



Service Manual

for

RSS-236 and RSS-236R

**SURE-TRAC SELF STEER AIR RIDE
SUSPENSION SYSTEM**



Revised 11/2003

Ridewell Corporation ♦ P.O. Box 4586 ♦ Springfield, MO 65808
800-641-4122 ♦ (417) 833-4565 ♦ Fax (417) 833-4560
www.ridewellcorp.com

CONTENTS

Basic Operation.....	X
Air Control Panel.....	X
Operational Inspection.....	X
Axle Caster Adjustment/Inspection.....	X
Preventative Maintenance.....	X
Basic Trouble Shooting.....	X
Bushing Replacement.....	X
Parts Illustration.....	X

SUSPENSION IDENTIFICATION: Ridewell Suspensions are identified by a metal tag welded to the left-hand hanger that indicates part number, model number, capacity and date of manufacture. Consult your vehicle manufacturer for your correct mounting height.

PARTS: For optimum suspension performance, order only Ridewell parts. Replacement parts for Model RSS-236 are shown in Section 8 of this manual.

SALES, SERVICE & WARRANTY: If you need assistance regarding this product, please contact us and we will be glad to help you.

Mailing Address	Shipping Address	Phones, Fax, email
Ridewell Corporation	Ridewell Corporation	800-641-4122, (417) 833-4565
P.O. Box 4586	3715 E. Farm Rd. 94	(417) 833-4560, fax
Springfield, MO 65808	Springfield, MO 65803	info@ridewellcorp.com

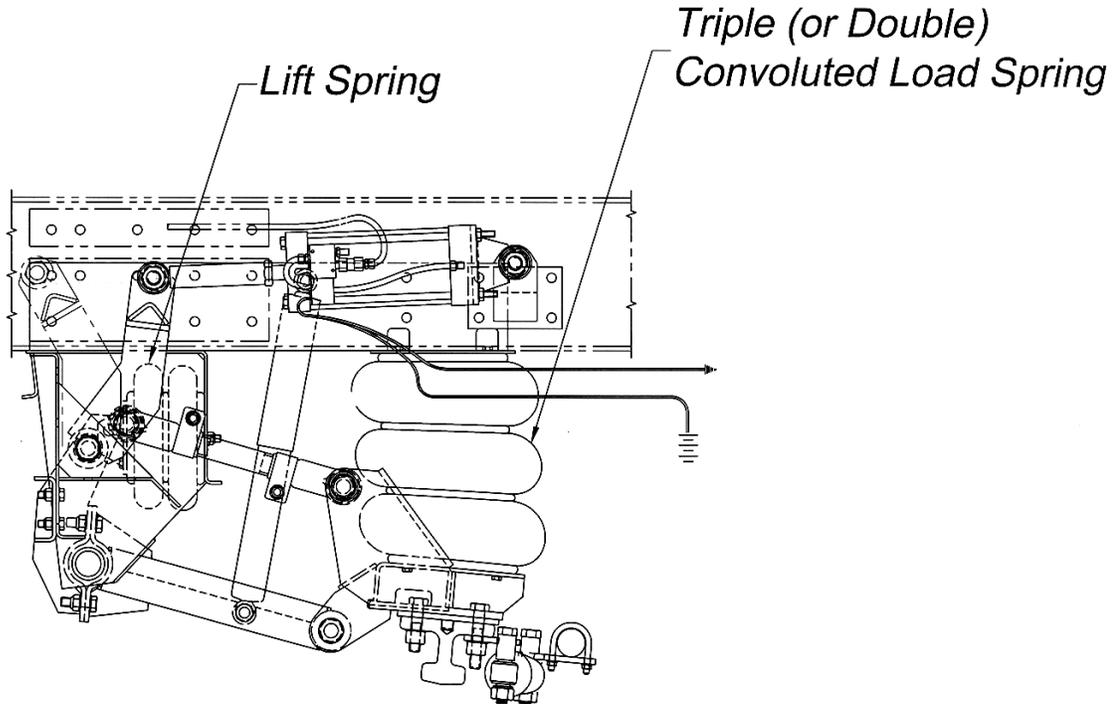
BASIC OPERATION

When properly maintained and operated within design limits, Ridewell's **SURE-TRAC RSS-236 & RSS-236R** self-steering suspension will provide many years of trouble-free service. It has several features which make it easy to operate and will keep maintenance and downtime to an absolute minimum.

- 1.) Extended life clamp-in urethane hanger pivot bushings for easy replacement.
- 2.) Optional automatic caster positioning for forward and reverse vehicle operation, with axle down and loaded.
- 3.) Cab mounted controls for axle lift-load position.
- 4.) Self-contained shock absorbers that allow precise installation and insure proper shock and air spring tolerances.
- 5.) Easy to install heavy-duty axle self-centering steering stabilizer.

Air Springs & Air Control Valve

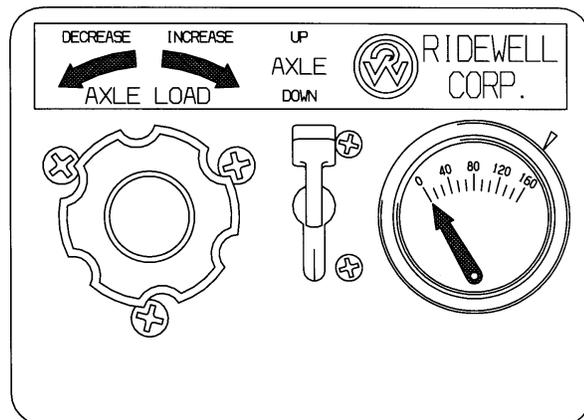
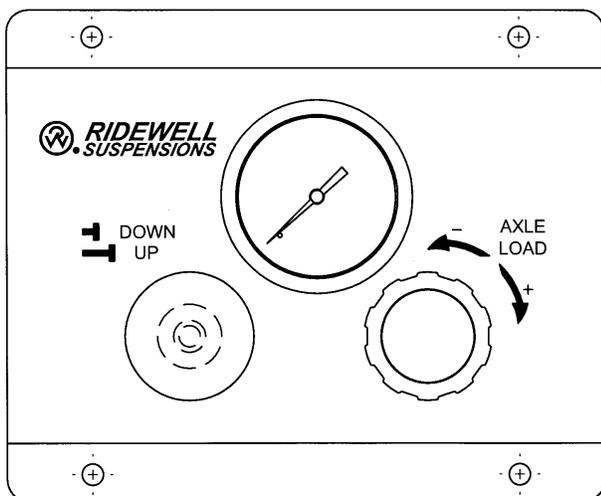
This air ride suspension is designed to provide an auxiliary or "part-time" steerable axle for the vehicle. The **4 air springs** on this suspension work in conjunction to "lift" the axle off the ground when not in use and provide "load" support when in use. The **air control system** controls the "lift" and "load" air springs by controlling the volume of the air in the springs.



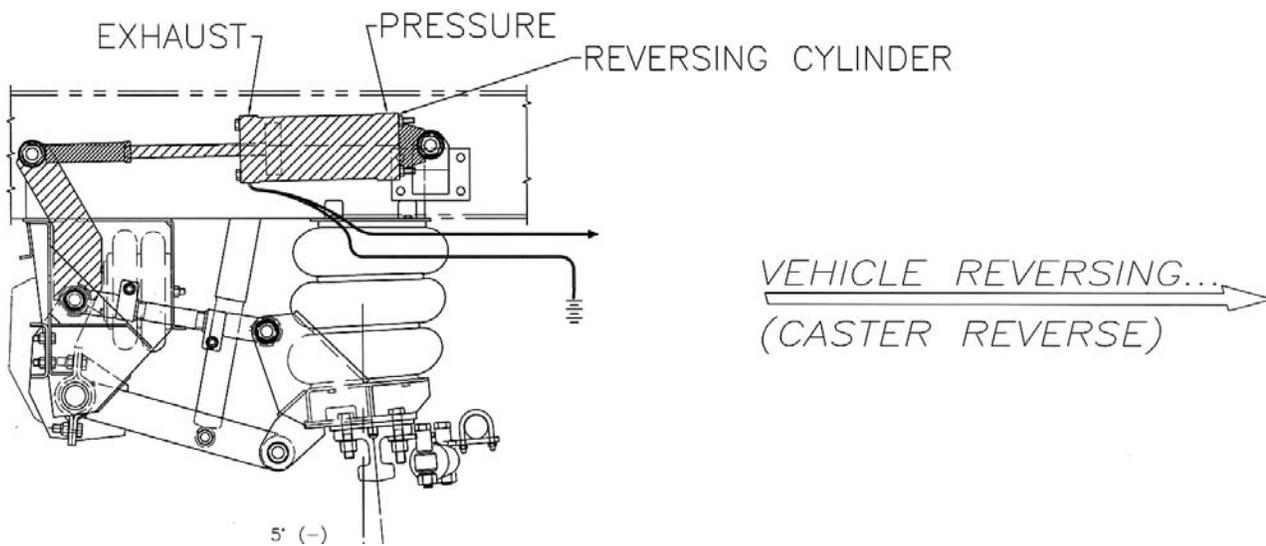
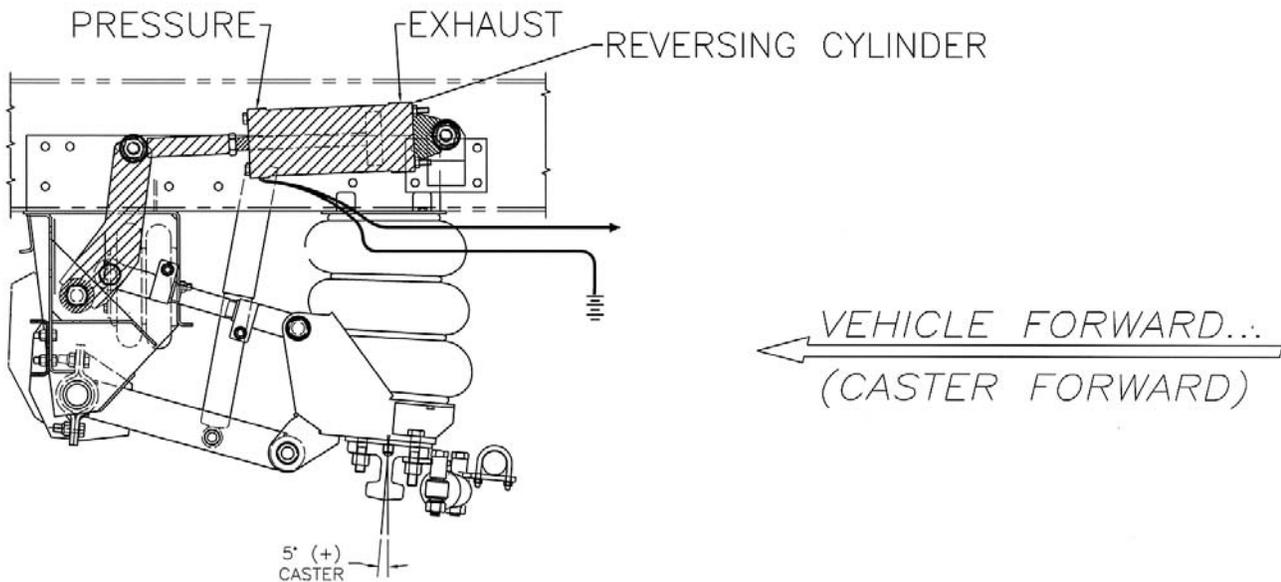
CONTROL PANEL ASSEMBLIES

2002 AND LATER

2002 AND EARLIER



The **air control system** will also control the **caster**, if the axle of your suspension is a “**reversing**” type, by automatic control through the vehicle back-up lighting systems, which actuates the reversing cylinder. This means if the axle is in use under load, the caster will automatically switch to the direction of the vehicle travel.



The air control system for a “**non-reversing**” suspension (meaning the caster is fixed for a vehicle forward operation only with the axle down and loaded) will automatically raise the axle as the vehicle is shifted into reverse.

IMPORTANT! It is recommended the suspension be allowed 5-10 seconds to activate prior to forward and reverse operation. If either suspension system fails to activate, the vehicle operator may put the axle in the up position or cease operations and inspect for the cause of failure. This will avoid causing possible damage to the suspension or axle.

AIR PRESSURE & BRAKE PROTECTION VALVE

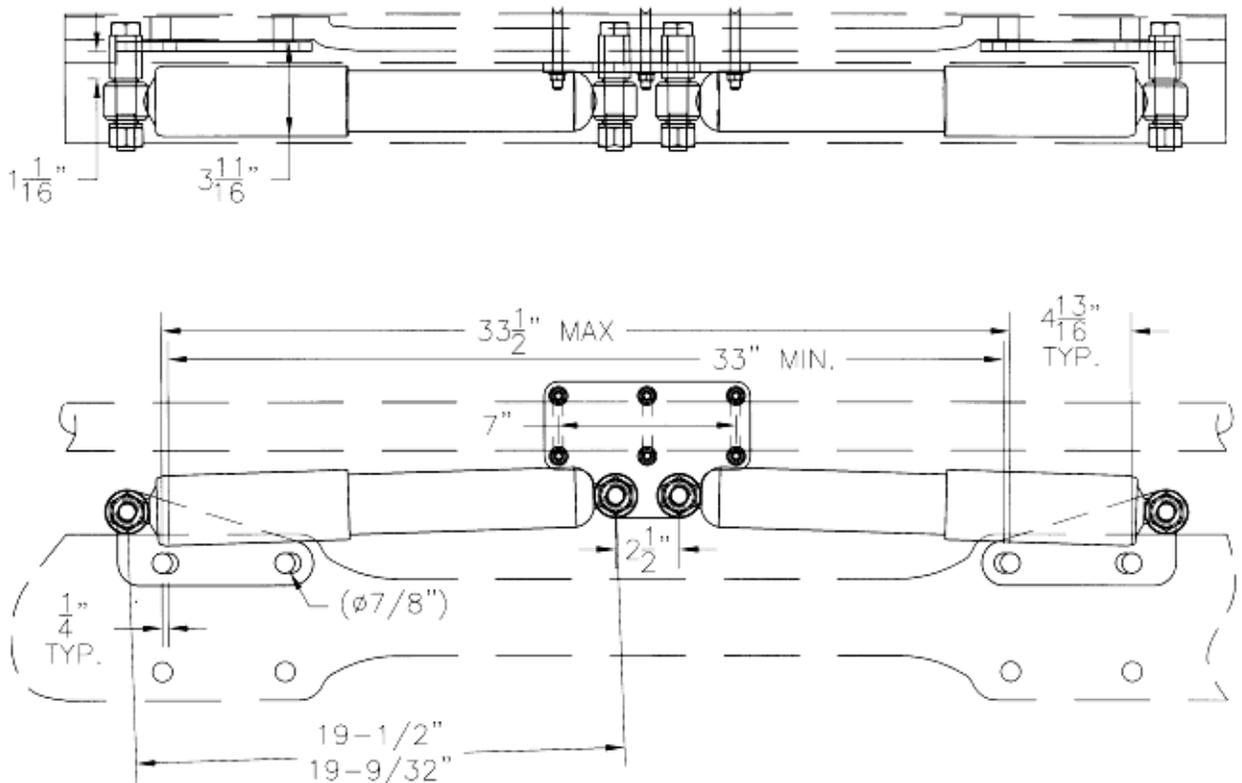
The air ride suspension is dependent on air pressure from the vehicle supply system. Air pressure must be maintained above 70 p.s.i. before operation. **A brake protection valve must be installed in the air system to prevent air loss below 70 p.s.i. and to insure safe air brake pressure in the event of air loss in the suspension system.**

SHOCK ABSORBERS

The suspension is equipped with **shock absorbers** to dampen road inputs. The shock absorber must be maintained to insure smooth operation.

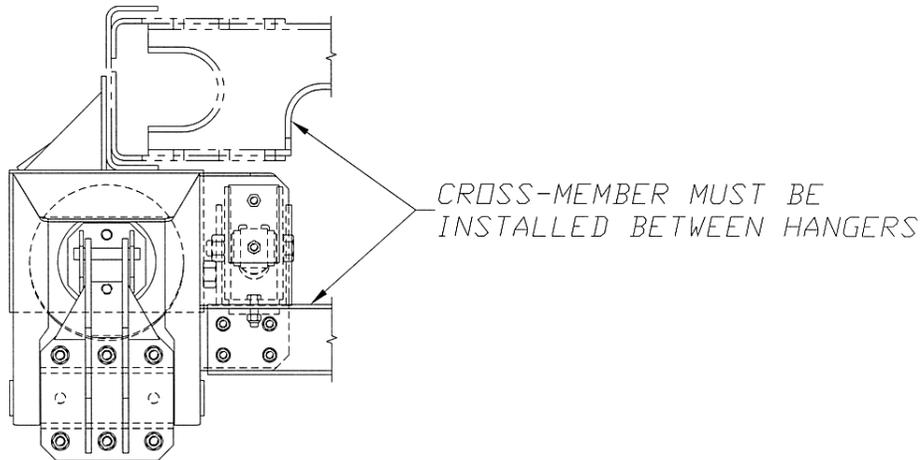
SELF CENTERING STEERING STABILIZER

The suspension is equipped with either one or two heavy-duty self-centering steering stabilizers that keep the tie rod centered while the axle is in the lifted position. They also dampen shimmy in the suspension as transmitted by the road and tires.

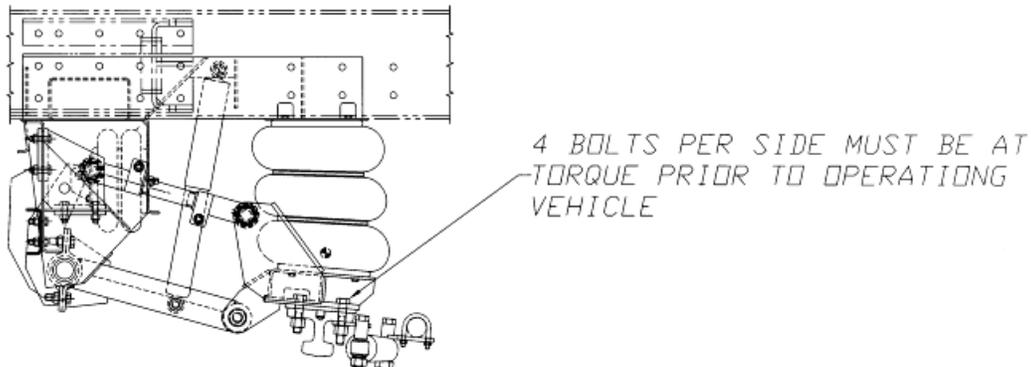


OPERATIONAL INSPECTION

1. Inspect all fasteners at hanger to frame connection.
2. Inspect for proper installation of cross members between hangers. Hangers should be adequately supported to prevent side movement.



3. Inspect axle to lower beam fasteners.



4. Build and maintain truck air pressure to 80 p.s.i. minimum.
5. Inspect air springs. Make sure all springs inflate and do not leak. Leaks may be checked with soapy water.
6. Check all air connections for leaks and tighten if needed.
7. Inspect air lines. They should be free of sharp edge contact to prevent premature failure.
8. If your vehicle is equipped with a **reversing caster** suspension, check reversing feature by alternately shifting from forward to reverse with the axle in the lift position.
9. If your vehicle is equipped with **non-reversing fixed caster** suspension, alternately shift from forward to reverse to make sure the axle will automatically raise and lower.

PREVENTATIVE MAINTENANCE

DAILY

Check for loose or broken parts on or around suspension to prevent any serious problems from occurring.

EVERY 30 DAYS

Check clearances around all moving suspension parts, air springs, tires and shock absorbers. Any signs of interference should be immediately corrected.

Visually inspect axle beam bolted connection to make sure bolts are tight and there are no signs of wear.

EVERY 90 DAYS & WITH ANNUAL INSPECTION

Inspect items required in daily and 30-day inspections.

Inspect all welded connections.

Inspect all pivot and clamping connections such as the suspension pivots and shock mounts.

DO NOT PAINT THIS STICKER

RIDEWELL SUSPENSION TORQUE CHART	
BOLT SIZE	LUBRICATED THREADS
1 1/2"	1,100 FT. LB. (1,490 N·m)
1 1/4"	1,000 FT. LB. (1,350 N·m)
1 1/8"	500 FT. LB. (680 N·m)
1"	GRADE 5 360 FT. LB. (490 N·m)
1"	GRADE 8 460 FT. LB. (625 N·m)
7/8"	350 FT. LB. (475 N·m)
3/4"	GRADE 5 160 FT. LB. (220 N·m)
3/4"	GRADE 8 190 FT. LB. (260 N·m)
5/8"	100 FT. LB. (135 N·m)
*3/4"	50 FT. LB. (70 N·m)
*1/2"	25 FT. LB. (35 N·m)

*** AIR SPRING CONNECTION ONLY**

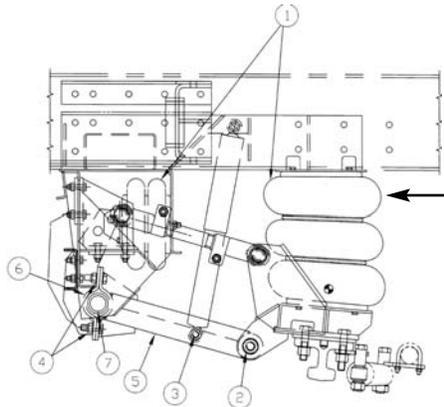
After suspension has been in operation for approximately 6,000 miles (10,000 KLMS), all fasteners must be re-tightened to specified torque. Repeat every 50,000 miles (80,000 KLMS).

DO NOT OVER TORQUE!

990301

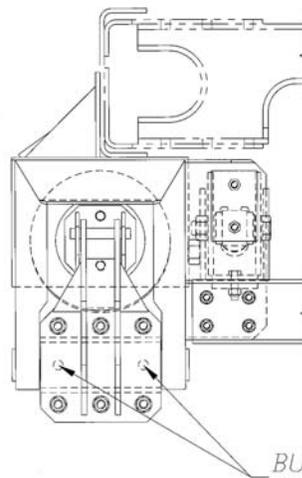
PIVOT BUSHING AND/OR LIFT AIR SPRING REPLACEMENT

The **SURE-TRAC RSS-236** and **RSS-236R** self-steering suspensions feature an easy to replace clamp-in bushing at the main hanger. No special tooling is required for service. The torque beam has press-in rubber (2002 and earlier) or urethane (2002 and later) bushings. All press-in rubber bushings may be replaced with urethane. We recommend replacing all urethane hanger pivot bushings and torque beam bushings when servicing is required. Service may proceed as follows:



Triple Convolved Load Spring
(NOTE: Your suspension may use double convoluted.)

1. Deflate all air springs.
2. Remove the 1" cap screw at the axle end of the torque beam.
3. Remove the lower shock bolt.
4. Rotate the torque beam slightly downward to remove the six (6) bolts at the main pivot clamp. Remove the torque beam.
5. Press the old bushing out of the beam eye. Clean inside the eye so it is free of glue, rubber and debris. Coat the inner sleeve of the replacement bushing with light coat of anti-seize. Press in each half of the new bushing followed by the inner sleeve.
6. Remove the urethane bushing from hanger pivot tube. **(NOTE: The bushing is pre-split along its length for easy removal and replacement.)**
7. Clean the pivot tube on the hanger and apply a light coating of anti-seize to the tube. Install the new bushing. (NOTE: The **lift spring** may be replaced at this time if required.)
8. Re-assemble the torque beam to the lift spring arm, making sure the alignment knobs on the urethane bushing are in line with the holes in the beam and lift arm housing.



BUSHING ALIGNMENT
KNOBS

9. Assemble the six (6) bolts to the pivot clamp and torque to **120 ft. lbs. each**.
10. Assemble the 1" bolt in torque beam to lower beam pivot and torque to **460 ft. lbs.**

OPERATING INSTRUCTIONS - AIR CONTROL PANEL

UNDERSTANDING THE CONTROL PANEL

The control panel is equipped with one (1) adjustable pressure regulator, one (1) air gauge, and one (1) flip switch or push/pull knob. The pressure regulator is labeled "**Axle Load**" and is used to adjust the pressure in the load air spring. The flip switch or push/pull knob is labeled "**Up/Down**" and is used to raise or lower the axle. The air gauge displays the air pressure in the load air spring only.

TO LIFT AXLE

Move the flip switch lever to the "**Up**" position or pull the knob out to raise the tires from the ground. This will exhaust air from the load springs and fill the lift springs.

TO LOAD AXLE

Move the flip switch lever to the "**Down**" position or push the knob in to lower tires to the ground. This will exhaust air from the lift springs and fill the load springs. Slowly turn pressure regulator labeled "**Axle Load**" clockwise while noting the pressure reading on the air gauge. As air pressure increases, the load applied to the auxiliary axle will increase. For the desired axle load distribution, correlate scaled axle weights to the reading on the air pressure gauge. **CAUTION: Do not operate suspension in "down" position with less than 30 p.s.i. shown on gauge.**

TRACTION CONTROL

Turn pressure regulator labeled "**Axle Load**" counterclockwise to reduce air pressure (load). This will transfer load to the driving axle(s). Turn the regulator only until the desired traction is obtained. **CAUTION: Do not overload drive axle(s).**

SUSPENSION PERFORMANCE

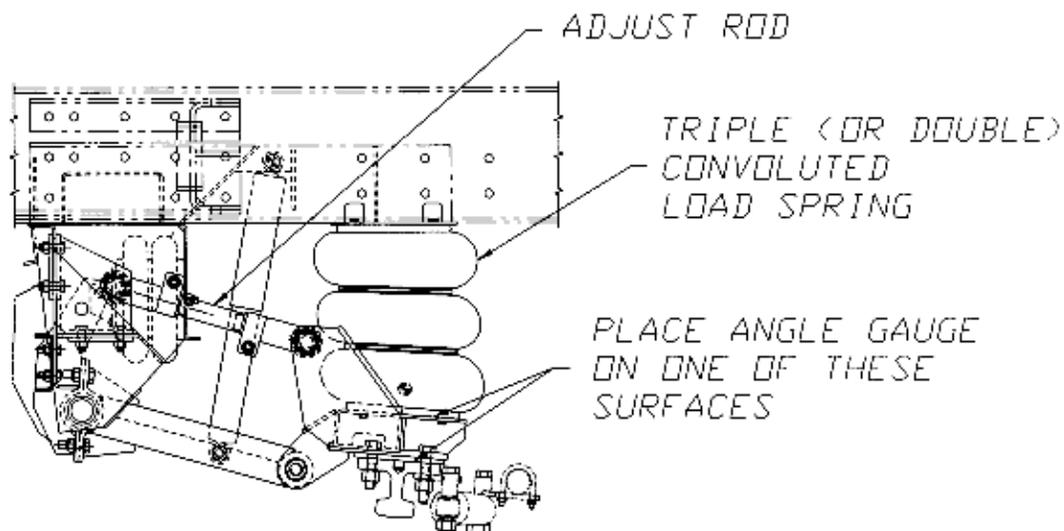
For trouble-free operation, follow instructions and perform maintenance as outlined on installation drawings.

AXLE CASTER ADJUSTMENT / INSPECTION PROCEDURE

Your Ridewell **SURE-TRAC RSS-236 and RSS-236R** suspension offers an adjustable caster torque rod feature, which can easily adjust to the proper axle caster angle that will give you optimum suspension performance. The caster angle should be checked and/or adjusted during annual inspection, after major repairs, after re-bushing the main pivots, or if "tracking" problems occur.

PROCEDURE AS FOLLOWS:

1. Build and maintain a minimum of 80 p.s.i air pressure in the system.
2. With the vehicle on level ground, lower the axle.
3. Adjust load spring pressure to 30 p.s.i.
4. **Check forward caster** by placing an inclinometer (angle gauge) on the load spring mounting plate or other machined axle surface that is perpendicular to the king pin center line. See illustration below:



Forward caster angle should be set between 3 - 5 1/2 degrees positive caster. If caster is not in this range, see Basic Operation section.

- a. Loosen adjustable torque rod clamp bolts (reference part number 5037482B000).
 - b. Turn threaded torque rod until proper angle is achieved.
 - c. Tighten clamp bolts to **60 ft. lbs.**
5. If you have a **reversing caster suspension**, shift vehicle to reverse and read inclinometer. **Reverse caster should be between 3 1/2 - 5 degrees in the negative direction.** If adjustment is required, repeat steps above.

BASIC TROUBLESHOOTING

MODEL RSS-236 (FIXED CASTER)

NOTE: Do not check system until minimum 80 p.s.i. air pressure is built and maintained.

1. **Tracking Improperly - Check the following:**
 - a. Caster angle
 - b. Excessive bushing wear
 - c. Axle mounting bolts
 - d. Load spring air pressure
 - e. Steering stabilizer(s)
 - f. Hanger alignment
2. **Axle Fails to Lift - Check the following:**
 - a. Air system and lift springs
 - b. Solenoid and electrical
 - c. Improper assembly of torque beam after servicing
3. **Tie Rod Not Centering in Lift Position - Check the following:**
 - a. Steering stabilizer(s)

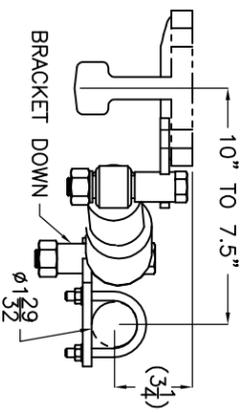
MODEL RSS-236R (REVERSING CASTER)

NOTE: Do not check system until minimum 80 p.s.i. air pressure is built and maintained.

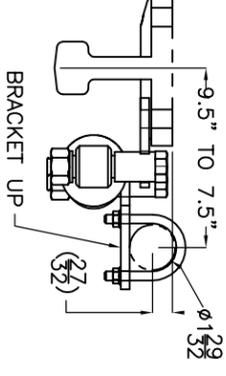
1. **Tracking Improperly - Check the following:**
 - a. Caster angle
 - b. Excessive bushing wear
 - c. Axle mounting bolts
 - d. Load spring air pressure
 - e. Steering stabilizer(s)
 - f. Hanger alignment
 - g. Reversing cylinder and lever
 - h. Solenoid and electrical
 - i. Air system (supply)
2. **Axle Fails to Lift - Check the following:**
 - a. Air system and lift springs
 - b. Solenoid and electrical
 - c. Improper assembly of torque beam after servicing
3. **Tie Rod Not Centering in Lift Position - Check the following:**
 - a. Steering stabilizer(s)
 - b. Solenoid and electrical
 - c. Air system (supply)

PARTS ILLUSTRATIONS

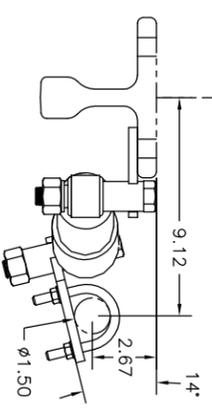
SIDE VIEW: WESTPORT 20K AXLE



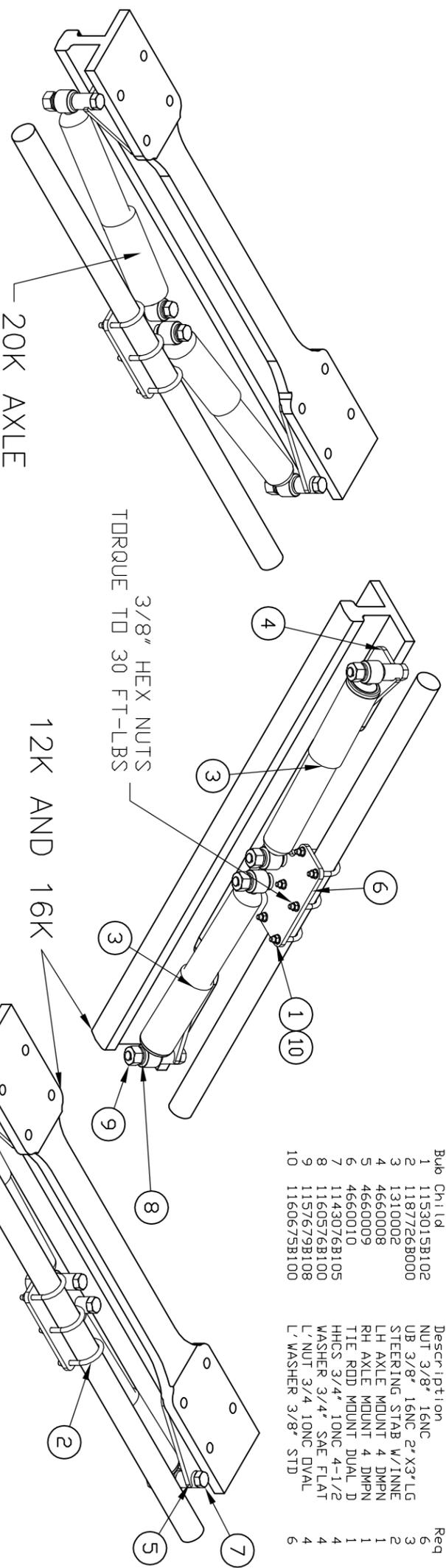
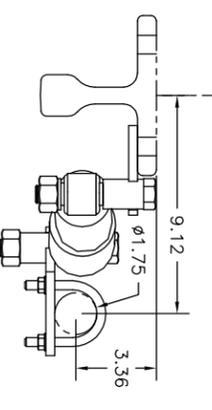
SIDE VIEW: WESTPORT 12K AND 16K



SIDE VIEW: MERITOR FF-9666



SIDE VIEW: MERITOR FF-943

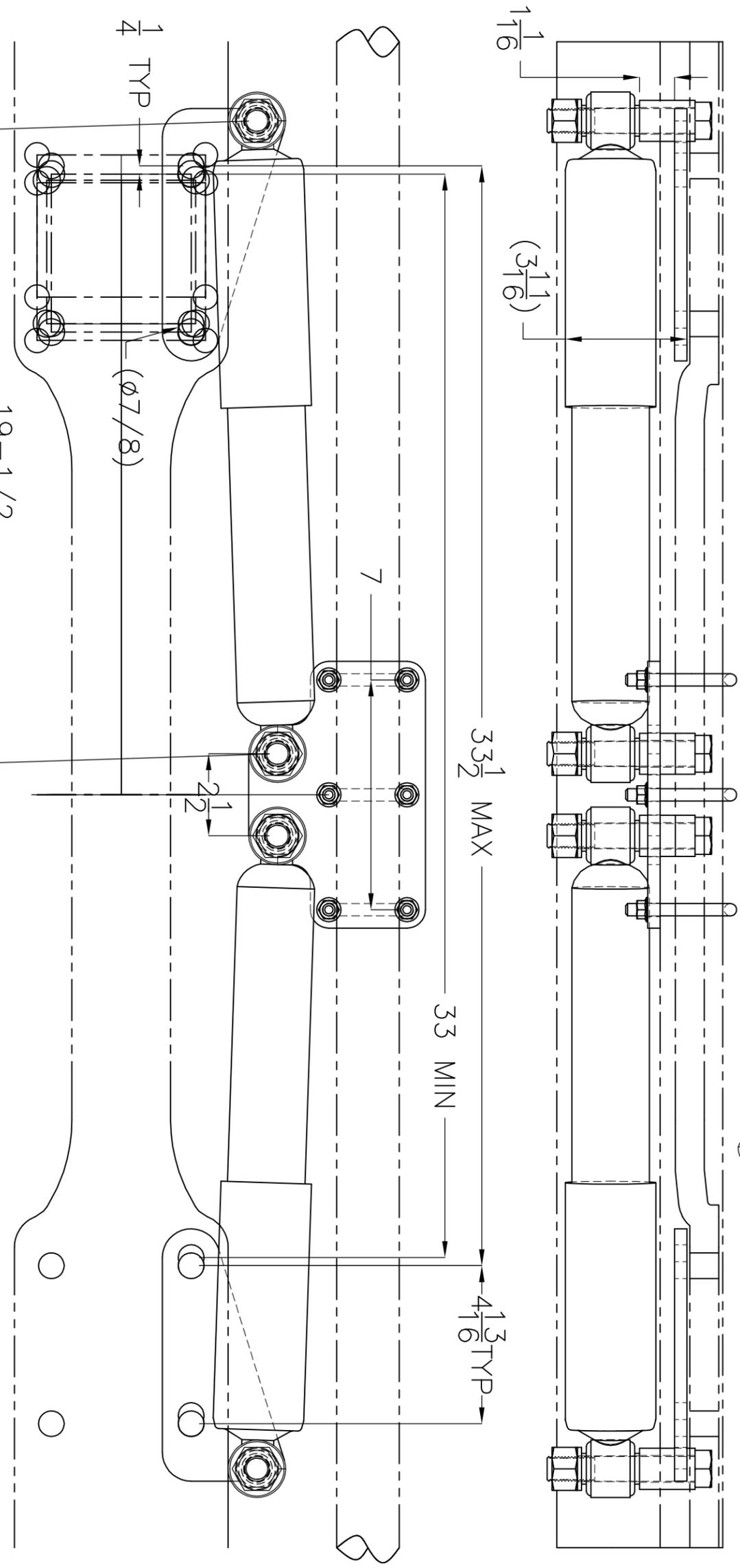


Bub	Chilid	Description	Req
1	1153015B102	NUT 3/8" 16NC	6
2	1187726B000	UB 3/8" 16NC 2" X3" LG	3
3	1310002	STEERING STAB W/TINNE	2
4	4660008	LH AXLE MOUNT 4 DMPN	1
5	4660009	RH AXLE MOUNT 4 DMPN	1
6	4660010	TIE ROD MOUNT DUAL D	1
7	1143076B105	HHCS 3/4" 10NC 4-1/2	4
8	1160576B100	WASHER 3/4" SAE FLAT	4
9	1157679B108	L' NUT 3/4 10NC DYAL	4
10	1160675B100	L' WASHER 3/8" STD	6

Assembly notes:

Mount Stabilizers with dust tube tilted up, to not collect water.

1. Bolt pcs 4 & 5 into place.
2. Loosely bolt stabilizers to pcs 4 & 5.
3. Loosely bolt stabilizers to pc 6.
4. Push pc 6 into place and loosely attach u-bolts.
5. Position wheels dead ahead.
6. Measure lengths of stabilizers and adjust pc 6 until equal lengths.
7. Tighten all bolts.



This drawing and/or electronic media containing this drawing is the sole property of the Ridewell Corp. and is loaned with the express condition that it is not to be used in any way deleterious to the interest of the Ridewell Corp. The acceptance of this drawing and/or electronic media foregoing conditions. Drawings and/or electronic media containing this drawing are to be returned to the Ridewell Corp. upon request.

COVERED UNDER U.S. & FOREIGN PATENTS EXISTING & APPLIED FOR

371	2	TORQUE DN 3/8 FLGD NUT WAS 80 FT-LBS, 7/8 HOLES WERE 25/32.	06/21/99	RL	JM
346	1	ADDED TORQUE TO 3/8" FLGD NUTS	04-29-99	BAB	JMK
ECN NO.	REV	REVISION DESCRIPTION	DATE	CHG BY	APPV'L

RIDEWELL CORP.
 SPRINGFIELD, MO. USA

UNIVERSAL DUAL STEERING DAMPNER KIT
 INTERNAL SPRING CENTERING DEVICE
 MOUNTS TO MOST AXLE CONFIGURATIONS

FILE: **B** SIZE: **6030007**

REVISION: **2**