SECTION 10: FRONT AXLE

CONTENTS

LIST OF ILLUSTRATIONS

1. FRONT AXLE

1.1 Description

All H3 vehicles have a front axle of the "Reverse Elliot" type manufactured by GKN. The front axle consists of a girder section axle bed or beam with stub axles. Each stub axle is carried on a taper king pin, with a steep angle taper roller bearing at its top and a plain phosphor bronze bush at the bottom. The hub taper roller bearings are of a generous size and they are adjusted by means of shims, and secured by a special nut and washer. Brakes are manufactured by KNORR-BREMSE. Steering ball joints with hardened balls and rubbing pads incorporate compression springs which automatically take up any wear.

The tie rod simplifies toe-in adjustment. The maximum turning angle is set through stop screws installed on the inner side of the knuckle.

Steering stabilizer (damper), hydraulic cylinder and steering drag link which are mounted on the front axles are described in Section 14, "Steering" of this manual.

2. LUBRICATION

Perform periodic lubrication. Lubrication points of the front axles are shown on the lubrication and servicing chart annexed to Section 24, "Lubrication". Grease fittings such as the tie rod ends and knuckle pins are provided with grease fittings for pressure lubrication. These grease fittings should be serviced every 6,250 miles
(10 000 km) or twice a year whichever comes first. Good quality lithium-base grease NLGI No. 1 and 2 are recommended.

3. MAINTENANCE

A periodic inspection of the front axle assembly should be made to check that all bolts are tight, and that no damage and distortion have taken place. Suspension support stud nuts, U-bolt nuts, tie rod arms, steering arm nuts, and stop screws should be checked and tightened, if necessary, to the torque specifications given at the end of this section. Also check the condition of the steering knuckle pins and bushings. In case of excessive looseness, the bushings and pins should be replaced.

Any looseness in the steering linkage under normal steering loads is a sufficient cause to immediately check all pivot pins for wear, regardless of accumulated mileage. Steering linkage pivot points should be checked each time the axle assemblies are lubricated. Looseness in the steering linkage pivot points can be visually detected during rotation of the steering wheel.

Steering knuckles, knuckle pins, and bushings may be replaced without removing the axle from the vehicle. However, if extensive overall work of the front axle is necessary, the axle should be removed.

4. REMOVAL AND REPLACEMENT

The following procedure deals with the removal of the front axle assembly. The method used to support the axle and suspension components during removal and disassembly depends upon local conditions and available equipment.

4.1 Removal

1. Raise the vehicle by its jacking points on the body (see Section 18, "Body" under heading, "16. VEHICLE JACKING POINTS") until vehicle body is approximately 20 inches (508 mm) from the floor. Place jack stands under frame. Remove the wheels (if required, refer to Section 13, "Wheels, Hub and Tires" under heading, "3.1 REMOVAL").

2. Exhaust compressed air from the air supply system by opening the drain valve of each air reservoir.

3. Install jacks under axle jacking points to support the axle weight.

Warning: *To help prevent personal injury caused by the axle rolling off the jacks, the jack lifts should be equipped with U-adaptors, or similar equipment.*

4. Disconnect the steering drag link from the steering arm.

5. Remove the ABS sensors from their location in the hub units (if vehicle is so equipped).

6. Disconnect the height control valve link from its support on the axle.

7. Disconnect the hoses from brake chambers.

Note: *Position the air lines so that they will not be damaged when removing the axle.*

8. Remove the steering stabilizer cylinder (damper) and the hydraulic cylinder from steering top lever.

9. Remove bolts and nuts fixing the steering (damper) and the hydraulic cylinder mounting support to the front axle.

10. Remove the bolts and nuts fixing the axle to the left-hand and right-hand side air bellows mounting supports.

11. Use the jacks to lower axle. Carefully pull away the jacks and axle assembly from under the vehicle.

4.2 Replacement

Reverse removal procedure to reinstall the axle. Make sure that the air bellows support mounting plates are clean.

Note: *Refer to Section 16, "Suspension", Section 14, "Steering" and to paragraph "6. SPECIFICATIONS" at the end of this section for proper torque tightening.*

5. SERVICE INSTRUCTIONS FOR STEER AXLE

Refer to GKN Parts and service manual for axles annexed to the end of this section. See Section B.

6. FRONT WHEEL ALIGNMENT

Correct front wheel alignment must be maintained for ease of steering and satisfactory tire life. Road shocks, vibrations, normal stress and strains on the front-end system under average operation can result in loss of front wheel alignment.

Check the front wheel alignment when the following occurs:

1. Every 200,000 miles (320 000 km) or 24 months (normal maintenance);

2. When the vehicle does not steer correctly; or

3. To correct a tire wear condition.

There are two types of front wheel alignments: a minor alignment and a major alignment.

6.1 Minor Front Wheel Alignment

Perform a minor front wheel alignment for all normal maintenance conditions.

Perform the minor front wheel alignment in the following sequence:

1. Inspect all the systems that affect the wheel alignment. See paragraph "6.3 INSPECTION BEFORE ALIGNMENT" in this section.

2. Check and adjust the hub bearings, See Section 13, "Wheels, Hubs and Tires", under heading "11.1.5 TO ASSEMBLE THE HUB".

3. Check and adjust the toe-in.

6.2 Major Front Wheel Alignment

Perform a major front wheel alignment to correct steering and tire wear conditions.

Perform the major front wheel alignment in the following sequence:

1. Inspect all the systems that affect the wheel alignment. See paragraph"6.3 INSPECTION BEFORE ALIGNMENT" in this section.

2. Check and adjust the hub bearings. See Section 13, "Wheels, Hubs and Tires", under heading "11.1.5 TO ASSEMBLE THE HUB".

***Note**: If steering angle stoppers are changed, a special procedure is required for readjusting gearbox poppet valves. (see paragraph "6.6 HYDRAULIC STOP" of this section).*

3. Check and adjust the turning angle adjustment.

4. Check the camber angle.

5. Check and adjust the caster angle.

6. Check and adjust the toe-in.

6.3 Inspection Before Alignment

Check the following before doing a front wheel alignment:

1. Ensure that the vehicle is at normal ride height (see Section 16, "Suspension" under heading "7. SUSPENSION HEIGHT ADJUSTMENT").

2. Ensure that front wheels are not the cause of the problem (refer to Section 13, "Wheels, Hubs and Tires"). Inspect the tires for wear patterns that indicate suspension damage or misalignment.

a. Make sure the tires are inflated to the specified pressure.

b. Make sure the front tires are the same size and type.

c. Make sure the wheels are balanced.

d. Check wheel installation and straightness.

3. Check the wheel bearing adjustment.

4. Check steering linkage for bending and pivot points for looseness.

5. Check knuckle pins for evidence of excessive wear.

6. Check radius rods for bending and rubber bushings for evidence of excessive wear.

7. Make sure all fasteners are tightened to the specified torque. Use a torque wrench to check the torque in a tightening direction. As soon as the fastener starts to move, record the torque. Correct if necessary. Replace any worn or damaged fasteners.

6.4 Turning Angle Adjustment

The maximum turning angle is set through the two steering stop screws installed on the axle center. The turning angle is factory adjusted to accommodate the chassis design, and therefore, does not require adjustment on new vehicles. However, these should be checked and adjusted, if necessary, any time any component of the steering system is repaired, disassembled or adjusted.

Proceed with the following method to check steering maximum turn angle.

6.5 Mechanical Stop

Check if front tires rub against the frame or if the steering gear has been serviced.

6.5.1 R.H. Turn Adjustment

1. Turn steering wheel to the right until the boss on the axle touches the right stop screw.

2. Verify the nearest point of contact of the ball socket body with the air bellows support assembly. Measure the distance between those two points.

3. The distance between these two points should be approximately 1/8 inch (3 mm). If not, the steering stop screws must be readjusted.

4. Check the nearest point of contact of the drag link with the tire. Measure the distance between these two points.

5. The distance should be 1 inch (25 mm) or more. If not, the steering stop screws must be readjusted.

6. This must be done for a full right turn.

7. If readjustment is required:

   a. Remove the swivel stop screw.

   b. Add to the stop screw the required number of washers to obtain the proper measure. Tighten the stop screw afterwards. Two washer thicknesses are available: 1/16 inch and 3/16 inch spacers.

6.5.2 L.H. Turn Adjustment

1. Turn steering wheel to the left until the boss on the axle touches the left stop screw.

2. Verify the nearest point of contact of the ball socket body with the air bellows support assembly. Measure the distance between these two points.

3. The distance should be approximately 1/8 inch (3 mm). If not, the steering stop screws must be readjusted.

4. Check the stroke of the steering stabilizer cylinder (damper). It should not exceed 12.59 inches (320 mm).

5. This must be done for a full left turn.

6. If readjustment is required:

   a. Remove the swivel stop screw.

   b. Add to the stop screw the required number of washers to obtain the proper measure. Tighten the stop screw afterwards. Two washer thicknesses are available: 1/16 inch and 3/16 inch spacers.

Note: *If steering angle stoppers are changed, a special procedure is required for readjusting gearbox poppet valves (see paragraph "6.6 HYDRAULIC STOP" of this section).*

6.6 Hydraulic Stop

Note: *Before poppet valve readjustment, verify vehicle wheel alignment, and ensure that oil level is checked and that air bleeding is done.*

Refer to "TAS Steering Gear Service Manual" annexed to Section 14, "Steering", under headings: "FILLING AND AIR BLEEDING THE SYSTEM" and "POPPET READJUSTMENT".

6.7 Front Wheel Camber

Wheel camber is the number of degrees the top of the wheel tilts outward (positive) or inward (negative) from a vertical plane (Fig.1).

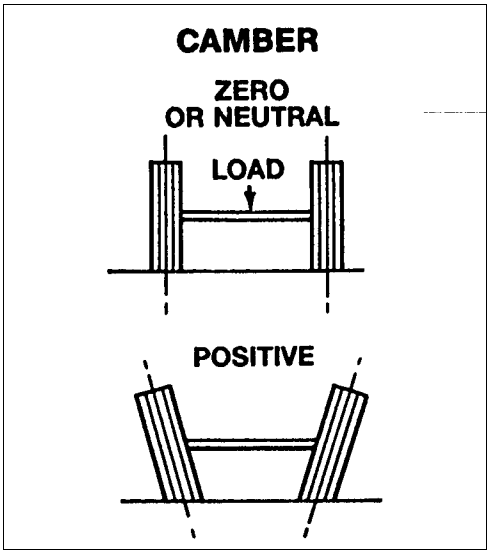

FIGURE 1: CAMBER 10006

The camber angle is not adjustable. Camber variations may be caused by wear at the wheel bearings, steering knuckle pins, or by a bent knuckle or sagging axle center. Steering effort is affected by improper camber, and uneven tire wear will result. Excessive positive camber causes an irregular wear of tire at the outer shoulder, and excessive negative camber causes wear at the inner shoulder.

6.7.1 Camber Check

For camber specifications, refer to paragraph "8. SPECIFICATIONS" in this section.

***Note**: Camber angle varies with axle loading. If the vehicle is not completely empty, please refer to the camber angle curve in the specifications at the end of this section .*

1. Use an alignment machine to check the camber angle.

2. If camber reading is not in the specifications, adjust the wheel bearings and repeat the check. If the reading is still not within specifications, verify the steering knuckle pins and axle center.

   See instructions in "GKN Parts and Service Manual For Axles", annexed to the end of this section, under heading "TO REMOVE THE STUB AXLE ASSEMBLY" .

3. Check the wheel lateral distortion as instructed in Section 13, "Wheels, Hubs and Tires", under heading "6. CHECKING FOR DISTORDED WHEEL ON VEHICLE". If distortion is excessive, straighten or replace wheel(s).

6.8 Front Axle Caster

For caster specifications, refer to paragraph "8. SPECIFICATIONS" in this section.

Positive caster is the rearward tilt from the vertical axis of the knuckle pin. Negative caster is the forward tilt from the vertical axis of the knuckle pin (Fig. 2). This vehicle is designed with a positive caster. The purpose of the caster angle is to give a trailing effect. This results in stabilized steering and a tendency for the wheels to return to the straight-ahead position after taking a turn.

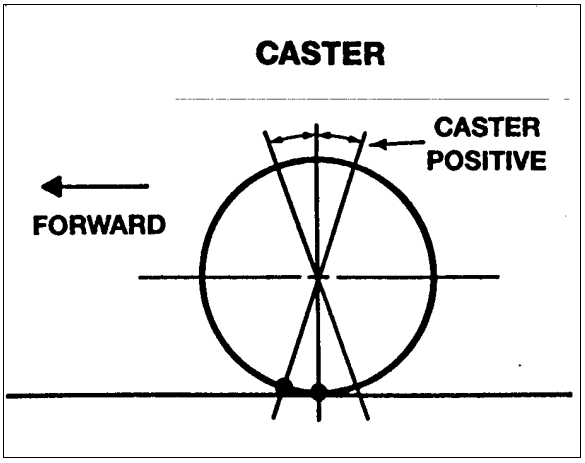

FIGURE 2: CASTER **10007**

Excessive caster results in hard steering around corners. A shimmy may also develop when returning to the straight-ahead position (pulling out of curves).

Insufficient caster will cause wandering and steering instability. Caster variations may be caused by a bent axle, tilting or distortion of the side suspension supports, damaged radius rod bushings, or unequal tightening of the front and rear suspension support bolts. Incorrect caster must be corrected by replacing the damaged suspension parts. A precision instrument should be used to measure the caster.

Note: *The caster of this vehicle is factory set and is nonadjustable. However, if after replacing damaged parts on the vehicle or in case of improper caster due to irregular setting, the front axle caster can be adjusted by means of shims (Prévost # 110663) on the left-hand side upper radius rod support in order to obtain minor adjustment.*

6.9 Front Wheel Toe-in

Wheel toe-in is the degree (usually expressed in fractions of an inch) to which the forward part of the vehicle front wheels are closer together than the rear part, measured at wheel centerline height with the wheels in the normal *"straight-ahead"* position of the steering gear. Incorrect toe-in results in excessive tire wear caused by side slippage and also steering instability with a tendency to wander. Toe-in may be measured from the center of tire treads or from the inside of the tires. Take measurements at both front and rear of axle (see "A" and "B" in Fig. 3).

When setting *"toe-in"* adjustment, the front suspension must be neutralized; that is, all component parts must be in the same relative position when making the adjustment as they will be when in operation.

To neutralize the suspension, the vehicle must be rolled forward, approximately ten feet.

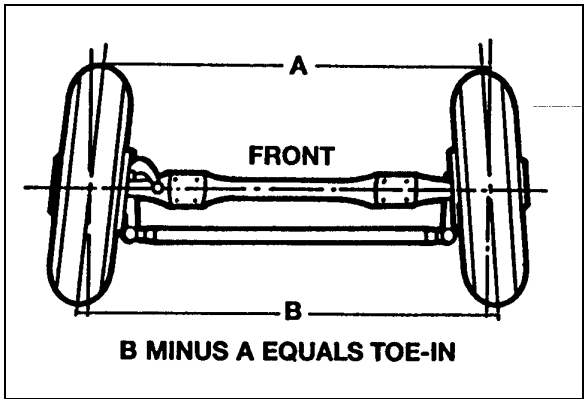

FIGURE 3: TOE-IN **..... 10008**

For toe-in specifications, refer to paragraph "8. SPECIFICATIONS" in this section.

By rolling the vehicle forward, all tolerances in the front suspension are taken up and the suspension is then in its normal operating position. Neutralizing the front suspension is extremely important, especially if the vehicle has been jacked up in order to mark the tires. Otherwise the front wheels will not return to their normal operating position due to the tires gripping the floor surface when the vehicle jack is lowered.

Note: *"Toe-in" measurements must be taken at the horizontal axis of the wheel centerline.*

6.9.1 Inspection and Adjustment

Before checking front wheel toe-in, first check the camber angles and make the necessary corrections.

1. Measure the toe-in.

2. If the toe measurement is not at the specified distance, Refer to the following procedure:

a. Loosen the pinch bolt nuts and bolts on each end of the tie rod.

b. Turn the tie rod until the specified toe-in distance is obtained.

c. Tighten pinch bolt nuts alternately and progressively to 65-75 lbf•ft (88-102 N•m), thus securing all joint to tie rod.

7. TROUBLE SHOOTING

Condition	Cause	Correction
Tires wear out quickly or have uneven tire tread wear.	1. Tires have incorrect air pressure. 2. Tires out-of-balance. 3. Incorrect tag axle alignment. 4. Incorrect toe-in setting. 5. Incorrect steering arm geometry.	1. Put specified air pressure in tires. 2. Balance or replace tires. 3. Align tag axle. 4. Adjust toe-in specified setting. 5. Service steering system as necessary.
Vehicle is hard to steer.	1. Low pressure in the power steering system. 2. Steering gear not assembled correctly. 3. Steering linkage needs lubrication. 4. King pins binding. 5. Incorrect steering arm geometry. 6. Caster improperly adjusted. 7. Tie rod ends hard to move. 8. Worn thrust bearing.	1. Repair power steering system. 2. Assemble steering gear correctly. 3. Lubricate steering linkage. 4. Replace king pins. 5. Service steering system as necessary. 6. Adjust caster as necessary. 7. Replace tie rod ends. 8. Replace thrust bearing.
Bent or broken steering arm, steering top lever, tie rod assembly	1. Too much pressure in the power steering system. 2. Cut-off pressure of the power steering system improperly adjusted. 3. Vehicle not powered on correctly. 4. Power steering system not installed correctly.	1. Adjust power steering system to specified pressure. 2. Make sure vehicle is powered on correctly. 3. Correctly install the power steering system. 4. Correctly install power steering system
Worn or broken steering ball stud.	1. Drag link fasteners tightened past specified torque. 2. Lack of lubrication or incorrect lubricant. 3. Power steering stops improperly adjusted.	1. Tighten drag link fasteners to specified torque. 2. Lubricate linkage with specified lubricant. 3. Adjust stops to specified dimension.
Worn king pins and knuckle bushings.	1. Worn or missing seals and gaskets. 2. Incorrect lubricant. 3. Axle not lubricated at scheduled frequency. 4. Incorrect lubrication procedures. 5. Lubrication schedule does not match operating conditions.	1. Replace seals and gaskets. 2. Lubricate axle with specified lubricant. 3. Lubricate axle at scheduled frequency. 4. Use correct lubrication schedule to match operating conditions. 5. Change lubrication schedule to match operating conditions.
Vibration or shimmy of front axle during operation.	1. Caster not adjusted properly. 2. Wheels and/or tires out-of-balance. 3. Worn steering stabilizer cylinder.	1. Adjust caster. 2. Balance or replace wheels and/or tires. 3. Replace steering stabilizer cylinder.

8. SPECIFICATIONS

Front Axle

Make ..... GKN
Axle type S-82
Front track ..... 84.4 inches / 2145 mm
Capacity (each) ..... 18,067 lbs / 8 200 kg

Torque Specifications

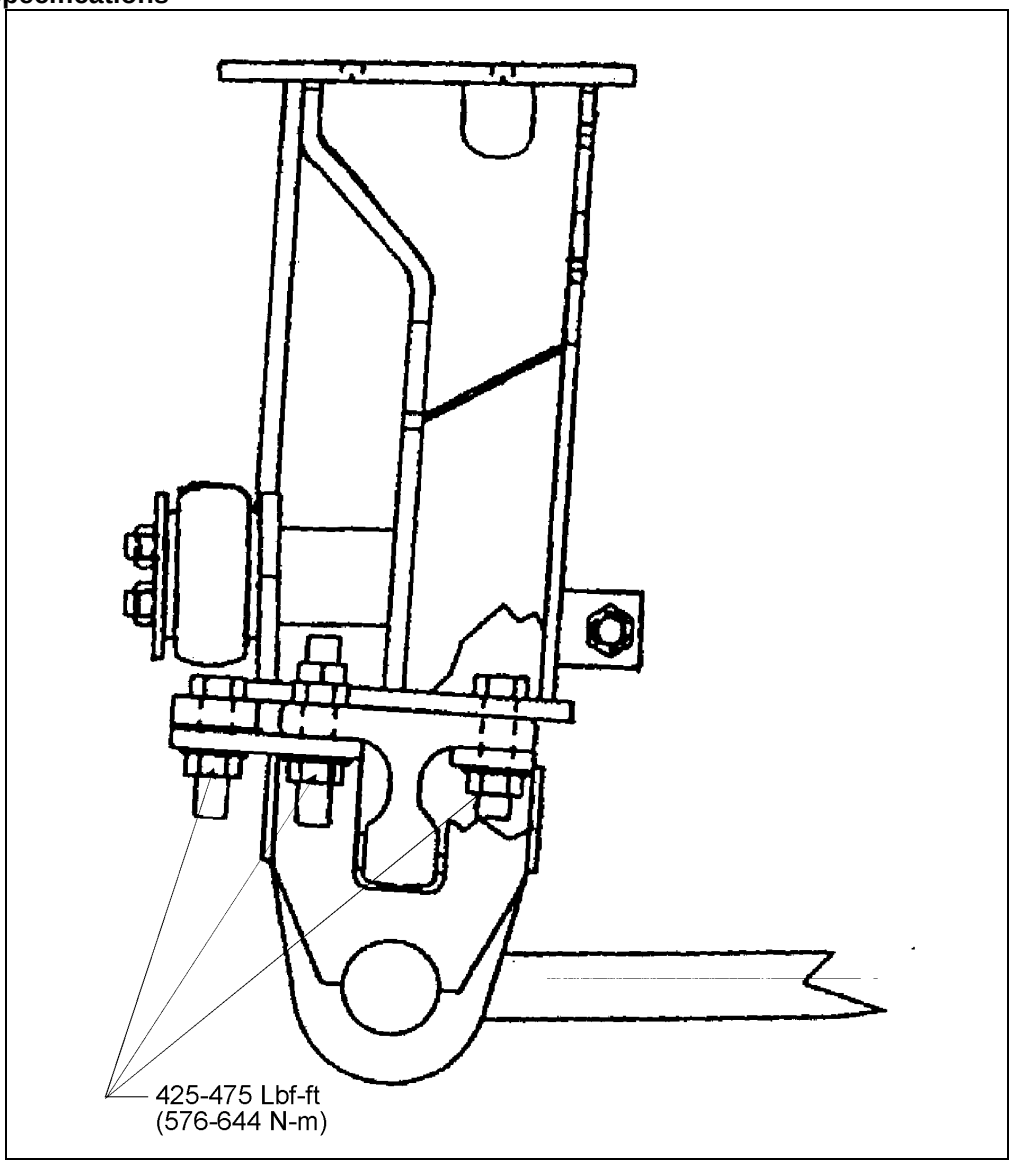

FIGURE 4: AIR BELLOWS MOUNTING SUPPORT AND AXLE 10009

For more torque specifications, see "GKN Parts and Service Manual For Axles", Manual No. 1604, Issue A, Section B annexed to the end of this section, under heading "Tightening Torque Table for Type S82 Steer Axle" .

Front wheel alignment specifications			
Front wheel alignment	**Minimal**	**Nominal**	**Maximal**
Camber (C), degrees R.H. and L.H. *	-1/2	0	+1/2
Caster (G), degrees R.H. and L.H.	+ 2	+ 2 3/4	+ 3 1/2
Toe-in (F minus E), inches	+ 1/16	+ 3/32	+ 1/8

Note: *Camber angle changes with loading. The given numbers are for an empty vehicle. See chart below for possible correction, if loaded.*

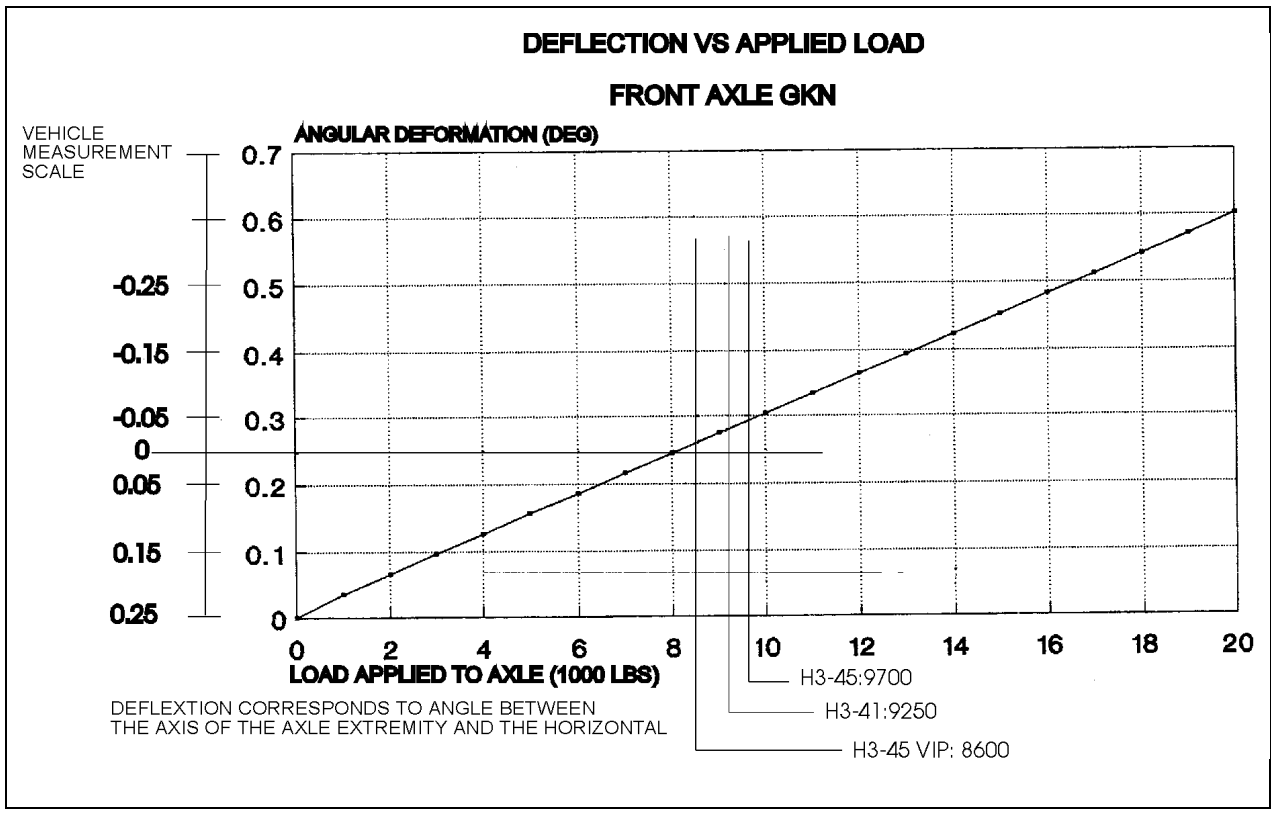

FIGURE 5: DEFLECTION VERSUS APPLIED LOAD **10010**

PARTS AND SERVICE MANUAL
FOR AXLES FITTED
TO PREVOST 6 X 2 COACH

1st. AXLE TYPE S82
AXLE ASSEMBLY No.25546
CUST. REF. 610985

REF. DRAWING *Nos.*
Hub F4651 A
Instl F4651 E

2nd AXLE TYPE TS5
AXLE ASSEMBLY *No.* 33533
CUST. REF. 621535

REF. DRAWING *NOS.*
Hub R9855C

Compiled by *David Ratcliffe*

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REF. DRAWING *NOS.*
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Compiled by *David Ratcliffe*

The description, testing procedures, and specifications contained in this parts / service publication were current at time of printing. This manual will not be updated. If in doubt about any aspect of maintenance or servicing of the axle please contact the vehicle bullder or our service department direct.

GKN Axles Ltd. Kirkstall Division reserves the right to discontinue or modify its procedures and to change specifications at any time without notice and without incurring obligation.

The recommendations of the vehicle manufacturer should be considered as the primary source of service Information regarding this GKN Axles product. This manual la Intended to be used as a supplement to such information.

Any references to brand names in this publication is made simply as an example of the types of tools and materials recommanded for use and, as such, should not be considered as an endorsement. Equivalents, if avallable, may be used.

MANUAL ISSUE SHEET

Page No.	Issue	Description / Alteration	Reason	Date
All	A	New manual		Aug. 94

MANUAL CONTENTS

SECTION A LUBRICATION

SECTION B SERViCE INSTRUCTIONS FOR STEER AXLE TYPE S82

SECTION C SERVICE iNSTRUCTIONS FOR TS5 HUB UNIT

LUBRICATION INSTRUCTIONS FOR AXLES FITTED TO PREVOST 6 X 2 COACH

MANUAL SECTION A

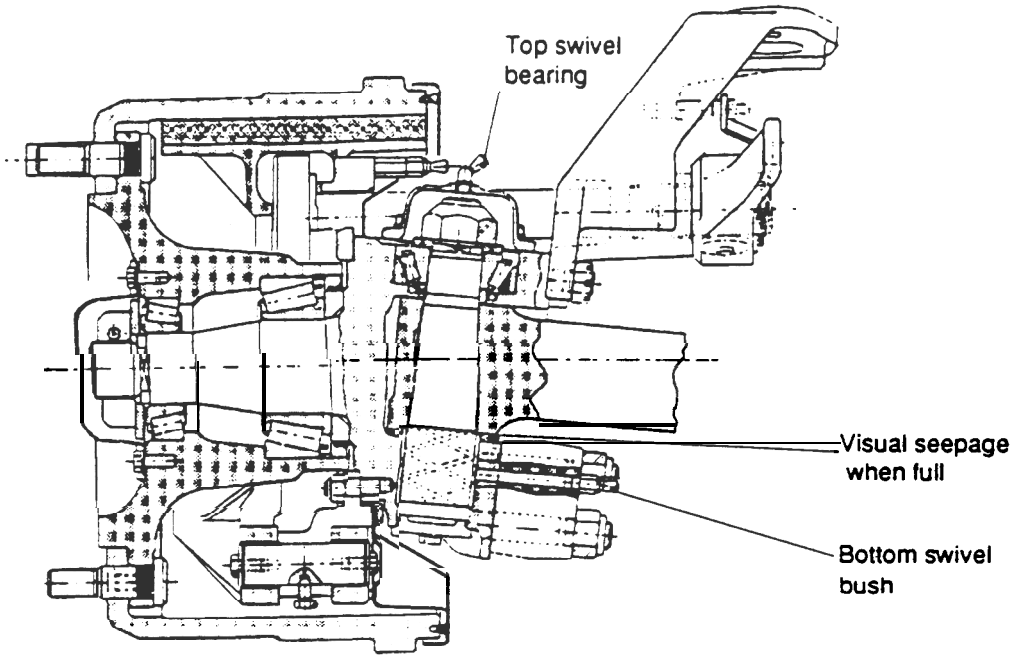
LUBRICATION INSTRUCTIONS FOR TYPE S82 STEER AXLE

1.1 Lubricate the stub axle and socket assemblies with one of the following recommended greases at regular intervals not exceeding 10,000 miles or 6 (six) week Whichever occurs first at grease points as shown (fig. no.1).

.,2 Clean out and recharge hub & hub bearings every 12 months. See figure no.2 for amount of grease to be used.

Recommended Greases

Lithium base roller bearing grease NLGI - no.2 (Shell Retinax LX or equivalent).



Greasing points
Fig No. 1

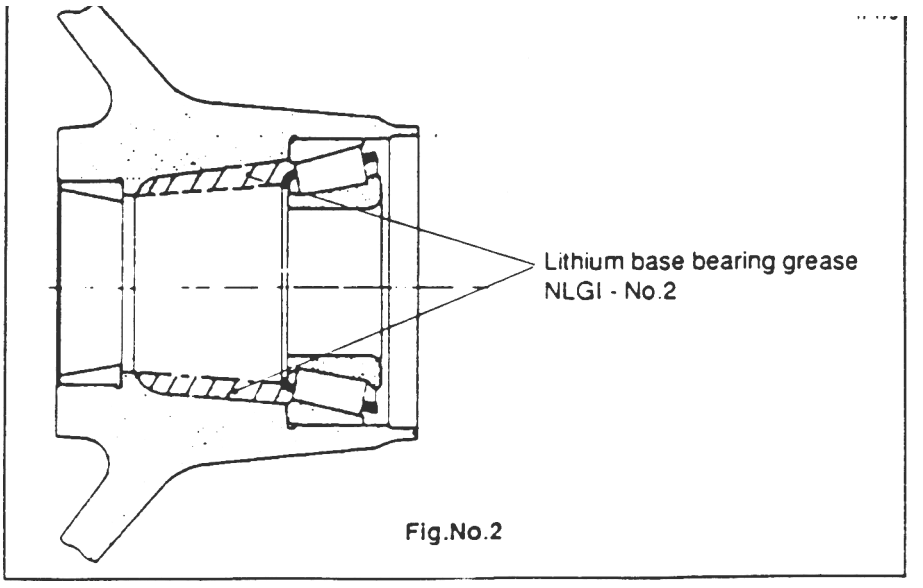


Fig.No.2

LUBRICATION INSTRUCTIONS FOR TS5 HUB UNIT WITH KNORR AIR DISC BRAKE

Clean out and recharge hub & hub bearings every 12 months See figure no.3 for amount of grease to be used.

Recommended Greases

Lithium base roller bearing grease NLGI - no 2 (Shell Retinax LX or equivalent)

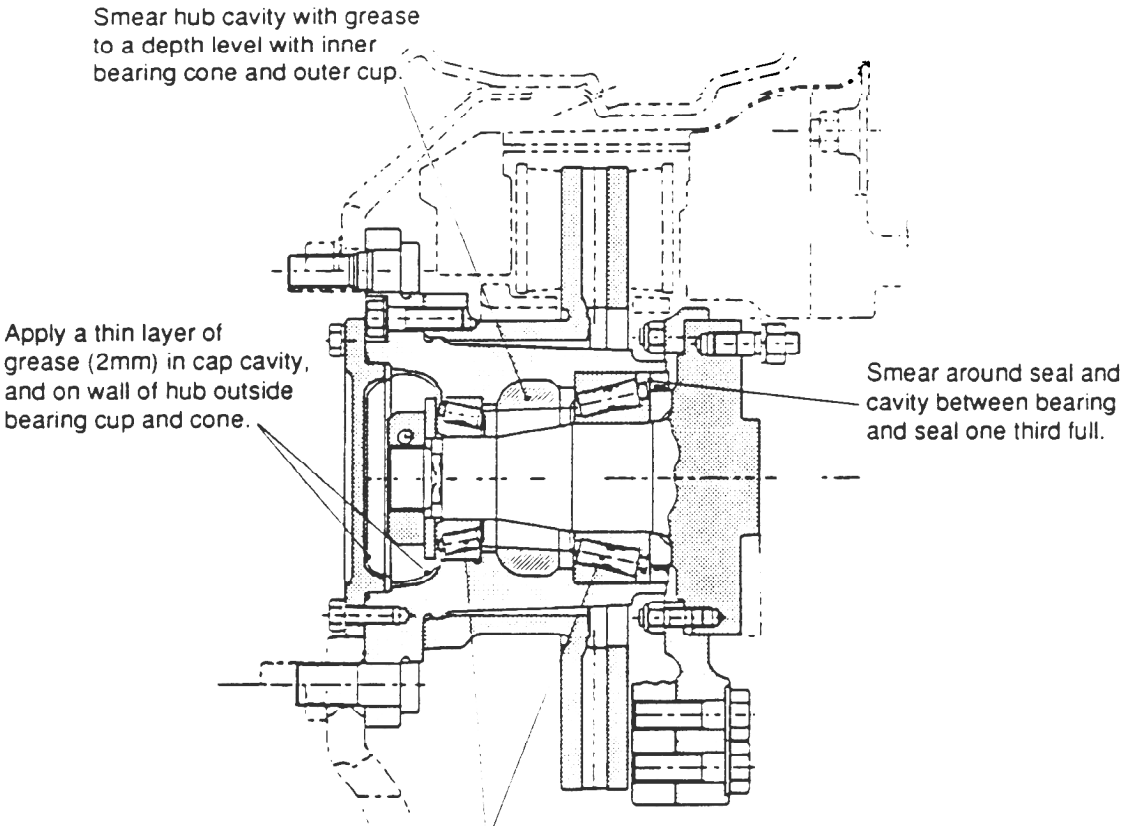


Fig. No. 3

Notes

PARTS AND SERVICE INSTRUCTIONS FOR S82 STEER AXLE WITH KNORR AIR DISC BRAKE

ILLUSTRATION No.F47

MANUAL SECTION B

PARTS AND SERVICE INSTRUCTIONS FOR TYPE S 82 STEER AXLE

DESCRIPTION

The axle is of the 'Reverse Elliot' type comprising a girder section axle bed or beam with stub axles. Each stub axle is carried on a taper king pin, with a steep angle taper roller bearing at its top and a plain phosphor bronze bush at the bottom.

The hub taper roller bearings are of a generous size and, adjusted by means of special split nut with 'D' washer.

Brakes may be of GKN or proprietary manufacture which can be serviced without disturbing the hub.

Steering ball joints with hardened balls and rubbing pads incorporate compression springs which automatically take up any wear.

SECTION 1 ROUTINE MAINTENANCE

1.1 Hub bearing adjustment

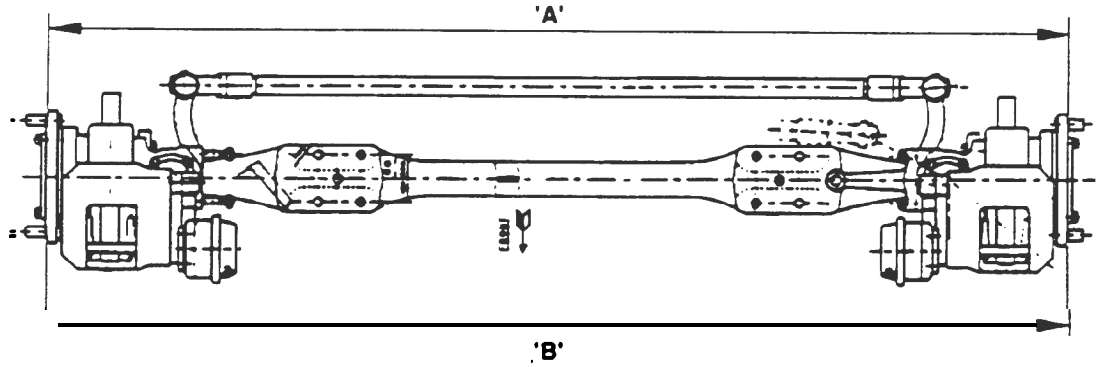
a) An inspection should be made after the first 3,000 miles (4,800 km) and then at intervals of 25,000 miles (40,000km). With the wheels raised they should revolve quite freely without roughness.

b) Hub bearings should have a slight end float movement within the limits 0.0005" to 0.002" when rocked forwards and backwards on axle stub.
See section 8, page B9 if any adjustment is required.

1.2 To check front wheel' Toe In'

a) To preserve correct steering and avoid excessive tyre wear, tracking (or alignment) of the front wheels should be checked periodically, as follows :-
Set the front wheels in straight ahead position and at points level with wheel centre, measure distance between edges of wheel rims, troth in front and behind axle centre. For correct 'Toe In', front measurement 'B' should be O" to $^{1}/_{32}$" smaller than rear measurement 'A'. See fig.no.1.

b) To allow for inaccuracies in wheels, the same check should be made with vehicle moved an equivalent to half of wheel revolution. Any adjustment required can be effected by slackening the clamp bolts in ball sockets and rotating tie (track) rod tube.
After adjustment, tighten clamp bolts to 51-62 Ibs. ft. (69 - 84Nm.) torque.



Measure dimensions 'A' and 'B' over hub flanges on horizontal centre line, To give correct 'TOE IN' dimension 'A' should be O" - 1/32" greater than dimension 'B'

Fig. No. 1

SECTION 2 TO REMOVE HUB UNIT

2.1 Chock the appropriate wheels.
2.2 whilst road wheels are still on ground loosen wheel nuts (7 Posn) slightly.
2.3 Raise vehicle, remove road wheel nuts and remove road wheels.
2.4 Disconnect air line from brake caliper (13).
2.5 Remove brake caliper setscrews with washers (16 & 15) then lift off brake caliper assembly (13).
2.6 Remove hub cap setscrews and washers (1 & 2).
2.7 Remove hub cap (3) with 'O' ring(4) then discard 'O' ring.
2.8 Remove hub bearing pinch bolt nut (5) and bolt (66), then remove hub bearing nut (67) along with hub bearing washer (6).
2.9 Remove hub (8) complete with its bearings (11/11 A & 64/64A) and oil seal (12) then lift off outer bearing cone (64A).
2.10 Remove oil seal (12) and inner bearing cone (11A) from hub (8)
2.11 Drive out hub bearing cups (11 & 64) from hub (8).
2.12 If hub bearing distance piece (oil seal wear sleeve) (60) shows Signs of wear or corrosion it must be removed and replaced with a new part.

SECTION 3 TO REMOVE THE STUB AXLE ASSEMBLY

3.1 Remove split pin (46) followed by nut (47) with washer (48), then separate ball socket (39) from bottom lever (49) with suitable ball pin extractor.

Note :- When separating ball joint from steering lever, an extractor tool MUST be used. DO NOT strike areas around ball pin tapers with hammer blows under any circumstances due to possible bail pin taper deformation.

3.2 Remove swivel lop cap setscrews and washers (25 & 24), enabling swivel top cap (23) to be removed.
3.3 Remove sealant from top cap and swivel mating faces (23 & 58) using Loctite' Chisel Gasket Remover ' or by carefully scraping sealant from faces
3.4 Remove bottom cap setscrews and washers (53 & 54).
3.5 Pull off swivel bottom cap (55) then remove sealant from bottom cap and swivel mating faces (55 & 58) using Loctite' Chisel Gasket Remover' or by carefully scraping sealant from faces.
3.6 Remove swivel pin nut and washer (22 & 21).
3.7 Give axle beam (37) a sharp tap to loosen swivel pin (56). The swivel pin (56) can then be driven out downwards, thus releasing it from axle beam.
3.8 The swivel assembly can be removed from axle beam (56).
3.9 Take out swivel pin bearing (20/20A), swivel bearing adjustment shims (19), swivel bearing sleeve (17) and swivel pin oil seal (18) from top of swivel (58).
3.10 Take out swivel bush seal (52) and swivel pin bush (57) from bottom of swivel (58).
3.11 Remove bottom lever nuts (42), then pull off bottom lever (49).
Care must be taken not to damage bottom lever studs (50 & 51).
3.12 Check the condition of swivel stop nut (33), and adjusting washer (32), removing for replacement if required.

Inspection

Thoroughly clean all parts, respect for wear and renew if required

SECTION 4 DISMANTLING BALL SOCKET SEE FIG No 2.

4.1 Remove dirt seal (15) also dirt Seal (pressing) (16) from ball pin.

4,2 Slacken pinch bolt nut (10) then unscrew and remove ball socket assembly from tie rod having first marked ball socket body and tie rod to enable tracking on re-assembly,

4,4 Remove adjuster split pin (9) from ball socket body (3).

4.5 Remove Cap (8) then using a suitable tool ie: a piece of 1 " x 1/8 " x 9 " flat bar, unscrew and remove adjusting piece (7). Waggle ball (2) to free thrust cap (5).

4.6 Remove compression spring (6) also thrust cap (5) from ball socket body.

4.6 Relieve peening on socket body top (3) then using a hide faced mallet, tap half pin (2) out of body. This operation will also remove cover plate (1) from body (3).

4.7 The rubbing pad (4) can now be removed from body (3).

Thoroughly clean all parts and check for wear, renewing where necessary.

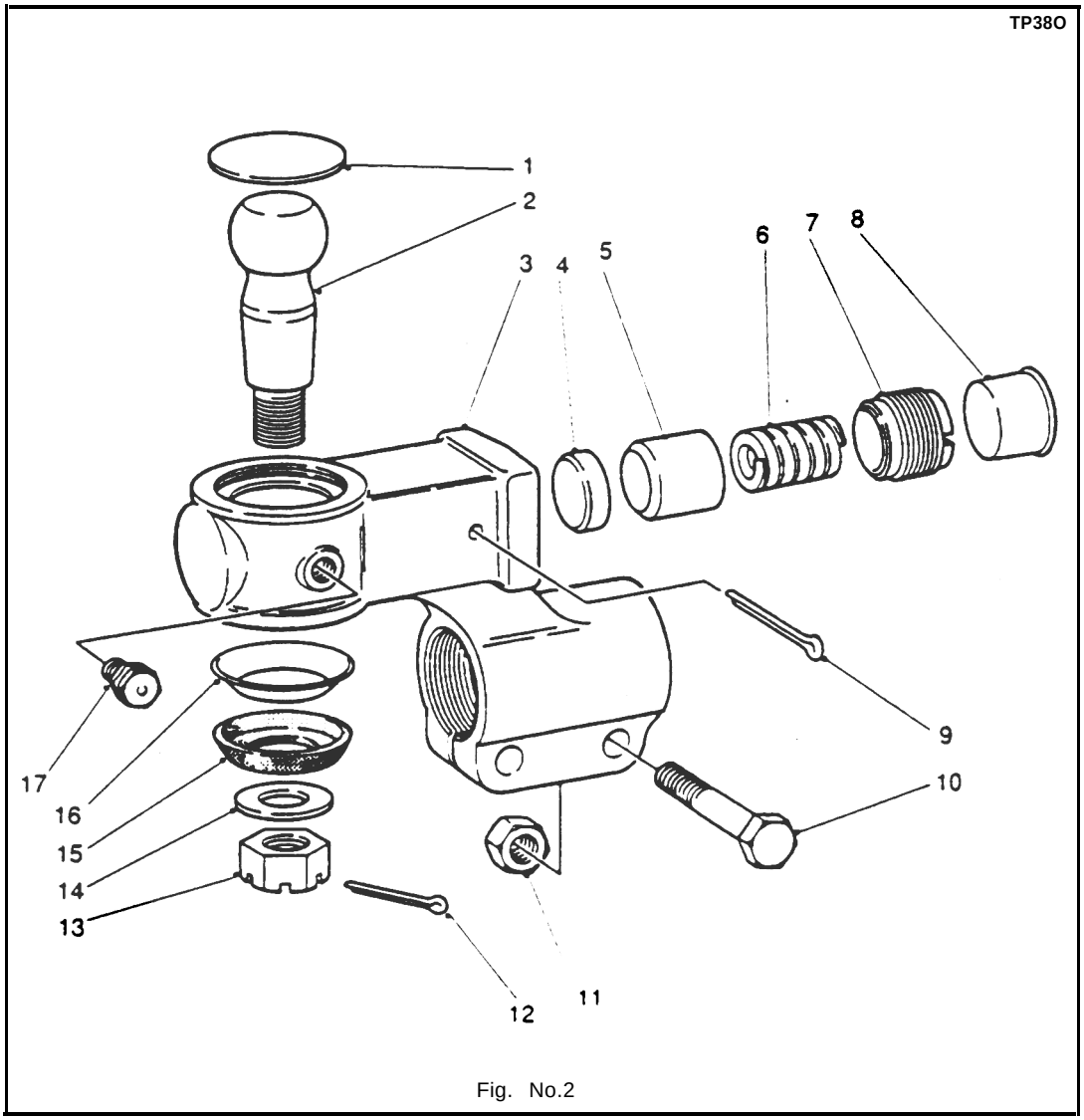


Fig. No.2

SECTION 5 ASSEMBLY OF BALL SOCKET ANO TIE ROD Fig No 3.

Note :- Method of assembling ball socket is same for drop type shown and alternative straight body type.

5.1 Apply a bead of Loctite 638 Sealant to mating corner of rubbing pad (4) in socket body (3) then knock rubbing pad (4) into its recess in ball socket body.

5.2 Thoroughly grease rubbing pad (4) and ball pin (2) with Shell 'Retinax LX' or equivalent.

5.3 Insert ball pin (2) into body.

5.4 insert thrust cap (5), compression spring (6) and adjuster piece (7) into body.

5.5 Using a suitable tool ie: a 1" x 1/8 " x 9" long flat bar, tighten adjuster piece (7) fully home (SOLID) locating thrust cup (5) onto ball pin (2).

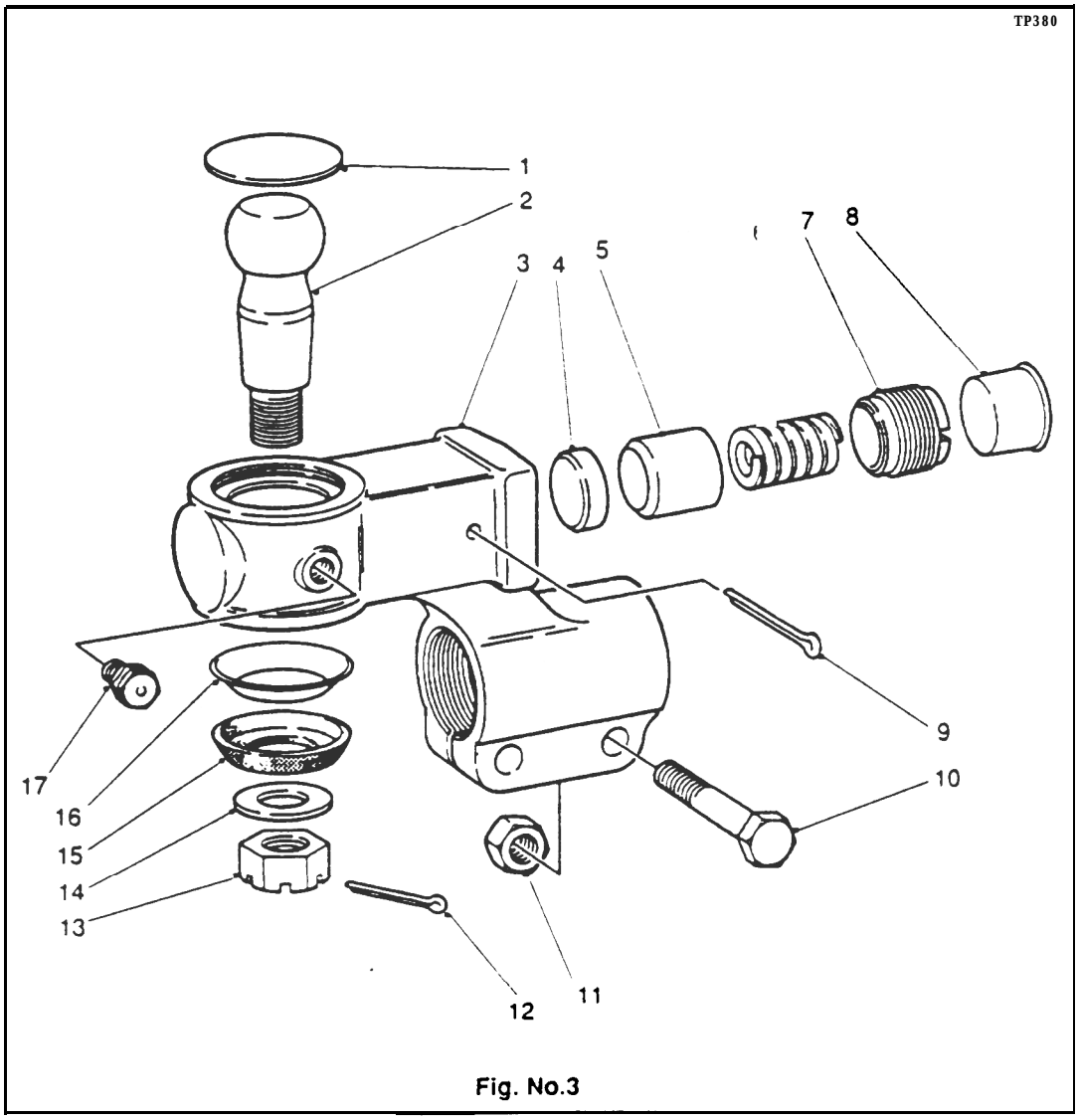


Fig. No.3

SECTiON 5 ASSEMBLY OF BALL SOCKET AND TIE ROD Cont.

5 7 Still with tool located on adjuster Piece (7), back off carefully **(LEAST AMOUNT)** until adjuster piece. split pm (9) IS allowed to pass through body, and that bail pin shank can be moved by force of hand, then remove tool.

Note :- If ball pin (2) does not rotate when re-adjusted in line with above instructions, this suggests that ball pin has local worn flats as shown in fig.no.4. In this instance ball pin (2), thrust cup (5) and rubbing pad (4) MUST be replaced, if not FAILURE could occur in service, Ie ball pin (2) not being able to move in assembly when turning from lock to lock as shown in fig 5.

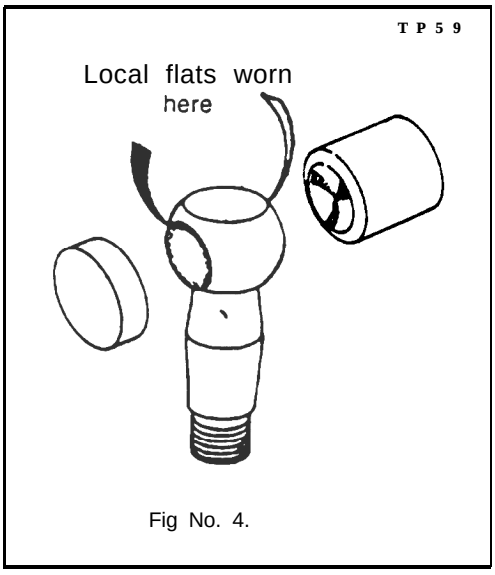


Fig No. 4.

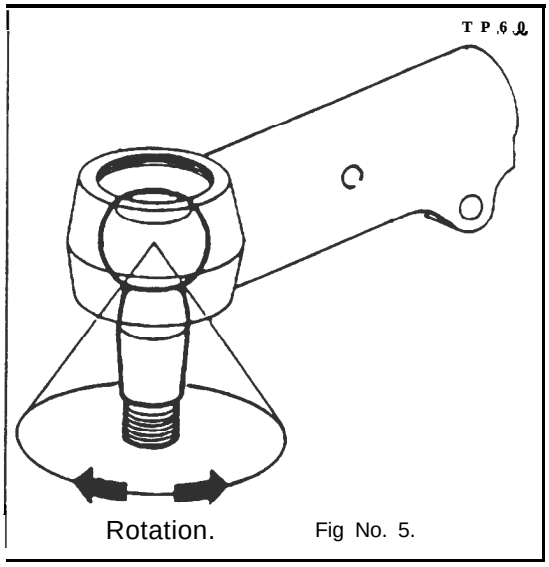


Fig No. 5.

5.8 Fit cover plate (1) into top of ball socket body, re-peen using a cold chisel to secure.
5.9 Screw assembled ball socket onto tie rod. Lining up marks on both body and tie rod previously made, or retracing using manual instructions.
5.10 Fit pinch bolts (1O) and nuts (11) then ighten nuts (11) alternately and progressively to 65- 75lbs.ft. (88 - 102Nm.) thus securing ball joint to tie rod.
5.11 Fit dirt seal (pressing) (16) and dirt seal (rubber) (15) onto ball pin (2).
5.12 Locate ball socket and tie rod assembly with steering lever, carefully align and fit ball pin (2) into hole in steering lever.

Note :- Ball pin (2) and ball pin tapers in bottom steering levers (49. F47) must be clean, dry and free from oil prior to assembly.

5.13 Fit pin washer (14) onto ball pin (2).
5.15 Screw pin nut (13) onto ball pin (2) then tighten to 175 tbs. ft. (237Nm.) torque.
5.16 Using a 21b hammer, tap steering lever to 'Shock' ball pin (2) into taper hole.
5.17 Re-torque pin nut (13) to 175 Ibs. ft. (237Nm)
5.18 Fit split pin (12), if slot / hole are not in line, adjust up to next slot.

Min pin nut torque 175 Ibs. ft. (237Nm). Max pin nut torque 200 Ibs ft. (271Nm)

519 Re-charge ball socket with Shell 'Retinax LX' or equivalent grease through lubricator (17).

SECTION 6 REFITTING SWIVEL ASSEMBLY

61 Prior to assembly, pack swivel pin bearing (20/20A) with lithium base grease (Shell Retinax LX or equivalent) using a bearing packer or manually knead grease between rollers, race and cage.

62 Coat all internal surfaces / parts with clean gear oil.

63 Fit swivel pin top oil seal (18), open side first, into position in top swivel bore (58).

64 Fit swivel pin bearing cup (20) into position in swivel bore (58),

65 Press swivel pin bottom bush (57) into position in swivel bore (58) flush with bottom face of swivel.

66 Fit swivel bush seal (52) onto the protruding diameter of swivel pin bottom bush (57) then place dirt excluder (78) into position over seal.

67 Position swivel assembly onto axle beam (37).

Note :- care must be taken during this operation so as not to roll or trap swivel bush seal (52).

Suggest a thin piece of card or plastic placed on seal during this operation.
Make sure that swivel pin bore is free of burrs and corrosion, then grease bore with multi purpose chassis grease.

68 Drive swivel pin (56) through swivel (58) and axle beam (37).

6.9 Lubricate swivel pin bearing sleeve (17) with clean oil / grease then fit over protruding swivel pin (56), large chamfer first to locate in oil seal bore (18) and abut axle bed (37).

6.10 Select swivel bearing adjustment shims (19) with a total thickness of approximately 0.020” and place in position on top swivel bearing sleeve (37).

6.11 Fit swivel pin cone (20A) into swivel pin bearing cup (20)

6.12 Fit swivel pin washer (21) and swivel pin nut (22) then tighten nut to 500-700 tbs. ft. (678 - 949Nm.)

6.13 Using a 7/14 lb hammer, shock load axle beam (37) on forged end area.

SECTION 7 SWIVEL BEARING ADJUSTMENT

7.1 With nominal shim (19) thickness of O 020 " placed between bearing (20/420A) and bearing sleeve (17), attach a cord and spring balance capable of reading 25 Ibs (11 ½ kg) to end of stub axle (58) as shown in fig. no. 6.
Pull swivel from lock to lock, noting spring balance reading, ignoring the force needed to start movement. The correct reading should be between 12 to 24 Ibs. (5.5 to 1 Ikg.) pull giving 10-20 Ibs ft. (13.6 - 27Nm.)
If the reading is outside these limits, it WiII be necessary to alter shim thickness (39) between bearing cone (20A) and its sleeve (17).

To increase the load required, remove shims from nominal pack.

To decrease the force required, add shims to the nominal pack.

Add or subtract shims as required until a reading of 10-20 Ibs. ft. (13.6 - 27Nm.) is obtained.

7.2 When swivel is set correctly, check that swivel pin nut (22) is tightened to 500-700 Ibs. ft. (678 - 949Nm.) torque.

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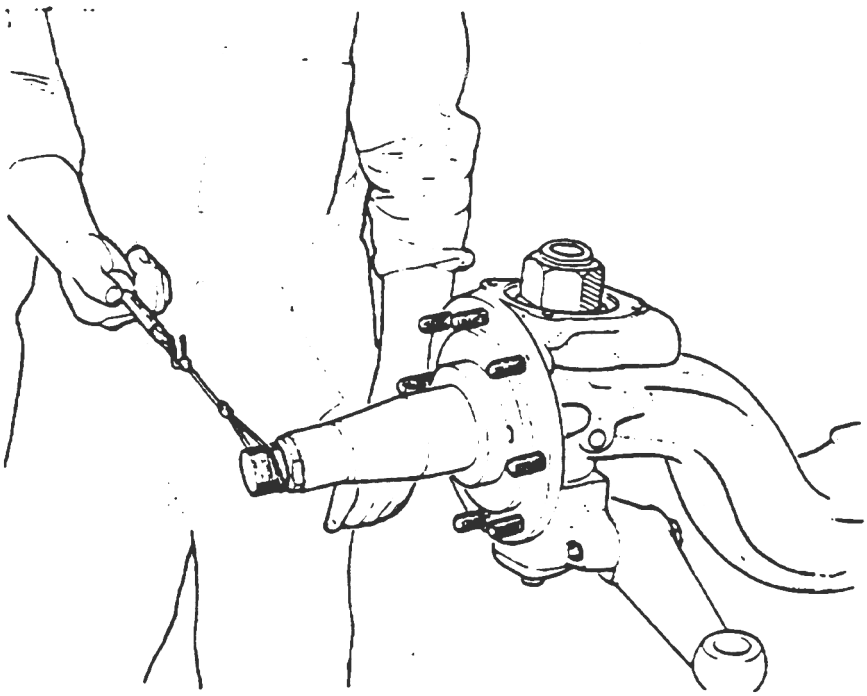


Method of checking swivel bearing adjustment

Fig. No. 6.

SECTION 8 SWIVEL FINAL ASSEMBLY

8.1 Apply a thin layer (1/18 "- 15mm) of lithium base grease (Shell Retinax LX or equivalent) to the inside of swivel top cap (23).

8.2 Clean fop cap and swivel mating faces (23 & 58) with Loctite Superclean Safety Solvent no.706 or other suitable chlorinated solvent then apply a complete 1/8" bead of Loctite Superflex (black) around base of top cap (23) before fitting to swivel (58) within 5 minutes of applying Loctite. See fig. no.3

8.3 Secure top cap (23) with swivel top cap setscrews and washers (25 & 24) and lighten to 51-62 tbs. ft. (69 - 84 Nm.).

8.4 Clean bottom cap and swivel mating faces (55 & 58) with Loctite Superclean Safety Solvent no.706 or other suitable chlorinated solvent then apply a complete 1/8" bead of Loctite Superflex (black) around base of bottom cap (55) before fitting to swivel (58) within 5 minutes of applying Loctite. See fig. no.7

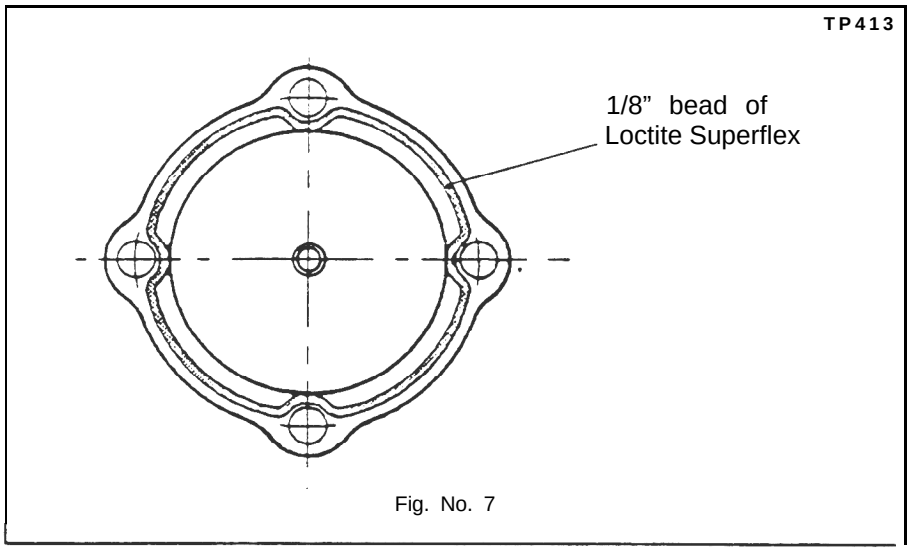


Fig. No. 7

8.5 Secure bottom cap (55) with swivel bottom cap setscrews and washers (53 & 54) then tighten to 26 - 32 lbs. ft. (33 - 35 Nm.).

8.6 Check tightening torque of bottom lever studs (50 & 51) is within limits of 190 - 210 Ibs ft. (258 - 285 Nm.).

8.7 Locate bottom steering lever (49) onto studs (50 & 51). then fit steering lever nuts (42) and tighten to 190 - 275 Ibs. ft. (258 - 353 Nm.).

8.8 Check that tightening torque of top steering lever studs (28) is between limits 190 - 210 Ibs ft. (258 - 285 Nm.).

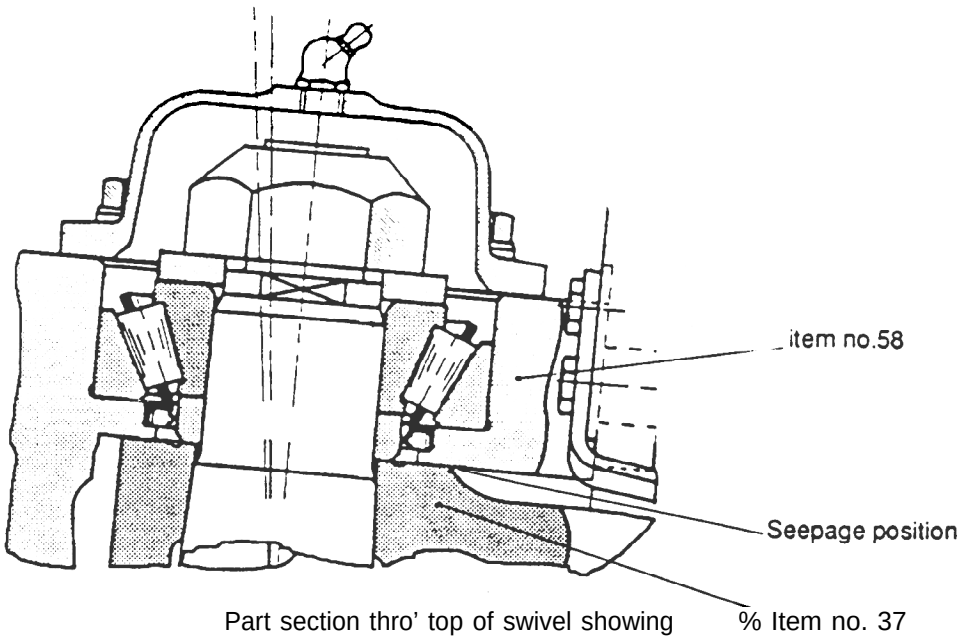
8.9 Fit top steering lever (29) onto studs (28) then fit nuts (30) and tighten to 190 - 275 Ibs.ft. (258 - 353 Nm.).

8.10 Fit new lubricators (26 & 44) with protective caps (27 & 43) into their respective pcsitions in swivel top cap (23) and bottom steering lever (49).

SECTION 8 SWIVEL FINAL ASSEMBLY Cont.

8.12 Charge swivel assembly with grease,
Swivel is full when grease seeps from between **upper face** of axle beam (37) and swivel jaw (58) in top-half (see fig. no. 8) and from between swivel oil seal (58) and **lower face** of axle beam (37) (see fig. no.9).

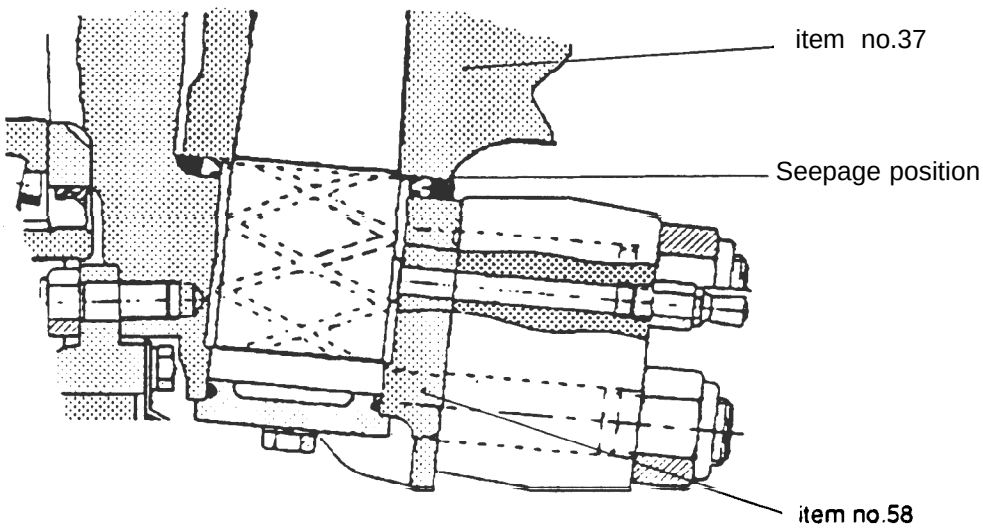
TP377



Part section thro' top of swivel showing grease seepage position when full.

Fig. No. 8

TP748



Part section thro' bottom of swivel showing grease seepage position when full.

Fig. No. 9

8.13 Reconnect ball socket and tie rod (39 & 38) to steering lever (49)

Note :- Ball pin (39) and ball pin tapers in bottom steering levers (49) must be clean, dry and free from oil prior to assembly.

SECTION 9 TO ASSEMBLE THE HUB

Prior to assembly, pack hub bearing (11/11A & 64/64A) with lithium base grease (Shell Retinax LX or equivalent) using a bearing packer or manually knead grease between rollers, race and cage.

9.1 Fit hub bearing distance piece (60) onto swivel stub axle (58).
9.2 Fit inner and outer hub bearing cups (11 & 64) onto their bores in hub (8).
9.3 Fill hub cavity with lithium base grease (Shell Retinax LX or equivalent) from outer bearing shoulder to centre line of inner bearing cone as shown in figure no.10.

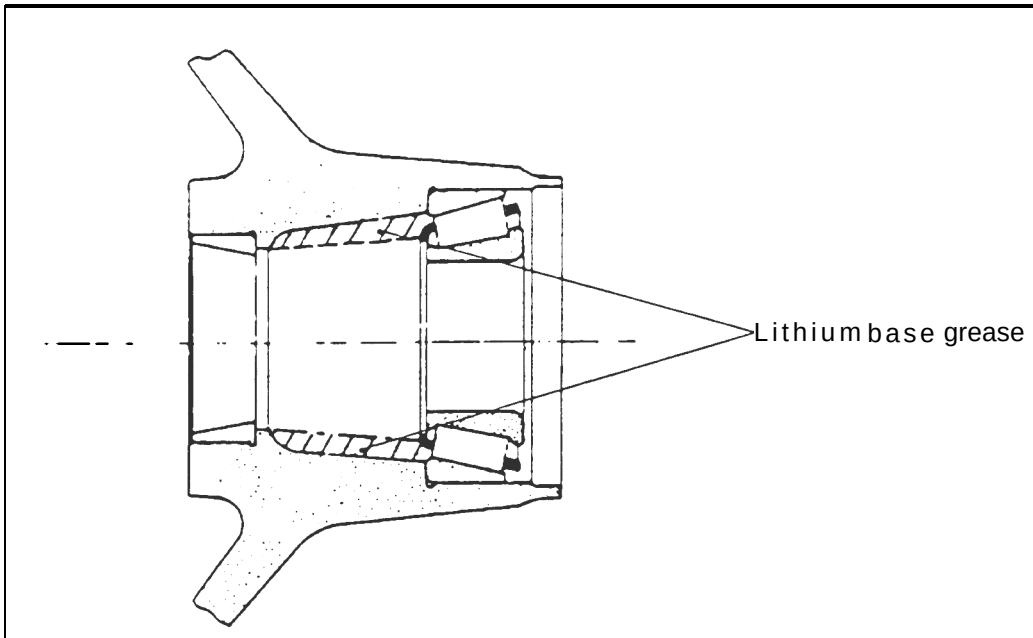


Fig. No.10

9.4 Fit inner hub bearing cone (11A) into its cup in hub (8).
9.5 Press hub oil seal (12) into position in hub (8)using a suitable bumper tool which locates on outer parltof seal to prevent damage on assemble.
9.6 Fit hub assembly onto swivel stub axle (58).
9.7 Fit outer bearing cone (64A) into its cup (64).
9.8 Fit hub bearing washer and hub bearing nut (6 & 67). Tighten nut hard with the aid of a small tommy bar just enough to take up bearing slack.
9.9 Fit hub bearing nut pinch bolt and nut (66 & 5), tighten finger tight.

SECTION 9 TO ASSEMBLE THE HUB Cont.

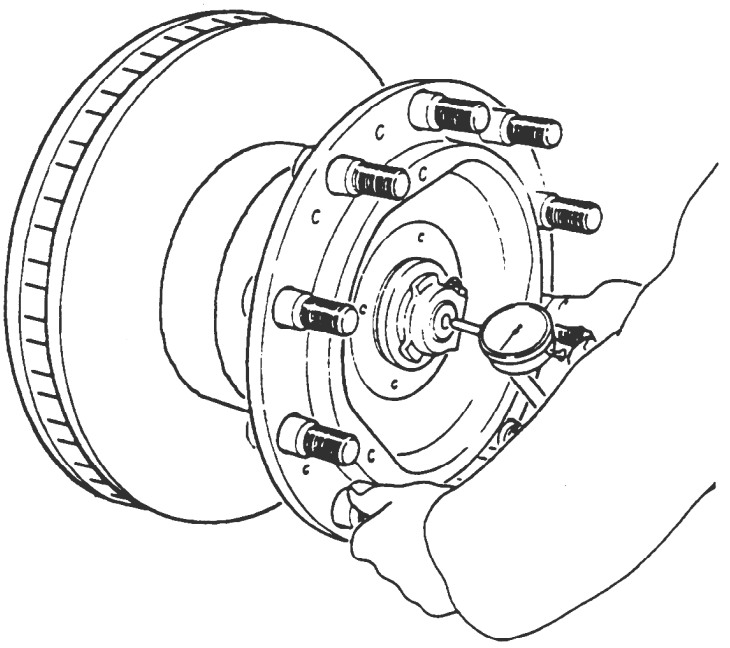
9.10 Adjust hub 'End Float' as follows :-
Rotate hub and using a hide faced mallet, knock hub backwards and forwards along axle arm to 'Shock Load' and thus settle bearings in positlion.

Note :- It Is very important to rotate and 'shock load' the hub because :-

a) The rotation serves to ensure that bearing rollers Settle into running in their correct tracks.
b) The' Shock Load" is to ensure that bearings are seated correctly up to their abutment shoulders.

Test the tightness of hub bearing nut (67), if loose, re-tighten hard.
Rotate and' Shock Load' the hub again.
Continue this procedure until hub bearing nut (67) cannot be tightened further after hub has been rotated and' Shock Loaded '.
Back off hub bearing nut (67) by approximately30' then rotate again and knock hub outward along axle arm to release bearings.
Mount a dial indicator on hub flange (8) and position its pointer on end of axle stub (see fig. no. 11.).
Rock the hub backwards and forwards along axle arm, taking a reading on dial indicator.
The correct' End Float' is between Iimits 0.0005" to 0.002" (0.013 to 0.050 mm).
Tighten the hub bearing pinch bolt nut (5) to 24-26 lbs ft. (33 - 35 Nm.).
Check the' End Float' again, using above procedure, and adjust if outside specified limits.

TP843



To adjust hub 'End Float'
Fig. No. 11.

SECTION 9 TO ASSEMBLE THE HUB Cont.

9.11 Smear the inside of hub cap (3) with a thin coating of grease as indicated in Iubrication section A, page no A3.

9.12 Clean hub cap and hub mating faces (3 & 8) with Loctite Superclean Safety Solvent no.706 or other sultable chlorinated solvent then apply a complete 1/8" bead of Loctite superflex (black] around mating face of hub cap (3). See fig. no. 12.

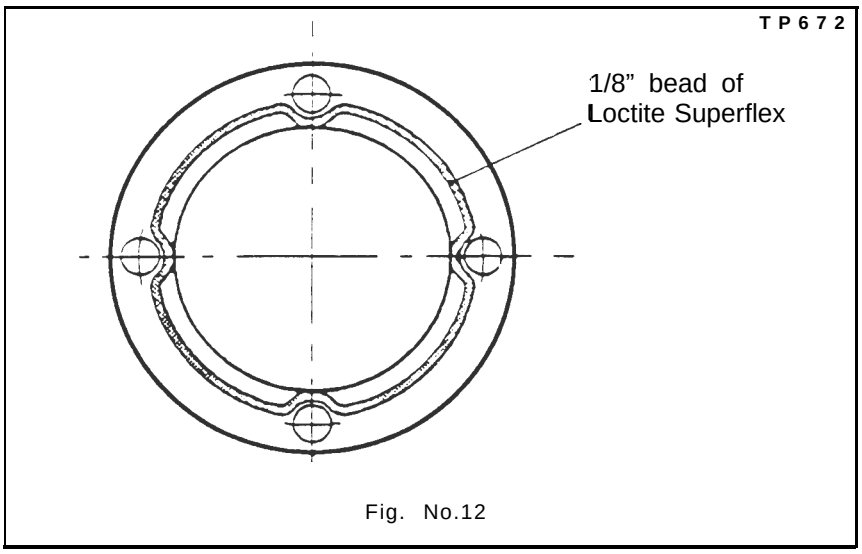


Fig. No.12

9.13 Fit hub cap along (3) within 5 minutes of applying sealant then secure with hub cap setscrews and washers (1 & 2) tightening setscrews to 85-103 Ibs. ft. (115 - 140 Nm.).

SECTION 10 FINAL ASSEMBLY

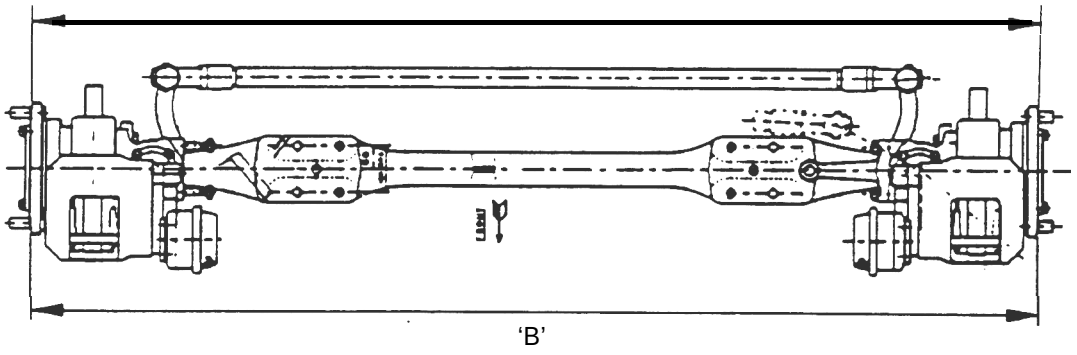
10.1 Refit road wheels, securing with wheel nuts (7 posn.).
Tighten nuts to 475-525 Ibs. ft. (644 - 712 Nm).

10.2 Check axle supports then lower vehicle to ground.

10.3 Remove chocks and jacks.

10.4 Check wheel alignment as follows:-
Set the wheels in a straight ahead position, and at points level with wheel centre, measure distance between edges of wheel rims both in front and behind axle centre.
For correct alignment the front measurements should be O“ to 1/32 " smaller than that of rear ie : ‘Toe In’ to allow for inaccuracies in the wheels, the same checks should be made with vehicle moved so that wheels have moved a further half a revolution (see fig. no.13)
Adjust if required by slackening ball joint clamp bolts and rotating track rod tube.

DO NOT forget to re-tighten the clamp bolts to 51-62 tbs. tt. (69 - 84Nm.) after adjusting.



Measure dimensions ‘A’ and ‘B’ over hub flanges on horizontal centre line, To give correct **‘TOE IN’** dimension ‘A' should be O“ - 1/32” greater than dimension ‘B'

Fig. No. 13

TORQUE TABLE FOR S 82 STEER AXLE WITH KNORR AIR DISC BRAKE

Item No	Description	Torque
1	Hub cap setscrew	85 - 103 lbs. ft. (115 - 140Nm)
5	Hub pinch bolt nut	24 - 26 lbs. ft. (33 - 35Nm)
7	Wheel nut	475 - 525 lbs. ft. (644 - 712Nm)
16	Brake caliper setscrew	310 - 340 lbs. ft. (420 - 461Nm)
22	Swivel pin nut	500 - 700 lbs. ft. (678 - 949Nm.)
25	Top cap setscrew	51 - 62 lbs. ft. (69 - 84 Nm)
28	Top Lever stud	190 - 210 lbs. ft. (258 - 285Nm)
30	Top Lever nut	190 - 275 lbs. ft. (258 - 373Nm)
31	Caliper bracket nut	85 - 103 lbs. ft. (115 - 140Nm.)
42	Bottom lever nut	190 - 275 lbs. ft. (258 - 373Nm)
47	Ball socket nut	100 - 170 lbs. ft. (136 - 231Nm)
50 & 51	Bottom lever stud	190 - 210 lbs. ft. (258 - 285Nm)
53	Bottom cap setscrew	26 - 32 lbs. ft. (35 - 43Nm)
59	Caliper bracket stud	51 - 62 lbs. ft. (69 - 84Nm.)
62	Caliper bracket nut	85 - 103 lbs. ft. (115 - 140Nm.)

PARTS LIST FOR S82 STEER AXLE (WITH KNORR DISC BRAKE)

CUSTOMER PREVOST **AXLE ASSEMBLY No.2554E**

ILLUSTRATION No.F47

Item No	Description		Qty.Per Axle	Part No.	Recommended Spares Holding Per 25 Axles	50 Axles	100 Axles
1	Hub cap setscrew		8	ML6012/35S	8	8	16
2	Hub cap spring washer		8	ML5712/1	8	8	16
3	Hub cap		2	F4651/29	2	4	6
4	Hub cap 'O' ring		2	R9434/149	2	2	4
5	Bearing nut pinch nut		2	SL228/4	2	4	6
6	Hub bearing 'D' washer		2	7786/30	2	4	6
7	Wheel stud protective cover		20	R9855/161			
8	Hub		2	F4651/28	2	4	6
9	Wheel stud RH		10	F4561/75	30	60	120
	Wheel stud LH		10	F4561/76	30	60	120
10	Pole wheel		2	F4651/100	2	4	6
11	Hub outer bearing cup	Kit no.	2	SL289/107	4	8	16
11A	Hub outer bearing cone	17899/1	2	SL289/286	4	8	16
12	Hub oil seal		2	7786/32	4	8	16
13	Brake caliper RH		1	SM486/2K	1	2	3
	Brake caliper LH		1	SM486/3K	1	2	3
14	Caliper mounting bracket RH		1	F4651/86	1	2	3
	Caliper mounting bracket LH		1	F4651/87	1	2	3
15	Brake caliper retaining washer		12	N70040	12	12	24
16	Brake caliper retaining bolt		12	N70251	12	12	24
17	Swivel pin bearing sleeve		2	7662/19	2	4	6
18	Swivel pin oil seal		2	F4350/32	4	8	16
19	Adjusting shim (0.005")			4493/119	6	12	24
	Adjusting shim (0.010")		as	4493/119A	6	12	24
	Adjusting shim (0.015")		reqd	4493/119B	6	12	24
	Adjusting shim (0.008")		·	4493/119D	6	12	24
	Adjusting shim (0.006")		·	4493/119E	6	12	24
20	Swivel bearing cup	Kit no.	2	SL289/47	4	8	16
20A	Swivel bearing cone	17898I75	2	SL289/48	4	8	16
21	Swivel pin 'D' washer		2	7433/30	2	4	6
22	Swivel pin nut		2	F4330/15	2	4	6
23	Top cap		2	F4561/16	2	4	6
24	Top cap setscrew spring washer		8	SL241/5	8	8	16
25	Top cap setscrew		8	SL554/4	8	8	16
26	Lubricator		2	SL1000/1	2	2	4
27	Lubricator protective cap		2	SL1000/76	2	2	4
28	Top steering lever stud LH		2	SL778/11	2	2	4
	Top steering lever stud RH		2	SL778/21	2	2	4
29	Top lever (LH)		1	F4651/9	1	2	3
30	Top lever nut		4	SL222/9	4	4	8
31	Brake caliper bracket nut		6	SL228/6	6	6	12
32	Stop screw adjusting washer		as	SL246/151	6	12	24
	Stop screw adjusting washer		reqd	SL246/152	6	12	24
	Stop screw adjusting washer		·	SL246/153	6	12	24
	Stop screw adjusting washer		·	SL246/269	6	12	24
33	Swivel stop screw LH		1	7903/44A	1	2	3
	Swivel stop screw RH		2	7903/44G	2	4	6
34	Supplied within item 58						
35 & 36	Not required on this application						
37	Axle bed		1	F4651/1	1	2	3
38	Tie rod (assy with itm 39 - 25632/1)		1	F4560/12			
39	Socket assembiy		1	25630			
	Socket assembiy		1	25631			
40	Lubricator		2	SL1000/1	2	2	4
41	Lubricator protective cap		2	SL1000/76	2	2	4
42	Steering lever stud nut		4	SL222/9	4	4	8

AXLE ASSEMBLY No.25546
ILLUSTRATION No.F47

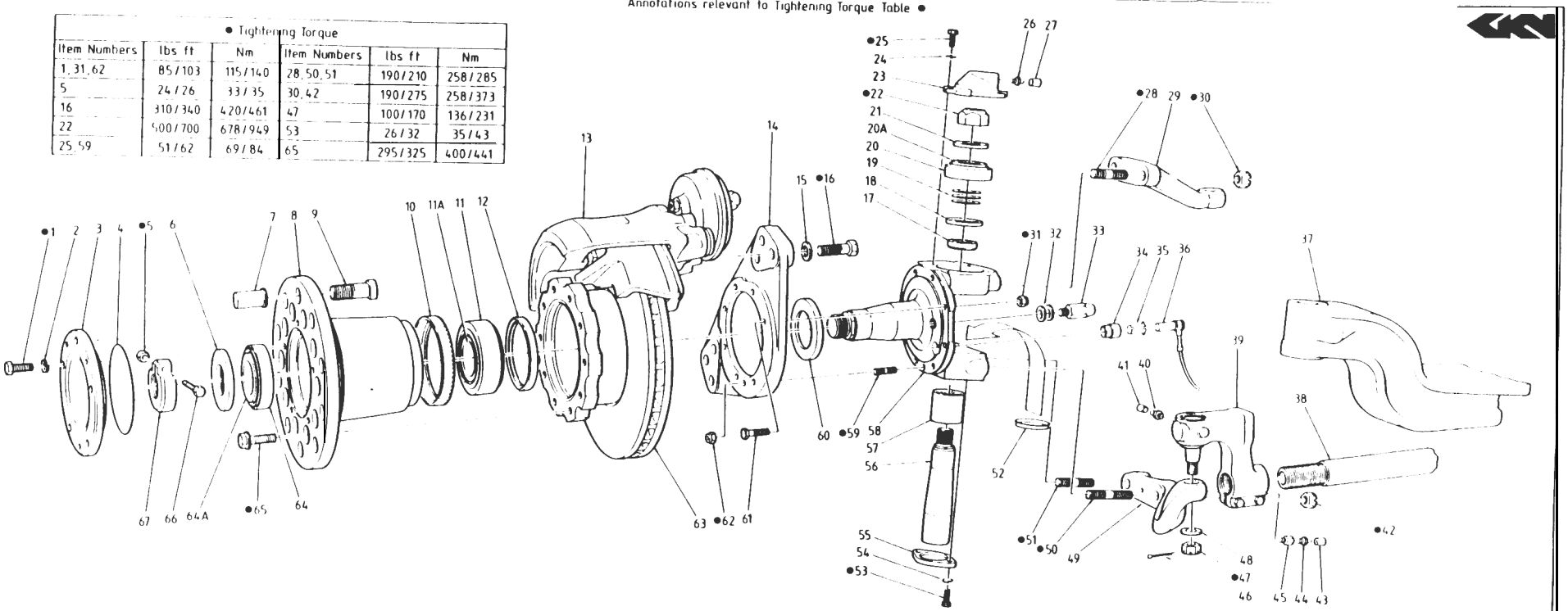
Item No	Description		Qty.Per Axle	Part No.	Recommended Spares Holding Per 25 Axles	50 Axles	100 Axles
43	Lubricator protective cap		2	SL1OOOI76	2	2	4
44	Lubricator		2	SL1000/1	2	2	4
45	Lubricator extension		2	SL1OOO/31			2
46-48	Supplied within item 39						
49	Bottom lever RH		1	F4651/7	1	2	3
	Bottom lever LH		1	F4651/8	1	2	3
50	Steering lever stud - long		2	SL778/18	2	2	4
51	Steering lever stud - short		2	SL778/13	2	2	4
52	Swivel pin seal (upper) ('V' ring)		2	LS1060/64A	6	12	24
53	Bottom cap setscrew		4	SL553/4	4	4	8
54	Spring washer		4	SL242/4	4	4	8
55	Swivel bottom cap		2	5430/34	2	4	6
56	Swivel pin		2	7786/14	2	4	6
57	Swivel pin bottom bush		2	7786/20	2	4	6
58	Swivel assembly LH		1	SF4651/2	1	2	3
	Swivel assembly RH		1	SF4651/3	1	2	3
59	Brake caliper bracket stud		10	SL785/110	10	10	20
60	Hub bearing distance piece		2	7816/26	2	4	6
61	Brake caliper bracket bolt		6	SL795/68	6	6	12
62	Brake caliper bracket nut		10	SL228/6	10	10	20
63	Brake disc		2	F4651/88	2	4	6
64	Hub Inner bearing cup	Kit no,	2	SL289/293	4	8	16
64A	Hub inner bearing cone	17899/2	2	SL289/294	4	8	16
65	Brake disc capscrew		20	ML7916/50X	20	20	40
66	Bearing nut pinch bolt		2	SL553/17	2	4	6
67	Hub bearing nut		2	7786/77A	2	4	6

Notes

Drawn by D J Highton February '94

Annotations relevant to Tightening Torque Table ●

● Tightening Torque					
Item Numbers	lbs ft	Nm	Item Numbers	lbs ft	Nm
1, 31, 62	85/103	115/140	28, 50, 51	190/210	258/285
5	24/26	33/35	30, 42	190/275	258/373
16	310/340	420/461	47	100/170	136/231
22	500/700	678/949	53	26/32	35/43
25, 59	51/62	69/84	65	295/325	400/441



S82 DEAD STEER HUB UNIT

Illustration No F47

PARTS AND SERVICE INSTRUCTIONS FOR TS5 HUB UNIT WITH KNORR AIR DISC BRAKE

ILLUSTRATION No.H86

MANUAL SECTION C

PARTS AND SERVICE INSTRUCTIONS FOR TYPE TS5 HUB UNIT

DESCRIPTION

The hub unit consists of a stub axle fitted with Knorr air disc brakes.
The hub taper roller bearings are of a generous size and, adjusted by means of a special split nut with pinch bolt arrangement.

SECTION 1 ROUTINE MAINTENANCE

1.1 Hub bearing adjustment

a) An inspection should be made after the first 3,000 miles (4,800 km) and then at intervals of 25,000 miles (40,000km). With the wheels raised they should revolve quite freely without roughness.

b) Hub bearings should have a slight end float movement within the limits 0.0005" to 0.002" when rocked forwards and backwards on axle stub.
See section 8, page B9 if any adjustment is required.

SECTION 2 TO REMOVE HUB UNIT

2.1 Chock the appropriate wheels.
2.2 Whilst road wheels are still on ground, loosen wheel nuts (7 posn.) sightly.
2.3 Raise vehicle, remove road wheel nuts and remove road wheels.
2.4 Disconnect air line from brake caliper (12).
2.5 Remove brake caliper setscrews with washers (15 & 14) then lift off brake caliper assembly (1 2).
2.6 Remove hub cap setscrews and washers (1 & 2).
2.7 Remove hub cap (3) with 'O' ring (4) then discard 'O' ring.
2.8 Remove hub bearing pinch bolt nut (5) and boft (26), then remove hub bearing nut (27) along with hub bearing washer (6).
2.9 Remove hub (8) complete with its bearings (11/1 1A & 24/24A) and oil seal (12) then fii off outer bearing cone (24A).
2.10 Remove oil seal (12) and inner bearing cone (11 A) from hub (8)
2.11 Drive out hub bearing cups (11 & 24) from hub (8).
2.12 If hub bearing distance piece (oil seal wear sleeve) (16) shows signs of wear or corrosion it must be removed and replaced with a new part

SECTION 3 TO ASSEMBLE THE HUB

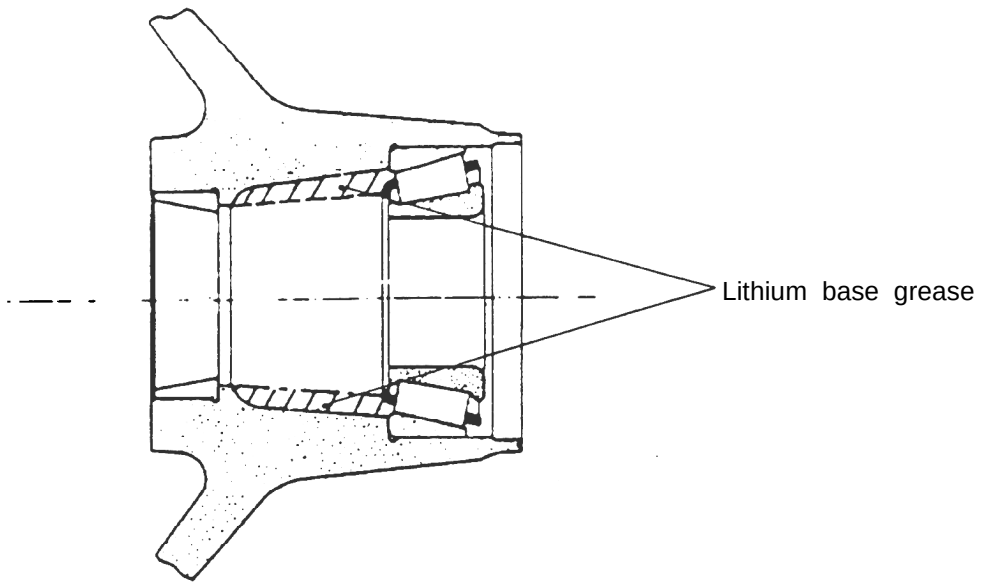
Prior to assembly, pack hub bearing (11/11A & 24/24A) with lithium base grease (Shell Retinax LX or equivalent) using a bearing packer or manually knead grease between rollers, race and cage.

3.1 Fit hub bearing distance piece (16) onto swivel stub axle (1 7).

3.2 Fit inner and outer hub bearing cups (11 & 24) onto their bores in hub (8).

3.3 Fill hub cavity with lithium base grease (Shell Retinax LX or equivalent) from outer bearing shoulder to centre line of inner bearing cone as shown in figure no.1.

TP175



Flg.No.1

3.4 Fit inner hub bearing cone (11 A) into its cup in hub (8).

3.5 Press hub oil seal ({2) into position in hub (8) using a suitable bumper tool which locates on outer part of seal to prevent damage on assemble.

3.6 Fit hub assembly onto swivel stub axfe (1 7).

3.7 Fit outer bearing cone (24A) into its cup (24).

3.8 Fit hub bearing washer and hub bearing nut (6 & 27). Tighten nut hard with the aid of a small tommy bar just enough to take up bearing slack.

3.9 Fit hub bearing nut pinch bolt and nut (26 & 5), tighten finger tight.

SECTION 3 TO ASSEMBLE THE HUB Cont.

3.10 Adjust hub 'End Float' as follows :-
Rotate hub and using a hide faced mallet, knock hub backwards and forwards along axle arm to 'Shock Load' and thus settle bearings in position.

Note :- It is very important to rotate and ' shock load ' the hub because :-

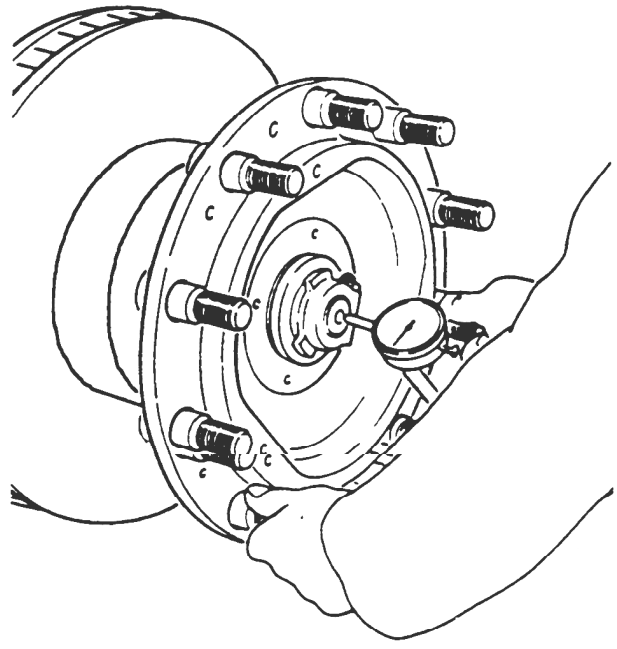
a) The rotation seines to ensure that bearing rollers settle into running in their correct tracks.
b) The' Shock Load ' is to ensure that bearings are seated correctly up to their abutment shoulders.
Test the tightness of hub bearing nut (27), if loose, re-tighten hard.
Rotate and' Shock Load ' the hub again.
Continue this procedure until hub bearing nut (27) cannot be tightened further after hub has been rotated and' Shock Loaded'.
Back off hub bearing nut (27) by approximately 30•then rotate again and knock hub outward along axle arm to release bearings.
Mount a dial indicator on hub flange (8) and position its pointer on end of axle stub (see fig. no. 2.).
Rock the hub backwards and forwards along axle arm, taking a reading on dial indicator.

The correct' End Float' is between limits 0.0005 to 0.002 (0.013 to 0.050 mm).

Tighten the hub bearing pinch bolt nut (5) to 24-26 lbs ft. (33 - 35 Nm.).

Check the' End Float' again, using above procedure, and adjust if outside specified limits.

TP310



To adjust hub 'End Float'

Fig. No.7.

SECTION 3 TO ASSEMBLE THE HUB Cont.

3.11 Smear the inside of hub cap (3) with a thin coating of grease as indicated in lubrication section A, page no.A3.

3.12 Clean hub cap and hub mating faces (3 & 8) with Loctite Superclean Safety Solvent no.706 or other suitable chlorinated solvent then apply a complete 1/8" bead of Loctite Superflex (black) around mating face of hub cap (3). See fig. no. 3.

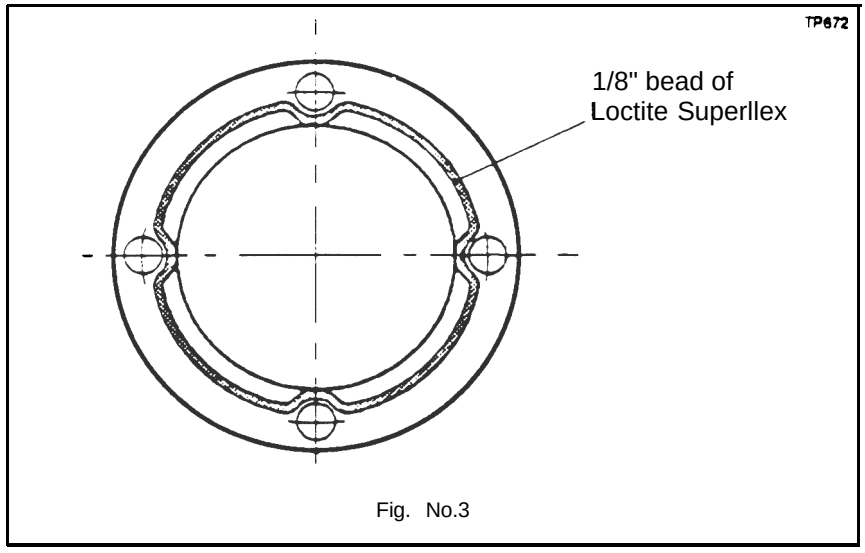


Fig. No.3

3.13 Fit hub cap along (3) within 5 minutes of applying sealant then secure with hub cap setscrews and washers (1 & 2) tightening setscrews to 85-103 lbs. ft. (115 - 140 Nm.).

SECTION 4 FINAL ASSEMBLY

4.1 Refit road wheels, securing with wheel nuts (7 pan.). Tighten nuts to 475-525 lbs. ft. (644 -712 Nm).

4.2 Lower vehicle to ground.

4.3 Remove chocks and jacks.

TORQUE TABLE FOR TS5 HUB UNIT WITH KNORR AIR DISC BRAKE

Item No	Description	Torque
1	Hub cap setscrew	85 - 103 lbs. ft. (115 - 140Nm)
5	Hub pinch bolt nut	24 - 26 lbs. ft. (33 - 35 Nm)
7	Wheel nut	475 - 525 lbs. ft. (644 - 712 Nm)
15	Brake caliper setscrew	310 - 340lbs. ft. (420 - 461 Nm.)
18	Axle stub stud	95 - 105lbs.ft. (129 - 142Nm.)
20	Axle Stub nut	210 - 256lbs.ft. (285 - 347Nm.)
21	Caliper bracket nut	85 - 103lbs.ft. (115 - 140Nm.)
22	Caliper bracket nut	85 - 103lbs.ft. (115 - 140Nm.)
59	Caliper bracket stud	51 - 62lbs. ft. (69 - 84Nm.)

PARTS LIST FOR TS5 HUB UNIT (WITH KNORR DISC BRAKE)

CUSTOMER PREVOST **AXLE ASSEMBLY No.33537**

ILLUSTRATION No. H86

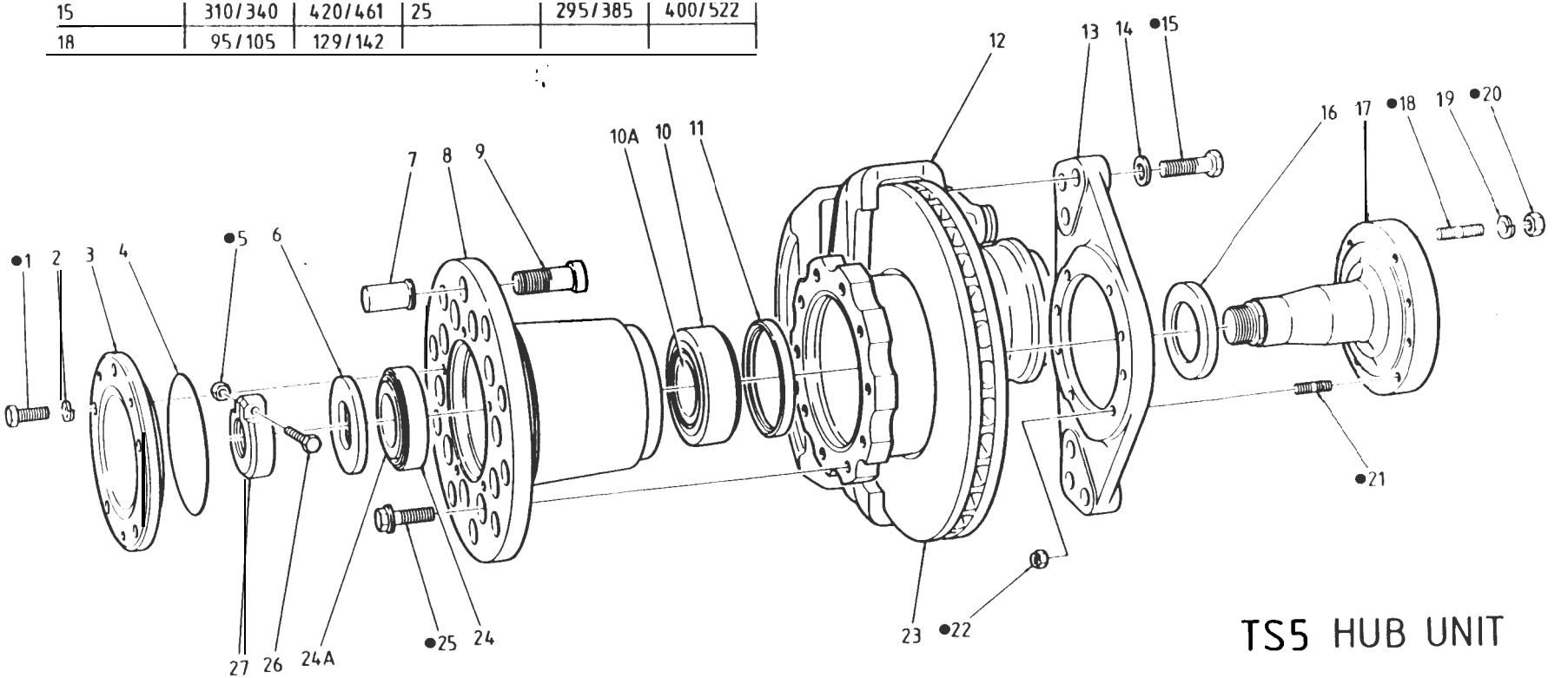
Item No	Description		Qty.Per Axle	Part No.	Recommended Spares Holding Per 25 Axles	50 Axles	100 Axles
1	Hub cap setscrew		8	ML6012/35S	8	8	16
2	Hub cap spring washer		8	ML5712/1	8	8	16
3	Hub cap		2	F4651/29	2	4	6
4	Hub cap 'O' ring		2	R9434/149	2	2	4
5	Bearing nut pinch nut		2	SL228/4	2	4	6
6	Hub bearing 'D' washer		2	7786/30	2	4	6
7	Wheel stud protective cover		20	R8464/161			
8	Hub		2	F4651/28	2	4	6
9	Wheel stud RH		10	F4561/75	30	60	120
	Wheel stud LH		10	F4561/76	30	60	120
10	Hub Inner bearing cup	Kit no.	2	SL289/293	4	8	16
10A	Hub Inner bearing cone	17899/2	2	SL289/294	4	8	16
11	Hub oil seal		2	7786/32	4	8	16
12	Brake caliper RH		1	SM486/4K	1	2	3
	Brake caliper LH		1	SM486/5K	1	2	3
13	Caliper mounting bracket		2	R9855/65	2	4	6
14	Brake caliper retaining washer		12	N70040	12	12	24
15	Brake caliper retaining bolt		12	N70251	12	12	24
16	Hub bearing distance piece		2	7816/26	2	4	6
17	Axle stub		1	R9855/238	1	2	3
18	Chassis mounting stud		16	SB6416/42V	16	16	32
19	Chassis mounting washer		16	ML5716/1	16	16	32
20	Chassis mounting nut		16	ML50/61X	16	16	32
21	Brake caliper bracket stud		16	SL785/110	16	16	32
22	Brake caliper bracket nut		16	SL228/6	16	16	32
23	Brake disc		2	F4651/88	2	4	6
24	Hub outer bearing cup	Kit no.	2	SL289/107	4	8	16
24A	Hub outer bearing cone	17899/1	2	SL289/286	4	8	16
25	Brake disc capscrew		20	ML7916/50X	20	20	40
26	Bearing nut pinch bolt		2	SL553/17	2	4	6
27	Hub bearing nut		2	7786/77A	2	4	6

Notes

Drawn by D J Highton February '94

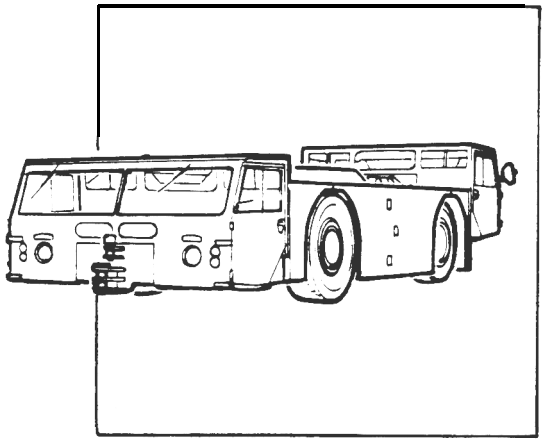
Annotations relevant to Tightening Torque Table ●

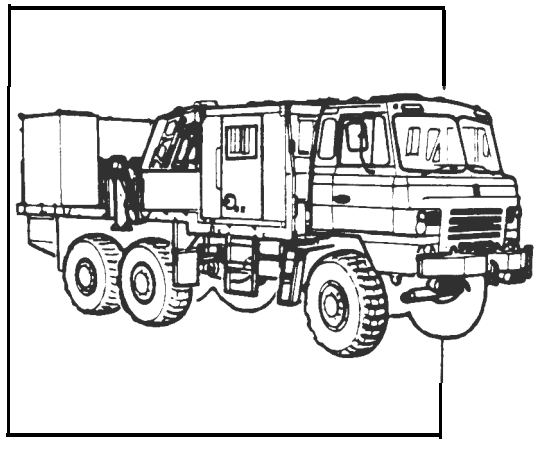
● Tightening Torque					
Item Numbers	lbs ft	Nm	Item Numbers	lbs ft	Nm
1, 22	85/103	115/140	20	210/256	285/347
5	24/26	33/35	21	51/62	69/84
15	310/340	420/461	25	295/385	400/522
18	95/105	129/142			

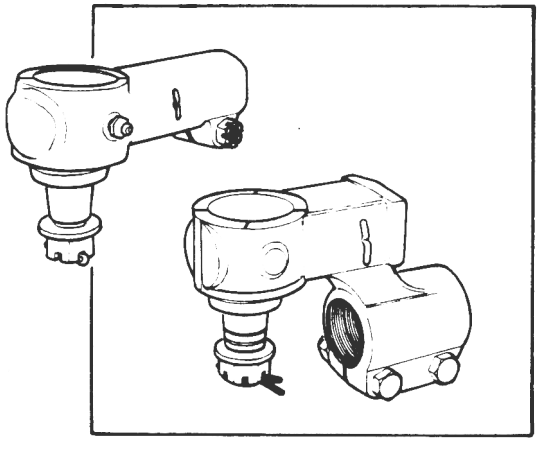


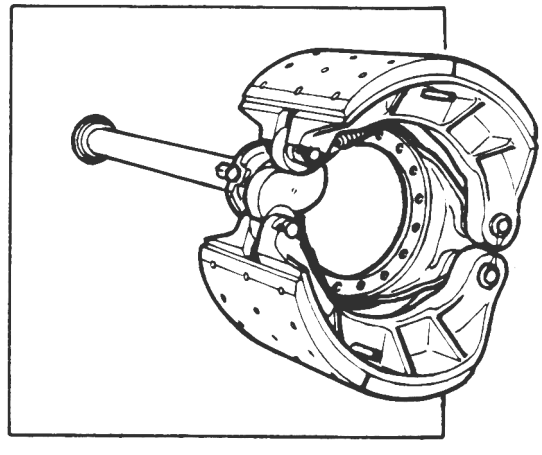
TS5 HUB UNIT

Illustration No H86









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MANUAL No.1604 Issue A