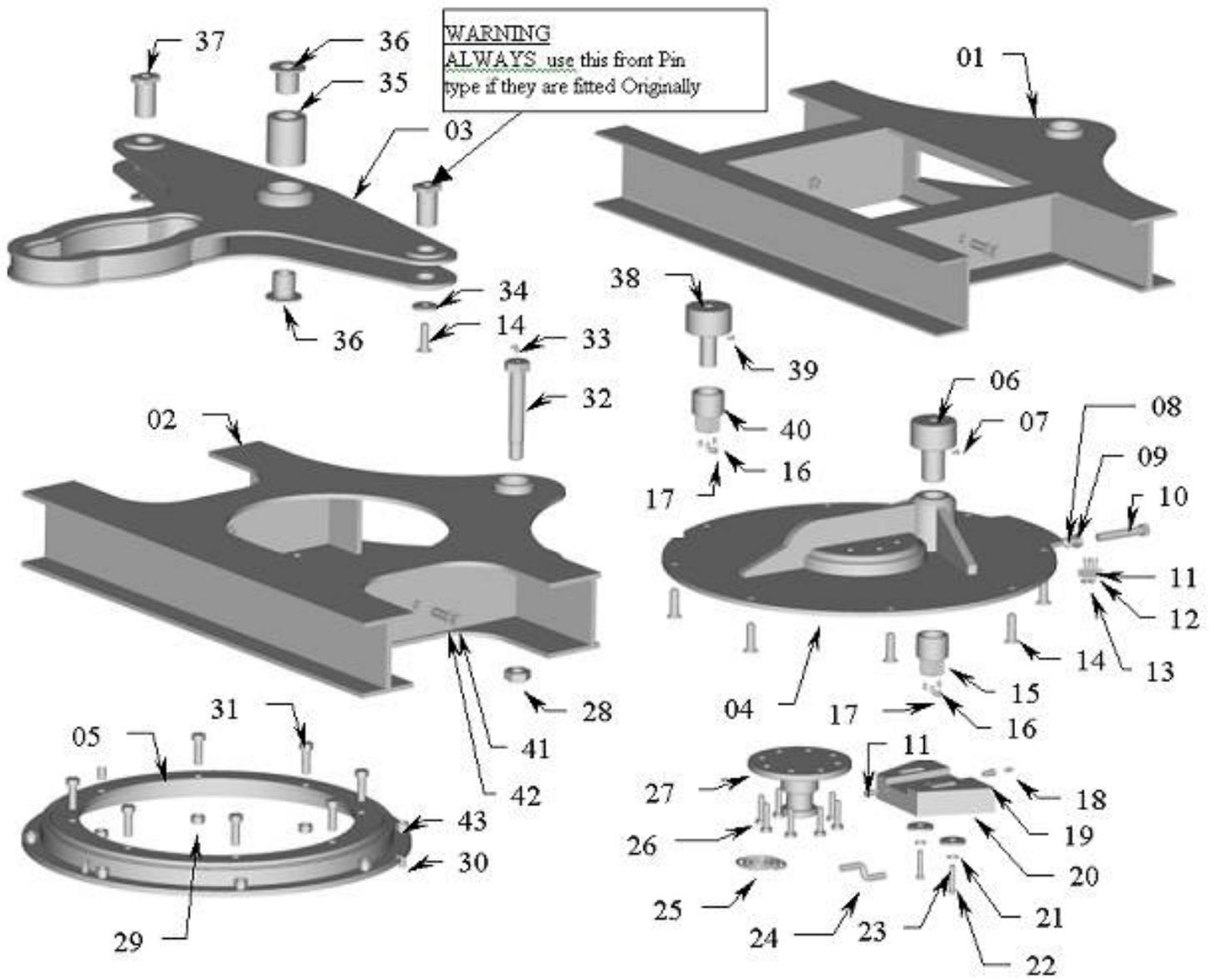
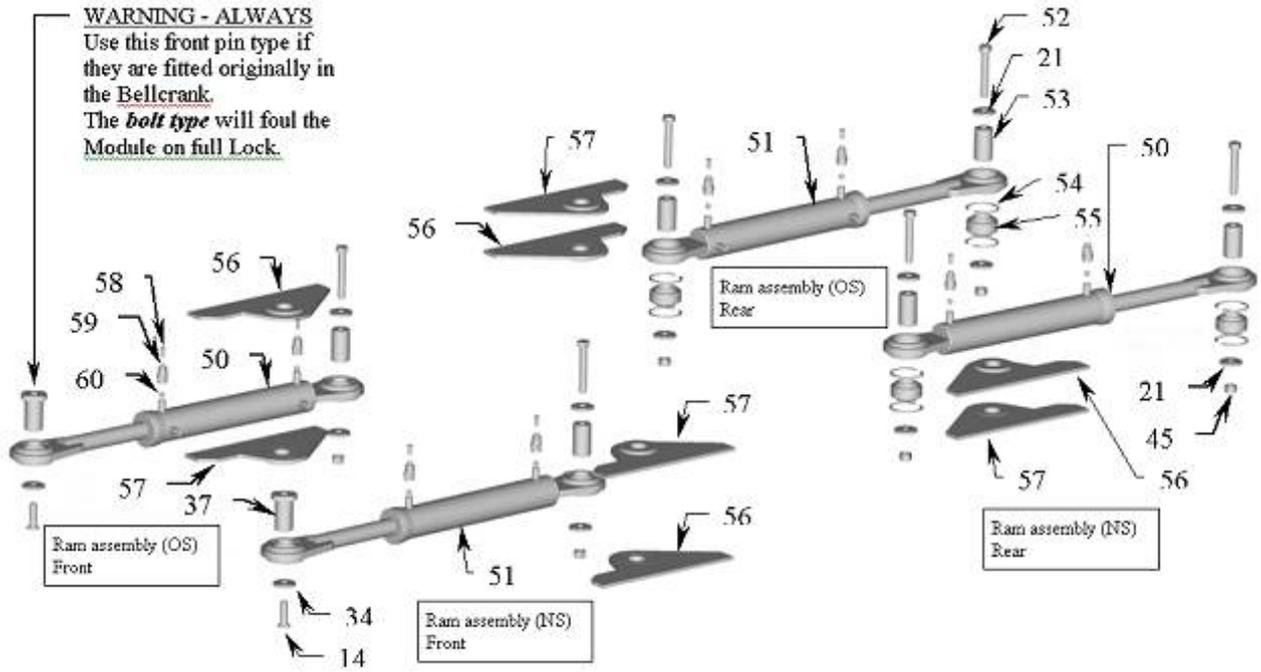


Figure 1 Standard Module Parts and Assemblies

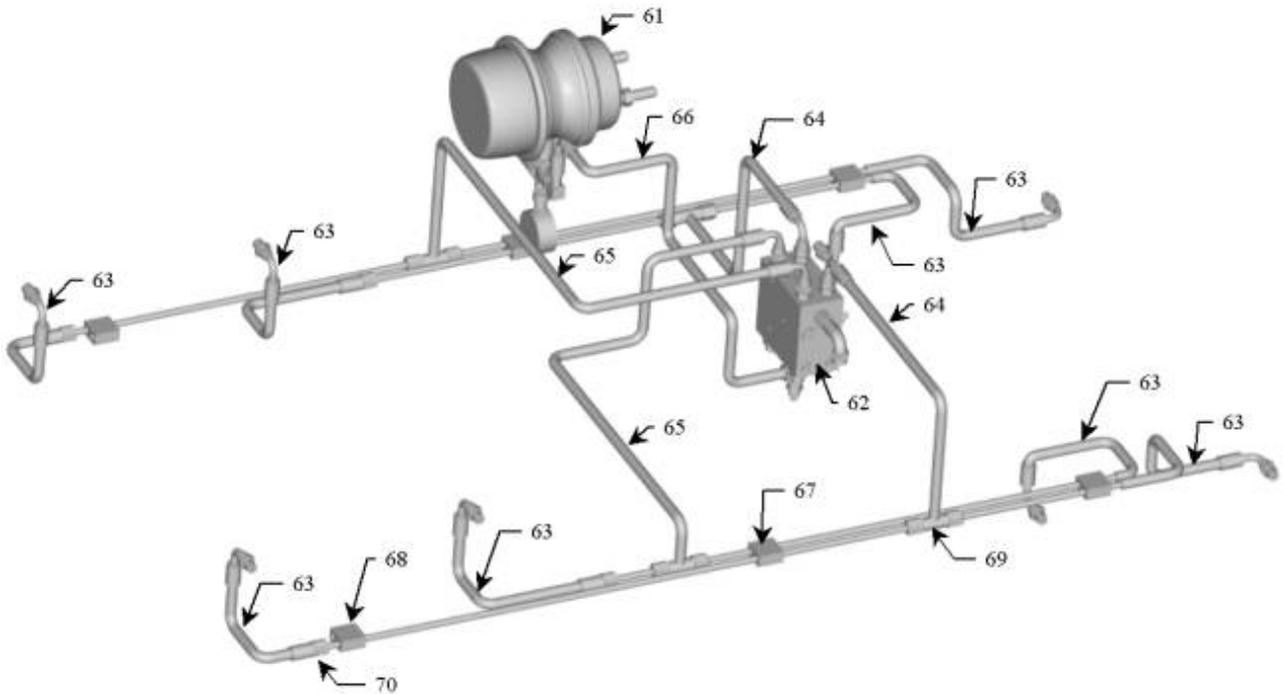
Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

Hydraulic Rams Assembly



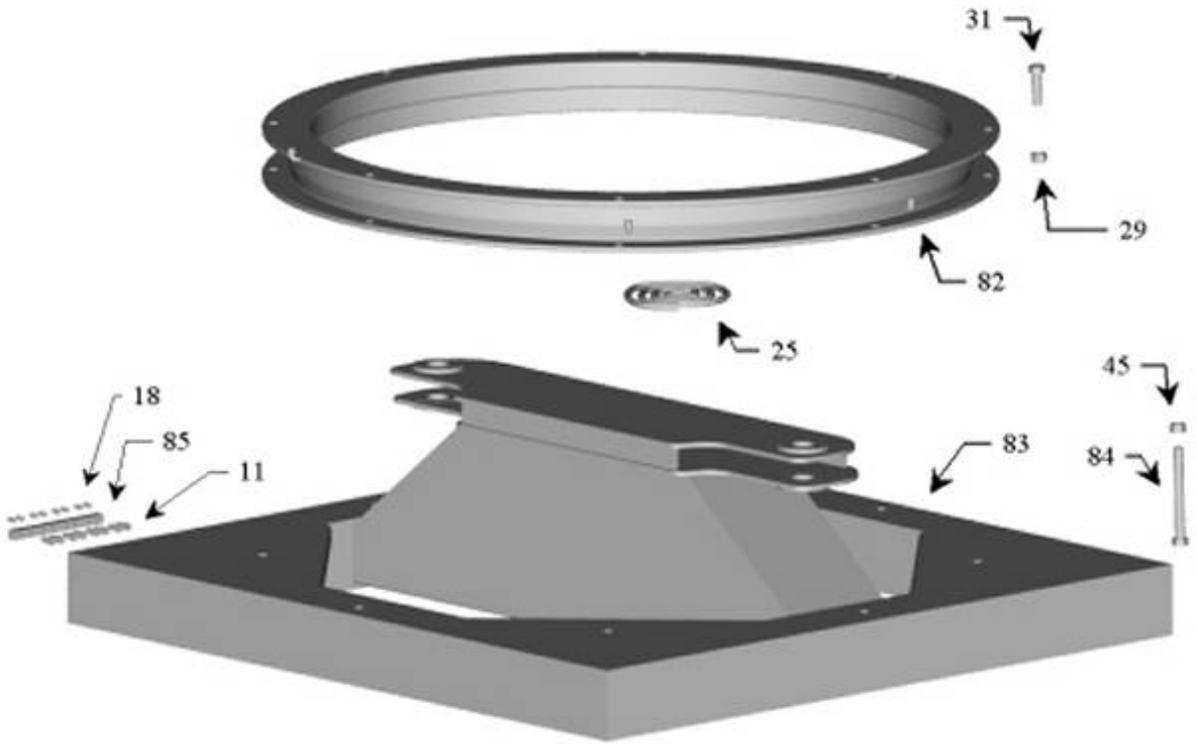
Piping Assembly



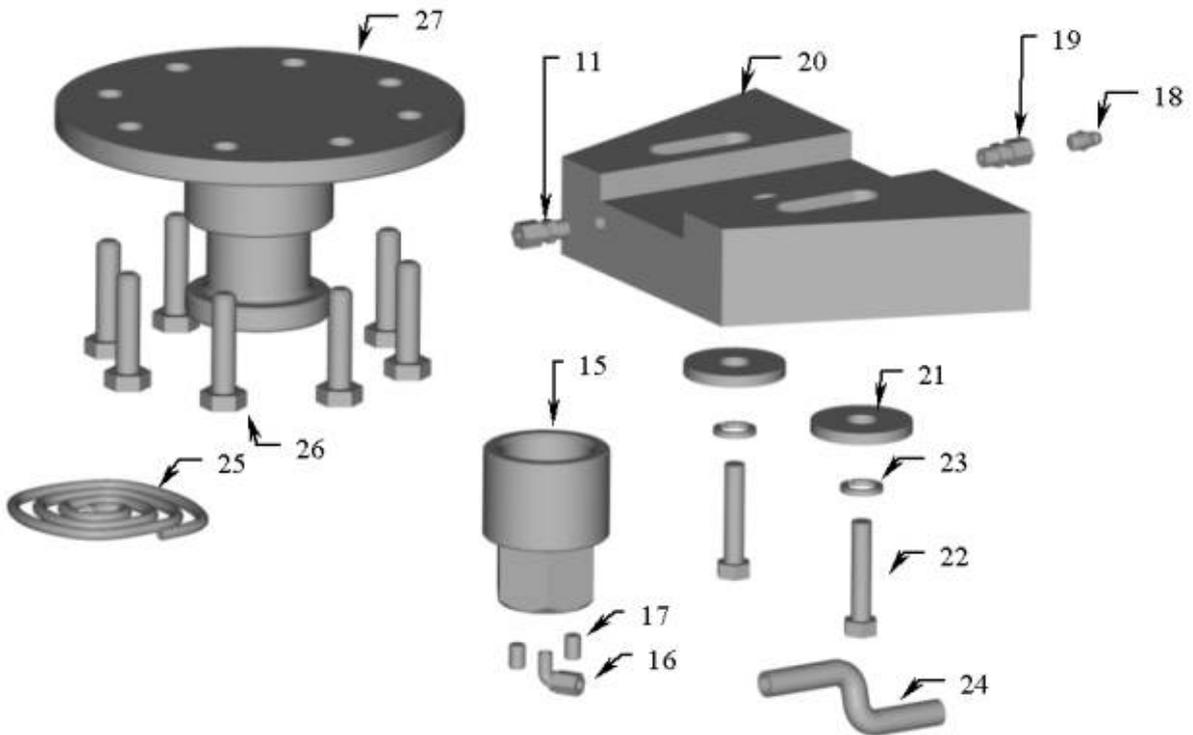
Information on operation, adjustment, repairs and maintenance of Muldoon Positive Rear Steer System

Pages - [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [6](#) | [7](#) | [8](#) | [9](#) | [10](#) | [11](#) | [12](#) | [13](#) | [14](#) | [15](#) | [16](#) | [17](#) | [18](#) | [19](#) | [20](#) | [21](#) | [22](#) | [23](#) | [24](#) | [25](#) | [26](#) | [27](#) | [28](#) | [29](#) | [30](#) | [31](#) | [32](#) | [33](#) | [34](#)

Back Bogey



Wedge Parts



Accumulator

