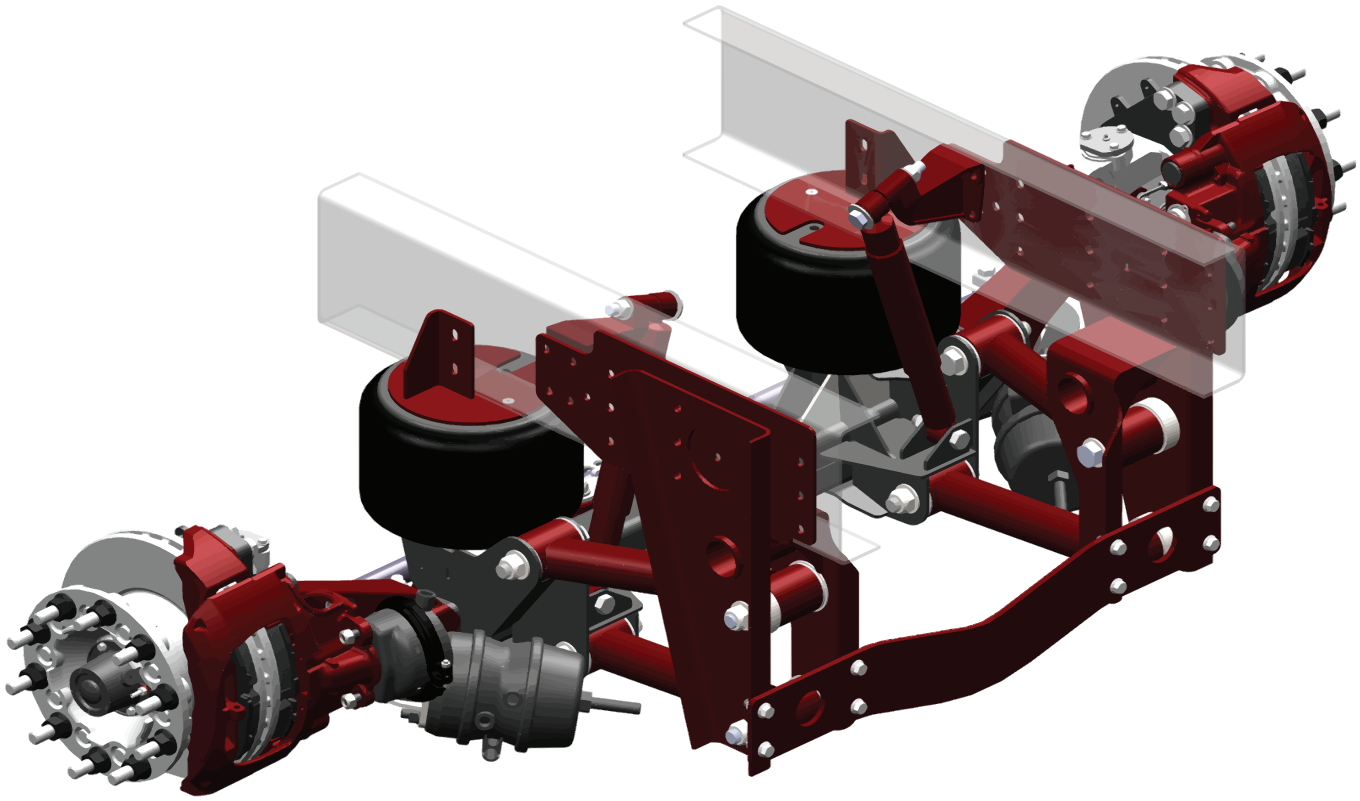
Reyco Granning SUSPENSIONS

# Motorhome Suspensions Owner's Manual

# ASAPAT 1000|1200|1400
# RTSe 1000|1200|1400

**Series Passive Steer Tag Suspension**

**Installation Instructions**
**Maintenance Instructions**
**Service Parts**



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Revision History

| REV | ECR # | DATE | CHANGE DESCRIPTION | BY | CHK | APV |
|---|---|---|---|---|---|---|
| C | 22987 | 2/16/24 | Change torque for item 20 on page 18 from 180-200 to 375 lb-ft | KMH | RSC | JAH |
| B | 22807 | 6/15/23 | Added RTSE info to manual, also updated manual format | STM | GMC | JAH |
| A | 21932 | 8/15/20 | Remove the current calipers (715074-01/-02) and brake chambers (715111-01) from the unit. And replace them with the Bendix calipers (707240-01/-02) | STM | CRG | JAH |
| OR | | 5/01/19 | Original Release | JWS | RSC | JAH |

Introduction

## Company Profile

Reyco Granning Suspensions was formed by the merger and acquisition of two well-known names in the heavy-duty vehicle suspension industry—Reyco and Granning.

Reyco grew out of the Reynolds Mfg. Co and was first known as a major supplier of brake drums for heavy duty vehicles and later developed a full line of air and steel-spring suspensions for trucks, buses, trailers and motorhomes.

Granning Air Suspensions was founded in 1949 in Detroit, Michigan as a manufacturer of auxiliary lift axle suspensions.  Granning later became an innovator of independent front air suspensions for the motorhome industry.

Reyco Granning LLC was formed in early 2011 through a partnering of senior managers and MAT Capital, a private investment group headquartered in Long Grove, Illinois.

# INTRODUCTION

## Service Notes

This Service Manual describes the correct service and repair procedures for the **Reyco Granning**® Passive Steer Tag suspension Model ASAPAT/RTSE 1000/1200/1400 with 10,000/12,000/14,000 lbs. Gross Axle Weight Rating (GAWR). Overloading the suspension may result in adverse ride and handling characteristics.

You must read and understand all procedures and safety precautions presented in this manual before conducting any service work on the suspension.

You must follow your company safety procedures and use proper safety equipment when you service or repair the suspension.

The information contained in this manual was current at the time of printing and is subject to change without notice or liability. **Reyco Granning**® reserves the right to modify the suspension and/or procedures and to change specifications at any time without notice and without incurring obligation.

**Reyco Granning**® uses the following types of notices for potential safety problems and to give information that will prevent damage to equipment.

### WARNING

**A warning indicates procedures that must be followed exactly. Serious personal injury can occur if the procedure is not followed.**

### CAUTION

**A caution indicates procedures that must be followed exactly. Damage to equipment or suspension components and personal injury can occur if the procedure is not followed.**

### NOTE

**A note indicates an operation, procedure or instruction that is important for correct service.**

## Special Notes

Proper tools must be used to perform the installation procedures in the manual. Some procedures require the use of special tools for safe and correct service. Failure to use the proper and/or special tools when required can cause personal injury and/or damage to suspension components.

## CAUTION

**The ASAPAT/RTSE 1000/1200/1400 suspension, as with all suspension systems, must be installed at the proper Ride Height to insure trouble-free operation. If the Ride Height is off, the suspension may not carry its share of the load under all conditions. Running at the incorrect Ride Height may damage the suspension or other vehicle components.**

**You must follow your company safety procedures and use proper safety equipment when you service or repair the suspension.**

**The information contained in this manual was current at the time of printing and is subject to change without notice or liability. Reyco Granning® reserves the right to modify the suspension and/or procedures and to change specification at any time without notice and without incurring obligation.**

Defective or incorrect components are to be returned to **Reyco Granning®** in exchange for replacement components, conditionally based upon warranty requirements being met.

For additional information concerning suspension selection, contact the **Reyco Granning®** Customer Service Department at 800.753.0050

## Installer Responsibilities:

º To insure that the vehicle will function properly under the increased weight conditions and loading that will exist when an additional axle is installed.

## NOTE

**A correct installation must result in a loaded ride height of 8.25".**

º **To determine the correct location of the suspension in order to provide the proper vehicle load distribution.**

º **To insure that the load carried by each axle on the vehicle does not exceed the rated capacity of the components involved or exceed State and Federal laws where the truck is operated.**

º **To insure that proper clearance exists between:**

º **The drive shaft and the tag axle on pusher units.**

º **Tires in the lateral, force, aft, and vertical directions.**

º **Air springs when they are at their maximum diameter.**

º **Any other moving suspension components not listed.**

**No welding is permitted on any of the suspension components, except where specified by Reyco Granning®.**

**No alterations are permitted to any of the suspension components.**

# IDENTIFICATION

Identification

The suspension model and serial number are stamped on an aluminum tag that is riveted to the suspension on the left hanger (Figure 1). The serial number is used by **Reyco Granning**® for control purposes and should be referred to when servicing the suspension or requesting technical support (Figure 2).

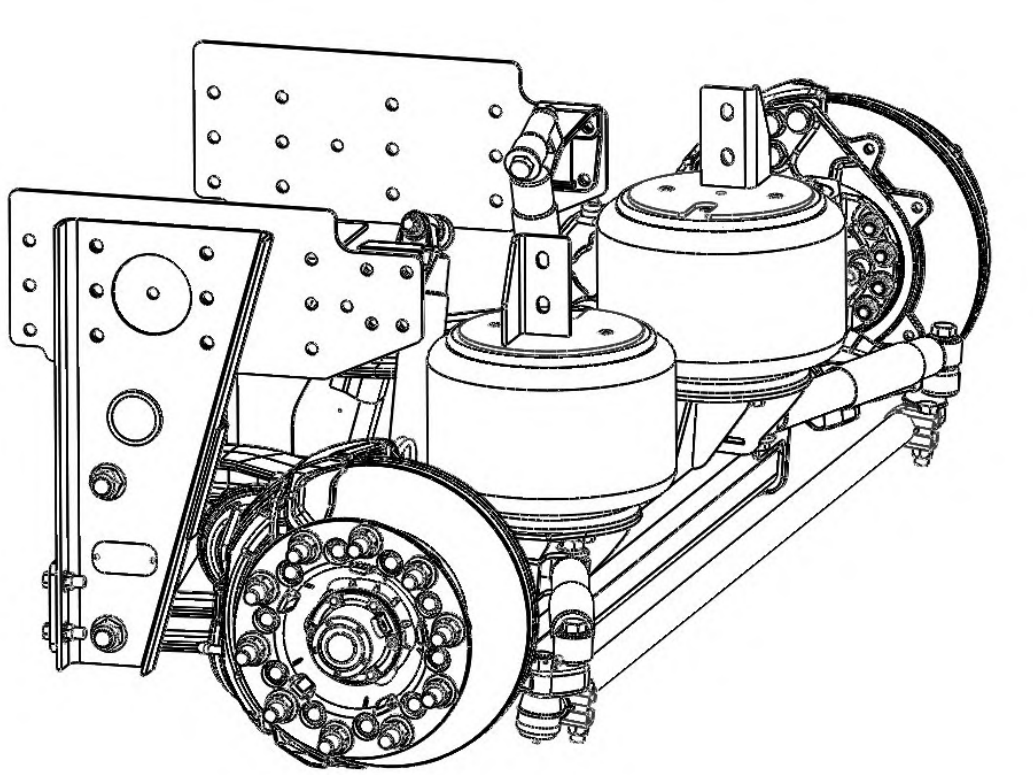


**Figure 1**- Suspension Identification Location

(ASAPAT/RTSE1401 shown)

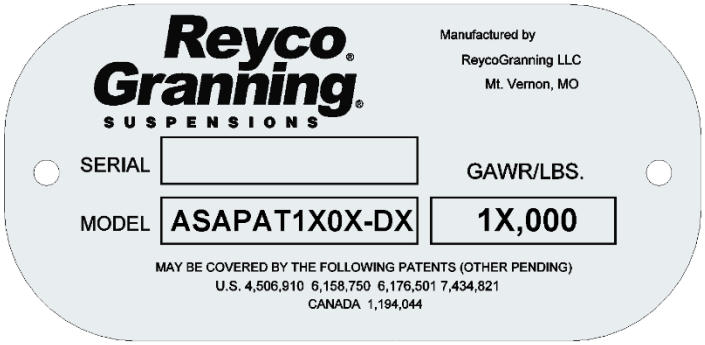
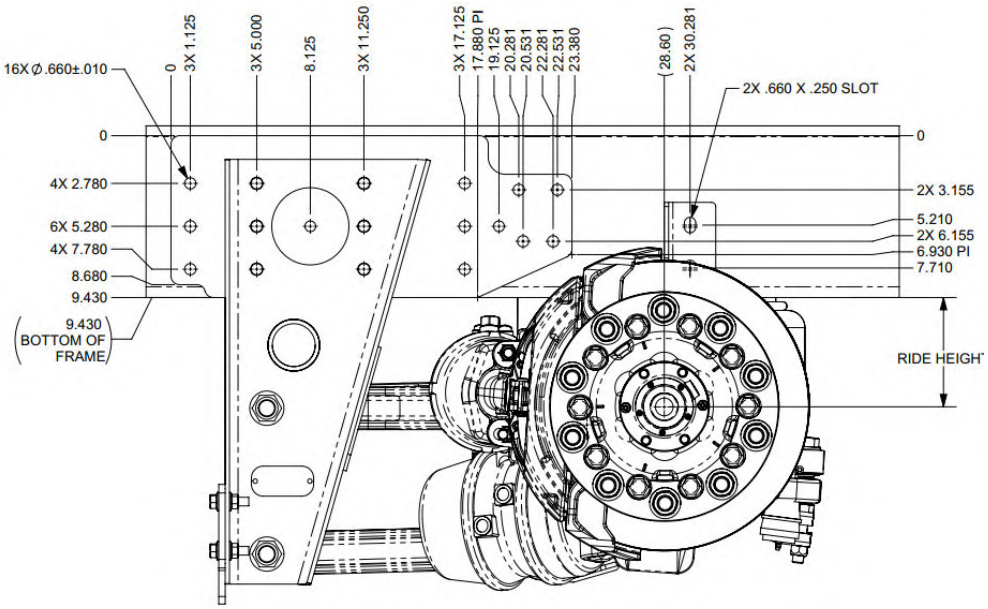



**Figure 2**- Suspension Serial Number Tag

# SUSPENSIONS SPECIFICATIONS

Suspension Specifications

| ASAPAT/RTSE 1X0X-DX SUSPENSION SPECIFICATIONS | | | |
|---|---|---|---|
| MODEL: | SEE TABLE 1 | BRAKE TYPE: | SEE TABLE 1 |
| CAPACITY (LB): | SEE TABLE 1 | BRAKE SIZE: | SEE TABLE 1 |
| FLANGE TO FLANGE (IN): | 97.12 | BRAKE LINING: | SEE TABLE 1 |
| KPI (IN): | 73.9 | BRAKE ANGLE (DEG): | 60 BAF |
| CASTER (DEG): | 4.0 | DUST SHIELDS: | NO |
| MAX INNER WHEEL CUT (DEG): | 17.0 | BRAKE CHAMBER SIZE: | SEE TABLE 1 |
| CONTROL LINK BUSHING DUROMETER: | 85 SA | CHAMBER ANGLE (DEG): | SEE TABLE 1 |
| BOLT CIRCLE: | 10 ON 11.25 IN DIA | CHAMBER PORT SIZE: | 3/8-18 NPTF |
| WHEEL PILOT TYPE: | HUB | AIR SPRING PORT SIZE: | SEE TABLE 1 |
| STUD SUZE: | M22-1.5 | ABS: | INSTALLED |
| WHEEL TYPE: | ALUMINUM | FRAME WIDTH (IN): | 34.25 |
| CAP NUTS: | YES | RIDE HEIGHT (IN): | 8.25 |
| WHEEL SEAL: | OIL | JOUNCE TRAVEL (IN): | 3.5 |
| HUB OIL SUPPLIED: | YES | REBOUND TRAVEL (IN): | 4.3 |
| | | LATERAL AXLE OFFSET (IN): | ± .38 |
| | | LATERAL AXLE COMPLIANCE (IN): | ± 1.75 |




| TABLE 1 | | | |
|---|---|---|---|
| MODEL: | ASAPAT1003-DR RTSE1003-DRK | ASAPAT1203-DR RTSE1203-DRK | ASAPAT1403-DS RTSE1403-DSK |
| CAPACITY (LB): | 10,000 | 12,000 | 14,000 |
| BRAKE TYPE | DRUM | DRUM | DISC |
| AIR SPRING MAX GROW (IN): | 15.2 | 15.5 | 16.4 |
| BUMPER CONTACT HEIGHT (IN): | 5.4 | 5.4 | 5.4 |
| BRAKE SIZE | 15 X 4 | 15 X 4 | MC225 |
| BRAKE LINING | ES420 | ES420 | JURID 539-SS29 |
| BRAKE CHAMBER SIZE | T20 | T20 | T16 |
| CHAMBER ANGLE (DEG) | 36 ± 2 CBA | 36 ± 2 CBA | 12 |
| AIR SPRING PORT SIZE | 3/8-18 NPTF | 3/8-18 NPTF | 1/4-18 NPTF |

# INSTALLATION INSTRUCTIONS

Installation Instructions

1. Check that the suspension you received matches the specification provided to you by your production or engineering department.
2. Check the drive shaft clearance for your suspension and verify that the vehicle's drive shaft does not protrude past the frame lower than that dimension at the desired installation location. This dimension is 10" for the ASAPAT/RTSE 1000/1200/1400.
3. On any auxiliary axle application:

   º Verify that axle spacing conforms to Federal and local bridge laws.
   º Verify that the auxiliary suspension location is based on front axle steering angle, vehicle wheelbase and maximum recommended auxiliary axle spacing from center of tandem.
   º Verify that the vehicle will have the proper load distribution after installation.
   º Verify that there is sufficient fore/aft frame rail clearance to mount the auxiliary suspension(s)

4. Confirm that the components listed have been provided in sufficient quantities. (See Figure3) Contact **Reyco Granning**® Customer Service Department if any missing or damaged components are found.

## WARNING

**Adequate suspension support must be provided within the vehicle frame. See the suspension interface drawing for suggested frame crossmember locations.**

Components Shipped: (1) ASAPAT/RTSE 1000/1200/1400 Auxiliary Axle

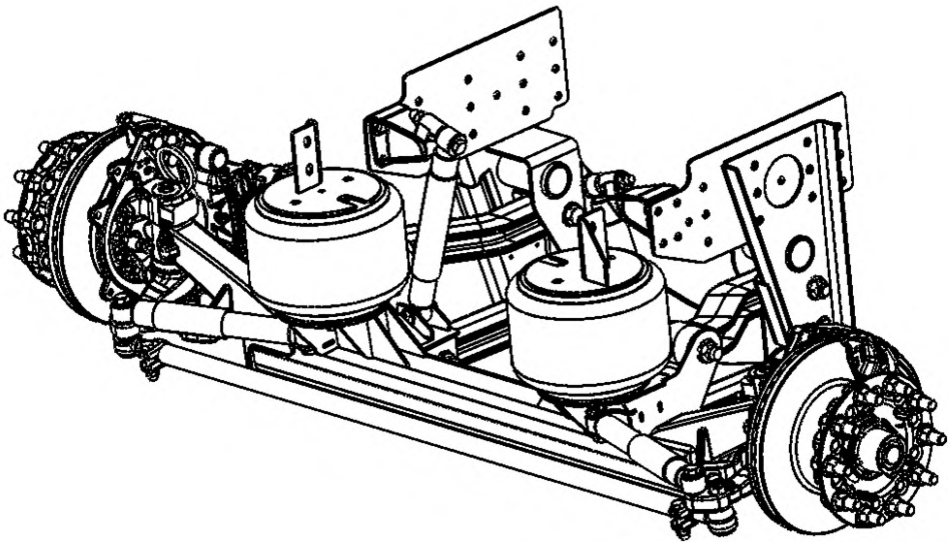


**Figure 3**

## Installation

**Reyco Granning**® provides a wide variety of suspensions to accommodate most common frame heights. The loaded frame to ground dimension and the intended tire size are used to find the correct ride height of the suspension.

The following formula may be helpful in finding the correct ride height:

| | | | | |
|---|---|---|---|---|
| Loaded Frame to Ground (x) | - | Static Loaded Tire Radius (y) | = | Required Ride Height (z) |

## NOTE

**The loaded frame to ground measurement should be acquired at the desired suspension location on a LOADED vehicle.**

## CAUTION

**The ASAPAT1400 suspension is custom fit for a specific frame height. Using a spacer will result in component overload.**

The suspension ride height is the distance between the center of the axle spindle and the bottom of the frame to which the suspension is attached. (See Figure 4).

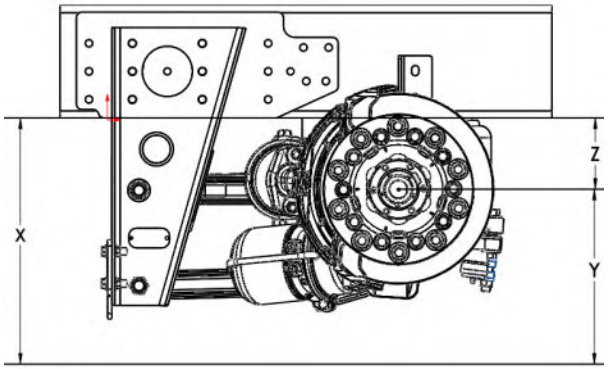



Figure 4

The installed suspension ride height must be within the range specified on the height table for the model being installed when it is in the LOADED condition.

## CAUTION

**Installing a suspension with an out of range ride height may result in insufficient axle lift, inadequate ground clearance, improper loading at the axle, and suspension component overload.**

## Caster Angle

Caster is the fore aft angle of the axle king pin with respect to true vertical. (See Figure 5). Positive caster is when the top of the king pin is positioned rearward of the vertical position. Negative caster is defined as the top of the king pin being ahead of the vertical position. ASAPAT suspensions are built with preset positive caster (4°) from the factory. If your frame has more than 2° of rake, this can have an adverse effect on steering. Please contact Reyco Granning, LLC Customer Service for further instructions if this condition exist.

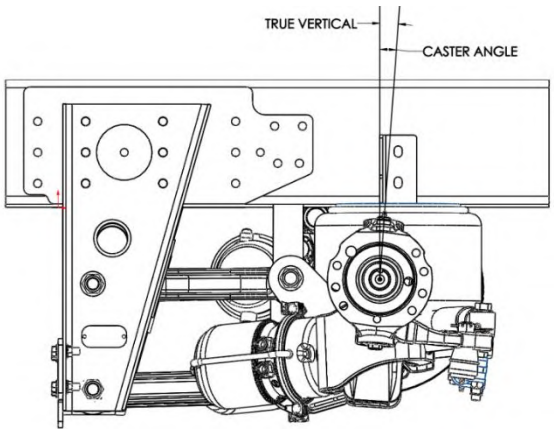



Figure 5

## Camber Angle

A camber angle of 0.5°is preset at the factory.

## Air Control System

When installing your air kit (customer supplied) the following rules generally apply:

1. Never add lubrication or anti-freeze to the air system.
2. Avoid drawing the air lines tight, kinking the air lines or passing them through areas that might cause damage.
3. Use only DOT approved air line fittings to plumb the system.
4. DOT type brake line should be used to plumb the system.

## Axle Controls

ASAPAT/RTSE 1000/1200/1400 is of the return to center type. Chassis manufacturer needs to prove controls for the centering mechanism to be activated in reverse.

## Final Assembly

1. Install the air control kit and plumbing.
2. Install wheels and torque lug nuts to wheel manufacturer's specification.
3. Check that the steering axle wheel bearings are filled with oil.
4. Install brake lines for steer brakes, per the chassis manufacturer's specifications.
5. Make all ABS connections.
6. Inspect brakes and adjust if necessary.
7. On steer arm at snubber contact patch, apply thick bearing grease (example: Lucas oil marine grease or super lube)
8. Adjust centering mechanism per OE chassis direction in relation to drive axle alignment.

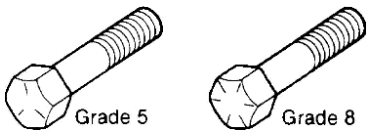
## Final Assembly Check

1. Check that all suspension bolts are tightened to the recommended torque values. (See Torque Tables).
2. Check air system for leaks and proper centering functionality.
3. Cycle the suspension through its entire range with wheels and tires installed, and check for interference between the tires, wheel, axle, brake chambers etc. and the truck frame, body, or other components.
4. Inspect lug nuts for proper torque.
5. Make sure that wheels rotate freely.
6. Make sure that brakes are properly adjusted.
7. Ensure oil in the hubs is at the proper level.

# INSTALLATION INSTRUCTIONS

## Torque Table

Threaded fasteners are covered by specifications that define required mechanical properties, such as tensile strength, yield strength, proof load, and hardness. These specifications are carefully considered when a fastener is selected for a particular application. To assure continued safe vehicle performance and suspension operation, replacement fastener used most of the same mechanical and physical properties as the fasteners originally provided.




Grade Markings on Bolts

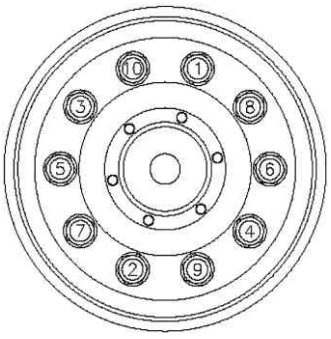
| Grade | Lock Nut Grade B, F | Lock Nut: Grade C, G |
|---|---|---|
| Identification |  |  |
| | 3 Dots | 6 Dots |

Grade Markings on Lock Nuts

Most fasteners have identification markings as shown that indicate the fastener strength or grade. Care must be taken to ensure replacement fastener strength or grade is the same as the original fastener.

| Application | Nut Size | Torque Specification (cleaned and lubricated) (lb-ft) | Torque Sequence (if required) |
|---|---|---|---|
| Upper Control Arm Bolts | 1-14 Grade G | 660-720 | N/A |
| Lower Control Arm Bolts | 1-14 Grade G | 660-720 | N/A |
| Cross Member Bolts | 1/2-20 Grade G | 110 | N/A |
| Shock Bolts | 3/4 | 150-190 | N/A |
| Ride Air Spring Mounting (upper) | 3/4-16 Grade 5<br>1/2-13 Grade 5 | 35 | N/A |
| Ride Air Spring Mounting (lower) | 3/4-16 Grade 5<br>1/2-13 Grade 5 | 35 | N/A |
| Hub Cap Bolts | 5/16-8 Grade 5 | 12-16 | N/A |
| Hub Spindle Nuts | Refer to Installation Drawing | Refer to Installation Drawing | Refer to Installation Drawing |

Torque Table 7
Disc and Drum style Hubs

| Hub Type | Step torque to: | |
|---|---|---|
| Hub Piloted Hubs: M22x1.5 | 50 ft-lb<br>450 - 500 ft-lb |  |

# BILL OF MATERIALS

Bill of Materials

## ASAPAT/RTSE 1000/1200

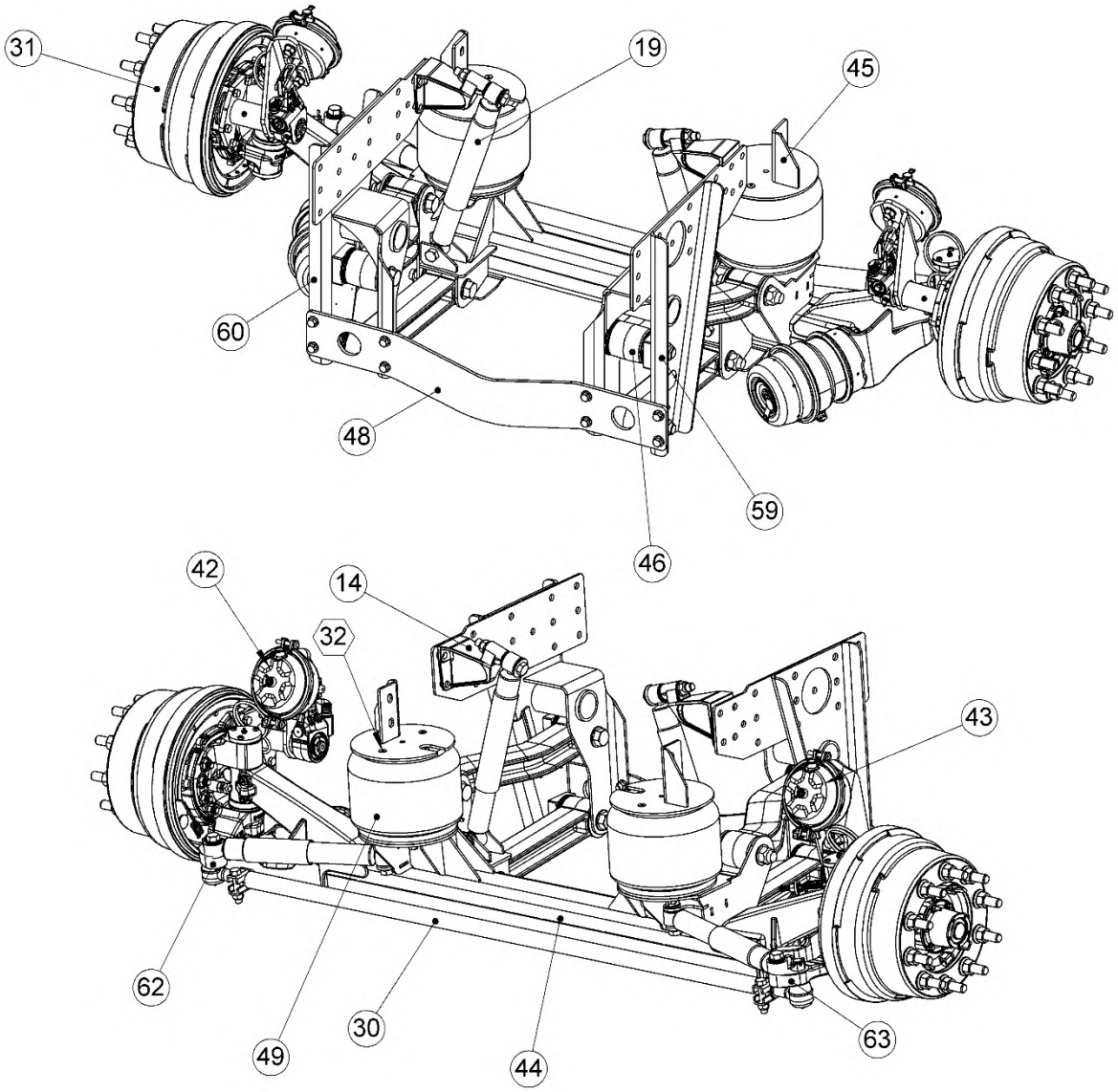
| Item | Part No. | Description | Torque (LB-FT) | Item | Part No. | Description | Torque (LB-FT) |
|---|---|---|---|---|---|---|---|
| 1 | 126 | HHB 5/8-18 X 2, GR. 8, ZN | 150-180 | 37 | 712877-12 | INSERT-FOAM, KNUCKLE PIN | -- |
| 2 | 167 | HHB, 1-14 X 6 GR .8 ZY | 750-790 | 38 | 712877-13 | DRAW KEY, 3.73IN | -- |
| 3 | 188 | POP RIVET .125 DIA X .525 L | -- | 39 | 712877-14 | DRAW KEY HEX NUT | 30-45 |
| 4 | 266 | HHB 5/16-18 GR5 ZC W/SLW | 16-Dec | 40 | 712877-15 | BELLEVILLE WASHER | -- |
| 5 | 276 | FHB 1/2-13 X 1.75 GR 8 ZN | 70-80 | 41 | 712877-17 | THRUST BEARING | -- |
| 6 | 307 | FHB 1/2-13 X 1.50, GR. 8, ZINC | 70-80 | 42 | 713099-03 | 15X4 BRAKE-LH | -- |
| 7 | 308 | LFN 1/2-13, GR. G ZN | 70-80 | 43 | 713099-04 | 15X4 BRAKE-RH | -- |
| 8 | 2571 | HFW 1 .09# | -- | 44 | 713163-01 | AXLE WELDMENT - ASAPAT | -- |
| 9 | 2617 | PLATE-SERIAL NO | -- | 45 | 713167-02 | AIR SPRING MOUNT, UPPER | -- |
| 10 | 4599 | LFN 5/8-18 G PH | 150-180 | 46 | 713190-01 | CONTROL LINK, UPPER ASY | -- |
| 11 | 6946 | ABS - SENSOR SPRING RETAINER | -- | 47 | 713191-01 | CONTROL LINK, LOWER ASY | -- |
| 12 | 7328 | ABS SENSOR (STRAIGHT W LEAD) | -- | 48 | 713254-01 | HANGER CROSS PLATE | -- |
| 13 | 12895-02 | WSHR FLAT 3/4 X 2.00 X .100 HD | -- | 49 | SEE TABLE 1 | AIR SPRING ASY | -- |
| 14 | 20185-03 | SHOCK BRACKET, UPPER | -- | 50 | 714147-02 | GASKET HUB CAP | -- |
| 15 | 25153-01 | BOLT HEX 3/4-16 UNG 5.50 GR 5 | 165-195 | 51 | 714176-01 | STUD HUB CAP | 12-16 |
| 16 | 100048-P1 | HHB 1/2-13 X 1 GR8 ZN | 30-35 | 52 | 714615-01 | CENTERING MECHANISM ASSEMBLY | -- |
| 17 | 101445-P1 | COTTER PIN- 1/8 X 1 1/2 | 750-790 | 53 | 714944-02 | FT STEER STOP 5/8-18 X 2-3/4 | -- |
| 18 | 700020-01 | HHB 1-14 X 7, GR. 8 ZN | -- | 54 | 714945-01 | JAM NUT 5/8-18 UNC GR.B | 110-120 |
| 19 | SEE TABLE 1 | SHOCK ABSORBER | -- | 55 | 714950-01 | INTERNAL RETAINING RING 1-1/2 OD | -- |
| 20 | 700525-04 | GASKET, KING PIN CAP | -- | 56 | 715050-01 | STEER STOP TUBE | -- |
| 21 | 702703-01 | SHIM 3.50X1.00X.125 THK. | -- | 57 | 715233-01 | PRESET PLUS HUB ASSEMBLY, DRUM | -- |
| 22 | 704140-01 | WEAR SPACER, POLYETHYLENE | -- | 58 | 716175-01 | FF/FG KNUCKLE KING PIN CAP | -- |
| 23 | 704153-01 | BUSHING AIR SPRING PIVOT | -- | 59 | 716281-01 | HANGER WELDMENT LIGHT, LH | -- |
| 24 | 705011-15 | BOLT, KING PIN CAP | 20-30 | 60 | 716281-02 | HANGER WELDMENT LIGHT - RH | -- |
| 25 | 705011-16 | GREASE FITTING, STRAIGHT | -- | 61 | 716427-01 | FF/FG KNUCKLE KINGPIN | -- |
| 26 | 705011-27 | SLEEVE ABS MOUNTING | -- | 62 | 716438-01 | ASY, KNUCKLE, LH | -- |
| 27 | 707980-01 | FN M22-1.5 X 27MM | SNUG | 63 | 716438-02 | ASY, KNUCKLE, RH | -- |
| 28 | 709750-01 | SHOCK ABSORBER | -- | 64 | 8120384 | SLW 1/2 .523X.873X.135 ZP | -- |
| 29 | 710825-13 | HUB OIL MINERAL 80W90 | -- | 65 | 8131017 | FW 3/4 .812X1.469X.134 ZP | -- |
| 30 | 711775-7206 | TIE ROD ASY-72.06 | -- | 66 | 8223829 | HHB 3/4-16 X 3.0 8 ZN | 165-195 |
| 31 | 712216-01 | BRAKE DRUM, 15X4 | -- | 67 | 8223831 | HHB 3/4-16 X 3.50, GR. 8, ZN | 165-195 |
| 32 | 712749-01082 | SFHCS 3/8-16 X 1 GR8 ZN | 30-35 | 68 | 89422308 | LN 3/4-16, GR. C | 150-175 |
| 33 | 712867-01 | HUB CAP, SENTINEL - 4.50 BCD | -- | 69 | 89422312 | LN 1-14 GR C PHOS & OIL | 675-725 |
| 34 | 712877-04 | SHIM .030 THK | -- | 70 | 89429048 | N 5/16-18 8 ZN | 12-16 |
| 35 | 712877-05 | SHIM .005 THK | -- | 71 | T-2437 | LW 5/16 | -- |
| 36 | 712877-06 | SHIM .010 THK | -- | | | | |

**TABLE 1**

| PART NUMBER | DESCRIPTION | RATING (LB) | AIR SPRING (ITEM 49) | SHOCK (ITEM 19) |
|---|---|---|---|---|
| ASAPAT1003-DR | ASAPAT1003-DR TOP LEVEL ASSEMBLY | 10,000 | 714749-02 | 700178-12 |
| ASAPAT1203-DR | ASAPAT1203-DR TOP LEVEL ASSEMBLY | 12,000 | 713769-01 | 700178-12 |
| RTSE1003-DRK | RTSE1003-DRK TOP LEVEL ASSEMBLY | 10,000 | 714749-02 | 716088-01 |
| RTSE1203-DRK | RTSE1203-DRK TOP LEVEL ASSEMBLY | 12,000 | 713769-01 | 716088-01 |

# BILL OF MATERIALS

## ASAPAT/RTSE 1000/1200

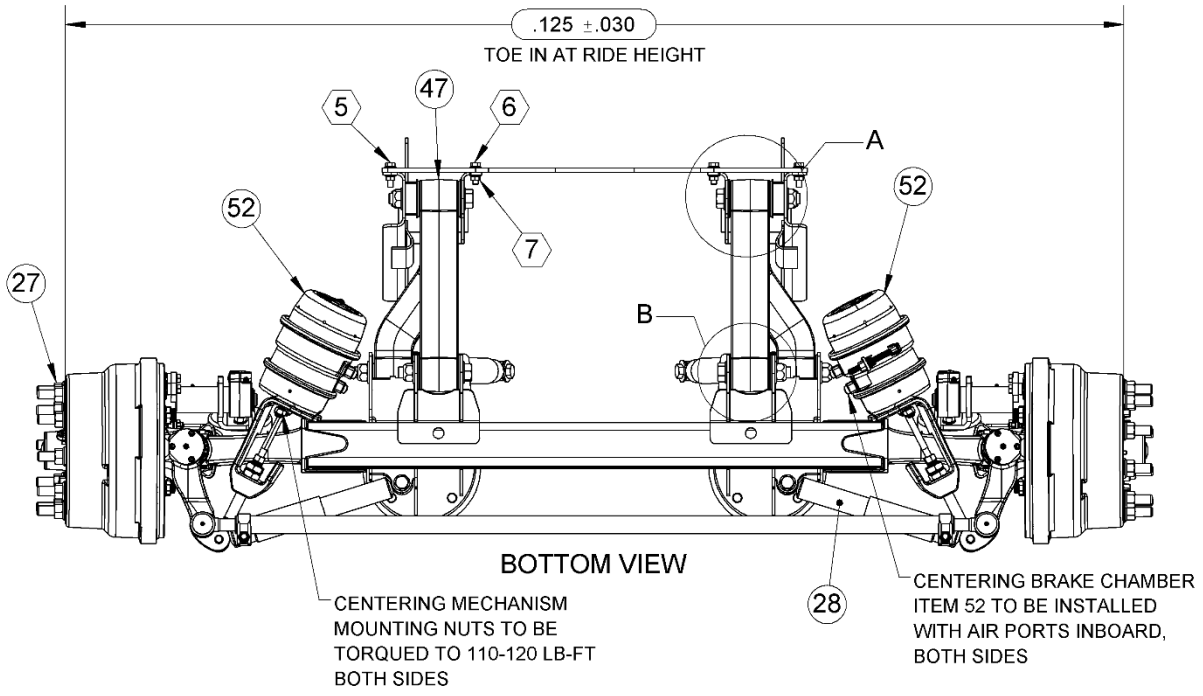


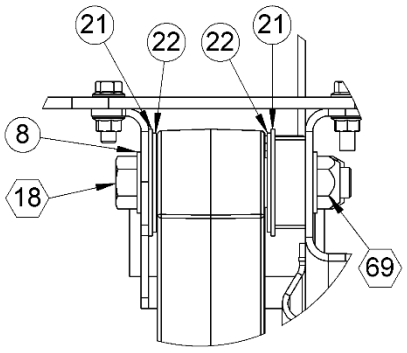

NOTES:

1. TIGHTEN TIE ROD NUTS TO 90-100 LB-FT, THEN TIGHTEN NUT UNTIL CUTOUTS ALIGN WITH COTTER PIN HOLE. INSTALL COTTER PIN. AFTER TOE IS SET, TORQUE TIE ROD CLAMPS TO 55-60 LB-FT
2. TORQUE FASTENERS TO VALUES LISTED IN BOM UNLESS OTHERWISE NOTED
3. ITEMS IN HEXAGON BALLOONS ARE TO BE TORQUED PER VALUES LISTED IN BOM
4. ITEMS IN DIAMOND BALLOONS ARE TO BE INSTALLED WITH MEDIUM STRENGTH THREAD LOCKER ON THREADS, THEN TORQUED PER VALUES LISTED IN BOM
5. INSTALL STEER SHOCK (28) WITH BOOTED END OUTBOARD

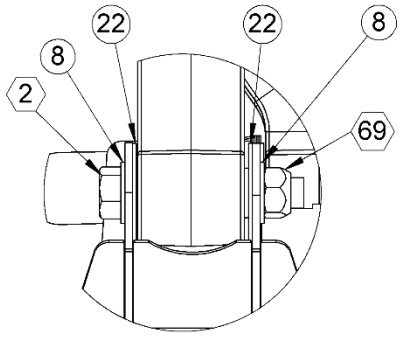
# BILL OF MATERIALS

## ASAPAT/RTSE 1000/1200



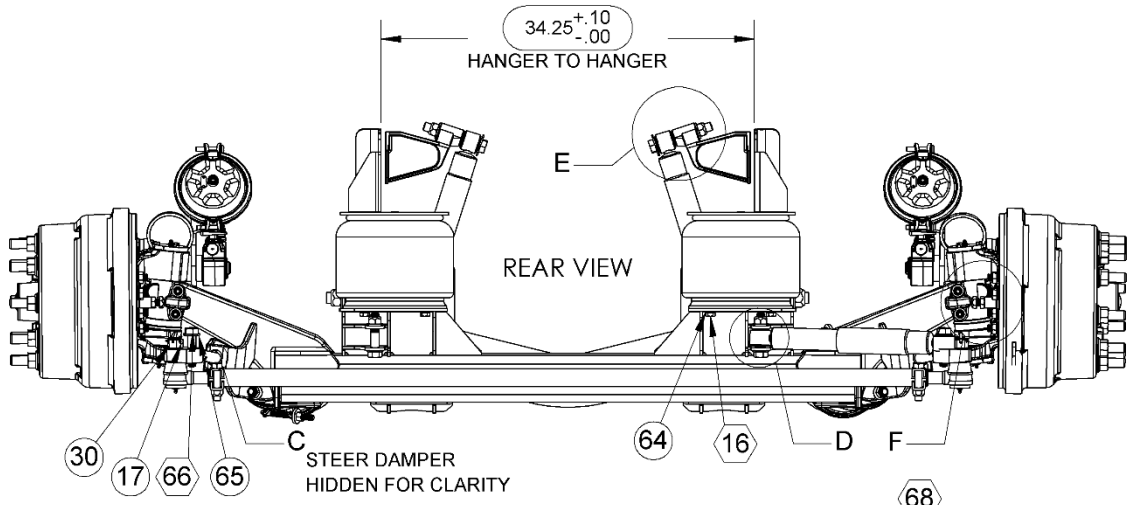

DETAIL A
SCALE 1 : 5

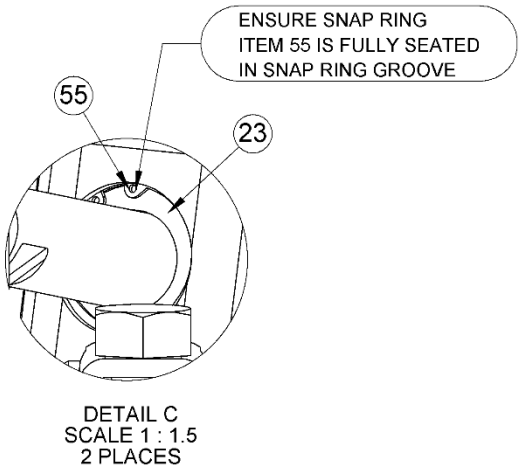



DETAIL B
SCALE 1 : 5

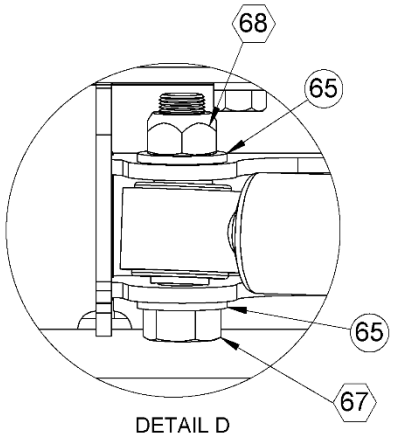
# BILL OF MATERIALS

## ASAPAT/RTSE 1000/1200

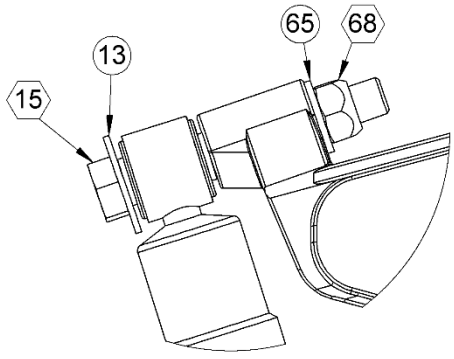


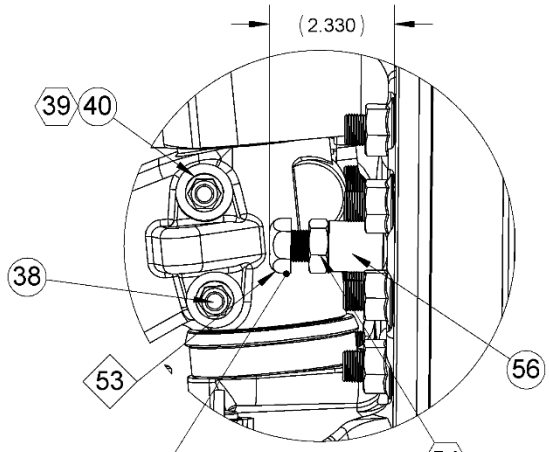

DETAIL C
SCALE 1 : 1.5
2 PLACES




DETAIL D
SCALE 1 : 2.5
2 PLACES




DETAIL E
SCALE 1 : 3
2 PLACES

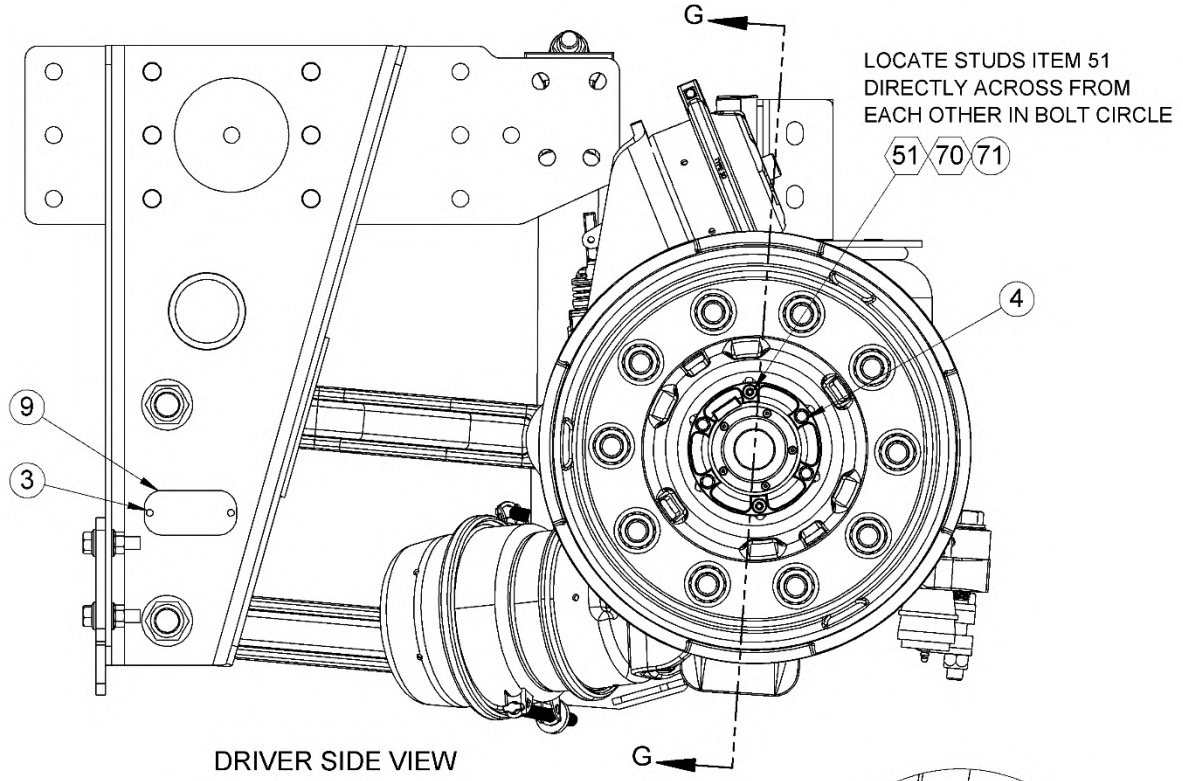


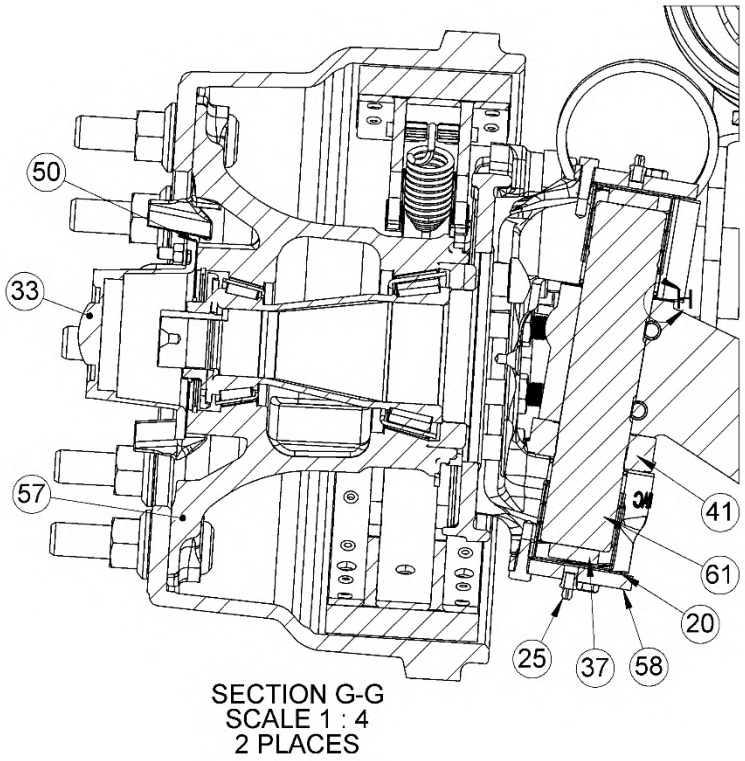

SET ITEM 53 TO 2.330
FROM MACHINED
KNUCKLE SURFACE

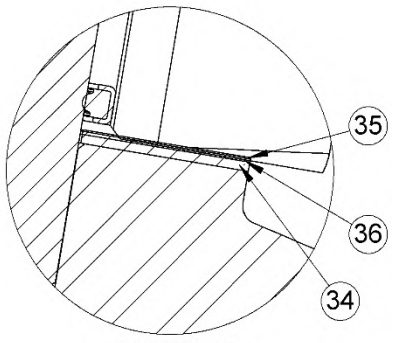
DETAIL F
SCALE 1 : 3
2 PLACES

# BILL OF MATERIALS

## ASAPAT/RTSE 1000/1200

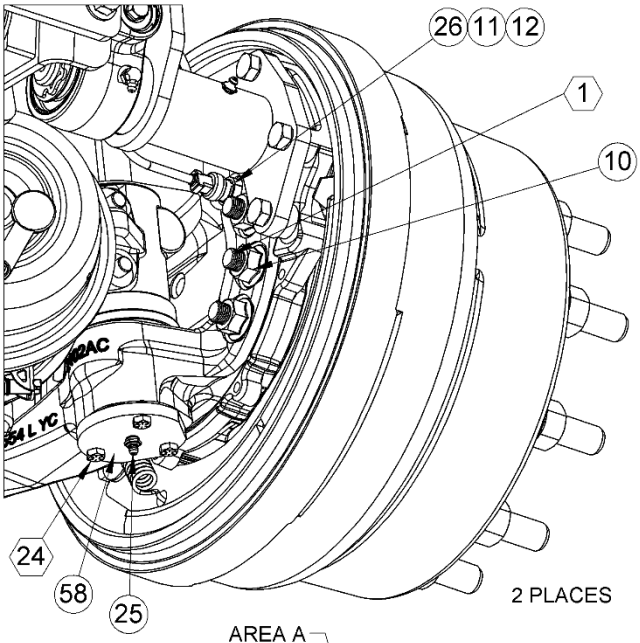


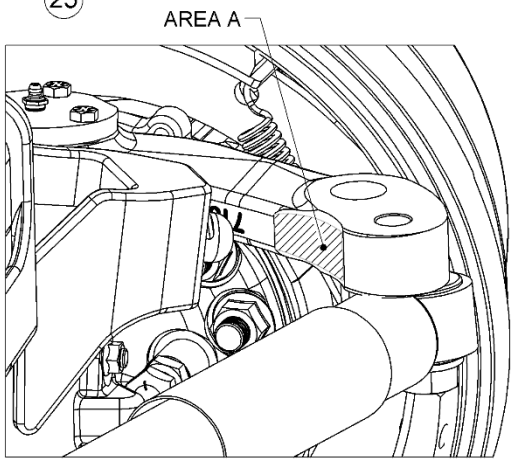



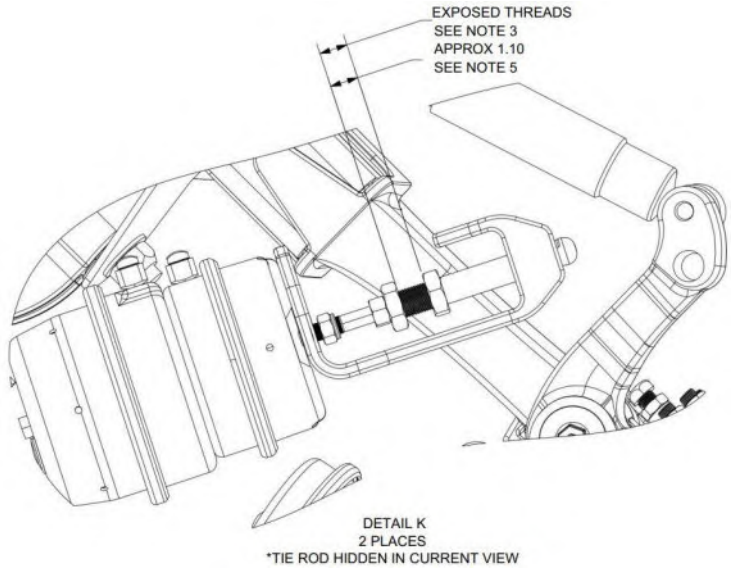



# BILL OF MATERIALS

## ASAPAT/RTSE 1000/1200




ABS INSTALL NOTES (ABS):

1. INSERT SPRING AND RETAINER INTO ABS BUSHING BEFORE INSTALLING BUSHING INTO ABS MOUNTING HOLE IN KNUCKLE
2. PRESS ABS BUSHING AND SPRING RETAINER INTO KNUCKLE FROM SPINDLE SIDE SUCH THAT THE BUSHING END PROTRUDES APPROX .300 IN FROM THE BRAKE MOUNTING FACE
3. INSERT ABS SENSOR THRU SPRING RETAINER AND ABS BUSHING FROM SIDE OPPOSITE SPINDLE. INSERT ABS SENSOR INTO BUSHING UNTIL SENSOR LIGHTLY CONTACTS TONE RING ON HUB
4. VERIFY ABS SENSOR FUNCTION. REFER TO ENG INS-014 IFS WHEEL END ASSEMBLY, SECTIONS 8 AND 9 FOR ABS TEST SPECIFICATION AND PHYSICAL CHECK
5. COIL WIRE LEAD FROM ABS SENSOR AND SECURE TO BRAKE CHAMBER BRACKET WITH TIE STRAP

CENTERING MECHANISM ASSEMBLY ADJUSTMENT (LEFT & RIGHT) NOTES:
**PRIOR TO CENTERING MECHANISM ASSEMBLY ADJUSTMENT, ENSURE OVERALL TOE IS WITHIN SPEC**

**DURING ADJUSTMENT, TIRES MUST BE STEERED STRAIGHT RELATIVE TO CHASSIS (EQUAL TOE ON EACH SIDE RELATIVE TO CHASSIS) (SEE DETAIL K)**

1. APPLY LIBERAL AMOUNT OF MARINE GREASE (WATERPROOF, EX. LUCAS OIL MARINE GREASE OR SUPER LUBE) IN AREA "A" SHOWN
2. CAGE BRAKE CHAMBER SUCH THAT ALL EXTERNAL THREADS ON SNUBBER ARE ENTIRELY EXPOSED
3. UNTHREAD BOTH JAM NUTS BY HAND IN OPPOSING DIRECTIONS UNTIL EACH JAM NUT BOTTOMS OUT ON THE END OF THE THREADS
4. HAND THREAD THE REAR MOST JAM NUT TO POSITION SHOWN IN DETAIL K
5. UNCAGE BRAKE CHAMBER UNTIL REAR MOST JAM NUT CONTACTS INSIDE CASTING FACE
6. ADJUST CLEARANCE BETWEEN SNUBBER AND STERRING ARM BY ROTATING REAR MOST JAM NUT UNTIL CLEARANCE OF .O15" IS OBTAINED
7. **HAND THREAD FORWARD MOST JAM NUTS UNTIL IT CONTACTS REAR MOST JAM NUT
8. TORQUE JAM NUTS IN POSITION TO 120 LB-FT (**UNITS PRIOR TO HAVING LOCK WASHER BETWEEN JAM NUTS WILL REQUIRE LOCTITE 242 ON THREADS PRIOR TO TORQUING JAM NUTS)

# BILL OF MATERIALS

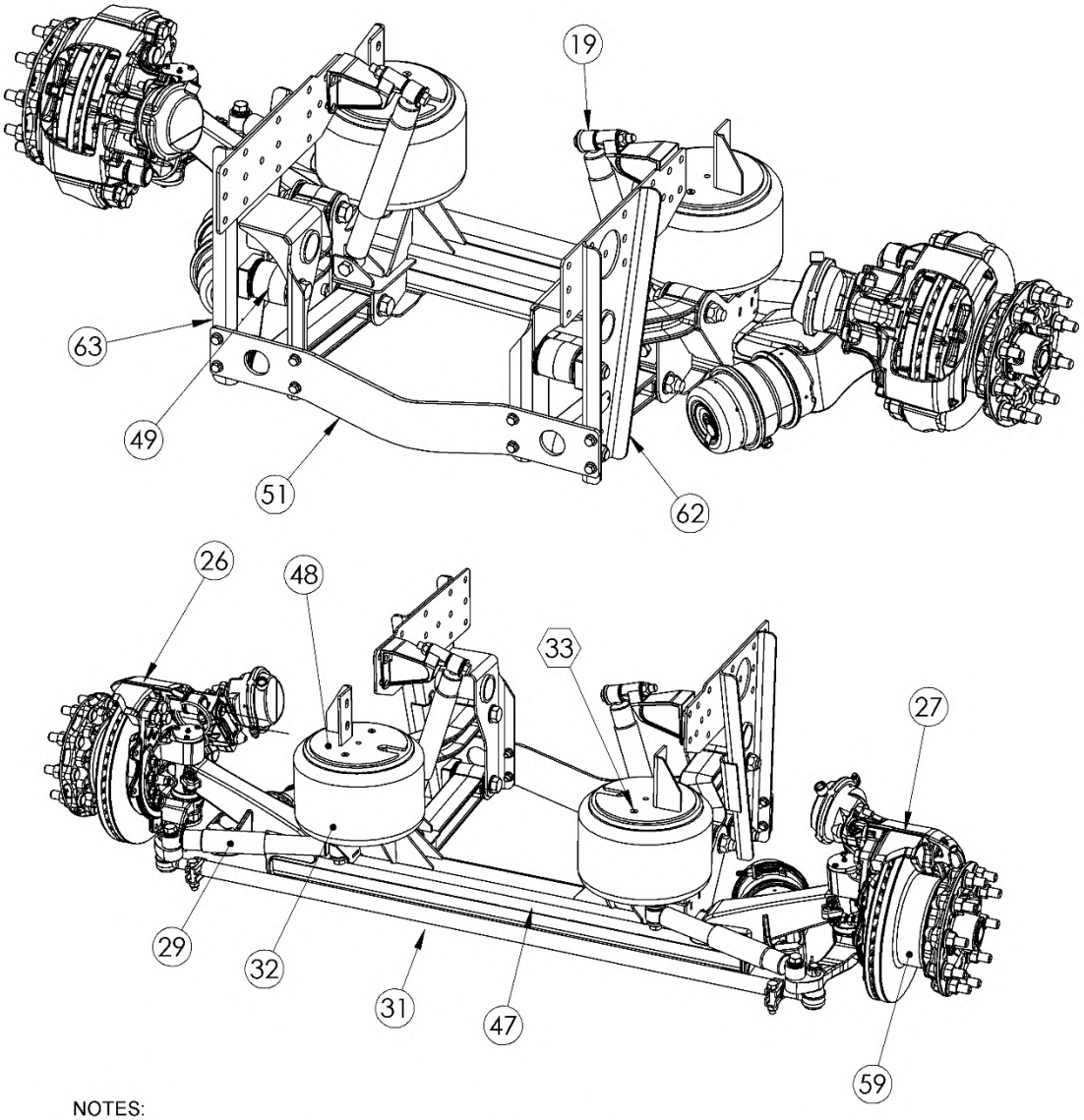
## ASAPAT/RTSE 1400

| Item | Part No. | Description | Torque (LB-FT) | Item | Part No. | Description | Torque (LB-FT) |
|---|---|---|---|---|---|---|---|
| 1 | 126 | HHB 5/8-18 X 2, GR. 8, ZN | 150-180 | 38 | 716175-01 | FF/FG KNUCKLE KING PIN CAP | |
| 2 | 167 | HHB, 1-14 X 6 GR .8 ZY | 750-790 | 39 | 712877-12 | INSERT-FOAM, KNUCKLE PIN | -- |
| 3 | 188 | POP RIVET .125 DIA X .525 L | -- | 40 | 712877-13 | DRAW KEY, 3.73IN | 30-45 |
| 4 | 266 | HHB 5/16-18 GR5 ZC W/SLW | 12-16 | 41 | 712877-14 | DRAW KEY HEX NUT | 30-45 |
| 5 | 276 | FHB 1/2-13 X 1.75 GR 8 ZN | 70-80 | 42 | 712877-15 | BELLEVILLE WASHER | -- |
| 6 | 307 | FHB 1/2-13 X 1.50, GR. 8, ZINC | 70-80 | 43 | 712877-17 | THRUST BEARING | -- |
| 7 | 308 | LFN 1/2-13, GR. G ZN | 70-80 | 44 | 716427-01 | FF/FG KNUCKLE KINGPIN | |
| 8 | 2571 | HFW 1 .09# | -- | 45 | 716438-01 | ASY, KNUCKLE, LH | -- |
| 9 | 2617 | PLATE-SERIAL NO | -- | 46 | 716438-02 | ASY, KNUCKLE, RH | -- |
| 10 | 4599 | LFN 5/8-18 G PH | 150-180 | 47 | 713163-01 | AXLE WELDMENT - ASAPAT | -- |
| 11 | 6946 | ABS - SENSOR SPRING RETAINER | -- | 48 | 713167-02 | AIR SPRING MOUNT, UPPER | -- |
| 12 | 7328 | ABS SENSOR (STRAIGHT W LEAD) | -- | 49 | 713190-01 | CONTROL LINK, UPPER ASY | -- |
| 13 | 12895-02 | WSHR FLAT 3/4 X 2.00 X .100 HD | -- | 50 | 713191-01 | CONTROL LINK, LOWER ASY | -- |
| 14 | 20185-03 | SHOCK BRACKET, UPPER | -- | 51 | 713254-01 | HANGER CROSS PLATE | -- |
| 15 | 25153-01 | BOLT HEX 3/4-16 UNG 5.50 GR 5 | 165-195 | 52 | 714147-02 | GASKET HUB CAP | -- |
| 16 | 100048-P1 | HHB 1/2-13 X 1 GR8 ZN | 30-35 | 53 | 714176-01 | STUD HUB CAP | 12-16 |
| 17 | 101445-P1 | COTTER PIN- 1/8 X 1 1/2 | -- | 54 | 714615-01 | CENTERING MECHANISM ASSEMBLY | -- |
| 18 | 700020-01 | HHB 1-14 X 7, GR. 8 ZN | 750-790 | 55 | 714944-02 | FT STEER STOP 5/8-18 X 2-3/4 | -- |
| 19 | SEE TABLE 2 | SHOCK ABSORBER | -- | 56 | 714945-01 | JAM NUT 5/8-18 UNC GR.B | 110-120 |
| 20 | 700690-04 | HHB M20-2.5 X 60 CL10.9 ZN | 375 | 57 | 714950-01 | INTERNAL RETAINING RING 1-1/2 OD | -- |
| 21 | 702703-01 | SHIM 3.50X1.00X.125 THK. | -- | 58 | 715050-01 | STEER STOP TUBE | -- |
| 22 | 703553-02 | HFW M20 40X23X3 ZN | -- | 59 | 715063-01 | HUB/ROTOR ASSY, CONMET | -- |
| 23 | 704140-01 | WEAR SPACER, POLYETHYLENE | -- | 60 | 716022-01 | 350 DEGREE TORQUE PLATE | -- |
| 24 | 704153-01 | BUSHING AIR SPRING PIVOT | -- | 61 | 716022-02 | 350 DEGREE TORQUE PLATE | -- |
| 25 | 705011-27 | SLEEVE ABS MOUNTING | -- | 62 | 716281-01 | HANGER WELDMENT LIGHT, LH | -- |
| 26 | 707240-01 | CALIPER ASM ADB22X LH | -- | 63 | 716281-02 | HANGER WELDMENT LIGHT - RH | -- |
| 27 | 707240-02 | CALIPER ASM ADB22X RH | -- | 64 | 8120384 | SLW 1/2 .523X.873X.135 ZP | -- |
| 28 | 707980-01 | FN M22-1.5 X 27MM | SNUG | 65 | 8131017 | FW 3/4 .812X1.469X.134 ZP | -- |
| 29 | 709750-01 | SHOCK ABSORBER | -- | 66 | 8223829 | HHB 3/4-16 X 3.0 8 ZN | 165-195 |
| 30 | 710825-13 | INSTALLATION, HUB OIL, 80W90 | -- | 67 | 8223831 | HHB 3/4-16 X 3.50, GR. 8, ZN | 165-195 |
| 31 | 711775-7206 | TIE ROD ASY-72.06 | -- | 68 | 89422308 | LN 3/4-16, GR. C | 150-175 |
| 32 | 712702-01 | AIR SPRING ASY | -- | 69 | 89422312 | LN 1-14 GR C PHOS & OIL | 675-725 |
| 33 | 712749-01082 | SFHCS 3/8-16 X 1 GR8 ZN | 30-35 | 70 | 89429048 | N 5/16-18 8 ZN | 12-16 |
| 34 | 712867-01 | HUB CAP, SENTINEL - 4.50 BCD | -- | 71 | T-2437 | LW 5/16 | -- |
| 35 | 712877-04 | SHIM .030 THK | -- | 72 | 700525-04 | GASKET, KING PIN CAP | - - |
| 36 | 712877-05 | SHIM .005 THK | -- | 73 | 705011-16 | GREASE FITTING, STRAIGHT | - - |
| 37 | 712877-06 | SHIM .010 THK | -- | 74 | 705011-15 | BOLT, KING PIN CAP | 20-30 |

| TABLE 2 | | | |
|---|---|---|---|
| **PART NUMBER** | **DESCRIPTION** | **RATING (LB)** | **SHOCK (ITEM 19)** |
| ASAPAT1403-DS | ASAPAT1403-DS TOP LEVEL ASSEMBLY | 14,000 | 700178-12 |
| RTSE1403-DSK | RTSE1403-DSK TOP LEVEL ASSEMBLY | 14,000 | 716088-01 |

# BILL OF MATERIALS

## ASAPAT/RTSE 1400




NOTES:

TIGHTEN TIE ROD NUTS TO 90-100 LB-FT. THEN TIGHTEN NUT UNTIL CUTOUTS ALIGN WITH COTTER PIN HOLE. INSTALL COTTER PIN. AFTER TOE IS SET, TORQUE TIE ROD CLAMPS TO 55-60 LB-FT

TORQUE FASTENERS TO VALUES LISTED IN BOM UNLESS OTHERWISE NOTED

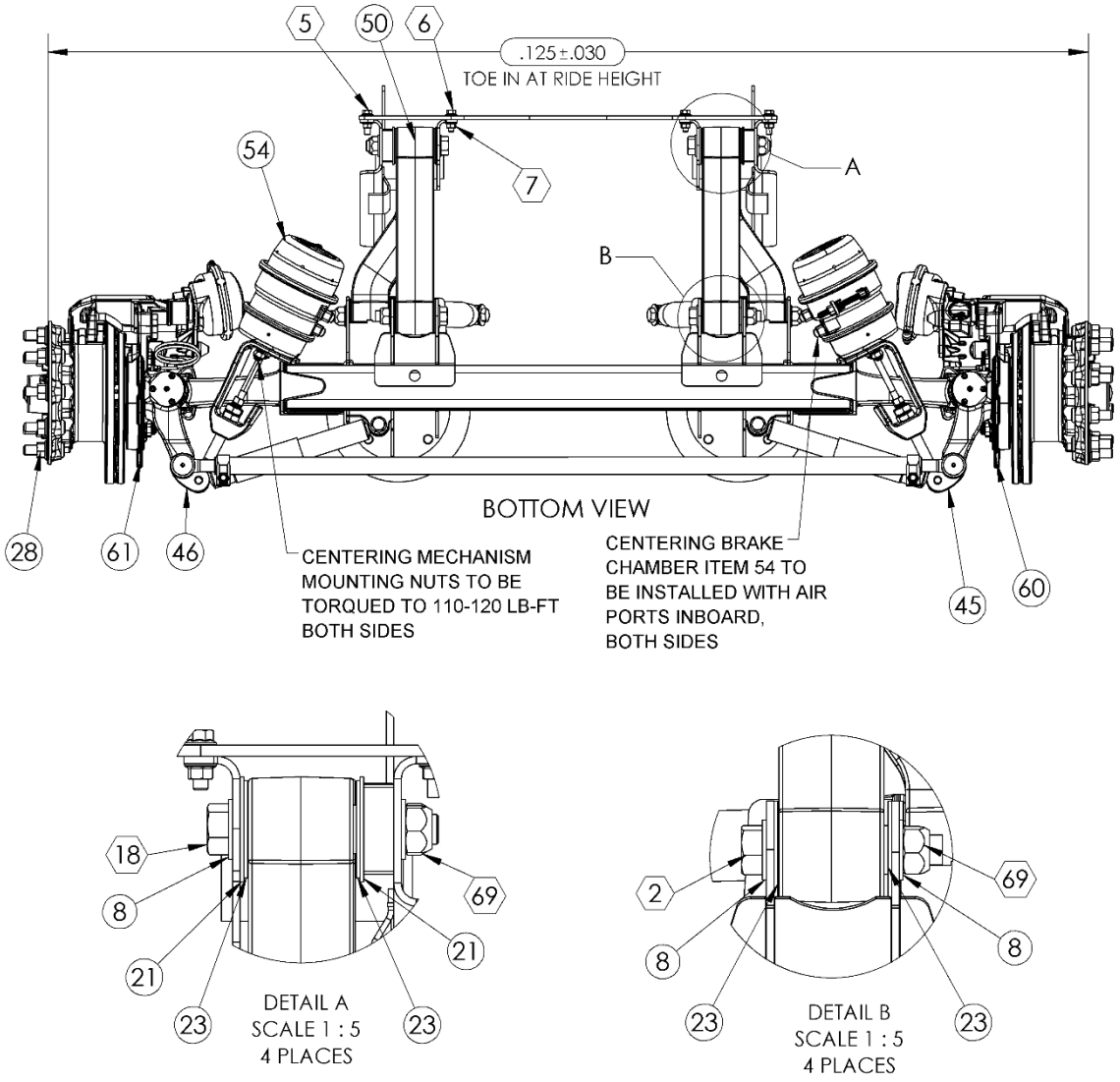
ITEMS IN HEXAGON BALLOONS ARE TO BE TORQUED PER VALUES LISTED IN BOM

ITEMS IN DIAMOND BALLOONS ARE TO BE INSTALLED WITH MEDIUM STRENGTH THREAD LOCKER ON THREADS, THEN TORQUED PER VALUES LISTED IN BOM

INSTALL STEER SHOCK (29) WITH BOOTED END OUTBOARD

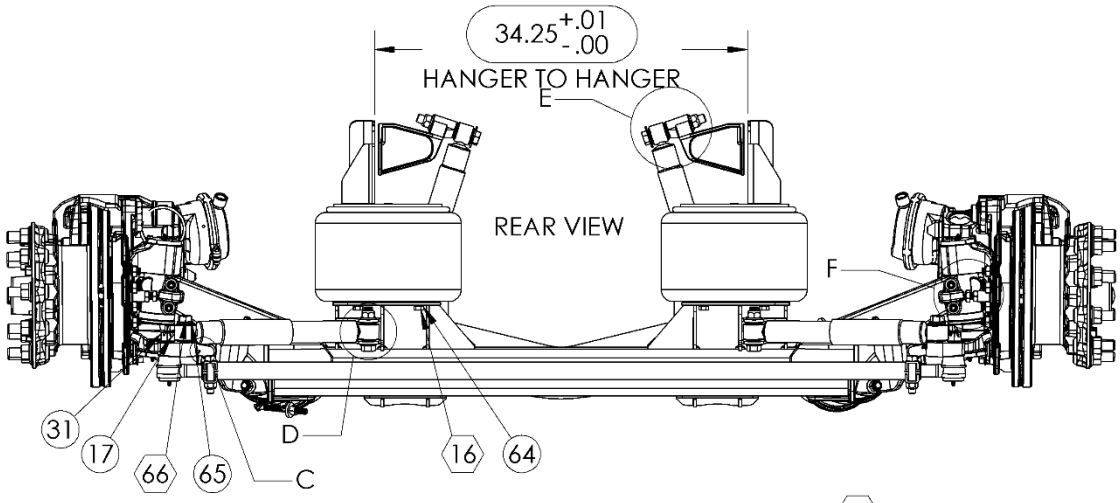
# BILL OF MATERIALS

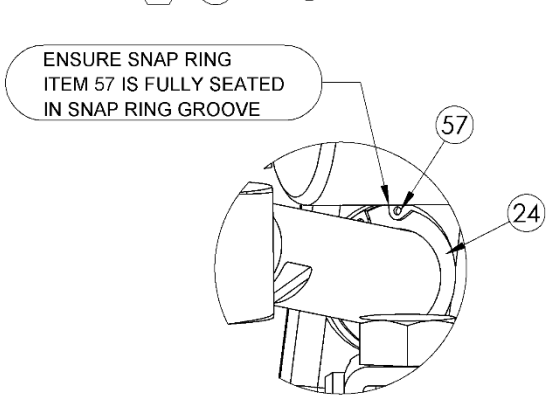
## ASAPAT/RTSE 1400



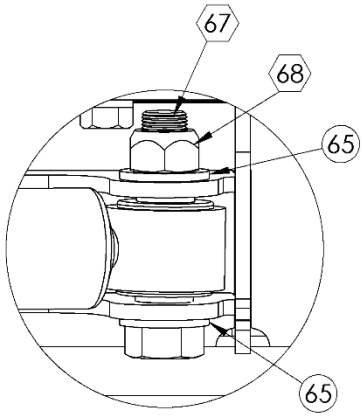
# BILL OF MATERIALS

## ASAPAT/RTSE 1400

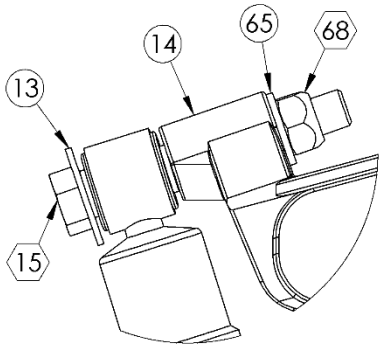


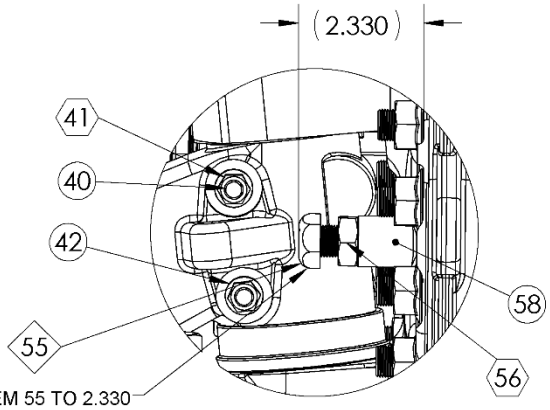

DETAIL C
SCALE 1 : 1.5
2 PLACES




DETAIL D
SCALE 1 : 2.5
2 PLACES




DETAIL E
SCALE 1 : 3
2 PLACES

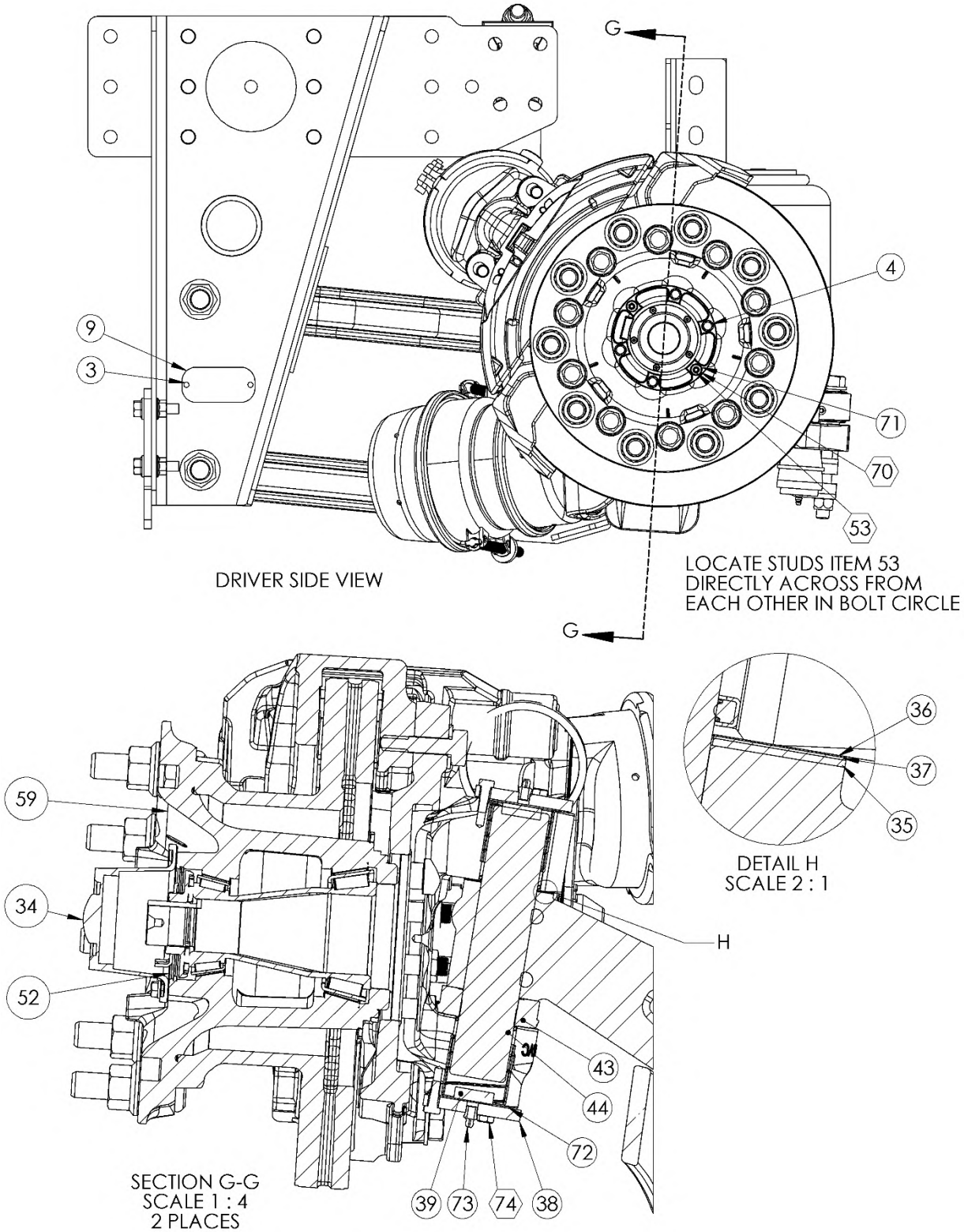



SET ITEM 55 TO 2.330
FROM MACHINED
KNUCKLE SURFACE

DETAIL F
SCALE 1 : 3
2 PLACES

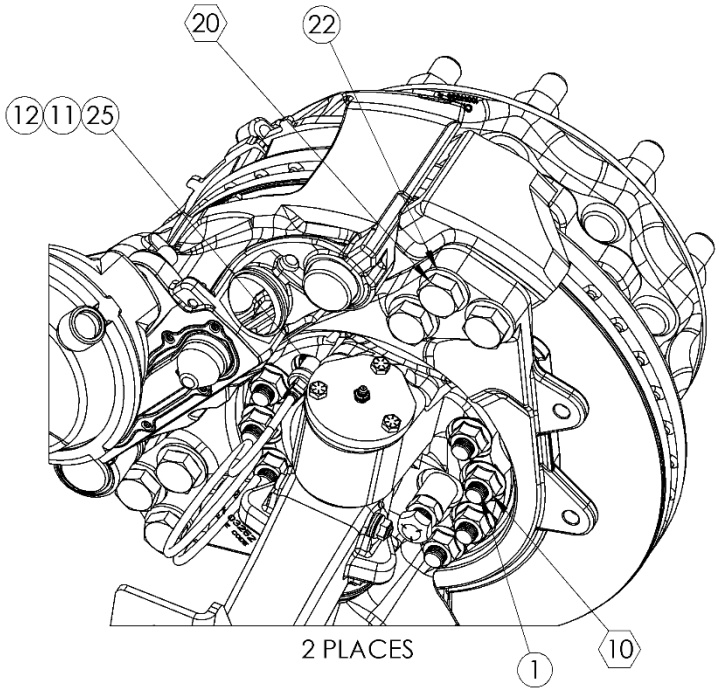
# BILL OF MATERIALS

## ASAPAT/RTSE 1400



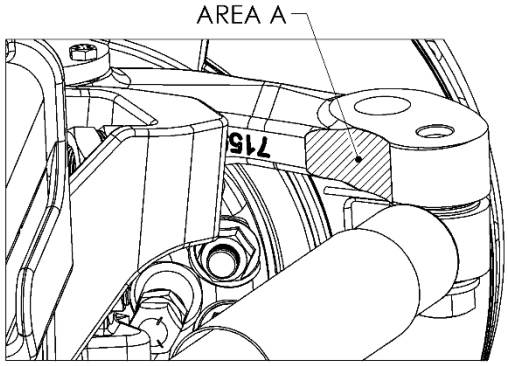
# BILL OF MATERIALS

## ASAPAT/RTSE 1400




ABS INSTALL NOTES (ABS):

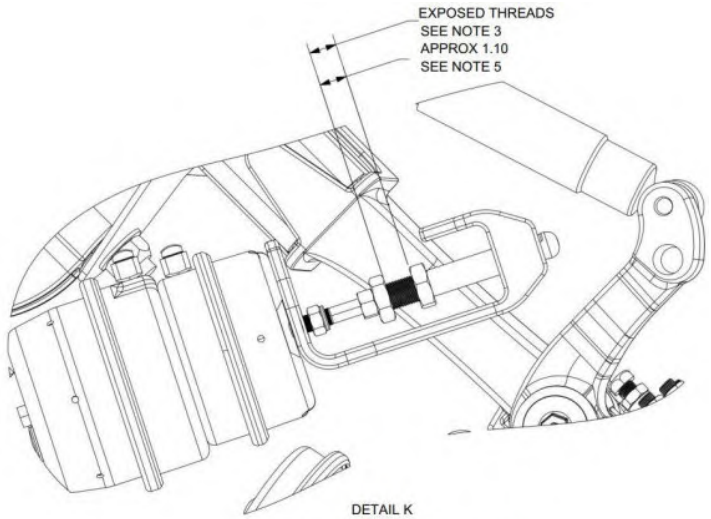
1. INSERT SPRING AND RETAINER INTO ABS BUSHING BEFORE INSTALLING BUSHING INTO ABS MOUNTING HOLE IN KNUCKLE
2. PRESS ABS BUSHING AND SPRING RETAINER INTO KNUCKLE FROM SPINDLE SIDE SUCH THAT THE BUSHING END PROTRUDES APPROX .300 IN FROM THE BRAKE MOUNTING FACE
3. INSERT ABS SENSOR THRU SPRING RETAINER AND ABS BUSHING FROM SIDE OPPOSITE SPINDLE. INSERT ABS SENSOR INTO BUSHING UNTIL SENSOR LIGHTLY CONTACTS TONE RING ON HUB
4. VERIFY ABS SENSOR FUNCTION. REFER TO ENG INS-014 IFS WHEEL END ASSEMBLY, SECTIONS 8 AND 9 FOR ABS TEST SPECIFICATION AND PHYSICAL CHECK
5. COIL WIRE LEAD FROM ABS SENSOR AND SECURE TO BRAKE CHAMBER BRACKET WITH TIE STRAP




CENTERING MECHANISM ASSEMBLY ADJUSTMENT (LEFT & RIGHT) NOTES:
**PRIOR TO CENTERING MECHANISM ASSEMBLY ADJUSTMENT, ENSURE OVERALL TOE IS WITHIN SPEC**

**DURING ADJUSTMENT, TIRES MUST BE STEERED STRAIGHT RELATIVE TO CHASSIS (EQUAL TOE ON EACH SIDE RELATIVE TO CHASSIS) (SEE DETAIL K)**

1. APPLY LIBERAL AMOUNT OF MARINE GREASE (WATERPROOF, EX. LUCAS OIL MARINE GREASE OR SUPER LUBE) IN AREA "A" SHOWN
2. CAGE BRAKE CHAMBER SUCH THAT ALL EXTERNAL THREADS ON SNUBBER ARE ENTIRELY EXPOSED
3. UNTHREAD BOTH JAM NUTS BY HAND IN OPPOSING DIRECTIONS UNTIL EACH JAM NUT BOTTOMS OUT ON THE END OF THE THREADS
4. HAND THREAD THE REAR MOST JAM NUT TO POSITION SHOWN IN DETAIL K
5. UNCAGE BRAKE CHAMBER UNTIL REAR MOST JAM NUT CONTACTS INSIDE CASTING FACE
6. ADJUST CLEARANCE BETWEEN SNUBBER AND STERRING ARM BY ROTATING REAR MOST JAM NUT UNTIL CLEARANCE OF .O15" IS OBTAINED
7. **HAND THREAD FORWARD MOST JAM NUTS UNTIL IT CONTACTS REAR MOST JAM NUT
8. TORQUE JAM NUTS IN POSITION TO 120 LB-FT (**UNITS PRIOR TO HAVING LOCK WASHER BETWEEN JAM NUTS WILL REQUIRE LOCTITE 242 ON THREADS PRIOR TO TORQUING JAM NUTS)



Repairs

# Pre-Adjusted with Integral Spindle Nut Wheel Hubs

## Recommended Service

When inspections indicate that service is necessary on a Pre-Adjusted with Integral Spindle Nut Hub, follow the recommended service, inspection, reassembly and reinstallation instructions found in the following section. In order to ensure optimum wheel hub performance, Reyco Granning recommends that only approved Pre-Adjusted with Integral Spindle Nut service parts be used to replace all critical components of the system. Refer to the back of this section for a listing of approved parts.

### WARNING

**Vehicles on jacks can fall, causing serious personal injury or property damage. Never work under a vehicle supported by a jack without supporting the vehicle with stands and blocking the wheels. Wear eye protection.**

1. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
2. Raise the axle until the tires are off the floor.
3. Place safety stands under the vehicle as specified by the chassis manufacturer.
4. Remove the tire and wheel assembly using procedures specified by the wheel manufacturer.
5. For disc brakes, remove caliper per manufacturers' recommended procedure.
6. Place a container under the hubcap to receive the draining oil, then remove the hubcap or drive axle shaft. Do not reuse the oil. Correctly dispose of the lubricant.
7. Remove the red locking ring. Use caution not to damage the locking ring. Do not remove the spiral snap ring that holds the spindle nut in the hub.

### WARNING

**Never loosen the axle spindle nuts by striking them directly with a hammer or striking them with a drift or chisel placed against them. Damage to the parts will occur, causing possible loss of axle wheel-end components and serious personal injury.**

8. Use a breaker bar to loosen the spindle nut. Pre-Adjusted with Integral Spindle Nut spindle nut installation torque is **300 lb-ft**.

**NOTE: Use only 6-point forged sockets for installation and removal of Pre-Adjusted with Integral Spindle Nut spindle nuts.**

9. After the spindle nut is initially loosened with a breaker bar, continue to unthread the spindle nut to remove the hub from the spindle. The internal snap ring will act as a hub puller and will aid in removal of the hub from the spindle. Do not exceed 50 ft-lbs of torque when removing the hub from the spindle. If the hub will not come off the spindle without exceeding this torque value, remove the spiral snap

ring and the spindle nut assembly and use a conventional hub puller to remove the hub from the spindle.

10. Slide the hub off the spindle. Remove and save the outer bearing cone. Be careful when you remove the hub that you do not damage the outer bearing by dropping it on the floor. If the hub is difficult to remove because the seal is stuck on the spindle, use a mechanical puller to remove the hub. If part of the seal remains on the spindle, carefully remove the part of the seal that remains on the spindle.

**NOTE: If the bearing does hit the floor, while removing the hub, clean and inspect the bearing as stated in the section below.**

11. Place the hub on its outboard end and remove the seal. Retain the seal if it needs to be returned for warranty consideration.
12. Remove the inner bearing cone and spacer.

**NOTE: Component Inspection and Replacement Hazard Alert Messages**

Read and observe all hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

## WARNING

**To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.**

**Observe all warnings and cautions provided by the press manufacturer to avoid damage to components and serious personal injury.**

Do not hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result. Use brass or synthetic mallet for assembly and disassembly procedures.

Solvent cleaners can be flammable, poisonous and cause burns. Examples of solvent cleaners are carbon tetrachloride, and emulsion-type and petroleum-based cleaners. Read the manufacturer's instructions before using a solvent cleaner, then carefully follow the instructions. Also follow the procedures below. Wear safe eye protection.

Wear clothing that protects your skin.

Work in a well-ventilated area.

Do not use gasoline or solvents that contain gasoline. Gasoline can explode.

You must use hot solution tanks or alkaline solutions correctly. Read the manufacturer's instructions before using hot solution tanks and alkaline solutions. Then carefully follow the instructions.

**CAUTION**

**Do not use hot solution tanks or water and alkaline solutions to clean ground or polished parts. Damage to parts can result.**

**CAUTION**

**Clean and dry components Worn or Damaged Components**

**WARNING**

**Do not repair or recondition wheel-end components. Replace damaged, worn or out-of-specification components. Do not mill or machine any components. Using repaired, reconditioned, damaged or worn components can cause wheel end failure, which can result in serious injury and property damage.**

### Hub and Component Cleaning

1. Use a clean filtered solvent to clean the hub and all wheel end components.
2. Clean and inspect the wheel bearing cups and cones, race, spindle bearing and seal journals on the spindle and hub. Bearings should be cleaned with clean filtered solvent and dried with a lint-free rag.
3. Clean and inspect the spindle. Be sure to clean the full length of the seal journal on the spindle.
4. Parts must be dried immediately after cleaning. Dry parts with clean paper towels or rags. Do not dry bearings by spinning with compressed air.
5. Apply light oil to cleaned and dried parts that are not damaged and are to be immediately assembled. Use only the type of oil used by the manufacturer. Do NOT apply oil to the brake linings or the brake drums.
6. If the parts are to be stored, apply a good corrosion preventative to all surfaces. Do NOT apply the material to the brake linings or the brake drums. Store the parts inside special paper or other material that prevents corrosion.

### Inspecting Bearing Cups, Cones & Bearing Spacer

**NOTE: Pre-Adjusted with Integral Spindle Nut hubs use a precision-machined spacer in conjunction with specially toleranced bearings to control wheel end play. Reyco Granning recommends installing a new Pre-Adjusted with Integral Spindle Nut service kit when inspection indicates that component replacement is necessary. Pre-Adjusted with Integral Spindle Nut service kits are available from a parts dealer or distributor.**

**CAUTION**

**If you choose to reuse existing bearings at this service, they must be inspected in accordance with the bearing manufacturers recommended guidelines.**

**CAUTION**

**If this inspection indicates that existing bearing component(s) must be replaced, bearing cups and cones must be replaced as a set. Whenever new bearings are installed, replacement of the bearing spacer is also recommended.**

1. After components have been properly cleaned, visually inspect the cups, cones and spacer for any wear or damage. Reference materials for proper bearing inspection procedures are available from the bearing manufacturers.

   Bearing spacers should be visually inspected for signs of wear or damage. Carefully inspect the machined ends of the bearing spacer. Wear of the bearing spacer can appear as a sharp ring of standing metal at either edge of the machined surfaces. Replace the spacer if it has visible wear evidenced by a raised edge on the machined end.

2. If removal or replacement is required, follow the steps outlined below.

### Removing Cups in Iron Hubs

1. On an iron hub, remove the bearing cup using a large hammer and a mild steel bar or a hydraulic press. Take precautions to avoid damaging the bearing cup bore and shoulder.

**2.** Inspect the bearing cup bore for evidence of cup rotation or spun cups. If cup rotation exists, replace the hub.

### Installing a New Cup in Iron Hubs

Iron hubs do not need to be heated for bearing cup installation. Press the bearing cup into the hub, being certain that it is fully seated. Use a 0.001" to 0.002" feeler gauge to ensure the cup is fully seated against the shoulder of the bearing bore.

## Pre-Adjusted with Integral Spindle Nut Wheel Hubs

### Reassembly

**CAUTION**

**When using an oil bath system, do not pack the bearing with grease. Grease will prevent the proper circulation of axle lubricant and can cause premature wheel seal and bearing failure.**

1. Place the hub, seal end up, on a clean work bench surface.
2. For steer hubs, install the tubular bearing spacer with the tapered end down.
3. Lubricate the inner bearing cone with the same lubricant as will be used in the hub and install it into the inner bearing cup.

**NOTE: The seal must be replaced every time the hub is removed from the spindle. Do not apply any gasket sealant to the seal's outer or inner diameter. Always use the seal installation tool specified by the seal manufacturer. Using an improper tool can distort or damage the seal and cause premature seal failure.**

4. Position the seal into the hub bore. Use a flat plate and a small mallet to install the seal.

**NOTE: Seals require the proper tool for installation. For other seals, refer to the specific manufacturers' instructions.**

5. When installing the seal, tap the adapter plate of the installation tool around the outer edge to position the seal. Drive the wheel seal into place. Once the tool bottoms out, the seal is installed correctly.
6. Check to be certain the seal is not cocked and that the seal inner diameter and the inner bearing turn freely.
7. Lubricate the inner diameter of the seal with a light film of the same lubricant as will be used in the hub.

**CAUTION**

**Failure to lubricate the inner diameter of the seal may result in premature seal failure.**

8. Turn the hub over and place it seal end down on a dry clean surface. Install a bearing spacer. If the spacer has a tapered end, it should face towards the outboard end of the hub.
9. Lubricate the outer bearing cone with the same lubricant as will be used in the hub and install it into the hub assembly.

### Spindle Nut and Spiral Snap Ring Reassembly

1. Seat the flat washer into the back of the spindle nut.
2. Position the spindle nut and washer against the outer bearing.
3. Install the spiral snap ring into the snap ring groove in the hub. Make sure that the snap ring is fully seated into the groove in the hub.

## Installing the Pre-Adjusted with Integral Spindle Nut

### Wheel Hub Assembly

**WARNING**

**Failure to fill the hub with the correct amount of lubricant can cause premature failure of the Pre-Adjusted with Integral Spindle Nut hub assembly, which, if not avoided, could result in death or serious injury.**

**NOTE: Use the proper hubcap for the type of lubricant intended to be used.**

1. Clean the spindle to remove any lubricant, corrosion prevention coating, foreign material, or surface rust that may be present.
2. Lubricate the bearing journals on the spindle, or the inside diameter of the bearing cones with Grade 2 grease or the lubricant that will be used in the wheel end. Do not coat the seal journal on the spindle.
3. Lubricate the inside diameter of the seal with the same lubricant that will be used in the wheel end.
4. If present, remove the red locking snap ring from the spindle nut. Verify that the bearing spacer is in proper alignment. Align the key or

flat on the washer with the keyway or flat on the spindle as the hub is placed onto the spindle. Use a smooth firm motion and place the hub onto the spindle. When the threads on the nut engage the threads on the spindle, rotate the nut in a clockwise direction to fully engage the threads.

5. Torque the spindle nut to **300 lb-ft** while rotating the hub. DO NOT BACK OFF THE SPINDLE NUT.
6. Visually examine the three holes in the face of the spindle nut. One of the holes will line up with the holes in the inner washer. Install the tab of the red locking snap ring through the hole in the nut and washer that are aligned. Spread the locking ring, push it over the spindle nut and in to the machined grooves in the spindle nut. Use caution not to bend the locking ring permanently. If the locking ring is damaged or bent, replace it with a new one.
7. Install the hub cap with a new gasket. Torque the hub cap bolts in a star pattern to **12 to 16 lb-ft**.

1. Connect a voltmeter to the connector pins of the sensor lead wire. Set the voltmeter to read AC voltage on a millivolt scale.
2. Spin the hub by hand and read the voltage output of the sensor. A minimum reading of 800mV (.8V) AC is required. Skip to Step 6 if minimum reading is obtained.
3. If the minimum reading is not obtained, then check the voltmeter connection and proximity of the sensor and tone ring. The air gap between the sensor and tone ring should not exceed .027”. Repeat step 4.
4. If the minimum reading is not obtained, check the tone ring for damage and its installation. The tone ring should have a maximum run out of .008”. Replace as needed and repeat step 4.
5. If the minimum reading is still not obtained, then replace the sensor and repeat the installation procedure.
6. Route and secure the sensor lead wire the same as the removed sensor.
7. Connect the sensor lead wire to the chassis. Secure wire lead to prevent damage during suspension movement.

# MAINTENACE SCHEDULE

Maintenance Schedule

| GENERAL MAINTENANCE | SERVICE TO BE PERFORMED | MILEAGE INTERVAL (IN THOUSANDS) | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 3 | 15 | 30 | 60[2] |
| Control Arm Pivot Connections | Check locknut torque | X | X | X | X | X |
| | Inspect for looseness from worn components | | X | X | X | X |
| | Inspect for bushing wear | | X | X | X | X |
| Air Springs | Inspect for proper clearance (1" minimum all around) | | X | X | X | X |
| | Check mount nut and bolt torque | | X | | | |
| | Inspect for signs of chafing or wear | | X | X | X | X |
| | Check air line fitting connections | | X | | | |
| | Inspect for air leaks using soapy water solution | | X | | | |
| Air Fittings and Air Lines | Inspect for air leaks using soapy water solution | X | X | X | X | X |
| | Inspect for signs of chafing, cracking, or wear | X | X | X | X | X |
| Wheels and Hubs | Check wheel nut torque[1] | X | X | X | X | X |
| | Check hub end play | X | X | X | X | X |
| Brakes | Check slack setting | X | X | X | X | X |
| | Check brake shoe wear | X | X | X | X | X |
| Automatic Slack Adjuster, and Brake Cam Bushings | Grease[3] | X[3] | X[3] | X[3] | X[3] | X[3] |
| Centering Mechanism Assembly | Inspect straightening pin gap, (straight steered) | 1 year / 2500 miles[4] | | | | |
| | Re-grease steer arm at snubber contact patch | 1 year / 2500 miles | | | | |

## Axle Lubrication Schedule

| Axle Component | Lubrication Interval | Lubrication Type |
|---|---|---|
| King Pin | 6 mo. / 2500 miles | Multipurpose NLGI 2 or equivalent chassis lubrication |
| Tie Rod Ends | 6 mo. / 2500 miles | Multipurpose NLGI 2 or equivalent chassis lubrication |
| Wheel Bearing Lubrication | Check oil level every 1000 miles | EP-SAE 90 gear oil or equivalent chassis lubrication |

[1] Wheel nut toque must be checked after the first 50 to 100 miles of service.
[2] Continue to perform period inspections every 15,000 miles or at regular engine service intervals.
[3] Grease the brake automatic slack adjuster and the cam bushing at 2,500-mile intervals.
[4] See pages 17 & 23 for centering mechanism adjustment if gap out of tolerance (jam nut breakaway torque: 130 lb-ft)

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