

RIDEWELL SUSPENSIONS

The Engineered Suspension Company

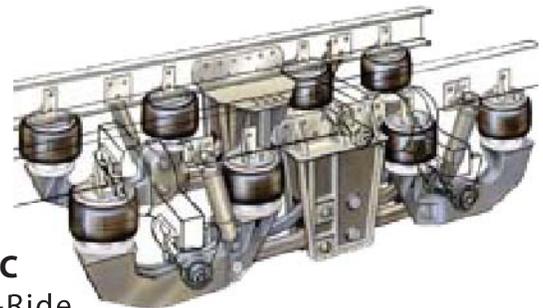
Air-Ride 227 Series

Models: RAD-227, RAD-227C, RAD-227WB, & RAS-227

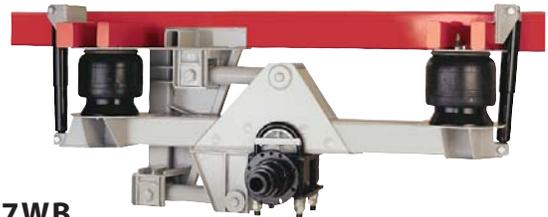
Owner's Manual



RAD-227
10,000 - 25,000 lb. capacities



RAD-227C
100% Air-Ride
34,000 - 48,000 lb. capacities



RAD-227WB
"Wide Base" 100% Air-Ride
10,000 - 25,000 lb. capacities



RAS-227
7,000 - 15,000 lb. capacities



www.ridewellcorp.com

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Suspension Identification:

Ridewell Suspensions are identified by a metal tag attached to the left-hand hanger that indicates model number, capacity, and a date-coded serial number. Consult your vehicle manufacturer for your correct mounting height.

Parts:

For optimum suspension performance, order only Ridewell parts. Replacement parts for Model RAS-227, RAD-227, RAD-227C, and RAD-227WB are shown on pages 11-15 of this manual.

Sales, Service & Warranty:

If you need assistance regarding this product, please contact us and we will be glad to help you.

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Contents

Basic Operation.....	3-4
Operational Inspection.....	4
Preventative Maintenance.....	5
Basic Troubleshooting.....	6
Axle Alignment Procedures.....	7
Bushing Replacement Procedures.....	8
Ride Height/Height Control Valve Adjustment.....	9
Shock Adjustment Procedure.....	10
Parts Illustrations.....	11-15

Basic Operation

When properly maintained and operated within design limits, Ridewell's **RAD-227** (Drive Axle), **RAS-227** (Steer Axle) and **RAD-227WB** (Drive Axle Wide Base) will provide many years of trouble-free service.

The **RAD-227** series suspensions have several unique features which keep maintenance to a minimum and performance at a maximum:

1. 100% ride on air
2. Parallelogram design promotes road stability allowing axle movement with no change in steering or drive line angle.
3. A patented eccentric bolt and/or screw rod feature allows for simple, positive axle alignment.
4. Rubber bushed pivot points require no lubrication.
5. A self-contained shock absorber that allows precise installation and ensures proper shock and air spring relationship is maintained.



Basic Operation Continued

Air Springs & Height Control Valve

Your air-ride suspension is designed to damp the shocks transmitted from road surface to vehicle frame through the air springs. The height control valve is used to maintain the volume of air in the air springs. You may use a single valve system to maintain ride height only or use a double valve system to maintain ride height and level the vehicle. Please check with your vehicle manufacturer for your suspension's ride height.

IMPORTANT NOTE:

The air springs used on all Model 227 suspensions have internal rubber bumpers designed to carry the vehicle load should air spring failure or sudden loss of air supply occur. Should an air spring fail on a single height control valve system, all of the air springs will deflate allowing the suspension to operate on internal bumpers until repairs can be made. Should an air spring fail on a double height control or leveling valve system, the springs would deflate on one side only. Simply deflate the other side by removing the vertical linkage rod from the valve and rotate the horizontal lever arms down to fully exhaust the springs.

Air Pressure & Brake Protection Valve

This air-ride suspension is dependent on air pressure from the vehicle supply system. Air pressure must be maintained above 65 p.s.i. before operation. **A brake protection valve must be installed in the air system to prevent loss below 65 p.s.i. to ensure safe air brake pressure in the event of air loss in the suspension system.**

Shock Absorbers

The suspension is equipped with shock absorbers to damp dynamic frequencies. The shock absorber is very important and must be maintained to ensure smooth operation.

Operational Inspection

1. Inspect all fasteners at hanger to frame connections.
2. Build and maintain vehicle air pressure to 65 p.s.i. minimum.
3. Inspect air springs. Make sure all springs inflate and do not leak. Soap test if leaking is suspected.
4. Check all air connections for leaks and tighten if needed.
5. Inspect air lines. They should be free of sharp edge contact to prevent premature failure.
6. Check for proper ride height. If incorrect, adjust per the *Ride Height/Height Control Valve Adjustment* section of this manual.
7. Cross members must be installed between hangers.



Preventative Maintenance

Daily

Check for loose or broken parts on or around suspension to prevent any serious problems from occurring. If loose or broken parts are detected, immediate corrective action must be taken.

Every 30 Days

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

Every 90 Days & with Annual Inspection

Inspect items required in daily & 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 SUSPENSIONS 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 km), all fasteners must be re-tightened to specified torque. Repeat every 50,000 miles (80,000 km).

DO NOT OVER TORQUE!



RIDEWELL
SUSPENSIONS

#1990020

Figure 1



Basic Troubleshooting

NOTE: Do not check system until minimum 65 p.s.i. air pressure is built and maintained.

1. All air springs flat or slow to fill - check the following:
 - a. Air pressure
 - b. Air brake protection valve
 - c. Height control valve
 - d. Possible air line leakage

2. Air springs flat on one side of suspension - check the following:
 - a. Air springs
 - b. Height control valve
 - c. Height control valve setting
 - d. Possible air line leakage

3. When vehicle is parked suspension deflates rapidly - check the following:
 - a. Air lines
 - b. Air springs

4. Vehicle pulls to left or right - check the following:
 - a. Tire pressure
 - b. Axle alignment
 - c. Suspension bushings

5. Vehicle has excessive sway - check the following:
 - a. Air springs firmness
 - b. Sway bar bushings
 - c. Torque beam bushings



Axle Alignment Procedures

Procedure 1

For suspensions with eccentric bolts only:

1. Loosen all 1¼" eccentric bolt nuts.
2. Remove anti-turn washers from head of eccentric bolts.
3. Align axle by turning eccentric bolt arrow (on bolt head) on the lower most torque beam to the direction the axle needs to move.
4. Turn the upper eccentric arrow to the same position of the lower arrow. Check alignment and repeat as necessary.
5. After alignment is achieved, install anti-turn washers to eccentric bolt heads.
6. Tighten 1¼" nuts to **1,000 ft. lbs. torque.**

Procedure 2

For suspensions with threaded rod type adjustable torque arms only:

1. Loosen cast clamp bolts on threaded torque arms.
2. Turn lower most torque arm threaded rod either clockwise or counter-clockwise to lengthen or shorten torque rod as required.
3. Measure **new** length of lower torque arm using center of mounting bolts as reference.
4. Adjust upper torque arm to match lower arm length.
5. Check alignment and repeat as necessary.
6. Tighten cast clamp bolts on adjustable torque arm to **100 ft. lbs. torque.**

Procedure 3

For suspensions with eccentric bolt adjustment on lower torque beam and an upper threaded rod type adjustable torque arm:

1. Loosen all 1¼" eccentric bolt nuts.
2. Remove anti-turn washers from eccentric bolt head.
3. Align axle by turning eccentric bolt arrow (on bolt head) to the direction the axle needs to move.
4. Loosen cast clamp bolts on torque arm and adjust the upper threaded rod type torque arm approximately the same distance the axle has moved. Check alignment and repeat as necessary.
5. After alignment is achieved, install anti-turn washer to eccentric bolt head.
6. Tighten 1¼" nuts to **1,000 ft. lbs. torque.**
7. Tighten cast clamp bolts on adjustable torque arm to **100 ft. lbs. torque.**



Bushing Replacement Procedures

Procedure 1

Replacement of torque beam bushings:

1. Lift frame of vehicle with proper jacks or stands and exhaust air from suspension system.
2. Remove tires from axle.
3. Block axle with proper jacks or stands.
4. Remove anti-turn washers from heads of eccentric bolts. Remove weld from clamp block (if applicable).
5. Remove 1¼" nuts on eccentric bolts. **Turn eccentric bolt arrow to 12 o'clock position** and tap out (otherwise damage to components WILL occur).
CAUTION: DO NOT DAMAGE THREADS).
6. Remove 1½" cap screws from lower beam assembly.
7. Remove torque beams from suspension and press bushings out in hydraulic press.
8. Using an approved rubber lubricant, press in new bushings. Make sure bushings are centered in torque beam sleeve.
9. Install torque beams into suspension.
10. Move axle up or down to proper ride height and torque 1½" cap screws to **1,100 ft. lbs.**
11. Re-install eccentric bolts and the 1¼" nuts.
12. Align axle (see *Axle Alignment Procedures*).
13. Install anti-turn washers after alignment.
14. Torque 1¼" nuts to **1,000 ft. lbs.**

Procedure 2

Replacement of adjustable torque arms or sway bar bushings:

1. Remove 1" bolts from torque arms or sway bar.
2. Remove torque arms or sway bar, and using an approved rubber lubricant, re-bush making sure bushings are centered in sleeves.
3. Install torque arms or sway bar. If your format uses 7/8" cap screws, tighten to 350 ft. lbs. torque. If your format uses 1" cap screws, tighten to 360 ft. lbs. torque.
4. Align axle if required (see *Axle Alignment Procedures*).



Ride Height / Height Control Valve Adjustment

Operation

As load is applied, the horizontal actuating lever arm moves from **netural** position to **up** (intake) position. As load is removed, the horizontal actuating lever arm moves from neutral position to down (exhaust) position. The valve opens and air is allowed to exhaust from air springs bringing the horizontal actuating lever back to a neutral position. Optimum performance is achieved when valve is adjusted accurately to the suspension by increasing or decreasing horizontal lever arm length to a point where valve and lever arm approach 45 degrees maximum, up or down from neutral position.

Adjustment

1. With vehicle on level ground, build and maintain supply air pressure in excess of 65 p.s.i.
2. Loosen vertical link hose clamp to allow **P** shaped rubber connector to slide freely up and down vertical link.
3. Rotate horizontal lever arm down to exhaust air springs or rotate up to inflate springs until proper ride height is achieved.
4. Tighten hose clamp on vertical link connector while holding horizontal lever arms in neutral position.
5. **TEST:** Disconnect vertical link rod grommet from pin bracket at axle. Rotate horizontal lever arm **down** to exhaust air springs about halfway. Rotate horizontal lever arm **up** until grommet is back to pin bracket level. Air springs should re-inflate to ride level height.
6. Re-connect grommet to pin. Check to see if air springs are of equal firmness. Make sure vertical link rod **extends completely through** the rubber **P** connector at all times.



Shock Adjustment Procedure

If your suspension is equipped with Koni Adjustable Shock Absorbers and requires adjustment, proceed as follows:

NOTE: READ THIS ENTIRE PROCEDURE BEFORE STARTING.

1. Remove the shock absorber from the vehicle and hold it vertically with the lower eye in a vice.
2. Press top of shock down while turning gently counter-clockwise until you feel the cams of the adjusting nut engage in the recesses of the front valve assembly. When engagement is made, turn top of shock 2 **half** turns clockwise and stop. Adjustment is complete.
3. Pull top of shock up about ½" and remove from vice.
4. Re-install the vehicle.

IMPORTANT NOTE:

Shock absorbers must be adjusted in pairs. There is a maximum of 5 half turns clockwise adjustment on your shock absorber. Do not use excessive force when making adjustments. If you are having difficulty, please contact your nearest Ridewell representative.



Parts Illustrations

ITEM No.	PART No.	PART DESCRIPTION	QTY	REMARKS
1	1237185B000	AIR COMPRESSOR, 1/3 H.P., 12 VDC	1	
2	1237257B000	AIR COMPRESSOR, 1/4 H.P., 12 VDC	1	
3	1230067	RELAY/WIRE ASSY, 12VDC, 70 AMP	1	
4	1234924B000	CHECK VALVE - ONE WAY	1	
5	1234250B327	TUBING, COPPER, 3 FT.	1	
6	1234250B327	TEE, STREET, 1/4" NPT	1	
7	1230037	SWITCH, PRESSURE	1	
8	1230038	BUSHING, HEX, 1/4" NPT X 1/8" NPT	1	
9	1234250B301	HEX NIPPLE - 1/4" NPT	1	
10	1230065	CONN, FEMALE, 1/4" FNPT X 1/4" TUBE	1	
11	1234250B303	CONN, MALE, 1/4" NPT X 1/4" TUBE	1	

WIRE DESIGNATION

A	1/4" 3A, 2 FT LONG, ORANGE
B	RELAY #25 TO #41 MOTOR TERMINAL
C	RELAY #17 TO #18, RED PINKS
D	1/4" 3A, 7 INCHES LONG, BLACK
E	GROUND TO #10W AS ON MOTOR
F	RELAY #27 TO PRESSURE SWITCH
G	RELAY #26 TO GROUND
H	RELAY #25 TO GROUND
I	RELAY #26 TO PRESSURE SWITCH

ELECTRICAL WIRING DETAIL

PLUG END VIEW OF RELAY

BASE END VIEW OF RELAY

1/4 HP MOTOR END ELECTRICAL DETAIL

1/3 HP MOTOR END ELECTRICAL DETAIL

MOUNTING FOOTPRINT FOR BOTH COMPRESSORS

NOTES: (CONT.)

1. DIELECTRIC GREASE RECOMMENDED ON TERMINALS.
2. A SCREWDRIVER IS REQUIRED TO REMOVE RELAY FROM BASE. EXCESSIVE PULLING ON RELAY HOUSING MAY CAUSE DAMAGE. DISCONNECT POWER BEFORE REMOVING RELAY.
3. RECOMMENDED WIRE TYPE: SXL
4. USE PIPE SEALANT ON ALL FITTINGS AND TIGHTEN TO 10-12 FT LBS. ALL CONNECTIONS MUST BE AIR TIGHT FOR PROPER PERFORMANCE.
5. AIR FILTER IS PART OF AIR COMPRESSOR ASSEMBLY. (ITEM 1). THE AIR FILTER MUST BE CHANGED ANNUALLY UNDER NORMAL CONDITIONS. MORE FREQUENT CHANGES ARE NECESSARY WHEN OPERATED IN A DUSTY ENVIRONMENT. REPLACEMENT AIR FILTER ASSEMBLY P/N 1237257B001.

OPTIONAL

TO 12V 35 AMP FUSE
USE 8 GAUGE WIRE
MINIMUM

TO AIR TANK

REV	DATE	BY	CHK	REV	DATE	BY	CHK
1	02/14/02			1	02/14/02		
2	4/24/02			2	4/24/02		
3	5/14/02			3	5/14/02		

ADDED OPTIONAL WIRING NOTES

REVISION DESCRIPTION

RIDEWELL CORPORATION
PO BOX 4596 SPRINGFIELD, MISSOURI 65808

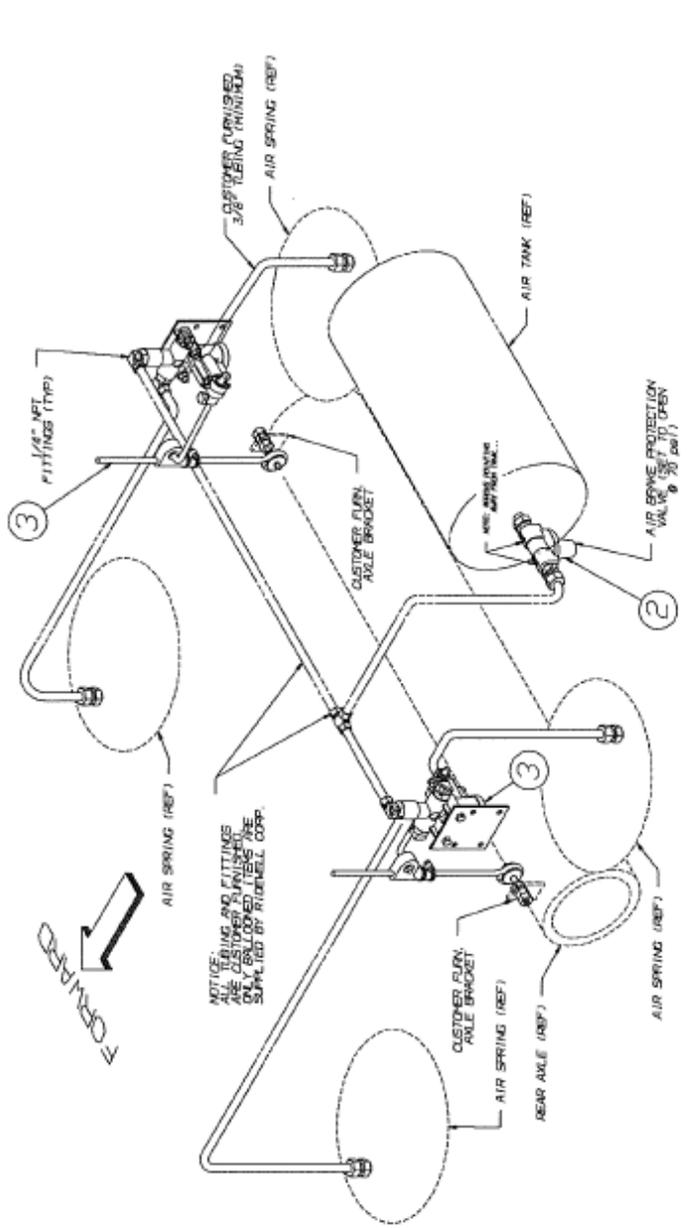
RELAY: D1171 3-2002 NIS
AIR COMPRESSORS: 1/3 & 1/4 H.P.

SHEET 1 OF 1 PART NO. 1220016/17 REV. A

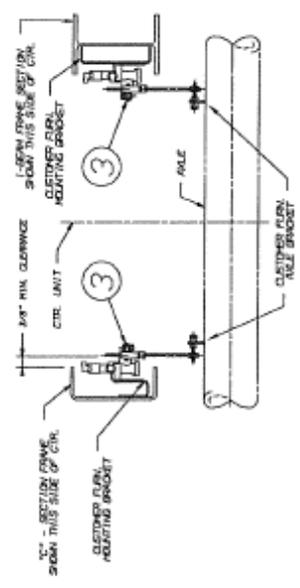
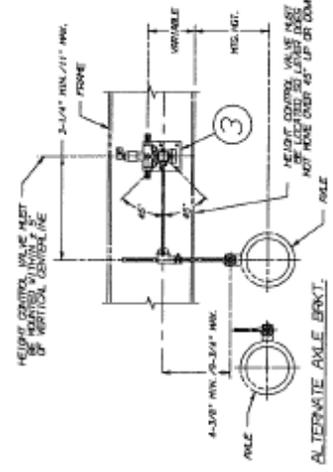


ITEM	QTY	PART NO.	DESCRIPTION	REV.
1	1	OMITTED	OMITTED (REF. REV. BJ)	
2	1	1244761R000	RES'R PRCT'N VLV W/SCREEN	1
3	1	6240503	RA HDV AXLE BRK & MTC SET	2

NOTE 1: FOR ADDITIONAL AIR TANK BREAK-DOWN ON ITEM NO. 2, SEE PART RA 6240503.
 NOTE 2: FOR FRONT AXLE APPLICATIONS MOUNT HEIGHT CONTROL VALVES ON THE REAR AXLE UNLESS OTHERWISE SPECIFIED.
 NOTE 3: ALL CONTROL VALVES (CONTROL VALVE MOUNTED TO REAR) OR LATERALLY AS SPACE PERMITS, AIR TANK MAY BE LOCATED TO SUIT...



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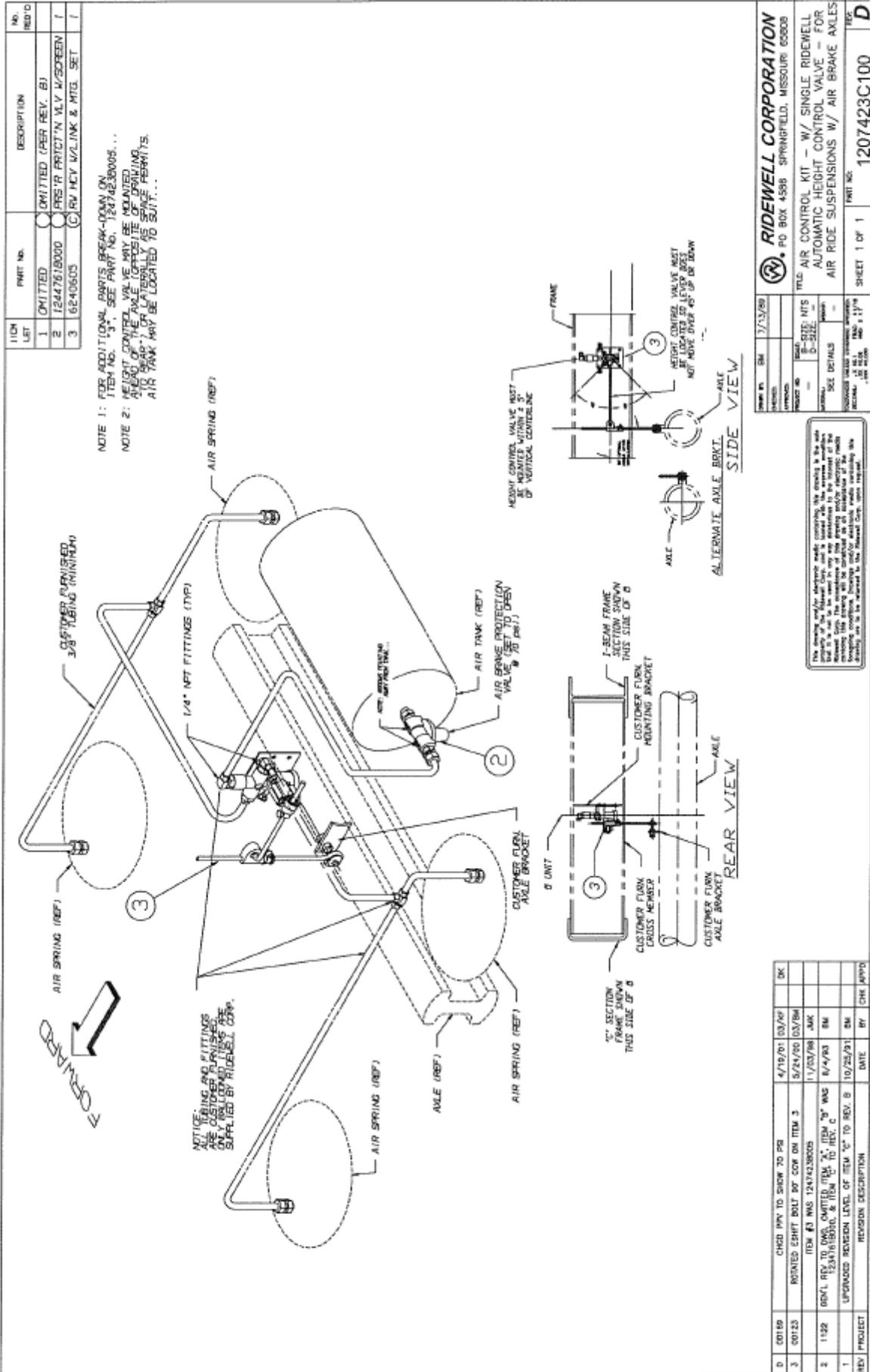
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B	1244761R000	8/19/00	JMK		
A	1244761R000	8/19/00	JMK		
		10/25/01	JMK		

NAME: RA
 PROJECT: 1244761R000
 DATE: 7/13/00
 BY: DJ/MT
 CHK: MJD
 APP'D: DK

RIDEWELL CORPORATION
 PO BOX 4586 SPRINGFIELD, MISSOURI 65808

AIR CONTROL KIT - W/ DUAL RIDEWELL
 AUTOMATIC HEIGHT CONTROL VALVES - FOR
 AIR RIDE SUSPENSIONS W/ AIR BRAKE AXLES

SHEET 1 OF 1
 PART NO. 1207423C200
 REV. D



ITEM LIST	PART NO.	DESCRIPTION	NO. REQ'D
1	OMITTED	OMITTED (PER REV. B)	
2	12447618000	PRS'R PRIC'T 'N VLV W/SCREEN	1
3	6240605	C/RV HCY W/LINK & MTG. SET	1

RIDEWELL CORPORATION
 PO BOX 4588 SPRINGFIELD, MISSOURI 65808

THIS AIR CONTROL KIT - W/ SINGLE RIDEWELL AUTOMATIC HEIGHT CONTROL VALVE - FOR AIR RIDE SUSPENSIONS W/ AIR BRAKE AXLES

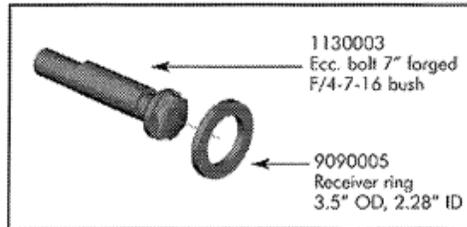
DATE: 1/13/90
 SCALE: NTS
 SCALE: DETAILS
 DRAWN: J.M.
 CHECKED: J.M.
 PART NO.: 1207423C100

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REV	PROJECT	REVISION DESCRIPTION	DATE	BY	CHK	APP'D
0	00159	CHGD P/N TO SHOW TO PR	6/19/01	03/AF		DK
3	00123	ROTATED SHFT BOLT BOT SIDE ON ITEM 3	5/24/90	03/SM		
2	1122	ITDM #3 WAS 1241238005 OMITTED ITEM #3, ITEM C WAS 8/4/83	1/10/78	JMK		
1		UPGRADED REVISION LEVEL OF ITEM C TO REV. B	10/25/91	SM		



Common replacement parts are shown below. For air springs, hangers, and torque beams, refer to your specific installation drawing.



NOTE: This new style eccentric bolt replaces previous style with square head.

