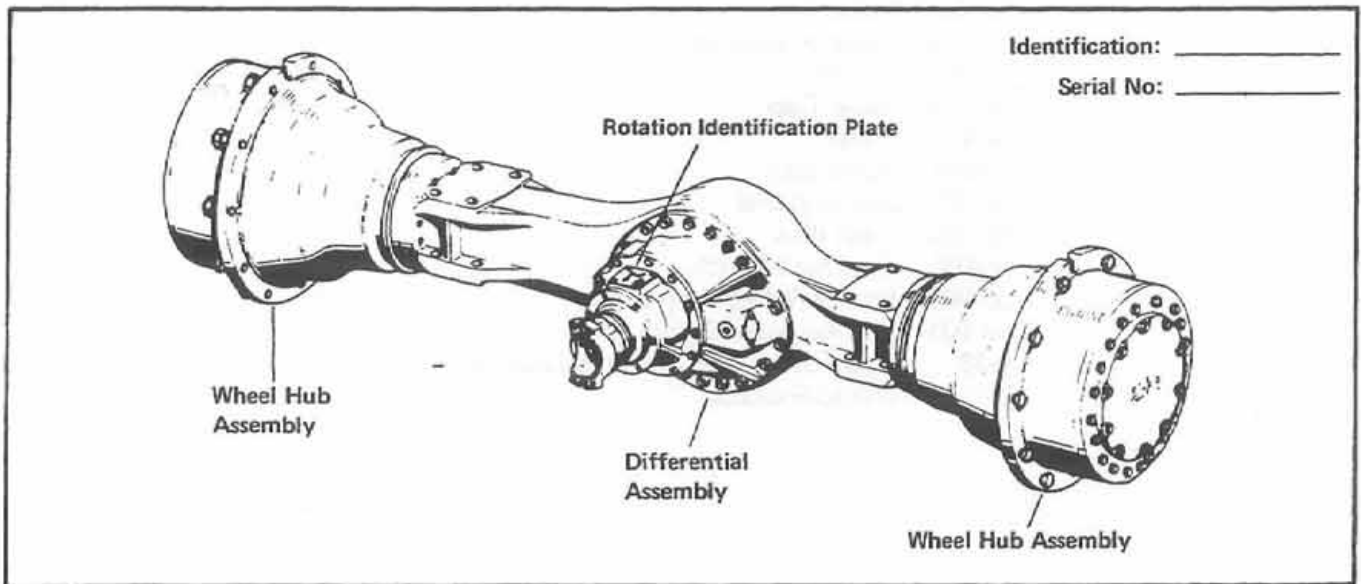




MODEL K598-00/10 & 20/30 AXLE

SERVICE MANUAL



IMMEDIATE ACTION LETTER REFERENCE:

No./Date

1 _____ 4 _____ 7 _____

2 _____ 5 _____ 8 _____

3 _____ 6 _____ 9 _____

SERVICE NEWS REFERENCE:

No./Date

1 _____ 4 _____ 7 _____

2 _____ 5 _____ 8 _____

3 _____ 6 _____ 9 _____

SERVICE BULLETIN REFERENCE:

No./Date

1 _____ 4 _____ 7 _____

2 _____ 5 _____ 8 _____

3 _____ 6 _____ 9 _____

Special Tools

58-007	Puller Plate
58-008	Spanner Wrench
58-009	Sleeve
58-010	Puller Cap
58-011	Puller
58-012	Puller Bolt
58-077	Seal Installer
58-080	Push Pins
58-087	Spanner Wrench
58-095	Socket (Wheel Lug Bolts)
58-100	Hub Remover Stand
y-33	OTC Power Twin (Procure Locally)
	Metric Sockets

Using The 58-278 NOK Seal Installation Tool Kit

K598 00/10 & 20/30 Axle

NOK Seal Installation Procedures

1. Remove the wheels and axle hub assembly from the affected axle as outlined in the 598 00/10 -20/30 Axle Repair Manual.
2. Support the hub assembly on a lifting fixture and wood block as shown (Fig. 1).

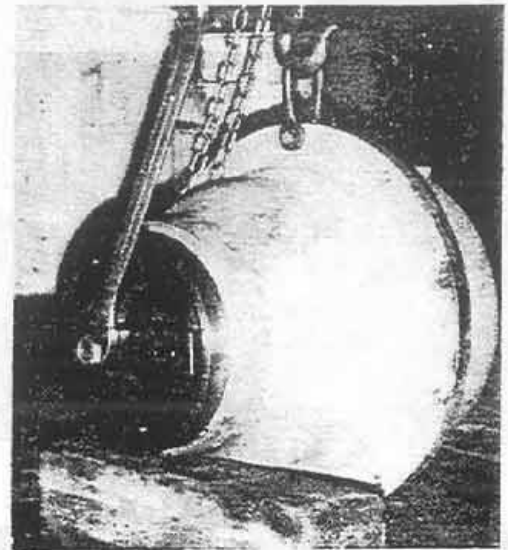


Figure 1:

3. Install the 58-006 bridge to the hub and install the forcing screw as shown with one nut on each side of the bridge plate, tighten these nuts securely (Fig. 2).
4. On the seal side of the hub, screw a forcing screw nut part way onto the forcing screw and install seal retainer puller bridge from the 58-278 tool kit as shown (Fig. 3).

NOTE: An alternative method is to install the 58-281 forcing plug into the center hole of the puller bridge and use the forcing screw to push directly against the bridge.



Figure 2:

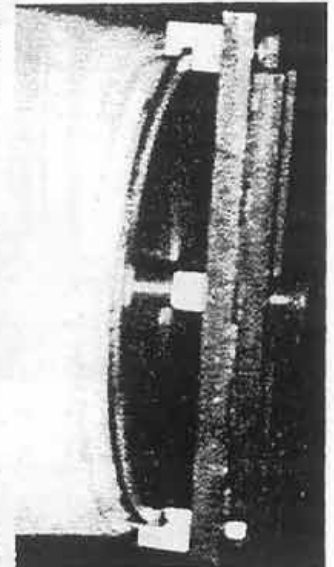


Figure 3:

5. Use an open end wrench to tighten the forcing screw nut against puller bridge as shown to force the seal case assembly from the hub (Fig. 4).

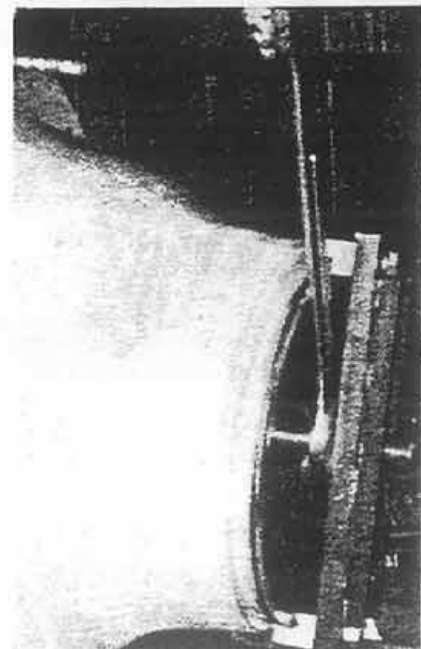


Figure 4:

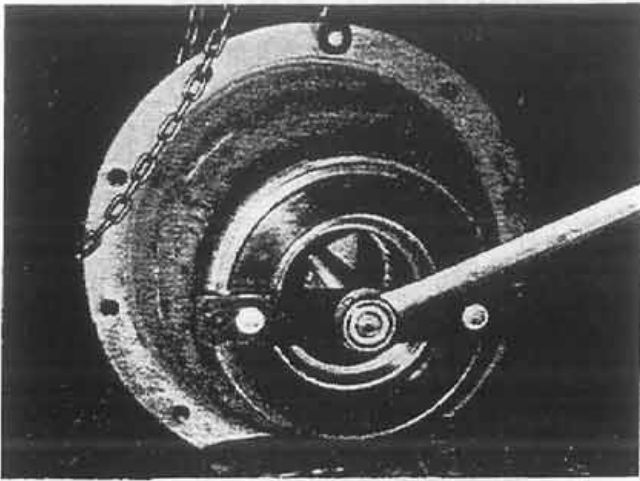


Figure 5:

6. Clean the hub to seal case mating surface, apply a light even coat of RTV sealant to the seal case to hub mating surface. Position the seal case in the hub bore, use a dead blow type hammer to lightly start the seal case squarely in position. Install the push ring and bridge assembly on the forcing screw. Install the forcing screw nut and carefully tighten the nut to pull the seal case into the hub until bottomed in the hub bore. Remove the installer ring and bridge.

NOTE: A new seal case must be used with the new NOK seal because of the greater outside diameter of this seal.

IMPORTANT: Do not install the NOK seal into the seal case before installing the seal case into the hub.

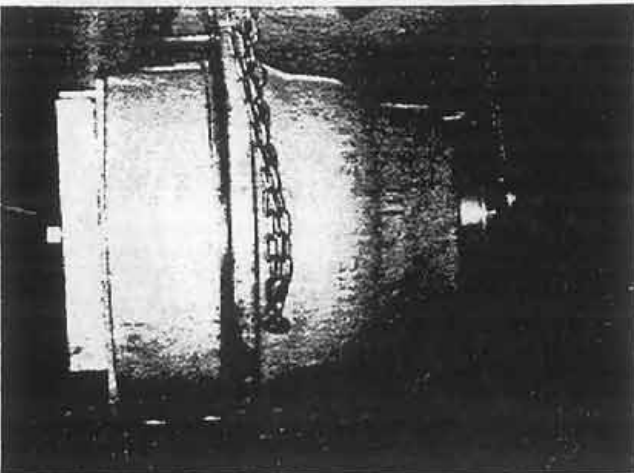


Figure 6:

7. Apply a light even coat of RTV sealant to the OD of the NOK seal assembly. Install the seal assembly by hand over the shouldering ring into the bore of the seal case. Carefully install the pusher ring and bridge over the forcing screw and into the seal case against the seal assembly. Install the forcing screw nut and carefully draw the seal assembly into the seal case until bottomed (Fig. 7).

IMPORTANT: It may be necessary to use a dead blow hammer to tap around the pusher ring as it is being drawn in to ensure the seal assembly starts squarely into the bore of the seal case.

NOTE: The NOK seal is a 2-piece assembly, do not separate the seal during the installation procedure.

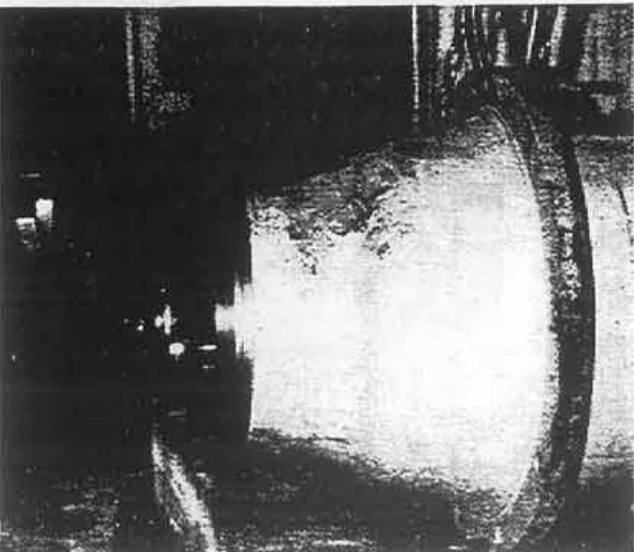


Figure 7:

8. Reassemble hub assembly to the axle as outlined in the 598 00/10 & 20/30 axle repair manual.

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Foreword:

The Steiger Model K598-00/10 Axle first went into service on some 1975 models: Cougar II, Panther II and Turbo Tiger II. This axle features a dual planetary wheel hub and a high speed differential ratio. The K598-00/10 wheel hub in-board planetary utilizes three (3) planet pinion gears around a common axle sun gear. The out-board planetary carrier has five (5) planet pinion gears around a sun gear.

In approximately March of 1978 a later design K598-20/30 axle was released. The first model tractors to receive these latest design axles were the Series III ST325 Panther, first serial no. 123-00415 and the Series III ST310 Panther starting serial no. 107-00107. The major design change to the K598-20/30 axles were in the wheel hub; the in-board planetary was changed to a five (5) planet pinion carrier with new design thrust washers and a "floating" ring gear, and the perch stud in the wheel and cover is no longer used. Rather, axle end clearance is accomplished by a thrust plate that screws directly into the inner planet carrier and is locked into place. There was also a design change made to the axle hub sealing arrangement.

Both the model K598-00/10 and the K598-20/30 axle are identical in their physical appearance and both model axles feature a CW or CCW ring gear and pinion arrangement so care must be taken to identify the front and rear differentials whenever removal and/or repair is necessary. Installation must be in accordance with the position of the direction indicating plate fixed to the axle housing. The arrow on the plate should point to the forward direction of the tractor. The plate also provides information on the gear tooth inclination.

NOTE: One method used to distinguish "CW" (Rear) and "CCW" (Front) gear sets apart is to lay the ring gear teeth side down on the bench or floor, while facing the gear, if the convex side (toe) of the tooth is to your right, the gear is "CW" (rear) set.

In the early design K598-00/10 axles, the designation K598-10 indicates the front axle assembly and K598-00 indicates the rear axle assembly.

In the later design model K598-20/30, the designation K598-30 indicates the front axle assembly and K598-20, the rear axle assembly.

This service manual includes the information necessary to maintain and repair the axle sub-assemblies as well as the assembly.

Certain repairs can be done without removing the axle assembly from the tractor or without raising the tractor.

Repair of the wheel hub planetary carriers, axle shafts and differential section, can be done without removing the entire axle assembly or raising the tractor. (Jacking is required to remove the rear differential on most Series tractors.)

Repair of wheel hub seals, bearings and planetary ring gears requires the tractor be lifted and adequately supported.

Be sure to read and follow the instruction provided in this manual before attempting to service or repair the model K598 Axles.

The disassembly and reassembly procedures for both the model K598-00/10 and the K598-20/30 axle will be the same unless noted. When different procedures are required, both procedures will be given.

NOTE: Refer to exploded view of 598-00/10 (Page 8) and 598-20/30 (Page 10) axle assemblies for specific differences in axles.

Steiger Tractor, Inc. reserves the right to change design, material specifications and/or procedures without incurring obligations to make these changes to existing tractors, manuals or literature.

Steiger-K598 Axle Specifications

LUBRICATION	METRIC	U. S. STANDARD
Wheel Hub(s) Capacity	7 liter	approx. 7-1/2 quarts
Differential Section Capacity	8 liter	approx. 8-1/2 quarts
Lubrication Oil Type	All axle lubricants must meet the MIL-L-2105B and/or API GL-5 specification for gear lube.	SAE 80W-90 (P/N 01-4642) or equivalent under normal conditions. E.P. SAE 85W-140 (P/N 01-4640) or equivalent. EP-90 MIL-L-2105-B MPGM 3-5 molybdenum disulfide MIL-M-7866
Grease Pack Thrust washer and perch stud in hub cover. (598-00/10)		

FITTING SPECIFICATIONS—DIFFERENTIAL SECTION:

Ring Gear Run Out	0.08 mm	0-.003 Total indicator Runout
Differential Assembly Bearing Preload	0.03-0.05 mm	.001-.002"
Differential/Pinion Backlash	.2 mm-.5 mm	.008-.020
Bevel Pinion Gear Bearing Preload (Rotating torque)	0.1-0.2 mkp	9-17 in. lb.
Differential Side Gear Clearance	0.1-0.2 mm	.004"-.008"

FITTING SPECIFICATIONS—HUB SECTION:

Hub Taper Bearing Preload	0-0.05 mm	0-.002"
Inner Planetary/Cover Thrust Bearing—Clearance	0.5-1.0 mm	1/64-1/32 in. .019-.039 in.
Axle Shaft/Cover Perch Stud Clearance	0.5-1.0 mm	1/64-1/32 in. .019-.039 in.

TORQUE SPECIFICATIONS:

Thread size	No.	Assembly	Wrench size	N.M.	LB-FT
41 mm	(1)	Pinion Shaft Nut	54 mm	537-586	398-434
12 mm	(12)	Differential Housing Bolts	19 mm	78-99	58-73
18 mm	(12)	Ring Gear to differential housing flange	27 mm	293-342	217-253

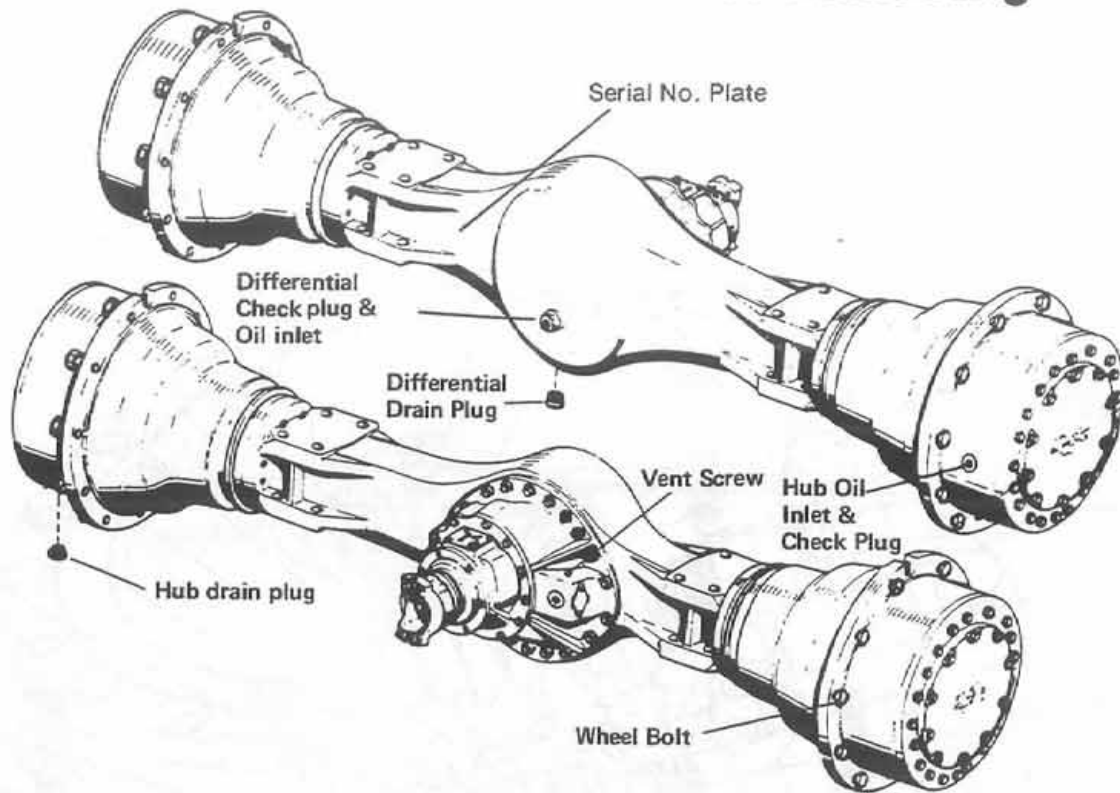
Specifications Cont.

Thread Size	No.	Assembly	Wrench size	N.M.	LB-FT
24 mm	(2)	Differential Bearing Cap Bolts	37 mm	537-586	398-434
12 mm	(18)	Differential Drive Housing to Axle Housing	19 mm	76	56
14 mm	(12)	Pinion Housing to Differential Case Bolts	22 mm	117-136	87-101
8 mm	(6)	Pinion Shaft Seal Plate Bolts	14 mm	19-30	14-22
105 mm	(1)	Hub to Axle Nut (Outer Locknut)	5" spanner	338-405	250-300
14 mm	(24)	Ring Gear Support to Inner Ring Gear	22 mm	176	130
Special Shoulder Bolt	(3)	Inner Planet Carrier Nuts	10 mm hex	196-243	145-180
14 mm	(20)	Outer Planet-Carrier to Hub	22 mm	196	145
10 mm	(10)	Hub Cover to Planet Carrier	17 mm	35	26
7/8" std	(10)	Wheel Bolts	1-1/4" - 1-5/16" std	608	450
1"	(8)	Axle to Frame Mount Bolts	1-1/2 std	608	450
20 mm	(16)	Stub Axle to Axle Housing	30 mm	331	245

RATIOS:

Ring Gear/Pinion	$27/13 = 2.077$
Inner Planetary	$64/26 + 1 = 3.46$
Outer Planetary	$64/26 + 1 = 3.46$
Total Ratio	24.885

Periodic Maintenance and Troubleshooting



Checking Oil Level:

The oil should be changed after 100 hours of operation. Oil should be changed after every 500 hours of operation thereafter.

The oil level should be checked after every 100 hours of operation.

Hubs:

The oil level of the hubs should be checked as follows:

A. Turn hub position until the lower edge of the drain plug is located 1-1/2 inches below the horizontal center line of the axle. Oil should be level with the lower edge of the hole in this position.

B. Each hub should contain approximately 7-1/2 quarts of oil.

C. Check each drain plug for metal particles and contamination. Clean the plug by washing in clean solvent.

Differential Section:

The oil should be changed after 100 hours of operation. Oil should be changed after every 500 hours of operation thereafter.

A. The oil level in the differential section should be level with the lower edge of the check plug hole.

B. The differential section should contain approximately 8-1/2 quarts of oil.

C. Check the plug for contamination and metal particles. Clean the plug by washing in clean solvent.

Air Vent Screw:

Remove the air vent screw and thoroughly clean in clean solvent and blow clean with compressed air.



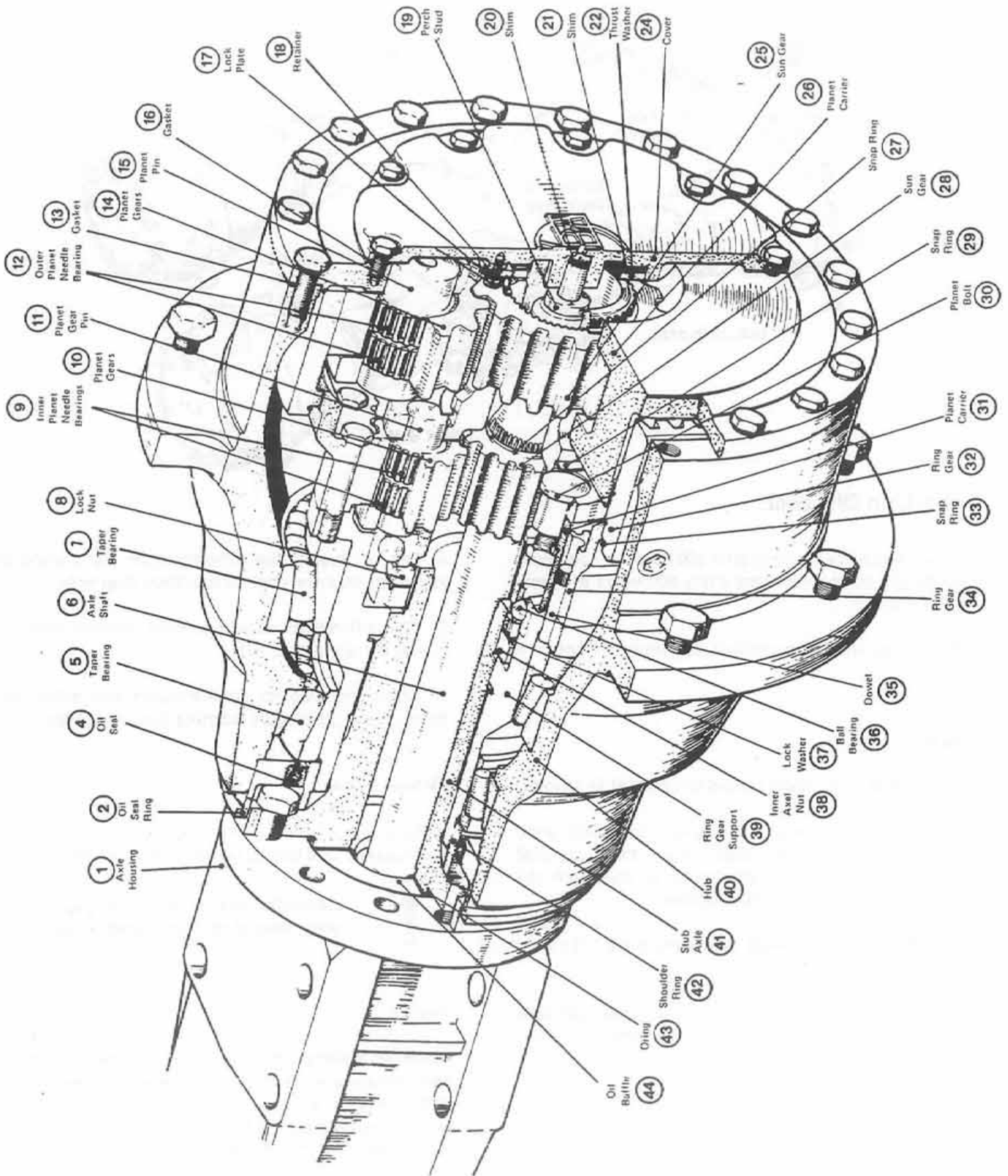
CAUTION: Always direct compressed air away from body and toward a safe area.

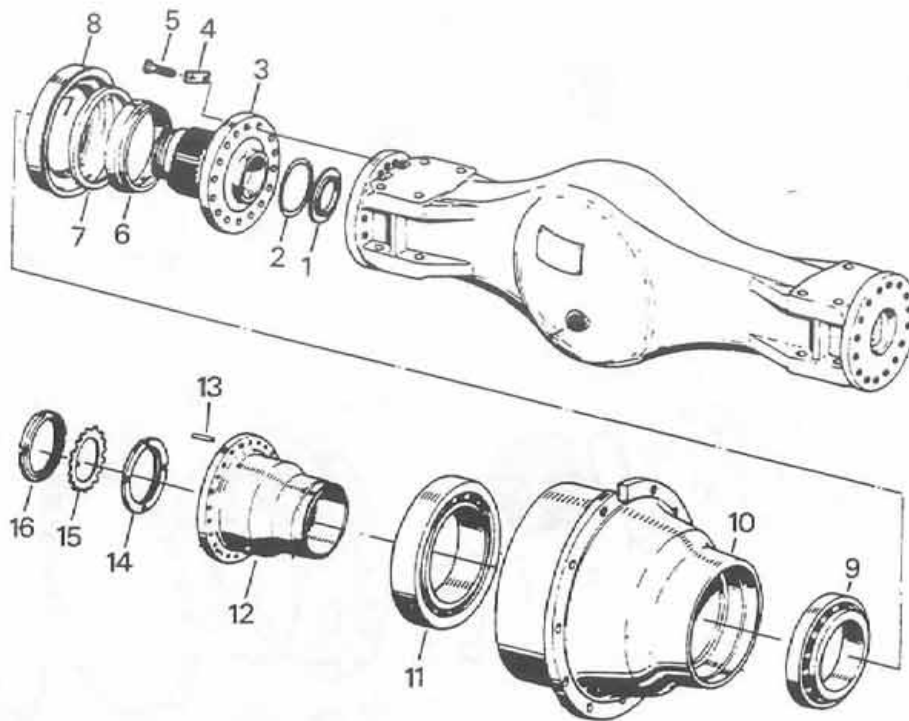
Torque:

Check all wheel bolts, dual bolts and plugs for tightness. Check specification for tightness values. If any part of axle is disassembled, reassemble using new gaskets and tighten all bolts with a torque wrench to the values listed in specifications.

Steiger K598-00/10 Axle

Hub Cutaway Illustration

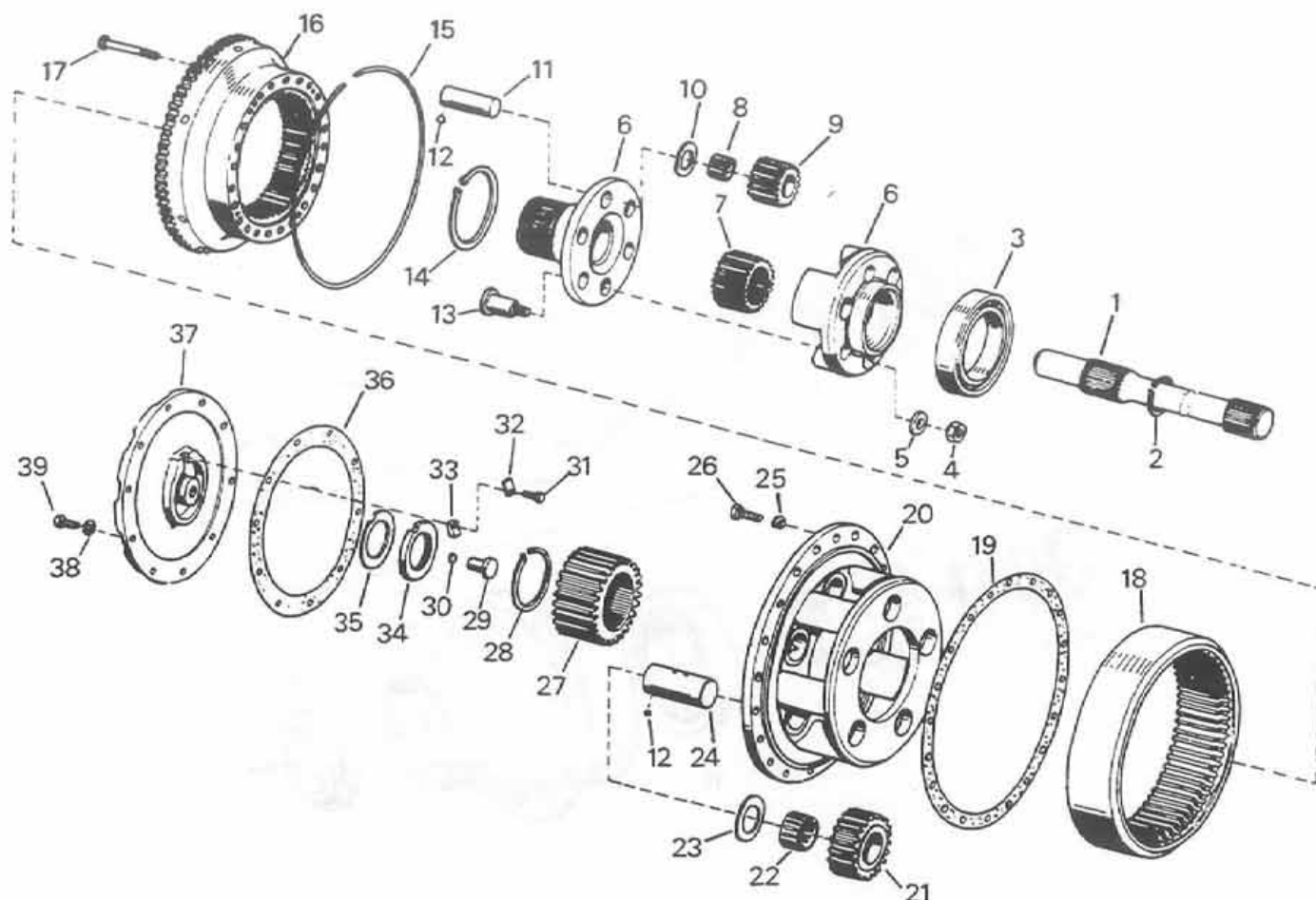




Model K598-00/10 Axle Assembly

Ref.	Description	Qty.
1	Baffle Plate	2
2	O-Ring	2
3	Axle Stub	2
4	Locking Washer	16
5	Hex. Screw	32
6	Shouldering Ring	2
7	Sealing Ring	2
8	Sealing Case	2

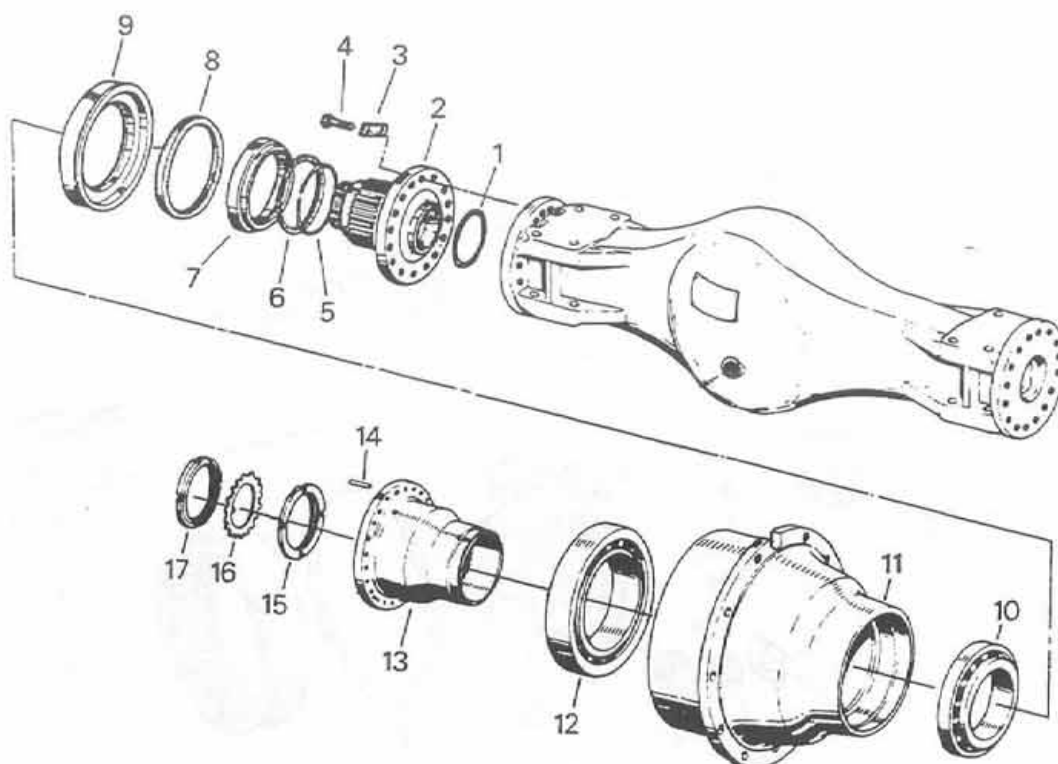
Ref.	Description	Qty.
9	Tapered Roller Bearing	2
10	Wheel Hub	2
11	Tapered Roller Bearing	2
12	Ring Gear Support II	2
13	Dowel Pin	8
14	Shaft End Nut	2
15	Locking Washer	2
16	Shaft End Nut II	2



Model K598-00/10 Planetary

Ref.	Description	Qty.
	Axle Shaft II Assy. (includes Items 2, 7 & 1-P/N 16-1595)	1
	Wheel Hub Planetary Outer Assy. (includes Items 20-24 & 12)	1
	Axle Shaft I Assy. (includes Items 1-P/N 16-1594, 2 & 7)	1
	Wheel Hub Planetary Inner Assy., (consists of Items 5, 8-12 & 14)	2
1	Axle Shaft I, 1078 MM Long	1
2	Axle Shaft II, 1208 MM Long	1
3	Snap Ring for Shaft	4
4	Ball Bearing	2
5	Hexagon Nut	6
6	Washer	6
7	Carrier, Planet Pinion, Inner Assembled w/ Items 4, 5, 13	2
8	Sun Pinion	2
9	Needle Roller Bearing	12
10	Planet Pinion	6
11	Spacer Ring	12
12	Planet Pinion Shaft	6
13	Steel Ball	16
14	Clamping Screw	6
15	Snap Ring for Shaft	2
16	Clamping Ring	2
17	Double Ring Gear	2
	Hexagon Screw	48

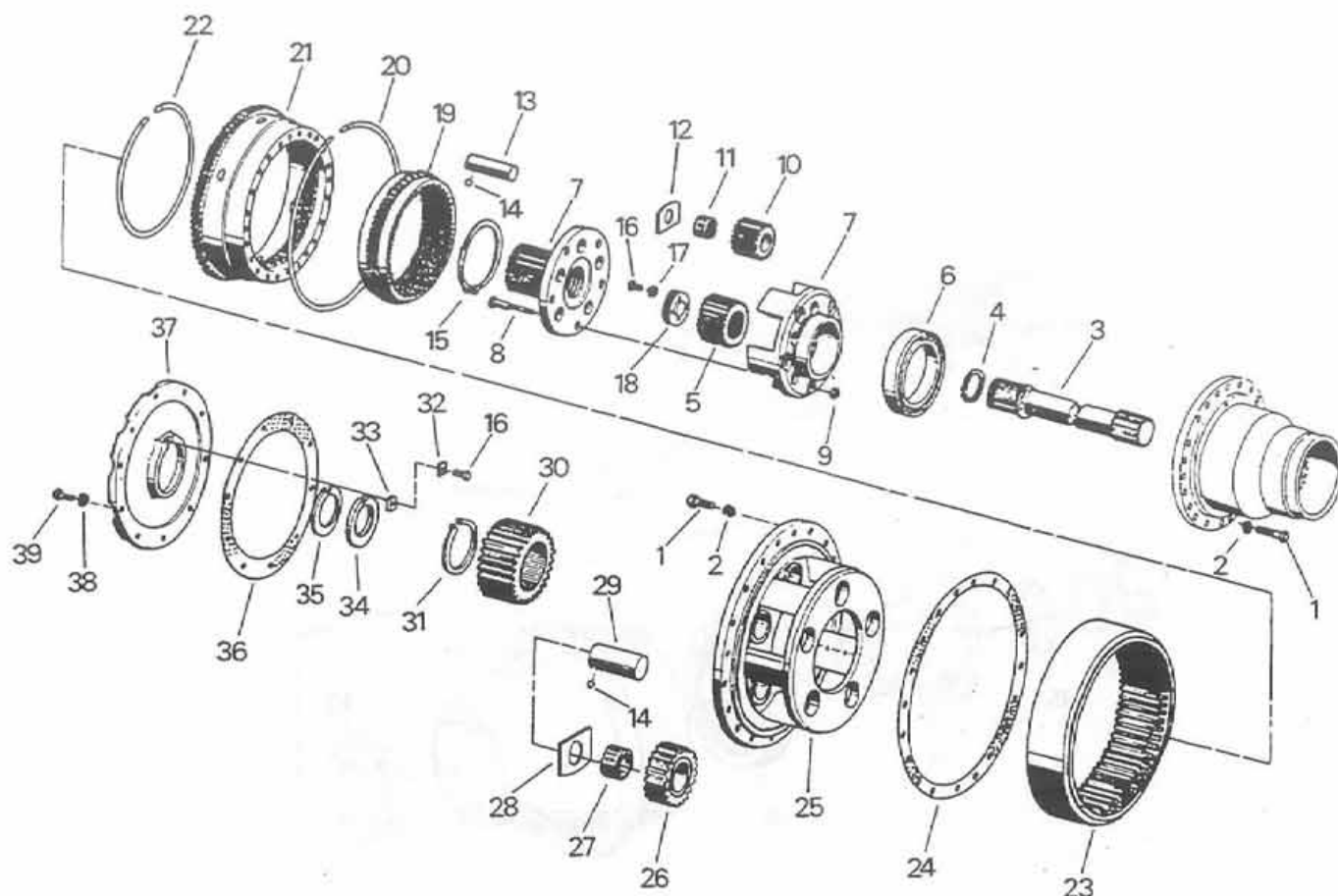
Ref.	Description	Qty.
18	Ring Gear	2
19	Gasket for Carrier, Planet Pinion, Outer	2
20	Carrier, Planet Pinion Outer	2
21	Planet Pinion, Outer	10
22	Needle Roller Bearing	20
23	Spacer Ring	20
24	Planet Pinion Shaft Outer	10
25	Spring Washer	40
26	Hexagon Screw	40
27	Sun Pinion, Outer	2
28	Snap Ring for Shaft	4
29	Support Pin	2
30	Shim I	AR
31	Hexagon Screw	2
32	Locking Washer	2
33	Clamping Plate	2
34	Thrust Bearing	2
35	Shim	AR
36	Gasket for Cover	2
37	Cover	2
38	Spring Washer	20
39	Hexagon Screw	20



Model K598-20/30 Axle Assembly

Ref.	Description	Qty.
1	O-Ring	2
2	Axle Stub	2
3	Locking Washer	16
4	Hex. Screw	32
5	Circlip	2
6	Sealing Ring	2
7	Shouldering Ring	2
8	Sealing Ring	2
9	Sealing Case	2

Ref.	Description	Qty.
10	Tapered Roller Bearing	2
11	Wheel Hub	2
12	Tapered Roller Bearing	2
13	Ring Gear Support II	2
14	Dowel Pin	8
15	Shaft End Nut	2
16	Locking Washer	2
17	Shaft End Nut II	2



Model K598-20/30 Planetary

Ref.	Description	Qty.
1	Hexagon Screw	84
2	Spring Washer	84
3-5	Rear Axle Shaft I Assy.	1
	Rear Axle Shaft II Assy.	1
3	Rear Axle Shaft I (975 mm)	1
	Rear Axle Shaft II (1105 mm)	1
4	Snap Ring	2
5	Sun Wheel	2
6	Ball Bearing	2
7	Inner Planet Carrier	2
8	Clamping Screw	10
9	Hexagon Nut	10
10-18	Planetary Wheel Hub Assy., Inner (also contains Ref. 7)	2
10	Planet Pinion	10
11	Needle Roller Bearing	20
12	Spacer Plate	20
13	Planet Pinion Shaft	10
14	Steel Ball	20
15	Snap Ring	2
16	Hexagon Screw	6
17	Spring Washer	4
18	Support Screw	2
19	Ring Gear	2
20	Clamping Ring	2
21	Double Ring Gear	2
22	Circlip	2
23	Ring Gear	2

Ref.	Description	Qty.
24	Gasket	2
25-29	Planetary Wheel Hub Assy., Outer (also contains Ref. 14)	2
25	Planet Carrier, Outer	2
26	Planet Pinion, Outer	10
27	Needle Roller Bearing	20
28	Spacer Plate	20
29	Planet Pinion Shaft, Outer	10
30	Sun Wheel, Outer	2
31	Snap Ring	2
32	Locking Plate	2
33	Clamping Plate	2
34	Thrust Bearing	2
35	Shim	AR
36	Gasket	2
37	Cover	2
38	Spring Washer	20
39	Hexagon Screw	20

Disassembly Procedures:

The instructions contained herein cover the disassembly and reassembly of the axle assembly in a sequence that would normally be followed after the unit has been removed from the vehicle and is to be completely overhauled. However, most axle repairs can be accomplished with the assembly in the tractor. When axles are repaired with the axle assembly removed from the tractor frame, mount the axle assembly on sturdy steel stands or V-blocks with at least a 3000 lb. load carrying capacity.

NOTE: Cleanliness is of extreme importance in the repair and overhaul of this unit. Before attempting any repairs, the exterior of the unit must be thoroughly cleaned to prevent the possibility of dirt and foreign material entering the mechanism. If major damage is found within the axle, the entire axle will need to be flushed and washed out. This may be accomplished by the use of high pressure hot water or a steam cleaner.

All parts should be cleaned before inspection is performed to determine failed and reusable parts.

IMPORTANT: Accurate diagnosis of reusable parts can only be made after the parts have been thoroughly cleaned. This may also provide you with some valuable information on why the failure occurred.

All parts should be arranged in an orderly fashion, and reinspected before assembly.

During reassembly of the unit, refer to the torque requirements given in the assembly procedures. Pay close attention to the location of the fasteners used to assure proper torque is applied.

Disassembly of the Model K598 Wheel Hub

NOTE: Steps 1 through 9 may be done without jacking and supporting the tractor if you do not wish to remove the wheels and tires. However, it will be much easier to jack and support the tractor and remove the wheels to perform repairs to the hub assembly.

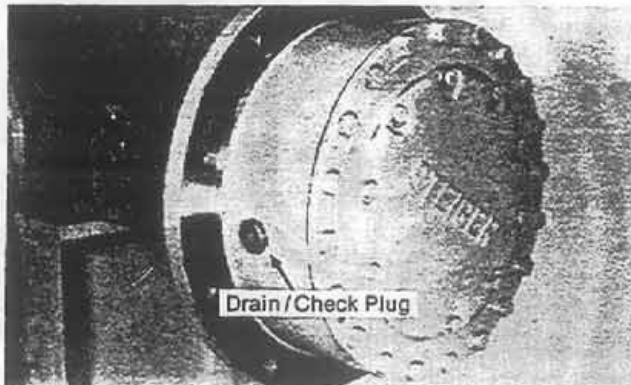


Figure 1: Early Production

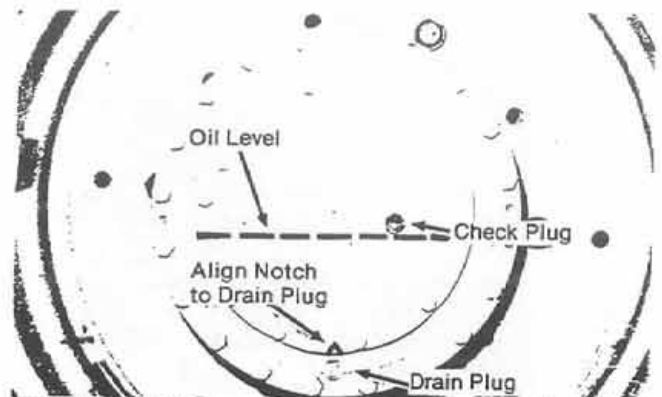


Figure 1A: Later Production (Correct Cover to Drain Plug Location)

Step 1. Drain all oil from the entire axle before disassembly. Oil flows to all compartments within the axle. To prevent further damage from contamination, fresh oil should be placed in the axle when reassembled. Axle contains 5.8 gallons of oil. Use at least a 6 gallon container when draining to prevent spillage. Turn drain plugs on hubs to lowest point to get complete drainage.

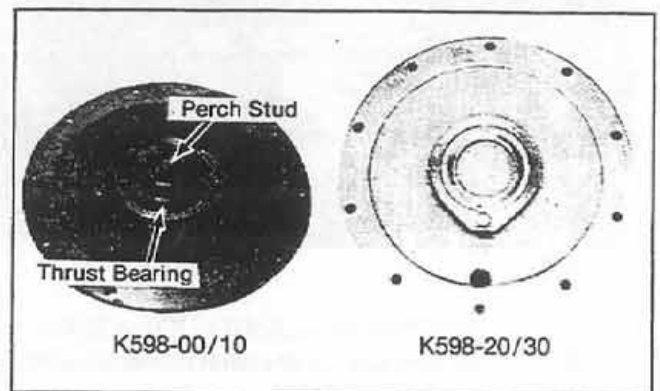


Figure 2:

Step 2. Remove cover cap screws and remove cover from the hub.

NOTE: The K598-00/10 has a perch stud and thrust bearing in center of cover. There is a shim pack under the stud and under the bearing. Keep the shim pack intact for reassembly. (K598-20/30 has thrust bearing only.) See Fig. 2.

Steiger K598 Axle

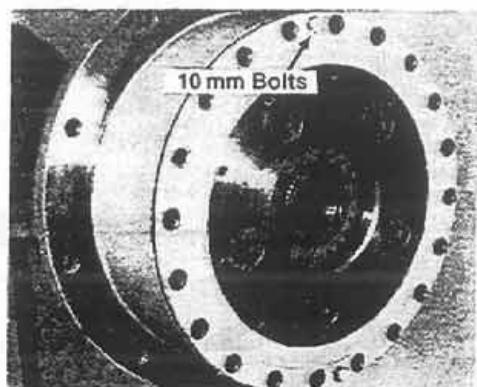


Figure 3:

Step 3. Remove the outboard planet carrier capscrews (20). Pull outer planet carrier by turning two 10 mm bolts into the threaded puller holes on opposite sides of the planet carrier flange (Fig. 3).

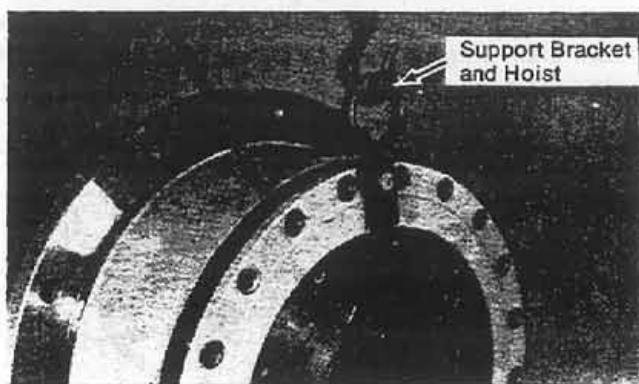


Figure 4:



CAUTION: Use a hoist or lifting fixture to remove and lower planet carrier assembly as shown in Fig. 4.

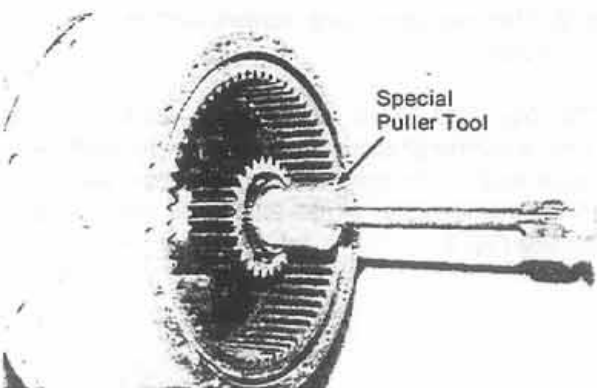


Figure 5:

Step 4. Remove the inner planet carrier with the special puller (P/N 58-011) and puller bolt. A slide hammer may be used to pull assembly (see Fig. 5).

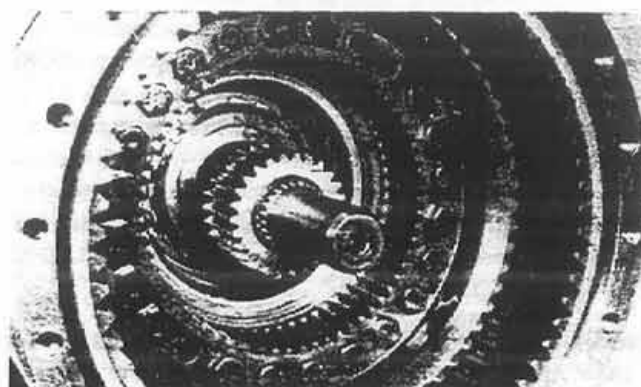


Figure 6:

Step 5. Remove axle shaft and sun gear. The axle will slide out of the center section freely. There is no fastener on the axle in the center section (see Fig. 6).

Step 6. Sun gears may be removed from the axle shaft and the inner planet carrier by removing snap rings and sliding sun gear from spline.

Step 7. (K598-00/10 only) Remove (22) 14 mm cap screws from inner and outer ring gear to ring gear support. Install P/N 58-080 push pins into the two (2) tapped holes (B) using two (2) of the previously removed 10 mm capscrews from the front cover. Screw the bolts in to the holes until they contact the pins. Tighten the bolts evenly and alternately to pull the ring gear assembly loose from the stationary ring gear support (see Fig. 10).

After removal the double ring gears may be separated by removing the large retaining snap ring around the inner outside diameter of the outer ring gear.

NOTE: On models K598-20/30 the inner "floating" ring gear may be removed by pulling it out of the support. To remove the outer ring gear assembly will require the removal of the hub assembly. (Refer to steps 10 through 14.)

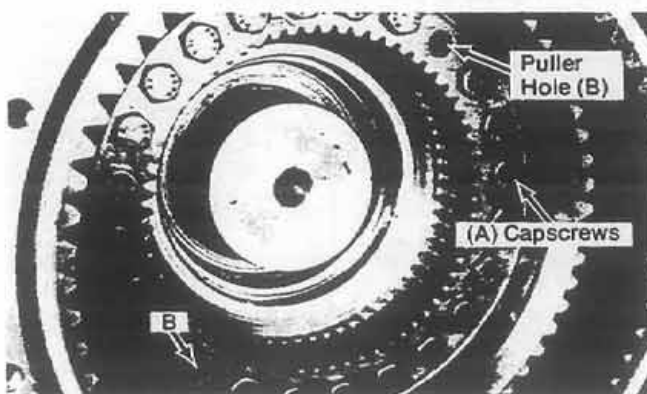


Figure 7:

Outer Planetary Disassembly

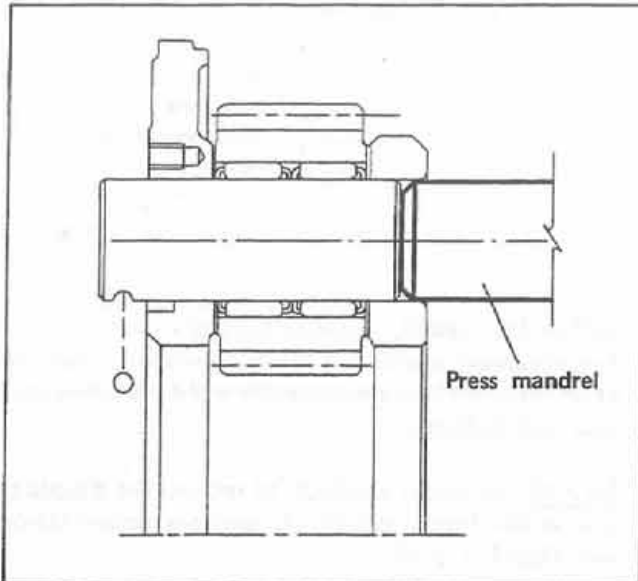


Figure 8:

Step 8. Disassembly of the Outer Planet Carrier.

NOTE: Mark each planet gear, pin and planet pin bore to assure the same location for reassembly.

A. Press out planetary gear pin (s) toward outer flange (see Fig. 8). Be sure to catch ball lock as pin emerges.

B. If pin and/or bearing replacement is required, replace pin and bearing as a matched set.

B. Remove the snap ring and press out planetary gear pins toward the sun gear side. Be sure to catch the lock ball(s) as pin(s) emerge.

NOTE: Model K598-00/10 will have three planet pinion gears and pins. Model K598-20/30 will have 5 planet pinion gears and pins.

C. The inner planet carrier may be disassembled by removing the hex nuts on the clamping screws, (3) model K598-00/10, (5) model K598-20/30. After removing the hex nuts the clamping screws will need to be pressed (pushed) out. Be sure to match mark the case halves for alignment upon reassembly.

NOTE: Further disassembly steps 10 through 30 require the tractor to be lifted and supported by safety stands.

IMPORTANT: Entire axle housing should be drained and flushed if breakage has occurred. Pieces of metal may have flowed to other areas of the axle in the oil.

Step 10. If further axle hub disassembly is required and the wheels have not been previously removed, to continue disassembly requires the removal of wheels.

Inner Planetary Disassembly

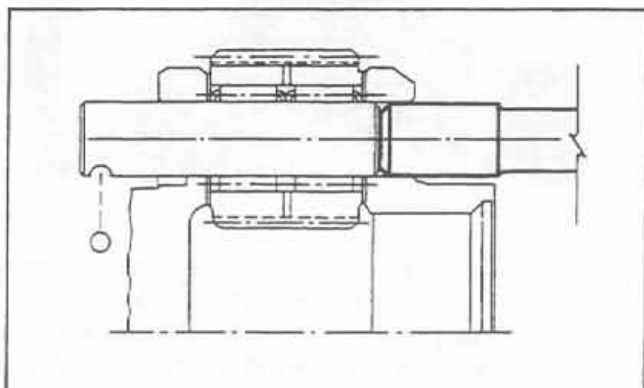


Figure 9:

Step 9. Disassembly of the Inner Planet Carrier.

A. Remove the inner planet carrier support bearing with an O.D. bearing puller. (Later production axles will not require puller for bearing is loose on carrier.)

NOTE: Bearing may remain in hub housing. In this case pull the bearing using an I.D. bearing puller.



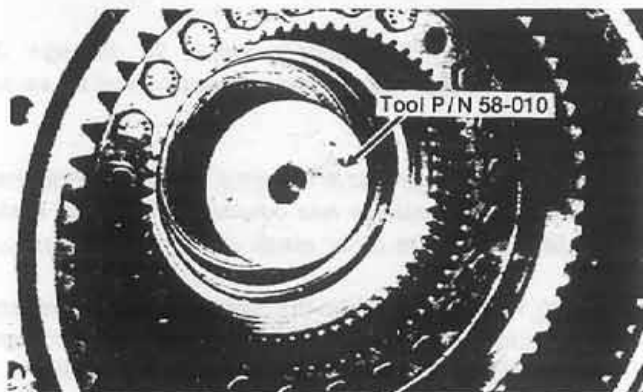
CAUTION: Place hoist in place directly over hub. Support hub by bolting chain to wheel mount flange. The hub weighs approximately 300 lbs. Hoist and chain must support this weight as hub is pulled free. Be sure the opposite end of the axle is supported so tipping does not occur when hub is removed (see Fig. 12).

Steiger K598 Axle



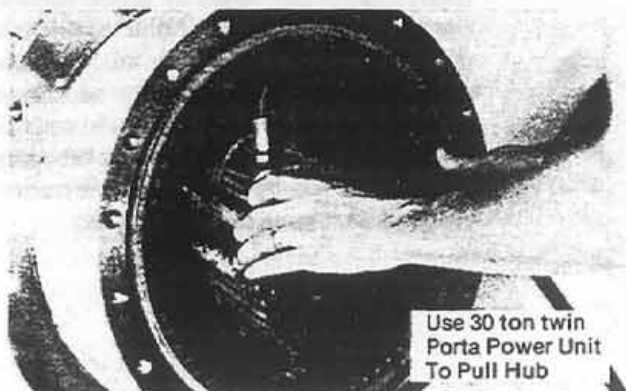
Use Special Tool
Spanner Wrench to
Remove and Tighten

Figure 10:



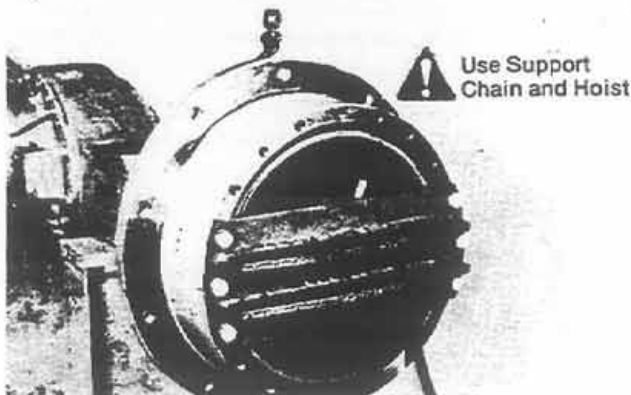
Tool P/N 58-010

Figure 11:



Use 30 ton twin
Porta Power Unit
To Pull Hub

Figure 12:



Use Support
Chain and Hoist

Figure 13:

Step 11. Using spanner wrench P/N 58-008, remove stub axle locking nut, remove locking washer and second spindle nut (Fig. 10). Screw special puller cap P/N 58-010 over stub axle threads (see Fig. 11). Place a 30 ton power-twin hydraulic unit (or equivalent) against the puller cap and between the hub puller plate P/N 58-007. Bolt puller plate securely to the hub as shown (see Fig. 13). Jack (push) hub loose from stub axle (see Note).

NOTE: This usually requires jacking or pushing of the hub assembly a distance of approximately 1-1/2" to 2" at which point the hub assembly will slide freely on the stub axle splines.

Step 12. On model K598-00/10 remove the double ring gear at this time if it had not been previously removed (see Step 7, Fig. 7).

On Model K598-00/10 only.

Step 13. Remove the hub seal and seal retainer as an assembly. This may be done with the use of driver tool with a wide, blunt blade. Using the driving tool, tap around the O.D. of the retainer flange until seal assembly comes out of the bore of the hub.

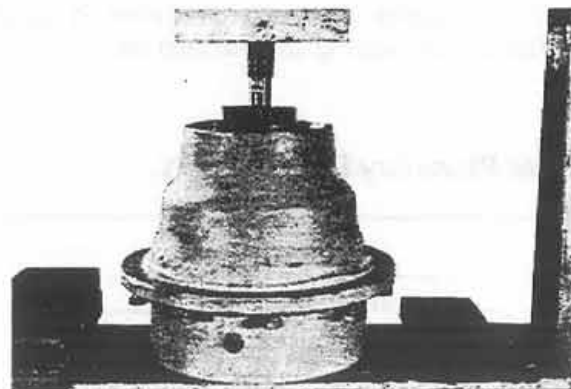


Figure 14:

Step 14. Remove the ring gear support seal shouldering ring and rear taper roller bearing by pressing (pushing) on the stationary carrier. This will require at least a 10 ton press. Place the outer end of the hub "down" on a press table and push out stationary ring gear carrier as shown (Fig. 14). Place a wooden block under the carrier to prevent damage to the carrier or bearing when it presses free from the hub.



Figure 15:

Step 15. The inner bearing may be removed from the carrier by the use of an O.D. bearing puller, or it may be "pushed" off by threading bolts through the carrier flange holes and pushing against the inner race of the bearing. Place bolts equal distance apart on the flange, turn bolts down alternately and evenly a little at a time (Fig. 14).

NOTE: On the K598-20/30 axle the inner bearing will need to be pulled off using an O.D. type puller or pressed off with the use of a clamping type arrangement. This is because on the K598-20/30 axle the cap-screws retaining the double ring gear go through the hub carrier from the bearing side.

Step 16. Bearing cups should be removed from the hub using an inside expanding bearing puller. An alternate method is to use a "brass" drift and tap around the outer diameter of the bearing cup to drive out the cups.



CAUTION: If drift is used, use only "brass," do not use steel drift, to avoid damage to the bearing cup and the possibility of personal injury.

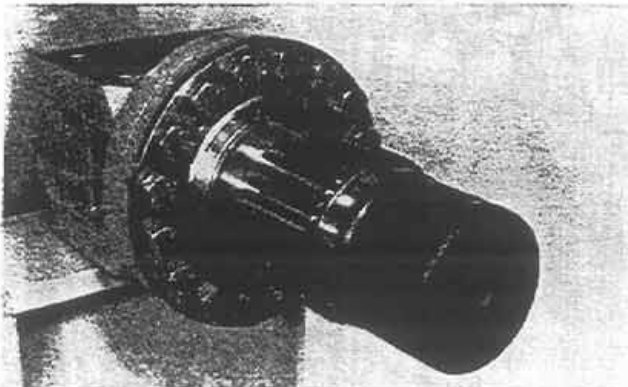
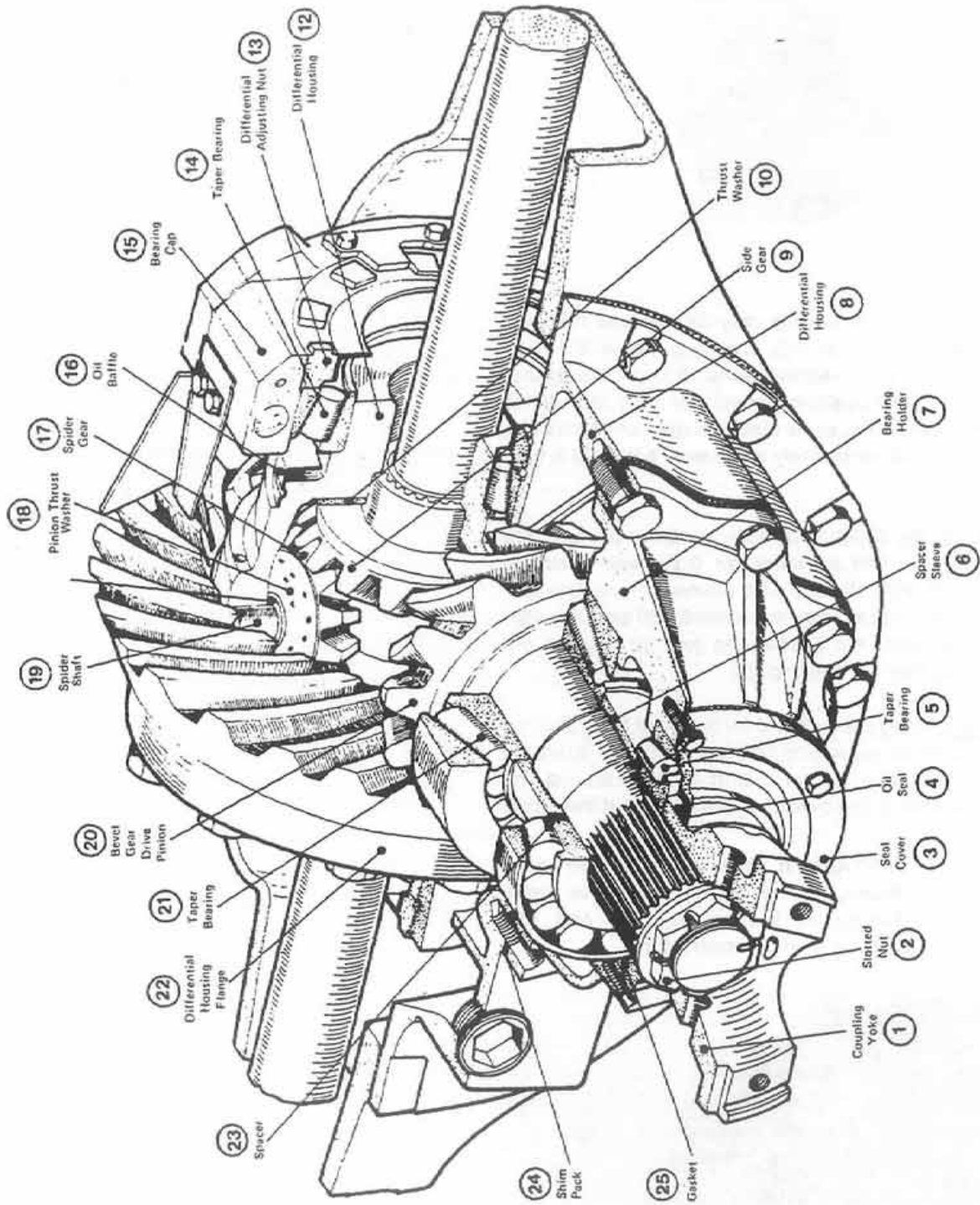


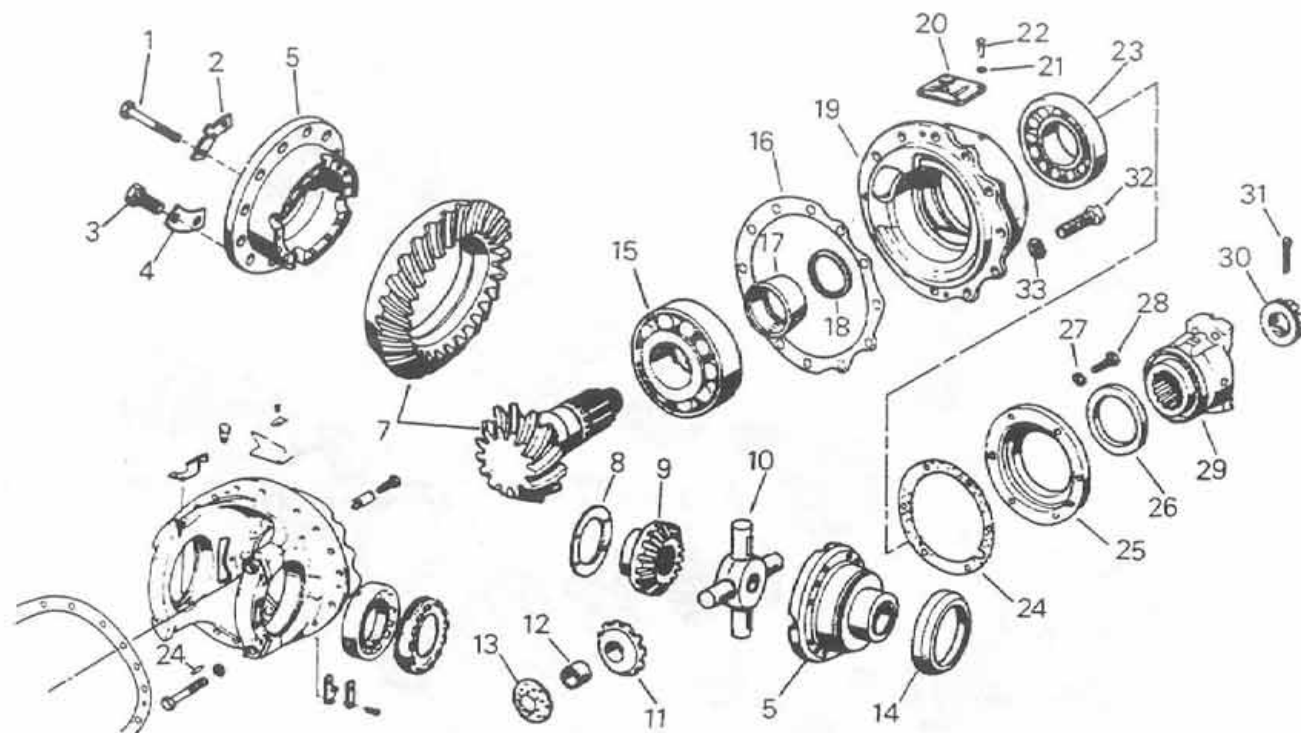
Figure 16:

Step 17. Remove axle stub (spindle) from the axle housing by removing 20 mm bolts and locking strap. Remove O-ring and oil baffle seated between the spindle and axle housing. This completes hub disassembly. All parts should now be cleaned and inspected to determine failed and reusable parts before reassembly.

Steiger K598 Axle

Differential Cutaway Illustration



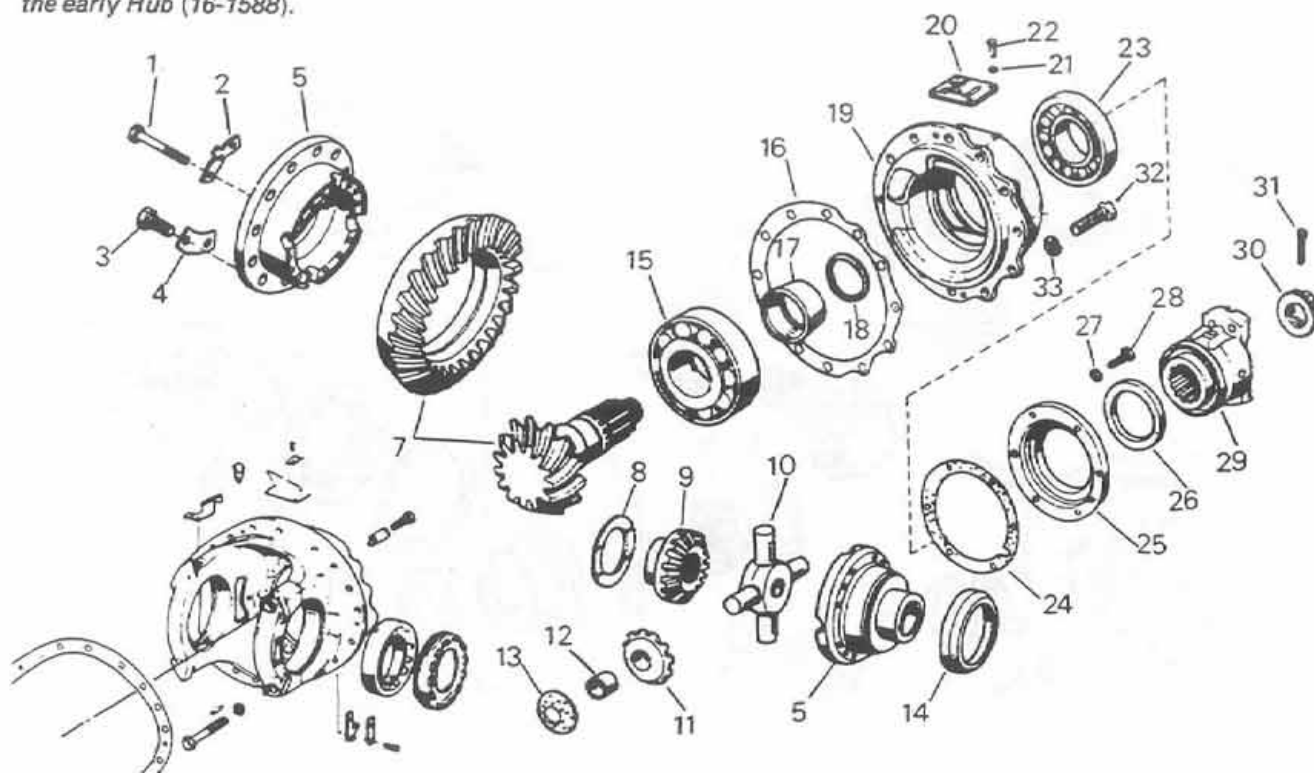


Model K598 00/10-20/30 Differential

Ref.	Description	Qty.
	Differential Housing Assy. (Items 1, 2, 5, 8-14)	1
1	Hexagon Screw	12
2	Locking Plate	4
3	Hexagon Screw	12
4	Locking Plate	6
5	Differential Housing Valves Assembled w/Items 1, 2, 14	1
7	Ring Gear & Pinion, Rear Axle, Assembled w/Items 3, 4, 30, 31	1
	Ring Gear & Pinion, Front Axle, Assembled w/Items 3, 4, 30, 31	1
8	Spacer Ring for Big Differen- tial Bevel Pinion, 4.6 MM	AR
	Spacer Ring for Big Differen- tial Bevel Pinion, 4.7 MM	AR
	Spacer Ring for Big Differen- tial Bevel Pinion, 4.8 MM	AR
	Spacer Ring for Big Differen- tial Bevel Pinion, 4.9 MM	AR
	Spacer Ring for Big Differen-	AR

Ref.	Description	Qty.
	tial Bevel Pinion, 5.0 MM	AR
	Spacer Ring for Big Differen- tial Bevel Pinion, 5.1 MM	AR
	Spacer Ring for Big Differen- tial Bevel Pinion, 5.2 MM	AR
	Spacer Ring for Big Differen- tial Bevel Pinion, 5.3 MM	AR
9	Big Differential Bevel Pinion	2
10	Spider	1
11	Small Differential Pinion Assembled with Item 12	4
12	Bushing for Small Differential Bevel Pinion	4
13	Spacer Ring for Small Differential Bevel Pinion	4
14	Oil Baffle Plate	1
15	Tapered-Roller Bearing	1
16	Shim, 1.00 MM	AR
	Shim, .50 MM	AR
	Shim, .30 MM	AR
	Shim, .20 MM	AR
	Shim, .25 MM	AR
17	Spacer Sleeve	1

NOTE: Coupling Hub P/N 16-1588 is no longer available. When ordering a replacement, please order Hub (01-6858) and new seal (01-6857). The old seal (16-1585) is still available but should only be used with the early Hub (16-1588).



Model K598 00/10-20/30 Differential

Ref.	Description	Qty.
18	Spacer Ring for Bearing Adjustment, 2.05 MM	AR
	Spacer Ring for Bearing Adjustment, 2.00 MM	AR
	Spacer Ring for Bearing Adjustment, 1.00 MM	AR
	Spacer Ring for Bearing Adjustment, .50 MM	AR
	Spacer Ring for Bearing Adjustment, .20 MM	AR
	Spacer Ring for Bearing Adjustment, .10 MM	AR
19	Bearing Holder	1
20	Direction Indicating Plate	1

Ref.	Description	Qty.
21	Spring Washer	4
22	Hexagon Screw	4
23	Tapered-Roller Bearing	1
24	Gasket for Cover	1
25	Cover	1
26	Sealing Ring (83 mm inside diameter)	1
	Sealing Ring (85 mm inside diameter)	
27	Spring Washer	6
28	Hexagon Screw	6
29	Coupling Hub (see Note)	1
	Coupling Hub	
30	Slotted Hub	1
31	Cotter Pin	1
32	Hexagon Screw	12
33	Spring Washer	12

Disassembly of Differential Section:

Step 18. Drain all oil from axle as outlined at beginning of Hub disassembly.

Follow steps 1 through 5 to disassemble hubs and pull left and right axle shafts from differential section.

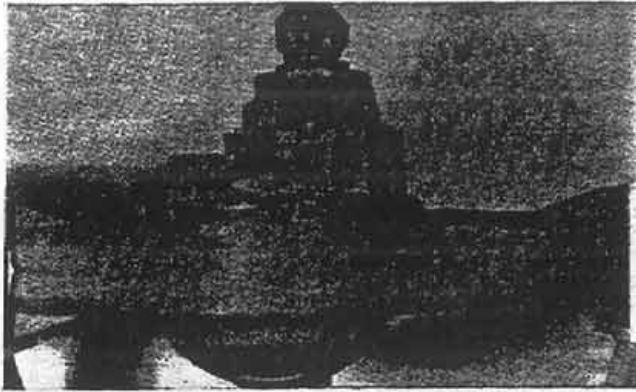


Figure 17:

Step 19. Remove differential carrier to axle housing capscrews. There are two threaded holes in opposite sides of differential housing. Install two (2) capscrews and tighten capscrews alternately and evenly to separate differential housing and gasket from the axle housing. Attach chain lift to drive yoke and lift differential carrier out of axle housing.



Figure 18:

IMPORTANT: Check and record ring gear and pinion back lash in three (3) locations before disassembly of the differential assembly. This should be done in the event the original ring gear and pinion is to be reused so that they will be reset the same on reassembly of the unit (Fig. 17).

Step 20. Remove capscrews, retaining pinion bearing carrier to differential housing. Do not lose any of the shims or gaskets. The shim or gasket pack thickness should also be measured and recorded at this time in the event the original gear set is to be reused. This shim pack is used to adjust the pinion at the correct depth to the ring gear.

Step 21. Remove the cotter pin from the pinion shaft nut. Remove the castle nut from the pinion shaft.

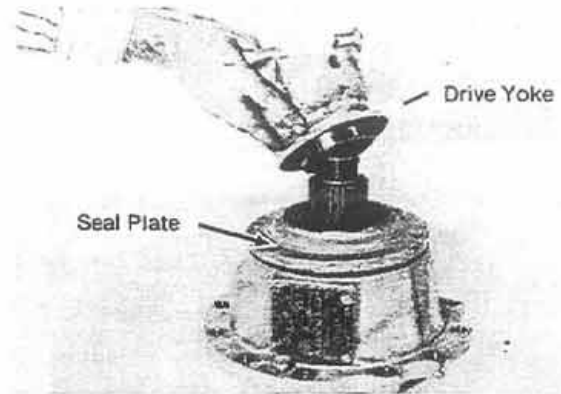


Figure 19:

Step 22. Pull the drive yoke from the pinion shaft (see Fig. 19).

Step 23. Remove the seal plate from the pinion shaft (see Fig. 19).

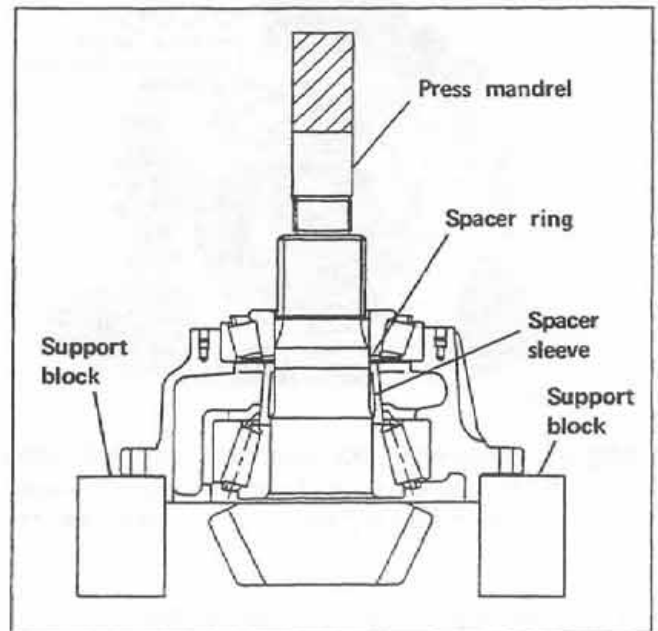


Figure 20:

Step 24. Support the pinion bearing case assembly as shown (Fig. 20). Press out the pinion through the bearings and case.

NOTE: Keep the spacer ring and spacer sleeve in one assembly for reassembly. Use the same spacer ring and spacer sleeve for trial reassembly. After trial test of preload on the pinion bearings, change the spacer sleeves as necessary to set correct preload. (See steps 40-43, Differential Reassembly.)

Steiger K598 Axle

Step 25. Press out the bearing cups from the bearing cage. This is necessary only if new bearings are to be installed.

Disassembly of Ring Gear/Differential Housing

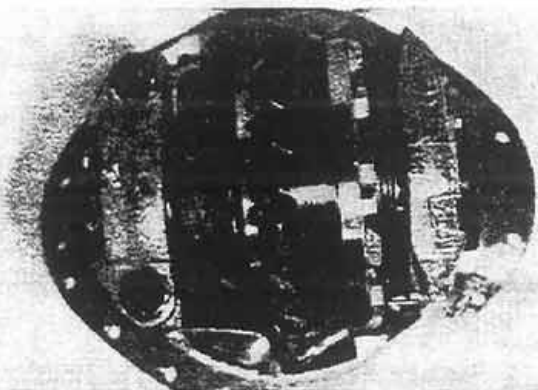


Figure 21:

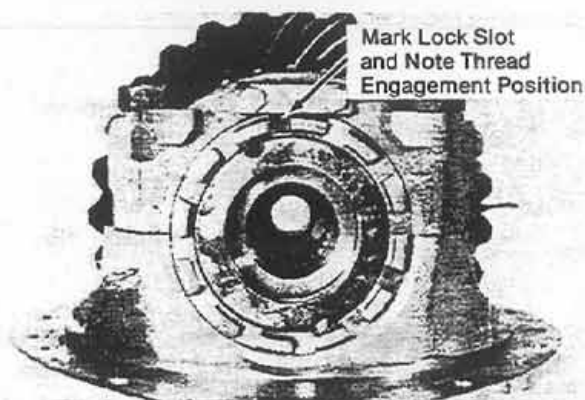


Figure 22:

Step 26. Remove the lock plate from each differential side bearing adjuster nut and mark the nut and housing position with a center punch or dye marker (see Fig. 21).

NOTE: Marking the adjusting nuts at each side of the differential is necessary to position the differential upon reassembly, if the original gear set is to be reused. Count the number of turns required to screw out each adjusting nut from its marked position and record. If pinion or ring gear is damaged or worn this will not be necessary as both gears must be replaced as a matched set.

Step 27. Remove the differential carrier cap and bearing cup.

Step 28. Using a sling or chain and lifting tool move carrier assembly to one side and lift it out of the case.

Step 29. Remove 18 mm bolts from ring gear and differential housing flange to remove ring gear. If pressing is required to separate ring gear from case, care must be taken not to distort or damage case flange.

Step 30. Remove the 12 mm bolts from the ring gear side of the differential housing and separate the differential housing. (Mark differential housing for reassembly.)

Step 31. Remove side gear and spacer. Remove the spider gear assembly. Keep all thrust washers and spider gears on the same shaft ends as they originally were when disassembled.

NOTE: The side gears have a thrust washer on the axle side. Be sure to replace the same washer or a washer of correct thickness to remove clearance from cluster gear assembly. These washers are available in thicknesses of 4.6 mm to 5.3 mm in 1 mm steps. Follow step 33 of reassembly procedure.

Step 32. Bearings may be pulled from differential housing with a bearing puller of correct dimension.

Assembly:

After each part has been inspected for damage or wear and all parts have been thoroughly cleaned, reassemble all component parts using the following procedure.

Step 33. Reassemble the spider gears in the differential case.

NOTE: The side gear thrust washers will determine the side clearance within the differential. Part D of this step explains thrust washer tolerance.

A. Place thrust washer and side gear into differential case (side gear tolerance).

B. Assemble spider, pinion gears and pinion thrust spacers and place in differential case.

C. Place the thrust washer and side gear in place on the spider-pinion gear assembly and place the other half of the differential case in place.

D. Secure the case together with four bolts placed at 90 degree intervals. If the side gear(s) turn without play, clearance is correct. If the gear does not turn or if there is play in the gear, the thrust spacers must be changed behind the side gears. They range in size from 4.6 mm to 5.3 mm in steps of 0.1 mm (side gear clearance is 0.1 mm to 0.2 mm).

E. When the side gears turn without play, the spacers are correct. Assemble the differential and tighten to 72 ft. lbs. (97 N.M.) with a torque wrench.

Step 34. Assemble the oil baffle to the differential housing. Secure it with a center punch by placing a punch mark in four places 90 degrees apart. This will keep the baffle from turning.

Step 35. Place two alignment bolts through the differential case flange into the ring gear, then install the ring gear to the case. If the ring must be pressed on, rest the ring gear (facing downward) on hard wooden blocks in a press and press on the end of the differential case. (Care should be taken that the ring gear presses on squarely to the case so that the ring gear does not "shave" off metal from the case.) In many cases a slight press fit is required to seat the ring gear against the flange of the differential case.

Insert the remainder of the ring gear bolts and locking straps. Now torquing of all the fasteners can be done by placing the unit in a press to prevent rotation. Tighten the ring gear bolts to 220-250 lb. ft. (297-338 N.M.) with a torque wrench.

NOTE: If a new ring gear is installed, the bevel pinion gear must also be replaced. Ring and pinion gears are replaced in matched sets only.

Step 36. If the bearings are replaced, press a new bearing cup into the bearing seat on the full cast side of the differential drive housing.

Step 37. Press the bearings on the differential housing bearing seat.

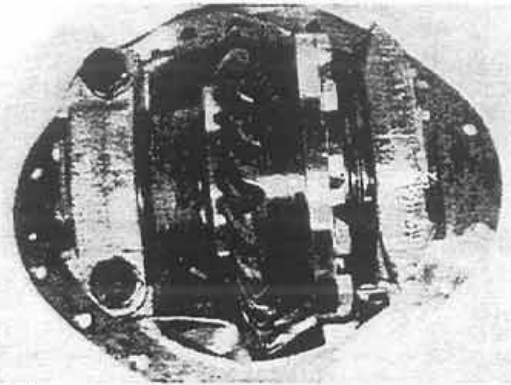


Figure 23:

Step 38. Seat the ring gear differential assembly into the differential housing and prepare to set the side play and the bearing preload. Place the bearing cup and bearing cap into place and fasten the two bearing cap retaining bolts, not to exceed 10 lb. ft. at this time. Turn the side adjustment toward the bearing until original scribe marks line up. Turn the opposite adjusting nut in toward the bearing until the adjuster nut contacts the bearing cup, then continue turning in the adjuster nut 2 to 3 additional notches to seat in and square up both the bearing cups. Then reset both the side adjustment nuts as close to their original position as possible.

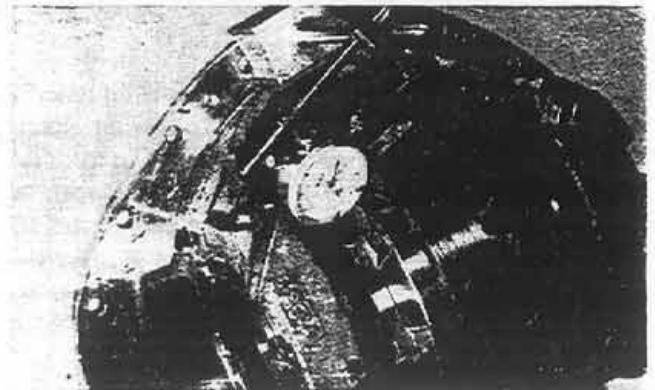


Figure 24:

Step 39. With the use of a dial indicator as shown (Fig. 24), check the back face of the ring gear. While rotating the ring gear assembly at least one full turn, check the face runout. The total ring gear runout must not exceed .003". If the runout is excessive, remove the assembly and check for burrs or debris between the ring gear and the case and recheck the torquing procedure.

Steiger K598 Axle

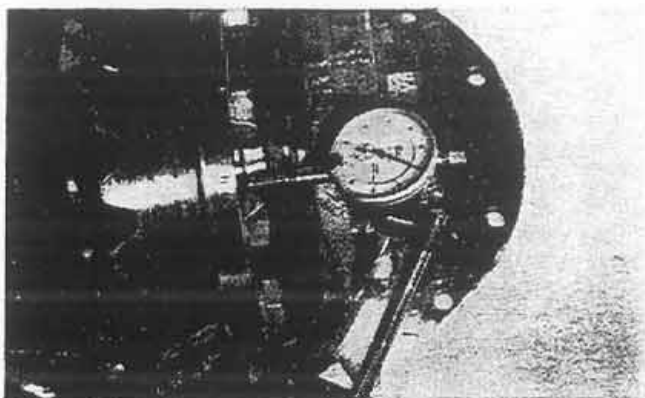


Figure 25:

Step 40. With the dial indicator in place on the side of the ring gear, adjust the nuts until the differential assembly has approximately .010"-.015" side play. Then adjust to a point where there is 0 side play (Fig. 25).

NOTE: Further lateral adjustment of the differential will require that one adjusting nut be loosened the same amount that the opposite nut is to be tightened. This will maintain 0 side play in the bearing (s).

The bearing on the pinion shaft must be set at the correct preload. The preload is correct when the bearings turn smoothly when exerting a torque of 86-172 in. lbs. (1-2 mkp). Steps 41 to 44 will explain how this is done.

NOTE: It will be easier and save time if a fitting shaft is used to set preload rather than the pinion shaft. Machine a shaft that will allow the bearing to slide on and off without the use of a press. Machine a discarded pinion shaft down until bearings will slide on and off with ease. When the correct preload has been adjusted, place the bearings on the shaft to be used and apply the correct torque.

Assembly of the Pinion Gear Shaft



Figure 26:

Step 41. Press the bearing cups into the pinion shaft case. (This will only need to be done if previously removed.)

Step 42. Place the rear bearing on the pinion shaft (or the fitting shaft) and place the original spacer and the shim washers on the shaft. Place the shaft in the bearing case. Install the outer bearing, the drive yoke and the retaining nut. Tighten the drive yoke retaining nut to 398-434 lb. ft. (537-586 N.M.).

IMPORTANT: Do not install the drive yoke seal or the retainer at this time.

Check the tightness or looseness of the bearing. Change the shim washers until the approximate bearing preload is achieved (the shaft should turn by hand but with some resistance).

IMPORTANT: After torquing the drive yoke retaining nut each time, give the pinion assembly a sharp blow with a soft mallet to square up and seat the bearings so as to not get a false preload indication.

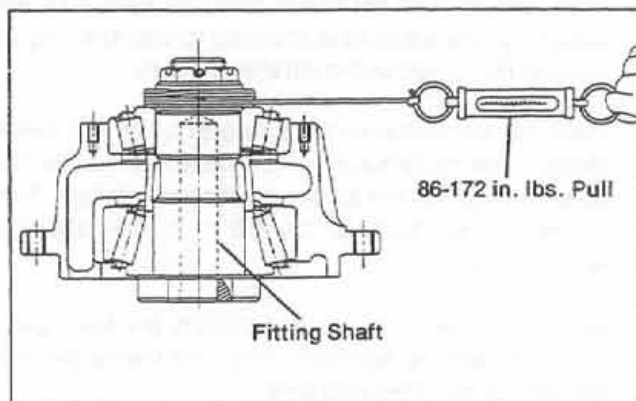


Figure 27:

Step 43. To check the correct preload, fasten a 36" string or a light, flexible wire to the pinion shaft nut and wind it around the washer behind the nut. Connect a spring scale and while rotating the pinion shaft with a steady, even pull, correct preload should be 86-172 in. lb. or 5-9 lb. ft. (6.8-12 N.M.). (see Fig. 27).

An alternate method to the spring scale would be to adapt an inch-pounds torque wrench to the pinion nut that is already torqued to the proper specifications. Note the reading of the torque wrench while maintaining a steady, smooth rotation of the drive pinion and compare with the correct preload specification. If within this range, the preload is correct.

Step 44. When the correct bearing preload is set, remove the drive pinion nut. Place a new seal in the pinion shaft seal plate and install. Then reinstall the drive yoke, the washer and the lock nut. Torque the lock nut once more to the final torque of 398 to 434 lb. ft. (540-589 N.M.).

Step 45. Install the pinion bearing case assembly into the differential case using the original shim pack removed. Tighten the retaining bolts to 87-101 lb. ft. (117-136 N.M.).

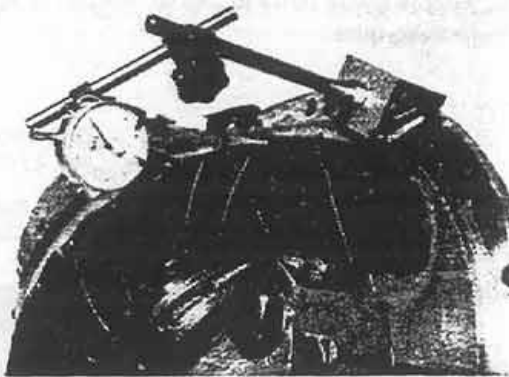


Figure 28:

Step 46. Use a dial indicator to check the backlash between the ring gear and the pinion shaft gear. The backlash is adjusted by moving the ring gear toward or away from the pinion shaft gear. Move the ring gear by loosening one lock nut and tightening the opposite. Move each lock nut the same distance so that the bearing adjustment made in the previous paragraph is not disturbed. Adjust the position until the gear backlash is between .007" and .030" if the new gear set is used, or adjust to the backlash noted at the disassembly for old gears. The specific backlash should be determined after the bearing cap bolts have been torqued 398-434 lb. ft. (540-589 N.M.). Check backlash at three points around the ring gear (Fig. 28).

Step 47. Check the ring and the pinion gear for proper tooth contact. Paint the ring gear with a mixture of red lead and linseed oil. When the ring and the pinion gears are rotated, the red lead is squeezed away by the contact of the teeth, leaving bare areas the exact size, shape and location of the contacts. As a rule, painting about 10 or 12 teeth is sufficient for checking purposes.

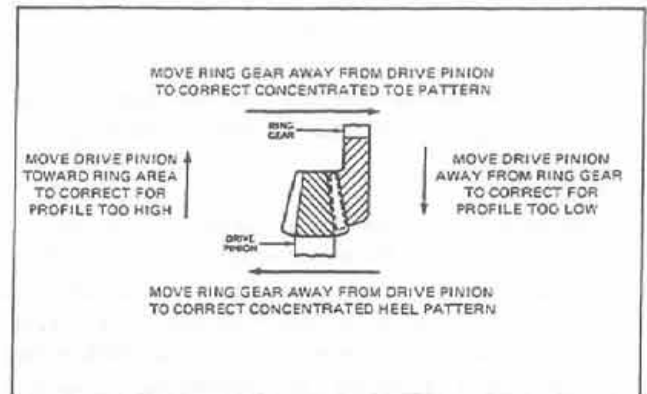


Figure 29:

NOTE: Sharper impressions may be obtained by applying a small amount of resistance to the ring gear with wood or a flat steel bar and using a wrench to rotate the pinion. Gears should be rotated, under slight load, until the ring gear has turned at least one revolution in both directions.



Figure 30:

Step 48. Check the tooth contact pattern on the drive side (convex side) of the ring gear teeth. The coast side will automatically correct when the drive side pattern is correct. If the proper tooth contact pattern is not obtained, readjust the backlash or add or subtract from the shim pack between the pinion bearing case flange and the differential housing. Addition of or subtraction of the shims should be made in small increments until the proper contact is established (see Fig. 30).

Steiger K598 Axle

Reassembly of Hub:

ALL the disassembled parts should be completely cleaned and inspected before reassembly.

Step 49. Assemble the hub ring gear support bearing by pressing the ring gear support to the largest taper bearing (Fig. 15).

IMPORTANT: On the model 598-20/30 axle the double ring gear will need to be mounted to the ring gear support flange before pressing on of the large taper bearing. Torque the double ring gear to the support bolts to 130 lb. ft. (176 N.M.) (see Fig. 14A). Now the large taper bearing may be pressed on the ring gear support.

Step 50. Place the bearing cups into the hub if previously removed. Place the bearing and the ring gear support assembly into the hub and place the hub and the ring gear assembly in a press so all the pressure is placed on the center flange of the ring gear support and the outer flange of the hub is not contacting the press table (see Fig. 14). Press the rear taper bearing on to the ring gear support. While rotating the hub assembly by hand, continue pressing on of the bearing. Press until a slight resistance is felt on the bearings while rotating. If binding or lock-up occurs, the bearing pre-load is too great.

Step 51. Press the oil seal shoulder ring on the ring gear support immediately after the taper bearing. Press the shoulder ring on until it just contacts the bearing inner race. Rotate the hub assembly by hand. It should rotate freely but with a slight resistance.

NOTE: The newer design shoulder ring has an inner seal ring retained by a circlip. The former ring did not have this seal. If the shoulder ring **without** the seal is used, it will require the use of no. 2 Permatex or equivalent on the shoulder ring area of the stub axle before assembly of the hub assembly to the stub axle (See Fig. 31).

Step 52. Using the P/N 58-077 seal installer, press the hub oil seal into the seal retainer.

Step 53. Press the assembled oil seal and retainer into the hub.

IMPORTANT: Care should be taken not to distort or damage the oil seal upon assembly or leakage will occur when placed in service.

Step 54. Turn the hub assembly over after removing it from the press and install the stationary ring gears (model 598-00/10). The outer ring gear is locked to the inner gear with an I.D. snap ring, which must be installed before bolting the double ring gears to the ring gear carrier flange within the hub (no. 33, p. 8). Tighten the 13 mm bolts to 130 lb. ft. (176 N.M.) (see Fig. 10, p. 11).

Step 55. Mount the stub axle to the axle housing by first placing the O-ring on the inside flange and the oil baffle in the axle housing, then secure the stub axle to the flange of the axle housing with 20 mm bolts. Torque these bolts to 245 lb. ft. (331 N.M.) and lock the locking tabs.

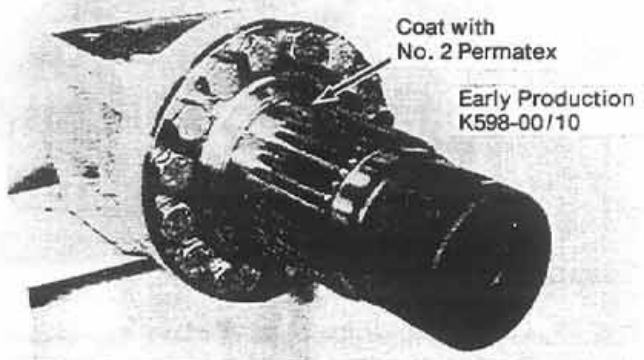


Figure 31:

Step 56. Mount the special puller cap (P/N 58-010) on the stub axle thread. This will protect the lip of the hub oil seal from being damaged on the stub axle threads when mounting the hub.

NOTE: Seal the stub axle with no. 2 Permatex before mounting the hub assembly on the early model 598-00/10 axle assemblies that do not have the new design seal shoulder ring with the new seal arrangement (Fig. 31).

Step 57. Lift the hub to an in-line position with the axle stub and push the hub on the axle stub until the spline aligns and engages.

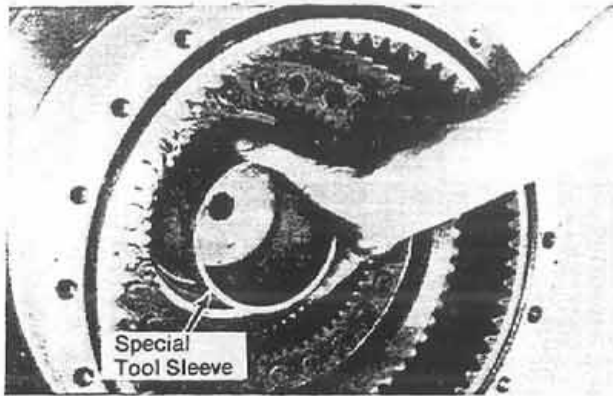


Figure 32:

Step 58. Place the special push collar P/N 58-004 (Fig. 32) over the puller cap. Place a 30 ton power-twin unit against the push collar and install the 1" puller bolt through the port-a-power unit (Fig. 33). Engage the bolt threads until the port-a-power unit is snug against the collar.

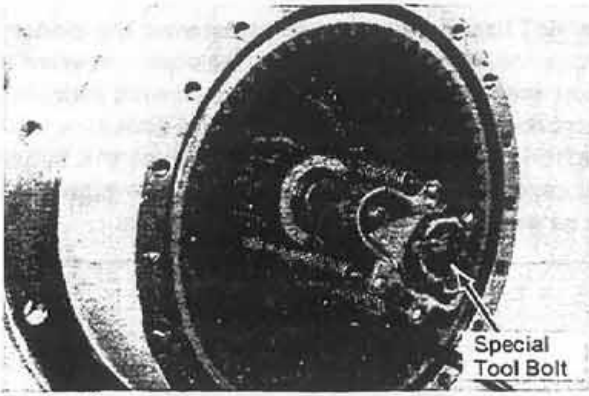


Figure 33:

Step 59. Pull the hub onto the splined axle stub until it is completely engaged on the splined axle stub.

Step 60. Remove the puller, bolt and puller cap from the axle stub.

Step 61. Install the axle nut and tighten until there is no end play in the bearings. This may require that end play be measured until no measurement of end play exists as the nut is being tightened.

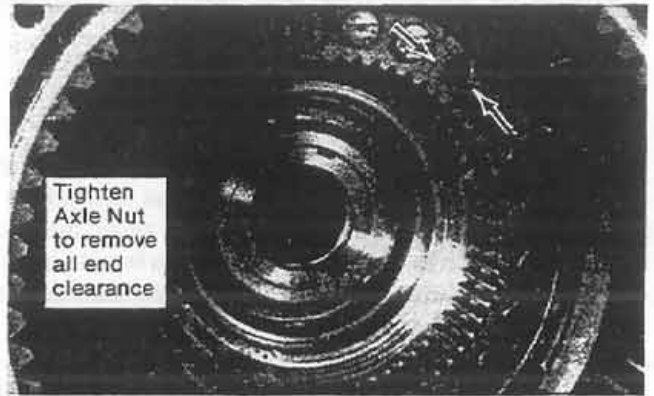


Figure 34:

Step 62. When the nut is tightened until no end play exists, lock it with the lock washer. Place the outer lock nut in place and tighten to 250-300 lb. ft. (338-405 N.M.). Lock the nut with the lock washer previously installed.

Step 63. Bump the outer side of the hub assembly with a wooden block or rawhide hammer to "seat up" the bearings. The hub should turn freely but with resistance from the oil seal and preloaded bearings. No end play should exist.

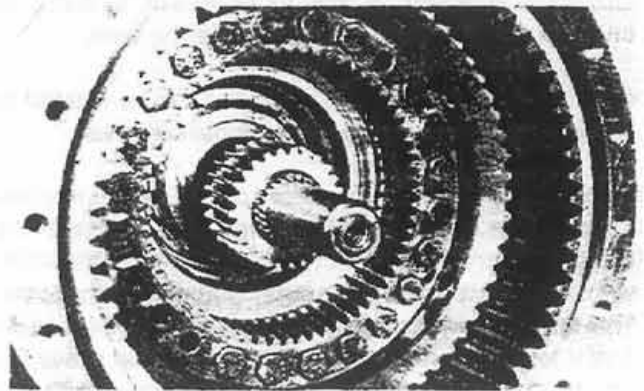


Figure 35:

Step 64. Place the axle shaft with the attached sun gear into the housing. Do not insert the axle shaft all the way in at this time (Fig. 35).

Steiger K598 Axle

Step 65. On the 598-20/30 axle, install inner planetary "floating" ring gear.

Step 66. Reassemble the inner planetary unit:

A. Assemble the planetary case. Be sure to align the match marks. Support the case in press and press in the special shoulder case bolts. The bolts must be pressed in such that the bolt nuts can be installed from the bearing side of the case. Torque the bolt nuts to 145-180 lb. ft. (196-243 N.M.).

B. Replace the bearings in the inner planet gears with the thrust washer on each side of the gear. Press the pin into the carrier bearing and gear. Be sure to align the pin lock bolts with the groove in the carrier case when installing the pin.

C. Replace all the pins, bearings, thrust washers and gear assemblies as described, and place the pin retaining snap ring on the carrier.

D. Install the ball bearing onto the planet carrier.

E. Hang the planet carrier assembly on the axle sun gear and slide the axle and planet sun gear assembly into place as a unit. It may be necessary to bump or drive the carrier assembly into the bearing bore.

NOTE: The carrier assembly may need to be rotated to engage axle spline into the differential side gear.

Step 67. Install the new outboard carrier gasket in place on the hub. Use a non-hardening sealer. Place the outer planetary over the sun gear on the inner planetary carrier and mesh with the outer stationary ring gear. This may be made easier with the use of three (3) equal 6 inch long guide bolts screwed into the hub in the 10, 2 and 6 o'clock positions of the hub. Tighten all 10 mm bolts to 145 lb. ft. (196 N.M.).

NOTE: Before the hub cover can be installed, the clearance must be adjusted between the cover thrust ring and the inner planetary carrier (both the 598-00/10 and 598-20/30) and also between the axle shaft and the cover perch stud (see fig. 36, 598-00/10 only).

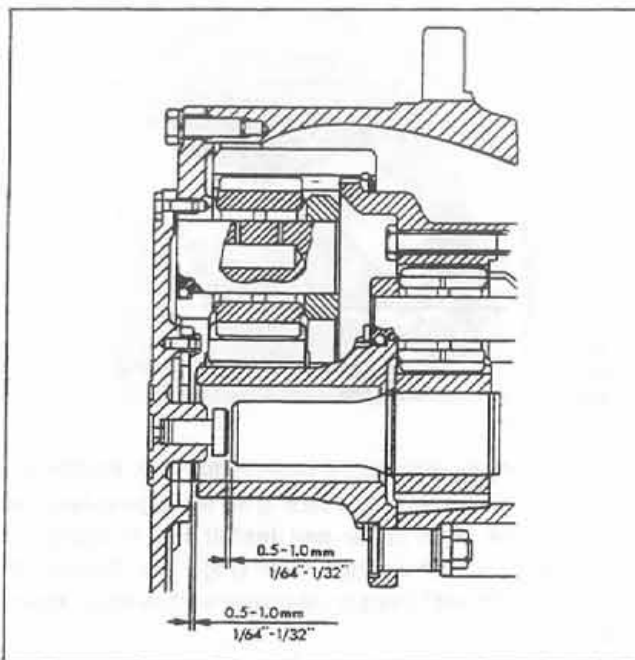


Figure 36:

Step 68. To check the clearance between the planetary carrier and the thrust washer in the cover, measure the distances in fig. 37 and use the following formula to determine the clearance. Measure the distances with a straight edge and machinists rule. Place the straight edge and rule as illustrated. Place the new gasket on the cover when taking cover measurements.

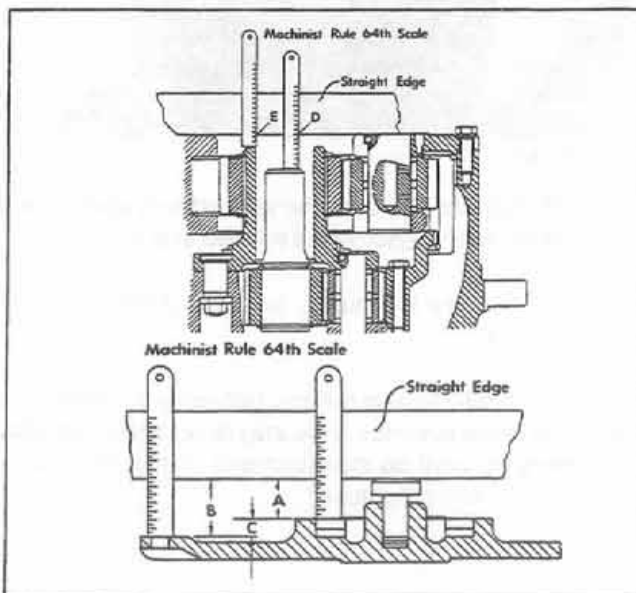


Figure 37:

MEASURE B	_____
MEASURE A SUBTRACT FROM B	_____
DIFFERENCE EQUALS C	_____
MEASURE E	_____
SUBTRACT C	_____
DIFFERENCE EQUALS CLEARANCE	_____

Clearance should be .019-.039 in. (.05-1.0 mm). Add or subtract the shims under the washer until the correct clearance is established. The washer is removed by pulling with the same tool P/N 58-011 that threads into the inner planetary carrier. (Fig. 38)

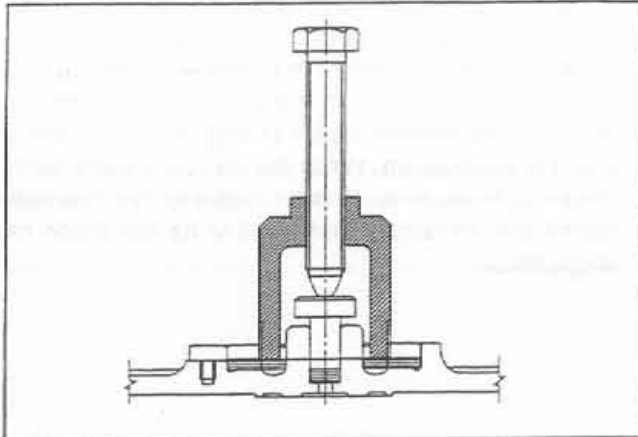


Figure 38:

Step 69. To check the clearance between the axle shaft and the perch stud on the 598-00/10, measure the distances in Fig. 37 as illustrated. Be sure the axle shaft is pushed all the way into the differential against the spider thrust surface.

MEASURE B MEASURE D SUBTRACT FROM B DIFFERENCE EQUALS CLEARANCE

The clearance should be 1-64" to 1-32". Add or subtract the shims under the perch stud until the correct clearance is established. The perch stud is removed by driving a straight punch through the center hole on the outside of the cover.

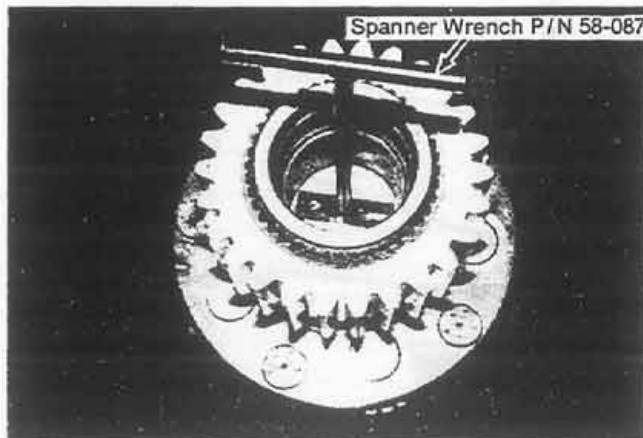


Figure 39: K598-20/30 Axle Clearance Adjustment

IMPORTANT: On the model 598-20/30 axle, clearance should also be .019-.039 in. (.05-1.0 mm). On this model axle, the axle end adjustment is controlled by a

locking thrust plate that screws into the inner planetary carrier assembly. To make this adjustment all that is required is to loosen the thrust plate locking cap-screws, insert the spanner wrench P/N 58-087, back off the thrust plate at least two (2) full turns if not previously removed.

Screw the thrust plate in until it just makes contact with the end of the axle shaft. From this point back off the thrust plate 1/4 (90°) turn. Torque the thrust plate locking capscrews 14-22 lb. ft. (19-30 N.M.).

NOTE: If a no-spin has been installed in the differential, it will be necessary to place the cover on one side of the axle and check the axle shaft clearance from one side only. This is because a floating spacer slug replaces the stationary spider that is normally in the differential. All play must be removed by pushing the axles against the perch bolt on the opposite side of the axle. Then, complete measurement as outlined in Step 67 & 68. The clearance specification will now be doubled, 1/32" minimum to 1/16" maximum.

Step 70. Pack the thrust ring and perch stud cavity with high-temp grease. Seal both surfaces of the gasket with a non-hardening gasket material and place the gasket and cover in place. Torque all the cover bolts to 26 lb. ft. (35 N.M.).

Step 71. If removed from the tractor frame, reinstall the axle assembly to the tractor operating positions. Attach the drive shaft and all other components requiring removal. Torque all axle to frame bolts.

Step 72. Fill each wheel hub with approximately 7-1/2 quarts (7.10 L) gear oil. Fill the differential section with approximately 8-1/2 quarts (8.05 L) of gear oil.

IMPORTANT: Use 85W-90 EP or 90 EP gear oil. All gear oil must meet the MIL-L-2105B and/or API-GL-5 specifications.

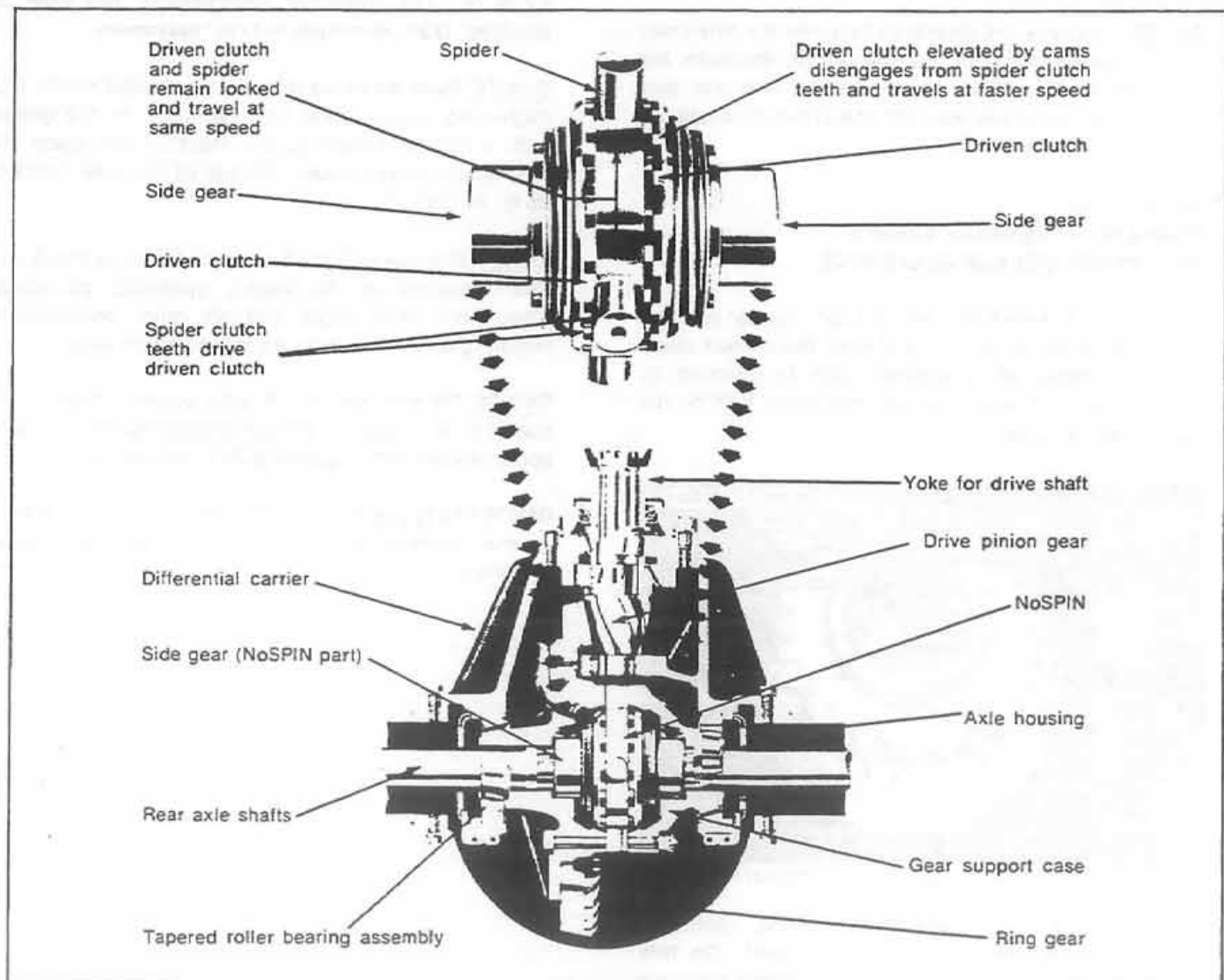
Steiger K598 Axle

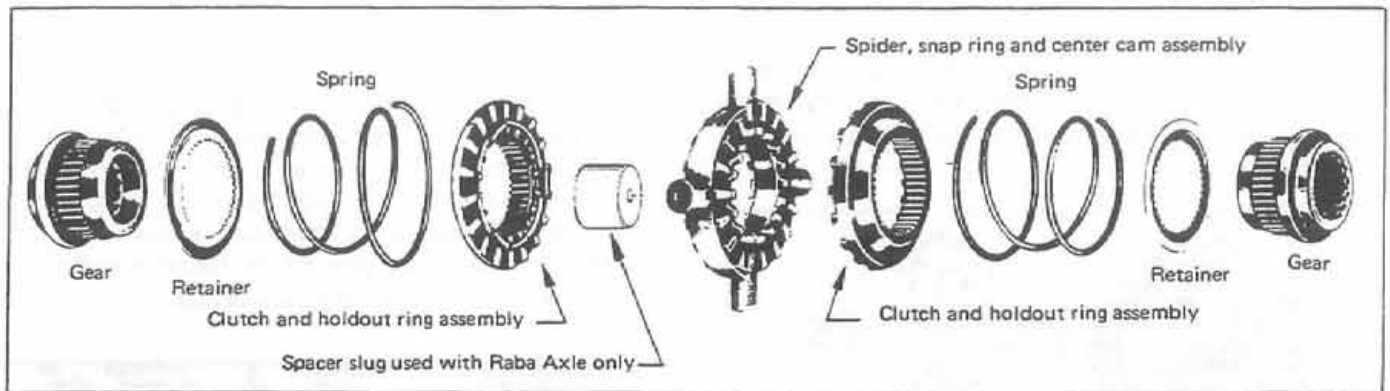
NoSPIN General Information:

The NoSPIN differential has two prime functions. One is to compensate for the differences in driving wheel travel which occurs when turning or traveling over uneven ground. The other is to prevent wheel-spin when one wheel loses traction, a condition which would stall a vehicle not equipped with a NoSPIN differential. This is because the NoSPIN prevents the driving torque from forcing one wheel to rotate faster than its opposite wheel.

When a vehicle is being driven in a straight-forward direction, the NoSPIN's clutch teeth and cams are fully engaged and give both the rear wheels driving torque. The clutch teeth and cams are so positioned that neither wheel can turn more slowly than ring-gear speed. If one wheel should lose traction momentarily by rolling onto ice or snow, or over a soft shoulder of the road, the opposite wheel, which still has traction, continues to pull the vehicle until traction is regained by both the wheels.

In normal operation when the right rear wheel passes over an obstruction, or if the vehicle makes a left turn, the right wheel must travel faster and farther than the left wheel. When this happens, the NoSPIN automatically allows for this difference in wheel travel. The spider continues to drive the left wheel as the left clutch teeth remain completely engaged. But as the right wheel forces ahead, the right driven clutch member instantly rises on the incline of the center cam ring and over as many teeth as may be necessary for wheel speed compensation during the turn or passing over the obstruction. When the vehicle is again back on the straightway or on smooth highway, the disengaged clutch is automatically returned to its full clutch tooth engagement.





Installation of the NoSPIN

General Information:

Installation of the NoSPIN differential is accomplished by the following procedure.

Step 1. Place the steering locks on both the steering cylinders.

Step 2. Remove the axle from the tractor as follows:

A. Disconnect the drive shaft from the differential yoke.

B. Remove the axle to the frame bolts.

C. Jack and block the tractor to a height that will allow the axle to clear the frame when rolled out on the tires. The tires will not have to be removed.

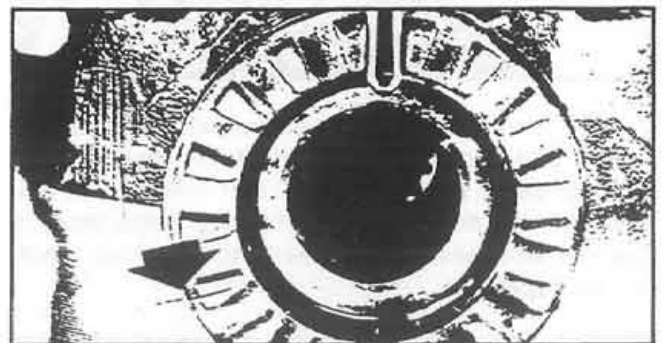
Step 3. Disassemble the axle differential section as outlined in Steps 1 through 7 and 23 through 27.



WARNING: Do not allow anyone under tractor when jacking or hoisting tractor from axle. When the tractor frame is raised from the axle the differential section will roll down. Be sure to clear the area under the differential section. Be sure the tractor is securely blocked when axle is removed.



Step 4. Remove the carrier assembly from the vehicle. Before dismantling the assembly, be sure that each bearing cap is marked as to its position on the carrier bearing saddles (right or left side). If the caps are not identified, mark them with a prick punch or chisel to assure proper reassembly. If the caps are reversed (as they can be in some assemblies), this might affect bearing alignment.

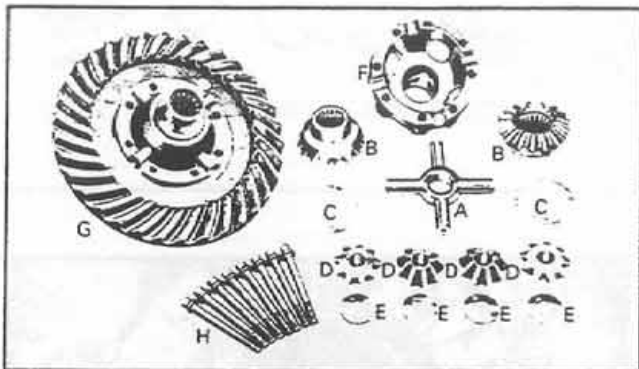


NOTE: Follow steps.

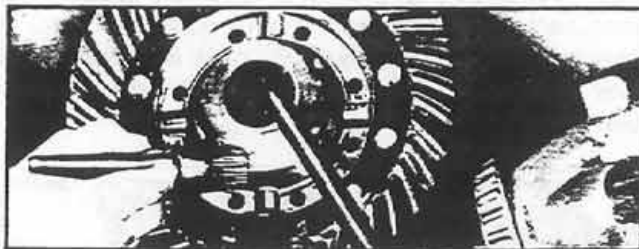
Step 5. The NoSPIN does not affect bearing adjustment. Time can usually be saved by marking the original position of the differential bearing adjusting nuts, locks, rings or caps with a prick punch or cold chisel. Then when reassembling, the adjusting nuts are turned until the locks can be placed in the same position (the marks aligned as shown). If the axle is new,

Steiger K598 Axle

very probably the factory adjustment was correct, and it may be assumed that the bearings are properly adjusted. If the axle is used, a new adjustment may have to be made. In either event, the final adjustment should be verified according to the manufacturer's recommendations.



Step 6. Open the differential gear support case (F). Then lift it out and discard the old differential assembly (Part A through E should be discarded; Parts F, G and H should be retained). The NoSPIN replaces the spider (A), side gears (B), pinion gears (D) and all of the thrust washers (C and E) of the original differential. Do not remove the cone assemblies from the differential gear support case (F) or the cover (F) if the bearings (not shown) are to be reused.



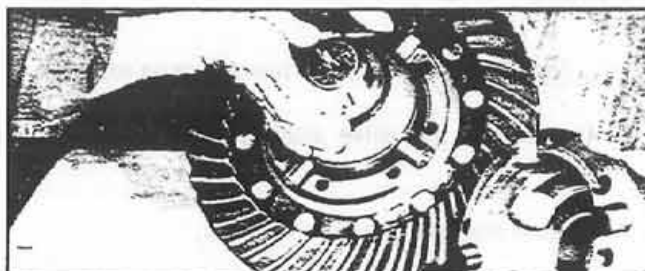
Step 7. Thoroughly clean all of the parts that may be reused (the ring gear with half of the case and the bearing cone, the loose case half (cover) and the bearing cone, and the bolts and nuts). Rinse them in clean solvent and dry. Set these parts on a clean bench top for inspection.



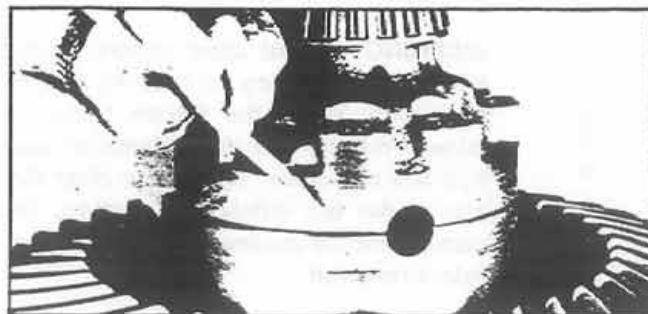
Step 8. Carefully examine the differential case. If trunnion holes are worn or scored, or if the thrust surfaces on the inside ends of the differential case are worn or scored, the case should be replaced. Examine the threads of all the bolts and nuts or capscrews. Replace those which show indications of being stripped or damaged. At this time it is a good practice to carefully examine the bearings and the ring gear for wear or damage. Be sure all the thrust washers have been removed from the differential case.



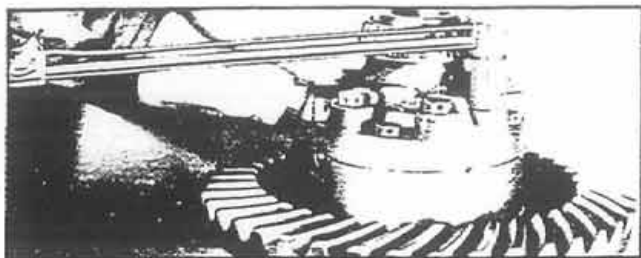
Step 9. Clean the axle shafts and examine the splined ends. Remove any roughness or burrs with a file or stone.



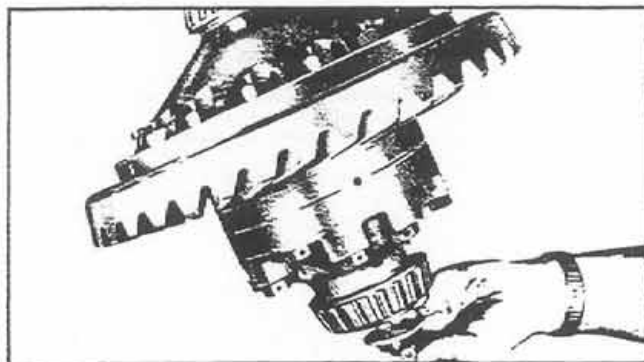
Step 10. Place the NoSPIN assembly in the differential case. (For good performance, a snug fit of the differential case around the trunnions of the spider is absolutely necessary). Do not remove the retainer bolt, nut and washers from the NoSPIN assembly at this time.



Step 11. Position the differential case halves around the NoSPIN. If the case halves are marked for proper alignment, be sure they are properly aligned!

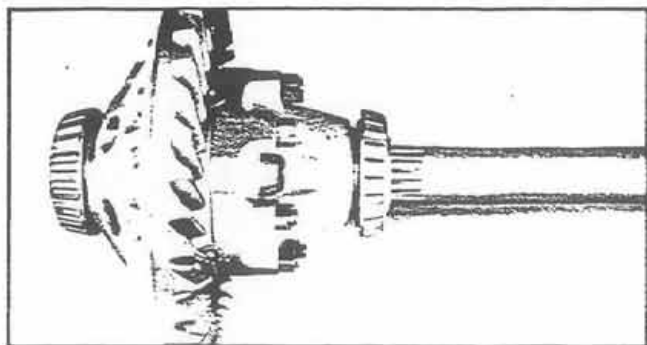


Step 12. Install the bolts and nuts or the capscrews, whichever used. Tighten them snugly but do not over-torque and strip the threads. If capscrews are used, do the final tightening with a torque wrench. Recheck the fit between the spider trunnions and the case. As mentioned before, a loose fit between the spider and the case can stand in the way of the successful performance of the NoSPIN.



Step 13. Remove the NoSPIN retaining bolt, nut and washers. Discard or retain for future use, if desired.

IMPORTANT: Check for the spacer slug in the center of the NoSPIN. This slug provides the end thrust bearing surface for both the axles. If it is not in the NoSPIN, the axles will slide out of the hub planetaries and ruin the gears. Be sure to check the axle end clearance as outlined previously in the service manual.



Step 14. Before assembling into the axle carrier and housing, check the splined end of the axle shafts for a free sliding fit into the side gear (as shown). See

the "Important Note" below. Follow the manufacturer's instructions for finishing installation—Reassembly NoSPIN— equipped ring gear and carrier assembly in the axle housing. Adjust the differential bearings if required. Check for proper fit of the thrust blocks, etc. Refill the axle housing with the lubricant recommended.

IMPORTANT: Upon the final assembly, the axle shafts should slide freely into the side gear splines. Do not attempt to force a shaft to fit by driving it into place or drawing it into place when tightening the studs or nuts at the flange end. This may compress the springs in the NoSPIN and cause it to malfunction.

Step 15. Reassemble the differential as outlined in the Service Manual.

NOTE: No adjustment can be made to the NoSPIN. All the normal differential adjustments are required upon reassembly of the ring gear and the pinion drive shaft.

