SECTION 7 - RUNNING GEAR

WHEELMOTORS

DESCRIPTION AND LOCATION

The wheelmotors are cylindrical shaped electric motor drive power packages attached to the side of the axlebox inside each of the rear dual tire assemblies.

OPERATION

Electrical power from the alternator/generator and control circuits is converted to mechanical power (torque) in the armature assembly. The torque output of the armature is then multiplied by a compound planetary gear reduction system which is transmitted through the torque tube to the dual rear tires.

For a more complete explanation of the operation of a wheelmotor, refer to the appropriate wheelmotor manufacturer's information.

TROUBLESHOOTING, MAINTENANCE AND ADJUSTMENT

Refer to the appropriate wheelmotor manufacturer's information for detailed troubleshooting and maintenance procedures.

REMOVAL

The wheelmotor may be removed as follows:

NOTE: *If an overhead crane is to be used, the dump body must be removed. Refer to the instructions in Section 2 - Structure.*

1. Park the truck in a SAFE POSITION on level terrain and secure so that it cannot move, even if the brakes are released.

2. Jack the truck and remove the tire and rim assemblies as outlined in Section 7 - Running Gear.

3. Drain the oil from the wheelmotor gearbox sump.

4. Disconnect all cables and hoses connected to the motor inside the axlebox. Label each to aid in reconnection.

5. Remove the "rock knockers" or secure them out of the way.

6. Support the wheelmotor by forklift, crane, wheel dolly or other suitable means.

NOTE: *If an overhead crane is to be used either a suitable special fixture must be used or the dump body must be removed. Refer to the instructions in Section 2 - Structure.*

NOTE: *Each wheelmotor assembly weighs* in excess of:*

WHEELMOTOR	*lb**	*kg**
GE 772	*11,000*	*4 990*
GE 776DP	*14,000*	*6 350*
GE 776	*14,500*	*6 575*
GE 787	*25,000*	*11 350*
GE 788	*22,000*	*9 980*
GE 791	*14,000*	*6 350*
*Reliance W-30***	*13,000*	*5 900*
*Reliance W-40***	*18,000*	*8 165*

**Add approximately 700 to 1000 lb (315 to 455 kg) if brakes are to be left installed.*

***With "plug-in" traction motor installed.*

Be sure the lifting mechanism is sufficient to safely lift this weight. Also be sure the motor is supported as recommended by the wheelmotor manufacturer.

7. Remove the capscrews that connect the motor to the axlebox. Move it straight out until the inner edges and equipment are clear of the axlebox before lifting.

8. Set the wheelmotor on blocking as recommended by the manufacturer. Be sure it is sufficient to support the weight and will not damage the wheelmotor.

9. If required, remove the brakes as instructed in Section 8 - Brake System.

SERVICE

Periodic maintenance of the wheelmotors should include the following:

1. Daily, inspect the wheelmotor and attached brakes for evidence of leakage or damage. Repair or replace as required.

2. If the wheel studs are found to be damaged, they may be replaced as followed:

NOTES:
1. Newer stud assemblies incorporate a hex shape on the open end allowing the direct use of the appropriate tools to assist in the removal and installation of the stud.
2. On older assemblies (without the hex), a driver or multiple lug nuts tightened onto the stud to function as a driver may be needed to assist in the removal and installation of the wheel studs.

a. Using suitable tooling, remove the old wheel stud.

NOTE: *In instances where hand tools alone will not work, apply localized heat to the stud or casting to warm to approximately 485° F (240° C). Taking the appropriate measures, remove while hot.*

b. Clean and inspect the threads in the wheelmotor. Repair as required following the directions in the appropriate manufacturer's service publication.

c. Clean and prepare the threads in the wheelmotor and on the stud using the appropriate cleaner/primer for the locking compound to be used.

d. Coat the threads on the stud that will engage the threads in the casting with several drops of Loctite 242 (liquid) or sufficient 248 (stick) material (or equivalent).

NOTE: *More detailed instructions on the proper preparation and use of Loctite is contained in Section 7 – Running Gear.*

e. Insert the cone end of the stud into the threaded hole. Tighten until the cone end contacts the bottom of the hole. A final "light" torque of 15 to 20 ft-lb (20 to 27 Nm) should suffice.

f. Allow the Loctite to cure as required before installing the tires and rims and tightening the wheel clamps.

NOTE: *Full strength typically requires 24 hours. In some installations, special accelerants may be used to decrease this time, but may adversely affect overall total strength. Check/test before using.*

3. Refer to the appropriate manufacturer's manual for detailed information and service procedure.

INSTALLATION

The wheelmotor may be installed as follows:

1. Lift the assembly and maneuver it into position on the axlebox. Threaded studs, 6 or 8 inches (150 or 200 mm) long, screwed into three of the tapped holes in the axlebo will aid in the assembly process.

IMPORTANT: *Because of the limited clearance between the wheelmotor gear case sump and the axlebox, use care during the mating process.*

2. Install the capscrews and hardened washers that connect the assembly to the axlebox, lubricating the threads and washers. Torque to:

a. 1250 - 1400 ft-lb (1700 - 1900 Nm) on trucks with GE 788 and 787 wheelmotors and 776 wheelmotors with 1-1/4 inch capscrews.

b. 895 to 995 ft-lb (1215 to 1350 Nm) on all other trucks.

3. Connect the hoses and cables to the wheelmotor as marked. Bleed entrapped air and contaminants from the brakes as instructed in Section 8 - Brake System.

NOTE: *If the brakes were removed, reinstall them as instructed in Section 8 - Brake System.*

4. Fill the wheelmotor gear sump to the appropriate leve with the required fluid. Refer to the manufacturer's manua for the specific type and amount of lubricant.

5. Reinstall the tire and rim assembly as instructed in Section 7 - Running Gear.

6. Follow the procedure recommended by the manufacturer for testing prior to placing the wheelmotor back into service.

KEY	
01.	Wheelmotor
02.	Stud Bolt
03.	Hardened Flatwasher
04.	Capscrew (Grade 8)
05.	Special Flanged Nut
06.	Wheel Clamp
07.	Dual Spacer
08.	Spin-On Air Filter
09.	Breather Adapter
10.	Pipe Fitting
11.	Adapter Fitting
12.	Pipe Fitting
13.	Pipe Fitting
14.	Hose Clamp
15.	Heater Hose
16.	Drain Valve
17.	Pipe Fitting
18.	Pipe Fitting
19.	Pipe Fitting
20.	Pipe Fitting
21.	Pipe Fitting
22.	Reducer Bushing
23.	Pipe Fitting
24.	Pipe Plug

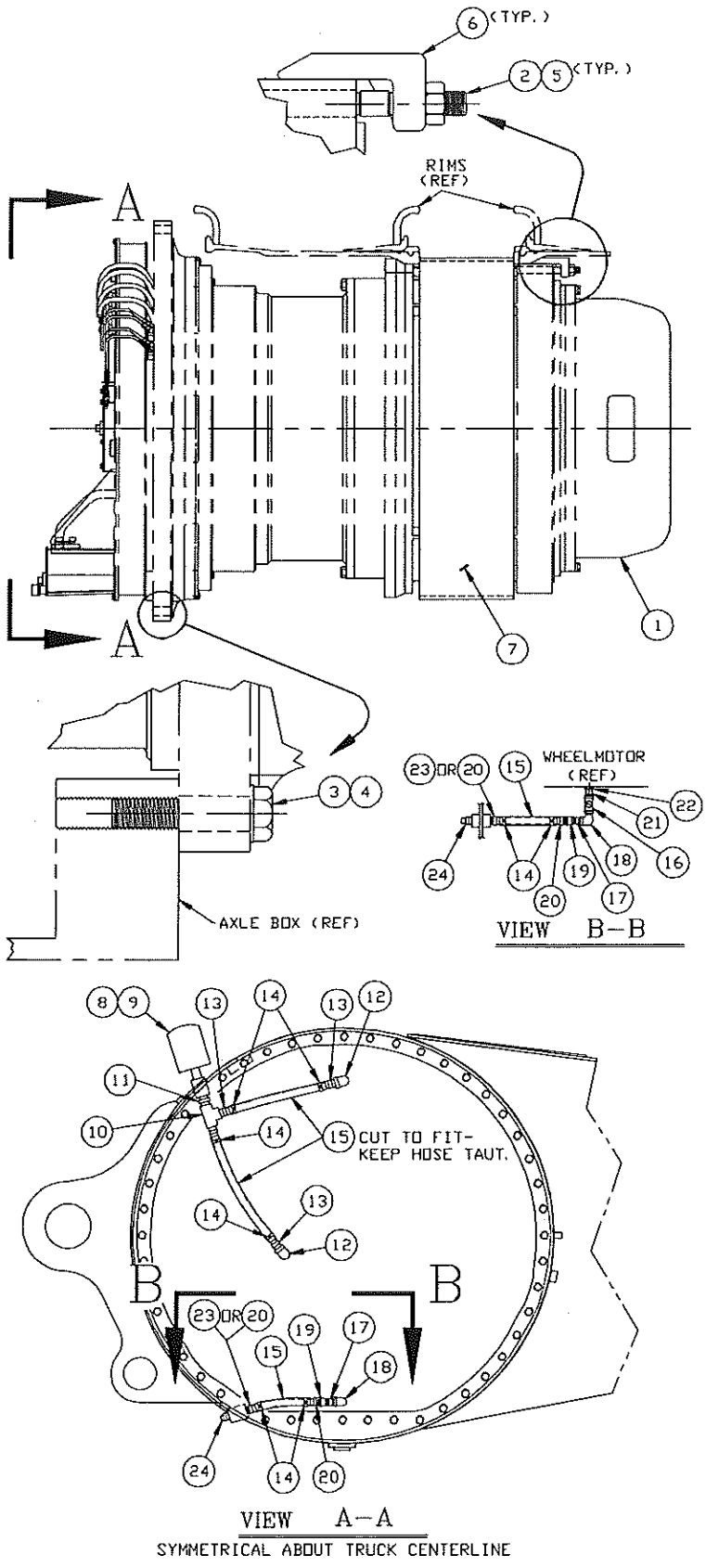


FIGURE 1 - TYPICAL WHEELMOTOR INSTALLATION (A83829)

TIRE AND RIM ASSEMBLY

NOTE: *This module contains information for "5-piece style" rims, available from a variety of sources. For other configurations, refer to Section 9 - Options or the appropriate manufacturer's information.*

DESCRIPTION AND LOCATION

The large rubber tire and metal rim assemblies support the truck. One tire and rim assembly is mounted to each front wheel. Dual tires and rims are mounted to both rear wheelmotors.

OPERATION

Rubber tires support the vehicle weight, and transmit the propulsion, retarding, braking, and steering forces. The tires provide some cushioning due to their construction and hollow, pressurized inner core. Tires are available in several constructions and tread combinations. Refer to the appropriate manufacturer's information for specific details.

The metal rim secures the tire to the wheel, seals the hollow center core, and maintains the basic tire shape. Refer to the appropriate manufacturer for specific information concerning the rim assembly.

NOTE: *Special rim assemblies are now available that allow the tires to be changed without removing the rim assemblies, including the outer dual components, from the truck. If these are installed, the appropriate changes to these instructions must be made. Contact the rim manufacturer or your TEREX|UNIT RIG representative for detailed instructions.*

An optional device is available that releases the compressed gas in each of the assemblies if the temperature or pressure exceed preset limits.

NOTE: *One of these devices, known by the proper name "Defuzer", contains a "rupture disc" designed to release the pressure if the pressure exceeds 190 psi (1 310 kPa) or the temperature exceeds 200° F (93° C). See Figure 3.*

TROUBLESHOOTING

For specific details concerning tire and rim assemblies, contact the appropriate component manufacturer or TEREX|UNIT RIG representative.

MAINTENANCE AND ADJUSTMENT

Periodic maintenance should include the following:

⚠ DANGER

Failure to follow all safety precautions when handling a tire and rim assembly could result in an explosion and serious injury.

IMPORTANT: *Tire and rim servicing can be hazardous unless correct procedures are practiced by trained personnel. The use of personal safety equipment such as hard hats, ear protection, safety glasses and shoes, etc., and proper tools and equipment is highly recommended.*

1. Before performing any inspection and maintenance on the tire and rim assemblies, park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

2. Check the tires for cuts, missing pieces, tread depth or other indications of damage. Repair or replace as required.

3. Check the tires for proper inflation pressures. Because these can vary due to a number of factors including load, haul profile, environmental considerations, etc., refer to the appropriate tire manufacturer's recommendations for specific pressure requirements at your location.

NOTES:

1. Always verify that the side or lock rings are fully seated before adding air.

2. Never reinflate a flat tire on a vehicle. Replace the flat tire with spare or repair before continuing operations. Disassemble and inspect the flat tire and rim assembly thoroughly as outlined in the information in Inspection and Repair later in these instructions.

3. Over-inflation results in high cord stresses which reduce resistance to blowouts from impacts and increases the danger of rock cutting. Under-inflated tires are subject to more deflection and flexing. Operation under this condition will result in uneven tread wear, sidewall radial cracks, ply separation, and loose or broken cords inside the tire.

4. Never run a loaded truck on one tire and rim of a dual assembly. The carrying capacity of that single assembly may be greatly exceeded. Operation of a truck in this manner can cause serious damage to the rim and tire and may result in sudden, unexpected failure.

4. Inspect the rim for proper assembly and evidence of damage or wear. Repair or replace as required.

Never try to reseat rings or other components by hammering while the tire is partially or fully inflated. This may cause the assembly to unexpectedly come apart with great force. If misassembled components are found, deflate, inspect, and reassemble following the correct procedures.

IMPORTANT: *Never add or remove any attachment or modify a rim (especially by heating, welding, or brazing), unless the tire has been removed and approval has been received from* TEREX|UNIT RIG *and the rim manufacturer.*

5. On rims equipped with "Defuzer" valves (or equivalent):

a. Inspect the valve for evidence of damage or leakage.

b. Replacement of the valve is recommended at one year intervals when operating under normal conditions. A more frequent replacement may be necessary due to corrosion, fatigue, temperature, or adverse operating conditions. This may need to be determined through actual operating experience.

NOTES:

1. If a rupture disc is not replaced periodically when exposed to these conditions, premature rupturing of the disc may occur, releasing the pressure in the tire.

2. The valves are supplied fully assembled as a sealed unit. They should be replaced as a complete assembly.

6. Verify that the stud/clamp assemblies are properly installed and torqued, typically to 525 to 550 ft-lb (710 to 745 Nm).

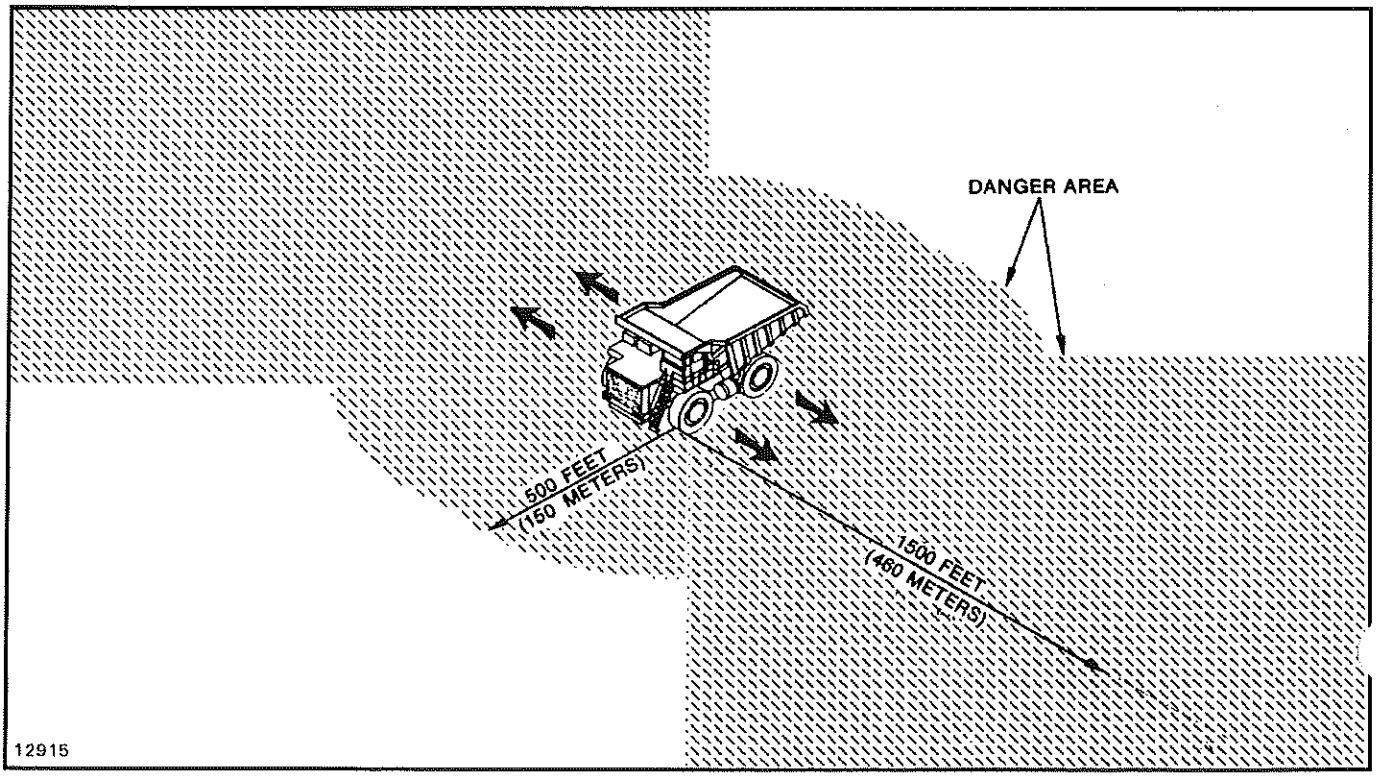
7. Verify that cover caps are installed on each valve stem.

⚠ DANGER

There is danger of tire explosion due to fire/ excessive heat in wheel area.

Whenever the smell of burning rubber or excessively hot brakes is detected on the truck, there could be a distinct possibility of danger of a tire explosion. It could also occur when fire on the truck reaches the tire and wheel area. Under such conditions DO NOT APPROACH THE TRUCK OR ENTER THE DANGER AREA as shown in the illustration. Move the truck to a remote area only if it can be done without endangering the operator or other personnel in the area.

Stay at least 500 feet (150 meters) away from th tread area and 1500 feet (460 meters) from the tire side wall. If it is absolutely necessary to reach the suspect tire, approach from the front or the back of the truck and use a large dozer blade as shield in



front. If there is evidence of brake fire or smell of burning rubber, do not go near the truck. Fight these fires from a distant, remote location. Do not rush to the truck with hand-held fire extinguisher in an effort to control the blaze. Allow at least eight hours for the tire to cool before approaching the truck.

REMOVAL

The tire and rim assembly may be removed as follows:

1. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

⚠ DANGER

Failure to follow all safety precautions when handling a tire and rim assembly could result in an explosion and serious injury.

2. Jack the truck until the tire assembly is clear of the ground. Block securely in this position before proceeding.

⚠ CAUTION

When removing the front tires and rims, place a jack under the bottom of front axle assembly (trucks equipped with beam axles) or the lower frame crossmember (trucks with integrated suspension/ axle assemblies) and use a safety block under the front bumper. When removing the tires and rims, place a jack under the axlebox lower rear suspension mount. Always install blocking as a safety precaution.

3. Completely deflate the tire. If it is a rear dual tire, deflate both tires before loosening any clamps.

⚠ WARNING

Always completely deflate the tire (to zero pressure) before loosening the lug nuts. When removing a rear tire and rim, always deflate both tires even if only one tire needs service. A broken or damaged rim or component under pressure may rupture or be propelled by the pressure.

NOTES:

1. When releasing the pressure from the tire assembly, remove the valve core from the valve stem. Stand clear during the deflation to avoid particles in the high speed air flow.

2. If the air flow is trapped, check the valve stem passage for obstruction by carefully running a piece of wire through the stem, taking care that the wire cannot injure you if there is a sudden release of pressure when the obstruction is moved.

4. Support the tire and rim with a forklift, overhead crane, or other suitable means.

IMPORTANT: *If removing dual tire assemblies, make sure to brace both of the tire and rim assemblies so they cannot move until they are to be removed.*

5. Remove the lug nuts and associated clamps.

NOTES:

1. Some clamps contain provisions for using jackscrews to ease removal.

2. If the truck is equipped with the appropriate rim assemblies designed for tire removal on the truck, the clamps securing the rim to the wheel assembly should not be loosened. Always follow the specific instructions available from the rim manufacturer.

6. Remove the tire and rim from the wheel.

⚠ DANGER

If inflated tires are kept in storage, they should be contained in a safety cage.

DISASSEMBLY (Figures 1 and 2)

The tire and rim assembly may be disassembled as follows:

⚠ DANGER

Failure to follow all safety precautions when handling a tire and rim assembly could result in an explosion and serious injury.

NOTE: *Refer to the appropriate manufacturer's publication for specific details on the disassembly and assembly of the tire and rim assembly. Use the following procedure only as a guide.*

1. Verify that the tire is completely deflated, and the valve core removed.

2. Depress the bead seat ring until both the lock ring and O-ring can be removed.

IMPORTANT: *When unseating the tire beads, always use the proper tools, keep fingers clear of any pinch or injury points, and stand to one side. This is especially true when removing the lock ring and O-ring assemblies.*

3. Press the rim base out of the tire.

IMPORTANT: *Always use lifting devices and mechanical aids when handling heavy tires, rims, or components.*

INSPECTION AND REPAIR

Refer to the appropriate manufacturer's information for detailed procedures. These should include instructions to:

1. Always clean the dirt and rust from all wheel parts to ease and improve the inspection process and to aid in proper component reassembly. This is especially important for the interlocking parts of the multi-piece rim components, particularly the gutter section that secures the lock ring in place.

2. Once the parts are clean, thoroughly inspect them for evidence of pitting from corrosion, cracking, bending, wear, or other damage. Replace as required, and then repaint to prevent corrosion.

IMPORTANT: *Never attempt to rework, weld, heat, or braze any rim base or components under any circumstances. If repairable, repairs can be performed by the rim manufacturer or an authorized dealer or distributor of the rim manufacturer. Replace with new parts or parts that are not cracked, broken, or damaged and which are of the same size, type, and manufacturer.*

3. Never reinflate a tire that has been run flat or seriously under-inflated without first disassembling and inspecting the tire and rim assembly.

a. Check the rim for cracks and other damage.

b. Double check the side ring, flange, bead seat band, lock ring, and O-ring for damage.

c. The tire should be inspected by the tire manufacturer before remounting.

d. During reassembly, make certain that all components fit properly and the lock ring is secure in the rim gutter section.

4. On trucks equipped with "Defuzer" valves on the rims:

a. The valve assembly is supplied fully assembled. If the valve disc ruptures, leaks, or requires replacement for any reason, the entire assembly should be replaced.

b. If replacement is required:

(1) Park the truck in SAFE POSITION. It must be secured by means other than the truck's friction brake system.

(2) If the tire and rim assembly remains on the truck, make sure that it is secure so that the assembly cannot move.

(3) Make sure that the tire is completely deflated and the valve core assembly has been removed. There must be no residual pressure in the tire if it is still on the rim assembly.

(4) Using the appropriate wrench on the "flats" on the outside of the valve, remove the valve assembly. Inspect and then discard.

(5) Clean and inspect the threads in the rim assembly. They must be free of grit, dirt, or other foreign material to form a proper seal.

NOTE: *The threads are ¾ Inch NPT.*

(6) Inspect the new valve assembly to be:

(a) Of the correct pressure and temperature rating for the application. This is stamped on the valve body.

(b) Free of damage, especially to the internal rupture disc.

(c) Clean and inspect the threads on the valve. They must be free of grit, dirt, or other foreign material to form a proper seal.

(7) Coat the threads with the appropriate sealing material for the application.

(8) Using the appropriate wrench on the "flats" on the outside of the valve, install the valve assembly. Torque to 75 to 90 ft-lb (100 to 120 Nm).

NOTES:
1. Do not remove the protective cap on the valve. Use the inlet hex only for tightening.
2. Do not attempt to dismantle or replace the rupture disc.

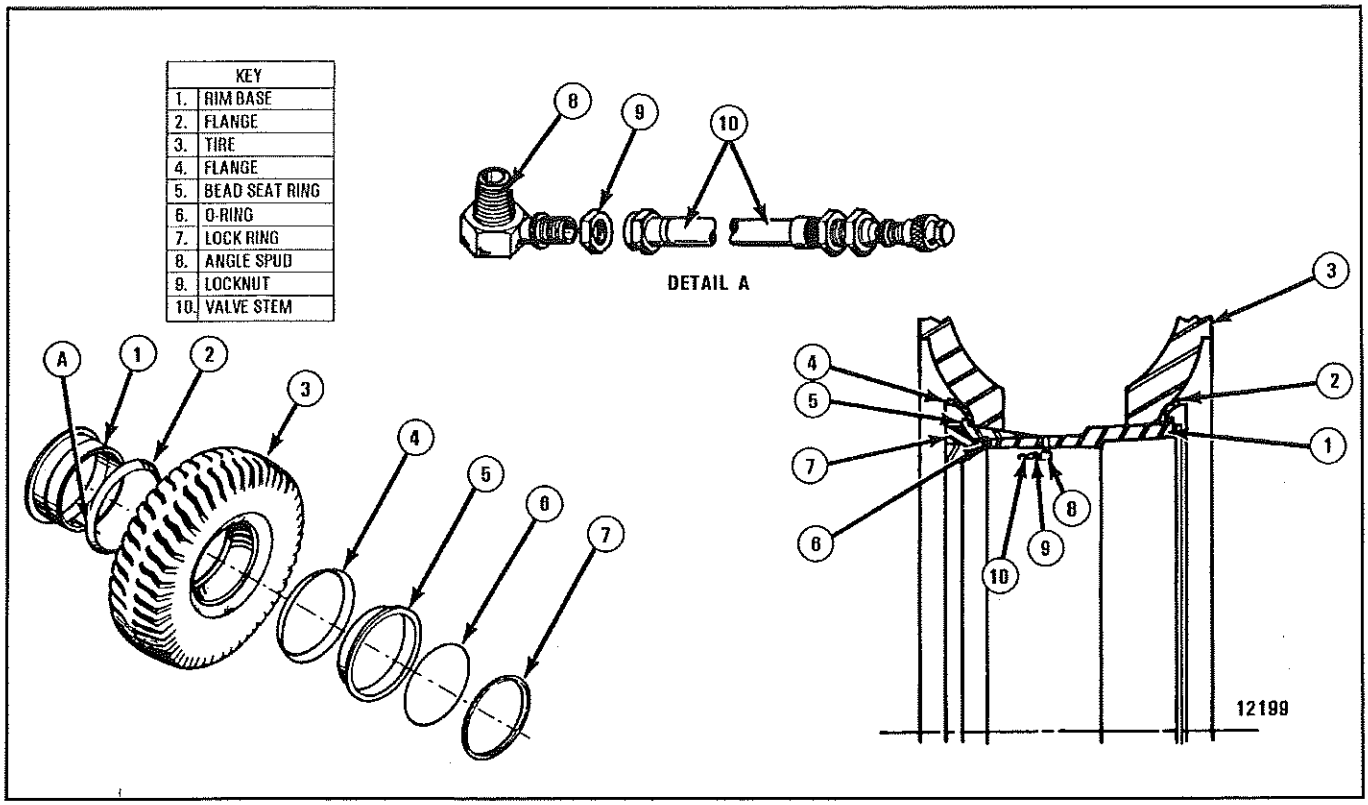


FIGURE 1 - TYPICAL FRONT TIRE AND RIM ASSEMBLY (12199)

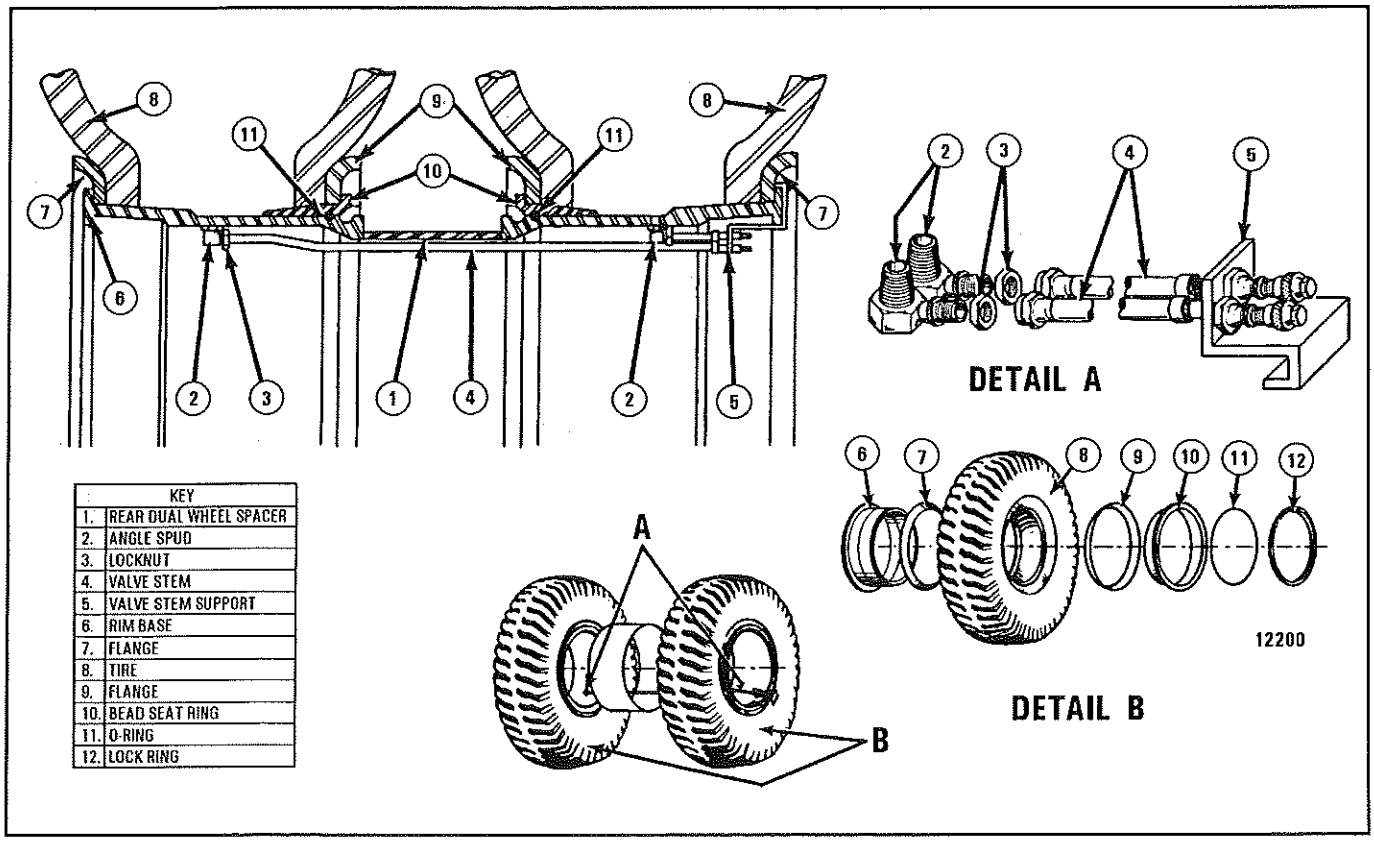
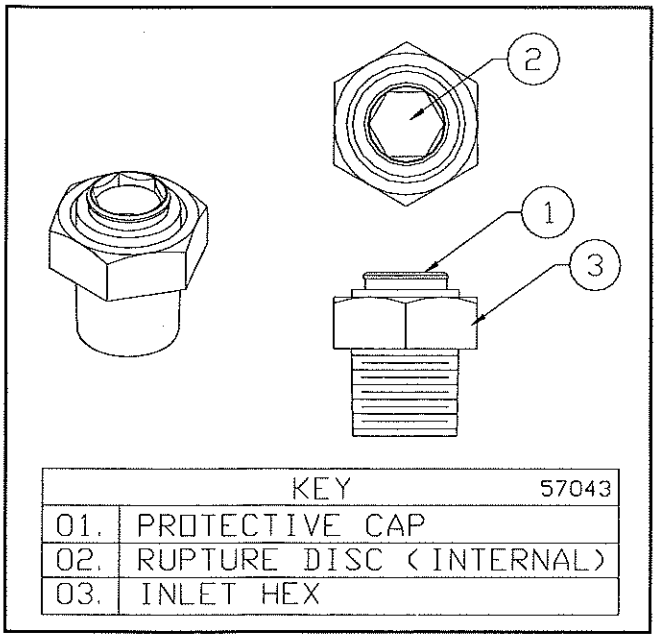


FIGURE 2 - TYPICAL REAR TIRE AND RIM ASSEMBLY (12200)



KEY	57043
01.	PROTECTIVE CAP
02.	RUPTURE DISC (INTERNAL)
03.	INLET HEX

FIGURE 3 – TIRE DEFUZER (57043)

3. Care should be taken during assembly and installation to ensure that nothing sharp protrudes into the inlet or outlet cavities. A rupture disc that has been scratched, dented, or damaged in any way may result in premature failure.

ASSEMBLY (Figures 1 and 2)

The tire and rim assembly may be assembled as follows:

1. Verify that all components are of the correct size, model, and manufacturer of parts for the assembly being worked on.

⚠ DANGER

Never intermix components from different manufacturers or even different models from the same manufacturer without the express written permission and instructions of the rim manufacturer and TEREX|UNIT RIG.

⚠ DANGER

Failure to follow all safety precautions when handling a tire and rim assembly could result in an explosion and serious injury.

2. If the assemblies are equipped with Defuzer valves, inspect and service as outlined in other portions of the information in this module.

3. Place the side ring on the rim base.

4. Place the tire on the rim.

5. Place the bead seat ring and side ring on the tire.

6. Press the bead seat ring down until the O-ring and lock ring can be installed.

IMPORTANT: *Do not hammer on the rim or components with steel hammers. These may damage or distort the rim or components, causing improper fitting of parts or premature failure. If it is necessary to tap uninflated components during assembly, use a rubber, lead, plastic, or brass faced mallet. If the components are correctly matched and assembled as designed, they will seat without tapping during inflation.*

⚠ DANGER

Do not pressurize the tire prior to mounting on the truck.

INSTALLATION

The tire and rim assembly may be installed as follows:

⚠ DANGER

Failure to follow all safety precautions when handling a tire and rim assembly could result in an explosion and serious injury.

NOTES: *If the truck is equipped with the appropriate rim assemblies designed for tire removal/installation on the truck, the clamps securing the rim to the wheel assembly should not have been loosened. Always follow the specific instructions available from the rim manufacturer.*

1. Using a forklift or crane, lift the tire and rim and install it on the wheel.

2. Install the clamps and lug nuts.

NOTE: *Refer to Loctite procedure for wheel studs, in Section 7 - Running Gear.*

3. Gradually tighten the lug nuts 180° apart from each other in even increments. Do not tighten them to full torque at once.

4. Tighten the nuts to 525 to 550 ft-lb (710 to 750 Nm) final torque.

5. Install the valve core.

6. Install safety cage or equivalent restraining device to the tire and rim assembly.

7. Have specifically trained personnel inflate the tire slightly, typically to 3 psi (21 kPa) then halt the inflation.

IMPORTANT: *It is recommended that:*
1. The inflation equipment have a filter to remove oil, moisture, and dirt from the air source. The moisture can cause corrosion of the rim and components, leading to difficult disassembly or premature failure. The filter should be periodically checked to ensure that it is functioning properly.
2. Always use a remote air valve with a clip-on air chuck and an in-line gauge and pressure regulator assembly to allow the tire mechanic to remain away from the tire during the inflation process. Always stand away from the tire to minimize possible contact should problems develop.
3. All personnel must remain out of potential component trajectories during the inflation process.

8. Recheck that all side or lock rings are properly installed. If an assembly is not fitting as designed, deflate and reassemble. Never attempt to seat rings or components by hammering when the tire is even partially inflated, because it may become dislodged and fly apart.

9. When the installation is okay at the 3 psi (21 kPa) pressure level, fully inflate and seat the tire to the recommended air pressure.

10. Lower the truck to the ground.

11. Fill the tire to the predetermined required pressure for the application and equipment. If not available contact the TEREX|UNIT RIG representative for detailed information.

12. Remove inflation equipment.

13. Replace the cover cap on the valve stem.

14. Inspect the tire for evidence of leakage or damage.

15. After the truck has been in operation for one or two loads, recheck the lug bolts and re-torque as required. Repeat several times until the rims remain tight.

NOTE: *When the truck is first driven after changing the tires, it is recommended they be observed to verify that they are properly installed and "running true". If not, repeat the procedures under Removal and Installation and correct the error.*

For other configurations, refer to Section 9 - Options or the appropriate manufacturer's information.

LOCTITE PROCEDURE FOR WHEEL STUDS

PURPOSE

It is the intention of these procedures to provide a satisfactory means of installing and removing wheel studs using adhesive Loctite 242 (liquid), 248 (stick), or equivalent. This procedure is exclusive to front and rear wheel studs for the purpose of maintaining the studs in a stationary position in the steel during nut installation and removal.

SURFACE CONDITIONS

1. The parts must be dry and free of oil, wax, grease, paint, rust inhibitor, or other surface preservative treatment.

2. If cleanliness of parts is in question, use an appropriate solvent that will not leave any residue.

STUD REMOVAL

1. If the studs have been installed without primer, approximately 300 to 350 ft-lb (415 to 485 Nm) may be required to remove the stud.

2. To ease removal, apply 485 to 500° F (250 to 260° C) heat to the threaded area and remove the stud while the parts remain hot. Tempsticks, pyrometers, or equivalent methods should be used to measure the applied heat.

STUD INSTALLATION/APPLICATION

Newer stud assemblies incorporate:
1. A "shoulder" on the threaded area to provide proper installation depth.
2. A hex shape on the open end allowing the direct use of the appropriate tools to assist in the removal and installation of the stud.

On older assemblies (without the shoulder or hex):
1. Installation depth is a measurement of the length of the stud that extends out of the wheel casting. On most installations this dimension is 2-5/16 inches (58.7 +/- 1.5 mm) (See Figure 1).
2. A driver or multiple lug nuts tightened onto the stud to function as a driver may be needed to assist in the removal and installation of the wheel studs.
3. The proper end of the stud to be coated may be identified by a truck's front or rear wheel assembly drawing (in the TEREX|UNIT RIG Assembly Parts Manual).

REAR WHEELS

On all models, lightly seat the stud in the wheelmotor and torque to 15 to 20 ft-lb (20 to 27 Nm).

GENERAL

1. All methods are intended for adhesive application only on the portion of the stud in the wheel.

2. The adhesive is not to be applied to the nut portion of the stud assembly.

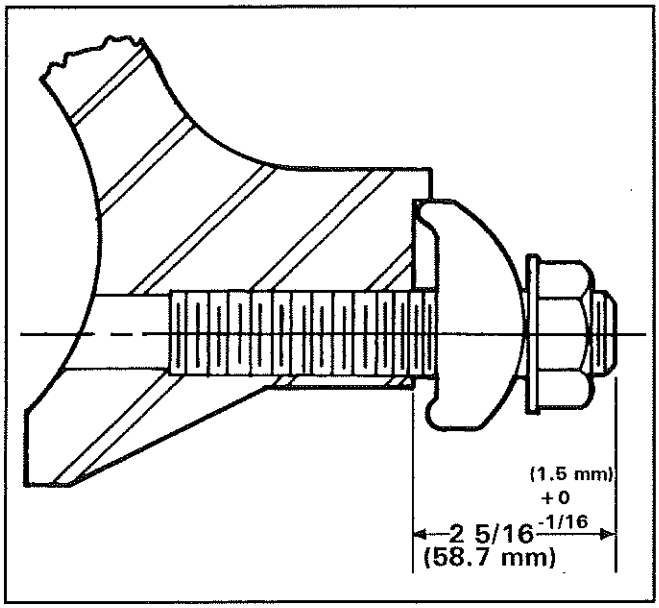


FIGURE 1 - FRONT WHEEL STUD INSTALLATION POSITION (#12925)

FRONT WHEEL ASSEMBLY (GREASE LUBRICATED WHEEL BEARINGS)

DESCRIPTION AND LOCATION (Figure 1)

The front wheel assembly consists of the large saucer-shaped disc found inside each of the front tire and rim assemblies and the associated bearing and rim mounting hardware.

OPERATION

The front wheel assembly functions as a "connecting link" between the front axle and the tire and rim assembly. The wheel rotates around the rigid front axle on a pair of tapered roller bearings. The tire and rim assembly is secured to the wheel by means of multiple clamps attached to the outer perimeter of the wheel.

MAINTENANCE AND ADJUSTMENT

Periodic maintenance includes the following steps:

1. Inspect the wheel for evidence of damage. Repair or replace as required.

2. Verify that each wheel lug clamp is in good repair and properly torqued to 525 to 550 ft-lb (710 to 745 Nm).

NOTES:

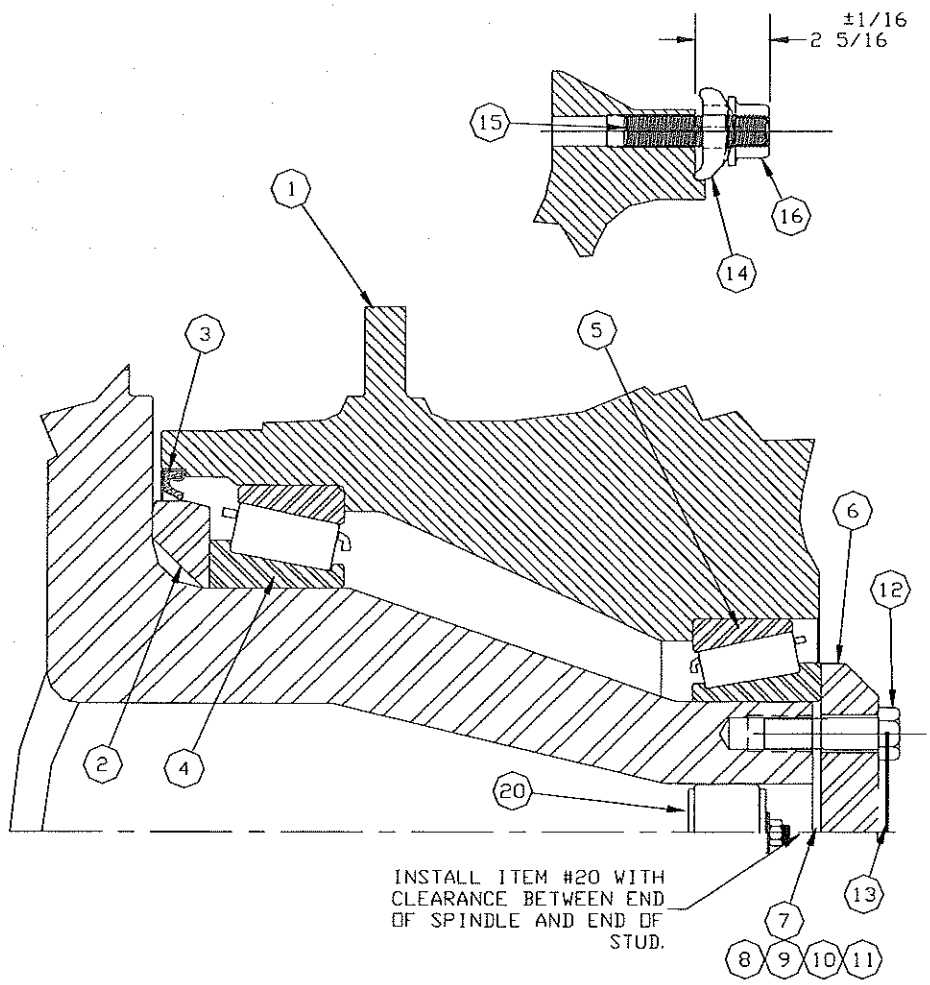
1. Newer stud assemblies incorporate:

a. A "shoulder" on the threaded area to provide proper installation depth.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Wheel loose	Bearings improperly adjusted - too many shims	Inspect bearing and reshim as outlined in Maintenance and Adjustment.
Wheel dragging or not rotating freely	Brakes dragging (not fully released)	Verify brakes are released. If not, see instructions in Section 8 - Brake System.
	Bearings rough or damaged	Inspect bearings and reshim as outlined in Maintenance and Adjustment.
	Bearings shimmed too tightly - binding the wheel	
Tire not running true (straight)	Rim bent	Inspect tire and rim assembly. Replace as required.
	Rim not properly seated on wheel	Inspect the rim's position on the wheel. Adjust as required.
	Wheel damaged	Inspect the wheel for damage. Replace if necessary.
Short bearing life	Improper lubrication	Follow recommended lubrication practices.
	Bearings improperly adjusted	Shim the bearing as outlined in the procedures in Maintenance and Adjustment.
	Bearing overloaded or damaged in service	Check operating conditions and load. Correct as required.

12615



KEY					82559E
01.	FRONT WHEEL	07.	SHIM	13.	SAFETY WIRE
02.	WHEEL BEARING SPACER	08.	SHIM	14.	WHEEL CLAMP
03.	WHEEL SEAL	09.	SHIM	15.	WHEEL STUD
04.	INNER WHEEL BEARING	10.	SHIM	16.	WHEEL NUT
05.	OUTER WHEEL BEARING	11.	SHIM	20.	EXPANSION PLUG
06.	BEARING RETAINER	12.	DRILLED HEAD CAPSCREW		

FIGURE 1 - FRONT WHEEL ASSEMBLY (40 X 57 TIRES)

b. A hex shape on the open end allowing the direct use of the appropriate tools to assist in the removal and installation of the stud.

2. On older assemblies (without the shoulder or hex):

a. Installation depth is a measurement of the length of the stud that extends out of the wheel casting.

b. A driver or multiple lug nuts tightened onto the stud to function as a driver may be needed to assist in the removal and installation of the wheel studs.

3. In either case, it is recommended that Loctite 242 (liquid), 248 (stick) or equivalent, is applied to the threads to secure in place.

3. Inspect the front wheel bearings for proper lubrication and preload setting. (See procedure below.)

FRONT WHEEL BEARING ADJUSTMENT
(Figures 1 and 2)

Each time the front axle, wheels, or wheel bearings are removed or replaced, the following procedure should be employed to properly set the bearing preload.

NOTE: *This procedure may be accomplished with tire and rim assemblies either on or off. If removal of the tires is desired, refer to the instructions on tire removal in Section 7 - Running Gear.*

NOTE: *This information is important and will be used in several steps in the following procedure.*

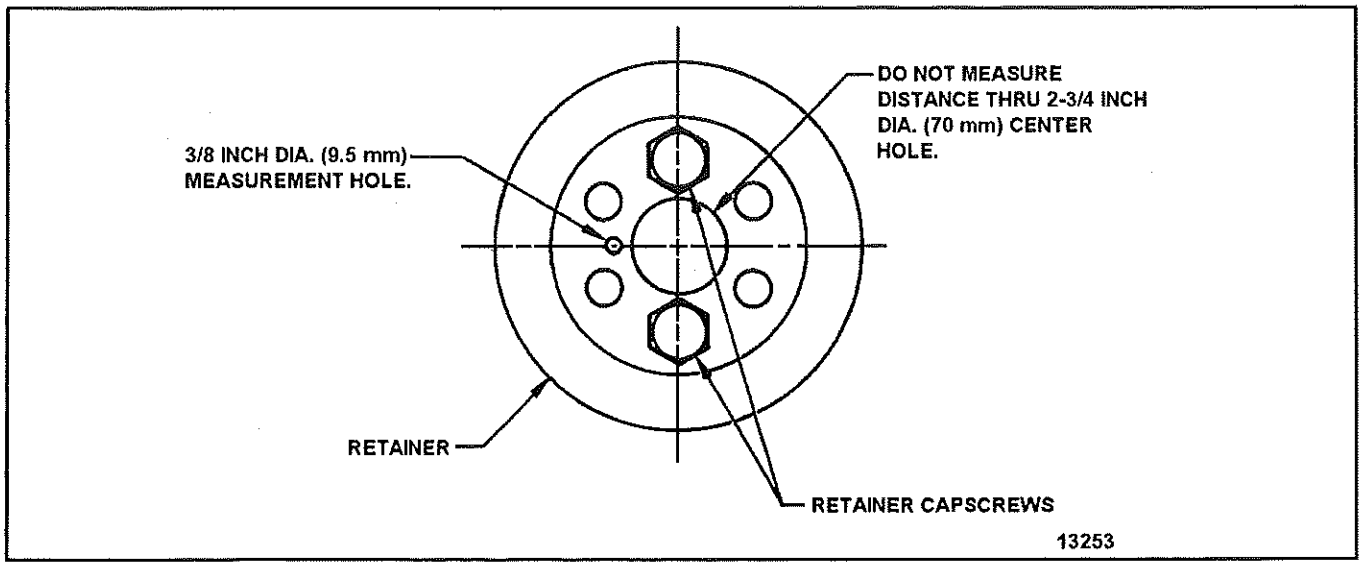


FIGURE 2 - FRONT WHEEL BEARING RETAINERS

1. Measure the bearing retainer (6) thickness using a 1 to 2 inch (25 to 50 mm) micrometer. Stamp this dimension on the retainer for future use.

2. Install the inner and outer bearing cups in the wheel hub.

NOTES:
1. Check that the cups are fully seated against the shoulders using a 0.002 inch (0.5 mm) feeler gauge. Insert the gauge in between the cup edge and the shoulder in a minimum of three places around the bore. If the gauge will fit in the gap, continue to seat until the gap is gone.
2. Use the proper tools and taking extra care not to damage or contaminate the bearings, seals or other components during the process.

3. Install the expansion plug (20) (if it was previously removed). Make sure that there is clearance between the end of the spindle and the end of the stud.

4. Install the seal (3) and fill the cavity between the seal and the inner bearing cup partially with grease.

NOTE: *The seal lip should be facing the rotating wheel assembly.*

5. Pack the inner bearing (4) only with grease. Make sure that the grease is forced between the rollers. Apply a generous coat of grease to the outside of the rollers.

NOTE: *The outer bearings must not be lubricated at this time to ensure proper bearing preload.*

6. Install the cone of the inner bearing on the spindle and seat it against the rub ring.

7. Partially fill the void between the back of the inner bearing and the rub ring with grease and the cavity from the small diameter of the outer bearing cup to the small diameter of the inner bearing cup.

8. Place the wheel on the front axle, using a forklift truck, crane or other suitable means.

9. Slide the outer bearing (5) onto the spindle.

10. Lubricate the six drilled head capscrews (12) with wheel bearing grease.

11. Install the retainer (6) (with no shims) using the six drilled head retainer capscrews (12).

12. Alternately tighten the retainer capscrews to:

250 ft-lb (340 Nm) in 50 ft-lb (70 Nm) increments.

NOTE: *Rotate the wheel while tightening to properly seat the bearing rollers.*

13. Loosen the four retainer capscrews to take the preload off the bearing.

14. Remove the retaining capscrews as indicated in Figure 2.

15. Alternately retighten the capscrews to:

110 ft-lb (150 Nm) in 20 ft-lb (25 Nm) increments.

NOTE: *Rotate the wheel while tightening to properly seat the bearing rollers.*

16. Using the depth micrometer, measure the distance from the end of the axle to the outer face of the bearing retainer.

17. To determine the shim requirements, subtract the thickness of the retainer (measured previously) from this latter measurement.

18. Prepare a shim stack equal to the dimension obtained in step 17. Always clean all shims and measure individually.

19. Remove bearing retainer (6) and outer bearing (5).

20. Pack the outer bearing (5) and cavity with grease (as outlined previously) and install shim stack (7, 8, 9, 10, and 11) bearing (5), and bearing retainer (6).

21. Alternately tighten all six drilled head capscrews (12) to:

560 ft-lb (760 Nm) in 100 ft-lb (135 Nm) increments.

NOTE: *Rotate the wheel (1) while tightening to properly seat the bearing rollers.*

22. Lockwire the retainer capscrews in place using safety wire (13).

23. Install the hubcap and secure with capscrews.

NOTE: *To provide an improved seal, first make sure that all mating surfaces are smooth and clean and then apply a thin coat of RTV sealant between the hubcap and the wheel.*

24. If the tire and rim assembly has been removed, install as instructed in the procedures in Section 7 - Running Gear.

REMOVAL (Figure 1)

The front wheel may be removed from the truck as follows:

1. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

2. Remove the tire and rim assembly as outlined in the instructions in Section 7 - Running Gear.

3. Disconnect the brake hydraulic supply line at the caliper assemblies. Install a clean plug on the hydraulic lines and a clean cap on each of the calipers.

⚠ DANGER

The hydraulic brake system is a high pressure system. Relieve all pressure before disconnecting any lines.

4. Remove the hydraulic line between the caliper housings. Install clean plugs and caps on all open fittings.

5. Remove the caliper assemblies as outlined in the procedures in Section 8 - Brake System.

NOTE: *Retain the shims and identify the location removed from. The shims may be reinstalled with the caliper assembly to center the caliper with the disc. If new pads, discs, or bearings are installed, it will require reshimming the caliper assembly.*

6. Remove the hubcap.

7. Support the wheel adequately to prevent accidental movement and remove the capscrews (12), retainer (6), shims (7, 8, 9, 10, and 11), and bearing (5).

8. Slide the wheel off the axle spindle, being careful to protect the inner bearing (4), seal (3), and spacer or rub ring (2).

9. Remove the seal (3) and bearing (4) from the inner portion of the wheel.

10. If necessary, remove the disc by removing the capscrews attaching the disc to the wheel.

INSPECTION AND REPAIR

The disassembled wheel may be serviced as follows:

1. Thoroughly clean the axle spindle, bearing, and wheel hub with clean solvent. Dry with clean, dry compressed air.

2. Inspect the inner seal for excessive wear or damage. Repair or replace as required.

3. Inspect the wheel bearing spacer or seal wear ring (2) for evidence of damage or wear. Repair or replace as required.

4. Inspect the inner and outer bearings and races for evidence of damage, spalling, and rough spots. If the bearing races are defective, replace the bearing and races, both inner and outer.

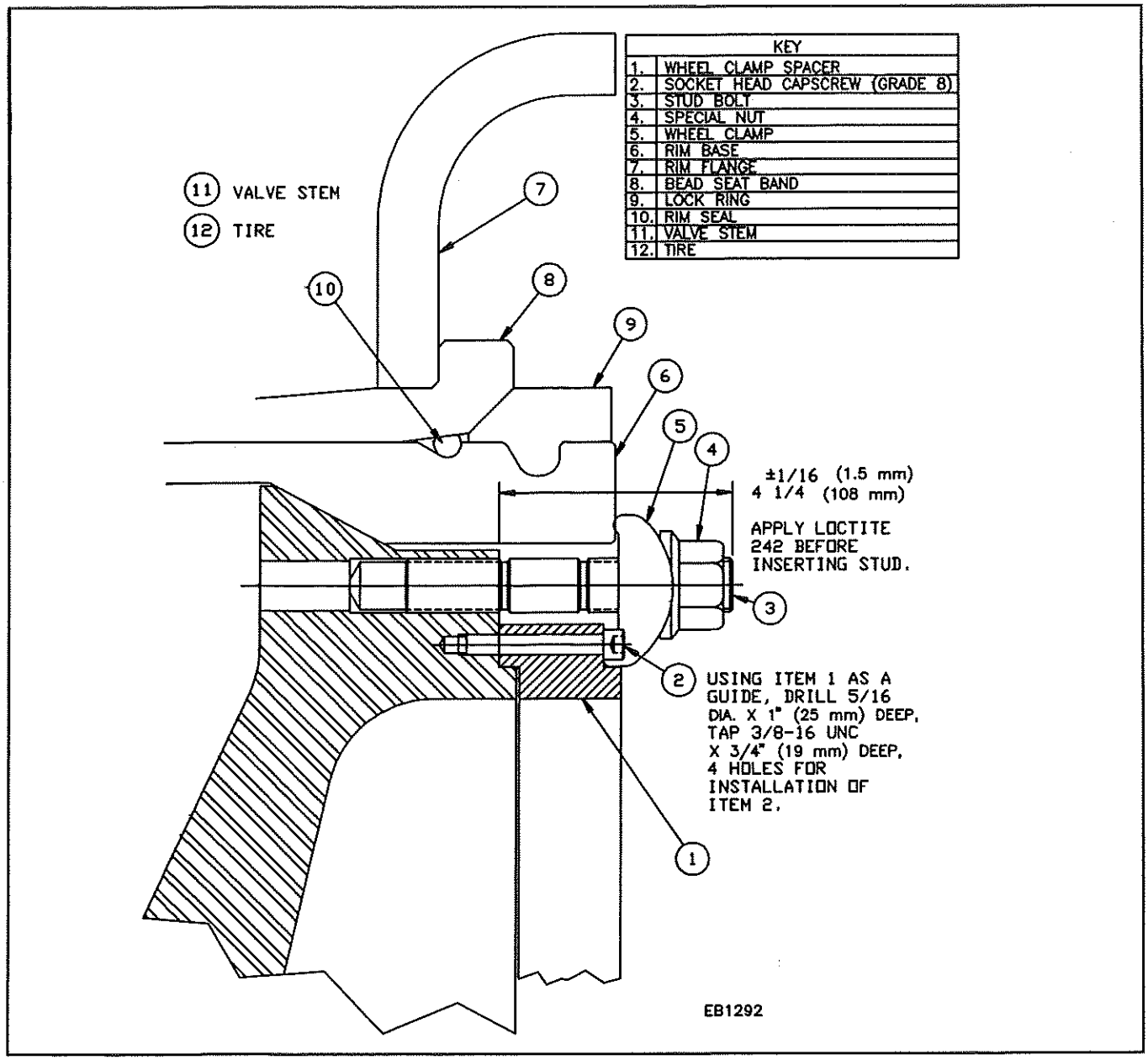


FIGURE 3 - FRONT WHEEL ASSEMBLY (48/95R57 TIRES)

5. Check that the bearing races are properly seated by attempting to force a 0.001 inch (0.03 mm) feeler gauge between the race back face and the wheel shoulder. Reposition as required.

6. Using magnetic particle, dye-check or other suitable methods, check the radius on the base of each side of the disc mounting bolting flange on the inboard side of the wheel for evidence of damage or cracking. If defects are found, replace as required. Contact your Terex Unit Rig representative for more detailed information.

7. Inspect the wheel studs for proper installation and evidence of wear or damage. If loose or damaged and require replacement, it may be done as follows:

NOTES:

Newer stud assemblies incorporate:

1. A "shoulder" on the threaded area to provide proper installation depth.

2. A hex shape on the open end allowing the direct use of the appropriate tools to assist in the removal and installation of the stud.

Older assemblies (without the shoulder or hex):

1. Stud installation depth is a measurement of the length of the stud that extends out of the wheel casting.

2. A driver or multiple lug nuts tightened onto the stud to function as a driver may be needed to assist in the removal and installation of the wheel studs.

a. Using suitable tooling, remove the old wheel stud.

NOTE: *In instances where hand tools alone will not operate; apply localized heat to the stud or casting to warm to approximately 485° F (250° C). Taking the appropriate measures, remove while hot.*

b. Clean and inspect the threads in the wheel casting. Repair as required.

c. Clean and prepare the threads in the wheel casting and on the stud using the appropriate cleaner/primer for the locking compound to be used.

NOTE: *They both must be free of contamination and oil, wax, paint, rust inhibitor, or any other preservative treatment. It is important to use solvents that do not leave any residual materials or film.*

d. Coat the threads on the stud that will engage the threads in the casting with several drops of Loctite 242 (liquid) or sufficient 248 (stick) material or equivalent.

NOTE: *More detailed instructions on the proper preparation and use of Loctite are contained in Section 7 – Running Gear.*

e. Install the studs:

(1) On trucks equipped with the new stud, insert the threaded end of the stud into the threaded hole. Tighten until the "shoulder" contacts the wheel assembly. A final "light" torque of 15 to 20 ft-lb (20 to 27 Nm) should suffice.

(2) On trucks equipped with the older stud assembly, install the long threaded ending into the casting until the exposed threaded length is 2-5/16 +/- 1/16 inch (59 +/- 1.5 mm) from the machined edge to the wheel.

f. Allow the adhesive to harden per its listed instructions.

NOTE: *Full strength typically requires 24 hours. In some installations, special accelerants may be used to decrease this time, but may adversely affect overall total strength. Check/test before using.*

INSTALLATION (Figure 1)

The wheel may be installed as follows:

1. Pack the interior of the wheel hub one-half to three-fourths full of grease.

2. Pack the inner bearing with grease.

NOTE: *The outer bearing must not be lubricated at this time to ensure proper bearing preload.*

3. Replace brake disc (if removed) and mounting adapter. Torque the bolts as outlined in the instructions in Section 8 - Brake System.

4. Install and shim the wheel assembly as outlined in the instructions in Maintenance and Adjustment.

5. After the wheel has been installed, reinstall and bleed the brake caliper assemblies as outlined in Section 8 - Brake System.

6. Install the tire and rim assembly as outlined in Section 7 - Running Gear.

FRONT AXLE

DESCRIPTION AND LOCATION (Figure 1)

The front axle has a long, box configuration curved at each end. It is mounted under the frame and in between the front wheel assemblies.

OPERATION

The front axle is a major structural component of the truck. It provides a:

1. Mounting and pivot point for the spindles in the front wheel assemblies.

2. Series of mounting points for the steering assembly.

3. Connection point for the suspension assemblies.

The front suspension strut assemblies control the oscillation of the axle. Four parallel radius rods are included to control the fore and aft and twisting movements. A transverse radius rod is employed to limit its lateral movement while maintaining its ability to oscillate at various heights.

MAINTENANCE AND ADJUSTMENT

Periodic maintenance of the front suspension should include the following:

1. Check for cracks in the axle structure and radius rods. Repairs should be made as per the structural welding instructions in Section 10 - Miscellaneous.

2. Check the various pins and other wear points for evidence of proper lubrication. Correct as required.

3. Check the kingpin assembly for evidence of wear, damage, or slack in the kingpin assemblies. At normal inspections this may be done visually. However, at regularly scheduled intervals, (typically 500 hours) a detailed inspection is recommended. This may be done as follows:

NOTE: *This measurement may be taken on each front wheel separately or simultaneously depending upon the availability of measurement and lifting equipment.*

a. Park the empty truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system. The tires should be positioned straight ahead and the engine and Master Switch should both be off.

⚠WARNING

Verify that any residual pressure in the steering accumulators is released before working near the front tire and rim assemblies.

b. Measure the radial run-out of the kingpin assembly as follows:

(1) Install dial indicators on the inside of the top and bottom bosses of the front spindle assembly to measure movement of the spindle bosses relative to the front axle assembly directly toward and away from the center of the truck. See Note A on Section C – C of Figure 1.

NOTES:

1. In this application, dial indicators with a mushroom shaped head, provide more accurate readings. Use of a pointed head tends to read the contour of the surface and not to provide accuracy.

2. The contact area of the pointer must be clean, smooth, and free of irregularities throughout the dial indicator's operating range.

3. The indicator should be adjusted to an initial reading of 0 inches (mm) and set so that they can accurately measure a minimum of 0.040 to 0.050 inches (1.0 to 1.3 mm) movement in either direction.

(2) Using jacks or other suitable means of lifting the frame or front axle without contacting either front tire, wheel or spindle assembly, raise the truck until the tires are clear of the floor. Secure in this position, with the tire, wheel, and spindle assemblies free.

(3) Read and record the measured movement on each of the dial indicators.

(a) If either measurement is between 0.035 to 0.040 inches (0.88 and 1.0 mm), the clearances shown significant wear but if no other problems are noted are still acceptable to be placed back into normal service. However, it is recommended that the operation and wear be more closely monitored.

NOTE: *Typically this would involve a significant decrease in the time between normal inspections. For example, if the normal inspection period is 500 hours, checking at lesser intervals, depending upon the length of time over which the original wear occurred.*

(b) If either measurement exceeds 0.040 inches (1.0 mm), the wear is considered excessive and the assemblies should be disassembled and repaired or replaced as required. Detailed service information is included later in this module.

⚠WARNING

Failure to service the component assemblies will result in increased rates of wear and eventually to malfunctioning of the front axle/spindle assemblies.

(4) Repeat the procedure if required on the other side.

(5) After the check is complete:

(a) Remove the dial indicators.

(b) Remove the blocking securing the truck and components.

(c) Lower the truck to the ground.

c. Measure the vertical play of the kingpin assembly as follows:

NOTE: *This measurement serves to provide a means of monitoring the wear condition of the kingpin's bottom thrust washer and related items.*

(1) Using feeler gauges, measure the clearance between the lower face of the top portion of the spindle and the top surface of the upper thrust ring. See Note B on Section C-C in Figure 1.

NOTE: *To obtain the most accurate measurement, the feeler gauges should be carefully inserted to ensure they are on top of the thrust ring and against the kingpin.*

(2) Record the clearance measured, including the date and operating hours.

(3) The kingpin assembly should be disassembled, inspected, and components replaced as required if the measured clearance is greater than the initial clearance plus 0.160 inches (4.05 mm).

NOTES:

1. The wear measurements should be taken at both the front and rear of the assembly, approximately 180° apart.
2. The recorded and monitored measurement should be an average of the two measurements.
3. It is imperative that an initial measurement be taken and recorded whenever kingpin assembly components are serviced or replaced. If not then the extra clearance from the initial assembly cannot be included in the monitoring of wear.

d. After the check is complete:

(1) Remove the dial indicators.

(2) Remove the blocking securing the truck and components.

(3) Lower the truck to the ground.

NOTE: *Trucks with Serial Numbers MH102 and up and earlier trucks modified by Engineering Bulletin EB 1327B are as shown in the illustration. Earlier trucks using different bearing assemblies do not include the roll pins (38) securing the bearing housing (9) and bronze thrust bearing (8) or their installation provisions. Refer to the appropriate* TEREX|UNIT RIG *Parts Manual or Engineering Bulletin for assistance in identifying the configuration installed.*

4. Check the radius rod pins for evidence of slack or damage. Repair or replace as required.

5. Check that the capscrews retaining the radius rod pins are properly tightened.

REMOVAL

The front axle assembly may be removed as follows:

NOTE: *Removal of the front tire and rim, wheel, and/or assemblies is not required to remove the axle. Typically, however, it is desirable for them to be removed to minimize the weight and size of the assembly being handled.*

1. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

2. Raise the truck and secure the truck frame and front axle with adequate blocking to prevent unwanted movement.

3. Verify that:

a. All brakes are released.

b. All pressure has been released from the steeri and brake accumulators and the hydraulic tank systems.

⚠ DANGER

It is important that all pressure in the hydraulic steering and brake systems be released prior to working on any components or loosening any hydraulic fittings.

4. Remove the tire and rim assemblies as outlined in the instructions in Section 7 - Running Gear.

5. Remove the front wheel (and brake assemblies) as outlined in the instructions in Section 7 - Running Gear and Section 8 - Brake System.

NOTE: *Again this may not be absolutely necessary, but it will reduce the weight and mass of the material being moved if handling equipment is limited.*

6. Disconnect and cap the hydraulic hoses from the steering cylinders and brake and automatic or manual lube assemblies.

7. Discharge all nitrogen precharge pressure in the front suspension struts as outlined in the procedure in Section 7 - Running Gear.

8. Raise the truck until the suspension is fully extended. Stop before the axle begins to lift. Secure the suspension in this position.

9. Remove the capscrews, washers, lock, and pin from the suspension lug on the front axle as outlined in the instructions in Section 7 - Running Gear. Secure the suspension out of the way.

10. Resecure the truck frame and front axle assemblies.

11. Remove capscrews, washers, and locks from the radius rod pins. Using air-arc or other suitable means, remove the lock on the upper axle end radius rod pin retainers.

12. Remove the pins and the radius rods marking the positions removed from to aid in installation.

⚠ WARNING

Each large upper radius rod weighs approximately 425 lb (190 kg). Each large lower radius rod weighs approximately 650 lb (230 kg). The smaller transverse radius rod weighs approximately 230 lb (105 kg).

NOTE: *While removing the pins, pay attention to the orientation of the pin removed from each location, particularly the eccentric style pins that are found in the ends of the upper link assemblies. This will also aid in installation.*

13. Remove the axle from under the frame.

14. Remove any material remaining on the axle required to effect repairs as outlined in the instructions in Section 5 - Hydraulic System, Section 7 - Running Gear, or Section 8 - Brake System.

15. If removal of the spindles is required proceed as instructed in the disassembly instructions in this module.

DISASSEMBLY

The spindle/kingpin assembly may be removed as follows:

1. Secure the axle assembly and spindles to prevent undesired movement of any components.

2. Remove the capscrews (12) and washers (13) from the kingpin cover (11). Remove the cover.

3. Remove the setscrew (14) that anchors the kingpin (3) from the side of the axle.

4. While supporting the spindle assembly, pull the kingpin from the axle.

⚠ WARNING

Each spindle weighs approximately 2000 lb (910 kg).

5. Remove the spindle and remaining components from the axle.

INSPECTION AND REPAIR

The assemblies may be serviced as follows:

1. Inspect radius rods, spindle, and axle for cracks, chips, or other abnormalities. Repair or replace as required. Structural field welding procedures are included in Section 10 - Miscellaneous.

NOTE: *Do not attempt to repair or weld on these components without first consulting a* TEREX|UNIT RIG *representative.*

2. Inspect the bearings, bushings, machined surfaces, and kingpins for scratches, wear spots, or other imperfections. Repair or replace as required.

NOTE: *Be careful not to scratch or damage machined surfaces.*

3. Verify that the roll pins (38) used to secure the bronze thrust bearing (8) and bearing housing (9) are properly installed and in good repair. Replace as required.

NOTE: *Trucks with Serial Numbers MH102 and up and earlier trucks modified by Engineering Bulletin EB 1327B are as shown in the illustration. Earlier trucks using different bearing assemblies do not include the roll pins (38) securing the bearing housing (9) and bronze thrust bearing (8) or their installation provisions. Refer to the appropriate* TEREX|UNIT RIG *Parts Manual or Engineering Bulletin for assistance in identifying the configuration installed.*

RADIUS ROD BUSHINGS

The self-aligning bushings in the ends of the radius rods may be changed as follows:

1. Using the appropriate tools, remove the retainer rings (30, 32) from the bearing.

2. Remove the old bearing.

3. Inspect the sleeve in the bore. If found damaged, repair if possible. If it must be replaced, this may be done as follows:

a. Using the appropriate cutting and related tools, remove the damaged sleeve from the bore.

b. Inspect the bore's condition and repair as required.

c. Install the new sleeve as follows:

IMPORTANT: *Sleeves with high interference fit may be installed using either of the methods outlined here. The liquid nitrogen method typically provides a more consistent installation.*

(1) Liquid Nitrogen Method

⚠WARNING

Due to the cold temperatures of both the liquid nitrogen cooling medium and the parts being cooled, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(a) Inspect the new sleeve for evidence of damage, burrs, etc. Repair as required.

(b) Using all of the appropriate precautions because of the cold temperatures of the materials involved, gently immerse the sleeve into a pool of liquid nitrogen.

(c) After allowing sufficient time to fully cool, carefully remove from the liquid nitrogen and install in the appropriate bore properly oriented.

(d) Allow the sleeve to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the sleeve.*

(2) Heating Method

⚠WARNING

Due to the cold temperatures of both the liqu nitrogen cooling medium and the parts being coo and the heat applied to the receiving component area, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(a) Inspect the new sleeve for evidence of damage, burrs, etc. Repair as required.

(b) Using all of the appropriate precautions because of the cold temperatures of the materials involved, carefully cool the sleeve to a temperature of -40° to -70° F (-40° to -57° C).

(c) Evenly heat the bore into which the sleeve is to be installed to 300° to 350° F (150° to 175° C).

IMPORTANT: *Heat the massive side of the lug additionally to ensure that the bore is heated and expanded evenly.*

(d) Once both components are at the proper temperatures, carefully remove the sleeve from the cooling medium and install in the appropriate bore properly oriented.

(e) Allow the sleeve to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the sleeve.*

4. Install the new bearings into the sleeves/bores as follows:

IMPORTANT: *Steel spherical bearings should not come in direct contact with dry ice and should not be immersed in liquid nitrogen. Either of these actions could result in the change of the metallurgical character of the bearing affecting subsequent fit and operation.*

⚠WARNING

Due to the cold temperatures of both the dry ice or other cooling medium and the parts being cooled, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(a) Inspect the new bushing/bearing for evidence of damage, burrs, etc. Repair as required.

(b) Using all of the appropriate precautions because of the cold temperatures of the materials involved, carefully cool the bearing assembly to a temperature of -40° to -70° F (-40° to -57° C).

(c) Once both components are at the proper temperatures, carefully remove the bearing from the cooling medium and install properly oriented into the appropriate bore.

(d) Allow the bearing assembly to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the bearing or bore.*

(e) Install the retaining rings to secure the bearings.

KINGPIN BUSHINGS

The upper and lower bushings in the kingpin assembly may be changed as follows:

1. Verify that the upper bearing (4) is removed.

2. Knock out the old upper and lower bushings (6 and 7) with a long punch taking extra care not to contact or damage the inner surfaces of the kingpin assembly.

3. Verify that the inner bore surface of the kingpin assembly is free from edges, knicks, or other damage that will interfere with the installation of the new bushings.

4. Freeze the complete new bushings in dry ice or equivalent to shrink the outer diameter.

5. Install the bottom bushing (7), chamfered end first, into the bore (from the bottom) until seated. The end of the bushing should be even with or slightly below the end of the kingpin bore.

6. Install the bearing spacer (34) with the split positioned to clear the socket head setscrew (14).

7. Install the top bushing (6) until the flange is seated on the end of the kingpin housing.

NOTE: *If either of the bushings stick or do not install properly, remove before they have a chance to equalize temperatures and stick in place. Otherwise they may be damaged in the removal/reinstallation phase.*

8. Allow to equalize to room temperature before continuing with the assembly process.

9. Install the relief fitting, if so equipped.

NOTE: *The relief valve is not used on trucks equipped with anti-rotational provisions on the bearing housing and thrust ring.*

ASSEMBLY

The spindle/kingpin assembly may be assembled as follows:

1. Fit the bearings in the top (4) and bottom (5) of the spindle.

NOTES:
1. The bottom bearing (5) must be flush with the bottom of the spindle (2).
2. Install the parting split on the top bearing (4) inboard (toward the truck frame). Install the parting split on the bottom bearing (5) outboard (away from the truck frame).

2. Install the thrust washer (10) in position.

3. Install the thrust bearing (8) in the bearing housing (9), securing each with the roll/coil spring pins (38).

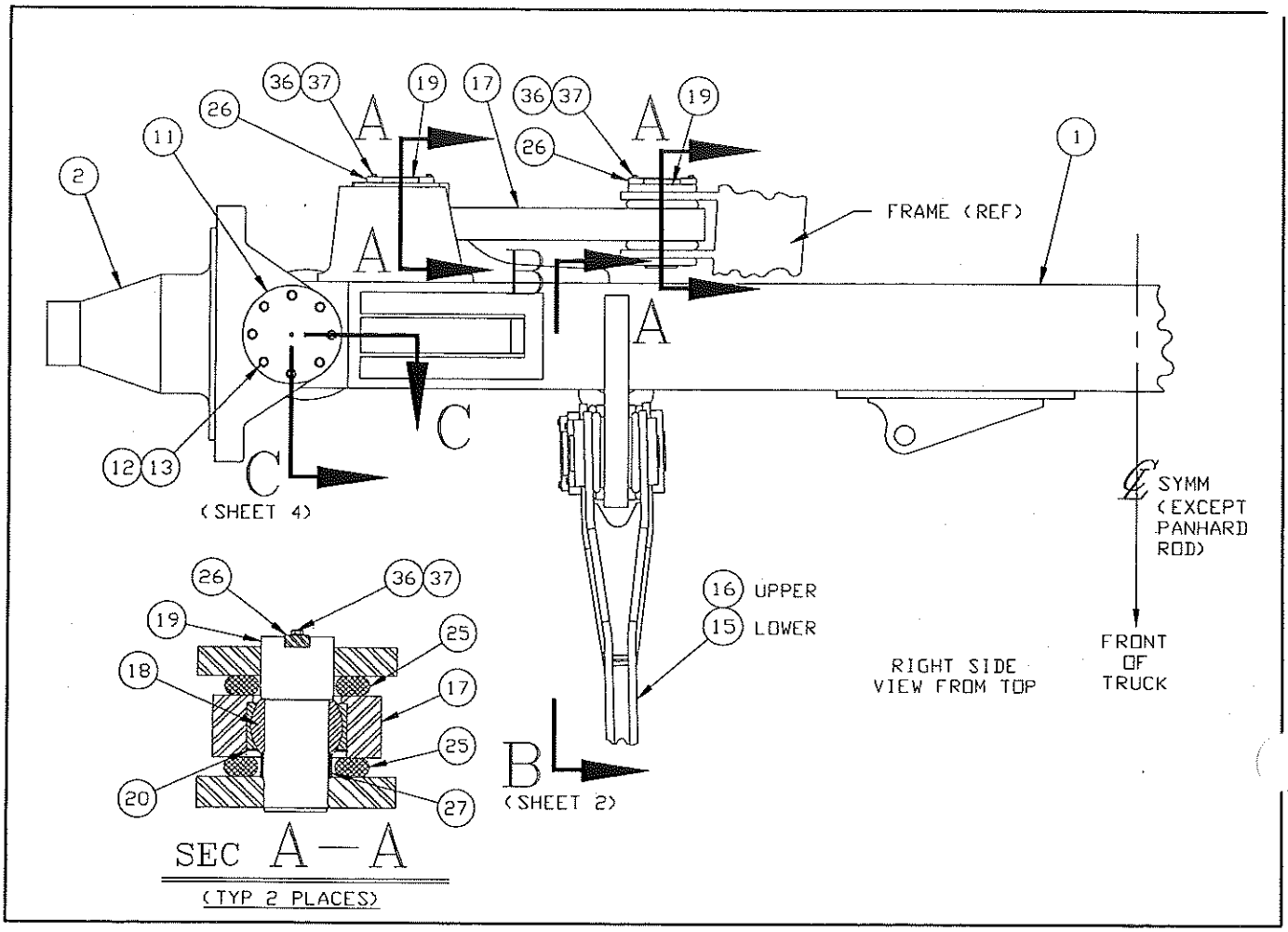


FIGURE 1 - FRONT AXLE ASSEMBLY (A85224, SHEET 1 OF 4)

NOTE: *Trucks with Serial Numbers MH102 and up and earlier trucks modified by Engineering Bulletin EB 1327B are as shown in the illustration. Earlier trucks using different bearing assemblies do not include the roll pins (38) securing the bearing housing (9) and bronze thrust bearing (8) or their installation provisions. Refer to the appropriate* TEREX|UNIT RIG *Parts Manual or Engineering Bulletin for assistance in identifying the configuration installed.*

4. Align the bearing housing assembly (9), spindle assembly, and axle (1).

5. Align the countersink in the kingpin (3) with the hole in the side of the axle. Insert the kingpin into place.

NOTE: *Be careful not to scratch or damage machined surfaces.*

6. Verify that there is a maximum of 0.065 inches (1.65 mm) clearance between the bottom of the upper kingpin assembly (3) and the top of the upper thrust washer (10). If the clearance exceeds this amount, the axle should be disassembled and the appropriate thicker alternative bearing housing (9) installed. Then repeat the assembly procedure as outlined previously.

NOTES:

1. The alternate bearing housings include 82836M (0.063 inch (1.60 mm)) oversize and 82836N (0.125 inch (3.18 mm)) oversize.

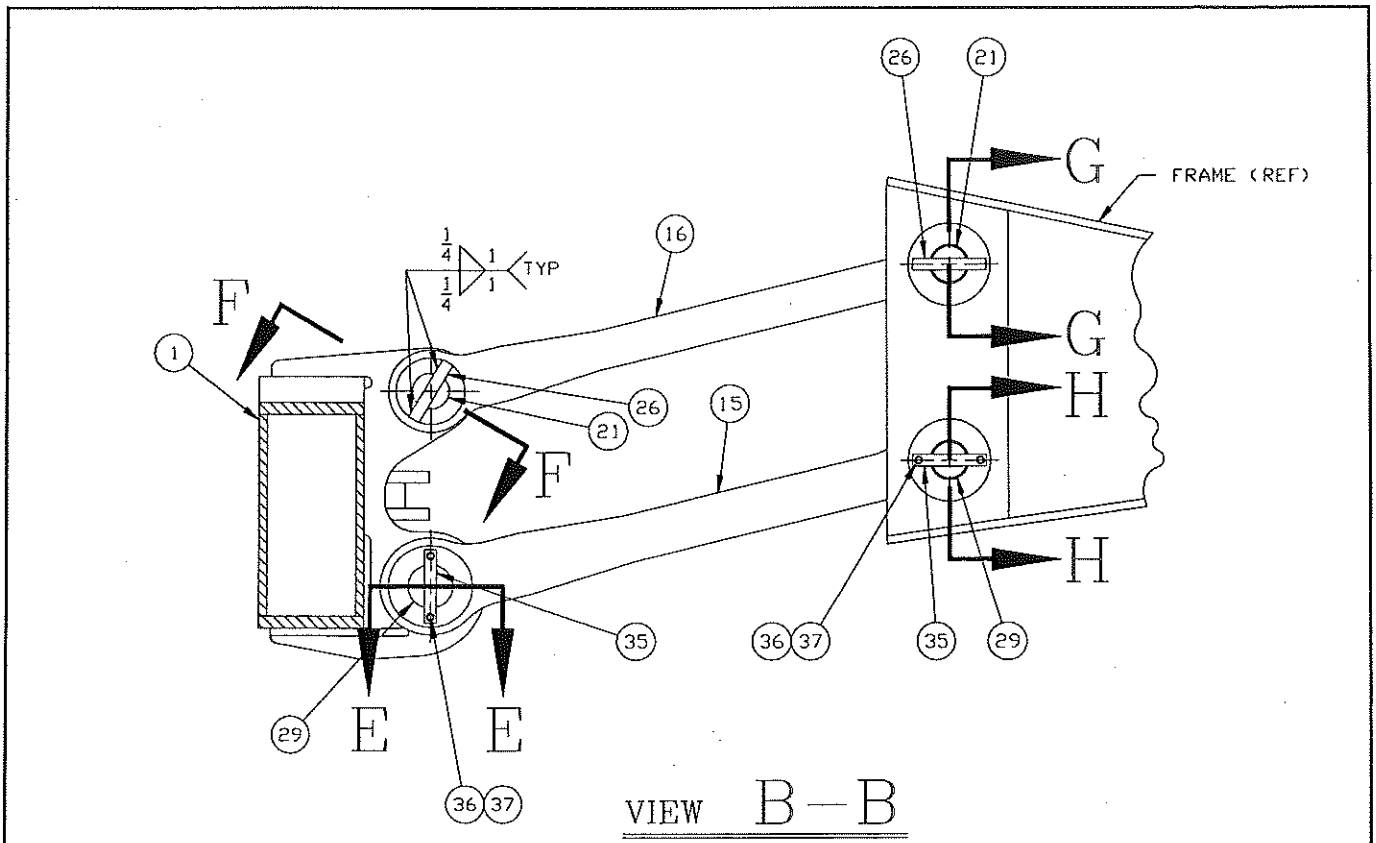
2. If these bearing housings are required on earlier, unmodified trucks, it is recommended that TEREX|UNIT RIG *Engineering Bulletin EB 1327B installing roll pins to prevent the rotation of the components also be performed.*

7. Apply Loctite 242 or equivalent to the setscrew (14) and install. Torque to 500 ft-lb (680 Nm).

NOTES:

1. Before installation, coat the outboard ¾ inch (19 mm) of the threads with Loctite 242 (or equivalent).

2. After installation and final torquing, the setscrew should be flush (+/- ¼ inch (6.3 mm)) with the surface of the axle.



KEY A85224

01.	Front Axle Assembly	14.	Setscrew, Grade 8, Cone Point	27.	Pin Spacer
02.	Front Spindle Assembly	15.	Lower Radius Rod	28.	Self-Aligning Bushing
03.	Kingpin	16.	Upper Radius Rod	29.	Pin
04.	Upper Bearing	17.	Transverse Radius Rod	30.	Internal Retaining Ring
05.	Lower Bearing	18.	Self-Aligning Bushing	31.	Bearing Bore Sleeve
06.	Upper Bushing	19.	Radius Rod Pin	32.	External Retaining Ring
07.	Lower Bushing	20.	Internal Retaining Ring	33.	Bearing Spacer
08.	Bronze Thrust Bearing	21.	Eccentric Pin	34.	Bushing Spacer
09.	Bearing Housing	22.	Bearing Bore Sleeve	35.	Pin Retainer
10.	Thrust Ring	23.	Self-Locking External Retaining Ring	36.	Capscrew
11.	Kingpin Cover	24.	Pin Spacer	37.	Hardened Flatwasher
12.	Capscrew, Grade 8	25.	Dirt Ring	38.	Roll/Coil Spring Pin
13.	Hardened Flatwasher	26.	Pin Retainer		

FIGURE 1 - FRONT AXLE ASSEMBLY (A85224, SHEET 2 OF 4)

3. After the setscrew is installed and properly torqued, apply Loctite 242 (or equivalent) to the perimeter of the setscrew/threads to seal against water and corrosion.

8. Install the kingpin cover (11) and secure it with capscrews (12) and washers (13).

INSTALLATION (Figure 1)

The front axle assembly may be installed as follows:

1. Position the axle assembly under the main frame, perpendicular to the main frame rails.

2. Beginning with either of the lower parallel links, install the radius rods as follows:

a. Position the rod with the double end toward the axle and the lube holes pointed upward.

b. Move the radius rod into position on the axle end.

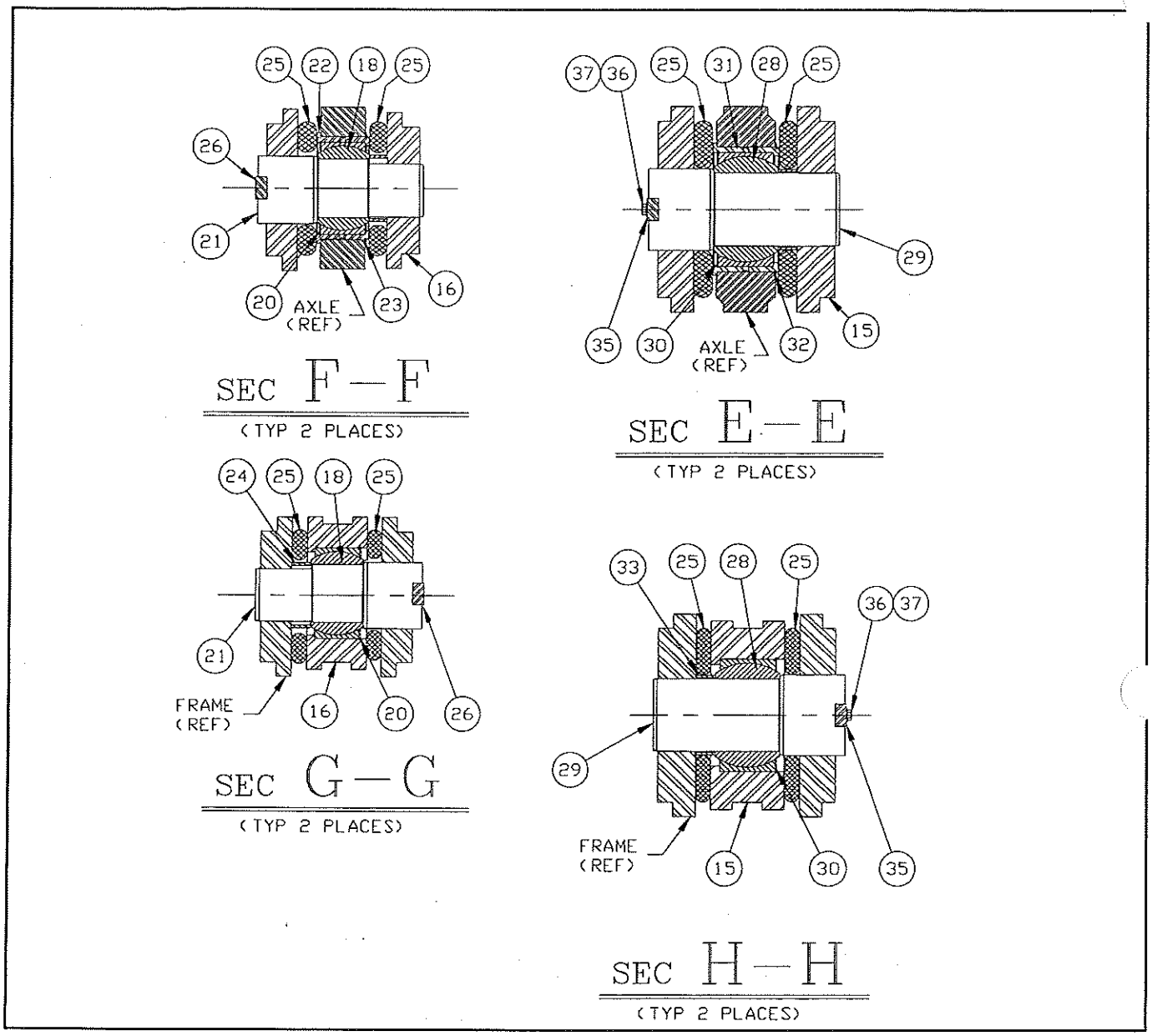


FIGURE 1 - FRONT AXLE ASSEMBLY (A85224, SHEET 3 OF 4)

c. Align the bores and install the radius rod pins (29).

d. Repeat step c. on the frame end.

NOTE: *Use the standard pins only. The eccentric pins are used only in a designated location and will be installed last.*

e. Install the retainers and secure with the capscrews and washers.

3. Repeat steps 2a. – e. on the other bottom link.

4. Install the left hand upper link as follows:

a. Position the rod with the double end toward the axle and the lube holes pointed downward.

b. Move the radius rod into position on the axle end.

c. Align the bores and install the radius rod pins (29).

d. Install eccentric pins (21) in both ends with the slot vertical and the eccentric portion of the pins up.

IMPORTANT: *Do not install the retainers at this tim*

5. Install the right side upper link as follows:

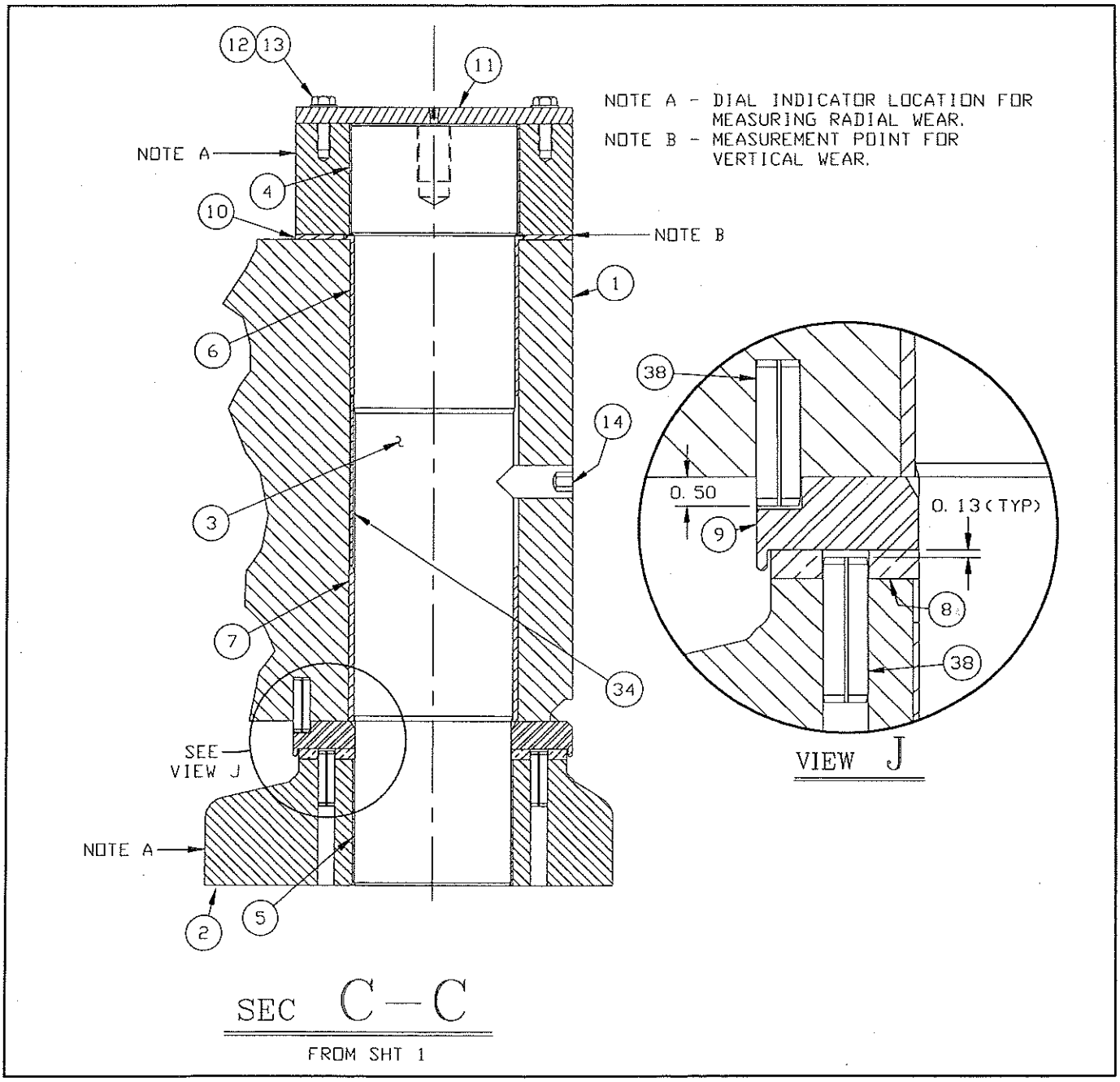


FIGURE 1 - FRONT AXLE ASSEMBLY (A85224, SHEET 4 OF 4)

a. Install the frame end eccentric pin as outlined in steps 4a.-d.

b. Rotate the eccentric pins in the three upper links until the pin bore in the remaining link is aligned with the bore sufficiently to allow installation of the other eccentric pin. Install the pin.

6. Weld the retainers (26) of the eccentric pins to the bosses on all upper pin assemblies with a 1/4 fillet weld 1 inch (25 mm) long on both sides of the retainers.

7. Install the transverse radius rod as outlined in steps 2a.-e.

8. Install the dirt seals (25) on each side of each self-aligning bearing. Secure with the tie-wrap.

9. Install the front suspension strut assemblies as outlined in the instructions in Section 7 - Running Gear.

10. Install the front wheel and brake assemblies (if removed) as outlined in the instructions in Section 7 - Running Gear and Section 8 - Brake System.

11. Install the tire and rim assemblies as outlined in the instructions in Section 7 - Running Gear.

12. Recharge the front suspensions as outlined in the instructions in Section 7 - Running Gear.

13. Service and test the steering and brake systems as outlined in the instructions in Section 5 -Hydraulic System.

14. Remove the blocking and lower the truck to the ground.

15. Complete servicing and testing the truck system.

NOTE: *It is recommended that each time the front axle kingpin assembly has been serviced, particularly when components are repaired or replaced, a recheck of the final amount of clearance be made to serve as a starting point for measuring wear of the components. Detailed instructions are included in the Maintenance and Adjustment instructions in this module.*

16. Check the front wheel alignment as outlined in the procedure on the steering linkage in Section 7 - Running Gear.

STEERING LINKAGE

DESCRIPTION AND LOCATION (Figures 2 and 3)

The steering linkage consists of the following components:

1. Steering cylinders - double acting hydraulic cylinders (with clevis type ends) with the base end attached to the anchor on the front axle assembly and the rod end attached to the arm on the front spindle assembly.

2. Drag link - adjustable link (turnbuckle style) connected between the arms on the two spindle assemblies.

OPERATION

The function of the mechanical steering linkage assembly is to control the movement of the front axle spindle assemblies and thus steer the truck. Movement of the linkage assemblies is regulated by the steering cylinders. For a detailed explanation of this portion of the system refer to the information in Section 5 - Hydraulic System.

When the steering wheel is moved to make a turn, one steering cylinder extends and the other retracts. This relative motion causes the two spindles to turn on their respective kingpins allowing the tires to "steer". The drag link ties the relative motion of the two spindle assemblies together to aid in coordination during steering and to maintain the desired toe-in adjustment.

MAINTENANCE AND ADJUSTMENT

Periodic maintenance should include the following steps:

1. Inspect all components for evidence of wear or damage. Repair or replace as required. Never allow a truck to operate with defective components.

2. Verify that all components are properly lubricated and that all seals are in generally good condition. Repair or replace as required.

3. Check the front wheel toe-in and adjust as outlined below.

ADJUSTING FRONT WHEEL TOE-IN (Figure 1)

The truck's toe-in (deviation from parallel) should be checked regularly. Proper toe-in adjustment will improve tire and component life, and improve the truck's steering control. Adjustment should be done as follows:

NOTE: *The truck must be empty and parked on a level surface in an area which will permit both forward movement of at least two truck lengths. The tires should be pointed as straight ahead as possible.*

1. Verify that the front wheel bearings are properly adjusted. Refer to the information in Section 7 - Running Gear.

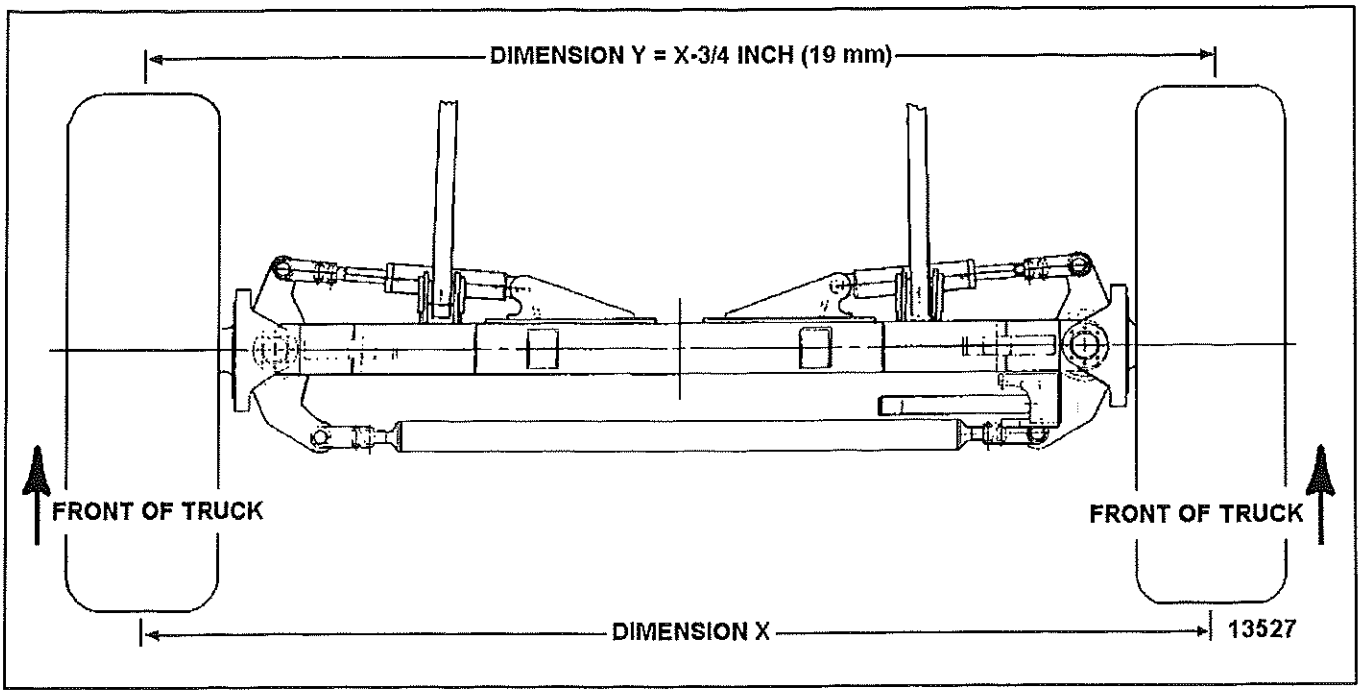


FIGURE 1 - FRONT AXLE TOE-IN ADJUSTMENT

2. Verify that both the front and rear Nitrogen/Oil suspensions are at the proper recommended empty ride height.

3. Adjust the drag link to obtain an initial length of 188 inches (4 775 mm) between the pin centers.

4. Adjust the yokes on the cylinder rods to an initial setting of as few exposed threads as possible on each cylinder assembly.

5. After driving the truck forward on the smooth, level surface, park it in a SAFE POSITION with the front wheels directed straight forward. It must be secured by means other than the truck's friction brake system.

NOTES:
1. There should be sufficient distance in front of the truck to allow it to be moved almost a full tire rotation forward without interference.
2. To ensure the consistency of all measurements the last movement of the truck must always be forward.

6. Place a thumb tack in each tire located as follows:

a. To the rear of the tire;

b. At the center of the tread (side to side);

c. As high and equidistant above the ground level as possible to permit clearance of all truck components by a tape measure or other suitable device strung between the tacks parallel to the ground.

NOTE: *They should be as close to the height of the centerline of the hub as possible.*

7. Record the distance between the tacks (X) and the distance above the ground.

8. Start the truck in a normal manner and drive straight forward until the tacks are low enough to the ground for the tape to clear all components and are about the same distance above the ground in front of the tire as they were to the rear in step 7. Again the final direction of travel must be forward.

9. Secure the truck in a SAFE POSITION. It must be secure by means other than the truck's friction brake system. The final direction of travel must be forward.

10. Record the distance between the tacks (Y).

11. Determine the truck's correct front wheel toe setting as follows:

Y = X - 3/4 inches (19 mm)

12. Adjust the drag links equally as required to obtain the required dimension.

NOTE: *Remember that because of steering geometry the required adjustment will be approximately 1/2 of the calculated change as the opposite side of the tire is moving an equal distance in the opposite direction to that being measured.*

13. When the adjustment is complete, recheck by backing the truck past the original position (step 1 of this procedure) and repeating the measurements and adjustments until correctly completed.

14. Tighten the clamping bolts on the various cylinders and drag links to secure the final settings.

15. Start the truck in a normal manner. Turn the wheels completely in both directions to ensure that the steering cylinders and linkages are reaching the end of their travel. Readjust as required.

NOTE: *To double check the centering of cylinder length adjustments, make left and right turning circles at low speeds (5 mph (8 kph)). They should be within 3 to 5 feet (1 to 1.7 m) of equal if all is adjusted properly. If not, they should be re-centered and re-adjusted as required.*

REMOVAL

The steering linkage components may be removed as follows:

1. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

2. If removal of the steering cylinder is desired, follow the instructions in Section 5 - Hydraulic System.

3. Remove the steering tie rod as follows:

a. Remove the capscrew and hardened flatwasher.

b. Remove the pin retainer.

c. After carefully securing the rod so it will not move until it is lifted, remove the pins from each end of the rod.

d. Lift the rod clear of the steering arms.

4. Remove the steering arm as follows:

a. Remove the steering cylinder and yoke assembly as outlined in the information in Section 5 - Hydraulic System.

b. Remove the steering rod yoke as outlined in step 3 above.

c. Remove the tapered nuts securing to the spindle assembly.

d. Remove the steering arm. Note the side it is removed from to aid in reassembly.

INSPECTION AND REPAIR

The various steering components may be serviced as follows:

1. Inspect and repair all components in and on the steering cylinder as outlined in the information in Section 5 - Hydraulic System.

2. Inspect the self-aligning bushings for evidence of wear or damage. If the bushings need to be replaced:

a. Remove retaining ring and self-aligning bushing.

b. Install new self aligning bushing and retaining ring.

3. Inspect the studs in the spindle of evidence of wear or damage. If they need replacement:

a. Remove the old studs. Applying heat to the assembly should assist in breaking previous adhesive bonds.

b. Apply a coating of Loctite 242 (or equivalent) to the threads of the new stud that are to be installed into the spindle.

c. Install the stud until 2 +/- 1/16 inches (51 +/- 1.7 mm) remains exposed from the spindle assembly.

d. Allow the adhesive to dry before continuing.

4. Inspect all remaining components for evidence of wear or damage. Repair or replace as required.

INSTALLATION

NOTE: *Figure 2 reflects trucks equipped with expander type pins. Figure 3 reflects configurations with the pin/nut assembly.*

The steering linkage components may be installed as follows:

1. Install the steering arm as follows:

a. Select the correct assembly for the side of the axle being assembled, noting that there is a left and a right arm assembly.

b. Verify that the mating surfaces on both the arm and the spindle assembly are clean and free of grease, debris, or other foreign objects.

c. Install the properly oriented steering arm assembly.

d. Secure with the tapered nuts with the taper toward the mounting surface. Torque each sequentially to a final torque listed in the chart in Section 10 - Miscellaneous.

2. Install the steering cylinder on the steering arm as outlined in the instructions in Section 5 - Hydraulic System. Note that there should be a minimal amount of thread showing on the cylinder rod end.

3. Install the steering tie rod assembly as follows:

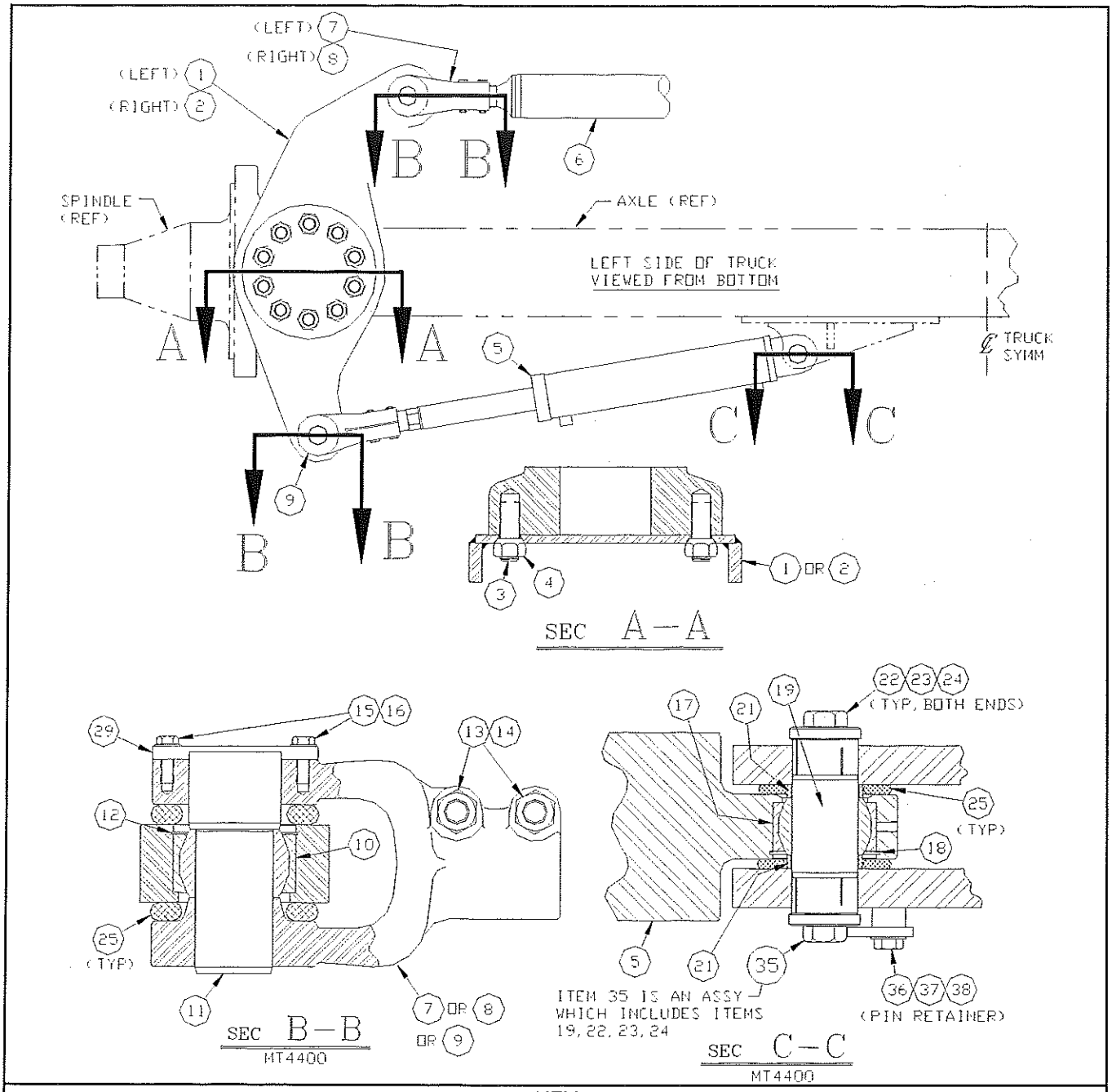
a. Position the yoke assembly over the self-aligning bushing. Note that the larger bore hole is at the top.

b. Install the pin. Secure with pin retainer, capscrews, and hardened flatwashers.

c. Repeat with the other side.

d. Install the grease/dirt seals above and below the self-aligning bushings at each end.

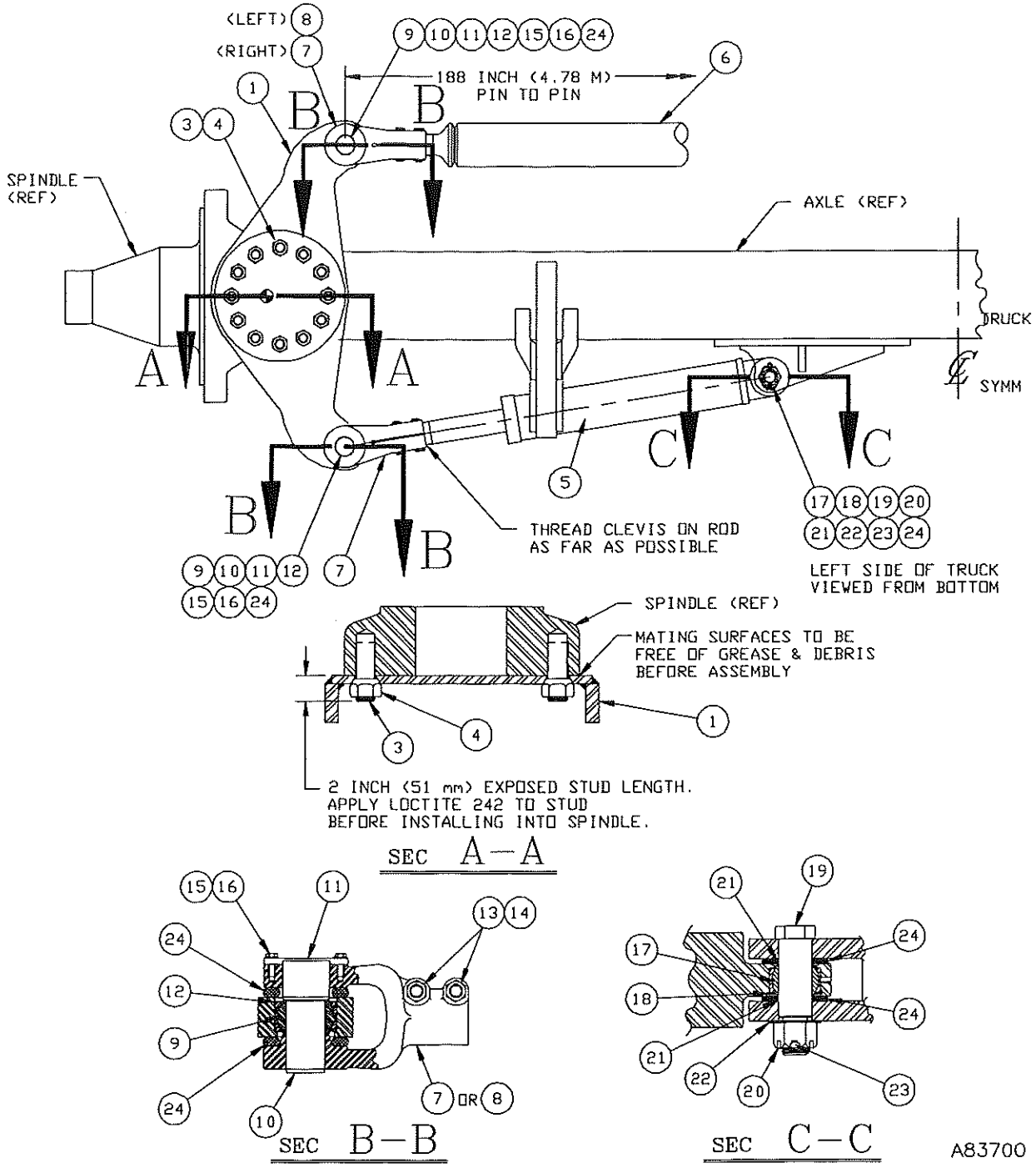
e. Adjust the tire toe-in as outlined in Maintenance and Adjustment. Tighten the clamping bolts on the various cylinders and drag links to secure the final settings.



KEY MHA86052

01.	Steering Arm	12.	Retaining Ring (Internal)	23.	Expander Washer
02.	Steering Arm	13.	Capscrew	24.	Capscrew (Metric)
03.	Stud (Grade 8)	14.	Locknut	25.	Grease Seal
04.	Taper Nose Nut (Grade 8)	15.	Capscrew	26.	– 28. Not Used
05.	Steering Cylinder	16.	Hardened Flatwasher	29.	Pin Retainer
06.	Tie Rod	17.	Self-Aligning Bushing	30.	– 34. Not Used
07.	Steering Yoke (LH Threads)	18.	Retaining Ring (Internal)	35.	Expander Pin Assembly
08.	Steering Yoke (RH Threads)	19.	Expander Pin		(Includes items 19, 22, 23, and 24)
09.	Steering Yoke	20.	Not Used	36.	Expander Pin Retainer
10.	Self Aligning Bushing	21.	Bearing Spacer	37.	Flatwasher
11.	Expander Pin	22.	Expander Sleeve	38.	Capscrew

FIGURE 2 - STEERING COMPONENT INSTALLATION ASSEMBLY – EXPANDER PIN CONFIGURATION (MHA86052)



KEY					A83700A
1.	STEERING ARM	9.	SELF ALIGNING BUSHING	17.	SELF ALIGNING BUSHING
2.	NOT USED	10.	PIN	18.	RETAINING RING (INTERNAL)
3.	STUD (GRADE 8)	11.	PIN RETAINER	19.	PIN
4.	TAPER NOSE NUT	12.	RETAINING RING (INTERNAL)	20.	SLOTTED NUT
5.	STEERING CYLINDER	13.	CAPSCREW	21.	BEARING SPACER
6.	TIE ROD	14.	LOCKNUT	22.	HARDENED FLATWASHER
7.	STEERING YOKE (R.H. THREADS)	15.	CAPSCREW	23.	COTTER PIN
8.	STEERING YOKE (L.H. THREADS)	16.	HARDENED FLATWASHER	24.	GREASE SEAL

FIGURE 3 - STEERING COMPONENT INSTALLATION ASSEMBLY – STRAIGHT PIN/NUT CONFIGURATION

AXLEBOX

DESCRIPTION AND LOCATION (Figure 1)

The axlebox is the large housing located at the rear of the truck directly under the frame and dump body, which serves as the mounting for the wheelmotors. It is made of high strength steel and is attached to the frame at four locations.

The nosecone bearing assembly at the front of the axlebox serves as one attachment point. It consists of a large spherical bearing, which attaches to the lower crossmember on the main frame.

A radius or panhard rod connects the upper axlebox to the frame. Its purpose is to limit lateral movement of the axlebox while permitting vertical movement and oscillation.

The rear of the axlebox connects to the lower portion of the rear suspension assemblies. The upper portion of the rear suspensions attaches to the rear of the main frame.

OPERATION

The axlebox assembly serves as a mounting support for the electric wheelmotor assemblies and rear suspensions, a mounting point and protection for necessary brake and drive system components, and as a plenum chamber for cooling air to the wheelmotor assemblies.

During operation, the acceleration, retarding, and braking forces generated by the rear wheelmotors are transmitted to the truck through the nosecone portion of the axlebox.

The radius or panhard rod allows vertical motion and oscillation of the axlebox especially when the truck is loaded, but limits lateral movement.

The rear suspension axlebox connections limit but allow some vertical movement of the axlebox. Shock caused during vehicle operation is absorbed in the suspension.

MAINTENANCE AND ADJUSTMENT

Periodic maintenance should include the following steps:

1. Park the truck in a SAFE POSITION. It must be secured by means other than the friction brake system.

2. Clean the assembly.

3. Verify that the axlebox access door is in good condition, and forms a good seal. Repair or replace as required. Use a 3M Rubber Adhesive (or equivalent) to attach the rubber seal to the inside of the door.

4. Inspect axlebox structure for evidence of damage.

5. Every 500 hours visually inspect the following for damage, excessive wear, proper installation and lubrication, and freedom from contamination with dirt or other material.

   a. Nosecone bearing cap, capscrews, and washers

   b. Radius Rod

   c. Suspensions and mounts

   d. Grease seals

6. Every 2500 hours check nosecone pivot bearing clearance as follows:

   a. Be certain the nosecone bearing cap attaching bolts are properly torqued.

   b. Locate the jacks aft of the rear wheel centerline as shown in Figure 1. Jack the truck until the rear tires clear the ground. Secure in place with adequate blocking.

   c. Attach two dial indicators to the axlebox as indicated in Figure 1, using magnetic attaching blocks. Orient the indicators to measure vertical clearance.

   d. Measure bearing vertical clearance by raising and lowering with a small jack under the nosecone assembly. After determining the clearance, use the jack to center the bearing.

   e. Reposition the dial indicators to measure horizontal clearances.

   f. Using blocking and a pry bar, port-a-power or other suitable device, move the nosecone from side to side to determine horizontal clearance.

NOTE: *When bearing vertical clearance exceeds 0.125 inch (3.2 mm) or horizontal clearance exceeds 0.437 inch (11.1 mm) the bearing should be replaced as outlined in the instructions later in this module.*

   g. Remove all measuring equipment.

h. Remove jacks and blocking and lower to the ground.

REMOVAL (Figure 1)

The axlebox may be removed as follows:

NOTE: *If only the nosecone pivot bearing is being removed or replaced, it is not necessary to remove the radius or panhard rod, suspensions, wheelmotors, or other components. Verify that the D-rings and suspensions do not bind during this procedure.*

NOTE: *The axlebox assembly may be removed with or without the wheelmotors installed. If it is necessary or desirable to remove the wheelmotors, follow the procedures outlined in Section 7 -Running Gear. Additional information on the brakes and other hardware is contained in Section 5 -Hydraulic System, and Section 8 - Brake System.*

1. Park the truck in a SAFE POSITION. It must be secured by means other than the friction brakes and rear wheels.

2. Jack or lift the truck until the tires are clear of the ground.

3. Support the frame at the dump cylinder attachment points. Support the axlebox adequately to allow controlled movement, without allowing it to move by itself.

NOTE: *It is recommended that the assembly be lifted at the "D"-rings assembly point with clamps, slings, or other suitable means.*

4. If desired, (if the axlebox is to be removed) remove the tires and wheelmotors as outlined in the instructions in Section 7 - Running Gear.

5. Disconnect all cables and hoses from the axlebox and pull them through their entry holes. Unclamp them from the nose portion of the axlebox.

⚠ DANGER

The hydraulic brake system is a high pressure system. Relieve all pressure before disconnecting any lines.

NOTE: *Label each cable and hose to assist in the assembly procedures. Cap or plug all openings.*

6. Loosen the clamps on the cooling air inlet hose on the axlebox nose. Remove the flexible air coupling.

7. Support the axlebox adequately to hold the weight. Disconnect the rear suspensions as outlined in the instructions in Section 7 - Running Gear.

NOTE: *Total removal of the suspensions will aid in the removal of the axlebox assembly.*

8. Remove the radius or panhard rod assembly by removing the retainers and the pins securing to the frame and axlebox.

NOTE: *The rod must be level when removing.*

9. Remove the capscrews in the bearing cap.

10. Using a come-along on the eye of the bearing cap for support, remove the cap.

NOTE: *Handle the cap with care to prevent the bearing from falling out or being damaged.*

11. Using cables and the come-along, lower the nose of the axlebox, then move the entire axlebox down and rearward out.

NOTE: *If only the nosecone pivot bearing is being replaced, it is necessary to move the axlebox to the rear only enough to gain operating clearance.*

12. Remove all remaining components. Secure the axlebox to prevent movement for safe repair.

INSPECTION AND REPAIR

The axlebox may be inspected/repaired as follows:

1. Inspect all structural components for evidence of wear or damage. Repair or replace as required using the welding procedures outlined in Section 10 - Miscellaneous.

2. Inspect the nosecone pivot bearing surfaces for evidence of wear or damage. Repair or replace as required.

NOTE: *The top and bottom sections of the nosecone pivot bearing are a matched set.*

3. Inspect all remaining seals as required for evidence of wear or damage. Repair or replace as required using 3M Rubber Adhesive (or equivalent) to attach.

4. Inspect the self-aligning bushings in the panhard or radius assembly and the suspension mounting points for evidence of wear or damage. They may be changed as follows:

a. Removing the retainers and bearings using air arc, grinding or other suitable means.

b. Inspect the inner bore of each sleeve in the assemblies for evidence of wear or damage. It must be free of defects and within 0.001 inch (0.025 mm) of round. Small ridges or grooves may be repaired with emery cloth. Otherwise the sleeve should be replaced. This may be done as follows:

(1) If so equipped, carefully remove the damaged sleeve, exercising care not to damage the bore in the frame/front axle.

(2) Inspect the bore in the frame/front axle for evidence of wear or damage. It must be free of defects and within 0.001 inch (0.025 mm) of round. Small ridges or grooves may be repaired with emery cloth.

NOTE: *If defects are found or the bore is not within tolerances, contact the local Unit Rig Service Representative for detailed repair recommendations.*

(3) Install the new sleeves as follows:

IMPORTANT: *Sleeves with high interference fit may be installed using either of the methods outlined here. The liquid nitrogen method typically provides a more consistent installation.*

Liquid Nitrogen Method

⚠WARNING

Due to the cold temperatures of both the liquid nitrogen cooling medium and the parts being cooled, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(a) Using all of the appropriate precautions because of the cold temperatures of the materials involved, gently immerse the sleeve into a pool of liquid nitrogen.

(b) After allowing sufficient time to fully cool, carefully remove from the liquid nitrogen and install in the appropriate bore properly oriented.

(c) Allow the sleeve to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the sleeve.*

Heating Method

⚠WARNING

Due to the cold temperatures of both the liquid nitrogen cooling medium and the parts being cooled and the heat applied to the receiving component area, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(a) Using all of the appropriate precautions because of the cold temperatures of the materials involved, carefully cool the sleeve to a temperature of –40° to –70° F (-40° to –57° C).

(b) Evenly heat the bore into which the sleeve is to be installed to 300° to 350° F (150° to 175° C).

IMPORTANT: *Heat the massive side of the lug additionally to ensure that the bore is heated and expanded evenly.*

(c) Once both components are at the proper temperatures, carefully remove the sleeve from the cooling medium and install in the appropriate bore properly oriented.

(d) Allow the sleeve to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the sleeve.*

(e) Verify that with the sleeve properly installed, it is within 0.001 inch (0.025 mm) of round. Small ridges or grooves may be repaired with emery cloth.

c. Install the self-aligning bushings as follows:

IMPORTANT: *Steel spherical bearings should not come in direct contact with dry ice and should not be immersed in liquid nitrogen. Either of these actions could result in the change of the metallurgical character of the bearing affecting subsequent fit and operation.*

⚠WARNING

Due to the cold temperatures of both the dry ice or other cooling medium and the parts being cooled, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(1) Using all of the appropriate precautions because of the cold temperatures of the materials involved, carefully cool the bearing assembly to a temperature of –40° to –70° F (-40° to –57° C).

(2) Once both components are at the proper temperatures, carefully remove the bearing from the cooling medium and install properly oriented into the appropriate bore.

(3) Allow the bearing assembly to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the bearing or bore.*

(4) Secure with the new retainers (7) using care not to contaminate the new bushings.

INSTALLATION

The axlebox may be installed as follows:

1. Verify that the bearing and threaded surfaces are clean and free of damage or burrs.

2. Install the lower nosecone pivot bearing section in the nosecone.

3. Insert the upper nosecone pivot bearing section in the bearing cap assembly.

4. Liberally coat the surfaces of the spherical inner bearing with clean chassis grease.

5. Move the axlebox into position.

6. Install the upper bearing cap, aligning the two sections with the coiled spring or roll pin (35) (on trucks so equipped).

a. Make sure that on trucks so equipped the bearing is secured with the anti-rotational stop (34).

b. Secure with hardened flatwashers and Grade 8 capscrews coated with Loctite 242 (or equivalent).

c. Tighten in 50 ft-lbs. (68 Nm) increments using a standard cross tightening technique to a final torque of 280 ft-lbs. (380 Nm).

NOTES: *It is recommended that a bead of RTV or equivalent be spread completely around the edges of the mating surfaces on the two halves of the bearing cap to prevent the ingestion of dirt or other contamination. Use care not to allow the material to enter the bearing area so that it might be drawn into the bearing assembly.*

7. Install the nosecone grease seal as shown in Figure 1 using 3M Rubber Adhesive (or equivalent).

a. Make sure to position to the rear of the crosstube:

(1) Splice in the seal.

(2) Screw in the clamp.

b. Make sure that the exposed edge on the rubber seal is oriented downward to avoid the ingress of water and other contamination.

8. Reinstall all hoses, cables, etc. removed previously. Verify all items entering the axlebox are sealed on both the inside and outside.

9. Install the panhard or radius rod as follows:

a. Position the rod in the near horizontal position.

b. Position the axlebox to align the rod assembly with the mounting points in the frame and axlebox.

c. Install the pin on each end of the rod installing the neoprene rings on each side of the self-aligning bushings.

d. Secure each pin with the retainer, capscrews, and flatwashers.

10. Install the rear suspensions as outlined in the instructions in Section 7 - Running Gear.

11. Install the wheelmotors and tires as outlined in the instructions in Section 7 - Running Gear.

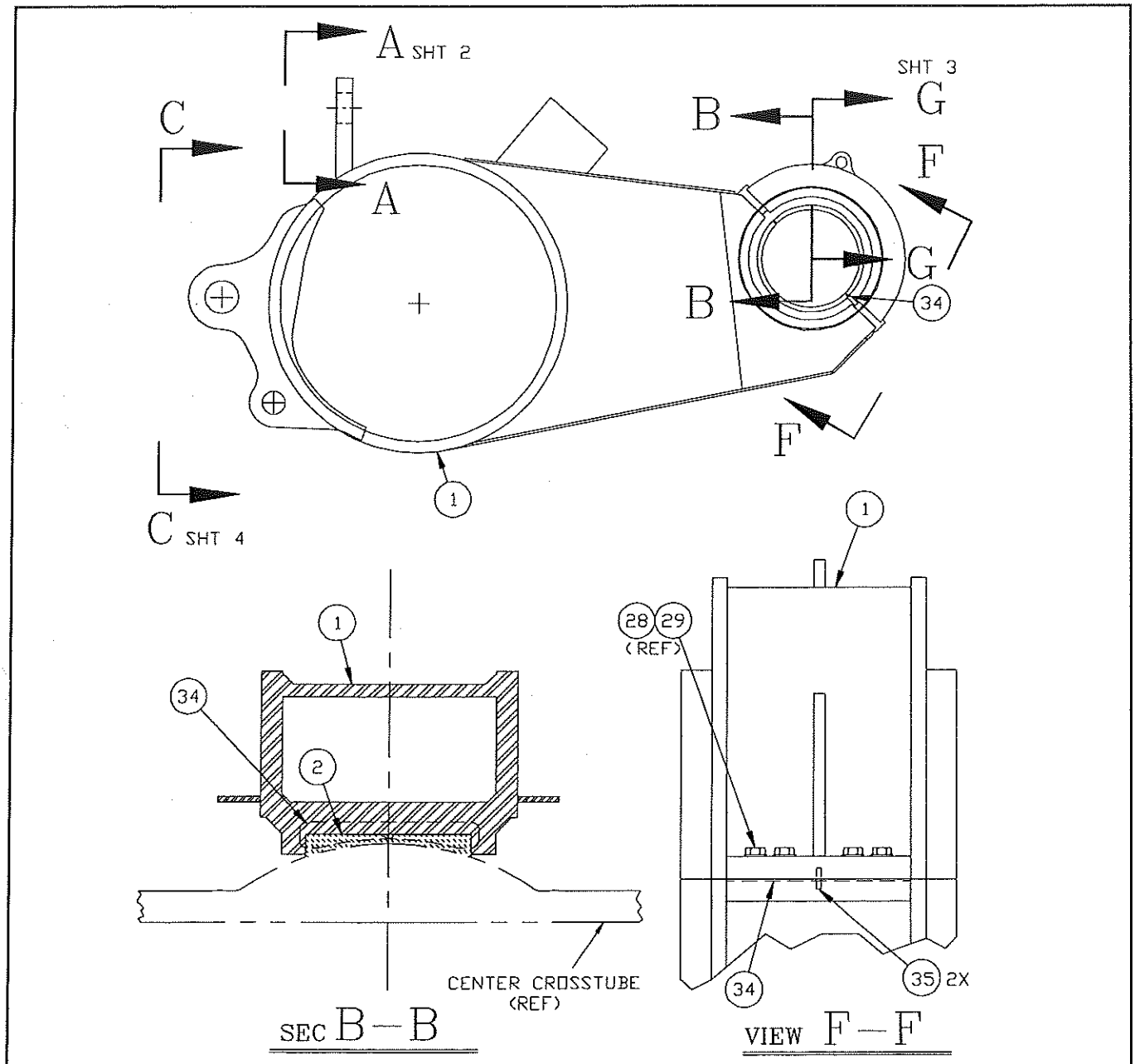
12. Connect all remaining lines.

13. Lubricate all components.

14. Lower the unit to the ground.

15. Check or test each system as outlined in the appropriate instructions prior to operating the truck.

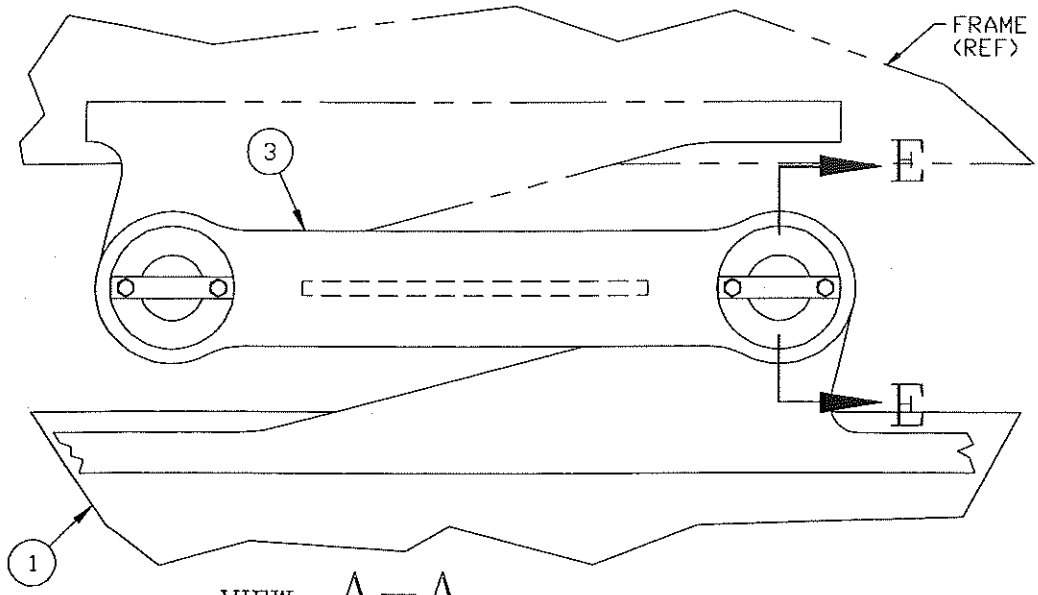
16. Recheck the torque on the nosecone bearing cap capscrews after the first 125 hours of operation each time the bolts are removed. Then return to the normal 500 hour inspection, 2500 hour retorque routine.



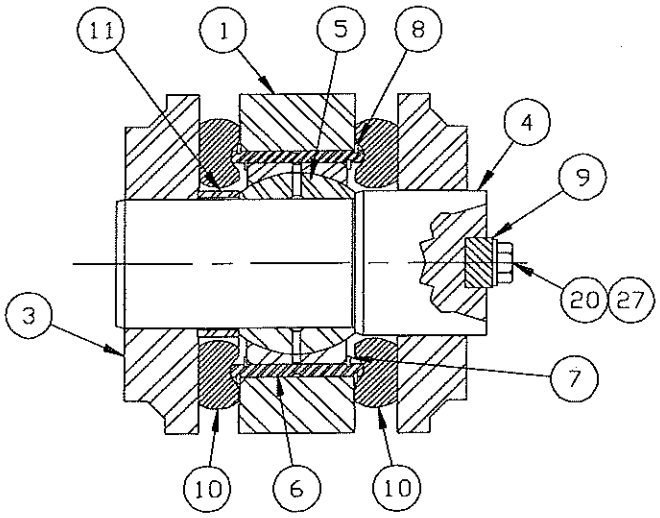
KEY A85221

01.	Axlebox	13.	Adjustable Clamp	25.	Acorn Nut
02.	Nosecone Pivot Bearing	14.	Banding Clamp	26.	Cellular Rubber Seal
03.	Radius (Panhard) Rod	15.	Rubber Adhesive	27.	Capscrew
04.	Pin	16.	Access Cover Door	28.	Capscrew
05.	Self Aligning Bushing	17.	Hinge Bracket	29.	Hardened Flatwasher
06.	Bearing Bore Sleeve	18.	Capscrew	30.	Not Used
07.	Internal Retaining Ring	19.	Locknut	31.	Not Used
08.	External Retaining Ring	20.	Hardened Flatwasher	32.	Not Used
09.	Pin Retainer	21.	Eye Bolt	33.	Heavy Duty Hose Clamp
10.	Dirt Ring	22.	Eye Bracket	34.	Anti Rotational Key
11.	Bearing Spacer	23.	Clevis Pin	35.	Roll/Coil Spring Pin
12.	Bearing Seal	24.	Speed Ball Handle		

FIGURE 1 - AXLEBOX ASSEMBLY (A85221, SHEET 1 OF 4)



VIEW A–A



SEC E–E

2 PLACES

KEY A85221

01.	Axlebox	13.	Adjustable Clamp	25.	Acorn Nut
02.	Nosecone Pivot Bearing	14.	Banding Clamp	26.	Cellular Rubber Seal
03.	Radius (Panhard) Rod	15.	Rubber Adhesive	27.	Capscrew
04.	Pin	16.	Access Cover Door	28.	Capscrew
05.	Self Aligning Bushing	17.	Hinge Bracket	29.	Hardened Flatwasher
06.	Bearing Bore Sleeve	18.	Capscrew	30.	Not Used
07.	Internal Retaining Ring	19.	Locknut	31.	Not Used
08.	External Retaining Ring	20.	Hardened Flatwasher	32.	Not Used
09.	Pin Retainer	21.	Eye Bolt	33.	Heavy Duty Hose Clamp
10.	Dirt Ring	22.	Eye Bracket	34.	Anti Rotational Key
11.	Bearing Spacer	23.	Clevis Pin	35.	Roll/Coil Spring Pin
12.	Bearing Seal	24.	Speed Ball Handle		

FIGURE 1 - AXLEBOX ASSEMBLY (A85221, SHEET 2 OF 4)

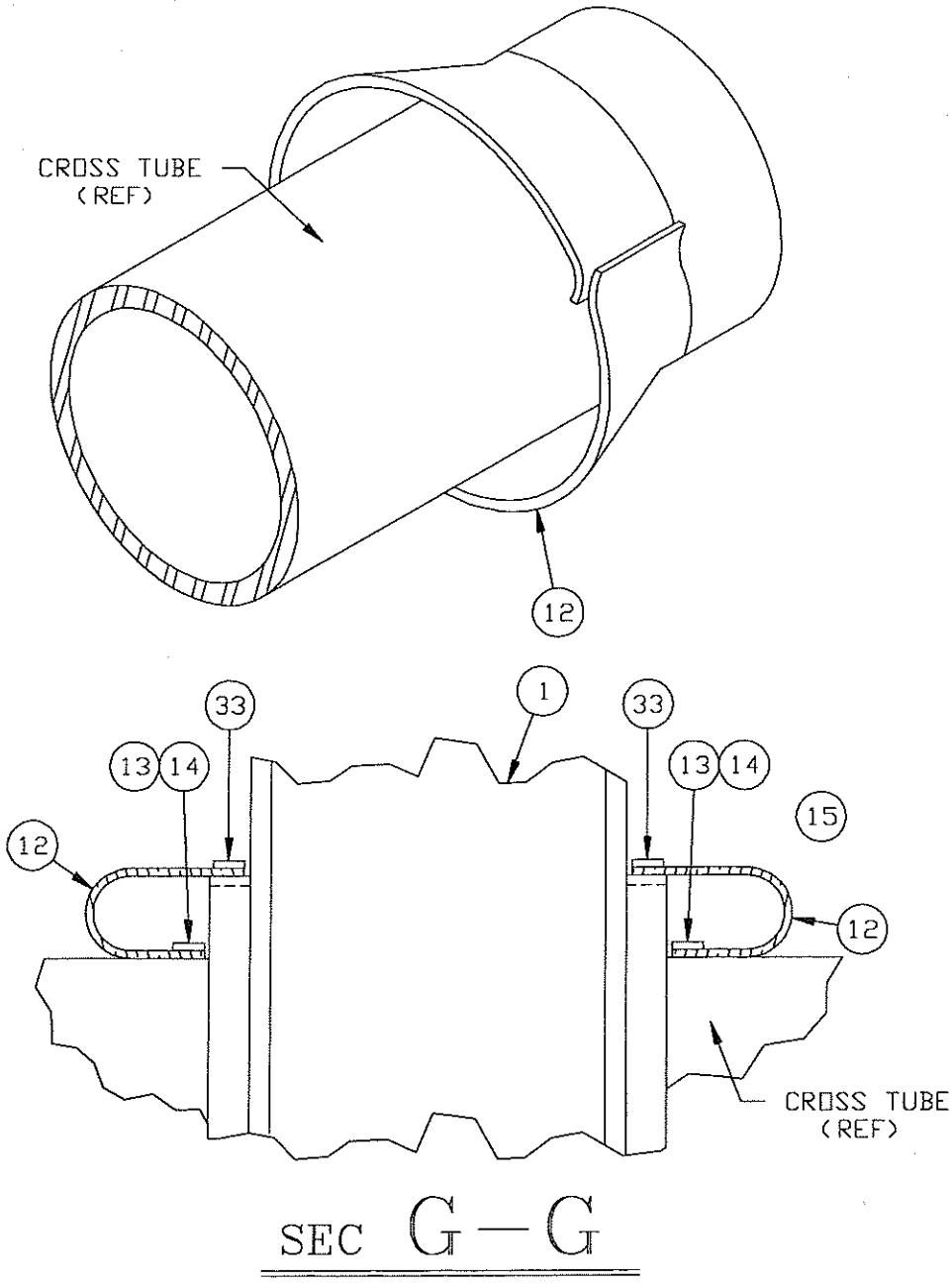
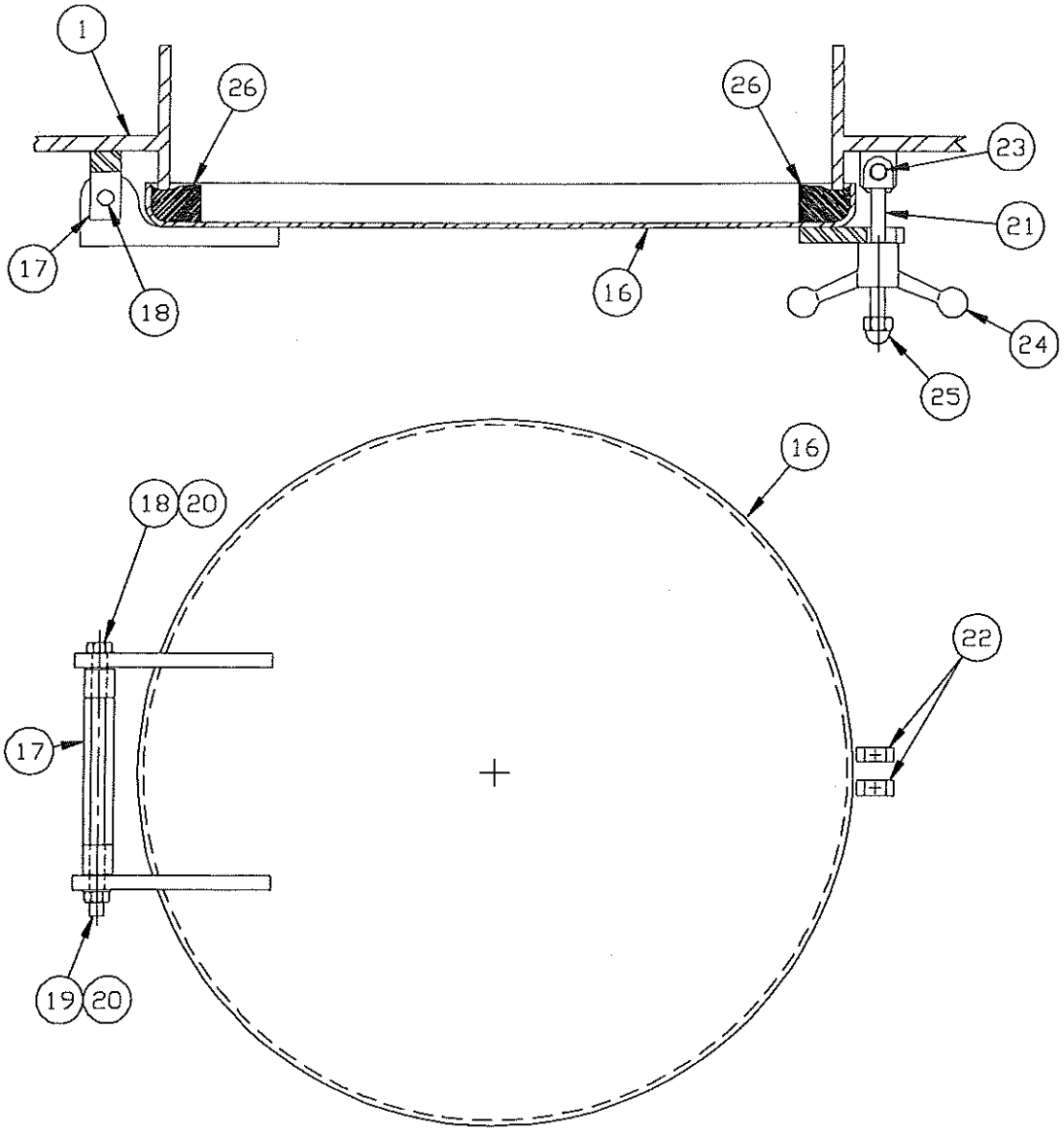


FIGURE 1 - AXLEBOX ASSEMBLY (A85221, SHEET 3 OF 4)



VIEW C – C

KEY A85221

01.	Axlebox	13.	Adjustable Clamp	25.	Acorn Nut
02.	Nosecone Pivot Bearing	14.	Banding Clamp	26.	Cellular Rubber Seal
03.	Radius (Panhard) Rod	15.	Rubber Adhesive	27.	Capscrew
04.	Pin	16.	Access Cover Door	28.	Capscrew
05.	Self Aligning Bushing	17.	Hinge Bracket	29.	Hardened Flatwasher
06.	Bearing Bore Sleeve	18.	Capscrew	30.	Not Used
07.	Internal Retaining Ring	19.	Locknut	31.	Not Used
08.	External Retaining Ring	20.	Hardened Flatwasher	32.	Not Used
09.	Pin Retainer	21.	Eye Bolt	33.	Heavy Duty Hose Clamp
10.	Dirt Ring	22.	Eye Bracket	34.	Anti Rotational Key
11.	Bearing Spacer	23.	Clevis Pin	35.	Roll/Coil Spring Pin
12.	Bearing Seal	24.	Speed Ball Handle		

FIGURE 1 - AXLEBOX ASSEMBLY (A85221, SHEET 4 OF 4)

FRONT SUSPENSION - NITROGEN/OIL

DESCRIPTION AND LOCATION (Figure 3)

This version of the TEREX|UNIT RIG nitrogen/oil front suspension is identified externally by the location of the charge ports on the side of the outer tube assembly. It is a cylindrical, telescoping unit that suspends the front axle from the main frame assembly. The suspensions are mounted outside of the main frame, between the ends of the superstructure support and directly under the superstructure support frame crossmember and the ends of the front axle assembly.

NOTE: *There have been two basic front axle/wheel/suspension configurations used on the MT 3300AC trucks.*
1. Some trucks were equipped with a smaller front axle assembly. These utilized the original design front suspension and wheel assemblies. They can be identified quickly visually by the fact that the two steering arms are symmetrical and interchangeable. Typically these were earlier production trucks and later units built for fleet compatibility and are identified as such in this material.
2. Other trucks used a larger front axle assembly. These utilized new design shorter front suspension and different wheel assemblies that incorporated larger components. They can be identified quickly visually by the fact that the two steering arms are asymmetrical and not interchangeable. Typically these were later production trucks and are identified as such in this material.
It is important to determine which configuration the truck has before beginning servicing the components as there are differences between the two.

OPERATION

The front suspensions consist of two major assemblies that move in relationship to each other. The outer tube assembly is pivoted on the main frame upper crossmember. The inner tube, attached to the axle at its lower end, slides inside the outer tube. The front wheel, steering, and brake assemblies mount on the axle.

The front suspensions serve as both spring and shock absorber. The spring function is provided by the compression of the nitrogen gas. The shock absorber function is handled by controlling the flow of oil between the inner and outer chambers in the suspensions.

In a static condition, compressed nitrogen gas in the internal cavity creates sufficient force to support the truck. When the tire strikes something (a hole, rock, etc.) the resultant forces cause the inner tube to slide upward in the outer tube. This compresses the nitrogen, absorbing the energy. At the same time, oil flows through the passages in the piston rod wall from the main chamber to the dampening chamber (annular volume between the piston rod outside diameter and the outer tube I.D.).

After the impact has been absorbed, the increased gas pressure begins to force the inner tube downward to its original position. As it does, oil flows from the dampening chamber back into the main chamber. However, a portion of the passages are now closed, restricting flow in this direction. This difference in flow characteristics provides dampening/rebound control.

NOTE: *Earlier versions of the suspension incorporated a configuration with two large "check" balls. Later versions were configured with four ½ inch (13 mm) check balls. This earlier/later designation does not necessarily coincide with the earlier/later (longer/shorter) configuration of the suspension on the MT 3300AC trucks outlined elsewhere in this module.*

MAINTENANCE AND ADJUSTMENT

NOTES:
1. As outlined in Description and Location, MT 3300AC trucks may have either of two distinct suspension configurations:
a. Earlier configurations were longer. They can be visually identified by the vendor part number, (1380 or 1380M, for 2 or 4 check ball configuration, stamped into it) or by the increased length of plunger tube exposed below the bellows.
b. Later configurations are shorter, with the difference in length in the plunger tube. They can be visually identified by the vendor part number, (1380S or 1380SM, for 2 or 4 check ball configuration, stamped into it) or by the decreased length of plunger tube exposed below the bellows.
2. A more definitive method of identification involves measuring the overall fully extended length - from the center of one mounting pin to the center of the other mounting pin.
a. If the suspension is not mounted, this may be done by extending the suspension manually until it is mechanically stopped.
b. If the suspensions are mounted, this may be done by jacking or lifting the truck by the front points until the tires are lifted from the ground.
c. Overall extended lengths are:

(1) Earlier configuration (longer) suspensions - 68-1/4 inches (1 735 mm)
(2) Later configuration (shorter) suspensions - 64-5/8 inches (1 640 mm)

Periodic maintenance should include the following steps:

1. Clean the unit. Inspect for evidence of wear, damage, or leakage especially in the area of the exposed portion of the inner tube and the charging valves. Repair or replace as required.

NOTE: *An optional split bellows assembly with a zipper is available that allows its replacement without removing the suspension or mounting pins.*

2. Check all retaining screws for evidence of damage or looseness. Repair or replace immediately if found loose, defective, or broken.

⚠WARNING

Prior to loosening any capscrews, always jack and support the truck to remove its weight from the suspension, release all gas pressure and secure the suspension by appropriate means. Under some conditions, these members support the weight of the truck and failure to remove the weight and pressure could result in personal injury or equipment damage.

3. Inspect the exterior of the suspension for evidence of fluid leakage. If there is leakage, repair or replace as required and recharge with oil as outlined in the procedures later in these instructions.

NOTE: *For detailed instructions on checking/charging the suspension oil level, refer to the procedures later in this portion of the module.*

4. Check the relative operating condition of the suspension as follows:

a. Operate the truck for a sufficient period of time to allow both suspensions to equalize at normal operating temperatures.

b. With the empty truck resting on a smooth, flat surface, measure the distance between the center of the upper and lower mounting pins as shown in Figure 1. The measurement should be approximately (+/- 1/2 inch (13 mm)):

MK30B	64-1/4 inches (1 630 mm)
MT 2700/3000	64-1/4 inches (1 630 mm)
MT 3300	64-1/4 inches (1 630 mm)
MT 3300AC	
Earlier configuration (longer)	64-1/4 inches (1 630 mm)
Later configuration (shorter)	60-5/8 inches (1 540 mm)
BD 220	
Earlier configuration (longer)	64-1/4 inches (1 630 mm)
Later configuration (shorter)	60-5/8 inches (1 540 mm)
MT 3600B	58-3/8 inches (1 485 mm)
BD 240 & 270	58-3/8 inches (1 485 mm)
MT 3700B/3700AC	58-3/8 inches (1 485 mm)
MT 4000AC	69-1/8 inches (1 755 mm)
MT 4400/4400AC	69-1/8 inches (1 755 mm)
MT 5500	69-1/8 inches (1 755 mm)

If the suspension is not within these limits, check and adjust the nitrogen precharge pressure as outlined in the procedures that follow.

Items that may indicate that the suspension may now or will soon require servicing internally include:

(1) Evidence of oil leakage around the suspension.

(2) Frequent changes in ride height requiring recharging with nitrogen gas.

NOTES:
1. A decrease in the ride height usually accompanies a loss of gas. Loss of gas can only occur around the charge valve or TEREX|UNIT RIG *Weigh or Two-Speed Overspeed System transducers.*
2. Increased deflection with a normal ride height indicates a loss of oil.

(3) Harsh or bouncy ride are indications that the suspensions are repeatedly operating at the end of their travel strokes.

5. On trucks equipped with the TEREX|UNIT RIG Weigh System, visually inspect all components and wiring for evidence of wear or damage. Repair or replace as required.

CHARGING PROCEDURE - NITROGEN/OIL FRONT SUSPENSION (Figure 1)

NOTE: *The following procedure describes how to service the suspension with both nitrogen and oil. During factory*

or rebuild assembly of the suspensions they are to be filled with oil only. They are to be charged with nitrogen only after being installed on a truck. Prior to removing from a truck, the nitrogen charge should be decreased to less than 100 psi (690 kPa) and blocked in the extended position.

⚠ DANGER

The main bodies of the suspensions are to be charged with dry nitrogen only. Use of oxygen, compressed air or other gases may result in a violent explosion.

⚠ CAUTION

The struts contain gas and oil under high pressure. Extra care must be taken when adjusting or servicing the struts. Since internal pressures can exceed 2000 psi (13 800 kPa), it is important to open the charge valves slowly and allow the pressures to be fully released before working on the struts. Also only dry nitrogen gas should be used for charging.

CHARGING WITH OIL (Original or refill after significant servicing)

NOTES:

1. This procedure is recommended if the suspensions have experienced a fluid loss due to some other reason than an external leak. If an external leak develops, the suspension should be removed and replaced. Return the suspensions to TEREX|UNIT RIG *for repair as unauthorized repair may affect their warranty.*

2. To modify or customize ride characteristics, contact your local TEREX|UNIT RIG *representative for detailed instructions, detailing the suspension part number, mine location, and truck model and serial number.*

3. Suspensions are delivered with the proper amount of oil and should not require checking when new or rebuilt.

The oil level of the suspensions mounted on a truck may be checked and adjusted as follows:

NOTE: *During truck operation, the nitrogen precharge in the strut tends to mix with the oil. This appears as an oily froth that comes out of the suspension when the nitrogen pressure is released.*

To accurately measure the oil level, the nitrogen must be removed from the oil. This is done by drawing a vacuum on the gas portion of the suspension assembly or by supporting the frame adequately with blocking and opening and leaving open the upper charge valves for 24 hours. The only time that this need be done is if external leakage is evident (indicating the need for repair) or when the empty to loaded deflection seems excessive.

NOTE: *On trucks equipped with most of the later versions of the suspension, a setscrew/drain plug combination is installed at the bottom to allow the easy draining of the oil if so desired. If the plugs are removed, they should be reinstalled as outlined in the Assembly instructions in this publication.*

NOTE: *The procedure assumes that the suspensions are mounted on a truck. If not, suitable support and means of securing the suspensions should be in place before proceeding.*

1. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

2. Raise the truck until the suspensions are fully extended. Secure in this position with suitable blocking.

MK30B	68-1/4 inches (1 735 mm)
MT 2700/3000	68-1/4 inches (1 735 mm)
MT 3300	68-1/4 inches (1 735 mm)
MT 3300AC	
Earlier configuration (longer)	68-1/4 inches (1 735 mm)
Later configuration (shorter)	64-5/8 inches (1 640 mm)
BD 220	
Earlier configuration (longer)	68-1/4 inches (1 735 mm)
Later configuration (shorter)	64-5/8 inches (1 640 mm)
MT 3600B	64 inches (1 570 mm)
BD 240 & 270	64 inches (1 570 mm)
MT 3700B/3700AC	64 inches (1 570 mm)
MT 4000AC	72-3/4 inches (1 850 mm)
MT 4400/4400AC	72-3/4 inches (1 850 mm)
MT 5500	72-3/4 inches (1 850 mm)

3. Remove the protective covers over the charge valves and carefully open both valves, releasing the gas charge.

4. Connect a vacuum pump to one of the charge valve assemblies to allow a vacuum to be drawn.

NOTE: *To draw this vacuum, special pneumatic valves and electric pump assemblies are available from* TEREX|UNIT RIG.

5. Verify that the other charging valve is closed.

6. Start the vacuum process and monitor its progress until all gas has been extracted. This is indicated by the oil in the suspension turning a smoother, darker color.

NOTES:

1. Do not allow liquid oil to be drawn from the suspension.
2. Typically this process will take approximately 15 minutes (with a vacuum of 29 inches Hg (98 kPa)) to 30 minutes (with a vacuum of 10 inches Hg (34 kPa)).

7. Stop the vacuum process.

8. Remove the blocking and slowly lower the truck frame until the distance between the upper and lower mounting pins are approximately (+/- 1/2 inch (13 mm)):

MK30B	58-1/4 inches (1 480 mm)
MT 2700/3000	58-1/4 inches (1 480 mm)
MT 3300	58-1/4 inches (1 480 mm)
MT 3300AC	
Earlier configuration (longer)	58-1/4 inches (1 480 mm)
Later configuration (shorter)	54-5/8 inches (1 390 mm)
BD 220	
Earlier configuration (longer)	58-1/4 inches (1 480 mm)
Later configuration (shorter)	54-5/8 inches (1 390 mm)
MT 3600B	51 inches (1 295 mm
BD 240 & 270	51 inches (1 295 mm)
MT 3700B/3700AC	51 inches (1 295 mm)
MT 4000AC	62-3/4 inches (1 595 mm)
MT 4400/4400AC	62-3/4 inches (1 595 mm)
MT 5500	62-3/4 inches (1 595 mm)

9. Release any residual gas pressure in the suspension as outlined previously.

10. Remove the weigh system transducer port adapter fitting near the top of the suspension and replace with the appropriate charging adapter.

11. Open the port and observe if oil flows from the vent hole in the adapter. If not, the oil level is low and charging as outlined below is required.

12. Attach the oil charging kit to this port.

13. Connect the suction line of the charging pump to a supply of clean, good quality SAE 10W hydraulic/ transmission fluid (Conoco/Phillips Power Tran III or equivalent).

The approximate volumes of oil required for the initial filling of each suspension is:

MK30B	8.6 gallons (32.6 liters)
MT 2700/3000	8.6 gallons (32.6 liters)
MT 3300	8.6 gallons (32.6 liters)
MT 3300AC	
Earlier configuration (longer)	8.6 gallons (32.6 liters)
Later configuration (shorter)	7.8 gallons (29.5 liters)
BD 220	
Earlier configuration (longer)	8.6 gallons (32.6 liters)
Later configuration (shorter)	7.8 gallons (29.5 liters)
MT 3600B	9.8 gallons (37.1 liters)
BD 240 & 270	9.8 gallons (37.1 liters)
MT 3700B/3700AC	9.8 gallons (37.1 liters)
MT 4000AC	9.7 gallons (36.7 liters)
MT 4400/4400AC	9.7 gallons (36.7 liters)
MT 5500	9.7 gallons (36.7 liters)

NOTE: *In arctic conditions it is recommended that a synthetic fluid (Conoco Syncon Synthetic R & O or equivalent) be substituted. The fluid should have the properties:*

ISO 46 Viscosity Grade
-70° F (-55° C) Pour Point
PAO Synthetic – May be used with common seals

14. Connect the charge kit pump to an air supply source, 90 psi (620 kPa) minimum.

15. Start the charging pump and add oil until it comes out of the drain hose. Stop the pump.

NOTE: *During the filling operation, loosen the charge valve body slightly to remove pressure and to check the oil level. Oil and gas under minimum pressure will escape through the vent hole.*

16. When the process is complete, remove the oil charging kit and charging fittings.

17. Reinstall the weigh system transducer port adapter previously removed with new sealing washers. Torque to 14 +/- 1 ft-lb (19 +/- 1 Nm).

18. Charge the suspensions with nitrogen as outlined in the separate procedures.

CHARGING THE SUSPENSION WITH GAS (NITROGEN)

The suspensions are only to be charged with nitrogen to a pressure in excess of 100 psi (690 kPa)

when mounted on a truck. Use only dry nitrogen. Do not use oxygen or compressed air as their use or other gases may result in a violent explosion.

IMPORTANT: *The supply cylinder must be of the type that vaporizes the nitrogen when it is withdrawn. Do not charge with liquid nitrogen or any other gas.*

NOTE: *Use a gas regulator on the nitrogen bottle (not furnished with the* TEREX|UNIT RIG *charging kit) to protect the pressure gauge. An accurate reliable pressure gauge is essential to proper suspension adjustment.*

NOTE: *When removing the protective caps from the charging valves, allow for the residual gas pressure, if present, to escape before fully removing the cap.*

1. Park the truck in a SAFE POSITION in a level place. It must be secured by means other than the truck's friction brake system.

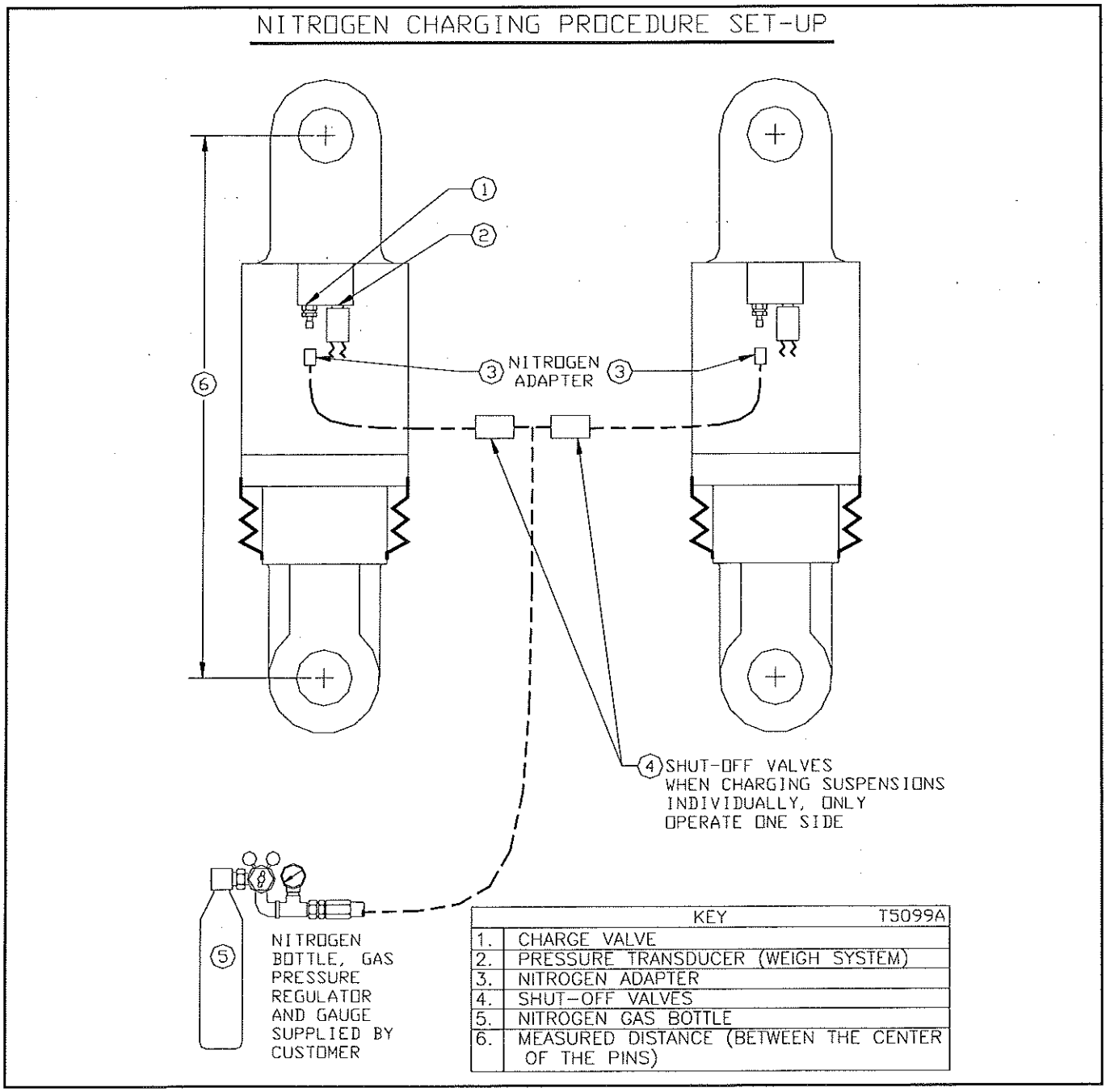


FIGURE 1 - SUSPENSION CHARGING EQUIPMENT AND INFORMATION

NOTE: *All dirt and other foreign material should be removed from the frame and dump body before charging the suspensions.*

2. Carefully remove the charging valve protective covers, as residual gas pressure may be present.

3. Connect the gas charging kit to the charging valves on the suspensions (with the shut-off valves closed) and to the regulator on the nitrogen supply bottle.

a. Connect the shorter hose assemblies to the two suspensions at the charge valves.

b. Connect the longer supply hose to the nitrogen supply.

4. Adjust the pressure regulator to approximately 600 psi (4 140 kPa).

NOTE: *Use care to protect the pressure gauge against over-pressurization. Pressures in excess of 2000 psi (13 790 kPa) are easily obtainable.*

5. Open the charge valve and charge the suspension until the distance between the centers of the upper and lower mounting pins is approximately (+/- 1/2 inch (13 mm)):

NOTE: *During the filling process, gas should be added slowly enough and the flow stopped periodically to allow the suspensions to equalize. The exact process will vary slightly with equipment, material, and operator.*

MK30B	64-1/4 inches (1 630 mm)
MT 2700/3000	64-1/4 inches (1 630 mm)
MT 3300	64-1/4 inches (1 630 mm)
MT 3300AC	
Earlier configuration (longer)	64-1/4 inches (1 630 mm)
Later configuration (shorter)	60-5/8 inches (1 540 mm)
BD 220	
Earlier configuration (longer)	64-1/4 inches (1 630 mm)
Later configuration (shorter)	60-5/8 inches (1 540 mm)
MT 3600B	58-3/8 inches (1 485 mm)
BD 240 & 270	58-3/8 inches (1 485 mm)
MT 3700B/3700AC	58-3/8 inches (1 485 mm)
MT 4000AC	69-1/8 inches (1 755 mm)
MT 4400/4400AC	69-1/8 inches (1 755 mm)
MT 5500	69-1/8 inches (1 755 mm)

NOTES:
1. If the resulting empty ride height is not correct, repeat the above procedure raising or lowering the charge pressure in 20 psi (140 kPa) increments. The important parameter is to charge the suspensions to provide the correct empty ride height.
2. If the truck will be operated in ambient conditions significantly colder than that in the work area, it is recommended that the adjusted empty truck ride height be increased 1/2 to 1 inch (12 to 25 mm) to compensate for the effects to the reduced temperatures.

6. Close the individual shut off valves and then the gas pressure regulator.

7. Remove the charging equipment and check for leaks using a soap solution.

NOTE: *If a leak is found in the charge valve core area:*
1. Check the torque on the valve core. It should be torqued to 3 to 4 in-lb (0.35 to 0.45 Nm).
2. If this does not stop the leak it may be necessary to check the valve core area for damage or contamination or replace the valve core. It is important that all pressure in the suspension be relieved prior to removal of the valve core using the charging unit.

8. Install the protective covers. Torque to 40 to 50 in-lb (4.5 to 5.5 Nm).

9. Remove the blocking and lower the truck to the ground.

10. Operate the truck for approximately 24 hours, and then repeat the empty ride height checking process. Adjust as required.

REMOVAL (Figure 4)

The suspensions may be removed as follows:

1. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

2. Raise the front of the truck until both suspensions are at full travel and the tires are clear of the ground. Secure the frame assembly in this position with adequate blocking then lower the truck slightly to remove the load from the suspension and pins. Block the main frame in this position.

3. Release the nitrogen (gas) pressure in both of the front suspensions to less than 100 psi (690 kPa) as outlined in the instructions in Maintenance and Adjustment in this module.

NOTE: *On trucks equipped with most of the later versions of the suspension, a setscrew/drain plug combination is installed at the bottom to allow the easy draining of the oil if so desired. If the plugs are removed, they should be reinstalled as outlined in the Assembly information in this module.*

4. On trucks equipped with the TEREX|UNIT RIG Weigh System, disconnect the wiring from the pressure transducers.

5. Support the suspension adequately before removal of the connecting pins.

⚠WARNING

Each suspension unit weighs in excess of:

MK30B	**1250 lb (565 kg)**
MT 2700/3000	**1250 lb (565 kg)**
MT 3300	**1250 lb (565 kg)**
MT 3300AC	**1250 lb (565 kg)**
BD 220	**1250 lb (565 kg)**
MT 3600B	**1900 lb (860 kg)**
BD 240 & 270	**1900 lb (860 kg)**
MT 3700B/3700AC	**1900 lb (860 kg)**
MT 4000AC	**1900 lb (860 kg)**
MT 4400/4400AC	**1900 lb (860 kg)**
MT 5500	**1960 lb (890 kg)**

6. Remove the capscrews (7), flatwasher (8), and pin retainers (5) from both the upper and lower pin assemblies.

7. Using a soft head mallet, tap the end of the pin opposite of the capscrew holes and remove one pin at a time. Slight movement of the suspensions may be required to minimize the forces on the pins. Be cautious when handling the pins. There may be some pressure on the pins caused by supporting the suspension.

⚠WARNING

Take care not to bind the connecting pins in the lugs.

8. Carefully remove the suspension unit from the vehicle.

DISASSEMBLY (Figures 2 and 3)

The suspension may be disassembled as follows:

1. Using the appropriate means, remove the oil from the suspension.

NOTES:

1. On trucks equipped with most of the later versions of the suspension, a setscrew/drain plug combination is installed at the bottom to allow the easy draining of the oil if so desired. If the plugs are removed, they should be reinstalled as outlined in the Assembly information in this module.

2. The expected oil volumes involved are in a chart in the Maintenance and Adjustment information in this module.

2. Remove the guard assembly (3) secured by capscrew (1) and lockwasher (2).

3. Remove the charge valve (23) and plug (26) or transducers, if not removed previously. Temporarily replace with plugs.

4. Using a crane and suitable handling and support fixtures, invert the suspension and secure in place with the outer barrel or tube (5) at the bottom.

5. Remove the bellows (17 or 18).

NOTE: *In some installations, removal of the bellows over the lower mount assembly may not be possible. In those installations, it should be moved and secured to the lower mounting point for later removal.*

6. Remove the Grade 8 capscrews (22) and hardened washers (21) that secure the stuffing box to the outer tube assembly.

7. Carefully raise the lower plunger tube/stuffing box assembly from the outer tube assembly (5) using care not to damage the surfaces on any of the components. This assembly can now be positioned horizontally on a clean work surface for additional disassembly, if desired.

8. Remove the grade 8 capscrews (6) and hardened washers (7) securing the piston (8) onto the plunger tube assembly. Remove the piston from the plunger tube assembly.

9. Remove the two balls (9) from the bores in the plunger tube.

10. Carefully remove the stuffing box (13) from the outer tube assembly (5) using care not to damage the surfaces on any of the components.

11. Inspect, then remove the O-ring (11) and back-up ring (12) from the grooves on the outer surface area of the stuffing box (13).

12. Inspect then remove the wiper (16), seal (15), and buffer (14) from the grooves in the inner bore of the stuffing box (13).

13. Drain all oil from the outer barrel or tube assembly and move as required.

INSPECTION AND REPAIR

The disassembled suspension may be serviced as follows:

1. Inspect all component parts both inside and outside. They must be smooth and polished. Remove all nicks, chipped or cracked finishes, and rust spots. Remove all oil and other contamination. If rust is evident in the vicinity of the seals, clean the surface with 400-grit emery cloth.

2. Inspect the self-aligning bearings in the frame and axlebox for evidence of wear and/or damage. They must be free of defects and still properly installed.

If they require replacement, this may be done as follows:

a. Remove the bushing retainers by the appropriate means, exercising special care to prevent damage to the frame/front axle or sleeve bores.

b. If required, use air arc or other appropriate means to split and remove the entire bushing assembly. Again exercise care not to damage the mounting bore and/or sleeve in the frame/front axle.

c. Inspect the inner bore of the sleeve in the frame/front axle for evidence of wear or damage. It must be free of defects and within 0.001 inch (0.025 mm) of round. Small ridges or grooves may be repaired with emery cloth. Otherwise the sleeve should be replaced. This may be done as follows:

(1) If so equipped, carefully remove the damaged sleeve, exercising care not to damage the bore in the frame/front axle.

(2) Inspect the bore in the frame/front axle for evidence of wear or damage. It must be free of defects and within 0.001 inch (0.025 mm) of round. Small ridges or grooves may be repaired with emery cloth.

NOTE: *If defects are found or the bore is not within tolerances, contact the local* TEREX|UNIT RIG *Service Representative for detailed repair recommendations.*

(3) Install the new sleeves as follows:

IMPORTANT: *Sleeves with high interference fit may be installed using either of the methods outlined here. The liquid nitrogen method typically provides a more consistent installation.*

Liquid Nitrogen Method

⚠WARNING

Due to the cold temperatures of both the liquid nitrogen cooling medium and the parts being cooled, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(a) Using all of the appropriate precautions because of the cold temperatures of the materials involved, gently immerse the sleeve into a pool of liquid nitrogen.

(b) After allowing sufficient time to fully cool, carefully remove from the liquid nitrogen and install in the appropriate bore properly oriented.

(c) Allow the sleeve to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the sleeve.*

Heating Method

⚠WARNING

Due to the cold temperatures of both the liquid nitrogen cooling medium and the parts being cooled and the heat applied to the receiving component area, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(a) Using all of the appropriate precautions because of the cold temperatures of the materials involved, carefully cool the sleeve to a temperature of -40° to -70° F (-40° to -57° C).

(b) Evenly heat the bore into which the sleeve is to be installed to 300° to 350° F (150° to 175° C).

IMPORTANT: *Heat the massive side of the lug additionally to ensure that the bore is heated and expanded evenly.*

(c) Once both components are at the proper temperatures, carefully remove the sleeve from the cooling medium and install in the appropriate bore properly oriented.

(d) Allow the sleeve to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the sleeve.*

(e) Verify that with the sleeve properly installed, it is within 0.001 inch (0.025 mm) of round. Small ridges or grooves may be repaired with emery cloth.

d. Install the self-aligning bushings as follows:

IMPORTANT: *Steel spherical bearings should not come in direct contact with dry ice and should not be immersed in liquid nitrogen. Either of these actions could result in the change of the metallurgical character of the bearing affecting subsequent fit and operation.*

⚠WARNING

Due to the cold temperatures of both the dry ice or other cooling medium and the parts being cooled, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(1) Using all of the appropriate precautions because of the cold temperatures of the materials involved, carefully cool the bearing assembly to a temperature of -40° to -70° F (-40° to -57° C).

(2) Once both components are at the proper temperatures, carefully remove the bearing from the cooling medium and install properly oriented into the appropriate bore.

(3) Allow the bearing assembly to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the bearing or bore.*

(4) Secure with the new retainers using care not to contaminate the new bushings.

ASSEMBLY (Figures 2 and 3)

The suspension may be assembled as follows:

1. Lubricate each seal and the OD of the plunger tube (10), and the inner bore of the outer tube assembly (5) with oil compatible with that to be used to fill the suspension assembly.

2. Install wiper (16), primary seal (15), and buffer seal (14) into the appropriate grooves in the inner bore of the stuffing box (13).

3. Install the O-ring (11) and back-up ring (12) into the appropriate grooves on the outer surface area of the stuffing box (13).

NOTE: *The back-up rings (12) are installed in the groove first, on the side of the groove toward the lower or larger end of the stuffing box. The O-rings (11) are installed toward the smaller, high pressure end of the stuffing box groove.*

4. Install the bellows (17), small end first toward the lower mounting clevis, onto the lower plunger tube assembly.

NOTE: *An optional split bellows assembly with a zipper (18) is available that allows its replacement without removing the suspension or mounting pins.*

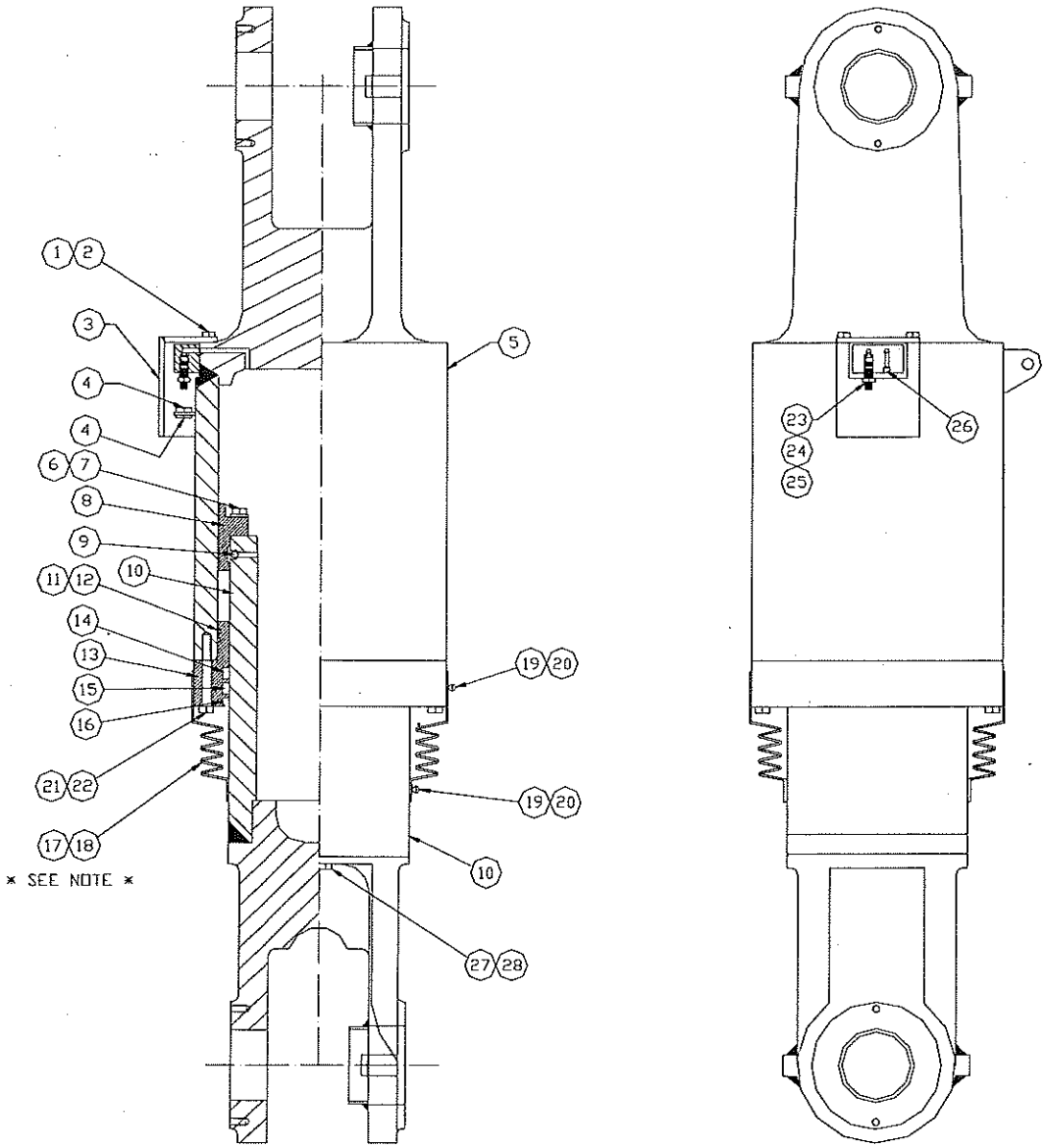
5. Using the appropriate seal expander or equivalent to prevent damage to the seals, carefully install the stuffing box (13) onto the plunger tube (10), large end first.

6. Install the balls (9) into the bores in the plunger tube.

NOTES:
1. On trucks equipped with the later ½ inch diameter balls, there are four balls per suspension. On earlier versions with larger balls, there are 2 balls per suspension. The correct number and diameter ball for the application must be used.
2. A small amount of clean grease may be used to assist in temporarily holding them in place during the remainder of the assembly process.

7. Install the piston (8) onto the plunger tube assembly, securing with grade 8 capscrews (6) and hardened washers (7). Tighten evenly to the final torque listed below in a crossing pattern in increments of 50 ft-lb (65 Nm).

5/8 - 11NC 160 ft-lb (215 Nm)
3/4 - 10NC 280 ft-lb (380 Nm)



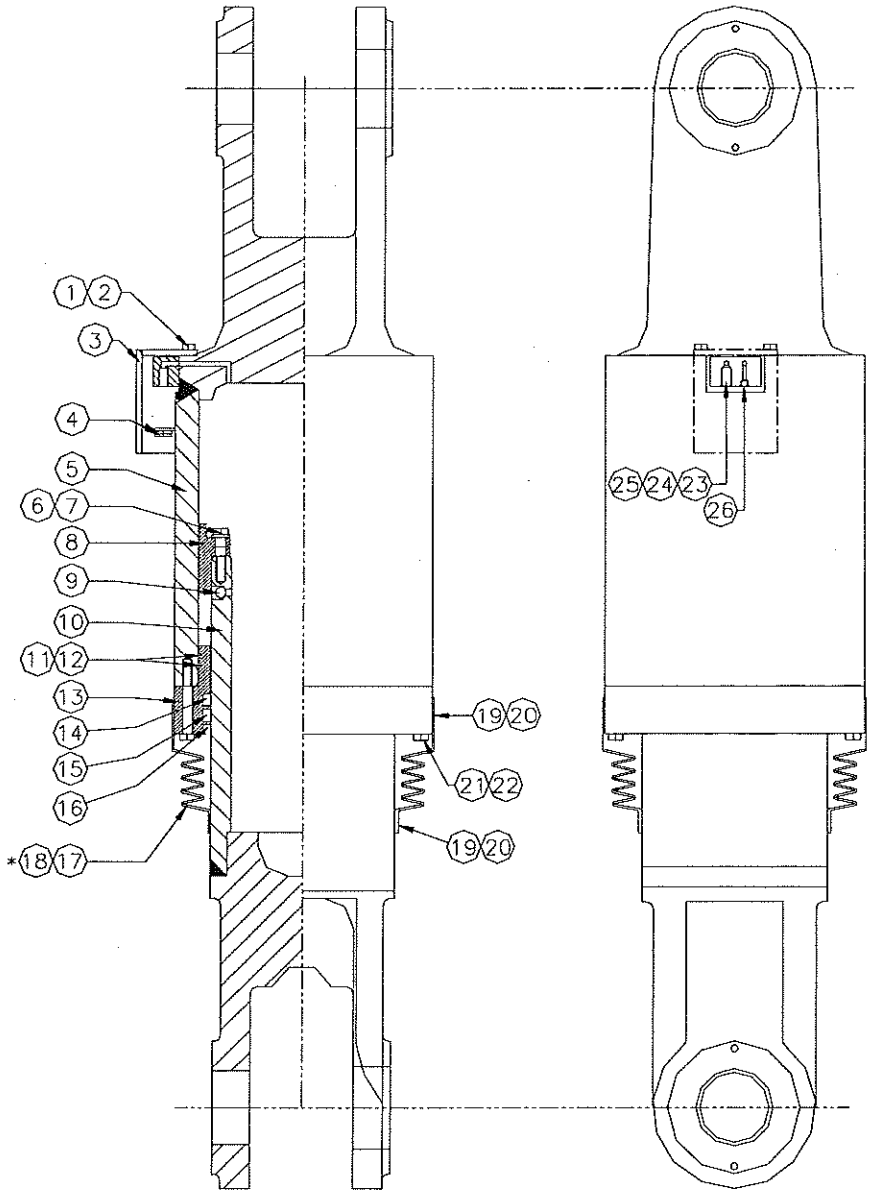
* NOTE:
The optional bellows with zipper (18) allows the bellows to be serviced with the suspension mounted on the truck.

The standard bellows (17) requires the installation over the lower mounting portion of the plunger tube assembly (10) which must be removed from the truck.

KEY 57110

01.	Capscrew (Grade 8)	11.	O-ring	21.	Hardened Flatwasher
02.	Lockwasher	12.	Back-up Ring	22.	Capscrew (Grade 8)
03.	Valve Guard	13.	Stuffing Box	23.	Charge Valve
04.	Locknut	14.	Buffer Seal	24.	Charge Valve Core
05.	Outer Tube or Barrel Assembly	15.	Primary Seal	25.	Charge Valve Cap
06.	Capscrew (Grade 8)	16.	Wiper	26.	Plug
07.	Hardened Flatwasher	17.	Bellows	27.	O–Ring Boss Drain Plug
08.	Piston	18.	Bellows with Zipper (Optional)	28.	O-ring
09.	Ball	19.	Adjustable Fastener Clamp	29.	Setscrew
10.	Plunger Tube Assembly	20.	Banding Clamp		

FIGURE 2 - FRONT SUSPENSION ASSEMBLY – LATER CONFIGURATION ASSEMBLIES (57110)



*NOTE: The optional bellows with zipper (18) allows the bellows to be serviced with the suspension mounted on the truck.

The standard bellows (17) requires the installation over the lower mounting portion of the plunger tube assembly (10) which must be removed from the truck.

KEY 55895

01.	Capscrew (Grade 8)	10.	Plunger Tube Assembly	19.	Adjustable Fastener Clamp
02.	Lockwasher	11.	O-ring	20.	Banding Clamp
03.	Valve Guard	12.	Back-up Ring	21.	Hardened Flatwasher
04.	Locknut	13.	Stuffing Box	22.	Capscrew (Grade 8)
05.	Outer Tube or Barrel Assembly	14.	Buffer Seal	23.	Charge Valve
06.	Capscrew (Grade 8)	15.	Primary Seal	24.	Charge Valve Core
07.	Hardened Flatwasher	16.	Wiper	25.	Charge Valve Cap
08.	Piston	17.	Bellows	26.	Plug
09.	Ball	18.	Bellows with Zipper (Option)		

FIGURE 3 - FRONT SUSPENSION ASSEMBLY – EARLIER CONFIGURATION ASSEMBLIES (55895)

8. Using a crane and suitable handling and support fixtures, invert the outer barrel or tube assembly and secure in place with the mounting end at the bottom.

9. Using appropriate tools and precautions, raise the lower plunger tube assembly and install into the outer barrel or tube assembly (5) over the lower plunger tube assembly until it is far enough for the installation of the stuffing box.

10. Using a seal compressor or equivalent to prevent damage to the seals, carefully install the stuffing box (13) into the outer tube assembly with the bolt holes in each properly aligned.

11. Secure the stuffing box to the outer tube assembly, securing with grade 8 capscrews (22) and hardened washers (21). Tighten evenly to the final torque listed below in a crossing pattern in increments of 50 ft-lb (65 Nm).

5/8 - 11NC 160 ft-lb (215 Nm)
3/4 - 10NC 280 ft-lb (380 Nm)

12. Install the bellows (17), securing to the stuffing box and outer tube assembly as needed. Secure with banding clamp (20) and adjustable fastener clamp (19).

NOTE: *An optional split bellows assembly with a zipper (18) is available that allows its replacement without removing the suspension or mounting pins.*

13. Install the charge valve (23) and plug (26) or transducers, if removed previously. Torque the:

a. Pressure transducers to 14 +/- 1 ft-lb (19 +/- 1 Nm).

b. Charge valve to 37 +/- 7 ft-lb (50 +/- 10 Nm) in increments of 10, 20, and 37 ft-lb (14, 27, and 50 Nm).

NOTE: *If removed, reinstall the valve cores and protective covers.*
1. Torque the valve cores to 3 to 5 in-lb (0.35 to 0.45 Nm).
2. Torque the protective covers to 40 to 50 in-lb (4.5 to 5.5 Nm).

14. Install the guard assembly (3) secured by capscrew (1) and lockwasher (2) for protection.

15. On suspensions equipped with the setscrew/drain plug combination:

a. After coating the threads with the appropriate thread sealant, install the setscrew (29, Figure 2). Tighten securely, but do not over-tighten to damage the threads. Make sure that the setscrew is installed to a sufficient depth to allow proper installation of the outer plug.

b. Install the drain plug assembly (27, Figure 2) into the plunger tube assembly. Tighten the special O-ring boss plug until the bosses make metal-to metal contact with the suspension. This should slightly compress the O-ring seal (28), but not cause it to distort.

16. Switch the suspension from the inverted position to a normal vertical operating position.

17. Secure in place and fill with oil as outlined in the procedures in Maintenance and Adjustment in this module.

INSTALLATION (Figure 4)

The front suspensions may be installed as follows:

1. Clean and smooth all mating surfaces on the suspension and the frame.

2. On trucks equipped with pressure transducers, use extra care to prevent damage to system components.

3. Raise the suspension assembly into position making sure the charge valves are located to the outboard side of the suspension.

⚠WARNING

Each suspension unit weighs in excess of:

MK30B	**1250 lb (565 kg)**
MT 2700/3000	**1250 lb (565 kg)**
MT 3300	**1250 lb (565 kg)**
MT 3300AC	**1250 lb (565 kg)**
BD 220	**1250 lb (565 kg)**
MT 3600B	**1900 lb (860 kg)**
BD 240 & 270	**1900 lb (860 kg)**
MT 3700B/3700AC	**1900 lb (860 kg)**
MT 4000AC	**1900 lb (860 kg)**
MT 44004400AC	**1900 lb (860 kg)**
MT 5500	**1960 lb (890 kg)**

4. Align the holes in the suspension and in the lugs and insert the suspension pins from the center toward the tires.

5. Install the pin retainers (5) and secure with hardened flatwashers (8) and Grade 8 capscrews (7).

6. Place the neoprene dirt rings (6) in between the suspension and the lugs. Secure with tie wraps.

KEY					A85225
01.	Front Suspension	06.	Dirt Ring	11.	Sacrificial Sleeve (Axle Assembly)
02.	Mounting Pin	07.	Capscrew	12.	Internal Retaining Ring
03.	Self Aligning Bushing	08.	Hardened Flatwasher	13.	External Retaining Ring
04.	Not Used	09.	Not Used	14.	Sacrificial Sleeve (Frame Assembly)
05.	Pin Retainer	10.	Not Used		

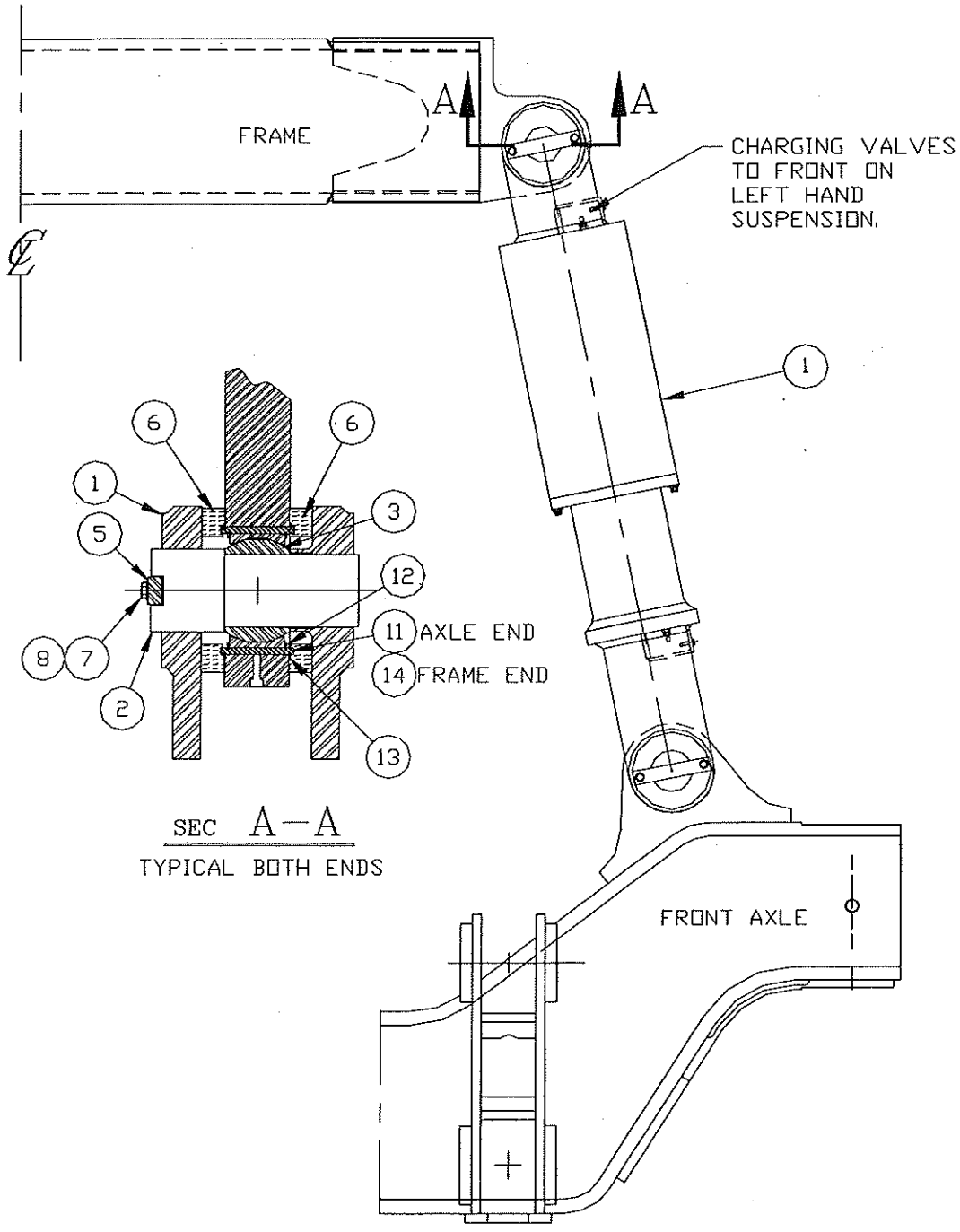


FIGURE 4 - FRONT SUSPENSION MOUNTING ASSEMBLY (A85225)

7. On trucks equipped with the TEREX|UNIT RIG Weigh System:

a. Install the pressure transducer if not installed previously. Torque to 14 +/- 1 ft-lb (19 +/- 1 Nm).

NOTE: *The joint indicated in item 4 of Figure 5 must be watertight. It is recommended to use liquid pipe sealant on the threads and apply RTV sealant around the clearance hole to prevent moisture seepage and pooling. Also make sure to install the appropriate sealing grip (3) on the cable end of the transducer, using the body nut as a locknut.*

b. Install all wiring, making sure to allow sufficient freedom for the travel of the suspension.

8. Remove the blocking and lower the truck to the ground.

9. Charge the suspension with dry nitrogen gas as outlined in the instructions in Maintenance and Adjustment in this module.

10. Check operation of the suspension as outlined in Maintenance and Adjustment before placing back into operation.

11. If so equipped, check the operation of the TEREX|UNIT RIG Weigh System.

KEY			
01.	Suspension	03.	Grip
02.	Pressure Transducer	04.	Watertight Joint

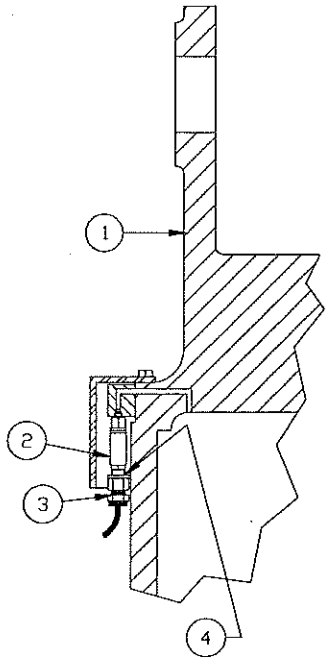


FIGURE 5 – PRESSURE TRANSDUCER INSTALLATION (A84726)

REAR SUSPENSION - NITROGEN/OIL

DESCRIPTION AND LOCATION (Figure 3)

This version of the TEREX|UNIT RIG nitrogen/oil rear suspension is identified externally by the location of the charge ports on the side of the outer tube assembly. It is a cylindrical, telescoping unit that suspends the rear part of the truck. The suspensions are mounted on the rear of each rail of the main frame, directly under the dump body and above the rear of the axlebox assembly.

OPERATION

The rear suspensions consist of two major assemblies that move in relationship to each other. The outer tube assembly is pivoted on the main frame. The inner tube, attached to the axlebox at its lower end, slides inside the outer tube.

The rear suspensions serve two separate functions - spring and shock absorber. The spring function is provided by the compression of the nitrogen gas. The shock absorber function is handled by controlling the flow of oil between the inner and outer chambers in the suspensions.

In a static condition, compressed nitrogen gas in the internal cavity creates sufficient force to support the truck. When the tire strikes something (a hole, rock, etc.) the resultant forces cause the inner tube to slide upward in the outer tube. This compresses the nitrogen, absorbing the impact energy. At the same time, oil flows through the passages in the piston rod wall from the main chamber to the dampening chamber (annular volume between the piston rod outside diameter and the outer tube inner diameter).

After the impact has been absorbed, the increased gas pressure begins to force the inner tube downward to its original position. As it does, oil flows from the dampening chamber back into the main chamber. However, a portion of the passages are now closed, restricting flow in this direction. This difference in flow characteristics provides dampening/rebound control.

MAINTENANCE AND ADJUSTMENT

Periodic maintenance should include the following steps:

1. Clean the unit. Inspect for evidence of wear, damage, or leakage especially in the area of the exposed portion of the inner tube and charging valves. Repair or replace as required.

NOTE: *An optional split bellows assembly with a zipper is available that allows its replacement without removing the suspension or mounting pins.*

2. Check all retaining hardware for evidence of damage or looseness. Repair or replace immediately if found loose, defective, or broken.

⚠WARNING

Prior to loosening any capscrews, always jack and support the truck to remove its weight from the suspension, release all gas pressure and secure the suspension by appropriate means. Under some conditions, these members support the weight of the truck and failure to remove the weight and pressure could result in personal injury or equipment damage.

3. Inspect the exterior of the suspension for evidence of fluid leakage. If there is leakage, repair or replace as required and recharge with oil as outlined in the procedures later in these instructions.

NOTE: *For detailed instructions on checking and/or charging the suspension oil level, refer to the procedures later in this portion of the module.*

4. Check the relative operating condition of the suspension as follows:

a. Operate the truck for a sufficient period of time to allow both suspensions to equalize at normal operating temperatures.

b. With the empty truck resting on a smooth, flat surface, measure the distance between the center of the upper and lower mounting pins as shown in Figure 1. The measurement should be approximately (+/- 1/2 inch (13 mm)):

MK30B	58-3/4 inches (1 495 mm)
MT 2700/3000	58-3/4 inches (1 495 mm)
MT 3300/3300AC	58-3/4 inches (1 495 mm)
BD 220	58-3/4 inches (1 495 mm)
MT 3600B	67-7/16 inches (1 715 mm)
BD 240/270	67-7/16 inches (1 715 mm)
MT 3700B/3700AC	67-7/16 inches (1 715 mm)
MT 4000	67 inches (1 705 mm)
MT 4000AC	61-7/8 inches (1 570 mm)
MT 4400/4400AC	61-7/8 inches (1 570 mm)
MT 5500	61-7/8 inches (1 570 mm)

If the suspension is not within these limits, check and adjust the nitrogen precharge pressure as outlined in the procedures that follow later in this section.

Items that may indicate that the suspension may now or will soon require servicing internally include:

(1) Evidence of oil leakage around the suspension.

(2) Frequent changes in ride height requiring recharging with nitrogen gas.

NOTES:

1. A decrease in the ride height usually accompanies a loss of gas. Loss of gas can only occur around the charge valve or TEREX|UNIT RIG *Weigh or Two-Speed Overspeed System transducers.*

2. Increased deflection with a normal ride height indicates a loss of oil.

(3) Harsh or bouncy ride are indications that the suspensions are repeatedly operating at the end of their travel strokes.

5. On trucks equipped with either or both the TEREX|UNIT RIG Weigh and Two-Speed Overspeed Systems, visually inspect all components, and wiring for evidence of wear or damage. Repair or replace as required.

CHARGING PROCEDURE - NITROGEN/OIL REAR SUSPENSION

NOTE: *The suspension is to be charged with nitrogen only after being installed on a truck. Prior to removing from a truck, the nitrogen charge should be decreased to less than 100 psi (690 kPa) and blocked in the extended position.*

⚠ DANGER

The main bodies of the suspensions are to be charged with dry nitrogen only. Use of oxygen, compressed air or other gases may result in a violent explosion.

⚠ CAUTION

The struts contain gas and oil under high pressure. Extra care must be taken when adjusting or servicing the struts. Since internal pressures can exceed 2000 psi (13 800 kPa), it is important to open the charge valves slowly and allow the pressures to be fully released before working on the struts. Also only dry nitrogen gas should be used fo charging.

CHARGING WITH OIL (Original or refill after significant servicing)

NOTES:

1. This procedure is recommended if the suspensions have experienced a fluid loss due to some other reason than an external leak. If an external leak develops, the suspension should be removed and replaced. Return the suspensions to TEREX|UNIT RIG *for repair as unauthorized repair may affect their warranty.*

2. To modify or customize ride characteristics, contact your local TEREX|UNIT RIG *representative for detailed instructions, detailing the suspension part number, mine location, and truck model and serial number.*

3. Suspensions are delivered with the proper amount of oil and should not require checking when new or rebuilt.

The oil level of the suspensions mounted on a truck may be checked and adjusted as follows:

NOTE: *During truck operation, the nitrogen precharge in the strut tends to mix with the oil. This appears as an oily froth that comes out of the suspension when t nitrogen pressure is released.*

To accurately measure the oil level, the nitrogen must be removed from the oil. This is done by drawing a vacuum on the gas portion of the suspension assembly or by supporting the frame adequately with blocking and opening and leaving open the upper charge valves for 24 hours. The only time that this need be done is if external leakage is evident (indicating the need for repair) or when the empty to loaded deflection seems excessive.

NOTE: *On trucks equipped with later versions of the suspension, a setscrew/drain plug combination is installed at the bottom to allow the easy draining of the oil if so desired. Always release all residual pressure in the system prior to beginning to drain the suspensions by any means. If the plugs are removed, they should be reinstalled as outlined in the Assembly instructions in this publication.*

NOTE: *The procedure assumes that the suspensions are mounted on a truck. If not, suitable support and means of securing the suspensions should be in place before proceeding.*

1. Park the truck in a SAFE POSITION. It must secured by means other than the truck's friction bra system.

2. Raise the truck until the suspensions are fully extended. Secure in this position with suitable blocking.

MK30B	62-3/8 inches (1 585 mm)
MT 2700/3000	62-3/8 inches (1 585 mm)
MT 3300/3300AC	62-3/8 inches (1 585 mm)
BD 220	62-3/8 inches (1 585 mm)
MT 3600B	71-1/8 inches (1 807 mm)
BD 240/270	71-1/8 inches (1 807 mm)
MT 3700B/3700AC	71-1/8 inches (1 807 mm)
MT 4000	72 inches (1 830 inches)
MT 4000AC	64-7/8 inches (1 650 mm)
MT 4400/4400AC	64-7/8 inches (1 650 mm)
MT 4400AC	64-7/8 inches (1 650 mm)
MT 5500	64-7/8 inches (1 650 mm)

3. Remove the protective covers over the charge valves and carefully open both valves, releasing the gas charge.

4. Connect a vacuum pump to one of the charge valve assemblies to allow a vacuum to be drawn.

NOTE: *To draw this vacuum, special pneumatic valves and electric pump assemblies are available from* TERX|UNIT RIG.

5. Verify that the other charging valve is closed.

6. Start the vacuum process and monitor its progress until all gas has been extracted. This is indicated by the oil in the suspension turning a smoother, darker color.

NOTES:
1. Do not allow liquid oil to be drawn from the suspension.
2. Typically this process will take approximately 15 minutes (with a vacuum of 29 inches Hg (98 kPa)) to 30 minutes (with a vacuum of 10 inches Hg (34 kPa)).

7. Stop the vacuum process.

8. Remove the blocking and slowly lower the truck frame until the distance between the upper and lower mounting pins are approximately (+/- 1/2 inch (13 mm)):

MK30B	56-1/8 inches (1 425 mm)
MT 2700/3000	56-1/8 inches (1 425 mm)
MT 3300/3300AC	56-1/8 inches (1 425 mm)
BD 220	56-1/8 inches (1 425 mm)
MT 3600B	65-3/8 inches (1 660 mm)
BD 240/270	65-3/8 inches (1 660 mm)
MT 3700B/3700AC	65-3/8 inches (1 660 mm)
MT 4000	64-1/2 inches (1 640 mm)
MT 4000AC	59-5/8 inches (1 515 mm)
MT 4400/4400AC	59-5/8 inches (1 515 mm)
MT 5500	59-5/8 inches (1 515 mm)

9. Release any residual gas pressure in the suspension as outlined previously.

10. Remove the weigh system transducer port adapter fitting near the top of the suspension and replace with the appropriate charging adapter.

11. Open the port and observe if oil flows from the vent hole in the adapter. If not, the oil level is low and charging as outlined below is required.

12. Attach the oil charging kit to this port.

13. Connect the suction line of the charging pump to a supply of clean, good quality SAE 10W hydraulic/ transmission fluid (Conoco Power Tran III or equivalent).

The approximate volumes of oil required for the initial filling of each suspension is:

MK30B	7.8 gallons (29.5 liters)
MT 2700/3000	7.8 gallons (29.5 liters)
MT 3300/3300AC	7.8 gallons (29.5 liters)
BD 220	7.8 gallons (29.5 liters)
MT 3600B	11.5 gallons (43.5 liters)
BD 240/270	11.5 gallons (43.5 liters)
MT 3700B/3700AC	11.5 gallons (43.5 liters)
MT 4000AC	8.9 gallons (33.7 liters)
MT 4400/4400AC	8.9 gallons (33.7 liters)
MT 5500	12.5 gallons (47.3 liters)

NOTE: *In arctic conditions it is recommended that a synthetic fluid (Conoco Syncon Synthetic R & O or equivalent) be substituted. The fluid should have the properties:*
ISO 46 Viscosity Grade
-70° F (-55° C) Pour Point
PAO Synthetic – May be used with common seals.

14. Connect the charge kit pump to an air supply source, 90 psi (620 kPa) minimum.

15. Start the charging pump and add oil until it comes out of the drain hose. Stop the pump.

NOTE: *During the filling operation, loosen the charge valve body slightly to remove pressure and to check the oil level. Oil and gas under minimum pressure will escape through the vent hole.*

16. When the process is complete, remove the oil charging kit and charging fittings.

17. Reinstall the weigh system transducer port adapter previously removed with new sealing washers. Torque to

14 +/- 1 ft-lb (19 +/- 1 Nm).

18. Charge the suspensions with nitrogen as outlined in the separate procedures.

CHARGING THE SUSPENSION WITH GAS (NITROGEN)

⚠ DANGER

The suspensions are only to be charged with nitrogen to a pressure of more than 100 psi (690 kPa) when mounted on a truck. Use only dry nitrogen. Do not use oxygen or compressed air as their use or other gases may result in a violent explosion.

IMPORTANT: *The supply cylinder must be of the type that vaporizes the nitrogen when it is withdrawn. Do not charge with liquid nitrogen or any other gas.*

NOTE: *Use a gas regulator on the nitrogen bottle (not furnished with the* TEREX|UNIT RIG *charging kit) to protect the pressure gauge. An accurate reliable pressure gauge is essential to proper suspension adjustment.*

NOTE: *When removing the protective caps from the charging valves, allow for the residual gas pressure, if present, to escape before fully removing the cap.*

1. Park the truck in a SAFE POSITION in a level place. It must be secured by means other than the truck's friction brake system.

NOTE: *All dirt and other foreign material should be removed from the frame and dump body before charging the suspensions.*

2. Carefully remove the charging valve protective covers, as residual gas pressure may be present.

3. Connect the gas charging kit to the charging valves on the suspensions (with the shut-off valves closed) and to the regulator on the nitrogen supply bottle.

a. Connect the shorter hose assemblies to the two suspensions at the charge valves.

b. Connect the longer supply hose to the nitrogen supply.

4. Adjust the pressure regulator to approximately 600 psi (4 140 kPa).

NOTE: *Use care to protect the pressure gauge against over-pressurization. Pressures in excess of 2000 psi (13 790 kPa) are easily obtainable.*

5. Open the charge valve and charge the suspension until the distance between the centers of the upper and lower mounting pins is approximately (+/- 1/2 inch (15 mm)):

NOTES:

1. During the filling process, gas should be added slowly enough and the flow stopped periodically to allow the suspensions to equalize. The exact process will vary slightly with equipment, material, and operator.
2. If the rear suspensions are being charged together, open the shut off valves first, then the gas pressure regulator.

MK30B	58-3/4 inches (1 495 mm)
MT 2700/3000	58-3/4 inches (1 495 mm)
MT 3300/3300AC	58-3/4 inches (1 495 mm)
BD 220	58-3/4 inches (1 495 mm)
MT 3600B	67-7/16 inches (1 715 mm)
BD 240/270	67-7/16 inches (1 715 mm)
MT 3700B/3700AC	67-7/16 inches (1 715 mm)
MT 4000	67 inches (1 705 mm)
MT 4000AC	61-7/8 inches (1 570 mm)
MT 4400/4400AC	61-7/8 inches (1 570 mm)
MT 5500	61-7/8 inches (1 570 mm)

NOTES:

1. If the resulting empty ride height is not correct, repeat the above procedure raising or lowering the charge pressure in 20 psi (140 kPa) increments. The important parameter is to charge the suspensions to provide the correct empty ride height.
2. If the truck will be operated in ambient conditions significantly colder than that in the work area, it is recommended that the adjusted empty truck ride height be increased 1/2 to 1 inch (12 to 25 mm) to compensate for the effects to the reduced temperatures.

6. Close the individual shut off valves and then the gas pressure regulator.

7. Remove the charging equipment and check for leaks using a soap solution.

NOTE: *If a leak is found in the charge valve core area:*
1. Check the torque on the valve core. It should be torqued to 3 to 4 in-lb (0.35 to 0.45 Nm).
2. If this does not stop the leak it may be necessary to check the valve core area for damage or contamination or replace the valve core. It is important that all pressure

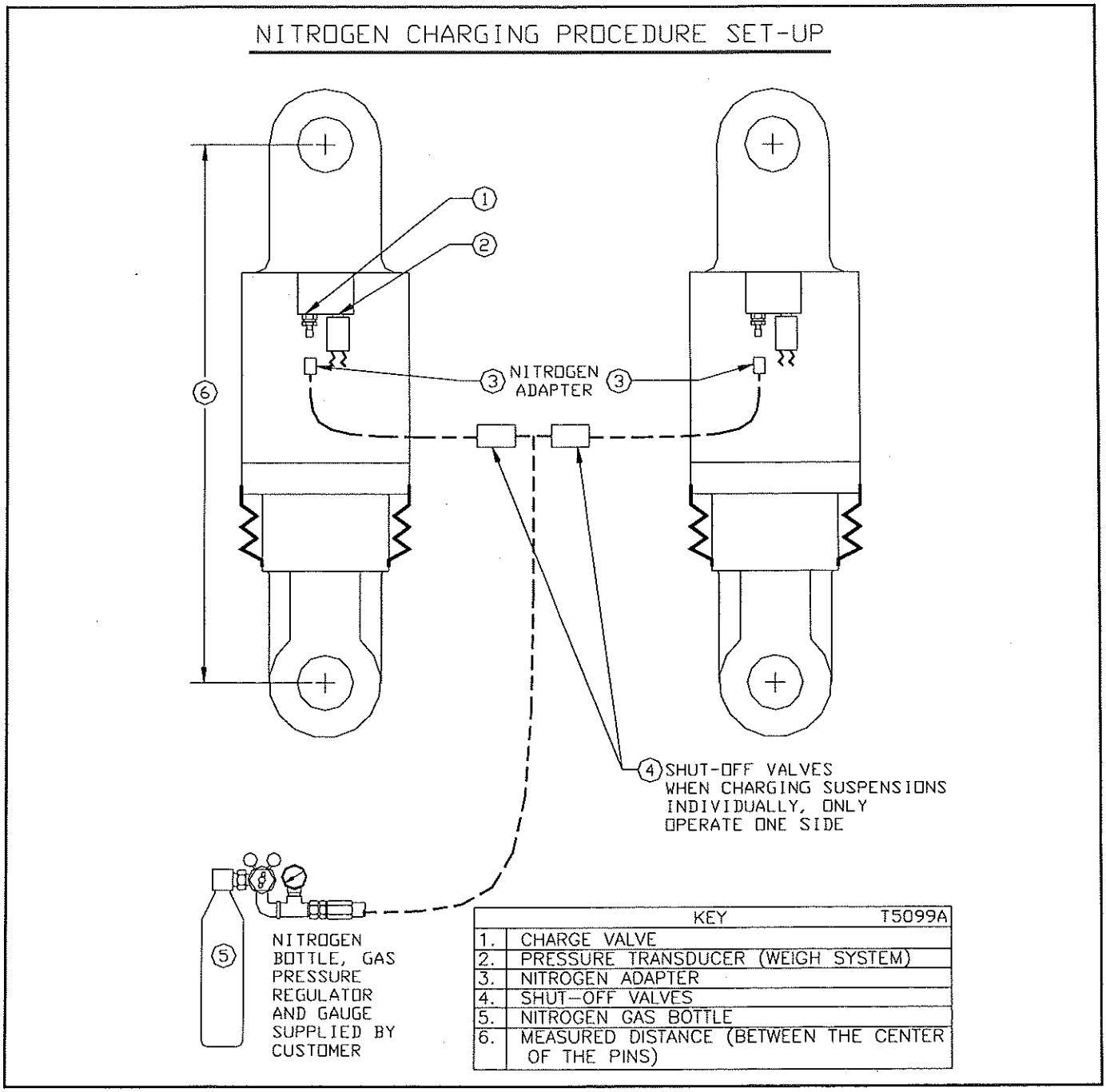


FIGURE 1 - SUSPENSION CHARGING EQUIPMENT AND INFORMATION

in the suspension be relieved prior to removal of the valve core using the charging unit.

8. Install the protective covers. Torque to 40 to 50 in-lb (4.5 to 5.5 Nm).

9. Remove the blocking and lower the truck to the ground.

10. Operate the truck for approximately 24 hours, and then repeat the empty ride height checking process. Adjust as required.

REMOVAL (Figure 3)

The suspensions may be removed as follows:

1. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

2. Raise the rear of the truck until both suspensions are at full travel and the tires are clear of the ground. Secure the axlebox assembly in this position with adequate

blocking, and then lower the truck slightly to remove the load from the suspension and pins. Block the main frame in this position.

3. Reduce the nitrogen (gas) pressure in both of the rear suspensions to less than 100 psi (690 kPa) as outlined in the instructions in Maintenance and Adjustment.

4. On trucks equipped with either or both the TEREX|UNIT RIG Weigh and Two-Speed Overspeed Systems, disconnect the wiring from the pressure transducers.

5. Support the suspension unit adequately before removal of the connecting pins.

⚠WARNING

Each suspension unit weighs in excess of:

MK30B	**1250 lb (565 kg)**
MT 2700/3000	**1250 lb (565 kg)**
MT 3300/3300AC	**1250 lb (565 kg)**
BD 220	**1250 lb (565 kg)**
MT 3600B	**1650 lb (750 kg)**
BD 240/270	**1650 lb (750 kg)**
MT 3700B/3700AC	**1650 lb (750 kg)**
MT 4000	**1650 lb (750 kg)**
MT 4000AC	**1650 lb (750 kg)**
MT 4400/4400AC	**1650 lb (750 kg)**
MT 5500	**2320 lb (1 050kg)**

6. Remove the capscrews (7), lockwashers (8), and pin retainers (5).

7. Using a softhead mallet, tap the end of the pin opposite of the capscrew holes and remove one pin at a time. Slight movement of the suspensions may be required to minimize the forces on the pins. Be cautious when handling the pins. There may be some pressure on the pins caused by supporting the suspension.

⚠WARNING

Take care not to bind the connecting pins in the lugs.

8. Carefully remove the suspension unit from the vehicle.

DISASSEMBLY (Figure 2)

The suspension may be disassembled as follows:

1. Using the appropriate means, remove the oil from the suspension.

NOTES:

1. On trucks equipped with later versions of the suspension, a setscrew/drain plug combination is installed at the bottom to allow the easy draining of the oil if so desired. If the plugs are removed, they should be reinstalled as outlined in the Assembly information in this module.

2. The expected oil volumes involved are in a chart in the Maintenance and Adjustment information in this module.

2. Remove the guard assembly (3) secured by capscrew (1) and lockwasher (2).

3. Remove the charge valve (23) and plug (24) or transducers, if not removed previously. Temporarily replace with plugs.

4. Using a crane and suitable handling and support fixtures, invert the suspension and secure in place with the outer barrel or tube (5) at the bottom.

5. Remove the bellows (17 or 18).

NOTES:

1. In some installations, removal of the bellows over the lower mount assembly may not be possible. In those installations, it should be moved and secured to the lower mounting point for later removal.

2. An optional split bellows assembly with a zipper is available that allows its replacement without removing the suspension or mounting pins.

6. Remove the grade 8 capscrews (22) and hardened washers (21) secure the stuffing box to the outer tube assembly.

7. Carefully raise the lower plunger tube/stuffing box assembly from the outer tube assembly (5) using care not to damage the surfaces on any of the components. This assembly can now be positioned horizontally on a clean work surface for additional disassembly, if desired.

8. Remove the grade 8 capscrews (6) and hardened washers (7) securing the piston (8) onto the plunger tube assembly. Remove the piston from the plunger tube assembly.

NOTE: *In some installations, particularly those with steel piston assemblies, a non-metallic guide bearing is installed in a special groove in the piston. New bearings are provided with the seal kits and these should be inspected, removed and replaced each time the suspension is disassembled and serviced.*

9. Remove the ball or balls (9) from the bore in the plunger tube.

10. Carefully remove the stuffing box (13) from the plunger tube (10), again using care not to damage the surfaces on any of the components.

11. Inspect, then remove the O-ring (11) and back-up ring (12) from the grooves on the outer surface area of the stuffing box (13).

12. Inspect then remove the wiper (16), seal (15), and buffer (14) from the grooves in the inner bore of the stuffing box (13).

13. Drain all oil from the outer barrel or tube assembly and move as required.

INSPECTION AND REPAIR

The disassembled suspension may be serviced as follows:

1. Inspect all component parts both inside and outside. They must be smooth and polished. Remove all nicks, chipped or cracked finishes, and rust spots. Remove all oil and other contamination. If rust is evident in the vicinity of the seals, clean the surface with 400 grit emery cloth.

2. Inspect the self-aligning bearings in the frame and axlebox for evidence of wear and/or damage. They must be free of defects and still properly installed.

If they require replacement, this may be done as follows: (Figure 3)

a. Remove the bushing retainers by the appropriate means, exercising special care to prevent damage to the frame/axlebox or sleeve bores.

b. If required, use air arc or other appropriate means to split and remove the entire bushing assembly. Again exercise care not to damage the mounting bore and/or sleeve in the frame/axlebox.

c. Inspect the inner bore of the sleeve in the frame/axlebox for evidence of wear or damage. It must be free of defects and within 0.001 inch (0.025 mm) of round. Small ridges or grooves may be repaired with emery cloth. Otherwise the sleeve should be replaced. This may be done as follows:

(1) If so equipped, carefully remove the damaged sleeve, exercising care not to damage the bore in the frame/axlebox.

(2) Inspect the bore in the frame/axlebox for evidence of wear or damage. It must be free of defects and within 0.001 inch (0.025 mm) of round. Small ridges or grooves may be repaired with emery cloth.

NOTE: *If defects are found or the bore is not within tolerances, contact the local* TEREX|UNIT RIG *Service Representative for detailed repair recommendations.*

(3) Install the new sleeves as follows:

IMPORTANT: *Sleeves with high interference fit may be installed using either of the methods outlined here. The liquid nitrogen method typically provides a more consistent installation.*

Liquid Nitrogen Method

⚠WARNING

Due to the cold temperatures of both the liquid nitrogen cooling medium and the parts being cooled, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(a) Using all of the appropriate precautions because of the cold temperatures of the materials involved, gently immerse the sleeve into a pool of liquid nitrogen.

(b) After allowing sufficient time to fully cool, carefully remove from the liquid nitrogen and install in the appropriate bore properly oriented.

(c) Allow the sleeve to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the sleeve.*

Heating Method

⚠WARNING

Due to the cold temperatures of both the liquid nitrogen cooling medium and the parts being cooled and the heat applied to the receiving component area, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(a) Using all of the appropriate precautions because of the cold temperatures of the materials involved, carefully cool the sleeve to a temperature of -40° to -70° F (-40° to -57° C).

(b) Evenly heat the bore into which the sleeve is to be installed to 300° to 350° F (150° to 175° C).

IMPORTANT: *Heat the massive side of the lug additionally to ensure that the bore is heated and expanded evenly.*

(c) Once both components are at the proper temperatures, carefully remove the sleeve from the cooling medium and install in the appropriate bore properly oriented.

(d) Allow the sleeve to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the sleeve.*

(e) Verify that with the sleeve properly installed, it is within 0.001 inch (0.025 mm) of round. Small ridges or grooves may be repaired with emery cloth.

d. Install the self-aligning bushings as follows:

IMPORTANT: *Steel spherical bearings should not come in direct contact with dry ice and should not be immersed in liquid nitrogen. Either of these actions could result in the change of the metallurgical character of the bearing affecting subsequent fit and operation.*

⚠WARNING

Due to the cold temperatures of both the dry ice or other cooling medium and the parts being cooled, it is important to take extra precautions that neither comes in contact with skin, clothing, or other items during the entire procedure.

(1) Using all of the appropriate precautions because of the cold temperatures of the materials involved, carefully cool the bearing assembly to a temperature of -40° to -70° F (-40° to -57° C).

(2) Once both components are at the proper temperatures, carefully remove the bearing from the cooling medium and install properly oriented into the appropriate bore.

(3) Allow the bearing assembly to warm slowly and evenly to ambient temperature, making sure that the retaining rings may be properly installed.

IMPORTANT: *The use of externally applied heat to speed up the process may result in uneven cooling and warping of or damage to the bearing or bore.*

(4) Secure with the new retainers using care not to contaminate the new bushings.

ASSEMBLY (Figure 2)

The suspension may be assembled as follows: (Figure 2)

1. Lubricate each seal and the OD of the plunger tube (10), and the inner bore of the outer tube assembly (5) with oil compatible with that to be used to fill the suspension assembly.

2. Install wiper (16), seal (15), and buffer (14) into the appropriate grooves in the inner bore of the stuffing box (13).

NOTE: *In some seal kits, a special O-ring is provid to assist in properly securing the sealing components in the seal (15) in their proper operating orientation, particularly in unusual operating environments.*

3. Install the O-rings (11) and back-up rings (12) into the appropriate grooves on the outer surface area of the stuffing box (13).

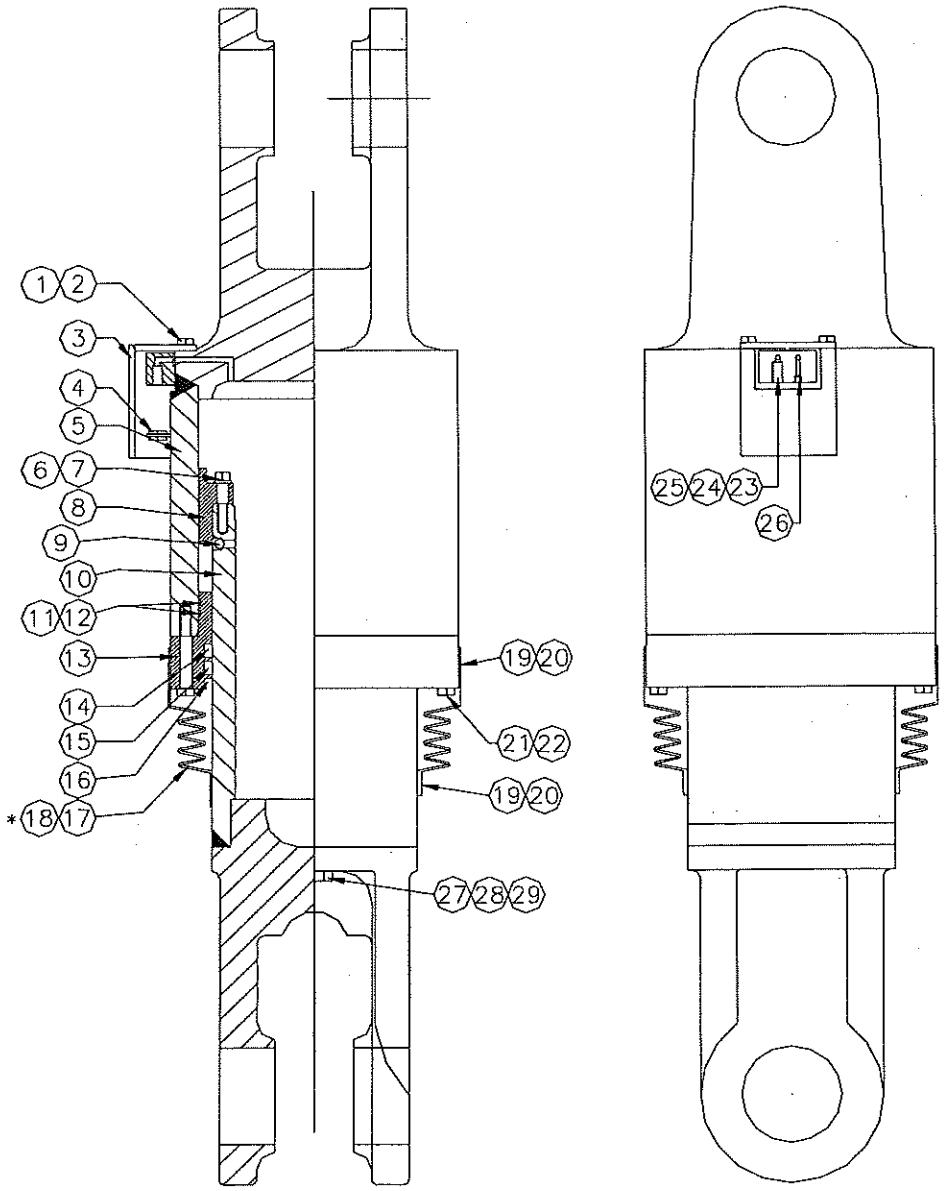
NOTE: *The back-up rings (12) are installed in the groove first, on the side of the groove toward the lower or larger end of the stuffing box. The O-rings (11) are installed toward the smaller, high pressure end of the stuffing box groove.*

4. Install the bellows (17), small end first toward the lower mounting clevis, onto the lower plunger tube assembly.

NOTE: *An optional split bellows assembly with a zipper (18) is available that allows its replacement without removing the suspension or mounting pins.*

5. Using the appropriate seal expander or equivalent to prevent damage to the seals, carefully install the stuffing box (13) onto the plunger tube (10), large end first.

6. Install the ball or balls (9) into the bore in the plunger tube.



*NOTE: The optional bellows with zipper (18) allows the bellows to be serviced with the suspension mounted on the truck.

The standard bellows (17) requires the installation over the lower mounting portion of the plunger tube assembly (10) which must be removed from the truck.

KEY 55896

01.	Capscrew (Grade 8)	11.	O-ring	21.	Hardened Flatwasher
02.	Lockwasher	12.	Back-up Ring	22.	Capscrew (Grade 8)
03.	Valve Guard	13.	Stuffing Box	23.	Charge Valve
04.	Locknut	14.	Buffer	24.	Charge Valve Core
05.	Outer Tube or Barrel Assembly	15.	Seal	25.	Charge Valve Cap
06.	Capscrew (Grade 8)	16.	Wiper	26.	Plug
07.	Hardened Washer	17.	Bellows	27.	O-ring Boss Plug
08.	Piston	18.	Bellows with Zipper (Option)	28.	O-ring
09.	Ball	19.	Adjustable Fastener Clamp	29.	Setscrew
10.	Plunger Tube Assembly	20.	Banding Clamp		

FIGURE 2 - REAR SUSPENSION ASSEMBLY (55896)

NOTE: *A small amount of clean grease may be used to assist in temporarily holding it in place during the remainder of the assembly process.*

7. Install the piston (8) onto the plunger tube assembly, securing with grade 8 capscrews (6) and hardened washers (7). Tighten evenly to the final torque listed below in a crossing pattern in increments of 50 ft-lb (65 Nm).

5/8 - 11NC	160 ft-lb (215 Nm)
3/4 - 10NC	280 ft-lb (380 Nm)

NOTE: *In some installations, particularly those with steel piston assemblies, a non-metallic guide bearing is installed in a special groove in the piston. New bearings are provided with the seal kits and these should be carefully lubricated and installed each time the suspension is disassembled and serviced. An appropriate seal compressor or installation tool will ease the installation process.*

8. Using a crane and suitable handling and support fixtures, invert the outer barrel or tube assembly and secure in place with the mounting end at the bottom.

9. Using appropriate tools and precautions, raise the lower plunger tube assembly and install into the outer barrel or tube assembly (5) over the lower plunger tube assembly until it is far enough for the installation of the stuffing box.

10. Using a seal compressor or equivalent to prevent damage to the seals, carefully install the stuffing box (13) into the outer tube assembly with the bolt holes in each properly aligned.

11. Secure the stuffing box to the outer tube assembly, securing with grade 8 capscrews (22) and hardened washers (21). Tighten evenly to the final torque listed below in a crossing pattern in increments of 50 ft-lb (65 Nm).

5/8 - 11NC	160 ft-lb (215 Nm)
3/4 - 10NC	280 ft-lb (380 Nm)

12. Install the bellows (17), securing to the stuffing box and outer tube assembly as needed.
Secure with banding clamp (20) and adjustable fastener clamp (19).

NOTE: *An optional split bellows assembly with a zipper (18) is available that allows its replacement without removing the suspension or mounting pins.*

13. Install the charge valve (23) and plug (24) or transducers, if removed previously. Torque the:

a. Pressure transducers to 14 +/- 1 ft-lb (19 +/- 1 Nm).

b. Charge valve to 37 +/- 7 ft-lb (50 +/- 10 Nm) in increments of 10, 20, and 37 ft-lb (14, 27, and 50 Nm).

NOTE: *If removed, reinstall the valve cores and protective covers.*
1. Torque the valve cores to 3 to 5 in-lb (0.35 to 0.45 Nm).
2. Torque the protective covers to 40 to 50 in-lb (4.5 to 5.5 Nm).

14. Install the guard assembly (3) secured by capscrew (1) and lockwasher (2) for protection.

15. On suspensions equipped with the setscrew/drain plug combination:

a. After coating the threads with the appropriate thread sealant, install the setscrew (29). Tighten securely, but do not over-tighten to damage the threads. Make sure that the setscrew is installed to a sufficient depth to allow proper installation of the outer plug.

b. Install the drain plug assembly (27) into the plunger tube assembly. Tighten the special O-ring boss plug until the bosses make metal-to metal contact with the suspension. This should slightly compress the O-ring seal (28), but not cause it to distort.

16. Switch the suspension from the inverted position to a normal vertical operating position.

17. Secure in place and fill with oil as outlined in the procedures in Maintenance and Adjustment in this module.

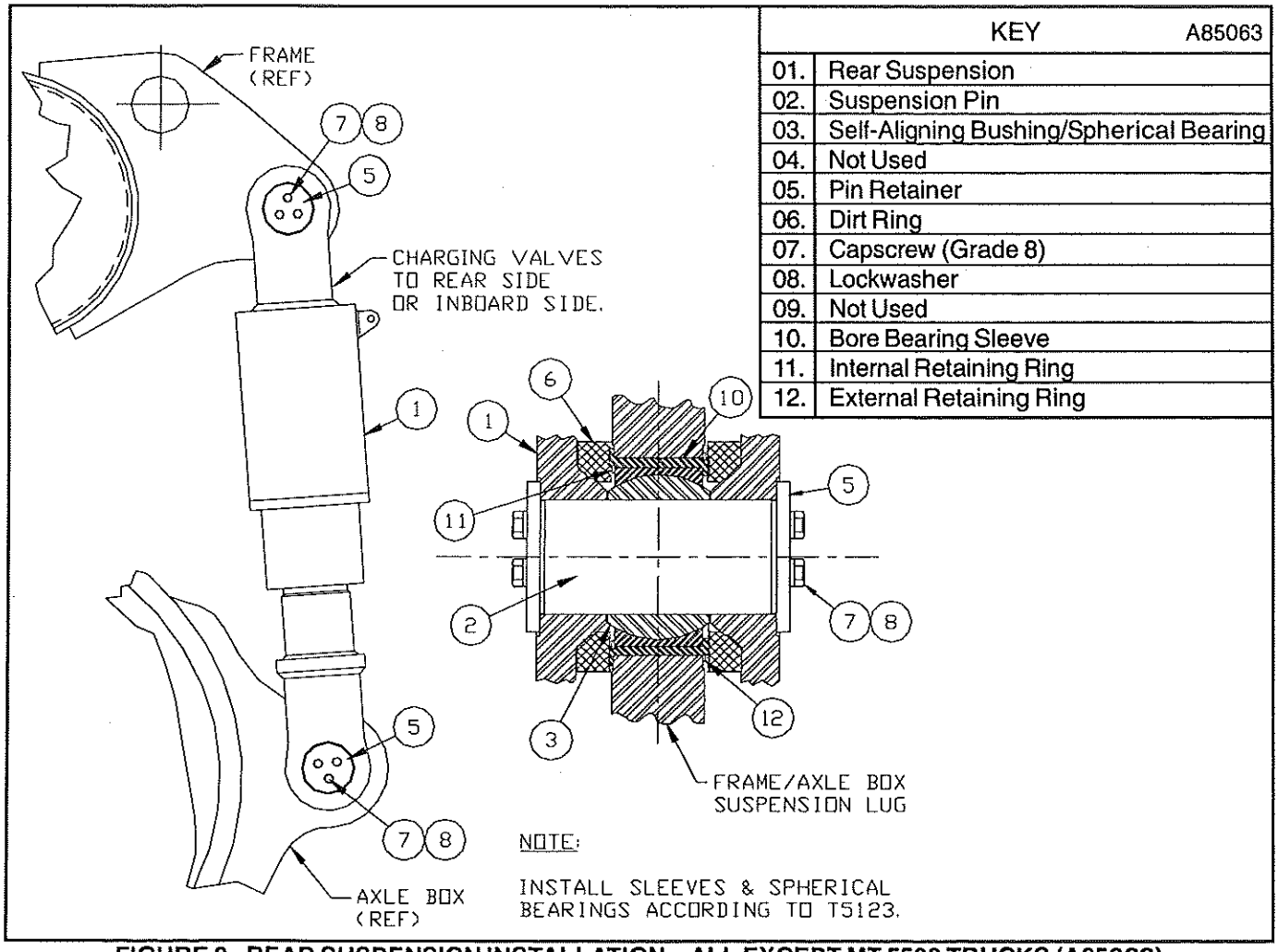
INSTALLATION (Figure 3)

The rear suspensions may be installed as follows:

1. Clean and smooth all mating surfaces on the suspension and the frame.

2. On trucks equipped with pressure transducers, use extra care to prevent damage to system components.

3. Raise the suspension assembly into position making sure the charge valves are located to the rear of the truck.



KEY	A85063
01.	Rear Suspension
02.	Suspension Pin
03.	Self-Aligning Bushing/Spherical Bearing
04.	Not Used
05.	Pin Retainer
06.	Dirt Ring
07.	Capscrew (Grade 8)
08.	Lockwasher
09.	Not Used
10.	Bore Bearing Sleeve
11.	Internal Retaining Ring
12.	External Retaining Ring

FIGURE 3 - REAR SUSPENSION INSTALLATION – ALL EXCEPT MT 5500 TRUCKS (A85063)

⚠WARNING

Each suspension unit weighs in excess of:

MK30B	**1250 lb (565 kg)**
MT 2700/3000	**1250 lb (565 kg)**
MT 3300/3300AC	**1250 lb (565 kg)**
BD 220	**1250 lb (565 kg)**
MT 3600B	**1650 lb (750 kg)**
BD 240/270	**1650 lb (750 kg)**
MT 3700B/3700AC	**1650 lb (750 kg)**
MT 4000	**1650 lb (750 kg)**
MT 4000AC	**1650 lb (750 kg)**
MT 4400/4400AC	**1650 lb (750 kg)**
MT 5500	**2320 lb (1 050kg)**

4. Align the holes in the suspension and in the lugs and install the suspension pins (2).

5. Install the pin retainers (5) and secure with lockwashers (8), and Grade 8 capscrews (7).

6. Install the neoprene dirt rings (6) in between the suspension and the lugs. Secure with tie wraps.

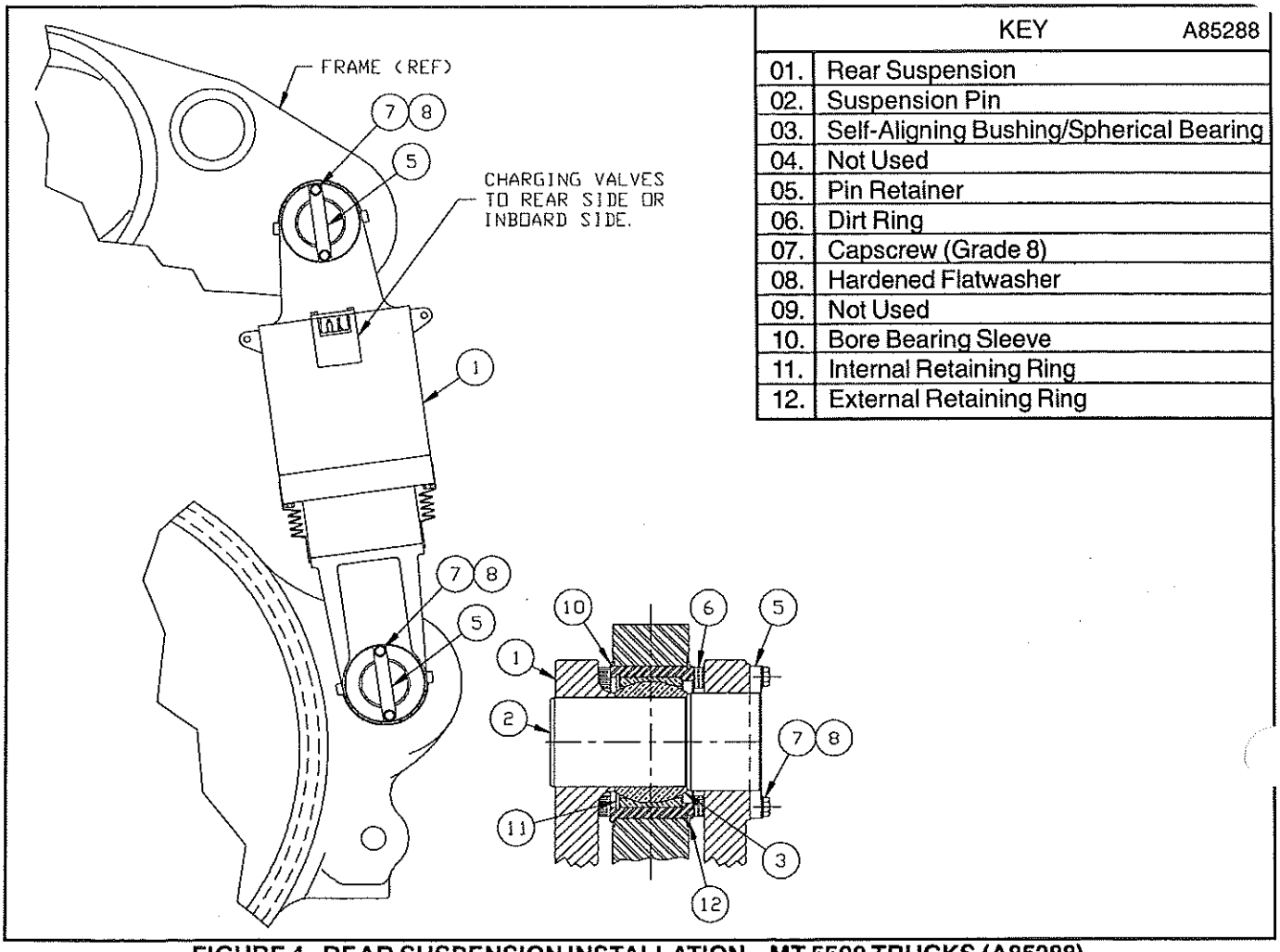
7. On trucks equipped with either or both the TEREX|UNIT RIG Weigh and Two-Speed Overspeed System:

a. Install the pressure transducer if not installed previously. Torque to 14 +/- 1 ft-lb (19 +/- 1 Nm).

NOTE: *The joint indicated in item 4 of Figure 5 must be watertight. It is recommended to use liquid pipe sealant on the threads and apply RTV sealant around the clearance hole to prevent moisture seepage and pooling. Also make sure to install the appropriate sealing grip (3) on the cable end of the transducer, using the body nut as a locknut.*

b. Install all wiring, making sure to allow sufficient freedom for the travel of the suspension.

8. Remove the blocking and lower the truck to the ground.



KEY	A85288
01.	Rear Suspension
02.	Suspension Pin
03.	Self-Aligning Bushing/Spherical Bearing
04.	Not Used
05.	Pin Retainer
06.	Dirt Ring
07.	Capscrew (Grade 8)
08.	Hardened Flatwasher
09.	Not Used
10.	Bore Bearing Sleeve
11.	Internal Retaining Ring
12.	External Retaining Ring

FIGURE 4 - REAR SUSPENSION INSTALLATION – MT 5500 TRUCKS (A85288)

9. Charge the suspension with dry nitrogen gas as outlined in the instructions in Maintenance and Adjustment in this module.

10. Check operation of the suspension as outlined in Maintenance and Adjustment before placing back into operation.

11. If so equipped, check the operation of the TEREX|UNIT RIG Weigh or Two-Speed Overspeed System.

KEY	
01.	Suspension
02.	Pressure Transducer
03.	Grip
04.	Watertight Joint

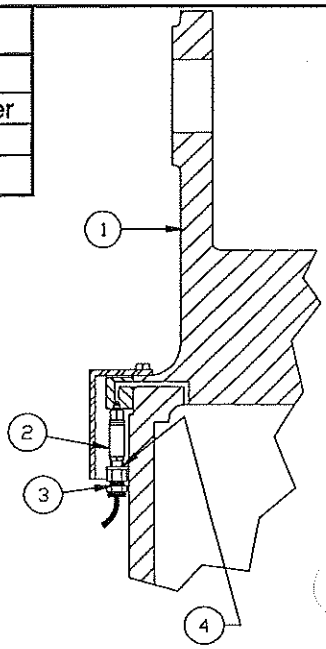


FIGURE 5 – PRESSURE TRANSDUCER INSTALLATION (A84726)

FRONT WHEEL ASSEMBLY (OIL LUBRICATED WHEEL BEARINGS)

DESCRIPTION AND LOCATION (Figures 1A and 1B)

The front wheel assembly consists of the large saucer shaped disc found inside each of the front tire and rims assemblies and the associated bearing and rim mounting hardware.

OPERATION

The front wheel assembly functions as a "connecting link" between the front axle and the tire and rim assembly. The wheel rotates around the rigid front axle on a pair of tapered roller bearings, lubricated by a constant bath of gear oil lubricant. The tire and rim assembly is secured to the wheel by means of multiple clamps attached to the outer perimeter of the wheel.

The face type seal consists of two metallic seal rings that have the same geometric contour and are flexibly located in the O-rings. These O-rings act like springs and maintain axial sealing pressure on the rings, providing a static seal between the seal ring and the housing bore and transmit frictional torque.

Some versions of the assembly are "non-vented" or "closed". Other versions are "vented" to the atmosphere and may contain filtered breather elements.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Wheel loose	Bearings improperly adjusted - too many shims	Inspect bearing and reshim as outlined in Maintenance and Adjustment.
Wheel dragging or not rotating freely	Brakes dragging (not fully released)	Verify brakes are released. If not, see instructions in Section 8 - Brake System.
	Bearings rough or damaged	Inspect bearings and reshim as outlined in Maintenance and Adjustment.
	Bearings shimmed too tightly - binding the wheel	
Tire not running true (straight)	Rim bent	Inspect tire and rim assembly. Replace as required.
	Rim not properly seated on wheel	Inspect the rim's position on the wheel. Adjust as required.
	Wheel damaged	Inspect the wheel for damage. Replace if necessary.
Short bearing life	Improper lubrication	Follow recommended lubrication practices.
	Bearings improperly adjusted	Shim the bearing as outlined in the procedures in Maintenance and Adjustment.
	Bearing overloaded or damaged in service	Check operating conditions and load. Correct as required.

12615

MAINTENANCE AND ADJUSTMENT

Periodic maintenance includes the following steps:

1. At least daily:

a. Inspect the wheel especially the inner and outer seal areas for evidence of leakage, wear, or damage. Repair or replace as required.

NOTE: *For proper operation and life of the seal, lubricant is required to maintain proper rotational operation and friction in the sealing gap. The lubricant is admitted to the gap by capillary action and centrifugal force in the normal course of rotation of the wheel assembly. Slight seepage of the seal assembly in this area should be considered normal.*

b. Verify that each wheel lug clamp is in good repair.

NOTES:

1. Newer stud assemblies incorporate:

a. A "shoulder" on the threaded area to provide proper installation depth.

b. A hex shape on the open end allowing the direct use of the appropriate tools to assist in the removal and installation of the stud.

2. On older assemblies (without the shoulder or hex):

a. Installation depth is a measurement of the length of the stud that extends out of the wheel casting.

b. A driver or multiple lug nuts tightened onto the stud to function as a driver may be needed to assist in the removal and installation of the wheel studs.

3. In either case, it is recommended that Loctite 242 (liquid), 248 (stick) or equivalent, is applied to the threads to secure in place.

2. At regular intervals, typically 250 hour lubrication reviews:

a. It is recommended that a lubricant sample be drawn from each of the bearing cavities and spectrochemically analyzed for material content. Corrective actions should be taken if the tests show:

NOTES:

1. The sample should be taken within 15 minutes of the truck being shut down from actual haulage use. The bearing system and lubricant should have reached operating equilibrium (mixing of all of the oil and any other materials and including normal temperatures) just before the sample is taken.

2. The sample should be taken from the same depth of the oil and the same location in the cavity each time. This may be aided by fabricating a sampling rod indexed from the hubcap port. The rod should have a "stand-off" feature near the inlet to prevent the end of the tube from touching any components inside.

(1) A loss of viscosity or lubricity. Continued operation with the deteriorated oil will adversely affect bearing and seal life.

(2) A wear particle analysis with a count of particles greater than 25 microns in size, in units of "particles per milliliter of oil".

IMPORTANT: *Records should be kept. An increase in the metal contents, particularly iron and chromium often indicates bearing wear and continued operation in this condition will also adversely affect bearing and seal life.*

NOTES:

1. Particle contamination typically is measured using spectroscopic analysis, a process that can detect microscopic metal particles in oil samples. This process can measure concentrations of about twenty different metals and concentrations of particles up to a size to 5 to 10 microns. It can not typically detect larger particles.

2. Wear particle analysis emphasizes particle size in addition to concentration and is a more useful indicator of the condition of a bearing system.

3. While particles of 15 microns in size may cause wear in a hydraulic fluid power systems, particles over 25 microns in size are generally required to cause damage to wheel bearings.

4. Proper and consistent sampling techniques are critical to the success of an oil analysis program. It is important that just before any sample is taken, the system should be at normal operating temperatures.

b. Inspect the lubricant level indicated in the front wheel hubcap plug as follows:

(1) Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

(2) Verify that the level checking plug in the hubcap assembly is at approximately the horizontal centerline of the front axle spindle.

NOTE: *It may be necessary to move the truck slowly and slightly to properly orient the plugs on one or both of the wheels. It is recommended that the level be checked after the truck has not moved for a minimum of 15 minutes to allow the oil to drain from the bearing cavities.*

TABLE 1 - APPROVED LUBRICANTS	
AMBIENT TEMPERATURE RANGE	**RECOMMENDED VISCOSITY (OR EQUIVALENT)**
-67° to 59° F (-55° to 15° C)	SHC 150
-35° to 77° F (-37° to 25° C)	SHC 220
-29° to 95° F (-34° to 35° C)	SHC 320
-20° to 104° F (-29° to 40° C)	SHC 460
-9° to 122° F (-23° to 50° C)	SHC 680

NOTES:

1. All of the lubricants recommended are fully synthetic. If the use of other lubricants, including mineral based oils, is desired, contact your local Terex|Unit Rig *Representative.*

2. The listed recommended viscosity is typical for many brands. For detailed information, refer to the information in Section 10 - Miscellaneous or to your Terex Unit Rig *Representative for more detailed information.*

13820

(3) Remove the plug and observe the flow of oil out of the opening:

(a) It is a slow, steady trickle, the level is acceptable.

(b) If the flow is heavy or appears contaminated with water or other foreign material, determine the cause and correct before proceeding.

(c) If there is no flow, add the appropriate gear lubricant until flow just begins through the opening.

NOTES:

1. A complete fill is approximately 3.3 gallons (13 liters) of lubricant. This equates to an approximate 50% fill of the oil cavity.

2. If frequent refilling is required, determine the cause and repair.

(4) Reinstall the plug.

3. At 500 hour intervals:

a. Check that the wheel clamps are properly torqued to 525 to 550 ft-lb (710 to 745 Nm).

b. On trucks equipped with replaceable breather elements for wheel bearing reservoir area, inspect the element for indications of contamination. Since this is functioning as a very low pressure breather, replace if they appear contaminated or "oil soaked".

4. At 2,500 hour intervals (or as indicated by the oil analysis outlined above), the lubricant should be changed as follows:

a. Sample the oil lubricant as outlined previously.

b. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

c. Verify that the drain plug in the wheel assembly is at approximately the vertical centerline of the front axle spindle (bottom of its travel).

NOTE: *It may be necessary to move the truck slowly and slightly to properly orient the plugs on one or both of the wheels. It is recommended that the wheels be allowed to drain after the truck has not moved for a minimum of 15 minutes to allow the oil to drain from the bearing cavities.*

d. Remove the plug and observe the flow of oil out of the opening.

NOTE: *If the oil appears heavy or appears contaminated with metal particles, water or other foreign material, determine the cause and correct before proceeding.*

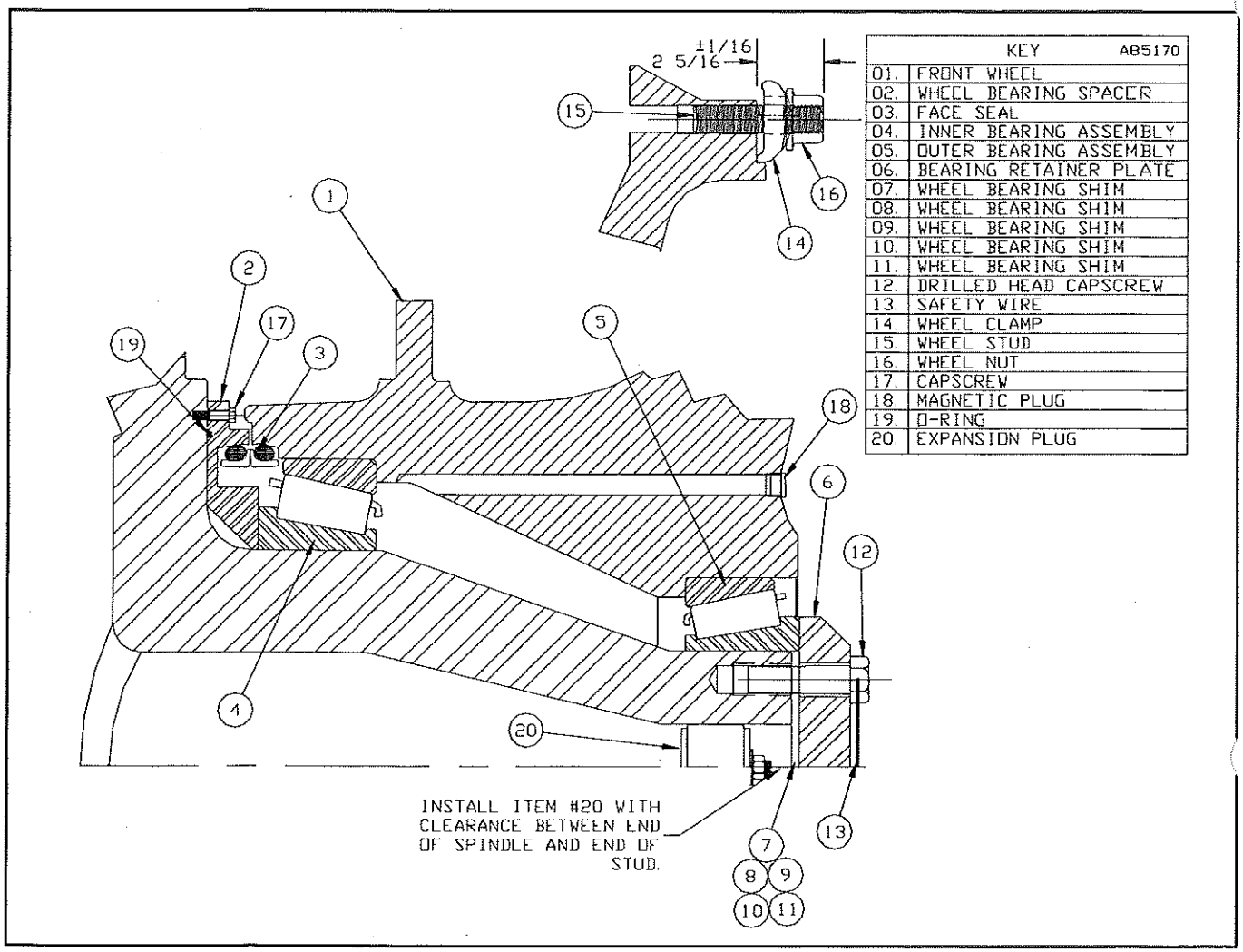
e. Replace the drain plug.

f. Verify that the level checking plug in the hubcap assembly is properly oriented as in step 2.

g. Add the appropriate gear lubricant until flow just begins through the opening.

NOTES:

1. A complete fill is approximately 3.3 gallons (13 liters) of lubricant.



KEY	A85170
01.	FRONT WHEEL
02.	WHEEL BEARING SPACER
03.	FACE SEAL
04.	INNER BEARING ASSEMBLY
05.	OUTER BEARING ASSEMBLY
06.	BEARING RETAINER PLATE
07.	WHEEL BEARING SHIM
08.	WHEEL BEARING SHIM
09.	WHEEL BEARING SHIM
10.	WHEEL BEARING SHIM
11.	WHEEL BEARING SHIM
12.	DRILLED HEAD CAPSCREW
13.	SAFETY WIRE
14.	WHEEL CLAMP
15.	WHEEL STUD
16.	WHEEL NUT
17.	CAPSCREW
18.	MAGNETIC PLUG
19.	O-RING
20.	EXPANSION PLUG

FIGURE 1A - FRONT WHEEL ASSEMBLY – NON-VENTED

2. For detailed information, refer to the information in Section 10 – Miscellaneous or to your Terex Unit Rig Representative for more detailed information.

h. Reinstall the level checking plug.

5. At 5,000 hour intervals, drain the lubricant as outlined previously. Disassemble and inspect the front wheel bearings for wear, damage, proper preload settings and evidence of proper lubrication. Reassemble and adjust the preload as outlined below.

FRONT WHEEL BEARING ADJUSTMENT

Each time the front axle, wheels, or wheel bearings are removed or replaced, the following procedure should be employed to properly set the bearing preload.

NOTE: *This procedure may be accomplished with tire and rim assemblies either on or off. If removal of the tires is desired, refer to the instructions on tire removal in Section 7 - Running Gear.*

1. Inspect the inner wheel and hub area for damage and foreign material. It is very important that this area be clean and free of any debris.

2. If the bearing assembly has been replaced, install the bearing cups or races. Seat the cups against the shoulders in the bearing bores.

NOTES:

1. Check that the cups are fully seated against the shoulders using a 0.002 inch (0.5 mm) feeler gauge. Insert the gauge in between the cup edge and the shoulder in a minimum of three places around the bore. If the gauge will fit in the gap, continue to seat until the gap is gone.
2. Use the proper tools and taking extra care not to damage or contaminate the bearings, seals or other components during the process.

KEY					A85439
01.	FRONT WHEEL	11.	WHEEL BEARING SHIM	21.	FILTER BRACKET
02.	WHEEL BEARING SPACER	12.	DRILLED HEAD CAPSCREW	22.	PIPE FITTING
03.	FACE SEAL	13.	SAFETY WIRE	23.	ADAPTER FITTING
04.	INNER BEARING ASSEMBLY	14.	WHEEL CLAMP	24.	HOSE ASSEMBLY
05.	OUTER BEARING ASSEMBLY	15.	WHEEL STUD	25.	ADAPTER FITTING
06.	BEARING RETAINER (PLATE)	16.	WHEEL NUT	26.	BREATHER ADAPTER
07.	WHEEL BEARING SHIM	17.	CAPSCREW	27.	SEAL PLATE
08.	WHEEL BEARING SHIM	18.	MAGNETIC PLUG	28.	O-RING
09.	WHEEL BEARING SHIM	19.	O-RING	29.	ADAPTER FITTING
10.	WHEEL BEARING SHIM	20.	SPIN ON AIR FILTER ELEMENT		

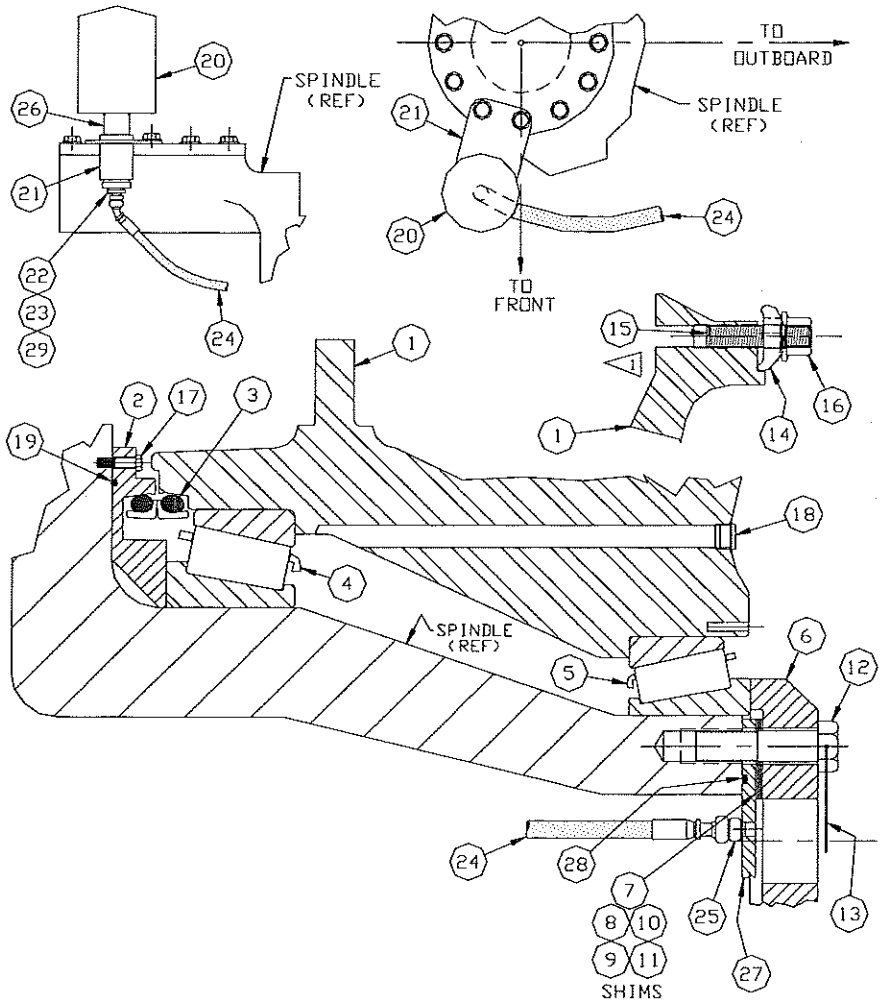


FIGURE 1B - FRONT WHEEL ASSEMBLY – VENTED WITH FILTER

3. On trucks equipped with spindles for press-fit front wheel bearings, heat the cups or races evenly to 75° F (42° C) above the ambient temperature before installing. Use an appropriate tool to evenly push the cups into their required position and allow to cool before continuing installation.

3. Install the seal adapter ring (2) onto the spindle.

4. Install the inner bearing cone (4) into the wheel.

5. Install the seal assembly as follows: (Figure 2 for step 5 only)

a. Remove the seal assembly from the original wrapping material just prior to installation.

b. Verify that the seal housing is free of all grease, metal and other contaminants. Also check again that it is free of all metal.

c. Insert the installation tool or spring onto the seal in preparation. Use extra care not to damage the O-ring or seal face.

NOTE: *Contact your local Terex Unit Rig representative for information on these special tools.*

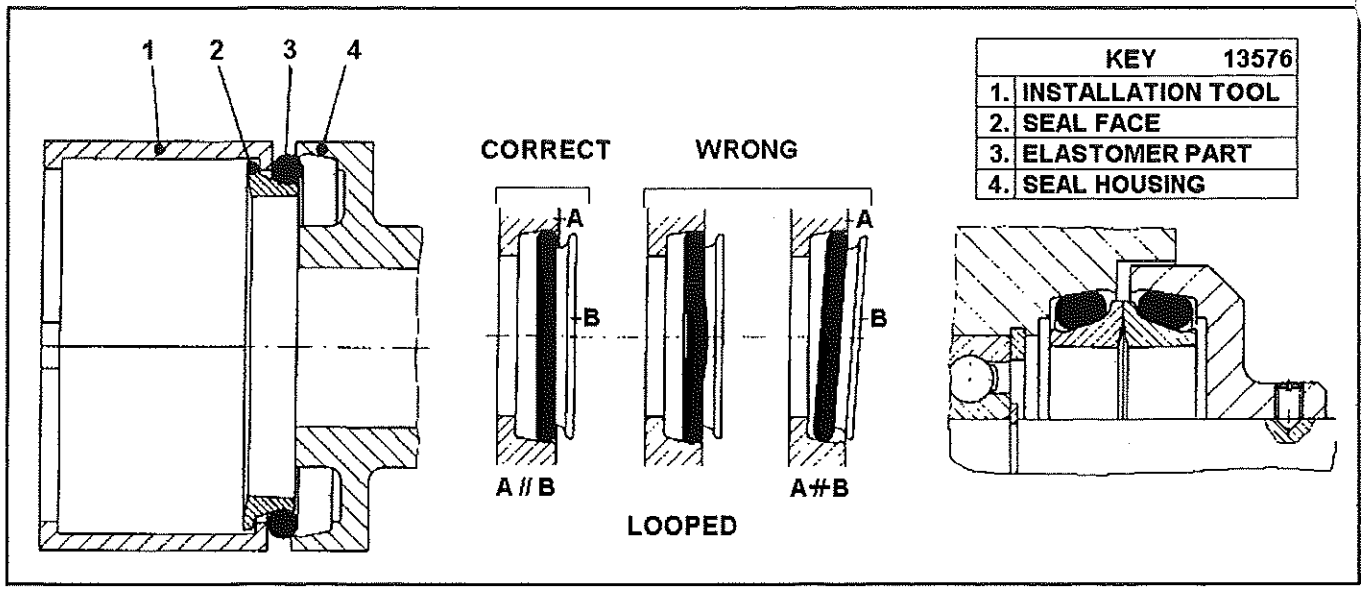


FIGURE 2 - FACE SEAL INSTALLATION

d. Install the face seal into the housing with the tool or spring. The pressure must be applied evenly and directly to the elastomer parts.

NOTE: *For easier assembly, moisten the bore and elastomer parts with white spirit.*

e. Press the seal ring like a push button into the housing. Take extra care to ensure that after installation the seal surface A (Figure 2) is parallel to B.

IMPORTANT: *The O-rings must not sit wave like in the housing bore or bulge partially looped out of the bore area.*

f. Wipe the seal face with a lint free cloth and apply a thin film of clean oil (SAE 30 - 40) to the sealing face.

IMPORTANT: *The oil must not wet any other surface. Also do not touch the seal face with your hands or any contaminated source.*

6. With the wheel in a level position and supported by a crane, install the wheel on the spindle. Raise and lower the wheel slightly to fully engage and seat the inner bearing against the bearing spacer.

NOTE: *When installing the wheel onto the spindle, use extreme caution to ensure that it remains centered in relation to the spindle. Damage to the bearing may occur if the wheel is cocked or not centered.*

7. Slide the outer bearing (5) onto the spindle.

8. Lubricate the six drilled head capscrews (12) with wheel bearing lubricant.

9. Install the bearing retainer plate (6) (with no shims) using the six drilled head retainer capscrews (12).

NOTE: *On trucks equipped with vented oil bath wheel bearings, the seal plate (27) and O-ring (28) should be removed from the bearing retainer plate (6) at this time.*

10. Alternately tighten the retainer capscrews to:

250 ft-lb (340 Nm) in 50 ft-lb (70 Nm) increments.

NOTE: *Rotate the wheel while tightening to properly seat the bearing rollers.*

11. Loosen the retainer capscrews to take the preload off the bearing.

12. Remove the retaining capscrews as indicated in Figure 3.

13. Alternately retighten the two capscrews to:

110 ft-lb (150 Nm) in 20 ft-lb (25 Nm) increments.

NOTE: *Rotate the wheel while tightening to properly seat the bearing rollers.*

14. Using the depth micrometer, measure the distance from the end of the axle to the outer face of the bearing retainer.

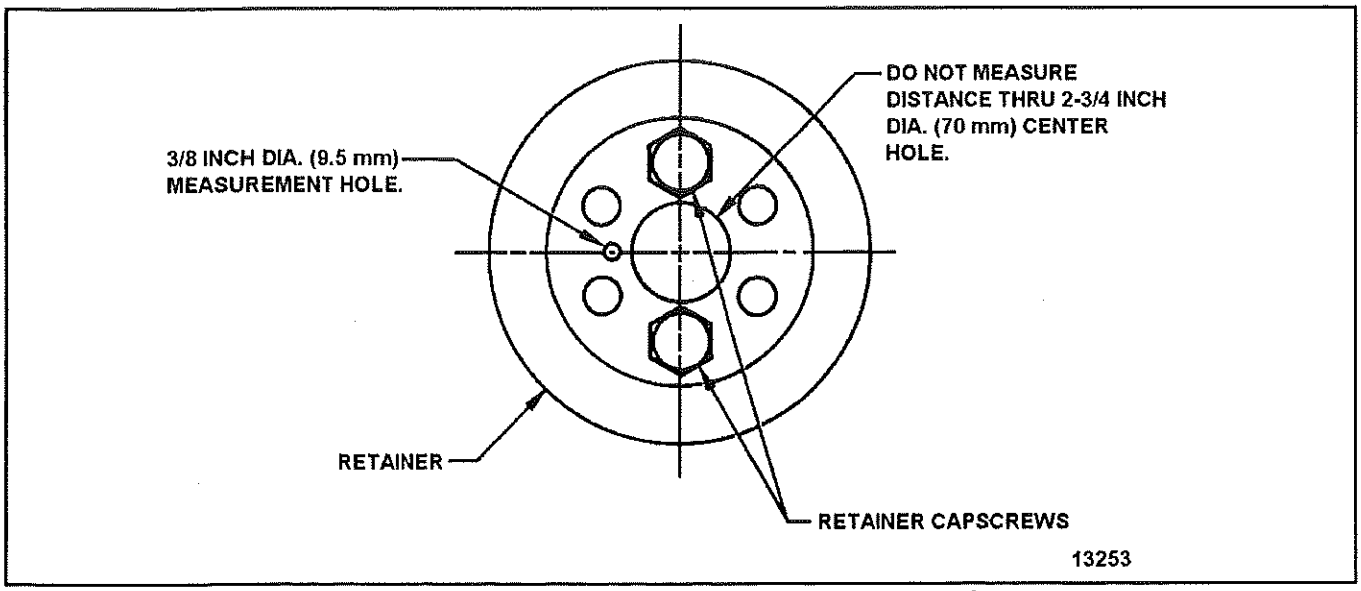


FIGURE 3 - FRONT WHEEL BEARING RETAINERS

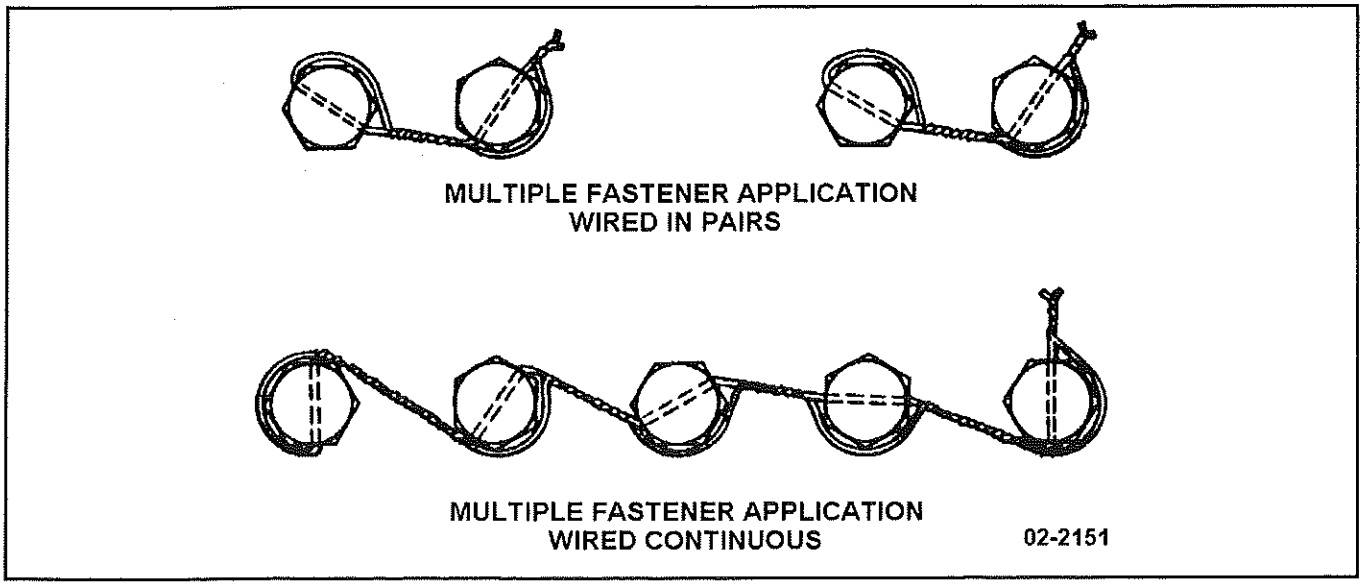


FIGURE 4 – INSTALLATION OF SAFETY WIRE

15. To determine the shim requirements, subtract the thickness of the retainer (measured previously) from this latter measurement.

16. Prepare a shim stack equal to (within 0.001 inch (0.002 mm)) the dimension obtained in step 15.

NOTES:

1. Always clean all shims and measure individually.

2. On trucks equipped with vented oil bath wheel bearings, measure the thickness of the seal plate (27) and include in the total thickness of the shim stack.

17. Remove bearing retainer (6) and outer bearing (5).

18. Coat the outer bearing (5) with wheel bearing lubricant (as outlined previously) and install shim stack (7, 8, 9, 10, and 11) bearing (5), and bearing retainer (6).

NOTE: *On trucks equipped with vented oil bath bearings, install the hose assembly (24) and adapter fitting (25) to the seal plate (27). Install the seal plate with the marked "UP" orientation.*

19. Alternately tighten all six drilled head capscrews (12) (lubricated) to:

560 ft-lb (760 Nm) in 100 ft-lb (135 Nm) increments.

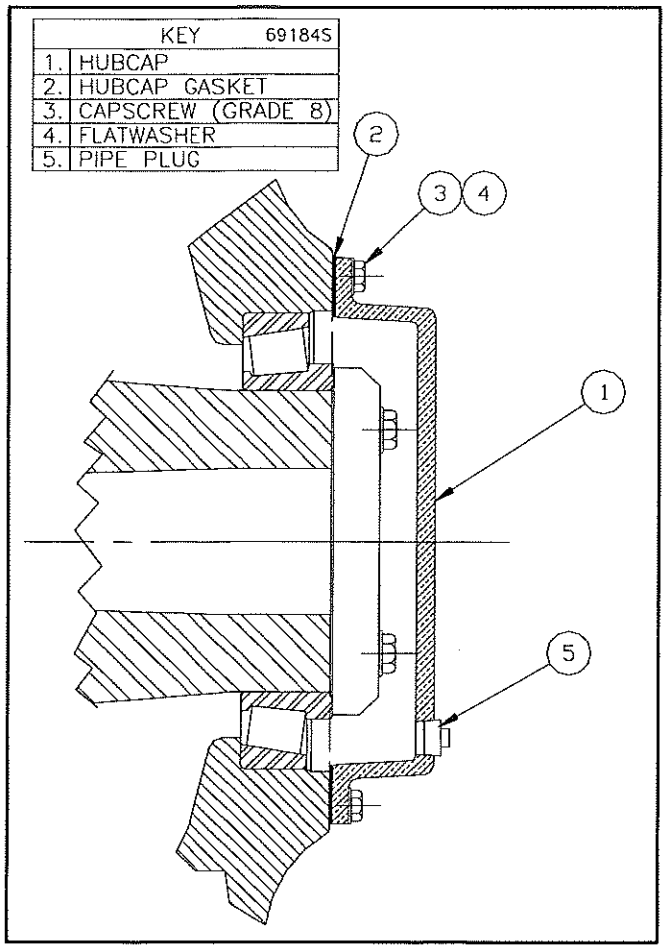


FIGURE 5A - STANDARD HUBCAP ASSEMBLY

NOTE: *Rotate the wheel (1) while tightening to properly seat the bearing rollers.*

20. Lockwire the retainer capscrews in place using safety wire (13).

21. Clean the mating surfaces for hubcap mounting on both the hubcap flange and the wheel.

22. Install the hubcap with the proper gasket around the flange and bolt holes. Secure with capscrews.

NOTE: *To provide an improved seal, first make sure that all mating surfaces are smooth and clean and then apply a thin coat of RTV sealant between the hubcap and the wheel.*

23. If the tire and rim assembly has been removed, install as instructed in the procedure in Section 7 - Running Gear.

24. Fill the wheel with approximately 3.3 gallons (13 liters) of the appropriate gear lubricant through the fill/

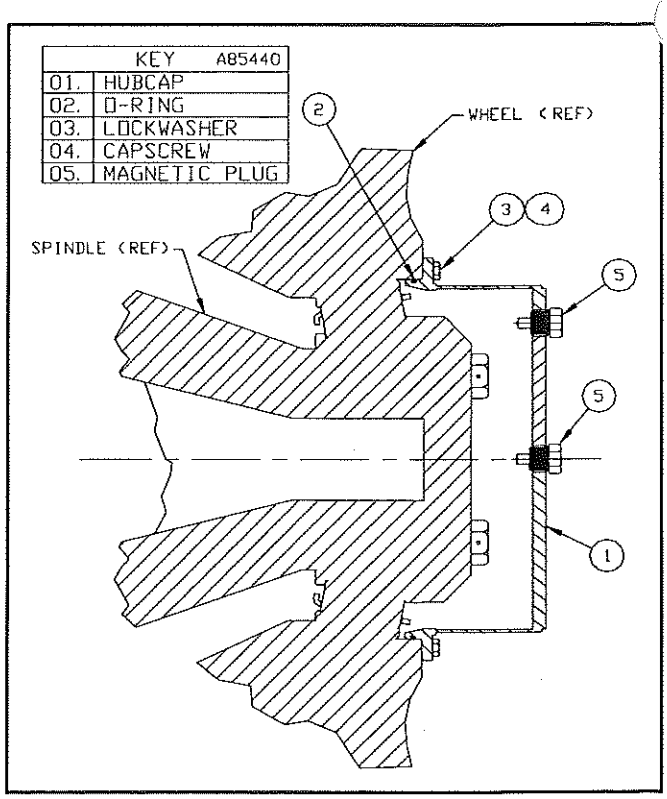


FIGURE 5B – HUBCAP ASSEMBLY WITH VENTED WHEEL BEARINGS

check port in the side of the hubcap as outlined previously.

REMOVAL (Figures 1A and 1B unless otherwise listed)

The front wheel may be removed from the truck as follows:

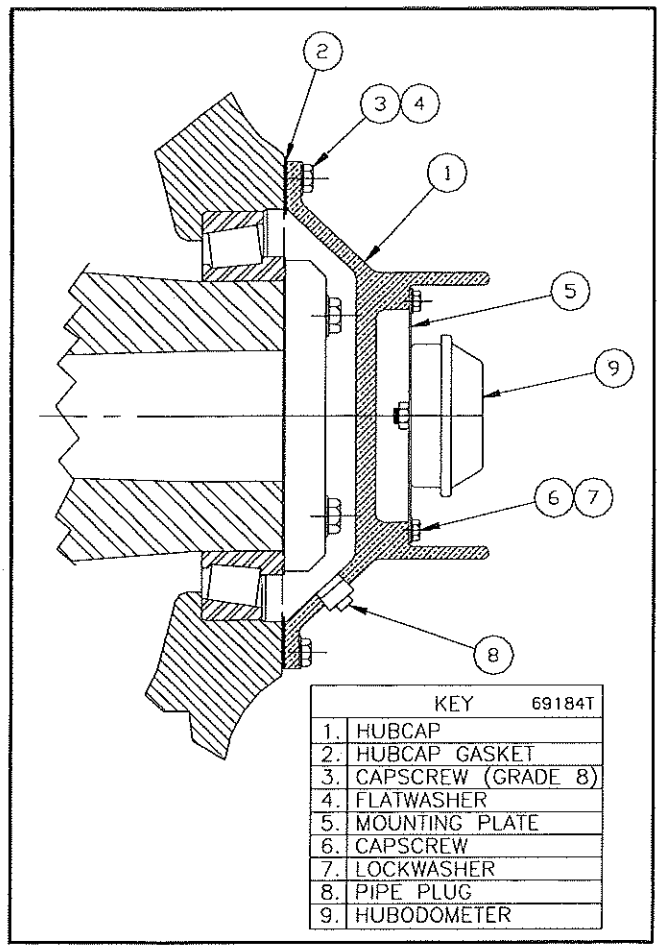
NOTE: *This procedure may be accomplished with the tires and rim assemblies either on or off. If removal of the tires is desired, refer to the instruction on tire removal in Section 7 - Running Gear in this manual.*

1. Park the truck in a SAFE POSITION. It must be secured by means other than the truck's friction brake system.

2. Release all pressure in the brake and steering systems as outlined in the procedures in Section 5 - Hydraulic System.

⚠ DANGER

The hydraulic brake system is a high pressure system. Relieve all pressure before disconnecting any lines.



KEY 69184T	
1.	HUBCAP
2.	HUBCAP GASKET
3.	CAPSCREW (GRADE 8)
4.	FLATWASHER
5.	MOUNTING PLATE
6.	CAPSCREW
7.	LOCKWASHER
8.	PIPE PLUG
9.	HUBODOMETER

FIGURE 6 - HUBODOMETER HUBCAP ASSEMBLY

3. Raise the truck until the tires clear the ground then securely block in this position.

4. If desired, remove the tire assemblies as outlined in Section 7 - Running Gear.

5. Disconnect the brake hydraulic supply line at the caliper assemblies. Install a clean plug on the hydraulic lines and a clean cap on each of the calipers.

6. Remove the hydraulic line between the caliper housings. Install clean plugs and caps on all open fittings.

7. Remove the caliper assemblies as outlined in the procedures in Section 8 - Brake System.

NOTE: *Retain the shims and identify the location removed from. The shims may be reinstalled with the caliper assembly to center the caliper with the disc. If new pads, discs, or bearings are installed, it will require reshimming the caliper assembly.*

8. Rotate the wheel assembly until the magnetic drain plug (18) on the wheel hub is pointing down.

9. Remove the plug and allow all lubricant to drain. Observe the draining oil and the plug itself for evidence of metal particles, water, or other contamination.

10. Remove the hubcap (Figures 5A and B and 6).

11. Support the wheel adequately to prevent accidental movement and remove the capscrews (12), bearing retainer (6), shims, and outer bearing (5).

NOTE: *On trucks equipped with the vented oil bath wheel bearings, the hose and adapter fittings (24 and 25, respectfully), will need to be removed.*

12. Slide the wheel off the axle spindle, being careful to protect the inner bearing (4), seal (3), and brake disc.

13. Remove the seal (3) and bearing (4) from the inner portion of the wheel.

14. Remove the seal adapter (2) and seal (3). Exercise care not to damage the sealing surfaces or allow to become contaminated.

15. If necessary, remove the disc by removing the capscrews attaching the disc to the wheel.

INSPECTION AND REPAIR

The disassembled wheel may be serviced as follows:

1. Thoroughly clean the axle spindle, bearing and wheel hub with clean solvent. Dry with clean, dry compressed air, but do not cause the bearing to spin freely, driven by the air.

2. Inspect the seals for excessive wear or damage. Repair or replace as required. It is recommended that they be replaced each time the wheel is removed.

3. Inspect the rub or seal wear ring for evidence of damage or wear. Repair or replace as required.

NOTE: *Since the surfaces wear in against each other in normal operation, it is recommended that the face seals be replaced each time the wheel assembly is removed.*

4. Inspect the inner and outer bearing cones and cups for evidence of damage, spalling and rough spots. If the bearing races are defective, replace the bearing cones and cups, both inner and outer.

5. Check that the bearing cups are properly seated by attempting to force a 0.002 inch (0.02 mm) feeler gauge

between the cup back face and the wheel shoulder. Reposition as required.

6. Using magnetic particle, dye-check or other suitable methods, check the radius on the base of each side of the disc mounting bolting flange on the inboard side of the wheel for evidence of damage or cracking. If defects are found, replace as required. Contact your Terex Unit Rig representative for more detailed information.

7. Inspect the wheel studs for proper installation and evidence of wear or damage. If loose or damaged and require replacement, it may be done as follows:

NOTES:
Newer stud assemblies incorporate:
1. A "shoulder" on the threaded area to provide proper installation depth.
2. A hex shape on the open end allowing the direct use of the appropriate tools to assist in the removal and installation of the stud.
Older assemblies (without the shoulder or hex):
1. Stud installation depth is a measurement of the length of the stud that extends out of the wheel casting.
2. A driver or multiple lug nuts tightened onto the stud to function as a driver may be needed to assist in the removal and installation of the wheel studs.

a. Using suitable tooling, remove the old wheel stud.

NOTE: *In instances where hand tools alone will not operate; apply localized heat to the stud or casting to warm to approximately 485° F (250° C). Taking the appropriate measures, remove while hot.*

b. Clean and inspect the threads in the wheel casting. Repair as required.

c. Clean and prepare the threads in the wheel casting and on the stud using the appropriate cleaner/primer for the locking compound to be used.

NOTE: *They both must be free of contamination and oil, wax, paint, rust inhibitor, or any other preservative treatment. It is important to use solvents that do not leave any residual materials or film.*

d. Coat the threads on the stud that will engage the threads in the casting with several drops of Loctite 242 (liquid) or sufficient 248 (stick) material or equivalent.

NOTE: *More detailed instructions on the proper preparation and use of Loctite are contained in Section 7 – Running Gear.*

e. Install the studs:

(1) On trucks equipped with the new stud, insert the threaded end of the stud into the threaded hole. Tighten until the "shoulder" contacts the wheel assembly. A final "light" torque of 15 to 20 ft-lb (20 to 27 Nm) should suffice.

(2) On trucks equipped with the older stud assembly, install the long threaded ending into the casting until the exposed threaded length is 2-5/16 +/- 1/16 inch (59 +/- 1.5 mm) from the machined edge to the wheel.

f. Allow the adhesive to harden per its listed instructions.

NOTE: *Full strength typically requires 24 hours. In some installations, special accelerants may be used to decrease this time, but may adversely affect overall total strength. Check/test before using.*

INSTALLATION

The wheel may be installed as follows:

1. Install the seal adapter onto the spindle assembly.

2. Replace the brake disc (if removed) and mounting adapter. Torque the capscrews as outlined in the information in Section 8 - Brake System, in even increments.

3. Assemble and shim the wheel and bearing assembly as outlined in the instruction on Maintenance and Adjustment.

4. After the wheel has been installed, reinstall and bleed the brake caliper assemblies as outlined in Section 8 - Brake System.

5. Install the tire and rim assembly as outlined in Section 7 - Running Gear.

6. Verify the proper oil level in the wheel cavity before operating the truck.